Responding Collaboratively to Nitrate

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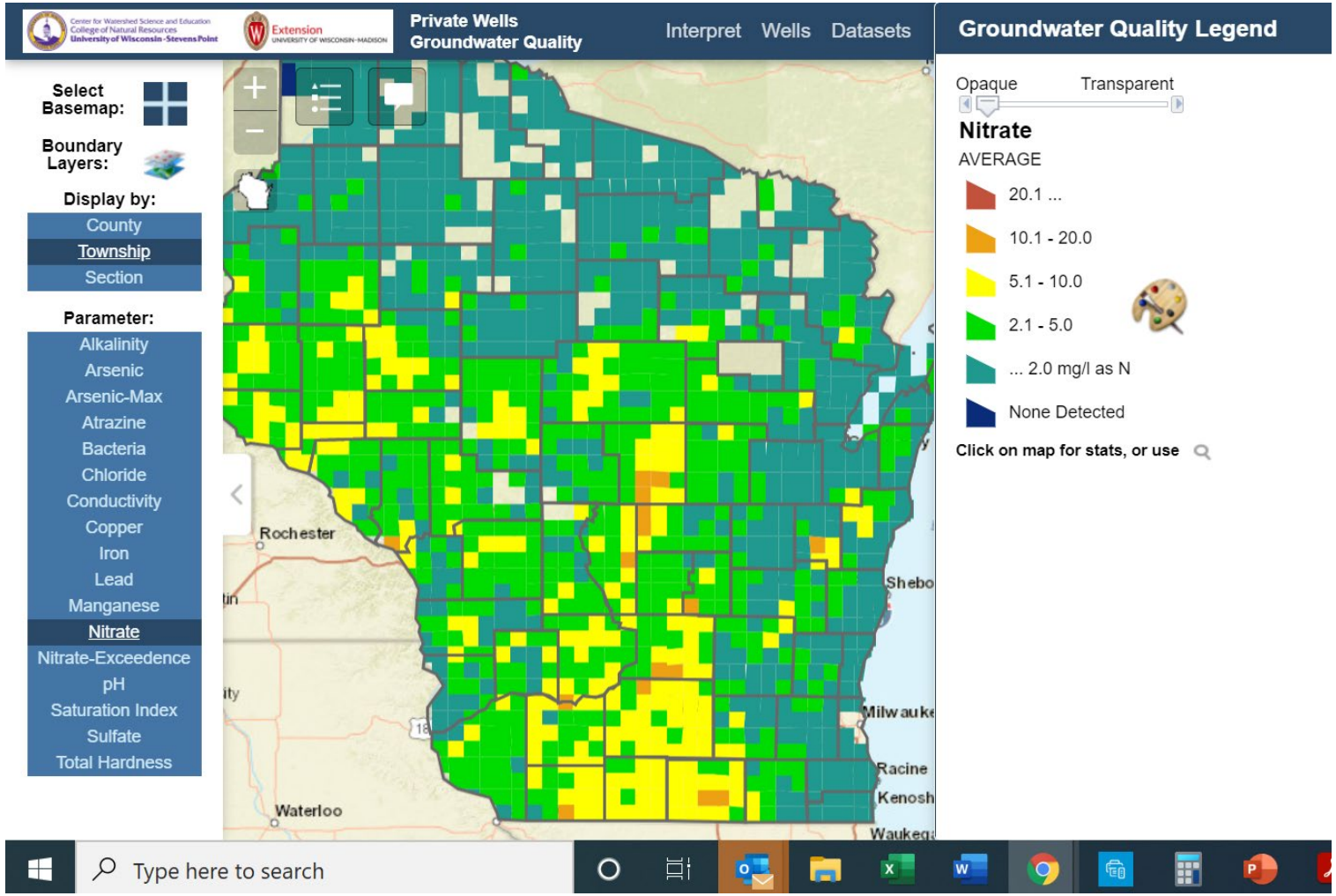
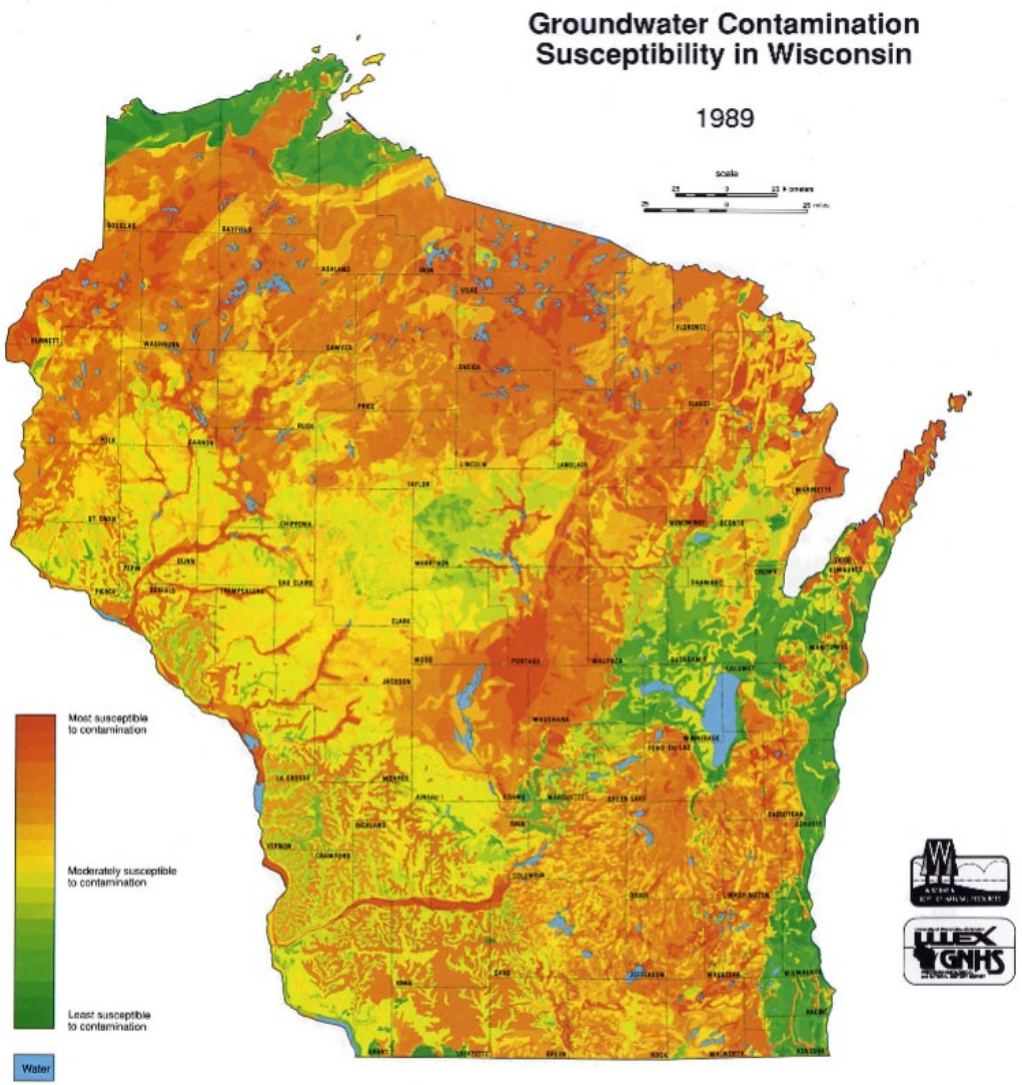
Major points

- Why tackle nitrate?
- Create & leverage partnerships to address nitrate
- Scan of collaborative models

Nitrate Level by township



Groundwater Susceptibility



Health & Environmental Effects of Nitrate

Health

- Can cause blue baby syndrome
- Increased risk of:
  - Colon cancer; birth defects; thyroid disease
- Aborted fetuses > livestock

Environmental

- Eutrophication > Anoxia (low oxygen level) surface water
- Harmful algal blooms (HABs)
- Freshwater and ocean “dead zones” in estuaries

Lake Erie, 2015. NASA/NOAA

Nitrate Driving Eutrophication

Norton Slough – Lower Wisconsin Riverway

Photos: Dave Marshall, WI DNR

	Practice	Comments	% Nitrate-N Reduction*	% Corn Yield Change**
			Average (SD†)	Average (SD†)
Nitrogen Management‡	Timing	Moving from fall to spring pre-plant application	6 (25)	4 (16)
		Spring pre-plant/sidedress 40-60 split Compared to fall-applied	5 (28)	10 (7)
		Sidedress – Compared to pre-plant application	7 (37)	0 (3)
		Sidedress – Soil test based compared to pre-plant	4 (20)	13 (22)††
	Source	Liquid swine manure compared to spring-applied fertilizer	4 (11)	0 (13)
		Poultry manure compared to spring-applied fertilizer	-3 (20)	-2 (14)
	Nitrogen Application Rate	Nitrogen rate at the MRTN (0.10 N:corn price ratio) compared to current estimated application rate. (ISU Corn Nitrogen Rate Calculator – **http://cnrc.agron.iastate.edu** can be used to estimate MRTN but this would change Nitrate-N concentration reduction)	10	-1
	Nitrification Inhibitor	Nitrapyrin in fall – Compared to fall-applied without Nitrapyrin	9 (19)	6 (22)
	Cover Crops	Rye	31 (29)	-6 (7)
		Oat	28 (2)	-5 (1)
	Living Mulches	e.g. Kura clover – Nitrate-N reduction from one site	41 (16)	-9 (32)
Land Use	Perennial	Energy Crops – Compared to spring-applied fertilizer	72 (23)	
		Land Retirement (CRP) – Compared to spring-applied fertilizer	85 (9)	
	Extended Rotations	At least 2 years of alfalfa in a 4 or 5 year rotation	42 (12)	7 (7)
	Grazed Pastures	No pertinent information from Iowa – assume similar to CRP	85	

Range of Nitrate Reduction

ISU Extension: *Reducing nutrient loss: Science Shows What Works*

A Case for Partnerships

- Large increases in adoption of N management practices needed
- Equity and fairness pervades everything
- Opportunities for civic engagement
- Counteract desperation and frustration
- Maximize existing $ and other resources
- *Expand* $ and other resources


Sauk Soil & Water Improvement Group

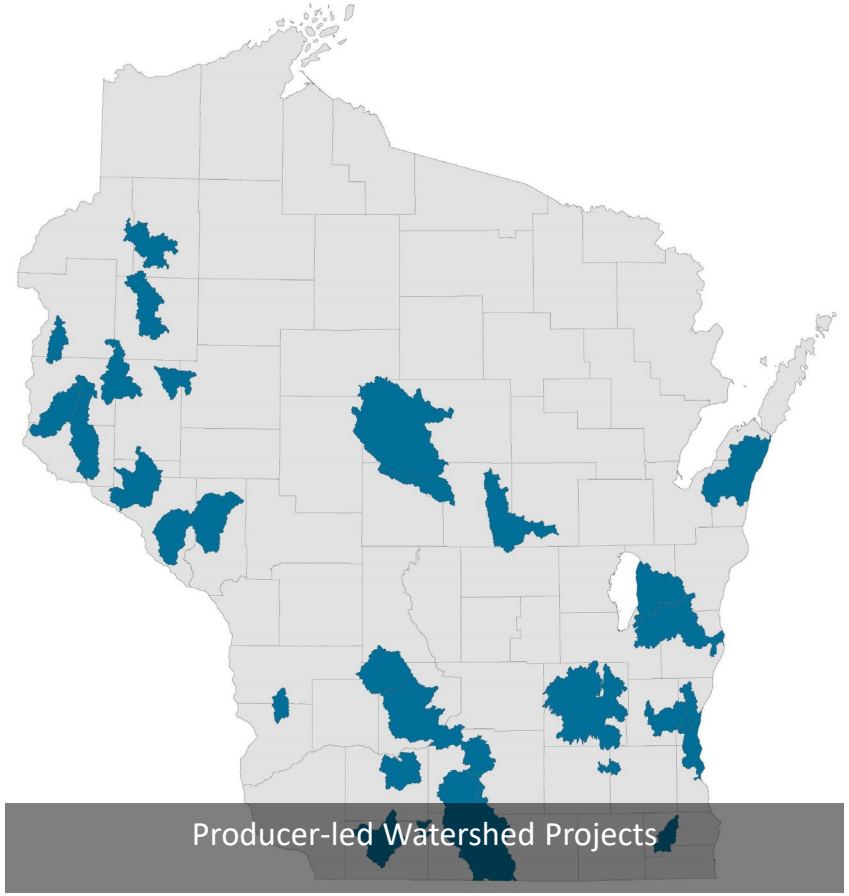

Dodge County Alliance for Healthy Soil – Healthy Water

Partnership Models

- Social-Intellectual
- Knowledge sharing
- Financial
- Policy

Local Nitrate Partnerships

- Bear Creek/Chippewa Farmer Groundwater Group
- Farmers for Tomorrow (River)



Producer-led Watershed Projects

State-level Nitrate Partnership

Extension, DNR, DATCP, NRCS

- Identifying mutual needs & priorities
- Addressing gaps in research, funding, training, outreach
- Training internally & externally on state of science and best practices
- Developing nitrogen leaching tools to inform on-farm, agronomic decision-making
- Consensus on the science & associated reality
- Support for local partnerships

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