

MERIT Hydro: Global 90m-resolution hydrography map based on latest topography datasets.

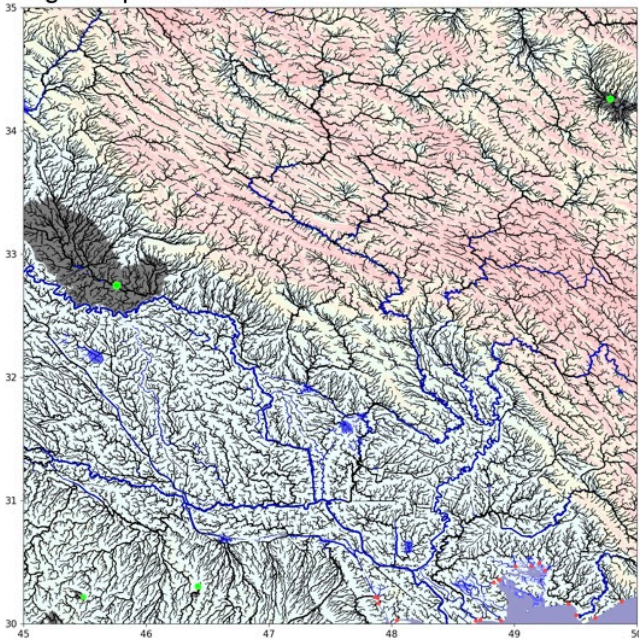
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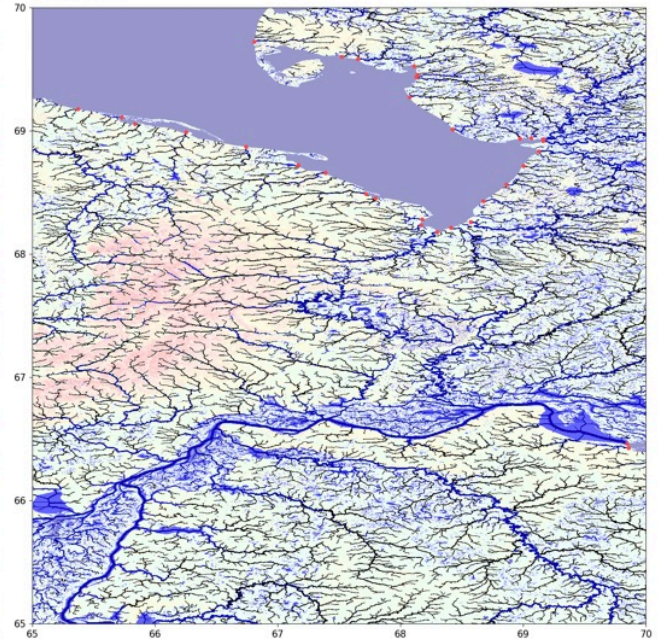
High-resolution raster hydrography maps are a fundamental data source for many geoscience applications. Here we introduce MERIT Hydro, a new global flow direction map at 3 arc-second resolution (~90 m at the equator) derived from the latest elevation data (MERIT DEM) and water body datasets (G1WBM, GSWO, and OpenStreetMap). We developed a new algorithm to extract river networks near-automatically by separating actual inland basins from dummy depressions caused by the errors in input elevation data. After a minimum amount of hand-editing, the constructed hydrography map shows good agreement with existing quality-controlled river network datasets in terms of flow accumulation area and inland basin distribution. The location of river streamlines was realistically aligned with existing satellite-based global river channel data. Comparison to GRDC gauges confirmed the accuracy of drainage basin delineation for global river networks in most cases. Discrepancies in flow accumulation area were found mostly in arid river basins containing depressions that are occasionally connected at high water levels and thus resulting in uncertain watershed boundaries. MERIT Hydro improves on existing global hydrography datasets in terms of spatial coverage (between N90 and S60) and representation of small streams, mainly due to increased availability of high-quality baseline geospatial datasets. The new flow direction and flow accumulation maps, along with accompanying supplementary layers on hydrologically adjusted elevation and channel width, will advance geoscience studies related to river hydrology at both global and local scales.

Keywords: Global Hydrology, River dataset

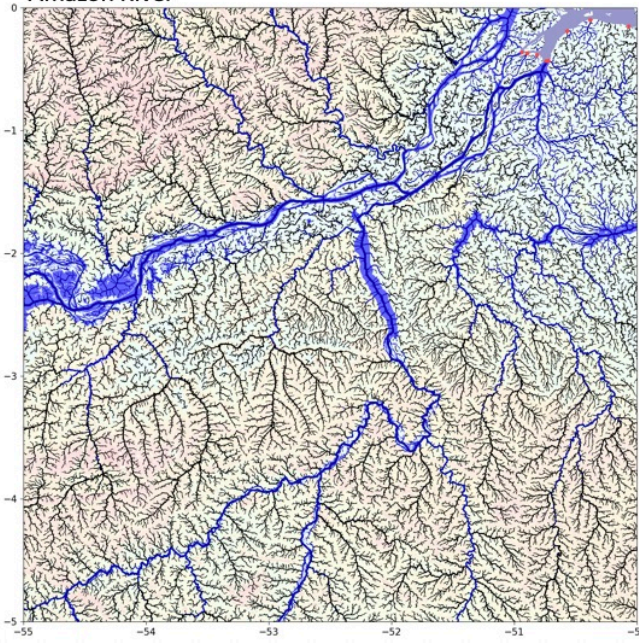
Tigris-Euphrates River



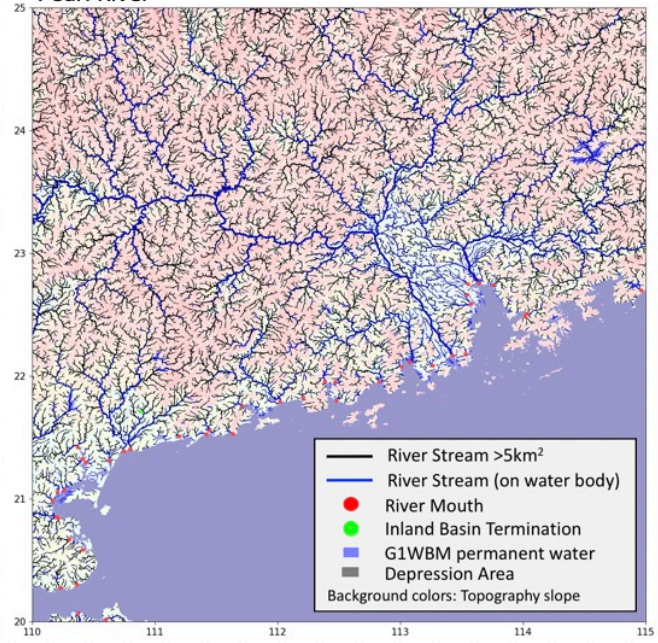
Ob River



Amazon River



Pearl River



- River Stream >5km²
 - River Stream (on water body)
 - River Mouth
 - Inland Basin Termination
 - G1WBM permanent water
 - Depression Area
- Background colors: Topography slope