

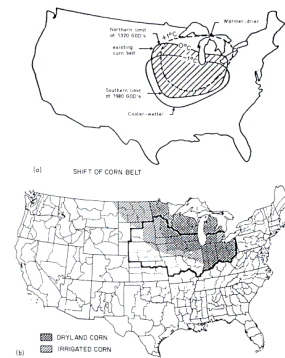
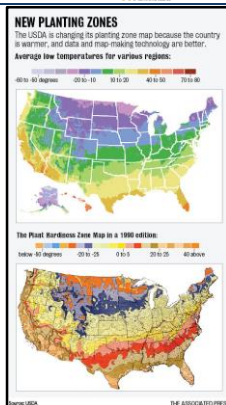
Hard Choices in Agriculture Under Climate Uncertainty

Risk & Decision Analysis Applied to Climate Adaptation

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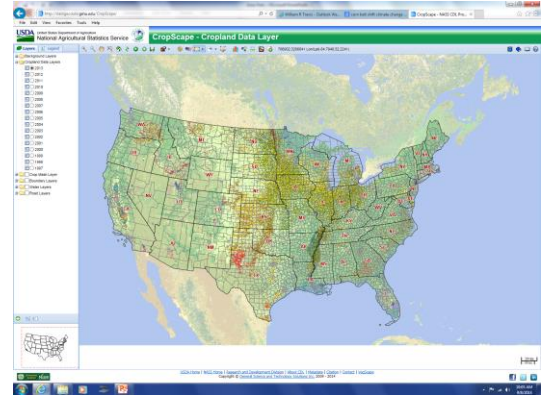
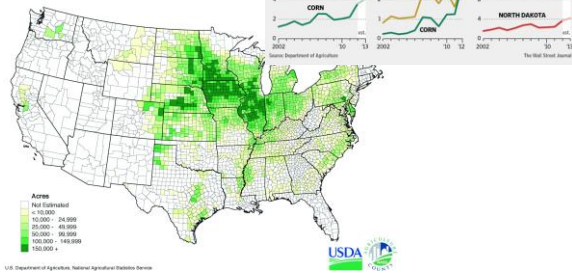
When and how farmers adapt affects the landscape



Newman, J. E.
(1980) Climate change impacts on the growing season of the North American Corn Belt, *Biometeorology* 7 (part 2), 128-142.

Wall Street Journal

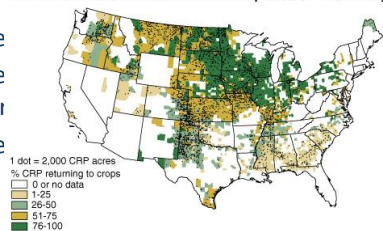
U.S. Corn Belt Expands to North Warmer Climate, Hardier Seeds Help Crop Gain on Wheat, North Dakota's Staple



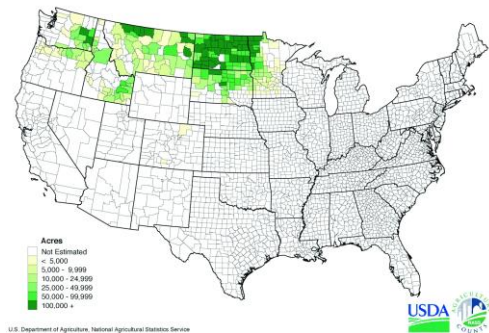
How big are climate-driven land use shifts?

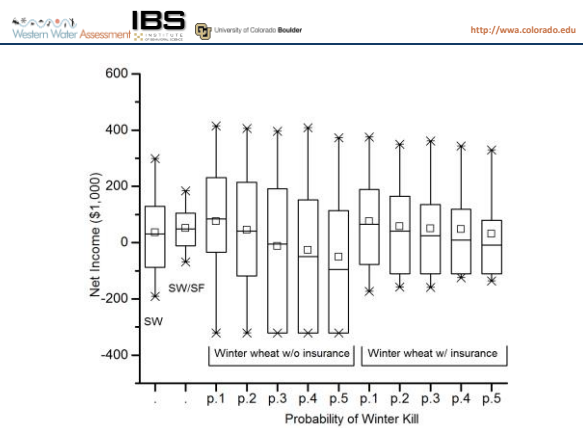
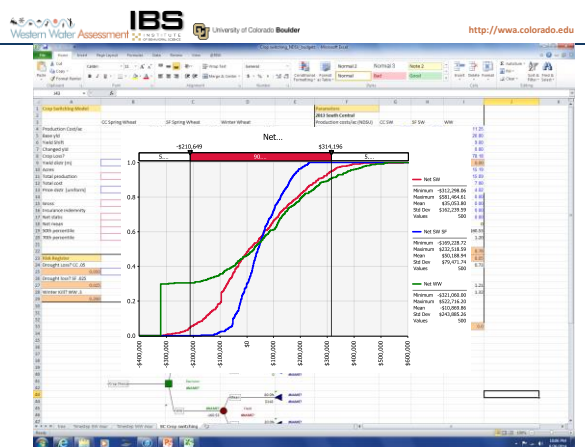
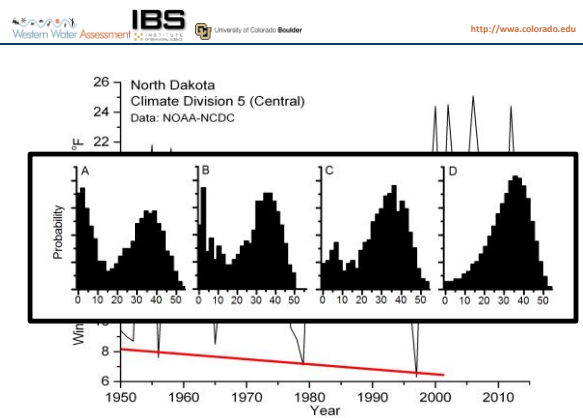
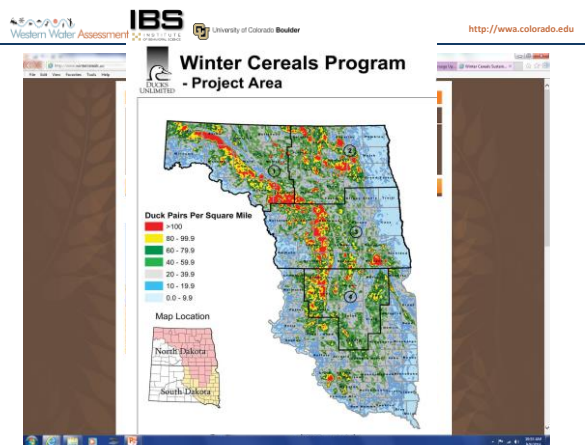
The likelihood that CRP acres would return to production varies widely

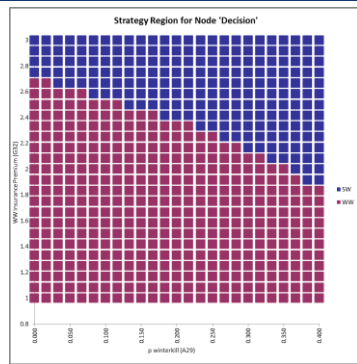
- Compare
- Compare energy ci
- Compare shifts?



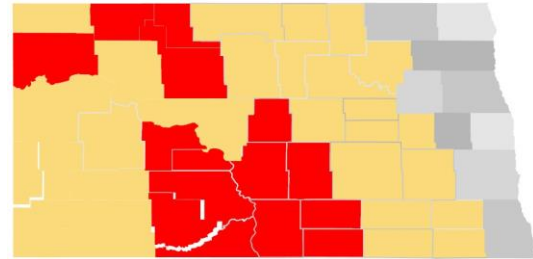
Note: Each dot represents 2,000 acres enrolled in CRP as of 1997, but dot size is not proportional to actual land area. The color shading indicates the estimated share of CRP land in a county that would have returned to crop production had contracts expired by 1997.



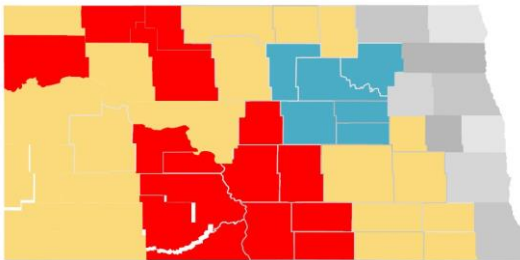




North Dakota base

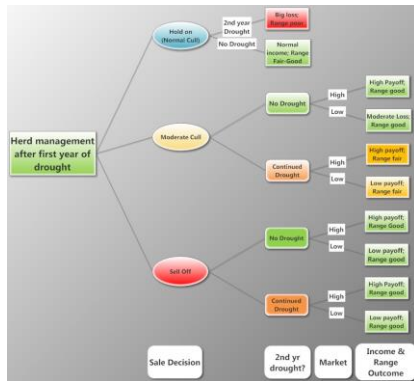


North Dakota Step 2

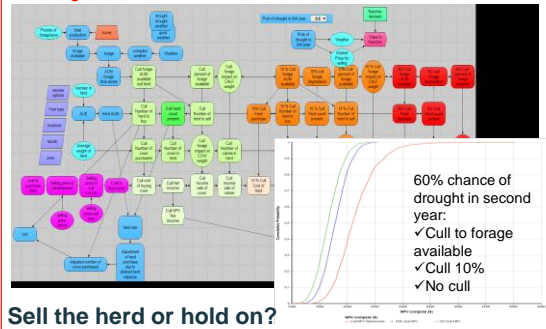


Insurance Instruments

- Yield deficiency
- Income protection
- Index insurance (often rainfall, but maybe range condition, even NVDI)
 - Is insurance adaptive?
 - Can insurance schemes keep up with climate and technological change?
 - Might it incentivize risky behaviors and non-adaptation (worries from the flood insurance program in the US)?



Ranching drought decision-making model



Risk analysis and risk management and decision-support emerging as important adaptation tools



End

FarmAdap: Great Plains Dryland Wheat Farm Model

