



# UNAVCO Education and Outreach Program

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**Abstract**  
In 2004-2005, UNAVCO has made significant strides in establishing a long term education and outreach program addressing the needs of various audiences. A new internship program will commence in 2005 with one UNAVCO intern. Funding for a pilot project through the NSF Office of Education and Diversity in the Geosciences will commence in Fall, 2005. This collaboration among UNAVCO, IRIS, USGS, and several institutions of higher learning will significantly broaden participation of students of underrepresented groups in geophysics. The University of Colorado, a UNAVCO member institution, will join the USGS in Golden in providing mentors for scientific research for undergraduate students visiting Boulder for 10 weeks each summer. Highline Community College, located near Seattle, Washington, will join forces with the Department of Geological Sciences, Central Washington University, to build a bridge program from community colleges to four year geoscience programs.

The PBO Nucleus (existing western networks) has received NSF funding which will also support a new staff member in education and outreach. Building modules of cutting-edge GPS-based measurement of crustal deformation for three audiences is the theme of this educational project. Researchers from UNAVCO member institutions will work on materials to be used in general education classes such as Physical Geology and other course titles. Existing courses for upper level geophysics majors in member institutions will be modified to share on the web. Lastly, research scientists and teachers of Earth Science in secondary schools will work together on material for earth science classes. All of these materials will be made widely available through workshops, the web, and printed materials.

Longer term planning and articulation of UNAVCO's mission in education and outreach are under the leadership of a new standing committee of the UNAVCO Board of Directors. Building on existing projects such as the Jules Verne Voyager, UNAVCO will continue to strategically build programs for both education to broader audiences as well as provide service to its members.

## UNAVCO Board of Directors' Standing Committee on Education and Outreach

The mission of UNAVCO Education and Outreach Program is to promote a broader understanding of geodynamics and earth deformation processes in which UNAVCO's research community is engaged.



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Dir. of Strategic Partnerships  
Digital Library for  
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Mike Willis  
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Dr. John Taber  
E&O Director, IRIS

James Cano (no picture available)  
Secondary Science Teacher  
Warren High School, San Antonio, TX

The Education and Outreach Standing Committee was convened in April, 2005 with an initial task of helping craft a strategic plan for UNAVCO's E&O Program. The first draft of the mission statement, goals, and strategies will be refined during 2005 with input from the broader UNAVCO community. To have input into the E&O strategic plan, please contact Susan Eriksson at UNAVCO.

**The goals of the Education and Outreach Program are to:**

1. Build a sustainable, excellent Education and Outreach Program that supports the strategic directions UNAVCO.
2. Broaden the use of UNAVCO data and products.
3. Collaborate with other organizations to provide systemic impact on geoscience education.
4. Increase the diversity and broader participation in geoscience education and research.



Dr. Kelly MacGregor  
Asst Prof, Macalester College



Dr. Rajul Pandya  
Director, SOARS, UCAR

## Research Experiences for Students in Solid Earth Science: RECESS

### A collaboration among UNAVCO, IRIS, USGS (Golden) in partnership with SOARS (Significant Opportunities in Atmospheric Research and Science)

Based on BEST (Building Engineering and Science Talent), the first and only comprehensive assessment of programs that develop the technical talent of under-represented groups in higher education. Their report identifies exemplary and promising programs and distills common design principles from their practices. These principles, which provide the conceptual framework for RECESS, are:

- Targeted recruitment
- Enriched research experiences
- Personal attention
- Faculty engagement
- Peer support
- Bridging
- Institutional leadership
- Continuous evaluation

Ethnicity and gender	Resident Population of the United States in 2001 (18-24) <sup>1</sup>	Enrollment in Graduate Programs in Solid Earth (1994-2000) <sup>2</sup>
African American/Black	14.0	1.1
Hispanic/Latino/Chicano	17.4	2.6
Native American/American Indian/Alaskan	0.9	0.5
Asian American & Pacific Islander	4.3	2.7
European/American (Caucasian)	61.9	88.9
Female	48.8	79.0
Male	51.2	45.0

RECESS encourages applications from individuals who:

- are members of a group that is historically under-represented in the solid earth geosciences and related sciences, including students who are Black or African American, American Indian or Alaskan Native, and Hispanic or Latino,
- have experienced, and worked to overcome, educational or economic disadvantage; and/or
- have personal or family circumstances that may complicate their continued progress in research careers.

### Community College Connection

A disproportionate number of students from underrepresented groups go to two-year colleges (54% Hispanic, 52% American Indian, and 46% African Americans compared to 44% of all U.S. undergraduates). Because of this, RECESS includes a community college partner.

Highline Community College in the Seattle, Washington area will work with Central Washington University Department of Geosciences to recruit students from community college to CWU's geoscience program and enlist these students for summer internships.

Highline Community College has a total student population of 17,227 (63% female and 37% male) and a total of 45% non-white student population (18% Asian/Pacific Islander, 13% African American, 8% Hispanic, 1% Native American or Native Alaskan and 5% Other

**Goal:** Increase the number of individuals from underrepresented populations who complete Masters' and PhD degrees in solid earth geoscience.

- Objectives:**
- Build a robust, independent program of research experiences and mentoring of individuals from underrepresented populations.
  - Educate faculty and other researchers in solid earth geoscience about mentoring, the value of undergraduate research in successful graduate careers, and the culture of science and how it relates to recruitment and retention of individuals from underrepresented populations.
  - Build a sustainable program that can endure past the time period of this proposed grant.



SOARS 2005 Interns

High Level Data Products for Education developed in UNAVCO's E&O projects will include a contextual framework for data, integrating various types of data, working with visualization, and be tailored for specific audiences



### Earth Exploration Toolkit

An EarthScope team is working on a chapter for the Earth Exploration Toolkit using GPS data (DLESE Data Workshop in April, 2005) for use in an Earth Science classroom in middle /secondary school. This will be part of a topical collection on EarthScope for the Digital Library for Earth Systems Education (DLESE). IRIS and UNAVCO are partnering in E and O efforts with each other and with EarthScope to provide a coherent program of programming and products.

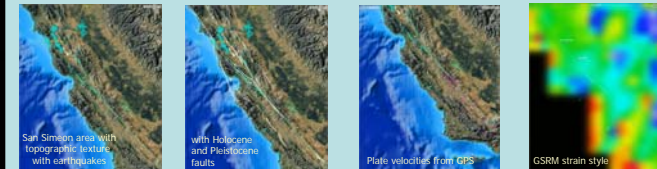
This chapter will be modified for use in an undergraduate, general education classroom

### Jules Verne Voyager

For more details on the EarthScope Voyager – the educational version of the Jules Verne Voyager mapping tool, visit the poster by Hamburger et al.



The "Did You Know" portion of the educational materials developed for the Jules Verne Voyager Map Tool is targeted at secondary school and general audience. The project team is working toward inquiry-based, student centered educational materials in support of teaching standards and EarthScope goals. More specific modules targeted at upper level geoscience majors can be modified from researchers' existing curriculum at their universities and colleges.



Tools such as the Jules Verne Voyager can provide multiple data sets which provide a context for students (and researchers) to compare and contrast data for making and testing hypotheses.

### Short Course on using Borehole Strainmeter Data

aimed at researchers (including graduate students) July 13-15, 2005 at UNAVCO, Boulder, CO

- Strainmeters and tiltmeters
- Long-term trends in data
- Data formats
- Tides and ocean loading
- And more!

A limited number of scholarships are available.

### Get Involved

Please contact the UNAVCO Education and Outreach Coordinator ([eriksson@unavco.org](mailto:eriksson@unavco.org)) for more information on how to participate in UNAVCO Education and Outreach activities.

### Other upcoming events

Short Courses on GPS data processing using GLOBK (Tom Herring from MIT) and OCCA (Danon Dong from JPL) Times to be determined (probably fall 2006)

