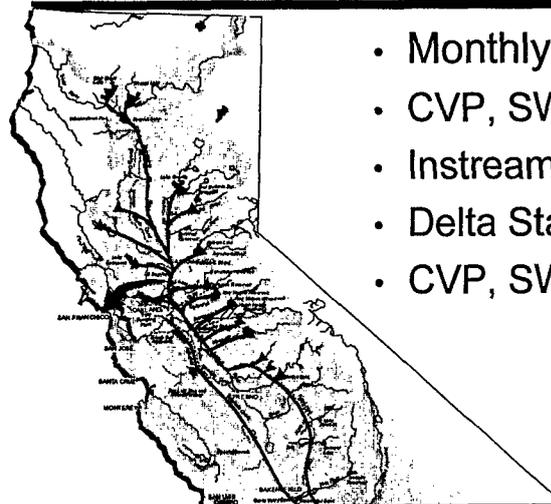


DWRSIM System Modeling

CALFED Bay-Delta Program Water Supply Opportunities



- Monthly Accounting Model
- CVP, SWP Operations
- Instream Flows
- Delta Standards
- CVP, SWP Deliveries

Existing Condition Assumptions

- 1995-Level Hydrology
- 2.6-3.5 MAF Variable SWP Demand
- 3.5 MAF W/ Level II Refuge CVP Demand
- Delta Standards - May 1995 WQCP
- Instream Requirements
 - Sacramento & American - April 26, 1996 CVPIA Flow Criteria
 - Yuba, Mokelumne & Tuolumne - New FERC Agreements
 - Feather, Stanislaus, Merced - Existing Requirements
- Trinity River Diversion 340 TAF/Year

No Action Assumptions

- 2020-Level Hydrology
- 3.3-4.2 MAF Variable SWP Demand
- 0-138 TAF Variable SWP Interruptible Demands
- 3.5 MAF w/Level IV Refuge CVP Demand
- Instream Requirements
 - Sacramento & American - April 26, 1996 CVPIA Flow Criteria
 - Stanislaus - CVPIA Draft PEIS Flow Criteria
 - Yuba, Mokelumne & Tuolumne - New FERC Agreements
 - Feather, Merced, San Joaquin - Existing Requirements

No Action Assumptions

- Delta Standards
 - May 1995 WQCP
 - CVPIA (b)(2) Water Management
 - Additional Upstream Actions
 - 1:3 to 1:5 April-May Export Restriction
 - Additional Chipps Island X2 Days at 1962 Level of Development for May & June
 - Delta Cross Channel Closed from Sept. thru. June
- Trinity River Diversion 340 TAF/Year

Program Alternatives ERPP

- Environmental Flow Targets - ERPP
 - Flow Targets
 - March & April/May 10 Day Upstream Flow Event Targets
 - March & April/May 10 Day Delta Outflow Flow Event Target
 - 13,000 cfs May Freeport Flow Target
 - Operating Priorities
 - First Priority - New Environmental Storage
 - Second Priority - Water Acquisition from Willing Sellers (Modeled as "Add Water")

Water Supply Opportunities Under Existing Conditions and No Action

Average Annual System Deliveries

(in 1,000 acre-feet per year)

	Critical Dry Period	Long-Term
Existing Conditions	4,200	5,600
No Action	4,050	5,900



Program Alternatives Improved SWP-CVP Coordination

- Joint Points of Diversion
- Increased wheeling of CVP water through SWP facilities

Program Alternatives Increase Permitted Banks Pumping Plant Capacity Conveyance Operating Parameters

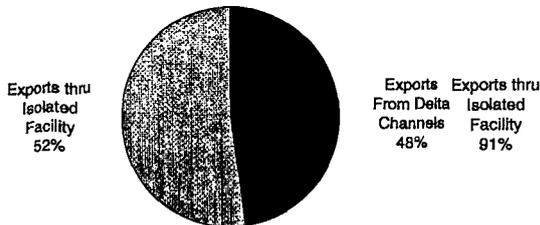
- South Delta Improvements
 - Channel Enlargements
 - Barriers
 - Fish Screens
- Banks Pumping Plant @ 10,300 cfs Capacity

Isolated Conveyance Facility

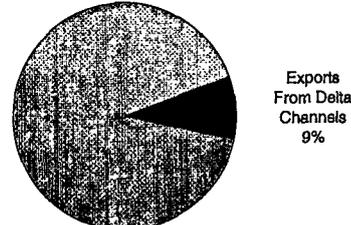
- Delta Standards with Isolated Facility
 - Minimum South Delta Exports - 1,000 cfs July thru. March
 - Sensitivity Assumption with and without E/I Ratio
 - Delta Cross Channel closed Sept. thru. June

Isolated Facility System Operations

Percentage of Total SWP/CVP Exports
5,000 cfs I.F. under E/I Ratio



Percentage of Total SWP/CVP Exports
15,000 cfs I.F. under E/I Ratio

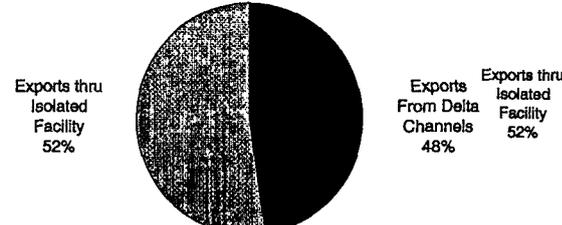


- 1922-94 Average Annual Results
 - Min. Required Outflow = 1,550 taf
 - Flow at Rio Vista = 3,220 taf
 - Total System Deliveries = 6,140 taf
 - Nov-June X2 Position = 72 km
- 1922-94 Average Annual Results
 - Min. Required Outflow = 1,630 taf
 - Flow at Rio Vista = 2,680 taf
 - Total System Deliveries = 6,044 taf
 - Nov-June X2 Position = 71.5 km

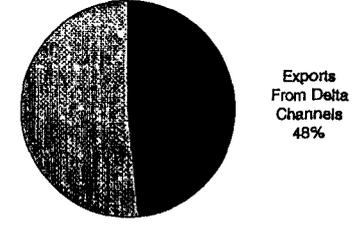


Isolated Facility System Operations

Percentage of Total SWP/CVP Exports
5,000 cfs I.F. under E/I Ratio



Percentage of Total SWP/CVP Exports
5,000 cfs I.F. not included in E/I Ratio

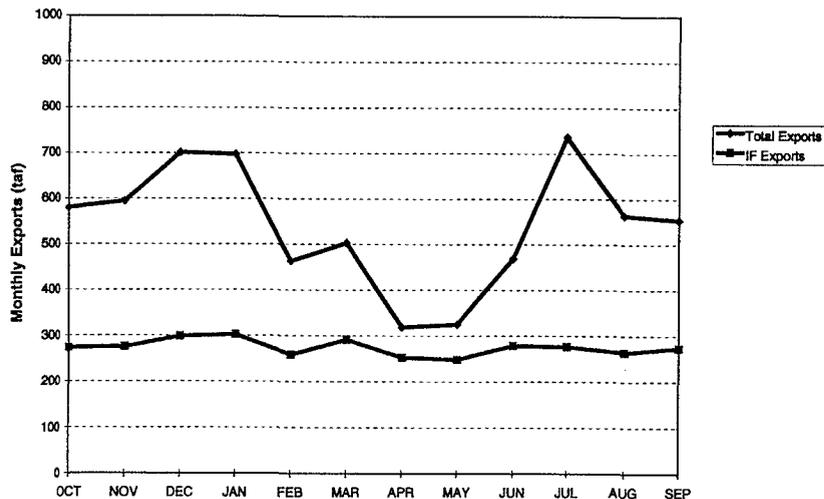


- 1922-94 Average Annual Results
 - Min. Required Outflow = 1,550 taf
 - Flow at Rio Vista = 3,220 taf
 - Total System Deliveries = 6,140 taf
 - Nov-June X2 Position = 72 km
- 1922-94 Average Annual Results
 - Min. Required Outflow = 1,550 taf
 - Flow at Rio Vista = 3,230 taf
 - Total System Deliveries = 6,267 taf
 - Nov-June X2 Position = 72.3 km



Isolated Facility System Operations

5,000 cfs Isolated Facility

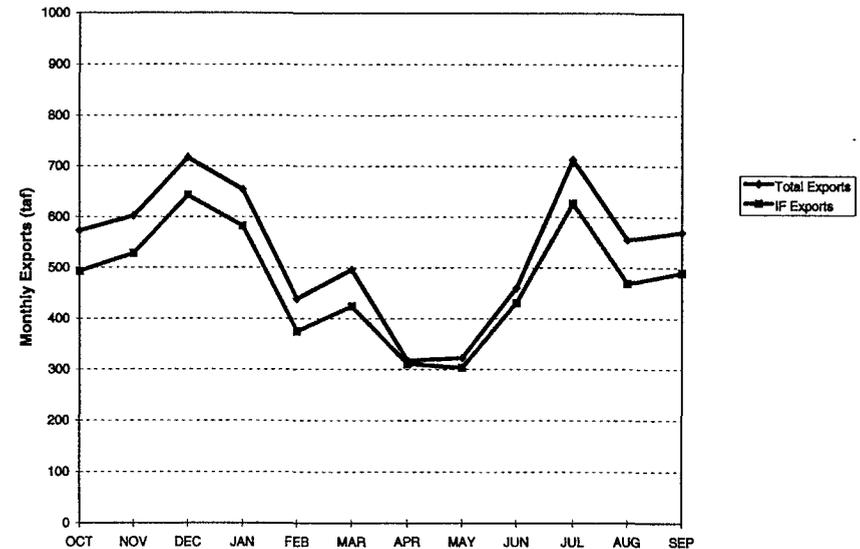


Program Alternatives Storage

- New Storage Fill & Discharge Criteria
 - Tributary Groundwater - Fill First & Discharge Last
 - Aqueduct Groundwater - Fill Second & Discharge Fourth
 - Aqueduct Surface Storage - Fill Third & Discharge Third
 - Tributary Surface Storage - Fill Fourth & Discharge Second
 - Delta Surface Storage - Fill Last & Discharge First

Isolated Facility System Operations

15,000 cfs Isolated Facility



Program Alternatives Storage Operating Parameters

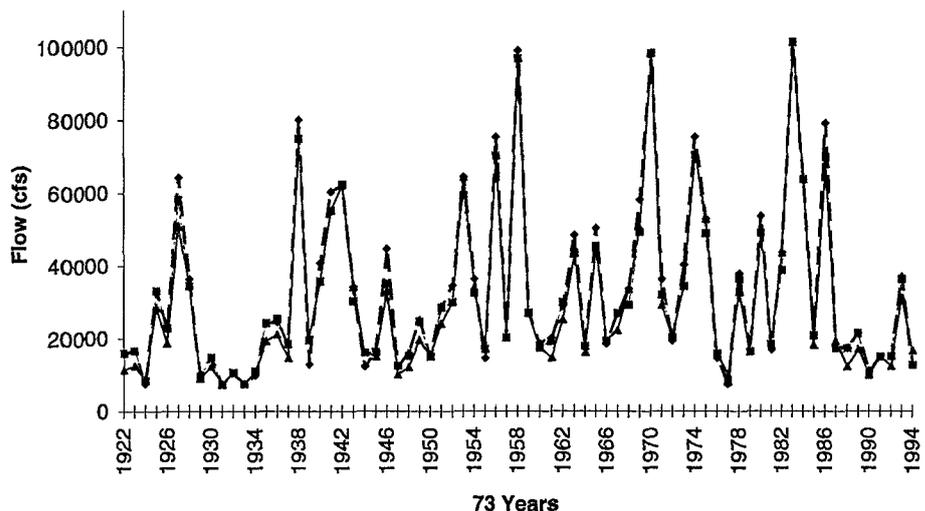
- New Storage Physical Facility Criteria
 - North and South of Delta Groundwater - Storage 250 (NDGS) & 500 (SDGS) TAF & Inlet/Outlet Capacity 500 cfs
 - Sacramento River Basin Surface - Storage 3.0 MAF & Inlet/Outlet Capacity 5,000 cfs
 - Off-Aqueduct Surface - Storage 2.0 MAF & Inlet/Outlet Capacity 3,500 cfs
 - San Joaquin River Basin Surface - Storage 250 TAF & Inlet/Outlet Capacity 5,000 cfs
 - Delta Surface Storage - Storage 200 TAF & Inlet/Outlet Capacity 5,000 cfs
- Fluvial Geomorphology Criteria
 - North Delta Surface - 60,000 CFS above Chico Landing / 0 cfs Below Chico Landing
 - Other Storage - No Criteria

Potential Action to Improve Water Supply Opportunities

Action	Estimated Average Annual Benefits (in 1,000 acre-feet per year)			
	Critical Dry Period		Long-Term	
	Low	High	Low	High
Improved Coordination of SWP-CVP Operations	0	10	0	50
System Improvements allowing Increase in Permitted Banks PP Capacity	100	150	150	250
System Improvements allowing Adjustments to Bay-Delta Operation Requirements (Isolated Facility)	0	200	0	300
Storage - 4.75 MAF (Includes Benefits of Increased Permitted Banks PP Capacity)	550	800	550	700

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Maximum Yearly Geomorphology Flows at Wilkin Slough



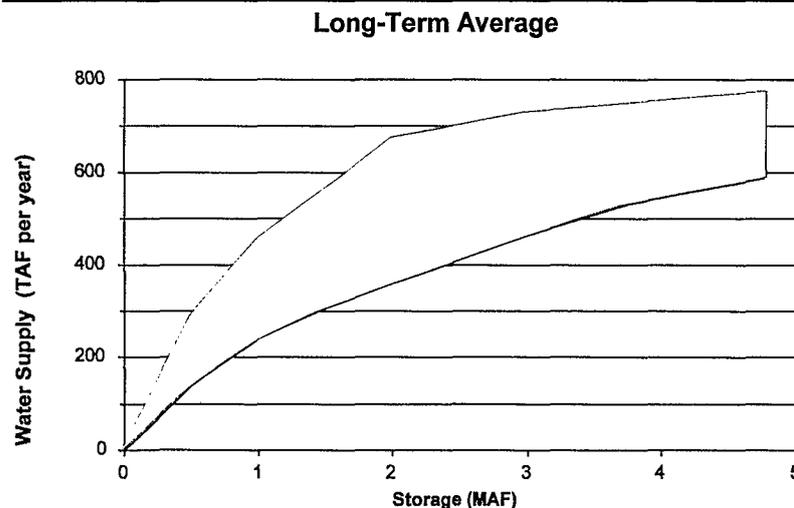
→ No Action - - - 2 Maf Sac R. Offstream Storage - - - w/Geomorphology criteria

Water Supply Opportunities Under Program Alternatives Compared to No Action

Alternative	Estimated Average Annual Benefits (in 1,000 acre-feet per year)			
	Critical Dry Period		Long-Term	
	Low	High	Low	High
Alternative 1				
Improved Coordination of SWP-CVP Operations	0	10	0	50
With Increase in Permitted Banks PP Capacity	100	150	150	300
With Storage	550	800	550	750
Alternative 2				
Improved Coordination of SWP-CVP Operations	0	10	0	50
With Increase in Permitted Banks PP Capacity	100	150	150	300
With Storage	550	800	550	750
Alternative 3				
Improved Coordination of SWP-CVP Operations	0	10	0	50
Isolated Facility	0	200	0	350
With Storage	550	850	550	850

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Water Supply versus Storage



Water Supply versus Storage

