

Impact of Future Water Demand on the Mahomet Aquifer

Preliminary Summary of Groundwater Flow Modeling Results

George S. Roadcap, Ph.D., P.G.
H. Allen Wehrmann, P.E., P.H. (GW), D.WRE
Center for Groundwater Science
Illinois State Water Survey

Institute of Natural Resource Sustainability
University of Illinois

*March 27, 2009
Springfield, IL*



ILLINOIS

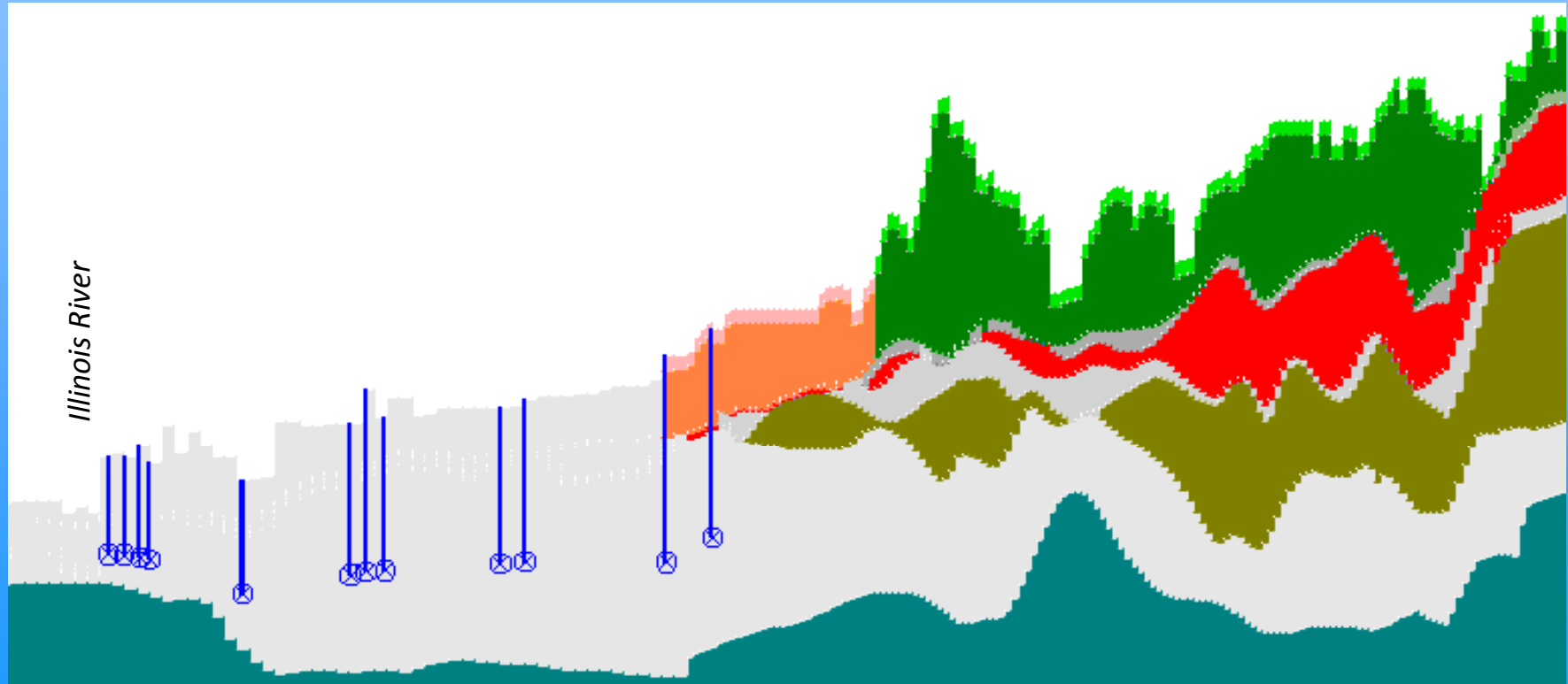
Flow Model Cross Section

Western Region

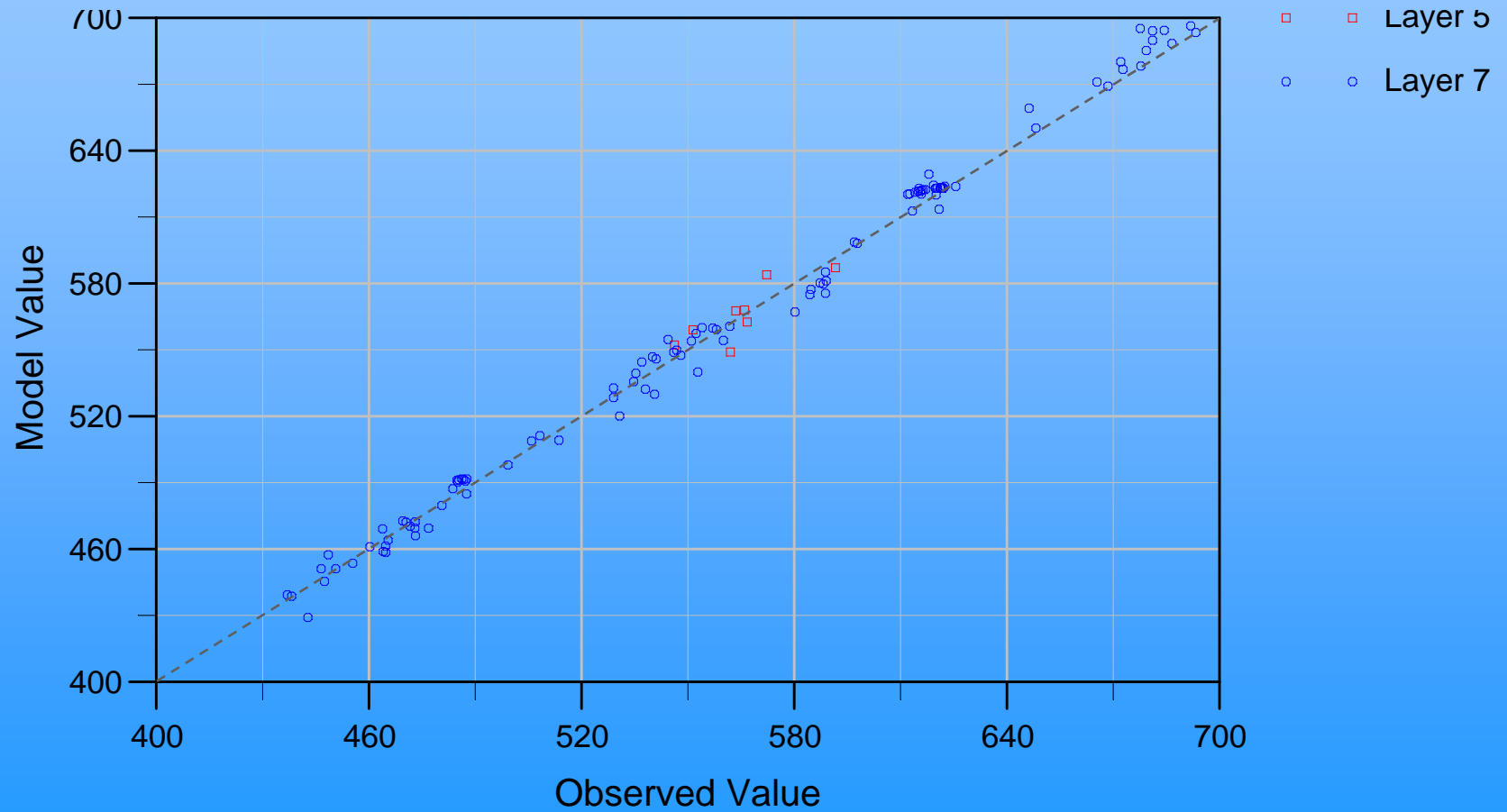
West

East

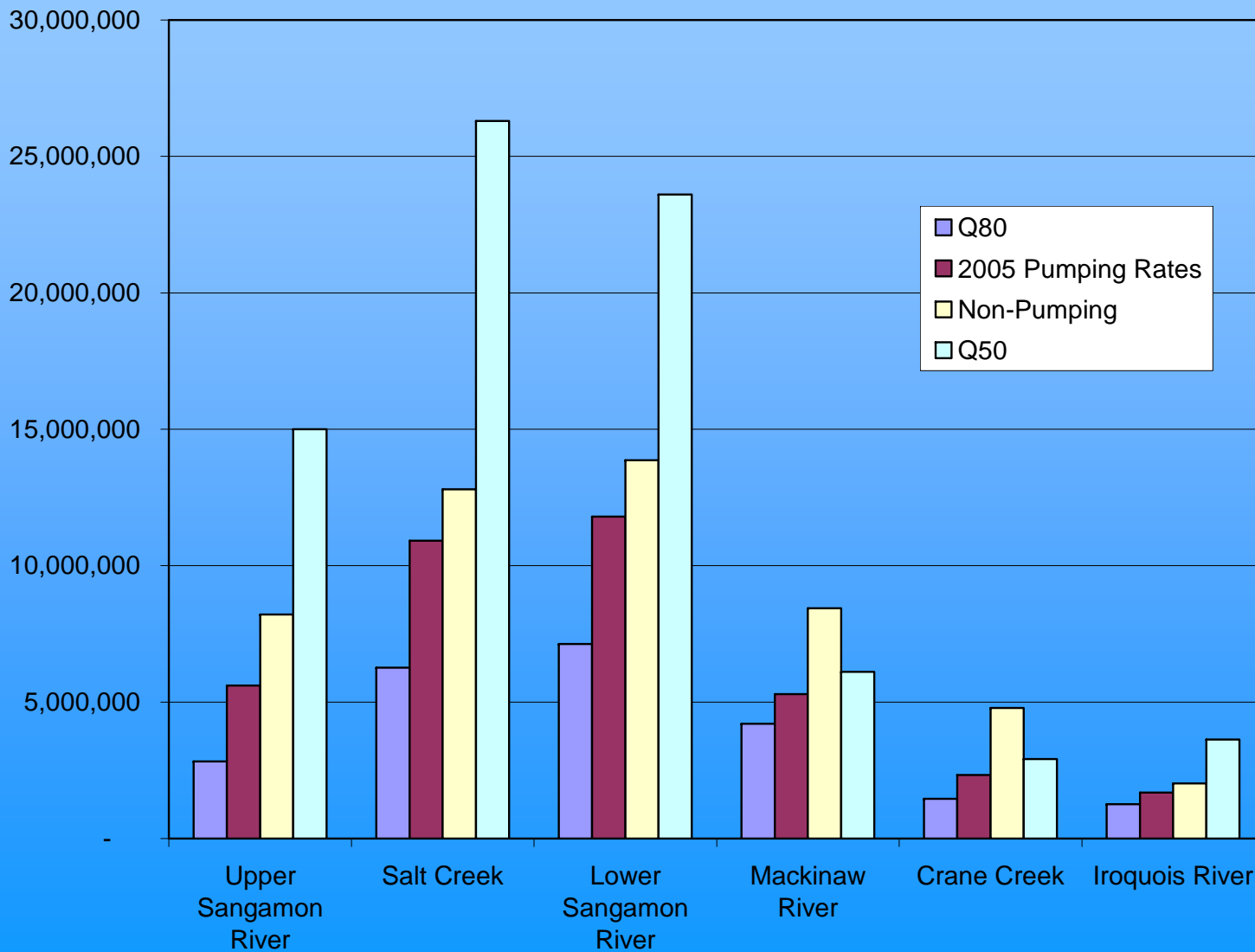
Bloomington



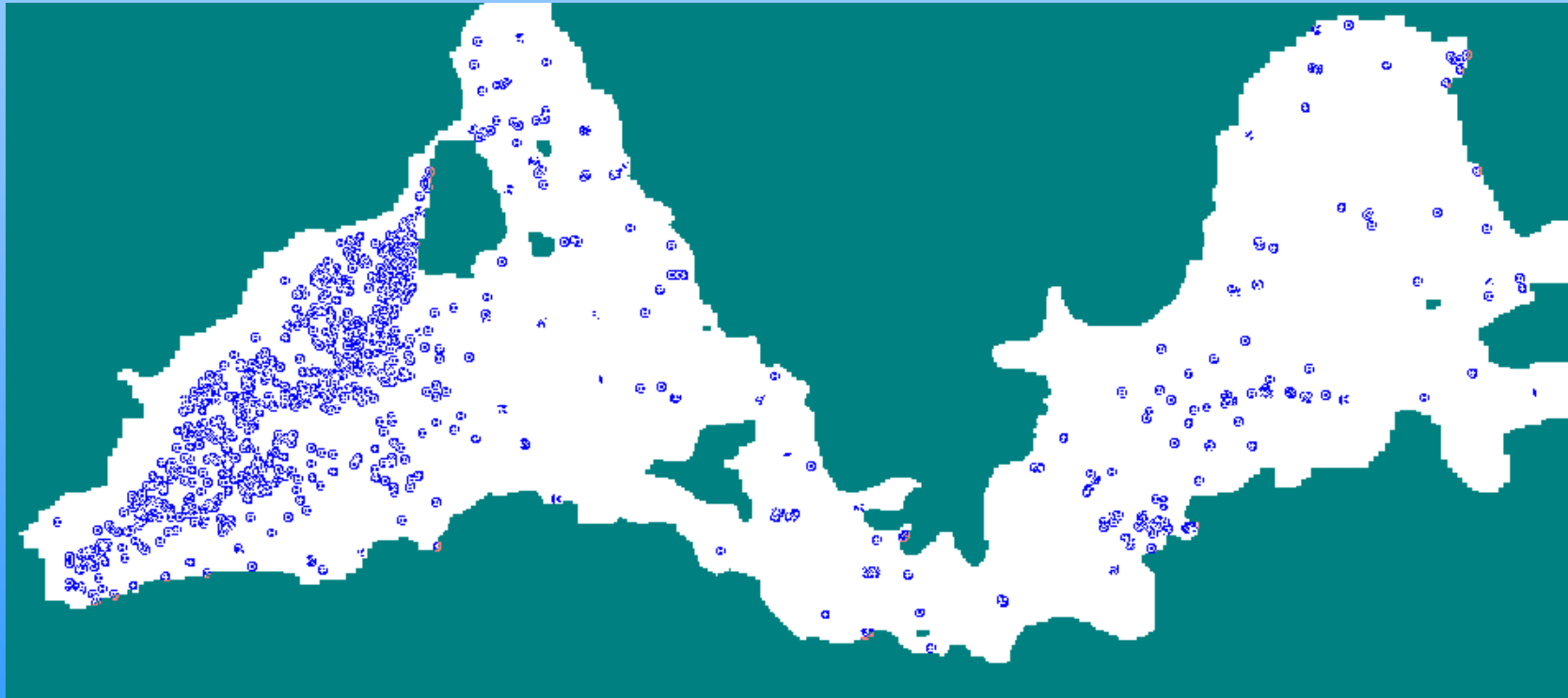
Model Calibration: Observed vs Simulated Heads



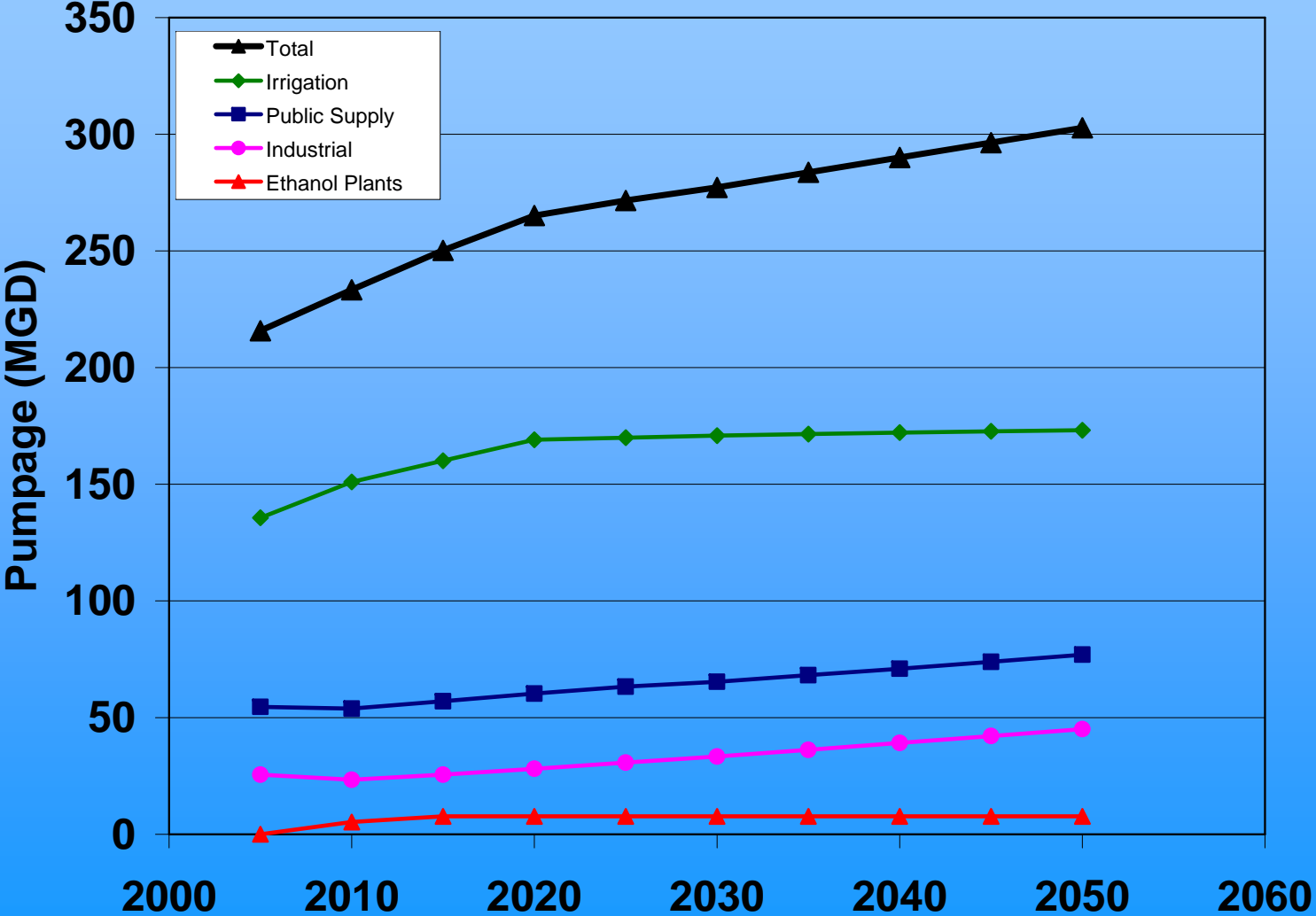
Baseflow and Model Discharges to Target Watersheds



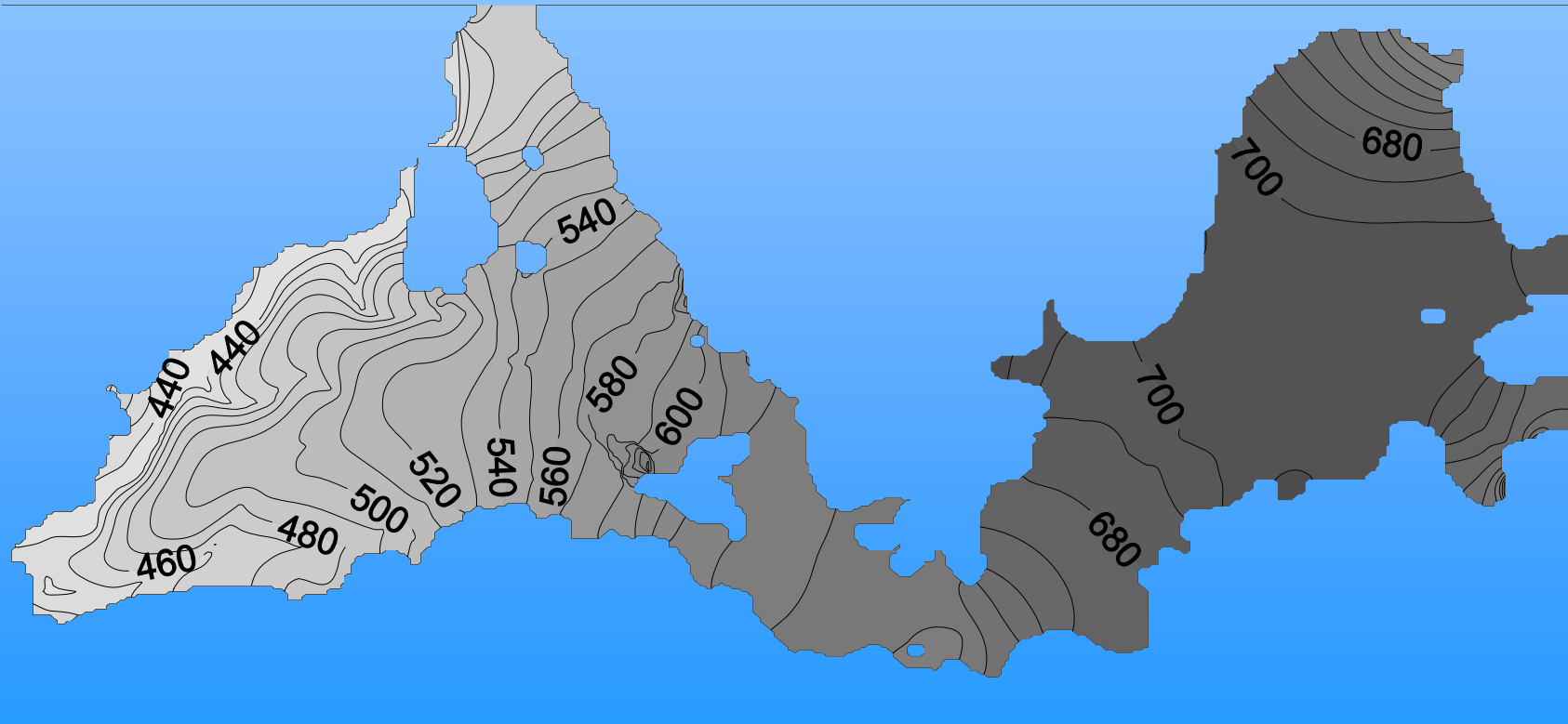
Distribution of Wells in Flow Model



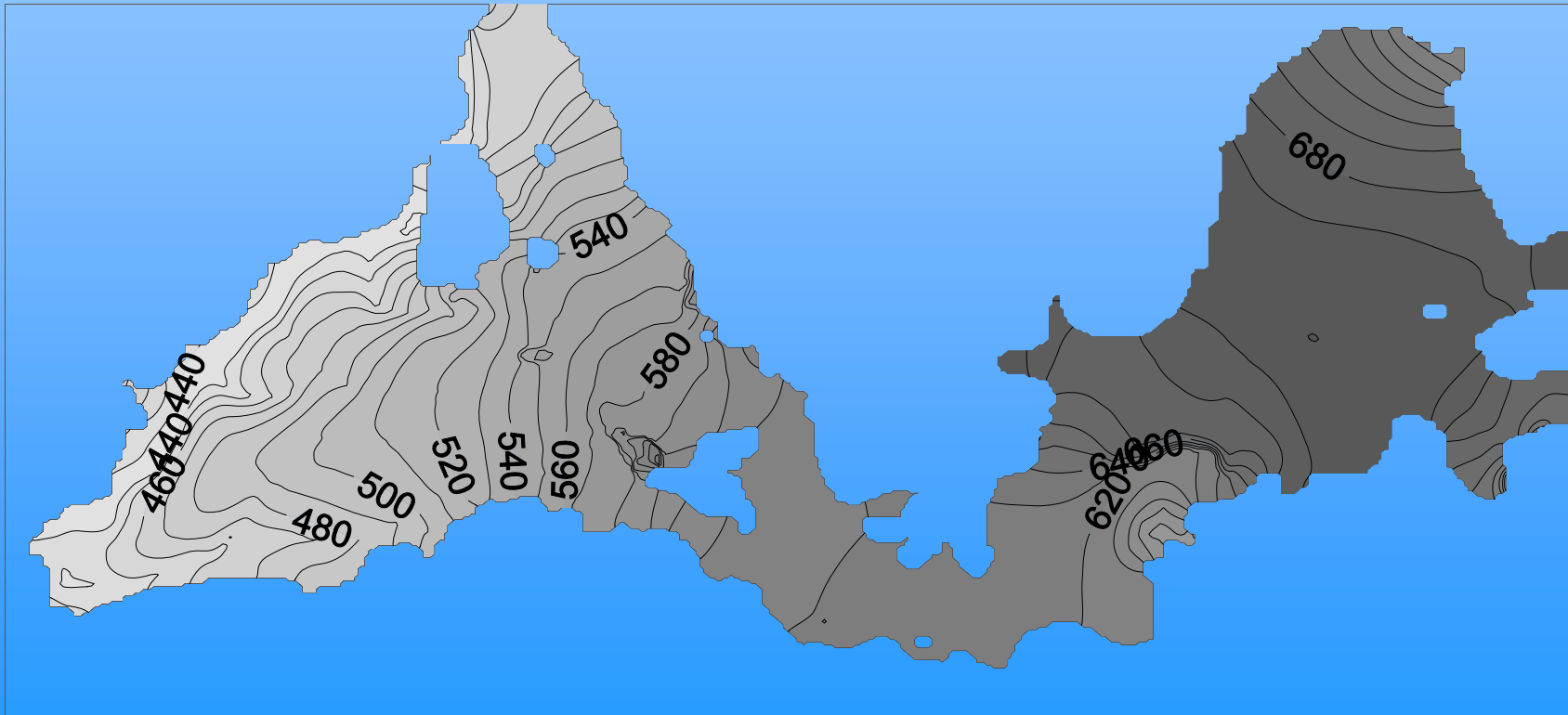
Simulated Baseline Scenario Sector Demand



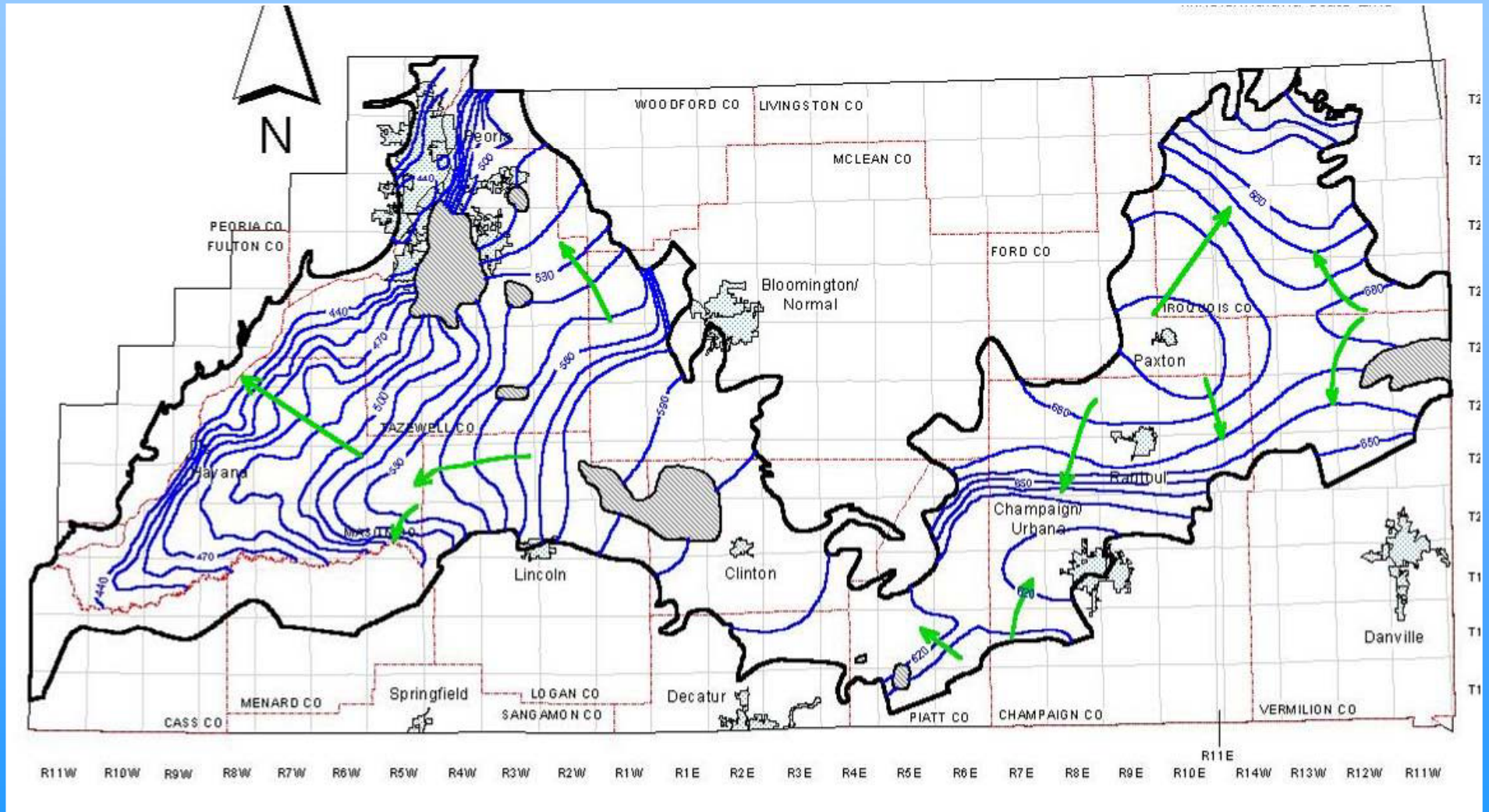
Model Calculated Pre-Development Head Surface



Simulated 2005 Head Surface

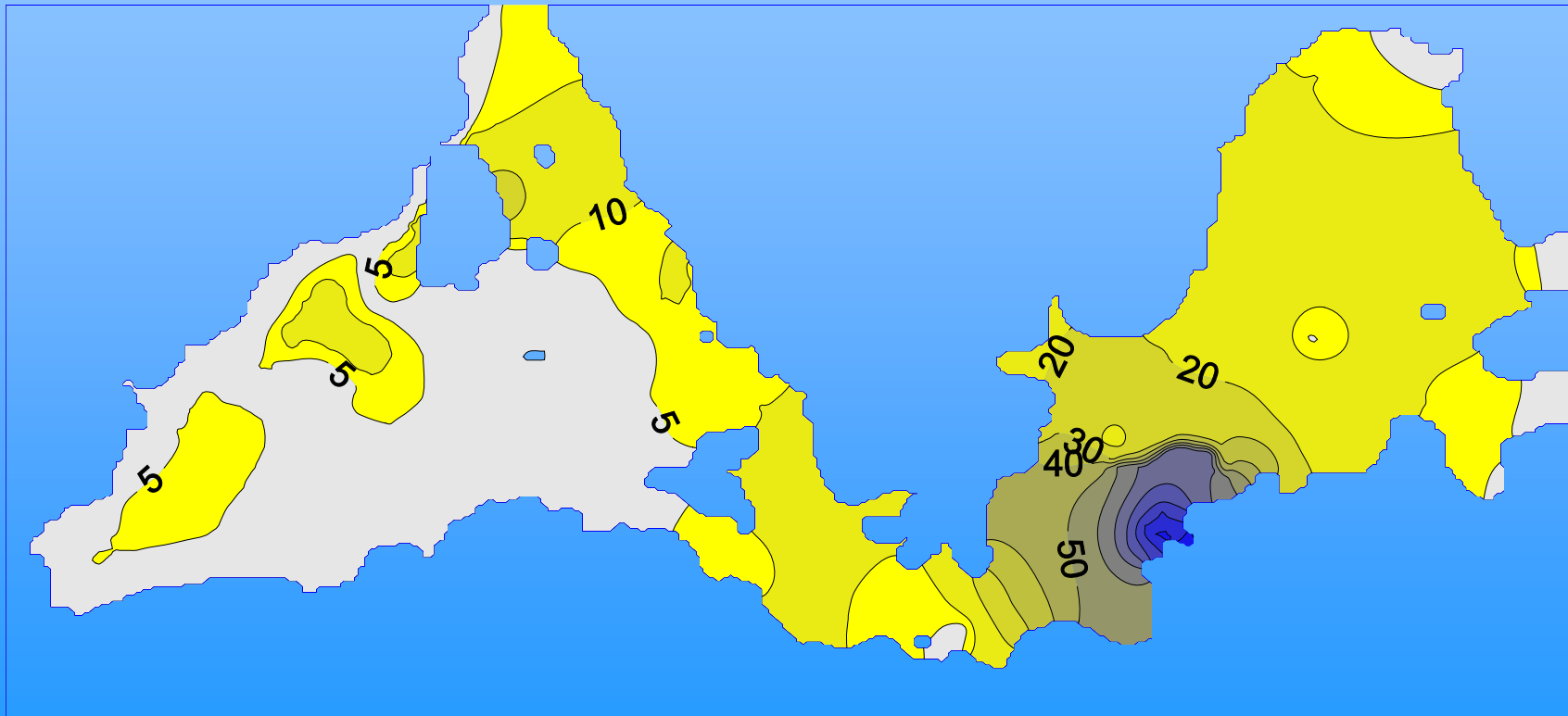


Composite Head Map – Observed Heads

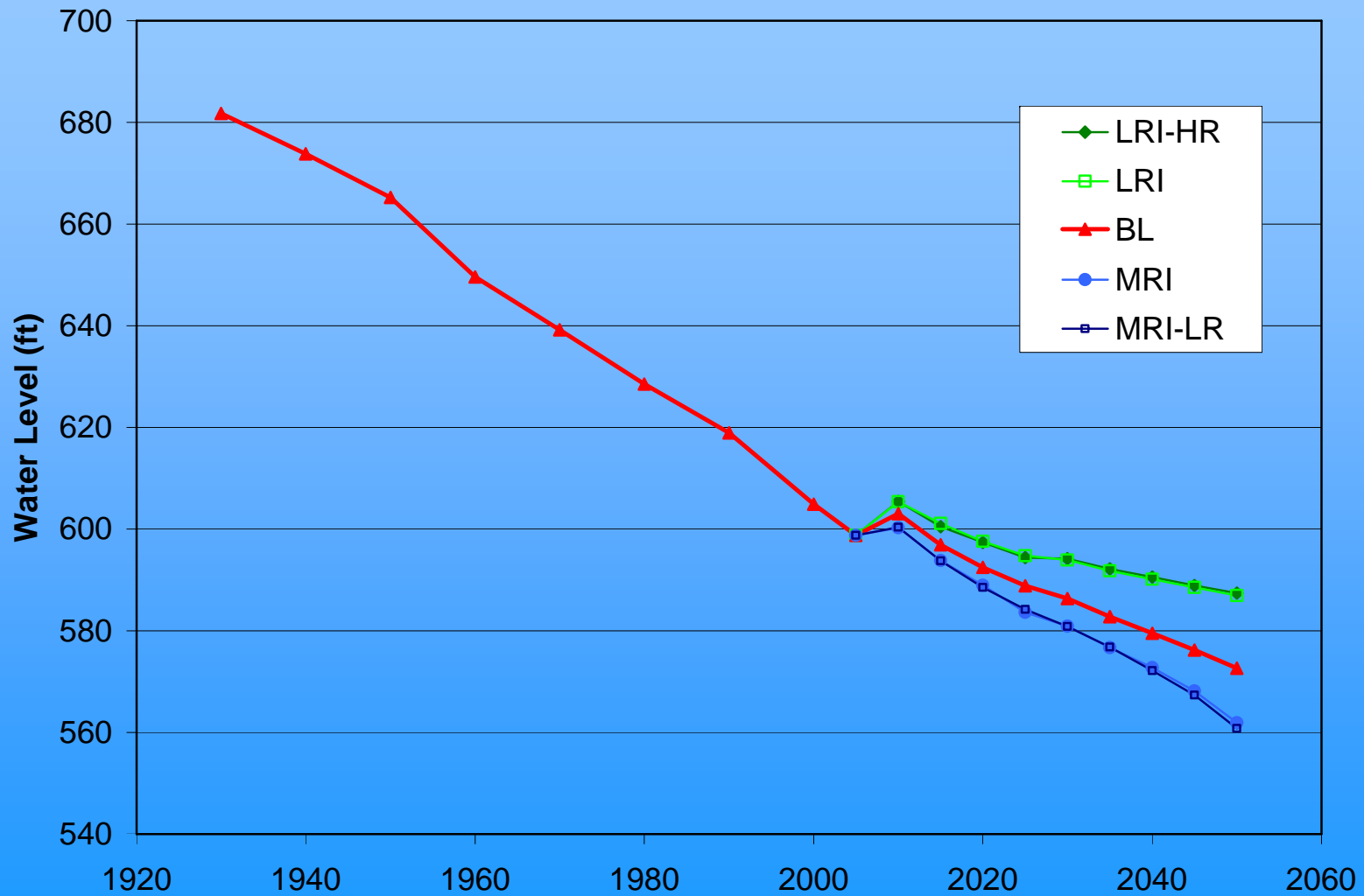


Source: Wilson et al., 1998, ISWS/ISGS Coop 19

Historical Drawdown: 1930 (predevelopment) - 2005

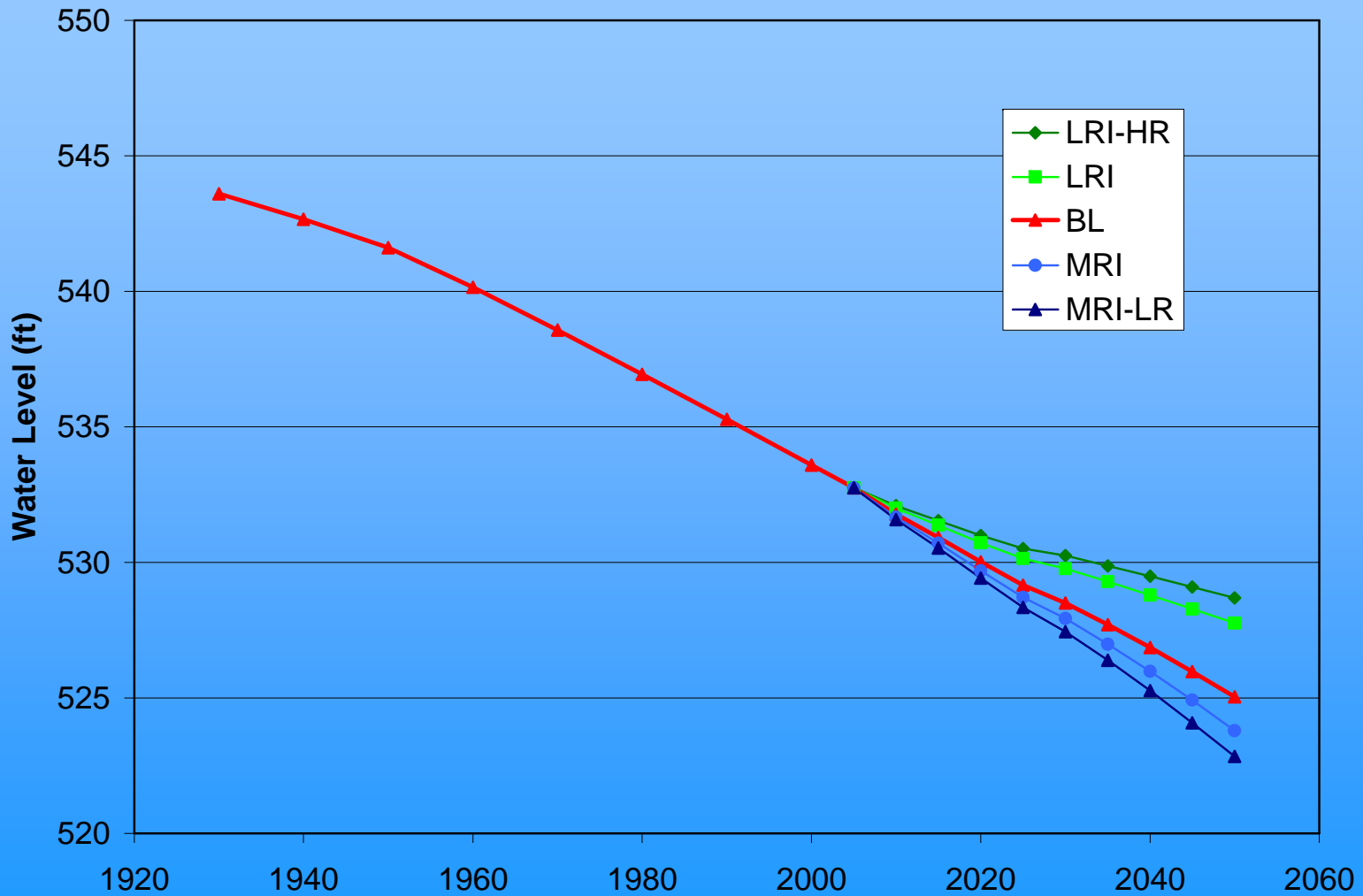


Simulated Hydrograph at Champaign (Petro-North Ob-Well)



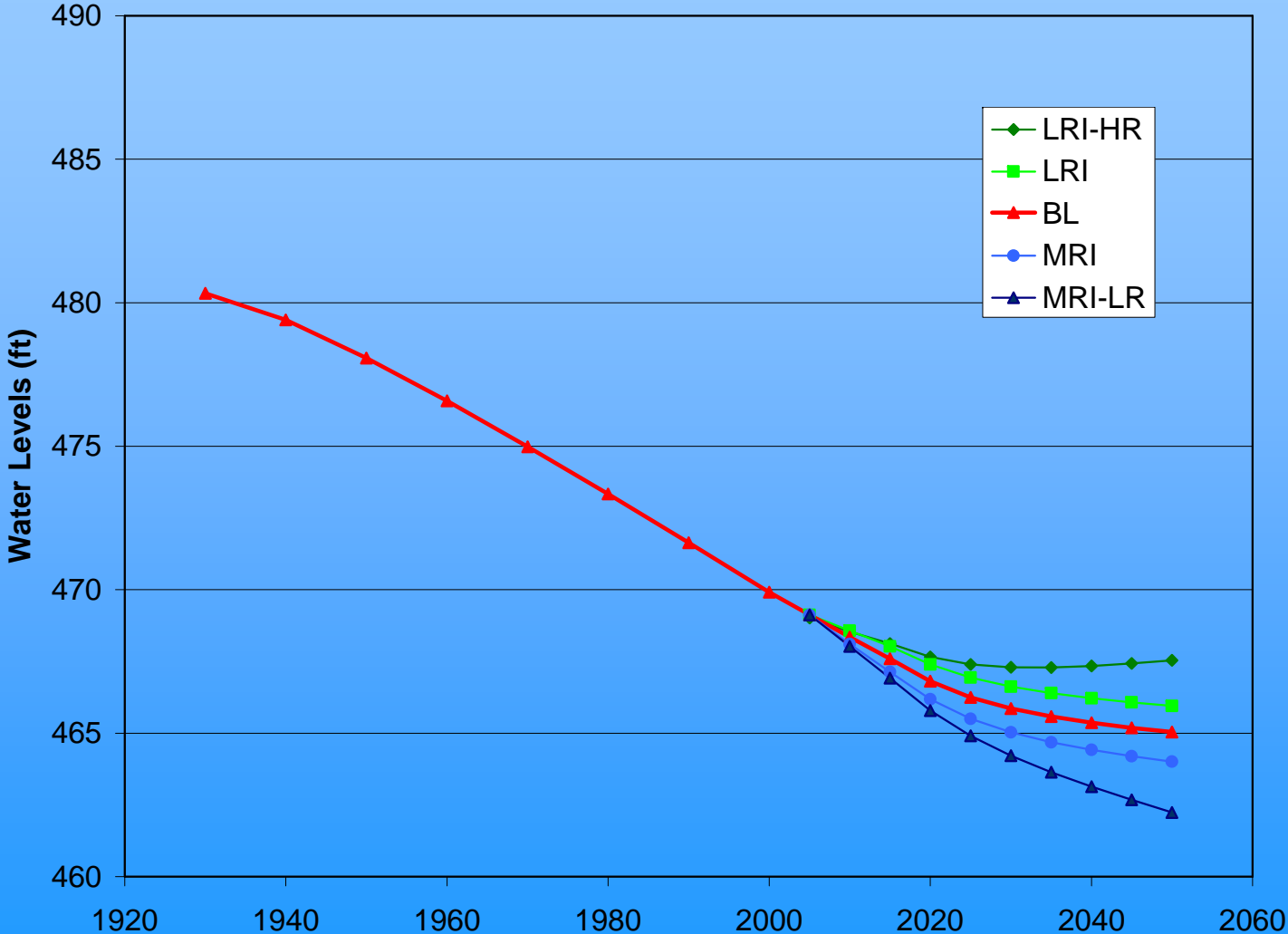
Confined aquifer - insignificant differences between high and low recharge

Simulated Hydrograph in Tazewell County (MTH-3 Ob-Well)



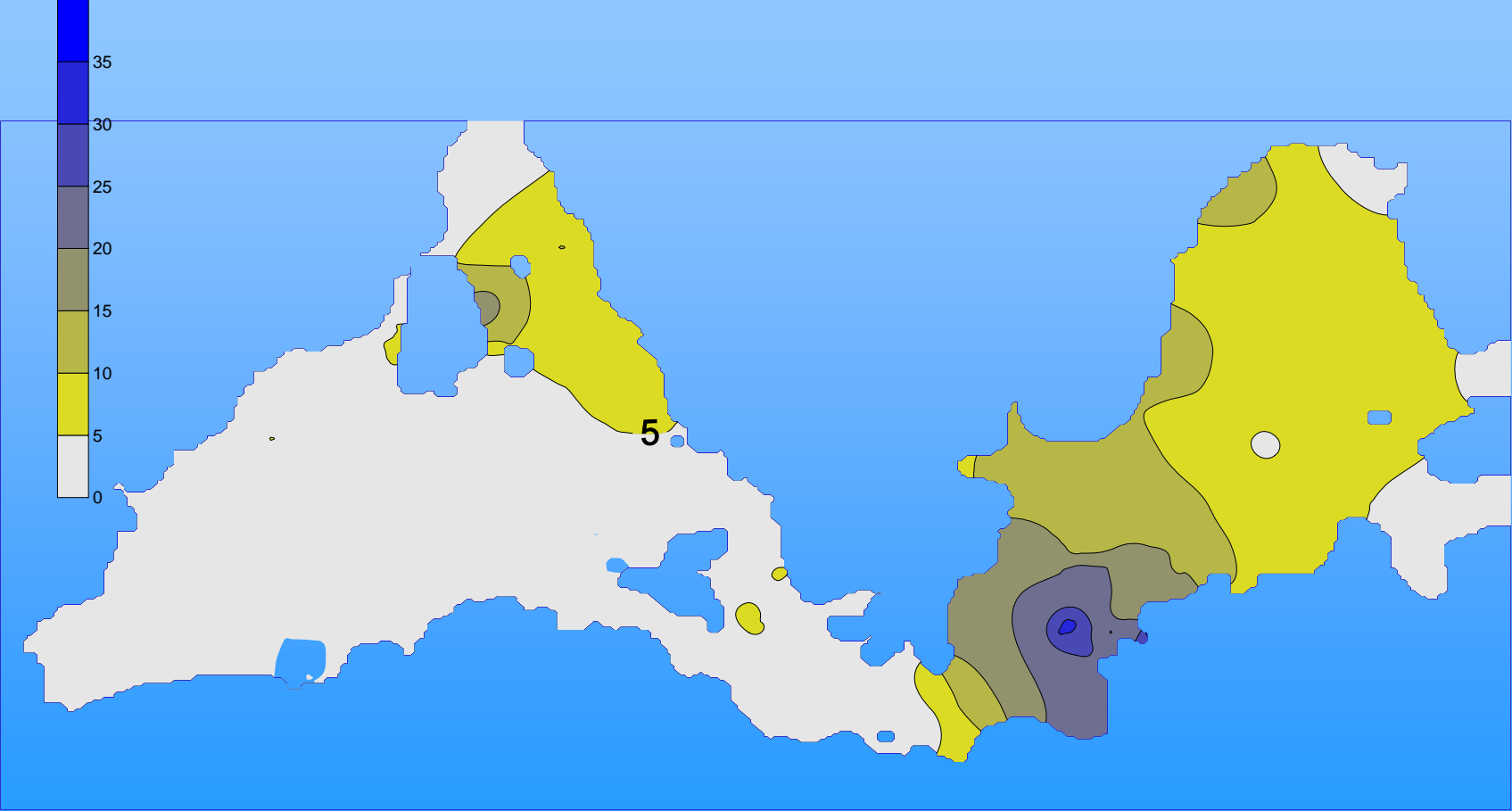
Unconfined aquifer – more significant differences between high and low recharge

Simulated Hydrograph in Mason County (MTOW-13 Ob-Well)

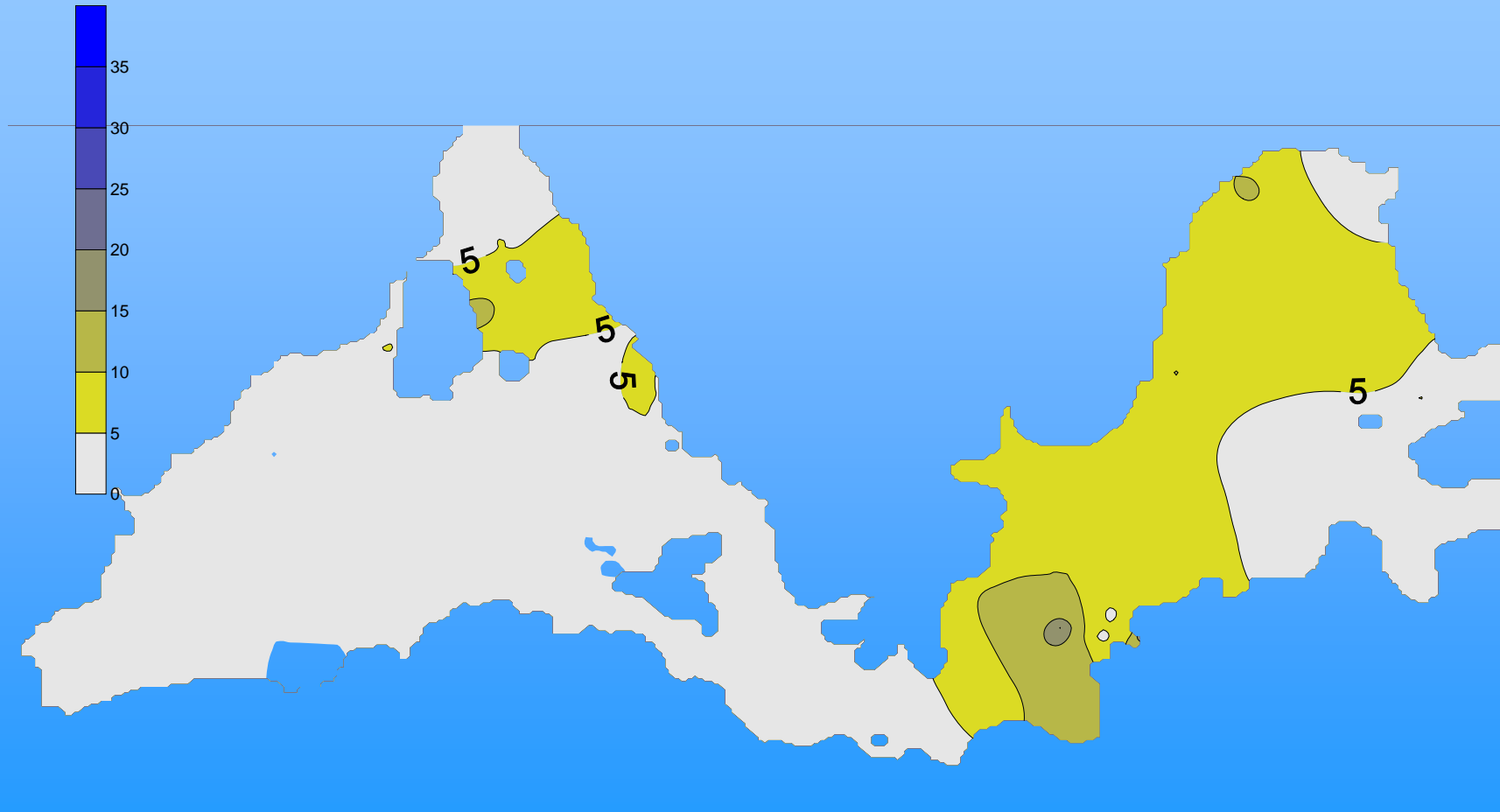


Unconfined aquifer – more significant differences between high and low recharge

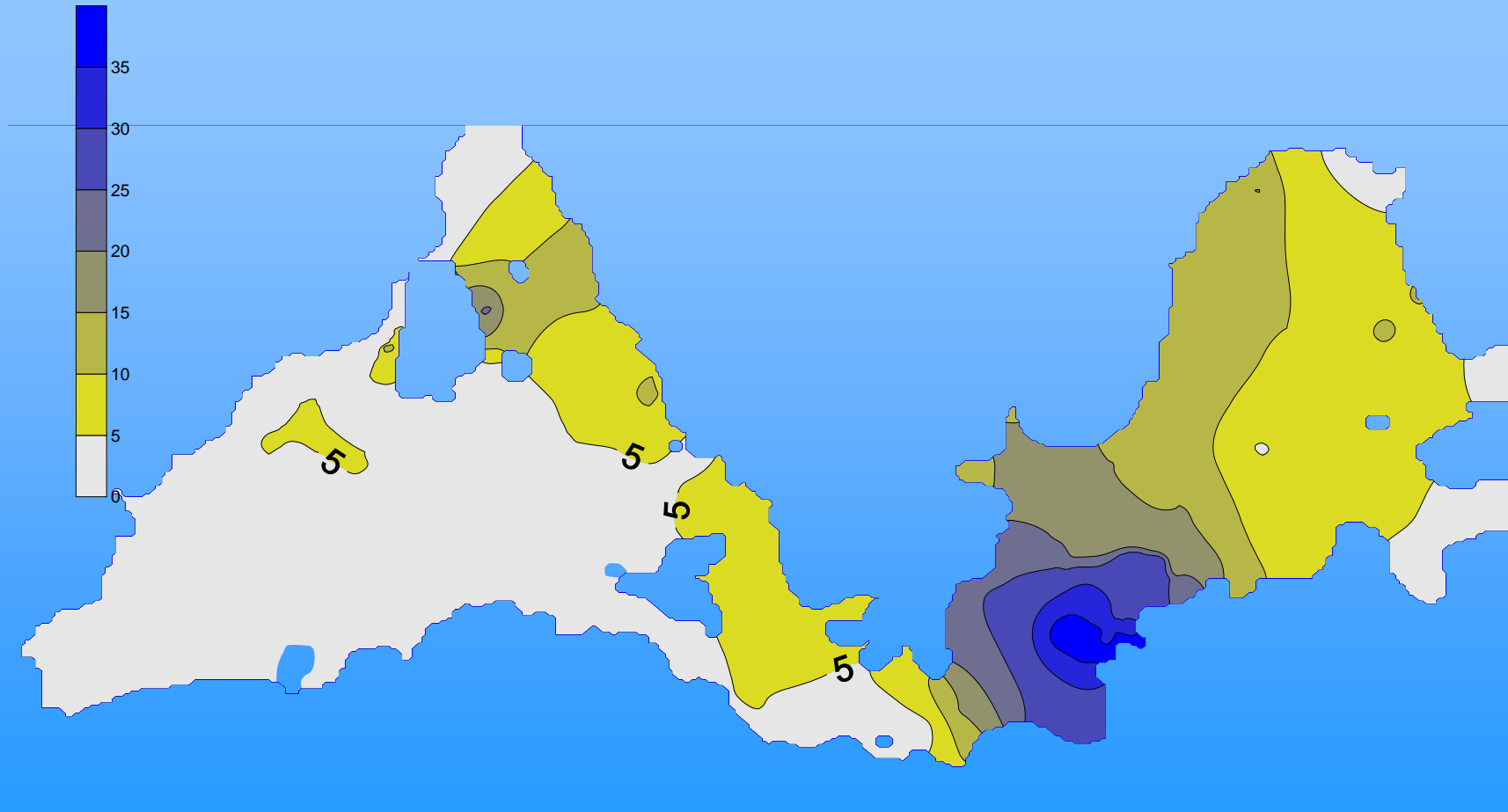
Drawdown: 2005 – 2050 Baseline Scenario



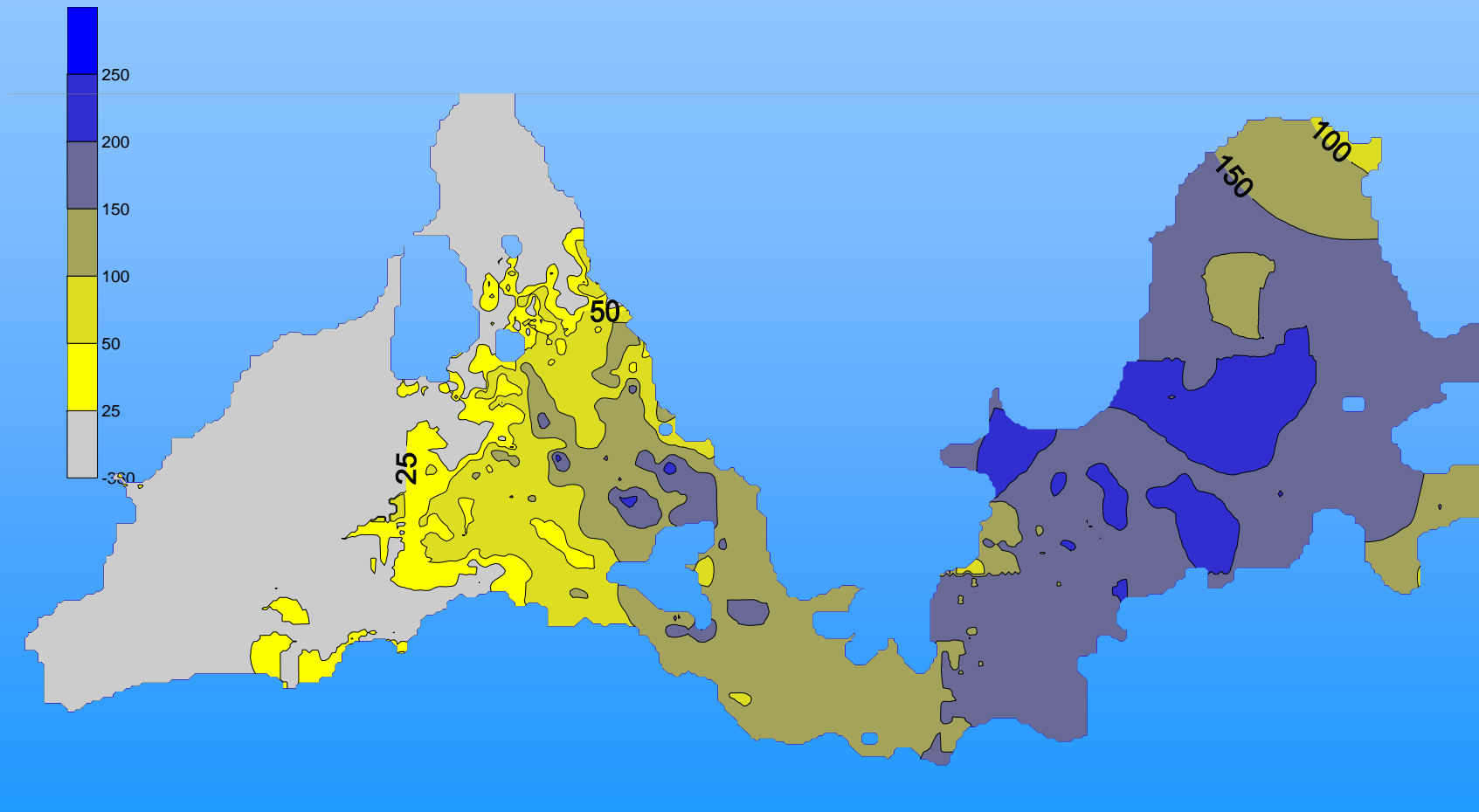
Drawdown: 2005 – 2050 LRI Scenario



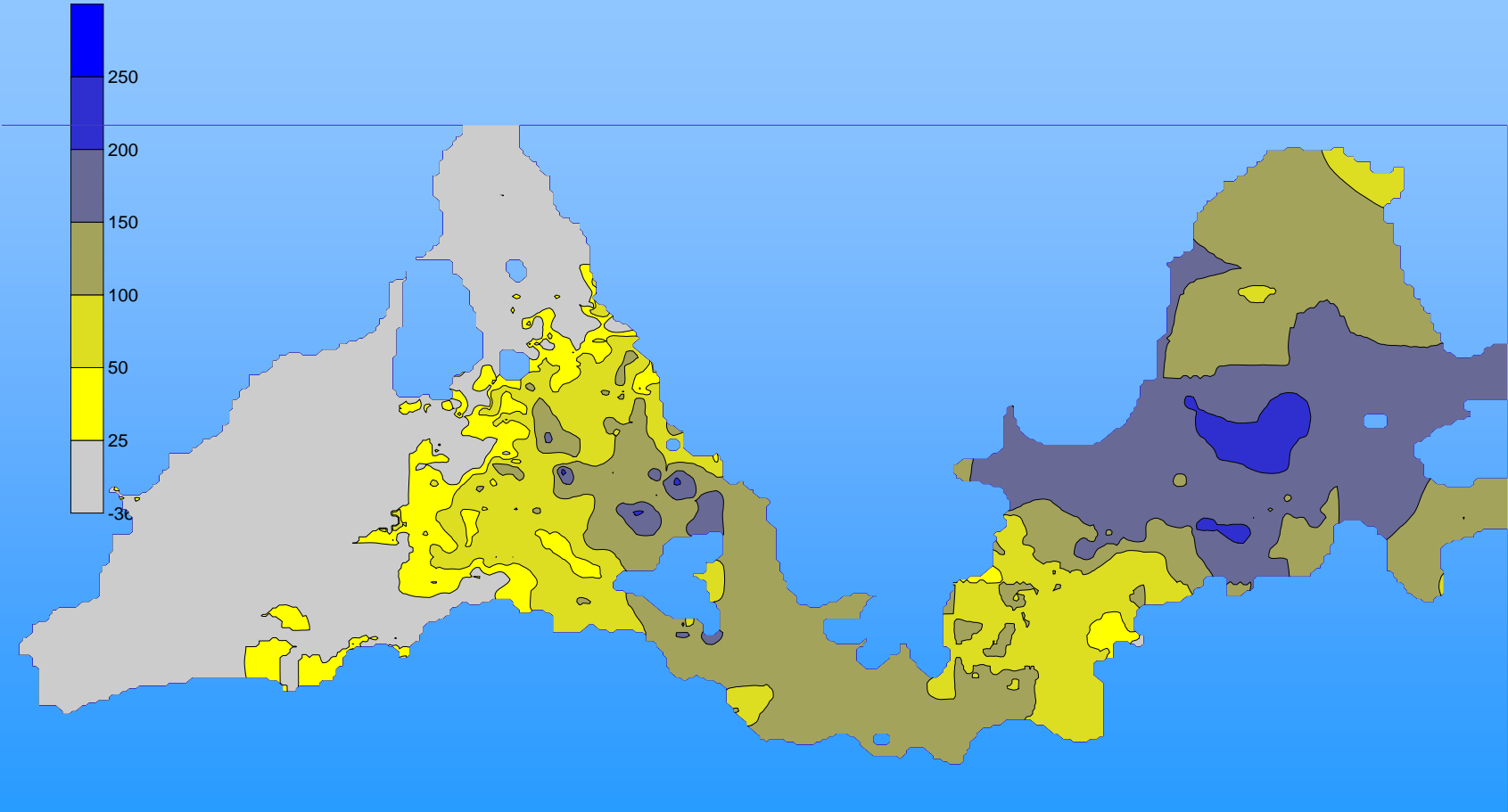
Drawdown: 2005 – 2050 MRI Scenario



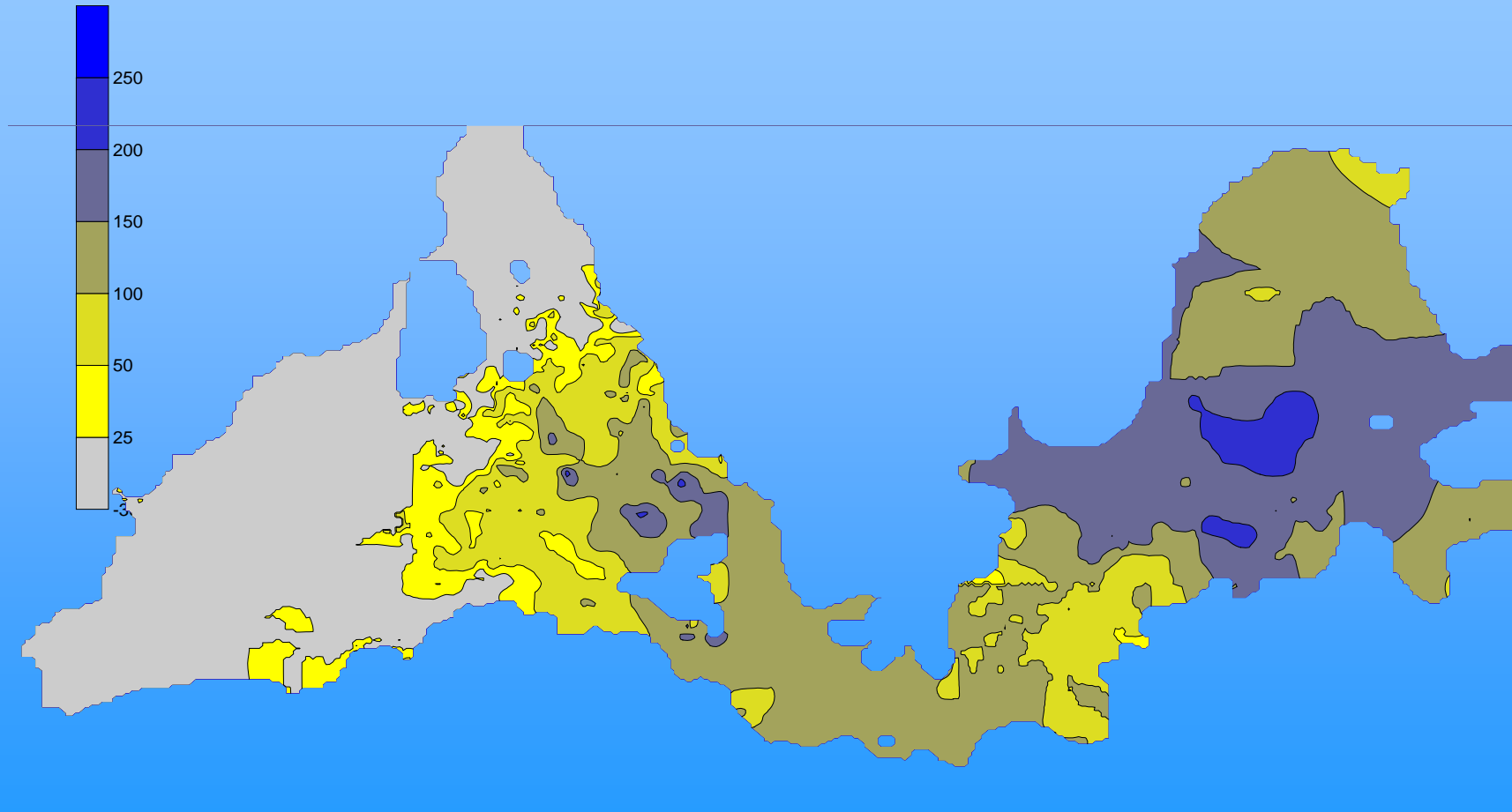
Available Head: Predevelopment Condition



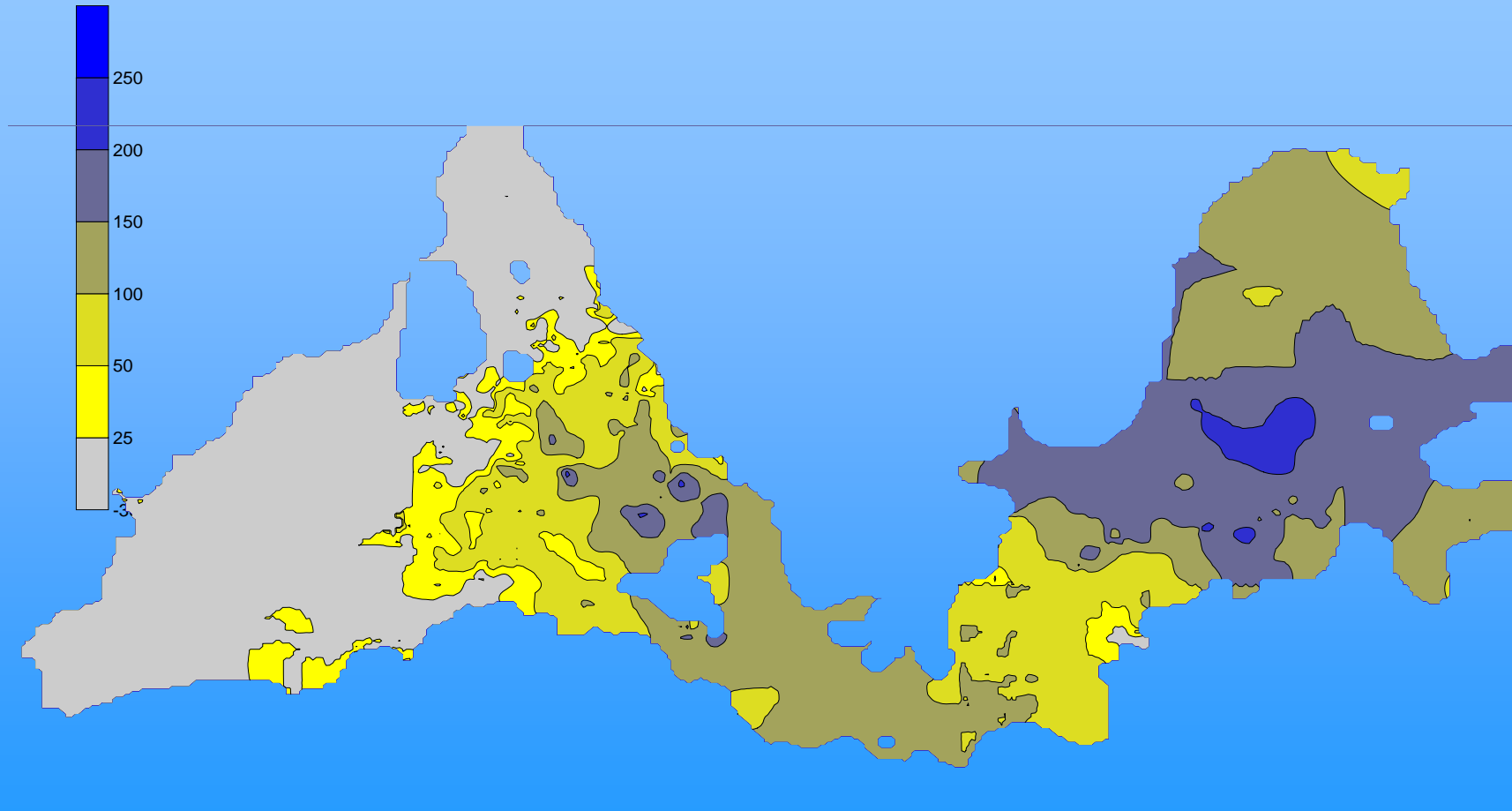
Available Head: 2050 Baseline Scenario



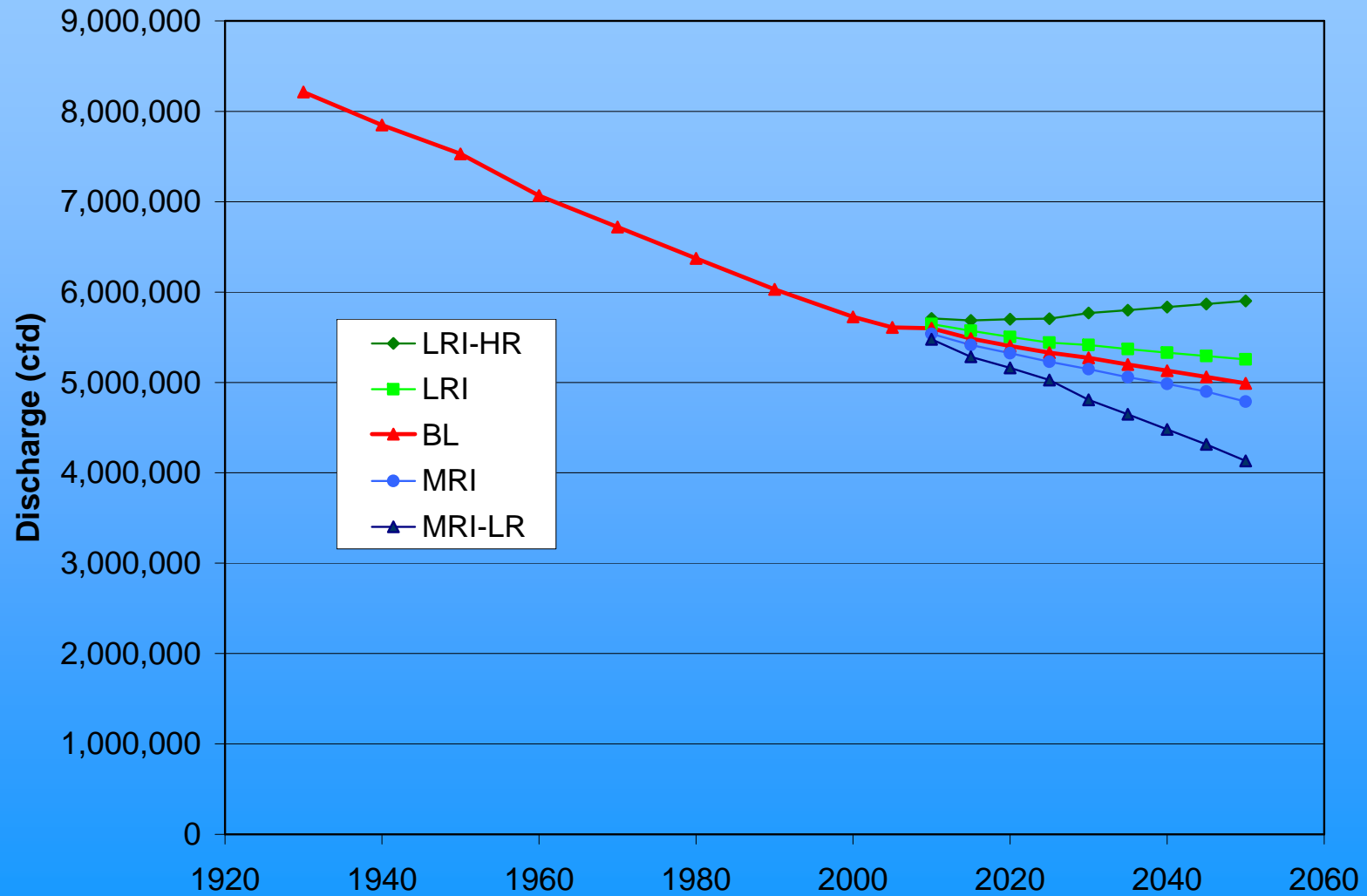
Available Head: 2050 LRI Scenario



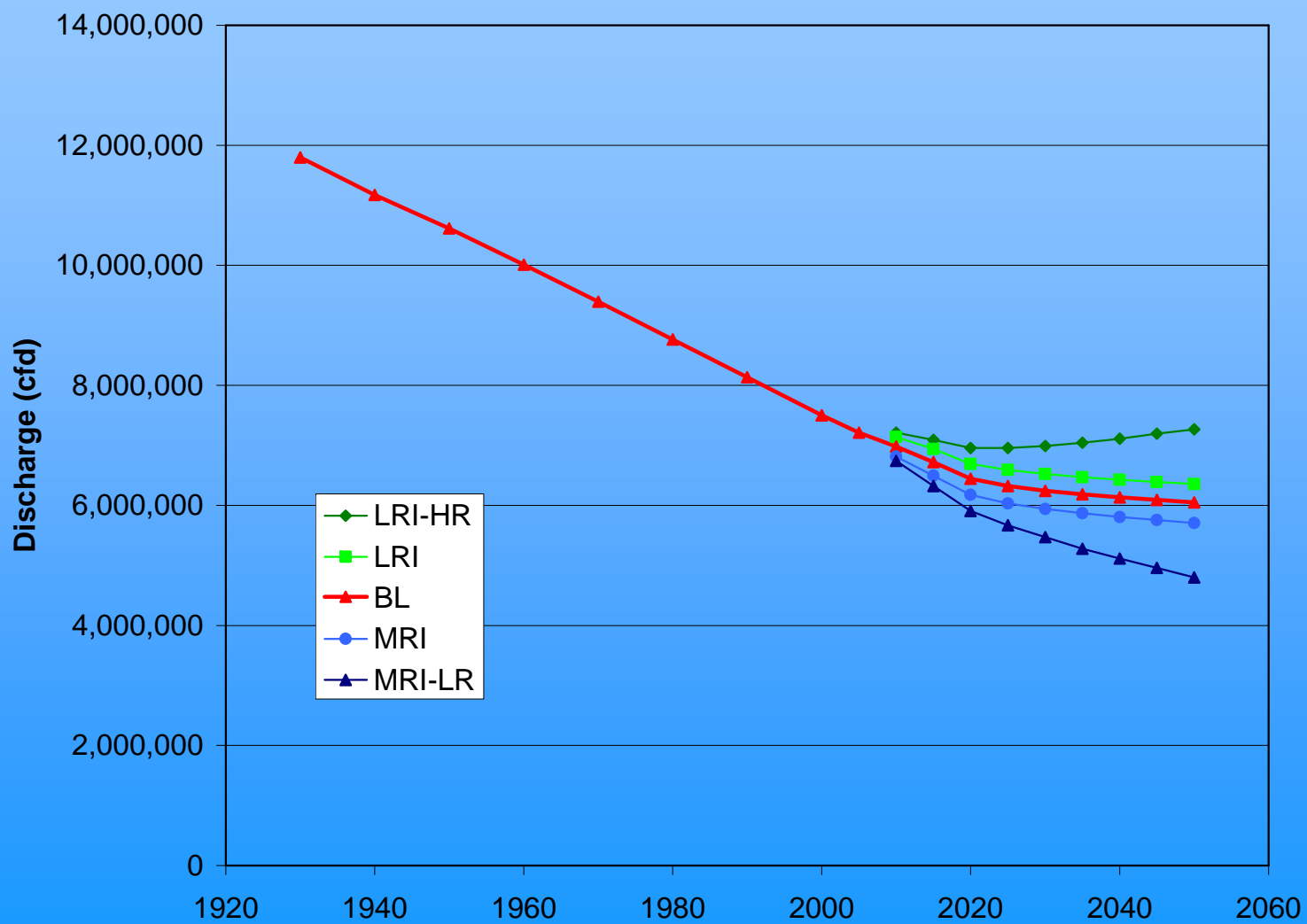
Available Head: 2050 MRI Scenario



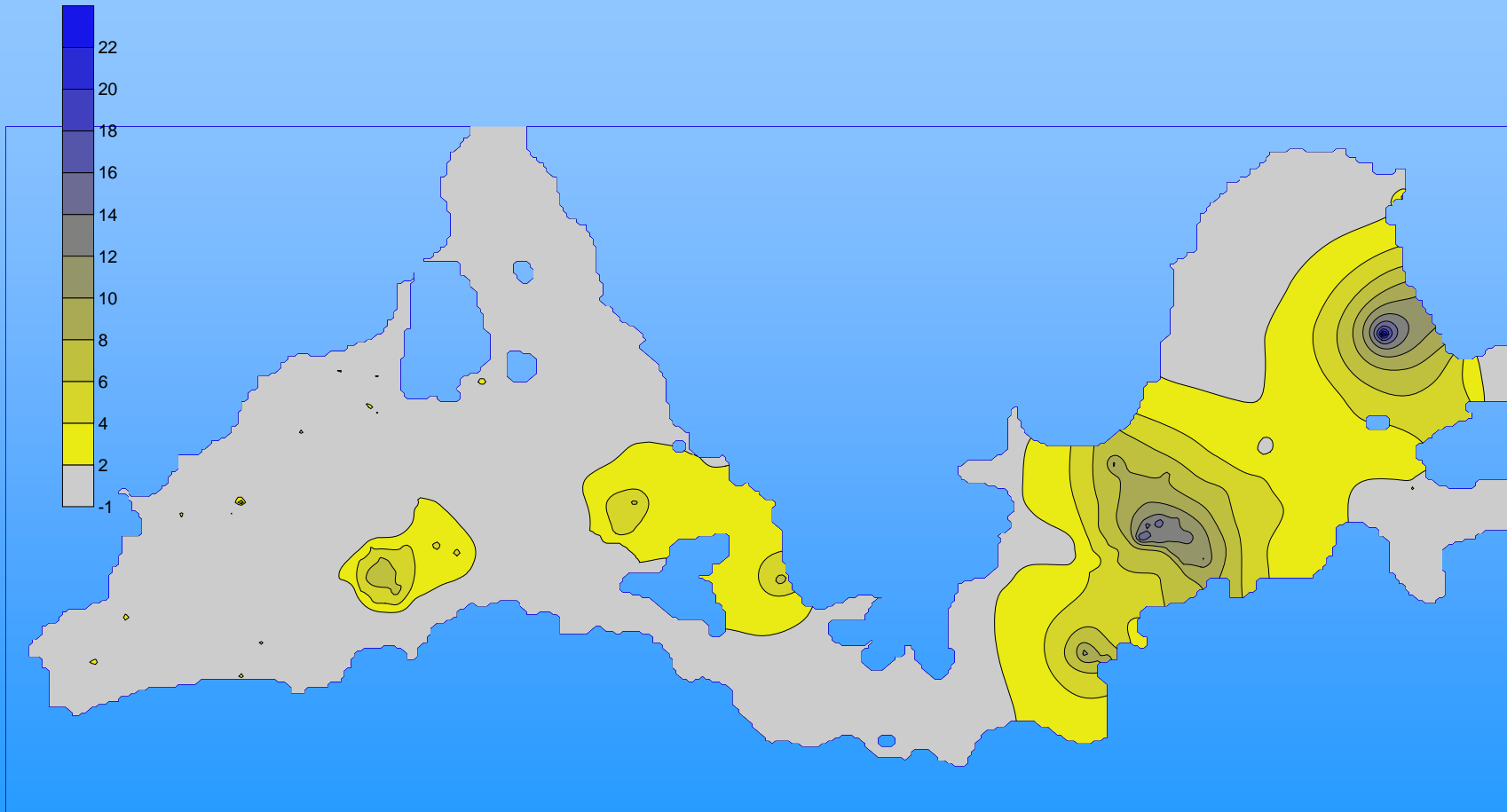
Simulated Groundwater Discharge to Upper Sangamon Watershed



Simulated Groundwater Discharge to Quiver Creek Watershed



Seasonal Drawdown from Irrigation (and Industrial Pumpage near Champaign)



Think
Spring!

