Séminaire hydrologique

Lundi 27 février 2017 – 10h15-11h45
Université Pierre et Marie Curie
Salle de conférence l’UFR Terre Environnement Biodiversité (TEB), Tour 56-46, 2ème étage
(voir plan page suivante)

Chaque intervention comprendra une présentation de 20 minutes suivie de 20-25 minutes de discussion avec la salle. Les présentations seront en anglais.

10:15 – 11:00

Prof. Hubert Savenije, Université de Delft

Modelling catchments as living organisms

Abstract - Catchment-scale hydrological models frequently miss essential characteristics of what determines the functioning of catchments. The most important active agent in catchments is the ecosystem. It manipulates and partitions moisture in a way that it supports the essential functions of survival and productivity: infiltration of water, retention of moisture, mobilization and retention of nutrients, and drainage. Ecosystems do this in the most efficient way, establishing a continuous, ever-evolving feedback loop with the landscape and climatic drivers. In brief, our hydrological system is alive and has a strong capacity to adjust itself to prevailing and changing environmental conditions. Although most models take Newtonian theory at heart, as best they can, what they generally miss is Darwinian theory on how an ecosystem evolves and adjusts its environment to maintain crucial hydrological functions. Through a Darwinian approach, we can determine the root zone storage capacity of ecosystems, as a crucial component of hydrological models, determining the partitioning of fluxes and the conservation of moisture to bridge periods of drought. Another crucial element of physical systems is the evolution of drainage patterns, both on and below the surface. Models that do not account for these patterns are not physical.

11:00 – 11:45

Prof. Marco Borga, Université de Padoue

Integrating hydropower and variable renewable energies: a call for hydrology

Abstract - One of the main recommendations of the 2015 UN Convention on Climate Change (Paris Agreement) for an energy transition is to use renewable energy sources instead of conventional, usually fossil ones. Integrating hydropower, solar and wind power to balance energy demand, considering at the same time other critically important usages of water, brings new challenges to the hydrological community and new opportunities for better understanding of fundamental hydro-climatic processes. Variable renewable power generation is characterized by a large degree of variability inherited from their driving climate variables. The presentation illustrates a framework for exploring and identifying optimal mixes of energy sources, i.e. obtained with the optimal share for each source. Optimal mixes are being identified and discussed for a number of regions worldwide.