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Two-monthly maximum water depth for the Murray–Darling Basin: Usage guidance

David J. Penton [a], Jin Teng [a], Catherine Ticehurst [a], Steve Marvanek [a], Andrew Freebairn [a], Jai Vaze [a], Fathaha Khanam [b] and Ashmita Sengupta [a]

[a] Commonwealth Scientific and Industrial Research Organisation, Australia
[b] Murray–Darling Basin Authority, Australia
Email: dave.penton@csiro.au

Abstract: The recently released two monthly maximum water depth maps by Teng et al., (2023) provide opportunities for scientists to examine the relationship between hydrological and ecological processes. The depth maps provide a consistent spatial estimate of flood water depth across the Murray–Darling Basin (MDB) over the past 35 years. The product is available from CSIRO's Data Access Portal at (https://doi.org/10.25919/c5ab-h019) and through web portal (https://map.csiro.easi-eo.solutions/). The dataset including its validation against hydrodynamic models is described in Penton et al. (2023). This abstract provides guidance on how best to use the product to undertake further analysis. We recommend a four-step process to systematically account for the product's accuracy. First, researchers should confirm with local sources (using web portal) that major floods in the region of interest are visible in the product (were cloud-free during acquisition). Second, most analyses will require around 20 two-monthly images so the model errors converge to a known statistical distribution (e.g. a Laplace or Cauchy distribution). Given enough images, it is then possible to remove the product bias by increasing the flood depth by 0.34 m (the median error estimated in the benchmark set). Third, when estimating the water depths for locations with permanent water storages (especially reservoirs) use a local data-source to infill. For example, infill with depths calculated from observed levels in large reservoirs using bathymetry, which are usually available from the reservoir operator (the bathymetry may need to be digitised). Finally, we recommend calculating the sensitivity of the results and conclusions to scaled depth inputs.

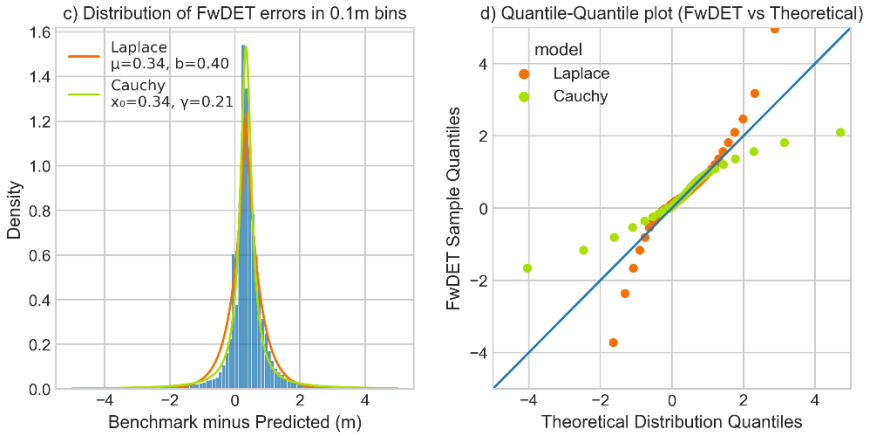

Figure 1. Distribution of errors between benchmark hydrodynamic model results and predicted water depths

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