

NEON: Transforming environmental data into information for societal benefit

Brian Wee[†]; Steve Aulenbach

[†] NEON, Inc., USA

Leading author: bwee@neoninc.org

The National Ecological Observatory Network (NEON), or the Observatory, is a NSF funded national investment in physical and information infrastructure. The Observatory's goal is to enable understanding and forecasting of the impacts of climate change, land use change and invasive species on continental-scale ecology by providing physical and information infrastructure to support research, education and environmental management in these areas. NEON provides vetted and authoritative data and information to scientists, educators, decision makers and the public on how land use, climate change and invasive species affect biodiversity, disease ecology, and ecosystem processes. NEON high-level data products are designed to enable ecological forecasts and analyses at a continental scale and facilitate the observation of decadal scale changes against a background of seasonal-to-interannual variability. We foresee that NEON's partners will utilize these products as input to advanced models that will help inform resource management, socio-economic analyses, environmental risk management, and decision support for climate change mitigation and adaptation. Interoperability, through the adoption of common observation strategies and adherence to technical standards for data discovery and exchange, is essential to facilitate the transition of NEON's capabilities and products into operational utility. Given the clear and unambiguous interest from Federal partners and other parties, the Observatory acknowledges the need to be aware of and implement interoperability best practices. NEON has drafted an MOU with the US Department of the Interior to facilitate collaborative activities that promote interoperability in observation methodologies and informatics. A NEON-NOAA National Climatic Data Center (NCDC) and Atmospheric Turbulence Diffusion Division (ATDD) MOU enables opportunities to collaborate on mutual projects and activities, such as working to co-locate stations where possible, and sharing techniques, data, algorithms, and expertise. NEON has also been in active and sustained discussions with the USDA about how observations can be extended to meet agricultural requirements. Similar activities are being pursued with the Smithsonian Global Earth Observation (SIGEO), as well as other international efforts like the Integrated Carbon Observatory (ICOS), Group on Earth Observations Biodiversity Observation Network (GEO BON), and others. Forecasting, interoperability, and research to operations are three of NEON's six Enterprise Strategies. The others are: (1) Open Data (All NEON data will be free and openly available for research, education and decision support), (2) Open Observation Infrastructure (the Observatory is designed to serve as a platform for additional observations, experiments and research projects), and (3) Public Engagement (NEON emphasizes producing usable information for students, teachers and citizens and views communicating scientific data and information as a priority). We foresee an ecosystem of government, NGO, and academic data sources that will serve as credible producers of linked data, promote data sharing, and champion responsible data life cycle management. This, together with interoperability initiatives and web-enabled tools, will open up the marketplace of ideas on ways for our citizens to synthesize ecological data into meaningful information for societal benefit.