

**PROFESSIONAL VITAE of DR. TIMOTHY W. FORESMAN**

**FORESMAN, Timothy W.**

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Elkridge, Maryland 21075 USA  
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Nationality: USA

**EDUCATION**

Ph.D., Geography, 1987, University of California at Santa Barbara, Santa Barbara, California  
M.Sc., Environmental Engineering, 1981, University of Southern California, Los Angeles, California  
M.Sc., Ecology, 1978, San Diego State University, San Diego, California  
B.Sc., Biology, 1974, San Diego State University, San Diego, California

**FACULTY or ACADEMIC POSITIONS**

2016 – 2017: Adjunct Professor, Chubu University  
2014 – 2016: Professor and SIBA Chair in Spatial Information, Institute for Future Environments, Science and Engineering Faculty  
2011 – 2012: Adjunct Professor, Department of Marine Science and Technology, Florida Keys Community College  
2002 – 2012: Adjunct Professor, Department of Geography, University of Maryland College Park, Greenbelt, Maryland  
2008 - 2011: Visiting Professor, Serious Games Institute, Coventry University, UK  
2006 – 2011: Senior Visiting Research Fellow, Qinqhai Academy of Animal Science and Veterinary Medicine  
2003 – 2005: International Visiting Scholar, Keio University, Faculty of Policy Management, Center of Information Infrastructure, Shonan Fujisawa Campus, Japan  
1998 – 2000: Research Professor, Department of Engineering, University of Maryland, Baltimore County, Catonsville, Maryland  
1992 – 1998: Assistant Professor, Department of Geography, University of Maryland Baltimore County, Catonsville, Maryland  
1988-1990: Adjunct Professor, Department of GeoSciences, University of Nevada, LV

**TEACHING EXPERIENCE**

2011 Introduction to Oceanography, Florida Keys Community College  
2010 Special Problems in Anthropology: Geographic Information Systems for Anthropologists (689D) – University of Maryland, College Park  
2006 Sustainability and Spatial Systems (500) – Qinghai University, China  
2004 Earth Design (400) Spatial Systems Seminar (600) –Keio University, Japan  
1996 Physical Geography (110) –University of Maryland Baltimore County (UMBC)  
1995 Field Research in Geography (485) –UMBC  
1994, 1996, 1998 Digital Image Processing for Environ. Applications (481) –UMBC  
1992 to 1999 Advanced Applications in GIS (486) –UMBC

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1992 to 1999 Introduction to Geographic Information Systems(GIS) (386) –UMBC  
1988-1990 Physical Geography (101) –University of Nevada, Las Vegas

**CERTIFICATIONS/REGISTRATIONS**

Senior Ecologist – Ecological Society of America  
GISP – GIS Certification Institute  
LEED AP – US Green Building Institute

**AWARDS**

ESRI Lifetime Achievement  
NASA Superior Service  
USMC Meritorious Service Medal  
UNEP Superior Service

**CAREER POSITIONS**

1999 - Present	President (Founder), International Center for Remote Sensing Education 6219 Rockburn Hill Road, Elkrigde, Maryland 21075
2014 – 2016	Professor and SIBA Chair in Spatial Information, QUT, Brisbane Qld
2013 – 2014	Special Staff, U.S. Marine Corps Headquarters, Pentagon, Washington DC
2006 – 2008	President ( <i>pro bono</i> ), Global Water, 1901 N. Fort Myer Drive, Suite 405, Arlington, Virginia22209
2005 - 2007	Director General, 5 <sup>th</sup> International Symposium on Digital Earth
2003 – 2005	International Visiting Scholar, Keio University, Faculty of Policy Management, Center of Information Infrastructure, Shonan Fujisawa Campus, Japan
2002 - 2003	Executive Science Advisor (Consultant Contract),United Nations Environment Programme, 1707 H Street, N.W. , Suite 300 Washington, D.C.20006
2000 - 2002	Director, Division of Early Warning and Assessment, United Nations Environment Programme (UNEP), P.O. Box 30552, Nairobi, Kenya
1999 - 2000	Visiting Scientist, Office of Earth Science, Code YO, National Aeronautics and Space Administration Headquarters, 300 E Street, SW., Washington, DC20546
1998 – 2000	Research Professor, Department of Engineering, University of Maryland, Baltimore County, Catonsville, Maryland
1992 – 1998	Assistant Professor, Department of Geography, University of Maryland Baltimore County, Catonsville, Maryland
1992 – 1999	Director, Spatial Analysis Laboratory, Department of Geography University of Maryland Baltimore County, Baltimore, Maryland21250
1991 - 1992	Executive Consultant, PlanGraphics, Inc.,202 W. Main Street, Suite 200 Frankfort, Kentucky 40601-1501
1988 - 1991	Manager, Geographic Information Systems, Clark County, 225 Bridger Avenue, Las Vegas, Nevada89155
1987 - 1988	President, Envir. Consultant, P.O. Box 530, Lagunitas, California94938
1986 - 1987	Manager, Remote Sensing/Geographic Information Systems, Systems Application, Inc.,101 Lucas Valley Road, San Rafael, CA94903

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1984 - 1986 Environmental Scientist, U. S. Environmental Protection Agency  
Environmental Monitoring Systems Laboratory, Las Vegas, NV98114

1978 - 1984 Research Ecologist, U. S. Naval Civil Engineering Laboratory,  
Port Hueneme, CA 93043

1976 – 1978 Associate Director, Ecographics, P.O. Box 706, La Jolla, CA 93043

**SUMMARY OF PROFESSIONAL SKILLS AND/OR EXPERTISE**

**Executive Leadership:**

Strong leadership and broad practical engineering and science experience has been a consistent hallmark of Dr. Foresman's career. His early career contains examples of leadership in science/engineering positions begin with the DOD and EPA, and as senior management at Clark County, Nevada. Working for the US Naval Civil Engineering Laboratory (NCEL) in cooperation with US Marine Corps, he initiated and directed many innovative projects for improving operations on US Marine installations, including Camp Pendleton, Twenty-Nine Palms, and Camp Lejeune. He was NCEL's first research ecologist and engineer tasked with interpreting the increasing mandates from local, state, and national laws for the protection and management of natural resources, including safe drinking water. He demonstrated innovative technical solutions to the complex litany of political, legal, financial and public affairs that created operations programs remain in use. He was able to effectively communicate with USMC HQ and base commanders to negotiate and implement facilitation of operational programs that led to multiple Department of Defense awards for environmental awards. He received special commendations from the US Marine Corps for his initiative in applying advanced technologies to solve operational challenges (including Top Secret DOD clearance work) facing base commanders. He established GIS and environmental monitoring and protection systems for public health and civil works. Dr. Foresman was the senior program manager, he was the lead scientist for the creation of the US Marine Corps Land Use Management Systems (LUMS) installed at Camp Lejeune, North Carolina. This system was documented as the best engineered design for decision support based geographic information systems. While working in the EPA Environmental Monitoring Systems Laboratory in Las Vegas, Dr. Foresman was the founding scientist/engineer for the San Gabriel Superfund Study that led to the use of linked ground water models with GIS for detection of historic drinking water detection, monitoring, and remediation. This landmark work created new protocols for the US EPA and industry (e.g., CH2MHill) in addressing Superfund contamination of groundwater throughout the United States. At Clark County, Nevada, while working directly for the County Manager, Dr. Foresman served at the highest executive levels of governance in a multi-billion dollar enterprise. Clark County's spatial data information system, established under his leadership, remains a national model for technology enterprise solutions including public works, water and waste water systems, and emergency 911. He created a strategic vision for automating Clark County's governance and interaction with its citizens. He developed strategic plans and multimillion dollar budgets, managed contracts and supervised numerous personnel. His remit included representing the County in public and coordinating with multiple municipalities within Clark County. At the University of Maryland, his real-world experience was instrumental in creating the Baltimore-Washington Collaboratory; a federal, state, county, academic, and business collaboration center. At the

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Collaboratory, he served as co-PI and data manager for the first National Science Foundation awards for the long term study of human ecosystems (NSF-Long Term Ecosystem Research Baltimore Ecosystem Study). Performance of the Collaboratory led to his selection at NASA Headquarters where he distinguished himself and was selected by the Assistant Administrator to head a US government-wide Digital Earth Initiative. He demonstrated his diplomatic skills while at NASA by leading consensus for the unprecedented signing by 17 federal agencies of formal letters of agreement to support Digital Earth. He led initiatives at NASA Headquarters on the commercialization of advance technology working with local, state, federal, industry and academia. His experience in commercialization has been a strong suit across much of his R&D experience. The United Nations Environment Programme (UNEP) was the next career progression exhibiting his senior executive leadership capacity leading 150 staff and setting up all multiple million dollar budgets and work plans.. As the chief environmental scientist and division director, his performance at UNEP was instrumental in the successes associated with leading numerous programs, including the Millennium Ecosystem Assessment and Global International Waters Assessment, and the Global Environmental Outlook reports, among others. His international reputation for vision, industry, integrity, and scientific competence has followed him throughout the world as he continues to serve the international Digital Earth community, risk assessment and disaster reduction communities, water protection and sustainability communities. As president of ICRSE, and with his multiple campus affiliations, he continues to demonstrate his science/engineering leadership ability and maintain effective connections with the application of Internet tools and Earth observation technologies and field work for human ecology, health, and safety. He has steadfastly applied the methods and technologies to help in the upgrade and distribution of educational resources for capacity building, engaging citizens, and enhancing the learning experiences for all citizens regarding our planet and its critical resources. His recent success as the Director-General of the 5<sup>th</sup> International Symposium on Digital Earth is testimony to the world caliber reputation and capacity for science leadership that he continues to exercise.

**Outreach and Education**

Throughout his career, the principles of communication, education, and outreach for environmental issues with special emphasis on the application of spatial information technology have been well documented. He recently led a campus-wide effort to create a foundation for spatial science on the Queensland University of Technology. This effort required an extraordinary engagement with national and regional business and government leaders, as well as cross discipline academic community. As a scientist, educator, and author he has effectively used his experience and talents for advancing Earth science, environmental, and sustainable-development science to a broad community of citizens both nationally and internationally. His textbook, *Visualizing Physical Geography*, (Foresman and Strahler) John Wiley and Sons, Inc., 2012, and publications attest to his reputation as a scholar.

At the United Nations Environment Programme (UNEP), he served as the Director of the Division of Early Warning and Assessment (DEWA), which included responsibility for numerous media and education programs. He managed complex programs and

implemented communication principles on controversial issues. He was in charge of the publications, Pachomama and GEO series. As designer and director of www.UNEP.net, he helped to modernize the management and access to global environmental information as a foundation to feed a global network of NGO and citizen consumers. The Vital Graphics program was also established under his supervision with the Norwegians. While at UNEP, his division was considered the most fruitful provider of media relevant information for all of UNEP. These highlights provide strong evidence of a solid background and understanding of education and mass media communications.

**Science/Engineering Fields of Expertise:**

Dr. Foresman's research and science experience includes multiple high-level positions in government, academia, and industry leading large teams of researchers and staff with over 30 years of senior management level expertise at county, state, university, federal, and international institutions. He was honored by Australia's spatial industry to serve as the first SIBA Chair for Spatial Information at Queensland University of Technology. This position required a profound understanding of the cross-disciplinary science and engineering elements of spatial science and information. Myriad applications make up the tapestry of science/engineering and research experience including land cover and land use assessments, forestry, environmental impacts and management plans, pollution research and assessment using geospatial tools and technology, urban information and infrastructure management, human health and disease, water, human ecosystems, hydrogen energy, and the search for sustainability. Some highlights include:

Environmental & Water Issues: His Master's Degree in engineering focused on water and waste water treatment technology, and hazardous waste assessment and modeling. This engineering foundation provides a sound basis for his technical skills. His doctorate further honed his skills in addressing the modeling and informatics tools and methods to apply to an array of hazardous and human-risk programs. While working in the US Naval Civil Engineering Laboratory provided assistance to Navy and Marine Corps base commanders for hazardous waste issues and contaminated water sources. Drafted communication documents with base commanders and coordinated various facility site ground water investigations. Provided briefing materials and presented briefings to senior base officials and the public on these investigations. Doctorate research, conducted in part while working in the US. EPA, focused on the use of spatial information technology for assessment and remediation of contaminated ground water drinking supplies to over one-million residents of San Gabriel Valley in California. This pioneering research was adopted for operational use by major engineering firms and the US EPA. Special experience in water policy and assessment issues includes serving on the Maryland Governor's Water Monitoring Council's Board of Directors and as principal scientist for development of Maryland's state-level web-based water quality information system. He served as top administrator for the UN Global International Water Assessment, administrator for a host of water and watershed programs funded by the Global Environmental Facility, while serving as the UN's senior environmental scientist. In addition, he served as co-Principal Investigator for the National Science Foundation Long-Term Ecological (LTER) Studies for Human Ecosystems which entailed detail assessment of watershed management units for rural and urban environments. He also led the U.S. Environmental Protection Agency's Superfund and

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Watershed Management research for San Gabriel Valley from 1984-1986. This work entailed advancing the state of knowledge regarding the application of surface flow and ground water modeling for assessment and remediation of water quality issues. He served as President (*pro bono*) for Global Water, an international water NGO established by Ambassador John W. McDonald in 1982. At Global Water, he created strategic vision, daily operational guidance, and policy development with other major water groups (e.g. Millennium Water Alliance, UNICEF, etc). This leadership position provided for assessment and evaluation of the major water activities in developing countries with a major mission to develop safe drinking water to rural communities.

Advance Technology: He has over three decades experience with national and international applications in geographic field research for ecological and environmental assessment, management, protection, and planning for human ecosystems and sustainable development. His career emphasis has been in the development of innovative improvements and methodologies based upon the application of remote sensing technology, geospatial information systems, and environmental/engineering models for regional, national, and global land change management assessment and protection, human ecosystems studies, and early warning detection systems. He was an innovator for linking hydrogeologic numerical models with GIS to generate forward and reverse modeling assessments. He worked in private industry to develop improved and innovated methods for ground water monitoring, hazardous waste and materials monitoring and remediation under contract with US Government and private agencies after leaving the US EPA. His senior-level administration experience has included policy evaluation and program implementation. He has significant national and international experience in the evaluation, design, planning, and implementation of integrated, Web-based geospatial information systems for environmental programs, sustainable systems, and early warning coordination. The US EPA selected Dr. Foresman, under contract in the early 1990s, to evaluate the efficacy of their investment of GIS and remote sensing technology for Bulgaria and the Czech Republic, due to his international science technology reputation.

Energy and Risk Assessment: The application of spatial analytical tools to address major issues facing humankind has been a hallmark of Dr. Foresman's career. He led the development of an information and assessment program on behalf of Clark County, Nevada regarding the Yucca Mountain Nuclear Repository. This work required the coordination of multiple municipal and state agencies along with federal agencies in the assessment of the planned management and operations of the proposed national nuclear radio-isotope storage area. He was responsible for uniting myriad agency data into an enterprise GIS to support decision making by stakeholders. His nuclear engineering training began as a US Naval officer, which included training on a nuclear ballistic submarine. The Japanese government contracted with him in 2003 to perform an assessment of the nuclear risks to Japanese population centers from nuclear waste geological burial and operations of nuclear power plants. This work included extensive seismic and geologic parameters as well as numerous 2-D and 3-D modeling tools. At the UNEP, he led a series of programs that focused on risk assessment and disaster reduction, leading to his nomination as the United Nation's chairman for early warning under the Interagency Task Force for Disaster Reduction. His tenure led to numerous

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programs that examine the full range of natural and man-made risk to humans and biodiversity. The US State Department sent Dr. Foresman to Bangkok, Thailand after the Indonesian tsunami due to various white papers he presented to the State Department regarding expectations and preparation for disaster response by international organizations and governments.

Under Dr. Foresman's UN leadership he initiated a series of initiatives that focused on developing and promote green and renewable energy, including geothermal. He had previously led renewable energy initiatives in Nevada that included a change to the Public Utility Commission policies for reviewing new power plants. The National Science Foundation awarded him with colleagues Robert Corell and Joe Romm for developing a 40-year plan on energy R&D related to hydrogen. His ability to bring together world experts for energy and technology research has been a steadfast of his career. The US Department of Agriculture recently (2013) hosted Dr. Foresman as a keynote speaker on energy research and development for bioenergy in response to the RFS2 initiatives of the US Government.

**Management Expertise:** A solid administrative and management foundation based on an academic and research career in the engineering, remote sensing, and life sciences have supported his executive leadership positions in international and national environmental fields. Dr. Foresman has demonstrated a refined talent at leading disparate groups of science and engineering experts to address major technology challenges. While at NASA Headquarters, he chaired the historical first, 17 federal agency committee for Digital Earth on Vice President Al Gore. He is fully trained and experienced in professional program management systems and operations. A deep understanding of design and application of environmental and engineering programs for sustainable development including advanced information systems for environmental and human assessment and early warning, policy implementation, decision support, and community-based decision systems has been documented over the past three decades. Nations and international agencies have frequently solicited his expertise to design, convene, and facilitate international forums for policy and science workshops.

On behalf of UNEP, he was responsible for the creation of a strategic plan for the monitoring and assessment of environmental programs around the globe and the implementation of this plan. In the UNEP capacity, he led the reconstruction of the Global International Waters Assessment, the formation of the Millennium Ecosystem Assessment, and the production of the Global Environmental Outlook (GEO-3) report. He also was the lead administrator and scientist for the Africa Environmental Outlook, which successfully launched the environmental initiatives in NEPAD and AMCEN. Other initiatives that demonstrate the diplomatic and technical skills include the initiation of the Global Marine Assessment proposal, design of the Asian Brown Cloud program, and the establishment of the Chinese centers of excellence for environment and sustainable development. This litany of activities and responsibilities demonstrates both the level of performance on the international scale and the diplomatic maturity requisite for service to the global community and sustainable development goals.

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His skill in applying technology into operational programs was evident in the development and co-convening with UN FAO for the Global Land Cover Network based on the use of Earth observation data. Numerous special reports, including the 30 years of Landsat analysis for Mesopotamia received international acclaim. He also engineered the NASA gift to the United Nations for the 1990 and 2000 global Landsat dataset, which continues to receive top recognition by NASA, USGS, and NOAA. His scientific achievements are noted by his service as co-PI on two NSF (National Science Foundation) initiatives: the *Baltimore Ecosystem Study* and the *Future Directions for Hydrogen Energy Research and Education*.

Dr. Foresman was honored with the Environmental Systems Research Institute (ESRI) Lifetime Achievement Award in 2003 for his career contributions to the field of geographic information systems and environmental protection with special note for contributions to the United Nations.

Advanced expertise in oral and written communications has been demonstrated with hundreds of presentations and keynote speeches and over 90 articles, book chapters, and books. He has served as an environmental and technology expert in Congressional Testimony.

Credentials or professional training relevant to his expertise includes Certified Senior Ecologist with Ecological Society of America, GIS Professional, and LEED AP Engineer. He was also certified as Contract Technical Representative for federal government, along with numerous professional training certificates in remote sensing, GIS, and various environmental models, and management theory and implementation. He has earned top academic credentials.

Computer Skills include advanced in remote sensing (ERDAS, Idrisi, and PCI), GIS (ArcInfo, ArcView, and MapInfo), and hydrologic models (TR55, MODFLO), as well as an array of web-based skills and office word processing software, spreadsheets, graphics and presentation, project management planning, and other office automation/web communication operating systems.

**SUMMARY OF RELEVANT WORK EXPERIENCE**

Present      President (Founder) of the International Center for Remote Sensing Education  
Leads an international team of colleagues on technological advances to education and Digital Earth technology for sustainability development and environmental protection. Provides leadership interventions with key institutions, including the United Nations, NASA, for development of applications based on spatial enablement and system strategies for implementation of advances in GIS, remote sensing, and modelling of Earth systems. Delivers thought provoking lectures and keynote talks to schools and business for promotion and enhanced understanding of societal disrupters and future conditions of the planet and society.

2014 – 2016      Title: Professor and SIBA Chair in Spatial Information  
Institute for Future Environments

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Science and Engineering Faculty  
Queensland University of Technology  
Brisbane, Australia

Served as the SIBA Chair (industry endowment) to provide academic and programmatic leadership at QUT for spatial information. Responsible for research and teaching of technology and applications associated with the emergent and rapid growth of the spatial information phenomena. Conducted assessments and surveys of spatial science for academic, government, and business communities. Represented the omnipresent spatial industry, with emphasis on Digital Earth technology, to various societal and professional settings. Presented over 60 keynote talks to highlight the dimensions of spatial information and science in society and its role for future development. Provided senior leadership with consultations on how to achieve economic and organizational efficiencies through the strategic application of spatial enabled enterprise solutions.

2013 – 2014 Title: Special Staff - MCICOM  
U.S. Marine Corps Headquarters  
Pentagon, Washington, D.C. 20350-3000

Served as top program manager for highly sensitive environmental issues in support of Commandant and Deputy Commandant command. Provided program leadership for coalition of legal, public affairs, media, on-site, congressional liaison, and contractor support members. Represented the USMC to Members of Congress and other senior US Government agencies on issues of scientific, health, medical, as well as other veteran affairs issues. Served as the senior most science expert for the command. Assisted with the development, outreach and training associated with the GeoFidelis, the USMC geospatial information system. GeoFidelis was originally established by Dr. Foresman in 1980.

Awarded the USMC Meritorious Service Medal for superior service.

1999-Present Title: President (Founder)  
International Center for Remote Sensing Education (aka Earth Party)  
P. O. Box 18285  
Baltimore, MD21227

Provides top technical and administrative leadership for non-profit organization. Established Earth Party for community-based sustainability and education activities under the ICRSE mandate ([www.earthparty.org](http://www.earthparty.org)). Serves as lead for the development of the Remote Sensing Core Curriculum, maintained under long-term agreement with the American Society for Photogrammetry and Remote Sensing and recently introduced to the International Society for Photogrammetry and Remote Sensing. Assists in planning and convening the annual workshops on Conference for Remote Sensing Education. Provides technical, managerial, and

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editorial support for the development of publications, such as, *A System for Survival: GIS and Sustainable Development*, 2002, ESRI Publisher. Published technical field guides to UNOCHA for GIS, remote sensing, and GPS. International activities include support to EIS Africa, UNEP Nairobi, GRID Arendal (Norway), and the International Society of Digital Earth (China; founding member). Leads workshop and center development activities for communities in Honduras and Qinghai, China for sustainable development initiatives. Co-founder of the International Hydrogen Partnership and co-PI for NSF Hydrogen Futures workshop.

Served as executive secretary for the Environmental Information Coalition in support of design, development, and implementation of the Earth Portal ([www.earthportal.net](http://www.earthportal.net)). Serves as technical consultant to ManyOne Networks ([www.manyone.net](http://www.manyone.net)) for formulation of the Digital Universe and integration of Digital Earth activities.

A recent six month consultancy provided a leading engineering firm with strategic guidance on development and implementation for 'green engineering' programs related to all aspects of engineering, with focus on facilities, transportation, and environmental. A series of green initiatives were established, including: created green building (LEED) committee, generated strategic green business plan, and established green marketing program. Major accomplishment was the creation of the Sustainable Housing And Renewable Energy (SHARE) concept.

Currently, retain by U.S. Marine Corps Headquarters to provide top leadership for congressional, media, scientific, and health relations regarding the Camp Lejeune Historic Drinking Water program. Providing risk communications, congressional liaison, and communications with array of government and civilian agencies. Assisting in establishing the legal and scientific and health strategies for investigation and remediation of historic contamination of grown water. Providing assessment on the political and scientific ramifications of all work efforts to ensure effective communications for all parties.

2006 –2008 Title: President (*pro bono*)  
Global Water  
1901 N. Fort Myer Drive, Suite 405  
Arlington, VA22209  
703-528-3863  
[www.globalwater.org](http://www.globalwater.org)

Provided the executive leadership for water policy and action for Global Water ([www.globalwater.org](http://www.globalwater.org)) . Served as top representative for negotiations and policy development process among the government, NGO, industry, and academic organizations collaborating on myriad active water initiatives including: Millennium Water Alliance, Blumenaur Water Bill, and numerous national water initiatives (Kenya, Ethiopia, Sudan, Honduras). Formulated proposals for

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streamlining delivery of water and sanitation projects in developing nations. Conducted consultations with international service organizations for creation of consortia to advance technology applications in financial, assessment and reporting, and community-based support enterprises. Led development of technology clearinghouse for water and sanitation solutions. *Pro bono*

2002-2003 Title: Executive Science Advisor (Consultant Contract)  
United Nations Environment Programme  
1707 H Street, N.W. , Suite 300  
Washington, D.C.20006

Provided science and technical guidance to UNEP for the performance of UNEP's mandates related to early warning and assessment of global environment. Supported activities include the following areas: Global Land Cover Network, global distribution of satellite data for assessment, development of UN GeoBrowser for decision-support systems, network design and implementation of UNEP.Net, strategic planning for the UN Geographic Information Working Group, and coordination with the Digital Earth community, including Global Spatial Data Infrastructure, Global Map, and UN Earthwatch. Additional expertise was applied to the creation of science panels for UNEP and the development of a science assessment framework, using the Human-Ecosystem Model, in cooperation with ICSU/SCOPE and the Harvard Forum on Science and Technology for Sustainability.

2000-2002 Title: Director (D2) - Division of Early Warning and Assessment  
United Nations Environment Programme (UNEP)  
P.O. Box 30552, Nairobi, Kenya

Led the UNEP program for global assessment of environmental status and trends on behalf of all member nations (189 countries). Created strategic plan and multimillion dollar budget for UNEP's program of work that included 150 staff and all personnel development plans. Served as top diplomatic representative for full range of environmental science issues, providing briefing materials and generating policy documents for international governance. Functioned as lead scientist and administrator for UNEP in the development of assessment methods for air, land, water, and biodiversity, as administrator of a team of globally distributed scientists at five major UN facilities, 33 strategy partnerships, and 189 national consortia in cooperation with other UN agencies (UNDP, FAO, WMO, WHO, UNESCO, etc). Lead scientist for production of GEO 3, UNEP's representative for production of World Resources Report and Vital Signs. Senior scientist and administrator for Global International Waters Assessment. Senior scientist on UNEP's management team for Millennium Ecosystem Assessment. Served as UN chairman for Early Warning, in cooperation with the UN supported Interagency Strategy for Disaster Reduction. Designed and implemented a system-wide environmental information management system (<http://www.unep.net>), a GIS and remote sensing public access system, and other

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indicator and decision support systems for scientists and policy makers. Developer of strategic plan, the "Global Land Cover Network" for conducting global land cover program using global Landsat and other satellite data, in conjunction with the Food and Agricultural Organization. Designer for Earthwatch Decision Support System graphic user interface in partnership with multiple industrial centers. Liaised and coordinated with leading scientific bodies, including Nobel Laureate panels, and ministerial for developing international networks and collaboration profiles for the application of remotely sensed data in conjunction with spatial data (GIS) for global land cover mapping and monitoring and for national to regional-level state of the environment reporting. Responsible for regular reporting and generating publications to governments and other decision-making bodies or the UN system on the global state of the environment.

1999-2000 Title: Visiting Scientist  
Office of Earth Science, Code YO  
National Aeronautics and Space Administration Headquarters  
300 E Street, SW.  
Washington, DC20546

Program Director for Digital Earth Program leading a multi-agency (NSF, EPA, NOAA, USGS, and others) working group, international working group, and public-private partnership. Responsible for developing policy, assessing technical and programmatic status, and managing multi-million dollar contracting programs through the formal development of a multi-agency program office. Position required top-level diplomatic and communications responsibilities with the White House and other political agencies and programs such as U.S. Global Change Research Program. Other NASA responsibilities include co-director of International Applications assisting NASA with program development and strategic planning for international and national applications of remote sensing for water monitoring, natural resources, and urban sprawl. Assisted with requirements definitions for international and education sectors for applications development and conduct workshops and other suitable outlets for NASA objectives in linking with an extended potential user community.

1992 – 1999 Title: Director, Spatial Analysis Laboratory  
Department of Geography  
University of Maryland Baltimore County  
1000 Hilltop Circle  
Baltimore, Maryland21250

Instructor for undergraduate courses in Physical Geography, Introduction to Geographic Information, Systems, Applications of Geographic Information Systems, Advanced Applications of Geographic Information Systems, Advanced Remote Sensing, and Field Research in Geography. Director of laboratory supervising 15 – 20 students and staff. Responsibly for maintaining state-of-the-

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practice hardware and software systems for remote sensing and GIS. Responsible for all personnel, technical, and financial management required to operate \$.5 million annual research budget. Principal investigator and lead scientist on numerous projects.

Significant international experience includes special envoy for the U. S. Environmental Protection Agency (EPA) in 1994 for the evaluation of GIS/Remote Sensing implementation for the Ministries of Environment in the Czech Republic and Bulgaria. Provided in country inspections and evaluations of the technical and administrative capacities of each country and an analysis of design for sustainability of these environmental programs. Confidential report prepared for EPA.

Served on a United Nations Secretariat from 1997 to 1998 for the United Nations Development Programme on Poverty Related Core Data Needs for the Asia-Pacific Region. This effort culminated with a regional conference in Kuala Lumpur, Malaysia, May 6-8, 1998, and a published report.

Served on the Governor's Water Management Board (Maryland) and created the first web-based water monitoring web site for the State of Maryland in 1996.

1991 - 1992 Title: Executive Consultant  
PlanGraphics, Inc.  
202 W. Main Street, Suite 200  
Frankfort, Kentucky40601-1501

Consultant for GIS/AM/FM industry. Administration and management responsibilities for initiating marketing to identify and secure contracts, developed client relations, coordinated project management, and supervised project staff of 3 to 5 persons. Projects included research into alternative technical solutions for upgrades and system migration of a municipality's GIS. This entailed assessment of GIS functions for new, heuristic-based processor technology. Other research included development of GIS sales guidance manual for major hardware vendor. International experience included project lead for preliminary research performed on integration of computing resources for spatial decision tools on behalf of the Kingdom of Saudi Arabia in 1992. Applications address the needs of the Kingdom for drinking water supplies, environmental protection, and infrastructure development. In-house research performed on automation of library and research tools for corporate use.

1988 - 1991 Title: Manager - Geographic Information Systems  
Clark County  
225 Bridger Avenue  
Las Vegas, Nevada89155

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Administration and management responsibilities included development and implementation of a countywide GIS. Created and managed a GIS management department working directly under the County Manager. Formulated and administrated a multi-year capital improvements and revenue sharing budget for automating land-management and tracking systems, staff, and support contracts impacting approximately twenty different departments, districts and agencies. Developed strategic implementation plans, coordinated all GIS data systems project management, created staffing plans, and supervised a multi-agency GIS Data Committee. Negotiated county-wide inter-local agreements for data standards, data acquisition, and data base administration for revenue cost-sharing and legal mandates. Coordinated with the District Attorneys Office to determine impacts of GIS use liability, data access standards and policies. Administered multiple large professional services contracts for hardware and software acquisitions, GIS data input and conversion, and served as contracting officer. Coordinated GIS data integration between Department of Energy Yucca Mountain Nuclear Repository Siting grant program and Clark County GIS. Served as GIS Chairperson for the State of Nevada Mapping Advisory Committee.

Research areas included large scale, multi-agency geographic information system. Created high spatial resolution orthophotographic and survey supported (global positioning satellite based) GIS baseline for 360 square miles of Las Vegas Valley. Established a Digital Equipment Computer (DEC) network for distributed processing linked to an International Business Computer (IBM) mainframe and linked to Hewlett Packard (HP) coordinate geometry (COGO)/computer-aided-design (CAD/CAM), SUN, Tektronix and Macintosh workstations. Evaluated and administered facility conversions for electrical, air-conditioning, and construction engineering to establish multiple agency user workstations. Designed interface with Planning Department's environmental database and augmented GIS database to include over 8,000 square miles. Coordinated multiple departments, agencies, and contractors for developing Clark County's data base design, data base dictionary, pilot study to test and evaluate data base design, and create macros using the ARC/INFO GIS software. Organized a team of GIS experts at Environmental Systems Research Institute (ESRI) in Redlands, California and facilitated the use of this team by the various departments and agencies in Clark County for network design, GBF/DIME and TIGER analysis, emergency response studies, parcel/land records based mapping, public works permit-tracking system, master planning, zoning case-tracking system, water and sewer systems, and health studies. Developed unique data base design and QA program for establishing standards on spatial accuracy, legal standards for quality assurance and quality controls, librarian and data base administration functions.

1987 - 1988    Title: President  
                  Environmental Consultant

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Administration and management skills provided management expertise and technical assistance on a variety of projects requiring effective and scientifically valid approaches in resolving or mitigating environmental hazards and land-use management issues. Provided assistance to various land management groups in formulating and facilitating interaction with government agencies to implement programmatic plans regarding offshore oil development and sewage disposal land-use alternatives and options for compliance with the Clean Water Act and other environmental statutes.

Projects included formulation a strategic operational plan to facilitate and coordinate research and educational programs for the Mexican government's development of a three-million hectare natural resources reserve in Baja California. Clientele included the National Aeronautics and Space Administration, various law firms, the Surfrider Foundation, The University of California at Santa Barbara, and Systems Application, Inc.

1986 - 1987 Title: Manager - Remote Sensing/Geographic Information Systems  
Systems Application, Inc.  
101 Lucas Valley Road  
San Rafael, CA 94903

Administration and management duties included formulating and implementing strategic marketing plan, developing client relations, coordinating project management, and supervising staff of 5 persons. Research areas included wetlands monitoring, baseline environmental flora and fauna surveys, historic environmental analysis, multi-media modeling, hazardous waste management, drinking water monitoring and remediation, and site engineering. Provided programmatic input to coordinate environmental research and teaching to UCLA as member of the NSF sponsored, UCLA Hazardous Control Center Industrial Review Committee.

1984 - 1986 Title: Environmental Scientist (GS-13)  
U. S. Environmental Protection Agency  
Environmental Monitoring Systems Laboratory  
Las Vegas, NV 98114

Scientific Project Officer for the Remote and Air Monitoring Branch of the Advanced Monitoring Systems Division. Administration and management included serving as the Laboratory's technical expert and consultant to EPA regional and program offices, other federal agencies, state governments, and municipalities on application of remote sensing and geographic information systems technology to large-scale, multi-site environmental protection and

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conservation planning projects, including RCRA, CERCLA, and the Clean Water Act. Conceived and led the San Gabriel Superfund Project that entailed innovating the integration of groundwater models and GIS for identification and developing remediation strategies for historic trends in drinking water contamination. Coordinated and managed large interdisciplinary, natural resources teams composed of regional, laboratory, and contractor personnel. Formulated technical approach, defined interpretation requirements, developed budget, and drafted alternatives for consideration where controversial problems arose and presented to top management.

Research areas included administering and coordinating comprehensive baseline determination of the San Francisco Bay natural wetland resources: coordinated and provided ecological data for Great Lakes Program, Chesapeake Bay Program, Texas coastal ecosystems, Great Basin desert, and Colorado alpine ecosystems; development of detection methodology for east coast forest ecosystem biomass changes, evaluation of Alaskan arctic tundra wetland identification and classification methods; system-wide operational plan for inventory and assessment of the Bureau of Land Management's Colorado River riparian habitat management program; and interact with numerous natural resources agencies in the Tennessee Valley Authority in formulating strategic planning of an EPA sponsored, long-term, multi-media, large-scale land-use impacts research and testing site.

1982 - 1984 Title: Research Ecologist (GS-12)  
U. S. Navy Civil Engineering Laboratory  
Port Hueneme, CA93043

Program Manager for the Land Use Management System (LUMS) and Project Leader for the NCEL Geographic Information Systems Team (GIS). Administration and management experience formulated and implemented a system-wide strategic plan for coordinating the management and operations of the U.S. Marine Corps' worldwide set of land resources. Supervised more than a dozen permanent staff of scientists and engineers, managed technical components of LUMS program, and provided quality briefings to Field Grade Officers, federal, and state interagency cooperatives (e.g. USFWS and EPA) for peer review and technical liaison on natural resources systems management. Authored major U.S. Marine Corps' policy for natural resources management and developed five- and ten-year budget appropriation, programmatic, and operational LUMS program plans. Initiated, developed strategic research plans, negotiated and secured funding from multiple Navy sponsors, and implemented operations for NCEL's GIS Team.

Research areas for LUMS program involved all major research and development activities associated with land-use systems, for example, requirements studies, field research, technical design and assessment, economic and human resources assessments. LUMS incorporated environmental management components of

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critical habitats for endangered species located on approximately one million acres, natural resources and renewable areas, training areas, and support facilities and engineering. All major ecosystems desert, coastal, mountain, chaparral, forest, and aquatic were included in the LUMS program. The NCEL GIS Team focused research on the application of ecological principles for land-use and natural resources management integration with existing Navy real estate management policies and programs.

1979 - 1982 Title: Research Ecologist (GS-11)  
U.S. Naval Civil Engineering Laboratory  
Port Hueneme, CA93043

Principal scientist for Navy ecosystems research. Organized, administered, and managed Navy-wide natural resources and ecosystems management research and development program. Interacted with various natural resources specialists within both the Department of Defense and the academic community. Formulated annual and five-year budget proposals, designed and monitored technical support contracts, edited and published research results. Organized and managed multiple task-oriented natural resources and ecological positions. Research areas multiple natural resources projects including worldwide desert ecosystems classification strategies, baseline ecological assessment techniques, vegetation analysis, and enumeration and classification of all critical habitats and endangered species resident on approximately one and a half million acres of Navy real estate. Coordinated with multi-agency environmental resources data base development programs.

1978 - 1979 Title: Environmental Protection Specialist (GS-9)  
U.S. Naval Civil Engineering Laboratory  
Port Hueneme, CA93043

Lead scientist for Navy natural resources research. Organized and implemented comprehensive environmental protection and management research program for use by the Navy at installations and bases throughout the United States and overseas. Provided expert assessment of NEPA and related legislation (e.g., Clean Water Act, Clean Air Act, RCRA, CERCLA) reporting requirements for Naval and US. Marine Corps installations. Managed budget allocations, monitored (A/E) contracts, and prepared technical reports. Coordinated and interacted with federal natural resources agencies. Conceived and conducted tri-service natural resources workshops and communications. Managed numerous technical personnel, civilian and military. Maintained rigorous travel schedule, communicated with military and academic research centers for environmental management and technology transfer. Research projects included terrestrial and marine ecosystems resident on Navy controlled lands relating to system-wide compliance under the National Environmental Policy Act. Large-area test (100,000 acres) and evaluation of ecological sampling, testing, analysis, and

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reporting methodologies. Formulated and tested approaches to classification of natural resources assets.

**RESEARCH GRANTS**

2004 –Total - \$99,999. National Science Foundation Research Grant (Co-PI)  
“Future Directions for Hydrogen Energy Research and Education.”  
Duration 1/04 – 11/04

1997 --Total - \$614,822. National Science Foundation Research Grant (Co-PI),  
“Human Settlements as Ecosystems: Metropolitan Baltimore from 1792-  
2100 (NSF: Long Term Ecological Research).” Duration 11/97 - 11/2005

1997 --Total - \$476,728. U.S. Environmental Protection Agency Research Grant  
(Co-PI), “Impact of Social Systems on Ecology and Hydrology in Small  
Watersheds: Integration for Restoration.” Duration 12/97 - 12/2000.

1997 --Total - \$83,400. Maryland Department of Natural Resources Research  
Grant, “Design Approach to Chesapeake Tidewater Ecosystem Database  
Distribution and Access System.” Duration 9/97-12/98.

1997 -1998 Total - \$24,990. Parks & People Foundation Research Grant, “Urban  
Forestry Management Plan.” Duration 6/97 - 6/98.

1996 -1997 Total - \$64,456. United States Geological Survey Research Grant,  
“The Baltimore-Washington Regional Digital Spatial Data Framework  
Demonstration Project for Gwynns Falls Subwatershed.”  
Duration 9/96 - 9/97.

1996 –1997 Total - \$9,000. USDA/USFS Research Grant, “Ecosystem  
Assessment of Tree Forest Patches.” Duration 6/96 - 10/97.

1996 – 1998 Year - \$58,550; Total - \$124,250. Maryland Department of the  
Environment Research Grant, “MDE GIS Database Development and  
Conversion.” Duration 5/96 - 12/98.

1996 Total - \$9,750. National Biological Service Research Grant, “Baltimore-  
Washington Regional Collaboratory Pilot Project LUHNA.”  
Duration 5/96 - 9/96.

1996 --Total - \$500,000. NASA Headquarters Research Grant, “Development &  
Support of EOS Potential User Community through Regional Data  
Collaboratory.” Duration 4/96 - 9/99.

1995 --Total - \$769,595. NASA Headquarters Research Grant, “Research and  
Development of a High Performance Baltimore-Washington Regional  
Spatial Database Calibration Testbed Directed Towards Supporting

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Applied Scientific Research and Commercial Operations Utilizing Remote Sensing Information Resources.” Duration 11/95 - 10/2000.

1995 –1996 Total - \$110,000. UCSB/NASA Headquarters Research Grant, “Local and State EOSDIS Extensions for the Baltimore-Washington Region.” Duration 10/95 - 9/96.

1995 –1998 Total - \$387,100. NASA Headquarters Research Grant, “Research and Development for Remote Sensing Applications Supporting a National Remote Sensing Core Curriculum: A Necessary Precursor to Earth Systems Science Education.” Duration 5/95 - 1/98.

1995 Total - \$5,000. Maryland Department of Natural Resources, “Support for Defining Coordinate Geometry along DNR Park Boundaries Using Digital Survey Programs.” Duration 7/95 - 12/95.

1994 – 1995 Total - \$21,407. Earth Observation Satellite Company, “Internship.” Duration 10/94 - 10/95.

1993 – 1995 Total - \$12,716. NASA Research Grant, “A Study of GIS Field Measurement Techniques for long-term Monitoring of Boreal Forest Ecosystems.” Duration 10/93 - 9/94.

1993 –1997 Total - \$619,195. NASA Research Grant (NAG5-2407), “A Study of the Roles of Image Processing, GIS and Visualization in Remote Sensing Research in the Earth Sciences,” Duration 11/93-6/97.

1993 – 1994 Total - \$20,000. NASA-ASEE Summer Faculty Fellowship, Goddard Space Flight Center/Earth Sciences Directorate, Greenbelt, Maryland.

**KEYNOTE PRESENTATIONS AND LECTURES**

27 Sep 2016. *International efforts for Sustainable Development*. Chubu University Workshop, Nagoya, Japan

7 July 2016. *Beyond Moore’s Law: Harnessing spatial-digital disruptive technologies for Digital Earth*. 6<sup>th</sup> International Summit on Digital Earth, Beijing, China

5 May 2016. *Seeing the Big Picture with Spatial Thinking*. EVB 210, QUT, Brisbane, Australia

20 Apr 2016. *Decoupling-Pivotal Moments*. EVB201 Global Environmental Issues, QUT, Brisbane, Australia.

14 Apr 2016. *Harnessing spatial-digital disruptive technologies for stakeholder prosperity and sustainability*. Locate 16 Conference, Melbourne, Australia.

26 Feb 2016. *What is Spatial?* SIBA-RDA Workshop, Brisbane, Australia.

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20 Feb 2016. *Disaster Management on a Digital Earth*. Chubu University, Nagoya, Japan.

20 Jan 2016. *Economics VS Sustainability? A False Dichotomy for Townsville and Australia*. Townsville Town Council, Townsville, Australia.

19 Jan 2016. *A Journey from a Digital Earth to a Sustainable Townsville*. Townsville Town Council, Townsville, Australia.

11 Nov 2015. *Pivotal Partnership Principles to Protect and Preserve Our Precious Planet*. 24<sup>th</sup> NSW Coastal Conference, Foster, NSW, Australia

6 Nov 2015. *Seeing is Believing* Digital Media Research Centre, Brisbane, Australia

5 Oct 2015. *QUT's The Cube Visualisation and Big Data Analytics Facility: New Paradigm for Digital Earth Governance, Trade, and Commerce*. ISDE 9, Halifax, Nova Scotia, Canada

30 Sep 2015. *Spatial Careers*. CEED, Brisbane, Australia

23 Sep 2015. *Citizen Science and Digital Earth Technology for River Resuscitation*. International River Symposium, Brisbane, Australia

11 Sep 2015. *Pivotal Principles for Economic Development*. EDA Conference, Redcliffe, Queensland, Australia

9 Sep 2015. *Thinking Differently: Spatially and Digitally Enabled Societies*. EDA Conference, Redcliffe, Queensland, Australia

26 Aug 2015. *Operational Best Practices with Spatial Information Systems for Municipal Governance*. Malaysian Delegation, Brisbane, Australia

1 Aug 2015. *Sustainable Development Principles as Prerequisites for Policy and Action*. BEN 710 Course, QUT, Brisbane, Australia

6 Jul 2015. *Soft Power and Citizen Digital Democracy: Sustainable Fuel for Effective Municipal Leadership*. Asia-Pacific Cities Conf, Brisbane, Australia

11 March 2015 *A Visionary Tale for the Spatial Innovation Revolution* Locate 15, Brisbane

4 March 2015 *From G20 to the Future: How Science and Technology Can Lead to Prosperity and Sustainability* Argentinian Embassy, Canberra

3 March 2015 *From G20 to the Future: How Science and Technology Can Lead to Prosperity and Sustainability* Croatian Embassy, Canberra

23 February 2015 *Space Age Launch of Big Data* ACEMS, Brisbane

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10 February 2015 *Scientific Visualisation for Energy and Climate Data as Prerequisite for Policy and Action*, Delhi Sustainability Development Summit, New Delhi

4 November 2014 *Geospatial Data Visualization Influences on Decision Making in the 21<sup>st</sup> Century*, Geosciences Australia, Canberra

10 November 2014 *The Future of ICT: A G20 Perspective*, G20 ICT Industry Forum, Brisbane

18 November 2014 *Where in the world are we going? Earth Squeeze in the 21<sup>st</sup> Century*, Rotary Club, Ipswich, Australia

19 November 2014 *Our world in the 21<sup>st</sup> Century*, GIS Day, Brisbane, Australia

21 November 2014 *Where on Earth are you going?* Kelvin Grove State College, Brisbane

3 December 2014 *Geospatial Relevance in Dynamic Whole Systems Engineering and Global Governance*, Geospatial Science Research 3, RMIT, Melbourne, Australia

8 December 2014 *Visualize the Future*, OzViz, Brisbane, Australia

10 October 2014 *Our Trajectory for the Spatial Industry and a Sustainable Future*, QCON 14, Cairns, Australia

20 September 2014 – ABC radio interview on *Brisbane Spatial Epicenter*

8 September 2014 *Queensland's Pivotal Open Data Dialog*, Open Data Committee, Premiers Office, Brisbane, Australia

27 August 2014 *Rocks to Rocks: Spatial Information Science and Technology at QUT* Global Café, QUT, Brisbane, Australia

8 August 2014 *Evolution of Big Data*, Innovation Series, Brisbane, Australia

9 June 2014. *Force Multiplier for Science through Crowd Source Validation and Visualization* Co-Data Conference on Big Data, Beijing, China

26 May 2014 *GIS and Science in Service to Humanity*, QUT, Brisbane

16 May 2014 *I know where we are going...Earth Squeeze in the 21<sup>st</sup> Century*, Ideas After Dark, Malanda, Queensland, Australia.

3 May 2014. *Tidal Wave of Change*, Northern Group Conference, SSSI, Townsville, Australia

8 April 2014. *Spatial Thoughts*, LOCATE 14, Canberra, Australia

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7 April 2014. *Spatial Thoughts* SIBA Breakfast Event, Canberra, Australia

22 November, 2013. *Back to the Future*, SIBA Executive Meeting, Brisbane, Australia

21 November, 2013. *Spatial Revolution*, QUT Grand Challenge Lecture, Brisbane, Australia

May 22, 2013. *Data Communities and Data Infrastructure Building*, UCGIS Symposium 2013 - Washington, DC

13 November 2012. *Innovations in a 21<sup>st</sup> Century Government*. Innovative Solutions Consortium, ITC, Herndon, Virginia

3 September 2012. *Earth Squeeze in the 21<sup>st</sup> Century*. 4<sup>th</sup> Digital Earth Summit Wellington, New Zealand

31 August 2012. *The Magic of Social Media for the Global [R]evolution*. Project [R]evolution Conference, Auckland University, New Zealand.

23 February 2012. *Climate Change for Undergraduates*. Wiley Faculty Lectures Series.

December 2011. *Where Are We in the World?*, Key West Collegiate School Internship Program, Key West Botanical Gardens, Key West, Florida.

20 May 2010. *Digital Earth and the Greening of Society*, 7<sup>th</sup> TIDES, Taipei, Taiwan.

30 July 2009. *Community-Based Sustainable Energy & Conservation*, MultiTemp 2009, Groton, Connecticut

24 May 2009. *Think Globally, Farm Locally: Local communities and their role in stopping global warming*, 2008 Maryland Heartland Sustainable Living Fair, Carroll County Farm Museum, Westminster, Maryland.

20 April 2009. *Balancing Energy Audits, Emission Calculators, and Local Sustainability*, CitiesGo Green, Portland, Oregon

16 February 2009. *Balancing Strategies in an Unbalanced Climate*, European 2020, Coventry University

30 October 2008. *Design for a Better Planet*, Environmental Scholars, University of Maryland

15 October 2008. *Digital Earths for Sustainability Epistemology*, PBI Ambassadors, Churchill, Manitoba, Canada

24 May 2008. *Think Globally, Farm Locally: Local communities and their role in stopping global warming*, Maryland Heartland Sustainable Living Fair, Carroll County Farm Museum, Westminster, Maryland

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11 April 2008. *Design of an Earth Operating System* University of Connecticut, CT

4 November 2007. *Climate Change and Polar Bears*, Community College of Baltimore County, Catonsville, MD.

8 November 2007. Panel Member *Choices and Challenges: Nuclear Power Reconsidered*, Blacksburg, VA.

20 October 2007. *From Bangalore to the Bay Area: Mapping Knowledge and Power for the Sustainable City and Countryside of the Future*, Bioneers Conference, Marin County, CA.

14 September 2007. *Digital Earth and Virtual Worlds*, Serious Games Institute, Coventry University, Coventry, UK

12 September 2007. *Digital Earth: The New Digital Commons*, UK e-Science, University of Nottingham, Nottingham, UK

28 June 2007. *NASA Earth Science and Applications Program: Fiscal Year 2008 Budget Request and Issues*, Congressional Testimony at the Committee on Science and Technology, U.S. House of Representatives, Washington, D.C.

5 June 2007. *Digital Earth Saga*, 5<sup>th</sup> International Symposium on Digital Earth, Berkeley, California.

30 May 2007 *Earth Operating System*, Where 2.0 Conference, San Jose, California

28 March 2007 *Digital Earth, Remote Sensing, and Modeling*, GTN 2007 Conference, Hannover, Germany

8 November 2006. *How do we know what we don't know: Roots for demystifying Global Change myths*. Campus Climate Change Initiative, University of Maryland, Baltimore County, Maryland.

28 August 2006. *Global to Local Challenges and Digital Earth*, Digital Earth Summit on Sustainability, Auckland, New Zealand

5 April 2005. *History of Remote Sensing*, University of Loma Linda, NASA Earth Science System, Redlands, California

6 April 2005. *Sensors and Platforms*, University of Loma Linda, NASA Earth Science System, Redlands, California

7 April 2005. *Geobrowsers and Portal*, Special ESRI Lectures Series, Redlands, California

**DR. TIMOTHY W. FORESMAN**

27 September 2004. *Engaging Conservationists in a Digital Universe*, Seventh Annual Society for Conservation (SCGIS) Conference, Shepherdstown, West Virginia

8 November 2004. *Challenges for Sustainability at the Local Level*, Virginia GIS Conference, Roanoke, Virginia

**PUBLICATIONS**

**Books**

*Visualizing Physical Geography*, (Foresman and Strahler) John Wiley and Sons, Inc, 2012

*The Last Little Polar Bear*, Blueline Publishing, Denver, CO, 2007

*The History of Geographic Information Systems: Perspectives from the Pioneers*, Prentice Hall, pp. 3-20, 1998 [Editor and chapter author]

**Articles and Chapters in Books (Peer Review):**

“The Second Law of Geography for a Spatially Enabled Economy,” (with R. Luscombe), *International Journal of Digital Earth*, DOI:10.1080/17538947.2016.1275830. 2017

“Pivotal Principles for Digital Earth Development in the 21<sup>st</sup> Century,” (with C. Desha, V. Vancheswaran, A. Reeve, and J. Hayes) *International Journal of Digital Earth*, June 2016.

“Does DE need a C? – A proposal for a DE Curriculum,” (with S. Schade, P. Georgiadou, and J. Strobl) *International Journal of Digital Earth*, Nov 2013

“Evolution and Intelligent Design of an Earth Operating System for Gaia,” in *Gaia in Turmoil*, (eds. Crist and Rinker) MIT Press, 2010

“History of GIS” in *Encyclopedia of Geography*, SAGE Press, 2009

“Evolution and implementation of the Digital Earth vision, technology and society,” *International Journal of Digital Earth*, Vol.1, No.1, March 2008.

“Making Science for Sustainable Development More Policy Relevant: New Tools for Analysis,” (with A. Singh, B. Moldan, T. Loveland, I. Basta, G. Beldtram, W. Burch, S. Etienne, G. Machlis, P. Marcotullio, J. Mellillo, D. Pillay, V. Fichelet, D. Rapport) ICSU Series on Science for Sustainable Development, No. 8, 28p, 2002.

“A System for Survival: GIS and Sustainable Development,” (a contribution with B. Shrestha, B. Bajracharya, S. Pradhan) (edited by A. Falconer and J. Foresman), ESRI Press, p 115, 2002.

"Global Environmental Outlook 3," (with GEO team), UNEP, 2002

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"An Assessment of the Status of the World's Remaining Closed Forest", (with A. Singh, H. Shi, and Z. Zhu) UNEP/DEWA/TR 01-2, Nairobi, Kenya, 2001.

"GLOBIO Global Methodology for Mapping Human Impacts on the Biosphere," (with C. Nellemann, L. Kullerund, I. Vistnes, B.C. Forbes, E. Husby, G.P. Kofinas, B.P. Kaltenborn, J. Rouaud, M. Magomediova, R. Bobiwash, C. Lambrechts, PIJ. Schei, S. Tveitdal, O. Gron and T. S. Larsen) UNEP/DEWA.TR.OR-3, 2001

"Mandate for Remote Sensing Education and the Remote Sensing Core Curriculum", (with T. Serpi) Geocarto International Vol. 14, No. 2, 1999

"Chapter 1: Introduction," (with K. Kline and J. Estes), In Global Environmental Databases (edited by R. Tateishi and D. Hastings) , ISPRS, Working Group IV/6, pp. 1-17, 2000.

"Large-Area Land Cover Characterization," (with T.R. Loveland, J.E. Estes, J. Scepan, K. D. Kline, and J. Hemphill), In Global Environmental Databases (edited by R. Tateishi and D. Hastings) , ISPRS, Working Group IV/6, pp. 105-125, 2000.

"Biodiversity Data and Information," (with C.P. Giri, S. Shrestha, and A. Singh) In Global Environmental Databases (edited by R. Tateishi and D. Hastings) , ISPRS, Working Group IV/6, pp. 126-156, 2000.

"Spatial Analysis and Mapping on the Internet", J. of Public Health Management Practice, 1999, 5(4), 57-64

"Entrenchment of GIS Technology for Enterprise Solutions in Maryland's State and Local Government. (with ., S.P. Walker, C.T. Daniel, D. Adams, V. DeFries, and L. Hennessee) in *Photogrammetric Engineering & Remote Sensing*, 1999, 65(11):1277-1286.

"The Baltimore-Washington Regional Collaboratory Land Use History Research Program," in Sisk, T.D., ed. Perspectives on Land Use History of North America: A Context for Understanding Our Changing Environment. U.S. Geological Survey, Biological Resources Division, Biological Science Report USGS/BDR/BSR-1998-0003, pp 33-42. 1998.

"GIS Early years and the Threads of Evolution," in T. Foresman, ed., The History of Geographic Information Systems: Perspectives from the Pioneers, Prentice Hall, pp. 3-20, 1998.

"Internet Teaching Foundation for the Remote Sensing Core Curriculum Program," (With T. Cary, T. Shupin, R. Eastman, J.E. Estes, N. Faust, J.R. Jensen, K.K. Kemp) ISPRS Journal of Photogrammetry & Remote Sensing, Vol. 52, pp 294-300, 1997.

*DR. TIMOTHY W. FORESMAN*

"Integration of Remote Sensing and GIS Technologies for Planning," (with Tom Millette) in J. Star and J. Estes, eds., Remote Sensing and Geographic Information Systems Integration, Cambridge University Press 1997.

"Methods for Spatial and Temporal Land Use and Land Cover Assessment for Urban Ecosystems and Applications in the Greater Baltimore-Chesapeake Region," (with S.T.A. Pickett and W.C. Zipperer) *Urban Ecosystems*, Vol. 1, pp. 201-216, 1997.

"A Conceptual Framework for the Study of Human Ecosystems in Urban Areas," (with S.T.A Pickett, W.R. Burch, S.E. Dalton, J.M.Grove, R. Rountree) *Urban Ecosystems*, Vol.1, pp. 185-199, 1997.

"Urban Tree Cover: An Ecological Perspective," (with W. Zipperer, S.M. Sisinni, and R.V. Pouyat) *Urban Ecosystems*, Vol.1, pp. 229-246, 1997.

"Chapter 1: Image Formation and Raster Characteristics," (with S. Morain, J. Estes, and J. Scepan), In *Raster Imagery in Geographic Information Systems*, OnWord Press, Santa Fe, NM, 1996.

"The NCGIA Core Curriculum in Remote Sensing," (with J. Jensen, J.E. Estes, J.L. Star, M.F. Goodchild, T. Cary, N. Faust, and T. Shupin), *Photogramm. Eng. Remote Sensing* **59** (1993), pp. 945–948.

"Coordinating Hazardous Waste Management Activities Using Geographic Information Systems," (with J.E. Estes, K.C. McGuire and G.A. Fletcher) *International Journal of Geographic Information Systems*, Vol.1, No.4, pp. 358-378, 1987.

"Mapping, Monitoring, and Modelling of Hazardous Waste Sites," *The Science of the Total Environment*, Vol. 56, pp. 255-263, 1986.

**Edited Publications:**

"Thermal Infrared Applications for Hot Markets," *Imaging Notes* Vol.24, No.3, 2009

"Infrastructure Stimulus: Green Economy and Green Jobs," *Imaging Notes* Vol. 24, No.1, 2009

"Appalachian Voices and Satellite Eyes: Winning Tools for Socio-Environmental Justice in the Energy War," *Imaging Notes* Vol. 23. No.2, 2008

"The Need for Mapping Polar Bear Habitat Collapse," *Imaging Notes* Vol.23, No.1, 2008

"Through the Looking Glass: A 21<sup>st</sup> Century Vision," *Imaging Notes* Vol. 22, No.2, 2007

"A Summit Stop in Middle Earth on the Way to the Digital Earth Symposium," *Imaging Notes* Vol.22, No.1, 2007

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"Digital Earth as an Operating System for a Troubled Planet," *Imaging Notes* Vol.22, No. 1, 2007

"Through the Looking Glass," *Imaging Notes* Vol.22, No.2, 2007

"Remote Sensing and Climate Change," *Imaging Notes*, Vol.21, No. 3, 2006

"Udo's World," *Imaging Notes*, Vol. 21, No. 2, 2006

"Satellite Censors," *Imaging Notes*, Vol.21, No. 1, 2006.

"3D Digital Earth Geobrowsers," (with H. Fukui). *GIM International*, Volume 18, Number 6, pp 48-51, June 2004.

"Science Progress in China," (foreign editor for English version), *Science Press*, Beijing, 2003

"Local, State, and Regional Government and Planning Applications for Remote Sensing," *EOM*, Vol. 8, No. 3, pp. 30-33, 1999.

"Link Globally, Act Locally: Baltimore Ecosystem Study", (with Steward Pickett, and Kristine Kuhlman), *Geo Info Systems*, Vol 9, No. 2, pp. 24-29. 1999.

"Report on the Regional Conference on Poverty Related Core Data Needs for the Asia-Pacific Region," (with J. Estes and D.W. Mooneyhan (eds.)), *United Nations Development Programme*, Kuala Lumpur, Malaysia, May 6-8, 1998, pps. 198.

"Relational Database Management Systems Fulfill Expectations," (special issue) *Showcase*, *Geo Info Systems*, Vol.4, No. 8, pp. 12-34.

"Academic Research and Education in GIS," *GIS World Source Book 1997*, pp. 361-369.

"Digital Communications for GIS in Las Vegas, Nevada, U.S.A.," (with Dave Edwards) in P.W. Newton, P.R.Zwart and M.E. Cavill, eds., *Networking Spatial Information Systems*, pp. 145-154, Belhaven Press, 1996.

"Academic Research and Education in GIS," *GIS World Source Book 1996*, pp. 377-386.

"Academic Research and Education in GIS," *GIS World Source Book 1995*, pp. 357-362.

"GIS in Local Government," *GIS World*, monthly column, 1992-1994.

"Tactical GIS Helps Marines Preserve Natural Resources at CampLejeune," *Geo Info Systems*, Vol. 3, No. 5, pp. 44-47, 1993.

"Digital Image Databases to Support GIS Operations," (with Thomas Lenzen) GIS World, Vol. 6, No. 11, pp. 36-38, 1993.

**Conference Proceedings:**

"Remote Sensing Utility Expansion through Earth Portal Internet Browser,' International Symposium on Remote Sensing of Environment, St. Petersburg, Russian, June 2005

"Earth Portal Launch Utilizes Digital Earth Technology," 4<sup>th</sup> International Symposium on Digital Earth, Tokyo, Japan, March 28-30, 2005

"Risk Communication Using Early Digital Earth Application," (with H. Fukui), 4<sup>th</sup> International Symposium on Digital Earth, Tokyo, Japan, March 28-30, 2005

"Progress with the Digital Earth global infrastructure," (with H. Guo and H. Fukui) 7<sup>th</sup> Global Spatial Data Infrastructure Conference, 2-6 February 2004.

"Digital Earth: The Status and the Challenge," Proceedings of Global Mapping Forum 2003, 12-15 July 2003, Okinawa, Japan

"Geographic Browsers for Spatial Data Interface and Access: Operational Specifications and Functions for a Universal Standard", Proceedings of ASPRS 2003 Annual Conference, May 5-9, 2003, Anchorage, Alaska

"Global Activities Harnessing Geo-Information to Support Science, Communications, and Action for Sustainable Development," LEAD Expert Meeting on Development of Field Survey and Geo-Informatics for Sustainable Development, Okinawa, Japan, November 17-20, 2002

"Lyme Disease in Maryland: Using Remote Sensing, GIS, and Epidemiology for Vector Analysis and Modeling," (with T. Serpi) Proceedings 27th International Symposium on Remote Sensing of Environment: Information for Sustainability, Tromso, Norway, pp. 805-808, 1998

"Development of a Three-Tier Metadata Documentation Scheme: Examining Level I as an Internet Accessible Metadata Input and Search Tool," (with Kuhlman, K.M. and Soffer, A.), Second IEEE Metadata Conference, Silver Spring, MD, 1997.

"Education Innovation with the NCGIA Remote Sensing Core Curriculum," American Society for Photogrammetry and Remote Sensing Conference and Exhibition Technical Papers, Vol. 1, pp. 524-530, 1996.

"Metadata Myth: Misunderstanding the Implications of Federal Metadata Standards," (with H. Wiggins and D. Porter), First IEEE Metadata Conference, Silver Spring, MD, 1996.

*DR. TIMOTHY W. FORESMAN*

“Remote Sensing & Core Data Needed to Support Planning and Policy Decision Making,” (with J. Estes, J. Garegnani, and D. Porter), International Geoscience and Remote Sensing Symposium, Vol. 4, pp. 2243-2245, 1996.

“Development of a Remote Sensing Core Curriculum,” (with J.E. Estes), International Geoscience and Remote Sensing Symposium, Vol. 4, pp. 820-822, 1996.

“Community Coalition Services Utilizing Spatial Technology: A Perspective on Baltimore Regional Activities,” NCGIA-Spatial Technologies, Geographic Information, and the City: A Research Conference, Baltimore, MD, 1996.

“Design and Documentation of a Baltimore-Washington Regional Spatial Database Testbed for Environmental Model Calibration and Verification,” (with W. Acevedo, P. Masuoka, D. Porter, and H. Wiggins), Third International Conference/Workshop on Integrating Geographic Information and Environmental Modeling, Santa Fe, NM, 1996.

“Origins and Philosophy of Building a Temporal Database to Examine Human Transformation Processes,” (with W. Acevedo, J. Buchanan), American Society for Photogrammetry and Remote Sensing Conference and Exhibition Technical Papers, Vol. 1, pp. 148-161, 1996.

“Developing a Temporal Database of Urban development for the Baltimore/Washington Region,” (with J. Crawford, W. Acevedo, J. Buchanan, W. Prince), American Society for Photogrammetry and Remote Sensing Conference and Exhibition Technical Papers, Vol. 3, pp. 101-110, 1996.

“Development of the Temporal Transportation Database for the Analysis of Urban Development in the Baltimore-Washington Region,” (with S. Clark, J. Starr, D. Hinzman, H. Wiggins, W. Acevedo, C. Solomon), American Society for Photogrammetry and Remote Sensing Conference and Exhibition Technical Papers, Vol. 3, pp.77-88, 1996.

“Techniques for Visualizing Urban Growth Using Temporal GIS Database,” (with P. Masuoka, W. Acevedo, S. Fifer and M. Tuttle), American Society for Photogrammetry and Remote Sensing Conference and Exhibition Technical Papers, Vol. 3, pp 89-100, 1996.

“Assessing Disease Vectors Using Remote Sensing: Unlocking the Door to Detection and Control,” (with T. Serpi), American Society for Photogrammetry and Remote Sensing Conference and Exhibition Technical Papers, Vol. 1, pp. 9-18, 1996.

“Visualization Techniques for the analysis of Baltimore Regional GIS data,” (with P. Masuoka, S. Fifer, W. Acevedo, S. Clark, J. Crawford, J. Buchanan), GIS/LIS '95 Annual Conference & Exposition Proceedings, Vol. 2, pp. 704-712, 1995.

*DR. TIMOTHY W. FORESMAN*

"Managing Error -- An Approach to Digital Spatial Accuracy," (with Dale Loberger) Proceedings of the Thirteenth Annual ESRI User Conference, Palm Springs, California, Vol. 2, pp. 291-299, 1993.

"Ensuring Long-Term Viability of a County-Wide GIS Network through Interlocal Agreements," Urban & Regional Information Systems Proceedings, San Francisco, CA, 1991.

"Embedding Quality into County-Wide Data Conversion," (with R.J. Garza) GIS/LIS '91 Proceedings, Atlanta, Georgia, Vol. 1, pp. 130-136, 1991.

"High-Speed Digital Solutions for GIS Network Communications in Nevada," (with Dave Edwards) GIS/LIS '90 Proceedings, Anaheim, California, Vol.1, pp.328-334, 1990.

"Centralized Management: Protecting Your Data Investment," (with Dave Edwards) Urban & Regional Information Systems Association Proceedings, Frank Westerlund, Ed., Vol. IV, Edmonton, Alberta, 1990.

"Desert Construction Siting Utilizing Remote Sensing Technology," (with Ralph Brown) Proceedings of the First Thematic Conference: Remote Sensing of Arid and Semi-Arid Lands, Cairo, Egypt, 1981.

**Research Reports:**

"Risk Communications Project – An International Perspectives Assessment," Japanese Ministry of Industry, Trade, and Industry, February, 2005

"Future Directions for Hydrogen Energy Research and Education" (with co-PIs J. Romm and R. Corell), National Science Foundation, Arlington, VA, June 27-29, 2004

"Research Initiative 15: Multiple Roles for GIS in US Global Change Research," (with M. Goodchild, J. Estes, and K. Beard), NCGIA Tech Report 96-5, Santa Fe, NM, 1996.

"Research Initiative 15: Multiple Roles for GIS in US Global Change Research, Report of the First Specialist Meeting," (with M. Goodchild, J. Estes, J. Robinson and K. Beard), NCGIA Technical Report 95-10, 1996.

**MEMBERSHIP**

American Association for the Advancement of Science  
American Society of Photogrammetry and Remote Sensing  
Association of American Geographers  
EIS Africa  
GeoDataAlliance  
International Society for Digital Earth  
International Society for Photogrammetry and Remote Sensing  
Network for Science and Technology for Sustainability  
Sigma Xi – 40 Year Member

**BOARD MEMBER/TECHNICAL ADVISOR**

**Positions**

d\_city. Associate Editor

International Society for Digital Earth, founding and life member

International Journal for Digital Earth, Editorial Board

International Center for Remote Sensing of Environment ([www.icrsed.org](http://www.icrsed.org)), President

**Previous Positions**

Chairman, ISPRS, Commission VI, WG 4 (2004-2008)

Environmental Information Coalition/EarthPortal.Net ([www.earthportal.net](http://www.earthportal.net))

ManyOne.Net ([www.manyone.net](http://www.manyone.net))

AM/FM International 1988-1990

Planetnetwork ([www.planetwork.net](http://www.planetwork.net))

GeoData Alliance ([www.geoall.net](http://www.geoall.net))

EOGEO ([www.eogeo.org](http://www.eogeo.org))

Imaging Notes, Editorial Advisory Board

Columnist (2005-2011) Imaging Notes, "Earth Scope", ([www.imagingnotes.com](http://www.imagingnotes.com))

**LANGUAGES**

Mother Tongue: English; functional working knowledge in Spanish.

**I CERTIFY THAT ALL INFORMATION STATED IN THIS RESUME IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF**

*Timothy W. Foresman*

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