

CeNCOOS: Data Management and Communications (DMAC) Plan

Appendix A - DMAC Personnel Resumes

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 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.

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

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

Bochenek, R.B., S. StClaire, B.Stone, L. Finfrock (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/>.

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

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Frederick L. Bahr

CeNCOOS Data and Information Manager
Monterey Bay Aquarium Research Institute
7700 Sandholdt Road
Phone: 831-775-1827
FAX 831-775-1620
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

2021-Present: Data and Information manager, CeNCOOS 7700 Sandholdt Road Moss Landing, CA 95039

Responsible for data management and communication (DMAC) efforts at Central and Northern California Ocean Observing System (CeNCOOS). Ensure the quality control and quality assurance of data streams ingested and archived by CeNCOOS and ensure that data streams are compliant with the standards currently set by IOOS. Responsible for developing and periodically reevaluating data stream plans and working with data providers to improve operating procedures. Responsible for maintaining the CeNCOOS webpage.

2008-2021: 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.

2008-2022: 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

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mooring data.

Monitored mooring data for quality.

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, PSi, DOC, DON, nutrients and CO₂.

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,

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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.

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.

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Marine Lebrec

Monterey Bay Aquarium Research Institute
Data Specialist, Central and Northern California Ocean Observing System
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(831) 775-2125 | mlebrec@mbari.org

Education

2023

M.S. in Marine Science from San Jose State University Moss Landing Marine Laboratories

Thesis: Phosphate and silicate analysis in seawater using programmable flow injection: optimization and applications of benchtop and in situ methodologies

2016

B.S. in Oceanography from the University of Washington, Seattle, WA

Professional Experience

Jan. 2023 - present

Data Specialist, CeNCOOS/MBARI, Moss Landing, CA

- Managing the integration of regional oceanographic datasets into CeNCOOS web products (data portals, websites) to meet stakeholder needs.
- Coordinating with ocean observing networks (MBON, iDOOS) to implement FAIR data best practices and comply with QA/QC standards.

Aug. 2020 - Feb. 2023

Graduate Researcher, Moss Landing Marine Laboratories, Moss Landing, CA

- Method development for measuring inorganic nutrients in seawater using programmable Flow Injection analysis in the laboratory and on research vessels.
- Developed an open-source nutrient analyzer to obtain high-resolution time-series at CeNCOOS shore station.

Jan. 2022 - Aug. 2022

Graduate Teaching Assistant, Moss Landing Marine Laboratories, Moss Landing, CA

- 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, geospatial / time-series analyses, data visualizations

May 2018 - May 2022

Associate Research Scientist, International Atomic Energy Agency, Monaco

- 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 regional and international meetings, and contributing to the UN Sustainable Development Goal 14.3.1 Methodology.

July 2016 - April 2018

Oceanographer/Engineer Assistant, University of Washington Applied Physics Laboratory

- Provided expertise and management for oceanographic and biological research projects including the Northwest Association of Networked Ocean Observing Systems (NANOOS) and the Washington Ocean Acidification Center (WOAC).

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- Managed field collection and laboratory analysis of biogeochemical samples (dissolved inorganic carbon, dissolved oxygen, chlorophyll, and plankton samples)

Recent Publications / Presentations

- Lebrec. Data Management Workflow and Challenges in Developing a California Ocean Acidification and Hypoxia Data Portal. IOOS DMAC Annual Meeting 2023, Silver Spring, MD.
- Lebrec & Harper, 2022. Enhancing access to ocean data and information products from the Central and Northern California Ocean Observing System (CeNCOOS) to support well-informed shellfishery management. Pacific Coast Shellfish Growers Association Annual Meeting 2023, Seaside, OR.
- Lebrec et al., 2022. Developing autonomous, open-source macronutrient monitoring instrumentation: the programmable flow injection ocean nutrient analyzer (pfiona). AGU Fall Meeting 2022, Chicago, IL.
- 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 CO2 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, virtual.
- 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. & Lebrec 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.