Teachers Breakout Session Notes

Below are some of the examples and discussions that took place during the Teacher Breakout Session at the 2013 Annual Meeting.

Implementation

Getting Started

Many teachers mentioned that they started through some sort of training session, either by being asked to attend, or by becoming enticed by the promise of free equipment and/or continuing educational units (CEUs). Several teachers mentioned getting started through a field campaign (e.g., Surface Temperature field campaign), others became interested when they saw student excitement at a GLOBE Games event.

Selecting Protocols

Most teachers recommended starting with one or a few protocols that are easy and have direct connections to what students are studying. Once students are experts with one or two protocols teachers can then propose adding more to allow different students (or student groups) to branch out to other protocols that they find interesting. Local environmental relevance is also key; which protocols make sense for our situation (if a water site is hard to access, then don't try to force hydrology into the mix).

Facilitating Data Entry

Veteran teachers have found that they spend a lot of time during planning periods or lunch periods, even after school, facilitating a group of students in data collection or data entry. Data entry, especially of large amounts of data, can become sources of "extra credit" for students. Teachers must realize that there is a time investment involved with GLOBE but that there is also a reward later on.

Fitting GLOBE into the daily/weekly routine

Some teachers mentioned having a GLOBE afterschool club that gets together outside of regular class time for data collection and entry; others felt they wanted the activities to be an in-class event. GLOBE at Night was also mentioned as a great way to engage parents.

There was mention that an entire class could collect the data, and the smaller group of students (e.g., GLOBE club) could enter the data into the website; this could reduce error as there are certain students solely responsible for entry.

Incorporating Student Research/Projects and Engaging the Local Community

Having students present their research in class is a great way for them to get practice presenting in public, as well as see how others might present material differently. Students can present their research to the school board or at community events as well as enter their GLOBE research in local science fairs. GLEs, while not often, are a great way to get students excited about research. Parents were often more interested in

attending school events (back-to-school events, science fairs, etc) when their children were excited about science. This happened more often in connection to GLOBE activities.

Making cross-curricular connections
A GLOBE teacher in Croatia who teaches Latin and Greek language has utilized GLOBE protocols in her classroom by showing students that the symbols in data collection and measurements are similar to the symbols seen in Greek, and that many of the scientific words used in GLOBE (especially animals and plants) are Latin-based words.

School-to-School connections
A teacher from Thailand mentioned that her GLOBE students connect with other GLOBE schools to share data as well as connect one-on-one with other students through a 'pen-pals' program.

Challenges

Funding
Several resources were given for ways teachers can obtain funds or supplies needed for GLOBE projects: American Waterworks Association ($2000 grants available quarterly), Space Grant Consortium (classroom supplies and professional development), donorschoose.org, freecycle.org and recycle.org, BP employee grants ($300 available per employee that they can give as grants).
Parents often work at companies that offer assistance towards education (time off to help with science fairs or help with transportation, matching donation programs, donation of "old" technology when upgrading). Many parents want to help but don't know how or think that teachers only want money.

Vandalism/Theft of Equipment
If students have ownership of their projects and the collection of data, they're less-likely to vandalize equipment. Ask that neighborhood watch programs and/or local police know to keep a watch on equipment that must be left outdoors (atmosphere instrument shelters or rain gauges).

Support from Administration
Having students present to the school board or other administrators can aid in the understanding of the benefits of GLOBE and how it directly affects the students and the school. Obtaining parental support can go a long way in helping administrators see the benefits of the GLOBE Program at their school.

Addressing the Needs of Curriculum Standards

Many GLOBE protocols tie-in directly with science standards in primary and secondary schools (Biology, Earth Science, Chemistry). With the new NGSS, GLOBE is a hands-on, real way for students to take and record data, as well as analyze it by presenting to their peers. NGSS is about allowing students to use science practices and analyze data. Common Core wants to build up academic language and allow students to read and comprehend expository texts, which can be met by having students work on a project and read journals for background information.

Changing Teacher Assignments
Some teachers mentioned being given different grade levels or subjects from year to year. Parts of GLOBE can fit into geography, art, language, technology, math, and others. Partnering with other teachers can help make GLOBE work.

Technology Issues
Using analog tools often works just as well as using digital tools or smart phones/tablets. Have students collect the data with analog tools, and then one student could enter the data, or even a teacher could enter the data if access to the Internet is limited. Having the hand-written data is just as useful, and can always be entered at a later date. In some remote areas of Africa, Peace Corps Volunteers assist in data entry when they travel to the Peace Corps office or visit an Internet Café.
Teachers without access to YouTube might have access to other sites such as Gaggle.com which can allow access to YouTube. Teacher tube is another option

Showcasing Student Engagement

Student Research
A key to the success of GLOBE is engaging students in research using data that they have collected as well as data from other schools. Therefore, it's very important that data be entered into the GLOBE website. Having students analyze data can be incorporated into science or math classes, and in some cases can have applications to social studies/geography classes. Reasons for students to want to analyze data for research can be events such as the Student Research Exhibitions (possibly a continuing part of the GLOBE Annual Meeting), GLEs, local science fairs, etc.

Calendar Art Competition
The GLOBE Calendar completion was very exciting for some students. This is also a great way to incorporate art into your science class. Schools could make their own calendar – or have a poster or t-shirt art contest. Make sure to publicize this on the GLOBE website for others to see. Maybe even exchange calenders or t-shirts with other schools.

Publicity

Some students have presented information on a local radio station every morning for the previous day, which helps students practice presentation skills as well as helps to involve the community in school functions. When students achieve something (selected to attend Student Research Exhibitions, GLEs, or local science fairs) contact the local newspaper. If a company provides funds for GLOBE activities be sure to give them publicity – they will be more likely to give money again if they see that it's worth it financially. Invite a local meteorologist or soil scientist to talk with the students; have students walk the guest speakers through their GLOBE activities, data analysis, and research.

Alumni Engagement
Millions of students have been involved in GLOBE since 1995; chances are good that previous GLOBE students (GLOBE alumni) live or work locally. Check with a local partner or country coordinator to find them and invite them to your school (if they are not local, invite them to connect via Skype or other electronic means). Students who are engaged in GLOBE activities at your school should be encouraged to "join" the GLOBE Alumni Network.

Making a Difference
One of the greatest reasons for teacher implementation of GLOBE is the potential impact it has on student learning and how students see themselves contributing to life on Earth. Several teachers noted that student involvement in GLOBE had a tremendous impact on low achieving students, as they were better capable of understanding concepts during hands-on portions. GLOBE also provided teachers with a new way to learn science and was also a way to teach students how to learn by engaging them in the scientific method (rather than having them memorize the steps). GLOBE also empowers students and helps them see that the data they collect are bigger than themselves and gives them ownership of a piece of something worldwide. Several teachers noted that students who were engaged in GLOBE activities often seemed more interested in science, potentially science careers.