New Data
New Standards
New Impairments
New Limits

= More Trades

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What I will cover

- Minnesota WQ Nutrient Standards
- Statutory Authority for Trading
- 20 Years of History
- New Challenges
- Minnesota River Basin Example
State Discharge Restrictions (SDRs)

- 1970s
- 1.0 mg/L if....
- Technology-based approach

Lakes

- 2008
- Prevent nuisance algae
- 12 month rolling total mass limits

- 2004
- Ensure sufficient dissolved oxygen (DO)
- May – Sept. 5 month seasonal mass limit

Rivers

- 2015
- Prevent Nuisance Algae
- June – Sept. 4 month monthly avg mass limit
Minn. Stat. 115.03(10)
Pollutant loading offset
No Rules
Only Statute + Guidelines
Tested in the Courts
History of Water Quality Trading in Minnesota
First trading permit issued 1997
3 Point source to non-point source trades
Trades under MN River Basin phosphorus permit since 2008
Low Dissolved Oxygen

- Completed phase 1 of General Phosphorus permit (35% ↓)
- Actual discharge way below limits
- HSPF computer model used to simulate point and nonpoint source reductions
New Challenges
River Eutrophication Standards (RES)

- Phase I Genera Permit limits – not protective
- Phase II General Permit (51% ↓) – close but also not protective
- Used HSFP model to simulate point and nonpoint source reductions
Minnesota River Basin Approach for River Eutrophication

- Model existed per Low DO TMDL
  - Looked at all summer flows for multiple years
- Scenarios were created to assess non-point management impact of TSS/TP
  - Allowed Non-point reductions to be taken into account
- Look at the impact of many facilities (~200) on the Minnesota River Mainstem
- The outcome --- we needed to go beyond the previous basin permit
What Does this look like at a Basin Scale?
Watershed Approach

- Major watershed within basin also have algae/impairments
- Simple dilution equations used to evaluate protection for major watersheds. (Greater Blue Earth, Redwood, Chippewa)
- Limits for Minnesota River RES, good enough to protect local reaches, generally
RES Trading Details/Examples

Little Cobb

Cobb
Trading With Non-point

Land Cover Class
- Woody Wetlands
- Shrub/Scrub
- Open Water
- Mixed Forest
- Herbaceous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceous Wetlands
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, High Intensity
- Deciduous Forest
- Cultivated Crops
- Barren Land
Getting at Non-point
Le Sueur Watershed

Watershed Health Report - Major Watershed
Le Sueur River

Average Watershed Health Score: 49

These health scores are calculated at the Major Watershed (MUCB) scale. Health score names followed by (*) are also calculated at the DNR Captachment scale (subdivided MUCB). Those results are reported on the following pages.

Hydrology
Component Health Score (index average) 60

- Index Scores
  - Perennial Cover*: 9
  - Impervious Cover*: 71
  - Water Withdrawal*: 99
  - Flow Variability: 65
  - Hydrologic Storage: 35
  - Surface Storage: 18

Geomorphology
Component Health Score (index average) 74

- Index Scores
  - Soil Erosion Potential*: 76
  - Groundwater Susceptibility: 55
  - Climate Vulnerability: 92

Biology
Component Health Score (index average) 38

- Index Scores
  - Terrestrial Habitat Quality*: 1
  - Stream Species Quality*: 76
  - Species Richness: 56
  - At Risk Species Richness: 18

Connectivity
Component Health Score (index average) 13

- Index Scores
  - Terrestrial Habitat Connectivity: 2
  - Aquatic Connectivity*: 45
  - Riparian Connectivity*: 44

Water Quality
Component Health Score (index average) 52

- Index Scores
  - Non-Point Pollution Sources: 31
  - Sub-Score: 31
  - Phosphorus Risk*: 5
  - Localized Pollution Source*: 81
  - Assessments: 39

Watershed Health Assessment Framework
Health score methodology - www.water.state.mn.us/whaf/about/scores

September, 2015
Non-Point Trading

Localized Pollution Sources - Animal Units

Health Score Distributions:
Le Sueur River
Min: 0
Max: 100
Median: 63.0
Mean: 57.29
Standard Dev: 32.55

Non-Point Source - Phosphorus Risk

Health Score Distributions:
Le Sueur River
Min: 11
Max: 61
Median: 18.0
Mean: 22.03
Standard Dev: 10.06
• Minnesota has numeric Lake and River Eutrophication Standards
• Standards are being implemented to permit limits
• Trading is supported in statute and as a means to meet nutrient limits
• The new standard and impairments make trading more complicated but more need there before