



## **Real-time monitoring of water fluxes using Enviro-Net and IBM Streams<sup>®</sup> analytics**

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Enviro-Net (<http://www.enviro-net.org/>) is an open data platform aimed to support environment-driven research from seventeen environmental monitoring sites in ten countries. The platform serves a hub for hyper-temporal meteorological data collected via Wireless Sensor Networks, optical phenology data, and carbon and water flux data collected via eddy covariance instruments around the globe. Data collected using these instruments is subsequently used to explore changes in ecosystem health associated with hydrological pressures. Enviro-Net/Stream<sup>®</sup> analytics products provide scientists and policymakers with an unprecedented ability to monitor and visualize global hydrological changes such as droughts in real-time. Enviro-Net's ability to ingest and visualize tens of thousands of data points streamlines data analysis efforts conducted by individual researchers and collaborating research groups.

Enviro-Net has been developed by the University of Alberta, in partnership with the Inter-American Institute for Global Change (IAI) and IBM Alberta Center for Advanced Studies. This collaboration has resulted in the development of a software tool that builds upon the IBM Stream Analytics<sup>®</sup> and allows for real-time monitoring of water fluxes and other essential environmental variables. Enviro-Net<sup>®</sup> is now used to provide invaluable regional data for global carbon/water flux modeling in Central America, and to estimate evapotranspiration losses in mining environments in Canada, where real-time monitoring is essential for efficient resource management. Furthermore, this platform is unique in the sense that it gives decision-makers and researchers an ability to act on information that was previously not available in real time.

In this PICO presentation, we showcase Enviro-Net and its new hydrological toolbox using datasets acquired from a tropical dry forest in Costa Rica and a mine site in northern Alberta that holds the largest tailings ponds in the world. Our presentation involves a demonstration of Enviro-Net's capacity to visualize real-time water fluxes from eddy covariance systems.