Geophysical Research Abstracts
Vol. 13, EGU2011-8592-1, 2011
EGU General Assembly 2011

Uncertainty estimation of historical streamflow records of mountainous watersheds

Anna Kuentz (1,2), Thibault Mathevet (1), Christian Perret (1), and Vazken Andreassian (2)

(1) EDF-DTG, Grenoble, France (anna.kuentz@edf.fr), (2) Hydrosystems and Bioprocesses Research Unit, Cemagref, Antony, France (vazken.andreassian@cemagref.fr)

Mountainous hydrosystems are particularly interesting because of the spatio-temporal heterogeneity of the atmospheric dynamics (rainfall, temperature, snow, etc.) and the variability of landscapes and hydrological processes. Moreover, the current context of climate variability and its impacts on mountainous hydrosystems increase the necessity to improve knowledge and understanding of mountains hydrology.

In this context, the aim of our research is to understand the past climate and hydrological variability of the Durance watershed in the south Alps during last century (1900-2010). This watershed is characterized by variable hydrological processes (from snowy to Mediterranean regimes) and a wide range of anthropogenic influences (hydropower generation, irrigation, industries, drinking water, etc.). We are convinced that this research is necessary before any climate and hydrological projections.

The aim of this paper is to highlight the numerous long-term streamflow records of the watershed. During last century, streamflow estimation techniques have largely evolved. Uncertainty estimation of streamflow records is very important to assess data quality and homogeneity over time. On a set of gauging stations, we present the uncertainty estimation of old streamflow records due to (1) daily punctual measurements of water height at the gauging station or (2) manual estimation of the daily mean water height at the gauging station. Results show that both methods generate biased streamflow estimation and non-homogeneous streamflow records. Moreover, the daily punctual measurement, widely used at the beginning of hydrometry, lead to moderate to strong bias. This bias depend on measurement time, watershed dynamic, hydrological processes and regime. As an example, due to snowmelt in the spring season, mean daily streamflow could be bias up to 20% on certain watersheds.