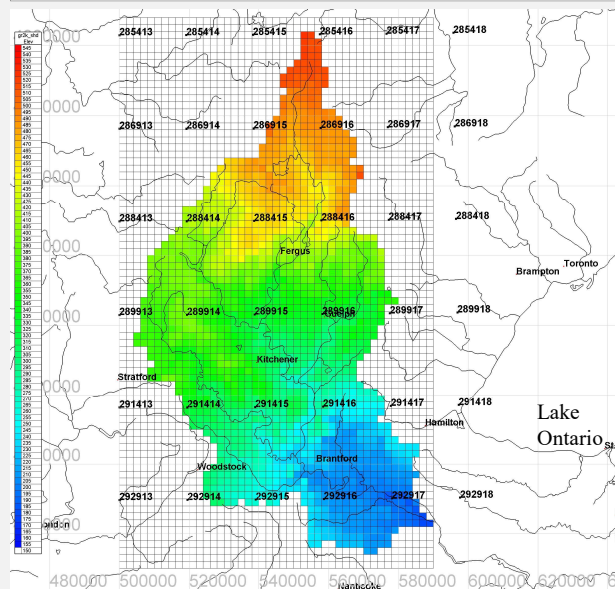


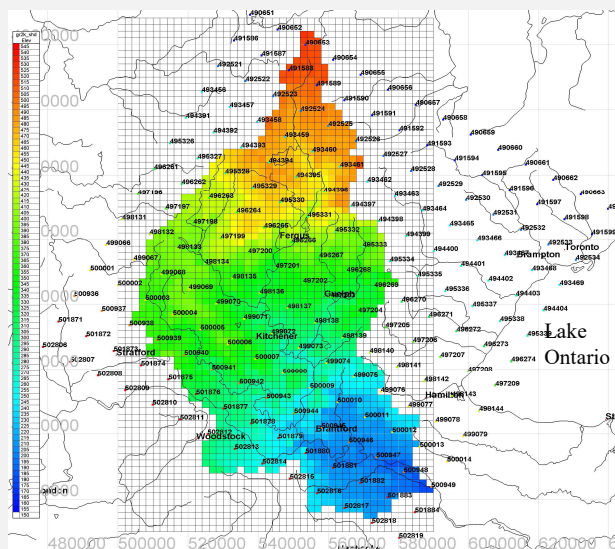
# Flood Forecasting with WATFLOOD® and Green Kenue™

Nicholas Kouwen Ph.D., Peng., F.ASCE.  
Civil and Environmental Engineering, University of Waterloo  
<http://www.watflood.ca> [kouwen@uwaterloo.ca](mailto:kouwen@uwaterloo.ca)

Please view the accompanying poster for the 4DM HydrologiX II fully automated web-based WATFLOOD system



1. CMC Global grid on the Grand River watershed in S. Ontario



2. CMC Regional grid on the Grand River watershed

## Flow Forecast Overview: 5 Simple Steps

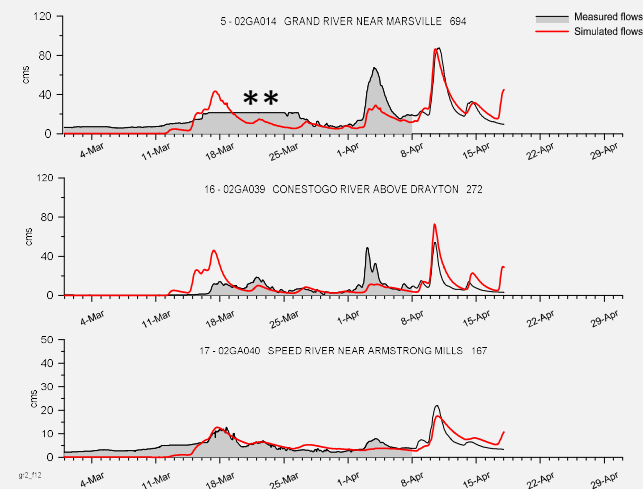
Takes 15 – 20 minutes

- Download** (automatic with task scheduler):
  - provisional WSC flow;
  - CMC CaPA precipitation;
  - CMC\_Regional forecast;
  - CMC\_Global forecast for the CMC domains for each data set.
- In **Green Kenue**, convert the Grib2 format CMC model data to Green Kenue r2c files for the CMC domain(s)
- Extract** the CMC Regl. & Glb. model data for the WATFLOOD domain from the CMC model domain r2c (with REGL\_CONV.exe & GLB\_CONV.exe respectively)
- Execute** the Canadian Hydrological And Routing Model (CHARM™) : spin up & forecast
- Evaluate flow forecast

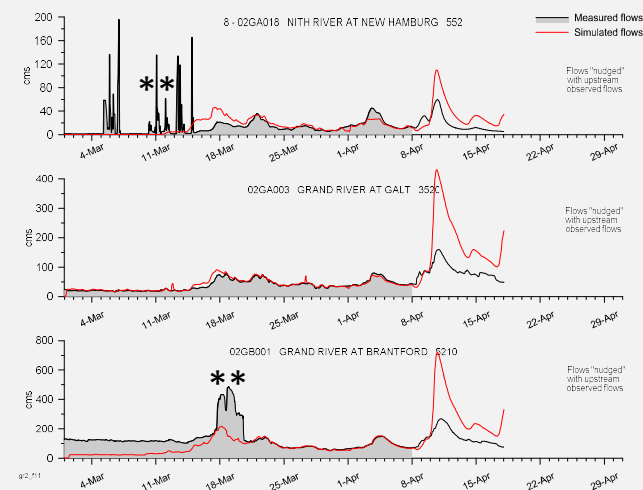
## The graphs on the left are an example Grand River forecast

- The x-origin is on March 1 2015
- The time of the forecast is 00:00 April 8, 2015
- The shaded hydrograph is the recorded hydrograph
- The black line hydrograph past Apr. 8 is the hydrograph that was eventually recorded (not known at the time of the forecast)
- The red hydrograph Mar. 01 to 00:00 Apr. 8 is the hindcast hydrograph based on CaPA precipitation and archived CMC Regional model forecast temperatures.
- The red hydrograph 00:00 Apr. 8 to 00:00 April 18 is the 10 day forecast hydrograph.
- The first 2 days of the forecast is based on the CMC Regional forecast
- The last 8 days of the forecast is based on the CMC Global forecast
- All recorded flows are WSC provisional hourly data
- Reservoir releases are based on target water levels – not actual releases.

Please see “Flood Forecasting Manual” on [www.watflood.ca](http://www.watflood.ca)



3. Forecast for Grand R. headwaters – above the Belwood, Conestoga & Guelph reservoirs respectively.



4. Forecast for the lower Grand River – first 2 days, good forecast – then, too much precip. In the CMC Global forecast

**\*\* CAUTION REQUIRED!!** Forecast precipitation and provisional flows can be unreliable.