Proof

CONTROL ID: 1818468

TITLE: Long-term Radiation Budget Variability in the Northern Eurasian Region: Assessing the Interaction with Fire

ABSTRACT BODY: In terms of global change, boreal regions are particularly important, because significant warming and change are already evident and significant future warming is predicted. Mean global air temperature has increased by 0.74°C in the last century, and temperatures are predicted to increase by 1.8°C to 4°C by 2090, depending on the Inter-governmental Panel on Climate Change (IPCC) scenario. Some of the greatest temperature increases are currently found in the Northern Eurasian winter and spring, which has led to longer growing seasons, increased potential evapotranspiration and extreme fire weather [Groisman et al., 2007]. In the Siberian Sayan, winter temperatures have already exceeded a 2090 Hadley Centre scenario (HadCM3GGa1) [Soja et al., 2007]. There is evidence of climate-induced change across the circumboreal in terms of increased infestations, alterations in vegetation and increased fire regimes (area burned, fire frequency, severity and number of extreme fire seasons).

In this paper, we analyzed long-term surface radiation data sets from the NASA/GEWEX (Global Energy and Water Exchanges) Surface Radiation Budget data products, CERES Surface EBAF and SYN data products and also the available surface radiation measurements in the region. First, we show that during overlap years SRB and CERES data products agree very well in terms of anomalies and we'll use this fact to evaluate 30 years of satellite based estimates of the variability of downwelling SW parameters first corresponding to locations of surface measurements and then for the region as a whole. We also show the observed variability of other SW components such as the net SW and the albedo. Next we assess the variability of the downward and LW fluxes over time and compare these to variability observed in the surface temperature and other meteorological measurements. We assess anomalies on various spatial scales.

Finally, we assess the correlation of this variability in specific locations to known fire events. Extreme fires burned in Sakha and Tuva in 2002 and 2004, respectively, and in contrast, a normal fire season burned in Sakha and Tuva in 1999 and 2002, respectively. For this reason, we focus on the fire season (April - September) for 1999, 2002, and 2004. We assess these data sets for evidence of relationships between the

net radiative fluxes and fire onset as well as evidence for residual influence of the fires upon the radiative budgets.

CURRENT SECTION/FOCUS GROUP: Global Environmental Change (GC)

CURRENT SESSION: GC049. Environmental, Socio-Economic and Climatic Changes in Northern Eurasia and their Feedbacks to the Global Earth System

INDEX TERMS: 0426 BIOGEOSCIENCES Biosphere/atmosphere interactions, 0702 CRYOSPHERE Permafrost, 1637 GLOBAL CHANGE Regional climate change, 1807 HYDROLOGY Climate impacts.

AUTHORS/INSTITUTIONS: P.W. Stackhouse, NASA Langley Research Center, Hampton, Virginia, UNITED STATES;
A.J. Soja, National Institute of Aerospace, Hampton, Virginia, UNITED STATES;
T. Zhang, J.C. Mikovitz, SSAI, Hampton, Virginia, UNITED STATES;

CONTACT (E-MAIL ONLY): amber.j.soja@nasa.gov

TITLE OF TEAM:

(No Image Selected)

(No Table Selected)

PRESENTATION TYPE: Assigned by Committee (Oral or Poster)
