



Agricultural Risk, Policy, & Insurance Collaboratory

The Latest Approaches to Weather-Related Agricultural Disasters

Keith Coble

coble@agecon.msstate.edu

@DrKeithHCoble



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Preface



- Low probability- severe impact weather events are one of the hallmarks of ag production
- Last Year's hurricane strike on Florida exemplifies this phenomenon
 - Flood insurance (government)
 - Ad hoc and standing disaster programs (government)
 - Property and casualty insurance (private)



A Few More Preliminary Thoughts

- Why do farmers behave as they do?
 - Difficulty assessing low probability events
 - May over or under-estimate risk
- Pricing risk
 - Accurately pricing agricultural weather risk is HARD!
 - Priced risk management may under or over estimate the risk



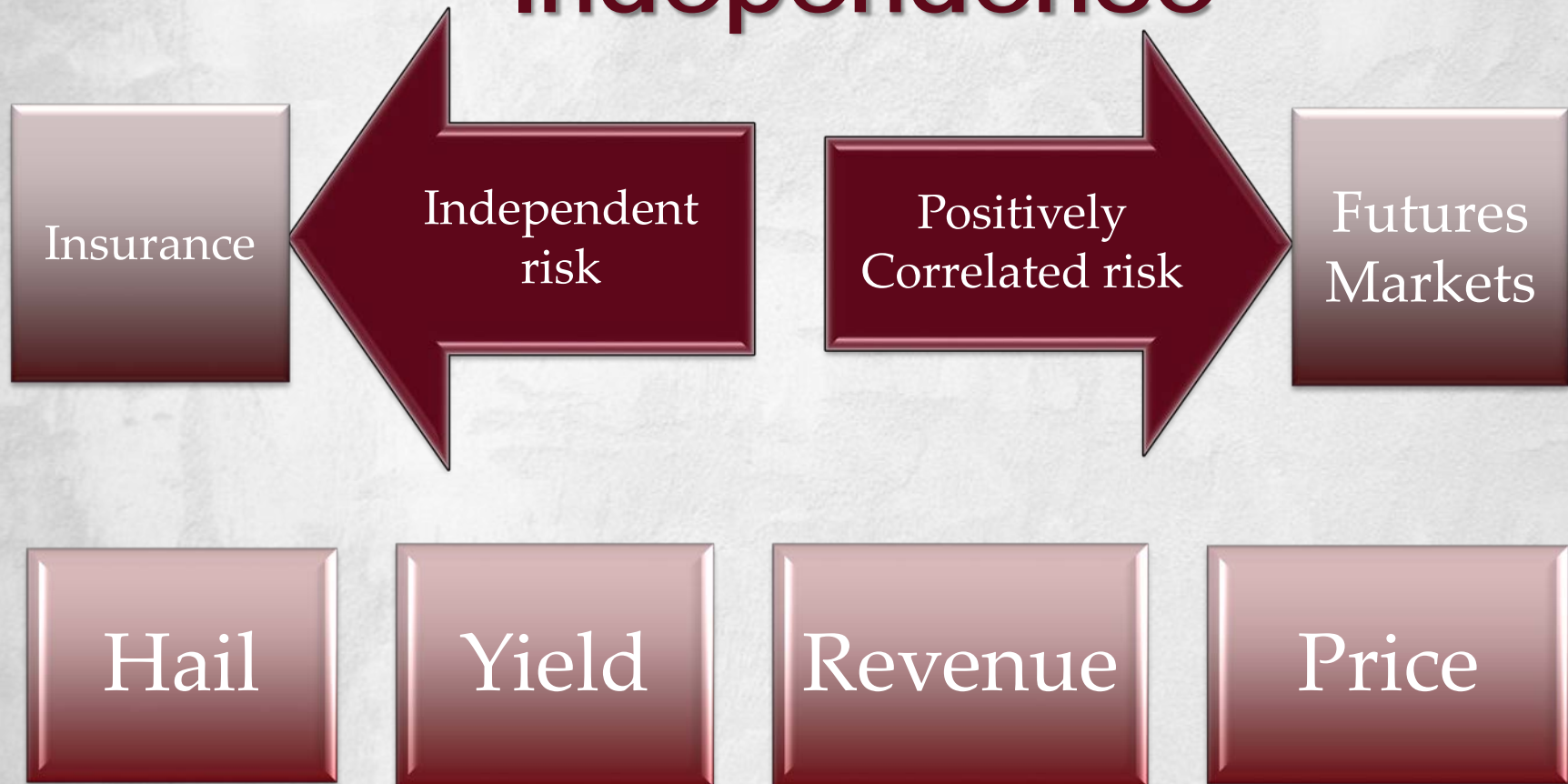
An inherent tension

- More years of data the accurate the probability of the event
- But,
 - Is weather stationary?
 - Is the response function stationary?

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.



Agricultural Crop Risk Spectrum of Risk Independence



Options

- Government Ex Ante (standardized terms, funds, policy certainty, timely indemnification, costly infrastructure)
 - Standing Disaster
 - Insurance
- Government Ex Post (ad hoc terms, funding uncertainty, policy uncertainty, without the infrastructure cost)
 - Ad hoc Disaster
- Private risk management (standardized terms, funds, policy certainty, timely indemnification, costly infrastructure, customer pays full cost)
 - Insurance
 - Cat bonds, index products, and other financial instruments



Modern Risk Management

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"



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An Example



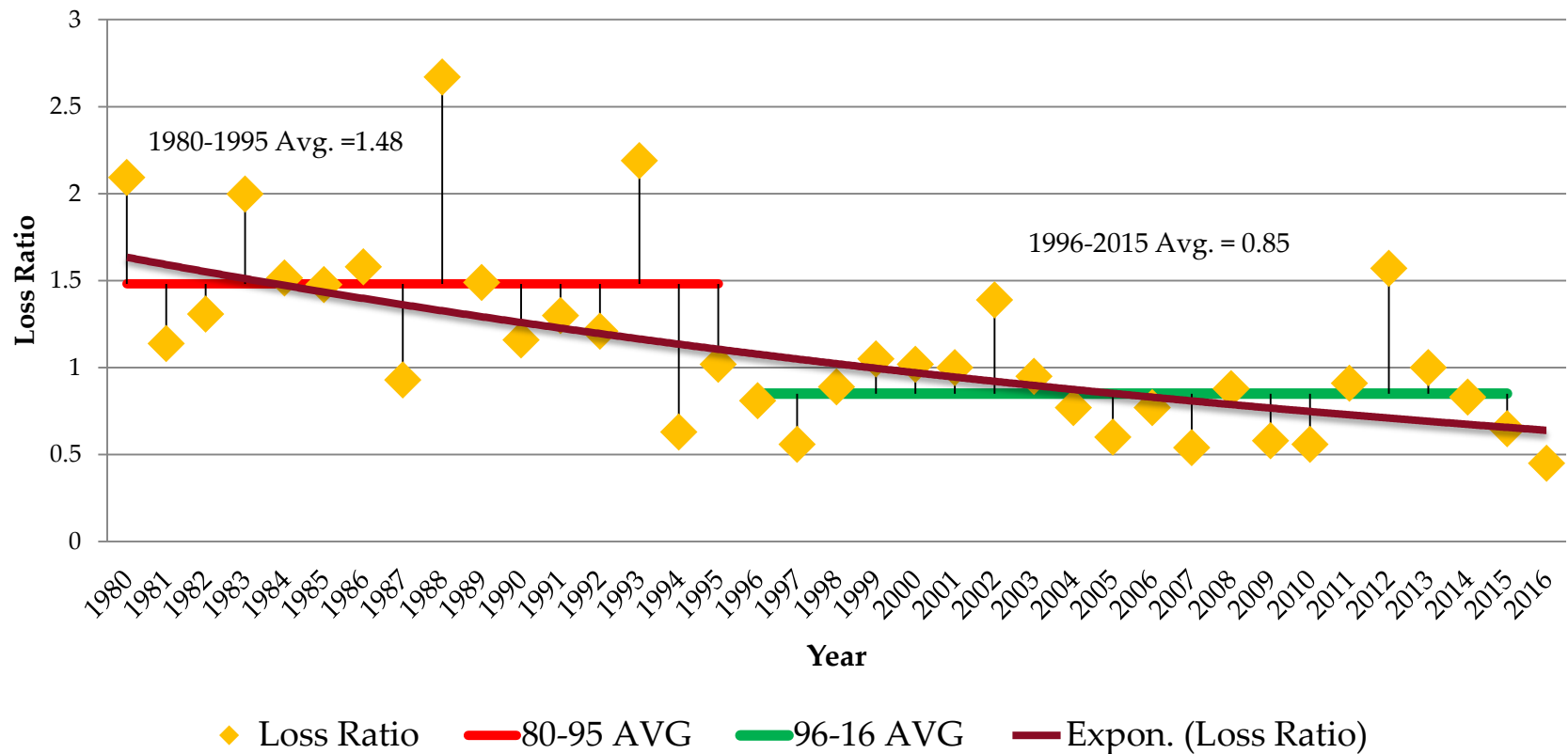
CROP INSURANCE



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Why good loss experience? Good weather, risk pool, production systems, or better crop insurance program

RMA Aggregate Loss Ratio 1980-2016



RMA Market Penetration

Principal Crops	Other Field Crops	Fruits and Nuts	Vegetables
93%	88%	54%	79%

Source : RMA Portfolio Analysis – Market Penetration 2013



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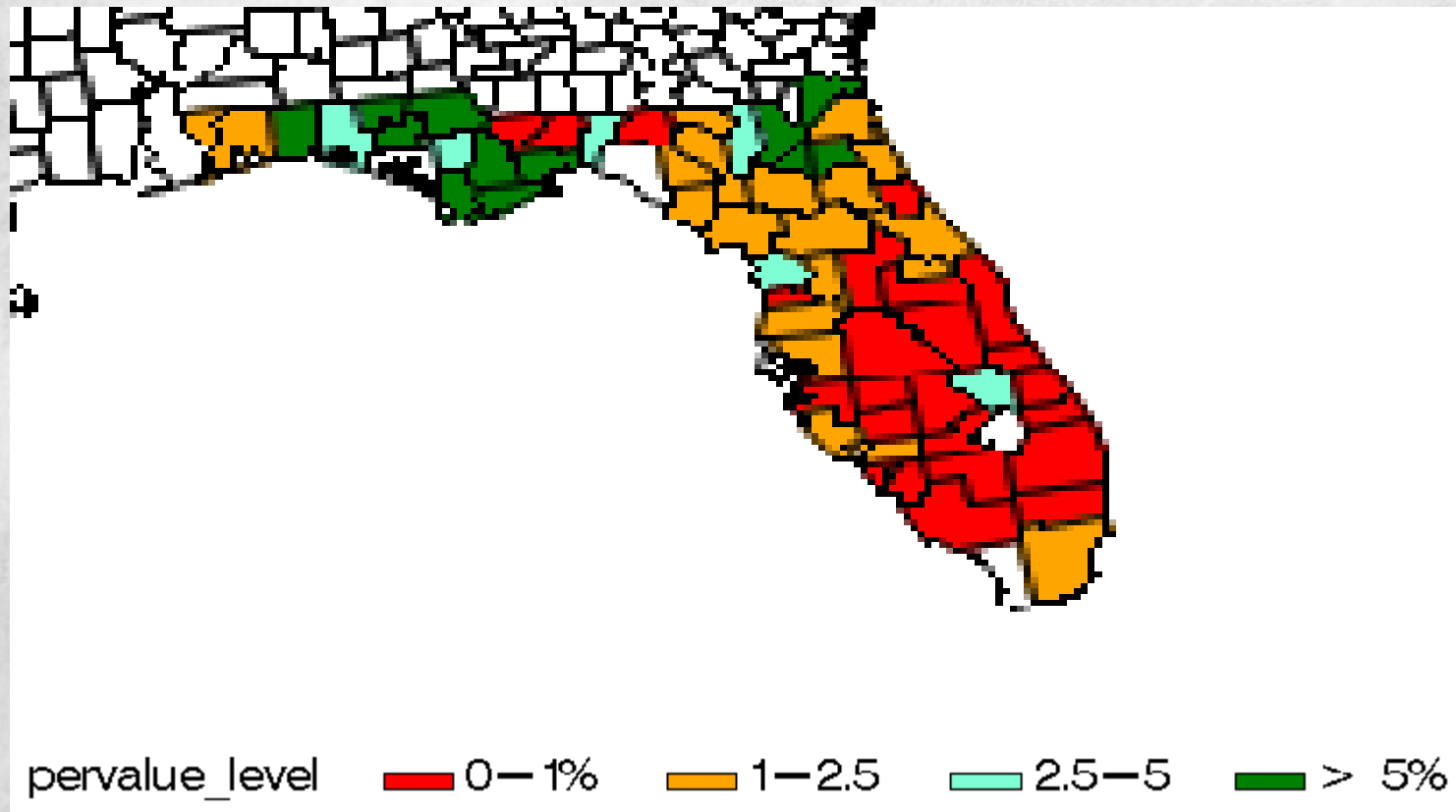
Crop Insurance Subsidy Levels

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

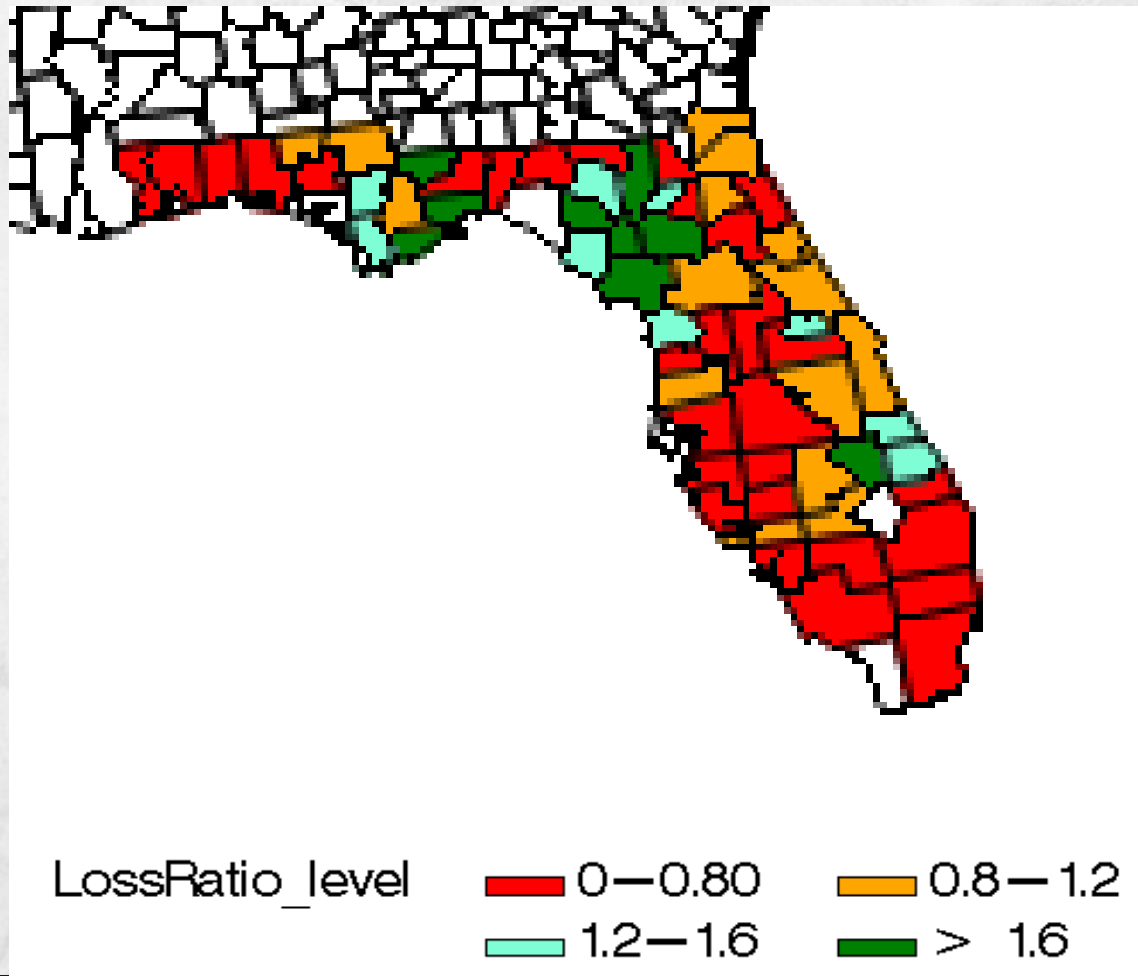


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2017 Florida Producer Paid Premium as a Percent of Crop Value (National average 2.53%)

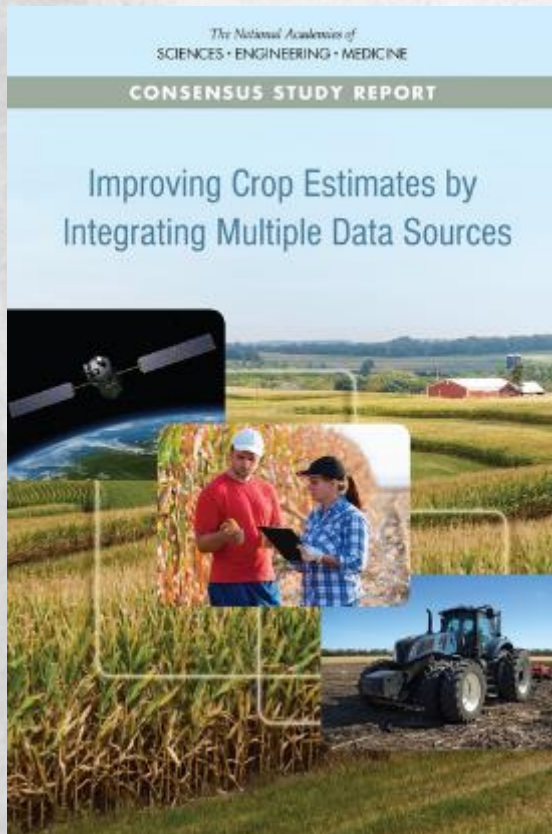


2017 Florida Crop Insurance losses



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Integrating Data Sources for Improved Estimates



AIR Worldwide

The Florida reports post- Irma



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Developing Consistent Ex Post Damage Estimation Procedure

- What are the best practices?
- What resources does one turn to when ask to do a damage assessment?
- Consistency of estimates across states and agencies
- The SAEA conversation



Final Thoughts



- What is the right mix of government program and private risk management?
- What research will make damage assessment faster and more accurate?
 - “Redesigning Farm Policy in an Era of Digital Agriculture,” New AFRI grant
 - Damage functions, etc.
- Farm Bill Title I and Title XI

