Geophysical Research Abstracts
Vol. 17, EGU2015-14676, 2015
EGU General Assembly 2015

Tracers transport in Aquatic Vegetated Flows

Simonetta Rubol (1), Ilenia Battiato (2), and Felipe de Barros (3)

(1) Civil, Environmental and Mechanical Engineering, Universita'degli Studi di Trento, via Mesiano 77, CAP 38123, Trento, Italy, (2) Mechanical Engineering, San Diego State University San Diego, CA, USA., (3) Sonny Astani Department of Civil and Environmental Engineering University of Southern California

We address transport of a passive scalar in rivers and channels in the presence of submerged vegetation. A semi-analytical solution is obtained through the use of the generalized integral transform technique and based on the vertical velocity profile derived in Battiato and Rubol [Single-parameter model of vegetated aquatic flows, Water Resources Research 50.8 (2014)]. The proposed modeling framework allows to investigate the key parameters controlling solute transport in these complex flow environments such as the geometry of the submerged canopy. The solution can be used to design laboratory experiments and to predict fate and transport of contaminants in meadows. Due to its semi-analytical characteristics, the model has a low computational cost and successfully reproduces previous published experimental data.