

A large flock of brown chickens is gathered in a field. In the background, there are tall corn stalks and some green foliage. The scene is outdoors, likely in a rural or farm setting.

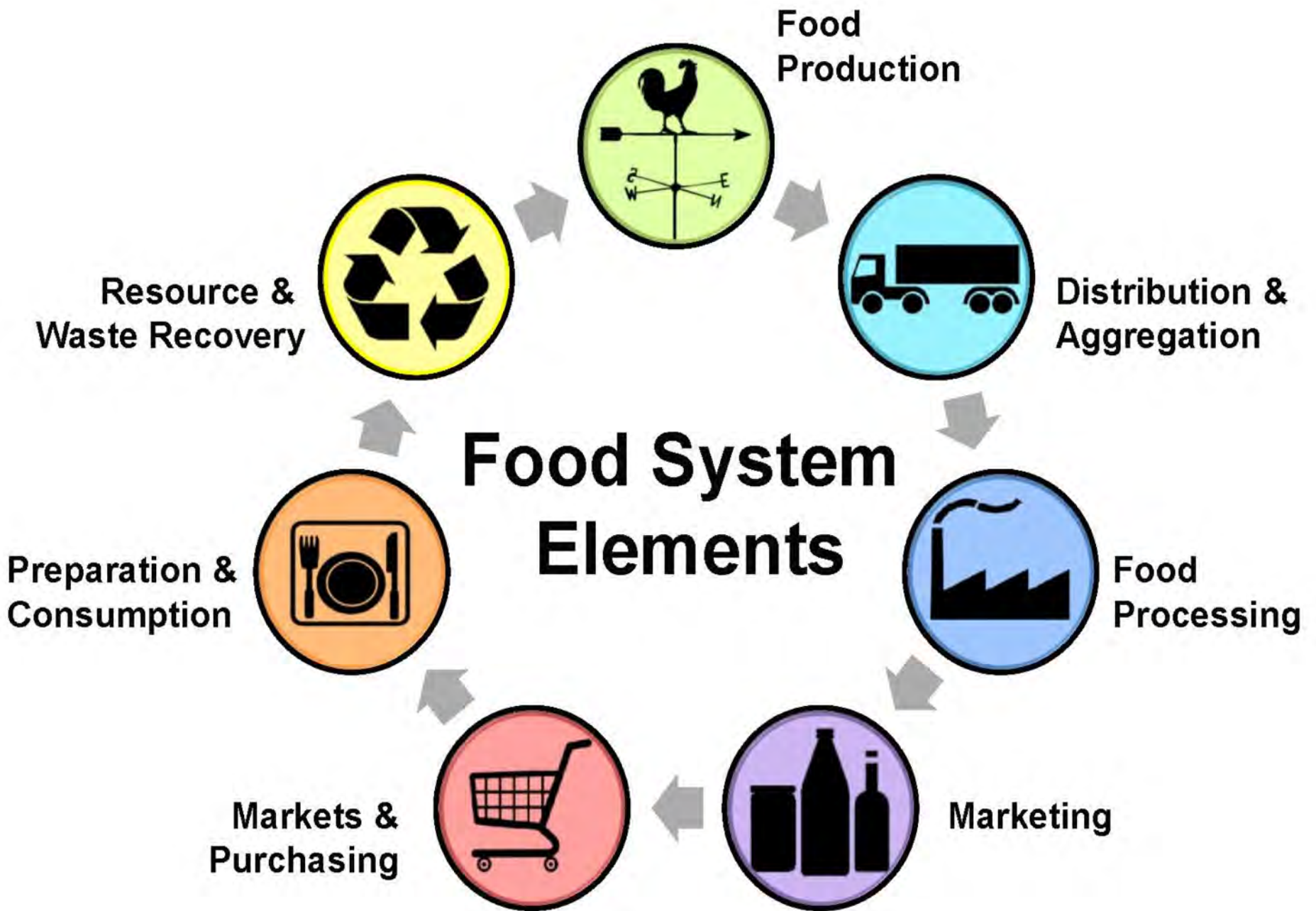
# **CLIMATE CHANGE AND REGIONAL FOOD SECURITY**

**Maine Sustainability and Water Conference**

March 28<sup>th</sup>, 2019, Augusta Civic Center

Scott Vlaun, Center for an Ecology-Based Economy





# FOOD SYSTEM CHALLENGES

*Non-renewable Inputs*

*Carbon Footprint*

*Food Miles*

*Soil Erosion/Toxic Runoff*

*Aquifer Depletion*

*Ocean Warming/Acidification*

*Loss of Ag Land (Flood and Drought)*

*Crashing of Biodiversity (Pollinators)*

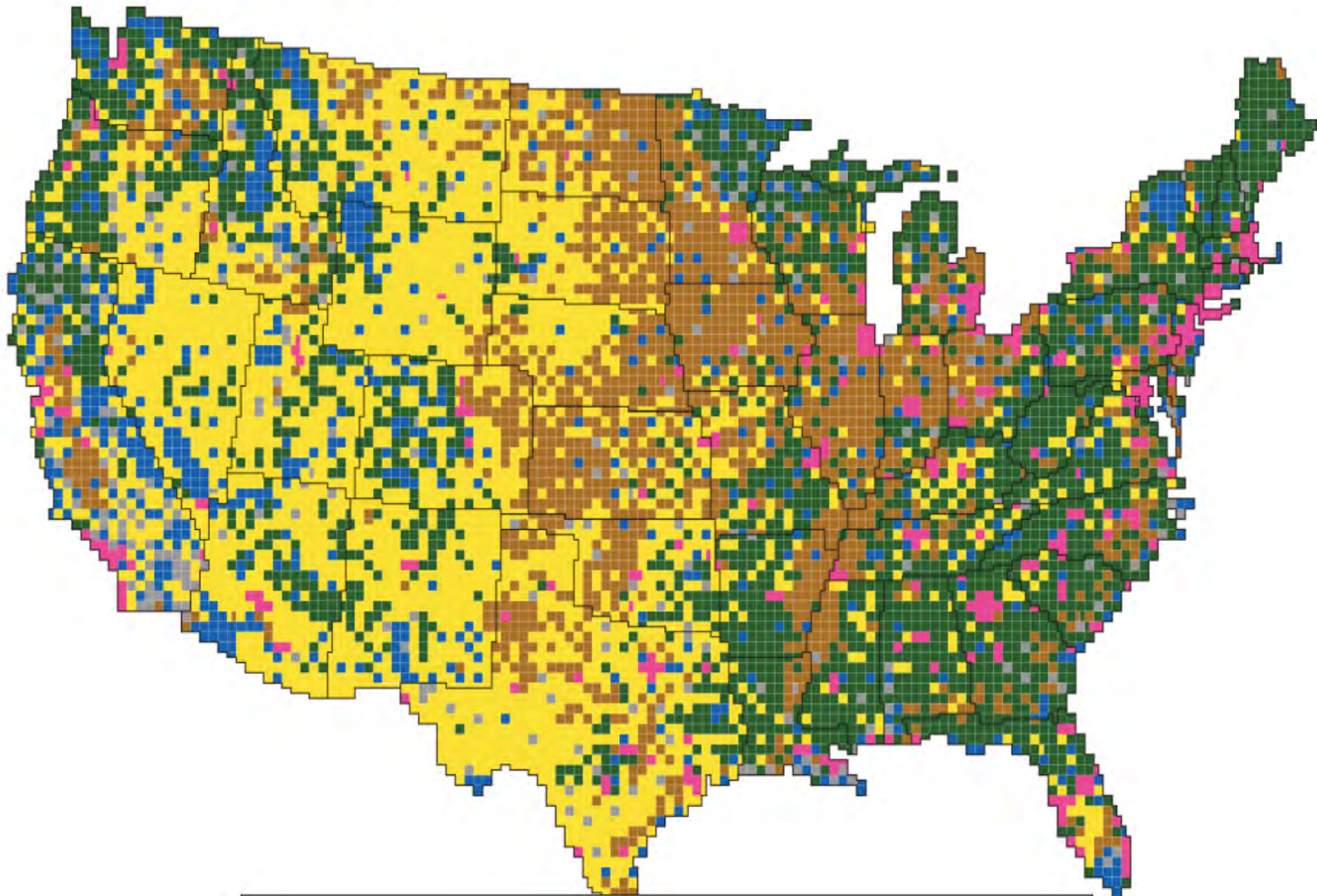


# FOOD SYSTEM CHALLENGES (Hunger)

*Nearly one third of the global population suffers from hunger and malnutrition.*

*30-50% of food produced globally is never eaten.*







An aerial photograph of a golf course, showing winding green fairways, yellow-blossomed trees, and a small clubhouse building in the distance. The image is semi-transparent, serving as a background for the text.

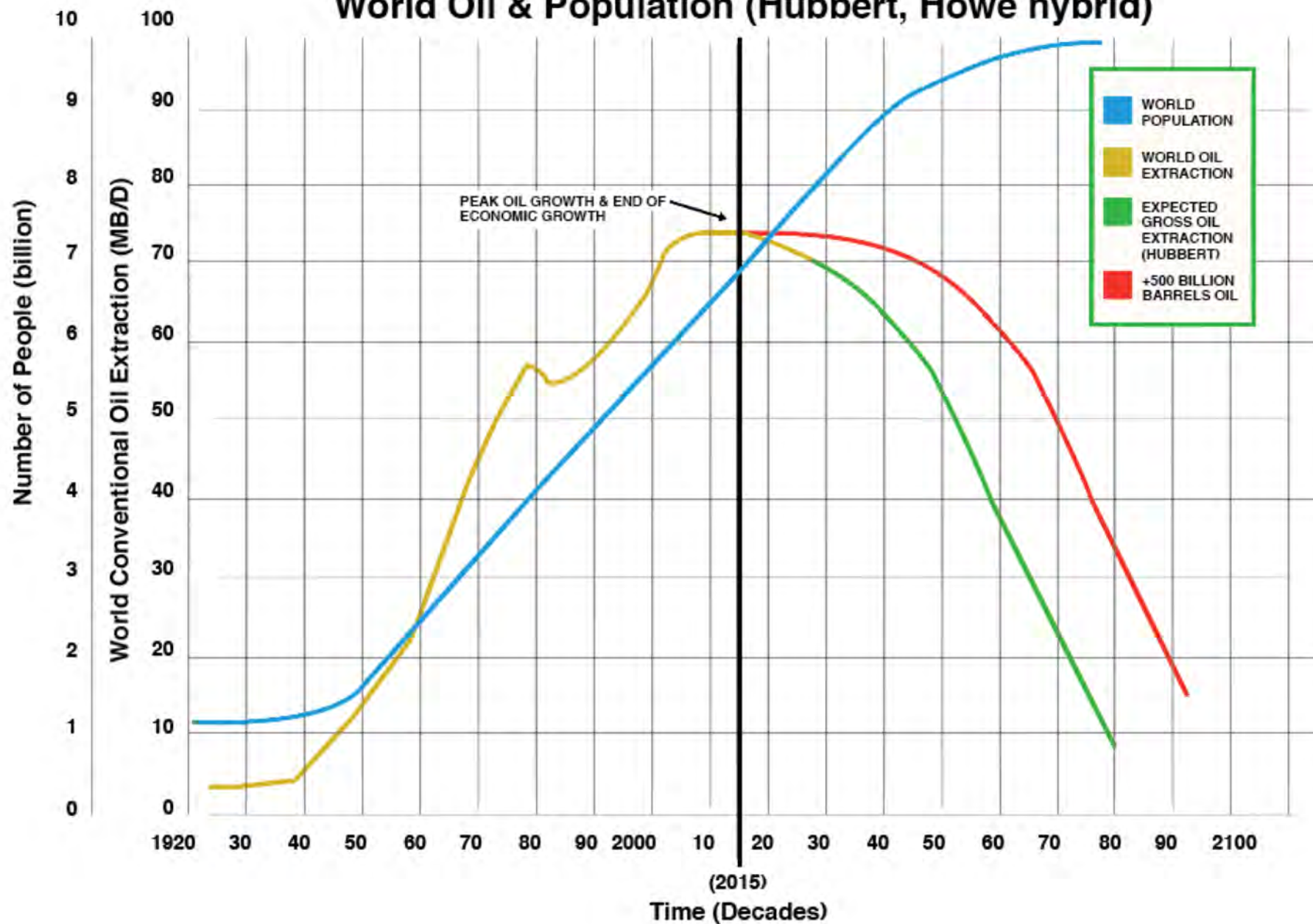
# OIL CONSUMPTION IN THE UNITED STATES

Approx. 22 barrels/**900+** gallons per person/year.

Approx. 10 barrels/**400+** gallons for food.



## World Oil & Population (Hubbert, Howe hybrid)

















# INTERNATIONAL PANEL ON CLIMATE CHANGE 2014

**“The effects of climate change on ... food production are evident in several regions of the world (*high confidence*)**

**All aspects of food security are potentially affected by climate change, including food access, utilization, and price stability (*high confidence*).” {7.3.3.1, Table 7-1}**



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# MAINE'S CLIMATE FUTURE

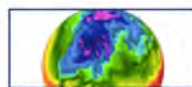
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10Green



Climate Reanalyzer



Ice Core  
Perspectives

IGERT

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Expeditions

MAINE'S  
CLIMATE  
FUTURE

Maine Climate

## Exploration & Discovery

THE CLIMATE CHANGE INSTITUTE is an interdisciplinary research unit organized to conduct research and graduate education focused on variability of Earth's climate, ecosystems, and other environmental systems and on the interaction between humans and the natural environment. The Institute provides expertise on climate-related matters to the people and governments of Maine, the Nation, and beyond.

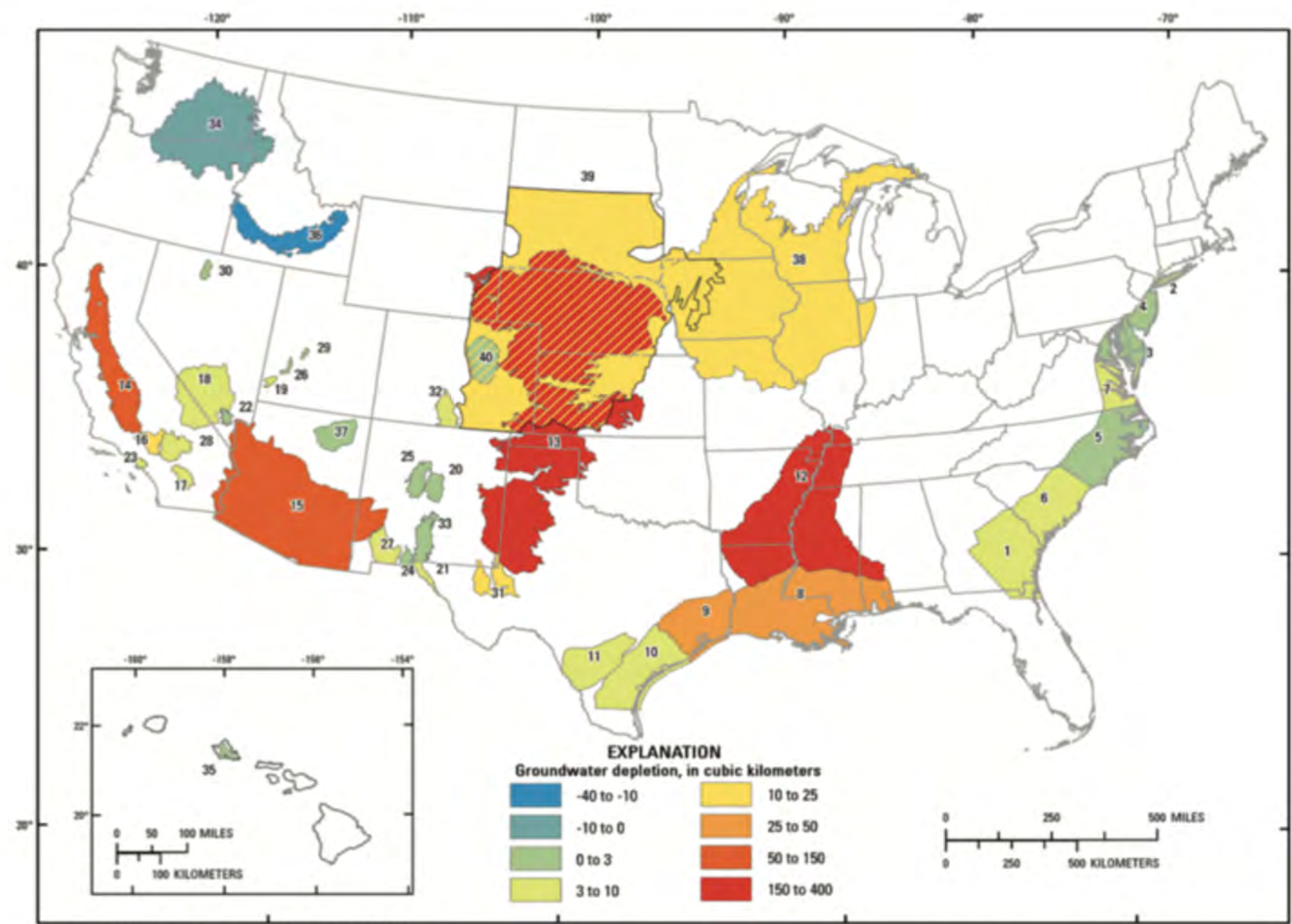
## NEWS & EVENTS

November 29, 2016

November 23, 2016



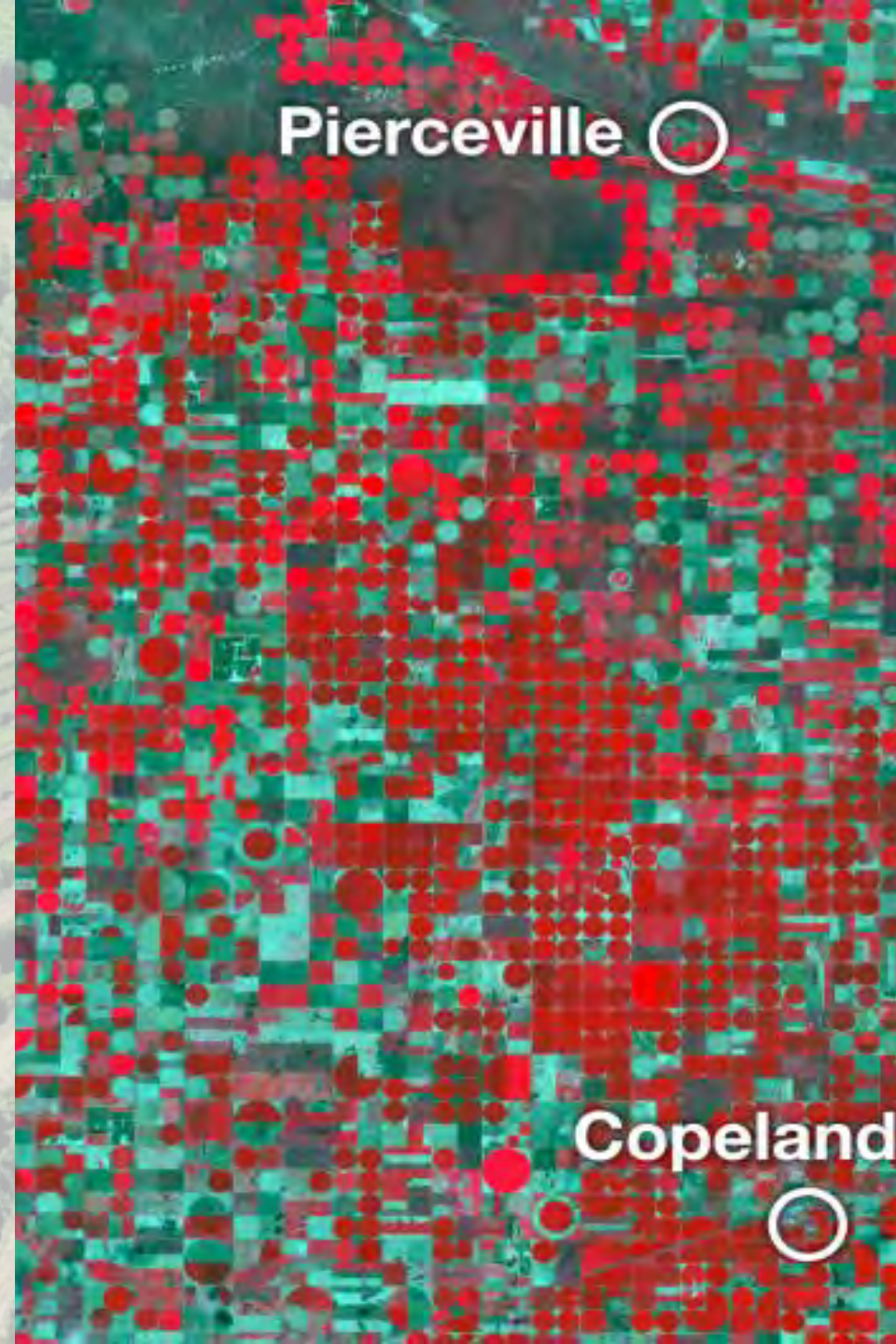
6 Groundwater Depletion in the United States (1900–2008)



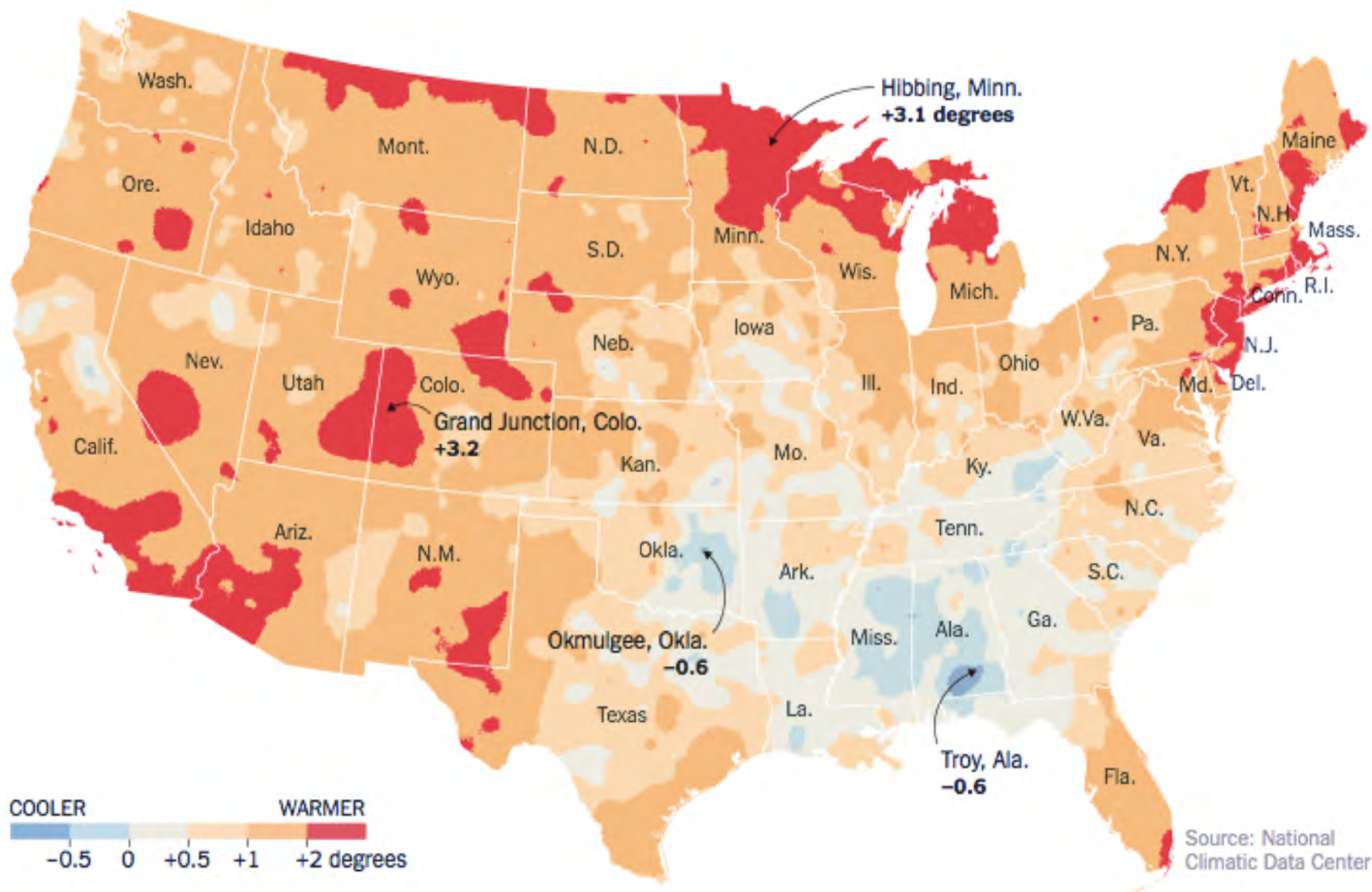












## Rising Temperatures

1991-2012 average temperature compared with 1901-1960 average



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Atlantic cod stocks are at their lowest levels in 40 years.

NEFSC/NOAA

## Collapse of New England's iconic cod tied to climate change

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# The race to save blueberries in Down East

A new breed of fruit fly is imperiling the crop in Maine



Top 10 Tren

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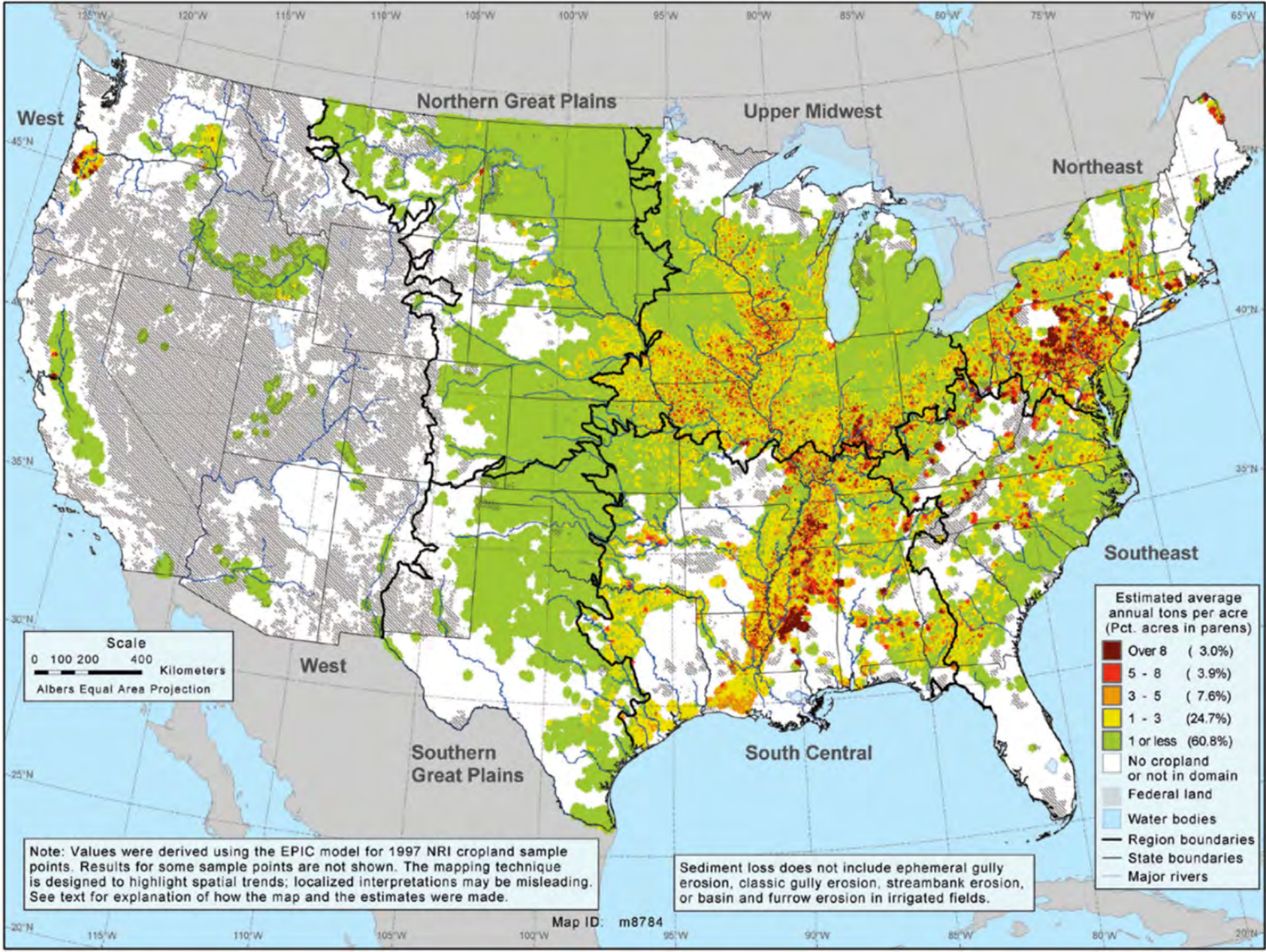
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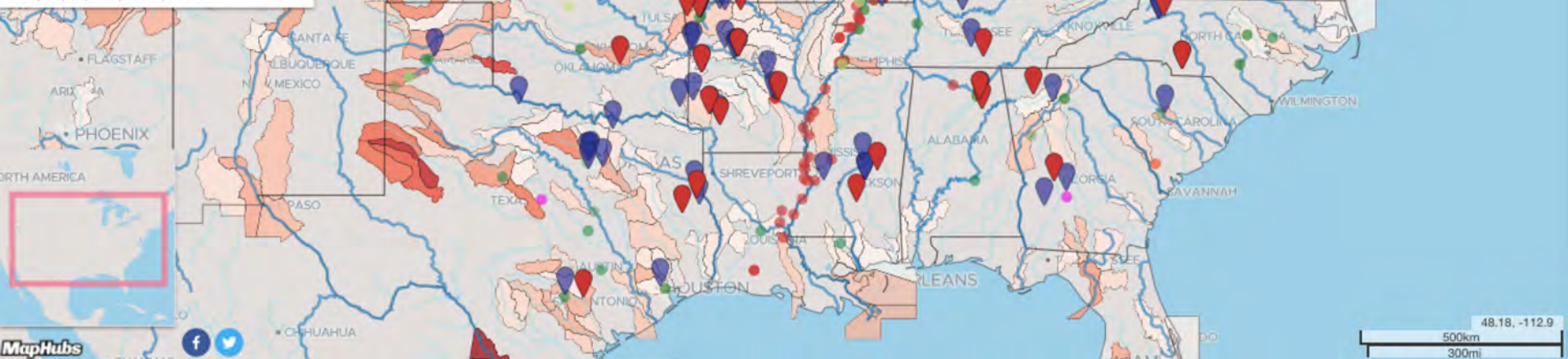
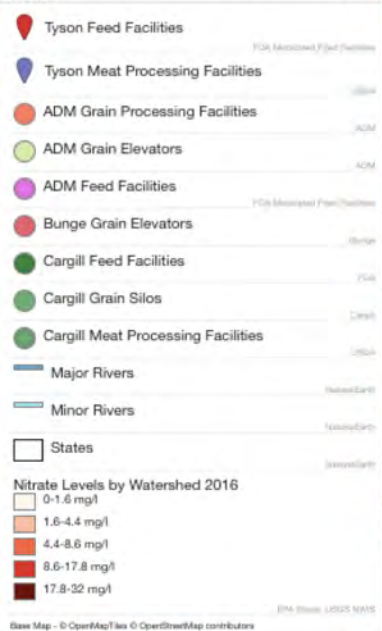




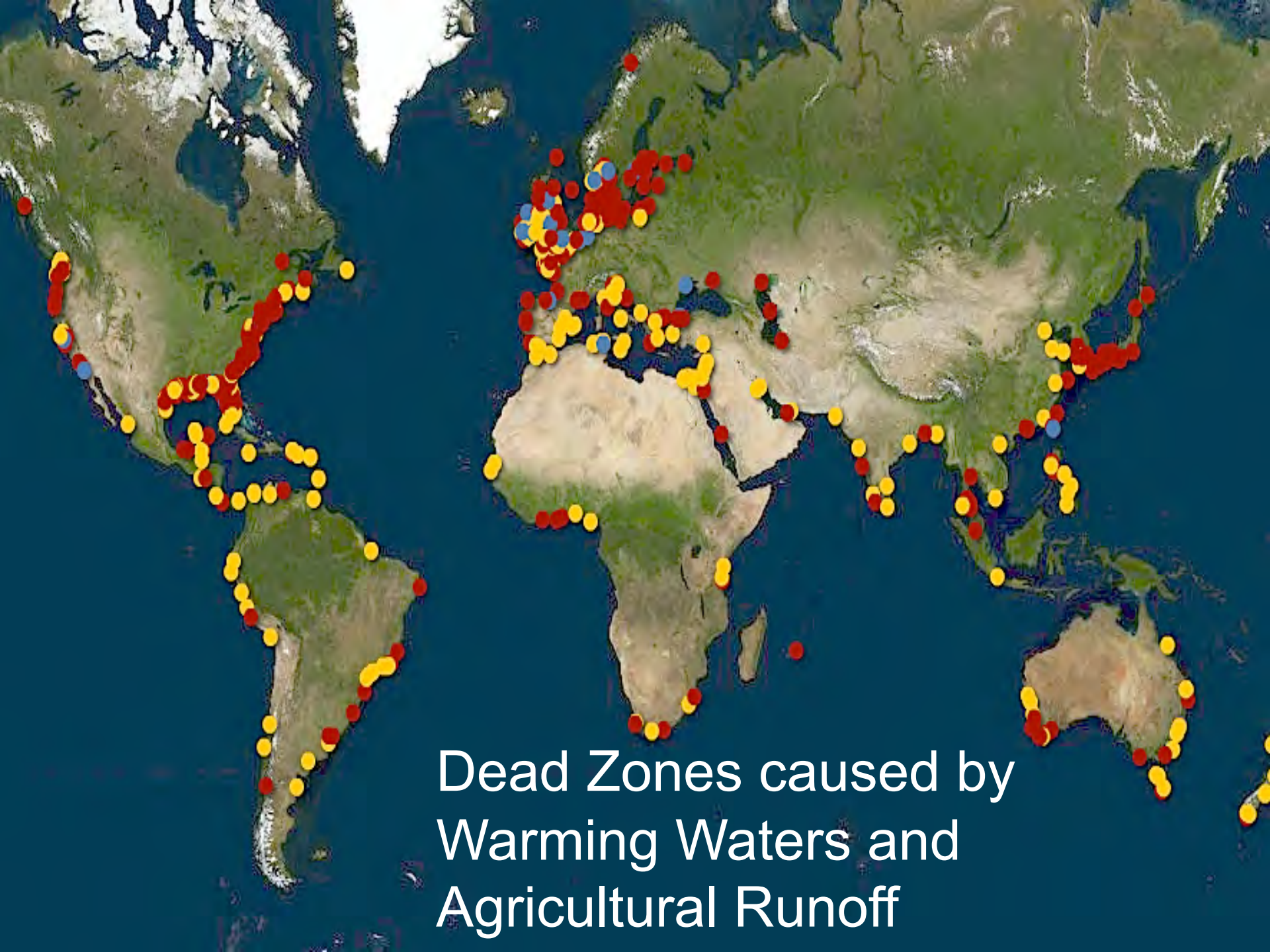




# Nitrate Levels by Watershed 2016

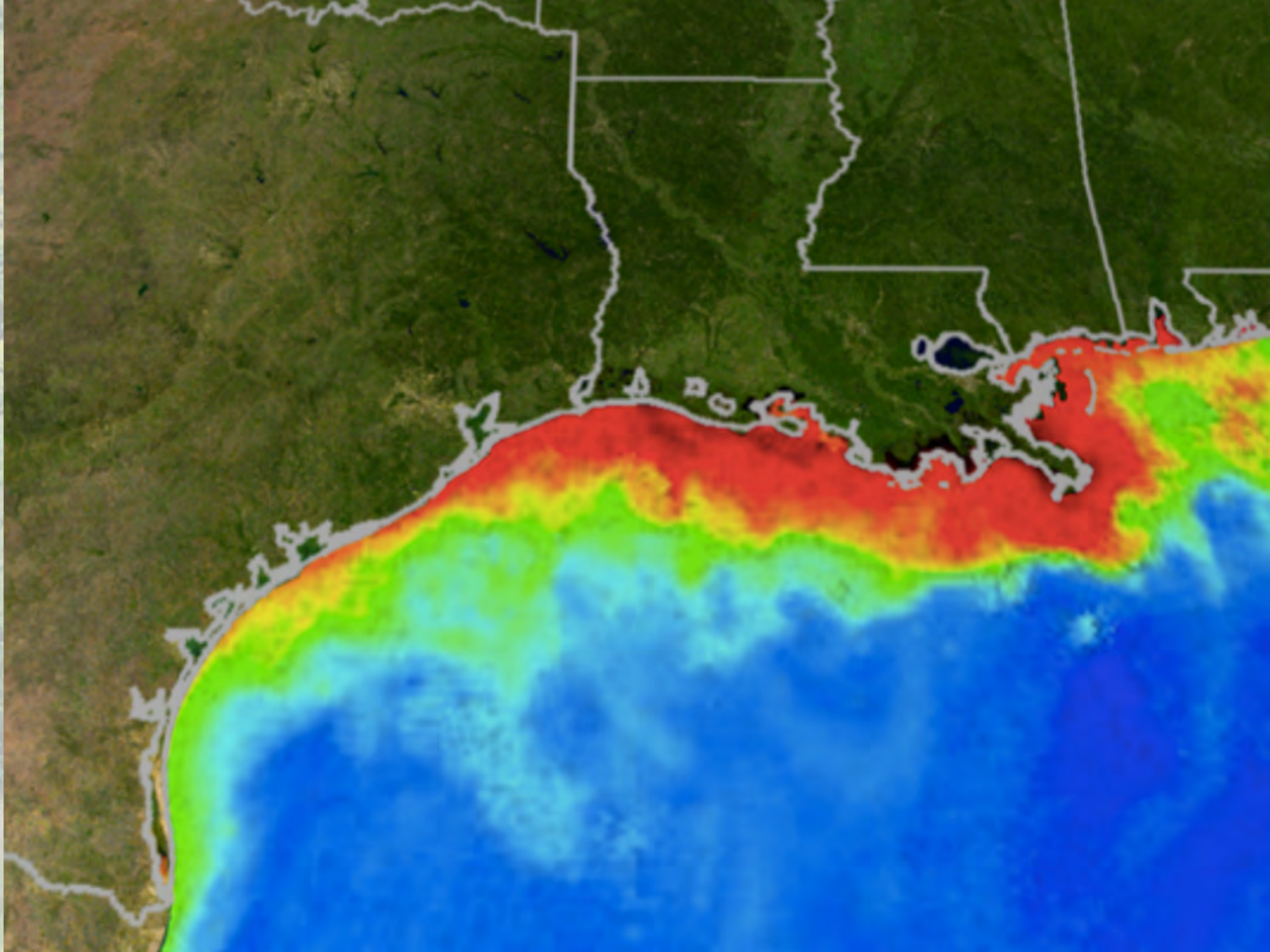






Dead Zones caused by  
Warming Waters and  
Agricultural Runoff































# FOOD SYSTEM OPPORTUNITIES

*Regenerative Agriculture*

*Nutrient Cycling and Retention*

*Carbon Sequestration*

*Nutrition per Acre*

*Local Production and Distribution*

*Foster Biodiversity*

*Reduce Food Waste*

*Regenerate Farming Communities*



## COOL THE PLANET. FEED THE WORLD.

The solution is in the soil: How regenerative agriculture addresses global warming and world hunger.

WHY REGENERATIVE AGRICULTURE?

# The future of agriculture is **regenerative**

✉ Subscribe to Newsletter

❤ Support Our Work

### OUR MISSION

To promote, facilitate and accelerate the global transition to regenerative food, farming and land management for the purpose of restoring climate stability, ending world

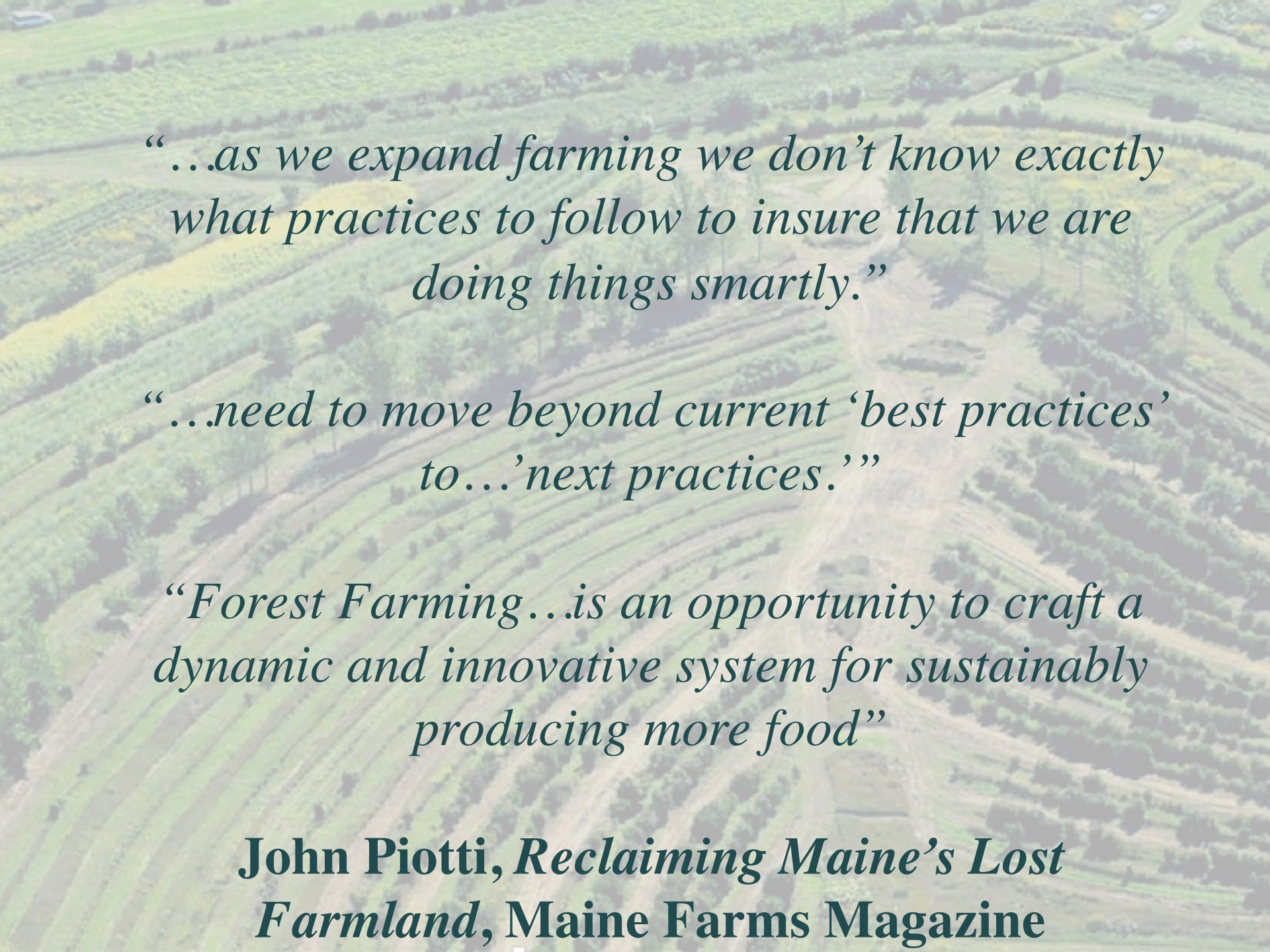
### OUR VISION

A healthy global ecosystem in which practitioners of regenerative agriculture and land-use, in concert with consumers, educators, business leaders and policymakers.

### OUR WORK

We work with multiple stakeholders in key regions of the world who are committed to building alternative food and farming systems on a regional or national level. We are



An aerial photograph of a rural landscape, likely in Maine, showing a mix of green forests, brownish-yellow fields, and winding roads. The image is slightly faded to serve as a background for the text.

*“...as we expand farming we don’t know exactly what practices to follow to insure that we are doing things smartly.”*

*“...need to move beyond current ‘best practices’ to...’next practices.’”*

*“Forest Farming...is an opportunity to craft a dynamic and innovative system for sustainably producing more food”*

**John Piotti, *Reclaiming Maine’s Lost Farmland*, Maine Farms Magazine**







































# Poultry-Centered Regenerative Agroforestry Ecosystems

## Regenerative Agriculture Capturing the Endless Cycles of Energy

### Upper Canopy Trees

Provides Shade, Protection from Predators,  
Reduces Runoff, Builds Soil, Contributes Fuel & Timber

### Middle Canopy Trees

Provides Shade, Protection from Predators,  
Reduces Runoff, Builds Soil, Contributes Food & Fiber

### Annual Vegetables

Provides Shade and Protection,  
Increases Production, Absorbs Nutrients,  
Feeds Chickens, Food Security

### Lower Canopy Shrubs

Provides Shade, Protection from Predators,  
Reduces Runoff, Builds Soil, Contributes Food & Fiber

### Poultry

Controls Insect &  
Weed Pressure,  
Builds Soil & Nutrients,  
Meat & Egg Production

### Perennial Ground Cover

Forage for Poultry, Ground Cover,  
Accumulates Nutrients

### Sprouted Grain

Nutrient Rich Grazing Feed

### Poultry Manure

Nitrogen Rich Nutrients  
Builds Soil Microbial Web

### Straw & Mulch

Ground Cover, Soil Builder  
Erosion & Runoff Reduction

















**Northfield, MN**

**Pine Ridge, SD**

**Guatamala**

**British Columbia, Canada**

**San Miguel d'Allende, Mexico**









# Toward Community Food Security

- Regenerate our agricultural land, and even marginal land, to grow nutritious food, increase biodiversity and sequester carbon
- Work to get fresh local food in our schools and institutions, create more school gardens and regenerative ag programs
- Help build a local food economy by supporting local farmers through tax incentives, zoning, easements, research...
- Revitalize our light industrial base to develop processing facilities and appropriate, human-scale, agricultural technology.
- Create a robust local food system to support community resilience to climate and resource challenges
- Share effective models.



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