The Future of Crop Insurance and Farm Safety Nets

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STATE AGRICULTURAL ECONOMICS

Agricultural Risk Policy & Insurance Collaboratory

Where I am coming from:

- Grew up on a farm in Missouri
- In grad school determined to spend my career focus on two things:
  - Agricultural economics must account for price and yield risk
  - Farmers are not yield or profit maximizers, they are **risk-return managers**

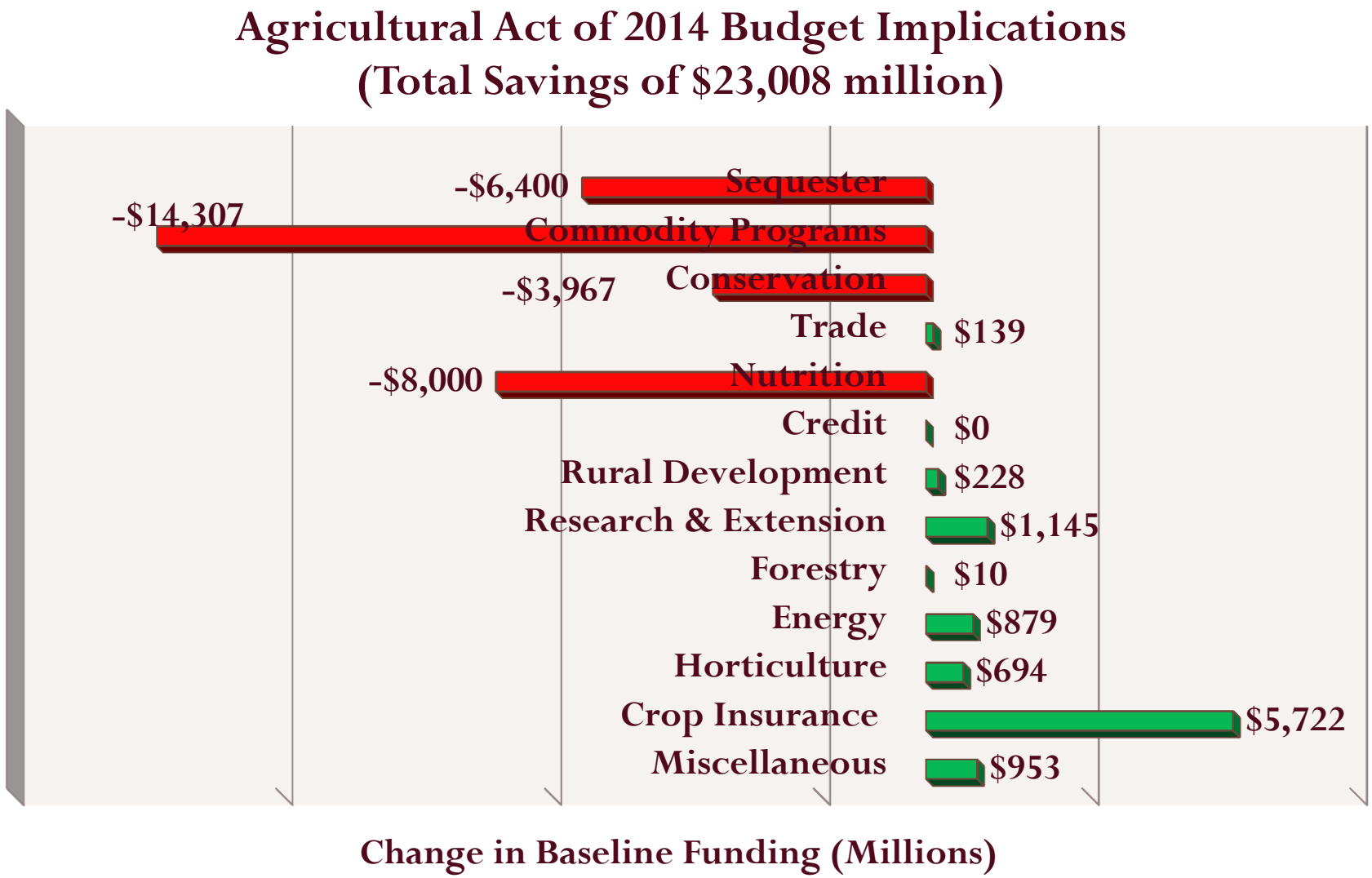
The revolutionary idea that defines the boundary between modern times and the past is the mastery of risk….Risk management guides us over the vast range of decision making from allocating wealth to safeguarding public health, from waging a war to planning a family, from paying insurance premiums to wearing a seatbelt; from planting corn to marketing cornflakes.

Peter Bernstein in "Against the Gods: The Remarkable Story of Risk

Where I am coming from:

- I am a policy empiricist, former hill staffer, & aim to be an 'honest broker' of scientific information
  - Ag policy is evolutionary
  - Ag policy is in a crisis
- Crop revenue insurance has become the core of the ag safety net
  - Title I programs are on base acres
  - ARC & SCO are revenue index experiments in this bill
- Crop yield & revenue risk is really really hard to insure
  - Have spent years consulting with RMA to improve crop insurance
- 'Big ag data' will revolutionize crop insurance & farm policy

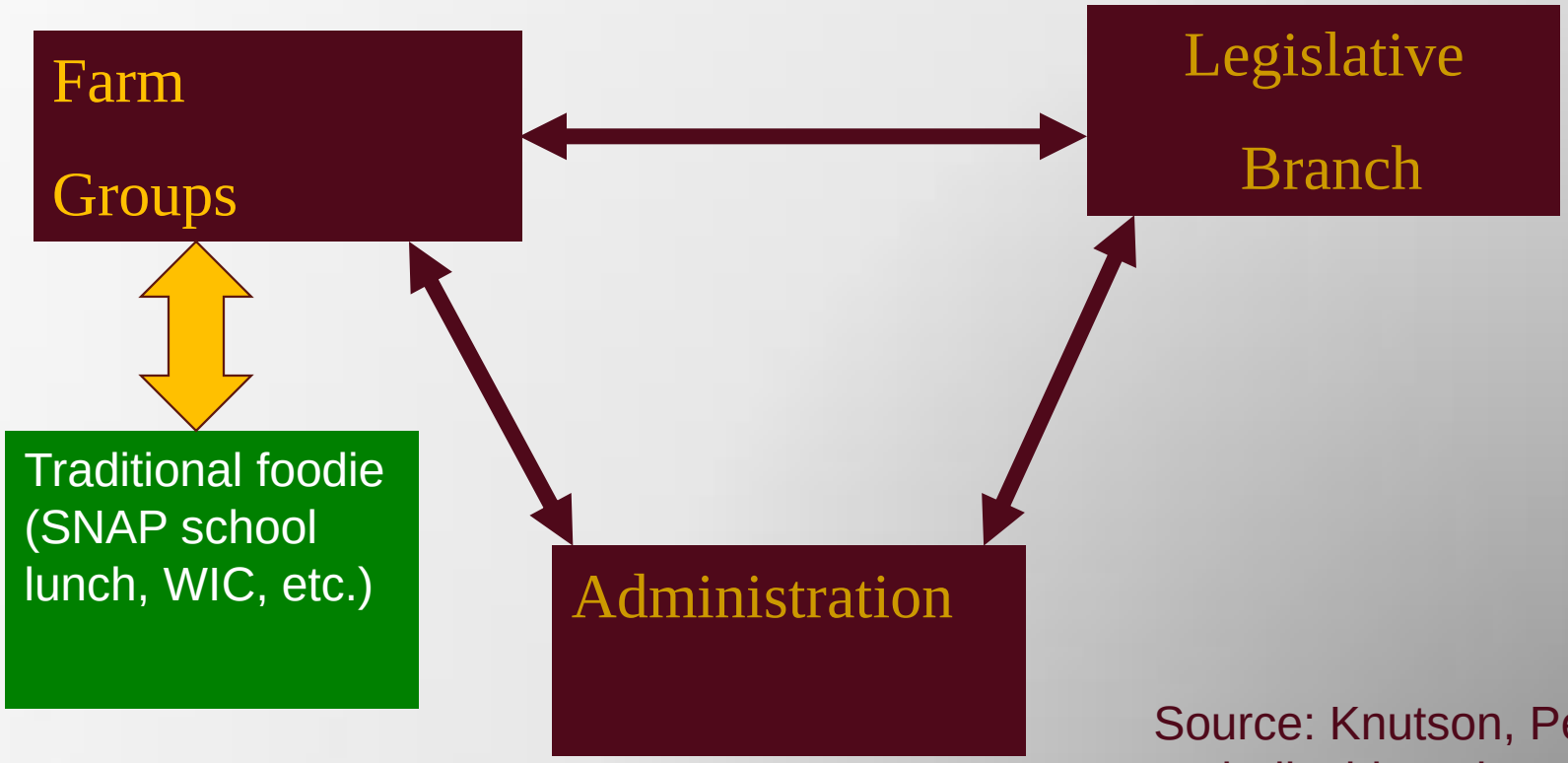
When you become 'THE Program' You become the 'THE Target'



The Past

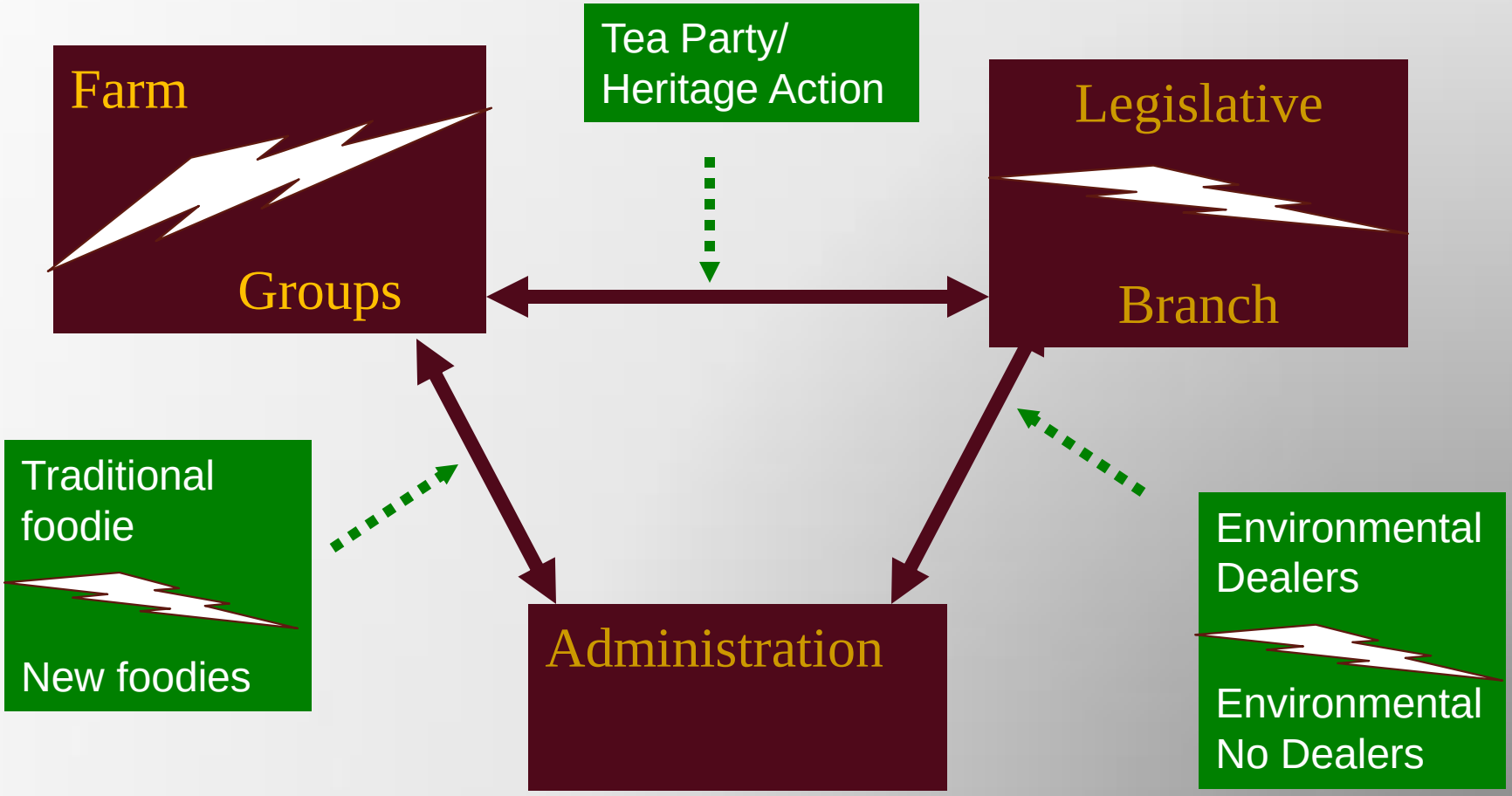
Factors leading to the 2014 Farm Bill
& the evolution of crop insurance

The Old Political Triangle of Farm Policy



Source: Knutson, Penn, and Flinchbaugh

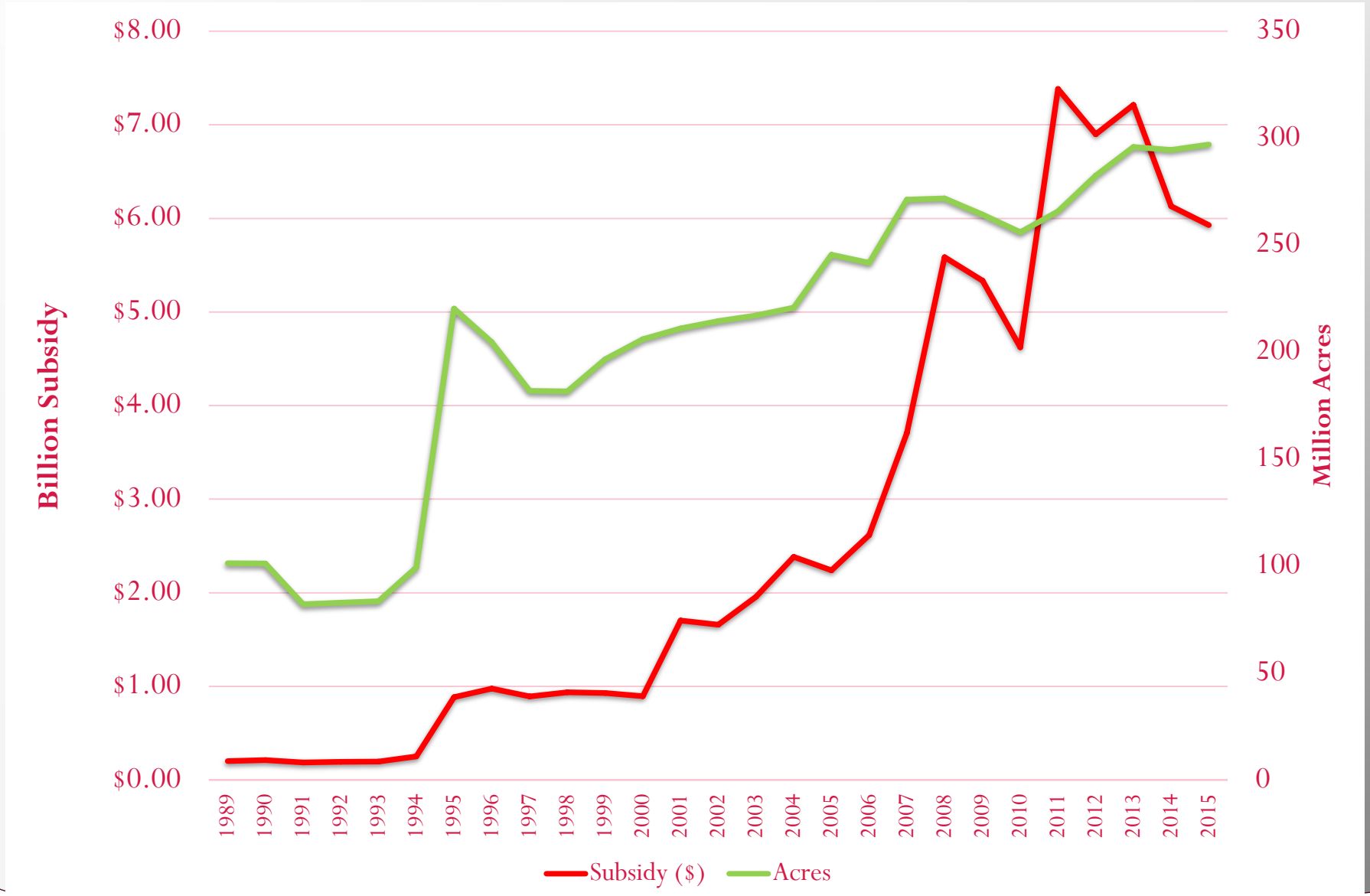
The New Political Context of Farm Policy



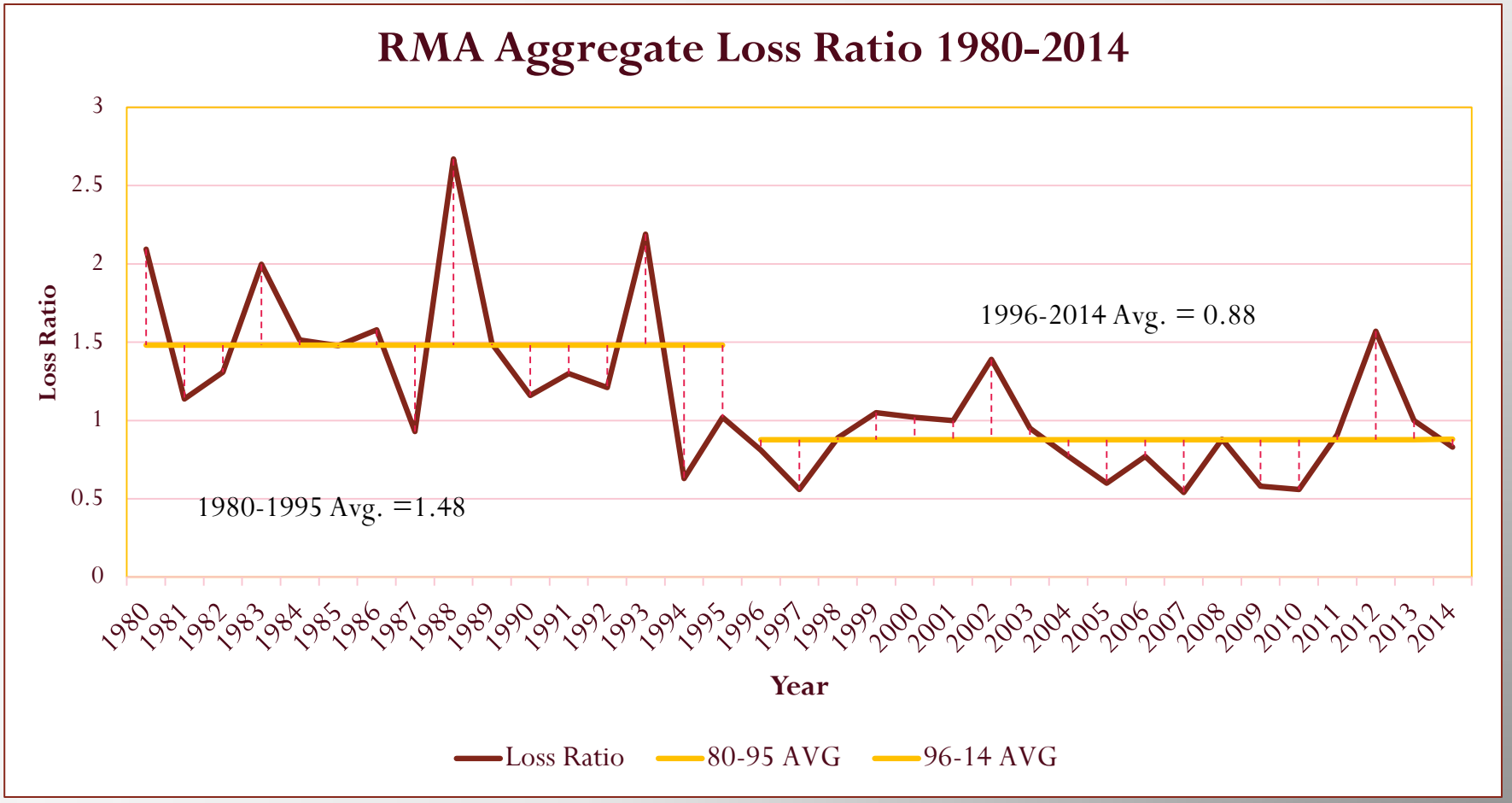
Crop insurance: Where have we been?

- The modern era since 1980
- Legislative changes and revenue insurance in mid-1990s
- ARPA 2000
- Subsidy grew & ad hoc disappeared
- Agricultural Act of 2014
  - The cotton experiment
  - Shallow loss emphasis

Crop Insurance Program Growth

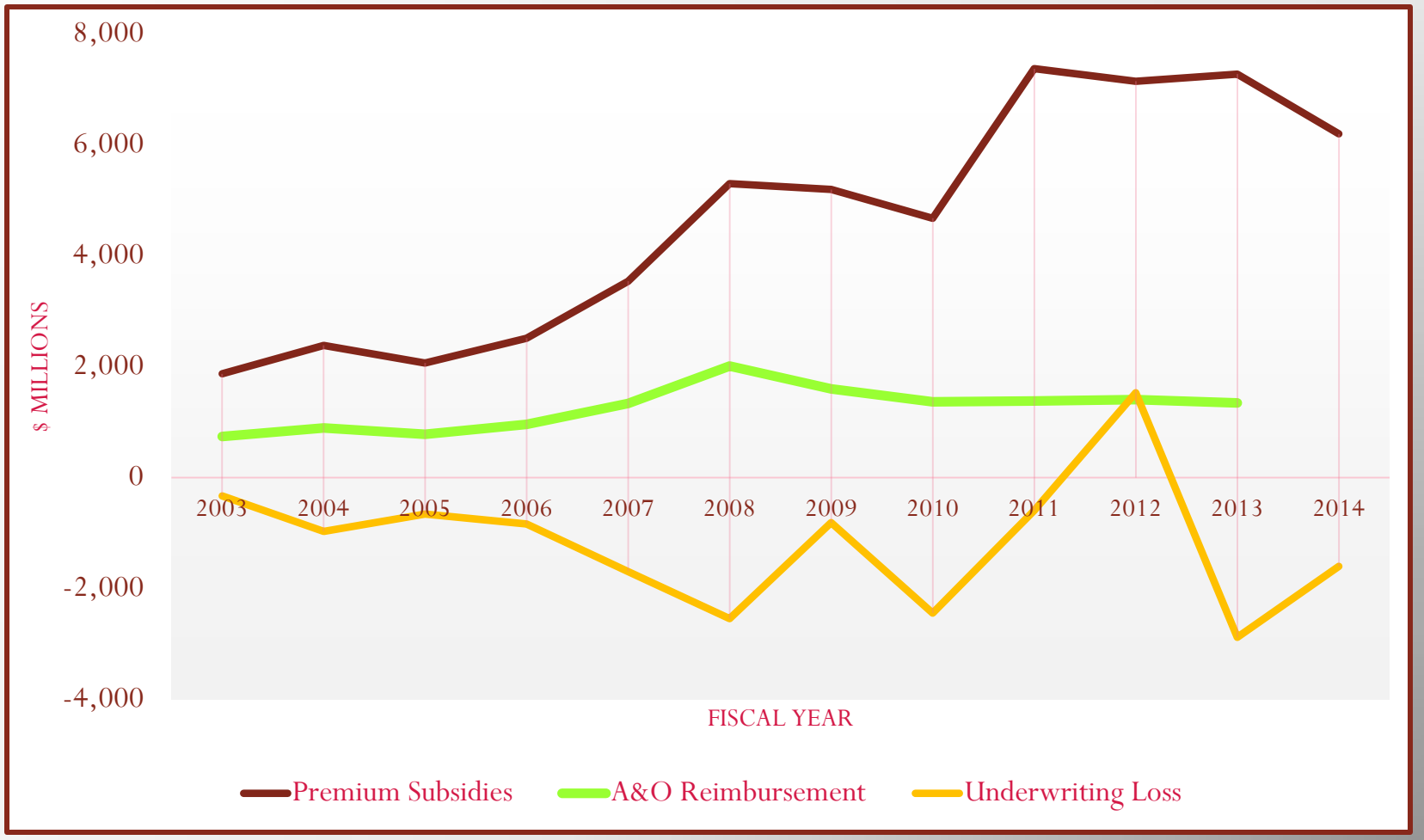


Improved Loss Ratio (indemnity / premium)

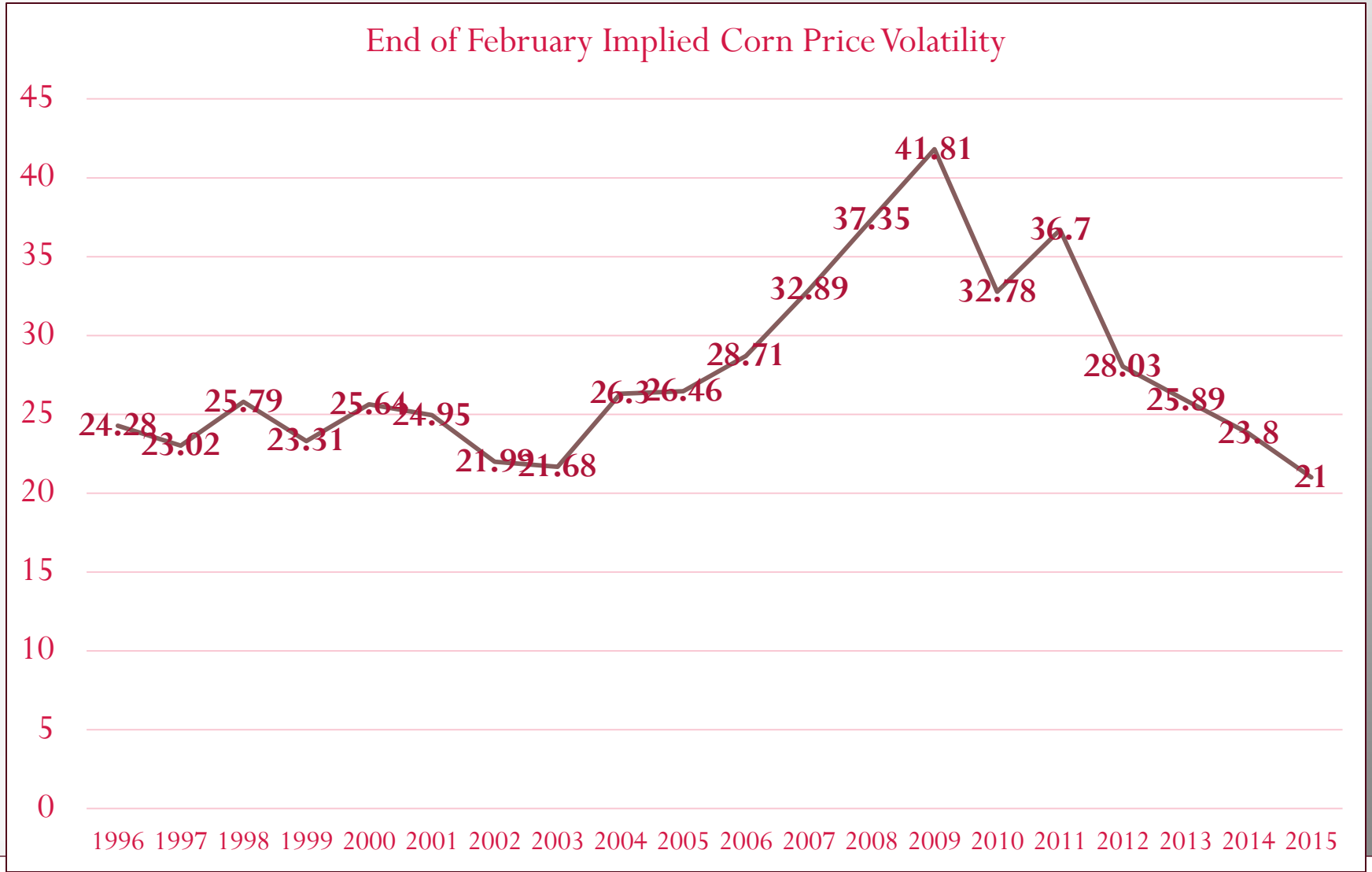


Why? Mixture of good weather, more participants, better production practices, better rates, better genetics, climate change??

Federal Crop Insurance Program Cost

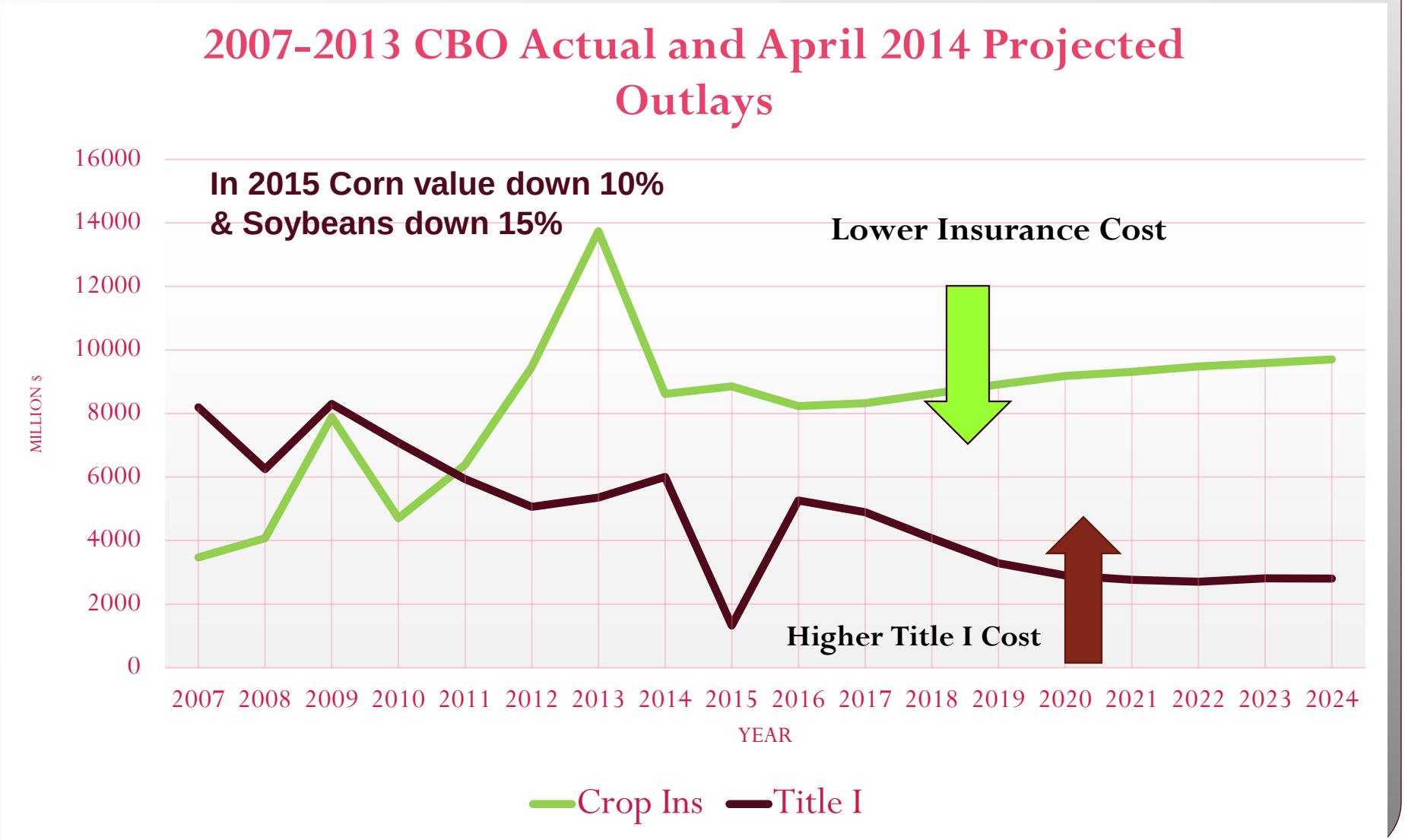


Enrollment Period Implied Price Volatilities Vary Across Years

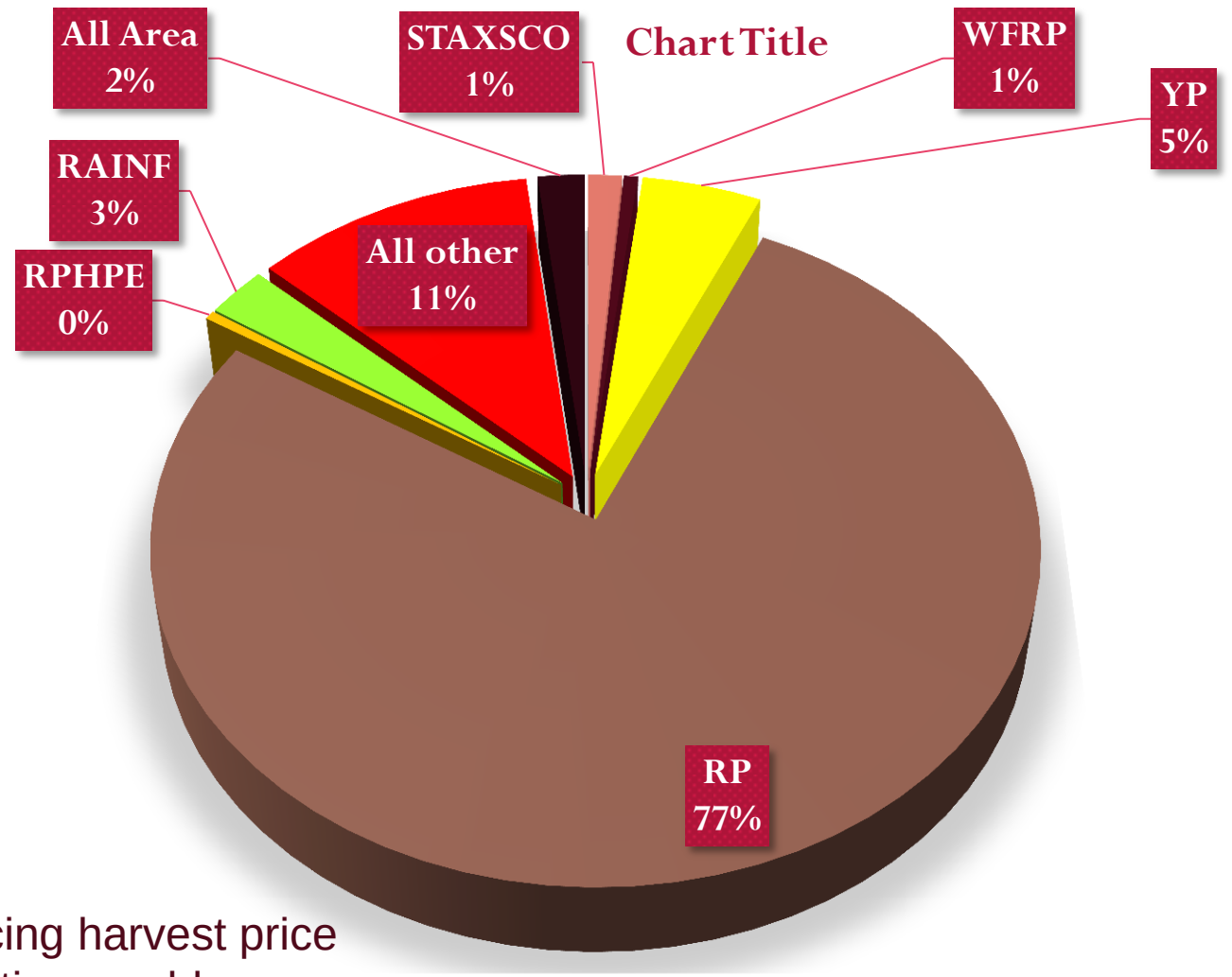


The Present

So what do lower prices do to these baselines?



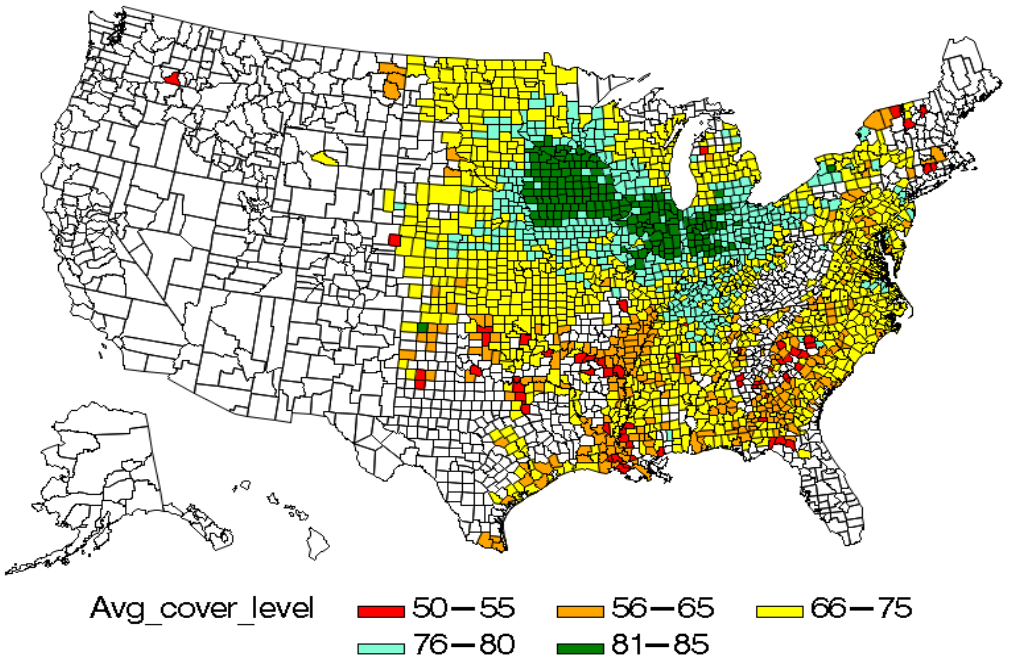
2015 Insurance Plan Premium Shares



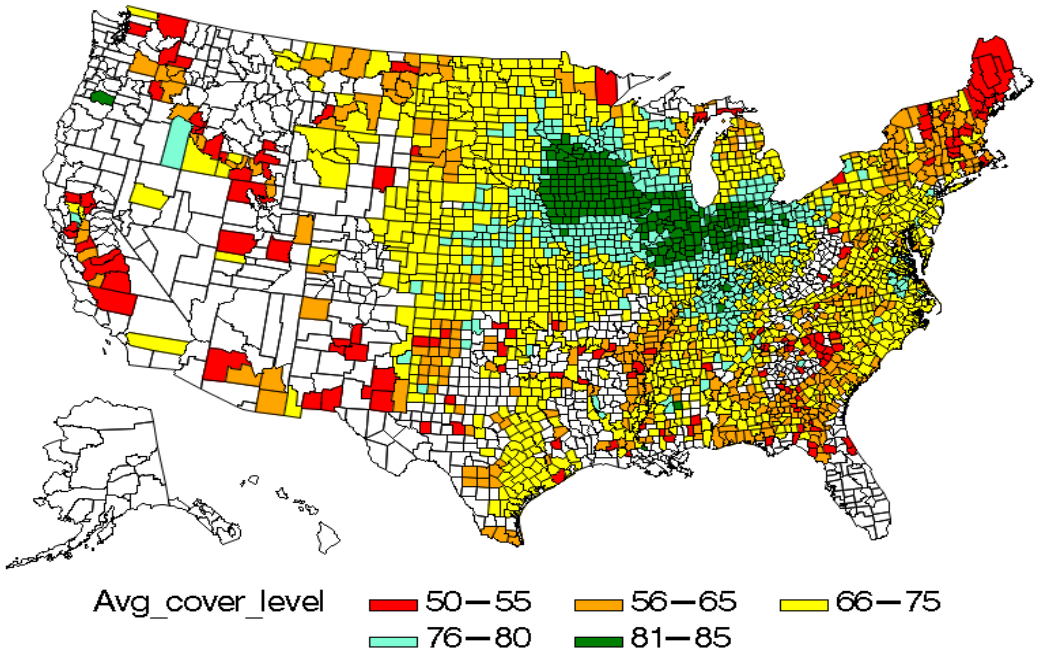
Reducing harvest price protection would save $1.1-1.3 Billion/year

Coverage Levels

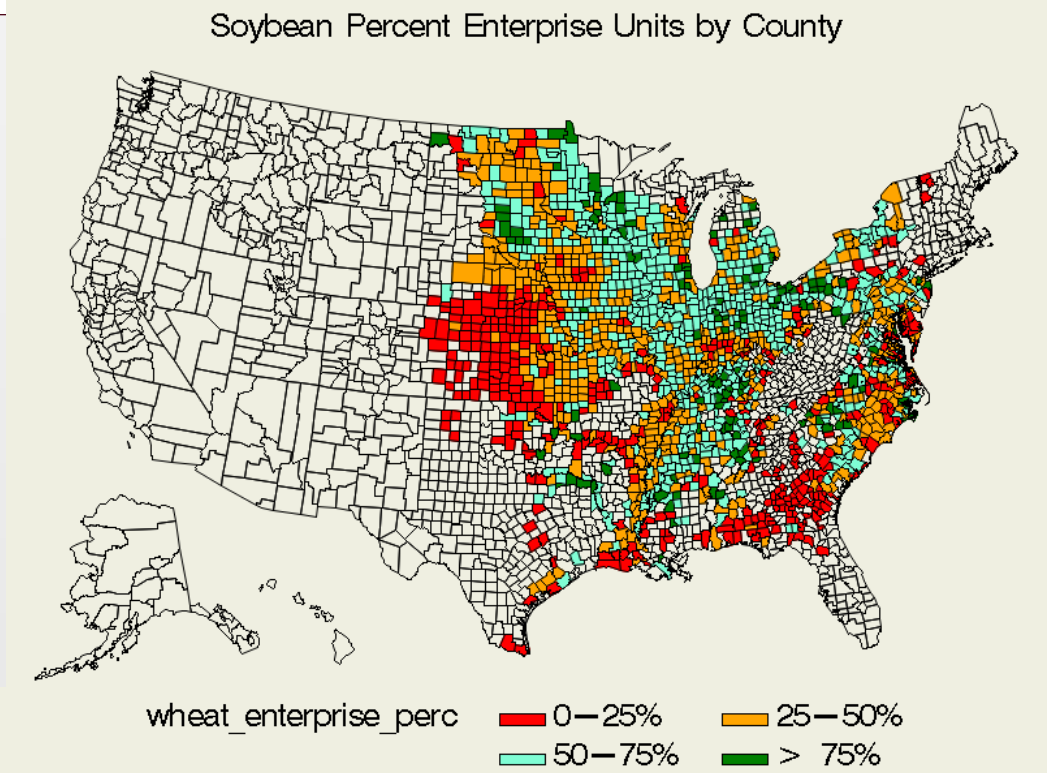
2015 Soybean Average Coverage Level

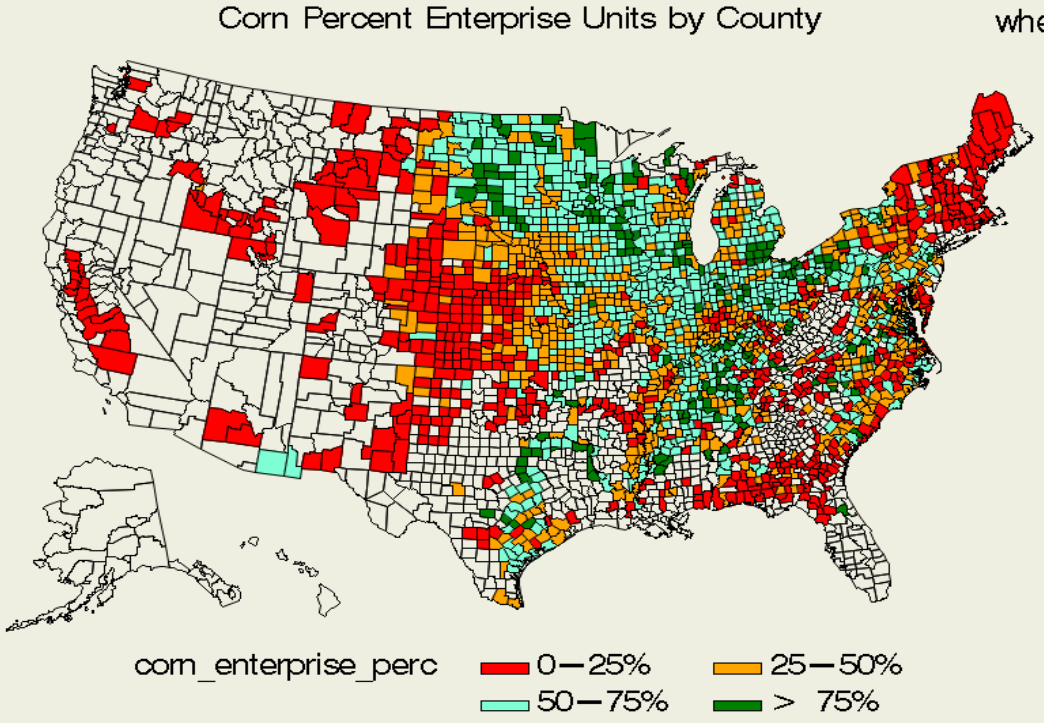


2015 Corn Average Coverage Level



Enterprise units are increasing





Deceiving ourselves about ag risk & why it matters for crop insurance

"It's easier to fool people than to convince them that they have been fooled." — Mark Twain

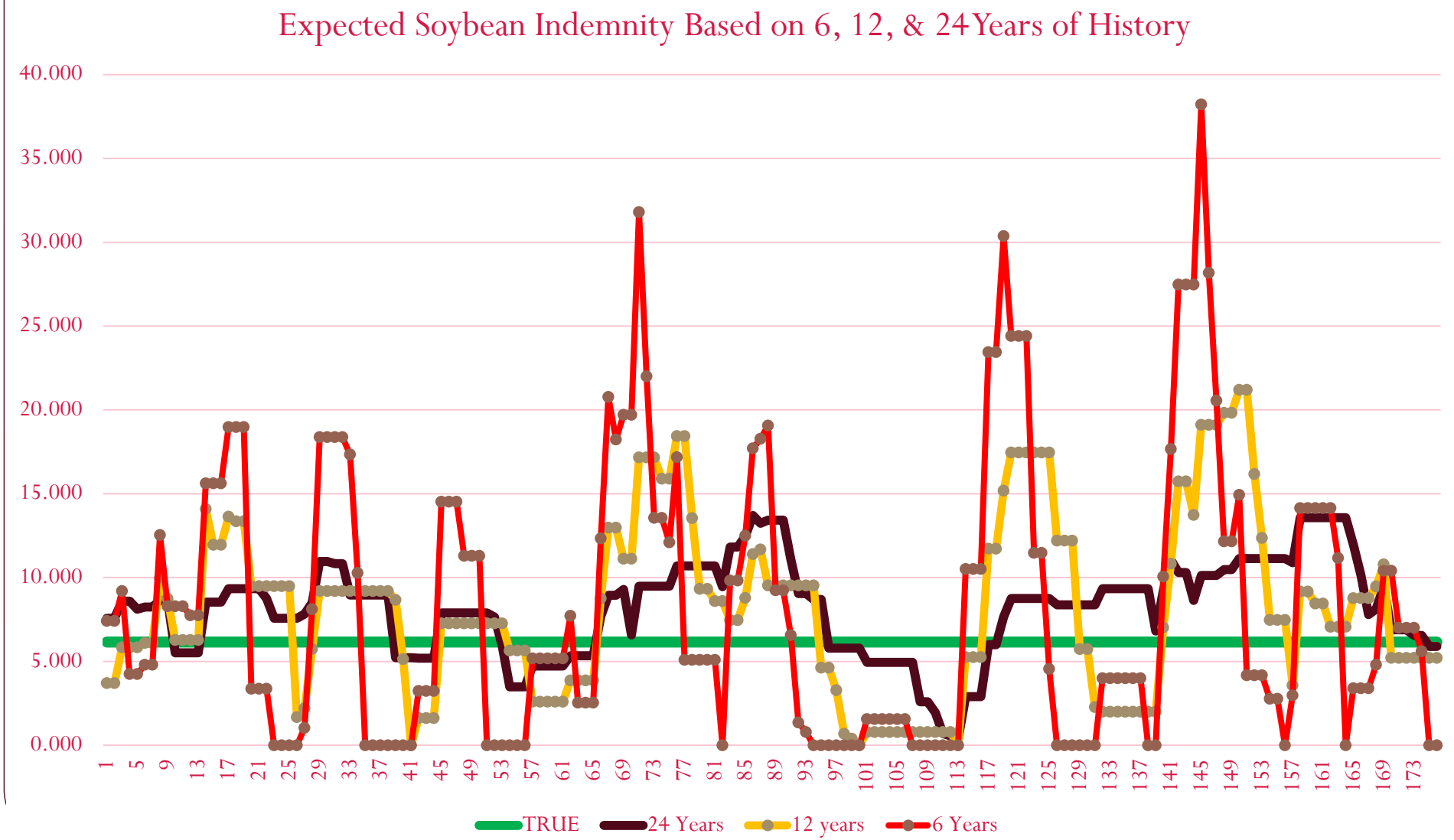
Why, sometimes I've believed as many as six impossible things before breakfast. - *Alice in Wonderland*.

The creature we study in economics is similar to Mr. Spock from Star Trek … The world I study is full of people more like Homer Simpson — Robert Thaler

Small samples lie!

- In the case of yield and revenue associated with crop agriculture we get one observation per year.
  - Small samples grow quite slowly into large samples.
- Producer and economists sometimes behave as if they believe small samples are big samples
  - too much weight on an evaluation based on very small samples.
    - "show us what the policy would have done over the last five years."
    - "just input the last five years yields and evaluate crop insurance"

Even using 24 years of data leads to inaccurate insurance rates

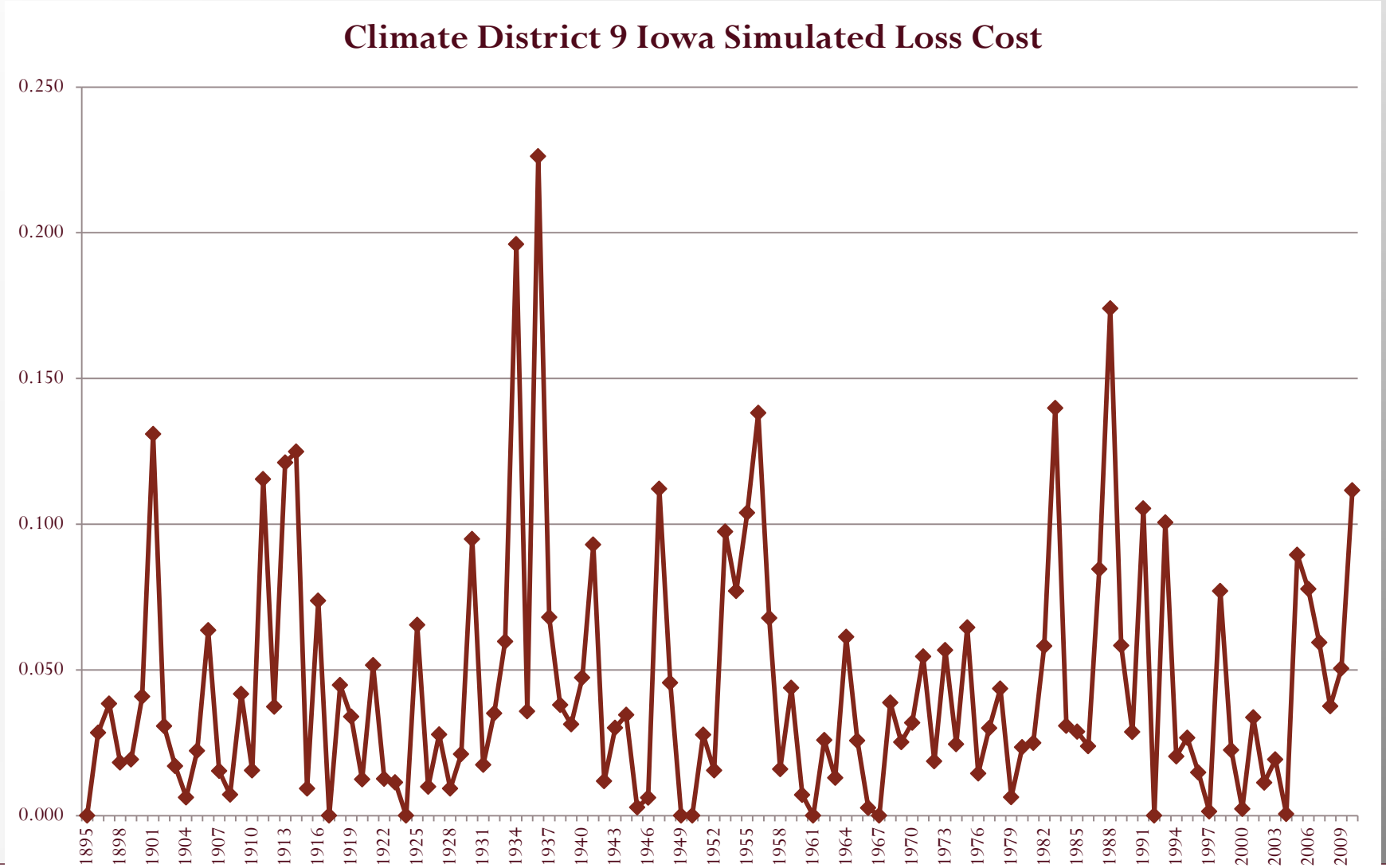


So how does one use actual losses with more robust probability?

- Recent history likely to misrepresent weather effects.
  - Was a bad year a 1 in 10 or a 1 in 50 year event?
- RMA now
  - Uses weather-weighting by climate division using data back to 1895
  - a base rating period to 20 years,

- *Coble, K.H., M. F. Miller, R. M. Rejesus, R. Boyles, B. K. Goodwin, T. O. Knight (2015) Accounting for Weather Probabilities in Crop Insurance Rating. Journal of Agricultural and Resource Economics 40(2):306–324.*

Example Loss Cost Index



The Future

Four Big Questions

1. What is the future of ARC, PLC, and LDPs?
   - A shrinking baseline
   - Competition with conservation and crop insurance
2. Can we harness 'big ag data' and technology to improve crop insurance?
   - knowledge of soils, inputs, practices & risk
   - Privacy issues, policy issues
3. What next for crop insurance
   - The subsidy bullseye
   - Incentives for environmental behavior
4. What will the next farm bill look like?

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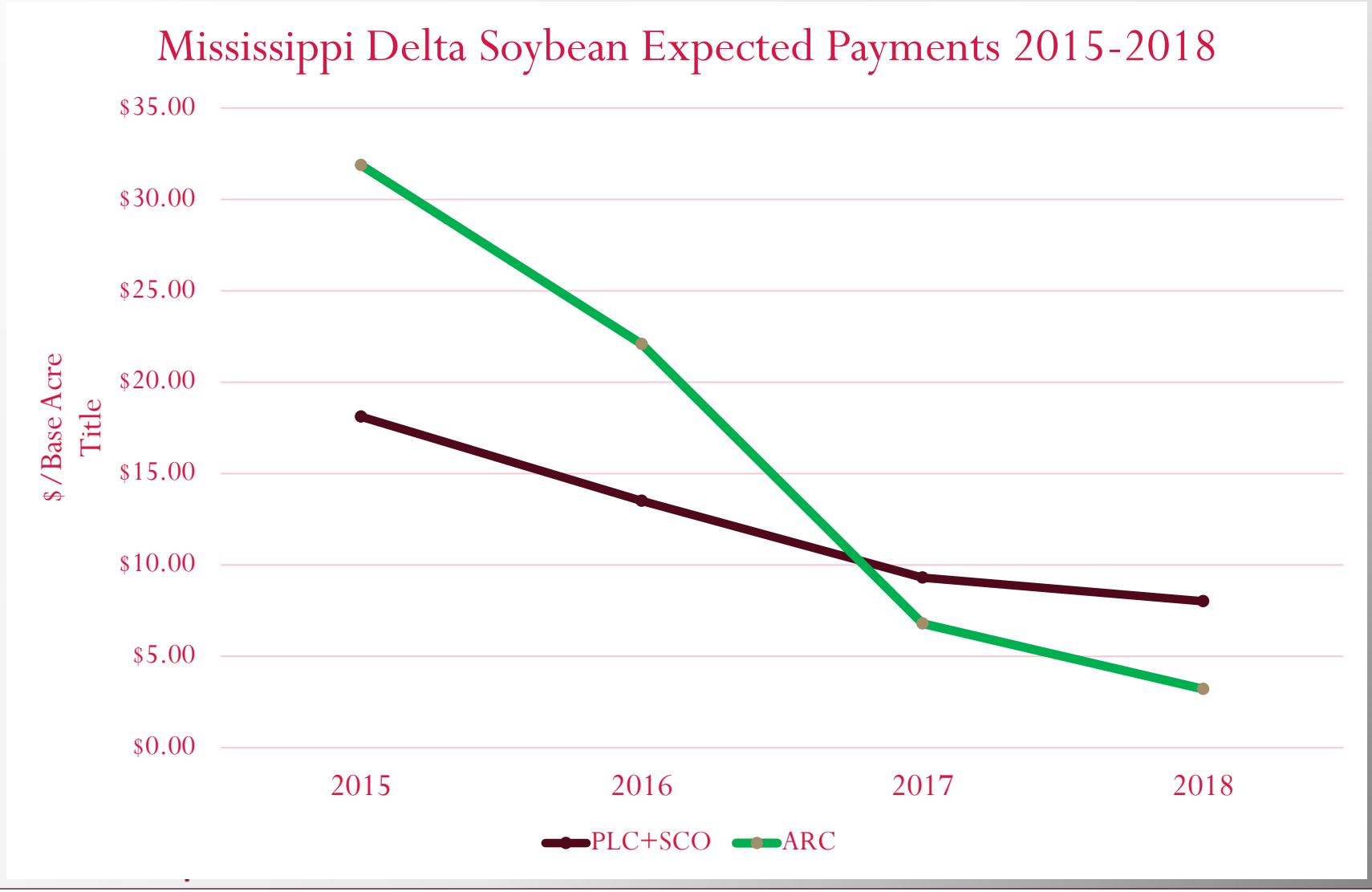
1. What is the future of ARC, PLC, and LDPs?

- County yields are difficult to estimate
- The satisfaction with county-yield triggered programs remains to be seen
  - Base acres risk protection < planted acre risk protection
  - Yield basis risk

Farm Program sign up

Percent of Farms and Base Acres that Made an ARC/PLC Election -- National by Crop			
	Percent of Bases Electing …		
	PLC	ARC-CO	ARC-IC
BARLEY	75%	22%	4%
CANOLA	97%	2%	1%
CORN	7%	93%	0%
GRAIN SORGHUM	66%	33%	0%
LONG GRAIN RICE	100%	0%	0%
MEDIUM GRAIN RICE (SOUTHERN)	96%	4%	0%
OATS	32%	67%	1%
PEANUTS	100%	0%	0%
SOYBEANS	3%	97%	0%
SUNFLOWERS	56%	43%	1%
WHEAT	42%	56%	2%

Trend in Estimated Soybean Payment over the Life of the Bill



Title I baselines are likely to shrink

Crop	Likely CBO Baseline in 2018 relative to the current baseline
Total	-14%
Feed Grains	-26%
Wheat	-13%
Soybeans	-28%

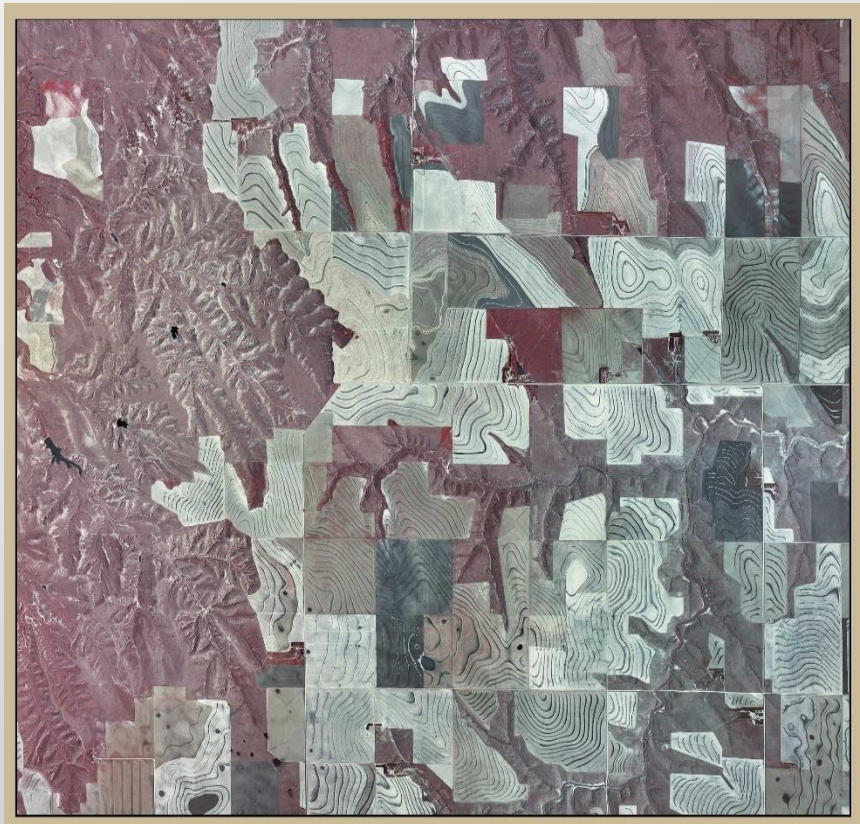
Based March 2015 CBO baseline with adjustment for a 3 year step forward

2. Can we harness 'big ag data' and technology to improve crop insurance?

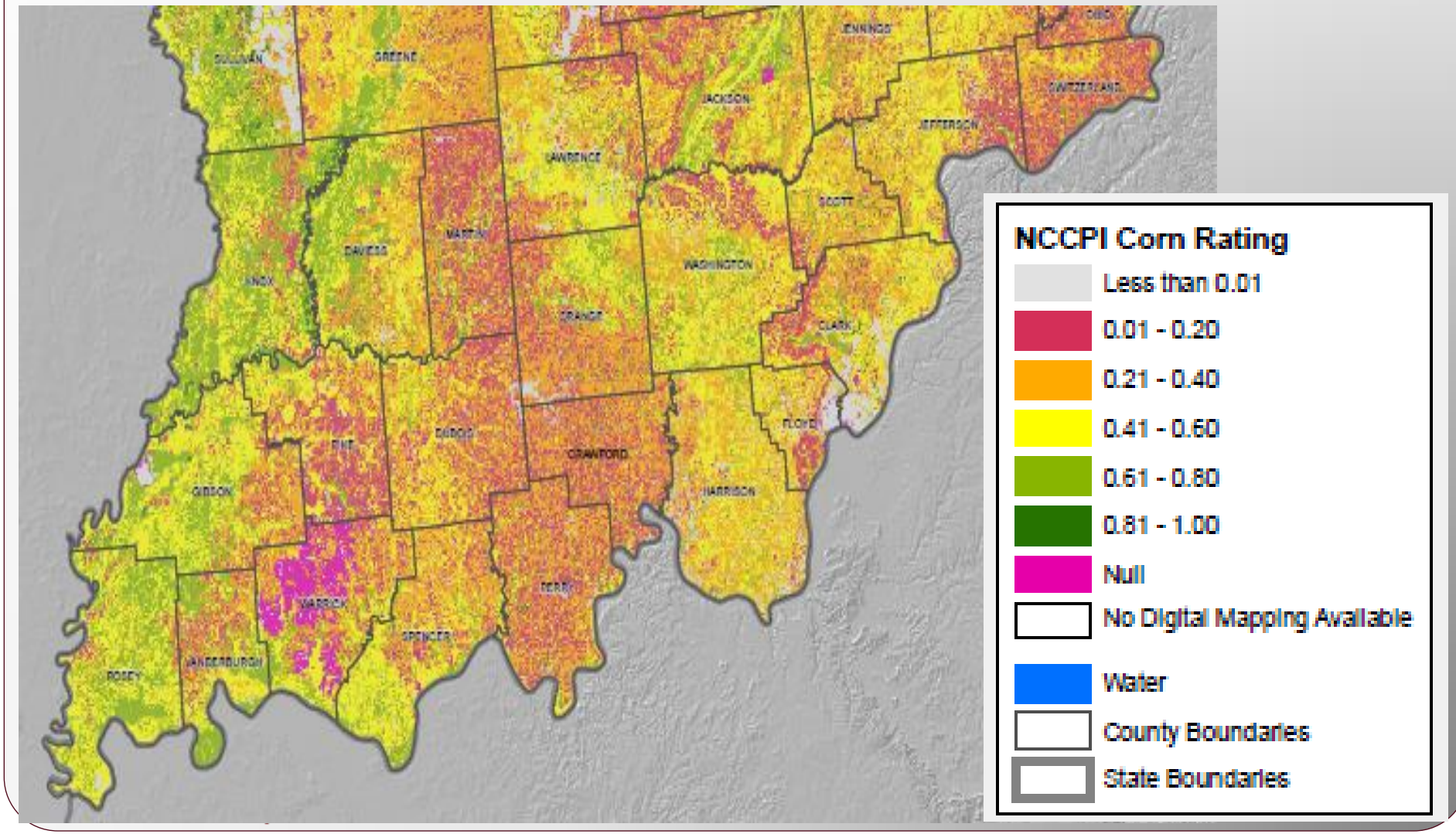
- **Past decade marked by**
  - Improved data quality & quantity
  - Re-estimation of various parameters
  - Implementation of revenue insurance
  - Weather weighting of loss history
- **Possible future**
  - The next step forward is fully geo-referenced data
    - More accurate crop location = soil
    - More accurate practice rating such as environmental attributes
    - Incorporating precision ag into rates, underwriting, and loss adjustment
    - If we don't do this top producers will leave in a less subsidized world
    - Yield =f(land, operator) ???

RMA will require full CLU reporting in 2016

- In 2016 Common Land Unit reporting is required for major insurance plans.



High quality soils maps + CLU Loss Experience = Rate Game Changer



3. What next for crop insurance policy?

- The subsidy bullseye

- Incentives for environmental behavior

The 2014 Act Subsidy Schedule

Coverage Level	Basic & Optional Subsidy %	Enterprise Unit Subsidy %	SCO Subsidy
	RP, RPHPE, YP		
50%	67%	80%	65%
55%	64%	80%	65%
60%	64%	80%	65%
65%	59%	80%	65%
70%	59%	80%	65%
75%	55%	77%	65%
80%	48%	68%	65%
85%	38%	53%	65%

Subsidizing Crop Insurance

- Subsidy = RMA estimated breakeven premium – producer paid premium

- Subsidy will increase with
  - Higher crop value
  - Greater risk
  - Higher coverage level
  - Enterprise Units
  - RP > RPHPE > YP

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Masking asymmetric information problems in the crop insurance program

- Coble et al 2010 Review of RMA Rates
  - Crop insurance rates must account for practices / technology / weather
- Inaccurate rates undercharge some and overcharges others.
  - Subsidy may entice over-rated producers into the program.
  - This is costly as the undercharged producer also receive subsidy

- **A 10% reduction in subsidy will likely result in a 4-7% reduction in liability and 2-4% fewer insured acres.**

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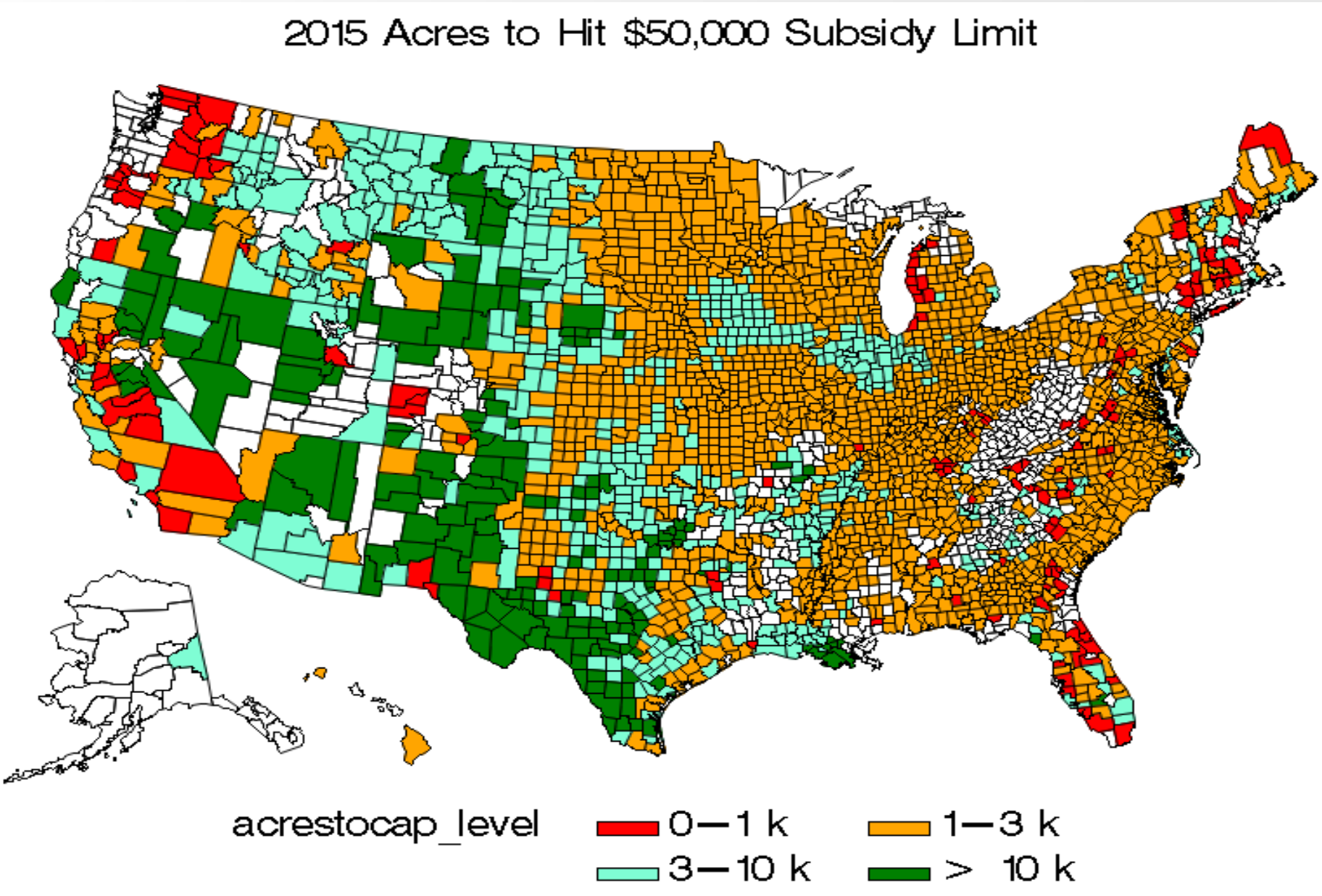
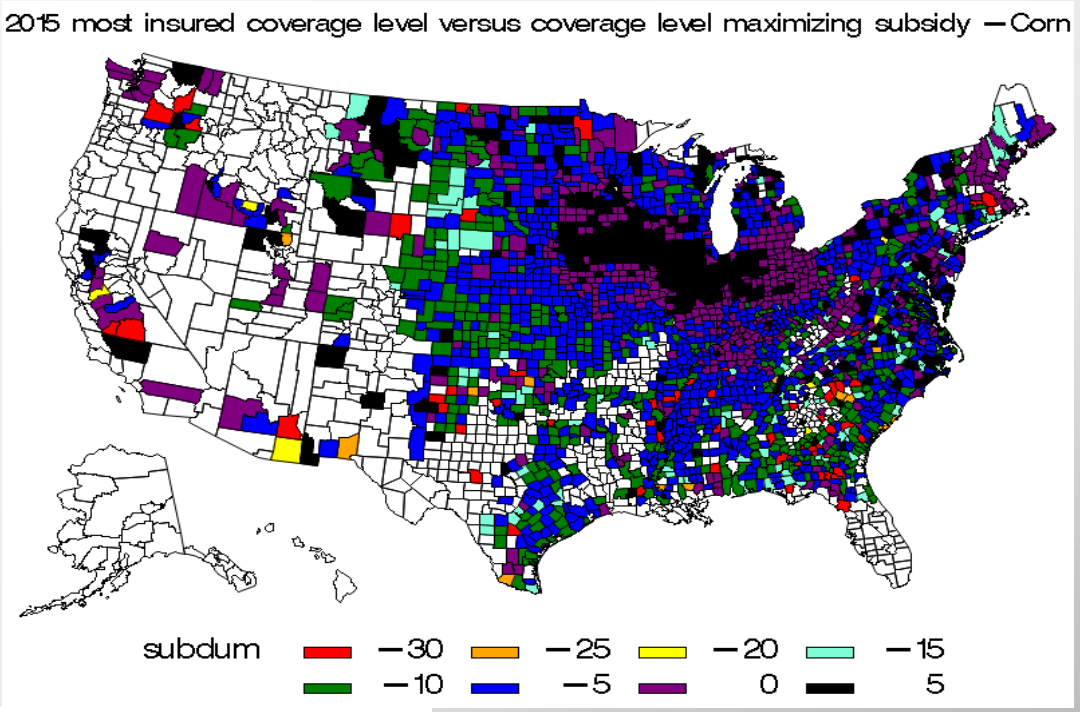
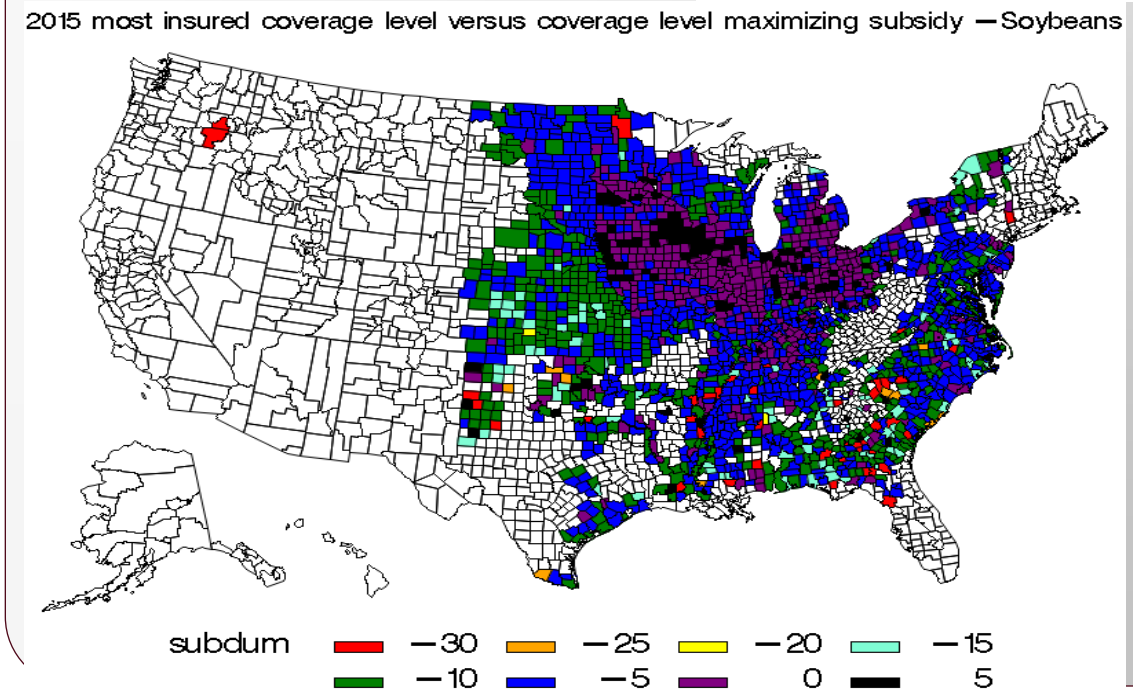
How impactful is a subsidy cap?



Do Farmers Maximize Subsidy?





Beyond Conservation Compliance

- Good soil health is a long term commitment
  - Insurance practices are 'current practice focused'
  - APH yields are a crude approximation
- Crop insurance as a 'carrot' to incentivize environmental stewardship
  - Some environmental practices are risk reducing
  - Is crop insurance the vehicle to reducing nitrogen runoff?

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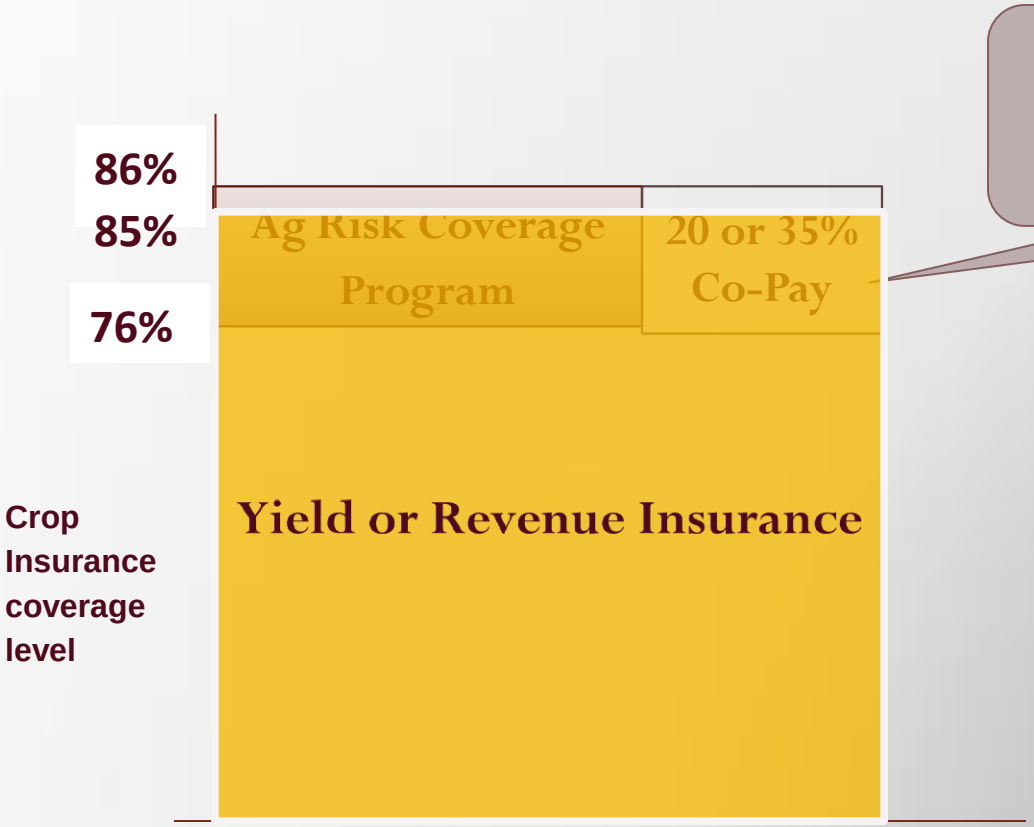
4. What will the next farm bill look like?

- Will it matter to our best producers?
  - Compared to trade, macro economics, regulation, or the RFS
- Will the ag alliance stand together?
- Will the ag/SNAP collation prevail?

4. What will the next farm bill look like?

- How to put all programs on auto-pilot
- Deep losses versus shallow losses
- Risk management vs. Environmental Services vs. ?????

Corn and Soybeans ARC + Crop Insurance



$2.2 billion of 2015 corn & soybean insurance liability overlapping with ARC

The question avoided in the 2014 farm bill: How will these three USDA Agencies relate to one another?

Will they duplicate, counteract, or complement each other?

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How will these three USDA Agencies Relate to one another?

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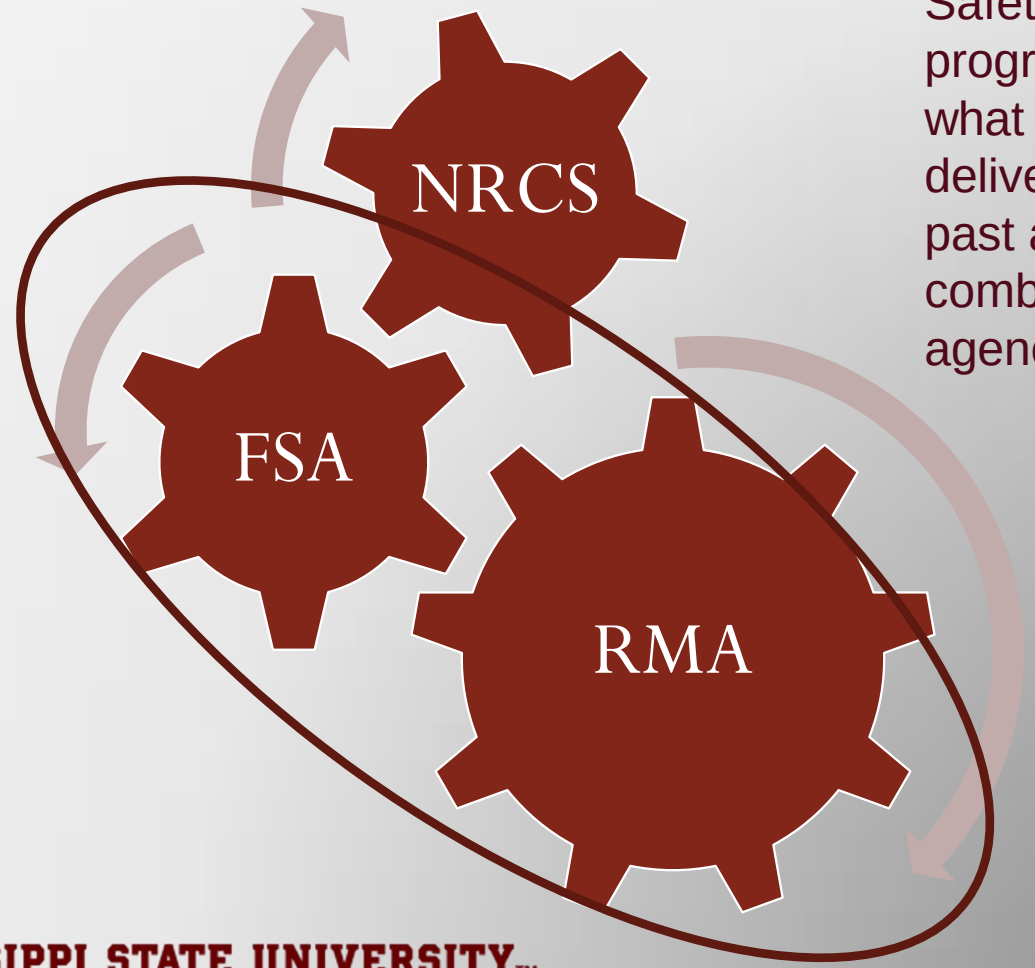

Safety net programs, but what of delivery, & the past attempt to combine these agencies?

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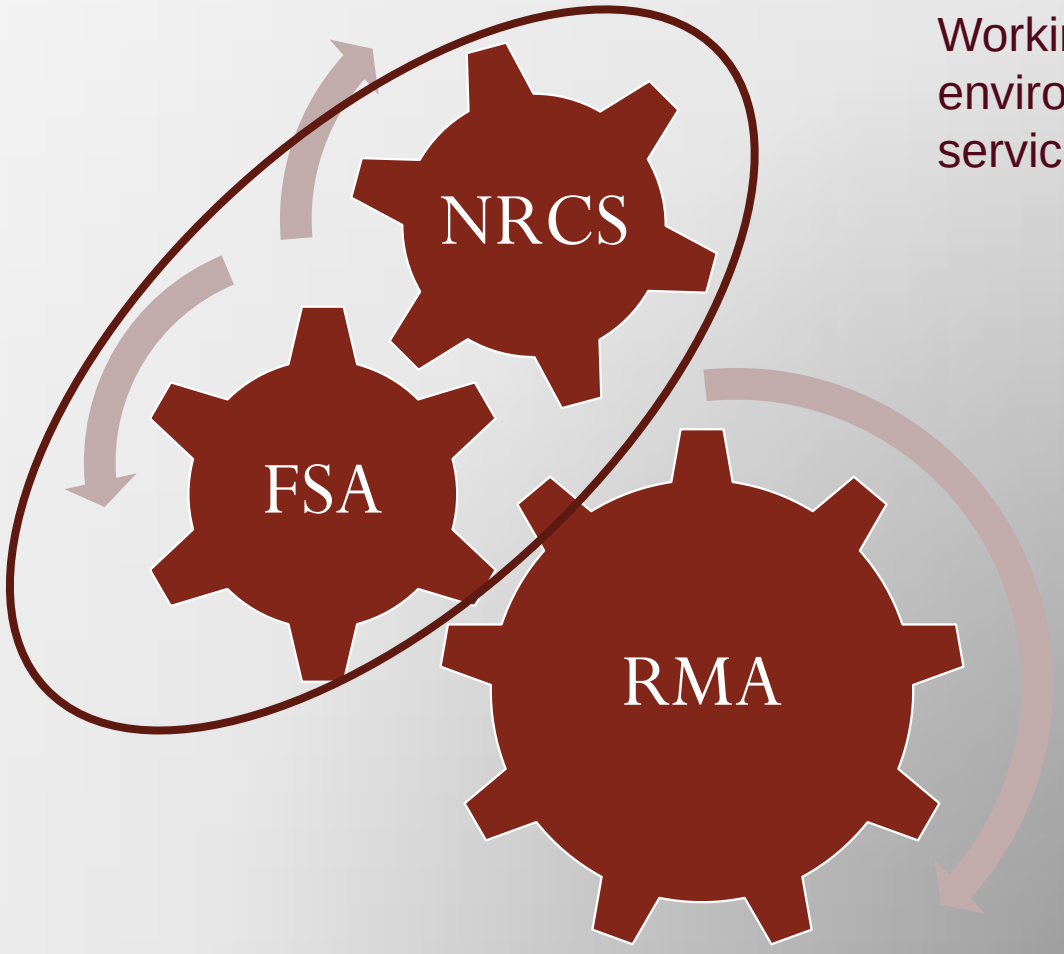
How will these three USDA Agencies Relate to one another?

Working land environmental services?

Will they duplicate, counteract, or complement each other?



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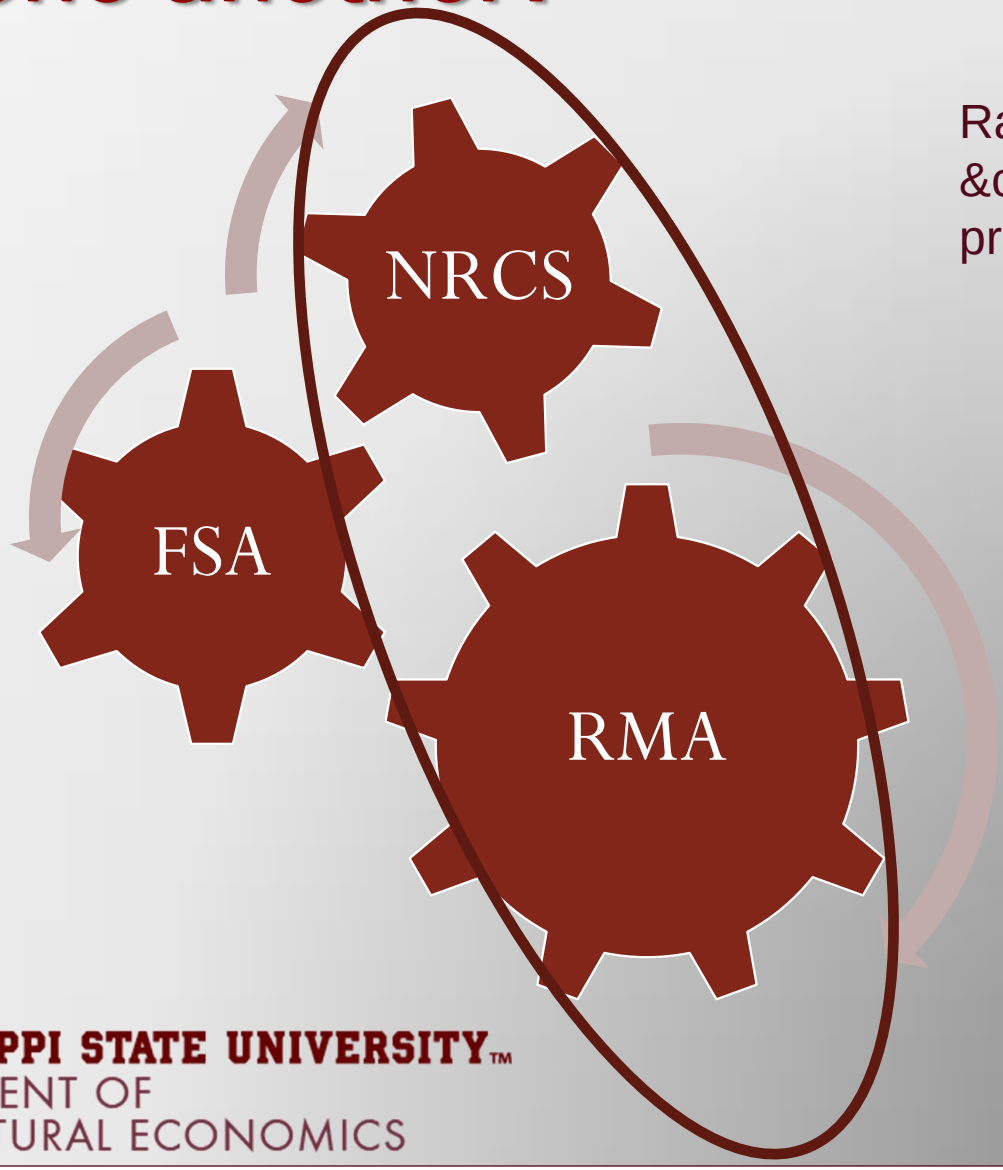

Rating &conserving practices

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Rank how would typical taxpayers view ag tax dollars support?

A. Helping farmers manage price & yield risk

B. Helping farmers conserve and protect the environment

C. None of the above just cut taxes

Thank You

- Contact me: coble@agecon.misstate.edu
- Follow me: @DrKeithhCoble

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