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UNOLS 2019 Annual Meeting
Alexandria, VA



Filling the exposure gap by...

1. taking advantage of unused capacity on University National Oceanographic Laboratories System (UNOLS) vessels to provide undergraduate students with high-impact experiences.
2. sailing both declared geoscience majors and non-majors with undergraduate faculty mentors for 5-10 day ship transits.
3. increasing the number of meaningful shipboard experiences available to undergraduate students.





Overarching hypotheses...

Mentored experiences during ship transits that expose students to geoscience data gathering methods, geoscience inquiry, career discussions, and reflection will result in:

- increased interest in geoscience topics
- increased enrollment in STEM classes
- higher rates of retention and enrollment in geoscience majors, and
- broadened representation in STEM fields and geosciences.

2019 STEMSEAS Transits

April 28 – May 10: ***R/V Neil Armstrong*** from Woods Hole, MA to Reykjavik, Iceland, 9 students

May 13 – May 18: ***R/V Sikuliaq*** from Newport, OR to Seward, AK, 14 students

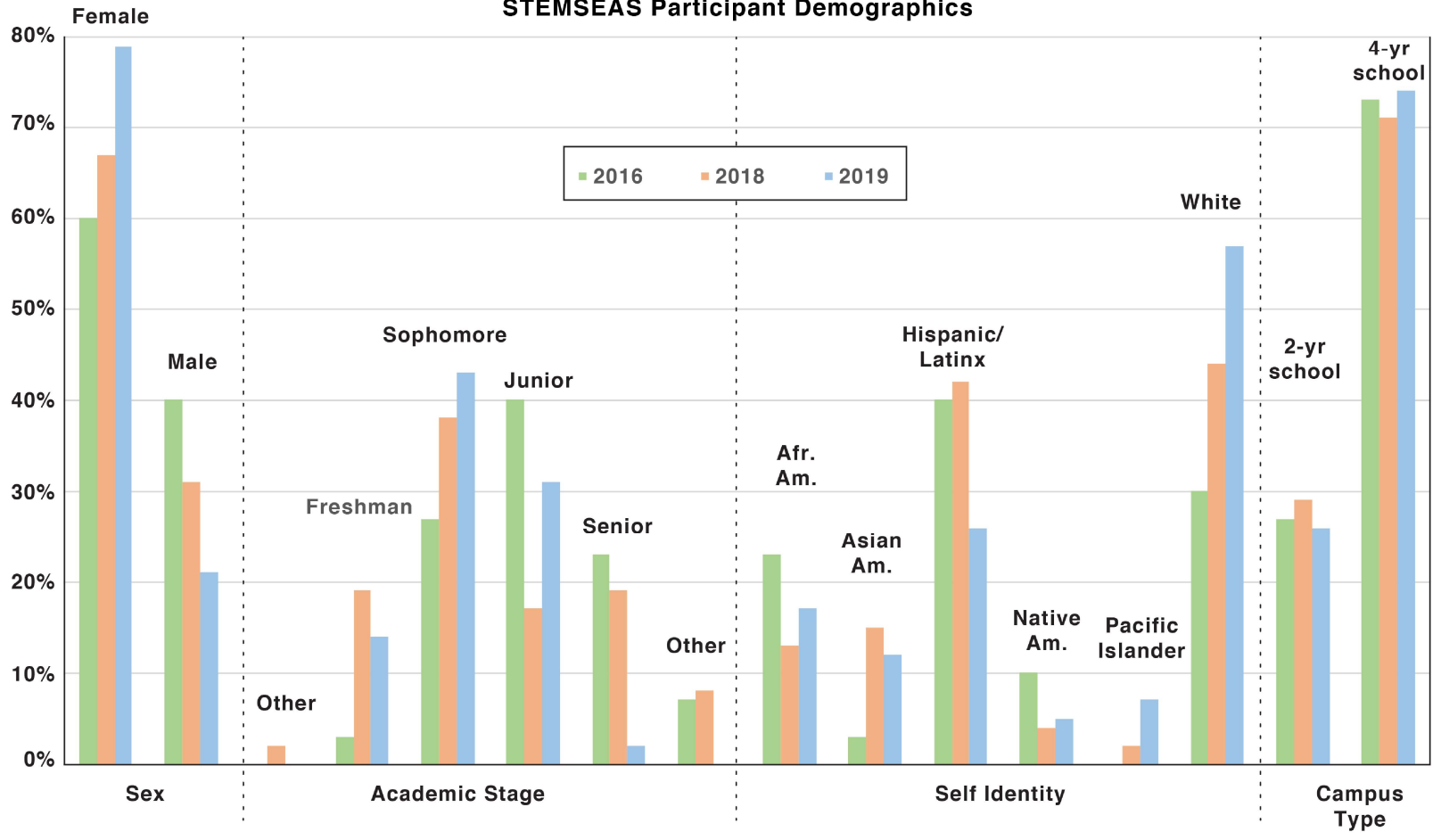
June 1 – June 8: ***R/V Endeavor*** from Morehead City, NC to Bridgetown, Barbados, 9 students

July 19 – July 25: ***R/V Atlantis*** from Newport, to San Diego, CA, 10 students

August 27 – September 7: ***R/V Sikuliaq*** from Kodiak, AK to Newport, OR, 4 students



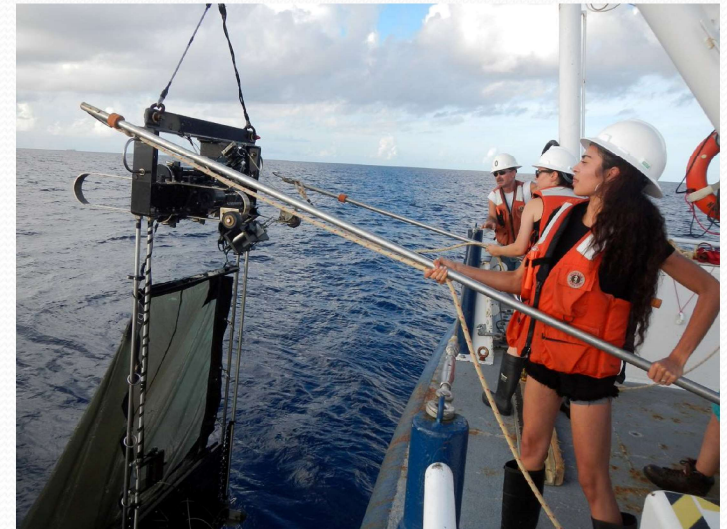
STEMSEAS Participant Demographics



impact on career trajectory

“Having the opportunity to go on this trip with STEMSEAS has been the single greatest thing I have ever done. I am so thankful for the opportunity that it has given me. I will never forget it.” – 2016 participant

“Disclaimer: I know I’m rating everything 10, but I honestly feel this way. It was chilling to have real scientist who makes a living off of their research as our peers and mentors. Never have I actualized the possibility of being a scientist like I did during our transit. I feel so happy and hopeful for the future, and I hope it’s a future filled with research.” – 2019 participant



impact on educational goals

“I was not sure if I wanted to go to grad school or not but after my educational experience at STEMSEAS I am already thinking about what grad schools I want to apply to.” – 2019 participant

“I want to get my PhD in Geology, probably in marine sciences.” – 2018 participant

”I was surprised by how my outlook of my future changed in the short two weeks. It made me realize I wanted to change my major and move towards a degree in a physical science, specifically geoscience.” – 2016 participant

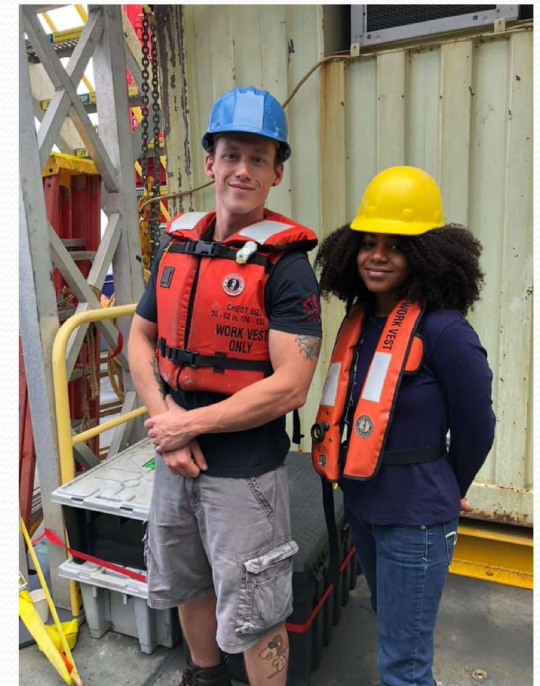


impact on confidence or motivation

“I also think it is worth noting that being around a diverse group of students that also share similar and contrasting interests is what made my experience a great one filled with happy memories and now new friendships...” – 2019 participant

“ The main benefit was the networking and experience aboard the ship, a truly invaluable gift! Everyone (cohort, instructors, mentor and crew) were intelligent, kind and passionate. I appreciate the opportunity to mesh with so many diverse backgrounds.” – 2019 participant

“The most surprising thing was how diverse the students and crew were. There were people that looked like me doing the job I wanted to do.” – 2016 participant



Opportunities for improvement





“More hands on science would be incredible, you’re already on a ship with a lot of amazing equipment I really wish we used more of it and got hands on with everything.” – 2018 participant

“ I think an improvement for the trip could have been using more proper or advanced equipment. At times we would do something to represent the way it is done, but it wasn’t the true way that scientists did it...” – 2018 participant



Photo : ©Elisabeth Rull / Divergence-Images

2019 program impact on perceptions of geoscience...

<i>Rank the following from strongly disagree (1) to strongly agree (5)...</i>	Before STEMSEAS		After STEMSEAS	
	Mean (1-5)	Strongly Agree/Agree	Mean (1-5)	Strongly Agree/Agree
Geoscience is very interesting	4.6	90%	4.5	94%
I plan to incorporate geoscience into my career	4.1	74%	4.1	71%
I feel comfortable with my level of geoscience knowledge*	3.1	38% 	3.6	64% 
I understand the types of careers that are available to geoscientists*	3.0	31% 	3.9	71% 

*statistically significant at $p < 0.01$

one element is “value added science” with student help...

Isotope chemistry of the open ocean

- Dr. Jessica Conroy, U. of Illinois
- Dr. Diane Thompson, Boston U.

Water column community structure through gene sequencing

- Dr. Anne Lise Ducluzeau, U of Alaska, Fairbanks

If you have sampling targets in waters we might cross, touch base.



For 2020

- 5 funded transits: tentative schedule below

April 22 - 28	Endeavor	Port Everglades	Narragansett
May 12-17	Sikuliaq	Seward	Seattle
July 11-17	Hugh Sharp	Gulfport	Lewes
August 9-13	Armstrong	Galway	Reykjavik
August 25-30	Langseth	Ketchikan	Dutch Harbor

- Possibilities for polar programs additional transit
- Building on current relationships
- Expanding recruitment to HBCUs through supplementary funding from NSF INCLUDES



NSF STEM for ALL video showcase





Questions?

We acknowledge support from
NSF Awards ICER 1540645,
1701168 and 1701174

