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# **The Influence of Changing Commodity Prices on the CRP**

**Daniel Hellerstein and Scott Malcolm**  
**USDA, Economic Research Service**

*Poster prepared for presentation at the Agricultural & Applied Economics Association 2010  
AAEA, CAES, & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010*

*The views expressed in this poster are those of the authors and should not be attributed to ERS or USDA*

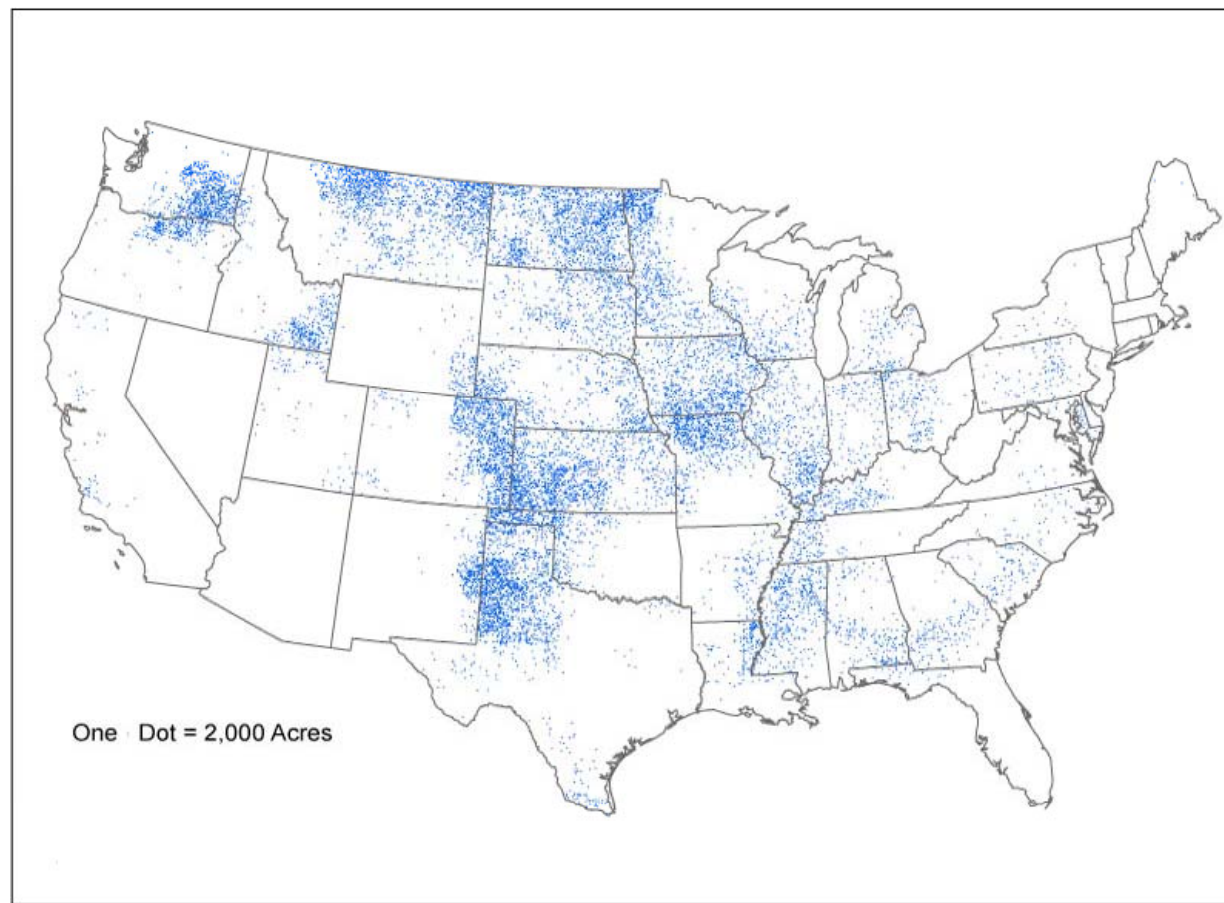
# **The Influence of Changing Commodity Prices on the CRP**

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In 2008, about 34.6 million acres of cropland were enrolled in the CRP. Driven by the 2008 Farm Act's mandated reduction in the program, the program enrolled 31.2 million acres as of March 2010 (includes about 4 million acres of "continuous" signup).

### Distribution of CRP Acreage (October 2009)



Source: ERS using FSA CRP contract data

*How might increases in commodity prices, along with the acreage reduction mandated in the 2008 Farm Act, impact the Conservation Reserve Program (CRP)?*

### **Modeling Strategy**

*The Likely To Bid (LTB) model “restarts” the CRP from scratch...*

Uses National Resources Inventory data to find parcels “likely” to offer acreage to the CRP

### **Policy scenarios**

*We consider several scenarios, both with and without increases in CRP rental rates.*

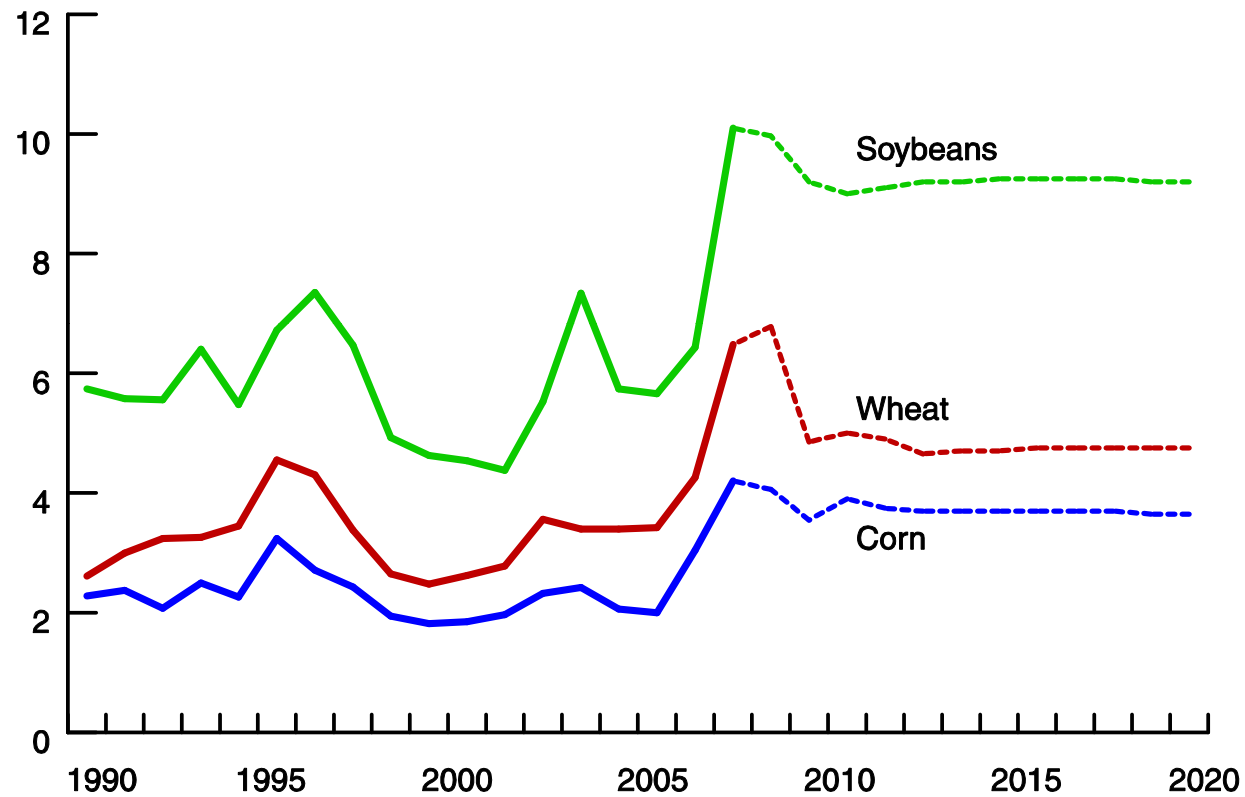
1. Continuation of current prices, which are well above prices prevalent when most CRP contracts were enrolled
2. Predicted prices due to an increase in biofuels production to 15 billion gallons
3. Expectation that summer 2008 prices will be the norm

### **Findings**

- Continuation of current, relatively high commodity prices would have noticeable impacts on the costs and environmental benefits of the CRP
- Additional impacts due to increasing ethanol production (from 6.5 to 15 billion gallons) would be relatively minor
- Additional impacts of a recurrence of summer 2008 prices would be substantial

## U.S. farm-level prices: Corn, wheat, and soybeans

Dollars per bushel



After a decade of relative stability, agricultural commodity prices trended up in 2006, peaking in the summer of 2008.

Source: <http://www.ers.usda.gov/Publications/OCE091/OCE091c.pdf>.

## The Likely To Bid (LTB) model was used to simulate the CRP under different price regimes

A simulated CRP is generated using parcels defined at Natural Resource Inventory (NRI) points. Each parcel point is assigned several measures, including:

- CRP *eligibility*
- Predicted net agricultural returns (*netAg*)
- Environmental Benefit Index (*EBI*) factor scores
- CRP soil rental rate (*SRR*)

Parcels for which CRP is relatively profitable (parcels with a sufficiently high value of *SRR/netAg*) are assumed to be *interested* in the program.

A simulated CRP is constructed by choosing 30 million acres (from the *eligible* and *interested* parcels) that have the best EBI scores.

In a separate set of analyses, we also used a current contracts model to investigate how current CRP participants might respond to higher prices (i.e., who would “opt out” if given the chance).

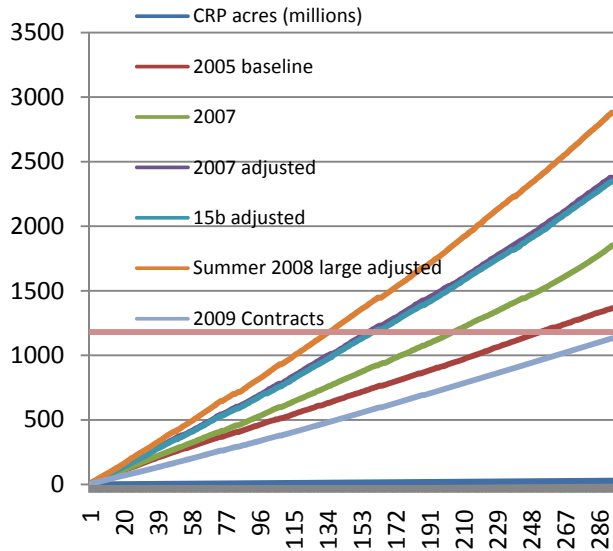
Simulated CRP's, under several policy scenarios and their associated commodity prices ...				
	2005 (baseline)	2007	15 billion gallon biofuel (15b)	Summer 2008
<b>Description</b>	Uses prices prevalent in 2005, which reflect commodity prices prevalent when most current CRP contracts were enrolled	Uses prices prevalent in 2007. These prices are close to current prices	Uses ERS's REAP model to generate predicted prices with biofuel production at 15 billion gallons	Uses the "peak" prices observed by USDA in the summer of 2008
<b>Prices</b>	<i>Each scenario is defined by a price regime.</i>			
<b>Corn (\$/bushel)</b>	2.00	3.39	3.80	5.40
<b>Sorghum (\$/bushel)</b>	1.86	3.21	3.32	4.90
<b>Wheat (\$/bushel)</b>	3.42	6.08	6.13	7.25
<b>Soybeans (\$/bushel)</b>	5.66	9.00	9.03	12.25
<b>Cotton (\$/bale)</b>	208.00	254.00	257.00	364.00
	<i>One, or several, sets of SRRs were considered for each scenario.</i>			
<b>SRR used</b>	<ul style="list-style-type: none"> <li>• 2005 SRRs</li> </ul>	<ul style="list-style-type: none"> <li>• 2007 SRRs</li> <li>• adjusted 2007 SRRs</li> </ul>	<ul style="list-style-type: none"> <li>• adjusted 2007 SRRs</li> </ul>	<ul style="list-style-type: none"> <li>• large adjusted 2007 SRRs</li> </ul>
	<p><i>The adjusted (and large adjusted) SRRs account for the strong likelihood that USDA will raise SRRs (as higher commodity prices lead to increased farmland rental rates).</i></p> <ul style="list-style-type: none"> <li>• <i>adjusted 2007:</i> across the board increase, of all 2007 SRRs, by 60 percent</li> <li>• <i>large adjusted 2007:</i> across the board increase, of all 2007 SRRs, by 120 percent</li> </ul>			



## Summary of Results

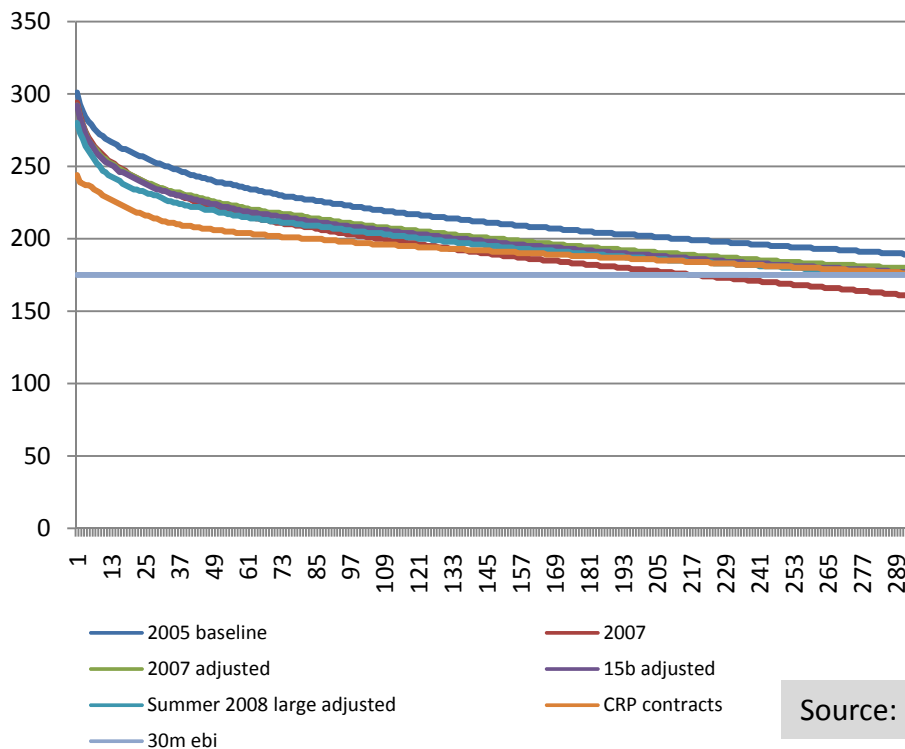
		<i>For the 30 million acres accepted from these offered acres...</i>			<i>What does this suggest?</i>
<b>Scenario</b>	<b>Acres offered</b>	<b>eEBI: EBI with cost factor removed (per offer)</b>	<b>Forgone net ag revenue (per-acre)</b>	<b>Average CRP rental payments (per acre)</b>	
<i>2005 (baseline) prices 2005 SRRs</i>	51.9	188	28	47	The baseline model does not precisely predict current CRP contracts. For example, as of March 2008 ,the 32.6 million general signup acres had an average eEBI of 173,and an average per acre rental rate of 45.
<i>2007 prices 2007 SRRs</i>	28.8	161	34	64	If the USDA does not raise CRP per-acre rental rates, it would be <u>unable</u> to reach a goal of 30 million enrolled (general signup) acres.
<i>2007 prices, adjusted 2007 SRRS</i>	44.7	179	48	83	Increasing rental rates by 60 percent will yield results (offered acres and eEBI scores) somewhat near the 2005 baseline, but increases program expenditures by about 75 percent <ul style="list-style-type: none"> <li>•An alternate scenario, where rental rates increase by 120 percent, yields results similar to the 2005 baseline, but at more than double program expenditures.</li> </ul>
<i>15b prices, adjusted 2007 SRRs</i>	42.7	176	47	82	Price changes due to an increase in ethanol production leads to a small reduction in “offered acres” of about 2 million. EEBI scores decrease by about 2 percent. Interestingly, CRP rental payments decrease slightly, as does forgone agricultural production.
<i>Summer 2008 prices, large adjusted 2007 SRRs</i>	43.4	175	56	101	In order to achieve results (in terms of offered acres and EEBI scores) similar to the <i>2007 adjusted</i> scenario, a large (2.2) SRR multiplier is required, yielding average rental payments of \$101/acre. <ul style="list-style-type: none"> <li>• If the <i>adjusted 2007 SRRs</i> are used, only 33.6 million acres are offered.</li> </ul>

Source: USDA/ERS Likely To Bid model simulations



What happens if an expenditure cap, equal to 2009 expenditures of \$1.1 billion, was imposed?

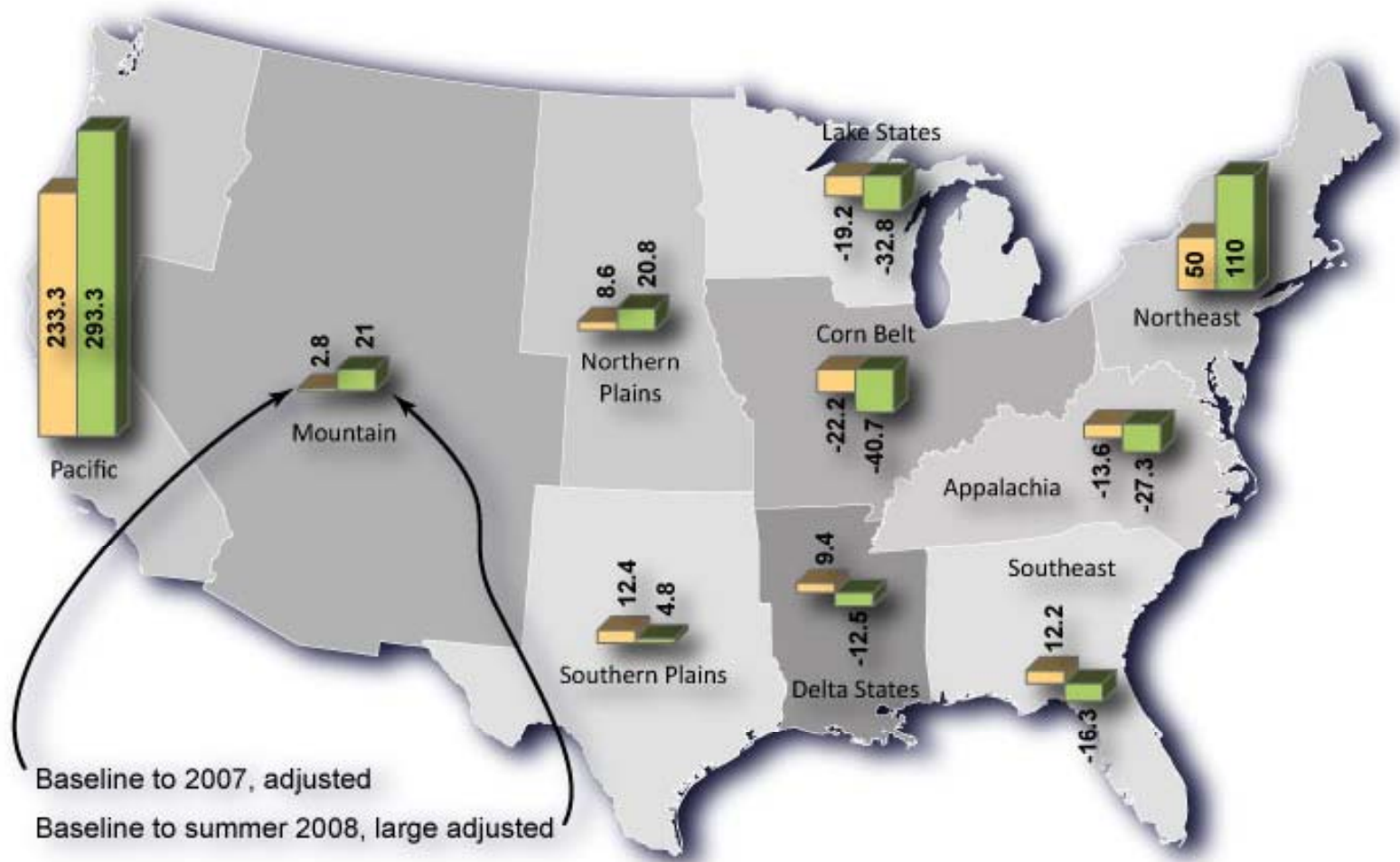
- In the 2007 scenario, only 20 million acres could be enrolled.
- In the 2007 adjusted and 15b adjusted scenarios (where SRR are increased across the board), only about 15 million acres could be enrolled.



At all acreage levels, the “adjusted” scenarios yield per acre EBI scores between those in the 2009 contracts and the 2005 baseline. This highlights the fact that increasing rental payments can be effective at maintaining environmental benefits.

Source: USDA/ERS Likely To Bid model simulations

## Percent change in acreage across different scenarios, by farm production region



**As prices rise, CRP acreage will shift to lower productivity regions.**

Note that this assumes “across-the-board” rental rate increases.

More geographically disaggregated increases in rental rates could change these results.

Source: : USDA/ERS Likely To Bid model simulations

## Findings

Given current prices, the impacts of higher prices, associated with increasing biofuels production, are not likely to have major impacts on the composition and environmental attributes of CRP acreage.

If commodity prices stay at relatively high levels, however, impacts on the program can be significant. And if prices observed in 2008 return, the impacts could be even larger.

These impacts can be offset by updating CRP rental rates, which will not be cheap, and may almost double program costs. To the extent such an increase does not occur, the program is likely to see fewer acres offered and a commensurate decrease in the EBI scores of accepted acres.