Water Management and Planning

National Association of State Budget Officers

August 9, 2016

Tony Willardson
Executive Director

Western States Water Council

- Advisory body to 18 western Governors on water policy issues
- Provides states collective voice
- Fosters collaboration
- Working with the Western Governors' Association (WGA)

1964 Western Governors' Conference Resolution

The future growth and prosperity of the western states depend upon the availability of adequate quantities of water of suitable quality.

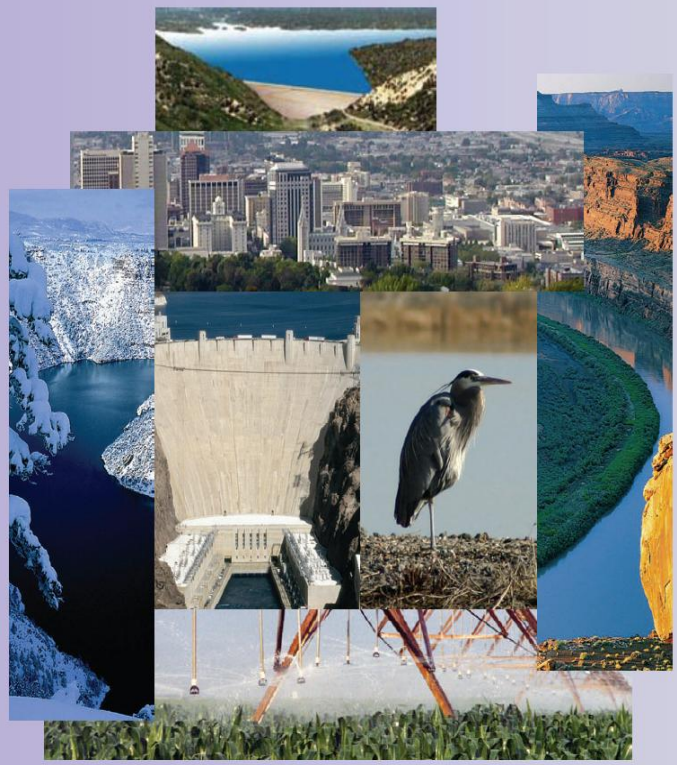
The need for an accurate and unbiased appraisal of present and future requirements of each area of the West and for the most equitable means of providing for such requirements demands a regional effort.


SMITH

Governor Ronald Reagan

"I am impressed with the need for the states of the West to look beyond sectional interests and to approach water resource development on a regional basis. Few endeavors offer more challenge…and greater potential for lasting benefit. Unless we are successful, lack of water will soon limit development throughout much of the West. I am convinced that the best approach to westwide regional planning is through cooperative state action. I see no need, certainly at this time, for the states to look to Washington to act as a broker in this endeavor."

Water Needs and Strategies for a Sustainable Future



Western Governors' Association ◊ June 2006

1. Growth and Water Policy Nexus
2. Meeting Future Water Demands
3. Water Infrastructure Needs and Strategies
4. Resolution of Indian Water Rights Claims
5. Climate Change – Drought/Floods
6. ESA & Protecting Aquatic Species

Risk and Uncertainty

- General lack of data on water needs and past, present and future uses
- Increasing population & water/energy needs
- Climate change and variability
- Endangered species' and other environmental uses, instream & outflows to bays and estuaries
- Unquantified Native American water rights
- Political divisions, unrest and discord

Planning the Future

"The number of variables converging on state and local government is enormous, diverse and growing. Insufficient infra-structure struggling economy, an evolving climate, increasing public expectations and complex service demands are driving the critical questions, 'Where are we going? And… How are we going to get there?

Dr. John F. Luthy

Water Needs and Strategies for a Sustainable Future

Western Governors' Association ◊ June 2006

Water Needs and Strategies for a Sustainable Future: *Next Steps*

Western Governors' Association ◊ June 2008

Western States Federal Agency Support Team

A Declaration of Cooperation

Working Together for the Sustainable and Efficient Use of Western Water Resources

We, as representatives of our respective Federal agencies, do hereby declare our intent to cooperate as members of a Western States Federal Agency Support Team (WESTFAST) partnership. We will work together whenever and wherever possible throughout the 17 Western States to promote and educate the public on the benefits of sustainable and efficient use of water resources.

We declare that WESTFAST supports a continued commitment on the part of Federal, and State organizations; working with local, Tribal, and other stakeholders; to improve the effectiveness of collaboration to seek watershed solutions to water issues in the Western States. This effort emphasizes proactive, voluntary, participatory and incentive-based approaches to water resource management and conservation assistance programs throughout the Western States.

We hereby declare that we as WESTFAST partners will collaborate with the Western States Water Council to guide the development of an appropriate action plan for this partnership.

We hereby declare to support, in concept, the establishment of a Federal liaison position to work with the WESTFAST members and the Western States Water Council in developing a collaborative work plan to carry forward joint water resource initiatives. Contributory cost-sharing such a position will be based on authorized and available funds.

Army Corps of Engineers

Bureau of Land Management

Bureau of Reclamation

Environmental Protection Agency

National Oceanic & Atmospheric Administration

Natural Resources Conservation Service

U.S. Fish & Wildlife Service

U.S. Forest Service

U.S. Geololgical Survey

U.S. Department of Energy

National Aeronautics and Space Administration

U.S. Department of Defense

National Park Service

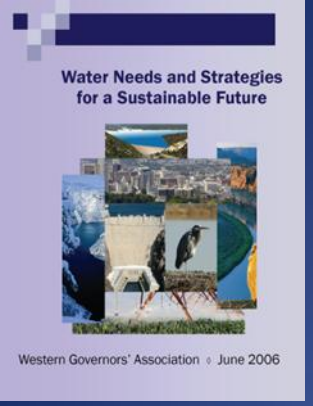
Western States Water Council
A VISION ON WATER
Position #384 - October 9, 2015

Effectively addressing our challenges will require stronger collaboration and cooperation that transcends political and geographic boundaries between states, federal agencies, tribes, and local communities.

Current Situation

- Growing population and changing values
- Competing economic & environmental needs
- Surface & ground water supplies under stress
- Data on supplies & demands lacking or limited
- Increasingly complex water user conflicts
- Uncertain water future & costly options
- Unpredictable climate & extreme weather events
- Aging & inadequate infrastructure
- Competing or poorly defined water rights
- Constantly evolving regulatory landscape
- Limited financial resources

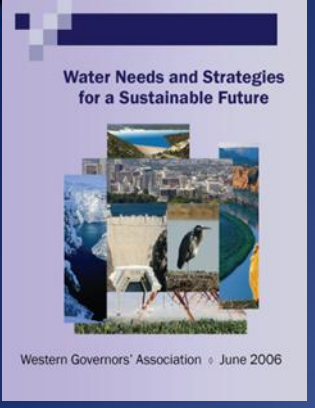
Decisions about where and how to grow are rarely influenced by the availability of water



Water Policy and Growth

Population growth is continuing at an unprecedented rate in the West with ramifications not only for cities but rural communities and agricultural areas.

In the future, we may not be able to sustain unlimited growth and still maintain our current quality of life. Difficult political choices will be necessary….

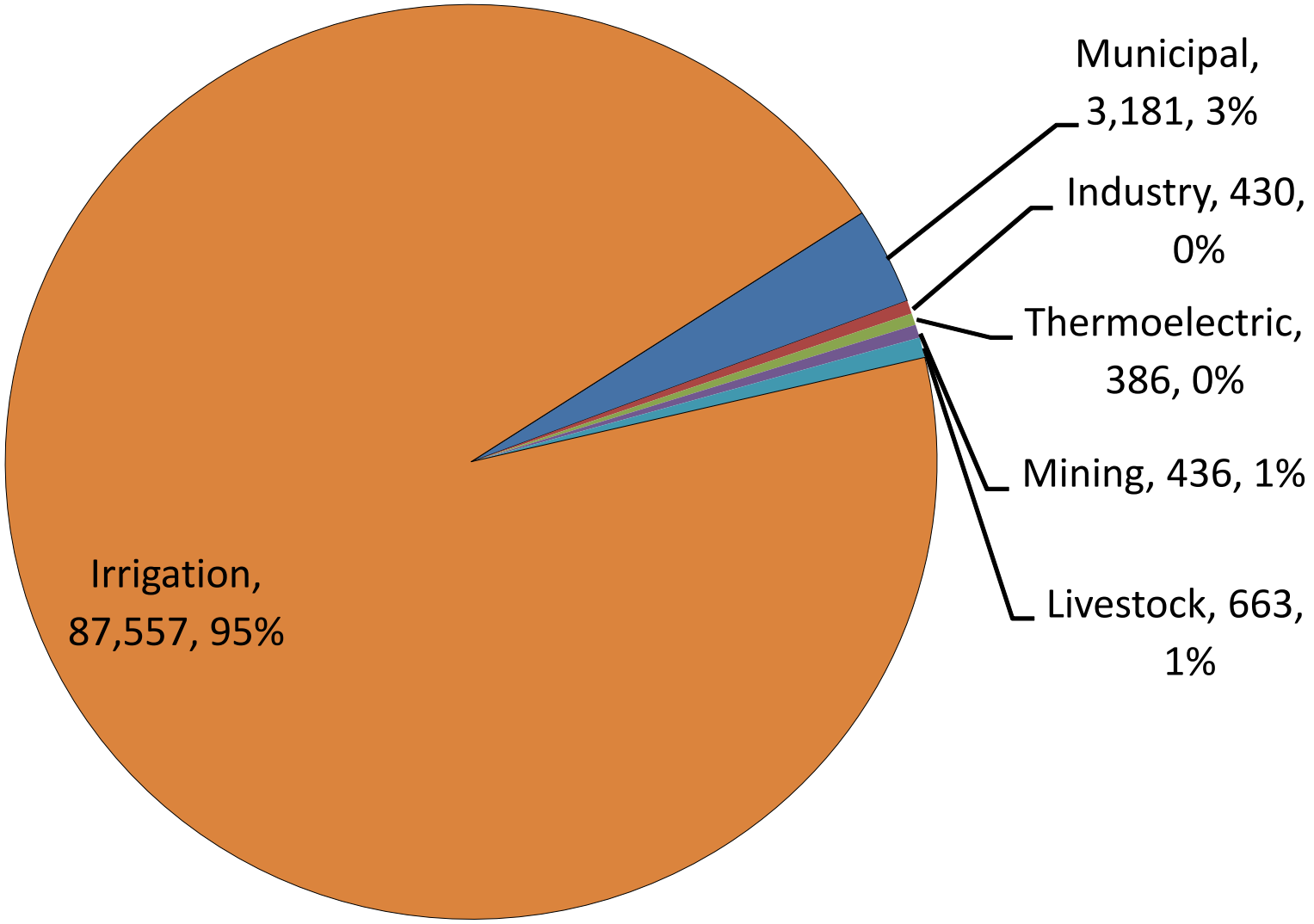


It is obvious that changing demographics and values placed on various water uses is transforming the future of water management.

New uses to accommodate growth must largely rely on water obtained from changes to existing uses of surface and ground water, with limited opportunities to develop new supplies.

In many instances, this will result in the reallocation of water to “higher valued uses.”

2010 Water Consumption (MGD)



The Western Governors' Association

Western Governors believe states should identify and promote innovative ways to ***allow water transfers from agricultural to other uses*** *(including* ***urban, energy*** *and* ***environmental****) while* ***avoiding or mitigating damages to agricultural economies*** *and communities.*

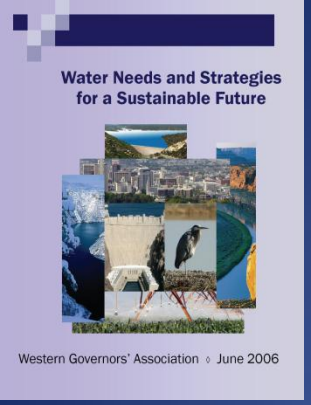
Policy 11-7

Water is a complex mixed good with public and private attributes, and water market transactions create challenges due to externalities or third party impacts

- Well Defined Rights to Private Goods
- Exclusive Use
- Ability to Buy/Sell/Lease Rights
- Value defined by Certainty/Scarcity/Competition
- Low Information and Transaction Costs

Water Law 101

- Law of Prior Appropriation
- First in Time, First in Use
- Priority Dates and Water Duties
- Use it or Lose it! (Non-speculation)
- Forfeiture and Abandonment Statutes
- Prohibits Waste (Water Conservation)
- Water Rights Transfers
- Consumptive Water Use
- No Injury



2006 WGA Water Report

To encourage sustainable growth policies and plans, states should identify the water demands and impacts associated with future growth.

Additionally, states should develop integrated growth and water resource scenarios so that the consequences of various growth scenarios can be evaluated for both the near and long term.

What do we need to know to balance our short/long term water budget?

- What's our income?

Precipitation
Streamflow
Ground water recharge

- How much is in savings?

Snowpack
Surface water storage
Groundwater
Aquifer storage/recovery
Soil moisture

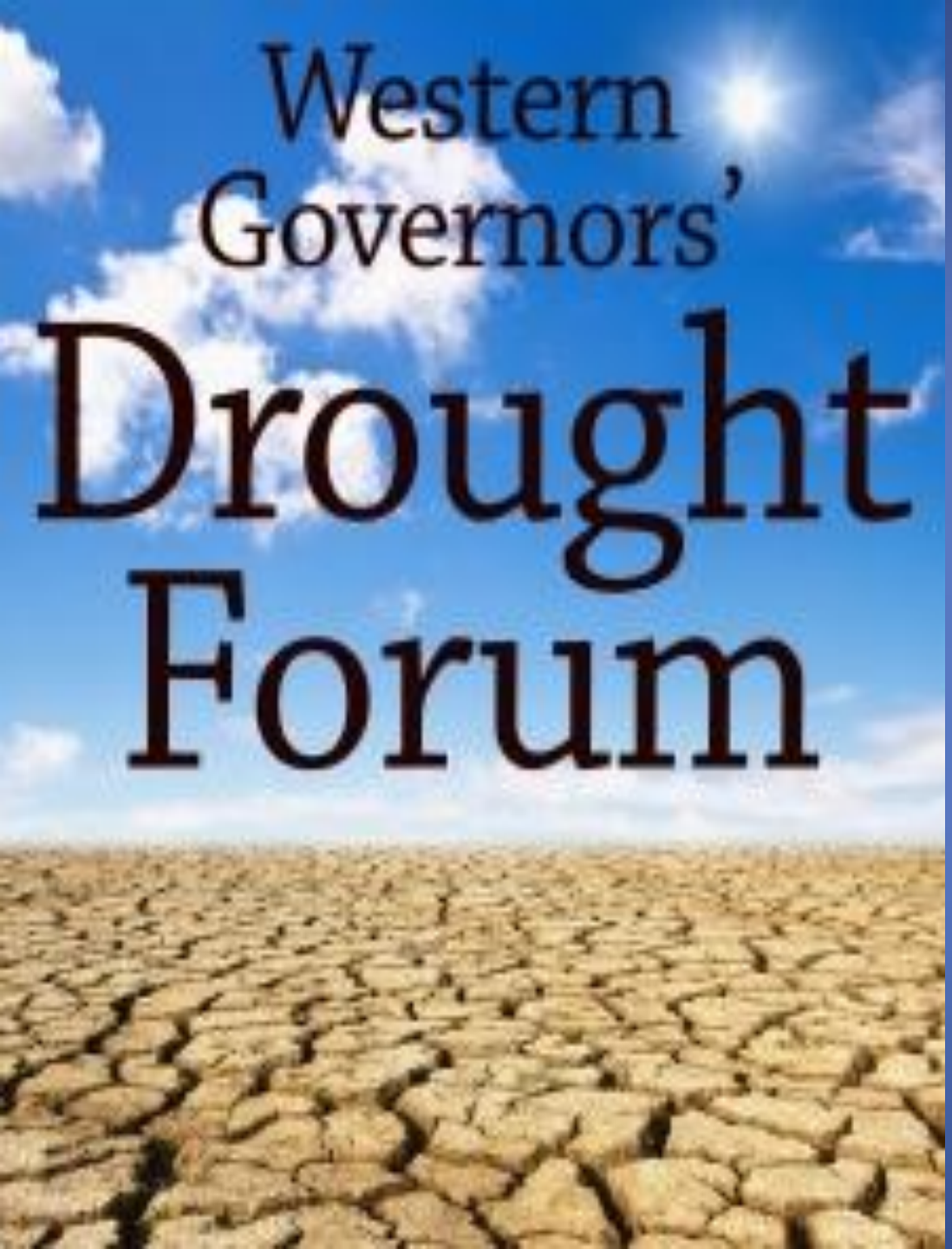
How much is my net worth?

- What are your fixed costs?

Water rights
Existing priority uses
Tribal/Federal water rights

- Who's writing checks?

Agriculture
Municipal & Industrial
Commercial
Energy
Environment
Recreation



- KEY THEMES

- Data and Analysis
- Produced, Reused and Brackish Water
- Forest Health and Soil Stewardship
- Water Conservation and Efficiency
- Infrastructure and Investment
- Working within Institutional Frameworks
- Communication and Collaboration

Comparative variability of Western precipitation

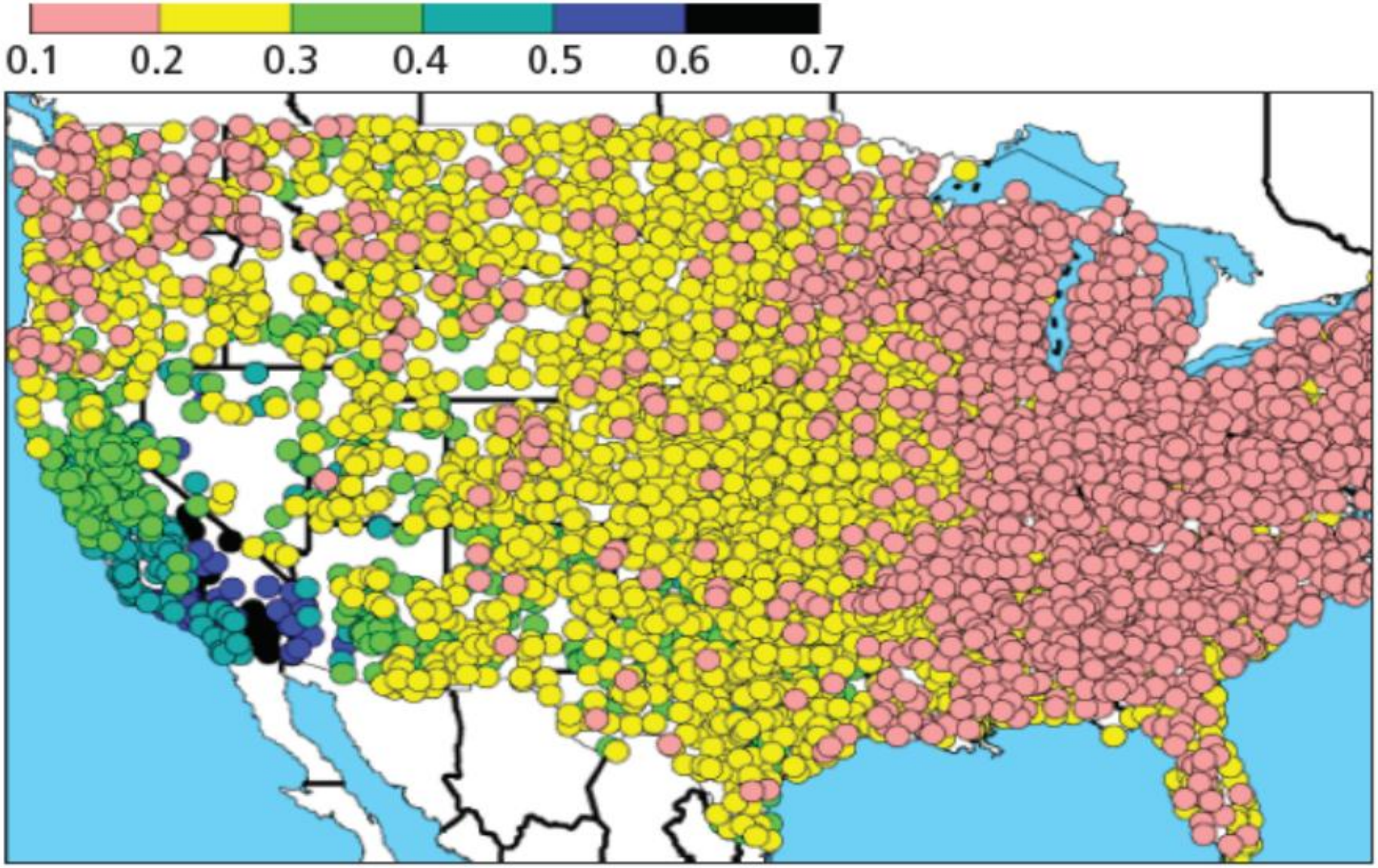


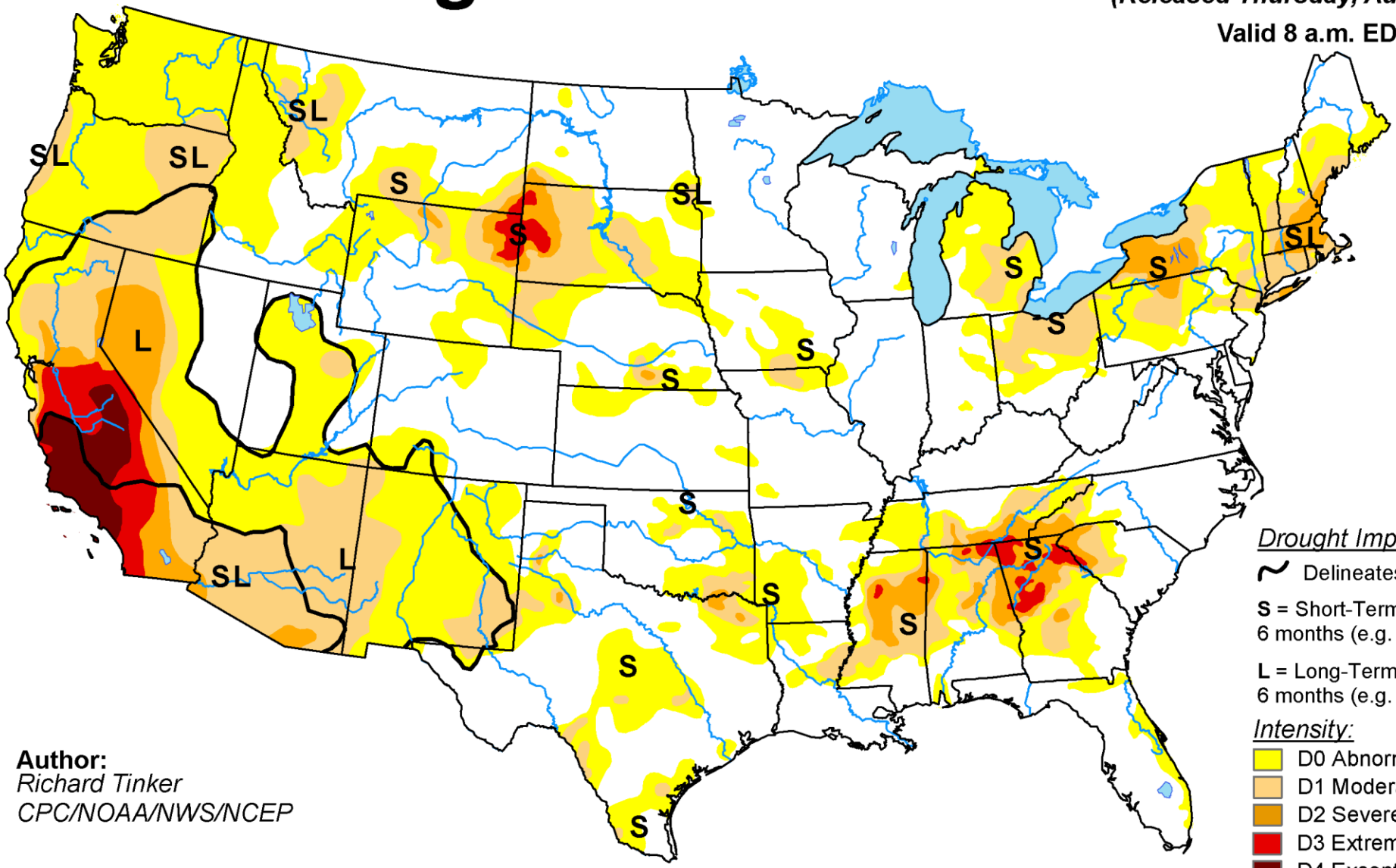
Figure provided courtesy of Mike Dettinger, USGS

U.S. Drought Monitor

August 2, 201

(Released Thursday, Aug.

Valid 8 a.m. EDT



Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

Drought Impac

Delineates d

S = Short-Term, ty
6 months (e.g. agr

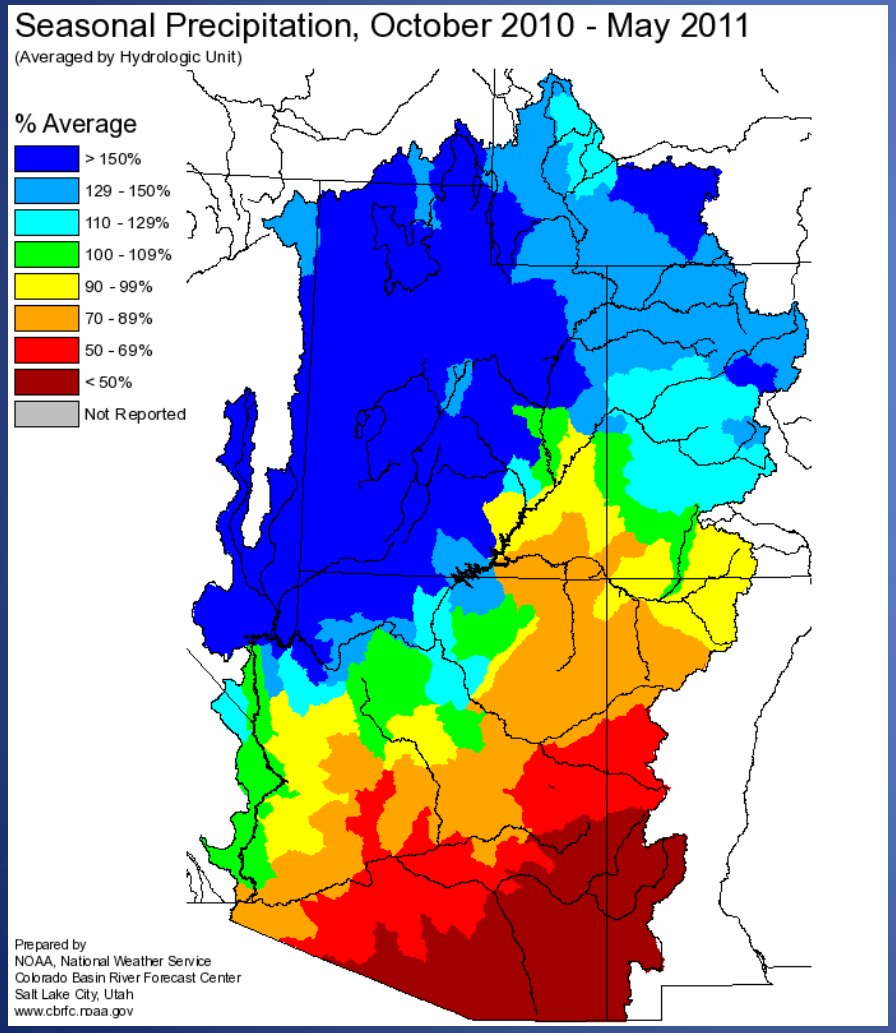
L = Long-Term, ty
6 months (e.g. hyd

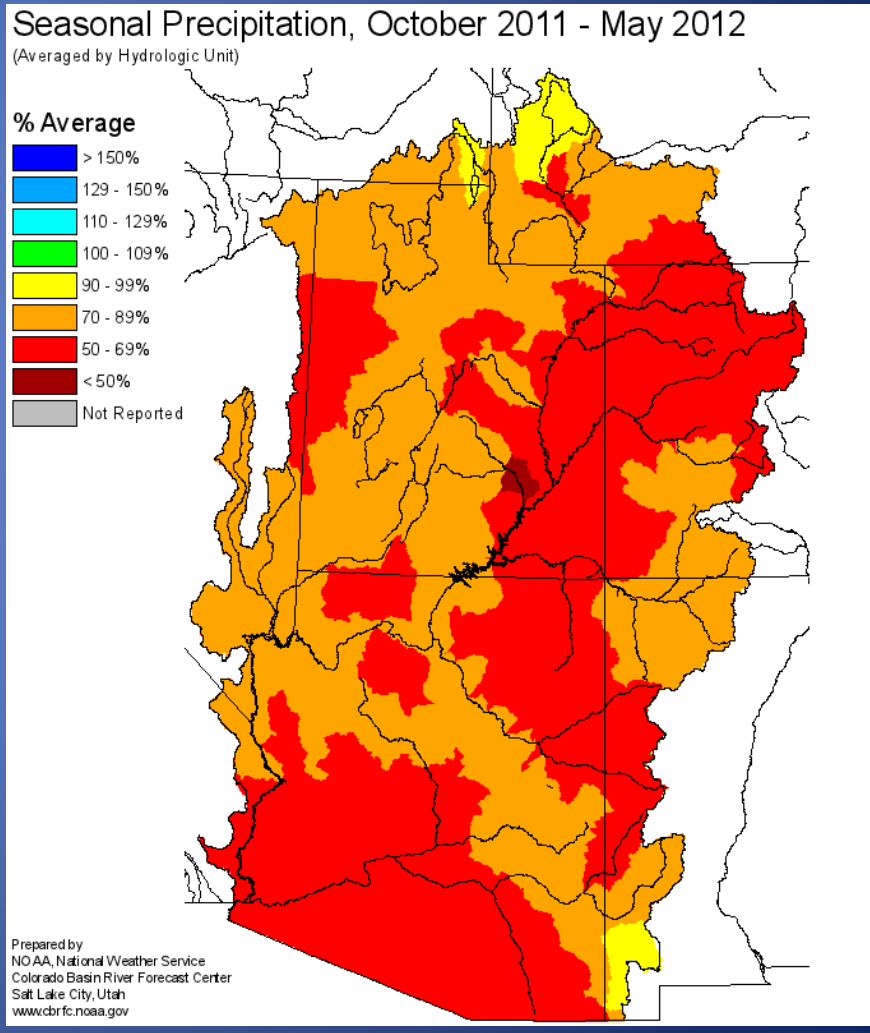
Intensity:

- D0 Abnormal
- D1 Moderate
- D2 Severe D
- D3 Extreme D
- D4 Exceptio

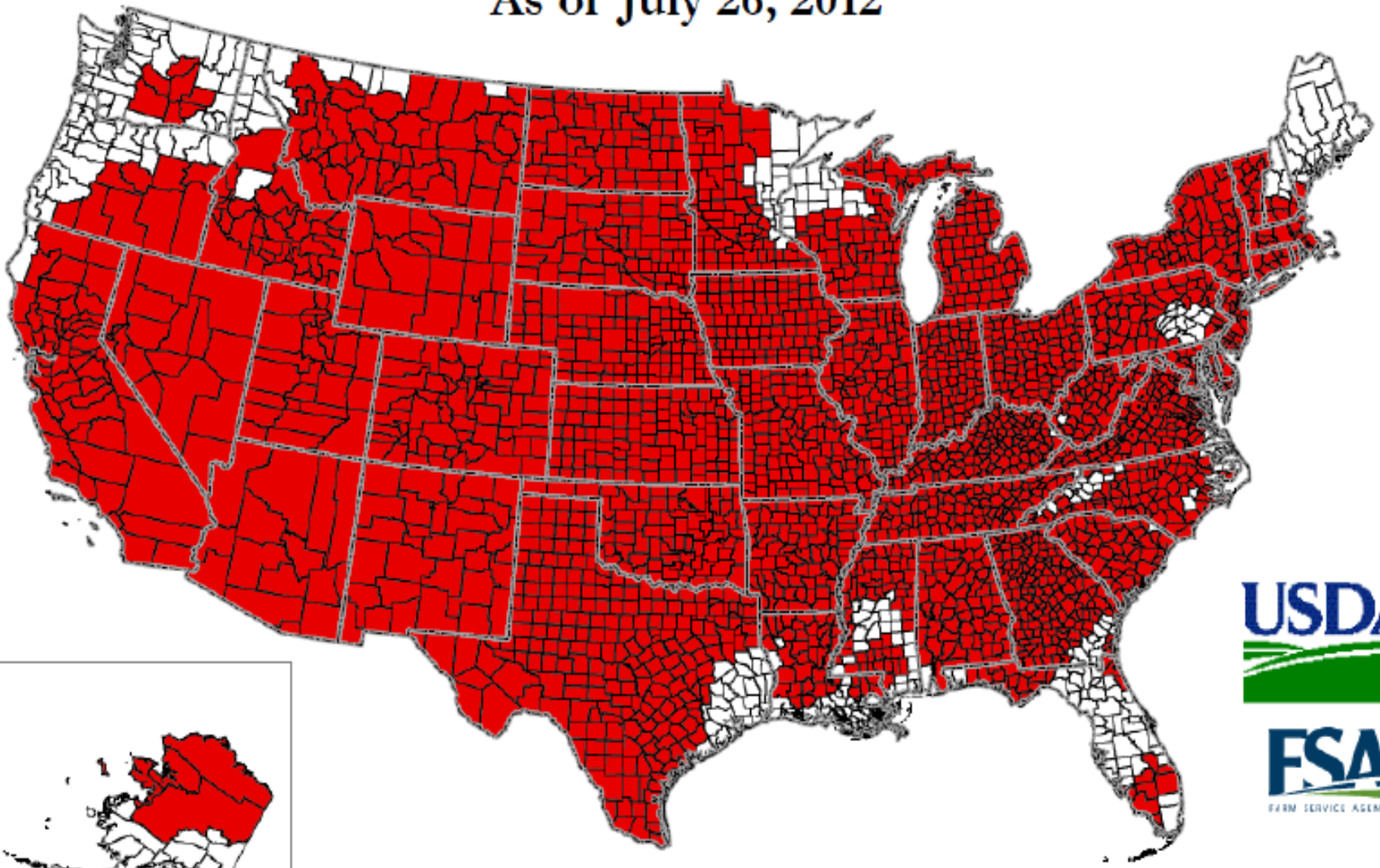
The Drought Monitor
scale conditions. Loc
vary. See accompan

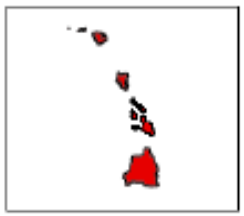
Very wet to very dry year…





US Counties With Drought Level D0 and Above
As of July 26, 2012





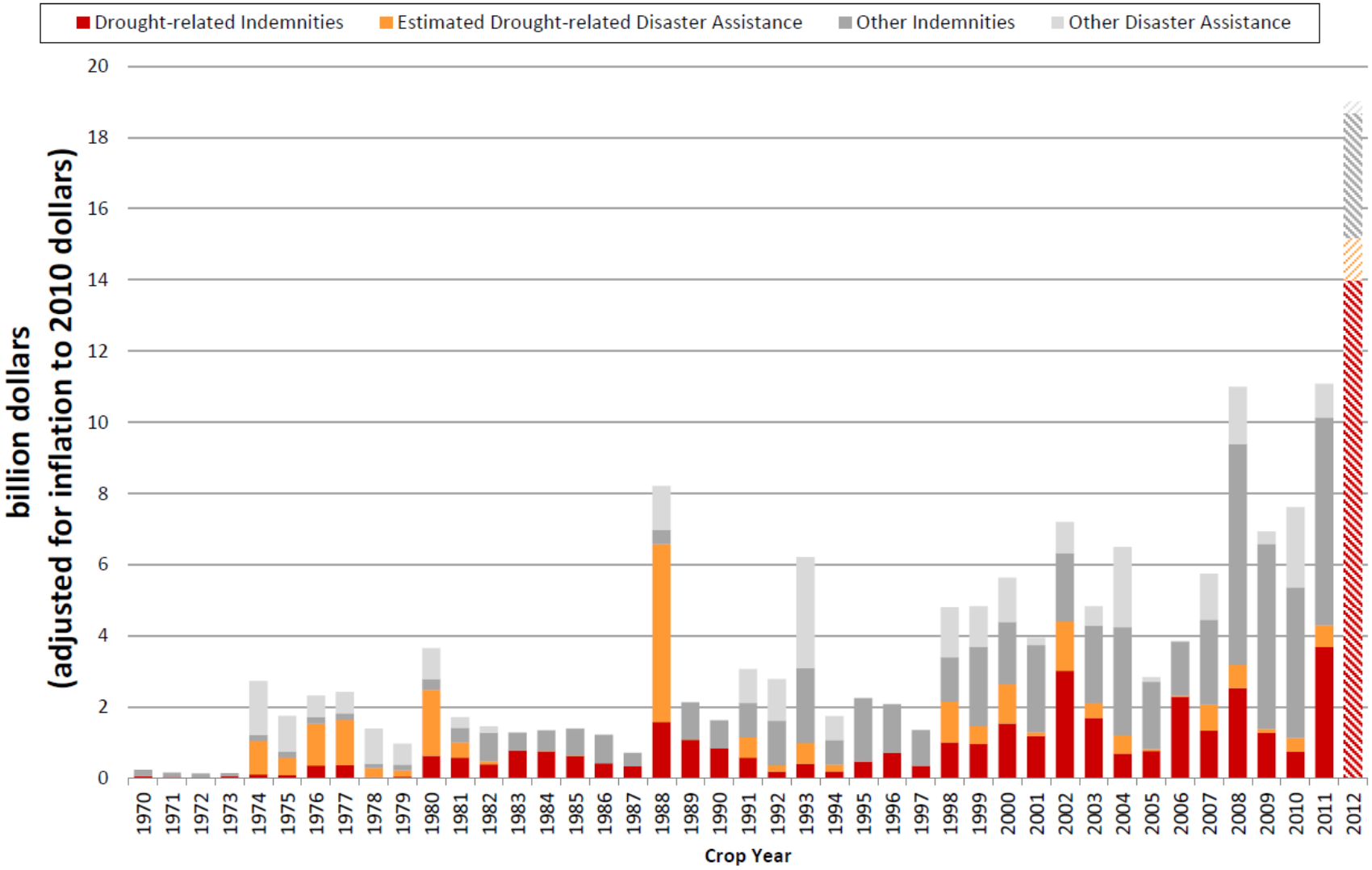
USDA

FSA
FARM SERVICE AGENCY

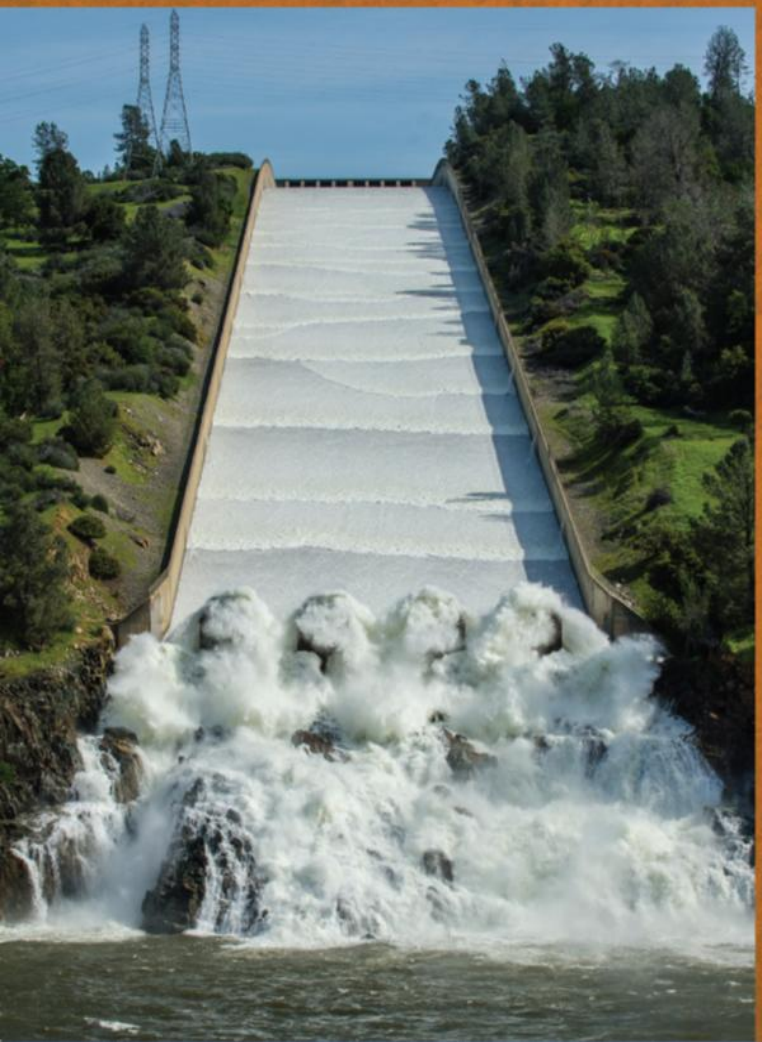
Drought Level D0 and Above

Map created by DAFP/CEPD/CAB July 27, 2012

Drought-related Indemnities and Disaster Payments



Improving
Sub-Seasonal to Seasonal
Precipitation Forecasting for
Water Management



WESTERN
STATES
WATER
COUNCIL

Will this year be dry/wet?

Is there enough water to meet current demands?

Should we curtail use?

Do we raise rates?

Can we buy supplemental supplies from water bank?

How much precipitation is needed to end the drought?

Can we store more water for next year? How? Where?

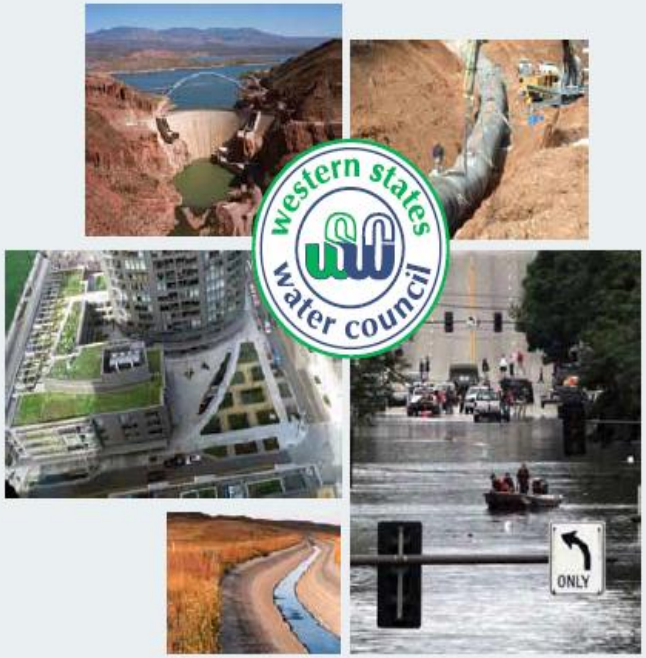
Can we use the flood pool?

Should we release water?

What should the public know?

Western Water Resources Infrastructure Strategies:

Identifying, Prioritizing and Financing Needs.



Sponsored by

RBC Capital Markets®

Federal, state, tribal and local governments face significant challenges in addressing their infrastructure needs.

Investing to support the availability of clean water is a key to continued economic growth.

Water stress is becoming a concern for investors.

State/Federal Water Project Financing

- General Funds
- General Obligation Bonds
- Revenue Bonds
- Credit Enhancements
- Dedicated Trust Fund
  - Mineral leasing revenues
  - Lottery revenues
- Sales Tax
- Miscellaneous Taxes/Fees
  - Fertilizer
  - Tobacco
- General Appropriations
- State Revolving Loan Funds (SRFs)
- Stimulus Funding
- Loan Guarantees
- Reclamation Fund
  - Mineral leasing revenue
  - Miscellaneous Land Sales
- Public/Private Partnerships

Can We Make the Pie Bigger?

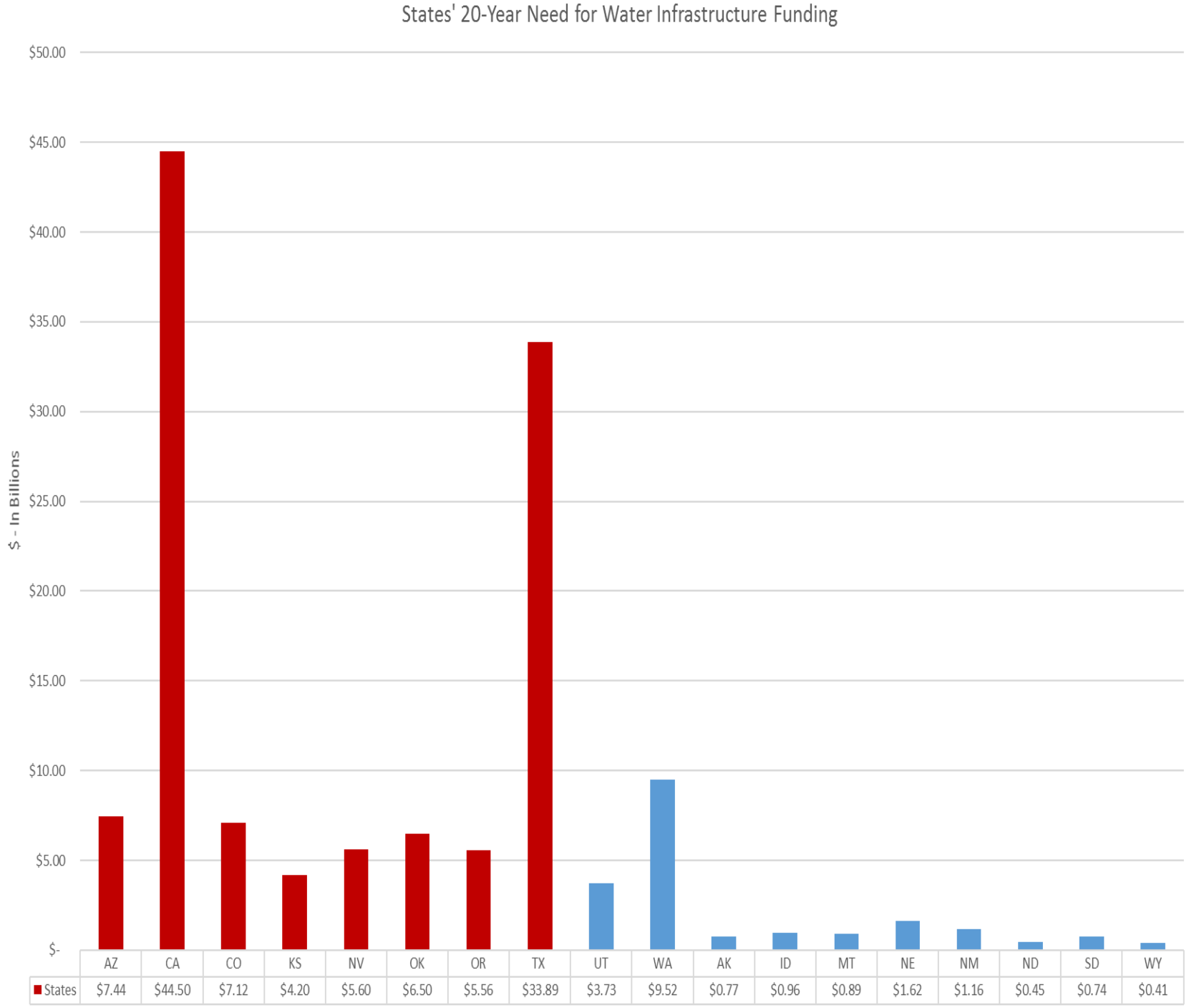
(or we can to cut it into smaller pieces!)

- Water Conservation/Demand Reduction
- Protect Water Quality/Watersheds
- Maximize Use of Existing & Aging Infrastructure
- New Water Storage Projects
- Integrated Surface/Groundwater Management
- Water Reuse & Use of Water of Impaired Quality
- Weather Modification (for Snow Augmentation)
- Desalination of brackish waters and seawater
- All of the Above

- Encourage conservation and efficient use
- Identify and quantify water infrastructure needs
- Promote asset management and capital budgeting
- Promote more public and private investment
- Facilitate timely construction of projects
- Encourage environmentally responsible projects
- Emphasize jobs and economic security
- Streamline regulatory requirements
- Support appropriate federal investments
- Evaluate state financing and funding authorities

EPA State Revolving Loan Funds

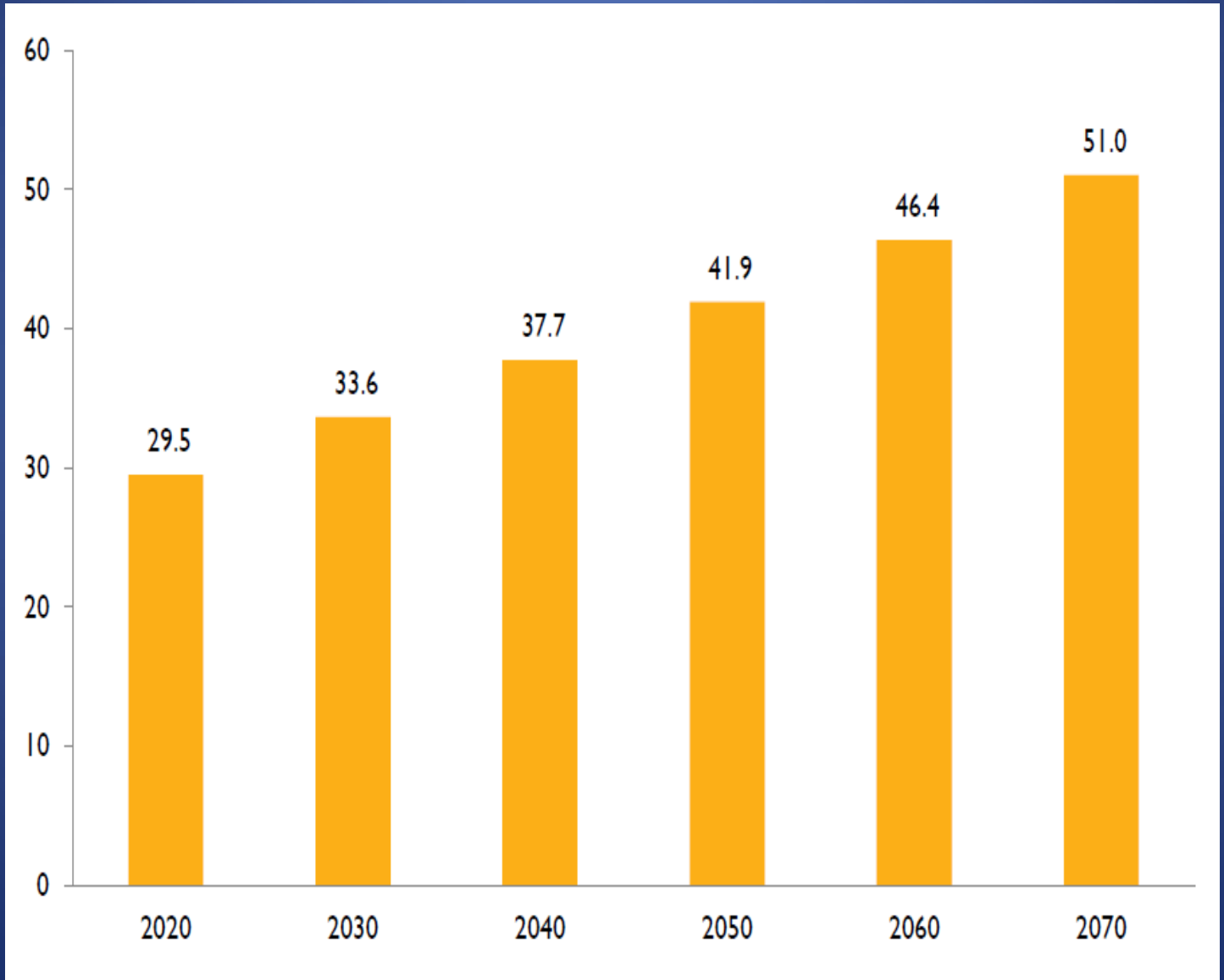
- Clean Water State Revolving Fund annual EPA capitalization grants, 20% state match (loan repayments & revenue bonds)
- Drinking Water State Revolving Fund low-cost loans with subsidies for disadvantaged, green infrastructure and small urgent need projects, 20% state match (loan repayments & revenue bonds)


States' 20-Year Need for Water Infrastructure Funding
$ - In Billions
$50.00
$45.00
$40.00
$35.00
$30.00
$25.00
$20.00
$15.00
$10.00
$5.00
$-
AZ CA CO KS NV OK OR TX UT WA AK ID MT NE NM ND SD WY
States $7.44 $44.50 $7.12 $4.20 $5.60 $6.50 $5.56 $33.89 $3.73 $9.52 $0.77 $0.96 $0.89 $1.62 $1.16 $0.45 $0.74 $0.41

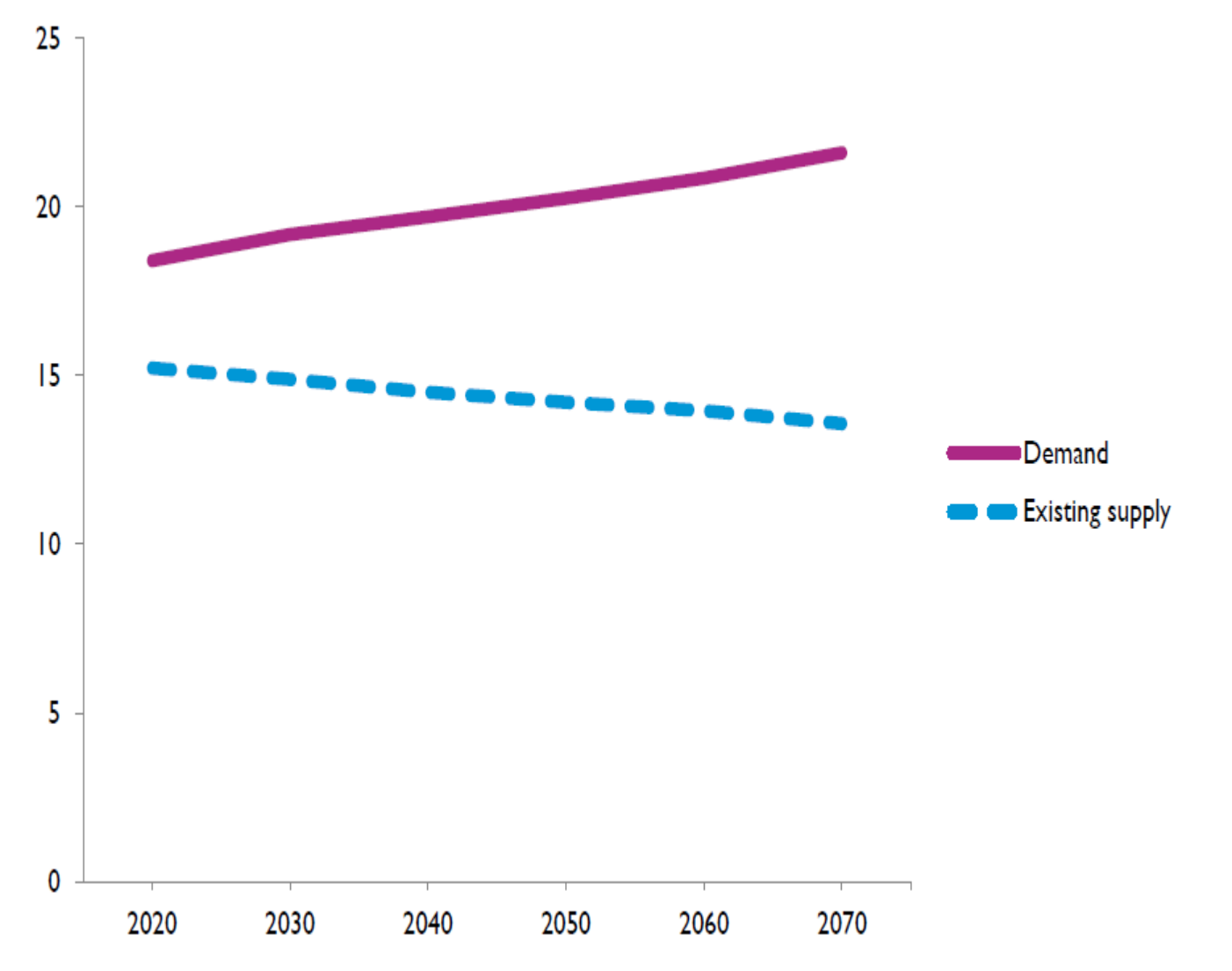
Texas Quick Facts

- Texas population to grow 70% to 51 million by 2070
- Without a plan 1/3rd of Texans would have <1/2 of the municipal water needed during a drought of record.
- Projected water demands up 17% from 18.4 to 21.6 Maf
- Water supplies down 11% by 15.2 to 13.6 Maf by 2070.
- Potential water shortage of 4.8 Maf in 2020 to 8.9 Maf in 2070 with drought of record conditions
- 5,500 water management strategies would provide 3.4 Maf by 2020 and 8.5 Maf in 2070.
- The estimated capital cost to design, and construct some 2,400 recommended projects by 2070 is $62.6 billion.
- Estimated annual economic losses not address needs due to the drought of record $73 B 2020 to $151 B in 2070.

Projected Population in Texas 2070 - (millions)



Projected annual water demand and existing water supply in Texas (millions of acre-feet)



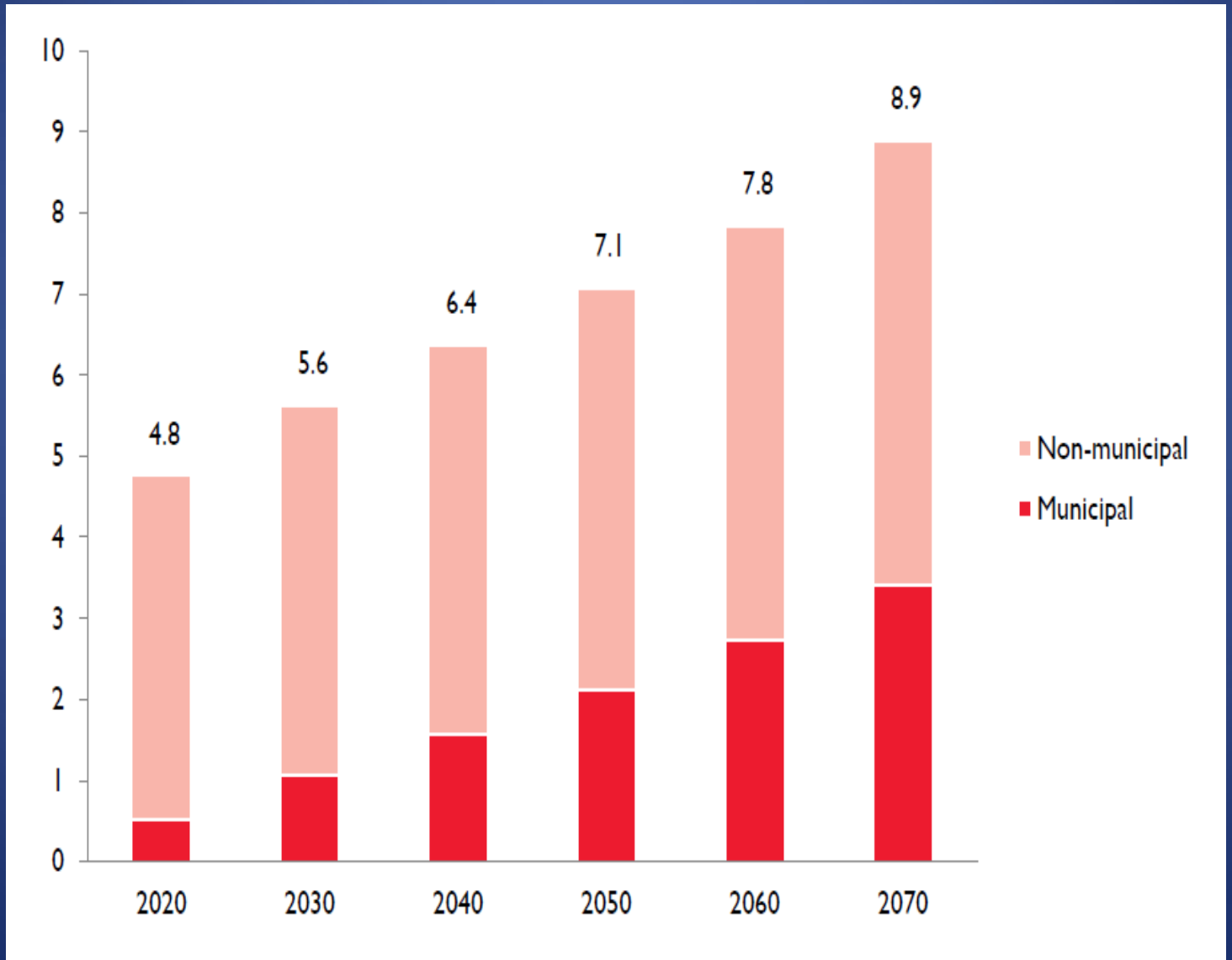
Texas Regional Water Planning Areas

Texas Water Development Board (TWDB)

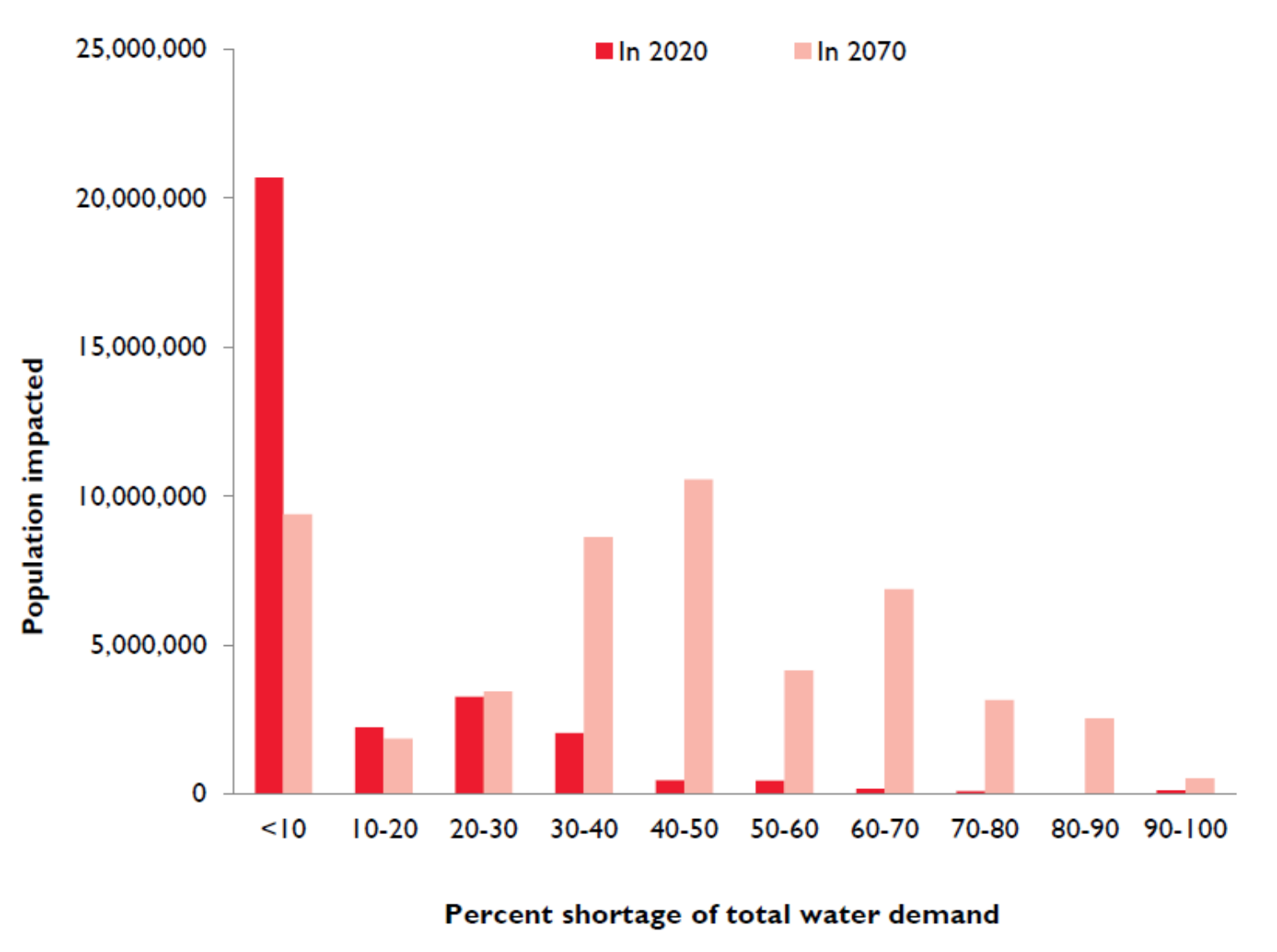
Texas Quick Facts

- $62.6 billion capital cost estimate to implement the 2070 Texas State Water Plan over the next 50 years
- Expected state financial assistance of $36.2 billion or 58%
- Reported need for municipal water up $8.1 billion over 2012 plan
- TWDB $1.9 B for state water plan projects in 2012 plan
- The TWDB has released a preliminary 2017 water plan and administers a variety of financial assistance programs and options to aid in the planning, permitting, and construction of state water plan projects.
- State Water Implementation Fund for Texas (SWIFT) created in 2013 to fund state water plan projects.

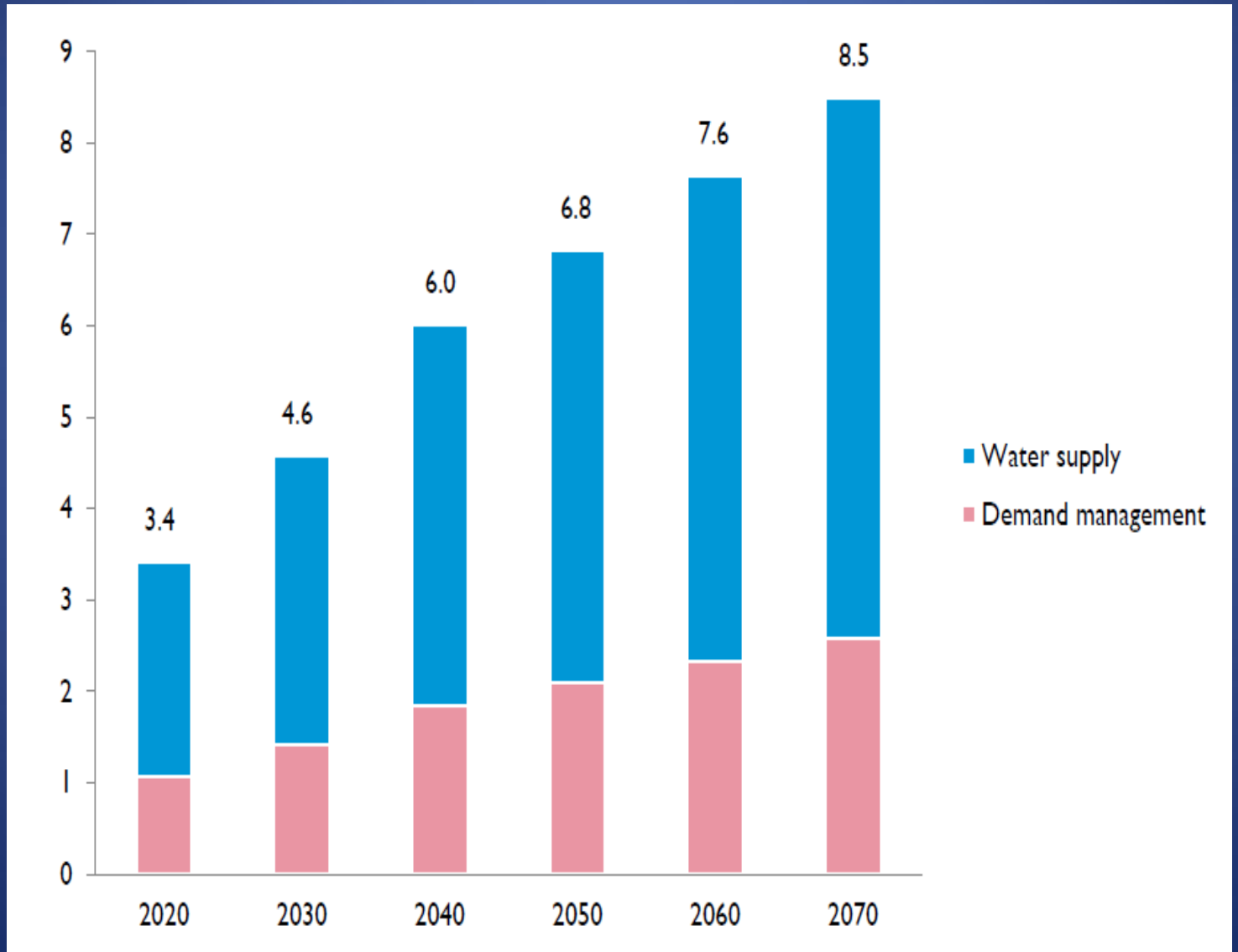
Projected annual water needs in Texas (millions of acre-feet)



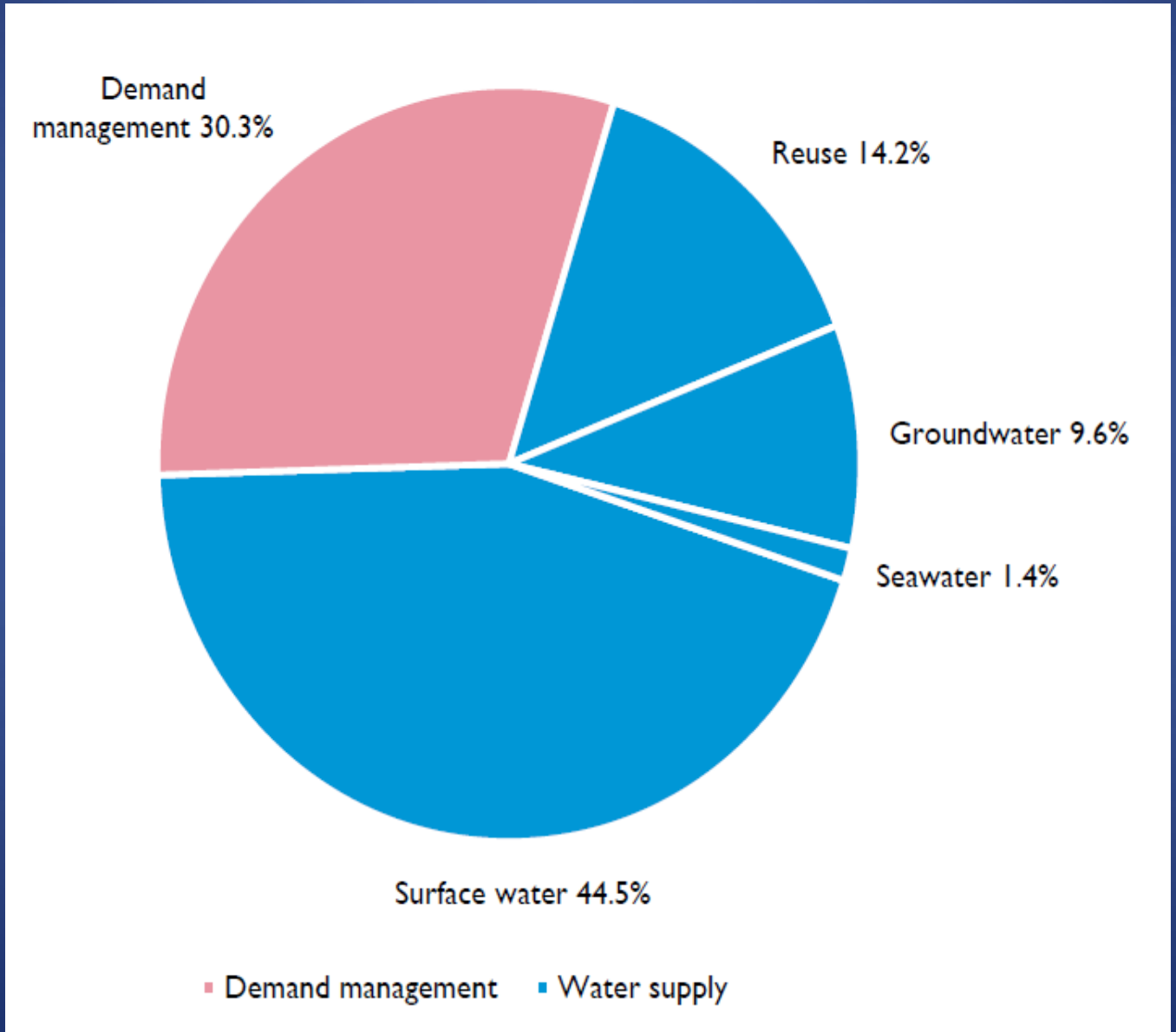
Statewide Population/Municipal Water Shortages 2020 and 2070



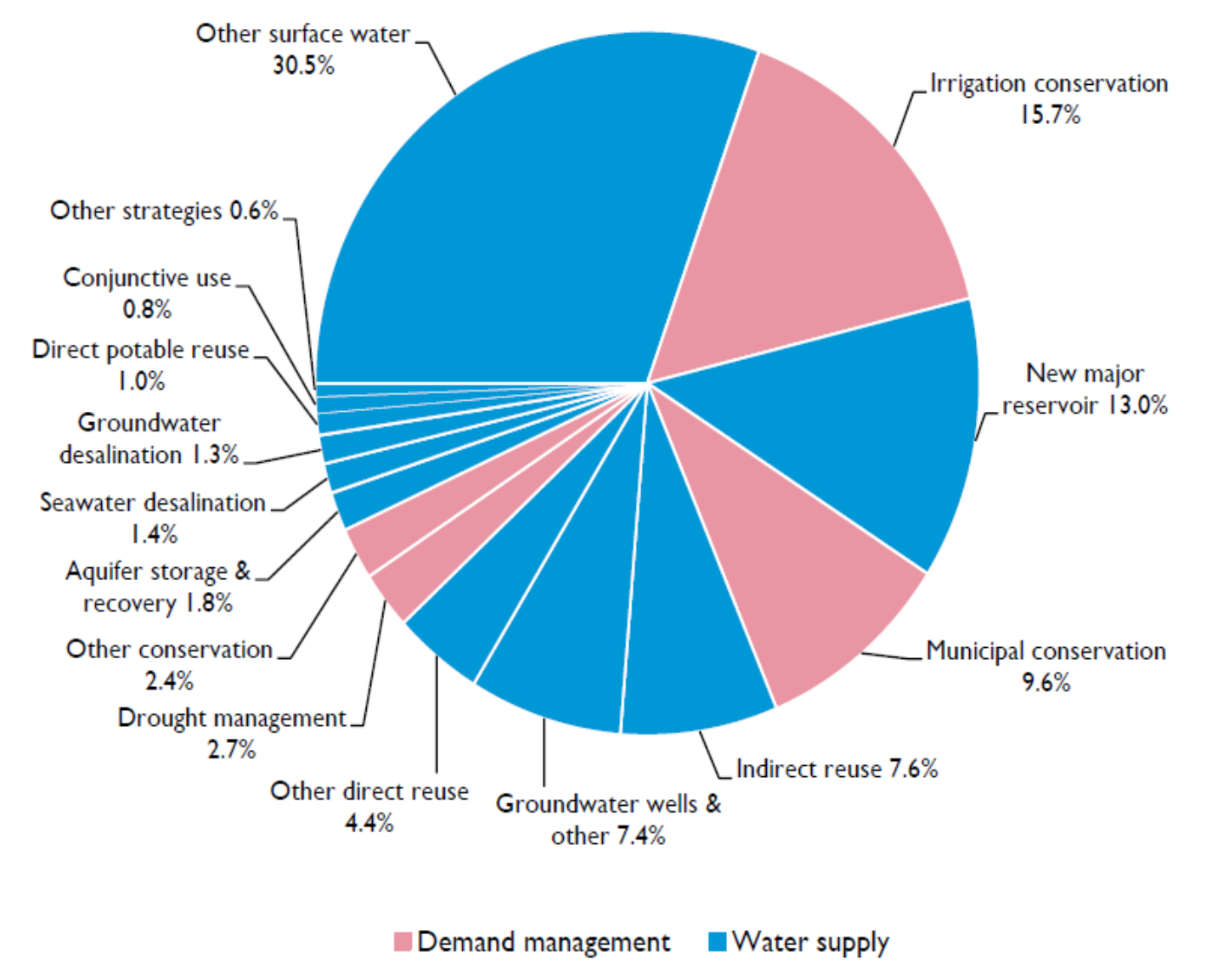
Annual volume of recommended water management strategies (millions of acre-feet)



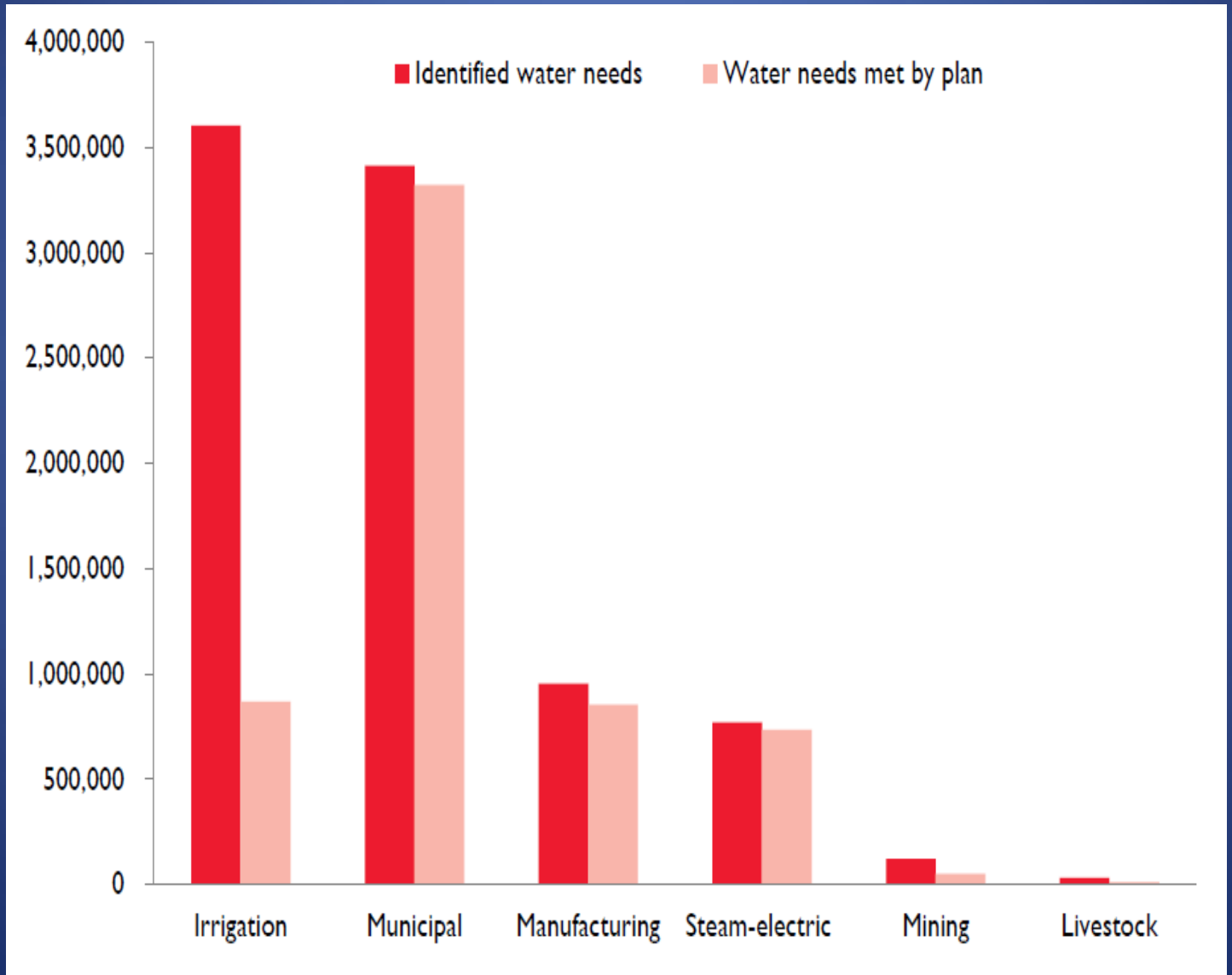
Share of recommended water management strategies by water resource in 2070



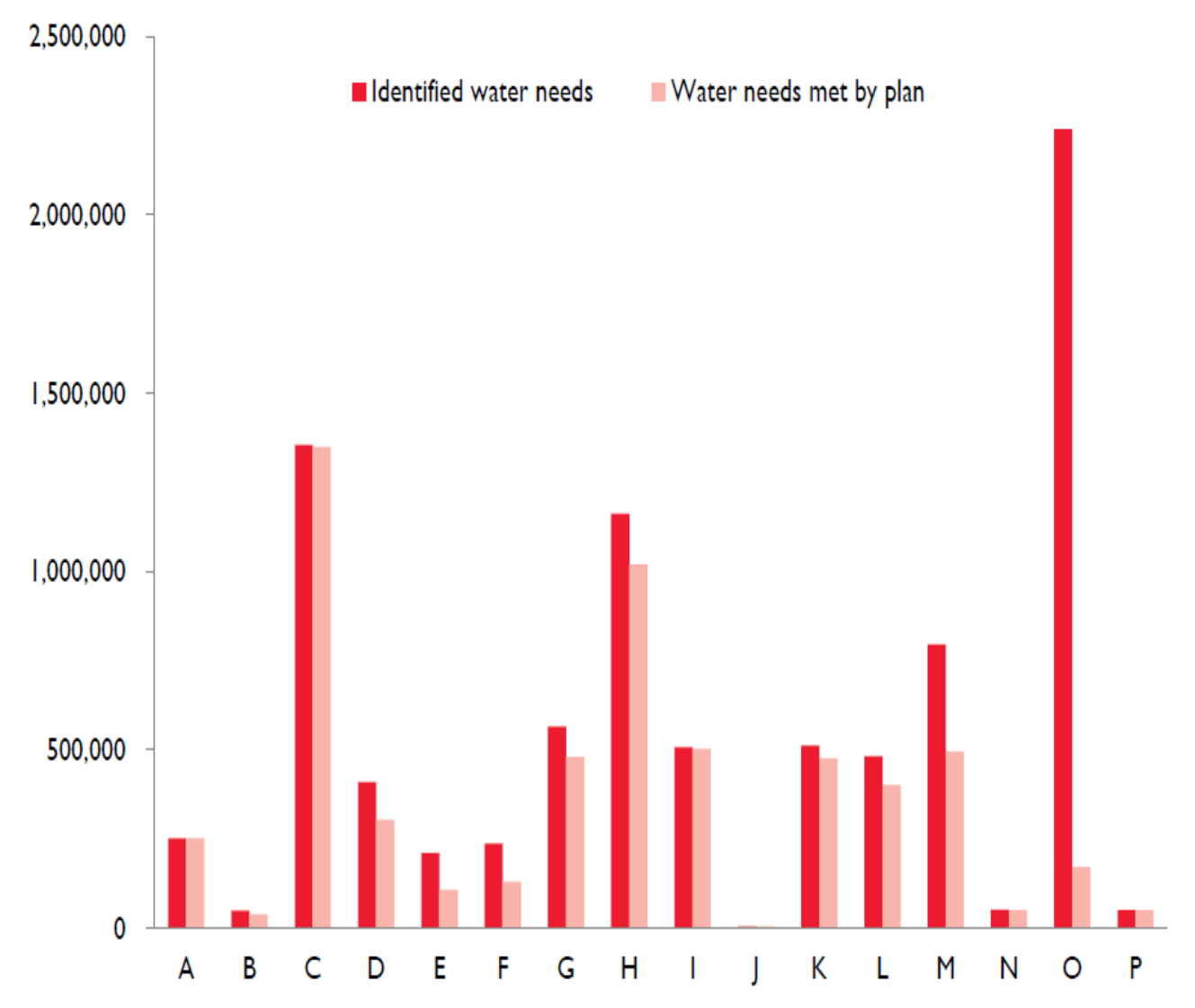
Share of recommended water management strategies by strategy type in 2070



Annual water supply needs and needs met by the plan by water use category in 2070 (acre-feet)



Annual water supply needs and needs met by the plan by region in 2070 (acre-feet)



Texas State Funded Programs

- Texas Water Development Fund (1957) loans for conservation, water supply, water quality, flood control & municipal solid waste
- State Participation Program (1962) general obligation bonds to finance optimal capacity
- Rural Water Assistance Fund (2001) low cost financing for rural utilities water/wastewater
- Ag Water Conservation (1989) low interest loans & grants for political subdivisions
- Economically Distressed Areas (1989) grants & loans
- Water Infrastructure Fund (2001) financial incentives GO bonds and general appropriations

SWIFT & SWIRFT

- State Water Implementation Fund for Texas
  - Address water needs and costs
  - Implement locally identified strategies
  - Fund projects in State Water Plan
  - Consistent dedicated source of funds
- State Water Implementation Revenue Fund
  - Constitutional amendment
  - Low-interest loans, extended repayment terms
  - Incremental repurchase of state ownership interest
  - 10% rural need or agricultural conservation
  - 20% water conservation or reuse projects

Regional/State Planning Changes

- State sets standards for projects
- State's local planning groups prioritize projects
- Incentives for regionalizing and right-sizing
- Incentives for larger projects w/more users
- Incentives for urban/rural cooperation
- Encourages greater use of conservation
- Increased emphasis on regional planning
- Emphasis on funding for rural Texans' needs

Water Project Financial Challenges

- Water availability as a growth management tool
- Quantifying beneficiaries & allocating costs
- Upfront financing and design costs
- Quantifying and managing risk
- Federal budget challenges/limitations
- State budget challenges/limitations
- Erratic public spending and investment
- Public/private partnership limitations
- Changing tax and investment incentives
- Appropriately valuing & pricing water

Obstacles to Projects

- Water availability/scarcity in general
- Climate and hydrologic uncertainty
- Lack of data on existing/future water needs
- Legal uncertainties
- State/tribal/federal water right adjudications
- Instreamflow & environmental protection needs
- Regulatory uncertainty & over regulation
  - Endangered Species Act
  - Clean Water Act (WOTUS, EPA Water Transfers Rule)

QUESTIONS?

Tony Willardson
Executive Director
Western States Water Council

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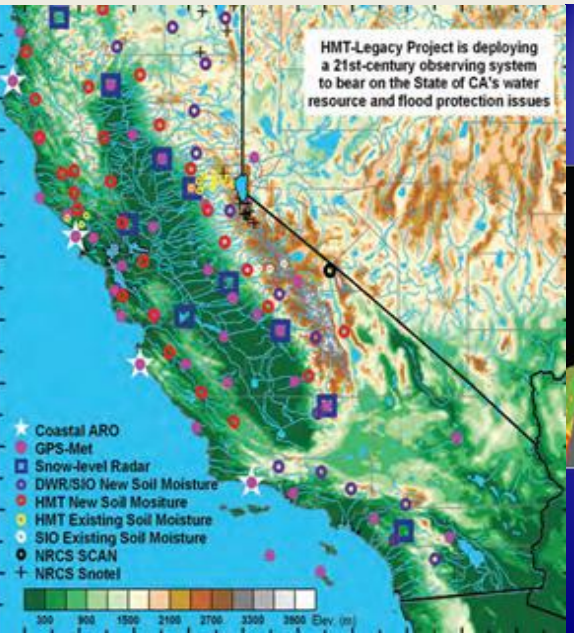
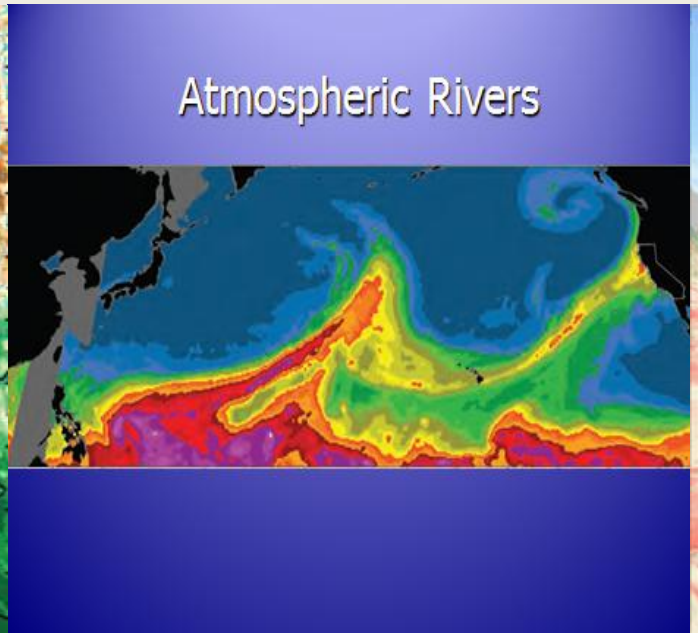
801-685-2555

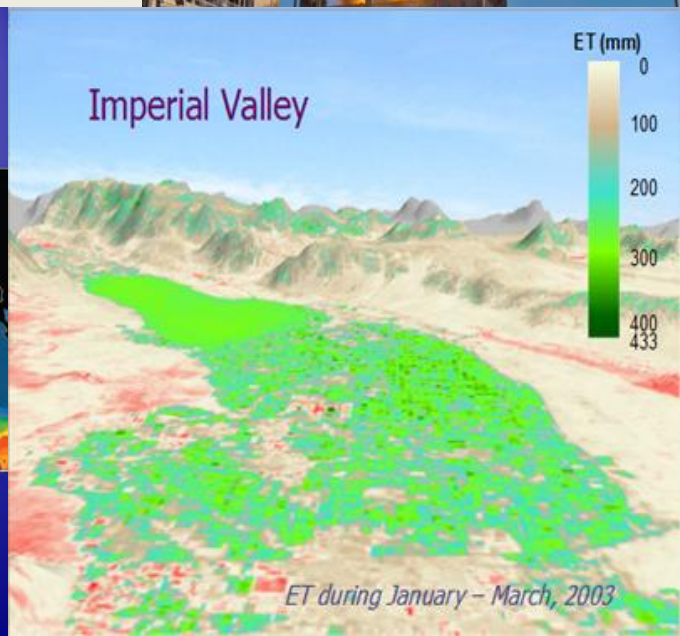
Extra Slides

Priority State & Federal Actions

- Increase support/funding for data
- Identify and close data gaps
- Gather/disseminate real-time data
- Foster remote sensing capabilities
- Reduce costs through innovation



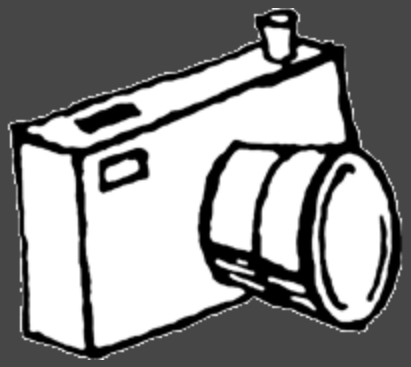





Imperial Valley, CA
via Landsat 7
Imperial Valley
ET (mm)
0
100
200
300
400
433
ET during January – March, 2003

Water Data Exchange (WaDE)

What are the Big Picture Goals?



To better enable the states to share important water data with each other, the public and federal agencies.

To improve the sharing of federal data with the states, to assist their planning efforts

Western Water Data Exchange (WaDE) Central Portal

A mapping application for discovering water data web services hosted by the states, federal agencies and Sandia National Lab

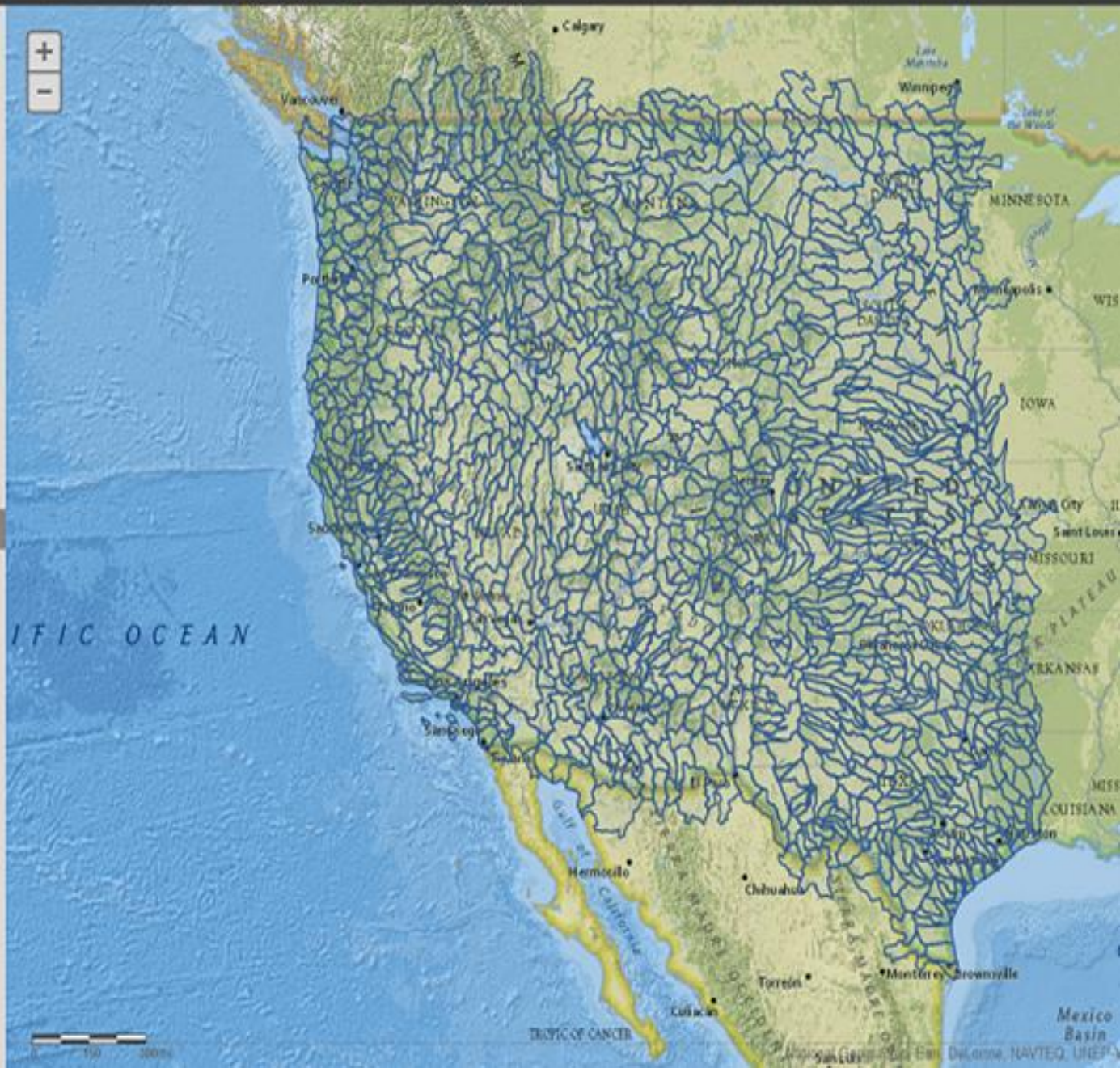
An state agency sponsored initiative to better share water data was begun in 2008 and has taken on a greater importance in more recent years. Faced with the need to collaborate on regional watershed management issues and the growing requests for access to water data, state agencies have initiated the Water Data Exchange (WaDE) project.

This Central Portal for WaDE provides access to state water data (pictured on the left), such as water planning, availability, use and allocation data, as well as summary water availability results from Sandia National Laboratory's Water/Energy Nexus Study (pictured on the right).

To use the portal, zoom and pan to find your area of interest. Both maps will adjust to the same location. Click on either of the maps to see summary information about the hydrologic unit (HUC) and for a link that queries active web services running at each of the state nodes and for Sandia National Laboratory. The hypertink sends parameter information to the various databases and brings back the information requested in a new browser window.

LEGEND

Western 8-Digit HUC Layer

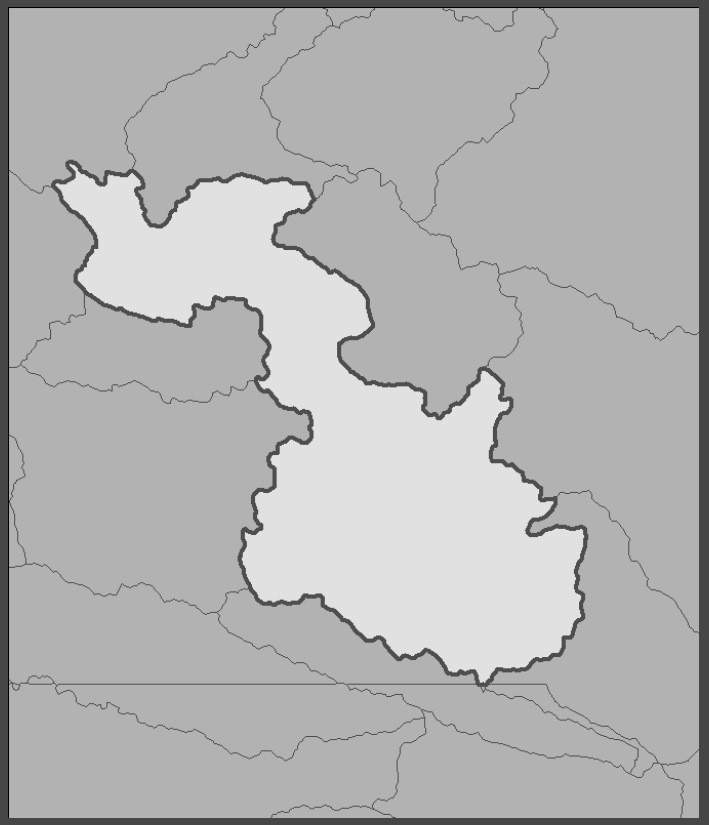


HOW DOES IT WORK?

Representational State Transfer (REST) Endpoint

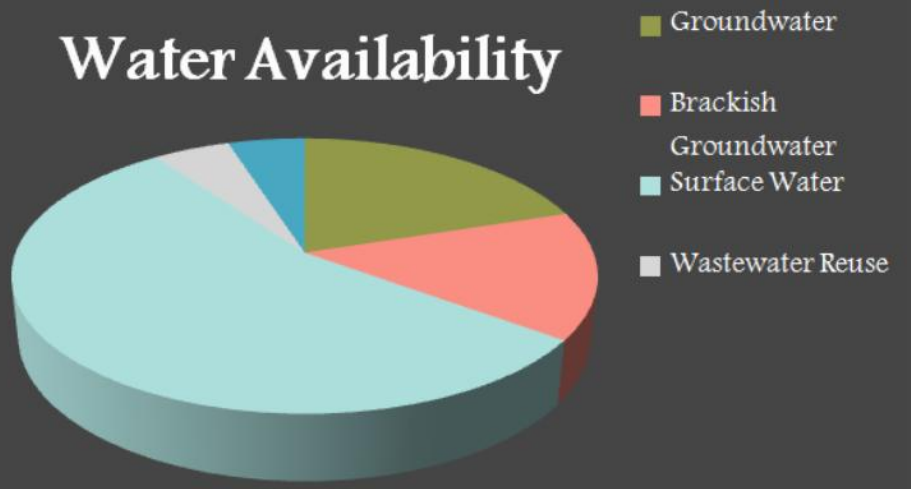
http://www.state.us/webservices/GetSummary

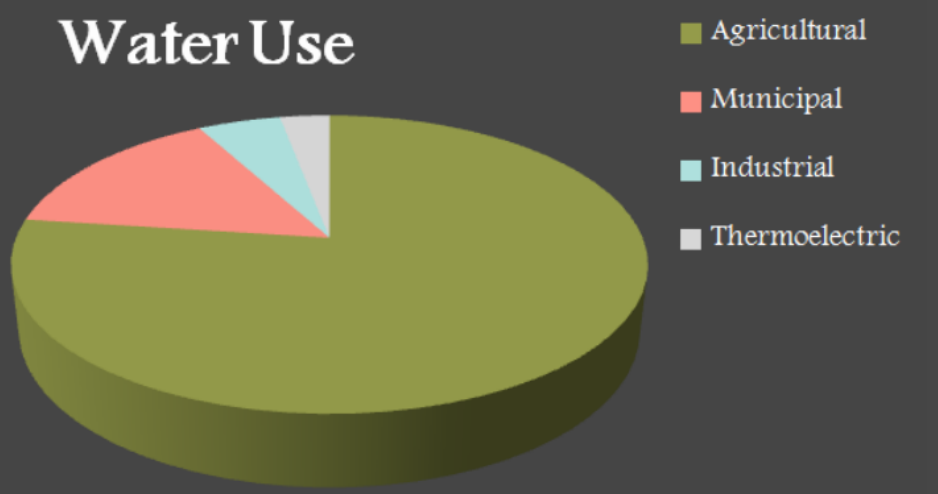
WHAT WILL IT PROVIDE?



Summaries of Data

7,550 acre-feet





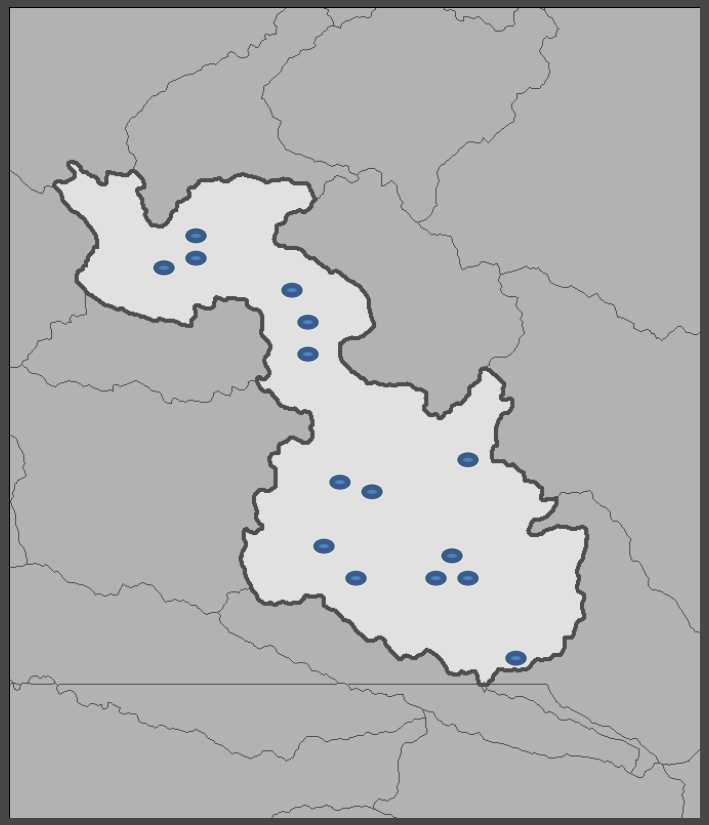
Water Supply Summary: 24,000 acre-feet

Regulatory & Allocation Summaries:

- Groundwater Management Areas
- % of Allocations by Beneficial Use Category

2,850 acre-feet

More Detailed Data



Allocation Data

- Owner
- Beneficial Use
- Status
- Priority Da

Diversions

Uses (withdra

Return Flows

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FUTURE STEPS:

States plugged in, grants, accessing federal data too