

Assessment of Biomass Consumption in North American Fire

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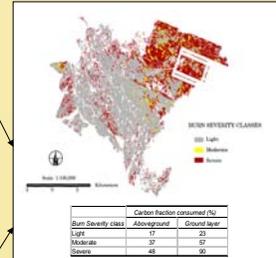
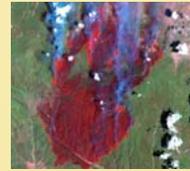
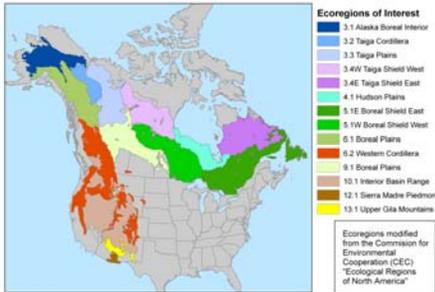
Basic Approach

Purpose:

To quantify the variability in biomass consumption during fires in forested ecosystems of northern and western North America for the purpose of improving carbon emission estimates from wildfire:

- Biomass consumption levels in forested regions of northern and western North America measured to learn the variability in consumption within a given ecoregion.
- Remote sensing used to sample fire-disturbed sites at broad spatial scales.
- The intention is to sample enough sites so consumption can be statistically described for each ecoregion.
- The result will be a more complete view of the amount of biomass consumed during burning so that estimates of carbon emissions can be better quantified.

Ecoregions in Study



Burn severity map for an Alaskan black spruce fire derived from Landsat TM data and field measurements, and table of estimated consumption percentage for each burn severity class based on field measurements (Figure 7 and Table 3 in Michalek et al. (2000)).



Remote Sensing of Burns

Can multi-spectral systems be used to map fuel consumption?

- USGS/NPS National Burn Severity Project and USFS BAER use pre-burn and post-burn difference Landsat TM/ETM+ images to map burn severity
- Field-based assessment methods (the Composite Burn Index – CBI) have been developed to link field-level severity to image-based severity

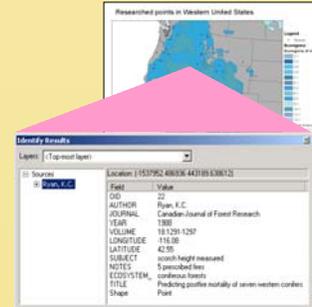
CAUTION:

Burn Severity \neq Fuel Consumption

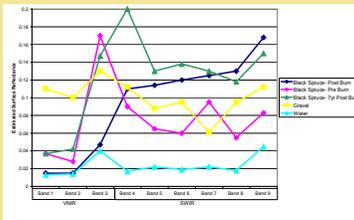
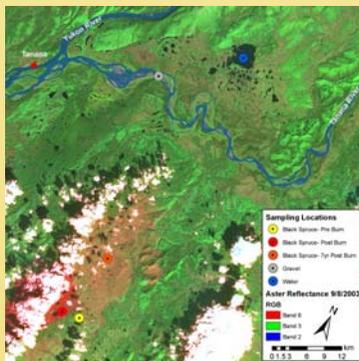
NASA-NIP Progress



Spatialized Literature Search



Landsat & ASTER Images of Alaska Burns



We are investigating ways of segmenting burn images to pull out the spatial patterns of burn severity/fuel consumption. Spectral separation of burn vs. unburned is possible. New segmentation methods using object oriented image classification is being investigated.

