2021 Draft Delivery Capability Report (DCR)

Modeling Support Office

Department of Water Resources, CA

April 4, 2022

Outline

- Assumptions
  - Existing Conditions
  - Differences with DCR 2019
- Results
  - Base Scenario with Existing Condition
  - Reasons for DCR 2019 and 2021 deliveries differences
  - Simulated vs historical allocation and deliveries comparison
- Q&A

DCR 2021 Simulation Model

- **CalSim 3.0 model -** DWR-USBR Model
- Coordinate and communicate with consultants, DWR different divisions, and Reclamation to share CalSim 3 fixes, updates, and improvements to include in the model

Assumptions: Existing Condition

- Level of development – 2020
- SWP demand –Full Table A
- Regulations
  - D1641
  - Incidental Take Permit for SWP, and
  - ROC on LTO for SWP and CVP
- Simulation period – 94 years (Water Year 1922-2015)

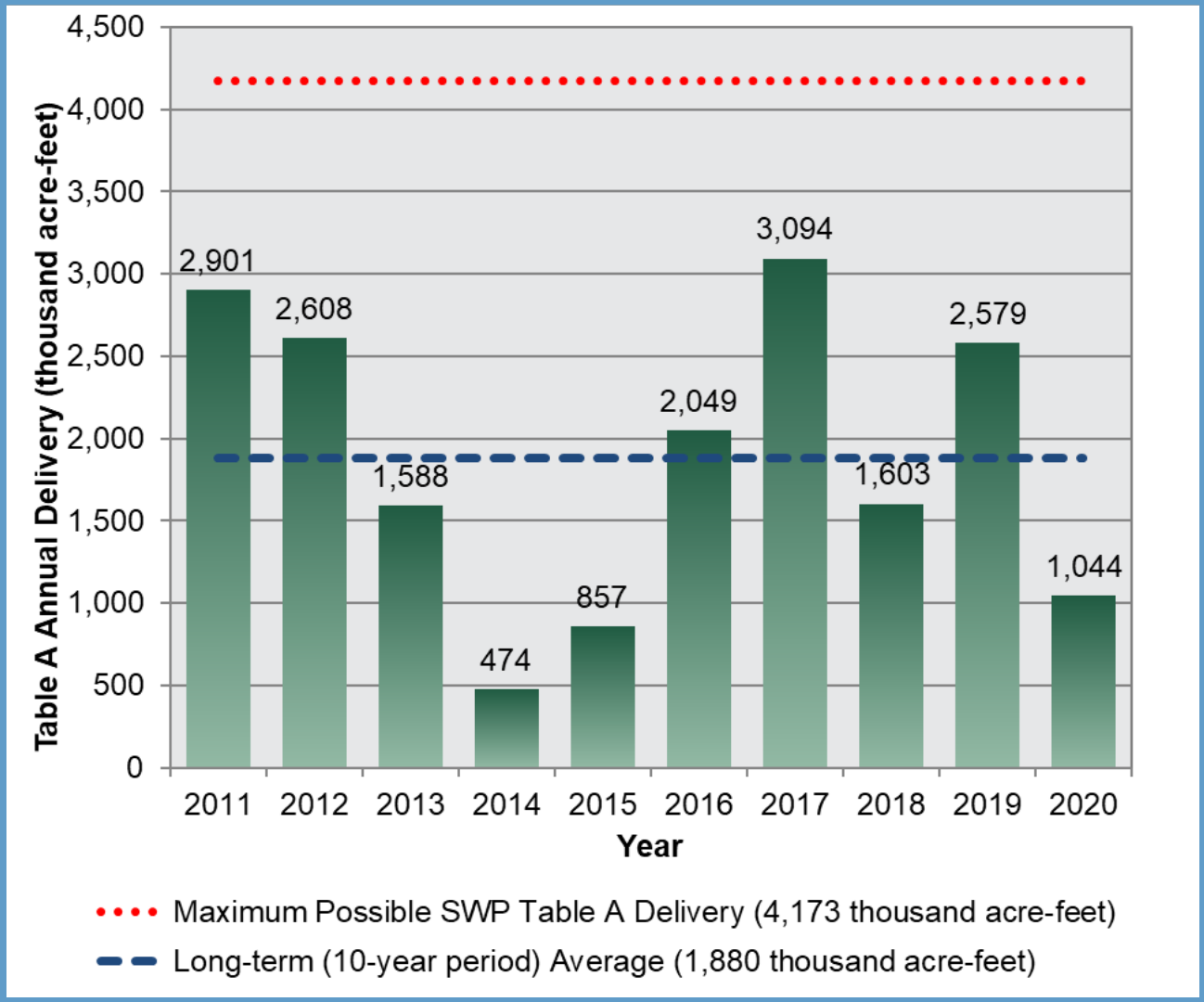
2021 vs. 2019 DCR Main Differences

- CalSim II -> CalSim 3
  - Longer period of record (WY 1922-2003 to WY 1922-2015)
  - Updated Hydrology
  - Larger and more refined spatial resolution
  - More explicit groundwater and surface water interaction
- SWP Table A contracts
  - Updated Dudley Ridge and Mojave Water Agency max contract amounts
- SWP and CVP operations
  - ROC on LTO refinements (2019)
  - ITP refinements
  - San Joaquin River Restoration Recapture
  - CVP allocation logic

Main Updates from Joint Release to Draft DCR 2021

- Reservoir initial conditions
- Negative carriage water logic
- SWP San Luis rule curve formulation
- Weights and penalties readjustment
- Transfer cycle refinement
- San Joaquin River Restoration Recapture
- Retrained WSI-DI
- Misc. fixes and clean up

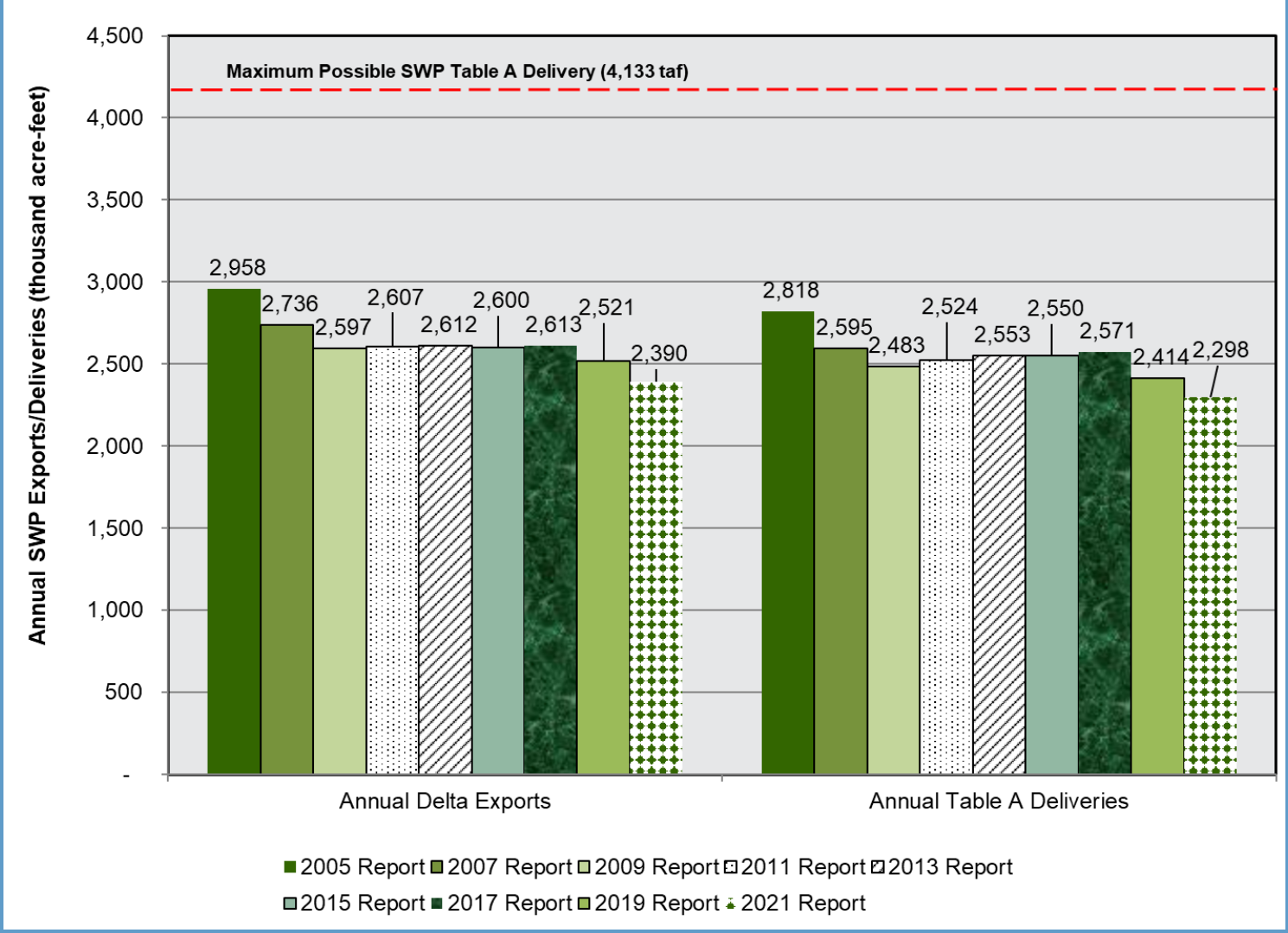
Historical Deliveries 2011 - 2020



Source: State Water Project Analysis Office

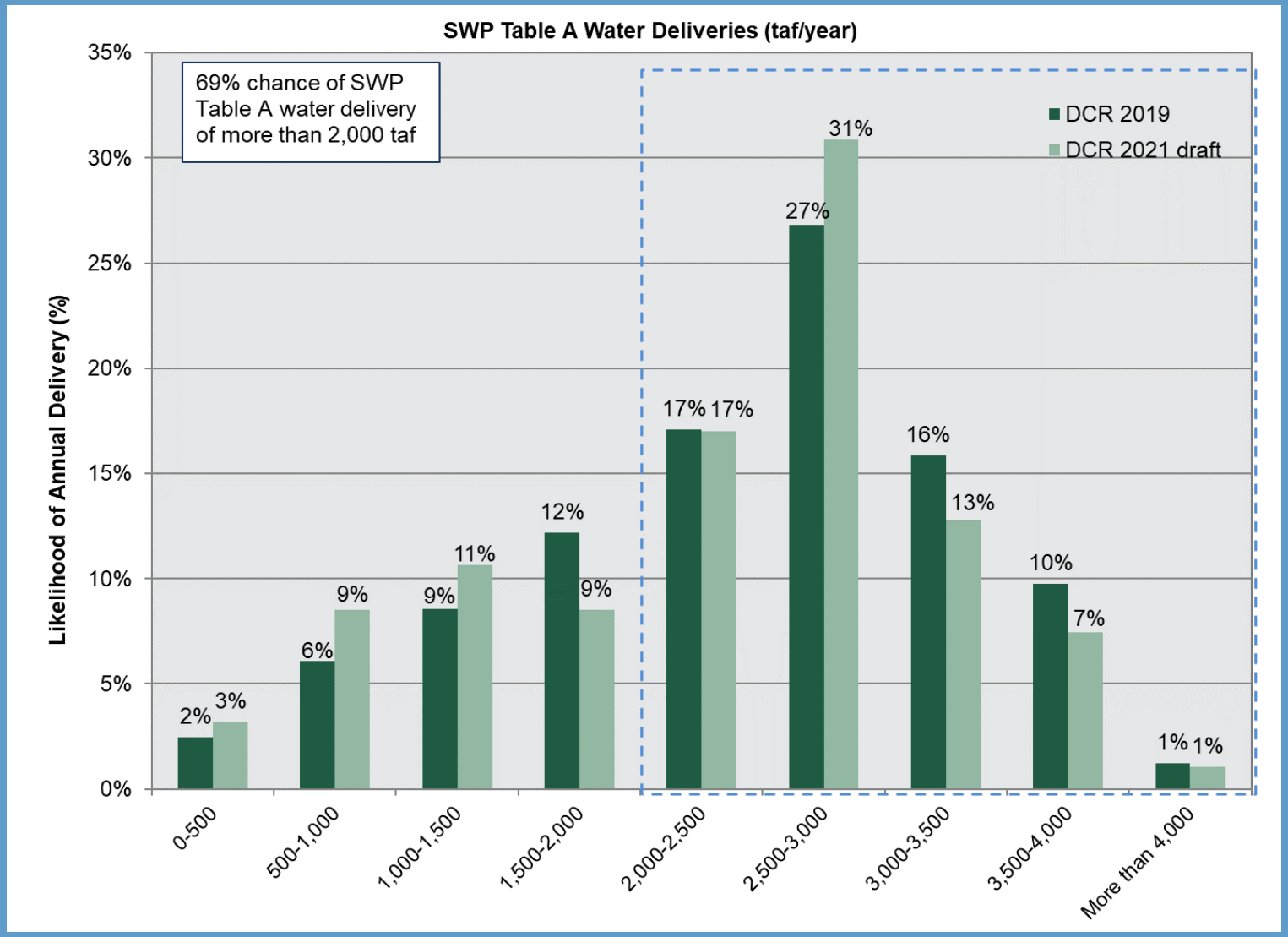
Model Results: Existing Condition

Trends in Estimated Average Annual Delta Exports and SWP Table A Deliveries



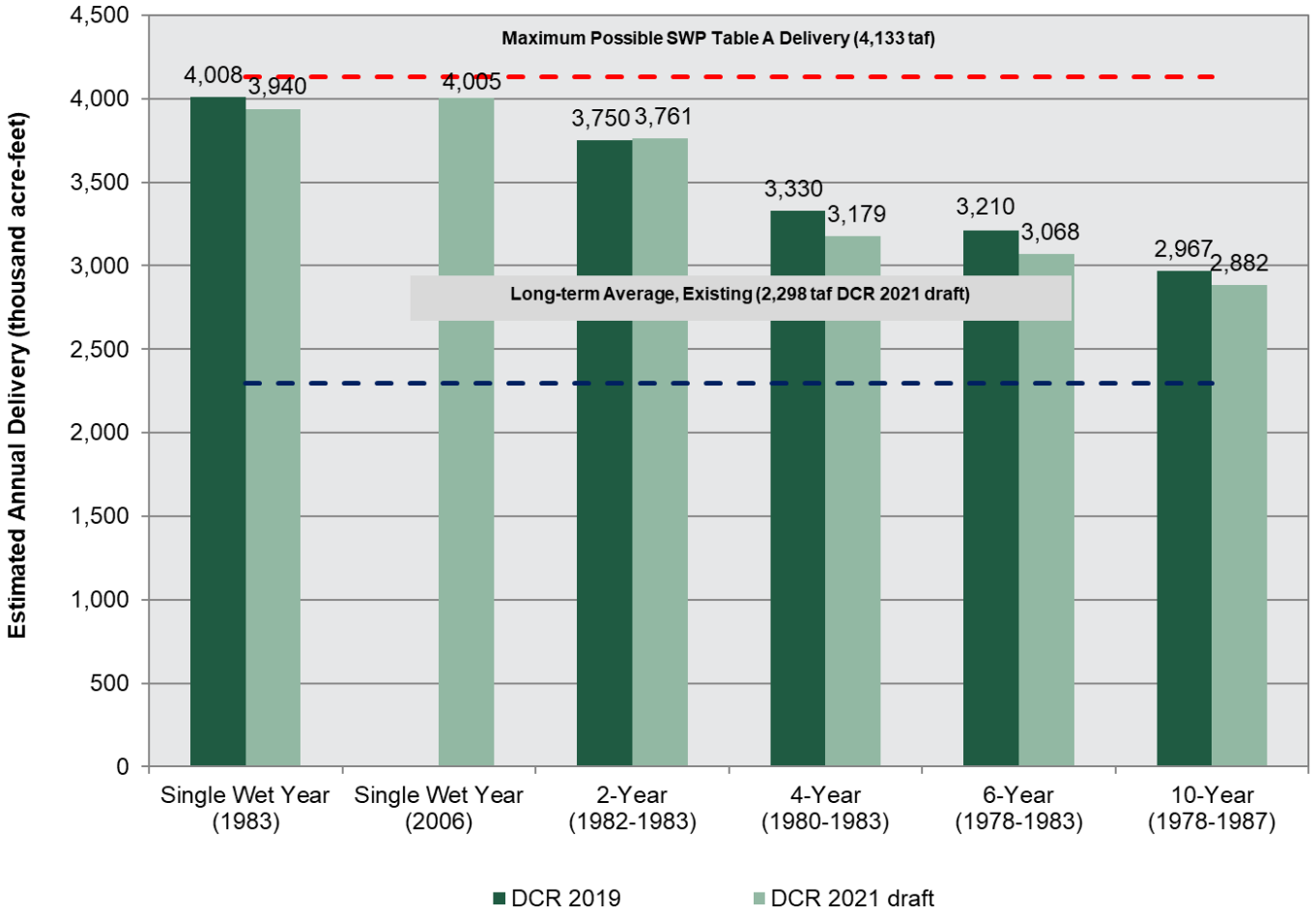
Model Results: Existing Condition

SWP Table A Water Deliveries, by Increments of 500 taf



Model Results: Existing Condition

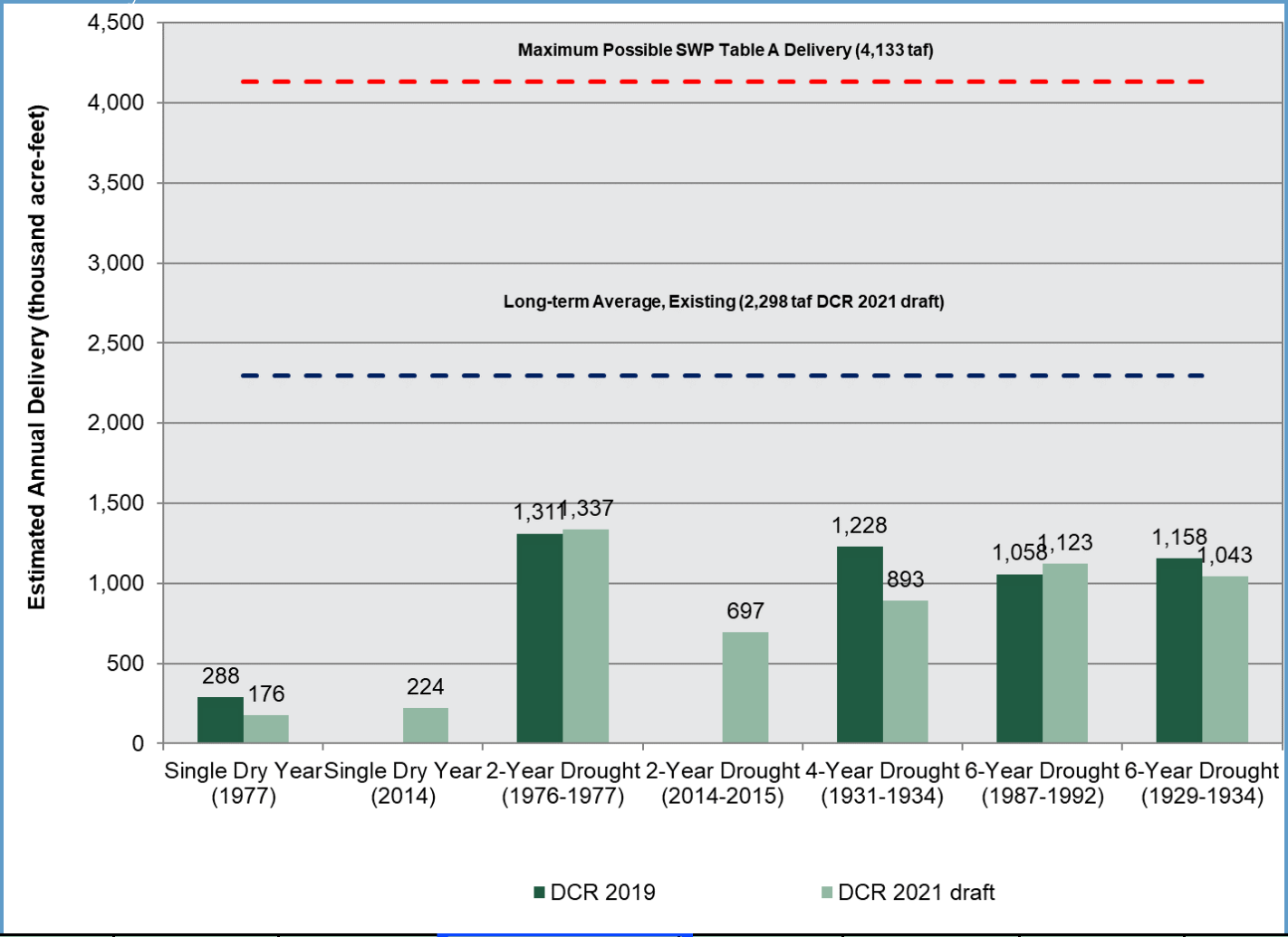
Wet Period SWP Table A Water Deliveries



Report	Long-term Average		Single Wet Year (1983)		Single Wet Year (2006)		2-Year (1982-1983)		4-Year (1980-1983)		6-Year (1978-1983)		10-Year (1978-1987)	
DCR 2019 (1922-2003)	2,408	58%	4,008	97%	-	-	3,750	91%	3,330	81%	3,210	78%	2,967	72%
DCR 2021 draft (1922-2015)	2,298	56%	3,940	95%	4,005	97%	3,761	91%	3,179	77%	3,068	74%	2,882	70%

Model Results: Existing Condition

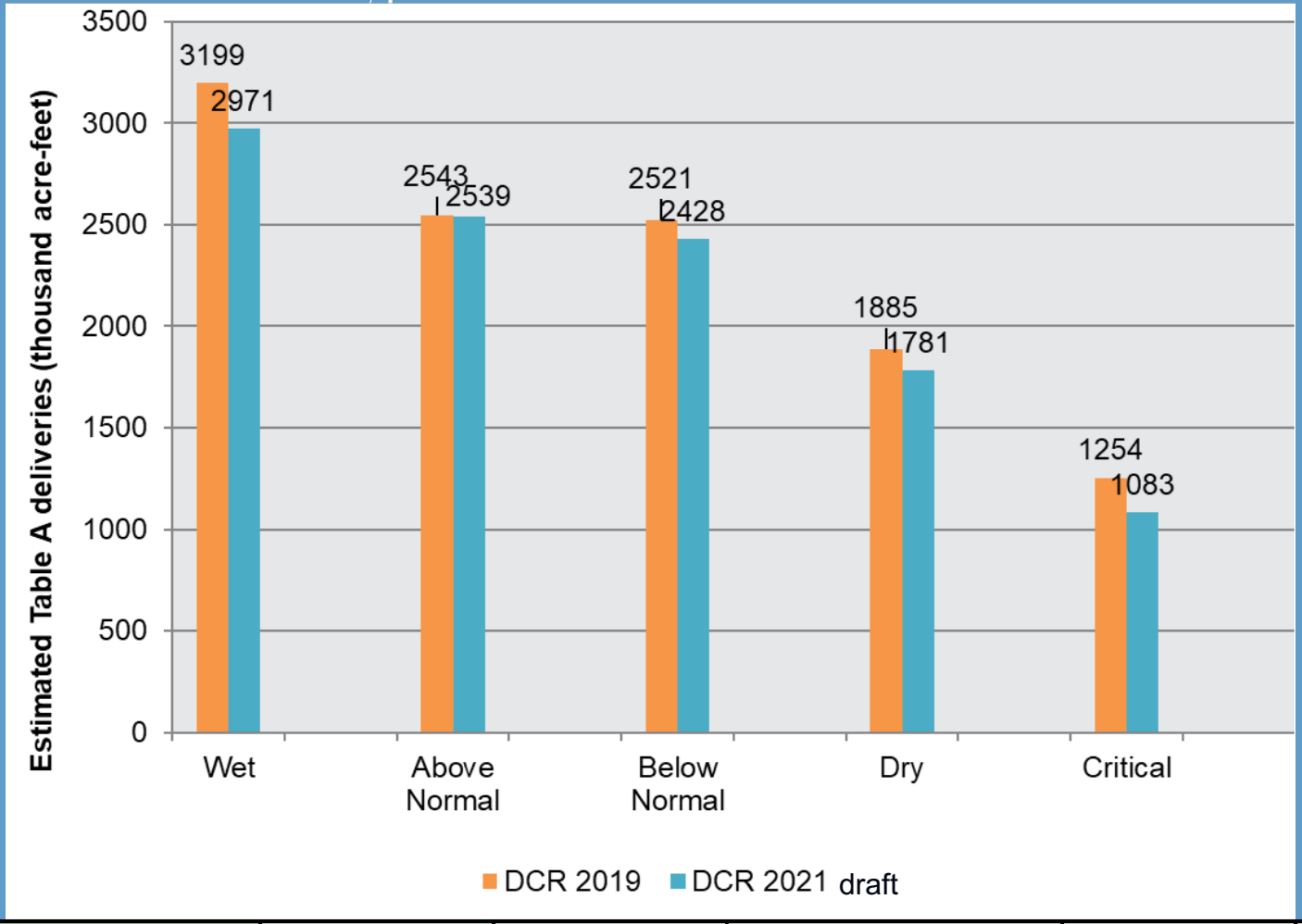
Dry Period SWP Table A Water Deliveries



Report	Long-term Average		Single Dry Year (1977)		Single Dry Year (2014)		2-Year Drought (1976-1977)		2-Year Drought (2014-2015)		4-Year Drought (1931-1934)		6-Year Drought (1987-1992)		6-Year Drought (1929-1934)	
DCR 2019 (1922-2003)	2,408	58%	288	7%	-	-	1,311	32%	-	-	1,228	30%	1,058	26%	1,158	28%
DCR 2021 draft (1922-2015)	2,298	56%	176	4%	224	5%	1,337	32%	697	17%	893	22%	1,123	27%	1,043	25%

Model Results: Existing Condition

SWP Table A Water Deliveries by Sacramento 40-30-30 Water Year Type



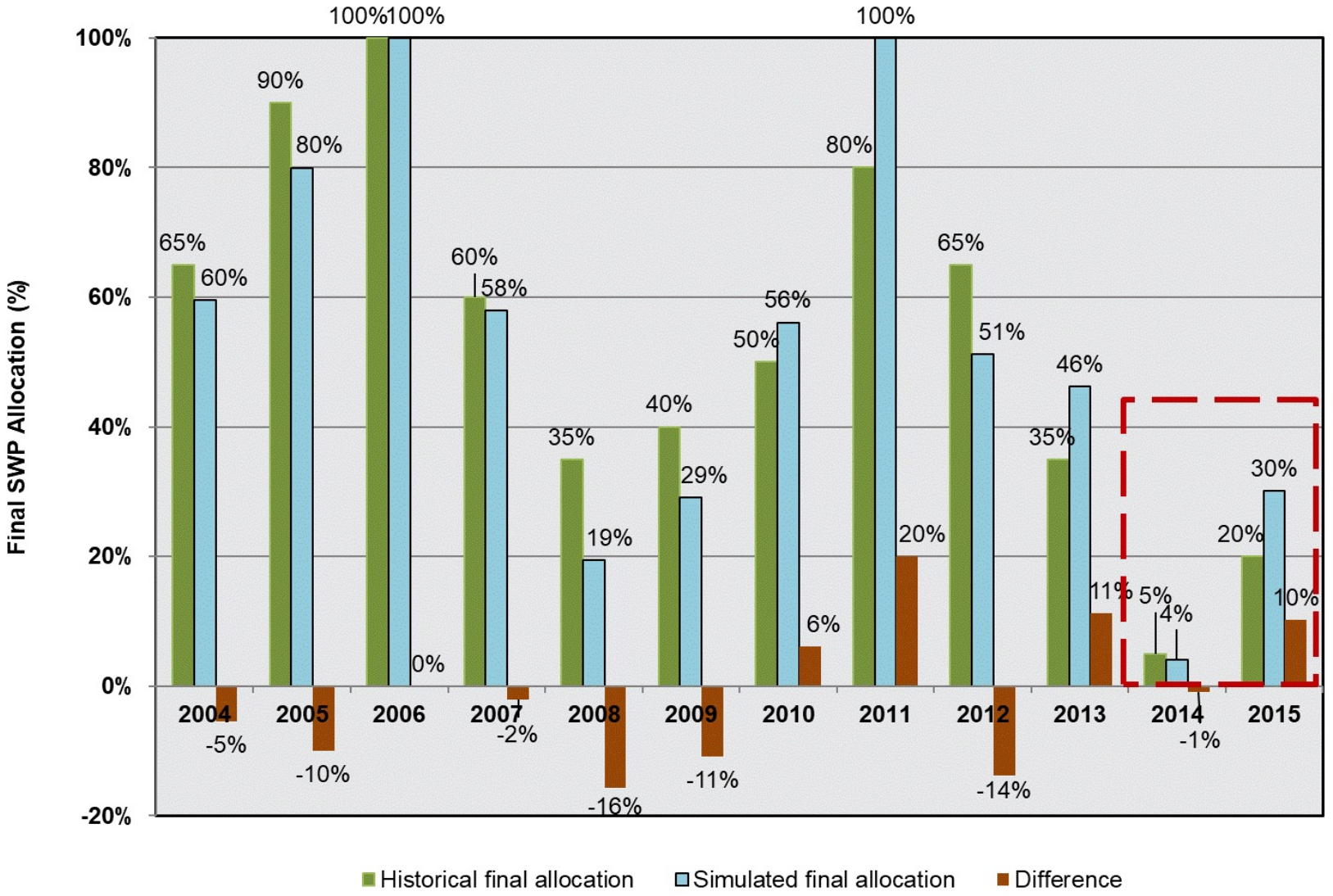
Report	Wet	Above Normal	Below Normal	Dry	Critical
DCR 2019 (1922-2003)	3199	2543	2521	1885	1254
DCR 2021 draft (1922-2015)	2971	2539	2428	1781	1083

Reasons for DCR 2019 and 2021 SWP Deliveries Differences

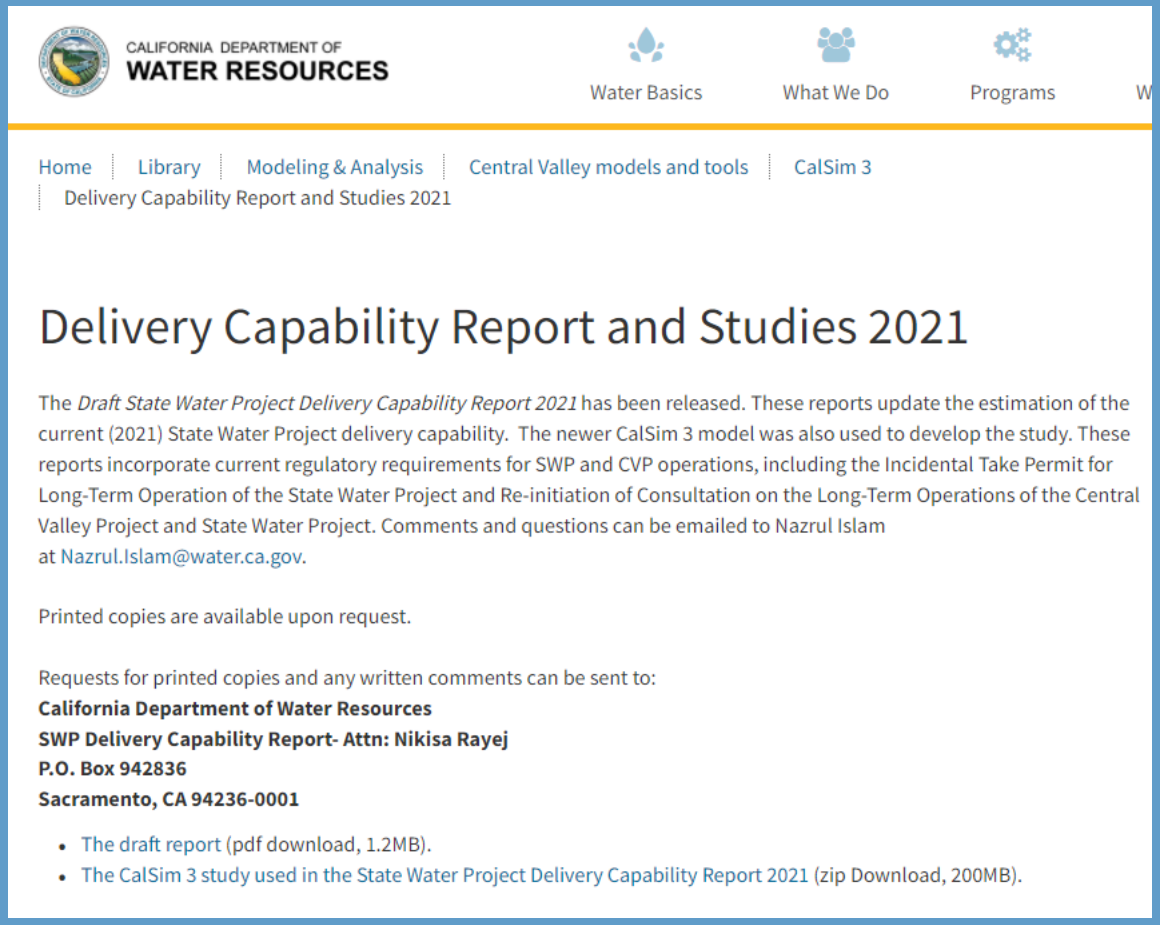
- Extension of **simulation period** - Includes one of the driest two-year period (2014-2015)
- Updates to **rim inflow and valley floor hydrology** in CalSim 3
- More explicit calculation of **Net Delta Outflow Index** (NDOI)
- More explicit modeling of **groundwater and surface water interactions** – Higher seepage losses, lower return flows, etc. which could reduce water supply
- **San Joaquin River Restoration Recapture** – Reduced San Joaquin Vernalis inflow to Delta, reducing water supply
- Update in **SWP San Luis Rule Curve** calculation – Balancing scheme prioritizes Oroville storage more compared to San Luis (less aggressive operation)

2004-2015 SWP allocation comparison

Historical data source: State Water Project Analysis Office



Draft DCR 2021 links



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Delivery Capability Report and Studies 2021

The *Draft State Water Project Delivery Capability Report 2021* has been released. These reports update the estimation of the current (2021) State Water Project delivery capability. The newer CalSim 3 model was also used to develop the study. These reports incorporate current regulatory requirements for SWP and CVP operations, including the Incidental Take Permit for Long-Term Operation of the State Water Project and Re-initiation of Consultation on the Long-Term Operations of the Central Valley Project and State Water Project. Comments and questions can be emailed to Nazrul Islam at Nazrul.Islam@water.ca.gov.

Printed copies are available upon request.

Requests for printed copies and any written comments can be sent to:
California Department of Water Resources
SWP Delivery Capability Report- Attn: Nikisa Rayej
P.O. Box 942836
Sacramento, CA 94236-0001

- The draft report (pdf download, 1.2MB).
- The CalSim 3 study used in the State Water Project Delivery Capability Report 2021 (zip Download, 200MB).

https://water.ca.gov/Library/Modeling-and-Analysis/Central-Valley-models-and-tools/CalSim-3/DCR2021

Final DCR 2021 links

- Report and stakeholders' comments and responses
- Existing and Future (Climate Change) studies
- Technical Addendum
  - Assumption
  - Delivery data
- Data
  - DSS
  - Excel
  - Tableau

Questions?