

# CeNCOOS: Data Management and Communications (DMAC) Plan

## Appendix A - DMAC Personnel Resumes

### **Frederick L. Bahr**

Data and Information Manager, Central and Northern California Ocean Observing System  
Monterey Bay Aquarium Research Institute  
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[flbahr@mbari.org](mailto:flbahr@mbari.org)

### **Education**

M.S. Degree in Physical Oceanography: Oregon State University, Corvallis OR 97331, 1991  
Thesis Title: *The Effects of Rainfall on Temperature and Salinity in the Surface Layer of the Equatorial Pacific.*

B.S. Degree in Oceanography: University of Washington, Seattle WA 98195, 1986

B.S. Degree in Physics: University of Washington, Seattle WA 98195, 1986

### **Work Experience**

2022-Present: CeNCOOS Data and Information manager, 7700 Sandholdt Road Moss Landing, CA 95039

- Maintained CeNCOOS website.

- Attended IOOS DMAC webinars.

- Applied IOOS DMAC standards to CeNCOOS datasets.

- Maintained CeNCOOS products that are fed into the CeNCOOS website.

- Migrated c-can.info website to an MBARI server.

- Provided feedback and guidance to the CeNCOOS DMAC partner Axiom.

- Processed and quality controlled physical data from the MBARI M1 mooring.

2008-Present: CeNCOOS Product Developer ( 90% time) 7700 Sandholdt Road  
Moss Landing, CA 95039

- Implemented Harmful Algal Bloom model (C-HARM, California-Harmful Algal Risk Mapping).

- Animated model currents and temperature.

- Created glider displays for CeNCOOS.

- Pushed CeNCOOS/NANOOS glider data to the US IOOS glider DAC.

- Created and automated various products for CeNCOOS.

- Migrated processing/display software from NPS to CeNCOOS.

- Migrated JPL model/observed wind programs to CeNCOOS.

- Processed data from recovered moored sensors.

2008-Present: Contract Oceanographer (10% time)

- Participated in numerous mooring recovery cruises in the South China Sea

- Processed moored data from the South China Sea.

- Processed lowered ADCP data.

- Processed data for Soliton Inc. in support of publishing research papers.

1998-2008: Oceanographer Naval Postgraduate School

- Wrote automated near real-time data display and quality control check software for telemetered mooring data.

- Monitored mooring data for quality.

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Processed data from recovered Moored sensors.  
Provided input to ICON partners about mooring data quality issues.  
Helped draft standard for sharing data between NPS and MBARI.  
Supervised another worker.  
Participated in several NOPP/ICON cruises  
Participated in ASIAEX 2000 cruise

1993-1998: Physical Oceanographic Technician with the Bermuda Atlantic Time Series (BATS) Bermuda Biological Station for Research Inc. 17 Biological Lane, Ferry Reach, St. Georges, Bermuda GE01

Post processed CTD data from 6 years of Hydrostation S and 4 years of BATS for sensor drift and wet salt and oxygen samples.  
Participated in BATS cruises sampling: salts, oxygens, POC/PON, P<sub>Si</sub>, DOC, DON, nutrients and CO<sub>2</sub>.  
Chief Scientist on several Hydrostation S, BATS Bloom, and BATS Validation cruises.  
Written Data processing and extraction software in Matlab, C, and Perl.  
Designed and Implemented several web data extraction pages  
Designed and Implemented near real time meteorological data display.  
Have run a Sea-Bird Electronics 911+ CTD and 24 Place Rosette.

1991-1993: Research Assistant

Oregon State University, Corvallis OR 97331

Participated in TOGA COARE aboard the *R/V Wecoma* on three 30-day legs.  
Wrote real-time data acquisition/display program.  
Made hourly meteorological observations and monitored them for quality.  
Did minor sensor repair/maintenance.  
Maintained PC's.

## Peer Reviewed Publications

Anderson, Clarissa R., Kudela, Raphael M., Kahru, Mati, Chao, Yi, Rosenfeld, Leslie K., **Bahr, Frederick L.**, Anderson, David M., and Norris, Tenaya A., 2016. Initial skill assessment of the California harmful algae risk mapping (C-HARM) system. *Harmful Algae*, 59:1-18.

Ramp, S. R., Y. J. Yang, D. B. Reeder, M. C. Buijsman, and **F. L. Bahr**, 2015: The evolution of mode-2 nonlinear internal waves over the northern Heng-Chun Ridge South of Taiwan. *Nonlin. Processes Geophys.*, **22**, 1-19.

Kevin Gomes, Danelle Cline, Duane Edgington, Mike Godin, Thom Maughan, Mike McCann, Tom O'Reilly, **Fred Bahr**, Francisco Chavez, Monique Messié, Jnaneshwar Das and Kanna Rajan. "ODSS: A Decision Support System for Ocean Exploration". In IEEE International Conference on Data Engineering, 2013.

Ramp, S. R., Y. J. Yang, D. B. Reeder, and **F. L. Bahr**, 2012: Observations of a mode-2 nonlinear internal wave on the northern Heng-Chun Ridge south of Taiwan. *J. Geophys. Res.*, **117**, C03043, doi:10.1029/2011JC007662.

Jnaneshwar Das, Thom Maughan, Mike McCann, Mike Godin, Tom O'Reilly, Monique Messié, **Fred Bahr**, Kevin Gomes, Frederic Py, Jim Bellingham, Gaurav S. Sukhatme and Kanna Rajan. "Towards Mixed-initiative, Multi-robot Field Experiments: Design, Deployment, and Lessons Learned". In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 3132-3139, 2011.

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Ramp, S. R., P. F. J. Lermusiaux, I. Shulman, Y. Chao, R. E. Wolf, and **F. L. Bahr**, 2011: Oceanographic and atmospheric conditions on the continental shelf north of the Monterey Bay during August 2006. *Dyn. Atmos. Oc.*, doi:10.1016/j.dynatmoce.2011.04.005.

Ramp, S. R., Y. J. Yang, and **F. L. Bahr**, 2010: Characterizing the nonlinear internal wave climate in the northeastern South China Sea. *Nonlin. Processes Geophys.*, **17**, 481-498, doi:10.5194/npg-17-481-2010.

Ramp, S. R., and **F. L. Bahr**, 2008: Seasonal evolution of the upwelling process south of Cape Blanco. *J. Phys. Oceanogr.*, **38**, 3-28.

Ramp, S. R., J. D. Paduan, I. Shulman, J. Kindle, **F. L. Bahr**, and Francisco Chavez, 2005: Observations and modeling of upwelling and relaxation events in the northern Monterey Bay during August 2000. *J. Geophys. Res.*, **110**, C07013, 21 p.

Ramp, S.R., C. S. Chiu, H.-R. Kim, **F. L. Bahr**, T.-Y. Tang, Y. J. Yang, T. Duda, and A. K. Liu, 2004: Solitons in the Northeastern South China Sea Part I: Sources and Propagation Through Deep Water. *IEEE/J. Oc. Eng.*, **29**, 1157-1181.

Ramp, S.R., C. S. Chiu, **F. L. Bahr**, Y. Qi, P. H. Dahl, J. H. Miller, J. F. Lynch, R. Zhang, and J. Zhou, 2004: The Shelf-Edge Environment in the Central East China Sea and its Impact on Low Frequency Acoustic Propagation. *IEEE/J. Oc. Eng.*, **29**, 1011-1031.

### Unrefereed Publications

BATS Data Report B-5 (Anthony Knap, *et. al.*)

BATS Methods Manual Version 4 (Anthony Knap, *et. al.*)

### Poster Presentation

*Periodic and Quasiperiodic Signals in Temperature and Salinity of the Northwestern Sargasso Sea.* Presented at the Fifth Scientific Meeting of the Oceanographic Society.

**Robert Bochenek**

**DMAC System Lead, CeNCOOS**

Information Architect, Axiom Data Science, LLC

Phone: 907.230.0304 | Email: rob@axiomdatascience.com

### Summary of Professional Experience

Rob Bochenek's extensive background and experience developing cyberinfrastructure capacity for earth science data will prove essential for the successful implementation of this project. Rob is currently the systems architect of several large scale data assembly centers and observing systems for geophysical and ecological data. His research

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interests lie within the intersection of high performance computing, scalable open source interoperability systems and developing cloud based technology that accelerates data synthesis and re-use.

### Education

B.S.E., 2001, Aerospace Engineering, University of Michigan

### Appointments

2017– Present	Information Manager, National Science Foundation, North Gulf of Alaska LTER Site
2015– Present	Technical Lead, Southeast Coastal Ocean Observing Regional Association, Charleston, SC
2013 – Present	Technical Lead, Central and Northern California Ocean Observing System, Moss Landing, CA
2010 – Present	Technical Lead, Alaska Ocean Observing System, Anchorage, AK
2006 – Present	Information Architect, Axiom Data Science, Anchorage, AK
2003 – 2006	Data Systems Manager, Exxon Valdez Oil Spill Trustee Council (EVOSTC), Anchorage, AK
2001 – 2002	Analyst Programmer, Alaska Department of Fish & Game, Anchorage, AK

### Publications

Turner, C. and Bochenek, R. (2017). "Cyberinfrastructure to support data management," in OCEANS Anchorage, 2017., 2017, Anchorage, AK, [Online]. Available: <http://ieeexplore.ieee.org/document/8232392/>

### Relevant Products

Bochenek, R.B., S. StClaire, B.Stone (2017), IOOS Environmental Sensor Map. Develop community standards for sensor observations; make regional data nationally accessible for >30,000 real-time sensors. Accessible from <http://sensors.ioos.us/>.

Bochenek, R.B., R. Martin (2017), Research Workspace. Web-based platform for collaboratively managing science projects through the entire data lifecycle. Accessible from: <https://researchworkspace.com>.

Bochenek, R.B., S. StClaire, B.Stone (2016), Marine Biodiversity Observation Network (MBON) data portal. Provide data integration and visualization interface for biological and biodiversity datasets. Accessible from <http://mbon.ioos.us/>.

Bochenek, R.B., S. StClaire, B.Stone (2016), North Pacific Research Board. Curation and archive of >700 historical project data in a public-facing catalog. Accessible from <http://projects.nprb.org/>.

Bochenek, R.B., S. StClaire, K. Wilcox (2016), US Geological Survey (USGS) Coastal and Marine Geology Program Data Portal. Portal to make video and photos available to explore in an easy-to-use geospatial viewer Accessible from <http://cmgvideo.usgsportals.net/>

Bochenek, R.B., S. StClaire, K. Wilcox (2015), Southeast Coastal Ocean Observing Regional Association (SECOORA) Data Management System. Accessible from <http://secoora.org/>.

Bochenek, R.B., S. StClaire, B.Stone (2012), AOOS Arctic Portal. Accessible from [http://portal.aos.org/?v=rand&portal\\_id=3](http://portal.aos.org/?v=rand&portal_id=3).

Bochenek, R.B., S. StClaire, D. Snowden, L. Finrock (2013), IOOS Sensor Observation Service. Accessible from <http://ioossos.axiomalaska.com/>.

Bochenek, R.B., S. StClaire, L. Finrock (2013), Central and Northern California Ocean Observing Data System. Accessible from <http://data.cencoos.org/>.

Bochenek, R.B., S. StClaire, B.Stone, L. Finrock (2013), Exxon Valdez Oil Spill Trustee Council Gulf Watch Data Portal. Accessible from <http://www.gulfwatch.org/>.

Bochenek, R.B., S. StClaire, B.Stone (2012), Alaska Ocean Observing System (AOOS) Data Management System. Accessible from <http://data.aos.org>.

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### Synergistic Activities

2012 – Present	Funded under the NOAA High Performance Computing program for exploratory research in applying HPC concepts to serving and visualizing gridded multidimensional models and observational data sets
2011 – Present	Member of the IOOS Sensor Observation Service standardization Committee
2010 – Present	Member of the Alaska Data integration Working Group (ADIWG) focused on developing frameworks for scientific information across Alaskan Agencies.
2008 – 2010	Development of the Prince William Sound Data Portal, A tool for scientists, educators and the public to visualize four dimensional fisheries data

### Collaborators

Broderson, Dayne	Geographic Information Network of Alaska (GINA), Fairbanks, AK
Baker, Betsy	North Pacific Research Board, Anchorage, AK
Dugan, Darcy	Alaska Ocean Observing System, Anchorage, AK
Howard, Katherine	Alaska Department of Fish and Game, Anchorage, AK
Jones, Matt	National Center for Ecological Analysis and Synthesis, Santa Barbara, CA
Krueger, Charles	Great lakes Fishery Council, Ann Arbor, MI
McCammon, Molly	Alaska Ocean Observing System, Anchorage, AK
Moffit, Steve	Alaska Department of Fish and Game, Anchorage, AK
Moss, Jamal	Alaska Fisheries Science Center, Juneau, AK
Mueter, Franz	University of Alaska, Juneau, AK
Mundy, Phillip	Alaska Fisheries Science Center, Juneau, AK
Pegau, Scott	Oil Spill Recovery Institute, Cordova, AK
Saupe, Susan	Cook Inlet Citizen's Advisory Council, Anchorage, AK
Smith, Stan	United States Geological Survey, Anchorage, AK
Snowden, Derrick	Integrated Ocean Observing System, Silver Springs, MD
Svoboda, Michael	Environment Canada, Whitehorse, Canada

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**Shane R. StSavage**

**Data Management Technical Lead, CeNCOOS**

Software Architect, Axiom Data Science, LLC

Phone: 907.350.8526 | Email: shane@axiomdatascience.com

### Professional Qualifications

University of Alaska Anchorage, Biological Sciences, B.S., 2002

### Appointments

2008 – Present                      Software Architect, Axiom Consulting and Design, Anchorage, AK  
2006 – 2008                         Analyst Programmer, Exxon Valdez Oil Spill Trustee Council, Anchorage, AK  
2002 – 2006                         Research Analyst, Alaska Department of Fish & Game, Anchorage, AK

### Publications

Brannian, L. K., K. R. Kamletz, H. A. Krenz, S. StClair, and C. Lawn. 2006. Development of the Arctic-Yukon-Kuskokwim salmon database management system through June 30, 2006. Alaska Department of Fish and Game, Special Publication No. 06-21, Anchorage.

Hamner, H. H., S. St Clair, and H. Moore. 2004. An inventory of age, sex and length data for Norton Sound, Kotzebue, and Kuskokwim chum salmon. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A04-06, Anchorage.

Estensen J. L., S. St Clair. 2003. Pacific herring stocks and fisheries in the Arctic-Yukon-Kuskokwim region of the Bering Sea, Alaska, 2003 and outlook for 2004. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A03-37, Anchorage.

Hamner H., S. Karpovich, S. StClair. 2003. Development Of A Shared AYK Salmon Database. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A03-23, Anchorage.

Hamner, H. H., S. Karpovich, S. St. Clair. 2003. Norton Sound salmon information database file inventory and problem review. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A03-01, Anchorage.

### Synergistic Activities

2014 - Present                      Facilitate access endpoint and metadata upgrades for CeNCOOS gridded datasets for ingestion by West Coast Governors' Alliance (WCGA)

2013 - Present                      Work with the Alaska Dept. of Fish & Game's Commercial Fisheries Arctic-Yukon-Kuskokwim region to augment their database with geospatial data and serve data via web services

2013 - Present                      Software Architect for the Central California Ocean Observing System (CeNCOOS) (ingest, process, and serve multidimensional oceanographic data)

2012 - Present                      Develop open source software tools to extract sensor data from arbitrary databases and insert into a Sensor Observation Service using OGC protocols

2011 - Present                      Member of the IOOS Sensor Observation Service standardization committee

2011 - Present                      Developer of IOOS customizations of 52°North SOS software and significant contributor to main codebase

2011 - Present                      Maintainer of GeoServer (open source geospatial data server) Excel WFS output plugin

2011 - Present                      Senior software engineer for the Alaska Ocean Observing System (AOOS) (ingest, process, and serve multidimensional oceanographic data)

2009 - Present                      Contributor to several widely used open source projects including GeoTools, Apache Jena

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	Maven Tools, Maven Shade, GeoDB, jTDS, csvkit, Redmine, Hibernate Hibernate Tools, and OpenScales
2009 - 2012	Developed spatially enabled online data management application for Alaska Dept. of Fish & Game aerial surveys and transferred software to client systems and programmers
2008 - Present	Developer for global seabird abundance, population health, and diet database in conjunction with USFWS, World Seabird Union, Pacific Seabird Group, and others

### Collaborators

Aime, Andrea	GeoSolutions, Reggio, Italy
Bridger, Eric	Gulf of Maine Research Institute, Portland, ME
Chaouchi, Mohamed	Center for Operational Oceanographic Products and Services, Silver Spring, MD
Deoliveira, Justin	OpenGeo, New York, NY
Dickinson, Ian	Epimorphics, Bristol, UK
Garcia, Mike	National Data Buoy Center, John C. Stennis Space Center, MS
Golden, Nadine	USGS Coastal and Marine Geology, Santa Cruz, CA
Hollmann, Carsten	52North Initiative for Geospatial Open Source Software, Muenster, Germany
Mayorga, Emilio	Northwest Association of Networked Ocean Observing Systems, Seattle, WA
McGuire, Tamara	LGL Limited Environmental Research Associates, Anchorage, AK
Patterson, Jennifer	Central California Ocean Observing System, Moss Landing, CA
Snowden, Derrick	Integrated Ocean Observing System, Silver Springs, MD

### Marine Lebrec

#### Data Specialist, Central and Northern California Ocean Observing System

Monterey Bay Aquarium Research Institute

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### Education

M.S. Degree in Chemical Oceanography, San Jose State University Moss Landing Marine Laboratories, Moss Landing CA.

Optimizing and applying methodologies for seawater nutrient analysis using novel microfluidic techniques.

B.S. Oceanography with minors in Marine Biology and Arctic Studies, University of Washington, Seattle WA.

### Experience

2023-Present: Data Specialist, Central and Northern California Ocean Observing System (CeNCOOS)

Integrating and managing data from regional data providers into CeNCOOS web products (e.g. data portals, websites)

Coordinating with ocean observing networks (MBON, iDOOS) to implement best practices and foster collaborations.

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2020-2023: Graduate Researcher, Moss Landing Marine Laboratories

Method development for measuring inorganic nutrients in seawater using programmable Flow Injection analysis in the laboratory and on research vessels

Collaborating with engineers to develop open-source nutrient analyzer to obtain high resolution time-series.

2022: Graduate Teaching Assistant, Moss Landing Marine Laboratories

Assisted with teaching graduate level course "Data Analysis in Marine Science", focused on applying Python programming to run statistical tests (significance testing, principal component analysis), modeling (generalized linear model, multivariate regression, poisson regression), geospatial/time-series analyses, data visualization.

2018-2020: Associate Research Scientist, International Atomic Energy Agency (IAEA)

Provided scientific and technical expertise to the Ocean Acidification International Coordination Centre (OA-ICC) and the Global Ocean Acidification Observing Network (GOA-ON) through organizing training courses, managing large databases and data portals, coordinating retreats and international meetings, and contributing to the UN Sustainable Development Goal 14.3.1 Methodology.

### Publications

Lebrec et al., 2022. Developing autonomous, open-source macronutrient monitoring instrumentation: the programmable flow injection ocean nutrient analyzer (pfona), AGU Fall Meeting 2022, Chicago.

Valauri-Orton et al., 2022. Advancing equity in ocean acidification research: development of a low-cost kit for OA monitoring, 5th International Symposium on the Oceans in a High CO<sub>2</sub> World, Lima Peru

Lebrec et al., 2022. Automated nutrient analysis via programmable flow injection: from benchtop to unattended operation at shore stations. Ocean Sciences Meeting.

Tilbrook et al., 2019. An enhanced ocean acidification observing network: from people to technology to data synthesis and information exchange. *Frontiers in Marine Science* 6: 337. Doi: 10.3389/fmars.2019.00337.

Lebrec et al. 2019. Ocean acidification impacts in select Pacific Basin coral reef ecosystems. *Regional Studies in Marine Science* 28: 100584. Doi: 10.1016/j.rsma.2019.100584

Hansson L. & Lebreac M., 2019. The Ocean Acidification International Coordination Centre (OA-ICC): A hub for the global OA community. The 4th GOA-ON International Workshop Hangzhou, China.

### Awards

Council on Ocean Affairs, Science & Technology (COAST) Graduate Student Award

Moss Landing Marine Laboratories Scholar Award