# Integrating the Social Sciences into Chesapeake Bay Restoration



**A Workshop Report Prepared by:**
**Chesapeake Bay Program's Scientific and Technical Advisory Committee**

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# About the Scientific and Technical Advisory Committee

The Scientific and Technical Advisory Committee (STAC) provides scientific and technical guidance to the Chesapeake Bay Program on measures to restore and protect the Chesapeake Bay. As an advisory committee, STAC reports periodically to the Implementation Committee and annually to the Executive Council. Since its creation in December 1984, STAC has worked to enhance scientific communication and outreach throughout the Chesapeake Bay watershed and beyond. STAC provides scientific and technical advice in various ways, including (1) technical reports and papers, (2) discussion groups, (3) assistance in organizing merit reviews of CBP programs and projects, (4) technical conferences and workshops, and (5) service by STAC members on CBP subcommittees and workgroups. In addition, STAC has the mechanisms in place that will allow STAC to hold meetings, workshops, and reviews in rapid response to CBP subcommittee and workgroup requests for scientific and technical input. This will allow STAC to provide the CBP subcommittees and workgroups with information and support needed as specific issues arise while working towards meeting the goals outlined in the Chesapeake 2000 agreement. STAC also acts proactively to bring the most recent scientific information to the Bay Program and its partners. For additional information about STAC, please visit the STAC website at www.chesapeake.org/stac.

**This report was produced by the following members of the workshop steering committee:**
Michael Paolisso, University of Maryland
Elizabeth Van Dolah, University of Maryland
Troy W. Hartley, Virginia Institute of Marine Sciences
Lisa A. Wainger, University of Maryland – Chesapeake Biological Laboratory
Jim Pease, Virginia Tech University
Douglas Lipton, University of Maryland
Susan Julius, Environmental Protection Agency

## Executive Summary

Among scientists and policymakers in the Chesapeake Bay region, there is increasing recognition that 1) human dimensions need to be better integrated into efforts to restore ecosystem functions, reduce pollution, and manage the sustainable use of natural resources, and 2) our understanding of the interactions of these human dimensions with restoration choices requires a combination of social science approaches. Increased population growth, expanding and contracting economic cycles, and a growing diversity of cultural and social groups generate complex social issues whose varied impacts on restoration strategies need to be analyzed and adaptively managed. To date, there has been little systematic assessment of these complex social issues and the resulting social science research needs and priorities, and the need for such an assessment is urgent.

On March 10, 2011, the Chesapeake Bay Program's (CBP) Scientific and Technical Advisory Committee (STAC) organized a workshop for over 70 scientists (social and natural), resource managers, students, and policymakers in Annapolis, Maryland to identify opportunities for advancing the contributions of social science research to Chesapeake Bay restoration. Over the year prior to the workshop, a committee of social scientists within STAC worked to identify areas where social science research is already contributing to Chesapeake Bay restoration and areas where social science research is needed. The committee also completed interviews with CBP leaders to help determine where opportunities exist to integrate social science research into existing programs and policies, and also identify the constraints to such integration. This baseline research, some of which is described below, was used to develop the goals and objectives for the social science workshop.

The goals of the workshop were to:

1) Inform program managers of the different types of social science research available;

2) Initiate a dialogue between regional program managers and social scientists on needs and capacities; and

3) Develop concrete next steps to better integrate social science research into Chesapeake Bay restoration activities.

To accomplish these goals, the committee organized the workshop to include:

1) A presentation on the results from interviews with key informants from the CBP, which occurred during the year prior to the workshop, on the needs and constraints to integrating social science research in Bay restoration;

2) Panel discussions on a) social science and understanding individual behavior change and b) social science and understanding group, community and organization change;

3) Working groups to identify constraints, opportunities, and actions, including priorities for action; and

4) A summary panel on final thoughts.

The workshop agenda, including names of presenters, is attached as Appendix 1. This report begins with discussion of the results from key informant interviews, followed by abstracts of the presentations by social scientists focused on the themes of understanding individual behavior change and group, community and organization change. Key points for managers and stakeholders to consider are listed in these abstracts. Next, the topics discussed during the working groups are listed. The report then presents a summary panel's observations and insights on the challenges and next steps to better integrate social science research. Finally, the report concludes with a few overall key research and program recommendations the workshop steering committee feel are important for sustaining our initial efforts to integrate and support social science contributions to Bay management and restoration.

**Key Informant Interview Results**

Using methods from anthropology, steering committee members Michael Paolisso, UMD, Liz Van Dolah, UMD/CRC-STAC Staff, and Jim Pease, Virginia Tech, conducted interviews with 12 key informants from the CBP community. Key informants were selected to include senior level managers and scientists from the CBP's Management Board and six Goal Implementation Teams, each of which is charged with directing the policies and programs for meeting restoration goals. As such, the selected key informants included representation from state, federal, non-profit, and academic institutions as well as across the CBP's priority restoration goals: 1) sustain healthy fisheries, 2) protect and restore vital habitat, 3) protect and restore water quality, 4) maintain health watersheds, 5) foster Chesapeake stewardship, and 6) enhance partnership, leadership, and management. Interviews were guided by six open-ended questions that were used to promote a dialogue with key informants in order to elicit perceptions of social science research needs and applicability to Chesapeake Bay restoration goals. These questions were:

1) *Date, name, current position/occupation?*

2) *How many years have you been involved in Chesapeake Bay restoration work?*

3) *Do you have examples of how social science research has played an important role in advancing Bay restoration? Do you have any examples that are not Chesapeake Bay related?*

4) *In your opinion, what Bay restoration priorities should be addressed from a social science perspective? Why is the social science perspective important*?

5) *What do you think are the constraints to generating and utilizing more social science research in Bay restoration efforts?*

6) *Any other thoughts or suggestions on the role of social science research in supporting Bay restoration?*

Interviews lasted approximately 45 – 60 minutes and were recorded while interviewers took notes. Interviewer notes were compiled into a thirty-page document and distributed to the full steering committee to analyze for key research themes. Each steering committee member submitted their identified themes to STAC Staff, who compiled and redistributed a list of themes for the steering committee to cull into priority social science research topics for the workshop. The steering committee met through a conference call following the exercise to discuss prioritized themes.

Steering committee members, Michael Paolisso and Liz Van Dolah, separately analyzed the interviews using the qualitative data analysis program, Atlas.ti. First, Paolisso and Van Dolah separately and inductively coded text from the thirty pages of interview notes for themes and sub-themes. Results were compared and themes re-aligned in preparation for the second phase, which comprised of separately and deductively coding text using the re-aligned themes. This second phase of analysis revealed five prominent themes:
1) There is a strong role for social science research
2) There is no strong role for social science research
3) Program opportunities for social sciences
4) Social science research needs
5) Constraints to using the social sciences

The last two themes, "social science research needs" and "constraints to using the social sciences," had the largest number and widest variation of associated sub-themes, and as a result, were the focus of the third and final phase of analysis, development and assessment of networks. Networks, as web-like visualizations of coded themes, are instrumental for weighing and evaluating the relationships between themes and sub-themes, which in coded text is difficult to assess. Networks of "social science research needs" and "constraints to using the social sciences" were qualitatively assessed by both researchers to determine how themes grouped or separated. Network analysis provided additional insights for how to guide workshop discussions.

*Social Science Research Needs*

The network analysis revealed five overarching research needs:

1) *Behavior-change research*: key informants expressed a desire to understand communities' and stakeholders' environmental knowledge, beliefs, and values about the Chesapeake Bay, its tributaries, and watershed. In relation to this, there was also strong desire to understand what motivates and drives individuals to make the choices they do or change behaviors in ways that have positive or negative impacts on the environment (e.g., what motivates individuals to give up their Saturday to participate in rain barrel events?). Key informants also recognized the need to connect people to the landscape/bayscape as an important step in bringing about behavior change. Lastly, it is widely believed that enhancing community engagement is essential to changing behaviors.

2) *Economic research:* Key informants identified a number of examples where additional economic analysis is needed, particularly in cost-benefits and cost-effectiveness estimates.

3) *Research on the cultural landscape:* Key informants also desired to know how to measure community expectations, and many suggested that conflicting expectations between what different communities believe are necessary measures to restore the Bay are preventing or slowing restoration progress. They also indicated the need to research the social dynamics and cultures that influence communities' knowledge, beliefs and values about nature. Related to the last point, some suggested conducting additional resource-use analyses to ground-truth understandings about stakeholder values.

4) *Research to address communication barriers:* Key informants believed that more investments must be made to better understand how different stakeholder groups define "success" and a "restored" Bay. By developing indicators to measure "success," we will be able to better navigate conflicts between various stakeholder groups (e.g., management community, scientists, farmers, watermen, suburbanites) and design effective communication tools that target those stakeholder understandings.

5) *Research to understand institutional change:* Finally, the key informants highlighted a number of examples that indicated the need to understand the dynamics of the political environment and its impacts on stakeholder groups. The CBP also needs research exploring how to balance equity and build effective partnerships among stakeholder groups who relate to the Chesapeake at different and sometimes conflicting scales.

*Constraints to Integrating the Social Sciences:*

When questioned about why the CBP has not yet been able to integrate social science research to address these research needs, four other overarching issues were illuminated:

1) *Lack of access to the tools and research:* A significant constraint to integrating the social sciences has been the lack of knowledge among managers and natural scientists about how to use social science tools and how to access the social science experts. There has been little promotion of the social sciences, and as a result, managers and scientists do not know who to turn to for expert guidance. The lack of self-promotion by the social sciences has also led to the perception that there is very little regional expertise available.

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2) *Institutional constraints:* Limited resources have forced the CBP, states, and Federal government to prioritize spending, and because there is limited knowledge about how to apply the social sciences, it is often among the first programs to be cut. There is also the sense that current thinking has been too traditional and has not allowed for the incorporation of these non-traditional sciences into the decision-making process. There are also a number of conflicting interests and priorities that managers do not necessarily want the social sciences to illuminate, as illuminating may threaten the continuance of certain policies and programs that are in direct conflict.

3) *Barriers of scale*: Key informants also indicated that they do not know how to use the social sciences in ways that can inform a system as large as the Chesapeake Bay Watershed, with its broad-ranging and often competing stakeholder needs and desires. They also indicated that the top-down regulatory approach currently in place does not allow for the bottom-up community involvement that social sciences promote.

4) *Communication:* Key informants suggested that social science integration has been constrained by competing "languages" used by managers and social scientists themselves; social science terminology is often difficult for scientists and managers to understand, and as a result its resonance is easily lost.

**Panel Discussions**

**Theme 1: Social science and understanding individual behavior change**

**The Psychology of Climate Change**
(**Poornima Madhavan, Old Dominion University**)

Recent polls have revealed that most Americans do not feel a personal connection to the issue of climate change (CC); since 2009, there has been a significant decline in Americans' beliefs, risk perceptions, and trust in the messengers of CC. The purpose of this presentation was to understand why communications on CC are failing to get public attention, what can be done to create a sense of urgency required for public discourse and action, and how to encourage the development of public support for policies that lead to environmental resiliency. We constructed and tested a social science driven process model of communicating CC that revealed insights into how people understand the risks and psychosocial impacts of CC, peoples' ability to cope with the perceived threat of CC, the psychosocial barriers that limit CC action, and the role that psychologists can play to assist in mitigating/adapting to CC. The first key finding is the existence of a 'finite pool of worry' effect or the inability of people to factor in additional risks after a certain threshold of tolerance has been reached (i.e., the existence of other classes of risks such as economic and health issues greatly reduces the probability of CC being factored into the 'pool of worry'). Second, 'place attachment' or the extent to which people identify with and feel emotionally connected to their environment plays a large role in willingness to take CC action. This is particularly problematic in coastal areas (e.g., Norfolk, Virginia) with large military populations that do not remain geographically connected to one place long enough to develop a personal sense of responsibility for environmental decisions. The third finding is the role of

'habit' or 'behavioral momentum' in environmental decisions. Specifically, people get habituated to a certain pattern of living; they are largely unwilling to change these patterns if they do not experience a sense of urgency and necessity that spurs immediate action. **Social** marketing techniques tailored to specific populations are now being designed (as a product of these findings) to address the issues of perceived urgency and peoples' willingness to take action to combat the impacts of CC.

Take home points:
- The purpose of this presentation was to understand why communications on CC are failing to get public attention, what can be done to create a sense of urgency required for public discourse and action, and how to encourage the development of public support for policies that lead to environmental resiliency.
- 'finite pool of worry'
- 'place attachment'
- 'habit' or 'behavioral momentum'
- Social marketing techniques


**Why Culture is Important to Environmental Behavior**
**(Michael Paolisso, University of Maryland)**

It is well recognized that culture influences behavior that directly or indirectly affects the environment. How culture influences environmental behavior has been a major research topic within anthropology. Over at least the last 60 years, anthropologists have developed theoretical and methodological approaches to study culture, behavior and environment. These approaches include the study of community- and local-based knowledge and values that affect natural resource use and ecosystem dynamics. Other approaches have focused on cultural knowledge and values as key factors that help create community environmental vulnerability, adaptation, and/or resilience. Still, other anthropologists have focused on culture as a cognitive framework for defining, understanding and valuing the environment.

A cognitive approach to the study of environmental behavior can be formalized using a set of theories and research approaches that is known as cultural models. Cultural models are presupposed, tacit, taken-for-granted knowledge models that groups of individuals have because of past, shared experiences with the environment. These cultural models allow groups of individuals to understand and respond to environmental problems in ways that make sense to them and also help define them as a group, often in contrast with other groups (who are doing the same but using different knowledge and values). In new or uncertain (environmental) situations, reasoning draws heavily on cultural models, which in turn are constructed of interconnected cognitive schemas. To a significant degree, the individuals who share them do not question cultural models of the environment. They are knowledge and understanding that is obvious and fundamental, based on repeated experiences and observations. Cultural models of the environment do change when new environmental experiences become integrated into existing knowledge schemas.

Cultural model knowledge of the environment is linked to behavior through emotions and core values. It provides reasoning and rationale for behavior. Behavior as experience leads to new cultural models if sustained and shared.

From a management and policy perspective, cultural models are the basis for multiple environmentalisms. Groups of Bay stakeholders may use different cultural models of the environment to understand and value Bay natural resources and support or oppose Bay restoration policies and programs. As a result, individuals from groups with different cultural models of the Bay could have very different understandings and interpretations of the same natural resource/ecological processes. They will bring different knowledge frames to the same physical, ecological, or biological reality, and thus end up with different conclusions about risk and response. Consequently, a major lesson learned from a cultural model approach is that we have multiple Chesapeake Bays at the cultural level. These multiple environmentalisms need to be understood and integrated into efforts to sustain the Bay's natural resources and ecosystem functions. Fortunately, cultural models of the Chesapeake Bay all have the core value to protect and manage the Bay's natural resources.

Take home points:

- Anthropologists provide a number of approaches for understanding environmental knowledge and values
- One useful approach is a cognitive one, specifically that of cultural models
- Cultural models capture implicit, tacit knowledge and values about environment
- Different cultural models for environmental phenomena lead to different forms of environmentalisms
- All natural resource/ecosystem restoration efforts will involve cultural phenomena that help stakeholders understand and define nature and restoration actions

**Applying Economics & Decision Science to Restoration Strategies**
**(Lisa A. Wainger, University of Maryland Center for Environmental Science, Chesapeake Biological Lab)**

The relevance of economics to a Chesapeake Bay restoration strategy will depend on whether we apply the appropriate economic analysis to a given social goal. Assigning monetary values to changes in the ecosystem service outputs of a natural system such as the Bay can help to inform decisions about how much to invest in restoration, particularly if the costs and benefits of a regional or national approach are being evaluated. However, a variety of alternative economic analyses may be more appropriate to motivating socially desirable choices on the part of individuals or firms.

Often economists are called on *after* a policy is designed to demonstrate net benefits, however, a major strength of economics is applying analysis *before* the policy is developed to promote approaches that are effective at motivating change, that promote innovation, and that manage costs. For example, some programs aimed at promoting adoption of agricultural best management practices (BMPs) have used an understanding of the business structure of farms and the risk-aversion of farmers to promote cost-effective solutions. Some BMPs are expected to save money, yet farmers don't adopt these approaches because they view change as risky. With

this understanding, programs have used insurance instruments to remove the financial risk of changing farming practices and promote adoption of practices that reduce pollution.

Past economic analysis has revealed that innovative solutions are promoted when governments set goals or establish pollution caps and then let individuals or firms decide the best way to achieve those goals. In other words, tell them *what* you want done but not *how* to do it. If you require an environmental management technology, such as no-till, you do not provide incentive to maximize performance because all the person has to do is show that they applied the practice, not that they applied the practice correctly to achieve an environmental benefit. Further, this one-size fits all approach does not provide the flexibility needed when local conditions, such as soil type, make this practice less effective or more burdensome and it does not promote innovative solutions since the "solution" has already been determined.

Two case studies were used to illustrate how economic analysis can inform policy development and implementation.

Fiscal impact analysis shows that the costs of sprawl vary by level of urbanization and that this variability explains, in part, the lack of acceptance in rural counties of policies aimed at curbing sprawl. In a study conducted in the Charlotte, NC region, it was shown that the fiscal benefits of compact growth were most likely to accrue to the central urban county but not to outlying rural counties because, in rural counties, the loss of tax revenues associated with compact growth (e.g., smaller houses on smaller lots) was likely to offset the reductions in expenditures on infrastructure costs. The study highlights the fact that in many policy situations "one size does not fit all." As a result, solutions are likely to be more accepted if they are tailored to local circumstances and if they promote localities finding their own solutions for achieving a goal.

The economic or social benefits of environmental restoration depend on how people use and value ecosystems. Social benefits are maximized by targeting efforts where net _payoffs_ are highest, which is not the same as targeting locations where ecological conditions are best /worst. Estimating the dollar values of the flows of ecosystem goods and services is an increasingly popular approach to capturing the payoffs of restoration in terms of the many direct and indirect ways that people benefit from natural systems. However, to use such information to prioritize specific restoration locations requires understanding how benefits vary spatially – something that is often lacking from studies that map values of ecosystem services.

Benefits of ecosystem services will not be homogenous across a given type of ecosystem because they will vary by environmental quality, accessibility, and substitutability of the goods and services produced at a given location. In addition, the reversibility of the environmental damage will have a substantial effect on the net benefits of restoration since it is the *change* in the ecosystem services that creates the benefits. Integrated modeling of environmental and economic conditions that drive willingness-to-pay for services within a given area can be used to quantify expected benefits of a restoration strategy.

Dollar values are the clearest way to communicate social benefits of an action but they can typically only be estimated for a subset of ecosystem services due to a lack of appropriate tools and data. Basing a decision only on the benefits that can be monetized may not be appropriate,

particularly when the majority of the benefits are coming from services that cannot be monetized. An example was shown where a wetland restoration choice based only on the monetizable benefits of commercial and recreational fishing was shown to be inferior to a choice based on a multi-criteria analysis of a more complete suite of ecosystem services that would be generated such as shoreline protection, aesthetics, and recreational boating, in addition to recreational fishing. Non-monetary metrics are widely used to evaluate relative benefits of choices and to demonstrate cost-effectiveness or the best "bang for the buck." These non-monetary metrics may represent environmental outcomes such as acres of bird habitat but they can be improved as measures of social benefits if they are developed through democratic approaches that consider stakeholder needs, preferences and priorities.

Take Home Points
  Opportunities for integrating economics into Bay restoration programs include:
  - Using economic behavioral models to understand choices, drivers of natural resource change, and where managing risk can be used to motivate socially-beneficial behavior changes
  - Assessing the social benefits of alternative policy actions based on location-specific factors of environmental quality and market conditions
  - Providing advice on how to harness market or market-like forces to achieve cost-efficiencies in program design

**Economics of Individual Behavior Change or Choice: Applications to Chesapeake Bay Management**
**(Doug Lipton, Department of Agricultural & Resource Economics, University of Maryland College Park)**

Economists analyze individual behavior change for two key reasons: 1) Deduce value for goods, services and environmental states; and 2) Predict individual responses to economic or other events as well as policy or regulatory changes. The approach taken to studying behavior change depends on what is being studied and the data available. The two categories of techniques are revealed preference approaches that rely on observation of behavior change and decisions, and stated preference approaches that use survey techniques to elicit responses to hypothetical situations. Small scale, highly controlled experiments are also increasingly being used to understand and predict behavior change.

**Panel 2: Social Science and Understanding Group, Community, and Organizational Change**

**Sociological Perspectives of Fishing Communities**
**Steve Jacob, York College of Pennsylvania**

Fishing communities are an important unit of analysis for fisheries managers of Federal waters. Federal regulations require that the negative social impacts of fisheries management be considered and minimized for communities that are largely dependent on the fishery. Although the Chesapeake is an inshore fishery, a similar approach would be useful to protect the local

culture and heritage of Chesapeake communities. One way of doing this is to develop an information system of social indicators to assess and monitor living conditions in coastal communities. Such a system relying on secondary data can be inexpensive, efficient, and has produced similar results to more intensive techniques such as ethnography. In addition the quantitative information can be used to efficiently model negative impacts of regulations before they are implemented so that adjustments can be made that minimize social impacts. Further the quantitative social indicators are also easier to integrate into ecosystem based fishery management models.

**Cognitive Models and Social Science: Salience, Community, and Conservation**
**Benjamin Blount, SocioEcological Informatics**

Cognition is the term applied to the processing of information by people, and cultural models are patterns of information processing which are widely shared by people in social groups. The importance of cultural models lies in their utility as default understandings of categories that relate to the environment in which social meaning takes place. Cultural models of the environment include the ways in which individuals relate to and value the environment. Specifically they need to identify with an environment in order to promote its conservation. Stated differently, if individuals invest identity in conservation, they are more likely to take issues of conservation seriously. Two examples illustrate the principle. On the coast of Georgia, a group of 28 shrimpers realized that they were in danger of losing their identity through the collapse of the fishery. To sustain shrimping they had to expand their identity to include marketing of shrimp through niche marketing. In a second example, the state of Texas began an advertising campaign, "Don't Mess with Texas," in order to attract young men, who were the worst offenders in terms of highway litter, and allow them to express their masculinity through challenging others to stop littering. The result is the most successful campaign ever in terms of preventing road litter. The major point is that personal identity is an essential factor in promoting conservation.

**Enacting Human Dimensions of Marine Ecosystem-Based Management**
**Kevin St. Martin, Rutgers University**

The traditions of human geography (nature/society and a concern for space) provide a basis for both investigating and enacting the place of communities within marine ecosystem-based management. Using, specifically, a political ecology approach (i.e. foregrounding forms of surplus production and its distribution, power relations, and systems of knowledge/representation) combined with participatory mapping methodologies, this research documents fishing communities' use of particular locations within the marine environment. While the latter is a contemporary site of economic and environmental upheaval (e.g. privatization of previously common resources, production rationalization, and community/cultural decline), knowing which communities are dependent upon which areas at sea suggests possible community-based alternatives to top-down management and the corporatization of fishing. Placing communities as key actors within the sea, rather than only as on-shore sites of regulatory impact, allows for a rich documentation of local ecological knowledge important to ecosystem-based management , but also creates a place within which

communities might experiment with new forms of production (e.g. community support fisheries) that build upon and foster community-based forms of stewardship.

**Public Administration & Policy—Landscape& Examples: Policy Processes, Implementation & Outcomes.**
**Troy W. Hartley, Virginia Institute of Marine Science**

Public administration and policy science is an academic field of research and education within a wide range of public policy arenas, e.g., public health, housing, welfare, homeland security, transportation, urban re-development, etc. A specialized sub-field has emerged since the late 1970s/early 1980s in environmental and natural resource policy and management; principally terrestrial-based resources and pollution control issues, but a growing field of coastal and marine policy and management. The overall field has led to governance advancements in Total Quality Management (TQM), performance-based governance and performance measures, and other approaches to re-inventing government. At the same time, the specialization in resource management and policy has led to adaptive management, ecosystem-based management, and collaborative or integrated management frameworks. Significant drivers or factors of interest in this field of study relate to organizations and institutions (e.g., authority, resources, capacity and expertise), groups (e.g., professional norms, organizational cultures); individuals (e.g., leadership, champions, policy entrepreneurs); political will and power (e.g., public opinion and support, stakeholders, societal events); or the inter-connected, coordinating mechanisms (e.g., Federalism, governance networks). As an example of public administration and policy research, the degree of inter-connectedness and extent of information-sharing communication pathways between fisheries and watershed management was discussed through a governance network analysis. The size, density and weighted average path length (a measure of reach across the network) of fisheries and watershed management in the Gulf of Maine illustrated the critical roles of bridgers who link otherwise unconnected information and capacities, the diversity of network structures and functions, and the huge communicative distance between fisheries and watershed management. A similar governance network analysis method was used in an example of ecosystem-based fisheries management in the Chesapeake Bay, illustrating the integration of scientists and managers in the project which facilitate the science-to-management process. Further, certain individuals played key connectivity roles in the network structure and function, with some far more connected as an information gatherer and others better suited as an information disseminator. Recognizing such roles can inform outreach and education strategies and objectives.

Take-home points:

• Networks have quantifiable structure and function; they cross sectors, jurisdictions, and professional groups; and networks are constantly changing as projects and priorities adjust the communication patterns of its participants.

• Understanding governance and communication network structure and function can improve the effectiveness of outreach strategies, identify bottlenecks, gaps and vulnerabilities in the network that inhibit information sharing, and illustrate opportunities to enhance network function, spur innovation, and improve communication.

**Working Group Discussions**

In the afternoon of the workshop, participants were organized into three working groups. Each workgroup will include social scientists, Chesapeake Bay experts and managers, and a facilitator to help guide discussions. Working groups were asked to:

1) Discuss a short list of participant-derived questions from morning panels (to be provided);
2) Identify a programmatic problem and determine how social sciences can and should be incorporated to enhance identified program or policy.
3) Identify related high priority social science research needs.
4) Identify short, intermediate, and long-term goals for integrating social science research into Chesapeake Bay restoration programs and policies.

Bulleted conclusions of the working groups are presented below.

**Group 1:  Key Themes, Issues and Questions**

- Should we focus on change in values or change in behavior based on existing values?
- Ethnography vs. demography
- Application of fisheries management resemblance to other important communities for Bay Goals
- Is self reported data accurate?
- "Finite pool of work" is real so what does that mean to restoration efforts?
- How do we use social network technology and theory to improve communication?
- If education leads to complacency, should we stop educating?
- Management Problems/Challenges:
  - Need widespread behavior change
  - CBP GITS need effective management structures/networks/decision-making tools
  - Regulatory vs. cooperative/voluntary approaches to achieve goals
  - How can social science inform the paths of least resistance (or most effectiveness) to activate goals?
  - Need social science monitoring strategy to inform strategies
- Management steps/action items:
  - Produce guidance for CBP management team on social science
  - Apply economic models/case studies to blue crab management challenges
  - Increase capacity of social science in CBP decision making process
  - How can social science design policies
- Next Steps:
  - Focus on how existing knowledge can inform policy/programs to increase effectiveness
  - Define an issue, bring in social science team, develop strategy, implement it!
  - Social science review and comment of WIPs
  - Stream fencing goal – apply social science theory and practice

**Group 2:  Key Themes, Issues and Questions**

- Environmental stewardship – is it part of our "deep structure"?
- How do we capture the "long-run" imagination of the populace?
- How do we help public distinguish misinformation?
- Can we adjust TMDL policy to be "trading-friendly"?
- Do Social marketing studies and models incorporate state of the art social science?
    - Write out reach/community engagement
- How effective are social marketing approaches?
- Do we have good indicators of social success (are we reaching people?)
    - Need quantitative performance measures
- Can we connect water quality parameters to things people care about?
    - Ex: crab social marketing; targeted fall fertilizers
- Is it true that what is more important than the why? And if so, what behaviors should we be promoting?
- Are we learning from existing research/experiments of opportunity?
- ID – information focusers
    - Children?
- Are there groups targeting religious communities?
- Who are people comfortable with re: BMP adoption
- Can we identify who is trusted in different groups?
- Are we learning from isolated case studies?
- Engaging vs.  manipulation – what turns people off?
- Themes:
    - What approaches are effective?
    - How do we link questions to techniques?
    - What do we value – how do we connect to different user groups?
        - Spatial variability – headwaters vs.  tidal waters
        - Intergenerational
        - Short vs.  long-term outcomes
    - Are we seeking to change values or understand values?
- Ideas:
    - Demonstrate geographics of dependence
    - Different funding mechanisms to promote coordinated studies of synthesis
    - Engage businesses to help us
        - Green image
        - Dependencies
    - Public gets multiple benefits from TMDL compliance
    - Eliciting benefits and barriers to change to use in outreach
    - ID value groups and tailor the message to them and the technology
    - Visioning approaches to community engagement
    - Learn from related marketing approaches (anti-smoking)
    - Use social media


**Group 3:  Key Themes, Issues and Questions**

- Questions:
  - Methods to motivate change? Yes/immediacy
  - Is the Bay Program about behavior change?
    - Is About science
  - Validity/respect across disciplines
  - Bottom-up needs assessment
- Funding, support for mainitaing conversation
  - Getting people to value maintenance as opposed to restoring health
    - "Maintain healthy watersheds"
- Human dimension measure of success.  Ecosystem services vs.  socio-economic system
- Cost avoidance – save now, pay later
- Agriculture – learn from other areas
  - Locavore
  - CSA/CSF
- Fisheries
- What are the tipping points calling if the right thing
- Identifying unengaged/unconnected
  - How to engage?
  - What are their needs/concerns (local)
  - Engage (e.g., ag community) – what do we share?
- Do integrated assessments (short)
- Experiment with participatory methods (all disciplines)
- Citizen science including social science
- Integrate social science into CBP
  - Into goal team recruit
- Communities that have taken initiative
- Leadership development

## Summary Panel:  Final Thoughts and Next Steps

The workshop concluded with a presentation by three experts with long-term experience in working on Chesapeake Bay resource management and restoration.  They were asked to summarize their conclusions, based in large part on the day's discussions, about the role and challenges of social science research and Bay restoration, and to offer their thoughts on next steps, for STAC, social scientists, resource manages and other Bay stakeholders.  Their conclusions are presented below, in bulleted form.

Anne Swanson (Executive Director, Chesapeake Bay Commission)
-The approaches and methods of the social sciences present challenges that important to address in our continued efforts to restore the Bay.
-To achieve better integration of social sciences, we need to reduce existing communication barriers.
-We need to better understand how social sciences inter-relate with the rest of the CB community?
-We need specific examples of social science research making a difference to Bay restoration,

and use those case studies as a rationale for more integration of the social sciences.
-We need the social sciences built into the TMDL framework.  Social science research can help translate how TMDL and WIPs information can and should be used.
-The social sciences can help us understand what motivates people to protect natural resources and ecosystems? The social sciences can help us figure out how to better educate policymakers.
-We need a body of social science papers/summary or fact sheets that can be used to illustrate what are the social sciences and why they are relevant to CB restoration.
-The social sciences can help us understand when it is better to choose behavior change and when laws or regulations are best.

Take home messages:
1) The public seems to be numb to how dirty the Bay is.  We need to change this.  How can the social sciences help?
2) We need to understand what is socially desirable behavior in the context of CB restoration?
3) We need to understand the role of leaders and the political process as it relates to CB restoration.

Rich Batiuk (Associate Director for Science at EPA's Chesapeake Bay Program Office)
- The social sciences need to reach out to the CB Program and show us what you do and why that is important.
- There are significant conceptual barriers.  We need a dummies' guide to the social sciences. We don't know how to talk social science language.
- Provide a road map to understand shared agenda.
- We need more collaboration.
- Provide a list of papers.
- We need more collaboration between CB Program staff and social scientists.

Peyton Robertson (Director, NOAA's Chesapeake Bay Office)
- We need to evaluate, mine and apply existing social science insights and apply them to CB restoration goals.
- We need to understand the impacts of demographic and social changes on Bay ecology and restoration efforts.
We need to better understand the human uses of the Bay: 1) Would like to have the ability to understand values and use those to achieve restoration and management goals and 2) Need to know where to make education investments.
The social sciences can help us evaluate trade-offs in our management goals and efforts:  There is no easy fix/1 size fits all.
-The social sciences can help us educate and inform leadership and help us understand how to appeal to people's projection of possibilities for the future?

**Conclusions and Challenges**

In May of 2011, the Chesapeake Bay Journal (Volume 21(3)) published a commentary on the need for more social science research to support Bay restoration (http://www.bayjournal.com/article.cfm?article=4112).  Written by the social science steering committee that organized the March workshop, the commentary provides a general summary of

the workshop and discusses challenges to advancing the contributions of social science research to Bay restoration. To conclude this report, we present a few of those key challenges that, if addressed, could lead to significant improvement in the contributions the social sciences can make to Chesapeake Bay restoration and management.

First, many Bay leaders have an interest in and recognition of the social sciences as avenues of research that could benefit and even advance the Bay restoration and management efforts. While the professional Bay research and management community still faces the challenge of exactly how to integrate the social sciences into that existing work in natural science, it is important to remember that the level of interest in doing so is new and was not even present only a few years ago. Dialogue, communication and institutional support are necessary to convert this new interest into sustained policy-relevant social science research.

Second, the workshop presented only a small sampling of the range of social science disciplines that are available to Bay restoration managers and professionals. Therefore, the next task leaders face is exploring the variety of research available and understanding how it all fits into policy and restoration decision-making. An important next step is to create organizational and program opportunities for tapping this social science expertise.

A third challenge is that of human behavior itself, which is perhaps even more complex than the Bay ecosystem. Until now, what our culture has seemed to value in terms of helping the Bay is the science-based understanding of the ecosystem. However, those involved in the work of saving the Bay know that doing so means engaging the region's 17 million people in the effort. The calls from Bay groups for people to "get involved" or alter their lives to help the Bay are numerous. So the challenge is for Bay leaders and others to begin to *truly* value what the social sciences could offer in terms of helping to understand and affect human behavior change. If leaders, managers, and research institutions provided both increased intellectual and financial support for social science research throughout the watershed, perhaps we would see clearer ways to affect real change in the way people live, work, and affect the Bay.

In conclusion, the social science workshop was a first in the almost three-decade history of the Chesapeake Bay Program. Organizers and participants alike recognize it as part of our beginning efforts to integrate social sciences into Bay restoration work. More discussions and engagement by individuals, many of whom were present at the workshop, will be needed to flesh out how different social science approaches can help us make better policy and program decisions for restoring and sustaining the Bay. The Chesapeake Bay is a socio-ecological system where the environment and people meet and interact daily, and the impact we humans have now and in the future is becoming an increasingly important driver of that ecosystem's health. In the future, a responsive and integrated social/natural science approach to Bay restoration will be even more important if we are to restore the Chesapeake.

# Scientific and Technical Advisory Committee Workshop:

# Social Science Research and Chesapeake Bay Restoration

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*The goals of this workshop are to:*
*1) Inform program managers of the different types of social science research available;*
*2) Initiate a dialogue between regional program managers and social scientists on needs and capacities;*
*3) And develop concrete next steps to better integrate social science research into Chesapeake Bay restoration activities.*
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## *Workshop Agenda*

**8:30am**        **Meet and Greet** (coffee and bagels provided)

**9:00am**        **Welcome and Brief Review of Goals of Workshop** (Michael Paolisso)

**9:10am**        **Social Science Research and Bay Restoration: Results from Key Informants**(Elizabeth Van Dolah)

## *Panel Discussions*

*Note cards will be provided for participants to record questions that will be used to direct afternoon break-out discussions.*

**9:30am**        **Theme 1: Social Science and Understanding Individual Behavior Change**

Four social scientists will document their research approaches, tools, methodologies, and/or case study(s) directed at analyzing and modifying behavior change, and will draw inferences concerning the integration of social science research and public programs. A brief discussion will follow, moderated by Kacey Wetzel, Chesapeake Bay Trust.

Panel Members:

*Dr. PoornimaMadhavan*is an Assistant Professor of Human Factors Psychology, and Director of the Applied Decision Making Lab at Old Dominion University. Her expertise include human decision making processes, environmental risk perception and attitude change in coastal communities, and the intersection of social science with public policy.

*Dr. Michael Paolisso* is an Associate Professor of Anthropology at the University of Maryland. His expertise is specialized in environmental change, household economics, gender development, and research methods. Current research endeavors include studies aimed at understanding cultural models of pollution and environment within the Chesapeake Bay region.

*Dr. Lisa Wainger* is a Research Associate Professor of Ecological Economics at the University of Maryland Center for Environmental Science. Her expertise includes developing integrated ecological and economic analysis tools that are used to communicate ecological conditions in terms of socio-economic impacts. Recent research has focused on spatial variability in the cost effectiveness of environmental restoration.

*Dr. Doug Lipton* is an Associate Professor for the University of Maryland's Department of Agricultural and Resource Economics. Dr. Lipton specializes in assessing the economic values of marine resources, and the economic impacts of policies affecting marine resources.

Facilitator:

*Kacey Wetzel* is the program manager for the Chesapeake Bay Trust Outreach and Community Engagement Grant Program and the Mini Grant Program. Kacey works with funding partners, non-profit organizations, community leaders, and schools to identify and develop projects that build Chesapeake Bay stewards through environmental education, on-the-ground restoration, and community engagement activities.

**10:45am       Break**

**11:00am          Theme 2:  Social Science and Understanding Group, Community & Organization Change**

Four social scientists will document their research approaches, tools, methodologies, and/or case study(s) directed at analyzing and modifying communities, groups, and organizations, and will draw inferences concerning the integration of social science research and public programs.  A brief discussion will follow, moderated by CarinBisland, EPA Chesapeake Bay Program.

Panel Members:

*Dr. Steve Jacob* is an Associate Professor of Sociology at York College of Pennsylvania.  His research interests are in understanding community structures, societal impacts on natural resources, program development and evaluation, social indicators, and fishing communities.  Recent research endeavors have focused on determining the social and economic impacts of regulatory changes, primarily among fishers and fish-reliant communities in the Gulf of Mexico.

*Dr. Ben Blount*is an Environmental Anthropologist retired from the University of Georgia and the University of Texas San Antonio.  He runs his own consulting firm, SocioEcological Informatics, and is engaged in research projects on the well-being (resilience and vulnerability) of communities on the Texas and Louisiana coasts.  His particular interests are in cognitive and human ecology, including the relevance of human information systems to adaptation and to ecosystem-based management.

*Dr. Kevin St. Martin* is a Human Geographer at Rutgers University, where he applies economic geography, political ecology, and GIS to enhance understandings of economic and environmental discourse. In particular, Dr. St. Martin studies fisheries in the US Northwest to examine the potential for community participation in development and resource management, the relationship between local ecological knowledge and formal science, and the representation of resource dependent communities.

*Dr. Troy Hartley* is the Director of the Virginia Sea Grant Program and an expert in public policy and political science.  His research investigates networks and stakeholder processes that are essential to integrated planning and management, adaptive management, and ecosystem-based management, and other forms of governance networks.  Dr. Hartley's research has been conducted in a wide array of land use planning, sustainable community development, water resource management, and environmental pollution control context.

*CarinBisland* is the Associate Director of the EPA's Chesapeake Bay Program Office.  Ms.  Bisland is also a member of the Chesapeake Bay Program's Management Board, and the Vice-Chair of the Chesapeake Bay Program's Enhance Partnering, Leadership, and Management Goal Implementation Team.

## 12:15pm        Lunch (provided)

*We encourage you to enjoy lunch in the Atrium where there will be the opportunity to network with attendees and explore what other social science disciplines have to contribute to environmental restoration through posters on display.*

## 1:15pm   Workgroups:  Identifying Constraints, Opportunities, and Action

Participants will break into four assigned workgroups.  Each workgroup will include social scientists, Chesapeake Bay experts and managers, and a facilitator to help guide discussions.

Breakout groups will be asked to:

5) Discuss a short list of participant-derived questions from morning panels (to be provided);
6) Identify a programmatic problem and determine how social sciences can and should be incorporated to enhance identified program or policy.
7) Identify related high priority social science research needs.
8) Identify short, intermediate, and long-term goals for integrating social science research into Chesapeake Bay restoration programs and policies.

## 2:45pm        Break

## 3:00pm        Workgroup Presentations and Discussion on Priorities

Participants will reconvene for a facilitated group discussion to share identified constraints and opportunities, near and long-term goals, and immediate/near-term actions.  Discussions will be facilitated by Troy Hartley, Virginia Sea Grant, and Jamie Baxter, Chesapeake Bay Trust.

## 4:00pm        Final Thoughts

Representatives from the Chesapeake Bay management community will share final thoughts on the day, and their perspectives on the future role of the social sciences in Chesapeake Bay restoration.

- Ann Swanson (Director, Chesapeake Bay Commission)
- Rich Batiuk (Director of Science, EPA Chesapeake Bay Program Office)
- Peyton Robertson (Director, NOAA Chesapeake Bay Office)
- Jim Edward (Director, EPA Chesapeake Bay Program Office)

**4:30pm          Workshop Adjourned**

***Please join us following the workshop for a reception sponsored by Virginia Sea Grant (Light refreshments will be provided).***

The reception will include a demonstration of the University of Virginia's Bay Game , a role-playing simulation that is being used for both educational purposes and increasingly with stakeholders and policy-makers to illuminate and foster discussions about societal trade-offs.