

**PROCHASKA, URI**  
**DHS Coastal Resilience Center**  
**Research Project:**  
**Annual Project Performance Report**

Covers reporting period January 1, 2016 – June 30, 2016

1. **Project Title:** Communicating risk to motivate individual action
2. **Principal Investigator / Institution:** Dr. James O. Prochaska, Cancer Prevention Research Center (CPRC), URI
3. **Other Research Participants/Partners:** Additional Investigators: Dr. Andrea Paiva, CPRC, URI, Pam Rubinoff, CRC, URI.
  - a. Significant partner: Pro-Change Behavior Systems, Inc.
4. **Short Project Description:** Communicates risk to motivate action by tailoring communication to diverse populations. Participants receive individualized feedback via online coaching based on their readiness to take action, thereby encouraging them to move forward in the behavior change process to prepare and mitigate impacts of coastal storms.
5. **Abstract:** Efforts to communicate disaster preparedness and risk messages lead to increased public awareness. However, FEMA surveys indicate that the public today is little more prepared to respond to a disaster than it was several years ago. This conundrum reflects the axiom in the science of behavior change that increasing awareness can start the change process, but cannot sustain it; reflecting a disconnect between theory and practice. Behavior change psychology indicates that: 1) the behavior targeted for change must be clearly defined and include specific achievable actions; and that 2) behavior change is a long process where each stage is a small step on the way to permanent behavior change. While efforts at linking behavior change and preparedness have been shown to be successful (Miletti and Darlington, 1995) it is not common place for most emergency managers, communicators and planners to incorporate behavior change psychology when communicating with the public.

This intervention will be based on the Transtheoretical Model of Behavior Change (TTM), which has demonstrated with more than 50 risk behaviors that change unfolds over time and involves progress through a series of five stages. 1) Precontemplation (Not Ready): people do not intend to take action in the foreseeable future, usually measured as the next six months. 2) Contemplation (Getting Ready): the stage in which people intend to change in the next six months. 3) Preparation (Ready): people intend to take action in the immediate future, usually measured as the next month. Typically, they have already taken some significant action in the past year. 4) Action: people have made specific overt modifications in their lifestyles within the past six months. 5) Maintenance: the stage in which people have made specific overt

modifications in their lifestyles more than 6 months ago. At each stage, different principles and processes of change need to be applied if populations are to take effective action and maintain that action. This project addresses key questions about what motivates individuals and groups to prepare for disasters before threats exist, when threats exist, and when a crisis is occurring. Our project parallels FEMA's effective application of our TTM Model in the research reported in Preparedness in America.

This project builds upon state-of-the-art approaches to communications designed to reduce risks, which most recently were adapted for a pilot related to natural hazard preparedness. The primary focus of this project will be on preparedness, which will utilize computer tailored interventions (CTIs) which are online, user-friendly programs that ask a series of questions and provide immediate feedback tailored to the users' responses. The CTI's have the greatest impact across populations and problems. Such communications can produce interventions for entire populations that are fully tailored to each individual and those constructs that drive the most change (e.g. stages of change and pros/cons of changing). Statistical decision-making rules determine the best messages that should be sent and provide feedback on where participants are making their best efforts, where they need to improve, and where they are progressing. The secondary focus will be on mitigation behaviors designed to reduce damage from wind and flooding. These behaviors will be tailored only on the individual's stage of change. Previous research on health risk behaviors has demonstrated that applying CTIs that are fully tailored to a primary behavior (in this case preparedness), and stage tailored to secondary behaviors (in this case wind and flood) has had significant impacts on each behavior.

To evaluate the efficacy of communication interventions, longitudinal studies are necessary over a period of time, including reassessing participants after one and two-year periods to determine how behaviors change by movement through the five stages, and to adjust the individualized coaching accordingly. This is not common practice. This program promotes such an effort and is scalable to large populations to effectively communicate disaster preparedness and risk messages.

6. **End users:** The direct end users of this project are coastal residents in New England and Florida. However, to ensure the continued use of this research in practice, it will also target local, state, and Federal emergency managers, and coastal planners, who can help us identify ways to incorporate and/or adapt the research findings to their communication programs. We have reached out to the following individuals and received several commitments to engage in our end-user team:

**National** – (1) FEMA's Individual & Community Preparedness Program;

(2) NOAA's Office for Coastal Management; Chad Berginnis, ASFPM Executive Director; Federal Alliance for Safe Homes).

We organized a meeting in Washington with her team and other stakeholders from NOAA, the National Weather Service, and our team, with the PI's presenting and other team members on teleconference. This half day meeting covered considerable ground including agreements that our team would be available to consult at no cost with the FEMA team and others. We also discussed an additional project targeting preparedness with high school teens serving as change agents guided by our Computer-Tailored Interventions and text message adaptation for teens and delivered in schools and homes. This proposal serves to support a way to disseminate our research via schools. Since that meeting, we have submitted a grant proposal for state funding aimed at reducing costly effects of coastal storms. As part of this project we received commitment from Westerly, RI's school department and the Red Cross of RI who has been interested in such a school-based program for possible national dissemination. Since the meeting, we also collaborate with the FEMA team on their National Household Survey and consulted on measures and analyses in order to compare results across projects.

**Regional** - Federal Federal Coordinating Officer and Disaster Recovery Manager for FEMA Region 1

**Rhode Island** – Jessica Stimson RI Emergency Management (to be confirmed); Igor Runge of the Rhode Island Floodplain Mitigation Association Board of Directors (Chapter of the ASFPM); Elizabeth Stone RI Department of Environmental Management and the RI Executive Climate Change Coordinating Council.

7. **Explanation of Changes:** No Changes
  
8. **Unanticipated Problems:** We have not experienced any unanticipated problems or challenges since the start of the project.
  
9. **Project Outcomes:** Previous research across a range of risk behaviors has identified four effects or drivers that predict successful behavior change at long-term follow-up. The first is the stage effect that generates the hypothesis that at-risk individuals who are in the preparation stage at baseline will have greater success in adapting preparedness behaviors than those in the contemplation stage who will have greater success than those in the Precontemplation stage. The effort effect generates the hypothesis that at-risk individuals making the best efforts at baseline (e.g., endorsing that they have more pros of changing and fewer cons of changing) will have higher percentages adopting preparedness behaviors than those with poorer efforts (endorsing a high number of cons of changing and few pros of changing). The severity effect generates the prediction that those who experience the more severe effects from storms (e.g., injuries, cost, and disruption) over the course of the project are most likely to take action and maintain a higher level of preparedness over time. Further, the team hypothesizes that the effects will continue to be seen at later time

points with changes in the outcome measures increasing over time from the 12 to 24 month time points. We will also compare outcomes by demographic groups with special emphasis on comparing the 500 participants from the New England region to the 500 from Florida's coastal communities. The team would also seek to benchmark annual rates of increases in preparedness against FEMA surveys of increases in preparedness in coastal populations. The team hypothesizes that there will be increased action success rates (taking action by making changes) across five stages of change based on feedback and length of intervention. The major outcome metric will be comparable to that used in more than 25 population trials – the percentage who progress from “not prepared” to “prepared” for disasters. A revised Internet-based CTI together with ongoing coaching through individualized text messages to 1000 participants is expected to increase the efficacy of storm preparedness —the key behavior targeted. The project will assess participants every 12 months so the team can dynamically tailor the messages to their stage.

We expect an evidence based CTI and texting program that is highly portable and could be delivered by end-users like FEMA and the Red Cross. Technically our University will own Intellectual Property and will follow national guidelines on how to share the program with the funding agency and others implementation across states, regions, and others for maximum nationally.

**10. Research Activity and Milestone Progress:**

**Research Activities and Milestones: Progress to Date**

<b>Reporting Period 1/1/2016 – 6/30/2016</b>			
<b>Research Activity</b>	<b>Proposed Completion Date</b>	<b>% Complete</b>	<b>Explanation of why activity / milestone was not reached, and when completion is expected</b>
Receive Human Subjects Institutional Review Board approval	1/31/16	100%	
Develop statistical decision rules for text-based CTIs	3/30/16	100%	
Update/customize Internet CTI for each region	6/30/16	100%	Based on discussions with end-users, like FEMA, the Red Cross and Smart Homes and based on our limited budget it was decided that the best customization for now would be bursts of texts that could be communicated at key times like prior to, and after, a severe storm in one of our target areas.

<b>Research Milestone</b>			
None for this period.			

11. Transition Activity and Milestone Progress:

**Transition Activities and Milestones: Progress to Date**

<b>Reporting Period 1/1/2016 – 6/30/2016</b>			
<b>Transition Activity</b>	<b>Proposed Completion Date</b>	<b>% Complete</b>	<b>Explanation of why activity / milestone was not reached, and when completion is expected</b>
Ongoing collaborative conference calls with End-user Team	1/1/2016 – 6/30/2016	100%	
Build capacity of End-user team on TTM/CTI behavior change methods	1/1/2016 – 6/30/2016	100%	
Working with DHS & URI intellectual property offices to facilitate transition prior to making the purchase	1/1/2016 – 6/30/2016	100%	
Engage end users for collaborative input for tailored messages for texting	1/1/2016 – 6/30/2016	100%	
<b>Transition Milestone</b>			
Completed one collaborative conference call with End-user Team	6/30/16	100%	This was one of the collaborative calls with the FEMA team and their Gallop support team with 7 people participating. One key result of this meeting is that both teams modified their measures to make direct comparisons possible from national surveys and other regional sample assessments. We have agreed that our team would collaborate in 2017 on the national survey in order to include behavior change variables that can provide more sensitive measures of preparedness and progress and can be stronger drivers of such change.
Webinar-based presentation with End-user team on behavior change methods	6.30/16	100%	This was a presentation for a RI Task Force charged with protecting coastal properties, including government and private property. About 20 individuals representing about 12 groups participated. A key outcome was our team's commitment to show both our baseline and follow-up assessments

			to help guide the Task Force's work.
Participation of majority of targeted end-users on End-User Team for collaborative input for tailored messages for texting	6/30/16	100%	This was a half-day meeting in Washington with about 20 people participating, including those on the phone. As indicated in Section 6 above there was robust dialog, exchange of ideas, like a future school-based program and commitments to work closely with the FEMA team and other end-users that were there.
Developed plan with DHS and URI intellectual property offices if DHS or any community want to use project's intellectual property	6/30/16	100%	The plan was that DHS as the funding agency could apply our IP with any community it serves.

**12. Interactions with education projects:** Our project team has been involved in several meetings with key stakeholders and partners, the most recent of which was in April when we presented our project to the FEMA team most responsible for the Preparedness in America project. Stakeholders from the National Weather Service, our DHS project officer and others, like Dr. Andrea Paiva and Pam Rubinoff, participated via teleconferencing.

- The URI research team held a meeting with Center PI Gavin Smith in Rhode Island on January 6<sup>th</sup>, 2016 to discuss our project's tasks, and to facilitate potential collaborations across the Center.
- The URI research team initiated planning for summer interns. Lack of adequate funds proved to be a challenge to funding summer interns. We are coordinating with the URI Summer Undergraduate Research Opportunity program, funded by National Science Foundation, to help fund one or more summer interns to collaborate on URI research projects for 2017.
- Project co-PI Dr. Austin Becker was invited to present for the education program "Expanding Coastal Resilience Education" at University of North Carolina. Date to be determined.
- Project co-PI Pamela Rubinoff University presented for a class at the University of North Carolina education program "Expanding Coastal Resilience Education"
- Project PI James Opaluch coordinated with CRC Team led by Dr. Rachel Davidson to facilitate collaborations among the two projects. We are now participating in periodic conference calls. The first joint call was held on Wednesday February 24<sup>th</sup>.
- URI-hosted conference on Monday, June 13, 2016 on coastal storm modeling attended by Dr. Rich Luettich. Following the conference, the URI research team met with Dr. Luettich to discuss issues of mutual interest, and to facilitate collaborations, including collaborations with educational programs.

13. **Publications:** No publications have been submitted in this first 6 month period.

**14. CRC Performance Metrics:**

<b>CRC Performance Metrics</b>			
<b>Metric</b>	<b>Research</b>	<b>Education</b>	<b>Center</b>
Courses/certificates developed, taught, and/or modified		See Table	
Enrollments in Center-supported courses/certificates			
HS-related internships (number)			
Undergraduates provided tuition/fee support (number)			
Undergraduate students provided stipends (number)			
Graduate students provided tuition/fee support (number)	1		
Graduate students provided stipends (number)			
Undergraduates who received HS-related degrees			
Graduate students who received HS-related degrees			
Certificates awarded (number)			
Graduates who obtained HS-related employment			
SUMREX program students hosted (number)			
Lectures/presentations/seminars at Center partners	2		
DHS MSI Summer Research Teams hosted (number)			
Journal articles submitted (number)			
Journal articles published (number)			
Conference presentations made (number)			
Other presentations, interviews, etc. (number)			
Patent applications filed (number)			
Patents awarded (number)			
Trademarks/copyrights filed (number)			
Requests for assistance/advice from DHS agencies	2		
Requests for assistance/advice from other Federal			
Total milestones for reporting period (number)	4		
Accomplished fully (number)	4		
Accomplished partially (number)	4		
Not accomplished (number)			
Product/s delivered to end-user/s (description and	See Table		
External funding received	See Table		
Leveraged support			
Articles on Center-related work published on website			
Coverage in media, blogs (number)			
Social media followers (number)			
Posts to social media accounts (number)			
Events hosted (number)			
Website hits (number)			

Table for Documenting CRC Research Project Product Delivery

Product Name	Product Type	Approx. Delivery	Recipient or Anticipated End
N/A			

Table for Documenting External Funding and Leveraged Support

External Funding			
Title	PI	Total Amount	Source
N/A			
Leveraged Support			
Description			Estimated Annual Value
Returned Indirect Cost <sup>1</sup>			\$4,948
Travel Support			\$500

<sup>1</sup> The University of Rhode Island's Coastal Institute (CI) has generously agreed to return 66% of their share of indirect cost return back to the project. The CI obtains 17% of the indirect cost, so roughly 11.3% of indirect cost is being returned to the project.