

# FIRO Adaptive Water Control Plans



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# Why Adaptive?

- Water Control Manual (WCM) updates can be expensive and time consuming. Updates usually in response to:
  - Change in physical condition (.e.g. new spillway)
  - Change in hydrology (updated, new SPF/PMF, etc.)
  - Commonly a multi-year effort
- FIRO Water Control Plans (WCPs) leverage weather and water forecasts to support release decisions
  - Forecast skill is expected to increase with research investments
  - Tools to better leverage forecast skill are expected to emerge
- A streamlined approach to integrate improved forecast skill and utilization to minimize the time and expense of a full WCM is needed

# Approach

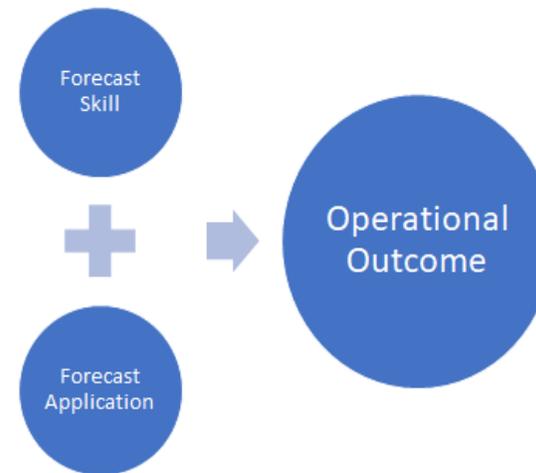
1. Avoid something “completely new.”
2. Focus on how release decisions are made rather than redefining the guide curve or creating a “variable flood control pool.”
3. Keep it as simple as possible.

# FIRO WCP Definition

*A Water Control Plan (WCP) that allows for an adaptable and bounded FIRO space. The magnitude of the FIRO space is defined by the demonstrated streamflow forecast skill, operational constraints, and procedures that leverage that skill to maintain or enhance defined flood risk management objectives for the project. The process and procedure for reevaluating and updating the FIRO space is described in the WCM.*

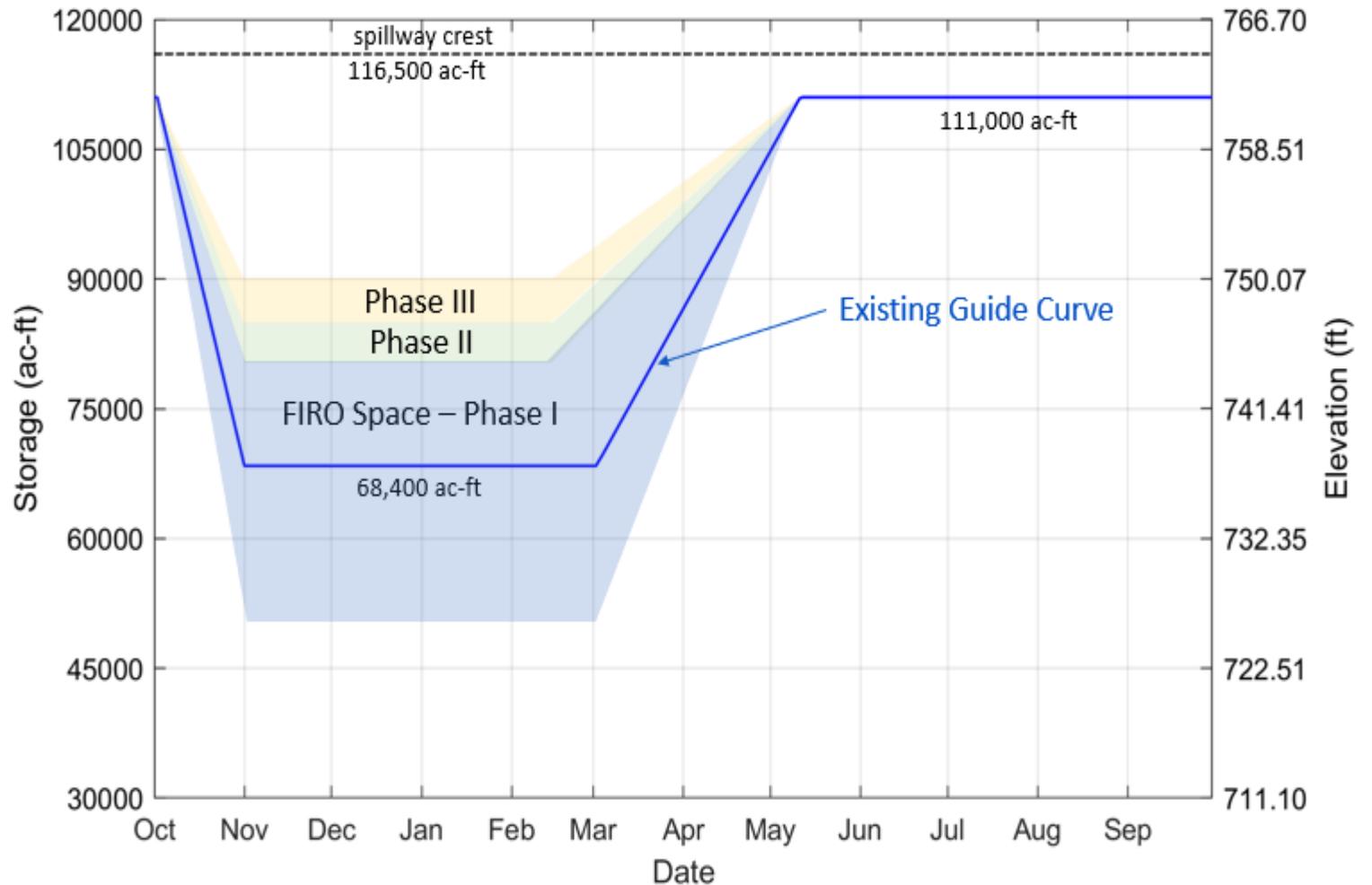
# Concept of “FIRO Space”

- Does not redefine guide curve
  - Flood control and water conservation pools remain the same
- Defines a storage space within the reservoir where release decisions can be informed by forecasts
- Attributes
  - Bounded
  - Adaptable
  - Magnitude limited by
    - ✓ demonstrated forecast skill
    - ✓ operational constraints
    - ✓ reservoir model / tool efficacy

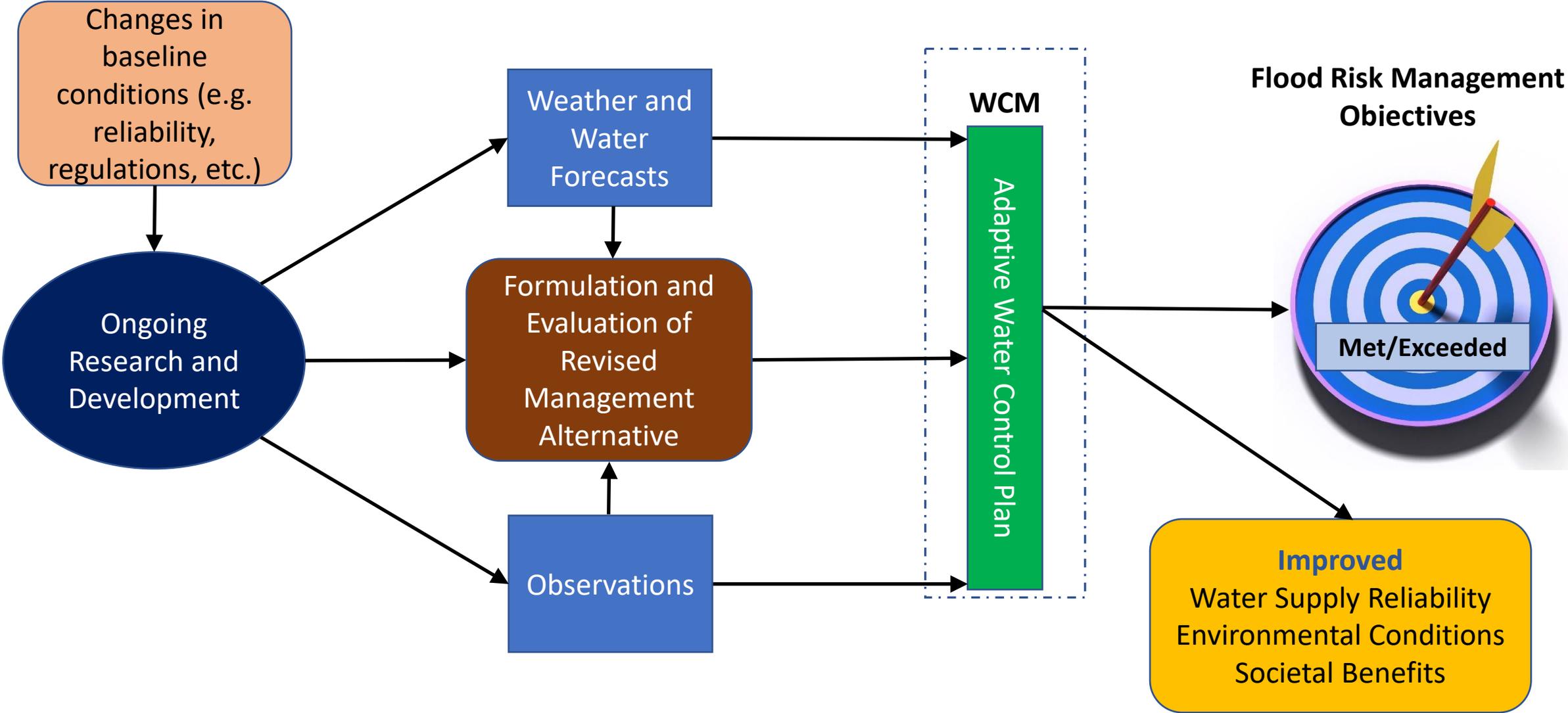


# Concept of “FIRO Space” as applied to Lake Mendocino

- Phase I in initial WCM
- Expansion to Phases II and III guided by a metrics-based process described in the WCM or a streamlined WCM update

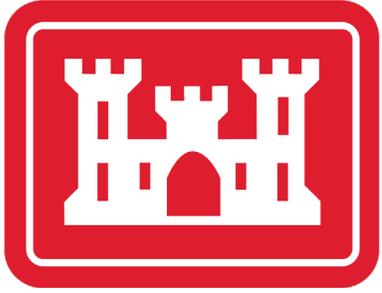


# FIRO Model for Adaptive Water Control Manuals



# Next Steps for Lake Mendocino

- Clearly define baseline targets for flood risk management
- Begin with the “FIRO Space” associated with the Modified Hybrid EFO model
- Begin collaborative development of forecast skill metrics that
  - Meet baseline FRM targets and
  - Accurately reflect the required level of reservoir operator confidence
- Work toward integrating the concept into the WCM update



# Thank You



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