The Drought and NRCS’s Water Efficiency Improvement Activities

Rob Sampson
National Water Management Engineer, NRCS

NRCS provides technical assistance on private lands to farmers, ranchers, Indian Tribes and local governments.

NRCS has offices in most counties to deliver National conservation programs. NRCS works with locally elected Soil and Water Conservation Districts to set conservation priorities.
• Get inside consumers’ heads (Schawbe)
• Increase role of water markets (Jessoe)
• Tiered water pricing works – and it’s legal (Baerenklau)
• Keep closer tabs on crop water use (Medellín-Azuara)
• Monitor and manage our groundwater (MacEwan)
Rich Californians balk at limits: ‘We’re not all equal when it comes to water’

By Rob Kuznia  June 13

People “should not be forced to live on property with brown lawns, golf on brown courses or apologize for wanting their gardens to be beautiful,” Yuhas fumed recently on social media. “We pay significant property taxes based on where we live,” he added in an interview. “And, no, we’re not all equal when it comes to water.”

White House Focuses on Drought and Wildfire Threats

Funding for water and land management, crop insurance relief, and jobs aims to lessen drought impacts and improve protection from wildfires.

Credit: Don DeBold  CC BY 2.0
By RANDY SHOWSTACK  18 June 2015
Everything I thought I knew about water in California is wrong
By Nathanael Johnson on 20 Apr 2015

Urban dwellers (reasonably) thought, *I don’t want to be a dupe and scrimp and save if agriculture isn’t doing the same.* So why didn’t California also demand that ag cut back? It actually did, said Doug Parker, director of the University of California Institute of Water Resources. Brown just didn’t talk about that when he made his big announcement (he’s probably kicking himself about that). Growers that rely on the State Water Project are taking an 80 percent cut from their normal water share.

Agriculture uses 80 percent of California’s water: Not the whole picture
This isn’t exactly wrong, but it’s useful to understand the nuance. Here’s how water is divvied up in California:

[Diagram showing California Water Use]

You do get farmers using 80 percent of water and cities using 20 percent if you don’t count the other pieces of the pie. But those pieces are important, and by no
Concentration: 7 states shown account for 60% of national irrigated area.

Source: Census of Agriculture, various years
Sources of irrigation water, total and by region

Irrigation Overview

Importance of irrigation in crop production, by region

Cropland irrigated (%)

Acre-feet (1,000)

Source: NRCS analysis of USGS Water Use data

Source: NRCS analysis of Census of Agriculture Data
Estimated sales for irrigated grain crops, by region, 2007

Source: NRCS analysis of Census of Agriculture Data

Estimated sales for irrigated non-grain crops, by region, 2007

Source: NRCS analysis of Census of Agriculture Data
Recent irrigated acres and water application levels show per acre water applications declining from improved technology and changing location of irrigation.
NRCS Irrigation Activities – Water Application Systems

Surface Irrigation

Sprinkler Irrigation

Micro Irrigation

NRCS Irrigation Activities

Number of Applied NRCS Irrigation Practices, 2006-2014

Total practices applied 131,747

- 31,680
- 29,259
- 12,144
- 25,137
- 10,636
- 22,891

Pipe line
Pumping plant
Sprinkler
Microirrigation
Surface & Support
Management
NRCS Irrigation Activities


Total Obligations $1.4 billion

- Pipeline: 314
- Pumping plant: 166
- Sprinkler: 30
- Microirrigation: 123
- Surface & Support: 484
- Management: 272

Chart labels in $ millions

NRCS Irrigation Activities


- Georgia: practices applied 6,399
- California: practices applied 11,008
- Arkansas: practices applied 5,365
NRCS Irrigation Activities

Irrigation Water Management

NRCS requires water management to be included with all irrigation design, planning and payment activities.
NRCS Water Management Activities

NRCS has a suite of Water Management Activities beyond Irrigation: Drainage Water Management, Water Table Management, and a Range of Water Quality Improvement Practices.

Denitrifying Bioreactor removes N from drainage water

Drainage Water Management structure

Water Table Control

Outlet

Drainage Water Management and water reuse ‘subsurface’
The new drill that Mr. Hundal ordered from Texas should be up and running in a few weeks. He says it can push 2,500 feet into the ground, tapping new aquifers and making way for wells that can produce thousands of gallons of water a minute. He plans to drill at least six new wells on his various farms across the Central Valley: Four of them are in Tulare, and two are on property 100 miles north.

“It’s about survival,” he said. “Everybody is pulling water out of the ground.”
Estimated water application reductions, 2008-2012

Practices to reduce water applications totaled 1.5 maf
Practices to reduce water applications and pressure reduced energy use by 33 mgde

Ogallala is a fossil water aquifer with limited recharge. All water extraction uses energy.
About 60% of reduced withdrawals from practices that convert from irrigation
About 40% of reduced withdrawals from improved management & technology

When valued at 2007 crop sales levels the 1.5 maf converts to $140 million
Reduced energy use of 33 mgde was not valued (at $3 per gallon diesel, $99 million)
NRCS Landscape Initiatives – Ogallala Aquifer Area

Targeting the Ogallala Aquifer Initiative

NRCS targeted funds from the Ogallala Aquifer Initiative to provide meaningful local impact of water application reductions. States chose different approaches.

For example:
Nebraska targeted on regions

Oklahoma targeted near towns in the Panhandle

For example:
Nebraska targeted on regions

Oklahoma targeted near towns in the Panhandle

NRCS Irrigation Practices

Low Energy Precision Application (LEPA) irrigation.

Subsurface drip irrigation combined with precision farming.
A good example is Tehama County (CA) rancher Sam Williams, who participated in a Farm Bill project in the Anderson Cottonwood Irrigation District (ACID) in 2010. Williams is using 37 percent less irrigation water, due to improved water use efficiency, and his fields have stayed lush and green despite 25 percent water curtailments in 2014 and again this year. Williams says that he has hardly been affected by the drought.

“It’s saving a lot of water,” said Williams. “The new system is much more efficient. It used to take me four days to irrigate everything. Now ... I can do it in 24 hours.

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/newsroom/releases/?cid=NRCSEPRD397606

---

NRCS Irrigation Practices

Case Studies – Marysville Gravity Pressurized Mainline, Idaho

54 inch diameter pipeline, replaces an extensive ditch system. Allows removal of pumps, and delivers water only when needed.

Over 100 cubic feet per second not diverted – Remains in storage for:
- river flow,
- power generation,
- longer irrigation season,
- more crop production.
NRCS Irrigation Practices

Case Studies – Marysville Gravity Pressurized Mainline, Idaho

<table>
<thead>
<tr>
<th>Project</th>
<th>Project:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>168,900</td>
</tr>
<tr>
<td>Flow</td>
<td>211.5</td>
</tr>
<tr>
<td>Low Cost</td>
<td>$22,200,000</td>
</tr>
<tr>
<td>High Cost</td>
<td>$27,700,000</td>
</tr>
<tr>
<td>Outlets</td>
<td>108</td>
</tr>
<tr>
<td>Acres</td>
<td>12,480</td>
</tr>
<tr>
<td>Horsepower</td>
<td>4212</td>
</tr>
<tr>
<td>Low $/acre</td>
<td>$1,800</td>
</tr>
</tbody>
</table>

Administration Response

U.S. Drought Portal

Temperature and Precipitation Products

- The Climate Prediction Center’s (CPC) Seasonal Drought Outlook is issued twice a month. The outlook predicts whether drought will emerge, persist, or end in the next three months. A Monthly Drought Outlook is also available from CPC.

- CPC offers many other products on its homepage, including whether precipitation and temperature are likely to be above or below normal. Forecasts show numerous intervals up to 11 months into the future.

- A graphical interface for the CPC temperature and precipitation forecasts is also available.

- CPC’s official seasonal outlooks incorporate a set of dynamic models showing monthly and seasonal outlooks for temperature, precipitation, and atmospheric conditions.

Additional Products

- Temperature and Precipitation
- Soil Moisture
- Water Use
- Improved Drought Prediction
- NWS Updates

Featured Product

U.S. Seasonal Drought Outlook
Administration Response

Disaster and Drought Information

The United States Department of Agriculture is working with producers, communities, affected states and other agencies to help address the current west-coast drought. Information on this page outlines programs and services available through USDA, coordinated with the seven agencies of the National Drought Resilience Partnership. USDA encourages affected producers to document their losses and to work closely with staff in their local USDA Service Centers.

Additional resources are available on the California Department of Food and Agriculture Drought website.

2015 Drought Disaster Updates

Disaster Fact Sheet Updated 11/13/15
Drought Disaster Designation Map (PDF, 1.4MB)
Text only (accessible) version
Map shows designations due to drought across the country under USDA's allocated role. Any county declared a primary (red) or contiguous (orange) disaster county makes producers in that county eligible for certain emergency aid.

List of Declared Drought Disaster Counties (PDF, 31KB).

Administration Response

Agriculture Secretary Vilsack announces $150 million, new partnership to support water quality and quantity in drought-stricken California

Contact:
USDA Office of Communications (202)720-4623

Resilient Lands and Waters partnership will focus public and private resources towards conserving and restoring the Sierra-Cascade California Headwaters

SUNOL, Calif., June 24, 2015 — Agriculture Secretary Tom Vilsack today joined Interior Deputy Secretary Mike Connor and California Secretary for Natural Resources John Laird to announce a new partnership focused on
Looking Forward

Areas Vulnerable to Post-Fire Flooding and Erosion
State of California (south)

Summary

- Droughts and highly variable weather patterns may be the normal climate.
- Urban dwellers and irrigators alike will need to be more flexible and resilient.
- USDA will continue to provide technical assistance, on the farm.
- NRCS will continue to target funding and technical specialists where the need is the greatest.
Thank you!

Rob Sampson
NRCS National Water Management Engineer

The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers, employees, and applicants for employment on the bases of race, color, national origin, age, disability, sex, gender identity, religion, reprisal, and where applicable, political beliefs, marital status, familial or parental status, sexual orientation, or all or part of an individual's income is derived from any public assistance program, or protected genetic information in employment or in any program or activity conducted or funded by the Department. (Not all prohibited bases will apply to all programs and/or employment activities.)