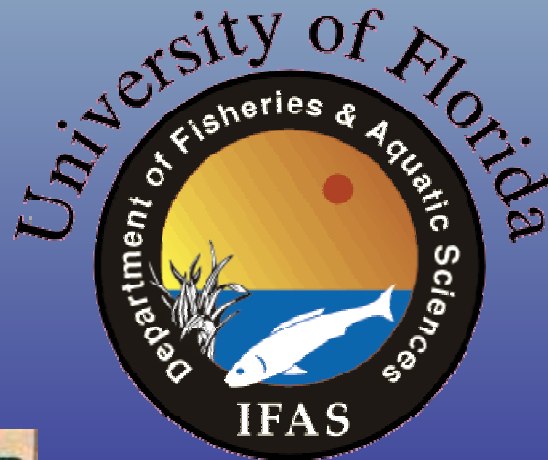


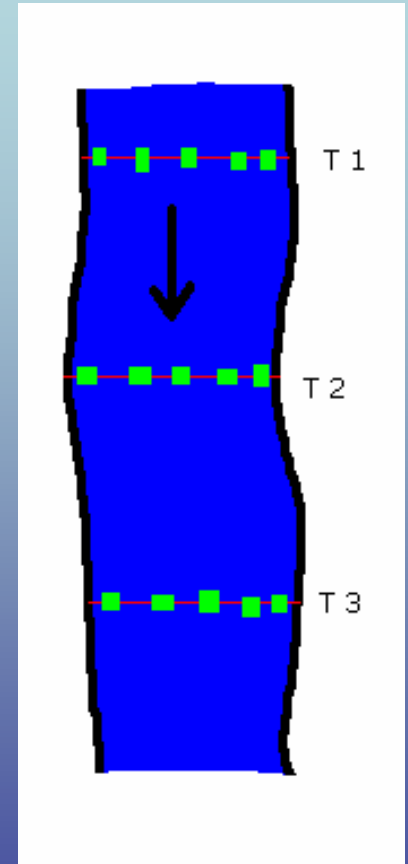
# A Chemical and Vegetative Characterization of the Ichetucknee River

Sky K. Notestein and Thomas K. Frazer



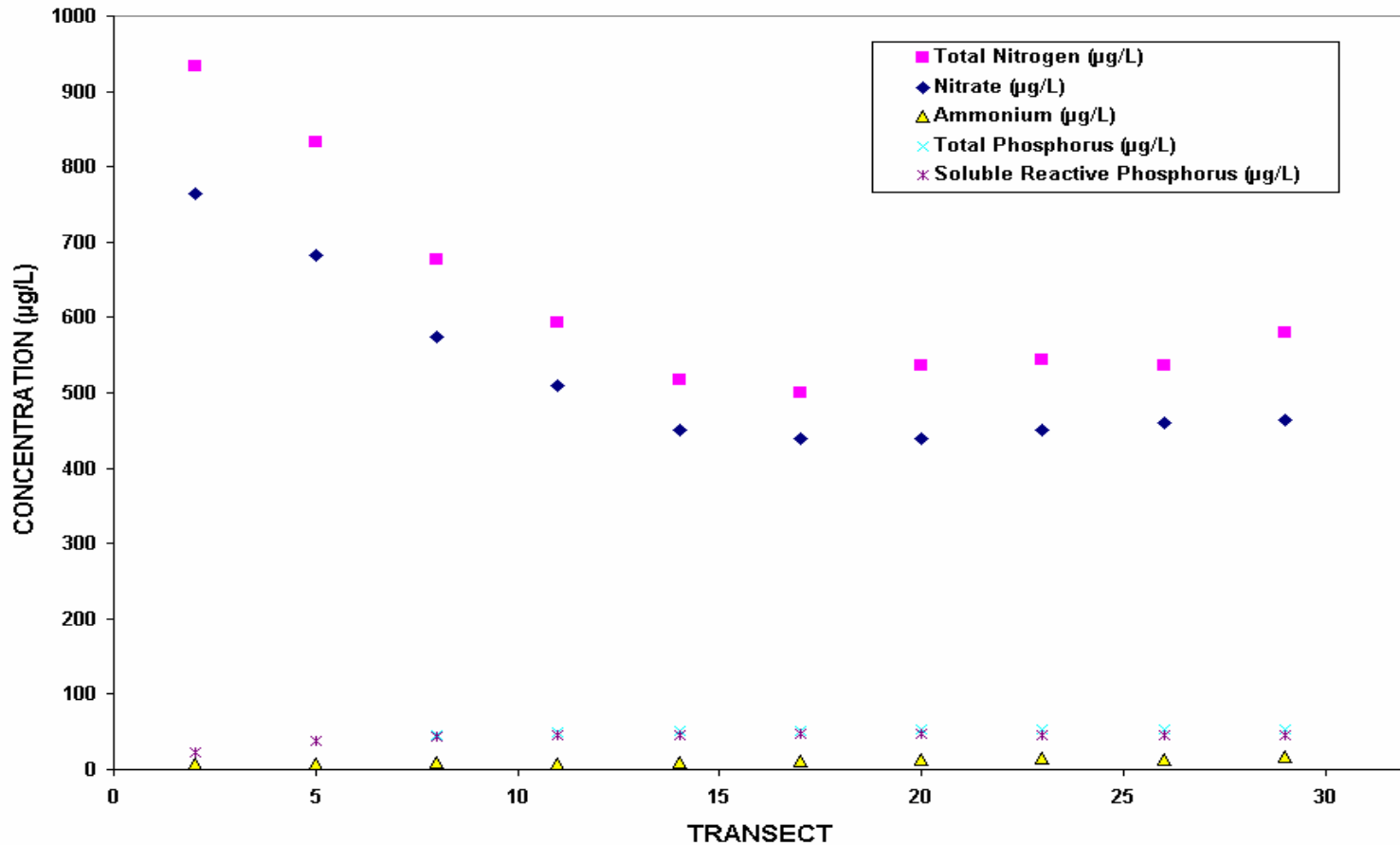
# Sampling methods

- Surveyed April 2003 & 2004
- 31 Transects with 5 stations each
- Suite of parameters measured
  - Depth, Flow, Terrestrial Cover, Substrate Type, Dissolved Oxygen, Conductivity, pH,  $K_d$
  - Coverage and Biomass of SAV
  - Periphyton abundance on SAV
- Also in 2004
  - Six Feeder Springs Sampled
  - Water column TN,  $\text{NH}_4^+$ ,  $\text{NO}_3^-$ , TP, SRP, color and chlorophyll measured



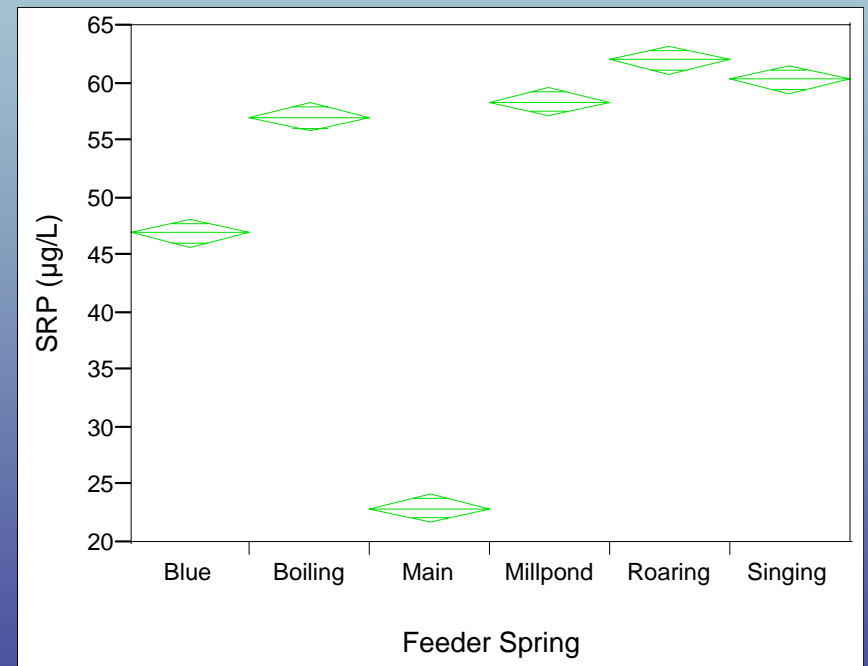
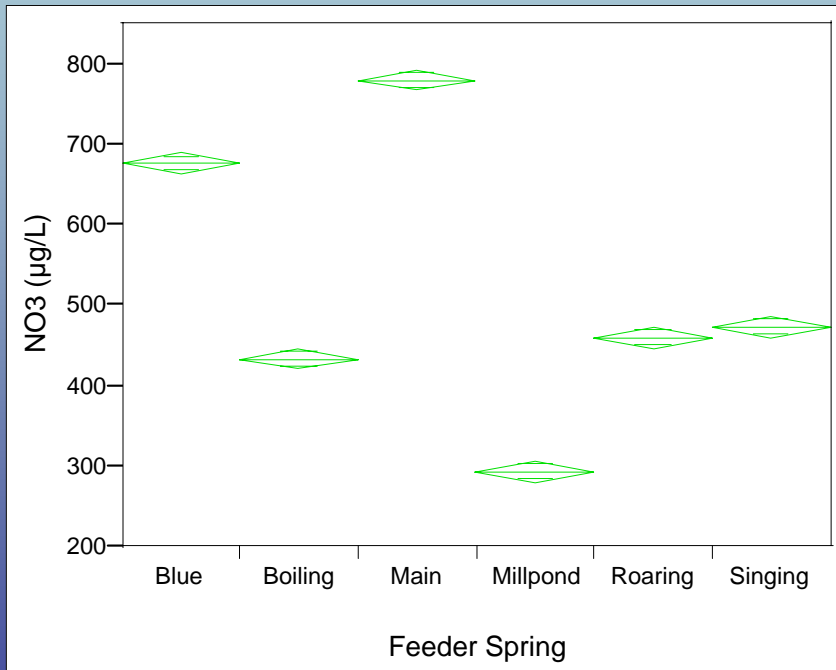
# Water Chemistry Results

- Elevated nitrate concentrations with a decline downstream
  - Average Ichetucknee River Values (n=30)
  - TN: 625,  $\text{NO}_3^-$ : 523,  $\text{NH}_4^+$ : 11, TP: 47, SRP: 43  $\mu\text{g/L}$



# Water Chemistry Results

## Among Spring Comparisons



# SAV Results

- Species observed similar to Dutoit (1979), Canfield & Hoyer (1988) studies
- High Biomass: 4.9 kg wet wt./m<sup>2</sup> (2 year average)
- High Coverage: 78 percent (2 year average)

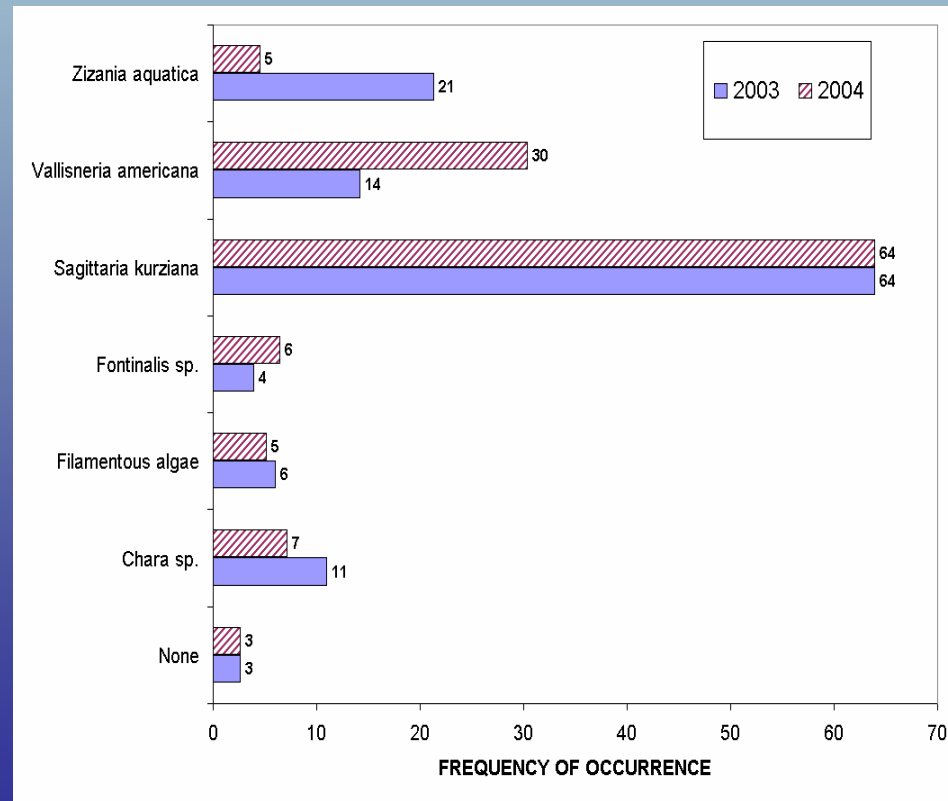
- Correlations between SAV abundance:

- Negative for Terrestrial Cover

- Substrate type important

- Positive for Depth

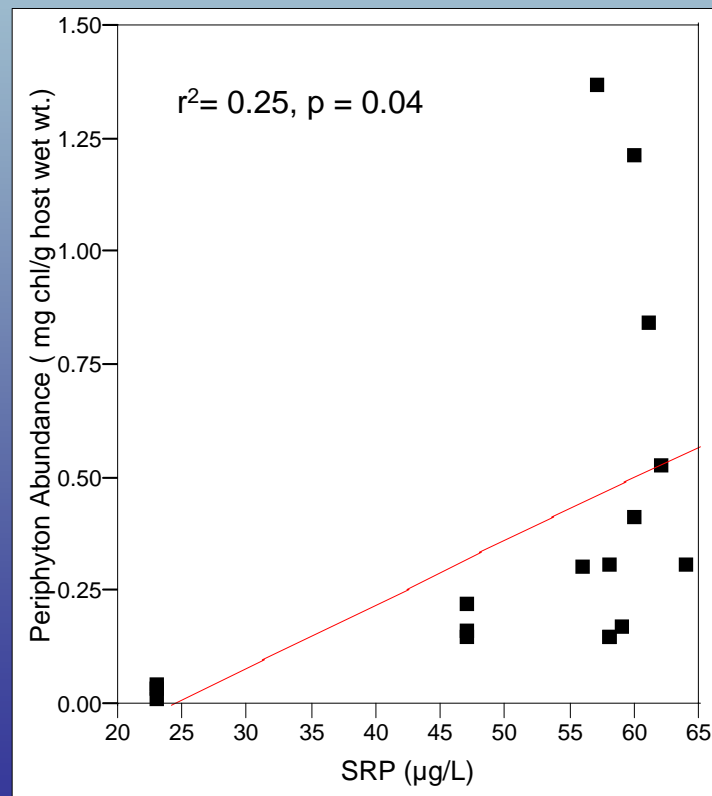
- Positive for Flow



# Periphyton

- Periphyton abundance moderate in river
  - Negatively correlated with flow rate and depth
- Periphyton abundance variable in feeder springs
  - Positively correlated with phosphorus concentrations within feeder springs

Feeder Springs →



# SAV comparison to other systems

Ichetucknee River



SAV: 4.9 kg wet wt/m<sup>2</sup>  
Nitrate: 523 µg/L  
SRP: 43 µg/L  
Depth: 1.5 m  
Flow: 0.21 m/s

Chassahowitzka River

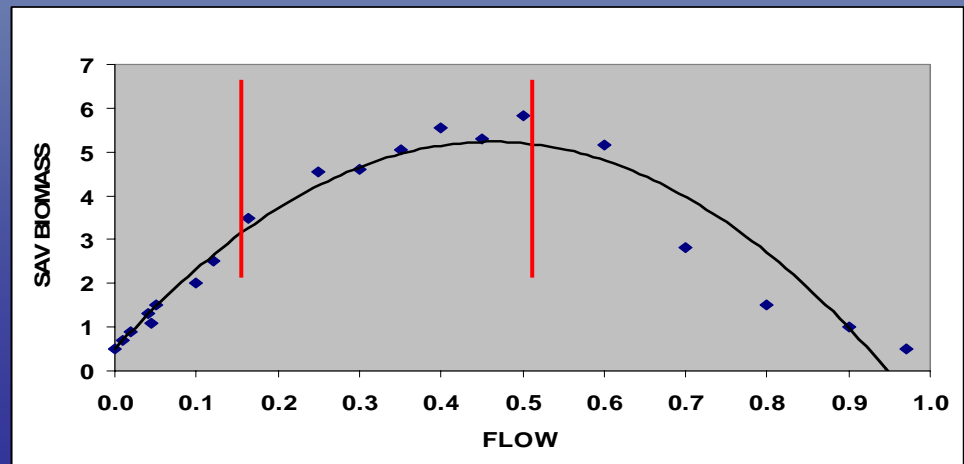


SAV: 1.3 kg wet wt/m<sup>2</sup>  
Nitrate: 436 µg/L  
SRP: 15 µg/L  
Depth: 1.1 m  
Flow: 0.09 m/s

# Stream Flow and SAV



- Haze is calcium carbonate precipitate
- CO<sub>2</sub> likely limiting SAV
- Periphyton and macroalgae better competitors for gas/nutrients (surface area to volume ratio)





# Conclusions

- Premier spring-fed river
  - SAV species composition appears to be stable, exotic species absent
  - Biomass and cover are high relative to many other spring-fed systems
  - Minimal amount of macroalgae present
- Water column nutrient concentrations
  - Elevated relative to historic concentrations
  - Are not likely limiting, however, phosphorus and periphyton abundance correlated in feeder springs
- High stream flow beneficial to SAV?
  - Empirical relations suggest that reductions in flow or depth may reduce SAV coverage and biomass
  - High stream flow moderating nutrient impacts by:
    - increasing periphyton/macroalgae sloughing?
    - increasing CO<sub>2</sub> diffusion rates for SAV?