REMOTE SENSING INDICATORS OF FIRE DANGER AND EFFECTS

Frank Barnes, Marshall Strong, Elijah Ramsey III, and Susan Grace
US Geological Survey, Biological Resources Division, National Wetlands Research Center, 700 Cajundome Blvd., Lafayette, Louisiana, 70506, USA
Phone: (318) 266-8618
E-mail: sue_grace@usgs.gov

ABSTRACT

This poster describes our development of remote sensing techniques to detect fire extent, estimate fire intensity, and monitor recovery and changes of natural resources. Development of these techniques is important because (1) viable methods do not exist to measure and detect burn spatial extent and intensity, and (2) the long-term effects of burns within a regional context are poorly known and understood. Specifically, this project investigates what and how much information can be derived from various remote sensing - spatial, spectral (color), and temporal resolutions that can be used to characterize, inventory, and monitor resource status, distribution, and trends, emphasizing monitoring fire extent and intensity and recovery and changes to natural resources due to fire. The goal is to determine what current sensor packages [e.g. NOAA Advanced Very High Resolution Radiometer (AVHRR), Landsat NOAA Geostationary Satellite (GOES), Thematic Mapper (TM), Passive and Active Microwaves] and future sensor packages expected onboard the Earth Observing Satellite [e.g., Moderate resolution Imaging Spectrometer (MODIS)] or separate satellite sensor systems address the needs of resource management problems, especially those dealing with fire management.

Described within this poster are synopses of fire related research activities carried-out on the Big Bend region of the Florida coast and the Louisiana coast. One component of each research project has been described in detail. The first describes use of multiple frequency and multiple polarization Synthetic Aperture Radar (SAR) to monitor burn recovery in a coastal marsh. The second relates ground-based measurements of vegetation canopy density and structure as well as helicopter measurements of light reflected from various vegetation canopies to operational satellite sensor measurements. The third discusses the generation of burn history maps with an optical sensor system (e.g., Landsat Thematic Mapper) covering an unmanaged marsh area in coastal Louisiana. The fourth describes the use of ground-based light attenuation and helicopter light reflectance measurements to monitor severe to subtle changes in pine to bottomland hardwood canopy and sub canopy components.