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## INFORMATION SYSTEMS

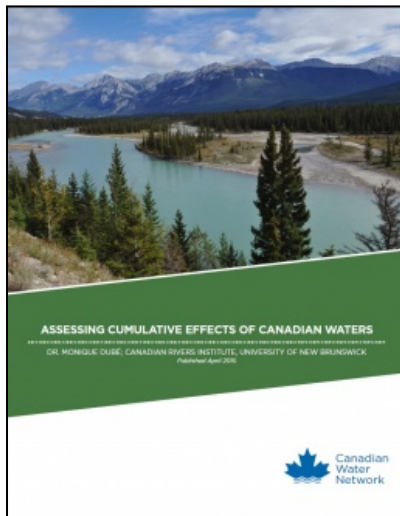
### Cumulative Effects Management

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## THREATS™ – The Healthy River Ecosystem Assessment System

Cumulative effects assessment and watershed planning / management requires these key components: 1) integrated monitoring to measure environmental changes due to a resource or land development; 2) modeling to predict environmental changes from different development scenarios; 3) policy, land use and watershed planning to establish a “sustainable vision” for the landscape; and, 4) a regulatory system that responds to monitoring results and ensures development is progressing along a planned trajectory and correcting the course, if necessary, through regulatory drivers. Significant progress has been made in Canada on modeling, policy, planning and development of regulatory systems. However, development of integrated monitoring tools (with wireless / internet capabilities) to support the components has not progressed to the same level. It is a significant limitation to tracking and assessing environmental change due to development activity and adaptive management. Therefore, cumulative effects management must recognize the sum of impacts from all landscape changes and actions.



**THREATS™** was originally developed from 2008 - 12 with the Canadian Water Network and team led by Dr. Monique Dubé. In 2016, Greenland secured the source code rights and received funding from the National Research Council – IRAP program. **THREATS™** is now available for use in Canada and projects with an integrated cumulative effects assessment, source water protection and watershed planning focus. The system is an Internet and (open source) GIS-based monitoring database platform that can access open data with proprietary client databases. In the summer 2017, discussions were initiated with Indigenous Peoples and resource industries to further customize **THREATS™** and with other stakeholders. **THREATS™** is now linked to available real-time climate and hydrometric data from all government stations in Canada. Therefore, **THREATS™** can now be used by researchers and watershed agencies to access accurate data, assess cumulative effects and store other watershed information.

The available **THREATS™** decision support system (and validated for use Ontario and Alberta) includes:

- A state-of-the-art database architecture designed to efficiently store / retrieve monitoring data from multiple monitoring stations, sampling events and contributing parties;
- Advanced statistical trends analysis;
- Dynamic updating of analysis as new data is added;
- Web accessibility for searching, plotting, mapping, preparing reports and adding data with a ‘dashboard’ type interface for managing and responding to environmental trends; and,
- Real-time ability to support a tier transition / triggers exceedance management approach while also having functionality to enable proactive risk mitigation practices and procedures.