

Use of Monitoring Information to Identify and Implement Water Quality Improvements

Tyler Baker

TVA

Aquatic Monitoring and Management

- **Systematic Monitoring Program Started in 1990 with 12 Reservoirs, Now 31**

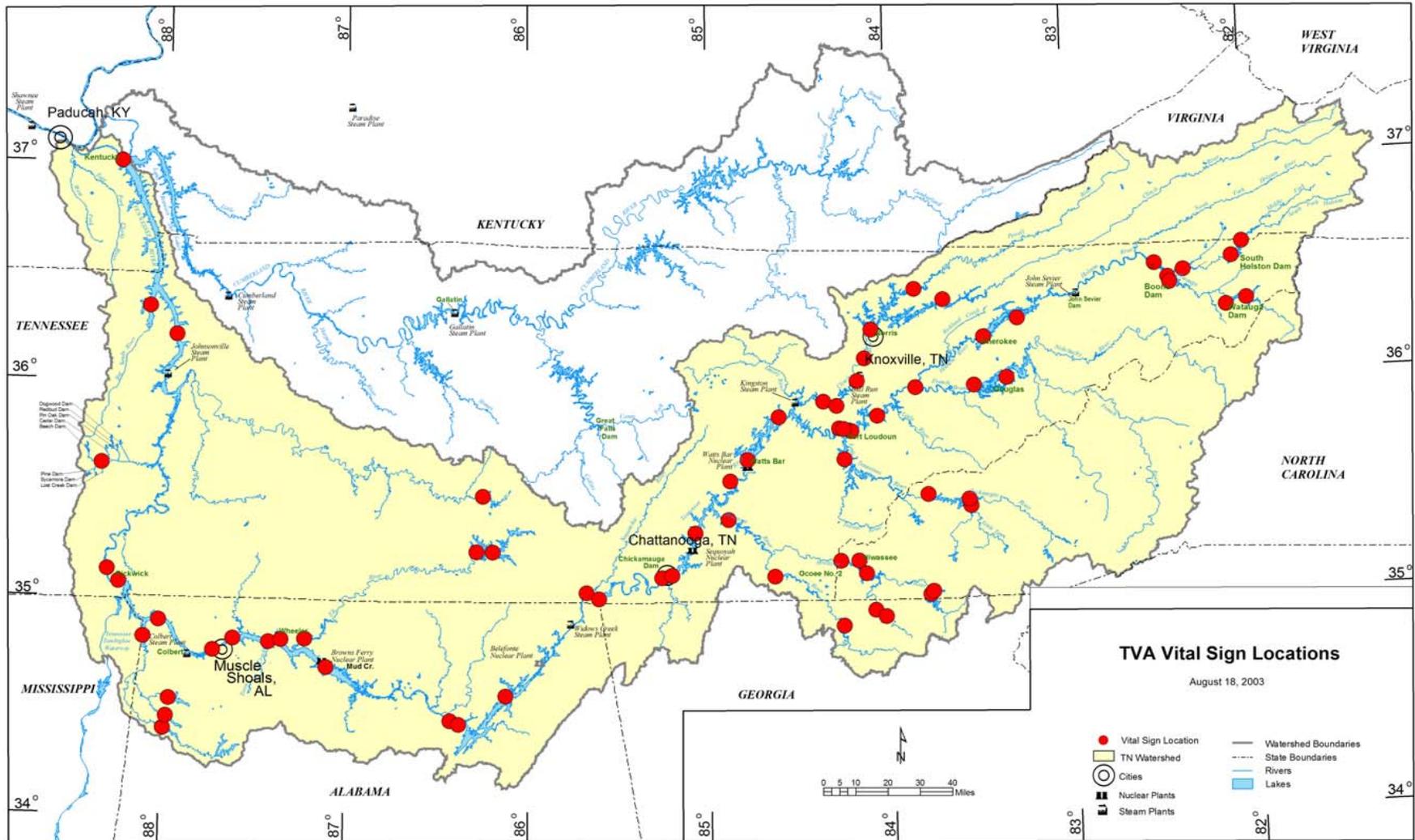
- **Objectives:**
 - Provide information on current reservoir “health”
 - Determine if conditions are changing
 - Target detail assessment studies
 - Provide a means of reporting results to the public

- **Uses Weight-of-Evidence Approach Based on Five Key Indicators**
 - Chlorophyll
 - Dissolved Oxygen
 - Fish Community
 - Benthic Macroinvertebrate Community
 - Sediment Quality

- **Reservoir Ecological Health Score Developed for Each Reservoir**

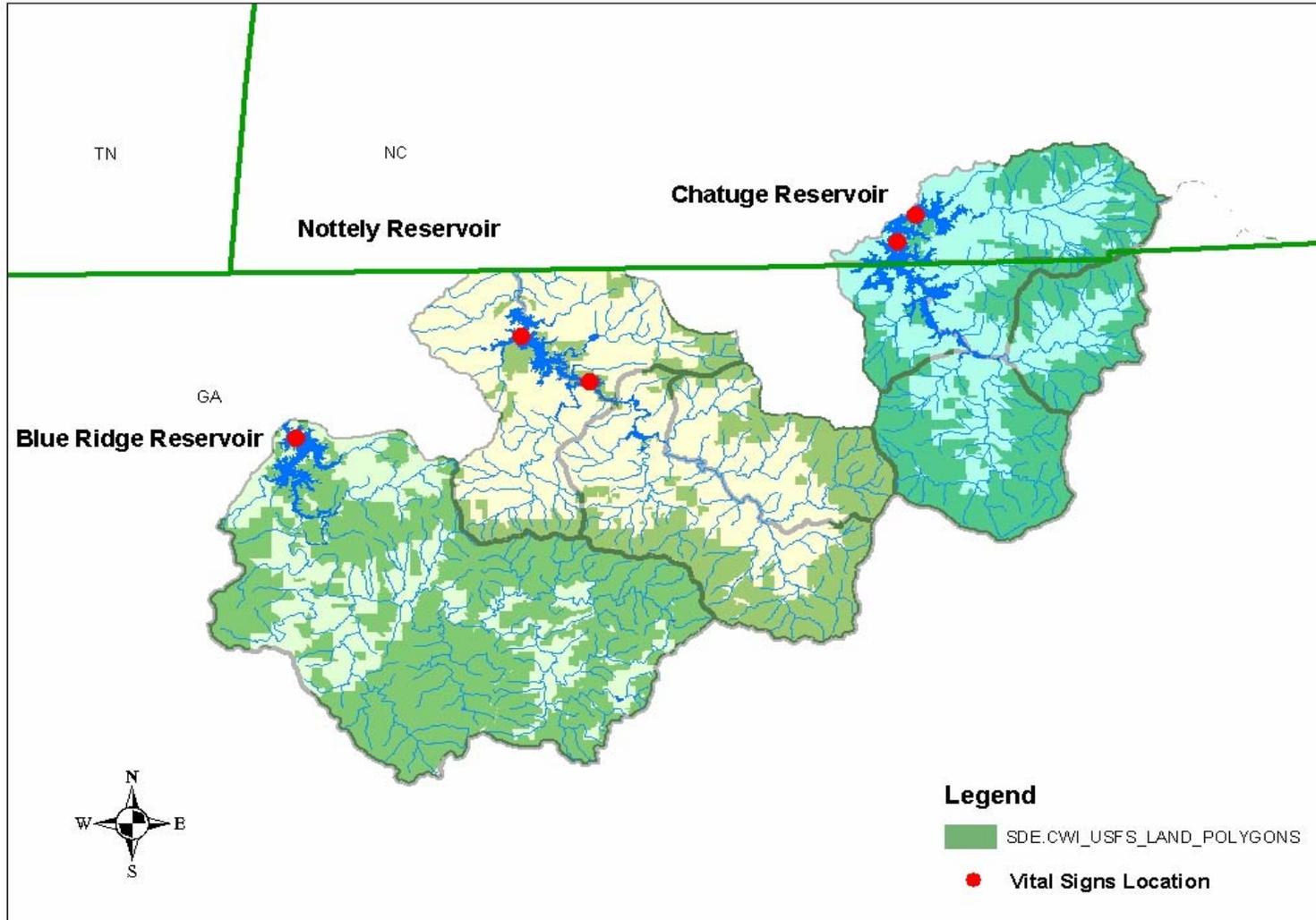


TVA Reservoir Vital Signs Monitoring Locations



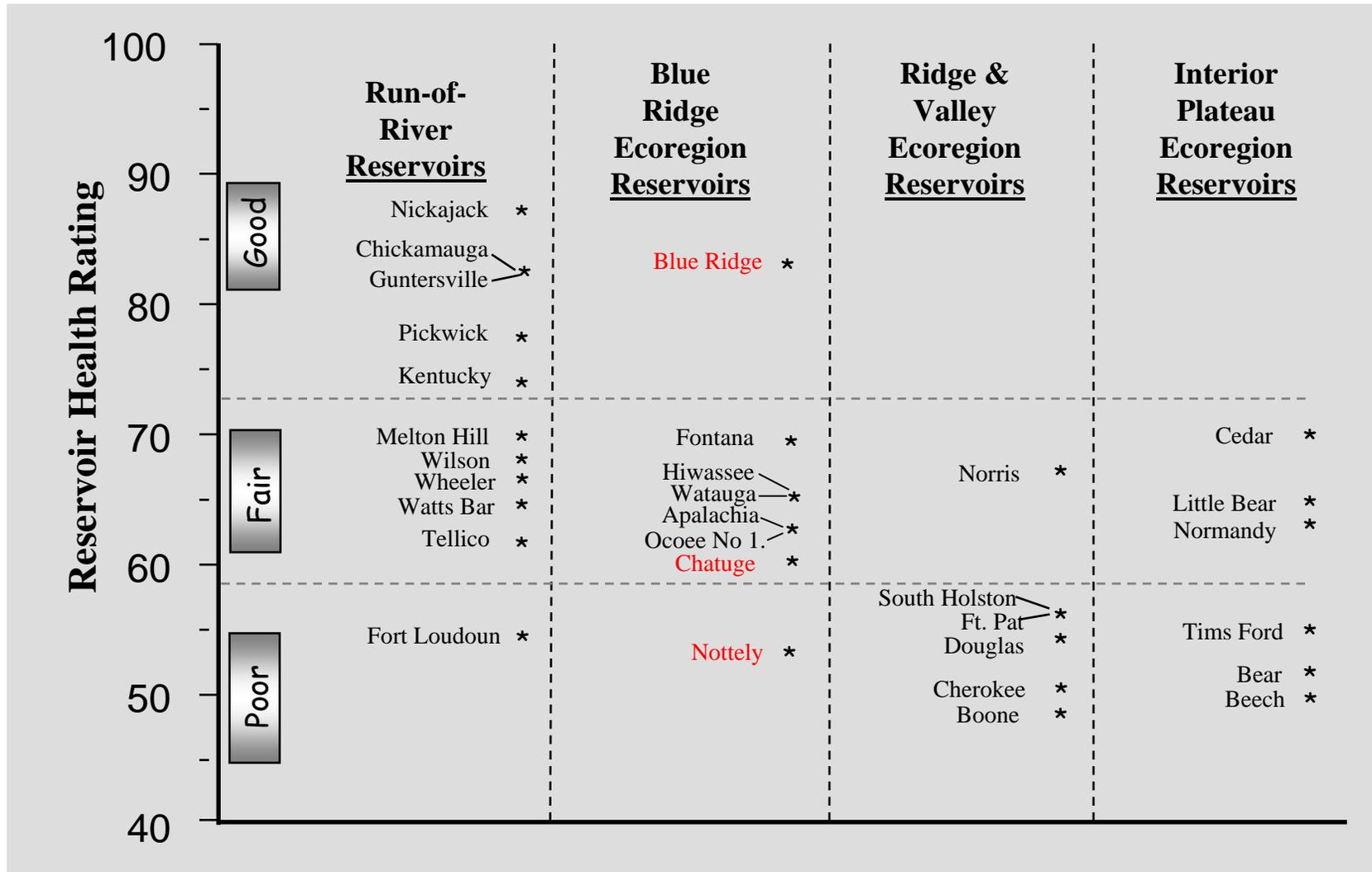


TVA Reservoir Vital Signs Monitoring Locations



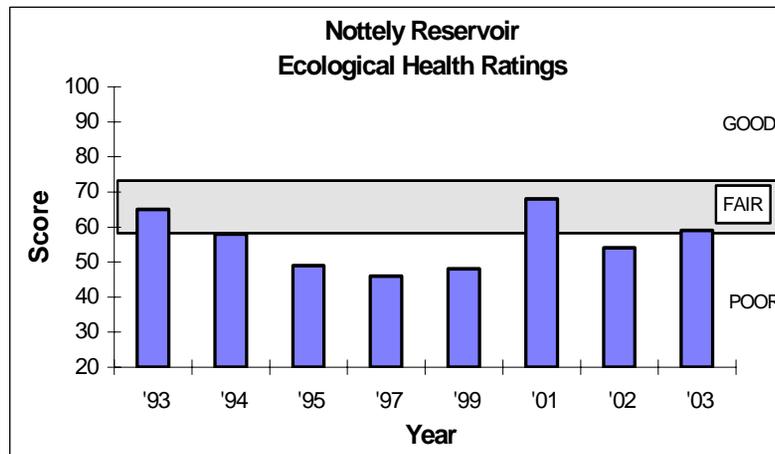
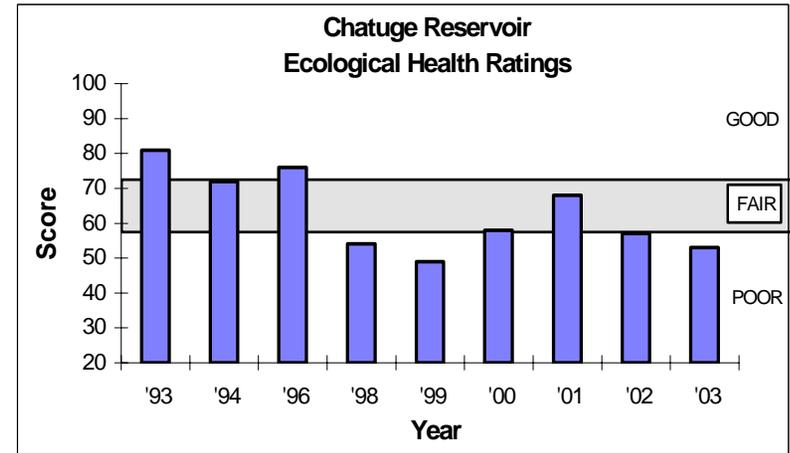
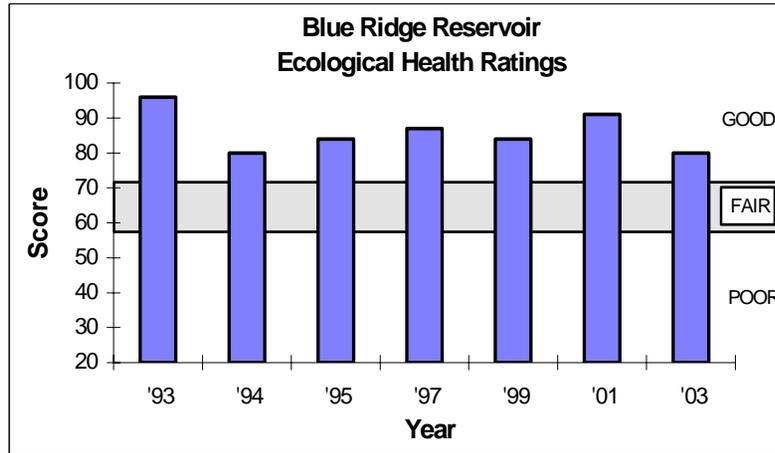


Long-Term Average Reservoir Ecological Health Scores





Long-Term Reservoir Ecological Health Scores 1993 to 2003

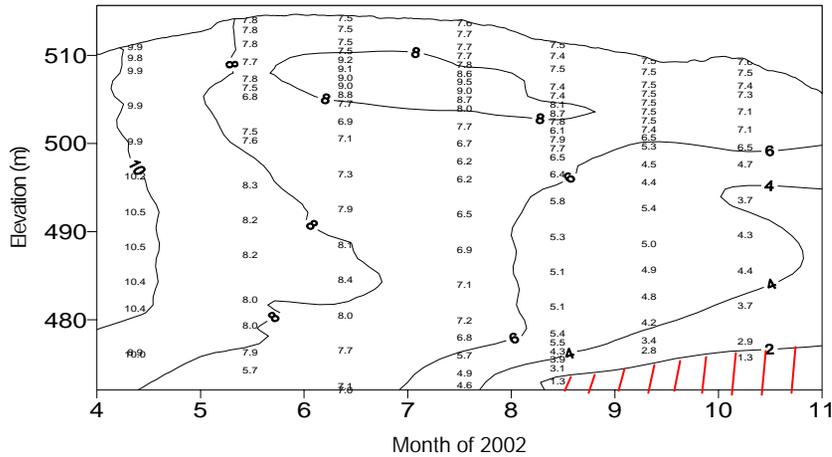




Dissolved Oxygen Concentrations

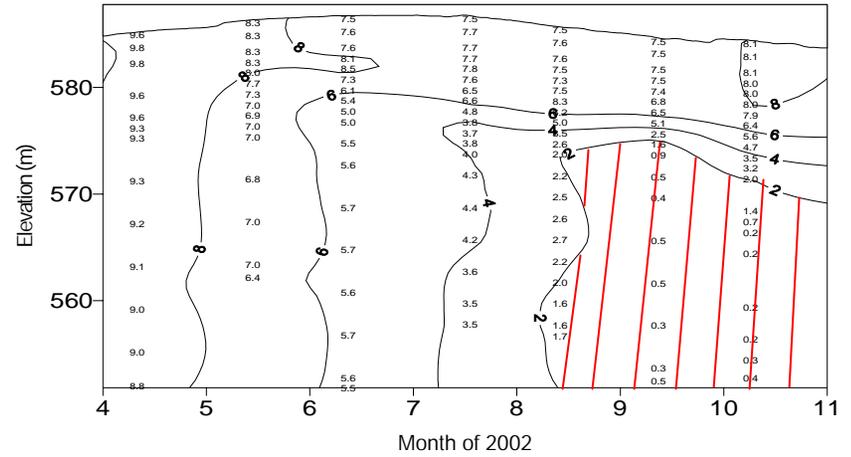
Blue Ridge Reservoir - ToRM 54.1

Dissolved Oxygen (mg/L)



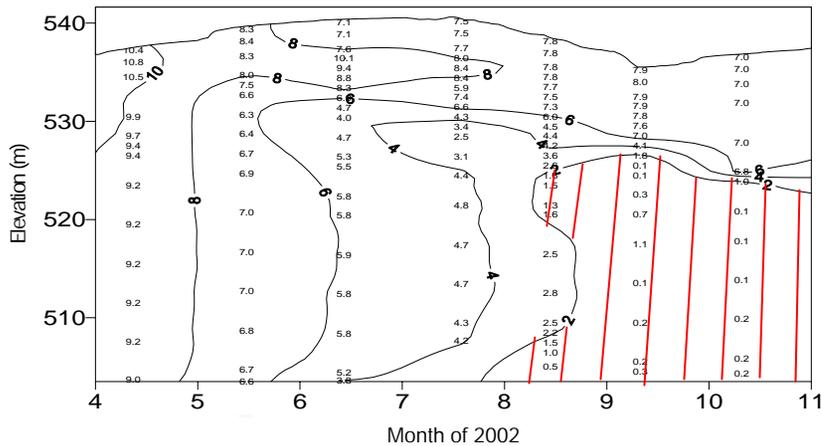
Chatuge Reservoir - HiRM 122.0

Dissolved Oxygen (mg/L)

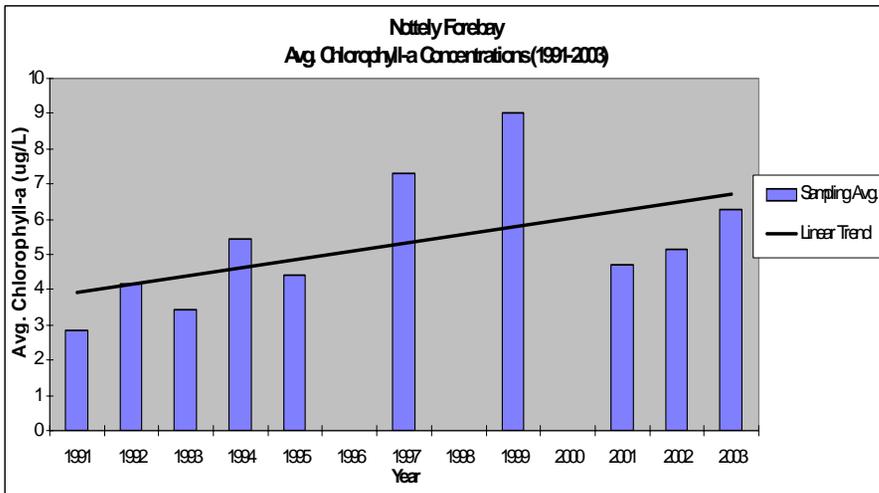
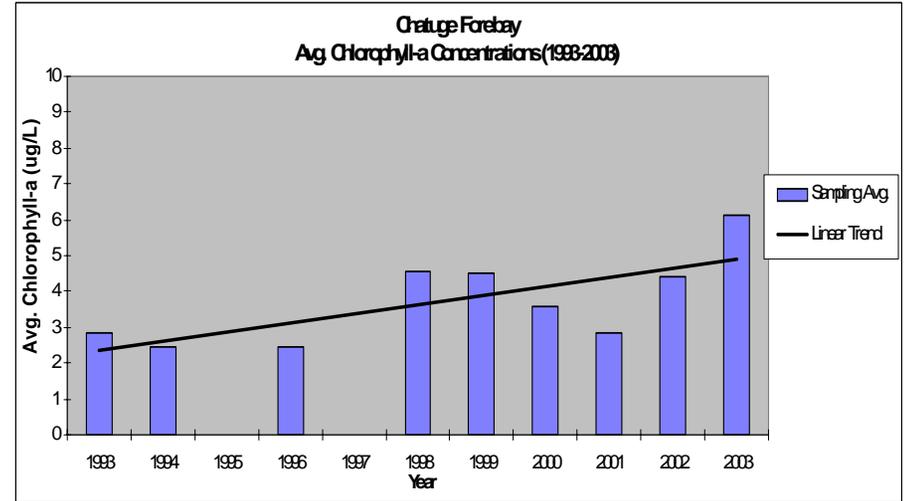
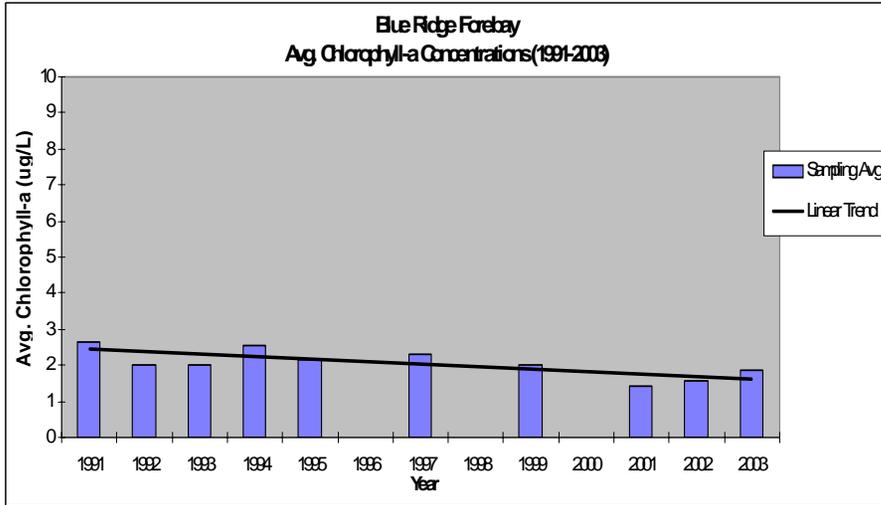


Nottely Reservoir - NRM 23.5

Dissolved Oxygen (mg/L)



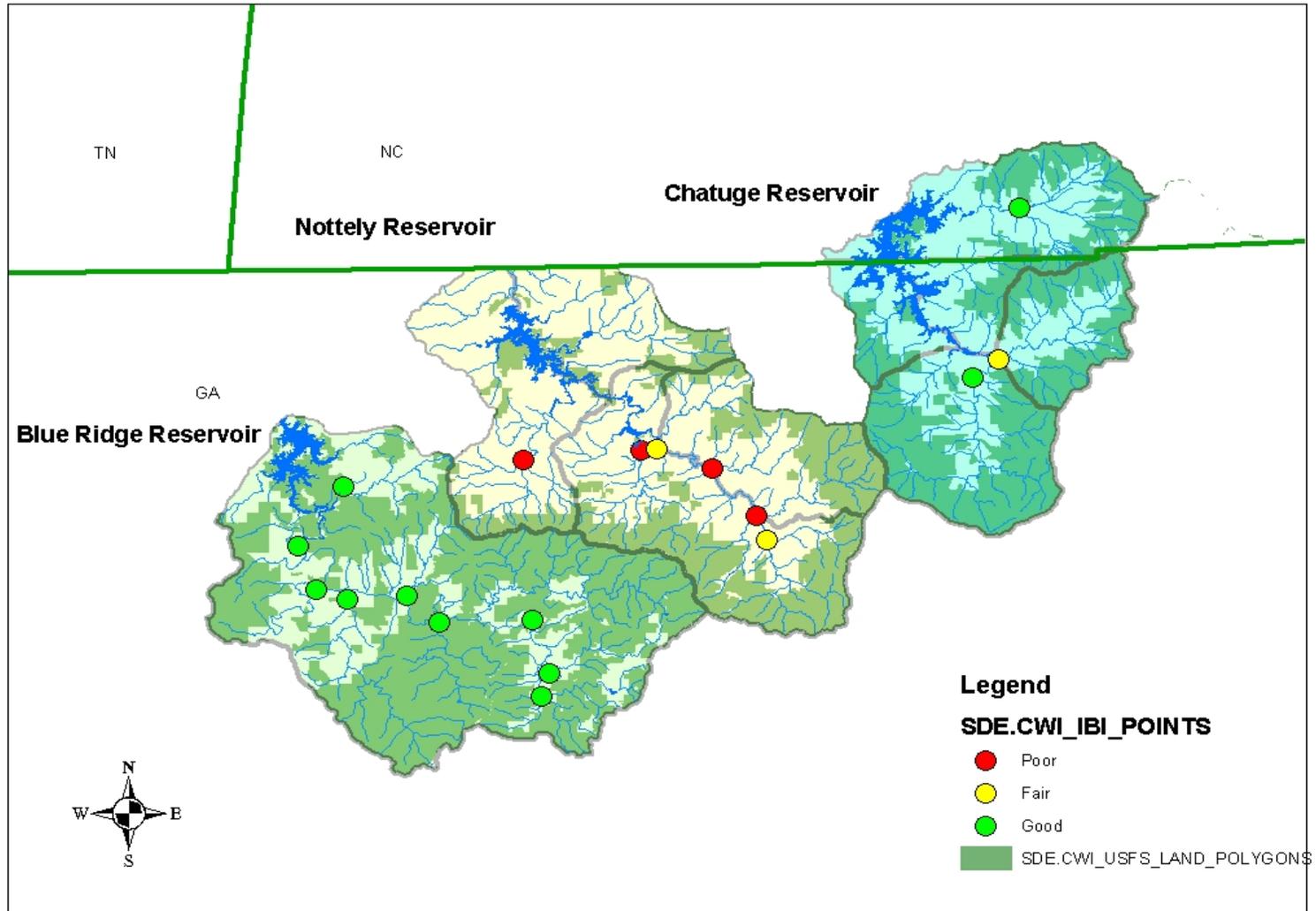
Chlorophyll_a Concentrations





Reservoir Vital Signs Monitoring: Indicator Ratings Through 2002

Reservoir	Chlorophyll	DO	Fish	Benthos	Sediment
Blue Ridge	Good	Good	Fair/Good	Fair/Good	Good
Chatuge	Good ↓	Fair/Poor	Fair	Fair	Poor/Fair
Nottely	Fair → Poor	Poor	Fair	Poor/Fair	Good



- TVA Watershed Teams- Develop an “ability to act” on water quality issues in targeted areas.
 - Build local coalitions
 - Partner on watershed improvement projects
 - Produce measurable improvements in watershed condition

- Formed in early 90's
- Covers four counties in two states
- Active in numerous water quality improvement projects
- Communicated TVA's monitoring results in a variety of public forums

Hiwassee River Watershed Coalition

- \$216,000 grant from the GA legislature
- Determine real “drivers” of deterioration of water quality in Chatuge & Nottely
- Additional Tech support through the Coalition's partnership with TVA
- Develop Watershed Action Plans to help reverse declining trends
- Gain community commitment & develop partnerships to implement plan!

- **Determine real “drivers” of deterioration of water quality in Chatuge & Nottely**
 - Collected aerial photography data for detailed land use analysis 2001
 - Monitored 11 sites in the Nottely watershed in 2002
 - Monitored 11 sites in the Chatuge watershed in 2003
 - Computer modeling in 2004 for each watershed

- Developing A Reservoir Water Quality Model Using **CE-Qual-W2**
- Integrated With **Hydrological Simulation Program Fortran Model (HSPF)**

Next Steps:

- Develop Watershed Action Plans to help reverse declining trends
- Gain community commitment & develop partnerships to implement plan!