

The Florida GLOBE Partnership Program

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As the international GLOBE program closes out its first decade, much of the responsibility for teacher training in the United States now rests with the state partners. In this paper, we describe how the Florida partnership has evolved, and we demonstrate our various successful training models for developing new GLOBE schools in Florida, and for retraining prior-trained teachers who never collected GLOBE data before.

The Florida GLOBE partnership at Florida State University (FSU) evolved out of a Science PI effort that led to the development of new GLOBE Atmosphere/Climate protocols in relative humidity and barometric pressure, and revised protocols for measuring cloud cover and cloud type. The team at FSU led the science investigations for 1998-2002 in these areas, and the new protocols became established in 2001. Field-testing of the new protocols, particularly for the relative humidity instruments (sling psychrometer, digital hygrometer, dial hygrometer) led to teacher training in Florida, tapping into a pool of teachers who had worked with our team before, in the EXPLORES! project, and also Florida GLOBE teachers were willing to participate. This led to us doing some teacher training, and we sensed an eagerness among Florida teachers to work with GLOBE protocols, given the strong standards-based and test-based ideals, but also given the opportunity to do inquiry-based science, with which GLOBE is so involved. Some of this work is found in the newest edition of the *GLOBE Teacher's Guide* (GLOBE 2003).

Our first training was involved in the development of a preservice course for science and elementary education majors at FSU, a course entitled "Teaching Earth and Space Science." That course has been taught each spring for the last three years, and all of the labs in the course come from the GLOBE protocols in the areas of atmosphere/climate, soils, hydrology, land cover/biology (including GIS imagery applications of Landsat photos), phenology, and GPS-based science. Students who take the course are working towards their BS or MS and will become classroom teachers. Three of our students are entering the K-12 workforce this fall, fully trained in GLOBE. We will describe the syllabus and protocols covered in this course, which also utilizes an online learning system called Blackboard.

Our next training model involves statewide teacher planning coordination and other technology conferences. Each year in October, state science teachers gather for a few days at various locations around the state. The Florida Association of Science Teachers meetings form an excellent opportunity for teacher training, and we have now conducted full GLOBE workshops for teachers at the Cocoa Beach and Sarasota meetings in 2001 and 2002, respectively. The 2003 meeting in Jacksonville will feature both a full blown GLOBE workshop sandwiched around the FAST meetings, as well as a one-day refresher workshop for anyone previously trained in GLOBE who is interested in learning about new protocols (for example, relative humidity, phenology, hummingbirds, macroinvertebrates, contrails). All protocols are correlated to national and state science teaching standards.

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Another model for training is to incorporate GLOBE training into other outreach and professional development programs. Our REALM project (which built a Miami/Dade County Mesonet) includes automated weather stations that have a new synergistic GLOBE protocol, allowing all REALM schools to share their data with GLOBE as well as with NOAA/NWS offices, in real-time to near-real-time. Our first summer training program in this three-year, NSF-funded project included a full GLOBE basic workshop as well as training in advanced protocols. GLOBE will also be featured as part of the next phase of our nationwide EXPLORES! project, which will include NOAA, NASA, and USGS satellites and their imagery in support of GLOBE science protocols.

The final model for training is a series of one day workshops strung throughout the academic year. This plan involved holding 1 or 1.5 day workshops at various locations in central Florida, taking advantage of several statewide meetings all located near Orlando. This plan was the least successful of all, but has recently become modified, thanks to the new NASA Explorer Schools program; at the initial teacher training workshop at Kennedy Space Center in July 2003, 20 teachers at 5 Explorer schools have become GLOBE trained, as they learned about their Atmosphere site definition and cloud protocols, and received an overview of the other GLOBE protocols. Each school will receive a GLOBE ID that will enable them to start taking GLOBE observations right away, hopefully facilitating their use of the protocols, and providing impetus for further training later. We anticipate offering other GLOBE "short-courses" which are highly protocol-specific, thanks to the new training model that GLOBE has adopted, allowing teachers to be considered GLOBE certified before they have completed an entire basic or advanced workshop.

Because of the implementation of high-stakes testing in Florida, and the state response to the *No Child Left Behind Act*, things are changing rapidly in Florida. Statewide science testing began in 2003, and will continue into the future, with substantial questioning based on inquiry, which is one of the hallmarks of the GLOBE program. We also will continue working with the State Department of Education to infuse GLOBE into state science curriculum as an alternative to text-based teaching.

The entire GLOBE program management structure is changing dramatically in 2003, with management now in transition from NASA to the UCAR/Colorado State University management team. This is an exciting and challenging time for GLOBE, and the Florida team remains committed to working with teachers in Florida and southwest Georgia to foster further use of GLOBE protocols and collection and dissemination of GLOBE data for scientific use.

Information on the GLOBE program, including full access to the *GLOBE Teacher's Guide* and all data submitted by students to GLOBE, is available via the Internet at <http://www.globe.gov/>.