Setting the Stage for Consideration of Long Term Issues for Nutrient Management & Water Quality

- Larry D. Sanders
- 2012 National Training Workshop on CWA 303(d) Listing & TMDLs
- Environmental Law Institute
- National Conservation Training Center
- Shepherdstown, West Virginia
- 10-12 April 2012
In apologia...

- This presentation isn’t about the technical aspects of CWA 303 (d) listing & TMDLs
- Rather, I suggest there are certain “macro” issues that will affect the factors that impact nutrient management & water quality
- Lots of data in presentation; don’t focus on detail, but trends & geographic distribution
- I assume that most producers & land owners care about the environment & are good stewards of the land
- Water quality is affected by a variety of sources
- I am not promoting specific policy agendas of any specific group(s)
Issues

1. Farm bill & commodity prices
2. Weather projections
3. Evolving dietary needs
4. Urban-rural fringe pressures
5. Ecosystem services as opportunities
6. Macroeconomic issues (including trade)
7. What are our goals—Sustainability? Protect environment/ ecosystems? Economic growth/development? Protect private rights?
Impaired waters, trace elements, soil conservation issues, ...
Farm Bill Update
—the Social Contract with Agriculture is evolving

http://www.ers.usda.gov/briefing/Farmpolicy/maps.htm#03
Where Would You Cut $1.5-$4.5 Billion/yr?

CBO Actual and Projected Costs of the 2008 Farm Bill

($ Millions)

<table>
<thead>
<tr>
<th>2008 Farm Bill</th>
<th>Commodity</th>
<th>Conserv.</th>
<th>Crop Ins.</th>
<th>Energy (a)</th>
<th>Export</th>
<th>SNAP (b)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (2008-12)</td>
<td>32,233</td>
<td>22,457</td>
<td>28,518</td>
<td>1,936</td>
<td>1,524</td>
<td>314,264</td>
<td>400,932</td>
</tr>
<tr>
<td>Average Annual</td>
<td>6,447</td>
<td>4,491</td>
<td>5,704</td>
<td>387</td>
<td>305</td>
<td>62,853</td>
<td>80,186</td>
</tr>
<tr>
<td>2013-17 Annual (Est)</td>
<td>6,408</td>
<td>6,260</td>
<td>7,840</td>
<td>101</td>
<td>345</td>
<td>67,955</td>
<td>88,909</td>
</tr>
</tbody>
</table>


a. Spending for farm-based “energy” programs included.
b. Supplemental Nutrition Assistance Program or SNAP. includes food stamps, as well as increased expenditures beginning in 2009 due to nutrition provisions in ARRA (P.L. 111-5), including costs for commodities under The Emergency Food Assistance Program (TEFAP) and the Puerto Rico block grant.

37 Programs with no baseline renewal 5 year budget = $9.815 Billion
Net returns for various crops

Dollars per acre

- Corn
- Soybean
- Wheat
- Sorghum
- Barley
- Oats

Market year


Net Farm Income & Direct Government Payments
(1991-2012f)
Weather Projections

• Short-intermediate term:
  – Climatologists predicting 3-15 years of ongoing drought pattern in OK-TX region
• Longer term:
  – Continued debate about global climate change
• Risk & uncertainty require adaptation and mitigation options & consideration of public & private investment
• If govt. isn’t funding, what will the private sector be likely to do?
Potential Impacts to Agriculture from Global Climate Change
--longer term geographic effect*

- World decline in productivity 3-16% by 2080s
- SE Asia crop production down 2-5%
- Japan up 6.2-10.4%
- Developing countries’ production down 10-25% by 2080s*
  - India down 30-40%; Sudan, Senegal down over 50%
- US crop production varies
- Increase in northern states
- 25-35% down in southeast, southwest
- US: Ag income down 10.9%;
- Widespread increase in insects, molds

*Center for Global Development
Some tools/options now available

- Crop insurance
- Conservation programs
- Research, development & education
- Futures markets
- Conservation tillage
- Holistic farm management
- Carbon sequestration
- Waste management
- Wetlands

http://www.radicalcartography.net/?crops
Urban Pressures — the Rural-Urban Fringe

Share of farms in a county that are beginning farms

Nutrient Sources & Transport to Streams, Reservoirs, Estuaries

Beginning Farms
(% of all farms in county)
- under 25%
- 25% - 30%
- 30% - 35%
- 35% - 40%
- over 40%

Includes farms where all operators have less than ten years experience on current farm.

Source: ERS Tabulations based on USDA-NASS 2007 Census of Agriculture.
Nutrient Concentration Trends
--complex sources

- Relatively localized
- Chesapeake Bay
- Southeast
- Miss. Watershed
- NW

http://pubs.usgs.gov/fs/2010/3078/
Beginning Farmers* and Type of Production

Grains and oilseeds
Specialty crops
Other crops
Cattle
Dairy
Hogs and pigs
Poultry and eggs
Sheeps and goats
Other animals

* Beginning farmers: about 1/5 of all farms
**OK Example: Percentage Cropland Acres Changed – 1992 to 2007**

-91.3 - -30.6
-30.5 - -20.6
-20.5 - -11.6
-11.5 - -0.9
1.0 - 18

400+: Indicates counties with change in number of farms with 100 or fewer acres, 1992-2007
Evolving dietary needs
Macroeconomy & agriculture--linkages

- Federal Budget
- Global Markets
- Energy
- Agricultural Industry, Agribusiness, Rural America
- Jobs
- Capital
US Agricultural Trade Balance, 1991-2011F
($mil/FY; agricultural product only)

*NOTE: If fish & forest product added to ag, trade balance would be $15.2 b. for fy10.
Populations without access to safe drinking water

from The World's Water
The Biennial Report on Freshwater Resources
(Gleick 1998)

http://www.worldwater.org/drinkwat.gif
The World of 2050, esp. without adjustments: 9-12 bil. people doesn't just mean more people

- Power shifts among countries and within countries
- More scarcity of natural resources, esp. potable water
- More crime
- More military adventurism & saber-rattling
- More social unrest, likely leading to more reliance on religion and less on science (post-modernism rules!)
- More hunger
- Less wild species, whether flora or fauna
- More disease
- More climate change/global warming unless mitigated
- More economic inequity
- White Anglo-Saxons will be in the minority everywhere--no more enclaves in US or Europe or Canada
- Fish will be farmed
- Less meat per capita--too expensive to produce relative to alternative uses of land & energy
OK example: Water resources under pressure

- More weather volatility
- Unknown/Unexplained events
- Growing population
- Invasive species
- Water uptake
- Economic development
- Ethanol production
- Water quality diminishes
- Effective water supply
- Lack of Investment
- Tribal rights
- Changes in water law/rights
- Texas rule of capture
- Thirsty neighbors

20 years ago, how many of these were unexpected events?
Net Farm Income & Direct Government Payments
(1991-2012f)

$ Billion

120
100
80
60
40
20
0

FAIR 1996
FSRIA 2002
FCEA 2008

net farm income
govt payments
NFI-G

$91.7 b.
$80.7 b.
$11.0 b.
Environmental Markets:
Ecosystem services as opportunities

Hypothetical Correlation between Land in Farms and Level of Ecosystem Services
Intersection of issues affecting our natural resource base...

- Evolving Diets
- Commodity Prices
- Changing social contract (Less Govt. Support)
- Weather/Climate projections
- Population Pressure/Composition
- Adaptation/Mitigation Opportunities (Environmental Markets?)
Views from the ground (NOT a scientific sample)... 

• Commercial producers
  – States/Feds need to give industry early access to process
  – Courts become the place for input/interaction
  – Need for Science
  – Small operations less likely to be enviro-friendly
  – Media/govt bias to find a villain not solution needs to end
  – Need to work together to find solutions
  – Commercial operations is adapting to be more enviro-friendly
  – Increase in lifestyle farms

• Nontraditional producers
  – Loss of govt support will hurt agribusiness more than producers
  – Many producers will shift to low-input practices
  – Increase in intensive grass land ag (beef, sheep, dairy)
  – Increase in regs will push more producers to retire/sell out, or into organic
  – Small operations are hobby farms, not interested in profit
  – Opportunities for sustainable ag to serve “locavores”
  – Environmental impact mixed; ethics is key
  – Increase in lifestyle farms
• If the Mayans are right, the good news is we have 254 days to party and get our affairs in order (as of 10 Apr).