



Impact of meteorological and hydrological extreme events (floods and droughts) on the Rhone delta hydraulic management

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The variability of natural and anthropic forcing processes, which are conditioning short and mid term evolution of the Rhone delta hydro-system, is directly impacted by global change. As a contribution to the IMPLIT project (“Impact of extreme events (sea storms and sea surges) linked to climatic change on the hydrosystems of the French Mediterranean coast”), funded by the French Ministry of Ecology and Sustainable Development, our task concern the analysis of the limits of hydraulic management in the “ Ile de Camargue ” hydrosystem, in critical situation (strong rains, river floods and sea storms). The forcing conditions as input to the central lagoon system are based on real hydrographs of drainage of the flooded area after dyke breaching, observed during the 1993-2003 period, for floods of 50 to 100 years return periods. Scenarii for external forcing conditions (river and sea water levels, wind speed and direction) are derived from analysis of available hydrometric and climatic data, using Intensity-duration-frequency and peak over threshold analysis. On the other side droughts and high temperature are impacting agriculture and aquatic ecosystem management. Some recent tendencies are depicted for local climatic conditions, comparing 1960-1990 and 1991-2005 periods: an increase of daily maximum temperature, a stronger variability of monthly precipitations. Due to combined relative sea level rise and more severe spring and winter droughts, the central lagoons are submitted more frequently to saline intrusion in summer. And the migration of the salt wedge estuary lead to interruptions of water uptake for irrigation during last summers in the southern delta.