

Advancing the Global Land Grant Institution: Creating a Virtual Environment to Re-envision Extension and Advance GSS-related Research, Education, and Collaboration

May 15, 2017

Faculty Lead

[Ralph Hall](#), Associate Professor, Director of the Undergraduate Program, School of Public and International Affairs, CAUS

GIS/Data Visualization/Data Architecture/Data Analytics/Information Systems

[Nicholas Polys](#), Director of Visual Computing, Affiliate Professor in the Department Computer Science, COE

[Peter Sforza](#), Director of the Center for Geospatial Information Technology, CNRE

[Stephen Eubank](#), Deputy Director and Professor in NDSSL, the Biocomplexity Institute, Population Health Sciences, and Vet Med; Adjunct Professor, Department of Physics

[Bryan Lewis](#), Research Associate Professor, the Biocomplexity Institute

Water Systems/Hydrogeoscience

[Leigh-Anne H. Krometis](#), Assistant Professor, Department of Biological Systems Engineering, COE

[Ryan Pollyea](#), Assistant Professor, Department of Geosciences, COS

[Stephen Schoenholtz](#), Director, Virginia Water Resources Research Center, CNRE

[Venkataramana Sridhar](#), Assistant Professor, Department of Biological Systems Engineering, COE

Program Support/Gender and Development

[Van Crowder](#), Executive Director of OIRED

[John Lipsey](#), Associate Director, Strategic Partnerships and Program Development

[Maria Elisa Christie](#), Director, Women and Gender in International Development

Learning in Virtual Environments

[George Glasson](#), Professor, Science Education, School of Education, CLAHS

[Hannah Scherer](#), Assistant Professor and Extension Specialist, Department of Agricultural, Leadership, and Community Education, CALS

Mzuzu University Library Design

[Jack Davis](#), Dean, CAUS

[Robert Dunay](#), ACSA Distinguished Professor, FAIA Director, Center for Design Research, CAUS

[Nathan King](#), Assistant Professor, School of Architecture + Design, CAUS

Community Health and Disease Systems

[Andre Muelenaer](#), Chief, Section of Pediatric Pulmonology/Allergy, Carilion Children's Hospital, Associate Professor, Department of Pediatrics Virginia Tech Carilion School of Medicine

[Penelope Muelenaer](#), Assistant Professor, Pediatrics, Virginia Tech Carilion School of Medicine

[Cassidy Rist](#), Assistant Professor, Center for Public and Corporate Veterinary Medicine, Department of Population Health Sciences, VA-MD CVM

[Sophie Wenzel](#), Associate Director, Center for Public Health Practice and Research, Department of Population Health Sciences, VA-MD CVM

1. Vision

The vision for this project has emerged from several years of research, teaching, and service in Africa and holds the potential to internationalize education at Virginia Tech and in our partner institutions in Malawi. The vision is simple, **to develop a state-of-the-art, data rich, virtual decision-support and learning environment that enables local-, regional-, and national-level actors in developed and developing regions to make decisions that improve resilience and sustainability**. Achieving these objectives will require a system that can combine biogeophysical and sociocultural data in a way that enables actors to understand and leverage these data to enhance decision-making at various levels. The project will begin by focusing on water, agricultural, and health systems in Malawi, and can be expanded over time to include any sector or system in any country. The core ideas are inherently scalable.

With the emergence of remote monitoring, precision agriculture, access to expanded wireless data transmission, use of –omics (plant/microbial) and computer vision, etc., we have reached a critical point where technology-enabled innovation can help support decision-making for resilient and sustainable ecosystems and the communities they support. Tapping into this opportunity requires interdisciplinary (global) teams of scientists and educators with complementary expertise and common goals to create appropriate technologies and systems that can provide essential information to local-, regional-, and national-level actors in resource rich and poor settings. Technology is now reaching a point where the digital divide is becoming less of a barrier and strong, long-term partnerships among educational institutions can be formed around the creation of common platforms that enhance decision-making and the internationalization of learning.

This proposal outlines the concept for an ambitious research, education, and extension agenda that brings together significant advances occurring at Virginia Tech in the areas of water modeling and simulation, [water systems management](#), data analytics and visualization, [modeling using synthetic global populations](#), [virtual environments](#) and [immersive education](#), [community health](#), and [disease detection and response](#). The initial concept for the project was first explored in [Burkina Faso in 2015](#) with support of an [ISCE grant](#). This research was followed by an ICAT SEAD grant to [demonstrate](#) data capture and Web3D visualization capabilities. The fieldwork in Burkina Faso revealed the critical need for an open access map-based system/service that can be used by actors at different levels to improve rural water decision-making. This idea attracted much interest from a diverse set of stakeholders because existing rural water data is not easily accessible, useful for decision making, or shared between NGOs and the government. Over the past two years the core team has continued to refine these ideas in northern Malawi and has expanded the scope of the project to include the synergistic areas of agricultural and health systems, along with a new focus on virtual learning enabled by the future design and construction of a new library at Mzuzu University in northern Malawi.

2. Relevance

Our vision is to create a next-generation open data fusion platform that will enable multidisciplinary scientists, decision-makers, development actors, and citizens to understand and leverage the potential of sensor-driven information and visual analytic and decision-support services. The platform targets the power of Web accessibility, open standards, and immersive media to integrate and communicate the interactions between complex, dynamic systems. The core team (along with new hires at the interface of targeted disciplines - see Appendix III) will develop the cyberinfrastructure for several innovations that include (1) the ingesting of data from online and government sources, field-stations, drones, citizens, development actors, communities, simulation models, etc., (2) the fusing and processing of these data through Models-as-a-Service (MaaS), and (3) the creation of Web3D interfaces designed for testing hypotheses and scenarios to enhance decision-making at various levels (community to national/international) (Figure 1).

This platform would also create a virtual learning space where students and faculty at Virginia Tech and at our international partner institution(s) would create *hybridized* knowledge in the pursuit of solutions to problems that stem from the global to community scale. For example, groundwater resource management is particularly well-suited for the proposed multi-scale data fusion platform because (1) groundwater is the primary freshwater source for many rural communities in east Africa, (2) groundwater occurrence is highly uncertain and cannot be directly visualized, and (3) aquifer recharge processes occur over a wide range of spatial and temporal scales, which results in complex decision making for aquifer management. In addition, a number of rich data sets presently exist for regional-scale hydrological attributes in east Africa (e.g., [MASDAP](#)); however, utilizing such data for community-scale water supply management and decision making requires further analysis and additional data acquisition at local scales. At these scales, data acquisition may comprise any combination of crowdsourcing, advanced sensor deployment, and/or individual actors, and integrating such data in a Groundwater MaaS (gMaaS) may yield near real-time aquifer resource estimates. Moreover, combining gMaaS with interactive, Web3D visualization technology holds tremendous potential for testing the effects of various aquifer management strategies, as well as projecting these impacts through integrated MaaS systems in the food, energy, and economic sectors.

The advanced geospatial and analytic components of the envisioned platform will be supported by the [Center for Geospatial Information Technology \(CGIT\)](#), the [Visualization Services](#) offered by Virginia Tech's Advanced Research Computing (ARC), and the [Network Dynamics and Simulation Science Laboratory \(NDSSL\)](#). The majority of the visualization components of the platform already exist in facilities such as the [Visionarium](#), [Mirror Words](#), the [ICAT Cube](#), and the planned visualization classrooms, which are linked with the Data Analytics and Decision Sciences (DADS) Destination Area (DA). Our vision is to leverage these resources to secure funding that will support the *development* and *application* of the platform to critical global problems. With regards to the former, significant funding opportunities exist through the NSF [INFEWS](#), [CNH](#), [CIRCL](#), and [IUSE](#) programs. With regards to the latter, funding can be sought from the U.S Government's [Feed the Future](#) program and [Innovation Labs](#), development programs led by the [United States Agency for International Development](#), the [Global Health Security Agenda](#), the Department of State's [Community Solutions](#) Program, the [Bill & Melinda Gates Foundation](#), the World Bank's [African Centers of Excellence](#) program (for partner funding), the [Ford Foundation](#) (in relation to equitable development), the [Rockefeller Foundation](#) (specifically with regards to freshwater resilience), and many other international development-related resources.

The proposed project would have *direct* links with the DADS and Integrated Security (IS) DAs, the Policy (P) and Creative Technologies and Experiences (CT+E) Strategic Growth Areas (SGAs), and the Beyond Boundaries Global Land Grant and Campus of the Future initiatives.

3. Curriculum and Global Learning

A unique aspect of this project is the future construction of a new library at [Mzuzu University](#), which was lost to a [fire](#) in December 2015. Since the fire, faculty, staff, and students at Virginia Tech have led the [Mzuni Library Initiative](#), which shipped over [8,000 books](#) to Mzuzu in 2017. Faculty in the School of Architecture + Design will now begin the process of designing the concept for a new library, one that is the embodiment and identity of technology and tradition. A programmatic feature of the new facility will be a data and virtual learning center that will directly connect with research and facilities at Virginia Tech.

Currently, only one fifth of undergraduate students at Virginia Tech have the opportunity to undertake a study abroad program and only a handful of students at Mzuzu University study overseas. A core aspect of this project would be to enable students at Virginia Tech and (initially) at Mzuzu University, to work and learn together in a virtual international environment (Figure 2). For example, students at Mzuzu University could explore [Stroubles Creek](#) and students at Virginia Tech could explore a virtual version of the [Freedom Gardens](#) in Malawi. Such an environment would also enable the formation of hybridized knowledge through

the integration of Western and African knowledge. A goal of this project is to provide students at Virginia Tech and Mzuzu University with meaningful international engagement that stimulates curiosity through harnessing the tension between reality and abstraction. In collaboration with faculty from a variety of disciplines, students will be engaged in problem-based learning by analyzing, modeling, and interpreting data in virtual reality for the purpose of learning about ecosystems that support sustainable agriculture and communities. Decision-making and learning would involve a hybridized approach in which Indigenous and Western scientific knowledge systems, technologies, and practices are negotiated to find viable solutions to local issues that have global impact. The collaboration between faculty and students from Virginia Tech, Mzuzu University, and other Malawian Institutions (e.g., Lilongwe University of Agriculture and Natural Resources, University of Malawi) would significantly enhance cultural understandings and innovative approaches to problem-solving that underpin the global land grant mission.

This project represents a unique opportunity to develop new knowledge about the affordances that an international virtual learning space can provide to support student learning about complex, real-world systems, and the development of systems thinking abilities. Through a design-based education research strategy, resources such as customizable student project templates, faculty training materials, and strategies for incorporating a virtual problem-based learning unit into a course can be developed and tested as this project unfolds. These products would allow for faculty in a wide range of disciplines (at Virginia Tech and in our partner institutions in Malawi) to implement virtual international experiences to enhance existing and new courses.

4. Resource Needs

The faculty hires will work at the *interface* of critical project components and disciplines. These faculty will need to demonstrate expertise in two or more disciplines that span the interface identified. Appendix III provides an outline of eight critical faculty positions across six colleges that would advance the proposed project.

With regards to critical infrastructure, the new hires will need to have access to one or more of the following facilities: the [Visionarium](#), [Mirror Words](#), the [ICAT Cube](#), and the planned visualization classrooms (linked with the DADS DA). As the project advances, a “decision theater” could greatly enhance the planning- and policy-related decision-making aspect of this project, while also providing a valuable service to other programs and researchers at Virginia Tech and in the local community. Table 1 provides a preliminary budget that would be further refined if awarded the grant.

Table 1: Budget

Item	Amount
Travel - VT faculty to Malawi	\$22,500
Travel - Malawian partners to VT	\$22,500
Faculty salary support (summer or AY)	\$20,000
Workshops/meetings (at VT)	\$5,000
Equipment (to support proof-of-concept work)	\$5,000
Total	\$75,000

Appendix I: Biosketches

Ralph P. Hall, MEng, S.M., S.M., PhD

Associate Professor, Urban Affairs and Planning, School of Public and International Affairs, Virginia Tech, <http://ralphhall.wordpress.com/>

Professional Preparation

Stanford University, California	Civil & Environmental Engineering	Postdoc 2008
MIT, Massachusetts	Technology, Management, & Policy	PhD 2006
MIT, Massachusetts	Technology & Policy	S.M. 2002
MIT, Massachusetts	Civil & Environmental Engineering	S.M. 2002
University of Southampton, England	Civil Engineering	MEng 1999

Recent Appointments

2016-pr.	Associate Professor, Urban Affairs and Planning, VT
2015-pr.	SPIA Undergraduate Program Director, VT
2013-pr.	Affiliate Scholar, Global Forum on Urban and Regional Resilience, VT
2013-pr.	Affiliate Member, Myers-Lawson School of Construction, VT
2011-pr.	Faculty Fellow, Metropolitan Institute, VT
2009-2016	Assistant Professor, Urban Affairs and Planning, VT
2006-2008	Postdoctoral Scholar, Civil & Environmental Engineering, Stanford

Five Related Publications

1. **Hall, R. P.**, Ranganathan, S, and Raj, G. C. (2017) [A General Micro-level Modeling Approach to Analyzing Interconnected SDGs: Achieving SDG 6 and More through Multiple-Use Water Services \(MUS\)](#). *Sustainability*, 9(2), 314.
2. Van Houweling, E., **Hall, R. P.**, Carzolio, M., and Vance, E. (2016) ["My neighbor drinks clean water, while I continue to suffer;" an analysis of the intra-community and intra-household impacts of a rural water project in Mozambique](#). *Journal of Development Studies*. DOI: 10.1080/00220388.2016.1224852.
3. Gudmundsson, H., **Hall, R. P.**, Marsden, G., and Zietsman, J. (2015). [Sustainable Transportation: Indicators, Frameworks, and Performance Management](#). Springer, New York, 304 pages. ISBN: 9783662469231.
4. **Hall, R. P.**, Vance, E. A., and Van Houweling, E. (2014). [The Productive Use of Rural Piped Water in Senegal](#). *Water Alternatives*, 7(3), 480-498.
5. **Hall, R. P.**, Van Koppen, B., and Van Houweling, E. (2013). [The Human Right to Water: The Importance of Domestic and Productive Water Rights](#). *Science and Engineering Ethics*, 20(4), 849-868.

Other Closely Related Publication

6. Ashford, N. A. and **Hall, R. P.** (2011). [Technology, Globalization, and Sustainable Development: Transforming the Industrial State](#). Yale University Press, New Haven, 752 pages. ISBN: 9780300169720.

Synergistic Activities

Hall has over a decade of academic and professional experience in applying the concept of sustainable development to large-scale infrastructure systems with a specific emphasis on transportation, water supply, and sanitation systems. Hall's most recent co-authored book, entitled *Sustainability in Transportation: Making it Count*, provides students and practitioners with a deep understanding of the basic concepts of sustainability as well as a coherent framework for how to apply them consistently in the context of transportation planning, management, and decision making at different levels.

1. **Sustainability-related Research:** PI of the Indian Institute of Technology-Kanpur (IIT-K) and Virginia Tech (VT) partnership on Sustainable and Resilient Infrastructure Development. The partnership was funded by the Obama-Singh 21st Century Knowledge Initiative.
2. **Professional Society Involvement:** Member of the Transportation Research Board (TRB) Committee on Transportation and Sustainability (ADD40); Member of TRB, 2002-present; Member of the Society of Socio-Economists, 2013-present.
3. **New Course Development (last 3 years):** Advanced Urban Infrastructure Planning (undergraduate/graduate course); Experience WASH in Malawi – Study Abroad (undergraduate/graduate course); International Development Planning Studio (graduate course); and Technology, Globalization, and Sustainable Development (graduate course).
4. **Reviewer:** Transport Policy; Transportation Research, Part D: Transport and Environment; Journal of Water, Sanitation, and Hygiene for Development; Urban Planning; The William & Mary Policy Review; Journal of Planning History; World Development; Water Alternatives; and Environmental Innovation and Societal Transitions.

Collaborators & Other Affiliations

Collaborators & Co-Editors

Nicholas Ashford (MIT); Robert Ashford (Syracuse University); Jennifer Davis (Stanford University); Michael Garvin (Virginia Tech); Henrik Gudmundsson (Technical University of Denmark); Robert Hope (University of Oxford); Anne Khademian (Virginia Tech); Brian Kleiner (Virginia Tech); Greg Marsden (University of Leeds); Shalini Misra (Virginia Tech); Sudhir Misra (IITK); Nicolas Polys (Virginia Tech); Tara Ramani (Texas A&M University); Shyam Ranganathan (Virginia Tech); Peter Soderbaum (Mälardalen University); Peter Sforza (Virginia Tech); Venkataramana Sridhar (Virginia Tech); Eric Vance (Virginia Tech); Emily Van Houweling (University of Denver); Sophie Wenzel (Virginia Tech); Josias Zietsman (Texas A&M University).

Graduate and Postdoctoral Advisors

Nicholas Ashford (MIT); Joseph F. Coughlin (MIT); David Marks (MIT); Joseph M. Sussman (MIT)

Thesis Advisor and Postgraduate Scholar Sponsor

Jessica Agnew (Virginia Tech); Yehyun An (Virginia Tech); Selma Elouardighi (Virginia Tech); Mark Fialkoff (Virginia Tech); Khushboo Gupta (Virginia Tech); Raj Kumar (Virginia Tech); Emily Van Houweling (Virginia Tech)

Current: [a] Doctoral Students: 4 (committee chair/co-chair), 7 (committee member); [b] Masters Students: 1 (committee chair), 4 (committee member); [c] Undergraduate Students: 2.

Former: [a] Doctoral Students: 3 (committee chair), 4 (committee member); [b] Masters Students: 14 (committee chair), 32 (committee member); [c] Undergraduate Students: 4.

Maria Elisa Christie

AFFILIATION: **Virginia Tech**

DIRECTOR, WOMEN AND GENDER IN
INTERNATIONAL DEVELOPMENT

526 Prices Fork Road | Blacksburg, VA 24061
Phone: 540-231-4297 | Email: mechristie@vt.edu

EXPERTISE: Gender, agriculture, and development; qualitative research methods; feminist political ecology; cultural ecology; house-lot gardens; geography of food, cuisine, and kitchenspace

EDUCATION: Ph.D., Geography, University of Texas at Austin
M.A., Spanish and Women's Studies, University of Oregon
B.A., International Studies, History, and Romance Languages, University of Oregon

LANGUAGES: Spanish, English, French

COUNTRIES OF WORK EXPERIENCE: Bolivia, Bangladesh, Cambodia, Ecuador, Ghana, Haiti, Honduras, India, Indonesia, Kenya, Mali, Mexico, Nepal, Nicaragua, Philippines, Republic of Guinée, Senegal, Uganda, Vietnam, West Indies, and Zambia

EXPERIENCE SUMMARY:

Dr. Maria Elisa Christie has more than 25 years of experience in international development. Throughout her career, she has worked with a variety of development, research, and non-governmental agencies around the developing world, along with local, state, and federal governments in the United States and Mexico. Christie has played a key role in launching new projects that support international collaboration. Christie's research focuses on gendered spaces and everyday life in nature/society relations, participatory research methodologies, kitchens and gardens, and women's reciprocity networks. She has published a book, *Kitchenspace: Women, Fiestas, and Everyday Life in Central Mexico*, with the University of Texas Press. As the Director for Women and Gender in International Development (WGD), Christie's primary role is to provide leadership within OIRED to ensure that all projects and programs are gender-sensitive and will have a positive effect on the most disadvantaged beneficiaries, many of whom are women. She has developed and facilitated workshops on gender and participatory research in the United States and in French-, Spanish-, and English-speaking countries.

EMPLOYMENT HIGHLIGHTS:

2006 – present	Director, Women and Gender in International Development (Research Scientist), Office of International Research, Education and Development (OIRED), Virginia Tech
2006 – present	Faculty Affiliate, Government and International Affairs Program, Women's and Gender Studies, Geography Department at Virginia Tech
2003 – 2010	Assistant Professor and Lecturer of Geography, University of Indianapolis, University of Texas; Southwestern University
1996 – 2000	Consultant, Ten State Coordinator for the Border Environment Dialogue, Western Governors' Association and Planner, Office of Border Affairs, Texas Natural Resource Conservation Commission

1994 – 1995	Coordinator, National and International Relations, Secretariat of Environmental Development, State Government of Morelos, Cuernavaca, Mexico
1991 – 1992	Development Director, Environmental Law Alliance Worldwide (ELAW), U.S. office, Eugene, Oregon
1988 – 1991	Administrator, Oxfam America Regional Office for Mexico and Central America, Mexico City

GRANTS:

USAID/Feed the Future Innovation Lab for Integrated Pest Management projects. Gender research component of the following projects: *Biological Control of the Invasive Weed Parthenium hysterophorus in East Africa*; *Strengthening production and export of Vietnamese fruit crops through innovative and market-orientated IPM*; and *Innovative Scientific Research and Technology Transfer to Develop and Implement Integrated Pest Management Strategies for Vegetable and Mango Pests in Asia*. \$224,174 (2015 to present).

USAID/Integrated Pest Management (IPM) Collaborative Research Support Program (CRSP). *Gender Global Theme: Gender Equity, Capacity building, and Research in IPM*. \$550,000. (2009-2014). Gender Research Program. \$35,000. (2007 – 2009).

USAID/Sustainable Agriculture and Natural Resource Management (SANREM) Collaborative Research Support Program (CRSP). *Gendered Knowledge of soils and access to assets in Conservation Agriculture Production Systems*. \$273,124. (2009 – 2014). Gendered access to markets: Gendered Networks and Livelihood Alternatives. \$111,000. (2007 – 2009).

USAID/Peanut Collaborative Research Support Program (CRSP). *Improving the health and livelihood of people of East Africa by addressing aflatoxin and gender-related constraints in peanut production, processing and marketing*. \$619,997. (2007 – 2012). *Gender Issues in Aflatoxin Incidence and Control in Groundnut Production Systems of West Africa*. \$79,978. (2006 – 2007).

SELECTED PUBLICATIONS:

Sumner, D., **M.E. Christie**, and S. Boulakia. 2014. Gendered Livelihoods and Conservation Agriculture in Northwestern Cambodia: Decision-making, Space, and Access. Accepted by *Agriculture and Human Values* (June 23, 2016).

Christie, M.E., M. Parks, & M. Mulvaney (2016). Gender and local soil knowledge: linking farmers' perceptions with soil fertility in two villages in the Philippines. *Singapore Journal of Tropical Geography* 37: 6-24. DOI: 10.1111/sjtg.12134.

Christie, M.E., E. Van Houweling, & L. Zselezky (2015). Mapping gendered pest management knowledge, practices, and pesticide exposure pathways in Ghana and Mali. *Agriculture and Human Values* 32(4): 761-775.

Christie, M.E., P. Kyamureku, A. Kaaya, and A. Devenport (2014). "Farmers, Peanuts and Aflatoxins in Uganda: a Gendered Approach." *Development in Practice* 25(1): 4-48.

Zselezky, L., **M.E. Christie**, and J. Haleegoah (2014). "Applying an Embodied Livelihoods Approach to Tomato Farmers' Gendered Experience of Pesticides in Tuobodom, Ghana." *Gender, Technology and Development*, 18(2): 249-274.

Harman Parks, M., **M.E. Christie**, and I. Bagares (2013). "Gender and Conservation Agriculture Production Systems: Constraints and Opportunities in the Philippines." *GeoJournal*. DOI 10.1007/s10708-014-9523-4.

Resume

L. Van Crowder

**Executive Director, Office of International Research, Education and Development (OIRE)
Professor, Department of Agricultural, Leadership, and Community Education**

Virginia Polytechnic Institute and State University, Blacksburg, VA

Phone: 540-231-9665; Email: vcrowder@vt.edu

Education:

B.S., Cornell, 1974; M.S., Communication Arts, Cornell

Ph.D., Adult and Continuing Education, Cornell.

Experience Summary: As Executive Director of the Office of International Research, Education and Development, Van Crowder oversees the university unit that manages large, donor-funded projects around the world. Currently, this represents a portfolio of approximately \$60 million. Dr. Crowder has more than 30 years of experience with international development projects. The many facets of his career include helping farmers in Nicaragua improve food security, managing a watershed project in Jamaica, evaluating education programs at a university in Yemen, and establishing a farmer advisory service in Uganda. His consultant work includes assignments in numerous countries across Latin America, Africa, Asia and the Middle East.

Professional Experience:

Senior Director, Human and Community Development (HCD), Millennium Challenge Corporation (MCC, U.S. State Department), 2008-2015. Responsible for \$800 million education, health and community development project portfolio in 12 countries.

Senior Advisor, Extension and Rural Knowledge Systems, Sustainable Development Department, Food and Agriculture Organization of the United Nations (FAO), Rome, Italy, 2007-2008.

Country Representative in Nicaragua for the Food and Agriculture Organization of the United Nations (FAO), 2002-2006.

Senior Officer, Communication for Development, Sustainable Development Department, Food and Agriculture Organization of the United Nations, Rome, Italy, 1993- 2002.

Knowledge/Technology Generation & Dissemination Advisor, Organization of American States (OAS)/Inter-American Institute for Cooperation on Agriculture (IICA), Jamaica, 1992-1993.

Associate Director, International Programs and Associate Professor (tenure), Institute for Food and Agricultural Sciences (IFAS), University of Florida, Gainesville, FL, 1981-1991.

Assistant Research Scientist (Extension Training/Communication), UF/USAID Project, Bolivia, 1978-1980.

Selected Publications:

L. Van Crowder. Public and Private Sector Extension in Agricultural Development. Agriculture and Human Values, Fall, 1988.

L. Van Crowder. Agents, Vendors and Farmers: Technology Development and Transfer in Ecuador. Agricultural Administration and Extension, Vol. 30, No. 3, 1988.

L. Van Crowder. Extension for Profit: Agents and Sharecropping in the Highlands of Ecuador. Human Organization, The Journal of Applied Anthropology, Vol. 50. No.], 1991.

T. Kumuk and L. Van Crowder. 'Harmonizing' T&V Extension: Some Experiences from Turkey. Journal of Extension Systems, Vol. 12, December 1996.

L. Van Crowder and J. Anderson. Linking Research, Extension and Education: why is the problem so persistent and pervasive? European Journal of Agricultural Education and Extension Vol. 3 No.4 1997.

L. Van Crowder. Training for Agriculture and Rural Development (Ed.). FAO Economic and Social Development Series. No. 55, Rome 1998.

L. Van Crowder, W.I. Lindley. T.H. Bruening & N. Doron. Education for Sustainable Rural Development: Challenges for Developing Countries in the 21st Century. The Journal of Agricultural Education and Extension, Vol. 5, No.2,] 998.

L. Van Crowder. Women in Higher Agricultural Education and Employment Opportunities. In Graduate Prospects in a Changing Society (A. Ronning and M. Kearney, Eds), UNESCO Publishing, Paris, 1998.

Jon Anderson and L. Van Crowder. The Present and Future of Public Sector Extension in Africa: Contracting-out or Contracting-in? Public Administration and Development, 20, 2000.

L. Van Crowder and J. Anderson. Contrasting Approaches for Extension Services in Mozambique. In Agricultural Extension Systems: An International Perspective (F. I. Brewer, Ed), Erudition Books, 2001.

L. Van Crowder and J. Anderson. Uganda: Private Sector Secondment of Government Extension Agents. In Contracting for Agricultural Extension: International Case Studies and Emerging Practices (W. Rivera & W. Zijp, Eds), CABI Publishing, 2002.

L. Van Crowder, R. Johanson, M. Shafiq. Tertiary Education in Developing Countries — Issues and Challenges. MCC Policy Paper, January 2011

Ramiro Ortiz and L. Van Crowder. Evolución de los Servicios de Extensión, FAO-Nicaragua, 2006 (final publication FAO-Rome, 2009).

L. Van Crowder, et al. Technical and Vocational Education and Training: Key Nexus for Corporate Partnership. Knowledge & Innovation Network (KIN), Journal of the Millennium Challenge Corporation (MCC) Technical Staff, Washington, DC, 2015.

A. J. (Jack) Davis, FAIA LEED AP

Dean and Professor

Reynolds Metals Endowed Chair in Architecture

EDUCATION

M.Arch Virginia Polytechnic Institute and State University 1975

B.Arch Virginia Polytechnic Institute and State University 1974

ACADEMIC APPOINTMENTS

2007 – Present Dean, College of Architecture and Urban Studies
2006 Interim Dean, College of Architecture and Urban Studies
2002 – 2007 Associate Dean for Academic Affairs;
Overseeing curriculum for 23 degrees, international programs
and Chair of Curriculum, Diversity and Honorifics Committees
1995 – 2006 Continuing Education Coordinator for School of Architecture + Design
1994 – 2001 Chairman, Professional Program; involves comprehensive education of 3rd, 4th
and 5th year architecture students; Approximately 350 students and 24 faculty
1985 – 1998 Director of Professional Extern Program, involves student placement in offices
and other universities, nationally and internationally
1984 Associate Professor, College of Architecture & Urban Studies, Virginia Tech
1983 Visiting Professor, College of Architecture & Urban Studies, Virginia Tech
1979 – 1980 Design Studio Instructor, Boston Architectural Center, Boston, MA
1975 – 1979 Assistant Professor, College of Architecture, University of Florida, Gainesville,
Fla.
1975 Appointment to Graduate Faculty, University of Florida
1974 Graduate Teaching Assistant in the Professional Program, College of
Architecture and Urban Studies, Va. Tech

RESEARCH, SCHOLARLY, AND CREATIVE ACHIEVEMENTS

Selected Research Grants and Activities

1994 Co-Principal Investigator, *A Proposal for the Development of Technology Courses at the Graduate and Undergraduate Level in Architecture*, Summer 1994 (Center for Excellence in Undergraduate Teaching, \$5,000)
1992–93 Co-Investigator, *Comparative Evaluation of Displacement Ventilation and Conventional VAV Systems for Indoor Air Quality Control*, (Philip Morris, Inc.: \$299,317.00.)
1991 Co-Investigator, *Research + Demonstration Facility Phase II*, This 4400 square foot Phase II is for an indoor air quality research laboratory and cold air distribution mechanical system. (Philip Morris, Inc. \$634,907.00.)
Co-Investigator, *Technology Development for Removal of Indoor Air Pollutants*, (Union Carbide Chemical and Plastic Company \$365,329.00.)
Principal Investigator, *Research Data Access and Dissemination* (Core Research Grant. \$4127.00.)
1990 Principal Investigator, *Concrete Masonry Investigative Tour*, Sponsored Programs/CAUS Special Travel Grant to Central Europe, \$3600.00.
Principal Investigator, *Research Analysis and Dissemination in Concrete Masonry Construction* (Core Research Grant, \$4500.00.)
1989 Principal Investigator, *Data Acquisition and Analysis in Concrete Masonry Construction, Part II*, (Core Research Grant, \$3047.00.)
1988 Principal Investigator, *Data Acquisition and Analysis in Concrete Masonry Construction, Part I*, (Core Research Grant, \$5000.00.)

Total Grant Involvement Dollars to date: \$2,535,627 (not including \$24,000 in grant funding to the Town of Blacksburg listed in Public Service)

SELECTED PUBLICATIONS

- 2014 [Interview](#) with Amelia Taylor-Hochberg; Archinect online magazine.
- 2008 Ali, Ahmed, Davis, A.J.; *A Threshold, or ataba, is a Challenging Design Opportunity*. MAGAZ DESIGN, Issue 104 October 2008.
- 2005 Davis, A. J., *Making Choices; Evaluating Qualities of a Design Education*, Design Intelligence, Vol. 11, No. 11, November 2005, pp. 13, 15
- 2004 Davis, A. J., Knox, P., *Urban Vitality through the CittaSlow Charter Movement*, Life in the Urban Landscape Conference, Gothenburg, Sweden.
- 2001 Davis, A. J., ARCC National Meeting Proceedings, [The Building of Research](#), A Center for the Study of Educational Facilities,
- 1997 Davis, A. J., ACSA International Conference 1997 Proceedings, *The Exportation of Dutch Social Housing; Herman Hertzberger in the Internationale Bauausstellung, Berlin*.
- 1995 Davis, A. J., O'Brien, M., 83rd ACSA Annual Meeting 1995 Proceedings, *The Re-Presentation of Designed Technical Courses*, p439 - 444.
- 1995 Galloway, W., Davis, A. J., *Contemporary Themes in Architectural Research*, Architecture Research Centers Consortium Proceedings, Howard University, P. 2-7, Spring 1994.
- 1993 Davis, A. J., **Energy Efficient Houses**, Fine Homebuilding Great Houses Series, *On The Mountainside*, p 16-22, Taunton Press; Newtown, Connecticut, 1993.
- Davis, A. J., Galloway, W., ACSA European Conference 1992 Proceedings, *The Place of Research in Architectural Education*, p 188-192.

MEMBERSHIP

- 2013–14 National Academy of Environmental Design, Board member
- 2012 – present Member, AIA Large Firm Roundtable
- 2010–13 National Academy of Environmental Design, Sponsoring member
- 2010–2016 Board of Directors and Vice President CIB (International Council for Research and Innovation in Building and Construction)
- 2009–11 Founding President; Architecture + Construction Alliance (A+CA)
- 2007 LEED Accredited Professional
- 1999 – present Elected to the College of Fellows, American Institute of Architects
- 1993 – present National Trust for Historic Preservation
- 1985 – present American Institute of Architects, National, Virginia and Blue Ridge Chapters
- 1994 University Affairs Committee, Virginia Society A.I.A.
Architects in Education; A.I.A. sub-committee
- 1986–88 Chairman; Energy Committee, Virginia Society A.I.A.
Coordinated the first "ENERGY + DESIGN AWARDS" Program with a Nationally recognized Jury
Coordinated presentations for "Building Virginia" in 1987 and 1988

REGISTRATION

- 1988 – present Registered Architect; State of Virginia
- 1986 National Council of Architectural Registration Board Certification Present (NCARB)
- 1982 – present Registered Architect; State of Florida

SELECTED PROFESSIONAL AWARDS AND RECOGNITION

- 2013 Senior Fellow, Design Futures Council
- 2009, 2014 Most Admired Educators of 2009 and 2014 by *DesignIntelligence*
- 1999 Elected to the College of Fellows, American Institute of Architects
Blue Ridge Chapter, Virginia American Institute of Architects, Merit Award;
Shepherd Residence
- 1998 Appointed Reynolds Metals Endowed Professorship, College of Architecture and Urban Studies, Va. Tech

Robert Dunay, FAIA

Director, Center for Design Research
ACSA Distinguished Professor, T.A. Carter Professor of Architecture

Professional Preparation

Virginia Tech Architecture B.Arch 1971
Virginia Tech Architecture M.Arch. 1978

Appointments

Director, Center, Design Research Virginia Tech, College of Architecture 2009 - present
Director, Industrial Design Virginia Tech, College of Architecture 1998 - 2008
Associate Dean Virginia Tech, College of Architecture 1993 - 2004
T. A. Carter Endowed Professor Virginia Tech, College of Architecture 1998 - present
Professor Virginia Tech, College of Architecture 1992 - present
Associate Professor Virginia Tech, College of Architecture 1975 – 1992

Honors and Awards (past 10 years)

- 2106 *The Noland Medal*, highest honor bestowed by the American Institute of Architecture Virginia to an architect (one awarded yearly)
- 2013 Named “Most Admired Educator of 2013” by Design Intelligence, (25 chosen nationally)
- 2012 *American Institute of Architects, National Institute Award for Excellence in Architecture*, Washington D.C., LumenHAUS cited as one of the nation’s nine best works of architecture, Jan, (with J. Wheeler, R. Schubert, D. Clark)
- 2012 Named “Most Admired Educator of 2012” by Design Intelligence, (25 chosen nationally)
- 2011 ACSA Distinguished Professor, one of four nationally (Association of Collegiate Schools of Architecture)
- 2011 Named “Most Admired Educator of 2011” by Design Intelligence, (26 chosen nationally)
- 2011 Creative Partnership Award of Excellence, CASE; Council for the Advancement of Scholarship and Education
- 2010 First Prize, Solar Decathlon Europe, Primary Faculty
- 2010 NCARB Prize, National Council of Architectural Registration Boards; one of six nationally recognized projects for integration of academia and practice
- 2010 American Institute of Architects Research Prize, Virginia Society
- 2010 X-caliber Award, Virginia Tech University Award for Outreach Excellence
- 2010 American Institute of Architects, Blue Ridge AIA Design Honor Award – LUMENHAUS
- 2009 Named “Most Admired Educator of 2009” by Design Intelligence (26 chosen nationally)
- 2009 Braun Prize Forum, invited forum juror to select 2009 Braun Prize winners, Braun/P&G Headquarters, Kronberg, Germany
- 2008 College of Architecture Award for Outreach Excellence
- 2007 American Institute of Architects Design Award for Excellence in Architecture, Virginia Society, Meditation Room, abc TV show Extreme/Makeover Home Edition
- 2006 American Institute of Architects Design Award for Excellence in Architecture, Virginia Society, Virginia Tech Solar House (with J. Wheeler and R. Schubert)
- 2006 NCARB Prize, National Council of Architectural Registration Boards, Honorable Mention, award for integration of academia and practice (with J. Wheeler and R. Schubert)
- 2006 State AIA Honor Award for Excellence in Architecture, Virginia Society AIA
- 2005 AIA President’s Award for Best Solar House, chosen from 20 research universities of the Solar Decathlon Competition
- 2005 International Contemporary Furniture Fair (ICFF), Jacob Javits Convention Center, New York City, one of six school selected nationally to exhibit work
- 2003 NCARB Prize, National Council of Architectural Registration Boards; one of six nationally recognized projects for integration of academia and practice, \$7500 (with R. Schubert and Solar Decathlon Team)
- 2003 “Editors’ Award for Best Design School,” International Contemporary Furniture Fair (ICFF), Jacob Javits Convention Center, New York City
- 2003 International Design Magazine Award, “Best Conceptual Project” (with R. Schubert and Solar

- Decathlon Team)
- 2003 XCalibur Award, Virginia Tech, university award program recognizing outstanding contributions to learning, illustrating innovative approaches to teaching using technology
- 2003 Outstanding Creative Achievement Award, Virginia Tech, College of Architecture

Publications

1. Dunay, R, Wheeler, J, Schubert, R, High Performance Buildings, "The Eclipsis Sun Control System," Franca Trubiano, editor, Solar Technology, Innovative Materials and Integrated Practice, Routledge Publishing, UK, book chapter, 2011
2. Dunay, R, Wheeler, J, Schubert, Nano House, "LUMENHAUS and the Eclipsis System Sun Control Screen," Phyllis Richardson, editor, "LUMENHAUS," Thames and Hudson Inc, UK, Oct 2011, book chapter, 2011 Page 58
3. Dunay, R, Wheeler, J, Schubert, R, Clark, D, Inter_Change: Design Education of Architecture and Urbanism, Department of Architecture, Faculty of Engineering, Kyushu University, pp42-49, Mar, 2011
4. Dunay, R, Wheeler, J, Schubert, R, Clark, D, Journal of Asian Urbanism No.5, "Design Research," International Society of Habitat Engineering, pp34-37, Sept 2011
5. Wheeler, J, Dunay, R, Schubert, R, 2A Architecture & Art, "LUMENHAUS – Quality of Life and Energy Awareness Integrated through Architecture," 2A Magazine, NO. 14, Dubai, UAE, Summer 2011

Related Publications

- Dunay, R., Schubert, R., Wheeler, J. "No Compromise: The Integration of Technology and Aesthetics." Journal of Architectural Education, 1:1, 60, no. 2, pp. 8–17, Nov 2006
- Dunay, R., Schubert, R., Wheeler, J. ConnectED 2007, "Technology and Poetics: Educational Collaboration." International Conference on Design Education, Sydney, Australia, 2007
- Dunay, R., Wheeler, J, Schubert, R., Connecting'07, "The Art of Integration," International Council of Society of Industrial Designers (Icsid) and Industrial Designers Society of America (IDSA) International/National Convention, conference proceedings, San Francisco, CA (with J. Wheeler, R. Schubert), 2007
- Dunay, R, Wheeler, J, "No Compromise: The Integration of the Technical and the Aesthetic." National Conference and Education Symposium, Industrial Designers Society of America, Austin, TX. (2006)
- Wheeler, J., Dunay, R., Schubert, R. "The 2005 Virginia Tech Solar House." Architecture Exchange East, VSAIA, Richmond, VA. (2005)

Synergistic Activities

- 2016 Prince William County, Eco-Park Learning Center, concept and design development, \$100,000, with Jonathan King, David Clark
- 2011 Solar Decathlon Europe, \$140,000, LUMENHAUS, winner of Solar Decathlon Europe, Primary Faculty
- 2011 AIA National Convention, Regional Design Revolution, Ecology Matters, New Orleans, LA, 2010
- 2008 Sharma, A, Dunay, R, Mills, J, Interdisciplinary Research Grant (IRG), formation of an interdisciplinary team to further research on autonomous electric vehicle, \$28,000
- 2007 ConocoPhillips research grant, Solar Decathlon Competition, \$350,000
- 2007 Sharma, A, Dunay, R, Institute for Critical Technology Advancement in Science (ICTAS), prospectus for the design of an autonomous electric vehicle, \$46,000
- 2007 Department of Energy research grant, Solar Decathlon Competition, \$100,000, Primary Faculty
- 2007 Consultant, GA. Tech Solar Decathlon Team, Atlanta, Georgia
- 2005 Extreme Makeover/Home Edition, design and construction of a house for the abc TV show designed in one week and built in four days. The two-hour show aired on national television in Jan 2006.
- 2005 Department of Energy Solar Decathlon Competition - primary faculty for the Virginia Tech entry to the national competition, \$5,000 + 180,000, Primary Faculty
- 2002 Department of Energy Solar Decathlon Competition - primary faculty for the Virginia Tech entry to the national competition, \$5,000 + 120,000, Primary Faculty Collaborators David Clark (Va Tech), Michael Ellis (Va Tech), D. Gracanin (Va Tech), Jonathan Grinham (Catholic University), M.

Graduate and Postdoctoral Advisors

Thesis Advisor and Postgraduate-Scholar Sponsor
Total number of students advised: 68

BIOGRAPHICAL SKETCH—STEPHEN EUBANK

Deputy Director, Network Dynamics and Simulation Science Laboratory, Biocomplexity Institute of Virginia Tech, Virginia Polytechnic Institute and State University, Blacksburg, VA 24060, tel: (540) 231-2504, Email: eubank@vbi.vt.edu

A. PROFESSIONAL PREPARATION:

Swarthmore College	Swarthmore, PA	Physics	B.A Honors	1979
University of Texas at Austin	Austin, TX	Physics	Ph.D	1986
La Jolla Institute	San Diego, CA	Fluid Dynamics	Postdoctoral	1987
Los Alamos National Laboratory	Los Alamos, NM	Nonlinear Dynamics		1988-91

B. APPOINTMENTS:

2014-present	Professor, Department of Population Health Sciences, Virginia Tech
2008-present	Nonresident Senior Fellow at The Brookings Institution Center on Social and Economic Dynamics
2005-present	Deputy Director, Network Dynamics and Simulation Science Lab, Biocomplexity Institute of Virginia Tech (formerly Virginia Bioinformatics Institute), Virginia Tech
2005-present	Adjunct Professor of Physics, Virginia Tech
1997-2004	Staff member, Basic & Applied Simulation Sciences Group, LANL, Los Alamos, NM
1995-1997	Invited Researcher, Interpreting Telecommunication Laboratory, ATR, Kyoto, Japan
1994-95	Complex Systems Associate (half time), Biosphere Space Ventures, Tucson, AZ ^[SEP]
1994-95	Contractor, TRANSIMS project, LANL, Los Alamos, NM ^[SEP]
1991-1994	Co-founder, Prediction Company, Santa Fe, NM

C. PRODUCTS:

(i) Products Most Closely Related to the Proposed Project.

1. Eubank S, Guclu H, Kumar VS, Marathe MV, Srinivasan A, Toroczka Z, Wang N. Modelling disease outbreaks in realistic urban social networks. *Nature*. 2004 May 13;429(6988):180-4.
2. Halloran ME, Ferguson NM, Eubank S, Longini IM Jr, Cummings DA, Lewis B, Xu S, Fraser C, Vulliamy A, Germann TC, Wagener D, Beckman R, Kadou K, Barrett C, Macken CA, Burke DS, Cooley P. Modeling targeted layered containment of an influenza pandemic in the United States. *Proc Natl Acad Sci U S A*. 2008 Mar 25;105(12):4639-44.
3. Alexander KA, Lewis BL, Marathe M, Eubank S, Blackburn JK. Modeling of wildlife-associated zoonoses: applications and caveats. *Vector Borne Zoonotic Dis*. 2012 Dec;12(12):1005-18.
4. Rivers C, Lum K, Lewis B, Eubank S. Estimating Human Cases of Avian Influenza A(H7N9) from Poultry Exposure. *PLoS Curr*. 2013 May 15;
5. Parikh N, Youssef M, Swarup S, Eubank S. Modeling the effect of transient populations on epidemics in Washington DC. *Sci Rep*. 2013 Nov 6;3:3152.

(ii) Other Significant Products.

1. Eubank S, Barrett C, Beckman R, Bisset K, Durbeck L, Kuhlman C, Lewis B, Marathe A, Marathe M, Stretz P. Detail in network models of epidemiology: are we there yet?. *J Biol Dyn*. 2010 Sep;4(5):446-55.
2. Taylor C, Marathe A, Beckman R. Same influenza vaccination strategies but different outcomes across US cities?. *Int J Infect Dis*. 2010 Sep;14(9):e792-5.
3. Huang SS, Avery TR, Song Y, Elkins KR, Nguyen CC, Nutter SK, Nafday AA, Condon CJ, Chang MT, Chrest D, Boos J, Bobashev G, Wheaton W, Frank SA, Platt R, Lipsitch M, Bush RM, Eubank S,

Burke DS, Lee BY. Quantifying interhospital patient sharing as a mechanism for infectious disease spread. *Infect Control Hosp Epidemiol*. 2010 Nov;31(11):1160-9.

4. Marathe A, Lewis B, Chen J, Eubank S. Sensitivity of household transmission to household contact structure and size. *PLoS One*. 2011;6(8):e22461.
5. Marathe A, Lewis B, Barrett C, Chen J, Marathe M, Eubank S, Ma Y. Comparing effectiveness of top-down and bottom-up strategies in containing influenza. *PLoS One*. 2011;6(9):e25149.

D. SYNERGISTIC ACTIVITIES:

1. *Computational modeling of infectious disease epidemiology*. Over the past decade and a half, as a PI for the NIH-NIGMS MIDAS project, I have advocated for bringing modern computational modeling to infectious disease epidemiology and, taking advantage of the power of these models, to incorporate more information about behavior at the individual level. I have applied mathematical and computational models of infectious disease to support decisions about health: smallpox for the White House Office of Homeland Security; influenza for DHHS and DoD; other diseases for DoD and IARPA.
2. *Bringing insights from computer science, physics, engineering and math to complex network science*. Over the past four years, I have extended the theory and applications of the concept of network reliability introduced by Moore and Shannon, integrated it with insights from computational complexity theory and critical phenomena in physics, and applied it to networked dynamical systems. These methods provide a powerful framework for understanding how the structure of complex networks affects dynamical processes taking place on those networks.
3. *Immune system modeling*. I led development of the ENISI immune system simulation. This high-performance computing enabled, agent-based simulation of interactions among spatially distributed epithelial cells, T-cells, macrophages, and bacteria, including the concentrations of intercellular cytokines and chemotaxis set a benchmark for immune system modeling. It transformed the way we think about modeling such systems and the ways modelers contribute to transdisciplinary approaches to immunology.
4. *TRANSIMS*. As a staff member at Los Alamos, I collaborated with the team building the Transportation Analysis and Simulation System. This early, high-performance computing- enabled, agent-based simulation of an actual, not idealized, large-scale engineered system set a benchmark for the field of modeling coupled social / technical systems. It completely transformed the way we think about modeling such systems and the kinds of scientific evidence transportation planners can expect from models. My role in this project was to help design the overall system and to implement specific capabilities in the traffic simulator.
5. *Time series prediction in nonlinear and chaotic dynamical systems*. Novel methods to identify chaos in experimental data and to make use of deterministic chaos to improve noise reduction and time series prediction. A paper with Theiler on the method of surrogate data has received over 3000 citations, according to Google Scholar.

GEORGE E. GLASSON

Professor, School of Education
Virginia Polytechnic Institute & State University (Virginia Tech)
370 Drillfield Drive, 203 War Memorial Hall
Blacksburg, VA 24061
Voice: 540-231-8346; Fax: 540-231-9075, E-mail: glassong@vt.edu

Professional Preparation

University of North Carolina-Chapel Hill, Curriculum & Instruction (Science Education), Ph.D., 1986
Duke University, Science Education, M.A.T., 1975
Duke University, Zoology, BA, 1973

Appointments

Virginia Tech, School of Education, Blacksburg, VA
Professor of Science Education, 1987 - present
Indiana University-Bloomington, Department of Curriculum & Instruction
Visiting Assistant Professor of Science and Environmental Education, 1986-87
Guy B. Phillips Junior High School, Chapel Hill, NC
Teacher (Life Science, Oceanography, Physical Science), 1977-1986
Hillside High School/Durham High School, Durham, NC
Teacher (Biology, Physics), 1974-76

Closely Related Publications

Glasson, G.E. (2016). Place-based STEM Education. Innovate: Innovation for Agricultural Training and Innovation. Office of International Research, Education, and Development, Virginia Tech.
<http://www.oired.vt.edu/innovate/resources/publications/good-practices/>
Glasson, G.E. (2011). Eco-justice and Place-based Education in Africa: Connecting Indigenous Knowledge with Western Science. In D. Berlin and A. White (Eds.), *International Innovations, Research, and Practices*, (pp. 55-65). Columbus, OH: Thirteenth International Consortium for Research in Science and Mathematics Education.
Glasson, G.E., Mhango, N., Phiri, A., & Lanier, M. (2010). Sustainability science education in Africa: Negotiating indigenous ways of living with nature in the third space. *International Journal of Science Education*, 32(1), 125-14.
Glasson, G.E. (2010). Developing a sustainable agricultural curriculum in Malawi: Reconciling a colonial legacy with indigenous knowledge and practices. In D. Tippins, M. Mueller, M. van Eijck, & J. Adams (Eds.), *Cultural Studies and Environmentalism: The Confluence of EcoJustice, Place-based (Science) Education, and Indigenous Knowledge System* (pp. 151-164). New York, NY: Springer Publishing Co.
Glasson, G.E., Frykholm, J., Mhango, N., & Phiri, A. (2006). Understanding the Earth Systems of Malawi: Ecological Sustainability, Culture, and Place-based Education. *Science Education* 90(4), 660-680.
Frykholm, J. Vierling, L., & Glasson, G.E. (2006). Learning mathematics and earth system science...via satellite. *Journal of Geoscience Education*. 54(3), pp. 262-271.

Other Related Publications

Shin, M., Lee, S., & Glasson, G.E. (2016). Characterizing scientific inquiry found in science core high schools (SCHS) in Republic of Korea. *Journal of Science Education*, 17(1), 4-7.
Shin, M. & Glasson, G.E. (2016). Probing Changes in Korean Teachers after Participating in a Research Internship in University Research Labs. *School Science Review*, 97(360), 55-65.
Glasson, G.E. (2015). Ponder this: Can ecojustice education go mainstream? In M. Mueller, and D. Tippins Ecojustice, citizen science and youth activism: Situated tensions for science education. (pp. 171-176). New York, NY: Springer Publishing Co.
Glasson, G.E. (2013). Is there an App for that? Connecting Local Knowledge with Scientific Knowledge. In M. Mueller, D. Tippins, A. Stewart, (Eds.) *Assessing Schools for Generation R (Responsibility): A Conversation to Guide Legislation and School Policy*. New York, NY: Springer Publishing Co.
Glasson, G.E. (2011). Global environmental crisis: Is there a connection with place-based ecosociocultural education in rural Spain? *Cultural Studies of Science Education*, 6(2), 327-355.
Klechaya, R. & Glasson, G.E. (2011). Active Engagement of Teachers and Children in Inquiry Science Teaching and Project-based Learning in Thailand. In D. Berlin and A. White (Eds.), *International Innovations*,

- Research, and Practices.* (pp. 187-194). Columbus, OH: Thirteenth International Consortium for Research in Science and Mathematics Education.
- Glasson, G.E. (2010). Revitalization of the shared commons: education for sustainability and marginalized cultures. *Cultural Studies of Science Education*, 5(2), 373-38.
- Brand, B.R., Glasson, G.E., & Green, A.M. (2006). Sociocultural issues influencing students' learning in science and mathematics: An analysis of the perspectives of African American students. *School Science and Mathematics*, 106(5), pp. 228-236.
- Brand, B. R. & Glasson, G.E. (2004). Crossing cultural borders into science teaching: Early life experiences, racial and ethnic identities, and beliefs about diversity. *Journal of Research in Science Teaching*, 41(2)119-141.

Synergistic Activities

- Subatomic Physics in Virtual Reality Project. Institute for Creativity, Arts, and Technology, Virginia Tech, (Co-PI, 2016-2017).
- Malawi STEM Education Workshop: Development of a Certificate Program for Secondary School Agriculture and Science Teachers, Office of International Research, Education and Development/Project Innovate, United States Agency of International Development (PI, 2015).
- The Virginia Tech PhysTEC Project, grant from the The Physics Teacher Education Coalition and National Science Foundation to help increase the number of secondary school physics teachers (Co-PI, 2011-2014)
- Active Engagement of Teachers and Children in Inquiry Science Teaching and Place-based Education in Thailand. (PI, 2010)
- Mobile Malawi Project (www.mmp.soc.vt.edu). Developed sustainable agricultural curriculum program connecting local farmers with primary schools via mobile phones, (PI, 2007-2010).
- Curriculum Development and Outreach Consultant for Nanoscale Processes in the Environment (Nano2Earth), NanoGeoscience and Technology Laboratory, funded by NSF (2002-2008).
- Earth Systems Connections Project: Co-developed integrated mathematics, science, and technology curriculum, funded by NASA, (Co-PI, 2000-2005).

Collaborators

Leo Piilonen, Physics, Virginia Tech
 John Simonetti, Physics, Virginia Tech
 Brenda Brand, Science Education, Virginia Tech
 Josiah Tlou, Social Studies Education, Virginia Tech (retired)
 Rojjana Klechaya, Science Education, Srinakharinwirot University, Thailand
 Myeong-kyeong Shin, Science Education, Gyeongin National University of Education
 Michael Hochella, Geoscience, Virginia Tech
 Ndalapa Mhango, Social Studies Education and Distance Learning, Domasi College, Malawi
 Andre Green, Science Education, University of South Alabama
 Lee Vierling, Geoscience, University of Idaho

Doctoral Students Chaired

Hey, Mae (Ph.D. 2017, Virginia Tech)
 Sulsberger, Megan (Ph.D., 2014, Univ. California State Univ.-Monterey Bay)
 Shelton, Mythianne (Ph.D. 2014, Radford University)
 Lanier, Marilyn (Ph.D., 2012, Fayetteville State University, NC)
 Phiri, Absalom (Ph.D., 2008, Malawi Ministry of Education, deceased)
 Mhango, Ndalapa (Ph.D., May 2008, Domasi College, Malawi)
 Grady, Julie, (Ph.D., May 2007, Arkansas State University
 Green, Andre' (Ph.D., 2006, University of South Alabama)
 McLaughlin, John (Ph.D., 2006. Lord Botetourt High School, VA)
 Grosshans, Kurt (Ed.D., May 2006, Christiansburg High School, VA)
 Casey, Dennis (Ph.D., 2001, Virginia Museum of Natural History, Martinsville, VA)
 Brand, Brenda (Ph.D., 1998, Virginia Tech University)
 McKenzie, Woodrow (Ph.D., 1996, Lynchburg College, retired)
 Taylor, B. (Ph.D., 1994, retired)

NATHAN KING
nathanking.king@gmail.com

EDUCATION

Harvard University Graduate School of Design, Cambridge, MA

Doctor of Design: 2015

Thesis: *A Framework for Understanding Automated Additive Manufacturing and Construction (AAMC) of Buildings*

Virginia Tech School of Architecture + Design, Blacksburg, VA

Master of Architecture, 2012

Thesis: *Implementation of Manufactured Components in User Assembled, Pre-Fabricated Building Systems*

Master of Science in Architecture: Industrial Design Concentration, 2012

Thesis: *Deployable Infrastructural Support for Science and Education.*

Randolph-Macon College, Ashland, VA

Bachelor of Arts in Studio Art, cum laude, with Honors, 2002

Thesis Exhibition: *A Time in Place: Large Format In-Situ Painting, Pace Gallery*

Bachelor of Arts in Art History, cum laude, with Honors, 2002

Thesis: *Black Mountain College: Art as the Foundation for Education.*

BOOK PUBLICATIONS

- M. Bechthold, a. Kane and N.King “Ceramic Material Systems in Architecture and Interior Design” Birkhauser, De Gruyter Berlin, November 2015
- M. Bechthold, N.King and A. Kane “Keramische Bausysteme in Architektur und Innenarchitektur” Birkhauser, De Gruyter Berlin, September 2015.
- N. King. and M. Shaffer “*The Machine Book- a Mechanical Extension, Exploration, and Empowerment in the Architectural Frontier*”, ACTAR, forthcoming 2016
- Chuck Hoberman and Nathan King “Transformable Design Methods” Harvard University Press – Expected Spring 2018.

SELECTED CONFERENCE AND JOURNAL PUBLICATIONS

- N. King, N.Melenbrink, N.Cote, and G. Fagerstrom. “BUILD-ing the Lo-Fab Pavilion: Dynamo-driven collaborative robotic fabrication workflows for the construction of spatial structures” in Proceedings of the 3rd International Conference on Robots in Architecture, Art, and Design (RobArch), expected-May 2016
- N. Melenbrink and N. King “Full-dome Interfacing: A Real-time Immersive Environment as a Design Tool” in Proceedings of the 20th Annual Conference on Computer-Aided Computational Design in Asia (CAADRIA), Daegu, Republic of Korea, May 2015.
- N. King, R. Vroman, K. King, and O. Mesa “Innovating Ceramics: Technology, Collaboration, and Pedagogy” in The Journal National Council on Education in the Ceramic Arts (NCECA), NCECA 2015
- N. King, J. Grinham, D. Saladik, M. Murphy, and A. Ricks “Crafting Eclipsis: Integrated Computational Design and Automation Through Programmed Craft-Based Fabrication in the Developing World” in Proceedings of the 2014 International ACSA Conference, Seoul Korea, June 2014

NATHAN KING

nathanking.king@gmail.com

- N. King, S. Pender, J. Grinham, R. Vroman, and D Clark “ Beyond Digital Steroids: a Pedagogical Approach to Foundation Design Through Design Robotics” in Proceedings of the 2014 International ACSA Conference, Seoul Korea, June 2014
- N. King. M. Bechthold, A.Kane, P. Michalatos, “ *Robotic Tile Placement: Tools Techniques and Feasibility*” , in Journal of Automation in Construction.
- N.King, M. Bechthold, and A. Kane “Modular Automation Strategies for Robotic Fabrication” in *Fabricating the Future* by Philip F. Yuan and Neil Leach, Tongji University Press, 2012
- M. Bechthold and N. King “*Design Robotics: A Strategic Research Approach*”, Proceedings of the 2012 Robot In Architecture, Art, and Design Conference; Vienna, Austria, 2012* (*Conference December 2012)
- N. King. and J. Grinham “*Automating Eclipsis: Robotic Fabrication of Optimized Metal Façade Components*”, Proceedings of the 2012 Robot In Architecture, Art, and Design Conference; Vienna, Austria, 2012* (*Conference December 2012)
- S. Andreani. J.L Garcia del Castillo, A. Jyoti, N. King, and M. Bechthold, “*Flowing Matter: Robotic Fabrication of Tectonic Ceramic Systems*”, Project Presentation, Acadia Conference, San Francisco California, October 2012
- N. King. M. Bechthold, A.Kane, P. Michalatos, “ *Robotic Tile Placement: Tools Techniques and Feasibility*” , Proceedings of the 29th International Symposium on Automation and Robotics in Construction, Eindhoven Netherlands, 2012* (*Conference June 2012)
- S. Andreani. J.L Garcia del Castillo, A. Jyoti, N. King, and M. Bechthold, “*Flowing Matter: Robotic Fabrication of Tectonic Ceramic Systems*” , Proceedings of the 29th International Symposium on Automation and Robotics in Construction, Eindhoven Netherlands, 2012

AWARDS

- 2015 **Excellence in Scholarship Award**, Virginia Tech, School of Architecture + Design
- 2015 **Innovator in Practice Fellowship**, University of Virginia (UVA)
- 2015 **Class Favorites: Best Projects of 2015**, (w/MASS Design- CTC)
- 2015 **10 Best Buildings of 2015**, Azure Magazine, (w/MASS Design- CTC)
- 2015 **Sappi Ideas That Matter**, Winner, (w/MASS Design- CTC)
- 2015 **Design Boston Biennial**, Winner, (w/MASS Design- CTC)

GRANTS | FUNDING

- 2017 **Autodesk BUILD Space grant Digital Glass**; Sponsored Research, (\$40K)
- 2016 **Aging in Place, Autodesk w/ GE Appliances**, Sponsored Research, (\$15K)
- 2016 **Autodesk Foundation Impact Design Grant-**, Virginia Tech, Center for Design Research; (\$100K/y)
- 2016 **Institutional Renovation Grant**, Virginia Tech; with R.Dunay and D.Clark (\$140K)
- 2016 **Glass Infrastructure Development Funding**, Virginia Tech, (\$120K)
- 2016 **Log Jam! Autodesk for SmartGeometry2016**; with G.Fagerstrom and N.Cote (\$5K)
- 2016 **Dynamo BUILD! RobArch2016**; w/G.Fagerstrom M.Jezyk, and N.Cote (\$5K)
- 2016 **Sponsored studio; Prince William County EcoPark**; with R.Dunay and D.Clark (\$53K)

Leigh-Anne Krometis, Ph.D., E.I.T.
Assistant Professor
Department of Biological Systems Engineering
Virginia Tech
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krometis@vt.edu](http://ww2.bse.vt.edu/krometis/krometis@vt.edu)

(a) Professional Preparation

Virginia Tech	Blacksburg, VA	Biological Systems Engineering	B.S. 2002
Virginia Tech	Blacksburg, VA	Biological Systems Engineering	M.S. 2004
U. of North Carolina	Chapel Hill, NC	Environmental Sci. & Eng.	PhD 2009

(b) Appointments

2011-Present	Biological Systems Engineering, Virginia Tech	Assistant Professor
2009-2011	Biological Systems Engineering, Virginia Tech	Research Assistant Professor
2009	Environmental Science & Eng, Univ of NC	Postdoctoral Researcher

Select Publications (out of 33 total peer-reviewed, H Index=11)

i. Five Related Publications

1. Chirwa, C. F. C., R. P. Hall, L. H. Krometis, E. Vance, A. Edwards, T. Guan, R. H. Holm. Pit latrine fecal sludge resistance using a dynamic cone penetrometer in low income areas in Mzuzu city, Malawi. *International Journal of Environmental Research and Public Health*. **2017**, 14(87): doi:10.3390/ijerph14020087..
2. Liao, H., L. Krometis, K. Kline. 2016. Coupling a continuous watershed-scale microbial fate and transport model with a stochastic dose-response model to estimate risk of illness in an urban watershed. *Science of the Total Environment*. **2016**, (551/552): 668-675.
3. Smith, T., L. H. Krometis, C. Hagedorn, B. Benham, A. H. Lawrence, E. Ling, P. Ziegler, S. W. Marmagas. Associations between fecal indicator bacteria prevalence and demographic data in private water supplies in Virginia. *Journal of Water and Health*. **2014**, 12(4): 824-834.
4. Davidson, C., L. Krometis, S. Al-Harathi, J. Macdonald-Gibson. Foodborne exposure to pesticides and methylmercury in the United Arab Emirates. *Risk Analysis*. **2012**, 32: 381-394
5. Krometis, L.H., E. P. Clark, V. Gonzalez, M. E. Leslie. The "death" of disciplines: Development of a team-taught course to provide an interdisciplinary perspective for first-year students. *College Teaching*. **2011**. 59(2): 73-78.

ii. Other Relevant Publications

1. Pieper, K., L. Krometis, D. Gallagher, B. Benham. Simultaneous influence of geology and system design on drinking water quality in private systems. *Journal of Environmental Health*. **2016**, 79(2): S1-S8.
2. Cook, N., E. Sarver, L. Krometis, J. Huang. Habitat and water quality as drivers of ecological system health in Central Appalachia. *Ecological Engineering*. **2015**, 84: 180-189.
3. Liao, H., L Krometis, C. Hession, R. Benitez, R. Sawyer, E. Schaeberg, E. von Wagoner, B. Badgley. Storm loadings of general and human-specific fecal indicators in an inland urban stream. *Science of the Total Environment*. **2015**, (530/531): 347-356.

4. Coffey, R., B. Benham, L. Krometis, M. L. Wolfe, E. Cummins. Assessing the effects of climate change on waterborne microorganisms: Implications for EU and USA water policy. *Human and Ecological Risk Assessment*. **2014**, 20: 724-742.
5. Allevi, R. P., L. Krometis, C. Hagedorn, B. Benham, A. Lawrence, E. Ling, P. Ziegler. Quantitative analysis of microbial contamination in private drinking water supply systems. *Journal of Water and Health*. **2013**, 11(2): 244-255.

(d) Synergistic Activities

- *Co-Director*, NSF StREAM REU (“Dynamics of Water and Societal Systems: An Interdisciplinary Research Program at the Virginia Tech StREAM Lab”), 2012-2014. Co-led summer research program focused on interdisciplinary watershed management; hosted 28 undergraduates from 18 different home institutions representing 18 different disciplinary degrees.
- *Virginia Tech Imagination Camp Faculty Volunteer*, 2010-2014. Designed and led hands-on field and lab-scale activities focused on environmental microbiology and public health for 100 middle-school students participating in a Virginia Tech summer camp.
- *Faculty Member*, Virginia Tech Center for Global Change, 2014-present. (steering committee for Interfaces of Global Change PhD Program, 2014-2015).
- *Team Member and Research Student Advisor*, Cooperative Extension Virginia Household Water Quality Program, 2011-2015. Provides education and low cost water quality testing to homeowners reliant on private water supplies (e.g. wells, springs); program received the Florence Hall Award from the National Extension Association of Family and Consumer Science in May 2013; six resultant peer-reviewed publications led by students.
- *Faculty Fellow*, Virginia Tech Honors Residential Commons, 2010-present. Broad aim is to support the development of interdisciplinary residential colleges that will house and nurture students academically throughout their college career.

Bryan Lewis

Virginia Tech – Biocomplexity Institute of Virginia Tech, formerly Virginia Bioinformatics Institute
1015 Life Science Circle, Blacksburg, VA 24061, (540) 231-9969, blewis@vbi.vt.edu

(a) Professional Preparation

Carnegie Mellon University	Pittsburgh, PA	Computational Biology	BS, 1997
University of California	Berkeley, CA	Infectious Disease	MPH, 2001
Virginia Tech	Blacksburg, VA	Genetics, Bioinformatics, & Comp Biology	PhD, 2011

(b) Appointments

2016-present	Research Associate Professor, Biocomplexity Institute of Virginia Tech, Virginia Polytechnic Institute and State University
2015-present	Research Assistant Professor, Biocomplexity Institute of Virginia Tech, Virginia Polytechnic Institute and State University
2011-2015	Research Scientist, Biocomplexity Institute of Virginia Tech, Virginia Polytechnic Institute and State University

(c) Most Relevant Publications

1. Lewis B, Eubank S, Abrams AM, Kleinman K. in silico surveillance: evaluating outbreak detection with simulation models. BMC Med Inform Decis Mak. 2013 Jan 23;13:12. PubMed PMID: [23343523](#); PubMed Central PMCID: [PMC3691709](#).
2. Halloran ME, Ferguson NM, Eubank S, Longini IM Jr, Cummings DA, Lewis B, Xu S, Fraser C, Vullikanti A, Germann TC, Wagener D, Beckman R, Kadau K, Barrett C, Macken CA, Burke DS, Cooley P. Modeling targeted layered containment of an influenza pandemic in the United States. Proc Natl Acad Sci U S A. 2008 Mar 25;105(12):4639-44. PubMed PMID: [18332436](#); PubMed Central PMCID: [PMC2290797](#).
3. Lewis B, Swarup S, Bisset K, Eubank S, Marathe M, Barrett C. A simulation environment for the dynamic evaluation of disaster preparedness policies and interventions. J Public Health Manag Pract. 2013 Sep-Oct;19 Suppl 2:S42-8. PubMed PMID: [23903394](#); PubMed Central PMCID: [PMC3962069](#).
4. Alexander KA, Lewis BL, Marathe M, Eubank S, Blackburn JK. Modeling of wildlife-associated zoonoses: applications and caveats. Vector Borne Zoonotic Dis. 2012 Dec;12(12):1005-18. PubMed PMID: [23199265](#); PubMed Central PMCID: [PMC3525896](#).
5. Marathe A, Lewis B, Chen J, Eubank S. Sensitivity of household transmission to household contact structure and size. PLoS One. 2011;6(8):e22461. PubMed PMID: [21829625](#); PubMed Central PMCID: [PMC3148222](#).

Other Significant Publications

1. Alexander K, Sanderson C, Marathe M, Lewis B, Rivers C, Shaman J, Drake J, Lofgren E, Dato V, Eisenberg M, Eubank S (2014) What factors might have led to the emergence of Ebola in West Africa?. PLOS Neglected Tropical Diseases, 1418-1425. PubMed [PMID: 26042592](#); PubMed Central PMCID: [PMC4456362](#).
2. Rivers C, Lofgren E, Marathe M, Eubank S, Lewis B (2014) Modeling the Impact of Interventions on an Epidemic of Ebola in Sierra Leone and Liberia. PLOS Currents Outbreaks, 2014 Oct 16. Edition 1. PubMed [PMID: 25914859](#).
3. Chakraborty P, Khadivi P, Lewis B. Forecasting a moving target: Ensemble models for ILI case count predictions. Philadelphia, PA: Society for Industrial and Applied Mathematics; 2014. pp. 262–70.
4. Granich RM, Oh P, Lewis B, Porco TC, Flood J. Multidrug resistance among persons with tuberculosis in California, 1994-2003. JAMA: The Journal of the American Medical Association. 2005 Jun 8;293(22):2732–9. PubMed [PMID: 15941802](#).

5. Eisenberg JNS, Colford JM, Hubbard AH, Porco TC, Lewis BL, Lewis BL, et al. Bias due to secondary transmission in estimation of attributable risk from intervention trials. *Epidemiology*. 2003 Jul;14(4):442–50. PubMed [PMID: 12843770](#).

(d) Synergistic Activities

1. 2008-present: Member of American Public Health Association
2. 2014-present: Member of International Society for Disease Surveillance

John Johnson Lipsey, II

Personal Information

Employer	Office of International Research, Education, and Development (OIREd) Virginia Tech, Office of Outreach and International Affairs 526 Prices Fork Road (0378), Blacksburg, VA 24060 +1 (540) 231-2009 jlipsey@vt.edu
Title	Associate Director, Strategic Partnerships and Program Development
Profession	International Development Specialist, Donor Relations and Partnerships
Expertise	International project planning and development; organizational management and development; team building and leadership; government relations; international business development and resource mobilization; communications and public outreach; technical writing; proposal facilitation; consulting technical advisory services

Country Experience

Austria, Cambodia, China, Germany, Ghana, France, Kenya, Japan, Laos, Lesotho, Nepal, Netherlands, Malaysia, Myanmar, Thailand, Philippines, Timor Leste, Togo, Vietnam, UK, USA

Short Profile/Summary

Mr. Lipsey has worked in international development and development cooperation for over fifteen years. He has experience across the international development community in forging relationships and developing opportunities with bilateral agencies, international financial, international agencies and organizations, foreign governments, and academic/research, and corporate and philanthropic foundations. Working with many foreign assistance donors and agencies, he has promoted technical and advisory services encompassing both hard disciplines (scientific, engineering, design) and soft disciplines (social, economic/financial, environmental, governance, human rights, gender equity, and individual and institutional capacity building) that combine to form robust and impactful projects in developing and emerging countries and communities.

He has managed resource mobilization, business development, and tender, proposal and grant management for NGOs and firms, improving program design, fundraising, competitive contracts, team and consortium building, and public outreach and communication. He has contributed to technical reports and papers on many subjects including program results, evaluations, due diligence investigations, environmental impact analyses, and capacity building. He has experience in policy and technical research and writing on issues and trends in international development, effectiveness, and impact. His technical writing has covered human and environmental health, water and natural resource management, and climate change.

His academic and professional dedication to responsible public policy translated into his interest in international development and the awareness that governments and businesses have a large role to play in balancing human development and environmental protection with creating economic opportunity and prosperity.

Education/Qualifications

2004-2005	MBA/Global Management , California State University/Transnational Executive MBA Program, Hayward, California USA: Cross-cultural international management education in organizational design, strategic planning, marketing, financial/economic
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research/analysis, and creative leadership with focus on global consulting and technical services.

1980-1986 **BA/Government & Foreign Affairs**, University of Virginia, Charlottesville, Virginia USA: Focus on comparative international systems, diplomatic history, economics, and international organizations, and foreign assistance programs.

Professional Experience Highlights

- 2016-present **Associate Director, Strategic Partnerships and Program Development, Office of International Research, Education, and Development (OIRE)**, Blacksburg, Virginia
VT's OIRE links Virginia Tech to the world by supporting the university's international mission through projects and research that raise the standard of living in developing countries. Mr. Lipsey is helping to expand the internationalization of university partners and programs in Virginia Tech areas of excellence in global research and development. He enhances diversity of strategic partners, donors and funding channels across university departments and colleges.
- 2016-2016 **Regional Public Sector Partnerships Coordinator, WWF Greater Mekong**, Phnom Penh, Cambodia
WWF's Greater Mekong Region, covering Cambodia, Laos, Myanmar, Thailand, and Vietnam, is protecting one of the world's most diverse biological regions. Mr. Lipsey managed Public Sector funding in the region and abroad to build partnerships to promote conservation strategies that protect, preserve, and restore the Mekong region's diverse wildlife species, unique landscapes, and threatened natural resources.
- 2013-2016 **Business Development and Partnerships Unit Head**, Swiss Centre for International Health, Swiss Tropical and Public Health Institute, Basel, Switzerland
To contribute to better human health, well-being, and quality of life particularly in low and middle income countries, the Swiss Centre for International Health draws on the excellence in research, technical services, technology, and training of the Swiss Tropical and Public Health Institute (Swiss TPH) based at the University of Basel. To increase and expand the SCIH's role and impact in building capacity of health systems across many countries, Mr. Lipsey is leading outreach and cultivating relationships and alliances with funding agencies, donors, and partners.
- 2012 **Trust Fund Evaluation Consultant**, The World Bank / Philippines
The World Bank, the developing world's largest source of funding and knowledge to raise social standards and protect the environment, delivers much of its social and environmental technical assistance through Trust Funds set up by international donors. Mr. Lipsey conducted an evaluation of the relevance, efficiency, effectiveness, sustainability, and impact of activities supported by trust funds and grants funded by international donors.
- 2009-2011 **Sr. Partnership Manager**, SNV Netherlands Development Organisation, Washington, DC USA: *SNV is a social enterprise that provides strategic advisory services, technical assistance, and innovative solutions to eliminate poverty and inequity in 35 developing countries in Asia, Africa, Latin America, and the Balkans.* For SNV's US office, opened in 2009, Mr. Lipsey provided strategic support and leadership in organizational change, fundraising, donor relations and procurement cycles, and communications and events for increased recognition and visibility.
- 2005-2009 **New Business Development Coordinator**, CDM Smith, Walnut Creek, California and Arlington, Virginia USA
CDM is a worldwide environmental consulting, engineering, and construction firm known for landmark infrastructure projects in master planning, water and sanitation, energy, transportation, and construction. Mr. Lipsey provided new business capture services from client relationships, research, and opportunity tracking, through proposal design, development and team facilitation.
- 1996-2004 **Business Development Director, NW & Pacific Region**, Tetra Tech, Inc. Resource Management Group, San Francisco Bay Area USA
Tetra Tech is an environmental engineering and planning firm providing environmental and natural resource management analysis and support worldwide. Mr. Lipsey provided strategic/tactical planning for environmental consulting in global climate change, ecosystem protection, and environmental impact analysis.

Biographical Sketch

Andre Albert Muelenaer, Jr, MD, MS

Associate Professor, Section Chief, Pediatric Pulmonology/Allergy
Department of Pediatrics, Virginia Tech Carilion School of Medicine
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540.985.9835 (office) 540.985.4018 (fax)

aamuelenaer@carilionclinic.org

(a) Professional Preparation

Virginia Tech	Blacksburg VA	Biology	BS 1975
Virginia Tech	Blacksburg VA	Zoology	MS 1979
Eastern Virginia Medical School	Norfolk VA	Medicine	MD 1979
William Beaumont Army Medical Center	El Paso TX	General Pediatrics Residency	1979-1982
University of North Carolina	Chapel Hill NC	Pediatric Pulmonology Fellowship	1985-1988

(b) Appointments

2014-present: Adjunct Professor- Virginia Tech Faculty of Health Sciences

2009-present: Chief Medical Officer & President, Pediatric Medical Device Institute.

2009- present: Associate Professor, Chief, Section of Pediatric Pulmonology and Allergy, Department of Pediatrics, Virginia Tech Carilion School of Medicine

2009- present: Associate, Childress Institute for Pediatric Trauma, Wake Forest University School of Medicine

2006-present: Adjunct Professor, Virginia Tech/Wake Forest University School of Biomedical Engineering and Sciences

2001-2011: Medical Director, Carilion Biomedical Institute, Roanoke, VA

1992-2013: Assistant Professor of Pediatrics, University of Virginia, Charlottesville, VA

1991- present: Medical Staff, Carilion Children's Hospital

1988-1991: Assistant Professor of Pediatrics, Attending Pediatric Pulmonologist, Research Director of B.S. Blackard Hypoventilation Research Center; Director, Pediatric Bronchoscopy Service, Division of Pulmonary Disease, Department of Pediatrics, Duke University Medical Center, Durham, NC

1984-1985: Staff Pediatrician and Chief of Newborn Services, Womack Army Hospital, Fort Bragg, NC

1982-1984: Staff Pediatrician, Frankfurt Army Regional Medical Center, West Germany

(c) Products

Taylor AR, Turovskiy J, Drew B, Muelenaer AA, Redican K, Kochersberger K, Bickford L. A Sustainable Engineering Solution for Pediatric Dehydration in Low-Resource Clinical Environments. *Journal of Humanitarian Engineering*. 18 April 2016. S89–S101

Muelenaer AA. Muelenaer PA, Taylor AR, Jung A, Repisky P, Stein. Applying a community wellness/disease management model to interprofessional global health experiences. **(oral presentation)** Collaborating Across Borders V- The Interprofessional Journey: Advancing Integration and Impact. Roanoke, Virginia, October 2015

L Sarment, C De Angelus, R Accolla, M Cole, J Brabender, J Bird, A Muelenaer, P Muelenaer. Novel Device for Rapid Acquisition of Heart Rates in Neonatal Patients for future use in Malawi, (poster) 8th Annual Global Health Conference, Consortium of Universities for Global Health, Washington, DC April 8, 2017

M David, A Muelenaer, P Muelenaer, J Bird, S Vespa, AYarrabothula, L Cashman. Distributed Thermistor for Continuous Temperature Monitoring of Malnourished Infants at Risk for Hypothermia. 8th Annual Global Health Conference, Consortium of Universities for Global Health, Washington, DC April 8, 2017

D De La Torre Campos, J Achempong, S Claybon, D DeVincentis, A Edrees, DL Jones, S Mackey, R Schliemann, S Thahir, J Bird, A Muelenaer, P Muelenaer. TEAM Malawi: Low Cost Digital Microscopy for Automated Lab Testing. (poster) 8th Annual Global Health Conference, Consortium of Universities for Global Health, Washington, DC April 8, 2017

(d) Synergistic Activities

Biomedical Engineering for Global Health (BMES 5984, CRN 17950 VT, BMES 708, Class Number 1235 WFU) Spring 2014 co-developed and initiated curriculum with Lissett Ramirez Bickford, PhD, Department of Mechanical Engineering, Virginia Tech

P Muelenaer, RP Hall, P Kelly, K Kochersberger, A Muelenaer, J Powell, P Talbot, AR Taylor. TEAM Malawi (Technology-Education-Advocacy- Medicine Malawi): A Multidisciplinary Global Health Experience," (poster) 8th Annual Global Health Conference, Consortium of Universities for Global Health, Washington, DC April 8, 2017

Muelenaer A. Designing for the Underserved, (platform presentation) Health Technology Forum Innovation Conference- Platforms for the Underserved. (oral presentation) UCSF, San Francisco, CA April 2103

Scieneering in Malawi: Leader of team from Virginia Tech and VTCSOM consisting of MD/MPH, MS- Mechanical Engineering, MS- Electrical Engineering, BS- Mechanical Engineering. Introduce appropriate affordable technologies at 8 hospitals throughout Malawi. Establish better working relationships with educational partners. (Mzuzu and Mulanje) Follow up educational activity for community-based research conducted in Malawi during summer 2013. July-August 2014

Co-Founder of TEAM Malawi: Since 2015, Virginia Tech faculty, staff and students have been engaged in an initiative called TEAM Malawi (Technology-Education-Advocacy-Medicine Malawi) that is a transdisciplinary collaboration, based upon a community wellness model of health, designed to meet the challenges of resource-limited environments through community based participatory research/design/pedagogy. Its vision is to utilize a community wellness model as the framework to integrate the activities of a disparate group of young investigators and mentors. The primary goal is Student Engagement, with a desire to:

- o Foster global perspectives of students.
- o Stimulate ideas for improving conditions in a developing country.
- o Create sustainable relationships that promote transdisciplinary models for development.
- o Encourage evidence-based applied scholarly research.

TEAM Malawi now collaborates with the Virginia Tech Office of International Research Education and Development, and there are TEAM Haiti and TEAM Uganda projects as well.

CitiHope Relief and Development: Vice President and Chief Medical Officer. Mission is to put a healthy life within reach by promoting health, preventing disease, and providing cure to underserved populations worldwide. Conducts needs assessments for donated medical supplies and pharmaceuticals in multiple countries throughout Africa, the Middle East, and Caribbean. Primary donor is the Coca Cola Africa Foundation.

Penelope Ann Muelenaer, MD, MPH

Assistant Professor

Department of Pediatrics, Virginia Tech Carilion School of Medicine

Roanoke, VA 24013, 540.798.6527 (office)

pamuelenaer@carilionclinic.org

(a) Professional Preparation

2014 Public Health, MPH, Virginia Tech, Blacksburg, VA
1985-1989 Pediatric, Infectious Disease, Fellowship, University of North Carolina, Chapel Hill, N.C.
1979-1982 Residency, Pediatrics, William Beaumont Army Medical Center, El Paso, TX
1979 Medicine, MD, Eastern Virginia Medical School, Norfolk, VA
1974 Biology, BS, Virginia Tech, Blacksburg, VA,

(b) Professional Appointments

2010-present Assistant Professor, Department of Pediatrics, Virginia Tech Carilion School of Medicine Roanoke, VA
1992-2004 Director, Pediatric Infectious Disease Clinic, Assistant Professor of Clinical Pediatrics, University of Virginia, Roanoke, VA
1991 Associate Professor Department of Pediatrics, Duke University Medical Center, Durham, N.C.
1990 Assistant Professor of Pediatrics, University of North Carolina, Chapel Hill, N.C.
1989 Clinical Instructor University of North Carolina at Chapel Hill
1984-1985 Staff Pediatrician (Major) Womack Army Hospital, Fort Bragg, N.C.
1982-1984 Staff Pediatrician, Frankfurt Army Regional Medical Center, West Germany

(c) Research and Publications

Wagner DK, Muelenaer PA, Henderson FW. Strain Specific F and G Antibody Responses in Young Children with Multiple Respiratory Syncytial Virus Infections, *Journal of Infectious Diseases*. 1991; 164:15-21.

Viani RM, Dankner WM, Muelenaer PA, Spector SA. Resolution of HIV Associated Nephrotic Syndrome with Highly Active Antiretroviral Therapy Delivered by Gastrostomy Tube. *Pediatrics*. 1999; 104: 1394-1396.

Muelenaer P. Management of HIV-Positive Pregnant Women and Exposed Infants. *Hospital Physician* 2000; 6: 1-4.

Muelenaer P. and Nagy-Agren S. Management of HIV Infected Children and Adolescents. *Hospital Physician* 2001; 7: 1-6.

Muelenaer, P. A., Redican, K. J., Marmagas, S. W., Holm, R. H. (2016). Understanding and improving water sanitation practices to improve health outcomes in Malawi. *The Lancet Global Health*, April 2016.

Alson BR, Harlan MR, Muelenaer AA, Bird JO, Muelenaer PA. Automating Water Quality Assessment with Computer Vision. Abstract accepted Pediatric Academic Societies 2015.

Muelenaer AA, Muelenaer PA, Taylor AR, Jung A, Repisky P, Stein. Applying a community wellness/disease management model to interprofessional global health experiences. (oral presentation) Collaborating Across Borders V- The Interprofessional Journey: Advancing Integration and Impact. Roanoke, Virginia, October 2015.

L Sarment, C De Angelus, R Accolla, M Cole, J Brabender, J Bird, A Muelenaer, P Muelenaer. Novel Device for Rapid Acquisition of Heart Rates in Neonatal Patients for future use in Malawi, (poster) 8th Annual Global Health Conference, Consortium of Universities for Global Health, Washington, DC April 8, 2017.

M David, A Muelenaer, P Muelenaer, J Bird, S Vespa, AYarrabothula, L Cashman. Distributed Thermistor for Continuous Temperature Monitoring of Malnourished Infants at Risk for Hypothermia. 8th Annual Global Health Conference, Consortium of Universities for Global Health, Washington, DC April 8, 2017.

D De La Torre Campos, J Achempong, S Claybon, D DeVincentis, A Edrees, DL Jones, S Mackey, R Schliemann, S Thahir, J Bird, A Muelenaer, P Muelenaer. TEAM Malawi: Low Cost Digital Microscopy for Automated Lab Testing. (poster) 8th Annual Global Health Conference, Consortium of Universities for Global Health, Washington, DC April 8, 2017.

(d) Synergistic Activities

Affiliate Faculty Virginia Tech (William Pierson) Veterinary Medicine, Population Health Sciences MPH Program, Prevention Infectious Diseases Course, Vaccination Programs, Nov, 2016.

P Muelenaer, RP Hall, P Kelly, K Kochersberger, A Muelenaer, J Powell, P Talbot, AR Taylor. TEAM Malawi (Technology-Education-Advocacy- Medicine Malawi): *A Multidisciplinary Global Health Experience*, (poster) 8th Annual Global Health Conference, Consortium of Universities for Global Health, Washington, DC April 8, 2017.

Sciencering in Malawi: Leader of team from Virginia Tech BS- Mechanical Engineering, BS- Electrical Engineering, Established need for appropriate affordable medical technology to develop a infant resuscitator for low and middle income countries. Follow up educational activity for community-based research conducted in Malawi during summer 2013. July-August 2014

Co-Founder of TEAM Malawi: Since 2015, Virginia Tech faculty, staff and students have been engaged in an initiative called TEAM Malawi (Technology-Education-Advocacy-Medicine Malawi) that is a transdisciplinary collaboration, based upon a community wellness model of health, designed to meet the challenges of resource-limited environments through community-based participatory research/design/pedagogy.

RYAN M. POLLYEA

Professional Preparation

University of Dayton	Dayton, OH	Environmental Geology	B.S. 1999
University of Idaho	Moscow, ID	Geology	Ph.D. 2012

Appointments

2015 – present	Assistant Professor, Dept. Geosciences, Virginia Tech
2013 – 2015	Assistant Professor, Dept. Geology & Env. Geosciences, Northern Illinois University
2002 – 2010	Staff Geologist, Shaw Environmental, Inc.
2001 – 2002	Water Use Analyst, California Dept. of Water Resources
2000 – 2001	Staff Geologist, Geotechnology, Inc.

Products – most closely related to proposal

- 2017 **Pollyea, R.M.** and Rimstidt, J.D. Rate equations for modeling carbon dioxide sequestration in basalt. *Applied Geochemistry*, v. 81, p. 52 – 62, May, doi:10.1016/j.apgeochem.2017.03.020.
- 2016 Jayne, R.S., **Pollyea, R.M.**, Dodd, J.P., Olson, E.J., and Swanson, S.K., Spatial and temporal constraints on regional-scale groundwater flow in the Pampa del Tamarugal Basin, Atacama Desert, Chile: *Hydrogeology Journal*, v. 24, no. 8, p. 1921 – 1937, doi:10.1007/s10040-016-1454-3.
- 2016 Jung, Y., Pau, G.S.H., Finsterle, S., and **Pollyea, R.M.**, TOUGH3: A new efficient version of the TOUGH suite of multiphase flow and transport simulators: *Computers & Geosciences*, Available online 23 September 2016, doi:10.1016/j.cageo.2016.09.009.
- 2016 **Pollyea, R.M.** Influence of relative permeability on injection pressure and plume configuration during CO₂ injections in a mafic reservoir: *International Journal of Greenhouse Gas Control*, v. 46, p. 7 – 17, March, doi:10.1016/j.ijggc.2015.12.025.
- 2015 **Pollyea, R.M.**, Van Dusen, E.W., and Fischer, M.P., Topographically driven fluid flow within orogenic wedges: Effects of taper angle and depth-dependent permeability: *Geosphere*, v. 11, no. 5, p. 1427 – 1436, October, doi:10.1130/GES01120.1.

Products – other

- 2014 **Pollyea, R.M.**, Fairley, J.P., Podgorney, R.K. and McLing, T.L., Physical constraints on geologic CO₂ sequestration in low-volume basalt formations: *Geological Society of America Bulletin*, v. 126, no. 3/4, p. 344-351, March/April, doi:10.130/B30874.1.
- 2013 **Pollyea, R.M.**, Fairley, J.P., Podgorney, R.K. and McLing, T.L., A field sampling strategy for semivariogram inference of fractures in rock outcrops: *Stochastic Environmental Research and Risk Assessment*, v. 27, no. 7, p. 1735-1740, October, doi:10.1007/s00477-013-0710-5.
- 2012 **Pollyea, R.M.** and Fairley, J.P., Implications of reservoir uncertainty for CO₂ sequestration in the east Snake River Plain, Idaho (USA): *Hydrogeology Journal*, v. 20, no. 4, p. 689-699, April, doi:10.1007/s/10040-012-0487-1.
- 2012 **Pollyea, R.M.** and Fairley, J.P., Experimental evaluation of terrestrial LiDAR-based surface roughness estimates: *Geosphere*, v. 8, no. 1, p. 1-7, February, doi:10.1130/GES00733.1.
- 2011 **Pollyea, R.M.** and Fairley, J.P., Estimating surface roughness of terrestrial laser scan data using orthogonal distance regression: *Geology*, v. 39, no. 7, p. 623-626, July, doi:10.1130/G32078.1.

Synergistic Activities

- Associate Editor - *Hydrogeology Journal*, 2013 – 2017.
- Departmental organizer for STEMfest 2012 – 2014, a regional exposition held annually at the NIU Convocation Center to encourage interest in the STEM fields for K-12 students in northern Illinois and greater Chicago metropolitan area.
- Developed outdoor field classroom for teaching data acquisition and analysis methods for undergraduate students with career interests related to environmental site characterization, remediation, and rehabilitation.
- Worked with Departmental student organization (Sigma Gamma Epsilon) to develop new geology curriculum for the Northern Illinois University Taft Campus, which is an outdoor educational facility designed to give hands-on outdoor educational experiences to 5th through 8th grade students from urban schools.

Nicholas F. Polys

Advanced Research Computing
Virginia Tech
Wright House (MC 0531)
Blacksburg, VA 24060

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npolys@vt.edu

Education

Vassar College	Cognitive Science	B.A.	1996
Virginia Tech	Computer Science	Ph.D.	2006

Appointments

Virginia Tech

Director of Visual Computing	Advanced Research Computing	08/01/08 – present
Affiliate Professor	Dept. of Computer Science	08/01/08 – present
Faculty	Health Sciences	06/01/16 – present
Catalyst Fellow	Institute for Creativity, Arts, and Technology	01/01/12 – present
Post-doctoral Researcher	Advanced Research Computing	08/01/06 – 08/01/08

Closely Related Products

- **Nicholas Polys**, Jessica Hotter, Laura Purcell, Madison Lanier, Jordan Wolf, Cully Hession, Peter Sforza and James Ivory (2017). "Finding Frogs: Using Game-Based Learning to Increase Environmental Awareness". In *Proceedings of the 22nd International Conference on 3D Web Technology (Web3D '17)*. ACM, New York, NY, USA.
- **Polys**, Sforza, Hession, Munsell (2016) "Extensible Experiences: Fusality for Stream and Field". In *Proceedings of the 21th International Conference on 3D Web Technology (Web3D '16)*. ACM, New York, NY, USA.
- **Nicholas F. Polys**, Benjamin Knapp, Matthew Bock, Christina Lidwin, Dane Webster, Nathan Waggoner, and Ivica Bukvic (2015). "Fusality: an open framework for cross-platform mirror world installations". In *Proceedings of the 20th International Conference on 3D Web Technology (Web3D '15)*. ACM, New York, NY, USA, 171-179.
- Ji-Sun Kim, **Nicholas Polys**, and Peter Sforza. (2015). "Preparing and evaluating geospatial data models using X3D encodings for web 3D geovisualization services". In *Proceedings of the 20th International Conference on 3D Web Technology (Web3D '15)*. ACM, New York, NY, USA, 55-63.
- Tilden, D., A. Singh, **N. F. Polys**, and P. Sforza. (2011). "Multimedia mashups for mirror worlds", *Web3D '11 Proceedings of the 16th International Conference on 3D Web Technology*, Paris, ACM.

Other Products

- Haitao Wang, Xiaoyu Chen, **Nicholas Polys** and Peter Sforza (2017). “A Web3D Forest Geo-Visualization and User Interface Evaluation”. In *Proceedings of the 22nd International Conference on 3D Web Technology (Web3D '17)*. ACM, New York, NY, USA.
- **Polys**, Sforza, & Singh (2016). “A Novel level-Of-Detail Technique for Virtual City Environments”. In *Proceedings of the 21th International Conference on 3D Web Technology (Web3D '16)*. ACM, New York, NY, USA.
- Sharakhov, Nikita, **Polys, Nicholas**, and Sforza, Peter. (2013) “GeoSpy: a Web3D Platform for Geospatial Visualization” *MapInteract*, ACM SIGSPATIAL, Orlando, FL.
- **Polys, Nicholas F.** “Information Visualization in Virtual Environments: Tradeoffs and Guidelines”. In: Handbook of Virtual Environments, Second Edition (eds.) Kelly Hale and Kay Stanney. CRC Press, 2014.
- Nikita Sharakhov, **Nicholas Polys**, and Peter Sforza. (2013). “SpeedSpy: a mobile Web3D platform for visualizing broadband data”. In *Proceedings of the 18th International Conference on 3D Web Technology (Web3D '13)*. ACM, New York, NY, USA, pg. 208.

Synergistic Activities

- **Co-Principle Investigator** on several undergraduate education and hardware infrastructure grants: NSF Computing Research Infrastructure (CRI II-New): *Living Lab for Asynchronous and Synchronous Investigation of Virtual and Real Environments*, NSF Research Experience for Teachers (RET) *New Dimensions in e-Learning*; NSF IUSE: *Wireless Testbeds for Authentic STEM Learning*; VT Visionarium Lab Director
- **President** (elected): Web3D Consortium international standards not-for-profit (2009-present) driving the standardization of ISO/IEC Extensible 3D (X3D) and X3DOM
- **Chair: General:** ACM Web3D 2014, 2008; **Program:** Web3D 2007, 2010, 2011; **Tutorial / Workshop:** IEEE VR 2007, Web3D 2006, 2012, 2013; **Publicity:** VR 2008; **Finance:** VR 2009, 2010, Web3D 2016
- **Member:** ACM, IEEE, VT Interdisciplinary Center for Applied Mathematics (ICAM) and the Center for Human-Computer Interaction (CHCI) (since 2006); Institute for Creativity, Arts, and Technology (ICAT) (since 2013), Web3D Consortium (since 2000)
- **Reviewer: Conferences:** (2002-present) Web3D, VIS, VAST, InfoVis, 3DUI, VR, VRST, SVR, SIGGRAPH, CHI, Graphics Interface; **Journals:** (2004-present) International Journal of Human-Computer Studies, Virtual Reality, Computer Graphics and Applications, Computers & Graphics, Computer Graphics Forum, VIRE, Information Visualization, Computer-Aided Civil and Infrastructure Engineering (Special Issue), Transactions on Applied Perception

Cassidy Rist

Assistant Professor

Center for Public and Corporate Veterinary Medicine

Department of Population Health Sciences

Virginia-Maryland College of Veterinary Medicine

Crist6@vt.edu

Professional Preparation

Harvard Medical School	Global Health and Social Medicine	Postdoc	2014-2015
CDC	One Health	Fellow	2012-2014
Emory University	Global Epidemiology	MPH	2014
University of Florida	Veterinary Medicine	DVM	2005

Appointments

2016 – pr.	Assistant Professor, Department of Population Health Sciences, Virginia-Maryland College of Veterinary Medicine, Virginia Tech, Blacksburg, VA
2015 – 2016	Veterinary Medical Officer, U.S. Department of Agriculture, Richmond, VA
2012 – 2014	Research Fellow, National Center for Emerging and Zoonotic Infectious Diseases, U.S. Centers for Disease Control and Prevention, Atlanta, GA
2014 – 2016	Contractor, U.S. Centers for Disease Control and Prevention, Atlanta, GA
2011 – 2012	Veterinarian, General Practice, Trenton Animal Hospital, Trenton, FL
2009 – 2011	Veterinarian, Emergency and Critical Care, Affiliated Pet Emergency Services, Gainesville, FL
2007 – 2009	Veterinarian, Emergency and Critical Care, Veterinary Emergency and Specialty Center, Santa Fe, NM
2006 – 2007	Intern, Small Animal Surgery, Wheat Ridge Veterinary Specialists, Wheat Ridge, CO
2005 – 2006	Intern, Small Animal Emergency and Critical Care, New England Animal Medical Center, West Bridgewater, MA

Relevant Publications

Rist CL, Arriola CS, Rubin C (2014). Prioritizing zoonoses: A proposed One Health tool for collaborative decision-making. *PLoS ONE* 9(10): e109986. doi:10.1371/journal.pone.0109986

Rist CL, Ngonghala CN, Garchitorena A, Brook CE, Ramananjato RH, Miller AC, Randrianarivehojosa M, Wright PC, Gillespie TR, Bonds MH (2015). Modeling the burden of poultry disease on the rural poor in Madagascar. *One Health*, vol 1:p60-65. doi:10.1016/j.onehlt.2015.10.002

Rist CL, Garchitorena A, Ngonghala CN, Gillespie TR, Bonds MH (2015). The burden of livestock parasites on the poor. *Trends in Parasitology*, 31(11):p527-530. doi:10.1016/j.pt.2015.09.005

Synergistic Activities

Member of the One Health Surveillance Working Group of the International Society for Disease Surveillance, and the Network for Evaluation of One Health, a European organization dedicated the development of tools for quantitative evaluation of One Health activities and programs. The current research program applies prospect theory to address and quantify decision makers' motivations and attitudes towards investment in One Health Surveillance activities, while addressing organizational complexities, such as perceived barriers, risk-related attitudes, and underlying drivers of decision-making to the facilitation or impedance of operationalizing One Health activities among government agencies.

Developed the semi-quantitative One Health Zoonotic Disease Prioritization Tool that is currently in use by the CDC globally, as part of the Global Health Security Agenda's Zoonotic Disease Action Package. The tool applies multi-criteria decision making to assist Ministries of Health and Agriculture in the joint prioritization of zoonotic diseases for prevention, detection, and response. Rist continues to consult with CDC on the use of the Tool, and engages VMCVM DVM students to learn about its application through simulated workshops in the Advanced Veterinary Public Health course.

Working with Johns Hopkins School of Public Health, Stanford University, Institute Pasteur, and PIVOT, an NGO dedicated to health systems strengthening in Madagascar, to deploy a regional dried blood spot sampling program for improved tuberculosis diagnostics.

Rist developed the One Health Clerkship in the Center for Public and Corporate Veterinary Medicine, which allows DVM students in the VMCVM to learn about the integration of One Health into government agencies, including the One Health Office at CDC and the One Health Coordination Center at USDA, and to work on projects associated with the agencies' current activities.

Collaborators

Kathy Alexander, Virginia Tech
Sofia Arriola, CDC
Matthew Bonds, Harvard Medical School (postdoctoral sponsor)
Cara Brooks, Princeton University
Andres Garchitorena, Harvard Medical School
Thomas Gillespie, Emory University (postdoctoral sponsor)
Purvesh Khatri, Stanford University
Kevin Kochersberger, Virginia Tech
Niaina Rakotosamimanana, Institut Pasteur, Madagascar
Calistus Ngonghala, University of Florida
Ann Miller, Harvard Medical School
Ranto Ramananjato, Ministry of Statistics, Madagascar
Carol Rubin, retired (formerly CDC)
Patricia Wright, Stony Brook University

Current advisor to 3 dual degree DVM/MPH students and 30 students in the public/corporate track students in the DVM program

Stephen H. Schoenholtz
Director and Professor
Virginia Water Resources Research Center and
Department of Forest Resources and Environmental Conservation
Virginia Tech
Phone (540) 231-0711; Fax (540) 231-6673; Email Stephen.Schoenholtz@vt.edu

A. Professional Preparation

Pennsylvania State University	Forest Science	B.S. with Distinction, 1979
Pennsylvania State University	Biology	B.S. with Distinction, 1979
Virginia Tech	Forest Biology	M.S. 1983
Virginia Tech	Forest Soils	Ph.D. 1990
Virginia Tech	Restoration Ecology	Postdoc. 1990

B. Appointments

Virginia Tech, Blacksburg, Virginia

Virginia Water Resources Research Center, *Director*, 2006-Present

Department of Forest Resources and Environmental Conservation, *Professor*, July 2006 to Present

Oregon State University, Corvallis, Oregon

Department of Forest Engineering, Resources, and Management, *Associate Professor, Professor*, 2001-2006, *Courtesy Professor*, 2006-2012

Mississippi State University, Mississippi State, Mississippi

Department of Forestry, *Assistant Professor, Associate Professor, Professor*, 1990-2001, *Adjunct Professor*, 2001-Present

Mississippi Water Resources Research Institute, *Director*, 2001

New Zealand Forest Research Institute, Rotorua, New Zealand

Soil and Site Productivity Research Group, *Visiting Senior Research Fellow*, January-July 1998 and January-February 2015

Virginia Tech, Blacksburg, Virginia

Department of Crop and Soil Environmental Sciences, *Postdoctoral Research Associate* 1990

Texas Forest Service, College Station, Texas

Staff Forester II, 1984-1986

Columbia University, Palisades, New York

Lamont-Doherty Earth Observatory, Tree-Ring Laboratory, *Research Assistant*, 1983-1984

C. Recent Relevant Refereed Journal Publications

Krenz III, R.J., **S.H. Schoenholtz**, and C.E. Zipper. 2016. Riparian subsidies and hierarchical effects of ecosystem structure on leaf breakdown in Appalachian coalfield constructed streams. *Ecological Engineering* 97:389-399.

Boehme, E.A., C.E. Zipper, **S.H. Schoenholtz**, D.J. Soucek, and A.J. Timpano. 2016. Temporal dynamics of benthic macroinvertebrate communities and their response to elevated specific conductance in Appalachian Coalfield headwater streams. *Ecological Indicators* 64: 171-180.

Christopher, S.F., **S.H. Schoenholtz**, and J.E. Nettles. 2015. Water quantity implications of regional-scale switchgrass production in the southeastern U.S. *Biomass and Bioenergy* 83: 50-59.

Evans, D.M., C.E. Zipper, E.T. Hester, and **S.H. Schoenholtz**. 2015. Hydrologic effects of surface coal mining in Appalachia (USA). *Journal of American Water Resources Association* 51(5): 1436-1452.

Slesak, R.A., **S.H. Schoenholtz**, and D.M. Evans. 2015. Hillslope erosion from high-risk sites following wildfire and salvage logging in southern Oregon, USA. *Forest Ecology and Management* 342: 1-7.

- Timpano, A.J., **S.H. Schoenholtz**, D.J. Soucek, and C.E. Zipper. 2015. Salinity as a limiting factor for biological condition in mining-influenced Central Appalachian headwater streams. *Journal of American Water Resources Association* 51(1): 240-250.
- Little, C., J.G. Cuevas, A. Lara, M. Pinto, and **S. Schoenholtz**. 2014. Buffer effects of streamside native forests on water provision in watersheds dominated by exotic forest plantations. *Ecohydrology*. doi: 10.1002/eco.1575
- Evans, D.M., **S.H. Schoenholtz**, P.J. Wigington, Jr., S.M. Griffith, and W.C. Floyd. 2014. Spatial and temporal patterns of dissolved nitrogen and phosphorus in surface waters of a multi-land use basin. *Environmental Monitoring & Assessment* 186(2):873-887.
- Danehy, R.J., R.E. Bilby, R.B. Langshaw, D.M. Evans, T.R. Turner, W.C. Floyd, **S.H. Schoenholtz**, and S.D. Duke. 2012. Biological and water quality responses to hydrologic disturbances in third order forested streams. *Ecohydrology* 5(1):90-98.
- Northington, R.M., E.F. Benfield, **S.H. Schoenholtz**, A.J. Timpano, J.R. Webster, and C.E. Zipper. 2011. An assessment of structural attributes and ecosystem function in restored Virginia coalfield streams. *Hydrobiologia* 671(1):51-63.
- Floyd, W.C., **S.H. Schoenholtz**, S.M. Griffith, J.P. Wigington, Jr., and J.J. Steiner. 2009. Nitrate-N, landuse/landcover, and soil drainage associations at multiple spatial scales. *Journal of Environmental Quality* 38(4): 1473-1482.

D. Grants and Contracts Received

- Virginia Tech -- \$3,030,000 for my individual research program
 - Administer annual budget for Virginia Water Resources Research Center of \$750,000-\$1,000,000
- Oregon State University -- \$1,164,000 for my individual research program
- Mississippi State University -- \$2,198,000 for my individual research program

E. Graduate Students and Post-docs Supervised

- Virginia Tech – 8 MS 5 PhD 2 Post-docs
- Oregon State University – 9 MS 3 PhD
- Mississippi State University – 13 MS 2 PhD

F. Synergistic Activities

- Developed new courses: Properties and Processes of Forested Watersheds, Forest Hydrology, Forest Soils, Advanced Forest Soils, Wetland Ecology and Management at Mississippi State Univ. & Oregon State Univ.
- Coordinated development and now oversee new interdisciplinary B.S. degree program in Water: Resources, Policy, and Management, Virginia Tech.
- *National Institutes for Water Resources*, President-Elect 2015-2016, President 2016-2017
- *Soil Science Society of America*, Former Chair, Forest, Range, and Wildland Soils Division
- *American Water Resources Association*, *Ad Hoc* Science Advisory Council member
- External reviewer for promotion and tenure: Univ. Alberta, Oregon State Univ., Univ. Arizona, Univ. Colorado, Univ. Georgia, SUNY-ESF, Louisiana State Univ., Texas A&M Univ., West Virginia Univ.
- Testified on behalf of the Mississippi State Univ. Forest and Wildlife Research Center before U.S. House of Representatives Subcommittee on Forests and Forest Health
- Organizing Committee, 10th, 12th, and 13th North American Forest Soils Conferences
- Committee Chair, Virginia Department of Environmental Quality Academic Advisory Committee
- International water-resources service activities in Armenia, Chile, Costa Rica, New Zealand, Sweden

Hannah Scherer

Assistant Professor and Extension Specialist, Virginia Tech, (540) 231-1759, hscherer@vt.edu

PROFESSIONAL PREPARATION

Ph.D.	Geological and Environmental Sciences	Stanford University	2006
B.A.	Geology	Macalester College	2000

APPOINTMENTS

2015-Present	Assistant Professor and Extension Specialist, Agricultural, Leadership, and Community Education, Virginia Tech, Blacksburg, VA
2011-2015	Research Assistant Professor, Agricultural, Leadership, and Community Education, Virginia Tech, Blacksburg, VA
2008-2011	Science Teacher, Springstone Community High School, Lafayette, CA

RELATED UNDERGRADUATE AND GRADUATE COURSES TAUGHT

Foundational Science Education Concepts for Agricultural Education (ALCE 5814), 2016
Teaching & Training Methods in Ag & Life Sciences (ALCE 4244), 2015, 2016, 2017
STEM Integration in Agricultural Education (ALCE 5054), 2013, 2014, 2015, 2016, 2017
Ecological Agriculture: Theory and Practice (co-taught, ALS 3404), 2013, 2014

SYNERGISTIC ACTIVITIES

1. Program Director, Virginia Tech Graduate Extension Scholars program. I secured funding to develop and implement this program (2014-16), which provided STEM graduate students in the College of Agriculture and Life Sciences the opportunity to work with youth educators to develop an educational module based on their research. Through the program, they learned how to develop high quality outreach programs that expanded youth awareness of and interest in STEM research opportunities in agriculture.

2. Course development: STEM Integration in Agricultural Education. I developed and teach this Master's level course at Virginia Tech to support in-service secondary agriculture teachers and 4-H youth development agents in their efforts to emphasize STEM content standards in their programs. Best practices for STEM teaching and learning are taught in the context of the unique challenges facing educators and students in agricultural education programs.

3. Curriculum Module Author, A Growing Concern: Sustaining soil resources through local decision making. This module was selected by project leadership of *Interdisciplinary Teaching about Earth for a Sustainable Future (InTeGrate)*, an NSF STEP Center. I worked collaboratively with a team of 3 faculty to develop, pilot, and publish a soil science teaching module using sustainable agriculture as a context. The module implements best practices for post-secondary science teaching and learning through a student-centered approach. The module was published in October, 2014.

4. Secondary agriscience outreach activities. I am involved in supporting secondary student agriscience research at the state and national level. I have served on the National FFA Agriscience Committee, which is responsible for planning and implementing the national

Agriscience fair competition, including advising the National FFA on judging rubrics, competition rules, and teacher professional development materials. At the state level, I led a team that secured funding for development and implementation of a new 4-H and FFA Agriscience Research Poster Contest at the State Fair of VA in 2013. As superintendent, I am responsible for providing leadership for the contest, including development of judging rubrics and contest rules, and developing and delivering professional development opportunities for educators.

5. Member, SDC343 Multistate Project: A model for secondary schools agriscience education programs that emphasizes the STEM content in agriculture. This multi-state effort will streamline and focus research in agriscience education and allow for longitudinal data and replication of studies across the United States. The successful completion of this research project will allow agricultural educators to have an increased awareness of the practices, cross-cutting concepts, and disciplinary core ideas included in a successful agriscience program. This increased awareness will be accompanied by modified curricula to guide secondary agriscience teachers in the highlighting of STEM concepts and ideas through articulated competencies.

SELECTED PUBLICATIONS

* denotes former/current students, **denotes outreach training program participants

Refereed Journal Articles

1. **Scherer, H. H.**, Holder, L., & Herbert, B. E. (accepted). Student learning of complex Earth systems: Conceptual frameworks of Earth systems and instructional design. *Journal of Geoscience Education*.
2. Wilk, A. A. *, Spindler, M., & **Scherer, H. H.** (2016). Scholar Development: A Conceptual Guide for Outreach and Teaching. *North American Colleges and Teachers of Agriculture Journal*, 60(4), 385-397.
3. Fortner, S., **Scherer, H. H.**, & Murphy, M. (2016). Engaging undergraduates in soil sustainability decision-making through an InTeGrate module. *Journal of Geoscience Education*, 64(4), 259-269.

Papers in refereed conference proceedings

1. Wilk, A. A. *, Spindler, M., & **Scherer, H. H.** (2016). *Professional identity development in the Graduate Extension Scholars Program: Motivations for participation and outcomes of experience*. Paper presented at the National Meeting of the American Association for Agricultural Education, Kansas City, MO.
2. **Scherer, H. H.** (2015). *What does Ag-STEM mean for me? Perceptions of teachers and 4-H agents*. A paper presented at the annual international conference of the National Association for Research in Science Teaching, Chicago, IL.

Digital scholarship

1. **Scherer H. H.** (2015). Teaching Systems Thinking. *Developing Effective InTeGrate Teaching Materials Resource Collection*. Retrieved September 14, 2015, from http://serc.carleton.edu/integrate/info_team_members/currdev/effective_materials/systems_think.html.

Biographical Sketch for Peter M. Sforza

Professional Preparation

Virginia Tech	Blacksburg, VA	Biology (Cum Laude)	B.S., 1997
Virginia Tech	Blacksburg, VA	Plant Pathology, Physiology, and Weed Sci.	M.S., 2004

Appointments

Note: CGIT = Center for Geospatial Information Technology; PPPWS = Plant Pathology, Physiology, and Weed Science

Virginia Tech, CGIT	Director and Research Scientist	2009-present
Virginia Tech, Geography	Affiliated teaching faculty	2008-present
CACI-Athena	Geospatial Intelligence Analyst	2012-2013
Virginia Tech, Geography	VirginiaView Remote Sensing Coordinator	2004-2009
Virginia Tech, PPPWS	Research Associate	1998-2004
Virginia Tech, Chemistry	General Chemistry Recitation Instructor	1997-1998

Products

(i) Products closely related to proposed project

1. Sforza, P., Pierson, M., Newman, J., Farrell, B., Wang, H., "Real-Time Weather and Grape Disease Risk Models for Virginia. Version 1." *Virginia Vineyard Portal*. Web. [1 Oct 2015] <<http://www.cgit.vt.edu/vineyard-weather.html>>.
2. Sforza, P., Newman, J., Farrell, B., "Eastern US Vineyard Site Assessment Tool" *Virginia Vineyard Portal*. Web. [1 June 2015] <<http://www.cgit.vt.edu/vineyards>>.
3. Sforza, P., Farrell, B., Newman, J., Herndon, B., "Broadband Planning and Analysis Toolbox." *Center for Geospatial Information Technology, Virginia Tech*. Web. [1 June 2014] <<http://www.cgit.vt.edu/broadband>>.
4. Sforza, P. and Wang, H., "Global Agroclimatology Mapping and Analysis." *Center for Geospatial Information Technology, Virginia Tech*. Web. [16 Oct 2015] <<http://arcgis-research.gis.vt.edu/cgit/global>>.
5. Kim, J., Polys, N., Sforza, P., (2015). Preparing and evaluating geospatial data models using X3D encodings for web 3D geovisualization services. *Proceedings of the 20th International Conference on 3D Web Technology (Web3D '15)*. ACM, New York, NY, USA, 55-63.

(ii) Other significant products

1. Sharakhov, N., Polys, N., Sforza, P., (2013). GeoSpy: a Web3D platform for geospatial visualization. *Proceedings of the 1st ACM SIGSPATIAL International Workshop on MapInteraction (MapInteract '13)*. ACM, New York, NY, USA, 30-35.
2. Sharakhov, N., Polys, N., Sforza, P. (2013). SpeedSpy: a mobile Web3D platform for visualizing broadband data. *Proceedings of the 18th International Conference on 3D Web Technology (Web3D '13)*. ACM, New York, NY, USA, 208-208.
3. Schutt, K., Newman, J., Hancock, K., Sforza, P., CARL: Crash Attribute and Reference Locator. *COM.Geo 2013*. San Jose, CA. July 24, 2013. ACM Library. <<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6602051&isnumber=6602019>>
4. Polys, N. and Sforza, P. (2012). 3D Blacksburg Novel LOD Mechanism. Editors: Arne Schilling, Benjamin Hagedorn, Volker Coors. *Open Geospatial Consortium. OGC 3D Portrayal Interoperability Experiment Final Report*. OGC Report # 12-075.

5. Sforza, P., Dickerson, T., Shelton, J., (2011). Interior space GIS: a foundation for campus-wide planning and management. *Proceedings of the 2nd International Conference on Computing for Geospatial Research & Applications*. Washington, DC.

Synergistic Activities

1. As a faculty member at Virginia Tech since 1998, Peter has successfully worked across multiple colleges and disciplines to cultivate interdisciplinary collaborations to develop insights and innovations for complex problems including a broad range of geospatial application domains including agriculture, broadband, facilities management, hazard assessment, transportation, safety and security, community resilience, health, energy, biotic and abiotic modeling, multi-criteria decision support systems, optimization, 3-D spatial data infrastructures, interoperability, crowdsourcing, data mining and visualization techniques.
2. Visualization, informatics, and 3D spatial data infrastructures are the main foci for research programs. Peter has led the development of multiple platforms and integrated processes with the VT Advanced Research Computing, Enterprise GIS, and various information technology assets to develop a world class computational infrastructure and research program. Current research platforms include an Integrated Broadband Toolbox featuring a crowd sourced vertical assets inventory, map books, RF propagation models, microwave transmission corridor modeling, and telecommunications policy database to support planning and analysis.
3. Peter is the lead researcher on Eastern US Vineyard Site Assessment, a macro and meso-scale multi-criteria decision analysis using soil, climate, topography, and land cover for 19 states. For global mapping and modeling, CGIT has developed the Global Agroclimate Analysis Tool.

Collaborators and Other Affiliations

(i) Collaborators

Erica Adams, Booz Allen Hamilton; Matt Bock, Virginia Tech (VT); David Carroll, VT; Bill Carstensen, VT; Imed Dami, Ohio State; Thomas Dickerson, VT; Mary Beth Dunkenberger, VT; Drew Ellis, VT; Brian Farrell, VT; John Fike, VT; Greg Frey, VT; Ralph Hall, VT; Kathleen Hancock, VT; Brandon Herndon, VT; Ji-Sun Kim, VT; Alan Lakso, Cornell; Azam, Moosavi, VT; John Munsell, VT; Joseph Newman, VT; Mizuho Nita, VT; Chris North, VT; Matt Pierson, VT; Nicholas Polys, VT; Peter Radics, VT; Laura, Roghair, VT; Kyle Schutt, VT; Nikita Sharakhov, VT; Jason Shelton, VT; Venkataramana Sridhar, VT; Chris Teutsch, VT; Eric Vance, VT; Justine Vanden Heuvel, Cornell; Emily Van Houweling, VT; Haitao Wang, VT; Sophie Wenzel, VT; Tony Wolf, VT.

(ii) Advisors

Erik Stromberg	Virginia Tech
Dan Brann	Virginia Tech
Roger Youngman	Virginia Tech

(iii) Advisees

Graduate students (1): Sunshin Lee

Venkataramana Sridhar, Ph.D., P.E., D.WRE

Assistant Professor, Biological Systems Engineering Department,
Virginia Tech, Blacksburg, Virginia 24061

Tel: (540) 231-1797; Fax: 540-231-3199; E-mail: vsri@vt.edu

(a) Professional Preparation

Tamil Nadu Agricultural Univ.	Coimbatore, India	Ag Engineering	B.S., 1991
Asian Institute of Technology	Bangkok, Thailand	Irrigation Engineering	M.Eng., 1994
Oklahoma State University	Stillwater, OK	Biosystems Engineering	Ph.D., 2001

(b) Appointments

2014-Present	Biological Systems Engineering, Virginia Tech	Assistant Professor
2012-2013	Civil Engineering, Boise State University	Associate Professor
2007-2012	Civil Engineering, Boise State University	Assistant Professor
2003-2007	School of Natural Resources, U. Nebraska	Research Assistant Prof.
2001-2003	Civil and Environmental Engineering, U. Washington	Postdoc

(c) Select Publications

i. Five Related Publications

1. Sridhar, V., K.A. Anderson (2017) Human-induced modifications to boundary layer fluxes and their water management implications in a changing climate, *Agricultural and Forest Meteorology*, 234, 66-79, DOI:10.1016/j.agrformet.2016.12.009
2. Sehgal, V., V. Sridhar, A. Tyagi (2017) Stratified drought analysis using a stochastic ensemble of simulated and in-situ soil moisture observations, *Journal of Hydrology*, 10.1016/j.jhydrol.2016.12.033
3. Seong, C.H., V. Sridhar (2016) Hydroclimatic variability and change in the Chesapeake Bay watershed, *Journal of Water and Climate Change, International Water Association* 7(4), jwc2016008, DOI: 10.2166/wcc.2016.008.
4. Sridhar, V. (2013) Tracking the influence of irrigation on land surface fluxes and boundary layer climatology, *Journal of Contemporary Water Research & Education*, Issue 152, Pages 79-93, Dec 2013.
5. Hoekema, D. J., V. Sridhar (2013) A system dynamics model for conjunctive management of water resources in the Snake River basin, *Journal of American Water Resources Association*, Vol 49, No. 6: 1327-1350, DOI: 10.1111/jawr.12092.

ii. Other Relevant Publications

1. Jaksa, W.T., V. Sridhar (2015) Effect of irrigation in simulating long-term evapotranspiration climatology in a human-dominated river basin system, *Agricultural and Forest Meteorology*, 200, 109-118.
2. Jaksa, W.T., V. Sridhar, J. L. Huntington and M. Khanal (2013) Evaluation of the Complementary Relationship using Noah Land Surface Model and North American Regional Reanalysis (NARR) Data to Estimate Evapotranspiration in Semiarid Ecosystems, *Journal of Hydrometeorology*, Vol 14, Issue 1, 345-359, Feb 2013 DOI: 10.1175/JHM-D-11-067.1
3. Sridhar, V., X. Jin, W.T. Jaksa (2012) Explaining the hydroclimatic variability and change in the Salmon River basin, *Climate Dynamics*, DOI 10.1007/s00382-012-1467-0
4. Hoekema, D., V. Sridhar (2011) Relating climatic attributes and water resources allocation: A study using surface water supply and soil moisture indices in the Snake River basin, Idaho, *Water Resources Research*, 47, W07536, doi:10.1029/2010WR009697.

5. Sridhar, V., D.B. Loope, J.A. Mason, J.B. Swinehart, R.J. Oglesby, C.M. Rowe (2006) Large Wind Shift on the Great Plains During the Medieval Warm Period, Science, Vol. 313. no. 5785, pp. 345 – 347, DOI: 10.1126/science.1128941.

(d) **Synergistic Activities**

1. Providing leadership with ICTAS Center in India in the water sector through collaboration with colleagues (Lohani, Pruden and others), the Lower Mekong Basin (Cambodia, Thailand, Lao, Vietnam) for food-energy-water nexus impacted by hydropower development projects.
2. ITRA-Water, Government of India, Review Panel Member to review five major water projects funded across India from 2013 to 2016.
3. Editorships: Editor, Journal of Water and Climate change, IWA Publishing, ISSN Print: 2040-2244 | ISSN Online: 2408-9354 Co-Editors: Fransje L. Hooimeijer, Junguo Liu, Chris Perera, Damien Serre.
4. Reviewer of Journals (International Journal of Climatology, Journal of Hydrometeorology, Remote Sensing of Environment, Journal of American Water Resources Association and Water Resources Research).
5. Review Panel Member, Horton Award Committee, American Geophysical Union, 2009-12.

Total number of students mentored/advised: 8

Sophie G. Wenzel, MPH
Associate Director, Center for Public Health Practice and Research
Department of Population Health Sciences
Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech
<http://www.vetmed.vt.edu/people/bios/wenzel.asp>

Professional Preparation

Georgetown University	Linguistics and Spanish	BSLI, 1998
Emory University	International Health	MPH, 2004
University of Illinois at Chicago	Public Health Leadership	DrPH, expected 2018

Appointments

2016-present	Associate Director, Center for Public Health Practice and Research, Virginia Tech University, Blacksburg, VA	
2013-2016	Assistant Director, Center for Public Health Practice and Research, Virginia Tech University, Blacksburg, VA	
2013	Public Health Consultant, Virginia Department of Health- New River Health District, Christiansburg, VA	
2008-2012	Adolescent Health Program Manager, Alaska Division of Public Health, Anchorage, AK	
2005-2008	Public Health Prevention Specialist, Centers for Disease Control and Prevention	
	<u>Assignments:</u> 2006-2008	State of Alaska Section of Epidemiology, Anchorage, AK
	2006	Division of Violence Prevention, Atlanta, GA
	2005	Division of Global Migration and Quarantine, Atlanta, GA
	Dec. 2005	Dengue outbreak investigation, Matamoros, Mexico/Brownsville TX
2004-2005	Prevention Advocate, Alle-Kiski Area Hope Center, Tarentum, PA	
2003-2004	Research Intern, Georgia Campaign for Adolescent Power and Potential, Atlanta, GA	
2003-2004	Research Intern, Centers for Disease Control and Prevention, Atlanta, GA	
2001-2002	Volunteer Coordinator, United States Peace Corps, Asuncion, Paraguay	
1999-2001	Volunteer, United States Peace Corps, Villa Boqueron, Chaco, Paraguay	

Products most closely related to proposal

1. Hall, R. P., Van Houweling, E., Polys, N., **Wenzel, S.** and Williams, P. (2015) *Interdisciplinary Exploratory Research: Visualizing Water Services for Decision Making*. Field Report, July 2015, Blacksburg, Virginia Tech, pages 57.

2. Ramos M, Mohammad H, Zielinski-Gutierrez E, Hayden MH, Robles Lopez JL, Fournier M, Rodríguez Trujillo A, Burton R, Brunkard J, Anaya-Lopez L, Abell A, Kuri-Morales P, Smith B, Munoz J, Waterman S, and **the Dengue Serosurvey Working Group**. (2008) Epidemic Dengue and Dengue Hemorrhagic Fever at the Texas-Mexico Border: Results of a household-based seroepidemiological survey, December 2005. *American Journal of Tropical Medicine and Hygiene* 78(3): 364-369
3. State of Alaska Epidemiology Bulletin Recommendations and Reports: Pike and Burbot (Lush) in Select Alaska Rivers: Mercury Exposure and Consumption Recommendations. (2016) Contributed by: Rachel Kossover, MPH; **Sophie Wenzel**, MPH; Angela Matz, PhD; Lori Verbrugge, PhD; Chung Nim Ha, MPH; Ali Hamade, PhD.

Other products

1. Verbrugge LA, **Wenzel, SG**, Berner, JE, and Matz AC. 2009. Human exposure to lead from ammunition in the circumpolar north. In R.T. Watson, M. Fuller, M. Pokras, and W.G. Hunt (Eds.). *Ingestion of Lead from Spent Ammunition: Implications for Wildlife and Humans*. The Peregrine Fund, Boise, Idaho, USA. DOI 10.4080/ilsa.2009.0110
2. State of Alaska Epidemiology Bulletin: Adult Blood Lead Epidemiology and Surveillance: Occupational Exposures — Alaska, 1995–2006. Contributed by **Sophie Wenzel**, MPH.
3. State of Alaska Epidemiology Bulletin: Blood Lead Epidemiology and Surveillance Non-Occupational Exposures in Adults and Children — Alaska, 1995–2006. Contributed by **Sophie Wenzel**, MPH.
4. State of Alaska Epidemiology Bulletin: Alaska Mercury Biomonitoring Program Update, July 2002–December 2006. Contributed by **Sophie Wenzel**, MPH.

Synergistic Activities

Ms. Wenzel has significant experience leading, implementing, developing, and evaluating public health projects in Paraguay, Mexico, Burkina Faso, the continental US, and Alaska. Ms. Wenzel's research and professional interests include maternal child and adolescent health, youth risk behaviors, international health, sexual and reproductive health, healthy eating/active living, community engaged research and participatory methods, and evaluation of public health programs.

Ms. Wenzel has designed and conducted both process and outcome evaluations. She has designed and conducted qualitative research projects, assisted in the design of a randomized controlled trial, and has experience with several sampling methodologies.

Appendix II: Figures

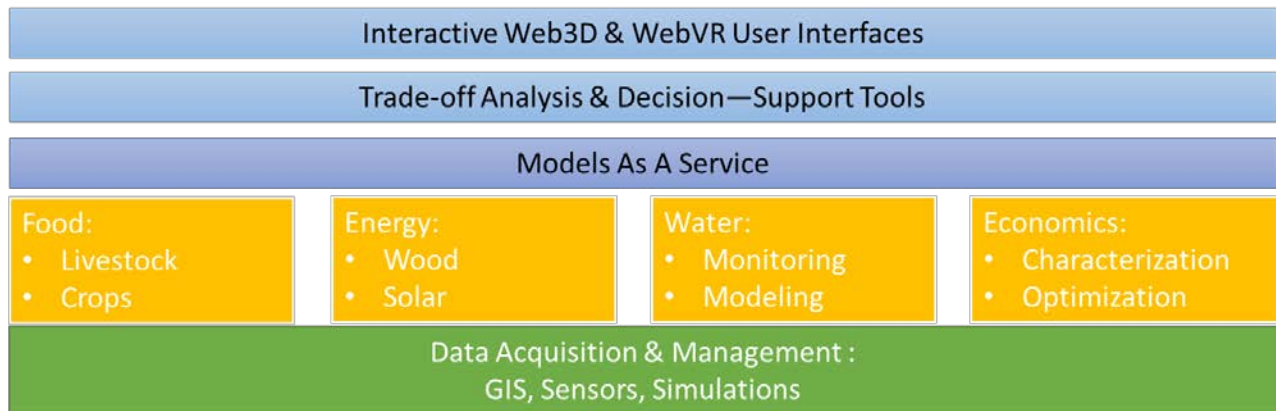


Figure 1: Functional Software Stack: Models-as-a-Service (MaaS)



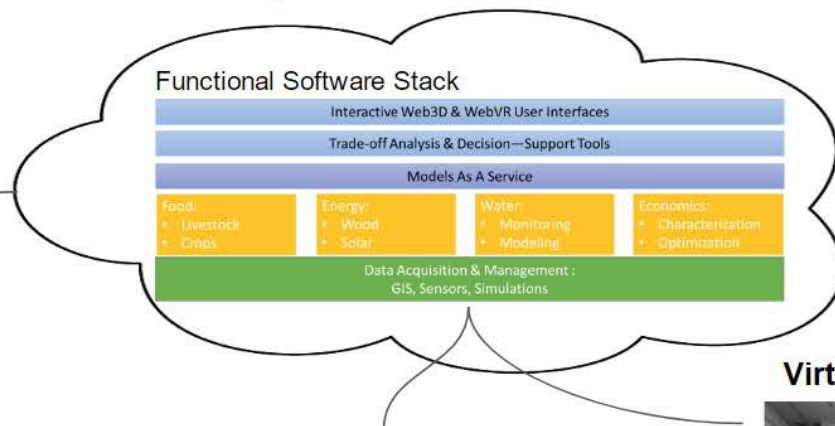
Visionarium

Mirror Words

ICAT Cube

Etc.

Cyberinfrastructure



Data Center

GIS Lab

Etc.

Virtual Research and Learning Environments



Information Flow in Burkina Faso

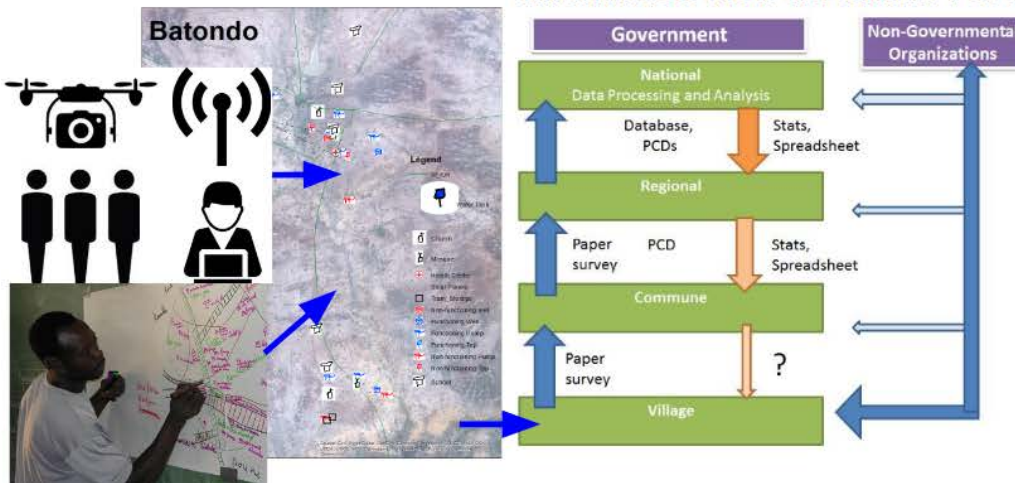


Figure 2: Virtual Decision-Support and Learning Environment

Appendix III: Provisional Job Ads

The following text describes the areas where new faculty could be hired at the interface of critical intersecting disciplines. The first three positions focus on faculty who would be needed to help develop the envisioned next-generation open data fusion platform.

- **Faculty Position in Science Education (CLAHS).** This position requires an academic and research background at the intersection of K-12 education, global sustainability studies, and emerging virtual learning technologies. Applicants with a strong background in STEM education, culture and equity studies, and curriculum and assessment in virtual learning environments are preferred.
- **Faculty Position in Community Computing (COE).** This position requires an academic and research background that can leverage the Human-Computer Interaction (HCI) approach to computer science with special emphasis on the role of user interfaces and mobile graphics to increase accessibility and community communications.
- **Faculty Position in Information Services (COE).** This position requires an academic and research background that is focused on the methods of server-side systems integration that will support Models-as-a-Service (MaaS), including issues of data access, validation, and quality of service over the Web.
- **Faculty Position in International Agricultural Systems Education (CALs).** This position requires an academic background and professional experience in community-based outreach and extension education in a global agricultural context. Applicants with a strong background and record of publication addressing interdisciplinary and systems-level agricultural issues and research questions (e.g., climate smart agriculture, agroecology, global food security, water sustainability) in both developed and developing countries are encouraged to apply. Experience in participatory research and evaluation methods and approaches will be given preference.
- **Faculty Position in One Health Surveillance (VMCVM).** One Health Surveillance (OHS) can be defined as the collaborative, on-going, and systematic collection and analysis of data from multiple domains to detect health related events and produce information that leads to more effective, evidence- and system-based health interventions in human and animal populations, and in support of sustainable ecosystems. This position requires an academic and research background in human and animal health systems, with experience in designing integrated information systems that use data from multiple sectors and sources. Applicants with a clinical degree (DVM or MD) and advanced training in informatics, computer science, or other related field are preferred.
- **Faculty Position in Environmental Health GeoSystems (COS).** Environmental Health GeoSystems occur where Earth system processes converge with anthropogenic processes to impact ecological, agricultural, and/or human health. Faculty candidates are expected to use or develop any combination of laboratory, field, modeling, or geospatial methods to address fundamental science questions at the intersection of near-surface geological processes and human health. Ideal candidates will have broad, interdisciplinary experience with a combination of geological, biological, or clinical training. The candidates will understand how global science perspectives and interdisciplinary convergence support informed decision-making, as well as the impacts of natural and anthropogenic processes on human health, socio-economic stability, natural resource sustainability (e.g., soil, air, water), and agricultural productivity.
- **Faculty Position in Medical Anthropology/Community Health (VMCVM/Population Health Sciences).** This position requires an academic and research background with significant on-the-ground experience engaging communities in Africa. Applicants with a strong background in community engagement, community-based participatory research methods, and an ability to incorporate community knowledge into scientific research endeavors are preferred.
- **Faculty Position in the Water Policy and Governance (CAUS).** This position requires an academic and research background at the intersection of water policy and governance, decision science, and data visualization. Applicants with significant international experience in water systems in Africa are encouraged to apply.