Water-for-energy: The state of current data and near-term options

June 5, 2018

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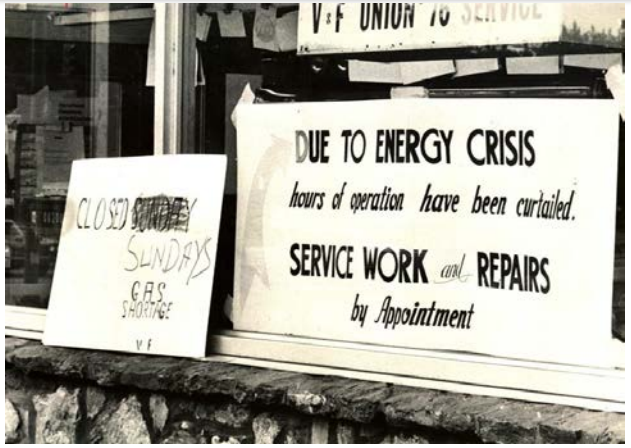
A crisis is a terrible thing to waste…



EIA was created…

"…unified energy data and information program which will collect, evaluate, assemble, analyze, and disseminate data and information which is relevant to energy resource reserves, energy production, demand, and technology, and related economic and statistical information, or which is relevant to the adequacy of energy resources to meet demands in the near and longer term future for the Nation's economic and social needs.

Public Law 95-91, Section 205

What about water?

Argonne NATIONAL LABORATORY

Impacts of Long-term Drought on Power Systems in the U.S. Southwest

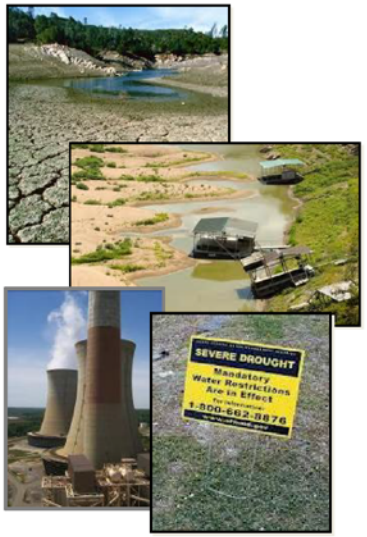
Prepared for:

U.S. Department of Energy
Office of Electric Delivery and Energy Reliability

Infrastructure Security and Energy Restoration

Purposes of the Study

- **Develop a hypothetical but plausible drought scenario involving the U.S. Southwest**
- **Assess the impacts of the drought scenario on the power systems comprising the U.S. Southwest:**
  - supply-demand balance
  - thermal and hydro capacity losses
  - reserve margin reductions
  - overall system reliability and vulnerability



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U.S. DEPARTMENT OF ENERGY

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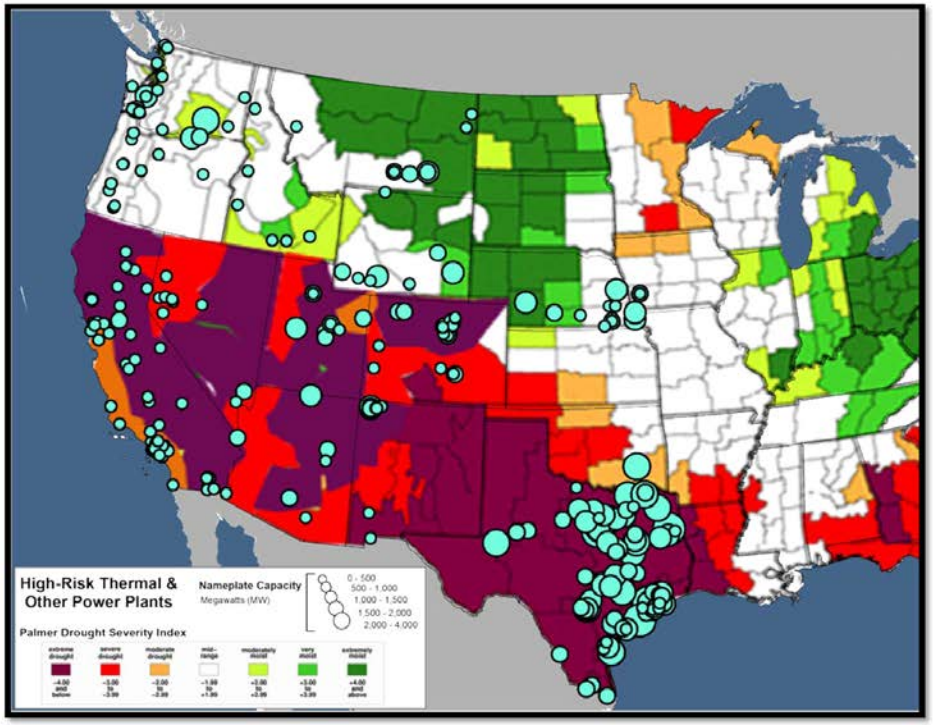
Dispersal Pattern of High-Risk Thermal Plants within WECC and ERCOT



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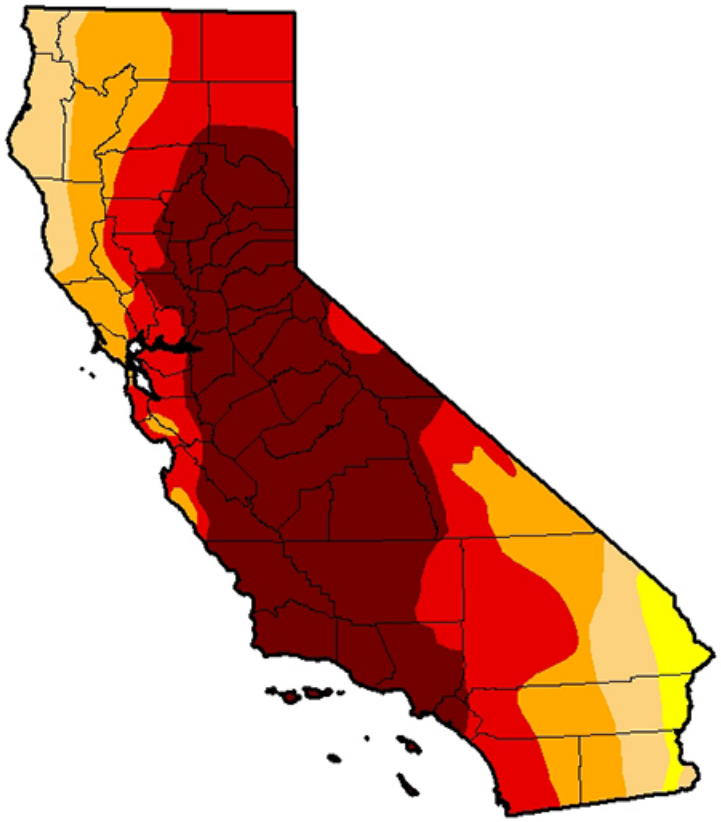
Water Directly Affects the US Energy Demand



U.S. Drought Monitor

California

January 12, 2016

(Released Thursday, Jan. 14, 2016)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	97.33	87.55	69.07	42.66
Last Week 1/5/2016	0.00	100.00	97.33	87.55	69.07	44.84
3 Months Ago 10/13/2015	0.14	99.86	97.33	92.36	71.08	46.00
Start of Calendar Year 12/29/2015	0.00	100.00	97.33	87.55	69.07	44.84
Start of Water Year 9/29/2015	0.14	99.86	97.33	92.36	71.08	46.00
One Year Ago 1/13/2015	0.00	100.00	98.12	94.34	77.52	39.15

Intensity:

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

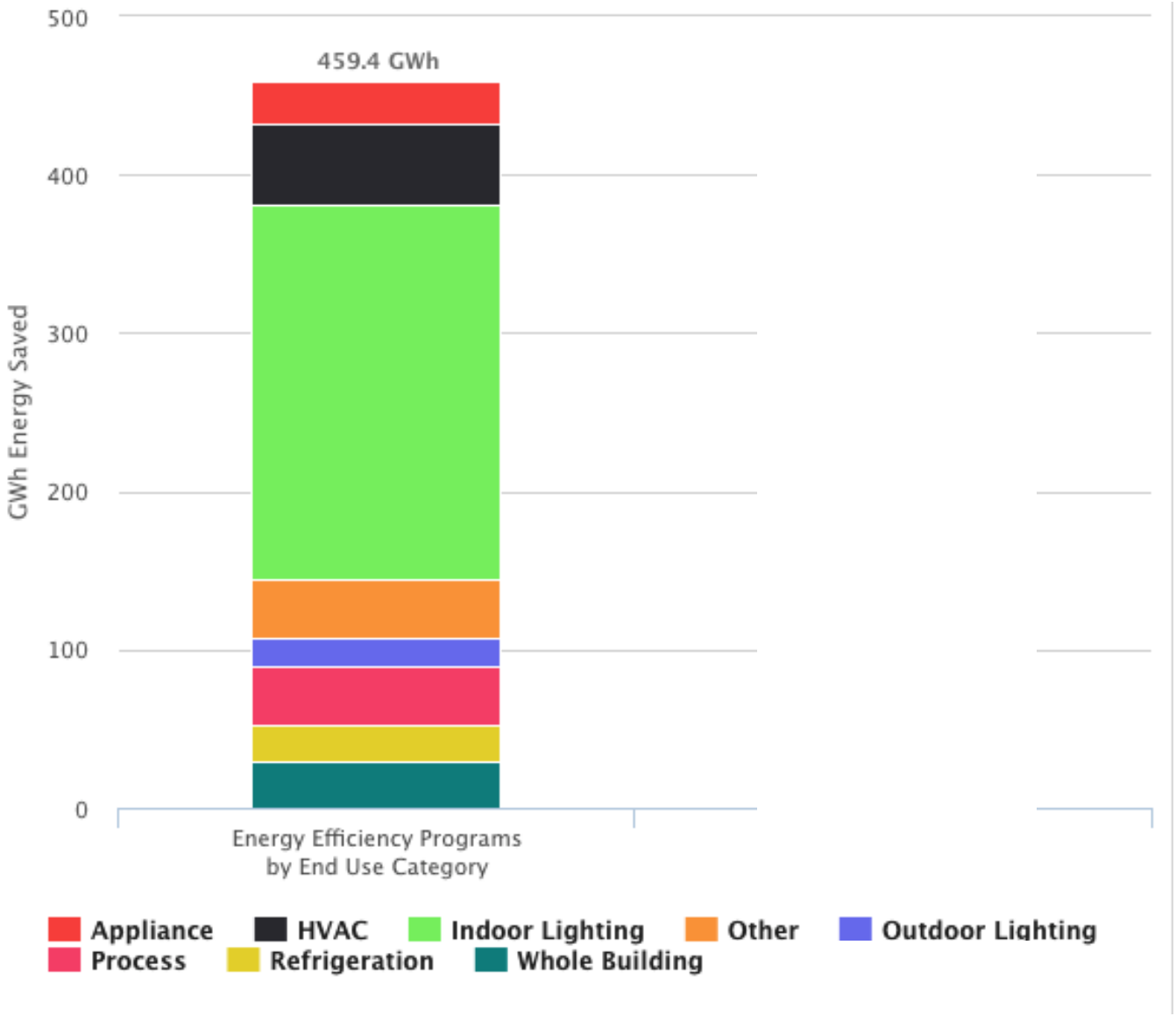
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Brian Fuchs
National Drought Mitigation Center

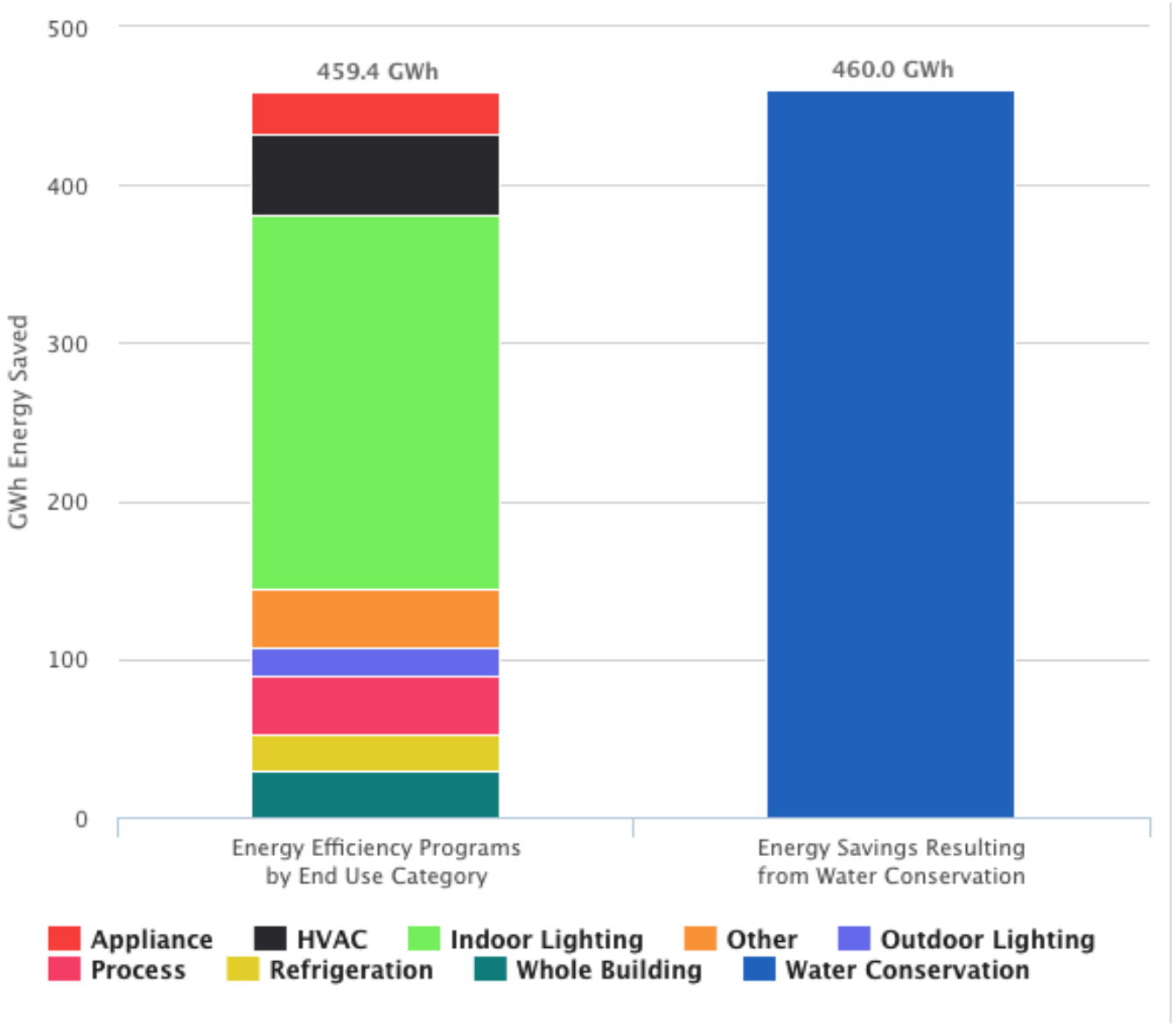
http://droughtmonitor.unl.edu/

State-wide conservation led to ~25% reduction in water use

California invests ~$800M in energy conservation measures… how much energy is saved when you conserve water?



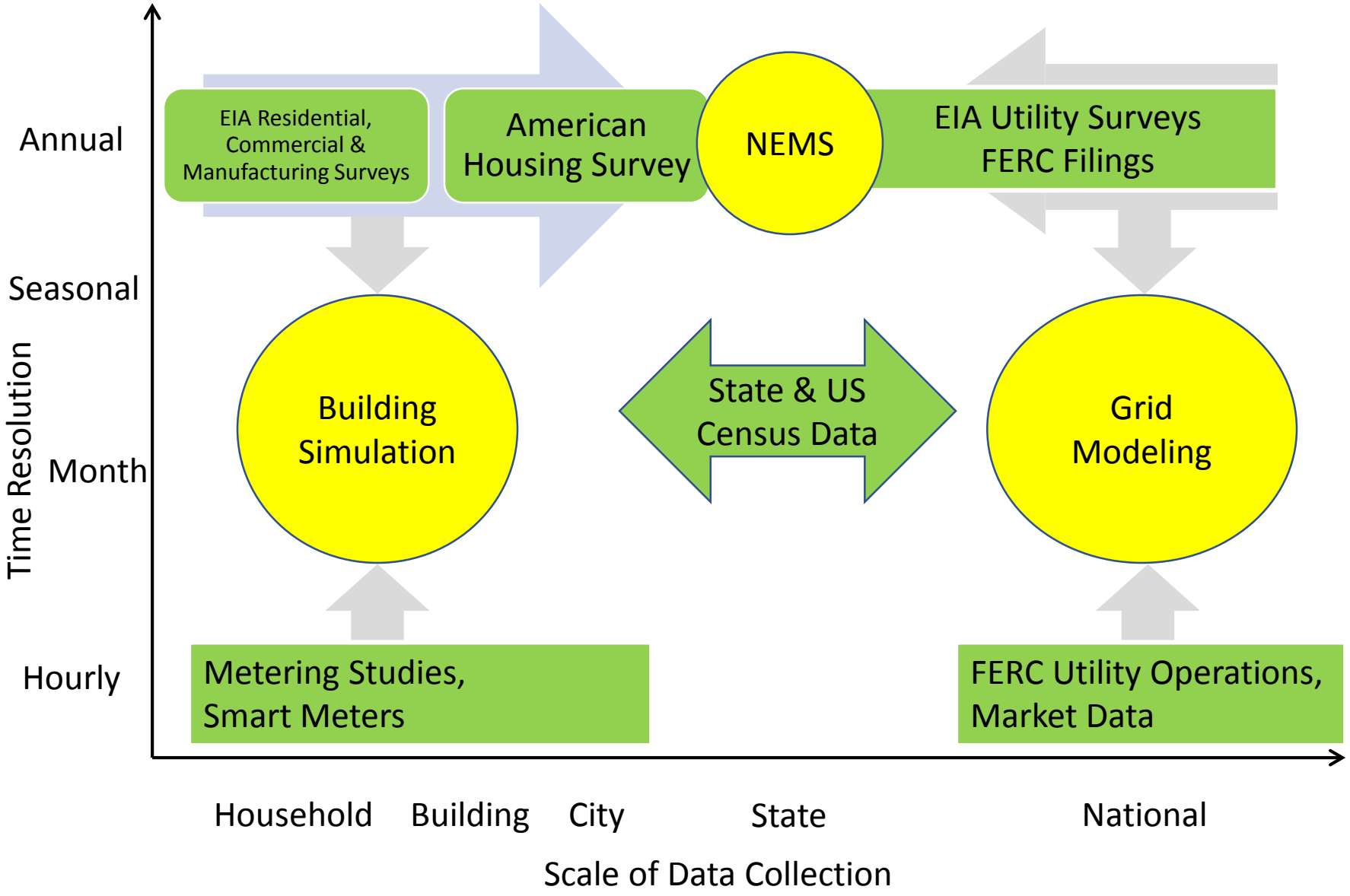
Water conservation during the drought saved as much energy as ALL other conservation programs… combined



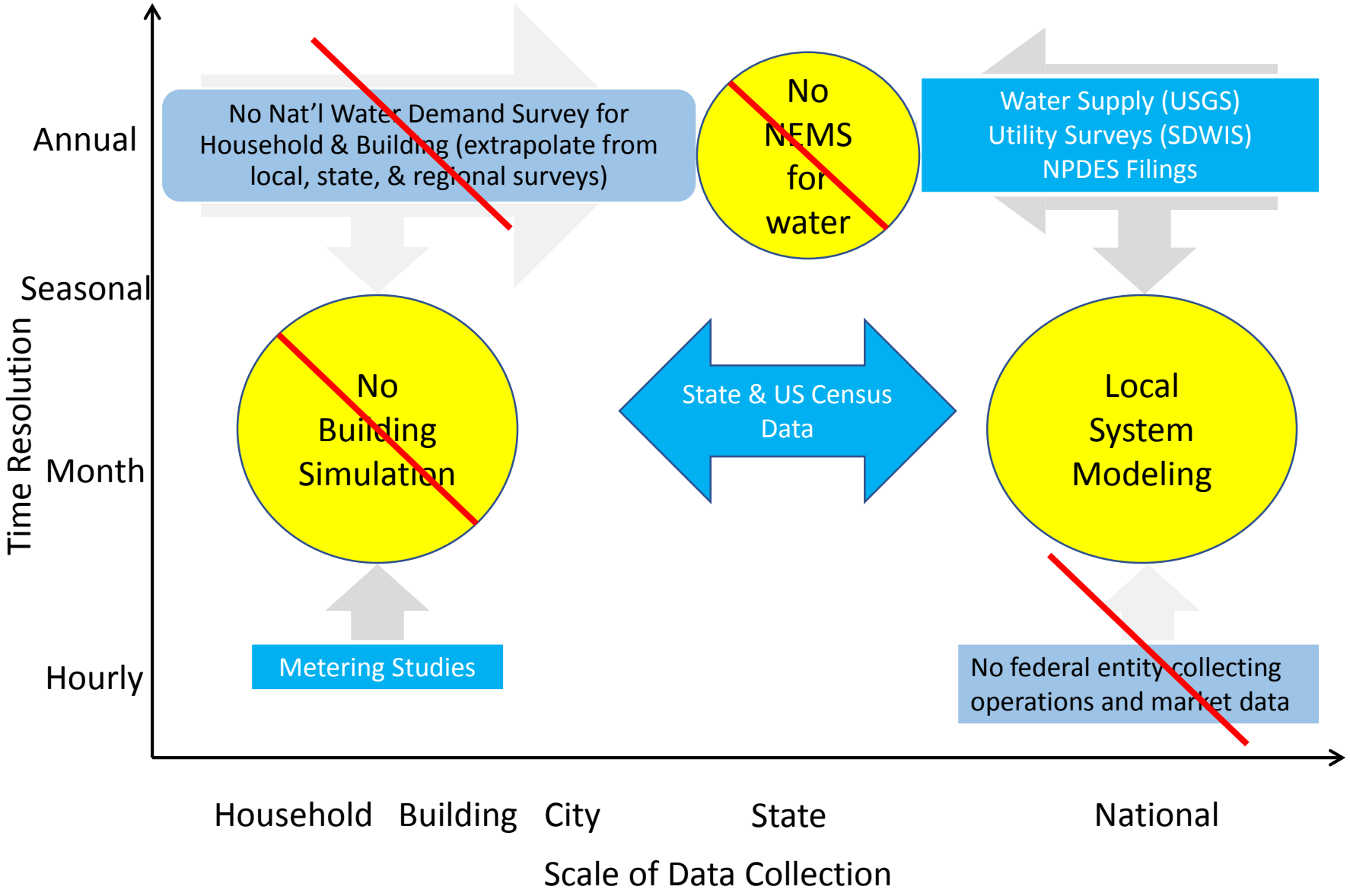
Spang et al., 2018

This was a complete surprise to everyone

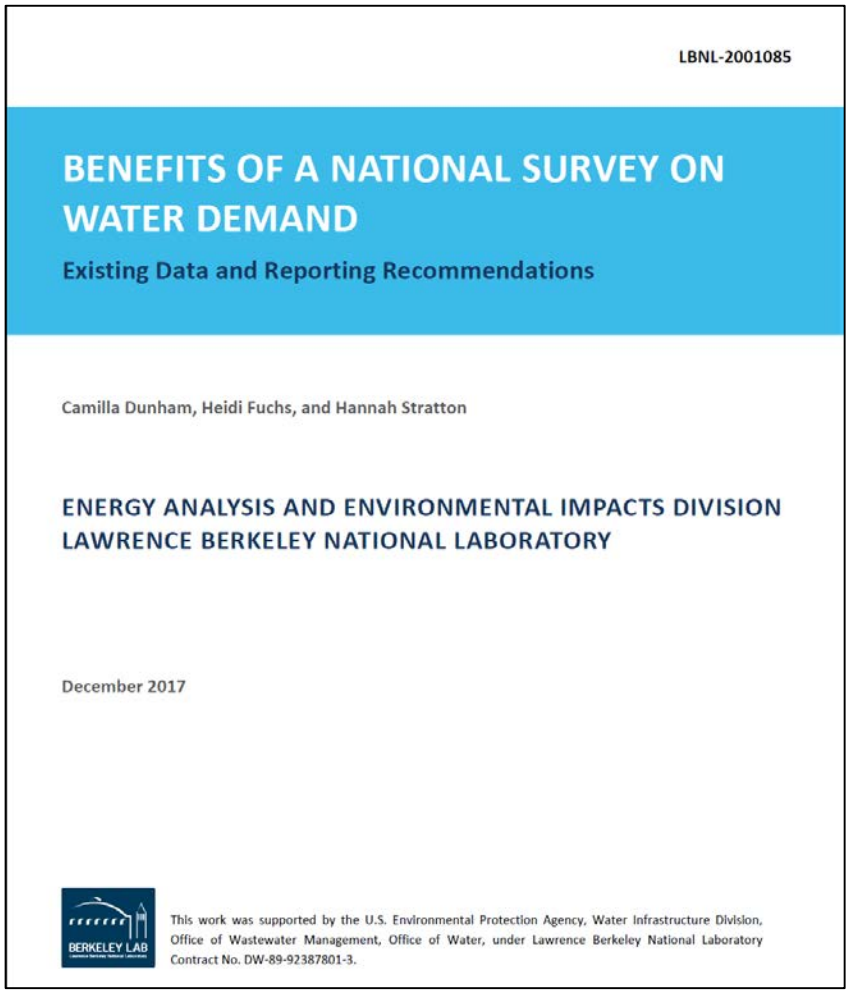
Scope of Available Energy Data



Scope of Available Water Data



National data on water supply AND demand are needed…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BENEFITS OF A NATIONAL SURVEY ON WATER DEMAND

Existing Data and Reporting Recommendations

Camilla Dunham, Heidi Fuchs, and Hannah Stratton

ENERGY ANALYSIS AND ENVIRONMENTAL IMPACTS DIVISION
LAWRENCE BERKELEY NATIONAL LABORATORY

December 2017

BERKELEY LAB

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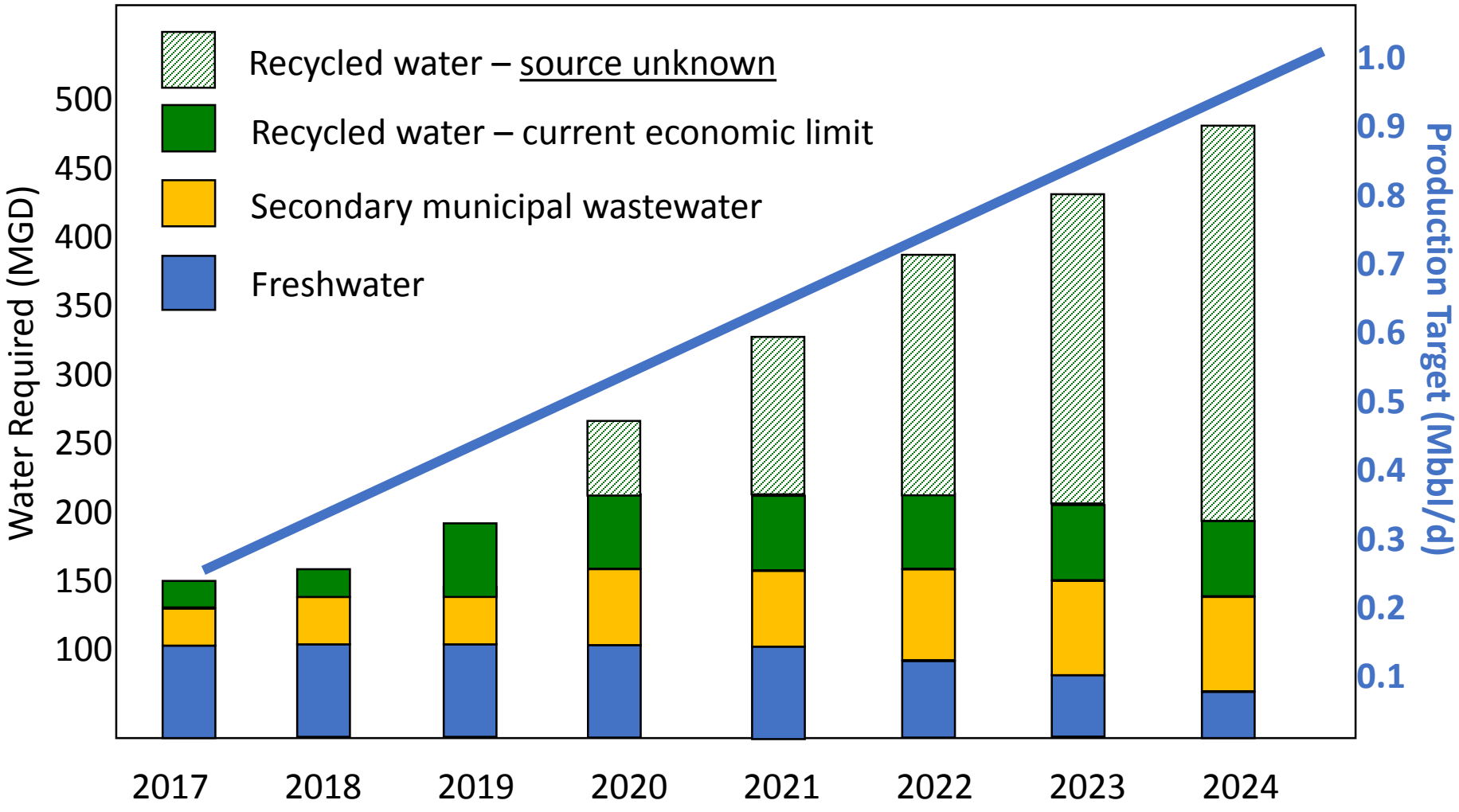
Dunham, Fuchs and Stratton, 2017

- Provide local utilities and planning agencies with data and tools they need to improve their operations and to secure adequate water supply
- Enable the creation of a long-term supply planning framework that deals effectively with hydrological uncertainty and water quality
- Provide methods to evaluate the benefits and economic value of alternative water sources such as reuse and storm water capture
- Link demand between all sectors

US unconventional oil and gas production will be limited by water



WATER DEEPLY

Water Conservation Saves Energy in California

Our panelists

Melissa Harris – is the USGS Regional Water-Use Specialist for the southeast and a member of the USGS National Water Use Leadership Team whose responsibilities include compiling and disseminating the nation's water-use data.

Rick McCurdy – is the Senior Engineering Advisor for Chesapeake Energy in Oklahoma City, OK. Rick has spent much of his career in treating oilfield water systems and is an expert in the reclamation and reuse of produced brines.

Dan Yates - is the Associate Executive Director of the Ground Water Protection Council. The GWPC's members consist of state ground water regulatory agencies The GWPC is dedicated to promoting and ensuring the use of best management practices and fair but effective laws regarding comprehensive ground water protection.