



The Premier Energy Training Workshop
and Trade Show for Federal Agencies

A River of Energy Solutions

Water and Our Future - 2030

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Federal Energy Management Program

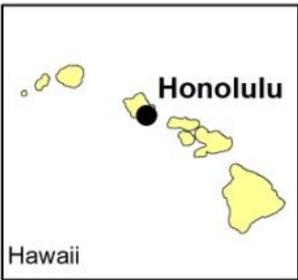
The mission of the Federal Energy Management Program is to facilitate the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the Nation's energy security and environmental stewardship.



Water in the Future

- Increased water rates
 - Escalation rates
 - Example
 - Escalation trends
- Increased drought impacts
- Alternate water sources
 - Case study examples

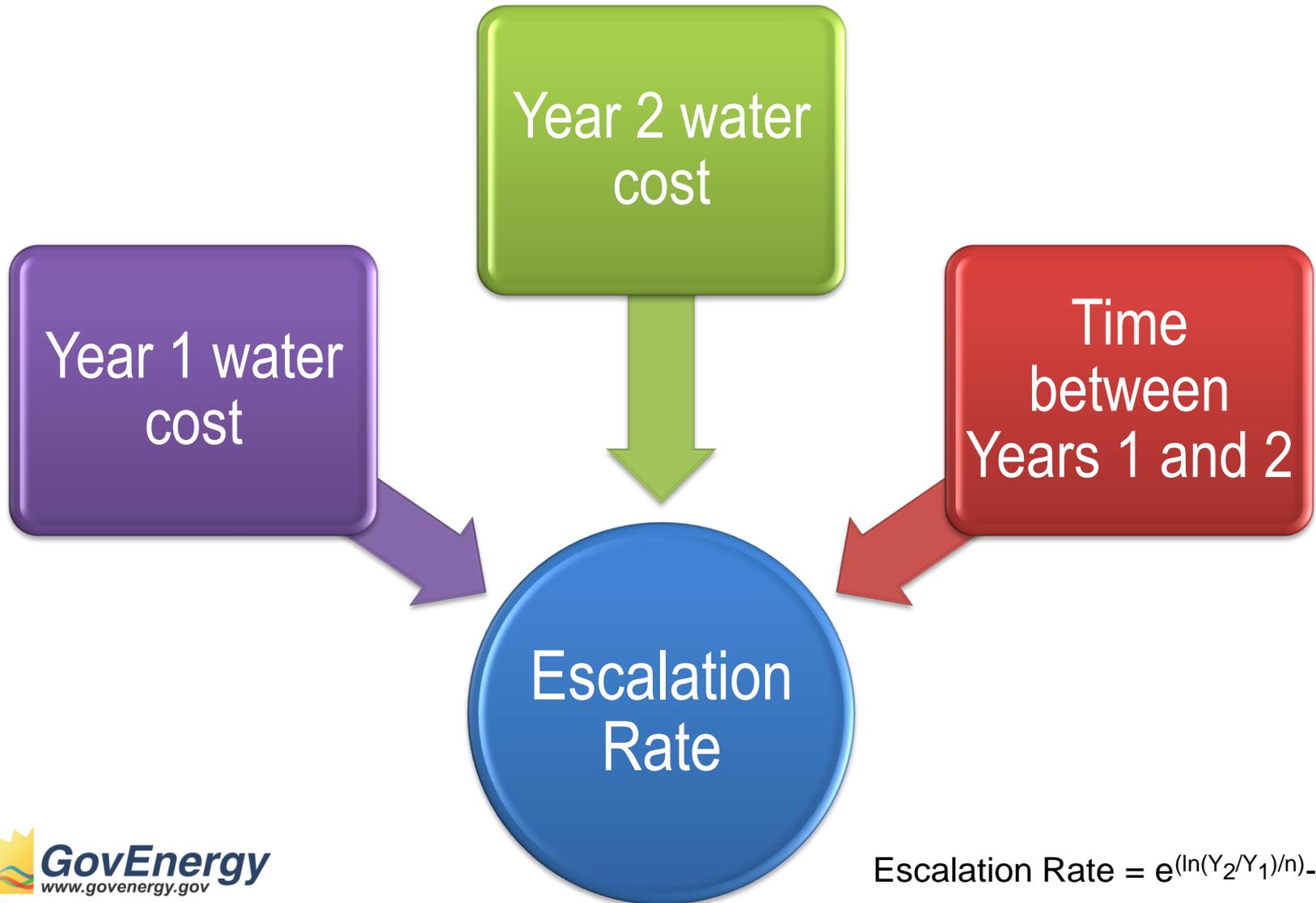
Cities Included in Rate Study



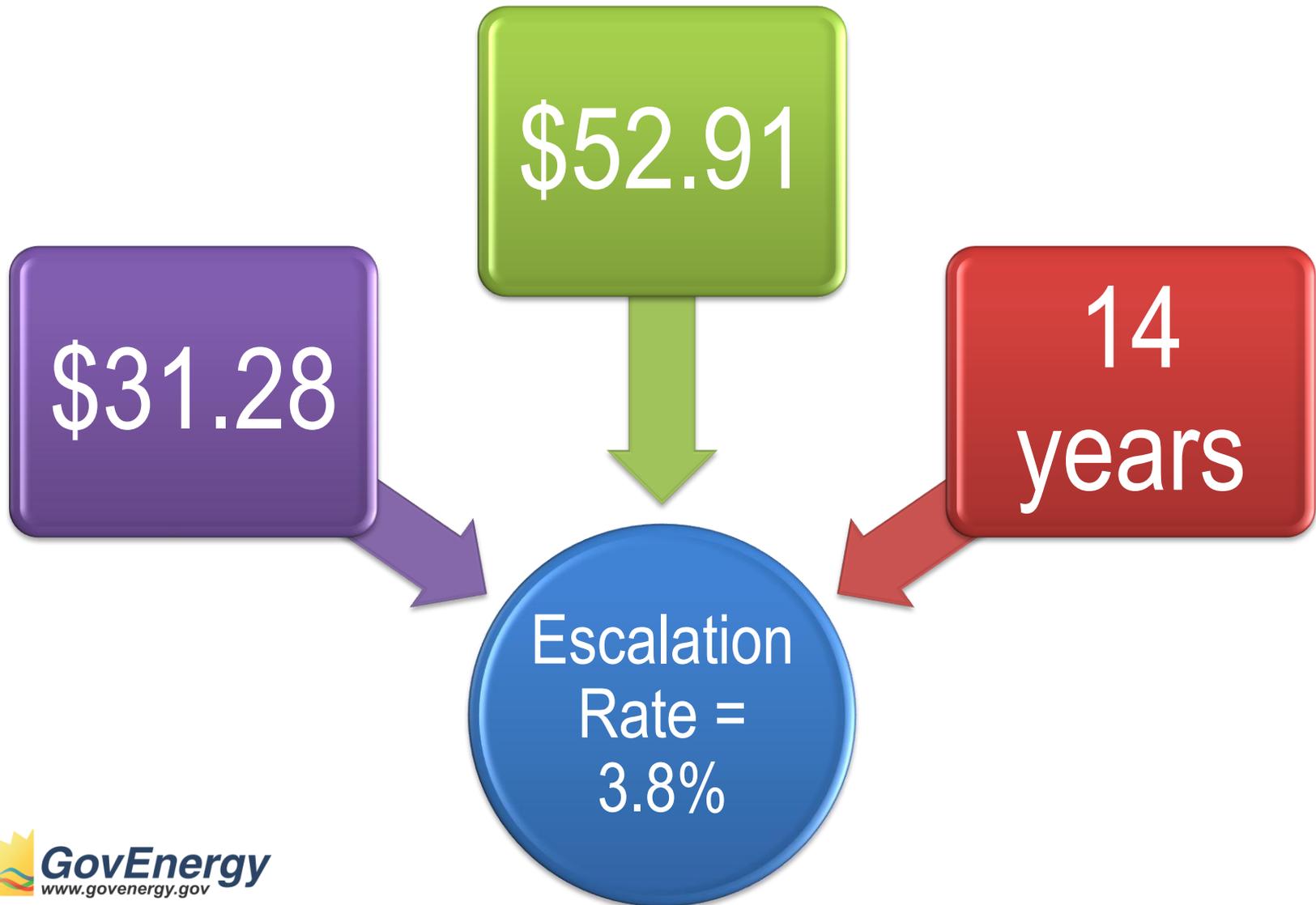
Water Rate Escalation

- Selection based on distance to Department of Energy facilities
- Data from voluntary surveys to Ernst & Young, Raftelis Financial Consultants, and American Water Works Association
- Survey years: 1994, 2002, 2008
- Non-manufacturing and industrial rates analyzed

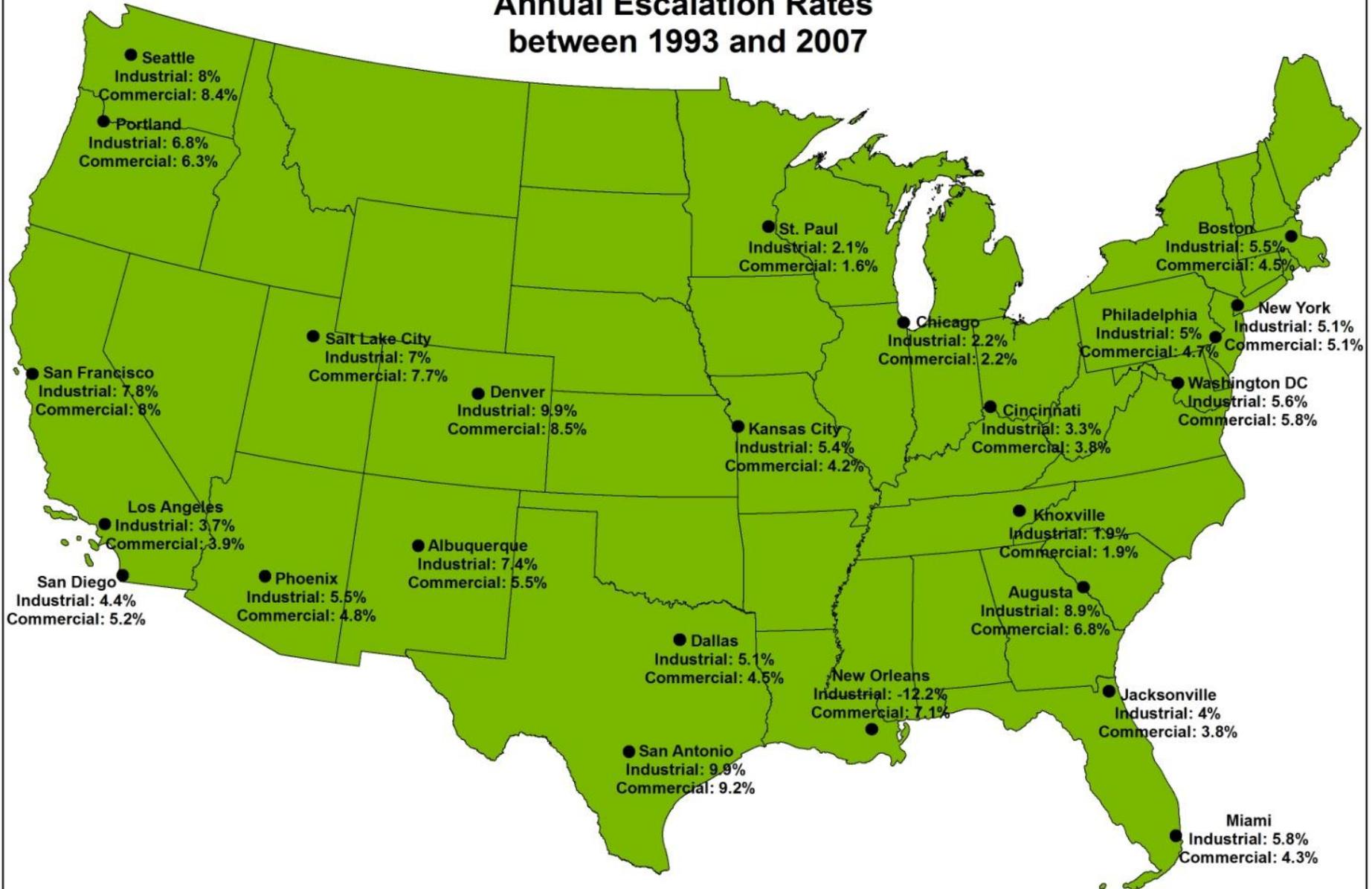
Water Rate Escalation



Water Rate Escalation Example

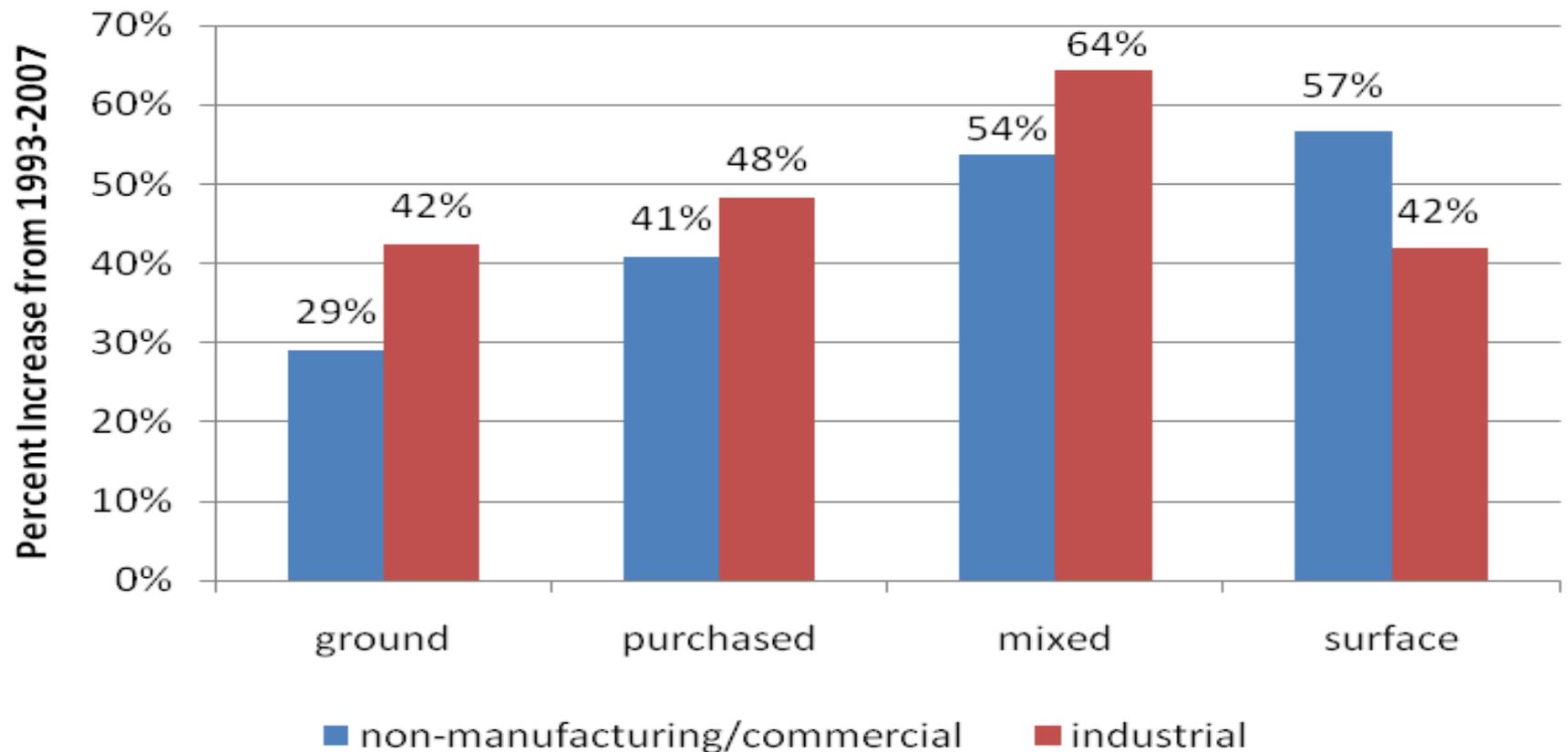


Industrial and Non-manufacturing/Commercial Annual Escalation Rates between 1993 and 2007



Escalation Rate Trends

- Regional Trends
- Source Trends



Drought Impacts

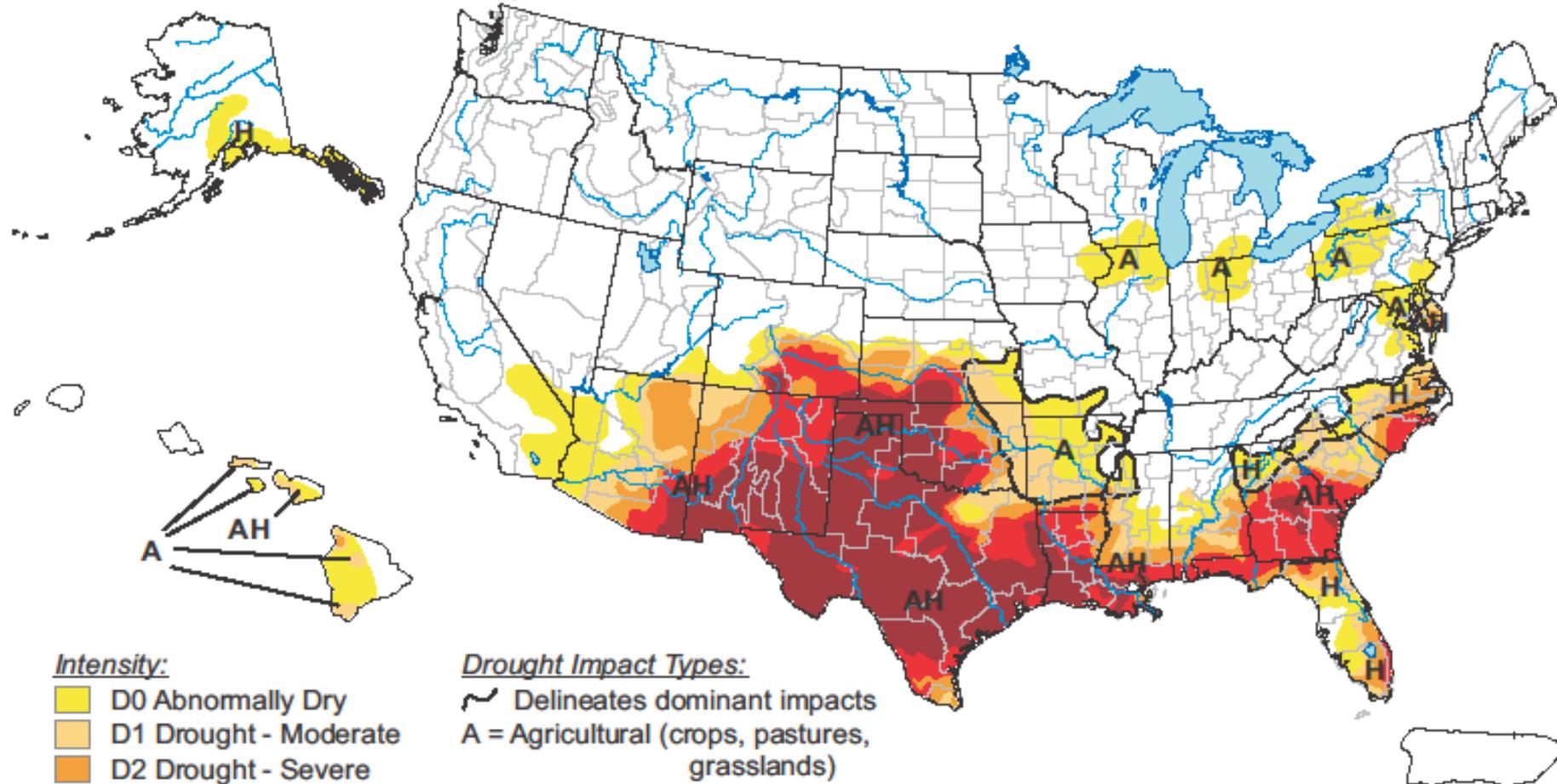
- Palmer Drought Severity Index
- 1895-1995 long range historical drought conditions
- 1996-2010 short range historical drought conditions
- 3 month forecast drought conditions

Palmer Drought Severity Index

- Established to compare meteorological moisture conditions of climate regions
- Positive Palmer numbers indicate excess moisture – flooding
- Negative Palmer number indicate lack of moisture – drought

U.S. Drought Monitor

July 19, 2011
Valid 8 a.m. EDT



Intensity:

-  D0 Abnormally Dry
-  D1 Drought - Moderate
-  D2 Drought - Severe
-  D3 Drought - Extreme
-  D4 Drought - Exceptional

Drought Impact Types:

-  Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

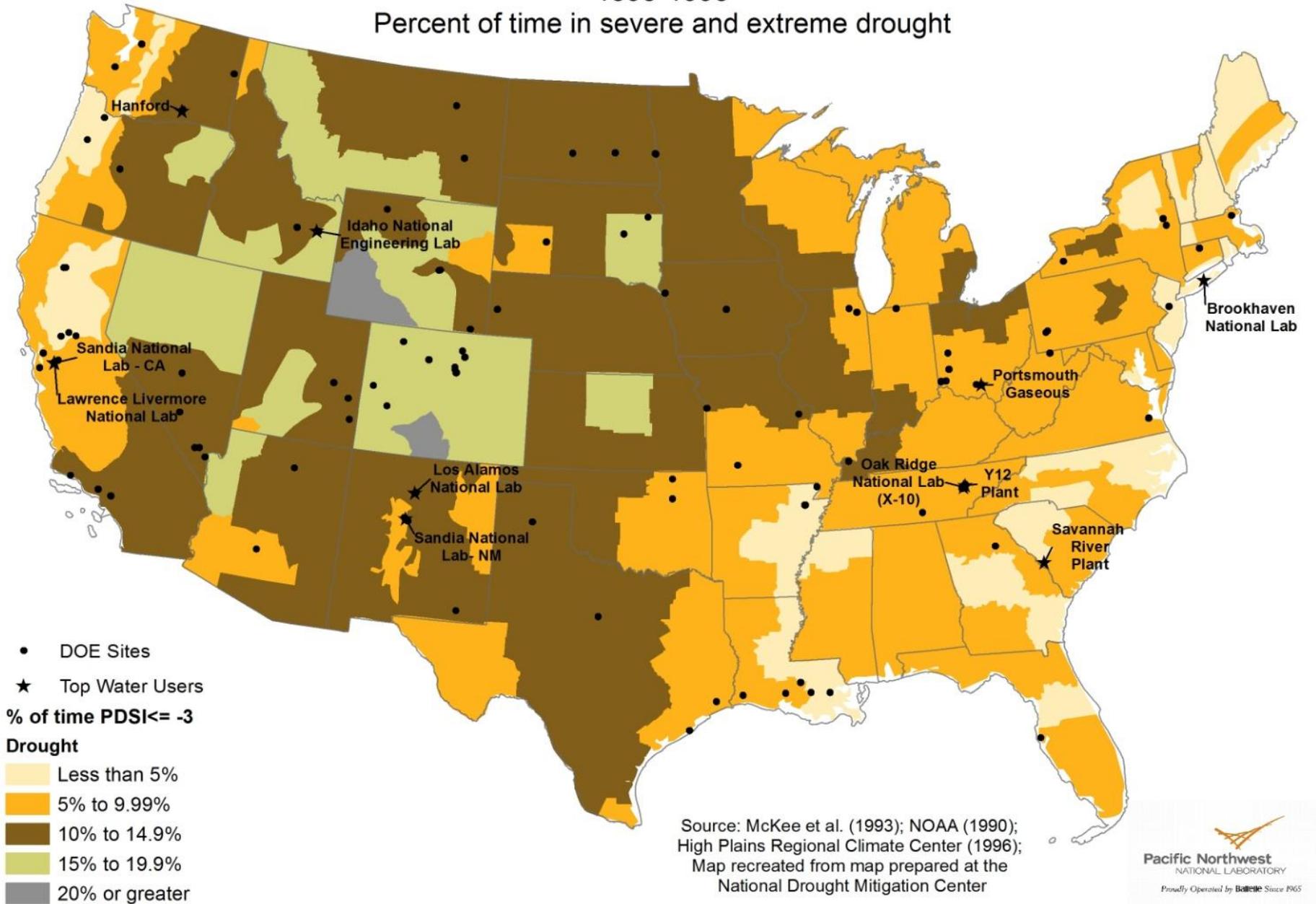


Released Thursday, July 21, 2011
Author: Matthew Rosencrans, NOAA/NWS/NCEP/CPC

Palmer Drought Severity Index

1895-1995

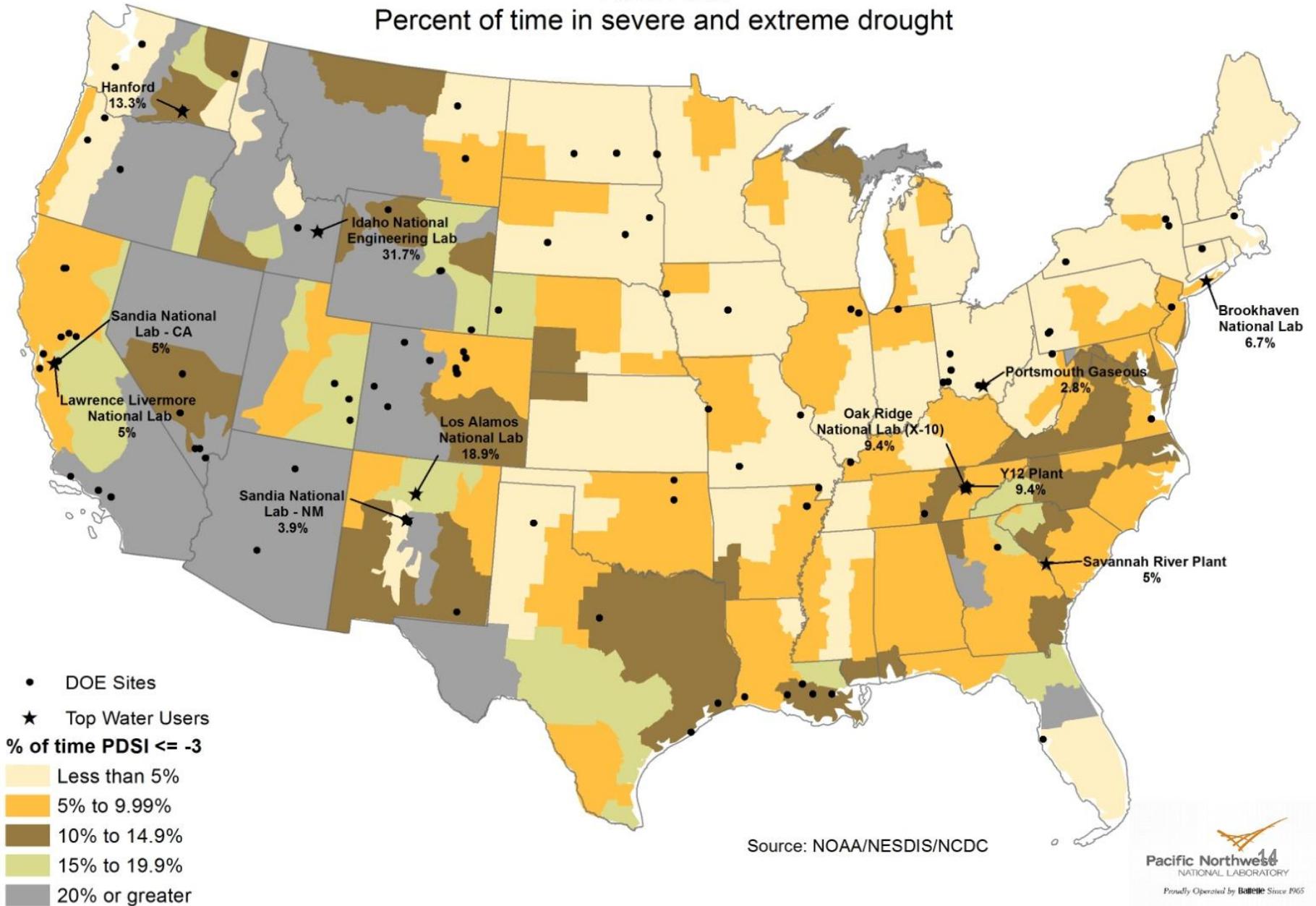
Percent of time in severe and extreme drought



Palmer Drought Severity Index

1996-2010

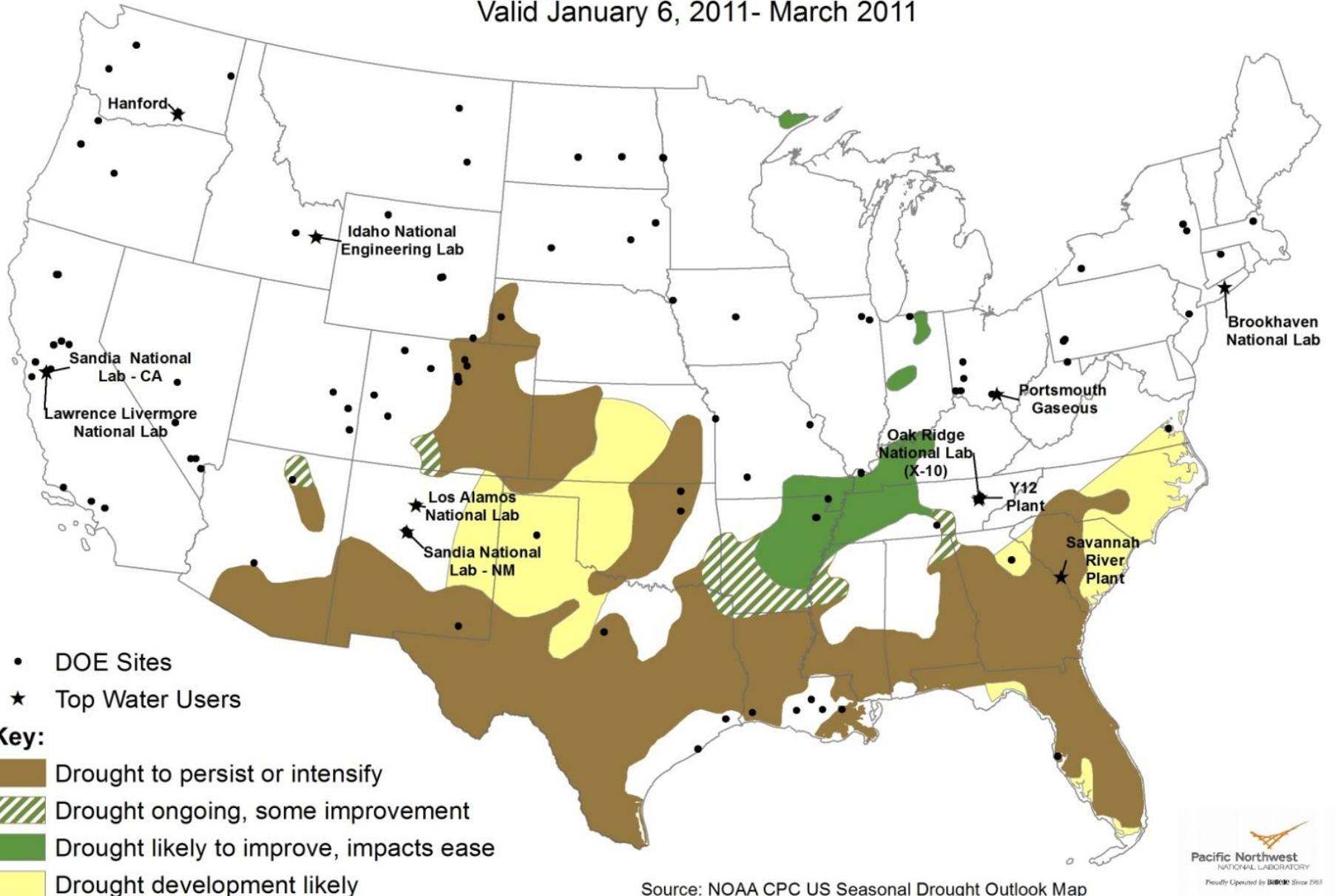
Percent of time in severe and extreme drought



U.S. Seasonal Drought Outlook

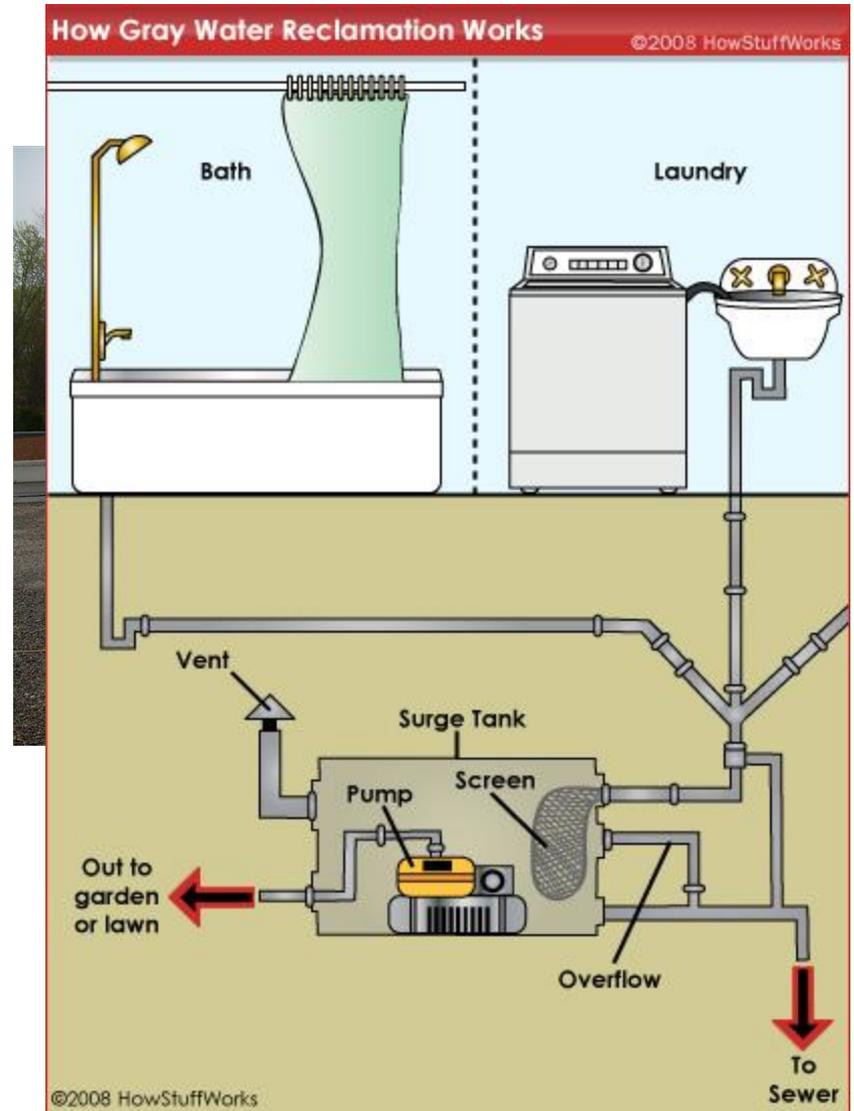
Drought Tendency During the Valid Period

Valid January 6, 2011- March 2011



Alternate Sources of Water

- Reclaimed Wastewater
- Gray Water
- Stormwater Harvesting
- Rainwater Harvesting
- Condensate Capture



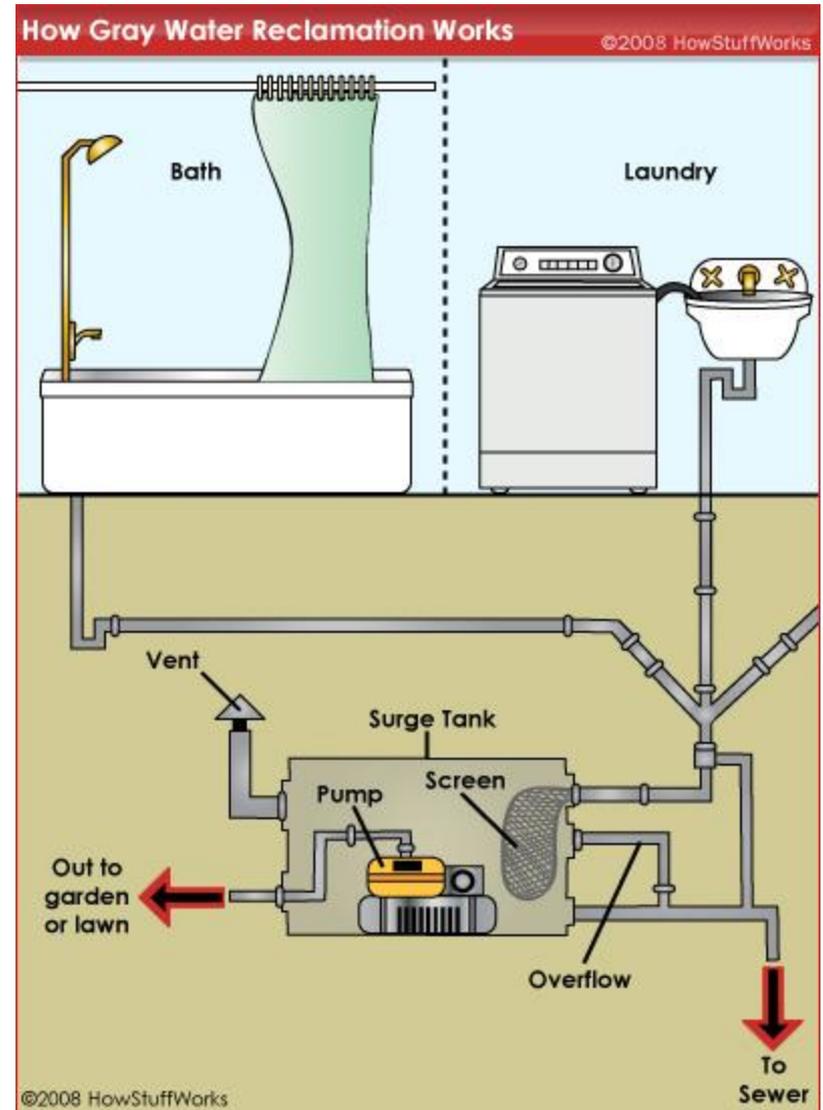
Reclaimed Wastewater

- Supplied from wastewater treatment facility
- Generally less expensive than potable water
- EPA Guidelines available online
 - EPA/625/R-04/108
- Regulated by local codes



Gray Water

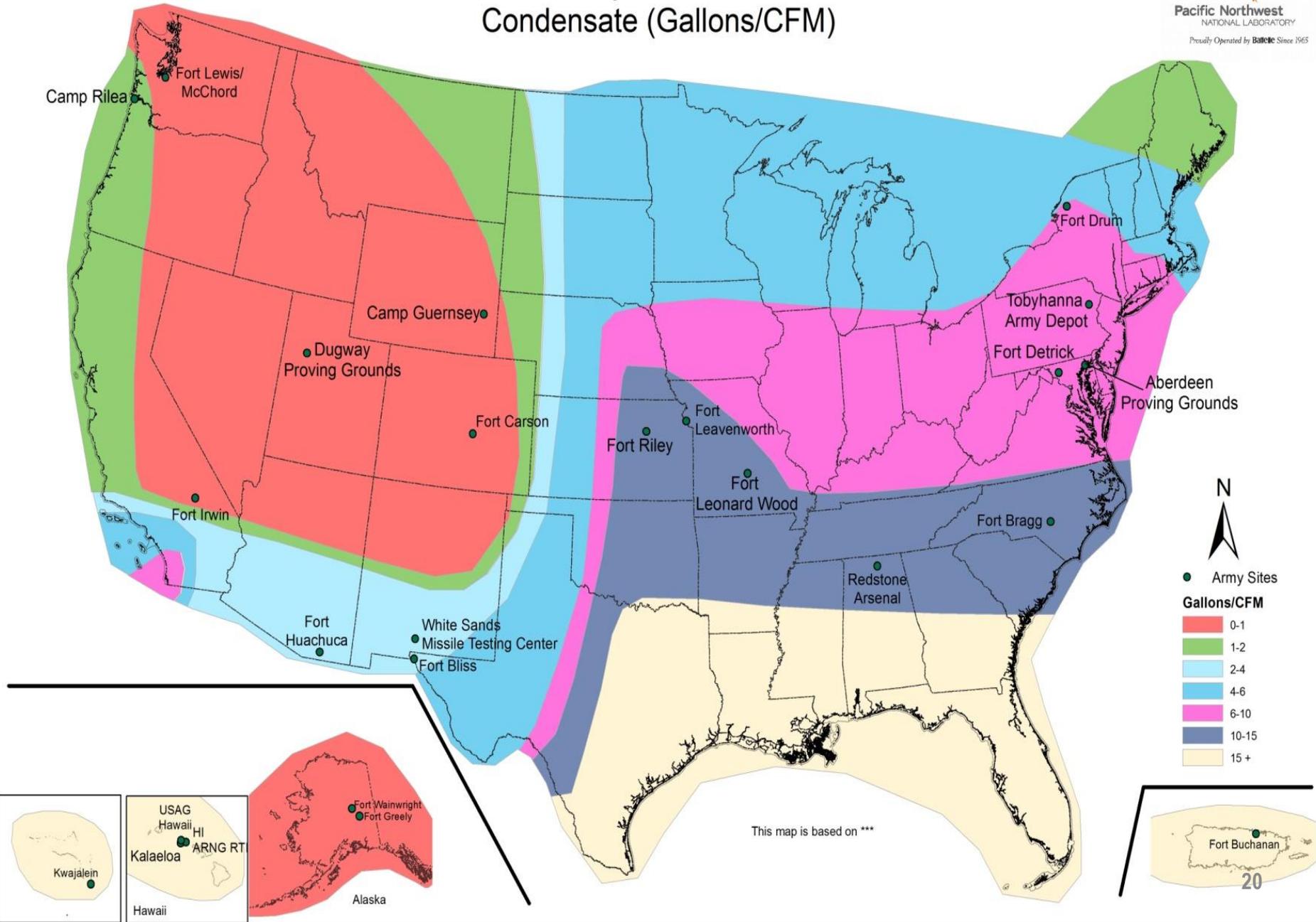
- Water sources
 - Bathroom sink wash water
 - Laundry sink wash water
 - Tubs
 - Clothes washers
- NOT gray water sources
 - Toilet and urinal
 - Dishwashers
 - Kitchen sink wash water



Stormwater and Rainwater Harvesting

- Stormwater
 - Collected from all impervious surfaces
 - Water quality treatment may be necessary
 - Used for many non potable uses
- Rainwater
 - Collected from roofs
 - Stored in cisterns
 - Minimal treatment required before use

Army Sites with Condensate (Gallons/CFM)



Alternate Water Source Example

Fort Carson Golf Course

- Reclaim Water for Irrigation
 - Near Colorado Springs, Colorado
 - Receives 16 inches of rain annually
 - Regulating agency is Department of Public Health and Environment
 - Plant is rated to produce 3 million gallons per day
 - Saves Fort Carson approximately 100 million gallons annually
 - Saved \$215,000 in 2008



Alternate Water Source Example

EPA Science and Ecosystem Support Division



- Condensate Capture

- Athens, GA
- Project captures condensate water from air handling units
- Condensate is sent to near-by cooling towers for make-up water
- System collected over 540,000 gallons of condensate in 2008
- Saved \$3,500 between May and December 2008



Questions?

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www.femp.energy.gov/program/waterefficiency.html