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Context and objectives

The CRUE-SIM (2014-2017) project is focused on the transport of dissolved and sorbed matter during flash floods. It is an interdisciplinary project that brings together atmosphere physicists, hydrologists and oceanographers to study and model flash floods across the Mediterranean region: it integrates water and sediment transport as a consequence of intense rainfall, from the catchment to the sea. The objectives of the project are:

1. the coupling between atmosphere, ocean and sea with continental hydrological and hydrodynamic models
2. the integration of the feedbacks and the forcing continuity from one compartment to the other along the brief but intense events that will be studied

In this poster we present the contribution of SWAT sub-daily modelling within the CRUE-SIM project.

CRUE-SIM modelling approach

- 4 compartments, 4 coupled models:
  - Atmosphere
  - Ocean
  - Symphonie (Meso-NH, meso-scale non-hydrostatic model)
  - SWAT (soil and water assessment tool)

Input data

DEM : SRTM 90 m
Land use : Corine Land Cover
Soil : FAO classes, INRA soil properties
Precipitation : SAFRAN when no rain, Meso-NH during rainfall events
PET climate variables : SAFRAN

SWAT model set up

Minimal drainage area = 1500 ha
66 sub-basins (20±14 km²), 549 HRU
Warm up : 2005-08, Cal.: 2009-11, Val. 2012-15

SWAT-CUP set up

Runoff model

Sub-daily time-step simulation : Green & Ampt equation

Conclusions and perspectives

- SWAT is able to simulate the hourly discharge of a highly reactive Mediterranean coastal basin
- The calibration of total suspended sediments during flash floods is in progress: next step!