



A new world lakes database for global hydrological modelling

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Lakes are crucial systems in global hydrology, they constitutes approximately a 65% of the total amount of surface water over the world. The recent advances in remote sensing technology have allowed getting new higher spatiotemporal resolution for global water bodies information. Within them, ESA global map of water bodies, stationary map at 150 m spatial resolution, (Lamarche et al., 2015) and the new high-resolution mapping of global surface water and its long-term changes, 32 years product with a 30 m spatial resolution (Pekel et al., 2016). Nevertheless, these databases identifies all the water bodies, they do not make differences between lakes, rivers, wetlands and seas. Some global databases with isolate lake information are available, i.e. GLWD (Global Lakes and Wetland Database) (Lernhard and Döll, 2004), however the location of some of the lakes is shifted in relation with topography and their extension have also experimented changes since the creation of the database.

This work presents a new world lake database based on ESA global map water bodies and relied on the lakes in GLWD. Lakes from ESA global map of water bodies were identified using a flood fill algorithm, which is initialized using the centroid of the lakes defined in GLWD. Some manual checks were done to split lakes that are really connected but identified as different lakes in GLWD database. In this way the database associated information provided in GLDW is maintained. Moreover, the locations of the outlet of all them were included in the new database. The high resolution upstream area information provided by Global Width Database for Large Rivers (GWD-LR) was used for that. This additional points location constitutes very useful information for watershed delineation by global hydrological modelling.. The methodology was validated using in situ information from Sweden lakes and extended over the world. 13 500 lakes greater than 0.1 km² were identified.