

MARYLAND COMMUNITIES ADAPTING TO CLIMATE CHANGE

**CLIMATE FORUM I:
LOST IN TRANSLATION**

**Linking Climate Science
to Local Communities**

*Prioritizing Research
and Communication
Needs at the Local Scale
in Maryland & the
Chesapeake Bay*

April 23, 2012



**MEETING NOTES AND
NEXT STEPS**

CLIMATE FORUM I: LOST IN TRANSLATION
Linking Climate Science to Local Communities

Prioritizing Research and Communication Needs at the
Local Scale in Maryland and the Chesapeake Bay

April 23, 2012

Meeting Notes and Next Steps

Climate Change Forum I: Lost in Translation — Linking Climate Science to Local Communities was held on April 23, 2012 in College Park, Maryland. This summary of the meeting notes and next steps from the forum was compiled by the Center for Watershed Protection and reviewed by Vicky Carrasco (Maryland Sea Grant) and steering committee members. Maryland Sea Grant communications staff proofed and formatted the final document. This summary document is produced by the University of Maryland Sea Grant Extension Program and funded by the NOAA Sea Grant Office under the project entitled “Maryland Communities Adapting to Climate Change: Sea Grant Climate Adaptation Capacity Building Initiative.”

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Key Objectives

On April 23rd, 2012, a group of scientists and community leaders came together in the forum **Lost in Translation: Linking Climate Science To Local Communities**. Maryland Sea Grant Extension, in collaboration with the Center for Watershed Protection, organized a steering committee (Appendix C) which helped guide the Forum's theme, objectives, concepts, and forum's structure. The forum's summary and other information can be found online here: http://www.mdsg.umd.edu/climate_forums/

[This forum is part of a larger, ongoing Maryland Sea Grant climate adaptation needs assessment project, which is in partnership with Maryland's Chesapeake and Coastal Bays and Maryland's Coastal Training Program (under Chesapeake Bay's National Estuarine Research Reserve) and funded by the NOAA Sea Grant Office under the project entitled "Maryland Communities Adapting to Climate Change."]

The first Forum had the following objectives, which guided the meeting:

- An exchange on experiences, efforts, ideas, and best practices focused on climate change research and community adaptation
- Identify roles that researchers have in climate change adaptation
- Update on Maryland's Climate Change Needs Assessment
- Discuss community engagement and research challenges
- Collaborate on effective climate change communication strategies

This scientific and research audience came together to hear from and share ideas with select local governments or other community stakeholder representatives to link climate change science to local communities (Figure 1). The agenda (Appendix A) included cross cutting speakers, panelists, and moderators (Appendix B). Forum I was planned and carried out by the Steering Committee (Appendix C). There were approximately 60 attendees (Appendix D). In addition to handing out agendas to attendees, a one-pager resources document with important links, including partners' websites, was included (Appendix E). This meeting, which was the first of two planned forums, focused on climate science. Forum II will focus on the needs of local governments and other community stakeholder representatives.



Figure 1. Presentation (left), group discussion (middle), and participants add to the Maryland Climate Network (left).

Meeting Overview

The agenda for this first forum had various components which included and encouraged dialogue between participants. At the core, this provided a unique exchange between community stakeholders AND the science community around climate change adaptation issues. The Steering Committee wanted to ensure that we had 1) community representatives as audience and/or panelists; 2) an opportunity for roundtable discussion; and 3) climate scientists discuss communication and engagement efforts.

Two key welcomes were given by Dr Patrick G. O'Shea, Vice President of Research at the University of Maryland and Dr. Cheng-i Wei, the Dean of University of Maryland's (UMCP's) College of Agriculture and Natural Resources (AGNR) and Director of University of Maryland Extension and Maryland Agricultural Experiment Station. This set the stage for the meeting, with recognition from both the AGNR College and the University system that this type of forum was important and relevant — right now.

The meeting began with a basic overview in the “Big Pictures” presentations focused on climate change at various levels, starting from a national and international perspective on where climate science is currently and where it is headed. This was followed by climate change science in both Maryland and the Chesapeake Bay region. Finally, focus was placed on where Maryland is its climate change adaptation. The presentations were followed by the community representative panel. Next, a focused roundtable discussion was conducted followed by group report-outs. The meeting continued with a panel of scientists working on community projects. Lastly, there was time for key participants to provide final thoughts and overarching themes that were expressed through the meeting. Forum I ended with a session wrap up and key next steps.

Presentations, Panels, and Discussions

Big Pictures

Moderator: *Sadie Drescher, Watershed Planner, Center for Watershed Protection*

Copies of this presentation can be found here: http://www.mdsg.umd.edu/climate_forums/

1. “Climate Science Now and in the Future” — *Dr. Tony Busalacchi, Director, Earth System Science Interdisciplinary Center (ESSIC) and Professor of the Earth System Science and the University of Maryland*
 - Presentation provided a global climate science overview of the state of the science and direction of the science in the next five to ten years. General trends in climate science were highlighted. An emerging transformation to meet social science and community based research needs was discussed. The concept for Climate Services to produce Actionable Climate Information in response to the end user needs at a regional level and in time scales from years to decades was provided.
2. “Climate Change in Maryland: What You Need to Know” — *Dr. Don Boesch, President, University of Maryland Center for Environmental Science (UMCES)*
 - Presentation provided a Chesapeake Bay, regional scale climate science overview. Bottom line conclusions, sources of uncertainty, and next steps to communicate climate science were conveyed. The major relevant points were provided from reports such as the Climate Change Impacts on the United States, America's Climate Choices, and Global Warming and the Free State and policy such as the MD Commission on Climate Change and MD Climate Action Plan. The need for and work in climate change sector-based adaptation, sustainability, and education were discussed.
3. “Climate Adaptation in Maryland: The Big Picture” — *Zoë Johnson, Program Manager for Climate Change Policy with the Office for a Sustainable Future, Maryland Department of Natural Resources (MD DNR)*

- Presentation provided an overview of the adaptation planning and climate change work at the state and local level. The state’s extensive resource documents underscore their climate change work and progress. An overview of the network of entities and group functions involved in climate adaptation science, planning and policy in Maryland was presented. Participants were asked to identify their function or role in the network.

Panel 1: Communities and Maryland Climate Change Needs Assessment

Moderator: Dan Nees, Senior Research Associate, UM Environmental Finance Center

Panelists: Vicky Carrasco (Sea Grant/UMCES), Jeff Allenby (Coastal Communities Planner, MD DNR and UM Center for Environmental Science), Maia Davis (Metropolitan Washington Council of Governments (MWCOG)), Ken Hranicky, Department of Planning, City of Baltimore, and John McCoy (Columbia Association)

Purpose: This panel provided a forum to discuss needs and real-life experiences on climate change adaptation in communities and how climate science was used and/or was relevant. Discussion points included identification of needs, challenges, opportunities, barriers, and interaction with scientists. If appropriate and possible, emphasis was placed on communication and/or interaction with scientists. Each panelist had 5-8 minutes and then the forum was opened up to the floor.

Questions were provided to the panelists beforehand as points of discussion and included the following:

1. Tell us a story about climate change in your community or work.
2. In your experience, what is working to communicate climate change (e.g., from the science to the users)?
3. In your experience, what is not working? Tell us when something went wrong and what, if anything, was done to fix it.

Panel 1 Summary Notes

- **Vicky Carrasco** provided an overview of the Maryland’s statewide Needs Assessment that is currently being conducted. It includes a survey of planners sent in December 2011, forthcoming interviews, and pilot projects in two Maryland communities (one is Prince George’s county, in partnership with Anacostia Watershed Society). Results of the survey are currently being analyzed. Preliminary results indicate that funding and staff time are one barrier that prevents planners from working on climate change adaptation. The final findings will be used to support statewide planning, training, and funding efforts in the future.
- **Jeff Allenby** discussed Coast Smarts Community Initiative and local training offered as support to local governments. There is a desire to focus on local level, but uncertainty about what scale is best, how to move to the relevant scale, and discerning between the products versus the process. When client-based research is done, follow up and application of the research is needed.
- **Maia Davis** represents 22 diverse local governments in the metro areas of MD, DC, and VA. MWCOG has a Climate, Energy and Environment Policy Committee that guides the work to meet regional greenhouse gas emission reduction goals established in the 2008 National Capital Region Climate Change Report. The Report also recommended climate adaptation measures. EPA and MWCOG have been working together to develop a climate adaptation guidebook. This guidebook focuses on what local governments can do to alleviate climate change impacts in the transportation, land use, building and water sectors. Next steps include using climate change research in this decision-making process.

EPA plans to make the guidebook available next month. Lessons learned include the need to communicate climate change trends. Local government staff needs community actionable information (e.g., stormwater planner needs to know how the 2 year/24 hr storm will change; air quality planner needs to know how many consecutive days will be > 90 degrees). Flooding is an issue of concern across sectors. Need to convey to the public how climate change actions can save money and protect health and children.

- **Ken Hranicky** discussed the Hazard Mitigation Plan that he is involved with and how this plan has climate change components. Major needs identified include a community of research from climate change that is linked to community needs; knowledge of stakeholder language; science and social science to communicate to people on the ground; groups/people to synthesize the scientific data (more than just an abstract) and an understanding of the implications for public infrastructure. What we decide today will impact the future. How do we influence the stakeholder? How far local communities go to identify the impacts of natural hazards will be limited by resources. Local governments have faced tremendous cutbacks so there are more demands on their time. It is harder for professionals to find time to identify and synthesize all the materials on climate change. Local governments do not have time to research all the available information and need assistance from scientists/researchers in creating a “clearinghouse” for this information. The proposed MD Climate Adaptation Network (being compiled by DNR) will do this.
- **John McCoy** works for a large non profit that manages amenities for Columbia, including 3600 acres of open space and 700 acres of managed ground. Implemented an adaptation strategy and there are reductions in gallons of fuel used and reduction in energy used. Restoration activities include building stormwater retrofits and planting trees. Often these efforts bring us into direct conflict with residents. Residents are concerned with health, children, and property values. Therefore, when conveying climate change actions such as decreased lawn fertilizer/maintenance, concerns about reduced lawn area resulting in reduced play spaces for children or a lower status in the community may arise. Other issues include concerns about Lyme disease and West Nile virus related to increasing woods and wetlands and decreasing turf. Similarly, the perception that reduced lawn = reduced property value means a policy will not proceed. John needs help with the climate change “argument,” clear statements that he can convey to residents, experts to help convey the message to public because the public trust these experts (e.g., Sea Grant extension service). Need experts that are “on the same page” with climate change message.

Panel 1 Question-and-Answer Session

- Q: Does the Chesapeake Bay TMDL represent an opportunity or obstacle to integrate climate change?
- A1: There are many solutions to add when implementing the Bay TMDL (e.g., increased stormwater runoff, public health, etc.)
- A2: We have discussed the TMDL with communities since 1999; the reaction was basically a blank, nothing. Need climate change to have a water restoration project and/or focus to increase neighborhood programs to reach the TMDL. This is what the community members will understand.
- Q: With all the plans available (e.g., watershed implementation plan, PlanMD, hazard mitigation plans, etc.), how do you relate these plans with climate change? Where is the connection at the local level?
- A: There are two dialogues that include: 1) local government and 2) public. Need to open the dialogue to work with the public (e.g., Dr. Paliosso’s work on the Eastern Shore).
- Statement: In terms of climate science/research, this dialogue is a call to do more research about the social norms and communicating these messages that resonate with average homeowners.

- Q: People are motivated by self interest and we need to listen first and then speak to where they are. How much are you pitching the direct health for the community? How much do you feel like you have the tools and information in the forms you need to communicate the risk?
- A: We need funding and modelers (experts) to talk about the risk to the community members. We need this support.
- Q: What timeframe do you need data at the local scale (e.g., 5 yrs, 100 yrs)? Where are your most urgent needs?
- A1: We need 50-100 years, but depends on the subject.
- A2: We need 25-75 years to align with the life cycle of infrastructure (e.g., roads life cycle is 25 years). 100 years is too long for planning needs.
- Q: What is the prospect that we can get a tax incentive for the environment at the local level (e.g., energy, stormwater credit, etc.)?
- A: This just happened with the passing of HS987 that makes 9 metro counties/cities have mandatory utilities that can create a funding base for stormwater management, infrastructure improvements, etc.
- Q: How do you view mentoring students with projects on the environment/ecosystems with the university?
- A1: It is important to have students working at the local level (e.g., Dr. Chanse's student work with Salisbury).
- A2: George Mason University class did an adaptation project that helped us fill in the gaps for local planner knowledge that supported our planning. We (MWCOG) would like to do more work with students.
- Q: How do you see facilitation in dialogue across and among departments?
- A: At the regulatory level there is great opportunity. Study with GMU was a start to involve the local government planner doing the work. Findings suggest there is good opportunity to bring the sectors together.

Roundtable Groups Discussion

Community Needs Focused (Facilitator Instructions on Appendix F)

Five major questions were provided to six roundtables to discuss for one hour (Figure 2). A Steering Committee member was in each group to facilitate the conversation and report the major points to the attendees. In addition, a local government, community stakeholder, or NGO was a part of each group discussion. The five questions for this discussion were the following:

1. What is happening on the ground? How is science used?
 - a. What is working?
 - b. What is NOT working?
 - c. What are some lessons you've learned on climate communication?
2. What types of information about a given climate change risk are needed before decision-makers can account for the risk in plans and policies?

3. What are the most important factors in making sure that information for adaptation continuously improves?
4. On the “receiving end” of the information process, what new skills, resources, or procedures may stakeholders need for making decisions in a changing climate?
5. Identify ONE research issue of importance to Maryland and/or the Chesapeake Bay, in regards to climate change adaptation.



Figure 2. Roundtable group discussions.

Group Report Outs

Moderator: *Sadie Drescher, Center for Watershed Protection*

Based on these discussions and report outs the following major points were:

Recommendations for Research

- Climate science should include recommended actions rather than leaving them to the interpretation of non-scientists
- Recommendations for action should be sector based and differentiate public vs private action opportunities
- Research grant conditions should emphasize early and continuous involvement with implementers; not as an add-on but integrated within the project and Principle Investigators (PIs).
- When evaluating faculty for tenure, universities should measure science impact based equally on whether the science is being used to inform decisions rather than just based on publishing in prestigious journals
- Behavioral studies are needed to understand how people respond to and act on climate information
- Return on investment studies are needed for climate actions (e.g., electrical savings, improved indoor air quality, etc.)
- Need greater resolution of models so results are relevant at local/property level as well as local maps that depict areas of impact or increased risk
- Need better storm surge maps (FEMA-maps are OK but not for storm surge)

- Develop better BMP efficiency and effectiveness data by narrowing range of values and identifying spatial variables (e.g., soil qualities such as depth to water table) that impact efficiencies
- Use a shorter climate science timeframe that can be applied (e.g., 100 years can be too general for some applications; 25-75 year range more useful)

Recommendations for Outreach

- Explain/show individual house/lot impacts (e.g., high resolution storm surge/flooding maps on the web for easy property-specific flooding likelihood; work to mandate that all property transfers must provide flooding probabilities)
- Communicate with a clear message, trusted messenger or an approach that establishes trust (e.g., by listening)
- Establish the context for discussion as hazard mitigation (i.e., via updates to the All Hazard Mitigation Plan) rather than climate change
- Outreach personnel need mechanisms to communicate local climate information needs and concerns to scientists
- Due to the overwhelming number of environmental “should do’s,” tie-in in to existing actions should be explored (e.g., we’re still suggesting that you build a stormwater detention basin, we’re just suggesting that it be larger given potential increases in precipitation). For example, tie needed climate change BMPs into requirements for meeting the TMDLs using county development and water supply plans, WIPs, and WIP2s
- Convey the result of action vs inaction (e.g., flooding)
- Raise audience awareness of impacts which can include:
 - Water potability
 - Flooding history and property damage through time, likely showing increasing frequency of contractor assistance in recent years vs. years to decades back
- Link with climate science and communication/communicate risk
- Connect BMP work to climate change, i.e., what BMPs also mitigate expected impacts from climate change
- Include the insurance industry early in the planning.
- Involve younger generation (e.g., create Apps, integrate into k-12 curriculum, education for the impacts people have to worsen or help climate change); develop effective social media to engage younger audiences
- LISTEN FIRST: Use open dialogue and listening
- Tell climate stories to convey message
- Use simple vocabulary
- Messenger and message are important
 - Provide a quick, “easy to use” expert and/or resource list for end-users

- Use risk management and the cost of NOT adapting to climate change as a “hook”
- How can we help with this transition: Delmarva manure management from poultry to organic farming? Shifting agriculture industry in some areas of the Delmarva could offer an opportunity for early education and climate change BMPs for these new farmers
- Identify the outputs (e.g., tool, specific information, data formats) that are most useful for community decision makers or various audiences
- Identify what factors influence decisions that relate to climate mitigation and adaptation (i.e., what factors are considered when establishing or revising free-board rules). Learn from what occurred in Hampton Roads (HR), VA, and the successes that the wetland watch has had in VA Beach-Norfolk-HR area)

Other:

- Link climate change with culture (e.g., Paolisso and Chanse work)
- Include recommendations for stormwater management and climate science to provide useful information (e.g., 1 year storm depth, rainfall pattern changes in the region, etc.)
- Need to have an iterative, ever-expanding MD Climate Science Network
- Need to identify risks, local impacts and approaches to address these issues
- Use the right spatial or time climate scale to access community perception
- Use boundary organizations
- Relate climate change to watershed scale impacts

Panel 2: Climate Change Science and Communication

Moderator: *Dr. Victoria Coles, Research Associate Professor, UMCES Horn Point Laboratory*

Panelists: *Dr. Michael Paolisso (Associate Professor of Anthropology, University of Maryland College Park) and Dr. Victoria Chanse (Assistant Professor, University of Maryland College Park)*

Purpose: *Researchers discussed case studies that highlight stakeholder engagement approach, tools and resources, and process.*

In this panel, the focus was on stakeholder engagement approaches that can be used to understand climate science and tools/resources that are unique to do this work. Panelists were asked to address the following points:

- *Give an example of when something went wrong and what solution (if there was one) you used.*
- *Tell a success story.*
- *Provide lessons learned on communication around climate change topics, at the local level and a summary of what you are working on now that the audience may be interested to hear.*

The hope was to try to address any of these points:

1. *Research gaps*
2. *Community gaps and needs*

3. *Communication and networks*
4. *User needs/mechanisms and successes/risks*
5. *Policy, gaps and needs*

Discussion points included how research can identify and overcome the challenges, opportunities, obstacles, and interaction with the local governments or other community stakeholder representatives.

Panel 2 Summary Notes

- **Dr. Victoria Chanse** teaches Community Design and worked on a pilot project with graduate students to conduct climate change research in Dorchester County. This research shifts from policy to “on the ground.” The work was inspired by NOAA Coastal Services Center (CSC) who performed climate change charettes in DE and other areas. The students looked at vulnerabilities and used two day long workshops on the Eastern Shore and in Blackwater Refuge to determine if identified vulnerabilities align with what people understand. The workshops focused on climate change impacts (e.g., rolling easements). This pilot work developed a methodology for policy decisions. The students also used SLAMM models to show inundated areas. One finding was that roads were the most important vulnerability issue to the communities. A few lessons learned from this work were the following: 1) terminology is important, e.g., use sea level change or hazard mitigation terminology instead of climate change and 2) visioning process with the community helps groups to visualize and understand those changes over time. Using effective graphics that relate to the groups is very important and the graphics for this pilot project were changed based on community feedback.
- **Dr. Michael Paolisso** has done recent climate change research to identify community trends in climate change, identify vulnerabilities, and identify adaptation actions. This work is with two Eastern Shore communities (Dorchester County and Somerset County) and used a cognitive cultural management approach which extracts cultural knowledge around environmental issues. The NOAA-funded pilot project involves environmental justice and coastal climate change adaptation to identify the community and determine how their climate change views were different or vary. Example climate change questions posed to the community were the following: 1) “What do you see?” or 2) “Please tell us all the words that come to mind when you hear the phrase climate change.” Multi-dimensional scaling was used to select terms identified by the groups and sort the words spatially. In this exercise, similar terms are placed closer together. There are community and individual climate change impacts and responses. In one community when flooding maps were presented and showed vulnerabilities, there was no large response because most were relocated. However, strategies to elevate the church attended in a vulnerable area were important to the group. The next phase of the work is to examine similarities and differences across communities at a regional level (NSF funds). The community knowledge and local knowledge go back and forth for information exchange with the climate change science. The climate scientists and the locals are two overlapping professions with wealth of knowledge. An important lesson learned was that scientists and researchers should first listen to the community and then share the science or research. A scientist or researcher should not present information without the community dialogue and should not place a judgment on stakeholder knowledge. Paolisso asks, “What do we mean by community?” Community happens around an event. Scientists need to communicate both vertically (i.e., county, state) and horizontally (i.e., where you reside with neighbors). The process was important and the outcome was a researcher building trust and rapport with the group; this was a valuable result of that process. The work linked the pilot community with state researchers and managers (e.g., MD DNR).

Panel 2 Question-and-Answer Session

- Q: Case studies can have scale issues (e.g., why some farmers adapt and others do not), so what are more scalable issues that can help with climate change strategies?
- A: Case studies are where you can get insights and flesh out project ideas and details. For example, working with the watermen on the Eastern Shore, found there were not limited number of perceptions and patterns emerged. Therefore, a process to find patterns was scalable. A waterman conveyed the idea that if climate change ideas were accepted then he/she found that this resulted in questioning religious faith. In this example, reconciling religion with science emerged as a theme.
- Q: In climate change we, scientists, need to be more bold and if we are not bold enough as climate change scientists then how will this mis-communication issue be resolved?
- A: May not be an issue of not being bold but if the message contains too many “scary” images then not effective.
- Q: Religion offers a potential opportunity and potential obstacle. How can religion be used to better communicate climate science?
- A: Many of the people I work with are stewards of the land. How they steward the land may be perceived by others as harmful (e.g., pollutant loading). Working on the stewarding aspect means we can work together toward a common goal.
- Q: Since the 1980’s we (researchers) discussed what to do about vulnerable barrier islands and this is still an issue. In my experience as a professor, I presented the researched facts that were, in my view, logical and well formed, but the community had other concerns such as economics, history, etc.
- A: We (researchers) need to listen and be non-judgmental. We can look at how individual views change and/or if the individual learned.
- Statement: Listening to this forum I hear that change in behavior is a large issue and that researchers need to follow up with communities. This means that scientists need to talk to communities and outreach providers (e.g., Sea Grant extension) before forming a proposal, project, or grant idea. Involve these stakeholders early in the process, follow up after the grant, and plan for those next steps or action items from the project. Based on what I hear, I will work to research the social aspects and end-user needs. There will need to be funding to pay for adaptation in vulnerable areas identified.

Group Discussion: Past, Present, and Future

(Future application and translation)

- *Moderator: Sadie Drescher, Center for Watershed Protection*
- *Dr. Marcus Griswold (Program Coordinator, MD DNR/UMCES, Dr. Kevin Sellner, Director, Chesapeake Research Consortium) and Jennifer Dindinger, Watershed Restoration Specialist, UM Sea Grant Extension*

Group Discussion Purpose: Provide the final thoughts and major themes that include the following: 1) overview of the day; 2) role of science and what organizations are doing to help communication; 3) bridging gap between communities and researchers; and 4) action items.

Local governments are interested in local climate trends and this may serve as a way to start a larger conversation. We should communicate the co-benefits of climate change such as potable drinking water. We

should use trusted sources to communicate clear messages and find champions for dissemination. The traditional science communication tool (e.g. peer reviewed journals) may not be sufficient for reaching the desired audience. A stronger relationship with the outreach and education community is needed during the project planning and brainstorming phase. In addition, the following points were reported:

- Better climate science results from listening to and learning from the community (e.g., this forum)
- There is a need to improve climate science communication
- Scientists/researchers need to communicate early and often with local communities (e.g., at grant proposal stage)
- Research should focus on the end-user needs (e.g., how the 100 year storm will change, how many days above 90°F in a row, etc.)
- Regional spatial scale and 10-50 year time scale are needed for climate science translation to end-users
- Fact sheets, summary statements, or more “easy to use” information is needed for end-users
- Scientists and researchers need to summarize their findings or find a group to do this and provide to the end-users
- Experts are needed to convey to end-users and/or the stakeholders specific information (e.g., models)
- End-users can be limited by governing bodies (e.g., politics), stakeholder interests and perceptions (e.g., managed lawn needed), and other factors; this can limit climate science application and/or implementation timeframes
- Coastal communities can deal with only so much/many stressors (i.e., tipping point)
- Chesapeake Bay TMDL can support climate change strategy implementation
- MD’s progressive climate change strategy includes research, plans, collaborators, and case studies
- MD and the Chesapeake Bay have a strong network of climate scientists dedicated to communicate the science to end-users
- MD’s Climate Network is a platform to communicate climate science
- Climate science words and imagery are important to communicate ideas to the end-users
- Do not place judgment on community climate science knowledge or perception
- There is uncertainty as well as perceived uncertainty in the science
- Forum I groups largely absent included graduate students, non profits (NGOs), and political stakeholders
- Funding mechanisms are needed for climate science outreach and communication improvements
- Calls for funding should be better focused to meet the end-user needs

Summary, Next Steps, and Forum II

This meeting was well attended by researchers, scientists, and community stakeholders from the local, state, and federal level. Group discussions, question and answer sessions, panels, and presentations facilitated networking, information exchange, and built momentum to enhance climate science communication between and among the multiple groups that need and use this information.

Common themes throughout the meeting included “action-oriented science.” The importance in both listening to communities and building rapport with them was underlined. Another major theme was the need to understand different community types and user groups. Also, participants provided comment on “who’s missing” at this meeting. While the intended audience of this first meeting was targeted, it was noted that elected officials were a key missing group.

Forum II will focus on the community and local level. The following are next steps and action items to move from Forum I to Forum II and also toward better communicating science through better research.

- Share the Big Picture presentations online (http://www.mdsg.umd.edu/climate_forums/)
- Summarize the meeting notes and post online
- Review Exit Evaluations by the organizers and Steering Committee to update these summary notes and/or improve Forum II.
- Share the informal Maryland Climate Network map that was introduced in a presentation online so that the network can grow and be used (*tabled - the Network will be released after additional vetting is done*)
- Share the Needs Assessment findings, such as the survey results. These will be shared online, as available.
- Follow up with these Forum I outputs to the attendees
- Include additional groups identified during Forum I (e.g., graduate students, grassroots organizations, and public officials)
- Update the Forum I (and II) website to include these and other next steps and action items http://www.mdsg.umd.edu/climate_forum/
 - Link the website to CIRUN, MD DNR, and others

Appendix A – Lost in Translation: Linking Climate Science to Local Communities Agenda

8:30	Breakfast and Networking (Icebreaker)
9:00	<p>Welcome and Meeting Overview <i>Vicky Carrasco, Coastal Communities Specialist, Maryland Sea Grant Extension</i></p> <p>University Welcomes <i>Dr. Patrick G. O’Shea, Vice President of Research, University of Maryland (UM)</i> <i>Dr. Cheng-i Wei, Dean and Director, Agricultural Experiment Station and UM Extension College of Agriculture and Natural Resources</i></p>
9:15	<p>Big Pictures <i>Moderator: Sadie Drescher, Watershed Planner, Center for Watershed Protection</i></p> <ol style="list-style-type: none"> 4. Science now and in the future - <i>Dr. Tony Busalacchi, Director, Earth System Science Interdisciplinary Center (ESSIC) and Professor of the Earth System Science and the University of Maryland</i> 5. What we need to know: Climate change in Maryland and the Bay - <i>Dr. Don Boesch, President, University of Maryland Center for Environmental Science (UMCES)</i> 6. What the network of professionals in MD looks like - <i>Zoë Johnson, Program Manager for Climate Change Policy with the Office for a Sustainable Future, Maryland Department of Natural Resources (MD DNR)</i>
10:00	<p>Panel 1: Communities and Maryland Climate Change Needs Assessment <i>Moderator: Dan Nees, Senior Research Associate, UM Environmental Finance Center</i> <i>Panelists: Vicky Carrasco (Sea Grant/UMCES), Jeff Allenby (Coastal Communities Planner, MD DNR and UM Center for Environmental Science), Maia Davis (Metropolitan Washington Council of Governments), and Ken Hranicky (Department of Planning, City of Baltimore), and John McCoy (Columbia Association)</i></p>
11:00	Roundtable Groups Discussion – Community Needs
Noon	LUNCH
1:00	Group Report Outs - Moderator: Sadie Drescher, Center for Watershed Protection
1:30	<p>Panel 2: Climate Change Science and Communication <i>Moderator: Dr. Victoria Coles, Research Associate Professor, UMCES Horn Point Laboratory</i> <i>Panelists: Dr. Michael Paolisso (Associate Professor of Anthropology, University of Maryland College Park) and Dr. Victoria Chanse (Assistant Professor, University of Maryland College Park)</i></p>
2:45	Break
3:00	<p>Group Discussion: Past, Present, and Future (Future application and translation) <i>Moderator: Sadie Drescher, Center for Watershed Protection</i> <i>Dr. Marcus Griswold (Program Coordinator, MD DNR/UMCES, Dr. Kevin Sellner, Director, Chesapeake Research Consortium) and Jennifer Dindinger, Watershed Restoration Specialist, UM Sea Grant Extension</i></p> <ul style="list-style-type: none"> - Overview of the day -Role of science and what organizations are doing to help communication -Bridging gap between communities and researchers -Action items
3:45	Summary, Next Steps, and Forum II
4:00	Adjourn

Appendix B – Bios for Speakers (including speakers also in Steering Committee)

*Lost in Translation: Linking Climate Science to Local Communities
Prioritizing Research & Communication Needs at the Local Scale in Maryland & the Chesapeake Bay*

**Monday, April 23, 2012
8:30 am-4:00 pm**

SHORT BIOGRAPHIES

Thank you to our guest speakers, panelists, and moderators!

Welcome and Meeting Overview

Vicky Carrasco, Coastal Communities Specialist, University of Maryland Sea Grant Extension

Vicky Carrasco currently works with University of Maryland in College Park, MD, and is Coastal Communities Specialist with Maryland Sea Grant Extension program since February, 2005. Vicky is originally from Texas and she holds a Master's degree in Urban Planning and a Bachelor's of Science in Renewable Natural Resources from Texas A&M University in College Station. Her thesis work focused on geospatial analysis and sprawl reduction policies and she has worked in both urban and rural settings. She was a Center for Housing and Urban Development Fellow and has co-authored three peer-reviewed scientific articles in the following journals: Journal of Planning Education and Research, Landscape and Urban Planning, and Environmental Management.

She works on issues related to urban growth and development, water quality, recreation and tourism in coastal Maryland and the Chesapeake Bay watershed. Most recently, she has been engaged in climate change adaptation efforts in partnership with state agencies. She is also involved in an informal network called CLUE, which is the Collaborative for Land Use Education. Maryland Sea Grant is supported by funding from NOAA (National Oceanic and Atmospheric Administration) and the State of Maryland. Vicky is also past chair of a national group called Sea Grant's Sustainable Coastal Community Development Network.

Additional professional interests are in volunteering at the local, regional and national level, on a variety of issues, such as diversity, education and affordable housing. As a member of the American Planning Association and current chair of Latinos and planning division, she has been involved in dialogues (dialogue events). At the local level, Vicky is also in the Board of Directors of the Montgomery Housing Partnership, which is nonprofit organization in Maryland, focused on increasing and improving affordable housing in Montgomery County. She also recently joined the Board of Latinas Leading Tomorrow (LLT), a group focused on building leadership and promoting further education among young Latina students. She enjoys kayaking, wakeboarding, swing dancing and playing volleyball.

University Welcomes

*Dr. Dr. Patrick G. O'Shea, Vice President of Research, University of Maryland
Chief Research Officer Professor of Electrical & Computer Engineering and Distinguished Scholar-Teacher,
University of Maryland*

Previously he has served as Chair of the Department of Electrical & Computer Engineering Executive Director of the Center for Applied Electromagnetics, Co-Director of the Maryland Cyber Security Center; Director of the Institute for Research in Electronics and Applied Physics, all at the University of Maryland; Project Leader at the Los Alamos National Laboratory, and on the faculty of Duke University.

He was born in Cork, Ireland, and holds a B.Sc. degree in Physics from the University College Cork, and M.S. and Ph.D. degrees from the University of Maryland. He holds affiliate appointments in the Department of Physics, the Institute for Research in Electronics & Applied Physics, the Maryland NanoCenter, and the Maryland Energy Research Center. He played a leading role in the founding of the Maryland NanoCenter, the Maryland Center for Applied Electromagnetics, and the Maryland Cyber Security Center.

Professor O'Shea's technical expertise lies in the field of applied electromagnetics, and particle accelerators for applications in medicine, nanoscience, high energy physics, and energy. He has published over 200 scientific articles. In recognition of his leadership in science, engineering and education he has been elected a Fellow of the American Physical Society, Fellow of the Institute of Electrical and Electronic Engineers, and a Fellow of the American Association for the Advancement of Science. He is a Distinguished Scholar-Teacher of the University of Maryland.

Dr. Cheng-i Wei, Dean & Director, Agricultural Experiment Station & University of Maryland Extension, College of Agriculture & Natural Resources

Dean Wei has served as Dean of the College of Agriculture and Natural Resources, and Director of the Maryland Agricultural Experiment Station and University of Maryland Extension since September 1, 2005. Prior to coming to Maryland, Dean Wei served as Associate Dean for Research and Graduate Studies of the College of Human Environmental Sciences at Oklahoma State University, as well as Interim Head of the Department of Nutritional Sciences. He was Bruno Professor and Head of the Department of Nutrition and Food Sciences at Auburn University, Alabama, for four years. Dean Wei received his B.S. in biology from the Tunghai University of Taiwan in 1970, an M.S. in medical microbiology from National Taiwan University in 1972, and a Ph.D. in microbiology from the University of California-Davis, in 1979. His research interests are in food microbiology and safety, toxicology, and immunotoxicology. Dr. Wei has secured over \$11 million in external funds and published 200 refereed papers.

Big Pictures

*Dr. Antonio J. Busalacchi, Professor and Director
Earth System Science Interdisciplinary Center (ESSIC)
Chair, Council on the Environment University Maryland, College Park*

Antonio J. Busalacchi, Jr., is Director of the Earth System Science Interdisciplinary Center (ESSIC) and Professor in the Department of Atmospheric and Oceanic Science and at the University of Maryland. He also chairs the University of Maryland Council on the Environment. Antonio J. Busalacchi received his Ph.D. degree in oceanography from Florida State University in 1982. He began his professional career that year at the NASA/Goddard Space Flight Center. His research has supported a range of international and national research programs dealing with global change and climate, particularly as affected by the oceans. In 1991, he was appointed as Chief of the NASA/Goddard Laboratory for Hydrospheric Processes, and member of the Senior Executive Service. In year 2000, he was selected as the founding director of ESSIC at the University of Maryland. Dr. Busalacchi has been involved in the activities of the World Climate Research Program (WCRP) for many years and currently is chair of the Joint Scientific Committee that oversees the WCRP. He previously was co-chair of the scientific steering group for its subprogram on Climate Variability and Predictability. He has

served extensively on National Academy of Science/National Research Council (NAS/NRC) activities, including as Chair of the Climate Research Committee and the Committee on Earth Science and Application: Ensuring the Climate Measurements from NPOESS and GOES-R, as co-chair of the Committee on National Security Implications of Climate Change on U.S. Naval Forces, and as a member of the Committee on Earth Studies, Institute of Medicine Committee on the Effect of Climate Change on Indoor Air Quality and Public Health, and Committee on Assessing the Impacts of Climate Change on Social and Political Stresses. Dr. Busalacchi currently serves as chair of the NRC's Board on Atmospheric Sciences and Climate and he also serves on the Committee on the Assessment of NASA's Earth Science Program. Professor Busalacchi has received numerous awards and honors. Among these, in 1991, he was the recipient of the prestigious Arthur S. Flemming Award, as one of five outstanding young scientists in the entire Federal Government. In 1995 he was selected as Alumnus of the Year at Florida State University, in 1997 he was the H. Burr Steinbach Visiting Scholar at Woods Hole Oceanographic Institution, in 1999 he was awarded the NASA/Goddard Excellence in Outreach Award and the Presidential Rank Meritorious Executive Award. He is a Fellow of the American Meteorological Society (AMS), the American Geophysical Union (AGU), the American Association for the Advancement of Science (AAAS), and in 2006 was selected by the AMS to be the Walter Orr Roberts Interdisciplinary Science Lecturer.

Dr. Don Boesch, President, University of Maryland Center for Environmental Science (UMCES)

Dr. Boesch is President of the University of Maryland Center for Environmental Science and also serves as Vice Chancellor for Environmental Sustainability for the 12-institution University System of Maryland. He earned his BS from Tulane University and PhD from the College of William and Mary and held faculty positions in Virginia and Louisiana before coming to Maryland in 1990.

An oceanographer who has conducted research on coastal and continental shelf ecosystems through the United States and in China and Australia, Dr. Boesch has focused much of his career on research and science-based management and restoration of Chesapeake Bay the Mississippi Delta ecosystems. In recent years Don has also been engaged in national and regional assessments of the impacts of global climate change and was a contributing author to the 2009 report on *Global Climate Change Impacts in the United States* and the 2011 National Research Council report *America's Climate Choices*.

Zoë Johnson, Program Manager, Office for Sustainable Future, Maryland Department of Natural Resource (MD DNR)

Zoë is the Program Manager for Climate Change Policy with the Office for a Sustainable Future at the Maryland Department of Natural Resources. She has been actively involved in climate change planning and policy initiatives in the State of Maryland since 1998 and is the author of various reports and publications on climate change and sea level rise adaptation. She serves as key staff to Maryland's Commission on Climate Change Adaptation and Response Working Group. The Working Group released Phase I of Maryland's Strategy for Reducing Vulnerability to Climate Change: Sea Level Rise and Coastal Storms in 2008; and its Phase II Strategy: Building Societal, Economic and Ecologic Resilience in January 2011. Using the Phase I and II Strategies as a guide, she is currently pursuing the development of state-level policy, as well as the execution of on-the-ground projects to implement a suite of natural resource adaptation priorities.

Zoë holds a B.A. in Urban and Regional Planning from Western Washington University (1992) and a M.M.A. in Coastal and Marine Policy from the School of Marine Affairs at the University of Washington (1998).

Sadie Drescher, Watershed Planner, Center for Watershed Protection

Sadie Drescher is a Watershed Planner for the Center for Watershed Protection, Inc. Sadie develops watershed management strategies and tools for local communities and watershed groups with an emphasis on coastal stormwater management solutions. As a Watershed Planner at the Center, Sadie's responsibilities include watershed and stormwater assessments, proposal development, project management, project design, conducting field assessments, technical writing and analysis, translating science to end users, training and workshop leadership, and community partnering and outreach. Prior to joining the Center, Sadie worked for SC's Office of Ocean and Coastal Resource Management in the Science and Policy Division and focused on stormwater management, policy and regulatory support, and local stakeholder outreach. Sadie has over eleven years of environmental professional experience. Sadie has a B.S. in Environmental Biology from Tennessee Technological University and a M.S. in Environmental Studies from The College of Charleston.

Panel 1: Communities and MD Climate Change Needs Assessment

Dan Nees, Senior Research Associate, Environmental Finance Center, University of Maryland

Dan has recently rejoined the Environmental Finance Center (EFC) as a Senior Research Associate. Prior to returning to EFC, he led environmental market and water quality programs at Forest Trends, a global NGO that seeks to develop market and economic solutions to global environmental problems. Prior to joining Forest Trends, Dan led water quality programs at the World Resources Institute (WRI), an environmental think-tank located in Washington, DC. Dan first joined the Environmental Finance Center in 1998 as a graduate intern, and eventually assumed the role of Director. During his tenure with EFC, Dan has assisted communities throughout the Chesapeake Bay watershed and the Mid-Atlantic region in their efforts to implement and finance environmental and sustainable development initiatives. Dan's work currently focuses on developing innovative market and performance-based financing systems to reduce the cost of environmental compliance at local, state, and regional levels. Dan holds a B.A. in Economics, a Master of Environmental Policy, and a Master of Business Administration, all from the University of Maryland, College Park.

Vicky Carrasco (Sea Grant/UMD) (See above bio)

Jeff Allenby (Coastal Communities Planner, MD DNR and UMD Center for Environmental Science)

Jeffrey Allenby manages the CoastSmart Communities Initiative as a partnership between the Maryland Department of Natural Resources and the University of Maryland Center for Environmental Science. Through this program, Jeff provides technical assistance to communities throughout Maryland's coastal zone and manages a competitive grant program providing funding to county and municipal governments to incorporate coastal hazards and sea level rise adaptation into local planning and management efforts. Jeff holds a Master of Environmental Management Degree, including a Certificate in Geospatial Analysis, from the Nicholas School of the Environment at Duke University and a Bachelor of Science Degree from the University of Richmond, VA.

Maia Davis, Metropolitan Washington Council of Governments (MWCOCG)

Maia Davis is an Environmental Planner IV at the Metropolitan Washington Council of Governments working on climate, energy and air quality. She previously was with the Atlanta Regional Commission (ARC) as a Principal Environmental Planner where she was the program manager for ARC's Green Communities Program and the Metro Water District's Water Supply and Water Conservation Management Plan. In 2006, Maia earned a Masters Degree from Georgia Institute of Technology in City and Regional Planning with specializations in

Environmental Planning and Geographical Information Systems. She earned her Bachelor's of Science from the University of Maryland Eastern Shore.

Ken Hranicky, AICP, CFM, Department of Planning, City of Baltimore

Kenneth Hranicky (ran-ni-key) is a City Planner and floodplain manager for Baltimore City since 2005. Before coming to work for the City Ken worked for Maryland Department of Planning on Chesapeake Bay watershed issues. Ken holds a Master in Urban and Regional Planning from Portland State University and is a certified planner and floodplain manager. Currently the City of Baltimore is updating the All-Hazard Mitigation Plan that will consider climate change scenarios/impacts and then develop adaptation measures with public support.

John L. McCoy, Watershed Manager, Community Building and Sustainability Service Bureau Columbia Association

John manages the town of Columbia's water resources. Implement watershed restoration program and interact with the residents and developers to promote and protect restoration activities and prevent further degradation.

Prior to this position, John has 25 years in State service that include the last 15 years of service with Maryland Department of Natural Resources. John's last position at DNR was the Director, Ecosystem Restoration Center. Groups within the Center specialized in restoring shorelines, wetlands and streams. General watershed restoration projects include the Corsica Watershed Restoration project, support for the Chesapeake Bay 2010 Fund projects, and the Anacostia Restoration. Specialized programs include stream buffer restoration through the Natural Filters Program.

Education includes: Dickinson College, Carlisle, Pennsylvania, B.S., Biology 1979 University of Maryland, College Park, Maryland, M.S., Agronomy, 1984

Panel 2: Climate Change Science and Communication

Dr. Victoria Coles, Research Associate Professor, University of Maryland for Environmental Science Horn Point Laboratory (UMCES)

Research Interests are climate variability and change, coastal and estuarine response to climate variability and change, the use of tracers to examine ocean processes, and ocean biogeochemistry and biophysical interactions. My research uses models and data to understand ocean response and feedback to climate variability. I also study the role of ocean ecosystems in setting large scale ocean biogeochemistry and its response to climate variability and change. I have a BS from the University of California at San Diego in Physics with Earth Sciences (1991) and a PhD from the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami in Physical Oceanography (1998), and did my Post-doc at NASA Goddard Space Flight Center (1998-2000).

Dr. Michael Paolisso, Associate Professor of Anthropology, University of Maryland College Park

Michael Paolisso is an Associate Professor in the Department of Anthropology at the University of Maryland, College Park. He completed his PhD training in anthropology at the University of California, Los Angeles (UCLA). He has conducted short- and long-term fieldwork in the areas of environment and development in Venezuela, Honduras, Ecuador, Kenya and Nepal. For the past 13 years he has focused his research on natural resource and pollution issues for Chesapeake Bay watershed, including water quality, agricultural nutrient runoff, crab and

oyster fisheries, land conservation, and climate change. His Chesapeake research seeks to demonstrate how cultural models of the environment have a direct bearing on the use and management of natural resources, and how cultural models and socio-ecological systems can be used to improve intra- and inter-stakeholder understanding, dialogue and collaboration in addressing environmental issues.

Dr. Victoria Chanse, Assistant Professor, University of Maryland College Park in the Department of Plant Science & Landscape Architecture

As a researcher and community planner/designer, my work encompasses the following: 1) civic engagement around urban watershed planning and design and 2) transdisciplinary collaboration around watershed and climate change issues. My expertise in these arenas include serving on the Board of Directors for the Environmental Design Research Association, serving as co-guest editor for a special theme issue on transdisciplinary action research for Landscape Journal, and real-world projects such as the Sand River Restoration project and the Sand River Headwaters Green Infrastructure project. This latter project was accepted into the 2010 Sustainable Sites Initiative TM Pilot Program. During my three years at Clemson University, I developed projects that include civic engagement and service learning in the neighborhoods of North Charleston, South Carolina, and a green infrastructure project in conjunction with several Clemson University colleagues in Aiken, South Carolina. I have taught studios and graduate seminars on community participation, ecological design and green urbanism in the Landscape Architecture program at Clemson University's Landscape Architecture Program. As an assistant professor in Landscape Architecture at the University of Maryland, I teach the community design studios at the graduate and undergraduate levels. In spring 2011, I worked with the Town of Forest Heights and the Neighborhood Design Center to work with the University of Maryland students and the Forest Heights residents to develop a sustainability plan. In summer 2011-current, I embarked on a transdisciplinary project focusing on civic engagement on climate change in Dorchester County, MD. Some outcomes of this grant funded work included the fall 2012 Civic Engagement on Climate Change studio and the related collaboration with the Architecture studios in spring 2012. The content of these design studios include civic engagement practices and cross-disciplinary dimensions of transportation, planning, public health, civil engineering to developing landscape-scale approaches to neighborhood planning and design. My projects shape my transdisciplinary research, teaching, and service approaches.

Dr. Poornima Madhavan, Assistant Professor, Old Dominion University

Dr. Poornima Madhavan is an Assistant Professor in the Department of Psychology at Old Dominion University. She studies human decision making processes in complex environments that embody risk, stress, time pressure, and uncertainty. She is currently studying the issue of sea level rise in terms of how support systems can help in the process of making decisions about community adaptation to this complex issue. She is one of the investigators on a recently concluded survey of residents in the city of Norfolk, VA which provided insights into their attitudes, opinions and willingness to take action on issues related to climate change and sea level rise. Poornima was recently awarded the Earl Alluisi Award for Early Career Achievement from the American Psychological Association for outstanding contributions to her field within 10 years of receiving her doctorate degree.

Group Discussion: Past, Present and Future

Dr. Marcus Griswold, Program Coordinator, DNR/UMCES

Marcus Griswold currently coordinates climate change adaptation in Maryland in partnership with the University of Maryland Center for Environmental Science and the Maryland Department of Natural Resources to move forward state and local climate adaptation practices and policies. Marcus' background is in watershed

management, restoration, and assessment with a focus on ecological resilience and recovery from human and natural disturbances. He received both his Master's and Ph.D. from the University of Florida, with a focus on invasive species and best management practices in headwater streams.

Dr. Kevin Sellner, Director Chesapeake Research Consortium (CRC)

As CRC Director, Kevin is responsible for identifying and expanding research activities in or relevant to the Chesapeake Bay watershed for the extensive scientific community within the CRC member institutions as well as other regional scientists. Additionally, Kevin is strongly committed to ensuring transfer of research results to regional managers and policy makers in understandable formats and manners for consideration in policy development for the Bay, its sub-estuaries, and non-tidal areas. It's only through consideration of the most recent research results of the outstanding scientific community of the area that the most practical and scientifically defensible management of the watershed and its living resources can be assured. As Executive Secretary of the Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC), Kevin is also responsible for administering activities of this standing experts committee.

In 2001, Kevin joined the CRC as Director after twenty years of active research in plankton ecology at the Academy of Natural Sciences and a four year period with NOAA's Center for Sponsored Coastal Ocean Research. Kevin focused his research program on determining the fate of primary production in aquatic systems, particularly algal blooms. His research included extensive studies on cyanobacteria and dinoflagellate blooms in the Chesapeake and its tributaries as well as in the Baltic Sea and upwelling waters of Peru. At NOAA, he acted as the coordinator for the interagency research program ECOHAB (Ecology and Oceanography of Harmful Algal Blooms) and during his tenure, over \$50M was committed to bloom research in U.S. coastal waters. Kevin holds a BA in Biology from Clark University, a MS in Marine Science from the University of South Carolina, and a PhD from Dalhousie University in Oceanography.

Appendix C – Steering Committee List and Additional Bios

Steering Committee

- *Vicky Carrasco, Coastal Communities Specialist, University of Maryland Sea Grant Extension*
- *Sadie Drescher, Watershed Planner, Center for Watershed Protection*
- *Zoë Johnson, Program Manager, Office for Sustainable Future, Maryland Department of Natural Resource (MD DNR)*
- *Dr. Victoria Coles, Research Associate Professor, University of Maryland for Environmental Science Horn Point Laboratory (UMCES)*
- *Dr. Michael Paolisso, Associate Professor of Anthropology, University of Maryland College Park*
- *Dr. Victoria Chanse, Assistant Professor, University of Maryland College Park in the Department of Plant Science & Landscape Architecture*
- *Dr. Kevin Sellner, Director Chesapeake Research Consortium (CRC)*
- *Dr. Adel Shirmohammadi, Professor Associate Dean for Research & Assoc. Director of MAES Maryland Agricultural Experiment Station College of Agriculture and Natural Resources (Bio provided)*
- *Dr. Stephen Halperin, Professor and CIRUN Director (Bio provided)*
- *Peter J. Claggett, Research Geographer, U.S. Geological Survey - Chesapeake Bay Program Office (Bio provided)*

Additional Input from the following:

- *Jeff Allenby, Coastal Communities Planner, MD DNR and UMD Center for Environmental Science*
- *Sasha Land, Coastal Training Program Coordinator, Chesapeake Bay National Estuarine Research Reserve (CBNERR)*

Peter J. Claggett, Research Geographer, U.S. Geological Survey - Eastern Geographic Science Center; Chesapeake Bay Program Office

Mr. Peter Claggett is a Research Geographer with the U.S. Geological Survey's Eastern Geographic Science Center. Mr. Claggett has received Master degrees in Geography and Environmental Science from Miami University of Ohio and a B.A. in Environmental Science from the University of California at Berkeley. Mr. Claggett started his career as a Peace Corps volunteer followed by positions with the U.S. Environmental Protection Agency and Canaan Valley Institute. For the past nine years, Mr. Claggett has worked for the U.S. Geological Survey where he conducts research on land change characterization, analysis and modeling in the Chesapeake Bay watershed.

Dr. Steve Halperin, Professor of Mathematics and Director of the Climate Information Responding to User Needs (CIRUN) initiative

Dr. Steve Halperin is Professor of Mathematics and Director of the Climate Information Responding to User Needs (CIRUN) initiative at the University of Maryland (UMD). CIRUN seeks to develop mechanisms to provide actionable information about environmental change to decision makers. Dr. Halperin has been with UMD for more than 12 years, serving as the dean of a major science college until August 2011.

Previously, he was professor and chair in the Department of Mathematics at the University of Toronto, where he also served as acting Vice President for Research and International Relations. He was the PI and founding program director for Canada's National Network of Centres of Excellence (MITACS) connecting mathematicians across Canada to industrial users of mathematics.

Dr. Halperin has authored four books and over 80 refereed articles in pure mathematics. He is a Fellow of the Royal Society of Canada, Chevallier de l'Ordre des Palmes Academiques, and a Fellow of the Fields Institute for Mathematical Sciences. He earned his doctorate in mathematics from Cornell University in 1970, and holds a Bachelor of Science and a Master of Science in mathematics from the University of Toronto.

Dr. Adel Shirmohammadi, Professor Associate Dean for Research & Assoc. Director of Maryland Agricultural Experiment Station (MAES), College of Agriculture and Natural Resources

Dr. Shirmohammadi is a Professor of Biological Resources Engineering in the Department of Environmental Science and Technology and for last two years he has been serving as an Associate Dean for Research in the College of AGNR and Associate Director of Maryland Agricultural Experiment Station (MAES) at the University of Maryland. He is also an affiliate faculty with MEES Graduate Program, Bioengineering Department and the department of Civil and Environmental Engineering. Since his tenure at the University of Maryland in 1986, Dr. Shirmohammadi has been involved in Teaching and Research in the areas of Water Resources Engineering, Hydrologic and Water Quality Modeling and monitoring at different scales (process-based, field, and watershed/basin). He has taught both undergraduate and graduate courses, has been major advisor for 14 Ph.D. graduates and 15 MS graduates besides serving in the graduate committees of more than 50 students in multiple disciplines related to environmental, soil science, hydrology, and engineering. He served as the Director of Undergraduate program in the Fischell department of Bioengineering for four years before assuming his current position as the Associate Dean and Associate Director in AGNR. His research in the areas of hydrologic and water quality modeling and monitoring has produced more than 250 publications of which more than 75 are in refereed journals. He also has given more than 50 invited presentations with several of them being Keynote presentations at different national and international conferences related to Modeling nonpoint source pollution and hydrology. He has served in many state, regional, and national professional Panels and Committees. His most recent and relevant services to this Forum have been the following:

- a) Member of National Research Council (NRC) Panel in National Academy of Sciences on Chesapeake Bay
- b) Member of Eastern US and Canada "Think Tank" Committee on Climate Change Adaptation and Mitigation
- c) Member of the Northeast Experimental Station Directors Committee on Climate Change Adaptation for Agro-ecosystems focusing on Water Resources in Northeast
- d) External Panel Member for Chesapeake Bay's STAC review committee on the Evaluation of Models for TMDLs

Finally, he is a proud Fellow of American Society of Agricultural and Biological Engineers (ASABE) since 2005. He enjoys multi-institutional collaboration including collaboration with many international institutions around the world.

Dr. Shirmohammadi has a PhD from North Carolina State University (1982), MS from the University of Nebraska, and a BS from the University of Rezaeiyeh, Iran.

Appendix D – List of Participants

First Name	Last Name	Place of work	Position Title	Email
Rowland	Agbede	Maryland Department of Agriculture	GIS Coordinator	agbedero@mda.state.md.us
Jeff	Allenby	Department of Natural Resources	Coastal Communities Planner	jeff@allenby.com
Phillip	Arkin	University of Maryland	Director, Cooperative Institute for Climate and Satellites	parkin@essic.umd.edu
Kathryn	Au	HUD		kathryn.au@hud.gov
Donald	Boesch	University of Maryland Center for Environmental Science	President	boesch@umces.edu
Jeffrey	Brainard	MD Sea Grant/UMD	Assistant Director for Communications	brainard@mdsg.umd.edu
Joshua	Brown	NOAA	Climate Coordinator	joshua.brown@noaa.gov
Kaye	Brubaker	Univ. of Maryland, Civil & Environmental Engineering	Associate Professor	kbru@umd.edu
Antonio	Busalacchi	Earth System Science Interdisciplinary Center and the Department of Atmospheric and Oceanic Science	Professor and Director	abusalac@umd.edu
Vicky	Carrasco	Maryland Sea Grant	Coastal Communities Specialist	vcarrasco@arec.umd.edu
Victoria	Chanse	PSLA	Assistant Professor	vchanse@umd.edu
Kate	Charbonneau	Critical Area Commission	Regional Program Chief	kcharbonneau@dnr.state.md.us
Peter	Claggett	U.S. Geological Survey	Research Geographer	pclaggett@usgs.gov
Kathleen	Clendaniel	University of Maryland		clenkate@gmail.com
Gabriel	Cohee	DNR	Conservation Specialist	gcohee@dnr.state.md.us
Victoria	Coles	UMCES	Research Associate Professor	vcoles@umces.edu
Chris	Cortina	MD DNR	Natural Resources Planner	ccortina@dnr.state.md.us
Susie	Crate	George Mason	Associate Professor of Anthropology	scrate1@gmu.edu
Maia	Davis	MWCOG	Environmental Planner IV	mdavis@mwkog.org
Jennifer	de Mooy	Delaware Division of Energy and Climate	Climate Adaptation Project Manager	Jennifer.DeMooy@state.de.us
Jennifer	Dindinger	UMD Sea Grant Extension	Watershed Restoration Specialist	jdinding@umd.edu
Sadie	Drescher	The Center for Watershed Protection, Inc.	Watershed Planner	srd@cwpp.org
Morgan	Ellis	Delaware Division of Energy and Climate	Climate Planner	morgan.ellis@state.de.us

First Name	Last Name	Place of work	Position Title	Email
Ann	Elsen	Elsen Energy Consulting	Executive Director of the Howard County Green Business Council	Ann@ElsenEnergy.com
Shirley	Fiske	Department of Anthropology, U MD	Research Professor	sfiske@umd.edu
Matt	Fitzpatrick	University of Maryland Center for Environmental Science	Assistant Professor	mfitzpatrick@umces.edu
Marcus	Griswold	DNR/UMCES	Program Coordinator, Climate Adaptation	mgriswold@dnr.state.md.us
Steve	Halperin	University of Maryland	Professor	shalper@umd.edu
Sabrina	Harder	Frederick County Government	Green Homes Program Coordinator	sharder@FrederickCountyMD.gov
Ken	Hranicky, AICP, CFM	Baltimore City	Department of Planning	Kenneth.Hranicky@baltimorecity.gov
Megan	Hughes	Environmental Finance Center	Program Manager	mhughes3@umd.edu
Jeff W	Johnson	Self-Employed	Climate Change Policy Consultant/CAPT, U.S. Navy (Retired)	johnsoncapt@yahoo.com
Zoe	Johnson	Maryland DNR	Program Manager	zjohnson@dnr.state.md.us
Michael	Kearney	Environmental Science and Technology	Professor	mkearney01@yahoo.com
Vic	Kennedy	UMCES	Professor	kennedy@umces.edu
Hali	Kilbourne	UMCES-CBL	Assistant Research Professor	kilbourn@umces.edu
Evamaria	Koch	UMCES	Associate Professor	koch@umces.edu
Wan-Jean	Lee	National Sea Grant Office	Knauss Sea Grant Fellow	wanjuan.lee@noaa.gov
Xin-Shong	Liang	Earth System Science Interdisciplinary Center and Department of Atmospheric and Oceanic Science	Professor	xliang@umd.edu
Fred	Lipschultz	USGCRP	Regional Coordinator, National Climate Assessment	flipschultz@usgcrp.gov
Chris	Luther	Maryland Sea Grant	Intern	cluther@terpmail.umd.edu
John	McCoy	Columbia Association	Watershed Manager	john.mccoy@columbiaassociation.com
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Appendix E – Resources Handout

A Few Key Resources

Chesapeake and Coastal Program (MD DNR)

<http://www.dnr.state.md.us/CoastSmart>

Check out their CoastSmart Communities Initiative, which provides access to an online resource center for financial and technical assistance to address vulnerability to the impacts of sea level rise and climate change.

Maryland Sea Grant Climate Initiatives

www.mdsg.umd.edu/climate

This website provides a description of University of Maryland's Sea Grant Extension's climate change initiatives, including a information on needs assessment projects and project in Talbot County, where issues around shorelines and stormwater retrofits in villages were addressed.

NOAA Coastal Services May/June 2011

Adapting to Climate Change Impacts: Maryland is Turning Plans into Action

<http://www.csc.noaa.gov/magazine/2011/03/>

This article looks at Maryland's work to address the impacts of climate change. "In a lot of ways, we're adding climate change as a new element to consider in things that are already going on." - Zoe Johnson, Maryland Department of Natural Resources

The Watershed Assistance Collaborative

http://www.dnr.state.md.us/ccp/healthy_waters/wac.asp

The collaborative provides technical and financial assistance to local communities and governments for watershed protection and restoration in Maryland.

Maryland Coastal Atlas (Access to Online Mapping Tool)

<http://www.dnr.state.md.us/ccp/coastalatl/index.asp>

Through the atlas, users can access the shorelines mapping tool to see shoreline erosion data, visualize coastal inundation from storms, and identify areas at risk to sea level rise.

Appendix F – Small Group Facilitator Instructions

Lost in Translation: Linking Climate Science to Local Communities *Prioritizing Research & Communication Needs at the Local Scale in Maryland & the Chesapeake Bay*

Monday, April 23, 2012

Facilitator Instructions Small Group Discussions of Questions (45min – 1 hour).

- I. **Facilitator** will explain their **role** (primarily to help ensure that everyone in the group has a chance to speak and be heard, to keep the conversation on topic, to provide a summary of the conversation).
- II. Select a **recorder/reporter** to take notes, either on computer (if avail) or on notebook paper.
 - a. Remind the group that the recorder will be capturing the major points discussed in the notes. If PPT, 3 slides MAX.
- III. State the five questions to be answered by group.
 6. ***What is happening on the ground? How is science used?***
 - a. ***What is working***
 - b. ***What is NOT working***
 - c. ***What are some lessons you've learned on climate communication?***
 7. ***What types of information about a given climate change risk are needed before decision-makers can take account of the risk in plans and policies?***
 8. ***What are the most important factors in making sure that information for adaptation continuously improves?***
 9. ***On the "receiving end" of the information process, what new skills, resources, , or procedures may stakeholders need for making decisions in a changing climate?***
 10. ***Identify ONE research issues of importance to Maryland and/or the Chesapeake Bay, in regards to climate change adaptation.***
- IV. Discussion should proceed in an open format and please allow **everyone** (round robin) to have an opportunity for comment. Be sure that the conversation is moving around the group and not being dominated by one or a couple of people.
- V. Save time to summarize ideas and report back to the group as a whole.
- VI. Wrap up and BREAK for LUNCH