Current Issues in Crop Insurance

Central States Actuarial Forum
September 27-28
EMC Insurance Companies
717 Mulberry Street, Des Moines, IA

Frank Schnapp
Senior VP, National Crop Insurance Services

Session Description

- Focus - Federal Crop Insurance program
  - Coverage offered to farmers
  - Operational differences between the program and traditional Property/Casualty insurance
  - Changes introduced by the 2008 Farm Bill
  - Renegotiation of the Standard Reinsurance Agreement effective in 2011
  - Outlook for the 2012 Farm Bill
  - Effect of recent rate activity on the profitability
  - Potential impact of the 2012 drought
- No discussion of Crop-Hail

What is NCIS?

- National Crop Insurance Services
  - Not-for-profit crop insurance industry trade association
  - Licensed statistical agent to State Insurance Departments for Crop-Hail insurance program
  - In existence, in some form, since 1915
- Members are crop insurance companies
- Every company writing Federally sponsored Crop Insurance is an NCIS Member
  - 97% + of all Crop Hail policies are written by an NCIS member company
  - International insurance and reinsurance companies

NCIS Functions

- MPCI and Crop-Hail Program Development and Analysis
  - Policy Analysis, Loss Adjustment Procedures, Legal Analysis, Agronomic Research
- Economic and Actuarial Analysis
- Education and Training
  - Loss Adjuster Schools – 15 (1,482 attendees)
  - National Conferences – 4 (1,041 attendees)
  - Annual Regional/State Meetings – 13 (466 attendees)
- Crop-Hail Advisory Organization and Statistical Agent
  - Licensed by Individual State Insurance Department
- Public Relations and Industry Outreach
  - (2011 Southwest Case Study – You Tube)
  - (Crop Insurance 101)
  - (2011 Midwest Case Study – YouTube)

Federal Crop Insurance Program

Multiple Peril Crop Insurance or MPCI

Federal Crop Insurance Program

- Multiple Peril risk protection
  - Covers drought, flood, insects, other natural perils
    - Excludes inadequate farm management practices
  - Pays for farmer's loss of yield or revenue
    - As compared to a guaranteed level
    - Guarantee based on expected yield or revenue
      - 50% to 85% (90% for Area plans)
    - Farmer's expected yield determined from historical yields
    - Prices from commodity markets

Public/Private Partnership

- Risk Management Agency (RMA)
  - USDA Agency
  - Regulator
  - Federal Crop Insurance Corporation (FCIC)
  - Full access to Treasury funds as needed
- Approved Insurance Providers
  - 15 AIPs in 2012
  - Issue policies & settle claims
  - Obligated to sell coverage to all eligible farmers
  - AIPs also sell Crop-Hail

RMA Role

- Develop policy language
- Loss adjustment procedures
- Set rates
- Program management and oversight
  - Standards for AIPs to enter program
  - 2011 flooding
- Regulate company activity
  - Quality control
    - Program eligibility
    - Monitor claim adjustment
- Financial support
  - Farmer premium subsidies (approx. 40%)
  - Pays A&O to insurers
    - Due to no expense loading in premium
  - Reinsurance
    - Proportional and non-proportional

Unusual Characteristics

- Insures an “uninsurable” risk
  - Very high correlation among exposures
  - No ability to underwrite risks
  - No control over rates
    - No ability to recoup losses
    - Uncertainty regarding rate adequacy
  - Extensive governmental oversight
- Insures business activity, not property
  - Creates need to limit waste, fraud & abuse
  - Low incidence of fraud
- Requires highly specialized insurance operation
  - Very different from P&C
  - Massive data reporting requirements / High IT costs

Numerous Challenges

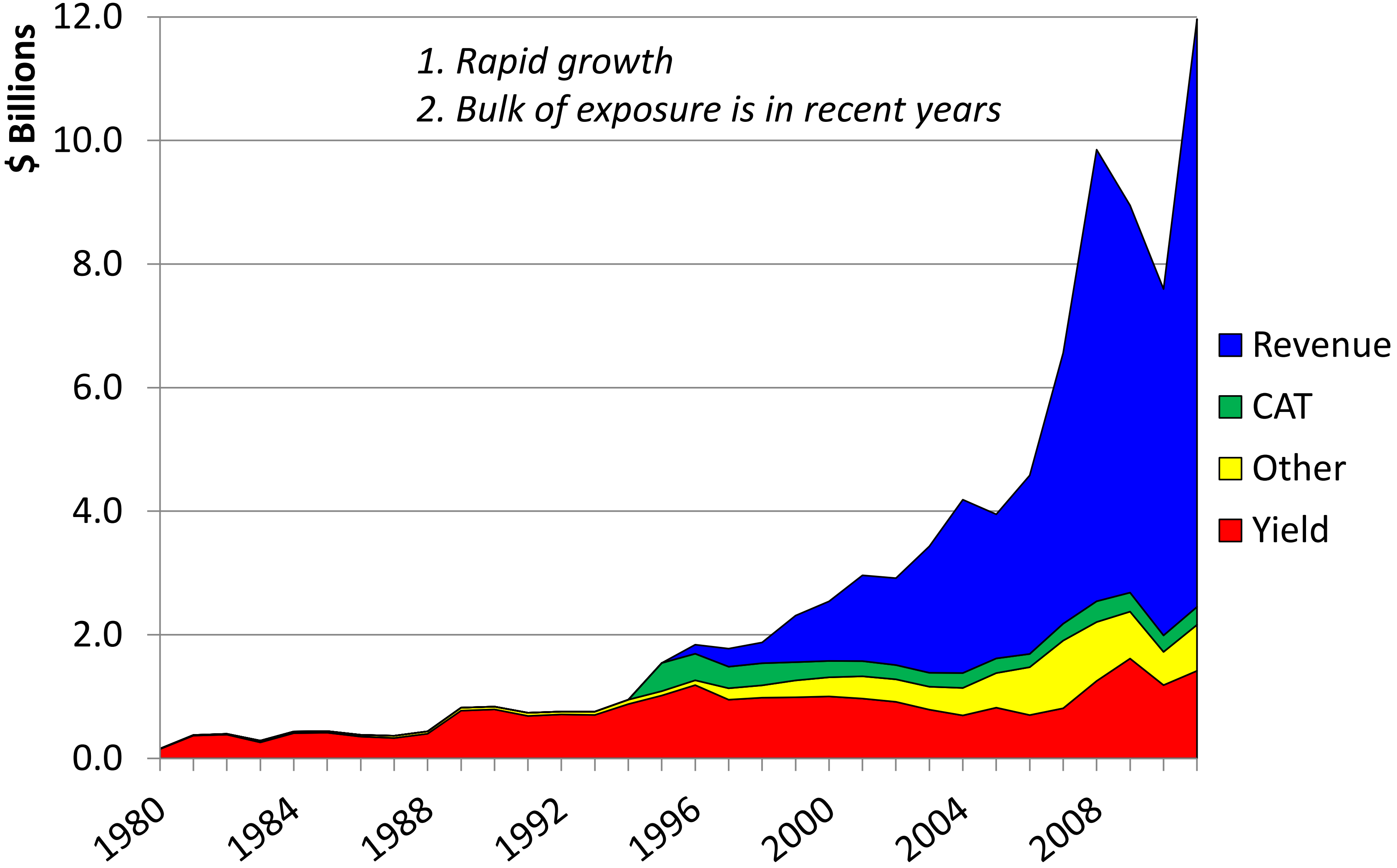
- Farm Bills - every 5 years
  - Supporters introduce enhancements
  - Opponents propose cuts or elimination
    - Farmer Premium Subsidies; Individual Risk Protection
    - Private sector delivery; A&O; Underwriting Gains
- Administration
  - Presidential Budget proposals – Annual
  - OMB, OIG reports
- Renegotiate SRA - every 5 years
- New ratemaking methodology
- Maintaining reinsurer participation
- Cash flow
- Rate of return concerns
- Insufficient A&O
- 2012 Cost of Delivery study

Overview of MPCI Protection

Types of MPCI Protection

- Individual risk
  - Yield
  - Revenue
  - Revenue with harvest price exclusion
- Group risk
  - County yield
  - County revenue
- Specialty programs
  - Rainfall & vegetation indices
  - Trees
  - Plant nurseries
  - Livestock margin coverage
  - Oysters, catfish

MPCI Premium by Type of Plan

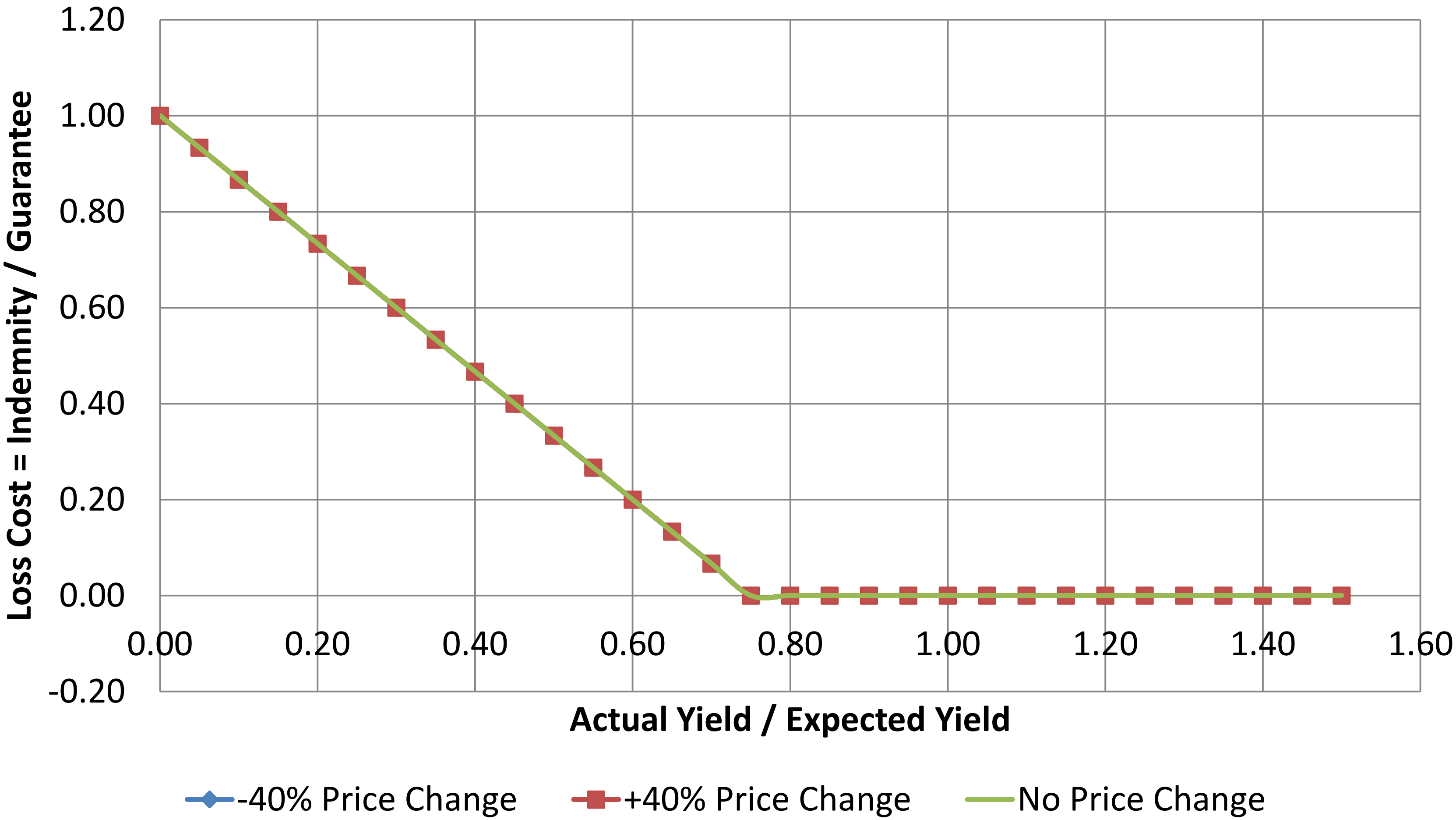


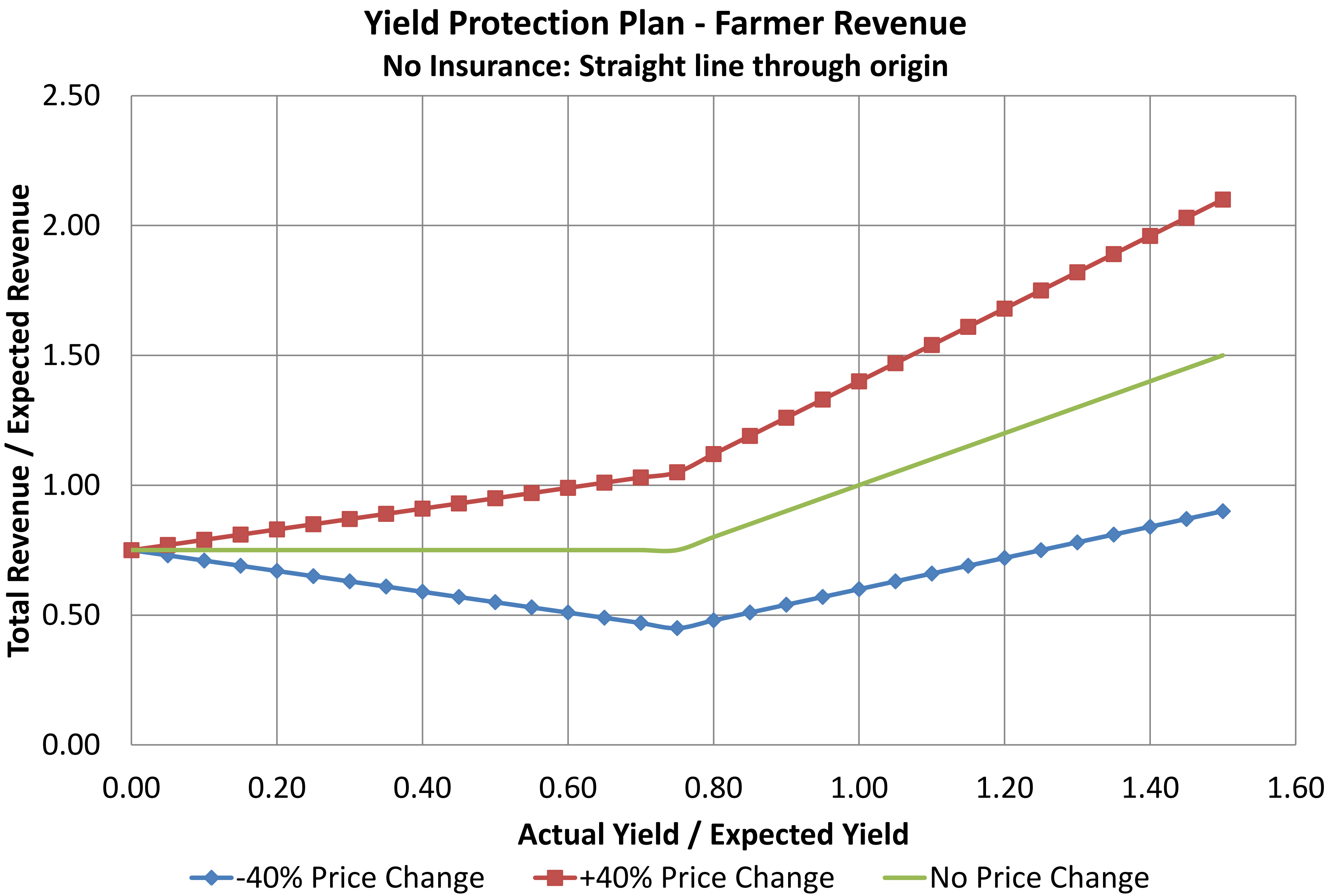
Yield Protection Insurance

- Yield Guarantee per acre
  – APH x Coverage Level
    - APH = Farmer’s average historical yield
    - Coverage Levels: 50% to 85%
    - Deductible = 100% - Coverage Level
- Indemnity per acre
  – Replaces lost bushels
  – Pays when Harvested Production < Guarantee

  (Yield Guarantee – Harvested Production) x Base Price

Yield Protection Plan – Indemnity
Guarantee = 75% of expected yield




Yield Protection Plan - Farmer Revenue
No Insurance: Straight line through origin
Total Revenue / Expected Revenue
2.50
2.00
1.50
1.00
0.50
0.00
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
Actual Yield / Expected Yield
-40% Price Change
+40% Price Change
No Price Change

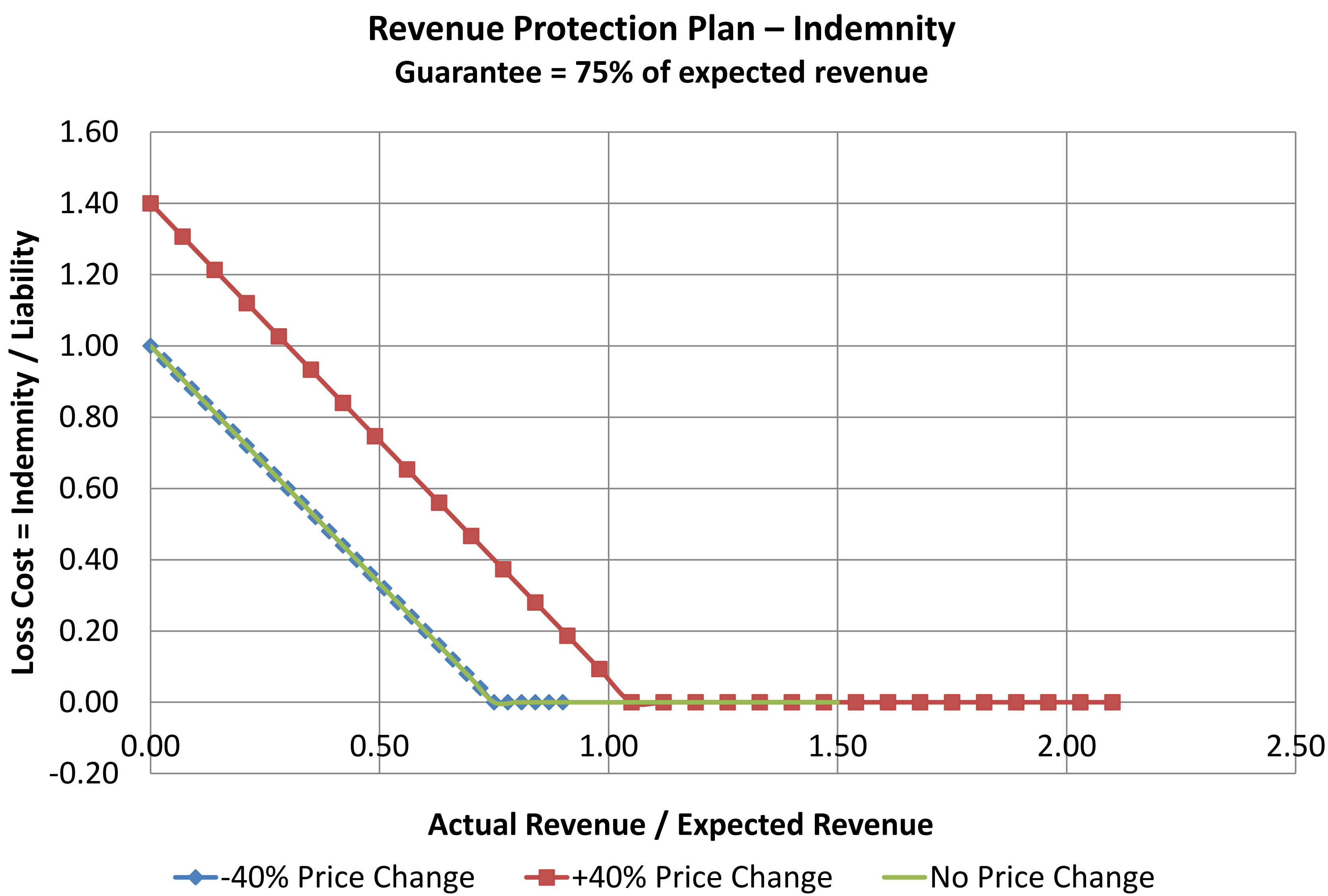
Revenue Protection Insurance

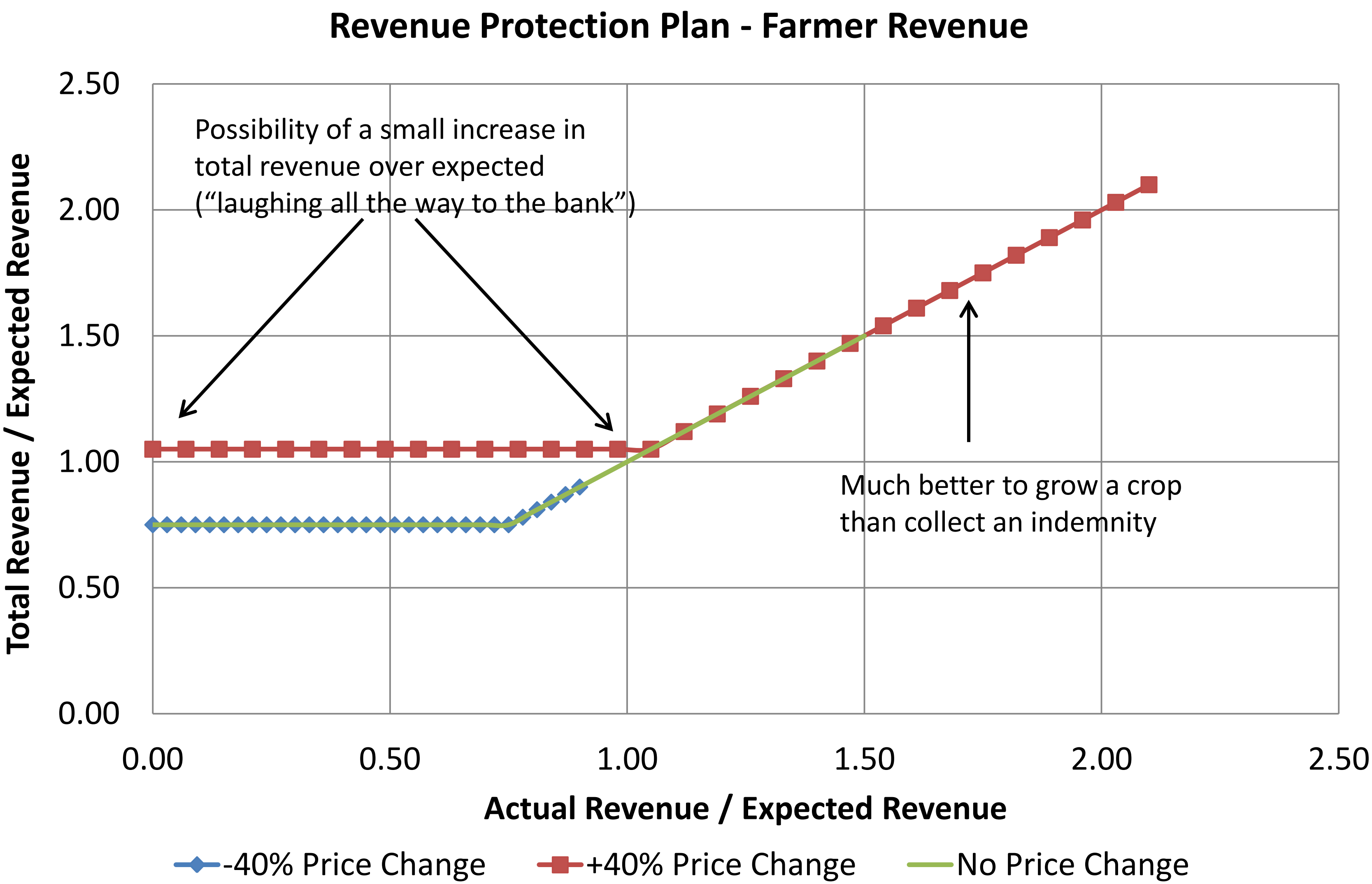
- Revenue Guarantee
  - APH x Coverage Level x Base Price
  - Guarantee can increase at harvest
    - APH x Coverage Level x Max(Base Price, Harvest Price)
    - Applies to RP only, not RP with Harvest Price Exclusion
- Actual Revenue
  - Harvested Production x Harvest Price
- Indemnity
  - Pays loss of revenue, not yield
  - Protects farmer when forward marketing his crop
  - Pays when Actual Revenue < Revenue Guarantee

    Revenue Guarantee – Actual Revenue

Base and Harvest Crop Prices

- Uses options on futures contracts sold on commodity exchanges
  - Crop price
    - Sets Base Price prior to planting
    - Sets Harvest Price in month of normal harvest
  - Volatility
  - Extended price discovery period
- Iowa corn example:
  - Futures contract for December delivery
  - Base Price discovery period Feb. 1 – Feb. 28
  - Harvest Price discovery period Oct. 1 – Oct. 31


Revenue Protection Plan – Indemnity
Guarantee = 75% of expected revenue
Loss Cost = Indemnity / Liability
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
0.00
0.50
1.00
1.50
2.00
2.50
Actual Revenue / Expected Revenue
-40% Price Change
+40% Price Change
No Price Change


Revenue Protection Plan - Farmer Revenue
Possibility of a small increase in total revenue over expected ("laughing all the way to the bank")
Much better to grow a crop than collect an indemnity
Total Revenue / Expected Revenue
Actual Revenue / Expected Revenue
0.00
0.50
1.00
1.50
2.00
2.50
-40% Price Change
+40% Price Change
No Price Change

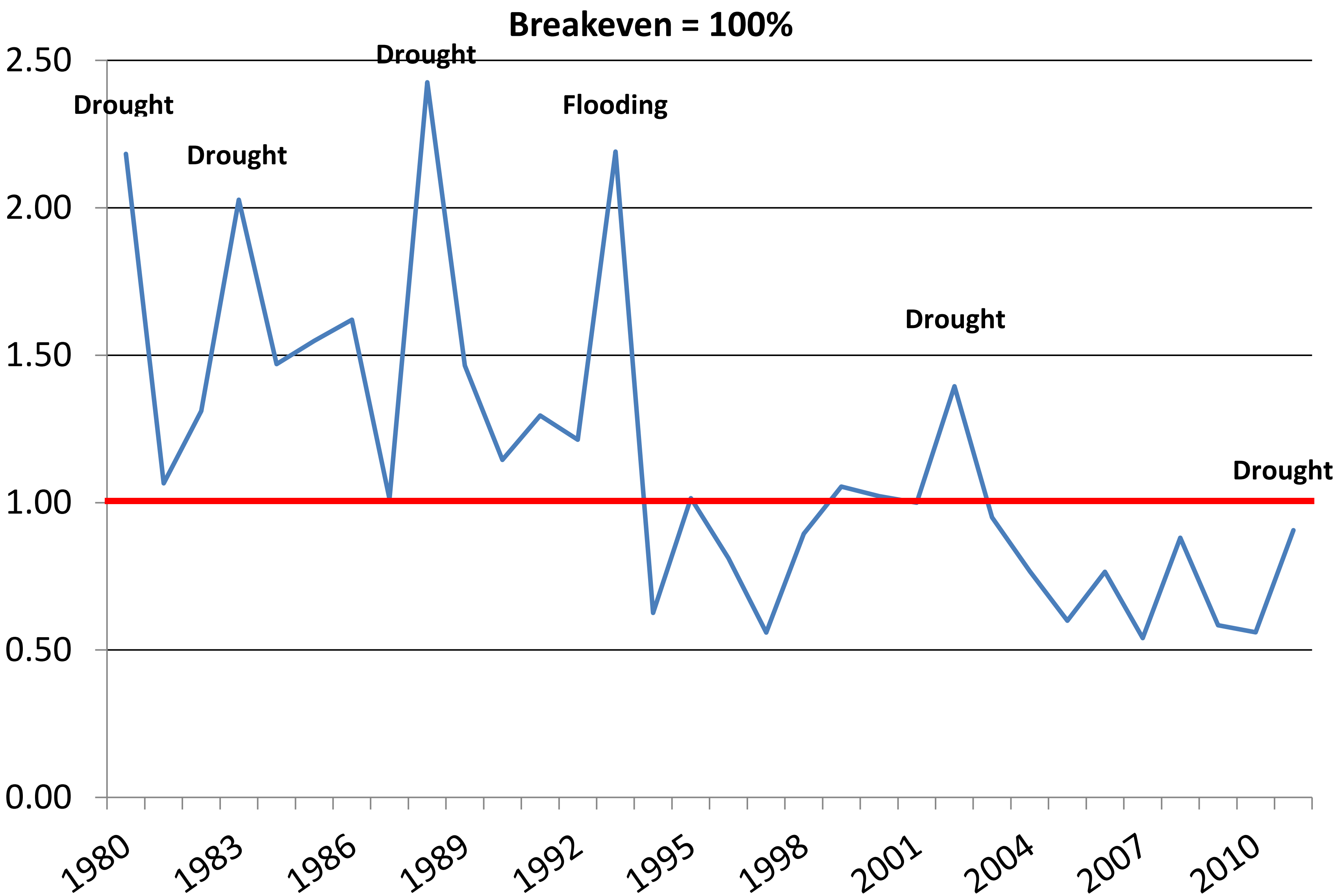
RMA Ratemaking Methods

MPCI Ratemaking Methodology

Used through 2011

- Loss Cost method
  - County base rates
  - Exclude loading for expenses or profit
  - Based on loss costs from 1975 to present
    - Convert Revenue Plan experience to Yield Protection
    - Exclude CAT experience
    - Adjust to 65% coverage level
    - Cap county LC's at 80th percentile
    - Smooth county LC with neighboring counties
  - Loadings
    - State excess load
    - Prevented Planting
    - Disaster Reserve (contingency loading)

Historical Performance / Loss Ratios

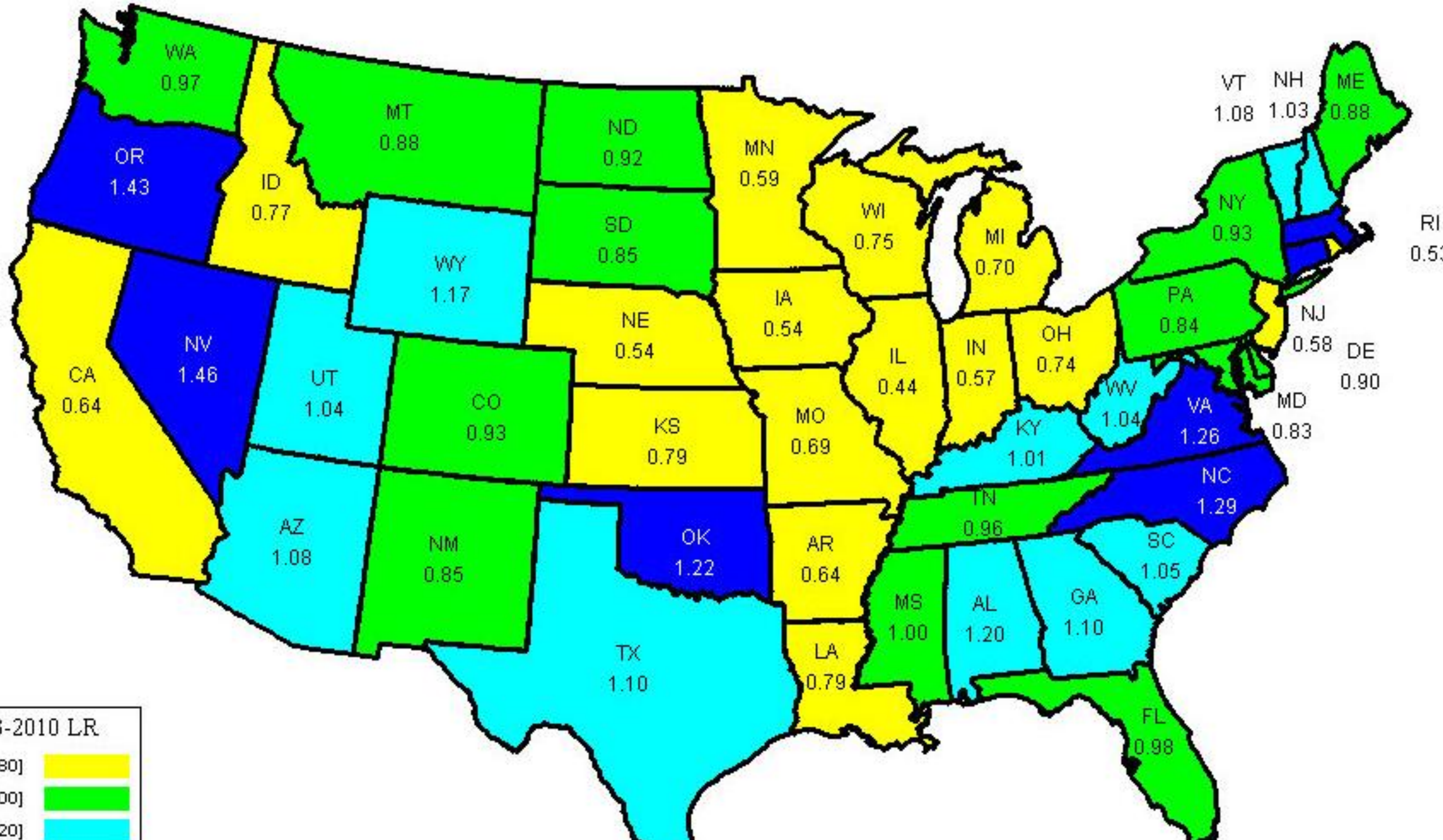


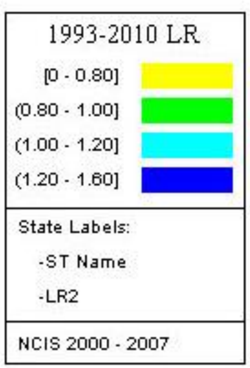
New Ratemaking Methodology

- Uses same historical experience
  - Modifies weighting to account for rare events (e.g. 1 in 500 year event)
  - Revamps other aspects of methodology
- 2012
  - Reductions to Corn & Soybean rates
- 2013
  - Further reductions to Corn & Soybean rates
  - Introduce methodology to Wheat & other crops
    - Amount still not known

Motivation for New Methodology

MPCI Loss Ratios: 1993-2010

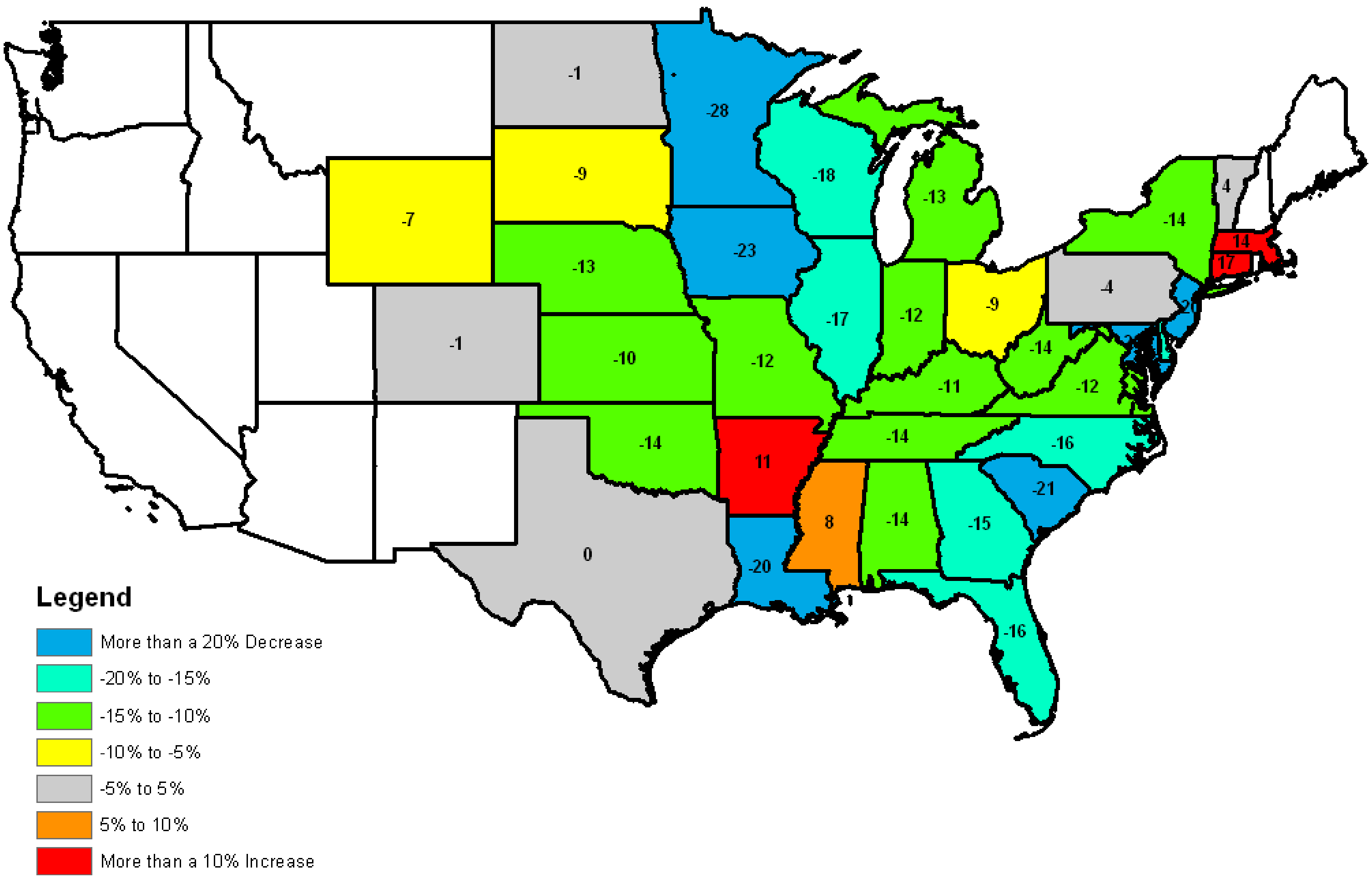




Potentially biased due to greater premium in recent years with good experience

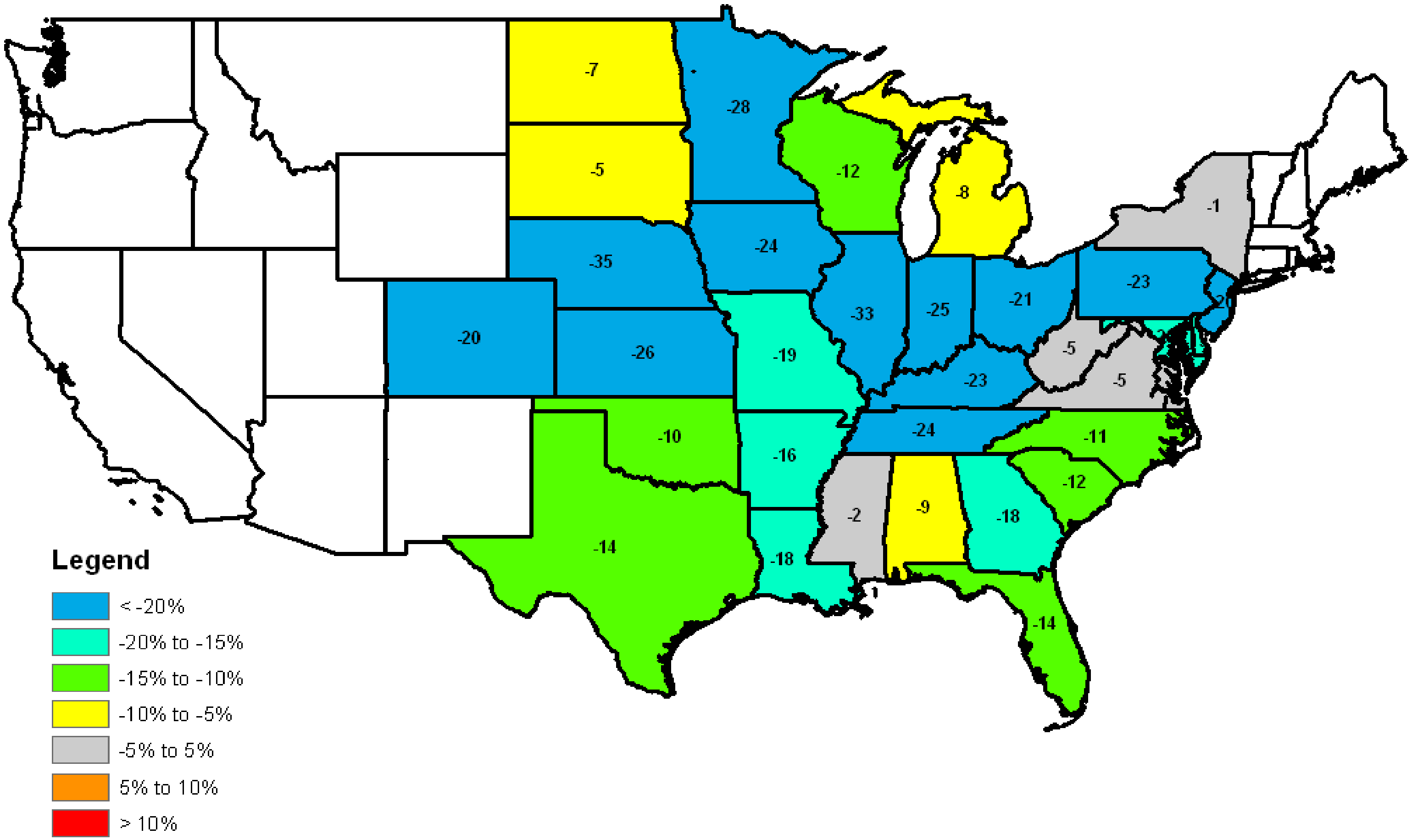
Overall Impact of All Changes (2012/2013)

Corn: Percent Change in Premium



Overall Impact of All Changes (2012/2013)

Soybean: Percent Change in Overall Premium

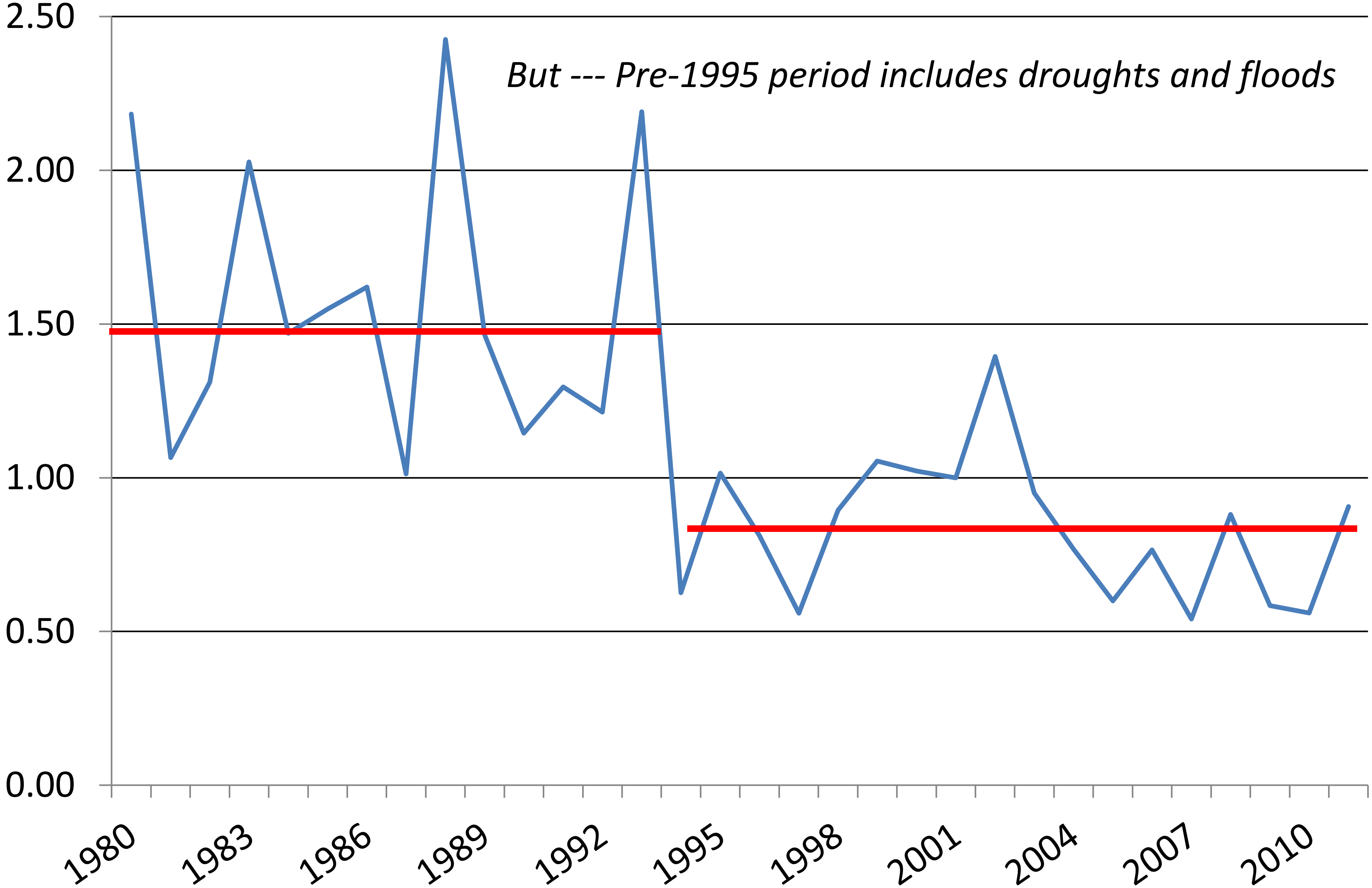


Major Concerns with New Approach

- Weather weighting ("bins")
  - Original purpose of study
    - Reduce weight assigned to years with rare events
  - Limited effectiveness
    - Does not improve performance of ratemaking process
  - Statistical justification
    - Model chosen based on correlation
      - Additional variables increase correlation
- Unanticipated methodology changes
  - Reduce influence of data from older years
  - Very large impact

MPCI Loss Ratios

Pre-1995 Adjustment



Triple Modification to Older Experience

- Pre-1995 adjustment
  - Not supported in the literature
  - *When is a total loss not a total loss?*
- Net acreage adjustment
  - Weights historical experience based on acreage
  - Program has grown rapidly in recent years
    - Effect is to assign less weight to earlier years
  - *But credibility is <u>not</u> a function of exposure volume*
- Use of 20 year experience period
  - Formerly 1975 to present
  - Currently 1992 to 2011
  - 1993 drops out in two more years
- All three modifications target the older years
  - *Major weather events in 1983, 1988, 1993*

Standard Reinsurance Agreement

Standard Reinsurance Agreement (SRA)

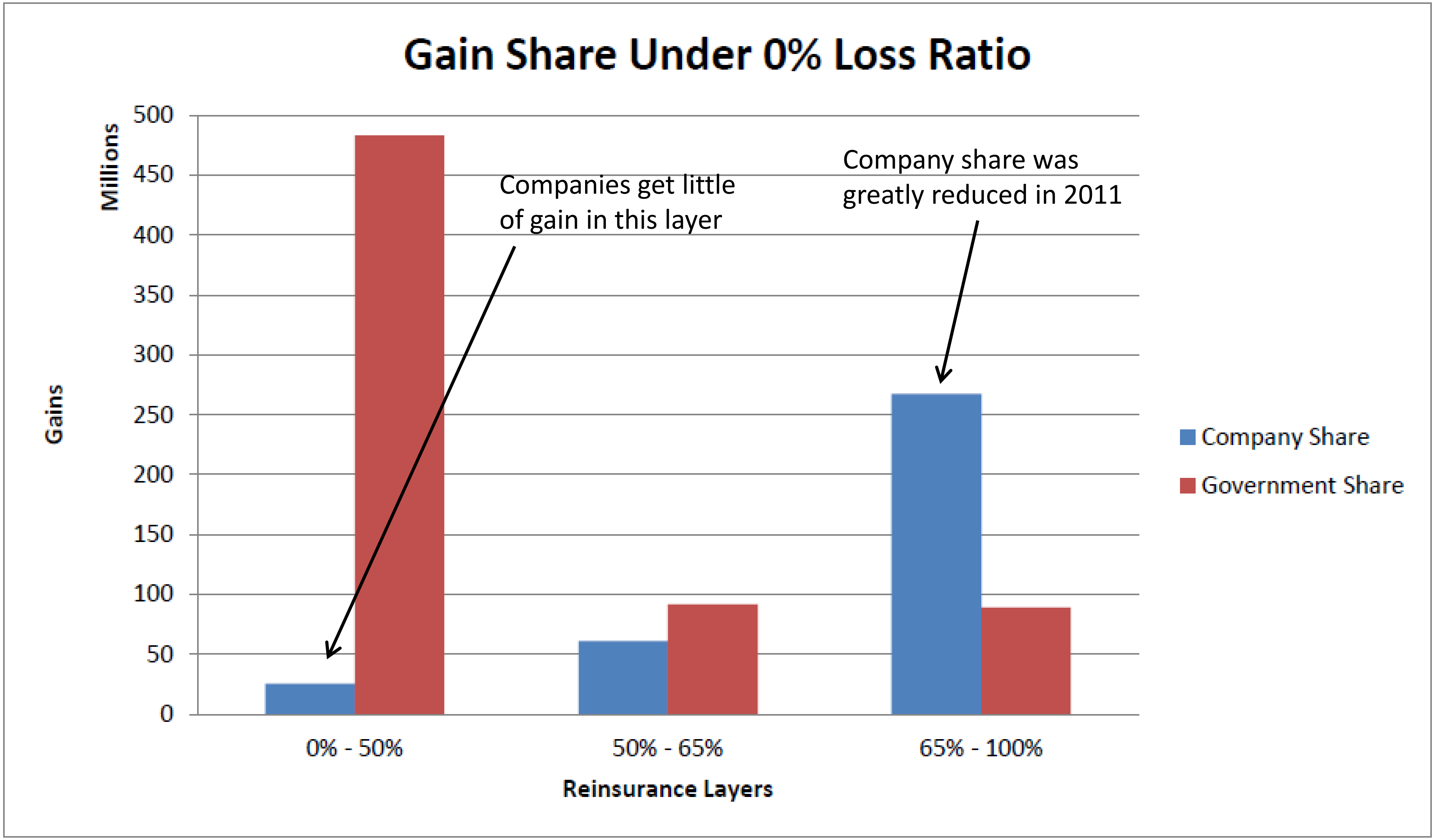
- Cooperative Financial Assistance Agreement
  - Between the Federal Crop Insurance Corporation (FCIC) and Insurance Company
  - Administered by RMA
  - Establishes Terms Under Which FCIC Provides Reinsurance and Subsidies on Eligible Crop Insurance Contracts Sold by the Insurance Company

2011 SRA

- Reduced industry revenues by $6 B over 10 years
  - Reduced U/W gains
    - Particularly in Corn Belt
    - Gov't also took larger share of U/W losses
  - Cut number of reinsurance funds from 7 to 2
  - Capped A&O
  - Restricted Agent Compensation
    - Capped at 80% of A&O, by state
    - Allows up to another 20% for profit sharing
  - Increased incentives to write in underserved states

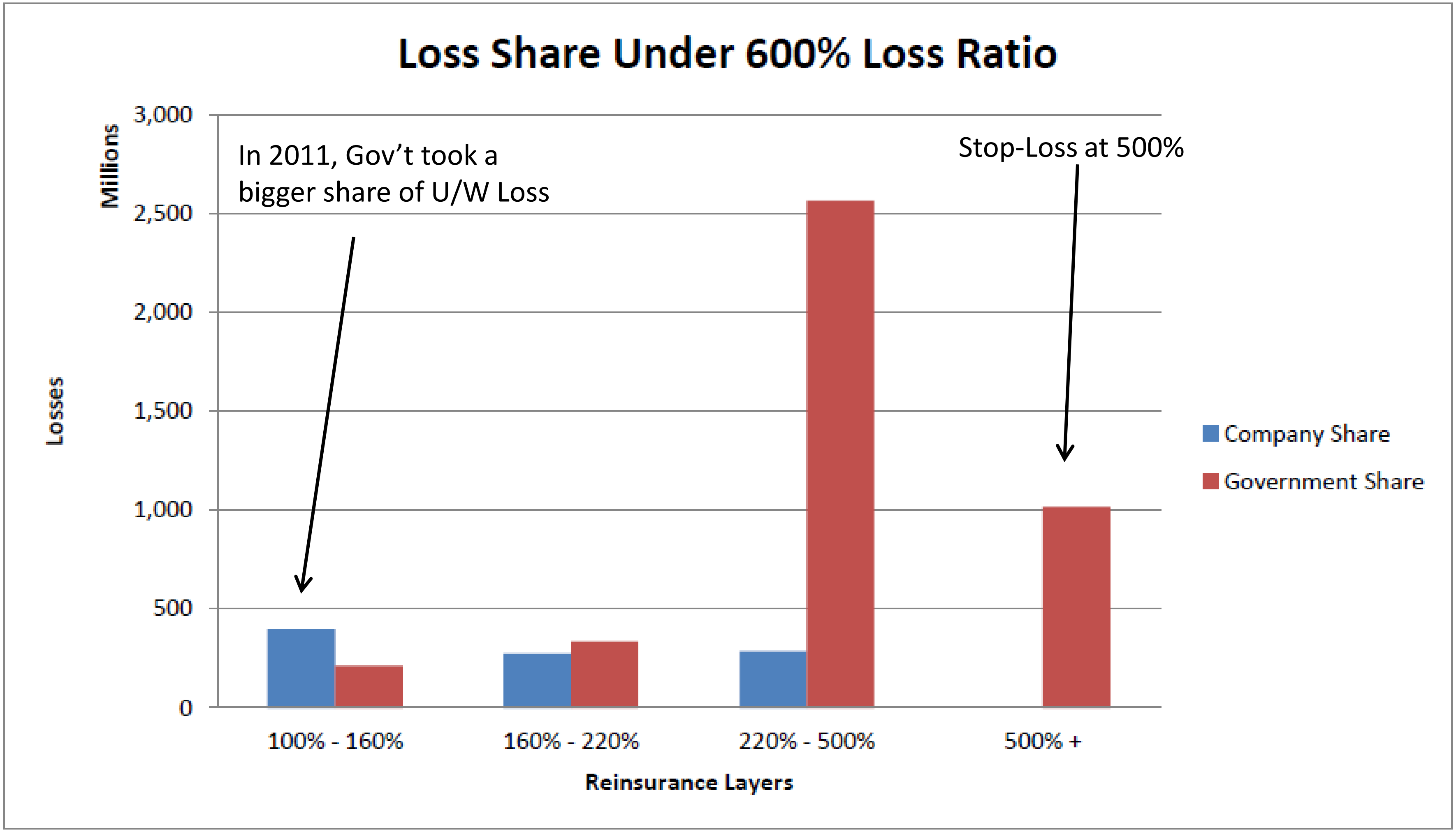
Underwriting Gains

Iowa scenario under 2011 SRA



Underwriting Loss Scenarios

Iowa scenario under 2011 SRA

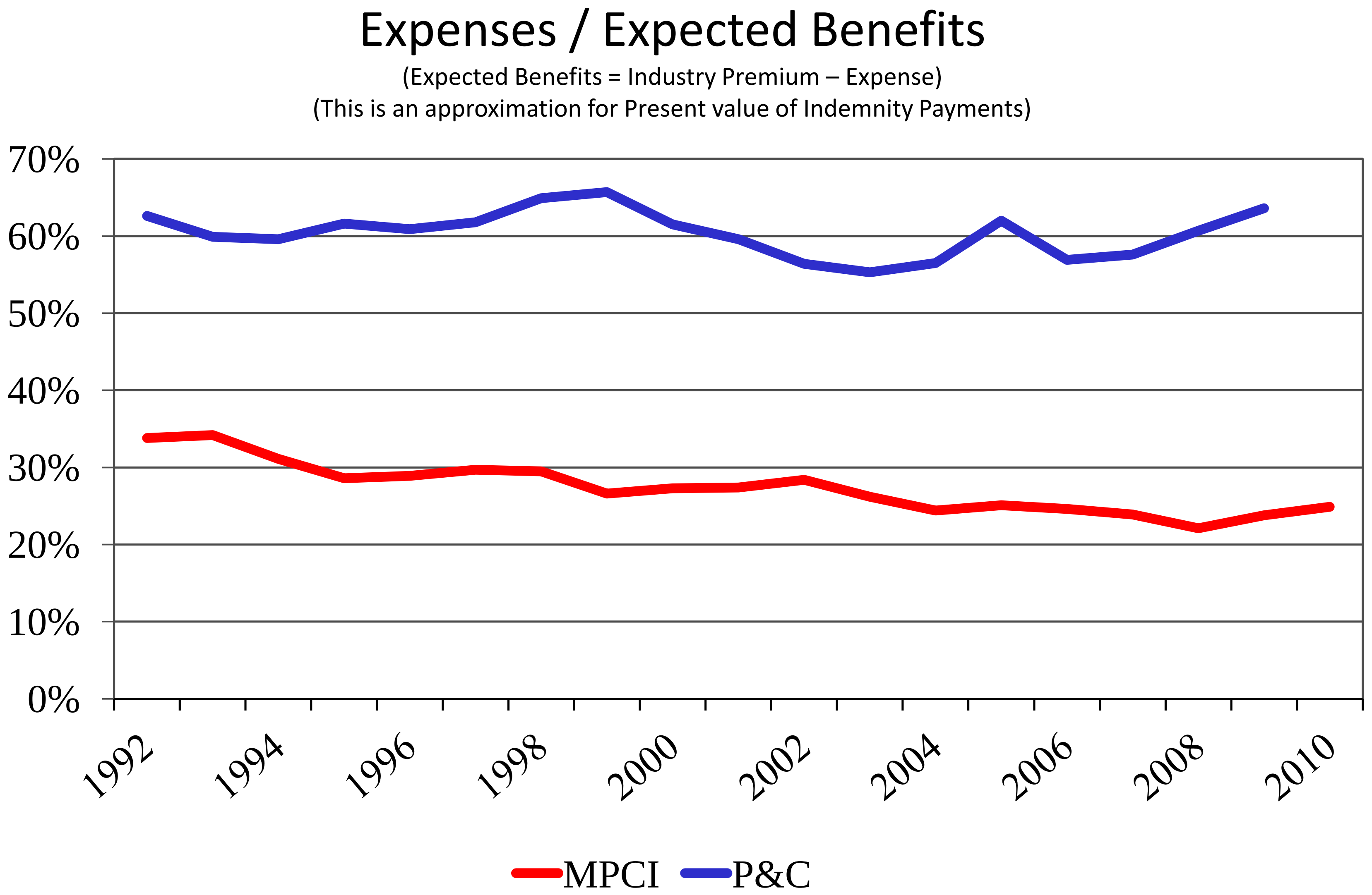


A&O & CAT LAE Payments

- Compensates AIPs for delivery costs
- Nominal rates
  - As % of <u>unloaded</u> premium
    - CAT: 6%
    - Area plans: 12%
    - Revenue plans: 18.5%
    - Other (including Revenue with HPE): 21.9%
- Maximum A&O for 2012
  - $2.06 B --- Capped at $1.32 B
  - 18.6% --- Capped at 11.9%
- No minimum A&O

Profitability and Expense Studies

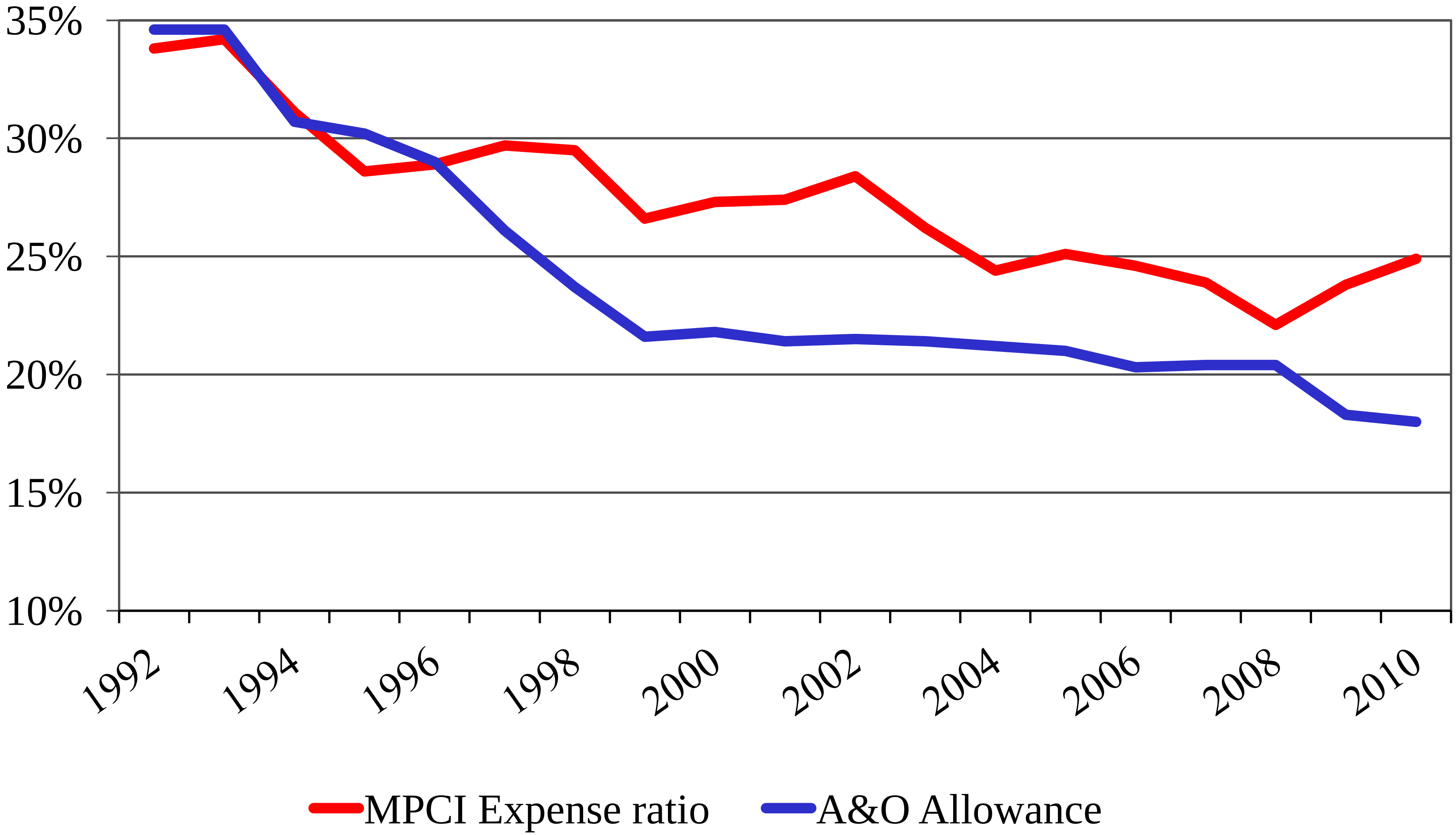
MPCI Has Much Lower Delivery Costs than P&C



Profitability and Effectiveness of the Federal Crop Insurance Program; Ben Wilner, Ph.D., Laura Carolan, and Frank Schnapp; Crop Insurance Today; May 2011
http://www.ag-risk.org/NCISPUBS/Today/2011/Today05-11.pdf

A&O Not Sufficient to Cover Industry Expenses

Projected to fall to 11-12% in 2011/2012



Profitability and Effectiveness of the Federal Crop Insurance Program; Ben Wilner, Ph.D., Laura Carolan, and Frank Schnapp; Crop Insurance Today; May 2011
http://www.ag-risk.org/NCISPUBS/Today/2011/Today05-11.pdf

2012 RMA Cost of Delivery Study

- Study of industry delivery costs
  - Primarily focused on Agent Compensation
  - 2012 expense projection: 16.9% of premium
  - 2012 A&O projection: 11.9% of premium
  - May lead to further cuts in A&O

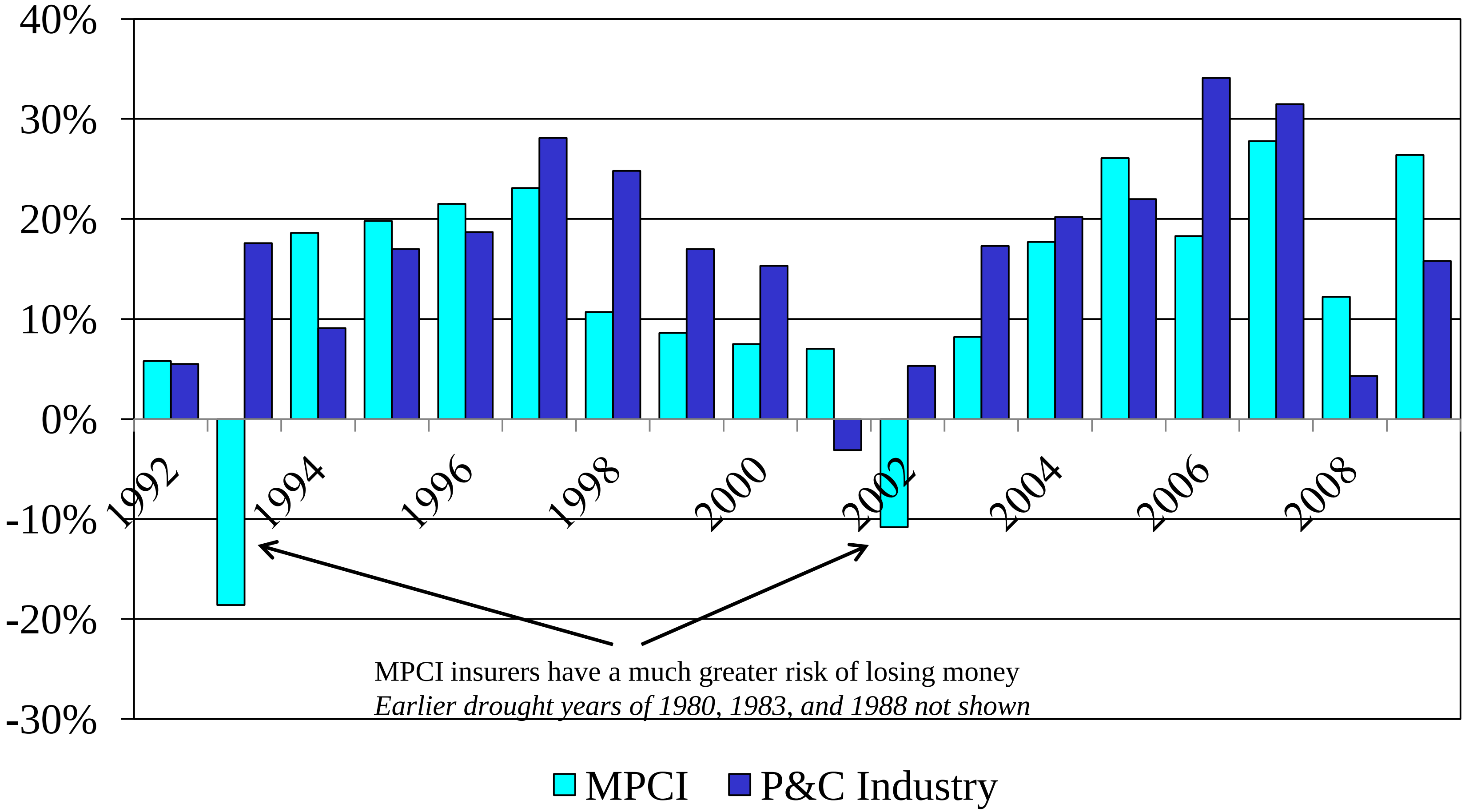
2012 Projected Expenses and Premium		
	Amount ($MM)	% of Premium
Loss Adjustment & Company Overhead	$0.629	6.0%
Agent Compensation	$1.132	10.9%
Premium	$10.417	---

Crop Insurance Rate of Return: Issues and Concerns; Frank Schnapp
Crop Insurance Today, August 2012
http://www.ag-risk.org/NCISPUBS/Today/2012/Aug_2012_TODAY.pdf

Underwriting Gains Not Sufficient to Make Up the Gap

MPCI vs. P&C Industry Profitability

MPCI is riskier yet less profitable when evaluated on a consistent basis



Profitability and Effectiveness of the Federal Crop Insurance Program; Ben Wilner, Ph.D., Laura Carolan, and Frank Schnapp; Crop Insurance Today; May 2011

http://www.ag-risk.org/NCISPUBS/Today/2011/Today05-11.pdf

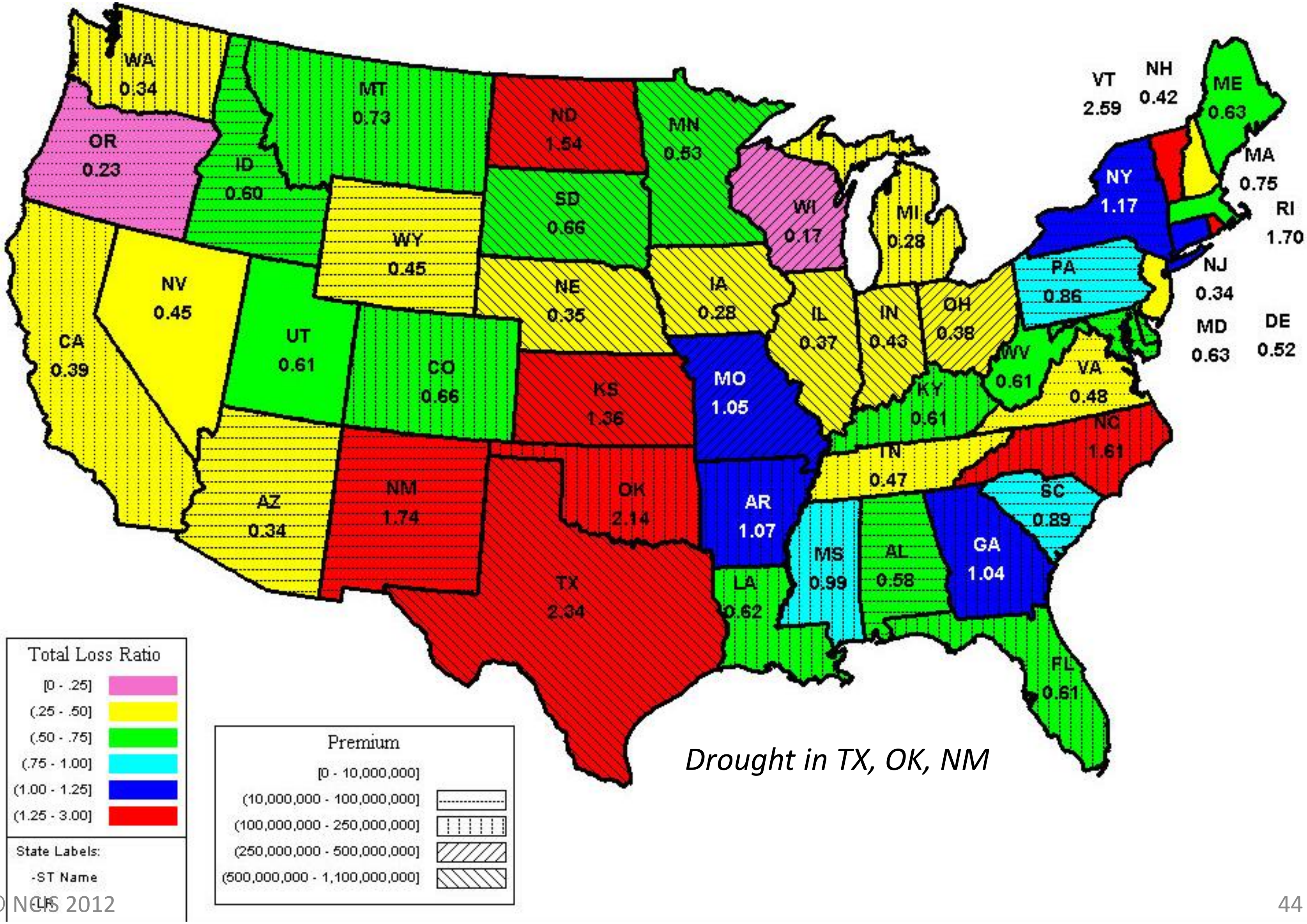
Crop Insurance Industry Income Statement *(2012 Forecast, not including impact of drought)* In Millions of Dollars	
Premium and Equity	
Gross Premium	10,417
Retained Premium after reinsurance and Quota Share	8,265
Equity	10,871
Revenue	
Underwriting Gain/Loss	1,033
Investment Income on Equity	353
A&O Payments	1,332
Expense	
Loss Adjustment and Company Overhead	(629)
Commissions and processing fees	(1,132)
Cost of borrowed funds due to delay in payment of A&O and Underwriting Gain	(42)
Income = Revenue – Expense	
Pretax Income	915
Federal Income Tax	(287)
After-tax Net Income	628
Rate of Return	
Return on Equity (ROE)	5.8%
Cost of Capital (Required Return on Equity)	12.7%

"Crop Insurance Rate of Return: Issues & Concerns", Crop Insurance Today, August 2012, Vol. 45, No 3

2011 Actual & 2012 Conditions

2011 MPCI Premium and Loss Ratios

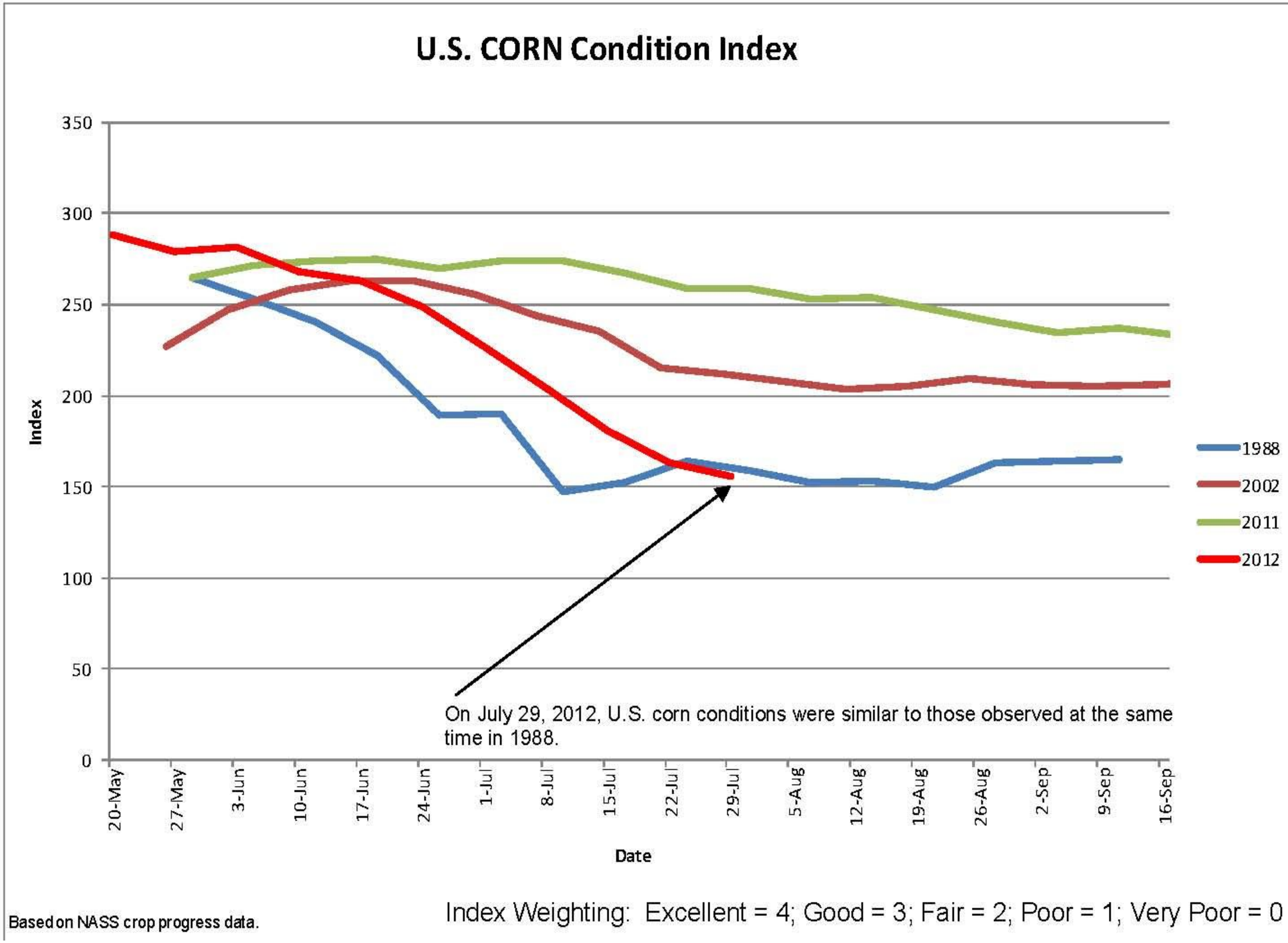
All Plans Combined



Drought in TX, OK, NM

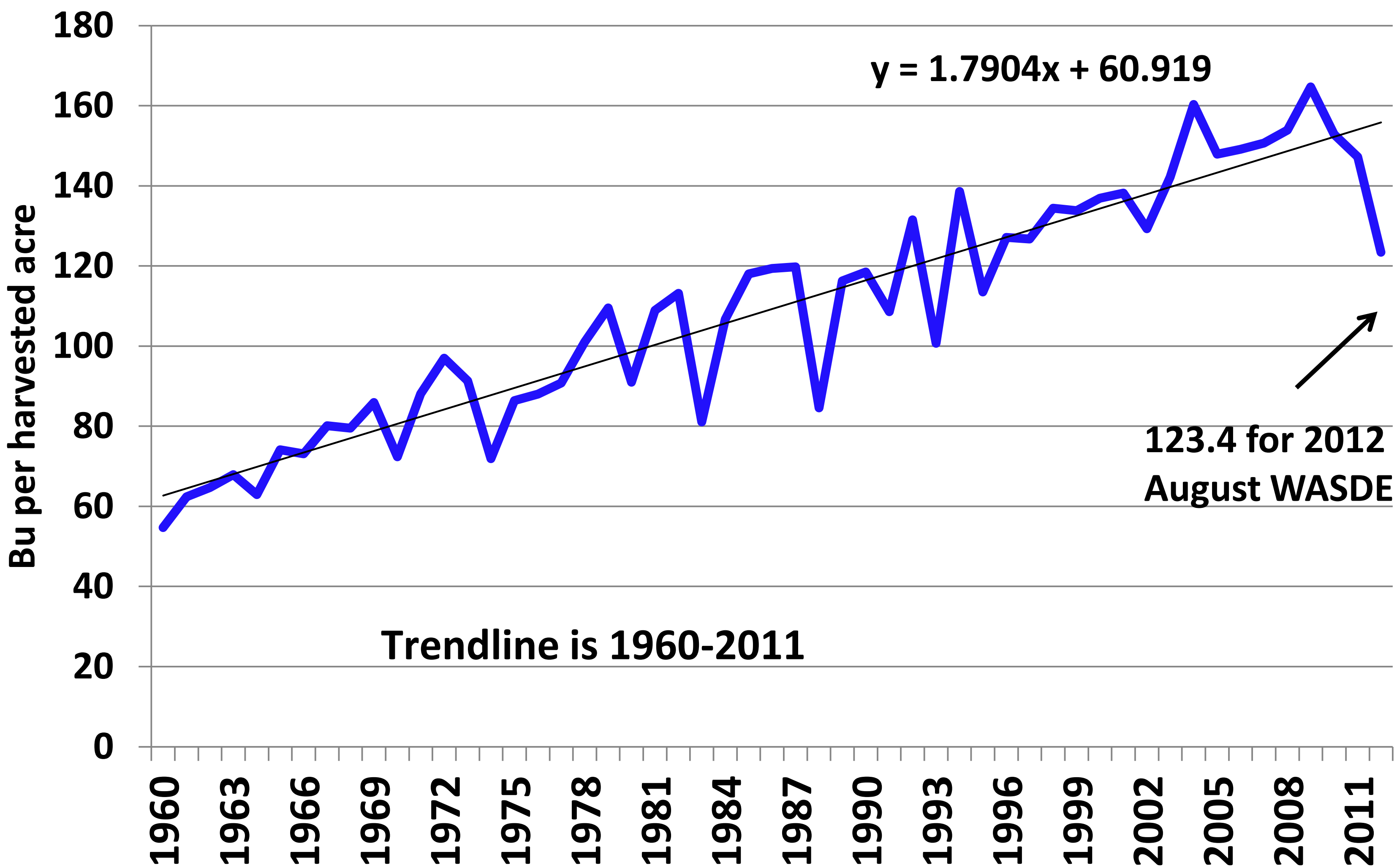
2012 Drought

- Affects Corn Belt and Great Plains
- Published estimates
  - Loss Ratios: 120% to 270%
  - Indemnities: $13 to $30 Billion
  - Gross U/W Loss: $2 to 18 Billion
  - Industry U/W Loss: $1 to 4 Billion



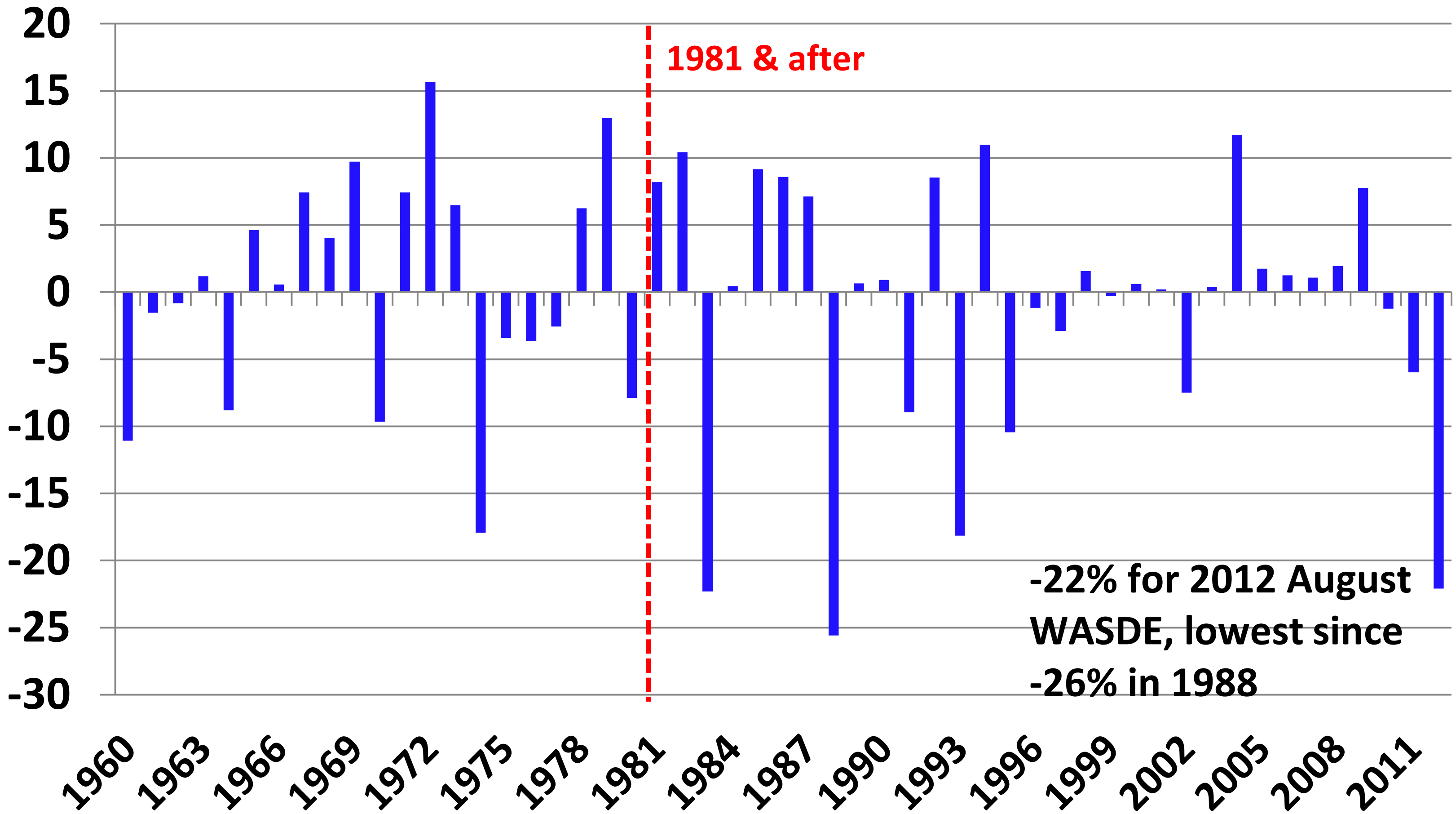
NOAA Weekly Weather and Crop Bulletin, July 31, 2012

Corn Yield per Harvested Acre



Corn Yield Percent Deviation from Trend

Low Yields ➔ High Indemnities



Low Yield Years for Corn since 1981

- **Years of 5% or more drop in yield from trend:**

Year	Yield deviation from trend	Loss cost
1983	-22.3%	13.4%
1988	-25.6%	15.3%
1991	-9.0%	6.4%
1993	-18.1%	17.4%
1995	-10.4%	5.2%
2002	-7.5%	11.0%
2011	-6.0%	6.3%
2012	-22.1%	?

Farm Bills

2008 Farm Bill

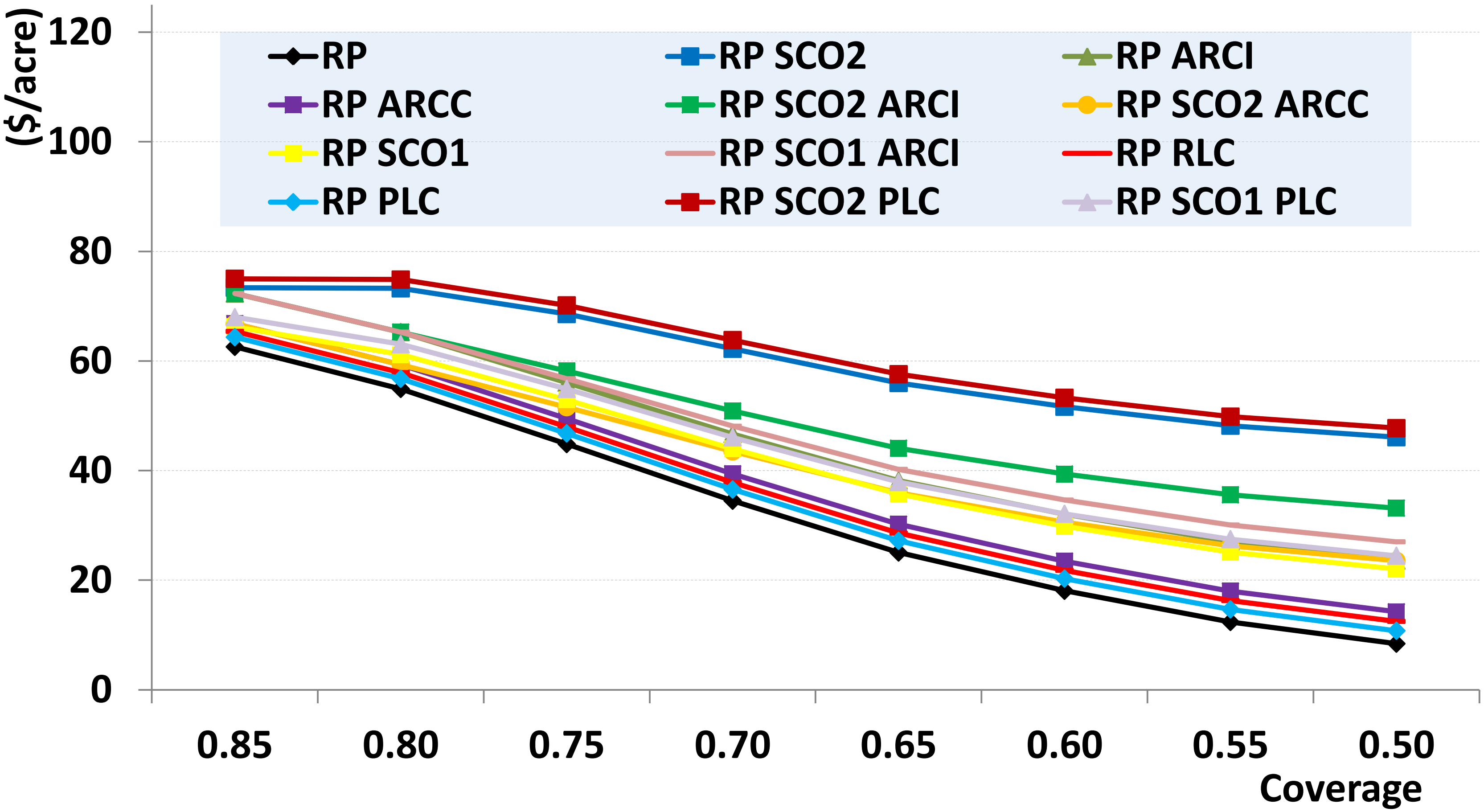
- A&O reduced 2.3 points
- Delays payments to companies
  - A&O delayed 3 months
  - U/W gains delayed 8 months
- Cash flow issues
- Achieved Budget savings of $6 B over 10 years

2012 Farm Bill

- Final bill still in progress
  - Combines Food Stamps and farm programs
  - Eliminates Direct Payments
    - Saves $4 B per year
  - Protects crop insurance
    - Impact on industry still unknown
  - Makes farm programs more like crop insurance
  - Net savings to taxpayers of $23 B over 10 years

Value of 2012 Farm Bill Programs with RP in 2012 *

(CI: Optional Units Subsidy Rates, Simulated Fair Premium Rates ;
SCO: 70% Subsidy Rate, Simulated Fair Premium Rates)



- For a representative corn farm in in Champaign County, IL with 100 acres, Certainty Equivalent (CE) of wealth with the option minus CE of wealth without the option (no government support). The difference is divided by the number of acres. Notation: SCO1: SCO Yield Policy; SCO2: SCO Revenue Policy for RP; ARCI: ARC Indiv.; ARCC: ARC County; RLC: Revenue Loss Coverage; PLC: Price Loss Coverage. Analysis as of 9/5/12

Despite Challenges, Crop Insurance is An Essential Tool

1--Producers share program cost

2--Producers take personal responsibility for risk management

3--Producers get individual risk management solutions

4--Producers receive indemnities in the timeliest way

5--Program can be quickly adjusted and is self-correcting

6--Payments are not in excess of losses

7--Protection can be used as collateral for loans

8--Program enables pre-harvest marketing

9--Producers not subject to payment limits

10--Producers benefit from the efficiencies of private sector delivery

11--Crop insurance can be green box under the WTO and has flexibility to meet WTO support limits

12--Crop insurance has contributed to deficit reduction

54

A World Of Information

National Crop Insurance Services