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A Project for Developing an Original Methodology Intended for Determination of the River Basin/Sub-Basin Boundaries and Codes in Western Mediterranean Basin in Turkey with Perspective of European Union Directives

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From the view of integrated river basin management, basin/sub-basin boundaries should be determined and encoded systematically with sufficient accuracy and precision. Today basin/sub-basin boundaries are mostly derived from digital elevation models (DEM) in geographic information systems (GIS). The accuracy and precision of the basin/sub-basin boundaries depend primarily on the accuracy and resolution of the DEMs. In this regard, in Turkey, a survey was made for the first time within the scope of this project to identify current situation, problems and needs in General Directorates of State Hydraulic Works, Water Management, Forestry, Meteorology, Combating Desertification and Erosion, which are the major institutions with responsibility and authority. Another factor that determines the accuracy and precision of basin/sub-basin boundaries is the flow accumulation threshold value to be determined at a certain stage according to a specific methodology in deriving the basin/sub-basin boundaries from DEM. Generally, in Turkey, either the default value given by GIS tool is used directly without any geomorphological, hydrological and cartographic bases or it is determined by trial and error. Although there is a system of catchments and rivers network at 1:250,000 scale and a proper method has already been developed on systematic coding of the basin by the General Directorate of State Hydraulic Works, it is stated that a new system of catchments, rivers network and coding at larger scale (i.e. 1:25,000) is needed. In short, the basin/sub-basin boundaries and codes are not available currently at the required accuracy and precision for the fulfilment of the obligations described in European Union (EU) Water Framework Directive (WFD). In this case, it is clear that there is not yet any methodology to obtain such products. However, a series of projects should be completed such that the basin/sub-basin boundaries and codes are the fundamental data infrastructure. This task must be accomplished by the end of the negotiation process with the EU. For these reasons this subject is chosen as primary and important goal in this project issue and it is aimed to develop an original methodology for determining the boundaries and codes of the drainage basins/sub-basins at required accuracy and precision for the fulfilment of obligations described in the WFD.

In Turkey, existing highest accuracy and reliable elevation and hydrography data will be used for the first time, in this project. Along with the widely known and used flow accumulation threshold approaches, the approach developed by Gökgöz et al. (2006) will be used as well. The practicability and suitability of the encoding method developed by the General Directorate of State Hydraulic Works and the Infrastructure for Spatial Information in Europe will be verified respectively. The resulting drainage network, basin/sub-basin boundaries and codes will be compared to CCM2 (Catchment Characterisation and Modelling), ECRINS1.5 (European Catchments and Rivers Network System) and Catchments and Rivers Network System of General Directorates of State Hydraulic Works.
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