

Fostering big data ocean observation research experiences for high-school level students via remote instruction and in-person workshops

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Effectively recruiting young students from diverse backgrounds into ocean sciences and STEM fields calls for new approaches that cater to their interests and learning styles. Students today are different than students in pre-COVID-19 times not just because of the wider opportunities to access scientific information, remote learning, and big data; but also, in their work habits and communication styles.

This presentation concerns a NASA OCEAN Minority University Research and Education Project (MUREP) based at Florida Atlantic University's (FAU) Harbor Branch Oceanographic Institute in partnership with FAU High School. Several high-school students from underrepresented groups were mentored via individual, long-term, directed independent research modules surrounding the greater project that focused on monitoring carbon dynamics in coastal margins using satellite remote sensing and in situ ocean observations. Additionally, 25 high-school students engaged in a 2-day ocean and data science workshop, providing an introduction to exciting field, laboratory, and data science activities, including directly working with NASA satellite remote sensing data products.

For the directed research, interns undertook sub-projects tailored to their expertise and interests within broader research objectives. Satellite remote sensing was used to map seasonal patterns and the carbon cycle in the northern Gulf of Mexico (nGOM). Then, using available ocean observing data from our own efforts and external web portals, the interns crafted a three-dimensional view of the carbon-optics relationship in the nGOM. Finally, the interns analyzed long-term datasets to gauge the effects of hurricanes and major storms on the nGOM.

During in-person workshops, topic-specific training modules were complemented by data challenge questions, encouraging students to harness web-based NASA satellite data. Ocean optics concepts were further cemented through boat tours, hands-on sample collection, and

lab activities ranging from refraction rainbows and road dust to laser tanks. To wrap up, students explored diverse ocean science careers and enjoyed lunchtime discussions with oceanographers.

Here, we review our progress on this ongoing effort during COVID and post-COVID eras, including our insights and 360 feedback on what was and was not effective from largely remote mentoring perspectives.

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My Contributions:

Workshops: Helped create workshop material by reviewing and editing worksheets and mini-lab experiments. As an intern I supervised students and guided them through the various phases of the workshops.

Presentation: Created 1/3 of slideshow presentation.