

Progress Report

Project Title: Sustaining and Expanding the Southern California Coastal Ocean Observing System

Award number: NA21NOS0120088

Period of Activity: 01/01/2023 – 6/30/2023

Principal Investigator: Clarissa Anderson, UCSD - SCCOOS Executive Director

I. PROJECT MILESTONES:

Milestone Table. Developed and modified from the SCCOOS milestone table available on the cover page of our FY21 and FY22 descope report as well as SCCOOS Goals, Objectives, and Tasks in Table 4 of our [FY21-26 proposal](#). Projects are organized by SCCOOS subsystems and listed in bold. High-level milestones/deliverables are listed below each project. Status of each milestone/deliverable is reported as complete, on-track, or delayed. If the milestone is delayed, a justification for the delay is provided along with a new completion date and description of activities employed or to be employed to mitigate the delay under section II. Progress and Accomplishments.

Project and Task(s)	Status
GOVERNANCE SUBSYSTEM	
SCCOOS Regional Association Organization & Outreach/Education	
SIO - 1) Maintain a centralized program office that oversees SCCOOS operations and effectively coordinates with all partners to expand capacity 2) Develop regionally relevant, user-driven analysis, decision-support, and visualization products and tools to address historic and emerging stakeholder requirements in the SCCOOS region; 3) Engage stakeholders to gather customer feedback and refine requirements for SCCOOS products and services. 4) Expand and strengthen state, federal, and industry partnerships to innovate ocean observations and information products in collaboration with CeNCOOS.	On-track
OBSERVING SUBSYSTEM	
HF Radar Operations & Maintenance	
Sustain & operate 31 High Frequency Radar in the SCCOOS Region - continuous service via HFRNet, SCCOOS, and CeNCOOS	On-track

California Underwater Glider Network (CUGN)	
SIO - Sustain & operate two Spray glider lines in the SCCOOS region - continuous service with 3-5 month deployments per Spray	On-track
Harmful Algal Bloom (HAB) Monitoring Program + SPATT	
SIO/USC/UCLA/UCSB/CalPoly - Sustain weekly sampling at five pier sites in the SCCOOS region for HAB species, particulate toxins, chlorophyll-a, temperature, salinity, & inorganic nutrients. Harmful plankton taxa abundances, chlorophyll-a, temperature and salinity are reported weekly, and data are submitted weekly to the SCCOOS database. Samples are shipped monthly to USC for domoic acid analysis. Samples are shipped quarterly to UCSB for nutrient analysis.	On-track
SIO/USC/UCSB - Sustain weekly SPATT sampling for a suite of dissolved toxins and shipped monthly to USC for analysis.	On-track
SCCOOS Automated Shore Stations (SASS)	
SIO/CSUN/UCSB - Operate & maintain four SCCOOS Automated Shore Stations (SASS) - continuous data service at a 4-min ingestion frequency, with routine (monthly) sensor cleaning and maintenance. Standard station parameters are temperature, salinity, depth, and chlorophyll fluorescence.	On-track
OAH Monitoring on SASS Stations	
SIO - Integrate, operate & maintain self-calibrating SeapHOx (pH and Oxygen sensors) on 3 automated shore stations in the SCCOOS region: Scripps Pier, Santa Monica Pier, and Stearns Wharf. Data are provided continuously, with near real-time calibrations applied. Routine instrument cleaning and servicing (e.g. reagent replacement) is coordinated with SASS personnel.	Delayed - see details below
CalCOFI- Distribution and abundance of marine birds in the Southern California Bight and adjacent waters	
Farallon Inst - Collect seabird & marine mammal distribution and abundance data on winter, spring, and summer CalCOFI cruises and spring/summer NMFS RREAS (rockfish recruitment survey) and deliver annual reports to SCCOOS for incorporation into CCIEA and NMS reports.	On-track
California Multivariate Ocean Climate Indicator (MOCI)	
Farallon Inst - Update and disseminate the Multivariate Ocean Climate Indicator (MOCI) - CeNCOOS collaboration- for incorporation into customized data synthesis products and curated data views	On-track

Statewide Kelp Canopy Area/Biomass Dynamics	
WHOI - Incorporate kelp biomass database into our portal & develop user-driven discovery tools & displays - CeNCOOS collaboration - for incorporation into customized data synthesis products, curated data views, and made available for all relevant assessments, e.g. MPAs	On-track
California Coastal Flood Network	
SIO - Support & expand the California Coastal Flood Network, adding a new Southern California site to the threshold validation/evaluation process each year	On-track
HABON Pilot - CA IFCB Network O&M	
Operate and maintain a network of twelve Imaging FlowCytobots (IFCBs) to identify HAB species in real-time at critical land-based <i>and</i> offshore locations throughout California.	On-track
CDIP - Long Beach Wave Buoy Model Validation	
Operate and maintain the Long Beach wave buoy and model validation in support of marine operations/navigation at the Port of Long Beach.	On-track
DATA MANAGEMENT AND CYBERINFRASTRUCTURE SUBSYSTEM	
SCCOOS DMAC	
SIO - 1) Support ongoing maintenance, operation, and development of SCCOOS cyberinfrastructure to sustain long-term data stewardship for our partners and stakeholders; 2) Promote data standardization, automation, discovery, and public access; 3) Strengthen data stewardship within the SCCOOS consortium to improve data quality, access, attribution, exchange, delivery, and storage and; 4) Support the functionality of national data assembly centers through leadership in observation and product delivery, quality control methods, and capacity building.	On-track
Axiom Data Science, a Tetra Tech Company	
ADS - 1) Enable and support SCCOOS Cyberinfrastructure and development of a new Statewide Data Portal; 2) Ingest and maintain SCCOOS-operated and Non-SCCOOS Data Assets, including sensors, Gliders, HF Radar, models, biological, and historical legacy time series; 3) Implement real-time sensor data quality control system and; 4) Support the creation of data-driven products and applications.	On-track
CalCOFI - Data Synthesis and Serving/Product Development	
SIO - Data synthesis & product development in support of CalCOFI, fisheries, &	On-track

National Marine Sanctuaries; continual syntheses and automated, curated data views will be developed and vetted with crucial stakeholder partners	
MODELING AND ANALYSIS SUBSYSTEM	
ROMS - 3 km Statewide Operational model	
Seatrec - Support & serve real-time, data-assimilative ROMS predictions to SCCOOS & CeNCOOS end-users; models are run on SCCOOS servers and output is provided hourly to daily to the SCCOOS portal. This operation was terminated October 31, 2022 and replaced by the WCOFS run at NOAA.	Completed
ROMS - High Resolution Shelf and Nearshore Physics	
UCLA - Support nearshore ROMS development for improved physics of direct relevance to water quality managers and SCCOOS partners; SCCOOS supports a project page with annual updates of model output/visualizations of nearshore physics developments	On-track

II. PROGRESS AND ACCOMPLISHMENTS

High-Frequency Radar		
Amount	Funding Area	Task
\$2,170,000	Core	<p>Status:</p> <p>Accomplishments:</p> <p>Issue (if any): Delays in antenna calibrations at AGL1, ARG1, and FBK1 due to need for a drone on the DIU Blue UAS Cleared List since those sites are on Vandenberg Space Force Base. Ordered and received (in July 2023) new Blue Halo IE-V2 drone for future calibrations at these sites.</p>

Names of existing and planned HFR stations	Status	Date of most recent antenna calibration	Date planned for next antenna calibration	Recapitalization needs

AGL1	Operational. Modem issues resolved, installed new RX antenna whip, new split cables on antenna base	9/15/2021	ASAP	TX chassis, RX chassis, TX antenna
ARG1	Operational. Reinstalled guy wires multiple times after TX antenna fell over, new lock and receptacle on box, installed new hard drive for Codar Archives	9/15/2021	ASAP	RX chassis, TX chassis, TX/RX combined dome antenna
PTC1	Operational. Modem issues resolved.	09/21/2022	09/2023	RX chassis, TX chassis
FBK1	Operational. Replaced AWG unit, removed TX/RX chassis for troubleshooting (ongoing)	9/27/2021	ASAP	TX/RX combined dome antenna
LUIS	Operational. Replaced ethernet power controller, installed new UPS inverter, installed new educational sign requested by landowner, installed new hard drives	10/21/2021	ASAP	RX chassis, TX chassis, TX/RX combined dome antenna
SDPL	Operational. Computer was upgraded. Script was added for site to send radial distributions on a daily basis.	12/15/2022	12/2023	New HPWREN link antennas and power infrastructure
SDBP	Operational. Hardware enclosure was hardened and gaskets were replaced. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.	06/06/2022	06/2023	
SDSE	Operational. New Tx/Rx chassis were installed after our last receiver failed. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.	06/06/2022	06/2023	
SDSC	Operational. Station experienced a long outage after the main panel supplying power to the station burned out. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.	4/27/2021	02/2023	Rx Chassis Tx Chassis Rx Antenna Tx Antenna
SDCP	Operational. Experienced an outage due to a network problem and limited site	Ideal Pattern	Unknown	Install AIS receiver and upgrade software to

	access. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.			include autoAPM.
SDUT	Operational. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.	06/07/2022	06/2023	Rx Chassis Rx Antenna
SDDP	Operational. Computer was upgraded. Script was added for site to send radial distributions on a daily basis.	6/27/2019	06/2023	Rx antenna
SDWW	Operational. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.	12/15/2022	12/15/2023	Tx Chassis Rx Chassis
SDCI	Not operational. This site might be phased out if no headway is made in regaining access to it. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.	10/18/2018	Unknown	Batteries for solar system Rx antenna New HPWREN link antennas
SDSL	Operational. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.	6/08/2020	06/2023	Rx Chassis Tx Antenna
SDSN	Operational. Computer was upgraded. Script was added for the site to send radial distributions on a daily basis.	03/20/2021	04/2022	
RFG1	Operational: Computer was upgraded to latest CODAR R22 and M1 chip mac mini	11/17/2022	02/2024	Rx Chassis Tx Antenna New AC Shed will need refurbishing
TRL1	Ready to deploy	N/A	N/A	New Mac Mini Solar trailer currently located at UCSB.
SCI1	Operational: SCI1 has been operating fairly consistently during the reporting period. Will need to retune TX antenna	08/24/2022	08/2023	Rx Chassis Tx Antenna New AC New Mac Mini
SNI1	Non Operational: At request of US	AIS	N/A	Rx Chassis

	NAVY and ongoing radio frequency project	pattern coming soon		Tx Antenna New Trailer Enclosure New AC AIS antenna pattern hardware/license New Mac Mini
COP1	Operational: Computer was upgraded to latest CODAR R22 and M1 chip mac mini	07/2023	07/2024	Rx Chassis Tx Antenna
PTM1	PTM1 has been operational over the reporting period.	08/23/2022	08/2023	Rx Chassis Tx Antenna New Mac mini
SSD1	SSD1 has been operational over the reporting period.	06/202321	06/2024	New A/C New Mac Mini
MGS1	MGS1 has been operating fairly consistently during the reporting period.	06/2023	06/2024	Rx Chassis Tx Antenna New AC New Mac Mini
NIC1	NIC1 has been operational over the reporting period. Operation has been satisfactory.	02/01/2022	02/2023	New Front Door for enclosure New Mac Mini New Modem
SCCI	Operational. Auto APM software installed.	Auto APM installed 4/15/22	06/2023	
SCDH	Non-Operational. The site has been non-operational since mid-February. The electronics need to be relocated and a new enclosure and air conditioner were received. Additional materials are on order for reinstall.	n/a	Fourth quarter 2023	
ANI1	Anacapa Island- Site to be installed sometime in July/Aug 2023.			
SCTB	Operational. A new dome antenna was installed and the GPS and cell antenna	11/18/2021	Third quarter	

	were relocated. A new computer will be installed in the third quarter 2023.		2023	
SCPF	Operational. The site has been operating satisfactorily throughout this project period. A new dome antenna will be installed in the third quarter 2023.	02/28/2018	Third quarter 2023	New Tx chassis (\$36,750) New Rx chassis (\$68,250)
SCNB	Operational. The computer hard drive was reformatted and reinstalled.	10/24/2021	Third quarter 2023	New antenna (\$23,000) New cables (\$1,800) New electronics enclosure (\$5,000)
SCDB	Non Operational. The Rx chassis was sent to CODAR for a retune to meet ITU requirements. A new dome antenna is on order along with an Auto APM kit and should be installed in the fourth quarter of 2023.	11/23/2021	Fourth quarter 2023	

Additionally, if your RA operates HFR data servers or other information technology (IT) computing infrastructure for HFR beyond the stations themselves, please include a narrative for each such component in the table below (adding rows as needed).

Names of RA's HFR IT Systems	Status	Recapitalization needs
SIO Portal	Operational	N/A - planned in HFRNet
UCSB Portal	Operational - The portal is hosted as a virtual machine that is in the processing of being migrated to a new hardware cluster.	N/A - planned in HFRNet
Rutgers Portal	Operational	N/A - planned in HFRNet
USM Portal	Operational	N/A - planned in HFRNet
MBARI Portal	Operational	N/A - planned in HFRNet
UMiami Portal	Operational	N/A - planned in HFRNet
OSU Portal	Operational	N/A - planned in HFRNet

Gliders and Other Uncrewed Systems (UxS)

Summary of glider activities over the reporting period: Line 80 and alongshore

Mission	Serial No.	Deploy Date	Recover Date	Days	Distance (km)	Dives
22B05801	58	29-Nov-2022	16-Mar-2023	107	2183	1046
23305501	55	16-Mar-2023	06-Jul-2023	112	2480	1036
22B02001	20	22-Nov-2022	19-Jan-2023	58	1320	544
23203001	30	21-Feb-2023	20-Jun-2023	119	2432	1016
0040 active	40	20-Jun-2023	Ongoing	20	400	197

Accomplishments / successes: All operations are on track.

Problems/delays: None

Other UxS activities of note (status/accomplishments, etc.): Continuing collaboration with SWFSC through REFOCUS project. An objective is to integrate pH and nitrate sensors onto newly developed Spray2 underwater glider. Beginning recapitalization of glider fleet with Spray2's.

Other Core Observation Activities

Summary of other Observation Activities over the reporting period:

SCCOOS Automated shore stations (SASS)

PIs: Anderson/Carter (SIO), Silbiger (CSUN), Washburn (UCSB)

Accomplishments / successes:

- Scripps Pier: Maintained and operational over the reporting period. Completed one 7-month test of a new Turner ECO fluorometer configured in open (non-pumped) mode.
- Newport Beach Pier: Maintained and operational for a majority of the reporting period. Minimal outage was due to infrastructure upgrades to conduit, cables, and pier clamp. The conduit for power and data was re-secured and new cables were installed on May 16th and 17th (Carter and Martin). This work was required due to large storms in the

winter 2022. The pier clamp replacement project was conducted from May 31st to June 2nd (Carter and Martin) and the Air Blaster system was re-installed on June 2nd (Salazar). All infrastructure upgrades were successfully completed and are currently operational.

- Santa Monica Pier: PI Kerry Nickols left CSUN to accept a new position at Ocean Visions on February 13th, 2023. We brought Nyssa Silbiger, CSUN Associate Professor, on board as the SCCOOS Santa Monica Pier Shore Station principal investigator. This station has been maintained and operational over the reporting period. Carter and Martin have conducted 2 maintenance dives and one training dives with new PI Silbiger during this reporting period.

Problems/delays:

- Stearns Wharf: Site is currently offline due to cable failure. New cable has been ordered and will be installed when received.
- Santa Monica has been online though it has a non-operational pump discovered on May 5th which will affect data quality until replaced.
- All sites have had an overgrowth of biofouling (mussels and barnacles) this spring season causing pump and cable failures, and some data quality issues. Higher frequency maintenance dives should be considered to maintain data quality over spring months.

Station	Parameters	Date of Most Recent Deployment	Recapitalization Needs
Scripps Pier	Temperature Chlorophyll Salinity Depth pH Oxygen IFCB	CTD Package: 12/2/2022 Self-calibrating SeapHOx: 12/2/2022	Pier Clamp, Power-Data Conduit Replacement (need in 2023) New Fluorometer- (ASAP -Seabird discontinued current fluorometer) CTD Cable x 2 (Backups for other stations - 2023)
Newport Beach Pier	Temperature Chlorophyll Salinity Depth pH Oxygen IFCB	CTD Package: 6/9/2022 SeaFET: 6/9/2022 IFCB: 7/7/2022	Pier Clamp, Power-Data Conduit Replacement (completed June 2nd) New Fluorometer (ASAP -Seabird discontinued current fluorometer)
Santa Monica Pier	Temperature	CTD Package:	Pier Clamp,

	Chlorophyll Salinity Depth	3/10/2022	Power-Data Conduit Replacement (need in 2023) New Fluorometer-ASAP (Seabird discontinued current fluorometer)
Stearns Wharf	Temperature Chlorophyll Salinity Depth IFCB	CTD Package: 2/25/2022 IFCB: 4/15/2022	Pier Clamp, Power-Data Conduit Replacement (need in 2023) New Fluorometer-ASAP Pier Clamp (2023) CTD Cable Site is currently offline due to cable failure. New cable has been ordered and will be installed when received.

OAH Monitoring on SASS Stations

PI: Martz (SIO)

Accomplishments / successes: Carter and Martin have assisted with maintaining Scripps Pier OAH sensor in collaboration with SASS station.

Problems/delays:

Harmful Algal Bloom Monitoring Alert Program

PIs: Anderson/Carter (SIO), Shipe (UCLA), Caron (USC), Brzezinski (UCSB), Pasulka (Cal Poly)

Accomplishments / successes: Sampling is on track, and timely information on HAB abundances and relevant environmental conditions at the five sample sites is uploaded to the CalHABMAP website and data server on a weekly basis. Expanded HABs sampling into Morro Bay Estuary (2 sites weekly monitoring) through funding from the MBNEP. Leveraging data and methods from the Cal Poly Pier HABs monitoring site to compare HAB patterns across these to local sites.

Problems/delays:

Multivariate Ocean Climate Indicator (MOCI)

PI: Garcia-Reyes (FI)

Summary of other Observation Activities over the reporting period: MOCI updated as scheduled.

Accomplishments / successes:

- MOCI updated for 2022 fall and 2023 winter quarters.
- Scripts for input data have been updated.
- Data are now shared via the CalOOS Data Portal
- Alternative ways to fill buoy wind data have been explored

Problems/delays: None

Seabird and Marine Mammal Observations

PI: Sydeman (FI)

Summary of other Observation Activities over the reporting period: Surveys of seabirds at sea on CalCOFI and RREAS surveys were conducted as scheduled, including participation on CalCOFI surveys in January and April, and RREAS in early May.

Accomplishment / successes: Time series of seabird density at sea was updated to include new data collected during 2023. Data reports were produced in near real-time, and posted to the SCCOOS website. Data is updated and available on NOAA ERDDAP. Data were used in ecosystem status reports, including the CCIEA report, and the State of the California Current manuscript.

Problems/delays: RREAS was truncated due to ship staffing issues, but about 10 days of observations were obtained.

Statewide Kelp Canopy Area/Biomass Dynamics

PI: Bell (WHOI)

Accomplishments / successes: Kelp canopy products (biomass/area) were derived for Q4 2022 & Q1 2023 and delivered to the data portal during this period. New Landsat 9 imagery has been integrated into the dataset that replaced Landsat 7 (now decommissioned). Additional analysis of Monterey Peninsula using both Landsat and Sentinel 2 imagery was completed for CDFW.

Problems/delays: None.

California Coastal Flood Network

PI: Merrifield (SIO)

Summary of other Observation Activities over the reporting period: The new flood forecast site (Leucadia) has been established as scheduled.

Accomplishments / successes: The [Leucadia TWL forecast](#) has been created, with further validation and model refinement still ongoing pending the permitting delay from Q1 and Q2. A new [flood reporting tool](#), along with a [viewer](#) for past events, is now available. The 6-January 2023 large wave event was documented with a [storymap](#). The CoastSnap network in San Diego continues to show sustained engagement from the public. A [dashboard](#) was created to display the latest snaps from the three sites maintained by the Coastal Processes Group.

Problems/delays: None

DMAC Activities

PI: Anderson (SIO), Bochenek (ADS)

Summary of other Observation Activities over the reporting period: We continue to ingest, maintain, and serve SCCOOS and non-SCCOOS data assets for discovery and access in [the CalOOS data portal](#).

Accomplishments / successes: Added new IFCB data streams (data are being displayed through an [IFCB dashboard](#)), updated ingestion workflow to merge datastreams at [the Scripps Pier Automated Shore Station](#), updated [“Submitting Data to Axiom” guidelines](#) to support data providers, ingested and backfilled new datasets including [HAB Predictions from the C-HARM System version 3.0](#), updated [kelp biomass and area dataset](#), City of San Diego Moorings (new deployments 2023: [Point Loma mooring](#)), refreshed [MOCI climate indicator](#) for the latest quarter. Axiom also provided user support by tracking and responding to data requests and feedback submitted through the data portal.

Additionally, Newgrids system was tested and deployed to production to replace a data ncWMS service for model data display. The ingestion of gridded data sets to support ingesting OFS models were included from AWS, which will ease the challenge of inconsistent data access from CO-OPS endpoints. WCOFS was used as a test model for automated regridding and COG generation in the tile-catalog service for visualization. Additional testing of the regridding workflow is underway for other models including: VCOM or other non-ROM; HYCOM; GHRSSST; GFS Waves; SFBOFS; and NWGOA. Further, following the Axiom-IOOS RA meeting in April 2023, the development of a technical plan is underway to address near-term feedback for portal improvements, including improving the search function in the data catalog; improving portal load time; and reviving the virtual sensor for time series display for gridded data.

Axiom Data Science also participated in various regional, state, and national DMAC activities, including the Axiom-IOOS RA meeting, regular weekly calls, and regional meetings in support of SCCOOS DMAC.

SCCOOS has also internally built out successful end products on top of these data layers, including a [domoic acid and marine mammal stranding tracking tool](#) in response to the large DA event that occurred during early summer in Central and Southern California, and [a workflow](#) for creating a FAIR data product from IFCB classifications with recommendations to further [best practices and recommendations for plankton imaging data management](#).

Problems/delays: None

CalCOFI - Data Synthesis and Serving/Product Development

PI: Semmens (SIO)

Summary of other Observation Activities over the reporting period: We have continued to develop an integrated database that serves front-end data visualizations. We have engaged with key partners and stakeholders to ensure that the development of the data products meets user needs and requirements.

Accomplishments / successes: We have developed an integrated database PostGres SQL database with hydrographic and larval fish data that follows community-based data and metadata standards. To ensure this work is produced with input from the community, we have developed

an Integrated Database Working Group that meets monthly to review progress, set priorities, and share resources. Additionally, we have shared the visualization with stakeholders at the annual CalCOFI Conference 2022 and the CalCOFI Workshop 2023. The database interfaces with an interactive data visualization to share trends and patterns of the ocean ecosystem off of southern California (see [here](#)). Additionally, we have created a scrollytelling [app](#) to share about hypoxia with California citizens.

Problems/delays: None

ROMS High Resolution Shelf and Nearshore Physics

PI: *McWilliams (UCLA)*

Summary of other Observation Activities over the reporting period: We continue to configure nested model domains with surface wave coupling to the circulation and material transport. The present focus is on nearshore currents in the Santa Barbara region.

Accomplishments / successes:

Problems/delays: None.

IOOS, NOAA, Other Agency Funding (non-core funding)		
Funding amount spent	Funding Area /Recipient	Task: please provide a status update.
Provided \$20,000 Spent Remaining \$242.23	CDIP - Long Beach Buoy Wave Buy Model Validation	Status: on-track Accomplishment: These funds support the maintenance of CDIP Long Beach Wave Buoy Issue (if any):
Provided \$297,500 Spent Remaining \$182,060.05	HABON Pilot - CA IFCB Network O&M	Status: on-track Accomplishments: Maintained four operational IFCB nodes in southern California, dissemination real-time imagery via a live dashboard that is hosted on the CalOOS Portal and HABDAC portal supported by Axiom Data Science. Classifiers were refined and will be generating real-time products for stakeholders within the next month. Issue (if any): Stearns Wharf, Newport Beach Pier, and Del Mar IFCBs required significant repairs and testing over the last six months, leading to long down-times at those sites.
Provided \$69,329 Spent Remaining	HFR FCC	Status: on-track HFR Federal Communications Commission (FCC) and Re-tuning

\$26,264.26		
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III. PROJECT CHALLENGES/MODIFICATIONS RELATED TO COVID (200 words):

- NA

IV. PUBLICATIONS AND REPORTS:

*SCCOOS PIs are in bold

1. Asokan, A. (2023). The First 10 Years: Measuring The Success Of California's Underwater Parks. *NRDC*. - **References Rhul CeNCOOS and SCCOOS MPA paper**
2. Bartoloni S.E., **Walter R.K.**, Wewerka S.N., Higgins J., O'Leary J.K., and Bockmon E.E. (2023), Spatial distribution of seawater carbonate chemistry and hydrodynamic controls in a low-inflow estuary, *Estuarine, Coastal and Shelf Science*, 281, <https://doi.org/10.1016/j.ecss.2022.108195>.
3. **Bell, T. W.**, Cavanaugh, K. C., Saccomanno, V. R., Cavanaugh, K. C., Houskeeper, H. F., Eddy, N., ... & Gleason, M. (2023). Kelpwatch: A new visualization and analysis tool to explore kelp canopy dynamics reveals variable response to and recovery from marine heatwaves. *Plos one*, 18(3), e0271477. <https://doi.org/10.1371/journal.pone.0271477>
4. Bresnahan, P., Briggs, E., Davis, B., Rodriguez, A. R., Edwards, L., Peach, C., ... & **Merrifield, M.** (2023). A Low-Cost, Diy Ultrasonic Water Level Sensor For Education, Citizen Science, And Research. *Oceanography*, 36(1), 51-58. <https://www.jstor.org/stable/27200038>
5. Byrne, S., **Merrifield, M.**, **Carter, M.**, Cayan, D., Flick, R., Gershunov, A., & Giddings, S. (2023). Southern California winter precipitation variability revealed by 100-year ocean salinity record. *Research Square*. <https://doi.org/10.21203/rs.3.rs-1769820/v1>
6. Cavanaugh, K. C., Cavanaugh, K. C., Pawlak, C. C., **Bell, T. W.**, & Saccomanno, V. R. (2023). CubeSats show persistence of bull kelp refugia amidst a regional collapse in California. *Remote Sensing of Environment*, 290, 113521. <https://doi.org/10.1016/j.rse.2023.113521>
7. Charles S. Colgan Center & Castelletto Anthony. (2023). [The US Integrated Ocean Observing System \(IOOS\): A Prototype User Valuation](#). - References all RAs; SCCOOS.
8. Gangrade, S., & Franks, P. J. (2023). Phytoplankton patches at oceanic fronts are linked to coastal upwelling pulses: Observations and implications in the California Current System. *Journal of Geophysical Research: Oceans*, <https://doi.org/10.1029/2022JC019095>. - **References SCCOOS HFR derived surface currents**
9. Hoogstra, L. (2023). (Mathematics, M.S. Thesis at Cal Poly SLO), "Detecting coherent transport structures in ocean surface flows."- **utilized HFR data for analysis**
10. Hypolite, D., Romero, L., **McWilliams, J. C.**, & Dauhajre, D. P. (2023). Langmuir circulations transfer kinetic energy from submesoscales and larger scales to dissipative

scales. *Journal of Physical Oceanography*, 53(1), 253-268.

<https://doi.org/10.1175/JPO-D-22-0126.1>

11. Johnson, E. (2023). Masters of Science from Cal Poly, SLO - **Thesis used HABs data and nearshore station data from the Cal Poly Pier.**
12. **Kenitz, K. M.**, Orenstein, E. C., Anderson, C. R., Barth, A. J., Briseño-Avena, C., **Caron, D. A.**, **Carter, M. L.**, Eggleston, E., Franks, P. J. S., Fumo, J. T., Jaffe, J. S., McBeain, K. A., Odell, A., Seech, K., Shipe, R., Smith, J., Taniguchi, D. A. A. , Venrick, E. L., & Barton, A. D. (2023). Convening Expert Taxonomists to Build Image Libraries for Training Automated Classifiers. *Limnology and Oceanography Bulletin*.
<https://doi.org/10.1002/lob.10584>
13. **Kenitz, K.M.**, **Anderson, C.R.**, **Carter, M.L.**, Eggleston, E., Seech, K., Shipe, R., Smith, J., Orenstein, E.C., Franks, P.J., Jaffe, J.S. and Barton, A.D. (2023). Environmental and ecological drivers of harmful algal blooms revealed by automated underwater microscopy. *Limnology and Oceanography*, 68(3), 598-615.
<https://doi.org/10.1002/lno.12297>
14. Ludka, B. C., Young, A. P., Guza, R. T., O'Reilly, W. C., & **Merrifield, M. A.** (2023). Alongshore variability of a southern California beach, before and after nourishment. *Coastal Engineering*, 104223. <https://doi.org/10.1016/j.coastaleng.2022.104223>
15. Munsch, S. H., Beaty, F. L., Beheshti, K. M., Chesney, W. B., Endris, C. A., Gerwing, T. G., ... & **Walter, R. K.** (2023). Northeast Pacific eelgrass dynamics: interannual expansion distances and meadow area variation over time. *Marine Ecology Progress Series*, 705, 61-75. <https://doi.org/10.3354/meps14248>
16. Pistorius, P. A., **Sydeman, W. J.**, Watanuki, Y., Thompson, S. A., & Orgeret, F. (2023). Climate change: The ecological backdrop of seabird conservation. In Conservation of Marine Birds (pp. 245-276). *Academic Press*.
<https://doi.org/10.1016/B978-0-323-88539-3.00020-0>
17. Satterthwaite, E. V., Allen, A. E., Lampe, R. H., Gold, Z., Thompson, A. R., Bowlin, N., ... & **Semmens, B. X.** Toward Identifying the Critical Ecological Habitat of Larval Fishes: An Environmental DNA Window into Fisheries Management. In Frontiers in Ocean Observing: Emerging Technologies for Understanding and Managing a Changing Ocean. E.S. Kappel, V. Cullen, M.J. Costello, L. Galgani, C. Gordó-Vilaseca, A. Govindarajan, S. Kouhi, C. Lavin, L. McCartin, J.D. Müller, B. Pirenne, T. Tanhua, Q. Zhao, and S. Zhao, eds, *Oceanography* 36(Supplement 1),
<https://doi.org/10.5670/oceanog.2023.s1.29>.
18. Simpson, A., Giddings, S., Spydell, M., Grenzeback, R., Harvey, M., Young, A., ... & Gallien, T. (2023). Mouth Morphodynamics Of An Intermittently Closed Estuary In Response To Storm Events. In *Coastal Sediments 2023: The Proceedings of the Coastal Sediments 2023* (pp. 2604-2614). https://doi.org/10.1142/9789811275135_0238 -
references SCCOOS

19. Tallam, K., Nguyen, N., Ventura, J., Fricker, A., Calhoun, S., O’Leary, J., ... & **Walter, R. K.** (2023). Application of Deep Learning for Classification of Intertidal Eelgrass from Drone-Acquired Imagery. *Remote Sensing*, 15(9), 2321.
<https://doi.org/10.3390/rs15092321>
20. Taherkhani, M., Vitousek, S., **Walter, R. K.**, O’Leary, J., & Khodadoust, A. P. (2023). Flushing time variability in a short, low-inflow estuary. *Estuarine, Coastal and Shelf Science*, 108277. <https://doi.org/10.1016/j.ecss.2023.108277>
21. Tasker, M. L., & **Sydeman, W. J.** (2023). Fisheries regulation and conserving prey bases. *Conservation of Marine Birds*, 439-455.
<https://doi.org/10.1016/B978-0-323-88539-3.00005-4>
22. Werb, B. E., & Rudnick, D. L. (2023). Remarkable changes in the dominant modes of north Pacific sea surface temperature. *Geophysical Research Letters*, 50(4), e2022GL101078. <https://doi.org/10.1029/2022GL101078> - **references SCCOOS glider data**
23. Zheng, B. (2023). [*New observations of fine-scale physical and biogeochemical dynamics enabled by ocean-wave-powered profiling*](#) (Doctoral dissertation, UC San Diego). - **References SCCOOS funded WireWalker and IFCB on Del Mar mooring**
24. ZoBell, V. M., Gassmann, M., Kindberg, L. B., Wiggins, S. M., Hildebrand, J. A., & Frasier, K. E. (2023). Retrofit-induced changes in the radiated noise and monopole source levels of container ships. *Plos one*, 18(3), e0282677.
<https://doi.org/10.1371/journal.pone.0282677> - **References SCCOOS HFR data**

V. EDUCATION, MEDIA ENGAGEMENT, AND OUTREACH MATERIALS:

A. Notable Presentations, Posters, Exhibits, Tour and outreach efforts

- January 4-6, 2023: NOAA OAP Meeting, Scripps Institution of Oceanography, La Jolla, CA - M. Medina attended
- January 10, 2023: NOAA ECOHAB Technical Advisory Committee Meeting, Scripps Institution of Oceanography, La Jolla, CA - C. Anderson presented, M. Medina attended
- January 19, 2023: NHABON webinar, virtual - C. Anderson presented
- Jan. 23-26, 2023: CA IFCB Training Workshop, UCSC, Santa Cruz, CA - C. Anderson & K. Kentiz facilitated and presented
- February 1, 2023: “Critical Friends” Review Panel Kiel University, Keil, Germany - C. Anderson panelist
- February 5-8, 2023: Environmental Data Science Summit, Santa Barbara, CA - I. Brunjes attended
- February 9, 2023: Rear Admiral Chad Jacoby, USCG visited, Scripps Institution of Oceanography, La Jolla, CA - M. Medina & C. Anderson presented

- February 10, 2023: SCCOOS hosts open house and office warming party, Scripps Institution of Oceanography, La Jolla, CA - C. Anderson, Megan Medina, Ian Brunjes
- February 14, 2023: Oceanology Week, San Diego, CA - C. Anderson and M. Medina attended and helped host booth
- February 14, 2023: San Diego Marine Protected Area Collaborative, Scripps Institution of Oceanography, , La Jolla, CA - M. Medina
- February 15, 2023: NOAA leadership - Dr. Spinrad, Nicole LeBouef, and Carl Gouldman visited with SCCOOS, Scripps Institution of Oceanography, , La Jolla, CA - C. Anderson, M. Medina and D. Rudnick hosted meetings and tours
- February 16, 2023: San Diego Area Committee Quarterly Meeting, virtual - Megan M.
- February 21, 2023: NOAA West Watch Webinar, virtual - C. Anderson presented
- February 27- March 1, 2023: NASA PACE SAT Meeting, San Diego, CA - C. Anderson attended
- March 9, 2023: Evaluating California's Marine Protected Area network across habitats, regions, and lenses - K. Nickols presented
- March 9, 2023: Meeting with Senator Blakespeare, Scripps Institution of Oceanography, La Jolla, CA - C. Anderson presented
- March 13-16, 2023: CA MPA Network Assessment, virtual - C. Anderson attended
- March 14, 2023: MPA Collaborative Network Statewide Forum, Monterey, CA - M. Medina attended
- March 15, 2023: MPA Day, Monterrey, CA - M. Medina booth
- March 18, 2023: World Water Day, Agua Hedionda Lagoon, Carlsbad, CA - M. Medina hosted booth
- March 21-23, 2023: IOOS Spring meeting and Hill Visits, Washington, D.C. - C. Anderson, L. Washburn, M. Medina, and I. Brunjes. C. Anderson was an invited speaker to give a HABON update.
 - Rep Nanette Diaz Barragan
 - Senator Padilla
 - Rep Sydney Kamlager-Dove
 - Rep Robert Garcia
 - Rep Julia Brownley
 - Rep Sara Jacobs
 - Rep Mike Levin
 - Rep Darrell Issa
 - Rep Young Kim
 - Rep Scott Peters
- March 26-30, 2023: National Shellfisheries Association (NSA) Annual Meeting, Baltimore, MD - C. Anderson invited speaker

- April 4-6, 2023: Biennial Ocean Visions Summit, Atlanta, GA - R. Timmerman attended
- April 6-7, 2023: CA OAH Stakeholder & Technical Workshop, Monterey, CA - C. Anderson, E. Satterthwaite, M. Carter, T. Martz, and M. Medina attended
- April 10-14: ECOHAB Field Work, Monterey, CA - C. Anderson
- April 18, 2023: Changes in ocean conditions and seabird productivity across northern hemisphere marine ecosystems. [Effects of Climate Change on the World's Oceans Symposium](#). Bergen, Norway. - W. Sydeman, FI poster
- April 25-26, 2023: Axiom Users Workshop, Seattle, WA - C. Anderson and M. Medina attended
- May 1-3, 2023: Arctic ECOHAB Transition Advisory Committee Workshop, Sitka, AK - C. Anderson participated as a TAC member
- May 8-12, 2023: NASA Joint Science Meeting, College Park, MD - C. Anderson was plenary speaker
- May 12, 2023: MBON Annual Meeting, College Park, MD - C. Anderson led plankton session to bridge DMAC themes across NOAA and NASA
- May 11, 2023: San Diego Area Committee Quarterly Meeting, San Diego, CA- D. Muller attended
- May 16: NOAA West Watch Webinar, virtual - C. Anderson presented
- May 23-24, 2023: CeNCOOS Governing Council and PI meeting, virtual - C. Anderson, L. Washburn, M. Medina attended
- May 30, 2023: SCCOOS Board of Governors meeting, SCCWRP, Costa Mesa, CA - C. Anderson, L. Washburn, M. Medina, K. Kenitz, and D. Muller
- June 10, 2023: Ocean Beach Pier public workshop, San Diego, CA - D. Muller attended
- June 13-15, 2023: NOAA Western Regional Team Meeting, SWFSC, La Jolla, CA - M. Medina presented
- June 20, 2023: NOAA West Watch Webinar, virtual - M. Medina & J. Behrens presented
- June 26, 2023: San Diego Marine Protected Area Collaborative meeting, Scripps Institution of Oceanography - M. Medina & D. Muller attended
- June 27, 2023: Scripps Institution of Oceanography all hands meeting, virtual - C. Anderson presented
- June 27-29, 2023: IOOS FAC meeting, MBARI, Moss Landing, CA - D. Rudnick attended
- June 28-29, 2023: CCEIA & State of the CA Current Integrated Data Flow workshop, SWFSC, La Jolla, CA - M. Medina and E. Satterthwaite attended
- June 29, 2023: Southern CA Marine Exchange 100 year anniversary party, Long Beach, CA - J. Behrens attended

B. Education/Courses

- MSCI 403 (“Ocean Sampling Techniques”), co-taught by Walter and Pasulka at Cal Poly - utilize HFR and HABs data in student labs
- PSC 201 (“Physical Oceanography”) and PHYS 314 (“Ocean Dynamics”) taught by Walter at Cal Poly - show students HFR particle tracking animation for oil spill fate and transport
- Erin Satterthwaite conducted an invited lecture in the Masters of Environmental Data Science Machine Learning Course related to ocean observations and machine learning.
- February 28, 2023: UC Irvine course, Irvine, CA - C. Anderson presented
- March 8: Invited seminar, SIO, Drew Lucas course - C. Anderson

C. Outreach Materials

- [SCCOOS 2021-2026 Strategic Plan](#) - Megan Medina led the effort with contracted artist Kelly Lance. The plan was completed in March 2023 in time for SCCOOS annual congressional meetings with members of the House and Senate.
- Erin Satterthwaite, in partnership with Sea Grant & CalCOFI Data Storytelling Interns, developed a K-12 lesson plan on ocean data science using CalCOFI data which was presented at Carpinteria High School.
- Erin Satterthwaite tabled at Patagonia (Ventura, CA) to share the value of ocean observations with local citizens

D. Media Engagement

News articles that featured Clarissa Anderson, SCCOOS Director:

1. March 1, 2023: Clarissa Anderson interviewed for C3 My Show podcast
2. March 15, 2023: Clarissa Anderson interviewed for KnX talk radio - Los Angeles, CA
3. Kohnen, B. [San Diego Conservation Community Hosts Festival in Honor of World Water Day](#). *Highlight San Diego*. March 24, 2023.
4. Page, E. [Blue Waves Are Back: Bioluminescence Returns to San Diego Beaches](#). *NBC San Diego* Published April 21, 2023
5. Bartlett, A. [The Strange, real-life avian "invasion" in Santa Cruz that inspired Hitchcock's 'The Birds.'](#) *San Francisco Gate*. Published May 12, 2023.
6. [A ‘Team’ of Uncrewed Vehicles Reveals the Extent and Toxicity of a Harmful Algal Bloom in Monterey Bay, CA](#). *NCCOS*. Published May 23, 2023
7. Gutshall, P. [Neurotoxin Killing Dolphins And Seals On Faria Beach](#). *edhat Santa Barbara*. June 15, 2023
8. [Toxic Algal Bloom Suspected in Dolphin and Sea Lion Deaths in Southern California](#). *NOAA Fisheries*. June 16, 2023.
9. Summer, L. [What’s killing hundreds of sea lions and dozens of dolphins along the Southern California coast?](#) *Los Angeles Times*. June 20, 2023
10. Ritchie, E. [Over 1,000 sea lions, dolphins are getting sick and dying as toxic bloom off coast expands](#). *The Orange County Register*. June 22, 2023

11. Mercado, A. [A Toxic Algae Bloom Is Killing California's Sea Lions](#). *Yahoo News*. June 22, 2023.
12. [Dr. Clarissa Anderson - What is the Algae Bloom?](#) *The Resource Santa Barbara*. June 23, 2023.
13. Gorden, M. [Mammals getting sick due to toxic algae along California coast](#). *Fox Weather*. June 27, 2023.
14. Cleary, M. [‘It gets worse every day’: why are sea lions and dolphins dying along California’s coast?](#) *The Guardian*. June 28, 2023.
15. Duggan, T. [Toxic algae is killing ocean mammals on California coast. Could the bloom spread to the Bay Area?](#) *San Francisco Chronicle*. June 30, 2023.
16. Letang, A. [Scientists provide update on algae bloom impacting marine life](#). *Fox 5 San Diego*. June 30, 2023.
17. Callahan, M. [Toxin responsible for dead sea lions, dolphins washing ashore in Southern California not yet seen in Sonoma County, experts say](#). *The Press Democrat*. July 1, 2023.
18. [CNN](#). July 1, 2023. [transcript](#)
19. Elbein, S. [Hundreds of sick sea lions filling California beaches this holiday weekend](#). *The Hill*. July 1, 2023.
20. Carlson, C. [Hundreds of sea lions inundate rescue centers on California coast](#). *County Star*. July 1, 2023.
21. Duggan, T. [SF Bay Area Could get toxic algae bloom that harms dolphins](#). *San Francisco Chronicle*. July 1, 2023.
22. Alvarega, E. [Sick, disoriented and aggressive sea lions are washing ashore. Here’s why, and here’s how San Diegans can help](#). *The San Diego Union-Tribune*. July 2, 2023.
23. Anderson, E. [Toxic algae hitting sea lions hard along Southern California coast](#). *KPBS*. July 6, 2023.

Other SCCOOS PIs in the News:

1. Sulter, L. [SoCal's great white sharks are much closer to you than you think, groundbreaking report finds](#). *News*. June 4, 2023 - References C. Lowe, CSULB
2. Pierson, D. [Great White Sharks Near Surfers 97% of the Time in CA Waters, Study Shows](#). *SURFER*. June 5, 2023. - References C. Lowe, CSULB
3. Little, J. [A bigger boat won't help: Great white sharks are this close to San Diegans in ocean](#). *NBC San Diego*, June 6, 2023 - References C. Lowe, CSULB
4. [Study finds regular peaceful coexistence between sharks, humans in Southern California waters](#). *Fox News*. June 6, 2023 - References C. Lowe, CSULB
5. [Just keep swimming: SoCal study shows sharks, humans can share ocean peacefully](#). *WINK*. June 8, 2023 - References C. Lowe, CSULB
6. [Great white shark experts coming to Santa Barbara to reveal the most current research](#). *KEYT*. June 15, 2023 - References C. Lowe, CSULB

7. Handy, S. [Shark sightings on the rise in San Diego](#). *CBS8*. June 28, 2023 - References C. Lowe, CSULB
8. Islas, G. CSULB students use drone technology to survey shark patterns. *Daily 49er*. References C. Lowe, CSULB
9. County Remains Engaged in Harbor Water Quality. *Channel Islands Harbor*. June 15, 2023. - References D. Caron, USC
10. Halpert, M. [Toxic algae kills hundreds of dolphins and sea lions on California coast](#). *BBC News*. June 21, 2023. - References D. Caron, USC
11. Christiansen, A. Alarming Die-Off of Dolphins in California: “Algae is to Blame.” *La Voce di New York*. June 22, 2023. - References D. Caron, USC
12. Gegan, C. Toxic Algal Blooms Sickening Sealife in Southern Calif. *The Intertia*. June 22, 2023. - References D. Caron, USC
13. Rivera, M. California Toxic Algae: The Silent Killer of Dolphins and Sea Lions. *Southwest Journal*. June 23, 2023. - References D. Caron, USC
14. Pointing, C. The Climate Crisis Is Causing Algae to Overproduce. Here’s Why That’s a Big, Toxic Problem. *The Ethos*. June 25, 2023 - References D. Caron, USC

E. Newsletters

- [Spring 2023 Newsletter](#)
 - 557 people received
 - 354 people opened the email
 - 55 people clicked on links in the email

VI. PRODUCT DELIVERY:

- Interactive CalCOFI data portal developed: <https://shiny.calcofi.io/oceano/>

VII. SUCCESS STORIES

Success Story	Brief Description	Contact
SCCOOS Strategic Plan 2021-2026	SCCOOS released a new strategic plan in March 2023. The Strategic Plan provides a high-level summary of the four SCCOOS subsystems, the societal applications that our funded projects address, and testimonials from some of our key partners and stakeholders. We also address our vision for growth over the next five years that responds directly to the needs of Southern California coastal communities. You	M. Medina

	can view the Strategic Plan online or download the pdf .	
Dr. Richard Spinrad, Under Secretary of Commerce for Oceans and Atmosphere & NOAA Administrator, Visits SCCOOS	SCCOOS met with Dr. Richard (Rick) Spinrad, Nicole LeBoeuf, and Carl Gouldman on Wednesday, February 15th at Scripps Institution of Oceanography to showcase our long-term high-quality ocean observing assets and stakeholder success stories. We reviewed SCCOOS legacy and history, including California's initial investment towards HF Radar and the aging infrastructure, including that 79% of California's HFRs are over 15 years old and 20% have exceeded the 20-year normal service life. SCCOOS also discussed the critical need for investments in ecosystem models in support of Coastal Resilience and a Climate Ready Nation.	C. Anderson
NOAA NCCOS Response Funding	SCCWRP led proposal with SCCOOS, TMMC, UCSC, and SIO for NOAA NCCOS response funds in response to a massive domoic acid event in central and southern California from May to July 2023.	C. Anderson

VIII. Student Hires and Internships (advancing STEM education and retention at SCCOOS)

- Theresa Ngyue, NSF SURF Intern, SCCOOS/SIO. June 18, 2023 - August 18, 2023.
 - Looking at *pseudo-nitzschia* and domoic acid data from the HABMAP program at Stearns Wharf.
- Yaseen Zaky, undergraduate student lab assistant working on quality control of Spray underwater glider data. Worked in this capacity for two years and graduated with B.S. in Oceanic and Atmospheric Sciences in June 2023. Now a graduate student at Texas A&M.
- Michael Dalsin, undergraduate student lab assistant assisting with HFR operations and maintenance at Cal Poly SLO
- Mallika Gupta & Annie Adams participated in the Data Storytelling Internship - translating findings from ocean observing data to California citizens (2022-2023).

IX. CERTIFICATION UPDATES

Below is a list of new members we've invited to our board or committees.

- SCCOOS Program Office
 - Danielle Muller, UCSD, part-time Program Assistant
- Principal Investigators
 - Chris Lowe, CSU Long Beach, Professor, Shark Lab
 - Nyssa Silbiger, CSU Northridge, Associate Professor, Silbiger Lab
- Executive Steering Committee
 - Shauna Oh, CA Sea Grant Director
 - Kristen Davis, UC Irvine Professor
- Board Executive Committee
 - Kristen Koch, NOAA SWFSC Director
- Joint Strategic Advisory Committee
 - Jenn Eckerle, Ocean Protection Council, Director
 - Diane Windham, NOAA Fisheries, Southwest Regional Aquaculture Coordinator
 - Laura Terriquez, Orange County Sanitation District, Scientist
 - Scott Humphrey, Marine Exchange of San Francisco Bay Region

X. EXTRAMURAL FUNDING

Below is a list of extramural proposals submitted during the reporting period with C. Anderson as lead PI or Co-PI.

A. Successful

1. NOAA IOOS

Implementation of the Infrastructure Investments and Jobs Act: Improving and Enhancing the Southern California Coastal Ocean Observing System

Lead PI: C. Anderson, SCCOOS/SIO

Total Award Amount: \$1,169,000.00

12/01/2022 – 11/30/2024

2. NOAA NCCOS

Event Response Request Southern California Domoic Acid Event June 2023.

Lead PI: J. Smith, SCCWRP,

Co-PI: C. Anderson, SCCOOS/SIO

3. NOAA OAR

Cooperative Institute for Marine, Earth and Atmospheric Systems (CIMEAS)

Total Award Amount: \$1,589,288.00
07/01/2020 – 06/30/2025

B. Pending

1. NASA PACE

Validating PACE ocean color, biogeochemistry, net primary productivity, and phytoplankton community metrics with the CalCOFI Program

Lead PI: C. Anderson, SIO

2. NASA

Ecological Conservation Impact Assessment: Evaluating the Efficacy and Challenges of Research to Operations for HAB Forecasting

Lead PI: C. Anderson, SCCOOS/SIO

3. UC Los Angeles

Visualizing Vulnerability of Marine Protected Areas Across Multiple Climate Stressors

Lead: ??

Co-PI: C. Anderson, SCCOOS/SIO

Total Award Amount: \$300,000.00

07/01/2023 – 06/30/2025

4. NOAA NCCOS

Regional MERHAB: A novel observing system for HAB intraspecific diversity and associated toxins in Southern California

Lead PI: A. Barton, SIO

Co-PI: C. Anderson, SCCOOS/SIO

Total Award Amount: \$2,999,071

09/01/2023 – 08/31/2028

5. UC Santa Barbara

Protecting coastal food systems and public health under climate change

Lead: ??

Co-PI: C. Anderson, SCCOOS/SIO

Total Award Amount: \$80,000

08/01/2023 – 07/31/2025

6. OCSAN

ROMS-BEC Ocean Modeling Support Study

Lead: Vamsi Krishna Sridharan, TetraTech

Consultant: C. Anderson, SCCOOS/SIO

7. NOAA

Assessing the extent and scope of contaminant impacts and mitigation strategies for deep ocean dumping sites in Southern California, Yr2-3

Lead PI: B. Semmens, SIO
Co-PI: C. Anderson, SCCOOS/SIO

8. SIO
Environmental triggers of temporary and resting cysts formation of Lingulodinium polyedra - an emerging harmful alga in the Southern California
Lead PI: Kasia M. Kenitz, SIO/SCCOOS

C. Unsuccessful

1. OPC Climate Action
Protecting coastal food systems and public health under climate change
Lead PI: C. Free, UCSB
Co-PI: C. Anderson, SIO
Total Award Amount: \$80,000
08/01/2023 – 07/31/2025
2. NOAA NCCOS/OAP
Production and fate of domoic acid under the combined influences of OA & eutrophication.
Lead: R. Kudela, UCSC
Co-PI: C. Anderson, SCCOOS/SIO
3. NOAA NCCOS
Future Projections of Multiple Stressor Impacts on the CCE under Climate Change.
Lead: D. Bianchi, UCLA
Co-PI: C. Anderson, SCCOOS/SIO
4. NOAA NCCOS
Acidification, HABs, Hypoxia, and Heatwaves: Assessing the impacts and management implications of multiple stressors on indicator species in the California Current Ecosystem
Lead: K. Kroeker, UCSC
Co-PI: C. Anderson, SCCOOS/SIO
5. CA DDT Research 2023
Assessing, analyzing, & visualizing information assets to characterize potential exposure and population vulnerability related to DDT+ in the deep ocean of the Southern California Bight
Lead: E. Satterthwaite, SIO
Co-PI: C. Anderson, SCCOOS/SIO
6. NOPP
mCDR 2023: Minimizing Risk and Uncertainty: Developing an Observing Strategy for mCDR.

Lead: Center for Ocean Leadership
 Co-PI: C. Anderson, SCCOOS/SIO

D. Letters of Support submitted by SCCOOS

1. January 9, 2023: To Maria Kavanaugh, Oregon State University, to contribute to her MERHAB project “Routine fisheries surveys as essential HAB observing platforms in the Northern California Current.”
2. January 16, 2023: To Holly Bowers, Moss Landing Marine Laboratories, to support her MERHAB proposal titled, “Validating the Aquasens imaging platform to expand networked cell detection capabilities.”
3. January 23, 2023: To Honorable Anthony Rendon and Honorable Toni Atkins for the creation of a *California Legislature Sustainable Blue Economy Caucus*.
4. February 23, 2023: To Dr. Sophie Chu, Captura Corporation, in support of the proposal *mCDR 2023 Direct Ocean Capture for Atmospheric CO 2 Drawdown and Ocean Acidification Mitigation*.
5. March 3, 2023: To Dr. Kristy Kroeker, UC Santa Cruz, in support of the proposal *Promoting resilience of the Dungeness crab fishery to climate-induced HABs*.

XI. BUDGET SUMMARY

Cost Categories	Funding provided	Funds spent	Unspent funds remaining	Remaining %
Personnel	\$826,840.00	\$645,659.61	\$181,180.39	21.91%
Fringe Benefits	\$354,013.00	\$261,901.42	\$92,111.58	26.02%
Travel	\$162,038.00	\$76,124.97	\$85,913.03	53.02%
Equipment	\$328,625.00	\$164,614.66	\$164,010.34	49.91%
Supplies	\$140,282.00	\$120,874.57	\$19,407.43	13.83%
Contractual	\$2,479,946.00	\$1,732,455.84	\$747,490.16	30.14%
Other	\$689,391.00	\$591,561.26	\$97,829.74	14.19%
Total Directs Charges	\$4,981,135.00	\$3,593,192.33	\$1,387,942.67	27.86%
Indirects Charges	\$1,082,304.00	\$812,998.61	\$269,305.39	24.88%
Total Amounts	\$6,063,439.00	\$4,406,190.94	\$1,657,248.06	27.33%

1. Were the oldest ASAP TAS BETC accounting lines drawn down first?

2. Give a brief update on project invoicing for the reporting period. Were there any delays with invoicing or payment?
3. Provide details on any property or equipment charged directly to the award having a useful life of more than one year and an acquisition cost of \$5,000 or more per unit during the period.
4. Include changes in key scientific, technical or management personnel, not included in certification.
 - Hired part-time Program Assistant and Education Coordinator, Danielle Muller, SIO
5. Include changes to the organizational structure such as: changes in status or partners organizations and points of contact. As a reminder, a change to the award's Principal Investigator and a change in an award's Key Person Specified in the Application requires NOAA approval through Grants Online. Guidance for both these Award Action Requests is available on Grants Online.
 - George Robertson, OCSD retired and adjourned his position on SCCOOS Executive Steering Committee and Joint Strategic Advisory Council
 - See new members listed in section IX. Certification Updates above
6. Provide an update about travel completed during the reporting period.

SCCOOS Program Office:

 - January 18-20: OCB Scoping Workshop, WHOI, Woods Hole, MA - C. Anderson
 - Jan. 23-26, 2023: CA IFCB Training Workshop, UCSC, Santa Cruz, CA - C. Anderson & K. Kentiz facilitated and presented (OPC funded)
 - February 1, 2023: [Martin Visbeck](#), Kiel University, Keil, Germany - C. Anderson presented (Keil funded)
 - February 5-8, 2023: Environmental Data Science Summit, Santa Barbara, CA - I. Brunjes attended
 - March 14-15, 2023: MPA Collaborative Network Statewide Forum, Monterey, CA - M. Medina booth
 - March 21-23, 2023: IOOS Spring meeting and Hill Visits, Washington, D.C. - C. Anderson, L. Washburn, M. Medina, and I. Brunjes
 - March 26-30, 2023: 115th NASA Annual meeting, Baltimore, MD - C. Anderson presented
 - April 4-6, 2023: Biennial Ocean Visions Summit, Atlanta, GA - R. Timmerman attended
 - April 6-7, 2023: CA OAH Stakeholder & Technical Workshop, Monterey, CA - C. Anderson, E. Satterthwaite, and M. Medina attended
 - April 10-14: Carson Field Work, Monterey, CA - C. Anderson

- April 25-26, 2023: Axiom Users Workshop, Seattle, WA - C. Anderson and M. Medina attended
 - May 1-3, 2023: ECOHAB TAC, Sitka, AK - C. Anderson presented (ECOHAB funded)
 - May 8-12, 2023: NASA Carbon Cycle Meeting, College Park, MD - C. Anderson presented
 - May 30, 2023: SCCOOS Board of Governors meeting, SCCWRP, Costa Mesa, CA - C. Anderson, L. Washburn, M. Medina, K. Kenitz, and D. Muller
7. Give details on any delays with initiating a contract/subaward. Note any issues with the previous year funds or other issues that occurred during the reporting period. Will this result with a work stoppage or cause significant problems with the partnership?

End Report
