J4.7 AN EARTH SCIENCE WEB SITE FOR RANDOLPH HIGH SCHOOL

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1. INTRODUCTION

Randolph High School is situated in central Morris County, New Jersey, approximately 50 km west of New York City. Earth science is a mandatory course for the 400 ninth grade students at Randolph High School. The earth science course consists of several major topics including geology, oceanography, astronomy and meteorology.

Numerous studies have shown the significance of using technology to relate scientific concepts to real-world applications. (Duvall and Holzer, 2001) Real-time weather data available via the World Wide Web can allow students to see scientific concepts in action through the occurrence of weather phenomena. (Duvall, Holzer and Robinson, 2002)

The author, a meteorologist by training, was hired by the Randolph Township School District to blend local observations and expertise with the existing meteorology curriculum. GLOBE, WES, Datastreme and other programs support educators with professional development and activities from a national perspective. (Duvall, Holzer and Robinson, 2002) However there is also a need for more localized sets of education tools uniquely designed to support earth science educators faced with the challenge of immersing their students in local weather and climate.

Instructional materials were created or refined for Randolph students to include "real world" weather observations from the New Jersey area, similar to the lessons performed for ninth graders at a similar Morris County high school in 2000. (Duvall and Holzer, 2001)

A major component of this endeavor was the creation of the Randolph High School Earth Science (RHS ES) web site.

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2. THE RHS EARTH SCIENCE WEB SITE

The RHS ES web site was created for the spring semester of the 2004-2005 school year as a supplement for earth science instructional materials, providing access to archived and real-time "real world" data as well as links to outside web sites. A student lab assistant aided the author with creating, updating and expanding the web site on a regular basis.

The goal for the 2004-2005 school year was to design the RHS ES web site to supplement the meteorology unit. Lab and homework assignments were created or refined to utilize data from a variety of sources. The RHS ES web site has been structured to offer links grouped onto web pages that mirror academic units, such as the Air Temperature and Dew Point page. Web site visitors would find the Air Temperature and Dew Point page populated with the lab and homework documents for the Air Temperature and Dew Point unit along with any maps, graphs or tables necessary to understand and complete these assignments. (see Fig. 1)

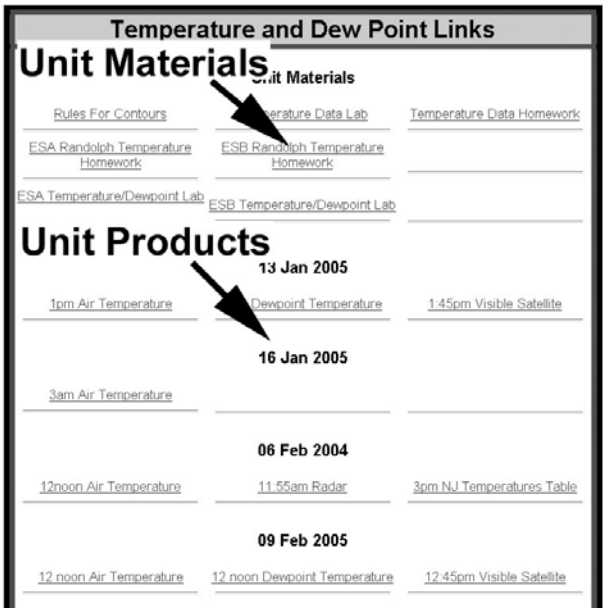

Fig. 1 The Air Temperature and Dew Point page for the 2004-2005 RHS ES web site.

Students would be asked specific questions, such as one Clouds and Precipitation unit assignment that asked students to identify which surface air temperature maps seem to show evidence of a sea breeze affecting New Jersey. Another assignment asked students to view a set of weather photos to identify different types of clouds and precipitation.

All data, products, and assignments were made available via the RHS ES web site, which was linked in turn to the Randolph Township Schools web site: http://www.rtnj.org. Students, parents and faculty were all able to access this public web site, enabling everyone to literally be on the same (web) page.

The primary data source for the weather observations was the New Jersey Weather and Climate Network (NJWxNet) operated by the Office of the New Jersey State Climatologist at Rutgers University. The NJWxNet products include colorful, hourly maps and tables of surface air temperature, dew point and other variables.

Focused on New Jersey, the NJWxNet maps are populated with a conglomeration of real-time, "real world" observations from several sources. This level of detail is unique to the NJWxNet, allowing observers to interpret mesoscale phenomena from sea breezes to outflow boundaries that cannot necessarily be observed through the use of maps set to a larger scale. (Robinson, Duvall, Sharma and Shmukler, 2002)

A Hobo Pro from Onset, Inc. was operated at RHS, providing a record of air temperature and dew point observations for portions of the 2004-2005 school year. A ninth-grade student volunteered to record twice-daily observations from her home about 2-3km south of the school using a manual max-min thermometer and a standard plastic rain gauge from November 2004 through March 2005. These sets of observations were analyzed by the students as part of the meteorology unit. The tenacity of the snowpack from the 22 January 2005 snowstorm as reflected by the suppressed high temperatures through early February 2005 was just one of the "teachable" phenomena observed by these datasets that helped students to relate the unit material to their own lives.

3. LOOKING FORWARD

The RHS ES web site has been expanded for the 2005-2006 school year to offer supplementary information regarding topics outside of the meteorology unit. Links have been provided for students to view and identify minerals and rocks for the geology unit with similar sets of outside links planned for the oceanography and astronomy units. Activities for these units will also be developed that harness the power of the Internet to supplement the existing curriculum. The RHS ES web site is a public web site, therefore while the data sources focus on New Jersey, the unit assignments can easily be modified to utilize local data sources in other areas.

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5. REFERENCES

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