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**DISCIPLINES:** GIS, Systems Dynamics, Spatial simulation, and Impacts evaluation

**KEYWORDS:** Spatial System Dynamics, GIS, System Dynamics



### **RESEARCH INTERESTS:**

Recent history has provided powerful reminders of just how vulnerable coastal regions can be. Hurricanes Juan (October 2003), Katrina (August 2005) and Ike (September 2008) alone had devastating effects on their respective recipient coastal communities, Charlottetown, New Orleans, and Houston. In recent years there has been a swell in category 4 and 5 storms, but not only has the frequency of severe storm increased, but so has the intensity and duration. This being the case, extremely vulnerable sites must be identified and research pertaining to the community and government response to storm surges must be conducted. The ability to forecast severe storm surges and predict coastal vulnerabilities to sea level rise in Canada is adequate, but there is growing anxiety that there is a lack of tactical connections between the current scientific knowledge and the institutions that are responsible for the response planning and adaptation of coastal communities. This knowledge gap needs to be bridged in order for coastal communities to properly understand and be prepared for intense storm activity.

In order to assess, rank and evaluate the biophysical and socioeconomic aspects of a coastal community's storm surge vulnerability, the site's spatial-temporal interactions with its environment must be taken into account. Maxx's research presents a model that uses a system dynamics (SD) approach to the spatial modelling of a vulnerable coastal community. The biophysical and socioeconomic aspects of the site will be represented as multiple, thematic, overlapping layers in a Geographic Information System (GIS) map. The goal of this model is to capture the changing dynamic information that arises through a series of simulations depicted on a static map and to present effective ways and means of presenting spatial dynamics representing the impacts of simulated coastal zone flooding on the physical environment, and on community infrastructure and socioeconomic resources. The application of this study will be specific to the case of Charlottetown, Prince Edward Island, Canada

### **BIOGRAPHY:**

Coming to Ottawa with a Mathematics background (Honours B. Sc. Saint Francis Xavier University 2007), Maxx is currently working towards his M. Sc. in System Sciences at the University of Ottawa. He is currently the President of the System Science Graduate Students Association.