

Jason Levy, Ph.D.

Visiting Professor (Spring 2008)

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Dr. Levy is an assistant professor of disaster reduction and emergency planning at Western Washington University, Huxley College of the Environment (Department of Environmental Studies). Dr. Levy is associated with both the new Emergency Planning and Hazards Mitigation program as well as the Institute for Global and Community Resilience (IGCR). The IGCR seeks to build capacity to secure livelihoods and to speed recovery in the event of disaster for Washington state cities and counties and the global communities to which they are linked. Dr. Levy supports this work by developing critical, interdisciplinary approaches to disaster reduction and emergency planning pedagogy, curricula, and research.

Dr. Levy is an affiliate faculty member with the Water Resources Research Center, University of Hawaii at Manoa. He served as a full-time, tenure-track faculty member for six years at the University of Hawaii (TN and H1B1 status). His research focuses on increasing the capacity of communities to promote comprehensive emergency management and sustainable environmental management. Dr. Levy developed internet-based disaster portals, co-organized the 2005 American Water Resources Association international specialty conference in Honolulu, Hawaii (June 27-29, 2005) and assisted the Office of the Mayor (City and County of Honolulu) with Honolulu International Watershed Week. Dr. Levy serves as a disaster reduction and emergency planning consultant for emergency response organizations in Hawaii.

Dr. Levy is an adjunct faculty member with the York University Emergency Management Program (Atkinson Faculty of Liberal and Professional Studies). This is one of only two universities offering a structured undergraduate Emergency Management education in Canada (and the only graduate emergency management program outside of British Columbia). Dr. Levy is currently collaborating with York University faculty on a number of major disaster and emergency management grants (NSERC, SSHRC, GEOIDE, PRECARN, etc) and recently served as a PhD external examiner for a York University GIS/disaster management doctoral thesis (Earth and Space Science Engineering Department).

As a Visiting Professor at the Disaster Prevention Research Institute (DPRI) (Kyoto University), Dr. Levy's research and teaching activities involved the use of geospatial information technology for comprehensive emergency management and multi-objective environmental hazards planning. Dr. Levy assisted with organizing the 3rd International Symposium on Integrated Disaster Risk Management in Kyoto, Japan (July 3-5, 2003). Dr. Levy's research uncovered that Japan's critical infrastructure could potentially be affected by both natural hazards, technologic disasters, and cyber threats. For example, the nation's bullet train network and electricity grids are vulnerable to disruption from earthquakes (physical threat), a major accident (physical or technologic disaster) or a computer attack that disables an essential control system (cyber threat). A number of tools were used to reduce socio-economic vulnerability in flood-affected Tokai communities, including hydraulic models, geomatics engineering (GIS/GPS), fuzzy-neural computing, and stochastic optimization.

Dr. Levy served as an Assistant Professor in Canada's first degree program in Applied Disaster and Emergency Studies (Bachelor of Science or Bachelor of Arts). He received the first NSERC strategic grant in the history of this institution. By exploring the complex interactions among hazards, society, and the built environment, Dr. Levy provided students with the skills and knowledge required to help communities prepare for, cope with, respond to, and recover from, the impacts of a broad range natural, technologic, and health-related disasters. Dr. Levy worked with Manitoba stakeholders (experts, civic leaders, businesses, etc.) to better understand the characteristics of disaster risk and to improve preparedness for emergency events. The overall result of Dr. Levy's emergency management teaching and research was to improve public safety, and emergency preparedness in Manitoba, Canada.

Dr. Levy is currently an affiliate faculty member in the Conflict Analysis Group, Department of Systems Design Engineering, University of Waterloo. From 1997-2000, Dr. Levy served as a researcher with the Institute for Risk Research (IRR) where he carried out hazards mitigation and emergency planning research. His work with colleagues in the Department of Systems Design Engineering, involves risk analysis, conflict resolution, and environmental management, and vulnerability science. As an Instructor at the University of Waterloo (Faculty of Engineering), Dr. Levy taught a multiplicity of risk management courses from a systems engineering perspective, with an emphasis on multi-objective hazards planning, fuzzy-neural modeling, geo-spatial information technologies, and time series analysis. Dr. Levy is currently a member of the Network for Environmental Risk and Management.

Dr. Levy promotes the use of integrated disaster planning and recovery strategies to increase enterprise operational efficiency after an emergency or unplanned outage. At IBM Canada, Dr. Levy tailored comprehensive business continuity solutions to meet specific customer needs (high systems resilience and availability, operational efficiency, etc). Jason is an expert on the provision of disaster recovery services (to ensure the protection of critical data) and the design of disaster infrastructure (to optimize system availability and performance).

Academic Degrees

Jason Levy's Ph.D. dissertation (Waterloo, 2001) developed advances in environmental multi-objective hazards planning through the use of risk analysis, geospatial information technologies and systems engineering tools. Specifically, Dr. Levy's integrated and systematic approach to disaster risk reduction harnesses advances in geomatics engineering (GIS/GPS), multiple-criteria decision making, vulnerability science, fuzzy-neural computing, and stochastic optimization in order to improve public safety, emergency preparedness, and the management of natural hazards.

Dr. Levy's Master's degree (Waterloo, 1996) developed algorithms and methodologies for modeling complex emergencies under conditions of uncertainty. Plans and policies were identified to promote community disaster resilience and to facilitate emergency management coordination, communication, and response. With reference to the Ciba-Geigy AG pharmaceutical company (now Novartis AG) it is shown how decision support can reduce conflict and improve the management of emergencies arising from the release of chemicals into the environment.

Research Overview

While the need to ensure timely and effective crisis management activities is essential, political commitment and resource allocation have often focused on short-term emergency response and the provision of relief assistance, to the detriment of long-term hazards prevention. Recognizing the need for improved disaster risk reduction strategies, Dr. Levy develops geospatial information technologies and systems engineering techniques to promote comprehensive emergency management, thereby saving lives, protecting ecosystems and livelihoods (environmental, social, and material assets), minimizing the disruption of essential services, and promoting a culture of disaster prevention.

With the Japanese Science and Technology Corporation, Dr. Levy carried out research in sustainable flood mitigation and emergency planning and management. The overall goal was to increase the disaster resilience of Japanese communities. Funding was provided by the Core Research for Evolutional Science and Technology Program (CREST). Advances in GIS and remote sensing were used to improve flood risk management in the Tokai region of Japan.

Dr. Levy's work with Natural Resources Canada (formerly Energy, Mines, and Resources) developed emergency plans and procedures for technologic hazards in Canada, including off-shore oil and gas facilities. Canada's petroleum infrastructure remains vulnerable to the sudden, unexpected, and unapprehended release of oil and gas into the environment.

Dr. Levy collaborated with the Center for International Environmental Cooperation (Russian Academy of Sciences) to develop sustainable development indicators and to apply geomatics for hazards mitigation. In particular, the latest techniques from the fields of geomatics, soft computing and information systems were used to improve environmental modeling, disaster management, and emergency response. Dr. Levy also assisted with several conferences on environmental indicators beginning with the first International Conference INDEX97 "Environmental Indices: Systems Analysis Approach", organized by the Center for International Environmental Cooperation (INENCO) of Russian Academy of Sciences in 1997. The conference was sponsored by the Encyclopedia of Life Support Systems (EOLSS) and Russian Fund for Basic Research (RFBR).

Dr. Levy's research with the Chinese Academy of Sciences (CAS), Institute for Atmospheric Physics, involves remote sensing, geomatics for emergency response, disaster planning, and comprehensive emergency management. Computer modeling is carried out for the prediction and simulation of environmental hazards. Our main concern involves sand-dust storm modeling and decision support for flood risk management. Land use and land cover change, and the relationship to regional climate in China is also investigated. Dr. Levy also served on the International Organizing Committee of the Chinese Academy of Science (CAS) / Third World Academy of Sciences (TWAS) / World Meteorological Organization (WMO) *International Symposium on Extreme Weather and Climate Events: Their Dynamics and Predictions* in Beijing, China from October 12-16, 2004.
