

DIATOM-BASED BIOMONITORING IN CANADA: REFLECTIONS ON 10 YEARS OF DEVELOPMENT, IMPROVEMENT AND PERSUASION

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Canadian provinces and territories have the primary jurisdiction over most areas of freshwater management and protection, and establish their own guidelines, objectives and regulations following the recommendations of the Canadian Council of Ministers of the Environment. These different jurisdictional roles have led to a number of laws and policies specific to each province and territory (eg., *Sustainable Development Act* in Québec, *Clean Water Act* in Ontario, *Water Management Framework* in Saskatchewan, etc.).

All these regulations require integrated water management systems with a good knowledge and understanding of reference conditions and the development of monitoring tools indicating a measure of departure from reference state. However, water quality monitoring in Canada has mostly been based on traditional chemical measurements, and water agencies have been seeking new approaches allowing for a more adequate monitoring of aquatic ecosystem integrity. Efforts have been made (especially in Ontario and Quebec) to promote a macro-invertebrate biomonitoring network for evaluating aquatic ecosystem conditions. However, although macro-invertebrates are excellent general indicators of habitat and water quality at the watershed scale, macro-invertebrate monitoring alone cannot always provide a reliable indication of eutrophication and is not as sensitive to water quality fluctuations as diatom assemblages are.

Inspired by the success of routine diatom-based monitoring in certain European countries, a similar approach has been suggested for assessing stream biological integrity in Eastern Canada. The Eastern Canadian Diatom Index (IDEC: *Indice Diatomées de l'Est du Canada*) was developed almost 10 years ago to monitor the biological integrity of streams and rivers in Eastern Canada. The IDEC gained popularity in Eastern Canada and has been used successfully to evaluate the biological status of more than 1500 diatom assemblages over the past 10 years. The experience gained on diatom-based monitoring over the years as well as the large number of samples added to the database led to the modelling of a new version of the IDEC in 2012.

This presentation will explain the steps to the creation of the IDEC, its evolution over the years, and will also expose our reflections on 10 years of diatom-based development, persuasion, and ongoing challenges.