THE UNIVERSITY OF ARIZONA
Cooperative Extension

Arizona Water and Agriculture

Jeffrey C. Silvertooth

Professor and Extension Specialist
Agronomy & Soil Science

Water & Arizona Agriculture

Water & Arizona Agriculture

- Arizona ag water use
- Agricultural production
- Ag exportation
- Food importation

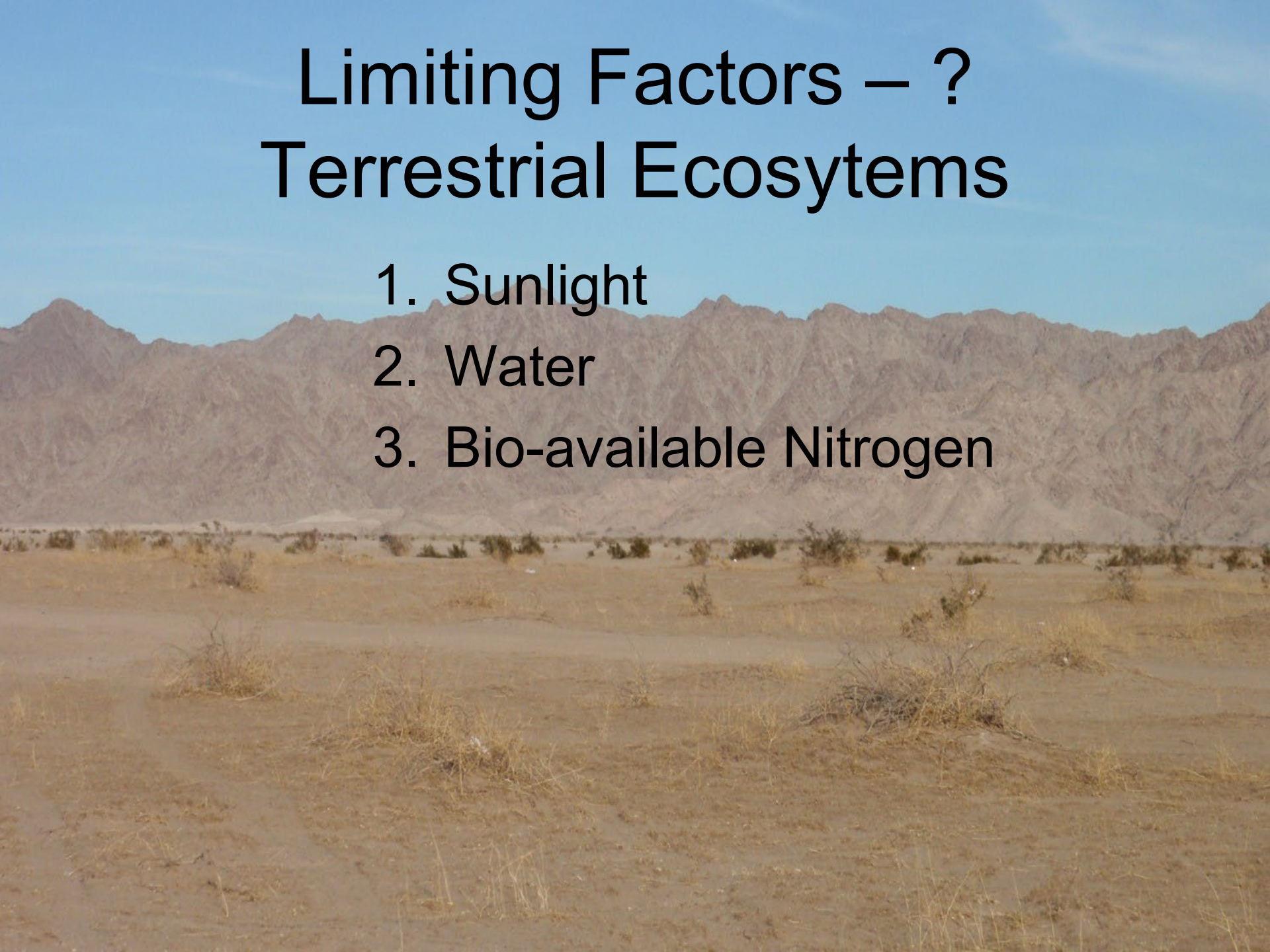






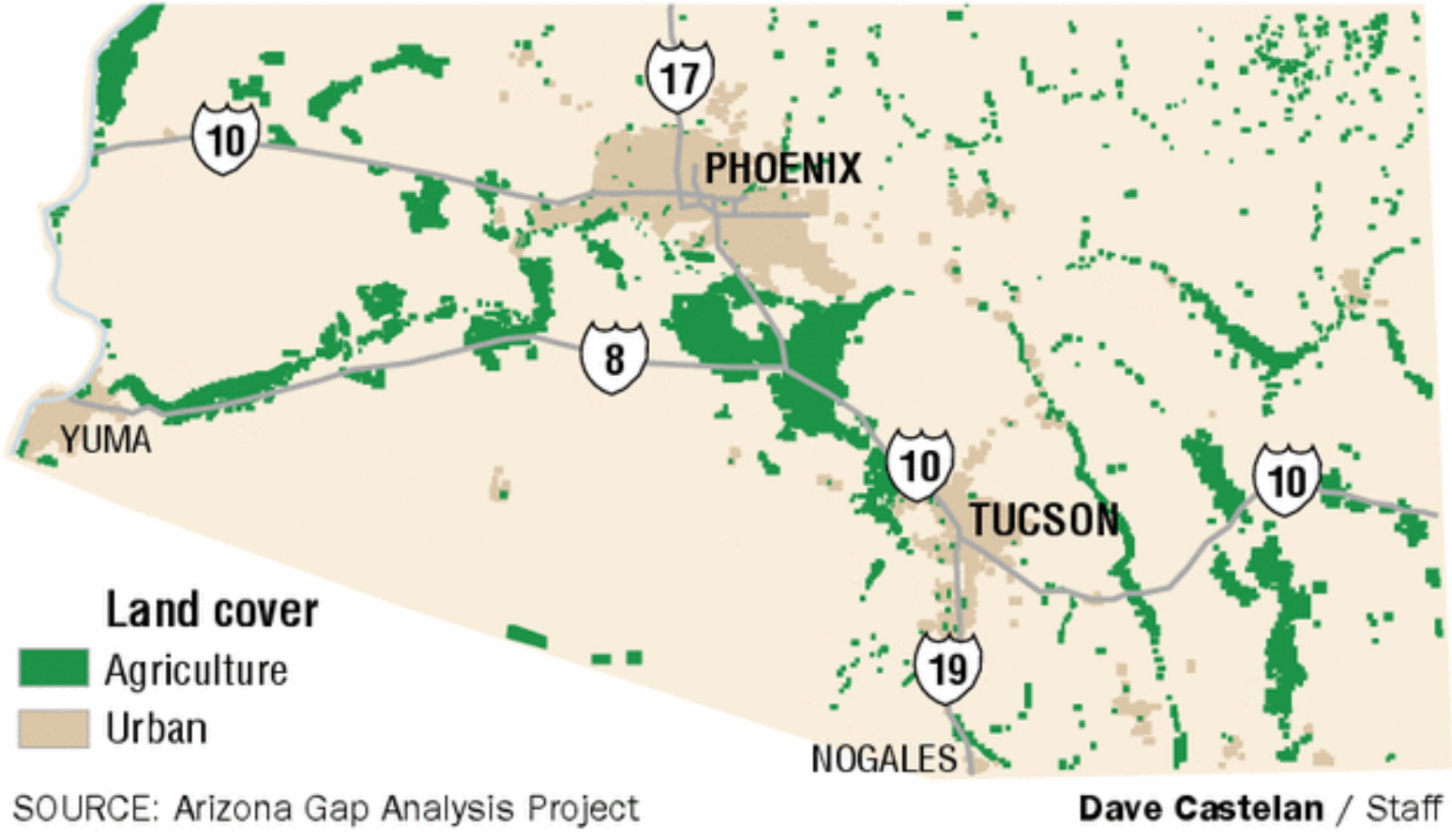
Limiting Factors – ?
Terrestrial Ecosytems

1. Sunlight
2. Water
3. Bio-available Nitrogen



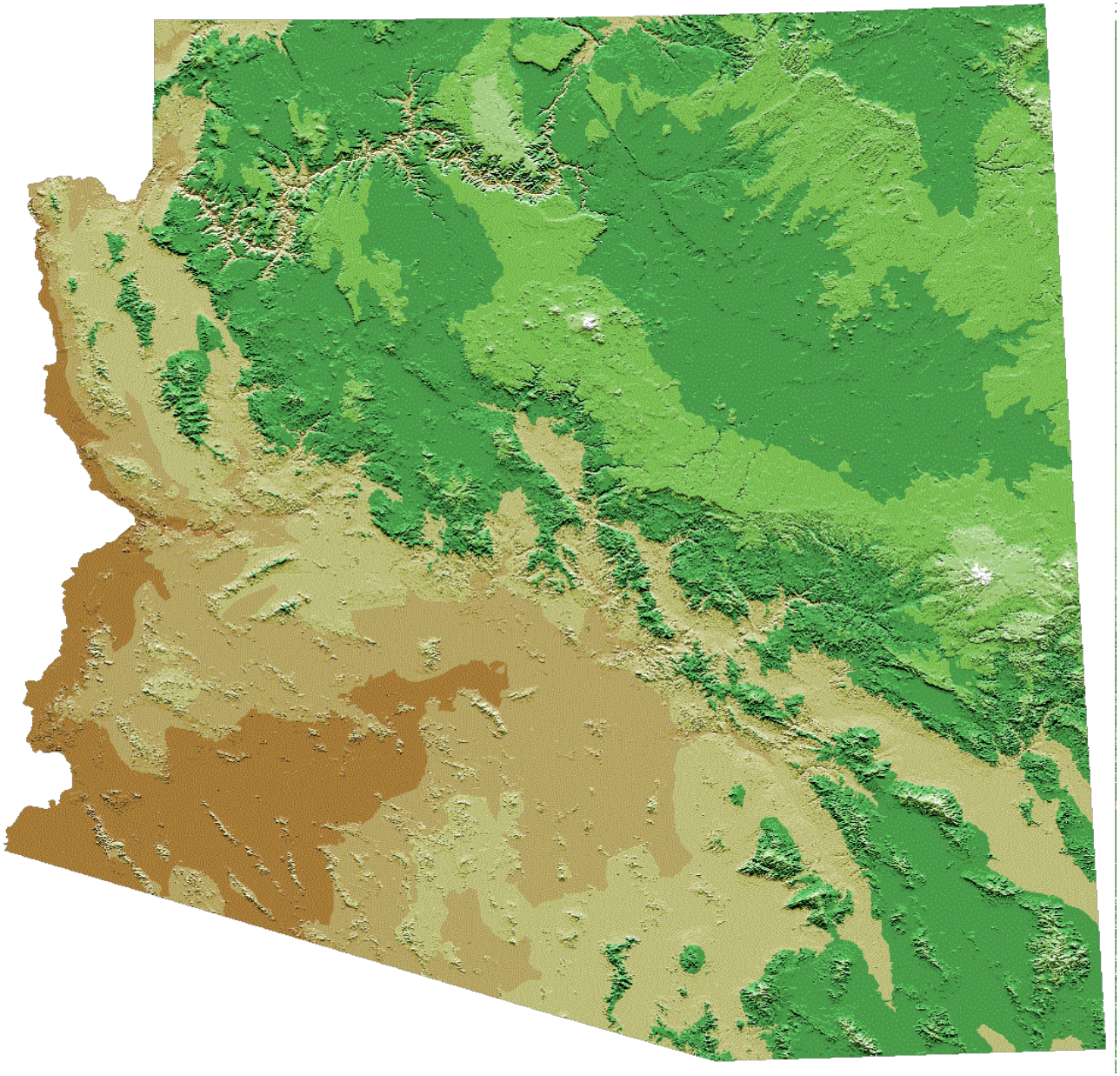
Arizona farms and urbanized areas

As Arizona's urban areas gobble up more land, many farmers are getting offers they can't refuse and selling.

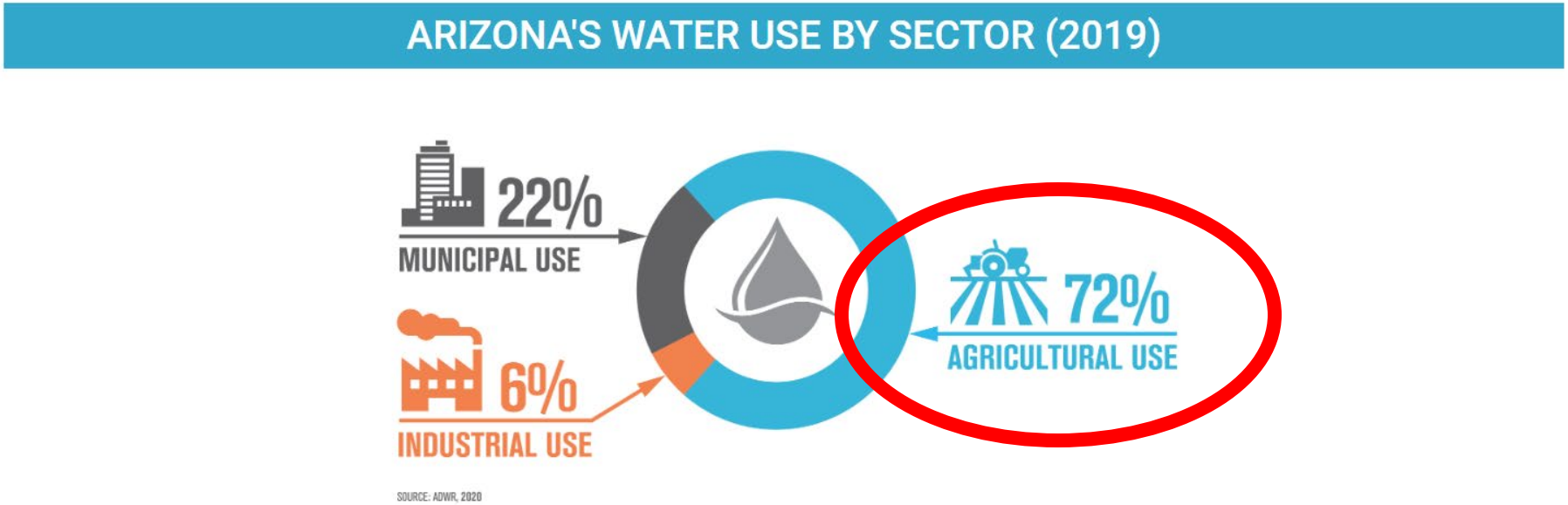


~1,222,000 acres (2022) https://www.usfarmdata.com

The Great State of Arizona



Arizona Ag Water Use



Source: ADWR, 2 August 2023

Colorado River Water

70-80%  **Agriculture**

(conventional estimates)

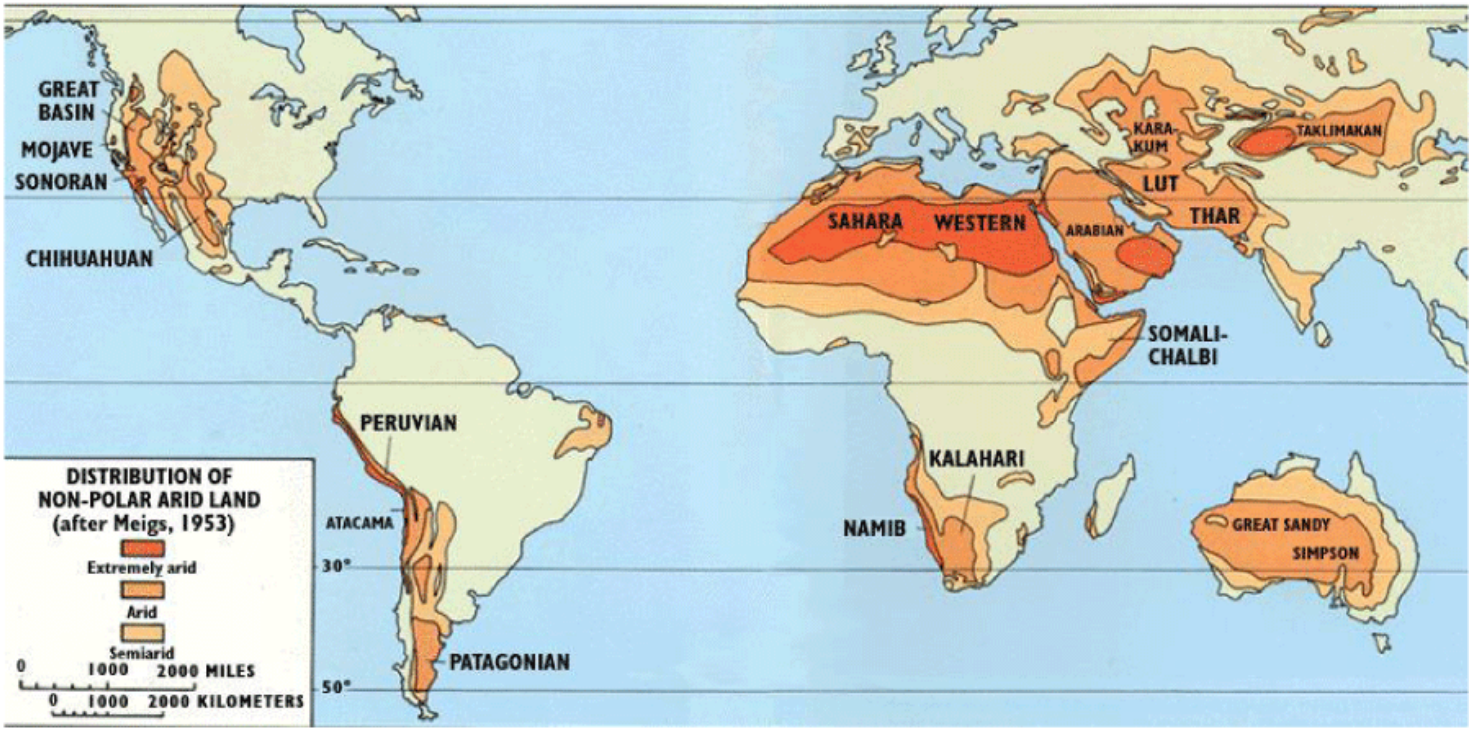
Water Use – United States

80%  **Agriculture**

Global Fresh Water Use

70% ⟶ Agriculture

Primarily in arid & semi-arid regions



Arid/Semi-Arid Regions

~ 40% of total crop production
~ 60-65% of grain production
~ 40-45% of global population

Increasing Global Demand Food & Fresh Water

- **By 2050**, feeding a planet of **9B people** will require:
  - **50 percent increase - agricultural production**
  - **15 percent increase - water demand**

Arizona Water

- Arizona consumes ~ **7M acre-feet (AF)/year**
- 72% used by agriculture ~ **5 MAF**

- Each Arizonan uses ~ **146 gallons water/day***
- 7.6M Arizonans → **1.2 MAF/year (wet water)**

*ADWR, https://www.azwater.gov/conservation/public-resources

Arizona Agricultural Production

- **Highest yields per acre (unit area).**
- **High quality crops**
- Maximize genetic potential
  - Crops
  - Animals
- Robust seed industry
  - National
  - International

Arizona Agricultural Economic Production

- **$30.9B** to the state's economy *
- Includes direct, indirect, and induced economic impacts.
- **Supporting over 126,000 jobs**
  - **$7.2B in labor income**
  - contributing significantly to stable employment and the state's overall economy.

* Montanía, C., D. Duval, G. Frisvold, J. Quintero. 2024. Arizona's Agribusiness System in the State Economy: An Economic Contribution Analysis for 2022. Department of Agricultural & Resource Economics, University of Arizona Cooperative Extension

Direct Agricultural Production

- Value of agricultural products sold in Arizona reached **$5.2B in 2022.**
  - **Crop production: 58%**
  - **Livestock: 42%.**

  } **~ 60/40 Split**

- Major agricultural products by value:
  - dairy products,
  - cattle and calves,
  - and vegetables/melons.

* Montanía, C., D. Duval, G. Frisvold, J. Quintero. 2024. Arizona's Agribusiness System in the State Economy: An Economic Contribution Analysis for 2022. Department of Agricultural & Resource Economics, University of Arizona Cooperative Extension

Growth & Diversification

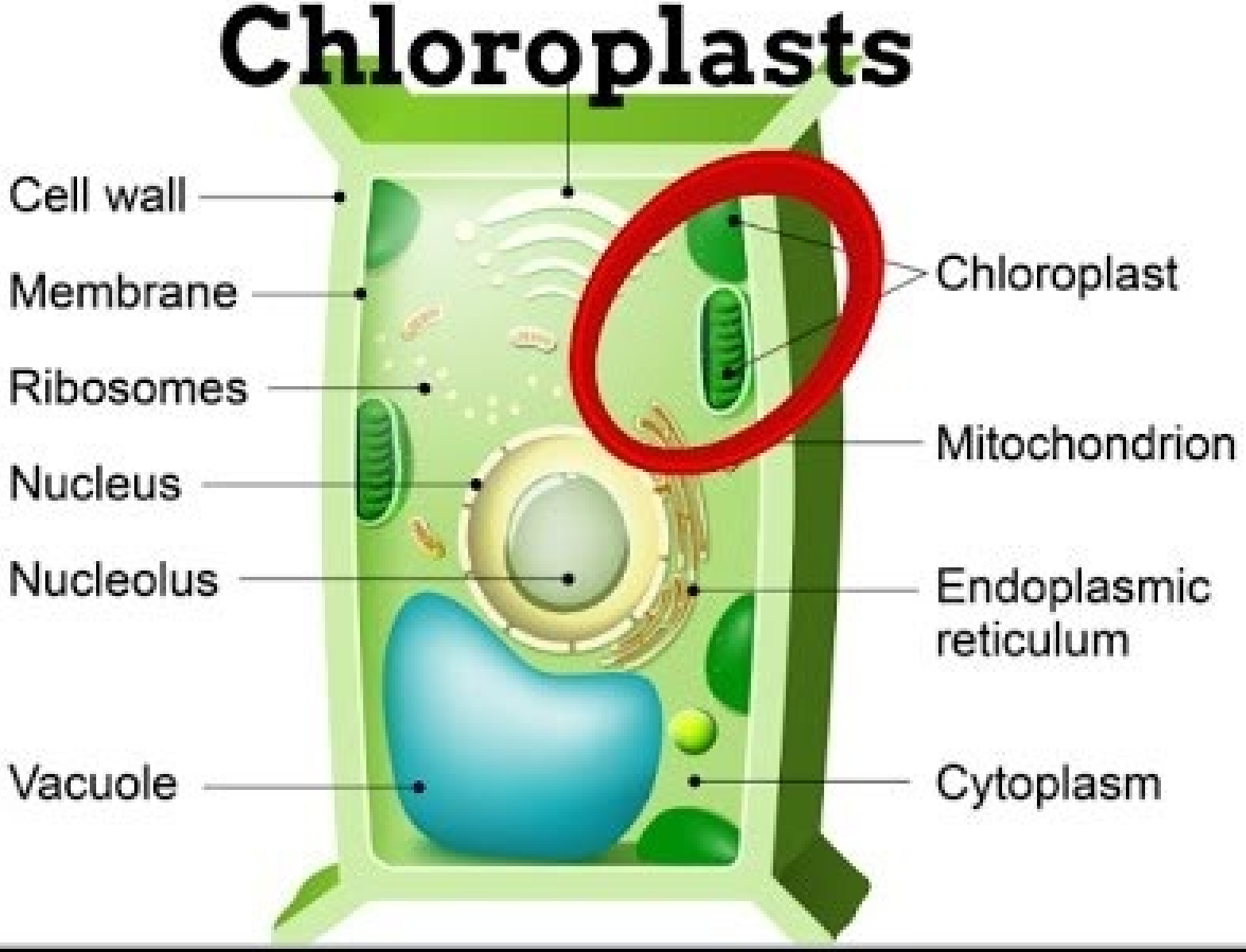
- **$30.9B 2022 = 35% increase in 5 years**
  - $23.3B figure reported in 2017

- **Increased diversity of ag production:**
  - Urban specialty crops
  - Greenhouses
  - Alfalfa
  - Dairy farms

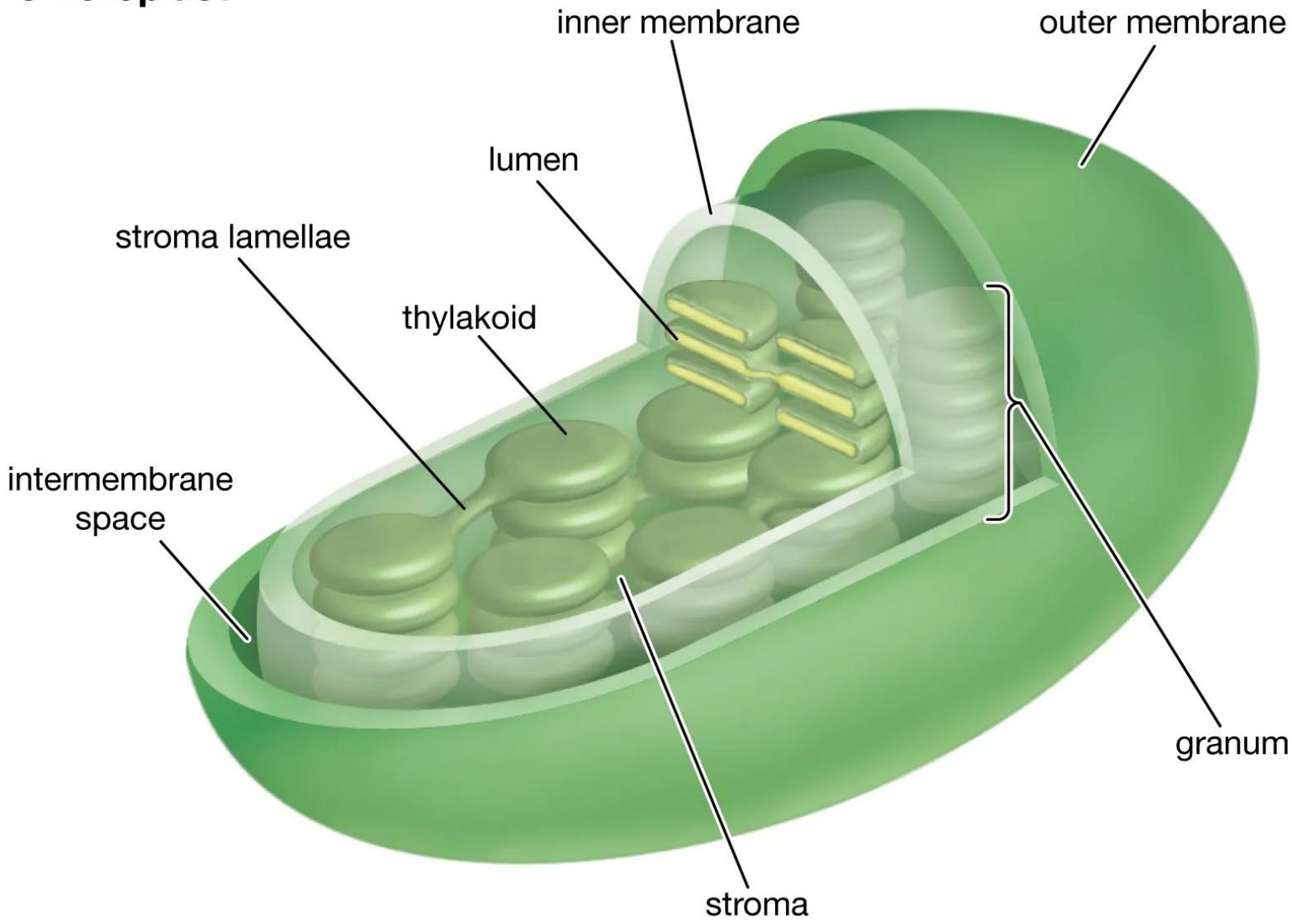
* Montanía, C., D. Duval, G. Frisvold, J. Quintero. 2024. Arizona's Agribusiness System in the State Economy: An Economic Contribution Analysis for 2022. Department of Agricultural & Resource Economics, University of Arizona Cooperative Extension


Crop Water Use

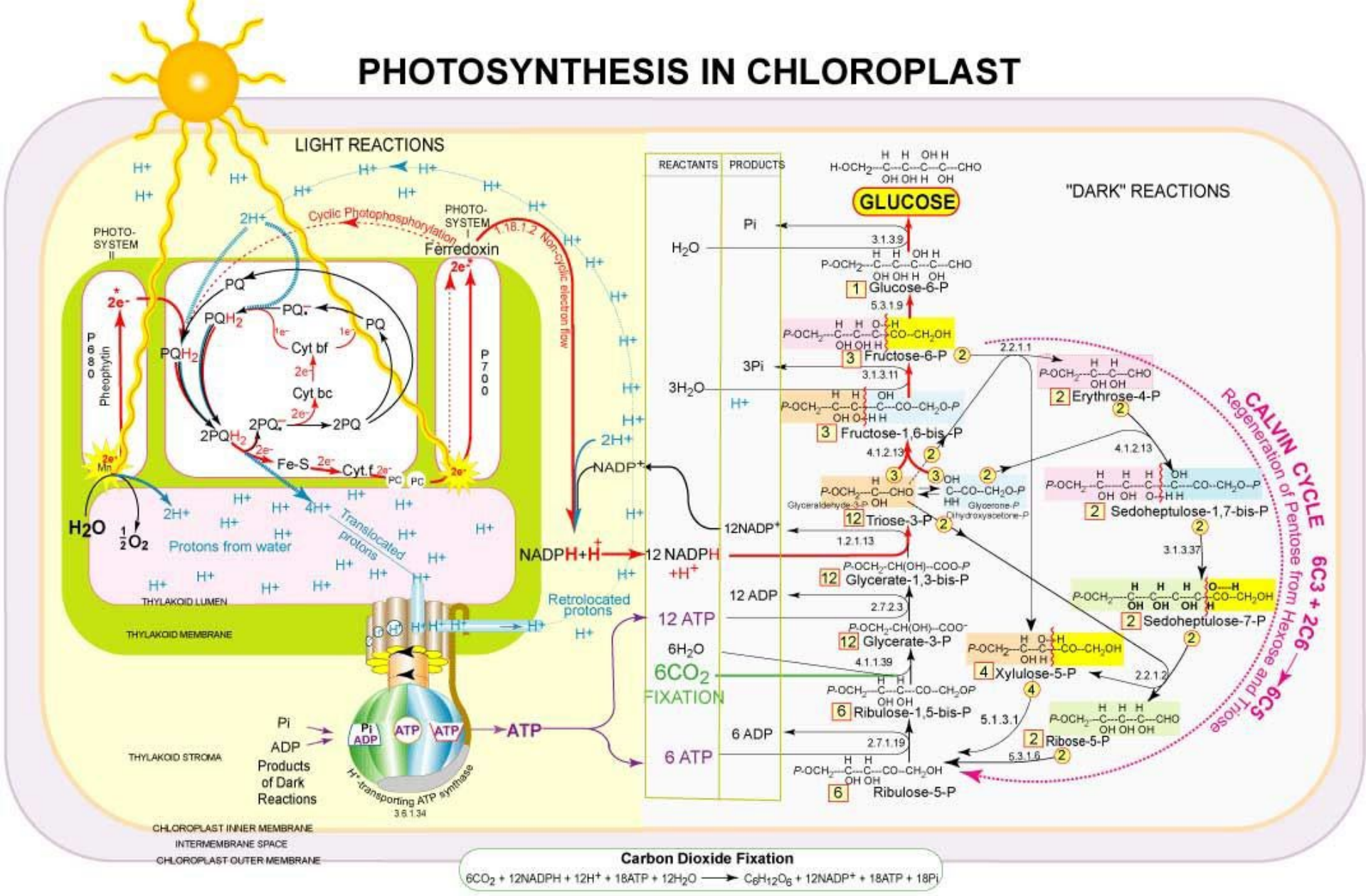
Chloroplasts



Chloroplast



PHOTOSYNTHESIS IN CHLOROPLAST



Carbon Dioxide Fixation

$6CO_2 + 12NADPH + 12H^+ + 18ATP + 12H_2O \longrightarrow C_6H_{12}O_6 + 12NADP^+ + 18ATP + 18Pi$

→ LIGHT-DRIVEN ELECTRON FLOW (electric current) from H_2O to $NADP^+$ and thence to Glucose (and starch)

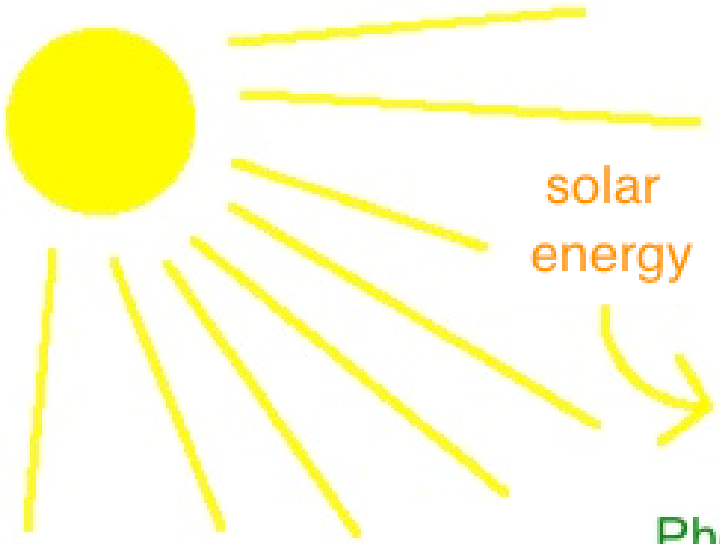
Reduced NADP inhibits Ferredoxin- NADPH reductase (1.18.1.2) and thus initiates

⇢ CYCLIC PHOTOPHOSPHORYLATION - a light-driven electron flow that drives

→ PROTON TRANSLOCATION from stroma to lumen. These protons, together with those from water produce a pH gradient that drives ATP synthase to form ATP

ENZYMES

1.2.1.13	Glyceraldehyde-3-P dehydrogenase	2.7.1.19	Phosphoribulokinase	4.1.1.39	Ribulose-bis-P carboxylase
1.18.1.2	Ferredoxin-$NADPH^+$ reductase	2.7.2.3	Phosphoglycerate kinase	4.1.2. -	Aldolase
2.2.1.1	Glycolaldehydetransferase (Transketolase)	3.1.3.9	Glucose-6-phosphatase	4.1.2.13	Fructose-bis-P aldolase
2.2.1.2	Dihydroxyacetonetransferase (Transaldolase)	3.1.3.11	Fructose-bis-phosphatase	5.1.3.1	Ribulose-P epimerase
		3.1.3.37	Sedoheptulose-bis-phosphatase	5.3.1.1	Triosephosphate isomerase
		3.6.1.34	ATP synthase	5.3.1.6	Ribose-5-P isomerase
				5.3.1.9	Hexose-P isomerase



Photosynthesis

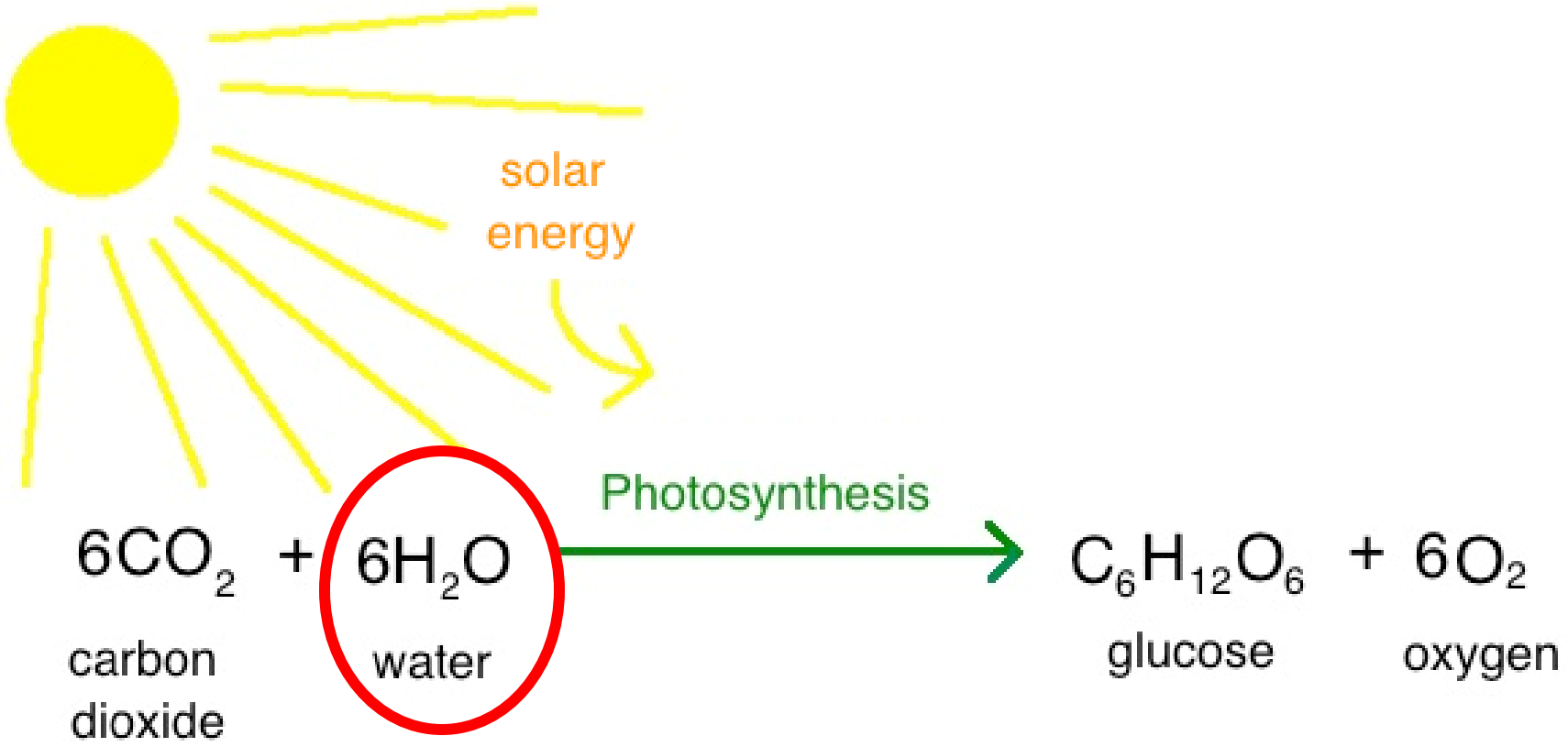
$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

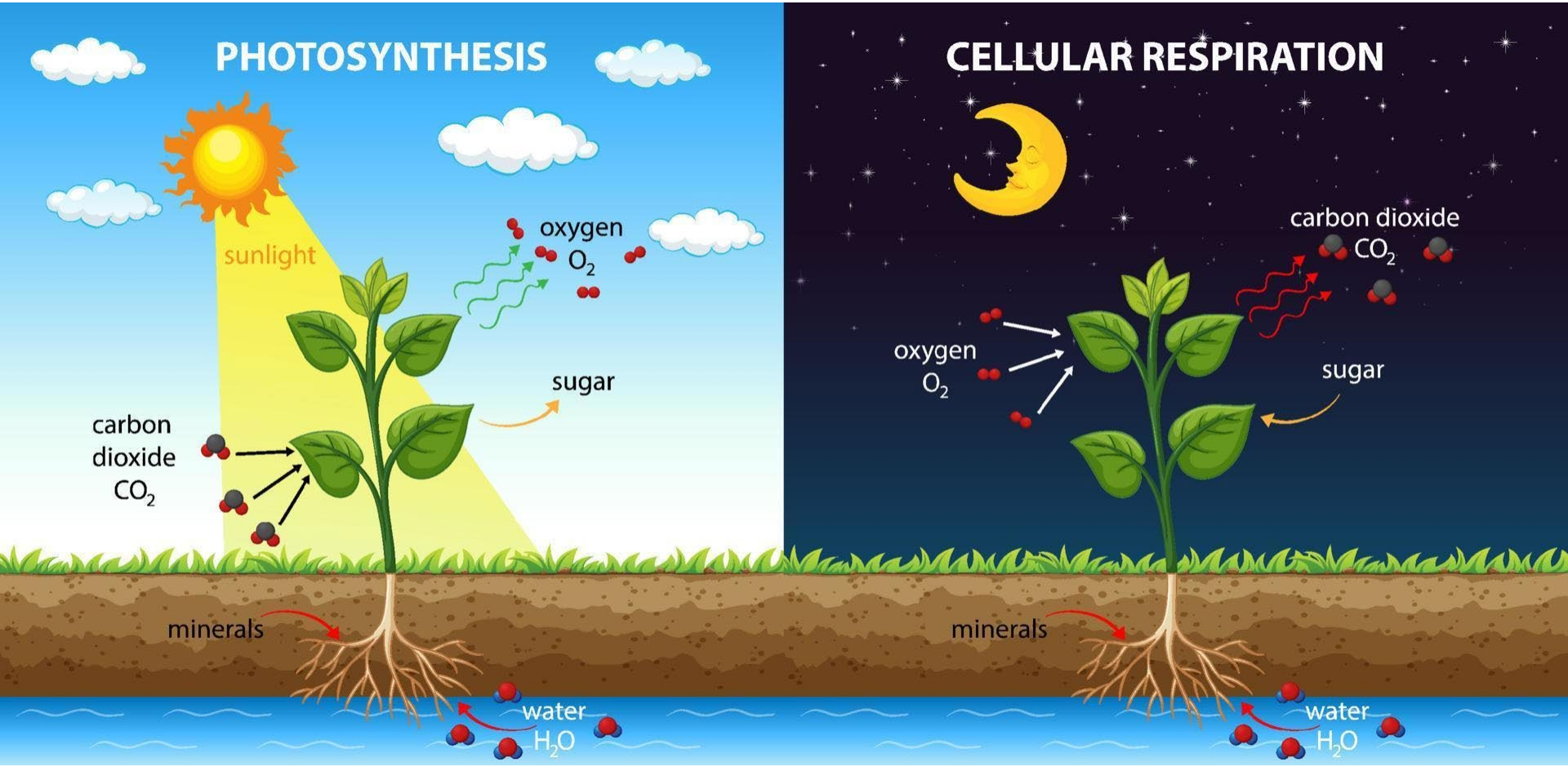
carbon dioxide

water

glucose

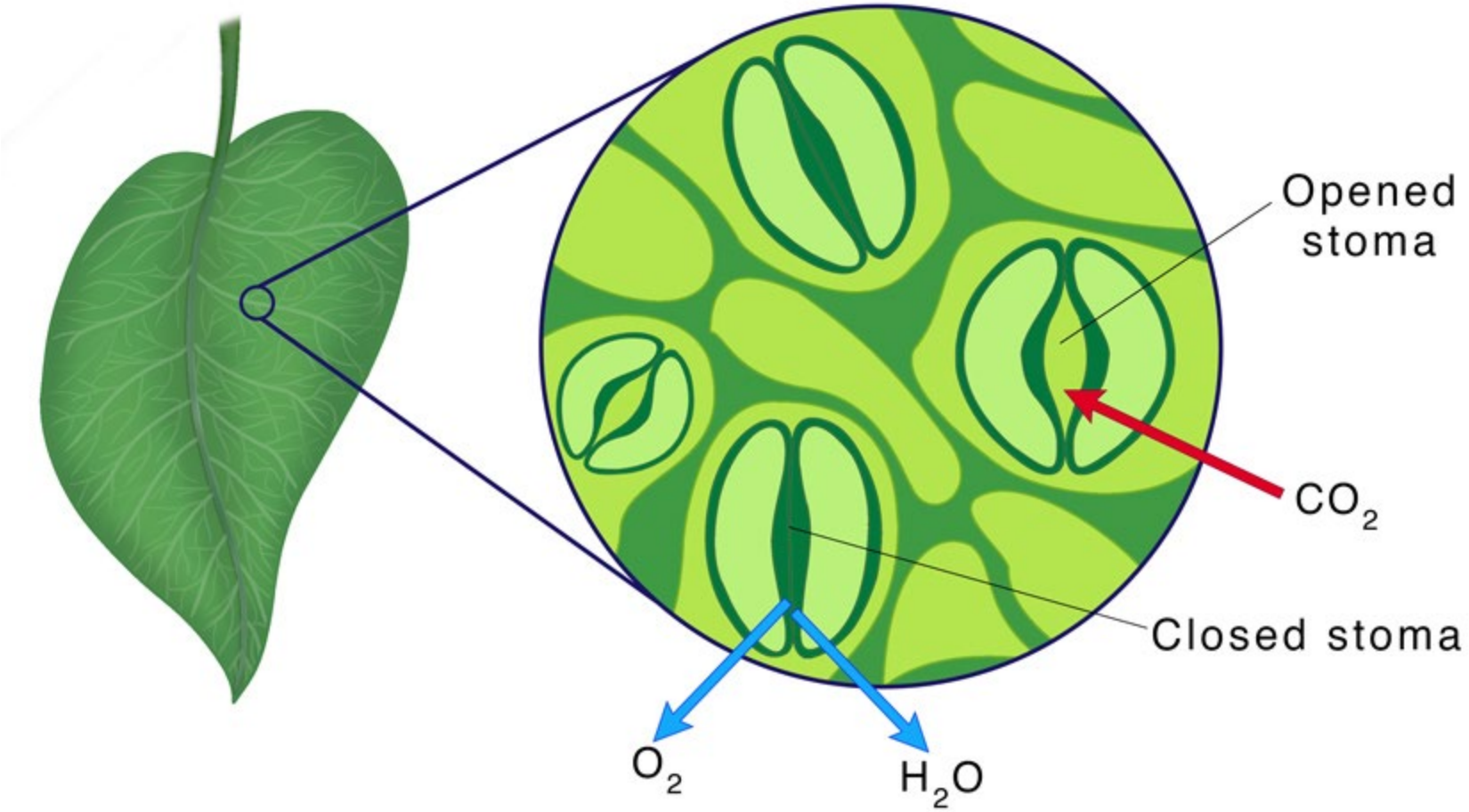
oxygen




PHOTOSYNTHESIS
sunlight
oxygen
O_2
sugar
carbon
dioxide
CO_2
minerals
water
H_2O
CELLULAR RESPIRATION
carbon dioxide
CO_2
oxygen
O_2
sugar
minerals
water
H_2O

Stomata

ScienceFacts.net




Evapotranspiration

Good Stewards of Arizona Land & Water Resources

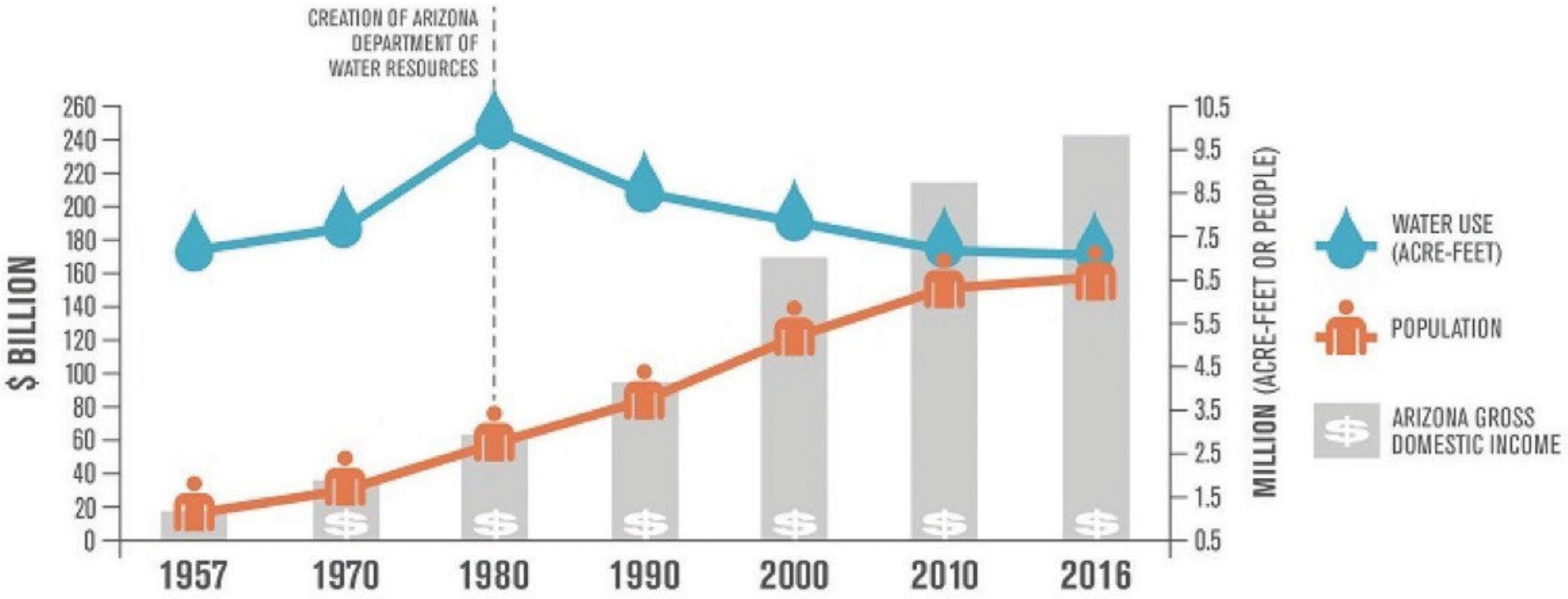
Photo Credit: Wayne Connelley Agriculture Photo Collection

Construction wrapped up on the Laguna Dam in 1909 — the same year the Yuma Territorial Prison closed. Coincidentally, Clark owns a restored church in Yuma, built in 1909.

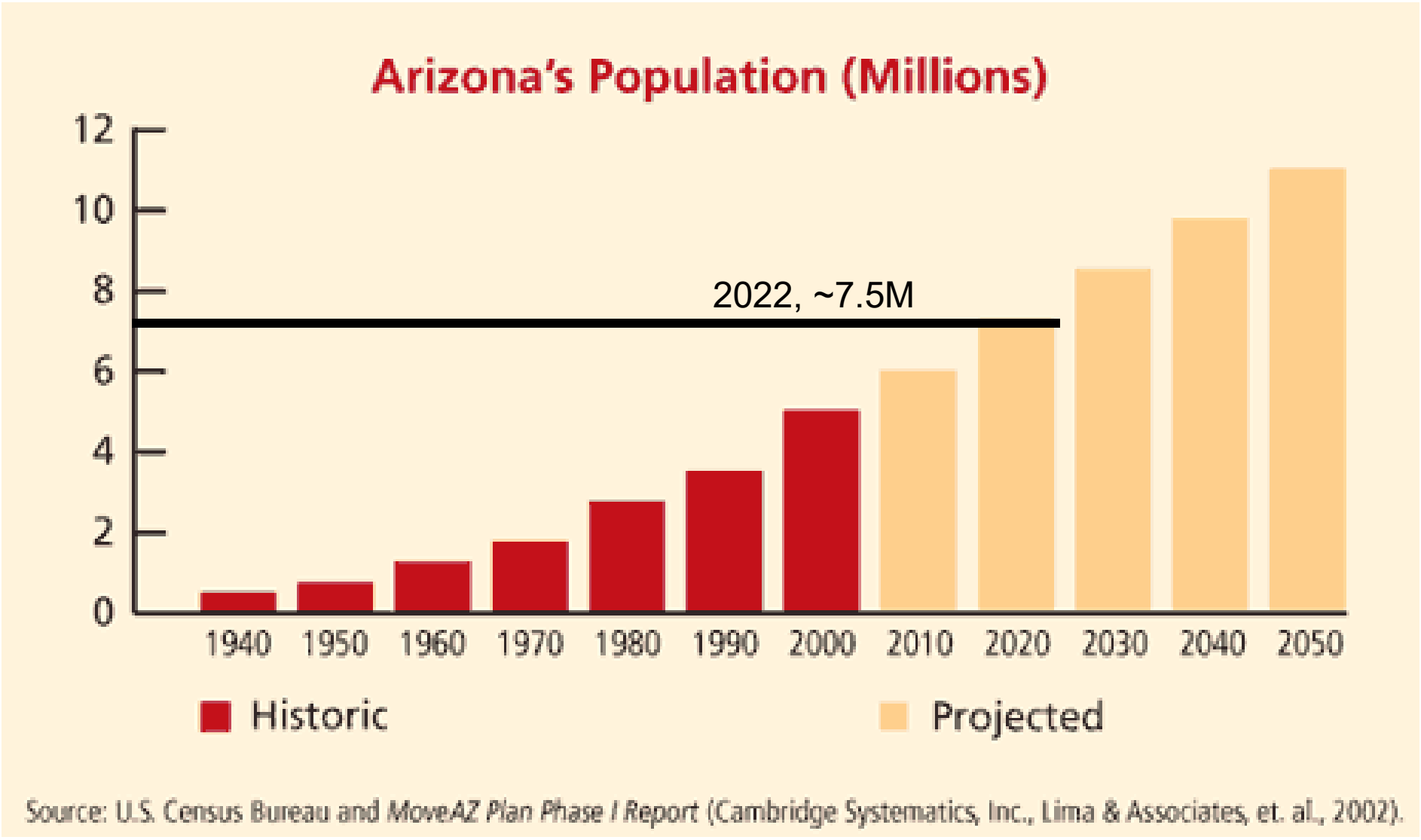
Decades of Improvements

- **Yields and efficiencies of production have increased in Arizona.**
  - **Higher yields**
    - Highest yields and quality of crops in the world.
  - **Less land utilized**
  - **Less irrigation water utilized per acre**
  - Less crop inputs, e.g. pesticides & fertilizers
  - Increased diversification of crops and cropping systems.
    - Including extensive seed production

ARIZONA WATER USE, POPULATION, AND ECONOMIC GROWTH (1957-2016)



SOURCE: ADWR, 2017



Source: U.S. Census Bureau and *MoveAZ Plan Phase I Report* (Cambridge Systematics, Inc., Lima & Associates, et. al., 2002).

Urbanization - 2022

Entity	% Urban Residents
Global	57*
U.S.	83 (86)
Arizona	90
California	95
Mexico	81

*60% by 2030, 68% by 2050 (UN)

Water to Feed Arizona

- Water required to feed one person

  (Virtual Water)

  800 – 2,000 gallons water/day

  - Range is dependent upon meat consumption
  - **Average is close to 2,000 gallons/day/person**

- Using 1,000 gallons/person/day

7.6M Arizonans = 8.3M AF/year

Arizona Water Footprint

- **7 MAF wet water consumed**

  5 MAF used by agriculture

- **8.3 MAF required / year**
  - **to feed 7.6M Arizonans**

- **Balance:**

  - 3.3 MAF (deficit) to feed AZ

Arizona Agriculture
&
Exportations

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Arizona Ag Exports

- **Foreign Exports account for 8% of Arizona agricultural sales**
- **Arizona Foreign exports:**
  - **88% of cotton,**
  - **39% of fruit,**
  - **24% of other crops and hay,**
  - **9% of vegetable and melon sales.**

The Contribution of Agricultural Exports to Arizona's Economy
Claudia Montanía, Dari Duval, George Frisvold
Department of Agricultural & Resource Economics, University of Arizona Cooperative Extension
March 2025.

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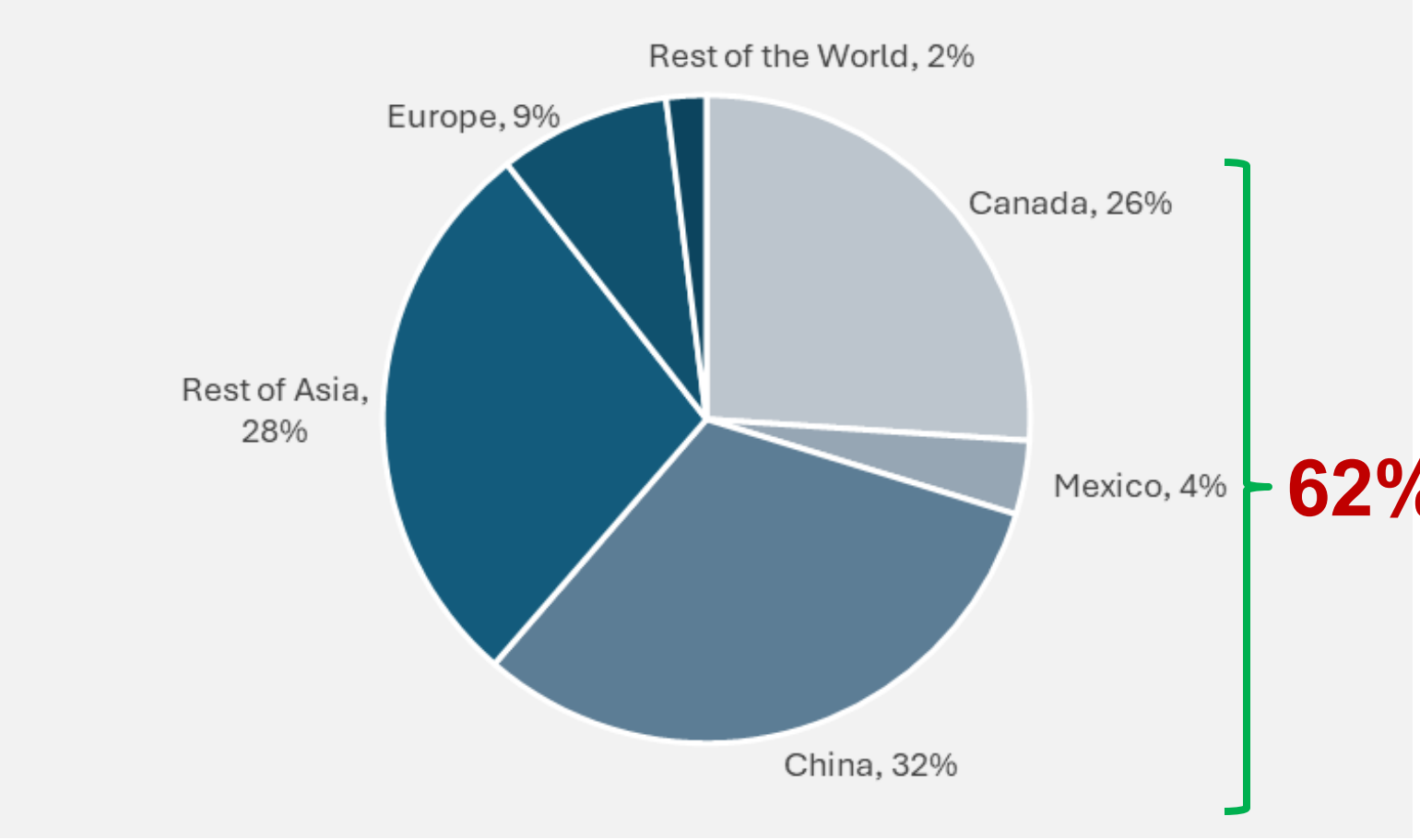
Destination of Arizona's Primary Agriculture Exports, in 2022 USD



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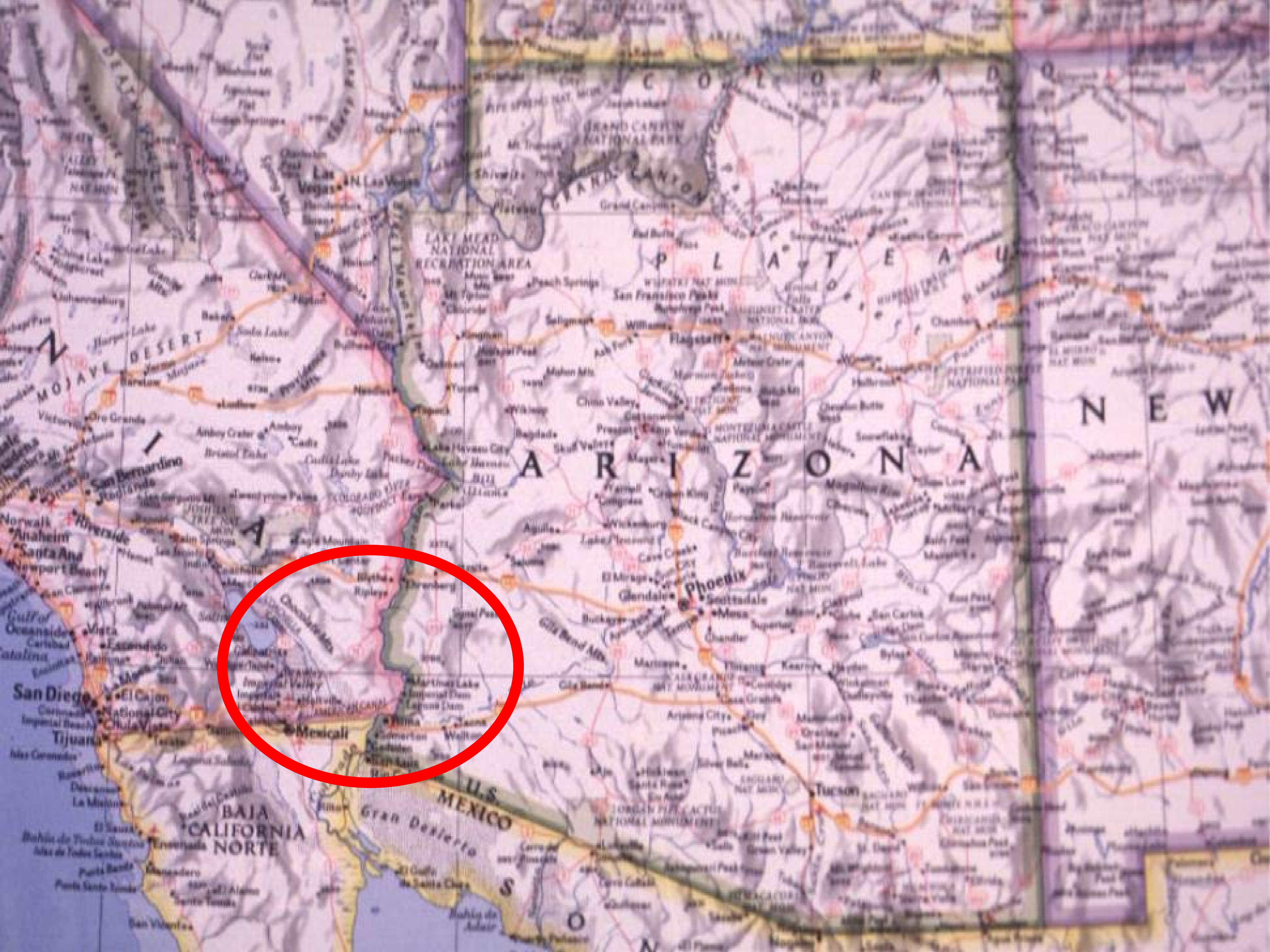
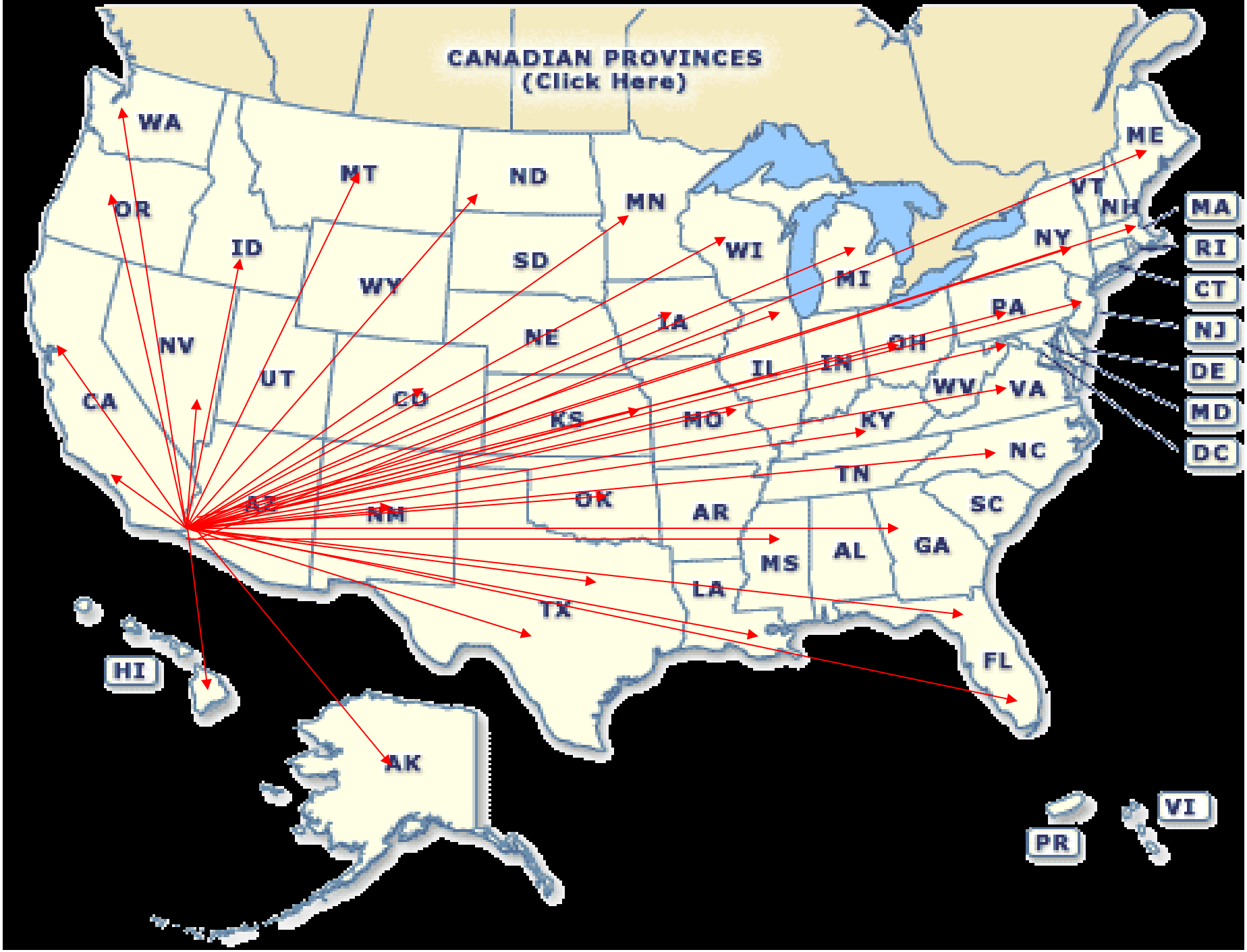


C O L O R A D O
P L A T E A U
A R I Z O N A
N E W
MOJAVE DESERT
GRAND CANYON NATIONAL PARK
LAKE MEAD NATIONAL RECREATION AREA
Las Vegas
Flagstaff
Kingman
Lake Havasu City
Phoenix
Scottsdale
Mesa
Glendale
Chandler
Gila Bend
Tucson
Yuma
San Bernardino
Riverside
Anaheim
Santa Ana
Newport Beach
Oceanside
San Diego
El Cajon
National City
Chula Vista
Tijuana
Mexicali
Imperial Valley
Blythe
BAJA CALIFORNIA NORTE
U.S.
MEXICO
Gran Desierto

Winter Vegetable Production

- Southwest Arizona
  - Yuma Valley, Lower Colorado River Valley
- **Principle winter vegetable production center for the U.S.**
  - **November to March**
  - **approx. 150,000 acres**


CANADIAN PROVINCES
(Click Here)
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VT
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ME
MA
RI
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NJ
DE
MD
DC
HI
AK
PR
VI

Arizona Lettuce/Leafy Greens

- **90% of the U.S./Canada winter supply of leafy green vegetables**
  - **Yuma, AZ**
- **25% of the nation's annual LGV production**

Arizona Leafy Green Winter Vegetable Production

- **$4.4B to Arizona's economy (2022)**
  - 56% of the state's agricultural GDP.

U.S. Agriculture
&
The Global Economy

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Global Economy

- **On the average, the U.S. exports ~20% of annual agricultural production.**
  - Top categories:
    - Grains, soybeans, and livestock

Source: USDA – ERS, 2025

Global Economy

U.S. imports ~15% of annual national food supply.

- Seasonal and climatic factors drive U.S. food imports
  - popular types of fruits, vegetables—and tropical products, such as cocoa and coffee.

Source: USDA – ERS, 2025

The United States is a Net Agricultural Importer

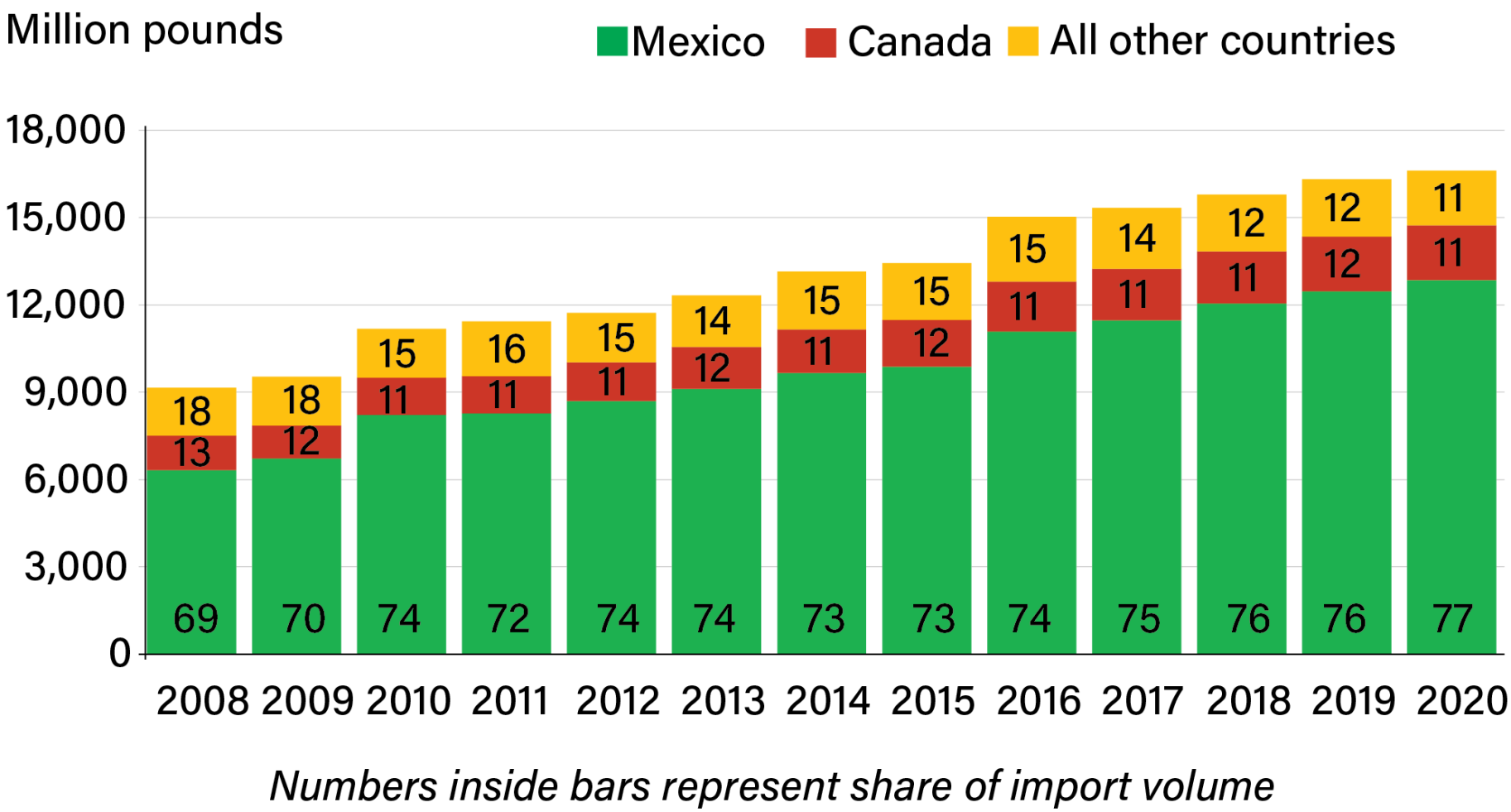
- U.S. imports exceeding exports by:

  $21 B in 2023; $39 B in 2024

- **The 2025 deficit was: $41 B**
  - increased demand for high-value imports i.e., **fruits, vegetables, processed foods**,
  - **Strong U.S. dollar** making imports cheaper,
  - **Rising consumer demand**
  - **Tariffs**

Kaufman, J. USDA-ERS. 2025. U.S. agricultural import values outpaced export values again in 2024. https://www.ers.usda.gov/data-products/chart-gallery/chart-detail?chartId=58310

U.S. fresh vegetable import volume continues steady growth



Numbers inside bars represent share of import volume

Notes: Fresh vegetables exclude potatoes and pulses (such as dry beans, lentils, peas, e.g.). See July 2021 Vegetables and Pulses Yearbook Tables 12–41 for the fresh vegetables included.

Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census data.

Mexico Ag Imports to the U.S. Economic Value - Nogales, AZ

- **Fresh Produce imports totaling $31.2 B, 2025**
  - Fruits, vegetables, and nuts
    - Fresh, frozen, and processed
    - **Fresh produce accounting for nearly 89% of the total.**
- **Mexico's agricultural imports into the U.S. reached $43.9B, 2025**

Arizona Ag Exports

- **48%** of Arizona's agricultural exports come from **primary agriculture**,
- **43%** from **food and fiber manufacturing**, and
- **9%** from **input suppliers**.

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Arizona Cotton Production is the Most Export-Dependent

Arizona cotton industry is more vulnerable to retaliatory tariffs or foreign import restrictions.

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Conclusions

- **Arizona consumes much more water through the food required to support the population than is used in statewide ag production.**

  5 MAF used in Arizona for food/fiber production

  8.3 MAF to feed Arizonans

3.3 MAF Deficit

Conclusions

- **Overall, exports account for 8% of Arizona agricultural sales.**
- **On the average, the U.S. exports ~20% of annual agricultural production.**
- **U.S. is a net importer of ag products**
  - **$21B in 2023 → $39B in 2024**

Conclusions

- **Arizona produces the highest yields and quality of crops – anywhere in the world.**

- **Arizona crop water use efficiency has steadily improved in the past 40 years.**

- **Arizona contributes to the regional, national, and global food supply.**

Water & Arizona Agriculture

Photo credit: Brian van der Brug / LA Times

Colorado River Water Update

5 November 2025

Jeffrey C. Silvertooth

Professor and Extension Specialist
Agronomy / Soil Science
Department of Environmental Science

Outline

- Background
  - Geography, hydrology, history
  - Law of the River
- Current situation
- Looking ahead – prospects for the future

Colorado River Watershed

- 1,450 mile river channel
- 244,000 sq. mile drainage
- greatest elevation drop in North America
- budgeted volume = **16.5 million acre-ft/year**
  - Columbia River: 192 million acre-ft/year
  - Mississippi River: 400 million acre-ft/year
- covers portions of **7 states** and **2 nations**
- **40M people w/ 30 American Indian Tribes**
- **~ 6.0M acres of farmland**

Colorado River Water Budget

- **16.5 MAF** Currently budgeted total

  (7.5+7.5 MAF = 15 MAF + 1.5 MAF Mexico)

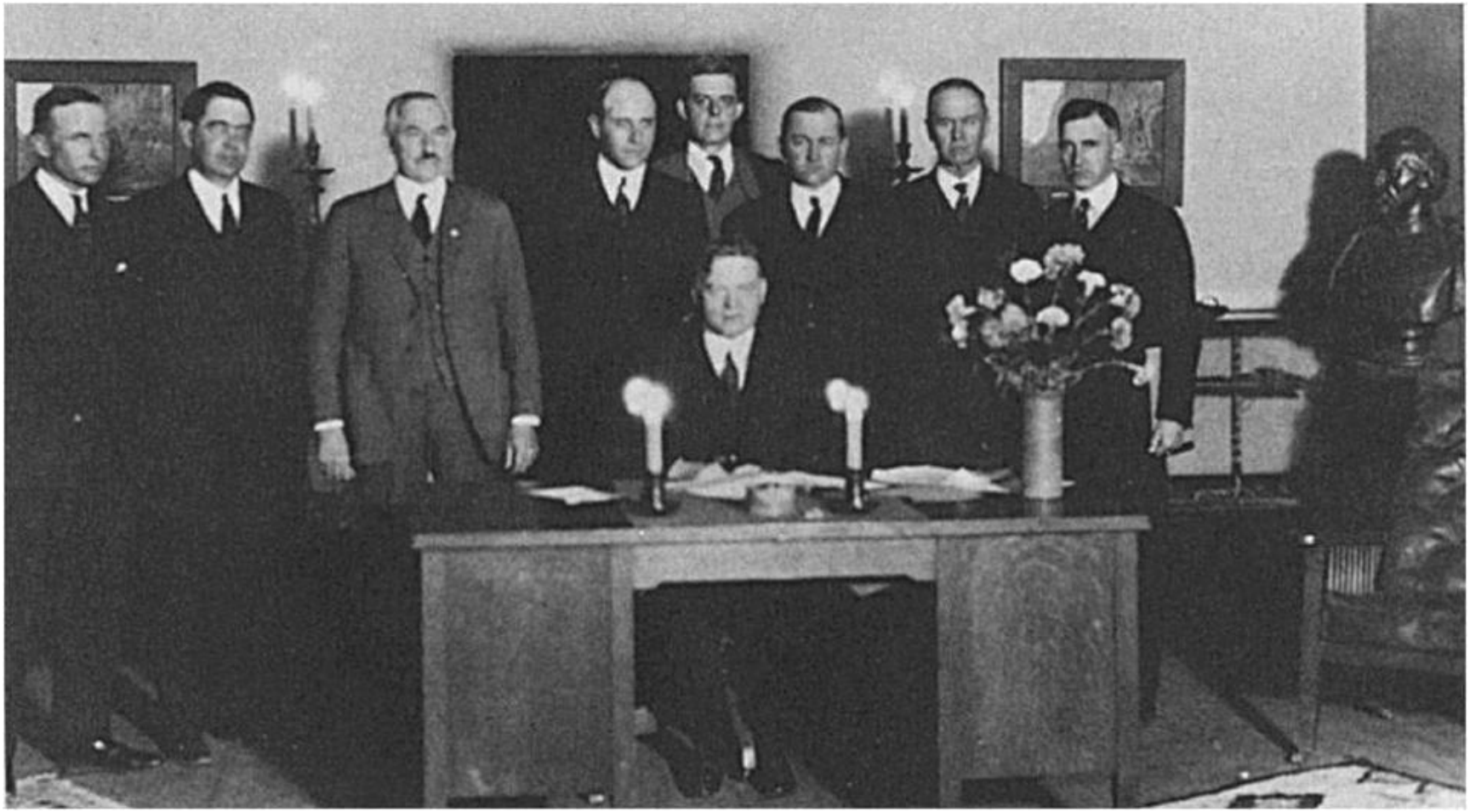
- Average annual flow:

  14.8 MAF/year; 1906-2000

Rio Colorado – Sonora/Baja California/Arizona

The Law of the River

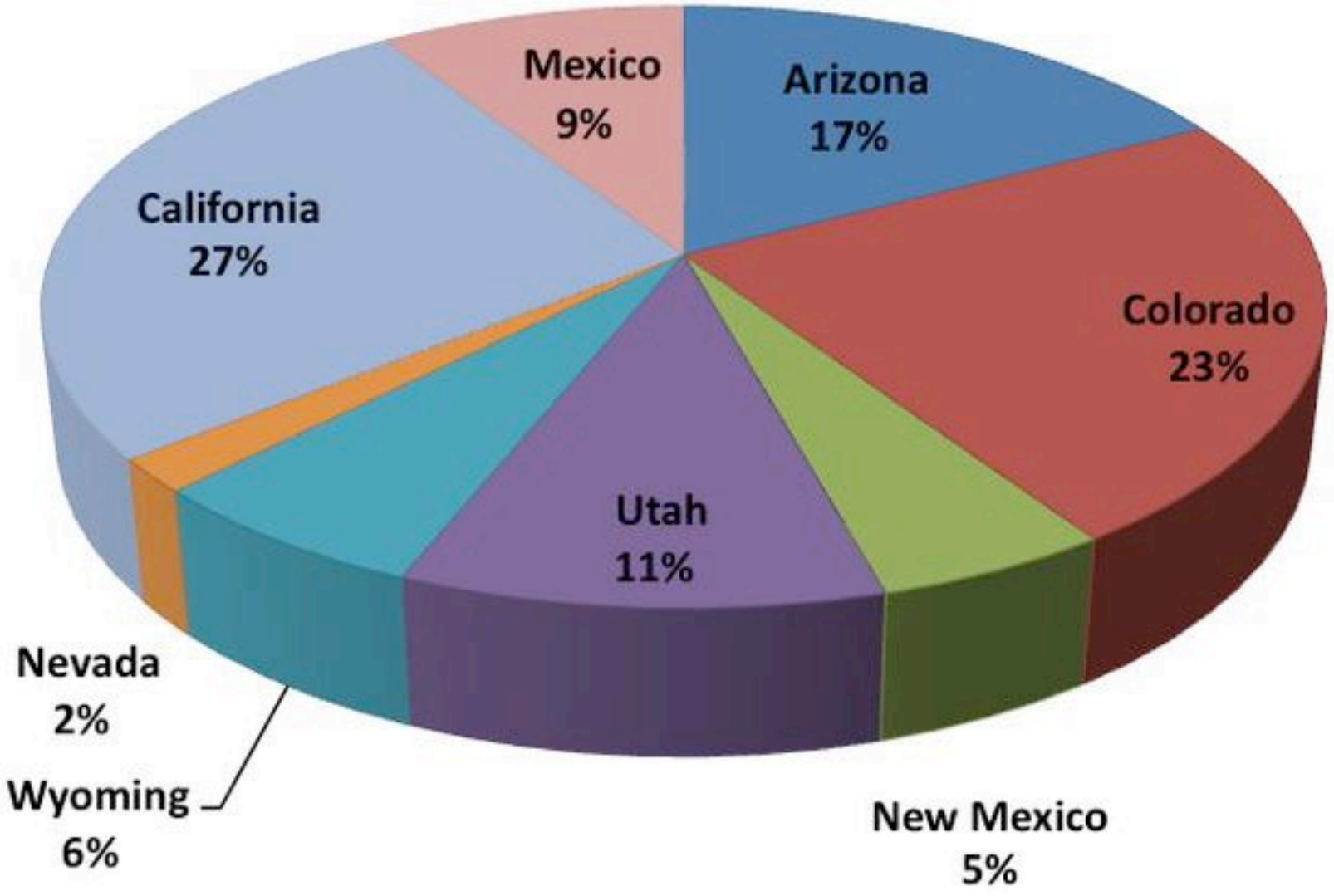
Colorado River Compact Signed 24 November 1922



Colorado River Compact

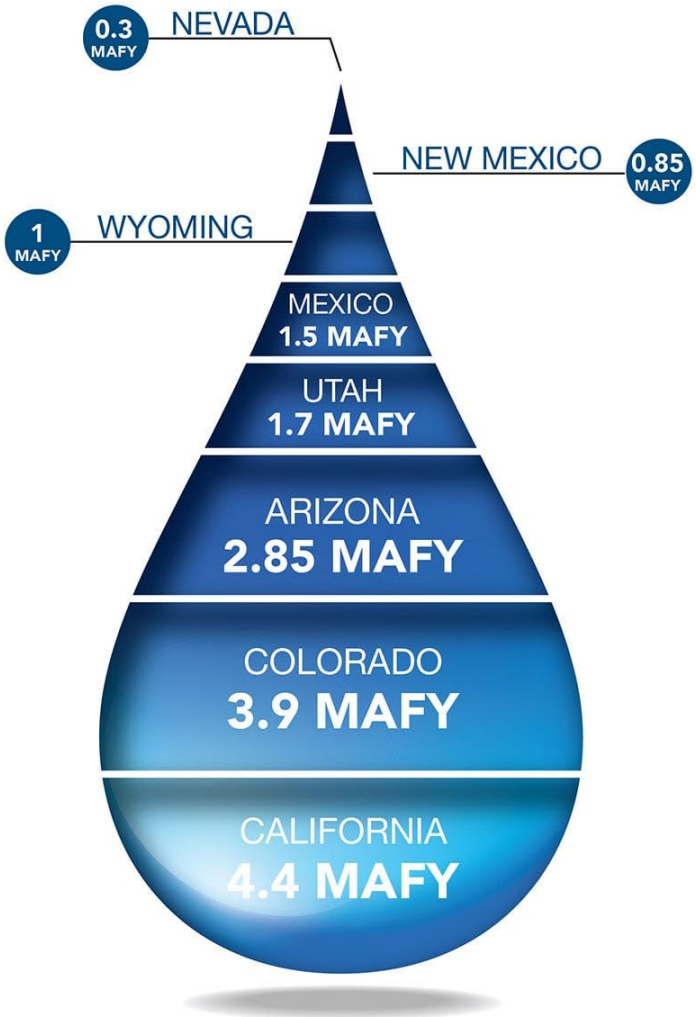
- **Created in 1922 to Divide the Water of the Colorado River**
  - At The Bishop's Lodge in Santa Fe, N.M
    - Secretary Herbert Hoover presiding
  - Signed 24 November 1922
  - **Ratified by Arizona on 3 February 1944**

Colorado River Apportionment



WHERE THE WATER GOES:

Who Shares the Colorado River?



MAFY = million acre-feet per year

SOUTHERN NEVADA WATER AUTHORITY™

Mexican Water Treaty of 1944

Minute 319

- Mexican Water Treaty of 1944 committed the U.S. to deliver 1.5 MAF of water to Mexico on an annual basis,
- + an additional 200 KAF under surplus conditions.
- Total Colorado River allocations: 16.5 MAF

Presa Morelos

Present Perfected Rights, PPRs

The "present perfected rights PPRs" is an important aspect of the Law of the River.

The PPRs are those rights to use Colorado River water that were acquired or **"perfected" by prior appropriation under state law before the Boulder Canyon Project Act of 1928 was passed.**

BoR has established a priority ranking of water rights to administer diversions from the river on a

"first-in-time-first-in-right" basis.

Colorado River in the 21st Century

Lake Mead

2000 - Full

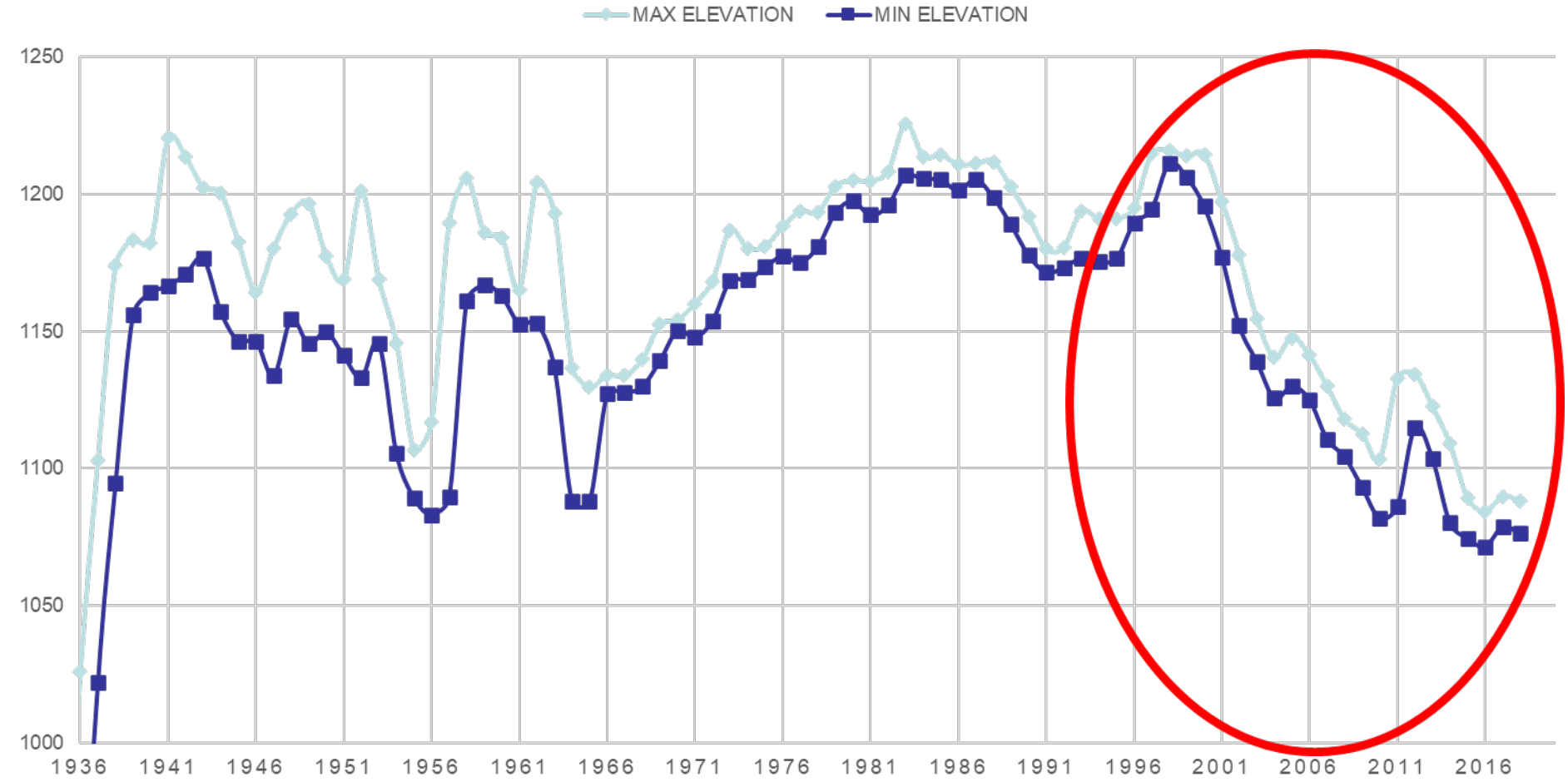
Colorado River – 21st Century

Average flow ~ **12.3 MAF**

16 % lower than the 20th Century average of **14.8 MAF/year**

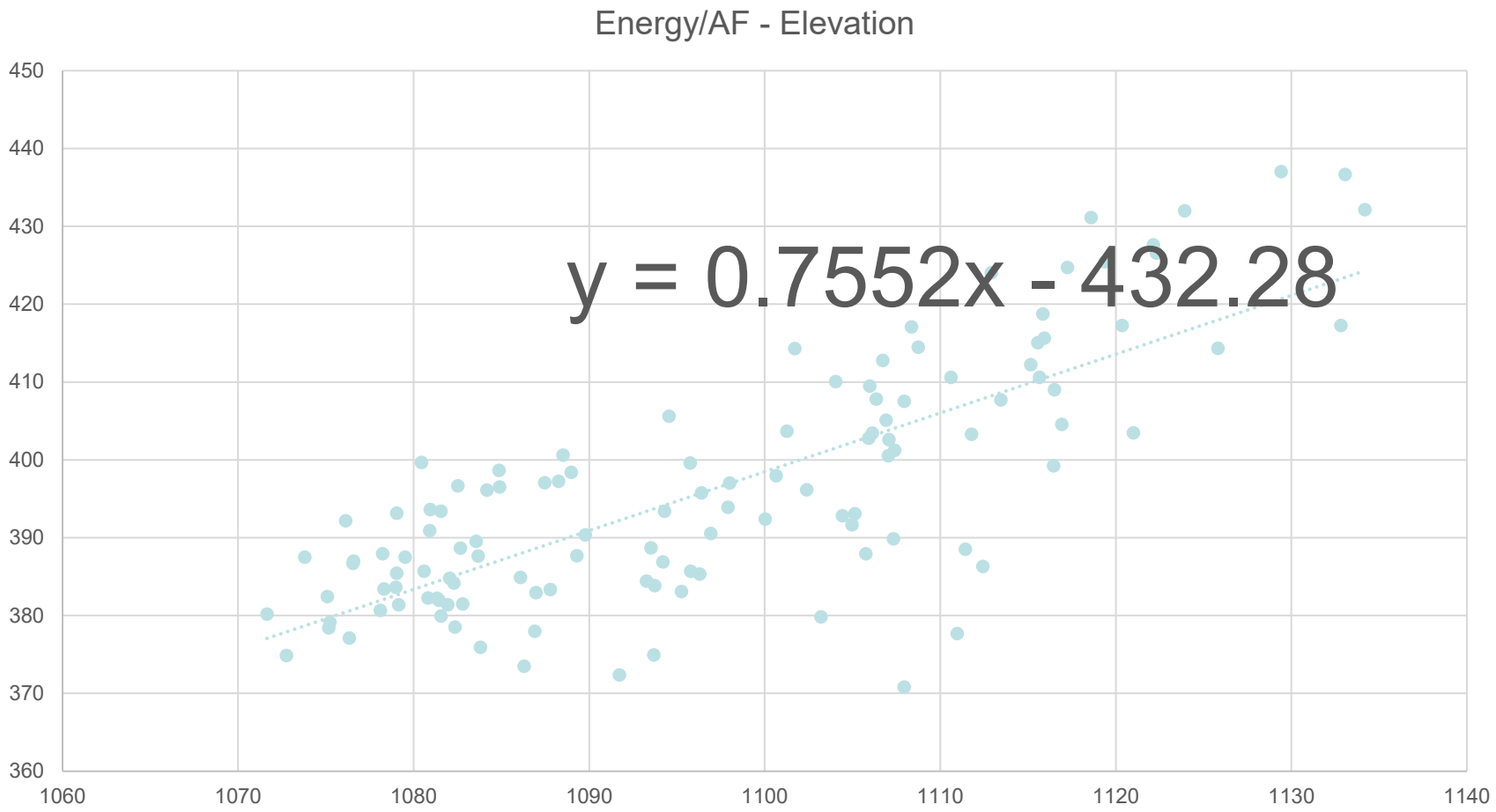
8.5 MAF in water year 2024-2025

HISTORY OF LAKE MEAD ELEVATIONS

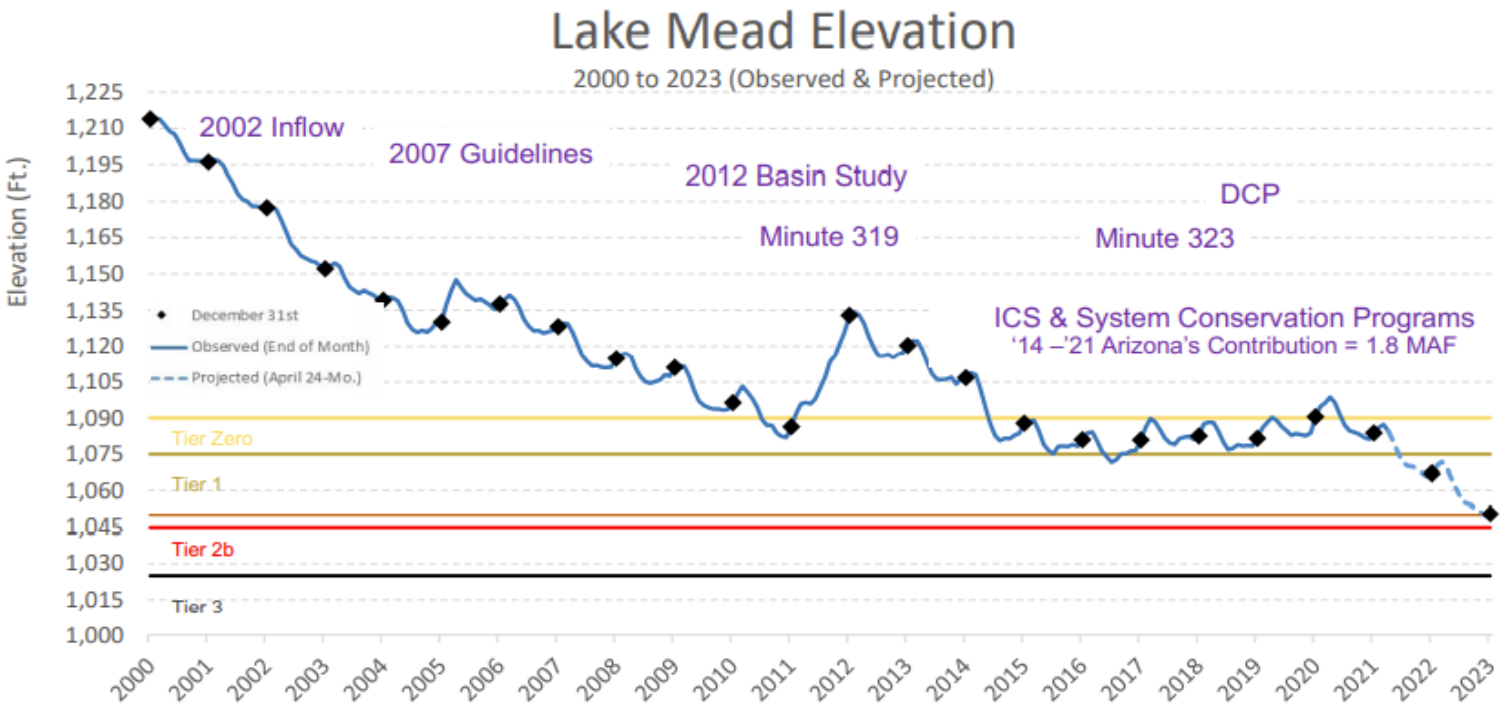


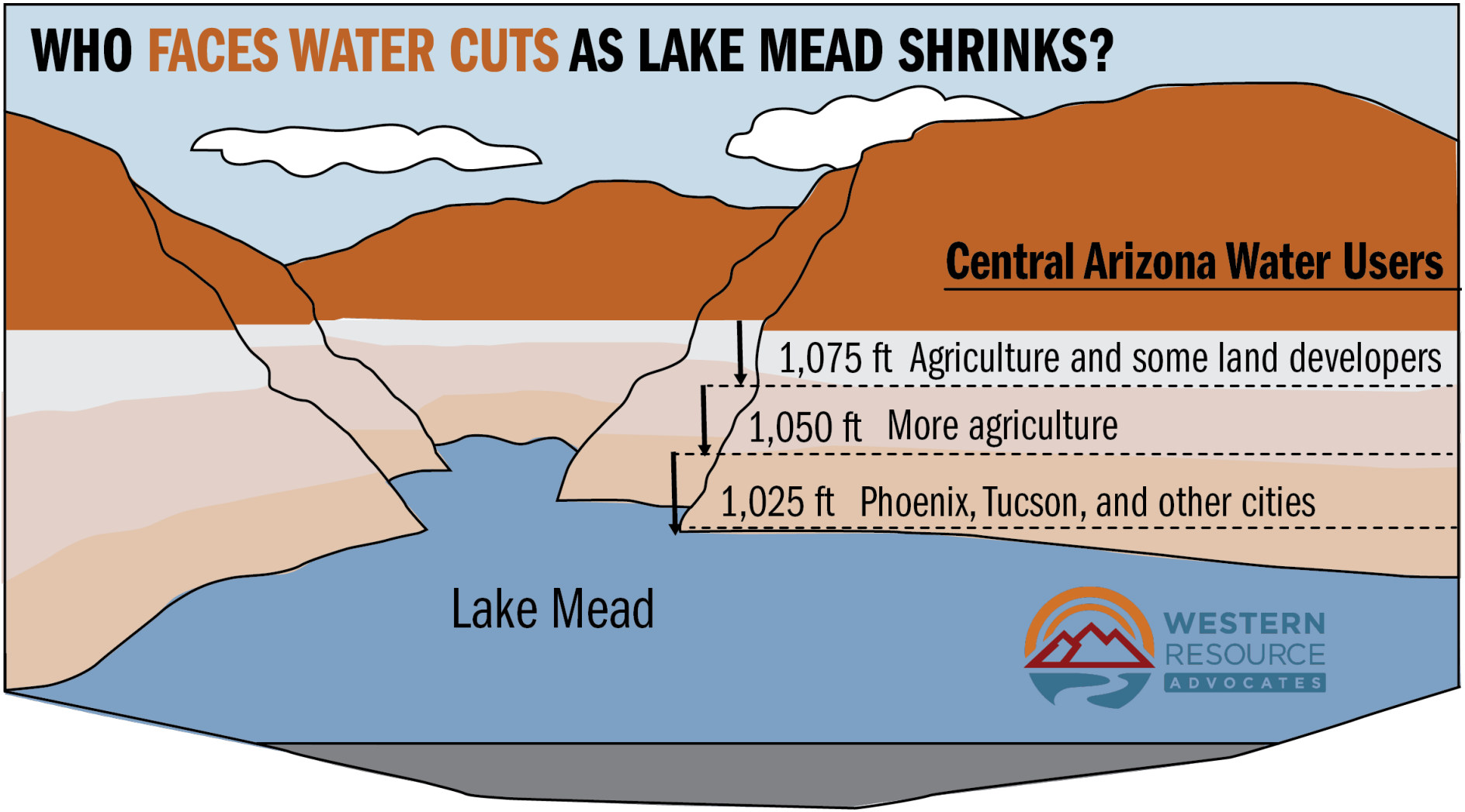
Lake Mead

Average Energy Production Based on Elevation at Hoover Dam



20 Years of Shortage Preparation





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COOPERATIVE EXTENSION

2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan, and Binational Water Scarcity Contingency Plan

Total Volumes (kaf)

Lake Mead Elevation (feet msl)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Water Savings Contributions			Binational Water Scarcity Contingency Plan Savings	Combined Volumes by Country *US: (2007 Interim Guidelines Shortages + DCP Contributions)* *Mexico: (Minute 323 Delivery Reductions + Binational Water Scarcity Contingency Plan Savings)*					Total Combined Volumes
	AZ	NV	Mexico	***Lower Basin States + Mexico***	AZ	NV	CA	Mexico	*AZ Total*	*NV Total*	*CA Total*	*Lower Basin States Total*	*Mexico Total*	***Lower Basin States + Mexico***
1,090 - 1,075	0	0	0	***0***	192	8	0	41	192	8	0	*200*	*41*	***241***
1,075 - 1050	320	13	50	***383***	192	8	0	30	512	21	0	*533*	*80*	***613***
1,050 - 1,045	400	17	70	***487***	192	8	0	34	592	25	0	*617*	*104*	***721***
1,045 - 1,040	400	17	70	***487***	240	10	200	76	640	27	200	*867*	*146*	***1,013***
1,040 - 1,035	400	17	70	***487***	240	10	250	84	640	27	250	*917*	*154*	***1,071***
1,035 - 1,030	400	17	70	***487***	240	10	300	92	640	27	300	*967*	*162*	***1,129***
1,030 - 1,025	400	17	70	***487***	240	10	350	101	640	27	350	*1,017*	*171*	***1,188***
<1,025	480	20	125	***625***	240	10	350	150	720	30	350	*1,100*	*275*	***1,375***

The Secretary of the Interior will take affirmative actions to implement programs designed to create or conserve 100,000 acre-ft per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the lower basin. All actions taken by the United States shall be subject to applicable law, including availability of appropriations.

2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan, and Binational Water Scarcity Contingency Plan

Total Volumes (kaf)

Lake Mead Elevation (feet msl)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Water Savings Contributions			Binational Water Scarcity Contingency Plan Savings	Combined Volumes by Country *US: (2007 Interim Guidelines Shortages + DCP Contributions)* *Mexico: (Minute 323 Delivery Reductions + Binational Water Scarcity Contingency Plan Savings)*					Total Combined Volumes
	AZ	NV	Mexico	***Lower Basin States + Mexico***	AZ	NV	CA	Mexico	*AZ Total*	*NV Total*	*CA Total*	*Lower Basin States Total*	*Mexico Total*	***Lower Basin States + Mexico***
1,090 - 1,075	0	0	0	***0***	192	8	0	41	192	8	0	*200*	*41*	***241***
1,075 - 1050	320	13	50	***383***	192	8	0	30	512	21	0	*533*	*80*	***613***
1,050 - 1,045	400	17	70	***487***	192	8	0	34	592	25	0	*617*	*104*	***721***
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Tier 1 Reductions

State	Reduction Acre-Feet	% Reduction of Allocation
Arizona	512,000	18
Nevada	21,000	7
Mexico	80,000	7

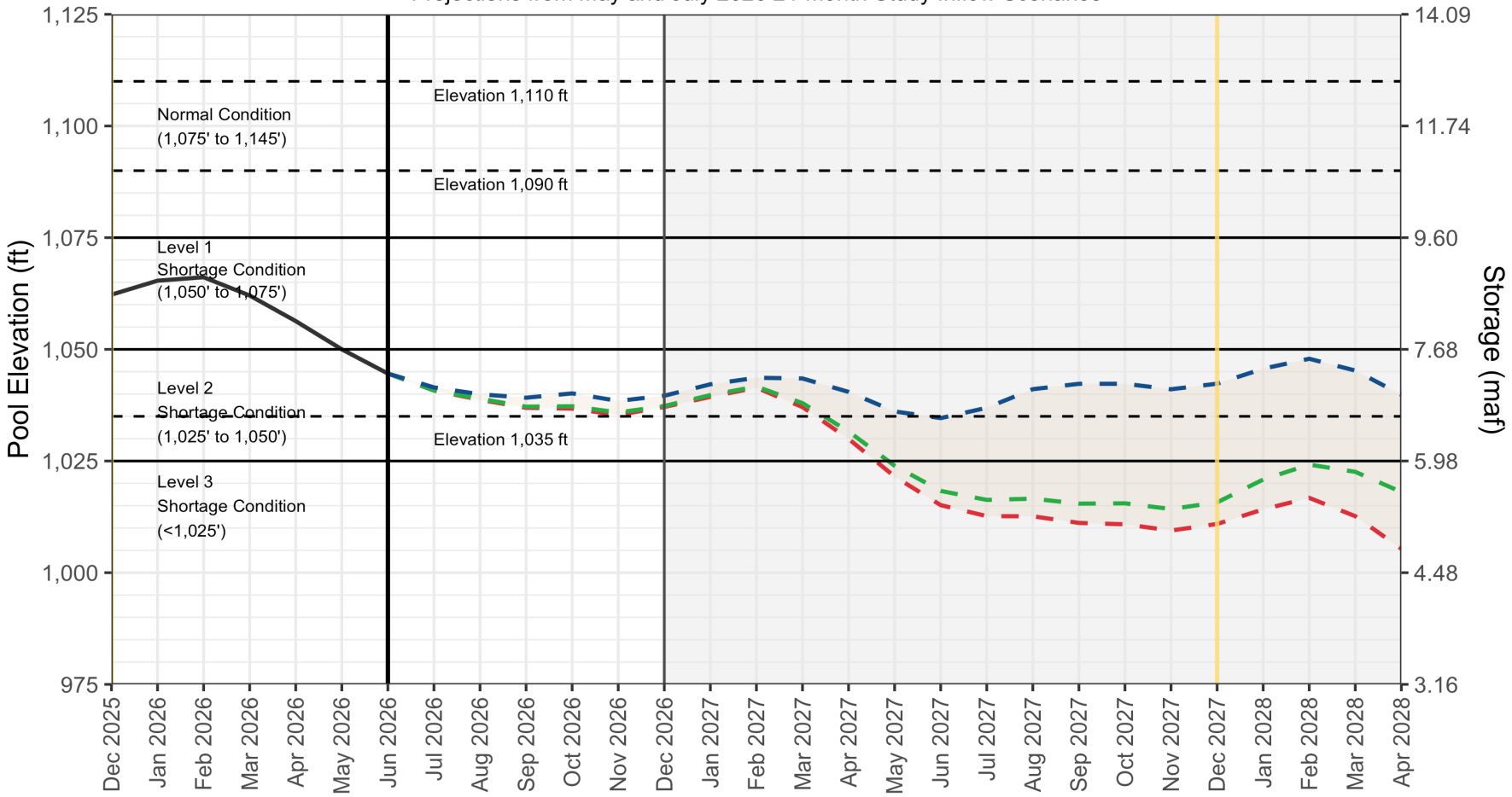
DCP Tier Reductions - 2026

Lake Level (fas)	Tier Level	Reduction Additions (KAF)	Total Reduction	Total % Reduction
1,075	**1**	**512**	**512 K AF**	**18**
1,050	2a	80	592 K AF	21
1,045	2b	48	640 K AF	23
1,025	3	480	1.2 M AF	43

DCP = Drought Contingency Plan
fas = feet above sea level on Lake Mead
KAF = thousand acre-feet
MAF = million acre-feet

Lake Mead End-of-Month Elevations[1]

Projections from May and July 2026 24-Month Study Inflow Scenarios



Historical Elevations

May 2026 Probable Maximum Inflow with a Lake Powell release of 6.00 maf in WY 2026 and 8.76 maf in WY 2027

July 2026 Most Probable Inflow with a Lake Powell release of 6.00 maf in WY 2026 and 7.00 maf in WY 2027

July 2026 DROA Probable Minimum Inflow with a Lake Powell release of 6.00 maf in WY 2026 and 7.00 maf in WY 2027

BUREAU OF RECLAMATION

The Drought Response Operations Agreement (DROA) is available online at https://www.usbr.gov/dcp/finaldocs.html.

[1]For modeling purposes, simulated years beyond 2026 assume a continuation of the 2007 Interim Guidelines including the 2024 Supplement to the 2007 Interim Guidelines (no additional SEIS conservation is assumed to occur after 2026), the 2019 Colorado River Basin Drought Contingency Plans, and Minute 323 including the Binational Water Scarcity Contingency Plan. With the exception of certain provisions related to ICS recovery and Upper Basin Demand management, operations under these agreements are in effect through 2026.

Colorado River Water Budget

- **16.5 MAF** Currently budgeted total

  (7.5+7.5 MAF = 15 MAF + 1.5 MAF Mexico)

- Average annual flow 2000 - 2018

  ~ 12.4MAF

  - 16 % lower than the 1906-2017 average of 14.8MAF/year

~ 4 MAF differential

2026

All Conservation Guidelines Expire

Post - 2026 Guidelines?

1. Follow the "Law of the River" and the high-priority senior water rights

   - "present perfected rights, PPRs"

2. Develop an entirely new approach to Colorado River management.

Colorado River Water Budget

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  (7.5+7.5 MAF = 15 MAF + 1.5 MAF Mexico)

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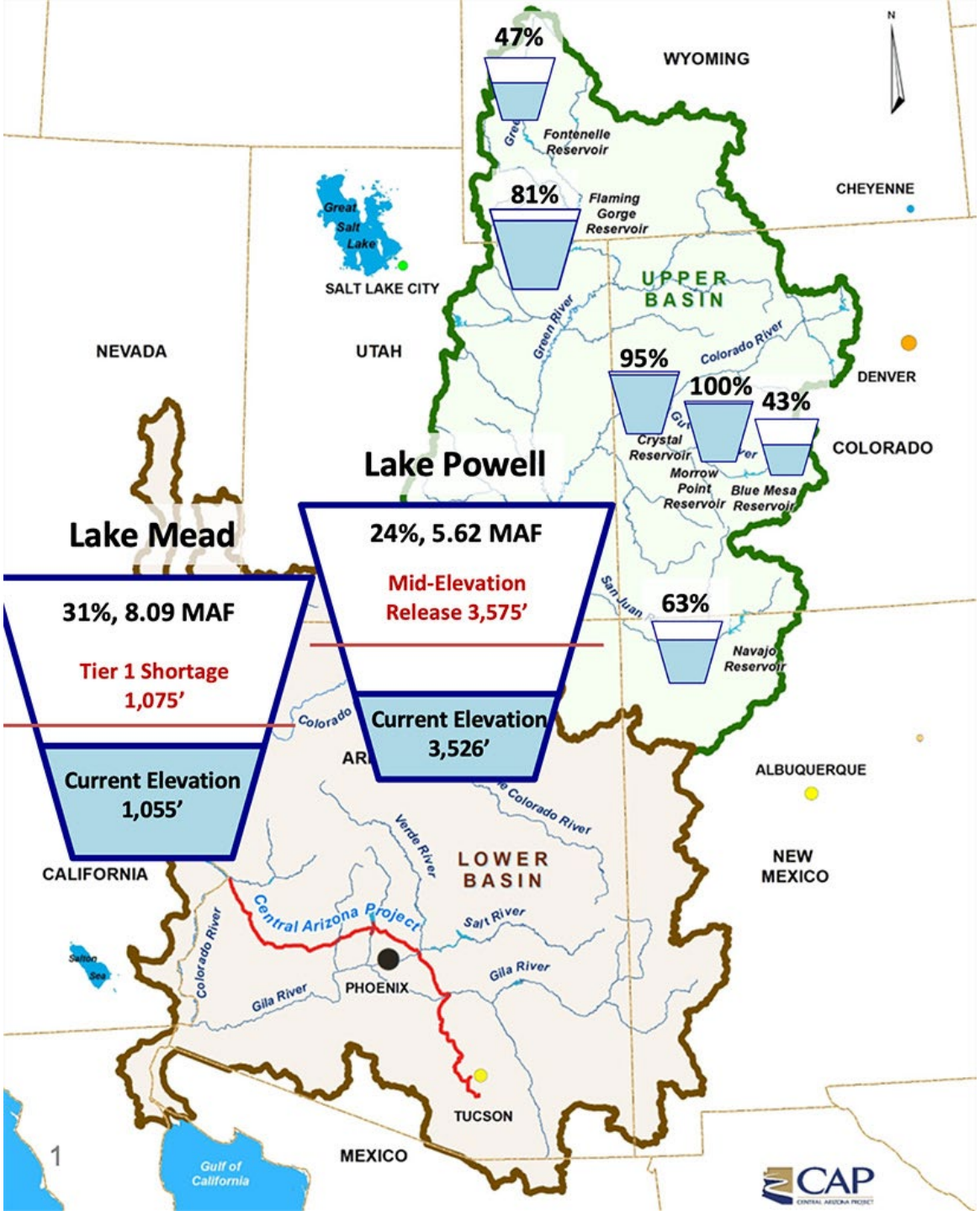
  ~ 12.4 MAF

  - 16 % lower than the 1906-2017 average of 14.8MAF/year

~ 4 MAF differential

(3-5 MAF, BoR)


47%
WYOMING
Fontenelle Reservoir
81%
Flaming Gorge Reservoir
CHEYENNE
Great Salt Lake
SALT LAKE CITY
UPPER BASIN
NEVADA
UTAH
Green River
Colorado River
95%
100%
43%
DENVER
COLORADO
Crystal Reservoir
Morrow Point Reservoir
Blue Mesa Reservoir
Lake Powell
Lake Mead
24%, 5.62 MAF
Mid-Elevation Release 3,575'
31%, 8.09 MAF
Tier 1 Shortage 1,075'
San Juan
63%
Navajo Reservoir
Current Elevation 3,526'
Current Elevation 1,055'
Colorado
ALBUQUERQUE
Verde River
LOWER BASIN
CALIFORNIA
NEW MEXICO
Central Arizona Project
Salt River
Colorado River
Gila River
PHOENIX
Salton Sea
TUCSON
MEXICO
Gulf of California
CAP

Basin States Cannot Agree

11 November 2025

(no proposal submitted)

- Basins asked for an extension from the BoR.

14 February 2026

No Agreement

Final decision in the summer of 2026

implementation beginning in October 2026

* PRINCIPAL DEPUTY ASSISTANT SECRETARY DoI

Bureau of Reclamation Plan Outline (13 May 2026)

- The **10-year framework** would be broken into **5, 2-year plans**.
- **Lake Powell to Lake Mead releases through 2036 could be down to 5 MAF**
  - Depending on conditions.
  - Continue to evaluate and adjust accordingly

BoR – May 2026

- **The Lower Basin states AZ, CA, & NV**
  - **possible reductions of up to 3 MAF/year**

40% reduction

- Release water from upstream reservoirs to support Lake Powell.
- Allows additional water storage up to:
  - 3 MAF in Lake Powell
  - 8 MAF in Lake Mead.

BoR Proposed Reductions to Lower Basin

3 MAF LB Reductions per year

- **Based on the the Law of the river.**
  - **Foundation:1922 Colorado River Compact,**
    - **IID, PVIDD, and YCWA have the highest priority rights for water use (PPRs)**

CAP potentially going to zero

Lower Basin Proposal May 2026 Reductions and Additional Conservation

	Arizona	California	Nevada	Total Lower Division States
2027	760 KAF	440 KAF	50 KAF	1,250 KAF
2028	760 KAF	440 KAF	50 KAF	1,250 KAF
Total Reductions 2027-2028				2,500 KAF
Additional Conservation 2027-2028	300 KAF	300 KAF	100 KAF	700 KAF[1]
Total Reductions and Conservation	1,820 KAF	1,180 KAF	200 KAF	3,200 KAF

[1]The Lower Division States anticipate working to a target of a cumulative contribution of at least 1 MAF if possible.

Lower Basin Proposal
Reductions and Additional Conservation

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[1]The Lower Division States anticipate working to a target of a cumulative contribution of at least 1 MAF if possible.

BoR Colorado River 2026 Timeline

1 May – LB states submitted a proposal

Late June - Final EIS

Late July - Record of Decision

1 October – Implementation of ROD

Groundwater Assessments

Dr. James S. Famiglietti Lab, ASU

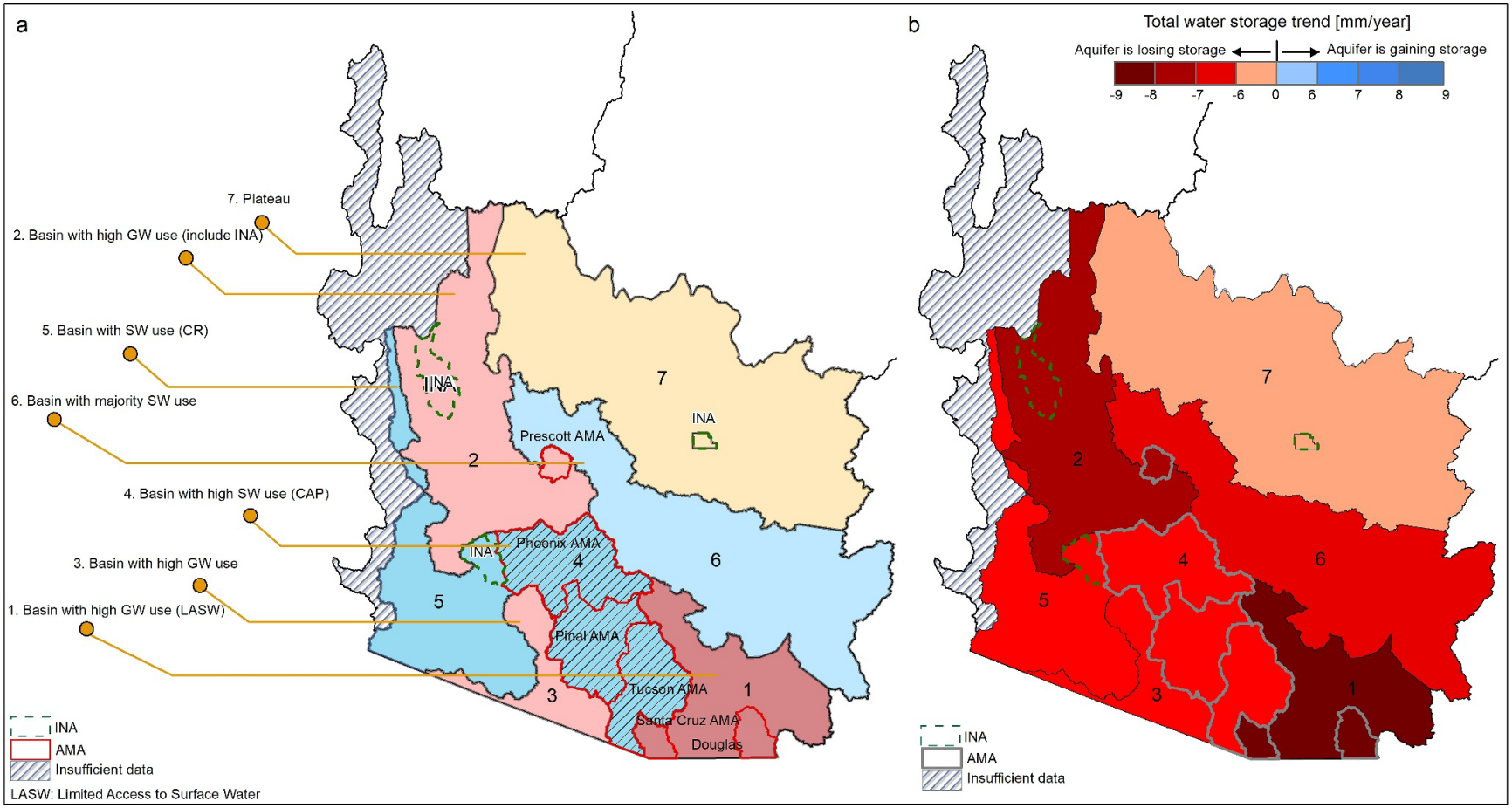
Declining Freshwater Availability in the Colorado River Basin Threatens Sustainability of Its Critical Groundwater Supplies

Abdelmohsen et al., 2025. Geophysical Research Letters, 52,

Unprecedented continental drying, shrinking freshwater availability, and increasing land contributions to sea level rise.

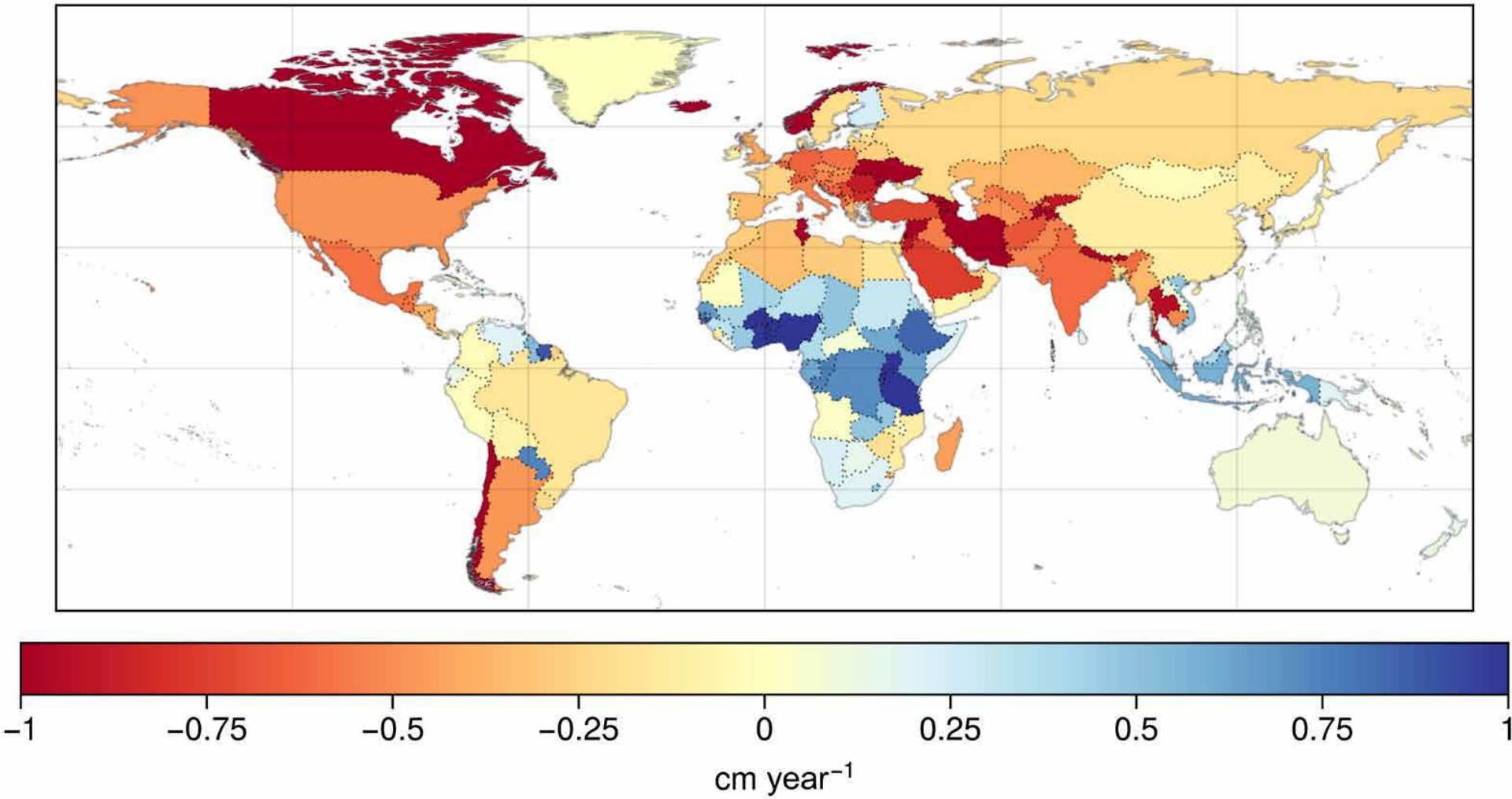
Chandanpurkar *et al.*, 2025. *Sci. Adv.* **11**

Groundwater in the CR Basin



Source: Abdelmohsen, et al. 2025.

Terrestrial Water Storage



Long-term mean TWS trends from GRACE/FO by country. TWS trends (February 2003 to April 2024) averaged for every country.

Chandanpurkar *et al.*, *Sci. Adv.* **11**, eadx0298 (2025) 25 July 2025

Water & Arizona Agriculture

Central Arizona Project. Santa Rosa Canal. Source: CAP