



NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

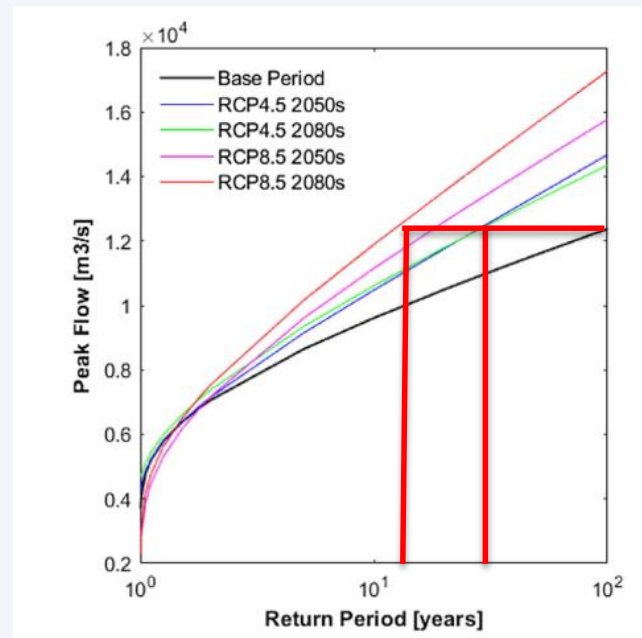


Safety is #1: Critical dam coordination during flood operations

Kevin Wheeler PhD P.E.

Increased Climate Extremes

- Ample evidence points towards more frequent large peak flow events in the Nile Basin



What was a 100-year flood event could soon be a ~15 to ~30 year event

Tariku, T. B., et al. (2021). "Impact of Climate Change on Hydrology and Hydrologic Extremes of Upper Blue Nile River Basin." Journal of water resources planning and management 147(2): 04020104.

Increased Climate Extremes

- Ample evidence points towards more frequent large peak flow events in the Nile Basin

Flooding from
Ethiopian
Highlands



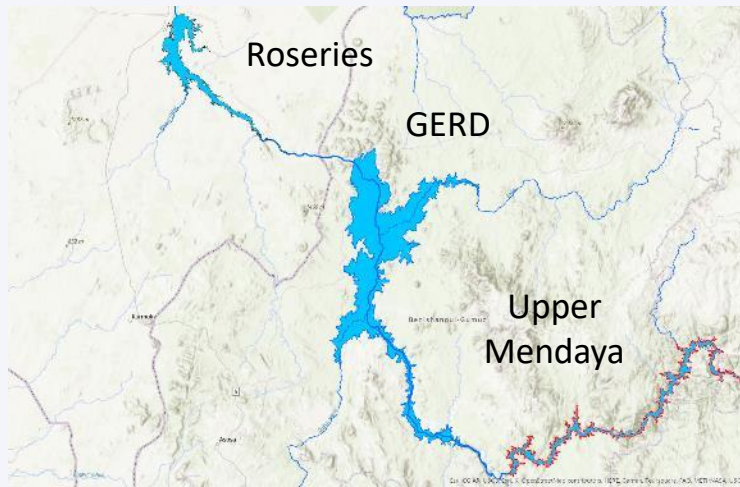
Wadi Flooding
events

September 2020 – Blue Nile Flooding

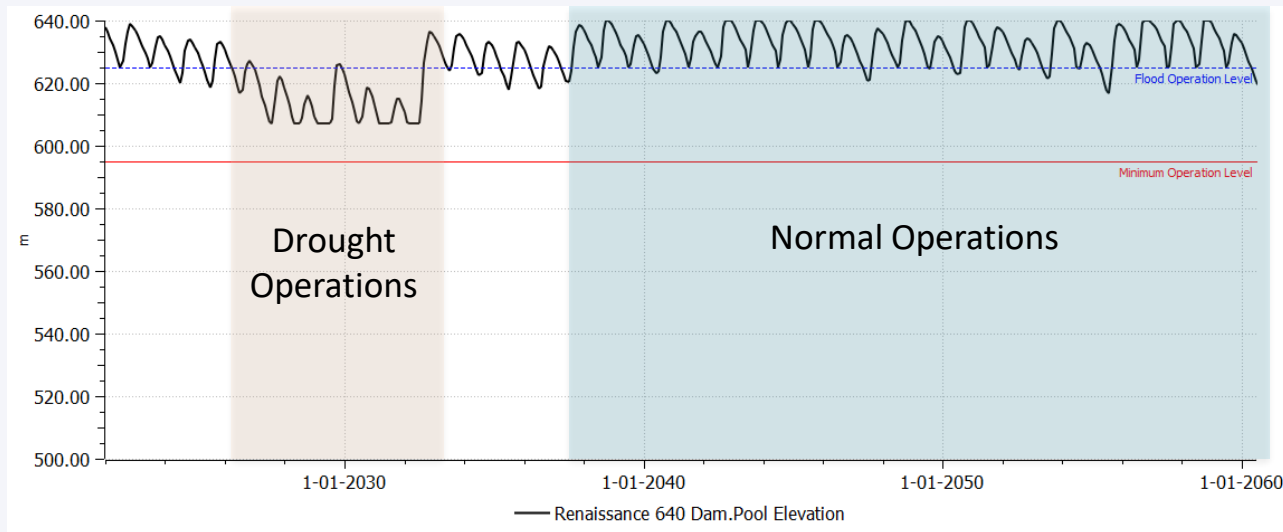


DEVELOPING NORMAL AND EXPECTED OPERATIONAL PROTOCOLS

Hydropower Dams



Intended to run full or nearly full most of the time



Flood Operations Center

Typical scene during flood operations
Lower Colorado River Authority

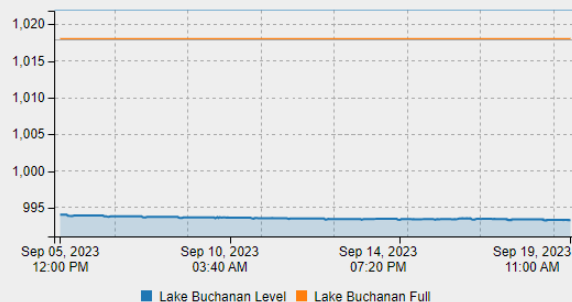


Flood Operations Center

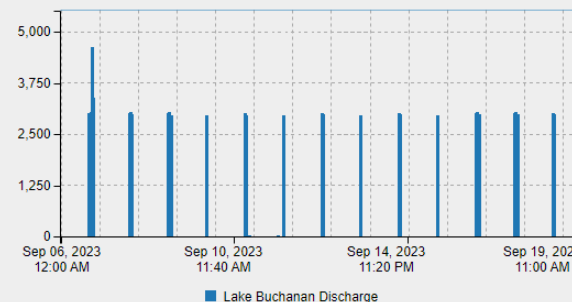
Lake Levels Over the Last: ▾

*Disclaimer: Data is automatically retrieved and subject to revision.

Buchanan Dam -- Lake Level (feet msl)



Buchanan Dam -- Discharge (cubic feet per second)



Lake Buchanan Floodgate Operations and Forecasts

Last Update: Sep 6 2023 7:43PM

Inflows: Inflows to Lake Buchanan are below levels that would require gate operations to pass floodwaters at Buchanan Dam.

Gate Operations: No gate operations to pass floodwaters are expected at Buchanan Dam at this time.

Lake level forecast: Please see the [River Operations Report](#) for current forecasts for Lake Buchanan.

Max Reading: 994.05 Sep 5 2023 7:30AM

Last Reading: 993.31 Sep 19 2023 11:00AM

Continuous Reporting of:

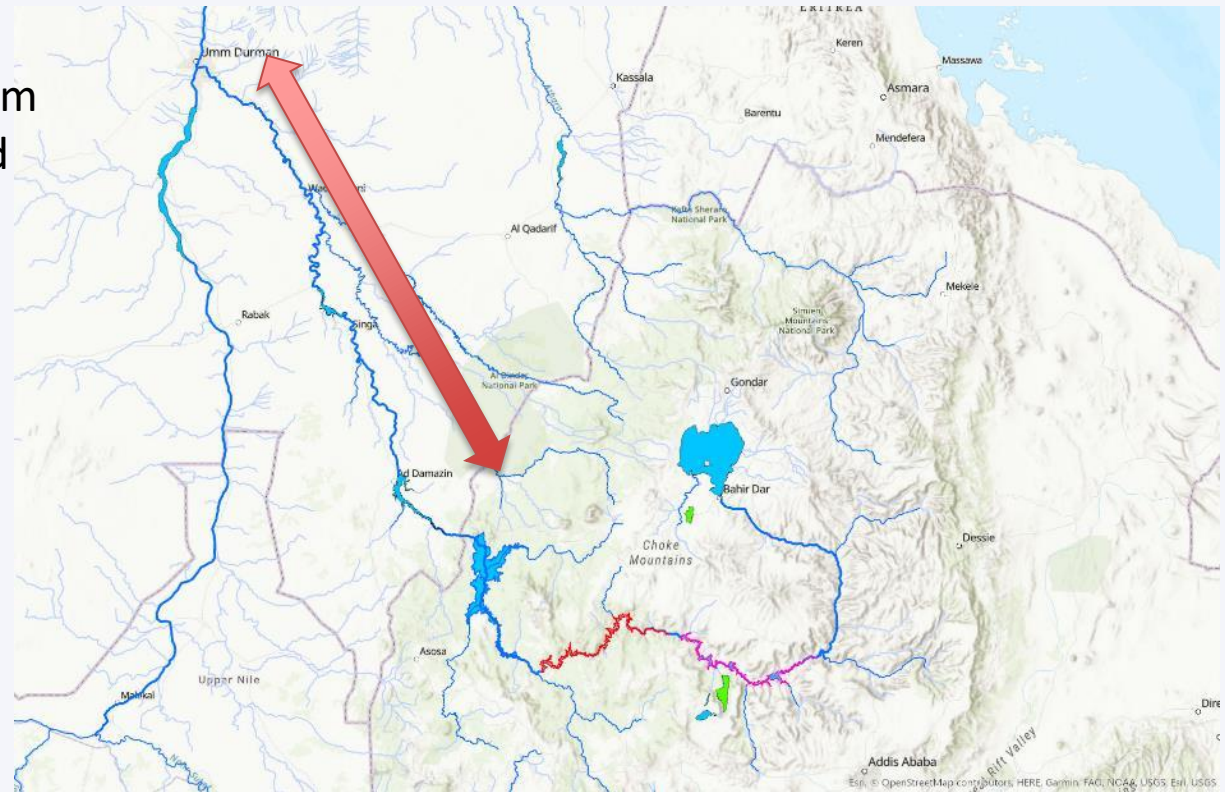
- Current Reservoir Levels
- Recent Releases
- Expected Releases
 - Turbines
 - Spillways



DEVELOPING EMERGENCY PROTOCOLS

Risk of Innundation

- 2 to 4 days for a flood wave to reach Khartoum
- Many analyses of flood inundation risk



Is this necessary?

**YES - FLOOD WARNING SYSTEMS ARE NECESSARY
REGARDLESS OF THE QUALITY OF THE DAM**

- Communication hotline to downstream dam operators
- Notification to potentially effected population centers
- Siren system alongside the river channel
- Emergency response plans
- Measurement system to track flood wave propagation



Whose responsibility is this?

Action Item Summary

Two flood-related requirements for responsible dam management

1. Protocol that includes regularly updated short-term operation plans
2. Dam flooding/failure early warning system and response plan



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**THANK
YOU!**