

NASA NICE Workshop – Wrap-Up Activity / August 10, 2012
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The information and experiences afforded by the 2012 NICE Workshop held at Elizabeth City State University August 6th through 10th will be a great benefit to for the various courses that I teach at Norfolk State University. Specifically, beginning this fall, 2012, two courses will be most impacted; these being a science teaching methods course (Science for Teachers/SCI 381 ad 381L, lecture and laboratory, and general biology course that is part of the University's General Education Program. The general biology course has both lecture and laboratory components, is taught both face-to-face, and online, and is identified as Biological Sciences 100 and Biological Science 100L.

The students that will be most directly impacted by the inclusion of climate education in these courses are non-science majors, and those in the early Childhood and Elementary Education Program. Between the general biology course and the science methods course, an estimated 60 to 70 students will be reached.

The overall learning objectives for the lessons that included workshop tools and datasets are as follows: (1) an introduction to climatology and environmental science; (2) the provision of an authentic experience with science using real and relevant data; (3) the provision of specific knowledge about currren issues in climatology, such as global warming as an example; (4) to provide concrete evidence as to how human activity can impact ecosystems on a global scale; and lastly, (5) to enhance the students' critical thinking skills by use of explorations in climatology.

Specific learning objectives relative to climate education include provision the following:

- (1) essential science content that one must have in order to undertake meaningful climate explorations;
- (2) experience with existing climate data sets, as well as the creation of similar datasets, along with analytical tools/protocols that allow meaningful inferences to be derived form the datasets.;
- (3) in-depth exposure to the most pressing environmental/climate concerns;
- (4) skill in using existing climate exploration tools, including both those directly manipulated by scientists and those accessed via computers in conjunction with Internet sources.

Specific climate education modules that I intent to use, both a given and with customization are the following:

OCEANS: (1) Satellite Image Analysis; (2) Seasonal Cycles: the North Atlantic Phytoplankton Bloom; (3) Ocean Iner-annual Variability: El Nino and La Nina; and (4) The Ocean-Carbon Connection.

TERRESTRIAL: (1) Investigating Climate change Data; Biome Climate Investigation; (3) Measuring the Greenness Index; (4) Changes in Seasonal NDVI; and (5) Carbon Cycle Field Investigation and General Filed Methods.

The modules and lessons listed above will be used to provide a context for the topics that are currently included in both the science teaching methods course and in the general biology course. Topics related to biodiversity (including taxonomy, and symbiosis), biological chemistry, the scientific method, anthropogenic impact on the earth, the cellular basis of life, and genetics will be presented by use of the climate education topics/modules/lessons. It is anticipated that presenting the standard topics for the course within a climatology context will provide greater relevance for the content and a better understanding of the connectivity of the content to the students' lives and to the world around them.

Other than possible issues related to the heavy dependency on use of somewhat novel and new climate education tools via the Internet, **no significant challenges or obstacles immediately come to mine** relative to my implementation efforts. However, as is true with any type of innovation, times will be a constant consideration/concern.

The effectiveness of the Climate Education modules/lessons will be assessed via use of a variety of approaches, some of which are as follows: (1) pre- and posttests regarding climate education topics/content, specifically as related to the specific learning objectives for the courses; (2) portfolios developed by the students as they; (3) observed participation of the students working in cooperative and collaborative groups as they address climate education problem-based assignments; (4) formal oral presentations and opportunities to facilitate discussions; and, to a limited degree, the more traditional pen-and-paper assessments.

