

# Modelling of continental surfaces

- 1) Models directed towards long term water budget simulations (WG2)
  - Continuous modelling
  - Modelling of the whole Mediterranean basin
  - Regional (1000 km<sup>2</sup>) modelling of some catchments with improved resolution
  - Local scale modelling for process studies and improvement of larger scales models
- 2) Models directed to flash flood modelling
  - Regional modelling for risk assessment
  - Local scale modelling for process studies and improvement of larger scale models
  - Improvement of real time models

# TTM Multi-scale modelling of continental surfaces?

TTMa: Whole Mediterranean basin hydro-meteorological modelling (WG2)

- Intercomparison of models, uncertainty assessment using multi-model runs

TTMb: Regional/Large river basin modelling (WG2 (evapotranspiration needed), WG3)

- Upscaling towards the whole Mediterranean model
- Intercomparison of models on selected catchments?

TTMc: Improvement of process parameterization using process observations

TTMd: Integrated modelling/interactions between the various scales of modelling

- Integration of improved process parameterization into regional models
- Integration of improved regional parameterization into the whole Mediterranean basin

TTMe: Real time modelling of flash floods

TTMf: Groundwater modelling?

TTMa: Whole Mediterranean basin hydro-meteorological modelling (WG2)  
Leading person: J.F. Mahfouf, CNRM, France

Model	Characteristics	Group
ARPEGE-SURFEX	Improved resolution 10 km, Use of high quality forcing, near real time satellite products, inclusion of a routing module	CNRM, France
LISFLOOD	Simulation of streamflow, evapotranspiration, soil moisture, extend existing catchments to the whole Mediterranean	JRC, Italy
Simplified rainfall-runoff models	Base-line models to evaluate the gain with the increase in complexity	Jim Freer??

# Data requirement to run and evaluate models

- At the mediterranean basin level :
  - Climatic data
    - ECMWF reanalysis (80 km) from 1989
    - Solar radiation (SAF land and MSG/SEVERI Products)
    - Vapour pressure products (willing of developping new tools)
    - **Times series of temperature, climate data, and precipitation on various areas (validation of reanalysis)**
  - Land use
    - ECOCLIMAP II, POSTEL 300m land Use map
    - **Land use evolution since 1989**
    - **Water use by human activities : Irrigation, urban areas**
  - Digital Elevation Model
    - American DEM model
  - Soil map and soil hydraulic properties data base
    - European soil map at the 1/1000000 scale, global FAO map
    - **Improved description of maximum extractable water (can rely on smaller scale existing national or regional soil map. How to collect them? How to homogeneize them?)**
  - Aquifer geometry and piezometer data
  - River discharge data
  - Soil moisture and vegetation
    - satellite products (SMOS, Cyclope, ....)

# Regional/Large river basin modelling

Leading person: A. Montanari, Univ. Bologna, Italy

Model	Area	Simulated processes	Contact
SIM	France	Surface energy balance, evapotranspiration, soil moisture, streamflow, groundwater flow	CNRM, France
LIQUID platform	Gard and Ardèche river	Evapotranspiration, soil moisture, streamflow.	Cemagref HHLY, France
AFFDEF	Secchia, Reno, Samoggia and Sieve rivers in Italy. Extension to Emilia Romania region	Evapotranspiration, soil moisture, streamflow.	University of Bologna, Italy
Safran-ISBA	Set up the system over the Ebro basin	Surface energy balance, evapotranspiration, soil moisture, streamflow?	Ebro Observatory, Spain
CHyM	Set up over Croatia	Streamflow, others?	Hydrometeorology services, Croatia
??	Set up over the Duero basin		To be organised
	Other proposals???		

# Data collection for regional modelling

- The same data as before, but with increased resolution and more specifically
  - Improved resolution for rainfall products (use of radar data) (WG3 in particular)
  - Increased density of streamflow measurements
- Rely on existing data on pilot sites and on additional data collected during HyMex from pilot sites and super-sites

# TTMe: Improved real time modelling of flash floods

## Leading person: ??

Model	Area	Group
LISFLOOD	Extension to the whole Mediterranean basin with possible focus on more densely instrumented sites	JRC, Italy
N-Topmodel	Set up over the whole OHM-CV HO	Edytem, Chambéry and LTHE, Grenoble, France
AFFDEF	Secchia, Reno, Samoggia and Sieve rivers in Italy.	University of Bologna, Italy
ATHYS platform	Set up over the whole OHM-CV HO? Or on selected catchments	HSM, Montpellier, France
Meso-NH/Surfex/Top model	Set up over the whole OHM-CV HO	CNRM, France

Other proposals???

# Data collection for (real time) modelling of flash floods

- Need for more measurements of streamflow during flash-floods
  - Increase the density of the LS-PIV camera network
  - Rely on post flood investigation
  - Need for a better knowledge of soil moisture: is the simulated soil redistribution realistic (aircraft measurements?)



# TTMc/TTMd: Improvement of process parameterization and integration in larger scale models

- A large diversity of processes so quite difficult to organize
- Related to HyMex data acquisitions during the EOP and SOP
- A need to work in close collaboration with regional scale and whole Mediterranean scale modelers to better define what they need and how they need it (compatibility between existing modeling frameworks)