

Stephen L Arnold

Systems Engineer/Architect and Applied Earth Scientist

Location: USA (Santa Maria, CA) Phone: +01.805.863.8299 Email: stephen.arnold42@gmail.com	Degrees: Geophysics Language: English	
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Education

- 1995-Present:** Graduate/short courses in Toxic Risk Assessment, C, Ada, Zope, Doppler and Polarimetric Weather Radar, 595th TEG Test and Evaluation Course, AMS Faculty Workshop, AHC Professional Development courses.
- 1990:** MS Degree in Geophysics, San Diego State University. Thesis topic:
Atmospheric Resonance Waves Over the Sea of Cortés: An Experimental Case Study
- 1986:** BS Degree in Geophysics, San Diego State University.

Technical skills

- Sciences:** Geophysical fluid dynamics, meteorology/geology/geography, environmental/health risk assessment, applied math modeling
- CS/SE:** Strong knowledge of programming languages and tools, system performance, design, testing, and administration, as well as the software lifecycle, CI, software processes, requirements engineering, and system architecture, CyberSecurity
- OS:** Unix/Linux/Embedded (Gentoo, OE, RHEL, Debian/Ubuntu), Android
- Proj Mgmt:** Planner, OpenAdams, SCM tools, Make/Autotools, trac/git, doxygen, TaskWarrior
- DataBase:** SQL, Postgres/spatial, sqlite, redis/nosql
- Software:** Libre/Open office tools, docutils, Graphviz, Dia, Inkscape, Maxima, Octave
- Embedded Systems:** Gentoo, OpenEmbedded, Android, design/build/deployment of applications for ARM and other embedded systems, Android, debian/Ubuntu

Languages

- English:** Native
- Spanish:** Conversational(-ish)
- Applied Math:** Fluent (linear systems, differential equations, functional analysis, non-linear dynamics, math modeling, statistical methods)
- Programming:** Python, Ada, Bash/POSIX Shell, C, Java, C++, Perl, js, AWK, FORTRAN
- Markup:** reStructuredText, HTML, DTML, XML, Markdown
- Architectures:** x86/x86_64, ARM/AVR, Sparc, PowerPC, MIPS
- Engineering:** IV&V, OOD/P, UML, DoDAF, 2167/498/12227, toolchains/SDKs, CI/Agile, jenkins/apache/trac/svn/git workflows, open document production

Recent Work Experience

- 2014 - Present:** Principal Scientist, Systems Architect, Business Development - [Vanguard Computer Technology Labs, Inc](#) - Goleta, CA. VCT Product/Project management, conferences/expos, open source outreach & education. IV&V, Range Meteorology, and Hazard/Risk Modeling Subject Matter Expert (SME), education & training instructor. Systems Architecture and CyberSecurity (specializing in Gentoo, OpenEmbedded, RHEL, and Debian/Ubuntu, Linux development, build, and deployment testing. Linux kernel/u-boot and software testing on various ARM devices (Gentoo Linux, OE). Business/community development (event support, outreach, presentations, proposals).
- 2004 - Present:** Startup / Tech Mentor - Technology and Open Source adviser, [Santa Maria Startup Weekend](#) and other local meetups and user groups. Open source presentations, technology training, demos.
- 2011 - 2014:** SynergyHD3 - Senior Software Engineer - [Arthrex California Technology, Inc.](#) - Goleta, CA. DevOps, software/systems engineering, CM/QA, test & integration. Agile infrastructure & CI process implementation, Jenkins build/test/deployment automation. Linux OS/Distribution engineering, software and manufacturing process validation.
- 2009 - 2011:** Staff Scientist, IV&V / Systems Engineering and Architecture Support - [ENSCO, Inc.](#) - VAFB, CA. Subject Matter Expert – Range Meteorological Systems, Flight Safety, Instrumentation. Launch Range Enterprise Architecture analysis (supersystem, subsystem, product). Safety-critical systems IV&V (Flight Termination, Range Timing). Range Architecture Model VV&A, model evaluation, code analysis, and test engineering. Software process, internal SCM and IV&V tool engineering.
- 2006 - 2009:** Staff Scientist, System Performance Evaluation and Validation - [ENSCO, Inc.](#) - VAFB, CA. Performance analysis and verification & validation of Weather, Flight Operations, TEMS/Timing and Infrastructure products for new Mission Flight Control Center. Responsible for Weather, Infrastructure, and Data Handling subsystems; technical IA and System Security/Accreditation support.
- 2002 - 2006:** Senior Scientist, [Meteorological And Range Safety System](#) (MARSS), Instrumentation and Infrastructure - [ENSCO, Inc.](#) - Santa Maria & VAFB, CA. RSA-MARSS and INF system design and requirements engineering, user training. Model evaluation and localization, integration with MM5/AWIPS, range instrumentation integration and test support.
- 1997 - 2002:** Senior Scientist - Independent Verification & Validation - [ENSCO, Inc.](#) - VAFB, CA. IV&V of Launch & Test Range Meteorological and Flight Safety Systems, Range meteorologist and engineering test support to AFOTEC and 17th Test Squadron.
- 1991 - 1997:** Senior Systems Engineer, IV&V Task Lead on Meteorological Range Safety Systems - Geodynamics Corp - VAFB, CA. Requirements/code analysis, windfield, dispersion, & hazard/risk [model evaluation](#), dense gas hazard analysis, developed new [statistical estimation algorithm](#) for processing time-averaged wind data without access to the raw samples. Also performed real-time range safety algorithm & performance analysis, instrumentation and data quality analysis.
- 1990 - 1991:** Applied earth science & software consultant, San Diego, CA. Air toxics risk assessment modeling studies, sensitivity studies, environmental assessments, cost-benefit analyses, bug-fixes and model enhancements (IWG Corp), geophysical data acquisition (JR & Assoc), database design/implementation (SDSU Instructional Media Center).
- 1984 - 1990:** Research Assistant, Coastal and Boundary Layer Meteorology - SDSU and Scripps Center For Coastal Studies, San Diego, CA. Field observations, data collection, analysis, post-processing for 3 major field programs, scientific programming, custom instrumentation development (tethered sounding gear, kite and balloon platforms).

Recent FOSS Experience

- 2015 - Present:** Co-maintainer of imx233-olinuxino boards for the [FSL Community BSP](#) (tested with Yocto/OpenEmbedded and meta-fsl*).
- 2014 - Present:** Founding member [Central Coast Open Source Solutions Exchange](#), an open source technology-focused meetup.
- 2012 - Present:** Contributing developer - [OpenEmbedded](#) and [Yocto](#).
- 2003 - Present:** Senior Developer - [Gentoo Linux](#). Maintainer of developer tools, GIS/scientific libraries, mentor of new developers, currently primary maintainer of [Gentoo ARM overlay](#) and my own [dev overlay](#).
- 2000 - Present:** Upstream developer and/or maintainer of several tools and utility libraries for source code metrics, graphics, science, and education. See the [maintenance release page](#) and the individual github project sites for more information.

Recent Education Experience

- 1999 - 2009:** Associate Faculty - [Allan Hancock College](#) (senior geography and meteorology instructor). Taught Physical and Human Geography courses and occasional technology courses, updated official geography course outlines, created new introductory meteorology course.
- 2014 - Present:** Volunteer Instructor/Mentor - Google Summer of Code, Computer Science Education Week, and Open Document Foundation's Document Freedom Day.
- [GSoC mentor for BeagleBoard.Org](#): BeagleSat project.
 - [Computer Science Education Week](#): Python Intro to CS course.
 - [ODF](#) contributor, [Document Freedom Day](#): Open Document Workshop.

Selected Projects

- Maintainer of [GNU Winds On Critical Streamline Surfaces \(GWOCSS\)](#) diagnostic windfield model.
- Senior Developer, [Gentoo Linux](#). Maintainer of [gentoo arm overlay](#), developer tools, gnat-gcc, misc.
- Project lead, [Open Source Weather Station](#) - Raspberry Pi weather sensors and display software, arduino lightning detector (AMS WeatherFest demo).
- Embedded OS build, test, deployment, validation. SynergyHD3 embedded surgical camera project, Arthrex California Technology.
- Lead Systems Engineer, Subject Matter Expert for Meteorological And Range Safety System (MARSS), VAFB. Model evaluation and localization, integration with MM5/AWIPS and local instrumentation, forecaster/maintainer training.
- Test Director, test tool development, and scientific & engineering support, RSA Weather and Range Safety Systems, AFOTEC and 17TS.
- IV&V and [model evaluation](#) of energy-balance evaporative source strength model for hypergolic propellant/oxidizer spills.
- Volunteer user group leader, technical support, and PoP maintenance, RAIN.
- Maintenance Development and Modeler, Air Emissions Risk Assessment Model (AERAM). Air toxics risk assessment modeling, sensitivity studies, control trade-offs. Added "batch" mode for large model runs, fixed bugs.
- Research Assistant, Data Analyst, Programmer on [Marginal Seas Experiment](#), 1984/85.
- Research Assistant, [Gibraltar Experiment](#), 1986.
- Research Assistant, [Shelf Mixed-Layer Experiment \(SMILE\)](#), 1989.

Selected Publications

Open Data Standards and Open Source Modeling Tools: The GPL'd Release of Winds On Critical Streamline Surfaces (GWOCSS) (2015) S. L. Arnold, presented at the 31st Conference on Environmental Information Processing Technologies, Open Data Standards and Sharing track (95th Annual AMS Meeting, 2015).

Incorporating the AMS Online Weather Studies Resources In the Design of a New Meteorology Course (2007) S. L. Arnold, presented at the Educational Initiatives Poster Session, 17th Symposium on Education (88th Annual AMS Meeting, 2008).

Open Source Technologies in Science Education: What's Your Geek IQ? (2004) S. L. Arnold, presented at the Joint Session on Cyberinfrastructure to Support Atmospheric and Oceanic Education: Examples and Strategies, 14th Symposium on Education (85th Annual AMS Meeting, 2005)

The Meteorological And Range Safety Support (MARSS) System: a GIS-based Tool for Launch Area Hazard Prediction and Visualization (2004) S. L. Arnold, A. Dianic, and E. Magnuson, presented at the 21st Int Conf on Interactive Information Processing Systems (IIPS) for Meteorology, Oceanography, and Hydrology (85th Annual AMS Meeting, 2005)

An Operational System for Real-time Lightning Display and Resource Protection (2004) E. Magnuson, S. L. Arnold, and A. Dianic, presented at the Conference on Meteorological Applications of Lightning Data (85th Annual AMS Meeting, 2005)

A Minimum Variance Approach to Estimating Wind Direction Statistics (2001) S. L. Arnold, presented at the 18th Int Conf on Interactive Information Processing Systems (IIPS) for Meteorology, Oceanography, and Hydrology (82nd Annual AMS Meeting, 2002)

Physical & Thermodynamic Properties of Hypergolic Propellants: A Review and Update. (1999) S. L. Arnold, Presented at the 1999 JANNAF Inter-agency Propulsion Committee PD&CS and S&EPS Joint Meeting, San Diego, CA

Professional

Affiliations: American Meteorological Society, American Geophysical Union, Assoc. for Computing Machinery, Computer Science Teachers Assoc, American Federation of Teachers

Interests: Earth Science Education, Computer Literacy/Fluency, Privacy and Security, Linux and Open Source, Environmental Risks and Hazards, Space Exploration and Technology

Personal

Home sites: <http://www.gentoogeek.org> and <https://www.linkedin.com/pub/steve-arnold/3/172/427>

Repositories: <https://github.com/sarnold> and <https://github.com/VCTLabs>

Publications: http://www.researchgate.net/profile/Stephen_Arnold4

Interests: Guitar/Bass/Percussion, Science Fiction, Open Source