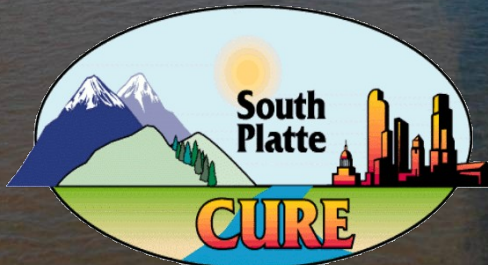


Nutrient Monitoring Activities in the South Platte Basin

Amy Woodis

SP CURE

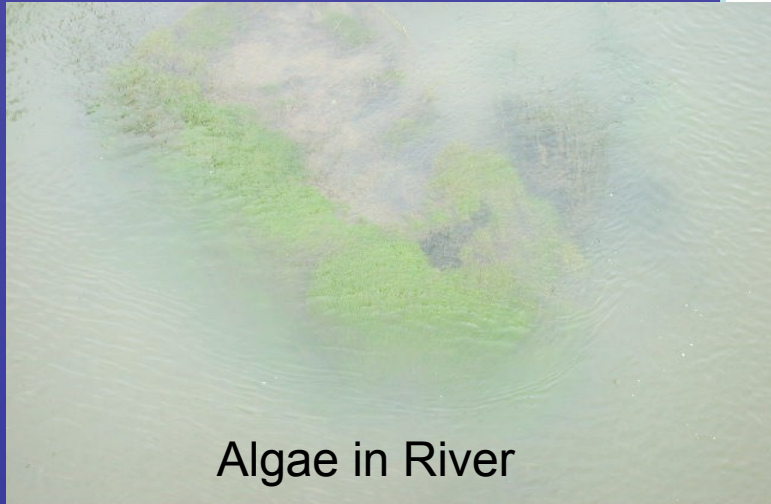
Metro Wastewater Reclamation District



**METRO WASTEWATER
RECLAMATION DISTRICT**



Barr Lake



Algae in River



Milton Reservoir



Some nutrient-related issues in the So. Platte Basin

What is Nutrient Monitoring and What are its Purposes?



- **Monitoring programs such as SP CURE involves in-stream and/or in-reservoir water quality sampling and analysis, particularly at a *watershed* scale**
- **Data can often be used in the development of a database to support analysis, such as modeling**
- **For nutrients, purposes of monitoring are to establish scientifically sound information to identify nutrient sources and loads, establish appropriate bases for TMDL development, site-specific standards & possible trading**

What are Proposed Regulated Discharger Regulation 85 Monitoring Requirements?

- **For process water dischargers**
 - Effluent monitoring (TN, TIN, and TP) to calculate loading to the receiving water
 - Minimum of six times a year (every 2 months)
 - Stream monitoring (TN, TP, and flow)
 - Locations include upstream & nearby gaging station
- **For municipal separate storm sewer systems**
 - Both wet and dry weather monitoring req's

The background of the slide is a photograph of a green pond. A yellow measuring tape is positioned vertically in the center of the frame, extending from the top to the bottom. The water in the pond is a vibrant green color, and there are some darker green patches of algae or vegetation visible. The overall scene is outdoors and appears to be a natural water body.

Proposed Regulation 85

Process Wastewater Discharger Data Quality Requirements

- Must be a sampling and analysis plan
- Data should be maintained in electronic format
- Data must be submitted to Water Quality Control Division each year

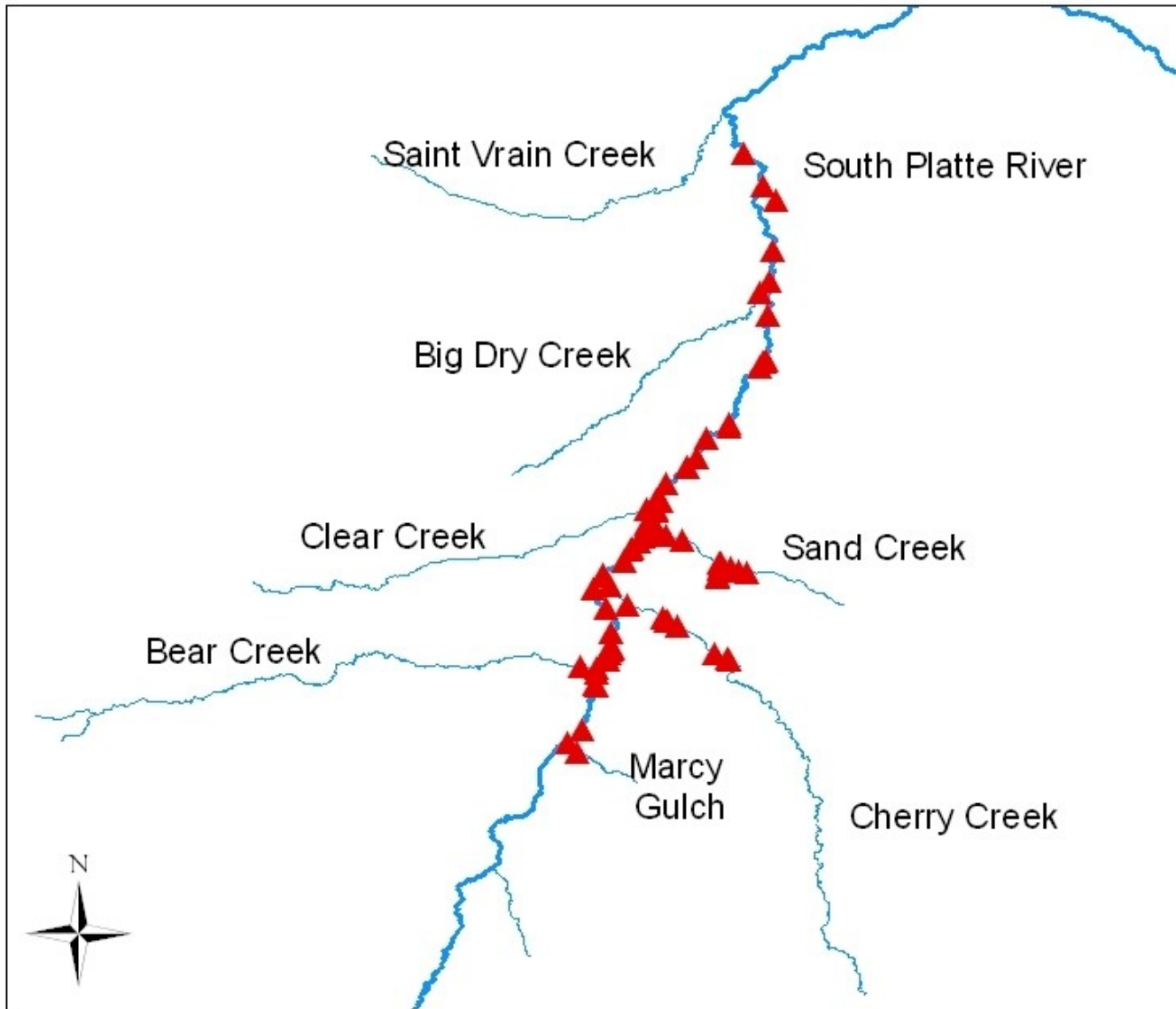
SP CURE Background

- SP CURE members have been monitoring since 1998
- Data are housed in Data Sharing Network and WQX (STORET)
- Monitoring locations are throughout the urban corridor
- SP CURE is a participant in the development of the Barr-Milton pH TMDL (control of Total Phosphorus)



124th Ave Drop Structure

South Platte CURE Sampling Locations



Example Costs: Metro Segment 15 Water Quality Monitoring Program

- Total cost is about \$50k per year
- This is “fully loaded,” e.g., staff time, laboratory analysis-related costs, and special studies
- Approximately \$20k of the total is internal analytical services plus outside biomonitoring analysis



SP CURE Monitoring Parameters

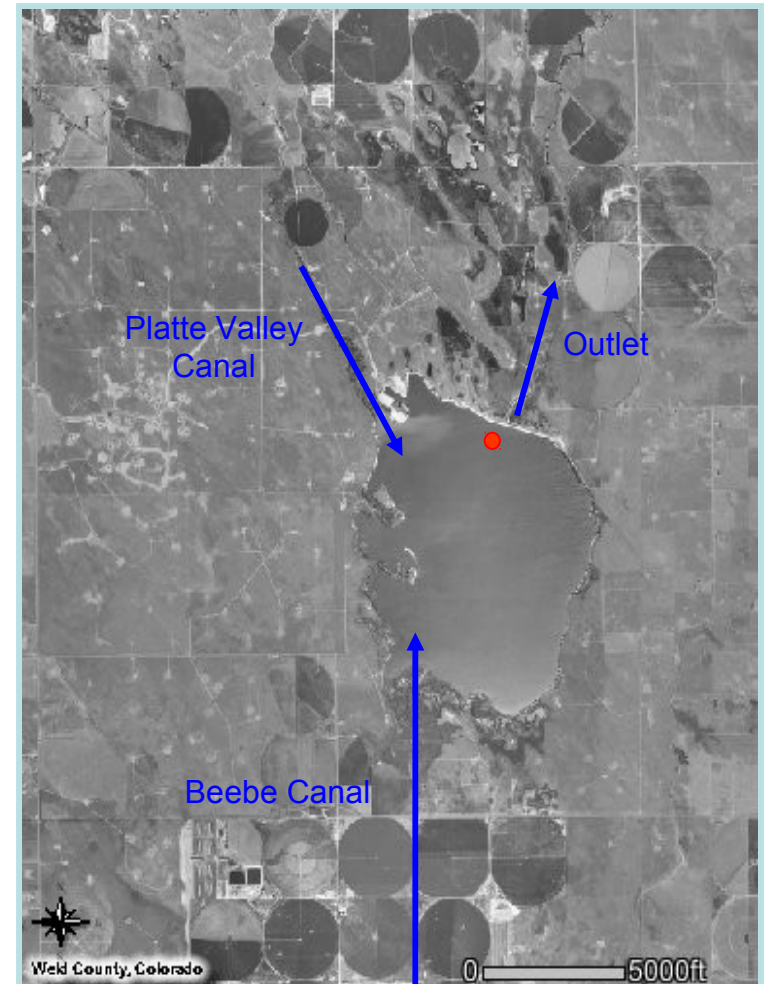
Flow Temperature
pH Conductivity
Ammonia Nitrate
Nitrite Phosphorus
TKN DOC
Alkalinity Hardness
Dissolved oxygen Silver
Zinc Mercury
Selenium Copper
Manganese Cadmium
E. Coli Sulfate
TDS TSS
Biomonitoring (bugs)- special study

Barr-Milton Sampling Locations

Barr Lake



Milton Reservoir



Barr-Milton Parameters

- Total Phosphorus
- Chlorophyll *a*
- TKN
- Nitrite
- Nitrate
- Ammonia
- TSS
- BOD
- Secchi Depth
- Temperature
- Dissolved Oxygen
- Conductivity
- Alkalinity
- Metals



Barr Lake Boat Ramp

SP CURE Nutrient Monitoring Coordination with Other South Platte Groups

Groups:

- Chatfield
- Cherry Creek
- Bear Creek
- Standley Lake Cities
- Upper Clear Creek
- Big Dry Creek
- Lower South Platte Watershed
- Big Poudre
- Coalition for Upper SP
- Boulder/St. Vrain
- Phase I MS4s (Denver, Aurora, Lakewood)

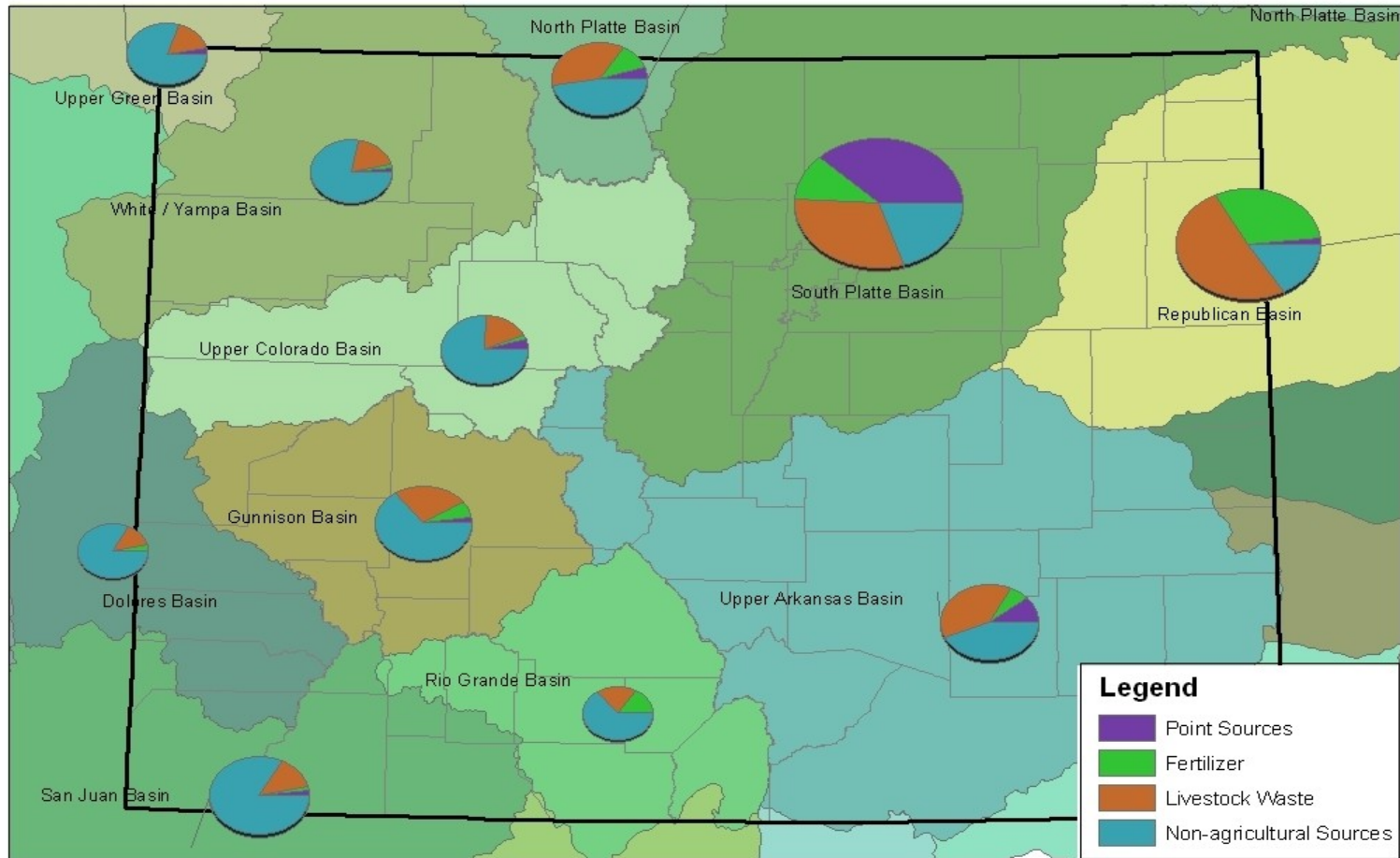
Goals:

- Understand what other watershed groups are doing
- Understand what questions are being investigated
- Identify data gaps
- Identify opportunities to share data to solve watershed-based issues

Why Other Basins Should Be Interested in Nutrient Monitoring

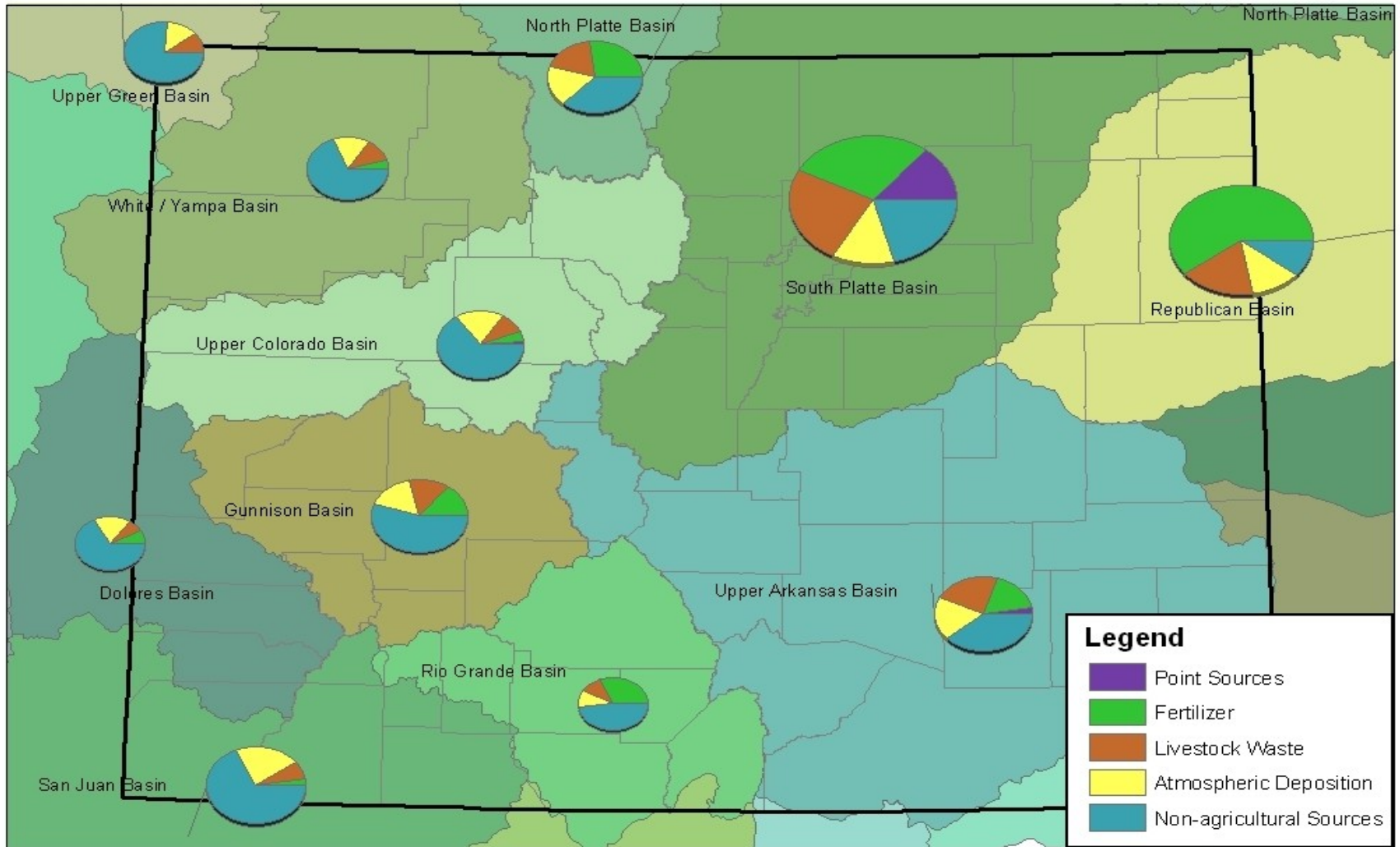
Watershed Phosphorus Yield From 4 Sources in Colorado

Adapted from: Smith, R. A., G. E. Schwarz, et al. (1997). "Regional interpretation of water-quality monitoring data." *Water Resources Research* 33(12): 2781-2798.

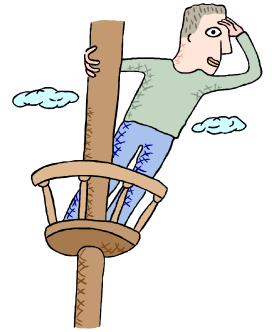


Watershed Nitrogen Yield From 5 Sources in Colorado

Adapted from: Smith, R. A., G. E. Schwarz, et al. (1997). "Regional interpretation of water-quality monitoring data." *Water Resources Research* 33(12): 2781-2798.



Looking Ahead...



- Compiling nutrient data on a statewide basis is critical
 - There is a need to have good statewide temporal and spatial baseline information
 - There is a need to track point source nutrient reductions over time
 - There is a need to quantify contributions from non-point sources (including diffuse stormwater)
 - It also may be beneficial to quantify costs and benefits of nutrient reduction capital improvements over time, e.g., “test” the results of the WRPD Authority cost-benefit study
- *Questions*
 - *Should this be the State’s responsibility?*
 - *Is using a third party more appropriate (like the initial SWSI study)?*
 - *Is there a role for areawide planning (208) agencies?*

What are the Implications of Nutrient Controls for Point Sources?

Benefit-Cost Summary, 2014 – 2038

	“Basic” BNR	“Enhanced” BNR	Limit of Tech.
Total Benefits	\$2.6 B	\$3.2 B	\$4.3 B
Total Costs	\$2.9 B	\$5.8 B	\$23 B
Benefit-Cost Ratio	0.88:1	0.55:1	0.19:1

What Questions Could a Nutrient Monitoring Program Help Answer?

- What sources/activities contribute TN & TP to surface waters?
- What are the relative contributions of those sources/activities?
- What are the data gaps?
- *If all regulated sources were controlled (e.g., zero loading from point sources), would the underlying numeric values be attained?*
- If not, what other sources/activities would have to be controlled and how would that be done?

For Additional Information:

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- <http://www.spcure.org> (SP CURE website)

