



# MRG Water Quality Monitoring Report

## July 13<sup>th</sup>, 2006

# Presentation Overview

- Project description
- Data from monthly and synoptic sampling
- Continuous data
- Web posting



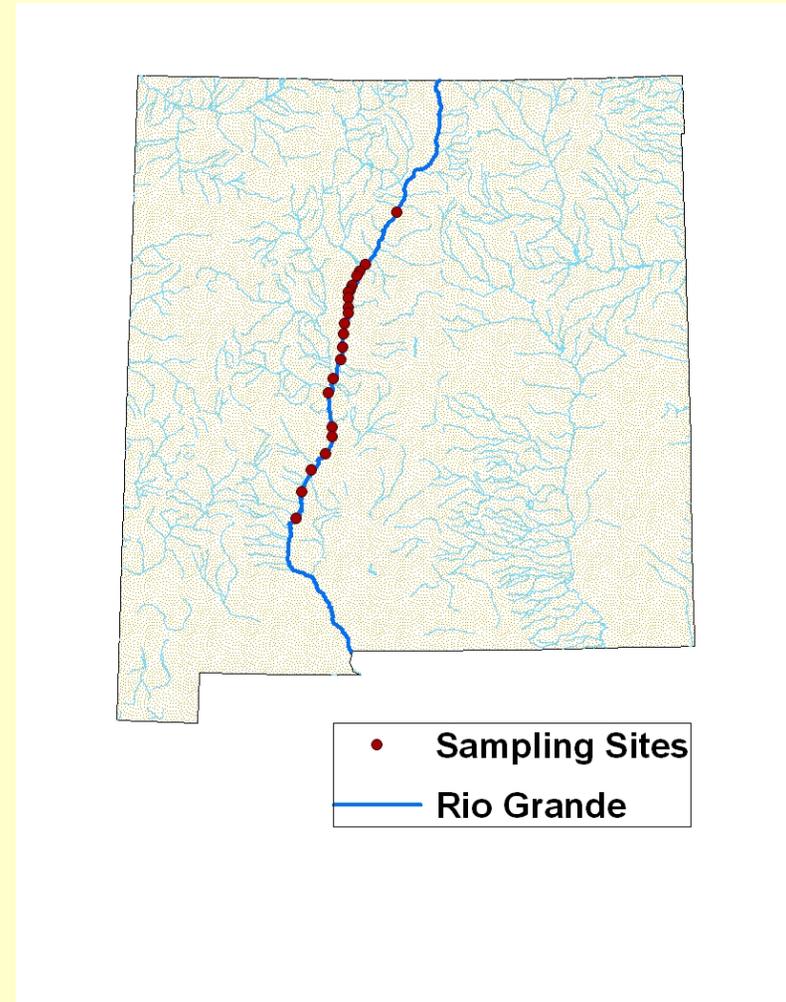
# Project Description

- Goal: Assess temporal and spatial trends in water quality of the Middle Rio Grande
- Three components
  - Monthly sampling: 25 sites
  - Synoptic sampling: ~ 45 sites
  - Continuous monitoring: 4 sites



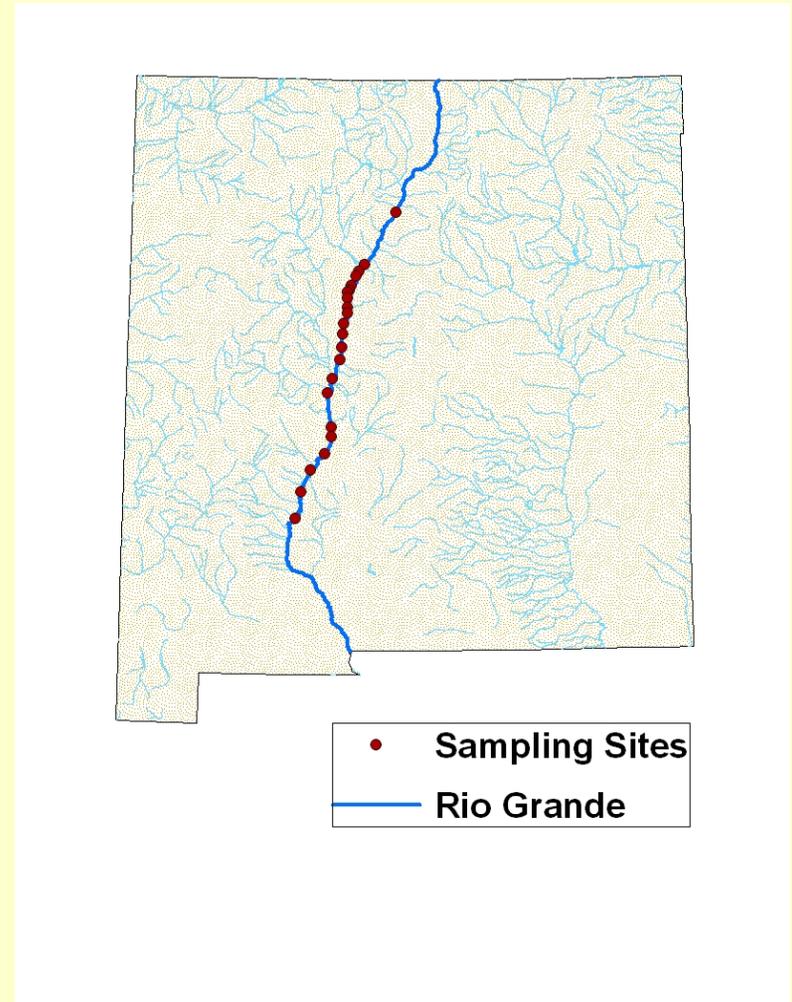
# Monthly Sampling

- Site Selection
  - Sites are located downstream of major inputs (~ 25 sites)
  - High flow and low flow sites: HF sites ~ 5 km downstream of inputs and LF sites ~ 1 km downstream of inputs
- Analytes Measured
  - Nutrients ( $\text{NH}_4$ ,  $\text{PO}_4$ ,  $\text{NO}_3$ , DOC)
  - Anions (Br, Cl,  $\text{SO}_4$ )
  - Cations (Na, K, Mg, Ca)
  - Miscellaneous (Chl-a, cond., temp., pH, DIC)



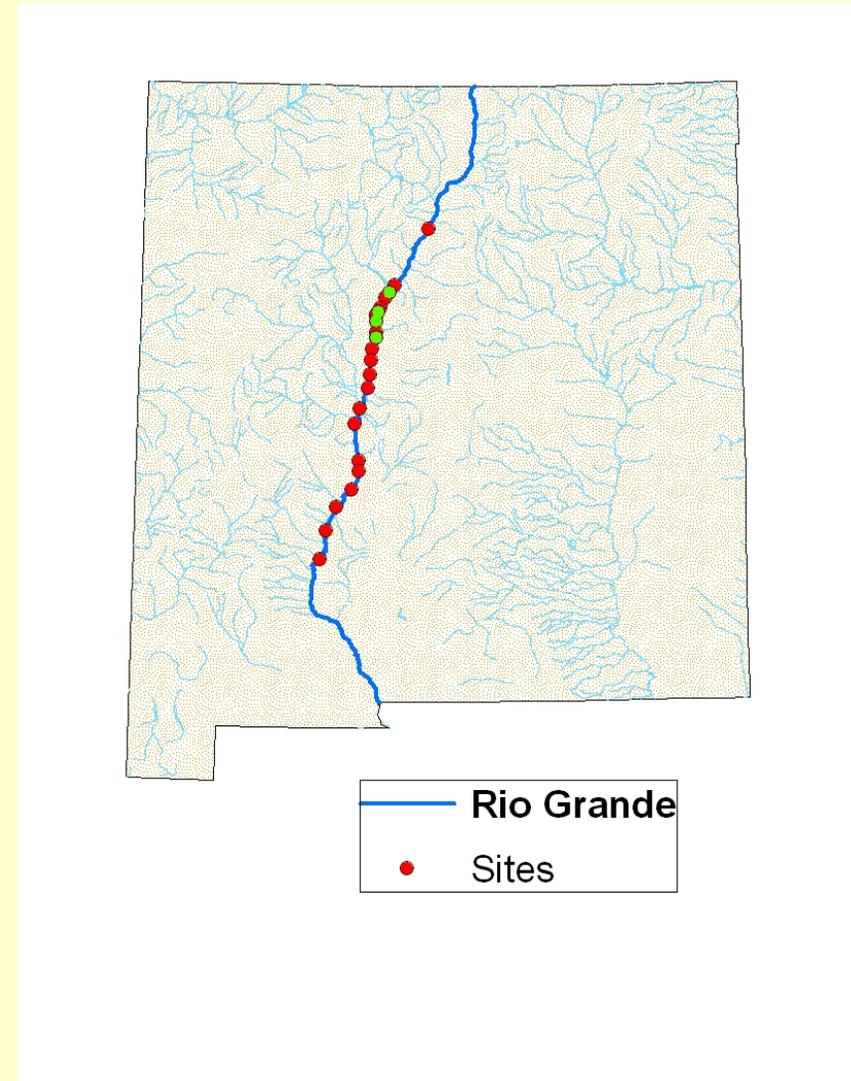
# Synoptic Sampling

- Site Selection
  - Includes 25 monthly sites as well as all natural tributaries and anthropogenic inputs (~ 45 sites total)
- Analytes Measured
  - Same as Monthly Sampling

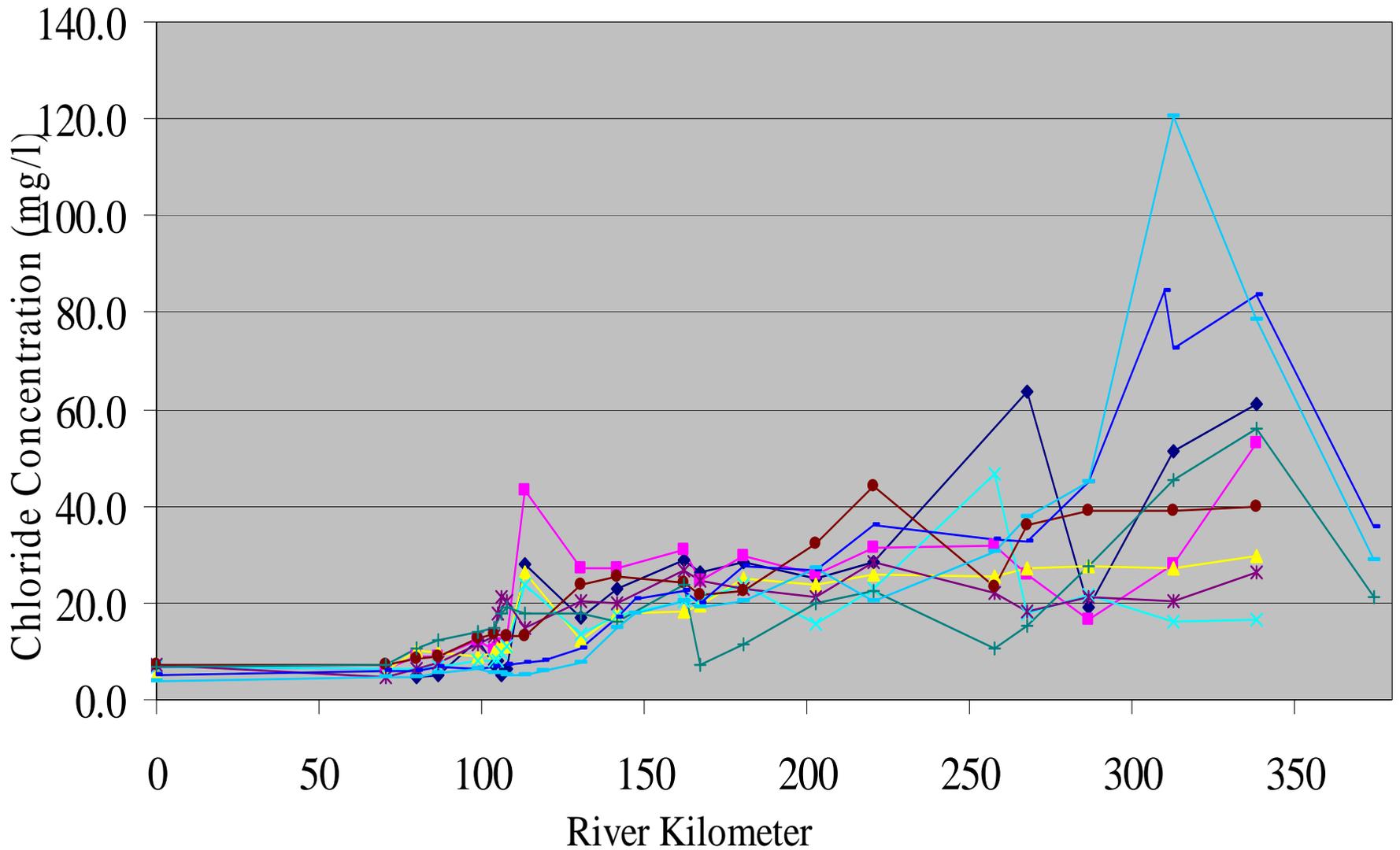


# Continuous Monitoring

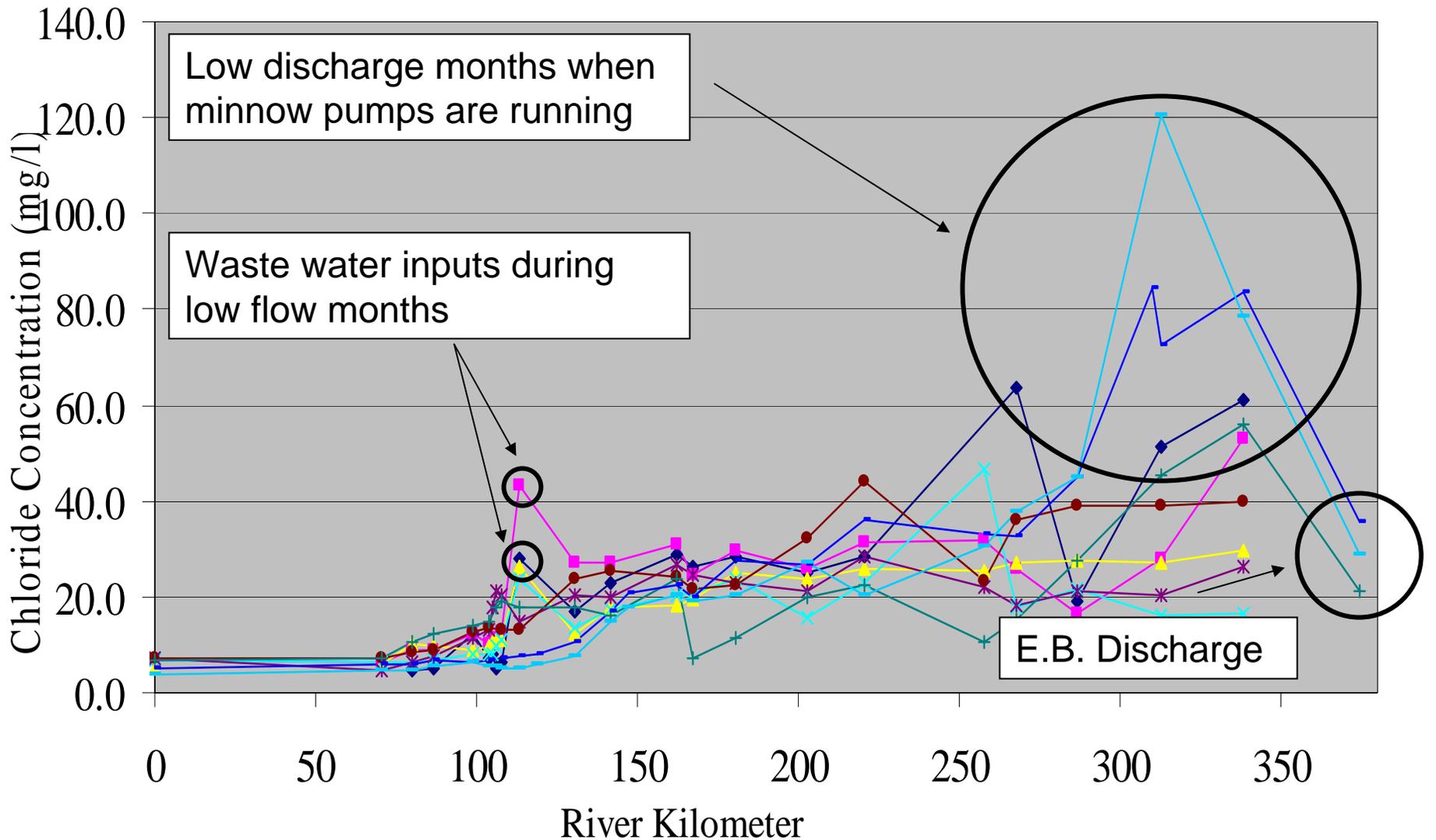
- Site Selection
  - Four sites in the Abq area
- Analytes Measured
  - DO
  - Turbidity
  - pH
  - Conductivity
  - Temperature



# Chloride Levels



# Chloride Levels



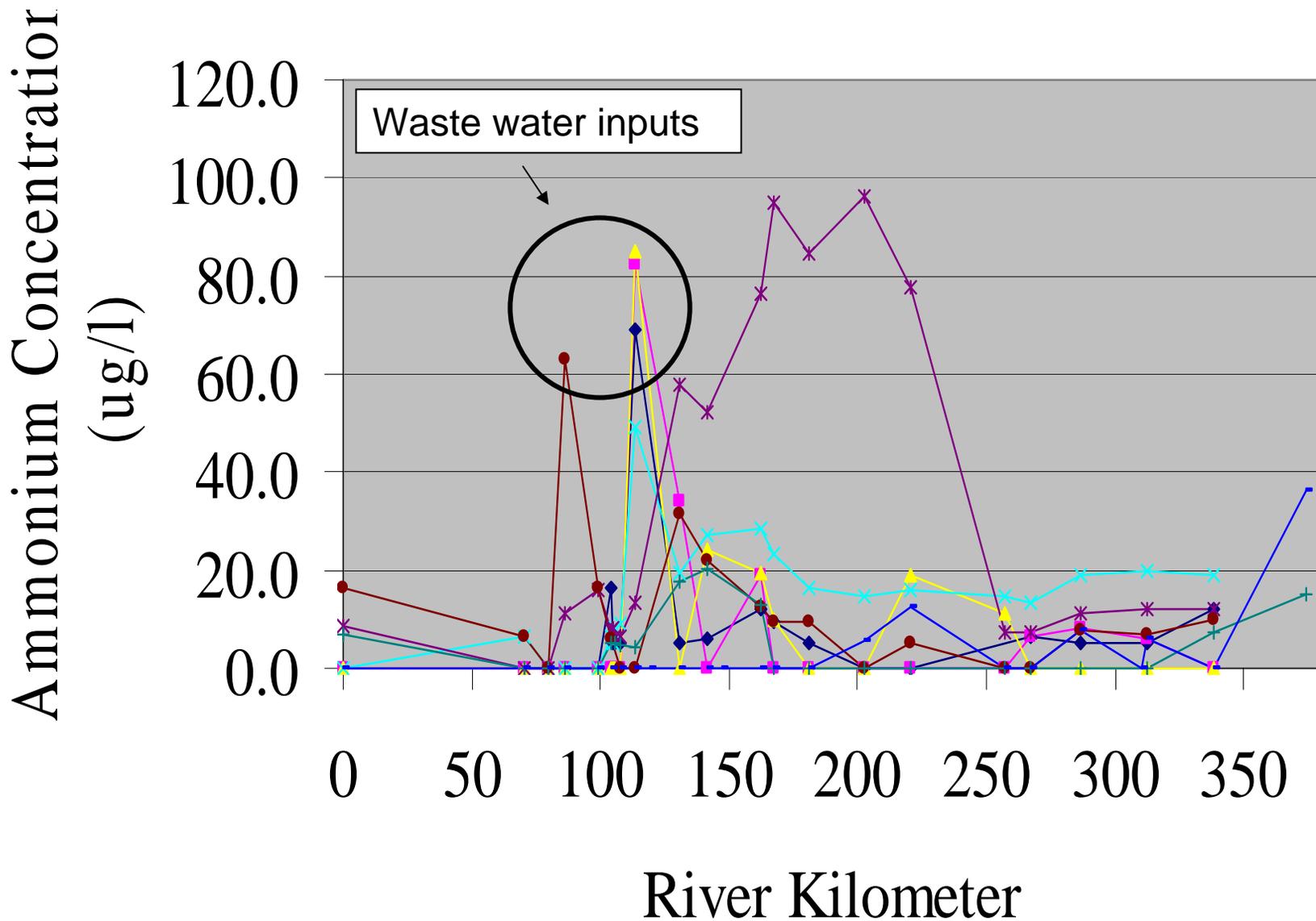


# Monthly Conservative Solute Summary

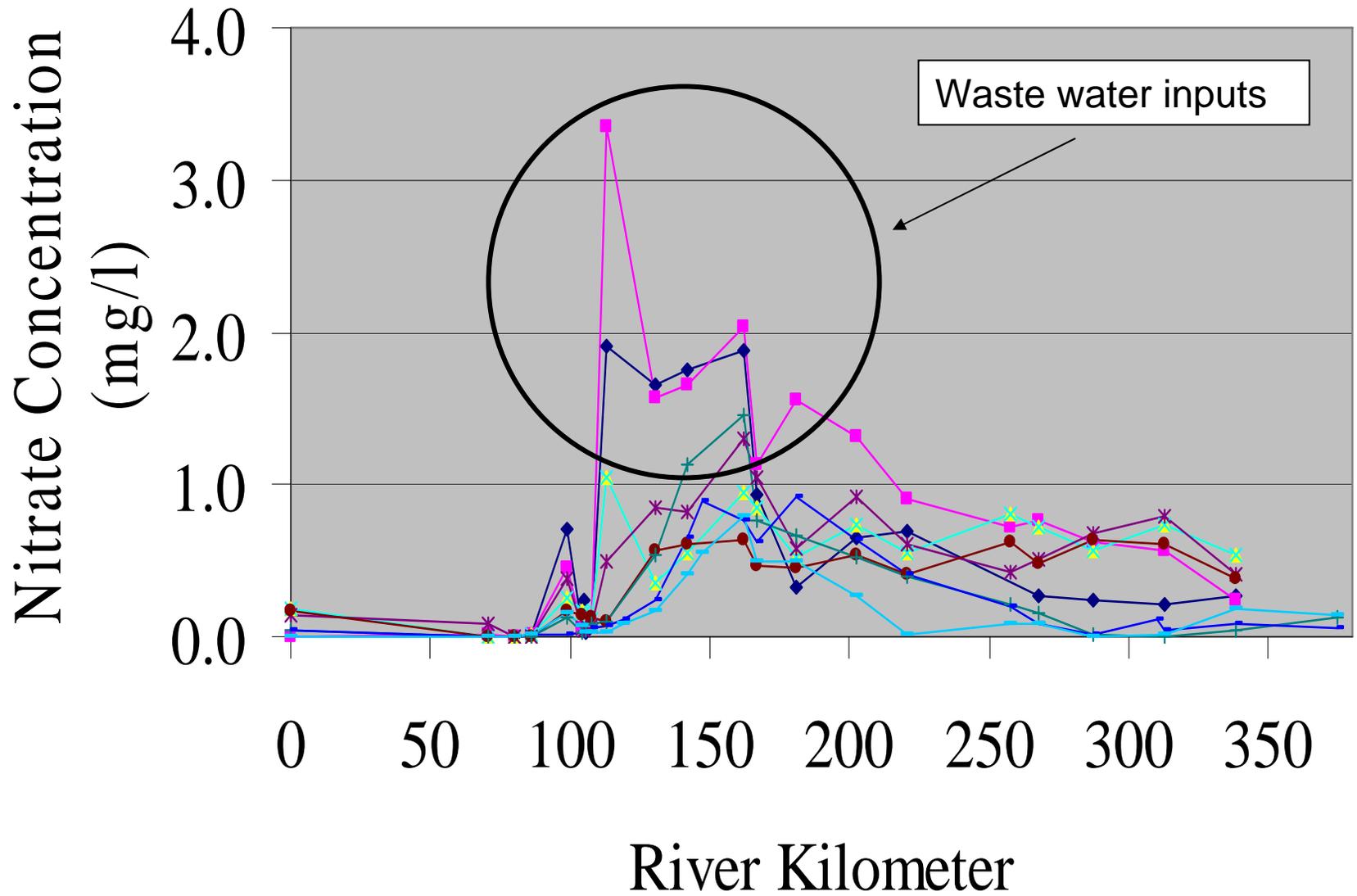
- There is a trend toward increased conservative solute concentrations in the downstream direction due to inputs from anthropogenic and natural sources
- Solute concentrations tend to be higher under low flows probably due to decreased dilution of inputs
- Minnow pumps contribute to high conservative solute concentrations



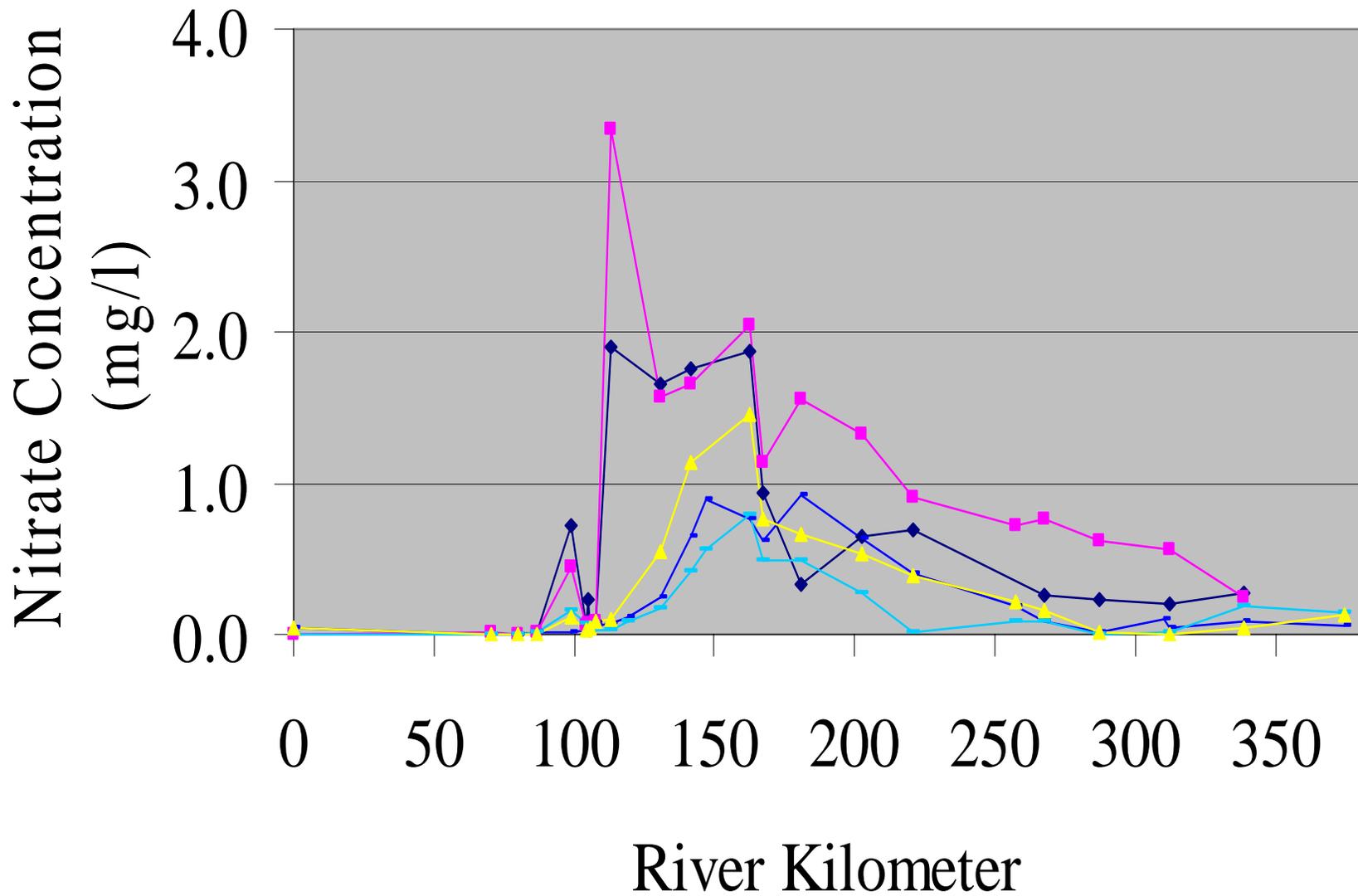
# Ammonium Levels



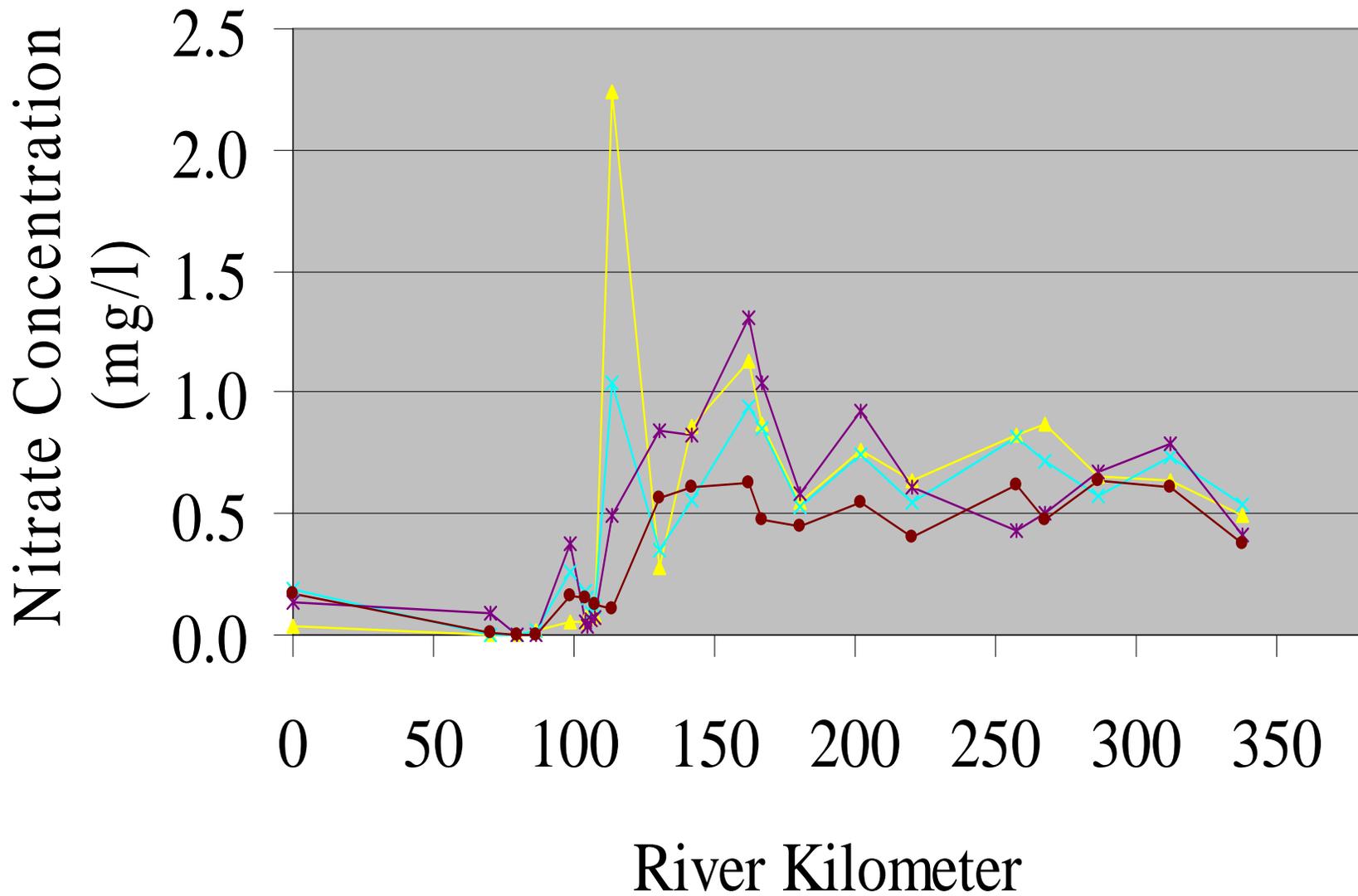
# Nitrate Levels



# Low Flow Nitrate Levels

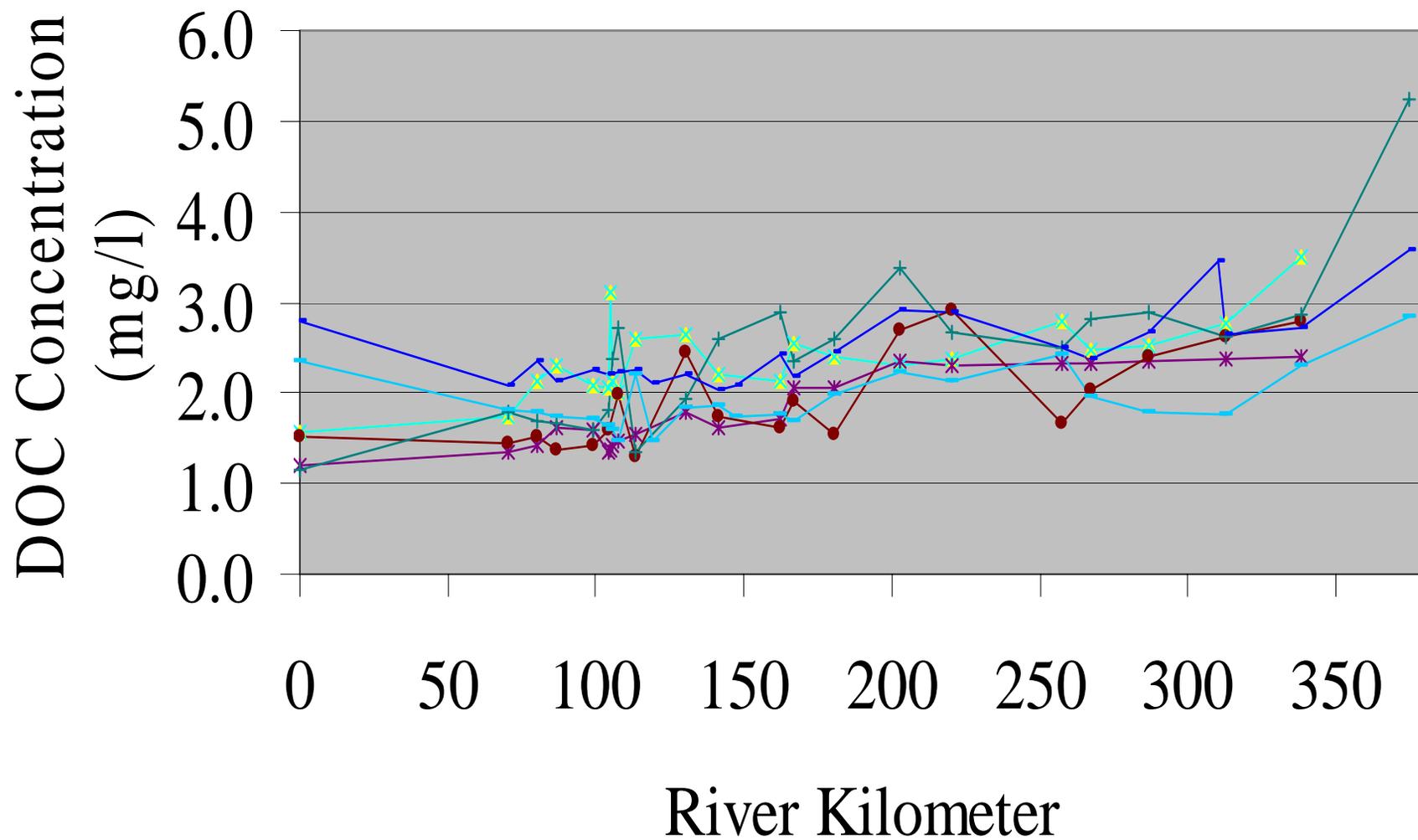


# High Flow Nitrate Levels





# DOC Levels

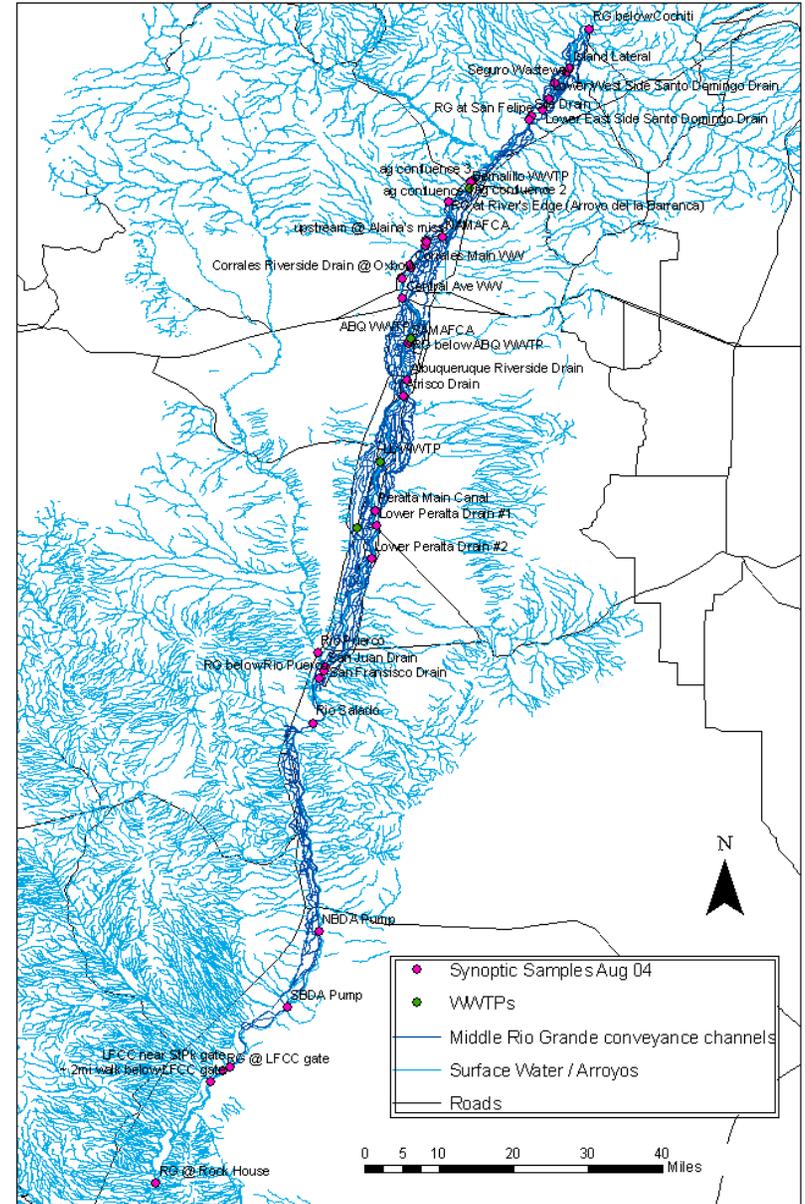


# Monthly Non-Conservative Solute Summary

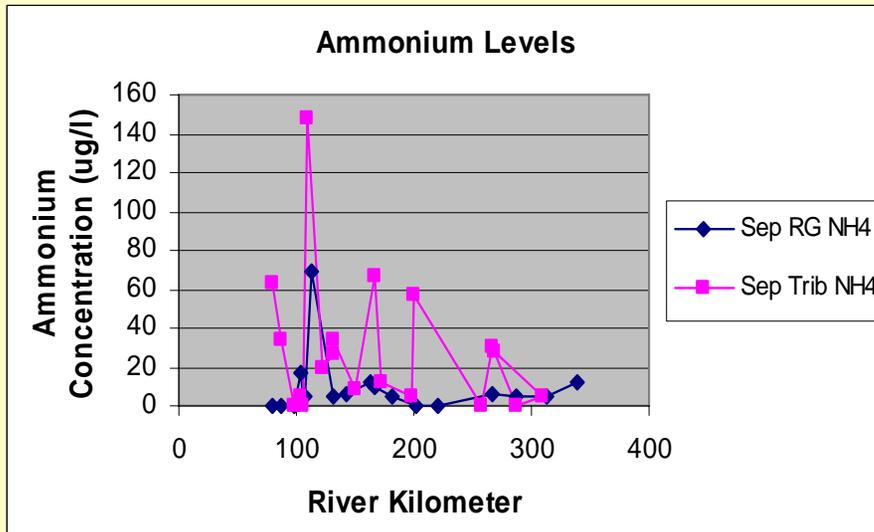
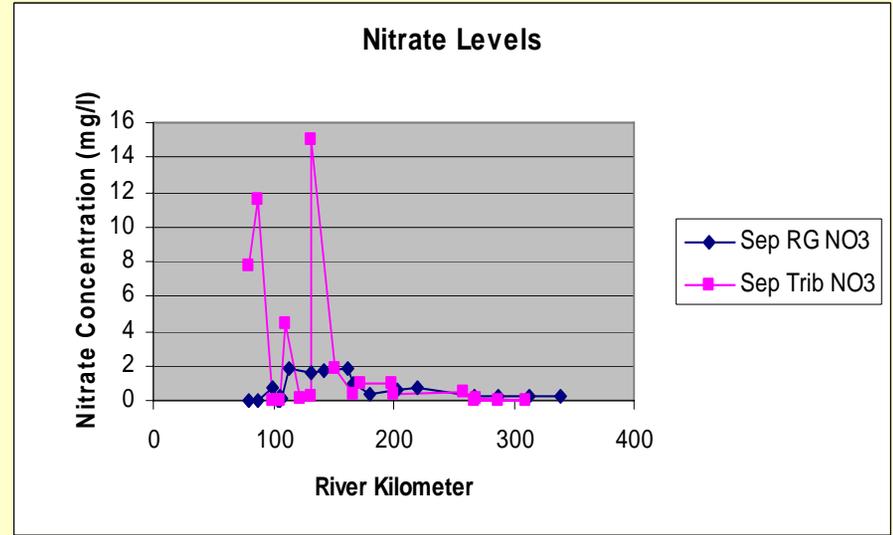
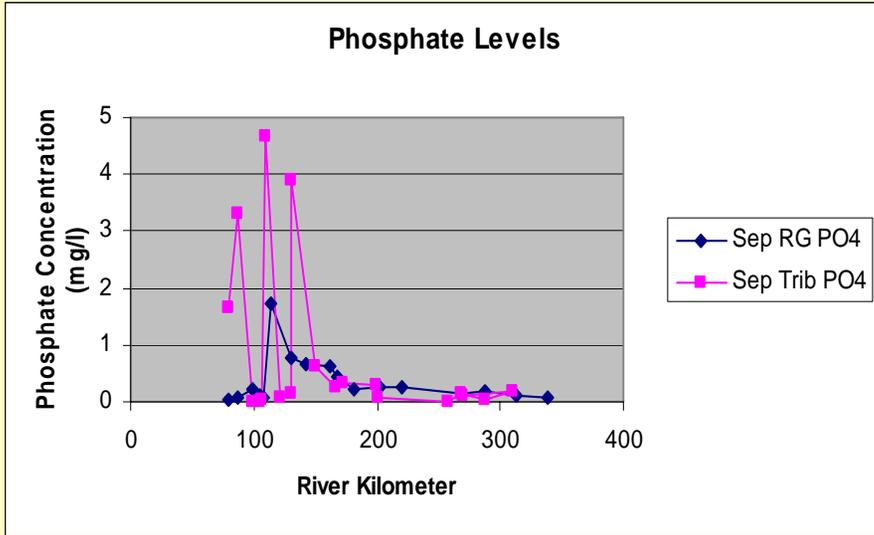
- $\text{NH}_4$  concentrations are low although point sources and episodic events can cause substantial increases
- Waste water inputs cause dramatic increases in nitrate concentrations – At high flows little instream processing occurs while at low flows concentrations decrease significantly with distance, probably due to increased benthic/water column interaction
- Point sources increase phosphate concentrations significantly – Elevated levels persist for long distances with some attenuation probably due to both abiotic and biotic processes
- DOC concentrations gradually increase in the downstream direction at all flow levels

# Longitudinal Sampling Update

- Tributary sites are located on each major tributary to the Rio Grande
- Main stem sites are located at the monthly sampling sites downstream from the tributary inputs



# September Synoptic: Non-Conservative Solute Data

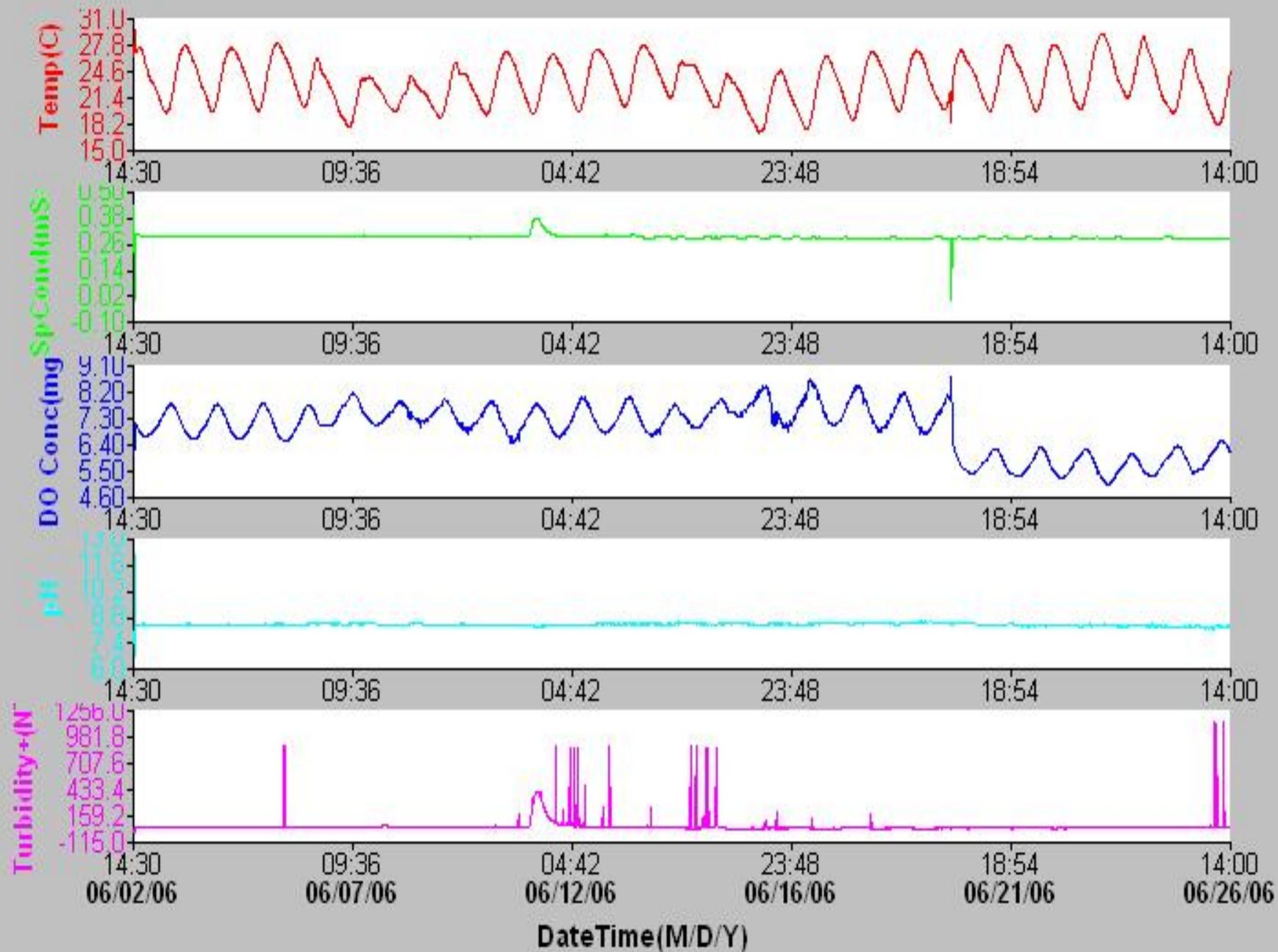


Tributary	River km
Bernalillo WWTP	80.0
Rio Rancho WWTP	86.5
Albuquerque WWTP	125
Los Lunas WWTP	156
Rio Puerco	257.5

# Synoptic Conservative and Non Conservative Summary

- During low flows tributary inputs have a much greater influence on the Rio Grande than at high flows
- Waste water treatment inputs are the major anthropogenic contributors of solutes to the Rio Grande – the Bernalillo and Los Lunas plants contribute relatively low volumes but high concentrations of solutes while the Albuquerque plant contributes high volumes and low concentrations
- Nutrient processing in agricultural return drains and during flood irrigation may decrease return flow nutrient concentrations

# RB06.DAT



# Website Query Interface

Mozilla Firefox

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http://129.24.125.52/data\_entry/riogrande/index.php

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## Sevilleta LTER

Long Term Ecological Research

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**Advanced search page.**

**Directions** - Use all or any portion of the riogrande data and/or select one or more choices from the tables below to create your search criteria. The name field search uses wildcards before and after your terms, so for example, putting "vetch" (without the quotes) in the common name field will bring up all records with vetch in the riogrande data. You may select more than one choice from a box using shift-click or ctrl-click.

**Site:**

Use site number or numbers separated by commas:

**OR**

choose sites from drop down menu SiteName:

**Date:**

Enter Date Range(mm/dd/yy):  
 and  (both dates included)

**Concentration:**

Enter Concentration and Range:  
 and  (both concentrations included)

**OR**

Concentration:

**Mainstem vs Tributary:**

Done

# Acknowledgments:

- US Army Corps of Engineers
- US Fish and Wildlife Service
- Bosque School
- Sevilleta LTER