



How do wetland type and location affect their hydrological services? – A distributed hydrological modelling study of the contribution of isolated and riparian wetlands

Maxime Fossey, Alain N. Rousseau, Stéphane Savary, and Alain Royer
INRS, Eau Terre Environnement ETE, Quebec City, Canada (maxime.fossey@ete.inrs.ca)

Wetlands play a significant role on the hydrological cycle, reducing peak flows through water storage functions and sustaining low flows through slow release of water. However, their impacts on water resource availability and flood control are mainly driven by wetland types and locations within a watershed. So, despite the general agreement about these major hydrological functions, little is known about their spatial and typological influences. Consequently, assessing the quantitative impact of wetlands on hydrological regimes has become a relevant issue for both the scientific community and the decision-maker community. To investigate the hydrologic response at the watershed scale, mathematical modelling has been a well-accepted framework. Specific isolated and riparian wetland modules were implemented in the PHYSITEL/HYDROTEL distributed hydrological modelling platform to assess the impact of the spatial distribution of isolated and riparian wetlands on the stream flows of the Becancour River watershed, Quebec, Canada. More specifically, the focus was on assessing whether stream flow parameters, including peak flow and low flow, were related to: (i) geographic location of wetlands, (ii) typology of wetlands, and (iii) season of the year. Preliminary results suggest that isolated and riparian wetlands have individual space- and time-dependent impacts on the hydrologic response of the study watershed and provide relevant information for the design of wetland protection and restoration programs.