



Global change effects on a Mediterranean river flow in NE Spain

Eduard Pla (1), Diana Pascual (1), Joan Albert López-Bustins (2), Robert Savé (3), Carmen Biel (3), Joan Serra (3), Roger Milego (4), and Karim Tamoh (5)

(1) CREAF. Universitat Autònoma de Barcelona. Bellaterra. Spain. accua@creaf.uab.cat, (2) Group of Climatology. Universitat de Barcelona. Barcelona. Spain, (3) IRTA. Caldes de Montbui. Spain, (4) ETC/LUSI. Universitat Autònoma de Barcelona. Bellaterra. Spain, (5) Hydrogeology Group. Universitat Politècnica de Catalunya. Barcelona. Spain

Climate change is generally accepted as a factor influencing hydrological cycles worldwide. However, these cycles are also affected by other phenomena, both (i) of natural (geomorphological and ecosystem changes, natural climate variations, etc) and (ii) human-related (changes of agro-forest uses, developments and settlements, changes on social dynamics, etc) origin.

In this context we have studied flow changes in the headwater of the Fluvià River, la Vall d'en Bas (NE Spain), along the recent 25 years (1984-2008). We have registered a 60%-reduction of river flow during this period. We have not detected a significant decrease on rainfall values (which remained relatively stable). However, we have measured an increase of 10% in mean annual temperature (+1.2 °C) which resulted on a significant 9%-increment in ETP.

This ETP increase could partially explain the reduction of surface water flow in the headwater of the Fluvià River. However, we conclude that there might be other reasons behind this flow decrease, such as modifications on forest and agricultural practices during the recent decades. We have detected significant land use changes for the period studied: rural abandonment and consequent natural colonization by forest species, reduction of forest management practices, increase of water demand (i.e., increase of irrigated crops, industry development and diffuse housing spreading). In further research we will analyze the contribution of each factor in water dynamics in order to define adaptive strategies.

This work is part of the ACCUA project (www.creaf.uab.cat/accua) that aims at evaluating the territorial vulnerability of the Mediterranean littoral to the main effects of global change in relation to water availability.