



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

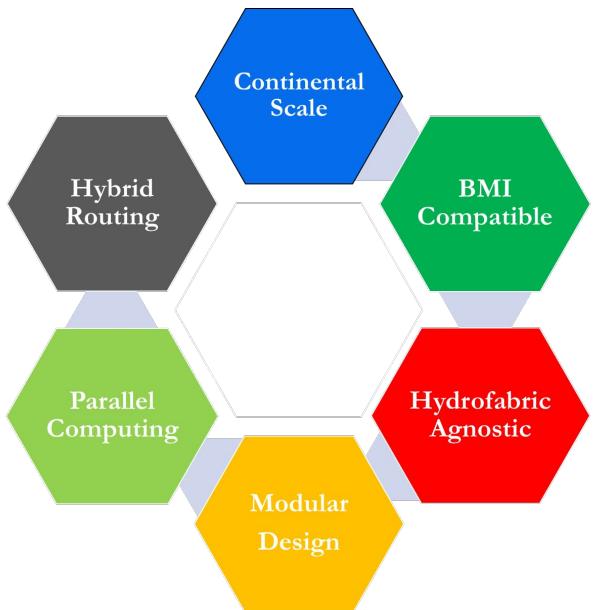


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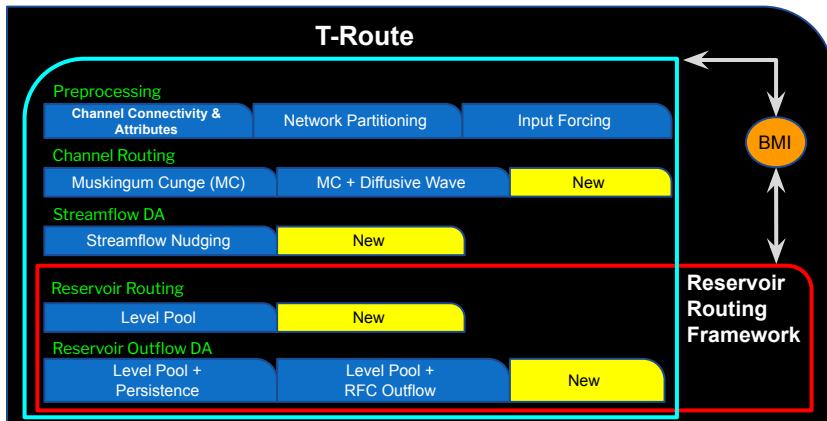
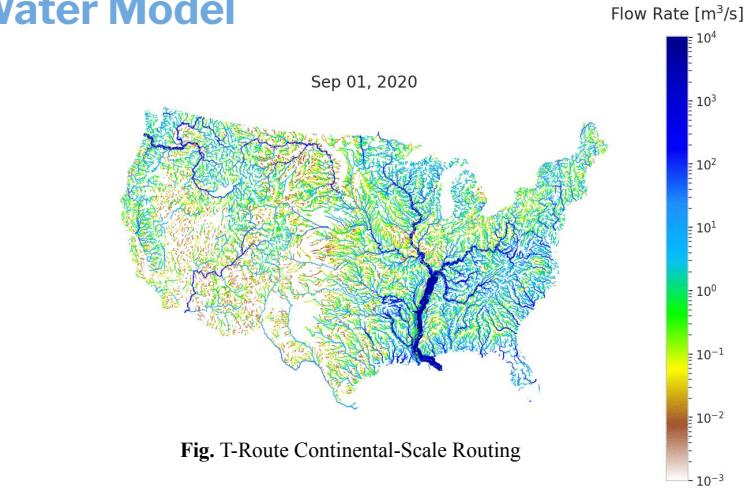
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<sup>2</sup>Cooperative Institute for Research to Operations in Hydrology (CIROH), Alabama Water Institute (AWI), University of Alabama

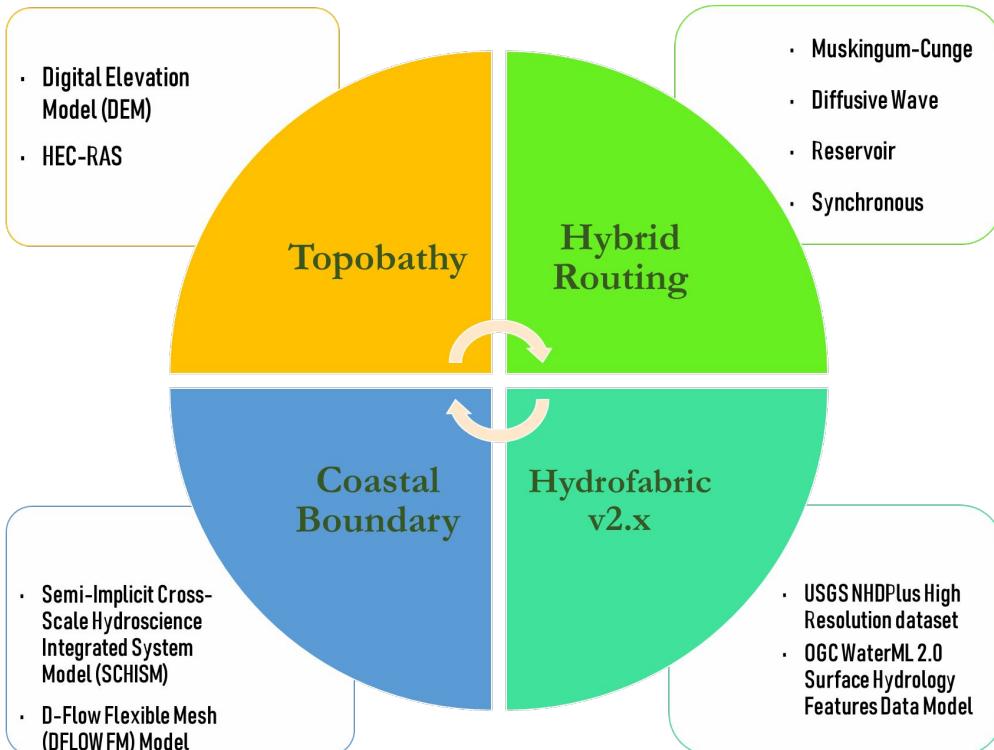
<sup>3</sup>Lynker, Leesburg, VA,



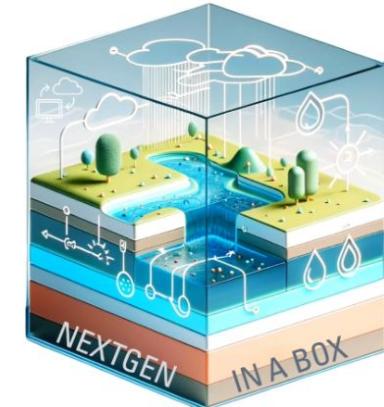
Stars 44 Forks 50 Commits 1057 Contributors 20



# T-Route Recent Advancements



**T-Route** Implementation in  
the Next Generation Water  
Resources Modeling Framework  
(NextGen) **'In A Box'**



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

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

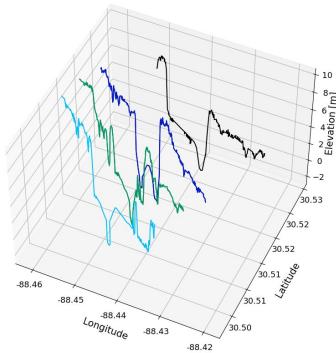


Fig. 3D representation of HEC-RAS Topobathy

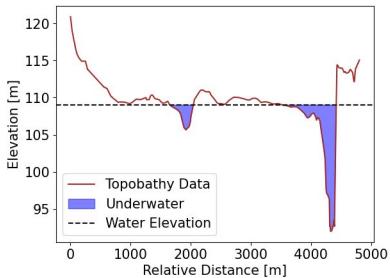


Fig. Generation of Hydraulic Property Lookup Table  
for Channel Cross-Sections

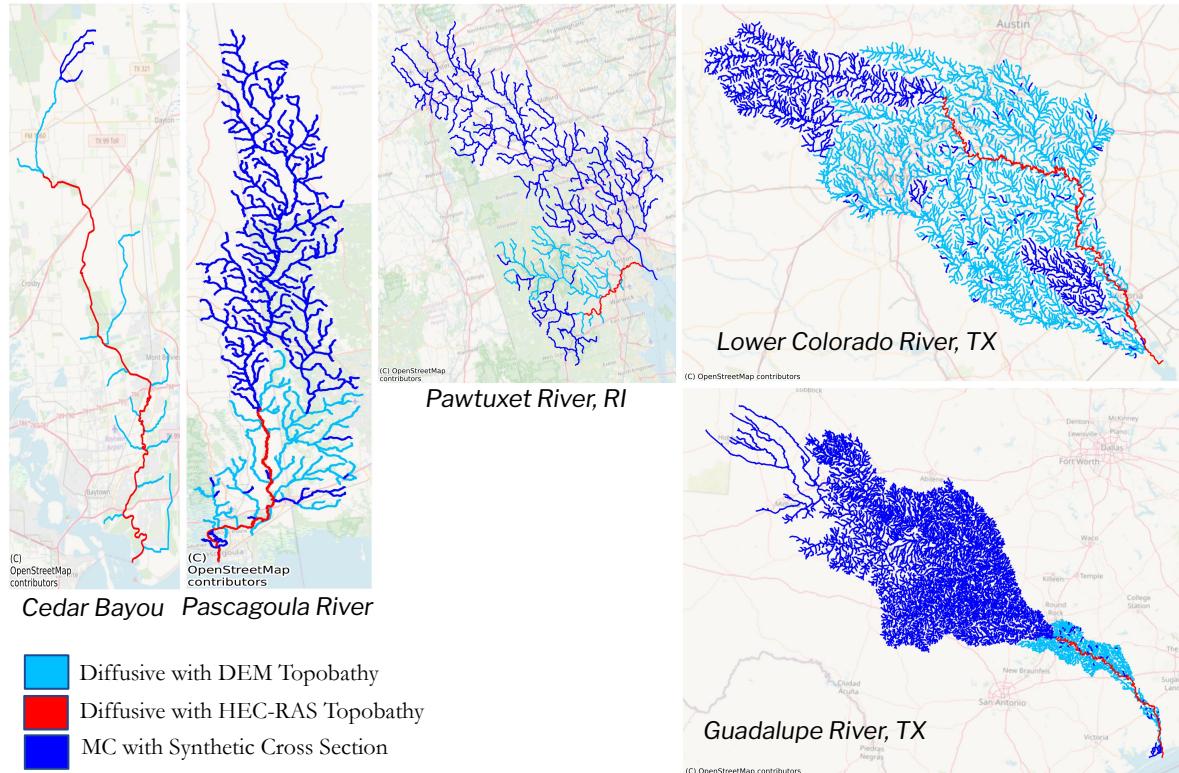


Fig. Channel Routing Subdomains in Hybrid Routing Scheme

# T-Route Integrating Hybrid Routing Schemes

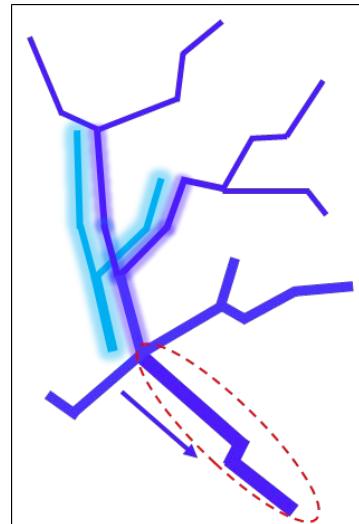
## Current Hybrid Routing

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

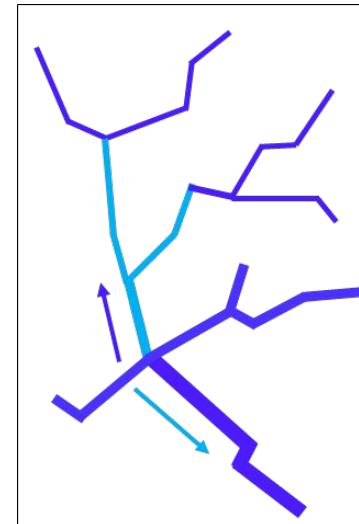
## Prototype

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

Diffusive Domain  
MC or Reservoir Domain



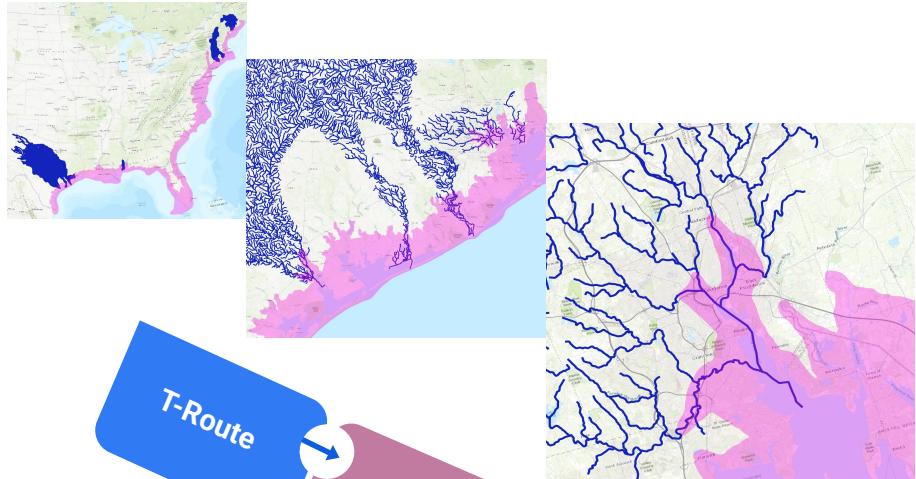
Current: Sequential Execution  
MC+Reservoir and then Diffusive



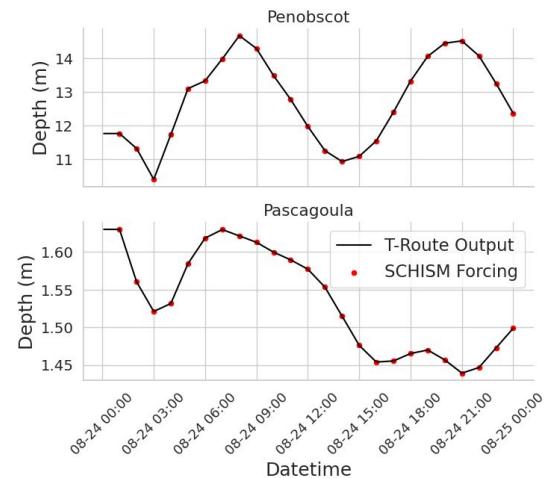
Prototype: Synchronous Execution  
MC + Reservoir + Diffusive

Fig. Hybrid Routing Schemes within T-Route

# T-Route Exchanging Boundary Data with Coastal-Estuary Model

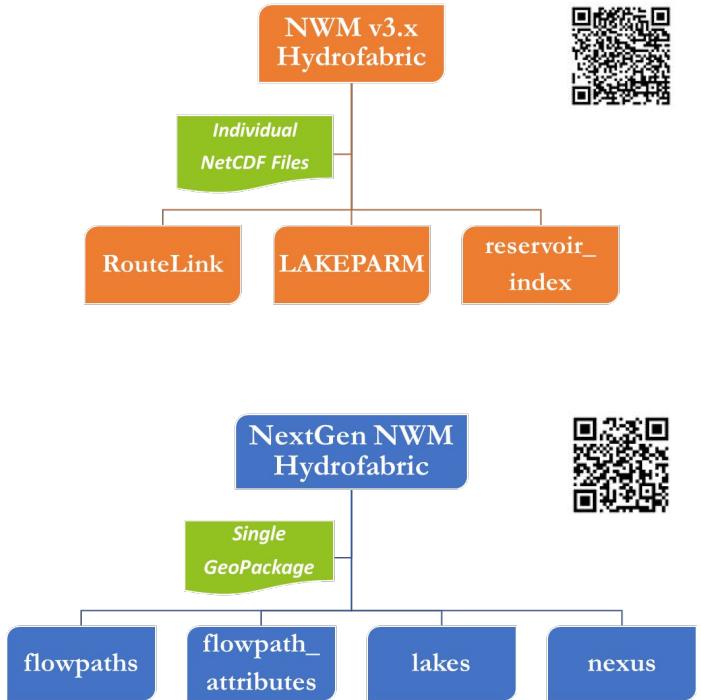


**Fig.** Boundary Data Exchange Between Inland (Streamflow) and Coastal-Estuary (Water Depth) Models

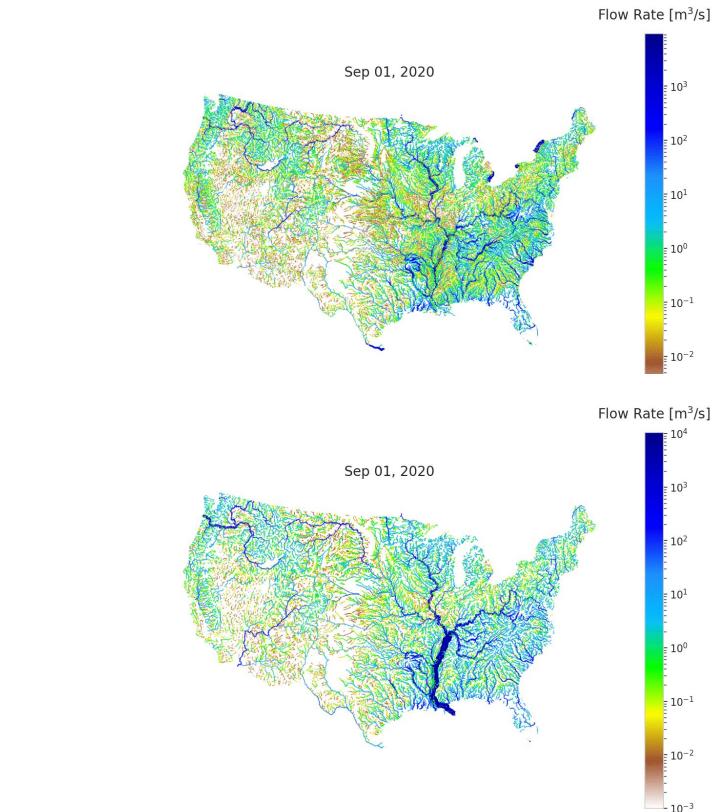


**Fig.** T-Route's Ingestion of the Downstream Boundary Data Provided By SCHISM

# 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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<https://water.noaa.gov>

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