Regional Hydrologic Simulation Model for the Oregon Side of the Walla Walla River Basin

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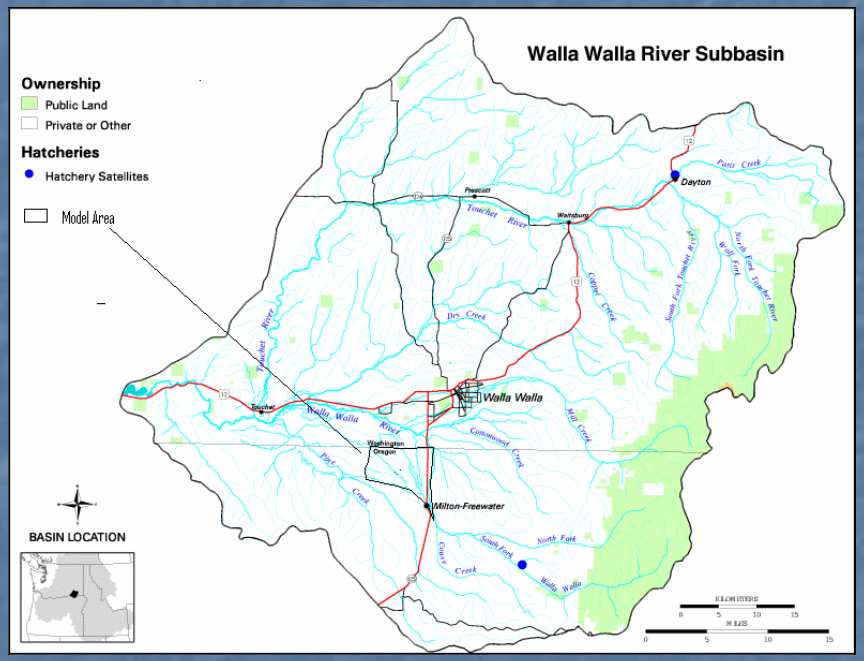
Model Area Location

- The Walla Walla Basin is shared by the states of Oregon and Washington, surrounded by the Snake River Basin to the north and the Umatilla River Basin to the south.

- Our study area is 58 km^2 on the Oregon side of the basin and includes the city of Milton-Freewater , agricultural land and bare soil



Basin Characteristics

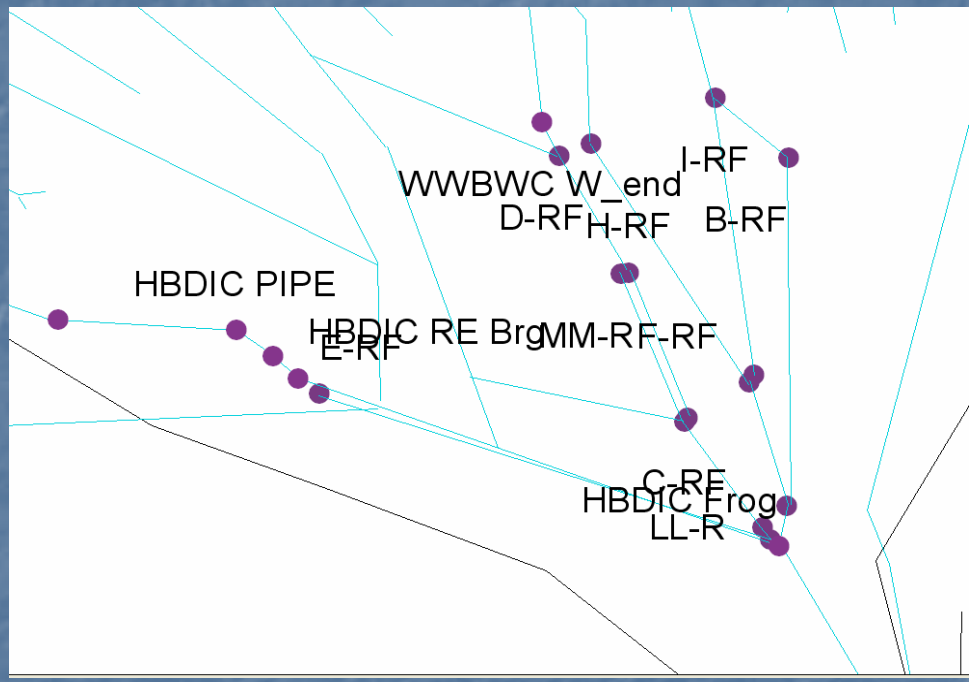
- Climate type continental (cold winters, hot summers)
- Average precipitation 250 to 300 mm/year Oct-May
- Elevation above sea level from 320 meters southeast to 228 meters northwest
- Walla Walla River has low summer flows and the discharge usually peaks due to the snowmelt in the Blue Mountains in April

Recharge from Infiltration Basins

Constructed infiltration basins recharge the shallow aquifer during the wet months. Since the recharge project has been running, old springs have re-appeared.

Recharge from Irrigation Canals

There is extensive use of irrigation canals that, together with the Walla Walla River and the Little Walla Walla River, lose water to recharge the unconfined aquifer.



Recharge from Walla Walla River

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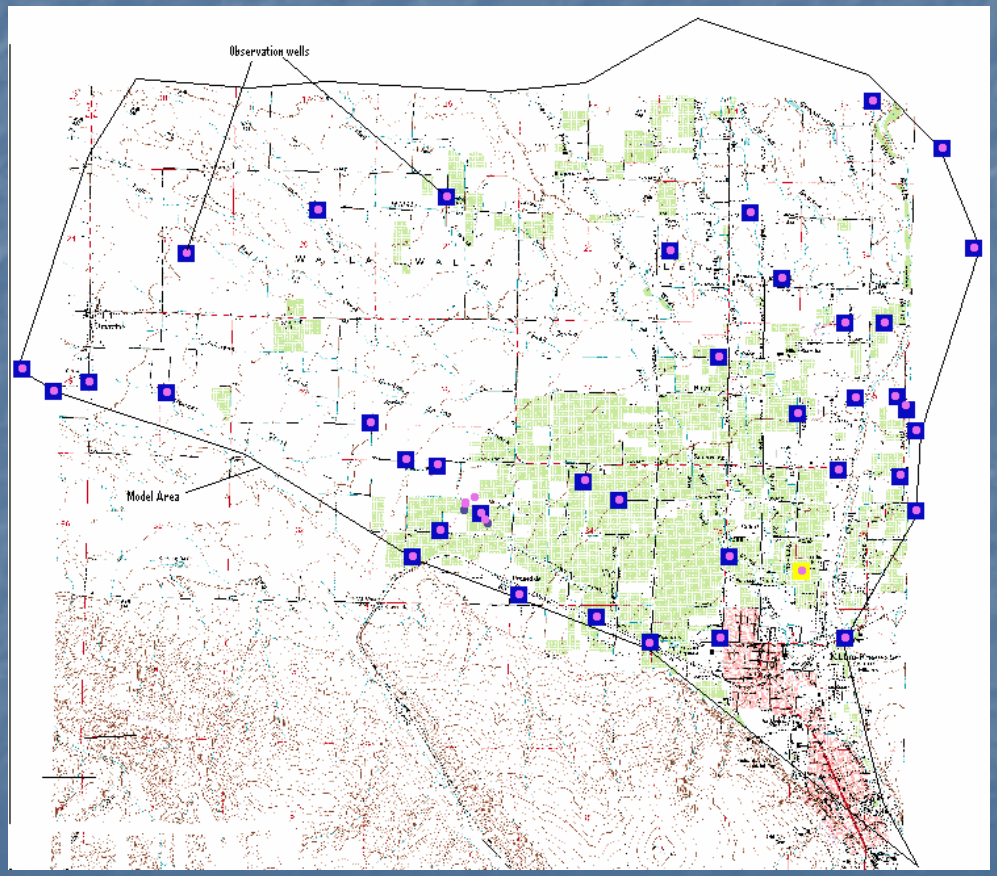
Discharge to Springs

Discharge from Irrigation and Domestic Wells



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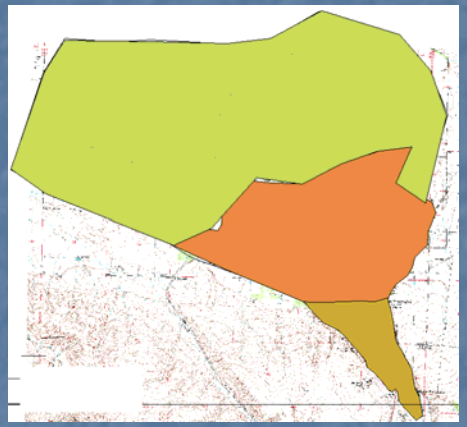
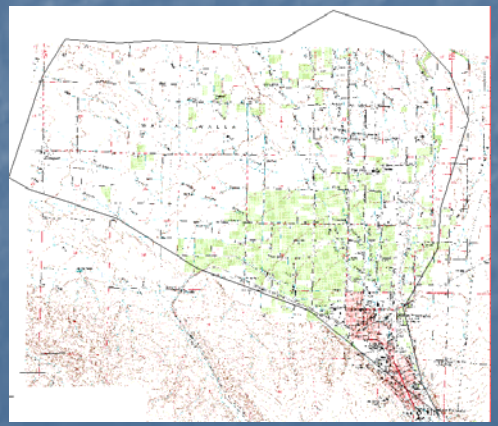
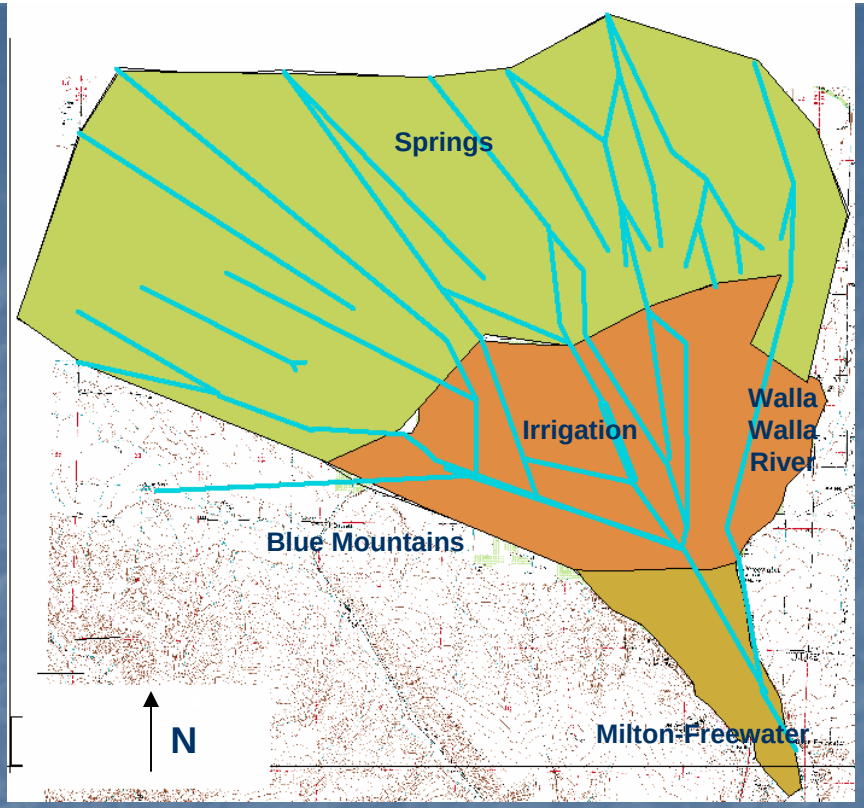
Three Different Land Uses

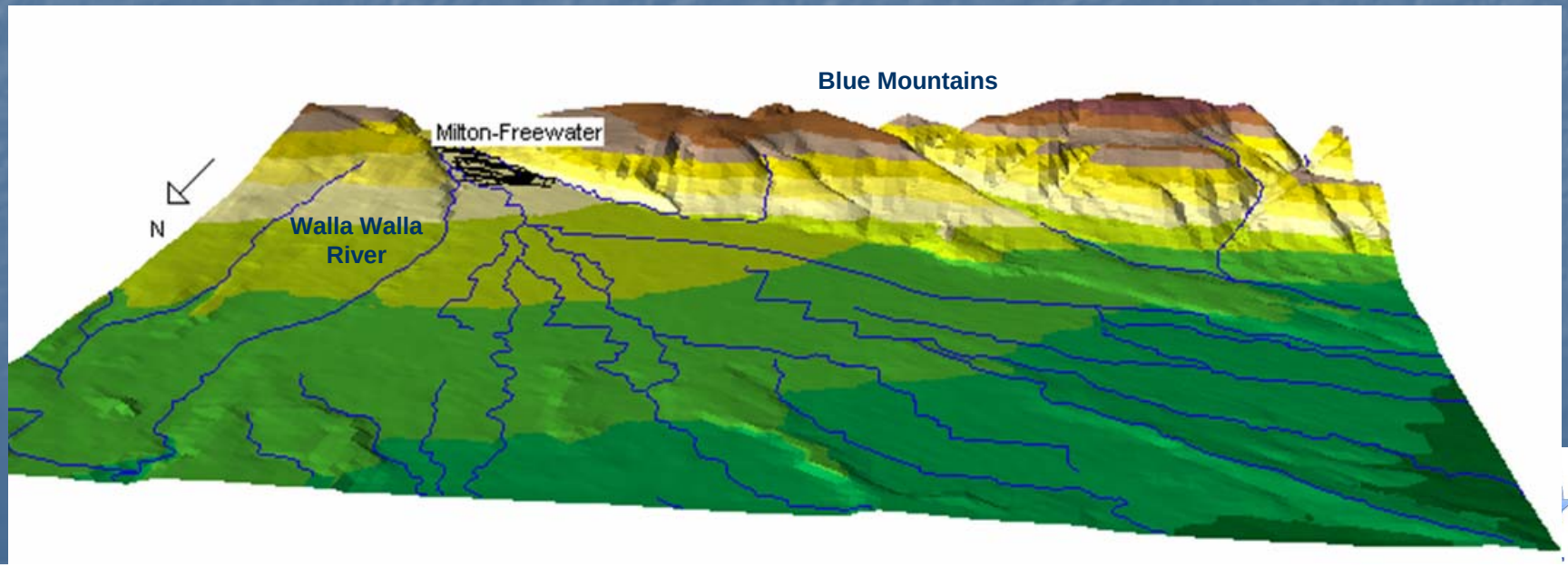
- The city of Milton-Freewater occupying only 7.7% of area
- Agriculture occupying 26.5% of land and majority of wells
- Bare soil , high infiltration rate spring area





Model Boundaries





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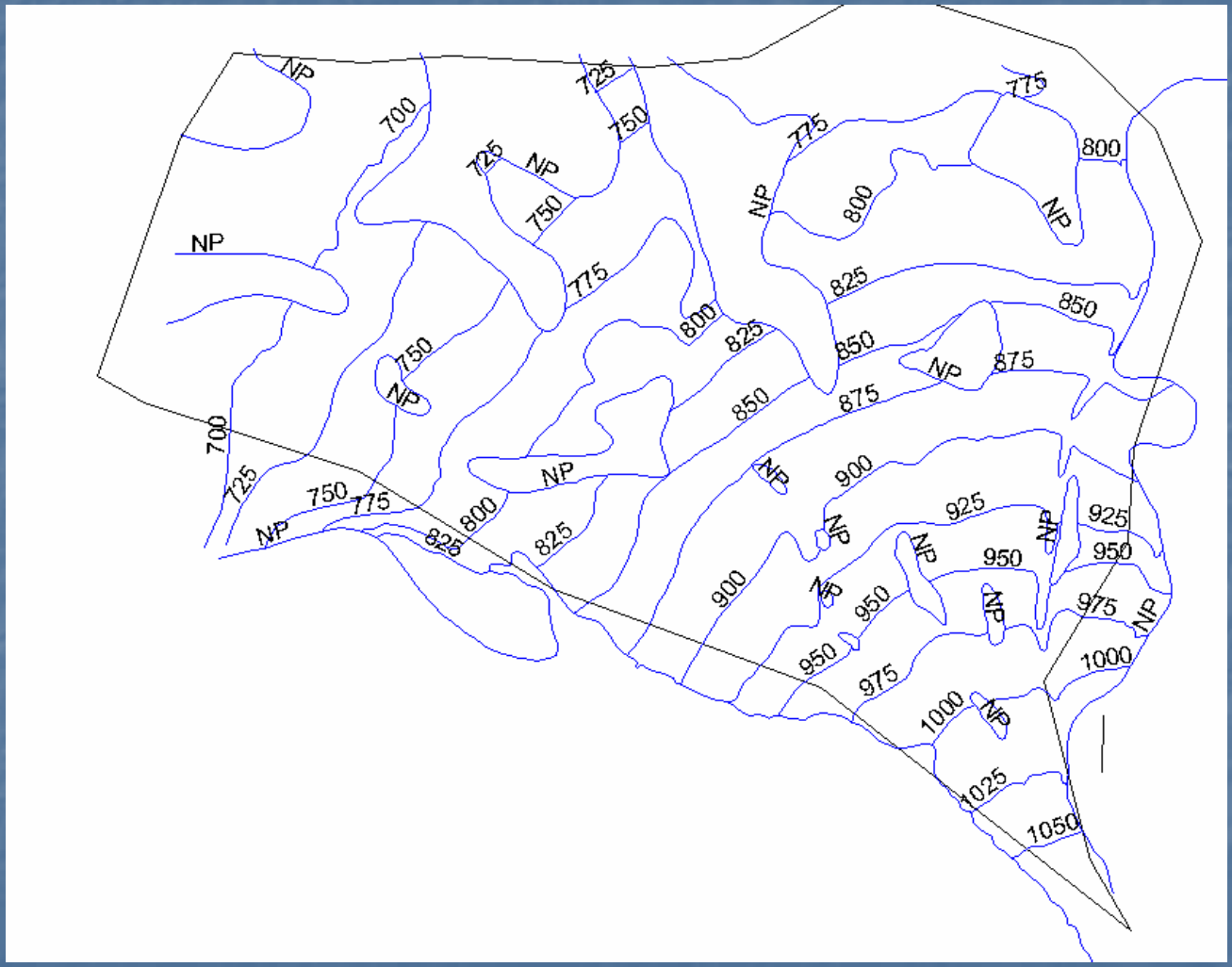

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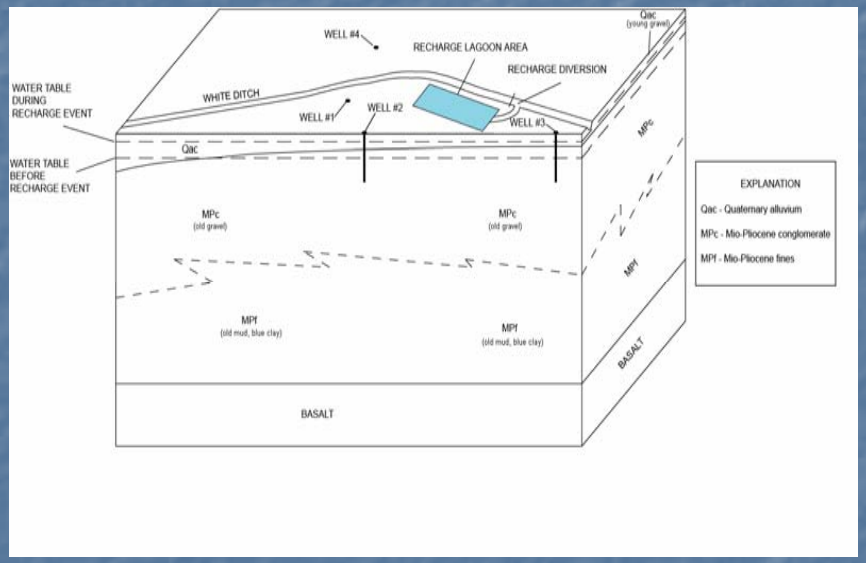


Data Flow

Review of existing literature & Data collected from the site

GIS Project

MS Excel Database

Access Database

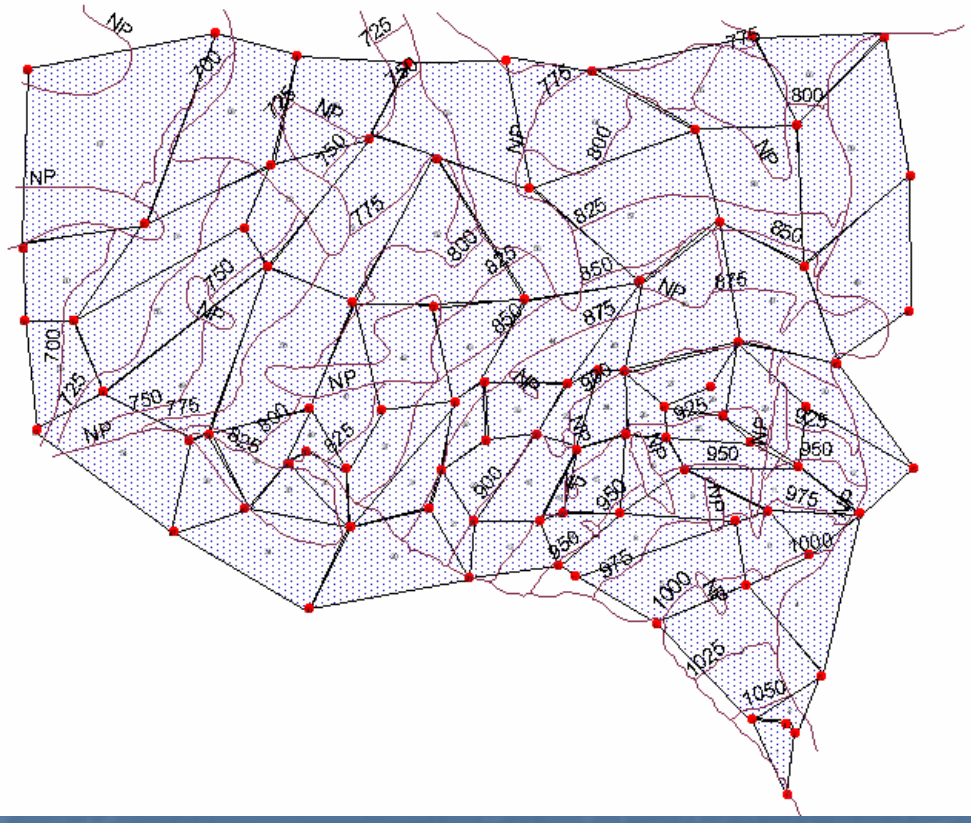
Database produces reports

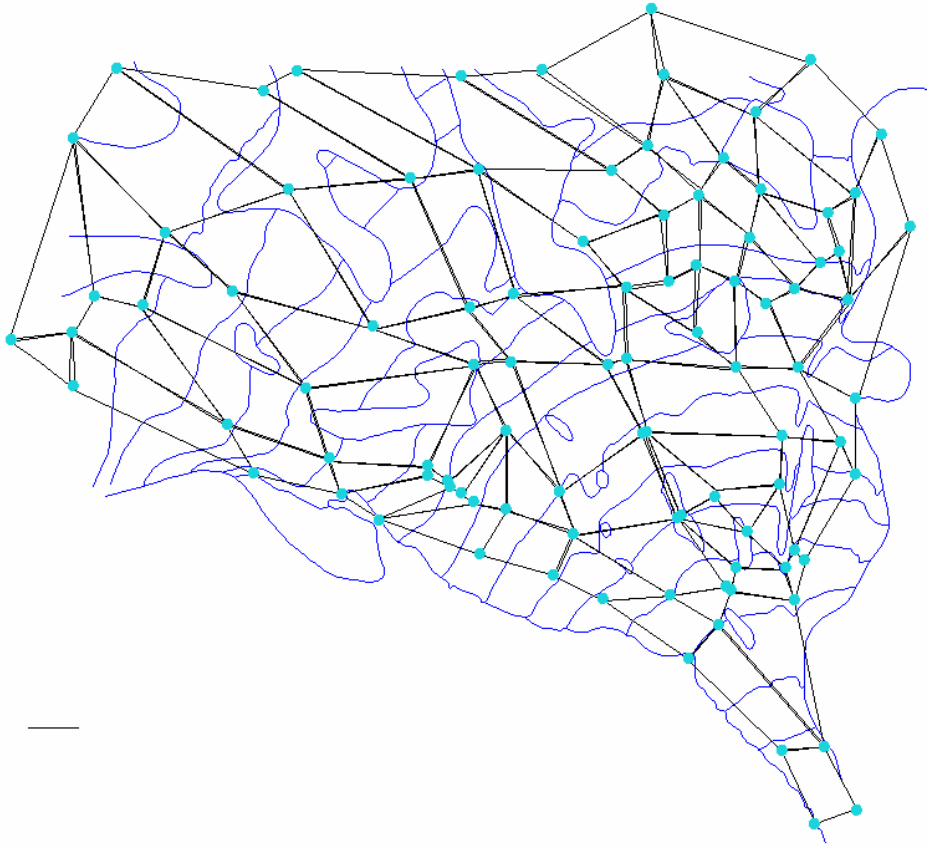
Reports saved as DATA files (.DAT)

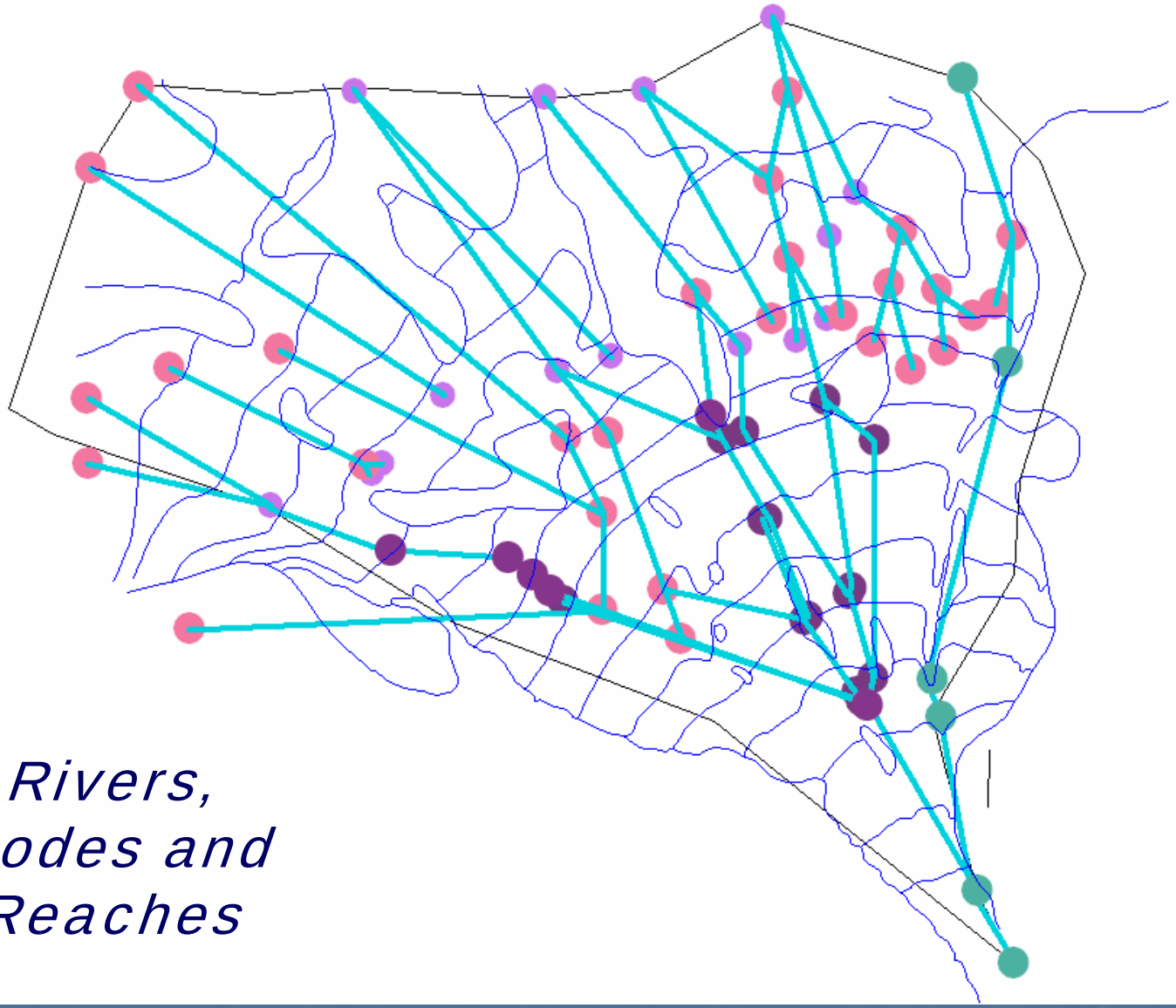
Files prepared:
Unit 5 - MAIN.IN1
Unit 7 - ELEMENT.DAT
Unit 8 - XY.DAT
Unit 9 - STRATA.DAT
Unit 11 - LAKES.DAT (opt)
Unit 13 - ELEMCHRC.DAT

Run PREPROCESS.EXE

Model Elements and Nodes







Rivers, Nodes and Reaches

Calibration and Verification

- Almost 3 years of continuous data from 2002 to 2005

- Looking at several tools for calibration and parameter estimation, e.g. UCODE (which performs inverse modeling using nonlinear regression)

Continuation of Project

- Finish field measurements and data analysis
- Refined conceptual model
- Run IWFM