



Welcome!

**Third Annual
Forum on Sustainable Agriculture**

***Columbia University Earth Institute, School of International
and Public Affairs, Agriculture and Food Security Center,
Columbia Water Center***

April 27, 2017



Questions and Comments

Use question cards and online via the Livestock

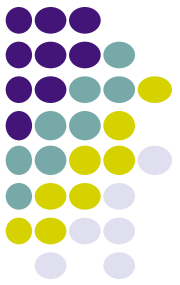
The Transition to Sustainable Agriculture



Agriculture is sustainable when it:

- Feeds and nourishes people
- Restores and protects the land, air, water and other species on our planet (across the full product lifecycle)
- Is resilient to and helps mitigate climate change
- Provides livelihoods and dignity for farmers, workers and rural communities

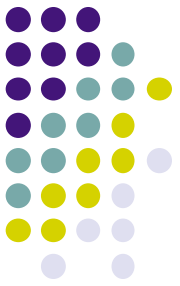
A practice By Any Other Name...



- The many approaches to sustainable agriculture:
 - Sustainable intensification
 - Agroecology
 - Agricultural best management practices
 - USDA organic
 - Climate-smart agriculture
 - Integrated agricultural production systems (permaculture, holistic management, etc.)
 - Multi-trophic aquaculture

These approaches all embrace agriculture as a dynamic, interdependent system

Sustainable Agriculture -- Measures of Success



There are many criteria by which to measure the performance of agriculture, some mutually reinforcing, some contradictory

- Maximize diverse yields into the future
- Produce nutritious foods (calories, protein, micronutrients)
- Optimize efficient use of land, labor and capital (buildings, equipment, inputs)
- Restore and maintain soil health (soil microbiology, avoid compaction)
- Reduce environmental externalities (climate change, air/water quality, water availability) -- strive for net positive footprint
- Build strong and resilient rural communities (business and job opportunities, etc.)
- Encourage, train and support young people to enter agriculture and food production (including land access)

NOTICE

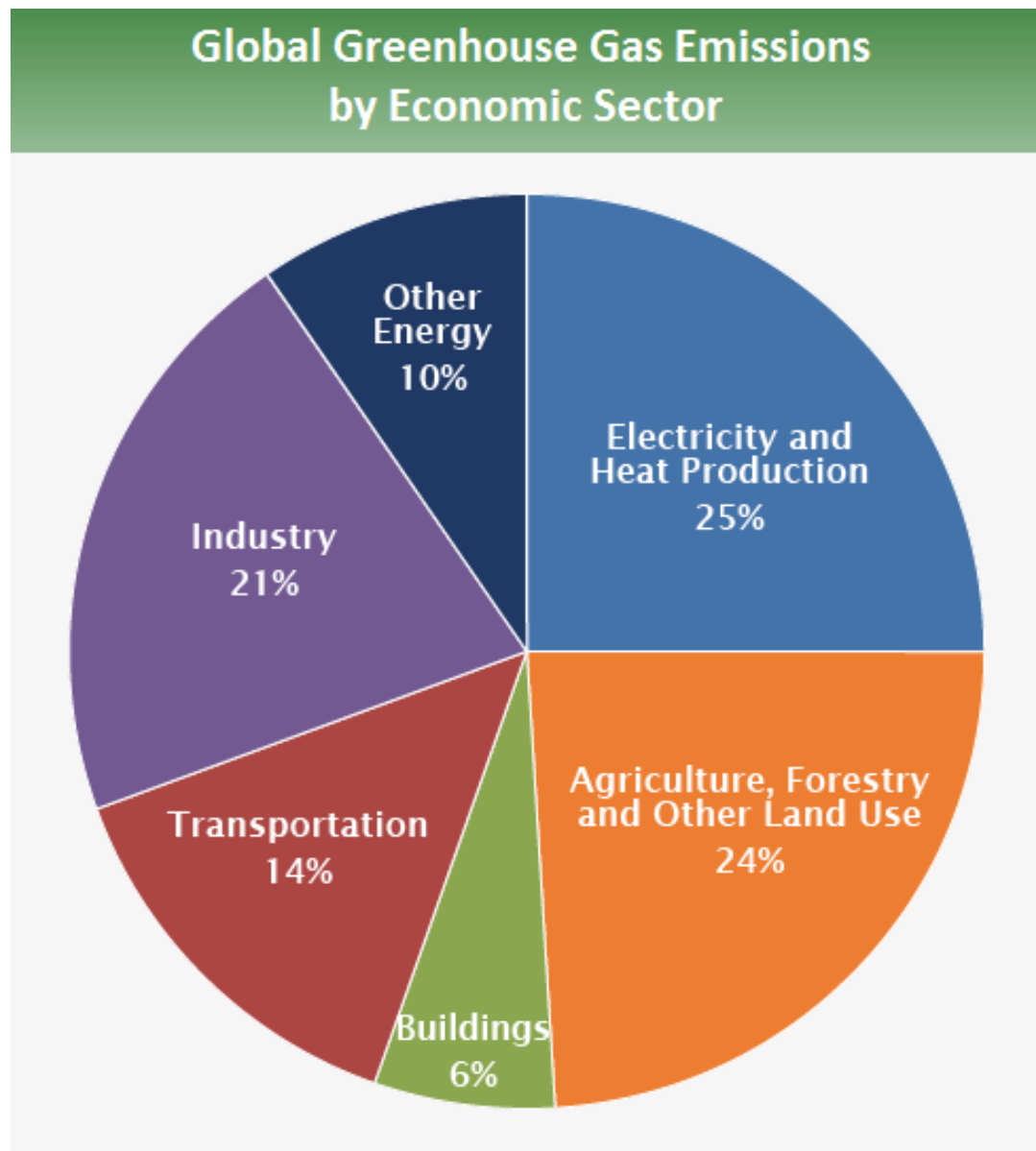
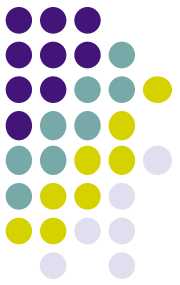
**An algae bloom has made
this area potentially
unsafe for water contact.
Avoid direct contact with
visible surface scum.**

530 Coastal Dead Zones and 228 Marine Eutrophic Sites



"Research by the World Resources Institute and the Virginia Institute of Marine Science identified more than 530 low-oxygen dead zones and an additional 228 sites worldwide exhibiting signs of marine eutrophication."

These areas encompass more than 95,000 square miles. The largest dead zone in the U.S., in the Gulf of Mexico, covers more than 8,500 square miles, roughly the size of New Jersey. Another large dead zone underlies much of the main-stem of Chesapeake Bay. According to US EPA, nutrients from row crop and concentrated animal feeding operations are the leading cause of the Gulf of Mexico dead zone and a significant contributing cause in the Chesapeake.



For calendar year 2010. Source: US Environmental Protection Agency, <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data> (original source, Intergovernmental Panel on Climate Change, 2014).

Summary of Projected Changes in Crop Yields Due to Climate Change Over the 21st Century

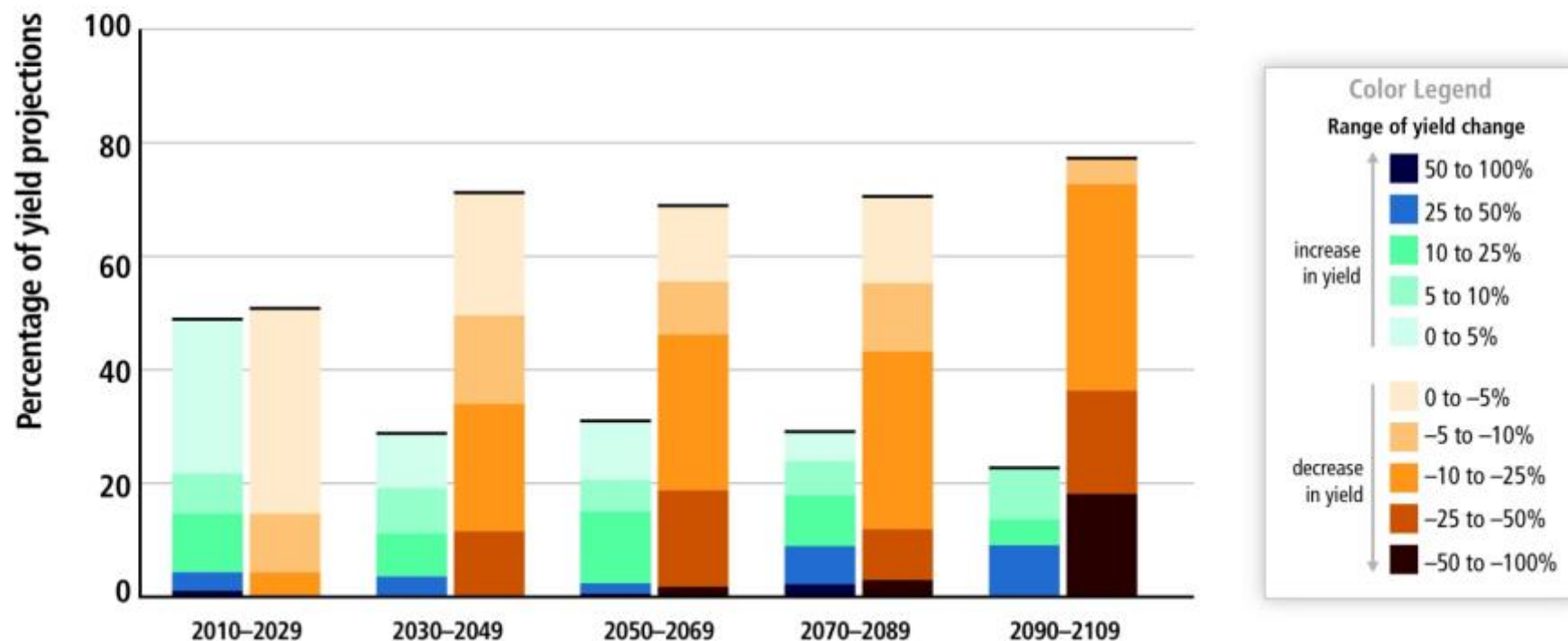
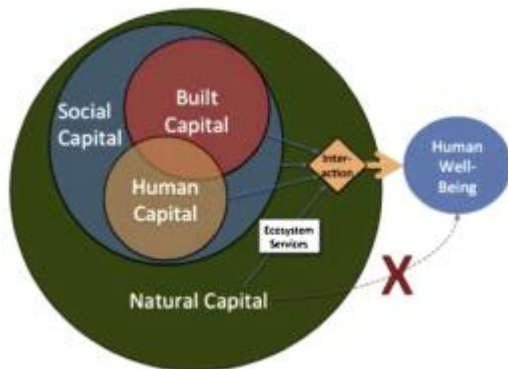
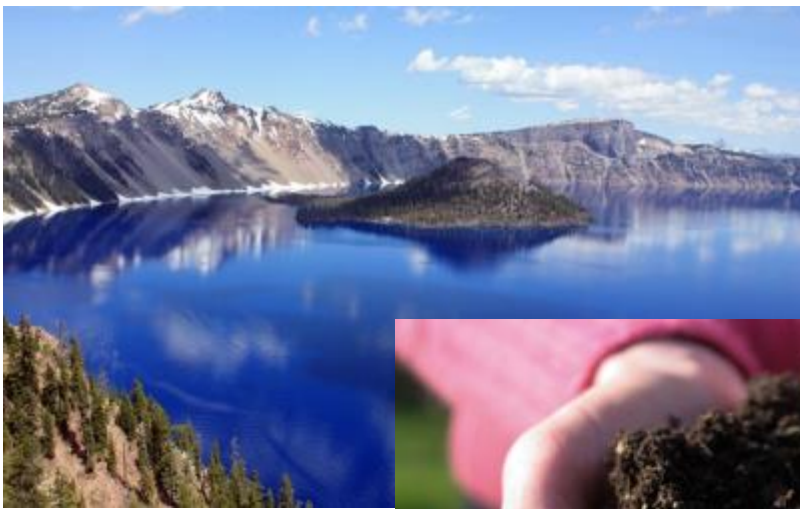


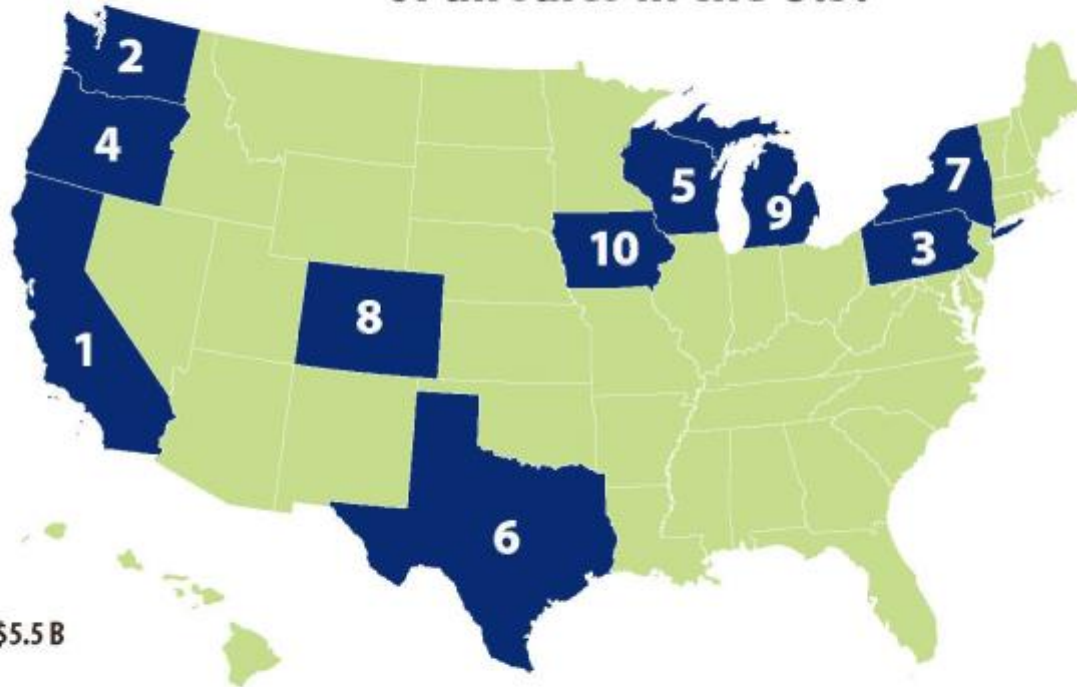
Figure SPM.7 | Summary of projected changes in crop yields, due to climate change over the 21st century. The figure includes projections for different emission scenarios, for tropical and temperate regions, and for adaptation and no-adaptation cases combined. Relatively few studies have considered impacts on cropping systems for scenarios where global mean temperatures increase by 4°C or more. For five timeframes in the near term and long term, data (n=1090) are plotted in the 20-year period on the horizontal axis that includes the midpoint of each future projection period. Changes in crop yields are relative to late-20th-century levels. Data for each timeframe sum to 100%. [Figure 7-5]

The Ecosystems, the Food, the People -- All Connected, All One Whole



Top 10 States in Organic Sales, 2014

These states account for 78%
of all sales in the U.S.



U.S. Total = \$5.5 B

| | |
|--------------|---------|
| California | \$2.2 B |
| Washington | \$515 M |
| Pennsylvania | \$313 M |
| Oregon | \$237 M |
| Wisconsin | \$201 M |
| Texas | \$199 M |
| New York | \$164 M |
| Colorado | \$147 M |
| Michigan | \$125 M |
| Iowa | \$103 M |

www.agcensus.usda.gov

U.S. Department of Agriculture
National Agricultural Statistics Service



**CENSUS OF
AGRICULTURE**

USDA First Local Food Marketing Practices Survey



More than 167,000 U.S. farms locally produced and sold food through direct marketing practices, resulting in \$8.7 billion in revenue in 2015. The report results cover both fresh and value-added foods, such as meat and cheese.

Farms selling food directly to institutions and intermediates, such as wholesalers who locally branded the product or food hubs, brought in the most revenue at \$3.4 billion. The next category, at \$3 billion in sales, was from approximately 115,000 operations with direct-to-consumer sales, such as on-farm stores and farmers markets. Sales directly to retailers were \$2.3 billion from over 23,000 operations nationwide.

The top five states were:

- California, \$2,869 million
- Michigan, \$459 million
- New York, \$441 million
- Pennsylvania, \$439 million
- Wisconsin, \$431 million

The survey also concluded that more than 80 percent of all direct market food sales occurred within 100 miles of the farm, and that most farms selling to consumers were less than 20 miles from their largest grossing marketplace.

Scenic Hudson, "Foodshed Conservation Plan: Protecting Farms and the Region's Food Supply"



The 2013 Foodshed Conservation Plan outlines a roadmap for protecting the agricultural land that supplies fresh, local food to the people of the Hudson Valley and New York City.

It prioritizes unprotected farmland, aiding stakeholders to focus on preserving agricultural lands most critical for meeting increasing demands for nutritious local food. It is believed to be the first-ever comprehensive, data-driven strategic plan to conserve farmland in a metropolitan foodshed.

A New England Food Vision



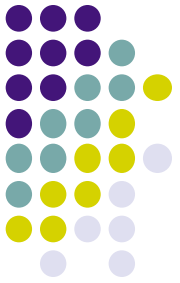
- *Healthy Food for All*
- *Sustainable Farming and Fishing*
- *Thriving Communities*

"A collaborative report that considers the future of our region: a future in which food nourishes a social, economic and environmental landscape that supports a high quality of life for everyone, including generations to come."

Source: Food Solutions New England, 2015,
<http://www.foodsolutionsne.org/new-england-food-vision>



Our Presenters



- **Dr. Ruth DeFries, professor of ecology and sustainable development, Columbia University**
- **Mr. Paul Helgeson, former sustainability manager, GNP Company, St. Cloud, Minnesota**
- **Mr. Michael Kinstlick, founder and CEO, Coopersea Distilling**

Why a Forum?

"a place, meeting, or medium where ideas and views on a particular issue can be exchanged."

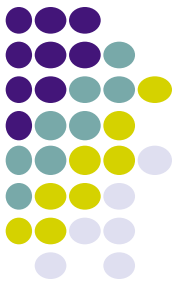




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Thank you for your interest and participation!



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