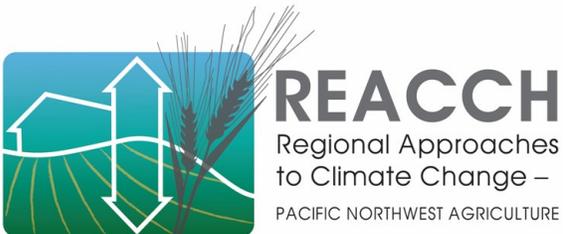


Assessing the Climate Change Impact on Wheat Systems: A Case Study from the Pacific Northwest

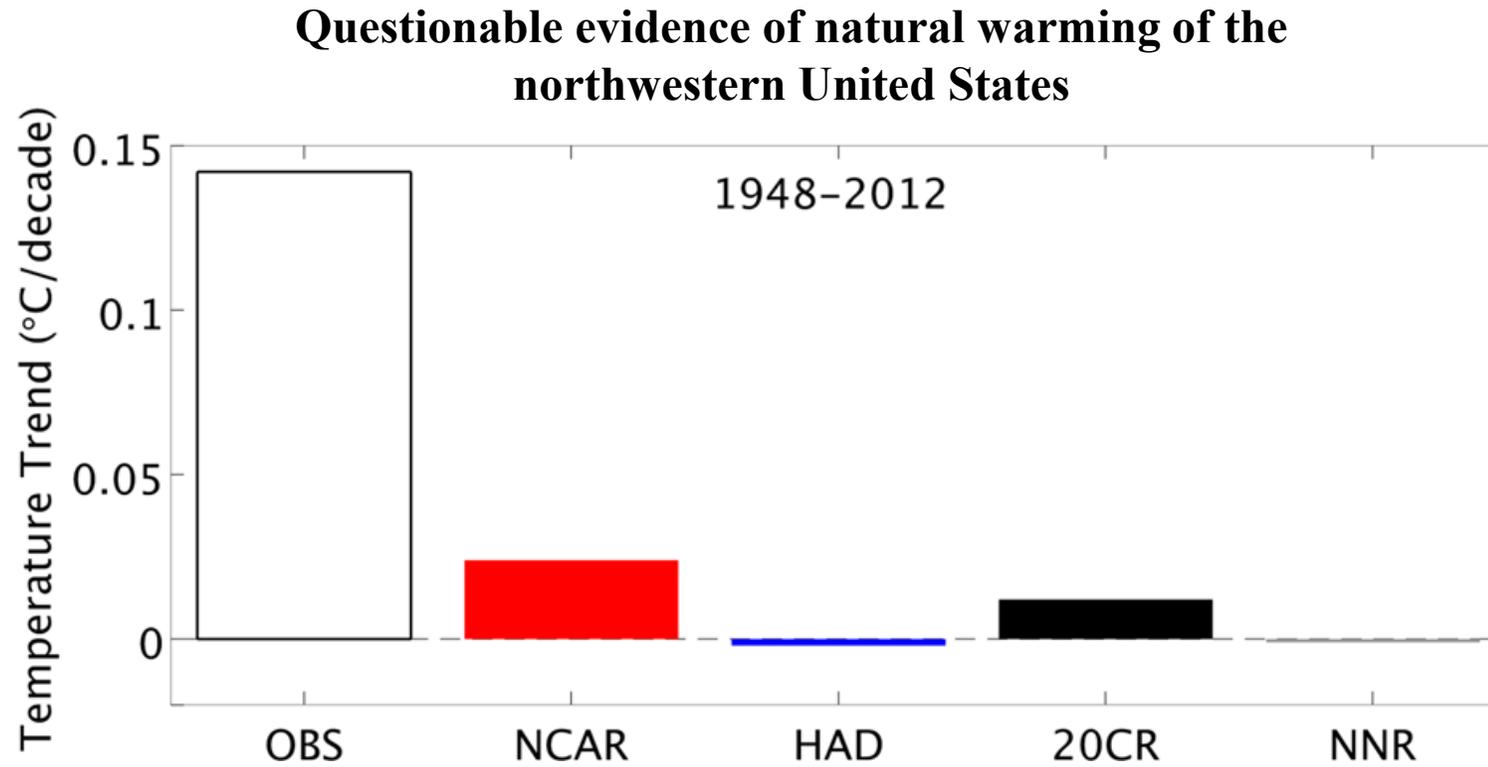
Hongliang Zhang
Applied Economics
Oregon State University



Applied Economics Graduate Program
Open House Feb 27, 2015



A changing climate



Source: Abatzoglou, Mote and Rupp, PNAS 2014

In this presentation:

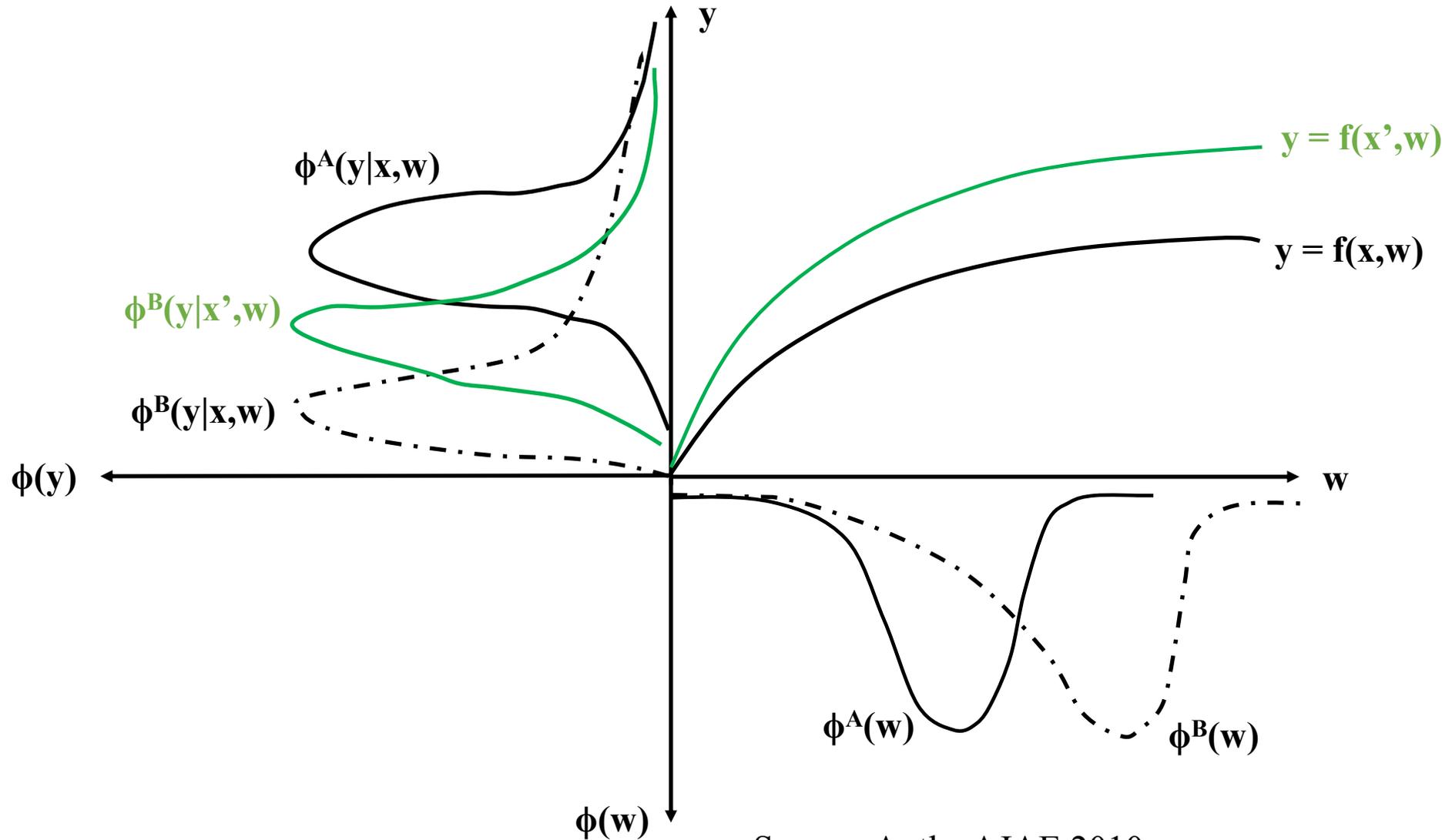
- Research question:

What are climate change impacts on the U.S. wheat systems?

- Methodologies

Statistical Approaches vs. Process-based Approaches

A moment-based statistical approach



Source: Antle, AJAE 2010

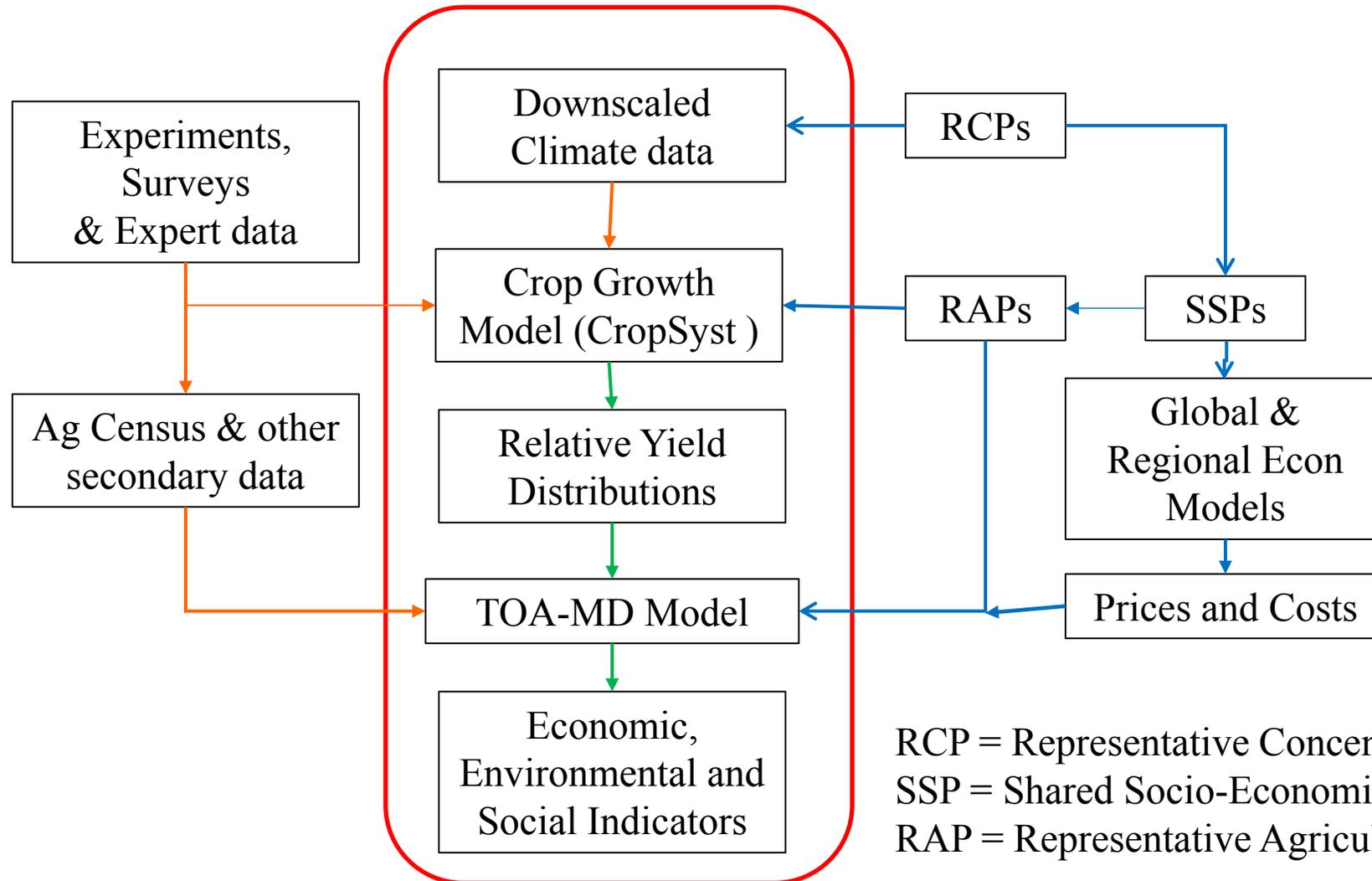
Case study results

Heteroskedasticity-Corrected SUR Estimates of Full- and Partial-Moment Function Parameters for Winter Wheat Production

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Mean	Full 2nd	Full 3rd	Lower 2nd	Upper 2nd	Lower 3rd	Upper 3rd
Precipitation	0.257*** (6.41)	0.0170 (0.12)	-10.90 (-0.99)	0.333* (2.22)	-0.662** (-2.68)	0.817** (2.84)	-1.212** (-3.09)
GDD	0.171 (1.36)	0.712 (1.68)	19.41 (0.83)	0.300 (0.59)	1.884** (3.13)	0.900 (0.94)	2.548* (2.33)
Irrigation	0.207*** (26.12)	0.176*** (5.22)	-5.182 (-0.90)	0.339*** (8.74)	-0.0642 (-1.06)	0.632*** (9.66)	-0.180 (-1.75)
Observations	13694	13694	13694	6696	6998	6696	6998

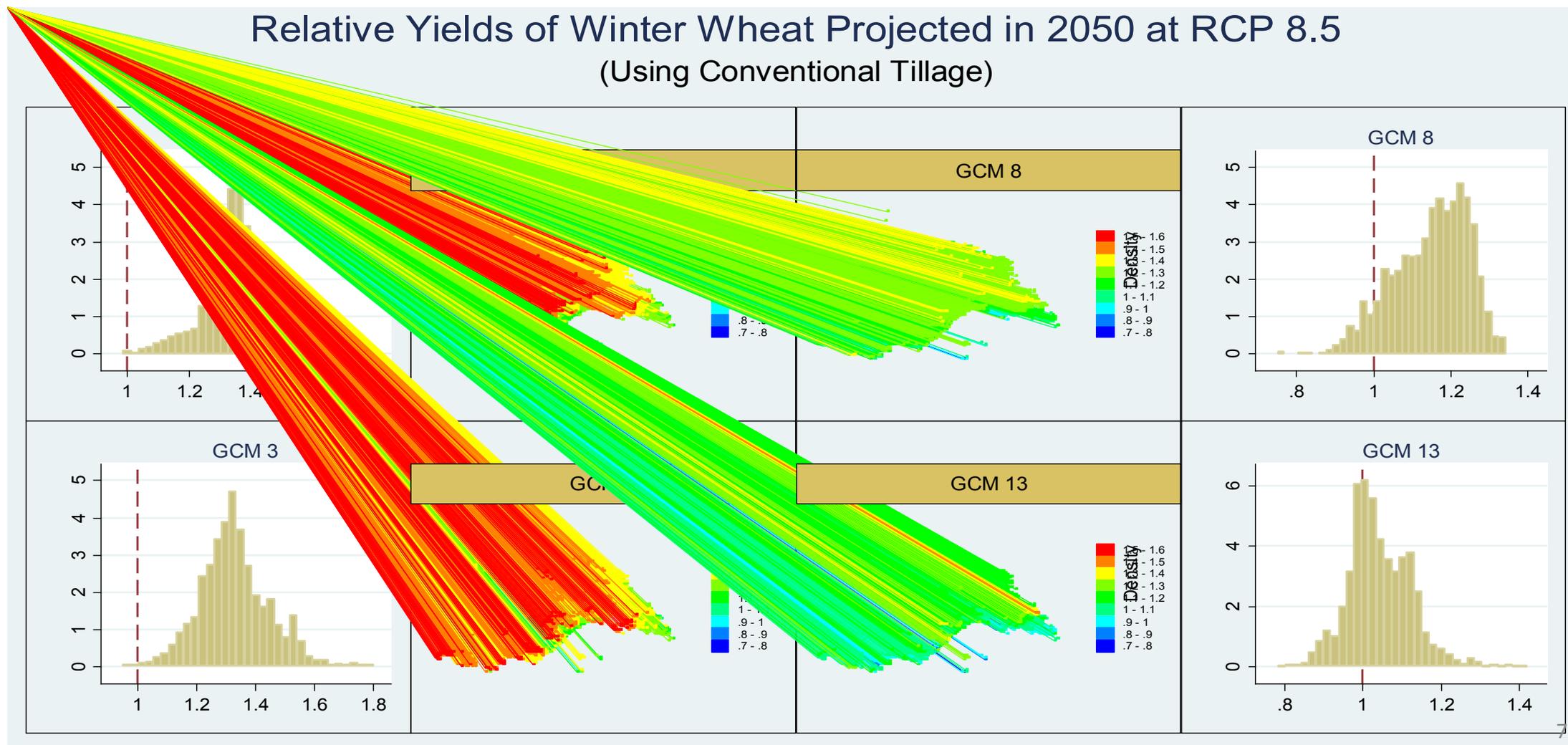
Notes: I only report some parameters in this table. t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

A process-based approach



Case study findings

Relative Yields of Winter Wheat Projected in 2050 at RCP 8.5
(Using Conventional Tillage)



Next steps

- Compare statistical approaches with process-based approaches
- Assess climate change impacts on revenues and net returns
- Evaluate potential climate adaptation strategies