

Regional Food Systems in the NE United States:

Status, Possibilities, and Food Security

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The logo for Tufts University, featuring the word "Tufts" in a large, white, serif font above the word "UNIVERSITY" in a smaller, white, sans-serif font, all set against a blue rectangular background.

Tufts
UNIVERSITY

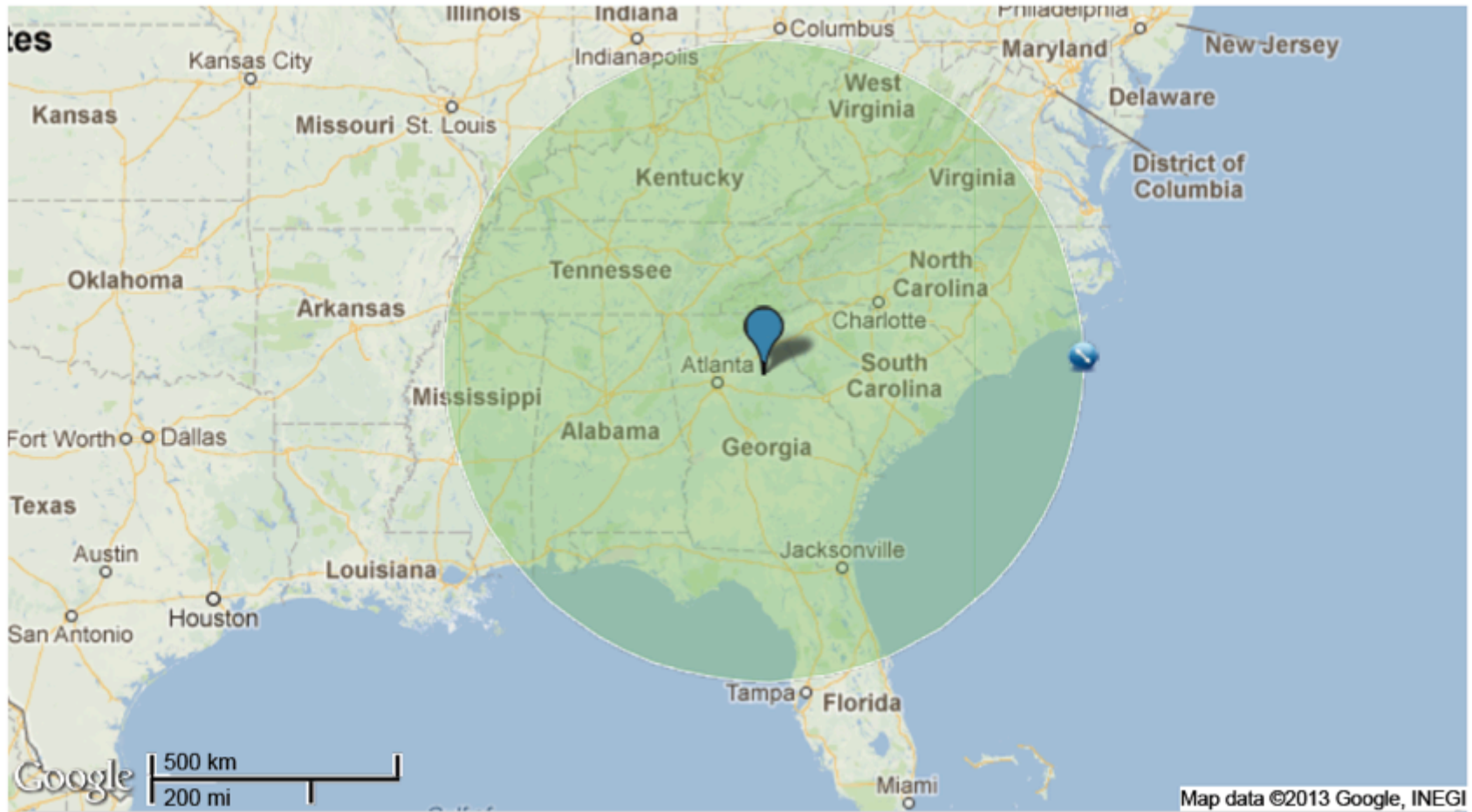
- Dueling Food Systems (?)
- Trends in the Northeast U.S.
- Setting the Baseline, Considering the Future
- Challenge of Interdisciplinary work



Do we have two food systems?



Local can imply *Distance*





ATHENS FARMERS MARKET
local and sustainable

SATURDAYS
BISHOP PARK
8AM—NOON

WEDNESDAYS
CITY HALL
4PM—7PM



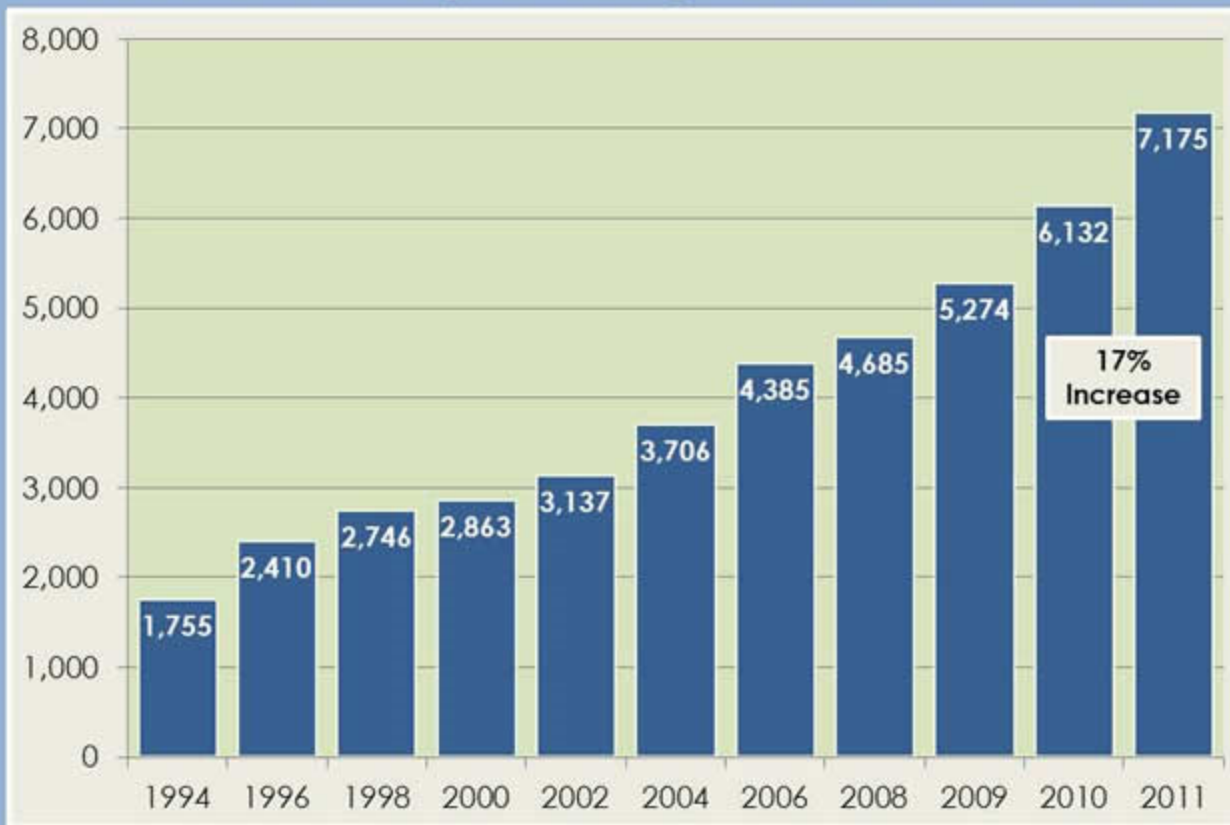
<http://www.fns.usda.gov/wic/images/FMNPfa2.jpg>



http://www.fnec.cornell.edu/Uploads/FMNP/barrels_of_peppers.jpg

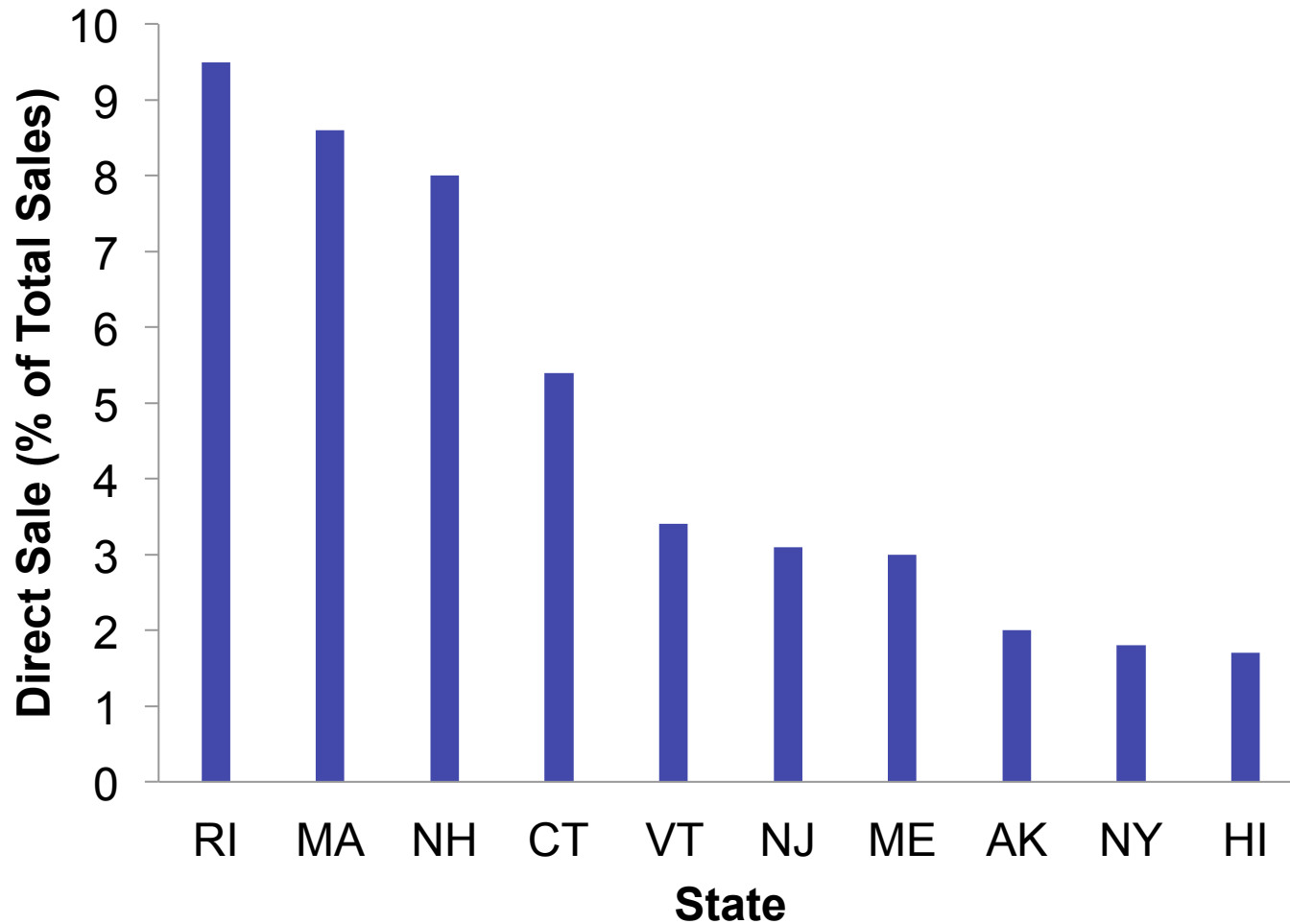
Relationships & markets

Number of Operating Farmers Markets



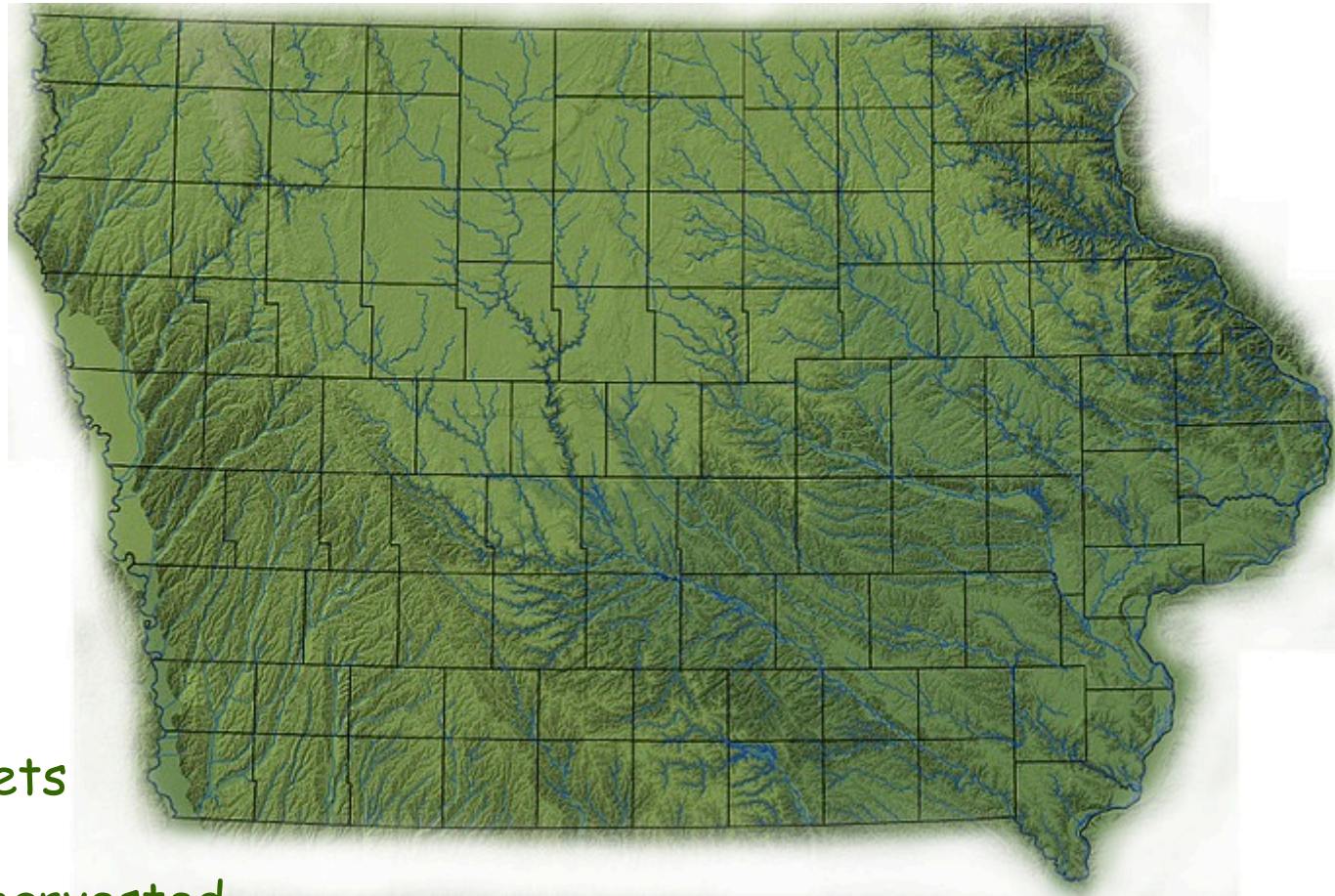
Source: USDA-AMS-Marketing Services Division

Direct to Consumer Sale of Food: Top 10 States





255 Farmers' Markets
7,691 Farms
0.154 million acres harvested



239 Farmers' Markets
92,900 Farms
23.7 million acres harvested

Share of the food system?

Impact on food security?
(Household and regional)

Interest in Northeast despite long-term agricultural challenges:

	1925	2007
Number of Farms	50,033	8,136
Land in Farms	5.16 million acres	1.34 million acres
Cropland	1.64 million acres	0.53 million acres

Quiz Question: Which Northeast state is this??

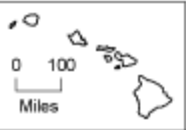
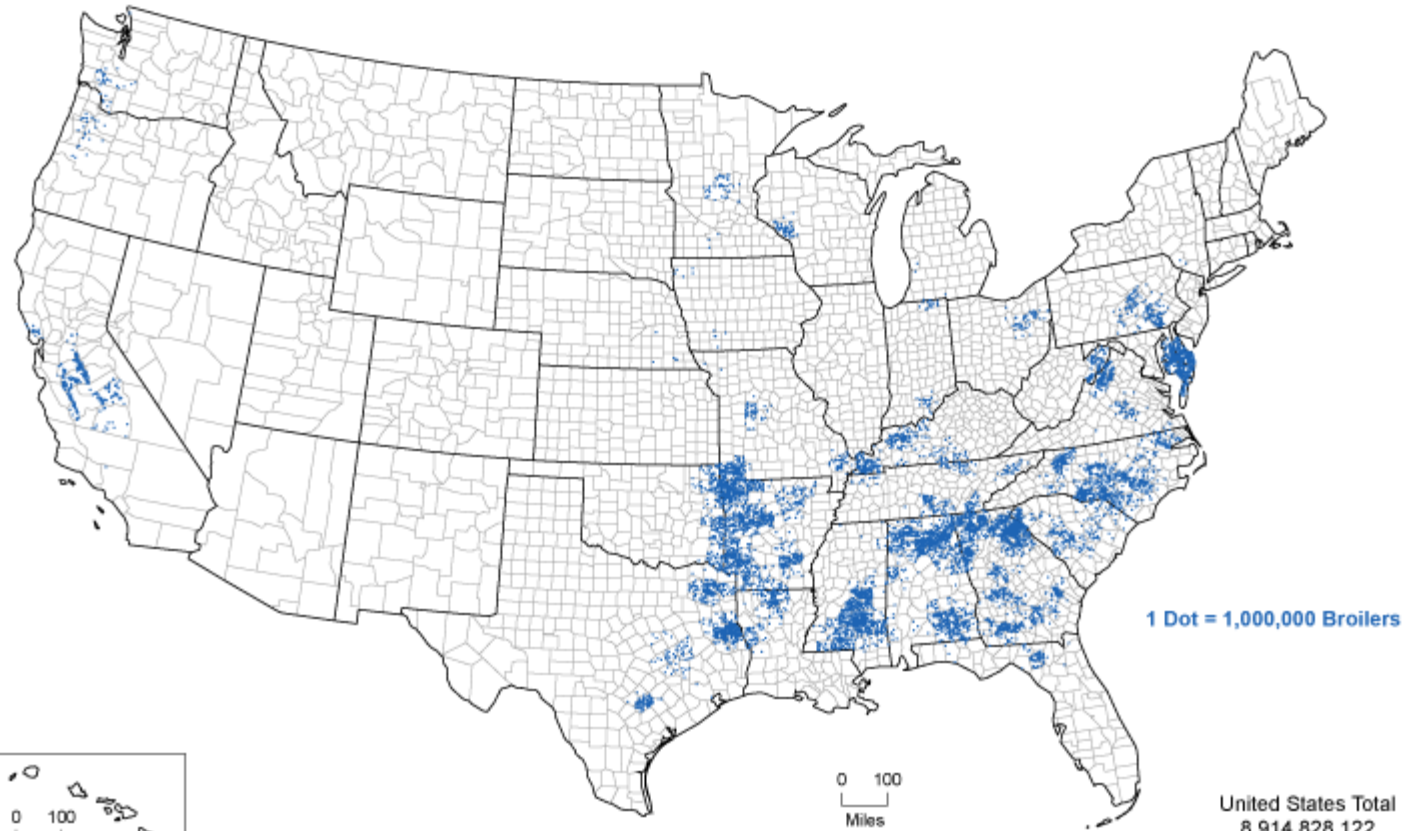
Comparative Advantage to Achieve Low Food Cost

Specialization

Economies of Scale

Input/Output Efficiency

Number of Broilers and Other Meat-Type Chickens Sold: 2007



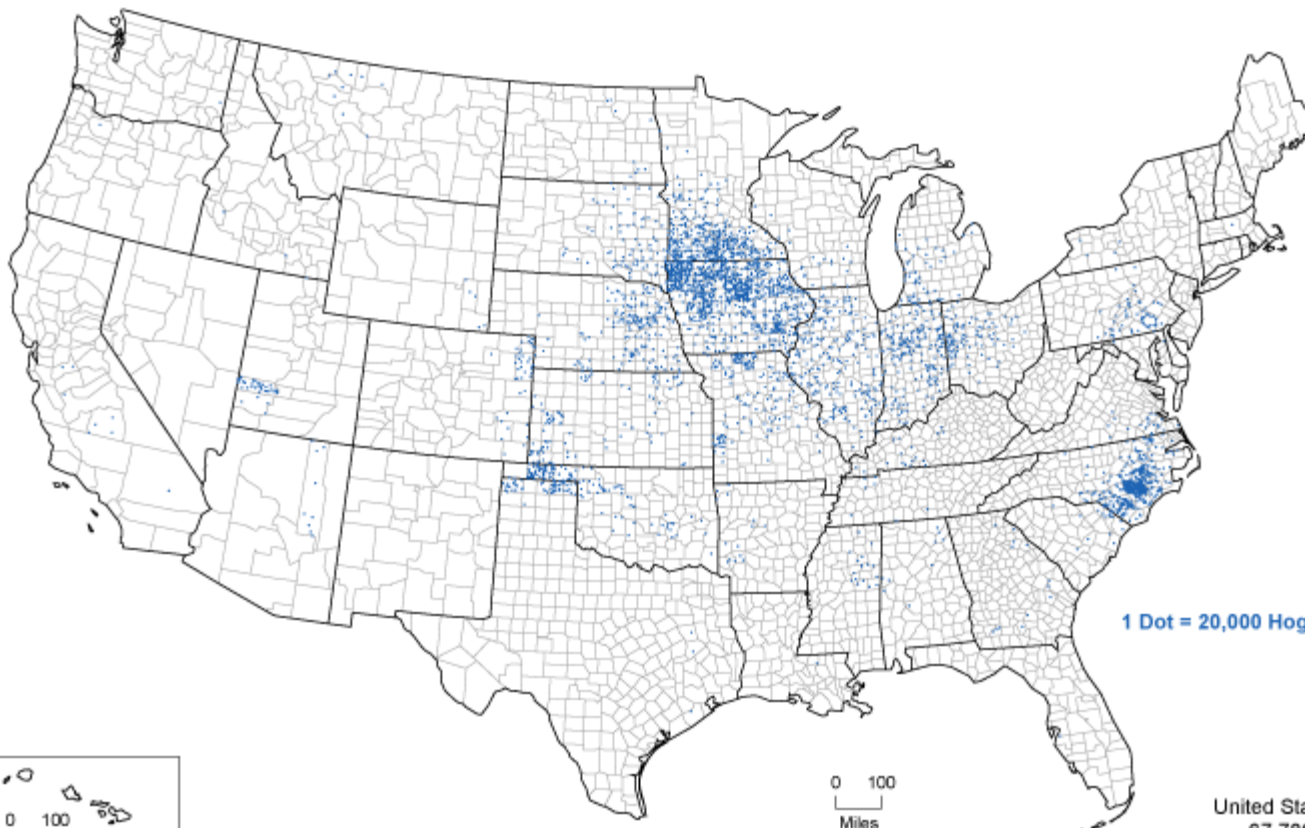
United States Total
8,914,828,122

07-M161
U.S. Department of Agriculture, National Agricultural Statistics Service

0 200
Miles

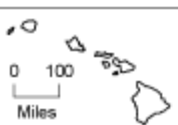


Hogs and Pigs - Inventory: 2007



1 Dot = 20,000 Hogs and Pigs

0 100
Miles



07-M149
U.S. Department of Agriculture, National Agricultural Statistics Service

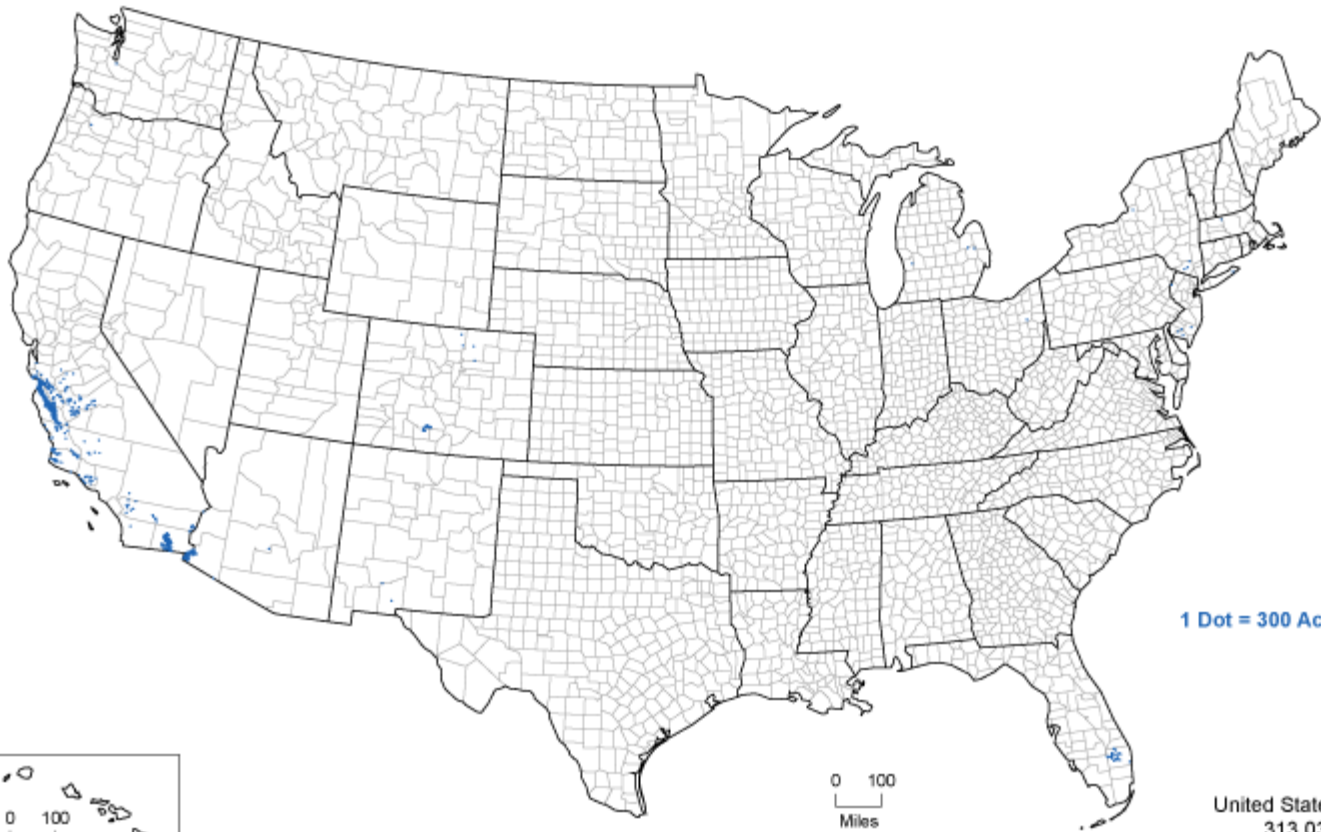
0 100
Miles

United States Total
67,786,318

0 200
Miles

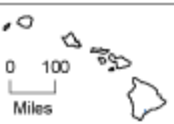


All Lettuce, Acres Harvested for Sale: 2007



1 Dot = 300 Acres

0 100
Miles



07-M225
U.S. Department of Agriculture, National Agricultural Statistics Service

United States Total
313,036

Nearly Complete Externalization of Non-Production Costs

Environmental Degradation

Health Impacts (direct and indirect)

Economic Opportunity

Local



Eric Brennan

Global



John Hendrickson

Getting back to Regional...



- Maine to West Virginia
- Supply chains
- Farms are the start
- Consumers are the end



EFSNE

Enhancing the Food Security of Underserved Populations in the Northeast U.S. through Sustainable Regional Food Systems (EFSNE)

*Funded by USDA/NIFA (Global Food Security Program)
Prepared for the March 26, 2013 PD Meeting, Washington, DC*



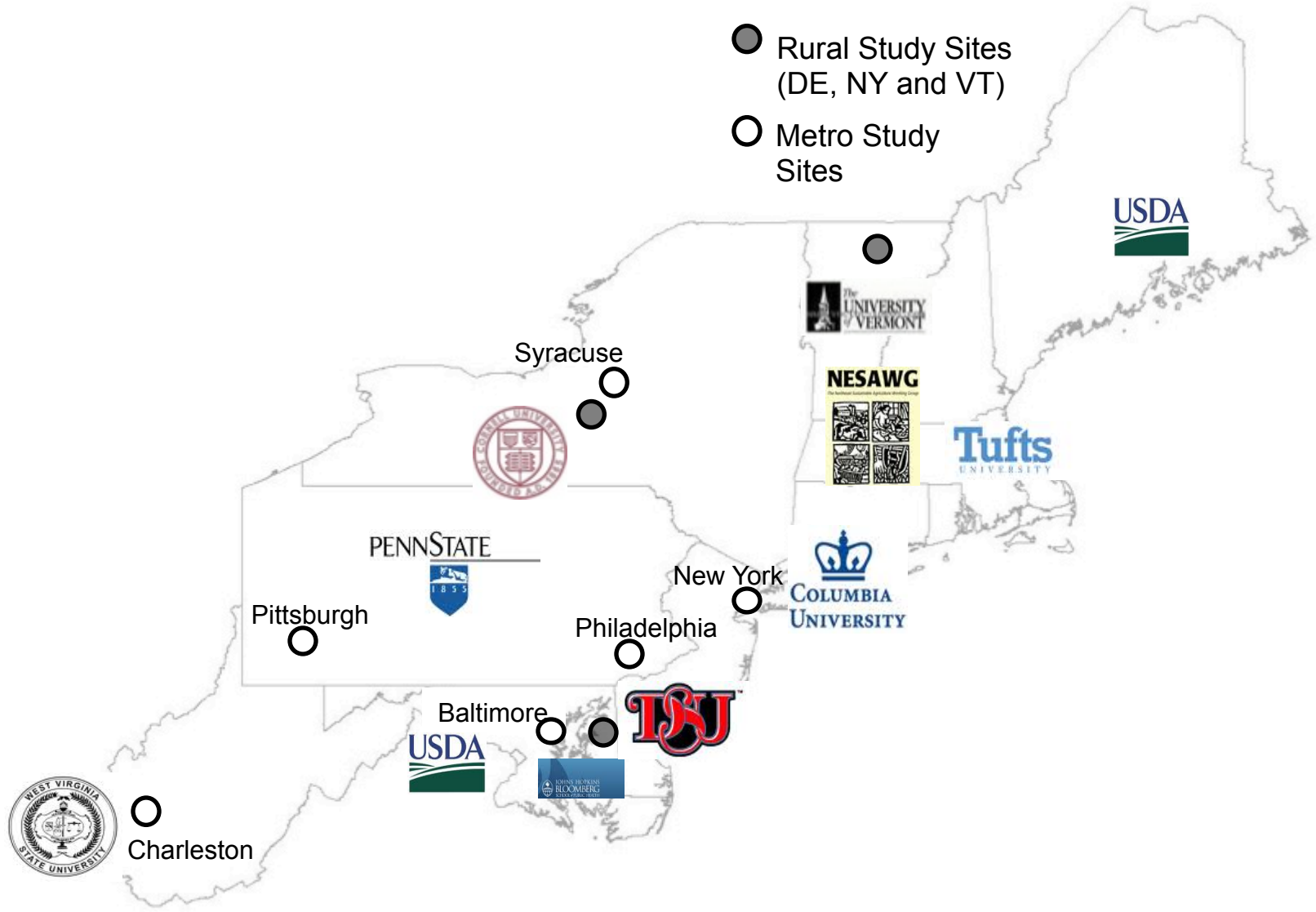
United States
Department of
Agriculture

National Institute
of Food and
Agriculture

Grant No. 2011-68004-30057

Northeast AFRI-GIS Project Sites and Collaborating Institutions

- Rural Study Sites (DE, NY and VT)
- Metro Study Sites







ISS011E06079

Supply Chains



Processing/Distribution



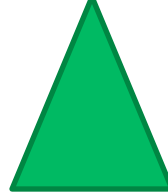
Access in Communities



Farm-level Production

Production

Consumption



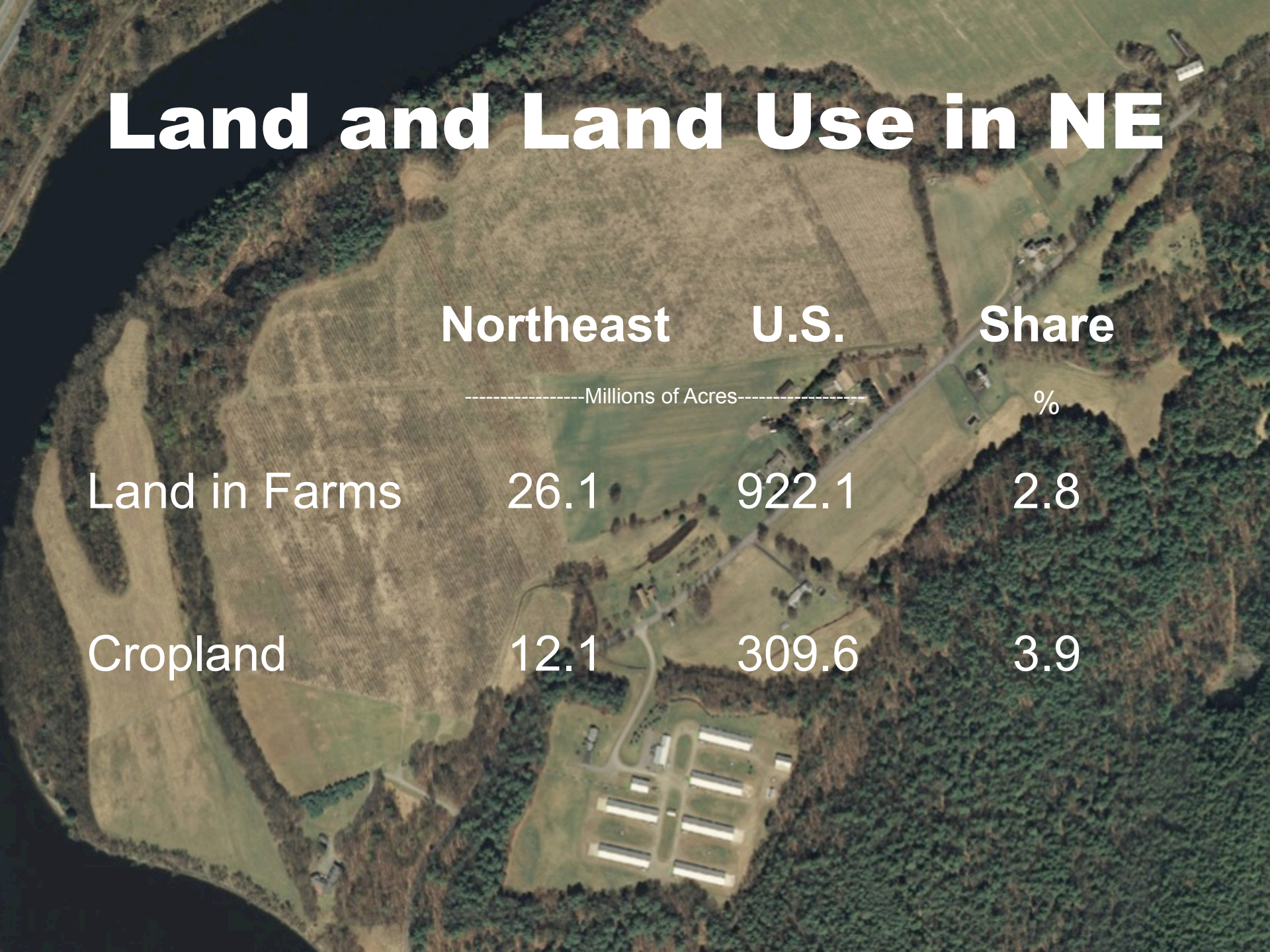
Land and Land Use in NE

Northeast U.S. Share

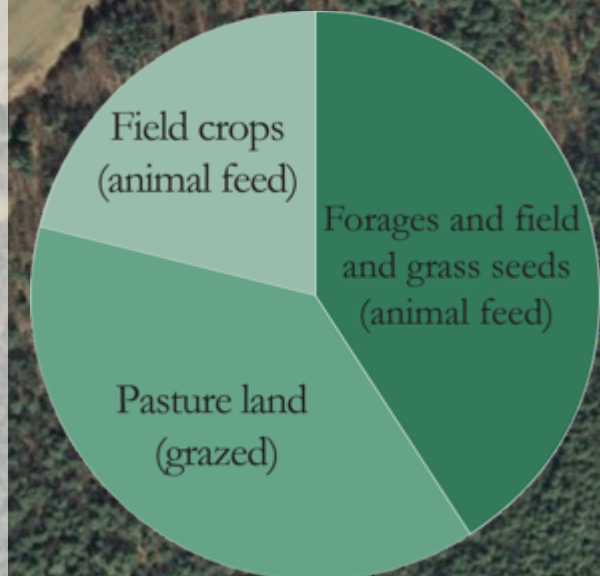
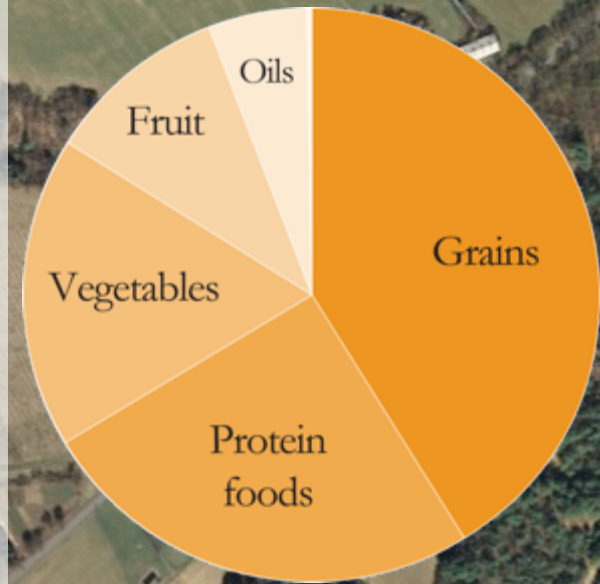
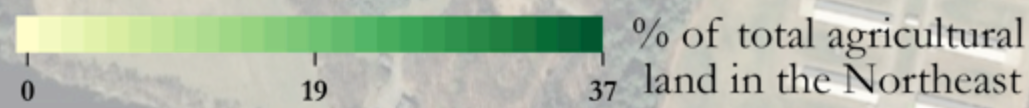
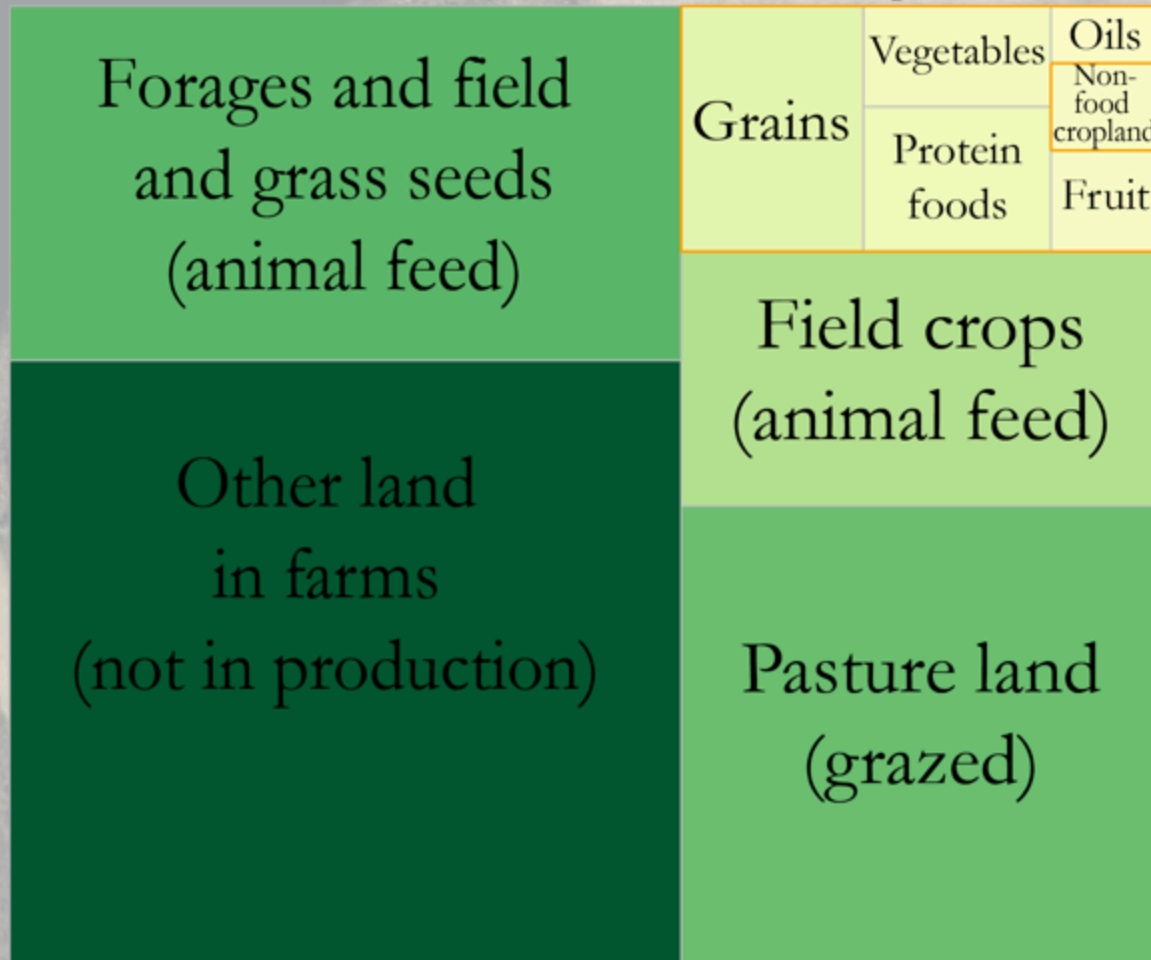
-----Millions of Acres----- %

Land in Farms 26.1 922.1 2.8

Cropland 12.1 309.6 3.9

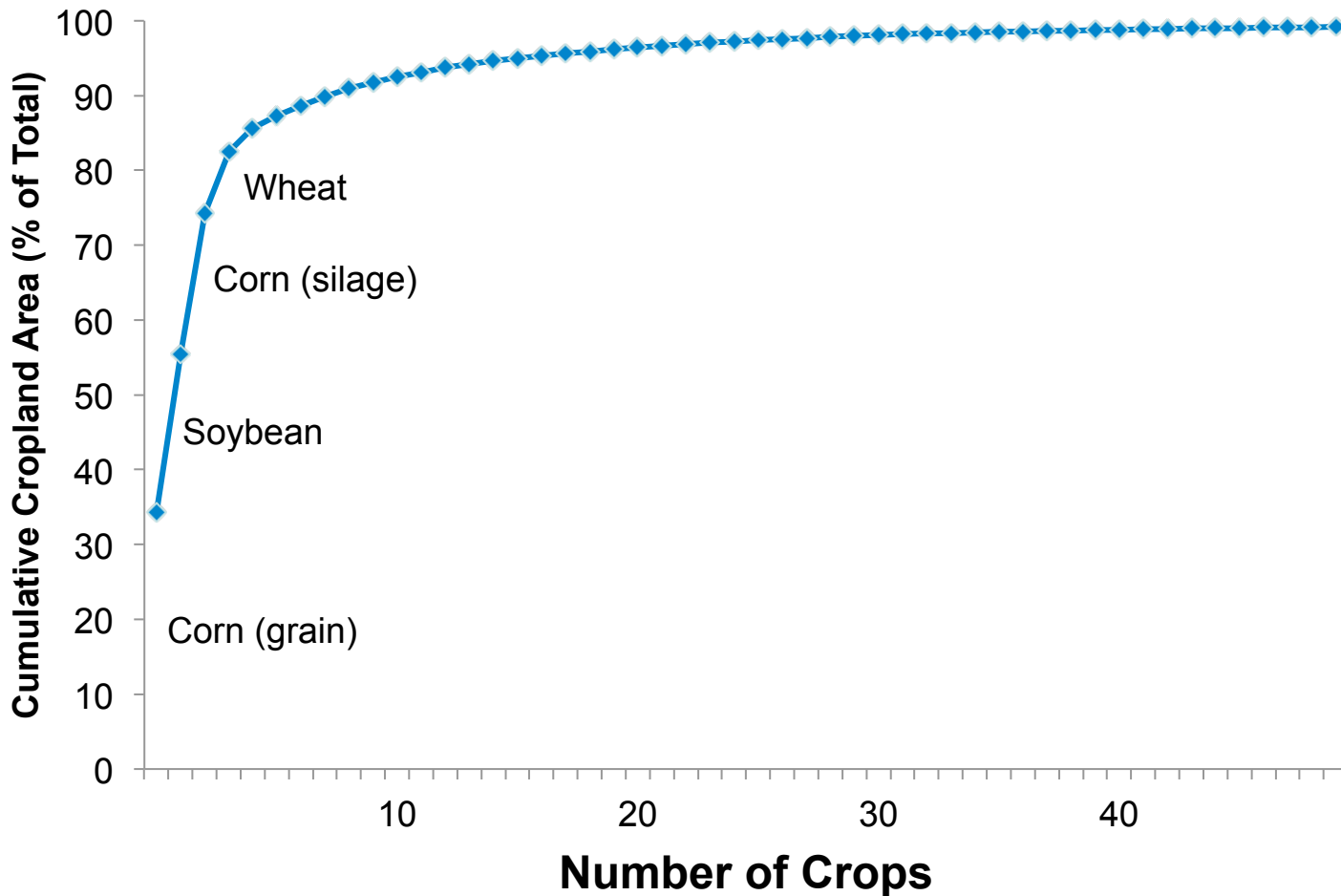


Northeast regional mean agricultural land area, 2001-2010



Crop Diversity in the Northeast

More than 300 different crops grown
(includes feed, food, non-food, “other”)



Category	Regional Self-Reliance (%)
Grains	8
Proteins	8
Vegetables	28
Fruit	19

Reliance = (regional production / regional consumption) * 100



Vegetable Group	Regional Self-Reliance
------------------------	-------------------------------

(%)

Dark Green

12

Starchy

44

Red and Orange

13

Other

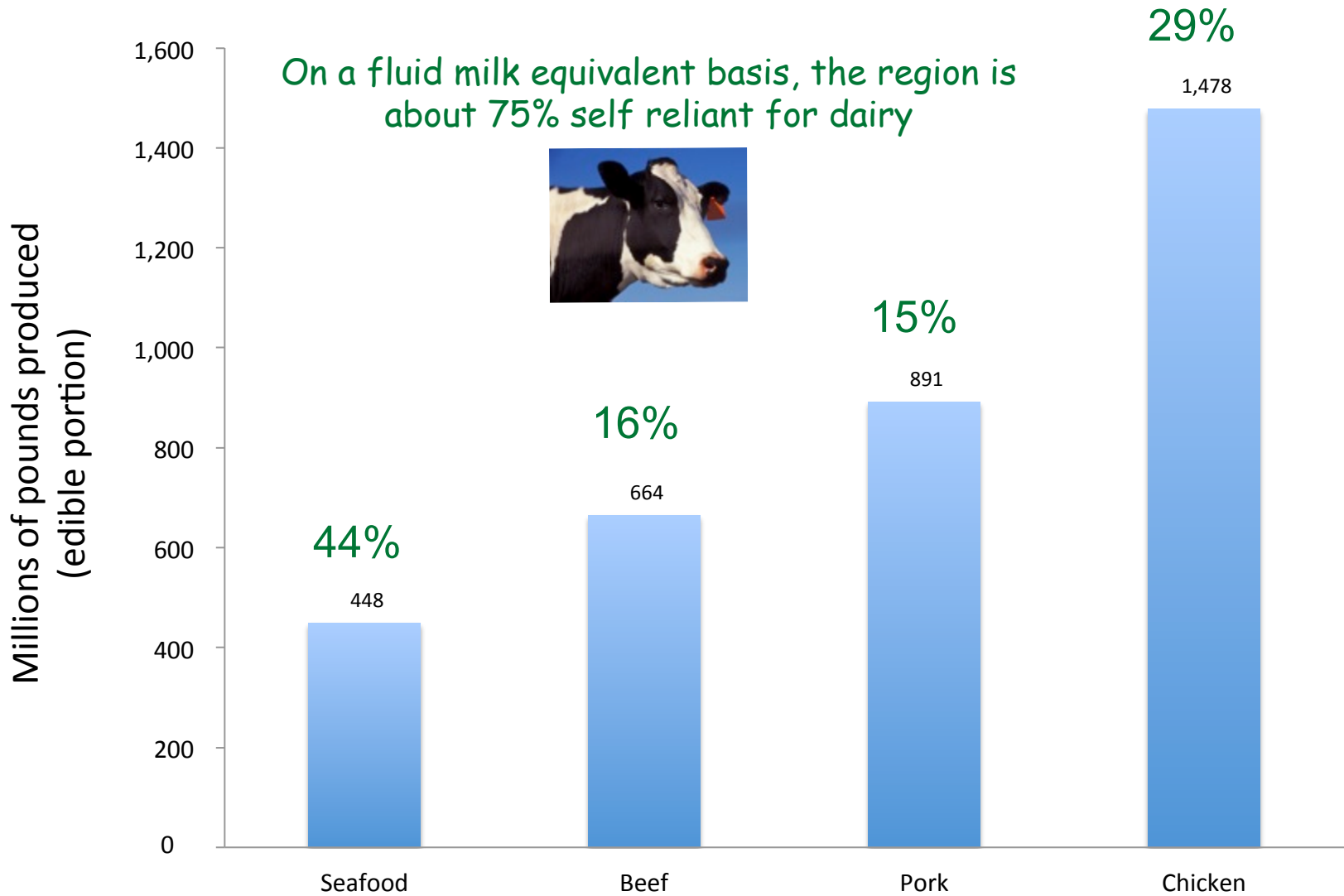
34



Fruit Group	Regional Self-Reliance
	(%)
“Commonly Eaten”	17
Berries	54
Melons	13



Northeast Regional Production from Meat Animals (mean, 2001-2010)



Fluid milk is a regional product;
Other dairy products are not (necessarily)



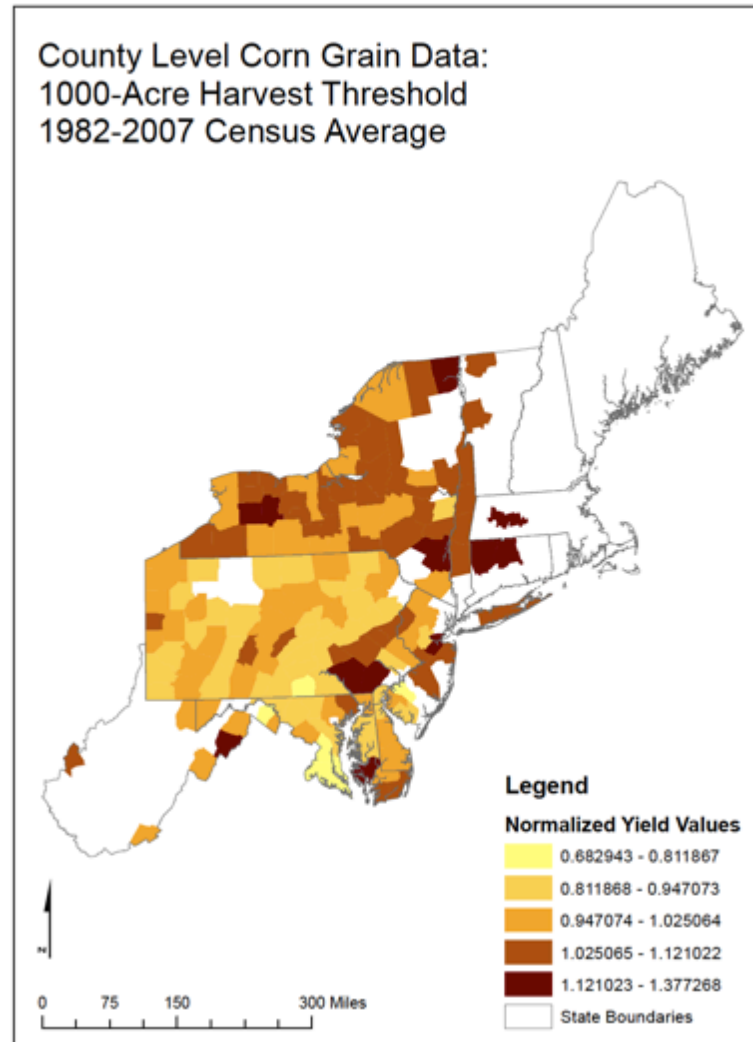
Production



Consumption

On a fluid milk equivalent basis, the region is
about 75% self reliant

Clustering of higher or lower yields and stability of yields over time

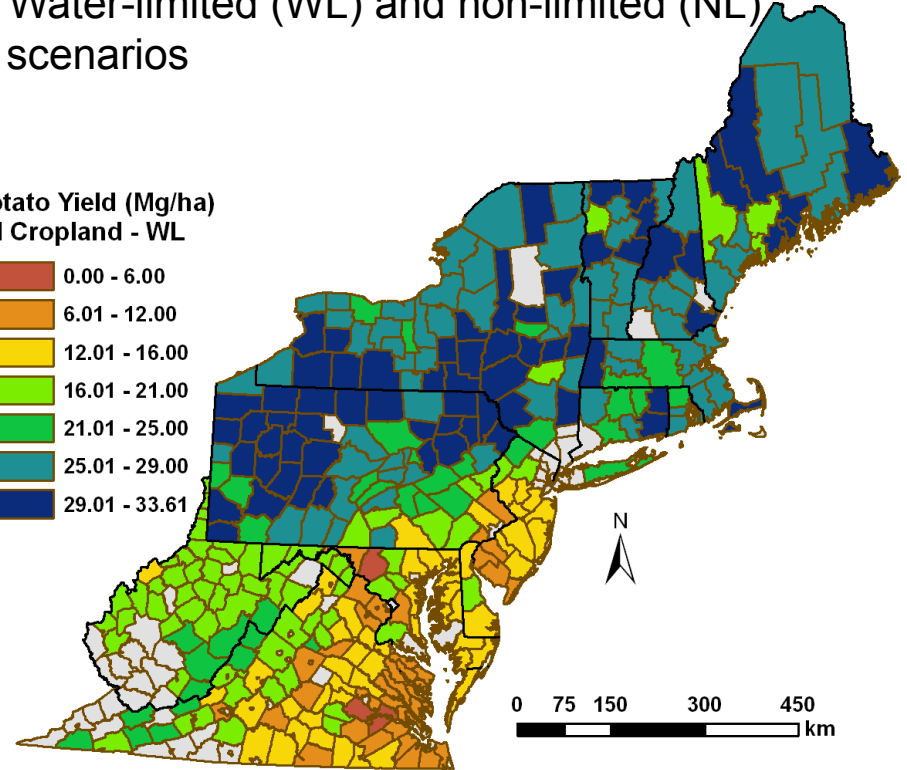
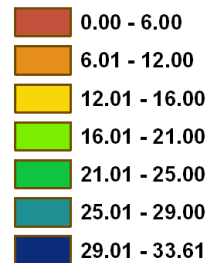


Geospatial Crop Modeling

- Current production
- Production Scenarios
 - Water use
 - Land use change
 - Climate change
- Questions:
 - How much land?
 - Highest potential yield?
 - Production constraints?
 - Resource needs?

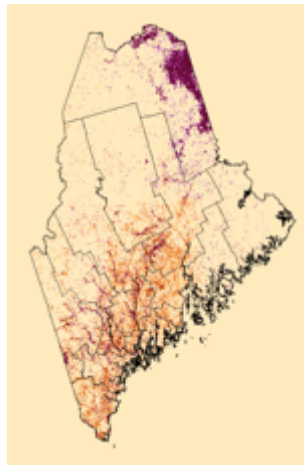
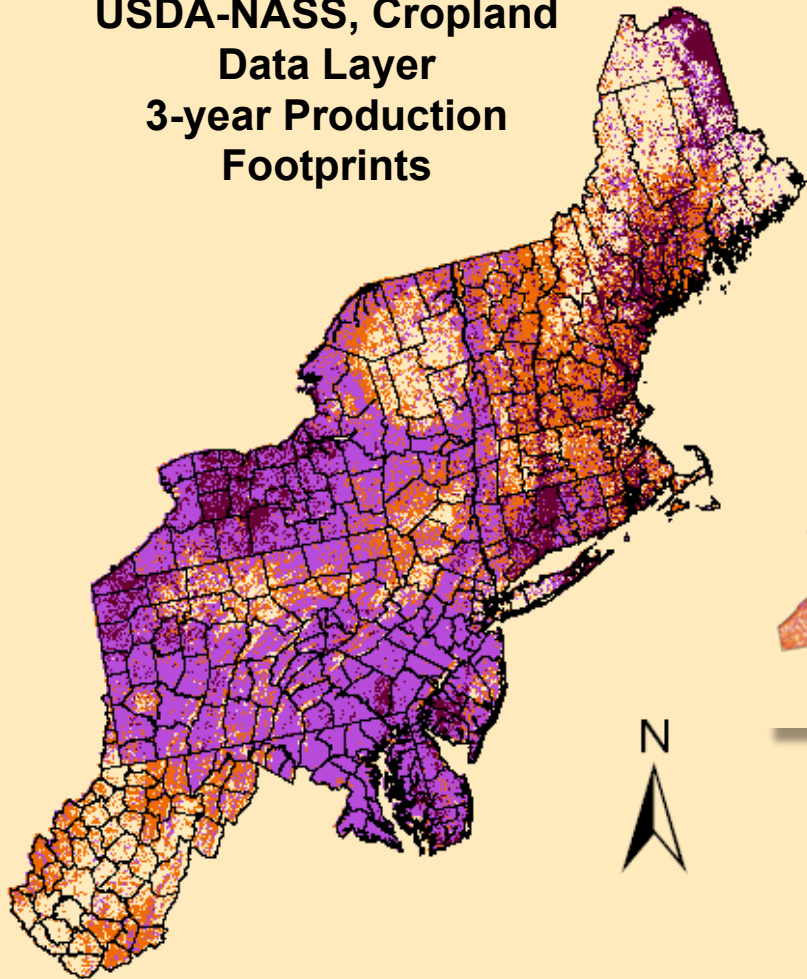
- Results aggregated to the county-level
- Three crops to be simulated (potatoes, corn, wheat)
- Water-limited (WL) and non-limited (NL) scenarios

Potato Yield (Mg/ha)
All Cropland - WL



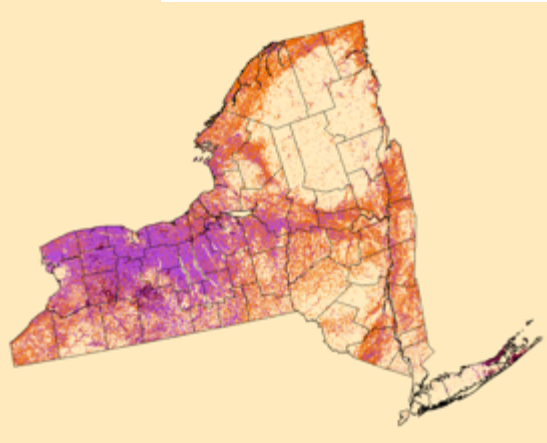
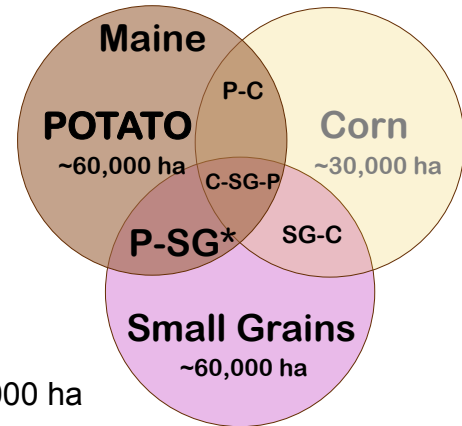
Cropping System Linkages

USDA-NASS, Cropland
Data Layer
3-year Production
Footprints

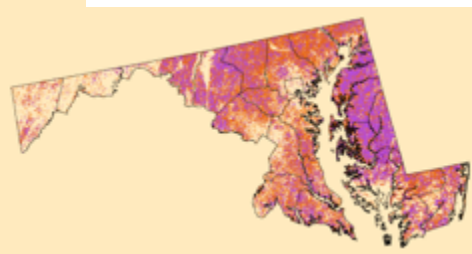
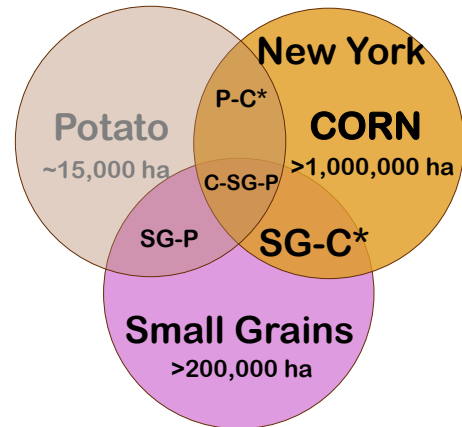


ME Total Cropland 214,000 ha

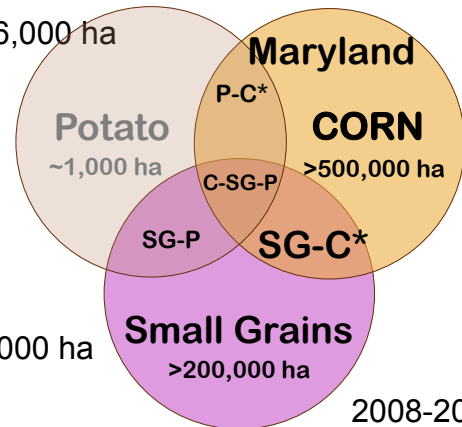
3-year Production Footprints



NY Total Cropland 1,746,000 ha



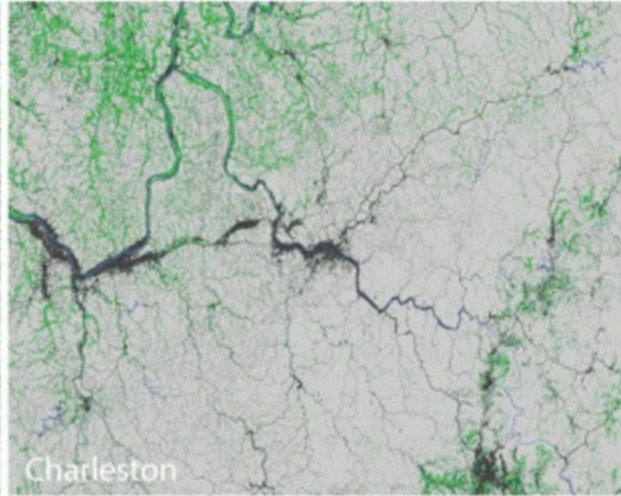
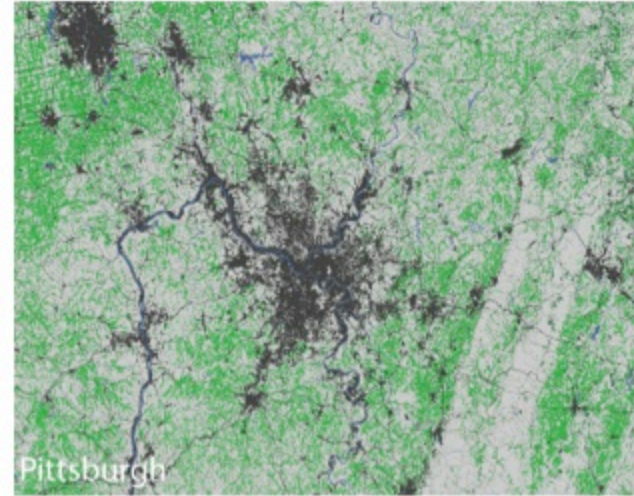
MD Total Cropland 569,000 ha



2007 Census of Agriculture

2008-2010

Urban & Peri-Urban Agriculture Assessment



Subsequent Questions:

If we are to grow more food within the region,
where would that occur?

How would such shifts be impacted by drivers
like climate change, dietary shifts, etc.?

How are production and consumption changes
likely to be affected by policy??

How does this type of work
get done?

"Emergent Learning Community"
(Clare Hinrichs, Penn State)

The Ideal...



PROD Team Meetings



Keeping in Touch

Data sharing and file versioning are very real challenges



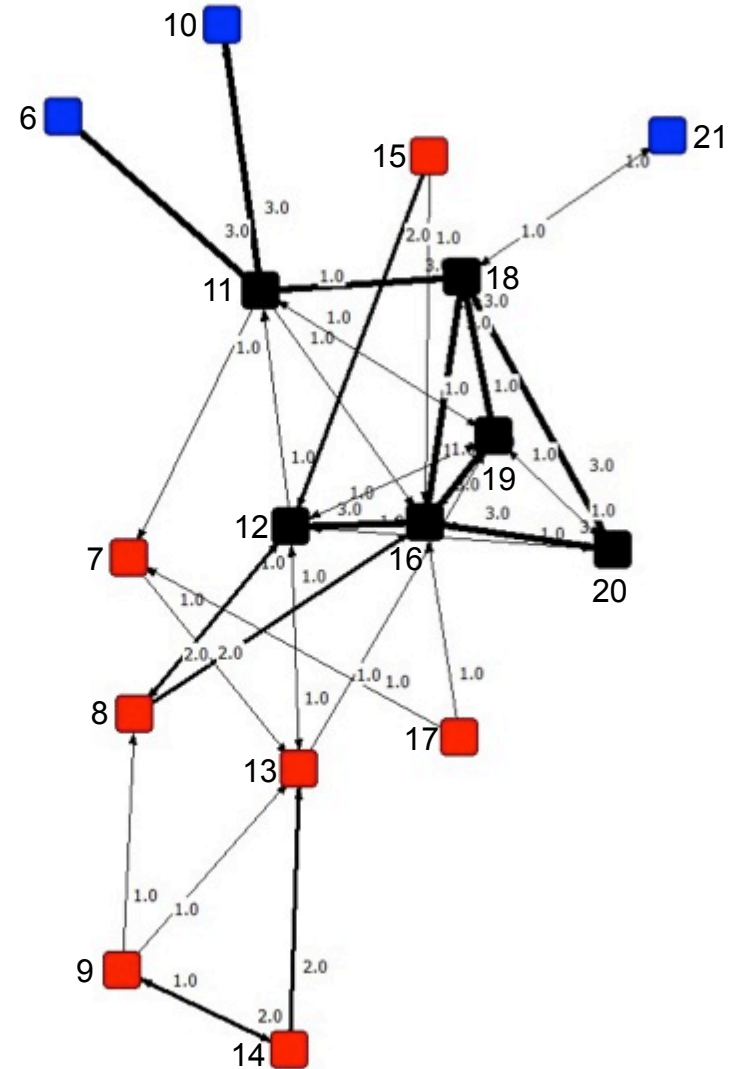
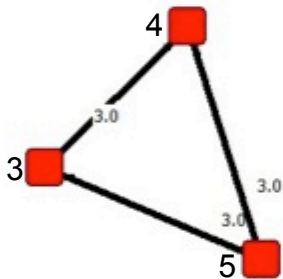
Our PROD group has had a conference call every 2nd Friday since March 2010

Other Learnings

1. Student interest and engagement greater than anticipated
2. Work at community level requires substantial effort-uneven results
3. Adaptive management is key to daily problem solving
4. Teams learning to utilize new methods from unrelated disciplines

GFS Project Network: 2006 (Stephan Goetz)

- 1 
- 2 



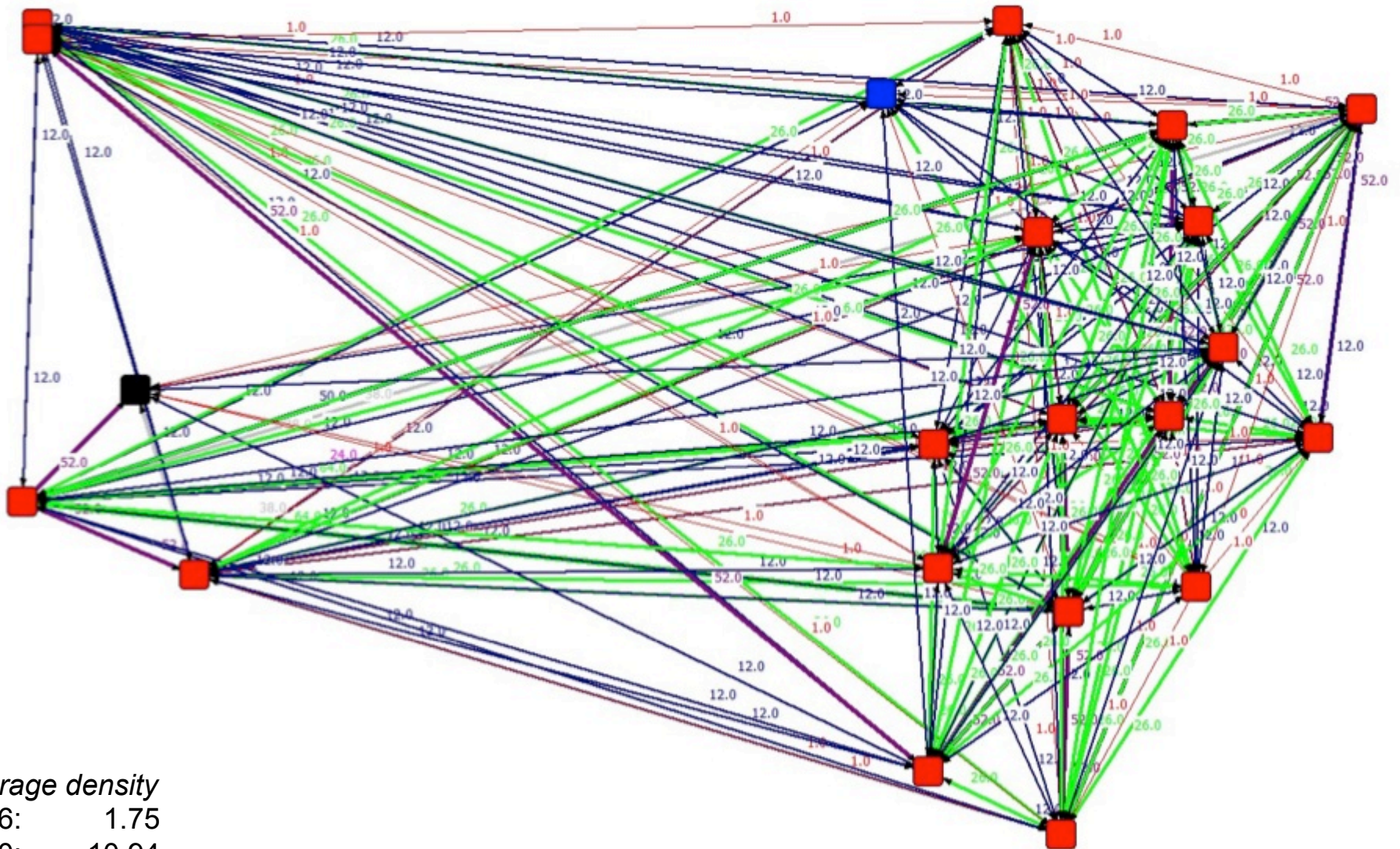
Average density
2006: 1.75

Legend

- 1: if knew of this individual in 2006
- 2: if ever cited this person's published work
- 3: if had working relationship with (in local or regional foods)

Note colors represent *k*-core

GFS Project Network: 2012 (Stephan Goetz)



Average density

2006: 1.75

2010: 10.94

2012: 18.29*

**t*-stat: (9.92) _{2012/2006}

Legend

Line colors show intensity of interaction

Node colors represent *k*-core

Thanks!