

The Evolution of Earth System Science – FSU's Tale Paul Ruscher • Alejandro Gallard • Ashley Kaepplinger Department of Earth, Ocean and Atmospheric Science • School of Teacher Education

Abstract

In 2010, FSU joined the Earth System Science Education Alliance (ESSEA). This follows a period of over 20 years providing teacher inservice in broad areas of geoscience across the state of Florida and throughout the southeastern US. ESSEA modules provide a perfect opportunity to broaden our goals of reaching out to a sometimes poorly-prepared community of physical and Earth science teachers across the state and the Gulf region.

This presentation will focus on the prior development of NSF-sponsored courses at FSU for inservice and preservice teachers, and how they are being transformed by using the structured online framework that ESSEA provides, in an effort to engage participants in inquiry-based problem-based learning. This transformation has been occurring in spite of substantial institutional upheavals; yet we manage to weather the storm.

We will address how interdisciplinary teaching and research communities have been affected by such external forces, as well - do the bonds strengthen in such times, or weaken?

Florida's Old Science Standards

DEvolution was not present in the standards until 2008 rewrite was completed

- **□**Earth science barely covered, and rarely taught as a key high school science class
- □Florida students took biology, chemistry, environmental science or other bio elective, most commonly
- □No geometry in the math standards required until the 2007 rewrite was completed
- Many students had problems with spatial analysis skills, perhaps owing to lack of geometry, geography, physics, Earth science
- **Effective Partnership between MET & SciEd explain**

Florida's New Science Standards and Other Realities

- \Box Paul blurb evolution \rightarrow life, physical, Earth standards for the first time
- **Climate change becomes the second most controversial aspect**
- Theory becomes scientific theory of _____
- **Acceptance in 2008; watered down by legislature 2008–2011**
- □Budget pressures on K-12 education slow down related reforms (increased professional development)
- □New teachers lose protection of long-term contracts (not really tenure) in 2011 and are further rights are eroded as well

Florida K-12 Science Rankings

According to national survey, Florida is ranked 50th out of 51 states (and DC) according to ACT performance

In the words of Florida Department of Education Bureau Chief Todd Clark, Florida is "pretty much last in the nation for science."

URBAN SYSTEMIC PROGRAM IN SCIENCE, MATHEMATICS, AND **TECHNOLOGY EDUCATION**



GLOBE Science PI team – 1997–2001 GLOBE School – 1999–present GLOBE Partnership Director – 2000–present

Many workshops and in-service classes, but demand for Earth Science classes *decreases* in spite of demonstrated national need, student and public interest, and critical shortages.



2008 – Disaster Strikes!

- education
- or reorganization
- scientific staff
- Union grievance restores tenure to laid off faculty (who accept it)
- 3rd science. De-emphasis on Physics and Earth Science
- Letter to editor in the Tallahassee Democrat from Rocky Hanna, a high school State University and have done fairly well in life."

Let's Get to Work! – Joined ESSEA in 2010

The Earth System Science Education Alliance (ESSEA) is a program for teachers to help them to incorporate **Earth System Science** into their classrooms Inquiry based learning

- **Provides teachers:**
 - Content knowledge
 - Resources/Tools for the classroom
- □ FSU's Implementation
- Teaching Earth and Space Science
- Geoscience Visualization
- > Current Topics in Earth Science
- Local K-12 Classroom Support

From GLOBE to A Perfect Storm

Economic disaster in Florida creates an aggregate of 10% budget cuts in higher

□ Science Education, Mathematics Education, Geological Science, Oceanography, Meteorology (among others) programs are all affected by termination, suspension,

• Numerous faculty and staff layoffs, including tenured faculty, newly hired assistant professors, endowed professors, National Academy fellows, and many support

□ Meanwhile, in a K-12 school near you, standardized high school science test (FCAT) was an unmitigated disaster, and was replaced with an EOC in Biology I only! Student graduation is predicated only on 3 units in science (labs unspecified) requiring Biology I, Chemistry or Physics (2012 being slated for elimination), and a

principal: "Did you take and pass Algebra II and either physics or chemistry in order to earn your diploma? Honestly, I didn't. And believe it or not, I still ended up with a master's degree from Florida