

# The Making of an Interactive Atlas of Vulnerability to Climate Change for Local Communities in Quebec

Francis Roy, Guy Mercier, Etienne Berthold (Canada) and Tidiane Ndiaye (Senegal)

**Key words:** Capacity building; Cartography; e-Governance; Geoinformation/GI; Risk management; Spatial planning; Heat Wave, Flood, Coastal Erosion

## SUMMARY

The increased frequency of extreme weather events caused by climate change can affect the health and safety of communities. The exposure to these events creates a risk that fluctuates according to geographical hazards, population socio-economical profile, and institutional empowerment. Some sites are more exposed due to their geographical location, the concentration of disadvantaged groups (like older and disabled people, single-parent and low-income families), and poorly empowered local institutions. The vulnerability of different communities to these hazards can differ both in the duration of the aftermath and in the size of the area hit, with particular communities and social groups more affected by their occurrence than others. Local and regional municipalities, though obliged to deal with the social and economic impacts of climate change, often lack the human and material resources to carry out needed analyses on vulnerability to climate hazards across their territory. The lack of synthetic geographical knowledge at a local scale prohibits localities and regions to integrate climate change and hazard concerns within their land use planning procedure and adapt their land use control by laws.

The goal of this project is to develop a digital interactive atlas to serve as a reference tool for analyzing the vulnerability of communities to extreme weather events (specifically identified as heat wave, flood, and coastal erosion). Based upon an extended on-line survey of municipalities and interviews with a selected sample of them, our research aims notably at describing the degree of climate change concerns expressed by local and regional authorities, and describes their need in terms of geographical information and vulnerability indices necessary to adapt their land use planning approach according to climate hazards. A great challenge is to conceptualize these vulnerability indices that are functions of three variables: geography, socio-economic group profile, institutional capacities. These indices will be integrated within an interactive on-line mapping tool, intended primarily for use by managers, planners and professionals from local and regional

---

The Making of an Interactive Atlas of Vulnerability to Climate Change for Local Communities in Quebec (8344)  
Francis Roy, Guy Mercier, Etienne Berthold (Canada) and Tidiane Ndiaye (Senegal)

FIG Working Week 2016  
Recovery from Disaster  
Christchurch, New Zealand, May 2–6, 2016

municipalities in the province of Quebec (Canada). As a result, it will increase the usability of existing georeferenced databases and help communities lessen potential material losses and health impacts by adapting land use planning, better respond to extreme weather events and increase post-event resilience.

This conference will present this research project undertaken at Laval University, and put an emphasis on the conceptual exercise of creating vulnerability indices based on geographical risks, population profile, and institutional capacities.

---

The Making of an Interactive Atlas of Vulnerability to Climate Change for Local Communities in Quebec (8344)  
Francis Roy, Guy Mercier, Etienne Berthold (Canada) and Tidiane Ndiaye (Senegal)

FIG Working Week 2016  
Recovery from Disaster  
Christchurch, New Zealand, May 2–6, 2016