Effects of different scale land cover maps in watershed modelling

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Water management is a rather complex process that usually involves multiple stakeholder, multiple data and sources, and complex mathematical modelling.

One of the key data sets to understand a particular water system is the characterization of the land cover. Land cover maps are essential for the estimation of environmental variables (e.g. LAI, ETa) related to water quantity. Also, land cover maps are used for modelling the water quality. For instance, watersheds that have intensive agriculture can have poor water quality due to increase of nutrients loading; forest fires have a significant negative impact over the water quality by increasing the sediment loads; forest fires can increase flood risks. The land cover dynamics can as well severely affect the water quantity and quality in watersheds.

In the MyWater project we are conducting a study to supply water quantity and quality information services for five study areas in five different countries (Brazil, Greece, Mozambique, Netherlands, and Portugal). In this project several land cover maps were produced both at regional and local scales, based on the exploitation of medium and high resolution satellite images (MERIS and SPOT 4). These maps were produced through semi-automatic supervised classification procedures, using an LCCS based nomenclature of 15 classes. Validation results pointed to global accuracy values greater than 80% for all maps.

In this paper we focus on studying the effect of using different scale land cover maps in the watershed modelling and its impact in results.