Satellite-derived Burned Area for Siberia (1979 –2000)
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*Soja Jeanine Amber[1]、 Stocks Brian[2]、 Potter Stefano[3]、 Rogers Brendan[3]、 Cahoon Donald[4]、 Jurko Natasha[5]、 Conard Susan[6]、 deGroot William 'Bill'[5]、 Tchebakova Nadezhda[7]
*Amber Jeanine Soja[1], Brian J. Stocks[2], Stefano Potter[3], Brendan Rogers[3], Donald R. Cahoon[4], Natasha Jurko[5], Susan G. Conard[6], William 'Bill' deGroot[5], Nadezhda Tchebakova[7]

1. National Iinstitute of Aerospace / NASA Langley Research Center、2. B.J. Stocks Wildfire Investigations Ltd.、3. Woods Hole Research Center 、4. Terra Systems Research、5. Canadian Forest Service/Service canadien des forêts、6. George Mason University,Fairfax, VA、7. Sukachev Institute of Forestry, Siberian Branch of the Russian Academy of Sciences
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Siberia is a distinct and crucial region because it has the physical size necessary to effect regional and global climate. The circumboreal zone contains the largest stock of terrestrial carbon on Earth, and Russia holds roughly two-thirds of that carbon pool. Fire is the primary natural disturbance in boreal forest, which acts to cycle carbon and maintain ecosystem diversity in sync with the climate. Under current climate change scenarios, the Russian boreal is expected to experience temperature increases that exceed the global mean. We have developed a long-term burned area database that will enable novel analyses on the multi-decadal time scale that is ultimately required for robust assessments, including those focused on carbon cycling, fire emissions, and importantly the links between fire regimes, fire weather, ecosystems, and climate.

In this presentation, we present a long-term burned area database that has been developed using Advanced Very High Resolution Radiometer (AVHRR) Global Area Coverage (GAC) data from 1979-2000. Burned area has been verified using Total Ozone Mapping Spectrometer data and validated using available Landsat imagery (160 scenes thus far representing 5.6 Mha of burned area, 219 fire events, and 11% of the total area burned in the AVHRR database). Visually the burned scar data compare well. Validation is in ongoing, though initial analyses show an intersection of 42% with commission and omission errors of 31% and 25%, respectively. Most commission and omission errors are related to spatial inconsistencies using imagery with significantly different spatial resolutions. Of the fire events missed by AVHRR (i.e., omissions), 86% are related to fires <10,000 ha (~ 6 AVHRR pixels) and 44% are related to fires <3,000ha (~ 2 AVHRR pixels). Total burned area compares well, with the AVHRR database under-representing burned area by 10% compared to the Landsat data analyzed. Correlation in burned scar area between the AVHRR and Landsat data is 0.98 for all fires and 0.68 for fires that are < 0.1 Mha.

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