NSF sponsored Chief Scientist Training Cruise Opportunity:
with an emphasis on Biological and Chemical Oceanographic research

Angelicque White and Matthew Church
UNOLS Annual Meeting, November 2024




Overall project objectives

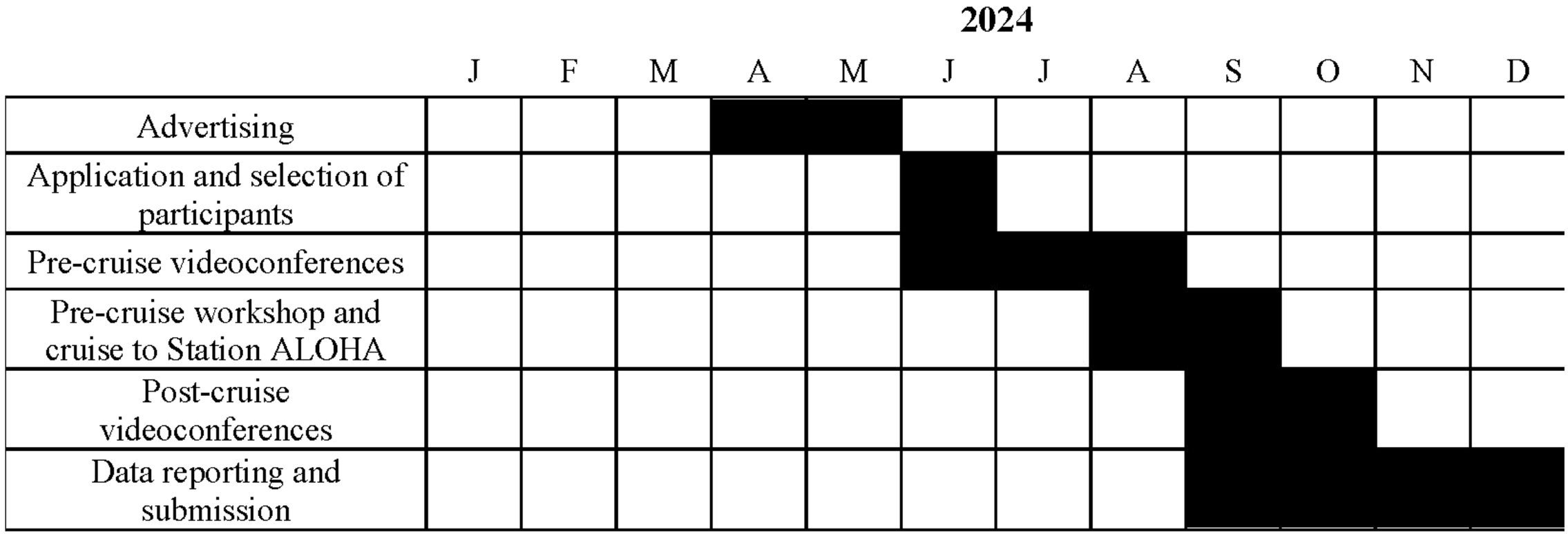
- Provide training opportunities and education to early career biological and chemical oceanographers on the efficient use and capabilities of the UNOLS research vessel fleet.
- Enable at sea cruise leadership opportunities and training in oceanographic sampling for early career biological and chemical oceanographers.
- Develop a collaborative cruise plan that maximizes the equitable and efficient use of shared resources (*e.g.*, ship time, equipment, supplies) to address key research questions related to the role of biology elucidate the role of biology in mediating vertical exchanges of bioelements between the upper ocean and the mesopelagic zone.

Leadership team*, 2024

* Matt and I were part of a similar effort in 2019

Timeline: relatively short fuse

Application posted to UNOLS in late April; applications due May 24th 2024. broadly from OCB to websites serving underrepresented groups in STEM disciplines (e.g., National Association for Black Geoscientists (NABG), Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)



Demographics

M/F	Institution
F	Oregon State University
M	University of South Carolina
F	Monterey Bay Aquarium Research Institute
M	MIT / Rutgers
F	University of Southern California
M	California State University Long Beach
F	University of Washington
F	Monterey Bay Aquarium Research Institute
M	Oregon State University
F	University of Miami/NOAA AOML
F	University of Hawai'i at Mānoa
M	University of Hawaii at Manoa
M	University of Hawaii at Manoa
F	University of Montana
M	MATE Program

38 applicants in a very short app. Period (< 2 mo.)

Selections:
8 Female / 7 Male + PIs and HOT Technician

12 Universities represented from US South, West Coast, East Coast, and Hawaii represented

Participants mostly new Assistant Professors or late-stage Postdocs, with one senior graduate student

NSF UNOLS Early Career Chief Scientist Training Workshop

Attendees: Angelicque White, AliceDoyle, Suchman, Cynthia L., David Karl, Danie Kinkade, Anita Lopez, Church, Matt, Dufour, Rose, Shannon Rauch

Agenda

Time (HST)	Tuesday August 20th 2024
08:00 - 08:45	Coffee, breakfast CMORE Hale (welcome to CMORE by Dave Karl)
08:45 – 09:00	Introduction to the workshop: PIs White and Church
09:00 – 9:30	NSF-OCE Program Officers: Cynthia Suchman, OCE-BIO; (Confirmed - Remote)
9:30 -10:00	NSF-OCE Program Officers: Rose Dufour, Program Director, Ship Operations (Remote); (Confirmed - Remote)
10:00 – 10:45	Data management and reporting: BCO-DMO Shannon Rauch (data submission, metadata, data policies; remote) (Confirmed- Remote)
10:45 – 11:00	Break
11:00 – 11:30	UNOLS and shipboard science: Alice Doyle, UNOLS Deputy Executive Secretary - Intro to MFP, especially Research Planner and completing an SME (Confirmed- Remote)
11:30 – 12:30	Lunch in CMORE Courtyard
12:30 – 13:15	UNOLS and shipboard science: Alice Doyle, UNOLS Deputy Executive Secretary - Intro to UNOLS and the Academic Research Fleet, UNOLS and shipboard science, Resources available through UNOLS (Confirmed- Remote)
13:15 – 14:00	Engaging the public through the media in your science: Dan Meisenzahl, UH Communications Director (Confirmed – In person)
14:00 – 14:15	Break
14:15 – 15:00	Conduct at sea and chief scientist responsibilities: Anita Lopez, Director of Research Vessel Operations (Confirmed – In person)
15:00 - 16:00	The HOT Team – Lessons from the decades (Confirmed – In person, Rohrer, Sadler, et al.)
16:00 – 17:00	Lightning talks from presenters
18:00	Group Dinner – Cruise Planning Discussions (Lulu's Waikiki, 2586 Kalākaua Ave, Honolulu, HI 96815)

- Pre-cruise in-person workshop **August 20-21**
  - **August 20*:** Philosophy of collaborative ocean science; specifics of cruise planning and assets [NSF, UNOLS]; personnel management, civility/safety at sea; data management, sharing and reporting [BCO-DMO]; intersectionality with ship operators [Lopez]; science outreach and interfacing with media [DM/UH]; talk story with HOT CS; continued discussion of science planning for this cruise

The **overall scientific motivation** for the cruise is to examine biological and chemical processes in the upper ocean and/or mesopelagic waters over daily time scales.

Broad themes that we believe can be addressed are:

- Quantify standing stocks of upper ocean plankton biomass using a combination of plankton imaging (imaging flow cytometry, VPR, UVP, PICA) and genomic approaches
- Quantify rates of primary production (C-based), N_2 fixation, and particle-mediated export of C, N, and P from the upper ocean to the mesopelagic zone.
- Weave in research goals and expertise of the selected participants to maximize the research scope.

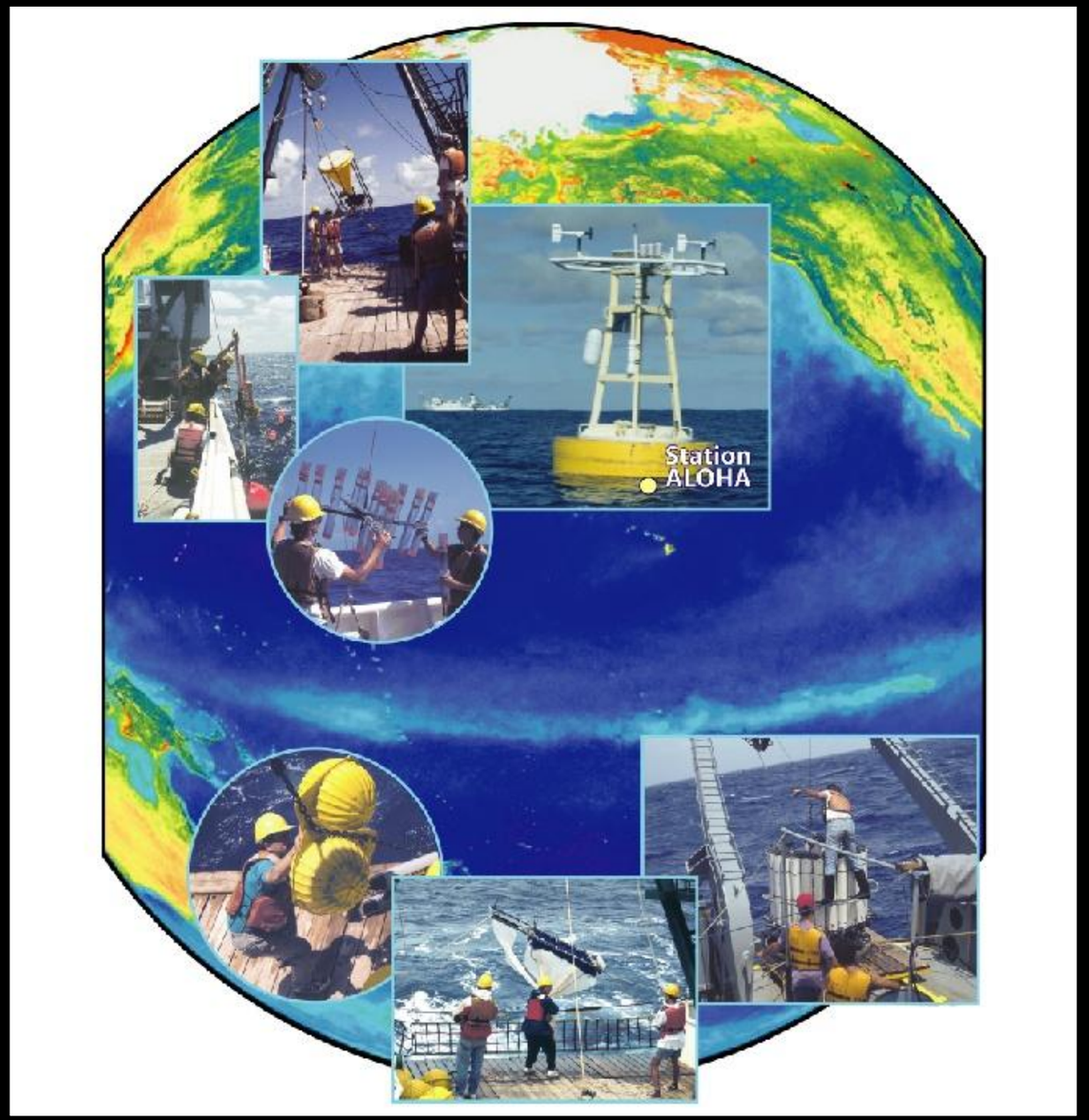
In teams, the participants developed focused, tractable research questions and hypotheses that could be addressed over the span of a 5-day cruise (N cycling/Particle export, Organismal diversity, C chemistry)

Study site: Station ALOHA (22° 45'N, 158° 00'W)

1988-present

2006-2016

2014-present

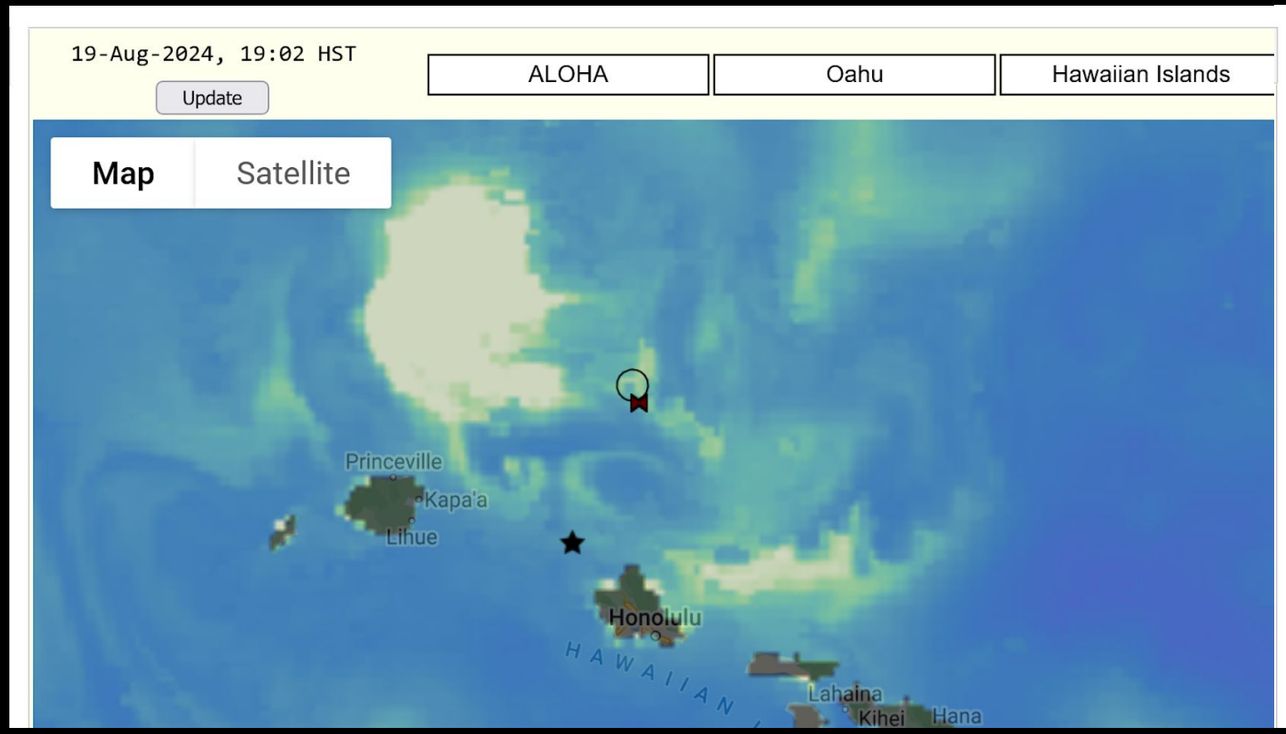


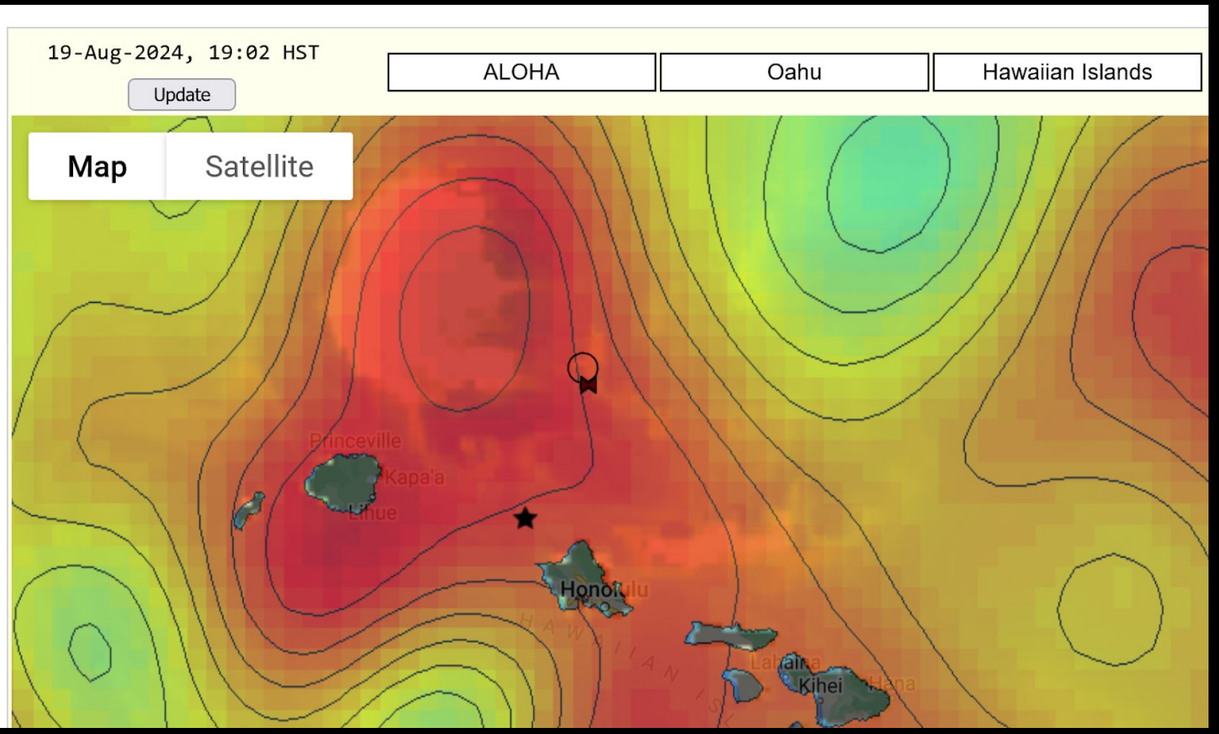
Hawaii Ocean Time-series: It's HOT! (1988 – present)

- Approximately monthly cruises to Station ALOHA – a deep, open ocean setting (~ 4800 m)
- More than 50 core measurements
- Highly leveraged site provides opportunity and knowledge
- Well characterized system

http://hahana.soest.hawaii.edu

Sampling Context:
A large bloom in an anticyclone moving west





https://hahana.soest.hawaii.edu/hot/trackmap/TrackMap.html

Successful cruise; + feedback; data in progress

First Time at Sea: An Experience of a Lifetime aboard the R/V Kilo Moana (By Charles Izuma Addey)

August 26, 2024 Angel White

Out on the vast North Pacific Ocean! Having embarked on what turned out to be a transformative journey aboard the R/V Kilo Moana and inspired by the rhythmic sway of the ocean waves, it complements my thoughts, narrating 5-day adventure that blends science, teamwork, and the awe-inspiring beauty of oceanography research.

https://csw.unols.org/

Mushrooms of the sea (by Xuefeng “Nick” Peng)

August 25, 2024 Angel White

Witnessing the Decay of a Diatom Bloom Near Station ALOHA by Michael Carlson

August 25, 2024 Angel White

A rising tide lifts all boats

September 4, 2024 Angel White

A success by all measures (science, networking, outreach)
Current status = data being worked up; post-cruise check-ins pending