P1.15 DISTRICT ELEVEN EARTH AND WEATHER STUDY PROGRAM

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1. INTRODUCTION

The District Eleven Weather Study Program (DEWS) was established in 1983 as an atmospheric-science education program directed toward all fifth- and eighth-grade students attending school in Community School District 11 (CSD 11), which is located in the northeast Bronx. Since its inception, more than 100,000 students have participated in lessons at the Northeast Bronx (District 11) Weather Station (NBWS), the center of weather-related activities in the district.

The predominant principal that has governed the program from the beginning is that the utilization of near real-time weather information in the classroom will help to motivate young students to develop an interest in the study of science.

Lessons at the NBWS, wherever appropriate, were designed to allow pupils to work directly with such current-weather products as surface observations, radar summaries, satellite imagery, and various weather charts.

2. DEWS: PROGRAM EVOLUTION

As the program moved into the 1990's, the Internet changed the course of DEWS by providing schools an opportunity to obtain near real-time weather data at a modest cost. In order to ensure that this information be applied as successfully as possible to classroom instruction, it became evident that extensive training would be required for teachers in the fundamentals of meteorology as well as in the use of the Internet. It was for this purpose that Project WeatherWatch was set up in 1994.

During the years 1994 – 1999, the WeatherWatch program has been offered to middle school teachers in New York City by the City College of New York (CCNY). Each year, a sizable number of teachers from District 11 have opted to attend the Summer Institute at CCNY. The four-week training consisted of daily three-hour morning recitations in meteorology followed by two-hour Internet Laboratory sessions. Each laboratory paralleled such morning-session themes as "Weather Systems" and "Weather Radar." The lab exercises focused on Web sites that provide the type of weather information that could be appropriately used in class lessons, particularly at the middle-school level

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3. A VISION FOR THE FUTURE

As a result of the positive outcomes of the DEWS and WeatherWatch programs, CSD 11's Science Curriculum Team (SCT) composed of Director of Science, Rose Villani, Steven Richards, district science staff developers, and exemplary science teachers, decided to explore whether the programs' strategies, atmospheric science base, and inquiry practices had the potential to serve as the linchpin of a new approach to the science teaching in the district.

The challenge was to transition from a project focusing on the atmospheric sciences alone and on comparatively few teachers, to a unification of program delivery of the atmospheric, earth, physical and life sciences, building on the learning, skills, interest, and enthusiasm DEWS and WeatherWatch engendered but addressing science-education standards. As a result of their investigations, the SCT concluded that a selected curriculum could be added to the district-wide science program to better implement national, state and local standards. The curriculum would address concepts from the atmospheric, earth, physical and life sciences; general science concepts; scientific connections and applications; scientific thinking; scientific tools and technologies; scientific communication; and scientific investigation.

The SCT-recommended new approach to ESS learning involves the use of atmospheric science themes as the basis of an integrated and interdisciplinary program that unifies the atmospheric, earth, physical and life sciences in conformance with the National Science Education Standards, the American Association for the Advancement of Science (AAAS) Project 2061 Benchmarks for Science Literacy, the New York State Intermediate Level Science Core Curriculum Grades 5-8 and the New York City New Standards Performance Standards for Science.

4. A NEW "DEWS" PROGRAM

Following the presentation of the committee's findings to district principals and teachers, and after receiving a nearly uniform affirmation to proceed, the committee began to make concrete plans to develop a project to implement the new curriculum that has prompted CSD 11's decision to restructure its science curriculum for grades 5 - 8. Beginning in September 2001, an Earth Systems Science (ESS) thematic approach to science instruction will be in place, wherever appropriate, across these grade levels. This new approach to science learning will lead to the use of

atmospheric science themes as the basis of an integrated, unified science curriculum.

In order to support the transformation to its new curriculum, beginning in fall 2001, the DEWS program designation will become the "District 11 Earth Systems and Weather Study Program." CSD 11 is currently updating all of its individual grade curriculum guides so that each reflects the new curriculum. In September 2001, every grade level, 5-8, will feature a single overriding theme. For example, the year-long theme for grade five will be "EarthSystemsWatch: Water in the Earth System\Floods."

District 11's Science Server Web Site will become a major resource to sustain this effort beginning in the academic year 2001-2002. The atmospheric and earth systems sciences will be represented prominently on the pages of this Web site in support of the new curriculum. When fully operational, this site will lead students to inquiry-based activities in current weather, floods, hurricanes, acid rain, tornadoes, and similar themes. These exercises will be interdisciplinary, drawing on principles, concepts, and information linking the atmosphere, geosphere, hydrosphere and biosphere. Also, a Web page (Project WeatherWatch Bookmarks) has been created for teachers that is composed of links to near real-time weather products and to Web sites that offer educational resources for Earth Systems Science (ESS) study.

Instructional lessons in the atmospheric sciences at the Northeast Bronx Weather Station will be modified so that important interdisciplinary and interdependent relationships within the earth system will be highlighted.

Beginning in the academic year 2001-2002, the NBWS will also assume a leading role in designing atmospheric and ESS "Exit Projects." These long-term research projects will provide pupils with the opportunity to explore a topic, in depth, which will build a foundation for future discoveries. It should be noted that the subject matter for many of the grade eight science projects is to be drawn from a group of Earth and Space Science topics listed in *The New York City Board of Education's Grade Eight Exit Project Guide*. The list includes the following themes: the atmosphere, erosion, hydrosphere, lithosphere, oceans, seasons, the water cycle and weather. In order to facilitate the location of Internet resources for these research projects, teachers and their students also will be trained in the use of the Digital Library for Earth System Education (DLESE).

The New York City Board of Education has mandated that in addition to passing a New York State science assessment test, an Exit Project must be completed successfully as a precondition for a student's promotion to the next grade level. This requirement was introduced in the academic year 2000-2001 for grade eight and will be authorized for grade four in the 2001-2002 in all New York City public schools. The obligation will be extended to all K-8 grade levels in subsequent years.

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