The meeting teleconference will begin shortly

Listen to the meeting by using your computer or tablet speakers or by calling (877) 853 5247 using meeting ID 979 215 700

View the live meeting presentation at https://sbvmwd.zoom.us/j/979215700
PASSCODE: 3802020

Public comments, suggestions or questions regarding technical issues may be emailed to comments@sbvmwd.com

Please use the chat feature in the Zoom toolbar to let the moderator know that you would like to make a comment during the meeting or use the digital "raise hand" ✋ function in Zoom.

Please mute your microphone during the meeting to reduce background noise. Click on the microphone icon to unmute your microphone if needed.

Call to Order

Board of Directors Workshop - Resources
Thursday, November 5, 2020

Chairperson – Director Hayes
Vice-Chair – Director Harrison

Introductions

Following the introduction of Directors and District staff, participants may use this time to state their name and agency/affiliation in order to be included in the formal record of attendees.

Public Comment

Any person may address the Board on matters within its jurisdiction.

- *Please use the chat feature on the Zoom toolbar or digitally raise your hand to let the moderator know you would like to make a comment.*

Summary of Previous Meeting (Pg. 3)

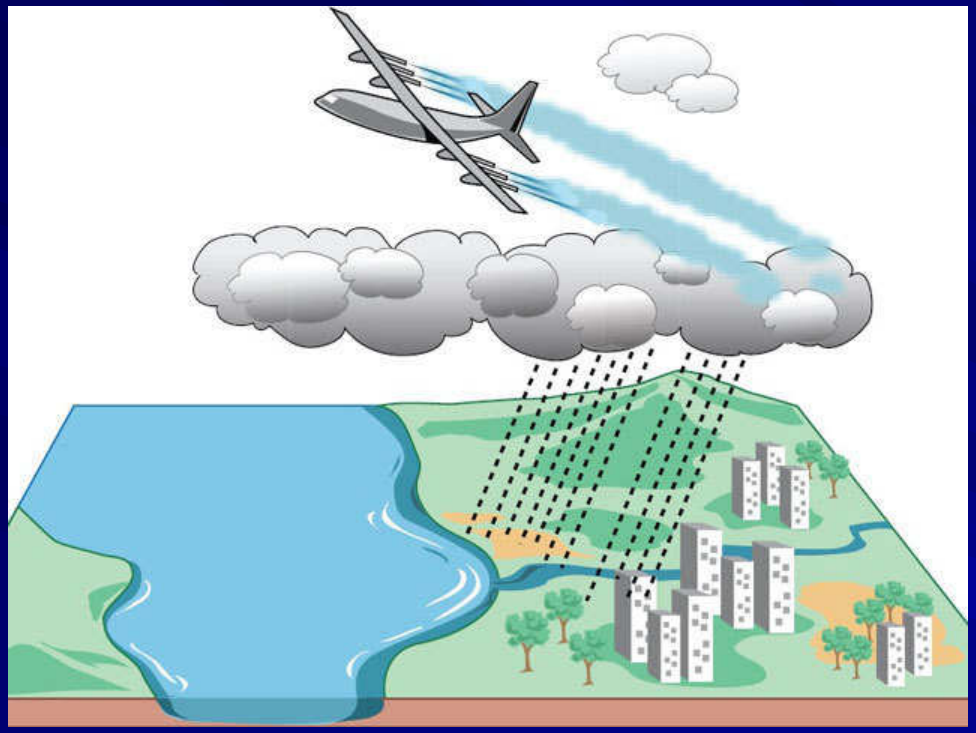
Board of Directors Workshop – Resources – October 1, 2020

Presentations (Pg. 6)

Mark Norton, PE
Water Resources & Planning Manager
Santa Ana Watershed Project Authority

Santa Ana River Watershed Weather Modification and Feasibility Study

Staff Recommendation
Receive and file.



Santa Ana River Watershed Weather Modification for Water Supply Feasibility Study

Mark Norton, PE, Water Resources & Planning Manager

SBVMWD Board Workshop
November 5, 2020

SAWPA

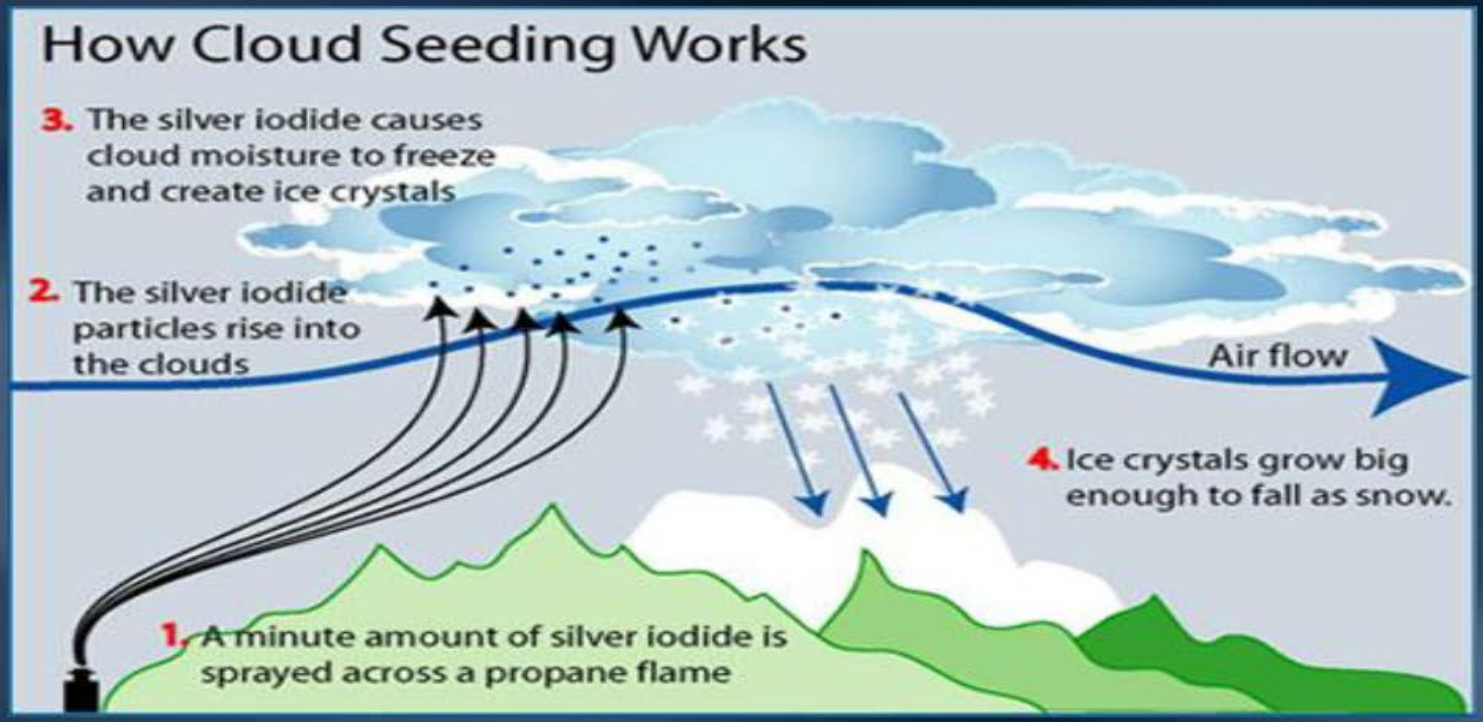
WxMod Purposes & Process

- "Natural" weather
  - Dust, ash, pollution nuclei
- Precipitation augmentation and snowpack enhancement, hail suppression, fog dispersal
- Super-cooled Liquid Water (SLW)
  - Silver iodide (AgI) as nuclei
- Ground (generators, flares) or aerial based
- 10% increase in precipitation
  - Within range of variability
- Not a drought buster

WxMod History

- Background
  - Started in the U.S. in 1940s
  - Overselling, minimal science
  - Misconceptions remain
- Advances since the 1940s
  - WX forecasting
  - Measurement
  - Computing
  - Seeding methods

Winter Conceptual Model

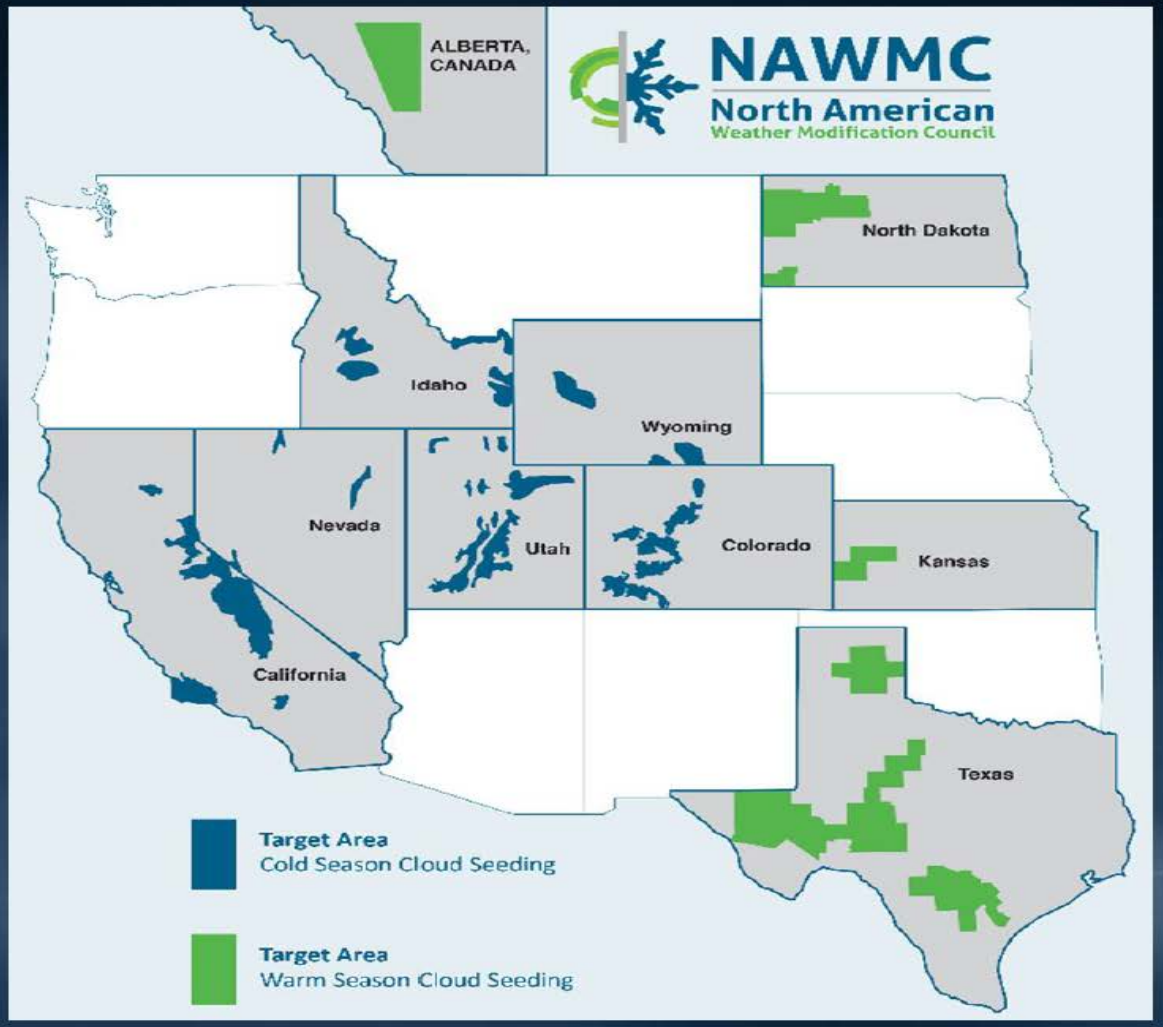


WxMod Users & Costs

- 150 programs in 40 countries and 11 states
  - Ski areas, Power utilities
  - Insurance companies
  - Water resources agencies
  - Conservation, and Irrigation districts
  - Research institutes
- Costs
  - $4-40/AF, including planning

North American Projects

- Local sponsorship
- Education
- Outreach



Cloud Rustling

- Downwind Effects Misconception
  - "Robbing Peter to pay Paul"
  - WxMod activates precipitation otherwise unavailable
  - Long-term research (44+ studies) consistently shows no precipitation decreases; some downwind increases shown

Potential Environmental Effects

- AgI is not soluble or biologically available
- 50 years of physical, biological, aquatic, soils & vegetation studies found:
  - Subtle or indiscernable effects
  - Potentially beneficial (more runoff)
- Strong studies with credible results
- Newer assessment methods and regulations suggest continued research
- Consider cumulative effects, monitoring

Potential Health Effects

- Silver Iodide (AgI)
  - Not been measured above background
- Human effects
  - No effects found in 50 years
  - More silver exposure in tooth fillings
  - More iodine in salt on food
- Concentrations
  - EPA drinking water quality 0.1 mg/l
  - U.S. Public Health Service level 0.5 mc/l
  - Seeded rainfall is 0.1 mc/l

Increased Snowload

- Avalanche
  - Suspension criteria
- Snow removal
  - Similar amount of effort required
- Flooding potential
  - Agency coordination
- Crop yield / pasture value
- Economic trade-offs
  - Snow removal v. water supply / tourism

Licensing and Permitting

- Operators licensed
- Project permits issued
  - Conditions and safeguards
  - Record keeping and annual reporting
- State statutes
  - Governmental immunity
- Liability insurance
- Separate from environmental
- Few legal challenges

ASCE Guidance

- Design and Operation of Precipitation Enhancement Projects (42-17)
- Manual on Engineering Practice #81, Guidelines for Cloud Seeding to Augment Precipitation (3rd edition)
- Design and Operation of Hail Suppression Projects (39-15)
- Design and Operation of Supercooled Fog Dispersal Projects (44-13)

California Projects

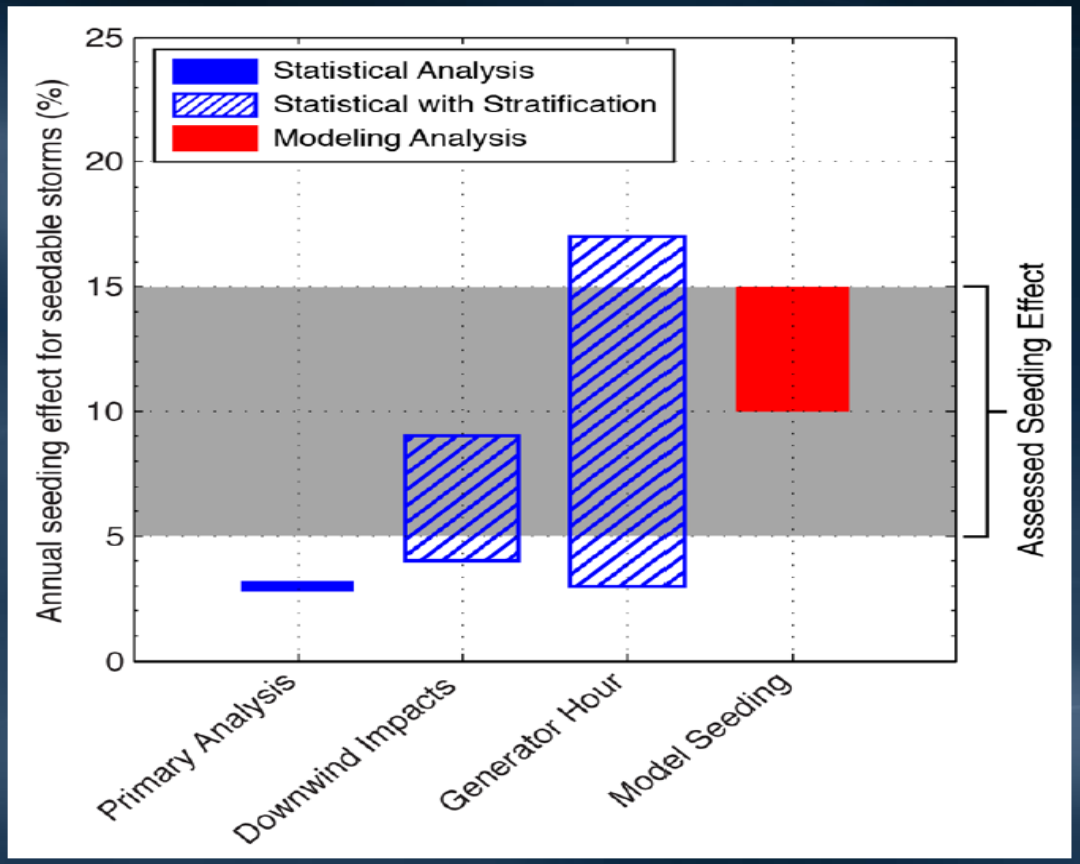
- Since the 1950s
- 12-15 per year
- Winter orographic
- Water and power
- Described in California Water Plan

Wyoming WxMod Pilot Program

- State funded $15 million over 10 years
- Randomized cross-over experiment
- Independent evaluation by NCAR
- Radiometers, snow chemistry, high resolution precipitation gauges

WWMPP Conclusions

- Estimate of seeding effect by simulation of seeded and natural clouds for three seasons (about ½ of the cases) shows 10-15% increase



WWMPP Conclusions

- Statistical, physical, and modeling analysis shows cloud seeding is a viable technology
- Climatology study demonstrates that 30% of wintertime precipitation fell from seedable storms
- Half the time that seedable conditions were met there was no precipitation, indicating cloud seeding opportunities

Summary

- Advances since the 1940s, misconceptions remain
- +5-15% increase within range of variability
- Cost-effective part of water operations portfolio
- None or positive downwind effects
- No environmental or health effects
- Local leadership, education, support is important
- Number of projects increasing
- Recent research answering key questions

On June 4, 2019 Tom Ryan from MWDSC discussed ongoing weather augmentation for water supply – cloud seeding programs with SAWPA Commission

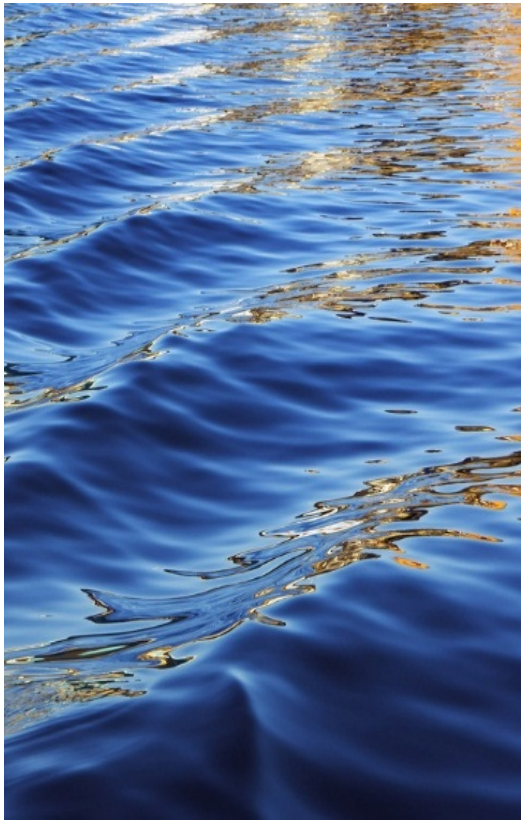
SAWPA Member Agency GMs feedback

- SAWPA staff asked SAWPA Member Agency General Managers if weather augmentation in the Santa Ana River Watershed should be studied
- GMs felt feasibility study to evaluate implementation in the Santa Ana River Watershed may be worthwhile
- Could lead to possible request under DWR's Prop 1 IRWM Round 2 grant program in FY 2021-22 to implement by SAWPA

RFP and Consultant Selection

- SAWPA directs staff to issue RFP for Santa Ana River Watershed Weather Augmentation Feasibility Study
- Two consultants responded to feasibility study RFP
  - North American Weather Consultants Inc.
  - RHS Consulting, Ltd.
- Proposal Review Team
  - SBVMWD, WMWD, OCWD, SAWPA, MWDSC
- - North American Weather Consultants Inc. recommended and awarded contract for $75K to conduct feasibility study

Seeding Methods & Design



Ground Based Seeding Methods

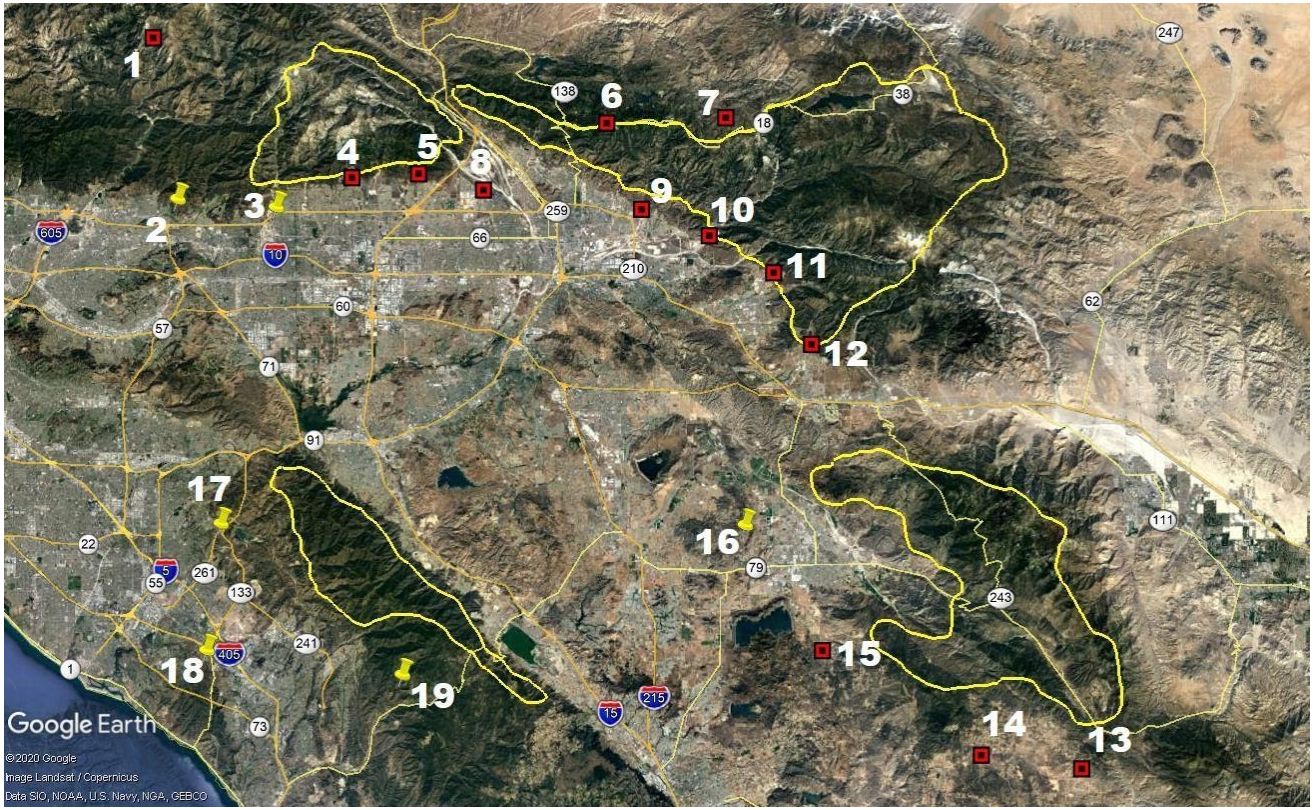
CNG's (Cloud Nuclei Generators)

- Ideal for orographic lift (winds caused by land barriers)
- Create a continuous plume
- Inexpensive to install and operate

AHOGS (Automated High Output Ground Seeding) Systems

- Depend on strong convective storm attributes (turbulence)
- Deliver a higher concentration of Silver Iodide – rapid release
- Operated remotely

Ground Based Seeding Locations



Aerial Seeding

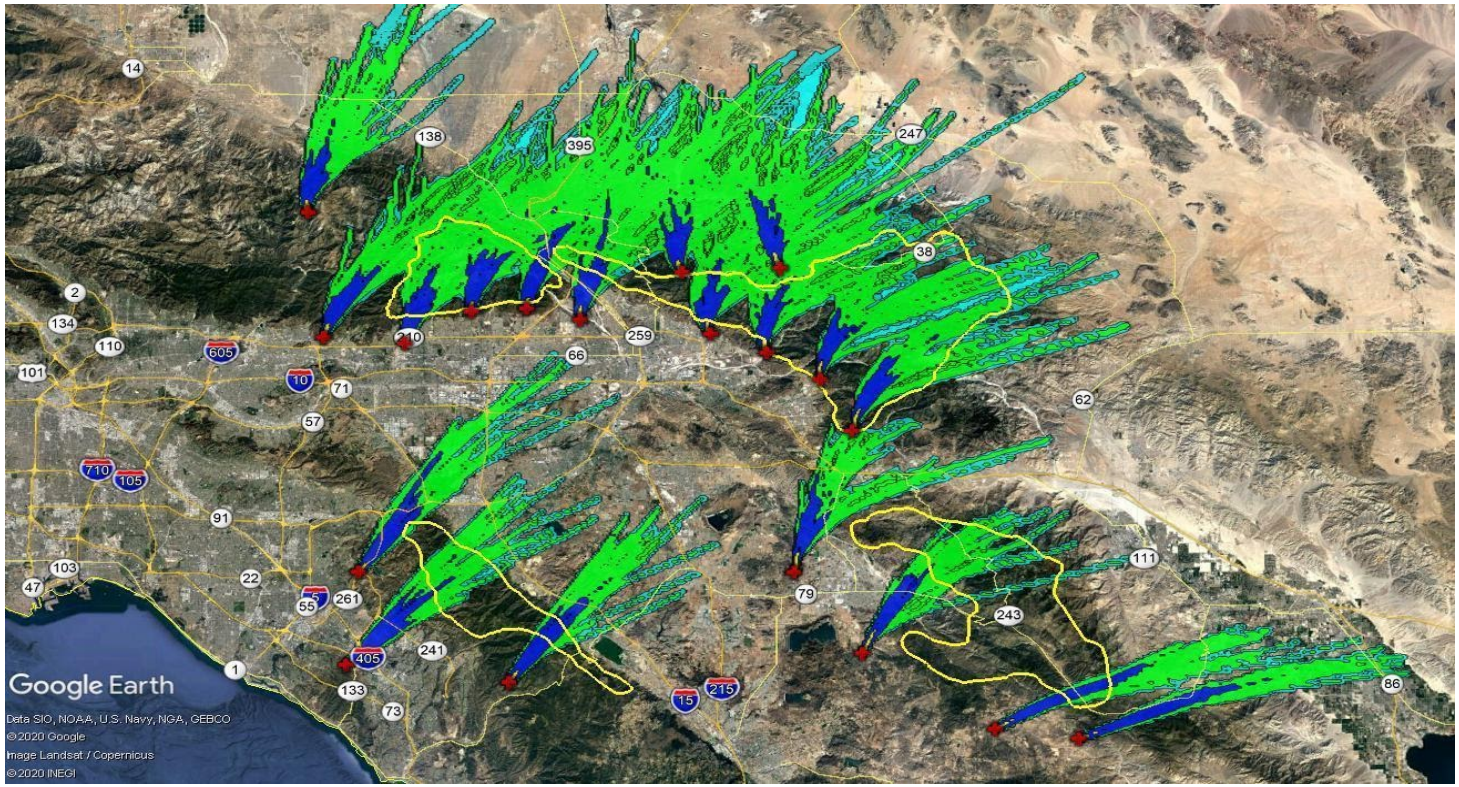
Technical Feasibility

- Unlike commercial air traffic that quickly leaves an area of high traffic, cloud seeding aircraft occupy the same airspace for an extended period of time
- Flight tracks for the eastern target areas are more likely to receive FAA approvals during times of high traffic, and during periods of storm activity.

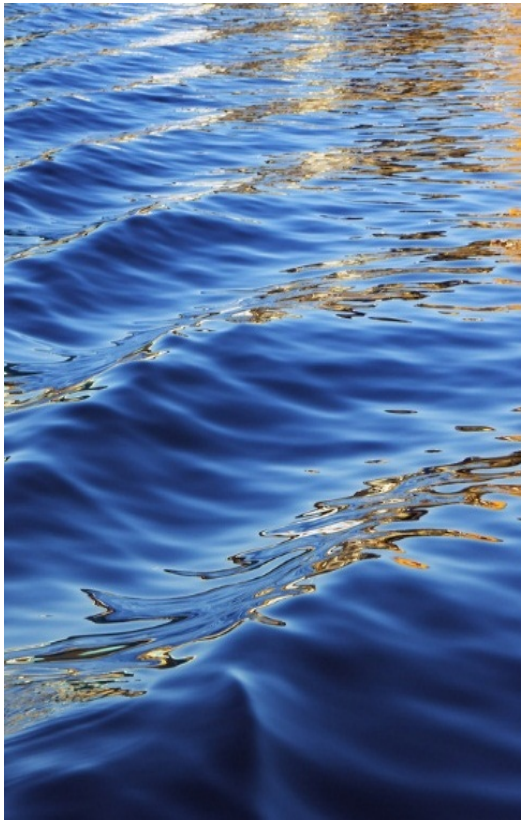
Economic Feasibility

- Land barriers must be of an appropriate size to benefit from aerial seeding
- Annual runoff must support the investment of an aerial component
- Preference should be given to areas with greater potential increases

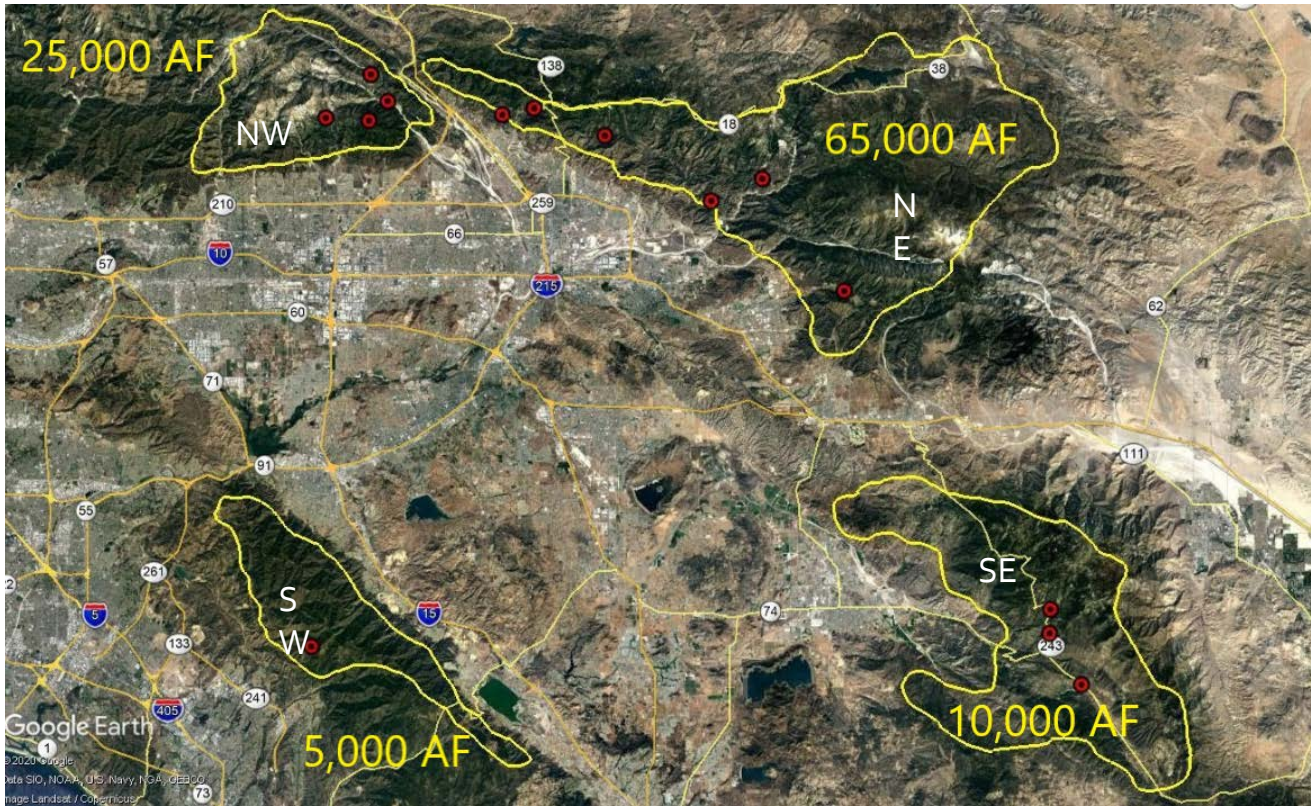
Ground Based Seeding Dispersion Model



Productivity Increase Estimates



Estimated Natural Annual Streamflow



Total Projected Increases

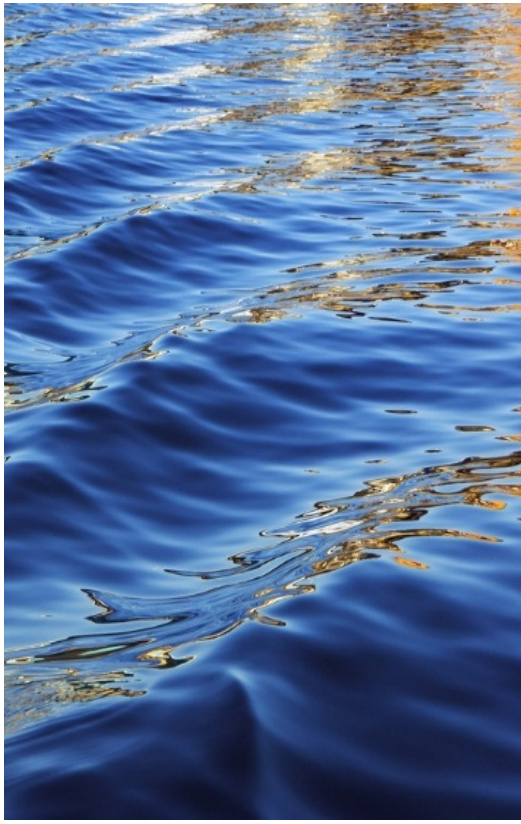
Ground Only Seeding

Target Area	Seasonal Precip. Increase (inches)	Percent Increase	Avg. Natural Streamflow (AF)	Streamflow Increase (AF)	Percent Increase
NW	0.41	3.5%	25,000	2,043	8.2%
NE	0.49	4.1%	65,000	4,330	6.7%
SW	0.59	3.7%	5,000	447	9.0%
SE	0.49	4.5%	10,000	1,373	13.7%
	TOTAL w/ Ground Only		**105,000**	**8,193**	**7.8%**

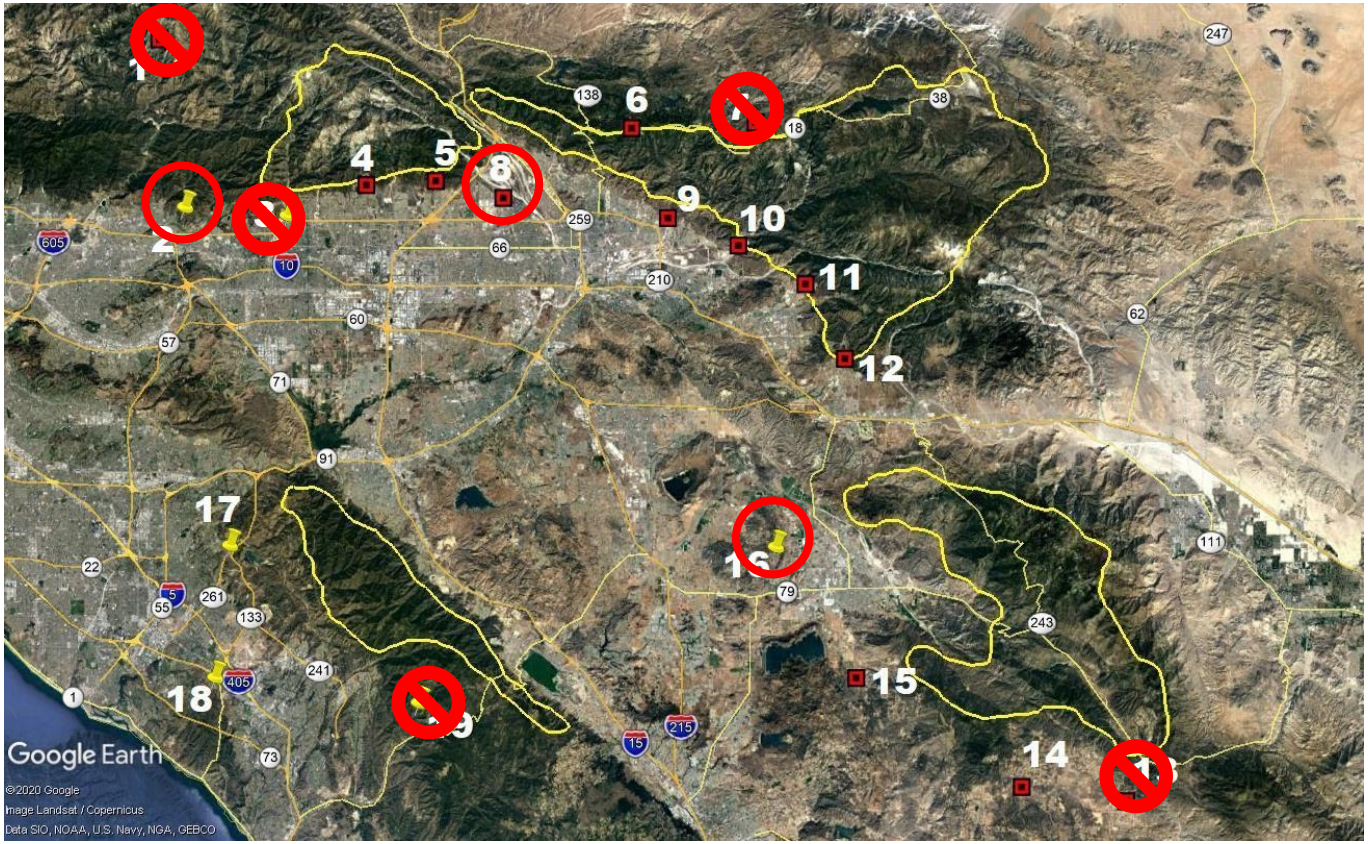
With Aerial Support in the NE Target

Target Area	Seasonal Precip. Increase (inches)	Percent Increase	Avg. Natural Streamflow (AF)	Streamflow Increase (AF)	Percent Increase
NW	0.41	3.5%	25,000	2,043	8.2%
NE	0.89	7.3%	65,000	7,772	5.3%
SW	0.59	3.7%	5,000	447	9.0%
SE	0.49	4.5%	10,000	1,373	13.7%
		TOTAL	**105,000**	**11,635**	**11.1%**

Efficiency Program Design

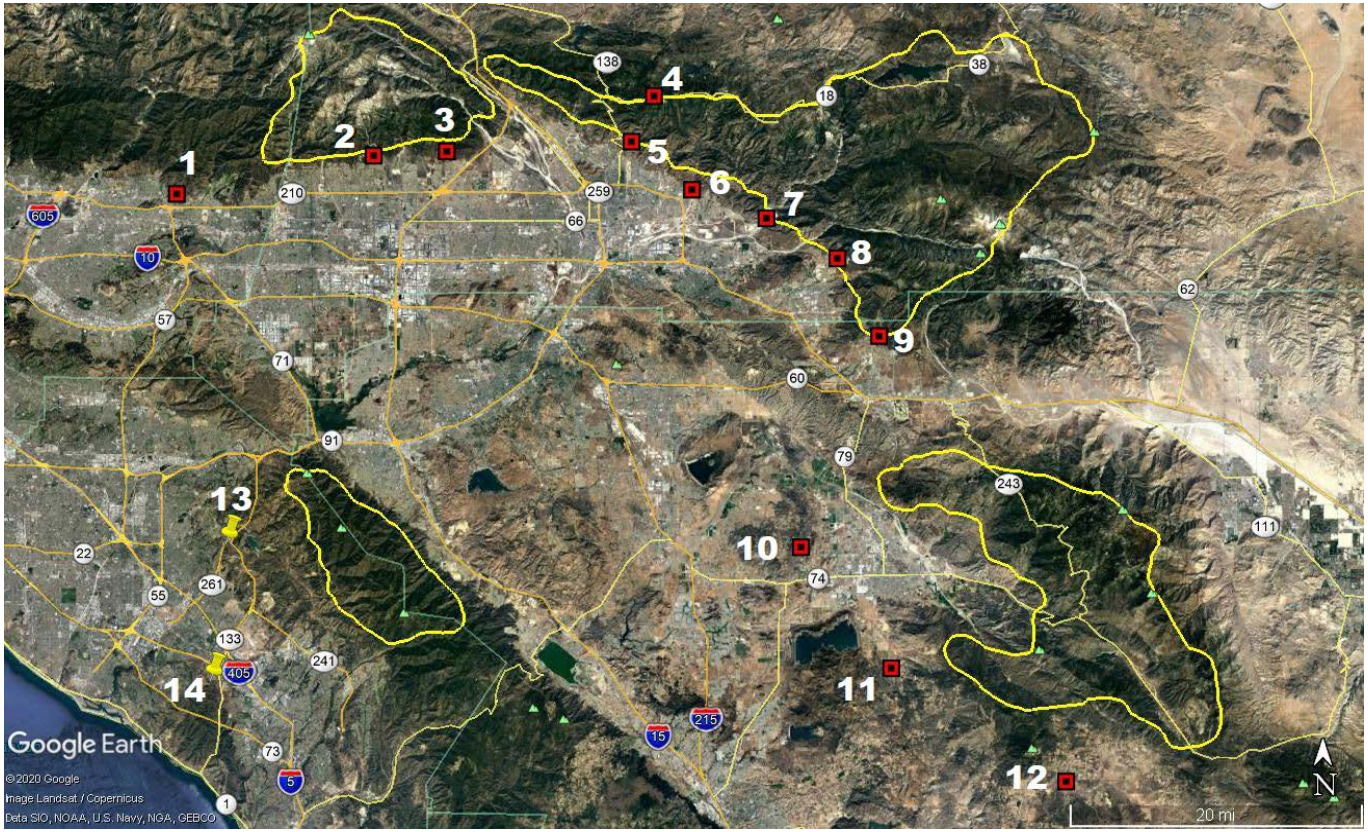


Original - Ground Seeding Sites



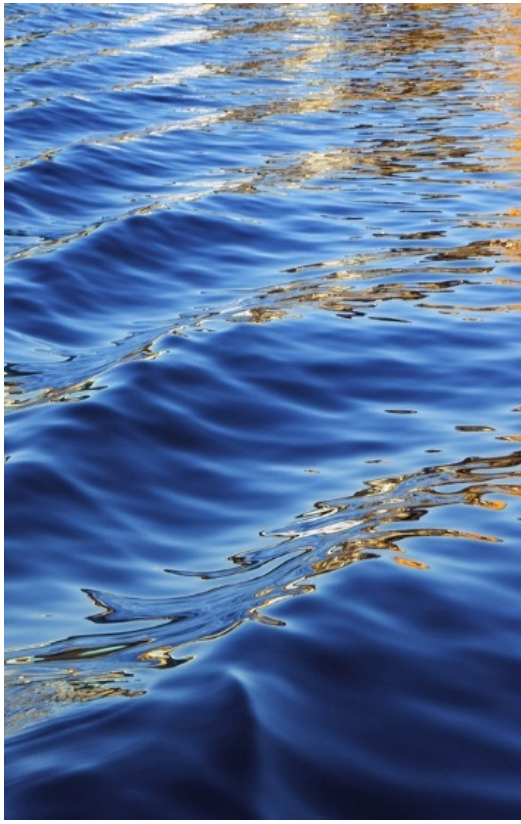
Yellow Pins = Automated High Output Ground Seeding (AHOGS)
Red Bullseyes = Cloud Nucleating Generator (CNG)

Refined – Ground Seeding Sites



Yellow Pins = AHOGS
Red Bullseyes = CNG's

Cost Effectiveness



Estimates – Ground and Aerial Seeding

	Rate		Frequency		
Annual Operations					
Set Up	$	40,000	1	$	40,000
Take Down	$	31,000	1	$	31,000
Reporting	$	10,000	1	$	10,000
Monthly Operations					
Fixed Services	$	55,000	5	$	275,000
Variable Items (timed expenses are billed on a per hour basis)					
Ground Flares	$	110	60	$	6,600
Generator Run Time	$	19.50	600	$	11,700
Flight Time	$	375	30	$	11,250
Aerial Flares	$	110	150	$	16,500
			TOTAL	**$**	**402,050**
			COST PER ACRE-FOOT	**$**	**35.61**
			Benefit to Cost		**7.16**

Pricing Estimates – Ground Based Seeding Only

	Rate	Frequency	
Annual Operations			
Set Up	$ 33,500	1	$ 33,500
Take Down	$ 24,000	1	$ 24,000
Reporting	$ 10,000	1	$ 10,000
Monthly Operations			
Fixed Services	$ 24,500	5	$ 122,500
Variable Items (timed expenses are billed on a per hour basis)			
Ground Flares	$ 110	60	$ 6,600
Generator Run Time	$ 19.50	600	$ 11,700
Flight Time	$ 375	N/A	-
Aerial Flares	$ 110	N/A	-
		TOTAL	**$ 208,300**
		COST PER ACRE-FOOT	**$ 25.42**
		Benefit to Cost	**10.03**

Next Steps

- Continue briefings to interested governing bodies and agencies in watershed
- Recommendations on next steps will be brought to SAWPA Commission on Dec. 1st
  - Study of Ground Based Seeding Unit Sites and Access
  - CEQA/Permits
- Potential cost share partner agencies and companies who may benefit are being approached by SAWPA

Director Comments and Discussion

T. Milford Harrison
President

Paul Kielhold
Vice President

Susan Longville
Treasurer

June Hayes
Director

Gil Navarro
Director

Staff Recommendation

Receive and file.

Discussion Item 5.1 (Pg. 111)

Bob Tincher, PE, MS – Chief Water Resources Officer/Deputy General Manager

Consider Continued Participation in the Delta Conveyance Project

Staff Recommendation

Staff recommends that the following actions be forwarded to the Board of Directors for consideration:

1. Establish Valley District's participation level at 2.8% of the total
2. Approve the funding agreement for Valley District's portion of the planning and engineering costs
3. Approve Notice of Exemption

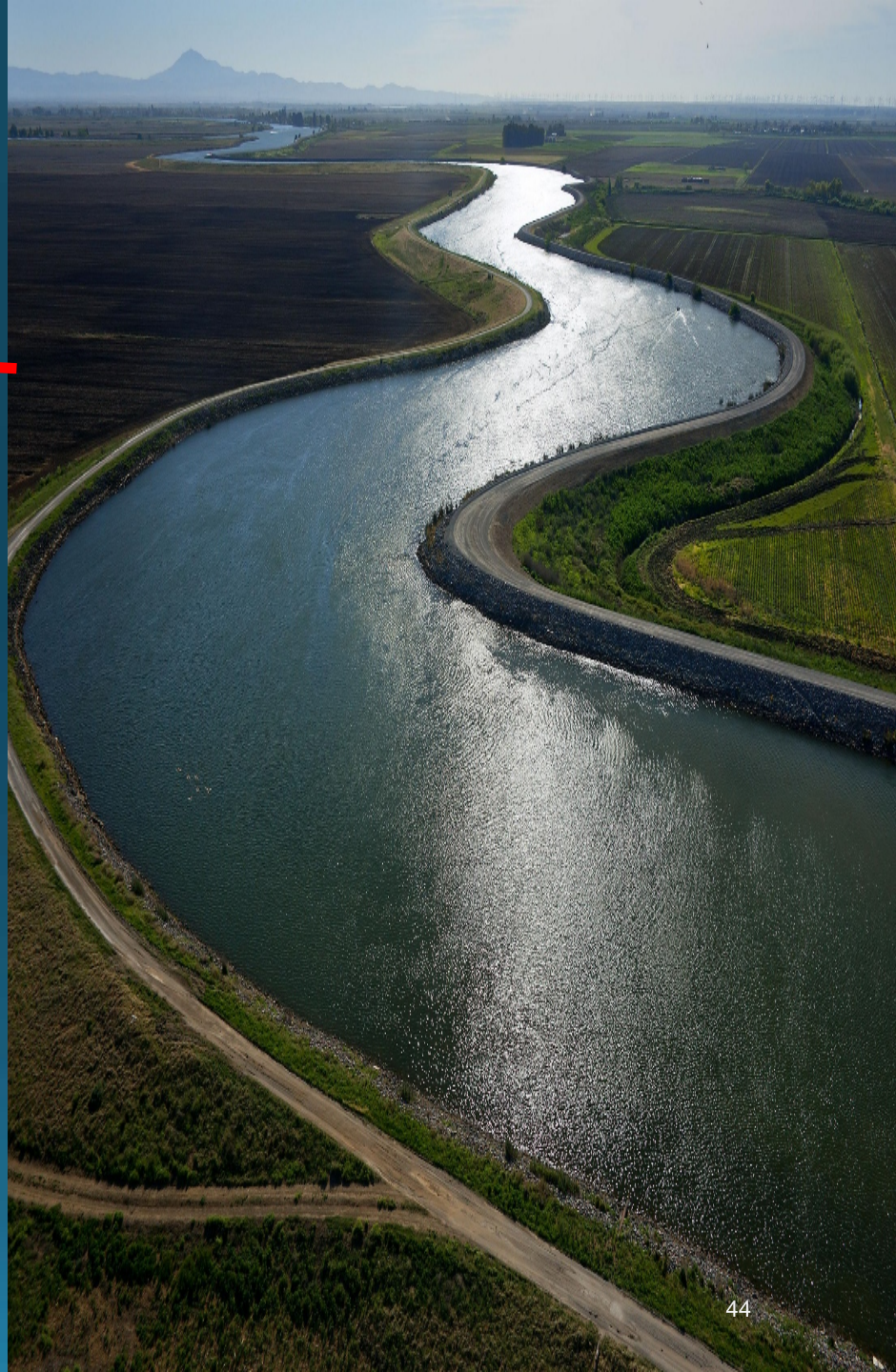
~~Delta Habitat Conservation and Conveyance Program~~

~~California WaterFix~~

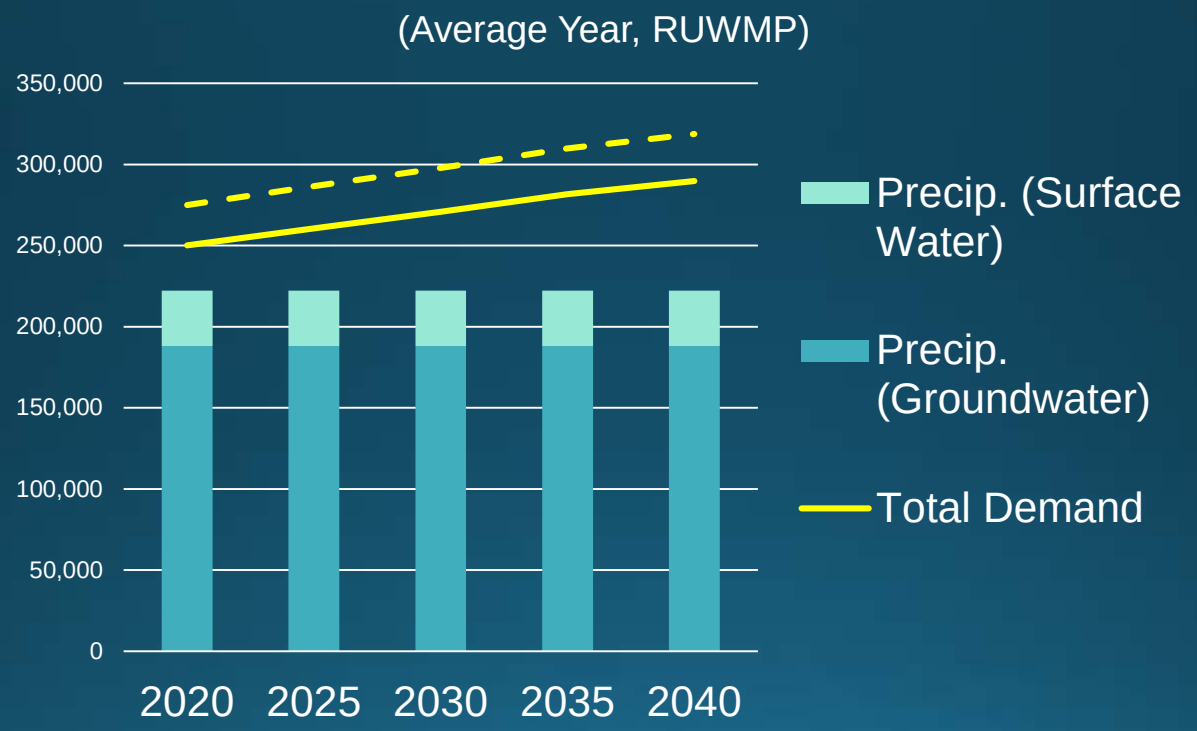
Delta Conveyance Project

San Bernardino Valley Municipal Water District

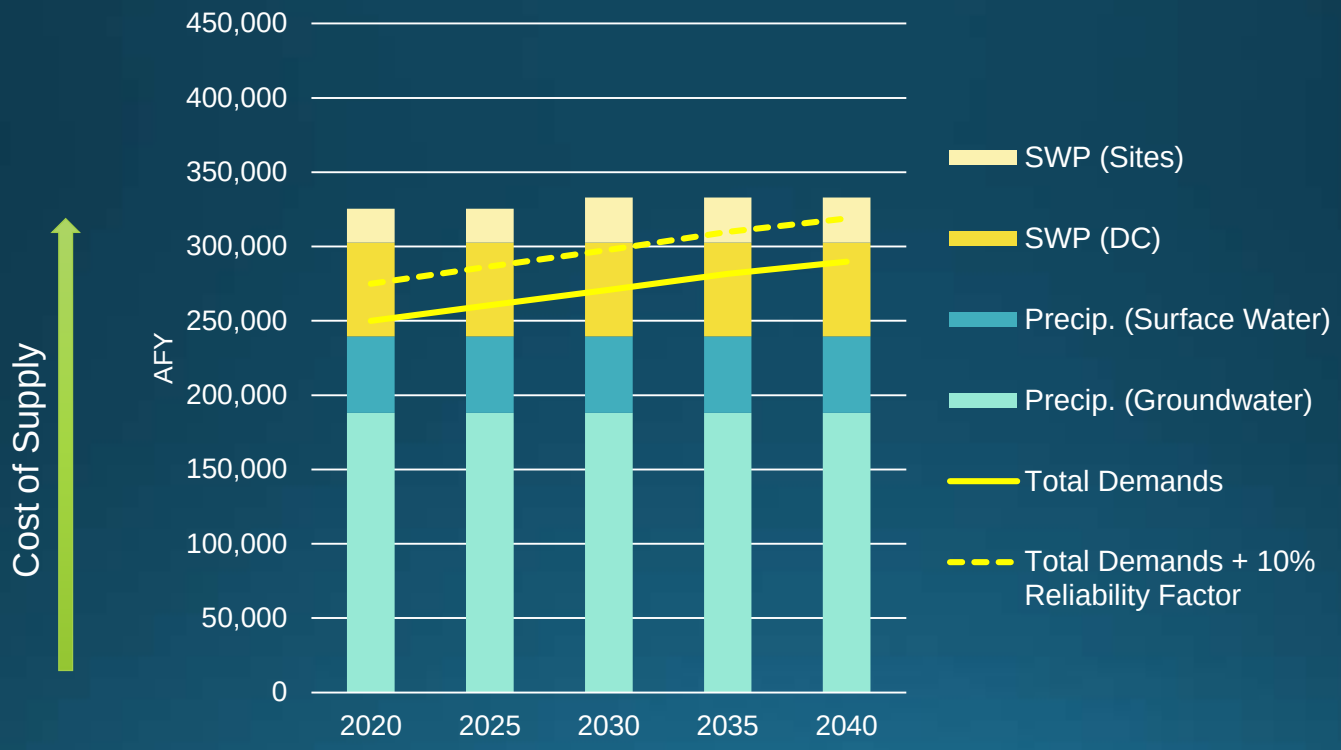
November 5, 2020



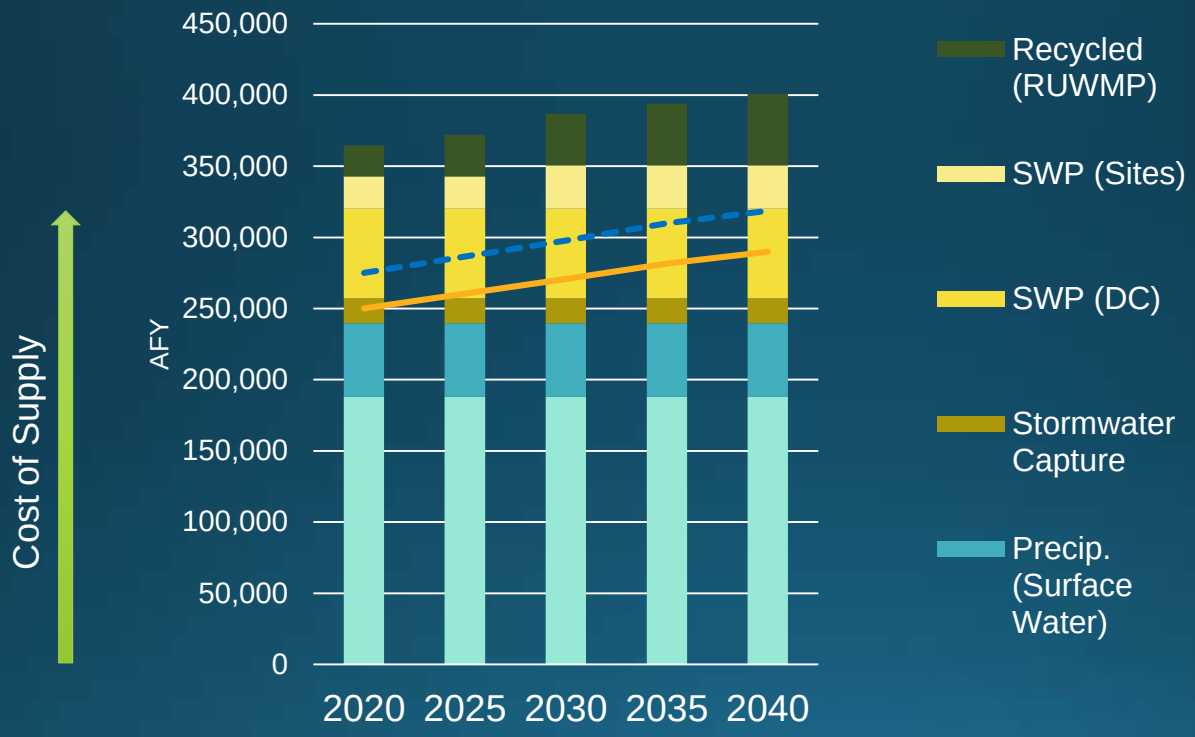
Local Rainfall is Not Enough



Local Rainfall + SWP

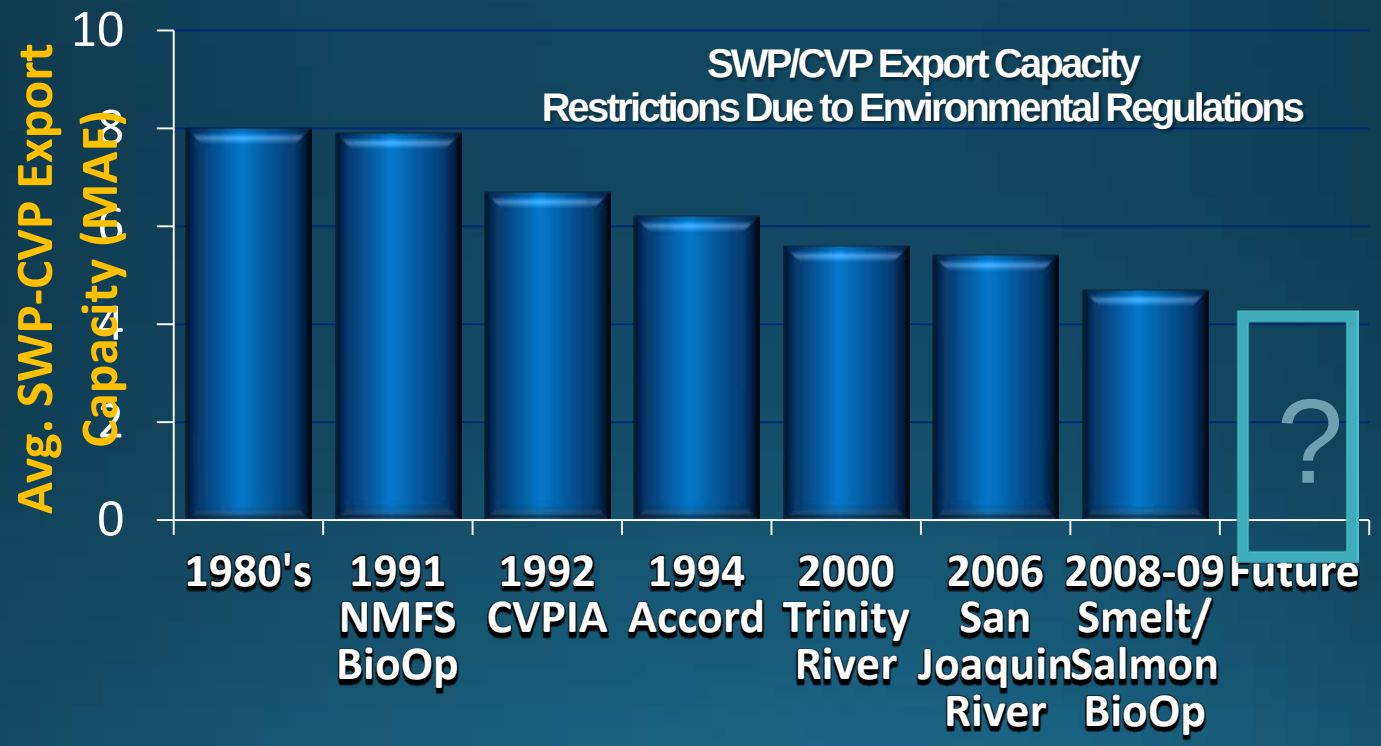


Local Rainfall + SWP + Stormwater + Recycled

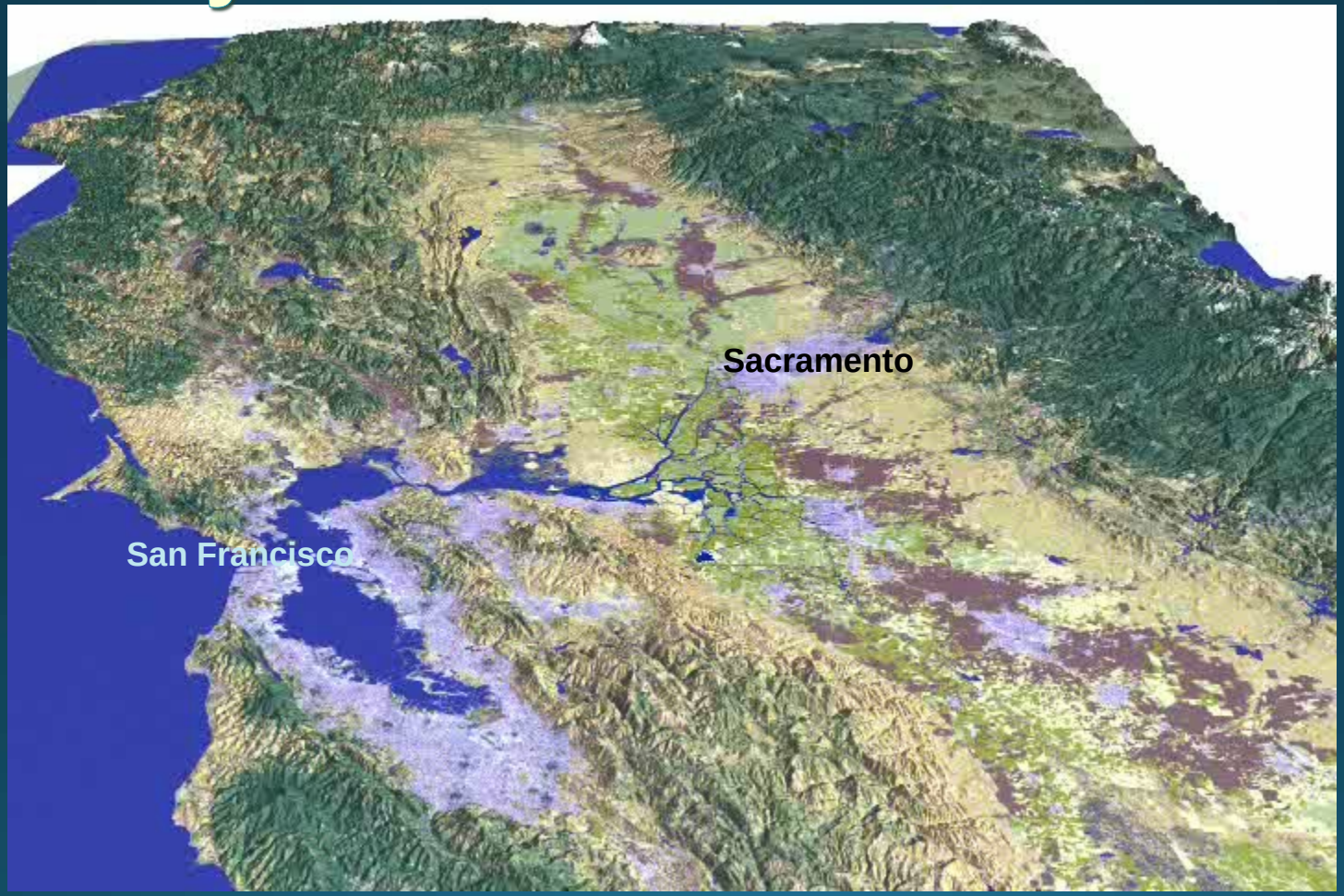


Return on $1 Billion Investment in SWP

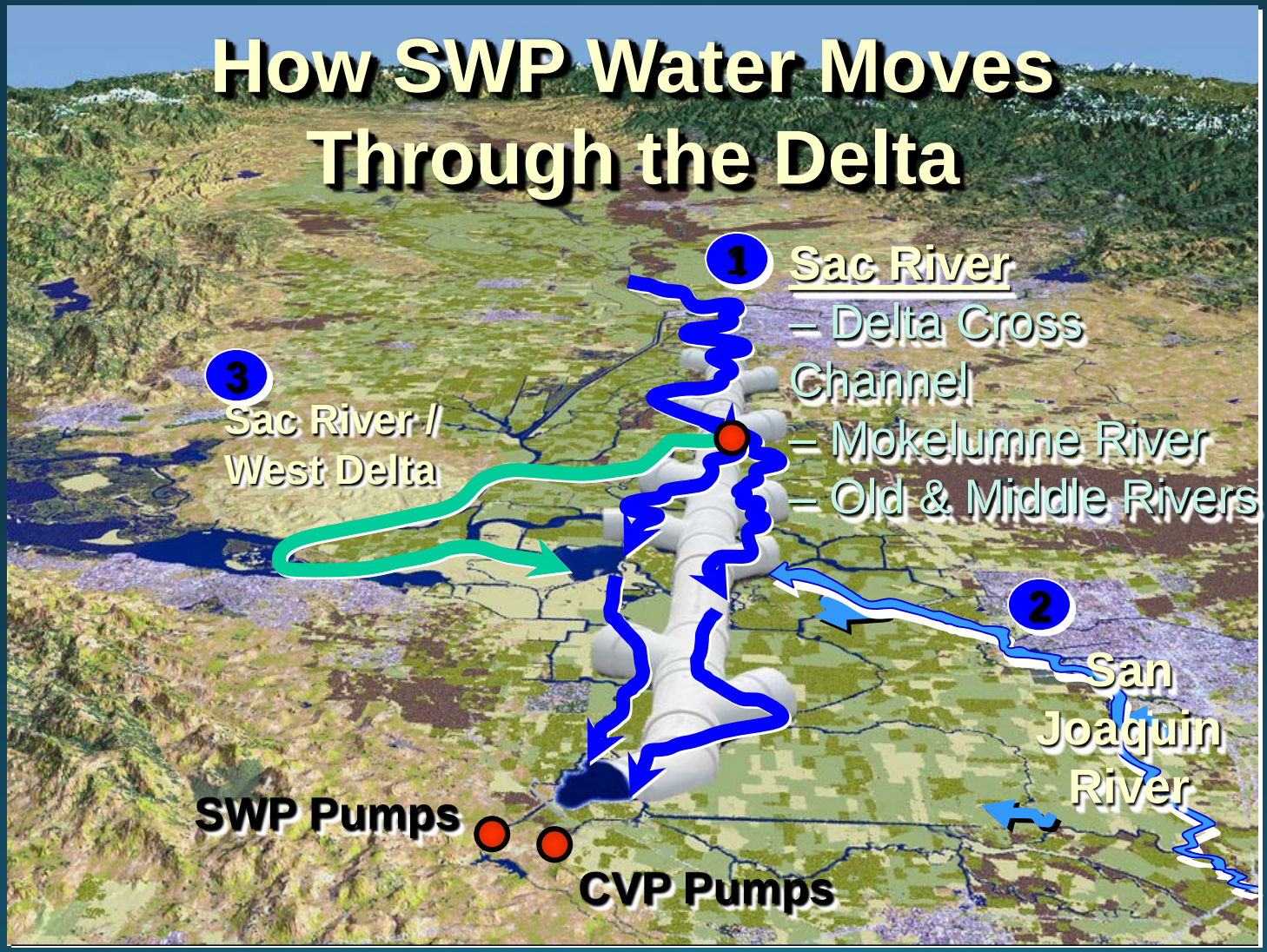
History of Regulatory Restrictions



Bay Delta

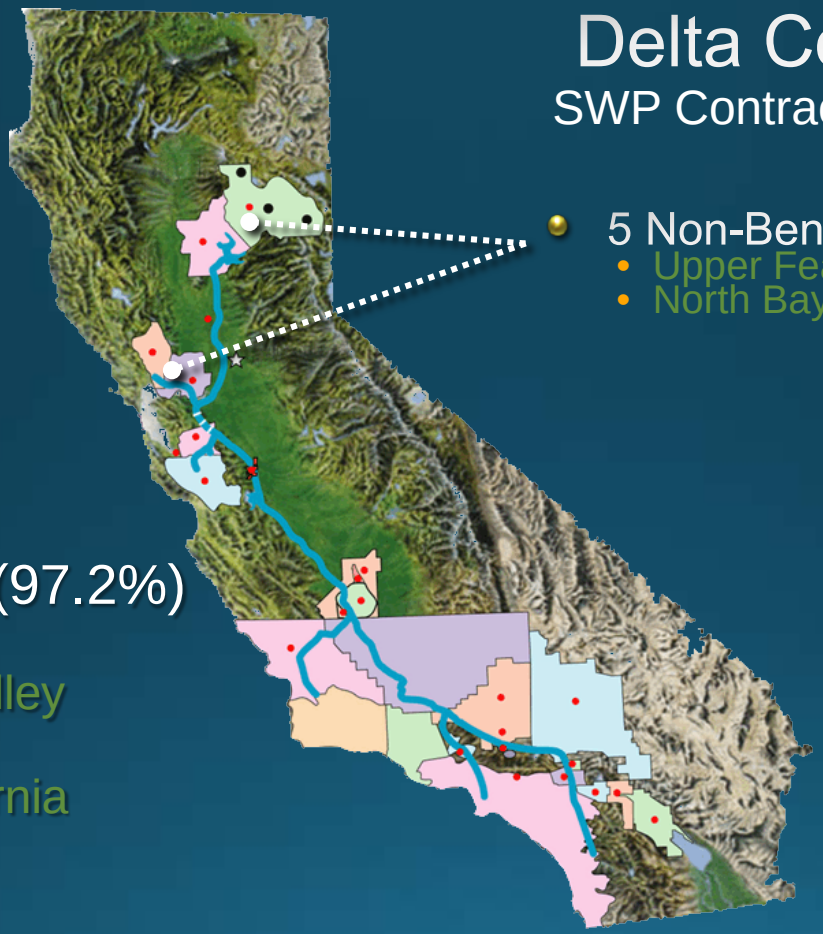



Subsidence
Fishery Declines
Delta Risks
Seismic
Sea Level Rise


How SWP Water Moves Through the Delta
1
Sac River
– Delta Cross Channel
– Mokelumne River
– Old & Middle Rivers
3
Sac River / West Delta
2
San Joaquin River
SWP Pumps
CVP Pumps

Delta Conveyance

SWP Contractor Beneficiaries



- 5 Non-Beneficiaries (2.8%)
  - Upper Feather River
  - North Bay Area

- 18 Beneficiaries (97.2%)
  - South Bay Area
  - San Joaquin Valley
  - Central Coast
  - Southern California

Previous Board Actions

2008	$1.85 million	• Valley District's share of for planning and pre-design
2012	$1.25 million	• Environmental and design
2018	$10 million gap funding	• Share: 2.5% • 2 Tunnels (9,000 cfs) • About $1.8 million spent and will be reimbursed. Remainder can be applied toward this round of funding

Recent Developments

FEB 2019	Governor Newsom State of the State	• Announced he did not support CA WaterFix as configured, but did support a single tunnel
JAN 2020	Department of Water Resources (DWR)	• Released Delta Conveyance NOP • Single Tunnel (6,000 cfs)
APR 2020	Department of Water Resources (DWR)	• Completes DCF AIP negotiations except for contractor participation amounts (part of today's requested action)

Requested Board Action

- Agreement in Principle for SWP Contract Amendment
  - **Consider establishing Valley District's allocation of Delta Conveyance Project benefits and costs**
- **Consider funding Valley District's portion of environmental permitting and planning**
- **Consider Amended Delta Conveyance Design and Construction Authority (DCA) governance structure to reflect updated participation**
- **Consider Memorandum of Understanding with Class 8 Contractors to establish election procedures for DCA**

Delta Conveyance Objective

To restore and protect ability to deliver SWP Water Supply

- CLIMATE RESILIENCY: Addresses climate change, extreme weather, and rising sea-levels in the Delta for the SWP
- SEISMIC RESILIENCY: Minimizes health/safety risk to public from earthquake-caused reductions in water delivery quality and quantity from the SWP
- WATER SUPPLY RELIABILITY: Restores and protects ability to deliver SWP water in compliance with regulatory and contractual constraints
- OPERATIONAL RESILIENCY: Provides SWP operational flexibility to improve aquatic conditions and manage risks of additional future constraints

Delta Conveyance – Notice of Preparation

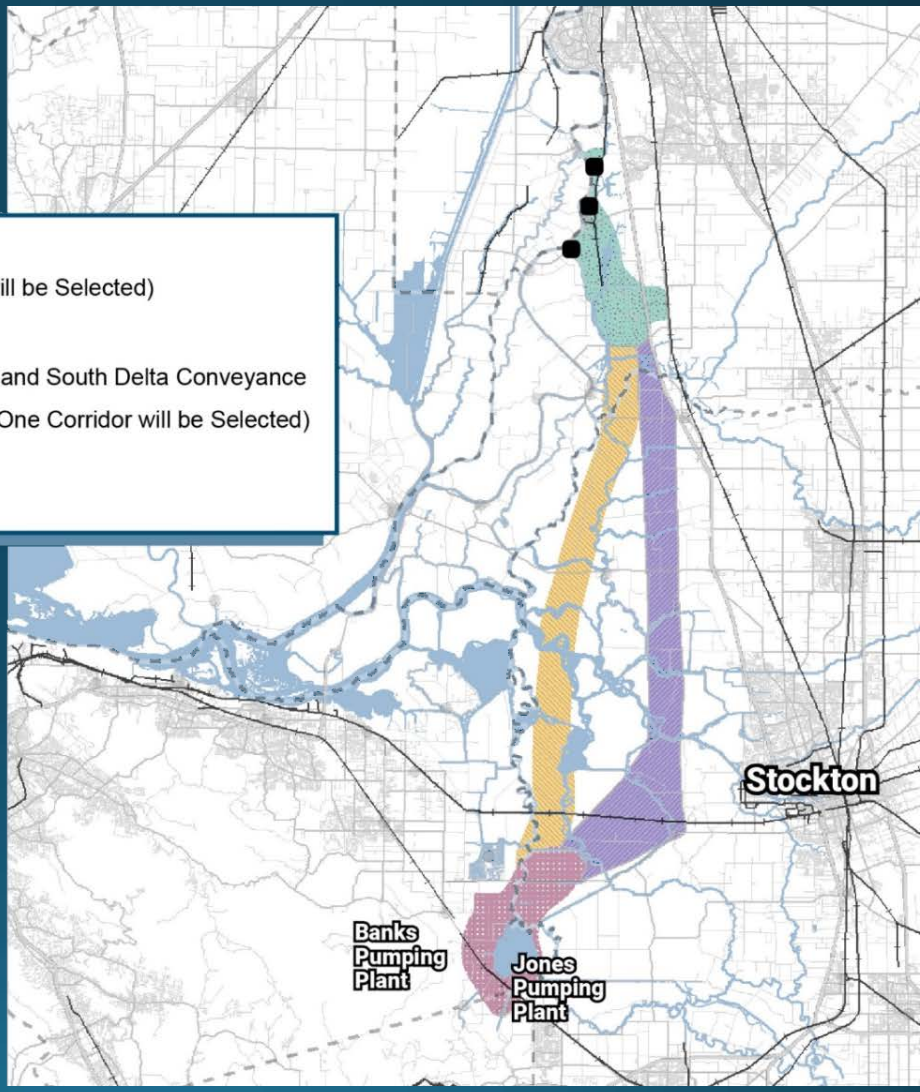
Alternatives:

- **Proposed Project: Single tunnel up to 6,000 cfs**
- DWR considering alternatives
  - Capacities ranging from 3,000 to 7,500 cfs
  - Varying degrees of involvement of the CVP, including no involvement
- Final choice of potentially feasible alternatives for Draft EIR in process

Delta Conveyance – Notice of Preparation

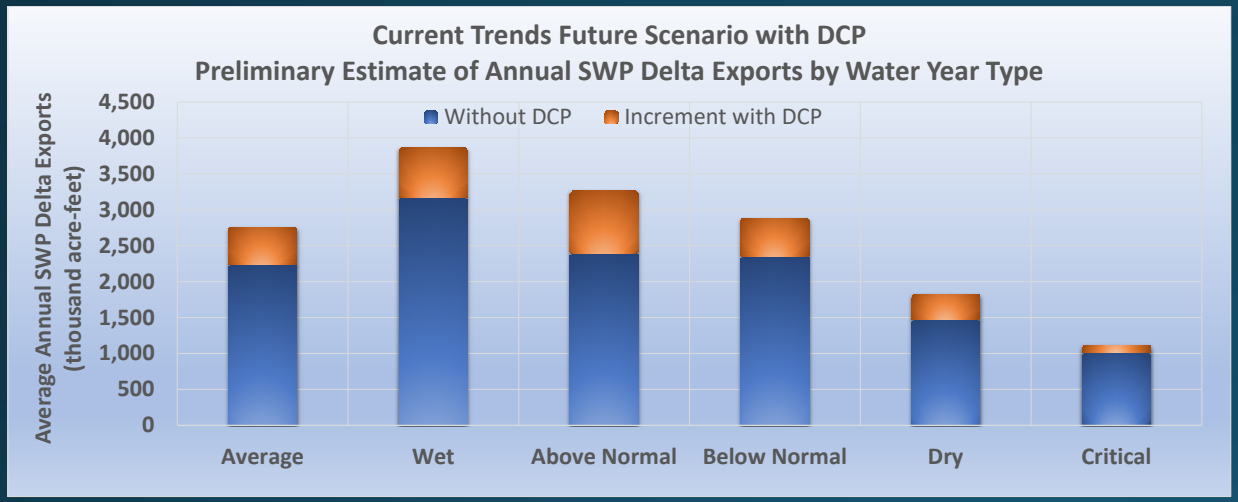
New Facilities

Essentially provides a northern intake



DCP Estimated Benefits

DCP Provides Benefits in All Year Types

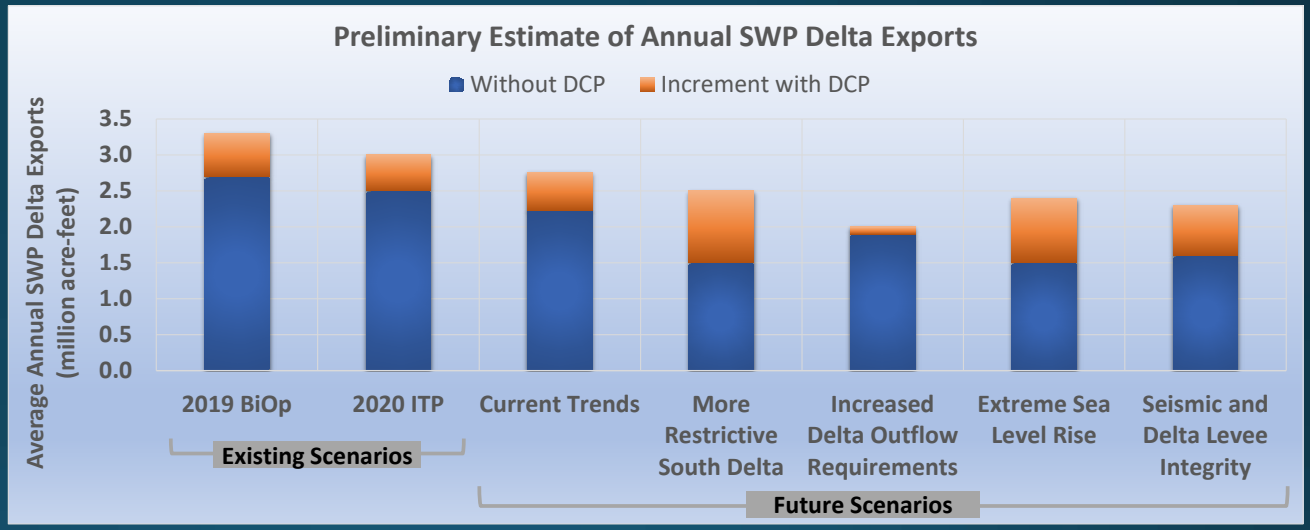


**TAFY: thousand acre-feet per year on average*

- Assumes:
  - Current Delta regulations
  - Projected climate change and sea level rise around year 2040
  - WaterFix operations for DCP
- SWP export improvement with DCP of ~500 TAFY
- Most of the export improvement in wetter years
- As DCP Proposed Project is further defined and modeling is refined, water supply estimates may change

DCP Provides Benefits in All Possible Scenarios

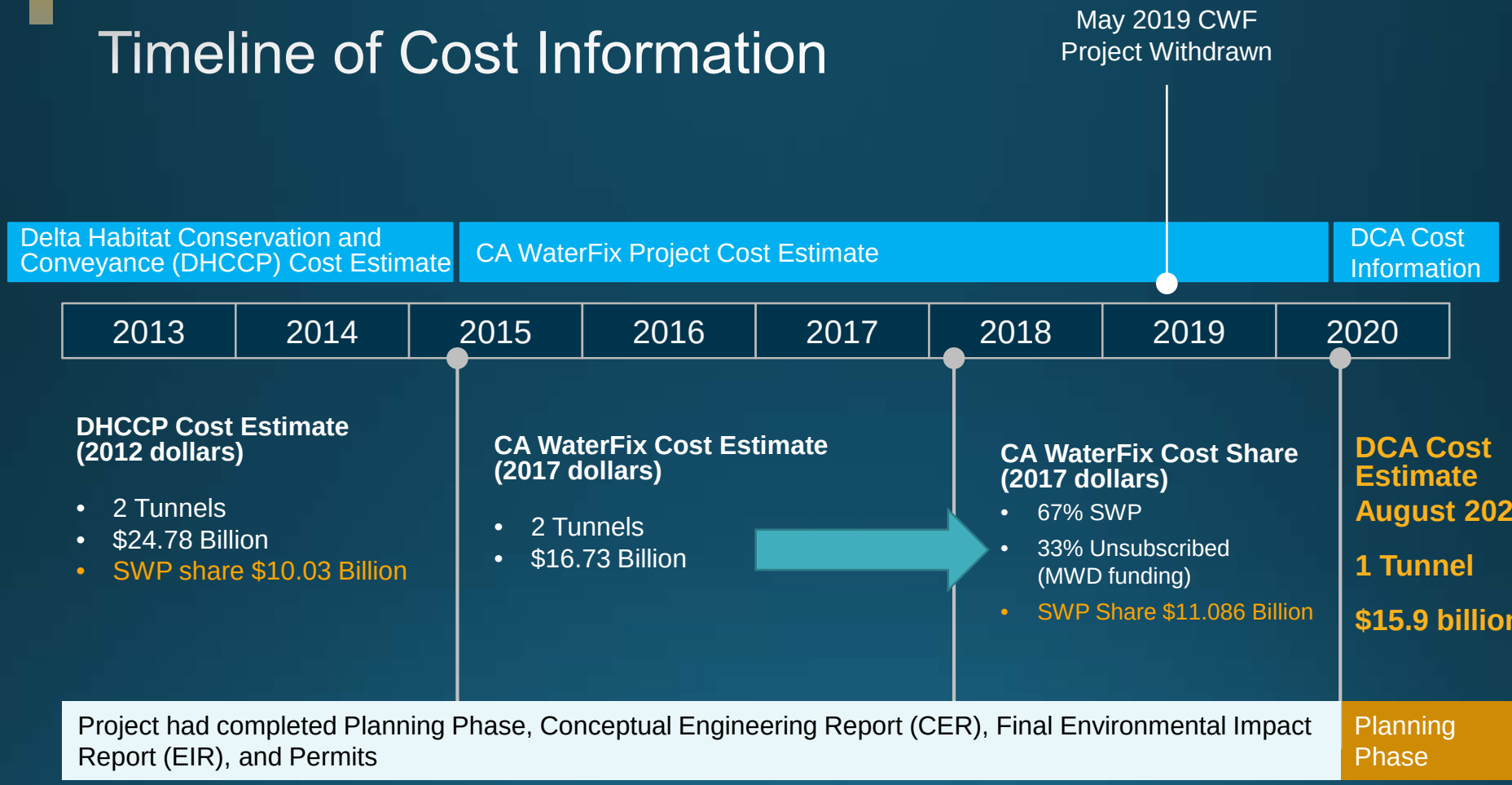
- DCP shows potential to alleviate reductions under many plausible future risk scenarios
  - ~100 TAFY to 1 MAFY under greater regulatory restrictions
  - ~700 TAFY under seismic risks and delta island flooding
  - ~900 TAFY under extreme sea level rise
- Exact future unknown



**TAFY: thousand acre-feet per year on average*

DCP Preliminary Costs and Cost Allocation

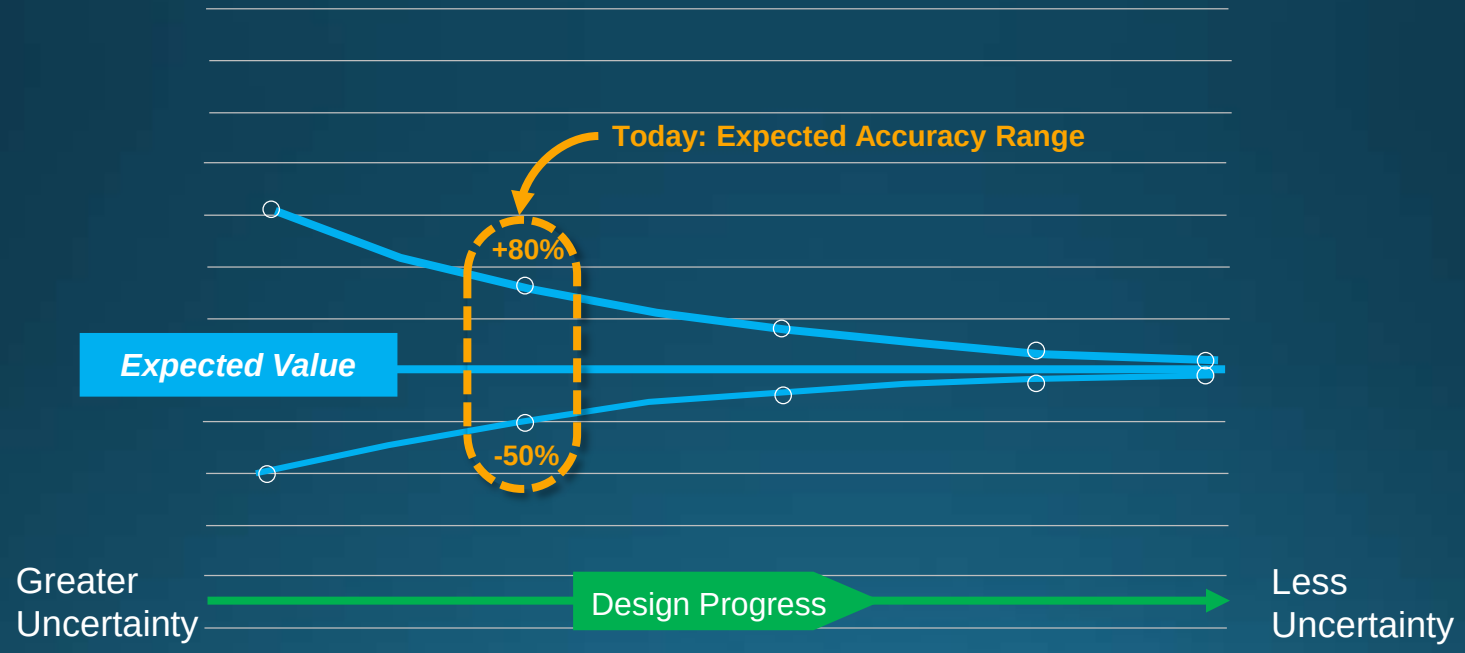
Timeline of Cost Information



DCA Cost Assessment – Refinement Over Time

Confidence Interval Accuracy Range for most probable construction cost of $12.1 billion

DCA Cost Assessment $15.9 billion (non discounted dollars)

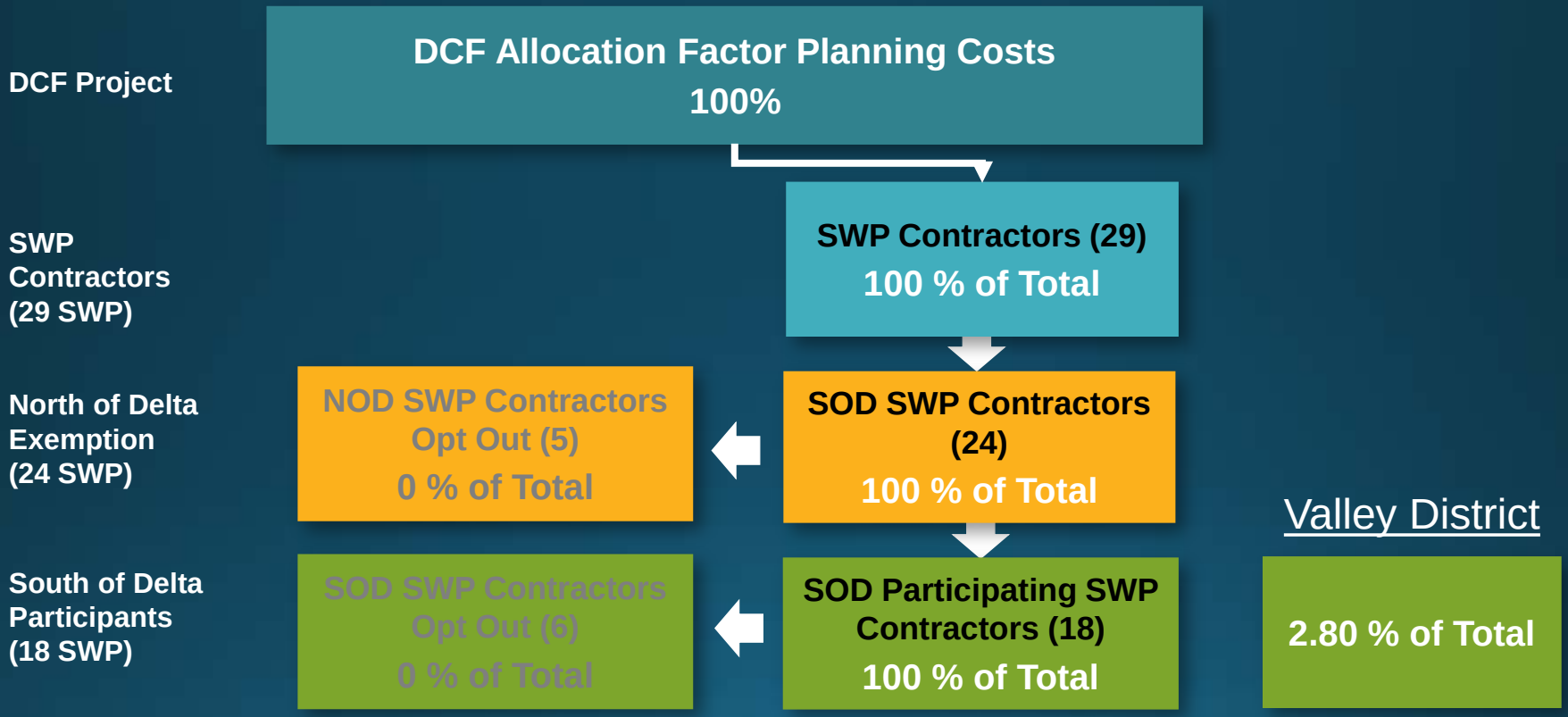


Contingency and Soft Cost Variance

Category	DCA Estimate ($ Billions)	% of Baseline Construction Cost	Industry Range[4] (% of Baseline Construction Cost)	Applied Industry Range ($ Billions)	Variance from Industry Range ($ Billions)
Baseline Construction	8.37[1]	100	100	8.37	-
Contingency	3.71[2]	**44**	**10 to 30**	0.84 to 2.51	1.20 to 2.87
Program Management	0.42	5	6	0.50	(.08)
Design & CM	2.42	**29**	**10 to 15**	0.83 to 1.26	1.16 to 1.59
Subtotal for Variance[3]	**14.92**	**178**	**126 to 151**	**10.55 to 12.64**	**2.28 to 4.37**
DCO oversight, mitigation, land acquisition	.98	n/a	n/a	n/a	n/a
Total Project	**15.9**	n/a	n/a	n/a	n/a

2. This adds $354 M to the DCA stated contingency of 3.3 to include risk mitigation contingencies.
3. Does not include DCO oversight, mitigation, land acquisition, capital costs, and O&M costs.
4. Based on level of detail provided in DCA documents and estimate

DCF Allocation Factor (%) – Planning Costs



Valley District's Estimated Cost and Benefit

- Approximate benefit: 15,000 AF
- Approximate cost: $445 million

$$\frac{\$445 \text{ million}}{15{,}000 \text{ AF} \times 55 \text{ years}} = \$540/\text{AF}$$

Current Table A: 60%
Table A with DC: 75%

Agreements

Date

Agreements for Board Consideration

1. Agreement in Principle (AIP) for the SWP Delta Conveyance Contract Amendment
   - Agency's DCF Participation Factor = **2.80 %**
2. Funding Agreement for DCF Planning Costs
3. Amended Delta Conveyance Design and Construction Authority (DCA) JPA Agreement

Agreement in Principle (AIP) for SWP Delta Conveyance Contract Amendment

Delta Conveyance AIP – Foundation for Future Agreement

- Option to opt-out of DCF costs and benefits
- Option to assume additional DCF costs and benefits
- Effective Date will be on, or after, the contract extension billing transition date
- Costs and DCF water supply are allocated based on the DCF Participation Table (beneficiary pays)
- Adopt “Pay-As-You-Go” Billing Provisions for both the Capital and Minimum Components

Scope Changes and Funding Amount

Date

Focus in Near-Term

- DCA has completed critical work to inform the footprint and analysis needed for the EIR/EIS
- The revised planning schedule is 4 years instead of 2 as originally anticipated
- The Stakeholder Engagement Committee (SEC) is critical and will continue
- The DCA Board will continue to meet periodically

Near-Term Change in Scope

- Saves over $50 million
- The DCA Scope is being revised to focus on environmental support and the SEC in the near-term
- When the project is ready for design and construction, the DCA will be fully re-engaged
- Changes do not impact the overall planning schedule

Total Planning Costs 2020-2024 (DCA and DWR)

Year	Total Planning $M (DCA and DWR)	Total Savings Compared to Previous Estimates ($M)
2021	$61.5	($17.5)
2022	$60	($26)
2023	$100	($10)
2024	$110	-
TOTAL	$331.5	($53.5)

Total Cost Includes True-Up for DCF Gap Funds

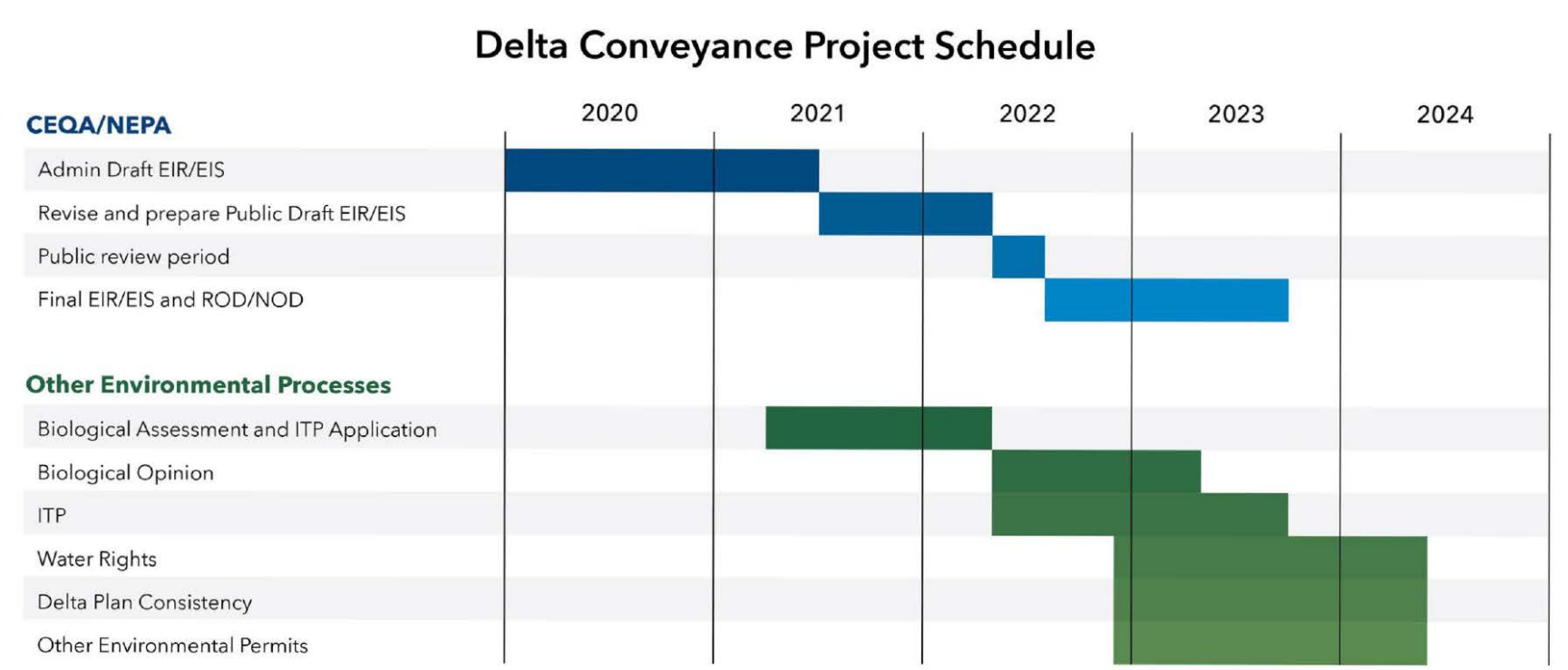
- 4 SWC Agencies provided $9.2M gap funding to support DCP planning in 2020
- $9.2M will be credited to those agencies over the 4-year planning period
- Total needed from DCP participants is:

$331.5 + $9.2M = **$340.7**

Valley District Portion of the Current DCF Planning Funds

$10,000,000	Gap funding paid by Valley District
($1,805,663)	Gap funds spent (to be reimbursed)
$8,194,337	Valley District Balance of Gap funds
($9,540,991)	Valley District's Share (2.8%) of DCF Planning Funds
$8,194,337	
($1,346,654)	Remainder owed over the next 4 years

Tasks and Schedule



Delta Conveyance

Agency Board Actions

December 2020
2021-22 Planning Costs

- Funding Agreement for planning costs
- Review Delta Conveyance Agreement in Principle
- Potential updates to DCA agreement

Post-2022 Planning Costs

Post-2023

- Project Participation
- Approve Project/Contract Amendment for Conveyance

Planning Activities (2020 – 2024)

- Draft EIR/S
- Final EIR/S
  - Federal/State ESA Approvals
  - Project Approval ROD/NOD
    - SWRCB - Change in Point of Diversion
    - DSC -Certification of Consistency

This slide does not show all necessary permits and regulatory processes. It is a general representation of one-way DWR may seek to comply with regulatory requirements.

Schedule for Consideration and Approval

CRESTLINE LAKE ARROWHEAD WATER AGENCY	November
VENTURA	trying for Nov
PALMDALE WATER DISTRICT	11/9/2020
SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT	11/9/2020
DUDLEY RIDGE WATER DISTRICT	11/11/2020
MOJAVE WATER AGENCY	11/12/2020
ACWD	11/12/2020
SAN GORGONIO PASS WATER AGENCY	11/16/2020
SANTA CLARITA VALLEY WATER AGENCY	11/17/2020
SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT	**11/17/2020**
SANTA CLARA VALLEY WATER DISTRICT	11/17/2020
SAN LUIS OBISPO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT	11/17/2020
ALAMEDA COUNTY FC&WCD ZONE 7	11/18/2020
KERN COUNTY WATER AGENCY	11/19/2020
COACHELLA VALLEY WATER DISTRICT	11/24/2020
ANTELOPE VALLEY-EAST KERN WATER AGENCY	11/24/2020
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA	12/8/2020

Recommendation

- Support for Valley District's continued participation in the Delta Conveyance Project by:
  - Establishing Valley District's initial "share" of the project at 2.8%
  - Participating in the next round of planning for $9,540,991 (net outlay $1,346,654)

Director Comments and Discussion

T. Milford Harrison
President

Paul Kielhold
Vice President

Susan Longville
Treasurer

June Hayes
Director

Gil Navarro
Director

Staff Recommendation

Staff recommends that the following actions be forwarded to the Board of Directors at their next meeting for consideration:

1. Establish Valley District's participation level at 2.8% of the total
2. Approve the funding agreement for Valley District's portion of the planning and engineering costs
3. Approve Notice of Exemption

Discussion Item 5.2 (Pg. 143)

Bob Tincher, PE, MS – Chief Water Resources Officer/Deputy General Manager

Consider Amendments to the Delta Conveyance Design and Construction Joint Powers Authority Agreement

Staff Recommendation

Direct staff to place the Amended and Restated Joint Powers Agreement Forming The Delta Conveyance Design and Construction Joint Powers Authority on an upcoming Board of Directors agenda for consideration.

DCA Role

	Valley District Construction Project	Delta Conveyance Project
Authority	Board Authorizes Project	18 Boards Authorize Project
Project Management	Staff Design/Construction Oversight	DCA "Board" Design/Construction Oversight

DCA Governance Changes

- Increase the number of DCA Board of Directors from five (5) to seven (7)
  1. One (1) seat for Class 2 members, except Santa Clara Valley Water District
  2. One (1) seat for Classes 3, 5, and 7
  3. At large seat for Class 8 members } Valley District in Class 8
  4. At large seat for Class 8 members
  5. Metropolitan Water District of Southern California (State Water Project)
  6. Kern County Water Agency
  7. Santa Clara Valley Water District
- Option to reconsider budget, some contract items with 70% of contracted proportionate share

MOU to Select Class 8 At Large Members and Alternates

Date

Overview

- Generally modeled after process used for State Water Contractors “Board”
- General Qualifications: design, construction, financing, large project construction
- Positions may be filled by staff or elected officials
- Nomination “pool” by December 15, 2020 and September 30 for subsequent years
- Voting by Class 8 State Water Contractor staff members
- Top two vote totals – Director
- Third and fourth highest vote totals – Alternates
- Term: alternating 2 year

Recommendation

- Forward the Amended DCA JPA Agreement to the Board for consideration
- Forward the Class 8 MOU for selecting DCA Board members to the Board for consideration

Director Comments and Discussion

T. Milford Harrison
President

Paul Kielhold
Vice President

Susan Longville
Treasurer

June Hayes
Director

Gil Navarro
Director

Staff Recommendation

Direct staff to place the Amended and Restated Joint Powers Agreement Forming The Delta Conveyance Design and Construction Joint Powers Authority on an upcoming Board of Directors agenda for consideration.

Adjournment