International Society for Geomorphometry Coffee Talk

February 5th, 2025

7:00 MDT (UTC -7), 9:00 EST (UTC -5), 11:00 BRT (UTC -3), 14:00 GMT (UTC +0), 15:00 CET (UTC +1), 16:00 EET (UTC +2), 22:00 CST (UTC +8)

Hydrography90m: pushing the boundaries of computational hydrology

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Bio: Dr. Amatulli is a passionate forester and spatial modeler by training (M.Sc. & Ph.D. in GeoScience and Forestry) and computer scientist by trade. His research activity is mainly dedicated to spatial modeling, GIS and remote sensing with special emphasis in species distribution model, areal distribution and potential shift under climate change condition, wildland fire occurrence and pattern recognition, and wildfire risk assessment based on human and bio-physical parameters. Ultimately, his dealing with geomorphology and stream networks analysis to derive high accuracy flow estimation. He is daily dealing with high resolution data in the context of complex and modern modeling techniques using stand-alone implementation process under Linux environment. He supports the use of open source for ecological modeling giving dedicated courses using (and maintaining) the www.spatial-ecology.net web page.

Abstract: Streams and rivers drive several processes in hydrology, geomorphology, geography and ecology. A global standardized hydrographic network that accurately delineates streams and rivers, along with their topographic and topological properties, is needed for worldwide environmental applications. Using the MERIT Hydro Digital Elevation Model at 90m and by employing a suite of GRASS GIS hydrological modules, we calculated the range-wide upstream flow accumulation and flow direction to delineate a total of 1.6 million drainage basins and extracted globally a total of 726 million unique stream segments with their corresponding sub-catchments. Besides, stream topographic variables comprising stream slope, gradient, length, and curvature attributes as well as stream topological variables to allow for network routing and various stream order classifications were computed. The validation shows that the newly developed Hydrography90m has the highest spatial precision and contains more headwater stream channels compared to three other global hydrographic datasets. More information at https://doi.org/10.5194/essd-14-4525-2022

Register here: https://forms.gle/nFEWc8L2hjT1bA989

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