

NERRS Science Collaborative Progress Report for the Period 09/01/13 through 2/28/2014

Project Title: Building the Capacity of Coastal Communities to Address Climate Change Risks Through the Use of Role-Play Simulations

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A. Progress overview: *State the overall goal of your project, and briefly summarize in one or two paragraphs, what you planned to accomplish during this period and your progress on tasks for this reporting period. This overview will be made public for all reports, including confidential submissions.*

The overall goal of this project, which we refer to as the New England Climate Adaptation Project (NECAP), is to 1) build the capacity of coastal New England towns and cities to manage climate change risks, 2) build the capacity of NERR sites to catalyze and support coastal adaptation efforts, and 3) test the effectiveness of role-play simulations as a tool for educating and engaging the public in climate change adaptation. During the third quarter of the project (ending on February 28, 2014), our goal was to engage over 100 diverse stakeholders in each of our four partner municipalities (Barnstable, MA; Cranston, RI; Dover, NH; and Wells, ME) in the role-play simulation designed for that site through a series of workshops. We also aimed to collect data from all role-play simulation workshop participants through before-and-after surveys and to conduct follow up in-depth interviews with 20 to 30 percent of all workshop participants. During the third quarter, we also planned to get our our entire New England Climate Adaptation Project team together for a full team meeting, and to conduct targeted “check-in meetings” with our municipal and NERR partners in each of our four sites. Finally, we aspired to finalize the climate change risk assessments, stakeholder assessments, and role-play simulation teaching packages we prepared for our four partner towns and to make these available to our project partners in both electronic form and hardcopy.

During this quarter, we achieved all of these goals. We successfully engaged between 115 and 170 diverse participants in each town through a series of 7 to 8 workshops in each site. We also collected data through before-and-after surveys from almost all participants, and conducted in-depth follow-up interviews with approximately 25 percent of all workshop participants. Our before-and-after survey data has been entered into a database and is now being statistically analyzed. Our follow-up interviews have been transcribed into interview memos, which we are now coding and analyzing for key findings. We hosted an “all-team” NECAP gathering for all project staff and partners in Cambridge in October, and were fortunate to have representatives from all partner town and NERR sites, as well as Dolores Leonard from the NERRS Science Collaborative, attend and participate. Carri Hulet from CBI, along with Paul Kirshen and Cameron Wake from University of New Hampshire, met with our partners in each site last fall to discuss the findings from the risk assessment, stakeholder assessment, and public poll completed in each town over the last year, as well as how to build on this information to advance adaptation efforts in the region. We also have finalized our stakeholder assessments, role-play simulation teaching packages, and risk assessments for all towns. The

simulations are now publicly available for a nominal fee through the clearinghouse of the inter-university Program on Negotiation (PON) at Harvard Law School. The links for the four NECAP games are:

- The Shoreham Game (prepared for Barnstable, MA):
<http://www.pon.harvard.edu/shop/coastal-flooding-in-shoreham-responding-to-climate-change-risks/>
- The Northam Game (prepared for Dover, NH):<http://www.pon.harvard.edu/shop/flooding-and-climate-change-risks-in-northam/>
- The Launton Game (prepared for Wells, ME): <http://www.pon.harvard.edu/shop/coastal-flooding-and-climate-related-risks-in-launton/>
- The Milton Game (prepared for Cranston, RI):
<http://www.pon.harvard.edu/shop/flooding-in-milton-collectively-managing-climate-change-risks/>

In early March, we will share the finalized risk assessments, stakeholder assessments, and game teaching packages in hardcopy and electronic copy with each partner municipality. The finalized risk assessments for all four towns will also be posted on our website.

B. Working with Intended Users:

- *Describe the progress on tasks related to the integration of intended users into the project for this reporting period.*
- *What did you learn? Have there been any unanticipated challenges or opportunities?*
- *Who has been involved?*
- *Has interaction with intended users brought about any changes to your methods for integration of intended users, the intended users involved, or your project objectives?*
- *How do you anticipate working with intended users in the next six months?*

Our intended users—key stakeholders in each of our partner municipalities as well as NERR staff—have been integrally involved in all of our activities since we launched the project in September 2012. During the third quarter, we worked with our town partners and CTP Coordinator partners to organize and host 7 to 8 role-play simulations in each site. Our local partners played a central role in organizing and running the workshops, as well as in getting diverse stakeholders and members of the public to participate. Our municipal partners and other key stakeholders have also been involved in helping us improve, refine, and finalize the risk assessment documents for each site. Intended users from each site also attended and participated in our all-team NECAP meeting in October.

Through our role-play simulation workshops, we were able to—as mentioned above—engage well over 100 participants from each community in our role-play simulations and follow up discussions about climate change risks and adaptation. Workshop participants included local elected and appointed officials, agency personnel, business representatives, general citizens, and some state and regional government officials.

Getting people to our workshops proved to be a bit trickier than we had originally anticipated. However, our team in each site—consisting mainly of a Masters student from MIT, municipal partners, and CTP staff from the local NERR—were able to, through trial-and-error, refine their outreach and communications strategy to attract people to the workshops. We experienced a bit of a snowball effect, meaning it becoming easier to get people to the workshops after we reached a critical mass of participants. It proved to be most difficult to get workshop participants to attend in Dover, NH, and Wells, ME. This was likely largely due to the smaller sizes of these communities, but may also have been related to less concern about climate change risks. Ultimately, while we had to temper our workshop participant expectations

(we had originally hoped to get over 150 participants in all towns), we were successful in reaching our goal of engaging over 100 participants per site, and exceeded the 150 mark in Barnstable and Cranston (although we only collected complete before-and-after packets from over 150 people in Cranston).

As was expected, we did encounter some “climate change skeptics” in our workshops. We also had a couple participants who were strongly opposed to climate change action leave the workshops before they were over. While this at times made for challenging workshop dynamics and required more active workshop facilitation, it was not significantly disruptive. We never anticipated that the role-play simulations workshops would attract a lot of climate change “deniers,” nor do we envision our simulations being a tool to convince people climate change is happening. Hence, we were particularly appreciative that people with this perspective attended when they did. It helped demonstrate for other workshop participants some of the challenges and tensions towns are likely to face in moving forward with collective climate change risks management approaches.

Intended users have also been directly involved in the project through the process of follow up interviews. Approximately 30 to 40 diverse workshop participants from each site participated in our in-depth follow up interviews. Through these semi-structured discussions, we were able to learn more about participants’ experience in the simulation and whether and how it affected them, as well as to gain better insight into their perspectives, concerns, and interests around climate change risks and adaptation options.

Over the next six months, we intend to continue working closely with our town and city partners, and to engage other intended users in a variety of ways. While a lot of our data processing and analysis will be done by the MIT team, we seek to, where appropriate, work with our municipal and NERR partners to make sense of these findings. We will also remain in close communication with them about our data findings, as they emerge. Further, we will work with our partners in each municipality and NERR site to generate press releases and other communications materials about our research findings and project outputs. We are currently in the process of developing a NECAP team media strategy to guide these outreach efforts in our four partner sites..

In April or early May, project staff from CBI will conduct a second round of check-in meetings with key stakeholders in each partner locality to explore how this project has affected public awareness and concern about climate change risks and adaptation, and to explore how the town or city can build on the momentum created by this project to meaningfully move forward with climate change risk management strategies. During these check-in meetings, we will try to help our municipal partners develop some concrete and achievable steps to move forward with adaptation. Where opportunities arise, we will also work with intended users in our partner sites to prepare and submit funding proposals to secure resources to help them move forward adaptation efforts, such as through conducting additional vulnerability analyses.

Finally, in late April or early May, we will contract Triton Polling to conduct an “exit” public poll in each town. This phone poll will be very similar to the poll we conducted in May 2013. It will survey 100 randomly selected citizens in each partner municipality to generate a sense of public sentiments about climate change risks and support for adaptation following our role-play simulation workshops and broader project intervention.

C. Progress on project objectives for this reporting period:

- *Describe progress on tasks related to project objectives for this reporting period.*
- *What data did you collect?*
- *Has your progress in this period brought about any changes to your methods, the integration of intended users, the intended users involved or the project objectives?*
- *Have there been any unanticipated challenges, opportunities, or lessons learned?*
- *What are your plans for meeting project objectives for the next six months?*

From the workshops in each site, we collected before-and-after surveys from between 110 to 156 participants, resulting in complete survey sets from 510 participants. We also successfully completed follow-up interviews with 20 to 30 percent of all workshop participants in each site (about 130 total). Further, at each workshop, we took observational notes, including detailed notes on the post-simulation debriefing conversation.

There were no significant changes to our methods or integration of intended users throughout the data collection process. However, running role-play workshops and getting people to participate was an ongoing learning process, and we learned a number of important lessons along the way.

One of the key lessons we learned is that, for this type of research, it can be challenging to get sufficient workshop participation to allow for robust statistical analysis of findings. We were ultimately successful in engaging our targeted number of participants, but doing so required hard work on behalf of the entire team, including our MIT and CBI staff, NERRS staff, and town partners. Widespread commitment to the project by all involved parties, as well as willingness to work together and learn together, was critical. We are in the process of collecting and collating our “lessons learned” about what techniques and approaches were most effective in getting people to the workshops; we intend to write up and share our lessons learned after the completion of the project.

Prior to running our role-play simulation workshops, we developed a process for administering and collecting materials for each workshop participant. This included handing out workshop materials (e.g., role-specific simulation materials, informed consent forms, and surveys) in envelopes to all participants and asking them to return all materials back to us in the same envelope. While this process was largely effective, we still ran into issues such as surveys sometimes going missing or not being filled out completely. While this will not significantly affect the quality or quantity of our data, it created headaches for project staff and led to some participant data having to be discarded. We have concluded that our data collection approach was extremely effective, despite a few minimal losses in data, given the number and diversity of individuals we engaged. However, we learned that simple efforts, such as repeatedly reminding people during workshops to fill out both sides of their surveys, to put everything back in their envelopes, and to return everything to us before leaving, were necessary and helpful.

We also learned that it can be challenging to get people to participate in follow-up interviews. Most participants were quite willing and even eager to participate in the 20 to 30 minute post-workshop interviews. However, we found that for some workshops—particularly those run at colleges—it was difficult to get over 20 percent of workshop participants to do the interviews. Fortunately, we discovered that offering \$10 Amazon gift cards for interview participation can be quite effective in generating participation, particularly with college students.

Over the next six months, we will be largely focused on processing all of the data we have collected from our workshops in each site—which includes data from the 510 before-and-after survey sets, memos from the 130 follow-up interviews, debriefing notes from all simulation workshops, and observational data collected throughout the project. We will also conduct another public poll in each of our four towns in April or May; this public poll will be contrasted

against the findings of the public poll we conducted last May. We will also conduct check-in meetings with our project partners in each of our four sites to debrief on their experience with the project, explore whether any changes in the town have occurred as a result of or in some way connected to the NECAP project, and to help them generate tangible next steps for moving forward with adaptation after the project. We will also be very focused on translating our findings into a series of reports and papers, including those laid out in Appendix A. Our MIT team will spearhead the process of report and article writing, but our municipal and NERR partners will have the chance to review and provide feedback on all project-specific outputs.

D. Benefit to NERRS and NOAA: *List any project-related products, accomplishments, or discoveries that may be of interest to scientists or managers working on similar issues, your peers in the NERRS, or to NOAA. These may include, but are not limited to, workshops, trainings, or webinars; expert speakers; new publications; and new partnerships or key findings related to collaboration or applied science.*

Our four climate change adaptation role-play simulations are now finalized and are available online through the Program on Negotiation (see links above) for use by NERRS and NOAA staff, as well as anyone else who wants to use them in their community or school. The risk assessments and stakeholder assessments we have produced for our four partner towns and cities are also finalized, and may provide useful information and examples for NERRS and NOAA staff and others seeking to advance adaptation. Additionally, we have now run two role-play simulation teacher training workshops (one in Wells last summer and one on the Cape this February); we hope to build on these trainings to advance the use of role-play simulations as a teaching tool in more traditional educational environments, such as high schools. We hope that the various articles and reports we have underway (see below) and/or will be working on over the next six months will be of great use to NERRS, NOAA, and others working on adaptation and collaborative research.

E. Other: *Describe any activities, products, accomplishments, or obstacles not addressed in other sections of this report that you feel are important for the Science Collaborative to know.*

In addition to achieving these above goals, we have continued to maintain our project website (necap.mit.edu), including posting links to articles and other media about NECAP and writing team member blogs about the workshops and adaptation-related topics. We also helped host a role-play simulation teachers training event with our partners at the Waquoit Bay NERR in February, along the same lines as the teacher training we hosted with Wells Reserve last summer.

During the past quarter, project staff from CBI and UNH worked with our partners in Wells, ME, to submit a grant proposal to fund a more comprehensive vulnerability analysis. While this proposal was unfortunately not funded, we are optimistic that we may be able to pursue other funding to advance Wells' adaptation efforts. We anticipate working with our project partner in all four sites to pursue funding for adaptation efforts as opportunities arise.

In addition to bringing on and training three new Masters student researchers this fall, we have brought on and worked with a total of eight MIT undergraduate students. Through their involvement in the project, these undergraduate students—whose majors range from planning to engineering to physics—have had an opportunity to get first hand experience with applied, interdisciplinary research, as well as to build their skills for community outreach and engagement.

During this quarter, the project has attracted a lot of publicity and attention. In addition to multiple articles being written about the project (such as an excellent article in EcoRI: www.ecori.org/massachusetts-climate/2014/1/4/climate-change-games.html), NECAP was featured in the CBI Fall Annual Report (<http://www.cbuilding.org/node/1902%3Farticle=1901>). Danya Rumore also recently submitted an article about the project for publication in the Carolina Planning Journal's special edition on innovative collaborations for building local capacity. This article is currently in its final revision phase, and will be published this summer. An abstract prepared by NECAP staff and others for an article on the use of role-play simulations as a climate change adaptation tool has been accepted by *Nature Climate Change*; we anticipate submitting the article draft article this spring. Additionally and excitingly, our MIT and CBI "Building Consensus, Enabling Adaptation" proposal won the MIT Climate Co-Lab Enabling Adaptation competition last fall.

Finally, a sustainability consultant in the Naivasha basin outside of Nairobi, Kenya, who heard about NECAP through a post about our Climate CoLab proposal on Twitter, contacted the project a few months ago and is currently in conversation with CBI to determine how she can use games to engage a wide range of diverse stakeholders in developing a climate adaptation update to a massive sustainability development plan. Also, the co-chair of a local sustainability committee in Dedham, Massachusetts has become interested in the potential for role-play simulations to spur climate adaptation action in her town, and is currently considering using one of the NECAP games to prompt action in Dedham.

Appendix A: NECAP anticipated working papers and reports

1. **Summaries of Role-Play Simulation Results for Each Community:** For each town, we will prepare a summary of the findings from the 110 to 156 before-and-after surveys and 20 to 40 in-depth follow up interviews with participants who played the game. These will also draw on the debriefing narratives from some of the workshops.
2. **Comparative Analysis of the Role-Play Simulation Results Across All Sites:** In addition to the summary for each town, we will prepare a paper that summarizes and compares the results from our role-play simulations across all four communities.
3. **Explanation of Summary Risk Assessments and Risk Perceptions:** This paper will summarize the findings of our Summary Risk Assessments for each community, as well as how community members understand and make sense of these risks.
4. **Baseline Assessment of Public Opinion About Climate Change Risk:** We will prepare summaries for each community of the findings from our initial May 2013 Triton Polling randomized telephone surveys.
5. **Second Round Assessment of Public Opinion About Climate Change Risk:** We will prepare summaries for each community of the findings from our May 2014 Triton Polling randomized telephone surveys, and will tie these findings to the findings from our initial 2013 public poll.
6. **Analysis of the Impacts of Widespread Playing of Tailored Role-Play Simulations on Public Willingness to Engage in Adaptation Planning:** This paper will analyze the effects of widespread role-playing on local proclivity to undertake adaptation action. This paper will draw on our workshop results, the two check-in meetings with elected and appointed officials in each community, and our tracking of public agency decisions related to managing climate change risks. It will also require some one-on-one interviews with town partners.
7. **What We Have Learned About Designing Role Play Simulations for Public Engagement and Public Learning:** This paper will summarize the lessons we draw from this project about games and game design. It will highlight the process of creating tailored games by beginning with stakeholder assessments and, in this case, scientific risk assessment (including the question of how much technical information can be conveyed through these educational tools).
8. **What We Have Learned About Engaging Stakeholders and the Public Around Climate Change Preparedness and Adaptation:** This paper will summarize the lessons we have drawn about messaging and engagement techniques from our experience engaging stakeholders in our workshops.
9. **What we Have Learned About the Prospects of a “Bottom-up” or “Collaborative Adaptive Management” Approach to Climate Adaptation:** This paper will try to summarize and interpret what we have found in regards to the readiness of New England municipalities to take deliberate steps to manage climate change risks. We will draw on all our results to determine the extent to which different types of communities (or different groups in communities) are willing to support alternative approaches to climate risk management and adaptation.

Appendix B: List of main project outputs, to date, by municipality

Barnstable, MA

- Barnstable Risk Assessment
- Barnstable Stakeholder Assessment
- Coastal Flooding in Shoreham role-play simulation, available online at: <http://www.pon.harvard.edu/shop/coastal-flooding-in-shoreham-responding-to-climate-change-risks/>
- Results from the Triton Polling public poll of 100 randomly selected members of the public in Barnstable, conducted during May 2013

Cranston, RI

- Cranston Risk Assessment
- Cranston Stakeholder Assessment
- Flooding in Milton role-play simulation, available online at: <http://www.pon.harvard.edu/shop/flooding-in-milton-collectively-managing-climate-change-risks/>
- Results from the Triton Polling public poll of 100 randomly selected members of the public in Cranston, conducted during May 2013

Dover, NH

- Dover Risk Assessment
- Dover Stakeholder Assessment
- Flooding and Climate Change Risks in Northam role-play simulation, available online at: <http://www.pon.harvard.edu/shop/flooding-and-climate-change-risks-in-northam/>
- Results from the Triton Polling public poll of 100 randomly selected members of the public in Dover, conducted during May 2013

Wells, ME

- Wells Risk Assessment
- Wells Stakeholder Assessment
- Coastal Flooding and Climate Related Change Risks in Launton role-play simulation, available online at: <http://www.pon.harvard.edu/shop/coastal-flooding-and-climate-related-risks-in-launton/>
- Results from the Triton Polling public poll of 100 randomly selected members of the public in Dover, conducted during May 2013
- "Town of Wells Climate Change Vulnerability Assessment," Maine Coastal Communities Grant Application