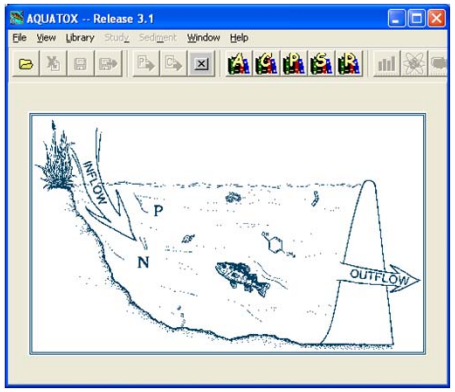
Lower Boise River
AQUATOX Model Primer

September 2013

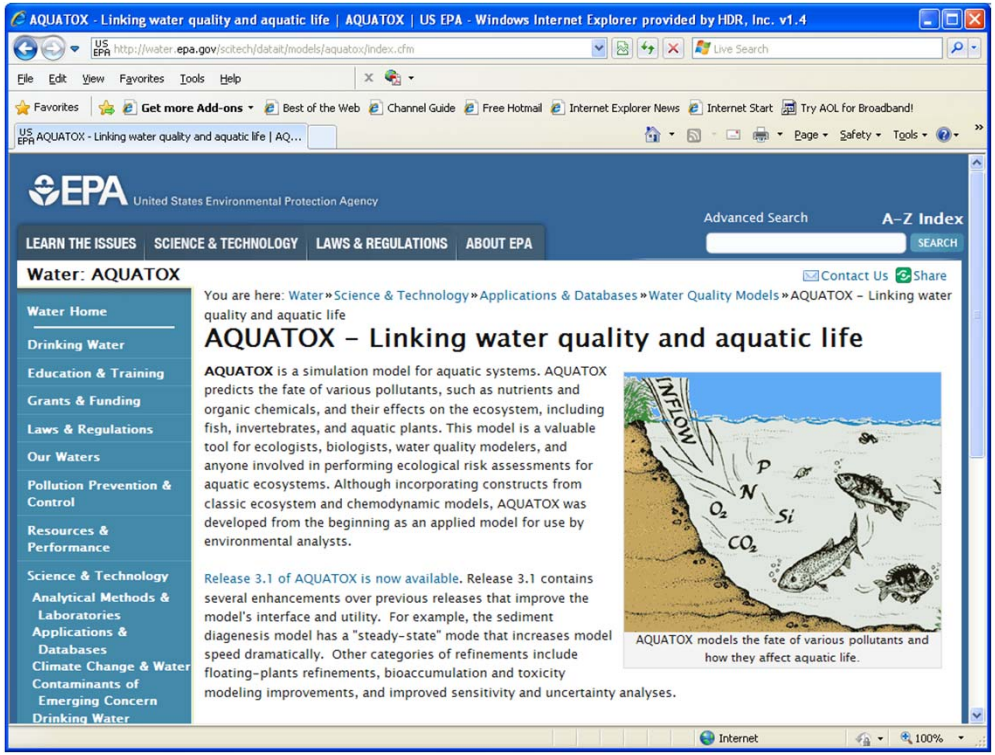
Introduction

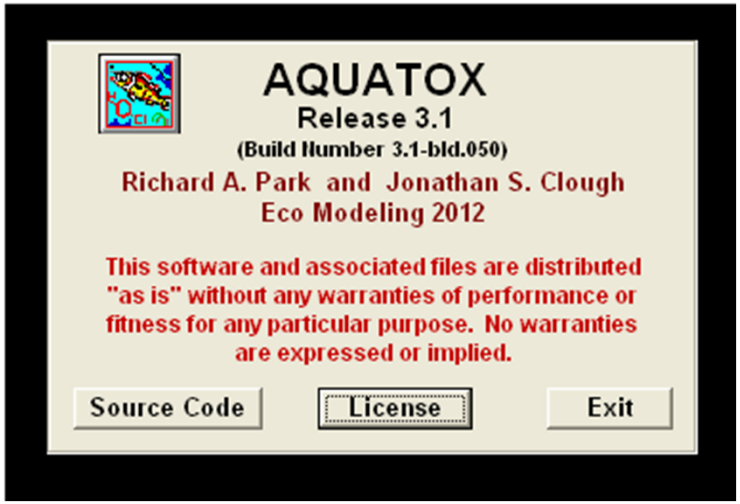
- An AQUATOX model of the lower Boise River (LBR) has been created
  - 13 Segments
- Model has been updated with 2012 through April 2013 data
- These slides provide a summary of the associated model files and use related to the model
- This model is consider representative but not fully calibrated
- This model is publically available for comment

AQUATOX MODEL



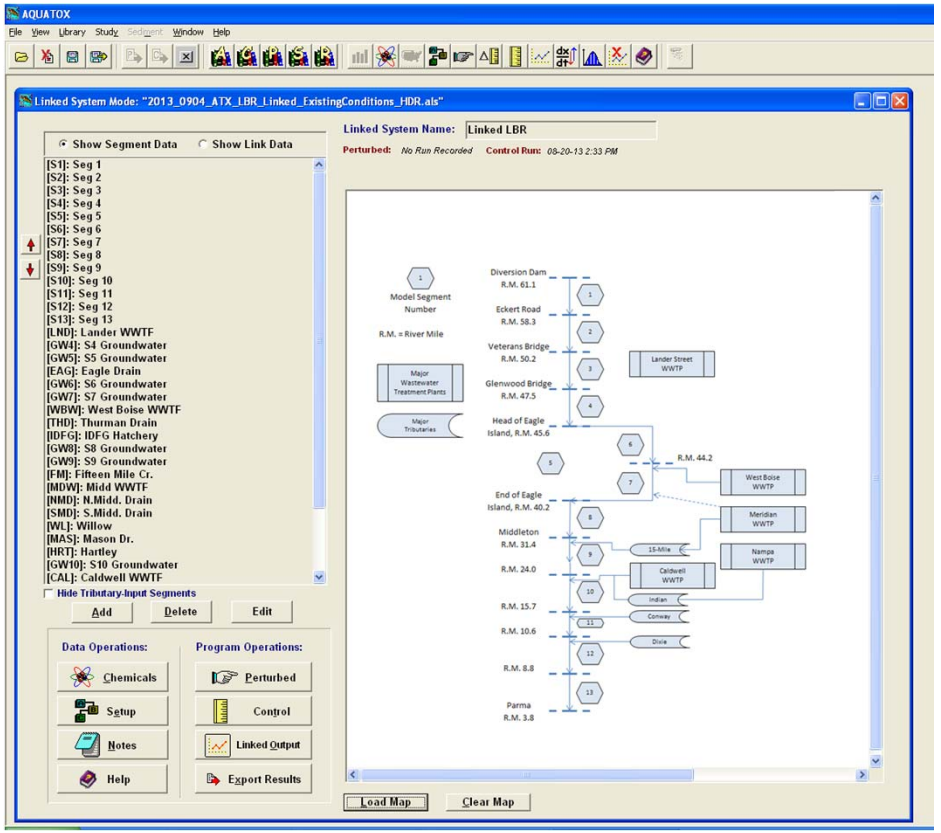
- Requires software
- Use Release 3.1
- http://water.epa.gov/scitech/datait/models/aquatox/index.cfm





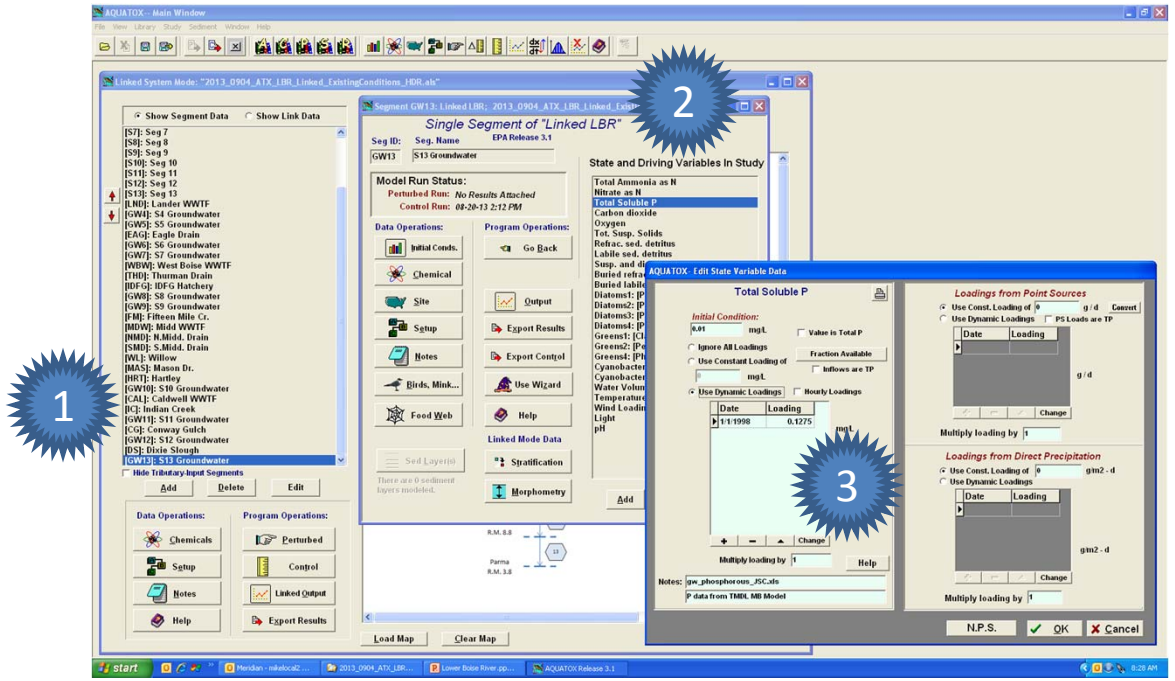
LBR AQUATOX MODEL

- The model file is
  - 2013_0904_ATX_LBR_Linked_ExistingConditions_HDR.als
- Open file in AQUATOX
- User may
  - Change an inputs
  - Simulate model (Control button)
  - Look at output graphs (Linked Output button)
  - Export data (Export Results button)



EXAMPLE INPUT CHANGE

- Change groundwater phosphorus concentration
  - 1) Select Input
  - 2) Select constituent
  - 3) Edit concentration



DOCUMENTATION REQUEST

- If you intend to share a model simulation and results, please follow the following guidelines
  - Use the naming protocol convention
    - yyyy_mmdd_ATX_LBR_FileDescriptor_Condition or Scenario_User
    - Where:
      - yyyy_mmdd = year, month, and day the file was created (e.g. 2012_0625.)
      - ATX = AQUATOX
      - LBR = Lower Boise River
      - FileDescriptor = description of file (e.g. Linked, Results, Import, etc.)
      - Condition = the condition depicted in the analyses (e.g., ExistingCondition, etc.)
      - Scenario = the scenario depicted in the analyses (e.g. Points350 = point sources at 350 ug/l,, NonPoinst100 = nonpoint sources at 100 ug/l, etc.)
      - User = Agency, consultant, or other identifying name
  - Document what changes were made to the model
  - Provide the model file
  - Provide associated spreadsheets used
  - Document processing of results and findings

ALTERNATIVE METHOD TO CHANGING MODEL INPUTS

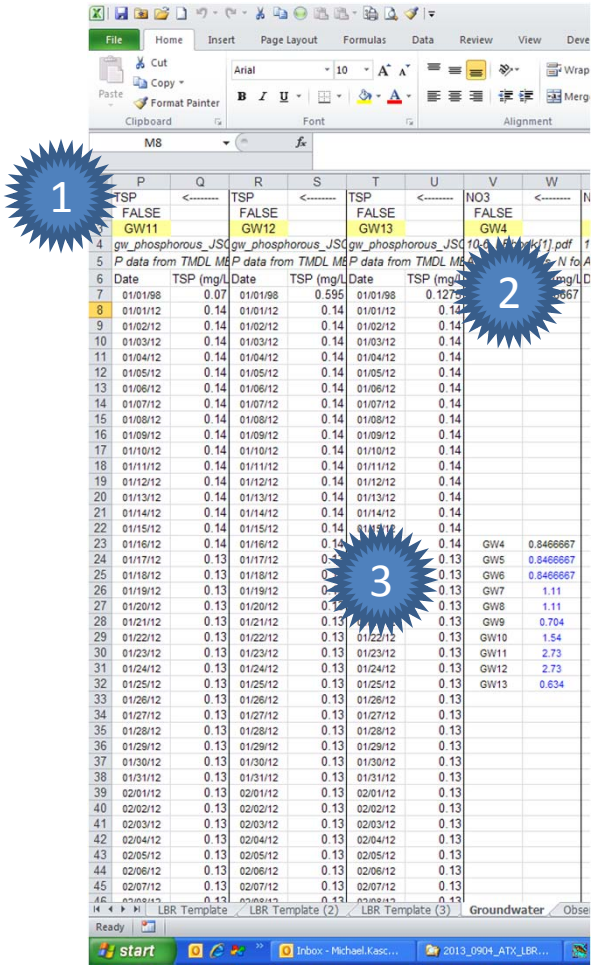
- Use the import spreadsheet
  - 2103_0904_ATX_LBR_Linked_EC_Import_HDR.xls
- File contains
  - Five tabs with initial conditions, flows, water quality, groundwater, and observed data
  - Times series and associated data
- Load the data into the *.als file by using Study, Add Timeseries from Excel

IMPORT SPREADSHEET

- Do NOT change layout of the tabs and data
  - LBR Template: Initial Conditions, Flows, WQ
  - LBR Template (2): Additional Water Quality
  - LBR Template (3): Forcing Data
  - Groundwater: Flow and Water Quality
  - Observed Import: Monitoring Data shown on Graphs
- Various data sources used, see DEQ documentation, primarily USGS data
- Time series of data may be edited (changed or added to) and then read into the model

EXAMPLE INTUT CHANGE USING IMPORT SPREADSHEET

- Change groundwater phosphorus concentration
  - 1) Locate the constituent
  - 2) Find the location
  - 3) Edit concentration



CHARTS OF IMPORT DATA

- Separate spreadsheet with charts of inputs
  - 2013_0904_ATX_LBR_Linked_EC_InputGraphs_HDR.xlsx
- Useful for visualizing the data
- Organization by segment
  - Inflows
  - Forcing data
  - Tributaries and drains
  - Groundwater
  - Withdrawal (inflow to next segment)

FLOW BALANCE

- AQUATOX uses an external flow balance
  - 2013_0904_ATX_LBR_Linked_EC_FlowSetup_HDR.xlsx
- File contains
  - Six tabs including flow data (cfs), edits (cfs) and conversion ready for AQUATOX (cms)
- Changes to the flow balance must then be copied into the import spreadsheet and then uploaded into AQUATOX
  - Use caution if editing the flow balance!
    - Interrelated equations are complex
    - Not simple addition flows, routing included

MODEL RESULTS STATISTICS

- Separate spreadsheet to calculate statistics and provide graphs
  - 2013_0904_ATX_LBR_Linked_EC_OutputCharts_HDR.xlsx
- Use Export data button in AQUATOX
  - Add constituents
    - NH3 & NH4+
    - NO3
    - Tot. Sol. P
    - Oxygen
    - Phyto Chlorophyll
    - Peri. Chlorophyll
    - TP
    - CBOD5
  - Other constituents may be selected but will not fit into the preformatted spreadsheet!
  - Export Results spreadsheet is basically an archive file used in the OutputCharts
- Cut and paste results into first two tabs
- Statistics on tab Targets
- Charts on tab Graphs