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Recent Advances in Channel Routing for River Networks For the Next Generation National Water Model

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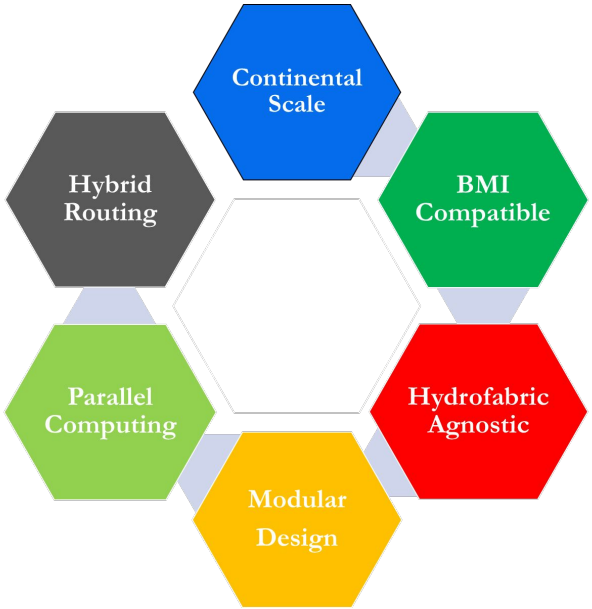
T-Route

Dendritic Channel Routing Framework for The Next Generation National Water Model



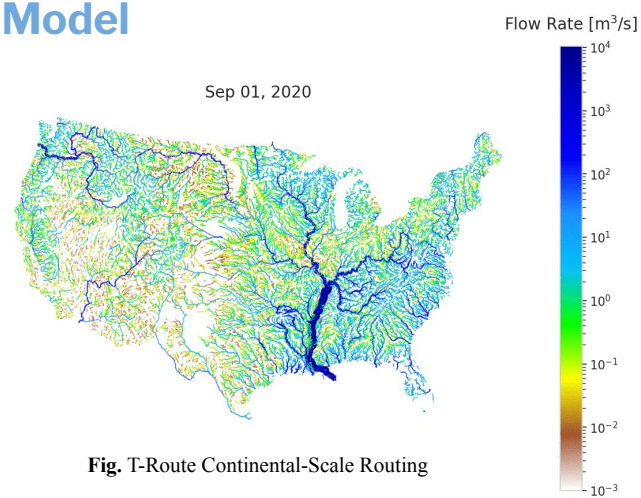
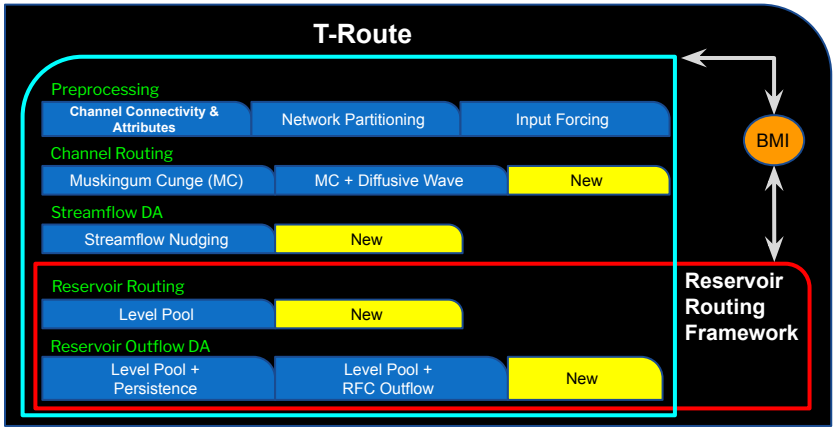
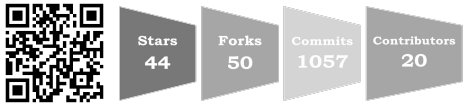
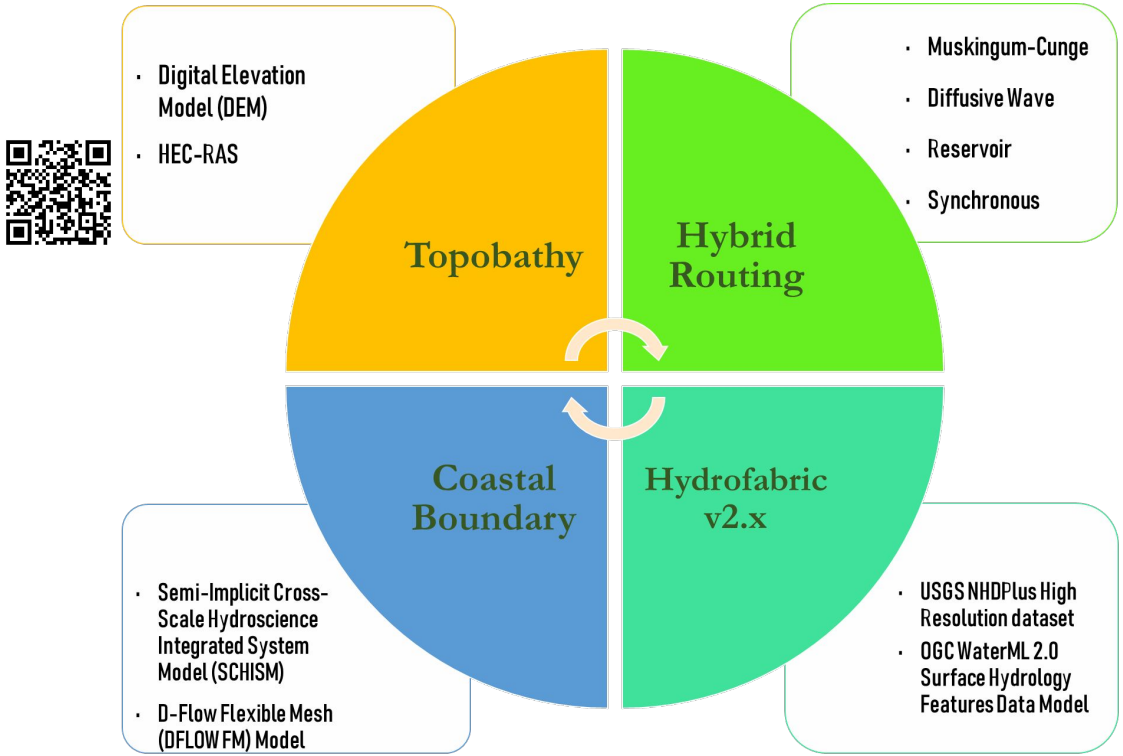


Fig. T-Route Continental-Scale Routing

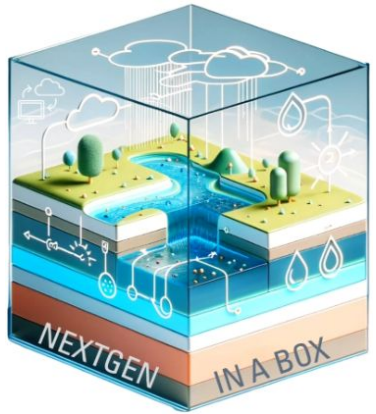




T-Route Recent Advancements



T-Route Implementation in the Next Generation Water Resources Modeling Framework (**N**ext**G**en) '**I**n **A** **B**ox'



Source:https://github.com/CIROH-UA/NGIAB-CloudInfra

T-Route Integrating Natural Channel Cross-Section Data For Improved Routing

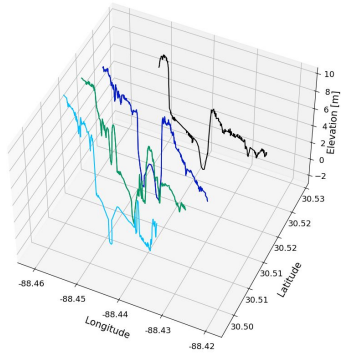


Fig. 3D representation of HEC-RAS Topobathy

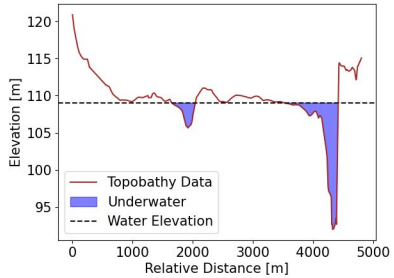


Fig. Generation of Hydraulic Property Lookup Table for Channel Cross-Sections

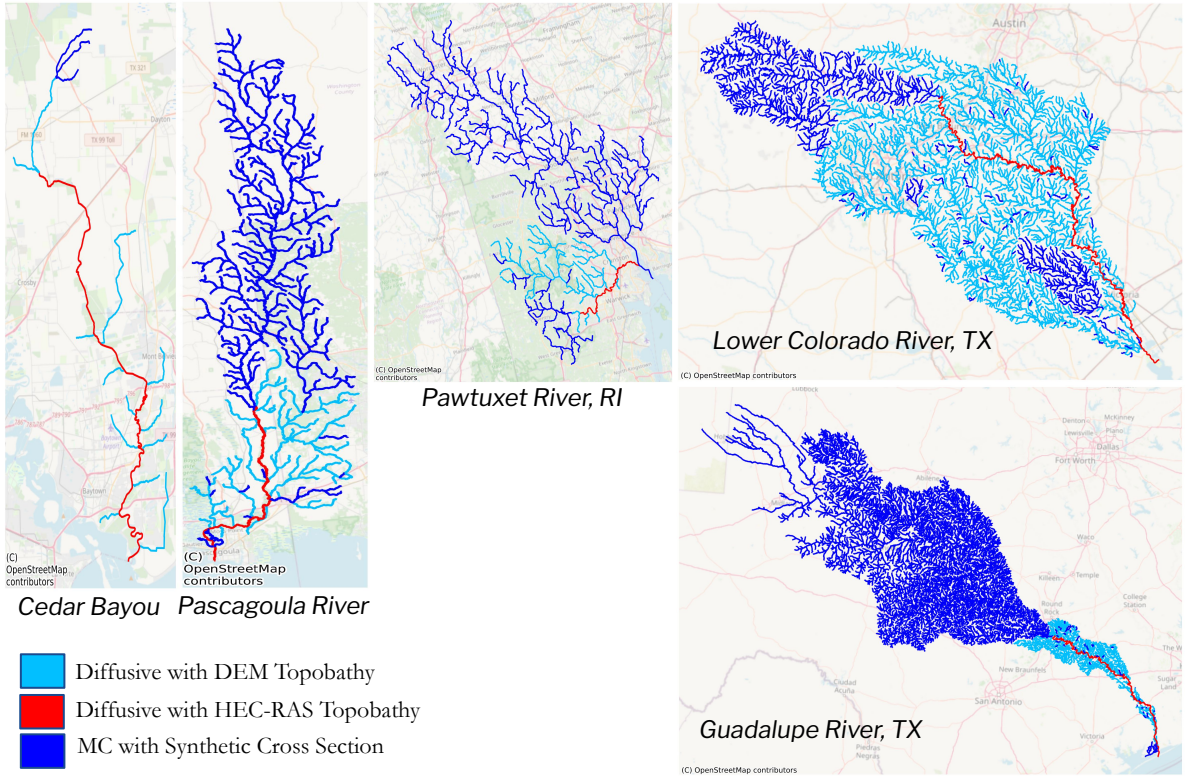


Fig. Channel Routing Subdomains in Hybrid Routing Scheme

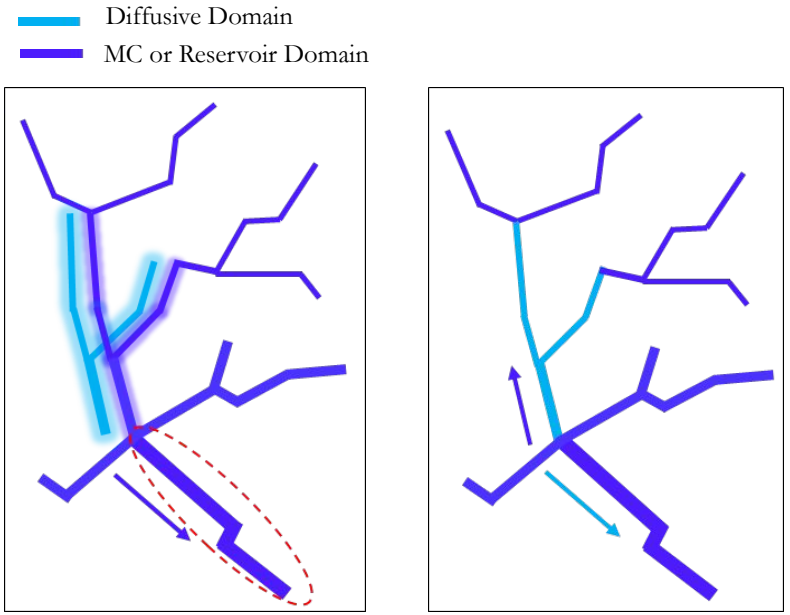
T-Route Integrating Hybrid Routing Schemes

Current Hybrid Routing

Real-Time, Synchronous output exchange between the MC and reservoir modules, followed by the **separate execution** of the diffusive wave module.

Prototype

Real-Time, synchronous output exchange among the MC, reservoir, and diffusive wave modules during runtime.



Current: Sequential Execution
MC+Reservoir and then Diffusive

Prototype: Synchronous Execution
MC + Reservoir + Diffusive

Fig. Hybrid Routing Schemes within T-Route

T-Route Exchanging Boundary Data with Coastal-Estuary Model

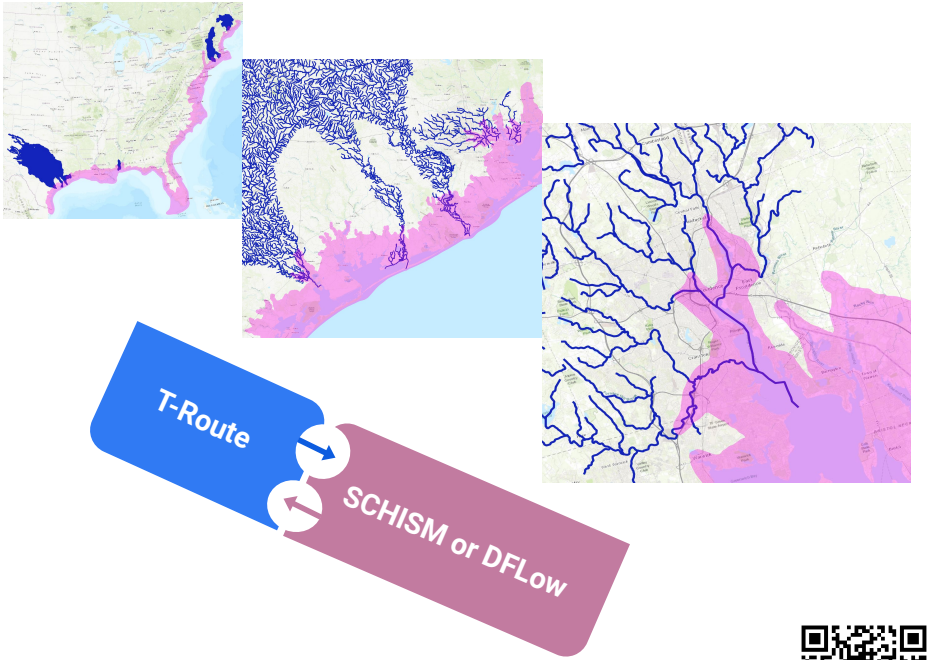


Fig. Boundary Data Exchange Between Inland (Streamflow) and Coastal-Estuary (Water Depth) Models

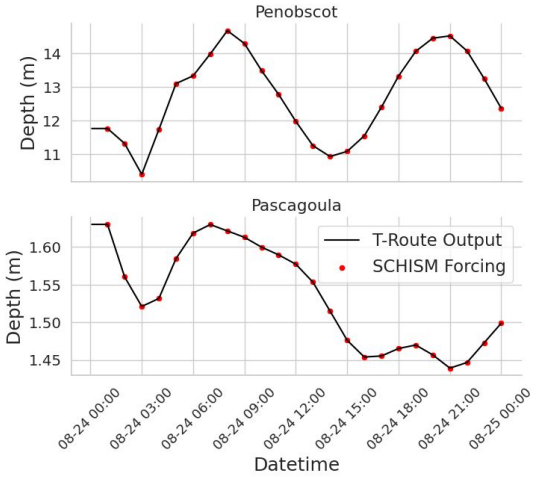


Fig. T-Route's Ingestion of the Downstream Boundary Data Provided By SCHISM

T-Route Agnostic To Any Hydrologic Geospatial Fabric (Hydrofabric) of the National Water Model (NWM)

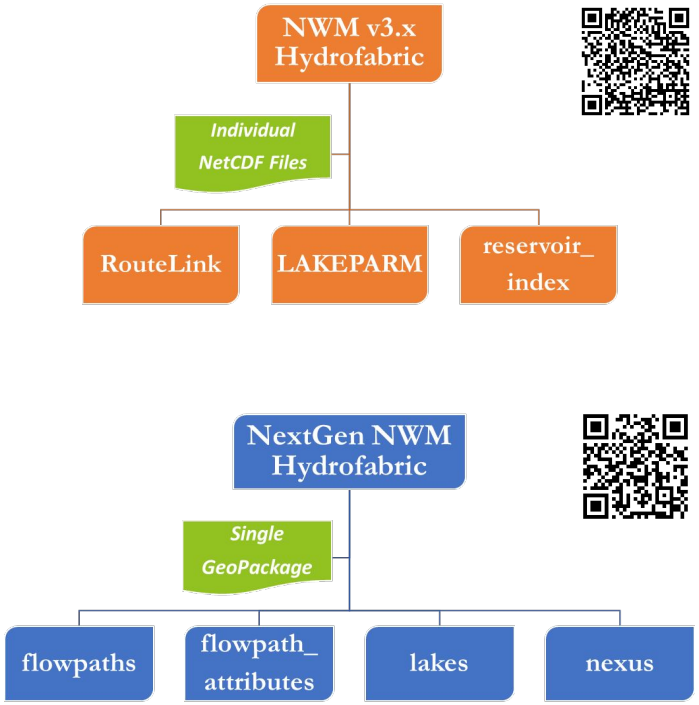


Fig. Comparison of NWM v3.x and NextGen NWM Hydrofabric Components

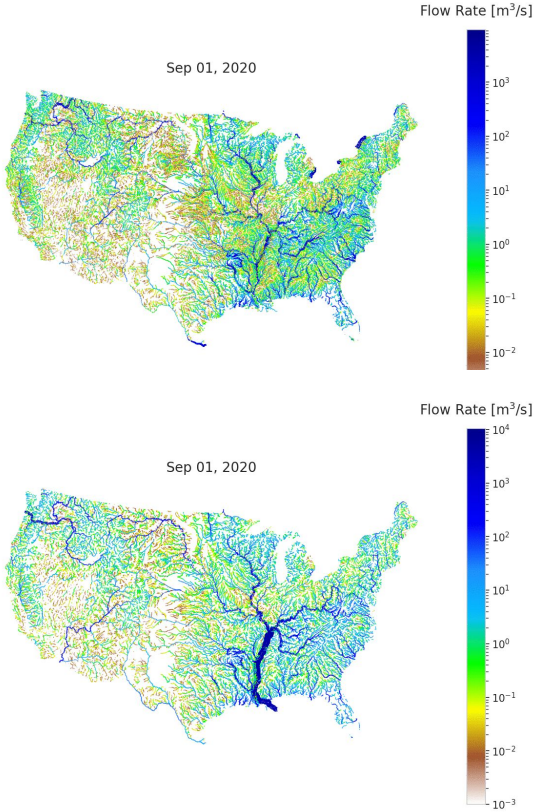


Fig. T-Route Long-Range Forecast for CONUS using NWMv3.0 Hydrofabric (Top) and NextGen NWM Hydrofabric 2.2 (Bottom)

Thank You!

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