

# Report to Council



**Date:** March 8, 2021

**To:** Council

**From:** City Manager

**Subject:** UBCM-CEPF – Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning – Prediction Analytics to Address Flood Risk in Kelowna.

**Department:** Infrastructure Engineering

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## **Recommendation:**

THAT Council receives for information, the report from Infrastructure Engineering dated March 8, 2021, with respect to the UBCM Community Emergency Preparedness Fund (CEPF) - Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning – Prediction Analytics to Address Flood Risk in Kelowna;

AND THAT Council authorizes staff to apply for a UBCM CEPF Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning grant as outlined in this report;

AND THAT Council authorizes staff to execute the UBCM CEPF Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning grant, if the application is successful;

AND FURTHER THAT the 2021 Financial Plan be amended to include the grant funding for the Prediction Analytics to Address Flood Risk in Kelowna Project if the application is successful.

## **Purpose:**

To consider staff's recommendation to apply for a UBCM-CEPF - Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning Program Grant.

## **Background:**

Okanagan Lake has exceeded its designated full water level in three of the last four years. These flood events were the result of a combination of high freshet and high rainfall events, both of which can be quantified and predicted using available data. The City of Kelowna is developing tools to predict overland flood events by leveraging real-time and historic data in artificial intelligence (AI), machine learning (ML), risk and flood models. The City collects flow, temperature, rainfall, and snow-water equivalents time series data with a vast array of sensors in our watersheds. This information currently feeds the Emergency Operations Centre (EOC) flood dashboard but has the potential to predict peak flows downstream hours before the peak occurs. The capabilities of AI and ML tools can be integrated with previous risk assessments to determine cost and priority of areas at risk. The goal is the creation of a flood prediction tool to enhance preparedness and mitigation actions.

The City already uses several data sources to create the EOC hydrometric dashboard that is used by EOC's throughout the Okanagan. The scalability of the current solution and the analytics capabilities, however, is limited.

**Discussion:**

The City will engage a consultant to deliver an end to end reporting and predictive solution. Staff will provide guidance throughout the project to assure that deliverables can be replicated and expanded in the future for larger areas. The consultant's scope will include the following tasks:

- Establish a datastore in the cloud which contains direct connections to weather, snowpack and hydrometric sensors and their data, necessary to do predictive flooding analytics.
- Develop predictive flood analytics using the artificial intelligence tools and machine learning capabilities offered in the Microsoft Azure cloud computing environment.
- Add predictive outcomes to a self-serve PowerBI EOC dashboard.
- Review and calibrate results, and upon success, add the product to the regional EOC platform.
- Provide a draft and final report detailing the analysis and operations processes.

This work will be completed by qualified professionals engaged to complete the project.

**Conclusion:**

The City is applying for a grant for a project that provides data analytical processes and tools for use in Emergency Operations Centres, public display and future flood risk modeling. As part of the application process, a Council resolution is required indicating support for the current proposal of activities and willingness to provide overall grant management.

**Internal Circulation:**

Department Director, Information Services  
Financial Planning Manager  
Grants & Special Projects Manager  
Infrastructure Engineering Manager

**Financial/Budgetary Considerations:**

The project is budget is \$85,000, and the City is requesting a \$74,400 grant from the UBCM Community Emergency Preparedness Fund (CEPF) - Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning Program to cover the cost of eligible activities. The remaining budget will be obtained from Information Services operational budget already approved in the 2021 Financial Plan. If the application is successful, information services will engage a consultant to complete the work.

**Considerations not applicable to this report:**

Alternate Recommendation:

Communications Comments:

Existing Policy:

External Agency/Public Comments:

Legal/Statutory Authority:

Legal/Statutory Procedural Requirements:

Personnel Implications:

Submitted by:

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Utility Planning Manager

**Approved for inclusion:**

A square box containing a handwritten signature in black ink, which appears to be 'A. Newcombe'.

A. Newcombe, Divisional Director, Infrastructure

cc: Department Director, Information Services  
Divisional Director, Financial Services  
Divisional Director, Corporate Strategic Services  
Infrastructure Engineering Manager  
Financial Planning Manager  
Grants & Special Projects Manager