

BUILDING HURRICANE AWARENESS IN FLORIDA

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1. INTRODUCTION

For 15 years, EXPLORES! has been providing a public portal of information for Florida teachers related to weather hazards, including those associated with hurricanes. This work began with an online bulletin board system with the state Department of Education email system known as FIRN, and beginning in 1995, expanded to the World Wide Web. Our site continues to provide access to much information of value to teachers about hurricane threats and vulnerabilities. Curriculum materials have also been developed that tie in with use of satellite imagery as part of educational advancements in geoscience visualization.

For the past 7 years, Florida has also created a newspaper in association with Hazardous Weather Awareness Week that also focuses on hurricane hazards (among others); unfortunately this material comes out to schools in February, when HWAW occurs. We seek to provide suggestions here for how to provide a more rich experience for teachers in coastal communities that can be applied year-round, and also provides teachers with important information related to new types of forecast products.

Many teachers are involved in hurricane awareness through the use of their schools as emergency shelters, a high degree of weather awareness and participation in earth science projects, and volunteer work with non-profit agencies and local emergency management offices. But they sometimes lack critical information related to real risks associated with weather hazards, including hurricanes. This knowledge has come to light particularly after 8 hurricanes affected Florida in a 16 month period from 2004-2005.

Coastal counties continue to have their populations grow and property values (and insurance rates) soar. And students being tested on practical earth science knowledge for the first time on statewide assessment tests are failing to achieve at a high level, and that is impacting their overall ability to advance. This poor performance also makes a difference in assessments of schools and teachers, but most importantly provides an example of how critical thinking in an emergency situation can dramatically alter preparations and actions, potentially providing lifesaving consequences.

Before we review the programs that have been in place in the state, however, it is instructive to note that nothing prepares the public more than exposure to actual disasters, whether anticipated or perceived. Much of this response can be assessed in terms of BA (Before Andrew) or AA (After Andrew), 1992. The year of 1998 found Florida with its worse tornado outbreak on record (in terms of fatalities), worse wildfire record (including the evacuation of an entire county at one point), and several serious hurricane threats. In 1999, the entire Atlantic coast seemingly evacuated as Hurricane Floyd approached, anticipating another Andrew-like event only on a much larger (geographically) scale.

2004 and 2005 found the state inundated with major storm after major storm, and other lesser storms also produced major impacts. The debate increased in intensity, too, as various explanations for the increase (real? – define your meaning please!) in hurricane activity were put forth. Our desire here is to provide the means for the general public to assess their own personal safety and risk and to begin to understand the limits of government services.

2. EXPLORES!

The EXPLORES! program, begun by Ruscher and Kloesel in 1992 as an educational outreach program for K-12 teachers in Florida (Ruscher et al. 1993; Lusher and Ruscher 2002) quickly became a means to train teachers in recognizing various aspects of tropical cyclone life cycles and their importance in Florida; our first teacher workshop occurred only 10 days before Andrew made landfall in south Florida. Started as a means to deliver direct readout weather satellite imagery to schools, it ultimately led to the development of curricula on the use of geoscience imagery for science teachers (Ruscher-Rogers et al. 2005). Our curricula includes several modules that have been developed to aid teachers in the understanding of tropical cyclone life cycles and has also informed new laboratory material taught at FSU in the non-science majors introductory laboratory course (Ruscher and Stephens 2005).

Our main gateway information portal on the World Wide Web (WWW) is found at <http://www.met.fsu.edu/explores/>; we continue to provide support for teachers who are operating their weather satellite receiving stations, and we also will revamp our curricula once the new state standards are approved in spring 2008 (see §5).

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3. STATEWIDE HAZARDOUS WEATHER AWARENESS WEEK

The Florida Division of Emergency Management built a large new facility in Tallahassee soon after Hurricane Andrew, and it became the model for many other states to emulate. Its mission includes providing for the needs of the citizens of Florida in an organized manner to assist localities with centralized needs where it makes sense for the state to do so. It also participates in mutual-aid activities, such as assisting nearby states in disasters (e.g., Hurricane Katrina and its effects in Mississippi and Louisiana).

A major focus of its preparation work is in training of local and county emergency managers and first responders, and in preparation of public materials for dissemination during Florida's Hazardous Weather Awareness Week (mid-February). Each year a newspaper is developed and published with assistance of the *Newspapers in Education* project. Personnel from state agencies, NOAA, FEMA and the academic community are all involved in the development of print and online materials. Resources are available on the WWW at the following sites and will be reviewed at the presentation.

Florida Division of Emergency Management:

<http://www.floridadisaster.org/>

2007 *Lightning Ledger* – Hazardous Weather Awareness Week site:

<http://www.floridadisaster.org/kids/index2.htm>

We hope to be able to secure funding to produce an independent assessment of these materials and their value to society, and to expand their use in other communities and settings, including an expansion of materials in Spanish and Creole.

4. REALM

The REALM project was designed to address gender inequity and inequality in schools by facilitating access to automated weather station data and information in the GLOBE (<http://www.weather.gov/>) program for Miami-Dade County. It had a follow-on component that was funded by a state DCA-funded grant program to 4-H/Extension offices in north Florida (REALM²); its goals are described in Ruscher (2005). These programs incorporated important contributions related to natural disaster preparations sponsored by the American Red Cross, including the *Masters of Disaster* program (American Red Cross 2007).

5. NEW STATE EDUCATION STANDARDS

One of the authors (Ruscher) has been involved as a Framer of the new statewide science standards for Florida, which have received almost as much news attention as those in Texas, Georgia, and Kansas in recent months. New thrusts in weather and climate, the importance of the oceans, coastal ecosystems and water management, and emergency preparedness and mitigation are

included in the standards, which means that they will be testable, which means that they (theoretically) will lead to greater public understanding. The lessons learned in Oklahoma related to tornado fatalities (Brooks and Doswell 2002) resound here, but unfortunately, in Florida we have not yet achieved the same level of understanding, apparently, as many youths continue to fall victim to natural disasters (not just in hurricanes, but also to lightning, flood events, and rip currents).

The new state standards are set to be adopted by the Florida Board of Education in February 2008 and will be reviewed for our paper (they are set to be released in final draft form only on 18 January 2008, prior to submission of this paper). It is hoped that by incorporating the value and implementation of disaster planning into state-mandated curriculum materials, the public will be better prepared to respond to actions requested by local officials.

6. CHALLENGES

Many across the nation are suffering from information overload at present in association with the 2008 U. S. Presidential election, and hurricane season will be not much different this fall, to be sure. With the addition of new products by NOAA/NHC (reviewed elsewhere at this meeting), new publics offered by the private sector, and potential for a busy season (who knows?), the public on the one hand clamors for good information and accurate forecasts, but on the other hand may be sadly unable to deal competently with the information. Local, state, and federal government agencies should partner with appropriate private sector entities, broadcast partners, and schools and University programs to develop messages and materials that can be accessible to K-12 students as well as families and businesses.

The Governor's Hurricane Conference each spring convenes to try to address this approach, but we suggest that a deeper commitment to public outreach and an assessment of its effectiveness needs to be made. It should also be addressed nationally for coastal communities from Texas to Maine, Hawaii, Puerto Rico, U. S. Virgin Islands, and Pacific Ocean territories. We have started developing this partnership in Florida but we have a long way to go and look forward to learning more from other coastal states and territories in this process.

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