If You Could See Me Now
- Implementation of the CVP WTMP

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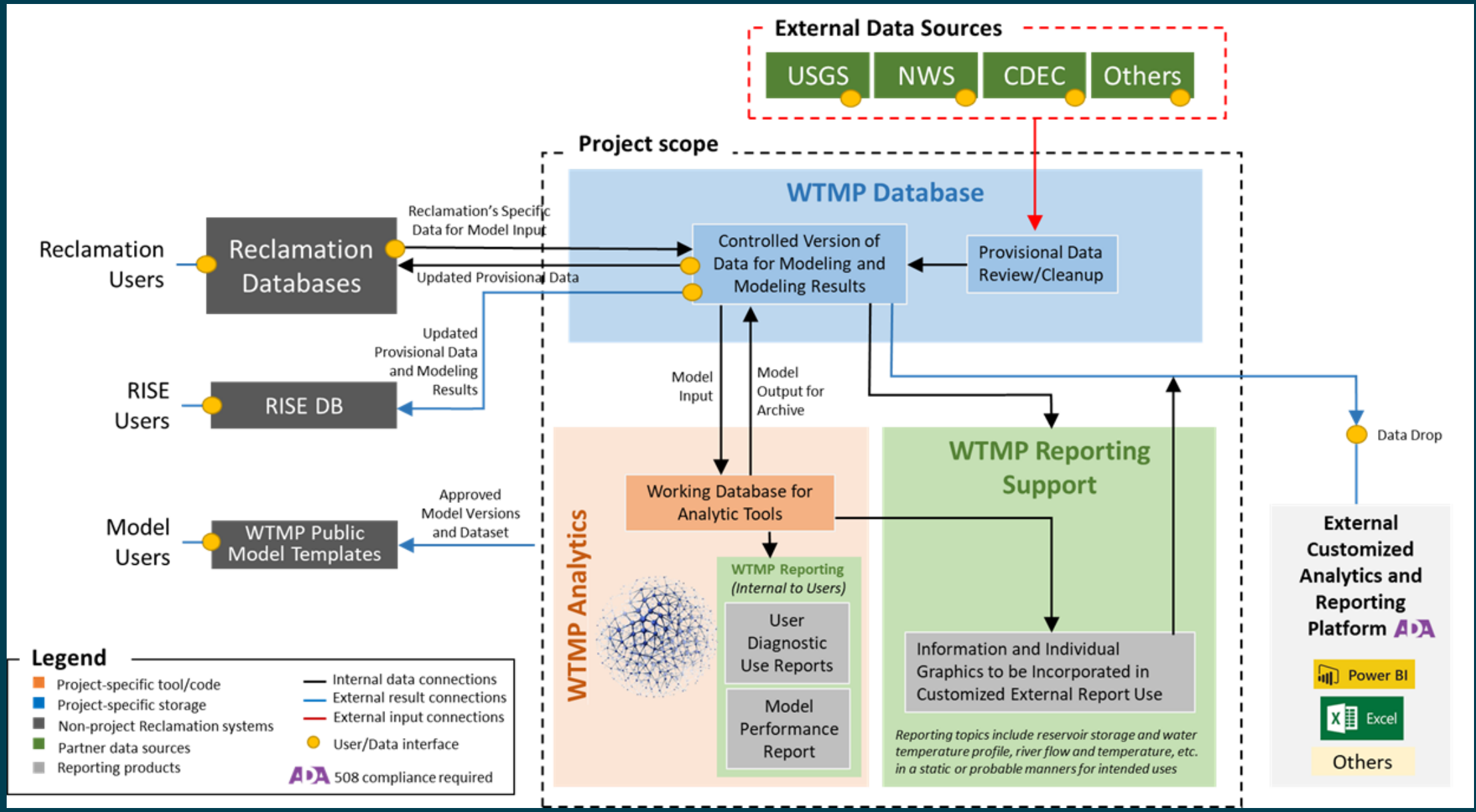
WTMP Objectives

Enhance Efficiency, Consistency, Adaptability and Transparency

- Ease model application and output interpretation
  - Reduce requirement for training on file editing and information flow
  - Reduce the time it takes to carry out modeling activities
  - Facilitate standard approaches for data management and reporting
  - Automate repetitive modeling tasks
- Facilitate the use of multiple models individually or in a sequence
- Managing updates and addition of new features
- Reducing input error and errors in general!

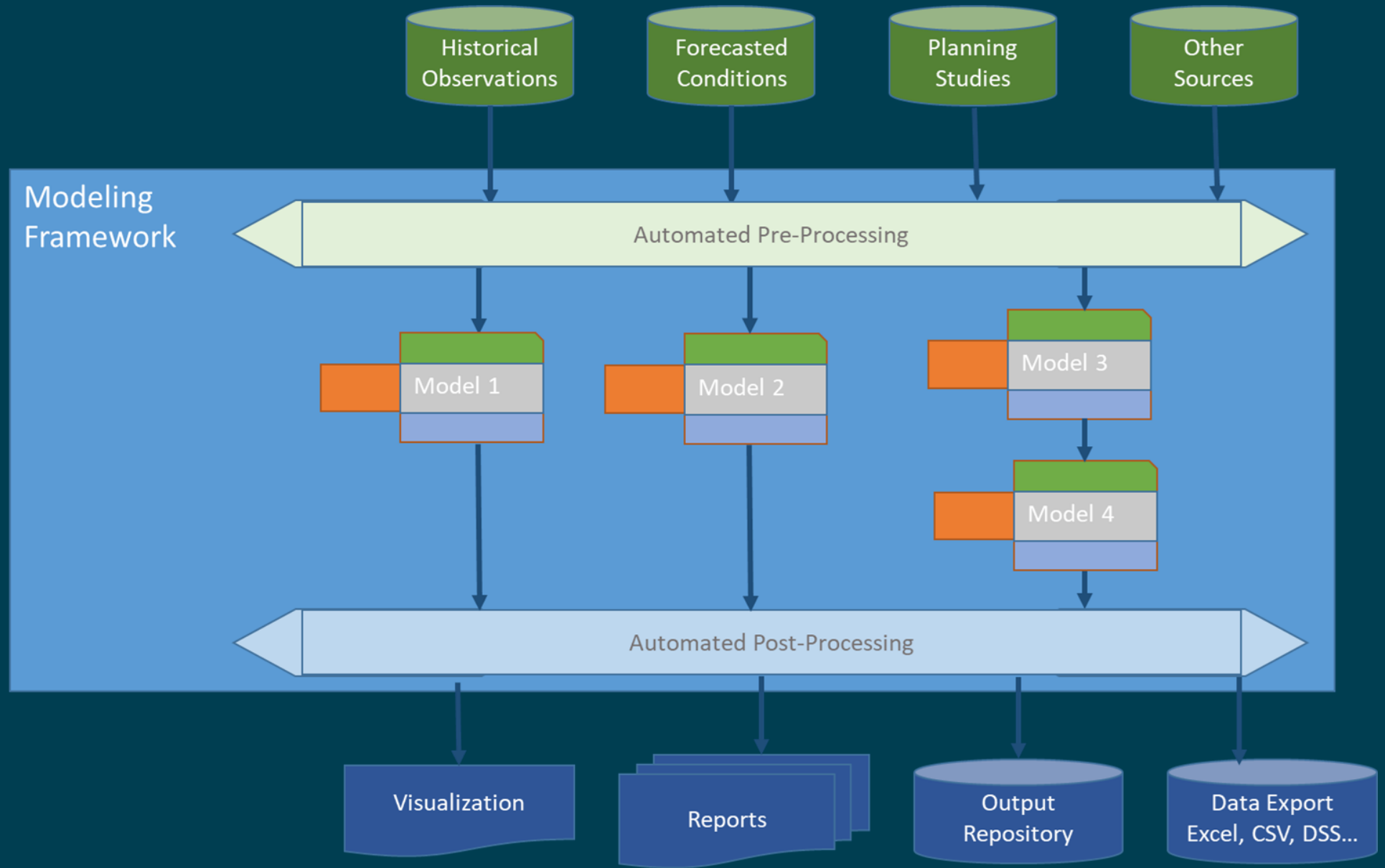
Water Temperature Modeling Platform



Framework Functions for Team Members with Different Roles

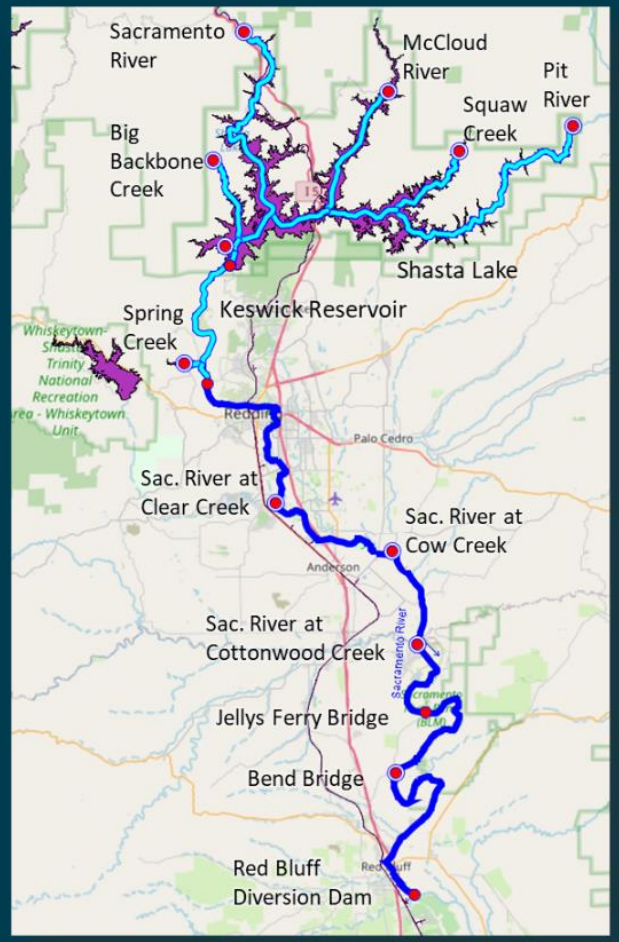
- **Model Operator:** Carries out modeling studies
- **Power User:** Configures automated processing for pre- and post- processing, designs reports, manages model linkages
- **Expert Modeler:** Responsible for configuration and calibration of a model for a particular system
- **Model Developer:** Responsible for the development and maintenance of a model's computational engine
- **IT Support:** Manages the IT infrastructure to facilitate team modeling and provide connectivity to web data sources

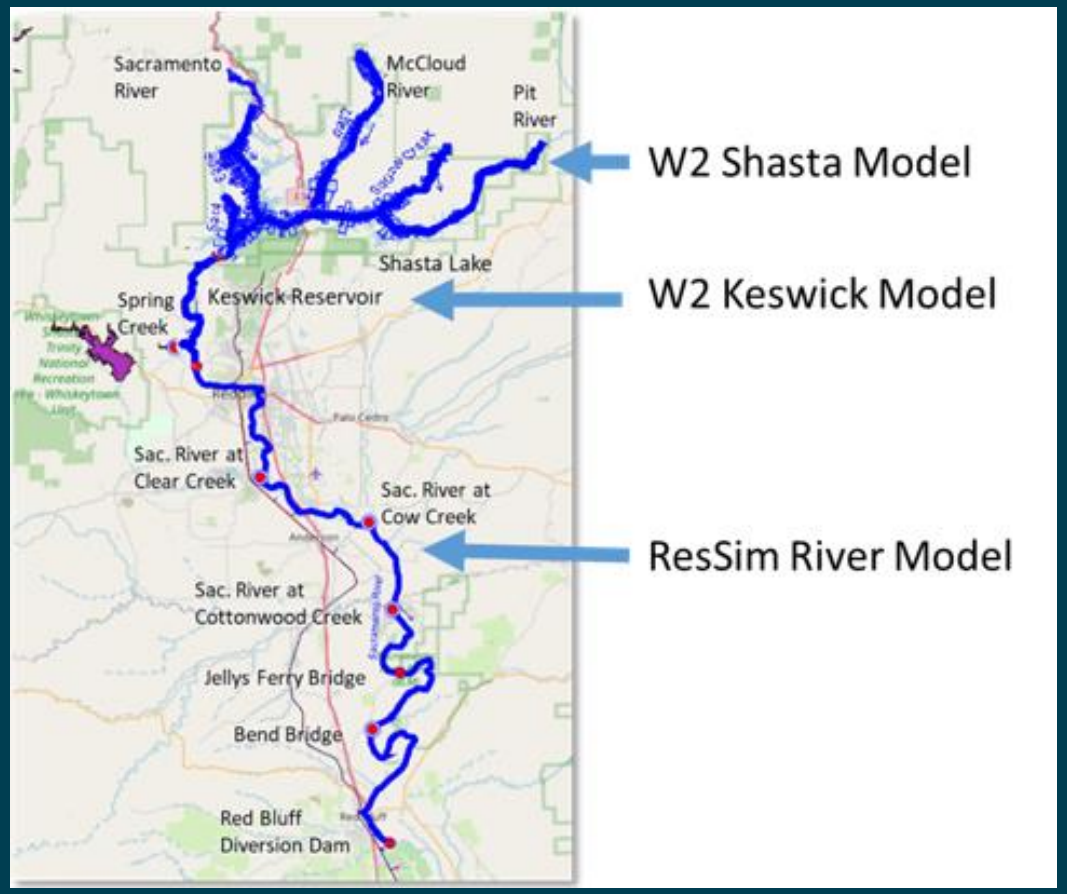
WTMP Analytics Framework



Running Different Models with Consistent Boundary Conditions

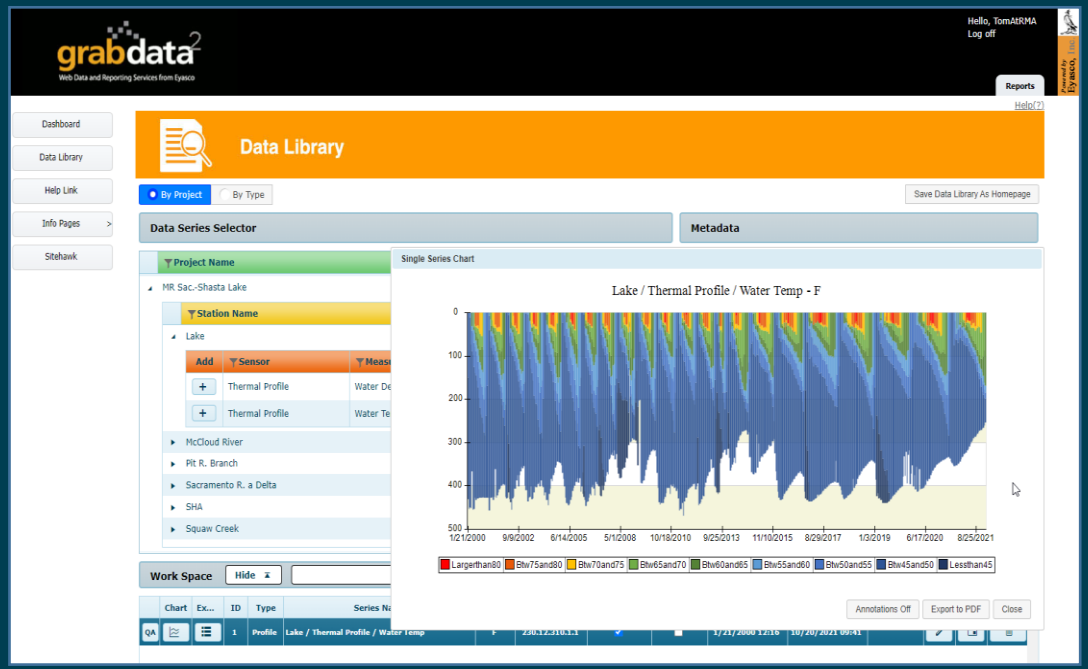
- Shasta-Keswick-Upper Sacramento River
  - ResSim Only
  - Combined W2 and ResSim





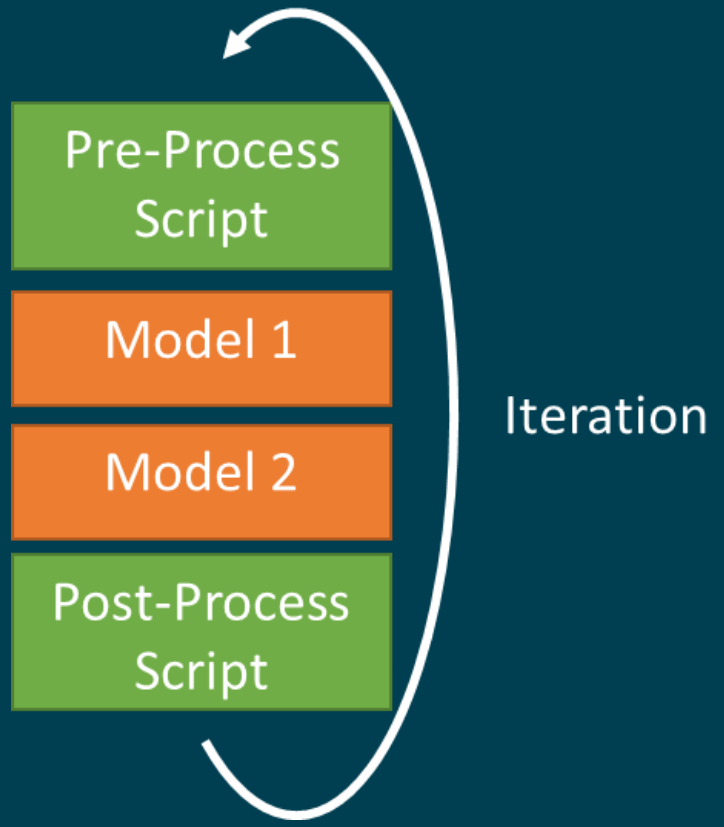
WTMP – Integration with Data Management System

- Web-service interface for WTMP data access
- Automated download of
  - “Model Ready” data for boundary conditions
  - Observed data for comparison to model results
- Time series data organized in “templates”
- Elements in models associated with templates



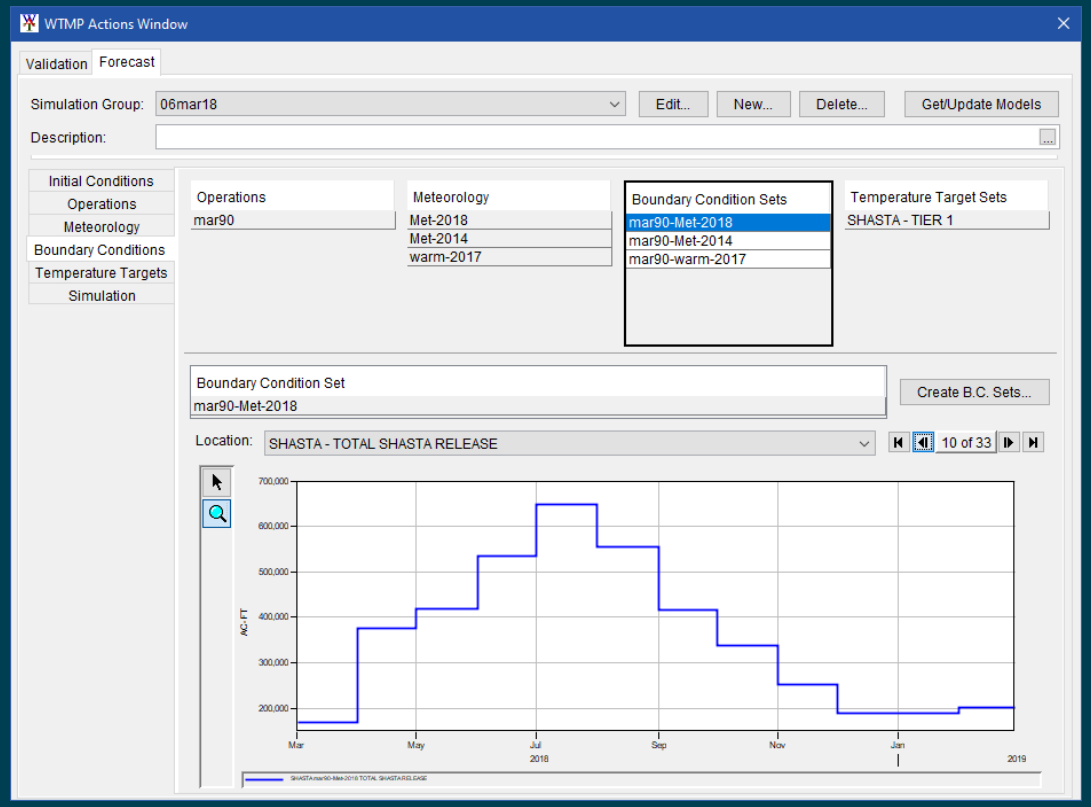
WTMP – Iterative Simulation

- Sensitivity testing
  - Varying one or more model parameters over a fixed range
- Ensemble simulation
  - Correlated sets of time series
  - Iteration over all or selected collection members
- Position analysis
  - Replacement of selected boundary conditions for the simulation period shifted from a longer time series
  - Iteration over all available years or selected years
- Use of DSS collections to manage time series sets



Seasonal Temperature Management Plan Simulation Workflow

- Forecast data preparation
  - Extract recent reservoir temperature profiles and river conditions from DMS
  - Gather CVP Operations Outlook Spreadsheets
  - Estimate future Meteorologic Conditions from Position Analysis, Local 3-Month Temperature Outlook, NCAR Ensemble Forecasts (planned)
  - Established and User Defined Temperature Target Sets
- Ensemble simulation exploring variability in operations, meteorology, and temperature target objectives
- Automated reporting from ensemble output

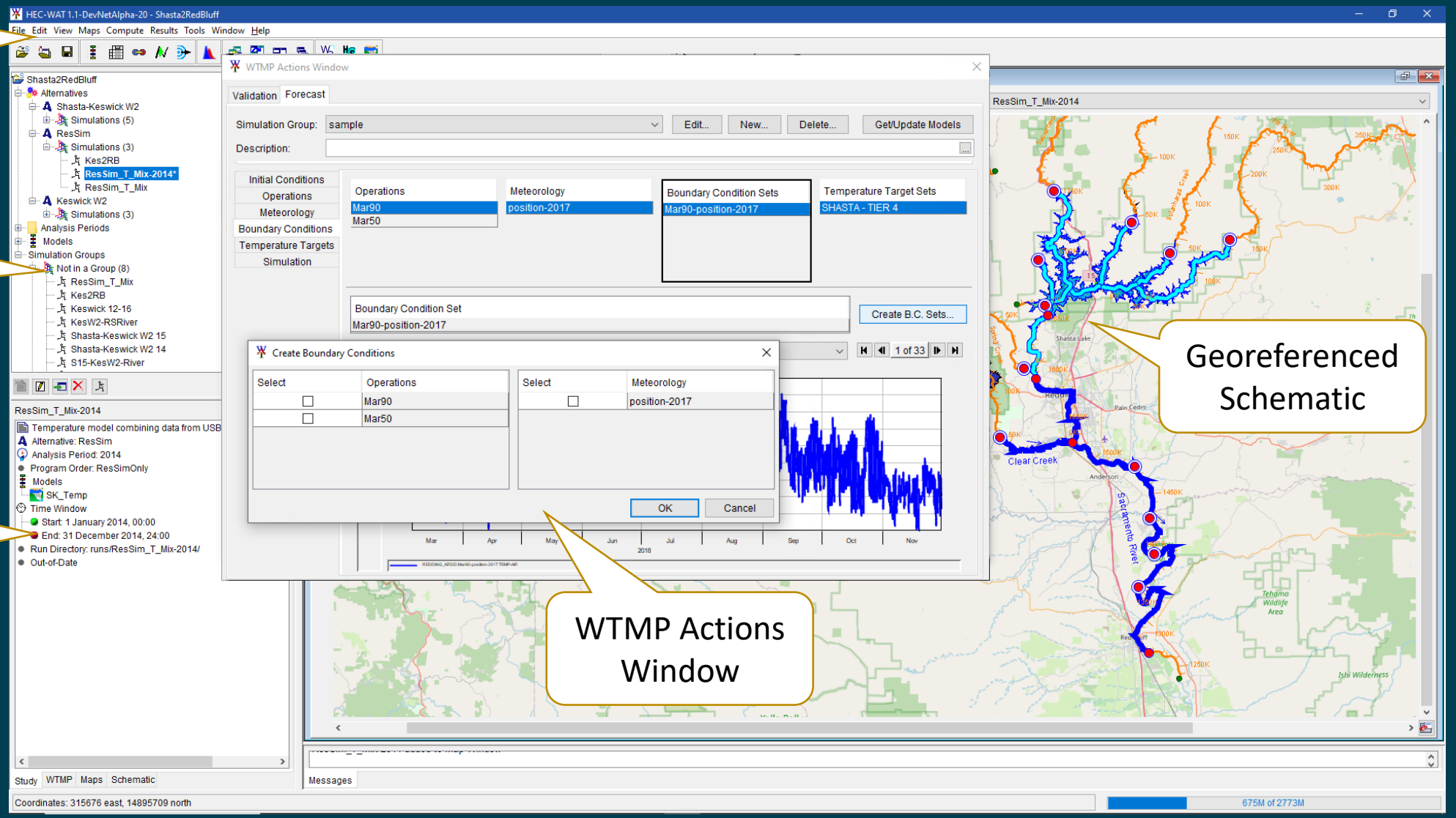


WTMP Modeling Framework User Interface

Menus and Toolbar Buttons

Study Tree

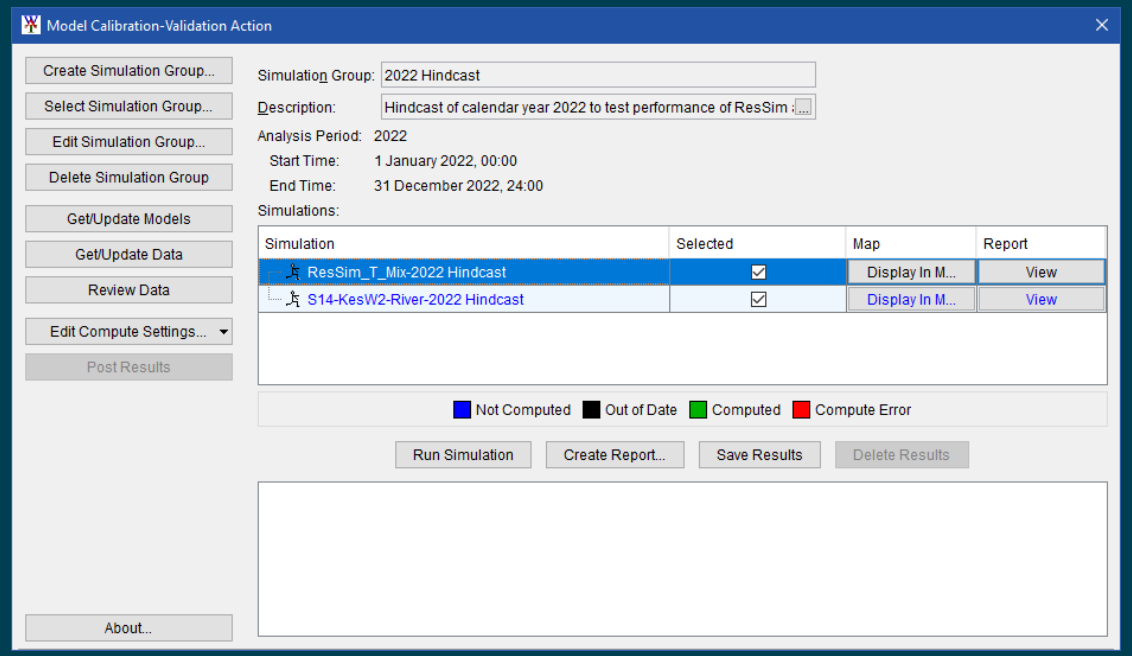
Study Element Details



End-of-Year Hindcast/Validation Workflow

Easily perform simulations for the previous year checking performance of the models against field data

- Set up a simulation group for the recent period selecting the models to test
- Extract historical data from DMS
  - Model Ready Data for boundary conditions
  - QA-ed observed data for comparison to model results
- Perform simulations
- Create and review automated reports



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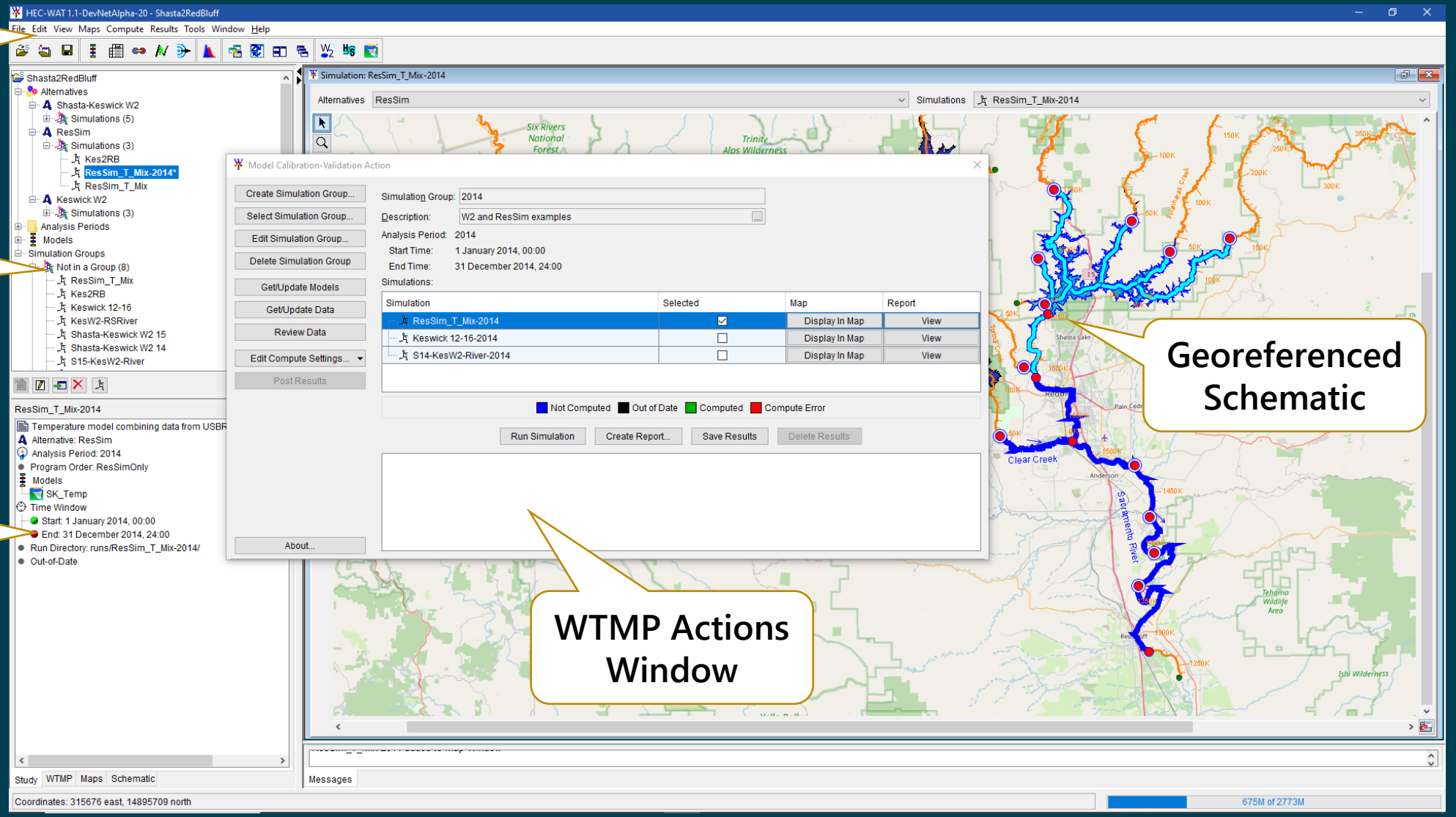
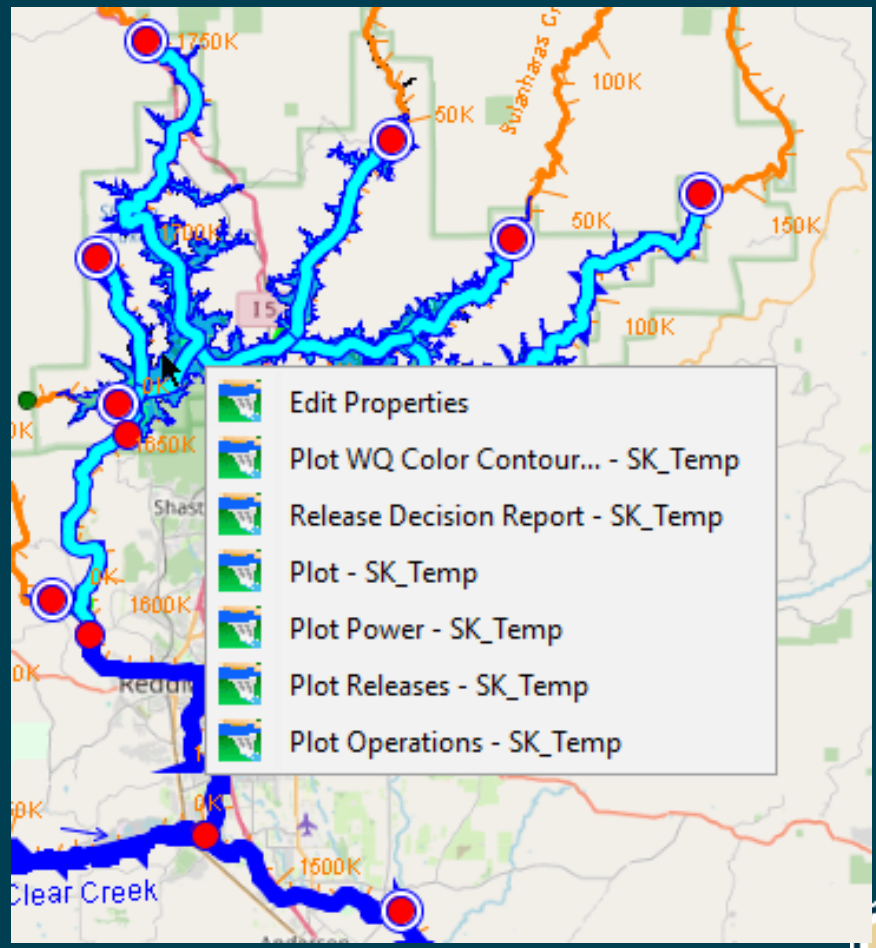


Georeferenced Schematic

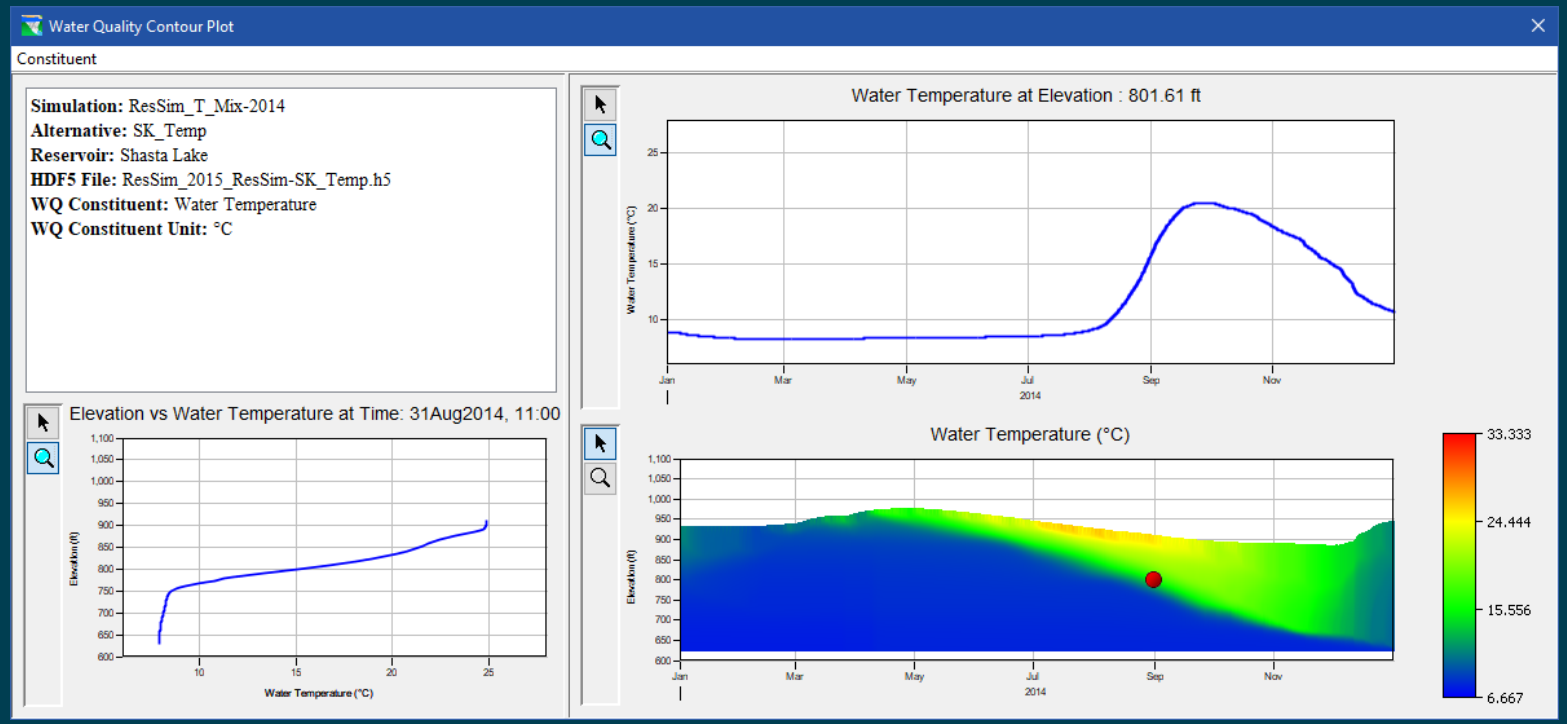
WTMP Actions Window

Display editors, plots, and tables from the HEC-WAT Schematic

- Display of schematic elements
- “Right Click” context menus
- Access to native editors (available for HEC-ResSim only at this time)
- Plots
- Tables

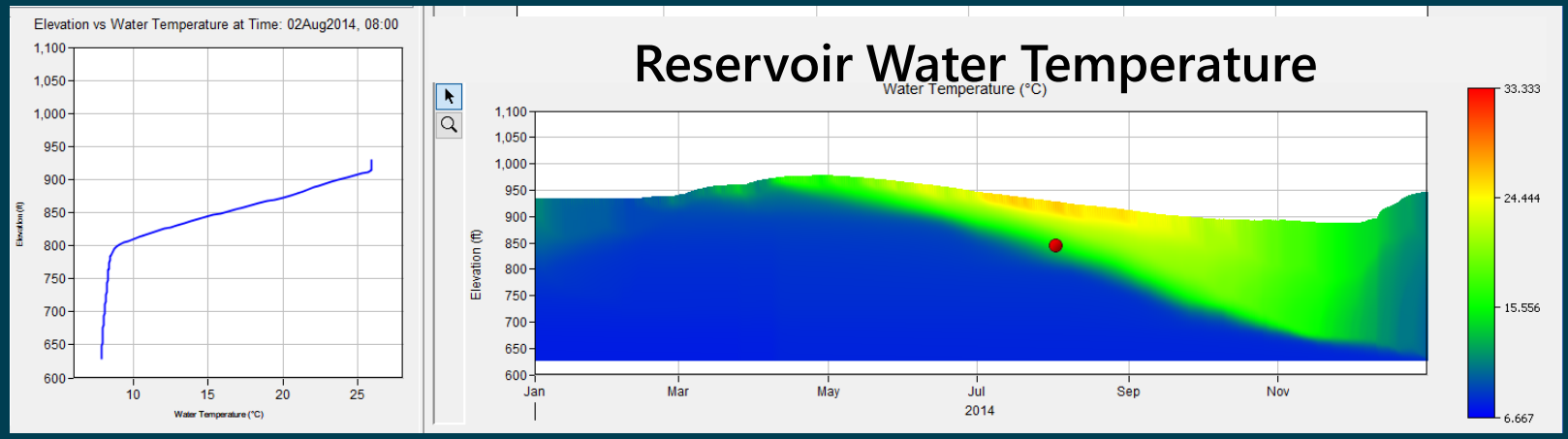


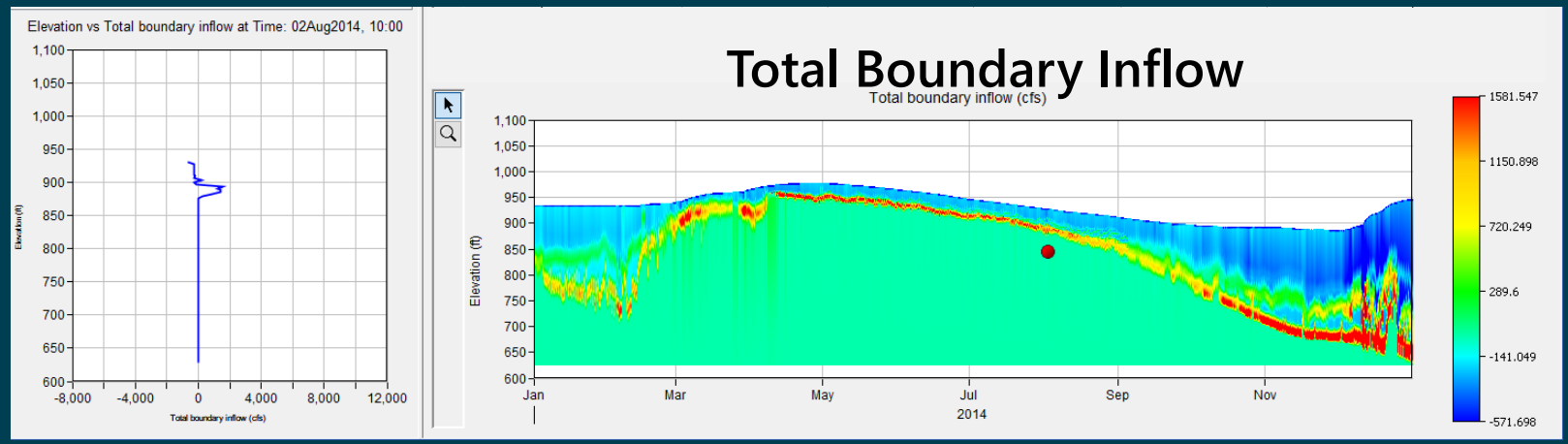
HEC-ResSim Interactive Reservoir Profile Plotting Tool

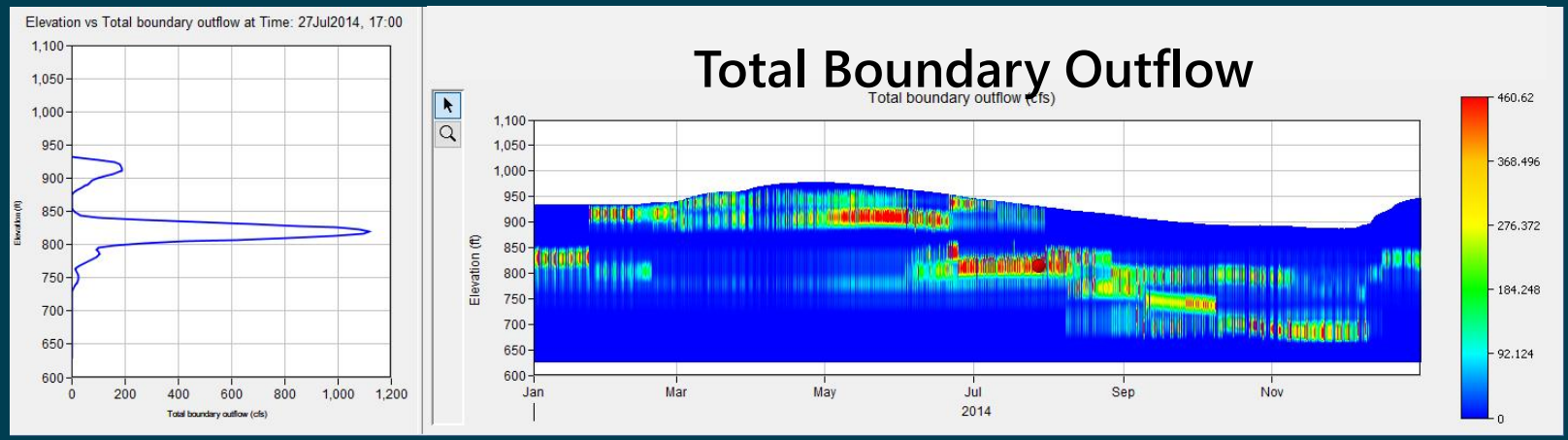


- Open from the schematic
- Components of the Plot
  - Depth-vs-time water quality contour plot
  - Profile plot
  - Water quality time series at a selected elevation
- Click or drag a marker point on the color contour to select the time and elevation for the profile plots
- Menu controls selection of constituent to display

Example Contour Plots for Reservoir Conditions (HEC-ResSim)

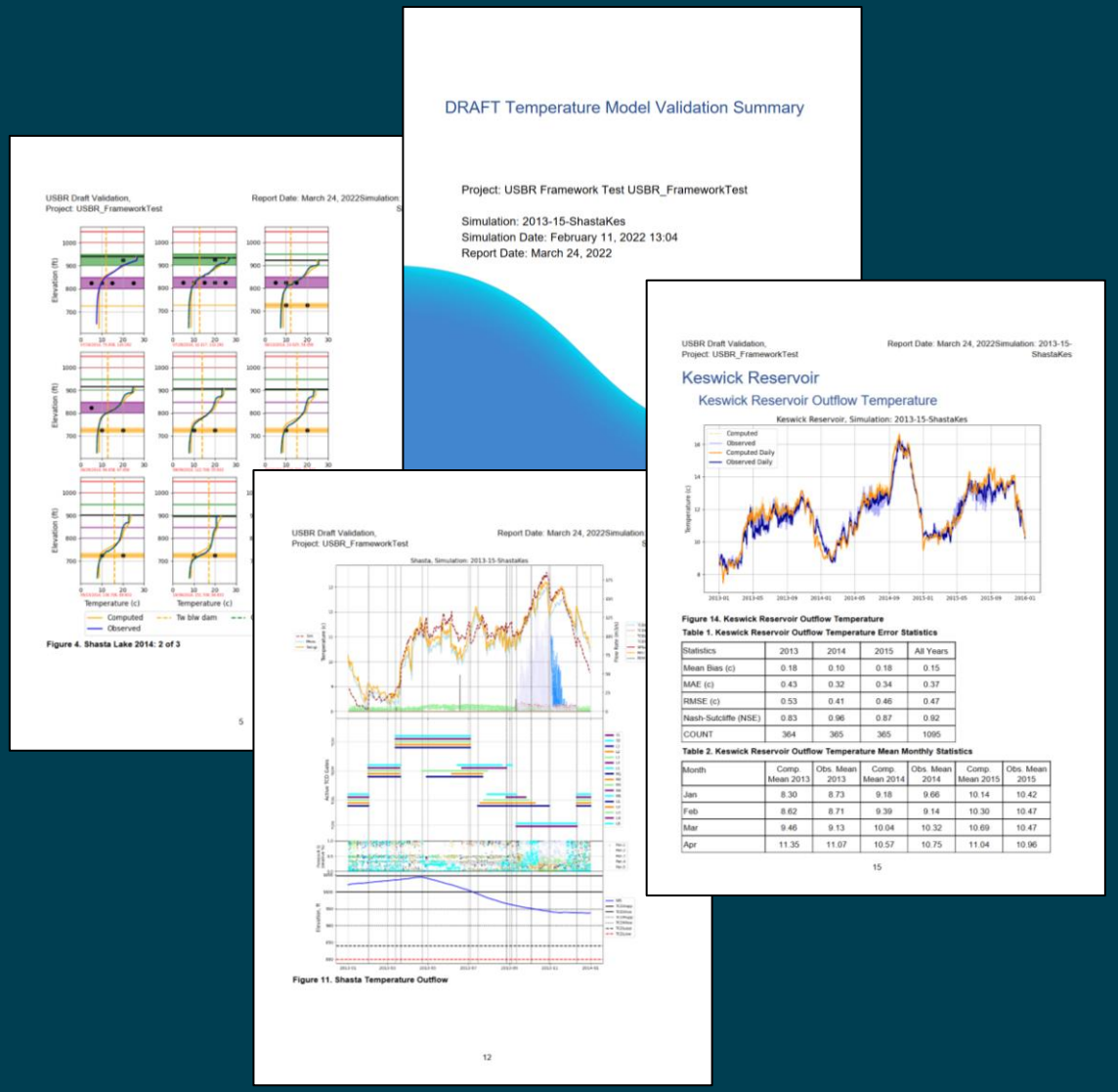






Automated Plotting and Tabulation of Results

- Rapid creation of key output tables and graphics to facilitate results review by modelers
- Creation of tables and graphics that could be incorporated in other reporting and presentation products



W2-ResSim Comparison, Shasta Lake Temperature Profiles for 2014