New advances in computing technology plus data availability from the Internet have made high resolution modelling of distributed hydrologic processes possible. Using the program Soil Water Assessment Tool (SWAT) (Arnold, et al., 1998) (http://www.brc.tamus.edu/swat/), in this WP, we will apply a high-resolution (sub-catchment spatial and daily temporal resolution) water balance model to the entire Black Sea Catchment (BSC). The BSC model will be calibrated and validated using river discharge data, river water quality data, and crop yield data. Looking at the hydrological components, calibration and validation based on ET and RO ensure a correct aquifer recharge and soil water storage component. As part of the modelling work, uncertainty analysis will also be performed to gauge the confidence on all model outputs. As SWAT is an integrated model containing a large agricultural management component, the spatial variation in the quality of water balance components will provide a good indication of critical regions across the BSC. Subsequent analysis of land use change, agricultural management change, and/or climate change can then predict the consequence of various scenarios.