Biographical Sketch — Kyle Wilcox

Kyle Wilcox will function as project lead and provide expertise on model ingest, assessment and registration of partner catalogs, automated metadata improvement and translation, and best practice documentation. Kyle Wilcox has over 8 years experience working in the ocean and environmental sciences, where he specializes in making environmental data easily discoverable through standardized web services such as CSW, SOS, and THREDDS. After earning a BS in Computer Science from the University of Rhode Island in 2006, he went to work for the NOAA Chesapeake Bay Office in Annapolis, MD, working on managing huge collections of modeled and observed data. He relocated back to his home state and started working for Applied Science Associates in 2009. While at ASA, Kyle led the software development team which was focused on the visualization, analysis and storage of large scale environment data. Kyle joined Axiom Data Science in November 2013. Throughout his career, Kyle has been involved in many IOOS related projects including the IOOS catalog (http://catalog.ioos.us/), the MARACOOS regional association (http://maracoos.org/), and the Coast & Ocean Modeling Testbed (http://testbed.sura.org/). Kyle is a member of the GeoPython organization (https://github.com/geopython) which authors Python software packages for serving, managing, and accessing environmental and geospatial data and the sci-wms organization (https://github.com/sci-wms) which contirbutes to and manages the releases of the sci-wms software package.

Position and Address
Senior Software Engineer
Axiom Data Science, Providence, RI

Professional Preparation
University of Rhode Island, Computer Science, BS 2006

Appointments
2013 – Present	Software Architect, Axiom Data Science, Providence, RI
2009 – 2013	Software Engineer/Project Manager, Applied Science Associates (ASA), Providence RI
2008 – 2009	Software Engineer, Public Display, Providence, RI
2006 – 2008	IT Project Lead, Veridyne Inc., Annapolis MD

Publications
Wilcox, K., & Vance, T. (2015). Particle tracking in ocean and atmospheric studies. In L. Armstrong, K. Butler, J. Settelmaier, T. Vance, & O. Wilhelmi (Eds.), *Mapping and modeling weather and climate with GIS* (pp. 129-138). Redlands, CA: ESRI Press.

Vance, T., **Wilcox, K.**, Beegle-Krause, CJ., Schroeder, M. (2013, July). Modeling marine larval behavior using enhanced technologies. Paper presented at ESRI User Conference, San Diego, CA.

Wilcox, K., Crosby, A. (2013, July). LarvaMap - A python powered larval transport modeling system. Paper presented at SciPy, Austin, TX. Available at http://pyvideo.org/video/2074/larvamap-a-python-powered-larval-transport-mode-1.

Wilcox, K., Sontag, S. (2011, September). Bringing the oceans to life using OGC services and

dynamic visualization. Paper presented at FOSS4G, Denver, CO.

Howlett, E., **Wilcox, K.**, Stuebe, D., Galvarino, C. (2010, June). Merging Web 2.0 Technologies with Cloud-Based Web Services to Address Ocean and Coastal Geospatial Applications. Paper presented at Com.Geo, Washington, DC.

Synergistic Activities

2009 – 2013   Worked for the IOOS national office and two regional offices to catalog solutions for data streams and feeds, performing systems integration and support, and developing and supporting various Python libraries and tools for data access, manipulation, and visualization.

2010 – 2012   Managed logistics and requirements for the Dubai Coastal Ocean Observing System, including development of applications for integrating data from real-time meteorology and oceanography stations, HF radar, and video cameras.

2009 – 2012   Planner, system architect, and developer for NOAA's Coastal Ocean Modeling Testbed.

2008 – 2009   Optimized cloud architecture for scalability and cost efficiency for a small start up and their clients.

2007 – 2008   Project assessment, planning, design, development, and deployment of the cyberinfrastructure currently in use by the Chesapeake Bay Observing System (CBOS) to obtain, analyze, and share observational and modeled data with the public

Biographical Sketch - Chris Turner

Chris Turner will provide expertise in scientific metadata standards and use case development and formalization to assess the metadata policies, scope, and quality in WCGA partner data catalogs, recommend improvements, and provide training and best practices documentation related to metadata use. Chris's experience with formal metadata began while cataloging and maintaining the serials collection at University of Alaska's Consortium Library from 2008-2010. In 2011 Chris interned at the National Snow and Ice Data Center where he created a translation between the IPY polar metadata profile and a draft of ISO 19115-1, and wrote a detailed comparison of seven metadata standards and profiles in use by the polar research community. While an eScience Fellow at Syracuse University, Chris worked as a data management consultant for NSF funded, multi-PI research groups. In this role he was part of a team that interviewed researchers, and researched methods and data flows for multiple methods in several specialized disciplines, in order to suggest optimized research workflows and to design sample and subject tracking systems. Chris has a Master of Science in Library and Information Science from Syracuse University and a Bachelor of Science in Mathematics from University of Alaska, Anchorage.

Position and Address
Data Librarian
Axiom Consulting and Design, 1016 W. 6th Ave Suite 105, Anchorage, AK 99501, USA

Professional Preparation
Syracuse University, Library and Information Science, M.S., 2012
University of Alaska Anchorage, Mathematics, B.S., 2007

Appointments

2012 – Present	Data Librarian, Axiom Consulting and Design, Anchorage, AK
2011 – 2011	Polar Profile Intern, National Snow and Ice Data Center, Boulder, CO
2010 – 2012	eScience Graduate Fellow, Syracuse University, Syracuse, NY
2008 – 2010	Serials Technician, University of Alaska Anchorage, Anchorage, AK

Synergistic Activities

2011 – 2012	Data management consultant for the Thermochronology and Techtonics Research Group, Syracuse University
2011 - 2012	Founded *Filling in the Spaces*, a graduate student organization to identify and help provide necessary skills not addressed in the LIS curricula
2011	Data management consultant for Human Migration Research Group, Syracuse University
2010 – 2011	Researched policies and funding models for Open Access data repositories to inform decisions concerning sustainability planning for the FLOSSmole data repository

Graduate Advisor
Dr. Jian Qin — Syracuse University, Syracuse, NY

Biographical Sketch — Robert Bochenek

Rob Bochenek's extensive background and experience developing cyberinfrastructure tools for marine science data will prove essential for the successful implementation of this project. Rob is currently involved in the DMAC support of AOOS, CeNCOOS and GLOS regional associations. Rob has also played a key architectural role in several IOOS funded projects including the the development of the 52 North IOOS SOS stack, IOOS scalability experiment and the IOOS Systems Integration Test. He has been involved in data management and the development of cyberinfrastructure for large scale federal and regional scientific marine research efforts for the last 15 years. Rob started Axiom Data Science/ to focus on broader multi-agency efforts to manage scientific data via an end-to-end systems approach.

Position and Address
Information Architect
Axiom Consulting and Design, 1016 W. 6th Ave Suite 105, Anchorage, AK 99501, USA

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

Appointments

2013 – Present	Co-Lead, Central and Northern California Ocean Observing System (CeNCOOS), Moss Landing, CA
2010 – Present	Technical Lead, Alaska Ocean Observing System (AOOS), 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, 99504
2001 – 2002	Analyst Programmer, Alaska Department of Fish & Game, Anchorage, AK

Products

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

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, Lance Finfrock (2013), Central and Northern California Data System. Accessible from http://data.cencoos.org/.

Bochenek, R.B., S. StClaire ,B.Stone, Lance Finfrock (2013), Gulf Watch Data Portal . Accessible from http://www.gulfwatch.org/.

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

Synergistic Activities

2015 – Present	Core member of IOOS coordinated Marine Biodiversity Observation Network DMAC team. Leading the Arctic MBON and co-leading the Monterey Bay/Florida Marine Sanctuaries DMAC efforts.
2012 – 2014	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 interchange of scientific information across Alaskan Agencies.

Collaborators and Co-editors

Anderson, David	Central and Northern California Observing System, Moss Landing, CA
Broderson, Dayne	Geographic Information Network of Alaska (GINA), Fairbanks, AK
Canonico, Gabrielle	Integrated Ocean Observing System, Silver Springs, MD
Hopcroft, Russ	School of Fisheries and Ocean Science, Fairbanks, AK
Howard, Matt	Gulf of Mexico Coastal Ocean Observing System
Jones, Matt	National Center for Ecological Analysis and Synthesis, Santa Barbara, CA
McCammon, Molly	Alaska Ocean Observing System, Anchorage, AK
Moffit, Steve	Alaska Department of Fish and Game, Anchorage, AK
Mueter, Franz	University of Alaska, Juneau, AK
Mundy, Phillip	Alaska Fisheries Science Center, Juneau, AK
Saupe, Susan	Cook Inlet Citizens' Advisory Council, Anchorage, AK
Golden, Nadine	United States Geological Survey, Santa Cruz, CA
Snowden, Derrick	Integrated Ocean Observing System, Silver Springs, MD

Biographical Sketch — Shane R. StClair

Shane StClair has been working with biological and physical ocean data for over thirteen years. After earning a Bachelor of Science degree in the biological sciences from the University of Alaska, Anchorage in 2002, he worked for four years at the Alaska Department of Fish & Game developing a large scale database management system project involving data rescue, quality control, database design, and functional programming for salmon data in the Arctic-Yukon-Kuskokwim region. In 2008 Shane joined Axiom Data Science as a senior software engineer and has been the lead developer on countless data management, geospatial visualization, and interoperability projects. He is currently a lead engineer for the Alaska and Central California Ocean Observing Systems (AOOS and CeNCOOS) and a core contributor to the 52°North Sensor Observation Service project. Shane has worked with a full spectrum of ocean data, ranging from simple CSV files to complex multidimensional netCDF archives. He has long been an evangelist for open, interoperable, standards based software, and has contributed to many open source projects including 52°North SOS, GeoServer, and GeoTools. Shane specializes in Java, Maven, geospatial databases, and interoperable, OGC standards based software stacks. He is a strong proponent of object oriented programming techniques, early and often release cycles, and clean, maintainable code.

Position and Address
Software Architect
Axiom Consulting and Design, 511 SW 10th Ave, Portland, OR 97205, USA

Professional Preparation
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

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 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, Reggiolo, 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

Biographical Sketch — William C. Koeppen

Will Koeppen has a Bachelor of Science degree from Juniata College (Geology and Physics, 2001), a Masters degree from Washington University in St. Louis (Earth and Planetary Science, 2003), and a PhD from the University of Hawaii at Manoa (Geology and Geophysics, 2008). His dissertation work involved determining and describing the surface composition of Mars using thermal infrared satellite data and analog laboratory and field analyses. In his post-graduate work, Will planned, developed and completed a hybridized time-series analysis algorithm for detecting volcanic eruptions on Earth by comparing near real-time data from the Moderate-resolution Imaging Spectroradiometer (MODIS) onboard the Terra and Aqua satellite platforms to decadal thermal averages. He also worked on statistical deconvolution methods to identify the presence of geologic materials associated with nuclear enrichment in thermal infrared airborne data. Since working at Axiom, he has helped to develop, organize, describe, manipulate and interpret thousands of static, near real-time, and real-time terrestrial and ocean-based data layers for use by scientists worldwide. He serves as the scientific and technical liaison for multiple large-scale oceanographic research groups working to effectively share and describe their data both internally and publicly.He is the lead author of articles published in the Bulletin of Volcanology and the Journal of Geophysical Research, he has peer-reviewed numerous papers for scientific journals, and he has served as an outside reviewer for NASA funding opportunities.

Position and Address
Staff Scientist
Axiom Consulting and Design, 1016 W. 6th Ave, #105, Anchorage, AK 99501

Professional Preparation
University of Hawaii at Manoa, Geology and Geophysics, Ph.D., 2008
Washington University in St. Louis, Earth and Planetary Science, A.M., 2003
Juniata College, Geology & Physics, B.S., 2001

Appointments

2012 – Present	Staff Scientist, Axiom Consulting and Design, Anchorage, AK
2008 – Present	Director, Earth and Ecological Science Institute, Honolulu, HI
2008 – 2010	Postdoctoral Fellow, Hawaii Institute for Geophysics and Planetology, University of Hawaii
2003 – 2008	Graduate Research Assistant, Hawaii Institute for Geophysics and Planetology, University of Hawaii
2001 – 2003	Graduate Research Assistant, Earth and Planetary Science Department, Washington University
1999 – 2001	Assistant Field Geologist. Department of Geology, Juniata College, Huntingdon, PA.

Publications

Koeppen, W. C., M. Patrick, T. Orr, J. Sutton, and R. Wright (2013), Constraints on the partitioning of Kilauea's lavas between surface and tubed flows estimated from infrared satellite data, sulfur dioxide flux measurements, and in situ observations. *Bull. Volc.*, 75:716, doi: 10.1007/s00445-013-0716-3.

Koeppen, W. C., E. Pilger, and R. Wright (2011), Time series analysis of low resolution thermal infrared satellite data for detecting thermal anomalies: a hybrid approach., *Bull. Volc.*, 73(5), 577-593, doi: 10.1007/s00445-010-0427-y.

Koeppen, W. C. and V. E. Hamilton (2008), Global distribution, composition, and abundance of olivine on the surface of Mars from thermal infrared data, *J. Geophys. Res.*, 113,

E05001, doi: 10.1029/2007JE002984.

Koeppen, W. C. and V. E. Hamilton (2005), Discrimination of glass and phyllosilicate minerals in thermal infrared data, *J. Geophys. Res.*, E08006, doi:10.1029/2005JE002474.

Arvidson, R. E., F. P. Seelos IV, K. S. Deal, N. O. Snider, J. M. Kieniewicz, W. C. Koeppen, B. M. Hynek, M. T. Mellon, and J. B. Garvin (2003). Mantled and Exhumed Terrains in Terra Meridiani, Mars, *J. Geophys. Res.*, 108(E12), 8073, doi:10.1029/2002JE001982.

Synergistic Activities

2014	Protection of the Arctic Marine Environment Ecosystem Assessment Workshop participant; Spatial Tools for Arctic Mapping and Planning workshop co-convener; IOOS System Integration Test Participant
2013 – Present	Scientific and technical liaison for the Russian-American Long-term Census of the Arctic (RUSALCA)
2012 – Present	Scientific and technical liaison for the Gulf of Alaska Integrated Ecosystem Research Program (GOAIERP)
2008 – Present	Publication referee for *Journal of Geophysical Research*, *Chemie der Erde*, *American Mineralogist*, *Polar Science*, *Geophysical Research Letters*
2008 – Present	Non-panelist grant reviewer for NASA's *Planetary Geology and Geophysics Program*, *Mars Data Analysis Program*, and *Mars Fundamental Research Program*
2006 – 2008	Presenter (2006), Organizer (2007), and Judge (2007, 2008), Tester Memorial Symposium, an interdisciplinary natural science symposium sponsored by the UH Zoology Department

Collaborators and Co-editors

Dickson, Danielle	North pacific Research Board, Anchorage, AK
Dugan, Darcy	Alaska Ocean Observing System, Anchorage, AK
Garbeil, Harold	Hawaii Institute of Geophysics and Planetology, Honolulu, HI
Hamilton, Victoria	Southwest Research Institute, Boulder, CO
Howard, Katherine	Alaska Department of Fish and Game, Anchorage, AK
McCammon, Molly	Alaska Ocean Observing System, Anchorage, AK
Mundy, Phillip	Alaska Fisheries Science Center, Juneau, AK
Oakley, Adrienne	Kutztown University, Kutztown, PA
Olsen, Amanda A.	University of Maine, Orono, ME
Olsen, Brian J.	University of Maine, Orono, ME
Orr, Tim	Hawaii Volcano Observatory, Hawaii Volcanoes National Park
Osterloo, Mikki	Southwest Research Institute, Boulder, CO
Patrick, Matthew	Hawaii Volcano Observatory, Volcano, HI
Pilger, Eric	Hawaii Institute of Geophysics and Planetology, Honolulu, HI
Seelos, Frank	Johns Hopkins University Applied Physics Laboratory, Wash. D.C.
Sutton, Jeffrey	Hawaii Volcano Observatory, Hawaii Volcanoes National Park
Stimpert, Alison	Ocean Acoustics Laboratory, Monterey, CA
Tyler, Ellen	Alaska Ocean Observing System, Anchorage, AK
Wiese, Francis	North pacific Research Board, Anchorage, AK
Winter, Michael	Technical Research Associates, Honolulu, HI
Wright, Robert	Hawaii Institute of Geophysics and Planetology, Honolulu, HI
Young, Lindsay	Department of Zoology, University of Hawaii, Honolulu, HI

Graduate Advisors

Dr. Victoria E. Hamilton — Southwest Research Institute, Boulder, CO

Dr. Raymond E. Arvidson — Washington University in St Louis, St. Louis, MO

Postdoctoral Supervisor
Dr. Robert Wright — Hawaii Institute of Geophysics and Planetology, Honolulu, HI