

DEQ Lake Thunderbird Project  
**Technical Advisory Committee**  
First Meeting

September 22, 2011

# Agenda

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1. Welcome and introduction of the committee members
2. Project background
3. The TMDL/watershed plan process
4. Purpose of the TAC
5. Watershed and lake water quality monitoring
6. Project update: modeling timeline and status
7. Suggestions, requests, needs, visions from the committee
8. Logistics of the TAC
9. Next meeting time and place



# 1. The Committee

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- ▶ ACOG
- ▶ (COMCD)
- ▶ (City of Del City)
- ▶ City of Midwest City
- ▶ City of Moore
- ▶ City of Norman
- ▶ City of Oklahoma City



## The Committee (cont'd)

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- ▶ Oklahoma Conservation Commission (OCC)
- ▶ Oklahoma Secretary of the Environment (OSE)
- ▶ Oklahoma Water Resources Board (OWRB)
- ▶ US Bureau of Reclamation
- ▶ University of Oklahoma

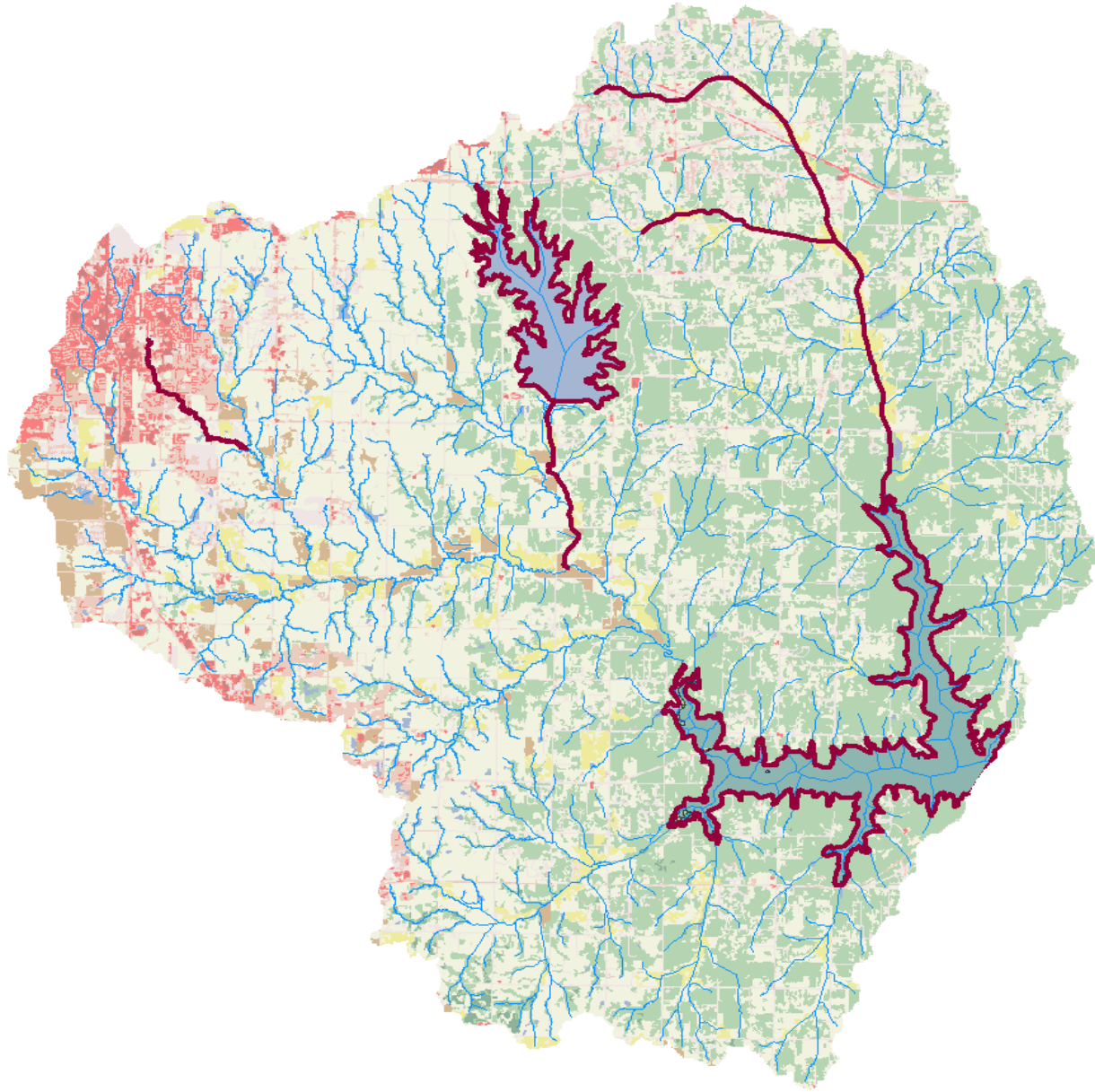


## 2. Project Background

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- ▶ Lake Thunderbird: a Sensitive Water Supply (SWS) lake
- ▶ Lake Thunderbird on State's 303(d) list
- ▶ COMCD and DEQ settlement
- ▶ As shown by all successful TMDLs, stakeholder involvement is critical





# 2008/10 303(d) list

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Name	Size	Unit	Category	Chl_a	E_coli	DO	TDS	Turbidity
Thunderbird Lake	6070	ACRES	5a	X		X		X
Hog Creek	11.89	MILES	5a			X		X
Hog Creek, West Branch	3.69	MILES	5a			X		
Elm Creek	1.44	MILES	5a		X		X	X
Elm Creek, East	2.4	MILES	5a			X		
Stanley Draper Lake	2900	ACRES	5a					X
Moore Creek	4.02	MILES	5c				X	



### 3. The TMDL/Watershed Plan Process

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- ▶ **What's in a TMDL/watershed plan in lieu of TMDL**
  1. What is the problem
  2. What are the current loadings/sources of the problem
  3. What are the target loadings and source load allocations
  4. How are we going to achieve the target (watershed plan)
  
- ▶ **Identify target pollutants: sediment, nutrients**





### 3. The TMDL/Watershed Plan Process (cont'd)

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- ▶ **Build models for quantifying loadings and establishing goals**
  - ▶ Collect monitoring data for model calibration
  - ▶ Build and calibrate models
  - ▶ Run models to estimate current loadings
  - ▶ Run models to simulate load reduction results (how much we need to reduce?)
- ▶ **Establish TMDL/watershed plan based on**
  - ▶ Modeling results
  - ▶ Stakeholder input
- ▶ **Approval/acceptance by EPA**



## 4. Purpose of the TAC

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- ▶ **Be informed on technical issues, e.g.,**
  - ▶ Model parameter selections
  - ▶ Model limitations
- ▶ **Provide advice on technical issues, e.g.,**
  - ▶ Load reduction options
  - ▶ Load allocation options (e.g., do we leave room for future growth?)
- ▶ **Act as a bridge between DEQ and stakeholders**



## 5. Watershed and Lake Monitoring

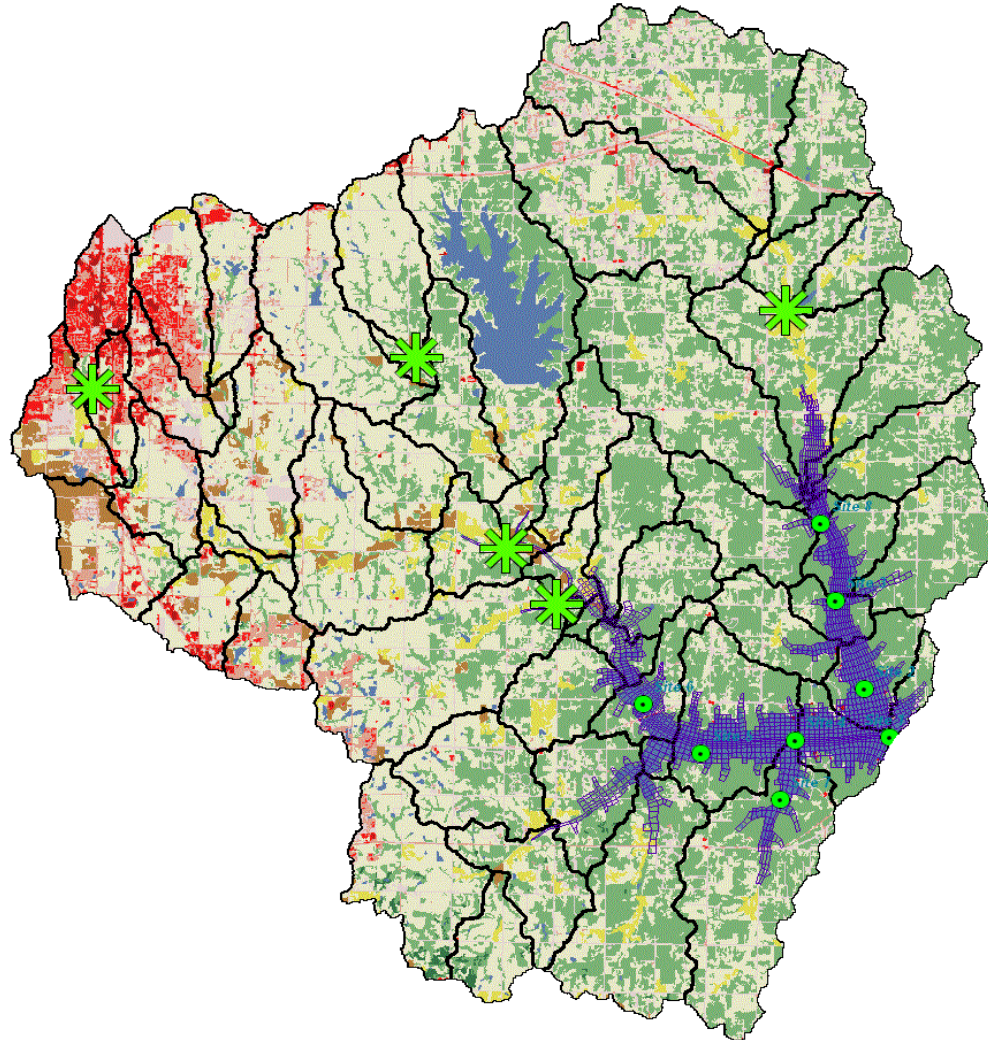
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- ▶ First step for model establishment if available data are insufficient
  - ▶ Watershed (streams)
    - ▶ Insufficient data for a watershed model calibration
    - ▶ April 2008 – April 2009 monitoring:
      - 5-min rain gage, continuous flow,
      - Weekly temperature, DO, suspended sediment, phosphorus and nitrogen constituents, TOC and DOC
  - ▶ Lake
    - ▶ Sufficient data collected over the years by OWRB/COMCD, but we needed more frequent sampling and more sample sites, plus some model specific parameters
      - TOC in the water and COD, TP and TKN in the sediment
    - ▶ Monitoring coinciding with the watershed monitoring



## 5. Watershed and Lake Monitoring (cont'd)

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## 5. Watershed and Lake Monitoring (cont'd)

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- ▶ OWRB Thunderbird lake monitoring program
- ▶ Steven Cadenhead



## 6. Project Update

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### ▶ Timeline

- ▶ Modeling done by December
- ▶ Draft modeling reports done by March 2012
- ▶ Final modeling reports done by June 2012
- ▶ TMDL/watershed plan by December 2012 ???

### ▶ Watershed model

- ▶ HSPF (Hydrologic Simulation Program – FORTRAN)
- ▶ EPA supported watershed model



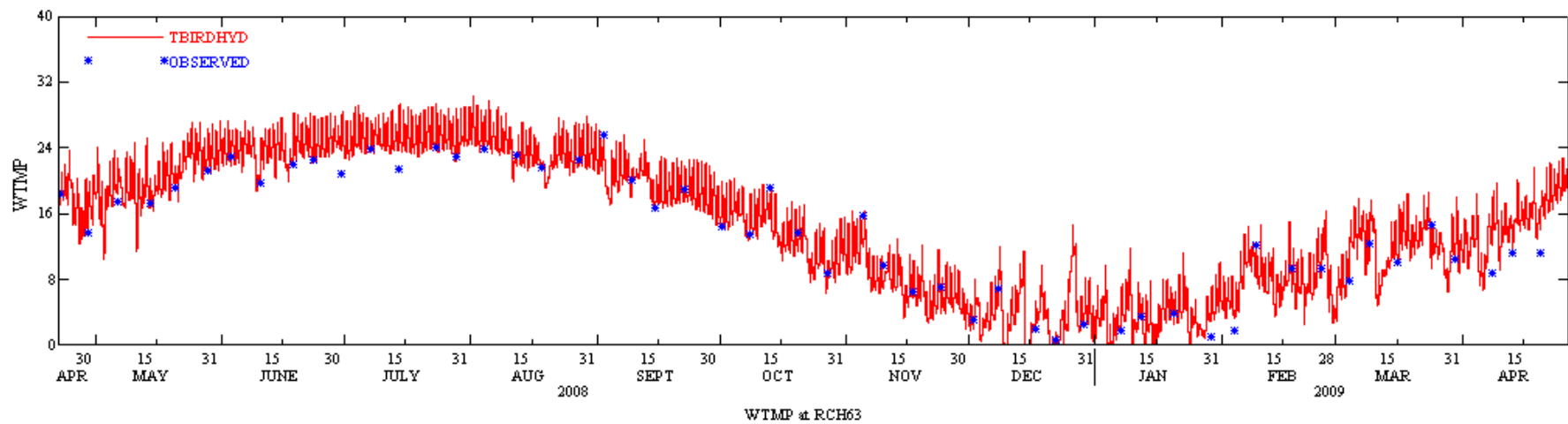
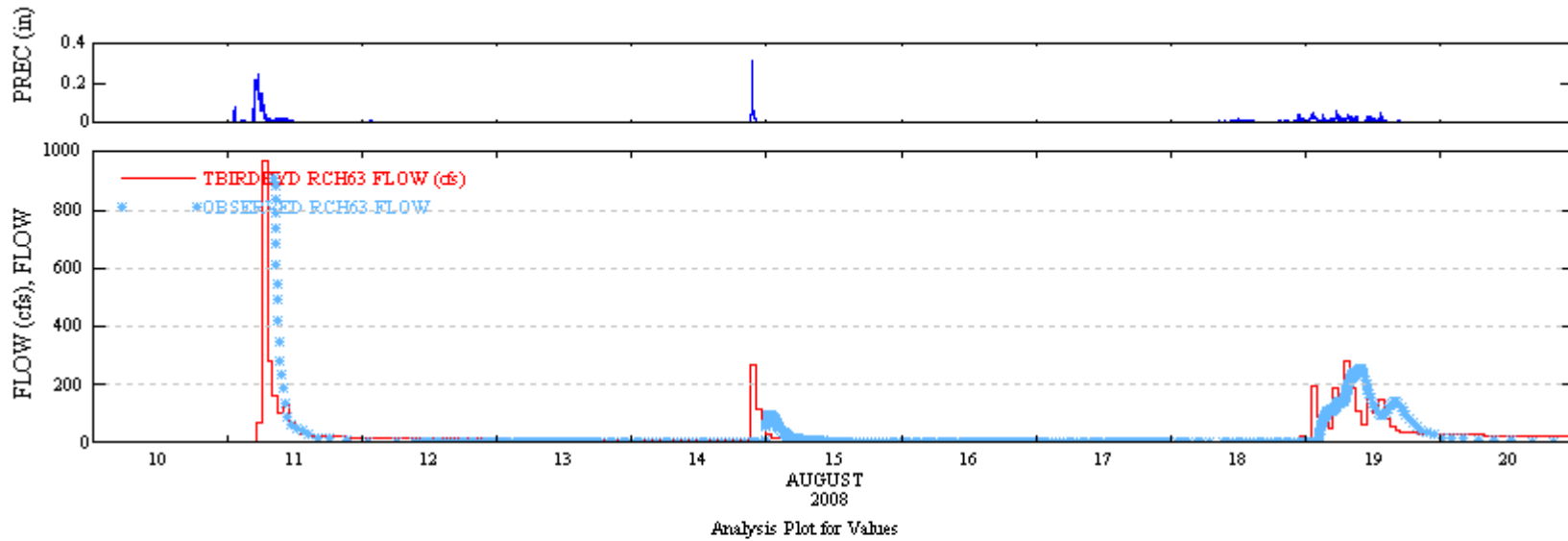
# HSPF model

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- ▶ Simulates stream flow and pollutant loading from the watershed on the hourly step
- ▶ Generates input for the lake model (flow, temp, sediment, nutrients)
- ▶ Shows loading sources and their load contribution
- ▶ Estimates impacts of management practices on loadings
- ▶ Update
  - ▶ Done: flow, temperature, sediment
  - ▶ Ongoing: nutrients, DO
- ▶ DEQ is building the model in-house



# HSPF model





## 6. Project Update (cont'd)

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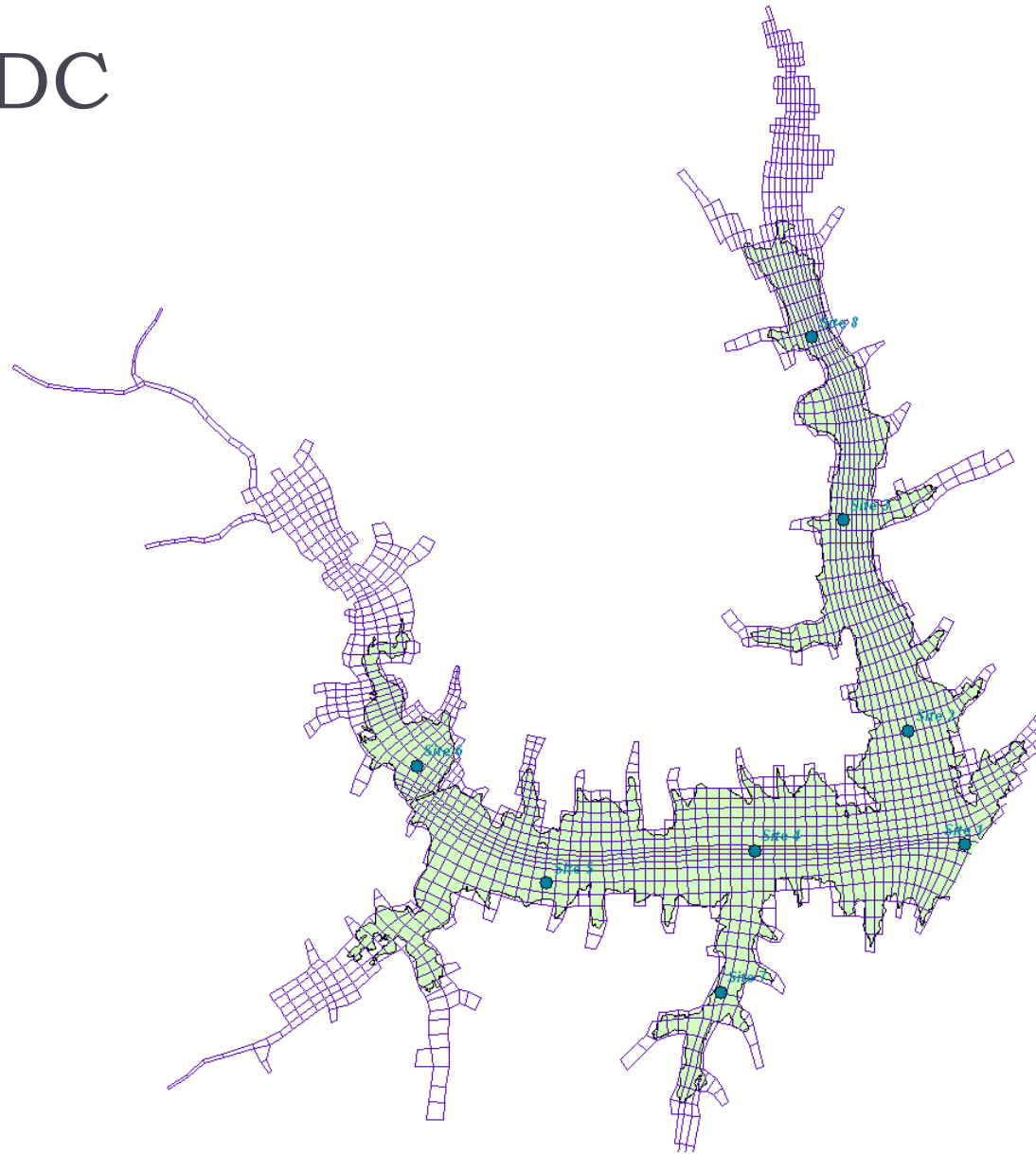
### ▶ Lake model

- ▶ EFDC (Environmental Fluid Dynamics Code)
  - ▶ EPA supported hydrodynamics and water quality model
- ▶ Simulates lake hydrodynamics for water balance and temperature
- ▶ Simulates lake water quality for DO, nutrients, algae (chl-*a*) and sediment
- ▶ Update
  - ▶ Done: setup, hydrodynamics with temperature
  - ▶ Ongoing: water quality parameters



# 3-D EFDC

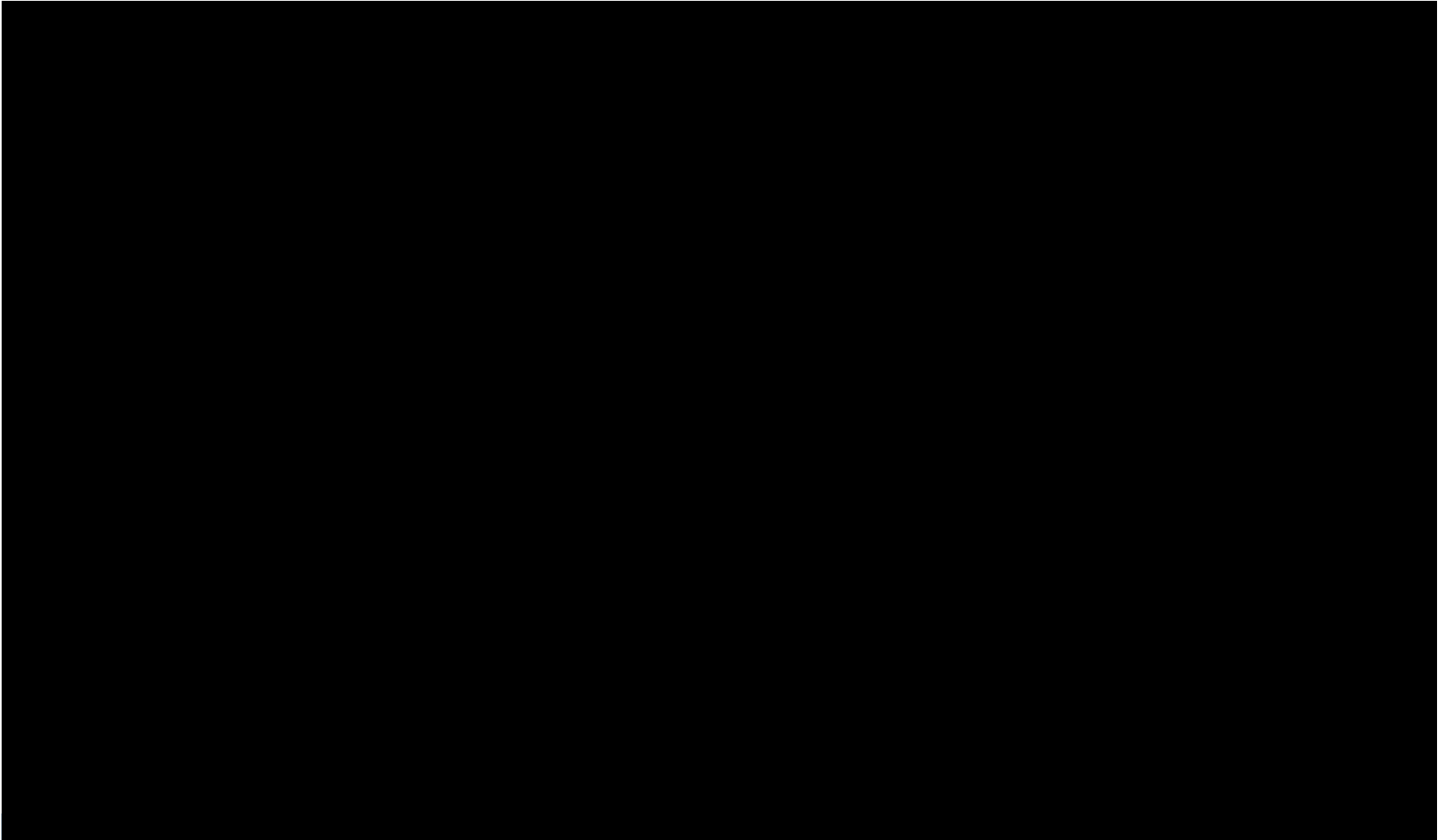
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## 3-D EFDC

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- ▶ Animated EFDC simulation for DO profile (Lake Tenkiller)



## 7. Suggestions, comments?

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- ▶ Questions?
- ▶ What would you like to get from the TAC?



## 8. Committee logistics

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- ▶ **Composition of the committee membership**
- ▶ **How often should we meet?**
  - ▶ Monthly? Quarterly? As needed according to the timeline?
- ▶ **Where should we meet?**
  - ▶ One fixed place like the MNTC?
  - ▶ Rotating among the members?
- ▶ **Communication channels**
  - ▶ Email list
  - ▶ Project website hosted by DEQ
  - ▶ Point of contact: Andrew Fang, DEQ



## 9. Next meeting

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- ▶ **Main topics**
  - ▶ Model results update
  - ▶ TMDL vs. watershed plan in lieu of TMDL
  
- ▶ **Time**
  
- ▶ **Place**

