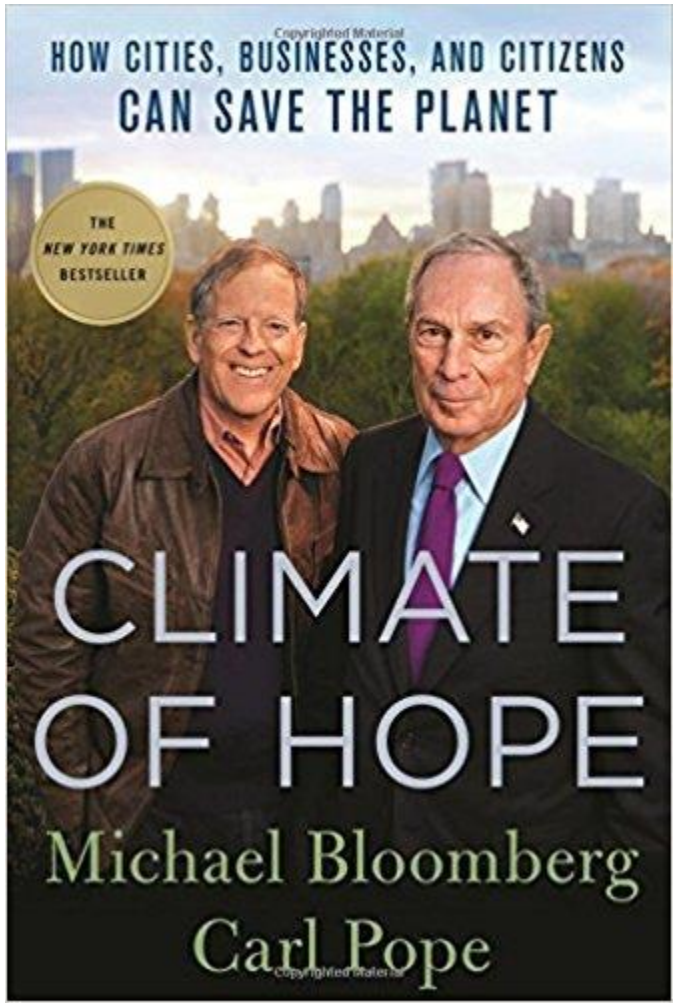
Climate of Hope

Discussion with Berkeley Friends Church

Agenda

- Introduction
- Water Supply
- Clean Energy Transition
- Land Use and Agriculture
- Forests
- Next Steps and Wrap-Up



Water

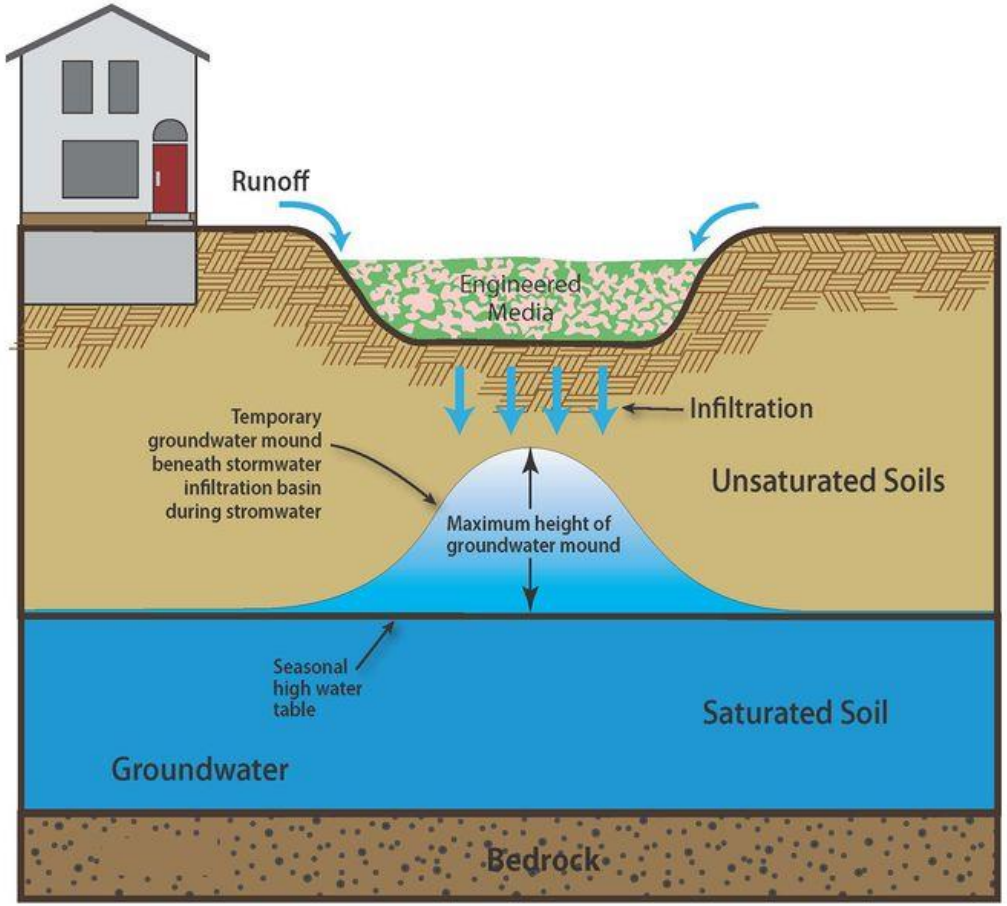
Bad News

- Sudden, Severe Rain storms
- Water wasted
- Drought

Good News

- Impermeable hard scape in the form of concrete and paving can be altered:
  - "Sponge zones"
  - Water squares
  - Parks
  - Bioswales
- Recharging aquifers
- Rain and waste water recycling
- Conservation, Encourage water-capture by farmers

Runoff Capture



Water Square

Groundwater Depletion

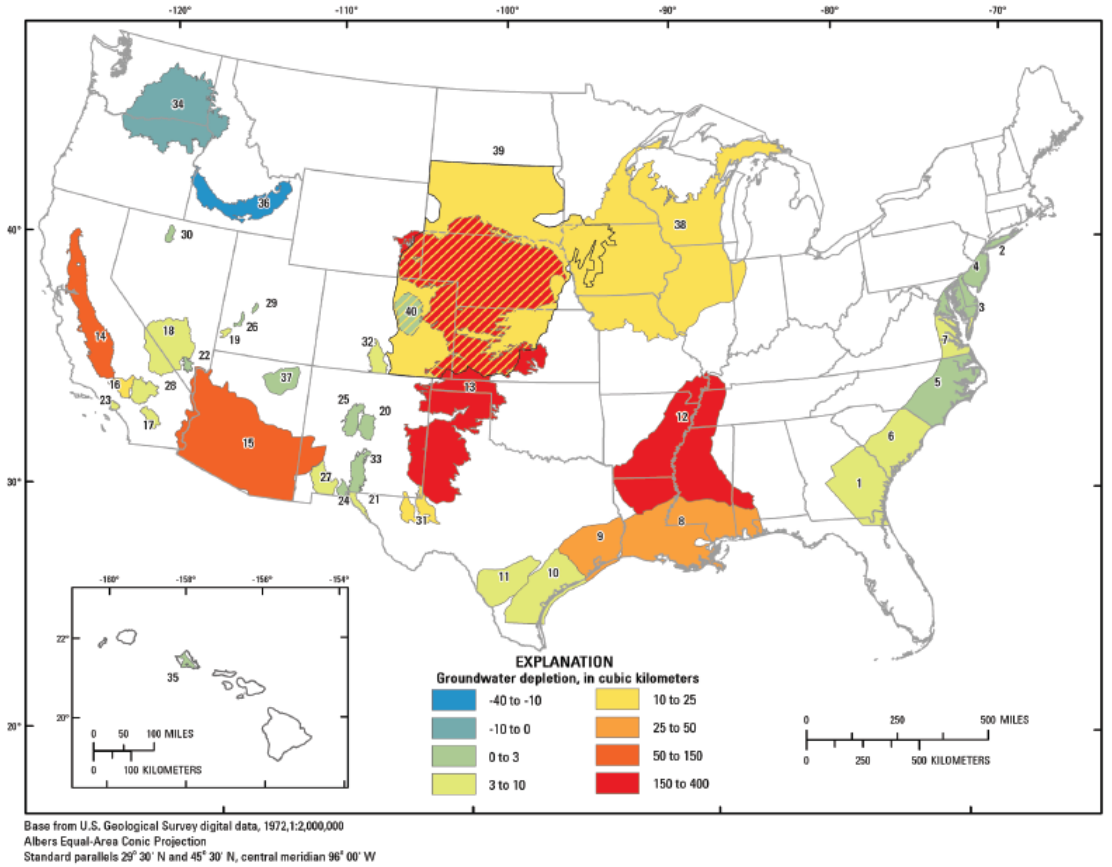
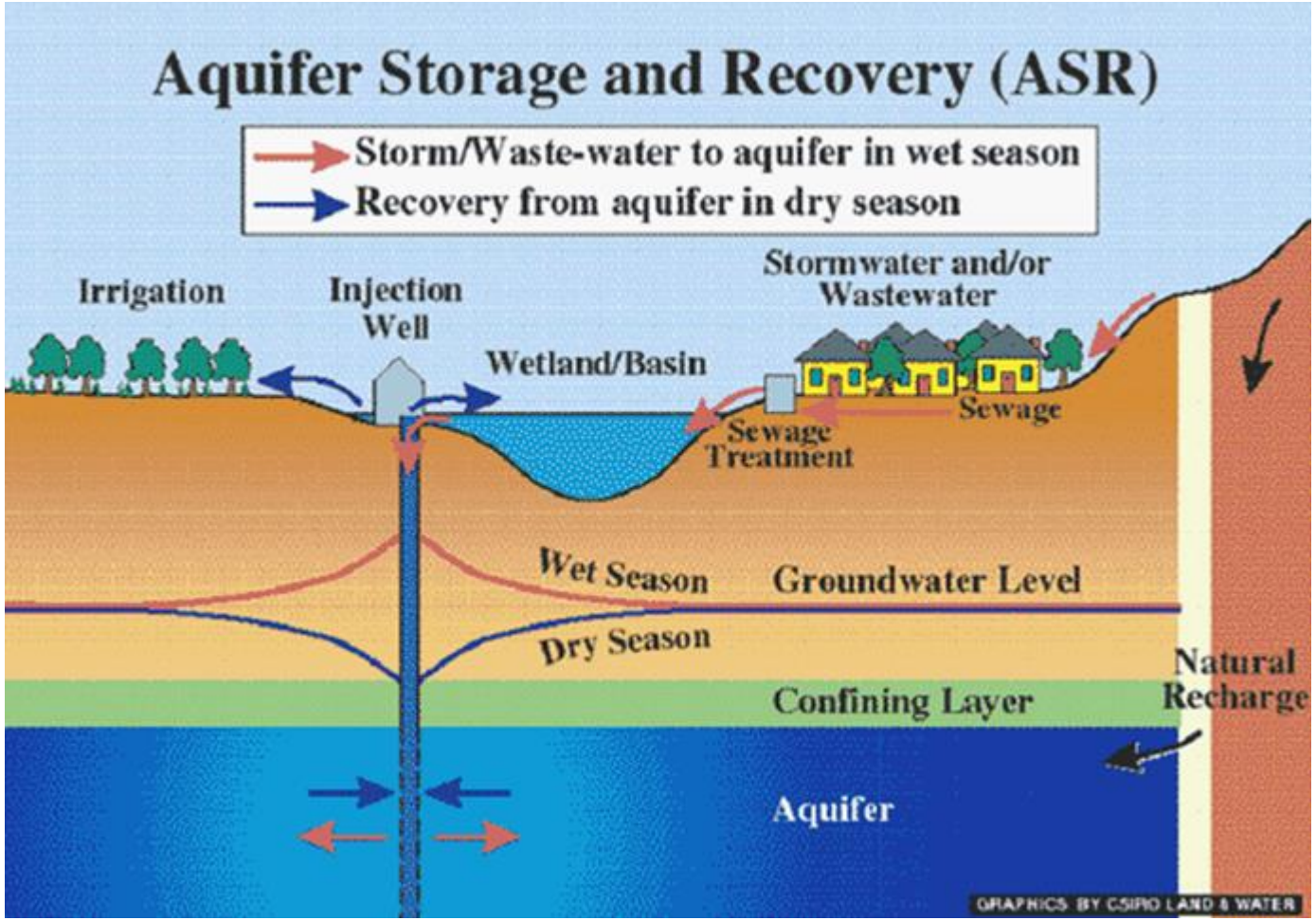


Figure 2. Map of the United States (excluding Alaska) showing cumulative groundwater depletion, 1900 through 2008, in 40 assessed aquifer systems or subareas. Index numbers are defined in table 1. Colors are hatched in the Dakota aquifer (area 39) where the aquifer overlaps with other aquifers having different values of depletion.

Aquifer Storage and Recovery



Energy Use

Bad News

- Cities are the source of 70% of greenhouse gas emissions:
  - Buildings
  - Construction
  - Heating & air-conditioning

Good News

- Quick wins
  - White roofs
  - Efficient lighting
- Green building design
  - Green roofs
  - Use of natural light
  - Rooftop solar panels
  - So much more…
- City leadership is stepping up
- Growth in electric demand has stalled
  - Growth rates of 1% or less the norm

Energy Use

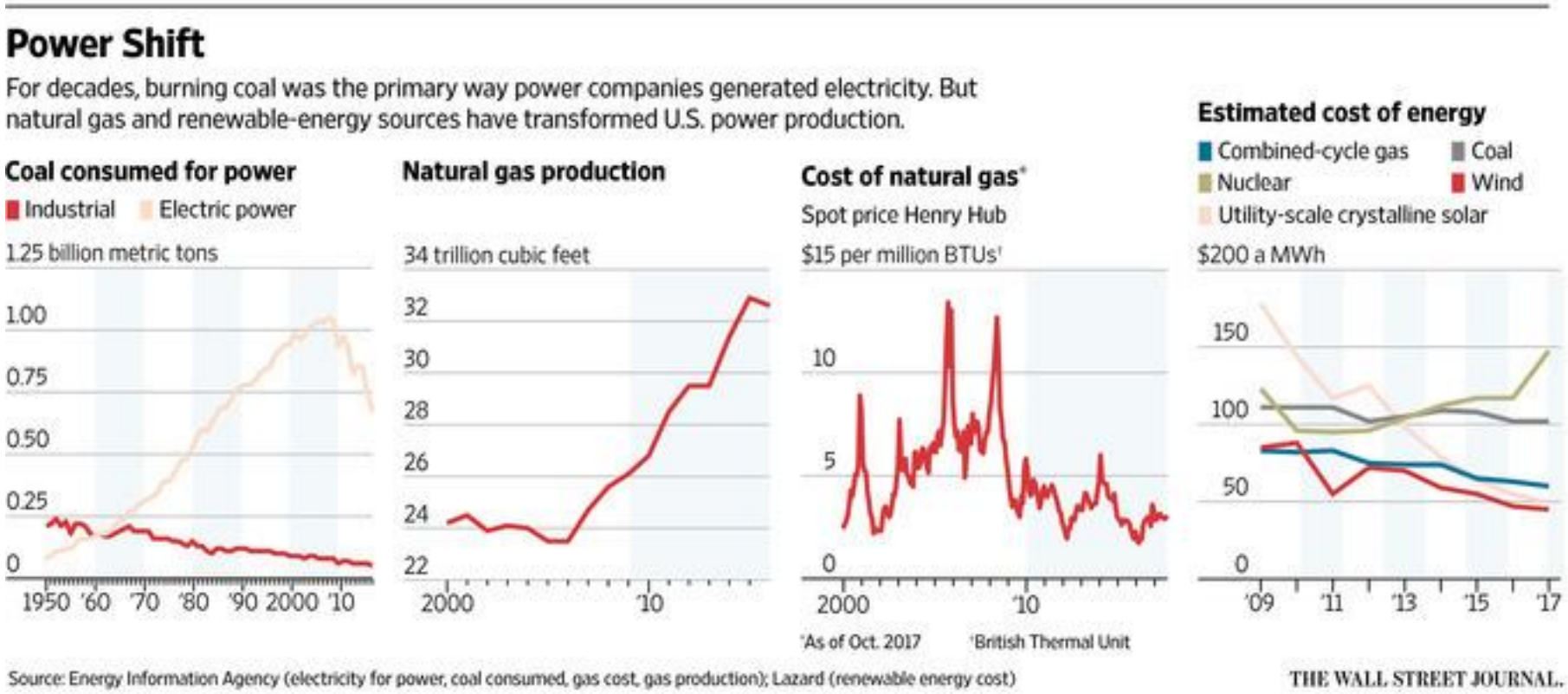
Bad News

- Fossil fuel combustion causes climate change and pollutes the air we breathe
  - Coal is the most destructive fossil fuel
- Coal's Toll
  - Emits one quarter of all greenhouse gas emissions
  - Kills through respiratory disease and toxic mercury
  - Destroys rivers and groundwater
  - Causes acid rain

Good News

- Transition away from coal is underway and accelerating
  - Coal is no longer economically viable
  - Natural gas and wind are cheaper
  - "Beyond Coal Campaign" of the Sierra Club has helped close or phase out 240 plants--more closures are announced all the time

Power Grid Trends



Energy Use

Bad News

- Natural gas extraction from fracking leaks methane into the atmosphere and may pollute water supplies
- Methane holds onto solar heat at a rate of 84% higher than CO_2

Good News

- Shale gas extraction has decimated the coal industry
- Fracking and other fossil fuel extraction should be regulated
  - Methane leaks at wells and pipelines can be plugged
  - Can capture methane instead of flaring it

Energy Use

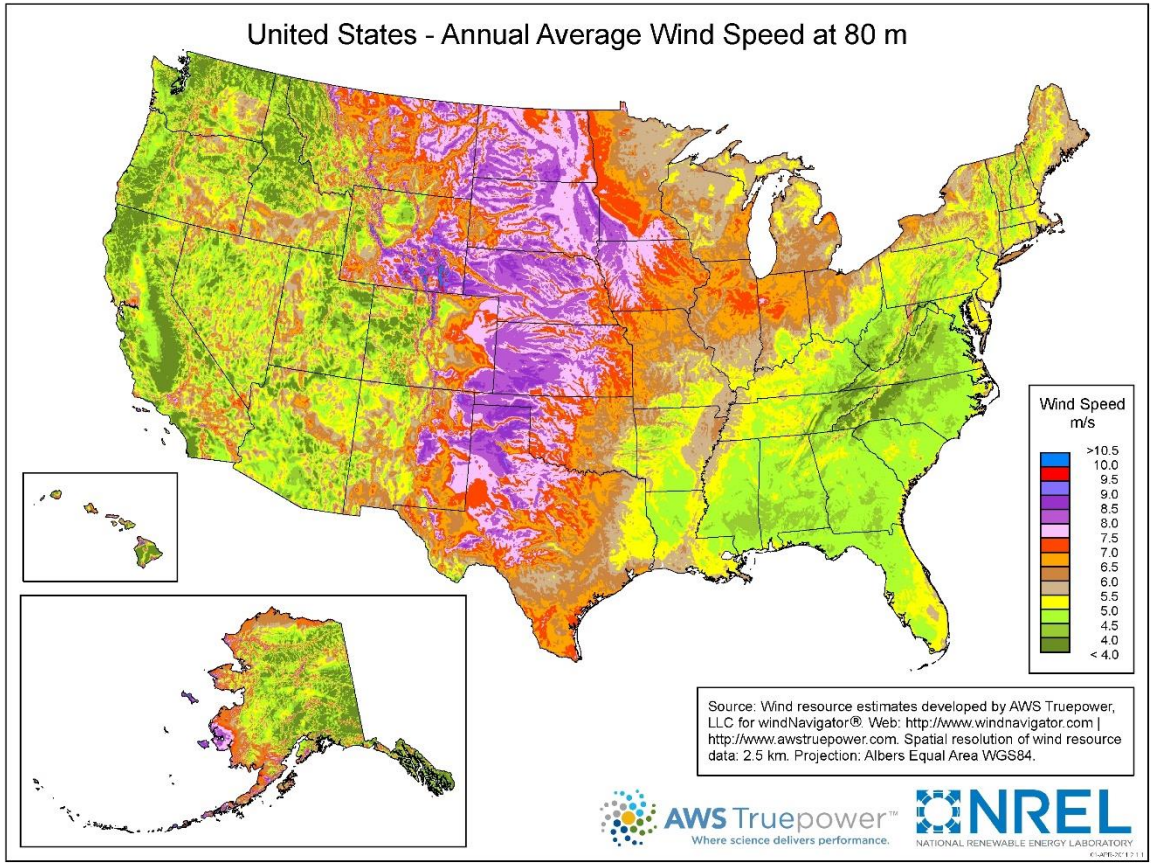
Bad News

- Solar energy is expensive
- Large up-front cost

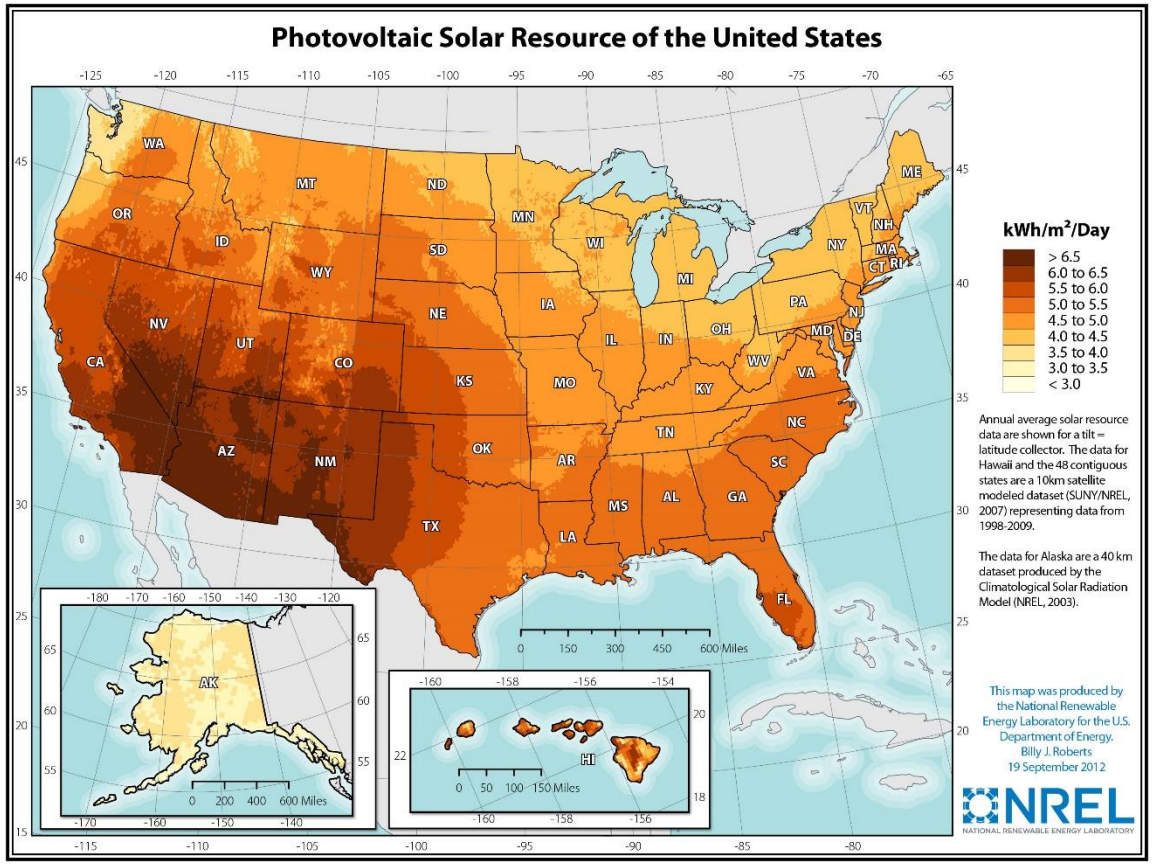
Good News

- Cost of solar PV and battery storage has dropped dramatically and continues to fall
- Solar PV coupled with battery storage could power the planet
  - Including EV transportation
- Financing for solar is available

Wind Potential



Solar Potential



Eating/Farming

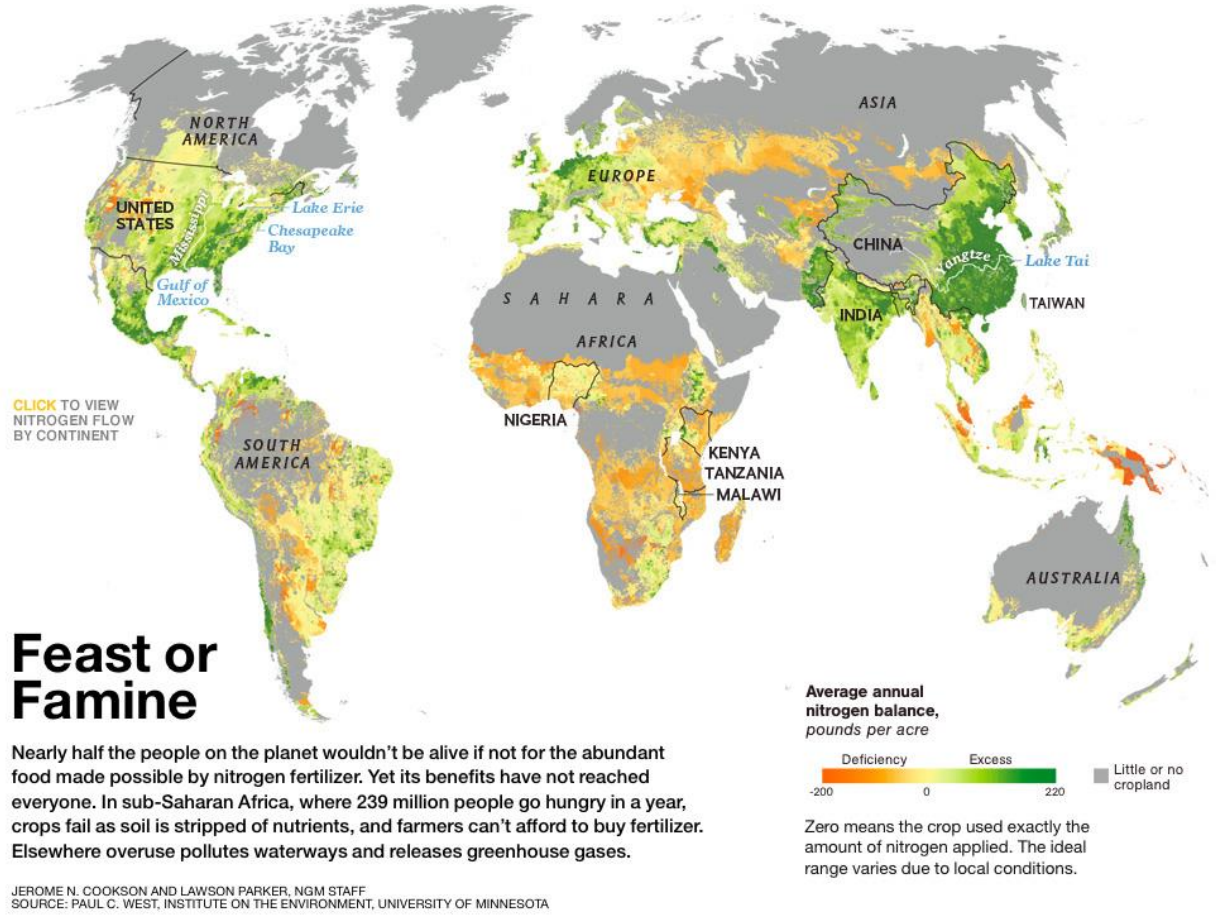
Bad News

- Fertilizer overuse
- Striping carbon from soil.
- Meat-heavy diet
- Food waste
- Cooking with biomass: wood, straw, cow-dung
- Subsistence farmers most as risk

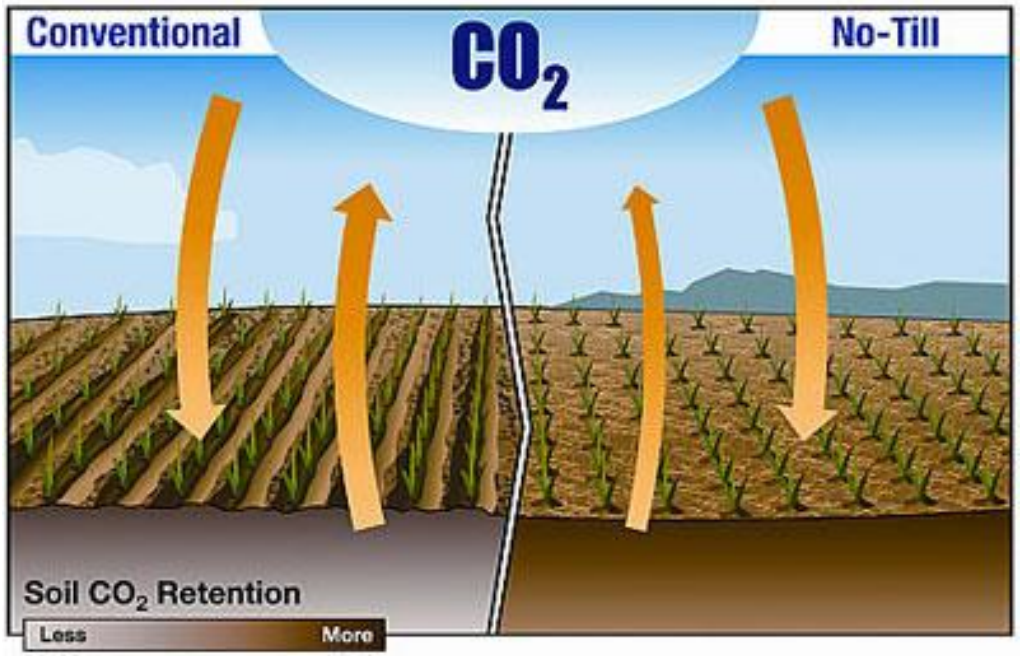
Good News

- New precision technologies
- "Regenerative" agriculture
- Vegetarian diet
- Recycling; standardizing expiration labels, eliminate cosmetic "quality" standards.
- Provide access to clean, natural gas, propane and ethanol.
- Global Embrapa

Fertilizer Use



Regenerative Agriculture



Forests

Bad News

- Timber acquired illegally
- Deforestation

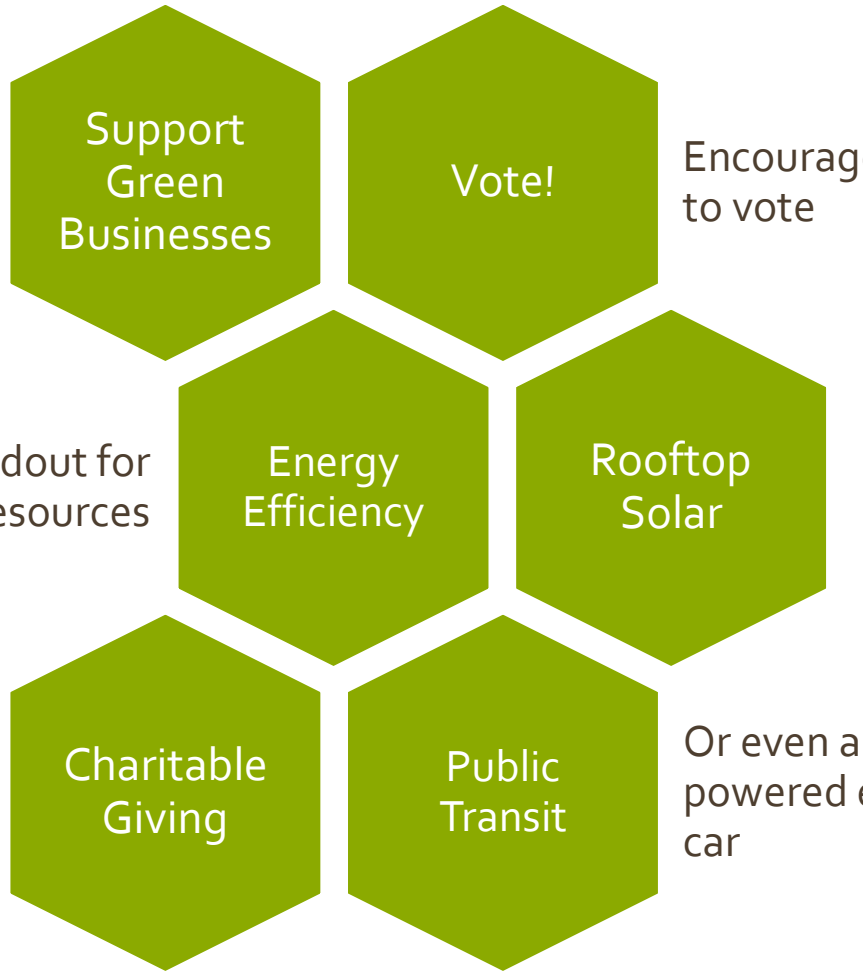
Good News

- Laws can help. People can research the lumber they purchase.
- Reforestation, restoring Mangroves

Mangroves

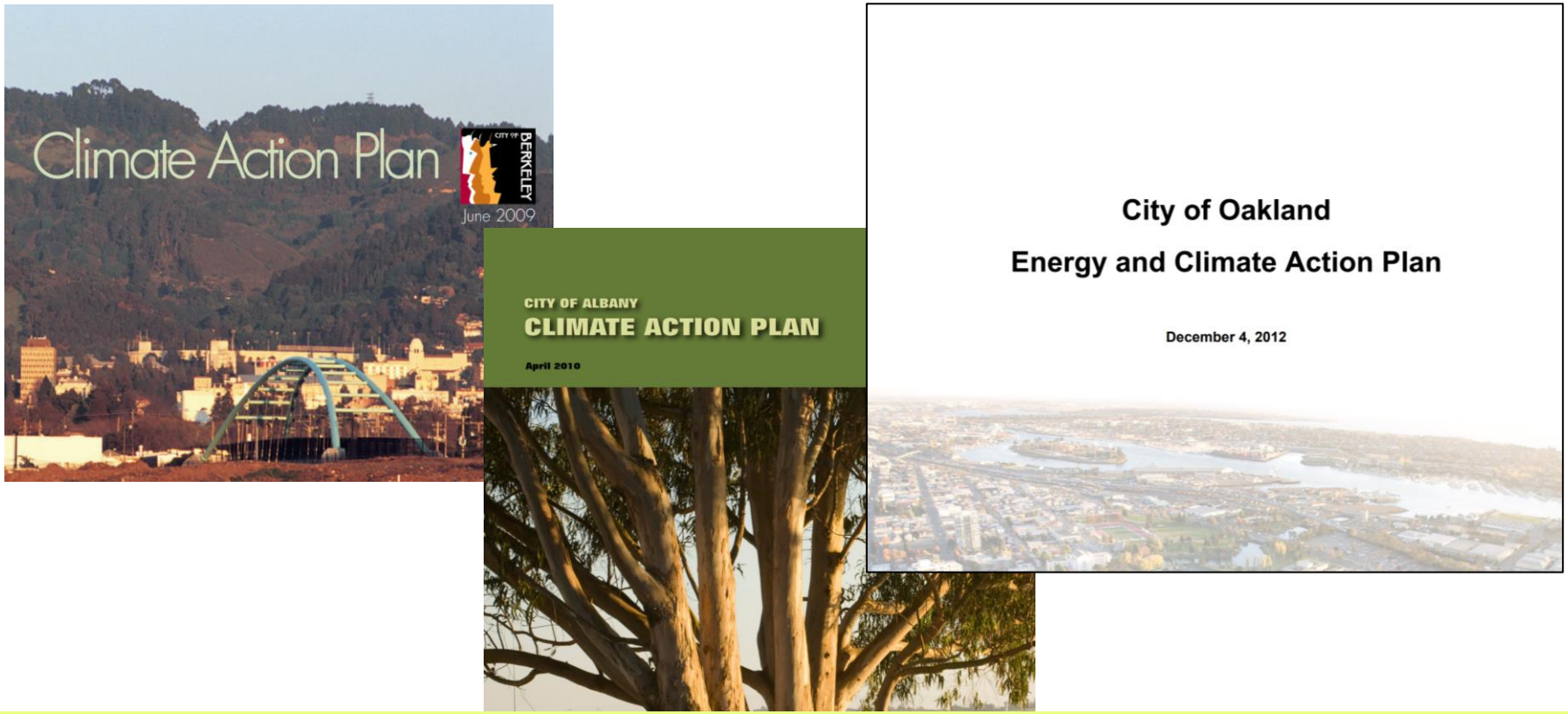
Forest Cities to the Rescue?

Take Action!


Support Green Businesses
Vote!
Encourage others to vote
See handout for more resources
Energy Efficiency
Rooftop Solar
Charitable Giving
Public Transit
Or even a solar-powered electric car

Cities Take the Lead

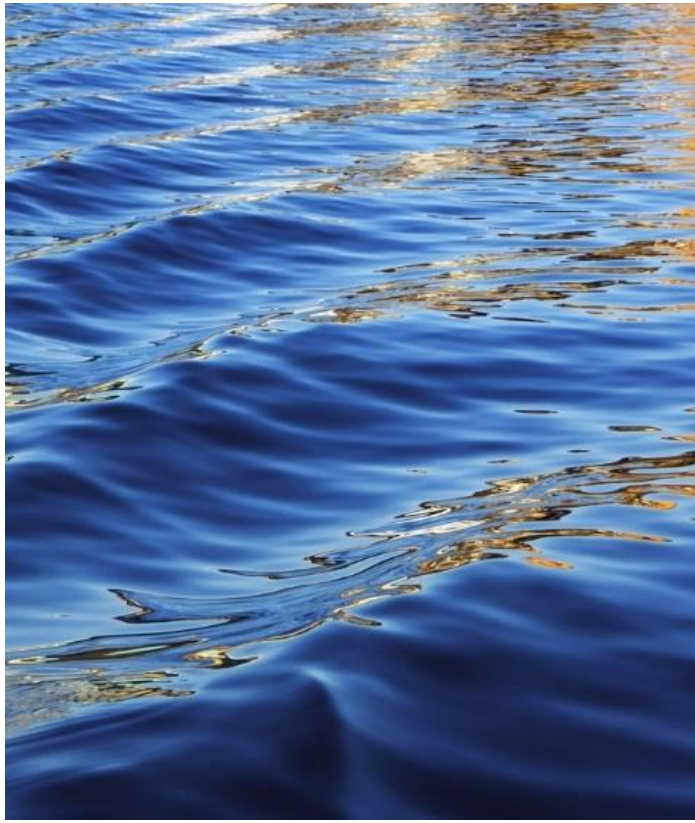
- Cities have climate action plans
  - Read yours!
  - Get involved



Global Problem Requires Global Solution

- Climate Change can bring the world together
  - Paris Accord
- New Win!: US Dept. of Defense must report to Congress on climate change vulnerabilities and expected costs
  - Result of bipartisan action
- Shared Security

Appendix



Solar PV Trade and Tariffs

- With stimulus from Chinese government, China now dominates solar PV manufacturing
  - Chinese market share of PV cell production grew from 1.6% in 2003 to 60% in 2011
- Previous Tariffs on Chinese PV imports
  - Due to subsidies offered by Chinese government, trade considered unfair
  - First round of tariffs in 2012, then another in 2014 to close a loophole
- Trade War in Response
  - China levied tariff on U.S.-manufactured polysilicon used to make solar cells, crippling the U.S. industry

https://thediplomat.com/2018/02/chinas-solar-power-dominance-and-trumps-trade-tariffs/

Solar PV Trade and Tariffs

- Partially in response to tariffs, China looked to new markets for PV
  - Huge increase in domestic installations
  - Largest export market is now India
- China also backing away from subsidies
- Many thought tariffs now unproductive, but Trump didn't listen
- Trump levied tariff on all PV panel imports from all other countries
  - Starts at 30% decreasing 5%/year to 15%

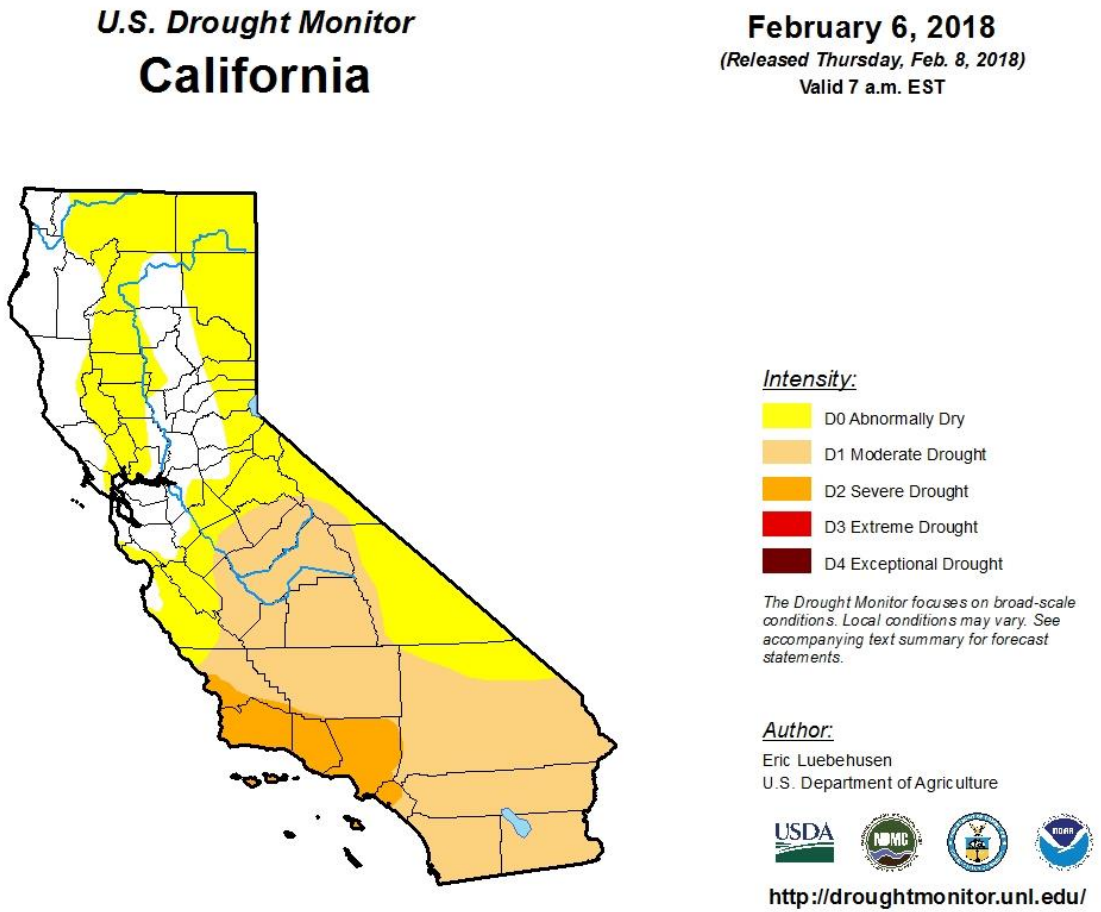
https://thediplomat.com/2018/02/chinas-solar-power-dominance-and-trumps-trade-tariffs/

Solar PV Trade and Tariffs

- General consensus is that the tariffs are not good for the solar industry or the US
  - China's market position now entrenched; tariffs will not change this
  - Increases cost of the panels, which could limit solar installations in the US
  - Potentially decreases US solar jobs
    - Most jobs are for installation
    - Manufacturing is increasingly automated
  - Risks further trade wars
- Panel "hoarding" will limit cost increases
  - Tariffs were expected
- Potential upside: Could increase investment in US factories
  - However, many of the factories will be owned by foreign companies, including Chinese companies

https://thediplomat.com/2018/02/chinas-solar-power-dominance-and-trumps-trade-tariffs/

Drought


U.S. Drought Monitor
California
February 6, 2018
(Released Thursday, Feb. 8, 2018)
Valid 7 a.m. EST
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:
Eric Luebehusen
U.S. Department of Agriculture
USDA
http://droughtmonitor.unl.edu/