National Aeronautics and Space Administration

Monitoring and Predicting Floods Using Earth Observations for Planning and Preparedness

Exercise 3: Examine Streamflow using GEOGLOWS River Forecast System in South Sudan

Review: Recent Flood in South Sudan

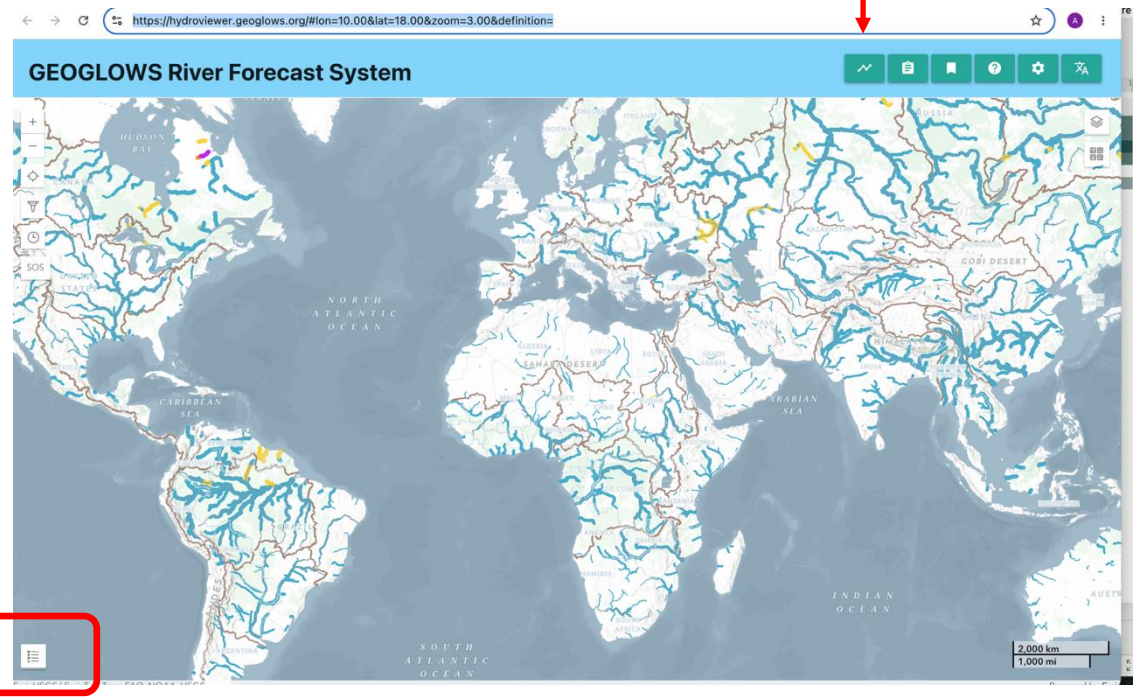
- Over the past few years, South Sudan has faced ongoing severe floods. Most recently, intense seasonal flooding in May and June 2026 impacted over 1.35 million people and displaced roughly 375,600. (FEWS NET).
- The most affected areas are in the states of Jonglei and Unity (Reliefweb).
- In Exercise 2, we used Worldview to compare the OPERA Dynamic Surface Water Extent (DSWx) with the Global Flood Product, monitoring flooded areas in South Sudan from May 15 to 31.
- Exercise-3 will use GEOGLOWS Hydroviewer River Forecast System (RFS) to examine streamflow in South Sudan river segments to check if the flooding was predicted by the RFS.

Note: Some of your homework questions will be based on this exercise.

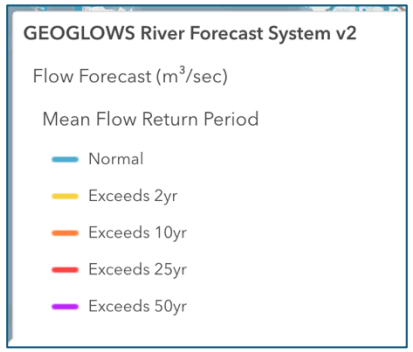
GEOGLOS Hydroviewer River Forecast System

- Open Hydroviewer
- Lines on the map show rivers and streams
- A stream can be selected by zooming in on the map

View Chart

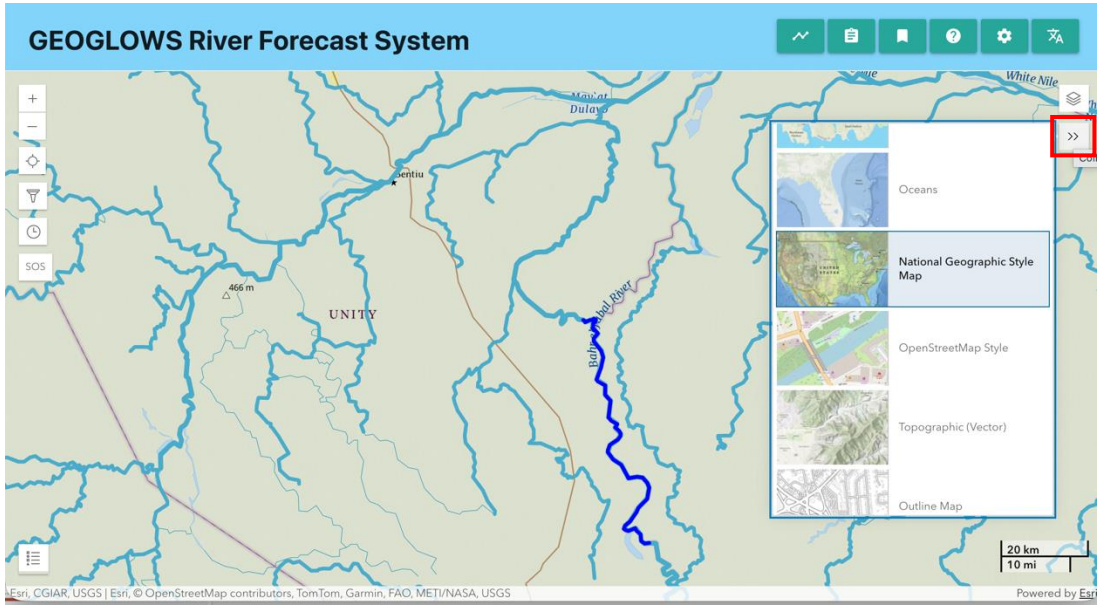


Colors indicate Flood Return Period

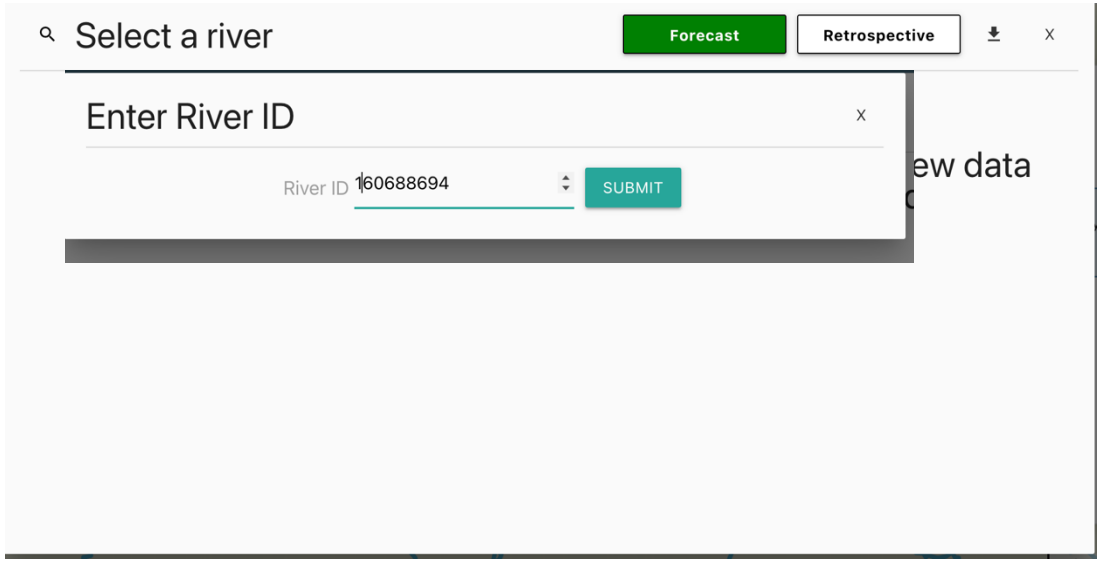


Examine Retrospective Streamflow

1. Select a basemap by clicking on the icon in the upper right of the map window—here National Geographic Style is selected.
2. Zoom to South Sudan and select a stream by clicking on the blue segments.
3. Click on the **View Charts icon.**
   - A window will open
   - Select Retrospective
   - Click on the Search icon and enter River ID: 160688694 → **Select River** → **Enter River ID** and **select Submit**
   - This ID corresponds to a segment of While Nile river (Bahr Al Jabal) indicated on the map.

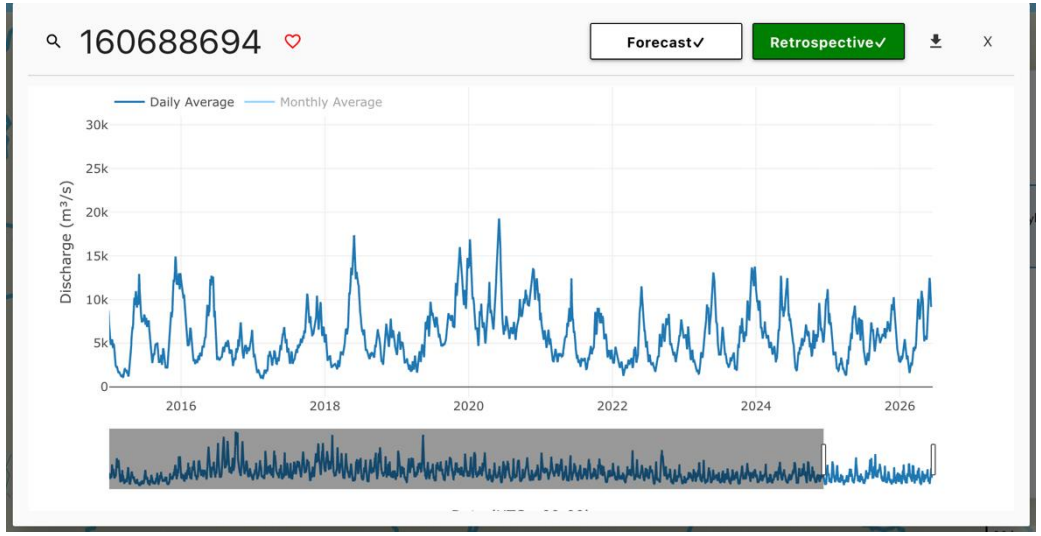


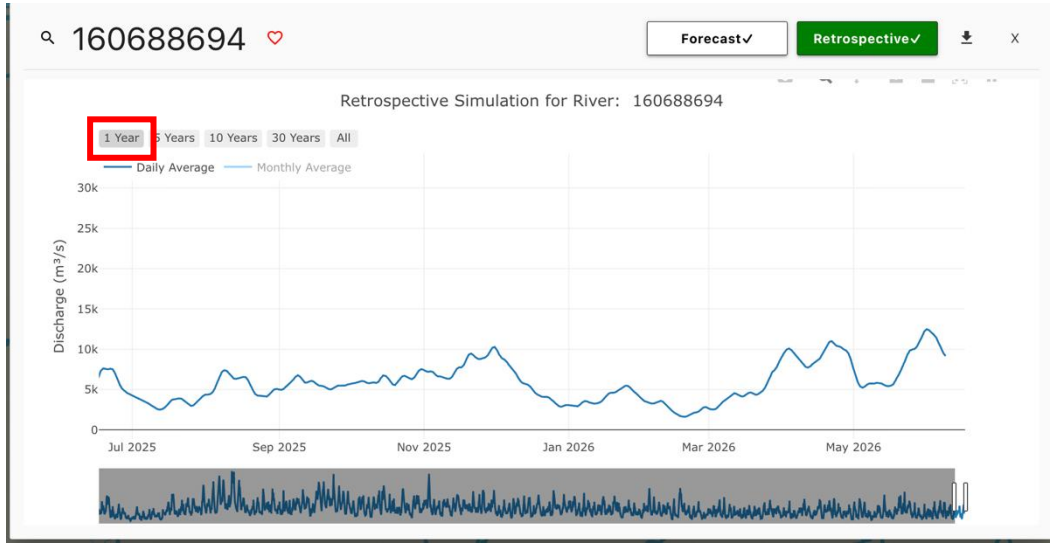
Select basemap



Examine Retrospective Streamflow

4. A time series of Discharge will be created for this river segment.
   - Select **1 Year** time series from top left of the chart.
   - A time series from June 2025 to present will be created.
5. Hover over the time series to see date and daily average discharge value at each point.
6. **Note down the discharge value with units for May 31, 2026.**





Examine Streamflow Prediction for June 2026

7. Select **Forecast** from the top right of the chart.
8. Using left and right arrows, or calendar, select **Forecast date** of 06/15/2026.
   - You will get 15-day prediction of discharge.
9. By looking at the time series of discharge could we predict that the area around this river is likely to continue flooding between June 15 and June 30, 2026? Why?