Charlton Galvarino
Curriculum Vitae

P.O. Box 50960   (803) 233-6205

Columbia, SC 29250   charlton@2creek.com

Summary

I have spent much of my professional career applying my software development and database design expertise to create end-to-end, web-accessible GIS applications for a variety of clients and users. Such applications require a vast array of disparate data to be aggregated, translated, and ultimately packaged in a user-friendly way. I leverage my active involvement and leadership in regional and national data management committees to find, implement, and create the best-fit solution for data packaging, delivering end-to-end programming with an open source attitude.

Education

Bachelor of Science in Computer Science, University of South Carolina, *cum laude*; 1998.

Bachelor of Science in Biology, University of South Carolina, *cum laude*; 1998.

Work experience

Sole Proprietor; Second Creek Consulting, LLC; Columbia, SC; 2005-current.
With customers ranging from the private sector to the federal and academic sectors and projects ranging from legacy data visualization to sailboat race tracking, I have applied my passion for customer service and my years of IT experience to meet a variety of challenges. Below are highlights from select clients.

Private sector client highlight: Horizon Marine, Inc. (HMI).
HMI specializes in providing oceanographic services to clients that range from large oil companies to individuals participating in yacht racing competitions. I was contracted to **create geospatial databases** for their buoy and ship data since they had not fully developed a centralized data repository for ocean observations. Once this step was completed, I **designed geographic information system (GIS) websites** that are essential components of their day-to-day operations as well as portals for data access by their clients. My approach to data integration and standardization has enabled HMI to **share their data via Open Geospatial Consortium (OGC) protocols** (namely Web Mapping and Web Feature Services, **WMS** and **WFS**, respectively). As an example, much of this end-to-end work was encapsulated in iBoattrack, an HMI research and development project that creates sailboat race tracking web sites and GPS tracking devices. I was responsible for the **website programming, mapping, database design and population, binary buoy data decoding, system administration of the network clusters, and fail-safe redundancy**. Visit the iBoattrack 2009 Marion to Bermuda Cruising Yacht race via my portfolio page, http://www.2creek.com/portfolio/.

Federal sector client highlight: NOAA's National Weather Service (NWS).
Many ocean observing system organizations aspire to have their data products and data management practices become part of a larger, more permanent and integrated footprint. As the **primary architect and programmer**, I leveraged the work I had done for small, medium, and large ocean observing groups, Caro-COOPS, SEA-COOS, and IOOS (all mentioned and defined below), to **aggregate disparate data into the new Marine Weather Portal** (MWP) for NOAA's National Weather Service. This **interactive mapping and data website** is becoming the standardized template for all coastal weather forecast offices to display marine data and marine hazards. Up until the advent of the MWP, NWS did not have a standardized template for their marine web pages. In order to facilitate deployment and the eventual handoff of this Google Map-based suite to the NWS, the entire backend is housed within a **VMWare ESXi environment**. This virtualization will help maintain **system scalability** as the geographic footprint increases. Visit its development site via my portfolio page, http://www.2creek.com/portfolio/.

Academic sector client highlight: Woods Hole Oceanographic Institution (WHOI).
Scientists and researches at WHOI have a wealth of physical and biological oceanographic data housed in a system developed as part of the U.S. Joint Global Ocean Flux Study (U.S. JGOFS). I was contracted to **create a GIS** to make this data available via a complimentary interface to its existing set of text-only web pages. With this particular client and application, I did not have the luxury of a standard database to house the base data. Instead, I programmed my web application to **interface with their developing metadata ontology** database to yield an **OGC-compliant** front-end to their data. One of the requirements for this WHOI application was that data be available via the new **Oceans layer in Google Earth**. As a result of our work to homogenize the data via my middleware and their ontology, much of their data is readily available in several OGC formats which include **Keyhole Markup Language (KML)**, a format that Google Earth readily accepts. Visit the website via my portfolio page, http://www.2creek.com/portfolio/.

Non-profit sector highlight: Southern University Regional Association (SURA) Coastal Ocean Observing and Prediction (SCOOP) Program.
SURA-SCOOP was an end-to-end implementation of a **Service Oriented Architecture (SOA) system** to produce hurricane ensemble-based forecast products. One of my primary functions was to take a variety of forecast outputs and to place a **common API in front of this binary gridded data** in a timely fashion. I manipulated the forecast products to avail them via **Web Mapping and Web Feature Services**. As a result, scientists across the southeast could see **GIS visualizations** of their products in real-time during and after major storm systems. I also availed in-situ and model data via the **Sensor Observation Service (SOS)** thereby providing a way to easily perform **model-to-in-situ and model-to-model time series** comparisons.

Systems Analyst; Baruch Institute & The Advanced Solutions Group (ASG), University of South Carolina (USC); 1998-2005.
While working at USC, I became aware of the benefits of Open Source technology and implemented **best-fit software solutions** for GIS applications. An example of this was my **development, coordination, implementation, and documentation** of applications based on MapServer, other Open Source software packages, and ESRI desktop applications (proprietary software) for **local, regional, and international GIS efforts**. I moved from a position at ASG of **database design, architecture, and programming** for state agency software, to a position within the Marine Science program at The Baruch Institute. I **spearheaded the coordination and implementation** of early efforts to produce a **GIS web portal** for near real time integrated coastal ocean observation data and model products. This application suite was an embodiment of my professional strengths: **database design, binary data translation, data integration, and data dissemination**. I carried these approaches from a Carolinas-only regional program, the Carolinas Coastal Ocean Observing and Prediction System (Caro-COOPS), to the Southeast Coastal Ocean Observing System (SEA-COOS), and finally to a national project, the Integrated Ocean Observing System (IOOS). Each time the geographic footprint of my project grew, so did my appreciation for **product scaling and software modularity**. By the time I began direct involvement with the IOOS, I had begun to leverage the **OGC communication** protocols to allow my applications to interface with others.

Software Developer, E811; Columbia SC; 1998-2001.
Within this elite team at E811, my responsibilities grew to include acting as the project manager of statewide **Oracle-based** legal assistance case management system. It was also my first real-world exposure to the customer as a **liaison to intercept, resolve, prioritize, and relay software fix and database modification requests**. Customer interaction continued as I acted as a software training instructor catering to large and small user groups. When there weren't customer service fires to extinguish, my software programming scope grew to include **configuring and designing database front-end applications** from the ground-up. These applications provided interfaces to large **DB2-based** data warehousing projects.

Technology expertise
- Databases: PostgreSQL, PostGIS, Oracle.
- Data access: OGC (WMS, WFS, KML, SOS); Open-source Project for a Network Data Access Protocol (OPeNDAP), and Simple Object Access Protocol (SOAP).
- Languages: Perl, PHP, UNIX system scripting.
- Development libraries and environments: UMN MapServer, Google Maps, Google Earth, Geospatial Data Abstraction Library (GDAL) / OpenGIS Simple Features Reference Implementation (OGR); The Generic Mapping Tools (GMT); ImageMagick; ESRI ArcGIS.
- Data formats: Network Common Data Form (NetCDF), GRIdded Binary (GRIB); ESRI Shapefile.
- Other: VMWare ESXi, Cloud computing.

Group memberships, affiliations, and awards
- IOOS (Integrated Ocean Observing System) DIF (Data Integration Framework) Web Services & Data Encodings (WSDE); 2008.
- Southeast Costal Ocean Observing Regional Association (SECOORA) Data Management Coordinating Committee (DMCC) and SECOORA RCOOS (Regional Coastal Ocean Observing System) Development Team; 2008.
- NOAA Public Service Award in recognition for services contributing to the development of the Carolinas Coast marine website; 2007.
- COTS (Coastal Ocean Technology System) / ONR (Office of Naval Research) Common Interface Working Group and Data Transport Working Group; 2004.
- Phi Beta Kappa; 1997.

Publications, abstracts, and presentations
- R. C. Groman, M. D. Allison, C. L. Chandler, <u>C. Galvarino</u>, D. M. Glover, P. H. Wiebe, S. R. Gregg, (2009) Further Enhancements of the Geospatial Interface to the Biological and Chemical Oceanography Data Management System; AGU Fall Meeting, San Francisco, CA.
- J. Dorton, V. Subramanian, <u>C. Galvarino</u>, D. Porter, (2009) Ocean Observing: Linking Observations to the NWS and Marine Community; MTS/IEEE Oceans '09 Conference, Biloxi, MS.
- L. Bermudez, P. Bogden, E. Bridger, T. Cook, <u>C. Galvarino</u>, G. Creager, D. Forrest, J. Graybeal, (2009) Web Feature Service (WFS) and Sensor Observation Service (SOS) Comparison to Publish Time Series Data; 2009 International Symposium on Collaborative Technologies and Systems.
- J. Dorton, D. Porter, <u>C. Galvarino</u>, S. Pfaff, V. Subramanian, (2009) Southeastern Marine Weather Portal: NWS and COOS Working Together for the Benefit of the Marine Community; Coastal GeoTools; Myrtle Beach, SC (presenter).
- L. Bermudez, J. Graybeal, G. Creager, T. Cook, D. Forrest, P. Bogden, <u>C. Purvis (Galvarino)</u>, E. Bridger, (2008) OpenGIS® Ocean Science Interoperability Experiment 1; Submitted to Open Geospatial Consortium, Inc.
- <u>C. Galvarino</u>, (2008) Expansion of the Carolinas Coast Marine Weather Template within the SECOORA Region; IOOS Regional Grantees Data Management Workshop (presenter).
- F. Muller-Karger, C. Hu, B. Murch, J. Taylor, R. Helber, R. Weisberg, E. Kearns, <u>C. Purvis (Galvarino)</u>, (2005) Remote Sensing Contributions to the Southeast Atlantic Coastal Ocean Observing System (SEACOOS); Coastal GeoTools; Myrtle Beach, SC (presenter).
- P. Bogden, T. Shyka, T. Lavoi, <u>C. Purvis (Galvarino)</u>, COTS/ONR Partners, (2005) Coastal Observing Systems: Present Status and Future Directions; 2005 International Ocean Research Conference; UNESCO Headquarters, Paris, France.
- <u>C. Purvis (Galvarino)</u>, (2005) Near Real-Time Ocean Data Management: An Implementation of Open Source Technologies and OGC Protocols; 2005 North Carolina Geographic Information Systems Conference; Raleigh, NC; (presenter).
- <u>C. Purvis (Galvarino)</u>, J. Cothran, J. Donovan, M. Fletcher, S. Haines, R. Helber, C. Hu, E. Kearns, F. Muller-Karger, B. Murch, J. Nelson, D. Porter, H. Seim, V. Subramanian, J. Taylor, R. Weisberg, E. Williams, (2004) Near Real-Time Ocean Observations Online: Data Management within the Southeast Atlantic Coastal Ocean Observation System (SEACOOS); Open Source GIS Conference Jun 2004; Ottawa, Canada (presenter).