

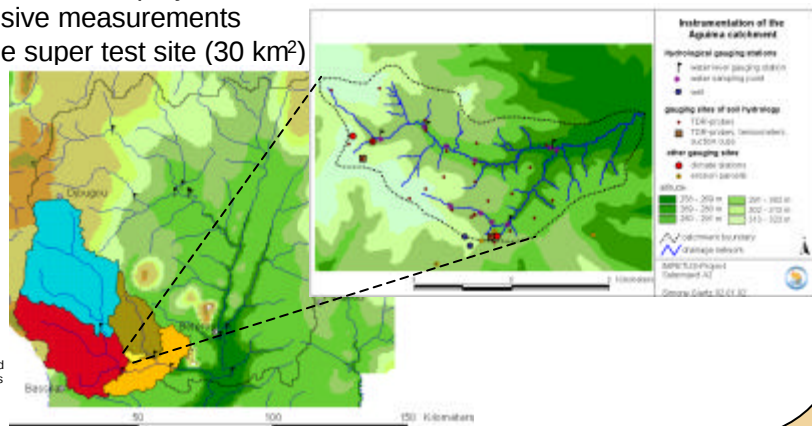
Soil Water Dynamics, Surface Runoff, Groundwater Recharge, and Soil Degradation on Local to Regional Scale

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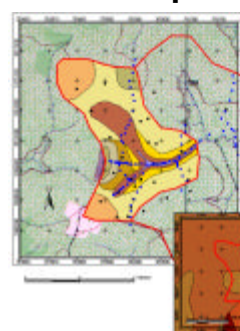
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Catchments – local to regional scale

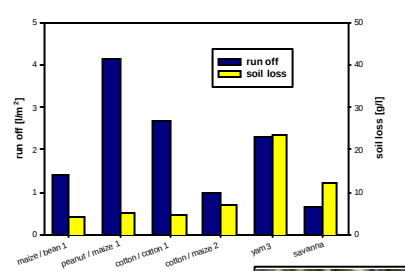
- nested approach: investigated catchments from local to regional scale (from 3 to 15.000 km²)
 - data of CATCH project within the HVO basin
 - intensive measurements at the super test site (30 km²)
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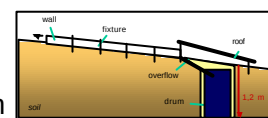
Soil map and erosion plots



Run off and Soil loss of different cultures

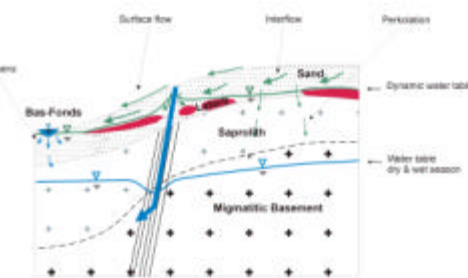


- analysis of the quality of the regional soil map 1:200.000 at the super test site scale (30 km²)
- analysis of dominant processes of soil genesis (influence of water)
- analysis of the effect of land use on erosion and soil loss

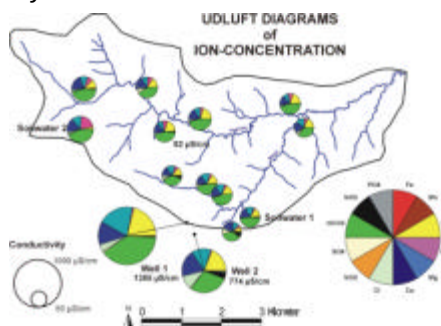


Hydrogeology

- analysis of the dominant processes concerning groundwater recharge
- development of a conceptual hydrogeological model based on water chemistry



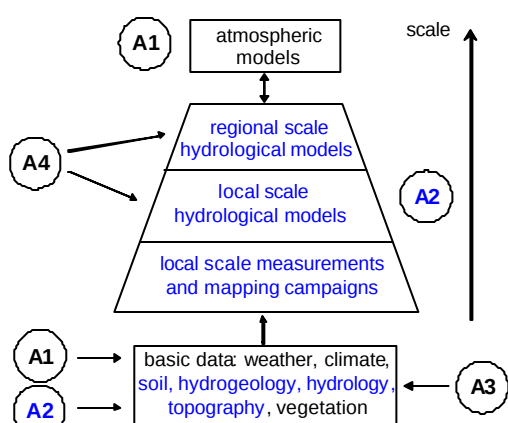
- analysis of the catchment water chemistry



Objectives of subproject A2

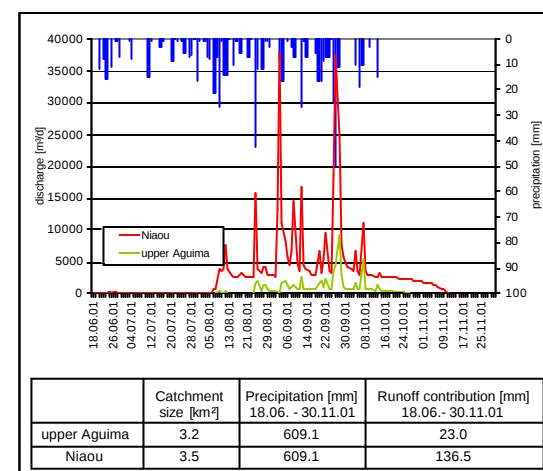
- to understand the hydrological processes under subhumid tropical conditions
- to reproduce the catchment water fluxes by a hydrological model
- to develop a tool for a scenario analysis of environmental and climate change effects on catchment hydrology

A2 within the IMPETUS network



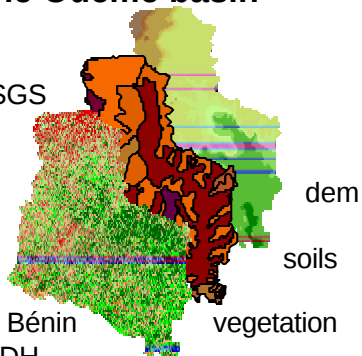
Catchment hydrology – local scale (super test site)

- analysis of dominant processes for runoff generation
- analysis of the effects of soil properties and vegetation distribution on runoff generation at the local scale
- analysis of soil water dynamics
- analysis of the spatial variability systematics



Hydro GIS – data base of the Ouémé basin

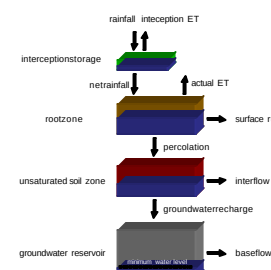
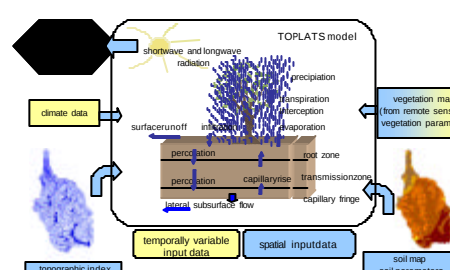
- digitised spatial data:
 - digital elevation model 1:200.000 and USGS
 - soil map 1:200.000
 - vegetation classifications A3 and USGS
 - geological map 1:200.000
 - available temporal data:
 - climate station Parakou
 - rainfall gauges CATCH and met. service Bénin
 - discharge gauging stations CATCH and DH
 - IMPETUS-measurements at the local scale (Aguima catchment)
 - (climate, soils, vegetation, topography, hydrogeology)
-
- The map displays the spatial distribution of three key data layers: digital elevation model (DEM), soil types, and vegetation. The DEM is represented by brown areas, indicating higher elevations. Soils are shown in green, and vegetation is shown in red. The map includes a legend on the right side with labels for 'dem', 'soils', and 'vegetation'. A scale bar at the bottom indicates distances in kilometers (0, 10, 20, 30 km).



Hydrological modelling on different scales

process based

conceptual



- model calibration versus physical interpretation of model parameters
- feasibility of the model to be used for scenario analysis
- feasibility of coupling to the atmosphere and to socio-economic factors (anthropogenic influence and its effect on the water cycle)
- validation and quality assessment of the model (uncertainty analysis)