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IMPROVING NATIONAL SHRUB AND GRASS FUEL MAPS USING REMOTELY SENSED DATA TO SUPPORT FIRE RISK ASSESSMENTS

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THEME: Forests, Biodiversity and Terrestrial Ecosystems. I have been invited to contribute an abstract to the "Remote Sensing of Wildfires" special session organized by Vince Ambrosia (Vincent.G.Ambrosia@nasa.gov).

KEY WORDS: Rangelands, grasslands, fire, remote sensing, NDVI

ABSTRACT:

Rangeland and grassland communities in the western United States are especially prone to fire events, yet current available data sets for assessing fire risk in these areas are not adequate. We are conducting assessments of the relationships between intra- and inter-annual variability in biomass, as modeled using remotely sensed data, and fire behaviour in western US shrub and grasslands. Our findings thus far indicate that: (1) intra and inter-annual spectral variability in these shrub-grass ecosystems is high; (2) spectral variability is highly correlated to climate variables, most notably precipitation; (3) fire activity has a higher likelihood of occurring in areas where the differential between spring and summer normalized difference vegetation index (NDVI) values is especially high; (4) live and dead biomass can be modeled through the combination of NDVI data, existing LANDFIRE land cover information, and field estimates obtained from multiple sources including the published literature; (5) fire activity tends to be most prevalent where live and dead biomass is the highest, which relates to 1-hour fuels; (6) programs such as STARFM and their derivatives can be effectively used to use combine the high temporal resolution attributes of MODIS data (which has comparatively low spatial resolution) with high spatial Landsat data (which has relatively low temporal resolution for intra-annual fire applications); and (7) Employing the newly-derived biomass information in fire spread models greatly alters the values of standardly-used fire behaviour indices used by practitioners (e.g. flame height), as compared with data values from existing sources. Our longer term plans are to transfer the approaches that we are developing to refine fuel characterization to the LANDFIRE project, which operationally generates spatial fuels data for the entire United States for fire applications.

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