

**Mid-Atlantic Region Ecological Observatory: A NEON Planning Initiative
MAREO**

MEETING PREPARATION

NEON Domain 2 District Planning

**February 27 – March 1, 2006
NZIP Conservation and Research Center
The Smithsonian Institution
Front Royal, Virginia**

Prepared by:

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Informational documents and all meeting material are available at **MAREO.org**.
NEONInc.org and *NEONCOREO.org* also provide valuable background information.

Meeting Plan:

The February 2006 MAREO meeting will be a working meeting in which participants with interests in participating as a NEON Domain 2 Site will gather to construct multiple possible District scenarios. The product of the meeting will be one or more proposed Districts. In the weeks and months following the meeting participants will be responsible for fleshing out and better defining their particular District proposal. Completed District proposals will be collected and synthesized into a single Domain 2 Prospectus to present to NEON Inc. and the NSF later in 2006. It will be NEON and NSF's responsibility to select which District will be constructed in Domain 2. Participation in the meeting requires non-trivial preparation beforehand in the preparation and submission of the information outlined below.

Below we first present the current scope and parameters NEON is operating within. We then outline the information meeting participants must provide on-line in advance of the meeting.

Scope and Parameters:

The NEON planning project (Hayden et al.) has defined priorities, questions, and District requirements around which NEON is being developed. All the material below is adapted or copied directly from the NEON Inc. web site (neoninc.org/archive/2005/11/dear_friends_of.html) and from a draft document distributed by the planning project at the November 2005 COREO meeting in Michigan (*NEON Infrastructure: Request for Information*). Detailed definitions and a description

of District design is given in the MAREO Report from that November COREO meeting (mareo.org/local/2005_Nov_COREO_Meeting_Report.pdf).

NEON's Scope:

NEON will support systematic study of seven US ecological priorities: invasive species, infectious disease, climate change, land-use change, biogeochemical cycles, biodiversity, and aquatic ecosystems. These elements are reflected in three overarching questions that the Observatory will address:

- 1. How are ecological systems affected by changes in land use, climate, and biogeochemistry across a range of spatial and temporal scales?*
- 2. How do changes in the availability and distribution of the Nation's water affect ecological systems and what are the feedbacks that in turn affect water resources?*
3. How do the patterns and movement of genes and organisms across the continent affect biodiversity, ecosystem function, and the spread of infectious diseases and invasive species?

Some NEON parameters:

- 1) NEON will encompass the continental US, Alaska, Hawaii, and Puerto Rico.*
- 2) Each Domain will host a NEON District that will include a land use/land cover gradient incorporating an urban/settled area, a managed/production landscape, and a wild area.*
- 3) Each Site (urban, managed, wild) will fall in a small watershed where transitions from terrestrial to aquatic landscapes occur (1st order watershed).*

NEON Sampling Notes:

It is important to note that while NEON is designed to sample climatic variation across the North American continent (as represented by the US) with a stratified sample of 20, and it is designed to sample (once) the range of "land use" within Domains, it is **not** designed to sample climatic variation within Domains. The resulting inferential design will permit analysis of land use effects controlled for climate. Site design will take advantage of local microclimate variation and a 1st order water shed gradient.

Why Participate in NEON?

Why should you spend the significant time and energy proposing a NEON Site? There are many reasons why it is advantageous for institutions and partnerships to participate in NEON:

- Ability to influence the siting of major infrastructure for ecological sciences.

- Measurements will be made in areas of regional and institutional interest.
- Availability of infrastructure capacity in excess of NEON programmatic needs (e.g., instrumentation, facilities, sites).
- Infrastructure will serve as an attractor for future and other research.
- Infrastructure and NEON education and science programs will provide significant added value to existing research, education and management programs.
- Participation in NEON will raise institutional profiles in the national and international scientific community.
- Access to capital streams from NEON-associated competitive research and education programs.
- Access to NEON space and infrastructure for research and education.
- Availability of novel educational programs.

NEON District Design Guidelines:

1. Ideally, the three Sites should be located within a District that approximates the average or modal climatic conditions of the Domain. Districts should be on the order of hundreds of square kilometers in extent.
2. Each Site should be on the order of tens of square kilometers in extent. Sites should be separated by distances on the order of 100km or less. No two Sites should be more than 200km from each other.
3. Fifteen separate field locations for deployment of sensor arrays will be defined within each Site. Each sensor array field location will be of 1ha or less in extent. The maximum distance between two field locations should be on the order of 1km or less.

District-level criteria that will be important in prospectus development:

These three items will be relevant during the meeting, but **do not need prior planning.**

- 1) List of institutional contributors.
- 2) Specific partnerships that will compose the District.
- 3) How do prospective sites within this climate domain integrate with the continental observatory?

Site-level criteria and requirements that must be supplied by meeting participants IN ADVANCE of the February meeting:

A web form will appear shortly to collect these data. **Please prepare SHORT answers and SIMPLE lists as appropriate.** The data you provide will be entered into a database and used to generate discussion-friendly material we can work with easily in small groups at the meeting. **Long narratives will not be useful (the time for that will come later).** Since we hope site representatives will be at the meeting,

elaborations and discussion can be done then. Sites that will not be represented should make arrangements with the meeting organizers.

Data to prepare now, and make ready to enter on-line:

- o. What kind of Site are you proposing? Choose one:
 - a. Urban/settled
 - b. managed/production
 - c. wild

- i. What is the ownership status of the property? Choose one:
 - a. Owned by institution
 - b. Privately owned
 - c. Held in trust
 - d. Leased long-term by institution. If so, give lease expiration date.

- ii. What is the size of the site (acres / ha)?
- iii. Are there and land use or access restriction? If so, explain.
- iv. Are there any existing easements on the site? If so, explain.
- v. Please provide a map of the site (enter URL link OR email to enagy@virginia.edu).
 - a. Describe existing gradients on site (e.g. abiotic variables, land use, topography, hydrology)
 - b. Describe knowledge base for the site (legacy data, history of land units in relations to disturbance, fertilization, soil maps, checklist of biota, etc.)
 - c. List and description of recent and ongoing research and monitoring activities, in the context of NEON questions (see "Scope" above).
- vi. Provide details of physical, research, monitoring, sensing infrastructure already existing on the site for each of the categories below:
 - a. Housing (e.g. capacity for using existing buildings, leasing or building new year-round housing for at least 40 people)
 - b. Laboratory (e.g. capacity for using existing, leasing, or building new laboratories, with sample processing, interior work space)
 - c. Utilities – Describe electrical, gas and other necessary power available for housing, laboratory and field facilities. Specify water source(s) (wells, municipal, etc.) and availability for housing, laboratory, and field uses.
 - d. Describe existing computer resources, and cyberinfrastructure, including
 - i. Internet access (I2, T1, T2, T3, National Lambda Rail, wireless, etc.)
 - ii. Computer hardware and server resources
 - iii. Data and information management policies
 - iv. Other relevant attributes (including any plans for modifying prior to installation of NEON infrastructure).
 - e. Describe Road access to site (including all field locations)
 - f. Assess security status and needs for prospective NEON field and lab installations.

- vii. Can you assure property access and long-term availability (50+ years)?
 - a. Can you assure ability to run (manage) national experiments to address future issues?
 - b. Permission and long-term use agreements:
 - i. What additional land areas are available for potential NEON Research Reserves (e.g. future observational or manipulative experiments).
 - ii. What type of permissions of long-term use agreements can be negotiated for NEON Sites and/or Research Reserves (e.g. lease, easements, memorandum of understanding, ownership transfer).
 - c. Environmental Impact Status
 - i. Has there been an Environmental Impact Study performed? If yes, when? And outcome?
 - ii. Are there any characteristics of the site that may make it easier or more difficult to complete an EIS (e.g. known or suspected archeological issues?)