

David K. Arctur, Ph.D.

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Summary

My life goal is to help nurture networks of people and ideas across domains and institutions, to advance the study and shared understanding of Earth system sciences. I've worked in several distinct fields, with more than 35 years of graduate study and professional experience including:

- Active research, leadership, program management, and outreach for geoscience informatics and for international geospatial data exchange standards development (1996-present);
- GIS web applications, data modeling, programming, software engineering, technical writing, course development and professional instruction for relational, object-oriented, and geographic database systems and applications (1977-2006, starting again in 2016);
- Engineering and field operations for space exploration, telephone network maintenance, petroleum exploration and production, and electric utilities research & development, during and after undergraduate education (1970-77).

Professional Experience

4/12 – Present: University of Texas at Austin

Research Fellow (4/12 – present), Jackson School of Geosciences

Research Fellow (10/12 – 6/14), Research Scientist (6/14 – present), Cockrell School of Engineering

UT [Center for Integrated Earth System Science \(CIESS\)](#) director Dr. Liang Yang and associate director Dr. David Maidment invited me to be Research Fellow in this new center, formed in 2011. Goals are to support and help organize interdisciplinary research in geosciences, engineering, and public policy across UT schools and departments; conduct seminars and webinars for outreach; and support UT's access and influence in international standards communities.

Primary funded project work is with the [Center for Water and the Environment](#) in the Cockrell School of Engineering:

- 2017-2021: Senior personnel for [National Center for Infrastructure Modeling and Management \(NCIMM\)](#), funded by EPA to modernize SWMM and EPANET.
- 2016-2017: Senior personnel and GIS support for Texas Division of Emergency Management project for National Water Model outreach at state level, to develop practices for flood inundation mapping at local and state level. Primary developer of statewide address database, now in transition to TNRIS for ongoing maintenance.
- 2015-2017: Co-PI, NSF EarthCube Integrative Activity "[Advancing NetCDF-CF for the Geoscience Community](#)"
- 2014-2016: Co-PI, "Enhancement of mutual discovery, search, and access of data for users of NASA and GEOSS-cataloged data systems", NASA ROSES ACCESS
- 2013-2015: Senior personnel for EarthCube Building Blocks funded initiative "[Integrating Discrete and Continuous Data](#)".
- 2012-2015: Co-PI, "Bridging the Digital Divide between Discrete and Continuous Space-Time Array Data", NASA ROSES ACCESS

Am continuing my volunteer participation in [NSF EarthCube](#), started while OGC staff:

- 2016, Chair of Organizing Committee for [EarthCube Architecture Workshop](#), and lead author of [final report](#).
- 2015-2016: elected to be at-large member of EarthCube Leadership Council, the governing body of EarthCube.
- 2014-2016: participate in [iSamples Research Coordination Network](#), as co-chair of [working group on Identifiers and metadata](#).
- 2013-2014: serve on steering committee for EarthCube [Marine Seismic Data Workshop](#).
- 2013: organized and led an [EarthCube-OGC Workshop](#), co-located with OGC Technical Committee meeting.
- 2012-2013: served on the Cross-Domain Interoperability Test Bed Concept Group and the Governance Community Group, co-authoring EarthCube framework and roadmap documents, and serving on community engagement team.

From 2012-2015, served as project lead for [GEOSS Architecture Implementation Pilot \(AIP\)](#) projects to develop water informatics registries to enable and broaden public discovery, access and decision support for water data, maps and models. Completed [AIP-5](#) project in 2012; [AIP-6](#) in 2013; [AIP-7](#) in 2014, and [AIP-8](#) in 2015.

2013-2014: studied & led changes at OGC to improve recognition and citability for OGC standards authors & publications.

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2013: started coordinated endowments for the Jackson School of Geosciences and the Information School, to advance research and applications in digital preservation of physical geological and other collections in Earth sciences.

2013: Completed my role as co-chair of the [Standards and Interoperability Forum \(SIF\)](#) of GEOSS, started while OGC staff. The SIF helps develop and educate on use of the GEOSS infrastructure.

Adjunct Faculty, School of Information (1/13 – 12/13)

Taught graduate-level GIS Introduction course for two semesters in 2013. Could not continue after Fall 2013 due to other work commitments. Course syllabi available for limited time at [Spring 2013: INF 385T](#) and [Fall 2013: INF 385T](#).

6/08 – 6/12: Director, Interoperability Programs, Open Geospatial Consortium, Austin TX

My primary responsibility was to organize and lead sponsored test beds ([OWS-6](#), [OWS-7](#), [OWS-8](#)) to advance standards, best practices, and cyberinfrastructures for sensor web, geoprocessing workflow, security & event architectures, visualization, and decision support, each resulting in a set of reports & demonstrations ([OWS-6](#), [OWS-7](#), [OWS-8](#)). I also initiated and led development of these videos: [About OGC](#) and [OWS-8 Demonstrations Overview](#).

- In 2008, I initiated and helped develop the relationship and [MoU between OGC and WMO](#), which endorsed OGC's position as an affiliated standards body and strengthened OGC working groups for hydrology, meteorology, oceanography, climate, and other Earth system sciences.

8/06 – 6/08: President and Chief Technology Officer, OGC Interoperability Institute, Austin TX

Directed the OGCii program for education and outreach to advance the interoperability of digital scientific data collections in the geosciences and for institutional spatial data infrastructures (SDI). Helped identify and recruit government, academic, and commercial partners for specific projects, helped write grant proposals, and the technical and executive reports of these projects. Key project during this period was for requirements analysis and architecture of the Pennsylvania Map SDI (PAMAP). Also helped convene sessions on interoperability and open science at AAAS conferences.

2/00 – 7/06: Environmental Systems Research Institute (Esri)

Interoperability Engineer, Austin TX (1/05 – 7/06)

Represented Esri in the Open Geospatial Consortium technical committee, serving as co-chair of three working groups. Have written position papers and edited standards specifications. Main accomplishments were to catalyze the completion and adoption of the GML Simple Features Profile specification, and to bring about the addition of elevations and measures within the Simple Features for SQL specification. Have also conducted one-day geodatabase design workshops at URISA national conferences, Esri International User Conferences, GeoTec and Geo-Alberta annual conferences.

Product Specialist, Austin TX (2/02 – 1/05)

Coauthored the book, *Designing Geodatabases: Case Studies in GIS Data Modeling* (Esri Press, 2004). Assisted in quality assurance program for distributed geodatabase technology development. Also conducted one-day geodatabase design workshops at URISA and Esri UC.

Data Architect, Redlands CA (2/00 – 2/02)

Developed system requirements, architecture and database designs, and led development of domain-specific data models for use with ArcGIS products, particularly for Defense/Intelligence projects and applications. Was lead data architect in a project to build data warehouse for Defense/Intelligence community. Collaborated, coordinated with technology partners on development projects. Prototyped application interfaces with COM/Visual Basic. Wrote technology white papers and conducted workshops on object-oriented GIS at URISA national conferences.

Education

Ph.D. Urban and Regional Planning, College of Architecture, University of Florida, Gainesville (1996)
Dissertation: "Design of an Extensible, Object-Oriented GIS Framework with Reactive Capability"

Graduate study in Database Management and Computer Science, Stanford University, Palo Alto, California (1988-89)

M.S. Electrical Engineering, University of Texas at Austin (1979)

Thesis: "Implementing a Monthly Production Simulator for the Regionalized Electricity Model"

B.S. With Honors in Electrical Engineering, University of Texas at Austin (1975)