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Rosa Galvez

Laval University, Canada

Climate change and blue algal blooms: An example of extreme conditions

Canada has thousands of lakes with the number of lakes larger than three-square kilometers being estimated to 31 752 by the Atlas of Canada. Hundreds of these lakes are affected by algae blooms and implicate harmful cyanobacteria, posing toxic effects to human health, the environment and the Canadian economy. Toxic blue-green algae thrive in warm, slow-moving water and that is why lakes are particularly vulnerable. Harmful algae bloom during summer seasons. Warmer water due to climate change might favor harmful algae by encouraging blue-green algae survival and preventing water mixing. Moreover, Canada uses de-icing salts for winter road maintenance, which during spring are carried by surface runoff from highways ditches to streams and to lakes; this is provoking the presence of saline cyanobacteria to appear in freshwater environments. Algae need carbon dioxide to survive and higher levels of carbon dioxide in the air and water can lead to rapid growth of algae, especially toxic blue-green algae that can float or think according to their needs. While extreme rainfall events associated to climate change can dilute lake water volumes, these events are also followed by periods of drought that can lead to more algal blooms, or soil erosion carrying the associate undesired nutrients. This presentation will include statistics concerning Canadian lakes water quality; blue algae presence in Quebec province lakes. A case study will be presented: St-Augustin Lake, considered as an example where extreme conditions occur. Actions that can be applied to adapt and attenuate impacts.

Biography

Rosa Galvez background is in Civil engineering. In 1989 and 1994, she obtained her Masters and Doctorate in Environmental Engineering from McGill University, Canada respectively. She is a Full Professor at the Department of Civil and Water Engineering at Laval University in Quebec, Canada, were she served the last 6 years as Chair. Her fields of expertise include Water and Wastewater Treatment Process, Integrated Watershed Management, Municipal and Hazardous waste management, Soil Rehabilitation studies, Environmental Impacts Assessment, Risk Analysis and Aid Decision Methods. She is an internationally recognized researcher, author of hundreds of scientific articles and technical documents. More than 80 students have graduated under her supervision with many of them holding important posts in consulting and academic sectors around the world. She has received substantial funds that have allowed the construction and installation of state-of-the-art environmental laboratories.

galvez@sen.parl.gc.ca

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