

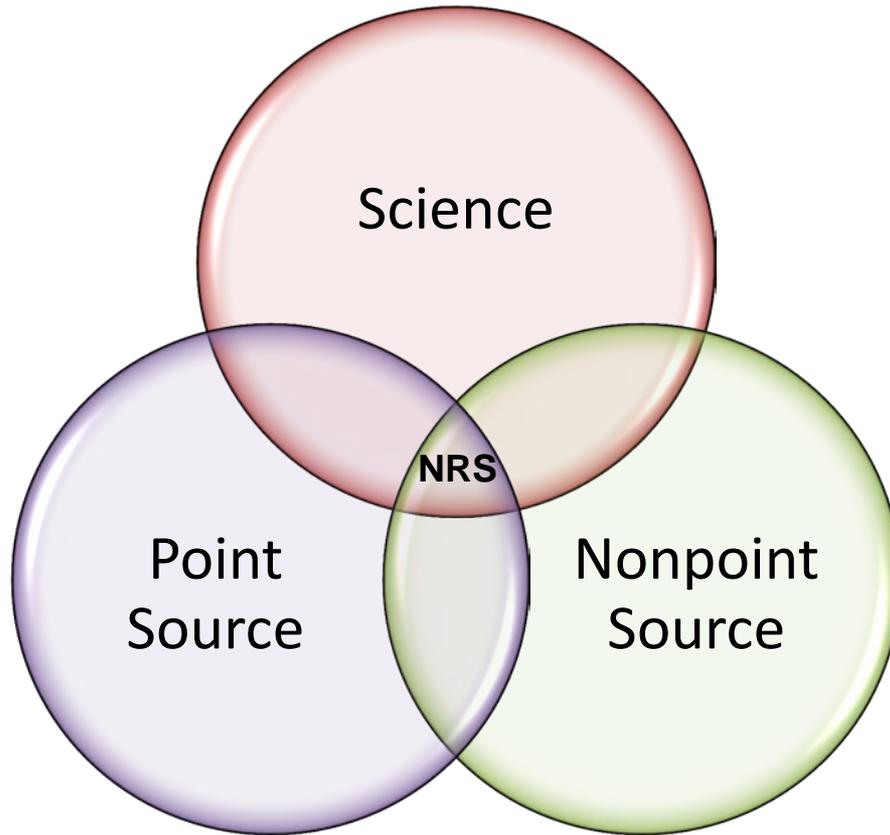
Iowa Nutrient Reduction Strategy: Stream Water-Quality Monitoring

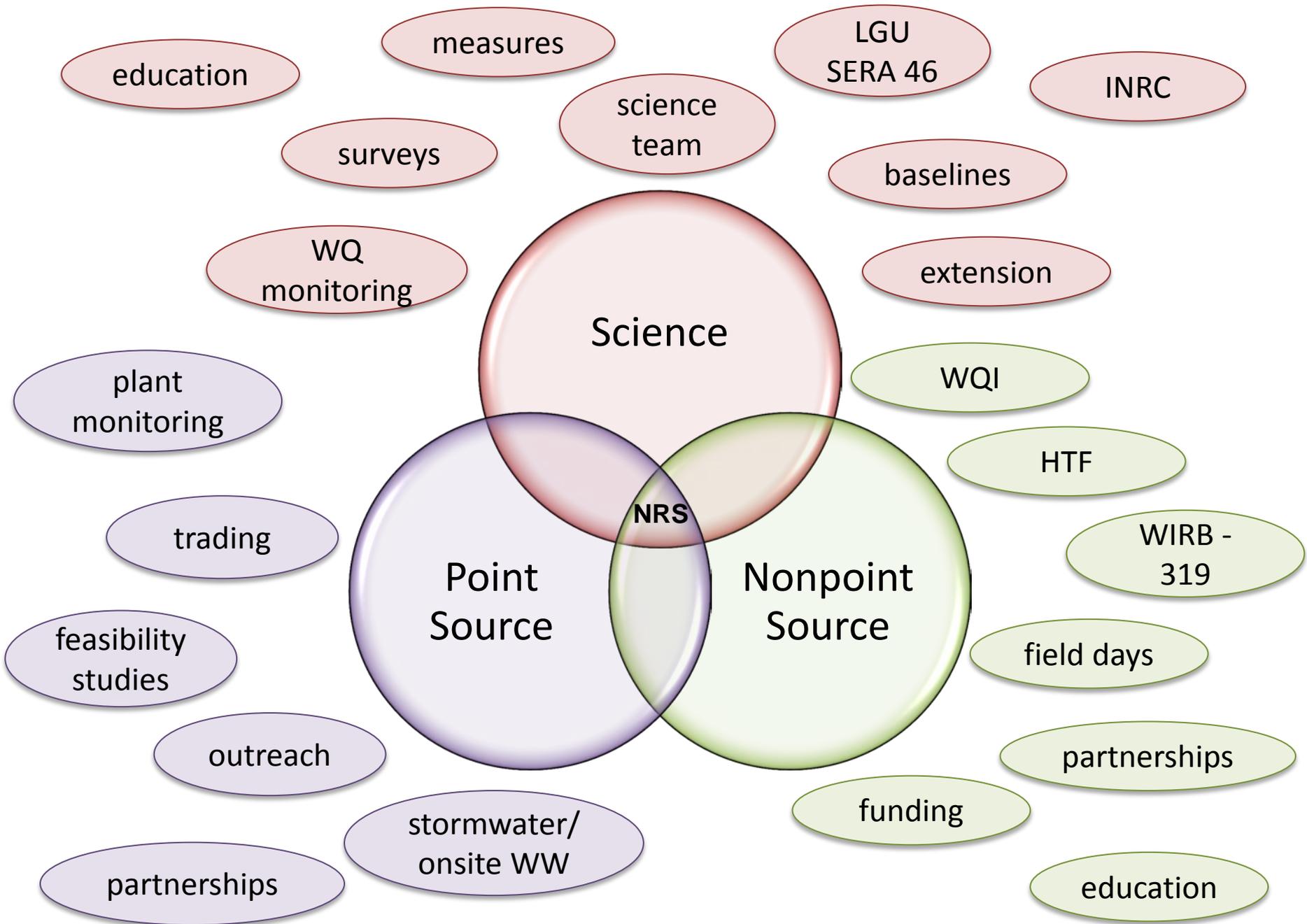
Adam Schnieders

Water Quality Coordinator

Iowa Department of Natural Resources

September 28, 2016





education

measures

LGU
SERA 46

INRC

surveys

science
team

baselines

WQ
monitoring

extension

Science

WQI

plant
monitoring

HTF

trading

NRS

WIRB -
319

Point
Source

Nonpoint
Source

feasibility
studies

field days

outreach

partnerships

stormwater/
onsite WW

funding

partnerships

education

How do you know when the Nutrient Reduction Strategy is successful?

MEASURABLE INDICATORS OF DESIRABLE CHANGE



INPUTS

- People
- Funding
- Agency resources
- Private sector resources



HUMAN

- Partner organizations
- Partner agribusinesses
- Farmer knowledge and attitude
- Point source communities and management knowledge and attitude



LAND

- Land use changes
- Practice adoption
- Point source implementation



WATER

- Calculated load reduction
- Measured loads in priority watersheds
- Organized watersheds reported load changes
- Measured loads at existing monitoring stations

*Nutrient Reduction Strategy Measure of Success Committee,
Water Resource Coordinating Council*

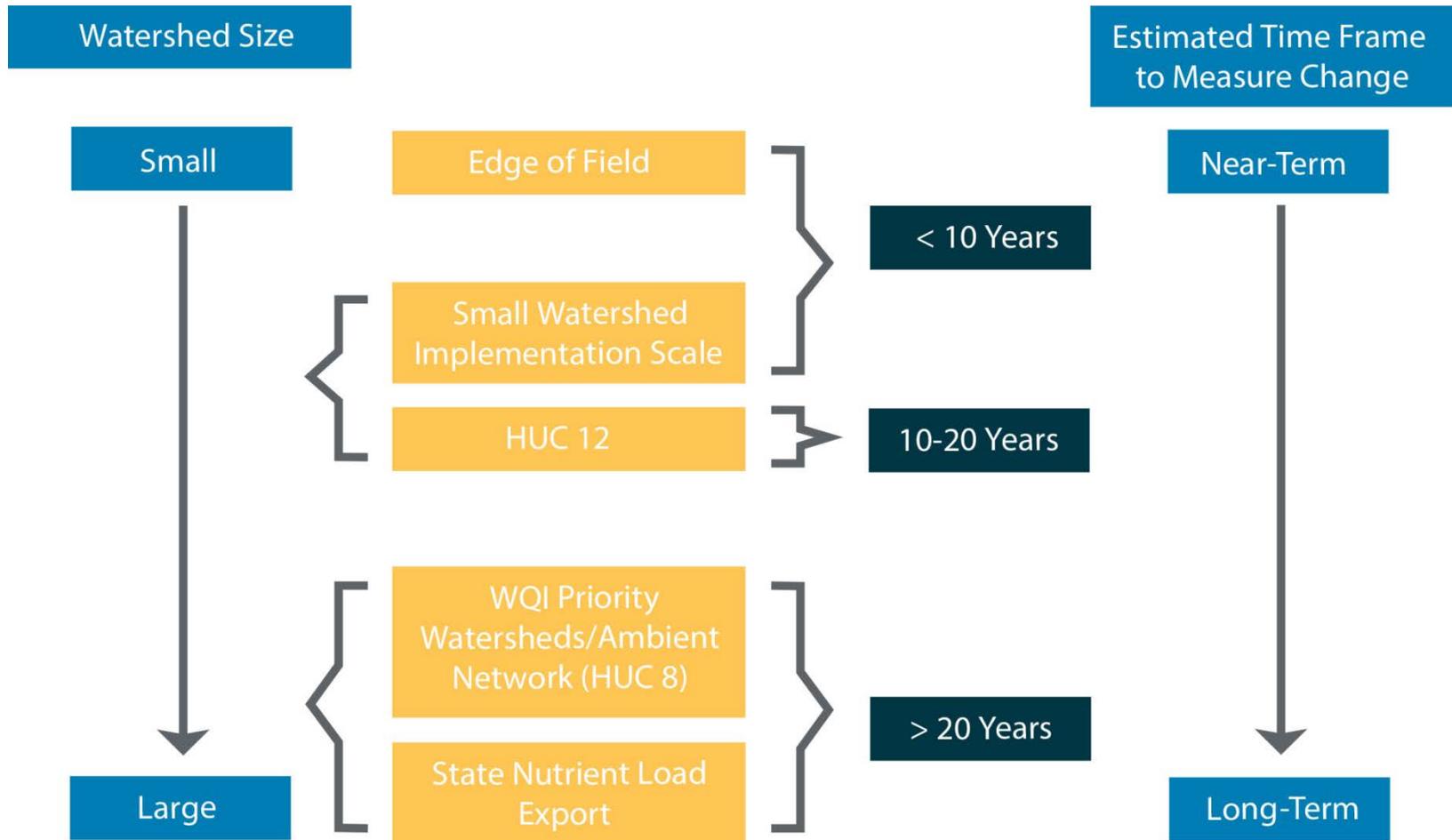
2014-2015 INRS Annual Report

- “Efforts are underway to improve understanding of the multiple nutrient monitoring efforts that may be available and can be compared to the nutrient WQ monitoring framework”

And

“to identify opportunities and potential data gaps to better coordinate and prioritize future nutrient monitoring efforts”

Nutrient Water Quality Monitoring Framework





Purpose of Report

- To describe and report on current known stream nutrient monitoring efforts in Iowa in context of the framework
- To discuss the challenges in collecting and using water quality data to demonstrate progress towards meeting the goals of the INRS
- To suggest ways to improve and coordinate the collection and evaluation of WQ data for these purposes

What questions are we trying to answer here?

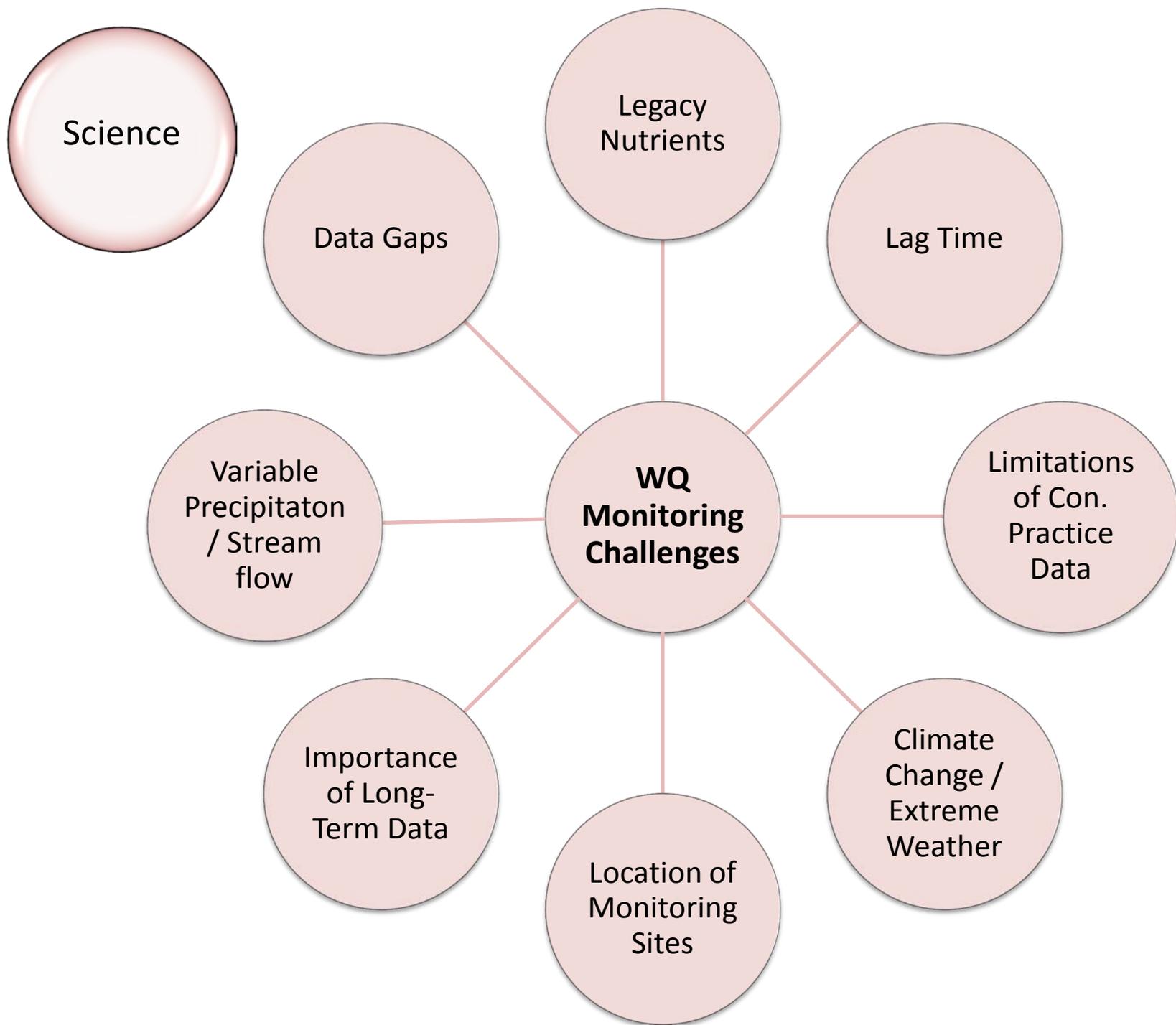
- Monitoring programs are designed to provide data to answer a specific question:
- “How much is nitrogen reduced by a bioreactor?”
- “How much phosphorus is removed by a city wastewater treatment plant?”
- “By how much is phosphorus reduced when a given amount of cover crops are planted and maintained in a watershed of 1,000 acres?”
- “How much nitrogen is discharged from the Iowa/Cedar River basin annually over a 20 year period?”

What questions are we trying to answer here?

- For monitoring programs to reliably assess changes in water quality they should be designed to answer specific questions and should consider a number of factors including, but not limited to:
 - the size of a watershed to be monitored,
 - the number of locations that need to be sampled,
 - how soon results are needed,
 - and the costs and other resources available to collect and analyze samples and interpret results.

What questions are we trying to answer here?

- What water quality monitoring resources are available and what additional monitoring is needed to measure the impact of the INRS on reducing nutrient loads in Iowa waters?
- What are the challenges associated with measuring changes in stream water quality?
- How much nitrogen and how much phosphorus are being exported from Iowa?
- What reductions in nitrogen and phosphorus occur following implementation of nutrient reduction practices by non-point sources?
- What reductions in nitrogen and phosphorus occur following installation of nutrient reduction technologies by point sources?



HTF Baseline and Goals via the Framework

Measurement	TN delivered (Metric Ton)	TP delivered (Metric Ton)
Baseline period for 1980-1996	1,575,176	137,276
5-year moving average for 2011-2015	1,249,400	155,220
20% reduction goal by 2025	1,260,141	108,821

What nutrient monitoring and assessment efforts are underway in Iowa?

- Summary of known stream WQ monitoring data and information
- Follows the Framework based on watershed size
- Analyzes:
 - Frequency
 - Duration
 - Parameters tested
 - Watershed name and size
 - General purpose of each effort

Recommended Next Steps

- This is all we know for nutrient monitoring in Iowa streams
- Highlights the importance of the determining TP loads
- Emphasizes the importance of paired watershed studies
- Calls for a re-evaluation of point source load estimates
- Emphasizes the importance of having information on the types and amounts of nutrient reduction practices
- Recommends a technical work group to develop recommendations for a monitoring design to measure INRS progress

What questions do you have?



Adam Schnieders

515.725.8403

adam.schnieders@dnr.iowa.gov