

Changes in climate extremes and associated impact in hydrological events in Romania (CLIMHYDEX)

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General objective:

Improving our knowledge in understanding the complex mechanisms controlling the variability of the most important climate extreme events in Romania at various time scales, to estimate the uncertainty associated to their projections in the future perturbed climate and to quantify climate change impact on hydrological regime, focusing on extremes events.

Partners:

- National Meteorological Administration (**coordinator**)
- National Institute of Hydrology and Water Management
- University of Bucharest, Faculty of Physics

Acknowledgements

This project is funded by the UEFISCDI, contract nr 5/2012.05.

WP2

- Seasonal/annual time series of climate (about 30 indices) and hydrological extremes;
- High temporal resolution (10 min) of rainfall data on pilot basin scale, 1km x1km (last 7 years);
- High resolution teledetection data ;
- Long term (1961-210) high resolution temperature and precipitation data set over Romania; 6h-temporal resolution, 1kx1km-spatial resolution.

WP3

- Mechanisms controlling the variability of seasonal extreme climate events using advance statistical techniques (EOF, CCA, etc) and various large-scale climate variables;
- Mechanisms controlling the heavy rainfall on short time.

WP4

- Developing of statistical downscaling models (SDMs) for seasonal climate extremes;
- Developing of SDMs for high spatial-temporal resolution climate parameters on river basin scale;
- Validation of global/regional climate models;
- Climate change scenarios for seasonal extremes over Romania and high resolution climate parameters on basin scale; estimation of the associated uncertainties.

WP5

- Extrapolation of spatial pattern of hydrological extreme events;
- Analysis of solid inflow and outflow from Tungujei reservoir during hydrological extremes;
- Quantifying the impact of climate change on the degree of silting-up of the Tungujei reservoir;
- Analysis of groundwater resources and the exchange between surface water and groundwater;
- Calibration of hydrogeological model and quantification of climatic factors on groundwater;
- Calibration of hydrological models with distributed and concentrated parameters in the selected river basins;
- Simulation of flow in selected basins under climate change scenarios; estimation the impact on hydrological extremes;
- Quantification of climate change on extreme flow regime by building impact functions.

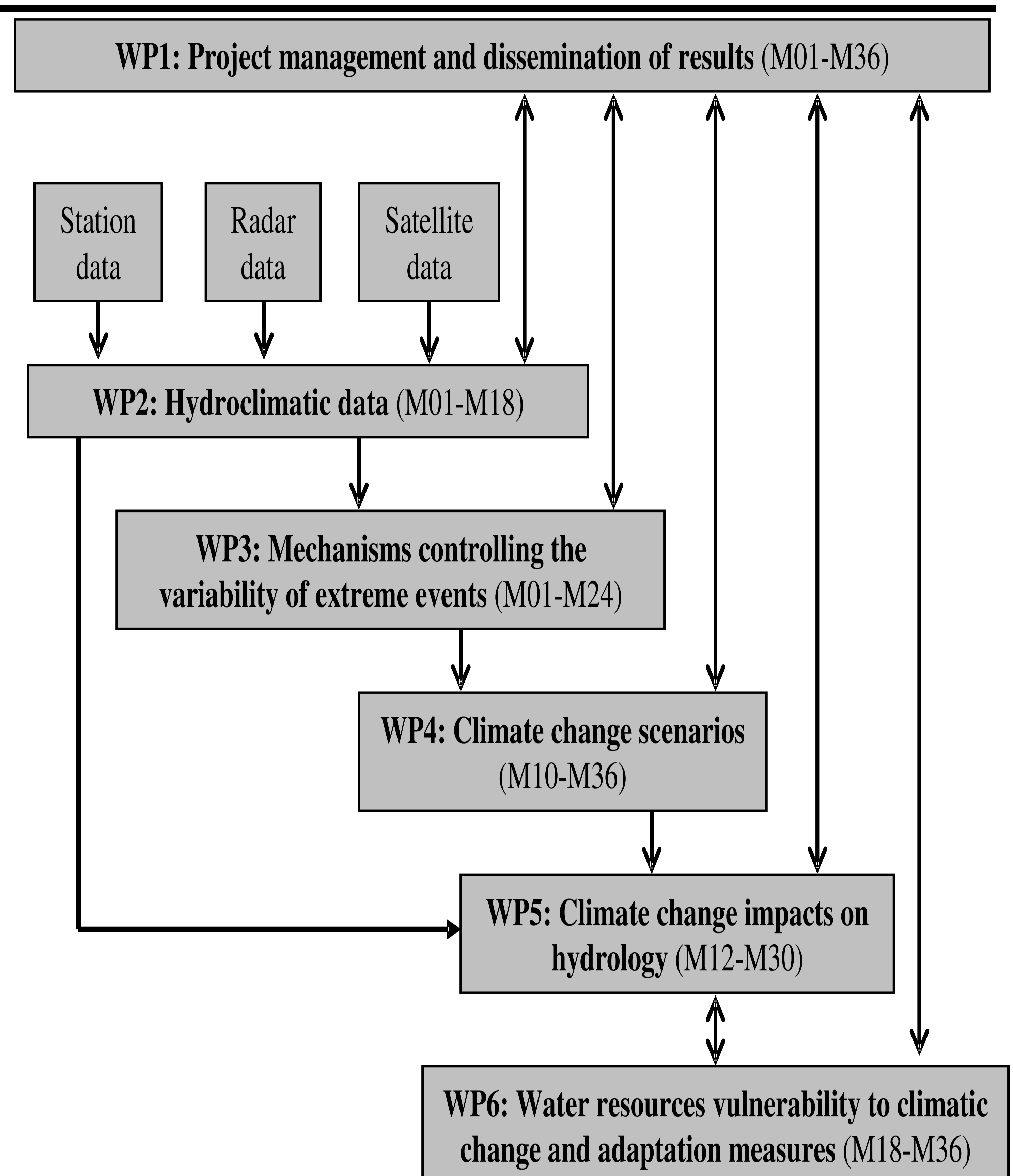


Fig. 1. The linkages between the workpages (WPs) in this project.

WP6

- Forecast of water demands of utilities;
- Determination of water resources vulnerability indicators;
- Measures for the mitigation of water resources vulnerability to the impact of climatic changes.

Novelty: Interdisciplinary approach to understand the mechanisms controlling the climate extremes leading to hydrological extremes; a wide range of indices describing the climate extremes and high quality and high resolution climate data will be for the first time produced ; developing of improved SDMs (including new models) on high spatial-temporal resolution; developing of improved hydrological models for pilot hydrological basins at various spatial-temporal scale, distributed models will be used for the first time in Romania.