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CONTROL ID: 1802383

TITLE: Fire dynamic and forest cover loss in Russia, 2000-2012

ABSTRACT BODY: Wildfires play an important role in the ecosystem dynamics of Russia. A number of Moderate Resolution Imaging Spectroradiometer (MODIS)-based burned area and forest fire loss products for Russia were created in recent years (Bartalev et al. 2008, Loupian et al. 2011, Giglio et al. 2009). However, characterizing the drivers and consequences of forest fires in Russia is challenging with the use of coarse spatial resolution products. Specifically, these burned area products do not discriminate between forest and agriculture fires within areas of fine-scale forest/cropland mosaics or in the regions with extensive agricultural land abandonment and recent afforestation. The use of 30 m spatial resolution Landsat-based products allows for more accurate detection of forest areas damaged or destroyed by fires, especially on the boundaries between forests and agricultural lands.

Forest cover loss was mapped annually using Landsat archive data. Fire-induced loss was separated from other stand-replacement dynamics using annual 500 m MODIS-based burned area products and 1 km MODIS active fire hotspots. Fire date was assigned for every forest burned area using MODIS hotspots.

Preliminary analysis indicates that the southern parts of Siberia and Far East Russia have short fire return intervals and a small proportion of the fire is stand replacement. Conversely, the areas of European Russia, Northern Siberia and Far East Russia predominately experience stand replacement fires. The proportion of stand replacement fires in these regions is larger than was estimated before (Korovin, 1998). The majority of forests were burned during large, catastrophic fire events in dry years. Timing of these forest fire events (July-September) is different from the period of active agricultural burning (April-May) in the region. Stand replacement forest fires were typically located within large forested landscapes away from active agriculture regions. Therefore cropland fires are presumably not the major driver of forest fire initiation. Agriculture fires can contribute to the degradation of forests bordering croplands; however, this process is difficult to quantify at the regional scale using Landsat data. Our results are important for developing a regional forest fire mitigation strategy in Russia.

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: 1632 GLOBAL CHANGE Land cover change, 1640 GLOBAL CHANGE Remote sensing, 4339 NATURAL HAZARDS Disaster mitigation, 0480 BIOGEOSCIENCES Remote sensing.

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TITLE OF TEAM:

(No Image Selected)

(No Table Selected)

PRESENTATION TYPE: Assigned by Committee (Oral or Poster) [Invited]