

## References:

- Aagaard, K., Carmack E.C., 1989: The Role of sea ice and other fresh Water in the Arctic circulation. *J. Geophys. Res.*, 94 (C10), 14485-14498.
- Aagaard, K., D. Darby, K. Falkner, G. Flato, J. Grebeier, C. Measures, and J. Walsh, 1999: *Marine Science in the Arctic: A strategy*. Arctic Research Consortium of the United States (ARCUS), Fairbanks, AK, 84 pp.
- Abaimov A., Zyryanova O., Prokushkin A., 2002: Long-term investigations of larch forests in cryolithic zone of Siberia: brief history, recent results and possible changes under global warming. *Eurasian J. For. Res.* 5, No.2, 95-106.
- Aber J.D. and Driscoll C.T., 1997: Effects of land use, climate variation, and N deposition on N cycling and C storage in northern hardwood forests. *Global Biogeochem. Cycles*, 11, 639-648.
- Abrazko V.I., 1992: Soil water regime in spruce forests of southern taiga. *Russian J. of Forest Science "Lesovedenie"*, No. 1, 50-58 (in Russian)
- Abushenko, N.A., S.A. Bartalev, A.I. Belyaev, D.V. Ershov, M.Yu. Zakharov, Ye.A. Loupian, G.N. Korovin, V.V. Koshelev, Yu.S. Krashennnikova, A.A. Mazurov, N.P. Min'ko, R.R. Nazirov, S.M. Semenov, S.A. Tashchilin, Ye.V. Flitman, and V.Ye. Shchetinskiy, 1999: Near real-time satellite monitoring of Russia for forest fire protection, *Mapping Science and Remote Sensing*, 36, No.1, 54-61.
- Abushenko, N.A., V.V. Koshelev, N.P. Minko *et al.*, 1998: Registration of forest fire by AVHRR/NOAA data for territories of East Russia. In: V.I. Sukhikh (ed.), *Air and Satellite Methods and Geographical Information Systems in Forestry and Forest Management*, Materials of the 2nd All-Russia Meeting, Moscow, 18–19 November 1998. RAS and Federal Forest Service, Moscow, 170–171 pp. (in Russian).
- Acevedo, M.F., Urban D.L. and Shugart H.H., 1996: Models of forest dynamics based on roles of tree species. *Ecological Modeling*, 87, 267-284.
- Adams, J.B., Smith, M.O., 1986: Spectral Mixture Modeling: A New Approach to Analysis of Rock and Soil Types At The Viking Lander 1 Site, *J. Geophys. Res.*, 91, 8098-8112.
- Adler, R. F., C. Kidd, G. Petty, M. Morrissey, and H. Goodman, 2001: Intercomparison of global precipitation products: The third Precipitation Intercomparison Project (PIP-3). *Bull. Amer. Meteor. Soc.*, 82, 1377–1396.
- Adler, R. F., G.J. Huffman, D. T. Bolvin, S. Curtis, and E. J. Nelkin, 2000: Tropical rainfall distributions determined using TRMM combined with other satellite and rain gauge information. *J. Appl. Meteor.*, 39, 2007–2023.
- Adler, R. F., Huffman, G. J., Chang, A., Ferraro, R., Xie, P., Janowiak, J., Rudolf, B., Schneider, U., Curtis, S., Bolvin, D., Gruber, A., Susskind, J., Arkin, P., Nelkin, E., 2003: The Version-2 Global Precipitation Climatology Project (GPCP) Monthly Precipitation Analysis (1979–Present). *J. Hydrometeorol.* 4, 1147–1167.
- Adler, R. F., Kummerow, C., Bolvin, D., Curtis, S., Kidd, C., 2003: Status of TRMM Monthly Estimates of Tropical Precipitation. *Meteorol. Monogr.*, 29, 223–223.
- Agrawala, S., M. Barlow, H. Cullen, and B. Lyons. 2001: The Drought and Humanitarian Crisis in Central and Southwest Asia: A Climate Perspective of Climate, IRI Report. <http://iri.columbia.edu/outreach/publication/irireport/SWAsia/index.html>
- Ahern, F.J., J.G. Goldammer, and C.O. Justice, 2001: *Global and Regional Vegetation Fire Monitoring from Space: Planning a Coordinated International Effort*. SPB Academic Publishing. The Hague, 303 pages
- Ahern, F.J., A.C. Janetos and E. Langham, 1998: Global observation of forest cover: A CEOS integrated observation strategy. Proceedings of 27th International Symposium on Remote Sensing of Environment, Tromsø, Norway, 8–12 June, pp. 103–105.
- Aizen V. B., Aizen E. M., Melack J., Dozier 1997a: Climate and Hydrologic Changes in the Tien Shan, Central Asia. *J. Climate*, 10, 1393-1404.
- Aizen V.B., Aizen E.M. 1997. Hydrological Cycle on North and South Peripheries in Mountain-Glacial Basins of Central Asia. *Hydrological Processes*, 11, 451-469.
- Aizen, E. M, V. B.Aizen, J. M. Melack, and A. N. Krenke. Heat exchange during snow ablation in plains and mountains of Eurasia. *J. Geophysical Research-Atmospheres*. 105, D22, 27,013-27,022, 2000b.
- Aizen, V. B., E. M. Aizen, J. Dozier, J.Melack, D. Sexton, V. Nesterov. 1997b. Glacial regime of the highest Tien Shan mountains, Pobeda-Khan Tengry massive. *J. of Glaciology*, 43,. 503-512,
- Aizen, V. B., E. M. Aizen, J.Melack. 1996: Precipitation, melt and runoff in the Northern Tien Shan, *J. Hydrology*, No. 186, 229-251.
- Aizen, V. B., E.M. Aizen, J. M. Melack, K. J. Kreutz and L. DeWayne Cecil, 2004: Association between atmospheric circulation patterns and firn-ice core records from the Inilchek Glacier, Central Tien Shan Mountains, Asia. *J. Geophys. Res.*, 109, No. D8, D08304, Paper No. 10.1029/2003JD003894.
- Aizen, V. B., E. M. Aizen, G. E. Glazirin, and H. A. Loaiciga. 2000a: Simulation of daily runoff in Central Asian alpine watersheds. *J. Hydrology*, No. 238, 15-34.
- Aizen, V.B., E. Aizen, K.Fujita, K.J.Kreutz, S.A. Nikitin. 2004: Isotopes time series from the Altai glaciers, Siberia, recovered from firn-cores and snow samples. *J. Glaciology*, (submitted)
- Aizen, V.B., E. Aizen, K.J.Kreutz, K.Fujita, L.D. Cecil, S.A. Nikitin. 2004: Approaches for Ice-Core Climatic Reconstruction in Central Asia. *KluwerAcademic Publishing*, in Book: Editors: L.D. Cecil, L.G. Thompson and J.R. Green. "Earth Paleoenvironments: Records Preserved in Mid- and Low Latitude Glaciers. Developments in Paleoenvironmental Research (Editors: L.Cecil. L.Thomson, G. Green), Volume 9, 2004, 248 pp.
- Aizen, V.B., V.A. Kuzmichenok, E.M. Aizen. The Tien Shan glacier's recession during last 100-130 years by land instrumental and satellite remote sensing data. *Journal of Glaciology*, 2003b (submitted).
- Aizen,V.B., E.M. Aizen. 1998: Estimation of glacial runoff to the Tarim River, Central Tien Shan. Proceedings of International Symposium "WaterHead'98", Merano, ITALY, *IAHS Publ.*, No 248, pp.191-199, 1998.
- Aleksandrova V.D., 1988: *Vegetation of the Soviet Union polar desert*. Cambridge University Press, UK. 228 pp.
- Alekseev V.G., 1994: *Plant stability in the North environment*. Moscow, Verlag "Nauka", 150 pp.

- Alewell, C., 2001: Predicting reversibility of acidification: the European sulphur story. *Water, Air, and Soil Pollution*, 130, 1271-1276.
- Alexander T., 1975: *Changes in World Climate. America*. 1975. No. 223, 23-27. (in Russian)
- Alexeev, V. A., E. M. Volodin, V. Ya. Galin, V. P. Dymnikov, and V.N. Lykosov, 1998: Modelling of the Present-Day Climate by the Atmospheric Model of INM RAS "DNM GCM". Description of the Model Version A5421 (Year 1997) and the Results of AMIP II Simulations. Institute of Numerical Mathematics RAS, Moscow, 225 pp.
- Alexeyev V., Birdsey R.A., Stakanov V.D. and Korotkov I.A. 2000. Carbon storage in the Asian boreal forests of Russia. *Ecological Studies*, 138. Springer Verlag. New York. 239-257.
- Alexeyev, V.A. and Birdsey, R.A., 1998: Carbon storage in forests and peatlands of Russia. General Technical Report, NE-244, USDA FS, 137 pp.
- Allen, M. R. and W. J. Ingram, 2002: Constraints on future changes in climate and the hydrological cycle. *Nature*, 419, 224-232
- Alsdorf, D., D. Lettenmaier, and C.J. Vörösmarti, 2003: The need for global, satellite-based observations of terrestrial surface water. *EOS*, 84, 269, 275-276.
- Alton C., and L. Fred, 1981: Prediction of snow-water equivalents in coniferous forests. *Can. J. Forest Res.* 7, No. 4, 854-857.
- AMAP, 2002: Arctic Pollution 2002. Arctic Monitoring and Assessment Programme (AMAP). Oslo, Norway. 113 pp.
- AMAP, 2002: *Arctic Pollution 2002: Persistent Organic Pollutants, Heavy Metals, Radioactivity, Human Health, Changing Pathways*. Oslo, Norway, Arctic Monitoring and Assessment Programme (AMAP). xii+112 pp.
- AMAP, 2003: AMAP Assessment 2002: Human Health in the Arctic. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway. 137 pp.
- AMAP. 2003: *AMAP Assessment 2002: Human Health in the Arctic*. Oslo, Norway, Arctic Monitoring and Assessment Programme (AMAP): xiv+137 pp.
- American Geophysical Union (AGU), 2003: AGU Position statement on Human Impacts on Climate, Adopted by AGU Council, December 2003. *EOS*, 84, 574.
- Amthor, J.S., J.M. Chen, J.S. Clein, S.E. Frolking, M.L. Goulden, R.F. Grant, J.S. Kimball, A.W. King, A.D. McGuire, N.T. Nikolov, C.S. Potter, S. Wang, and S.C. Wofsy. 2001: Boreal forest CO<sub>2</sub> exchange and evapotranspiration predicted by nine ecosystem process models: Intermodel comparisons and relationships to field measurements. *J. Geophys. Res. – Atmos.* 106, 33,623-33,648.
- Andreeva, O.V. and Kust, G.S., 1999: Mapping and Assessment of Desertification / Soil Cover Degradation in Russian Federation. In: *Desertification and Soil Degradation*. Proc. of the Int. scientific conf., Moscow, 273-284.
- Angelstam, P., Majewski, P. and Bondrupnielsen S., 1995: West-East cooperation in Europe for sustainable boreal forests. *Water, Air and Soil Pollution*, 82, 3-11.
- Anisimov, O., et al., 2001: Polar Regions (Arctic and Antarctic), in "Climate Change: Impacts, Adaption and Vulnerability, the Contribution of Working Group II of the Intergovernmental Panel on Climate Change, Third Assessment Review." Cambridge University Press, 801-841.
- Anisimov, O.A. and M.A.Belolutskaia, 2002. Assessment of the impacts of climate change and degradation of permafrost on infrastructure in the northern Russia. *Russian Meteorol. Hydrol.*, 2002, No. 9: 15-22 (in Russian).
- Anisimov, O.A., A.A. Velichko, P.F. Demchenko, A.V. Eliseev, I.I. Mokhov, and V.P. Nechaev, 2002b: Effect of climate change on permafrost in the past, present, and future. *Izvestiya, Atmos. Ocean. Phys.* 38 (S1), S25-S39.
- Anisimov, O.A., Shiklomanov, N.I., and F.E. Nelson, 2002: Variability of Seasonal Thaw Depth in Permafrost Regions: A Stochastic Modeling Approach. *Ecological Modeling*, 153, 217-227.
- Anisimov, O.A., Shiklomanov, N.I., and Nelson, F.E., 1997: Effects of global warming on permafrost and active-layer thickness: results from transient general circulation models. *Global and Planetary Change*, 15(2), 61-77.
- Antoine, D. and Co-Authors, 2003: In search of long-term trends in ocean color. *EOS*, 84, 301, 308-308.
- Antonevich, V.D. and Litvyakova, L.A., 1979: Peculiarities of time series of wind speed. *Transactions of the Main Geophys. Observ.*, 425, 42-46 (in Russian).
- Antonovsky, M.Ja., V.M. Buhstaber, L.S. Veksler and Zh.P. Malingro, 1992: Statistical analysis of data on global vegetation index. In: *Problems of ecological monitoring and ecosystems modeling*. Vol. VI, St. Petersburg, Hydrometeoizdat, 153-173 (in Russian).
- Aoki S., J. Asanuma, J. Kim, T. Choi, H. Lee, Z. Gao and J. Wang., 2001: Scaling Analysis of the Turbulence Heat Transfer over the Tibetan Plateau with Wavelet Transform of the Naqu Flux Site Data during GAME-Tibet IOP'98, *Proc. GAME ANN/Radiation Workshop*, Phuket, 79-80.
- Apps, M.J., W.A. Kurz, R.J. Luxmoore, L.O. Nilsson, R.A. Sedjo, R. Smidt, L.G. Simpson, T.S. Vinson, 1993: Boreal forests and tundra. *Water, air and soil pollution*, 70, 39-53.
- Archer S., Boutton T.W. and Hibbard K.A., 2001: Trees in Grasslands: Biogeochemical consequences of woody plant expansions. In: *Global Biogeochemical Cycles in the climate system*. (Eds. E.-D.Schulze, M.Haimann, S. Harrison, S. Holland, J.Lloyd, C.Prentice, and D. Schimel). Academic Press, San Diego, 115-138.
- Archer S., Schimel D.S. and Holland E.A., 1995: Mechanisms of shrubland expansion: land use, climate of CO<sub>2</sub>. *Climate Change*, 29, 91-99.
- Arctic Climate Impact Assessment (ACIA) Report 2004: International Arctic Research Center, University Alaska Fairbanks, Fairbanks, AK, *in preparation*
- Arctic Ecosystems in a Changing Climate* (Eds. F.S.Chapin III, Jefferies J.F., G.R.Shaver, and I. Svoboda), 1992: Academic Press, San Diego. 469 pp.
- Arctic Pollution*, 2002: AMAP, Arctic Monitoring and Assessment Programme, Oslo, 112 pp.
- Are, F.E. ,1999: The role of coastal retreat for sedimentation in the Laptev Sea. In: Kassens, H., Bauch, H.A., Dmitrienko, I.A., Eicken, H., Hubberten, H.-W., Melles, M., Thiede, J., Timokhov, L.A. (eds.) *Land-Ocean Systems in the Siberian Arctic*, Springer-Verlag, Berlin, 287-298.

- Arendt, A.A., Echelmayer, K.A., Harrison, W.D., Lingle, C.S., and Valentine, V.B., 2002: Rapid wastage of Alaskan glaciers and their contribution to rising sea level. *Science* 297: 382-86.
- Arkipov, V.I., A.N. Sarmanaev and V.G. Alekhin, 1992: Accounting and estimation of forest resources by remote methods. *Forestry*, No. 4–5, 28–29 (in Russian).
- Arkin, P. A., R. Joyce, and J. E. Janowiak, 1994: IR techniques: GOES Precipitation Index. *Remote Sens. Rev.*, 11, 107–124.
- Arkin, P. A. and B. N. Meisner, 1987: The relationship between large-scale convective rainfall and cold cloud over the Western Hemisphere during 1982–1984. *Mon. Wea. Rev.*, 115, 51–74.
- Armand D.L., 1955: Historical past of the contemporary steppe and forest steppe regions' environment. In: *Importance of the V.V. Dokuchaev's ideas for drought management*. Moscow, .738 pp. (in Russian).
- Armstrong, R. R.G.Barry, A.N.Krenke, T.G.Kadomtzeva, L.M.Kitaev, 1997: Monitoring snow cover fluctuations in the FSU using surface station data and passive microwave remote sensing. *Materials of glaciological studies*, 81, Moscow, VINITI, 179 - 192. (In English).
- Armstrong, R.L and M. J. Brodzik, 2001: Recent Northern Hemisphere snow extent: A comparison of data derived from visible and microwave satellite sensors. *Geophys. Res. Lett.*, 28, 3673-3676.
- Arnell N.W., 1999: Climate change and global water resources. *Global Environmental Change*, No 9, 31-49.
- Arneth A., Kurbatova J., Lloyd D., Kolle O., Schibistova O., Vygodskaya N.N. and Schulze E.-D. and Lloyd J., 2002: Ecosystem-atmosphere exchange of energy and mass in a European Russia and a central Siberia bog. 11. Internseasonal and interannual variability of CO<sub>2</sub> fluxes. *Tellus*, 54B (5), 514-530.
- Arneth A., Lloyd J., Santruckova H., Bird M., Grigoriev S., Kalaschnikov Y.N., Gleixner G. and Schulze E.-D. 2002: Response of central Siberia Scots pine to soil water deficit and long-term trends in atmospheric CO<sub>2</sub> concentration. *Global Biogeochemical Cycles*. 16, 5-1 – 5-13.
- Arora, V., 2002: Modeling vegetation as a dynamic component is soil-vegetation-atmosphere transfer schemes and hydrological models. *Review of Geophysics*, 40 (2), 1006, doi:1029/2001RG000103.
- Arora, V.K., and G.J. Boer, 2001: Effects of simulated climate change on the hydrology of major river basins, *J. Geophys. Res.*, 106 (D4), 3335-3348
- Artzybashev, E.S., 1974: *Forest fires and combating them*. Forest Industry, 150 p. (in Russian).
- Asian Change in the Context of Global Change* (Eds. J.Galloway and J.M.Meilillo), 1998: Internal Geosphere-Biosphere Publication Series, 3. Cambridge University Press. 378 pp.
- Asmus, V.V., O.N. Grigoryeva, V.A. Krovotynzev and S.V. Shvarev, 1998: Space monitoring of influence zone of projected railway in the North of Russia: Fragment of landscape cartographic base. In: A.S. Isaev and V.I. Sukhikh (eds.), *Aerospace Methods and Geoinformation Systems in Forestry and Forest Management*, Moscow, 51–56 (in Russian).
- Aurela, M., J.-P. Tuovinen, T. Laurila, 2001: Net CO<sub>2</sub> exchange of a subarctic mountain birch. *Theor. Appl. Climatol.*, 70, 135-148.
- Aurora, V.K., and G.J. Boer, 2001: Effects of simulated climate change on the hydrology of major river basins, *J. Geophys. Res.*, 106 (D4), 3335-3348.
- Avissar, R., C.P. Weaver, D. Werth, R.A. Pielke. Sr., R. Rabin, A.J. Pitman, and M. A. Silva Dias, 2004: The regional climate. Chapter A.3. pp. 21-32. In: Kabat, P., M. Claussen, P.A. Diermeier, J.H.C. Kash, L. Bravo de Guenni, M. Meibeck, R.A. Pielke, Sr., C.J. Vörösmarty, R.W.A. Hutjes, and S. Lütkemeier (Eds.), 2004: *Vegetation, Water, Humans and the Climate - A New Perspective on an Interactive System*. Springer Verlag, Amsterdam, 600 pp.
- Bakhtinova, E.V. and N.G. Fedorov, 1987: Implementation of large-scale air-photo images the inventory of recreation forests. *Forestry*, No. 12, 51–52 (in Russian).
- Baldocchi, D., Vogel, C., and Hall, B., 1997: Seasonal variation of energy and water vapor exchange rates above and below a boreal jack forest canopy. *J. Geophys. Res.*, 102, 28, 939-28, 951.
- Baldocchi, D., E. Falge, L. Gu, R. Olson, D. Hollinger, S. Running, P. Anthoni, C. Bernhofer, K. Davis, R. Evans, J. Fuentes, A. Goldstein, G. Katul, B. Law, X. Lee, Y. Malhi, T. Meyers, W. Munger, W. Oechel, K. U, K. Pilegaard, H. Schmid, R. Valentini, S. Verma, T. Vesala, K. Wilson, and S. Wofsy, 2001: FLUXNET: A new tool to study the temporal and spatial variability of ecosystem-scale carbon dioxide, water vapor, and energy flux densities. *Bull Amer.Meteorol. Soc.* 82, 2415-2434.
- Baldocchi, D.D., Kelliher, F.M., Black, T.A., and Jarvis, P., 2000: Climate and vegetation controls on boreal zone energy exchange. *Global Change Biology* 6, 69-83.
- Baldocchi, D.D., Valentini, R., Running, S., Oechel, W.C., Dahlman, R., 1996: Strategies for measuring and modelling carbon dioxide and water vapor fluxes over terrestrial ecosystems. *Global Change Biology*, 2, 159-167.
- Balzer, H., E. Talmon, W. Wagner, D. Gaveau, S. Plummer, J.J. Yu, S. Quegan, M. Davidson, Thuy Le Toan, M. Gluck, A. Shvidenko, S. Nilsson, K. Tansey, A. Luckman, C. Schmullius, 2002: Accuracy assessment of a large-scale forest cover map of Central Siberia from Synthetic Aperture Radar, *Canadian Journal of Remote Sensing*, 28, 719-737.
- Baranchikov Ju.N., Perevoznikova V.D., Vishniakova Z.B., 2002: Carbon emissions from soils of Siberian moth-damaged forests *Russian J. of Ecology*, 4, 51-75 (in Russian).
- Baranov, Yu.B., Yu.K. Korolev and S.A. Miller, 1997: Software for remote sensing data processing. *Informational Bulletin of GIS-Association*, No. 2 (9), 43–45 (in Russian).
- Barber, K.E. , 1981: *Peat stratigraphy and climate change. A palaeoecological test of the theory of cyclic peat bog regeneration*. Balkema, Rotterdam, The Netherlands. 219 pp.
- Barkstrom, B.R. and Co-Authors, 1989: The Earth Radiation Budget Experiment (ERBE) archival and April 1985 results. *Bull. Amer. Meteorol. Soc.*, 70, 1254-1262.
- Barkstrom, B.R., 1984: The Earth Radiation Budget Experiment (ERBE). *Bull. Amer. Meteorol. Soc.*, 65, 1170-1185.
- Barr, A. G., King, K. M., Gillespie, T. J., den Hartog, G., Neumann, H. H., 1994: A comparison of Bowen ratio

- and eddy correlation sensible and latent heat flux measurements above deciduous forest, *Boundary-Layer Meteorol.*, 71, 21-41.
- Barret, K., Schaug, J., Bartonova, A., Semb, A., Hjelbrekke, A.-G., Hanssen, J.E., 2000: Europe's Changing Air Environment. Two Decades of Trends in Acidifying Atmospheric Sulphur and Nitrogen in Europe; 1978 – 1998. EMEP/CCC-Report 7/2000, NILU, 193 pp.
- Barry, R.G., 1992: *"Mountain Weather and Climate"*, Routledge, London-New York, 402 pp.
- Bartalev S.A., Ershov D.V. and Isaev A.S., 1998: Estimation of forest defoliation with multi-spectral satellite images by a spectral mixture decomposition method. *Earth Observation from Space*, No. 3, 95 -107 [in Russian].
- Bartalev, S., Achard, F., Erchov, D., and Gond, V., 2000: The potential contribution of SPOT4/VEGETATION data for mapping Siberian forest cover at the continental scale. In proceedings of the VEGETATION Workshop held in Belgirate, Italy 3rd to 6th April 2000, (CNES: Toulouse, France), 127 – 142.
- Bartalev, S., M. Deshayes, S. Durrieu, G. Fabre, N. Stach, and V. Sukhikh, 1997: Monitoring by change detection in three different forest environments, Proceedings International Workshop Applications of Remote Sensing in European forest Monitoring, Vienna, 14-16 October 1996, Report EUR 17685 EN, 293-308.
- Bartalev, S.A., 1998: Development of methods for processing of satellite images, geoinformation systems and GIS technologies to provide forest monitoring. In: A.S. Isaev and V.I. Sukhikh (eds.), *Aerospace Methods and Geoinformation Systems in Forestry and Forest Management*, Moscow, 58–61 (in Russian).
- Bartalev, S.A., A.S. Belward, 2002: Land cover and phenological monitoring in boreal ecosystems using the SPOT - VEGETATION instrument: new observations for climate studies. In proceedings of the Use of Earth Observation data for phenological monitoring workshop held in Joint Research Centre, Ispra (VA) Italy 12th -13th December 2002, 41-48.
- Bartalev, S.A., A.S. Belward, D. V. Erchov, and A. S. Isaev, 2003: A new SPOT4-VEGETATION derived land cover map of Northern Eurasia, *International Journal of Remote Sensing*, 24, 1977 – 1982
- Bartalev, S.A., V.M. Zhirin and D.V. Ershov, 1995: Comparative analysis of data from satellite systems "Kosmos-1939", SPOT and LANDSAT-TM for boreal forest investigations. *Issledovaniya Zemli iz Kosmosa*, No. 1, 101–114 (in Russian).
- Bartholomé E. and A.S. Belward, 2005: GLC2000: a new approach to global land cover mapping from Earth Observation data, *Int. J. Remote Sensing*, in press
- Bartholomé E., A.S. Belward, F. Achard, S. Bartalev, C. Carmona-Moreno, H. Eva, S. Fritz, J-M. Grégoire, P. Mayaux and H-J. Stibig, 2002: GLC 2000 - Global Land Cover mapping for the year 2000 - Project status November 2002, Publ. of the European Commission, JRC, Ispra, Italy, EUR 20524 EN, pp. 55.
- Bauch H.A., Kassens H., Naidina O.D., Kunz-Pirung M., and J.Thiede, 2000: Composition and flux of Holocene Sediments on the Eastern Laptev Sea Shelf, Arctic Siberia, *Quaternary Res.*, 55, 344-351.
- Bauer G. and Vygodskaya N.N., 2002: Fire and site type effects on the long-term carbon and nitrogen balance in pristine Siberian Scots pine forest. *Plant and soil* ,242, 41-63.
- Bayrich, F., Richter, S.H., Weisensee, U., Kohsiek, W., Lohse, H., De Bruin, H.A.R., Foken, Th., Gookede, M., Berger, F., Vogt, R., Batchvarova, E., 2002: Experimental determination of turbulent fluxes over the heterogeneous LITFASS area: Selected results from the LITFASS-98 experiment, *Theor. Appl. Climatol*, 73, 19-34.
- Bazilevich, N.I., 1993: *Biological productivity of ecosystems of Northern Eurasia*. Moscow, "Nauka", 293 pp. (in Russian).
- Bazykin A.I., Berezovskaya F.S., Isaev A.S., Khlebopros R.G., 1993: Parametric justification of the stability principle for the dynamics of the system "phytophage – entomophage". *Transactions of the Academy of Sciences*, 333, 673-675 (In Russian).
- Becker A. 1992: Criteria for hydrologically sound structuring of large scale land surface models. In: *Advances in Theoretical Hydrology: A Tribute to James Dooge*. Ed. J. P. O'Kane. European Geophysical Society Series on Hydrological Sciences, 97-111
- Beljaars, A.C.M. and F. Bosveld., 1997: Cabauw data for the validation of land surface parameterization schemes, *J. Climate*, 10, 1172-1193.
- Belokrylova, T.A., 1989: On changes in the near-surface wind speed over the USSR territory. *Transactions of the All-Union Inst. For Hydrometeorol. Information*, 150, 38-47 (in Russian).
- Belyaev, A.V. and Georgiadi, A.G., 1992: Annual mean discharges of rivers during the last Interglacial and Holocene Climatic Optima. In: *Atlas of Paleoclimates and Paleoenvironments of the Northern Hemisphere. Late Pleistocene-Holocene*. Gustav Fesher Verlag, Stuttgart, Budapest, 133-134
- Bendat, J.S., Piersol, A.G., 1967: *Measurement and analysis of random data*, New York, 402 pp.
- Berendse F., Aerts R., and Bobbink R., 1993: Atmosphere nitrogen deposition and its impact on terrestrial ecosystems. In: *Landscape Ecology of Stressed Environment* (Eds. C.C.Vos and P.Opdam). 104-121. Chapman & Hall. London.
- Berezin, V.I., 1995: Inventory of hydro-forest-melioration systems based on air space images. *Forestry*, No. 6, pp. 28–30 (in Russian).
- Berg J., Linder S., Lundmark T., Elfving B., 1999: The effects of water and nutrient availability on the productivity of Norway spruce in northern and southern Sweden. *For. Ecol.Manage.*, 119, 51-62.
- Berg L.S., 1911: *On climatic changes during the historical epoch*.- Moscow, 98 pp. (in Russian)
- Berg L.S., 1947: Some thought about the post-glacial climatic changes and the forest-steppe zone. *Geography Issues, "Voprosy Geografii"* Вопросы географии.- Moscow, Geographgiz., 23. 57-84. (in Russian).
- Berg, B. and Matzner, E., 1997: The effect of N deposition on the mineralization of C from plant litter and humus. *Environ. Rev.*, 5, 1-25.
- Bergen, K. and co-authors, 2003b: Forest dynamics in the East Siberian boreal forest: Analysis using time series statistical and satellite data. Proc. of the 18th Annual Symposium International Association for Landscape Ecology-US Chapter, Banff Centre, Alberta, Canada.

- Bergen, K., Conard, S., Houghton, R., Kasischke, E., Kharuk, V., Krankina, O., Ranson, J., Shugart, H., Sukhinin, A., Treyfield, R. 2003: NASA and Russian scientists observe land-cover/land-use change and carbon in Russian forests. *Journal of Forestry* 101(4): 34-41.
- Berger A., 2001: The role of CO<sub>2</sub> sea-level and vegetation during the Milankovitch-forced glacial-interglacial cycles. In: *Geosphere-Biosphere Interaction and Climate*. (Eds. L.O. Bengtsson, C.U. Hammer). Cambridge Univ. Press, New York 620 pp.
- Beringer, J., A.H. Lynch, F.S. Chapin, III, M. Mack, and G.B. Bonan, 2001: The representation of arctic soils in the Land Surface Model (LSM): The importance of mosses. *J. Climate*, 14, 3324-3335.
- Bernard, S. M., J. M. Samet, et al., 2001: The potential impacts of climate variability and change on air pollution-related health effects in the United States. *Environmental Health Perspectives*, 109, 199-209.
- Bernhofer, Ch., Estimating forest evapotranspiration at a non-ideal site, *Agric. Forest Meteorol.*, 60, 17-32, 1992.
- Bernhofer, Ch., Gay, L.W., Granier, A., Joss, U., Kessler, A., Köstner, B., Siegwolf, R., Tenhunen, J.D. and R. Vogt, 1996: The HartX-synthesis: An experimental approach to water and carbon exchange of a Scots pine plantation. *Theor. Appl. Climatol.*, 53, 173-183.
- Betts, A.K., and J.H. Ball, 1997: Albedo over the boreal forest. *J. Geophys. Res.*, 103, (D24), 28901-28909.
- Betts, R.A., 2000: Offset of the potential carbon sink from boreal forestation by decreases in surface albedo, *Nature*, 408 (6809), 187-190.
- Beyrich, F., Richter, S.H., Weisensee, U., Kohsiek, W., Lohse, H., De Bruin, H.A.R., Foken, Th., Gookede, M., Berger, F., Vogt, R., Batchvarova, E., 2002: Experimental determination of turbulent fluxes over the heterogeneous LITFASS area: Selected results from the LITFASS-98 experiment, *Theor. Appl. Climatol.*, 73, 19-34.
- Beyrich, F., 2000: LITFASS-98 Experiment 25.5.1998 - 30.6.1998 Experimental Report, Deutscher Wetterdienst Forschung und Entwicklung, Arbeitsergebnisse Nr. 62.
- Bezuglaya, E., and Zavadsкая, E., 1998: Influence of the air pollution on human health. *Trudy GGO (Proceedings of the Main Geophysical Observatory)*, 549, 171 - 199 (in Russian)
- Bihle Z., Molday H., Ross J., 1980: Mathematical modeling of plant transpiration and photosynthesis under soil moisture shortage. Leningrad, Verlag "Hydrometeoizdat", 223 pp.
- Bird M.I., Santruckova H., Arneith A., Grigoriev S., Gleixner G., Kalashnikov Y.N., Lloyd J. and Schulze E.-D., 2002: Soil carbon inventories and carbon-13 on a latitude transect in Siberia. *Tellus*, 54B, No.5, 631-641.
- Bird, E.C.F., 1996: *Beach Management*. Wiley, Chichester, 281 pp.
- Bird, E.C.F., 1993: *Submerging Coasts: The Effect of a Rising Sea Level on a Coastal Environments*. Wiley, Chichester, 184 p.
- Bishop, M.P. et al., 2000: Remote-sensing science and technology for studying glacier processes in High Asia. *Annals Glaciol.*, 31, 164-70.
- Blanken P. D. Black, T. A., Yang, P. C., Neumann, H. H., Nestic, Z., Stabler, R., den Hartog, G., Novak, M. D., Lee, X., 1997: Energy balance and canopy conductance of a boreal Aspen forest: Partitioning overstory and understory components, *J. Geophys. Res.*, 75, 1117-1121.
- Bliss, L.C., O.W. Heal, and J.J. Moore (Eds.), 1981: *Tundra Ecosystems: A Comparative Analysis*, Cambridge University Press. 813 pp.
- Bochkov A.P., and Ivanova I.B., 1972: Inflow of surface waters into the Sea of Azov and its possible changes In: *Proc. State Hydrological Inst., Leningrad*, 200, 149-186. (in Russian).
- Bockheim, J.G., Everett, L.R., Hinkel, K.M., Nelson, F.E., and Brown, J., 1999: Soil organic carbon storage and distribution in arctic tundra, Barrow, Alaska. *Soil Science Society of America Journal*, 63, 934-940.
- Bodanskii, E.D., L.A. Kuzenkov and R.I. Elman (1984). Technological approach for automatization and thematic processing of images. *Issledovaniya Zemli iz Kosmosa*, No. 1, 92-100 (in Russian).
- Boer, G. J., G. M. Flato, and D. Ramsden, 2000b: A transient climate change simulation with greenhouse gas and aerosol forcing: Projected climate change for the 21st century. *Climate Dyn.*, 16, 427-450.
- Boer, G. J., G. M. Flato, M. C. Reader, and D. Ramsden, 2000a: A transient climate change simulation with greenhouse gas and aerosol forcing: Experimental design and comparison with the instrumental record for the 20th century. *Climate Dyn.*, 16, 405-425.
- Bogdanova, E.G., Ilyin, B.M., and Dragomilova, I.V., 2002: Application of a comprehensive bias correction model to precipitation measured at Russian North Pole drifting stations. *J. Hydrometeorol.*, 3, 700-713.
- Boles, S.H., X.Xiao, J.Liu, Q. Zhang, S. Munkhtuya, S. Chen, and D. Ojima, 2004: Land cover characterization in temperate East Asia using multi-temporal VEGETATION sensor data. *Remote Sens. Environ.*, 90, 477-489.
- Bolin, B., R. Sukumar, P. Ciais, W. Cramer, P. Jarvis, H. Khesghi, C. Nobre, S. Semenov, and W. Steffen, 2000: Global perspective. In *Land Use, Land Use Change and Forestry*. R.T. Watson, I.R. Noble, B. Bolin, N.H. Ravindranath, D.J. Verardo, and D.J. Dokken (eds.), A Special report of the IPCC, Cambridge University Press, pp. 23-51.
- Bolortsetseg B., S.H. Bayasgalan B. Dorj, Natsagdorj L. and G. Tuvaansuren, 2000: IV Impact on agriculture. *Climate change and its impacts in Mongolia*, P. 96-198, Ulaanbaatar.
- Bonan, G.B., 1989a: Environmental factors and ecological processes controlling vegetation patterns in boreal forests. *Landscape Ecology*, 3, 111-130.
- Bonan, G.B., 1989b: A computer model of solar radiation, soil moisture and soil thermal regime. *Ecological Modeling*, 45, 275-306.
- Bonan, G.B., 1990a: Carbon and nitrogen cycling on North American boreal forests. I. Litter quality and soil thermal effects in interior Alaska. *Biogeochemistry*, 10, 1-28.
- Bonan, G.B., 1990b: Carbon and nitrogen cycling on North American boreal forests. II. Biogeographic patterns. *Canadian Journal of Forest Research*, 20, 1077-1088.
- Bonan, G.B., 1997: Effects of land use on the climate of the United States. *Climate Change*, 37, 449-486.
- Bonan, G.B., 1998: The land surface climatology of the NCAR Land Surface Model coupled to the NCAR Community Climate Model. *J. Climate*, 11, 1307-1326.

- Bonan, G.B., 2002: *Ecological Climatology: Concepts and Applications*. Cambridge University Press, Cambridge. 678 pp.
- Bonan, G.B., Chapin, F.S. III, and Thompson, S.L. 1995: Boreal forest and tundra ecosystems as components of the climate system. *Climatic Change* 29, 145-167.
- Bonan, G.B., D. Pollard, and S. L. Thompson, 1992: Effects of boreal forest vegetation on global climate, *Nature*, 359, 716-718.
- Bonan, G.B., K. J. Davis, D. Baldocchi, D. Fitzjarrald, and H. Neumann, 1997: Comparison of the NCAR LSM land surface model with BOREAS aspen and jack pine tower fluxes. *J. Geophys. Res.*, 102, 29 065-29 075.
- Bonan, G.B., K.W. Oleson, M. Vertenstein, S. Levis, X. Zeng, Y. Dai, R.E. Dickinson, and Z.-L. Yang, 2003: The land surface climatology of the Community Land Model coupled to the NCAR Community Climate Model. *J. Climate*, in press.
- Bonan, G.B., S. Levis, S. Sitch, M. Vertenstein, and K.W. Oleson, 2004: A dynamic global vegetation model for use with climate models: concepts and description of simulated vegetation dynamics. *Global Change Biology*, submitted.
- Bonan, G.B., Shugart H.H., 1989: Environmental factors and ecological processes in boreal forests. *Annual Review of Ecology and Systematic*, 20, 1-28.
- Boone, A., and Co-Authors, 2003: The Rhone-Aggregation Land Surface Scheme Intercomparison Project: An Overview of Results, *J.Climate*, (in press).
- Borisenkov, Ye.P. (ed.), 1988: *Climate Fluctuations During the Last Millennium*. Gidrometeoizdat, Leningrad (in Russian).
- Borisenkov, Ye.P. and Pasetskii, V.M., 1983: *Extreme Natural Events in Russian Chronicles*. Gidrometeoizdat, Leningrad (in Russian).
- Borisenkov, Ye.P. and Pasetskii, V.M., 1988: *Millennial Registry of Unusual Natural Phenomena*. Mysl, Moscow, 1988, 524 p. (in Russian).
- Bormann B.T., Spaltenstein H., McClellan M.H., Ugolini F.C., Cromack J.R. and Nay A.M., 1995: Rapid soil development after windthrow disturbance in pristine forests. *J.Ecol.*, 83, 747-757.
- Botch M.S., Kobak K.I., Vinson T.S. et al., 1995: Carbon pools and accumulation in peatlands of the former Soviet Union. *Global Biogeochemical Cycles*, 9, 37-46.
- Botkin D.B. and Nisbet R.A., 1992: Vegetation feedbacks and prediction of carbon fluxes in the global carbon cycle. In: *Proceeding of the Workshop on Carbon Cycling in the Boreal Forest and Subarctic Ecosystems, 9-12 Sept. 1992, Corvallis, Oreg.* Eds. T. Kolchugina and T.Vinson. Oregon State University Press., Corvallis. 209-214.
- Bousquet, P., P. Ciais, P. Peylin, M. Ramonet and P. Monfray, 1999: Inverse modeling of annual atmospheric CO<sub>2</sub> source and sinks. 1. Method and control inversion, *J. Geophys. Res.*, 104, 26161-26178.
- Bowling L.C., D.P.Lettenmaier, B.Nijssen, L.P.Graham, D.B.Clark, M.E.Maayar, R.Essery, S.Goers, Ye.M.Gusev, F.Habets, B. van den Hurk, J.Jin, D.Kahan, D.Lohmann, X.Ma, S.Mahanama, D.Mocko, O.Nasonova, G.-Y.Niu, P.Samuelsson, A.B.Shmakin, K.Takata, D.Verseghe, P.Viterbo, Y.Xia, Y.Xue, Z.-L.Yang, 2003: Simulation of high latitude hydrological processes in the Torne-Kalix basin: PILPS Phase 2(e). 1: Experiment description and summary intercomparisons. *Global and Planetary Change*, 38, No. 1-2, 1-30.
- Bowling, L.C., D.P. Lettenmaier, and B.V. Matheussen, 2000: Hydroclimatology of the Arctic drainage basin. In: *The Freshwater Budget of the Arctic Ocean* (E. L. Lewis et al., eds.), Kluwer Academic Publishers, 57-90.
- Boyer, E.W., Goodale, C.L., Jaworski, N.A. and Howarth, R.W., 2002: Anthropogenic nitrogen sources and relationships to riverine nitrogen export in the northeastern U.S.A. *Biogeochemistry*, 57/58, 137-169.
- Braconnot, P. (ed.), 2002: PMIP, Paleoclimate Modeling Intercomparison Project (PMIP). Proceedings of the 3<sup>rd</sup> PMIP workshop, Canada, 4-8 October 1999/ WCRP-111, WMO/TD-1007, 271 pp.
- Bradley, N. L., Leopold, A. C., Ross, J., and Huffaker, W., 1999: Phenological Changes Reflect Climate Change in Wisconsin. *Proc. Nat. Acad. Sci. U.S.A. Ecology*, 96, 9701-9704.
- Bradley, R.S. and Jones, P.D., eds. 1992: *Climate Since A.D. 1500*. Routledge, L., 665 pp.
- Braswell B.H., Schimel D.S., Linder E. And Moore B., 1997: The responses of global terrestrial Ecosystems to interannual temperature variability. *Science*, 278, 870-872.
- Breido, M.D. and V.I. Sukhikh, 1995: Registration of spatial changes by space images in boreal Russian forests caused by clear cuts. *Issledovanija Zemli iz Kosmosa*, No. 4, 80-90 (in Russian).
- Breido, M.D. and V.I. Sukhikh, 1996: Use of space imagery to record geographical changes in the Russian boreal forests resulting from continuous felling. *Earth Obs. Rem. Sens.*, 13, 617-630.
- Breido, M.D. and V.M. Zhirin, 1989: Determination of some characteristics of fodder resources in desert pastures by air space information. *Issledovanija Zemli iz Kosmosa*, No. 3, 66-76 (in Russian).
- Breido, M.D., A.G. Popik, D.V. Rakov, D.A. Starostenko and R.I. Elman, 1995: Registration of the impacts of large scale forest fires by scanner space images. *Issledovanija Zemli iz Kosmosa*, No. 1, 115-126 (in Russian).
- Breido, M.D., E.D. Bodanskii, O.L. Orlova and R.I. Elman, 1992: Automatization of detection, registration and analysis of changes in forest funds by space images. Review information, VNIICLesresurce, 36 pp. (in Russian).
- Briffa K.R., Schweingruber F.H., Jones P.D., Osborn T.J., Shiyatov S.G. and Vaganov E.A. 1998: Reduced sensitivity of recent northern tree-growth to temperature at northern high latitudes. *Nature* 391, 678-682.
- Briffa, K.R., 2000: Annual climate variability in the Holocene: interpreting the message of ancient trees. *Quat. Sci. Rev.*, 19, 87-105.
- Broecker, W. S., 1987: The biggest chill. *Natural History*, 96, 74- 82.
- Broecker, W. S., 1997: Thermohaline circulation, the Achilles heel of our climate system: Will man-made CO<sub>2</sub> upset the current balance? *Science*, 278, 1582-1588.
- Broecker, W. S., 2000: Was a change in thermohaline circulation responsible for the Little Ice Age? *Proc. Nat. Acad. Sci. (USA)*, 97, 1339-1342.
- Bronfman A.M. and Khlebnikov E.P.. 1985: *The Sea of Azov: Basis for Reconstruction*. Gidrometeoizdat, Leningrad, 271 pp. (in Russian).

- Bronfman A.M., Dubinina V.G., and Makarova G.D., 1979: *Hydrological and Hydrochemical Basis of the Sea of Azov Productivity*. Pischevaya Promyshlennost', M., 288 pp. (in Russian).
- Brooks K.N., Folliot P.F., Gregersen H.M., Thmes J.L. 1991: Hydrology and management of watersheds. Univ. of Iowa Press, Ames, IA, 392 pp.
- Brovkin V., Ganopolski A., and Svirezhev Yu., 1997: A continuous climate-vegetation classification for use in climate-biosphere studies. *Ecological Modeling*, 101, 251-261.
- Brown, J., O.J. Ferrians, Jr., J.A. Heginbottom, and E.S. Melnikov, 1997; Circum-Arctic map of permafrost and ground-ice conditions, U.S. Geological Survey Circum-Pacific Map CP- 45, 1:10,000,000, Reston, Virginia.
- Brown, J., Hinkel, K.M. and Nelson, F.E., 2000: The Circumpolar Active Layer Monitoring (CALM) Program: Research designs and initial results. *Polar Geog.*, 24(3), 165-258.
- Brown, R.D., 2000: Northern Hemisphere snow cover variability and change, 1915-1997, *J. Climate*, 13, 2339-2355.
- Brukhanov, A.V., G.V. Gospodinov and Yu.F. Knizhnikov, 1982: Aerospace methods for geographic research. Moscow State University, 232 pp. (in Russian).
- Brutsaert, W., 1982: *Evaporation into the atmosphere: Theory, history and applications*, Reidel, Dordrecht, 299 pp.
- Brutsaert, W., 1998: Land-surface water vapor and sensible heat flux: Spatial variability, homogeneity and measurement scales, *Water Resour. Res.*, 34, 2433-2442.
- Bryazgin, N.N. and A.A. Dement'ev, 1996: *Dangerous meteorological events in Russian Arctic* (in Russian), St. Petersburg, Gidrometeoizdat, 156 pp.
- Bryson R. and Goodman B.M., 1980: Volcanic activity and climatic changes. *Science*, 207, 1041-1044.
- Bryzgalov, V.A., and Ivanov, V.V., 2003: Anthropogenic load at estuarine ecosystems from drainage areas of Northern and Siberian rivers. *J. Ecological Chemistry*, Teza, St. Petersburg, 12, No. 3, 160-170.
- Bubier J.L, Moore T.R, Bellisario L, Comer N.T, Crill P.M., 1995: Ecological controls on methane emissions from a northern peatland complex in the zone of discontinuous permafrost, Manitoba, Canada. *Global Biogeochem. Cycles*. 9, 455-470.
- Buchmann N., 2000: Biotic and abiotic factors regulating soil respiration rate in *Picea abies* stands. *Soil Biology and Biochemistry*, 32, 1625-1635.
- Budyko, M.I. (Ed.) 1963: *Atlas of Heat Balance of the World*. Moscow, Mezhdruvedomstvennyi Geophysicheskii Komitet, 69 pp. (in Russian).
- Budyko, M.I. and O.A. Drozdov, 1976: On causes of changes in the water cycle. *Water Resources*, 1976, No.6, 35-44 (in Russian).
- Budyko, M.I., 1971: *The Climate and Life*, Gidrometeoizdat, 470 pp. (in Russian; English translation: 1974., Academic Press, 508 pp)
- Bugmann, H.K.M. and Solomon A.M., 1995: The use of a European forest model in North America: A study of ecosystem response to climate gradients. *Journal of Biogeography*, 22, 477-484.
- Bugmann, H.K.M., 1994: *On the Ecology of Mountainous Forests in a Changing Climate: A Simulation Study* Ph.D. Thesis #10638 (Swiss Federal Institute of Technology, Zurich).
- Bulgakova I.V., YU.M. Polichtchouk, and O.S. Tokareva, 2003: Evaluation of the impact of atmospheric pollution on the forest in oil-producing regions by use of images taken from space. *Atmos. Oceanic. Opt.* 16, 464-476.
- Bulygina, O.N., N.N. Korshunova, V.N. Razuvaev, M.Z. Shaimardanov, N.V. Shvets, 2000a: Changes of climate extremes over the Russian territory. *Transactions of RIHMI-WDC*, 167, 16-32.
- Bulygina, O.N., N.N. Korshunova, R.A. Martuganov, V.N. Razuvaev, M.Z. Shaimardanov, 2000b: National data bank on Russian atmospheric precipitation. *Trans. RIHMI-WDC*, 167, (in Russian).
- Bulygina, O.N., N.N. Korshunova, V.N. Kuznetsova, V.N. Razuvaev, 2000c: Analysis of climate variations over the USSR territory during the past several decades. *Trans. RIHMI-WDC*, 167, in press (in Russian).
- Bunzl K., Puhakainen M., Riekkinnen I., Karhu P., Schimmack W., Heikinnen T., Jaakkola T., Nikonov V., Pavlov V., Rahola T., Rissanen K., Suomela M., Tillander M., Ayra M. Fallout, 2001: 137Cs, 90Sr and 239+240Pu in soils polluted by heavy metals: Vertical distribution, residence half-times, and external gamma-dose rates. *Journal of Radioanalytical and Nuclear Chemistry*, 247, 15-24.
- Burgess, M. M., et al., 2000: Global Terrestrial Network For Permafrost (GTNet-P): permafrost monitoring contributing to global climate observations, *Geological Survey of Canada, Current Research 2000 E-14*, 8 pp., (online; <http://www.nrcan.gc.ca/gsc/bookstore>).
- Burgess, M.M., Smith, S., Brown, J. and V. Romanovsky, 2001: The Global Terrestrial Network for Permafrost: Status Report to the IPA Executive Committee Meeting, Rome, March 25, 2001, 62 pp.
- Businger, J.A., Wyngaard, J.A., Izumi, Y., Bradley, E.F., 1971: Flux-profile Relationships in the Atmospheric Surface Layer, *J. Atmos. Sci.* 28 (2), 181-189.
- Butusov, O.B., B.V. Vinogradov and A.M. Stepanov, 1996: Space monitoring of forests of South Ural with air pollution. *Lesovedenie*, No. 3, 16-27 (in Russian).
- Butusov, O.B., L.M. Nosova and A.M. Stepanov, 1998: Analysis by remote sensing of recovering of forests after ecological catastrophes. *Izvestija RAS, Series Geographical*, No. 1, 90-101 (in Russian).
- Buzykin A.I., Pshenichnikova L.S. and Sukhovolski V.G., 2002: *Density and Productivity of Tree Coenoses*. – Novosibirsk, Nauka Publ. House – 150 pp. (In Russian)
- Caletnik, M., 2003: Immediate constituent of Polissya region name is "Forest." *Ukrainian Journal of Emergency Situations*, No. 4., 12-13.
- Callaway R.M., Jackson R.B., Ehleringer J.R., Mooney H.A., Sala O.E. and E.-D. Schulze, 1996: Maximum rooting depth of vegetation types at the global scale. *Oecologia*, 108, 583-595.
- Camill P. and Clark J. S., 2000: Long-term perspectives on lagged ecosystem responses to climate change: permafrost in boreal peatlands and the grassland/woodland boundary. *Ecosystems*, 3, 534-544.

- Canadian Forest Service, 1993: *The State Of Canada's Forests* (Natural Resources of Canada, Ottawa, ON, Canada).
- Cao M, K. Gregson, S. Marshall, 1998: Global methane emission from wetlands and its sensitivity to climate change. *Atmos. Environ.*, 32, 3293-3299.
- Cao M, S. Marshall, K. Gregson, 1996: Global carbon exchange and methane emissions from natural wetlands: application of a process-based model. *J. Geophys. Res.* 101,14399-14414.
- Cao, M., and F.I. Woodward, 1998: Dynamic responses of terrestrial ecosystem carbon cycling to global climate change. *Nature*, 393, 249-252.
- Carder, K.L., Chen, F.R., Lee, Z.P., and Hawes, S.K., 1999: Semianalytic Moderate-Resolution Imaging Spectrometer algorithms for chlorophyll a and absorption with bio-optical domains based on nitrate-depletion temperatures. *J. of Geophys. Res.*, 104, No. C3, 5403-5421.
- Caselles V., Delegido J., Sobrino J.A. and Hurtado E., 1992: Evaluation of the Maximum Evapotranspiration over the La Mancha region, Spain, using NOAA AVHRR Data. *Int. J. Remote Sensing*, 13, No 5, 939-946.
- Cava, D., Giostra, U., Tagliuzucca, M., 2001: Spectral Maxima in a Perturbed Stable Boundary Layer, *Bound.-Layer Meteorol.* 100, 421-437.
- Chambers S.D. and Chapin III F.S., 2003: Fire effects on surface-atmosphere energy exchange in Alaskan black spruce ecosystems. *J. Geophys. Res.*, 108, doi:10.1029/2001JD000530.
- Chan, J.W.-C., N. LaPorte, and R. DeFries, 2003, Texture classification of logging using achine learning algorithms. *Int. J. Remote Sensing*, 24, 1401-1407.
- Chapin F.S. III, Bret-Harte M.S., Hobbie S.E. and Zong H., 1996: Plant functional types as predictors of transient responses of arctic vegetation to global change. *J. Veg. Sci.*, 7, 347-358.
- Chapin F.S., III, 1988: The cost of tundra plant structures: evaluation of concepts and currencies. *The American Naturalist*, 133, 1-9.
- Chapin III F.S. and Starfield A.M., 1997: Time lags and novel ecosystems in response to transient climatic change in Arctic Alaska. *Climatic Change* 35, 449-461.
- Chapin, F. S., III, A. D. McGuire, J. Randerson, R. Pielke, Sr., D. Baldocchi, S. E. Hobbie, N. Roulet, W. Eugster, E. Kasischke, E. B. Rastetter, S. A. Zimov, W. C. Oechel, and S. W. Running, 2000: Feedbacks from arctic and boreal ecosystems to climate. *Global Change Biol.*, 6, S211-S223.
- Charney, J. G., Quirk, W. J., Chow, S.-H. and Kornfeld, J., 1977: A Comparative Study of Effects of Albedo Change on Drought in Semiarid Regions, *J. Atmos. Sci.*, 34, 1366-1385.
- Chase, T.N., B. Herman, R.A. Pielke Sr., X. Zeng, and M. Leuthold, 2002: A proposed mechanism for the regulation of minimum midtropospheric temperatures in the Arctic. *J. Geophys. Res.*, 107(D14), 10.1029/2001JD001425.
- Chase, T.N., J.A. Knaff, R.A. Pielke Sr., and E. Kalnay, 2003: Changes in global monsoon circulations since 1950. *Natural Hazards*, 29, 229-254.
- Chase, T.N., R.A. Pielke Sr., B. Herman, and X. Zeng, 2004: Likelihood of rapidly increasing surface temperatures unaccompanied by strong warming in the free troposphere. *Climate Res.*, 25, 185-190.
- Chase, T.N., R.A. Pielke, Sr., J.A. Knaff, T.G.F. Kittel, and J.L. Eastman, 2000: A comparison of regional trends in 1979-1997 depth-averaged tropospheric temperatures. *Int. J. Climatol.*, 20, 503-518.
- Chase, T.N., R.A. Pielke, Sr., T.G.F. Kittel, M. Zhao, A.J. Pitman, S.W. Running, and R.R. Nemani, 2001: The relative climatic effects of landcover change and elevated carbon dioxide combined with aerosols: A comparison of model results and observations. *J. Geophys. Res., Atmospheres*, 106, 31,685 -31,691.
- Chase, T.N., R.A. Pielke, Sr., T.G.F. Kittel, R.R. Nemani, and S.W. Running, 2000: Simulated impacts of historical land cover changes on global climate in northern winter. *Climate Dyn.*, 16, 93-105.
- Chen W.J., Black T.A., Yang P.C., 1999: Effects of climate variability on the annual carbon sequestration by a boreal aspen forest. *Global Change Biology*. 5, 41-53.
- Chen, J., W. Chen, J. Liu, and J. Cihlar, 2000: Annual carbon balance of Canada's forests during 1895-1996. *Global Biogeochemical Cycles*, 14, 839-849.
- Chernov Yu.I., 1980: *The living tundra*. Moscow, (in Russian). 236 pp.
- Chimitdorzhiev, T.N., 1998: Development of the methods of space observation of regional ecosystems using the zone of Chernobyl ANPS as a case study. Institute of Radiotechnic and Electronic, Moscow, 17 pp. (in Russian).
- Chmielewski, F. M. and Rötzer, T., 2000: *Phenological Trends in Europe in Relation to Climatic Changes*, Agrarmeteorologische Schrift 07 der Humboldt Universität Berlin, 17 pp.
- Christensen T.R., Jonasson S., Callaghan T.V. and Havström M., 1995: Spatial variation in high latitude methane flux – A transect across tundra environments in Siveria and European arctic. *J. Geophys. Res.*, 100 (D20), 21035-21045.
- Christensen T.R., Jonasson S., Callaghan T.V. and Havström M., 1999: Carbon cycling and methane exchange in Eurasian tundra ecosystems. *Ambio*, 28, 239-244.
- Churkina, G., and Running, S.W., 1998: Contrasting climate controls on the estimated productivity of global terrestrial biomes. *Ecosystems*, 1, 206-215.
- Ciais P., Tans P.P., Trolier M., White J.W.C. and Francey R.J. 1995: A large northern hemisphere terrestrial CO<sub>2</sub> sink indicated by the <sup>13</sup>C/<sup>12</sup>C ratio of atmospheric CO<sub>2</sub>. *Science*, 269, 1098-1102.
- Cihlar, J., D. Manak, and N. Voisin, 1994: AVHRR bidirectional reflectance effects and composite, *Remote Sens. Env.*, 48, 77-88.
- Cihlar, J., J.M. Chen, Z. Li, F. Huang, R. Latifovic and R. Dixon, 1998a: Can interannual land surface signal be discerned in composite AVHRR data? *J. Geophys. Res.*, 103, (D18), 23163-23172.
- Cihlar, J., L. St-Laurent, and J.A. Dyer, 1991: Relation between the normalized difference vegetation index and ecological variables. *Remote Sens. Env.*, 35, 279-298.
- Cihlar, J., Qinghan Xiao, J. Chen, J. Beaubien, K. Fung and R. Latifovic, 1998b: Classification by progressive generalization: A new automated methodology for remote sensing multichannel data. *Int. J. Remote Sensing*, 19, No. 14, pp. 2685-2704.



- Claussen M., 2001: Biogeophysical feedbacks and the dynamics of climate. In: "Global Biogeochemical Cycles in the Climate System" (ed. by Schulze E.-D., Heimann M., Harrison S., Holland E., Lloyd J., Prentice I.C., Schimel D.). Academic Press. San Diego. p.61-71.
- Claussen M., 2004: Feedbacks, synergisms, multiple equilibria and teleconnections. In: *Vegetation, Water, Humans and the Climate - A New Perspective on an Interactive System*. Springer Verlag, Amsterdam, 33-47.
- Claussen M., Brovkin V., Ganopolski A., Kubatski C., and Petoukhov V., 1998: Modeling global vegetation-climate interaction. *Phil. Trans. Roy. Soc. B*, 353, 53-63.
- Claussen, M., 1998: On multiple solutions of the atmosphere-vegetation system in present day climate. *Global Change Biol.*, 4, 549-560.
- Claussen, M., L.A. Mysak, A.J. Weaver, M. Crucifix, T. Fichefet, M.-F. Loutre, S.L. Weber, J. Alcamo, V.A. Alexeev, A. Berger, R. Calov, A. Ganopolski, H. Goosse, G. Lohmann, F. Lunkeit, I.I. Mokhov, V. Petoukhov, P. Stone, and Z. Wang, 2002: Earth System Models of Intermediate Complexity: Closing the Gap in the Spectrum of Climate System Models. *Climate Dyn.*, 18, 579-586.
- Clein, J.S., A.D. McGuire, X. Zhuang, D.W. Kicklighter, J.M. Melillo, S.C. Wofsy, P.G. Jarvis, and J. M. Massheder. 2002: Historical and projected carbon balances of mature black spruce ecosystems across North America: The role of carbon-nitrogen interactions. *Plant and Soil* 242, 15-32.
- Cohen, W.B. and C. O. Justice, 1999: Validating MODIS terrestrial ecology products: linking in situ and satellite measurements. *Remote Sensing of Environment* 70, 1-4.
- Cohen, W.B., T.K. Maiersperger, Z. Yang, S.T. Gower, D.P. Turner, W.D. Ritts, M. Berterretche, and S.W. Running, 2003: Comparisons of land cover and LAI estimates derived from ETM+ and MODIS for four sites in North America: a quality assessment of 2000/2001 provisional MODIS products. *Remote Sensing of Environment*, 88, 221-362.
- Collatz D.R., Berry J.A. and Clark J.S., 1998: Effects of climate and atmospheric CO<sub>2</sub> partial pressure on the global distribution of C<sub>4</sub> grasses: present, past and future. *Oecologia* 114, 441-454.
- Colwell, M. A., A. V. Dubynin, A. Y. Koroliuk and N. A. Sobolev, 1997: Russian nature reserves and conservation of biological diversity. *Natural Areas Journal*, 17, 56-68.
- Conard, S.G. and Ivanova, G.A., 1997: Wildfire in Russian boreal forests – potential impacts of fire regime characteristics on emissions and global carbon estimates. *Environmental Pollution*, 98, 305-313.
- Conard, S.G., A.I. Sukhinin, B.J. Stocks, D.R. Cahoon, E.P. Davidenko, G.A. Ivanova, 2002: Determining Effects of Area Burned and Fire Severity on Carbon Cycling and Emissions in Siberia. *Climatic Change*, 55, 197-211.
- Conway, T.Y., P.P. Tans, L.S. Waterman K.W, Thoning, D.R. Kitzis, K.A. Masarie, and N. Zhang 1994: Evidence for Interannual Variability of the Carbon Cycle from the NOAA/CMDL Global Air Sampling Network. *J. Geophys. Res.* 99, D11, 22831-22855.
- Corell, R. W., 2004: ACIA Arctic Climate Impact Assessment. Statement before the Senate Committee on Commerce, Science, and Transportation. Washington, D.C.
- Corell, R.W., 2004: ACIA Arctic Climate Impact Assessment. Statement before the Senate Committee on Commerce, Science, and Transportation. Washington, D.C. March 3, 2004. <http://www.acia.uaf.edu>.
- Cosgrove, B.A. and Co-Authors, 2003: Real-time and retrospective forcing in the North American Land Data Assimilation System (NLDAS) Project. *J. Geophys. Res.-Atmospheres*, 108, NO. D22, 8842, doi:10.1029/2002JD003118.
- Cotrufo, M.F., Berg, B. and Kratz, W., 1998: Increased atmospheric CO<sub>2</sub> and litter quality. *Environ. Rev.*, 6, 1-12.
- Cracknell A.P. and Xue Y., 1996a: Thermal inertia determination from space - a tutorial review. *Int. J. Remote Sensing*, 17, 431 - 461.
- Cracknell A.P. and Xue Y., 1996b: Estimation of ground heat flux using AVHRR data and an advanced thermal inertia model (SoA-TI model). *Int. J. Remote Sensing*, 17, 637-642.
- Cracknell, A.P., 1999: Remote sensing techniques in estuaries and coastal zones-an update. *Internat. J. Remote Sensing*, 19, 485-496.
- Cramer W, A. Bondeau, F.I. Woodward, I.C. Prentice, R.A. Betts, V. Brovkin, P.M. Cox, V. Fisher, J. Foley, A.D. Friend, C. Kucharik, M.R. Lomas, N. Ramankutty, S. Sitch, B. Smith, A. White, C. Young Molling, 2001: Global response of terrestrial ecosystems structure and function to CO<sub>2</sub> and climate change: results from six dynamic global vegetation models. *Global Change Biology*, 7, 357-374.
- Cuntz M., Ciais P. and Hoffmann G., 2002: Modelling the continental effect of oxygen isotopes over Eurasia. *Tellus*, 54B (5), 805-910.
- Curran, P.J. and Novo, E.M.M., 1988: The relationship between suspended sediment concentration and remotely sensed spectral radiance: A review. *J. Coastal Res.*, 4, 351-368.
- Currie, W.S., Galloway J.N. and Shugart H.H., 1996: Watershed base-cation cycle dynamics modeled over forest regrowth in a Central Appalachian ecosystem. *Water, Air and Soil Pollution*, 88, 1-22.
- Curry, J.A., and Coauthors, 2000: FIRE Arctic clouds experiment. *Bull. Amer. Meteorol. Soc.*, 81, 5-29.
- Dadykin V.P., 1952: Peculiarities of plant behavior on cold soils. Moscow, USSR Academy of Sciences Publishers, 279 pp. (in Russian).
- Dai, A., K. E. Trenberth, and T. Qian, 2004: A global dataset of Palmer Drought Severity Index for 1870-2002: Relationship with soil moisture and effects of surface warming. *J. Hydrometeorol.*, 5, 1117-1130.
- Dai, Y., Zeng, X., Dickinson, R. E., Baker, I., Bonan, G. B., Bosilovich, M. G., Denning, A. S., Dirmeyer, P. A., Houser, P. R., Niu, G., Oleson, K. W., Schlosser, C. A., Yang, Z.-L.. 2003: The Common Land Model. *Bull. Amer. Meteorol. Soc.* 84, 1013-1023.
- Dall'Olmo, G., A. A. Gitelson, and D. C. Rundquist, 2003: Towards a unified approach for remote estimation of chlorophyll-a in both terrestrial vegetation and turbid productive waters. *Geophys. Res. Lett.*, 30(18), 1938, doi:10.1029/2003GL018065.
- Danjulis, E.P. and V.M. Zhirin (eds.), 1989: *Remote sensing*

- in forestry*. Moscow, 223 pp. (in Russian).
- Dargaville R., McGuire A.D. and Rayner P., 2002a: Estimates of large-scale fluxes in high latitudes from terrestrial biosphere models and an inversion of atmospheric CO<sub>2</sub> measurements. *Climatic Change*, 55, 273-285.
- Dargaville R.J., Heimann M., McGuire A.D., Prentice I.C., Kicklighter D.W., Joos F., Clein J.S., Esser G., Foley J., Kaplan J., Meier R.A., Melillo J.M., Moore III B., Ramankutty N., Reichenau T., Schloss A., Sitch S., Tian H., Williams L.J. and Wittenberg U., 2002b: Evaluation of terrestrial carbon cycle models with atmospheric CO<sub>2</sub> measurements: Results from transient simulations considering increasing CO<sub>2</sub>, climate and land-use effects. *Global Biogeochemical Cycles*, 16: 1092, Doi:10.1029/2001GB001426.
- Dargaville, R. J., R. M. Law and F. Pribac, 2000: Implications of interannual variability in atmospheric circulation on modelled CO<sub>2</sub> concentrations and source estimates, *Glob. Biogeochem. Cyc.*, 14, 931-943.
- Darmenova, K., and I.N. Sokolik, 2002: Integrated analysis of satellite and ground-based meteorological observations of Asian dust outbreaks in Spring of 2001. *EOS Trans. AGU, Fall Meeting, Suppl.* p. F132.
- Darmenova, K., I.N. Sokolik, and A. Darmenov, 2005: Characterization of east Asian dust outbreaks in the spring of 2001 using ground-based and satellite data. *J. Geophys. Res.*, 110, D02204, doi: 10.1029/2004JD004842.
- Darnell W.L. Staylor, W.F., Gupta, S.K., Ritchey, N.A. and Wilbur, A. C., 1992: Seasonal variation of surface radiation budget derived from international satellite cloud climatology project C1 data, *J. Geophys. Res.*, 97, 15741-15760.
- Darnell, W. L., Staylor, W. F., Gupta, S. K., Denn, F. M. 1988: Estimation of Surface Insolation Using Sun-Synchronous Satellite Data. *J. Climate*, 1, 820-835.
- Davey, C.A., and R.A. Pielke Sr., 2004: Microclimate exposures of surface-based weather stations - implications for the assessment of long-term temperature trends. *Bull. Amer. Meteor. Soc.*, submitted.
- De Beurs, K.M., and G.M. Henebry, 2004: Land surface phenology, climatic variation, and institutional change: Analyzing agricultural land cover change in Kazakhstan. *Remote Sensing of Environment*, 89, 497-509.
- De Bruin, H.A.R. and A.A.M. Holtslag., 1982: Flux parameterization over land surfaces for atmospheric models, *J. Appl. Meteorol.*, 30, 327-341.
- De Gier, A., E. Wesunga, S. Beerns, P. van Laake and H. Savenije, 1999: User requirements study for remote sensing based spatial information for the sustainable management of forests. Final Report, ITC, Netherlands, 25 pp.
- De Jong, J.J.M., de Vries, A.C., Klaasen W., 1999: Influence of obstacles on the aerodynamic roughness of the Netherlands, *Bound.-Layer Meteorol.*, 91, 51-64.
- De Vries W., Posch M., Kämäri J., 1989: Simulation of the long term soil response to acid deposition in various buffer ranges *Water, Air and Soil Pollution*. 48, 349-390.
- De Vries, W. and Römkens, P., 1994: Mobilization of cadmium after land use changes. *Bodem* 2, 76-79 (in Dutch).
- De Vries, W., 1994: *Soil Response to Acid Deposition at Different Regional Scales: Field and Laboratory Data, Critical Loads and Model Predictions*. Wageningen, The Netherlands. 487 pp.
- DeFries, R., Bounoua, L. and Collatz, G.J., 2002: Human Modification of the Landscape and Surface Climate in the Next Fifty Years. *Global Change Biology*, 8, 438-458.
- Demchenko, P.F., A.A.Velichko, A.V.Eliseev, I.I.Mokhov, and V.P. Nechaev, 2002: Dependence of permafrost conditions on global warming: Comparison of models, scenarios, and paleoclimatic reconstructions. *Izvestia, Atmos Ocean Phys.*, 38 (2), 143-151.
- Demchenko, P.F., A.A.Velichko, A.V.Eliseev, I.I.Mokhov, and V.P. Nechaev, 2002: Dependence of permafrost conditions on global warming: Comparison of models, scenarios, and paleoclimatic reconstructions. *Izvestia, Atmos Ocean Phys.*, 38 (2), 143-151.
- Denning, A.S., Fung, I.Y., and Randall, D., 1995: Latitudinal gradient of atmospheric CO<sub>2</sub> due to seasonal exchange with land biota. *Nature*, 376, 240-243.
- Derevetz V.V., S.I. Kireev S.I., and S.M. Obrizan. 2003: Radiation Level in the Chernobyl Exclusion Zone in 2002. *State of the environment of the Chernobyl Exclusion Zone*. 1, No. 21, 3-33.
- Deserts of Zaaltai Gobi*. 1986: Moscow, "Nauka". 207 pp. (in Russian)
- Dessens, J., 1995: Severe convective weather in the context of a nighttime global warming. *Geophys. Res. Lett.*, 22, 1241-1244.
- Di Gregorio, A., and Jansen, L.J.M., 2000: Land Cover Classification System, concepts and user manual, GCP/RAF/287/ITA Africover (Food and Agriculture Organization of the United Nations Publishing Service, Viale delle Terme di Caracalla, 00100, Rome, Italy) 179 pp.
- Diak, G.R., Mecikalski, J.R., Anderson, M.C., Norman, J.M., Kustas, W.P., Torn, R.D., DeWolf, R.L., 2004: Estimating Land Surface Energy Budgets From Space: Review and Current Efforts at the University of Wisconsin—Madison and USDA—ARS. *Bull. Amer. Meteorol. Soc.*, 85, 65–78.
- Diakonov K.N., 2003: Geophysical indicators of landscape functioning for the assessment of anthropogenic impacts. Proceedings of Moscow State University. Ser.5. Geography, No.1, 15-19 (in Russian).
- Dickinson, R. E., M. Shaikh, L. Graumlich, and R. Bryant, 1998: Interactive Canopies for a Climate Model. *J. Clim.*, 11, 2823-2836
- Dikih, A.N. 1993: Glacial runoff of Tien Shan rivers and it's role in formation of total runoff. *Data of Glaciolog. Studies*. 77, 41-50. Moscow. (in Russian).
- Dinesman L.G. ,1977: *Steppe biogeocozenes in the Holocene*. Moscow, Verlag "Nauka" 150 pp. (in Russian)
- Dinesman, L.G. & Savinetsky, A.B., 1997: The historical monitoring of ecosystems. In: Sokolov, V.E. (ed.) *Monitoring of biodiversity*. Moscow. 100-104.
- Dinesman, L.G. and Savinetsky, A.B., 2000: The influence of pasture digression of steppe on the mammals of Russian Plain. *Zoological Journal*, 79, 388-396.
- Dinesman, L.G., Kiseleva, N.K., Savinetsky, A.B., Khassanov, B.F., 1999: *Secular dynamics of coastal zone ecosystems of the north-eastern Chukchi peninsula (Chukotka: cultural layers and natural depositions from the last millennia)*. Tubingen: Mo Vince Verlag. 131 pp.

- Dissing, D. and D.L. Verbyla, 2003: Spatial patterns of lightning strikes in interior Alaska and their relations to elevation and vegetation. *Canadian Journal of Forest Research*, 33: 770-782.
- Dixon, R.K., and O.N. Krankina, 1993: Forest fires in Russia: carbon dioxide emissions to the atmosphere, *Canadian Journal of Forest Research*, 23, 700-705.
- Dlugokencky, E.J., B.P. Walter, K.A. Masarie, P.M. Lang, E.S. Kasischke, 2001: Measurements of an anomalous global methane increase during 1998. *Geophys. Res. Lett.*, 28, 499-502.
- Dmitriev, I.D., E.S. Murahtanov and V.I. Sukhikh, 1989: *Forest aviation and air photo images*. Moscow, 366 p. (in Russian).
- Dobrovolskiy G.V. and Kust G.S., 1994: Basic Ways and Methods for the Prediction of Soil Evolution under Global Climatic Changes. *Vestnik Moskovskogo universiteta. Ser. Soil Science*, 1994, No.2, 3-14.
- Dobrovolskiy G.V. and Kust G.S., 2003: The Concept of Soil Resources: Present State, Prerequisites for its Reconsideration and Current Tasks. In: *Role of Soils in the Biosphere*, 3, Moscow, 6-23 (in Russian).
- Dobrovolskiy G.V., Urusevskaya I.S. 1984: *Soil Geography*. Moscow, 416 pp. (in Russian).
- Dobrovolskiy, G.V. and G.S.Kust (Eds.), 1999: *Desertification and Soil Degradation*, Proc. of the Int. Scientific Conf. , Moscow, 378 pp.
- Dobson, C.M., F.T. Ulaby, T. Le Toan, A. Beaudoin, E.S. Kasischke and N. Christensen, 1992: Dependence of radar backscatter on coniferous forest biomass. *IEEE Transactions in Geoscience and Remote Sensing*, 30(2), 412-415.
- Doefrer, R., and J. Fischer, 1994: Concentrations of chlorophyll, suspended matter, gelbstoff in case II waters derived from satellite coastal zone color scanner data with inverse modeling methods, *J. Geophys.Res.* 99, 7457-7466.
- Dokuchaev, V.V., 1951: *Transactions. Volume 6*. Moscow, Publ. Acad. Sci. USSR, 595 pp.
- Dokuchaev, V.V., 1900: *Collection pédologique*. Exposition Universelle de 1900 à Paris. Section Russe. Edition du Ministère des Finances, St. Petersburg (in French).
- Domanitsky A.P., Dubrovina R.S., Isaeva A.I., 1971: *Rivers and Lakes of the Soviet Union*. Leningrad, Gidrometeoizdat, 104 pp.
- Donchenko, V.V., N.I. Goltsova, O.M. Johansson *et al.*, 1998: Synergistic use of SAR and other satellite data to monitor damaged areas of boreal forests for St. Petersburg region. Proceedings of 27th International Symposium on Remote Sensing of Environment, June 8-12, 1998, Tromsø, Norway, 640-643.
- Dontchenko V.V., O. M. Johannessen, L. P. Bobylev, S. A. Bartalev, 1999: ERS/SAR data application for Russian boreal forests mapping and monitoring. Proc.IGARSS'99, 311-314.
- Dontchenko V.V., O.M. Johannessen, L. P. Bobylev, S.A. Bartalev, S.V. Maksimov, 1999: Russian boreal forests mapping and monitoring by ERS/SAR data application. Proc. Int. Symposium "Atmospheric radiation'99". 12-15.07.99. St. Petersburg State University. Russia, 113-114.
- Douville, H., F. Chauvin, S. Planton, J.-F. Royer, D. Salas-Méla, and S. Tyteca, 2002: Sensitivity of the hydrological cycle to increasing amounts of greenhouse gases and aerosols. *Climate Dynamics*, 20, 45-68.
- Dowdeswell, J. A., Hagen, J. O., Bjornsson, H., Glazovskiy, A. F., Harrison, W. D., Holmlund, P., Jania, J., Koerner, R. M., Lefauconnier, B., Ommanney, C. S. L. and Thomas, R., 1997: The mass balance of Circum-Arctic Glaciers and recent climate change. *Quaternary Research*, 48, 1-14.
- Drozdo, O.A., and A. S. Grigor'eva, 1963: *Water Cycle in the Atmosphere*. Leningrad, Gidrometeoizdat. 156 pp. (in Russian).
- Dudarev O.V., I.P. Semiletov, A.I. Botsul, I.V. Utkin, A.N. Charkin., V.V.Anikiev, G.M.Kolesov, and D.Yu. Sapozhnikov, 2001: The coastal erosion as a significant source of the particulate matter into the Arctic Shelf, *Proc. Second Wadati Conference on Global Change and the Polar Climate, March 7-9, 2001, Tsukuba, Japan*, 176-178.
- Dye, D.G., 2002: Variability and trends in the annual snow-cover cycle in Northern Hemisphere land areas, 1972-2000. *Hydrological Processes*, 16, 3065-3077.
- Dyer M.L., Meentemeyer V., Berg B., 1990: Apparent control of mass loss of leaf litter on a regional scale: litter quality versus climate. *Scandinavian J. of Forest Research*, 5, 311-323.
- Dyurgerov, M. 2001: Mountain glaciers at the end of the twentieth century: Global analysis in relation to climate and water cycle. *Polar Geog.*, 25(4), 241-336.
- Dyurgerov, M.B. and M.F. Meier, 1997: Year-to-year fluctuation of global mass balance of small glaciers and their contribution to sea level changes. *Arctic and Alpine Research* 29, 392-401.
- Dyurgerov, M.B. and M.F. Meier, 2000: Twentieth century climate change: Evidence from small glaciers. *Proceedings of the National Academy of Sciences*, 97, 1406-1411.
- Easterling, D. R., G. A. Meehl, C. Parmesan, S.A. Changnon, T.R. Karl, and L.O. Mearns, 2000b: Climate extremes: Observations, modeling, and impacts. *Science*, 289, 2068-2074.
- Easterling, D. R., J. L. Evans, P.Ya. Groisman, T. R. Karl, K. E. Kunkel, and P. Ambenje. 2000c. Observed variability and trends in extreme climate events: A brief review. *Bull.Amer.Meteorol. Soc.* 81(3): 417-425.
- Easterling, D.R., T.R. Karl, K.P. Gallo, D.A. Robinson, K.E. Trenberth, and A. Dai, 2000a: Observed climate variability and change of relevance to the biosphere. *J. Geophys. Res.*, 105, (D15), 101-114.
- Eastman, J.L., M.B. Coughenour, and R.A. Pielke, 2001: The effects of CO<sub>2</sub> and landscape change using a coupled plant and meteorological model. *Global Change Biology*, 7, 797-815.
- Edwards, W.C., and L.B. Owens, 1991: Large storm effects on total soil erosion. *Journal of Soil and Water Conservation*, 46, 75-78.
- Efimov, S.V. and S.A. Miller, 1997: Russian space and Russian market for space data. In: GIS technologies. Management. Usage. Business. Moscow, 2-6 June. GISAssociation, 218-230 (in Russian).
- Efimova, N.A., 1977: *Radiation factors of vegetation productivity*. Leningrad, Hydrometeoizdat. 216 pp.

- Efremenko, V.V. and A.V. Moshkov, 1997: Method for detection of vegetation by spectrazonal scanner. *Issledovanija Zemli iz Kosmosa*, No. 6, 3–9 (in Russian).
- Ehleringer J.R. and Field C.B., 1993: *Scaling physiological processes: leaf to globe*. Academic Press, Inc., San Diego, 388 pp.
- Eliseev, N. V., V. A. Zabrodin, V. I. Fertikov, A. M. Kolosov and O. A. Skarlato, 1985: *Red Book of the R.S.F.S.R.: Animals*. Moscow, Rosselkhoz Publishing, 455 pp.
- Ellsworth D.S., 1999: CO<sub>2</sub> enrichment in a maturing pine forest: are CO<sub>2</sub> exchange and water status in the canopy affected. *Plant Cell Environ.*, 22, 461-472.
- Elman, R.I., L.A. Kuzenkov and E.D. Bodanskii, 1984: Implementation of an automatic system for processing of space information on forests. *Forestry*, No. 6, 53–55 (in Russian).
- Elman, R.I., 1984: Scientific basis and directions for automatization of aerospace information processing on forests. International Training Seminar OON on Practical Application of Earth's Remote Sensing in Forestry. Moscow, 19 pp. (in Russian).
- Environment of Ukraine, 2001: *Statistical Yearbook*, Kiev-2001.
- Eriksson L. E. B., M. Santoro, A. Wiesmann, and C. Schmullius, 2003: Multi-Temporal JERS Repeat-Pass Coherence for Growing Stock Volume Estimation of Siberian Forest, IEEE Transactions on Geoscience and Remote Sensing, Accepted in April 2003.
- Erismann, J.W. and W. de Vries, 2000: Nitrogen deposition and effects on European forests. *Environ. Rev.*, 8: 65-93.
- Esch, D. C., and Osterkamp, T. E., 1990: Cold region engineering: Climatic warming concerns for Alaska, *J. Cold Regions Engineering*, 4(1), 6-14.
- Esper, J., Cook, E.R. and Schweingruber, F.H., 2002: Low-frequency signal in long tree-ring chronologies for reconstructing past temperature variability. *Science*, 295, 225-2253.
- Esseen P-A., Ehnstrom B., Ericson L., and Sjoberg K., 1997: Boreal forests. *Ecological Bulletins* 46, 16-47. Copenhagen.
- Etchevers P., Martin E., Brown R., Fierz C., Lejeune Y., Bazile E., Boone A., Dai Y.-J., Essery R., Fernandez A., Gusev Y., Jordan R., Koren V., Kowalczyk E., Nasonova O.N., Pyles R.D., Schlosser A., Shmakin A.B., Smirnova T.G., Strasser U., Verseghy D., Yamazaki T., Yang Z.-L., 2003: SnowMIP (Snow Model Intercomparison): main results of the mass and energy budget simulations. XXIII General Assembly of the International Union of Geodesy and Geophysics, June 30 - July 11, 2003, Sapporo, Japan. Abstracts, p.B50.
- Ewert F., D. Rodriguez, P. Jamieson, M.A. Semenov, R.A.C. Mitchell, J.R. Porter, B.A. Kimball, R. Manderscheid, H.J. Weigel, A. Fangmeier, F. Villalobos, 2001: Effects of elevated CO<sub>2</sub> and drought on wheat: testing crop simulation models for different experimental and climatic conditions. *Agr., Ecosys. Env.*, 19-20, 1–18.
- Fahl K., and R.Stein, 1998: Biomarkers as organic-carbon-source and environmental indicators in the Late Quaternary Arctic Ocean: problems and perspectives, *Marine Chemistry*, 63, 293-309.
- FAO, 2001: Global Forest Resources Assessment 2000. Main Report. FAO Forestry Paper 140. UN FAO, Rome, 479 pp.
- Federov, A. N., 1996: Effects of recent climate change on permafrost landscapes in central Sakha. *Polar Geography*, 20, 99-108.
- Federov, A.N. and P. Konstantinov, 2003: Observations of surface dynamics with thermokarst initiation, Yukechi site, Central Yakutia. In: Proceedings of the VII International Permafrost Conference, Switzerland, July 21-25, 2003, 239-243.
- Fedorov, S. F., 1977: *Studying the Components of Water Balance in the Forest Zone of the European Part of the USSR* (in Russian). Gidrometeoizdat, 264 pp.
- Fedosov M.V., Vinogradova E.G., 1955: The main characteristics of hydrochemical regime of the Sea of Azov. *Proc. VNIRO*, 31, 9-34 (in Russian).
- Feldman, G. M., A. S. Tetelbaum, N. I. Shender, and R. I. Gavriliev, 1988: *The guidebook for temperature regime forecast in Yakutia* (in Russian), Yakutsk, 240 pp.
- Ferraro, R. R., 1997: SSM/I derived global rainfall estimates for climatological applications. *J. Geophys. Res.*, 102, 16 715–16 735.
- Ferraro, R.R., F. Weng, N.C. Grody, and A. Basist, 1996: An eight year (1987-94) climatology of rainfall, clouds, water vapor, snowcover, and sea-ice derived from SSM/I measurements. *Bull. Amer. Meteorol. Soc.*, 77, 891-905.
- Fexsenfeld E., Calvert J., Fall R., Goldan P., Guenther A.B., Hewitt C.N., Lamb B., Liu S., Trainer M., Westberg H. and P.Zimmerman P., 1992: Emissions of volatile organic compounds from vegetation and the implications for atmospheric chemistry. *Global Biogeochem. Cycles*, 6, 389-430.
- FFSR, 1993: Concept of the forest inventory and planning. Decision of the Federal Service of Forestry of Russia on 25 June 1999. Moscow, 6 pp.
- Field C.B., Chapin F.S. 111, Matson P.A., and Mooney H.A., 1992: Responses of terrestrial ecosystems to the changing atmosphere: A resource-based approach. *Annu. Rev. Ecol. Syst.*, 23, 201-235.
- Filippchuk, A.N., 1998: Crises in the field of using remote sensing methods. In: A.S. Isaev and V.I. Sukhikh (eds.), *Aerospace Methods and Geoinformation Systems in Forestry and Forest Management*, Moscow, 35–40 (in Russian).
- Finlay B.J., Maberly S.C., and Cooper J.I., 1997: Microbial diversity and ecosystem function. *Oikos*, 80, 209-213.
- Finnigan, J.J., Clement, R., Malhi, Y., Leuning, R., Cleugh, H.A., 2003: A re-evaluation of long-term flux measurement techniques, Part 1: Averaging and coordinate rotation. *Bound.-Layer Meteorol.*, 107, 1-48.
- Fischer, G., and Sun, L., 2001: Model-based analysis of future land-use development in China., *Agriculture, Ecosystems & Environment*, 85, 163-176.
- Fischer, G., Shah, M., van Velthuisen, H., and Nachtergaele, F.O., 2001a: Global Agro-ecological Assessment for Agriculture in the 21st Century. International Institute for Applied Systems Analysis, Laxenburg, Austria. 155 pp.
- Fischer, G., van Velthuisen, H.T., and S. Prieler, 2001b: Assessment of Potential Productivity of Tree Species in China, Mongolia and the Former Soviet Union: Methodology and Results. IIASA Research Publ. IR-01-

- 015 (<http://www.iiasa.ac.at/Publications/Documents/IR-01-015.pdf>).
- Fischer, J., and Kronfeld, V., 1990: Sun-stimulated chlorophyll fluorescence. 1: Influence of oceanic properties. *Int. J. Remote Sensing*, 11, 2125-2147.
- Fitzjarrald D.R. and Moore K.E., 1992: Turbulent transport over tundra. *J. Geophys.Res. Atmosphere*, 97 (D15), 16717-16729.
- Fitzjarrald D.R. and Moore K.E., 1994: Growing season boundary layer climate and surface Exchanges in a subarctic woodland. *J. Geophys.Res.-Atmosphere*, 99 (D1), 1899-1917.
- Foken, Th., Gerstmann, W., Richter, S.H., Wichure, B., Baum, W., Ross, J., Sulev, M., Mölder, M., Tsvang, L.R., Zubkovskii, S.L., Kukharets, V.P., Aliguseinov, A.K., Perepelkin, V.G., Zeleny, J., 1993: *Study of the energy exchange processes over different types of surface during TARTEX-90*, DWD, Abteilung Forschung, Arbeitsergebnisse Nr.4, 34 pp.
- Foley, J. A., J. E. Kutzbach, M. T. Coe, and S. Levis, 1994: Feedbacks between climate and boreal forests during the Holocene epoch. *Nature*, 371, 52-54.
- Folland, C., J. Shukla, J. Kinter, and M. Rodwell, 2002: The climate of the twentieth century project. *Exchanges* (Newsletter of CLIVAR), 7, No.2, 37-39.
- Forbes B. C., Ebersole J. J., Strandberg B., 2001: Anthropogenic disturbances and patch dynamics in circumpolar Arctic ecosystem. *Conservation Biology*, 15, 954-969.
- Førland, E.J., and I. Hanssen-Bauer, 2000: Increased precipitation in the Norwegian Arctic: True or False? *Climatic Change*, 46, 485-509.
- Foster D.R., Aber J.D., Melillo J.M., Bowden R.D. and Bazzaz F.A., 1997: Forest response to disturbance and anthropogenic stress. *Bioscience*, 47, 437-455.
- Foster, D.R. and Fritz, S.C., 1987: Mire development, pool formation, and landscape processes on patterned fens in Dalarna, central Sweden. *J. Ecology*, 75, 409-437.
- Frank R., Prinz B., Hartwig S. 1999: Supporting land-use mapping by using multitemporal thermal infrared imagery in conjunction with simple diurnal temperature model. Proc. of the Fourth Intern. Airborne Remote Sensing Conference and Exhibition/ 21<sup>st</sup> Canadian Symposium on Remote Sensing. Vol. I. 21-24 June, 1999, Ottawa, Ontario, Canada, 353-360.
- Frankignoulle, M. Abril, G. Borges, A. Bourge, I. Canon, C. Delille, B. Libert, E. and Theate, J-M. (1998). Carbon dioxide emissions from European estuaries, *Science*, 282, 434-436.
- French, N.H.F., E.S. Kasischke, and D.G. Williams, 2002: Variability in the emission of carbon-based trace gases from wildfire in the Alaska boreal forest, *J. Geophys. Res.* 107, 8151, doi:10.1029/2001JD000480.
- French, N.H.F., E.S. Kasischke, L.L. Bourgeau-Chavez, and D. Barry, 1995: Mapping the location of wildfires in Alaskan boreal forests using AVHRR imagery, *Int. J. Wildland Fire*, 5, 55-61.
- French, N.H.F., P. Goovaerts, and E.S. Kasischke, 2003: Uncertainty in estimating carbon emissions from boreal forest fires. *J. Geophys. Res.* In review.
- French, N.H.F., 2002: The Impact of Fire Disturbance on Carbon and Energy Exchange in the Alaskan Boreal Region: A Geospatial Data Analysis, Ph.D. dissertation, 105 pp., University of Michigan, Ann Arbor.
- Friborg, T., H. Soegaard, T.R. Christensen, C. R. Lloyd, and N.S. Panikov, 2003: Siberian wetlands: Where a sink is a source. *Geophys. Res. Lett.*, 30 (21), 2129, doi: 1029/2003GL017797.
- Friedl, M. A., D. K. McIver, J. C. F. Hodges, X. Zhang, D. Muchoney, A. H. Strahler, C. E. Woodcock, S. Gopal, A. Schneider, A. Cooper, A. Baccini, F. Gao, and C. Schaaf, 2002: "Global land cover from MODIS: Algorithms and early results", *Remote Sens. Environ.*, 83, 287-302.
- Friedrich, R., 2003: Generation and evaluation of emission data. In: *Towards Cleaner Air for Europe – Science, Tools and Applications* (Eds. P. Midgley, M. Reuther), Part 2, 119 – 137.
- Friend, A.D., Shugart H.H. and Running S.W., 1993: A physiology-based gap model of forest dynamics. *Ecology*, 74, 792-797.
- Frolking, et al. 1996: Modelling temporal variability in the carbon balance of a spruce/moss boreal forest, *Global Change Biology*, 2, 343-366.
- Frolking, S., K. C. McDonald, J. S. Kimball, J. B. Way, R. Zimmermann, and S. W. Running, 1999: Using the space-borne NASA scatterometer (NSCAT) to determine the frozen and thawed seasons, *J. Geophys. Res.*, 104, (D22), 27,895-27,907.
- Fromm, M., J. Alfred, K. Hoppel, J. Hornstein, R. Bevilacqua, E. Shettle, R. Servranckx, Z.Q. Li, and B. Stocks, 2000: Observations of boreal forest fire smoke in the stratosphere by POAM III, SAGE II, and lidar in 1998. *Geophys. Res. Lett.*, 27 (9), 1407-1410.
- FSFMR, 1998: *Major indicators of activities of the Federal Service of Forest Management in Russia in 1988, 1992-1997*. Federal Service of Forest Management of Russia, Moscow, 233 pp. [in Russian].
- Fukuda, M. and J. N. Luthin, 1977: Heat and Water flow in frozen soils. *EOS Trans.*, 58, 1130.
- Furayev V.V., Vaganov E.A., Tchebakova N.M. and Valendik E., 2001: Effects of fire and climate on succession and structural change in the Siberian boreal forests. *Eurasian J. Forest Res.*, 2, 1-15.
- Furayev, V.V. and D.M. Kireev, 1983: Utilization of space images for estimation of forest damaged by fires. *Issledovanija Zemli iz Kosmosa*, No. 3, 43-49 (in Russian).
- Furayev, V.V., 1991: Monitoring of the impacts of forest fires. *Aerospace Monitoring of Forests*, Moscow, 122-135 (in Russian).
- Gaffin, S.R., C. Rosenzweig, X. Xing, and G. Yetman, 2004: Downscaling and geo-spatial gridding of socio-economic projections from the IPCC Special Report on Emissions Scenarios (SRES). *Global Environ. Change A* 14, 105-123, doi:10.1016/j.gloenvcha.2004.02.004.
- Galenko E.P., 1983: *Phytoclimate and energetic factors of productivity of conifer forests of the European North*. Leningrad, Verlag "Nauka", 129 pp. (in Russian).
- Galloway J. and Melillo J.M. (Eds.) 1998: *Azian Change in the Context of Global Change*. Internal Geosphere-Biosphere Publication Series, 3. Cambridge University Press. Xxx pp.
- GAME, 2001: Letter No.3., 32 pp.
- Ganopolskii A., Kubatzki C., Claussen M., Brovkin V., and Petoukhov V., 1998: The influence of vegetation-

- atmosphere-ocean interaction on climate during mid-Holocene. *Science* 280, 1916-1919.
- Garbuck, S.V. and V.E. Gershenson, 1997: Space systems for earth remote sensing. Moscow, 296 pp. (in Russian).
- Garratt, J.R., 1992: *The atmospheric boundary layer*, Cambridge University Press, 316 pp.
- Gates, W. L., 1992: AMIP: The Atmospheric Model Intercomparison Project. *Bull. Amer. Meteor. Soc.*, 73, 1962-1970.
- Gavriliev, P. P. and P. V. Efremov, 2003: Effects of cryogenic processes on Yakutian landscapes under climate warming. In: Proceedings of the VII International Permafrost Conference, Switzerland, July 21-25, 277-282.
- Gavriliev, R. I., 1998: *Thermophysical properties of soils and soils' covers within cryolithozone* (in Russian), Novosibirsk, 220 pp.
- Gavrilov, A. V., Romanovsky, N. N., Romanovsky, V. E., Hubberten, H.-W., and V. E. Tumskoy, 2003: Reconstruction of the Ice Complex remnants on the eastern Siberian arctic shelf, *Permafrost and Periglacial Processes*, 14, 187-198.
- Genikhovich E.L., Berlyand M.E., Onikul R.I., 1999: Progress in the theory of atmospheric diffusion as a basis for development of the air pollution prevention policy. In: Modern Studies at the Main Geophysical Observatory to its 150th Anniversary. v. 1 (Ed. M.E. Berlyand, V.P. Meleshko). Hydrometeorological Publishers, St. Petersburg. 99 – 126 (in Russian).
- Genikhovich E.L., 1996: Local-Similarity Description of Trajectories of Plumes and Jets in Neutrally Stratified Turbulent Shear Flow. In: Air Pollution Modeling and Its Application XI (Ed. S.-E. Gryning and F.A. Schiermeier), Plenum Press, NY, 399 –405.
- Genikhovich E.L., 1999: Double-flux description of the transport of passive scalars in the convective atmospheric boundary layer. In: *Air Pollution Modelling and Its Application XIII* (Ed. S.-E. Gryning, E. Batchvarova), Kluwer Academic/Plenum Publishers, NY. 409 – 416.
- Genikhovich E.L., Filatova E.N. and Ziv A.D., 2002: A method for mapping the air pollution in cities with combined use of measured and calculated concentrations. *International Journal of Environment and Pollution*, 18, No 1, 56 – 63.
- Genikhovich E.L., Ziv A.D. and Filatova E.N., 2001: Adaptive dispersion modeling and its applications to integrated assessment and hybrid monitoring of air pollution. In: *Air Pollution Modelling and Its Application XIV* (Ed. S.-E. Gryning, F. Schiermeier), Kluwer Academic/Plenum Publishers, NY. 475 – 480.
- Genikhovich, E. L., Gracheva, I. G., Onikul, R. I., Filatova, E. N., 2002: Air Pollution Modelling at an Urban Scale - Russian Experience and Problems. *Water, Air, & Soil Pollution: Focus*, v. 2, iss. 5-6. 501-512.
- Genikhovich, E., Gracheva, I., Filatova, E., 2002: Modeling of urban air pollution: principles and problems. In: *Air Pollution Modelling and Its Application XV* (Ed. C. Borrego, G. Schayes). Kluwer Academic/Plenum Publishers, New York. 275 – 285.
- Genikhovich, E., Sofiev, M., 2003: Bridges between meteorological and dispersion models at different scales. Proc. Baltic HIRLAM Workshop, <http://hirlam.fmi.fi/Baltic>
- Genikhovich, E., Ziv, A., Iakovleva, E., Palmgren, F., Berkowicz, R., 2003: Joint analysis of air pollution in street canyons in St. Petersburg and Copenhagen (submitted to *Atmospheric Environment*)
- Genikhovich, E.L., 1998: Russian Regulatory Diffusion Models: Status, Results of Validation and International Intercomparisons. In: "*Air Pollution in the Ural Mountains. Environmental, Health and Policy Aspects*" (Ed. I. Linkov & R. Wilson), Kluwer Academic Publishers, Dordrecht, 75 – 80.
- Genikhovich, E.L., and Schiermeier, F.A., 1995: Comparison of United States and Russian Complex Terrain Diffusion Models Developed for Regulatory Applications. *Atmospheric Environment*, 29, No. 17, 2375 – 2385.
- Genikhovich, E.L., Gracheva, I.G., Groisman, P.Ya., Khurshudyan, L.G., 2000: A new Russian regulatory dispersion model MEAN for calculation of mean annual concentrations and its meteorological preprocessor, *Int. J. of Environment and Pollution*, 14, No. 1-6, 443 – 452.
- Gent P.R., 2001: Will the North Atlantic Ocean thermohaline circulation weaken during the 21st century? *Geophys. Res. Lett.* 28, 1023-1026.
- Georgiadi A.G., 1993: Historical high water marks as a basis of estimation of spring discharges of Russian plain rivers. In: Proc. Yokohama Symposium on Extreme hydrological events: floods and droughts. IAHS Publ. 213, 207-210.
- Georgiadi A.G., 1981: Approaches to study of the maximum spring runoff. *Izv. USSR Acad Sci., Ser. Geography*, No. xx, 106-117 (in Russian).
- Georgiadi A.G., Dolgov S.V., Kashutina E.A., Kitaev L.M., Dobrodeev V.G., 1998: Intergeosystem, Intraecosystem and Regional Variability of soil moisture for Kursk model region. *Remote Sensing Reviews*, 17, 239-250.
- Georgiadi A.G., Milyukova I.P., 1997: The influence of intralandscape heterogeneity of water-physical properties of chernozem on the components of its water regime. *Pochvovedenie*, No. 4, 500-504 (in Russian).
- Georgiadi A.G., Milyukova I.P., 2002: Possible scales of hydrological changes in the Volga river basin during anthropogenic climate warming. *Meteorology and Hydrology*, No.2, 72-79 (in Russian).
- Georgiadi A.G., Onishchenko V.G., 1994: Thermodynamic Status of Moisture in Anthropogenically Affected Chernozem. *Pochvovedenie*, No.1, 61-66. (in Russian).
- Georgiadi A.G., Onishchenko V.G., 1998: Preliminary results of soil property analysis based on experimental data of field work at Spasskaya Pad'. Proc. of Second International Workshop on Water and Energy Cycle and GAME, November 26-28, 1997, Moscow. Research Report of IHAS, June 1998, No.4. Nagoya University, Nagoya, Japan, 22-30.
- Georgiadi A.G., Yasinski S.V. et.al., 1990: Temporal and spatial variability of soil moisture reserves in a forest-steppe landscape (based on KUREX-88 experiment). - In: Proc. of the Ljubljana Symp. April 1990). *IAHS Publ.*, 191, 25-32.
- Georgiadi A.G., Zolotokrylin A.N., Malyshev V.B. et al., 2001: Experimental Studies of Hydroclimate Characteristics of Permafrost Landscapes of Subarctic Tundra of Eastern Siberia. *Proceedings of Russian Academy of Sciences. Ser. Geography*. No.4, 99-106. (in Russian)

- Georgiadi A.G., 1991: The Change of the Hydrological Cycle under the Influence of Global Climate Warming. - In: *Hydrology for Water Manager of Large River Basin*, IAHS Publ., 201, Vienna, Austria, 11-12 August 1991, 119-128.
- Georgievsky V.Yu., Ezhov A.V., Shalygin A.L., Shiklomanov I.A., and Shiklomanov A.I., 1996: Evaluation of possible climate change impact on hydrological regime and water resources of the former USSR rivers. - "*Meteorology and Hydrology*", 1996, No. 11, 89-99. (in Russian).
- Georgievsky V.Yu., I. A. Shiklomanov and A. L. Shalygin, 2002: Long-term variations in the runoff over the Russian territory. Scientific Report of the State Hydrological Institute, St. Petersburg, Russia, 85 pp.
- Gershenson, V.E. and O.N. Tarakanova, 1997: "Resource-0" scans the Earth. The role of the Russian space program for operational monitoring of the earth's surface. *GISreview*, No. 1, 29-30 (in Russian).
- Gershunov, A., T. Barnett, D. Cayan, T. Tubbs and L. Goddard, 2000: Predicting and downscaling ENSO impacts on intraseasonal precipitation statistics in California: the 1997-1998 event. *Journal of Hydrometeorology*, 1, 201-209.
- Gershunov, A., 2003: Personal Communication. Alexandre Gershunov, Scripps Institution for Oceanography, La Jolla, California.
- Geyer B. and Jarvis P., 1991: *A Review of models of soil - vegetation - atmosphere - transfer - schemes (SVATS)*. A report to the TIGER III Committee. March 1991, Edinburgh, 69 pp.
- GFMC. 2003. *Forest Fire in the Russian Federation*. Global Fire Monitoring Center, available at the Internet: <http://www.fire.uni-freiburg.de/GFMCnew/>
- Giardina C.P., Ryan M.G., 2000: Evidence that decomposition rates of organic carbon in mineral soil do not vary with temperature. *Nature*, 404, 858-861.
- Gillespie A.R., 1985: Lithologic mapping of silicate rocks using TIMS. In: *The TIMS Data Users' Workshop*, JPL Publication 86-38, Jet Propulsion Laboratory, Pasadena, CA, 29-44.
- Gillespie A.R., Rokugawa S., Hook S., Matsunaga T. and Kahle A.B., 1996: Temperature/emissivity separation algorithm theoretical basis document, version 2.3, Jet Propulsion Laboratory, Pasadena, CA.
- Giorgi, F., B. Hewitson, J. Christensen, M. Hulme, H. von Storch, P. Whetton, R. Jones, L. Mearns, and C. Fu, 2001: Regional Climate Information – Evaluation and Projections. In: *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* [Houghton J. T., Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden, X. Dai, K. Maskell and C. A. Johnson (eds.)] Cambridge University Press, Cambridge, U.K. and New York, NY, USA, 881 pp.
- Girs G.N. and Stakanov V.D., 1986: Productivity process of pine forest in the Krasnoyarsk forest-steppe. *Russian J. of Forest Science "Lesovedenie"*, No. 3, 34-41 (in Russian).
- Giryayev, M.D., 1998: Experience and perspectives of application of air and space information in forest management in Russia. In: V.I. Sukhikh (ed.), *Air and Satellite Methods and Geographical Information Systems in Forestry and Forest Management*, Materials of the 2nd All-Russia Meeting, Moscow, 18–19 November 1998. RAS and Federal Forest Service, Moscow, 6–13 (in Russian).
- Gitelson, A. A. and K. Y. Kondratyev, 1991: Optical models of mesotrophic and eutrophic water bodies. *Internat. J. Remote Sensing*, 12, 373-385.
- Gitelson, A. A., 1992: The peak near 700 nm on radiance spectra of algae and water: relationships of its magnitude and position with chlorophyll concentration, *International Journal of Remote Sensing*, 13, 3367-3373.
- Gitelson, A. A., 1992: The peak near 700 nm on radiance spectra of algae and water: relationships of its magnitude and position with chlorophyll concentration, *Internat. J. Remote Sensing*, 13, 3367-3373.
- Gitelson, A. A., A. Viña, T. J. Arkebauer, D. C. Rundquist, G. Keydan, and B. Leavitt, 2003: Remote estimation of leaf area index and green leaf biomass in maize canopies, *Geophysical Research Letters*, 30 (5) 1248. doi:10.1029/2002GL016450.
- Gitelson, A.A, Yacobi, Y.Z., Schalles, J.F., Rundquist, D. C., Han, L. Stark, R. and Etzion, D., 2000: Remote estimation of phytoplankton density in productive waters, *Arch. Hydrobiol. Spec. Issues Advanc. Limnol.*, 55, 121-136.
- Glantz, M. H., 1999: (Ed.) *Creeping Environmental Problems and Sustainable Development in the Aral Sea Basin*. Cambridge University Press. 304 pp.
- Gleason, B.E., T.C. Peterson, Groisman, P.Ya., D.R. Easterling, R.S. Vose, and D.S. Ezell, 2002: A new global daily temperature and precipitation data set. Presented at the Thirteenth AMS Symposium On Global Change Studies, Orlando, Florida, 13-17 January, 2002.
- Glebov, F.Z. and Korzukian, M.D., 1992: Transitions between boreal forest and wetland. pp. 241-266. In: *A Systems Analysis of the Global Boreal Forest* (eds, Shugart, H.H., Leemans, R. and Bonan, G.B., Cambridge University Press, Cambridge).
- Glenn-Lewin, D.C., R.K. Peet and T.T. Veblin (eds.), 1992: *Plant Succession: Theory and Prediction*. Chapman and Hall, London. 352 pp.
- Gobeil C., B. Sundby, R.W. Macdonald, and J.N. Smith, 2001: Recent change in organic carbon flux to Arctic Ocean deep basins: evidence from acid volatile sulfide, manganese and rhenium discord in sediments. *Geophys. Res. Lett.*, 28 (9), 1743-1746.
- Gobron, N., B. Pinty, M. M. Verstraete, J.-L. Widowski and D. J. Diner, 2002: Uniqueness of Multiangular Measurements Part 2: Joint Retrieval of Vegetation Structure and Photosynthetic Activity from MISR, *IEEE Transactions on Geoscience and Remote Sensing, MISR Special Issue*, 40, 1574-1592.
- Godbold D.L. and Hutterman A. (Eds). 1994. *Effects of Acid Rain on Forest Processes*. Wiley-Liss, New York. 419 pp.
- Goetz, S.J. and S.D. Prince, 1996: Remote sensing of net primary production in boreal forest stand. *Agricultural and Forest Meteorology*, 78, No. 3, 149–179.
- Goita, K., A.E. Walker, and B.E. Goodison, 2003: Algorithm development for the estimation of snow equivalent in the boreal forest using passive microwave data. *Int. J. Remote Sensing*, 24, 1097-1102.
- Goldammer, J.G., and V.V. Furyayev (eds.), 1996: *Fire in ecosystems of boreal Eurasia*. Kluwer Academic Publ., Dordrecht, 528 pp.

- Golovanov, V. D., V. I. Fertikov, A. L. Takhatadjan, V. E. Sokolov, O. A. Skarlato, V. A. Zabrodin, A. M. Kolosov, P. T.N. and D. V. Geltman, 1988: *Red Book of the R.S.F.S.R: Plants*. Moscow, Rosagprom Publishing. 592 pp. (in Russian)
- Golubev, V.S. and Kuznetsov, V.I., 1980: Analis sostoyaniya seti vodnoisparitel'nyh stations i predlozheniya po ee ratsionalizatsii – *Trudy GGI*, 266, 64-73.
- Golubev, V.S., 1979: Empirical estimates of the water balance components. - In: *Ekspiermental'nye issledovaniya gidrologicheskikh processov i yavlenij*, ch.2, Moscow, Izdat.MGU. (in Russian).
- Golubev, V.S., Kalyuzhny I.L., and Fedorova T.G., 1980: Teploizolirovannyj isparitel' GGI-3000 TM i rezul'taty ego ispytaniy. - *Trudy GGI*, 266, 74-85.
- Golubev, V.S., Lawrimore, J., Groisman, P.Ya., Speranskaya, N.A., Zhuravin, S.A., Menne, M.J., Peterson, T.C., and Malone, R.W. 2001: Evaporation changes over the contiguous United States and the former USSR: A reassessment *Geophys. Res. Lett.*, 28, 2665-2668.
- Golubev, V.S., Speranskaya, N.A., and Tsitsenko, K.V., 2003: Total evaporation within the Volga River Basin and its variability. *Russian Meteorol. Hydrol.*, 2003, No.7, 89-99.
- Gons, H.J., 1999: Optical teledetection of chlorophyll a in turbid inland waters. *Environ. Sci. Technol.* 33, 1127-1133.
- Goodale, C. L., Apps, M. J., Birdsey, R. A., Field, C. B., Heath, L. S., Houfgton, R. A., Jenkins, J. C., Kohlmaier, G. H., Kurz, W., Liu, S., Nabuurs, G., Nilsson, S., and Shvidenko, A. Z. 2002. Forest carbon sinks in the Northern Hemisphere. *Ecological Applications*. 12, 891-899.
- Goodison, B.E., Louie, P.Y.T., and Yang, D., 1998: WMO solid precipitation intercomparison. Final Report. World Meteorol. Organ., Instruments and Observing Methods Rep. 67, WMO/TD 872, 87 pp. + Annexes.
- Goodrich, L.E., 1978: Efficient numerical technique for one-dimensional thermal problems with phase change. *International Journal of Heat and Mass Transfer*, 21(5), 160-163.
- Gorbacheva T. T., Lukina N.V. and Nikonov V.V., 2002: Modern Methods of Studying the Composition and Properties of Water in Al-Fe-Humus Podzols of Northern Taiga Forests. *Eurasian Soil Science, Supplementary Issue 1*, 35, 107-115.
- Gorbunov A.P., Marchenko S.S, Seversky E.V. and Titkov S.N., 1997: Geocryological condition changes in the Northern Tien Shan in connection of global climate warming. *Hydrometeorology and Ecology*, 3, Almaty, 217-222, (in Russian).
- Gordon, H. and A. Morel, 1983: *Remote Assessment of Ocean Color for Interpretation of Satellite Visible Imagery. A Review*. Springer-Verlag, New York, 114 pp.
- Gorham E., 1991: Northern peatlands: role in the carbon cycle and probable responses to climatic warming. *Ecological Applications*. 1:182-195.
- Gorham E., 1991: Northern Peatlands: Role in the carbon cycles and probable responses to climatic warming. *Ecol. Applications*, 1, 182-195.
- Gorny V.I., 1998: Convective Heat Flow of European Russia According the Remote Geothermal Method. Proceedings of the International Conference "The Earth's Thermal Field and Relative Research Methods". May 19-21, 1998, Moscow, Russia. 107-109.
- Gorny V.I., Kritzruk S.G., Latypov I.Sh. and Tronin A.A., 1997: Geothermal zoning of European Russia on the base of satellite infra-red thermal survey. Proc. of the 30th Int. Geological Congress, Beijing, China, 4-14 August 1996, v.10 - New Technology for Geosciences, VSP, Utrecht, The Netherlands, 63-80.
- Gorny, V.I. and T.E. Teplyakova, 2001: On the influence of the endogenic Earth heat on the generation in boreal zone of local areals of annual vegetation. *Transactions (Doklady) of the Russian Academy of Sciences, Geography*, 378, 560-561 (in Russian).
- Goulden, M. L., Daube, B. C., Fan, S.-M., Sutton, D. J., Bazzaz, M., Munger, J. W., Wofsy, S. C., 1997: Physiological responses of a black spruce forest to weather. *J. Geophys. Res.*, 102, 28987-28996.
- Goulden, M. L., Wofsy, S. C., Harden, J. W., Trumbore, S. E., Crill, P. M., Gower, S. T., Fries, T., Daube, B. C., Fan, S.-M., Sutton, D. J., Bazzaz, A., and Munger, J. W., 1998: Sensitivity of boreal forest carbon balance to soil thaw, *Science*, 279, 214-217.
- Goulden, M.L., Munger, J.W., Fan, S.-M., Daube, B.C., and Wofsy, S.C., 1996: Exchange of carbon dioxide by a deciduous forest: response to interannual climate variability. *Science*, 271, 1576-1578.
- Gower, J.F.R., 1980: Observations of *in-situ* fluorescence of chlorophyll-a in Saanich Intel. *Boundary-Layer Meteorol.* 18, 235-245.
- Graetz R.D., 1991: The nature and significance of the feedback of change in terrestrial vegetation on global atmospheric and climate change. *Climatic Change*, 18, 147-173.
- Graham L. P., Rummukainen M., Gardelin M, Bergstrom S., 2000: Modelling climate change impacts on water resources in the Swedish regional climate modelling programme. In: *Proc. of the Conf. on Detection and Modelling of Recent Climate Change and its Effects on a Regional Scale*, Tarragona, Spain, 29-31 May 2000.
- Grant R.F, Roulet N.T., 2002: Methane efflux from boreal wetlands: Theory and testing of the ecosystem model ecosys with chamber and tower flux measurements. *Global Biogeochem. Cycles*. 16(4) 1054, doi:10.1029/2001GB001702.
- Gravenhorst G., Vygodskaya N., Karpachevskij L., 2002: Chemische Zusammensetzung der atmosphärischen Niederschläge im Zentralen Waldreservat in Abhängigkeit von der synoptischen Wettersituation. In: *Monitoring of Energy-Mass Exchange between atmosphere and forest ecosystems*. (eds. G.Gravenhorst, N.Vygodskaya, O.Panfyorov), Gottingen, 2-7.
- Grégoire J-M., and S. Pinnock, 2000: The World Fire Web network. A satellite based system for globally mapping fires in vegetation. Publication of the European Commission, S.P.I.00.11, p. 6
- Grégoire J-M., K. Tansey, and J.M.N. Silva, 2003: The GBA2000 initiative: Developing a global burned area database from SPOT-VEGETATION imagery, *International Journal of Remote Sensing* 24(6), 1369 - 1376



- Grelle A., Lindroth M. and Molder M., 1999: Seasonal variation of boreal surface conductance and evaporation. *Agr. Forest Meteorol.* 98-99, 563-578.
- Grier C.C., 1988: Foliage loss due to snow, wind and winter drying damage: its effects on leaf biomass of some western conifer forests, *Can. J. Forest Res.*, 18, 1097-1102.
- Griffin, P. C., 1999: Endangered species diversity 'hot spots' in Russia and centers of endemism. *Biodiversity and Conservation*, 8, 497-511.
- Grigoriev, A.A., 1954: Geographical Law and some its rules. *Izv. Acad. USSR, Ser. Geograph.*, 1954, No.5 and 6.
- Grigoriev, M.N., and V.V. Kunitsky, 2000: Destruction of the sea coastal ice-complex in Yakutia. In: Hydrometeorological and Biogeochemical Research in the Arctic (in Russian), in *Trudy Arctic Regional Center*, 2, edited by I.P. Semiletov, 109-116, Vladivostok (in Russian).
- Grody, N. C., 1991: Classification of snow cover and precipitation using the Special Sensor Microwave/Imager (SSM/I). *J. Geophys. Res.*, 96, 7423-7435.
- Groisman P.Ya., 1991: Data on present-day precipitation changes in the extratropical part of the Northern hemisphere, p. 297-310 in: Schlesinger M.E. (editor) "*Greenhouse-Gas-Induced Climatic Change: A Critical Appraisal of Simulations and Observations*". Elsevier, Amsterdam, 615 pp.
- Groisman, P. Y., T. R. Karl and R. W. Knight, 1994: Observed impact of snow cover on the heat balance and the rise of continental spring temperature. *Science*, 263, 198-200.
- Groisman, P. Ya. and Genikhovich, E.L., 1997: Assessing surface-atmosphere interactions using Russian standard meteorological network data. Part 1: Method. *J. Climate*, 10, 2154-2183.
- Groisman, P. Ya., Genikhovich, E.L., and Zhai, P.-M., 1996: "Overall" cloud and snow cover effects on internal climate variables: The use of clear sky climatology. *Bull. Amer. Meteorol. Soc.*, 77, 2055-2065.
- Groisman, P. Ya., Genikhovich, E.L., R.S. Bradley, and B.M. Ilyin, 1997: Assessing surface-atmosphere interactions using Russian standard meteorological network data. Part 2. Cloud and Snow cover effects. *J. Climate*, 10, 2184-2199.
- Groisman, P. Ya., R. W. Knight, R. R. Heim, Jr. V. N. Razuvaev and B. G. Sherstyukov, and N. A. Speranskaya, 2003b: Contemporary Climate Changes in High Latitudes of the Northern Hemisphere Cause an Increasing Potential Forest Fire Danger. *AMS Proc. of the 5<sup>th</sup> AMS Symposium on Fire and Forest Meteorology Joint With 2nd International Wildland Fire Ecology and Fire Management Congress*, 16-20 November 2003, Orlando, Florida. Paper J9.1, 6 pp., CD ROM.
- Groisman, P. Ya., R.W.Knight, D. R. Easterling & T. R. Karl, G. C. Hegerl, 2004: Trends in Intense Precipitation in the Climate Record. *J. Climate* (accepted).
- Groisman, P.Y., T.R. Karl, D.R. Easterling, R.W. Knight, P.F. Jamason, K.J. Hennessy, R. Suppiah, C.M. Page, J. Wibig, K. Fortuniak, V.N. Razuvaev, A. Douglas, E. Forland, and P.M. Zhai, 1999: Changes in the probability of heavy precipitation: Important indicators of climatic change. *Climatic Change*, 42, 243-283.
- Groisman, P.Ya. and 9 others, 2003a: Contemporary climate changes in high latitudes of the Northern Hemisphere: Daily time resolution. CD ROM of papers presented at the 14th AMS Symposium on Global Change and Climate Variations, Long Beach, California (9-13 February, 2003).
- Groisman, P.Ya. and D.R. Legates, 1995: Documenting and detecting long-term precipitation trends: where we are and what should be done. *Climatic Change*, 31, 601-622.
- Groisman, P.Ya. and E. Ya. Rankova, 2001: Precipitation trends over the Russian permafrost-free zone: removing the artifacts of pre-processing. *Internat. J. Climatol.* 21, 657-678.
- Groisman, P.Ya., 2002: Homogeneity Issues in the Global Daily Climatology Network: Precipitation in Cold Climate Regions, Extended Abstract, CD ROM Proceedings of the WCRP Workshop on Determination of Solid Precipitation in Cold Climate Regions, Fairbanks, Alaska, June 9-14, 2002, 10 pp.
- Groisman, P.Ya., Koknaeva, V.V., Belokrylova, T.A., Karl, T.R., 1991: Overcoming biases of precipitation measurement: a history of the USSR experience. *Bull. Amer. Meteorol. Soc.*, 72, 1725-1733.
- Groisman, P.Ya., T.R. Karl, and R.W. Knight, 1994: Observed impact of snow cover on the heat balance and the rise of continental spring temperatures. *Science*, 263, 198-200.
- Gruber, A., X. J. Su, M. Kanamitsu, and J. Schemm, 2000: The comparison of two merged rain gauge-satellite precipitation datasets. *Bull. Amer. Meteor. Soc.*, 81, 2631-2644.
- Gruza, G.V., Rankova, E.Ya., Razuvaev, V.N. and Bulygina, O.A., 1999: Indicators of climatic change for the Russian Federation. *Climatic Change*, 42, 219-242.
- Gu, L., H.H. Shugart, J.D. Fuentes, T.A. Black and S.R. Shewchuk, 1999: Micrometeorology, biophysical exchanges and NEE decomposition in a two story boreal forest: Development and test of an integrated model. *Agricultural and Forest Meteorology*, 94, 123-148.
- Guenther A., 1997: Seasonal and spatial variability in natural volatile organic compound emissions. *Ecol. Appl.*, 7, 34-45.
- Guide on hydrological forecasts, 1982: *Long-term forecasts of elements of water regime of rivers, lakes and reservoirs*. Issue 1, Gidrometeoizdat, L., 358 pp. (in Russian).
- Gukov, A.Yu., Tischenko, P.Ya., Semiletov, I.P., V.V. Popov, and S.A. Shapkin, 1999: Features of the distribution of the macrobenthic biomass in upper sublittoral of southeastern part the Laptev Sea. *Oceanology*, 39 (3), 406-411.
- Gumilev, L.N., 1990: *Ethnogenesis and the Earth's Biosphere*. Gidrometeoizdat, Moscow, 528 pp. (in Russian).
- Gupta, S. K., Darnell, W.L., Wilber, A. C., 1992: A Parameterization for Longwave Surface Radiation from Satellite Data: Recent Improvements. *J. Appl. Meteorol.* 31, 1361-1367.
- Gupta, S.K., 1989: Parameterization for Longwave Surface Radiation from Sun-Synchronous Satellite Data, *J. Climate*, 2, 305-320.
- Gurney, K.R., R.M. Law, A.S. Denning, P.J. Rayner, D. Baker, P. Bousquet, L. Bruhwiler, Y.H. Chen, P. Ciais, S. Fan, I.Y. Fung, M. Gloor, M. Heimann, K. Higuchi, J.

- John, T. Maki, S. Maksyutov, K. Masarie, P. Peylin, M. Prather, B.C. Pak, J. Randerson, J. Sarmiento, S. Taguchi, T. Takahashi, and C.W. Yuen, 2002: Towards robust regional estimates of CO<sub>2</sub> sources and sinks using atmospheric transport models. *Nature*, 415, 626-630.
- Gurtz, J., Baltensweiler, A. and Lang, H., 1999: Spatially distributed hydrotop-based modelling of evapotranspiration and runoff in mountainous basins. *Hydrol. Processes*, 13, 2751-2768.
- Gusev Y.M., Busarova O.Y., Nasonova O.N., 1998. Modelling soil water dynamics and evapotranspiration for heterogeneous surfaces of the steppe and forest-steppe zones on a regional scale. *J. Hydrol.*, 206, 281-297.
- Gusev Y.M., Nasonova O.N., 2004: Modeling of processes of heat/water exchange between land and atmosphere at local scale for permafrost territories. "Eurasian Soil Science", 2004 (in press).
- Gusev, N.N. 1998: *History of Russian forest inventory and planning*. Moscow, Centresproect-group "Erko", 330 pp. (in Russian).
- Gusev, N.N. and S.G. Sinitsyn, 1981: *Forest inventory and planning in the USSR*. Moscow, 328 pp. (in Russian).
- Gustafsson, D., Lewan, E., Van der Hurk, B.J.J.M., Viterbo, P., Grelle, A., Lindroth, A., Cienciala, E., Moolder, M., Halldin, S., Lundin, L.-C., 2003: Boreal Forest Surface Parametrization in the ECMWF Model-1D Test with NOPEX Long-Term Data, *J. Appl. Meteorol.*, 42, 95-112.
- Gutman G., 1985: On modeling dynamics of geobotanic state-climate interaction. *J. Atmos. Sci.*, 43, 305-306.
- Guymon, G. L., Hromadka, T. V., and Berg, R. L., 1984: Two-dimensional model of coupled heat and moisture transport in frost-heaving soils. *Journal of Energy Resources Technology*, 106, 336-343.
- Haeberli, W., 1995: Glacier fluctuations and climate change detection - operational elements of a worldwide monitoring strategy. *WMO Bulletin* 44 (1), 23-31.
- Haeberli, W., Frauenfelder, R., Hoelzle, M. and Maisch, M., 1999: On rates and acceleration trends of global glacier mass changes. *Geografiska Annaler*, 81A, 585-591.
- Hagemann, S., and L. Dumenil, 1998: A parameterization of the lateral water flow for the global scale. *Clim. Dyn.*, 14, 17-31.
- Hagen, J.-O., 1996: Svalbard. In Jania, J., and Hagen, J. - O.(eds.), *Report on Mass Balance of Arctic Glaciers*. Working Group on Arctic Glaciology, International Arctic Science Committee, Sosnowiec/Oslo, 49 pp.
- Hagner, O., 1990: Computer aided forest stand delineation and inventory based on satellite remote sensing. Proceedings from the SNS/IUFRO Workshop, 26-28 February 1990, Umeå.
- Hansen, B., Turrell, W.R. & Osterhus, S., 2001: Decreasing overflow from the Nordic Seas into the Atlantic in the Faroe Bank Channel since 1950. *Nature*, 411, 927-930.
- Hansen, J., T.Bond, B. Cairns, H. Gaeggler, B. Liepert, T. Novakov, and B. Schichtel, 2004: Carbonaceous aerosols in the Industrial Era. *EOS*, 85, No. 25, 241, 244.
- Harden, J.W., E.T. Sundquist, R.F. Stallard, and R.K. Mark, 1992: Dynamics of soil carbon during deglaciation of the Laurentide ice sheet. *Science*, 258, 1921-1924.
- Hardes G., Zimmerman R. and Vygodskaya N.N., 1999: Above-ground biomass and Euro Siberian transect: an introduction to the experimental region. *Tellus*, 54B (5), 421-428.
- Harding, R. J., S.-E. Gryning, S. Halldin, and C. R. Lloyd, 2001: Progress in understanding of land surface/atmosphere exchanges at high latitudes. *Theor. Appl. Climatol.*, 70, 5-18.
- Harmon, M. E. and Marks, B., 2002: Effects of silvicultural treatments on carbon stores in forest stands. *Can. J. For. Res.*, 32, 863-877.
- Hatjes R.W.A. et al., 1998: Preface Biospheric Aspects of the Hydrological Cycle. *J. Hydrology*, 212-213, 1-21.
- Hättenschwiler S., Körner C., 1996: System-level adjustments to elevated CO<sub>2</sub> in model spruce ecosystems. *Global Change Biol.*, 2, 377-387.
- Haywood J. and O. Boucher, 2000: Estimates of the direct and indirect radiative forcing due to tropospheric aerosols: A review. *Reviews of Geophysics* 38, 513-543.
- Hedges J.I., Hu F.S., Devol A.H., Hartnett H.E., Tsamakis E., and R.G. Keil, 1999: Sedimentary Organic Matter Preservation: A test for selective degradation under oxic conditions, *American J.Sci.*, 299, 529-555.
- Hegerl, G.C., F.W. Zwiers, P.A. Stott and S. Kharin, 2004: Detectability of anthropogenic changes in temperature and precipitation extremes. *J. Climate*, 17, 3683-3700.
- Heim R.R.Jr. 2002: Review of Twentieth-Century Drought Indices Used in the United States. *Bull. Amer. Meteor. Soc.*, 83, 1149-1165.
- Heimann, M., and Co-Authors, 1998: Evaluation of terrestrial carbon cycle models through simulations of the seasonal cycle of atmospheric CO<sub>2</sub>: First results of a model intercomparison study. *Global Biogeochemical Cycles* 12, 1-24.
- Heino, R., and Coauthors, 1999: Progress in the study of climate extremes in northern and central Europe. *Climatic Change*, 42, 151-181.
- Heinselman, M.L., 1981a: Fire intensity and frequency as factors in the distribution and structure of northern ecosystems. In: *Fire regimes and ecosystem properties*. (eds. Mooney, H.A., Bonnicksen, T.M., Christensen, N.L., Lotan J.E. and Reiners W.A.), Gen. Tech. Rep. WO-26. Washington, DC: U.S. Department of Agriculture, Forest Service: 7-57.
- Heinselman, M.L., 1981b: Fire and succession in the conifer forests of northern North America. In *Forest Succession: Concepts and Application*, (eds. West, D.C., Shugart, H.H. and Botkin, D.B.) 374-405 (Springer-Verlag, New York).
- HELCOM, 2002: *Environment of the Baltic Sea area 1994-1998*. Baltic Sea Environmental Proceedings, # 82B. Helsinki Commission, 215 pp.
- Henderson-Sellers A., McGuffie K. & Pitman A.J., 1996: The Project for intercomparison of land-surface parameterization schemes (PILPS): 1992 to 1995. *Climate Dynamics* 12, 849-859.
- Henderson-Sellers A., Pitman A., Love P., Irannejad P., Chen T., 1995: The Project for Intercomparison of Land Surface Parameterization Schemes (PILPS): Phases 2 and 3. *Bull. Amer. Met. Soc.*, 76, 489-503.
- Heywood V.H. and Watson R.T. (Eds). 1995. *Global Biodiversity Assessment*. Cambridge Univ. Press, Cambridge. 1152 pp.
- Higgins, P.A.T., and M. Vellinga, 2004: Ecosystem Responses to Abrupt Climate Change: Teleconnections,

- Scale and the Hydrological Cycle. *Climatic Change*, 64, 127-142.
- Hinzman, L. D., Kane, D. L., Yoshikawa, K., Carr, A., Bolton, W. R., and M. Fraver, 2003: Hydrological variations among watersheds with varying degrees of permafrost. In: Proceedings of the VII International Permafrost Conference, Switzerland, July 21-25, 2003, 407-411.
- Hinzman, L., Bettez, N., Chapin, F. S., Dyrugerov, M., Fastie, C., Griffith, B., Hollister, R. D., Hope, A., Huntington, H. P., Jensen, A., Kane, D., Klein, D. R., Lynch, A., Lloyd, A., McGuire, A. D., Nelson, F., Oechel, W. C., Osterkamp, T., Racine, C., Romanovsky, V., Stow, D., Sturm, M., Tweedie, C. E., Vourlitis, G., Walker, M., Walker, D., Webber, P. J., Welker, J., Winker, K., Yoshikawa, K., 2003: Evidence and Implications of Recent Climate Change in Terrestrial Regions of the Arctic. *Climatic Change*, in review.
- Ho D., 1986: Thermal inertia and soil fluxes by remote sensing. IGARSS'86, University of Zurich, Switzerland, 8-11 September.
- Hobbie S.E., 1996: Temperature and plant species control over litter decomposition in Alaskan tundra. *Ecol. Monogr.*, 66, 503-522.
- Holland E.A., Braswell B.H., Lamarque J.-F., Townsend A., Sulzman J., Müller J.-F., Dentener F., Brasseur G., Levy 11 H., Penner J.E. and Roelofs G.-J., 1997: Variations in the predicted spatial distribution of atmospheric nitrogen deposition and their impact on carbon uptake by terrestrial ecosystems. *J. Geophys. Res.*, 102 (D13), 15,849-15,866.
- Hollinger D., Kelliher F.M., Schulze E.-D., Bauer G., Arneth A., Byers J.N., Hunt J.E., McSevny T.M., Kobak K.I., Milukova I., Sogachev A., Tatarinov F., Varlagin A., Ziegler W. and Vygodskaya N.N. 1998. Forest-atmosphere carbon dioxide exchange in eastern Siberia. *Agr. Forest Meteorol.*, 90, 291-306.
- Hollinger D., Kelliher F.M., Schulze E.-D., Vygodskaya N.N., Varlagin A., Miyukova I., Byers J.N., Sogachev A.F., Hunt J.F., McSevny T.M., Kobak K.I., Bauer G., Arneth A. 1995: Initial assesmnet of multi-scale measures of CO<sub>2</sub> and H<sub>2</sub>O fluxes in the Siberian taiga. *J. Biogeography*, 22, 425-431.
- Hollinger, D.Y., 1996: Optimality and nitrogen allocation in a tree canopy. *Tree Physiology* 16, 627-634
- Holmes R.M., Peterson B.J., Gordeev V.V., Zhulidov A.V., Meybeck M., Lammers R.B., and C.J.Vorosmarty, 2000: Flux of nutrients from Russian Rivers to the Arctic Ocean: Can we establish a baseline against which to judge future changes? *Water Resources Research*, 36(8), 2309-2320.
- Hooper M.D. and Vitousek P.M., 1997: The effects of plant composition and diversity on Ecosystem processes. *Science*, 277, 1302-1305.
- Hou, A. Y., Zhang, S. Q., da Silva, A. M., Olson, W. S., Kummerow, C. D., Simpson, J., 2001: Improving Global Analysis and Short-Range Forecast Using Rainfall and Moisture Observations Derived from TRMM and SSM/I Passive Microwave Sensors. *Bull. Amer. Meteorol. Soc.* 82, 659-680.
- Houghton R.A., 1995: Land-use change and the carbon cycles. *Global Change Biology*, 1, 275-287.
- Houghton R.A., Davidson E.A. and Woodwell G.M., 1998: Missing sinks, feedbacks, and understanding the role of terrestrial ecosystems in the global carbon balance. *Global Biogeochemical Cycles*, 12, 25-34.
- Houghton, J.T., Meiro Filho, L.G., Callander, B.A., Harris N., Kattenburg, A. and Maskell K. (eds), 1996: *Climate change 1995: The Science of Climate Change*, Cambridge University Press, Cambridge, U.K. 584 pp.
- Houghton, R.A., D.L. Skole, C.A. Nobre, J.L. Hackler, K.T. Lawrence, and W.H. Chomentowski, 2000: Annual fluxes of carbon from deforestation and regrowth in the Brazilian Amazon. *Nature*, 403, 301-304.
- Houix, J.P. (Ed.), 2000: *Complex Assessment System of Karelian Isthmus Forest Conditions*, IGNI, Paris, France. 23 pp.
- Hsu, K., S. Sorooshian, X. Gao, and B. Imam, 2003: Global precipitation observations from the PERSIANN system. *GEWEX News*, 13, 11-12.
- Hsu, K., X. Gao, S. Sorooshian, and H.V. Gupta, 1997: Precipitation estimation from remotely sensed information using artificial neural networks, *J. Appl. Meteorol.*, 36, 1176-1190.
- Huete, A.R., H.Q. Liu, K. Batchily, and W. van Leeuwen, 1997: A comparison of vegetation indices over a global set of TM images for EOS-MODIS, *Remote Sensing of Environment*, 59, 440-451.
- Huffman, G. J., R.F. Adler, M.M. Morrissey, D. T. Bolvin, S. Curtis, R. Joyce, B. McGavock, and J. Susskind, 2001: Global precipitation at one-degree daily resolution from multisatellite observations. *J. Hydrometeorol.*, 2, 36-50.
- Huffman, G. J., 1997: Estimates of root-mean-square random error for finite samples of estimated precipitation. *J. Appl. Meteorol.*, 36, 1191-1201.
- Huffman, G. J., and Coauthors, 1997: The Global Precipitation Climatology Project (GPCP) combined precipitation datasets. *Bull. Amer. Meteor. Soc.*, 78, 5-20.
- Huizhi L., Z. Hongsheng, H. Zhongxiang, H. Fei and C. Hongyan., 2001: The Turbulent characteristic in the surface layer over dune at Naiman in Inner Mongolia. *Proc. GAME ANN/Radiation Workshop*, Phuket, p. 49.
- Humes K.S., Kustas W.P., Moran M.S., Nichols W.D., Weltz M.A., 1994: Variability of emissivity and surface temperature over a sparsely vegetated surface. *Water Resources Research*, 20, 1299-1310.
- Hutchison B.A. and Hicks B.B. (Eds), 1985: *The Forest – Atmosphere Interaction*. D.Reidel Publishing Co, Dordrecht. 648 pp.
- Implementation of Satellite Information for Protection of Forests from Fires, 1977: Practical recommendations. Moscow-Leningrad, 14 pp. (in Russian).
- Inoue G., Maksyutov S., Panikov N., 1995: CO<sub>2</sub> and CH<sub>4</sub> emission from wetlands in west Siberia. *Proc. of the Third Symposium of the Joint Siberian Permafrost Studies between Japan and Russia in 1994*. Tsukuba, Japan, 37-43.
- Inoue, G. 2003: Personal Communication.
- Institute of Geography, 2002: Kolka Glacier: disaster again. Data of Glaciological Studies, Publication 93, Institute of Geography, Russian Academy of Science, Glaciological Association.
- Institute of Water Problems, IWP, 1984: (Ed. Kuznetsova). *Atlas, Content and transfer of moisture in the atmosphere over the USSR territory*. Institute of Water Problems of the Russian Academy of Science, 76 pp.

- Intergovernmental Panel on Climate Change (IPCC), 1990: *Climate Change. The IPCC Scientific Assessment*. J.T. Houghton, G.J. Jenkins, and J.J. Ephraums (Eds.), Cambridge University Press N.Y., 362 pp.
- Intergovernmental Panel on Climate Change (IPCC), 1996: *Climate Change 1995: The Science of Climate Change. The Second IPCC Scientific Assessment*. J.T. Houghton, L.G. Meira Filho, B.A. Callendar, N. Harris, A. Kattenberg, and K. Maskell, (Eds.), Cambridge University Press N.Y., 572 pp.
- Intergovernmental Panel on Climate Change (IPCC), 1998: *The Regional Impacts of Climate Change. An Assessment of Vulnerability*. A Special Report of IPCC Working Group II, Cambridge University Press., 517 p.
- Investigation of Characteristics and Sustainability of Boreal Forests, 1998: Report about the I and II stages. Joint Russian-American Commission on Economic and Technological Collaboration, 13 pp. (in Russian).
- Investigations of Taiga Landscapes by Remote Methods, 1979: Novosibirsk, 170 pp. (in Russian).
- IPCC I, 2001: *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* [Houghton, J. T., Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden, X. Dai, K. Maskell, and C. A. Johnson (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 881 pp.
- IPCC II, 2001: *Climate Change 2001, Impacts, Adaptation, and Vulnerability*. McCarthy, J.J., Canziani, O.F., Leary, N.A., Dokken, D.J. and K.S. White (Eds). Cambridge University Press. 1032 pp.
- Isachenko A.G., Shlyapnikova A.A., Robozerova O.D., Filipetckaya A.Z., 1988: The landscape map of the USSR. GUGK, Moscow, Russia (in Russian).
- Isachenko, A.G., Romanyuk, B.D., Knize, A.A., 1999: Landscape approach and modern problems of forestry. *Bull. Russ. Geogr. Soc.*, 131, (3), 17 – 23.
- Isaev A.S. et al., 1995: *Environmental problems of carbon gas absorption through reforestation and forest plantation in Russia* (Analytic review), Moscow: The Center of Environmental Policy of Russia. 156 pp. [In Russian]
- Isaev A.S., Ovchinnikova T.M., Pal'nikova E.N. and Sukhovolski V.G., 1997a: Distribution of phyllophage insects' populations depending on landscape and ecological characteristics of habitats. *Lesovedenie (Forest Science)*, 1997, No. 3, 70-73 (In Russian).
- Isaev A.S., Ovchinnikova T.M., Pal'nikova E.N. and Sukhovolski V.G., 1997b: Simulation modeling of pine looper population dynamics at different climate scenarios. *Lesovedenie (Forest Science)*, 1997, No.4, 40-48 (In Russian).
- Isaev A.S., Ovchinnikova T.M., Pal'nikova E.N., Sukhovolski V.G. and Tarasova O.V., 2000: The influence of insects on boreal ecosystems under global climate change. - In: *Disturbance of Boreal Forest Ecosystem: Human Impacts and Natural Processes* (International Boreal Forest Research Association 1997 Annual Meeting Proceedings. US Department of Agriculture Forest Service. North Central Research Station General Technical Report NC-209, pp.115-123.
- Isaev, A.S. and Korovin G.N., 2003: Large-scale changes in Eurasian boreal forests and methods of their assessment using space-borne information. *Lesovedenie (Forest Science)*, 2003, No. 2, 3-9 (In Russian).
- Isaev, A.S. (ed), 1997: *Program of extraordinary activities on biological struggle with pests in forests of Krasnoyarsk kray*. Federal Forest Service of Russia, Moscow, 154 pp. [in Russian]
- Isaev, A.S. (ed.), 1995: *Problems of monitoring and modeling the dynamics of forest ecosystems*. Moscow, 352 pp. (in Russian).
- Isaev, A.S. (ed.), 1997: Extraordinary program of biological struggle with insects in forests of Krasnoyarsk Krai. Moscow, 154 pp. (in Russian).
- Isaev, A.S. and F.I. Pleshikov, 1987: Main directions in investigations of Siberian forest resources by aerospace techniques. *Investigations of Forests by Aerospace Techniques*, Novosibirsk, 3–9 (in Russian).
- Isaev, A.S. and Korovin G.N., 1998: Carbon in forests of Northern Eurasia. In G.A. Zavarzin (ed.) *Carbon turnover in territory of Russia*. Russian Academy of Sciences, Moscow, 63-95 [in Russian]
- Isaev, A.S. and V.I. Sukhikh (eds.), 1991: Aerospace monitoring of forests. Moscow, 240 pp. (in Russian).
- Isaev, A.S. and V.I. Sukhikh (eds.), 1998: *Aerospace methods and geoinformation systems in forestry and forest management*. Moscow, 215 pp. (in Russian).
- Isaev, A.S. and V.I. Sukhikh, 1979: Conception of aerospace monitoring of forests. *Aerospace Monitoring of Forests*, Moscow, 7–26 (in Russian).
- Isaev, A.S. and V.I. Sukhikh, 1986: Aerospace monitoring of forest resources. *Lesovedenie*, No. 6, 11–21 (in Russian).
- Isaev, A.S., 1997: *Integrated Environmental Impact Assessment and Forest Pest Monitoring System Report of Russian Federation Environment Management Project*.
- Isaev, A.S., Khlebopros R.G., Nedorezov L.V., Kondakov Yu.P. Kiselev V.V. and Sukhovolski V.G., 2001a: *Population dynamics of forest insects*. – Moscow: Nauka Publ. House, 2001. – 374 pp. (In Russian)
- Isaev, A.S., Korovin G.N., Zamolodchikov D.G., Utkin A.I. and Pryaznikov A.A., 1995: Carbon stock and deposition in phytomass of the Russian forests. *Water, Air and Soil Pollution*, 82, 247-256
- Isaev, A.S., Korovin, G.N., Bartalev, S.A., D. Ershov, A. Janetos, Kasischke, E.S., Shugart, H.H., French, N.H., Orlick, B.E., and T.L. Murphy, 2002: Using remote sensing to assess Russian forest fire carbon emissions, *Climate Change*, 55(1-2), 235-249.
- Isaev, A.S., Ovchinnikova T.M. and Sukhovolski V.G., 2001b: Modeling of *Monochamus uralis* Fisch. population dynamics in Siberian dark conifer middle taiga. *Lesovedenie (Forest Science)*, 2001, No.4, 15-24 (In Russian).
- Isaev, A.S., V.V. Kiselev and Yu.P. Kondakov, 1991: Forest-pathological monitoring. *Aerospace Monitoring of Forests*, Moscow, 135–154 (in Russian).
- Iwashima, T. and R.Yamamoto, 1993: A statistical analysis of the extreme events: Long-term trend of heavy daily precipitation, *J. Meteorol. Soc. Japan*, 71, 637-640.
- Izrael Yu.A. and Abakumov V.A., 1991: On ecological state of surface waters of the USSR and criteria of ecological

- normalization. In: "Ecological Modifications and Criteria of Ecological Normalization". Tr. International Symposium. L., Gidrometeoizdat, 7-18.
- Izrael, Yu.A., Tsaturov, Yu.S., Nazarov, I.M., Tsyban, A.V., Tchernogaeva, G.M., Tchelyukanov, V.V., Egorov, V.I. (Eds.), 2002: *Review of Environmental Pollution in the Russian Federation in 2001*. Rosgidromet, Moscow, 221 pp. (in Russian)
- Izrael, Yu.A., Tsaturov, Yu.S., Nazarov, I.M., Tsyban, A.V., Tchernogaeva, G.M., Tchelyukanov, V.V., Egorov, V.I. (Eds.), 2003: *Review of Environmental Pollution in the Russian Federation in 2002*. Rosgidromet, Moscow, 305 pp. (in Russian)
- Jackson R.B., Schenk H.J., Jobbagy E.G., Canadell J., Colello G.D., Dickinson R.E., Dunne T., Field C.B., Friedlingstein P., Heimann M., Hibbard K., Kicklighter D.W., Kleidon A., Neilson R.P., Parton W.J., Sala O.E., Sykes M.T., 2000: Belowground consequences of vegetation change and its treatment in models. *Ecological Application*, 10, 470–483.
- Jackson, T. J., A.Y. Hsu, A. Shutko et al. 2002. Priroda microwave radiometer observations in the Southern Great Plains 1997 hydrology experiment. *Int. J. Remote Sensing*, 22, 231-248.
- Jacobs C.M.J., Bruin H.A.R. 1992. The sensitivity of regional transpiration to land-surface characteristics: Significance of feedback. *J. Climate*, 5, 683-698.
- Janetos A. C., A. S. Isaev, V. Sukhikh, V. Zhirin, S. Bartalev, D. Ershov, A. Shatalov, M. Gurskiy, A. Pismenniy, T. Ziemelis, S. Ivanov, H. H. Shugart, B.E. Orlick, T.L. Murphy, E.S. Kasischke, N.H.F. French, T. Stone, 1998: *Boreal Forest Characterization and Sustainability Study – Report on phase I and II*, U.S. – Russian Joint Commission on Economic and Technological Cooperation, Environmental Working Group, 13 pp.
- Janowiak, J. E., and P. A. Arkin, 1991: Rainfall variations in the Tropics during 1986–1989. *J. Geophys. Res.*, 96, 3359–3373.
- Janowiak, J.E., R.J. Joyce, and Y. Yarosh, 2000: A real-time global half-hourly pixel resolution infrared dataset and its applications. *Bull. Amer. Meteorol. Soc.*, 82, 205-217.
- Janssens I.A., Lanckreijer H., Matteucci G., Kowalski S., Buchmann N., Epron D., Pilegaard K., Kutsch W., Longdoz B., Grünwald T., Montagnani L., Dore S., Rebmann C., Moors J., Grelle A., Rannik Ü., Mongenstern K., Oltchev A., Clement R., Gudmundsson J., Minerbi S., Berbigier P., Ibrom A., Moncrieff J., Aubinet M., Bernhofer C., Jensen O., Vesala T., Granier A., Schulze E.-D., Lindroth A., Dolman A.J., Jarvis P.G., Ceulemans R. and Valentini R., 2001: Productivity overshadows temperature in determining soil and ecosystem respiration across European forests. *Global Change Biology*, 7, 269-278.
- Jarvis P.G., 1995: Scaling processes and problems. *Plant, Cell and Environment*, 18, 1079-1089.
- Jaskovski B., 2002: Genesis and soil properties of continental dunes as indicators of a dune-forming process dynamics on the Central Poland territory. Doctorite dissertation on Biology, Moscow, Moscow State University, 54 pp. (in Russian)
- Jenkins, J.C., D.W. Kicklighter and J.D. Aber, 2000: Regional impacts of increased CO<sub>2</sub> and climate change on forest productivity, In: *Responses of Northern U.S. Forests to Environmental Change*, R.H. Mickler, R.A. Birdsey and J. Hom (eds). Springer-Verlag, 383-423.
- Jernsletten J-L. L. and Klokov K. 2002: *Sustainable Reindeer Husbandry*. Arctic Council 2000-2002. Centre for Saami Studies, University of Tromsø. 157 pp.
- Jernsletten, J.-L. L. and K. Klokov, 2002: *Sustainable Reindeer Husbandry*. Tromsø, Centre for Saami Studies, University of Tromsø: 164 pp.
- Joiner D.W., Lafleur P.M., Caughey H.M. and Barlett P.A., 1999: Interannual variability in carbon dioxide exchange in boreal wetland in the BOREAS northern study area. *J. Geophys. Res.* 104, D22, 27,663-27,672.
- Jonasson S., Chapin III F.S., Shaver G.R., 2001: Biogeochemistry in the Arctic: Patterns, processes, and controls. In: *Global Biogeochemical Cycles in the climate system*. (Eds. E.- D. Schulze, M. Heimann, S. Harrison, S. Holland, J. Lloyd, C. Prentice, and D. Schimel). Academic Press, San Diego, 139-150.
- Jones, H.G., J.W. Pomeroy, D.A. Walker, and R.W. Hoham, 2000: *Snow Ecology: An Interdisciplinary Examination of Snow-Covered Systems*. Cambridge University Press, 378 pp.
- Jones, P.D. and Moberg, A. 2003: Hemispheric and large-scale surface air temperature variations: An extensive revision and an update to 2001. *J. Climate*, 16, 206-223.
- Jones, P.D., Ogilvie, A.E.J., Davies, T.D. and Briffa, K.R., eds., 2001: *History and Climate: Memories of the Future?* Kluwer Acad. Publ., 310 pp.
- Jones, R.G., Murphy, J.M., Noguer, M., and Keen, A.B., 1997: Simulation of climate change over Europe using a nested regional-climate model. II. Comparison of driving and regional model responses to a doubling of carbon dioxide. *Quart. J. Roy. Meteorol. Soc.*, 123, 265-292.
- Jorgenson, M.T., Racine, C.H., Walters, J.C., and Osterkamp, T.E., 2001: Permafrost degradation and ecological changes associated with a warming climate in central Alaska. *Climatic Change*, 48(4), 551-571.
- Joyce, R. J., and P. A. Arkin, 1997: Improved estimates of tropical and subtropical precipitation using the GOES precipitation index. *J. Atmos. Oceanic Technol.*, 14, 997–1011.
- Joyce, R. J., Janowiak, J. E., P. A. Arkin, and P. Xie, 2003: CMORPH: A new high-resolution global precipitation analysis system. *GEWEX News*, 13, 8-10.
- Justice C. O., Giglio L., Korontzi S., Owens J., Morisette J. T., Roy, D., Descloitres J., Alleaume S., Petitcolin F., and Kaufman Y., 2002: The MODIS Fire Products, *Remote Sensing of Environment*, 83(1-2), 244-262.
- Justice, C. O., J. R. G. Townshend, E. F. Vermote, E. Masuoka, R. E. Wolfe, N. Saleous, D. P. Roy and J. T. Morisette, 2002: An overview of MODIS Land data processing and product status, *Rem. Sens. Environ.*, 83(1-2), 3-15.
- Justice, C. O., S. W. Running, et al., 1998 : The Moderate Resolution Imaging Spectroradiometer (MODIS): Land remote sensing for global change research. *IEEE Trans. Geosci. Remote Sens.*, 36(4), 1228-1249.
- Justice, C.O., J.R.G. Townshend, B.N. Holben, and C.J. Tucker, 1985: Analysis of the phenology of global vegetation using meteorological satellite data. *Int. J. Rem. Sens.*, 8, 1271-1318.

- Kääb, A., Paul, F., Maisch, M., Kellenberger, T. and Haerberli, W., 2002: The new remote sensing-derived Swiss Glacier Inventory: I. Methods. *Annals Glaciol.*, 34, 362-366
- Kääb, A., Wessels, R., Haerberli, W., Huggel, C., Kargel, J. S. and Khalsa, S. J. S., 2003: Rapid ASTER imaging facilitates timely assessment of glacier hazards and disasters. *EOS*, 13/84, 117-124.
- Kabat, P., M. Claussen, P.A. Diermeier, J.H.C. Kash, L. Bravo de Guenni, M. Meibeck, R.A. Pielke, Sr., C.J. Vörösmarty, R.W.A. Hutjes, and S. Lütkemeier (Eds.), 2004: *Vegetation, Water, Humans and the Climate - A New Perspective on an Interactive System*. Springer Verlag, Amsterdam, 600 pp.
- Kader, B.A., Yaglom, A.M., 1972: Heat and mass transfer laws for fully turbulent wall flows, *Int.J.Heat Mass Transfer*, 15, 2329-2353.
- Kahle A.B., Madura D.P. and Soha J.M., 1980: Middle infrared multispectral aircraft scanner data: analysis for geological applications. *Appl. Opt.*, 19, 2279-2290.
- Kaimal, J.C. and Finnigan J.J., 1994: *Atmospheric boundary layer flows: Their structure and measurement*. Oxford University Press, New York, NZ, 289 pp.
- Kaimal, J.C., Wyngaard, J.C., Izumi, Y., Cote, O.R., 1972: Spectral characteristics of surface-layer turbulence, *Quart. J. Roy. Meteorol. Soc.* 98, 563-589.
- Kaipainen L.K., Bolondinsky V.K., Sazonova T.A., Sofronova G.I. 1995. Water regime and photosynthesis of Scots pine (*Pinus sylvestris*) under industrial pollution. *Russian J. Plant physiology*. 42 (3), 451-456.
- Kajii Y., Kato S., Streets D., Tsai N., Shvidenko A., Nilsson S., McCallun J., Minko N., Abushenko N., Altynev D., and Khozder T., 2003: Vegetation Fire in Russia in 1998: Estimation of area and emissions of pollutants by AVHRR satellite data. *J. Geophys. Res.*, 108, doi:10.1029/2001JD001078.
- Kalashnikov, E.N. and F.I. Pleshikov, 1991: General principles for monitoring of natural and anthropogenic processes. *Aerospace Monitoring of Forests*, Moscow, 73–76 (in Russian).
- Kalashnikov, E.N., N.V. Malysheva and V.I. Sukhikh, 1991: Cartographic support for monitoring. *Aerospace Monitoring of Forests*, Moscow, 36–63 (in Russian).
- Kämäri J., Posch M., Kähkönen A.-M., Johansson M., 1995: Modeling potential long-term responses of a small catchment in Lapland to changes in sulphur deposition. *The Science of the Total Environment*. 160/161, 687-701.
- Kaminski, T., W. Knorr, P.J. Rayner, and M. Heimann, 2002: Assimilating atmospheric data into a terrestrial biosphere model: A case study of the seasonal cycle. *Global Biogeochemical Cycles* doi:10.1029/2001GB001463.
- Kandel, R., Viollier, M., Raberanto, P., Duvel, J. Ph., Pakhomov, L. A., Golovko, V. A., Trishchenko, A. P., Mueller, J., Raschke, E., Stuhlmann, R. R., Scientific Working Group (ISSWG), International ScaRaB., 1998: The ScaRaB Earth Radiation Budget Dataset. *Bull. Amer. Meteorol. Soc.*, 79, 765–783.
- Kanemasu, E.T., Verma, S.B., Smith, E.A., Fritschen, L.J., Wesely, M., Field, R.T., Kustas, W.P., Weaver, H., Stewart, J.B., Gurney, R., Panin, G., Moncrieff, J.B., 1992: Surface Flux Measurements in FIFE: An Overview, *J. Geophys. Res.* 97, D17, 18,547-18,555.
- Kapitsa, A.P. and E.I. Golubeva, 1995: Bioindicators for disturbances of tundra ecosystems. Paper presented at the IGU Conference “Global Change and Geography”, Moscow (in Russian).
- Kaplin, P.A. and A.O. Selivanov, (eds.), 1997: *Evolution of Sea Coasts of Russia and Their Changes Under the Possible Global Sea-Level Rise*. Lomonosov Moscow University, Moscow, 305 pp.
- Kaplin, P.A. and A.O. Selivanov, 1999: *Sea-Level Changes in Russia and Coastal Evolution: Past, Present and Future*. GEOS, Moscow, 299 pp.
- Kaplin, P.A. and A.O. Selivanov, 2003: Future evolution of the southern Pechora Sea coasts under the anticipated global and regional climate and sea-level changes during the present century. In: *Berichter fur Palaeoforschung*, in press.
- Kaplin, P.A. and Selivanov, A.O., 1995: The flood that was, that is and that will be. *Science in Russia*, 2, 16-23.
- Karl, T. R., Groisman, P. Ya., Knight, R. W., Heim, R. R. 1993: Recent Variations of Snow Cover and Snowfall in North America and Their Relation to Precipitation and Temperature Variations. *J. Climate*, 6, 1327–1344.
- Karl, T.R. and W.E. Riebsame, 1989: The impact of decadal fluctuations in mean precipitation and temperature on runoff: A sensitivity study over the United States. *Climatic Change*, 15, 423-447.
- Karl, T.R., G. Kukla, V. Razuvayev, M. Changery, R.G. Quayle, R.R. Heim, D.R. Easterling, and C.B. Fu, 1991: Global warming: evidence for asymmetric diurnal temperature change, *Geophys. Res. Lett.*, 18, 2253-2256.
- Karofeld, E., 1998: The dynamics of the formation and development of hollows in raised bogs in Estonia. *The Holocene*, 8, 697-704.
- Karpachevskii L.O., 1981: *Forest and forest soils*. Verlag Lesnaya promushlenost, Moscow, 264 pp. (in Russian).
- Karpachevskii L.O., Borovinskaya L.B., Haidapova D.D.. 1994a: Role of root system in soil formation in the dry steppe environment. *Russian J. of Soil Science "Pochvovedenie"*, 11, 77-84 (in Russian).
- Karpachevskiy L.O., Voronin A.D., and Dmitriev E.A., 1994b: Biogeocenotic studies in forest biogeocoenoses. Moscow, Publ. House of the Moscow State University. xxx pp.
- Karpov V.G. (ed)., 1983: *Regulation factors of spruce forest ecosystems*. Leningrad, Verlag "Nauka", 317 pp. (in Russian).
- Kasischke, E.S. and Bruhwiler L.P. 2002. Emissions of carbon dioxide, carbon monoxide, and methane from boreal forest fires in 1998. *J. Geophys. Res.*, 107, 8146, Doi:10.1029/2001JD000461
- Kasischke, E.S. L. Morrissey, J.B. Way, N.H.F. French, L.L. Bourgeau-Chavez, E. Rignot, J. Steam, G.P. Livingston, 1995: Monitoring seasonal variations in boreal ecosystems using multi-temporal spaceborne SAR data, *Can. J. Remote Sens.*, 21, 96-109.
- Kasischke, E.S., and B.J. Stocks, 2000: (editors), *Fire, Climate Change and Carbon Cycling in the Boreal Forest*, Ecological Studies Series, Springer-Verlag, New York, 461 pp.
- Kasischke, E.S., Christensen Jr. N.L. and Stocks B.J. 1995: Fire, global warming, and the carbon balance of boreal forests. *Ecological Applications*, 5, 437-451.
- Kasischke, E.S., French, N. H. F., Harrell, P., Christensen N.L. Jr., Ustin, S.L. and Barry D., 1993: Monitoring of

- wildfires in boreal forests using large-area AVHRR NDVI composite image data. *Remote Sensing of the Environment*, 44, 1-10.
- Kattsov, V. M., and J. E. Walsh, 2000: Twentieth-century trends of Arctic precipitation from observational data and a climate model simulation. *J. Climate*, 13, 1362-1370
- Kattsov, V. M., J. E. Walsh, A. Rinke, and K. Dethloff, 2000: Atmospheric Climate Models: Simulations of the Arctic Ocean fresh water budget components. In: *The Freshwater Budget of the Arctic Ocean* (E. L. Lewis et al., eds.), Kluwer Academic Publishers, 209-247.
- Katul, G.G., Golts, S.M., Hsieh, C-I., Chang, Y., Mowry, F., Sigmon, J., 1995: Estimation of surface heat and momentum fluxes using the flux-variance method above uniform and non-uniform terrain. *Bound.-Layer Meteorol.*, 74, 237-260.
- Kauppi, P., R. Sedjo, M. Apps, C. Cerri, T. Fujimori, H. Janzen, O. Krankina, W. Makundi, G. Marland, O. Masera, G-J. Nabuurs, W. Razali, N.H. Ravindranath, 2001: Technical and Economic Potential of Options to Enhance, Maintain and Manage Biological Carbon Reservoirs and Geo-Engineering. In: *Climate Change 2001: Mitigation*. Contribution of working group III to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). 301-343.
- Kazanskiy A.B. and Zolotokrylin A.N., 1994: On the missing component in the equation for the land surface heat balance as applied to the heat exchange between the desert or semidesert surface and the atmosphere, *Boundary-Layer Meteorology*, 71, 189-195.
- Kazimirov N.I. and Morozova R.M., 1973: *Biological Cycle in Karelian Forest*. Leningrad, Verlag "Nauka", 175 pp. (in Russian).
- Kealy P.S., and Gabell A.R., 1990: Estimation of emissivity and temperature using alpha coefficients. In *Proceedings of the Second TIMS Workshop*, JPL, Publication 90-55, Jet Propulsion Laboratory, Pasadena, CA, 11-15.
- Keeling, C. D., Chin, F. J. S., and Whorf, T. P., 1996: Increased Activity of Northern Vegetation Inferred from Atmospheric CO<sub>2</sub> Measurements. *Nature*, 382, 146-149.
- Keeling, C.D. and T.P. Whorf, 2001: Atmospheric CO<sub>2</sub> records from sites in the SIO air sampling network. In *Trends: A Compendium of Data on Global Change*. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A.
- Keeling, C.D., Whorf, T.P., Wahlen, M., and v.d. Plicht, J., 1995: Interannual extremes in the rate of rise of atmospheric carbon dioxide since 1980. *Nature*, 375, 666-670.
- Keeling, R.F., Piper, S.C., and Heimann, M., 1996: Global and hemispheric CO<sub>2</sub> sinks deduced from changes in atmospheric O<sub>2</sub> concentration. *Nature*, 381, 218-221.
- Keller B.A., 1923: *Vegetation of Russian steppe, semi-deserts, and deserts*. Voronezh, 44 pp. (in Russian).
- Kelliher F.M., Hollinger D., Schulze E.-D., Vygodskaya N.N., Byers J.N., Hunt J.E., McSeveny T.M., Milyukova I.M., Sogachev A.F., Varlagin A.V., Ziegler W., Arneth A. and Bauer. G., 1997: Evaporation from an eastern Siberian larch forest. *Agr. Forest. Meteorol.*, 85, 135-147.
- Kelliher F.M., Leuning R., E.-D. Schulze, 1993: Evaporation and canopy characteristics of coniferous forests and grasslands. *Oecologia*, 95, 153-163.
- Kelliher F.M., Leuning R., Raupach M.R. and Schulze E.-D., 1995: Maximum conductance evaporation from global vegetation types. *Agric. Forest Meteorol.*, 73, 1-16.
- Kelliher F.M., Lloyd J., Baldocchi D., Rebam C., Wirth C. and E.-D. Schulze. 2001. Evaporation in boreal zone: physics, vegetation and climate. In : *Global biogeochemical cycles in the climate system* (eds. E.-D.Schulze, Harison S.P., Heimann M., Holland E.A., Lloyd J., Prentice C. and Schimel). Academic.Press.San Diego., 151-166.
- Kellomäki, S., 2000: Forests of the boreal region: gaps in knowledge and research needs. *Forest Ecology and Management*, 132, 63-71.
- Kennedy, P. and S. Folving, 1997: FIRS- Forest information from remote sensing. Status Report. JRS, European Commission, 24 pp.
- Kerr, Y., J. Font, P. Waldteufel, M. Berger, J.P. Wigneron, 2004: The SMOS mission: status of the project. Proc. of the 8<sup>th</sup> Specialist Meeting on Microwave Radiometry and Remote Sensing Applications. *Faculty of Engineering, University "La Sapienz", ROME, February 24-27, 2004*.
- Keyser, A.R., Kimball, J.S., Nemani, R.R., and Running, S.W. 2000: Simulating the effects of climatic change on the carbon balance of North American high-latitude forests, *Global Change Biology*, 6 (Supplement 1), 185-195.
- Kharin, V. V., and F. W. Zwiers, 2000: Changes in the extremes in an ensemble of transient climate simulations with a coupled atmosphere-ocean GCM. *J. Climate*, 13, 3760-3788.
- Kharin, V.V. and F.W. Zwiers, 2002: Climate predictions with multi-model ensembles. *J. Climate*, 15, 793-799.
- Kharuk, V.I. and K. Vintenberger, 1995: Analysis of technogenic degradation of neartundra forests by space images. *Issledovanija Zemli iz Kosmosa*, No. 4, 91-97 (in Russian).
- Kharuk, V.I., K.J. Ranson, T.A. Burenina and E.F. Fedotova, 2000: Radar sounding of taiga forests. *Russian J. Forestry*, No. 5, 29-34 (in Russian).
- Kharuk, V.I., Ranson, K.J, Kuz'michev, V.V. and Im, S.T., 2003: Landsat-based analysis of insect outbreaks in Southern Siberia. *Canadian Journal of Remote Sensing*, 29, 286-297.
- Khmelev V.A. (Ed.). 2002: *Steppes of Central Asia*. Novosibirsk, Academy of Sciences, Siberian Branch Publishers. 298 pp. (in Russian)
- Khotinsky N.A., 1984: Holocene vegetation history, In: *Late Quaternary Environments of the Soviet Union* (Ed; A.A. Velichko). Longman, London. 179-200.
- Khotinsky N.A. 1977: *Holocene of Northern Eurasia*. Moscow, Publ. House "Nauka", 310 pp.
- Khromova, T.E., Dyrurgerov, M.B. and Barry, R.G., 2003: Late-twentieth century changes in glacier extent in the Akshirak Range, central Asia, determined from historical and ASTER imagery. *Geophys. Res. Lett.*, 30, NO. 16, 1863, doi:10.1029/2003GL017233.
- Kieffer, H., Kargel, J. S., Barry, R., Bindschadler, R., Bishop, M., MacKinnon, D., Ohmura, A., Raup, B., Antoninetti, M., Bamber, J., Braun, M., Brown, I., Cohen, D., Copland, L., Due, Hagen, J., Engeset, R. V., Fitzharris, B., Fujita, K., Haerberli, W., Hagen, J. O., Hall, D., Hoelzle, M., Johansson, M., Kaeaeab, A., Koenig, M., Kononov, V., Maisch, M., Paul, F., Rau, F., Reeh, N.,

- Rignot, E., Rivera, A., de Ruyter de Wildt, M., Scambos, T., Schaper, J., Scharfen, G., Shroder, J., Solomina, O., Thompson, D., van der Veen, K., Wohlleben, T. and Young, N., 2000: New eyes in the sky measure glaciers and ice sheets. *EOS*, 81, No. 24, 13 June 2000, 265, 270-271.
- Kienast, F. and Kuhn, N., 1989: Simulating forest succession along ecological gradients in southern central Europe. *Vegetatio*, 79, 7-20.
- Kim J, Y. Harazono, S. Yamamoto, A. Miyata, N. Saigusa, T. Choi., 2001: Flux Measurements in Complex Landscape: How Reliable and Consistent Are Fluxes from Single Eddy Covariance Tower? *Proc. GAME ANN/Radiation Workshop*, Phuket, 83-84.
- Kimball, J.S., Thornton, P.E., White, M.A., and Running, S.W., 1997: Simulating forest productivity and surface-atmosphere carbon exchange in the BOREAS study region. *Tree Physiology*, 17, 589-599.
- Kind N.V., 1971: *Geochronology of the Late Pleistocene based on isotope data*. Nauka, Moscow, 257 pp.
- King G.A. and Neilson R.P., 1992: The transient response of vegetation to climate change: a potential source of CO<sub>2</sub> to the atmosphere. *Water Air Soil Pollut*, 64, 365-383.
- Kira, T. (Ed.). 1995: Proc. of Intern. Forum on 'The Caspian, Aral and Dead Seas, Perspectives of Water Environment Management and Politics.' UNEP, Osaka/Shiga, 146 pp.
- Kireev, D.M., 1977: Methods for forest investigations by space images. Novosibirsk, 212 pp. (in Russian).
- Kireev, D.M., 1992: Landscape mapping of forests. Moscow-St. Petersburg. VNIICLesresurs, 60 pp. (in Russian).
- Kirikov S.V. 1959: Change of the Animal World in natural zones of the USSR: XIII-XIX Cent.: Steppe zone and Forest-steppe. (Izmeneniya zhivotnogo mira v prirodnykh zonakh SSSR). Moscow. 175 pp.
- Kirikov S.V., 1960: The Changes of the Animal World in the natural zones of the USSR (XIII-XIX cent.): Forest zone and Forest-Tundra. (Izmeneniya zhivotno-go mira v prirodnykh zonakh SSSR: Lesnaya zona i lesotundra). Moscow 1960. 158 pp.
- Kirikov S.V., 1979: *Man and Nature in the Eastern European forest-steppe from the 10<sup>th</sup> to early 19<sup>th</sup> centuries*. Moscow, Publ. House "Nauka", 185 pp. (in Russian).
- Kirikov, S.V., 1979: Distribution of European bison in the USSR territory in the 11th-20th centuries. In: (ed Sokolov, V.E.), *European Bison: Morphology, Systematics, Evolution, Ecology*. Moscow, Nauka, 476-487.
- Kirilenko A.P. and Solomon A. M., 1998: Modeling dynamic vegetation response to rapid climate change based on bioclimatic classification. *Climatic Change*, 38, 15-49.
- Kirilenko A.P., 2001: On variability of vegetation migration predictions under climate change. *Doklady Akademii Nauk*, 376, No. 1, 130-132 (in Russian).
- Kirschbaum M.U.F., 1995: The temperature dependence of soil organic matter decomposition and the effect of global warming on soil organic C storage. *Soil Biology and Biochemistry*, 27, 753-760.
- Kirschbaum, M.U.F., 2003: Can trees buy time? An assessment of the role of vegetation sinks as a part of the Global Carbon Cycle. *Climatic Change*, 58, 47-71.
- Kiseleva, N.K., Savinetsky, A.B., Khassanov, B.F., 2002: Development of the natural processes on the Shemya island over the Holocene. *Proceedings of the Russian Academy of Sciences, Ser. Geogr.* (in Russian), No 1., 97-103.
- Kishino, M., Sugihara, S., and Okami, N., 1986: Theoretical analysis of the in-situ fluorescence of chlorophyll-a on the underwater spectral irradiance. *Bulletin de la Societe Franco-Japonaise d'Océanographie*, 24, 130-138.
- Kislov A.V., 1993: The simulation of climate conditions of Holocene optimum. *Izv. Acad. Sci. of the USSR, Fizika Atmosfery i Okeana*, 29, 173-181.
- Kitaev L.M. 2002: Spatial and temporal variations of snow depth in the Northern Hemisphere. – *Russian Meteorology and Hydrology*, Allerton Press. Inc., New York, NY, USA, No. 5, 20-25.
- Kitaev L.M. 2003: Features extreme of snow accumulation in mountain and foothill areas (on an example of the Big Caucasus). – *Russian Meteorology and Hydrology*, Allerton Press. Inc., New York, NY, USA, No. 7, 60-68.
- Kitaev L.M., Krenke A.N., Kislov A.V., Razuvaev V.N., Martuganov R. Konstantinov I., 2002: The snow cover characteristics of northern Eurasia and their relationship to climatic parameters. – *Boreal Environment Research*, Vammalan Kirjapaino Oy, P.O. Box 92, FIN-38201 Vammala, Finland, 7, N 4, 437-446.
- Kittel, T.G.F, Rosenbloom, N.A., Painter, T.H., Schimel, D.S., and VEMAP Modeling Participants, 1995: The VEMAP integrated database for modeling United States ecosystem/vegetation sensitivity to climate change. *J. Biogeography*, 22(4-5): 857-862.
- Klein Tank, A.M.G. and Coauthors, 2002: Daily dataset of 20th-century surface air temperature and precipitation series for the European Climate Assessment. *Int. J. Climatol.*, 22, 1441-1453.
- Klein Tank, A.M.G. and G.P. Können, 2003: Trends in indices of daily temperature and precipitation extremes in Europe, 1946-1999. *J. Climate*, 16, 3665-3680.
- Klein Tank, Albert, Janet Wijngaard and Aryan van Engelen, 2002. Climate of Europe; Assessment of observed daily temperature and precipitation extremes. KNMI, De Bilt, the Netherlands, 36 pp.
- Klein Tank, Albert, Janet Wijngaard and Aryan van Engelen, 2002: Climate of Europe; Assessment of observed daily temperature and precipitation extremes. KNMI, De Bilt, the Netherlands, 36 pp.
- Klige, R.K., Danilov, I.D. and Konishchev, V.N., 1998: *History of Hydrosphere*. Nauchnyi Mir, Moscow. 456 pp. (in Russian).
- Klige, R.K., Liu Hun and Selivanov, A.O., 1996: Regime of the Aral Sea in the historical past. *Water Resources*, 23 (4), 407-413.
- Klige, R.K., Voronov, A.M. and Selivanov, A.O., 1993: *Formation of Surface Waters in the East European Plain*. Nauka, Moscow, 128 pp. (in Russian).
- Klimanov V.A. and Sirin A.A., 1997: The Dynamics of Peat Accumulation by Mires of Northern Eurasia During the Last Three Thousand Years. Chapter 22, In: Trettin C.C., et al. Editors. *Northern Forested Wetlands: Ecology and Management*, Lewis Publishers/CRC Press, Boca Raton-N.Y.-London-Tokyo, 319-330.
- Klimatologicheskii spravochnik SSSR, (1961-1992). Vypusk 24, po Yakutskoi ASSR, severnoi chasti Khabarovskogo kraya, Magadanskoi oblasti i severnoi chasti Kamchatskoi oblasti. Meteorologicheskie ezhegodyachnie dannye za 1961-1992, chast' II, VII,



- Temperatura pochvy, tumany, grozy, meteli i grad*, Gidrometeoizdat, Leningrad (In Russian).
- Knizhnikov, Yu.F., 1997: Aerospace sounding. Methodology, principles, and problems. Studying material. Moscow State University, 129 p. (in Russian).
- Knohl A., Kolle O., Minaeva T.I., Milyokova I.M., Vygodskaia N.N., Foken T. and Schulze E.-D. 2002: Carbon exchange of the Russian boreal forest after windthrow. *Global Change Biol.*, 8, 231-246.
- Knoll, A., E.-D. Schulze, O.Kolle, and N. Buchmann, 2004: Large carbon uptake by an unmanaged 250 year-old deciduous forest in Central Germany. *Agricultural and Forest Meteorol.* (in review).
- Knyazikhin, Yu., G. Miessen, O. Panfyorov, and G. Gravenhorst, 1997: Small-scale study of three-dimensional distribution of photosynthetically active radiation in a forest, *Agric. For. Meteorol.*, 88, 215-239.
- Knyazikhin, Yu., Kranigk, J., Miessen, G., Panfyorov, O., Vygodskaia, N. and Gravenhorst, G., 1996: Modelling Three- Dimensional Distribution of Photosynthetically Active Radiation in Sloping Coniferous Stands. *Biomass and Bioenergy*, 11, 189-200
- Kobak K.I. 1988: *Biotical compounds of carbon cycles*. Leningrad, Verlag "Hydrometeoizdat", 247 pp. (in Russian).
- Kobak, K.I., Kondrasheva, N.Yu., Turchinovich, I.E., 2002: Influence of the climate changes on the natural zonality and ecosystems of Russia. In: *Climate Changes and Their Consequences* (Ed. G.V. Menzhulin), Nauka Publishers, St. Petersburg, 205 – 210 (in Russian)
- Kogan F.N., 1990: Remote sensing of weather impacts on vegetation in non-homogeneous areas. *Int. J. Rem. Sens.* 11, 1405-1409.
- Kogan F.N., 2002: World Droughts in the New Millennium from AVHRR-based Vegetation Health Indices. *EOS, Transactions, American Geophysical Union.* 83, 557-563.
- Kondratyev K.Ya., 1998: *Multidimensional Global Change*. Wiley/Praxis. Chichester, UK, 761 pp.
- Kondratyev K.Ya., Grigoryev A.I., Varotsos C.A., 2002: *Environmental Disasters. Anthropogenic and Natural*. Springer/Praxis. Chichester, UK, 484 pp.
- Kondratyev K.Ya., Krapivin V.F., Savinykh V.P., Varotsos C.A., 2004: *Global Ecodynamics and Human Society*. Springer/Praxis. Chichester, UK, 368 pp.
- Kondratyev, K.Ja. and V.V. Melentyev, 1995: Experiences of practical use of ERS-1 SAR – images for monitoring and improvement of hydrometeorological data for ice navigation in the Northern passage. *Issledovaniia Zemli iz Kosmosa*, No. 1, 74–88 (in Russian).
- Konstantinov, V.D. and S.M. Gorozhankina, 1991: Monitoring of ecological regimes of taiga ecosystems. *Aerospace Monitoring of Forests*, Moscow, 76–95 (in Russian).
- Konzelmann, T., D.R. Cahoon, Jr., and C.H. Whitlock, 1996: Impact of biomass burning in equatorial Africa on the downward surface shortwave irradiance: Observations versus calculations. *J. Geophys. Res.*, 101 (D17), 22833-22844.
- Kopanev I.D., 1982: *Climatic aspects of the snow cover research*. Leningrad, Gidrometeoizdat, 239 pp. (In Russian).
- Koptsik, G., Koptsik, S., Moiseev, B., Makarov, M. and Morgun, L., 1996: Critical loads of acid deposition on forest soils in European Russia on different regional scales. *ICEP-3*. Budapest. 176-187.
- Koptsik, S. and Koptsik, G., 2001: Effects of acid deposition on forest ecosystems in northernmost Russia: modelled and field data. *Water, Air and Soil Pollution.* 130, 1277-1282.
- Korolev, Yu.K. and Yu.B. Baranov, 1996a: Market for remote sensing data Marketing technological review). *Informational Bulletin of GIS-Association*, No. 1 (3), 66–75 (in Russian).
- Korolev, Yu.K. and Yu.B. Baranov, 1996b: Methods for remote sensing data processing. *Informational Bulletin of GIS-Association*, No. 2 (4), 51–55 (in Russian).
- Koronkevich N.I. and Zaitseva I.S., 2003: Water Resources of Russia at the Contemporary Stage. *Use and Protection of Natural Resources in Russia*. No.9-10, 83-89.
- Koronkevich N.I., 1990: *Water Balance of Russian Plain and its Anthropogenic Changes*. M.: Nauka, 203 pp.
- Koronkevitch N.I., 1996: Structural changes in water balance of the Russian Plain. *Water Resources*, 23 (2), 133-139.
- Koronkevitch N.I., Zaitseva I.S., 2003: Water Resources of Russia at the Contemporary Stage. *Use and protection of natural resources of Russia*. No. 9-10, 83-89.
- Koronkevitch N.I., Zakrutkin V.E., Dolgov S.V., Zaitseva I.C., Podolsky A.D., and Shaporenko S.I., 1999: Anthropogenic changes of water component of the environment in the Rostov Oblast. *Izv Russian Acad. Sci., Geography*, No. xx, 50-56 (in Russian).
- Korovin A.I., 1972: *Temperature role in the mineral feeding of vegetation*. Leningrad, Verlag "Hydrometeoizdat", 282 pp. (in Russian).
- Korovin G.N., S.A. Bartalev, and A.I. Belyaev, 1998: Integrated system of forest fire monitoring. "*Leshoye khozyajstvo*", 4, 45-48 [In Russian].
- Korovin, G.N. and N.V. Zukkert, 2003: Climatic change impact of forest fires in Russia. In: V.I. Danilov-Danilyan (Ed.), *Climatic Change: View from Russia.*, Moscow, TEIS Publ., 416 pp., 69-98.
- Korzun (ed), 1974: *World Water Balance and Water Resources of the Earth (WWB)*. Leningrad, Gidrometeoizdat (1974 in Russian, 1978 in English).
- Koshkina, V.S., 1998: Contemporary problems of ecopathology and evaluation of health risk in management of environmental quality in the Ural region. In: *Air Pollution in the Ural Mountains*. Environmental, Health and Policy Aspects (Eds. I. Linkov, R. Wilson). NATO ASI Series 2.Environment – vol. 40. Kluwer Acad, Publishers, Dordrecht, p. 241 - 250
- Kotlyakov V.M. and Krenke A.N., 1982: The data on the snow cover and glaciers for the Global Climate Models. Papers presented at the JSC study conference on Land Surface Processes in GLAS models. Geneva, Switzerland, WMO.
- Kotlyakov V.M., 1968: *Snow cover and glaciers of the Earth*. Leningrad, Gidrometeoizdat, 480 pp. (in Russian).
- Kotlyakov V.M., Georgiadi A.G., 1998: Russian Siberian Subprogramme of GEWEX Asian Monsoon Experiment. Proc. of The Third International Study Conference on GEWEX in Asia and GAME. Cheju, Korea, 26-28th March, 1997, 9-16.
- Kotlyakov, V. and T. Khromova, 2002: Maps of permafrost and ground ice. In Stolbovoi V. and I. McCallum. 2002.

- CD-ROM *Land Resources of Russia*. Laxenburg, Austria: International Institute for Applied Systems Analysis and the Russian Academy of Science. CD-ROM. Distributed by the National Snow and Ice Data Center/World Data Center for Glaciology, Boulder.
- Kotlyakov, V.M. (editor-in-chief), 1997: *World Atlas of Snow and Ice Resources*. 3 volumes, Institute of Geography, Russian Academy of Sciences, Moscow.
- Kotlyakov, V.M., 1976: Problems in the creation of the Atlas of snow and ice resources of the Earth. *News of AS USSR*, No.9, 95-100.
- Koutsenogii K.P. and P.K. Koutsenogii, 1997: Monitoring of Chemical and disperse composition of atmospheric aerosols in Siberia. *Chemistry for Sustainable development*, 6, 429-442.
- Kovda V.A., 1977: *Aridization of land and combating droughts*. Moscow, 392 pp.
- Kozharinov A.V. and Yu.G.Puzachenko, 2002: The evolution and dynamics of boreal spruce forests in Eastern Europe during the last 15000 years. In: *Monitoring of Energy-Mass Exchange between atmosphere and forest ecosystems*. (eds. G.Gravenhorst, N.Vygodskaya, O.Panfyorov), Göttingen, 22-30.
- Kozharinov A.V. and Yu.G.Puzachenko, 2005: Dynamics of vegetation cover in Eastern Europe during the past 15,000 years, in press (in Russian).
- Kozhevnikov, Y.P., 1996: *Vegetation Cover of Northern Asia in a Historical Perspective*, Mir i Semja, St.Petersburg, Russia, 396 pp. [In Russian]
- Kozlov, M.V., Berlina, N.G., 2002: Decline in length of the summer season on the Kola peninsula, Russia. *Climatic change*, 54, 387 -398.
- Krám, P., Laudon, H., Bishop, K., Rapp, L. and Hruška, J., 2001: MAGIC modelling of long-term lake water and soil chemistry at Abborrträsket, Northern Sweden. *Water, Air, and Soil Pollution*, 130, 1301-1306.
- Krankina O.N. and Vinson T.S., 1995: Dynamics of the dead wood carbon pool in Northwestern Russian boreal forests, *Water Air Soil Pollut.*, 85, 227-238.
- Krankina, O. N., Harmon, M.E., Kukuev, Y.A., Treyfeld, R.F., Kashpor, N.N., Kresnov, V.G., Skudin, V.M., Protasov, N.A., Yatskov, M., Spycher, G., Povarov, E.D., 2002: Coarse woody debris in forest regions of Russia. *Can. J. For. Res.* 32,768-778.
- Krankina, O., K. M. Bergen, et al. (2003 in press). Northern Eurasia. *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface*. Dordrecht, Netherlands, Kluwer.
- Krankina, O.N., Harmon, M.E., and J.W. Winjum, 1996: Carbon storage and sequestration in the Russian forest sector. *Ambio* 25(4), 284-288.
- Krankina, O.N., Harmon, M.E., Cohen, W.B., Oetter, D.R., Zyrina, O., Duane, M. V., 2003: Carbon Stores, Sinks, and Sources in Forests of Northwestern Russia: Can We Reconcile Forest Inventories with Remote Sensing Results? *Climatic Change*. In review
- Kravtsov, Yu.A. and A.V. Kuzmin (1997). Polarization peculiarities of radio-location images. *Isslედovaniia Zemli iz Kosmosa*, No. 6, 43-55 (in Russian).
- Krenke A.N., Kitaev L.M., Popova V.V., Titkova T.B. 2003: Role of snow cover in the multyear winter water cycle in the Northern Eurasia. Final ACSYS Conference Proceedings, (St. Petersburg, 11-14 October, 2003) (in press).
- Krenke, A. N., and A. N. Zolotokrylin, 1984: Investigation of the role of types of vegetation in the interaction between the underlying surface and the atmosphere. *Izv. Atmos. Oceanic Phys.*, 20, 923-928.
- Krenke, A. N., and Nosenko, G., 1996: The assessment of snow accumulation, precipitation and runoff over the Karakorum glacier system from satellite images. Proceedings of the International Conference on Ecohydrology of High Mountain Areas, Extended Abstracts. 24-28 March 1996, Kathmandu, 297-298.
- Krenke, A.N , Kitaev L.M., Turkov, D.V., Kadomtseva, T.G., and Aizina, E.M., 1997: Snow cover changes and their climatic role. *Earth Cryosphere*, 1, No.1, 39-46 and No.2, 58-66. (in Russian).
- Krenke, A.N. 1982: *Mass Exchange in Glacial Systems on the USSR Territory*. Hydrometeo Publishing, Leningrad, 287 pp. (in Russian).
- Kreutz, K., V. Aizen, D. Cecil, and C. Wake, 2001: Dust deposition and isotopic composition of precipitation recorded in a shallow ice core, Inilchek glacier, central Tien Shan. *J. Glaciology*, 47, 549-554.
- Kreutz, K.J., V.B. Aizen, C.P. Wake, L.D. Cecil, J.R. Green, and H-A. Synal, 2004: Event to Decadal-Scale Glaciochemical Variability on the Inilchek Glacier, Central Tien Shan. In: L.D. Cecil, L.G. Thompson and J.R. Green (Eds.) *Earth Paleoenvironments: Records Preserved in Mid- and Low Latitude Glaciers*. Springer.
- Krinov, E.L., 1947: *Spectral reflectance of natural objects*. Moscow-Leningrad, 271 pp. (in Russian).
- Krivolyzky D.A. and Pokarzhevsky A.D., 1986: Animals in the Biogenic Cycle. Moscow, Publ. House "Znanie", 64 pp. (in Russian).
- Krylova, P.N., 1915: On the variation of boundary between steppe and forest zones. *Trans. Botanical Museum of Russ. Acad. Sci.*, 14, 82-130 (in Russian).
- Kryuchkov, V.V., 1990: Extreme anthropogenic load and the state of the north taiga ecosystems. In: K.Kinnunen and M.Varmala (eds). *Effects of air pollution and acidification in combination with climatic factors on forests, soils and waters in northern Fennoscandia*, pp 197-205. Report from a Workshop, 17-19 October 1988, Rovaniemi. Nordic Council of Ministers , Copenhagen, Nord, February 1990.
- Kucharik, C.J., J.A. Foley, C. Delire, V.A. Fisher, M.T. Coe, J. Lenters, C. Young-Molling, N. Ramankutty, J.M. Norman, and S.T. Gower. 2000. Testing the performance of a dynamic global ecosystem model: Water balance, carbon balance and vegetation structure. *Global Biogeochemical Cycles*, 14(3):795-825.
- Kuchment, L.S., V.N. Demidov, Yu.G. Motovilov, 1983: *Streamflow formation*, AS USSR, Nauka, Moscow, 216 pp. (in Russian).
- Kudryavtsev, V. A., Garagula, L. S., Kondrat'yeva, K. A. and Melamed V. G., 1974: *Osnovy merzlotnogo prognoza* (in Russian). MGU (431 pp.) [ CRREL Translation: V. A. Kudryavtsev et al., *Fundamentals of Frost Forecasting in Geological Engineering Investigations*, CRREL Draft Translation 606, 1977, 489 pp.]
- Kuhlbusch T.A. and Crutzen P.J., 1995: Toward a global estimate of black carbon in residues of vegetation fires

- representing a sink of atmospheric CO<sub>2</sub> and a source of O<sub>2</sub>. *Global Biogeochem. Cycles*, 9, 491-501.
- Kuhlbusch T.A., Lorbert J.M., Crutzen P.J. and Warneck P., 1991: Molecular nitrogen emissions from denitrification during biomass burning. *Nature*, 351, 135-137.
- Kukuev, Y.A., Krankina, O. N., and Harmon, M. E., 1997: The Forest Inventory System in Russia. *J. Forestry*, 95(9), 15-20.
- Kukuev, Yu.A., 1998: Problems with providing sustainable development of Russian forestry. *Forest Management*, No. 2, 41-43 (in Russian).
- Kullman, L., 1996: Recent Cooling and Recession of Norway spruce (*Picea abies* (L.) Karst.) in the Forest-Alpine Tundra Ecotone of the Swedish Scandes. *J. Biogeogr.* 23, 843-854.
- Kummerow, C., Barnes, W., Kozu, T., Shiue, J., Simpson, J., 1998: The Tropical Rainfall Measuring Mission (TRMM) Sensor Package. *J. Atmos. Ocean. Tech.*, 15, 809-817.
- Kummerow, C., Hong, Y., Olson, W. S., Yang, S., Adler, R. F., McCollum, J., Ferraro, R., Petty, G., Shin, D.-B., Wilheit, T. T., 2001: The Evolution of the Goddard Profiling Algorithm (GPROF) for Rainfall Estimation from Passive Microwave Sensors. *J. Appl. Meteorol.* 40, 1801-1820.
- Kummerow, C., J. Simpson, O. Thiele, W. Barnes, A.T.C. Chang, E. Stocker, R. F. Adler, A. Hou, R. Kakar, F. Wentz, P. Ashcroft, T. Kozu, Y. Hong, K. Okamoto, T. Iguchi, H. Kuroiwa, E. Im, Z. Haddad, G. Huffman, T. Krishnamurti, B. Ferrier, W.S. Olson, E. Zipser, E.A. Smith, T.T. Wilheit, G. North, K. Nakamura, 2000: The status of the tropical rainfall measuring mission (TRMM) after two years in orbit, *J. of Appl. Meteorol.*, 39, 1965-1982.
- Kurbatova J., Arneth A., Vygodskaya N., Tchebakova N., Kolle O., Varlagin A., Milyukova I., Schulze E.-D. and Lloyd J., 2002: Ecosystem-atmosphere exchange of energy and mass in a European Russia and a central Siberia bog. 1. Interseasonal and interannual variability of energy and latent heat fluxes during the snowfree period. *Tellus*, 54B (5), 497-513
- KUREX-91, 1998: Guest Editors: V.Kozoderov and D.Deering, *Remote Sensing Reviews*. 17, 335 pp.
- Kurnaev S.F., 1973: *Forests' growing conditions zoning of USSR*, Moscow, Nauka, 203 pp. (In Russian)
- Kurz, W. A., and M. J. Apps, 1999: A 70-year retrospective analysis of carbon fluxes in the Canadian forest sector, *Ecol. Appl.*, 9, 526-547.
- Kurz W. A., M. J. Apps, T. Webb, and P. MacNamee, 1992: *The Carbon Budget of the Canadian Forest Sector: Phase 1*. ENFOR Information Report NOR-X-326, Forestry Canada Northwest Region, Edmonton, Alberta, Canada, 93 pp.
- Kust G.S., Kutuzova N.D., 2003: Approaches for the development of the Integrated Data Base on Soil Resources and of the Expert System for their specific assessment. In: *Role of Soils in the Biosphere*, 3, Moscow, 24-39 [in Russian].
- Kust, G.S., 1999: *Desertification: Principles of ecologogenesis estimation and mapping*. RAS Inst. Of Soil Science, Moscow. 362 pp. (in Russian).
- Kustas, W. P., R. D. Jackson, and G. Asrar, 1989: *Estimating surface energy balance components from remotely sensed data. Theory and Applications of Optical Remote Sensing*, John Wiley and Sons, 604-627.
- Kuzmichenok, V., V. Aizen, A. Surazakov, and E. Aizen, 2004: Assessment of Glacial Area and Volume Change in Tien Shan (Central Asia) During the Last 60 years Using Geodetic, Aerial Photo, ASTER and STRM Data. *EOS, AGU Trans.*, 85, Fall Meeting Suppl., Abstract A13B-0113. p. F110.
- Kuzmin P.P., 1957: *Physical properties of a snow cover*. Leningrad, Gidrometeoizdat, 127 pp. (in Russian).
- Kuznetsova, L.P., 1978: *Water Vapor Migration over the USSR Territory*. Nauka, Moscow, 92 pp. (in Russian).
- Kuznetsova, L.P., 1983: *Atmospheric water exchange over the USSR territory*. Moscow, Nauka, 173 pp. (in Russian).
- Kuznezova, L.P. 1984: (Ed.) Atlas of Moisture Contents and Transfer in Atmosphere over the USSR, Moscow, Main Department of Geodesy and Mapping Survey, 76 pp. (in Russian).
- Kyle, H.L. and Co-Authors, 1993: The Nimbus Earth Radiation Budget (ERB) Experiment: 1975 to 1992. *Bull. Amer. Meteorol. Soc.*, 74, 815-830.
- L'vovich M.I., 1963: *Man and water*. M., Geografiz, 568 pp. (in Russian)
- L'vovich M.I., 1974: *World Water Resources and their Future*. Moscow, Mysl', 448 pp.
- Labeled J. and Stoll M.P., 1991: Angular variations of land surface spectral emissivity in the thermal infrared: Laboratory investigations on bare soils. *Int. J. Remote Sensing*, 12, 2299-2310.
- Lafleur, P.M., 1992: Energy balance and evapotranspiration from a subarctic forest. *Agric. For. Met.*, 55, 149-166 .
- Lafleur, P.M., McCaughey, J. H., Joiner, D. W., Barlett, P. A., Jelinski, D. E., 1977: Seasonal trends in energy water, and carbon dioxide fluxes at a northern boreal wetland. *J. Geophys. Res.*, 102, 29 009-29 020.
- Lafont S., Kergoat L., Dedieu G., Chevillard A., Karstens U. Kolle O., 2002: Spatial and temporal variability of land CO<sub>2</sub> fluxes estimated with remote sensing and analysis data over western Eurasia. *Tellus*, 54B, 5, 820-832
- Lähde, E., O. Laiho, and Y. Norokorpi, 1999: Diversity-oriented silviculture in the boreal zone of Europe. *Forest Ecology and Management*, 118, 223-243.
- Lal, R., 2001: *Soil degradation by erosion. Land Degradation and Development*, 12, 519-539.
- Lamb, H.H., 1982: *Climate, History and the Modern World*. Methuen, London, 387 pp.
- Lamb, H.H., 1988: *Weather, Climate and Human Affairs*. Routledge, London, 438 pp.
- Lambin EF, Baulies X, Bockstael N et al. , 1999. Land-use and Land-cover change (LUCC): Implementation Strategy. A core project of the International Geosphere-Biosphere Programme and the International Human Dimensions Programme on Global environmental change. IGBP report 48/IHDP report 10. IGBP, Stockholm.
- Lammers, R.B., A.I. Shiklomanov, C.J. Vörösmarty, B.M. Fekete, and B.J. Peterson, 2001: Assessment of contemporary Arctic river runoff based on observational discharge records. *J. Geophys. Res. – Atmospheres*, 106 (D4), 3321-3334.
- Landsberg, J.J., and Gower, S.T., 1997: *Applications of Physiological Ecology to Forest Management*.

- Physiological Ecology Series, Academic Press, San Diego, CA, 354 pp.
- Landscape Methods in Forest Mapping*, 1987: Krasnoyarsk. Iliid SB AS USSR, 114 pp. (in Russian).
- Laszlo, I., and R.T. Pinker, 2001: Shortwave radiation budget of the Earth: Absorption and cloud radiative effects, *Quarterly J. Hungarian Meteorological Services*, 106 (1), 189-205.
- Latif, M., Roeckner, E., Mikolajewicz, U., Voss, R., 2000: Tropical Stabilization of the Thermohaline Circulation in a Greenhouse Warming Simulation. *J. Climate*, 13, 1809–1813.
- Laubach, J. and U. Teichmann., 1999: Surface energy budget variability: A case study over grass with special regard to minor inhomogeneities in the source area., *Theor. Appl. Climatol.*, 62, 9-24.
- Lavrov, V.N., 1997: Use of Russian space images for mapping and GIS. Proceedings from the forum "GIS-Technologies. Management. Usage. Business". Moscow, 2–6 June. Moscow GIS-Association, 91–92 (in Russian).
- Lawford, R.G., 1999: A midterm report on the GEWEX Continental-Scale International Project. *J. Geoph. Res.*, 104, 19279-19292.
- Le Toan, T., A. Beaudoin and D. Guyon, 1992: Relating forest biomass to SAR data. *IEEE Transactions on Geoscience and Remote Sensing*, 30, 403–411.
- Leavesley, G. H., Lichty, R. W., Troutman, B. M., and Saindon, L. C., 1983: Precipitation-runoff modelling system-users manual. *USGS Water Resources Investigation Report*: 83-4238.
- Lee, X., 1998: On micrometeorological observations of surface-air exchange over tall vegetation, *Agr. Forest Meteorol.*, 91, 39-49.
- Lee, X., and Black, T. A., 1993: Atmospheric turbulence within and above a Douglas-fir stand. Part 1: statistical properties of the velocity field, *Bounary-Layer Meteorol.*, 64, 149-174.
- Leemans, R. and Prentice I.C., 1987: Description and simulation of tree-layer composition and size distributions in a primeval *Picea-Pinus* forest. *Vegetatio*, 69, 147-156.
- Lefsky, M.A., Harding, D., Cohen, W.B., Parker, G. and Shugart H.H., 1998: Surface Lidar remote sensing of basal area and biomass in deciduous forests of eastern Maryland. *Remote Sensing of the Environment*, 67, 83-98.
- Lelieveld, J., and F. Dentener, 2000: What controls tropospheric ozone? *J. Geophys. Res.*, 105, 3531-3551.
- Lemeshko N.A. and Speranskaya N.A., 2003: Peculiarities of humidification of European Territory of Russia. International Conference \_Interaction of Society and Environment in the Conditions of Global and Regional Changes, Barnaul, July 22-29, 2003 (in Russian).
- Levin I., Ciasis P. et al., 2002: Three years of trace gas observations over the EuroSiberian domain derived from aircraft sampling- a concerted action. *Tellus*, 54B, 5, 696-712
- Liang, X., Wood, E., and Lettenmaier, D., 1996: Surface and soil moisture parameterization of the VIC-2L model: Evaluation and modifications, *Global Planet. Change*, 13, 195-206.
- Lindroth A., Grelle A., Moren A-S., 1998: Long-term measurements of boreal forest carbon balance reveal large temperature sensitivity. *Global Change Biology*, 4, 443-450.
- Ling, F. and T. Zhang, 2003: Impact of the timing and duration of seasonal snow cover on the active layer and permafrost in the Alaskan Arctic, *Permafrost and Periglacial Processes*, 14, 141-150.
- Lischke, H., B.Ammann, D.W.Roberts, N.E.Zimmermann, 2003: Developing a physiologically mechanistic tree migration model and simulating Holocene spread of forest trees. <http://www.wsl.ch/projects/TreeMig/treemig.html>
- Lischke, H., T.J. Löffler, and A. Fischlin, 1999: Aggregation of individual trees and patches in forest succession models - Capturing variability with height structured random dispersions. *Theoretical Population Biology*, ????
- Liski, J. and Kauppi, P., 2000: *Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (Industrialized Temperate / Boreal Countries): United Nations-Economic Commission for Europe /Food and Agriculture Organization Contributions to the Global forest Resources Assessment 2000*, United Nations, New York, 155-171.
- Liski, J.; H. Ilvesniemi, A. Makela, and C.J. Westman, 1999: CO<sub>2</sub> emissions from soil in response to climatic warming are overestimated - the decomposition of old soil organic matter is tolerant of temperature. *Ambio*, 28(2), 171-174.
- Liu J.G., 2000: Image enhancement and interpretation of Landsat TM Lhasa scene for snow and permafrost zone mapping. In: Proc. 14th International Thematic Conference on Geoscience. 6-8 November 2000, Las Vegas, Nevada, USA. (ERIM, Ann Arbor, Michigan). 535-542.
- Lloyd J., Langenfelds R.L., Francey R. et al., 2002: A trace-gas climatology above Zotino, central Siberia . *Tellus*, 54B, 5, 750-767
- Lloyd J., 1999: The CO<sub>2</sub> dependence of photosynthesis, plant growth responses to elevated CO<sub>2</sub> concentration and their interaction with soil nutrient status. 11. Temperate and boreal productivity and the combined effects of increasing CO<sub>2</sub> concentration and increased nitrogen deposition at a global scale. *Functional Ecol.*, 13, 439-459.
- Lloyd J., Kruijt B., Hollinger D. Y., Grace J., Francey R.J., Wong S.C., Kelliher F.M., Miranda A.C., Farquar G.D., Gash J.H.C., Vygodskaya N.N., Wright I.R., Miranda H.S. and E.-D. Schulze, 1996: Vegetation effects on the isotopic composition of atmospheric CO<sub>2</sub> at local and regional scales: theoretical aspects and comparison between a rainforest in Amazonia and a boreal forest in Siberia. *Aust. J. Plant Physiol.*, 23, 371-399.
- Lloyd, A. H., Yoshikawa, K., Fastie, C. L., Hinzman, L., and M. Fraver, 2003: Effects of permafrost degradation on woody vegetation at arctic treeline on the Seward Peninsula, Alaska. *Permafrost and Periglacial Processes*, 14(2), 93-102.
- Lloyd, C.R., 2001: The measurement and modeling of the carbon dioxide exchange at a high Arctic site in Svalbard. *Global Change Biology* (???)
- Loehle C., 2000: Forest ecotone responses to climate change: sensitivity to temperature responses functional forms. *Can.J.For.Res.*, 30, 1632-1645.

- Logofet, D.O. and E.V.Lesnaya, 2000: The mathematics of Markov models: what Markov chains can really predict in forest successions. *Ecological Modelling*, 126, 285–298.
- Lohmann, D., E. Raschke, B. Nijssen, and D.P. Lettenmaier, 1998: "Regional Scale Hydrology I: Formulation of the VIC-2L Model Coupled to a Routing Model," *Hydrological Sciences Journal*, 43(1), 131-142.
- Lohmann, D., K.E. Mitchell, P.R. Houser, E.F. Wood, J.C. Schaake, A.Robock, B.A. Cosgrove, J. Sheffield, Q. Duan, L. Luo, W. Higgins, R.T. Pinker, and J.D. Tarpley, 2004: Streamflow and water balance intercomparisons of four land-surface models in the North American Land Data Assimilation System project. *J. Geophys. Res.*, 109, D07S91, doi: 10.1029/2003JD003517.
- Lorenzoni, I., A. Jordan, M. Hulme, K. R. Turner, and T. M. O'Riordan, 2000: A coevolutionary approach to climate change impact assessment: Part1. Integrating socio-economic and climate change scenario. *Global Environmental Change*, 10, 57-68.
- Loupian, E., Mazurov, A., Nazirov, R., Proshin, A., Flitman, E., 1999: Development of Databases for the Systems for Acquisition, Processing and Distribution of Satellite Data CSIT'99, Proceedings of 1st International Workshop on Computer Science and Information Technologies, January 18-22, 1999, Moscow, Russia. MEPhI Publishing 1999, ISBN 5-7262-0263-5.
- Loveland, T. R., Zhu, Z., Ohlen, D. O., Brown, J. F., Reed, B. C., and Yang, L., 1999: An analysis of the IGBP Global Land-Cover Characterization Process. *Photogrammetric Engineering and Remote Sensing*, 65, 1021 – 1032.
- Lovelius, N.V. (translated by V. Netchaev), 1997: *Dendroindication of Natural Processes* (World and Family-95, St. Petersburg) 134 pp.
- Lovelock J.E., 1994: Geophysiological aspects of biodiversity. In: *Biodiversity and Climate Change*. (Eds.O.T.Solbrig, H.M.van Emden and P.G.W.J. van Oordt). CAB International: Wallingford, England, UK. 227 pp.
- Luckman, A., J. Baker, M. Hoznak and R. Lucas, 1998: Tropical forest biomass density estimation using JERS-1 SAR: seasonal variation, confidence limits and application to image mosaics. *Remote Sens. Environ.*, 63, 126–139.
- Ludwig, W., Amiotte-Suchet, P., and Probst, J.-L., 1996: River discharges of carbon to the world's oceans: Determining local inputs of alkalinity and of dissolved and particulate organic carbon. *C. R. Acad. Sci. Paris*, 323, 1007-1014.
- Lugina, K.M. P.Ya. Groisman, K.Ya. Vinnikov, V.V. Koknaeva, and N.A. Speranskaya, 2004: Monthly surface air temperature time series area-averaged over the 30-degree latitudinal belts of the globe, 1881-2003. In: *Trends: A Compendium of Data on Global Change*. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., USA. Available at <http://cdiac.esd.ornl.gov/trends/temp/lugina/lugina.html>].
- Lukina N. and Nikonov V., 2001: Assessment of environmental impact zones in the Kola Peninsula forest ecosystems. *Chemosphere*, 42/1, № 362, 19-34.
- Lukina N.V. and V.V. Nikonov, 2001: Nutritional Regime of Northern Taiga Forests (Methodological Aspects). *Eurasian Soil Science, Supplementary Issue 1*, 34, 119-126.
- Luo L., A.Robock, K.Ya.Vinnikov, C.A.Schlosser, A.G.Slater, A.Boone, H.Braden, P.Cox, P.de Rosnay, R.E.Dickinson, Y.Dai, Q.Duan, P.Etchevers, A.Henderson-Sellers, N.Gedney, Ye.M.Gusev, F.Habets, J.Kim, E.Kowalczyk, K.Mitchell, O.N.Nasonova, J.Noilhan, A.J.Pitman, J.Schaake, A.B.Shmakin, T.G.Smirnova, P.Wetzel, Y.Xue, Z.-L.Yang, Q.-C.Zeng, 2003: Effects of frozen soil on soil temperature, spring infiltration, and runoff: results from the PILPS 2(d) experiment at Valdai, Russia. *J. Hydrometeorol.*, 4,334-351.
- Lurje P.M., and Panov V.D., 1999: The Don River runoff in the conditions of anthropogenic climate change. In: *Ecological-Geographical Problems of the Russia South*. Rostov-on-Don, 202-212 (in Russian).
- Luthin, J. N. and Guymon, G. L., 1974: Soil moisture-vegetation-temperature relationships in central Alaska. *J. Hydrol.*, 23, 233-46.
- Lynch, A.H., A.R. Rivers, and P.J. Bartlein, 2003: An assessment of the influence of land cover uncertainties on the assimilation of global climate in the early Holocene. *Climate Dynamics*, 21, 243-256.
- MacDonald, R.W. and Thomas, D.J., 1991: Chemical interactions and sediments of the Western Canadian Arctic Shelf. *Continental Shelf Research*, 11(8-10):843-863.
- Machul'skaya, E.E. and V.N. Lykosov, 2002: Simulation of the Thermodynamic Response of Permafrost to Seasonal and Interannual Variations in Atmospheric Parameters. *Izvestiya. Atmosph. Ocean Physics*, 38, 20-33.
- Magnuson J.J., Robertson D.M., Benson B.J., Wynne R.H., Livingstone D.M., Arai T., Assel R.A., Barry R.G., Card V., Kuusisto E., Granin N.G., Prowse T.D., Stewart K.M. and Vuglinski V.S., 2000: Historical trends in lake and river ice cover in the northern hemisphere. *Science*, 289, 1743-1746.
- Mahli Y., Baldocchi D., Jarvis P., 1999: The carbon balance of tropical, temperature and boreal forests. *Plant, Cell and Environment*, 22, 715-740.
- Mahrt, L., 1998: Flux sampling errors for aircraft and towers, *J. Atmos. and Ocean. Technol.*, 15, 416-429.
- Makipaa R., 1995: Effect of nitrogen input on carbon accumulation of boreal forest soils and ground vegetation. *Forest Ecology and Management*, 79, No. 3, 217-226.
- Makipaa, R., T. Karjalainen, A. Pussinen, and S. Kellomaki, 1999: Effects of climate change and nitrogen deposition on the carbon sequestration of a forest ecosystem in the boreal zone. *Canadian Journal of Forest Research*, 29, 1490-1501.
- Malcolm, J. R., 1996: The Demise of an Ecosystem: Arctic Wildlife in a Changing Climate. Washington, D.C., World Wildlife Fund.
- Malevsky-Malevich, S. P., E. K. Molkentin, E. D. Nadyozhina, T. V. Pavlova and O. B., Shklyarevich, 2003: Possible changes of active layer depth in the permafrost areas of Russia in the 21st century. *Russian Meteorology and Hydrology*, in press.
- Malevsky-Malevich, S.P., E.K. Molkentin, T.D. Nadyozhina, O.B. Shklyarevich, 2001: Numerical Simulation of

- Permafrost Parameters Distribution. *Cold. Reg. Sci. and Tech.*, № 32, 1-11.
- Malysheva, N.V. and V.I. Sukhikh, 1991: Mapping of potential centers of entomological pests. *Aerospace Monitoring of Forests*, Moscow, 154–163 (in Russian).
- Malysheva, N.V., 1996: Aerospace monitoring of forests in the water-protected zone of Lake Baikal (Theoretical background, methodology, working experience). *Review Information*, 10, Moscow, VNIICLesresurs, 34 pp. (in Russian).
- Malysheva, N.V., S.V. Knyazeva, N.E. Raichenko, L.V. Babenko and T.A. Zolina, 1997a: Map of the current state of the forests in the Lake Baikal basin. Proceedings of the VII Annual Conference MAIBL "Sustainable Development of Boreal Forests", Moscow, 71–73 (in Russian).
- Malysheva, N.V., S.V. Knyazeva, V.I. Sukhikh and V.M. Shirin, 1997b: Maps of forests with ecological content. Methodology and experience of development. Proc. Jub. Sci.-tech. Conference "Present State and Perspectives for Development of Geodesy, Photo-Topography, Cartography, and GIS". Moscow, CNIIGAiK, 154–163 (in Russian).
- Manabe S., 1969: Climate and the ocean circulation. 1. The atmospheric circulation and the hydrology of the Earth's surface. *Mon. Wea. Rev.*, 97, 739-774.
- Manabe, S., R.T. Wetherald, and R.J. Stouffer, 1981: Summer dryness due to an increase of atmospheric CO<sub>2</sub> concentration. *Climatic Change*, 3, 347-386
- Manabe S., Spelman M.J. and Stouffer R.J., 1992: Transient Responses of a Coupled Ocean- Atmosphere Model to Gradual Changes of Atmospheric CO<sub>2</sub>. Part II: Seasonal Response. *J. Climate*, 5, 105-126.
- Manabe, S., R. T. Wetherald, P. C. D. Milly, T. L. Delworth, R. J. Stouffer, 2004: Century-Scale Change in Water Availability: CO<sub>2</sub>-Quadrupling Experiment. *Climatic Change*, 64, 59-76.
- Mann, M.E., Bradley, R.S. and Hughes, M.K., 1998: Global scale temperature patterns and climate forcing over the past six centuries. *Nature*, 392, 779-787.
- Mann, M.E., Bradley, R.S. and Hughes, M.K., 1999: Northern hemisphere temperatures during the past millennium: Inferences, uncertainties, and limitations. *Geophys. Res. Lett.*, 26, 759-762.
- Mann, M.E., Bradley, R.S. and Hughes, M.K., 2000: Long-term variability and the El Nino Southern Oscillation and associated teleconnections. pp. 357-412. In: *El Nino and the Southern Oscillation: Multiscale Variability and its Impacts on Natural Ecosystems and Society* (eds. Diaz, H.F. and Markgraf, V.) (Cambridge University Press, Cambridge).
- Manson G., Solomon S., and A.MacDonald, 2001: Describing Beaufort Sea coastal climate variability (abstract), *ACD-Arctic Coastal Dynamics, 2<sup>nd</sup> Workshop*, 26-30 November 2001, Alfred Wegener Institute, Potsdam.
- Marchenko S.S., 1998a: Dynamics of permafrost-climatic conditions in the Northern Tien Shan. Proceedings of International Conference on the Problems of Earth Cryology, Pushchino, pp. 171-173.
- Marchenko, S.S. 1998b: Evolution of Permafrost in the Northern Tien Shan during the Holocene and climatic-permafrost forecast for nearest decades. Proc. of National Conference "Stability, anthropogenic transformation and optimization of Kazakhstan environments", Almaty, 74-78. (in Russian).
- Marchenko, S.S., 1997: Forecast of Zailiysky Alatau frozen ground thermal state in connection with climate change. Proc. of *International Seminar and Conference on Climate Change*, (Russ.), Almaty, 198-208.
- Marchenko, S.S., 2002: Results of monitoring of the active layer in the northern Tien Shan mountains, *Earth Cryosphere*, VI, No. 3, 25-34 (in Russian).
- Margolis H.A. and Ryan M.G., 1997: A physiological basis for biosphere-atmosphere interactions in the boreal forests. *Tree Physiol.*, 17, 491-499.
- Marland, G., R.A. Pielke, Sr., M. Apps, R. Avissar, R.A. Betts, K.J. Davis, P.C. Frumhoff, S.T. Jackson, L. Joyce, P. Kauppi, J. Katzenberger, K.G. MacDicken, R. Neilson, J.O. Niles, D. dutta S. Niyogi, R.J. Norby, N. Pena, N. Sampson, and Y. Xue, 2003: The climatic impacts of land surface change and carbon management, and the implications for climate-change mitigation policy. *Climate Policy*, 3, 149-157.
- Marshall, C.H. Jr., R.A. Pielke Sr., and L.T. Steyaert, 2003: Crop freezes and land-use change in Florida. *Nature*, 426, 29-30.
- Marshall, C.H. Jr., R.A. Pielke Sr., L.T. Steyaert, and D.A. Willard, 2004: The impact of anthropogenic land cover change on warm season sensible weather and sea-breeze convection over the Florida peninsula. *Mon. Wea. Rev.*, 132, 28-52.
- Martin, P., 1992: EXE: A climatically sensitive model to study climate change and CO<sub>2</sub> enhancement effects on foests. *Australian Journal of Botany*, 40, 717-735.
- Matishov, G.G., (ed.), 2000: *Regularities of Oceanographical and Biological Processes in the Sea of Azov*. Russian Academy of Sciences, Kola Research Center, Apatity, 434 pp. (in Russian).
- Matishov, G.G., (ed.), 2001: *Environment, Biota and Modelling of Ecological Processes in Azov Sea*. Russian Academy of Sciences, Kola Research center, Apatity. 413 pp. (in Russian).
- Matthews, E., and I. Fung, 1987: Methane emission from natural wetlands: Global distribution, area and environmental characteristics of sources, *Global Biogeochem. Cycles*, 1, 61-86.
- Maynard, N. G., 2004: Satellites, Settlements, and Human Health". Remote Sensing of Human Settlements. 3rd Edition. in: *2003 Manual of Remote Sensing*. Eds. M. Ridd and J. Hipple. Washington, D.C., American Society of Phtotgrammatry and Remote Sensing.
- McAvaney, B. J., C. Covey, S. Joussaume, V. Kattsov, A. Kitoh, W. Ogana, A. J. Pitman, A. J. Weaver, R. A. Wood, and Z.-C. Zhao, 2001: Model Evaluation. In: *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* [Houghton, J. T., Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden, X. Dai, K. Maskell, and C. A. Johnson (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 881 pp.
- McCaughey, J. H., Lafleur, P. M., Joiner, D. W., Barlett, P. A., Costello, A. M., Jelinski, D. E., Ryan, M. G., 1997: Magnitudes and seasonal patterns of energy, water, and carbon exchanges at a boreal young jack pine forest in

- the BOREAS northern study are. *J. Geophys. Res.*, 102, 28 997-29 007.
- McFadden, J. P., F. S. Chapin, and D. Y. Hollinger, 1998: Subgrid-scale variability in the surface energy balance of arctic tundra. *J. Geophys. Res. -Atmospheres* 103,28947-28961.
- McGuire A.D. and Chapin III F.S. 2003c. Climate feedbacks. In: *Alaska's Changing Boreal Forest*. Oxford University Press. In review.
- McGuire A.D., Sitch S., Clein J.S., Dargaville R., Esser G., Foley J., Heimann M., Joos F., Kaplan J., Kicklighter D.W., Meier R.A., Melillo J.M., Moore III B., Prentice I.C., Ramankutty N., Reichenau T., Schloss A., Tian H., Williams L.J. and Wittenberg U. ,2001: Carbon balance of the terrestrial biosphere in the twentieth century: Analyses of CO<sub>2</sub>, climate and land-use effects with four process-based ecosystem models. *Global Biogeochemical Cycles* 15, 183-206.
- McGuire A.D., Sturm M. and Chapin III F.S., 2003a: Arctic Transitions in the Land-Atmosphere System (ATLAS): Background, objectives, results, and future directions. *J. Geophys. Res.* In press.
- McGuire, A. D., and J. E. Hobbie, 1997: Global climate change and the equilibrium responses of carbon storage in arctic and subarctic regions, pp. 53-54 in *Modeling the Arctic System: A Workshop Report of the Arctic System Science Program*, Arct. Res. Consort. of the U. S., Fairbanks, Alaska.
- McGuire, A. D., C. Wirth, M. Apps, J. Beringer, J. Clein, H. Epstein, D. W. Kicklighter, J. Bhatti, F. S. Chapin III, B. de Groot, D. Efreimov, W. Eugster, M. Fukuda, T. Gower, L. Hinzman, B. Huntley, G. J. Jia, E. Kasischke, J. Melillo, V. Romanovsky, A. Shvidenko, E. Vaganov, and D. Walker, 2002: Environmental variation, vegetation distribution, carbon dynamics, and water/energy exchange in high latitudes, *J. Vegetation Sci.*, 13, 301-314.
- McGuire, A. D., J. Clein, J. M. Melillo, D. W. Kicklighter, R. A. Meier, C. J. Vorosmarty, and M. C. Serreze, 2000a: Modeling carbon responses of tundra ecosystems to historical and projected climate: The sensitivity of pan-arctic carbon storage to temporal and spatial variation in climate, *Global Change Biol.*, 6, S141-S159.
- McGuire, A. D., J. M. Melillo, D. W. Kicklighter, and L. A. Joyce, 1995: Equilibrium responses of soil carbon to climate change: Empirical and process-based estimates, *J. Biogeogr.*, 22, 785-796.
- McGuire, A.D., J.M. Melillo, D.W. Kicklighter, Y. Pan, X. Xiao, J. Helfrich, B. Moore III, C.J. Vorosmarty, and A.L. Schloss, 1997: Equilibrium responses of global net primary production and carbon storage to doubled atmospheric carbon dioxide: Sensitivity to changes in vegetation nitrogen concentration. *Global Biogeochemical Cycles*, 11,173-189.
- McGuire, A.D., J.M. Melillo, J. T. Randerson, W.J. Parton, M. Heimann, R.A. Meier, J.S. Clein, D.W. Kicklighter, and W. Sauf, 2000b: Modeling the effects of snowpack on heterotrophic respiration across northern temperate and high latitude regions: Comparison with measurements of atmospheric carbon dioxide in high latitudes. *Biogeochemistry*, 48, 91-114.
- McGuire, A.D., M. Apps, F.S. Chapin III, R. Dargaville, M.D. Flannigan, E.S. Kasischke, D. Kicklighter, J. Kimball, W. Kurz, D.J. McCrae, K. McDonald, J. Melillo, R. Myneni, B.J. Stocks, D.L. Verbyla, and Q. Zhuang, 2003b. Canada and Alaska. Chapter 9 in *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface*. Dordrecht, Netherlands, Kluwer. In press.
- Mearns, L.O., R.W. Katz, and S. H. Schneider, 1984: Extreme high-temperature events: changes in their probabilities with changes in mean temperature, *J. Clim. Appl. Meteor.*, 23, 1601-1613.
- Meehl G.A., Zwiers F., Evans J., Knutson T., Mearns L., Whetton P., 2000: Trends in extreme weather and climate events: issues related to modeling extremes in projections of future climate change. *Bull. Am. Meteorol. Soc.*, 81, 427-436.
- Meehl, G. A., G. J. Boer, C. Covey, M. Latif and R. J. Stouffer, 2000: The Coupled Model Intercomparison Project (CMIP). *Bull. Amer. Meteor. Soc.*, 81, 313-318.
- Meier, M.F., Dyurgerov, M.B. and McCabe G.J., 2003: The Health of Glaciers. Recent Changes in Glacier Regime. *Climate Change*, 59(1-2), 123-135. Kluwer Academic Publishers.
- Meleshko, V.P., V.M. Kattsov, V.A. Govorkova, S.P. Malevsky-Malevich, E.D. Nadyozhina, and P.V. Sporyshev, 2004: Anthropogenic climate change in the 21<sup>st</sup> century in Northern Eurasia. *Russian Meteorology and Hydrology*. (in press).
- Melillo J.M., 1996: Carbon and nitrogen interactions in the terrestrial biosphere: anthropogenic effects. In: *Global Change in Terrestrial Ecosystems*. Eds. Walker B. and Steffen W. International Biosphere Geosphere Program Book Series, 2, Cambridge Univ. Press, Cambridge. 431-450.
- Melillo J.M., McGuire A.D., Kicklighter D.W., Moore B., Vorosmarty C.J. and Schloss A.L., 1993: Global climate change and terrestrial net primary production. *Nature*, 363, 234-239.
- Melillo J.M., Prentice I.C., Farquhar G.D., E.-D. Schulze and O.E.Sala, 1996: Terrestrial ecosystems: Biotic feedback to climate. In: *Intergovernmental Panel on Climate 1995: Scientific Assessment of Climate Change*. (Eds.Houghton J., L.C. Meria Filho, B.A. Callander, N. Harris, A. Kattenberg, and K. Maskel). Cambridge University Press, Cambridge, UK. 444-481.
- Meng, C.J., P. R. Houser, K. Mitchell, M. Rodell, U. Jambor, J. Gottschalck, K. Arsenault, B. Cosgrove, J. Radakovich, M. Bosilovich, J. K. Entin, J. P. Walker, H. L. Pan, and G. Gayno, 2003: Global land surface radiation budget and its impact on water and energy cycles. AMS Proceedings, Combined Preprints CD-ROM. 83 AMS Annual Meeting, 9-13 February, 2003, Long-Beach, California.
- Mengesha, Y. G., Taylor, P.A., Lenscow, D. H., 2001: Boundary-layer Turbulence Over the Nebraska Sandhills, *Bound.-Layer Meteorol.* 100, 3-46.
- Menon, S., J.E. Hansen, L. Nazarenko, and Y. Luo, 2002: Climate effects of black carbon aerosols in China and India. *Science* 297, 2250-2253.
- Menzel, A. and Fabian, P., 1999: Growing Season Extended in Europe, *Nature* 397, 659.
- Menzel, A., 2000: Trends in Phenological Phases in Europe between 1951 and 1996. *International Journal of Biometeorology*, 44 (2), 76-81.

- Menzel, A., 2003: Plant phenological anomalies in Germany and their relation to air temperature and NAO. *Climatic Change*, 57, 243–263.
- Menzhulin G.V. and Co-authors, 1996: Climate Changes Impacts on Agriculture and Global Food Production: Options for Adaptive Strategies. In: *Adapting to Climate Change: Assessments and Issues*. Eds: J.Smith, N.Bhatti, G.Menzhulin, R.Benioff, M.Budyko, M.Campos, B.Jallow, F.Rijsberman. Springer- Verlag New York, Inc. 1996. p.188-203.
- Menzhulin G.V., 1997: Global warming, carbon dioxide increase and the prospects of crop potential: The Assesments for Russia using alternative climate change scenarios. *J.Agr. Meteor. Spesial Issue*, 52, 377-408.
- Menzhulin G.V., Koval L.A., Badenko L.A., 1995: Potential effects of global warming and carbon dioxide on wheat production in the Commonwealth of Independent States. *Climate change abd Agriculture: Analysis and Potential Internatioanl Impacts. ASA Special Publication N 59 /Ed. G.A. Peterson. American Society Agronomy Inc., Madison Wisconsin, USA, 275-292.*
- Menzhulin G.V., Savateev S.P., 2002: World food problem and contemporary global warming. In: *Climate Changes and their Consequences*. S.-Peter. Verlag "Nauka, 122-150 (in Russian).
- Meshcherskaya A.V., I.F. Getman, M.M. Borisenko and E.I. Shevkunova, 2004: Wind speed monitoring on watersheds of the Volga and Ural rivers in the twentieth century. – *Russian Meteorol. Hydrol.*, 2004, No. 3, 83-97
- Meshcherskaya A.V., Margasova V.G., Obratsova M.Z. and O.Yu. Grigor, 2001: Decrease of anticyclone activity in the Northern Eurasia due to the Global Warming. – *News (Izvestia) of the Russian Akademy of Sciences, Ser. Geography*, 2001, No. 6, 5-24.
- Meshcherskaya, A. V., Blazhevich, V. G., 1997: The Drought and Excessive Moisture Indices in a Historical Perspective in the Principal Grain-Producing Regions of the Former Soviet Union. *J. Climate*, 10, 2670–2682.
- Methodology for Remote Control of Changes in the Forest Fund Caused by Oil Exploiting and Extraction (1990). Moscow, VNIICLesresurs, 13 pp. (in Russian).
- Methodology for Small-scale Mapping of Forest Fund Based on Space Images, 1981: Moscow, CBNTILesxoz, 8 pp. (in Russian).
- Michaelson, G.J., Ping, C.L., and Kimble, J.M., 1996: Carbon storage and distribution in tundra soils of Arctic Alaska, U.S.A. *Arctic and Alpine Research*, 28(4), 414-424.
- Miheev, V.S., A.K. Cherkashin and A.D. Kitov, 1996: Methods for land evaluation by using remote sensing data and GIS-technologies. Proceedings of International Conference "Intercarto-2: GIS for studying and mapping of nature", Irkutsk, 26–29 June, 152–154 (in Russian).
- Mil'kov, F.E., 1952: Forest – forest-steppe interaction and problems of the landscape zone shifts in the Russian Plain. *Izv. All-Union Geograph. Soc.*, 84, No. 5, 431-447 (in Russian).
- Miller J.R. and Russell G.L., 1992: The impact of global warming on river runoff. *J. Geophys. Res.*, 97, No. D3, 2757-2764.
- Miller J.R., Russell G.L., 1992: The impact of global warming on river runoff. *J.Geogr. Res.*, 97, 2757-2764.
- Miller S.H. and Watson K., 1977: Evaluation of algorithms for geological thermal inertia mapping. Proceedings of Eleventh International Symposium on Remote Sensing of Environment. v.II, Ann Arbor, Michigan. 25-29 April, 1977.
- Milly, P.C.D., R.T. Wetherald, K.A.Dunne, and T.L. Delworth, 2002: Increasing risk of great floods in a changing climate. *Nature*, 415, 514-517.
- Milyukova I.M., Kolle O., Varlagin A., Vygodskaya N.N., Schulze E.-D. and Lloyd J., 2002: Carbon balance of a southern taiga spruce stand in European Russia. *Tellus*, 54B, 5, 427-442.
- Minaeva T. Yu., Istomin A. V., Abrazhko V. I., Bazhenova T. P., Korablev N. P., Kuraeva E. N., Kurakina I. V., Pugatchevsky A. V., Rusanovich N. R., Shaposhnikov E. S. 2001. Study on biota reaction on climate changes in the Central Forest Nature Reserve. In: *Climate change impact on ecosystems. Nature protected areas in Russia. Analyses of long-term information.* Publications of WWF. Russia. Moscow, Russian University, 87-100 (in Russian).
- Minaeva T.Yu. and Sirin A., 2000: Peatlands conservation in Russia: experience and perspectives // Proc. 11 Intern. Peat Congr., Quebec, Canada, Vol. 1, 231-235.
- Minin, A.A., 2000: *Phenology of the Russian Plain: Data and Generalizations*. ABF Publ., Moscow. 160 pp.
- Mitchell, J.M., Dzerdzeevskii, B., Flohn., H., Hofmeyr, W.L., Lamb, H.H., Rao, K. N. and C.C. Wallen, 1966: *Climate Change, World Meteorological Organization*, Geneva. No.195, 100 pp.
- Mitchell, K. E., D. Lohmann, P. R. Houser, E. F. Wood, J. C. Schaake, A. Robock, B. A. Cosgrove, J. Sheffield, Q. Duan, L. Luo, R. W. Higgins, R. T. Pinker, J. D. Tarpley, D. P. Lettenmaier , C. H. Marshall, J. K. Entin, M. Pan, W. Shi, V. Koren, J. Meng, B. H. Ramsay, and A. A. Bailey, 2004: The multi-institution North American Land Data Assimilation System (NLDA5): Utilizing multiple GCIP products and partners in a continental distributed hydrological modeling system, *J. Geophys. Res.*, 109, D07S90, doi: 10.1029/2003JD003823.
- Mitchell, K., Y. Lin, E. Rogers, C. Marshall, M. Ek, D. Lohmann, J. Schaake, D. Tarpley, P. Grunmann, G. Manikin, Q. Duan, and V. Koren, 2000: Recent GCIP-sponsored advancements in coupled land-surface modeling and data assimilation in the NCEP ETA mesoscale model, *Preprints, 15<sup>th</sup> AMS Conference on Hydrology*, 180-184.
- Mitchell, T.D. et al., 2003: A comprehensive set of climate scenarios for Europe and the globe. In preparation.
- Mitrofanov D.P., 1977: *Chemical composition of the Siberian forest vegetation*. Novosibirsk, Verlag "Nauka", Siberian branch, 220 pp. (in Russian).
- Miyazaki, S., T. Miyamoto, H. Ohishi, I. Kaihotsu, T. Yasunari, G. Davaa, D. Oyunbaatar and L. Natsagdorj, 2002: Interannual and seasonal variation of surface heat balance observed over grassland in Mongolia *Proceedings of the 2002 International workshop on terrestrial change in Mongolia* , p.13.
- Miyazaki, S., T. Miyamoto, I. Kaihotsu, T. Yasunari, G. Davaa, D. Oyunbaatar, L. Natsagdorj, 2001: The relation among vegetation, soil moisture and seasonal variation of evapotranspiration over Mongolia, *Proceedings of the 5th International GAME Conference*, 1, 107-112
- Mokhov, I.I., V.A. Semenov, and V.Ch. Khon, 2003: Estimates of possible regional hydrologic regime



- changes in the 21<sup>st</sup> century based on global climate models. *Izvestia, Atmos. Oceanic Phys.*, 39, 130-144.
- Molchanov A.A., 1961: *Forest and Climate*. Moscow, Nauka, 279 pp. (in Russian).
- Molchanov A.G. 2000: Photosynthetic utilization efficiency of absorbed photosynthetically action radiation by Scots pine and birch forest stands in the southern Taiga. *Tree Physiology*, 20 (17), 1137-1148.
- Molkentin E.K., E.D. Nadyozhina, O.B. Shklyarevich, 2003: Model estimates of vegetation impact on permafrost degradation in the warming climate. *Russian Meteor. Hydrology*, No.3, 87-95.
- Mollicone D., Panferova E., Sidorov K.N., Varlagin A.V. and Wirth C., 2002: The Euro Siberian Transect: an introduction to the experimental region. *Tellus*, 54B, 5, 421-428.
- Monin, A.S. and Obukhov, A.M., 1954: Basic laws of turbulent mixing in the atmosphere near the ground, *Trudy Akad. Nauk., SSSR, Geofiz. Inst.*, 24 (151), 163-187 (in Russian).
- Monserud R, Tchebakova N., Leemans R., 1993: Global vegetation change predicted by modified Budyko's model. *Climate Change*, 25, 59-83.
- Monserud R., Tchebakova N., Denissenko O., 1998: Reconstruction of the mid-Holocene palaeoclimate of Siberia using a bioclimatic vegetation model. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 139,15-36.
- Monserud R.A., Denissenko O.V., Kolchugina T.P., Tchebakova N.M., 1995: Change in phytomass and net primary productivity for Siberia from the mid-Holocene to the present. *Global Biogeochemical Cycles*, 9, 213-226.
- Monserud R.A., Tchebakova N.M., Denissenko O.V., 1993: Comparison of Siberian paleovegetation to current and future vegetation under climate change. *Climate Research*, 3, 143-159.
- Monteith J.L. (ed.), 1975: *Vegetation and the atmosphere, vol. 1: Principles*. Academic Press, London. 278 pp.
- Monteith J.L. (ed.), 1976: *Vegetation and the atmosphere, vol. 2*. Academic Press, London. 439 pp.
- Mooney H.A., Canadell J., Chapin 111 F.S., Ehleringer J., Körner C., McMurtrie R.E., Parton W.J., Pitelka L.F., Schulze E.-D., 1999: Ecosystem physiology responses to global change. In: *The Terrestrial Biosphere and Global Change* (Eds. Steffen W., Canadell J., Ingram J.). Cambridge University Press, Cambridge 141-189.
- Moore, C.J., 1986: Frequency response corrections for eddy correlation system, *Bound.-Layer Meteorol.* 37, 17-35.
- Moran M. Susan, Jackson R.D., Raymond L.H., Gay L.W., Slater P.N., 1989: Mapping Surface Energy Balance Components by Combining Landsat Thematic Mapper and Ground-Based Meteorological Data. *Remote Sens. Environ.*, 30, 77-87.
- Morel, A. and L. Prieur, 1977: Analysis of variations in ocean color, *Limnology and Oceanography*, 22, 709-722.
- Morisette, J.T., J. Nickeson, P. Davis, Y. Wang, Y. Tian, C. Woodcock, N. Shabanov, M. Hansen, D.L. Schaub, A.R. Huete, W.B. Cohen, D.R. Oetter, and R.E. Kennedy, 2004: Submitted. The use of NASA's Commercial Data Purchase Program in support of MODIS land validation. *Remote Sensing of Environment (in review)*.
- Morrison J., Aagaard K., and M.Steele, 2000: Recent environmental changes in the Arctic: A review. *Arctic*, 53(4): 359-371.
- Mund M., Kummets, E., Hein, M., Bauer G.A., E.-D.Schulze, 2002: Growth and carbon stocks of a spruce forest chronosequence in Central Europe. *For. Ecology and Management*, 171, 275-296.
- Myneni, R. B., S. Hoffman, Y. Knyazikhin, J. L. Privette, J. Glassy, Y. Tian, Y. Wang, X. Song, Y. Zhang, G. R. Smith et al., 2002: Global products of vegetation leaf area and fraction absorbed PAR from year one of MODIS data. *Rem. Sens. Environ.* 83(1-2), 214-231.
- Myneni, R.B, J. Dong, C.J. Tucker, R.K. Kaufmann, P.E. Kauppi, J. Liski, L. Zhou, V. Alexeyev, and M.K. Hughes: 2001: A large carbon sink in the woody biomass of northern forests. *Proc. Natl. Acad. Sci. USA.*, 98(26), 14784-14789.
- Myneni, R.B., Keeling, C.D., Tucker, C.J., Asrar, G., and Nemani, R.R., 1997: Increased plant growth in the northern high latitudes from 1981 to 1991, *Nature*, 386, 698-702.
- Naeem S., Thompson L.J., Lawler S.P., Lawton J.H., and Woodfin R.M., 1994: Declining biodiversity can alter the performance of ecosystems. *Nature*, 368, 734-737.
- Naidu A.S., Cooper L.W., Finney B.P., MacDonald R.W., Alexander C., and I.P.Semiletov, 2000: Organic carbon isotope ratios [ $\delta^{13}\text{C}$ ] of Arctic Amerasian Continental shelf sediments, *Int.J.Earth Sci.*, 89, 522-532.
- Nakaegawa, T., Oki, T. and Musiak, K., 2000: The effects of heterogeneity within an area on areally averaged evaporation, *Hydro. Proc.*, 14(3), 465-479
- Nakićenović, N., J. Alcamo, G. Davis, B. de Vries, J. Fenhann, S. Gaffin, K. Gregory, A. Grübler, T. Y. Jung, T. Kram, E. L. La Rovere, L. Michaelis, S. Mori, T. Morita, W. Pepper, H. Pitcher, L. Price, K. Raihi, A. Roehrl, H.-H. Rogner, A. Sankovski, M. Schlesinger, P. Shukla, S. Smith, R. Swart, S. van Rooijen, N. Victor, and Z. Dadi, 2000: *IPCC Special Report on Emission Scenarios*. Cambridge University Press, United Kingdom and New York, NY, USA, 599 pp.
- Narisma, G.T., A.J. Pitman, J. Eastman, I.G. Watterson, R. Pielke Sr., and A. Beltran-Przekurat, 2003: The role of biospheric feedbacks in the simulation of the impact of historical land cover change on the Australian January climate. *Geophys. Res. Lett.*, 30(22), 2168, doi:10.1029/2003GL018261.
- Nastchekin V.D., 1975: Vegetation in the Krasnoyarsk Territory and its history. In: *History of Siberian Forests in the Holocene*. Krasnoyarsk. V. N. Sukachev Forest Institute Publishers. 20-36 pp.
- National Climatic Data Center, NCDC, 2002: Data Documentation For Data Set 9101, Global Daily Climatology Network, Version 1.0, 26 pp. [Available: at <http://nndc.noaa.gov/?http://ols.nndc.noaa.gov>].
- Naurzbaev M.M., Vaganov E.A., 2000: Variation of summer and annual temperature in the East of Taymir and Putoran (Siberia) over the last two millennia inferred from tree-rings. *Journal of Geophysical Research*, 105, 7317-7327
- Naurzbaev, M.M. and Vaganov, E.A., 1998: 1957-year tree-ring chronology of eastern part of Taymir. *Siberian Journal of Ecology*, 5, 48-59.

- Neff J.C., Asner G.P. ,2001: Dissolved Organic Carbon in Terrestrial Ecosystems: Synthesis and a Model. *Ecosystems* 4, 29-48
- Neishtadt, M.I., 1957: *Forest history and paleogeography of the USSR in the Holocene.*- Moscow, "Nauka", 1957. 404 pp. (in Russian).
- Neistadt, M.I., 1977: Origin and development rates of bogging processes. p. 39-47. In: *Scientific background of bog exploitation in West Siberia*" Nauka, Moscow, 228 pp.
- Nelson, F. E., O. A. Anisimov, and N. I. Shiklomanov, 2001: Subsidence risk from thawing permafrost. *Nature*, 410, 889-890.
- Nelson, F.E., Anisimov, O.A. and Shiklomanov, N.I., 2001: Subsidence risk from thawing permafrost. *Nature*, 410, 889-890.
- Nelson, F.E., Anisimov, O.A., and Shiklomanov, N.I., 2001: Subsidence risk from thawing permafrost. *Nature*, 410.: 889-890.
- Nelson, F.E., Anisimov, O.A., and Shiklomanov, N.I., 2002: Climate change and hazard zonation in the circum-Arctic permafrost regions. *Natural Hazards*, 26, 203-225.
- Nelson, F.E., Anisimov, O.A., and Shiklomanov, N.I., 2002: Climate change and hazard zonation in the circum-Arctic permafrost regions. *Natural Hazards*, 26, 203-225
- Nemani, R., M. White, P. Thornton, K. Nishida, S. Reddy, J. Jenkins, and S. Running, 2002: Recent trends in hydrologic balance have enhanced the terrestrial carbon sink in the United States. *Geophysical Research Letters*, 29, No. 10, 10.1029/2002GL014867, 2002.
- New, M., M. Hulme, P. Jones, 2000: Representing twentieth-century space-time climate variability. Part II: development of 1901-96 monthly grids of terrestrial surface climate. *J. Climate* 13, 2217-2238.
- Nicolopoulou-Stamati, P., L. Hens, V.C. Howard, and N. Van Larebeke (Eds.) *Cancer as an Environmental Disease*, March 2004 Kluwer Verlag, 236 pp.
- Nijssen B., Bowling L.C., D.P.Lettenmaier, D.B.Clark, M.E.Maayar, R.Essery, S.Goers, Ye.M.Gusev, F.Habets, B. van den Hurk, J.Jin, D.Kahan, D.Lohmann, X.Ma, S.Mahanama, D.Mocko, O.Nasonova, G.-Y.Niu, P.Samuelsson, A.B.Shmakin, K.Takata, D.Verseghe, P.Viterbo, Y.Xia, Y.Xue, Z.-L.Yang, 2003: Simulation of high latitude hydrological processes in the Torne-Kalix basin: PILPS Phase 2(e). 2: Comparison of model results with observations. *Global and Planetary Change*, 38, 31-53.
- Nijssen, B., R. Schnur, and D. P. Lettenmaier, 2001: Global retrospective estimation of soil moisture using the Variable Infiltration Capacity land surface model, 1980-1993. *J. Climate*, 14, 1790-1808.
- Nikonov V., Goryainova V., and Lukina N., 2001: Ni and Cu migration and accumulation in forest ecosystems on the Kola Peninsula. *Chemosphere*, 42/1, № 362, 93-100.
- Nilsson S. and A. Shvidenko, 1999: Is sustainable development of the Russian forest sector possible? *IUFRO Paper No. 11* ISSN 1024-414X.
- Nilsson S., Shvidenko A., Stolbovoi V., Gluck M., Jonas M., Obersteiner M., 2000: Full carbon account for Russia. Interim Report IR-00-021, International Institute for Applied Systems Analysis, Laxenburg, Austria, 180 pp.
- Nilsson S., Vaganov E., Shvidenko A., Stolbovoi V., Rozhkov V., McCallum I., Jonas M. 2003. Carbon budget of vegetation ecosystems of Russia. Reports of the Russian Academy of Sciences (in press).
- Nilsson, S. and A.Z. Shvidenko, 1998: Is sustainable development of the Russian forest sector possible? *IUFRO Occasional Paper No. 11*, ISSN 1024-414X, 76p.
- Nilsson, S. et al., 2000: Full carbon account for Russia. IIASA Interim Report IR-00-021. International Institute for Applied Systems Analysis, Laxenburg, Austria, forthcoming.
- Nilsson, S., Blauberg, K., Samarskaya, E., Kharuk, V. ,1998: Pollution stress of Siberian forests. In: *Air Pollution in the Ural Mountains*. Environmental, Health and Policy Aspects (Eds. I. Linkov, R. Wilson). NATO ASI Series 2.Environment – vol. 40. Kluwer Acad, Publishers, Dordrecht, p. 31 – 54.
- Nitsenko A.A., 1967: *A brief course of bog land science*. Vysshaia Shkola.147 pp.
- Norby R.J., Wullschlegler S.D., Gunderson C.A., Johnson D.W., Ceulemann R., 1999: Tree responses to rising CO<sub>2</sub> in field experiments: implication for the future forest. *Plant, Cell Environ.*, 22, 683-714.
- Normile,D., 1995: Polar regions give cold shoulder to theories, *Science*, 270, 1566.
- Novakov T., V. Ramanathan, J.E. Hansen, T.W. Kirchstetter, M, Sato, J.E. Sinton, and J.A. Sathaye, 2003, Large historical changes of fossil-fuel black carbon aerosols. *Geophys. Res. Lett.*, 30, 1324, doi: 10.1029/2002GL016345.
- Novorotskii P.N., 1984: *Heat balance of middle-elevation mountain regions (a study case of the south of Far East)*. Vladivostok. USSR Academy of Sciences. 130 pp.
- NRC, 1998: Chapter 7: "Human Dimensions of Global Environmental Change". in: *Overview : global environmental change : research pathways for the next decade*. National Research Council (U.S.). Committee on Global Change Research. Washington, D.C., National Academy Press: xii, 69 pp.
- NRC, 1998: GCIP: Global Energy and Water Cycle Experiment (GEWEX) Continental-Scale International project: A Review of Progress and Opportunities. Report of the Global Energy and Water Cycle Experiment (GEWEX) Panel Climate Research Committee Board on Atmospheric Sciences and Climate Commission on Geosciences, Environment and Resources, National Research Council, National Academy Press, Washington DC, 93 pp.
- NRC, 2000: New eyes in the sky measure glaciers and ice sheets. *EOS*, 81 (24): 265+270-271.
- Oberman, N.G. and G.G. Mazhitova, 2001: Permafrost dynamics in the north-east of European Russia at the end of the 20<sup>th</sup> century. *Norwegian Journal of Geography*, 55, 241-244.
- Odum, E. P. 1983: *Basic ecology*, Holt-Saunders International Editions, New York, 613 pp.
- Oechel W. C., Vourlitis G. L., Hastings S. J., Hinzman L., Kane, D. 2000: Acclimation of ecosystem CO<sub>2</sub> exchange in the Alaskan Arctic in response to decadal warming. *Nature*, 406, 978-981.
- Oechel W. C., Vourlitis G. L., Verfaillie J., Crawford T., Brooks S., Dumas E., Hope A., Stow D., Boynton B., Nosov V., Zulueta R. 2000b: A scaling approach for quantifying the net CO<sub>2</sub> flux of the Kuparuk River Basin, Alaska. *Global Change Biology*, 6 (Suppl. 1), 160-173.

- Oechel W.C., 1993: Net ecosystem carbon flux of age specific subarctic tussock tundra stands following fire: implications for Alaska interagency fire management. PNW 92-0253. Report to the National Park Service. Branch on fire and aviation management. 26 pp.
- Oechel, W.C., Hastings, S.J., Vourlitis, G., Jenkins, M., Riechers, G., and Grulke, N., 1993: Recent change of Arctic tundra ecosystems from a net carbon sink to a source. *Nature*, 361(6412), 520-523.
- Oechel, W.C., Vourlitis, G.L., Hastings, S.J., and Bochkarev, S.A., 1995: Change in Arctic CO<sub>2</sub> flux over two decades: effects of climate change at Barrow, Alaska. *Ecological Applications*, 5(3), 846-855.
- Oerlemans, J. 2001: *Glaciers and climate change*. Swets & Zeitlinger Publishers, Rotterdam - Netherlands, 160 pp.
- Ogorodov, S.A., 2003: Coastal dynamics in the Pechora Sea under technogenic impact, In: Rachold, V. et al. (2003). Arctic coastal dynamics: report of the 3rd International Workshop University of Oslo (Norway) 2-5 December 2002. *Berichte zur Polar- und Meeresforschung*, 44(3): pp. 74-80.
- Ogorodov, SA, 2001. Morphology and dynamics of the Pechora Sea coasts. *Proceedings of the Institute of Oceanology BAN, Varna*, 3, 77 – 86.
- Ogorodov, S.A., E. I. Polyakova, and P. A. Kaplin, 2003: Evolution of Barrier Beachs in the Pechora Sea. *Transactions (Doklady) of the Russian Academy of Sciences/Earth Science Section*, 2003, 388, No. 1, January-February. 114-116.
- Ohta, T., Hiyama, T., Tanaka, H., Kuwada, T., Maximov, T.C., Ohata, T. and Fukushima, Y., 2001: Seasonal variation in the energy and water exchanges above and below a larch forest in eastern Siberia, *Hydro. Proc.*, 15(8), 1,459-1,476.
- Ojima D.S, Galvin K.A, Turner, I.I.B.L, 1994: The global impact of land-use change. *Bioscience*, 44, 300-304.
- Olivier, J.G.J, A.G. Bouwman, J.J.M. Berdowski, C. Veldt, J.P.J. Bloos, A.J.H. Visschedijk, C.W.M. van der Maas and P.Y.J. Zandveld, 1999: Sectoral emission inventories of greenhouse gases for 1990 on a per country basis as well as on 1x1 degree. *Environmental Science & Policy*, 2, 241-264.
- Olivier, J.G.J. and J.J.M. Berdowski, 2001: Global emissions sources and sinks. In: J. Berdowski, R. Guicherit and B.J. Heij (eds.) *"The Climate System"*, 33-78. A.A. Balkema Publishers/Swets & Zeitlinger Publishers, Lisse, The Netherlands.
- Oltchev A., Cermak J., Gurtz J., Kiely G., Nadezhdina N., Tishenko A, Zappa M, Lebedeva N, Vitvar T., Albertson J.D., Tatarinov F., Tishenko D., Nadezhdin V., Kozlov B., Ibrom A., Vygodskaya N., Gravenhorst G., 2002: The response of the water fluxes of the boreal forest region at the Volga's source area to climatic and land-use changes. *J. Phys. Chem. Earth*, 27, 675-690.
- Oltchev A., Cermak J., Nadezhdina N., Tatarinov F., Tishenko A., Ibrom A., Gravenhorst G., 2002: Transpiration of a mixed forest stand: field measurements and simulation using SVAT models. *J. Boreal Environmental Reserach*, 7, 389-397
- O'Neill, K.P., E.S. Kasischke, and D.D. Richter, 2003: Seasonal and decadal patterns of soil carbon uptake and emission along an age sequence of burned black spruce stands in interior Alaska. *J. Geophys. Res.*, 108 (D1), FFR 11: 1-15.
- Onuchin A.A. et. al., 2003: GIS as a tool of reduction of the information deficit in forest hydrology studies. *Ecology*, (in press).
- Onuchin A.A., 2000: Anthropogenic dynamic of water protective functions of mountainous forest in Siberia. *Lesovedenie [Forestry]*, No.1
- Onuchin, A.A., 2001: General tenets of snow accumulation in boreal forests. *Izvestia RAS, Seria Geograph.*, 2001, No. 2, 45-48.
- Orlov A.Ya. and S.P. Koshel'kov, 1971: *Soil ecology of pine*. Moscow, Publ. House "Nauka", 322 pp. (in Russian).
- Orlova, O.L. and I.A. Vukolova, 1997: Estimation of post-harvesting dynamics of forest ecosystems by aerospace information and GIS technologies. *Proceedings of VII Annual Conference MAIBL "Sustainable Development of Boreal Forests"*. Moscow, 74-77 (in Russian).
- Osterkamp, T. E., and V. E. Romanovsky, 1999: Evidence for warming and thawing of discontinuous permafrost in Alaska, *Permafrost and Periglacial Processes*, 10(1), 17-37.
- Osterkamp, T. E., D. C. Esch, and V. E. Romanovsky, 1997: Infrastructure: Effects of climatic warming on planning, construction and maintenance, *Proc. of the BESIS Workshop*, Univ. of Alaska, Fairbanks, AK, 115-127.
- Osterkamp, T. E., L. Vierek, Y. Shur, M. T. Jorgenson, C. Racine, A. Doyle and R. D. Boone, 2000: Observations of thermokarst and its impact on boreal forests in Alaska, U.S.A. *Arctic, Antarctic and Alpine Research*, 32, 303-315.
- Overland, J., J. Calder, F. Fetterer, D. McGuire, J. Morison, J. Richter-Menge, N. Soreide, J. Walsh, 2003: Search Workshop on Large-Scale Atmosphere-Cryosphere Observations. *Bull. Amer. Met. Soc.*, 84, 1077-1082.
- Overland, J., J. Calder, F. Fetterer, D. McGuire, J. Morison, J. Richter-Menge, N. Soreide, J. Walsh, 2003: Search Workshop on Large-Scale Atmosphere-Cryosphere Observations. *Bull. Amer. Met. Soc.*, 84, 1077-1082.
- Ozkaynak, H., Spengler, J.D., Jaakkola, J.J.K., Ford, T., Xue, J., Egorov, A., Schwartz, J., Kuzmin, S., Rakitin, P., Provalova, L., Chebotarkova, S., Zemlianaia, G., 1998: Evaluation of existing environmental information systems in Russia applicable for human health effects assessment. In: *Air Pollution in the Ural Mountains. Environmental, Health and Policy Aspects* (Eds. I. Linkov, R. Wilson). NATO ASI Series 2.Environment – vol. 40. Kluwer Acad, Publishers, Dordrecht, p. 195 – 217.
- P'yavchenko, N.I., 1950: *Peatlands in Russian forest-steppe*. Moscow, Publ. Acad. Sci. of the USSR. 190 pp. (in Russian).
- Pacala, S. W., G. C. Hurtt, D. Baker, P. Peylin, R. A. Houghton, R. A. Birdsey, L. Heath, E. T. Sundquist, R. F. Stallard, P. Ciais, P. Moorcroft, J. Caspersen, E. Shevliakova, B. Moore, G. Kohlmaier, E. Holland, M. Gloor, M.E. Harmon, S.-M. Fan, J. L. Sarmiento, C. Goodale, D. Schimel, C. B. Field, 2001: Consistent land-and atmosphere-based U.S. carbon sink estimates *Science*, 292, 2316-2320.
- Pajula, R. 2000: Spatio-temporal development of the Soomaa mire system in SW Estonia. *Proc. Estonian Acad. Sci., Biology. Ecology*, 49, 194-208.

- Pal'nikova E.N., Sviderskaya I.V. and Sukhovolski V.G., 2002: *Pine looper in Siberian forests. Ecology, population dynamics, impacts on forest stands.* – Novosibirsk: Nauka Publ. House, 231 pp. (In Russian)
- Palutikov J.P., Kelly P.M. and Davis T.D., 1986: Wind speed variation and climate change - *Wind Engineering*, 10, №4, 182-190
- Pan, Y., J.M. Melillo, D.W. Kicklighter, X. Xiao and A.D. McGuire. 2001. Modeling struct. and func. responses of terrestrial ecosystems in China to climate and atmospheric CO<sub>2</sub>. *Acta Phytoecologica Sinica*, 25, 175-189.
- Panikov N.S. and Dedish S.N., 2000: Cold season CH<sub>4</sub> and CO<sub>2</sub> emission from boreal peat bogs (west Siberia): winter fluxes and thaw activation dynamics. *Global Biogeochem. Cycles*, 14, 1071-1080.
- Panin G., and A. E. Nasonov, 1998: Problems of Measurement and Calculation of Surface Fluxes in KUREX-91 Experiment, *Remote Sensing Reviews*. 17, 281-290.
- Panin G.N. and G.Tetzlaff, 1999: A measure of inhomogeneity of the land surface and parametrization of the turbulent fluxes in natural conditions, *Theor. Appl. Climat.*, 62, 3-8.
- Panin G.N., 1985: *Heat- and mass exchange between the water and the atmosphere in the nature*, Nauka, Moscow, 206 pp. (in Russian),
- Panin G.N., Tetzlaff, G., Raabe, A., 1998: Inhomogeneity of the land surface and problem in parametrization of the surface fluxes in natural conditions, *Theor. Appl. Climat*, 60, 163-178.
- Panin, G.N., 2001: Inhomogeneity of the land surface and parametrization of the turbulent fluxes in natural conditions, *Proc. GAME ANN/Radiation Workshop*, Phuket, p. 85.
- Panin, G.N., and Nasonov A.E., 1996: Problems of measurement, calculation and parametrization of near-surface flows, *Information AH USSR, Atmospheric physics and ocean*, 32, 448-455 (in Russian)
- Panin, G.N., and Nasonov A.E., 1998: Problems of measurement and calculation of surface fluxes in KUREX-91 experiment, *Remote Sensing Reviews*, 17, 281-290.
- Parmylin Yu. P., 1979: *Tundra-Forest in the USSR*. Publ. House "Mysl", 295 pp. (in Russian).
- Parris, T. M. and R. W. Kates, 2003: Characterizing a sustainability transition: Goals, targets, trends, and driving forces. *Proceedings of the National Academy of Sciences of the United States of America* 100(14): 8068-8073.
- Parry, M.L., C. Rosenzweig, A. Iglesias, M. Livermore, and G. Fischer, 2004: Effects of climate change on global food production under SRES emissions and socio-economic scenarios. *Global Environ. Change* 14, 53-67, doi:10.1016/j.gloenvcha.2003.10.008.
- Parton W.J., Lauenroth W.K., Smith F.M., 1981: Water loss from a shortgrass steppe. *Agric.Met.*, 24, 97-109.
- Pastor, J. and Post W.M., 1986: Influence of climate, soil-moisture and succession of forest carbon and nitrogen cycles. *Biogeochemistry*, 2, 3-27.
- Pastor, J. and Post W.M., 1988: Response of northern forests to CO<sub>2</sub>-induced climate change, *Nature*, 334, 55-58.
- Pattey, E., Desjardins, R. L., St-Amour, G., 1997: Mass and energy exchanges over a black spruce forest during key periods of BOREAS 94. *J. Geophys. Res.*, 102, 28 967-28 975.
- Patz, J. A., M. A. McGeheh, et al. (2000). US National Assessment of the Potential Consequences of Climate Variability and Change Sector: Human Health. *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change*. 108, 437-458.
- Paul, F., Kääb, A., Maisch, M., Kellenberger, T. and Haeberli, W., 2002: The new remote sensing-derived Swiss Glacier Inventory: I. Methods. *Annals Glaciol.*, 34, 355-61.
- Pavlichenko, E.A., S.I. Miskiv and V.J. Romasko, 1998.: Detection of forest fire by remote sensing methods from NOAA satellites and data base formation in GIS ARCVIEW. In: V.I. Sukhikh (ed.), *Air and Satellite Methods and Geographical Information Systems in Forestry and Forest Management*, Materials of the 2nd All-Russia Meeting, Moscow, 18–19 November 1998. RAS and Federal Forest Service, Moscow, 190–194 (in Russian).
- Pavlov A.V. 1979: *Heat physics of landscapes*. Novosibirsk, Publischer "Nauka", 285 pp. (in Russian).
- Pavlov A.V. 1984: *Energy exchange in the Earth's landscapes*. Novosibirsk, Nauka, Siberian branch, 256 pp. (in Russian).
- Pavlov A.V., 1975: *Teploobmen nochvu c atmosphere v severnuh and umerennuh shirotax territorii USSR*. Yakutsk, 302 pp. (in Russian)
- Pavlov, A. V., 1994: Current changes of climate and permafrost in the Arctic and Sub-Arctic of Russia, *Permafrost and Periglacial Processes*, 5, 101-110.
- Pavlov, A. V., Anan'eva, G. V., Drozdov, D. S., Moskalenko, N. G., Dubrovin, V. A., Kakunov, N. V., Minailov, G. P., Skachkov, Yu. V., and P. N. Skryabin, 2002: Monitoring of the active layer and temperatures of the frozen ground in the North of Russia, *Earth Cryosphere*, v. VI, 4, 30-39 (in Russian).
- Peatlands Action Plan: The Framework for Peatland Conservation and Wise Use in Russia, 2003: Ministry of Natural Resources of Russian Federation. Moscow: Wetlands International. 24 pp. (in Russian).
- Pereira, J.M.C., S. Flasse, A. Hoffman, J.A.R. Pereira, F. González-Alonso, S. Trigg, M.J.P. Vasconcelos, S. Bartalev, T.J. Lynham, G. Korovin, and B.S. Lee, 2001: Operational use of remote sensing for fire management: regional case studies. In: *Global and Regional Wildfire Monitoring from Space: Planning a Coordinated International Effort*, F. J. Ahern, J. Goldammer and C. Justice, editors. SPB Academic Publishing, The Hague, Netherlands, (in press).
- Peters-Lidard, C.D., Zion, M.S., Wood, E.F., 1997: A soil-vegetation-atmosphere transfer scheme for modeling spatially variable water and energy balance processes. *J. Geophys. Res.*, 102, 4303-4324.
- Peterson, B. J., R. M. Holmes, J. W. McClelland, Ch. J. Vörösmarty, R. B. Lammers, A.I. Shiklomanov, I.A. Shiklomanov, and S. Rahmstorf, 2002: Increasing River Discharge to the Arctic Ocean, *Science*, 298, Dec 13 2002, 2171-2173.

- Peterson, T. C. and R. S. Vose, 1997: An overview of the Global Historical Climatology Network temperature data base. *Bull. Amer. Meteorol. Soc.*, **78**, 2837-2849.
- Pfister, C., 1984: *Klimageschichte der Schweiz: 1525-1860*. Paul Haupt, Bern, Stuttgart. 324 pp.
- Pickett, S.T.A. and P.S. White (eds.), 1985: *The Ecology of Natural Disturbance and Patch Dynamics*. Academic Press, New York, 472 pp.
- Pielke R.A., Sr. and Avissar R., 1990: Influence of landscape structure on local and regional climate. *Landscape Ecol.*, **4**, 133-155.
- Pielke, R.A. Sr. and L. Bravo de Guenni, Eds., 2004: How to evaluate the vulnerability in changing environmental conditions. Part E In: *Vegetation, Water, Humans and the Climate: A New Perspective on an Interactive System. A Synthesis of the IGBP Core Project, Biospheric Aspects of the Hydrologic Cycle*, P. Kabat, Chief Editor, in press.
- Pielke, R.A. Sr. and L. Bravo de Guenni, Eds., 2004: How to evaluate the vulnerability in changing environmental conditions. Part E In: *Vegetation, Water, Humans and the Climate: A New Perspective on an Interactive System. A Synthesis of the IGBP Core Project, Biospheric Aspects of the Hydrologic Cycle*, (P. Kabat, Chief Editor), in press.
- Pielke, R.A., Sr., 1998: Climate prediction as an initial value problem. *Bull. Amer. Meteor. Soc.*, **79**, 2743-2746.
- Pielke, R.A., Sr., 2000: Overlooked issues in the U.S. national climate and IPCC assessments. *Climatic Change*, **52**, 1-11.
- Pielke, R.A., Sr., 2001: Influence of the spatial distribution of vegetation and soils on the prediction of cumulus convective rainfall. *Review Geophys.*, **39**, 151-177.
- Pielke, R.A., Sr., 2001: *Mesoscale meteorological modeling*, 2<sup>nd</sup> Edition. Academic Press, San Diego, 676 pp.
- Pielke, R.A., Sr., Avissar R., Raupach M., Dolman A.J., Zeng X.B., and Denning A.S., 1998: Interactions between the atmosphere and terrestrial ecosystems: influence on weather and climate. *Global Change Biol.* **4**, 461-475.
- Pielke, R.A., Sr., G. Marland, R.A. Betts, T.N. Chase, J.L. Eastman, J.O. Niles, D.S. Niyogi, and S.W. Running, 2002: The influence of land-use change and landscape dynamics on the climate system: relevance to climate-change policy beyond the radiative effect of greenhouse gases. *Phil. Trans. R. Meteorol. Soc. Lond. A.*, 1705-1719.
- Pielke, R.A., Sr., G.E. Liston, W.L. Chapman, and D.A. Robinson, 2004: Actual and insolation-weighted Northern Hemisphere snow cover and sea ice -- 1974-2002. *Climate Dyn.*, in press.
- Pielke, R.A., Sr., Schimel D.S., Lee T.J., Kittel T.G.K. and Zeng X., 1993: Atmosphere-terrestrial ecosystems interactions: Implications for coupled modeling. *Ecol. Model.*, **67**, 5-18.
- Piexoto J.P. and Oort A.H., 1992: *Physics of Climate*. American Institute of Physics. New York. 520 pp.
- Pimentel, D., Harvey, C., Resosudarmo, P., Sinclair, K., Kurz, D., McNair, M., Crist, S., Shipritz, L., Fitton, L., Saffouri, R. and Blair, R., 1995: Environmental and economic cost of soil erosion and conservation benefit. *Science*, **267**, 1117-1123.
- Pinker, R. T. et al. 2003: Surface radiation budgets in support of the GEWEX Continental-Scale International Project (GCIP) and the GEWEX Americas Prediction Project (GAPP), including the North American Land Data Assimilation System (NLDAS) project. *J. Geophys. Res.*, **108**, NO. D22, 8844, doi:10.1029/2002JD003301.
- Pinty, B., J.-L. Widlowski, N. Gobron, M. M. Verstraete and D. J. Diner, 2002: Uniqueness of Multiangular Measurements, Part 1: An Indicator of Subpixel Surface Heterogeneity from MISR. *IEEE Transactions on Geoscience and Remote Sensing*, MISR Special Issue, **40**, 1560-1573.
- Pirazzoli, P.A., 1996: *Sea-Level Changes: The Last 20 000 Years*. Wiley, Chichester, 212 pp.
- Piver, W. T., M. Ando, et al., 1999: Temperature and air pollution as risk factors for heat stroke in Tokyo, July and August 1980-1995. *Environmental Health Perspectives* **107**(11): 911-916.
- Pivovarova, Z.I., 1977: *Radiation characteristics of the USSR climate*. Gidrometeoizdat. 355 pp.
- Pleshikov, F.I. and V.A. Ryzhkova, 1991: Control of the dynamics of forest recovering processes at glades. *Aerospace Monitoring of Forests*, Moscow, 163-180.
- Pleshikov, F.I. and V.P. Cherkashin, 1996: GIS-technologies for forest monitoring and forestry management. Proceedings of International Conference "Intercarto-2: GIS for studying and mapping of nature", Irkutsk, 26-29 June, 1996, 174-177 (in Russian).
- Pleshikov, F.I., E.N. Kalashnikov, V.A. Ryzhkova, V.P. Cherkashin and V.Ja. Kaplunov, 1996a: Studying and mapping of current state of forests in middle Siberia using geoinformaton technologies. In: Intercarto-2: GIS for Studying and Mapping of Environment. Irkutsk, 172-174 (in Russian).
- Pleshikov, F.I., V.A. Ryzhkova and V.Ja. Kaplunov, 1991: Assessments of forest growth conditions. *Aerospace Monitoring of Forests*, Moscow, 95-110 (in Russian).
- Pleshikov, F.I., V.P. Cherkashin, V.A. Ryzhkova and V.Ja. Kaplunov, 1996b: Geoinformation technologies in solving problems of forest monitoring and forest management. In: Intercarto-2: GIS for Studying and Mapping of Environment. Irkutsk, 174-177 (in Russian).
- Polikarpov N.P., Tchebakova N.M., Nazimova D.I., 1986: *Climate and mountain forest of Southern Siberia*. Novosibirsk, Verlag "Nauka", 225 pp. (in Russian).
- Polonio, D., and M.R. Soler, 2000: Surface fluxes estimation over agricultural areas. Comparison of methods and the effects of land surface inhomogeneity, *Theor. Appl. Climat.*, **67**, 65-79.
- Polozhii, A.V., and Krapivkina E.D., 1985: Pelics of the tertiary deciduous forests in Siberian flora. Tomsk. Tomsk State Univ. Publishers, 158 pp.
- Polshvedkin, P.V., V.I. Stepanemko, V.N. Prokhorov, E.P. Gerasimov and O.I. Popova, 1998: Preparation to acquisition and use of satellite information in forest management of the Republic Komi by means of GIS-technologies. In: V.I. Sukhikh (ed.), *Air and Satellite Methods and Geographical Information Systems in Forestry and Forest Management*, Materials of the 2nd All-Russia Meeting, Moscow, 18-19 November 1998. RAS and Federal Forest Service, Moscow, 9-82 (in Russian).
- Polyakov, I. V., Bekryaev, R.V., Alekseev, G.V., Bhatt, U.S., Colony, R.L., Johnson, M.A., Maskhshtas, A.P., Walsh, D., 2003: Variability and Trends of Air Temperature and

- Pressure in the Maritime Arctic, 1875–2000. *J. Climate*, 16, 2067–2077
- Ponomarev, E.I. and A.I. Sukhinin, 1998: Information from NOAA satellite for assessment of forest fire risk by weather conditions. In: V.I. Sukhikh (ed.), *Air and Satellite Methods and Geographical Information Systems in Forestry and Forest Management*, Materials of the 2nd All-Russia Meeting, Moscow, 18–19 November 1998. RAS and Federal Forest Service, Moscow, 194–196 (in Russian).
- Popova E.P., 1983: *Nitrogen in forest soils*. Novosibirsk, Nauka, Siberian branch, 137 pp. (in Russian).
- Popova V.V., Shmakina A.B., 2003: Influence of the North Atlantic Oscillation on multiyear hydrological and thermal regime of Northern Eurasia. I. Statistical analysis of observational data. *Russian Meteorology and Hydrology*, 2003, No.5, 62-74.
- Potter C, J Bubier, P Crill, P Lafleur, 2001: Ecosystem modeling of methane and carbon dioxide fluxes for boreal forest sites. *Can. J. Forest Res.*, 31, 308-223.
- Pozdnyakov, L.K., 1963: *Hydroclimatic resources of larch forests of Central Yakutiya*. "Nauka", Moscow, 146 pp. (in Russian).
- Pozdnyakov, L.K., 1986: *Forest Science of the Permafrost Zone*. Novosibirsk, "Nauka", 192 pp. (in Russian).
- Prather M, D Ehhalt (lead authors) et al., 2001: Atmospheric chemistry and greenhouse gases. In *Climate Change 2001: The Scientific Basis*. IPCC Third Assessment Report, Cambridge University Press.
- Prentice et al, 2000: Chapter 3, The Carbon Cycle and Atmospheric Carbon Dioxide. In: Houghton, J.T., et al. (eds), *Climate Change 2001: The Scientific Basis*. IPCC Third Assessment Report, Cambridge University Press. 183-238.
- Prentice I.C., Cramer W., Harrison S.P., Leaman R., Monserud R.A. and A.M.Solomon, 1992: A global biome model based on plant physiology and dominance, soil properties and climate. *J. Biogeography*, 19, 117-134.
- Prentice K.C. and Fung I., 1990: The sensitivity of terrestrial carbon storage to climate change. *Nature*, 346, 48-50.
- Price, D.T., D.H. Halliwell, M.J. Apps, W.A. Kurz, and S.R. Curry, 1997: Comprehensive assessment of carbon stocks and fluxes in a boreal forest management unit. *Canadian Journal of Forest Research*, 27, 2005-2016.
- Price, D.T., R.M. Mair, W.A. Kurz, and M.J. Apps, 1996: Effects of forest management, harvesting, and wood processing on ecosystem carbon dynamics: A boreal case study. Pages 279-292, In M.J. Apps and D.T. Price, (eds.) *Forest ecosystems, forest management, and the global carbon cycle*. NATO ASI Series 1, Volume 40. Global environmental change. Springer-Verlag, Heidelberg, Germany.
- Project on Management of Environment of the Russian Federation, 1997: World Bank Loan 3806-RU. Program of extraordinary measures on biological struggle with pests in forests of the Krasnoyarsk krai. Final Report, Moscow, 144 pp. (in Russian).
- Project on Studies of Characteristics and Sustainability of Boreal Forests, 1998: Report on the 1st and 2nd Stages. Joint Russian-American Commission on Economic and Technological Cooperation, Moscow, 13 pp. (in Russian).
- Pruett, L., K. Kreutz, M. Wadleigh, V. Aizen, 2004: Assessment of sulfate sources in high-elevation Asian precipitation using stable sulfur isotopes. *Environmental Science and Technology*, ES035156O, August 9, 2004.
- Puzachenko Y.G., Skulkin V.S., 1981: *Vegetation structure of the forest zone of the USSR*. Moscow. Nauka, 276 pp. (in Russian)
- Puzachenko Yu..G., 1985: A climatic cause of the southern border of tundra. In: *Communities of Far North and Man*. Moscow, Nauka, 22-56 (in Russian).
- Qin Z. and Karnieli A., 1999: Progress in the remote sensing of land surface temperature and ground emissivity using NOAA-AVHRR data. *Int. J. Remote Sensing*, 20, 2367-2393.
- Quay P.D., King S.L., Stutsman J., Wilbur D.O., Steele L.P., Fung I. Gammon R.H., Brown T.A., Farwell G.W., Grootes P.M. and Schmidt F.H., 1991: Carbon Isotopic Composition of Atmospheric CH<sub>4</sub>: Fossil and Biomass Burning Source Strengths. *Global Biogeochemical Cycles*, 5, 25-47.
- Rachold, V., Alabyan, A., Hubberten, H.W. Korotaev, V.N. and A.A. Zaitsev, 1996: Sediment transport to the Laptev Sea - hydrology and geochemistry of the Lena River. *Polar Res.*, 15 (2), 183-196.
- Raich J.W. and Schlesinger W.H., 1992: The global carbon dioxide flux in soil respiration and its relationship to vegetation and climate. *Tellus*, 44B, 81-99.
- Ramankutty, N., and J.A. Foley, 1999: Estimating historical changes in global land cover: Croplands from 1700 to 1992. *Global Biogeochemical Cycles*, 13, 997-1027.
- Ramanswamy, V., O. Boucher, J. Haigh, D. Hauglustaine, J. Haywood, G. Myhre, T. Nakajima, G.Y. Shi, and S. Solomon, 2001: Radiative forcing of climate change. Pages 349 – 416 in *Climate Change 2001 - The Scientific Basis: Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*, edited by J. T. Houghton, Y. Ding, D. J. Griggs, M. Noguer, P. J. Van Der Linden, and D. Xiuasou, Cambridge University Press, Cambridge.
- Ramonet M., Ciasis P., Nepomniachii I. et al., 2002 : Three years of aircraft-based trace gas measurements over the Fyodorovskoe southern taiga forest, 300 km north-west of Moscow. *Tellus*, 54B, No.5, 714-734.
- Randall, D., Khairoutdinov, M., Arakawa, A., and Grabowski, W., 2003: Breaking the Cloud Parameterization Deadlock. *Bull. Amer. Meteorol. Soc.*, 84, 1547–1564.
- Randall, D., Krueger, S., Bretherton, C., Curry, J., Duynkerke, P., Moncrieff, M., Ryan, B., Starr, D., Miller, M., Rossow, W., Tselioudis, G., Wielicki, B., 2003: Confronting models with data: The GEWEX Cloud Systems Study. *Bull. Amer. Meteorol. Soc.*, 84, 455-469.
- Randel, D.L., Greenwald, T. J., Vonder Haar, T. H., Stephens, G. L., Ringerud, M. A., Combs, C. L., 1996: A New Global Water Vapor Dataset, *Bull. Amer. Meteorol. Soc.*, 77, 1233-1254.
- Randerson, J. T., C. B. Field, I. Y. Fung, and P. P. Tans, 1999: Increases in early season net ecosystem uptake explain changes in the seasonal cycle of atmospheric CO<sub>2</sub> at high northern latitudes. *Geophys. Res. Lett.*, 26, 2765-2768.

- Rango, A., 1992: Worldwide testing of the snowmelt runoff model with applications for predicting the effects of climate change. *Nordic Hydrology*, 23, 155-172.
- Ranson, K.J. and G. Sun, 1997: An evaluation of AIRSAR and SIR-CX-SAR images for mapping Northern forest attributes in Maine, USA. *Remote Sens. Env.*, No. 59, 203-222.
- Raschke, E., U. Karstens, R. Nolte-Holube, R. Brandt, H.-J. Isemer, D. Lohmann, M. Lohmeyer, B. Rockel and R. Stuhlmann, 1998: The Baltic Sea Experiment BALTEX: a brief overview and some selected results of the authors. *Surveys Geoph.*, 19, 1-22.
- Rauner, Yu.L., 1972: *Heat Balance of the Plant Cover*. Gidrometeoizdat, Leningrad, 210 pp. (in Russian).
- Rauner, Yu.L., 1976: Variations of droughts over the wheat regions of the USSR. *Izvestia Acad. Sci. of the USSR, Ser. Geograph.*, No. 6, 37-54 (in Russian).
- Raupach M.R., 1998: Influence of local feedbacks on land-air exchange of energy and carbon. *Global Change Biol.*, 4, 477-494.
- Raupach M.R. and Finnigan J.J., 1986: Single-layer models of evaporation from plant canopy are incorrect but useful, whereas multi-layer models are correct but useless: Discuss. *Aust. J. Plant Physiol.* 15, 705-716.
- Raupach M.R., 1991: Vegetation-atmosphere interaction in homogeneous and heterogeneous terrain: Some implications of mixed layer dynamics. *Vegetation*, 91, 105-120.
- Rawlins, M.A., Lammers, R.B., Frolking, S., Fekete, B., Vorosmarty, C.J., 2004: Simulating Pan-Arctic Runoff with a Macro-Scale Terrestrial Water Balance Model. *Hydrological Processes*, in press.
- Raymond, P.A., and Cole, J.J., 2003: Increase in the Export of Alkalinity from North America's Largest River. *Science*, 301, 88-91.
- Rayner, P.J., I.G. Enting, R.J. Francey, and R.L. Langenfelds, 1999: Reconstructing the recent carbon cycle from atmospheric CO<sub>2</sub>, δ<sup>13</sup>C, and O<sub>2</sub>/N<sub>2</sub> observations. *Tellus*, 51B, 213-232.
- Razuvaev et al. (2003) – Personal Communication.
- Razuvaev, V.N., Apasova, E.G. and Martuganov, R.A. 1993. 'Daily Temperature and Precipitation Data for 223 USSR Stations', ORNL/CDIAC-56, NDP-040, ESD Publ. No. 4194, Carbon Dioxide Information Data Center, Oak Ridge National Lab., Oak Ridge, Tennessee. 47 pp.
- Razuvaev, V.N., Apasova, E.G. and Martuganov, R.A., 1995: Six- and Three- Hourly Meteorological Observation from 223 USSR Stations. ORNL/CDIAC-66, NDP-048, Carbon Dioxide Information Analysis Center, Oak Ridge National Lab., Oak Ridge, Tenn., 68 pp.
- Razuvaev, V.N., E.G. Apasova, O.N. Bulygina, R.A. Martuganov, 1996: Assessment of natural variability of extreme temperatures over the former Soviet Union territory during the second half of 20<sup>th</sup> century. *Trans. RIHMI-WDC*, 162, 3-13.
- Reeburgh, W. S., and S. C. Whalen, 1992: High latitude ecosystems as CH<sub>4</sub> sources. *Ecol. Bull.*, 42, 62-70.
- Rees, W.G. and M. Williams, 1997: *Satellite remote sensing of the impact of industrial pollution on tundra biodiversity*. In: *Disturbance and recovery in Arctic lands*. Kluwer Academic Publisher, 253-279.
- Reeves, M. C., J. C. Winslow, and S. W. Running, 2001: Mapping weekly rangeland vegetation productivity using MODIS algorithms. *J. Range Management*, 54, A90-A105.
- Regina, O., 1998: Detection of pollution-induced forest decline in the Kola peninsula using remote sensing and mathematical modelling. Swedish University of Agricultural Science, Report 9, 81 pp.
- Regularities of Oceanographical and Biological Processes in the Sea of Azov*, 2000: Apatity: Publisher of Kolsky Research Center of Russian Academy of Sciences, 434 pp. (in Russian).
- Reilly, J., R. Prinn, J. Harnisch, J. Fitzmaurice, H. Jacoby, D. Kicklighter, J. Melillo, P. Stone, A. Sokolov, C. Wang, 1999: Multi-gas assessment of the Kyoto Protocol. *Nature*, 401, 549-555.
- Reilly, J., Tubiello, F.N., McCarl, B., and Melillo, J., 2001: Climate change and agriculture in the United States. In: Melillo, J., Janetos, G., and Karl, T., (Eds), *Climate Change Impacts on the United States: Foundation, USGCRP*. Cambridge University Press, Cambridge, UK. 612 pp.
- Reimnitz, E., Graves, S.M., and Barnes, P.W., 1988: Beaufort Sea coastal erosion, sediment flux, shoreline evolution, and the erosional shelf profile. *U.S. Geological Survey*. To accompany Map I-118z-G, 22 pp.
- Remizova S.S., 1984: Salt balance of the Sea of Azov. *Water Resources*, 3, 9-43 (in Russian).
- Remote Identification of Taiga Landscape Structure, 1981: Novosibirsk, 103 pp. (in Russian).
- Remote Investigations of Landscapes, 1987: Novosibirsk, 199 pp. (in Russian).
- Renn O., Klinker A., Busch G., Beese F., Lammel G., 2001: A new tool for characterizing and managing risk. In: *Global Biogeochemical Cycles in the climate system*. (Eds. E.-D. Schulze, M. Haimann, S. Harrison, S. Holland, J. Lloyd, C. Prentice, and D. Schimel). Academic Press, San Diego 303-316.
- Resources of surface water*. 1985 Reference Book (in Russian).
- Reynolds, R.W., N.A. Rayner, T.M. Smith, D.C. Stokes, and W. Wang, 2002: An Improved In Situ and Satellite SST Analysis for Climate. *J. Climate*, 15, 1609-1625
- Rial, J., Pielke R.A. Sr., M. Beniston, M. Claussen, J. Canadell, P. Cox, H. Held, N. de Noblet-Ducoudre, R. Prinn, J. Reynolds, and J.D. Salas, 2004: Nonlinearities, feedbacks and critical thresholds within the earth's climate system. *Climatic Change*, in press.
- Richman, M.B. 1986: Rotation of principal components. *J. Climatology*, 6, 293 - 335.
- Rikhter G.D., 1946: A role of a snow cover in physico-geographical processes. *Transactions of the Institute of Geography of the Academy of Sciences of the USSR*, 40, 248 pp. (In Russian).
- Ritchie, J.C., Walling, D.E. and Peters, J., 2003a: Application of geographic information systems and remote sensing for quantifying patterns of erosion and water quality: Introduction. *Hydrological Processes*, 17, 885-886.
- Ritchie, J.C., Zimba, P.V. and Everitt, J.H., 2003b: Remote sensing techniques to assess water quality. *Photogrammetric Engineering and Remote Sensing*, 69, 695-704.
- Roads, J. et al., 2003: GCIP Water and Energy Budget Synthesis (WEBS). *J. Geophys. Res.* 10.1029/2002JD002583, 2003.

- Roads, J., et al., 2002: GCIP Water and Energy Budget Synthesis. CD-ROM. ( Available from International GEWEX Project Office)
- Robinson, D. A., Dewey, K. F., Heim, R.R.Jr., 1993: Global Snow Cover Monitoring: An Update. *Bull. Amer.Meteorol. Soc.*, 74, 1689–1696.
- Robinson, D., and G. Kukla, 1985: Maximum surface albedo of seasonally snow-covered lands in the Northern Hemisphere. *J. Climate and Appl. Meteorol.*, 24, 402-411.
- Robinson, S., E.J. Milner-Gulland, I. Alimaev, 2003: Rangeland degradation in Kazakhstan during the Soviet era: re-examining the evidence. *J. Arid. Environ.*, 53, 419-439.
- Robock, A., and Co-Authors, 2003: Evaluation of the North American Land Data Assimilation (NLDAS) over the Southern Great Plains during the Warm Season, *J. Geophys. Res., Atmospheres*, (in press).
- Robock, A., Vinnikov, K. Y., Srinivasan, G.,Entin, J. K., Hollinger, S. E., Speranskaya, N. A., Liu, S., Namkhai, A., 2000: The Global Soil Moisture Data Bank. *Bul. Amer. Meteorol. Soc.* 81, 1281–1300.
- Robock, A., M. Mu, K. Vinnikov, I. V. Trofimova, and T. I. Adamenko (2005), Forty-five years of observed soil moisture in the Ukraine: No summer desiccation (yet), *Geophys. Res. Lett.*, 32, L03401, doi:10.1029/2004GL021914
- Rode A.A., 1964: Fundamentals of studies of soil water. v.1. USSR Academy of Sciences Publishers. Leningrad. Gidrometeoizdat, 664 pp.
- Rodell, M., P. R. Houser, U. Jambor, J. Gottschalck, C. J. Meng, K. Arsenault, B. Cosgrove, J. Radakovich, M. Bosilovich, J. K. Entin, J. P. Walker, and K. Mitchell, 2003: The Global Land Data Assimilation System (GLDAS), *Bull. Amer. Meteorol. Soc.* 85, 381-394.
- Rodenbeck, C.R., S. Houweling, M. Gloor, and M. Heimann, 2003: Time-dependent atmospheric CO<sub>2</sub> inversions based on interannually varying tracer transport. *Tellus*. In press.
- Rodrigues-Iturbe, I., P. D'Odorico, A. Porporato, and L. Ridolfi, 1999: On the spatial and temporal links between vegetation, climate, and soil moisture. *Water Resour. Res.*, 35, 3709-3722.
- Romankevich, E.A., Lisitsin, A.P. and Vinogradov, M.E., (eds.), 2003: *The Pechora Sea: Integrated Research*. More Publ., Moscow, 488 pp. (in Russian).
- Romanovsky N.N., Hubberten H.-W., Gavrillov A.V., Tumskey V.E., Topenko G.S., Grigoriev M.N., and Ch.Siegert, 2000: Thermokarst and Land-Ocean Interactions, Laptev Sea Region, Russia, *Permafrost and Periglacial Processes*, 11, 137-152.
- Romanovsky V.E. and Osterkamp T.E., 1997: Thawing of the active layer on the coastal plain of the Alaskan Arctic. *Permafrost and Periglacial Processes*, 8, 1-22.
- Romanovsky, V. E., and T. E. Osterkamp, 2000: Effects of unfrozen water on heat and mass transport processes in the active layer and permafrost, *Permafrost and Periglacial Processes*, 11, 219-239.
- Romanovsky, V. E., and T. E. Osterkamp, 2001: Permafrost: Changes and Impacts. In: R. Paepe and V. Melnikov (eds.), *Permafrost Response on Economic Development, Environmental Security and Natural Resources*, Kluwer Academic Publishers, 297-315.
- Romanovsky, V. E., Sergueev, D. O. and T.E. Osterkamp, 2003: Temporal variations in the active layer and near-surface permafrost temperatures at the long-term observatories in Northern Alaska. In: Proceedings of the VII International Permafrost Conference, Switzerland, July 21-25, 2003, 989-994.
- Romanovsky, V.E., T.E. Osterkamp, and N. Duxbury, 1997. An evaluation of three numerical models used in simulations of the active layer and permafrost temperature regimes, *Cold Regions Science and Technology*, 26, 195-203.
- Romanovsky, V., M. Burgess, S. Smith, K. Yoshikawa, and J. Brown, 2002: Permafrost Temperature Records: Indicators of Climate Change, *EOS, AGU Transactions*, 83, No. 50, 589-594.
- Ropelewski, C.F. and Halpert, M.S., 1996: Quantifying southern oscillation – precipitation relationships. *J. Climate*, 9, 1043-1059.
- Rosema J., Lambers H., S.C. van de Geljn, M.L. (Eds.) 1993: *CO<sub>2</sub> and biosphere*. Cambridge. Boston: Kluwer Academic Publishers. 484 pp.
- Rosenzweig, C. and Parry, M. L, 1994: Potential impact of climate change world food supply. *Nature*, 367, 133-138.
- Rosenzweig, C., and Abramopoulos, F., 1997: Land-surface development for GISS-GCM, *J. Climate*, 10, 2040-2054.
- Rosenzweig, C., Ritchie, J.T., Jones, J.W., Tsuji, G.Y., Hildebrand, P., 1995: Climate Change and Agriculture: Analysis of Potential International Impacts. *ASA Spec. Publ. No. 59*, ASA, Madison, WI, 382 pp.
- Rosenzweig C and Hillel D., 1998: *Climate Change and the Global Harvest: Potential Impacts of the Greenhouse Effect on Agriculture*. Oxford University Press. New York, N.Y., 324 pp.
- Rosenzweig C, Iglesias A, Yang XB, Epstein PR, Chivian E. 2001: Climate change and extreme weather events: implications for food production, plant diseases, and pests. *Glob. Change Hum. Health*, 2, 90-104.
- Rosenzweig, C., Tubiello, F.N., Goldberg, R.A., Jones, J.W., Bloomfield, J.A, 2002: Effects of excess precipitation on U.S. comproduction. *Glob. Environ. Change* 12, 197-202
- Ross J.K., 1975: *Radiation regime and architectonics of plant cover*. Leningrad, Hydrometeoizdat, 342 pp. (in Russian).
- Ross, R.J., and W.P. Elliott, 2001: Radiosonde-based Northern Hemisphere tropospheric water vapor trends. *J. Climate*, 14, 1602-1612.
- Rossov, W. B, and Y. -C. Zhang, 1995: Calculation of surface and top of the atmosphere radiative fluxes from physical quantities based on ISCCP data sets, 2. Validation and first results, *J. Geophys. Res.*, 97, 1167-1197.
- Rossov, W.B. and R. A. Schiffer, 1999: Advances in understanding clouds from ISCCP. . *Bull. Amer. Meteorol. Soc.*, 80, 2261-2287.
- Rötzer, T., Wittenzeller, M., Haeckel, H., and Nekovar, J., 2000: Phenology in Central Europe – Differences and Trends of Spring Phenophases in Urban and Rural Areas. *International Journal of Biometeorology*, 44, 60–66.
- Roujean, J.-L., C. B. Schaaf, and W. Lucht, 2004: Fundamentals of bi-directional reflectance and BRDF modeling. In: *Reflective Properties of Vegetation and Soil*, editors: M. von Schoenmark, B. Geiger, H.P.



- Roeser, Wissenschaft und Technik Verlag, Berlin, Germany, 352 pp., 105-120.
- Roulet, N.T., 2000: Peatlands, carbon storage, greenhouse gases, and the Kyoto Protocol: Prospects and significance for Canada. *Wetlands* 20, 605-615.
- Rowe, J.S., 1983: Concepts of fire effects on plant individuals and species. In *The Role of Fire in Northern Circumpolar Ecosystems*, (eds. R. W. Wein and MacLean, D.A.) 135-154 (J. Wiley, New York, 1983).
- Roy P.S., H-J. Stibig and S. Agrawal (eds), 2002: Forest Cover in Asia. in *Asian Forest Cover Assessment & Conservation Issues*, Dehra Dun, India, 12-14 February 2002, ISBN 81-901418-3-X, 369P, (Shiva offset press: Dehra Dun).
- Rozhdestvensky, A.V., A.V. Ezhov, and A.V. Sakharyuk, 1990: *Estimates of accuracy of hydrological calculations*. Gidrometeoizdat, Leningrad, 276 pp. (in Russian).
- Rudnev N.I., 1977: *Radiation balance of the forest*. Moscow, Nauka. 126 pp.
- Running, S. W., C. O. Justice, V. Salomonson, D. Hall, J. Barker, Y. J. Kaufmann, A. H. Strahler, A. R. Huete, J. P. Muller, V. Vanderbilt, Z. M. Wan, P. Teillet and D. Carnegie, 1994: Terrestrial remote sensing science and algorithms planned for EOS/MODIS. *Int. J. Remote Sens.*, 15, 3587-3620.
- Running, S. W., D. D. Baldocchi, D. P. Turner, S. T. Gower, P. S. Bakwin, and K. A. Hibbard, 1999: A global terrestrial monitoring network integrating tower fluxes, flask sampling, ecosystem modeling and EOS satellite data. *Remote Sens. Environ.* 70(1), 108-127.
- Running, S. W., P. E. Thornton, R. Nemani, and J. M. Glassy, 2000: Global terrestrial gross and net primary productivity from the earth observing system, pp. 44-57. In: *Methods in Ecosystem Science*, O.Sala, R. Jackson, and H.Mooney Eds. Springer-Verlag New York.
- Running, S.W. and R. Nemani, 1988: Relating seasonal patterns of the AVHRR vegetation index to simulated photosynthesis and transpiration of forests in different climates. *Remote Sensing of the Environment*. 24, 347-367.
- Ryan M.G., Lavigne M.B., and Gower S.T., 1997: Annual carbon cost of autotrophic respiration in boreal forest ecosystems in relation to species and climate. *J. Geophys. Res.*, 102, 28871- 28883.
- Ryapolov, V.Ya., 1985: Methodology for construction of maps on forests damaged by insects-pests. *Geography and Natural Resources*, No. 2, 97-107, (in Russian).
- Saarnio S, Alm J, Silvola J, Lohila A, Nykanen H, Martikainen P.J., 1997: Seasonal variation in CH<sub>4</sub> emissions and production and oxidation potentials at microsites in an oligotrophic pine fen. *Oecologia*, 110, 414-422.
- Sakai, R.K., Fitzjarrald, D.R., Moore, K. E., 2001: Importance of Low-Frequency Contributions to Eddy Fluxes Observed over Rough Surfaces, *Quart. J., Roy. Meteorol. Soc.* 118, 191-225.
- Samoilovich, G.G., 1964: Implementation of aviation and air photo shooting in forestry. Moscow, 484 pp. (in Russian).
- Santer B.D., Taylor K.E., Wigley T.M.L., Penner J.E., Jones P.D. and Cubasch U., 1995: towards the detection and attribution of an anthropogenic effect on climate. *Climate Dynamics*, 12, 77-100.
- Santruckova H., Bird M.I., Frouz J., Sustr V., Tajovsky K., 2000: Natural abundance of <sup>13</sup>C in leaf litter as related to feeding activity of soil invertebrates and microbial mineralisation. *Soil Biology and Biochemistry*, 32, 1793-1797.
- Sarmiento, J.L., and Wofsey, S.C., 1999: A US Carbon Cycle Science Plan. Report, Carbon and Climate WG, 69 pp.
- Sato, N., Ishii, Y., Kodama, Y., Nomura, M., Ishikawa, N. and Kobayashi, D., 2001: Characteristics of summer water balance in eastern Siberian tundra watershed, *Polar Meteor. Glacio.*, 15, 91-106.
- Savelieva N.I., Semiletov I.P., Vasilevskaya L.N., and S.P.Pugach, 2000: A climate shift in seasonal values of meteorological and hydrological parameters for Northeastern Asia, *Progress in Oceanography*, 47(2-4), 279-297.
- Savina L.N., 1986: Boreal Forest of Northern Eurasia in the Holocene. Novosibirsk, Verlag "Nauka", 190 pp. (in Russian).
- Savinetsky, A.B., 2000: The history of interrelation between man and wild animals in the mountains of North Osetia. In: *Natural resources of North Osetia-Alania. Animals*. Vladikavkaz, Proekt-press. 24-32.
- Savitsky, P.N., 1927: Geographical peculiarities of Russia. Praga, Eurazian Publ. House, 180 pp. (in Russian).
- Savinov, D.D., 1976: *Soil hydrothermic regime within permafrost zone*. Siberian Branch of the USSR Academy of Sciences, Novosibirsk, 254 pp. (in Russian)
- Sazonova, T. S. and V. E. Romanovsky, 2003: A Model for Regional-Scale Estimation of Temporal and Spatial Variability of the Active Layer Thickness and Mean Annual Ground Temperatures, *Permafrost and Periglacial Processes*, 14(2), 125-139.
- Sazonova, T. S., Romanovsky, V. E., Walsh, J. E., and D. O. Sergueev, 2004: Permafrost dynamics in 20<sup>th</sup> and 21<sup>st</sup> centuries along the East-Siberian Transect, *J. Geophys. Res. – Atmospheres*, in press.
- Schaer, C., Frei, C., Lüthi, C., and Davies, H.C., 1996: Surrogate climate change scenarios for regional climate models. *Geophys. Res. Lett.*, 23, 669-672.
- Schell D.M., 1983: Carbon-13 and Carbon-14 abundances in Alaskan Aquatic organisms: delayed production from peat in Arctic food web, *Science*, 219, 1068-1071.
- Schetinnikov, A. S., 1998: *The morphology and regime of Pamir-Alay glaciers*. SANIGMI, Tashkent, 220 pp.
- Schimel D.S., House J.I., Hibbard K.A., Bousquet P., Ciais P., Peylin P., Braswell B.H., Apps M J., Baker D., Bondeau A., Canadell J., Churkina G., Cramer W., Denning A.S., Field C.B., Friedlingstein P., Goodale C., Heimann M., Houghton R.A., Melillo J.M., Moore III B., Murdiyarso D., Noble I., Pacala S.W., Prentice I.C., Raupach M.R., Rayner P.J., Scholes R.J., Steffen W.L. and Wirth C., 2001: Recent patterns and mechanisms of carbon exchange by terrestrial ecosystems. *Nature*, 414, 169-172.
- Schimel J.P. and Gulledege J., 1998: Microbial community structure and global trace gases. *Global Change Biol*, 4, 745-768.
- Schimel J.P. and Clein J.S., 1999: Microbial responses to freeze-thaw cycles in tundra and taiga soils. *Soil Biol. Biochem.* 28, 1061-1066.
- Schimel, D., J. Melillo, H. Tian, A.D. McGuire, D. Kicklighter, T. Kittel, N. Rosenbloom, S. Running, P. Thornton, D. Ojima, W. Parton, R. Kelly, M. Sykes, R. Neilson, B. Rizzo, and L. Pitelka, 2000: Carbon storage by the natural and

- agricultural ecosystems of the US (1980-1993). *Science*, 287, 2004-2006.
- Schimel, D.S., 1995: Terrestrial ecosystems and the carbon cycle. *Global Change Biology*, 1, 77-91.
- Schindler D.W. and Bayley S.E., 1993: The biosphere as an increasing sink for atmosphere carbon: estimates from increased nitrogen deposition. *Global Biogeochem. Cycles*, 7, 717- 733.
- Schlesinger M.E., 1988: Quantitative analysis of feedbacks in climate model simulation of CO<sub>2</sub>-induced warming. In: *Physically-based modeling and simulation of climate and climate change, part 2* (Ed.M.E. Schlesinger), NATO ASI series, 653-735.
- Schlesinger W.H. ,1997: *Biogeochemistry – Analysis of Global Change*. Academic Press, San Diego. 543 pp.
- Schlosser, C. A., A. G. Slater, A. Robock, A. J. Pitman, K. Y. Vinnikov, A. Henderson-Sellers, N. A. Speranskaya, K. Mitchell, and the PILPS 2(d) contributors, 2000: Simulations of a boreal grassland hydrology at Valdai, Russia: PILPS Phase 2(d). *Mon. Weather Rev.*, 128, 301-321.
- Schmid, H.P., 1994: Source areas for scalars and scalar fluxes. *Bound.-Layer Meteorol.*, 67, 293-318.
- Schmullius, C. and A. Rosenquist, 1997: Closing the gap-a Siberian boreal forest map with ERS-1/2 and JERS-1. Proceedings of 3rd ERS Symposium on Space at the Service of our Environment, Florence, Italy, 17–21 March 1997 (ESA SP-414, 3 Vols., May 1997), 1885–1990.
- Schmullius, C., 1997: Monitoring Siberian Forests and Agriculture with the ERS-1 Windscatterometer, IEEE Transactions on Geoscience and Remote Sensing, 35, 1363-1366.
- Schmullius, C., Baker J., Balzter H., Davidson M., Eriksson L., Gaveau D., Gluck M., Holz A., Luckman A., Marschalk U., McCallum I., Nilsson S., Öskog A., Quegan S., Rauste Y., Roth A., Shvidenko A., Tansey K., Le Toan T., Vietmeier J., Wagner W., Wegmuller U., Wiesmann A., Yu J. J.,2001: SIBERIA - SAR Imaging for Boreal Ecology and Radar Interferometry Applications, Final Report, 4th Framework Programme of the European Commission, Remote Sensing Unit, Friedrich-Schiller-University Jena, June 2001.
- Scholes, R.J., E.D. Schulze, L.F. Pitelka, and D.O. Hall, 1999: Biogeochemistry of terrestrial ecosystems. In *The Terrestrial Biosphere and Global Change: Implications for Natural and Managed Ecosystems*. B. Walker, W. Steffen, J. Canadell, and J. Ingram (eds.), Cambridge University Press, Cambridge, 271-303.
- Schonwiese C.D.and Rapp J., 1997: *Climate trends atlas of Europe based on observation 1891 -1990*. Kluwer Academic Publishers, Dordrecht, Boston, London, 228 pp.
- Schotanus, P., Nieuwstadt, F.T.M. and H.A.R. de Bruin, 1983: Temperature measurement with a sonic anemometer and its application to heat and moisture fluxes, *Bound.-Layer Meteorol.*, 26, 81-93.
- Schultz, M.G., D.J. Jacob, Y. Wang, J.A. Logan, E.L. Atlas, D.R. Blake, N.J. Blake, J.D. Bradshaw, E.V. Browell, M.A. Fenn, F. Flocke, G.L. Gregory, B.G. Heikes, G.W. Sachse, S.T. Sandholm, G.L. Gregory, B.G. Heikes, G.W. Sachse, S.T. Sandholm, R.E. Shetter, H.B. Singh, and R.W. Talbot, 1999: On the origin of tropospheric ozone and NO<sub>x</sub> over the tropical South Pacific. *J. Geophys. Res.*, 104 (5), 5829-5843.
- Schultze, E.D., M. Heimann, S. Harrison, E. Holland, J. Lloyd, I.C. Prentice, and D. Schimel (Eds). 2001: *Global Geochemical Cycles in the Climate System*. Academic Press, San Diego - London, 350 pp.
- Schulze E.-D., 1989: Air pollution and forest decline in a spruce (*Picea abies*) forests. *Science*, 244, 776-783.
- Schulze E.-D., Högberg P., van Oene H., Persson T., Harrison A.F., Read D., Kjoeller and Matteucci G., 2000: Interactions between the carbon and nitrogen cycle and the role of biodiversity: A synopsis of a study along a north-south transect through Europe. In: *Carbon and Nitrogen cycling in European Forest Ecosystems*. Ed. E.-D. Schulze. Springer, Berlin. 468-491.
- Schulze E.-D., Högberg P., van Oene H., Persson T., Harrison A.F., Read D., Kjoeller and Matteucci G., 2000: Interactions between the carbon and nitrogen cycle and the role of biodiversity: A synopsis of a study along a north-south transect through Europe. In: *Carbon and Nitrogen cycling in European Forest Ecosystems*. Ed. E.-D. Schulze. 468-491. Springer, Berlin.
- Schulze E.-D., Lange O.L., Oren R. (Eds.), 1989: *Forest Decline and Air Pollution. A study of Spruce (Picea abies) on Acid Soils*. Springer, Berlin. 475 pp.
- Schulze E.-D., Lloyd J., Kelliher F.M., Wirth C., Rebmann C., Luhker B., Mund M., Knohl A., Milykova I., Schulze W., Ziegler W., Varlagin A., Valentini R., Sogachev A., Dore S., Grigoriev S., Kolle O., Tchebakova N. and Vygodskaya N.N., 1999: Productivity of forests in the Eurosiberian boreal region and their potential act as a carbon sink – a synthesis. *Global Change Biol.*, 5, 703-722.
- Schulze E.-D., Prokuschkin A., Arneith A., Knorre N. And Vaganov E.A., 2002: Net ecosystem productivity and peat accumulation in a Siberian Aapa mire. *Tellus*, 54B, 5, 531-536
- Schulze E.-D., Schimel D., 2001: Uncertainties of global biogeochemical predictions. In: *"Global Biogeochemical Cycles in the Climate System"* (ed. by Schulze E.-D., Heimann M., Harrison S., Holland E., Lloyd J., Prentice I.C., Schimel ). Academic Press. San Diego,3-15.
- Schulze E.-D., Scholes R.J., Ehleringer J.R., Hunt L.A., Canadell J., Chapin III, F.S., and Steffen W.L.,1999: The study of ecosystems in the context of global change. In: *The Terrestrial Biosphere and Global Change – Implications for Natural and Managed Ecosystems*. Eds. B. Walker, W.L. Steffen, J. Canadell and J.S.I. Ingram. Cambridge Univer. Press, Cambridge, 19-44.
- Schulze E.-D., Vygodskaya N.N., Tchebakova N.M., Mollicone D., Panferova E., Sidorov K.N., Varlagin A.V. and Wirth C. 2002. The Eurosiberian Transect: an introduction to the experimental region. *Tellus*, 54B, 5, 421-428.
- Schulze, E.-D. (Ed.), 2000: Carbon and nitrogen cycling in European forest ecosystems. *Ecological studies*, 142, Springer, Berlin, 500 pp.
- Schulze, E.-D. and H.A.Mooney (Eds.), 1994: *Design and Execution of Experiments on CO<sub>2</sub> Enrichment*. Ecosystems Research Report 6, Commission of the European Communities. ECSC-EEC-EAEC, Brussels-Luxenburg. 420 pp.
- Schulze, E.-D., D. Mollicone, F. Achard, G. Matteucci, S. Federici, H. D. Eva, and R. Valentini. 2003. Climate

- change: Making deforestation pay under the Kyoto Protocol? *Science*, 299, 1669.
- Schurath, U., Peeters, J., Wayne, R., Moortgart, G., Grigg, I., George, Ch., Herrmann, H., Poppe, D., 2003: Chemical mechanism development. In: *Towards Cleaner Air for Europe – Science, Tools and Applications* (Eds. P. Midgley, M. Reuther), Part 2, 73 – 98.
- Scipal K., Wagner W., Trommler M., Naumann K., 2002: The Global Soil Moisture Archive 1992-2000 from ERS Scatterometer Data: First Results, IGARSS'2002, Toronto, 24-28 June 2002.
- Sedykh, V.N., 1991: Aerospace monitoring of forest cover. Novosibirsk, 238 pp. (in Russian).
- Sedykh, V.N., 1996: Forests of Western Siberia and oil-gas complexes. Moscow, *Ecology Series*, Issue 1, 36 pp. (in Russian).
- Sedykh, V.N., 1999: Ecological problems of forests in West Siberia. *Forest Management Information*, No. 3-4, VNIIZlesresurs, Moscow, 24-41 (in Russian).
- Segers R., 1998: Methane production and methane consumption: a review of processes underlying methane fluxes. *Biogeochemistry*, 41, 23-51.
- Sekioka M. and Yuhara K. 1974: Heat Flux Estimation in Geothermal Areas Based on the Heat Balance of Ground Surface. *J. Geophys. Res.* 79, 2053-2058.
- Selivanov A.O., 1996: *Global Sea-Level Changes During the Pleistocene and Evolution of Sea Coasts*. Schwartz, Moscow. 268 pp. (in Russian).
- Selivanov A.O., 2001: "Coastal Catastrophe" on the Sea of Azov: Myth or Real Threat?. GEOS, Moscow, 84 pp. (in Russian).
- Selivanov, A.O., 1994: Global climate change and humidity variations over East Europe and Asia by historical data. In: Desbois, M. and Desalmand, F. (eds.) *Global Precipitations and Climate Change*. Springer, Berlin, Heidelberg et al., 77-104.
- Selivanov, A.O., 1996: Climate changes in East and Central Asia during the last millennia. In: *Repts. Russian Acad. Sci., Geogr*, 1996, No. xxx, 116-124 (in Russian).
- Selivanov, A.O., 2000: *Nature, History, Culture: Environmental Aspects of Ethnic Cultures of the World*. GEOS: Moscow, 324 pp. (in Russian).
- Selivanov, A.S. and Yu.M. Tuchin, 1988: The operational system "Resource-01" for Earth observations. *Issledovaniia Zemli iz Kosmosa*, No. 3, 101-106 (in Russian).
- Sellen A., 2001: Hydraulic and stomatal adjustment of Norway spruce trees to environmental stress. *Tree Physiol.*, 21, 879-888.
- Sellers P.J., Dickinson R.E., Randall D.A., Betts A.K., Hall F.G., Berry J.A., Collatz G.J., Denning A.S., Mooney H.A., Nobre C.A., Sato N., Field C.B. & Henderson-Sellers A., 1997: Modelling the exchanges of energy, water, and carbon between continents and the atmosphere. *Science*, 275, 502-509.
- Sellers, P.J., B.W. Meeson, J. Closs, J. Collatz, F. Corprew, D. Dazlich, F. G. Hall, Y. Kerr, R. Koster, S. Los, K. Mitchell, J. McManus, D. Myers, K. -J. Sun, P. Try, 1995: An Overview of the ISLSCP Initiative I – Global Data Sets. On: ISLSCP Initiative I Global Data Sets for Land-Atmosphere Models, 1987-1988. Volumes 1-5, Published on CD-ROM by NASA. Volume 1: USA\_NASA\_GDAAC\_ISLSCP\_001. OVERVIEW.DOC.
- Sellers, P.J., Hall F.G., Asrar G., Strelbel D.E., Murphy R.E., 1992: An overview of the first international satellite land surface climatology project (ISLSCP) field experiment (FIFE). *J. Geophys. Res.* 97, D17, 18,345-18,371.
- Sellers, P.J., Hall, F.G., Kelly, R.D., Black, A., Baldocchi, D., Berry, J., Ryan, M., Ranson, K.J., Crill, P.M., Lettenmaier, D.P., Margolis, H., Cihlar, J., Newcomer, J., Fitzjarrald, D., Jarvis, P.G., Gower, S.T., Halliwell, D., Williams, D., Goodison, B., Wickland, D.E. & Guertin, F.E., 1997: BOREAS in 1997: experiment overview, scientific results, and future directions. *J. Geophys. Res.*, 102D, 28,731-28,769.
- Semenov V. A. and L. Bengtsson, 2002: Secular trends in daily precipitation characteristics: Greenhouse gas simulation with a coupled AOGCM. *Climate Dynamics*, 19, 123-140.
- Sementsov I.V., and Eremenko V.G., 2000: Ponds of the Rostov Oblast and dynamics of their development, *Ecological-Geographical Bulletin of Russia*, 3: 38-42 (in Russian).
- Semiletov I.P. 2001: Greenhouse effect, carbon cycle in Arctic, Russian transarctic expedition-2000. *Herald of Russian Foundation of Basic Research*. No 2, 59-63 (In Russian).
- Semiletov I.P., 1999a: On aquatic sources and sinks of CO<sub>2</sub> and CH<sub>4</sub> in the Polar Regions, *J. Atmos. Sci.*, 56 (2), 286-306.
- Semiletov I.P., I.I. Pipko, N.Ya. Pivovarov, V.V. Popov, S.A. Zimov, Yu.V. Voropaev, and S.P. Davidov, 1996: Atmospheric Carbon Emission from North Asian Lakes: A factor of global significance. *Atmos. Environ.*, 30, 1657-1671.
- Semiletov, I., Makshtas, A., Akasofu S.-I., and E.L. Andreas, 2004: Atmospheric CO<sub>2</sub> balance: The role of Arctic sea ice. *Geophys. Res. Lett.*, 31, doi:10.1029/2003GL017996
- Semiletov, I.P., 1999b: Destruction of the coastal permafrost ground as an important factor in biogeochemistry of the Arctic Shelf waters, *Doklady Russian Academy of Sciences*, 368 (6): 679-682.
- Semiletov, I.P., N.I. Savelieva, G.E. Weller, I.I. Pipko, S.P. Pugach, A.Yu. Gukov, and L.N. Vasilevskaya, 2000: The Dispersion of Siberian River Flows into Coastal Waters: Meteorological, Hydrological and Hydrochemical Aspects. In: E.L. Lewis (ed.) *The freshwater Budget of the Arctic Ocean*, NATO Meeting/NATO ASI Series, Kluwer Academic Publishers, Dordrecht, 323-366.
- Serebryannaya T.A., 1982: On the dynamic of the forest-steppe zone in the center of the Russian Plain in the Holocene. In: *Main features of the nature dynamics over the USSR territory in Late Pleistocene and Holocene*. Moscow, Verlag "Nauka, 179-186.
- Sergueev, D., Tipenko, G., Romanovsky, V., and N. Romanovskii, 2003: Mountain permafrost thickness evolution under influence of long-term climate fluctuations (results of numerical simulation). In: *Proceedings of the VIII International Permafrost Conference*, Switzerland, July 21-25, 1017-1021.
- Serreze, M. C., Walsh, J. E., Chapin, F. S. III, Osterkamp, T. E., Dyrgerov, M., Romanovsky, V. E., Oechel, W. C., Morison, J., Zhang, T., and Barry, R. G., 2000: Observational evidence of recent change in the northern high-latitude environment, *Climatic Change*, 46, 159-207.

- Sevruk, B., 1982: Methods of correction for systematic error in point precipitation measurement for operational use. *Oper. Hydrol. Rep.*, 21, Publ. 589, Geneva, Switzerland: World Meteorol. Organ. 91 pp.
- Shao, G.F., 1996: Potential impacts of climate change on a mixed broadleaved-Korean pine forest stand: a gap model approach. *Climatic Change*, 34, 263-268.
- Shao, G.F., Shugart, H.H. and Smith T.M., 1996: A role-type model (ROPE) and its application in assessing climate change impacts on forest landscapes. *Vegetatio*, 121, 135-146.
- Sharkhuu, N., 2003: Recent changes in the permafrost of Mongolia. In: *Proceedings of the VII International Permafrost Conference*, Switzerland, July 21-25, 2003, 1029-1034.
- Sharov A.I., Glazovskiy A.F. and Meyer F., 2003: Survey of glacial dynamics in Novaya Zemlya using satellite radar interferometry. *Zeitschrift fuer Gletscherkunde und Glazialgeologie*, 38, 1-19.
- Sharov A.I., Meyer F., 2002: Technical report on algorithms, techniques and methods, for precise spatial modelling and hydrographic interpretation of coastal areas and tidewater glaciers using satellite images. *AMETHYST Project Product*, 2002. xxx pp.
- Sharov, A.I., K. Gutjahr, F. Meyer, M. Schardt, 2002: Methodical alternatives to the glacier motion measurement from differential SAR interferometry. *IAPRS*, XXXIV, 3A, 324 – 329.
- Shashi K. Gupta, David P. Kratz, Paul W. Stackhouse, Jr. and Anne C. Wilber, 2001: The Langley Parameterized Shortwave Algorithm (LPSA) for Surface Radiation Budget Studies--Version 1.0, NASA/TP-2001-211272, December 2001, 31 pp. [Available at: <http://techreports.larc.nasa.gov/ltrs/2001-cit.html>]
- Sherstyukov B.G., 2000a: Variability of the bioclimatic indices. –In: *Annals of weather, climate and ecology of Moscow*, N 1, 2000, Moscow, MGU, 78-79.
- Sherstyukov B.G., 2002: Possible climate changes in the 21<sup>st</sup> century, their influence on economy and leaving conditions in the different regions of Russia. In: *Proceedings of the conf. "Results of studying in meteorology and monitoring the soil the natural ambience"*. St.-Peterburg, April 23-26, 2002.
- Sherstyukov B.G. 2000b: Index of the fire danger. –In: *Annals of weather, climate and ecology of Moscow*, N 1, 2000, Moscow, MGU, 83-87.
- Shiklomanov A.I., R.B. Lammers, C.J. Vorosmarty, 2002: Widespread Decline in Hydrological Monitoring Threatens Pan-Arctic Research, *EOS*, 83, 3, 16-17.
- Shiklomanov A.I., 1997: *On the effect on anthropogenic change in the global climate on river runoff in the Yenisei basin*. Runoff Computations for Water Projects. Proc. of the St. Petersburg Symposium 30 Oct.-03 Nov. 1995. IHP-V UNESCO Technical Docum. in Hydrology, N9, 113-119.
- Shiklomanov I.A. 1976: Hydrological aspects of the Caspian Sea problem. Leningrad, Gidrometeoizdat, 79 pp. (in Russian).
- Shiklomanov I.A. 1989: *Impact of Economic Activity on River Runoff*. Leningrad, Gidrometeoizdat, 1989. 335 pp.
- Shiklomanov I.A. and Georgievsky V.Yu., 2003: Influence of human activities on the Caspian Sea water balance and level fluctuations. –In: *Hydrometeorological Aspects of the Caspian Sea and its Basin*. I.A. Shiklomanov and A.S. Vasiliev (eds.). Hydrometeoizdat, 400 pp. (in Russian), 267-277.
- Shiklomanov I.A., 1979: *Anthropogenic Changes of Rivers Water Content*. Leningrad, Gidrometeoizdat, 303 pp.
- Shiklomanov I.A., 2002: Impact of Anthropogenic Changes of Climate on Hydrological Regime and Water Resources. In: *Global changes of climate. Their after-effects for Russia*. Moscow, Ministry of Industry, Science and Technology of RF, 384-404.
- Shiklomanov I.A., 2002: *Impact of Anthropogenic Changes of Climate upon Hydrological Regime and Water Resources. Global Changes of Climate. Their after-effects for Russia*. 2002: Moscow, Ministry of Industry, Science and Technology of RF., 384-404. (in Russian)
- Shiklomanov I.A., and Georgievsky V.Yu., 1995: Impact of anthropogenic factors upon river runoff of the former USSR. In: *Geographical Trends in Hydrology*. Russian Academy of Sciences, Russian Geographical Society. M., 96-106 (in Russian).
- Shiklomanov, I.A., 1976: *Hydrological aspects of the Caspian Sea Problem*. Leningrad, Gidrometeoizdat. 79 pp. (in Russian).
- Shiklomanov, I.A., Georgievsky V.Yu., 2002: Impact of the anthropogenic climatic change on hydrological regime and water resources. In: Menzhulin (ed). *"Climate Change and Their Consequences"*, St. Petersburg, Nauka, 152-164 (in Russian).
- Shkolnik, I.M., V.P. Meleshko, T.V. Pavlova, 2000: A regional hydrodynamic model of the atmosphere for climate studies over the territory of Russia. *Russian Meteorology and Hydrology*. No.4, 2000, 32-49.
- Shlygin I.A., 1975: Role of the anthropogenic factor in changes of salinity of the Sea of Azov. In: *Proc. State Oceanogr. Inst. (GOIN)*, 125. 17-24 (in Russian).
- Shmakin A.B., 1999: Parameterization of processes within snow cover, freezing and thawing soil for climate models. *Russian Meteorology and Hydrology*, 1999, No.2, pp. 22-30.
- Shmakin A.B., 2003: Evaluation of snow cover and permafrost features in Northern Eurasia for some climate change scenarios. *Proceedings of the Arctic Climate System Study Final Conference*, St. Petersburg, November (in press).
- Shmakin, A.B., and Popova V.V., 2003: Distribution of temperature and precipitation extremes in Northern Eurasia in the 20th century. *World Climate Change Conference*, Moscow, Abstracts, p.536.
- Shnitnikov, A.V., 1975: Variations of climate and general moistening in 18<sup>th</sup> – 20<sup>th</sup> century and their future. *Izvestia of the All-union Geograph. Soc.* 107 (6), 473-484 (in Russian).
- Shubin, V.A., 1998: Targets of Russian foresters in the New Year. *Forest Management*, No. 1, 2–5 (in Russian).
- Shugart, H. H., 1984: *A Theory of Forest Dynamics: The Ecological Implications of Forest Succession Models*. Springer-Verlag, New York, 278 pp.
- Shugart, H. H., T. M. Smith, and W. M. Post. 1992a: The application of individual-based simulation models for assessing the effects of global change. *Annual Reviews of Ecology and Systematics* 23, 15–38.

- Shugart, H.H. and T.M. Smith, 1996: A review of forest patch models and their application to global change research. *Climatic Change*, 34, 131-153.
- Shugart, H.H., 1992: *Systems Analysis of the Boreal Forests*. New York: Springer-Verlag, 265 pp.
- Shugart, H.H., 1998: *Terrestrial Ecosystems in Changing Environments* (Cambridge University Press, Cambridge).
- Shugart, H.H., Antonovsky, M.J., Jarvis P.G. and Sandford A.P., 1986: CO<sub>2</sub>, climatic change and forest ecosystems: Assessing the response of global forests to the direct effects of increasing CO<sub>2</sub> and climatic change pp. 475-521. In: *The Greenhouse Effect, Climatic Change and Ecosystems* (SCOPE 29) (eds. Bolin, B., Döös, B.R., Jager J. and Warrick R.A., (John Wiley, Chichester).
- Shugart, H.H., R. Leemans, and G.B. Bonan (eds). 1992b. *A Systems Analysis of the Global Boreal Forest*. Cambridge University Press, Cambridge. 565 pp.
- Shugart, H.H., W.R. Emanuel and G.F. Shao, 1996: Models of forest structure for conditions of climatic change. *Commonwealth Forestry Review*, 75, 51-64.
- Shukla, J., Nobre, C., and Sellers, P., 1990: Amazon Deforestation and Climate Change. *Science* 247, 1322-1325.
- Shulc, V.L. 1965: *Rivers of Middle Asia*. Gidrometeoizdat, Leningrad, 692 pp. (in Russian)
- Shver, Ts. A., 1976: *Atmospheric precipitation over the USSR territory* (in Russian), Gidrometeoizdat, Leningrad, 302 pp.
- Shvidenko A.Z., and J.Goldammer, 2001: Fire situation in Russia. *International Fire News*, No 23, 49-65.
- Shvidenko, A., S., Nilsson, Stolbovoi, V., Wendt D., 1998: *Background Information for Carbon Analysis for the Russian Forest Sector*. IIASA Final Report for DCI Environmental Center.
- Shvidenko, A.Z. and Nilsson S., 2000: Fire and carbon budget of Russian forests. In E.S. Kasischke and B.J. Stocks (eds.), *Fire, Climate Change, and Carbon Cycling in the Boreal Forests, Ecological Studies*, 138, Springer, 289-311.
- Shvidenko, A.Z. and Nilsson S., 2002: Dynamics of Russian forests and the carbon budget for 1961-1998: An assessment based on long-term forest inventory data. *Climatic Change*, 50, 5-37.
- Shvidenko, A.Z. and S. Nilsson, 1997: Are the Russian forests disappearing? *Unasylva*, 48, No. 1, 57-64.
- Shvidenko, A.Z. and S. Nilsson, 2003: A synthesis of the impact of Russian forests on the global carbon budget for 1961-1998. *Tellus*, 55B, 391-415 pp.
- Shvidenko, A.Z., Nilsson S., and Roshkov V., 1995: Possibilities for increased carbon sequestration through improved protection of Russian forests. Working Paper WP-95-86, International Institute for Applied Systems Analysis, Laxenburg, Austria.
- Shvidenko, A.Z., Nilsson S., Stolbovoi V., Rozkov V., and Gluck M., 2000: Aggregated estimation of the basic parameters of biological production and the carbon budget of Russian terrestrial ecosystems: 1. Stock of plant organic mass. *Russian Journal of Ecology* 31, 371-378.
- Shvidenko, A.Z., Nilsson S., Stolbovoi V., Rozkov V., and Gluck M., 2001b: Aggregated estimation of the basic parameters of biological production and the carbon budget of Russian terrestrial ecosystems: 2. Net Primary Production. *Russian Journal of Ecology* 32, 71-77.
- Shvidenko, A.Z., Shepashenko D., and Nilsson S., 2001a: Aggregated models of phytomass for major forest forming species of Russia. *Forest Inventory and Forest Planning*, 1, 50-57 [in Russian]
- Sidorov K.N., Sogachev A., Langendorfer U., Lloyd D., Nepomniachii I.L., Vygodsakya N.N., Schmidt M. and Levin I., 2002: Seasonal variability of greenhouse gases in the lower troposphere above the eastern European taiga. *Tellus*, 54B, 5, 735-748
- Silapaswan, C. S., Verbila, D., and A. D. McGuire, 2001: Land cover change on the Seward Peninsula: The use of remote sensing to evaluate potential influences of climate change on historical vegetation dynamics. *Journal of Remote Sensing* 5, 542-554.
- Simonova O.A., 1991: Hydrogen sulphide in the Sea of Azov. In: Goptareva, N.P. et al., eds. *Hydrometeorology and Hydrochemistry of Seas in the USSR*, v. 5. *The Sea of Azov*. Gidrometeoizdat, SPb., 139-143 (in Russian).
- Sirin A.A., Minaeva T. (Eds.) 2001: *Peatlands of Russia: towards an analysis of sectorial information*. GEOS Publishing house, Moscow. 190 pp.
- Sirois, L., Bonan G.B. and Shugart H.H., 1994: Development of a simulation model of the forest-tundra transition zone of northeastern Canada. *Canadian Journal of Forest Research*, 24, 697-706.
- Sirotenko D.S., Abashina E.V., Pavlova V.M., 1995: Чувствительность сельского хозяйства России к изменениям климата, химического состава атмосферы и плодородия почв. *Russ. J. Meteorology and hydrology*, 4, 107-114 (in Russian).
- Sjors, H., 1961: Surface patterns in Boreal peatland. *Endeavour*, 20, 217-224.
- Skartveit A., Ryden B.E., and Kärenlampi L., 1975: Climate and hydrology of some Fennoscandian tundra ecosystems. In: *Fennoscandian Tundra Ecosystems. Part 1. Plants and Microorganisms*. (Ed. F.E. Wielgolaski), Springer-Verlag, Berlin, 41-53.
- Skole, D.L., W.A. Salas and V. Taylor (eds.), 1998: Global observation of forest cover. Fine resolution data and product design strategy. Report of a Workshop, 23-25 September 1998, Paris, France. Appendix 3 and 4: Fine resolution design team report and coarse resolution design report, 51 pp.
- Skryabin P., Skachkov, Y., and S. Varlamov, 2003: The thermal state of soils under contemporary climate change in Central Yakutia. In: *Proceedings of the VII International Permafrost Conference*, Switzerland, July 21-25, 2003, 1063-1066.
- Slater A.G., C.A.Schlosser, C.E.Desborough, A.J.Pitman, A.Henderson-Sellers, A.Robock, K.Ya.Vinnikov, K.Mitchell, A.Boone, H.Braden, F.Chen, P.M.Cox, P.de Rosnay, R.E.Dickinson, Y.-J.Dai, Q.Duan, J.Entin, P.Etchevers, N.Gedney, Ye.M.Gusev, F.Habets, J.Kim, V.Koren, E.A.Kowalczyk, O.N.Nasonova, J.Noilhan, S.Schaake, A.B.Shmakin, T.G.Smirnova, D.Verseghy, P.Wetzel, Y.Xue, Z.-L.Yang, Q.Zeng, 2001: The representation of snow in land surface schemes: results from PILPS 2(d). *J. Hydrometeorol.*, 2, 7-25.
- Smith S.V., and J.T.Hollibaugh, 1993: Coastal metabolism and the ocean organic carbon balance, *Rev. of Geophys.*, 31, 75-89.

- Smith T.M., Leemans R, and Shugart H.H (eds.), 1995: The Application of Patch Models of Vegetation Dynamics to Global Change Issues. *Climatic Change*, 34, 131-153.
- Smith, T. M., and H. H. Shugart, 1993: The transient response of terrestrial carbon storage to a perturbed climate, *Nature*, 361, 523-526.
- Smith, T.M., Halpin, P.N., Shugart H.H. and Secrett C.M., 1995: Global Forests. In: *If Climate Changes: International Impacts of Climate Change* (eds. Strzepke K.M. and Smith J.B.) 146-179 (Cambridge University Press, Cambridge).
- Smolyakova M.V., and Shlygin I.A., 1980: Present-day and restored water balance and salinity of the Sea of Azov. In: *Proc. State Hydrological Inst. (GOIN)*, 159, 104-118 (in Russian).
- Sogachev A., Menzhulin G.V., Heimann M., and Lloyd J., 2002: A simple three-dimensional canopy-planetary boundary layer simulation model for scalar concentration and fluxes. *Tellus*, 54B, 784-819.
- Sogachev, A., O. Panferov, G. Gravenhorst and T. Vesala, 2005: Numerical analysis of flux footprints for different landscapes. *Theor. Appl. Climatology*, 80, 169-185.
- Soil and Water Conservation Society, 2003: *Conservation Implications of Climate Change: Soil Erosion and Runoff from Cropland*. U.S. Soil and Water Conservation Society, Ankeny, Iowa. 24 pp.
- Sokolik I.N., 2003: Dust, in Holton, J.P., J.A. Curry, and J. Doyle, (Eds.), *Encyclopedia of Atmospheric Sciences*. Academic Press, London., 668-672.
- Sokolov V.A., 1997: *Basics of forest management in Siberia*. Krasnoyarsk, Verlag SB RAS, 308 pp. (in Russian).
- Solomon A.M., and A.P. Kirilenko, 1997: Climate change and terrestrial biomass: What if trees do not migrate? *Global Changes and Biogeog. Letters*, 6, 139-148.
- Solomon, A.M. and Webb III. T., 1985: Computer-aided reconstruction of late-Quaternary landscape dynamics. *Annual Reviews of Ecology and Systematics*, 16, 63-84.
- Solomon, A.M., 1986: Transient-response of forests to CO<sub>2</sub> – induced climate change: Simulation modeling experiments in eastern North America. *Oecologia*, 68, 567-79.
- Sorokin N.D., 1981: *Microflora of taiga soils in Central Siberia*. Novosibirsk, Nauka, 143 pp. (in Russian).
- Sorooshian, S., 2003: GEWEX support reaffirmed at recent WCRP/JSC meeting. *GEWEX NEWS*, . 13, No. 2, May 2003.
- Sorooshian, S., Gao, X., Hsu, K., Maddox, R. A., Hong, Y., Gupta, H. V., Imam, B. 2002: Diurnal Variability of Tropical Rainfall Retrieved from Combined GOES and TRMM Satellite Information. *J. Climate*, 15, 983–1001.
- Sorooshian, S., Hsu, K., Gao, X., Gupta, H. V., Imam, B., Braithwaite, D., 2000: Evaluation of PERSIANN System Satellite-Based Estimates of Tropical Rainfall. *Bull. Amer. Meteorol. Soc.*, 81, 2035–2046.
- Spirina, L.P. 1970: Long-term mean values of atmospheric pressure and surface air temperature of the Northern Hemisphere. *Trans. Main Geophys.Observ.*, 258, 119-123.
- Stackhouse, P. W., Jr., S. J. Cox, S. K. Gupta, M. Chiaachio, and J. C. Mikovitz, 2000: The WCRP/GEWEX Surface Radiation Budget Project Release 2: An assessment of surface fluxes at 1 degree resolution. International Radiation Symposium 2000. St. Petersburg, Russia, 24-29 July.
- Stackhouse, P. W., Jr., S. K. Gupta, S. J. Cox, J. C. Mikovitz, and M. Chiaachio, 2002: New results from the NASA/GEWEX Surface Radiation Budget Project: Evaluating El Nino effects at different scales. 11th Conference on Atmospheric Radiation, American Meteorological Society, Ogden, UT, June 3-7.
- Stackhouse, P.W., Jr., S. J. Cox, S. K. Gupta, J.C. Mikovitz, M. Chiaachio, 2004: The WCRP/GEWEX Surface Radiation Budget Data Set: A 1 degree resolution, 12 year flux climatology. (in preparation).
- Starkov, A.N., Landberg, L., Bezrukikh, P.P., and Borisenko, M.M., 2000: Atlas of winds over Russia. Moscow, Mozhaisk-Terra Publ. House, 560 pp. (in Russian).
- State Hydrological Institute, SHI, 2002: Estimates of possible changes in the Arctic river runoff with the help of mathematical model of runoff formation. In: *Climate of polar regions of Russia in 21st century as a factor of the North development and, in particular, of the Northern Marine Transport Pathway*. St. Petersburg, Russia (in Russian).
- State Report "On the state of the environment of the Rostov Oblast in 1995", 1996: Rostov-on Don. Rostoblkomprirody. 164 pp.
- State report "On the state of the environment of the Rostov Oblast in 1997". *Annual information and analytical document*, 1998: Rostov-on-Don. 288 pp.
- Steffen, W., J. Canadell, M. Apps, E.-D. Schulze, et al., 1998: The terrestrial carbon cycle: Implications for the Kyoto Protocol, *Science*, 280, 1393–1394.
- Stein, R., Fahl, K., Niessen, F., and Siebold, M., 1999: Late quaternary organic carbon and biomarker records from the Laptev Sea continental margin (Arctic Ocean): implications for organic carbon flux and composition. In: Kassens, H., Bauch, H.A., Dmitrienko, I.A., Eicken, H., Hubberten, H.-W., Melles, M., Thiede, J., and Timokhov, L.A. (eds.) *Land-Ocean Systems in the Siberian Arctic*, Springer-Verlag, Berlin, 635-656.
- Steinnes E., Lukina N., Nikonov V., Aamlid D., and Royset O., 2000: A gradient study of 34 elements in the vicinity of a copper-nickel smelter in the Kola Peninsula. *Environmental Monitoring and Assessment*, 60, 71-88.
- Stendel, M., and J. H. Christensen, 2002: Impact of global warming on permafrost conditions in a coupled GCM. *Geophys. Res. Lett.*, 29 (13), 10.1029/2002GL014345.
- Stewart, R.E., H.G. Leighton, P. Marsh, G.W.K. Moore, H. Ritchie, W.R. Rouse, E.D. Soulis, G.S. Strong, R.W. Crawford, and B. Kochtubajda, 1998: The Mackenzie GEWEX Study: the water and energy cycles of a major North American river basin. *Bull. Amer. Meteor. Soc.*, 79, 2665-2683.
- Stocker, T. F., G. K. C. Clarke, H. Le Treut, R. S. Lindzen, V. P. Meleshko, R. K. Mugara, T. N. Palmer, R. T. Pierrehumbert, P. J. Sellers, K. E. Trenberth, J. Willebrand, 2001: Physical Climate Processes and Feedbacks. In: *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* [Houghton, J. T., Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden, X. Dai, K. Maskell, and C. A. Johnson (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 881 pp.

- Stocks B.J. and Jynham T.J., 1996: Fire weather climatology in Canada and Russia. In: *Fire in ecosystems of boreal Eurasia*. Eds. J.G.Goldammer and V.V.Furyaev, Kluwer Academic Publisher, London, 418-487.
- Stocks, B.J. and J.K. Goldammer, 1997: International collaboration in investigations of fires in boreal forests. Proceedings of the VII Annual Conference MAIBL "Sustainable Development of Boreal Forests", 143-147.
- Stocks, B.J., 1991: The extent and impact of forest fires in northern circumpolar countries. In: *Global Biomass Burning: Atmospheric, Climatic, and Biospheric Implications* (ed. Levine, J.S.) 197-202 (MIT Press, Cambridge).
- Stocks, B.J., J.A. Mason, J.B. Todd, E.M. Bosch, B.M. Wotton, B.D. Amiro, M.D. Flannigan, K.G. Hirsch, K.A. Logan, D.L. Martell, and W.R. Skinner, 2002: Large forest fires in Canada, 1959-1997. *J. Geophysical. Res.* 107, 8149, doi:10.1029/2001JD000484.
- Stocks, B.J., M.A. Fosberg, T.J. Lynham, L. Mearns, B.M. Wotton, Q. Yang, J.-Z. Jin, K. Lawrence, G.R., Hartley, J.A. Mason, and D.W. McKenney, 1998: Climate change and forest fire potential in Russian and Canadian boreal forests. *Climatic Change* 38, 1-13.
- Stolbovoi V. and I. McCallum, 2002: CD-ROM "Land Resources of Russia", International Institute for Applied Systems Analysis and the Russian Academy of Science, Laxenburg, Austria.
- Stott, P. A., S. F. B Tett, G. S. Jones, M. R. Allen, W. J. Ingram, and J. F. B. Mitchell, 2001: Attribution of twentieth century temperature change to natural and anthropogenic causes. *Climate Dyn.*, 17, 1-21.
- Strakhov, V.V., A.N. Filippchuk and A.Z. Shvidenko, 1995: On reform of forest inventory in Russia. *Forest Management (Lesnoe khozjaistvo)*, No. 1, 11-14 (in Russian).
- Strakhov, V.V., A.N. Filippchuk and A.Z. Shvidenko, 2001: Sustainable development of the Russian forest sector and strategy of forest inventory. *Forest Management (Lesnoe khozjaistvo)*, No. 5 (in press) (in Russian).
- Streltsov, V.A. and V.A. Gorelov, 1990: Ways for increasing the efficiency of space images for earth natural resource investigations. *Review information*, Issue 2. Moscow, CNII GAIK, 64 pp. (in Russian).
- Study of geosystems at experimental stations*, 1984: Moscow, Academy of Sciences of the USSR. 271 pp. (in Russian).
- Stull, R.B., 1988: *An introduction to boundary layer meteorology*. Atm. Sci. Lib., Kluwer Academic Press. 666 pp.
- Sturm, M., McFadden, J. P., Liston, G. E., Chapin, F. S. III, Racine, C. H., and J. Holmgren, 2001b: Snow-shrub interactions in arctic tundra: a hypothesis with climatic implications. *J. Climate*, 14, 336-344.
- Sturm, M., Racine, C., and K. Tape, 2001a: Increasing shrub abundance in Arctic. *Nature*, 411, 547-548.
- Sugihara, S., Kishino, M., and Okami, N., 1985: Estimation of water quality parameters from irradiance reflectance using optical models, *J. Oceanogr. Soc. Japan*, 41, 399-406.
- Sugimoto, A., Naito, D., Yanagisawa, N., Ichianagi, K., Kurita, N., Kubota, J., Kotake, T., Ohata, T., Maximov, T.C. and Fedorov, A.N., 2003: Characteristics of soil moisture in permafrost observed in East Siberian Taiga with stable isotopes of water, *Hydrolog. Proc.*, (in press).
- Sukhikh, V.I. and S.G. Sinityn (eds.), 1979: *Air-space methods for nature preservation and forestry*. Moscow, Forest Industry, 228 pp. (in Russian).
- Sukhikh, V.I. and V.M. Zhirin, 1996: Estimation of the information content of high resolution space photo images for forest inventory. *Issledovaniia Zemli iz Kosmosa*, No. 2, 45-56 (in Russian).
- Sukhikh, V.I., 1995: The use of satellite information for forest study and evaluation in Russia. In: R. Kuittinen (ed.), *Proceedings of the Finnish-Russian Seminar on Remote Sensing in Helsinki*, 29 August-1 September, 1994, 65-72.
- Sukhikh, V.I., 1996: Assessment of the informativeness of high-resolution space photographs in the inventarization of forests. *Earth Obs. Rem. Sens.*, 14, 229-245.
- Sukhikh, V.I., 1998: Air and satellite methods and geo-information systems in forestry and forest management of current Russia. In: V.I. Sukhikh (ed.), *Air and Satellite Methods and Geographical Information Systems in Forestry and Forest Management*, Materials of the 2nd All-Russia Meeting, Moscow, 18-19 November 1998, RAS and Federal Forest Service, Moscow, 27-32 (in Russian).
- Sukhikh, V.I., E.P. Danjulis and R.I. Elman, 1982: Methods for forest resource investigations from space. In: *Ways for increasing the efficiency of forest management*. Moscow, 58-113 (in Russian).
- Sukhikh, V.I., N.N. Gusev, and E.P. Danjulis, 1977: *Air methods in forest management*. Moscow, 192 pp. (in Russian).
- Sukhikh, V.I., P.A. Kropov and V.A. Maksimov, 1981: Methods for small-scale mapping of the Forest Fund based on space photo images. Moscow, 23 pp. (in Russian).
- Sukhovolski, V.G., Buzykin A.I. and Khlebopros R.G., 1997a: Models of tree and forest stands phytomass distribution. *Lesovedenie (Forest Science)*, 1997, No.4, 3-13 (In Russian).
- Sukhovolski, V.G., 1997: Tree fractions free competition for resources and allometrical ratio. *Journal of Common Biology*, 1997, No.5, 80-88 (In Russian).
- Sukhovolski, V.G., Ovchinnikova T.M. and Vshivkova T.A., 2000: Insect as a consumer: model of an active behavior. *Transactions of the Academy of Sciences*, 373, 424-426 (in Russian).
- Sukhovolski, V.G., Pal'nikova E.N. and Tarasova O.V., 1997b: Characteristics of high frequency components of series of forest insects' population dynamics as indicators of the species population dynamics type. *Transactions of the Academy of Sciences*, 352, 140-142 (In Russian).
- Sun, B. and P. Ya. Groisman, 2000: Cloudiness variations over the former Soviet Union. *Internat. J. Climatol.*, 20, 1097-1111.
- Sun, B., Groisman, P.Ya., and I. I. Mokhov, 2001: Recent Changes in Cloud Type Frequency and Inferred Increases in Convection over the United States and the Former USSR. *J. Climate* 14, 1864-1880.
- Sun, B., P. Ya. Groisman, R. S. Bradley, and F. T. Keimig, 2000: Temporal Changes in the Observed Relationship between Cloud Cover and Surface Air Temperature, *J.*

- Climate*, 13, 4341-4357.
- Sun, J., M. Zhang, and T. Liu, 2001: Spatial and temporal characteristics of dust storms in China and its surrounding regions, 1960-1999: Relations to source area and climate. *J. Geophys. Res.* 106, 10325 – 10331.
- Susskind, J., Piraino, P., Rokke, L., Iredell, L., Mehta, A. 1997: Characteristics of the TOVS Pathfinder Path A Dataset. *Bull. Amer. Meteorol. Soc.* 78, 1449–1472.
- Suyker A.E, Verma S.B, Clement R.J, Billesbac D.P., 1996: Methane flux from a boreal fen: season-long measurement by eddy correlation. *J. Geophys. Res.* 101, 28637-28647.
- Tamaitchuk A.N., 2002: Physico-geographical regionalization of the Sea of Azov. *Izv. Russian Geogr. Soc.*, 134 (6), 14-23 (in Russian).
- Tanaka K. and H. Ishikawa, 2001: Long term monitoring of surface energy fluxes at Amdo in eastern Tibetan Plateau, *Proc. GAME ANN/Radiation Workshop*, Phuket, 40-43.
- Tanfil'ev, G.I., 1896: Prehistoric steppes of European Russia. *Land Science "Zemlevedenie"*, 3, ( 2) 73-92. (in Russian)
- Tans, P.P., I.Y. Fung and T. Takahasi, 1990: Observational constraints on the global atmospheric CO<sub>2</sub> budget. *Science*, 247, 1431-1438.
- Tansey, K. J., A. J. Luckman, L. Skinner, H. Balzter, T. Strozzi, W. Wagner, 2003: Classification of forest volume resources using ERS tandem coherence and JERS intensity data, *International Journal of Remote Sensing*, in press.
- Tarasov, P.E. and Co-Authors, 1996: Lake status records from the former Soviet Union and Mongolia: documentation on the second version of the data base. Paleoclimatology Publ. Ser. Rep., 5. NOAA. Boulder, USA.
- Targulian V.O., 1971: *Soil formation and weathering in cold and humid regions*. Moscow, Nauka, 268 pp. (in Russian).
- Taylor P.A., Sykes R.I., Mason P.J., 1989: On the parametrization of drag over small-scale topography in neutrally-stratified boundary layer flow, *Bound.-Layer Meteorol.*, 48, 409-422.
- Tchebakova N., Monserud R., Denisenko O., Parfenova E., 1999: Applications of a Siberian vegetation model to spatial-temporal studies. *Russian J. of Forest Science* (in Russian), 2, 3-12.
- Tchebakova N.M., Kolle O., Zolotoukhine D., Arneith A., Styles J., Vygodskaya N., E.-D.Schulze, Schibistova O. and Lloyd J., 2002: Inter-annual and seasonal variations of energy and water vapour fluxes above a *Pinus sylvestris* forest in the Siberian middle taiga. *Tellus* 54B, 5, 537-551.
- Tchebakova N.N., Parfenova E.I., Monserud R.A., 2002: Prognosis of forest phytomass change in Latitudinal and hight-altitudinal zones under climate warming. In: *Forest ecosystems of the Yenisey meridian* (Ed. Pleshikov F.L.) Publ. House of SB RAS, Novosibirsk, 84-91 (in Russian)
- Tchebakova, N.M., Monserud, R.A., and Nazimova, D.I., 1994: A Siberian vegetation model based on climatic parameters. *Can. J. For. Res.* 24, 1597-1607.
- Tchebakova, N.M., Monserud, R.A., Leemans, R., and Golovanov, S., 1993: A global vegetation model based on the climatological approach of Budyko. *J. Biogeogr.* 20, 129-144.
- Tchebakova, N.M., Rehfeldt, G.E., and Parfenova, E.I., 2003: "Redistribution of vegetation zones and populations of *Larix sibirica* and *Pinus sylvestris* in central Siberia in a warming climate" *Siberian Journal of Ecology*, 10, 677-686.
- Technical Instructions on the Inventory of Woody Shrub Vegetation of Deserts Based on their Photo Images, 1985: Moscow, 8 pp. (in Russian).
- Technical Training of Specialists for Inventory-decoding, 1995: In: *Practical Appliances on Forest Assessments, Contours, and Field Decoding of Air Photo Images*. St. Petersburg, 10–64 (in Russian).
- ten Brink, H., 2003: Composition and size evolution of the secondary aerosol. In: *Towards Cleaner Air for Europe – Science, Tools and Applications* (Eds. P. Midgley, M. Reuther), Part 2, 7 – 33.
- Texier D., de Noblet N., Harrison S.P., Haxeltine A., Jolly D., Jousaume S., Laarif F. Prentice I.C. and Tarasov P., 1997: Quantifying the role of biosphere-atmosphere feed-backs in climate change: coupled model simulations for 6000 years BP and comparison with palaeodata for northern Eurasia and northern Africa. *Climate Dynamics*, 13, 865-882.
- The study of geosystems at experimental stations*, 1984: Moscow, Academy of Sciences of the USSR. 271 pp. (in Russian)
- Thomas, G., and P. R. Rowntree, 1992: The boreal forests and climate. *Quart. J. Roy. Meteorol. Soc.*, 118, 469-497.
- Thunnissen H.A.M and Nieuwenhuis G.J.A., 1990: A Simplified Method to Estimate Regional 24-h Evapotranspiration from Thermal Infrared Data. *Remote Sens. Environ.*, 31, 211-225.
- Tian, H., J.M. Melillo, D.W. Kicklighter, S. Pan, et al. 2003. Regional carbon dynamics in monsoon Asia and its implications to the global carbon cycle. *Global and Planetary Change* 37, 201-217.
- Titlyanova, A.A. and M. Tesarzhova, 1991: *Regimes of the Biological Cycle*. Novosibirsk, Nauka, 150 pp. (in Russian).
- Tjuri, E.G., 1991: Examining glades from large-scale air images. *Forestry*, No. 1, 1–42 (in Russian).
- Tol, R., 2000: An Overview of European Vulnerability to Impacts of Accelerated Sea-Level Rise (ASLR). *Proceeding of SURVAS Expert Workshop on European Vulnerability and Adaptation to impacts of Accelerated Sea-Level Rise (ASLR)*. Hamburg, Germany, 19th-21st June 2000, p. 109.
- Tomirdiaro, S.V., 1990: *The Loess Ice-Rich Formation in the East Siberia During the Late Pleistocene (Lessovo-Ledovaya Formatsia Vostochnoi Sibiri v Pozdнем Pleistocene i Golocene)*. Nauka, Moscow (in Russian).
- Tomppo, E., 1996: Multi-source National Forest Inventory of Finland. In: Päivinen, R., Vanclay, J. & Miina, S. (eds.). *New Thrusts in Forest Inventory*. Proc. of Subject Group S4.02-00 'Forest Resource Inventory and Monitoring' and Subject Group S4.12-00 'Remote Sensing Technology'. Volume I. IUFRO XX World Congress, 6-12 August 1995, Tampere, Finland. EFI, *EFI Proceedings*, 7, 27-41.
- Treifeld, R.F., 1998: Forest inventory and planning based on air and satellite information and GIS-technologies. In: V.I. Sukhikh (ed.), *Air and Satellite Methods and*



- Geographical Information Systems in Forestry and Forest Management*, Materials of the 2nd All-Russia Meeting, Moscow, 18–19 November 1998. RAS and Federal Forest Service, Moscow, 92–99 (in Russian).
- Trenberth, K. E., 1999: Conceptual framework for changes of extremes of the hydrological cycle with climate change. *Climatic Change*, 42, 327–339.
- Trenberth, K.E., A. Dai, R.M. Rasmussen, and D.B. Parsons, 2003: The changing character of precipitation. *Bull. Amer. Meteorol. Soc.*, 84, 1205-1217.
- Trifonov, Yu.V., 1981a: Satellites of "Meteor". Investigations of earth from space. *Issledovaniia Zemli iz Kosmosa*, No. 5, 8–20 (in Russian).
- Trifonov, Yu.V., 1981b: Technical means for experiments of remote sensing of the Earth. *Issledovaniia Zemli iz Kosmosa*, No. 5, 21–27 (in Russian).
- Tubiello, F.N. and Ewert, F., 2002: Modeling the effects of elevated CO<sub>2</sub> on crop growth and yield: A review. *Eur. J. Agr.* 18 (1-2), 57-74.
- Tubiello, F.N., Jagtap, S., Rosenzweig, C., Goldberg, R., and Jones, J.W., 2002: Effects of climate change on U.S. crop production from the National Assessment. Simulation results using two different GCM scenarios. Part I: Wheat, Potato, Corn, and Citrus. *Climate Res.*, 20 (3), 259-270.
- Tubiello, F.N., Rosenzweig, C., Kimball, B.A., Pinter, Jr., P.J., Wall, G.W., Hunsaker, D.J., Lamorte, R.L. and Garcia, R.L. 1999: Testing CERES-Wheat with FACE data: CO<sub>2</sub> and water interactions. *Agron. J.*, 91, 247-255.
- Tucker, C. J., W. W. Newcomb, S. O. Los, and S. D. Prince, 1991: Mean and inter-year variation of growing-season normalized difference vegetation index for the Sahel 1981-1989. *Internat. J. Remote Sensing*, 12, 1113-1115.
- Tucker, C.J., 1979: Red and photographic infrared linear combinations for monitoring vegetation. *Remote Sensing of the Environment*, 8, 127-150.
- Turnipseed, A. A., Blanken, P. D., Anderson, D. E., Monson, R. K., 2002: Energy budget above a high-elevation subalpine forest in complex topography. *Agric. Forest Meteorol.*, 110, 177-201.
- Tzelniker Yu., Malkina I., Kovalev A., Molchanov A., Mamaev V., Chmora S., 1993: *Growth and CO<sub>2</sub>-gas exchange of forest trees*. Moscow, Verlag „Nauka“, 255 pp. (in Russian).
- Tzelniker Yu., Malkina I., Kovalev A., Molchanov A., Mamaev V., Chmora S., 1993: *Growth and CO<sub>2</sub>-gas exchange of forest trees*. Moscow, Nauka, 255 pp. (in Russian).
- Ulaby, F. T., R. K. Moore, and A. K. Fung, 1986: *Microwave Remote Sensing: Active and Passive*, Vol. III – Volume Scattering and Emission Theory, Advanced Systems and Applications, Artech House, Inc., Dedham, Massachusetts, 1100 pages.
- Ulaby, F. T., R. K. Moore, and A.K. Fung, 1982: *Microwave Remote Sensing: Active and Passive*, Vol. II – Radar Remote Sensing and Surface Scattering and Emission Theory, Addison-Wesley, Advanced Book Program, Reading, Massachusetts, 609 pages.
- United Nations Convention to Combat Desertification, 1992: <http://www.unccd.org>.
- Utechin V.D., 1997: *Primary biological production of forest-steppe ecosystems*. Moscow, Nauka, 197 pp. (in Russian).
- Utkin A.I. and Zukert N.V., 2003: Chapter 1. Boreal forests. In: Ed. By A.S. Isaev. Trace elements in boreal forests. M. Nauka, 5-20.
- Utkin A.I., 1995: The carbon cycle and forest science. *Russian J. of Forest Science (Lesovedenie)*, No. 5, 3-19 (in Russian).
- Vaganov E.A. Kirdianov A.V., Silkin P.P., 1999: Importance of early summer temperature and dates of the snowmelt for the tree growth in Sub-Arctic Siberia. *Russian J. of Forest Science "Lesovedenie"*, No. 6, 3-14 (in Russian).
- Vaganov, A., 1998: A "baby" that plays with sea level. *N.G. Science*, 6 June, 1-31, 1998.
- Vaganov, E. A., Shiyatov, S.G. and Mazepa, V. S., 1996: *Dendroclimatic Study in Ural-Siberian Subarctic* (Siberian Publishing Firm RAS, Novosibirsk), 246 pp.
- Vaganov, E.A. and E.S. Petrenko, 1997: Russian-American project on forest management in Southern taiga of Krasnoyarsk Krai, based on ecosystem approaches. Proceedings of the VII Annual Conference "Sustainable Development of Boreal Forests". Moscow, 20–29 (in Russian).
- Valendik, E.N. and A.I. Sukhinin, 1991: System for forecasting and observations of forest fires. *Aerospace Monitoring of Forests*, Moscow, 110–122 (in Russian).
- Valendik, E.N., 1996: Strategy for fire prevention of Siberian forests. *Forestry*, No. 3, 12–15 (in Russian).
- Valentini R., Dore S., Marchi G., Mollicone D., Panfyorov M., Rebmann C., Kolle O., and Schulze E.-D., 2000: Carbon and water exchanges of two contrasting central Siberia landscape types: regenerating forest and bog. *Functional Ecology*, 14, 87-96.
- Valentini R., Matteucci A., Dolman A., Schulze E.-D., Rebmann C., Moors E., Granier A., 2000: Respiration as the main determinant of carbon balance in European forests. *Nature*, 400, 149-151.
- Valentini, R. (Ed.), 2003b: *Fluxes of carbon, water and energy of European forests*. Ecological studies, Springer, Berlin. 274 pp.
- Valentini, R., 2003a: EUROFLUX: An integrated network for studying the long-term responses of biospheric exchanges of carbon, water, and energy of European forests. *Fluxes of Carbon, Water and Energy in European Forests*, 163, 1-8.
- Van Dorland R., Stammes, P., Holtslag, A.A.M. and W. Kohsiek., 1999: A longwave radiation transfer scheme for climate modelling and its evaluation with surface observations at Cabauw. In: *Radiation and Climate. From radiative transfer modelling to global temperature response*. Van Dorland, PhD thesis. ISBN 90-646-4032-7
- Van Eerden (ed.), 2000: *Pechora Delta: Structure and Dynamics of the Pechora Delta Ecosystems (1995-1999)*. Inst. Inland Water Management and Wastewater Treatment. 367 pp.
- Van Ulden A. P. and J. Wieringa J., 1996: Atmospheric boundary layer research at Cabauw. *Bound.-Layer Meteorol.*, 78, 39-69.
- Vannari, P.I., 1911: Meteorological networks in Russia and other countries. *Issue of Meteorological Papers in the Memory of the Chief of the Meteorological Committee of Emperor Russian Geography Society A.I. Voeikov*, 1, 51-64 (in Russian).
- Varjo, J., 1997: Change detection and controlling forest information using multitemporal Landsat TM imagery.

- Acta Forestalia Fennica*, 258, 64 pp.
- Varlagin A.V. and Vygodskaya N.N., 1993: Influence of ecological and morphological factors on stomata resistance of Norway spruce. *Russian J. of Forest Science "Lesovedenie"*, 3, 48-60 (in Russian).
- Vasiliev S.V., Tityanova A.A., Velichko A.A. (Eds.) 2001: *West Siberian Peatlands and Carbon Cycle: Past and Present*. Proc. Intern. Field Symp., Novosibirsk, 250 pp.
- Vasilkov, A., 1997: A retrieval of coastal water constituent concentrations by least-square inversion of a radiance model. Proc. Of the Forth Int. Conf. On Remote Sensing for Marine and Coastal Environment. Publ. by Env. Research Inst. of Michigan, Ann Harbor, Mich., 1997, 2, 107-116.
- Vedrova E.F., Mindeeva T.N., 1998: Intensity of carbon dioxide production under forest litter decomposition. *Russian J. of Forest Science (Lesovedenie)*, No.1, 30-41 (in Russian).
- Velichko A.A. (Ed.), 1984: Late Quaternary environments of the Soviet Union. University of Minnesota Press, Minneapolis 327 pp.
- VEMAP Members, 1995: Vegetation/Ecosystem Modeling and Analysis Project (VEMAP): Comparing biogeography and biogeochemistry models in a continental-scale study of terrestrial ecosystem responses to climate change and CO<sub>2</sub> doubling. *Global Biogeochemical Cycles*, 9, 407-437.
- Verkhoyarov, G.N., D.I. Gvozdev, V.D. Markov, A.S. Olenin, A.A. Sinadskij, 1980: *Peat deposits of Leningrad oblast* (surveyed by 01. 1978). Vols. 1 and 2. Publ. of the Ministry of Geology of the Russian Federation, Moscow, Russia (in Russian).
- Victorov, S., 1996: *Regional Satellite Oceanography*, Taylor and Francis, London, 312 pp.
- Vidal A. and Perrier A., 1989: Analysis of a Simplified Relation for Estimating Daily Evapotranspiration from Satellite Thermal IR Data. *Int. J. Remote Sensing*, 10, 1327-1337.
- Viereck, L.A., 1973: Wildfire in the taiga of Alaska. *Quaternary Research*, 3, 465-95.
- Viereck, L.A., 1975: Forest Ecology of the Alaskan Taiga. pp 1-22. In *Proceedings of the Circumpolar Conference on Northern Ecology* (National Research Council of Canada, Ottawa).
- Viereck, L.A., 1982. Effects of fire and firelines on active layer thickness and soil temperatures in interior Alaska. The Roger J.E. Brown memorial volume: proceedings of the Fourth Canadian Permafrost Conference, Calgary, Alberta, March 2-6, 1981, French, H.M., editor, NRCC -- National Research Council of Canada, no. 20124: 123-135.
- Viereck, L.A., Dryness, C.T., Van Cleve, K. and Foote, M.J., 1983: Vegetation, soils, and forest productivity in selected forest types in interior Alaska. *Canadian Journal of Forest Research*, 13, 703-720.
- Vilesov E.N. and Uvarov V.N., 2001: Evolyutsiya sovremennogo oledeneniya Zailiyskogo Alatau v XX veke (*The evolution of modern glaciation of the Zailiyskiy Alatau in the XX-th century*). Almaty: Kazakh State University. 252 pp. (in Russian)
- Vilesov, E. N. and Uvarov, V. N., 1997: Mountain Glaciers Fluctuation as a Climate Change Indicator. *Hydrometeorology and Ecology*, 3, 165-175. (in Russian).
- Viña, A., G. M. Henebry and A. A. Gitelson, 2004: Satellite monitoring of vegetation dynamics: Sensitivity enhancement by the Wide Dynamic Range Vegetation Index. *Geophysical Research Letters*, 31 (4) L04503. doi:10.1029/2003GL019034.
- Vinnikov, K. Ya. and Groisman, P. Ya., 1979: An empirical model of the present-day climatic changes. *Meteorology and Hydrology*, No. 3, 25-36 (in Russian, in English in *Soviet Meteorology and Hydrology*, 1979, No.3, 18-27).
- Vinnikov, K. Ya. and Yeserkepova, I.B., 1991: Soil Moisture: Empirical Data and Model Results. *Journal of Climate*: 4, 66-79.
- Vinnikov, K.Ya. and Groisman, P.Ya., 1982: Empirical study of climate sensitivity. *Physics of Atmosphere and Oceans*, 18, No.11, 1159-1169 (in English, pp. 895-902).
- Vinnikov, K.Ya., 1986: *Climate Sensitivity*. Leningrad, Gidrometeoizdat. 224 pp. (in Russian).
- Vinnikov, K.Ya., Groisman, P.Ya. and Lugina, K.M., 1990: The empirical data on modern global climate changes (temperature and precipitation). *J. Climate*, 3, 662-677.
- Vinogradov B.V., Kulik K.N., Sorokin A.D., Fedotov P.B. 1996: Izodynamic mapping of ecological damage using aero- and space images. *Reports of Russian Acad. Sci. Ser. General Biology*, 359, No 4, 560-564 (in Russian).
- Viovy N., 2002: Coupling chemistry and physics in the terrestrial biosphere: the PILPS-C1 experiment. *GEWEX News*, 12, No.3, p.8.
- Virtanen T., Mikkola K., Patova E., Nikula A. 2002: Satellite image analysis of human caused changes in the tundra vegetation around the city of Vorkuta, north-European Russia. *Environmental Pollution*, 120, 647-658.
- Viterbo, P., and A. K. Betts, 1999: Impact on ECMWF forecasts of changes to the albedo of the boreal forests in the presence of snow, *J. Geophys. Res.*, 104(D22), 27,803-27,810.
- Vitousek, P.M. and Farrington H., 1997: Nutrient limitation and soil development: Experimental test of a biogeochemical theory. *Biogeochemistry*, 37, 63-75.
- Vitousek, P.M., H.A. Mooney, J. Lubchenco, and J.M. Melillo, 1997: Human domination of earth's ecosystems. *Science*, 277, 494-499.
- Vitousek P.M. and Field C.B., 2001: Input/output balances and nitrogen limitation in terrestrial ecosystems. In: *Global Biogeochemical Cycles in the climate system*. (Eds. E.-D.Schulze, M.Haimann, S. Harrison, S. Holland, J.Lloyd, C.Prentice, and D. Schimel). Academic Press, San Diego, 217-225.
- Vitousek P.M. and Howard R.W., 1991: Nitrogen limitation on land and in the sea: How can it occur? *Biogeochemistry*, 13, 87-115.
- Vitt H.D., Halsey L.A. and Zoltai S.C., 2000: The changing landscape of Canada's western boreal forest: the current dynamics of permafrost, *Canadian Journal of Forest Research* 30, 283-287.
- Vlasova T.V. *Physical geography of the continents - Moscow*, "Enlightenment", 1976, 460 pp. (in Russian).
- VNIICLesresurs, 1995: Instruction on Forest Inventory and Planning in the Russian Forest Fund, Part 1, Organization of forest inventory. Field works. Moscow, 175 pp. (in Russian).
- Voeikov, A.I., 1889: Snow cover, its effects on soil, climate, and weather and methods of investigations, Notes of the Russian Geographical Society on the General Geography,

- 18, No. 2, 212 pp. (in Russian).
- Volodin, E. M. and V. N. Lykosov, 1998: Parameterization of Heat and Moisture Transfer in the Soil-Vegetation System for Use in Atmospheric General Circulation Models. 2. Numerical Experiments in Climate Modelling. *Izvestiya Atmosph. Ocean Physics*, 34, 559-574.
- Vompersky S.E. 1994a: Role of peatlands in carbon cycle. In: *Biogeocoenological peculiarities of peatlands and their rational use*. Moscow. Nauka Publishers, 1994a. 5–37.
- Vompersky S.E. et al., 1998: Paludified area of Russia as a factor of carbon deposition. In: Zavarzin G.A. (ed.). Carbon turnover on the territory of Russia. *Global changes in environment and the climate*. Selected scientific papers. Special issue. Moscow: Scientific Council of the Federal Research Program of Russia, State Scientific and Research Center for Warning on Geocological and Technogeneous Disasters, Moscow Branch SSRC WGD Ministry of Education of Russia. 124–144. (in Russian).
- Vompersky S.E., 1999: Biosphere role of peatlands, paludified forests and the problem of their sustainable use. In: Vompersky S.E. and Sirin A.A. (Eds.), 1999: *Peatlands and paludified forests within objectives of sustainable use of nature*. GEOS Publishing house, Moscow. 166–172.
- Vompersky S.E., Ivanov A.I., Tsiganova O.P., Valjaeva N.A., Glukhova T.V., Dubinin A.I., Glukhov A.I., Markelova L.G., 1994: Bogged organogenic soils and bogs of Russia and storage of carbon in their peat. *Soil Science (Pochvovedenie)*, No.12, 17-25 (in Russian)
- Vompersky S.E., Ivanov A.I., Tsyganova O., et al. 1994b: Peaty soils and peatbogs of Russia and carbon storage in their peats. *Eurasia Soil Science*, №12. 17-25.
- Vompersky S.E., Tsyganova O., Valyaeva N. et al. 1996: Peat-covered wetlands of Russia and carbon pool of their peat. *Peatlands Use — Present, Past and Future*. Proc. 10th Intern. Peat Congr. (Bremen, Germany, 27 May — 2 June 1996). Stuttgart: E.Schweizerbart'sche Verlagsbuchhandlung (Nägele u. Obermiller), Vol. 2. 381-390.
- Voronkov N.A., 1988: *Role of forest in protection of the water resources*. Leningrad, Verlag "Nauka", 286 pp. (in Russian).
- Voronkov P.P., 1970: Hydrochemistry of Local Runoff of the European Territory of the USSR. Leningrad, Gidrometeoizdat, 199 pp.
- Voropayev, G.V., 1997: The problem of the Caspian Sea level forecast and its control for the purpose of management optimization. In: M.H. Glantz and I.S. Zonn (Eds.), *Scientific, Environmental, and Political Issues in the Circum-Caspian Region*. Cambridge, UK: Cambridge University Press, 105-118.
- Vörösmarty, C. J., B. M. Fekete, M. Meybeck, R. B. Lammers, 2000: Global system of rivers: Its role in organizing continental land mass and defining land-to-ocean linkages. *Global Biogeochem. Cycles*, 14, 599-621.
- Vörösmarty, C.J., Grabs W., Goodison B., Barry R., Kitaev L., Hall A., 2001b: Global Water Data: A Newly Endangered Species. *EOS Transactions*, 82, 24-26.
- Vörösmarty, C.J., L.D. Hinzman, B.J. Peterson, D.H. Bromwich, L.C. Hamilton, J.Morison, V.E. Romanovsky, M.Sturm, and R.S. Webb, 2001a: *The Hydrologic Cycle and its Role in Arctic and Global Environmental Change: A Rationale and Strategy for Synthesis Study*. Fairbanks, Alaska: Arctic Research Consortium of the U.S., 84 pp.
- Vörösmarty, C.J., P.Green, J. Salisbury, and R.B. Lammers, 2000: Global water resources: Vulnerability from climate change and population growth. *Science*, 289, 284-288.
- Vörösmarty, C. and Co-Authors, 2004: Human Transforming the Global Water System. *EOS*, 85, 509, 513-514.
- Voskresensky, K.P., 1972: Long-term variability of annual runoff of rivers of the Soviet Union and separate its regions. *Transactions of the State Hydrol. Inst.*, 200, 88-102.
- Vuglinsky, V., 1997: River water inflow to the Arctic Ocean - conditions of formation, time variability and forecast. *Proceedings Conference on Polar Processes and Global Climate*. Rsarío, Orcas Island, Washington, USA, 3-6 November 1997, 275-276.
- Vukolova, I.A. and O.L. Orlova, 1997: Assessment of forest recovering on glades by remote methods. In: Problems of Forest Organization. Moscow, VNIILM, 93–99 (in Russian).
- Vygodskaya N., Schulze E.-D., Varlagin A., Kurbatova J., Milukova I., Sogachev A., Sidorov K., Tatarinov F., Kozlov D., Kolle O., Jeltuhun A., Heiman M., 2003: Long-term measurements of ecosystem-atmosphere exchange in southern European taiga. *European Conference "The continental carbon cycle"*, 19-21 March, 2003. Lisbon, Portugal, p. 33.
- Vygodskaya N.N., 1981: *Solar radiation regime and structure of mountain forests*. Hidrometeoizdat, Leningrad, 261 pp.(in Russian)
- Vygodskaya N.N., Milyukova I.M., Varlagin A.V., Tatarinov F.A., 1997: Leaf conductance and CO<sub>2</sub> assimilation of *Larix gmelinii* under natural conditions of Eastern Siberian boreal forest. *Tree Physiology*, 17, 607-615.
- Vygodskaya N.N., Puzachenko Y.U. Kozharinov A., Zavelskaya N., Tchernyshev M., Tatarinov F., Varlagin A., Milyukova I., 1995: Long-term effects of climate on *Picea abies* communities in South European taiga. *J. Biogeography*, 22, 433-443.
- Vygodskaya N.N., Schulze E.-D., Tchebakova N.M., Karpachevskii L.O., Kozlov D., Sidorov K.N., Panfyorov M., Abrazko M.A., Shaposhnikov E.S., Solnzeva O.N., Minaeva T.Y., Jeltuchin A.S., Pugachevskii M.Y., 2002: Climate control of stand thinning in unmanaged spruce forests of the southern taiga in European Russia. *Tellus*, 54B, 5, 443-461.
- Vygodskaya N.N., Schulze E.-D., Varlagin A., Kurbatova J., Kozlov D., Sogachev A., Oltchev A., Puzachenko Yu., Sidorov K., Tatarinov F., Kolle O., Lloyd J., Jeltuchin A. and Heimann M., 2003: EuroSiberian Carbonflux, TCOS-Siberia: Long-term measurements ecosystem-atmosphere CO<sub>2</sub> exchange in southern european taiga. Carbon conference "The continental carbon cycle". 19-21 March 2003, Lisbon, Portugal, 77-78.
- Vygodskaya N.N., Varlagin A.V., Kurbatova J.A., Milyukova I.M., 2003: Structure of evaporation in a forest under different soil moisture at the boreal European zone. *Dokl. RAS, ser. Biological* (in Russian, in review)
- Vygodskaya N.N., Varlagin A.V., Kurbatova J.A., Sogachev L. M., Sogachev A.F., Sidorov, K.N., Milyukova I.M., Shaposhnikov E.S., Nepomniaschii G.I. and Abrazko

- M.A. 2004: Multi-year variability of soil water and spruce mortality in southern European taiga. *Russian J of Forest Science "Lesovedenie"* (in Russian, in press)
- Vygodskaya, N. and Gorshkova, I., 1989; Calculations of canopy spectral reflectance using the Goudriaan reflectance model and their experimental evaluation. *Remote Sens. Environ.*, 27, 321 - 326.
- Vygodskaya, N. and Varlagin, A., 1993: Influence of ecological and morphological factors on stomata resistance of Norway spruce. *Lesovedenie (Russian J. of Forest Science)*, 3, 48-60 (in Russian).
- Vygodskaya, N., 1988: Climate as an ecological factor in mountain regions: current problems. *Abstracta Botanica*, 12, 89-102.
- Vygodskaya, N.N. and I.I. Gorshkova, 1987: *Theory and experiment in remote sensing of vegetation*. Gidrometeoizdat, Leningrad, 248 pp. (in Russian).
- Vygodskaya, N.N., Varlagin, A.V., Gorshkova, I.I., Zavelskaya, N.A., Milyukova, I.M., Tatarinov, F.A., Tchernyshev M.K., 1995b: An interactive role of vegetation in forming the energy and mass exchange between the underlying surface and atmosphere. In: *Problems of monitoring and modeling of forest ecosystem dynamics* (Ed. A.S. Isaev). Moscow, International Forest Institute, Centre on ecology and forest productivity, Russian Academy of Sciences, "ECOLEs" (in Russian). 77-103.
- Wagner W., Lemoine G., Borgeaud M., Rott H. 1999: A Study of Vegetation Cover - Effects on ERS Scatterometer Data. *IEEE Transactions on Geoscience and Remote Sensing*, 37, 938 -948.
- Wagner, W., A. Luckman, J. Vietmeier, K. Tansey, H. Balzter, C. Schmullius, M. Davidson, D. Gaveau, M. Gluck, T. Le Toan, S. Quegan, A. Shvidenko, A. Wiesmann, J. Jiong Yu, 2003: Large-Scale Mapping of Boreal Forest in SIBERIA using ERS Tandem Coherence and JERS Backscatter Data, *Remote Sensing of Environment*, 85(2), 125-144.
- Wagner, W., K. Scipal, C. Pathe, D. Gerten, W. Lucht, B. Rudolf, 2003: Evaluation of the agreement between remotely sensed soil moisture data with model and precipitation data, *J. Geophys. Res. – Atmos.*, in press.
- Wagner, W., Luckman, A., Vietmeier, J., Tansey, K., Balzter, H., Schmullius, C., Davidson, M., Gaveau, D., Gluck, M., Le Toan, T., Quegan, S., Shvidenko, A., Wiesman, A., Jiong Yu, J., 2003: Large-scale mapping of boreal forest in Siberia using ERS tandem coherence and JERS backscatter data. *Remote Sensing of Environment* 85 (2), 125-144.
- Walker, D. A., G. J. Jia, H. E. Epstein, M. A. Reynolds, F. S. Chapin , III, C. D. Copass, L. Hinzman, H. Maier, G. J. Michaelson, F. Nelson, C. L. Ping, V. E. Romanovsky, N. Shiklomanov, and Y. Shur, 2003: Vegetation-soil-thaw depth relationships along a Low-Arctic bioclimate gradient, Alaska: Synthesis of information from the ATLAS studies, *Permafrost and Periglacial Processes*, 14(2), 103-124.
- Walker, D.A., 2000: Hierarchical subdivision of Arctic tundra based on vegetation response to climate, parent material and topography. *Global Change Biology*, 6, S19-S34.
- Walling, D.E., 1999: Linking land use, erosion and sediment yields in river basins. *Hydrobiologia*, 410, 223-240.
- Walse, C., Schöpp, W., Warfvinge, P., Sverdrup, H., 1996: Modeling long-term impact on soil acidification for six sites in Europe. In: *Reports in ecology and environmental engineering*:3, Lund University, Lund, Sweden. 63 pp.
- Walter BP, M Heimann, E Matthews, 2001a: Modeling modern methane emissions from natural wetlands, 1, model description and results. *J. Geophys. Res.*, 106, 34189-34206.
- Walter BP, M Heimann, E Matthews, 2001b: Modeling modern methane emissions from natural wetlands, 2, Interannual variations 1982-1993. *J. Geophys. Res.*, 106, 34207-34219.
- Walter, F., 1998: Remote-sensing for forestry planning. Redogörelse Nr. 9. The Forestry Research Institute, Uppsala, Sweden.
- Wan Z., and Li Z.-L., 1997: A physics-based algorithm for retrieving land-surface emissivity and temperature from EOS/MODIS data, *IEEE Trans. Geosci. Remote Sens.*, 35, 980-996.
- Wang J., 2001: The correction of flux measurements in GAME-Tibet, *Proc. GAME ANN/Radiation Workshop*, Phuket, 81-82.
- Wang, G., and D. Schimel, 2003: Climate change, climate modes, and climate impacts. *Annu. Rev. Environ. Resour.*, 28, 1-28.
- Wang, Z., X. Zeng, M. Barlage, R. E. Dickinson, F. Gao, and C. Schaaf, Using MODIS BRDF and Albedo Data to Evaluate Global Model Land Surface Albedo, 2004: *J. Hydrometeorol.*, 5, 3-14.
- Wanner, W., A. H. Strahler, B. Hu, P. Lewis, J.-P. Muller, X. Li, C. L. Barker Schaaf, and M. J. Barnsley, (1997). Global retrieval of bidirectional reflectance and albedo over land from EOS MODIS and MISR data: theory and algorithm. *J. Geophys. Res.*, 102, 17143-17162, 1997.
- Wardle D., 1998: Control of temporal variability of the soil microbial biomass: a global –scale synthesis. *Soil Biol. Biochem.*, 30, 1627-1637.
- Waring R.H. and Running S.W, 1998: *Forest Ecosystems: Analysis at Multiple Scales*. Academic Press, San Diego, CA, USA. 370 pp.
- Warner-Merl, K., 1998: Air pollution in Siberia: A volume and risk-weighted analysis of a Siberian pollution database. International Institute for Applied Systems Analysis, Interim Report IR-98-059/October, 45 pp.
- Water and energy cycle in permafrost regions of Eastern Siberia*, 1999: (Eds. Georgiadi .G. and Fukushima Y.) Research report of IAHS, No.6 and GAME publication No.17, Moscow-Nagoya. Publisher: Institute for Hydrospheric-Atmospheric Sciences, Nagoya University, Nagoya, Japan, 265 pp.
- Water resources and water budget of the USSR*. Gidrometeoizdat, Leningrad, 1967, 199 pp. (in Russian)
- Water Resources of the USSR and their use*. 1987: Leningrad, Gidrometeoizdat, 302 pp.
- Watson K., 1974: Geothermal reconnaissance from quantitative thermal infrared images. *9-th Symp. Remote Sensing of Environment*, Univ. of Michigan, 1919 - 1932.
- Watson K., 1992a: Spectral ratio method for measuring emissivity. *Remote Sens. Environ.* 42, 113-116.
- Watson K., Rowan L.C., Offield T.V., 1971: Application of Thermal Modelling in Geologic Interpretation of IR Images. Proc. of 7-th Int. Symp. on Remote Sensing of Environment. Ann Arbor. Michigan.

- Watson R.T., M.C. Zinyowera, R.H. Moss (eds), *Climate Change, 1995: Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses*, Contribution of Working Group II to the Second Assessment of the Intergovernmental Panel on Climate Change, Cambridge University Press, UK. 878 pp.
- Watson, K., 1992b: Two-temperature method for measuring emissivity. *Remote Sens. Environ.* 42, 117-121.
- Watson, R.T., Noble, I.R., Bolin, B., Ravindranath, N. H., Verardo D. J., and Dokken, D. J., 2000. IPCC Special Reports. *Land Use, Land-Use Change, and Forestry*. Cambridge University Press, Cambridge, 324 pp.
- WCRP-72, 1992: Scientific concept of the Arctic climate system study (ACSYS) Report of the JSC Study Group on ACSYS. (Bremerhaven, Germany, 10-12 June 1991 and London, U.K., 18-19 November 1991) *WMO/TD-No 486*, 89 pp.
- Webb, E.K., Pearman, G.I. and R. Leuning, 1980: Correction of flux measurements for density effects due to heat and water vapour transfer, *Quart. J. R. Met. Soc.*, 106, 85-100.
- Websites of the International Council for the Exploration of the Sea (ICES) ([www.ices.dk](http://www.ices.dk)), the International Baltic Sea Fishery Commission (IBSFC) ([www.ibsfc.org](http://www.ibsfc.org)) and the Helsinki Commission (HELCOM) ([www.helcom.fi](http://www.helcom.fi)).
- Wegmueller, U. and C.L. Werner, 1995: SAR interferometric signatures of forest. *IEEE Transactions on Geoscience and Remote Sensing*, 33, No. 5, 1153-1161.
- Wegmueller, U. and C.L. Werner, 1997: Retrieval of vegetation parameters with SAR interferometry. *IEEE Transactions on Geoscience and Remote Sensing*, 35, No. 1, 18-24.
- Wein, R.W. and MacLean, D.A., 1983: *The Role of Fire in Northern Circumpolar Ecosystems*. J.Wiley and Sons, New York, 322 pp.
- Weinreb, M. P., M. Jamieson, N. Fulton, Y. Chen, J. X. Johnson, J. Bremer, C. Smith, and J. Baucom, 1997: Operational calibration of Geostationary Operational Environmental Satellite-8 and -9 imagers and sounders. *Applied Optics*, 36, 6895-6904.
- Weishampel, J.F., Sun, G., Ranson, K.J., LeJeune, K.D. and Shugart H.H., 1994: Forest textural properties from simulated microwave backscatter: the influence of spatial resolution. *Remote Sensing of the Environment*, 47, 120-131.
- Weishampel, J.F., Urban, D.L., Shugart H.H. and Smith J.B., 1992: Semivariograms from a forest transect gap model compared with remotely sensed data. *Journal of Vegetation Science* 3, 521-526.
- Weissflog, L., Pfennigsdorff, A., Martinez-Pastur, G., Puliafito, E., Figueroa D., Elansky N., Nikonov, V., Putz, E., Kruger G., and Kellner K., 2001: Trichloroacetic acid in the vegetation of polluted and remote areas of both hemispheres – Part 1. Its formation, uptake and geographical distribution. *Atmospheric Environment*, 35, 4511-4521.
- Werner R.A., Raffa K.F. and Illman B.L., 2003: Insect and pathogen dynamics in the Alaskan boreal forest. In: *Alaska's Changing Boreal Forest*. Oxford University Press. In review.
- Wetzel P. and Boone A., 1995: A parameterization for land-atmosphere-cloud exchange (PLACE): documentation and testing of a detailed process model of the partly cloudy boundary layer over heterogeneous land. *J. Climate*, 8, 1810-1837.
- Wickel, A.J., T.J. Jackson, and E.F. Wood, 2001: Multitemporal monitoring soil moisture with RADARSAT SAR during the 1997 Southern Great Plains 1997 hydrology experiment. *Int. J. Remote Sensing*, 22, 1571-1583.
- Widowski, J-L., B. Pinty, N. Gobron, M. M. Verstraete, and A. B. Davies, 2001: Characterization of Surface Heterogeneity Detected at the MISR/TERRA Subpixel Scale. *Geophys. Res. Lett.* 28, 4639-4642.
- Wielicki, B. A., R. d. Cess, M. D. King, D. A. Randall, E. F. Harrison, 1995: Mission to planet earth-role of clouds and radiation in climate. *Bull. Amer. Meteor. Soc.*, 76, 2125-2153.
- Wigley, T.M.L. Ingram M.J. and Farmer J., (eds.), 1981: *Climate and History*. Cambridge Univ. Press, Cambridge. 456 pp.
- Wilander, A., 2001: Effects of reduced S deposition on large-scale transport of sulphur in Swedish rivers. *Water, Air, and Soil Pollution*, 130, 1421-1426.
- Wilber, A.C., G. L. Smith and P. W. Stackhouse, Jr., 1999: Regional Climatology and Surface Radiation Budget, *American Meteorological Society 10th Conference on Atmospheric Radiation*, Madison, Wisconsin, June 28--July 2, 1999, [Available at: <http://techreports.larc.nasa.gov/ltrs/2001-cit.html>]
- Wild, M., 1999: Discrepancies between model-calculated and observed shortwave atmospheric absorption in areas with high aerosol loadings *J. Geophys. Res.*, 104 (22), 27361-27371.
- Wilhite D.A. (Ed.), 2000: *Drought. A global Assessment*. Routledge Hazards Disasters Series. Routledge. V.I. 395 pp.
- Williams, R.S. and Ferrigno, J. (eds) 1988-2003: *Satellite Image Atlas of Glaciers of the World..* U.S. Geol. Surv. Details: <http://pubs.usgs.gov/fs/fs133-99/>
- Williamson, D.L., J.T. Kiehl, V. Ramanathan, R.E. Dickinson and J.J. Hack, 1987: Description of the NCAR community climate model (CCM1). NCAR Technical Note TN-285+STR. National Center for Atmospheric Research, Boulder, Colorado.
- Willmott C.J., Rowe C.M., and Mintz Y., 1985: Climatology of the terrestrial seasonal water cycle. *J. Climatology*, 5, 589-606.
- Wilson K. and Baldochi D., 2000: Seasonal and interannual variability of energy fluxes over a broadleaved temperate deciduous forest in North America. *Agricultural and Forest Meteorology* 100, 1-18.
- Wilson, K., Goldstein, A., Falge, E., Aubinet, M., Baldocchi, D.D., Bernhofer, Ch., Ceulemans, R., Dolman, H., Field, C., Grelle, A., Law, B., Loustau, D., Meyers, T., Moncrieff, J., Monson, R., Oechel, W., Tenhunen, J., Verma, S., 2002: Energy balance closure at FLUXNET sites. *Agric. Forest Meteorol.*, 113, 223-243.
- Wirth C., E.-D.Schulze, Lühker B., Grigoriev S., Siry M., Harde., Ziegler W., Backor M., Bauer G. and Vygodskaya N.N., 2002: Fire and site type effects on the long-term carbon and nitrogen balance in pristine Siberian Scots pine forest. *Plant and Soil*, 242, 41-63.
- Wirth C., Schulze E.-D., Kusnetzova W., Harges G., Siry M. Schulze B. And Vygodskaya N.N., 2001: Comparing the influence of the site quality, stand age, fire and climate

- on aboveground tree production in Siberian Scots pine forests. *Tree Physiol.*, 22, 537-552.
- Wirth C., Schulze E.-D., Luhker B., Grigoriev S., Siry M., Harges G., Ziegler W., Backor M., Bauer G. and Vygodskaya N.N., 2002: Fire and site type effects on the long-term carbon and nitrogen balance in pristine Siberian Scots pine forest. *Plant and Soil*, 242, 41-63
- Wirth C., Schulze E.-D., Schulze W., von Stunzner-Karbe D., Ziegler W., Miljukova I., Sogachev A., Varlagin A.B., Panyvorov M., Grigoriev S., Kuznetzova W., Siry M., Harges G., Zimmerman R. And Vygodskaya N.N., 1999: Above-ground biomass and structure of pristine Siberian Scots pine forest as controlled by competition and fire. *Oecologia*, 121, 66-80.
- Wofsy, S. C. and D. Y. Hollinger, 1997: Science plan for AmeriFlux: Long-term flux measurement network of the Americas. 17 pp. [Available at: <http://public.ornl.gov/ameriflux/About/scif.cfm>].
- Wood, E.F., D.P. Lettenmaier, X. Liang, B. Nijssen, and S.W. Wetzel, 1997: Streamflow Simulation for Continental-Scale Watersheds, *Water Resources Research*, 33(4), 711-724.
- Wood, E.F., 1999: Hydrological modeling from local to global scales. In: *Anthropogenic Climate Change*, (H. von Storch and G. Floser, Eds.), Springer Verlag, New York. pp. 60-81.
- Woodward F.I., 1995: Ecophysiological control of conifer distributions. In: *Ecophysiology of coniferous forests*. Eds. W.K. Smith and T.M. Hinckley. Academic Press, San Diego, CA, 79-94.
- Wooster, M.J, Zhukov, B, Oertel, D., 2003: Fire radiative energy for quantitative study of biomass burning: derivation from the BIRD experimental satellite and comparison to MODIS fire products. *Remote Sens Environ.*, 86, 83-107.
- World Meteorological Organization, 1992: Scientific Plan for the GEWEX Continental-Scale International Project (GCIP). WCRP-67, WMO/TD-No. 461, WMO, Geneva, 65pp.
- World Meteorological Organization, 1997: Global Climate Observing System: GCOS/GTOS Plan for terrestrial climate-related observations, Version 2.0, GCOS-32, WMO/TD-No796, UNEP/DEIA/TR97-7, WMO, Geneva, Switzerland, 130 pp.
- Xiao, X., Boles, S., Liu, J., Zhuang, D., and Liu, M., 2002: Characterization of forest types in Northeastern China, using multi-temporal SPOT-4 VEGETATION sensor data, *Remote Sensing of Environment*, 82, 335-348.
- Xiao, X., Braswell, B., Zhang, Q., Boles, S., and Moore, B., III, 2004a: Satellite observations of leaf phenology and gross primary production in a deciduous broadleaf forest, *Global Change Biology*, (in review).
- Xiao, X., Braswell, B., Zhang, Q., Boles, S., Frohling, S., and Moore III, B., 2003: Sensitivity of vegetation indices to atmospheric aerosols: continental-scale observations in Northern Asia. *Remote Sensing of Environment*, 84, 385-392.
- Xiao, X., D.W. Kicklighter, J.M. Melillo, A.D. McGuire, P.H. Stone, A.P. Sokolov, 1997: Linking a global terrestrial biogeochemical model and a 2D climate model: implications for the carbon budget. *Tellus*, 49B, 18-37.
- Xiao, X., Hollinger, D., Aber, J., Zhang, Q., and Moore, B. III, 2004b: Satellite-based modeling of gross primary production in an evergreen needleleaf forest, *Remote Sensing of Environment* (in review)
- Xiao, X., Zhang, Q., Hollinger, D., Aber, J., and Moore, B., III, 2004c: How much radiation does forest canopy absorb for photosynthesis? *Global Biogeochemical Cycles* (in review).
- Xie, P., and P. A. Arkin, 1997: Global precipitation: A 17-year monthly analysis based on gauge observations, satellite estimates, and numerical model outputs. *Bull. Amer. Meteor. Soc.*, 78, 2539–2558.
- Xie, P., J. E. Janowiak, P. A. Arkin, R. F. Adler, A. Gruber, R. Ferraro, G. J. Huffman, and S. Curtis, 2003: GPCP pentad precipitation analyses: An experimental dataset based on gauge observations and satellite estimates. *J. Climate*, 16, 2197–2214.
- Xue, Y., S.P. Lawrence, D.T.Llewelling-Jones, and C.T.Multow, 1998: On the Earth's surface energy exchange determination from ERS satellite ATSR data: Part 1. Longwave radiation. *Int. J. Remote Sensing*, 19, 2561-2583.
- Xue, Y., D.T.Llewelling-Jones, S.P. Lawrence, and C.T.Multow, 2000a: On the Earth's surface energy exchange determination from ERS satellite ATSR data: Part 2. Short-wave radiation. *Int. J. Remote Sensing*, 21, 3415-3426.
- Xue, Y., D.T. Llewelling-Jones, S.P. Lawrence, and C.T.Multow, 2000b: On the Earth's surface energy exchange determination from ERS satellite ATSR data: Part 3. Turbulent heat flux on open sea. *Int. J. Remote Sensing* 21, 3427-3444.
- Yacobi, Y.Z. and A.A. Gitelson, 2000: Simultaneous remote measurement of chlorophyll and total seston in productive inland waters. *Verh. int. Ver. Limnol.* 27, 2983-2986.
- Yakurov, V. S., and S.V. Yakurov, 2003: Remote sensing determination of the permafrost thickness. In CD ROM of IUGG 2003 Abstracts, JSH01. The Remote Sensing of the Cryosphere (IAHS[ICS], ICRS], IAMAS, IAPSO) Permafrost, Snow Hydrology.
- Yakushev E.V., Sukhinov A.I., Lukashev Yu.F., Sapozhnikov F.V., Sergeev N.E., Skirta A.Yu. Sorokin P.Yu., Soldatova E.V., Fomin S.Yu., and Yakubenko B.G., 2003: Comprehensive oceanological investigations of the Sea of Azov in the 28-th voyage of "Akvanavt" research vessel (July-August, 2001). *Oceanology*, 43 (1), 44-53.
- Yamamoto S., N. Saigusa, S. Murayama and H. Kondo, 2001: Present Status of Asia Flux Network and Measurements Results of CO<sub>2</sub> Flux, *Proc. GAME ANN/Radiation Workshop*, Phuket, 71-74.
- Yang, D., D. L. Kane, L. Hinzman, X. Zhang, T. Zhang, and H. Ye, 2002: Siberian Lena River hydrologic regime and recent change. *J. Geophys. Res.*, 107(D23), 4694, doi:10.1029/2002JD002542.
- Yang, F., Kumar, A., Schlesinger, M.E., Wang, W., 2003: Intensity of Hydrological Cycles in Warmer Climates. *J.Climate*, 16, 2419-2423.
- Yarie, J., and Billing S., 2002: Carbon balance of the taiga forest within Alaska: present and future. *Canadian Journal of Forest Research*, 32, 757-767.
- Yaroshenko, A. Y., P. V. Potapov, S. A. Turubanova and L. Laestadius, 2001: *Last intact forest landscapes of Northern European Russia*. A joint publication of Greenpeace Russia and Global Forest Watch. 74 pp.

- Yatskov, M., Harmon, M.E., and Krankina, O.N., 2003: A Chronosequence of Wood Decomposition in the Boreal Forests of Russia. *Can. J. Forest. Res.*, 33,1211-1226
- Yershov, E. D., 1998: *General Geocryology*, Cambridge University Press, 580 pp.
- Yoshikawa, K. and L. D. Hinzman, 2003: Shrinking thermokarst ponds and groundwater dynamics in discontinuous permafrost near Council, Alaska, *Permafrost and Periglacial Processes*, 14(2), 151-160.
- Zagorodniuk, I. V., 1999: Steppe fauna hearth of Eastern Europe: its structure and prospects of protection. *Reports Natl. Acad. Sci. Ukr.*, No. 5, 203-210. (In Ukrainian, with English summary).
- Zagorodniuk I. V., 2000: Systematic position of a taxa as a criterium of its vulnerability. *Reports Natl. Acad. Sci. Ukr.*, No. 5, 180-186 (In Ukrainian, with English summary).
- Zaharov, A.I. and L.E. Nazarov, 1998: Classification of forest types based on analysis of texture characteristics by the radio locative images RSA SIR-C. *Issledovaniia Zemli iz Kosmosa*, No. 2, pp. 102–109 (in Russian).
- Zamolodchikov D. G., Karelin D. V., 2001: An empirical model of carbon fluxes in Russian tundra. *Global Change Biology*, 7, 147-162.
- Zamolodchikov D. G., Karelin D. V., Ivaschenko A. I., Oechel W. C., Hastings S. J., 2003: CO<sub>2</sub> flux measurements in Russian Far East tundra using eddy covariance and closed chamber techniques. *Tellus*, 55B, 879-892.
- Zamolodchikov D.G., Karelin D.V. and Ivaschenko A.I., 2000: Sensitivity of tundra carbon balance to ambient temperature. *Water, Air and Soil Pollution*, 119, 157-169.
- Zamolodchikov D.G., Karelin D.V., 1999: Biogenic carbon fluxes in Russian tundra. In: *Global Changes of Environment and Climate* (Ed. G.A. Zavarzin). 146-164. Ministry of science and technology of Russia, Moscow (in Russian).
- Zamolodchikov D.G., Karelin D.V., Ivaschenko A.I., 1998: Postfire alterations of carbon balance in tundra ecosystems: possible contribution to climate change. In: A.G. Lewkowitz and M. Allard. (eds.) *Proceedings of the Permafrost Seventh International Conference*. June 23-27, 1998. National Academy of Sciences. Washington, D. C. 1207-1212.
- Zamolodchikov D.G., Karelin D.V., Ivazhenko A.I., 1998: Threshold temperature of carbon balance of southern tundra. *Transactions ("Doklady") of Russian Acad. Sci.*, 358 (5) 6 1-2 (in Russian).
- Zhai, P. M., A. Sun, F. Ren, X. Liu, B. Gao, and Q. Zhang, 1999: Changes of climate extremes in China. *Climatic Change*, 42, 203–218.
- Zhai, P., Q. Chao, and X. Zou, 2004: Progress in China's climate change study in the 20<sup>th</sup> century. *J. Geograph. Sciences* (English version of *Acta Geographica Sinica*), 14, supplement (2004), 3-11. [Available at: [www.geog.cn](http://www.geog.cn)].
- Zhang, K., B.C. Douglas, and S.P. Leatherman, 2004: Global Warming and Coastal Erosion. *Climatic Change*, 64, 41-58.
- Zhang, T. and R. L. Armstrong, 2001: Soil freeze/thaw cycles over snow-free land detected by passive microwave remote sensing, *Geophysical Research Letters*, 28(5), 763-766
- Zhang, T-J., Heginbottom, J.A., Barry, R.G. and Brown, J., 2000: Further statistics on the distribution of frozen ground and permafrost. *Polar Geography*, 24(2), 126-131.
- Zhang, T-J., Barry, R.G., Knowles, K., Heginbottom, J.A., and Brown, J., 1999: Statistics and characteristics of permafrost and ground ice distribution in the Northern Hemisphere. *Polar Geography*, 23(2), 147-169.
- Zhang, X., M.A. Friedl, C.B. Schaaf, A. H. Strahler, J.C.F. Hodges, F. Gao, B. C. Reed, and A. Huete, 2003: Monitoring vegetation phenology using MODIS, *Remote Sens. Environ.*, 84, 471-475.
- Zhang, Y-C., W.B. Rossow, A.A. Lacis, V. Oinas and M.I. Mishchenko, 2004: Calculation of radiative fluxes from the surface to top of atmosphere based on ISCCP and other global data sets: Refinements of the radiative transfer model and the input data. *J. Geophys. Res.*, 109, D19105, doi:10.1029/2003JD004457.
- Zhao, S. and Q. Wang, 2000: Chinese Ecosystem Research Network (CERN). In: *The International Long Term Ecological Research Network 2000*, J. R. Gosz et al. (eds.). The U.S. Long Term Ecological Research Network Office, University of New Mexico, Albuquerque, New Mexico. 16-25.
- Zheleznyak, M. N., 1998: *Geothermal Conditions of the Cryolithozone within the Western Part of the Aldan Anticline*. Siberian Branch of the Russian Academy of Sciences Publishing, Yakutsk, 90 pp.
- Zhihao Q., Karneli A., 1999: Progress in the remote sensing of land surface temperature and ground emissivity using NOAA-AVHRR data. *Int. J. Remote Sensing*, 20, 2367-2393.
- Zhirin, V.M. and O.L. Orlova, 1985: Methods for estimation of forest recovering and formation of undergrowth in taiga zones glades by air space images. In: *New methods for collection and processing of information in forest inventory*. Moscow, pp. 29–32 (in Russian).
- Zhirin, V.M., 1984: Technology for inventory of woody shrub vegetation of deserts. International study seminar OON on practical implementation of Earth remote sensing in forestry. Moscow, 20 pp. (in Russian).
- Zhirin, V.M., 1991: Control of the conditions of desert vegetation. *Aerospace Monitoring*, Moscow, 218–230 (in Russian).
- Zhirin, V.M., 1998a: Remote methods for forest state assessments. Thesis for degree of Doctor of Agricultural Sciences. Brjansk, 37 pp. (in Russian).
- Zhirin, V.M., 1998b: Approximate estimate of phytomass of forest (vegetation) cover by values of vegetation index. In: V.I. Sukhikh (ed.), *Air and Satellite Methods and Geographical Information Systems in Forestry and Forest Management*, Materials of the 2nd All-Russia Meeting, Moscow, 18–19 November 1998. RAS and Federal Forest Service, Moscow, 119–122 (in Russian).
- Zhirin, V.M., S.A. Bartalev and D.V. Ershov, 1995: Spectrometric estimation of the conditions of woody vegetation by forest monitoring. In: *Monitoring and modeling of dynamics of forest ecosystems*. Moscow, 24–42 (in Russian).
- Zhirin, V.M., V.I. Sukhikh and S.P. Eydlina, 1996: Dynamic vegetation index and landscape peculiarities of vegetation cover. *Issledovaniia Zemli iz Kosmosa*, No. 4, 29–41 (in Russian).
- Zhou, L., R. K. Kaufmann, Y. Tian, R. B. Myneni, and C. J. Tucker, 2003: Relation between interannual variations in

- satellite measures of northern forest greenness and climate between 1982 and 1999, *J. Geophys. Res.*, 108(D1), 4004, doi:10.1029/2002JD002510.
- Zhou, L., Tucker, C.J., Kaufmann, R.K., Slayback, D., Shabanov, N.V., and Myneni, R.B., 2001: Variations in northern vegetation activity inferred from satellite data of vegetation index during 1981 to 1999. *J. Geophys. Res.*, 106, 20069-20083.
- Zhuang, Q., A.D. McGuire, J. Harden, K.P. O'Neill, V.E. Romanovsky, and J. Yarie, 2002: Modeling soil thermal and carbon dynamics of a fire chronosequence in interior Alaska. *J. Geophys. Res. - Atmospheres.*, 107, 8147, doi:10.1029/2001JD001244 [printed 108(D1), 2003].
- Zhuang, Q., A.D. McGuire, J.M. Melillo, J.S. Clein, R.J. Dargaville, D.W. Kicklighter, R.B. Myneni, J. Dong, V.E. Romanovsky, J. Harden, and J.E. Hobbie. 2004. Carbon cycling in extratropical ecosystems of the Northern Hemisphere during the 20<sup>th</sup> Century: A modeling analysis of the influences of soil thermal dynamics. *Tellus*, in press.
- Zhuang, Q., V.E. Romanovsky, and A.D. McGuire, 2001: Incorporation of a permafrost model into a large-scale ecosystem model: Evaluation of temporal and spatial scaling issues in simulating soil thermal dynamics. *J. Geophys. Res. - Atmospheres.* 106, 33,649-33,670.
- Zhuravin, S.A., 1993: Hydrological characteristics of small rivers in central European Russia. In: FRIEND, Flow Regimes from International Experimental and Network Data (ed. by P. Seuna, A. Gustard, N.W. Arnell, and G Cole. Proc. Second FRIEND Conf., Braunschweig, October 1993, 199-206, IAHS Publ., No 221.
- Ziegler W., 2000: Canopy transpiration in a chronosequence of Central Siberia pine forest. *Global Change Biol.*, 6, 25-37.
- Zimmermann R., Schulze E.-D., Wirth C., Schulze E.-E., McDonald K., Vugodskaya N.N. and Ziegler W., 2000: Canopy transpiration in a chronosequence of Central Siberia pine forest. *Global Change Biol.*, 6, 25-37.
- Zimov, S.A., Davidov, S.P., Voropaev, Y.V., Prosyannikov, S.F., Semiletov, I.P., Chapin, M.C., and Chapin, F.S., 1996: Siberian CO<sub>2</sub> efflux in winter as a CO<sub>2</sub> source and cause of seasonality in atmospheric CO<sub>2</sub>. *Climatic Change*, 33, 111-120.
- Zimov, S.A., Semiletov, I.P., Davidov, S.P., Voropaev, Yu.V., Prosyannikov, S.F., Wong, C.S., and Chan, Y.-H., 1993: Wintertime CO<sub>2</sub> emission from soil of northeastern Siberia. *Arctic*, 46(3), 197-204.
- Zimov, S.A., Voropaev, Y.V., Semiletov, I.P., Daviodov, S.P., Prosiannikov, S.F., Chapin, F.S. III, Chapin, M.C., Trumbore, S., and Tyler, S., 1997: North Siberian lakes: a methane source fueled by Pleistocene carbon. *Science*, 277, 800-802.
- Zolotaryev, Ye. A., Popovnin, V. V., Seinova, I. B., 1982: Rezhim lednika Kayarty na Tsentral'nom Kavkaze - aktivnogo selevogo ochaga. [Regime of the Kayarta Glacier, the Central Caucasus, - the active mudflow source]. *Materialy Glyatsiologicheskikh Issledovaniy (Data of Glaciological Studies)*, 43, 69-76.
- Zolotokrylin A.N., 2002: Correlation of Desertification Factors of Northern-Turan Ecotone. *Proceedings of the Russian Academy of Sciences. Geographical Series.* No.5. 38-46. (in Russian).
- Zolotokrylin A.N., 2003: *Climatic Desertification*. Nauka, Moscow, 246 pp. (in Russian).
- Zolotokrylin A.N., Samarina N.N., 1998: Energy Fluxes over Inhomogeneous Surface at a Sub-grid Scale of a Global Climatic Model, *Remote Sensing Rev.*, 17, 329-335.
- Zolotokrylin, A.N., Vinogradova, V.V., Titkova, T.B. and Ananiev, I.P., 2002: Computer archive of vegetation cover characteristics of Eastern Siberia, *Izv. RAN, ser. Geogr.* 2, 116-121 (in Russian).
- Zubakov, V. A., 1986: *Global climate events in the Pleistocene*. Leningrad, Gidrometeoizdat, 288 pp. (in Russian)