

## THE STRATEGIC PLAN FOR INTEGRATING SOCIAL SCIENCE INTO NOAA'S WEATHER AND WATER MISSION

Irving Leveson<sup>1</sup>  
Leveson Consulting, Jackson, NJ

John Gaynor,  
Director of NOAA Office of Weather and Air Quality, National Ocean Service, Silver Spring, MD

Rodney Weiher  
former NOAA Chief Economist, Washington, DC

### 1. OVERVIEW

The goal of the Social Science Strategic Plan for Weather and Water (SSSPWW) is *creating a stronger, more distributed, and coordinated social science capability that is integrated with programs and decision systems in support of improved decision-making*. The Plan is an outgrowth of several years of effort by the NOAA Research Council, the NOAA Executive Council, and the Office of Program Planning and Integration in cooperation with the NOAA Mission Goal Teams and line offices.

A starting point is recognition that weather and water programs will have to serve in an environment of extensive change to which social science can contribute greatly, but is not yet sufficiently prepared.

- NOAA and its weather and water programs will face increasing demands for program budget justification and a need to communicate priorities and decision criteria to an increasingly involved and diverse set of constituents.
- Social science can enhance the value of physical and natural sciences by improving the ability of programs to assess, understand and meet customer needs and demonstrate and articulate the value they create.
- Nevertheless, Weather and Water has a social science gap. Despite the importance of social science in addressing critical questions, Weather and Water has lagged behind other NOAA mission goals in the use of social science.

The paper describes the process of the plan's development through August 2008, notes its status and offers some comments on the future. References to the Plan refer to the August 2008 draft. The Plan's recommendations for long term and short term strategies to develop and integrate social science into weather and water programs are addressed. Key analytic priorities are noted and steps required for implementation are indicated. Recommendations are included for interaction with external organizations

and individuals for capacity building, exchange of ideas and information and infusion of social science thinking and research into weather and water programs.

### 2. DEVELOPMENT

Increased use of social science was recommended in the 2003 report of the Social Science Review Panel of the NOAA Science Advisory Board (SAB). The report found that "NOAA's capacity to meet its mandates and mission is diminished by the under-representation and under utilization of social science."<sup>2</sup> The Panel's recommendations were to improve social science literacy at all levels in NOAA, develop and support social science research strategies, plans, and programs, and integrate social science into NOAA's management structure. While these recommendations were repeatedly endorsed by NOAA leadership and embodied in the agency's plans, implementation generally has been slow.

Social science for weather and water has been handled indirectly for the most part. The Office of the Chief Economist in NOAA's Office of Program Planning and Integration commissioned a number of studies of methods and their applications, largely devoted to measurement of program benefits, conducted a series of workshops across NOAA on use of social science and organized a Social science Committee to bring social scientists together. Some work was commissioned through the U.S. Weather Research Program, notably efforts of the Societal Impacts Program at NCAR. And some related work was carried out in other parts of NOAA. However, the National Weather Service (NWS) did not develop a staff of social scientists or implement a systematic program.

Social science plans have been developed by other entities within NOAA. The National Marine Fisheries prepared and implemented an extensive economic research plan which was driven in large part by the need to better support legal challenges. The National Ocean Service put forth a plan in 2005 which it is in the process of implementing and updating. With the development of the Social Science Strategic Plan for Weather and Water, the Weather and Water Mission

Goal and the National Weather Service moves closer to a systematic approach.

The plan's development was initiated in 2006 by Rodney Weiher, John Gaynor and Irv Leveson. Avery Sen also made contributions to the writing. Briefings were held with and comments received from the Weather and Water Mission Goal Team, the NOAA Research Council Social Science Committee, the SAB Social Science Working Group, the leadership of the National Weather Service, and an external review panel. The plan went through many drafts to assure that critical issues were addressed and consensus developed. The plan had to reflect:

- The large and growing number of programs and issues.
- NOAA leadership's preference for social science to be largely decentralized in programs.
- A need to include a broader range of social sciences.
- Integration of social sciences with other sciences where possible.
- Interaction with external organizations and individuals for capacity building, exchange of ideas and information and infusion of social science thinking.

Consensus was particularly important because in the past, when social science had been included by line offices in their initial budget submissions, it tended to be dropped in favor of the science portions of programs when choices were required. Because complexity was already great, integration with the plans of the other mission goals was largely left to future versions.

Some important social science efforts started while the Plan was being developed and discussed. Several studies began in areas including communicating uncertainty in hurricane and weather forecasting and in hydrology. National Weather Service line offices began to include more social science content in their Program Operation Plans (POPS) which contain five year budget requests, albeit for budgets starting a couple of years out and subject to extensive modification in reviews through NOAA, the Department of Commerce, OMB and Congress. The NOAA Research Council's Social Science Committee now reviews social science in the POPS. And a new working group began to stimulate greater recognition of the importance of using social science for decision-making.

Impetus to acceptance and implementation has been given by the naming of the Social Science Working Group of the NOAA Science Advisory Board (SAB), composed of external experts, which began its work in Fall 2007. The Working Group has been examining all aspects development and use of social science within and for NOAA, holding discussions with The

Science Advisory Board, the NOAA Research Council, division heads (AAs) and social scientists. The final report is expected to be issued in Spring 2009. The Working Groups recommendations are expected to strongly support strengthening social science efforts and become NOAA policy. These efforts are already producing some results.

The main content of the Social Science Strategic Plan for Weather and Water was shared with the Working Group early in its deliberations, and the final SSSPWW Report was shared with the SAB Working Group after it was fully briefed throughout NOAA.

### 3. STRATEGIES

The Plan recommends that NOAA's weather and water social science objectives be accomplished through a range of long and short term strategies and analytic priorities.

Long term strategies include:

- Long term capacity building.
- Developing methods, analyses and data for decision support.
  - Analyzing customer needs, utilization of services and delivery systems, outcomes benefits and costs.
  - Examining efficiency of production and alternatives for producing data and services and achieving outcomes.
- Infusing results of analyses into decisions and programs to improve products and services.
  - Social science analyses can support a service delivery proving ground, including through efforts in close collaboration with programs and test beds.
- Improving the use of social science through:
  - Broadening the mix of social sciences.
  - Coordinating social science research within NOAA.
  - Coordinating and/or integrating with research in physical and biological sciences where beneficial.
  - Coordinating with, fostering and drawing on social science research outside of NOAA, working with external research and professional organizations.
  - Improving communication with and education of colleagues and constituencies.

- Continuing to set and refine priorities for analysis.
- Assuring an appropriate level of effort for social science in Weather and Water to meet growing needs.

Short term strategies include:

- Conducting and building capabilities for studies in priority areas.
- More fully examining external research to assure that available studies are utilized so that NOAA's social science resources are applied without unnecessary duplication.
- Developing analyses that can assist in setting priorities in the FY 2012- 2016 and subsequent Program Operation Plans (POPS), including coordination with test bed programs.
- Continuing to increase coordination through the NOAA Research Council Social Science Committee.
- Developing cooperative grant relationships with organizations such as the National Science Foundation, THORPEX and professional organizations with related interests.
- Strengthening NOAA's support for and relationship with the Societal Impacts Program at NCAR.

Analytic priorities include:

- User needs assessment, including understanding perceptions of and responses to various types and forms of weather and water information by types of users, including current and potential demand for services and distribution methods.
- Communication of forecast uncertainty and communicating complex information more generally.
- Use and impacts of more localized forecasts and warnings to help in determining what kinds of forecasts will be most useful and demonstrating the benefits of the forecast efforts to constituencies.
- Understanding the societal effects of high impact weather and implications for designing and implementing programs and determining their effectiveness.
- Addressing interrelated needs of communities and regions.

- Valuation of program benefits and other decision support services.
- Communicating with and educating stakeholders.

#### 4. RECOMMENDATIONS FOR IMPLEMENTATION

To further these efforts, the Plan concluded that for implementation:

- The Social Science Strategic Plan for Weather and Water should formally be integrated into the R&D portfolio of the Weather and Water Mission Goal Team and the other mission goal teams. The Mission Goal Teams should develop an operational strategy and program to strengthen and integrate social science into corporate and program-level planning, analysis and evaluation. Further, the Weather and Water Social Science Strategic Plan should be coordinated with present and future versions of the social science plans of other mission goals as well as the NOAA Strategic Plan and NOAA Research Plan."
- "Implementation plans should be prepared for specific areas of analysis in support of program decisions and outreach. Implementation plans should address social science activities, their approaches, expected outcomes and uses, organizational arrangements, budgets, timetables and processes for infusion into planning, decision-making and education.

At present Jennifer Sprague, Policy Analyst with the National Weather Service Office of Strategic Planning and Policy, is leading a Social Science Team that is making further revisions to the Plan. This process will hopefully lead to full acceptance by the top management of the National Weather Service and more systematic efforts at implementation.

#### 5. THE FUTURE

While a foundation has been laid, utilization of social science in NOAA's weather and water programs has fallen far short of the level of effort needed to meet today's challenges. With growing understanding of social science and its use in weather and water programs, some institutionalization of processes for using that understanding, and major changes taking place in government, this is an opportune time to build on the gains to achieve increased and sustainable penetration of social science into planning and decision-making.

A new administration means significant turnover at the top and among some experienced and accomplished employees. However, it creates new

opportunities to focus attention on critical issues and motivate and attract talent. Most people are optimistic that the momentum for making use of social science will continue and that more will be done to integrate social science with natural, biological, and physical science efforts. Many factors will determine the outcome.

- As succession takes place in the leadership of the National Weather Service, in line offices and in membership of the weather mission goal team, it will be critical to reinforce the message to assure that efforts continue and move forward.
- NOAA's Chief Economist, who was a driving force behind increased use of social science and many NOAA-supported weather and water studies, retired in mid-2008. He is expected to be replaced by another senior social scientist.
- Leadership and coordination among social scientists and encouragement of integration of social science into program operation plans will continue through the Social Science Committee of the NOAA Research Council. The NWS Office of Strategic Planning and Policy and the Weather and Water Mission Goal Team can play a major role.
- Weather and water social science must be better coordinated with efforts of other mission goal teams. There is an increasing need to work closely with oceans, ecosystems and fisheries and with any new initiatives on climate change. The nature of interactions will be influenced in part by any changes in the current matrix management system of line offices and cross-cutting mission goal teams.
- Great budget pressures could lead to increased use of social science to make resource allocation decisions and improve efficiency and program targeting or it could slow or even reverse efforts if the understanding of the role of social science in management decisions is not ingrained. It is important that there be understanding of the role of social science in providing information for choosing among programs, technologies and systems and determining their level of effort, as well as in designing and evaluating programs and demonstrating their value to constituents.
- A scientist at the top of NOAA could mean emphasis on integration of "hard sciences" in ways that, whether intended or not, work to reinforce separation from social sciences when applied by staff, or it could lead to greater understanding of the value of all sciences when used in harmony.

- The heightened emphasis on climate change could create new opportunities for social science to contribute to understanding and addressing societal consequences both of change and of programs aimed at prevention, adaptation, and amelioration, and it could lead to reliance on a richer mix of social science skills.

The Social Science Strategic Plan For Weather and Water and efforts at implementation should continue to evolve to meet the changing needs of a dynamic science and policy environment.

---

<sup>1</sup> *Corresponding Author Address:* Irving Leveson, Leveson Consulting, 10 Inverness Lane, Jackson, N.J. 08527-4047; office 732-833-0380; cell 609-462-3112; email: [ileveson@optonline.net](mailto:ileveson@optonline.net)

<sup>2</sup> NOAA Social Science Review Panel, *Social Science Research within NOAA: Review and Recommendations*, Final Report to the NOAA Science Advisory Board, March 18, 2003, p.13 [http://www.sab.noaa.gov/Reports/NOAA\\_SocialSciencePanelFinalReport.pdf](http://www.sab.noaa.gov/Reports/NOAA_SocialSciencePanelFinalReport.pdf)