

# FORECAST INFORMED RESERVOIR OPERATIONS (FIRO) IN THE RUSSIAN RIVER WATERSHED

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Presentation to the Storms, Flooding, and  
Sea Level Defense Conference

Oakland, CA

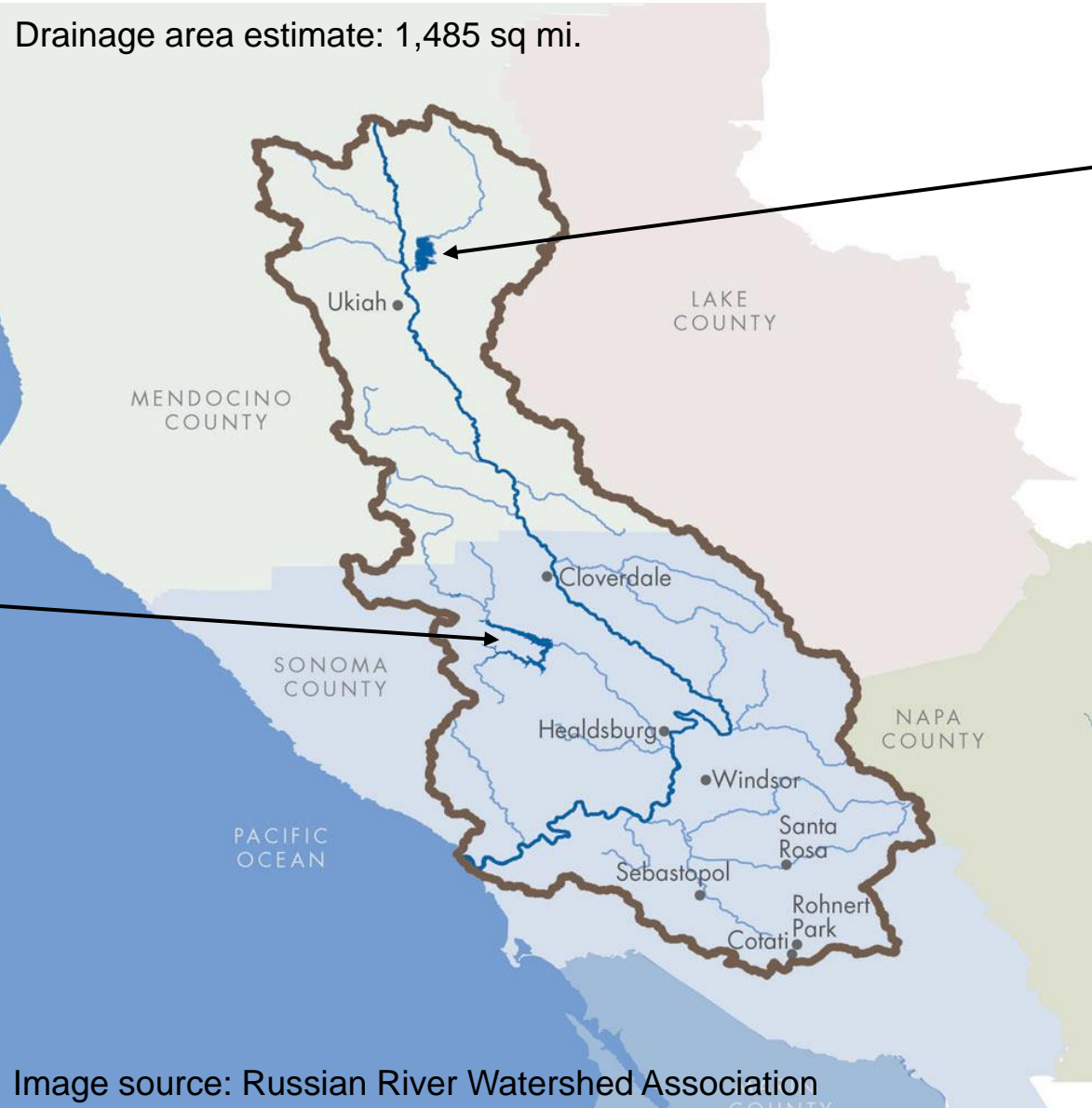
November 8, 2023



US Army Corps  
of Engineers®



# RUSSIAN RIVER WATERSHED



Lake Mendocino  
(Coyote Valley Dam)

Lake Sonoma  
(Warm Springs Dam)

Image source: Russian River Watershed Association



# TYPICAL EXISTING WATER CONTROL PLAN FOR A CORPS OF ENGINEERS OWNED AND OPERATED RESERVOIR



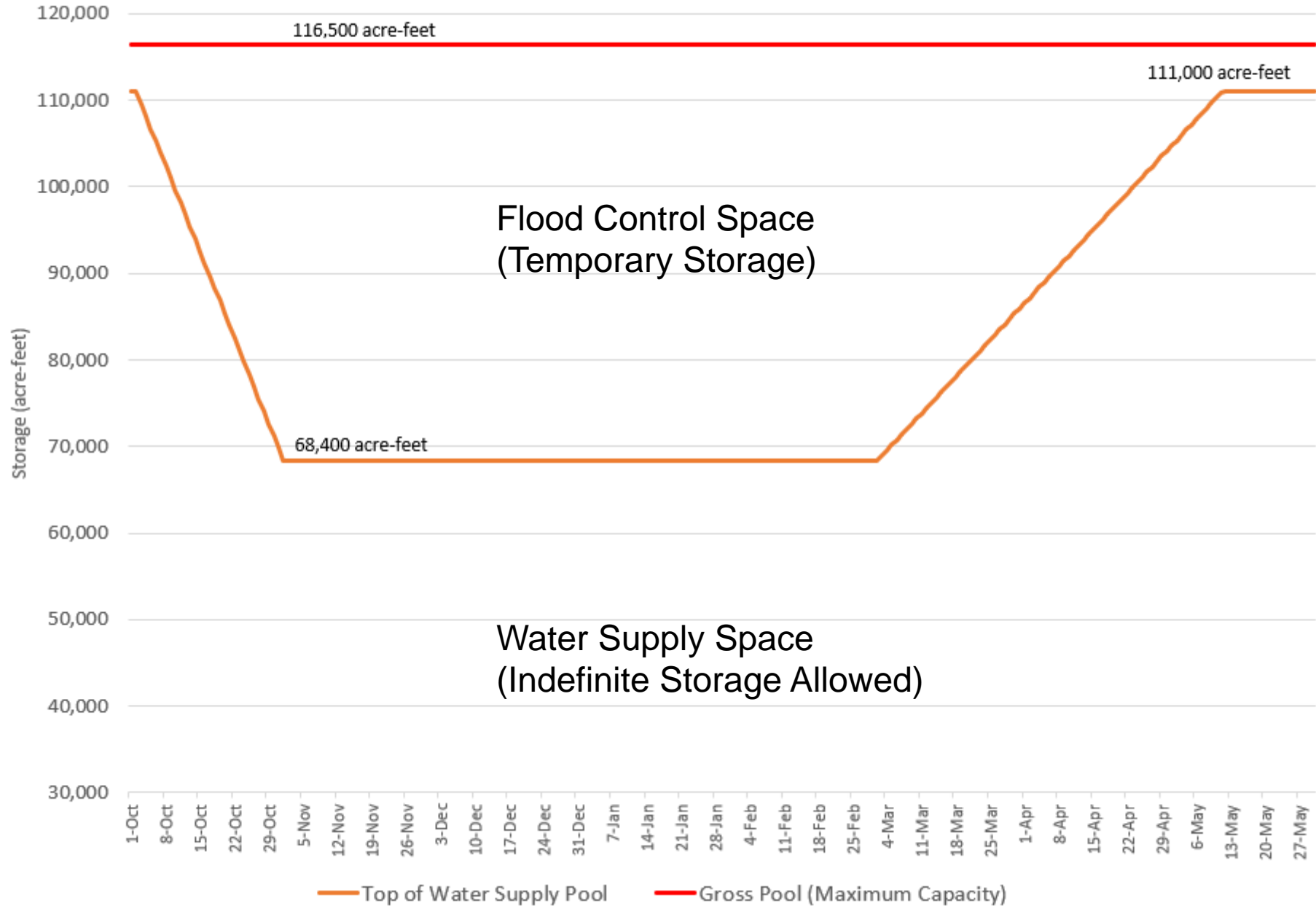
Reservoir releases are based on rules prescribed by the water control plan of a water control manual

Designated boundary for Water Supply Space and Flood Control Space

- Indefinite storage allowed in Water Supply Space (drinking water, irrigation, recreation)
  - Often though, minimal releases may be required to meet minimum in-stream flow requirements downstream
- Only temporary storage allowed in the Flood Control Space (rainfall/runoff)
  - Based on water on the ground, not forecasted conditions



### Lake Mendocino Existing Water Control Plan

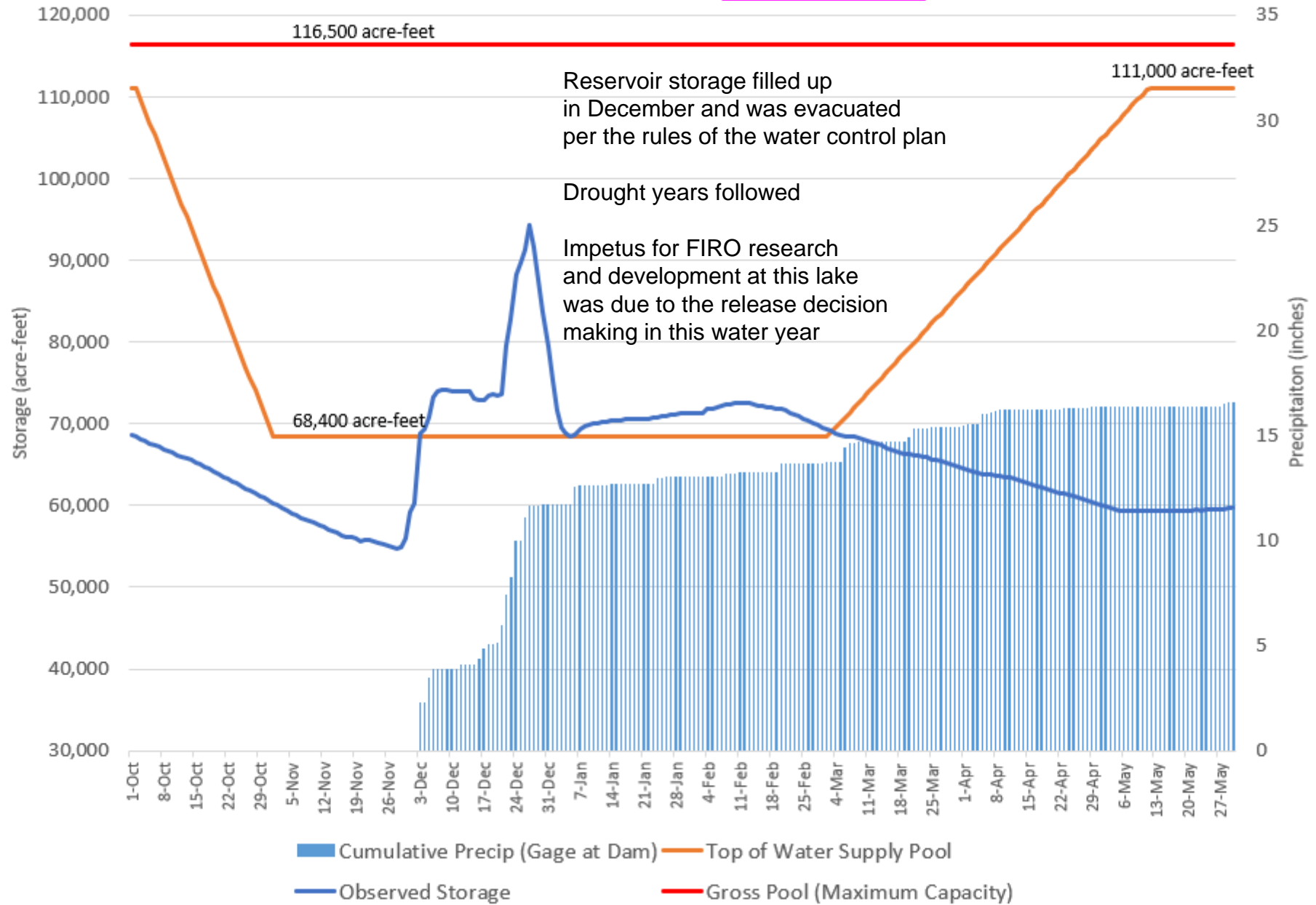


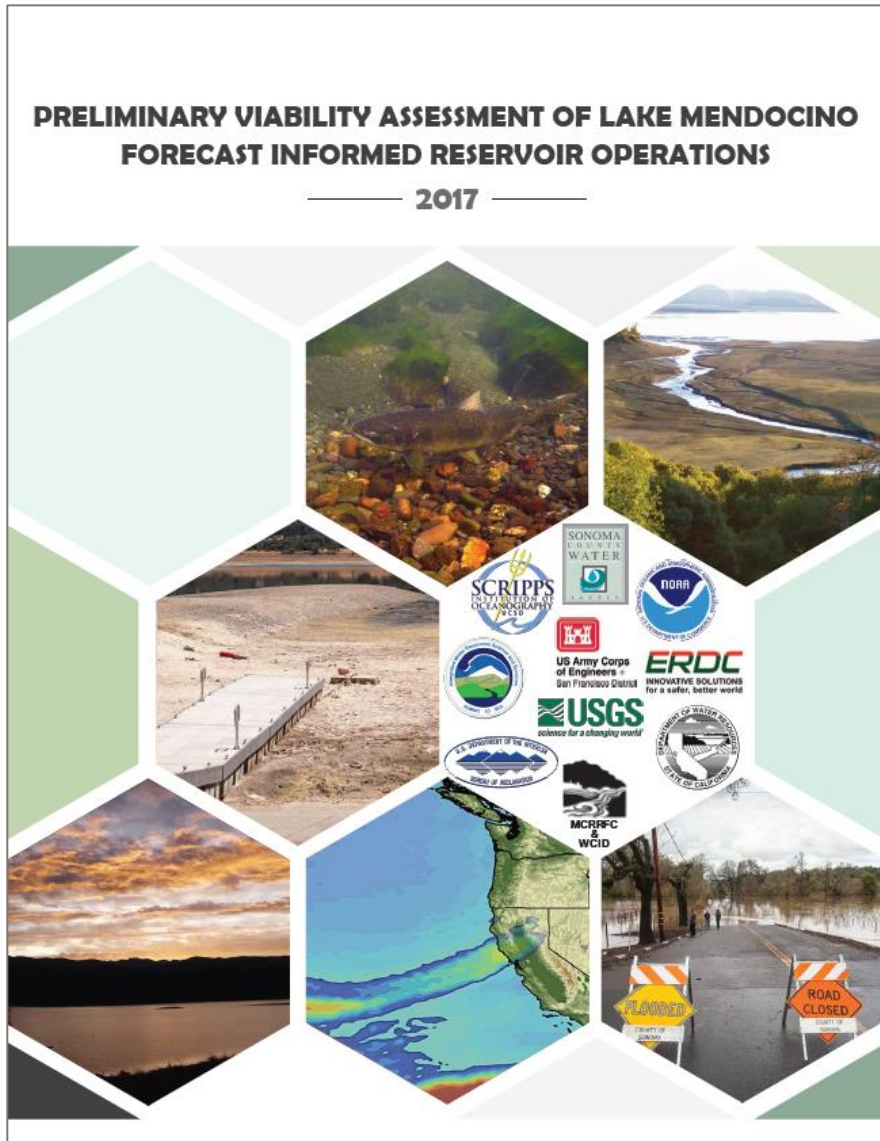
Note that the months of June through September are omitted from diagram since the top of water supply pool and gross pool remain the same as values shown for May





### Lake Mendocino Storage for **Water Year 2013**



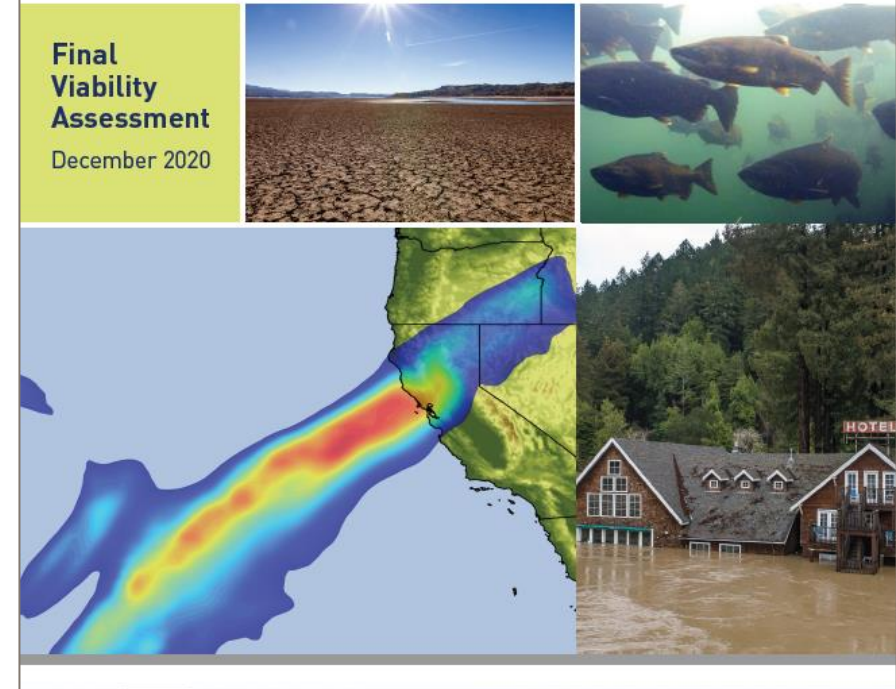


Key to answering the basic question  
“Is FIRO even possible at Lake Mendocino?”



# Lake Mendocino FORECAST INFORMED RESERVOIR OPERATIONS

Final  
Viability  
Assessment  
December 2020



Key to identifying actual possible FIRO operating  
alternatives for potential water control manual update

Both served as a forum for frank and open discussion between the various agencies!



# DEVIATION TO WATER CONTROL PLAN



Water Managers can operate differently than the rules prescribed in the existing Water Control Plan if a Deviation is requested and approved

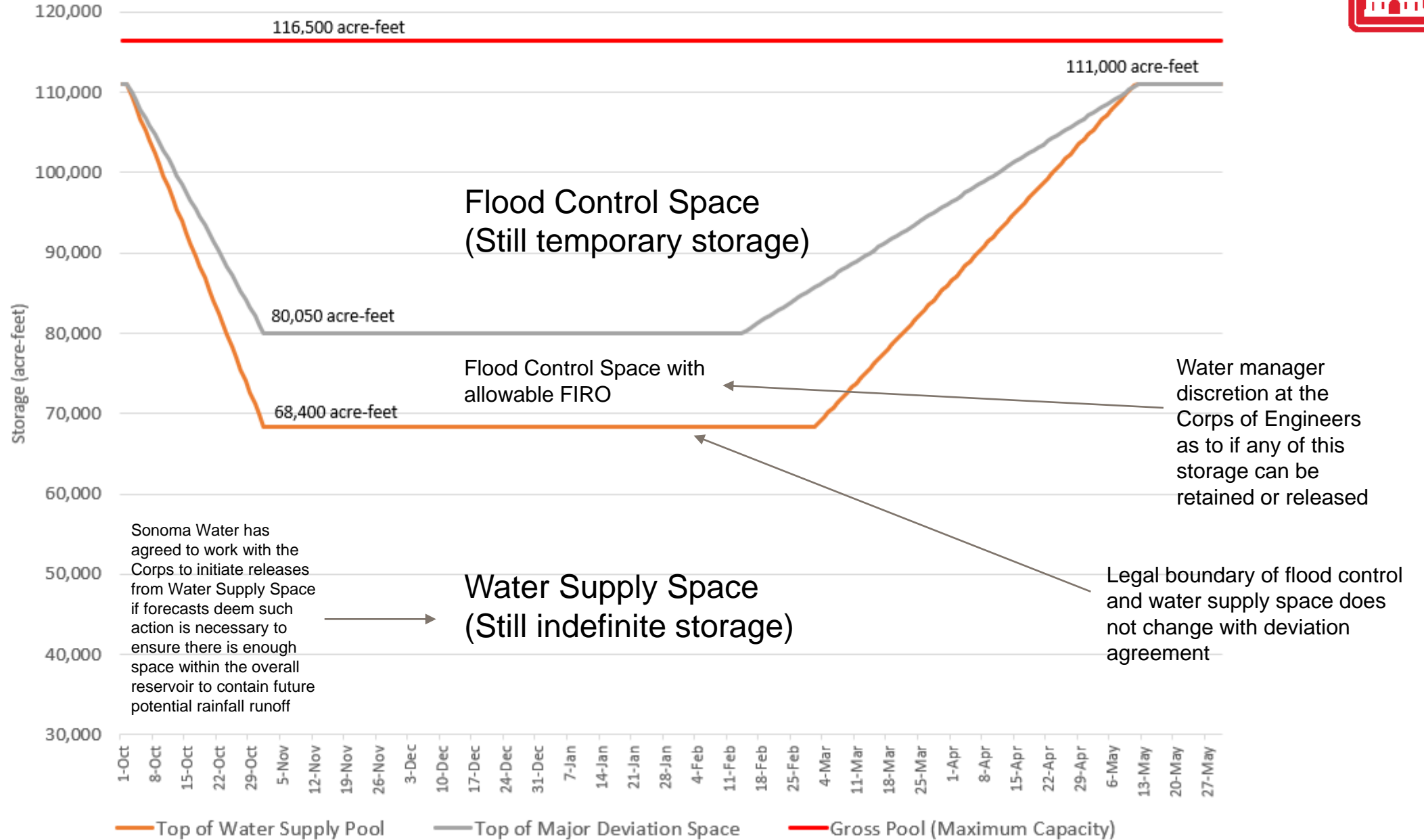
- Can be for various reasons, such as: planned construction, drought, etc.
- Includes environmental, engineering and dam safety review

Sonoma Water (local sponsor for the lake) has submitted deviation requests

- Three deviation requests and approvals for Water Year 2019, 2020 and 2021-2026 for Lake Mendocino
  - » **Supported by FIRO research and development**



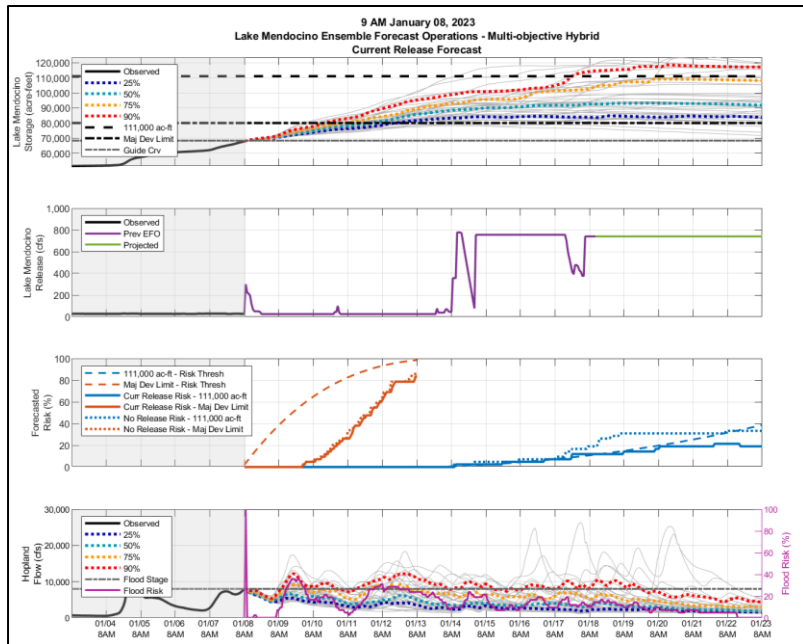
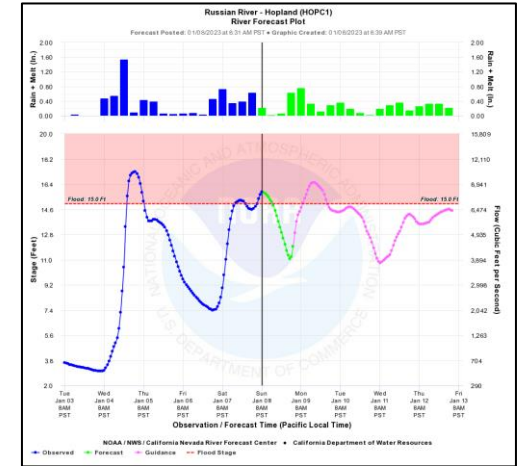
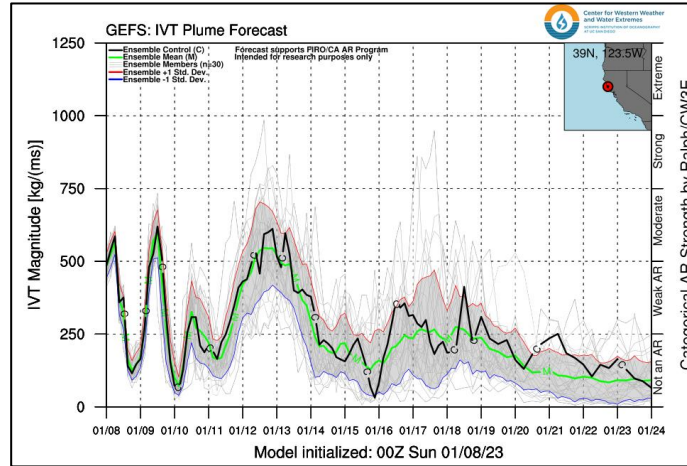
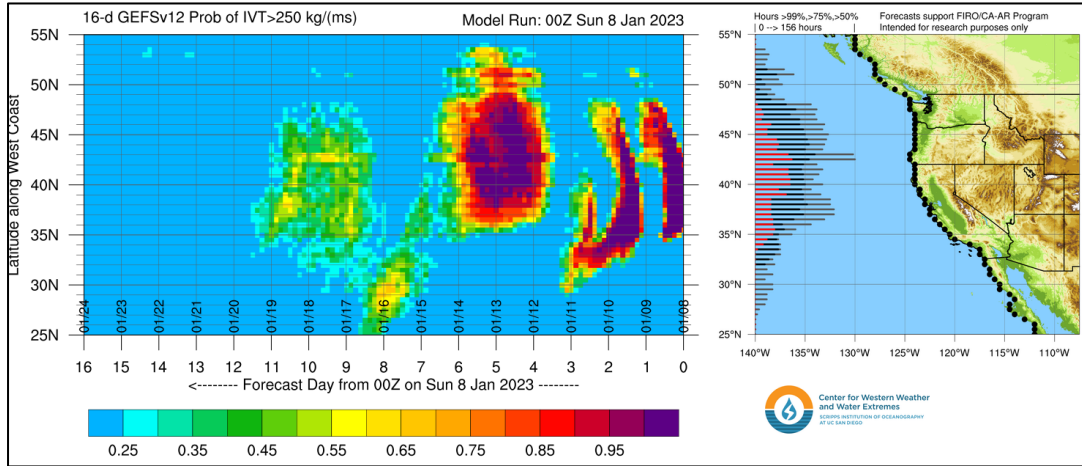
### Lake Mendocino Existing Water Control Plan + Major Deviation



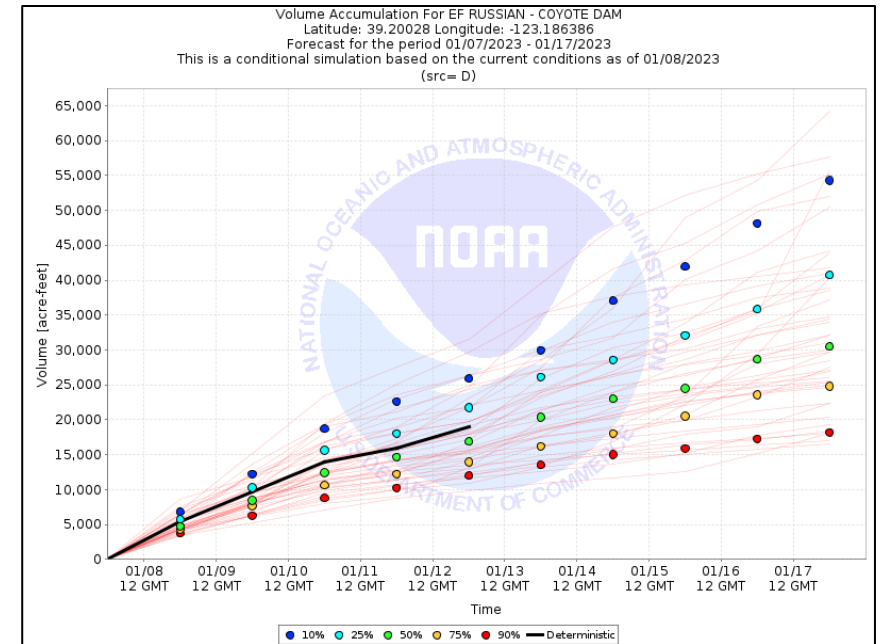




# HOW TO MANAGE RESERVOIRS AND APPLY FIRO?

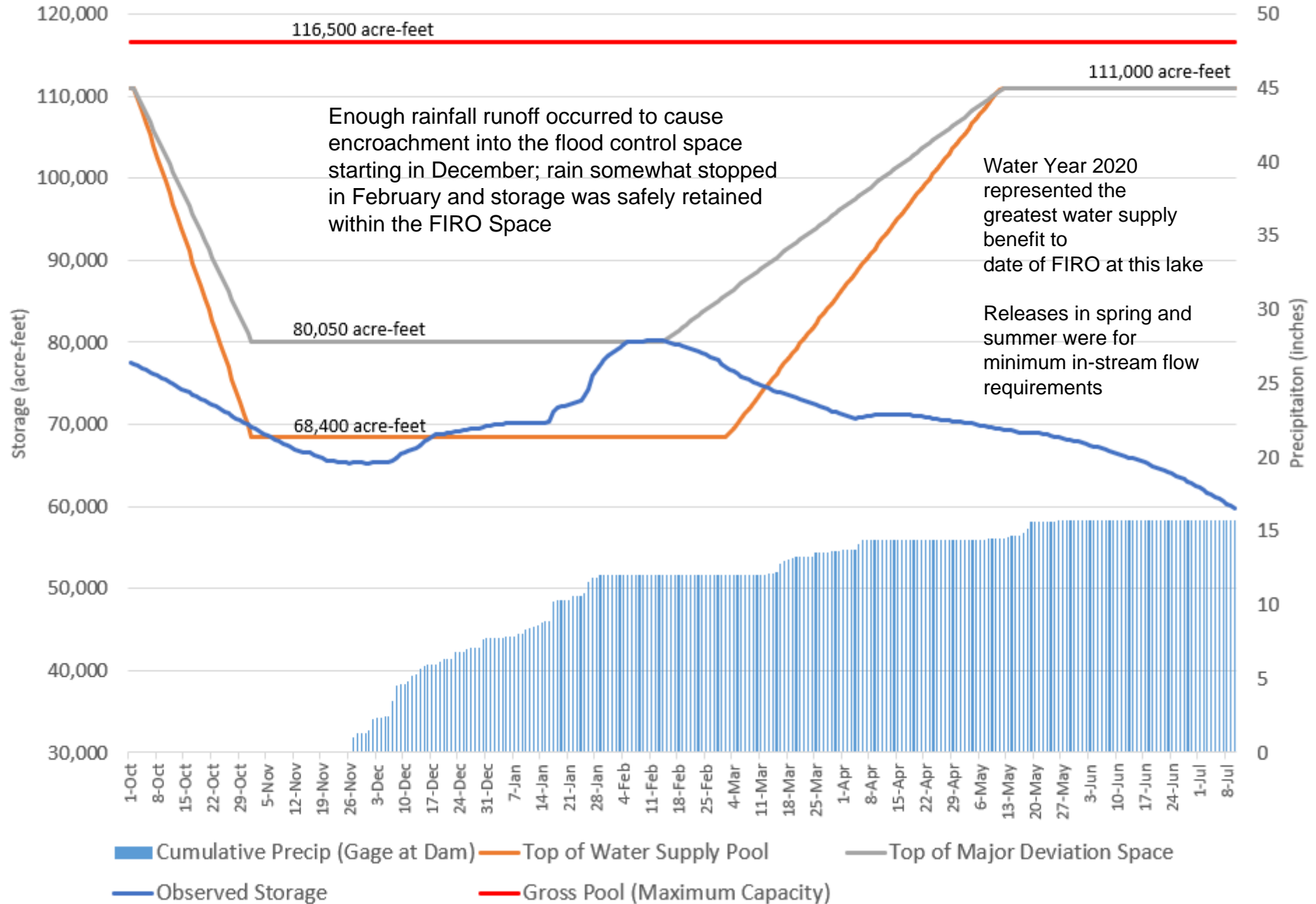


Actual products from January 8, 2023





# Lake Mendocino Storage for Water Year 2020





# FUTURE RESEARCH AND DEVELOPMENT OF FIRO IN THE RUSSIAN RIVER WATERSHED



Viability assessment of FIRO at Lake Sonoma is being initiated in 2023

Continued partnership and communication with experts in meteorology and hydrology for viability assessment and real-time application of FIRO