Jim Graham

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Publications

Publications in Refereed Journals

- * Graham, J., et al., How will climate change affect the potential distribution of Eurasian Tree Sparrows (Passer montanus)? Current Zoology, 2010. (in review)
- * Graham, J., et al., Bringing Modeling to the Masses: A Web Based System to Predict Potential Species Distributions. Future Internet, 2010
- Newman, G., A. Crall, L. Melinda, J. Graham, T. Stohlgren, J. Moore, K. Kodrich, K. Holfelder, 2010. Teaching citizen science skills online: Implications for invasive species training programs. Applied Environmental Education & Communication.
- Newman, G., D. E. Zimmerman, A. Crall, M. Laituri, J. Graham, and L. Stapel. 2010. User friendly web mapping: Lessons from a citizen science website. International Journal of Geographical Information Science online. DOI: 10.1080/13658816.2010.490532.
- Crall, A.W., G.J. Newman, C.S. Jarnevich, T.J. Stohlgren, D.M. Waller, and J. Graham. 2010. Improving and Integrating Data on Invasive Species Collected by Citizen Scientists. Biological Invasions Online.
- Simpson, A., C. S. Jarnevich, J. Madsen, R. Westbrooks, C. Fournier, L. Mehrhoff, B. Browne, J. Graham, and E. Sellers. 2009. Invasive species information networks: collaboration at multiple scales for prevention, early detection, and rapid response to invasive alien species. Biodiversity.
- Lee H, D.A., Reusser , J.D. Olden, S.S. Smith, J. Graham, V. Burkett , J.S. Dukes, R.J. Piorkowski, J. McPhedran. 2008. Integrated monitoring and information systems for managing aquatic invasive species in a changing climate. Conservation Biology 22: 575-584.
- * Graham J., A. Simpson, A. Crall, C. Jarnevich, G. Newman, T.J. Stohlgren. 2008. Vision of a cyberinfrastructure for nonnative, invasive species management. Bioscience 58: 263-268.
- * Graham J., G. Newman, C.S. Jarnevich, R. Shory, T.J. Stohlgren. 2007. A Global Organism Detection and Monitoring System for Non-Native Species. Ecological Informatics 2: 177-183.
- Jarnevich, C. S., J. Graham, G. Newman, A. Crall, and T. Stohlgren. 2007. Balancing data sharing requirements for analyses with data sensitivity. Biological Invasions

- Crall, A. W., L. Meyerson, T. J. Stohlgren, C. S. Jarnevich, G. Newman, J. J. Graham. 2006. Show Me the Numbers: What Data Currently Exist for Non-Native Species in the U.S. Frontiers in Ecology and the Environment.

Books and Dissertation

- Graham, J. J. 2006. A Global Organism Detection and Monitoring System for Non-Native Species Colorado State University, Fort Collins.

Competitive Proposals

- Co-PI: Facilitating Studies on Invasive Species and Biotic Interactions through Integrative Research, Outreach, and Education across NEON Core Sites and Domains. $1,896,309. National Science Foundation. 2010. (Submitted).
- Principle Investigator: The ID Source Web Site. $34,091. United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS). 2010.
- Principle Investigator: SI2-SSI: Making the Global Invasive Species Information Network a Robust and Pervasive Infrastructure for Sustained Research and Improved Decision Making. $988,022. National Science Foundation. 2010. (Not funded).
- Principle Investigator: CI-TEAM Diffusion Project: Reaching a tipping point : Broadening public participation in scientific research and cyberinfrastructure through citizen science. $989,823. National Science Foundation. 2009. (Submitted).
- Co-PI: Great Lakes Early Detection Network. $24,893. National Park Service. 2010.
- Principle Investigator: Information Innovative Technology Experiences for Students and Teachers (ITEST). $1,199,151. National Science Foundation. 2009. (Not funded).
- Co-PI: A Learning Progression-based System for Promoting Understanding of Carbon-transforming Processes. $3,500,000. National Science Foundation. 2009.
- Co-PI: Protecting Fresh Water Resources in the Face of Climate Change and Perilously Thin Public Understanding. $354,394. National Science Foundation. 2009. (Not funded).
- Co-PI: Contextual Research - Empirical Research - Formative Assessments for a Learning Progression on Water in Socio-ecological Systems. $757,266.00. National Science Foundation. 2009. (Not funded).
- Co-PI: Real time multi-scale modeling for the National Ecological Observatory Network (NEON). $1,499,987.00. National Science Foundation. 2009. (Not funded).

- Co-PI: Warner Mini-Grant: Project-Based Ecological Research: Phenology Observations & Invasive Species. $7,389. Colorado State University. 2009.
- Principle Investigator: Information Innovative Technology Experiences for Students and Teachers (ITEST), $1,562,271. National Science Foundation. 2009. (Not funded).
- Principle Investigator: Site Design Recommendations for FIU and FSU Measurements, $90,000. National Ecological Observing Network. 2008.
- Principle Investigator: Statistical Tools for Web-Based Data Analysis to Solve Bottlenecks for Invasive Species Early Detection. $90,000. United States Geological Survey. 2007-2009.
- Principle Investigator: Advanced Species Models: Developing and Testing Predictive Maps and Custom Models for Invasive Species. $250,000. United States Geological Survey. 2007-2012.
- Co-PI: Project-Based Ecological Research: Phenology Observations & Invasive Species Monitoring to Understand Changes in Local Environment. $7,389.00. Warner College of Natural Resources, Colorado State University. 2008.
- Co-PI: One if by Land, Two if by Sea. $22,129. Bohemian Foundation. 2008.
- Project Manager: CI-TEAM Implementation Projection: Using the GODM Cyberinfrastructure to Involve Citizen Scientists in Moving from Data Isolation to Data Integration. $900,000. National Science Foundation grant #OCI-0636210. 2006-2009.
- Key Personnel: National Biological Information Infrastructure Invasive Species Information Node. $167,467. 2007-2009. United States Geological Survey. 2007-2009.
- Key Personnel: Fingerprinting Native and Non-Native Biodiversity in the United States. $1,088,059. National Aeronautics and Space Administration. 2004-2009.
- Key Personnel: Proposed Integration of the Global Detection and Monitoring System with the Invasive Species Forecasting System Using an Early Adopters Approach. $49,000. United States Geological Survey. 2006-2009.

Affiliations

Organizations

- Member of the American Geophysical Union
- Founding member of the Geospatial Centroid at Colorado State University (gis.colostate.edu)
- Director for the International Biological Information System (IBIS.colostate.edu)
- Chief Scientist for the Colorado Division of AmericaView
- Editor for Management of Biological Invasions (www.managementofbiologicalinvasions.net)

- Member of the North American Invasive Species Network
- Affiliate faculty for the Graduate Degree Program in Ecology at Colorado State University
- Affiliate faculty for the Department of Forestry at Colorado State University
- Technical lead for the Global Invasive Species Information Network
- Member of the Taxonomic Database Working Group
- Treasurer for the Rocky Mountain Chapter of the Ecological Society of America

Committees

- Graduate committee member for Ted Manahan, masters student
- Graduate committee member for Nick Young, masters student
- Graduate committee member for Patty York, master's student
- Graduate committee member for Kirstin Holdfelder, Ph.D. student in the Graduate Degree Program in Ecology
- Graduate committee for Laurel Hartley, Department of Human Dimensions of Natural Resources
- Interview team for UVB, 2009-present
- NREL Committee for minority student recruitment, 2009-present
- Department of Ecosystem Science and Sustainability Curriculum Committee, 2009
- Colorado State University Geographic Information Science curriculum coordination committee, 2007-2010

Projects

Major Projects

- **International Biological Information System**
  - An enterprise-level cyberinfrastructure for research, education, and outreach
- **Math Science Program (www.niiss.org/MSP)**
  - Moving science literacy assessment onto the world-wide-web
- **Tamarix Map (www.tamarixmap.org)**
  - The first continental map of the invasive species *Tamarix*
- **The National Institute of Invasive Species Science Web Site (www.niiss.org)**
  - A web-enabled environment for integration, analysis, and dissemination of data and results for invasive species research
- **Citizen Science Web Site (www.citsci.org)**
  - An online environment for citizen scientists to contribute data and engage in environmental research

- **The Global Invasive Species Information Network (www.gisin.org)**
  - A global network for the exchange and access to information on invasive species
- **Colorado Trails Web Site (CoTrails.colostate.edu)**
  - An online solution for management and outreach for trails Colorado

Presentations

Selected Scientific Conference Presentations:

- The Global Invasive Species Information Network: contributing to GEO Task BI-07-01b. America Geophysical Union Meeting. San Francisco, California, 2009.
- To Cache or not to Cache: Results from creating a global system for invasive species data sharing. Ecological Society Annual Meeting. Albuquerque, New Mexico, 2009.
- The Global Invasive Species Information Network. GIS in the Rockies. Fort Collins, Colorado, 2009.
- Creating a cyber-infrastructure for citizen science: Proper planning can go a long way. Ecological Society of America Annual Meeting. San Jose, California, 2008.
- Creating a Cyberinfrastructure to Involve Volunteer Groups in Citizen Science, Ecological Society of America Annual Meeting. San Jose, California, 2007.
- Building A Global Invasive Species Information Network with a TAPIR Protocol, Taxonomic Database Working Group Annual Meeting, Bratislava, Slovakia. 2007.
- Improving performance and access to DiGIR based data for applications including forecasting for invasive species ranges. Taxonomic Database Working Group. St. Louis, Missouri. 2006
- Invasive Species Forecasting: A glimpse of the future. Annual Meeting of the Botanical Society of America. Chico, California. 2006.

Selected Meeting Presentations:

- National Institute of Invasive Species Science. North American Invasive Species Network Meeting. West Palm Beach Florida. 2010.
- Breakthroughs in using the web for field data. ISTec Meeting. Colorado State University. Fort Collins, Colorado, 2010.
- Global Organism Detection and Monitoring System. Buffelgrass Meeting. Tucson, AZ. 2010.
- Moving the Math Science Partnership onto the Web. Colorado State University. Fort Collins, CO, 2009.

- Global Invasive Species Information Network. USGS Office, Reston, Virginia. 2009.
- Global Positioning Systems (GPS) and Geographic Information Systems (GIS). Rocky Mountain High School, Fort Collins, Colorado. 2009.
- National Invasive Species Warehouse. USGS Fort Collins Science Center, Fort Collins, Colorado. 2009.
- Making Spatial Analysis for Predicting the Potential Distribution of Species Available in the Web, Engineering Software for Scientific Applications, Colorado State University, Colorado. 2008.
- Global Organism Detection and Monitoring System. USGS Fort Collins Science Center, Fort Collins, Colorado. 2008.
- Building an Online System for Research, Outreach, and Education of Geospatial Environmental Research. CSU Symposium on Imaging. Colorado State University. 2008.
- Building a Global Invasive Species Information Network. Integrating Invasive Plant Species Data in the Midwest: Solutions for Data Collection and Management. Madison, Wisconsin, 2008.
- GODMSurveyor: PDA software for field data collection. Integrating Invasive Plant Species Data in the Midwest: Solutions for Data Collection and Management. Madison, Wisconsin, 2008.
- Cyber-infrastructure (CI) for Species Distribution Modeling. Invited Presentation. California State University at Davis. 2007.

Workshops Given

- Global Invasive Species Information Network Working Group Meeting. Taxonomic Database Working Group Meeting. Montpellier, France, 2009.
- GeoCaching. GIS Days. Colorado State University, Fort Collins, Colorado. 2009.
- Global Invasive Species Information Network Standard Meeting III. Elmira, New York, 2009.
- Global Invasive Species Information Network Standard Meeting II. Elmira, New York, 2008.
- Scaling Ecology Across Audiences: From Citizens to Scientists. NREL symposium. Fort Collins, Colorado. 2008.
- GeoCaching. GIS Days. Colorado State University, Fort Collins, Colorado. 2008.
- Global Invasive Species Information Network Standard Meeting I. Athens, Georgia, 2008.
- Citizen Science Training Workshop: Mapping Invasive Species. Fort Collins, Colorado. 2008.

Teaching

- **Natural Resources 422, GIS Applications in Natural Resources, Spring 2009, Spring 2010**
- **Independent study 495, Building a Phenology Research Web Site for Teacher Professional Development, Chelsea Weiskerger.**
- **Natural Resources 322, Introduction to Geographic Information Systems, Fall 2008, Fall 2010**
- **Natural Resources 621, Design of Geographic Information Systems, Fall 2008**
- **Developed curriculum and taught new graduate level course 'Getting Control of Your Data' as an experimental class, 2007**
- **Teaching assistant for Systems Ecology at Colorado State University, 2006**
- **Informal seminars at Colorado State University in C++ and SQL, 2003**
- **HP Scanner Manufacturing Software Use and Support, 1996**
  - Instructed HP manufacturing sites in Malaysia and Singapore
- **Scanner Construction and Technology, 1994**
  - Taught to all HP Hardcopy Division personnel
- **Image processing, representation, and file formats, 1993**
  - Provided to HP Hardcopy Division manufacturing technical personnel
- **Diversity education, disability section, 1992**
  - Provided to all Northern Colorado HP divisions
- **Supporting and repairing scanners, 1986**
  - Instructed HP and dealer field service personnel across the US.

Formal Education

- **Doctorate of Philosophy at Colorado State University, Fort Collins, 2006**
  - Graduate study with the Natural Resources Ecology Lab
    - Creating a global cyberinfrastructure for managing invasive species
    - Joint project with Colorado State University, NASA, and USGS
  - Graduate study with the Biology Department's Herbarium
    - Placing the CSU Herbarium on the World-Wide-Web
- **Marine Field Ecology at Bodega Marine Lab in California, 2003**
  - Completed research paper on species diversity and abundance within inter-costal mussel beds of *Mytilus californianus*
- **Object-Oriented Analysis and Design from the Advanced Concepts Center, Martin Marietta, 1994**
- **Hewlett-Packard management classes, 1996**

- **Graduate course in artificial intelligence from National Technical University, 1986**
- **Bachelor of science in Computer Science with Math/Science option from California State University at Chico, 1984**
- **Bachelor of science in Mathematics from California State University at Chico, 1984**
- **Minor in Engineering from California State University at Chico, 1984**

Patents

- **System and Method of Spot Color Extraction**
  - United States Patent #5,222,154
- **Method and Apparatus for Removing Artifacts from Scanned Halftone Images**
  - United States Patent #5,821,915

Work Experience

Research Scientist at NREL **Dec 2006 - Present**

- Director of the International Biological Information System (IBIS)
- Principle Investigator for multiple EcoInformatics, Educational assessment, and Natural Resource Management projects.
- System architecture for the Global Organism Detection and Monitoring system

Information Technology Specialist and Graduate Student at CSU **Sept 2002 – Dec 2006**

- Project lead for Cyberinfrastructure for Invasive Species
- Database design and analysis for national invasive species database
- Developing C++ and Java components to increase performance of spatial statistics algorithms
- Technical lead and trainer for the team
- Additional responsibilities include selection, installation, and maintenance of servers, networks, enterprise databases, web-based information systems, and development tools
- Researching requirements for system to predict spread of invasive species

President/CEO of tecBugs, Inc. **Dec 1999 – July 2002**

- Led web development company that become profitable in its first year
- Managed company through major technology purchase
- Led development of cutting-edge proprietary geographic information server technology
- Project leader for GLEAM I and II

Software Quality Section Manager for Hewlett-Packard **Dec 1996 – Feb 2000**

- Managed group of 35 to 45 people with a budget of over 3 million dollars

Senior Manufacturing Software Engineer for Hewlett-Packard **Aug 1993 – Dec 1996**

- Lead engineer on effort to rewrite manufacturing software tools
- Lead engineer on analysis software for determining image quality statistics for flat bed scanners

Senior R&D Software Engineer for Hewlett-Packard **Oct 1984 – Aug 1993**

- Lead engineer on groundbreaking packaged software, DeskScan
- Lead architect for PrecisionScan technology
- Technical lead for TWAIN Working Group

Skills

- **Strong verbal and written communication skills**
- **Excellent formal and informal teacher**
- **Experienced in the following computer methodologies**
  - Object Oriented Methodologies, Capability Maturity Model, Structured Programming
- **Broad exposure to computer languages**
  - Fluent: in: C/C++, PHP, Java, JavaScript, T-SQL, HTML, XML
  - Significant experience with: Cold Fusion, Visual Basic, Python
- **Expert in Ecosystem Information Management**
  - Database experience includes SQL Server 2008 spatial, Microsoft Access, and PostgreSQL
  - Experienced in developing, integrating, and distributing large databases
  - Exposure to variety of technologies for service level communication including REST and SOAP based web services and AJAX
  - Facilitator in standards development including the GISIN protocol
- **Created a variety of software components for commercial use**
  - Database-driven web sites, DLLs, Applets, ASP Pages, COM components, ArcMap extensions, web servers, packaged software, end-user applications, peripheral drivers
- **Experienced in managing intellectual property**
  - Copyrights, trademarks, patents, and trade secrets
- **Advanced technical expertise**:
  - Image processing, Geographic Information Systems (GIS), software architecture and design, digital photography
- **Experienced Fortune 100 and small business manager**

- Business planning, financing, organization and structure
- **Effective Project Manager**
  - Scheduling, budgeting, people management, mentoring, and leadership

Other Interests

- Certified PADI SCUBA diver
- Certified ASA Captain
- Ice Hockey Goalie
- Amateur Nautical Historian