California Water: Corps IWRM System Perspective

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US Army Corps of Engineers
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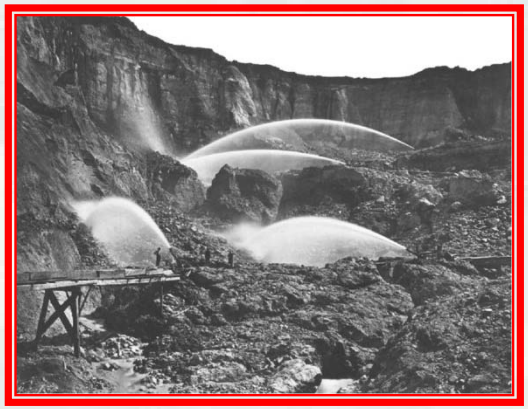
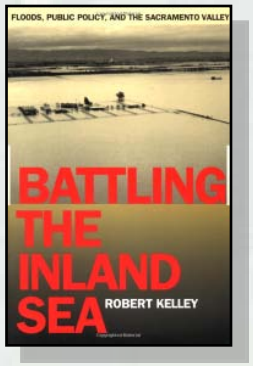
CORNERSTONE OF THE SOUTHWEST!

HISTORICAL CONTEXT FOR CA WATER ISSUES





Early History 1870-1917 → Flood Protection 1917-1960 → Water Supply 1933-1975 → Ecosystems 1972-today

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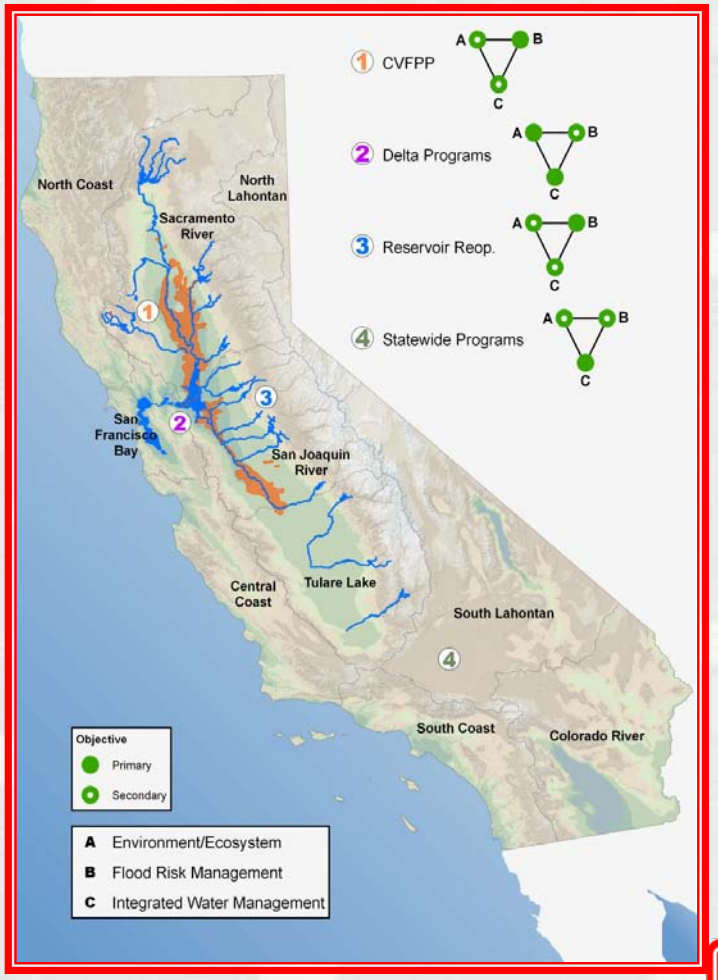
INTEGRATED WATER RESOURCE MGT (IWRM)

- **Future reality will likely include less resources, more demands and greater challenges.**
- **Business as usual won't suffice**
- **Must pursue an integrated, coordinated systems approach: *Flood Risk Reduction, Water Supply* & Ecosystem Restoration.**



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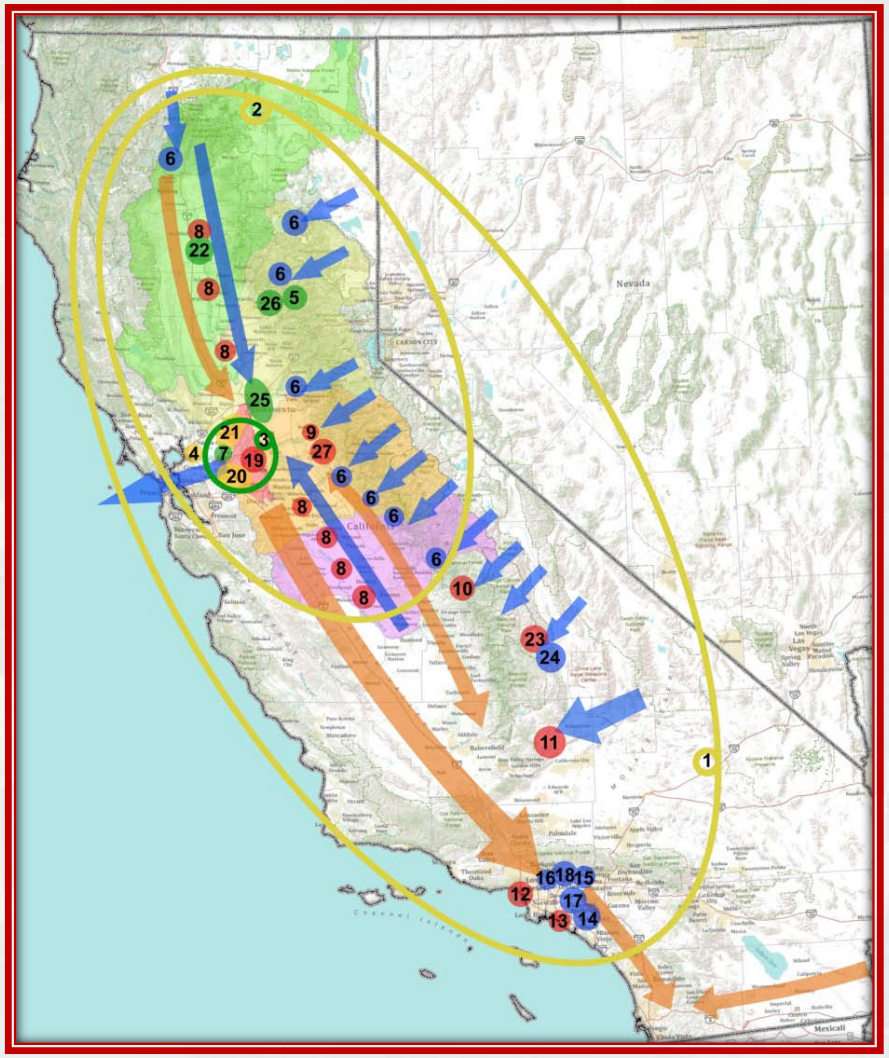
CA WATER IRWM SYSTEM



Priority Initiatives that, in combination, significantly improve:

- **Ecosystem**
- **Flood Risk Management**
- **Water Supply**
- **Conservation**
- **Navigation**
- **Recreation**
- **System (reservoir) Operations**

- **Key:**

Blue Arrows – Natural Flow Paths
Orange Arrows – Conveyance Systems
Yellow Dots – Navigation BL or Other
Green Dots – Ecosystem BL
Red Dots – Flood Damage Reduction BL
Blue Dots – Reservoir Operations/O&M

USACE ROLE IN SYSTEM (RESERVOIR) OPERATIONS

- Water Control Plans are required for all Corps projects & non-Corps reservoirs defined by Sec 7 of the Flood Control Act of 1944 (58 Stat 890)
- Regulate use of flood ‘storage’ space
- Addresses regime of pool elevations & conditions

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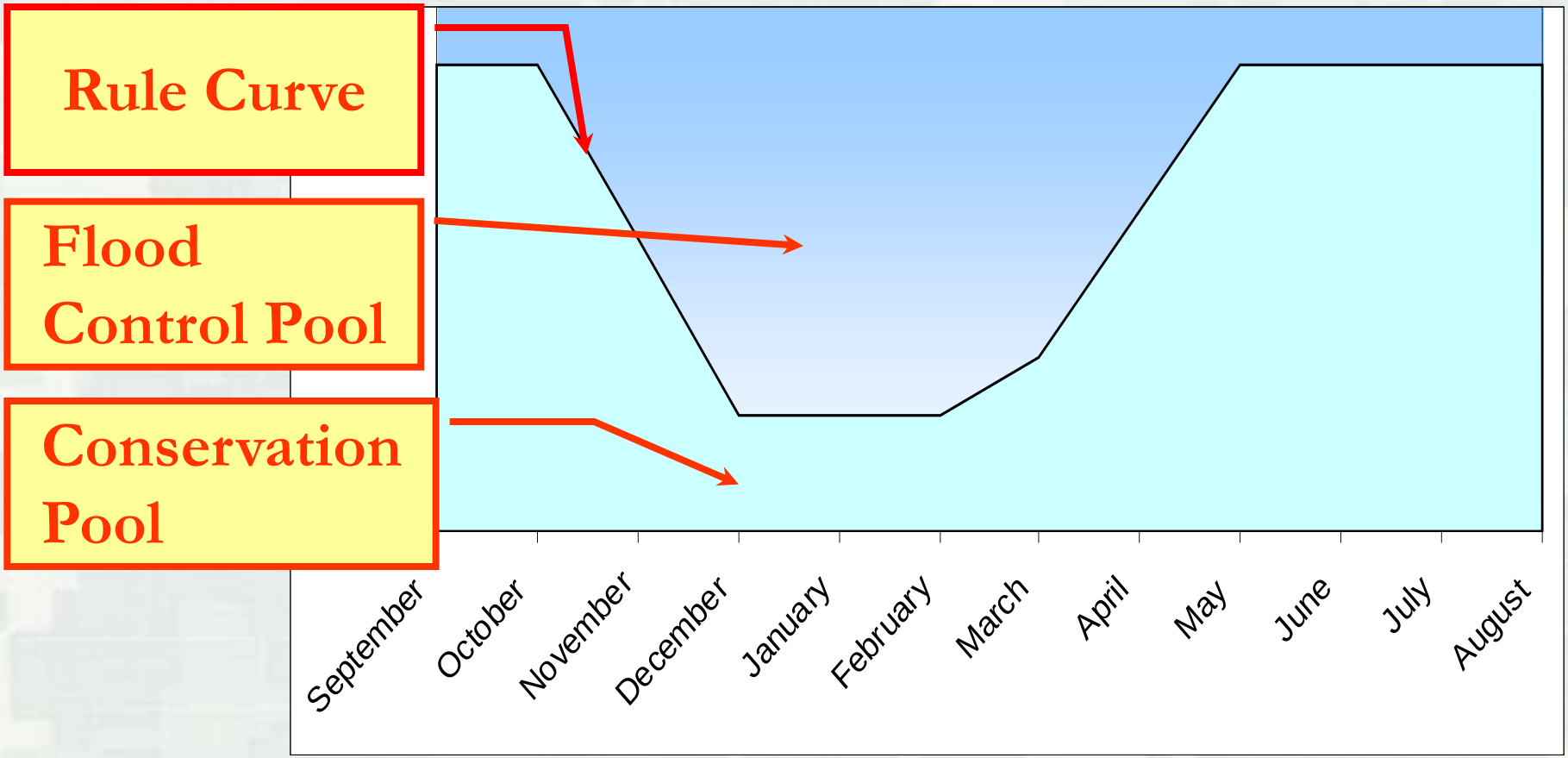
SOUTH PACIFIC DIVISION RESPONSIBILITY

- 82 Facilities in the Region
  - 40 Corps
  - 42 Section 7
- 51 in California
  - 31 Corps
  - 20 Section 7
  - Over 21 MAF of Gross Pool Storage
  - Over 6 MAF of maximum Flood Control Pool

CONCEPTUAL RULE CURVE



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SACRAMENTO WATERSHED

Dam	Operator	Gross Pool Volume AF	Max Flood VolumeAF
Black Butte	Corps	160,000	137,000
Folsom	US Bureau	977,000	400,000
Indian Valley	Yolo FC & WCD	300,600	40,000
New Bullards Bar	Yuba Co Water	960,000	170,000
Oroville	CA DWR	3,538,000	750,000
Shasta	US Bureau	4,552,000	1,300,000
		10,487,600	2,797,000

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SAN JOAQUIN WATERSHED

Dam	Operator	Gross Pool Volume AF	Max Flood VolumeAF
Hidden	Corps	90,000	65,000
Buchanan	Corps	150,000	45,000
New Hogan	Corps	317,100	165,000
Camanche	EB MUD	430,900	200,000
Don Pedro	Mod & Turl ID	2,030,000	340,000
Friant	US Bureau	520,500	390,000
Los Banos	BOR & DWR	34,600	14,000
New Exchequer	Merced ID	1,024,600	400,000
New Melones	US Bureau	2,420,000	450,000
		7,017,700	2,069,000

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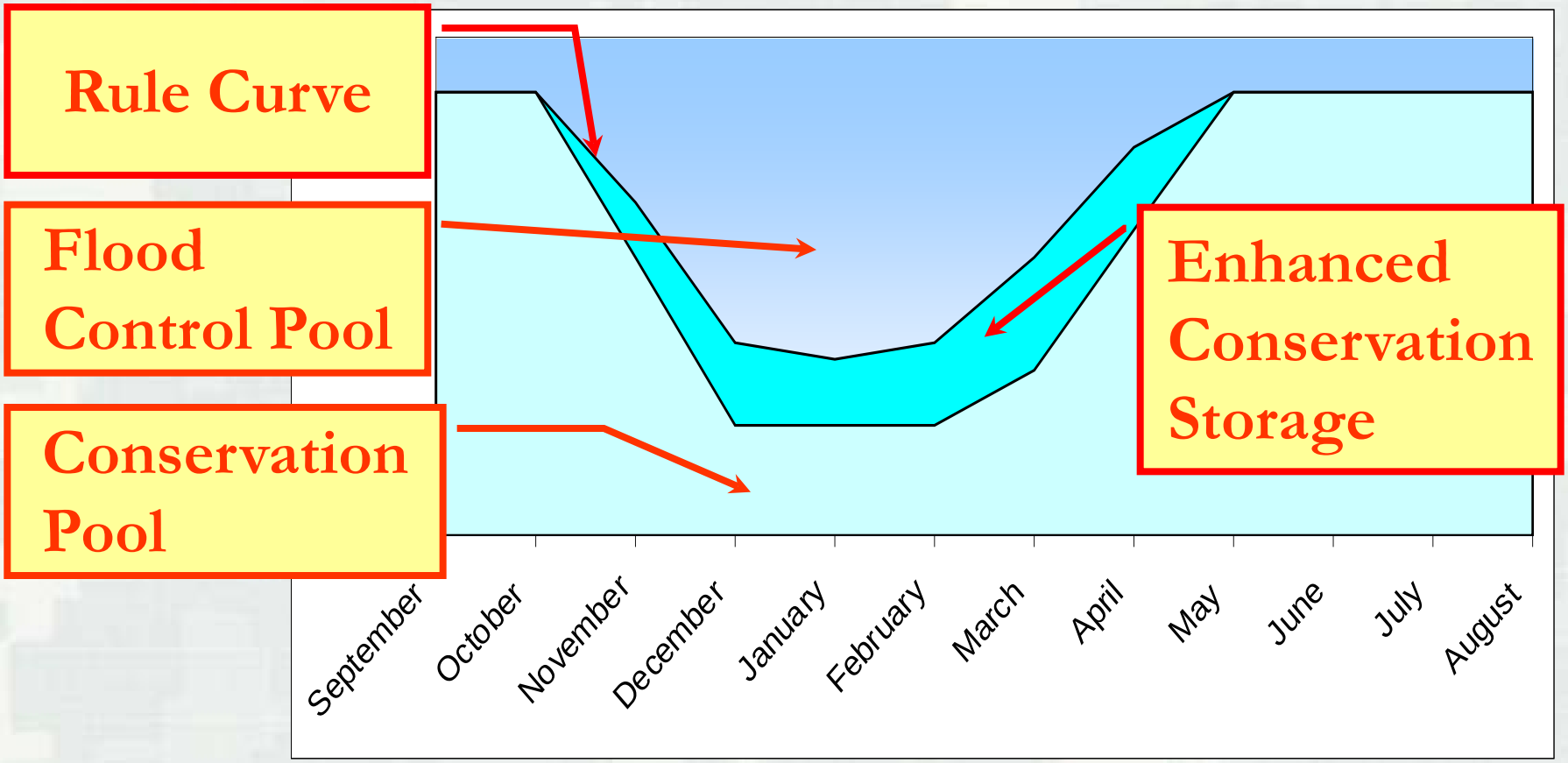
WATER SYSTEM OPTIMIZATION

- Many Water Control Manuals are not current, much less “system optimized”
- Climate change has not been fully incorporated
- Current hydrology & hydraulics are not fully reflected
- Weather forecasting is improving
- Multi-facility operations can be better coordinated
- Increased appreciation for IWRM System perspective

MODIFIED RULE CURVE



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CHALLENGES & BENEFITS

Challenges

- Costly (O&M funded)
- Resource intensive
- Political
- Congressional Authorization
- Coordination
- Corps Mission?
- Water rights issues?

Potential Benefits

- Improved public safety
- Compliance
- Reflect current hydrology & climate
- Raise trade-offs
- System optimization

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