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TITLE: Developing a Scalable Remote Sampling Design for the NEON Airborne Observation Platform (AOP)

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ABSTRACT BODY: The National Ecological Observatory Network (NEON) airborne observation platform (AOP) will collect co-registered high-resolution hyperspectral imagery, discrete and waveform LiDAR, and high-resolution digital photography for more than 60 terrestrial and 23 aquatic sites spread across the continental United States, Puerto Rico, Alaska and Hawaii on an annual basis over the next 30 years. These data, to be made freely available to the public, will facilitate the scaling of field-based biological, physical and chemical measurements to regional and continental scales, enabling a better understanding of the relationships between climate variability and change, land use change and invasive species, and their ecological consequences in areas not directly sampled by the NEON facilities. However, successful up-scaling of in situ measurements requires a flight sampling design that captures environmental heterogeneity and diversity (i.e., ecological and topographic gradients), is sensitive to temporal system variation (e.g., phenology), and can respond to major disturbance events. Alignment of airborne campaigns – composed of two payloads for nominal science acquisitions and one payload for PI-driven rapid-response campaigns -- with other ground, airborne (e.g., AVIRIS) and satellite (e.g., Landsat, MODIS) collections will further facilitate scaling between sensors and data sources of varying spatial and spectral resolution and extent.

This presentation will discuss the approach, challenges and future goals associated with the development of NEON AOP's sampling design, using examples from the 2013 nominal flight campaigns in the Central Plains (NEON Domain 10) and the Pacific Southwest (Domain 17), and the rapid response flight campaign of the High Park Fire site outside of Fort Collins, CO. Determination of the specific flight coverage areas for each campaign involved analysis of the landscape scale ecological, geophysical and bioclimatic attributes and trends most closely associated with the primary science questions NEON data is addressing in each domain. An effort was made to capture the range of spatial and temporal variability at each site and across multiple sites so as to enable the science community to extrapolate across multiple scales, from organisms to landscapes to domain- and continental-scales using a variety of field and

remotely sensed data.
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KEYWORDS: 0439 BIOGEOSCIENCES Ecosystems, structure and dynamics , 0480 BIOGEOSCIENCES Remote sensing, 1620 GLOBAL CHANGE Climate dynamics, 1615 GLOBAL CHANGE Biogeochemical cycles, processes, and modeling .

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Additional Details

Previously Presented Material:

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