

EGU23-16824, updated on 19 Apr 2024
<https://doi.org/10.5194/egusphere-egu23-16824>
EGU General Assembly 2023
© Author(s) 2024. This work is distributed under
the Creative Commons Attribution 4.0 License.



Flood Preparedness Application Using Pre-determined Global Flood Inundation Maps

Brett Snider, Robin Bourke, and Mathew Godsoe

Government of Canada, Public Safety, Canada (brett.snider@ps-sp.gc.ca)

In Canada, floods are the most common and most costly natural disaster. Floods threaten lives, properties, and the environment and these risks are only expected to increase alongside expected population increase and impacts from climate change. Flood early warning systems (FEWs) can help mitigate the impact of floods by helping inform the public when and where a flood may occur, identifying infrastructure that may be impacted, and disseminating evacuation routes that avoid flooded roads. FEWs have been shown to save lives and mitigate flood impacts. However, many existing FEWs are limited in terms of their forecast horizon and geographical coverage, and also require precise hydraulic models and substantial computing.

This paper develops a flood preparedness application for all of Canada to help prepare Canadians for future and imminent floods. This Canadian flood preparedness application addresses limitations associated with many of the developed FEWS in Canada by matching predicted river flows to predetermined return periods for developed global (or country-wide) flood inundation maps. By matching predicted river flow to return periods of predetermined inundation maps, complex computation is avoided reducing response time, and improving geographical coverage (by using a Canada-wide model). Lastly, using the static map approach, the public and emergency personal can help prepare for floods well in advance, identifying their own flood risk and as well as evacuation and muster locations strategies by identifying roads that would likely be flooded under various flood return periods. Overall the Canada-wide flood preparedness application will help protect and better prepare Canadians as flood risks continue to rise by increasing forecast horizon and geographical coverage and minimizing computation. The new approach of using global (or country-wide) static flood inundation maps to inform FEWS may be applicable in other countries where detailed hydraulic models are unavailable or too time consuming to calculate on a continuous or as needed basis.