



Update on West Point Lake Modeling and Standards Revisions

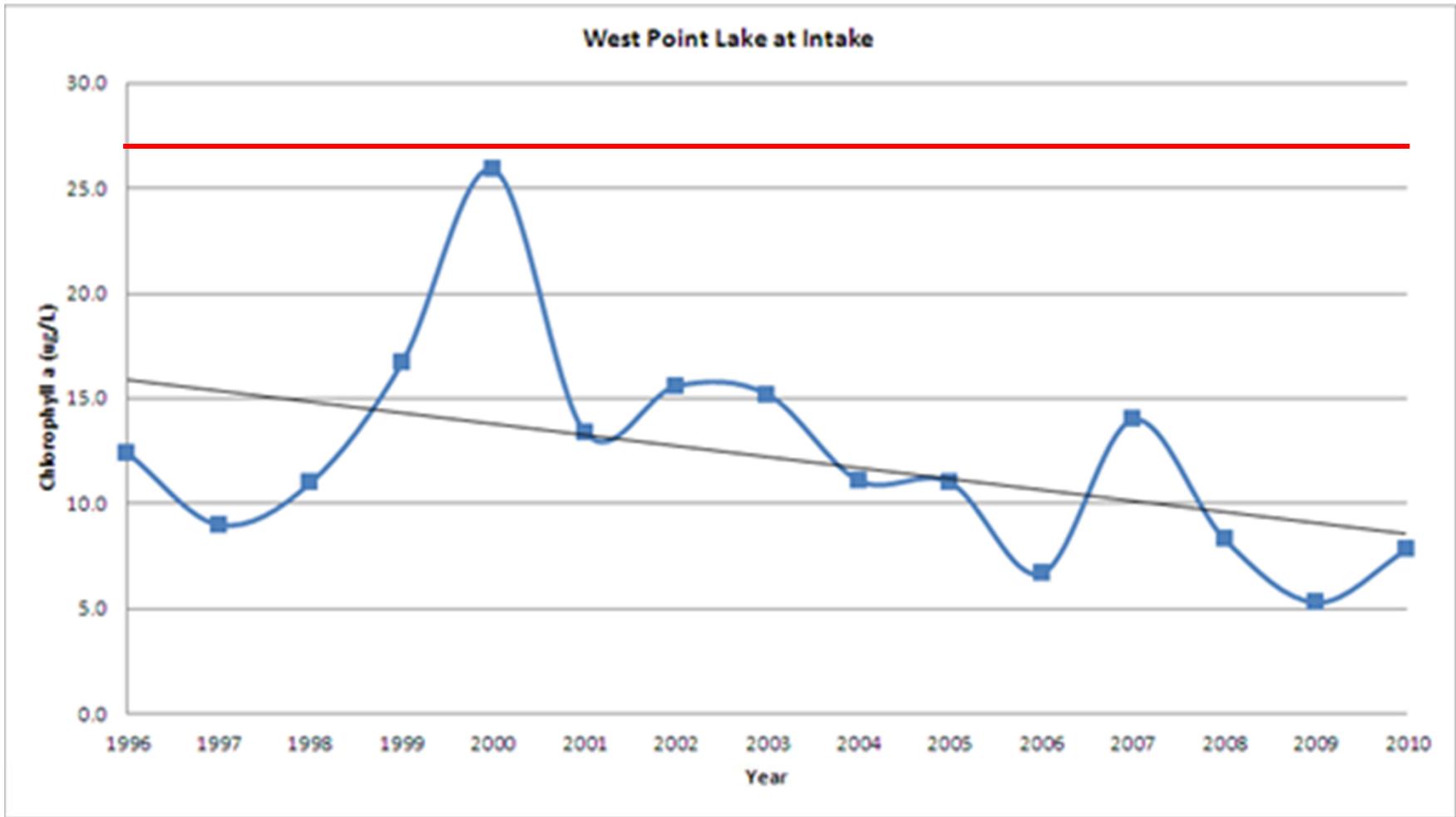
June 4, 2012

Presented by:
Elizabeth Booth, GA EPD

Outline

- ❑ LaGrange's request to revise standards
- ❑ Previous Meetings
- ❑ Meeting Summaries
- ❑ Lake Standard Revisions
- ❑ Next Steps
- ❑ Questions





Previous Meetings

- ❑ November 5, 2010
- ❑ January 20, 2011
- ❑ August 19, 2011
- ❑ September 13, 2011
- ❑ January 4, 2012

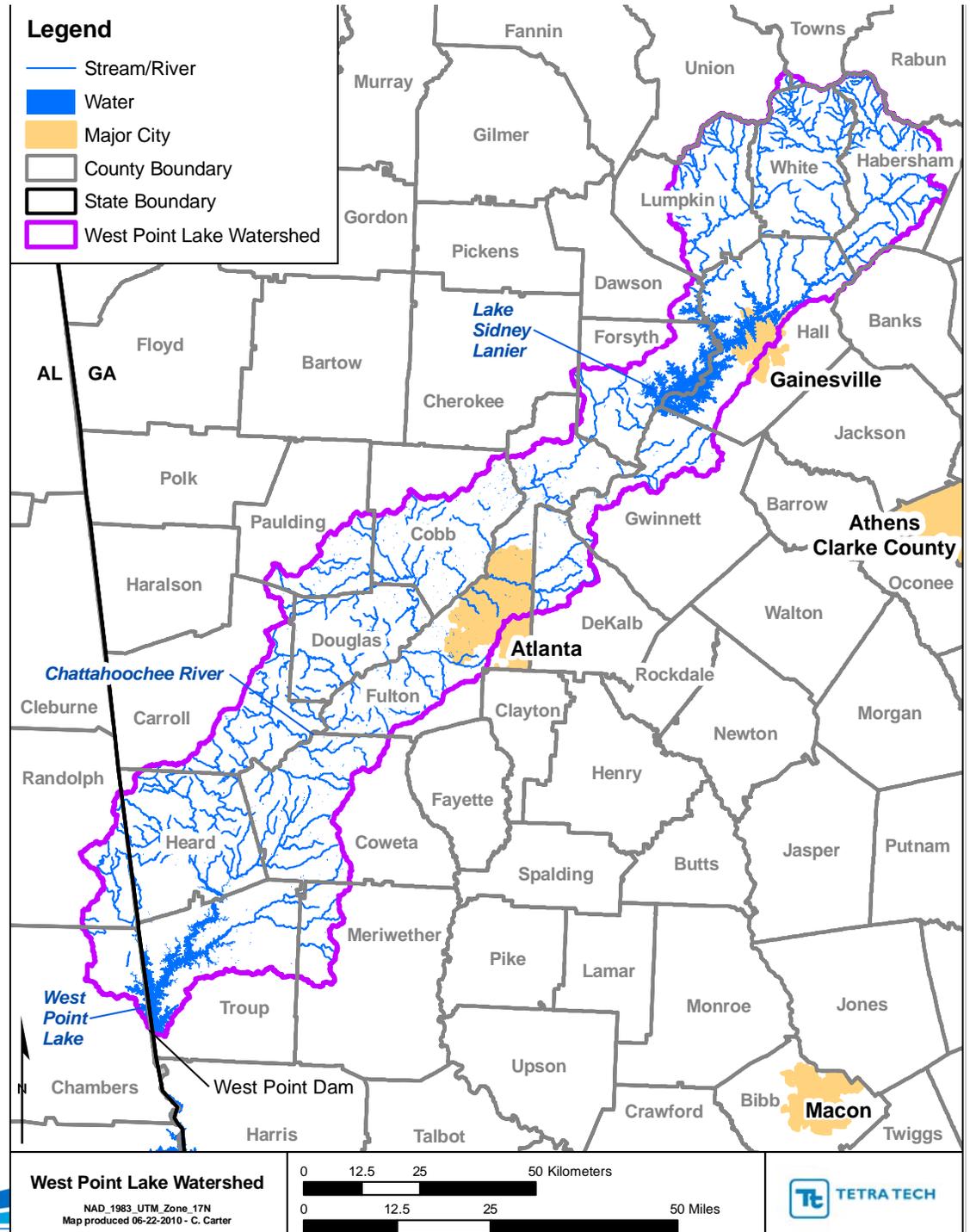


November 5, 2010 Meeting

- Review the methodology that will be used to determine the revised standards
- Watershed Model
 - Loading Simulation Program C++ (LSPC)
- Hydrodynamic and Water Quality Lake Model
 - Environmental Fluid Dynamics Code (EFDC)
- Database Management
 - Water Resources Database (WRDB)



West Point Lake Watershed



January 20, 2011 Meeting

□ Present Watershed Modeling Results

- Hydrology Calibration
- Water Quality Calibration

□ Present Preliminary Lake Modeling Results

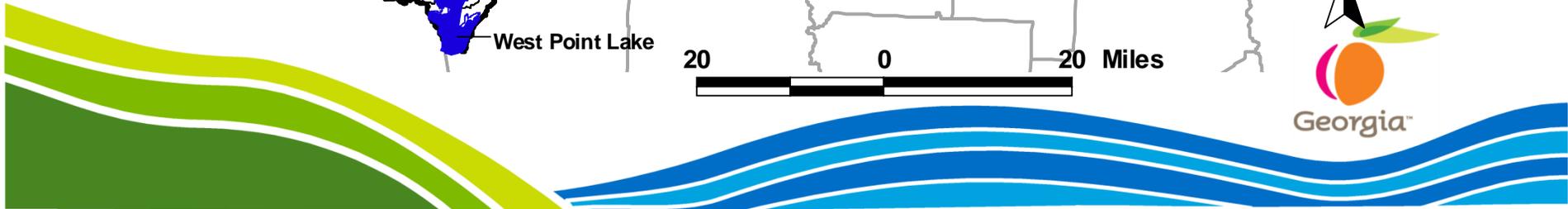
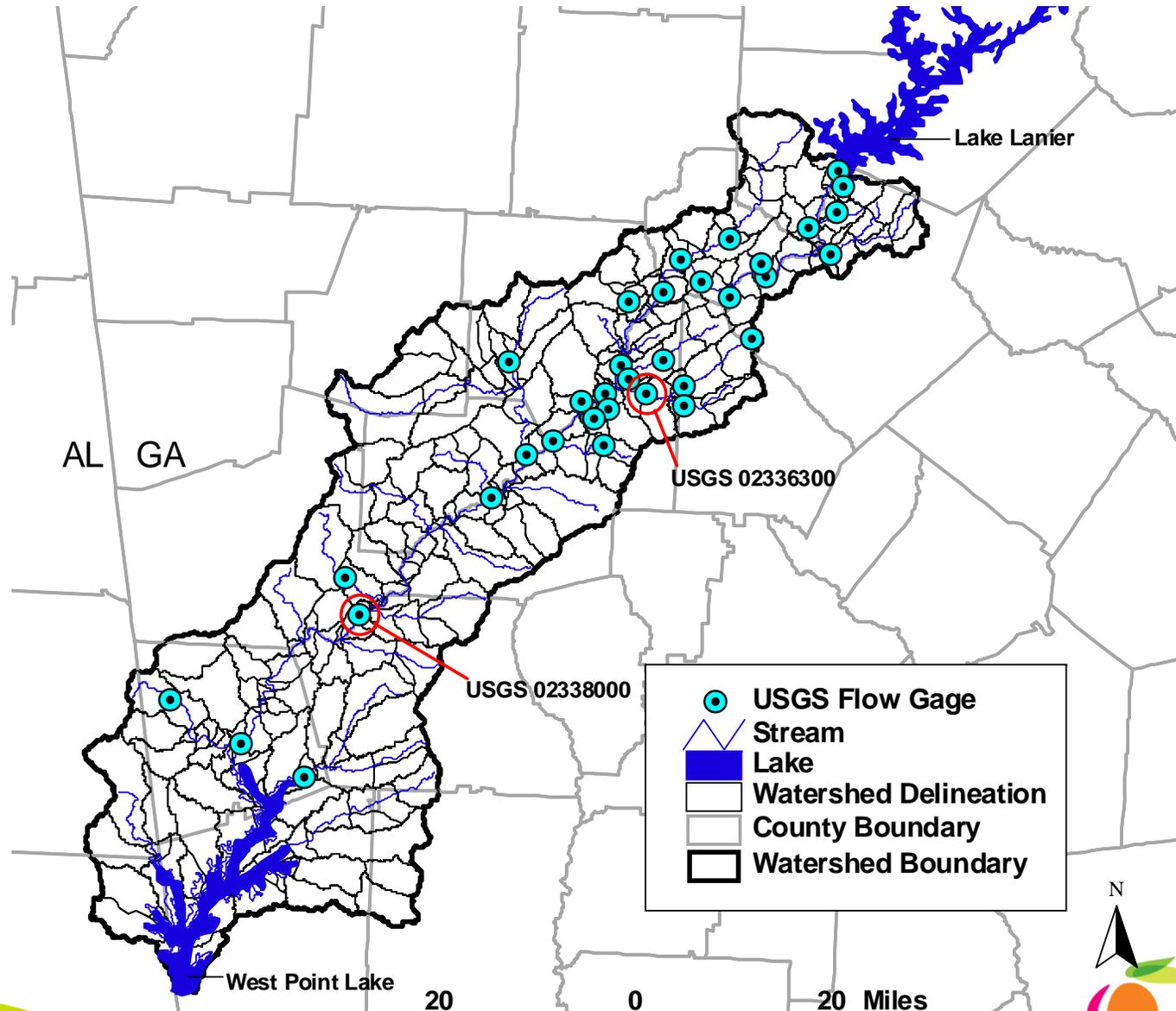
- Water Surface Elevation
- Water Temperature Calibration
- Nutrient Calibration
- Chlorophyll a Calibration

□ Preliminary Proposed Chlorophyll Standards

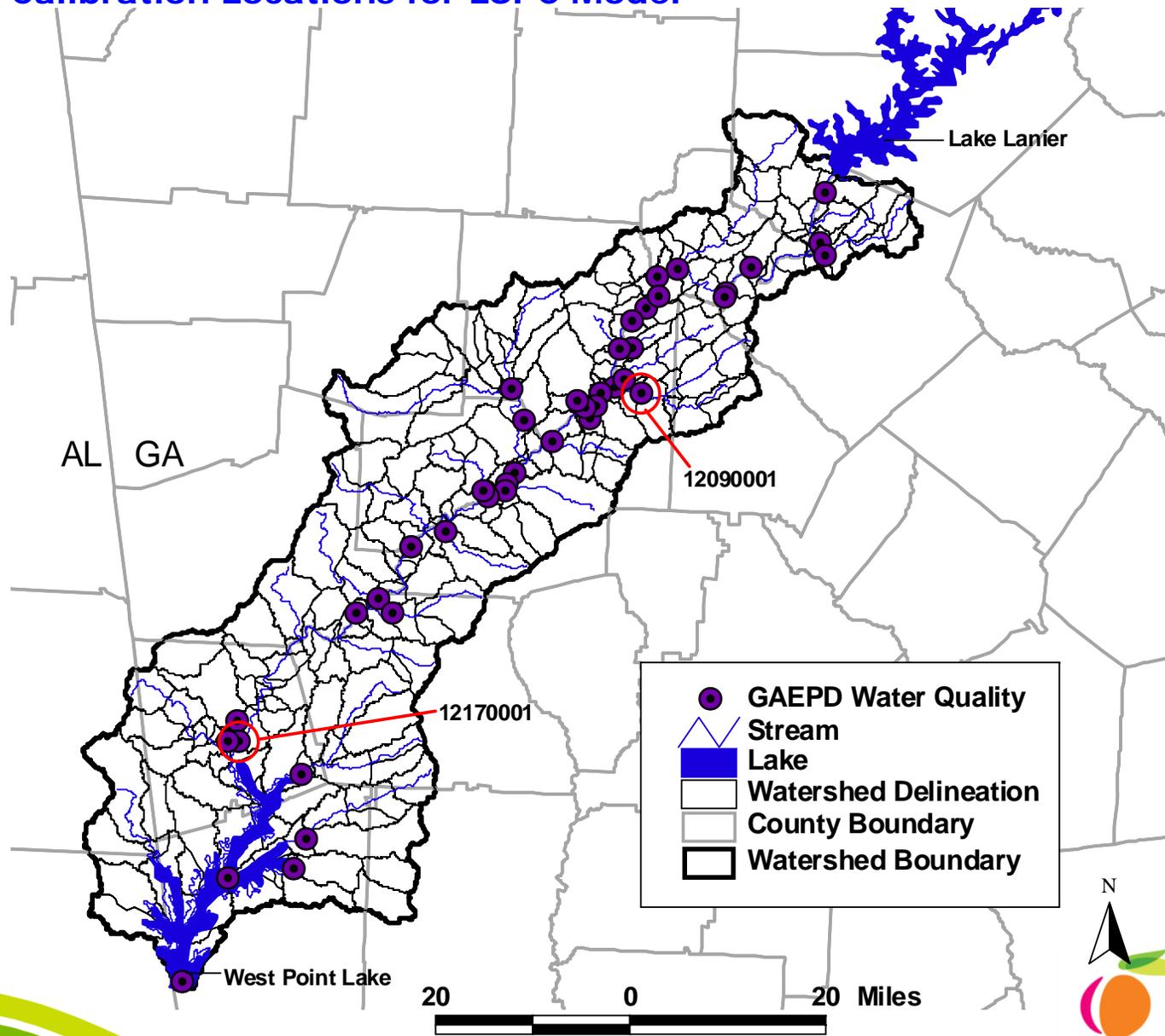
- Intake 27 ug/L, Dampool 25 ug/L



Hydrology Calibration Locations for LSPC Model



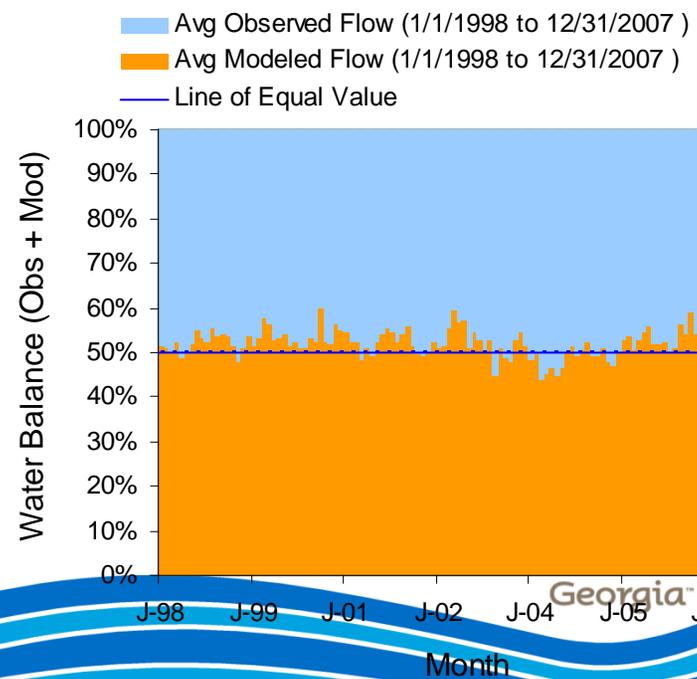
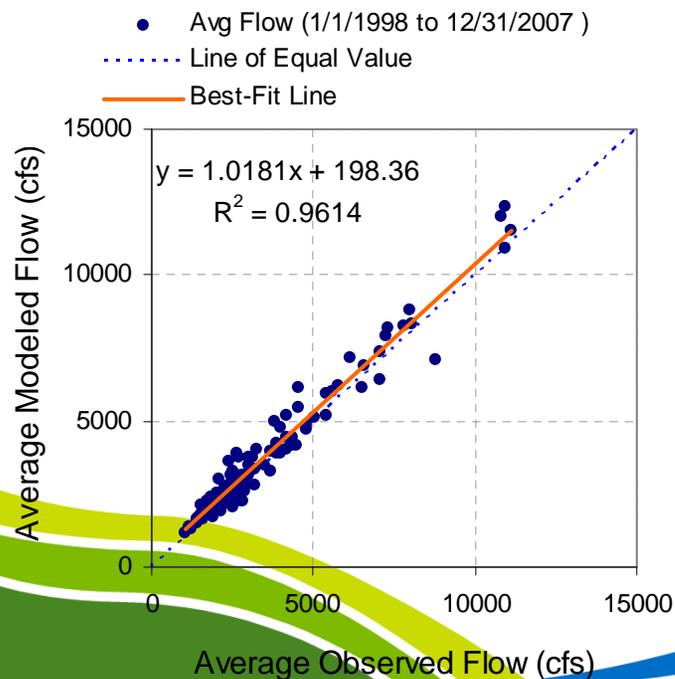
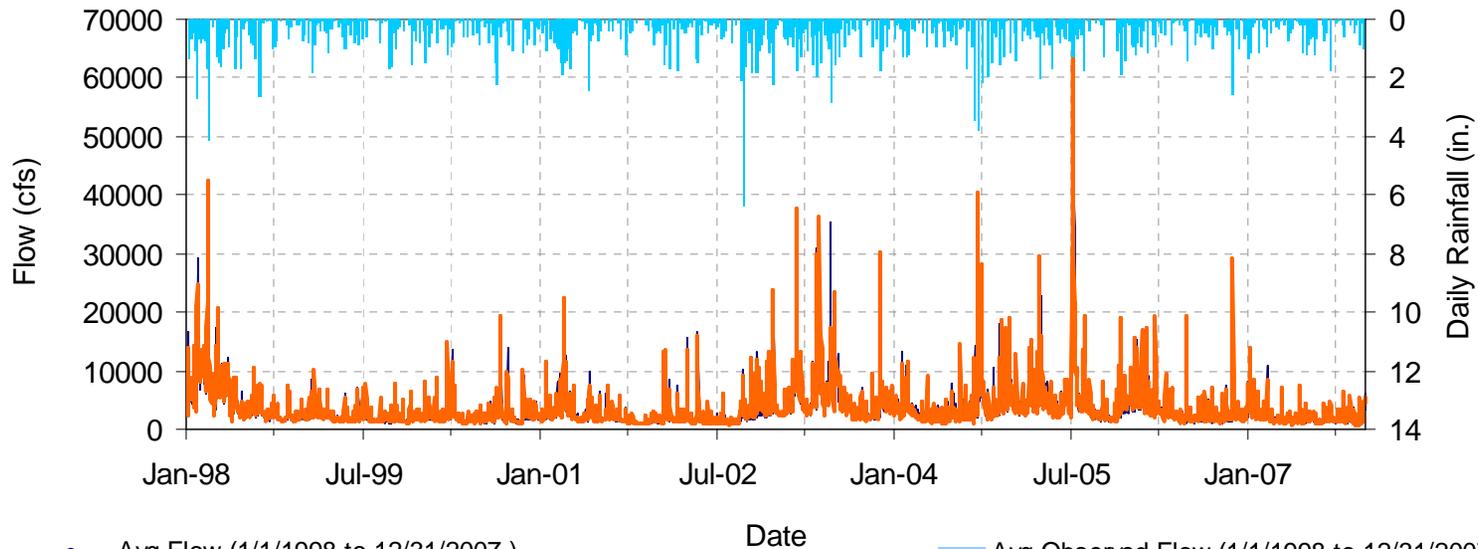
Water Quality Calibration Locations for LSPC Model



Chattahoochee River near Whitesburg, GA

02338000

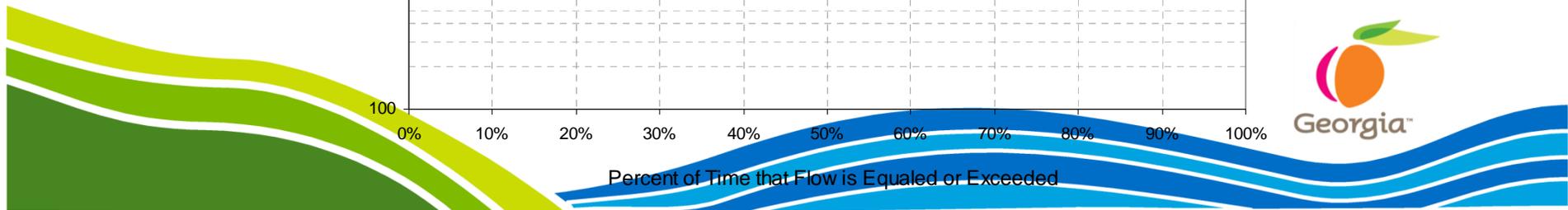
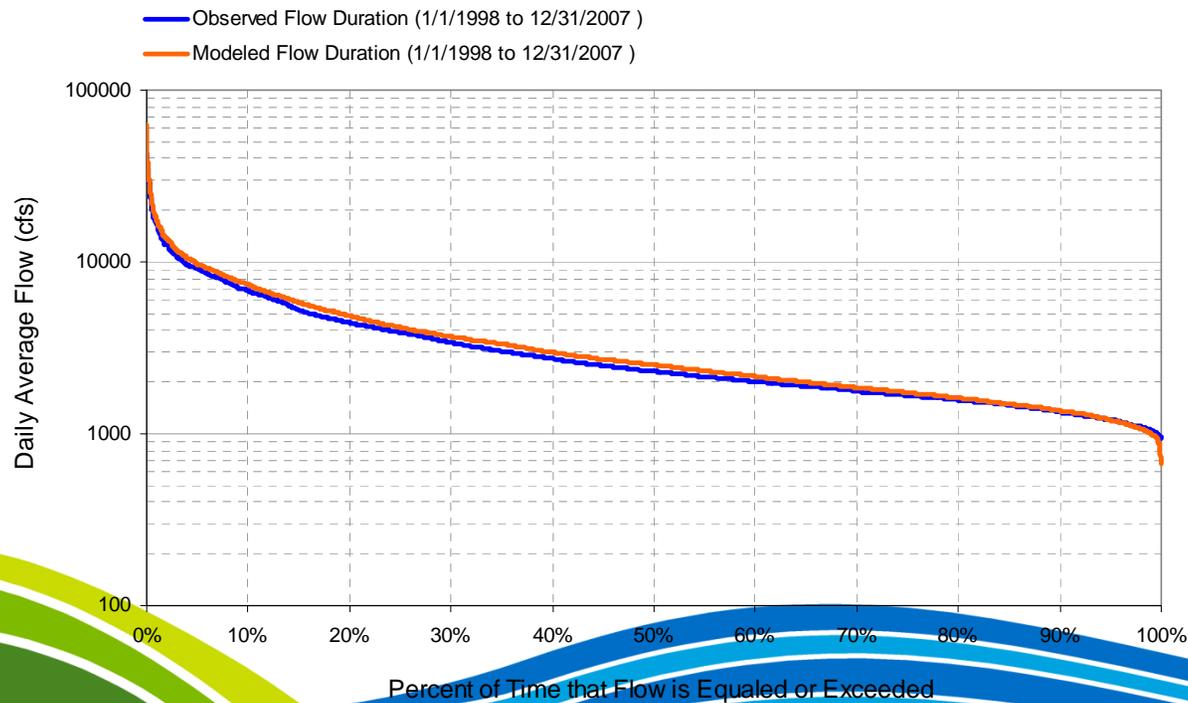
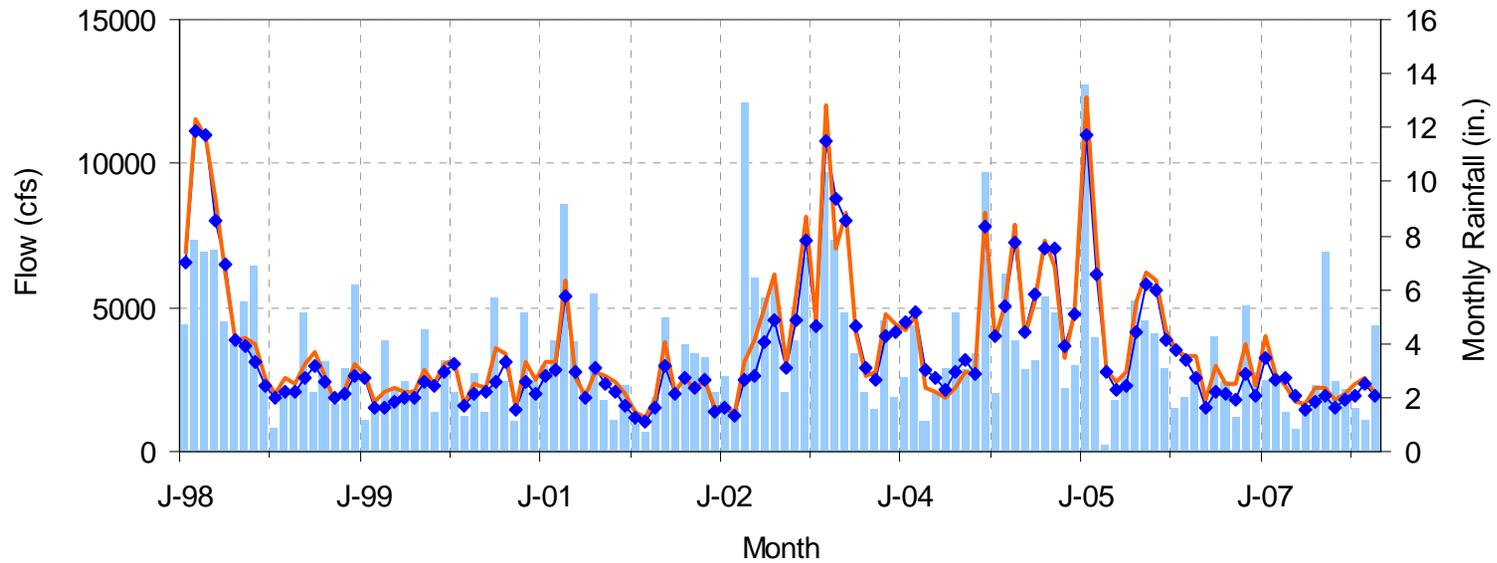
- Avg Daily Rainfall (in.)
- Avg Observed Flow (1/1/1998 to 12/31/2007)
- Avg Modeled Flow (Same Period)



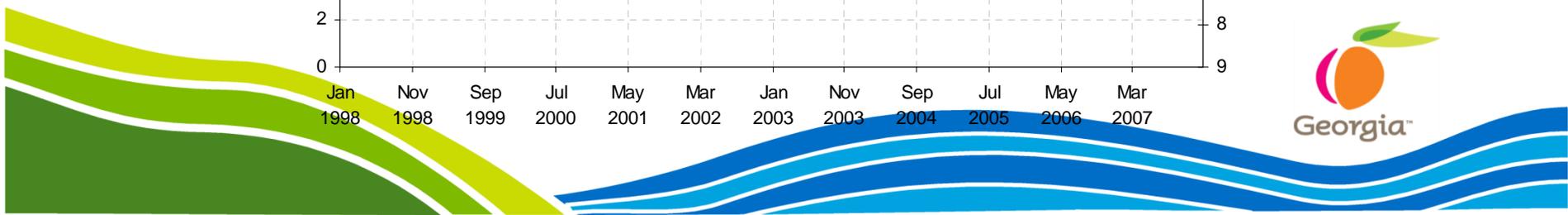
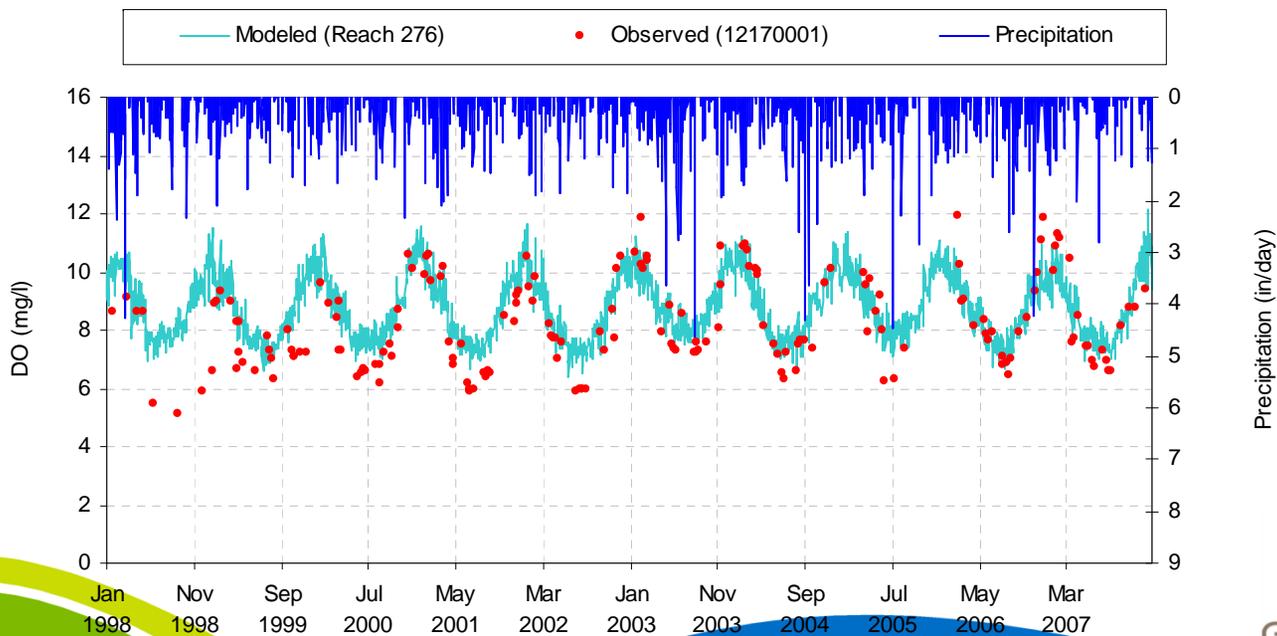
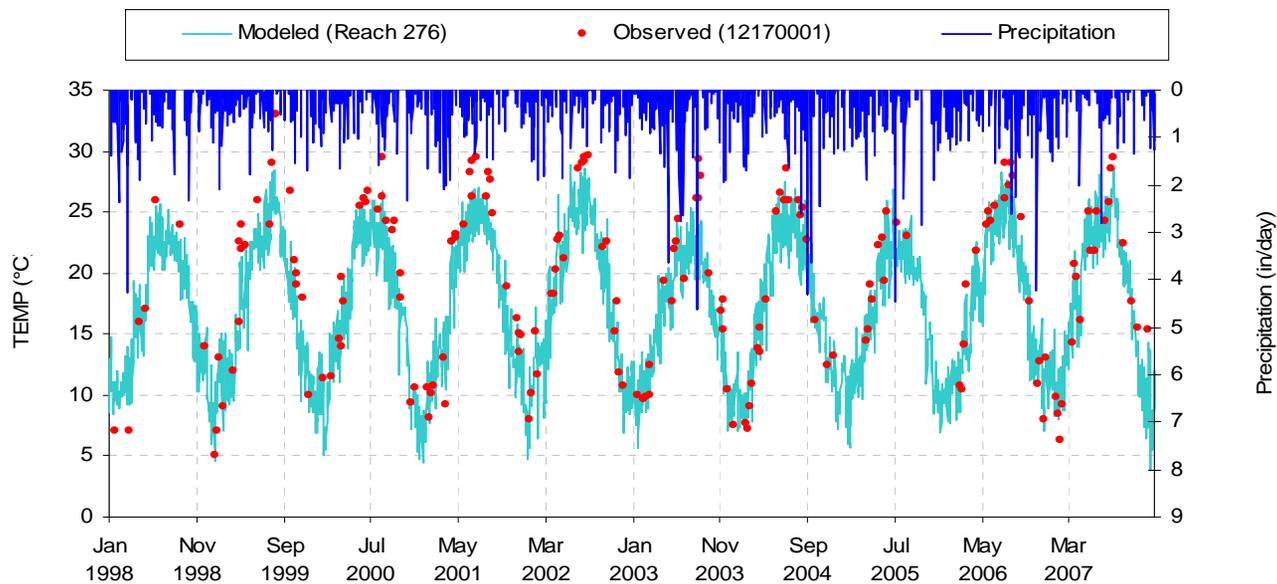
Georgia

Chattahoochee River near Whitesburg, GA 02338000

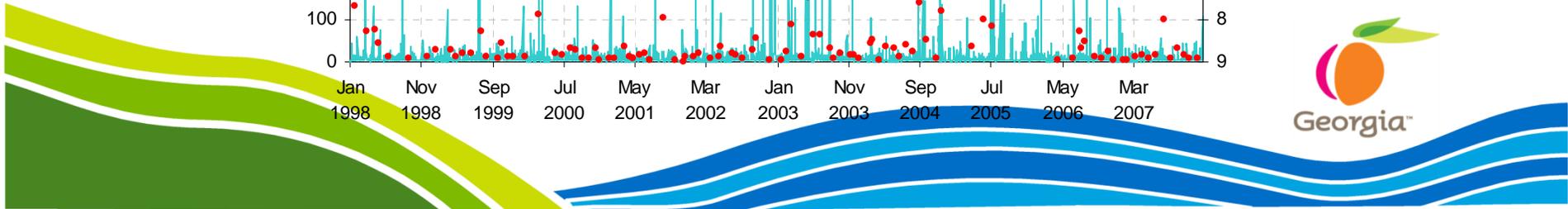
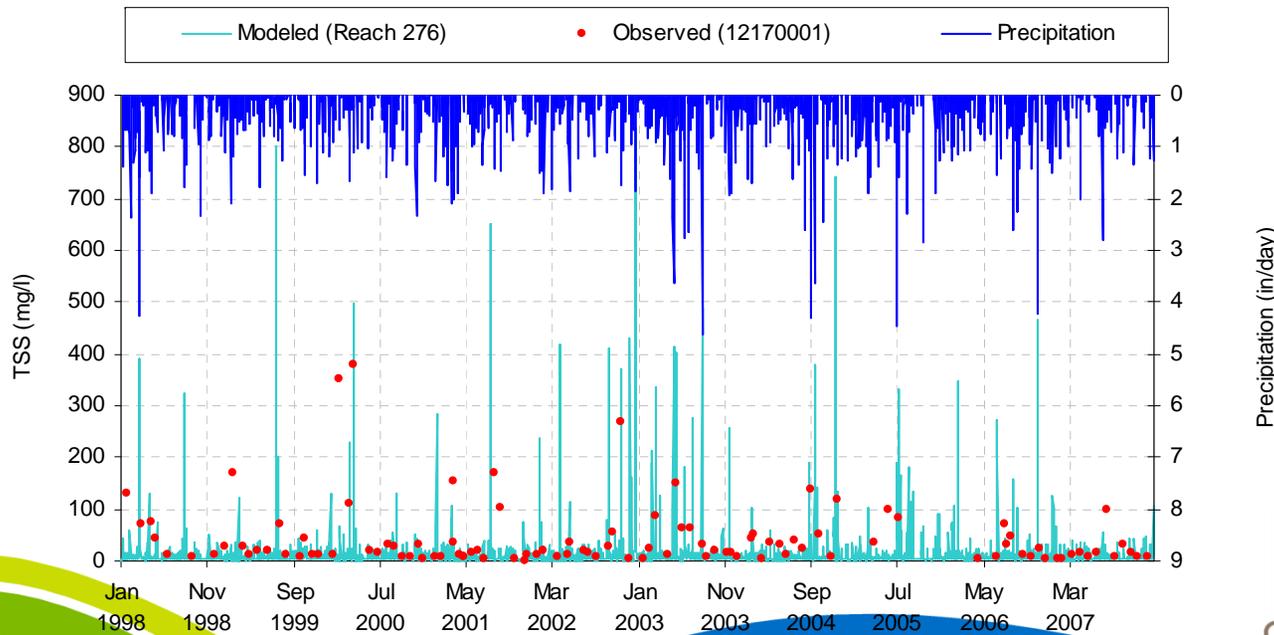
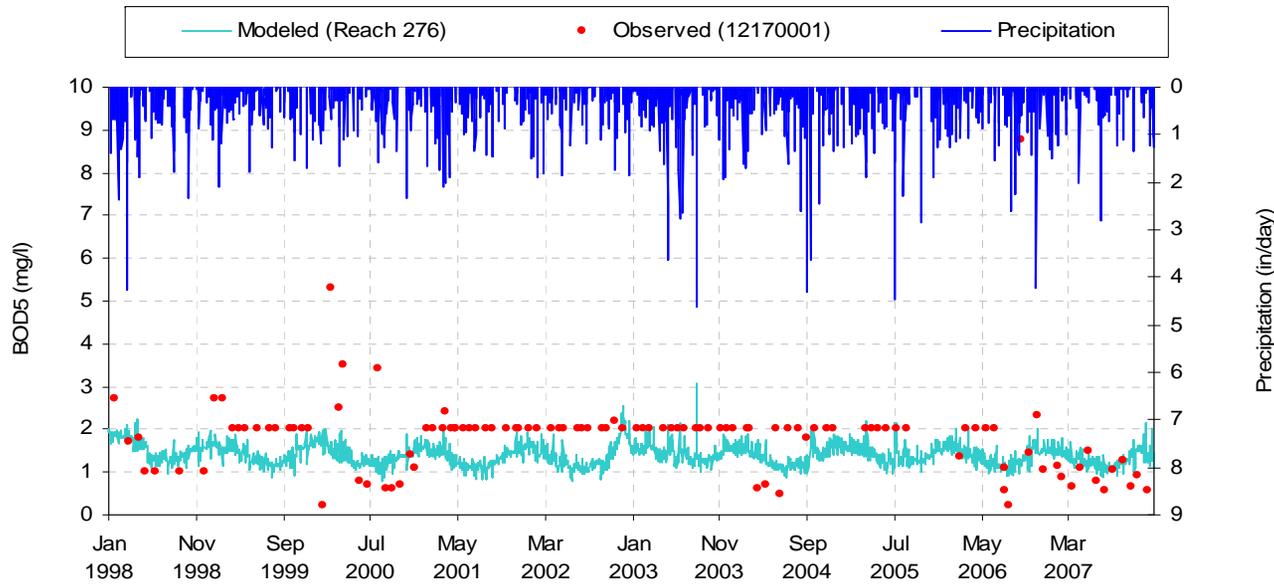
■ Avg Monthly Rainfall (in.)
◆ Avg Observed Flow (1/1/1998 to 12/31/2007)
— Avg Modeled Flow (Same Period)



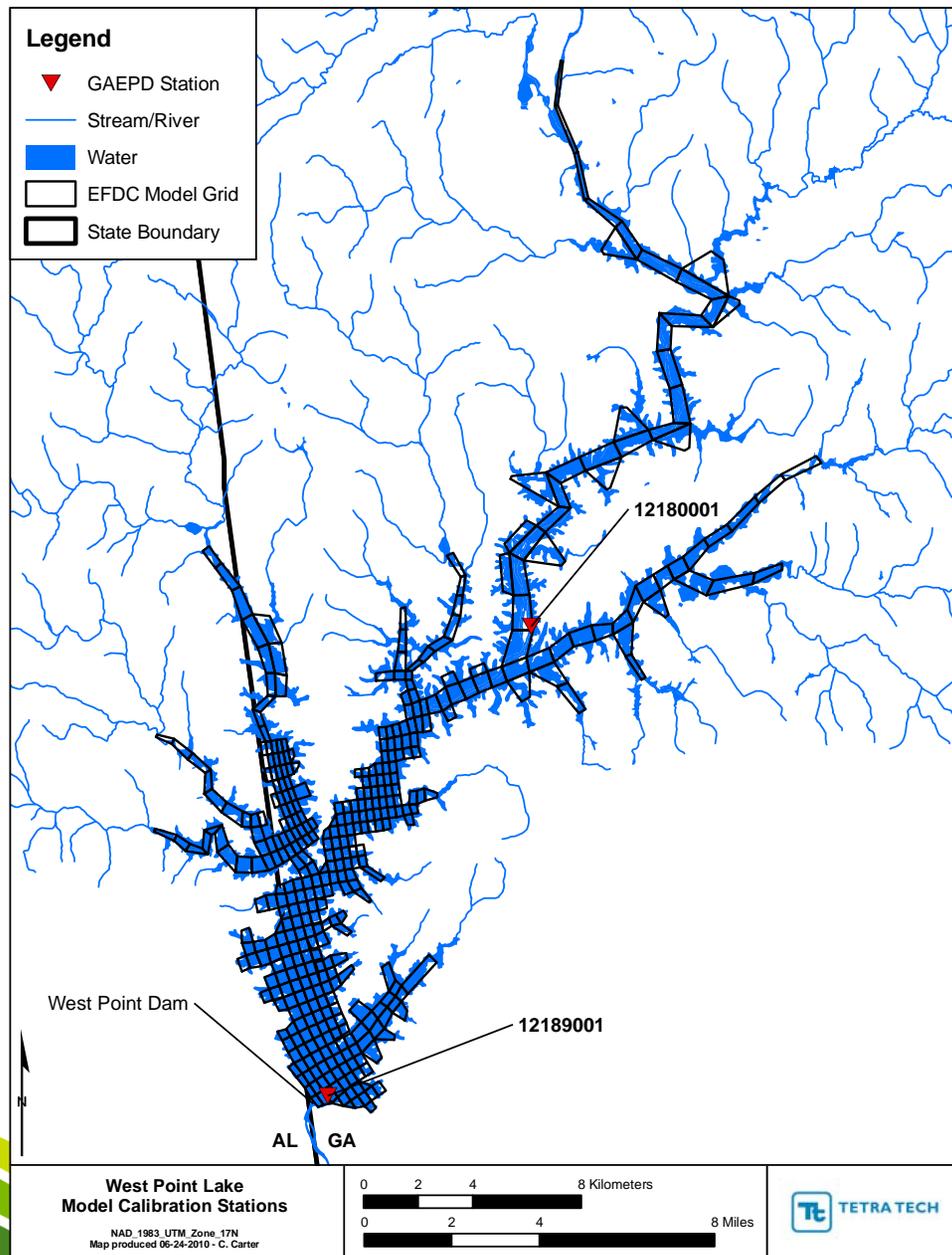
Chattahoochee River at U.S. 27 near Franklin, GA 12170001



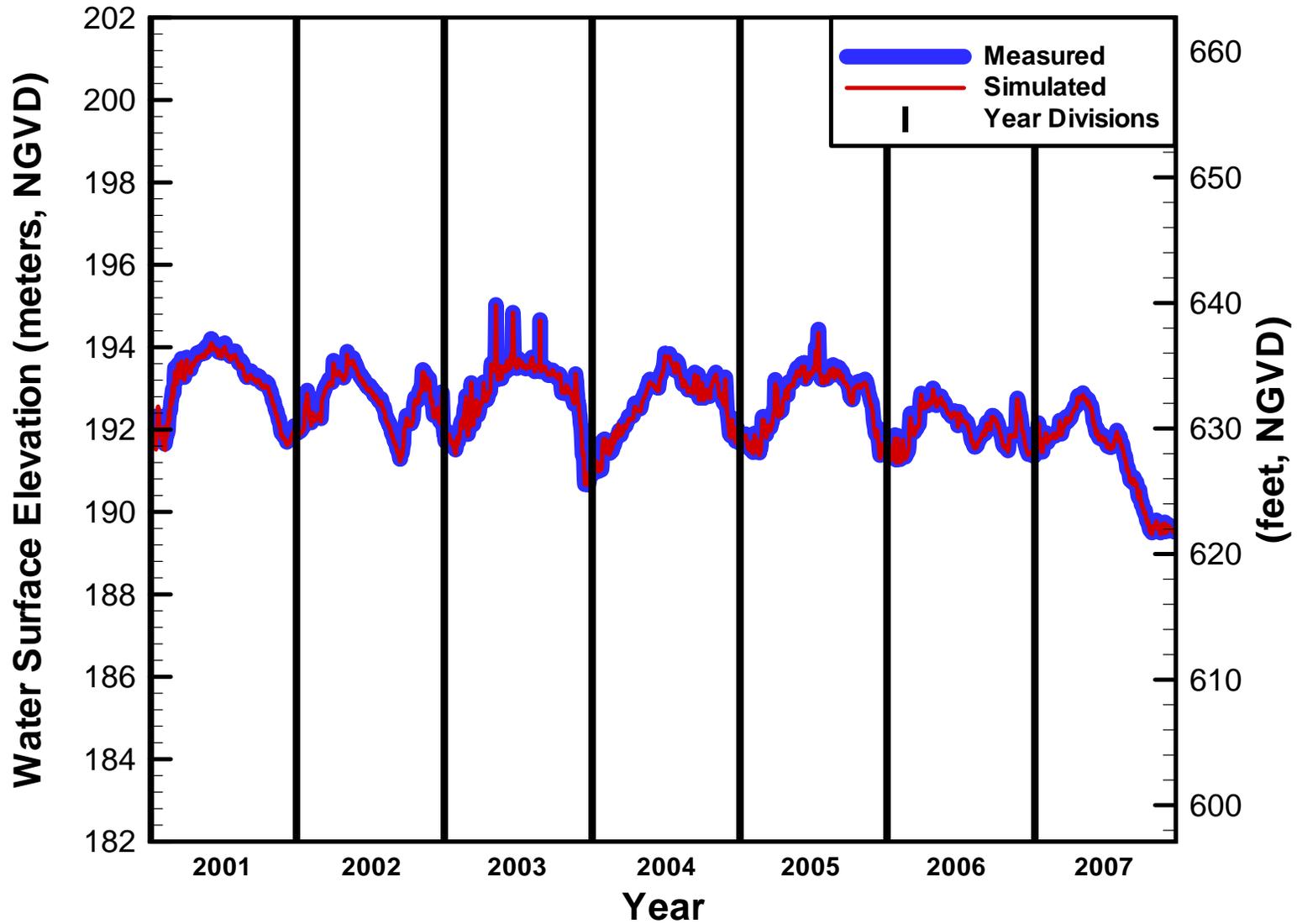
Chattahoochee River at U.S. 27 near Franklin, GA 12170001



Hydrology and Water Quality Calibration Locations for EFDC Model

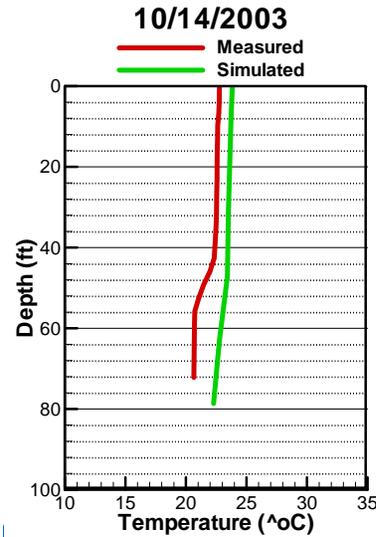
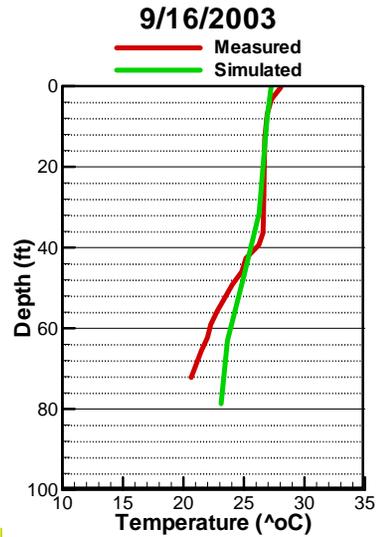
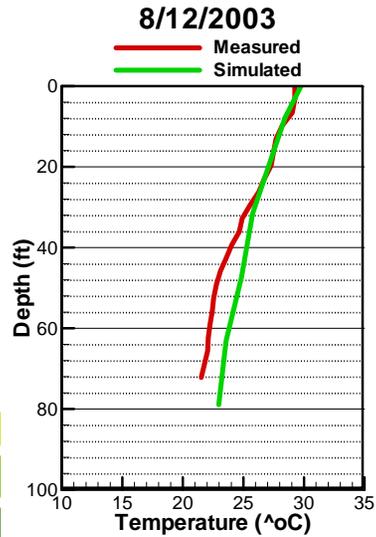
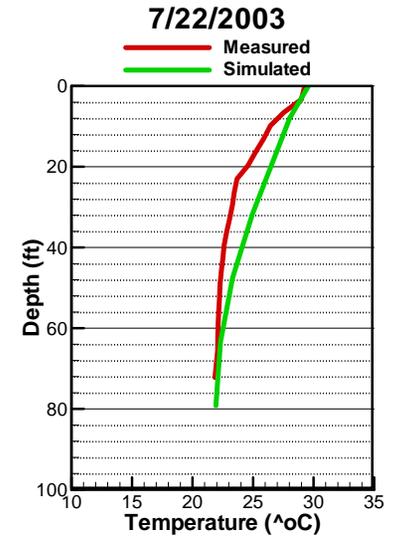
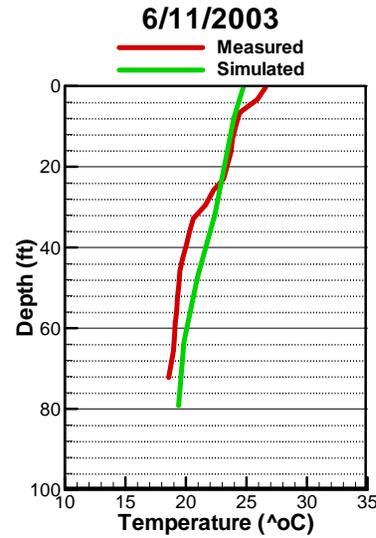
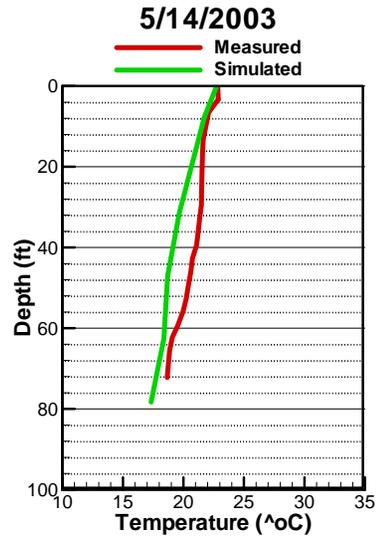
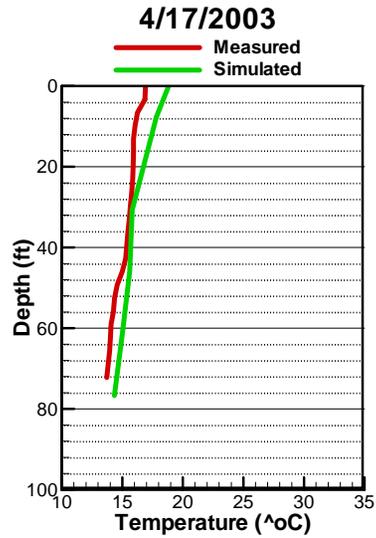


12189001 – Dampool (Forebay)

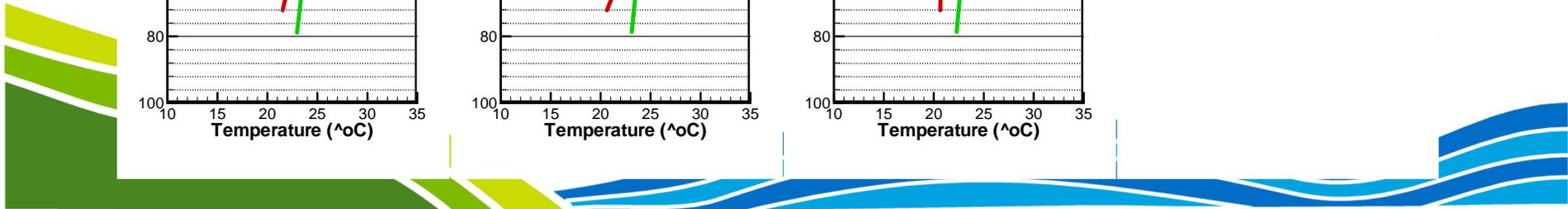


12189001 – Dampool (Forebay)

Wet Year

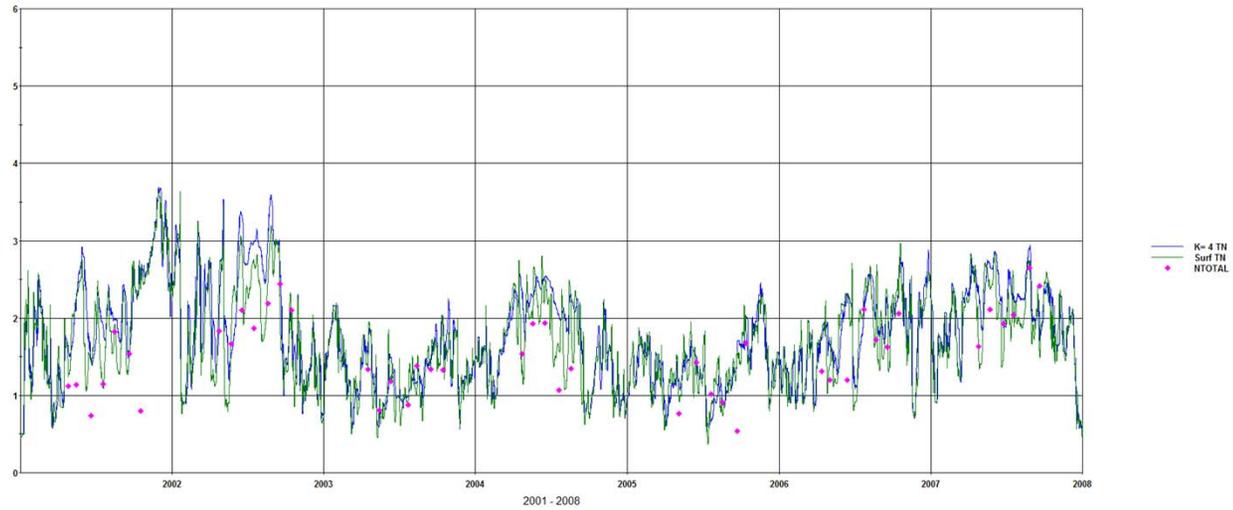


Lake West Point
Temperature Profiles
Dampool Station
2003

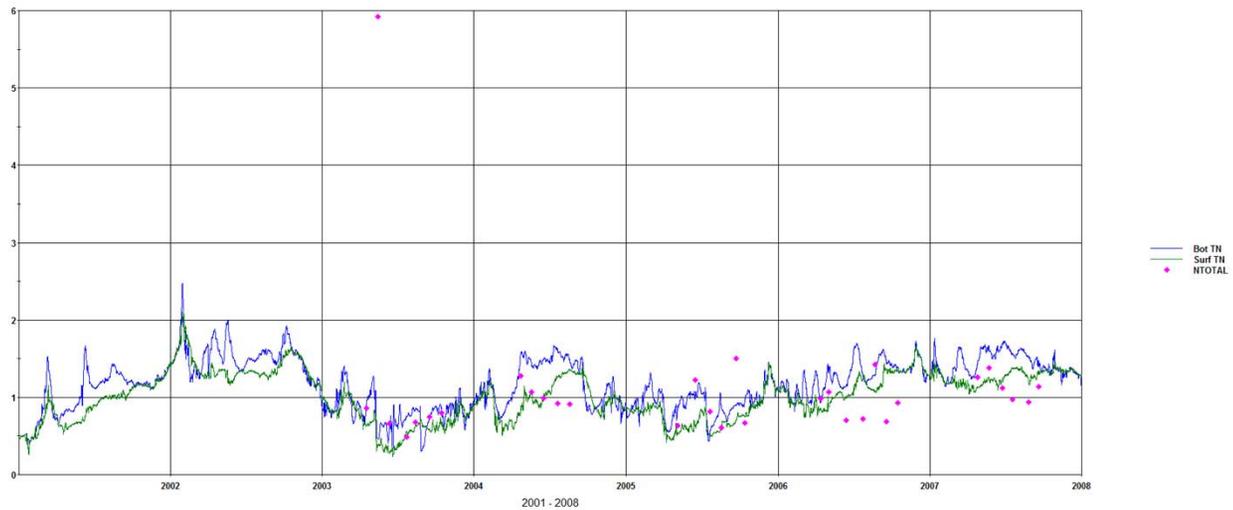


12180001 – Intake

Total Nitrogen

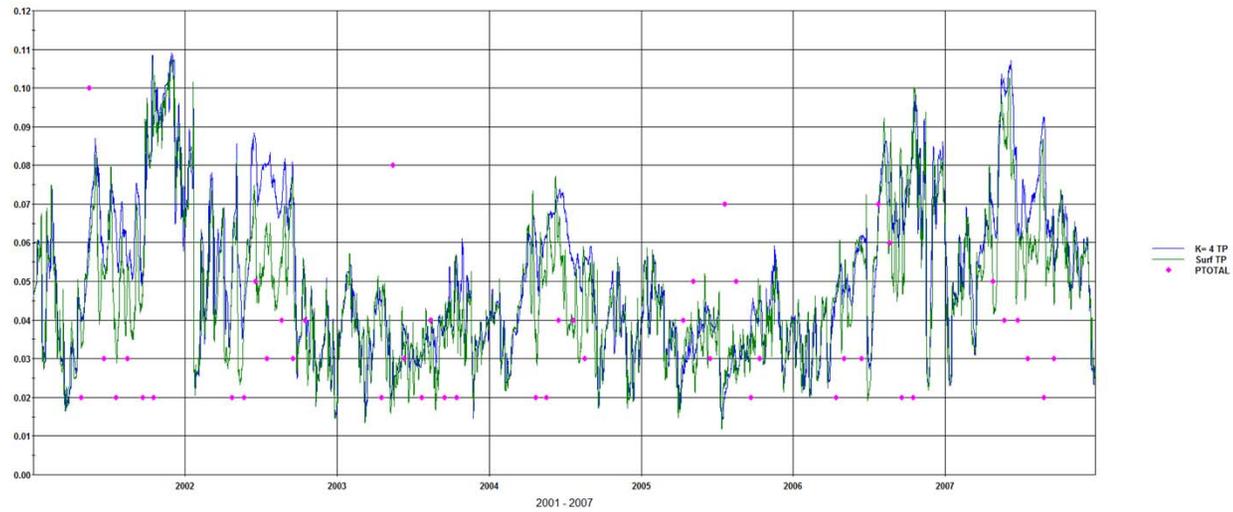


12189001 – Dampool (Forebay)

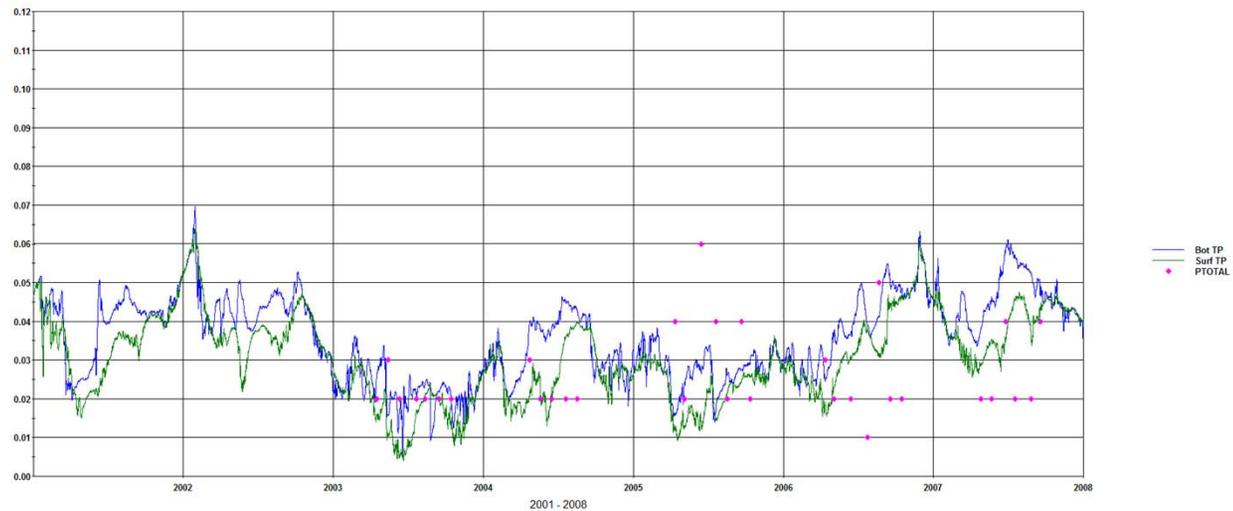


12180001 – Intake

Total Phosphorus

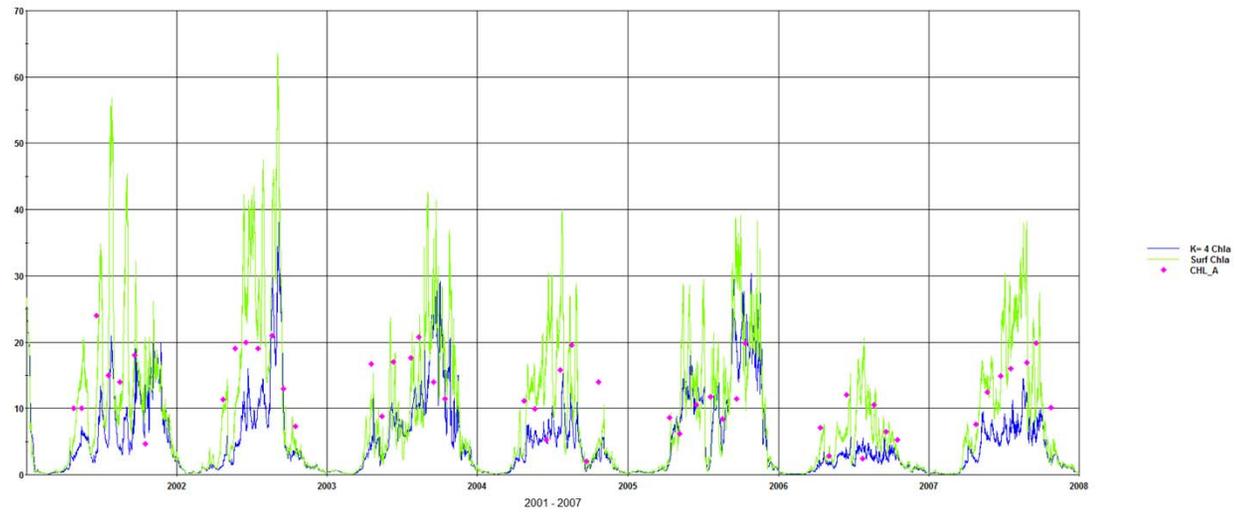


12189001 – Dampool (Forebay)

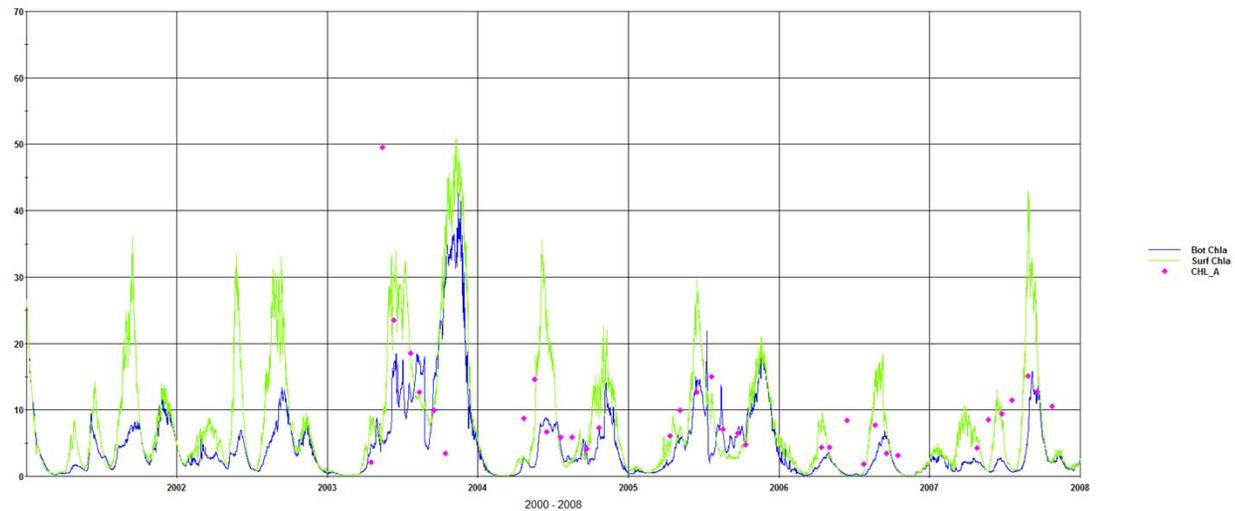


12180001 – Intake

Chlorophyll-a

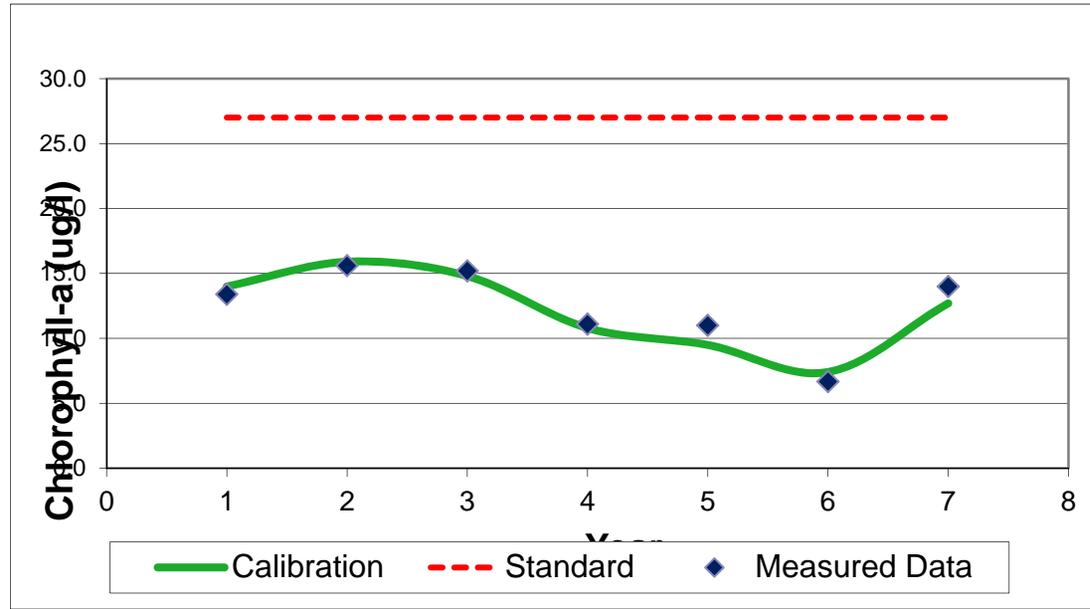


12189001 – Dampool (Forebay)

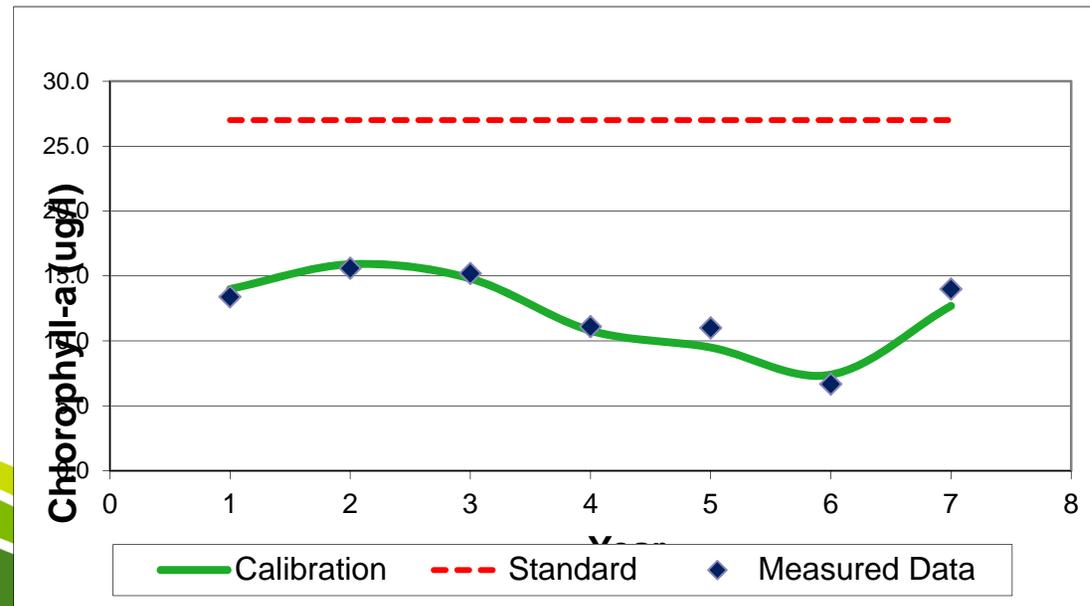


12180001 – Intake

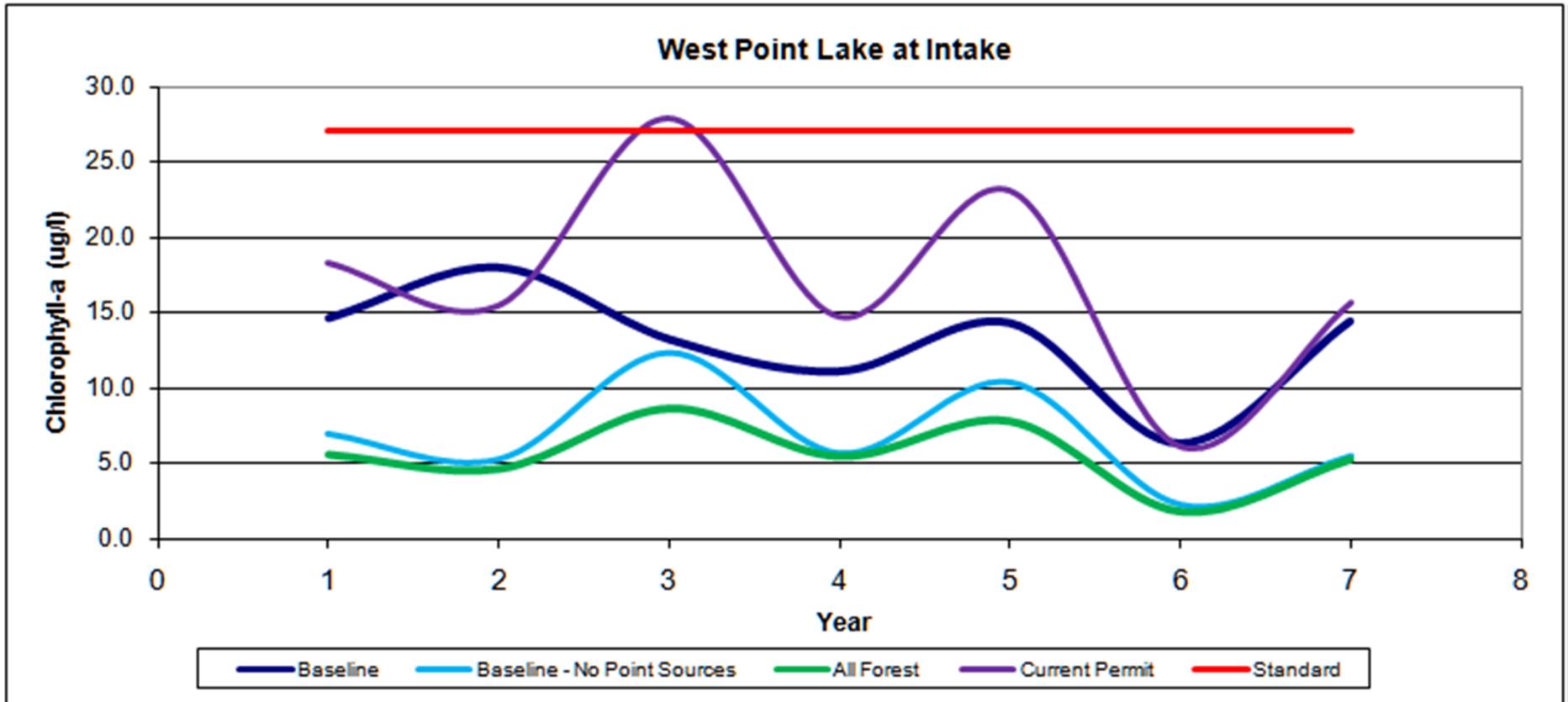
Chlorophyll-a Calibration



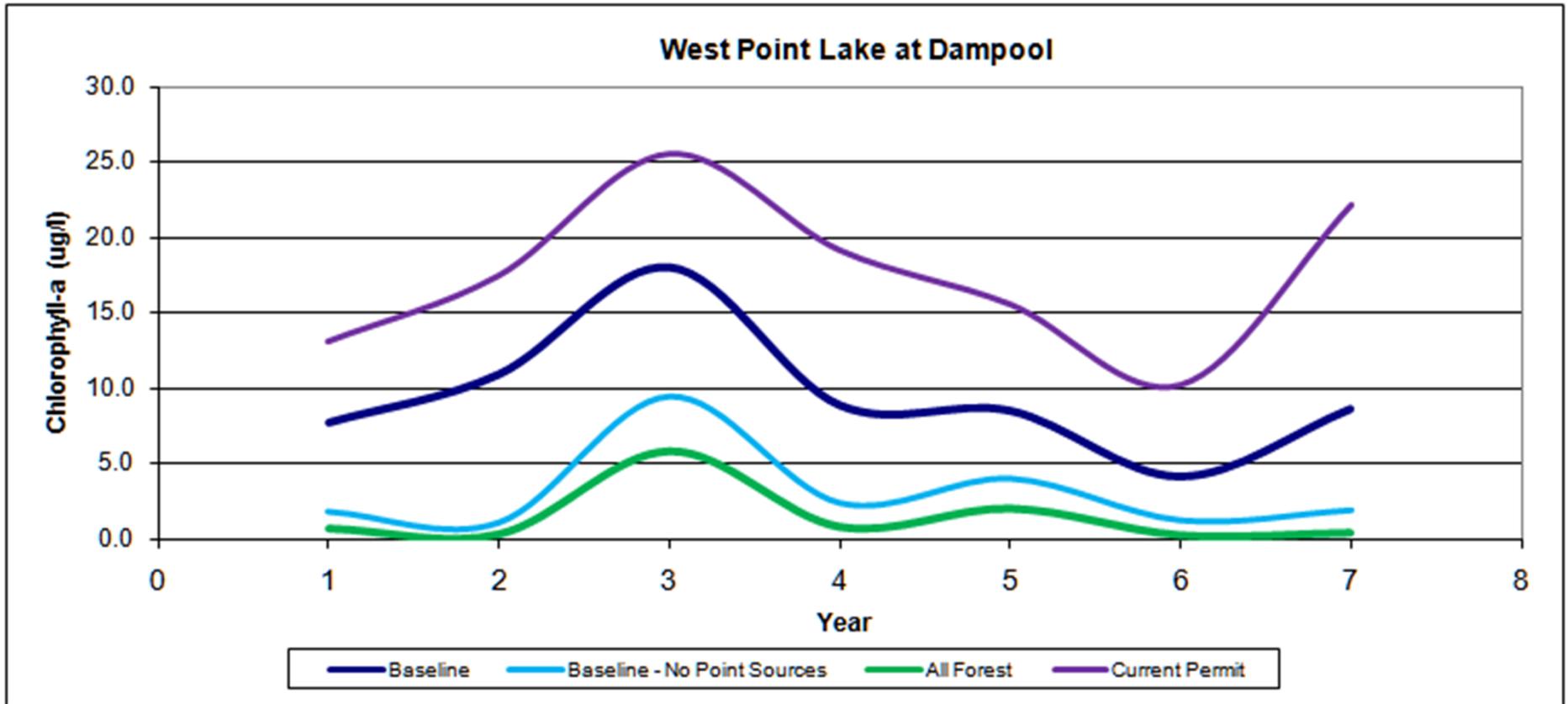
12189001 – Dampool (Forebay)



Growing Season Average Chlorophyll-a at Intake



Growing Season Average Chlorophyll-a at Dampool



August 19, 2011 Meeting

- ❑ Presentation to City of LaGrange
- ❑ Linked Lake Lanier Models with the West Point Watershed Model
- ❑ Presented Revised Lake Modeling Results
 - Chlorophyll a Calibration
- ❑ Revised Proposed Chlorophyll Standards
 - Intake 20 ug/L
 - Dampool 22 ug/L



Linked Models

Models

Outputs

Lanier Watershed



Subwatershed Flows
Subwatershed Concentrations
(Chl-a, TN, NH3, NOx, OrgN, TP, PO4, OrgP, BOD5, DO, Temp, TSS)

Lake Lanier



Water Surface Elevation
Temperature and Dissolved Oxygen profiles
Lake Concentrations
(Chl-a, TN, NH3, NOx, OrgN, TP, PO4, OrgP, BOD5, DO, Temp)

West Point Watershed



West Point Lake



Flows
Temperatures
Concentrations



Scenarios

□ Calibration

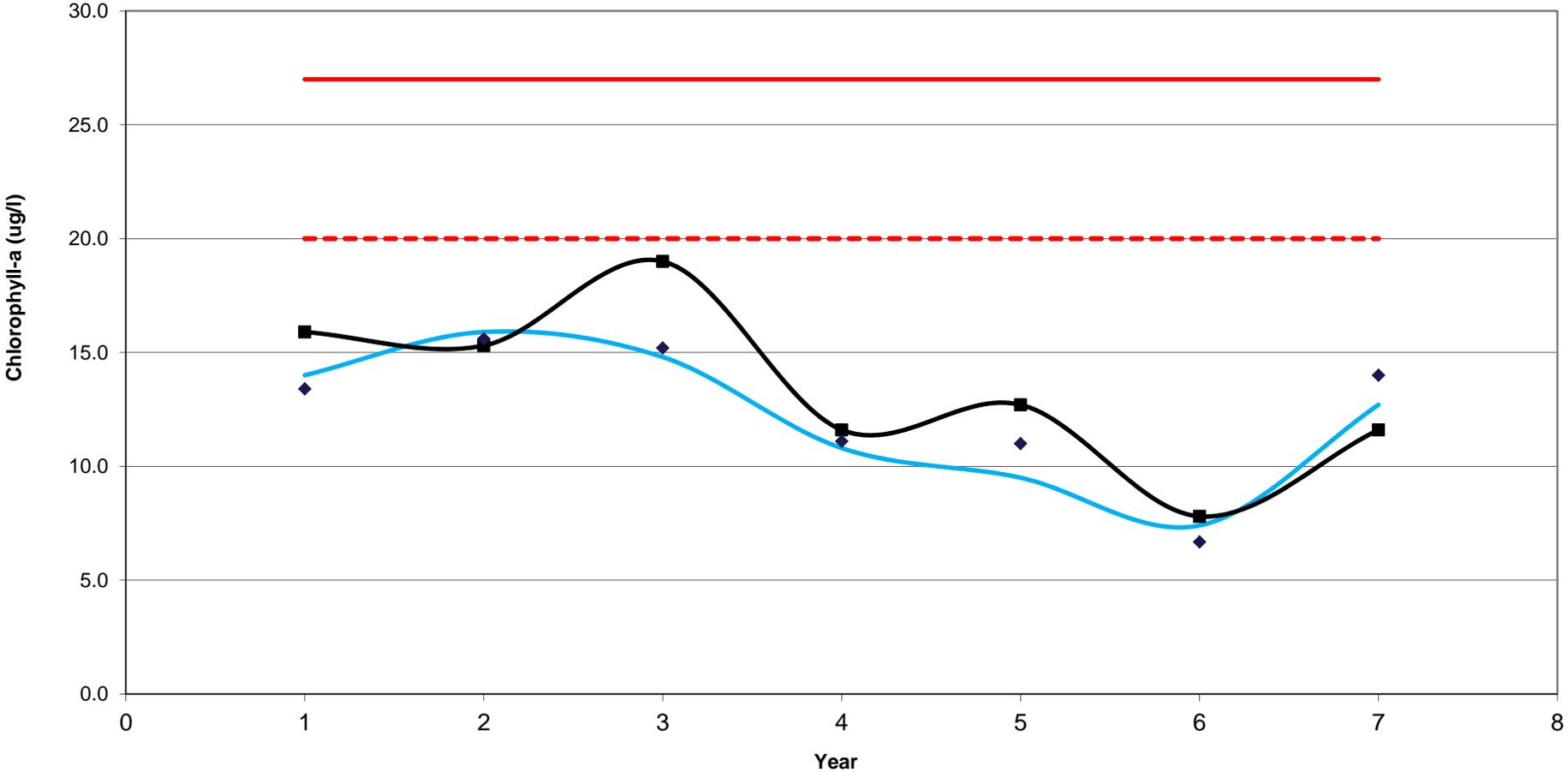
□ Full Permit

- All Point Sources input at Current Permitted Flows & Concentrations
- Land Use Unchanged
- Septics Unchanged
- West Point Dam Water Surface Elevation and Flows



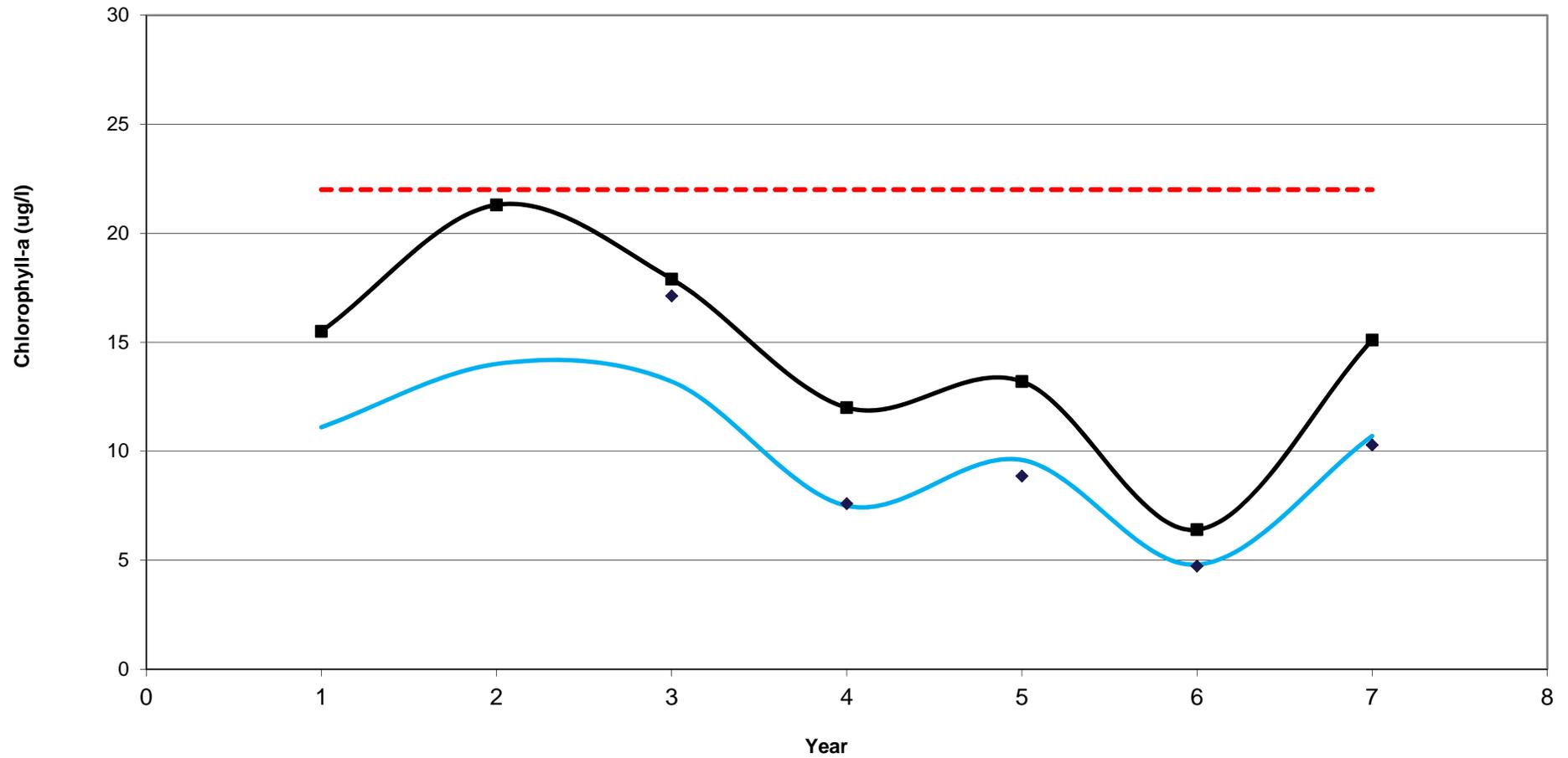
Growing Season Average Chlorophyll a

West Point Lake at Intake - Passdown



Growing Season Average Chlorophyll a

West Point Lake at Forebay - Passdown



— Calibration ◆ Measured —■ Permitted - - - Proposed Standard

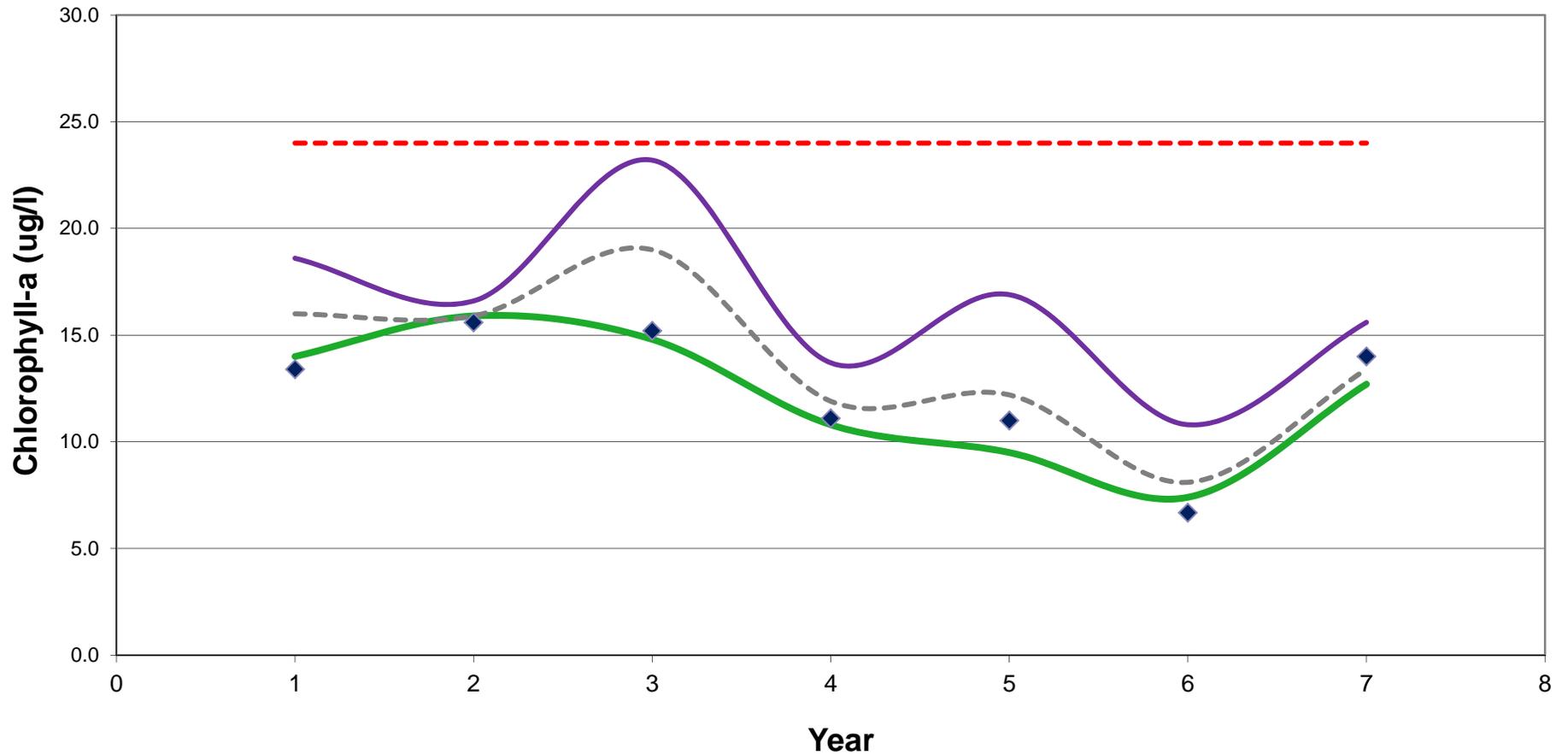
September 13, 2011 Meeting

- ❑ Public Meeting with Metro Dischargers and City of LaGrange
- ❑ Presented Revised Chlorophyll Standards
 - Intake 20 ug/L
 - Dampool 22 ug/L
- ❑ Request that modeling include future wastewater discharges outlined in the Metro District Plan (2035) and future landuse from the State Water Plan (2040)



Growing Season Average Chlorophyll a

West Point Lake at Intake - Passtown



— Calibration

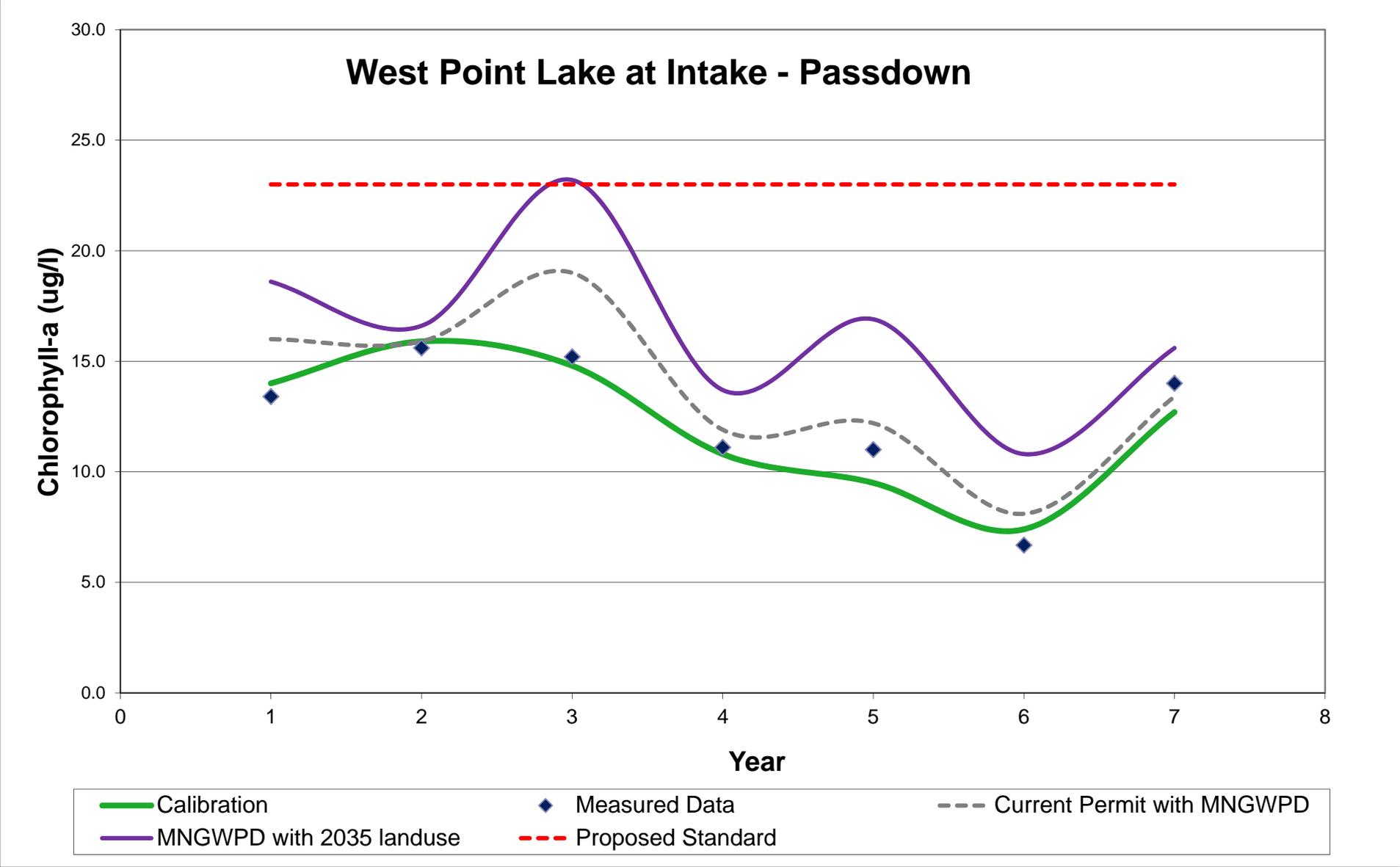
◆ Measured Data

- - - Current Permit with MNGWPD

— MNGWPD with 2035 landuse

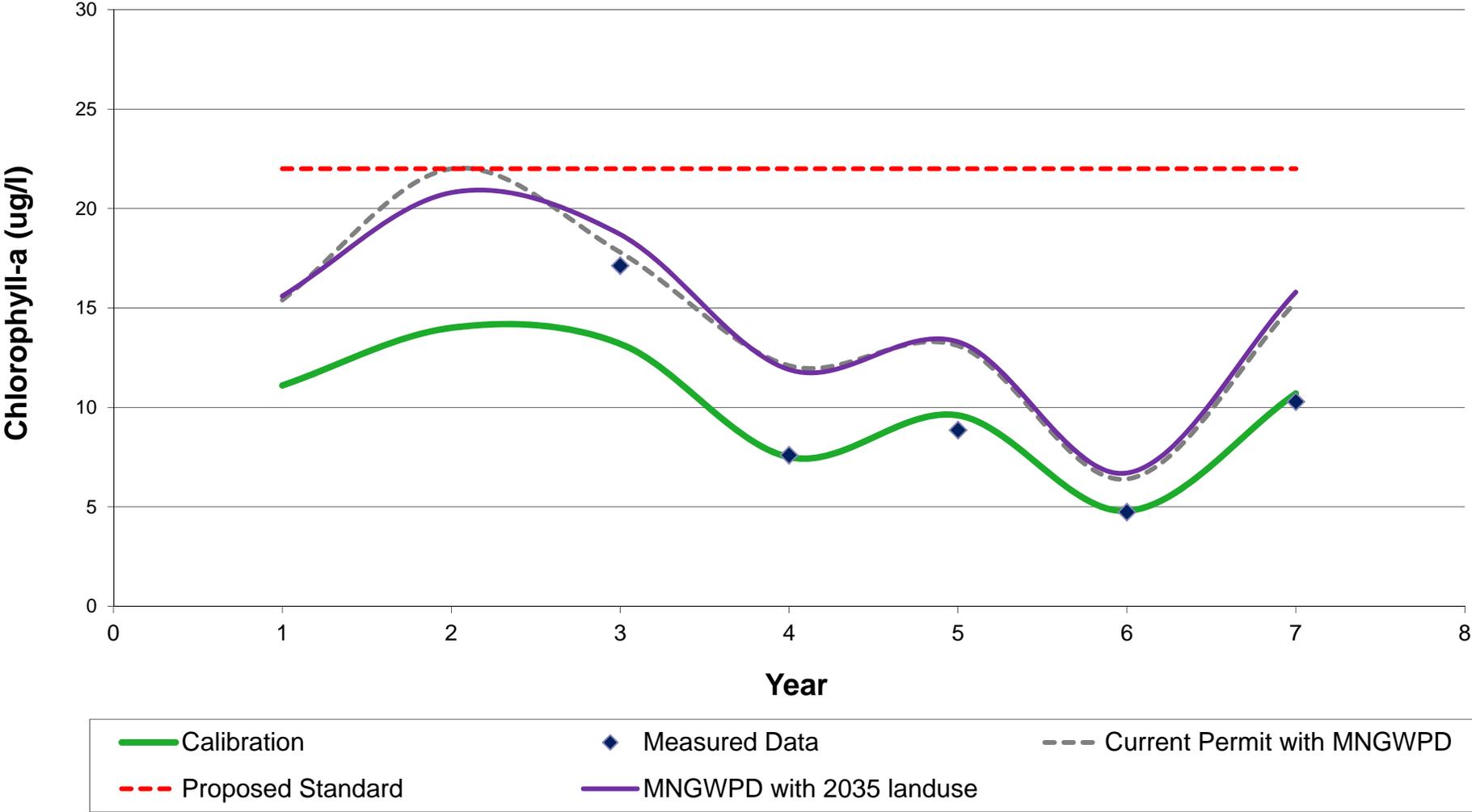
- - - Proposed Standard

Growing Season Average Chlorophyll a



Growing Season Average Chlorophyll a

West Point Lake at Forebay - Passtown



January 3-4, 2012

- ❑ Separate Meetings were Held with Metro Dischargers and the City of LaGrange
- ❑ Reviewed Modeling Results for Future Discharges (2035) and Landuse (2040)
- ❑ Proposed Chlorophyll Standards
 - Intake 24 ug/L
 - Dampool 22 ug/L
- ❑ Proposed a DNR Board Resolution



Proposed Chlorophyll a Standards

- Chlorophyll a: For the months of April through October, the average of monthly photic zone composite samples shall not exceed the chlorophyll a concentrations at the locations listed below more than once in a five-year period:

- | | |
|---|---------|
| 1. LaGrange Water Intake | 24 ug/L |
| 2. Upstream from the dam in the forebay | 22 ug/L |



Resolution Concerns

- ❑ Metro discharges concerned that the proposed criteria could be exceeded, and would necessitate a TMDL with required load reductions
- ❑ LaGrange concerned that proposed criteria are not protective enough and with implementation of BMPs, criteria could be lowered
- ❑ Future problems with compliance are primarily associated with land use, land management, and nonpoint source pollution
- ❑ Metro District anticipates the increasing use of BMPs to control nonpoint source pollution;



Resolution

Adaptive Management Approach

- ❑ The water quality standard will be reviewed every other triennial review to determine if new data and modeling of implemented BMPs warrant standard revisions, and
- ❑ EPD will, as budget and resources permit, review the water quality standard based on updated modeling, and
- ❑ If a TMDL is established, reductions in nutrient loads will be required of the permitted stormwater and nonpoint source load allocations



Next Steps

- Public Meeting in April or May
- Brief the DNR Board in June 2012
- Public Notice for 45 days starting late June 2012
- Hold Public Hearing in Mid August 2012
- Final presentation to the DNR Board September 2012
- Send standards to EPA for approval





Questions?

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