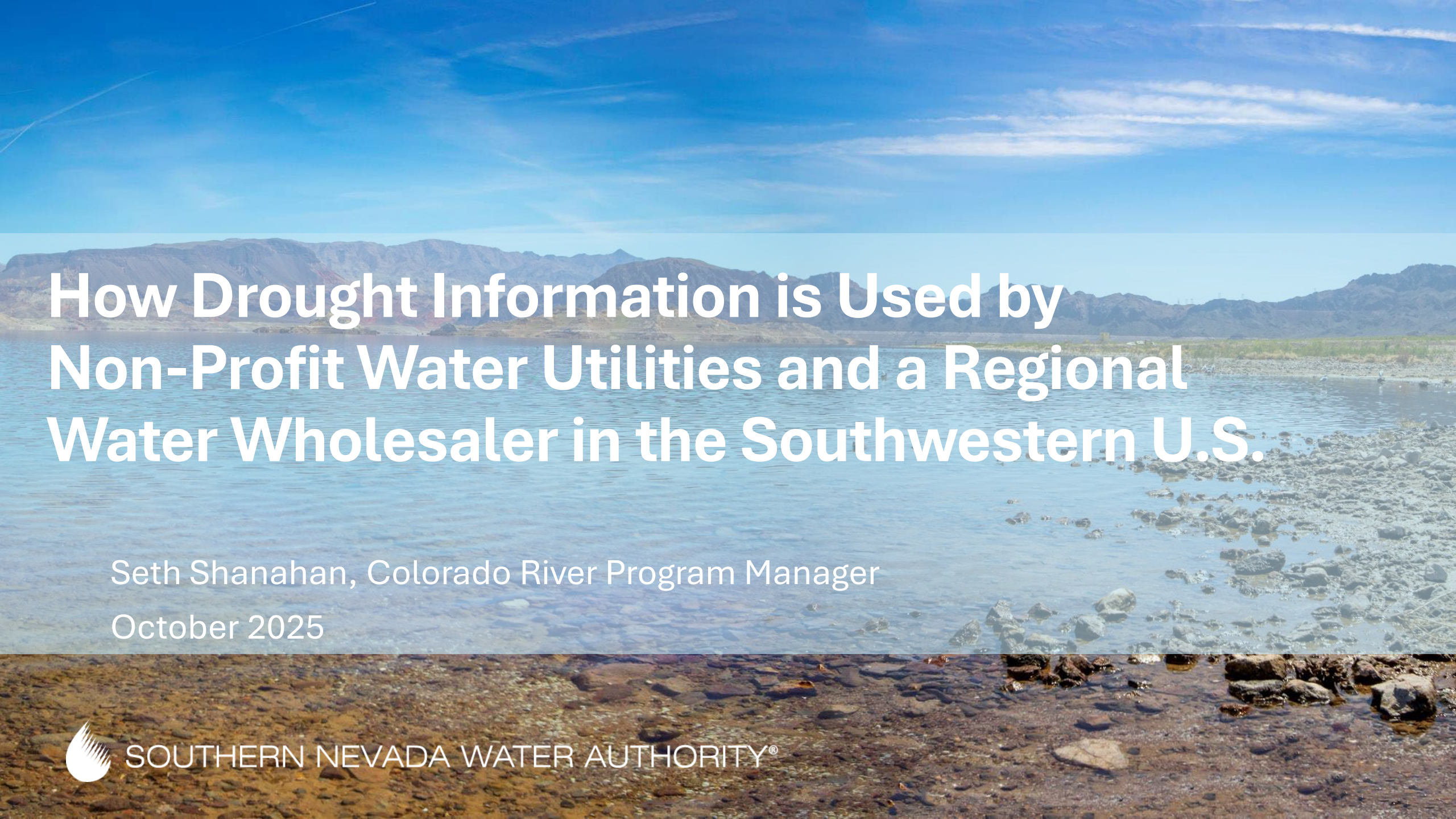


How Drought Information is Used by Non-Profit Water Utilities and a Regional Water Wholesaler in the Southwestern U.S.

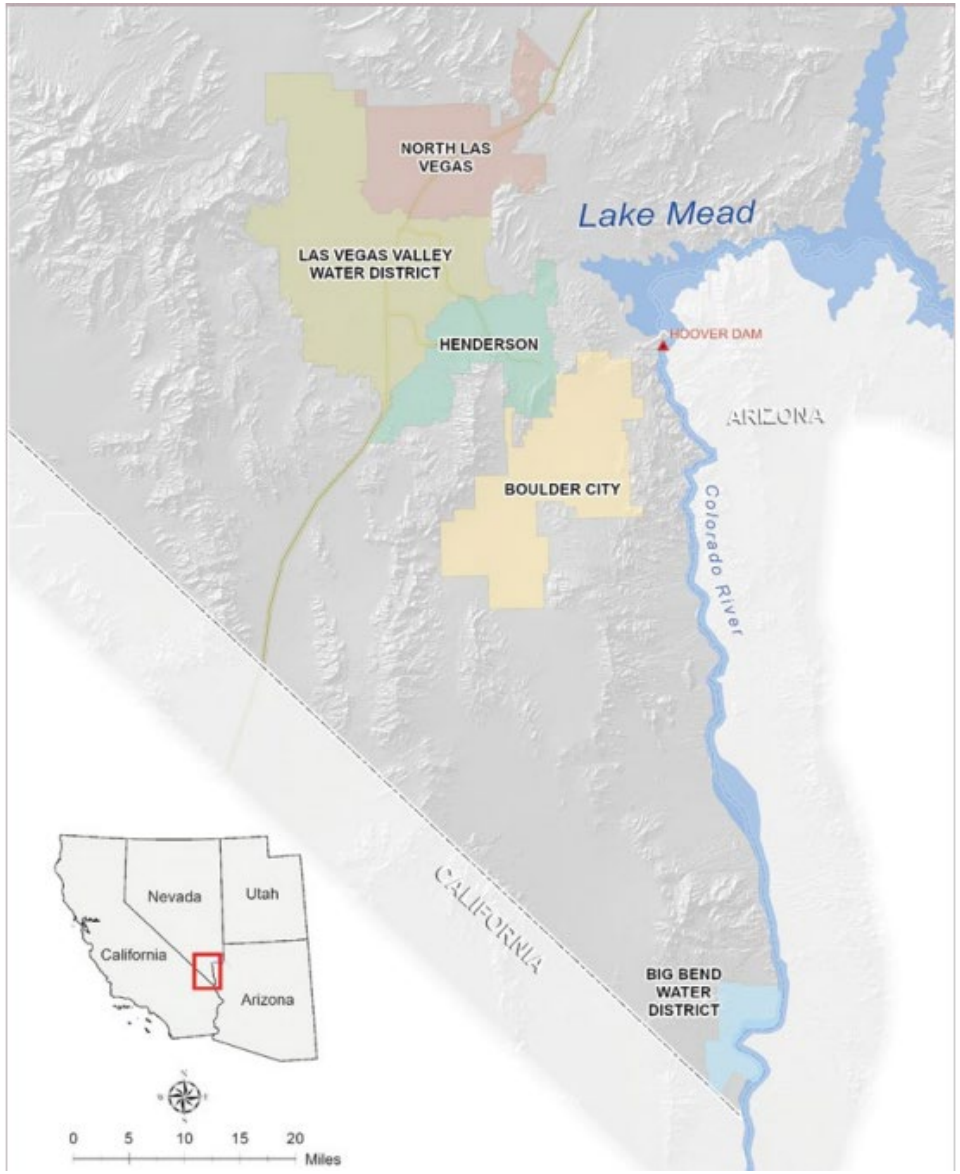
Seth Shanahan, Colorado River Program Manager

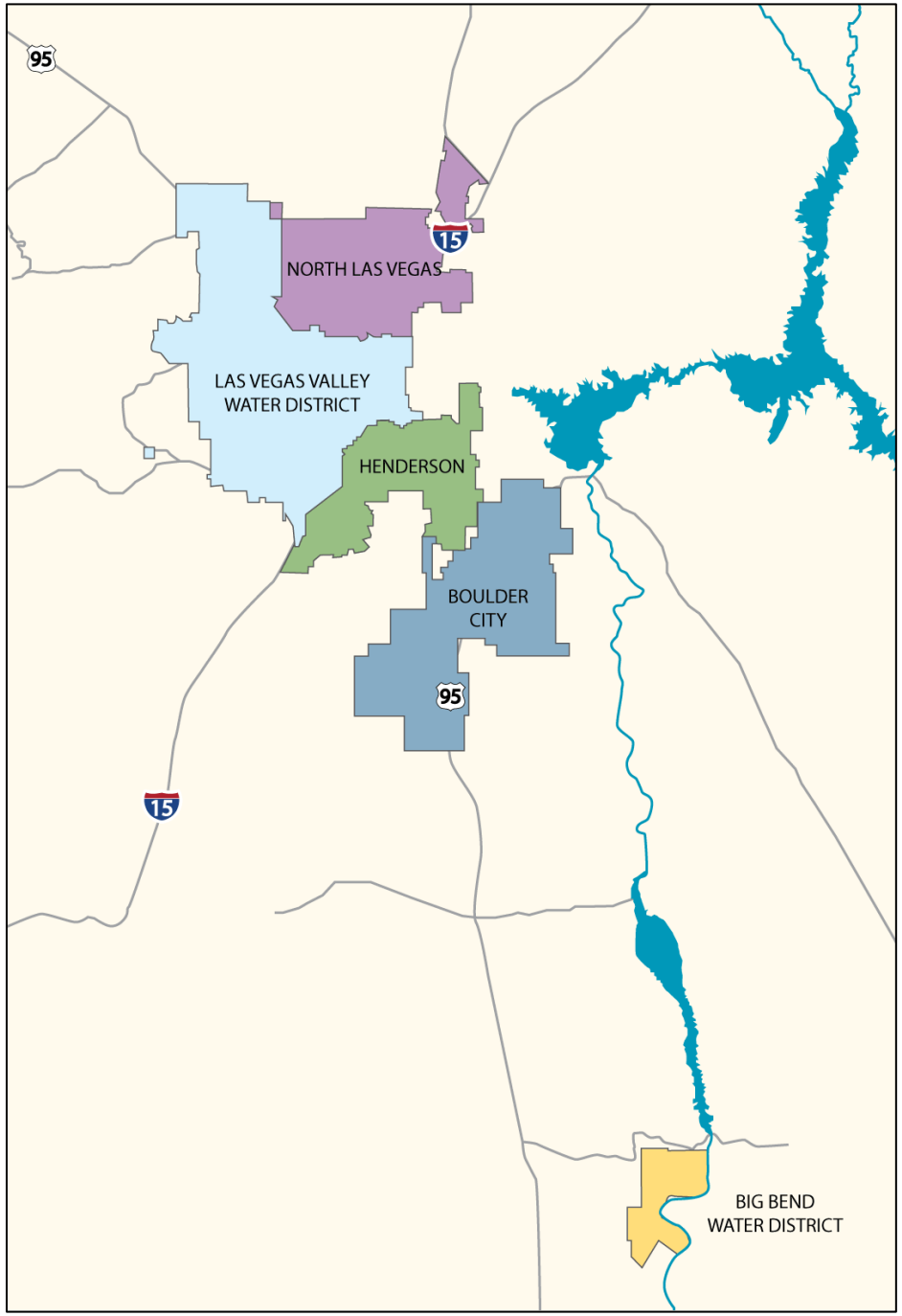
October 2025

SOUTHERN NEVADA WATER AUTHORITY®

About Us

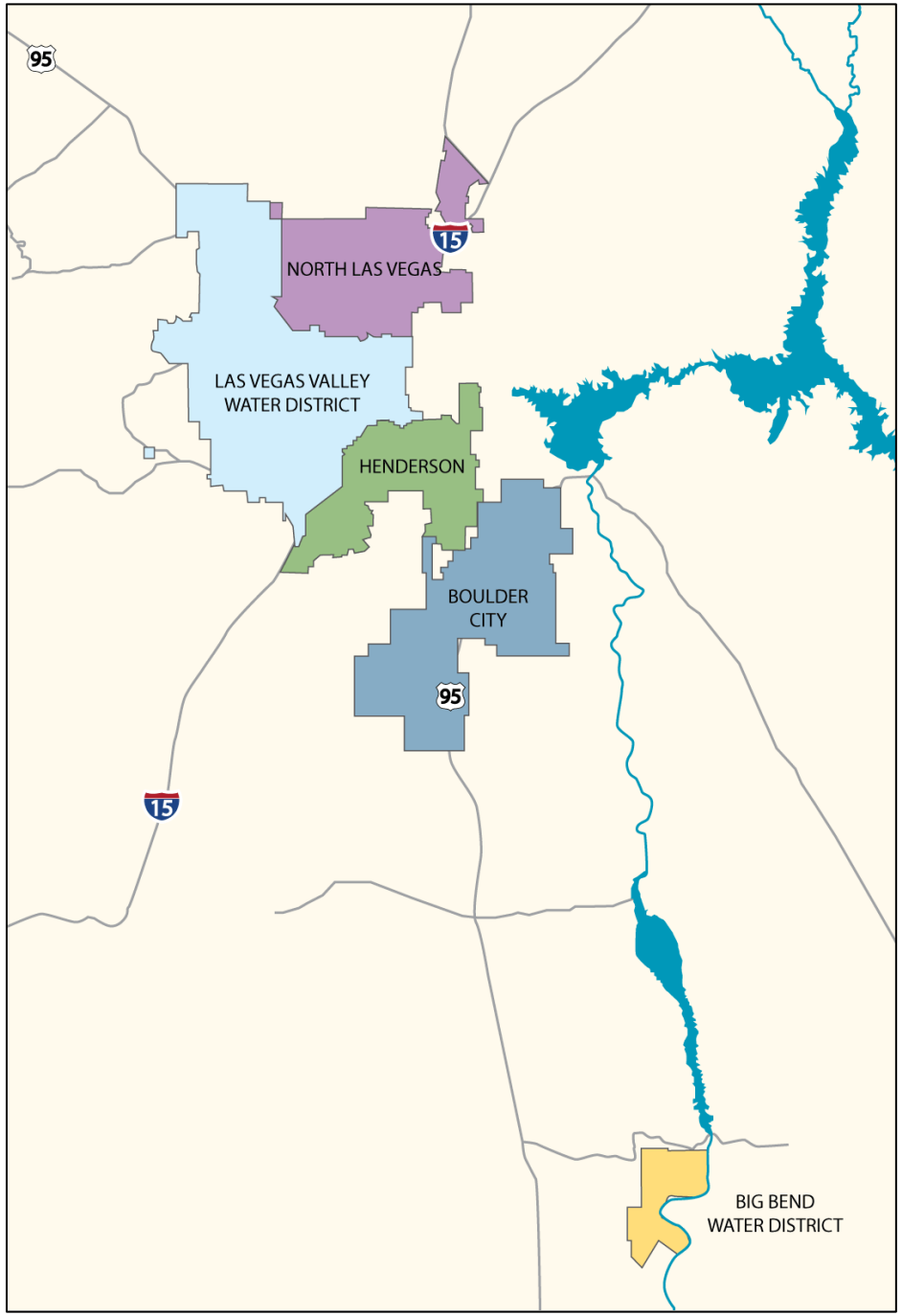
- Southern Nevada Water Authority
- Las Vegas Valley Water District
- Big Bend Water District
- 6 Small Water Systems
- Ranching Operations
- Springs Preserve (museum and cultural attraction)





SOUTHERN NEVADA WATER AUTHORITY

- Resource management at **regional level**
- **7 water and wastewater agencies**
- Includes 4 cities and unincorporated county
- **2 treatment plants (900 million gallons per day)**
- **250 miles** of large-diameter transmission mains
- **50 reservoirs** (more than 420 million gallons storage)
- **35 ROFC valves**
- **Ranching Operation** in East-Central Nevada



SOUTHERN NEVADA WATER AUTHORITY

SNWA Member Agencies include:

-Big Bend Water District (Laughlin)

-Boulder City

-Clark County Water Reclamation District

-City of Henderson

-City of Las Vegas

-Las Vegas Valley Water District

-North Las Vegas


SNWA
REGIONAL WATER SYSTEM
NORTH LAS VEGAS
LAS VEGAS VALLEY WATER DISTRICT
HENDERSON
AMSWTF
RMWTF
INTAKE THREE
INTAKE TWO
INTAKE ONE
To BIG BEND WATER DISTRICT
BOULDER CITY
CITY OF NORTH LAS VEGAS
LAS VEGAS VALLEY WATER DISTRICT
CITY OF HENDERSON
BOULDER CITY
BIG BEND WATER DISTRICT
NEVADA
NEVADA

AMS Glossary of Meteorology

Drought

- A period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance.

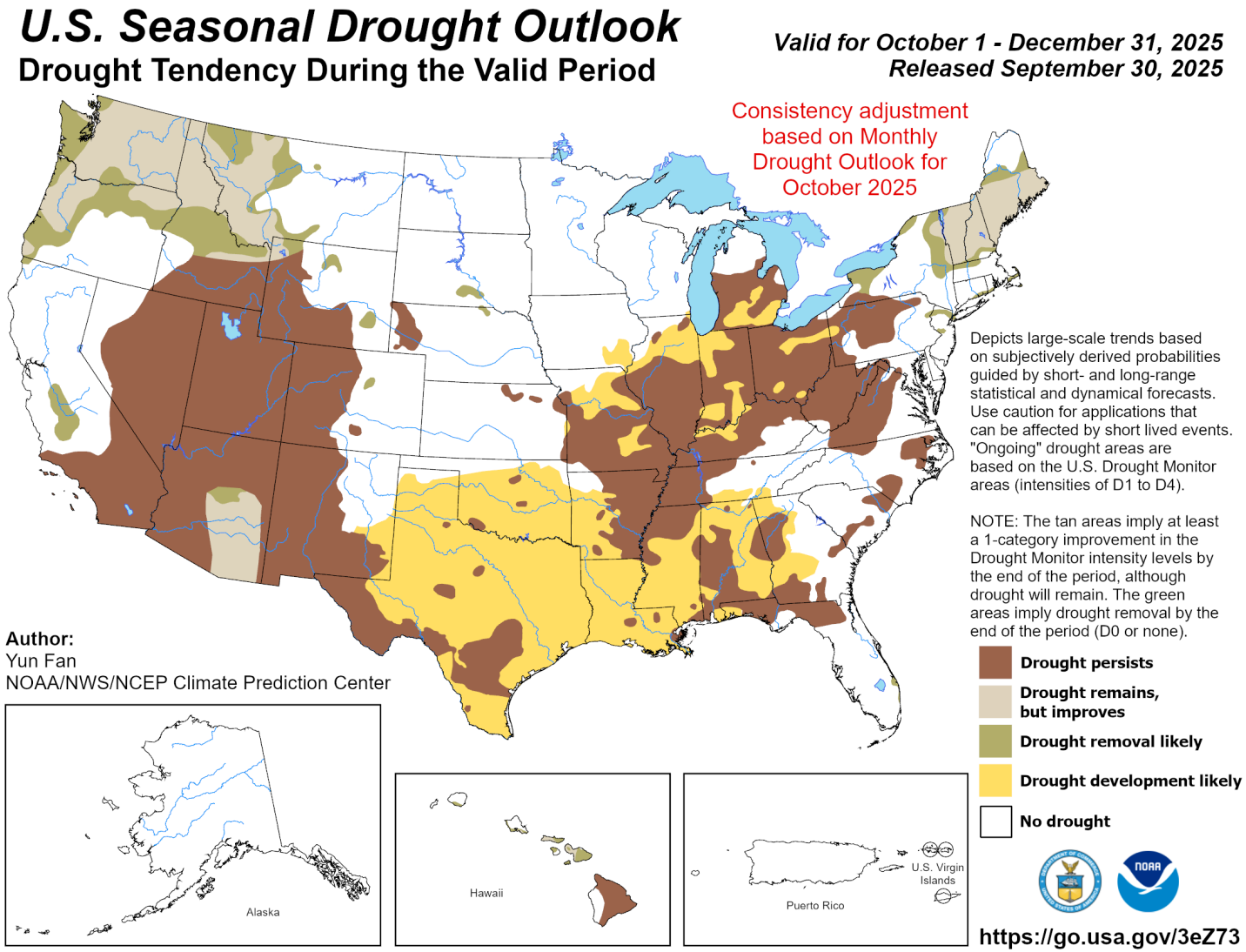
Hydrologic Drought

- Prolonged period of below-normal precipitation, causing deficiencies in water supply, as measured by below-normal streamflow, lake and reservoir levels, groundwater levels, and depleted soil moisture content.

Some Examples

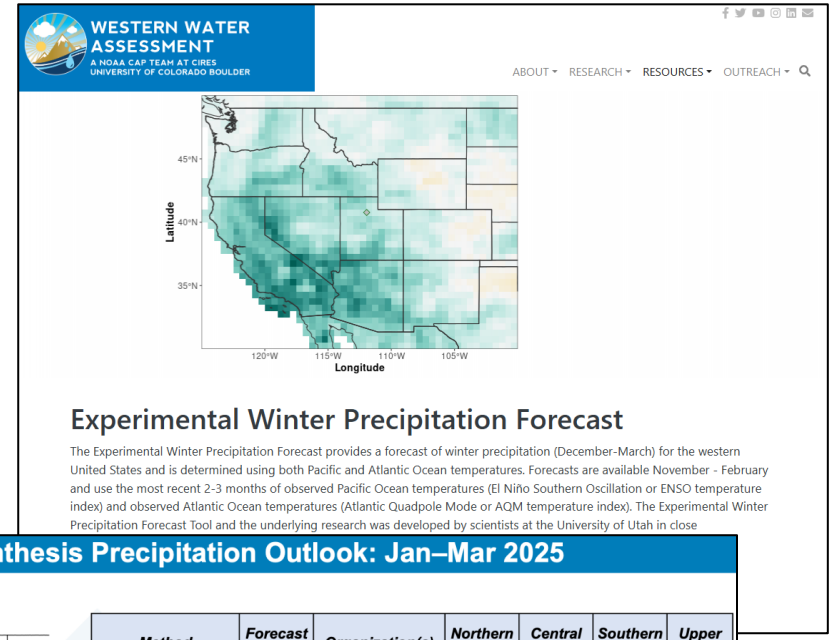
Drought Information Used

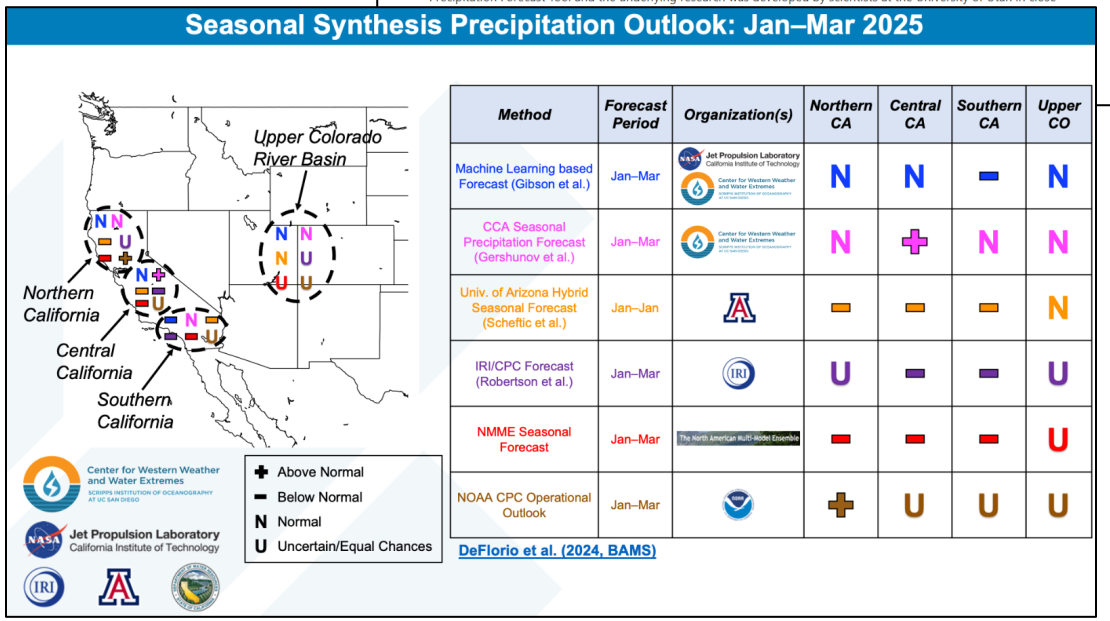
- The U.S. seasonal drought outlook map
- Presented monthly to elected Board of Directors
- Provides general update on drought conditions and situational awareness



Drought Information Used

- Subseasonal to seasonal precipitation accumulation outlooks for the Upper Colorado River Basin
- Reviewed by water modeling and planning staff for situational awareness
- Data acquired via various sources, including JPL, CW3E, U of Ariz, IRI, NOAA, U of Utah





Method	Forecast Period	Organization(s)	Northern CA	Central CA	Southern CA	Upper CO
Machine Learning based Forecast (Gibson et al.)	Jan–Mar		N	N	−	N
CCA Seasonal Precipitation Forecast (Gershunov et al.)	Jan–Mar		N	+	N	N
Univ. of Arizona Hybrid Seasonal Forecast (Scheftic et al.)	Jan–Jan		−	−	−	N
IRI/CPC Forecast (Robertson et al.)	Jan–Mar		U	−	−	U
NMME Seasonal Forecast	Jan–Mar		−	−	−	U
NOAA CPC Operational Outlook	Jan–Mar		+	U	U	U

Drought Information Used

- Historical periods of monthly hydrologic drought at streamflow points in the Colorado River Basin
- Used as a basis for developing water supply planning scenarios
- Supports annual water resource plan required by a legal agreement

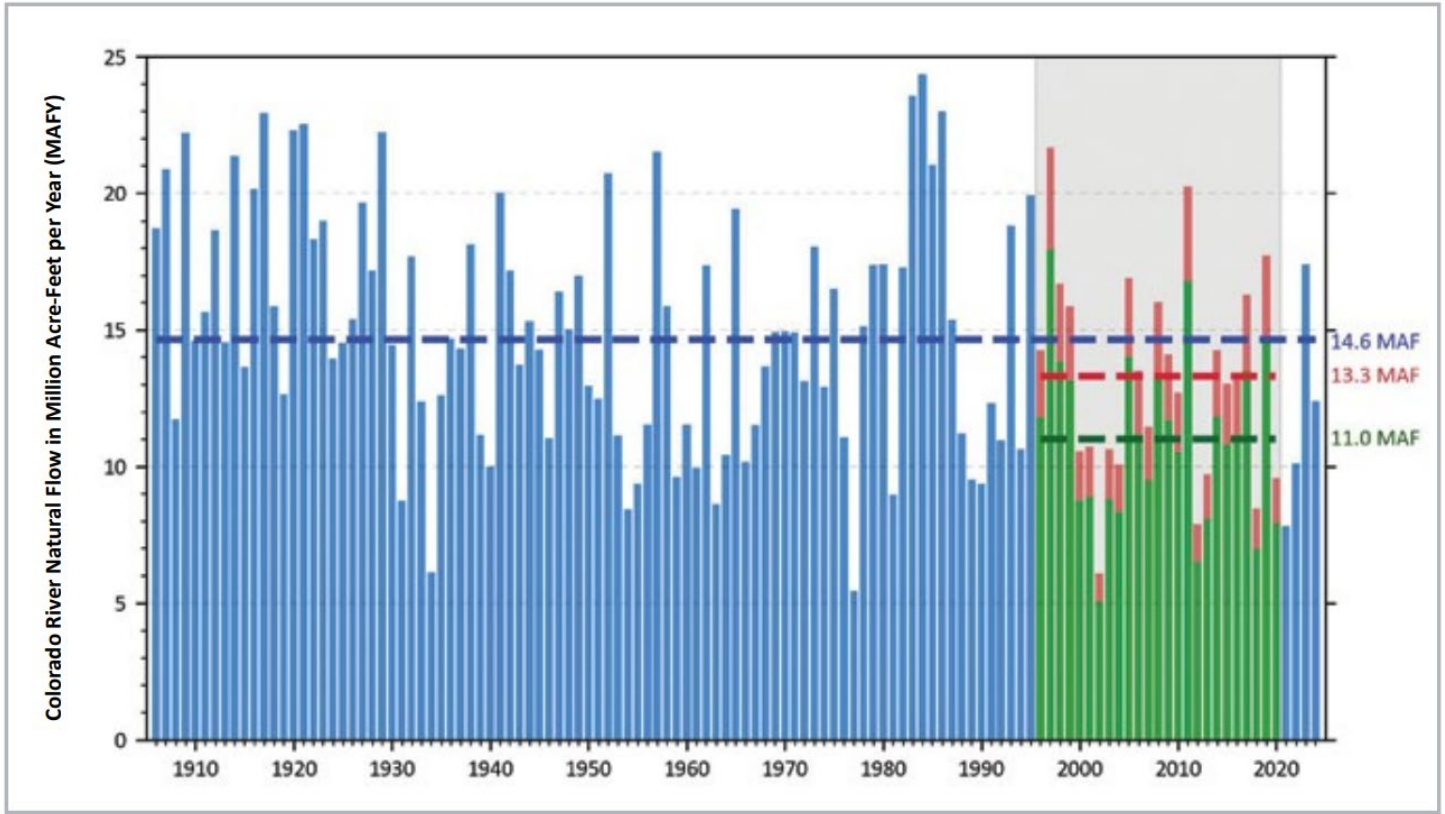
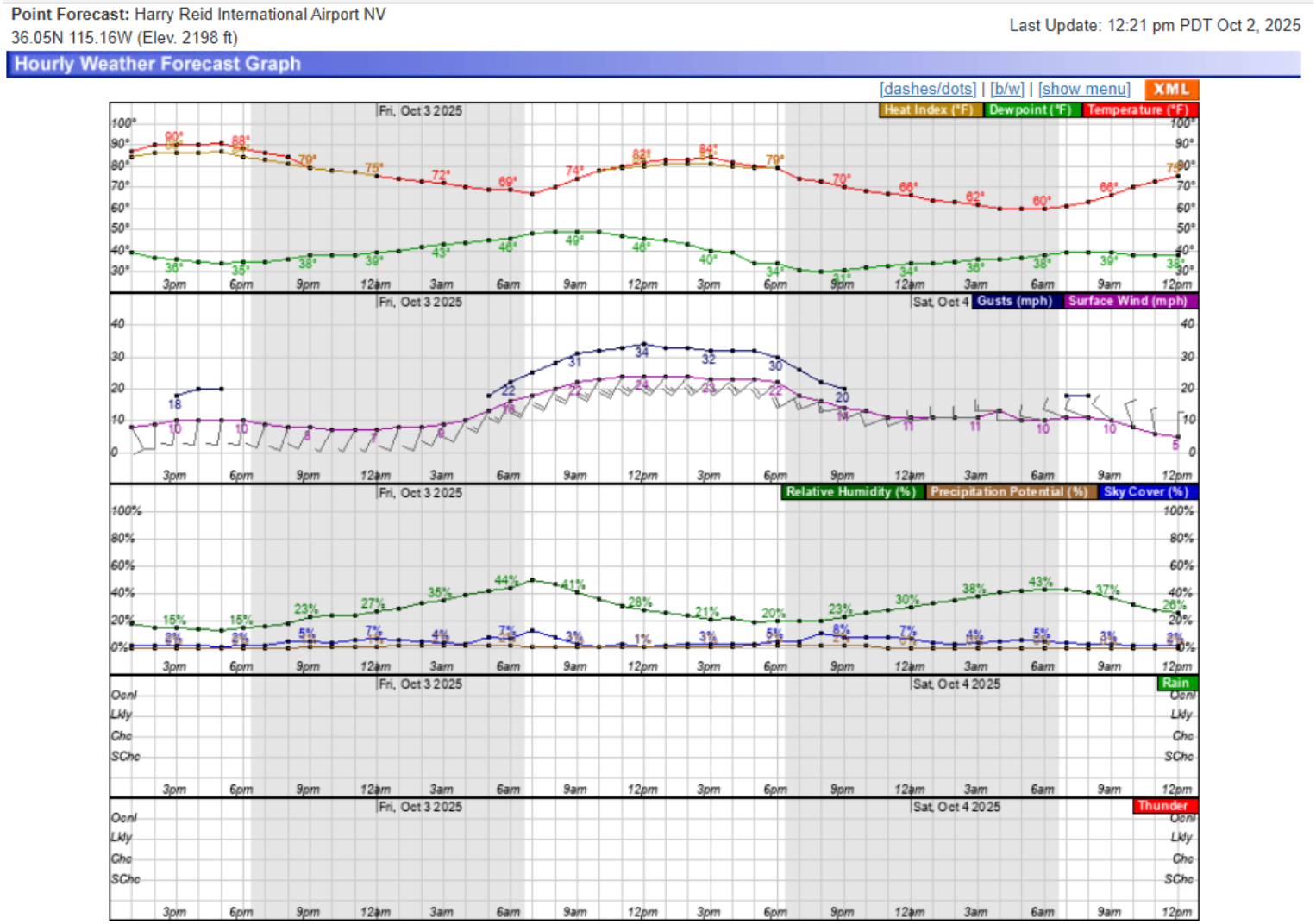


FIGURE 4.5 **Water Supply Conditions Evaluated in Planning Scenarios 1906 - 2024**

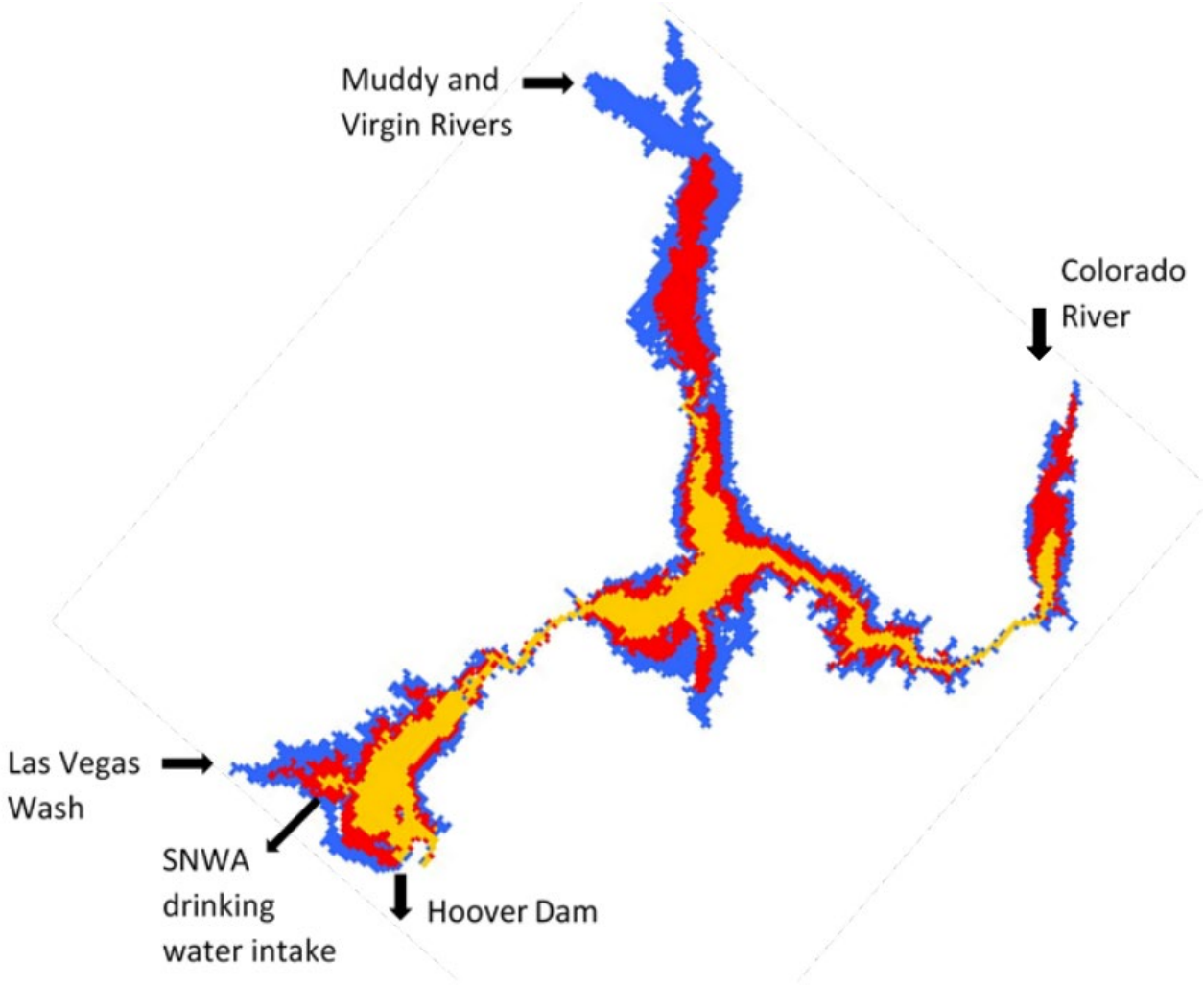
Drought Information Used

- Short to long-range NOAA precipitation forecasts
- Point locations are used in water demand models
- Supports schedule development for daily to multi-day water distribution system operations



Drought Information Used

- Historical periods and climate-projected periods of low precipitation and low streamflow
- Used to drive a hydrodynamic lake model for exploring biological, physical and chemical outcomes
- Supports and guides infrastructure operations and capital improvements



Drought Information Used

- Projected periods of monthly hydrologic drought at streamflow points in the Colorado River Basin
- Used as a basis for exploring future water supply conditions in reservoirs
- Analyzed to support operating conditions and water conservation actions

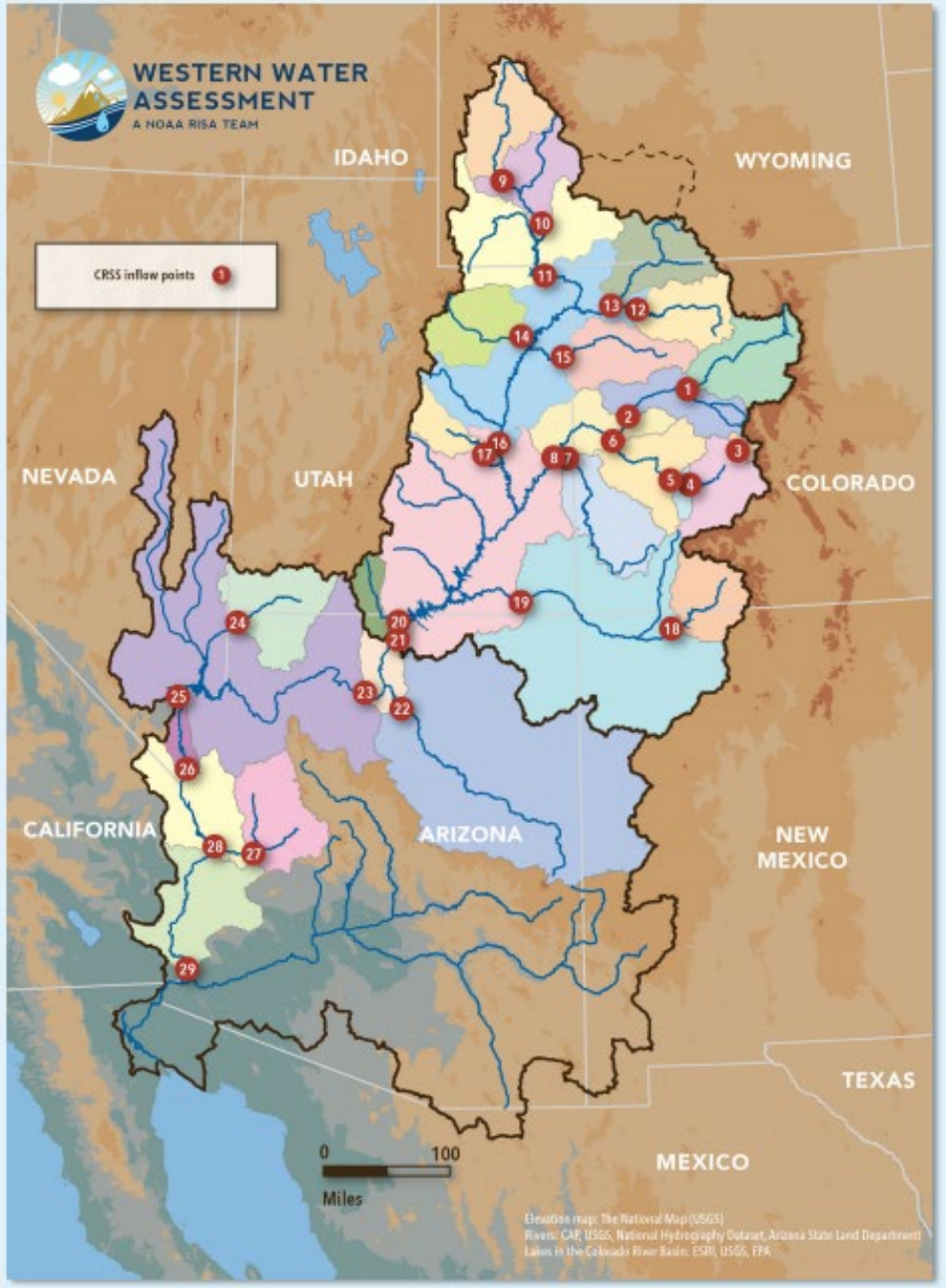
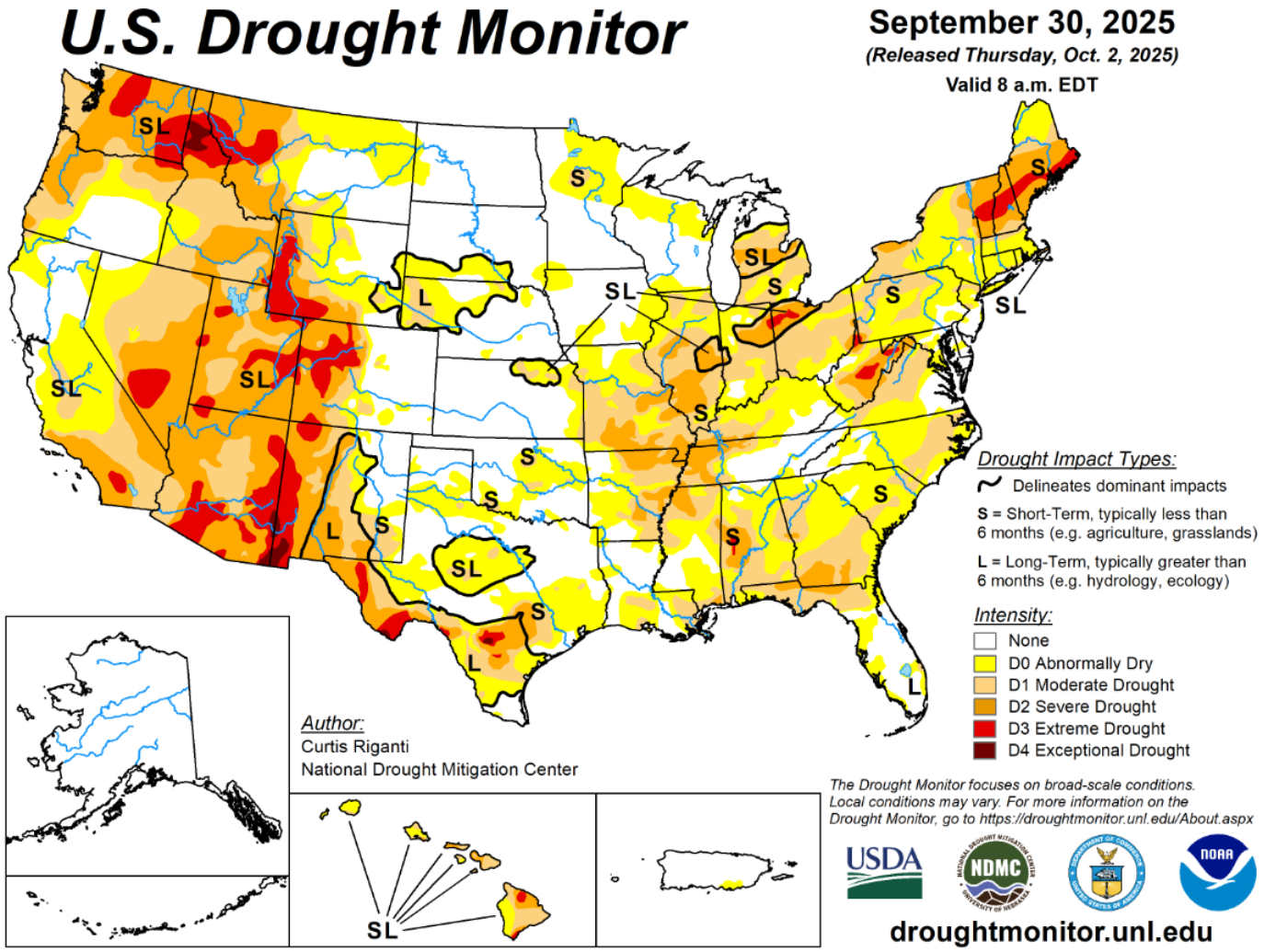


Figure 3.7
Map of CRSS inflow points. See Table 3.1 for details about each inflow location. (Source: Reclamation)

Drought Information Used

- The U.S. drought monitor map
- Reviewed twice a month
- Used as a point of comparison to rangeland condition observations and to inform agricultural irrigation



Drought Information Used

- Monthly monitoring of cumulative water year precipitation
- Used as situational awareness for potential future groundwater elevations
- Informs pumping operations