

**October 12-13, 2011, Workshop on the Development of a Network of Observatories
in the SBE Sciences: Summary Report**

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List of participants:

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Co-chairs: Emilio F. Moran, Anthropology, Indiana University
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Report:

The meeting was attended by 7 invited scholars representing SBE sciences, the convenors Emilio Moran and Sandra Hofferth, NSF program officers, and the Assistant Director for SBE, Myron Gutmann.

The issues we planned to address at this meeting were:

- **Will the observatories have core questions shared across the observatory network, or have a combination of core and signature questions that address local/regional specific interests?** Five such questions were proposed in the December 2010 workshop but no decisions were made at that time whether each observatory would address one or more of these questions or what the specific questions would be. The kinds of research will affect the siting strategy (see below). **This workshop should make a recommendation in this regard.**
- **Will the observatories be sited based on a representative sample of the American population, geographically representative and distributed,** or a combination of both that purposely locates some sites in low population areas to capture social processes currently not well represented in population-based representative samples? Obviously, recommendations made will affect the questions that might be addressed, and thus both of these two foci should be addressed together.

This workshop and its key questions, above, follows three earlier ones that addressed how new directions might be undertaken in SBE sciences that could transform work in these areas, particularly by developing cyberinfrastructure for the SBE sciences. The workshop in December 2010 specifically addressed the potential of developing a network of observatories to meet the needs of SBE sciences. The October 2011 meeting specifically addressed the recommendation from the December workshop, which was to focus on the major scientific questions that should underlie this ambitious network to make it a transformative moment for SBE research and to flesh out how the observatories might function. NSF is developing a series of efforts to advance interdisciplinary science and this effort fits within that goal, as a way to strengthen research across the SBE sciences.

The meeting emphasized the importance of local level research, i.e., understanding process in a local environment. Use of ethnographic and experimental methods were seen as particularly beneficial, especially in understanding the ways people make decisions at a fine grained scale. Another important goal of the observatories would be to develop data sets from administrative data that are richer than can be obtained from national samples both in terms of sample size and detail. On the latter there are many barriers but this was seen as an important task for SBE science to address and on which to build future scientific efforts. Likewise, observatories were seen as a way to develop partnerships and use social media data to understand how new virtual communities are formed, how people make new networks, and how place-based and non-place-based decisions on building communities and social relations are made.

At the December 2010 workshop, the scholars present defined 5 broad questions that could guide the network, but not settled was whether all sites in the observatory network would address all five broad thematic questions or only some of them, and it remained for another meeting to flesh out the exciting science questions that would be the charge to this network of observatories. During the October 2011 meeting the attendees were able to distill the 5 broad questions defined at the December 2010 workshop to two large themes that seemed to ideally encompass the potential of all SBE disciplines to collaborate in answering questions of interest to SBE and the nation.

Those two broad areas were seen as unifying of the SBE sciences, encouraging interdisciplinary collaboration and training approaches that would be directing at answering questions that are of more than disciplinary interest, and that would create data sets for SBE valuable across all the sciences. **The attendees proposed that the Observatory Network focus initially on two Science questions or themes, namely (1) Opportunity and Mobility and (2) Change and Adaptation. Examples follow for each one that clearly require engagement of all of the SBE sciences:**

1. Opportunity and mobility

Examples of questions that would be of interest within the theme:

What are the determinants of social differences in cognitive, non-cognitive, and linguistic development?

How do childhood and adolescent characteristics and experiences affect later opportunity and mobility?

How and why does mobility vary across sociodemographic groups?

If and how does neighborhood context matter?

What are the boundaries and characteristics of social, natural, and built environments?

What are the dynamics of neighborhood change, including causes and consequences?

What changes characterize the transition of adolescents to adulthood, in terms of such events and behaviors as civic involvement, employment, family formation, and completing schooling?

What is the geographic and social range of adolescent networks?

What are the roles of government, nonprofits, and for profit organizations in improving opportunity and mobility and what is the impact of their policies?

What are the consequences of economic and social conditions and change in those conditions for individual economic opportunity and mobility?

What are the biological mechanisms associated with social change?

How do norms, values, preferences, life styles, and cultural practices relate to opportunity and mobility?

How do changing family dynamics influence opportunity and mobility?

2. Change and adaptation

Examples of questions that would be of interest within the theme:

What are the responses of individuals, organizations, and governments to short-term crises such as natural and socioeconomic disasters as well as long term changes such as climate change, depletion of resources, and other social and political change?

What is the role of institutional and legal structures in altering adaptive capabilities of government systems?

What is the structure of networks and ability to mitigate effects of or environmental and socioeconomic impacts on social systems?

What is the impact of residential choice on natural systems?

How does population change (e.g., aging, composition of population) affect residential choice, life style choice, consumption, civic involvement, and residential density and their impact, in turn, on natural systems, social systems, and physical infrastructure?

How does the availability of some types of businesses and services in some neighborhoods influence the ability to adapt to short or longer-term changes?

What are the interdependencies, thresholds, and complexities among emergent properties in dynamic systems?

What are the interdependencies among authorities and interest groups in the ability to react to disasters?

What changes in family formation, dissolution, and migration occur as a result of changes in social and natural systems?

The Oct. 2011 workshop made further advances in fleshing out the way the network might develop. It recommended that any **SBE observatories be located in sites selected based upon a national probability sample**. The national sampling frame and primary sampling units would be determined before any solicitation or request for proposals for the pilots is issued. It recommended holding a workshop early in 2012 (it was decided that this would be Feb. 8 and 9, 2012) to agree on an approach to the national probability sample design. Competing approaches to sampling will be discussed at this meeting. Scientific communities will then be engaged and a sampling design recommended. A statistical team will propose and evaluate the plan, including appropriate stratification and representativeness. This will be followed by one or more statistician(s) drawing a sample to establish the primary sampling units.

The scientists at this meeting further recommended that a probabilistic sample design be used in a solicitation for pilot studies that NSF may undertake. In the actual solicitation for pilot studies, there will be several options. Investigators can propose to take X number of sampling units from the PSUs but they will need to justify their choice of the sites based upon their substantive areas of focus. Not all of the primary sampling units will need to be selected for pilot work at the outset and more units can be picked up later.

Projects would have to agree on core data. During the pilot stage there would be systematic efforts to develop these core data. Each pilot site could propose data collection that would be project-specific but would need to develop scientific themes that could be emphasized across sites in the core. The applicant could focus on one of these two themes or could include elements of both themes. It was also proposed that the pilots examine different levels and units of observation and test different methods/instruments across the different sites, but should plan to have some common linkages across sites. Pilot projects would need to describe the significance of linkage across sites, justify why these data could be linked across data sites, and specify other topics for which these data could be useful.

Below are some of the types of analytic units, data collection, data sharing, and partnerships that could be proposed for the pilot projects:

Types of analytic units: Objects of study can include but are not limited to human biomarkers, behaviors, attitudes, conversations, individuals, families, neighborhoods, labor markets, social

institutions such as government agencies, private firms, and other organizations, built and natural environments, socio-ecological systems, and relationships within and between them. These should be considered across time and space, in different and appropriate degrees of granularity, and taking into account the interaction between natural and human systems.

Types of data collection: The emphasis is on novel data collection including but not limited to Internet and social or political network data, smart phones, crowd-sourcing, distributed sensors, lab and field experiments, qualitative and ethnographic data, text mining, web scraping, and new ways of linking across types of data including administrative, commercial, or other proprietary information. The development of a framework to organize data across space and time is encouraged.

Data sharing: The development of novel ways to share data while protecting privacy and confidentiality in evolving systems is encouraged.

Types of partnerships: Innovative partnerships, such as with nonacademic institutions, are also encouraged.

The attendees agreed to work as liaisons to their disciplines and to attend national and regional meetings to inform the SBE community of the opportunities that the observatory network would offer to the sciences, so that excellent applications are submitted to NSF for the pilot sites and eventually for the full-fledged observatory sites. This would be done by applying for funds from NSF to create a Research Coordinating Network (RCN) addressing the need to further develop the observatory network, build support in the community for it through workshops at national and regional professional meetings, and by providing advice and counsel to NSF and the pilots should they be funded by NSF.

Should the pilots be launched, it was suggested that a team of SBE scientists, possibly those engaged in the proposed RCN, serve as a sounding board to the pilot sites in the first two or three years, work with them to engage the SBE community in this ambitious effort to transform the sciences, and offer ways to refine the expectations of the observatory network before it moves beyond the pilot stage. This would include setting up cross-site coordination and monitoring development of cross-site protocols/core data. Since an important charge to the observatories will be to mine existing administrative data from local and state governments, regular site visits are recommended to ensure that this develops as quickly as possible and with common protocols and understandings that would ensure data comparability across sites and pilots. Models for confidentiality and privacy agreements can be developed. The pilots and observatories will be expected to use innovative approaches in instrumentation, measurement and cyberinfrastructure, including methods such as web scraping, distributed sensors, data linkages, and other approaches that can be shared across sites to advance SBE science. As the pilots come to an end, the network can institute a period of review and assessment, followed by preparation of internal documents making recommendations for how to scale the pilot projects into a national set of observatories.