

CIGLR Rapid Grant Proposal: *Protecting Great Lakes coasts during periods of high water*

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Great Lakes water levels have reached record highs in 2019, eroding shorelines, threatening and damaging public/private infrastructure (e.g., marinas, homes and cottages), and overwhelming water systems in communities. On July 7, 2019, strong winds from the northwest pushed Detroit River water above the storm water system in Lasalle, Ontario, resulting in significant flooding, closure of streets, and limiting access to homes, public spaces (closed swimming pools and sport fields) and many businesses. The flood waters have remained for two days, despite sunny weather and lower wind speeds. This type of flooding, driven by strong winds, was relatively unprecedented for the community of 30,000, but has been a growing concern for communities along Lake St. Clair and the Detroit River this summer. The flood occurred with no warning, as the community and region does not have technology to monitor changes in wind speed, wave height or water levels along the Detroit River. Such technology could have allowed the city to respond and warn residents.

The flooding also raises issues for the health of the Detroit River ecosystems, and downstream systems including Lake Erie. The receding water can carry urban waste, including nutrients, chemicals and notably road salt. A recent study found that road salt was a major issue in Essex County, with levels in run off and streams at ocean water levels. This receding water may also have low oxygen, which could have a negative impact on ecosystem health.

There is an urgent need to monitor water levels in the region and catch this event while it is still ongoing. This will allow the community to develop protocols and procedures for dealing with flooding, ultimately that will contribute to making the Detroit River coast resilient to environmental change for the community and ecosystem. *We request rapid funds (\$9,000 USD) from CIGLR to support water level, wind speed and direction and wave height instruments to be installed on the Detroit River.* Funds will be leveraged with instruments and technological support from the Realtime Ecosystem Observation Network (RAEON), which is based at the University of Windsor and provides instruments for Great Lakes research. These instruments will be real-time, providing data at intervals of less than 5 minutes that will be available to city officials, along with researchers (data will also be provided to databases, including GLOS through the RAEON data management platform). RAEON, with support from Limnotech (a CIGLR partner) will also provide instruments that will monitor salinity and DO, that will support ongoing research on fish movements and species at risk research in the Detroit River lead by the PIs.

Budget

We are requesting funds to cover the costs of real-time water level instruments, REAON will cover wind, wave, DO and salinity instruments, as well as deployment and maintenance of the instruments. All funds in USD.

	CIGLR Rapid Fund	RAEON
Wave height monitors (n = 4)	\$7,140	

Wave and Wind buoy (n =1)		\$30,173
Integrated AquaHub for DO and salinity (n = 1)		\$11,173
Sim cards and cellular plans (n = 6) <i>estimate for 6 months</i>		\$3,300
Overhead (26%)	\$1,860	N/A
Total	\$9,000	\$44,646