P1.10 AMS DATASTREME PROGRAMS IN THE EMPIRE AND GARDEN STATES

Michael J. Passow*
White Plains Middle School and Lamont-Doherty Earth Observatory of Columbia University
William D. Blanchard
Shore Regional HS, West Long Branch, NJ
Carol A. Hildreth
AMS AERA, Capitol Area, Mechanicville, NY
Jeffrey T. Williams
Middle School 37, Bronx, NY
Gregory G. Hofer
Theatre Arts Production Company School, Bronx, NY
John D. Moore
Burlington County Institute of technology, Medford, NJ

1. INTRODUCTION

New York State ("The Empire State") and New Jersey ("The Garden State") schools provide K – 12 Earth Science courses to hundreds of thousands of students each year. These teachers serve in a variety of environments—urban suburban, and rural—but all their students are affected daily by weather and live within a couple of hours drive to the ocean or Great Lakes. AERAs (AMS Education Resource Agents) in these states provide many professional development opportunities to classroom teachers through DataStreme courses, workshops at science education conferences, and a variety of other programs. Our efforts seek to reach as many classroom educators in these states as possible, so that they will help create a generation more "weatherwise" than otherwise.

2. STATE EARTH SCIENCE STANDARDS

In both states, Earth Science topics form significant portions of the mandatory state curriculum and Standards-based testing at the elementary, middle, and high school levels.

* Corresponding author address: Dr. Michael J. Passow, White Plains Middle School, 128 Grandview Ave., White Plains, NY 10605; e-mail: michael@ earth2class.org.

In the New York State "Learning Standards for Mathematics, Science, and Technology" (http://www.emsc.nysed.gov/ciai/mst.html), it is expected that "Students will: understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science." (http://www.emsc.nysed.gov/ciai/mst/sciencestand/physset13.html) Resource guides with Core Curriculum expanding of the basic Standard statements have been developed for Elementary Level (K – 4); Intermediate Level (5 – 8); and High School (9 – 12). These are accessible through http://www.emsc.nysed.gov/ciai/mst/scirg.html.

Earth Science questions form significant parts of the state-mandates examinations administered during grades 4 and 8 (http://www.nysedregents.org/testing/elemintests.html). Earth Science has been one of the high school science examinations for many decades, and is taken annually by more than 150,000 students. Archived examinations are available at http://www.nysedregents.org/testing/hsregents.html.

In New Jersey, Earth Science concepts are included in the mandated NJ ASK (Assessment of Skills and Knowledge) (http://www.njpep.org/assessment/TestSpecs/ScienceNJASK/ppt/NJASKSciencePresentation_files/frame.htm); GEPA (Grade Eight Proficiency Assessment) (http://www.njpep.org/assessment/TestSpecs/ScienceGEPA/earth_astron/grade8.html) and HSPA (High School Proficiency

Assessment) (http://www.njpep.org/assessment/TestSpecs/ScienceHSPA/earth/grade12.html).

New York State has long held a preeminent position in Earth Science education. By some surveys conducted in the last few years, it has been estimated that New York State teachers and students account for more than 20% of all middle and high school enrollment in Earth Science classes (http://www.ccsso.org/pdfs/SM01appdx.pdf)

This is largely due to the extensive "Regents" courses that enable students to earn one credit towards high school graduation. Many DataStreme alumni have been involved in the NYS Regents exam development process (item writing, editing, pretest and field test development and rating, and exam review committees.) Several sets of questions in recent exams could be traced to materials originally presented in AMS programs.

Other surveys continue to indicate a continuing demand to enhance the subject knowledge competency of classroom educators in science (http://www.ccsso.org/content/pdfs/StateIndicatorsScienceMathEd2005.pdf). New York State is not included in this survey, but reports issued by the NY State Education Department (NYSED) over the past few years depict conditions in which many classroom teachers have relatively weak background knowledge in the geosciences.

This is especially true in New York City, the largest school system in the country with more than one million students. A report issued by the NY City Council outline many of the problems facing science education (http://www.nyccouncil.info/pdf_files/reports/lost%20in%20space%20science%20report.pdf).

Since then, draft guidelines for curricula to improve the situation have been issued (http://www.r9training.com/r9train/Docs/science/Scope%20and%20Sequence%20High%20School.pdf).

Two of the authors are NYC teachers, who know from first-hand experience that Earth Science Teachers are a shortage area in New York City schools, and because of this many teachers who are not licensed Earth Science teachers are asked to teach Earth Science. The fact that Datastreme courses are free and involve limited class time, make them an ideal choice for teachers with little or no knowledge of Earth Science to receive top rate information on the subject. This enables them to provide a better education for the children they teach.

3. AMS EDUCATION INITIATIVES

Over the past decade, New Jersey and New York AERAs (AMS Education Resource Agents) have developed a wide variety of approaches to help teachers from diverse knowledge backgrounds and teaching environments to enhance their understanding of atmospheric, oceanic, and hydrologic topics. This is part of the overall strategy needed to address the problems described above.

Local AERAs have provided courses to hundreds of NY and NJ teachers. They have reached many others through workshops at state and local meetings that incorporate web-delivered and printed materials from the AMS DataStreme courses, as well as Project Atmosphere, the Maury Project, and other AMS educational outreach efforts.

3.1 DATASTREME ATMOSPHERE

DataStreme Atmosphere is a major precollege teacher enhancement initiative of the American Meteorological Society (AMS), supported by the National Oceanic and Atmospheric Administration (NOAA). Its main goal is the training of Weather Education Resource Teachers who will promote the teaching of science, mathematics and technology using weather as a vehicle, across the K-12 curriculum in their home school districts.

The initial step in the training of Resource Teachers is their participation in the DataStreme Atmosphere distance-learning course. The 13-week course is offered twice a year to selected participants. It focuses on the study of the atmospheric environment through the use of electronically transmitted weather data and learning materials combined with Study Guide readings and investigations.

DataStreme Atmosphere is currently funded via the AMS/NOAA Cooperative Program for Earth System Education

(CPESE) with assistance from the U.S. National Weather Service and the State University of New York College at Brockport. DataStreme Atmosphere expects to train over 7,000 teachers nationally. Initial DataStreme Atmosphere operations were funded by the National Science Foundation.

Through the Fall 2005 term, five DataStreme Atmosphere LITs were operating in NY and NJ; however, due to funding limitations, it is anticipated that only two will function in the Spring 2006 term, one in NJ and one in central NY. Alternative programs to provide equivalent training to NYC and other teachers are actively being developed.

3.2 DATASTREME WES

DataStreme Water in the Earth System (WES) incorporates inquiry-based instructional strategies and a holistic concept of Earth from oceanic, atmospheric and terrestrial water and problem-focused perspectives. It is designed after the highly successful DataStreme distance-learning course, and investigates the mass and energy flows associated with the global water cycle, and with related issues. The WES course homepage is http://www.ametsoc.org/amsedu/WES/home.html

Two WES LITs have operated in NY and NJ since the program began. These continue to provide quality professional development for classroom teachers and others. For example, one of the NYSED Science Associates took the course and created a "Correlation of WES Investigations to the NYS Learning Standards" as part of her professional action plan.

Hildreth, who leads a WES LIT in the Capitol District, recently retired from teaching and will offer the WES course to teachers in western NY for one semester, in conjunction with the Buffalo NWSFO.

3.3 DATASTREME OCEAN

DataStreme Ocean is a precollege teacher enhancement program of the AMS/NOAA Cooperative Program for Earth System Education (CPESE). The program is funded by the National Oceanic and Atmospheric Administration (NOAA). DataStreme Ocean explores the ocean in the Earth system with special emphasis on (1) the flow and transformations of water and energy into and out of the ocean, (2) the internal properties and workings of the ocean, (3) interactions between the ocean and the other components of the Earth system (hydrosphere, atmosphere, lithosphere, and biosphere), and (4) the human/societal impacts on and response to those interactions. This approach is inquiry-based and consistent in methodology and goals with the National Science Education Standards. The DataStreme Ocean course web site is http://64.55.87.13/amsedu/DS-Ocean/home.html.

DataStreme Ocean LITs function in the Capitol District of New York and central NJ; however, some teachers from the New York City metropolitan region have participated through the LIT based in nearby Connecticut.

4. ADDITIONAL TEACHER TRAINING BASED ON AMS EDUCATION PROGRAMS

All of the authors have presented workshops at local, state, national, and international science education conferences. These have included adaptations of hands-on activities developed for Project Atmosphere and Maury Project teacher training guides, and also Project Atmosphere Canada.

AERAs and DataStreme alumni have developed a variety of graduate education programs with local colleges that are based on AMS programs. Hildreth is proposing to include a weather education course for graduate students pursuing a Masters in Advanced Teaching (MAT) degree.

Passow utilizes a wide variety of AMS-developed materials in the “Earth Science Teachers Get-Togethers” presented in conjunction with the NYC Department of Education Region One Learning Support Center (http://www.earth2class.org/er/teachers/programs/nyc%20estc%200506).

Together with Hofer and Williams, Passow also provides twice-a-year programs based on AMS materials through the Earth2Class Workshops for Teachers at the Lamont-

Doherty Earth Observatory of Columbia University. Descriptions of the 2004 programs were provided at the 14th Symposium on Education (http://ams.confex.com/ams/pdfpapers/82607.pdf).

One of the most effective demonstrations of how classroom teachers have been able to interact with LDEO research scientists and create effective classroom activities was provided by Hofer. He showed how he used a coffee filter to collect microfossils from deep-sea sediments distributed by Rusty Lotti Bond, Curator of the LDEO Deep Sea Sample Repository (http://earth2class.org/k12/w1_f2003/curriculum.htm)

5. AMS LIT LEADERS IN NY AND NJ

DataStreme ATM

John Moore
419 Lindsay Avenue
Laurel Springs, NJ 08021
Voice: 856-346-0282
Fax: 856-346-0282
Email: **moore_johnd@hotmail.com**

Rose Marie Camarda
108 Butterfield Circle
N. Syracuse, NY 13212
Voice: 315 458-8240
Fax: 315 458-8240
Email: rcamarda@twcny.rr.com

DataStreme Ocean

William Blanchard
203 Overlook Drive
Neptune, NJ 07753
Voice: 732-988-1472
Fax: 732-988-6318
Email: wmblanch@aol.com

Mary Bishop
151 Albany Ave.
Kingston, NY 12401
Voice: 845-338-0399
Fax: 845-338-0399
Email: mbishop148@aol.com

DataStreme WES

Carol A. Hildreth
711 Broadway
Mechanicville, NY 12118
Voice: 518-664-5340
Fax: 518-664-7226
Email: childreth@nycap.rr.com

DataStreme WES and Ocean
Dr. Michael Passow
296 Central Ave.
Englewood, NJ 07631-1658
Voice: 201-871-0846
Fax: 201-541-9702
Email: michael@earth2class.org