

KNIGHT, UMD
DHS COASTAL RESILIENCE CENTER
RESEARCH PROJECT
YEAR 3 PERFORMANCE REPORT
AND
FINAL PROJECT REPORT

Project Title: Development and Testing of a Project Management Curriculum for Emergency Managers

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Other Partners/Institutions:

John Hart Cable, Director, Project Management Program, A. James Clark School of Engineering, University of Maryland. Lead advisor for Project Management curricula and certification.

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Project Start and End Dates: January 1, 2016 – June 30, 2018

Short Project Description (“elevator speech”):

The goal of this educational work plan is to develop and test an educational and training curriculum that prepares professionals to manage and deliver disaster-related project(s), by merging the unique challenges of emergency management with the capabilities and technologies introduced by applying project management processes. By incorporating modern project management organizational processes, technologies, and skills, emergency managers will be able to manage and execute disaster-related projects and meet resilience goals more effectively and efficiently. By building disaster resilient concepts and emergency protocols and goals into project management processes, project managers will be equipped to contribute to a more sustainable and disaster-resilience future.

PROJECT NARRATIVE

1. Introduction and project overview:

Natural Disasters between 2003 and 2012 resulted in estimated global average annual economic losses of \$156.7 billion and average annual deaths of 106,654¹. In 2017, [climate-related disasters](#) alone in the United States caused \$306 billion in damages, the

¹ Guha-Sapir D, Hoyois Ph., Below R. *Annual Disaster Statistical Review 2013: The Numbers and Trends*. Brussels: Center for Research on the Epidemiology of Disaster (CRED): 2014

costliest year on record, according to the National Oceanic and Atmospheric Administration (NOAA). Three major hurricanes – Harvey, Irma and Maria – accounted for a staggering \$265 billion of those losses. They ranked 2nd-, 5th- and 3rd-most costly, respectively, in the 38 years NOAA has recorded billion-dollar disasters (Hurricane Katrina in 2005 was the costliest).

Emergency managers from federal, state and local agencies and/or organizations must manage the billions of dollars expended to prepare and recover from these losses. For instance, the federal disaster appropriations following Hurricane Sandy were approximately \$58 billion² and were dispersed via many programs and agencies with specific regulatory or policy requirements for execution. Disaster relief funds such as these are spent to get communities back on their feet by replacing or rebuilding critical infrastructure, key facilities, businesses and homes. Further, the organized response to a disaster shares all the characteristics and has all the organizational needs of a built project. It is also well understood that building resilience into our built, social and environmental systems prior to an event has recurring benefits to disaster losses. Therefore, resources are often allocated for mitigation following a disaster as well as on “sunny days.”

Managing the influx of funding from many disparate sources and for many purposes and projects related to response, recovery, and mitigation, can be daunting. Additionally, in a disaster or post-disaster environment, to minimize cascading and long-term impacts of a slow recovery, there is often a tension between building back quickly and building back better. Emergency managers are often assigned to lead many of the emergency activities and oversee the execution of large programs in the wake of disaster that are funded through federal and state programs. Also, agencies and organizations (federal, state and local governments, utilities, non-profits, private industry, etc.) with a strong reliance on contract support and expertise, may be responsible for the response and recovery for sector-specific projects or program execution (marine transportation, healthcare, supply chain, utilities, etc.). Therefore, it is imperative, in this often-urgent environment, that project and emergency managers have the right training and educational skills to effectively deliver projects on-time and on-budget while being considerate of the needs of the community and planning for a resilient future.

This education grant was used to explore the gaps and develop and test an educational and training curriculum that prepares professionals to manage and deliver disaster-related project(s), by merging the unique challenges of emergency management with the capabilities and technologies introduced by applying project management processes. By incorporating modern project management organizational processes, technologies, and skills, emergency managers will be able to manage and execute disaster-related projects and meet resilience goals more effectively and efficiently. By building disaster resilient concepts and emergency protocols and goals into project management processes, project managers will be equipped to contribute to a more sustainable and disaster-resilience future.

² <https://www.congress.gov/113/plaws/publ2/PLAW-113publ2.pdf>

2. The proposed research comprises three distinct phases:
 - 1) Understanding the requirements and needs of practitioners and developing a disaster-focused curriculum to be offered within the UMD Project Management program or Civil Engineering graduate program,
 - 2) Developing training and short course plans of instruction that align with existing certification programs, and
 - 3) Executing initial course offerings and/or training programs for delivering the developed approaches and technologies to practitioners.

3. Project History:

Year 1 – January 2016 -June 2016

Building on the experiences of the principle investigator and her established connection to both emergency managers and project managers, there was a dialogue throughout the project between her and the potential end-users. To codify the needs and establish requirements, a literature review and interviews and discussions with more than 15 experienced emergency and project managers within and external to DHS were conducted the first year. The conclusions were that there was value in bridging the gaps between these two sets of practitioners and training would be needed to improve disaster performance.

Another initial objective of the grant was to assure that any training developed through the grant met requirements of existing professional certification programs, such as the Certified Emergency Manager, offered through the International Association of Emergency Managers and the Project Management Professional, offered by the Project Management Institute. In discussion with both organizations, it was clear that obtaining official certification could happen only after permanently establishing the training. Based on discussions, however, the concepts of both types of training appeared to fit within the requirements of those programs, respectively, and could add value to the professional programs.

In June 2016, the PI attended the Emergency Manager Higher Education Symposium at the Emergency Management Institute in Emmitsburg, MD. Information and contacts made through that activity helped support the concepts that would be moved forward in the development of both a college level course and the development of Plans of Instruction suitable for training at EMI.

Year 2, July 2016-June 2017

A major activity in late 2016 was the development of a graduate level course in the Civil and Environmental Engineering Department at the University of Maryland. Working

with the Director of the Project Management Center in CEE, the course was approved as a graduate level engineering course to offer in the Spring 2017. The title would be *Principles of Disaster Management*.

In spring of 2017, the Principles of Disaster Management was offered and 11 graduate students enrolled. The course covered five key learning areas:

- Disaster-related policy and programs
- Emergency management protocols
- Phases of Disaster
- The Nexus of Emergency and Project Management
- Community Resilience

Through experiential learning, the students became immersed in the complexity and importance of disaster management. Using the lectures, socratic method of shared learning, and the rich experiences of guest lectures, the students gained knowledge and skills about disaster. They used these in a team project, a tabletop exercise and in a final individual research paper. For each assignment students were required to use both written and oral communication skills.

In June of 2017, the PI participated in the annual Hazard Mitigation Stakeholder Workshop, where she engaged approximately 50 students in a discussion and informal questionnaire about their own interest in project management training and what college courses might appropriate for a resilience engineering curriculum. Participation and feedback from this event informed ideas for project management training, identified critical tracks for higher education curriculum and helped to identify a sponsor within FEMA to further expand on these concepts.

Also in year 2, three new Plans of Instruction were developed in the format and with the requirements established by EMI to introduce new courses. These draft plans of instruction were to be the framework for establishing training that would provide participants with the project management knowledge and skills required to effectively facilitate and manage a disaster response. The three draft POIs were: Project Management for Emergency Managers in Response, Project Management for Emergency Managers in Preparedness and Project Management for Emergency Mangers in Recovery. Existing courses were already in place at EMI for mitigation that had elements of project management; E0214 Hazard Mitigation Assistance: Project Implementation and Closeout and E0212 Hazard Mitigation Assistance: Developing Quality Subapplication Elements.

Year 3 July 2017 – June 2018.

The last year of the grant unfolded into two major accomplishments; the establishment of a resilience engineering set of courses and the delivery of a project management workshop to approximately 70 hazard mitigation disaster employees.

Concurrent with the execution of this grant, the University of Maryland hired three new faculty for the explicit purpose of advancing research and education in disaster resilience. The emphasis on resilience at UMD, made the grant even more important, as the results to date helped UMD jump-start a set of graduate level offerings in resilience engineering. A two-year program was developed in the spring of 2018 that was informed by the requirements and findings to date on curriculum gaps, as well as the information gathered through the June 2017 Stakeholder Workshop. The initial offerings can be found at this web site. <https://cdr.umd.edu/academics> . Furthermore, the initial Principles of Disaster Management Course will be a core class offered every other year as a certification in resilient engineering is established in the engineering school at UMD.

Through the relationship established from the previous year's Stakeholder Workshop and following the major disasters that occurred in the fall of 2017, the PI collaborated with the Deputy Assistant Administrator of FEMA-FIMA's Risk Reduction Directorate and the Training Administrator for the Insurance and Mitigation Readiness Division, to build a half-day workshop for hazard mitigation mid-level disaster managers. The workshop, *A Project Management Framework for Hazard Mitigation Disaster Functions*, was designed to introduce a framework for project management for HM Disaster Cadre mid-level managers. The training identified current challenges and opportunities among individual jobs and processes and used a project management framework to identify priority areas to improve future delivery and performance.

The workshop was well-received by the 70 attendees and the FEMA sponsors. A follow-on briefing in July 2018, by the PI to the FEMA sponsor explored ideas to continue building project management into the activities of disaster employees. Several ideas emerged in the discussion including 1) offering a regular training at EMI capitalizing on the Plans of Instruction already developed, 2) developing a specialized training for specific programs such as grants, and 3) building a strategic guidance to incorporate new legislative requirements for implementing project management into federal agencies.

4. Results:

The results are described above and reiterated here.

A resilience engineering curriculum was initiated and is now being established with the original offering of Principles of Disaster Management becoming a regular biennial offering.

FEMA is interested in building project management into their practices and training. The exact approach has not been determined, but the seeds have been planted and some initial concepts explored.

5. Students:

The graduate level course in engineering had five women and 6 men at the masters and PhD level from diverse geographic origins: Chile, China, Iran, Puerto Rico, and the US.

The grant helped to support 1 graduate student part-time including tuition.

The training workshop at EMI included approximately 70 disaster employees with varying years of experience. The attendees were gender, age and racially diverse.

6. Institutionalization:

- a. What will be the sources of ongoing support?

I do not have further grant funds to continue pursuit of the project management training for emergency managers. I will be supported by UMD to teach the Principles of Disaster Management course.

- b. Where in your institution will your project be maintained?

The objective of the grant was to develop and test a training course and a college level course. Both were accomplished and therefore, nothing to maintain. However, the Civil and Environmental Engineering Department will continue to advance the resilience engineering curriculum and has institutionalized the graduate course developed under the grant as part of its regular curriculum.

- c. Who will be involved in sustaining your project? The project is over, but the PI is willing to continue discussions with sponsors such as FEMA. The existing faculty in CEE and the affiliates for the Center for Disaster Resilience will continue pursuit of disaster management.

7. Interactions with research projects:

During the course of the project, the PI established informative and collaborative exchanges with LSU and UNC. The PI visited the LSU campus for discussions about their disaster science program and a LSU faculty visited the UMD Center for Disaster Resilience to share about establishment of their coastal sustainability institute. Additionally, the PI served on a review committee for another CRC project at UNC on Resilience education.

8. Publications:

The PI has written a draft paper and is looking for the appropriate magazine or journal for submission. It was not submitted prior to the end of the project. Non-published, but available upon request, are the Needs Survey and the draft Plans of Instruction.

9. Lessons Learned: Assume you're starting your project again under the same conditions that existed at its beginning in Year 1. What would you do the same and why?

My hypothesis on the need to bridge Project Management and Emergency Management would be the same. It is clear it is needed. What changes would you make and why?

I would drop the professional certification objective. It appears that has its own set of requirements that will organically include new courses as appropriate.

10. Tables:

Table 1: Documenting CRC Education Project Courses and Enrollments

Courses Developed and Taught at U of MD under Project				
<u>Course</u>		<u>Developed (D), Revised (R), and/or Taught (T), by Project Year</u>		
<u>Number</u>	<u>Title</u>	<u>1</u>	<u>2</u>	<u>3</u>
CE688	Principles of Disaster Management		D,T	R
Offering: Elective (E), Concentration (C), Minor (M)		-	E	N/A
Enrollment		-	11	N/A
N/A	A Project management framework for hazard mitigation disaster functions			D,T
Offering: Elective (E), Concentration (C), Minor (M)		-		N/A
Enrollment		-		70

Table 2: Documenting External Funding and Leveraged Support

<u>2A: External Funding</u>			
<u>Title</u>	<u>PI</u>	<u>Total Amount</u>	<u>Source</u>
<u>2B: Leveraged Support</u>			
<u>Description</u>			<u>Estimated Annual Value</u>
Free office space at UMD			\$8,000
Portion of salary covered under CEE funds			\$12,000

Table 3: Performance Metrics:**KNIGHT METRICS TABLE**

<u>Metric</u>	<u>Year 1</u> (1/1/16 – 6/30/16)	<u>Year 2</u> (7/1/16 – 6/30/17)	<u>Year 3</u> (7/1/17 6/30/18)
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 (number)			
Graduate students who received HS-related degrees (number)			
Certificates awarded (number)			
Graduates who obtained HS-related employment (number)			
Lectures/presentations/seminars at Center partners (number)			
DHS MSI Summer Research Teams hosted (number)			
Journal articles submitted (number)			
Journal articles published (number)			
Conference presentations made (number)			
Other presentations, interviews, etc. (number)	20	2	2
Trademarks/copyrights filed (number)			
Requests for assistance/advice from DHS agencies (number)			2
Requests for assistance/advice from other agencies or governments			
Total milestones for reporting period (number)	2	2	4
Accomplished fully (number)	1	2	2
Accomplished partially (number)	1		1
Not accomplished (number)			1

11. Year 3 Education Activity and Milestone Achievement:

Education Activities and Milestones: Final Status as of 2018

Reporting Period 7/1/17 – 6/30/18			
Education Milestones	Proposed Completion Date	% Complete	Explanation of why activity/milestone was not reached
Top Priority Course Curriculum Offerings Descriptions: completion of 3 introductory course prospectus and targeted scheduling for initial delivery in year 2 and/or year 3 (depending upon university capacity): Course Prospectus and University Approval	02/28/2018	100	Actual completion date was 05/20/2018. A new resilience engineering curriculum was developed and prospectus completed and approved by department
Offer up to 2 initial training courses either on-line or in collaboration with partners such as FEMA, EMI or CDP	05/30/2018	100	One training workshop for FEMA was developed and executed May 15
Begin Certification Implementation Strategy with IAEM and PMI	07/31/2017	0	This activity was deemed not to be appropriate for a trial course or offering.
Education Activities: Note Activities were headers for milestones in my plan and did not have specific dates.			

12. Year 3 Transition Activity and Milestone Achievement:

Transition Activities and Milestones: Final Status as of 2018

Reporting Period 7/1/2017 – 6/30/2018			
Transition Milestones	Proposed Completion Date	% Complete	Explanation of why activity/milestone was not reached
Meetings and correspondence with PMI and IAEM, NEMA and others to develop process and implementation strategy (throughout project)	03/31/2018	95	Correspondence with appropriate end users and collaborators was maintained throughout the project. The actual connections were with some different agencies and organizations than listed in workplan.
Provide Plans of Instructions to interested institutions including FEMA, EMI and CDP	05/30/2018	95	The POIs were shared with FEMA. It is better for them to drive the implementation with EMI and others as appropriate.
Share course materials (POI and UMD Course syllabus) with IAEM, PMI, EMI, CDP, UMD and/or others for consideration and sharing with their members	03/30/2018	95	All of the course prospectus developed for UMD's resilience engineering courses have been widely disseminated to organizations including FEMA, USACE, and other universities as well as posted to internet. This was done after approval of those courses in June 2018. The POIs were given to FEMA are available if others want them.
Transition Activities: Note Activities were headers for milestones in my plan and did not have specific dates.			