

## Reform of Introductory Science Courses for Non-Majors

### Interim Report

Name of Person Submitting Report: **Dr. Suresh Muthukrishnan**

E-mail: **suresh.muthukrishnan@furman.edu**

Phone: **(864) 294-3361**

Institution: **Furman University**

Title of Project: **Earth from Space: Spatial Science and Technology Focused Introductory Geosciences Course Development and Implementation**

Date(s) of Project: **February 2006 – Jan 2007**

Amount Awarded: **\$13,235.00**

#### 1. Original Goals and objectives:

- a. Introduce geosciences to undergraduate students from a completely different perspective using GIS, GPS, and remote sensing technologies
- b. Integrate spatial sciences and technologies into the earth science course to achieve proficiency of scientific concepts among non-science majors
- c. Raise the level of science literacy and global awareness of undergraduate students
- d. Engage the students at a much deeper level of scientific discussions and understanding by developing course modules and field problem-solving exercises using technologies and tools such as PDA with built-in GPS, and Google Earth.

#### 2. Any changes made in goals/objectives to date:

- a. The goals and objectives remain the same as stated in the project proposal.

#### 3. Activities underway and/or completed to date.

- a. The proposal had six topics that were to be developed with GIS/GPS/Remote Sensing focus. So far, I have been working on gathering data and other resources necessary to design the labs and in-class activities.
- b. The ArcPad software needed to run GIS on the PDA has been purchased.
- c. Natural resources GIS data that shows how much petroleum and natural gas, and electricity is generated by each country in the world and how much import and export those countries have for these resources have been gathered.
- d. A simple GIS based plate tectonics activity has been developed using ArcMap program. Currently Google Earth is being used in creative ways to develop a study of landforms to understand plate tectonics processes. These two activities will be used together to reinforce the concept of plate tectonics and associated landforms.
- e. I have global dataset related to atmospheric and ocean conditions, and hurricanes, and global warming. I am intending to use these data to generate discussion materials and lab activities.
- f. Multiple activities are half-way through in preparation, but none of them are complete 100% as of now. I expect to have at least three of the five modules ready by the early August and all of them completed by mid-September when the classes start.

#### 4. Any snags or unanticipated delays encountered

- a. At the time of proposal, I was sure of purchasing Garmin iQue M4 model PDA with built-in GPS and data. However, after experimenting with one of these units for one month and testing its capabilities, I realized that it would not do

- everything that I want to be able to do. I am in the process of assessing other available models in the market that would help my case. This has delayed the purchase of the PDA's and developing PDA specific applications but should not adversely affect the project progress.
5. **Approved budget**
    - a. I have approved the purchase of the ArcPad s/w that was necessary to test tested on my PDA
    - b. I used my own money to purchase the test PDA unit with built-in GPS
  6. **Financial Accounting from receipt of funds through October 15, 2006, showing amounts spent to date and for what it has been spent.**
    - a. ArcPad s/w purchase - \$1066.83
  7. **Any other information you think will be helpful to include.**
    - a. The biggest challenge is gathering data for all the countries and putting it in usable format. I find it difficult to get GIS data for several countries. This may potentially limit the geographic extend of problem solving or studies that students may do using GIS.
    - b. In June, I attended a week long workshop in Pomona College, CA offered by National Institute for Technology in Liberal Education (NITLE) on "Web-Mapping: Exploring Browser-Based Applications as Teaching and Learning Tools". The main focus of this workshop was to introduce participants to the power of freely available spatial analysis tools such as Google Earth and American Fact Finder (Census). It was extremely valuable for me and I was able to use the time to consolidate some of the ideas and collect data that will be used in the class.
    - c. I have hired a student assistant and he is working his way through design of the labs and some other engaging activities for the course.

Send your report to  
Dr. Tim Ward  
Department of Chemistry  
Millsaps College  
1701 N. State Street  
Jackson, MS 39210  
Phone: 601-974-1405

This project is supported by the W.M. Keck Foundation of Los Angeles