

Flood and hydrological drought hazard identification and mitigation programs in Saskatchewan

Jaime Hogan, Shayne MacDonald, Breanna Gardner, Lynne Roszell, Leah Clark - Watershed Program Delivery Team, Water Security Agency, Saskatchewan

Background

Water Security Agency's vision: "being the best water management agency in North America providing safe, reliable water that drives economic growth"

Our mission: "to manage water resources for a better quality of life for all Saskatchewan people"

Two of the agency's core lines of business (WSA 2023-2026 strategic plan) include:

- water related emergency response and planning
- secure and resilient water supplies

Numerous communities in the province are vulnerable to riverine or lacustrine flood hazards (and other types of flooding) which present a risk to public health and safety, property and infrastructure. For example, recent flood events between 2010 and 2014 resulted in Provincial Disaster Assistance Program payments of \$260 Million (3 times higher than the previous 5 years).

Hydrological drought occurs when surface and/or groundwater supplies become constrained by extended dry conditions within catchments. A recent hydrological drought planning study included 17 communities in southern Saskatchewan.

This poster provides information on a few of the flood and hydrological drought initiatives that Water Security Agency is currently involved in. The agency also conducts flow and runoff forecasting, hydrometric monitoring, reservoir water management plans, hydrological and water supply studies to meet provincial needs.

Identifying Flood Vulnerable Communities

- Following large-scale flooding across the province, WSA was tasked with identifying communities that vulnerable to recurring flood events
- 117 of the province's urban municipalities were identified as being at elevated risk to flood hazards
- Documentation of known flood issues and mitigation is being shared with the communities



Flooding at Roche Percée, 2011



Flooding in Humboldt, 2018.

Emergency Flood Damage Reduction Program

- The EFDRP is a program administered by Water Security Agency since 2010 that aims to prevent damage from imminent risk of flooding of buildings, and it can be accessed by residents, businesses, rural municipalities and communities. It provides assistance to implement emergency flood protection measures.
- The EFDRP covers 100% of engineering/technical costs and up to 50% of construction, material, or pumping costs for flood mitigation measures.
- EFDRP has accepted over 3,400 applicants and Water Security Agency has paid out over \$84 Million since it began.



EFDRP-funded berm constructed at Meeting Lake in West-Central Saskatchewan. Photo taken during flood event in 2020.

Flood Damage Reduction Program

- The Flood Damage Reduction Program (FDRP) began in 2018 as a transition from EFDRP to support proactive flood damage prevention or reduction measures.
- Four activity streams have been eligible for funding: risk assessments, flood mapping, mitigation planning, and structural projects.
- Since its implementation, FDRP set up 34 agreements with clientele.



FDRP-funded gated culvert and dam installation at retention pond in Moosomin in 2019.

Community Flood Mapping

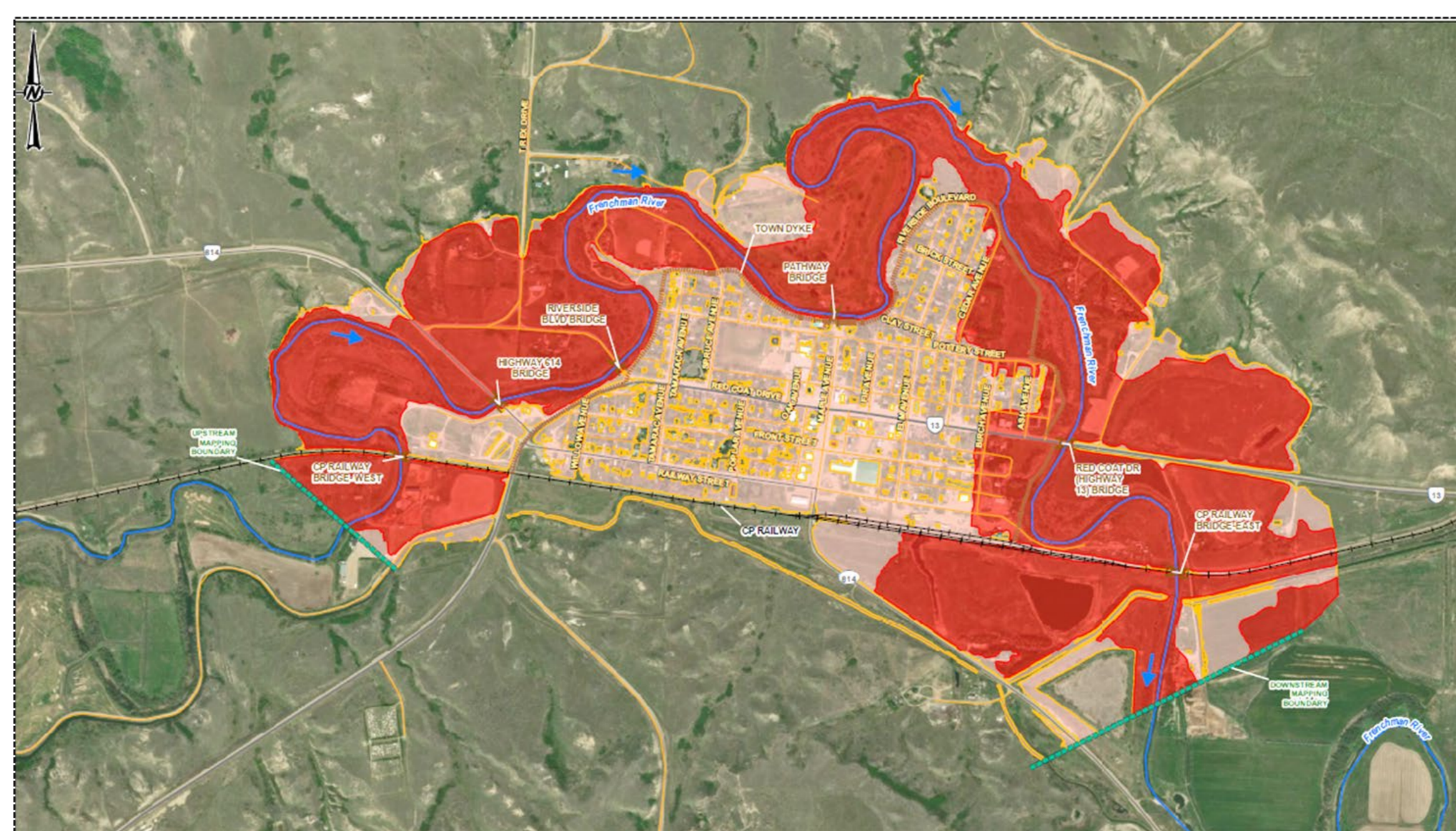
Objectives

Flood mapping that accurately delineates flood hazards serves as the precursor for more active mitigation activities including land-use planning, municipal emergency preparedness and construction of physical works and is the first step toward increasing community resilience from flooding.

Methods and Deliverables

Flood mapping studies include extensive topographic and hydrological data collection and analysis, and hydraulic modelling of the local terrain.

WSA engages communities and stakeholders throughout each study.



Town of Eastend Flood Hazard Map

Next Steps and Implementation

- As flood hazard maps and data are updated, they must be considered in community planning decisions at the municipal and provincial level. They can also be included in official community plans, zoning bylaws, emergency plans or flood risk assessments.
- Commitments have been made by WSA and NRCan for the next four years to collect new data and complete flood mapping studies.

Hydrological Drought Planning for Community Water Supplies

Between January 2019 and December 2022, the Water Security Agency, with support from Natural Resource Canada's Building Regional Adaptation Capacity and Expertise (BRACE) Program, and in partnership with Saskatchewan Research Council, Saskatchewan Public Safety Agency, Prairie Adaptation Research Collaborative, Prairie Water, Saskatchewan Urban Municipalities Association, and Saskatchewan Association of Watersheds, worked with communities to develop Hydrologic Drought Response Plans designed to assist Saskatchewan communities at risk for hydrologic drought.



Image of Broderick Reservoir (left 2020, right 2021)

Objective of the Project

To work with 17 communities with drought-vulnerable municipal water supplies to draft response plans that identifies actions to reduce impacts of a hydrologic drought.

Methods

WSA worked with partners to host community meetings where information about drought and climate change was provided to community representatives. During these meetings, local drought risk and response actions were identified by participants, with the goal of reducing the impact of drought on their community.

Next Steps

For the next phase, WSA has engaged SAW to work with the towns of Hudson Bay and Cabri to complete response plans for those communities.

WSA will continue to assess drought risk, including identifying additional communities that may have issues with their drinking water supplies.

WSA Drought Preparation

WSA is monitoring water supply reservoirs closely to allow us to adapt to dry conditions if required and work internally and across government to identify opportunities and programming to support residents in times of drought.

WSA will continue to work with the Ministry of Agriculture and Saskatchewan Crop Insurance Corporation to ensure a coordinated approach to provide appropriate support to producers, and provide timely support to Ministry of Agriculture for agricultural drought programs

Contact the Water Security Agency

Your first point of contact at WSA is:

client.service@wsask.ca

866-727-5420

Flood mapping inquiries:

Flood.Mapping@wsask.ca