United States Department of Agriculture

National Institute of Food and Agriculture

Organic Agriculture Funding & Priorities in the U.S.

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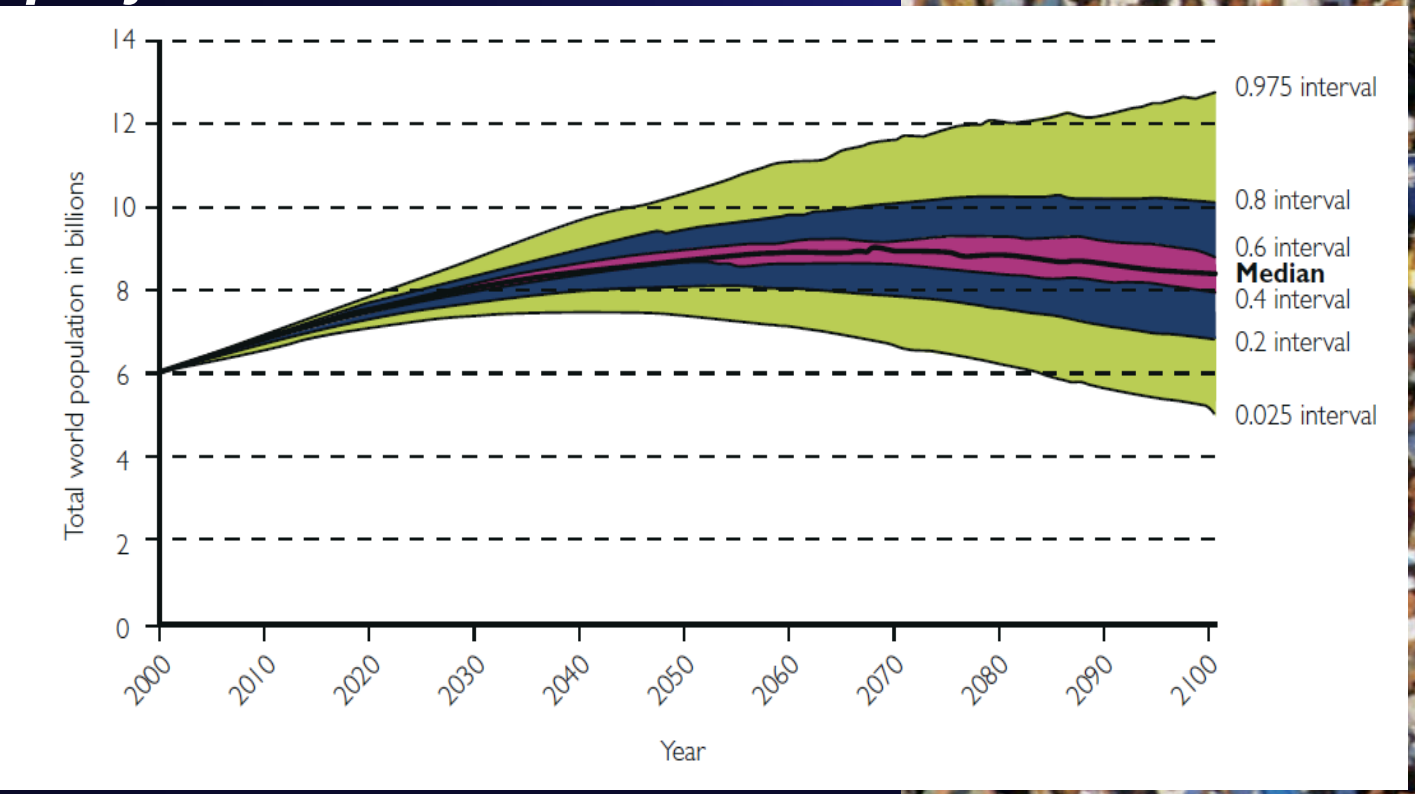
USDA NIFA

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

Organic Forum Feb., 26, 2014
Minneapolis

Meeting the challenges of a growing world population

Total world population in billions: probabilistic projections until 2100



Source: Foresight. The Future of Food and Farming (2011)

How to feed a growing world population with minimum footprint on the environment?

- **Reduce global poverty and hunger**
- **National security issue**
- **Many initiatives currently underway**

FEED THE FUTURE
The U.S. Government's Global Hunger and Food Security Initiative

Ultimate challenge

- ***We need new discoveries and technologies with global applications***
- ***Organic agriculture should be a key player in achieving these goals***

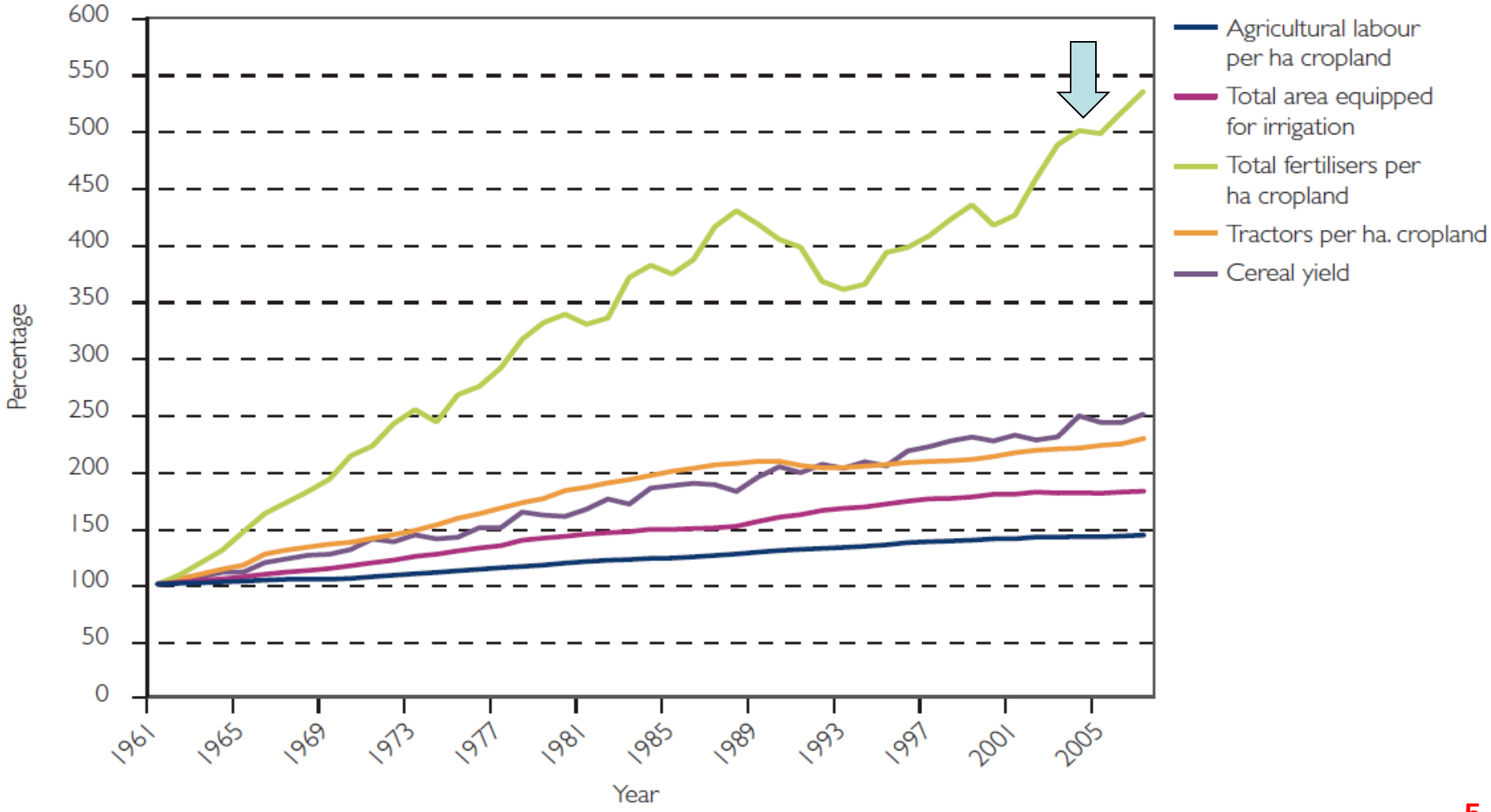
Progress in agriculture

Since World War II there has been significant changes in agriculture due to news discoveries and leap frog technologies

- **Pesticides: herbicides, fungicides, insecticides, nematicides, soil fumigants, etc..**
- **Fertilizers: specificity, placement, slow release…**
- **Machinery: tractors, sprayers,**
- **Technology: GPS, precision agriculture, plastics**
- **Molecular biology: stress resistant cultivars**

Fewer and fewer farms (2.1 million farms 2012) producing for the rest of the population (313.9 million 2012)

Global trends in the intensification of crop production



Source: Foresight. The Future of Food and Farming (2011)

Monoculture systems

Lettuce field:
Coachella Valley California

Radish: Michigan

Monoculture systems

- Low level of biodiversity
- High inputs
- High pest and disease pressure
- High potential for erosion

- Appropriate for Large-scale production
- Adapted to mechanization

1787 letter to Arthur Young in England (227 yrs ago)

"Our lands, as I mentioned in my first letter to you, were originally very good; but use, and abuse, have made them quite otherwise."

This was in reference to soil degradation caused by continuous tobacco or corn-wheat rotations in America

The organic agriculture approach

- *Increase crop diversification*
- *Prohibit most synthetic inputs*
  - *Pesticides: herbicides, insecticides, fungicides, ….*
  - *Fertilizers*

Hmmmm! Without those tools I need to go back to the drawing board !!!

The need for a systems research

- ***With few tools available the research needs to focus more on the entire cropping systems than specific practices.***
- ***Partnership between scientists and farmers becomes critical***
- ***Soil building becomes the foundation of the system***
- ***Critical need for a truly holistic approach in designing experiments***

- ***How to put all the pieces together into a working and efficient system?***

Components of an integrated cropping system

Systems approach to crop production

The need for a process-driven research

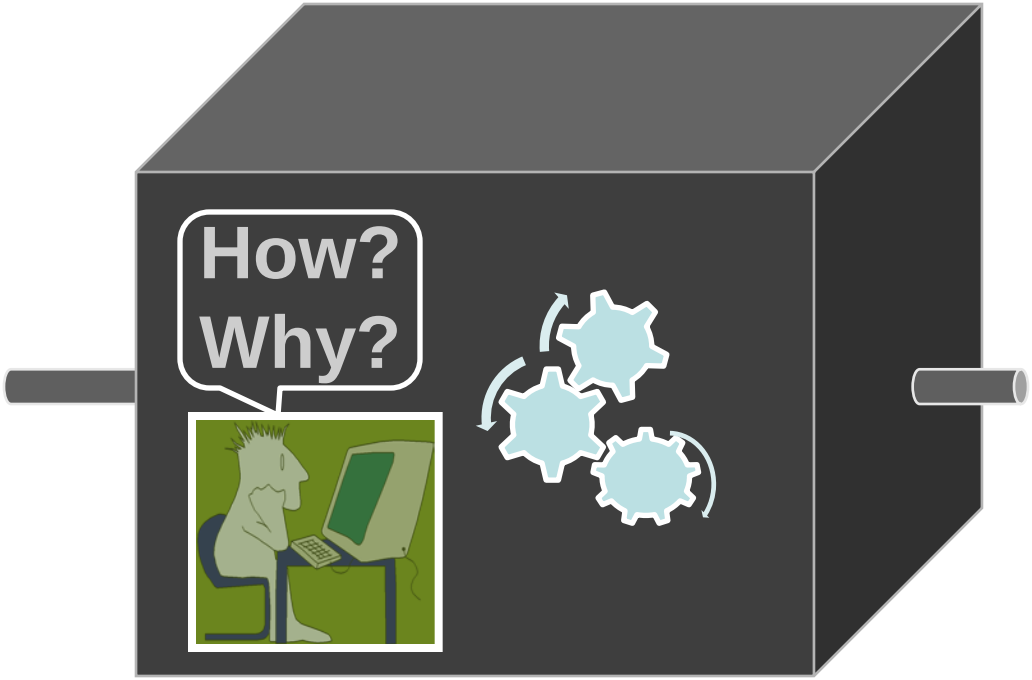
- **Studies based on observation will continue to play important role.**
- ***Critical to understand the processes underlying key observations***

- ***This requires a solid scientific background***

Process-driven research

- ***More focus on underlying processes***

Input
- Fertilizer
- New variety
- New practice
- Etc..



Output
- Yield
- Pest control
- Quality
- Etc..

Without a good understanding of the processes it is difficult to replicate successful results

The need for appropriate student training

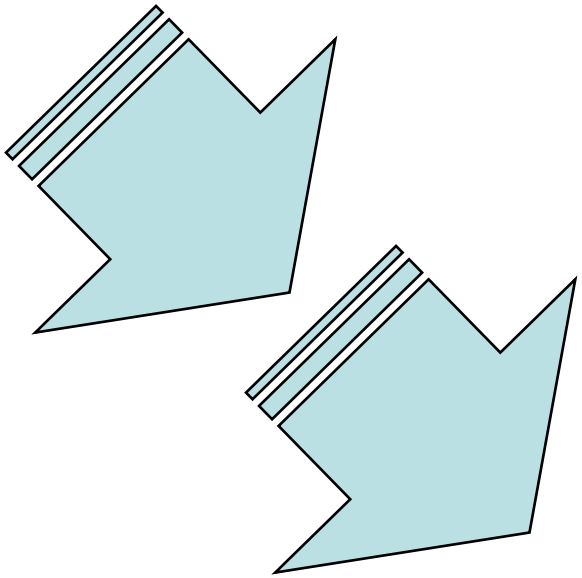
- Few scientists have received formal training in organic ag.
- It is critical to train the next generation of organic ag. scientists
  - Undergraduates
  - Graduates

- *Need to include organic courses in agricultural curricula*
- *That will broaden student experiences*

Capacity building

From general to specific priorities

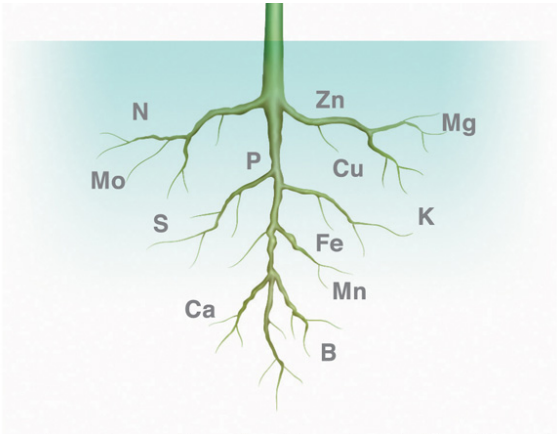
- Whole system research?
- Soil Quality
- Education
- Extension



Specific priorities

Nutrient management

- *Low external input systems*
- *Improved nutrient cycling*
- *Cultivars with improved nutrient use efficiency*
- *Soil amendments*
- *Cover cropping*
  - *Use of N fixing cover crops*



Macro Elements
N - Nitrogen
P - Phosphorous
K - Potassium

Secondary Elements
Ca - Calcium
Mg - Magnesium
S - Sulphur

Micro Elements
Fe - Iron
B - Boron
Zn - Zinc
Cu - Copper
Mn - Manganese
Mo - Molybdenum

Weed management

- Integrated management
  - Mechanical
  - Biological
  - Physical
  - Chemical
  - Cover cropping
  - No-till systems
- Engineering
  - New tools

Roller Crimper

Insect management

- Integrated management
  - Crop diversification
  - Trap cropping
  - Natural enemies
  - Biological insecticides
  - Etc.


Source: Colorado State Univ.

Source: Cornell Univ.

Disease management

- Disease suppressive systems
  - Crop diversification
  - Soil quality
  - Resistant cultivars


Photo credit: Hausbeck Lab, MSU

Ecosystem services

- Impact of organic production on
  - Carbon sequestration
  - Greenhouse gas emission
  - Biodiversity
  - Soil conservation

www.weru.ksu.edu

Wind erosion

Funding opportunities in organic agriculture

- ***Organic agriculture Research, Extension and Education is underfunded***

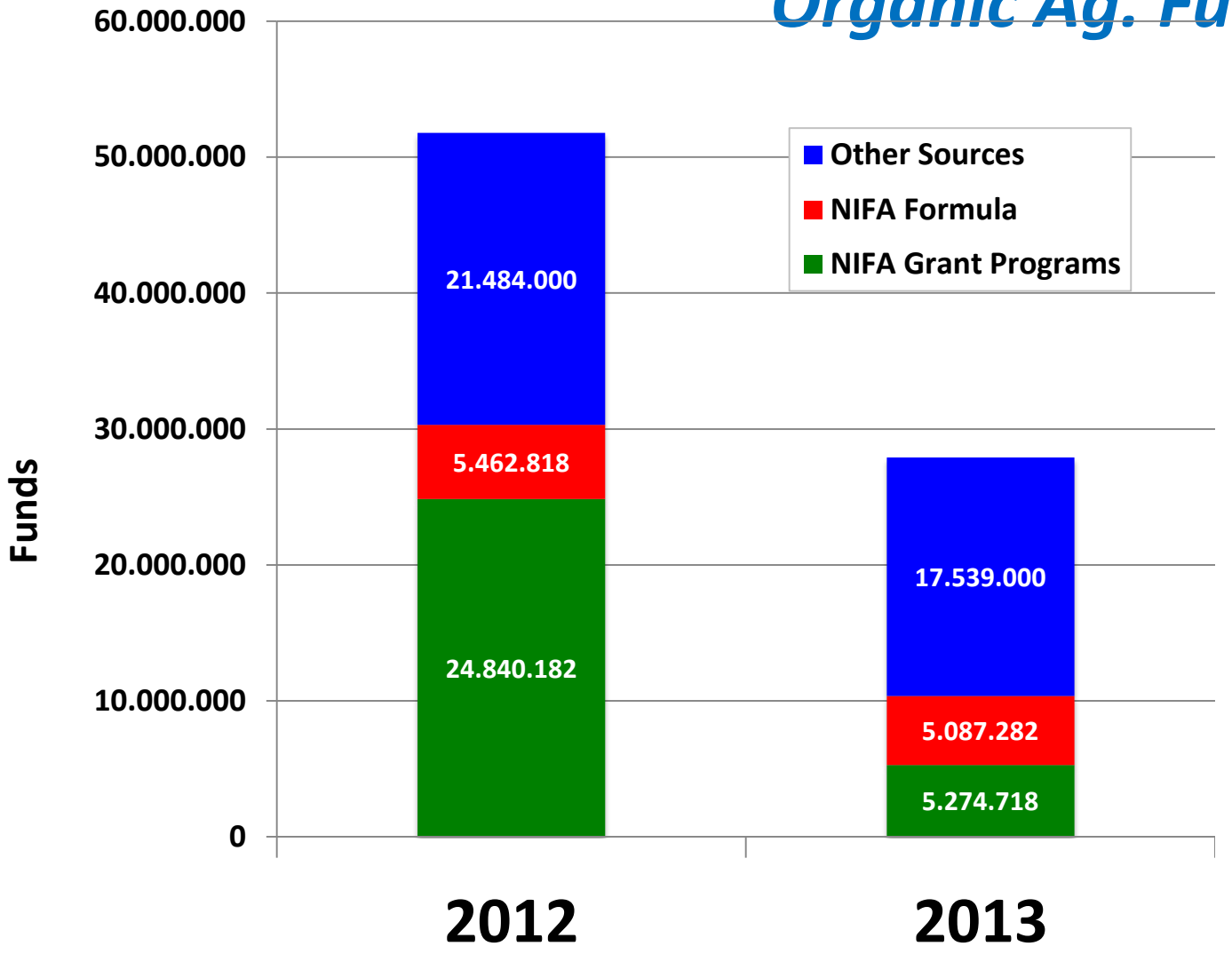
http://images.paraorkut.com/img/funnypics/images/s/sumo_wrestling_fight-13078.bmp

- **Where to go?**

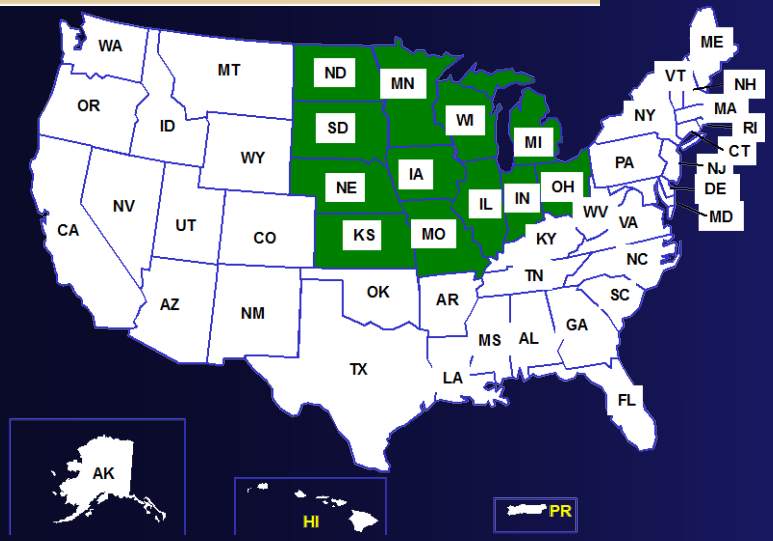
Funding of organic research

Focus on programs specific to organic agriculture

Organic Ag. Funding



Ceres Trust Foundation



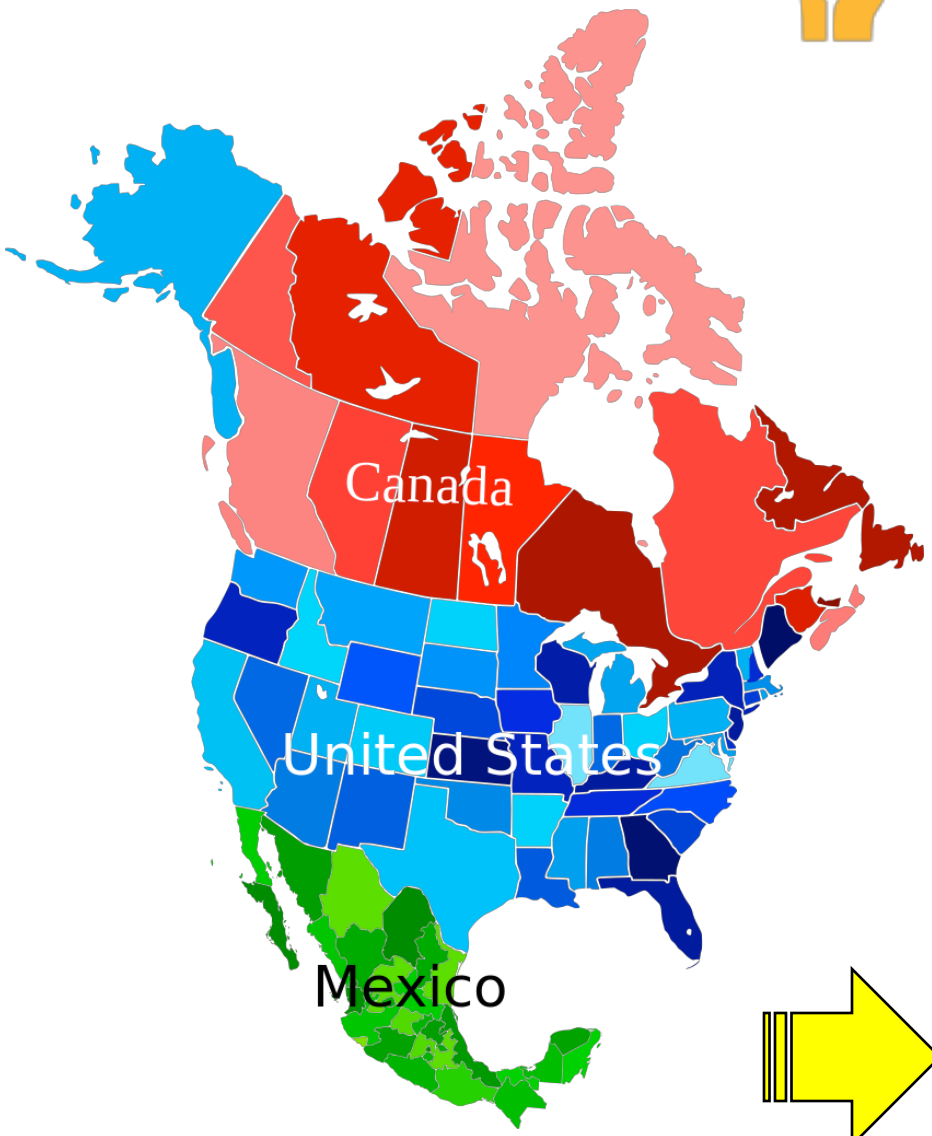
Organic Research Initiative (ORI)

- Started in 2009
- Universities in the 12-state North Central region.
- About 10 grants of $60,000 max. each per year

Organic Research by Graduate Students

- Started in 2010
- North Central region.
- About 10 grants of $10,000 max. each per year

ORGANIC FARMING
RESEARCH FOUNDATION



OFRF Grant program

- Canada, Mexico, U.S.
- Max. of $15,000/grant
- Current deadline is Thursday, May 15, 2014

- Small grants but huge impact
- Launching pad for larger projects

Organic Programs at NIFA

ORG
Organic Transitions

- *$4 million available in 2014*
- *About same amount in 2015*
- *RFA Deadline: ?*
- *Award Cap: $500,000*

OREI
Organic Ag. Res. & Ext. Init.

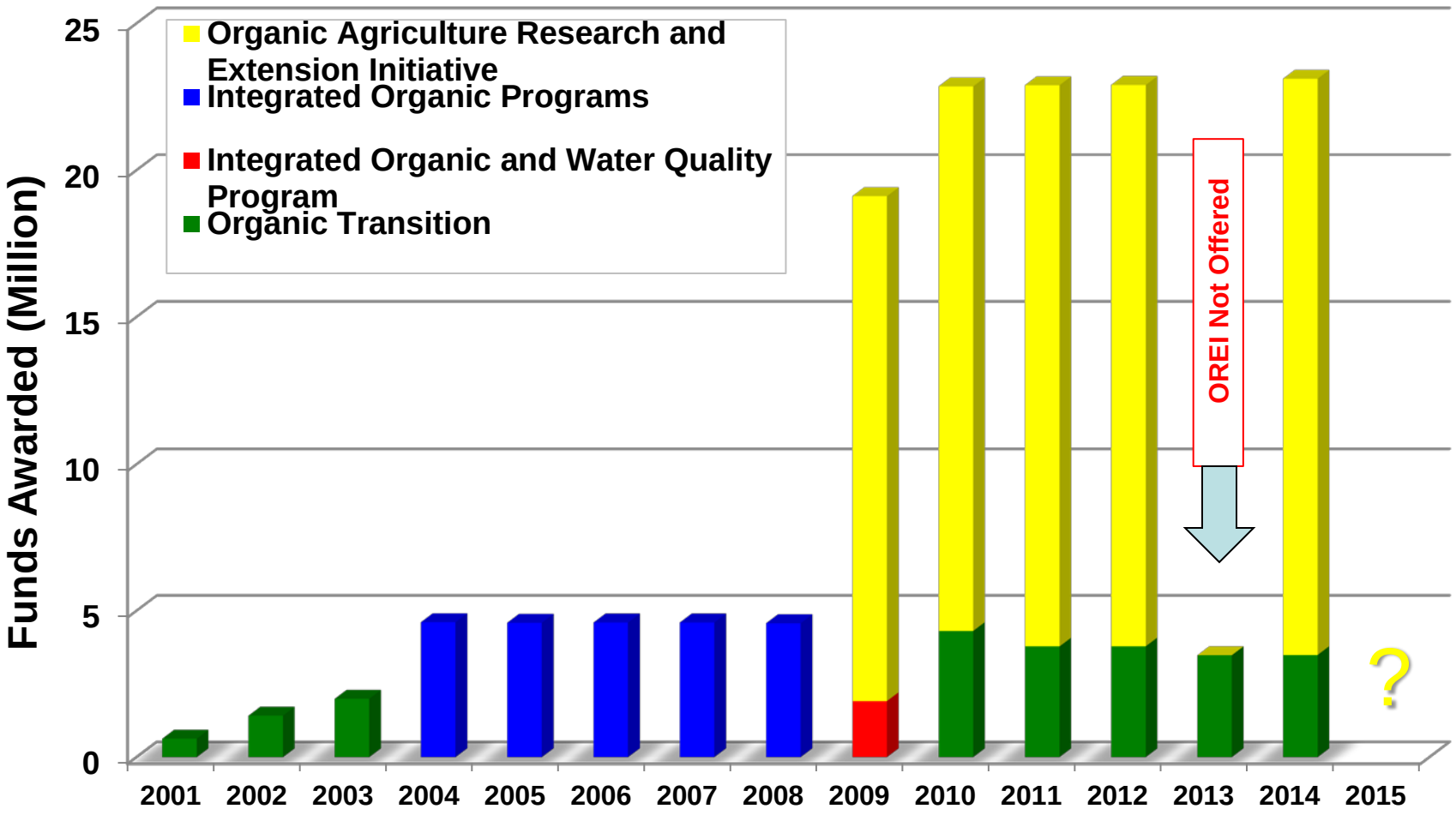
- **Integrated Projects***
  - Research
  - Extension
  - Education

  * Min. 2 functions

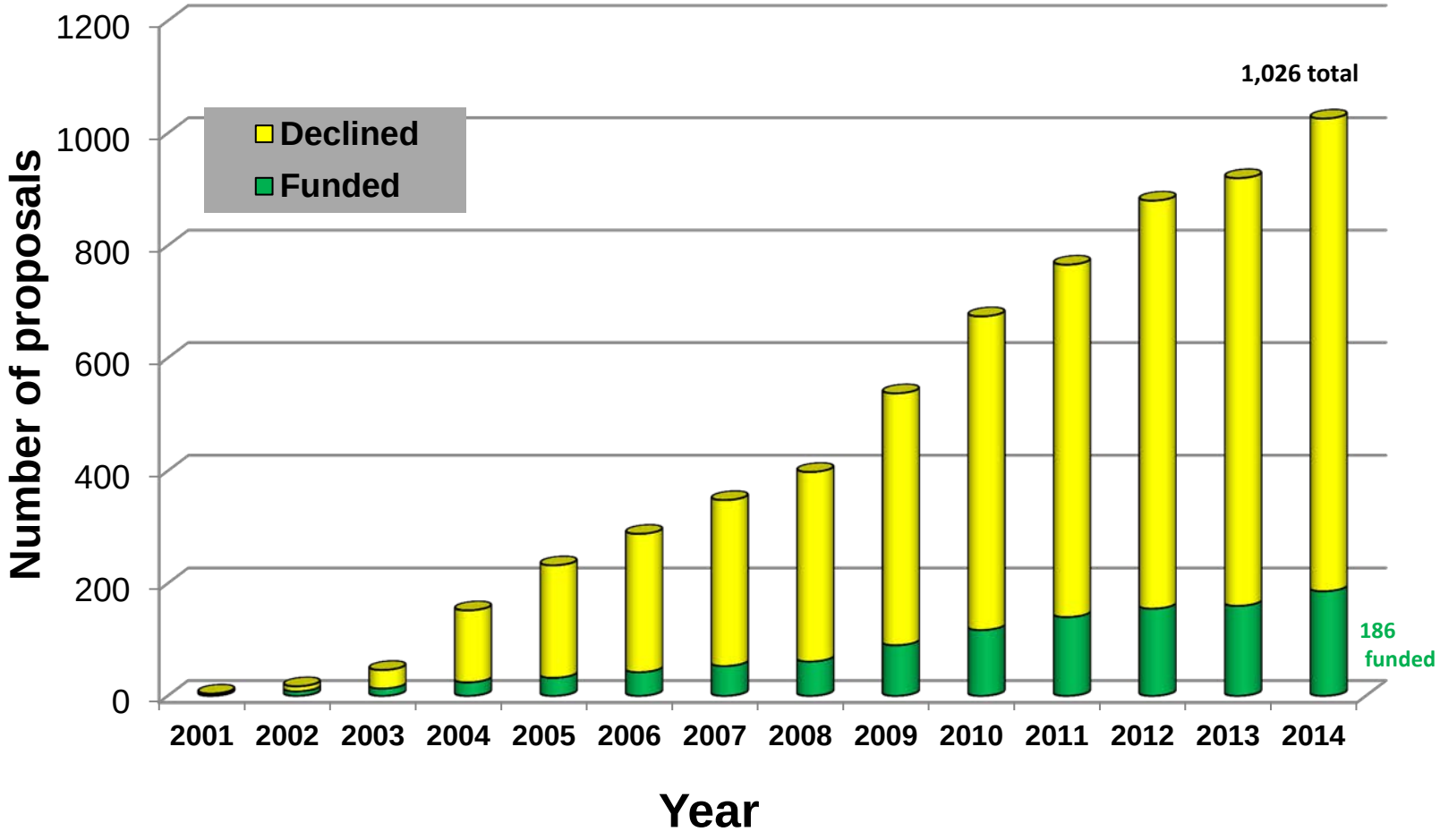
- **Others (historically)**
  - Conference
  - Planning
  - Analytical
  - eXtension

- *$20 million available in 2014*
- *About same amount in 2015*
- *RFA Deadline?*
- *Award Cap: $50K to $2M*

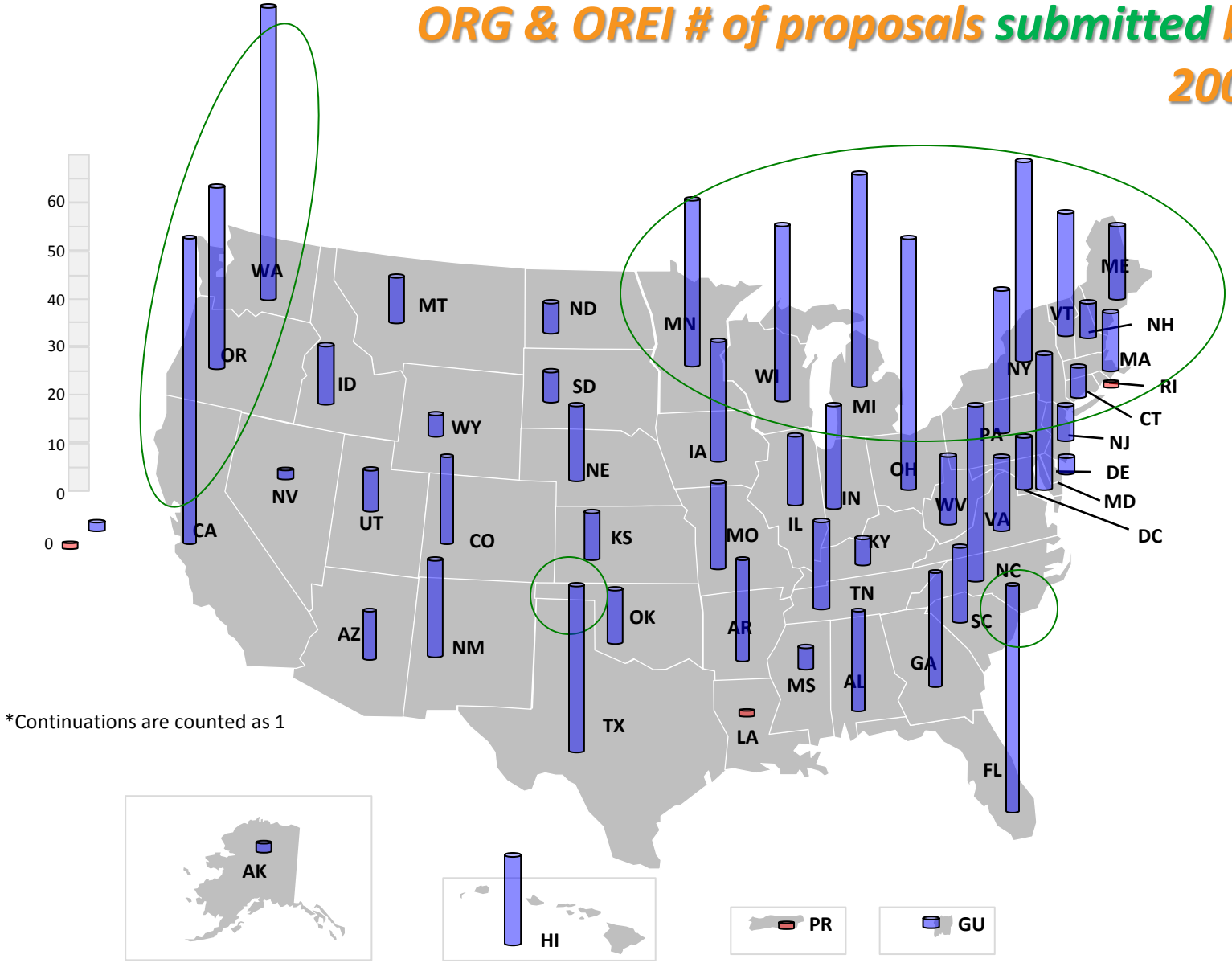
Funding to states by year



ORG and OREI cumulative # of proposals by year

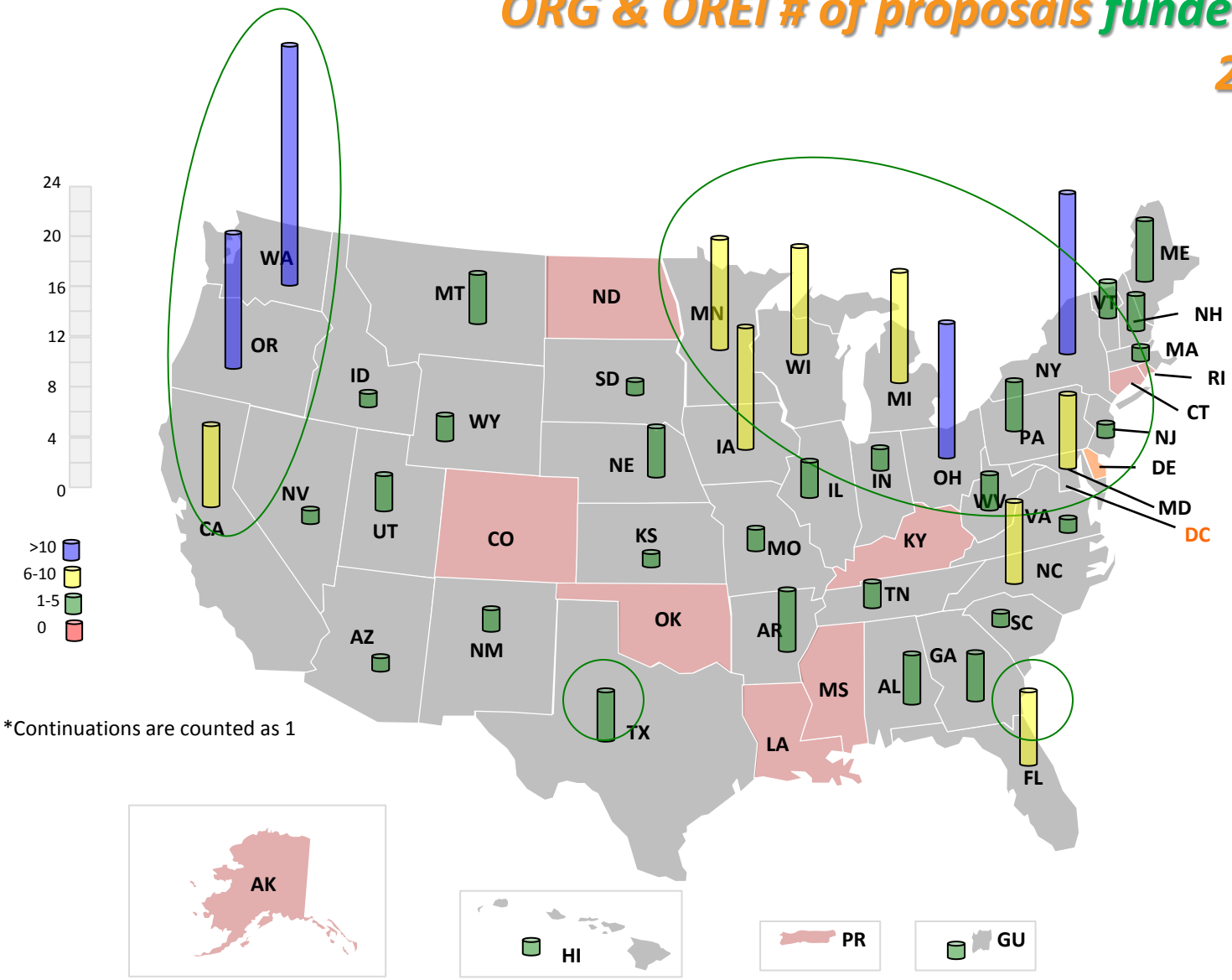


ORG & OREI # of proposals submitted by state 2001-2014



*Continuations are counted as 1

ORG & OREI # of proposals funded by state 2001-2014



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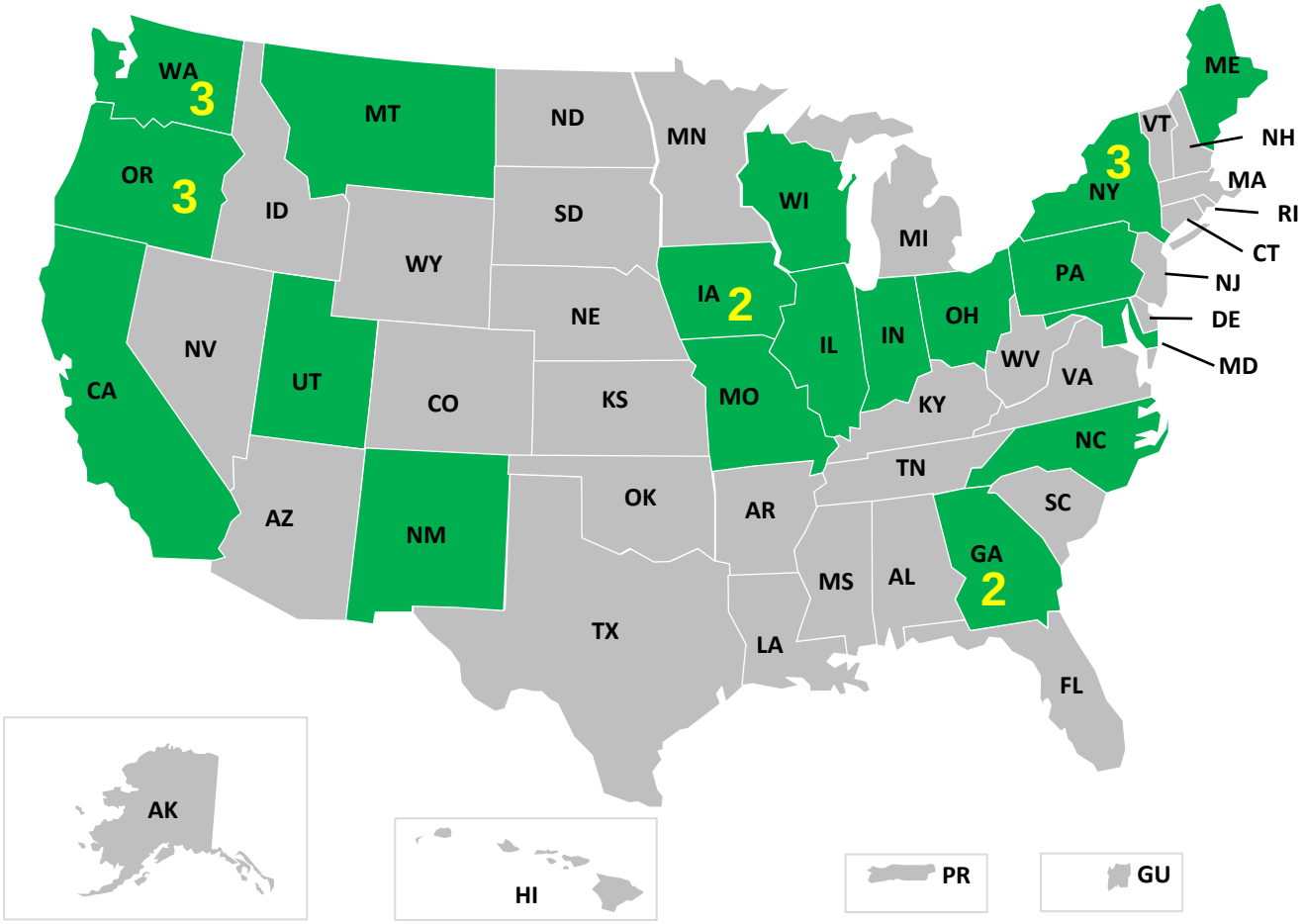
2014 ORG-OREI Grant Distribution



Some keys to success for NIFA Organic Programs

- **Human Capacity**
  - **Critical mass of organic scientists <u>working together</u>**
  - **Strong connection University-Extension-Organic industry**
- **Institutional capacity**
  - **Support from the upper administration**
  - **Certified facility for research**

Thank you for convening this meeting to tackle organic agriculture issues