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1. INTRODUCTION

Recently, the FSU Department of Meteorology has become involved in the **GLOBE** program (Global Learning and Observation to Benefit the Environment; The GLOBE Program, 1997; 2000). GLOBE is an international program that equips students to take scientific observations of their environment. Data obtained by students in GLOBE are then made available via the Internet to students and scientists worldwide. School-based observations provide scientists, atmospheric scientists for example, with a higher-resolution network of data reporting locations than the normal network of weather stations. In 1998, we were commissioned as GLOBE scientists to develop observation protocols to be used for taking various atmospheric measurements. The protocols we have developed include those used for observing *Barometric Pressure*, *Relative Humidity*, and *Visible Weather Satellite Imagery*. We also modified the existing *Cloud Protocols*. Also in 2001, GLOBE has added two new protocols compatible with the goals and objectives of a new program in environmental education outreach: *Haze* and *Surface Ozone*. A comprehensive GLOBE Atmosphere Teacher's Guide is also being finalized at this time, and is available online at <http://www.globe.gov/>.

Even more recently, we have initiated **FLIES** (the Florida Leadership Institute in Environmental Science). FLIES is being created to enhance environmental education and awareness through school-based data collection and analysis of these environmental observations. All developments are being correlated directly with the Florida Sunshine State Standards (Florida Department of Education 2000) and the National Science Education Standards (National Research Council 1996). In addition we are partnering with the Florida Department of Environmental Protection in its ozone-monitoring program, OzoneNet (Florida Department of Environmental Protection, 2000).

Our first workshop was conducted in the spring, when we taught a course entitled Teaching Earth and Space Science, a course that will be repeated each spring. Summer 2001 and Fall 2001 workshops at FSU and the Florida Association of Science Teachers meeting, respectively, followed.

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2. SUMMARY

Through FLIES professional development workshops, K-12 teachers will learn the proper techniques for collection of atmospheric and hydrological environmental data, and analysis techniques for these data, as used by scientists. The starting point for the training will be the set of protocols established under GLOBE and we will add other important protocols, as well. These protocols are listed here:

List of GLOBE Protocols to be trained: Atmosphere:

- Aerosol
- Barometric Pressure
- Cloud Type
- Cloud Cover
- Maximum, Minimum, Current Temperature
- Visible Satellite Imagery
- Precipitation pH
- Rainfall
- Relative Humidity
- Solid Precipitation
- Surface Ozone

Hydrology:

- Water Transparency
- Water Temperature
- Dissolved Oxygen
- pH
- Electrical Conductivity
- Salinity
- Optional Salinity Titration
- Alkalinity
- Nitrate
- Coastal macroinvertebrates

Land Cover/Soils:

- Soil Temperature
- Soil Moisture
- Soil Characteristics
- GPS
- GIS

Additional Protocols to be trained:

- Air wind direction
- Air wind speed
- Air mixing height
- Water phosphate content
- Volume of water (may be depth [lake, estuary] or flow rate [m³s])

REFERENCES

Florida Department of Education (2000). Sunshine State Standards. Tallahassee, FL: Available on the WWW at <http://www.firn.edu/menu/sss.htm>.

Florida Department of Environmental Protection (2000). OzoneNet. Tallahassee, FL: Air Quality Division. Available on the WWW at <http://www.dep.state.fl.us/air/ozonenet.htm>.

The GLOBE Program (1997). GLOBE Teachers Guide. Washington, D.C.: Superintendent of Documents. Available on the WWW at [http://www.globe.gov/sda-bin/wt?ghp/tg+L\(en\)](http://www.globe.gov/sda-bin/wt?ghp/tg+L(en)).

The GLOBE Program (2001). Welcome to GLOBE. Available on the WWW at <http://www.globe.gov>.

National Research Council (1996). *National Science Education Standards*. Washington, D.C.: National Academy Press, 262 pp.