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Full-automatic retrieval of global 90-m water mask from multi-decadal LANDSAT-GLS images

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Satellite-based high-resolution global water mask is essential for studies on terrestrial hydrology, aquatic ecosystem, and lake/wetland carbon cycle. In order to overcome drawbacks of previous water mask products (e.g. limited resolution not adequate to resolve small channels/levees, gaps in water mask due to cloud/ice/snow, unclear separation of permanent water body and temporally inundated area), a fully automated algorithm to retrieve global water mask from multiple satellite images is developed. Here we introduce new global 90-m water mask based on multi-decadal LANDSAT-GLS images. Analysis of the new water mask database suggested following advantages to previous water mask products: 1) Continuity of water body is ensured by filtering cloud/ice/snow and compositing multiple images, 2) Permanent water bodies (river channels, lakes) and temporally inundated area (floodplains, wetlands) are distinguished by calculating frequency of water body existence in multi temporal images, 3) Strict separation of river channels and surrounding floodplains is achieved by representing small channels and levees at 90 m resolution, 4) Small lakes in mountainous areas are well captured by classifying water and shadow using NDWI, NDVI, and topographic slope. Details of methods and further analysis are to be introduced at the conference.