



Relations between hydrological and landscape indicators for headwater catchment similarity study - A way to extrapolate hydrologic behaviour of elementary catchments at regional extent, Languedoc Roussillon (southern France).

A. Crabit (1), F. Colin (2), and P. Lagacherie (3)

(1) INRA, UMR LISAH, France (crabit@supagro.inra.fr), (2) Montpellier SupAgro, UMR LISAH, France, (3) INRA, UMR LISAH, France

On a regional extent, there is a need of acquiring hydrological knowledge under elementary ungauged basins because of their importance in agricultural practices management. On such extent, we note a lack of information concerning catchment hydrological behaviour and we meet high spatiotemporal heterogeneities of rainfall repartition, soils, vegetation, land use and agricultural practices. This study tests the hypothesis of a relation between landscape characteristics and hydrology behaviour and propose a methodology that allows extrapolating hydrological response of Mediterranean elementary catchments on a regional extent from representative sampled catchments.

The methodology is based on a coupled field observations-modelling approach aiming to define statistical relations between hydrological and landscape indicators. Taking into account the hypothesis that two catchments, which look similar from their physical properties, have a similar hydrologic response, we are able to predict hydrological behaviour with a given uncertainty on ungauged elementary watersheds. The current study is conducted on 14 headwater elementary catchments (1km²) located in the Mediterranean region Languedoc-Roussillon, Southern of France. Each catchment is equipped with a light device composed by a rain gauge and a limnometric station. Due to the Mediterranean climate particularities (quick and intensive storms), catchment's hydrology is studied at the event scale. Based on observed data the following methodology to analyse hydrological similarities is: (i) to define, landscape and hydrological indicators considering a perceptual model of catchment function, (ii) to compare catchments from those indicators to establish a classification, (iii) to improve catchment similarities by using distributed hydrologic modelling on semi-virtual catchments which are synthetics catchments distorted from real ones (by changing hydrographic network density, land use, soil properties...)

In this poster, we will show results concerning landscape indicators and hydrological catchment behaviour, obtained during the field observations period, to highlight catchment hydrological similarities. Those results will be completed with few semi-virtual basins cases, defined from a distributed hydrologic modelling approach.