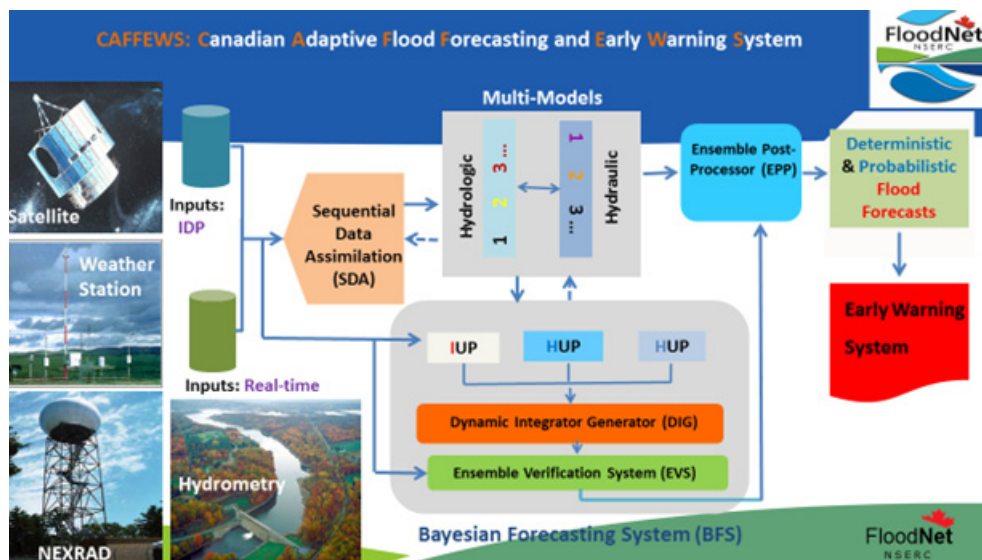## New integrated model brings enhanced flood forecasting capacity for Canada

A tool for more accurate profiling of diverse watershed conditions to improve flood early warning predictions

CAFFEWS – Advanced flood alert system will enhance flood forecasting capacity in Canada with significant benefits for flood mitigation [Coulibaly and FloodNet Team, 2015]

A new flood forecasting tool being developed by the FloodNet Research Team is the first of its kind to offer planners a flexible hydrological modeling framework that can be applied in all Canadian settings, across the country. It allows planners to more accurately profile diverse watershed conditions to improve flood early warning predictions.

Called, CAFFEWS – for Canadian Adaptive Flood Forecasting and Early Warning System – the model is the result of close collaboration between FloodNet and several Forecast Centers. It integrates data from selected watersheds, combining emerging information with existing watershed data, across different models .

CAFFEWS is a framework that integrates data and functions of different hydrological models. It allows forecasters to try emerging models alongside their centers' current forecasting systems – to display a comprehensive overview of flow forecasts from various sources. The system also opens access to improved weather forecast data.

Currently, centers do not typically save historical forecasts and so have no method of evaluating past flow forecast accuracy.

CAFFEWS allows to link both historical forecasted weather data and stored forecast flows, giving planners continual re-evaluation and improvement of their forecasts.

CAFFEWS is also a nation-wide collective data management system that facilitates data exchange and better communication between curators (in forecasting and conservation agencies) of neighboring or transboundary watersheds all across the country, and with the Environment and Climate Change Canada.

With CAFFEWS, forecasters will improve the quality of their technical analysis, producing more accurate flood warning information, and giving planners longer lead time (3-5 days) to respond to critical situations. The tool's improved access to data and cross-model comparison, support greater confidence in emergency preparedness decision making in floodplains. This helps authorities have a positive impact on people's lives, mitigate property damage and reduce economic losses.

CAFFEWS was developed based on a consultation with 10 Forecast Centers and Conservation Authorities across Canada. In a FloodNet survey, these authorities voiced a need for more precise tools and data to improve their flood early warning systems.

The survey gives a picture of how flood forecasting is currently practiced in Canada. Key findings are:

- Centers have a strong interest in testing new forecasting tools;
- Current weather forecast resources are inadequate;
- There is no facility to evaluate past flood forecasts;
- There is a lack of coordination and data sharing among forecasting agencies.