DEQ Lake Thunderbird Project
Technical Advisory Committee
Second Meeting

January 17, 2012

Agenda

1. Welcome and notes from last meeting
2. Progress on the watershed and lake models
3. Next project steps and timeline
4. Discussion of TMDL or Watershed Management Plan in Lieu of TMDL
5. Lawsuit by COMCD
6. Next meeting time and place
7. Open discussion

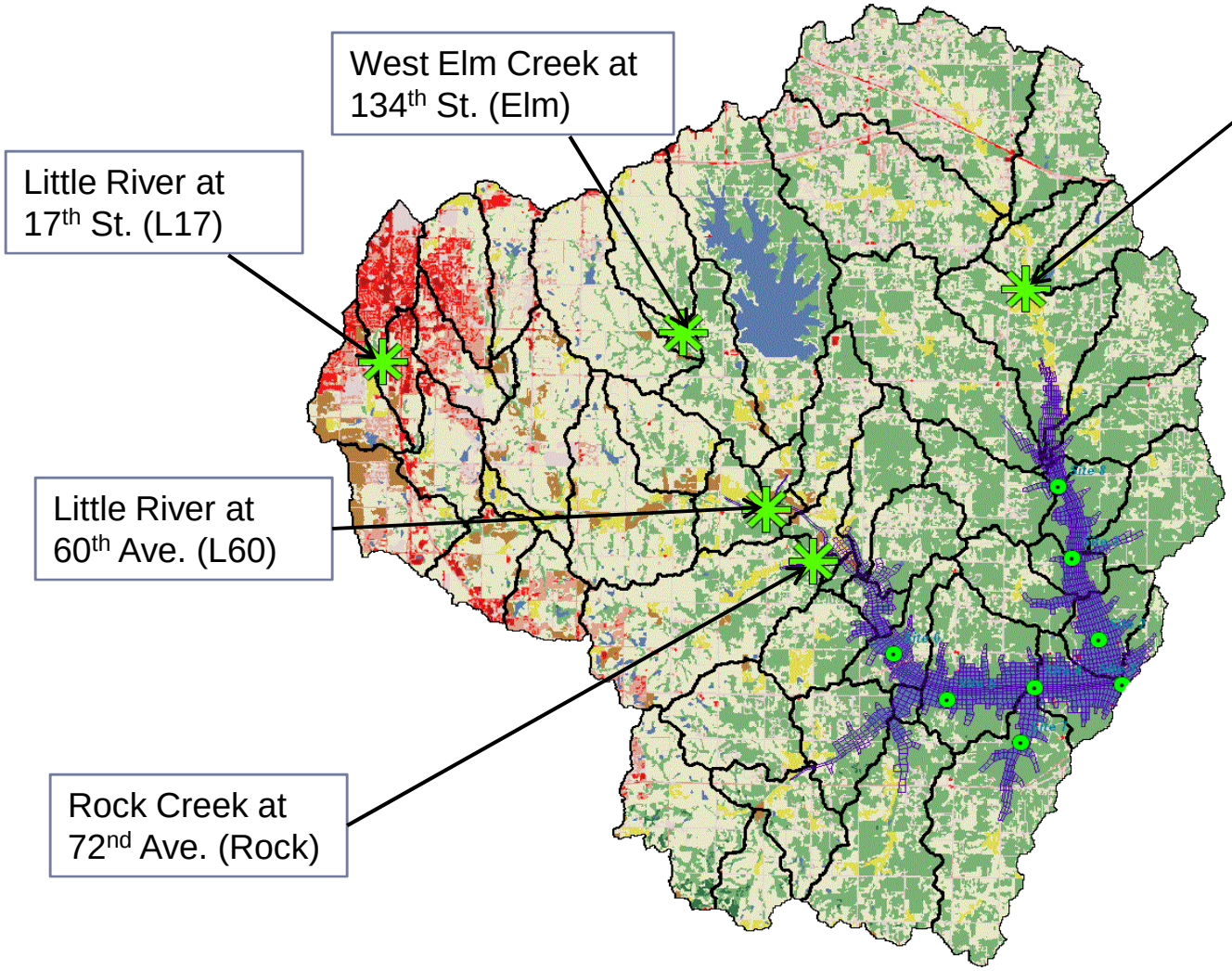
1. Welcome

- Current composition of the committee
  - Cities: Midwest City, Moore, Norman, and Oklahoma City
  - Agencies: Cleveland CCD, OCC, ODEQ, OSE, OWRB, and USBOR
  - OU
- The website http://www.deq.state.ok.us/WQDnew/tmdl/thunderbird/index.html
  - Current content OK? What else to be posted?
  - How to make it known to the public?

2. Update on Models

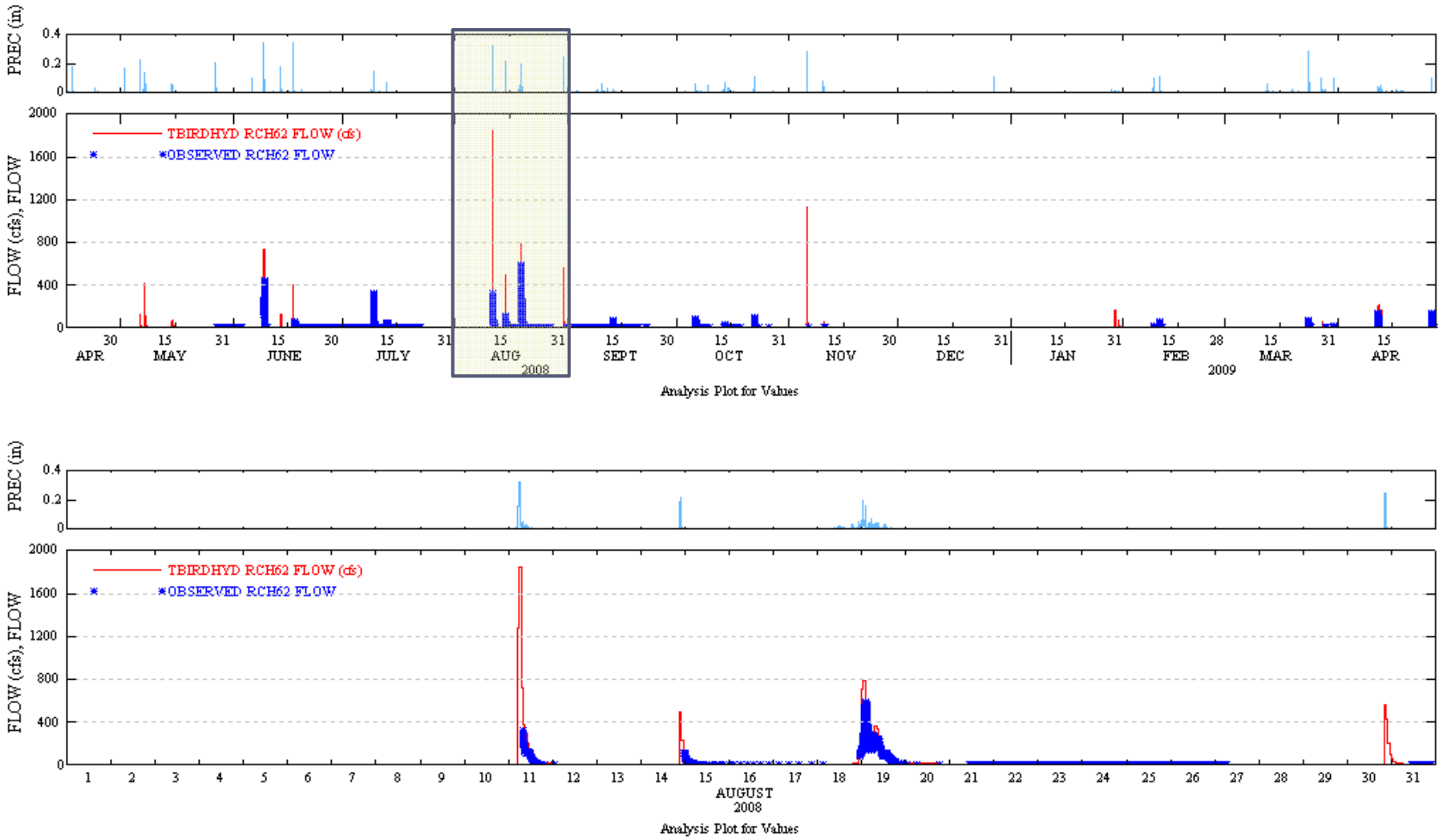
- Calibration of watershed and lake models
- Watershed model - HSPF
  - Hydrology, temperature
  - Sediment
  - TP, TKN, PO_4, NH_4, NO_3 and TOC
  - DO
- Lake model – EFDC
  - Hydrodynamics: water level and temperature
  - Water quality parameters similar to those by HSPF
  - Chlorophyll-a

2. Update on Models (cont'd) - HSPF

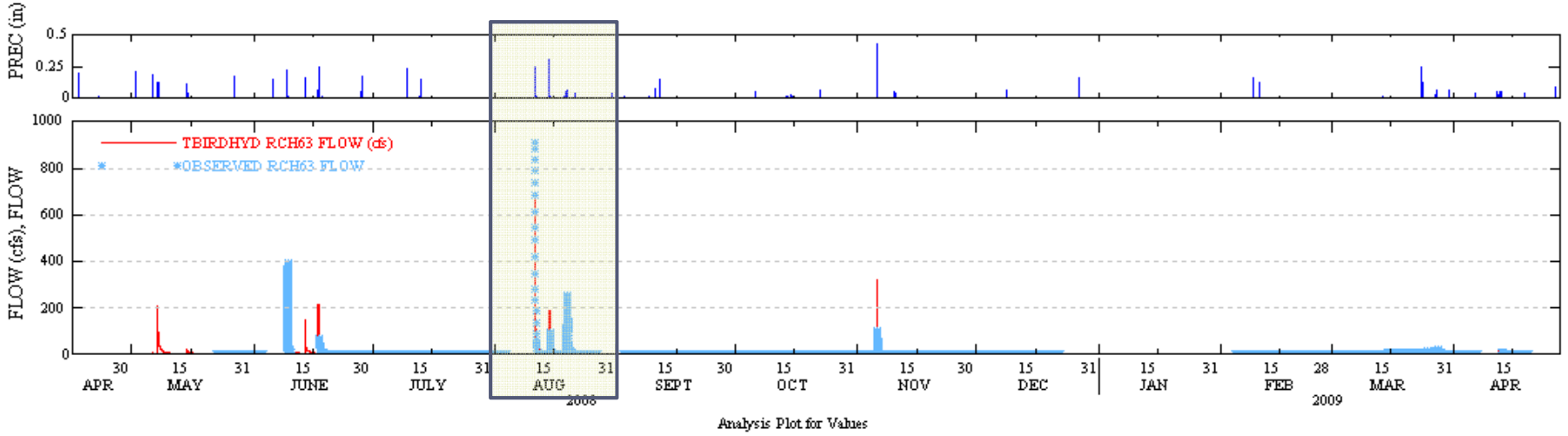


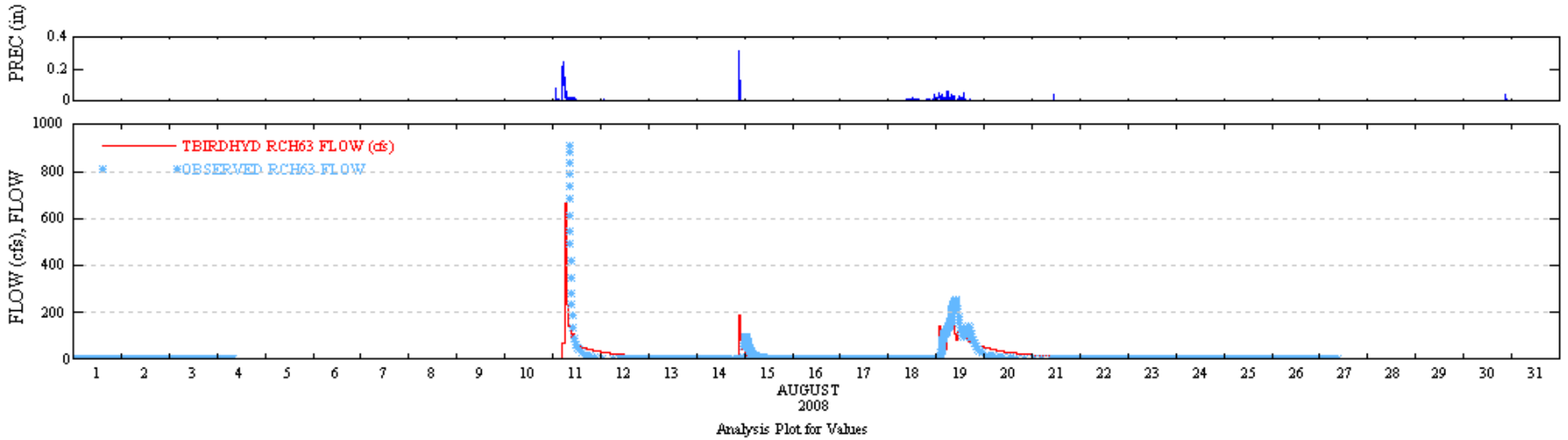
Monitoring Sites

HSPF watershed model (flow, L17 site)



HSPF watershed model (flow, Elm site)





HSPF watershed model – flows

	*Daily Average (obs., cfs)	#Daily Average (HSPF, cfs)	% diff.	r^2	Nash-Sutcliffe coeff.
L17	7.6	6.2	18%	0.92	0.66
Elm	2.3	2.4	4%	0.90	0.89
L60	9.6	11.0	15%	0.66	0.63
Rock	3.6	3.5	3%	0.78	0.78
Hog	13.2	15.3	16%	0.60	0.56

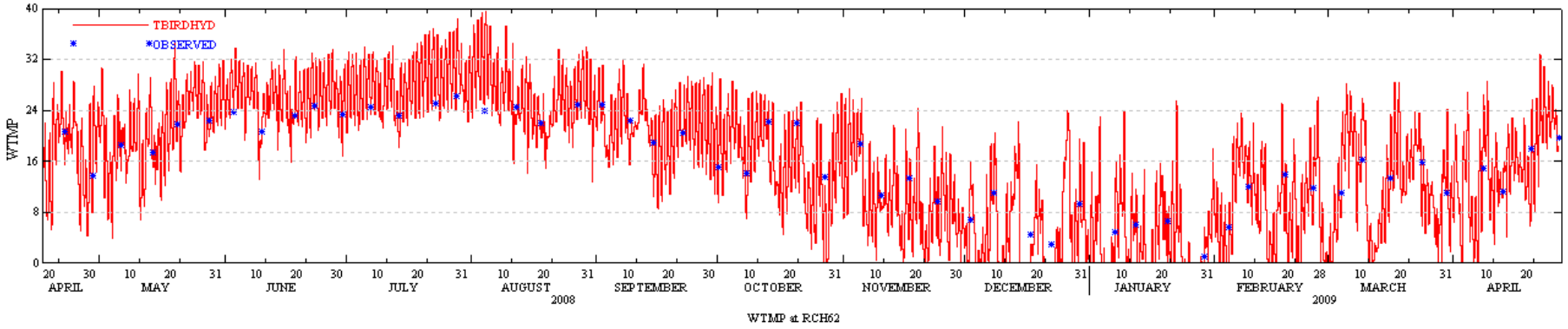
* Obs. data not available all the time; #simulated data corresponding to obs.

Total flow of the calibration period (million cubic feet)

HSPF	COMCD	ACOE
77,200	70,400	80,100

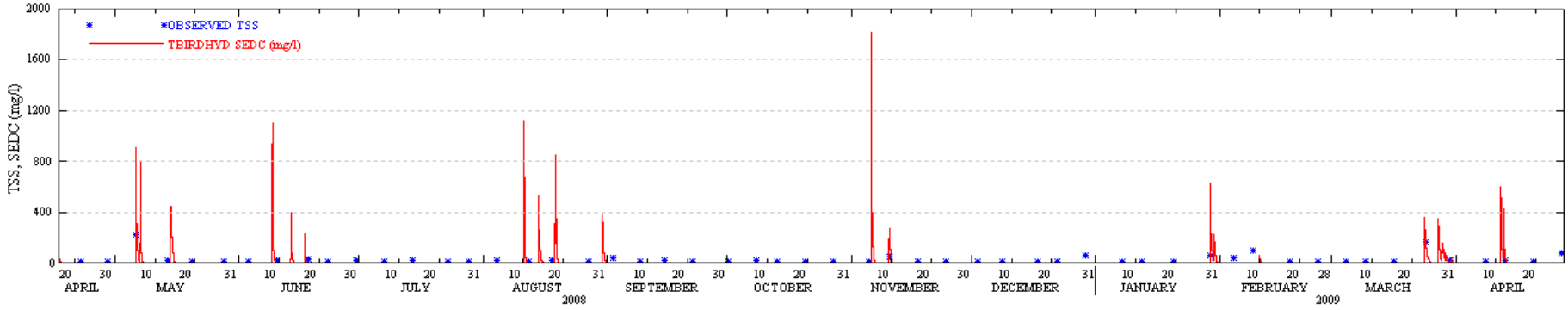
HSPF watershed model – Temperature

	Grab Samples (°C)	HSPF (°C)	% diff.	r^2	Nash-Sutcliffe coeff.
L17	16.3	16.3	0%	0.72	0.71
Elm	13.7	13.6	1%	0.94	0.93
L60	13.8	13.6	1%	0.95	0.92
Rock	17.0	16.2	11%	0.90	0.88
Hog	14.4	14.5	1%	0.94	0.94



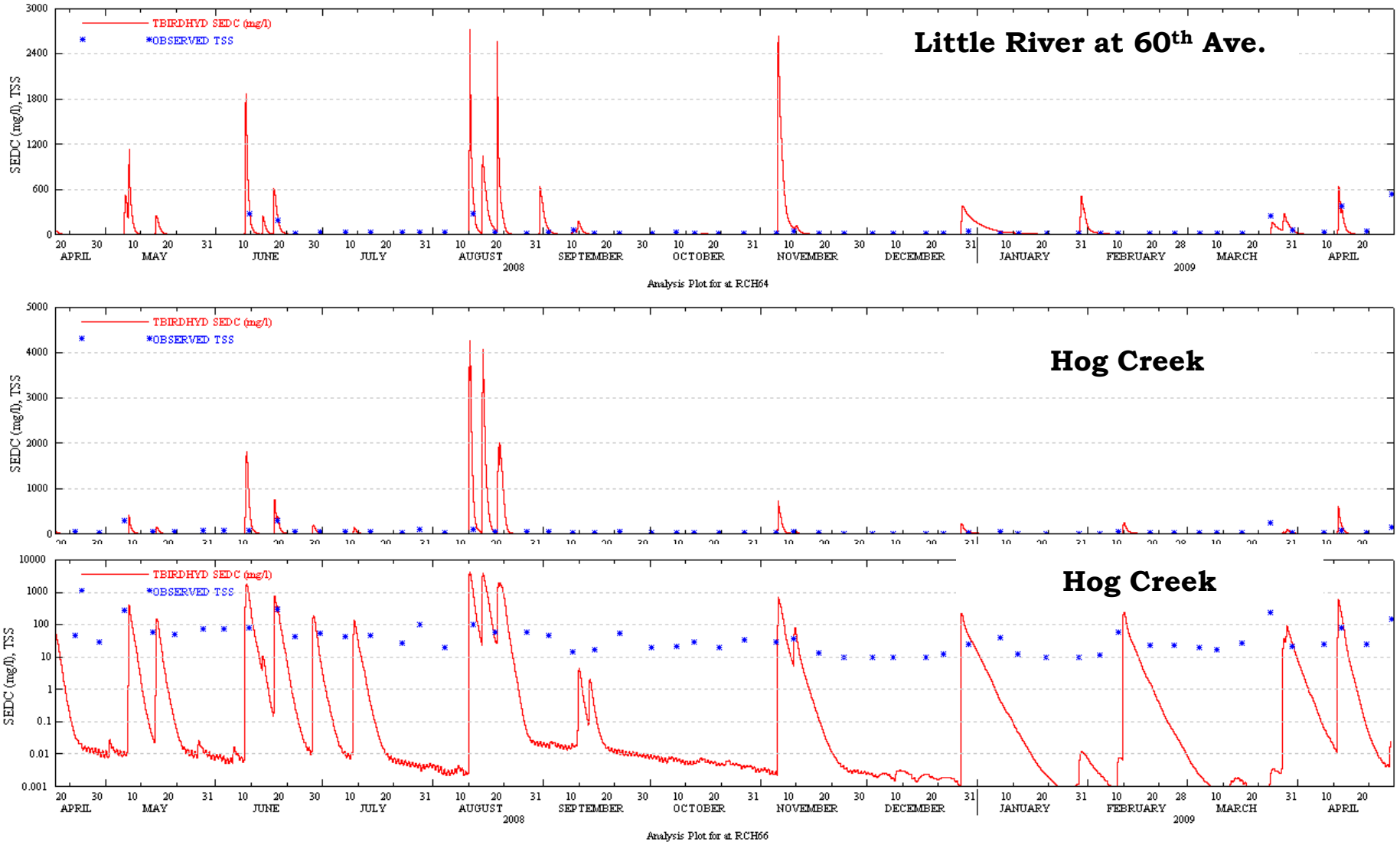
HSPF watershed model – TSS

	Grab Samples (mg/L)	HSPF (mg/L)	% diff.	r^2	Nash-Sutcliffe coeff.
L17	19.0	19.9	5%	0.60	-0.54
Elm	7.2	8.3	15%	0.33	-0.63
L60	45.6	45.0	1%	0.73	0.60
Rock	20.7	18.6	10%	0.14	-0.65
Hog	47.8	40.8	15%	0.12	-4.4



Little River at 17th St.

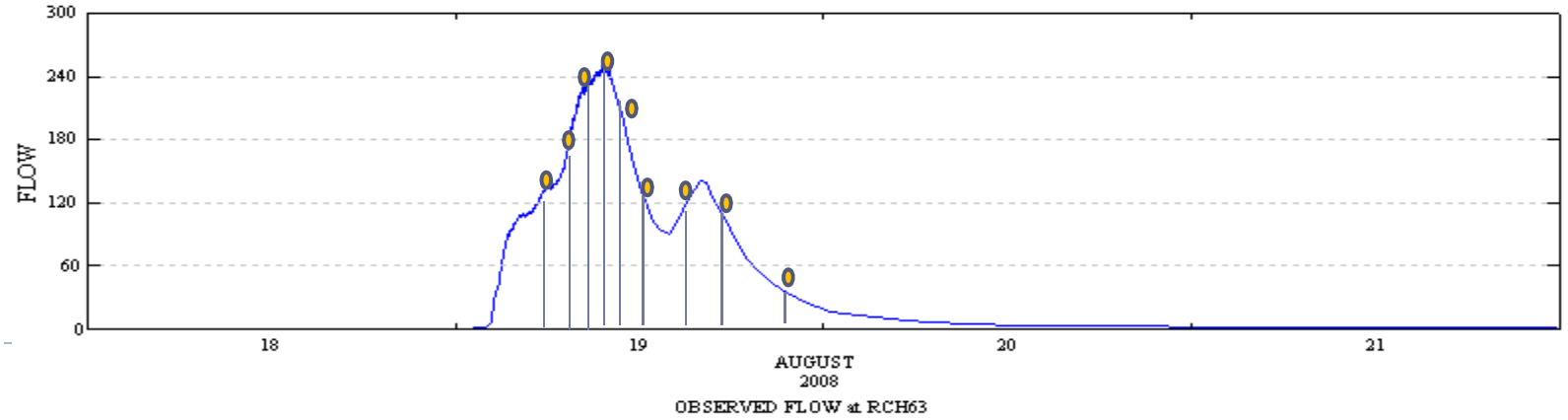
HSPF watershed model – TSS (cont'd)



HSPF watershed model – TP

	*Samples (mg/L)	HSPF (mg/L)	% diff.	r^2	Nash-Sutcliffe coeff.
L17	0.238	0.305	30%	0.17	-9.00
Elm	0.089	0.094	5%	0.66	0.65
L60	0.360	0.323	10%	0.63	0.48
Rock	0.275	0.212	23%	0.02	-0.66
Hog	0.178	0.120	32%	0.61	0.13

* Samples are flow-weighted composites



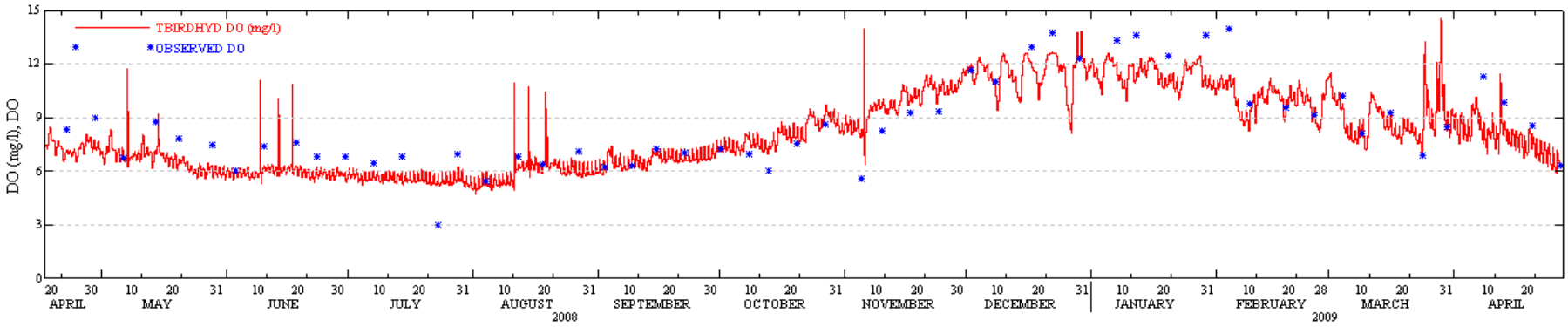
HSPF watershed model – TKN

	*Samples (mg/L)	HSPF (mg/L)	% diff.	r^2	Nash-Sutcliffe coeff.
L17	1.43	1.68	18%	0.17	-4.84
Elm	0.55	0.77	39%	0.81	0.65
L60	1.50	1.34	11%	0.71	0.70
Rock	1.34	1.34	0.6%	0.01	-0.75
Hog	1.17	0.92	21%	0.65	0.39

* Samples are flow-weighted composites

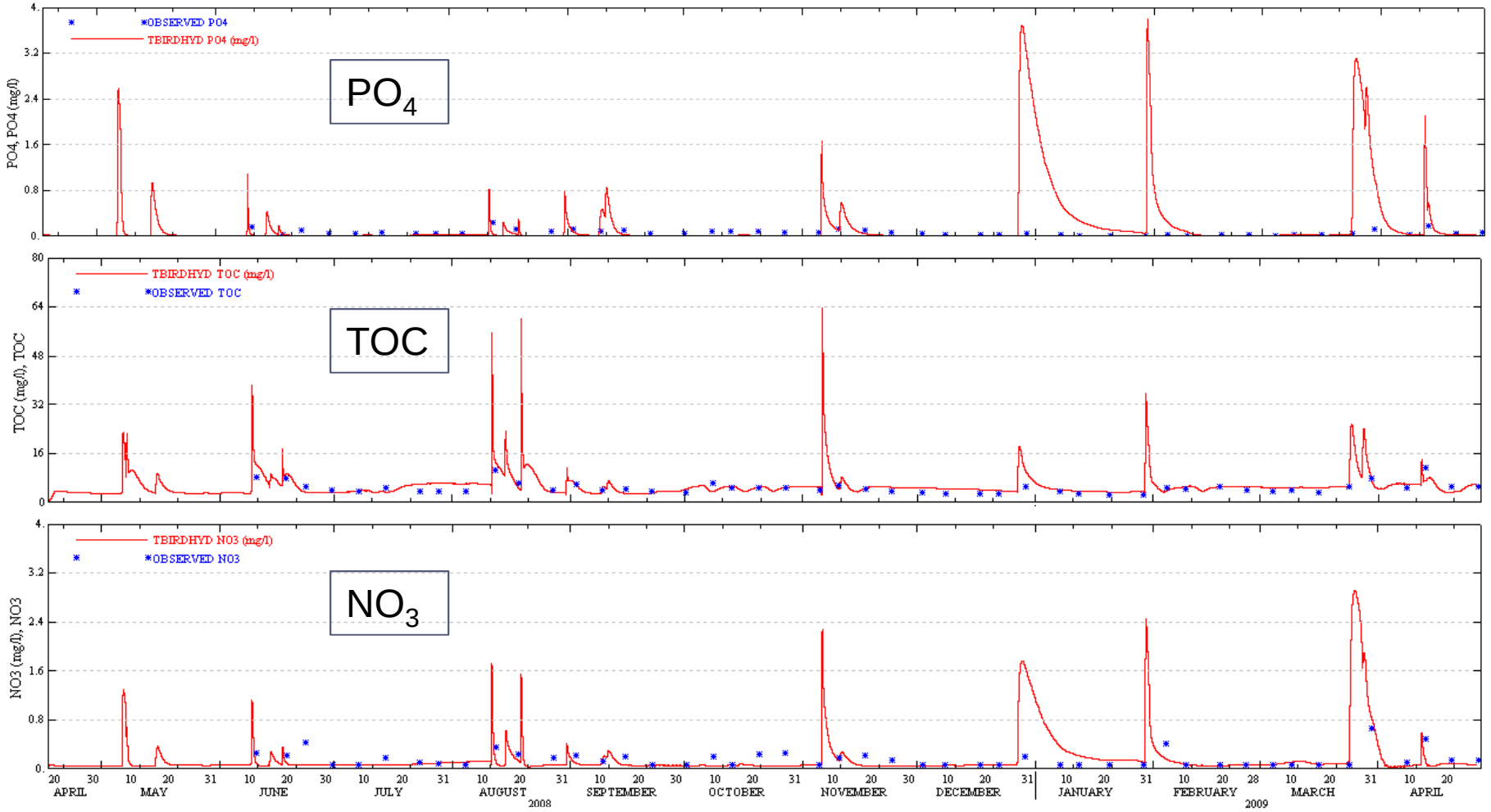
HSPF watershed model – DO

	Grab Samples(mg/L)	HSPF (mg/L)	% diff.	r^2	Nash-Sutcliffe coeff.
L17	8.5	8.3	2.1%	0.66	0.63
Elm	8.6	8.4	3.1%	0.79	0.77
L60	8.6	8.6	0.1%	0.88	0.80
Rock	7.3	8.5	16.6%	0.55	0.25
Hog	8.9	8.8	2.1%	0.82	0.80



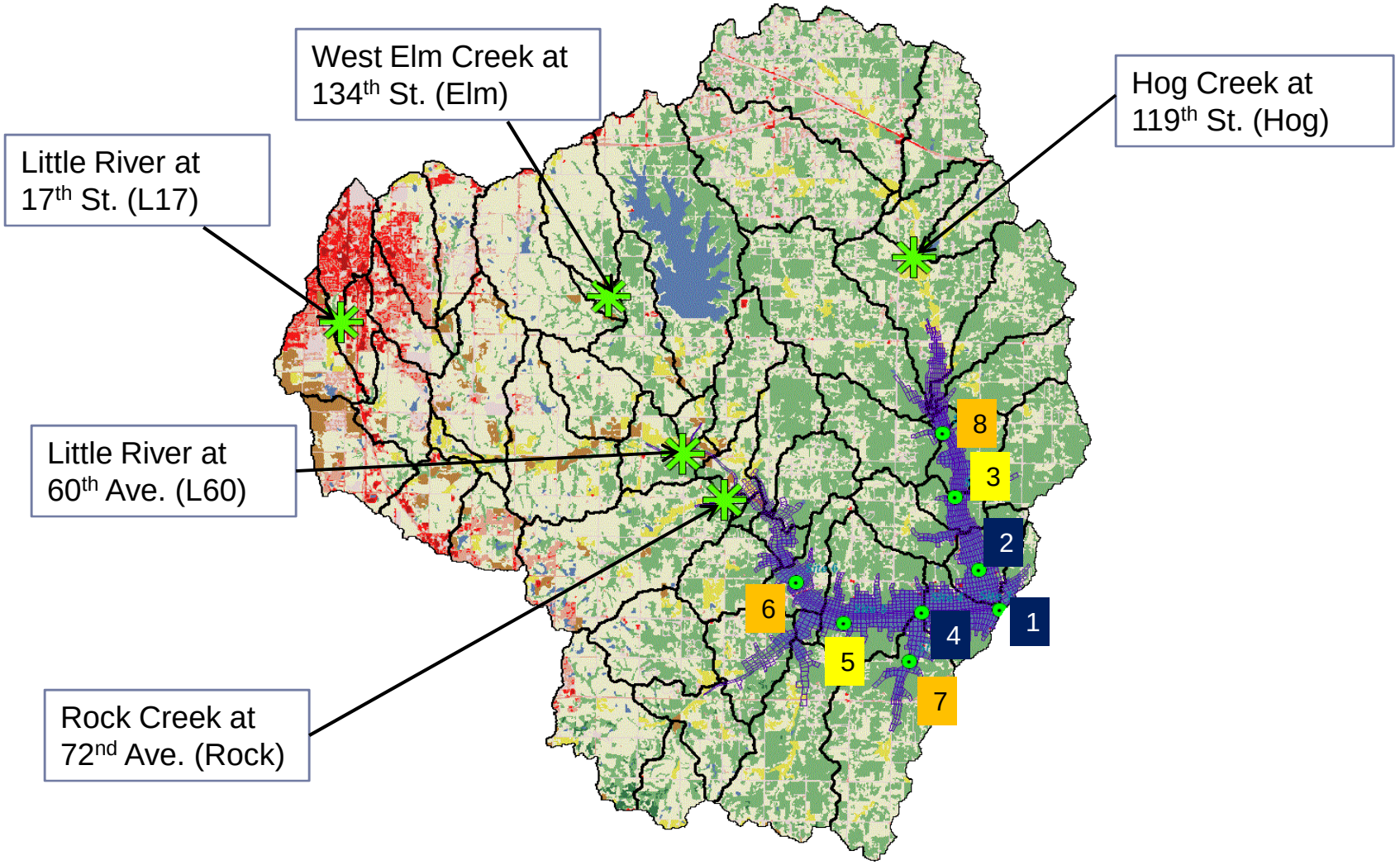
West Elm Creek

HSPF watershed model – PO_4, TOC, NO_3

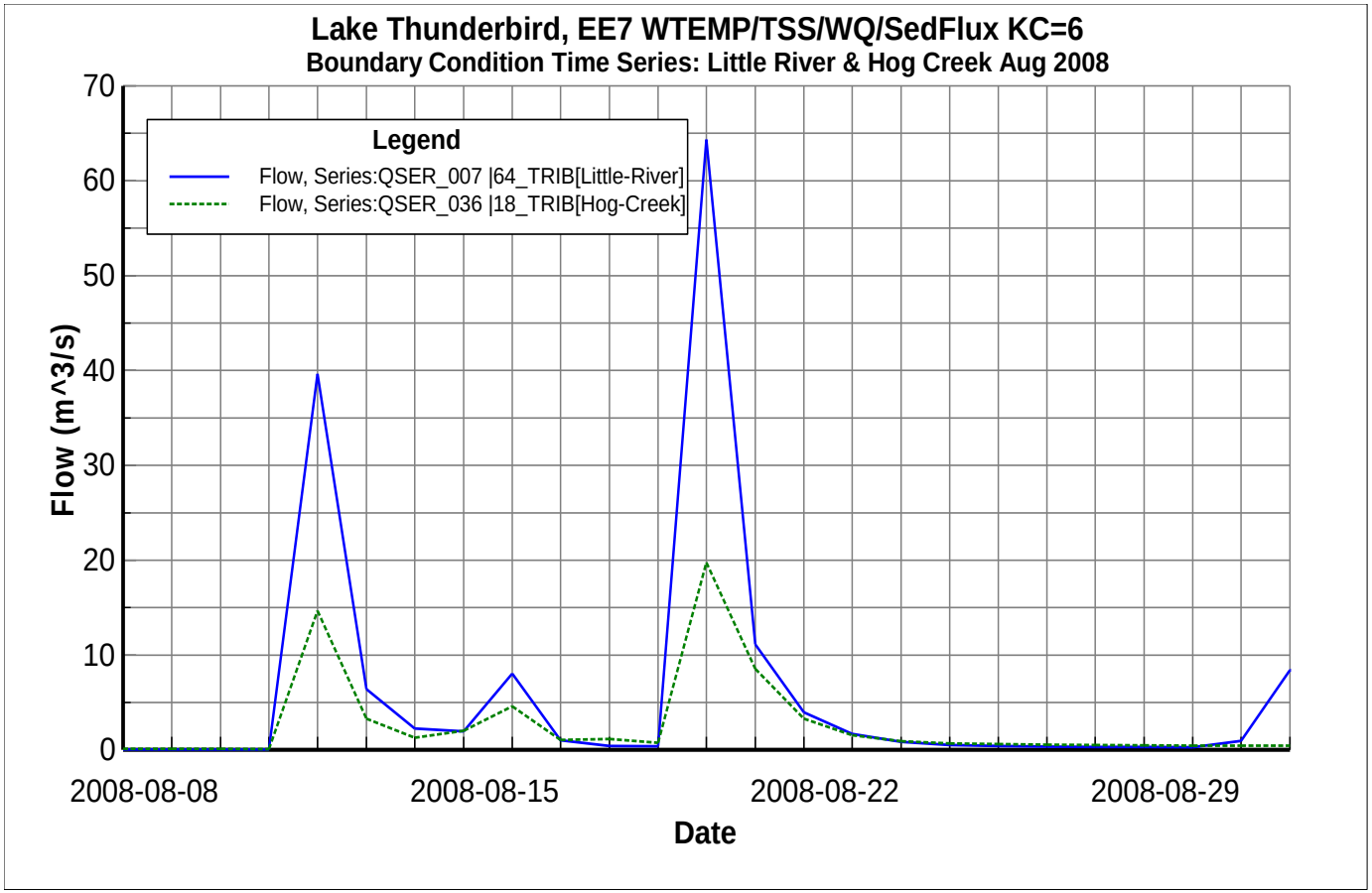


Little River at 60th Ave.

2. Update on Models (cont'd) - EFDC

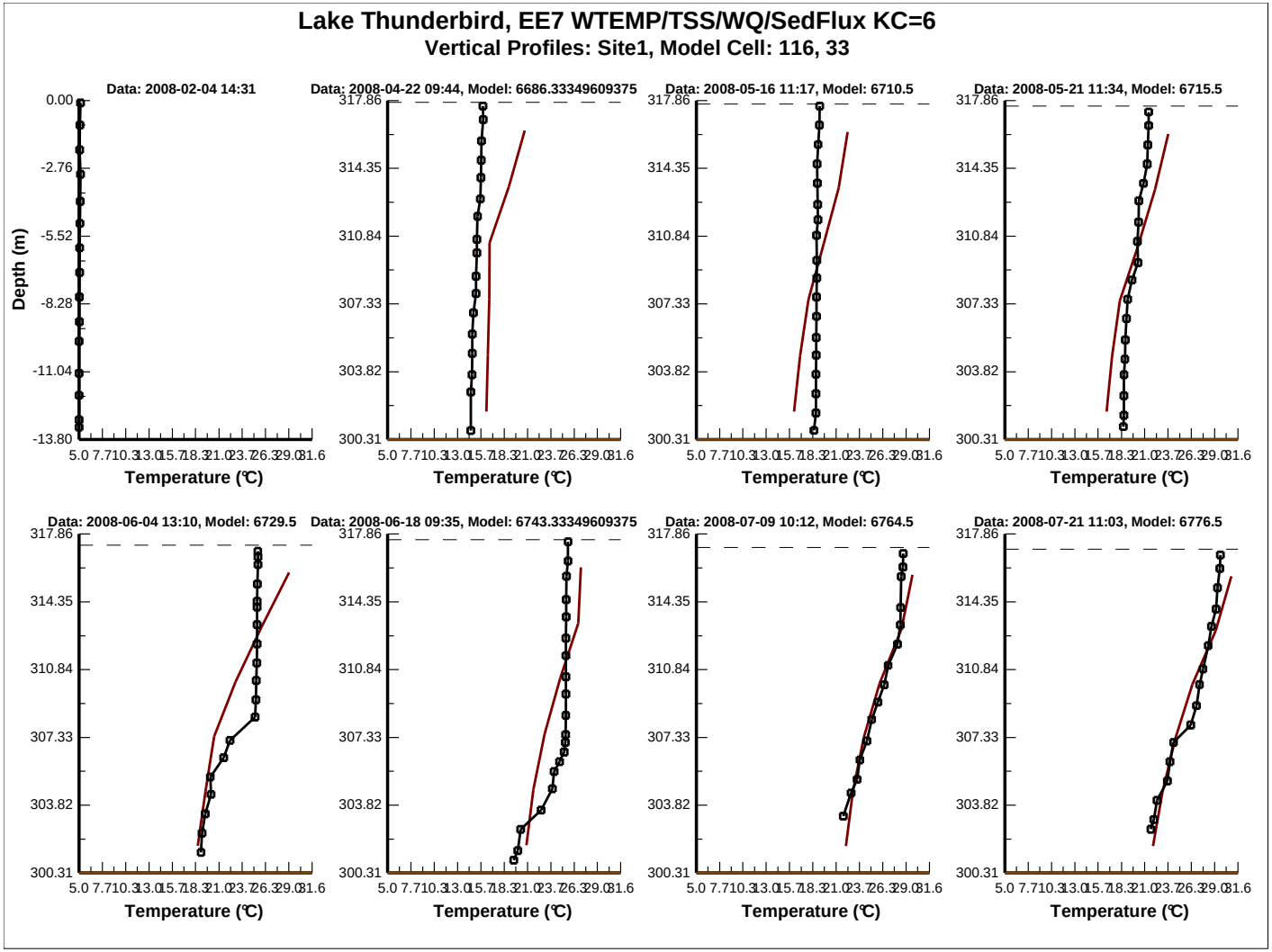


Major tributary in-flows (August 2008)

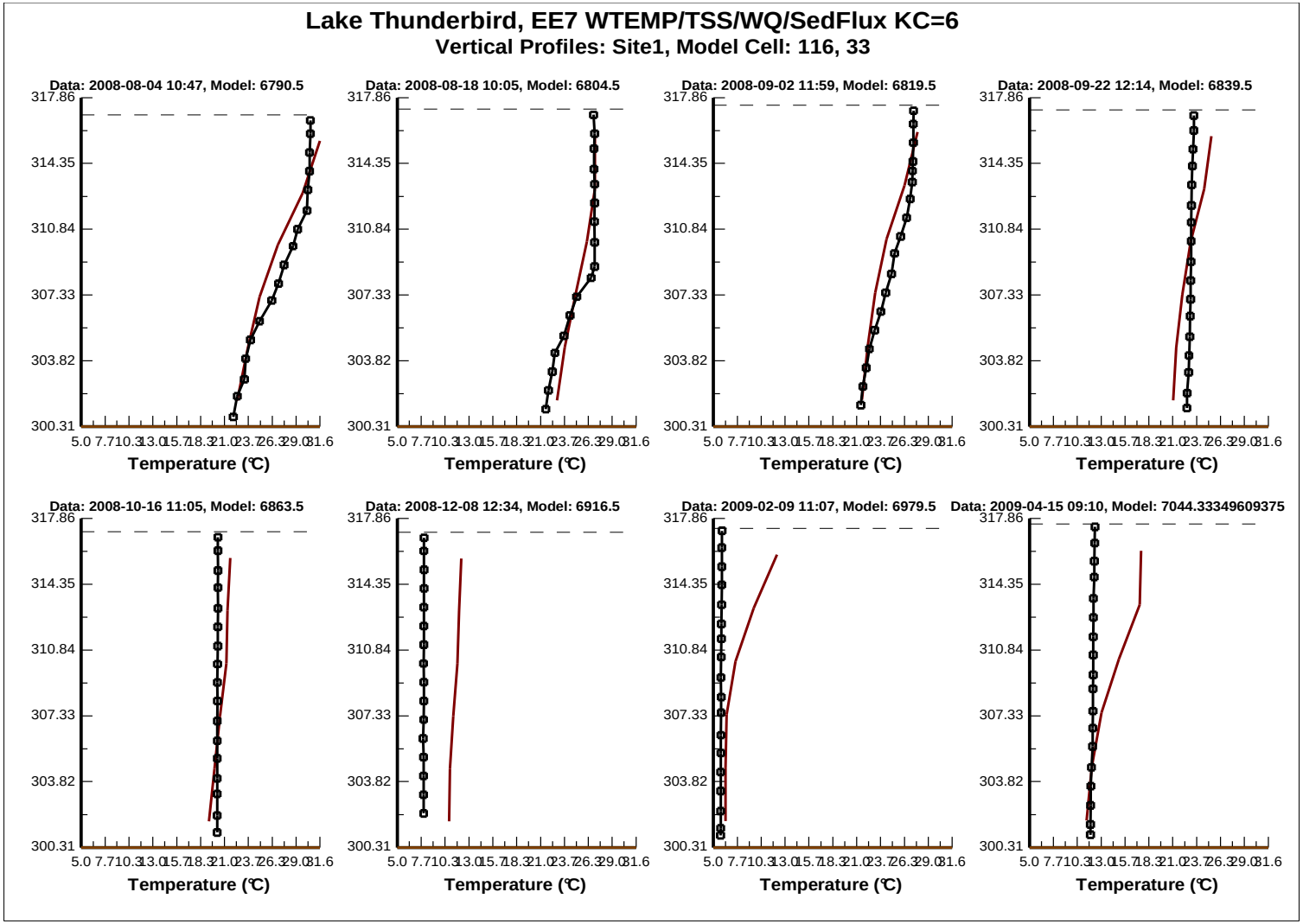


EFDC Lake water level (August 2008)

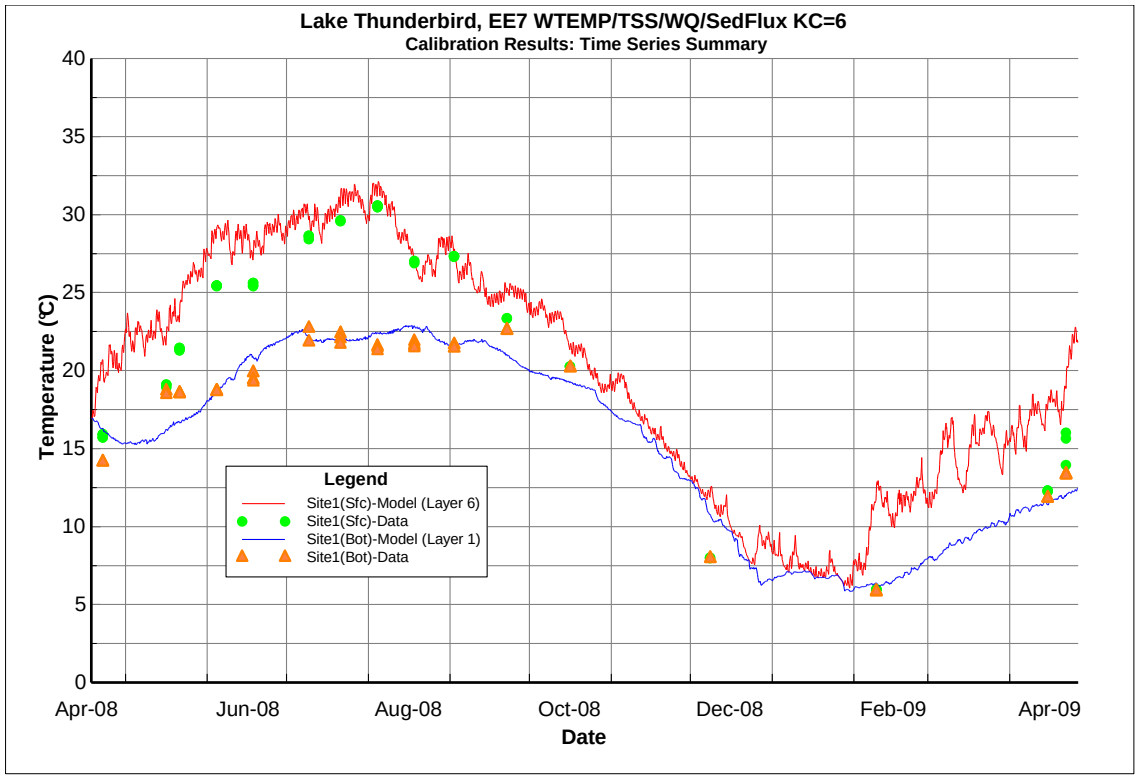
EFDC lake model (Temperature, site 1)



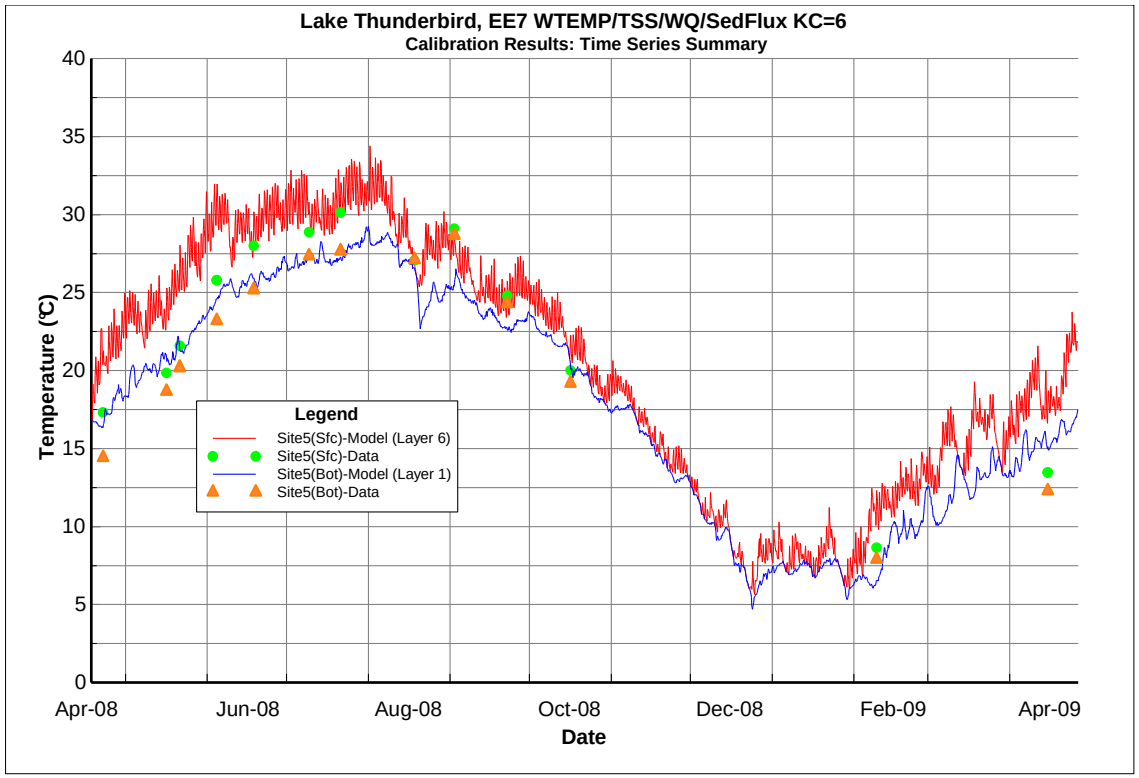
EFDC lake model (T, site 1, cont'd)



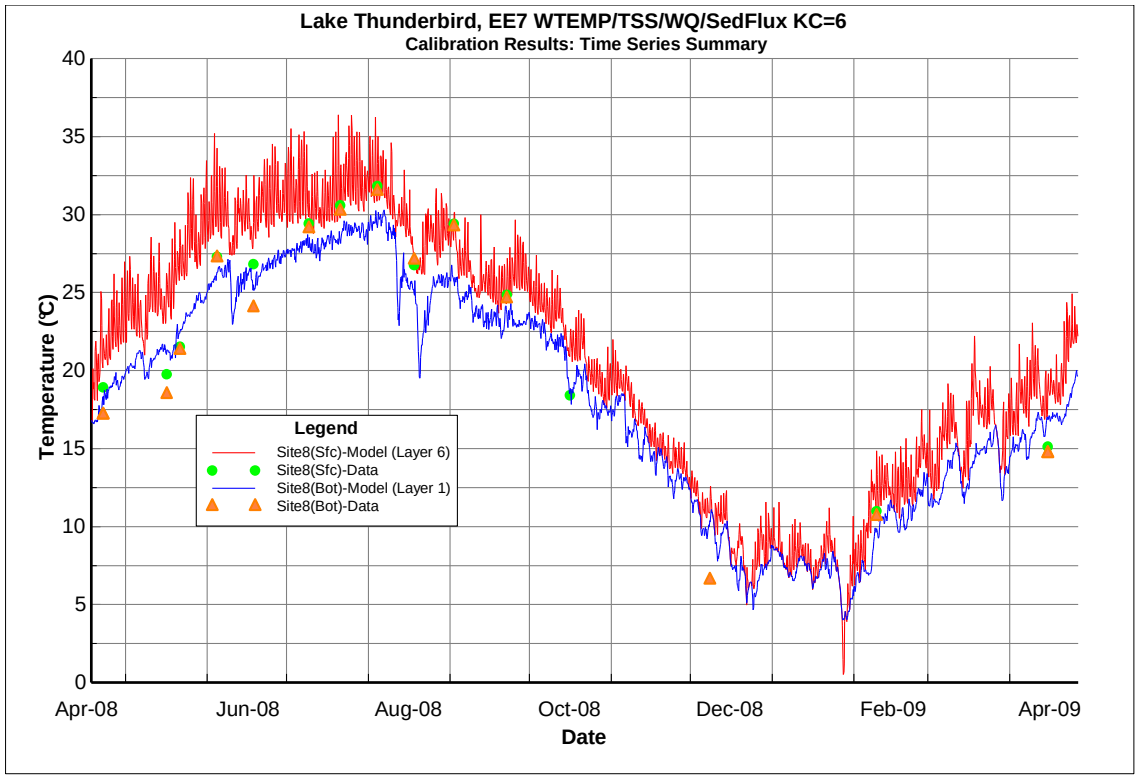
EFDC lake model (Temperature, site 1)



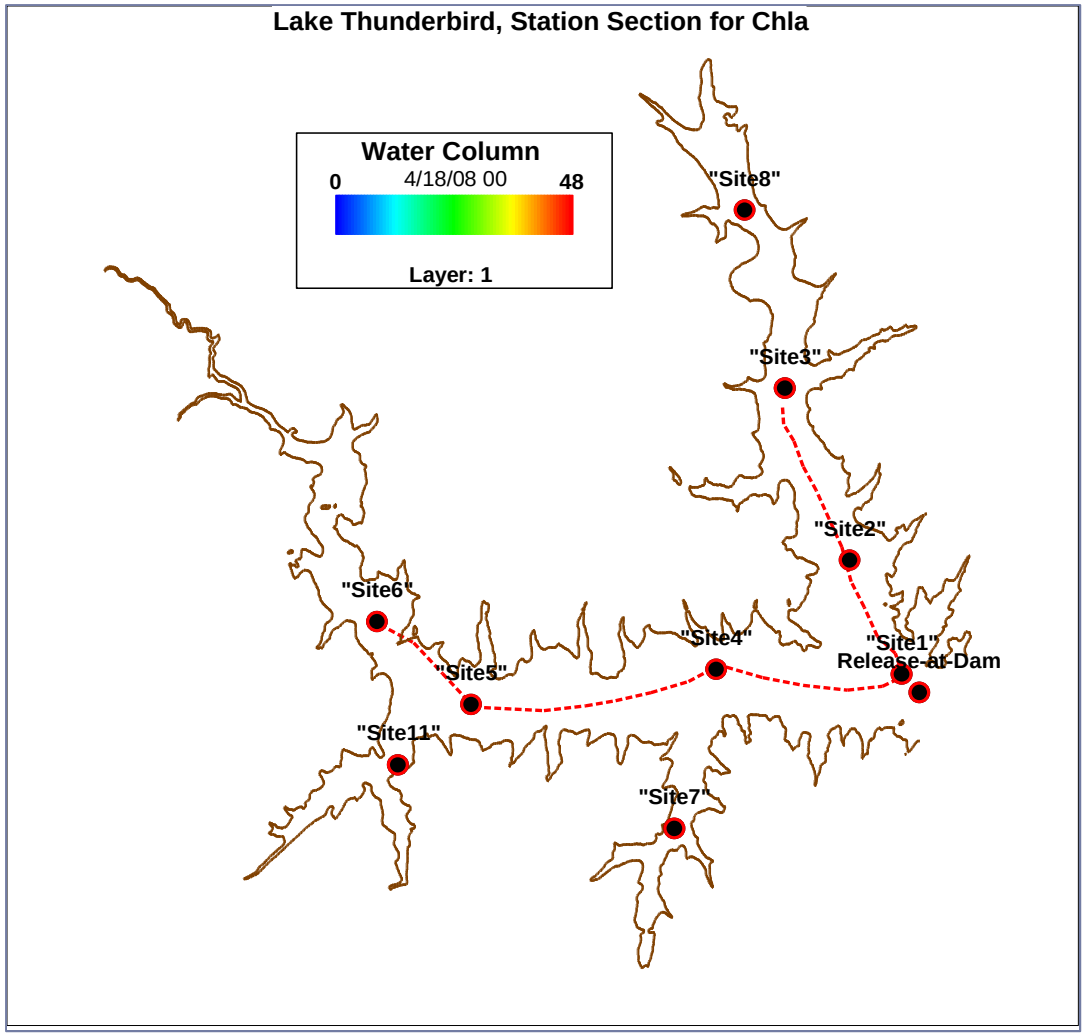
EFDC lake model (Temperature, site 5)



EFDC lake model (Temperature, site 8)



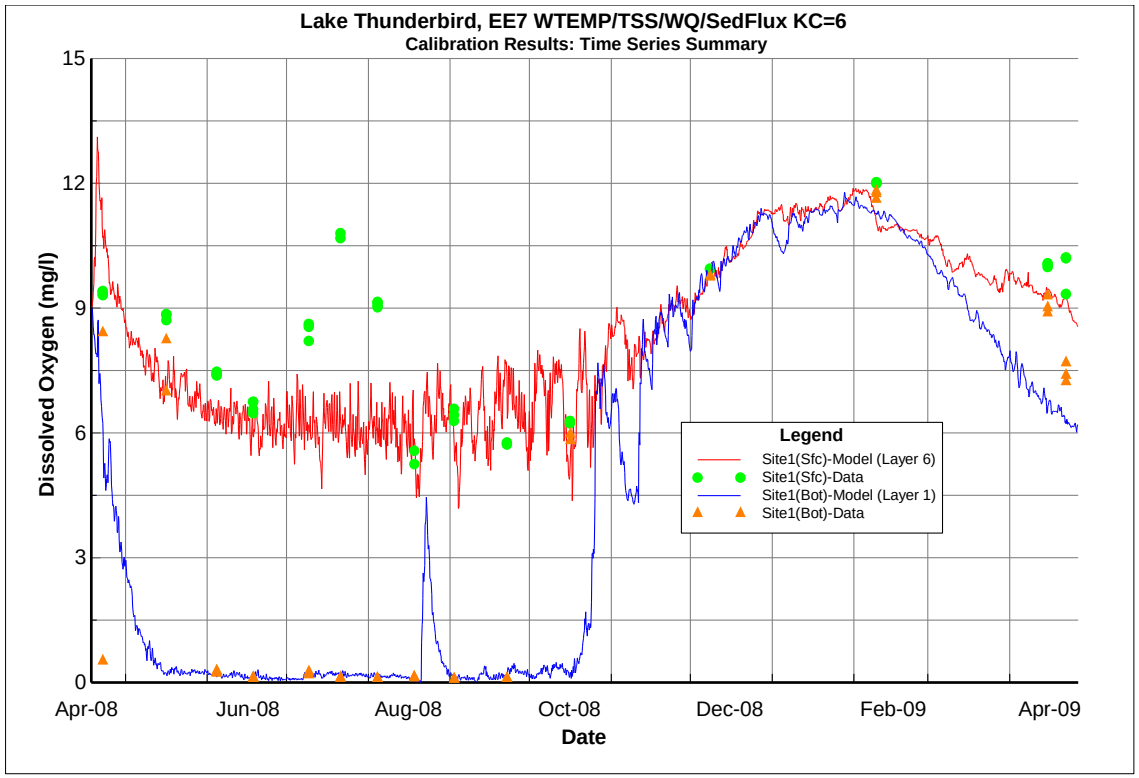
EFDC animation trans-section (profile)



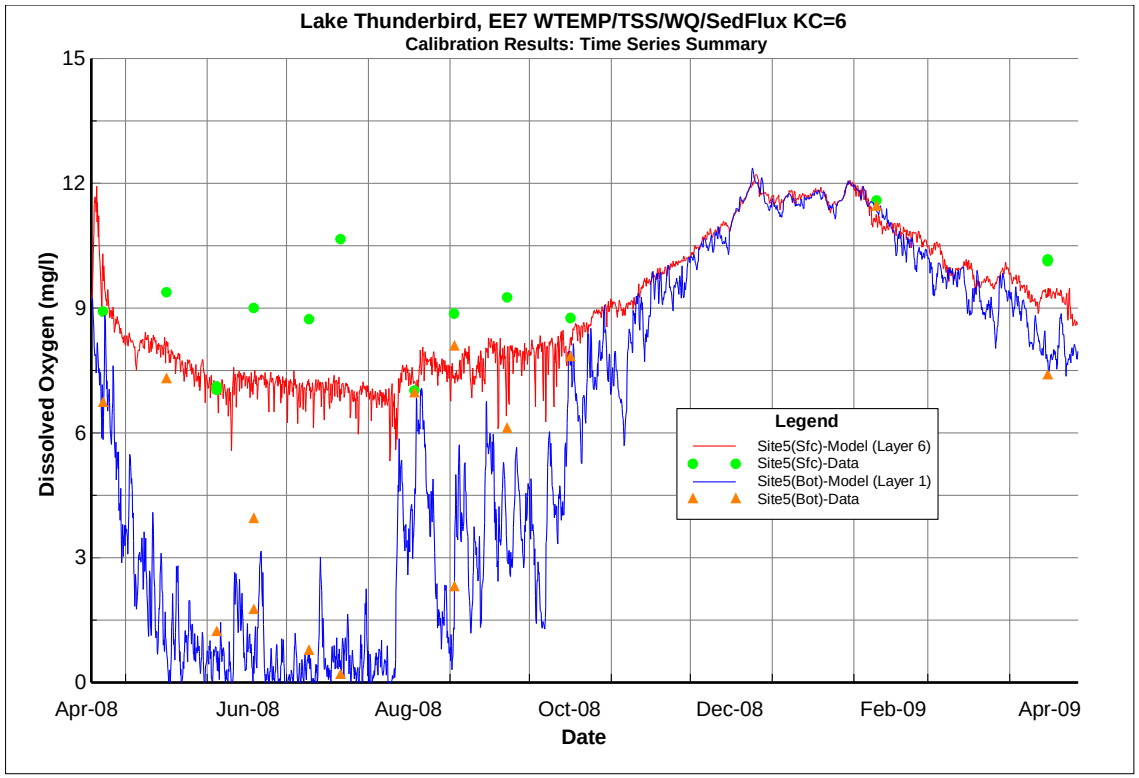
EFDC animations

- TSS: Storms and sediment (August 2008)
- TSS: Profile sediment (August 2008)

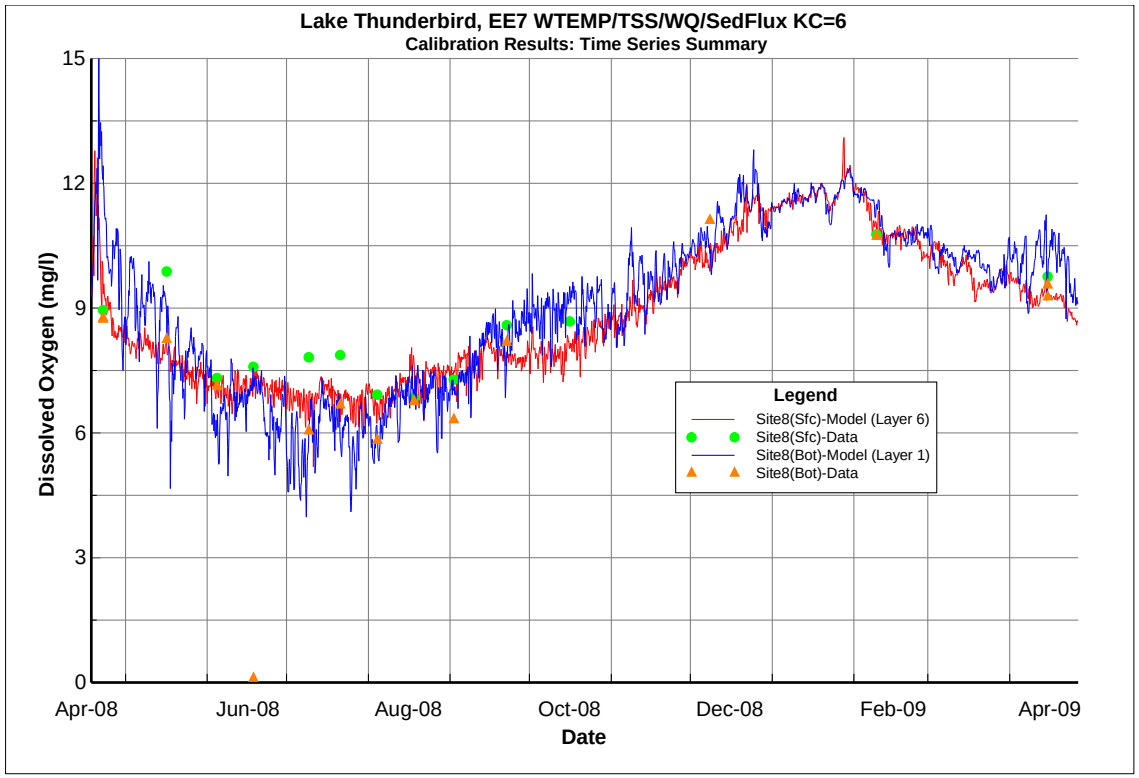
EFDC lake model (Oxygen, site 1)



EFDC lake model (Oxygen, site 5)



EFDC lake model (Oxygen, site 8)



EFDC animations

- Profile oxygen level (August 2008)
- Lake anoxic volume (July-Aug 2008)
- Profile Chl-a level (August 2008)

3. Next Steps

- Models
  1. Long term (~10-year) simulation of watershed loadings
  2. Lake load reduction needs to achieve lake Chl-*a* and DO standards
  3. Watershed options to get the reductions (TAC input)
  4. Lake options to get the reductions (TAC input)
  5. Draft modeling report by March 2012 (TAC input)
  6. Final modeling report by May 2012 (TAC review)

3. Next Steps (cont'd)

- Develop TMDL/Watershed Plan
  - DEQ drafts a report based on model reduction options
  - TAC input along the way (Oct 2012)
  - EPA technical review on the draft report (Jan 2013)
  - Public comment/meeting period (April 2013)
  - Final submission to and approval from EPA (July 2013)

4. A TMDL vs. WMP in Lieu of TMDL

- TMDL
- Watershed Management Plan
- Watershed Management Plan in Lieu of TMDL

5. COMCD suing DEQ

- 2007 Agreement between COMCD and DEQ
  - Dispute on stormwater permit for Oklahoma City
  - Agreement on a TMDL/WMP by April 2010
- DEQ/OCC proceeded with good faith (budget: ~ $570K)
  - Planning started 2007 for a monitoring program
  - One year watershed-lake monitoring started 2008
  - Modeling started 2009 after monitoring was completed
  - Lake modeling contract signed early 2010
  - Technical and funding issues delayed the completion of the models

5. COMCD suing DEQ (Cont'd)

- COMCD suing DEQ
  - DEQ not completing the TMDL/WMP
  - Wants a final TMDL by November 2012
- DEQ will continue completing the modeling effort
  - Aims to finish modeling by May 2012
  - Proposes to have a final TMDL by July 2013
    - Draft TMDL: October 2012 (TAC input)
    - Submit the Draft to EPA for technical review: January 2013
    - Final Draft for public review/comment: April 2013
    - Final TMDL: July 2013
- Now, beyond the models it depends on the outcome of the lawsuit

6. Next meeting

- Main topics
  - Draft modeling report
  - TMDL steps
- Time
  - Late April (Tuesday, April 24th)?
- Place
  - DEQ?

Open Discussion