

January 18, 2005

REPORT ON THE FIRST MEETING OF THE NEON CONSORTIUM DESIGN COMMITTEE (CDC)

The first meeting of the NEON Consortium Design Committee (CDC) was held on January 4 to 6, 2005 in Los Angeles, California. The CDC began its work by familiarizing itself with the mission, responsibilities, and essential capacities of the corporation that it is helping to design--NEON, Inc. Substantial time was also spent identifying and discussing the diverse community of NEON stakeholders and their potential involvement in NEON, Inc.

The progress of the CDC in developing recommendations for the organization and operation of NEON, Inc. is reported here. We began by reviewing aspects of the mission and context of NEON, Inc. Focal issues included membership, governance, and organizational capabilities. Much of the initial meeting was spent reviewing the structure of other institutions (mostly corporations) that operate similar scientific facilities; information from presentations by three such organizations is appended. The CDC's progress with regards to resolution of key issues is reported briefly. We close with a near-term plan of work directed toward incorporation of NEON, Inc. by the end of 2005.

NEON, INC.: MISSION, RESPONSIBILITIES, CAPABILITIES, AND STAKEHOLDERS

NEON, Inc. will be the non-profit corporation that is responsible for the construction, maintenance, operation, and evolution of the NEON facility. This work will be accomplished with funds provided to NEON, Inc. by the National Science Foundation (NSF) under a cooperative agreement.

The mission of NEON, Inc. will be management of the NEON enterprise so as to realize the vision of NEON as:

“. . . a continental scale research instrument consisting of geographically distributed infrastructure, networked via state-of-the-art communication. . . NEON will transform ecological research by enabling studies on major environmental challenges at regional to continental scales.” (NSF 2003)

NEON, Inc. will be responsible for:

- Construction of the NEON facilities on time and on budget;
- Maintenance of the NEON facilities;
- Scheduling use of the NEON facilities;
- Continued evolution of NEON including additions and modifications;
- Processing data into data and information appropriate for user groups;
- Operating the NEON information dissemination network; and
- Continuing assessment of the quality of the science program, including assurance of data continuity, quality, and consistency over time.

During the course of its discussions, the CDC suggested several additional items, which it feels should be part of NEON's responsibilities and capabilities, including:

- Assurance of data continuity and consistency over time;
- Facilitation of integrated analysis and synthesis across NEON-related efforts, and;
- Communications regarding NEON scientific findings with various stakeholders, including policymakers.

NEON, Inc. also must be designed with the capacity to respond to needs and opportunities outside of its NSF-sponsored mandate—i.e., to pursue NEON-related goals utilizing other funding from other (non-NSF) institutions.

To fulfill its responsibilities NEON, Inc. needs to be able to conduct the following functions:

- Project management, including contracting, accounting, and personnel management;
- Auditing;
- Assessment and evolution of the scientific program;
- Networking/communication, data management, and website operation;
- Community engagement and outreach, including the ability to interact effectively with stakeholder groups; and
- Self-governance.

NEON stakeholders include, among others:

- Scientific and educational users
 - Individuals
 - Societies/associations
- Universities/colleges and related institutions/laboratories
- Museums and field stations
- Other research institutions
 - Private (for profit and nonprofit)
 - Governmental
- Policy makers (e.g., legislative and executive, local to federal and tribal)
- Government agencies involved in management of natural resources (federal, state, local, and tribal);
- Government agencies involved in environmental regulation and land-use planning;
- NGOs and private companies;
- NEON implementers (e.g., operators of NEON facilities); and
- Public

Guiding principles for the creation of NEON, Inc, given its mission, set of objectives, capabilities, and diversity of stakeholders, include:

- Transparency and comprehensibility;
- Accountability (to NSF, Congress, and stakeholders);
- Design elegance;
- Measurable effectiveness;
- Budgetary efficiency;
- Inclusiveness and equity, and
- Sustainability, i.e., an ability to evolve and endure.

MODELS THAT INFORM OUR DISCUSSION

Numerous organizational models exist that can inform the CDC in the organization of NEON, Inc. Specifically there are many existing research facility-oriented non-profit corporations funded primarily by the National Science Foundation that can provide relevant information on issues and approaches. Consequently, the CDC devoted much of its initial meeting to a review of several of these organizations.

Three organizations were reviewed in detail, including presentations and question-and-answer sessions with by representatives: Richard Hooper, the Executive Director of the Consortium of Universities for Advancement of Hydrologic Science, Inc (CUAHSI); Richard Nigbor, a principal of the NEES Consortium, Inc. (NEESinc), the non-profit group that oversees the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES); and James Gosz, Chair of the Long-Term Environmental Research network (LTER). Highlights from these presentations and ensuing discussions are included as an appendix to this report.

Jeff Goldman briefly reviewed more than a dozen other scientific organizations; his analysis is available on the WIKI site. Several of these organizations were selected for more detailed review at the next meeting: Incorporated Research Institutions for Seismology (IRIS); the University-National Oceanographic Laboratory System (UNOLS); the University Corporation for Atmospheric Research/National Center for Atmospheric Research (UCAR/NCAR); and Universities National Oceanographic Laboratory System (UNOLS). Representatives of each will be invited to the next meeting of the CDC.

The conclusion of the CDC following the presentations and discussions was that *while other organizations provide important insights into the design of NEON, Inc., each is fitted to very specific circumstances and none can be adopted without major modifications.* There are unique conditions and challenges associated with NEON, Inc which must be reflected in the structure of NEON, Inc. As noted in the work plan, the CDC does feel that it is worthwhile to continue detailed review of several other non-profit science management corporations at its second meeting.

PRELIMINARY THOUGHTS ON THE ORGANIZATION OF NEON, INC.

Progress toward recommendations was achieved regarding several important aspects of NEON, Inc. including membership, governance, outreach, and scientific capacity. Current perspectives of the CDC on these topics are reviewed below.

Flexibility/Management Adaptability/Organizational Evolution

The CDC recognizes that NEON, Inc. will necessarily evolve through several stages. Once planning is completed and funding commences, NEON, Inc. will be engaged initially in a CONSTRUCTION stage--a multi-year period where the organization will be focused primarily on building the research platform. As components or scientific layers of NEON are completed, NEON, Inc. will move into an OPERATIONAL stage. Each of these stages will require some unique sets of capabilities, competencies, and even, perhaps, elements of governance. There will also be many elements of the organization that will be common to both the construction and operational stages, but with shifts in levels of staffing.

An additional challenge for NEON, Inc. will be building in the capacity to evolve. Some of this may involve gradual changes associated with evolution of the scientific questions and technologies adopted in the initial NEON program. Additional evolution of the program will certainly include identification of additional questions.

An important principle in creating an organization (NEON, Inc.) that has the necessary capacity to evolve and expand is keeping the organization and bylaws as simple as possible (the KISS principle). CDC will endeavor to keep this in mind during its deliberations!

Membership and Governance of NEON, Inc.

The CDC discussed membership and governance at great length but did not reach a consensus on these topics. Options for membership range from having an organization that has no "members," as such, to an organization with membership open to any organization or individual that cares to join. The most common model for science-related non-profit organizations appears to be an organization in which membership is confined to scientific and educational institutions.

In a member-based corporation, additional questions that need to be addressed include the rights and responsibilities associated with membership, including the question of dues. The organizations that CDC reviewed have very wide differences with regards to these issues. Dues, for example, range from 0 to tens of thousands of dollars per year, in the case of major institutional members.

Governance of a non-profit corporation is by a governing board. However, there is broad latitude in who selects or elects the governing board, the relative power between the governing board and chief executive, the size of the board, and, most importantly, what

interests are represented on the board and in what proportions. A common model appears to be election of a governing board by the membership.

Some of the possible options that were discussed by CDC are as follows. However, each issue (e.g., membership and governance) needs to be individually examined.

One option for NEON, Inc. would be a member-based organization to which scientific and educational institutions and professional associations could belong and who would contribute significant dues on a periodic basis. The membership would elect the governing board. Other stakeholder groups, such as groups seeking access and use of the NEON facilities, might be engaged by other mechanisms instituted over time, such as associate memberships, advisory councils, or committee participation.

Another option would be broad membership by both individuals and institutions, including election of the governing board by the broadly-based membership.

A third, simple option would be an organization that has no members and a governing board initially selected by those establishing the corporation and subsequently by a nominating committee.

Governance

In a non-profit corporation the governing board has the ultimate responsibility and authority for the corporation, including hiring and firing of the chief executive. Boards are typically selected to provide expertise in important aspects of a corporation's business. A potentially important issue in populating a board is the representation of different stakeholders. In the case of publicly traded corporations the issue is theoretically simple—the board represents the stockholders. The issue is more complex in addressing NEON, Inc. because of its public nature and the large array of potential stakeholders.

The CDC is considering a governing board for NEON, Inc. which represents a diversity of relevant skills, viewpoints, and stakeholders. An approach to allocating positions on the board will be considered in developing the final design. Scientists, educators, and engineers should certainly be represented on the governing board. Other skills and viewpoints that might logically be included include: business, financial, and auditing experience; project management expertise; fundraising ability; expertise in policy formulation; groups that use the scientific information generated by NEON, such as government agencies, NGOs, and corporations; and the public. NSF may wish to be represented on the governing board. Other considerations in populating the governing board include geographic distribution, diversity, and stature of members.

Many other aspects regarding the governing board were discussed. The size of the board is an important consideration—if boards are too large they become unwieldy and staff take control; on the other hand, the board needs to be large enough to represent key skills and interests. CDC members suggested a range of 15 to 25 members. A governing board

will also have an executive committee, which will include the Board Chair. Again, there are issues related to selection of the executive board and the chair and whether the chair should be partially compensated. There will be a number of standing committees to address such issues as finance, audit, nomination and board governance, operations, etc. All of this will ultimately have to be spelled out in the by-laws adopted at the time of incorporation.

Scientific Capacity

The CDC discussed the need for scientific leadership within NEON, Inc. at length. Credible leadership within NEON, Inc. is needed to fulfill several important responsibilities including continuing assessment of the quality of the program and assuring that higher level integration, synthesis, and reporting of the data is occurring. While the expectation is that NEON, Inc. is the research platform and but not a research program, *CDC feels that scientific leadership must be present within NEON, Inc. if it is to fulfill its responsibilities.*

Scientific staffing may not be needed during the construction phase of NEON, but could be phased in as the various scientific components of NEON become operational. Again, the CDC recognizes that the overwhelming majority of the research use of the NEON platform will be undertaken by the broad community of NEON users and not within NEON, Inc.

Community Engagement and Outreach

Broad community engagement is essential if NEON is to achieve its goals, and mechanisms to achieve this broad engagement were discussed. This issue is related to CDC's discussion of membership and associated rights and privileges.

NEON has to reach out to the broad elementary, secondary, and higher education communities, as well as traditionally underserved communities. CDC discussed some means of doing so, recognizing that this topic is largely the purview of the Education Committee.

Additional Topics Considered

Additional topics that were addressed by the CDC during the first meeting include:

- Research platform construction management;
- Research platform operations, including scheduling of facilities;
- Research platform ownership;
- Physical (geographical) location of NEON, Inc. and where it should be incorporated;
- The immense task of compliance with emerging financial auditing, corporate governance, and quality control/quality assurance procedures; and
- Directors and Officers insurance.

NEXT STEPS

The general operating approach by CDC will be to develop documents related to the various issues and, ultimately, draft bylaws and to vet these among the broader community for comment and discussion. The Web site will be the primary medium. The CDC may have one or more conference calls prior to the second (March) meeting of the CDC.

The next steps in planning and incorporating NEON, Inc., with leads and schedules, include:

<u>Task</u>	<u>Lead</u>	<u>Timing</u>
Circulation of draft report to committee members for comment, editing	Levitt, Franklin	January
Review and summary of Web-based feedback on CDC topics	Franklin, Levitt, Wee	Continuing
Review of additional corporate models (UCAR, UNOL, IRIS, LIGO)	Franklin, Levitt	February
Initial meetings with legal counsel	Levitt, Leighty	February
Meetings with AIBS and NEON mgmt	Franklin, Levitt	February
Conference/Andrew Neitlich	Levitt, Franklin et al.	February
Critical path analysis for incorporation	Levitt, Leighty	February
Presentations from UCAR-UNOL-IRIS, LIGO and Triad to full CDC	Invited guests	March
Development of Work Breakdown Structure (Saunders model)	Franklin, Wee	March
Initial draft of charter, articles of incorporation and bylaws	Levitt	March
Presentation of draft bylaw materials to CDC	Levitt	March
Development of initial organizational chart for NEON, Inc	Levitt, Franklin, Leighty, Goldman	April

Appendix: Highlights of Discussions with Representatives of Other NSF-Funded Research Platforms

Dialogue with CUAHSI Representative

Richard Hooper, Executive Director of CUAHSI, offered an informative Powerpoint presentation on Wednesday morning that dealt with a number of items relevant to the formation of NEON, Inc.

Hooper shared with us CUAHSI bylaws (posted on the CDC WIKI site) and discussed its membership and governance structure. CUAHSI has two classes of membership: “members” that offer advanced degrees in hydrologic science, which are entitled to all membership rights and privileges, and can vote for directors; and; “affiliate members,” which includes “all others,” which have all of the rights and privileges, except the right to vote for directors.

An important lesson in the CUAHSI history was the transition, after the first three years of incorporation, from a 97-member board that included a representative from each member, to a more manageable 15-member board with a five-member executive committee. Hooper emphasized that most meeting of the Executive Committee and the full Board are held by teleconference, and that most voting for directors and interaction with the broad membership is handled electronically. Even with the smaller board and electronic communications, Hooper emphasized the time-intensity of both his job and the job of Board Chair. He expressed his own opinion about the need to compensate that Board Chair, given the constant need for his/her involvement in the day to day activities of the organization.

Hooper underscored the need to understand that changing organizational functionality required flexibility, adaptability, and a willingness to evolve organizational governance. He was frank about his point-of-view that CUAHSI is still a young organization and will likely continue to evolve as it matures into a group that is offers its community a fully-developed research platform.

Dialogue with NEES Representative

Dr. Robert Nigbor, a Co-Principal Investigator for NEES, presented to us following the lunch break. Like Hooper, Nigbor also provided us with copies of his organization’s bylaws and a thoughtfully prepared presentation regarding the genesis and organization of his network. (Both of these documents can be accessed through the CDC WIKI page.) He spoke candidly about the hard work involved in being audited on a regular basis by NSF, about ongoing difficulties with the information infrastructure built for NEES, and about the need to get individuals with business and management experience involved both on the board and in the management of a “collaboratory” such as NEES. He also offered high praise for the consulting services provided by Andrew Nietlich during NEES’ organizational phase. As for models offered by other organizations, Nigbor noted that he thinks of IRIS as a highly successful and well-organized consortium.

Nigbor explained that NEES went through a board transition. The NEES Consortium Development Project and NEES, Inc. were initially steered by a group that was designated by project leadership in the 2001-2002 period. In May 2003, once the NEES collaboratory was well into its construction phase, an elected board of directors took office. At present, 12 of the 15 members of the NEES board are elected by its membership (six directors elected by 15 equipment site operators, three directors elected by 473 individual members, and three directors elected by 42 institutional members). In addition, three directors are elected by the existing board. Nigbor reports that the election process is relatively smooth and produces a well-qualified, hard-working board.

Dialogue with LTER Representative

The third presentation of the day was offered by Jim Gosz, a Principal Investigator of the NSF Long Term Ecological Research program with longtime experience in the management and planning of the LTER Network. Dr. Gosz, like the other presenters, provided us with his organization's bylaws as well as a Powerpoint presentation.

The committee had a lengthy discussion with Gosz regarding the ongoing planning effort at LTER, and about the developing relationship between LTER and NEON. Emphasis in the discussion was on the complementarity of LTER and NEON. LTER is appropriately seen as focusing primarily on research projects; in contrast, NEON is being conceived as "major research equipment" initiative that will provide the community with a unique "laboratory," or "infrastructure," or "platform" on which research may be performed. The NEON platform will be available for use by LTER researchers as well as others – for example, researchers primarily engaged in ecological research at the Smithsonian Institution, or at biological field station. With NEON, the researchers will be able to perform research on a regional or continental scale – research that could not, in the absence of the NEON platform, otherwise be performed.