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Lake Mendocino: Fisheries Ops and WQ Objectives

- 1. Russian River Salmonid ESA-listings & life histories (general)*
- 2. NMFS Biological Opinion (2008): CVD Fisheries Objectives*
- 3. WY 2015 ~ WQ (temperature)*
- 4. FIRO: Potential Fisheries Benefits*

Joshua Fuller
NOAA/NMFS
West Coast Region
FIRO June 2016

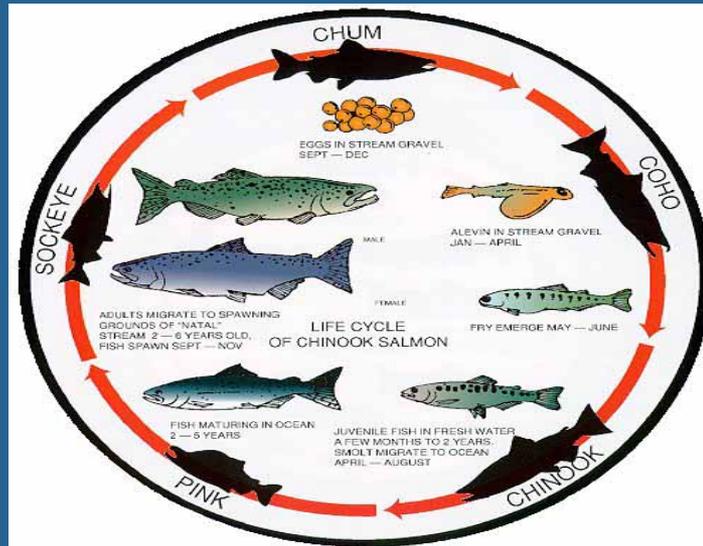
ESU: California Coastal (CC)

Chinook Salmon

Oncorhynchus tshawytscha
Fall-run



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General life history:

- Mainstem spawning/rearing
- <8 mos. in freshwater (juveniles)
- 2 - 4 yrs. in saltwater (sub-adults)
- Semelparous (1x spawners)

ESA-listing status: **Threatened**

Listing year: **1999**

RR Recovery Target: **8700**



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DPS: Central California Coast (CCC)

Steelhead Trout

Oncorhynchus mykiss

Winter-run



CCC Steelhead, Russian River



CCC Steelhead, Russian River



CCC Steelhead, Russian River

General life history:

- Tributary/mainstem spawning/rearing
- 1-2 yrs. in freshwater (juveniles)
- 2 yrs. in saltwater (sub-adults)
- Iteroparous (repeat spawners)

ESA-listing status: **Threatened**

Listing year: **1997**

RR Recovery Target:

19K RR (8.5K upper RR)

ESU: Central California Coast (CCC)

Coho Salmon

Oncorhynchus kisutch
Fall-run



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General life history:

- Tributary spawning/rearing
- 1 yr. in freshwater (juveniles)
- 2 yrs. in saltwater (sub-adults)
- Semelparous (1x spawners)

ESA-listing status: **Endangered**

Listing year: **1996**

RR Recovery Target: **10K**



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NMFS Regulatory BiOps

Russian River Biological Opinion (2008):

1. Modify Decision 1610 - minimum instream flow requirements
2. Turbidity associated with CVD
3. Ramping rates

Potter Valley Biological Opinion (2002):

1. Eel/Russian River trans-basin diversion
2. 2006 BiOp implementation
3. FERC Re-licensing ~ April 2017



Russian River BiOp: Modifications to Decision 1610



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- 1) Higher summer flows/velocities from CVD impacting 34 miles of juvenile steelhead rearing habitat within upper Russian River
- 2) Draft Environmental Impact Statement (EIR) expected fall 2016 ~ new fisheries flow prescriptions

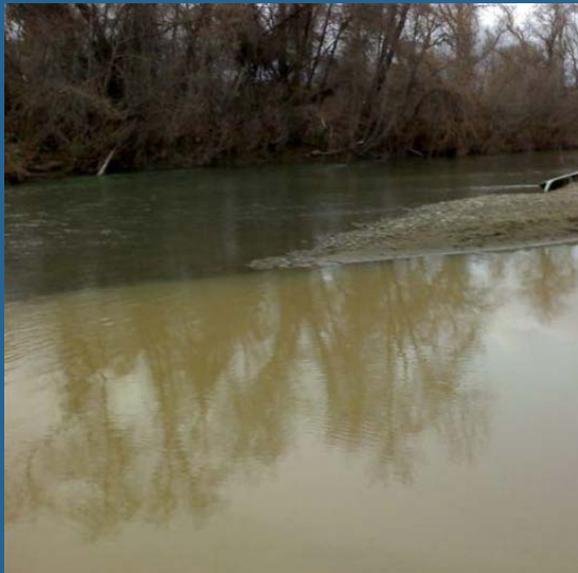


Russian River BiOp: Investigate turbidity associated with CVD



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- 1) Prolonged exposure to salmonids ~ negative impact to juvenile salmonid growth and spawning gravel quality (summer ~ spring)
- 2) Reduces hatchery steelhead angling opportunities downstream (winter)



Lake Mendocino Turbidity 6/3/2016



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Russian River BiOp: Investigate flow ramping effects to salmonids



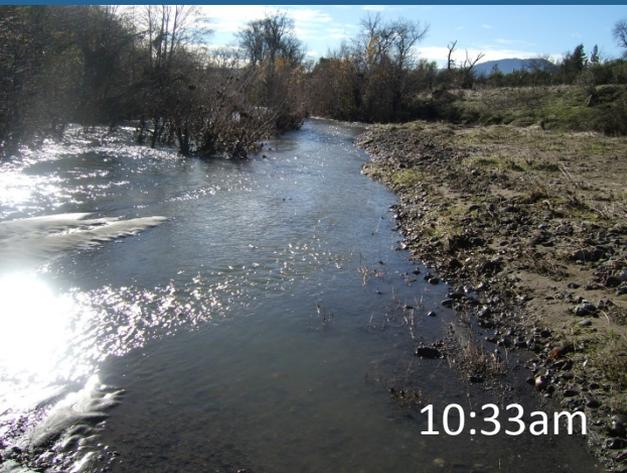
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1. Minimize the likelihood of stranding and mortality of salmonids due to ramping-down of CVD releases



Season	Daylight Rates ³	Night Rates
February 16 to June 15 ¹	No Ramping	2 inches/hour
June 16 to October 31 ²	1 inch/hour	1 inch/hour
November 1 to February 15	2 inches/hour	2 inches/hour

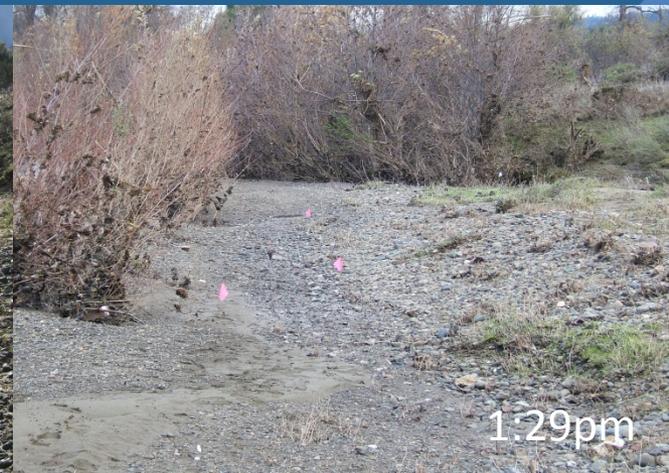
1 Salmon fry are present
2 Steelhead fry are present
3 Daylight is defined as one hour before sunrise to one hour after sunset



10:33am



12:23pm



1:29pm

CVD Ramping Criteria



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Ramp-Down (BiOp 2008 ~ Revised 2016)

1. 2500 to 4000 cfs: 250 cfs/hr
2. <2500 cfs: 100 cfs/hr
3. March 15 to May 15;
<250 cfs: 25 cfs/hr
* not to exceed 50 cfs/d
4. May 16 to March 14;
<250 cfs: 25 cfs/hr

Ramp-Up (BiOp 2008)

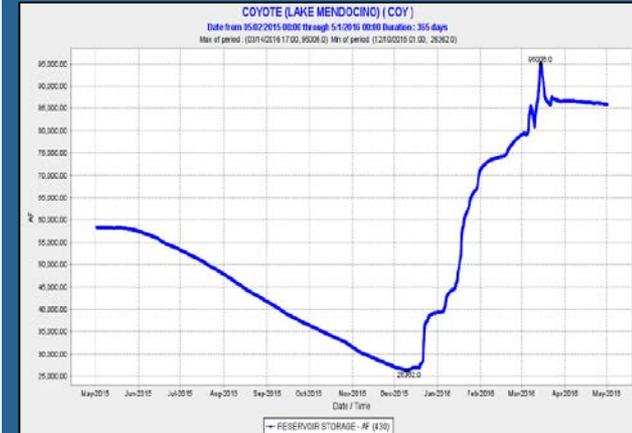
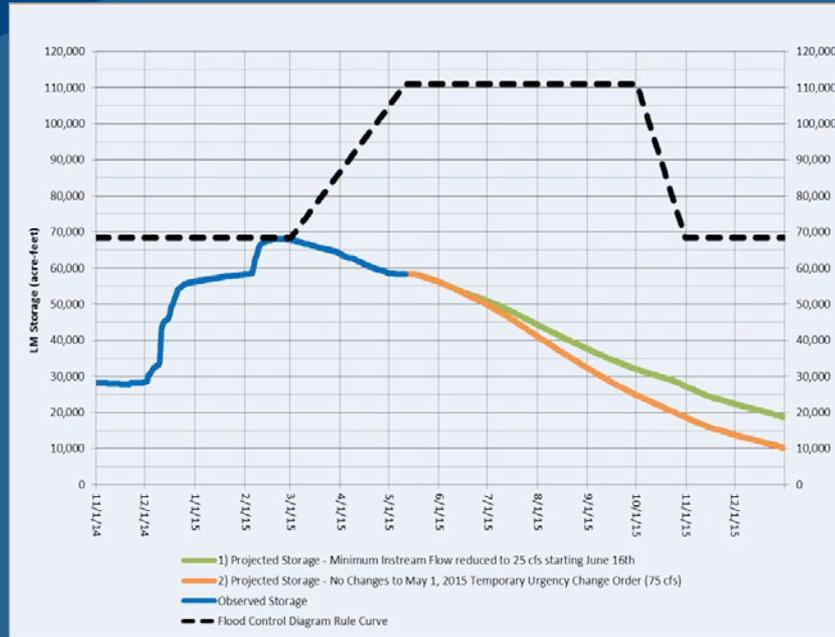
1. 0 – 250 cfs: 1000 cfs/hr
2. 250 – 1000: 1000 cfs/hr
3. >1000 cfs: 2000 cfs/hr



What happened with El Nino?



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1. Russian River D1610 ~ TUCO: May 1, 2015
2. Eel River PVP ~ Flow variance request: May 13, 2015
3. Russian River D1610 ~ TUCP/O Amended: May 27, 2015

* All resulted in severely reduced streamflows in the Russian and Eel rivers



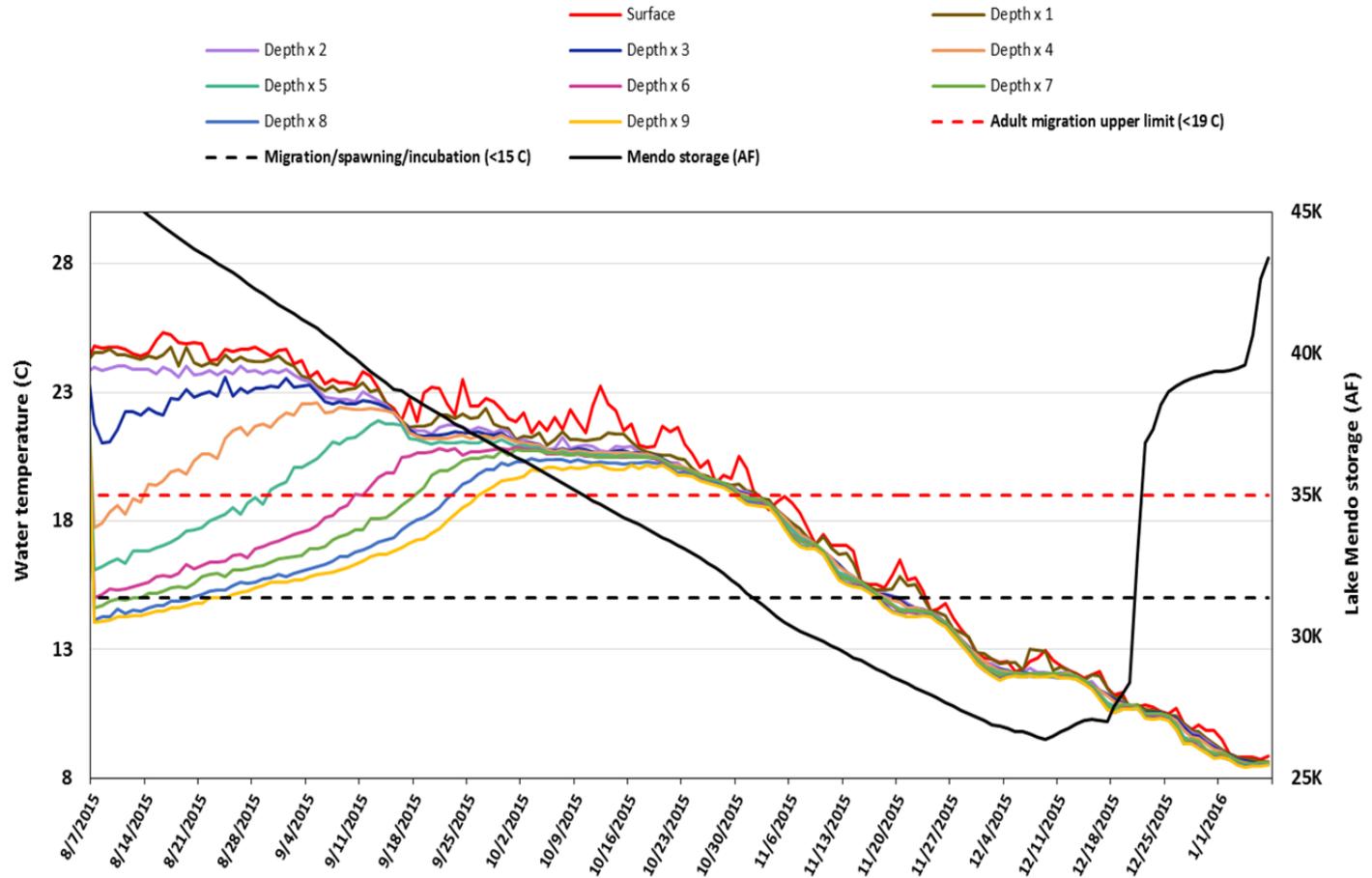
Lake Mendocino 2015 Water Temp. & Water Storage



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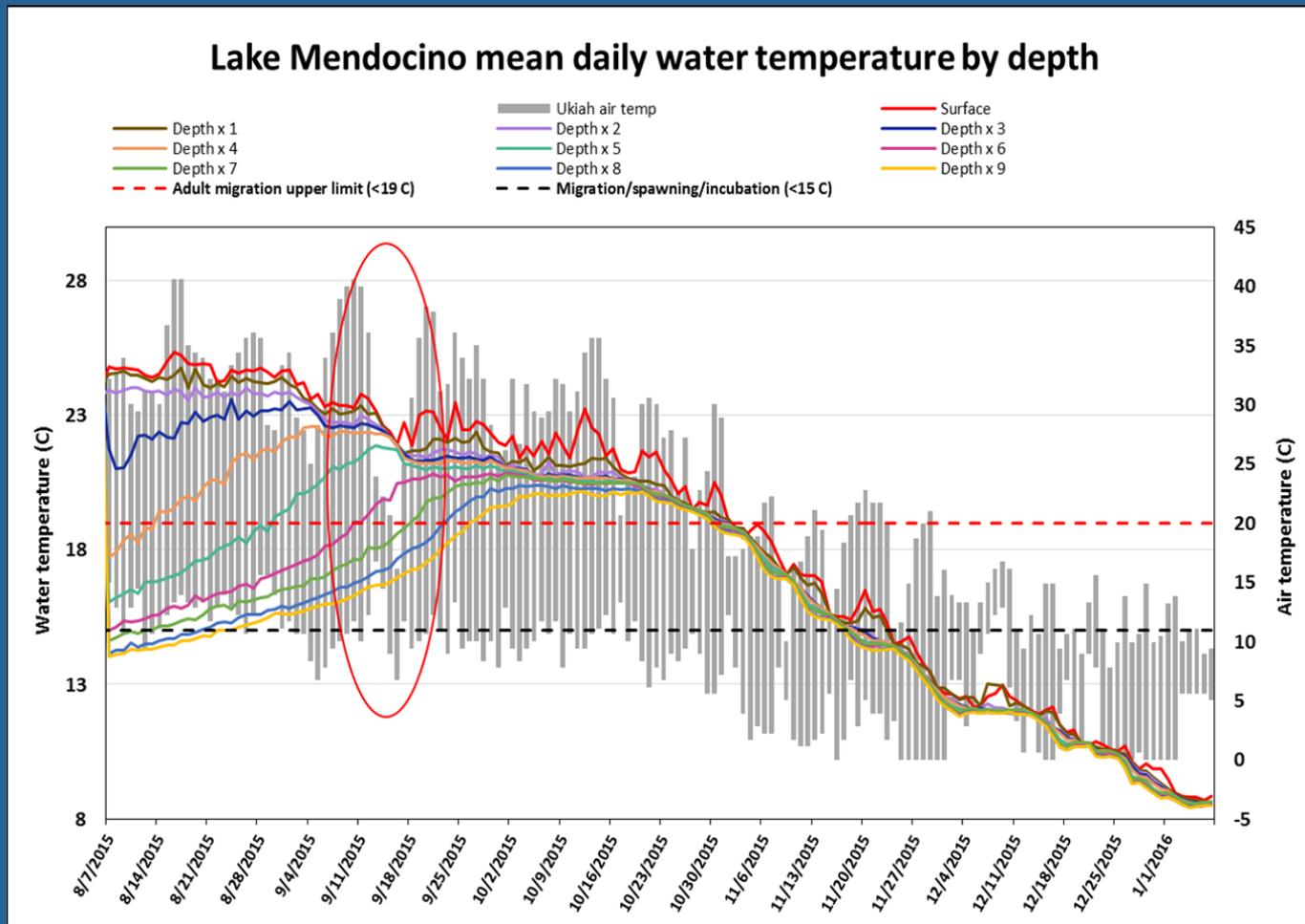
Lake Mendocino mean daily water temperature by depth



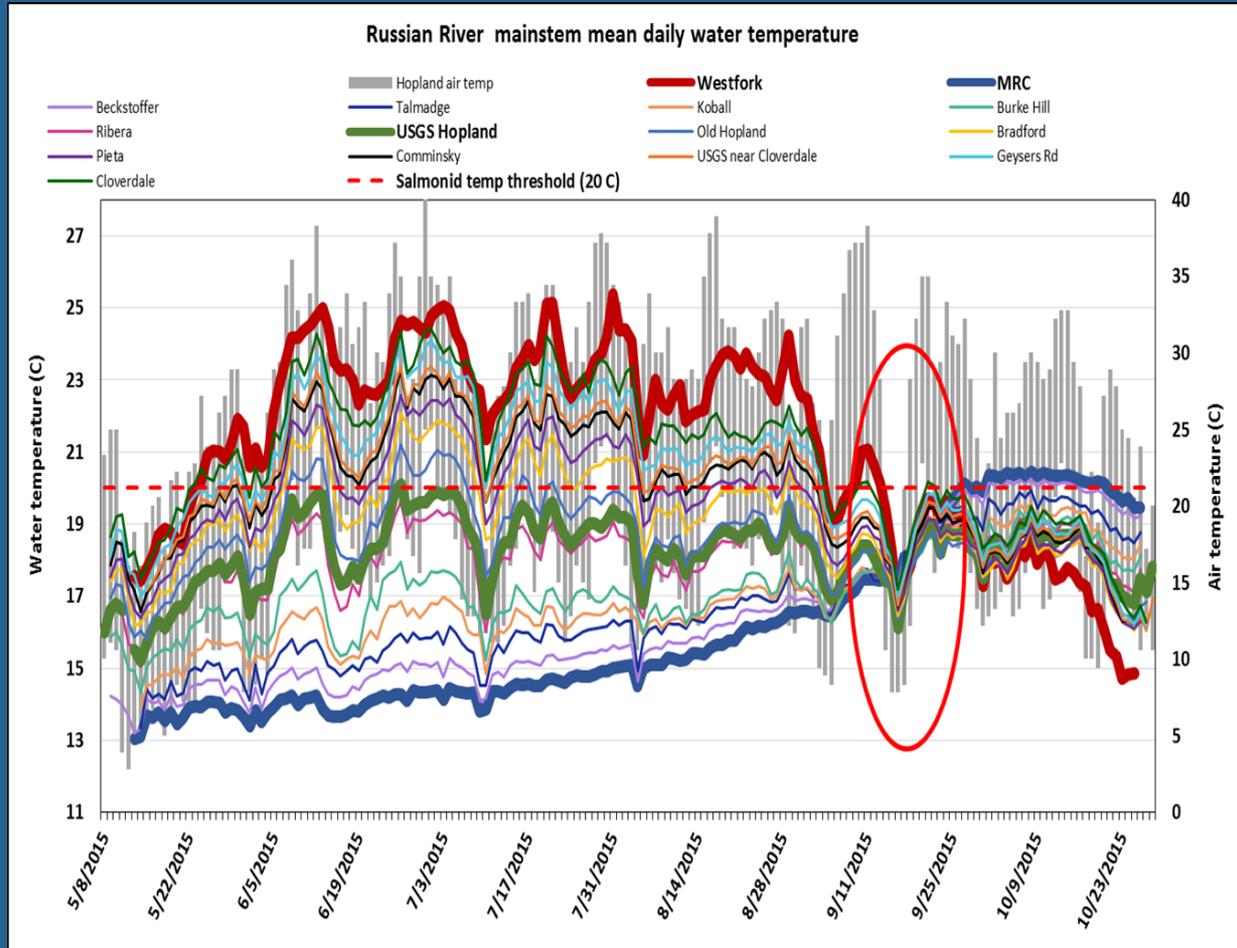
Lake Mendocino 2015 Water Temp. & Ukiah Air Temp.



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Upper Russian River Mainstem Streamflow Temperature Monitoring ~ 2015



How does FIRO potentially benefit fisheries?



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1. **Coldwater pool storage reliability:**
 - a) Adult Chinook upstream migration (fall)
 - b) Juvenile steelhead rearing conditions (summer)

2. **Downstream fisheries flows enhancement and reliability:**
 - a) Higher frequency of preferred “NORMAL YEAR” vs. “DRY YEAR” flow schedules (D1610)
 - b) Reduce the need for emergency changes in streamflows

3. **More storage = Operational flexibility**
 - a) Water availability for critical and/or emergency fisheries management situations