

**Beasley Lake Watershed
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Summary of Research

- Lake assessments
 - Water quality
 - Ecology
 - Fish
 - Plankton
 - Microbiology
- BMP assessments
 - CRP
 - Quail buffer
 - Sediment retention pond
- STEWARDS
- Modeling
 - Soil and water quality
 - Biology

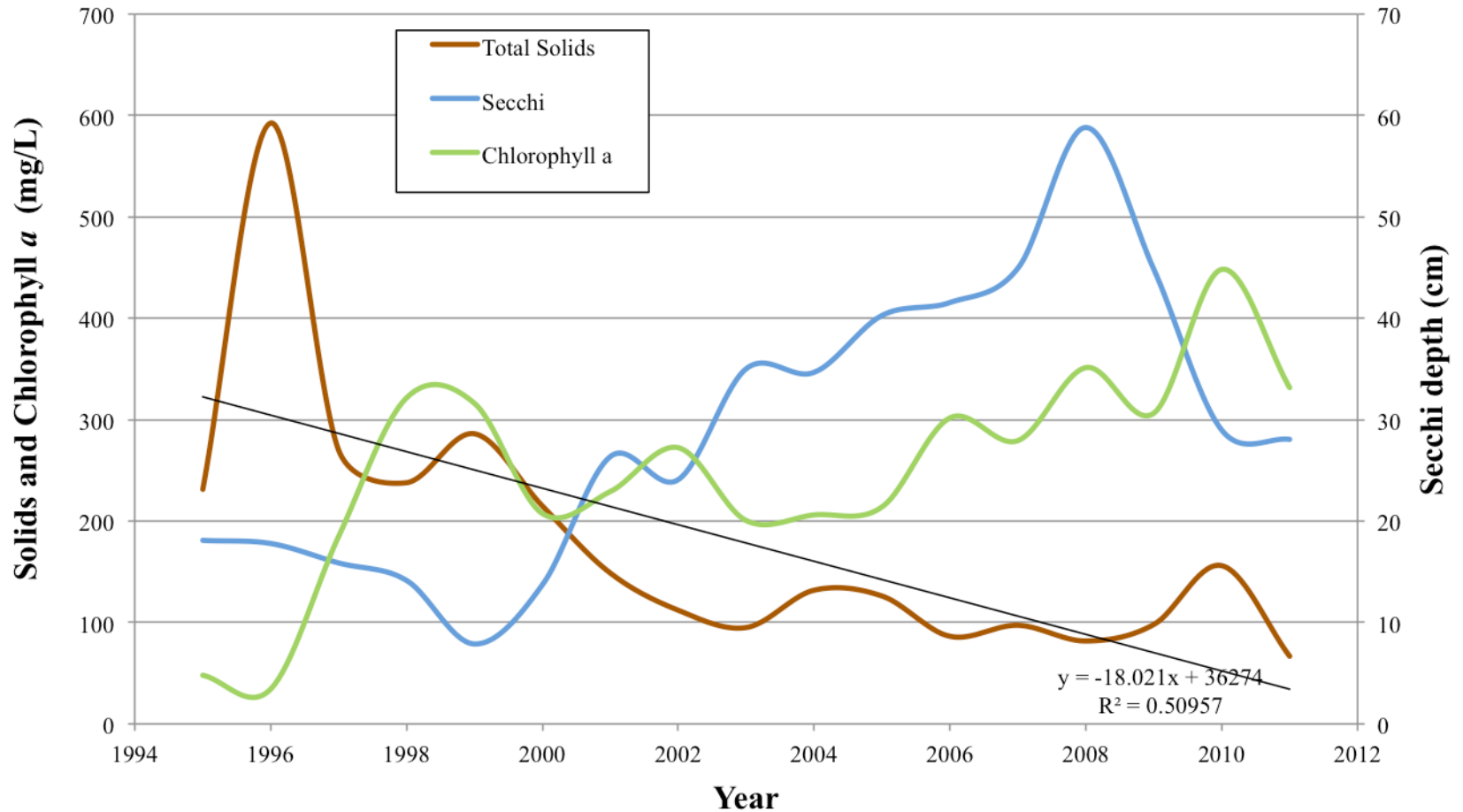


Steinriede, USDA-ARS

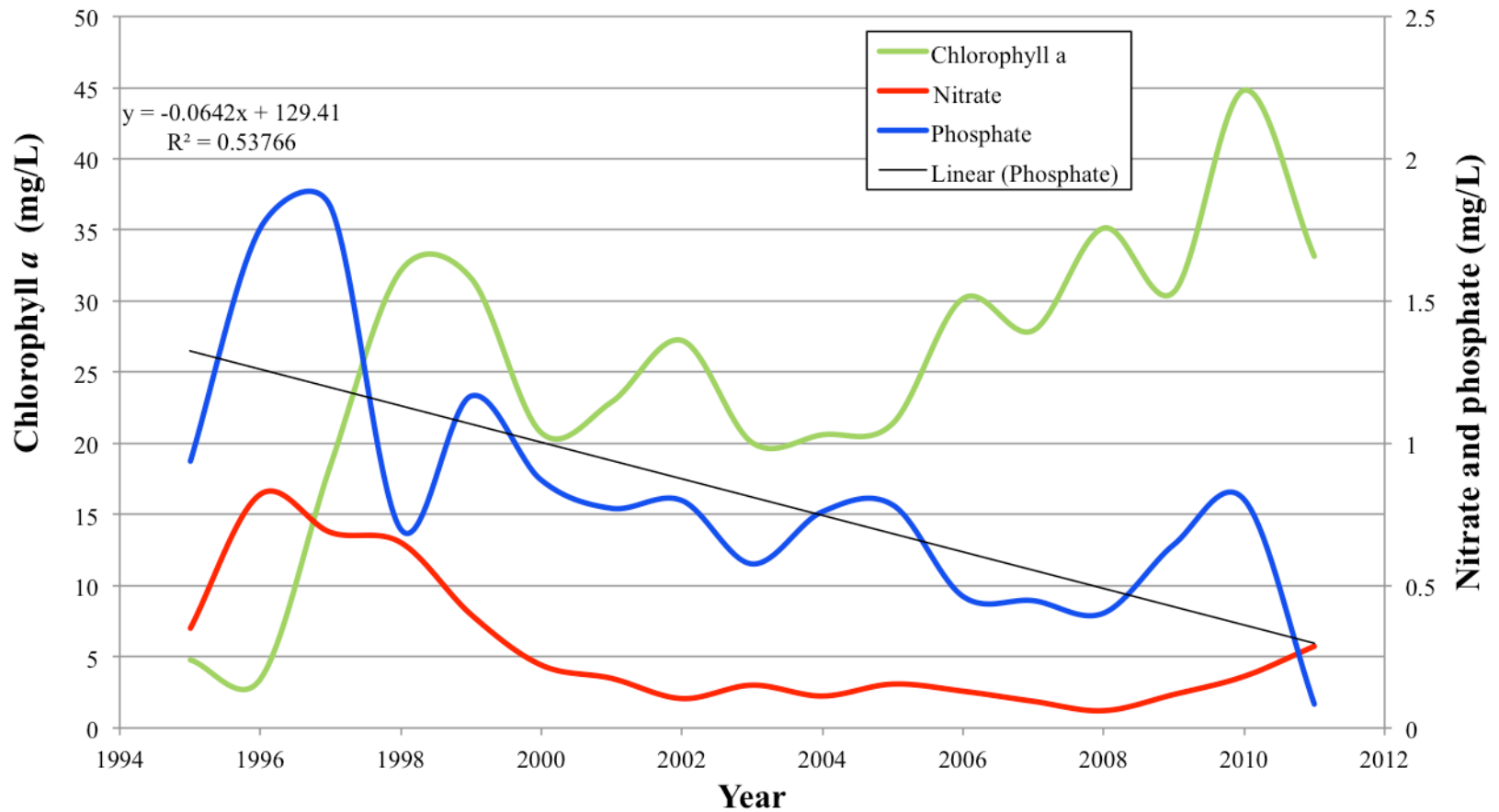
Beasley Lake Watershed: Summary of conservation practices implemented 1995-2011

- 1994 Conventional tillage cotton/soybeans
- 1996 Slotted pipes, riser pipes, grassed waterways
- 2001 Conservation tillage cotton/soybeans/corn
- 2003 Constructed wetland
- 2003 Conservation reserve program
- 2006 Quail buffer (4-5 ha)
- 2010 Sediment retention basin
- 2014 Tailwater recovery pond??

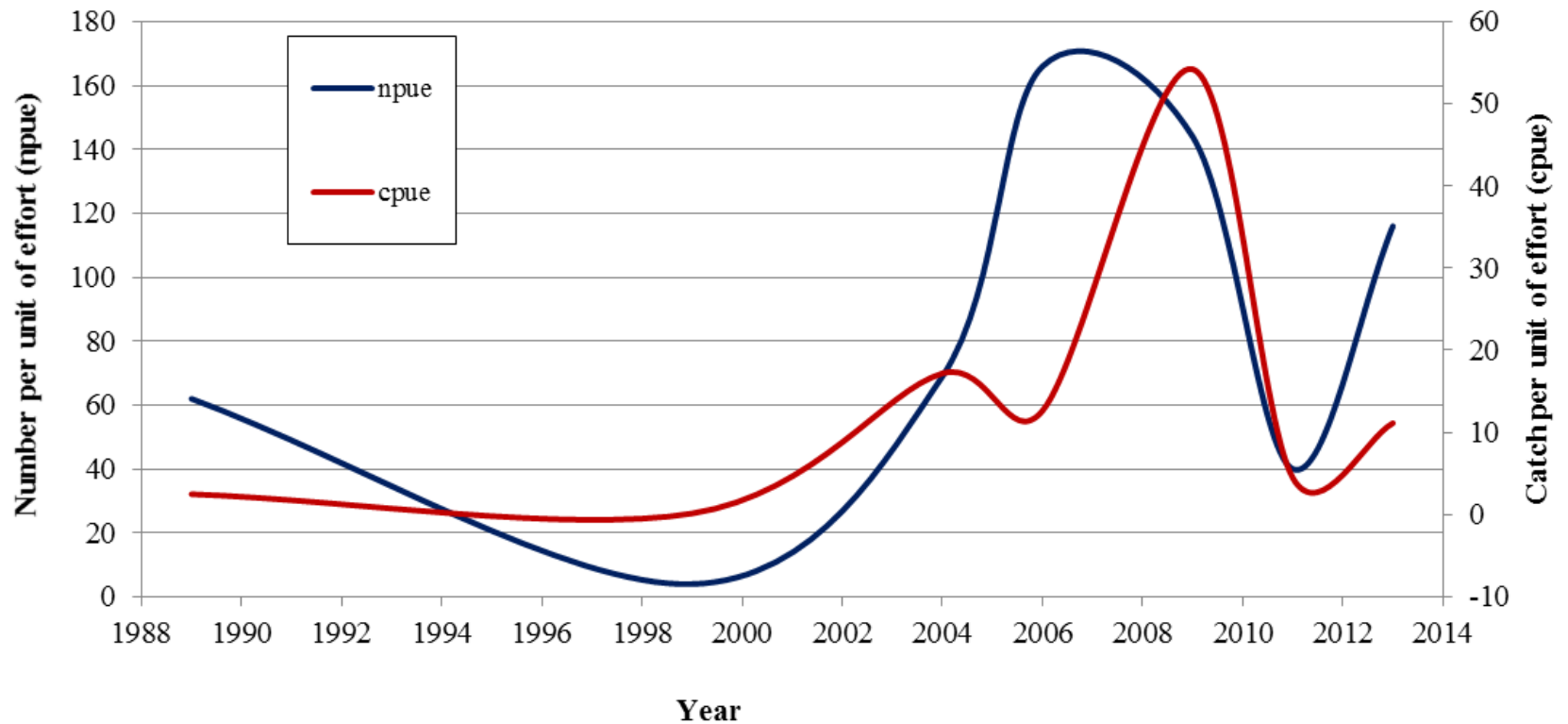
Annual means for total solids, Secchi and chlorophyll *a* in Beasley Lake from 1995 through 2011.



Annual mean chlorophyll *a*, nitrate and phosphate concentrations for Beasley Lake from 1995 through 2011.

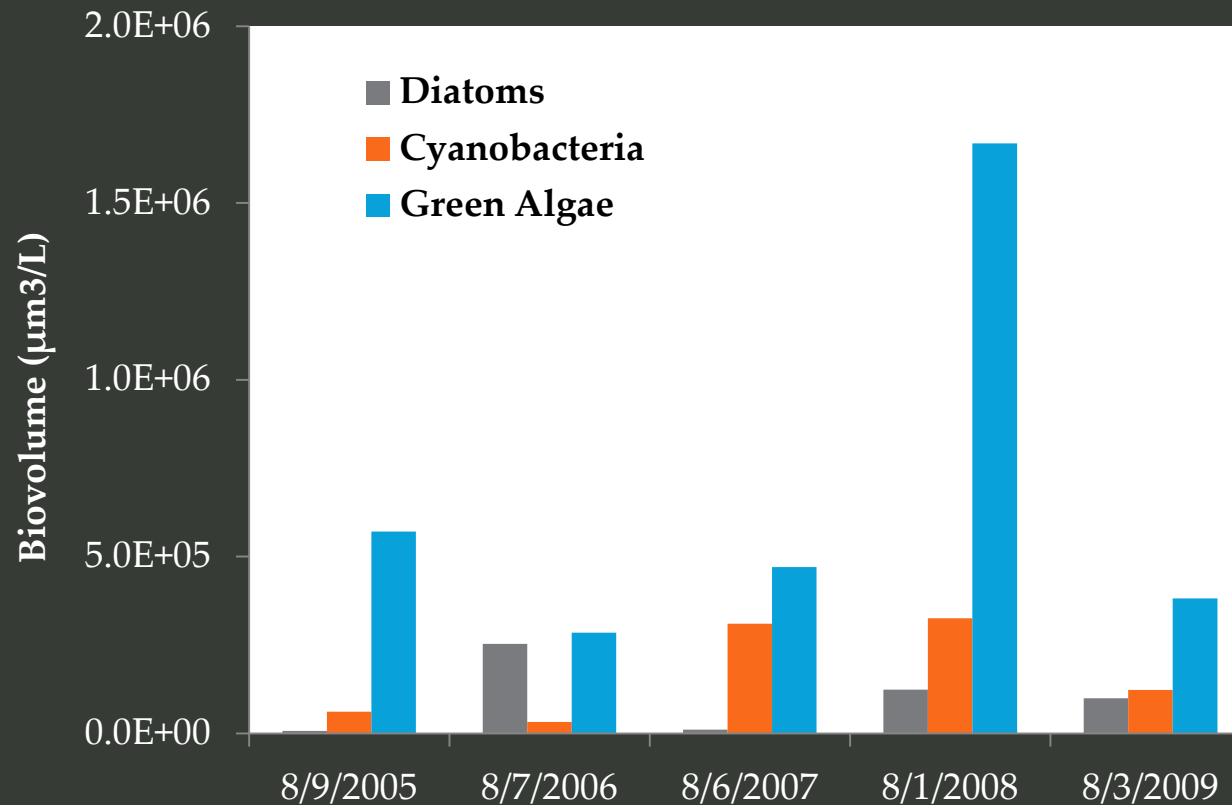


Catch per effort by number and weight for Centrarchidae from Beasley Lake per year.

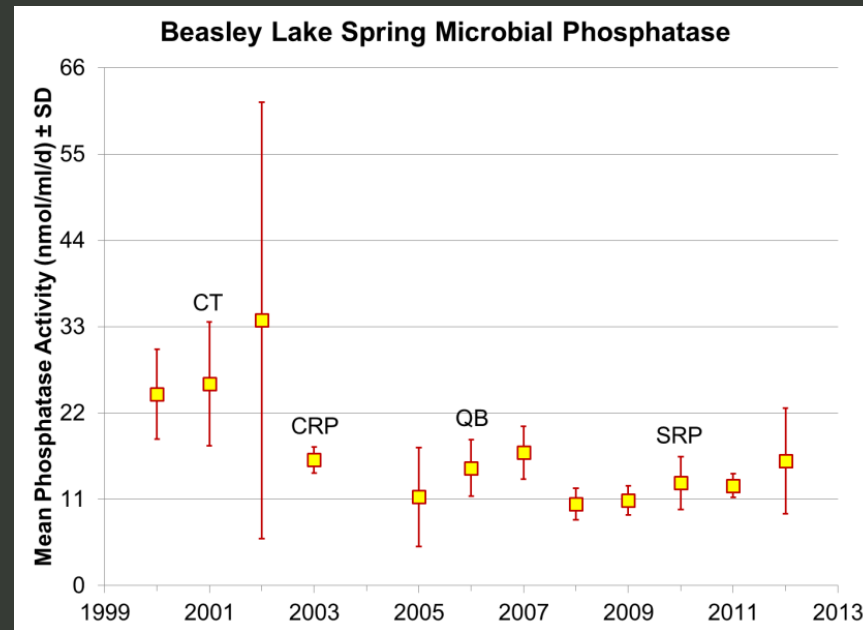
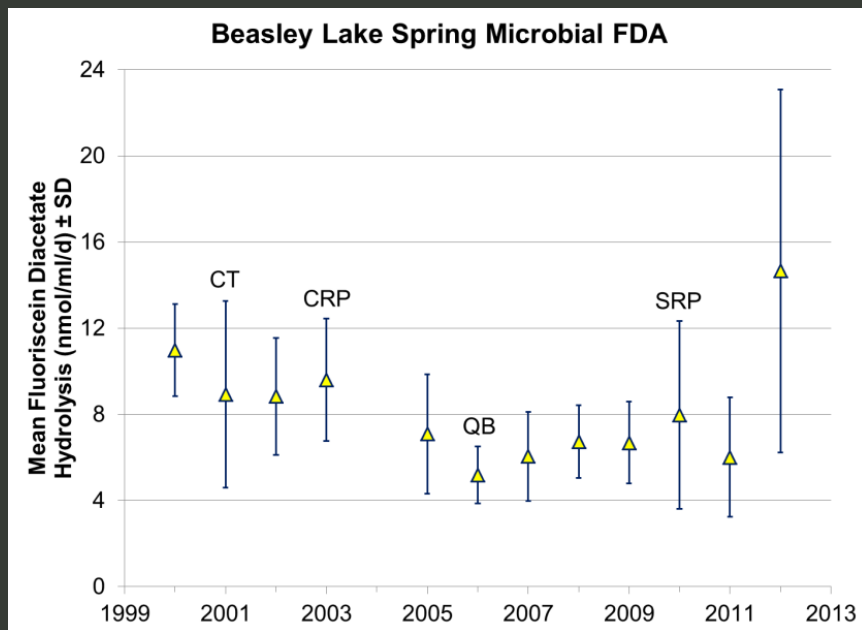


Beasley Lake Phytoplankton 2005 – 2012

- Biovolume dominant algal groups (green algae, diatoms, cyanobacteria)
- Identification of dominant algal species



Beasley Lake Microbial Enzyme Activity



Current Research

Biweekly

- FDA
- Phosphatase

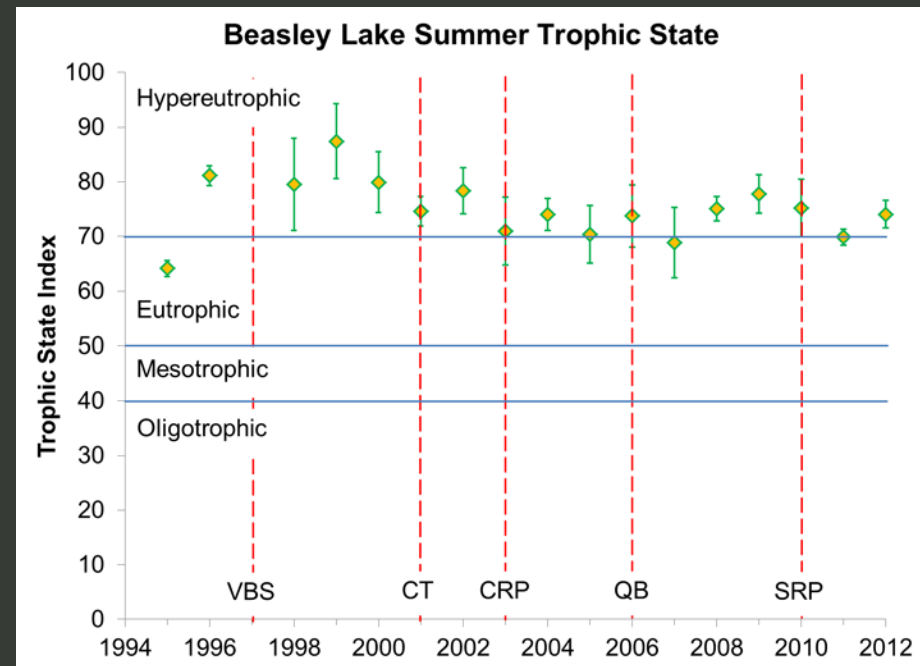
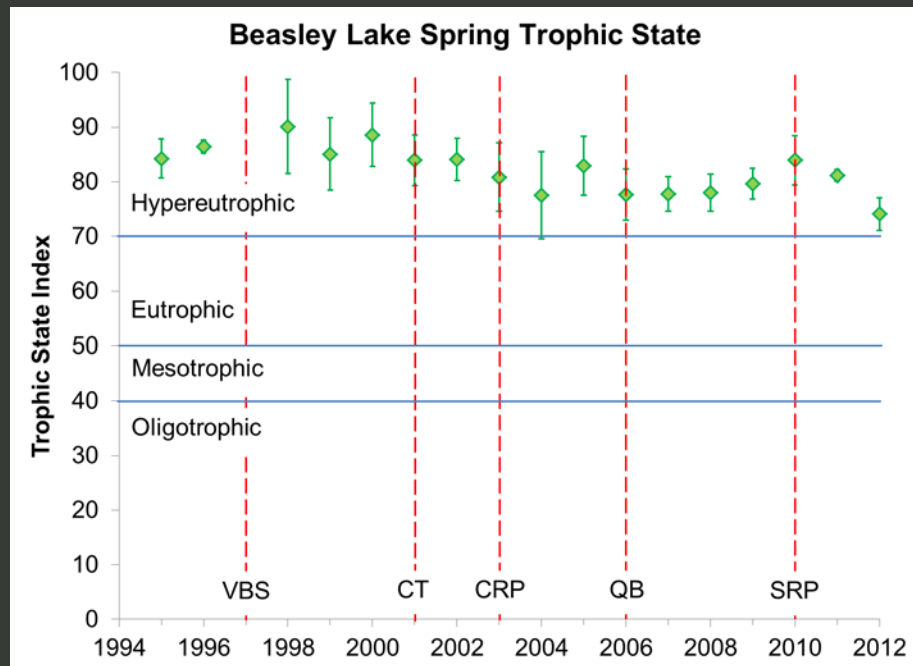
Future Research

Biweekly

- Leucine
- Amino Peptisidase
- Glucosidase

Beasley Lake: Carlson Trophic State Index

- Chlorophyll *a*
- Total Phosphorus
- Secchi Disk Transparency



Quail buffers – Beasley Lake Watershed

- Areas in Buffer and row crops were surveyed
- Sub-drainage areas were delineated
- Buffer (2.4 to 4.3 ha) and row crop (2.8 to 5.6 ha) areas were compared
- Automated samplers for runoff



Conservation Reserve Program (CRP) established in Beasley Lake Watershed, beginning in Fall 2003 (113 ha, 12% of the watershed)

- Sub-drainage areas were delineated (0.7 to 7.2 ha)
- Automated sampling



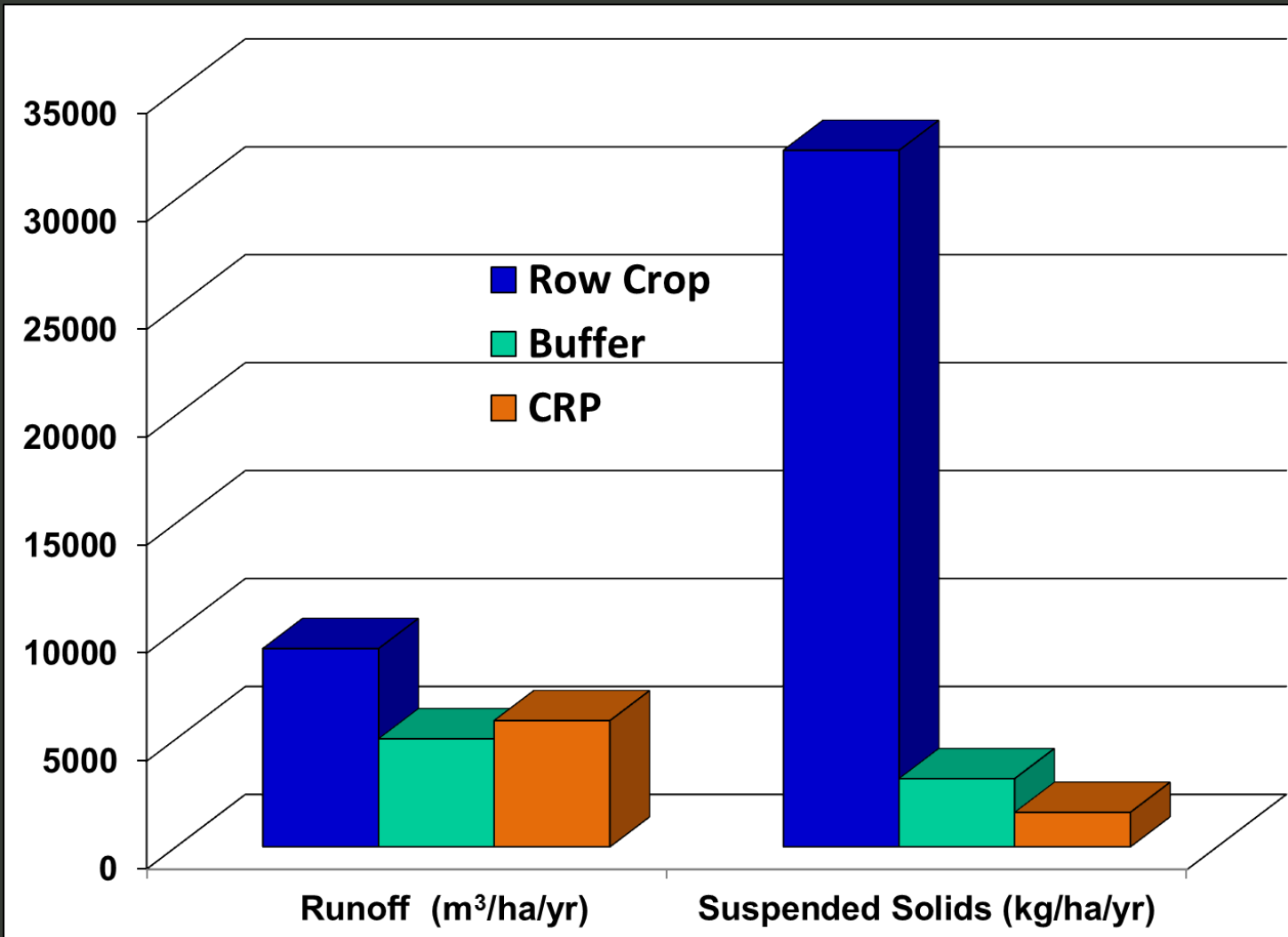
2003



2012

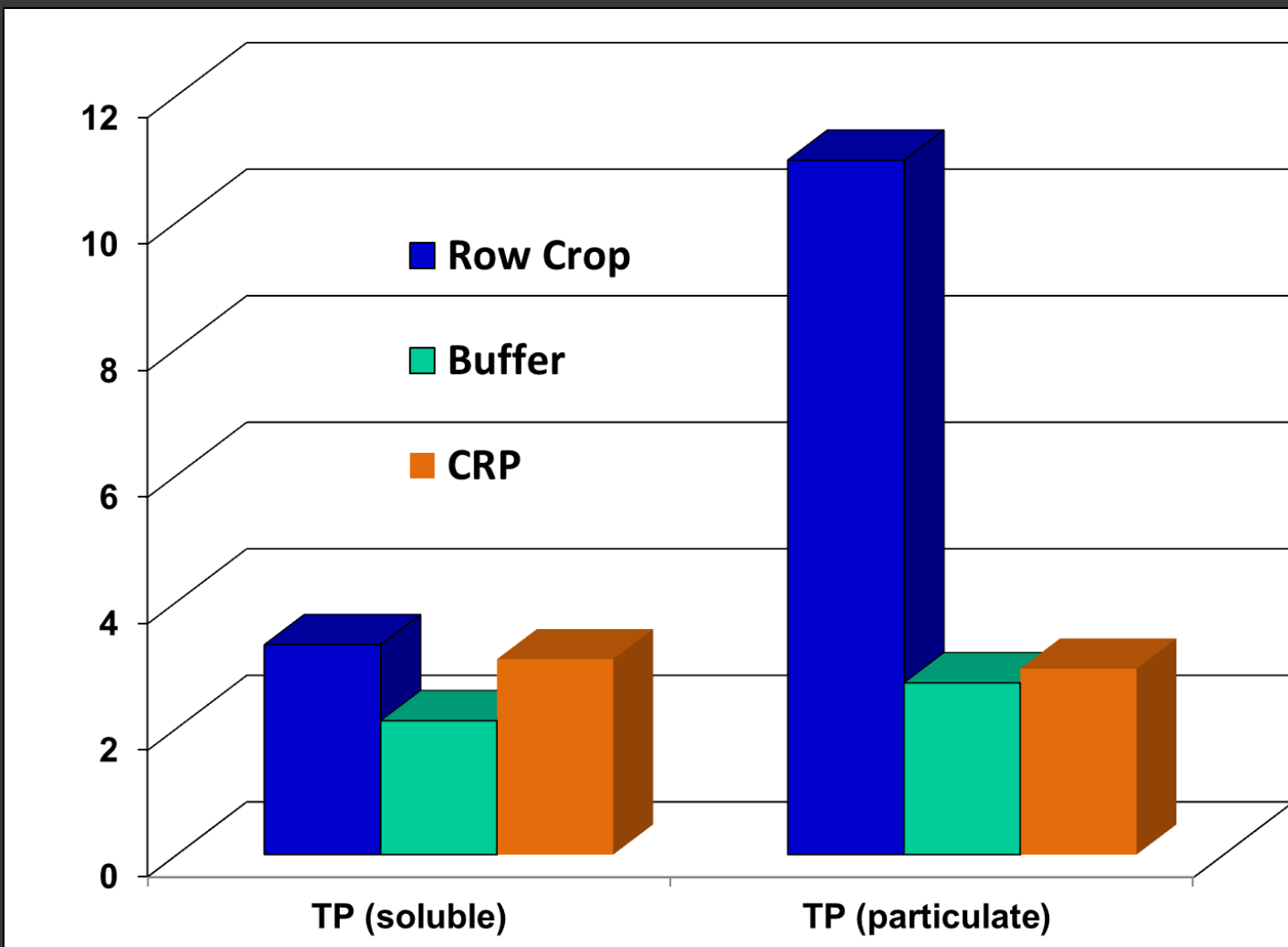
Beasley Lake Watershed: Runoff volume and suspended solids in runoff

8-year average annual



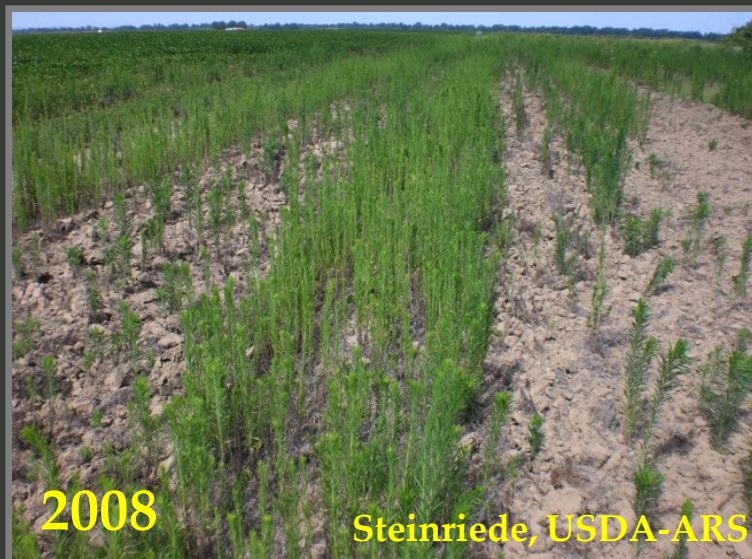
Beasley Lake Watershed: Total Phosphorus runoff

8-year average annual, kg/ha/yr

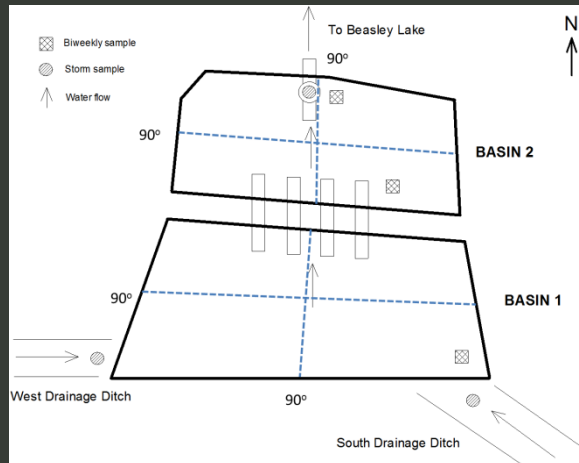


Plant succession in an area converted to a quail buffer

- Edge-of-field quail buffer in Mississippi established in 2007, and seeded with native species mixture
- Plant succession evaluated three times a year from 2008 to present
- Soil sampled periodically and characterized



Beasley Lake Sediment Retention Pond



Sediment Retention Pond Habitat: Aquatic Plants

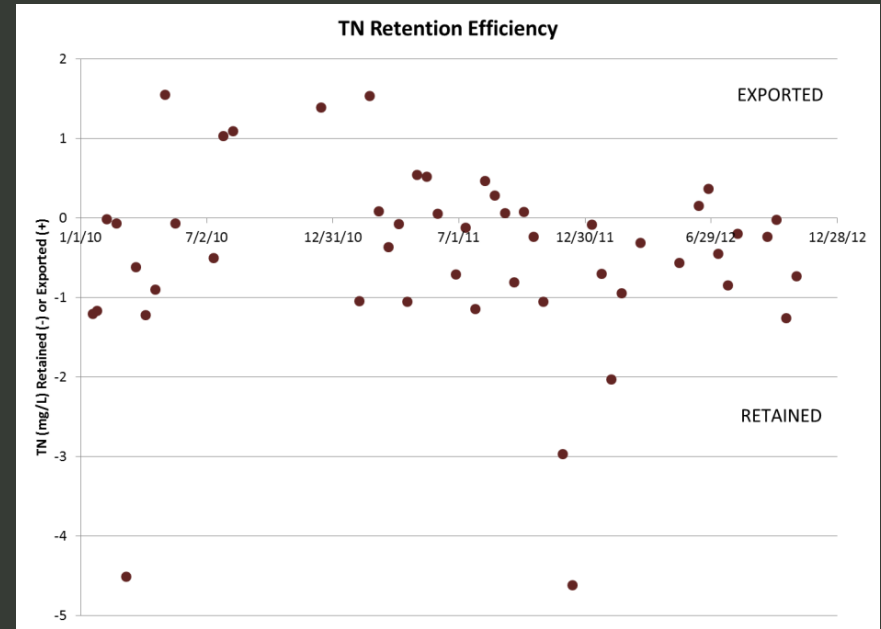
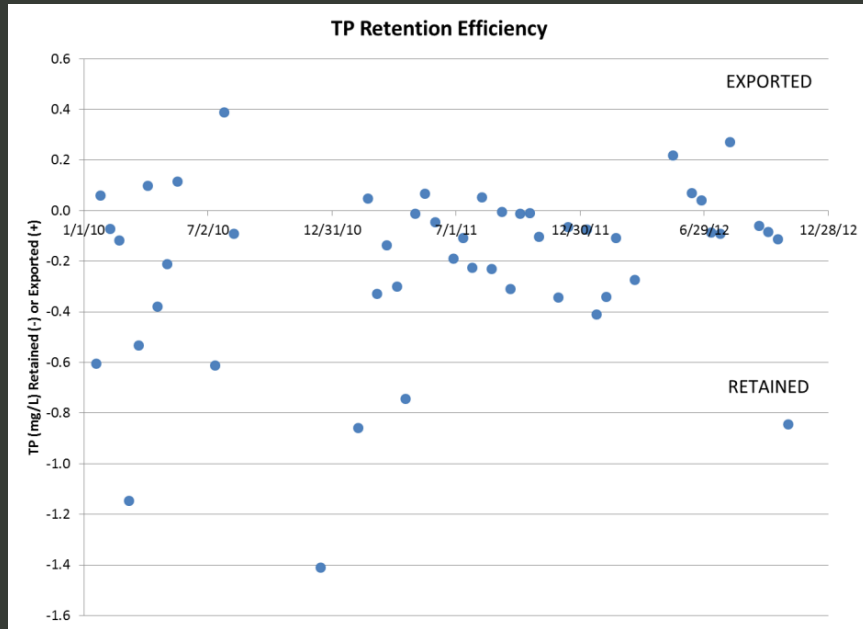
August 2011



August 2012



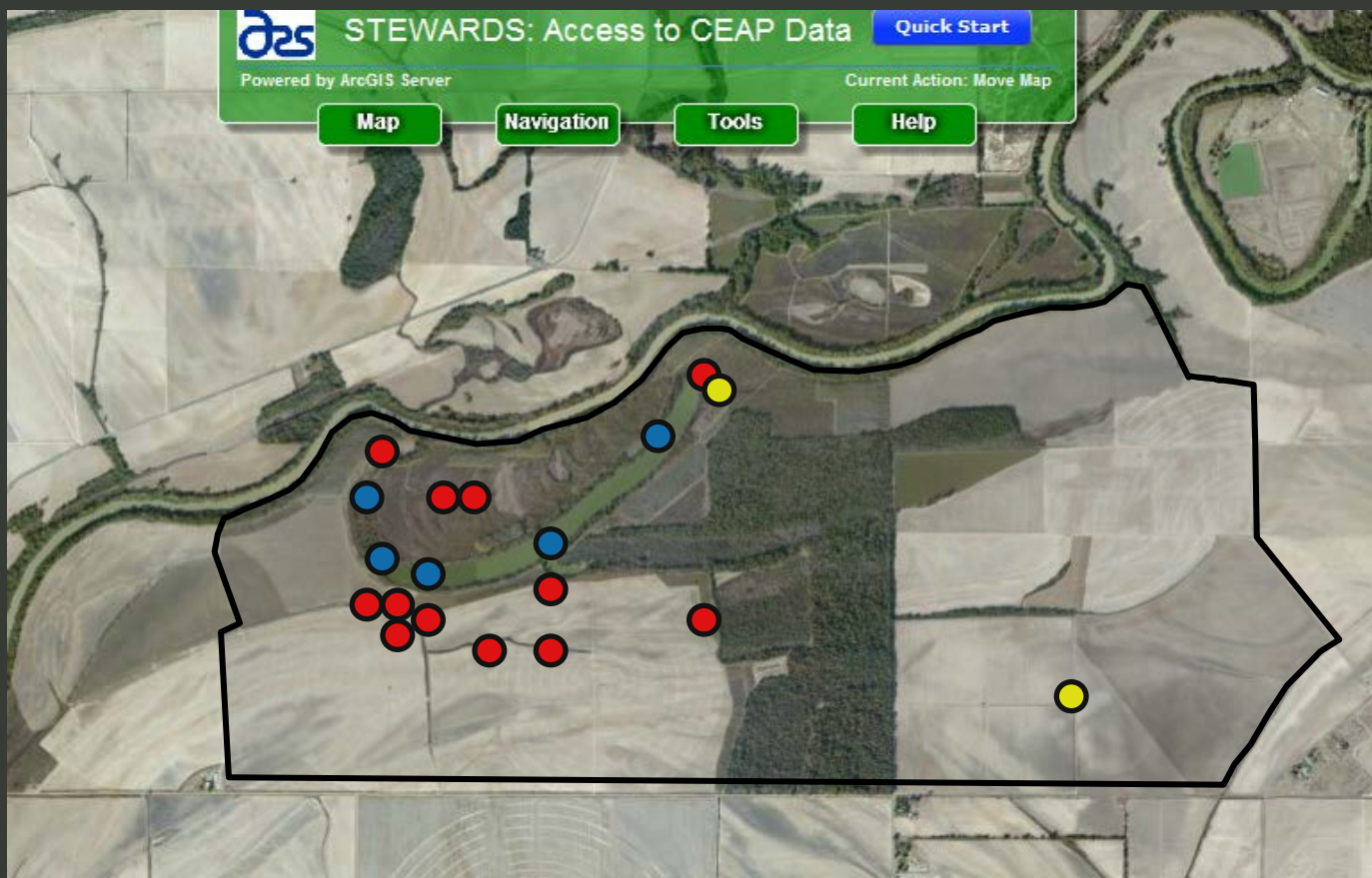
Sediment Retention Pond: Nutrient retention



Remote Sensing and Model Development

- Remote sensing imagery was obtained to evaluate the capability of assessing vegetative characteristics (crop type, buffers, wetlands) for model applications.
- Riparian buffer and wetland assessment technology was developed within AnnAGNPS to evaluate their impact on pollutant loadings into Beasley Lake.
- Long-term climate-change scenarios were developed with ARS-GRL to assess the effects of these changes on loadings into Beasley Lake.

Beasley Lake STEWARDS Data



- Lake water quality 1995-2012
- Watershed meteorological data 1996-2012
- Runoff water quality (available Fall 2013) 2005-2012
- Watershed management data (available Summer 2014) 1995-2012