

Program Book

URBAN ECOSYSTEMS AND HUMAN WELL-BEING: IMPLICATIONS FOR GLOBAL SURVIVABILITY

January 25, 2010

Continuing Education Center, University of Minnesota, St. Paul



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How can urban ecosystem science better inform the design and management of cities to accomplish greater human well-being and sustainability, both in the U.S. and throughout the world?

Participatory Exercise: Twin Cities Conceptual Mapping

During breaks, help us conceptualize a sustainable urban ecosystem by contributing your thoughts to a public 'map' of ideas and linking them to ideas from other participants.

To participate, look for the white boards at the back of the auditorium and follow the instructions.

Organizing committee:

Lawrence A. Baker	Water Resources Center
Sarah Hobbie	Ecology, Evolution and Behavior
K.V. Cadieux	Geography
Kristen Nelson	Forest Resources and Fisheries, Wildlife, and Conservation Biology
Paige Novak	Civil Engineering
Carissa Schively-Slotterback	Urban and Regional Planning Program, Humphrey Institute

Local arrangements

Lori Graven, College of Continuing Education
Heather Dorr, College of Continuing Education
Chris Hansen, Water Resources Center
Cheryl Konate, Water Resources Center

Symposium goal

The main goal of the symposium is to begin the development of an urban ecosystems research agenda for the Twin Cities, with an emphasis on the intersection between human well-being and the urban environment. The symposium will bring together practitioners and academics who deal with urban ecosystems to identify knowledge gaps needed to achieve long-term sustainability and research goals to fill these gaps. Potential outcomes of this research might include new visualization tools for planners, new approaches to more actively engage citizens, healthier and safer cities, reduced urban water pollution, and design concepts to adapt to climate warming. This research would benefit not only the Twin Cities, but cities throughout the urbanizing world.

Sponsors

Primary financial support for this symposium was provided by the **Minnesota Futures Program** from the Office of the Vice President for Research at the University of Minnesota. The objective of the Minnesota Futures Grant Program is to nurture interdisciplinary ideas or methodologies to a point where they are ready for and attractive to external funding. This program intends to underwrite the costs of converting ideas into viable research questions to enable faculty members to respond collaboratively and boldly to emerging opportunities in interdisciplinary research.

Funding for Dr. Margerum's travel has been provided by the **College of Liberal Arts Scholarly Events Fund**.

The symposium is co-sponsored by the **Water Resources Center** and the **Institute on the Environment**.

THE PROGRAM

8:00-8:30	Registration
8:30-9:00	Lawrence A. Baker , Senior Fellow, University of Minnesota Water Resources Center, "Developing a research agenda for urban ecosystems and sustainability".
9:00-9:30	Frances Kuo , Dept. Natural Resources and Environmental Sciences and Director, Landscape and Human Health Laboratory, University of Illinois-Champaign, "Healthy urban ecosystem, healthy human habitat".
9:30-10:00	BREAK
10:00-10:30	Randy Neprash , Bonestroo. "Integrating urban trees with stormwater management: a reason for public works engineers to hug trees".
10:30-11:00	Kristen Nelson , Department of Forest Resources and Dept. Fisheries, Wildlife, and Conservation Biology, and Sarah Hobbie , Dept. Ecology, Evolution, and Behavior, U. of Minnesota, "Biogeochemical fluxes through urban households: the role of household choice".
11:00-11:30	Parwinder Grewal , Dept. Entomology, Nematology, and Environmental Science and Director, Center of Urban Environment and Economic Development, Ohio State University, "Local self-reliance as an organizing principle for enhancing ecosystem resilience, human well-being, and global stability: the Cleveland ULTRA Experiment".
11:30-12:00	Reaction Panel
12:00-1:00	LUNCH
1:00-1:30	* Richard Margerum , Head, Dept. Planning, Public Policy, and Management, U. of Oregon, "Integrating information through collaboration: opportunities and challenges".
1:30-2:00	Loren Terveen , Dept. Computer Science Engineering, U of Minnesota. "Local knowledge sharing systems to facilitate citizen involvement".
2:00-2:30	Steve Sheppard , Departments of Forest Resources Management and Landscape Architecture and Jon Salter , Institute for Resources, Environment and Sustainability, University of British Columbia, "Visual planning and climate change visioning: Making community futures tangible with visualisation tools and processes".
2:30-3:00	BREAK
3:00-3:30	Gayle Prest , Sustainability Coordinator, City of Minneapolis, "Performance measures drive Minneapolis sustainability initiative".
3:30-4:00	Eric Sheppard , Geography Department, U. of Minnesota, "Cities, human well-being, social justice and nature: A research agenda".
4:00-4:30	Reaction Panel II.

* Travel supported by the College of Liberal Arts Scholarly Events Program.

ABSTRACTS OF TALKS

8:30-9:00 [Developing a research agenda for urban ecosystems and sustainability](#). Lawrence A. Baker, University of Minnesota. Modern cities are heavily dependent on importation of resources (especially energy), export large amounts of waste, and can be unhealthy. The modern study of urban ecosystems, started a decade ago, offers some promise for guiding urban sustainability efforts. These include better understanding of how energy and materials are used, thereby reducing both consumption and waste production; learning how to improve human health by reducing pollutant exposure and incorporating more “nature” into design; utilizing our ability to acquire, store, and process data to develop adaptive management strategies; and rethinking governance and economics as part of our human ecosystems. Specific opportunities over the next two years will be discussed.

9:00-9:30 [Healthy urban ecosystem, healthy human habitat](#). Frances Kuo, University of Illinois-Champagne. Ethology and work with zoo and laboratory animals tell us that organisms housed in unfit habitats undergo social, physical, and psychological breakdown. A surprising array of findings on the effects of the urban forest on people suggests that humans deprived of contact with trees and other natural elements undergo social, physical, and breakdown. In this talk I will give a brief overview of that evidence and consider what it tells us about the relationship between healthy urban ecosystems and human health

9:30-10:00 Integrating urban trees with stormwater management: a reason for public works engineers to hug trees. Randy Neprash, Bonestroo. In the past several years, there have been significant developments in the worlds of urban forestry and stormwater management & regulation. We are moving toward implementing stormwater best management practices based on biomass, but underutilizing urban trees. We have also developed new tree planting systems that allow for the installation of large root zone volumes of engineered soil that will remain uncompacted even if we build sidewalks or parking lots above them. This presentation will discuss how integrating all these developments could provide paths toward solving some of our most difficult stormwater management in urban settings by promoting the planting and growth of significant numbers of large urban trees.

10:00-10:30 [Integrating urban trees with stormwater management: a reason for public works engineers to hug trees](#). Randy Neprash, Bonestroo.

10:30-11:00 [Biogeochemical fluxes through urban households: the role of household choice](#). Kristen Nelson and Sarah Hobbie, University of Minnesota. Although fluxes of major elements like carbon (C), nitrogen (N), and phosphorus (P) through urban households contribute significantly to environmental pollution, little is known about how these fluxes vary among households, nor what factors contribute to that variation. We quantified household fluxes of C, N, and P in the Saint Paul-Minneapolis, Minnesota region.

We combined a mail survey, household energy records, lawn and urban forestry models, parcel data, and vegetation survey data to quantify fluxes associated with travel, diet, landscapes, paper and plastics, and pets. Carbon fluxes were dominated by transportation and household energy use. Nitrogen fluxes were dominated by fertilizer use, diet, and fossil fuel combustion, while P fluxes were dominated by pets, diet, and detergents. Fluxes of all elements were highly variable and often skewed, indicating that a smaller proportion of households contribute disproportionately to total fluxes. Income was positively related to many component C and N fluxes, while education and age had minor influences on a few fluxes. Some specific behaviors were associated with significant reductions in C and N fluxes. These results suggest policies aimed at mitigating urban pollution need to consider flux patterns and household choices; for example, fluxes dominated by the activity of relatively few households could be most effectively modified by targeting high emitters.

11:00-11:30 [Local self-reliance as an organizing principle for enhancing ecosystem resilience, human well-being, and global stability: the Cleveland ULTRA Experiment](#), Parwinder Grewal, Ohio State University. Human civilization is facing unprecedented local and global challenges which threaten its sustainability. While global warming and climate change associated with human activities threaten all life forms on earth, destruction of natural resources (soil, water, air) and associated ecosystem services, pose severe challenges for local communities. These challenges are growing acute due to increasing human population. The most tempting human experiment, globalization of the economy, is not only destroying the environment due to transportation related infrastructure and greenhouse gas emissions but is also wiping out the livelihood and core social fabric of local communities around the globe, driving once self-sustaining rural populations to the cities. More people now live in cities than rural areas and all future population growth is expected to occur in cities. Although life has gotten better for some, poverty, hunger, and malnutrition is pervasive in cities around the world. It is now evident that even the western lifestyle, for which most developing countries are aspiring, is furthering human ailments such as obesity, diabetes, heart disease, asthma, and depression.

Although cities occupy only 2% of the earth's land surface, they consume 75% of total global energy and produce 80% of all greenhouse gas emissions. Daily needs of modern cities for food, water, energy, and other materials are met almost exclusively through importation of goods from distant places, often across continents. Here, I propose local self-reliance (i.e. "capacity for self-sufficiency") as an organizing ecological principle for designing and transforming cities to address the most critical local and global issues. Under this principle, the goal of a city would be to use a holistic (ecosystem) approach to generate necessary resources locally and in a sustainable manner. Thus, the nutrient cycles of the self-reliant city will be closed, maximizing resource use efficiency and recycling of waste. A self-reliant city will be energy neutral, i.e. primary production of the city equals its respiration. A self-reliant

city will practice prevention rather than cure. It will focus on providing clean air, clean water, vitamin 'G' (green space), vitamin 'R' (recreation and exercise opportunities), peace and quiet, and a strong sense of community to prevent modern human ailments rather than just treating the symptoms.

The local self-reliance paradigm can serve as a driving force for scientific, educational, and technological innovations needed for an ecological transformation that will constructively address the intertwined challenges presented by climate change, rising energy costs, food insecurity, water shortages, environmental degradation, emerging health threats, increasing urban poverty, inner city decay, and urban sprawl. It can strengthen local communities and can bring global stability by inculcating a deep sense of environmental stewardship. This paradigm shift from an obsession with a worldwide "global village" to a passion for strong local economies producing "a globe of villages" will enhance resilience, minimize the ecological footprint of the growing human population, and improve local and global stability.

The Northeast Ohio Ecosystem Consortium (NEOECO), an NSF ULTRA-Ex funded project, is a partnership among ecological and social scientists, urban landscape designers, and natural resource managers, in efforts to understand the ecological and social dynamics of greenspaces, specifically parks and vacant/abandoned lands of the Cleveland urban ecosystem. The proposed research seeks to understand the separate and interactive effects of biophysical factors, urban design, and landscape management on the stability and resilience of urban greenspaces. The central hypothesis framing this work is drawn from current paradigms for sustainable landscape design, i.e., the principle that enhancing ecosystem services within urban neighborhoods promotes social stability and resilience. We also hypothesize that the stewardship values promoted by ecological restoration of urban landscapes promote ecological stability and resilience in urban greenspaces.

1:00-1:30 [Integrating Information through collaboration: opportunities and challenges](#). Richard Margerum, University of Oregon. Collaborative approaches to planning are cited for their ability to integrate data from a range of academic, agency, and lay perspectives. Discussions about information integration often focus on consensus building, but the most important aspects often relate to post-consensus activities. In my research of collaboration cases, I found that information sharing post-consensus presents both opportunities and challenges. One opportunity is for collaborative groups to use information integration to induce behavioral change among the public. In other words, rather than treating information as an output, it is a vehicle for engaging the public to understand its relationship to their decision making. However, this presents new challenges, because collaborative efforts must broaden their outreach to wider set of social networks. A second opportunity is to use collaborative groups as vehicles for ongoing information integration within government. This goes beyond a once off process of sharing data to a coordinated approach to information collection, storage and analysis. While

this offers tremendous opportunities for participating organizations, it also poses technical challenges and reduces their autonomy. However, ultimately information integration at both the community and organizational level are necessary to address the challenge of creating more sustainable cities.

1:30-2:00 [Local knowledge sharing systems to facilitate citizen involvement](#). Loren Terveen, University of Minnesota. My research group created Cyclopath, an interactive bicycle mapping and routing system. The most notable aspect of Cyclopath is that it is the first full-fledged geographic wiki. It does for map-based sites what wikis did for text sites: users can edit the transportation network itself, monitor changes, give each other feedback, and undo harmful changes. I will discuss the Cyclopath design rationale, showing why the wiki approach is appropriate and illustrating how it has engaged the bicycling community in the Twin Cities. I also will suggest other applications of similar local or community-oriented knowledge sharing systems, including some possibilities in urban ecosystems.

2:00-2:30 [Visual planning and climate change visioning: Making community futures tangible with visualisation tools and processes](#). Jon Salter and Stephan Sheppard, University of British Columbia. This presentation will investigate opportunities arising from the application of emerging tools and associated processes to sustainability planning at the community scale. In particular, the presentation will focus on the development of visualization tools, and their incorporation in participatory processes, such as 4D climate change visioning exercises.

The presentation draws on recent applications and methods of involving multi disciplinary experts and community stakeholders in developing and reviewing alternative future scenarios at the local level, factoring in climate change impacts, and adaptive/mitigative responses, with emphasis on the design and planning of community landscapes. It discusses how a variety of modeling and visualization tools can be used to rapidly increase public awareness and potentially improve planning/design solutions for the long term. The examples discussed will be placed in the broader context of a research cluster on visualization, modeling and community engagement being formed in association with the construction of the Centre for Interactive Research on Sustainability (CIRS) at UBC.

3:00-3:30 [Performance measures drive Minneapolis sustainability initiative](#). Gayle Prest, City of Minneapolis. Creating a more sustainable community is a top priority for Minneapolis leaders. To set a roadmap for making Minneapolis truly sustainable, Mayor R.T. Rybak and the Minneapolis City Council started integrating sustainability principles into City decision-making in 2003. The sustainability initiative is formulated to spur action, track results and better coordinate activities throughout the City. The City's sustainability indicators serve as a means to measure progress, and inspire critical thinking about our priorities and the impacts of our behaviors

3:30-4:00 [Cities, human well-being, social justice and nature: Implications for a research agenda](#). Eric Sheppard, University of Minnesota. Scholarship in political ecology, environmental justice and urban-economic geography offers important insights relevant to better understanding the relationship between urban ecosystems and human wellbeing. In this presentation, I will summarize some key insights from these approaches, and draw out their implications for urban sustainability in and beyond Minnesota. Political ecology examines how humans' utilization of, access to and impacts on the more-than-human world are shaped by economic systems, power relations and cultural norms. Recently, this scholarship has turned its attention from rural, third world to urban, first world contexts. Environmental justice examines how race, poverty and gender are correlated with the differentiated environmental risks to health and livelihood faced by individuals and communities at various geographical scales, and the processes driving these relationships. Urban and economic geography provide conceptual tools for understanding the geographically complex and differentiated nature of the relationship between urban and biophysical systems in our globalizing world. Taken together, these bodies of research raise questions about how to conceptualize (urban) sustainability, about the problems of treating cities as a unit of analysis, and about the difficulties of achieving a sustainable relationship between urban ecosystems and human well-being in cities whose economies are driven by commodity production and constitutive of socio-cultural inequality.

SPEAKER BIOGRAPHIES

Dr. Lawrence A. Baker is a Senior Fellow in the Minnesota Water Resources Center and owner of WaterThink, LLC. The broad goal of his consulting and research is to develop novel approaches for reducing pollution that are more effective, cheaper and fairer than conventional approaches. Recent and ongoing studies have included whole-watershed phosphorus balances to guide P reduction strategies, salt balances for five western cities to guide water softener bans, and the Twin Cities Household Ecosystem Project, which seeks to link behavioral drivers to fluxes of carbon, nitrogen and phosphorus (with U of M colleagues Sarah Hobbie and Kristen Nelson). New studies will expand the P balance approach, with foci on agricultural systems and street sweeping.

He has published about 100 technical papers and edited two books, most recently, *Water Environment of Cities* (2009). In addition to technical articles, he often writes for practitioner magazines (such as *LakeLine* and *Stormwater*) and public audiences (such as the *Minnesota Journal* and the *Minneapolis Star and Tribune*). He also is a frequent speaker or panelist at various public events and workshops and is chair of a citizen watershed group, Friends of the Sunrise

River. He is currently doing research for his first trade book, *The End of Pollution*.

Dr. Parwinder Grewal is a Professor of Entomology, Nematology and Environmental Science at the Ohio State University. He received his Ph.D. from Imperial College, London and has been at the Ohio State University since 1997. He led the formation of the Center for Urban Environment and Economic Development (CUEED) and the interdisciplinary Urban Landscape Ecology Program (ULEP) at the Ohio State University, the two programs that he now directs. He is the lead organizer of the biennial national Ecological Urban Landscaping Conference in Cleveland. He is a Co-PI on the Cleveland NSF ULTRA-EX project. He is also a Fellow of the Society of Nematology and currently serving as its President Elect

Dr. Sarah Hobbie is an associate professor in the Department of Ecology, Evolution, and Behavior at the University of Minnesota. Her research focuses on two main areas: 1) the influence of changes in atmospheric composition, climate, land use, and plant species composition on ecosystem processes, and 2) the effects of urbanization on biogeochemical cycles. In the area of global change, she is conducting research aimed at understanding how atmospheric nitrogen inputs affect decomposition; how variation in biodiversity, atmospheric carbon dioxide, nitrogen inputs, and precipitation influence grassland ecosystems; and how warming influences the establishment of boreal and temperate trees at the southern boreal-temperate forest ecotone. In the area of socio-ecological effects of urbanization, she is collaborating with engineers and social scientists to understand how human choices influence the cycling of elements through households in the Twin Cities, Minnesota, as well as the factors that influence household decisions relevant to biogeochemical cycling.

Dr. Hobbie is active in the National Science Foundation Long-Term Ecological Research program, with ongoing research at the Cedar Creek Ecosystem Science Reserve. She also serves on the LTER Executive Board. She is an Aldo Leopold Fellow and has served on the National Center for Ecological Analysis and Synthesis Center's Science Advisory Board and on several NSF panels. Most recently, she has contributed to a report for the Minnesota State Legislature evaluating the potential for Minnesota's terrestrial ecosystems to sequester carbon, and thus offset emissions from fossil fuel combustion.

Dr. Frances E. (Ming) Kuo is an internationally recognized scientist at the University of Illinois-Champaign who is examining the impacts of the urban landscapes on human health. Her research focuses on how the presence of trees, grass, and other natural elements within the settings of daily life supports healthy functioning. In studying the impacts of the urban forest on individuals, she's examined such outcomes as concentration, Attention Deficit/Hyperactivity Deficit symptoms, learning, life management, and aggression. In studying the impacts of the urban forest on neighborhoods, she's examined such outcomes as social ties, strength of community, litter,

vandalism, and crime. The City of Chicago embarked on the City's largest tree planting initiative in history (\$10 million) on the basis of her work, and her work has been used to argue for greening efforts in the UK, the Caribbean, Canada, and the Netherlands. The U.S. Conference of Mayors adopted a resolution in support of urban forests based in part on her work and has subsequently renewed that resolution annually. Recently she has been involved in establishing LEED-style standards for landscape design as part of the Sustainable Sites Initiative.

Dr. Richard D. Margerum is an Associate Professor and Department Head of the Department of Planning, Public Policy and Management at the University of Oregon. He holds a Ph.D. in urban and regional planning from the University of Wisconsin—Madison and Masters degrees in Water Resources Management and Urban Planning. For the past fifteen years, his research has focused on collaborative approaches to planning and management, including collaborative governance, stakeholder-based approaches to planning, and implementation issues elements of consensus based approaches to management. His research has examined practices in Wisconsin, Australia and the Pacific Northwest, and included evaluations of efforts addressing watershed management, regional growth management, social services, and regional transportation planning. Prior to taking the position at Oregon, Dr. Margerum was a postdoctoral Fulbright fellow in Australia, and was on the faculty at the Queensland University of Technology. He has published over 20 articles and book chapters on collaborative planning, and is currently working on a book entitled *Beyond Consensus* that focuses on the implementation lessons from collaborative practice. Richard was ranked in the top 50 of faculty for the number of journal article publications. In 2007-08, he was a Visiting Scientist with the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO), where he worked with researchers evaluating regional arrangements for natural resources along the Great Barrier Reef coastline.

Dr. Kristen C. Nelson is an environmental sociologist, who contributes to the interdisciplinary understanding of environmental change and its dynamic with human systems. Her urban ecosystems research focuses on what influences homeowner decisions (attitudes, norms, perceived control, sociodemographic factors), how behaviors influence biogeochemistry/environmental services and social change in complex systems (social networks). She does most of her work in collaboration with foresters, ecologists, entomologists, and engineers. Beyond urban ecosystems, her recent research focuses on deliberative governance and policy formation, environmental risk assessment, sustainable development, multi-functional agriculture, and wildfire preparedness; the research agenda emphasizes theoretical and practical insights regarding what influences human behavior and societal change at multiple scales.

At the University of Minnesota, she is a H. T. Morse Distinguished Faculty member, Major Co-Coordinator for *Environmental Science, Policy, and*

Management and an Associate Professor in the Department of Forest Resources and the Department of Fisheries, Wildlife and Conservation Biology. She has worked with international colleagues in Kenya, Brazil and Vietnam on governance and risk assessment methodologies for GMOs. Previous projects in sustainable development and conservation include carbon sequestration and organic coffee in Chiapas, Mexico and knowledge production for integrated pest management in Nicaragua. As a resident of St Anthony Park neighborhood, she recently served on the District 12 Task Force to develop a small area plan for Como Avenue: The Como 2030 Plan.

Randy Neprash is a professional engineer (civil) and stormwater regulatory specialist who has worked for Bonestroo, a consulting firm of engineers, scientists, and planners, for more than 15 years. Randy is currently the consultant and sole staff for the Minnesota Cities Stormwater Coalition (MCSC). MCSC is an organization of approximately 100 cities that are regulated under the Minnesota NPDES MS4 stormwater permitting program. MCSC is organized under the auspices of the League of Minnesota Cities.

Gayle Prest is Manager for Sustainability with the City of Minneapolis. She works directly for the City Coordinator and oversees the City's Sustainability Initiative including the development of environmental policies, regulations, and performance measures with a special emphasis on leading efforts related to climate change and renewable energy. Past positions with the City include managing the Environmental Regulatory Section and as Public Works Interagency Coordinator, focusing much of her time on environmental policy and communication issues. Prior to this, Gayle spent 13 years at Dakota County Minnesota managing solid waste, recycling, composting and household hazardous waste programs.

Gayle has a BS in Urban Studies from the University of Minnesota and completed coursework for Masters Degree in Public Administration from Hamline University. Interests include backpacking, cross country skiing, gardening and reading.

Jonathan D. Salter is a PhD student at the Institute for Resources, Environment, and Sustainability (IRES) at the University of British Columbia, and a researcher with the Collaborative for Advanced Landscape Planning (CALP). Jon's research focus is on the communication and use of scientific information in sustainability planning, and the combination of that information with other forms of knowledge. In previous research, Jon has investigated the use of landscape visualization and interactive computer interfaces in landscape planning. More recent research projects have included work on incorporating scientific models with visualization in participatory processes, and on methods for evaluating the impacts of those tools and processes on the participants and resulting planning outcomes.

Dr. Eric Sheppard is Regents Professor of Geography and Associate Director of the Interdisciplinary Center for the Study of Global Change, University of Minnesota. He has published *The Capitalist Space Economy* (with T. J. Barnes), *A Companion to Economic Geography* (with Barnes), *A World of Difference* (with Philip W. Porter), *Scale and Geographic Inquiry* (with R. B. McMaster), *Reading Economic Geography and Politics and Practice in Economic Geography* (with Barnes, J. Peck and A. Tickell), *Contesting Neoliberalism* (with H. Leitner and Peck), and over one hundred articles in such journals as *The Annals of the Association of American Geographers*, *Transactions of the Institute of British Geographers*, *Environment and Planning A*, *Society & Space*, *Journal of Regional Science*, and *Antipode*. His research interests include environmental justice, uneven geographies of globalization, urban politics and urban development, GIS and society, and social movements.

Dr. Steve Sheppard teaches in sustainable landscape planning, aesthetics, and ethical visualization in the Department of Forest Resources Management and Landscape Architecture programme at UBC. He received a BA/MA in Agricultural and Forest Sciences at Oxford, an MSc. in Forestry at UBC, and a Ph.D. in Environmental Planning at UC. Berkeley. He directs the Collaborative for Advanced Landscape Planning (CALP), a research group using perception-testing and 3D visualization tools to support public awareness-building, policy change, and planning on climate change and sustainability. He has over 25 years' experience internationally as an environmental consultant, has published three books on visual simulation and aesthetics, and was a co-author on the Canadian National Assessment of climate change impacts and adaptation (BC Chapter). He co-chairs a research cluster on visualisation, modelling, and community engagement for the Centre for Interactive Research on Sustainability (CIRS) at UBC.

Dr. Loren Terveen is a Professor of Computer Science and Engineering at the University of Minnesota. He specializes in Human-Computer Interaction and Social Computing. He applies theories from the social sciences to create new interaction techniques and algorithms that elicit more positive participation in online communities. He also does work to bring online and physically-based communities together, creating mobile and web-based systems that let people share information about geographical places and areas. As part of this, he has led work to develop the first full-featured geographic wiki. Specific problems he is working on include analyzing contribution to Wikipedia and improving the Wikipedia user experience, facilitating bicycling and other "active living" options, and applying distributed collaboration to programming education.