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Recruitment and retention of diverse geoscience students through the GEOPATHS multi-institutional program of hands-on shipboard oceanographic research and outreach

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Abstract Text:

The GEOPATHS program is an inter-institutional oceanographic research program, which aims to inspire and train diverse students to pursue careers in the geosciences through experiential research, and to assess the effectiveness of this approach. This program connects students, researchers and faculty from a land-locked HSI (CSUB) and a coastal liberal arts university (USD) with researchers from the Scripps Institution of Oceanography to engage in shipboard research, mentored research internships, geoscience career outreach, curriculum development, a teacher training workshop, and the generation of curated oceanographic samples and shipboard videos available for future education and research. Between 2018-22, over 170 undergraduate students (including undecided majors and pre-service teachers) and secondary teachers engaged as shipboard scientists on one of three 4-day and/or seven 12-hour research voyages aboard UNOLS research vessels. Most of the students had never been at sea and some had never seen the ocean, so living and working at sea was an empowering, transformative, life-changing experience. The intense, immersive 24-hour working environment aboard ship provided unique opportunities for professional socialization as well as exciting, hands-on training using

sophisticated state-of-the-art analytical equipment. Additional students engaged in the voyages through new curricula that included voyage samples, data, and videos of student impressions and scientific operations. New courses in oceanography were added to CSUB's curriculum and voyage data/activities were incorporated into existing courses. Over 20 students pursued mentored research internships and most presented at professional conferences. Geoscience career outreach activities connected students with local geoscience professionals. Several students have pursued graduate studies related to oceanography. Student responses to assessment surveys and a dissertation that focused on the impacts of the GEOPATHS research experiences indicated that regardless of their major, student participants in the program were positively impacted by the hands-on experiences at sea, highlighting the effectiveness of oceanographic and paleontologic research in engaging students in geoscience.

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