

National Science Teacher's Association Annual Conference, March 2007

- **4-hr Short course for teachers: Exploring Plate Tectonics Using the Global Positioning System (GPS)**
- **37 participants**

In this short course, approximately 37 participants learned about using Global Positioning System (GPS) data to measure plate deformation. They received an introduction to GPS principles and worked with place-based educational materials that highlighted new discoveries yielded by GPS research. We explored ideas for incorporating modern plate tectonics research into secondary earth science curricula and discussed strategies for assessing student work and mastery of content. Every participant received copies of workshop materials to take back to their classroom.

An end-of-course evaluation was administered which included 8 questions rated on a scale of 1 to 5 (from strongly disagree, disagree, undecided, agree, strongly agree) and two open ended questions. Demographic information about the participants, their teaching, and their schools was collected.

Twenty-three of the NSTA short course participants responded to the end-of-course evaluation. Responses were very positive to the evaluation questions with an overall median rating of strongly agree to all of the questions in the evaluation.

All participants responding to the evaluation, either Strongly Agree (SA) or Agree (A), with the median response of Strongly Agree that the workshop was well organized and facilitated [78% SA, 22% A], resulting in an average approval rating of 4.78 (avg) with a standard deviation (stdv) of .42.

While all but two respondents either strongly agreed or agreed [61% SA, 30% A, and 4% undecided (U)] and strongly disagree (SD) that they can easily apply the information/skills learned in this workshop to my teaching with limited modification, [average 4.43, standard deviation of .95]; all of the respondents but one [70% SA, 26% A, 4% U] indicated that as a result of this workshop, she/he will definitely implement some additional and plate tectonic science content to my teaching. [4.65 avg; 0.57 stdv]

The participants indicated the three topics from the short-course they anticipate to be more useful in their teaching include:

Demonstration and Activity: Using GPS Data to Visualize Plate Tectonics
Overview of GPS and UNAVCO
Investigate plate motions and deformation in California Using GPS Data

All but two participants either strongly agreed or agreed that they found the relative time devoted to the various workshop activities to be appropriate [57% SA, 35% A, and 9% U; 4.48 avg, 0.67 stdv] and that the workshop included a variety of effective instructional strategies (active engagement, use of prior knowledge, working in teams, real world applications, choice of activities) [78% SA, 17% A, and 9% U; 4.74 avg, 0.54 stdv].

All but one participant strongly agreed or agreed that as a result of workshop, they felt their preparedness to instruct about Plate tectonics and Earthquakes had increased, [78% SA 17% A, 4% D; 4.74 avg, 0.70 stdv] and that the workshop provided them with new and challenging content for using GPS data that was not overwhelming [87% SA, 9% A, 4% SD; 4.65 avg, 0.88 stdv].

In summary, 20 participants strongly agreed, 2 participants agreed, and one was undecided that overall, this workshop was a valuable use of their time [4.83, avg, 0.49 stdv]

Comments from participants were very positive and included a few suggestions for future workshops. They best liked the hands-on use of data, plotting of [GPS] data and using maps, drawing [GPS] vectors, and graphing. Their suggestions included shortening or removing the initial warm-up activity, walk them more thoroughly through the full workbook, and to use simplified-fictitious data.

From the demographics portion of the evaluation, participants self-identified that they belong to following groups:

- 1 response: Black or African American
- 1 response: Asian
- 1 response: Hispanic or Latino
- 20 responses: White (excluding Hispanic/Latino)

Half of the 20 participant responses indicated that over 21% of students in their school are currently enrolled in the Free and Reduced Lunch Program (FRLP):

- 4 participants indicating 81 – 100% students are enrolled in FRLP
- 1 participant indicating 61 – 80%
- 3 participants indicating 41- 60%
- 2 participants indicating 21 - 40%

Participants also identified the ethnic groups that compose more than ~10% of their school's student population:

- 8 responses: Black or African American
- 2 responses: American Indian or Alaska Native
- 16 responses: White (excluding Hispanic/Latino)
- 2 responses: Asian
- 8 responses: Hispanic or Latino