# Teaching Climate and Hazard Resiliency in a Junior High Using Local Data and Emergency Management

Danny E. Mattox, University of Oklahoma, Norman, OK; and M. Mattox, A. D. Melvin, M. A. Shafer, R. E. Riley, L. Kos, A. Petersen, and G. Longan

## BACKGROUND

As part of a National Oceanic and Atmospheric Administration (NOAA) funded project looking at extreme weather events and climate change, Adaptation International (AI) and the Southern Climate Impacts Planning Program (SCIPP) worked with four communities in the southcentral United States to identify critical weather thresholds. In each community, workshops were held to explain the thresholds and discuss how communities can better prepare for future extreme weather events. To increase dissemination of the message, the emergency manager for the City of Miami, OK worked with the school system to determine an appropriate way for the weather and climate data to be presented to a younger audience. As a result of her efforts, AI and SCIPP included a school component to the project so that children would be informed and share the information with their parents and others in the community. SCIPP and AI partnered with the City of Miami Emergency Management, the Oklahoma Climatological Survey (OCS), and the K-20 Center at the University of Oklahoma (OU) to develop a weather and climate hazards lesson for 8th graders in Miami.

## ABSTRACT

Each year, Oklahoma experiences a multitude of weather hazards, from tornadoes and extreme heat to ice, drought, and flooding. The public is keenly aware of the threats to life and property as a result of extreme weather events, but most do not know what steps should be taken to mitigate the damages in their community. Through a partnership with weather, climate, emergency management, and educational organizations, 175 eighth graders at Will Rogers Middle School in Miami, OK experienced an interactive, hands-on 5E science lesson covering hazards specific to their community and how to lessen detrimental impacts. The lesson was written specifically for this project and was aligned with the Next Generation Science Standards and the Oklahoma Academic Standards for Science. It focused on weather/climate data analysis, identifying hazards, and severe weather mitigation. Particular attention was given to critical thresholds where the weather goes from being a nuisance to a problem, and how emergency managers prepare for hazardous weather events.

## 5E LESSON


Image courtesy of Miami News Record

### 1 ENGAGE

**Four corners**: Four pictures of hazards were placed in each corner of the classroom. Students were asked to go to the hazard they felt was the most threatening to their community. As a group, they discussed why they thought that was the case, shared their thoughts with the class, and then had the opportunity to change corners based on what their peers said.

### 2 EXPLORE

Students identified thresholds by visiting two hands-on activity stations. One station demonstrated temperature thresholds using coconut oil structures, a heat lamp, and a thermometer. A second station demonstrated flooding thresholds using water, beakers, and farm dioramas.

### 3 EXPLAIN

This is the lecture portion of the lesson where the instructors related their activities to real-world examples. The lecture included data, key terms, clicker questions and discussion.

### 4 ELABORATE

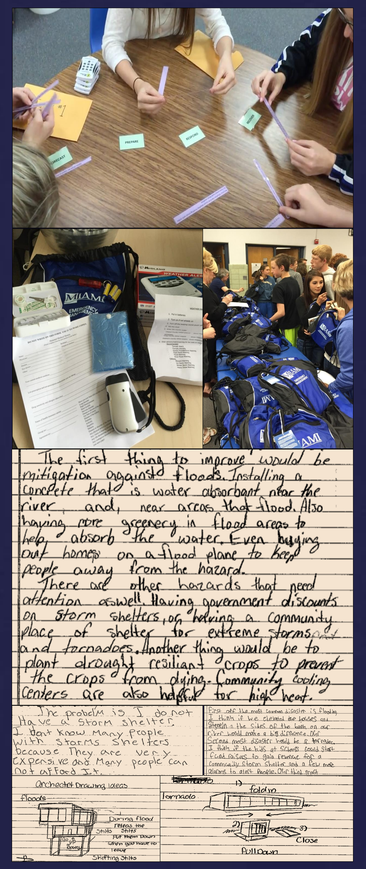
**Card Sort**: The students took the role of Emergency Manager and were given a real-life hazard scenario their community experienced in the past. They created a timeline of events and identified steps that could be taken in an emergency situation. The community's Emergency Manager then discussed with the students the actual timeline of events and community impacts that were experienced during that event.

*Card Sort Video*

**Weather Radios**: Weather radios and safety go-bags were distributed to the students and the purpose of each item was discussed.

### 5 EVALUATE

Students wrote a climate resiliency plan in the form of a letter to the City Council and Emergency Managers of their community.




## RESULTS

A 10 question pre-test and post-test were administered to the students. Overall, there was a 30% increase in test scores, with each question showing knowledge gains. Many of the student letters to city council were very insightful and showed they were engaged and found value in what they were learning. A Joplin TV station sent a reporter to the school, resulting in news coverage of the project. Additionally, an article was written in the local paper about the lesson and project. The teachers, school administration, and the city Emergency Manager would like this lesson to be taught again during the next school year.

## CONTACT INFORMATION

**E-mail:** dematttox@ou.edu | sascha@adaptationinternational.com
**Address:** 3100 Monitor Ave., Suite 200 Norman, OK 73072

Joplin, MO TV station media coverage:

Miami News Record media coverage:

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