

## **Mississippi Lake hydrodynamic and biogeochemical modeling project**

Report #1      date: December 5<sup>th</sup> 2017

The main focus of the investigation so far was collecting the required data to set up the hydrodynamic model. There were some unprecedented issues in this regard. For example, the Drummond climate station (the closest station to the Lake) only collects daily averaged data which is insufficient for the model since it needs sub daily climate data in order to simulate the diurnal temperature fluctuations. The other problem regarding the meteorological data was lack of solar radiation data which has not been collected after 2003 by the Environment Canada in Ontario. However, we have resolved these issues by using other available data from Kemptville, Ottawa Airport and Eagle Lake (Dr. Boegman's personal weather station). The solar radiation data was obtained from Eagle Lake station and the required sub daily parameters were obtained from Kemptville station. The bathymetry of the lake was provided by MVCA, based on a surveying in 60s, and it has been processes and modified as the model input. The timeseries of inflow and outflow are available based on the readings in Appleton and Ferguson and the main creeks flows will be given to the model based on the CANWET simulation which has not been completed yet. The next step is to run the hydrodynamic model (ELCOM) with the existing data and calibrate it by comparing the simulated results with the observations (e.g. temperature loggers near Betcher and Bell properties and etc). The water quality modeling will later be done using the CANWET water quality output and the field observations (including the stream data). Three figures related to the gathered data are attached to this report (bathymetry, meteorological data and inflow/outflow/water level).

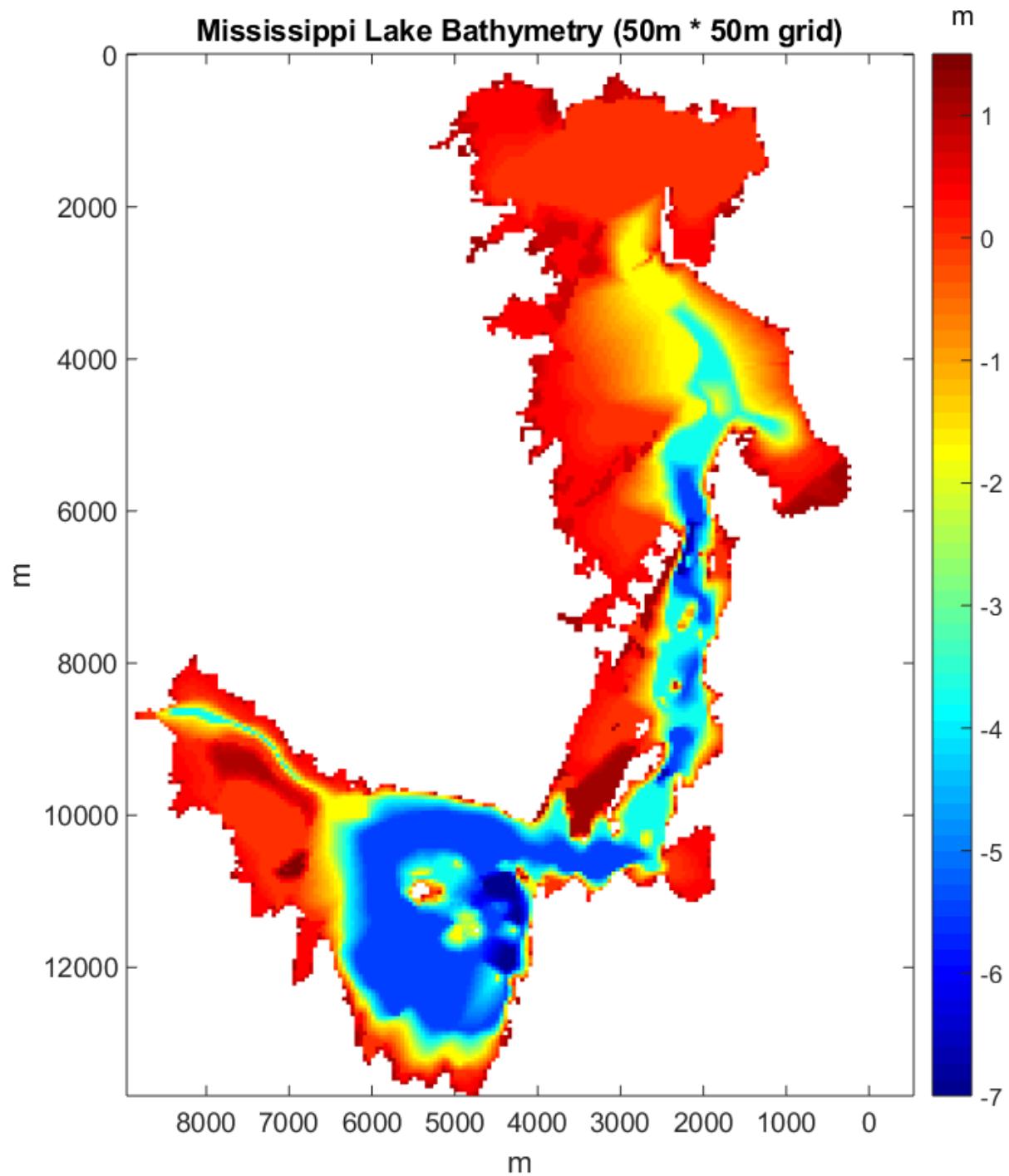


Figure 1- Mississippi Lake bathymetry

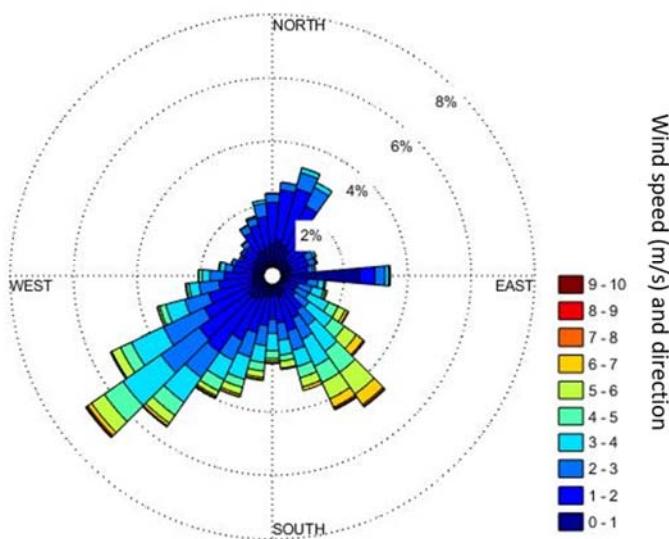
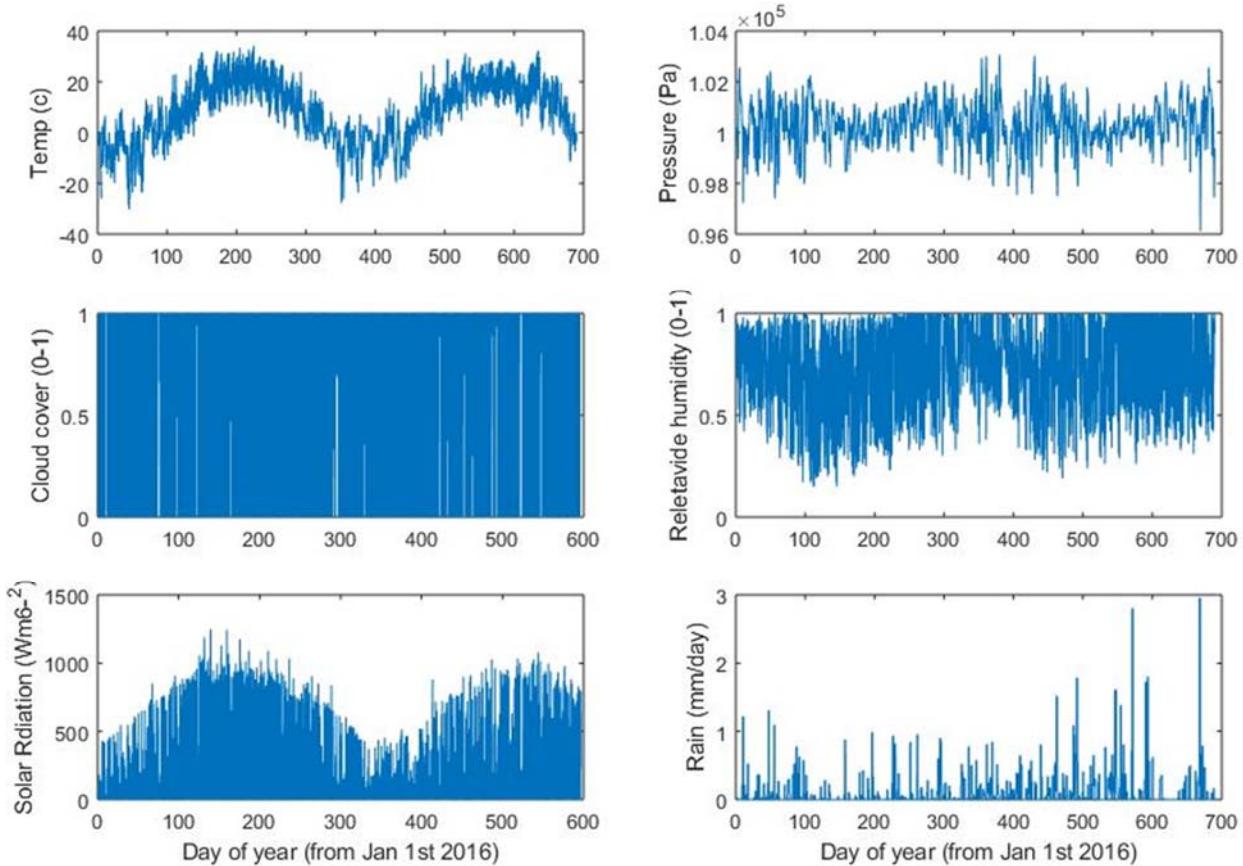


Figure 2- Meteorological data obtained from Kemptville, Drummond and Eagle Lake stations.

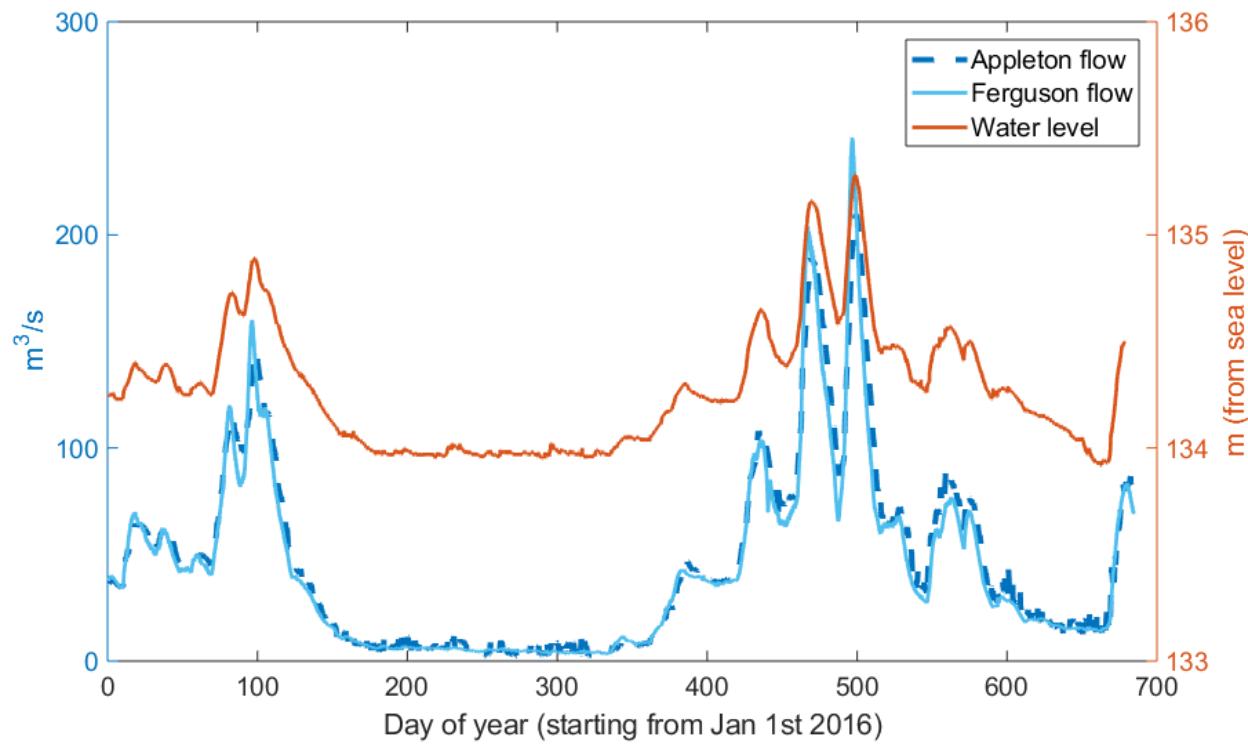


Figure 3- Appleton (outflow) and Ferguson (inflow) flow data and the water level.