

**Central Nevada Test Area (CNTA) Groundwater
Decision Support Model**

Gregg Lamorey
Performance Monitoring Workshop
Butte, Montana
June 21-23, 2005
Breakout Session 1

CNTA Groundwater Decision Support Model

CNTA- Central Nevada Test Site, consists of 1 test shot, located in Hot Springs Valley (halfway between Ely and Tonopah).

Objective: Assess impact of changes in water uses and explore various pumping scenarios.

Example groundwater management criteria: drawdown within CNTA not to exceed 2 meters in 100 years.

Water uses include irrigation and potential geothermal and mining operations.

Decision support model- MODFLOW model packaged so that it can be easily used by future managers to make better decisions, assess previous closure decisions.

OUI- Object User Interface

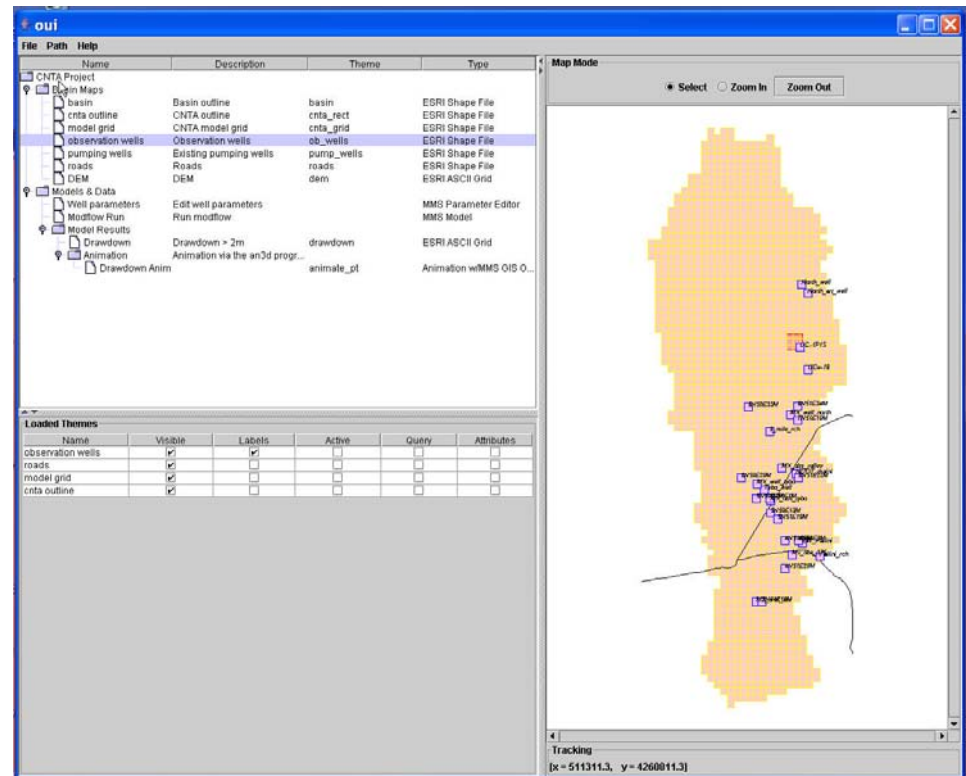
Decision Support Model consists of a MODFLOW model embedded in the Object User Interface (OUI). The OUI was originally developed for surface water models, also used for dust entrainment models. Current groundwater model version of OUI was developed to explore pumping scenarios and allow point and click entry of new wells to evaluate resulting drawdown.

OUI is user friendly, platform independent (written in JAVA), organized into the following:

GUI – graphical user interface, displays GIS panel, reads and writes ESRI shape and grid files, displays model output including 3D animations.

DMI- data management interface, automatically updates model input data (currently implemented for updating climate station data for surface water models).

MMI- model management interface, allows model to run in various modes (currently used in surface water models to run multiple basins with routing and Ensemble Stream Prediction runs for forecasting).

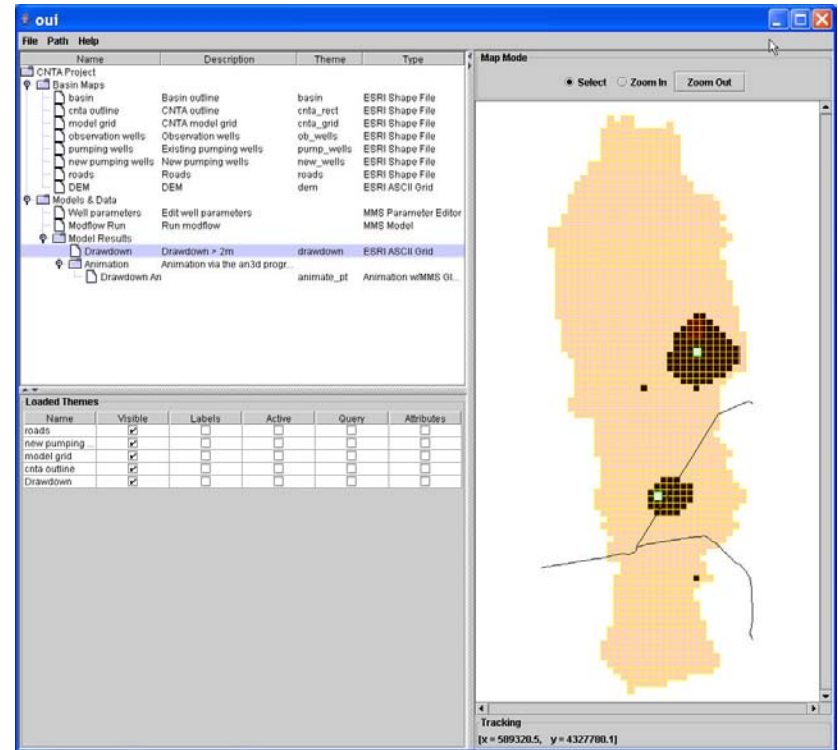
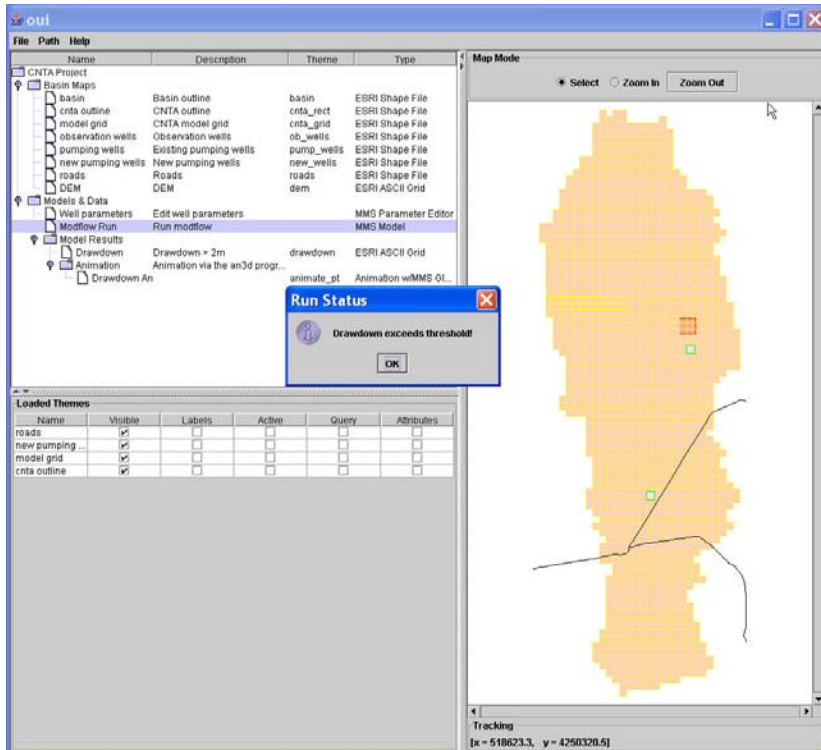


CNTA Groundwater Decision Support Model Example

An example run of the CNTA Decision Support Model is shown below.

Two new pumping wells have been added to the model as shown by the green dots in the GIS panel. A 100 year simulation is run to determine if the drawdown within the CNTA (shown in red on the GIS panel) exceeds a threshold of 2 meters.

After the run, a Run Status box is displayed with indicating that drawdown has exceeded the threshold. Areas where the drawdown exceeds 2 meters is shown in the GIS panel on the left.



Additional features to improve OUI functionality for Groundwater Models used in Performance Monitoring

Adapt the Data Management Interface to provide automatic updates of monitoring data.

Adapt the Model Management Interface to:

1. recalibrate model parameters (typically hydraulic conductivity field) using updated monitoring data.
2. run a monitoring well optimization routine on the groundwater model to identify best monitoring wells to be eliminated.