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Managing Water in the West

Sacramento River Temperature Management SWRCB Workshop

U.S. Department of the Interior
Bureau of Reclamation

March 18, 2016

Presentation Overview

- Improved Processes, Metrics and System Understandings
- Plan to Develop and Carryout 2016 Temperature Plan
- Outlook for 2016 Sacramento River Temperature Management

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Improved Processes

- Model Adjustments
- Added Tools and Data Collection
- Improved Communications

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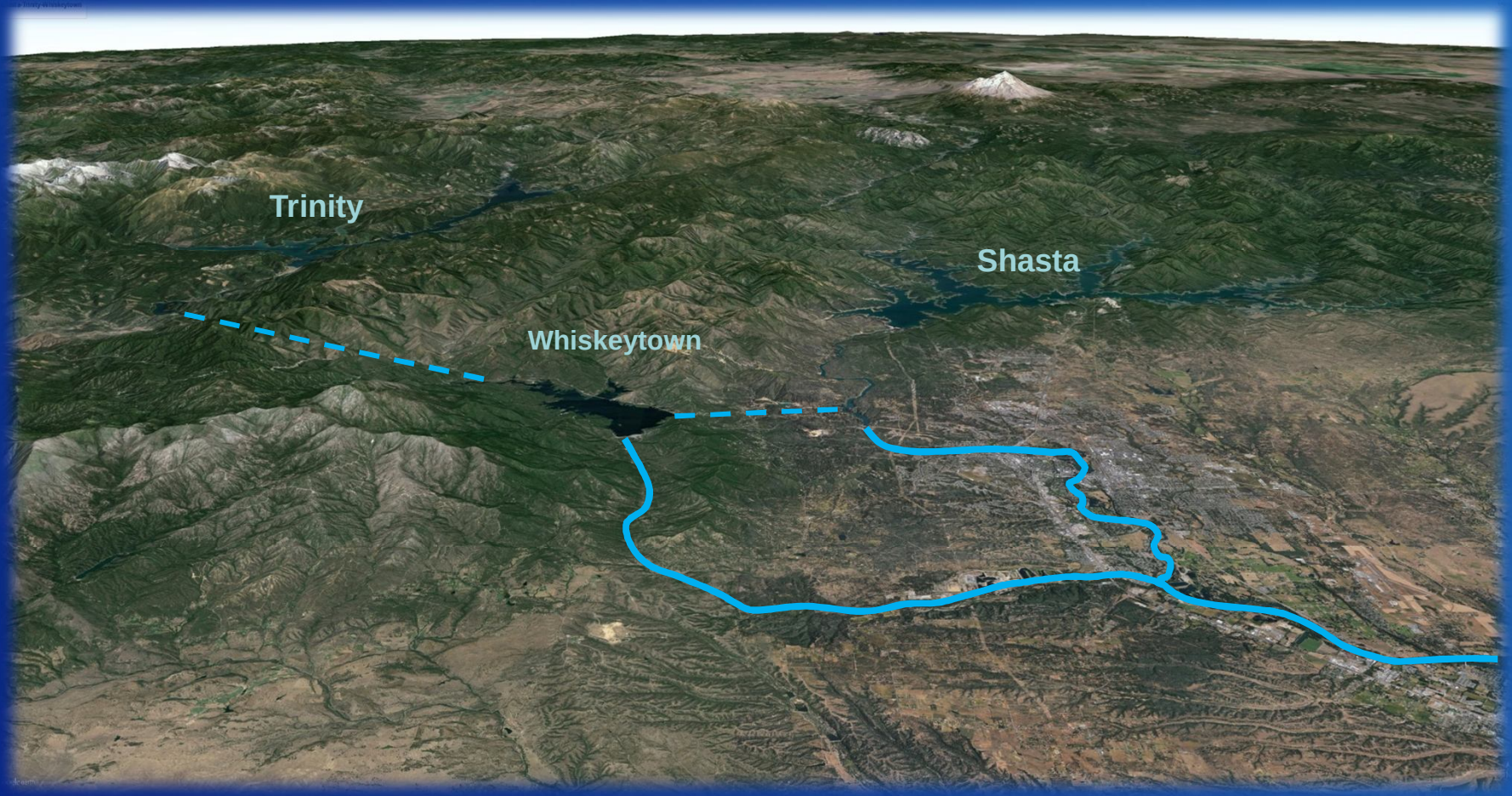
Northern CVP Reservoirs



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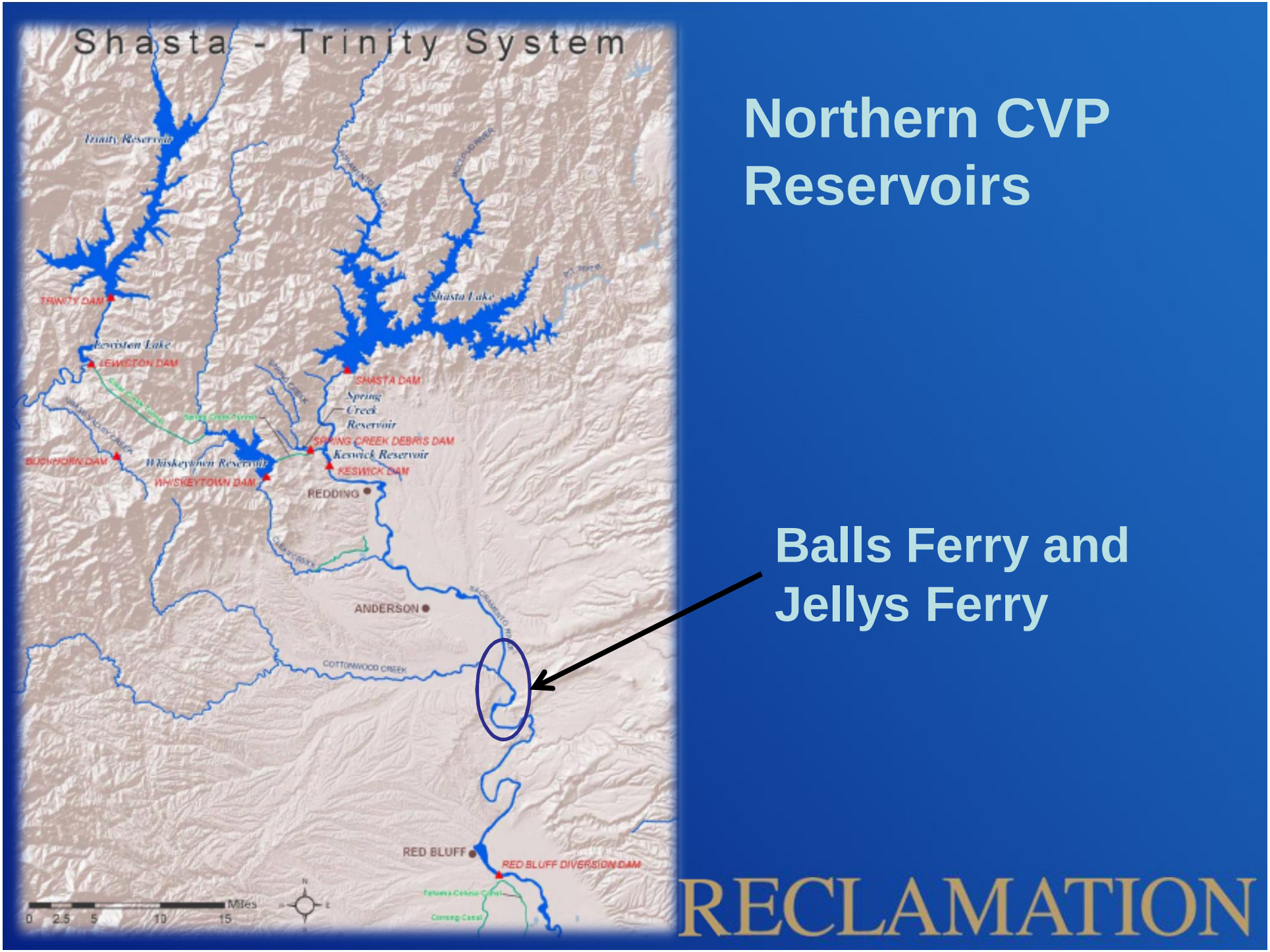

Northern CVP Reservoirs

Balls Ferry and Jellys Ferry

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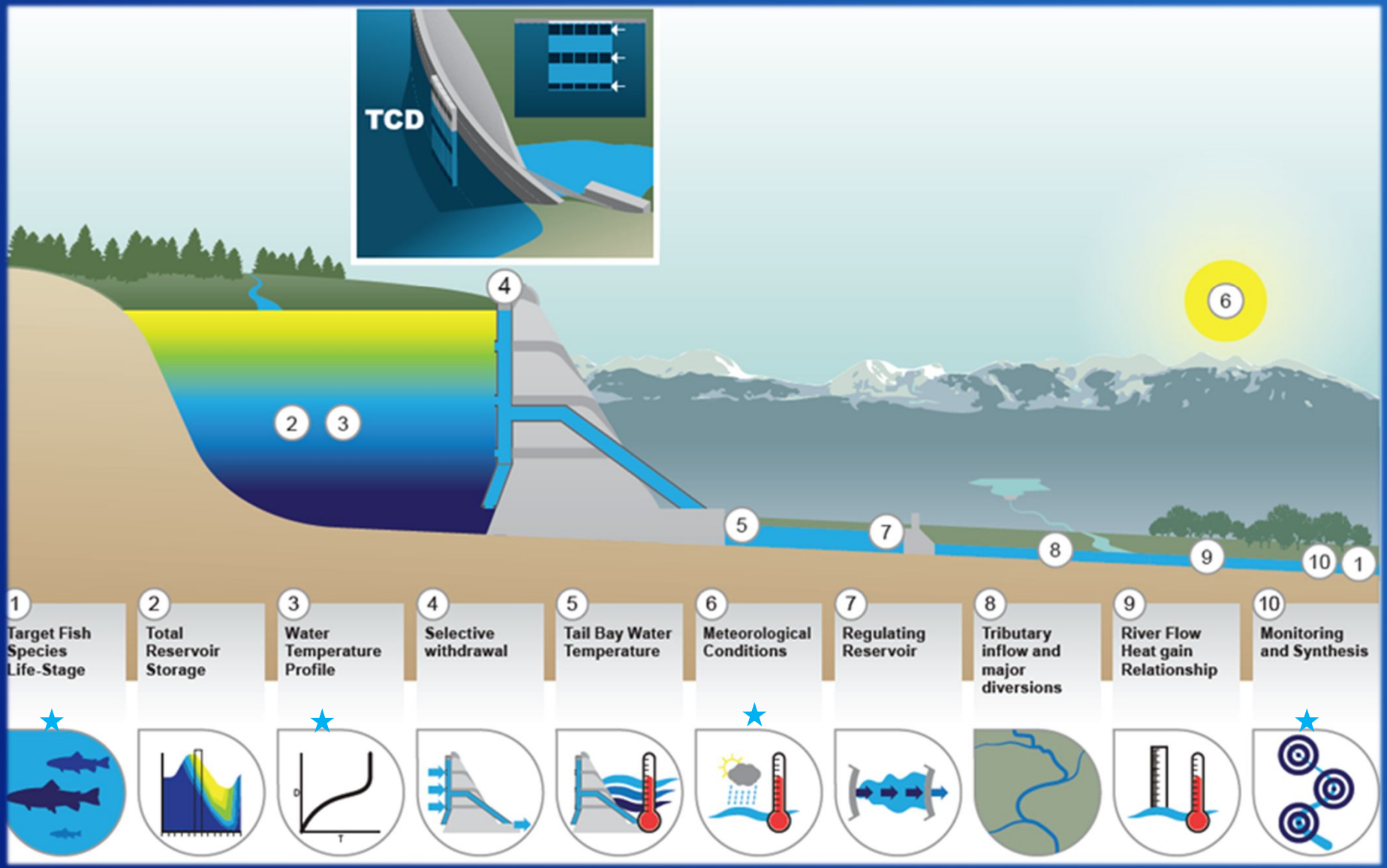
Elements of Temperature Management



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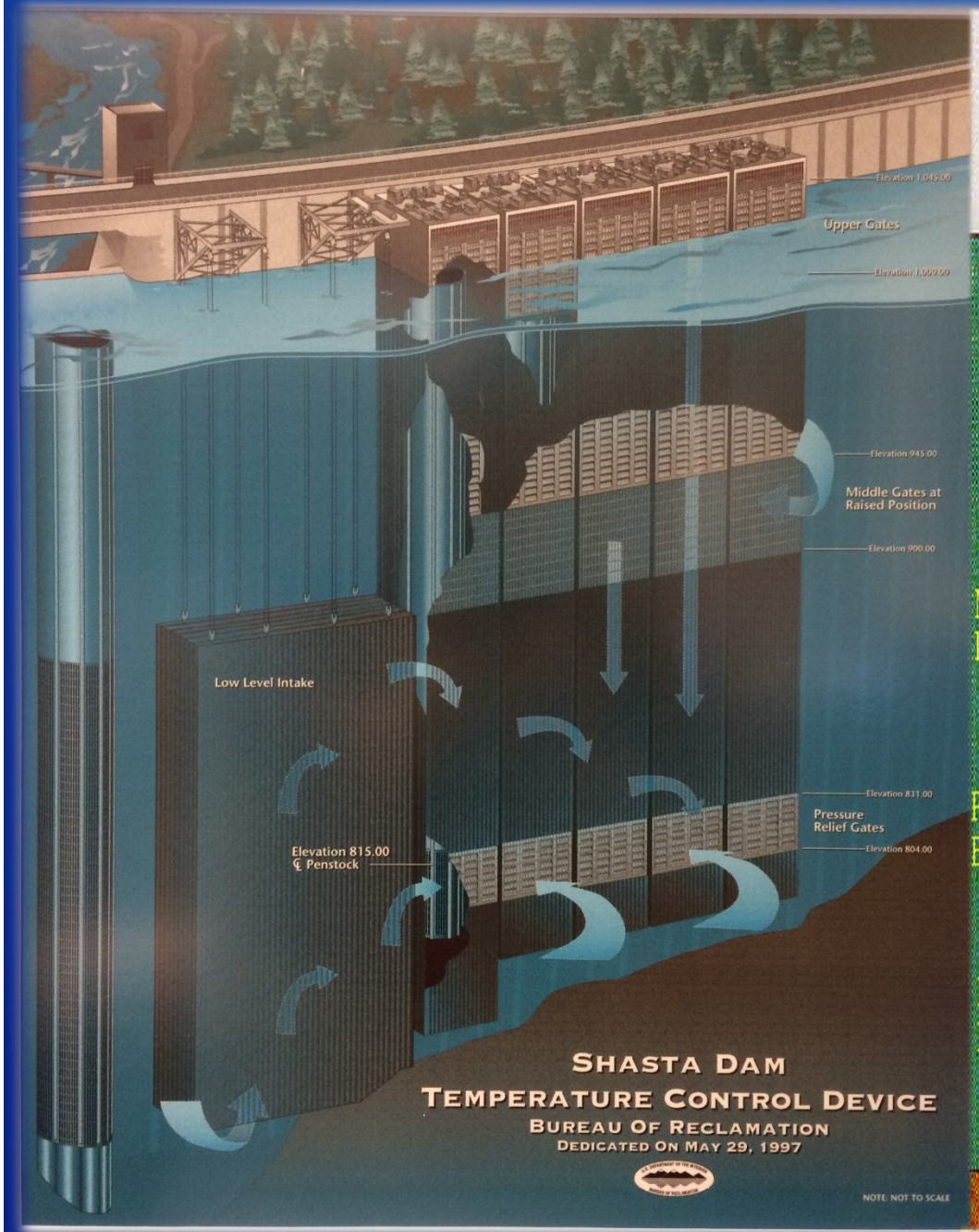

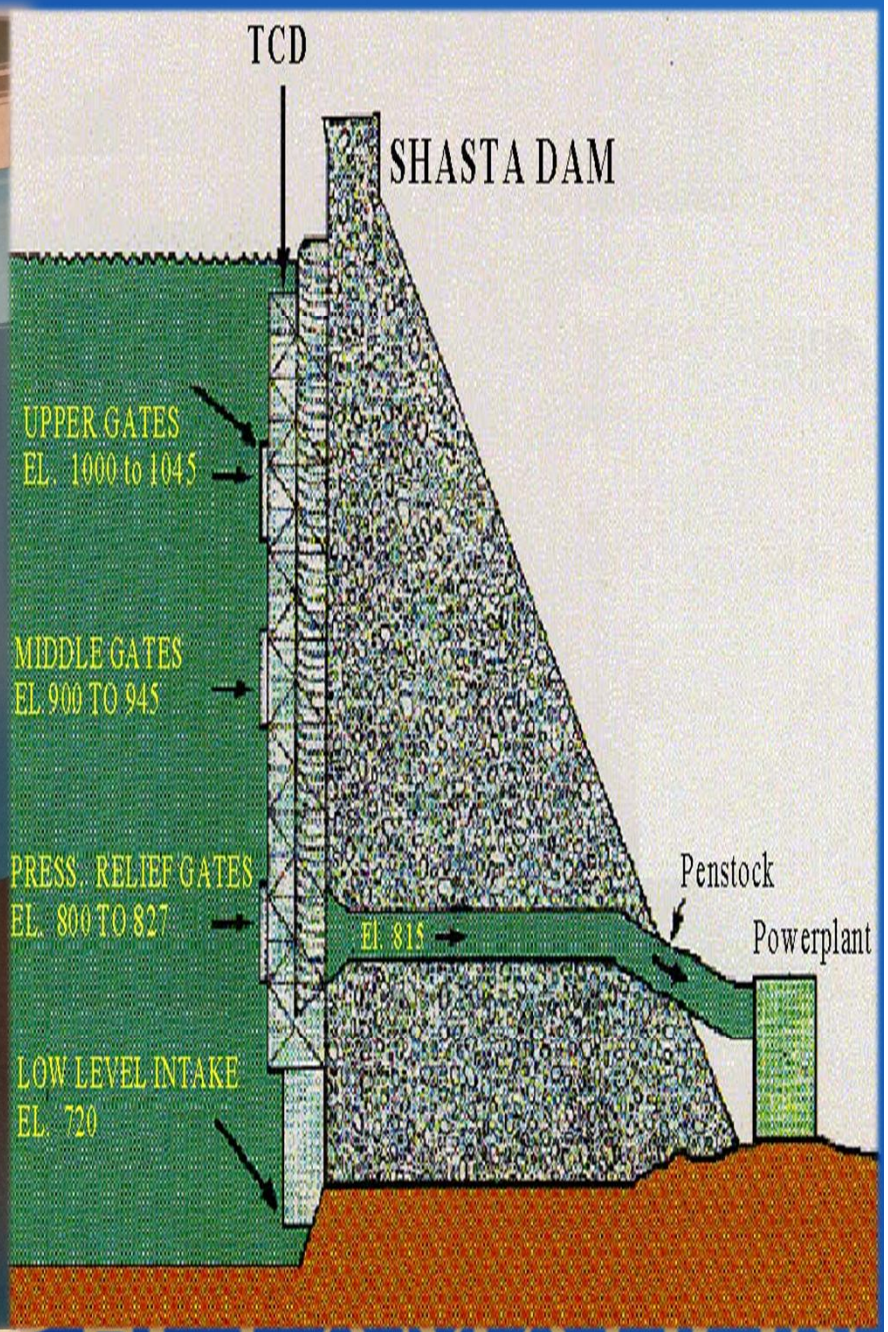

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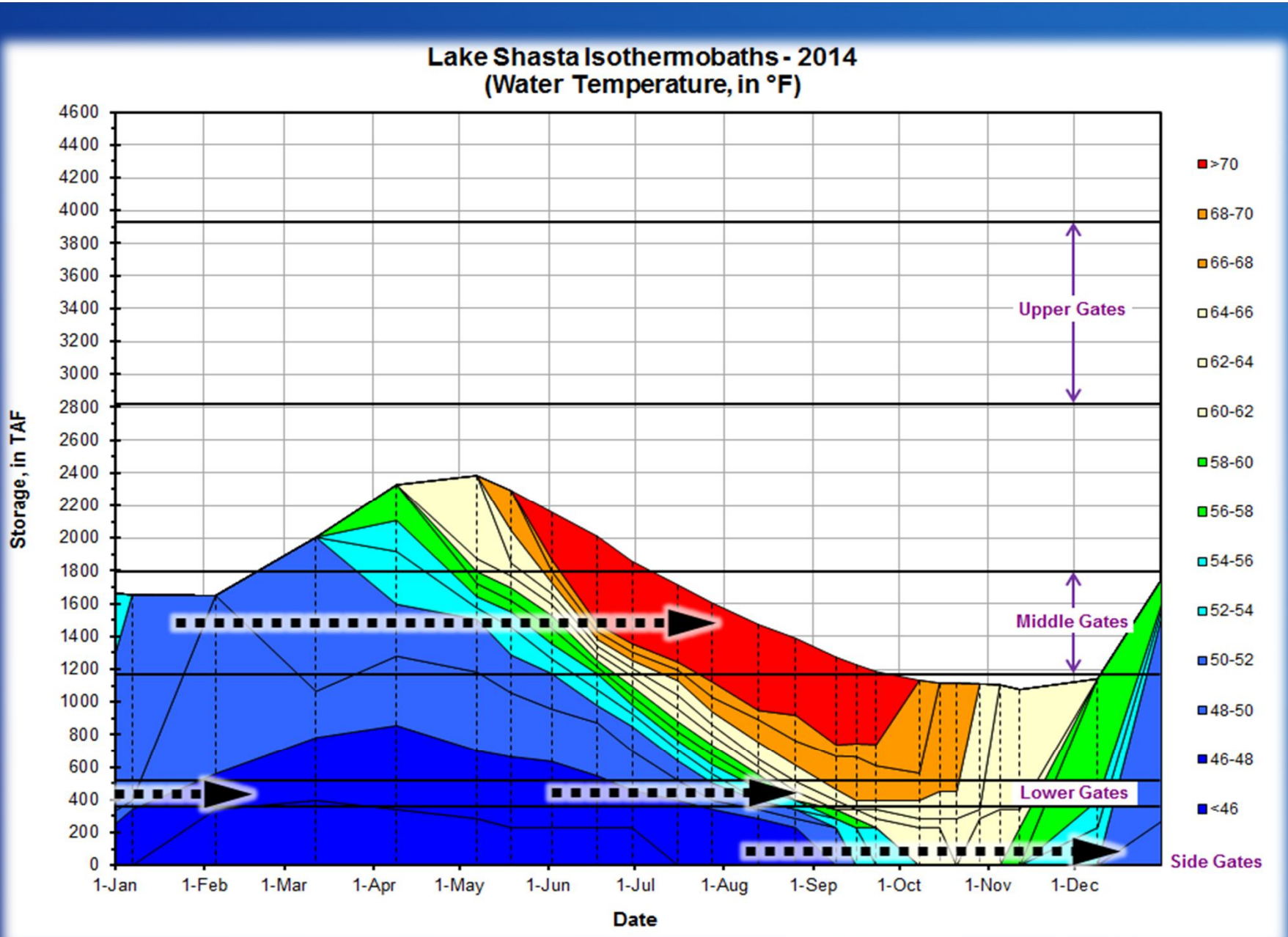

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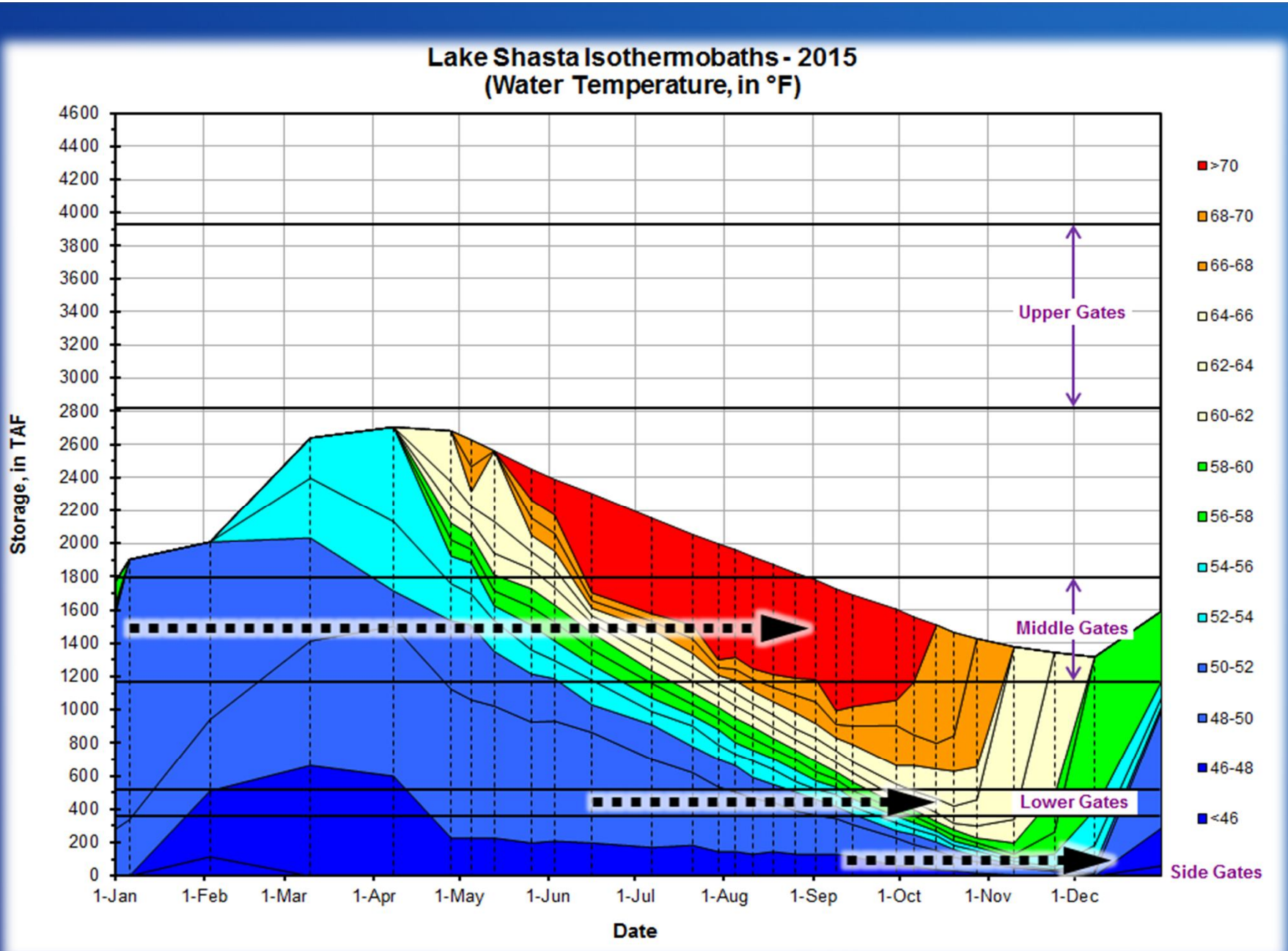

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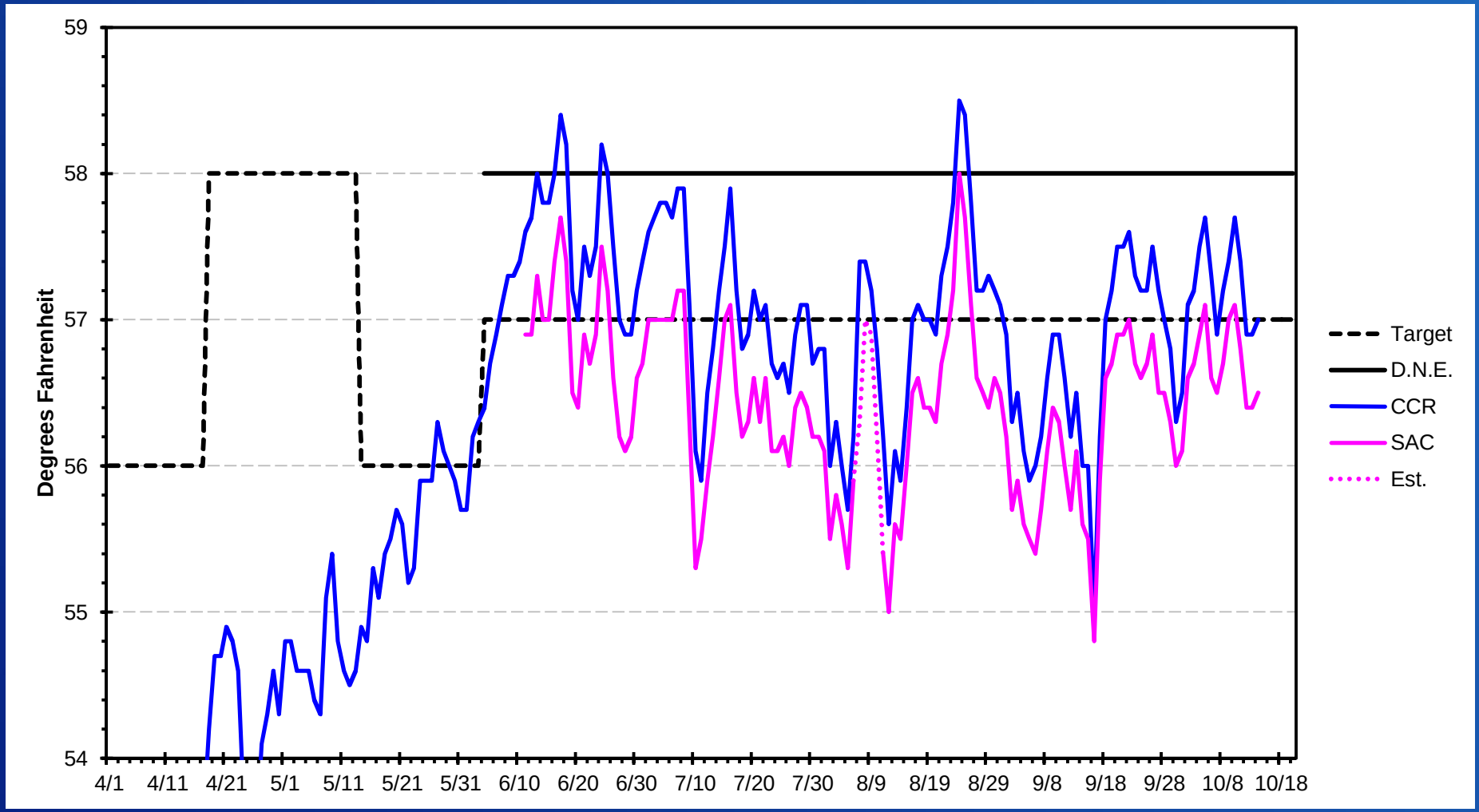
SAC and CCR Temperature



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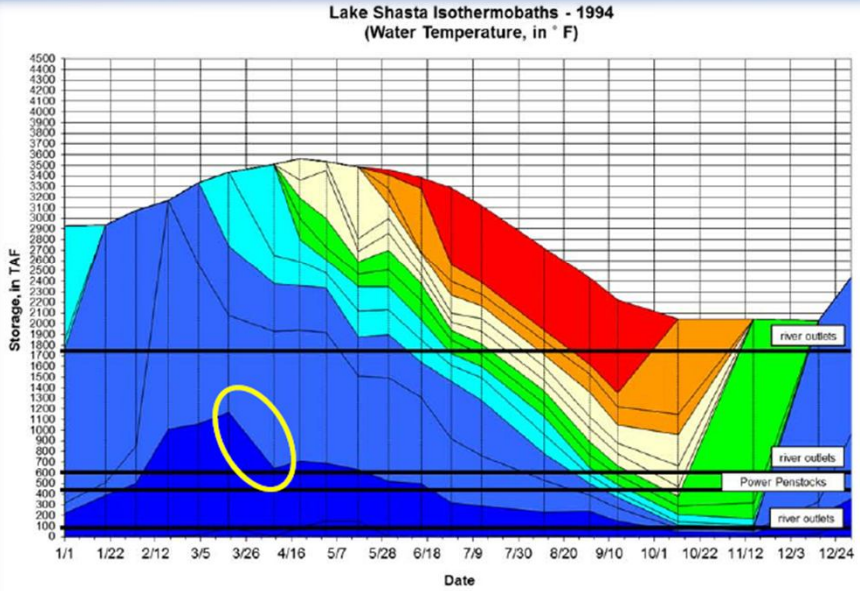
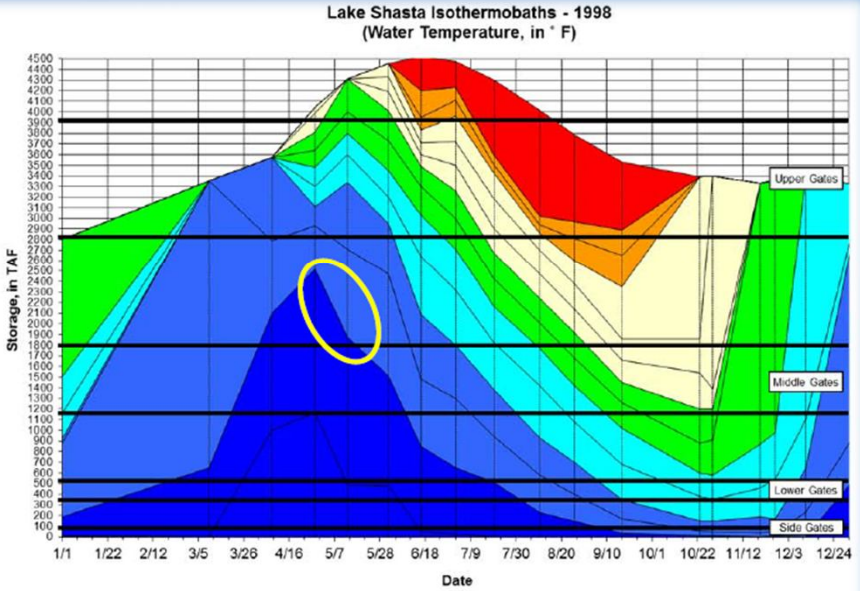
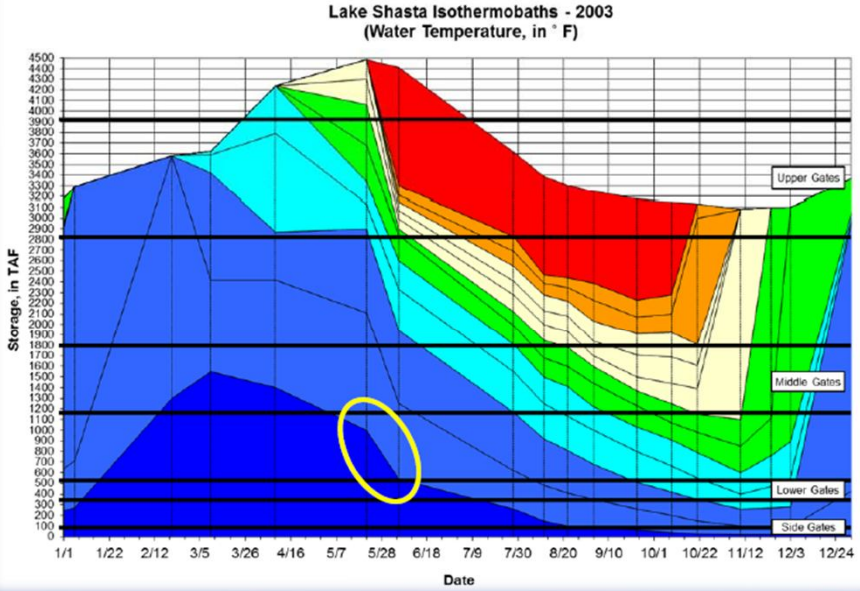
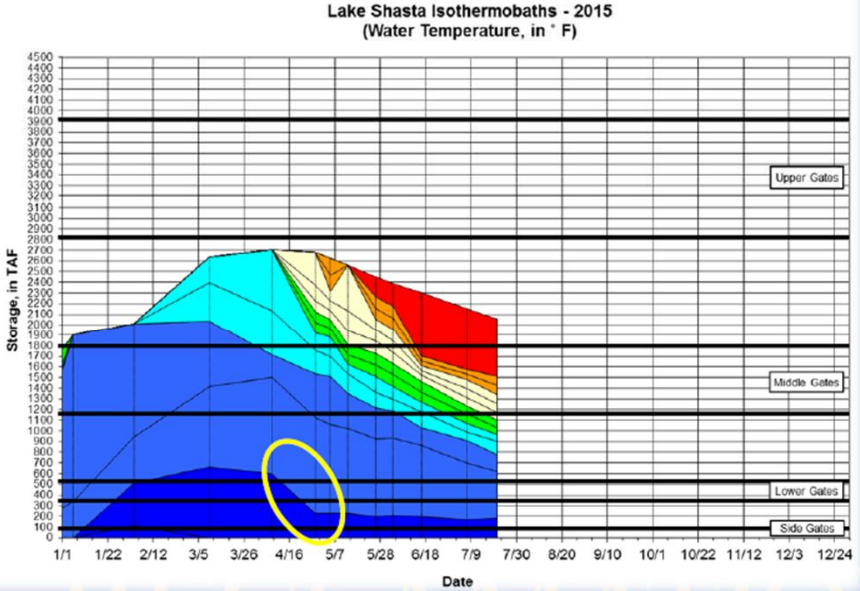
Uncertainties -- Initial Shasta Reservoir Temperature









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Adjustments in 2015

- New temperature gauge (SAC) right above Highway 44
- River Temperature Model Adjustment for the Reach KWK to CCR gage location
- Use of estimated 10% L3MTO meteorological data *(warmer outlook for the temperature season)*
- Installation of TCD Curtain *(to reduce potential warm water blending in the TCD)*
- Very Close Coordinated Operations with Sacramento River Settlement Contractors *(Wilkin Slough flows at or near 3,000 cfs for extended periods Summer 2016)*

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Additional Actions 2016

- New Oak Bottom Temperature Curtain Installation
- More Structured SRTTG Information Sharing
  - Meeting Structure
  - Data Exchange / Consolidation
  - Group Configuration
- Additional RAFT Model Information

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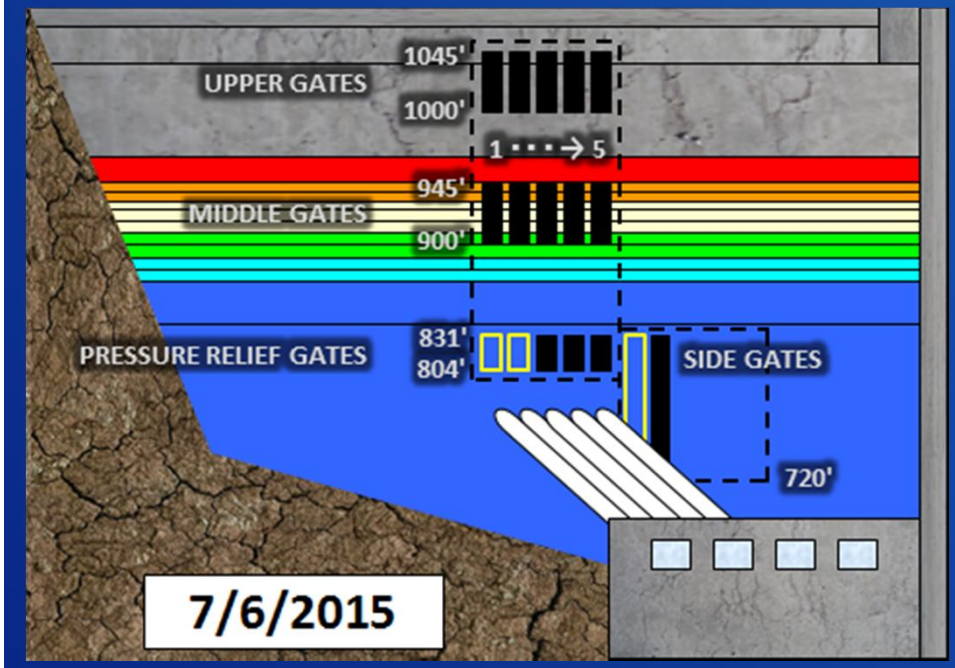
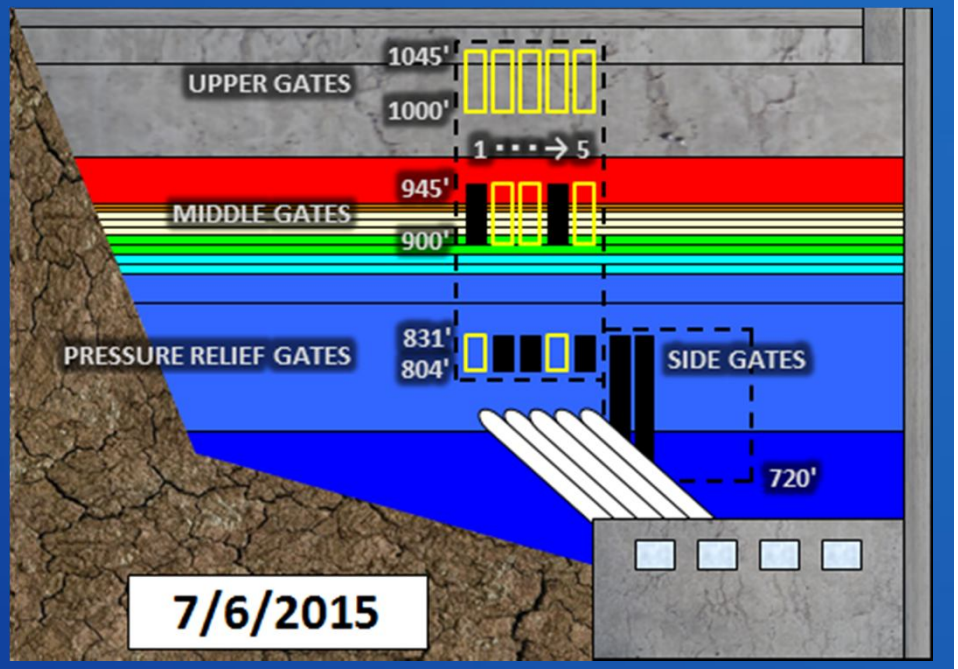
First Side Gate Opened (Per Model Run)



June 16th 10% model run results



Actual Operations

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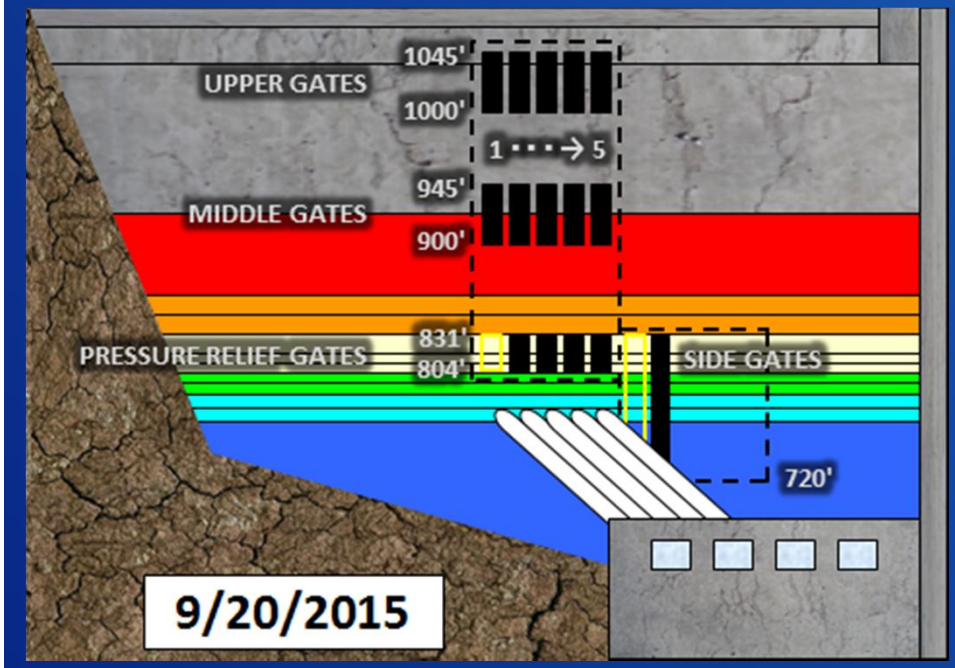
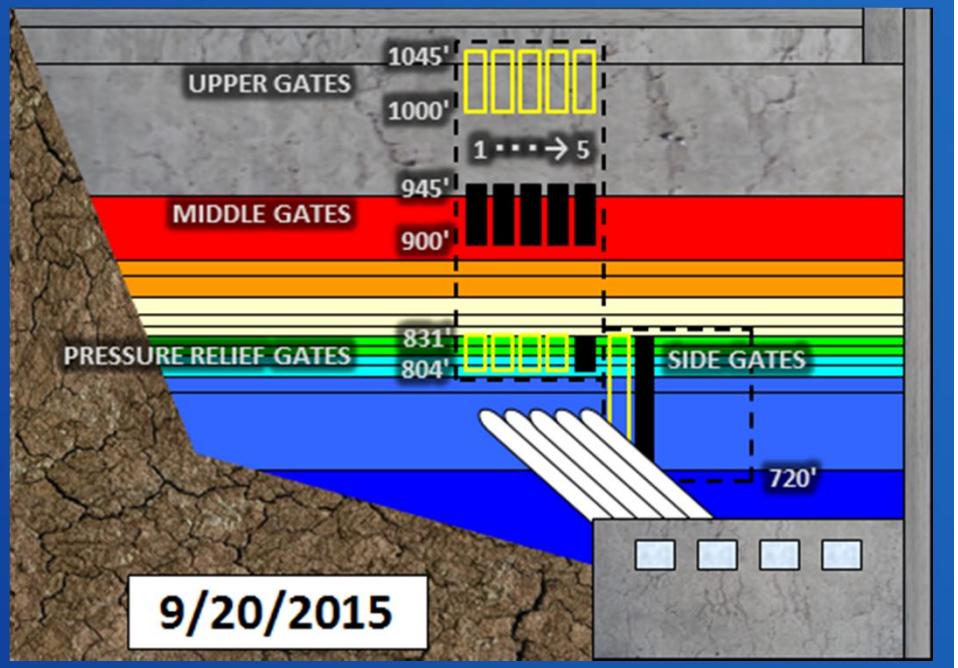
Primary Reliance of Side Gate (Per Model Run)



September 1st 10% model run results



Actual Operations

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NMFS Biological Opinion

RPA Actions I.2.3 – Sacramento River Temperature Planning

- I.2.3.A : If Balls Ferry compliance point and 2.2 maf EOS are both achievable: Standard Plan of Operations
- I.2.3.B : If only Balls Ferry compliance point or 2.2 maf EOS, but not both, are achievable: Reduced Spring Keswick Flows with Additional Coordination
- I.2.3.C : If either CCR compliance point or 1.9 maf EOS are not achievable: Additional Drought Actions

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2016 Plan Formulation

Agency and Stakeholder Input

- Agency-level Coordination (Ongoing)
- March 17 SWRCB Workshop
- Working Temp + Flow Forecast April 1
- Stakeholder Meeting Early April
- Submit Plan by April 22
- Fine-tuning mid-May, as needed

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2016 Plan Implementation

Structure to Guide Adjustments

- SRTTG Meetings
  - Structured Technical Monthly Meetings
  - Added Meetings as Conditions Warrant
  - Provides Real-time Information

- Agency-level Temperature Team
  - Assesses Plan Adjustments
  - Reports Out to WOMT and RTDOT

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Current Shasta Conditions

Challenge of Fill Management

- Current Storage – **3.9 maf**
- Encroached into Flood Space
- **15.4 inches** of Rain so far in March 2016
- Forecasted April – July Runoff
  - **25% - 2.4 maf**
  - **50% - 1.7 maf**
  - **90% - 1.5 maf**

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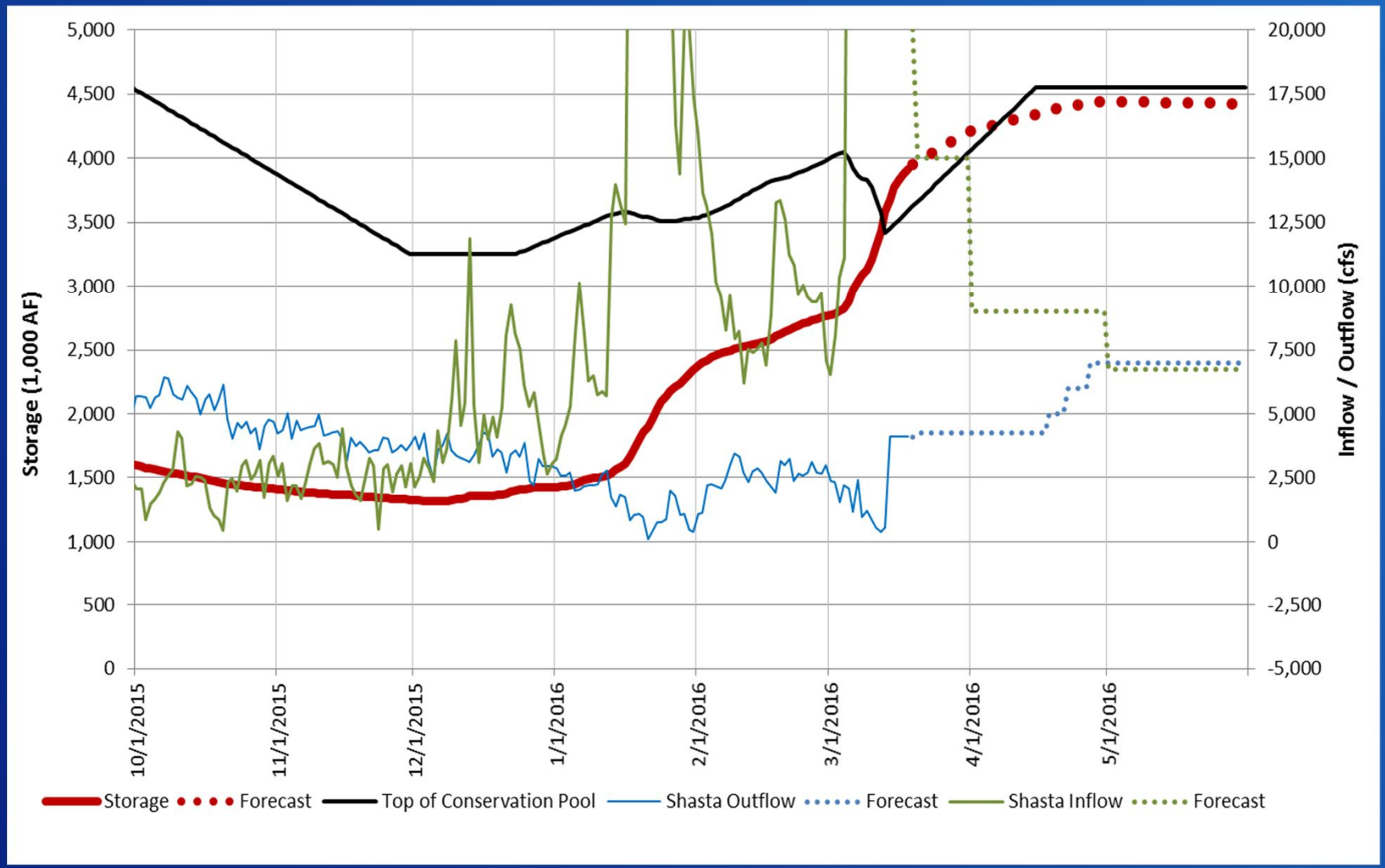
Shasta Flood Diagram



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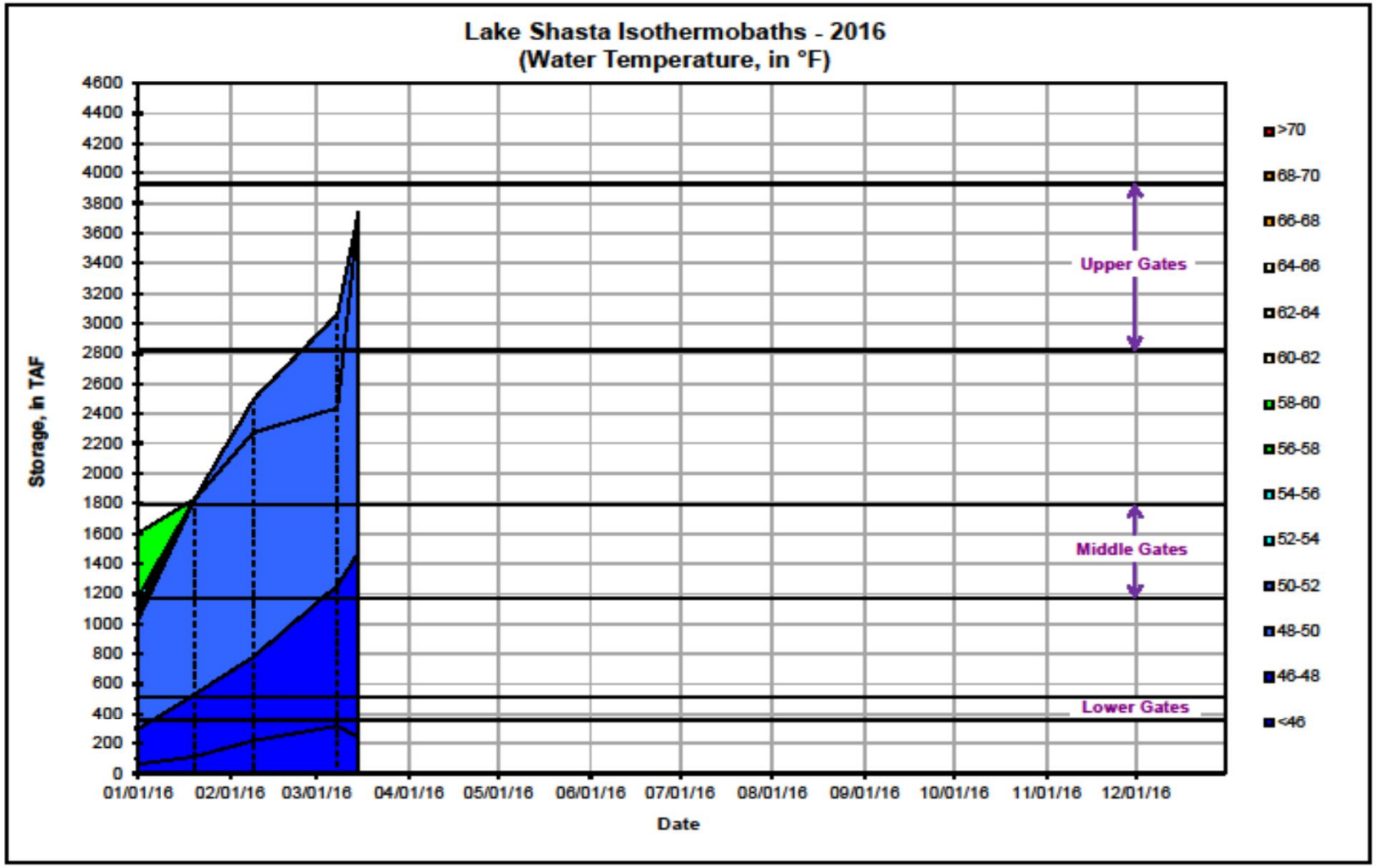

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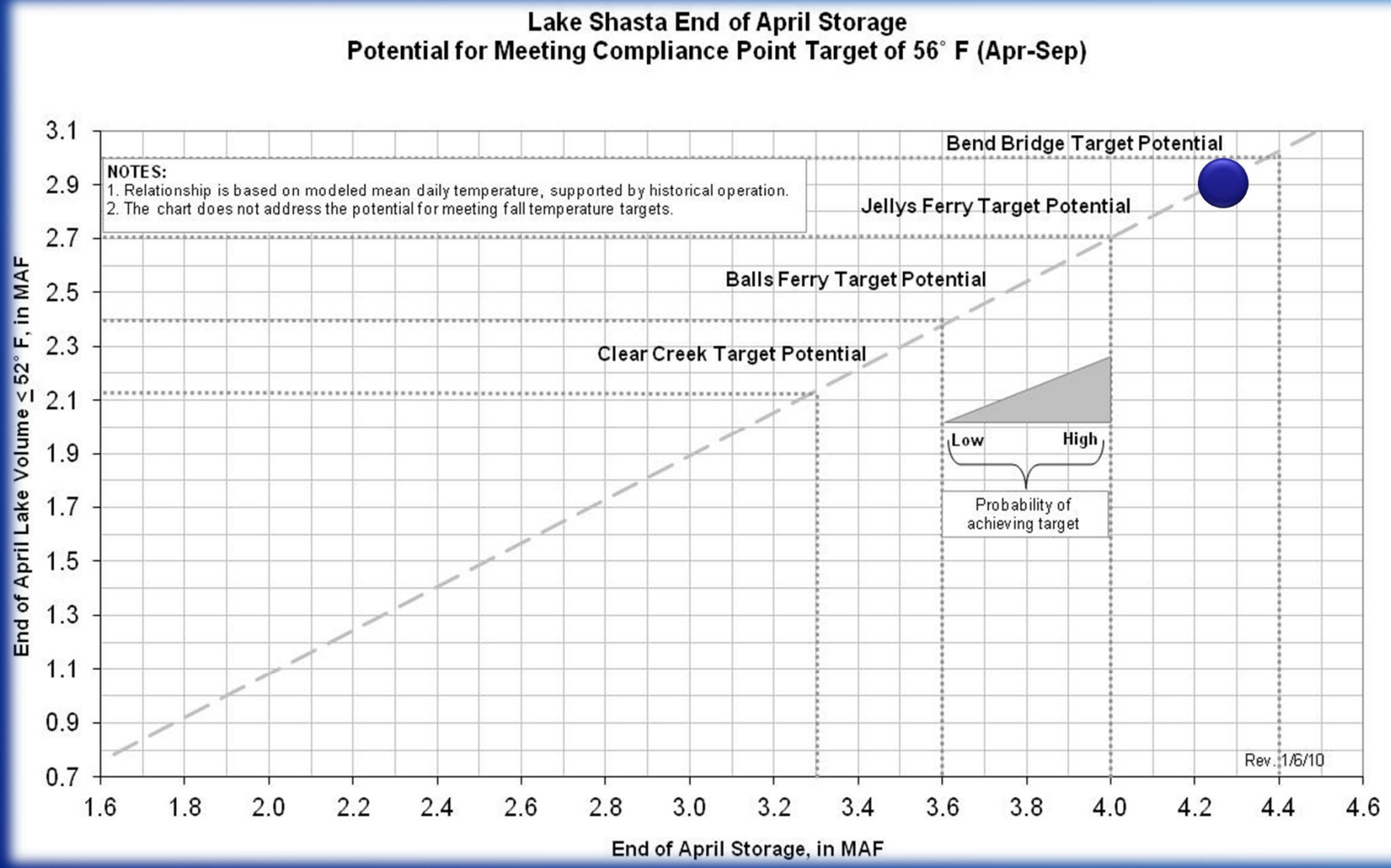
General "Rule-of-Thumb"



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Sacramento River Modeled Temperature
2016 Mar 90%-Exceedance Water Outlook - 10% L3MTO Historical
Approximately 52 degree at Kes