

Needs and Research Requirements for Land-Change Modeling

Committee

Daniel G. Brown

Chair

Daniel Brown is a Professor in the School of Natural Resources and Environment at the University of Michigan. His research focuses on land-use and land-cover dynamics and makes use of multiple methods, including GIS, remote sensing, digital terrain analysis, ecological mapping, social surveys and statistics, and computer simulation. Specific projects focus on the interacting social and ecological aspects of land use and cover change in rural and peri-urban environments, land use and vulnerability to flooding in China and spatial and social effects on health. He is a member of the American Association for the Advancement of Science, Association of American Geographers, American Society for Photogrammetry and Remote Sensing and the International Association for Landscape Ecology. He has written numerous peer reviewed articles and books. Dr. Brown is also the current recipient of grants from the National Institute of Health. He is an advisor to the U.S. Carbon Cycle Scientific Steering Group and Community Systems Foundation. Dr. Brown has served as a member of the National Research Council on the Panel on Human Health and Security and the Space Studies Board. Dr. Brown received a B.A. in geoenvironmental studies from Shippensburg University and an M.A. and Ph.D. in geography from the University of North Carolina at Chapel Hill.

Lawrence E. Band

Member

Lawrence Band is a Voit Gilmore Distinguished Professor in the School of Geography and the Director of the Institute for the Environment at the University of North Carolina at Chapel Hill. His research primarily focuses on the structure, function, and dynamics of watersheds with an emphasis on the quantity and quality of surface water, and ecosystem cycling of carbon and nutrients. Dr. Band is currently working in a range of watersheds within forested, agricultural, and urban environments encompassing a set of Long Term Ecological Research (LTER) sites (Baltimore Ecosystem Study and Coweeta), as well as other watersheds in North Carolina. He is a member of the Association of American Geographers, American Geophysical Union and the American Association for the Advancement of Science. He has received numerous grants from the National Science Foundation, Water Resources Research Institute of North Carolina, Duke Energy Foundation, Environmental Protection Agency, and the U.S. Forest Service. He has published numerous articles and technical reports. Dr. Band received a B.A. in geography from State University of New York at Buffalo and an M.A. and Ph.D. in geography from University of California at Los Angeles.

Kathleen O. Green

Member

Kass Green is the President of Kass Green and Associates where she consults on geospatial strategy, technology and policy issues to private, educational, and public organizations and the past President of American Society for Photogrammetry and Remote Sensing (ASPRS). Ms. Green is former president of both Space Imaging Solutions and Pacific Meridian Resources, a geospatial services company she co-founded in 1988 and sold to Space Imaging in 2000. Ms. Green has given several hundred research presentations throughout the world at various conferences and published articles in numerous journals. Her scientific service includes current membership on the National Geospatial Advisory Committee, past membership on three National Research Council panels for the National Academy of Sciences, authorship of several chapters of books, and co-authoring the text book, *Assessing the Accuracy of Remotely Sensed Data*. She is a 2011 ASPRS Fellow Award winner. Ms. Green received her B.S. degree in forestry from the University of California at Berkeley, her M.S. degree in resource policy and management from the University of Michigan, and advanced to Ph.D. candidacy at the University of California at Berkeley.

Elena G. Irwin

Member

Elena Irwin is an Assistant Professor in the Department of Agricultural, Environmental, and Development Economics at Ohio State University. Her research focuses on spatially disaggregate, economic models of land use conversion and household location patterns. Her secondary research focus has been on the development of a cellular automaton that stimulates the net effect or negative endogenous interactions among developed land parcels and the positive, attracting effects of a city center and built infrastructure. She has been the reviewer for *Ecological Modeling*, *Urban Studies*, *Journal of Environmental Economics and Management* and several other scientific journals. Dr. Irwin received the Distinguished Research Award and the Sustainability Science Award from the Ecological Society of America in 2009. She has published numerous books and peer reviewed journal articles. Dr. Irwin received a B.A. in German and history from Washington University in St. Louis and a Ph.D. in agriculture and resource economics from the University of Maryland.

Atul Jain

Member

Atul Jain is a Professor in the Department of Atmospheric Sciences at the University of Illinois. Dr. Jain's research focuses on understanding how interactions among the climate system alter the carbon cycle, and to provide useful projections of future changes in global carbon and resultant future climate change. His research goal is to provide the required scientific understanding about how the components of Earth's climate system interact; it is motivated by the practical and pressing issue of human induced climate change. Dr. Jain's has won numerous awards and honors, including the National Science Foundation's Faculty Early Career Development Award. He has served as a lead and contributing author for major assessments of the Intergovernmental Panel on Climate Change (IPCC). He is the author of over 100 scientific articles, including highly cited articles in *Nature* and *Science*, most relating to global climate change as affected by both human activities and natural phenomena. He also directs a number of research projects primarily oriented towards improving our understanding of the impacts that man-made and natural trace gases may be having on the Earth's climate. Dr. Jain received a Ph.D. in atmospheric sciences from the Indian Institute of Technology.

Eric F. Lambin

Member

Eric Lambin (NAS) is a Professor in the Department of Geography at the University of Louvain, Belgium, and the George and Setsuko Ishiyama Provostial Professorship at the Schools of Earth Sciences and Woods Institute for the Environment at Stanford University. Dr. Lambin has been a leader in the international development of land change science. He has developed novel methods to detect land change at sub-continental and high-temporal resolutions, demonstrated the causal dynamics for tropical deforestation and desertification, and explicated the conditions for transitioning to sustainable land uses. He leads a research team that is involved in several international scientific projects on human-environment interactions in different parts of the world. These projects combine remote sensing, socio-economic data, and spatial models to better understand and predict terrestrial ecosystem dynamics and their impacts. Dr. Lambin was the Chair of the international scientific project Land Use and Land Cover Change (IHDP/IGBP) from 1999 to 2005. He also contributed to the United Nations program Millennium Ecosystem Assessment. He is consulted by international organizations on issues related to tropical deforestation, desertification, the potential role of tropical forests in mitigating climate change, and environmental impacts of biofuels. Dr. Lambin was awarded the 2009 Francqui prize, the most prestigious scientific prize in Belgium, and has published numerous scientific papers and two broad audience books. He is a member of the National Academy of Sciences. Dr. Lambin received an M.S. and Ph.D. in geography from the University of Louvain, Belgium.

Robert G. Pontius, Jr.

Member

Robert Gilmore Pontius, Jr. is an Associate Professor in the Graduate School of Geography and the Department of International Development at Clark University, where he has been since 1998. His research interests are geographic information science (GIS), coupled human and natural systems, quantitative ecological modeling, and land change science and spatial statistics. He teaches his areas of expertise, advises in the Human Environmental Regional Observatory (HERO) research program, conducts funded research, supervises research assistants, and advises doctoral, masters and bachelors students. Dr. Pontius is a member of the Association of American Geographers (AAG), Honor Society of Phi Kappa Phi, American Civil Liberties Union, Union of Concerned Scientist and the Population Connection. He has been the reviewer for Climate Policy, Applied Geology, African Journal of Agricultural Research, and numerous other scientific journals. Dr. Pontius currently serves as the scientific advisory for Executive Committee of the Plum Island Ecosystems Long Term Ecological Research (LTER) site. Dr. Pontius received a B.S. in mathematics and economics from University of Pittsburgh, an M.S. in applied statistics from Ohio State University, and a Ph.D. in environmental science from State University of New York.

Karen C. Seto

Member

Karen Seto is an Associate Professor in the School of Forestry and Environmental Studies at Yale University. Her research focuses on characterizing urban land-use dynamics, understanding the process of urbanization, examining the environmental consequences of land-use change and urban experience and forecasting urban growth. She is an expert in remote sensing analysis and integrating satellite data with social science research methods. Dr. Seto's geographic expertise is in Asia, especially in China and India. She is the co-chair of the Urbanization and Global Environmental Change Project (UGEC) of the International Human Dimensions Program on Global Environmental Change (IHDP), and a coordinating lead author for Working Group III of the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report. Dr. Seto is an Aldo Leopold Leadership Fellow and recipient of a National Aeronautics and Space Administration New Investigator Program Award, a National Science Foundation Career Award, and a National Geographic Research Grant. Dr. Seto received an M.A. in international relations and resource and environmental management and a Ph.D. in geography from Boston University.

B. L. Turner, II

Member

Billie Lee Turner II (NAS) is a Gilbert F. White Professor of Environment and Society in the School of Geographical Sciences and Urban Planning and School of Sustainability at Arizona State University. His research focuses on the study of human-environment relationships. Dr. Turner examines these relationships in the use of land and resources by the ancient Maya civilization in the Yucatan peninsula region, the intensification of land use among contemporary smallholders in the tropics, and the land-use and land-cover change as part of global environmental change. He has contributed journal articles to the *Journal of Tropical Geography*, *Geographical Review*, *Professional Geographer* and many other publications. He is a member of the National Academy of Sciences and a fellow for the American Association for the Advancement of Science. Dr. Turner has served in several editorial positions, including the Editorial Board for the *Environmental Science and Policy*, *Regional Environmental Science*, and *Human-Environment Interactions: A Book Series*. Dr. Turner received B.A. and M.A. degrees in geography from the University of Austin at Texas and a Ph.D. in geography from the University of Wisconsin at Madison.

Peter H. Verburg

Member

Peter Verburg is a Professor of Environmental Spatial Analysis and head of the Department of Spatial Analysis and Decision Support at the Institute for Environmental Studies at Vrije Universiteit of Amsterdam, The Netherlands. He specializes in spatial analysis and simulation of human-environment interactions, with emphasis on land use and land cover change, ecosystem services and scenario studies. Dr. Verburg is the developer of the CLUE model (the Conversion of Land Use and its Effects), which is currently used by more than 100 institutions world-wide for simulation for land use change scenarios and ex-ante assessment of policies. He has been a member of the scientific steering committee of Global Land Project of International Human Dimensions Program on Global Environmental Change (IHDP) and International Geosphere-Biosphere Programme (IGBP). He has been involved in many European Union research projects, and he has coordinated large research projects for other organizations. He has published over 75 peer-reviewed articles and several book chapters. He has organized workshops and post-graduate courses on the topic of land use modelling and he is regularly an invited speaker at international symposia. Dr. Verburg received both an M.S. in physical geography and a Ph.D. in land use modelling from Wageningen University.