Agricultural Issues
The Soil Resource

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Adapting to Weather Extremes: The Economic Impact in Iowa
Food Demand ↑: Can we keep up?
WHY?
Supply/Productivity Limitations

- Land conversion
- 7% Ag land conversion by 2030

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Six million acres eroded at > 10 T/A in 2007
(Tolerable soil loss 5 T/A/YR; renewal rate ~0.5 T/A/YR)

Evidence – We Can Produce Enough

U.S. Corn Yield

[Graph showing U.S. corn yield from 1982 to 2012]
1 ton of Iowa soil has pore space to store
~ 93 gallons of water
Soil Erosion Flooding Implications

• 1 ton Iowa soil accommodates 93 gal. water

• Translocation 5 T/A from upland for 1 section
  – Reduces potential water storage by ~300,000 gal
  – 12/4/2013 DSM River flow was 1425 gal/sec (193 cfs)
    • Equivalent to ~ 3.5 minutes of flow

• Loss of soil greater flooding implication than loss of wetlands

• Erosion, upland water storage and extreme events???
Policy

• Tolerable soil loss gold standard (5 T/A/YR) established in 1940’s – lacks credibility
  – Science indicates soil development 0.5 T/A/YR

• Gold standard for estimating soil erosion
  – Only sheet and rill estimated
  – Ephemeral gullies ignored
  – Reality – erosion much greater than estimates

• Policies are tied to misrepresentation of soil erosion and sustainability claims that cannot be defended
Conclusion - In Light of Climate Extremes

- Iowa’s production increasingly important
- Production potential is being reduced through land degradation
- Degradation will continue and degradation rate very likely to increase
- Land degradation is limiting technology’s ability to elevate yields
- Off site erosion economic impacts are likely greater than we suspect