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TITLE: NEON Collaborative Data Collection Campaign at Pacific South West Site in California

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ABSTRACT BODY: The National Ecological Observatory Network (NEON) is a continental-scale observatory that will collect biological, chemical and geophysical data over the continental United States in order to study biodiversity, landcover change, climate change and invasive species. In June 2013, a large-scale data collection took place over NEON's Pacific South West (PSW) site 17 in CA, USA. Data were collected in the San Joaquin Experimental Range and the Sierra National Forest.

NEON's AOP (Airborne Observation Platform) acquired high spatial resolution hyperspectral data (~1m pixels), waveform lidar, discrete lidar, and RGB imagery over all three sites. A field team simultaneously collected atmospheric and vegetation inventory data, including tree locations, height, diameter-at-breast-height (DBH), species, and spectral data. The NEON collect was centered within a collaboration of multiple research entities, including NASA, Rochester Institute of Technology (RIT), University of Massachusetts (Boston; UMB, and Lowell; UML), Boston University (BU), and the University of Wisconsin, Madison (UWM). NASA's AVIRIS and MASTER sensors were flown over a wider area encompassing the NEON sites, with AVIRIS acquiring hyperspectral data (224 bands) at approximately 30m spatial resolution, and MASTER acquiring multispectral thermal data (50 bands) at approximately 50m spatial resolution. These data will be downscaled to approximate theoretical HyspIRI data (60m spatial resolution) as part of a large collection of preparatory research.

Concurrently, a variety of university teams were active in the field:
RIT collected ground-based lidar, leaf area index (LAI), herbaceous biomass measurements, wide-angle photographs, and spectral measurements. Data were collected over 20 80x80m sites, centered on existing 20x20m NEON sites. This data set will be used to inform synthetic scene design and to study the impact of sub-pixel structural variation on pixel-level spectral response; The BU, UMB, and UML team surveyed three sites in the Sierras with their terrestrial waveform lidar (DWEL) and collected Trac measurements of LAI, while UMB collected additional discrete ground-based lidar scans and additional forestry measures at San Joaquin and the Sierras; A team from the UWM collected leaf-level reflectance and transmission spectra and measured leaf-level gas exchange and chlorophyll fluorescence.

This multifaceted collaboration, funded by the NSF NEON and NASA HyspIRI Preparatory Science programs, will support key scientific developments by combining the expertise from multiple sensing modalities. This experiment highlights the advantages of data and skills sharing in remote sensing applications. An overview of the larger effort and individual early science will be presented.

KEYWORDS: 0480 BIOGEOSCIENCES Remote sensing, 0476 BIOGEOSCIENCES Plant ecology, 0414 BIOGEOSCIENCES Biogeochemical cycles, processes, and modeling , 1640 GLOBAL CHANGE Remote sensing.

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Additional Details

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