NMLG Model Results for White Bear Lake, 2050 and Ultimate Water Demands

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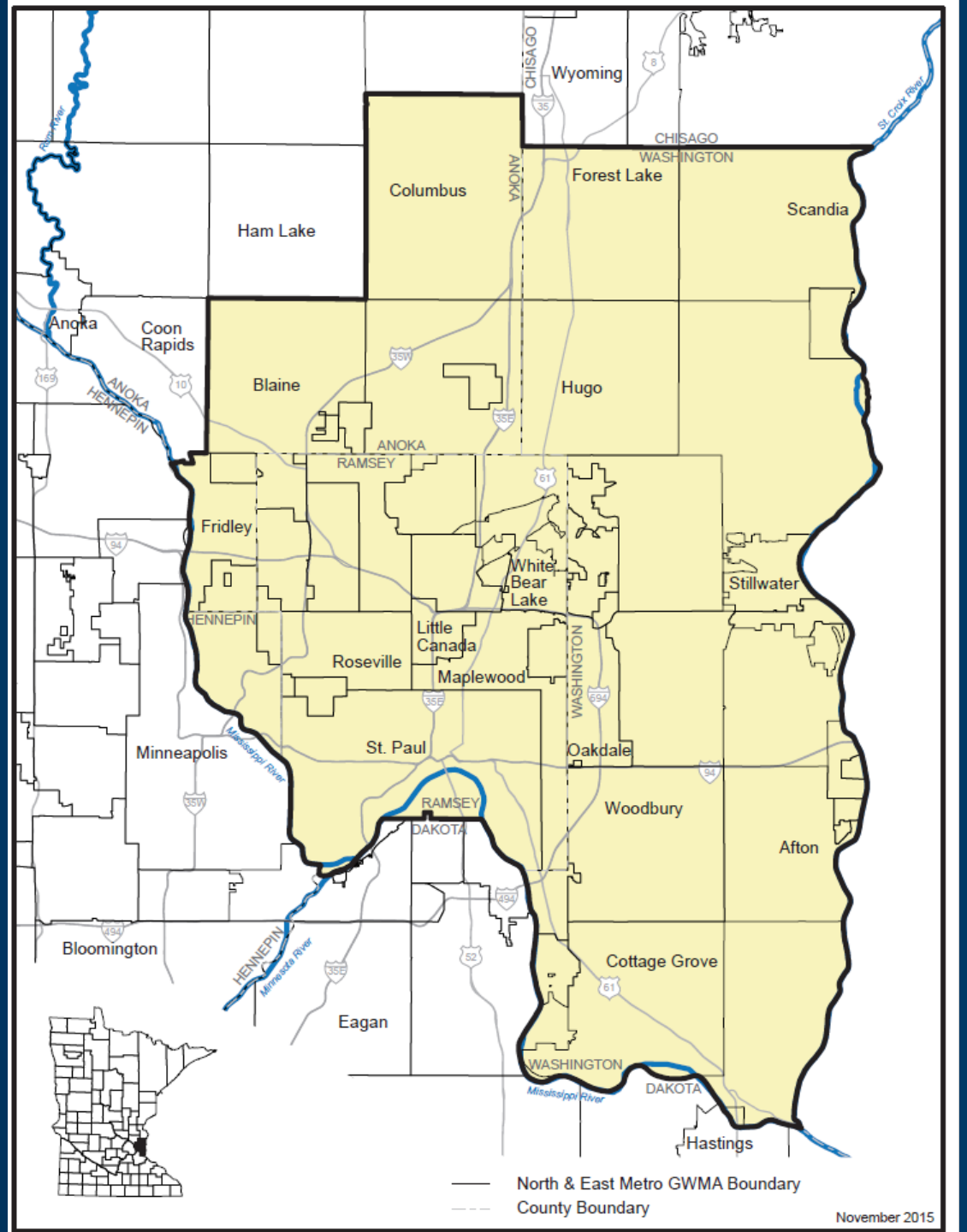
DEPARTMENT OF NATURAL RESOURCES

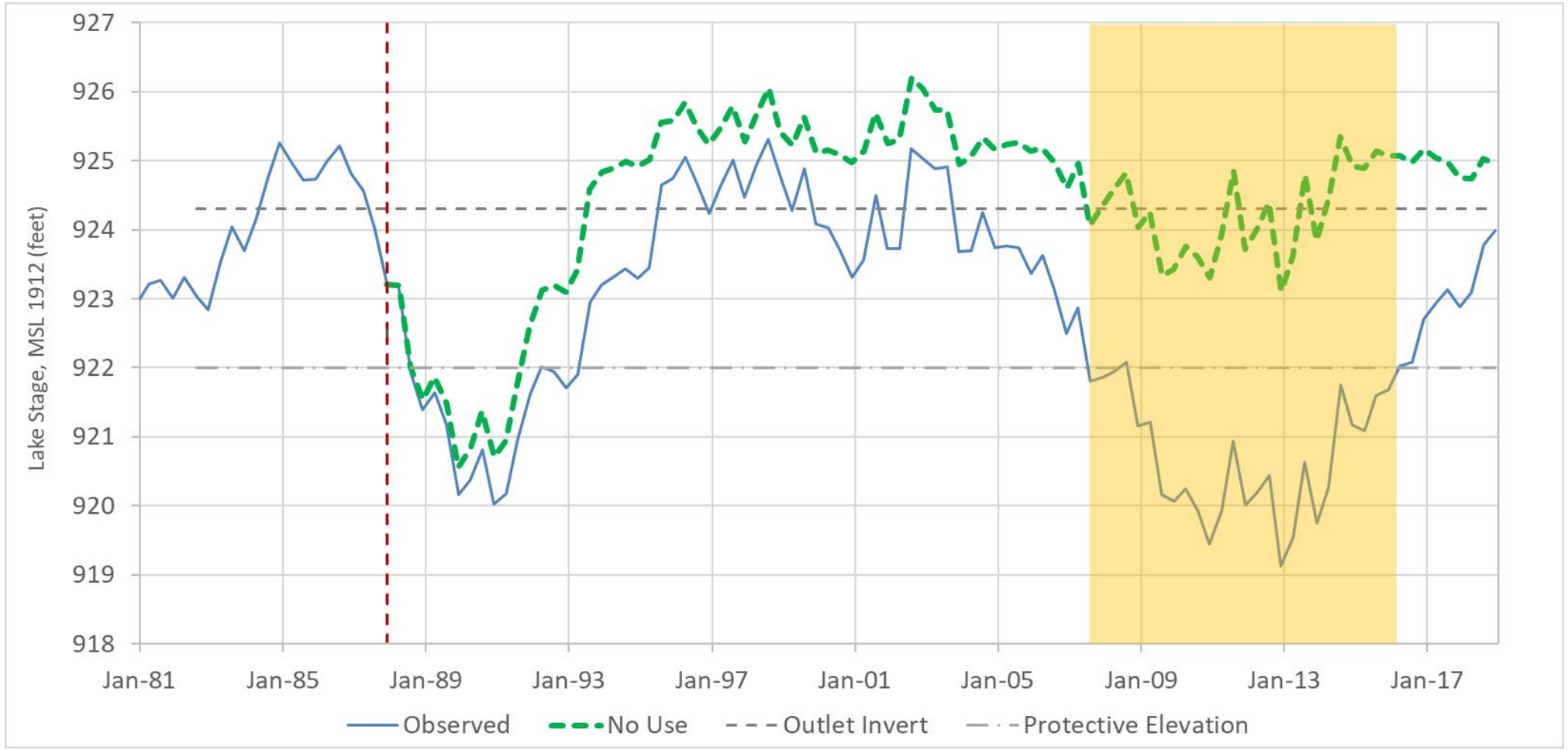
Overview

- Review approach for scenario modeling
- Review 2050 and Ultimate demands
- 2050 and Ultimate scenario results
- Next steps



North and East Metro Groundwater Management Area

Scenario Modeling



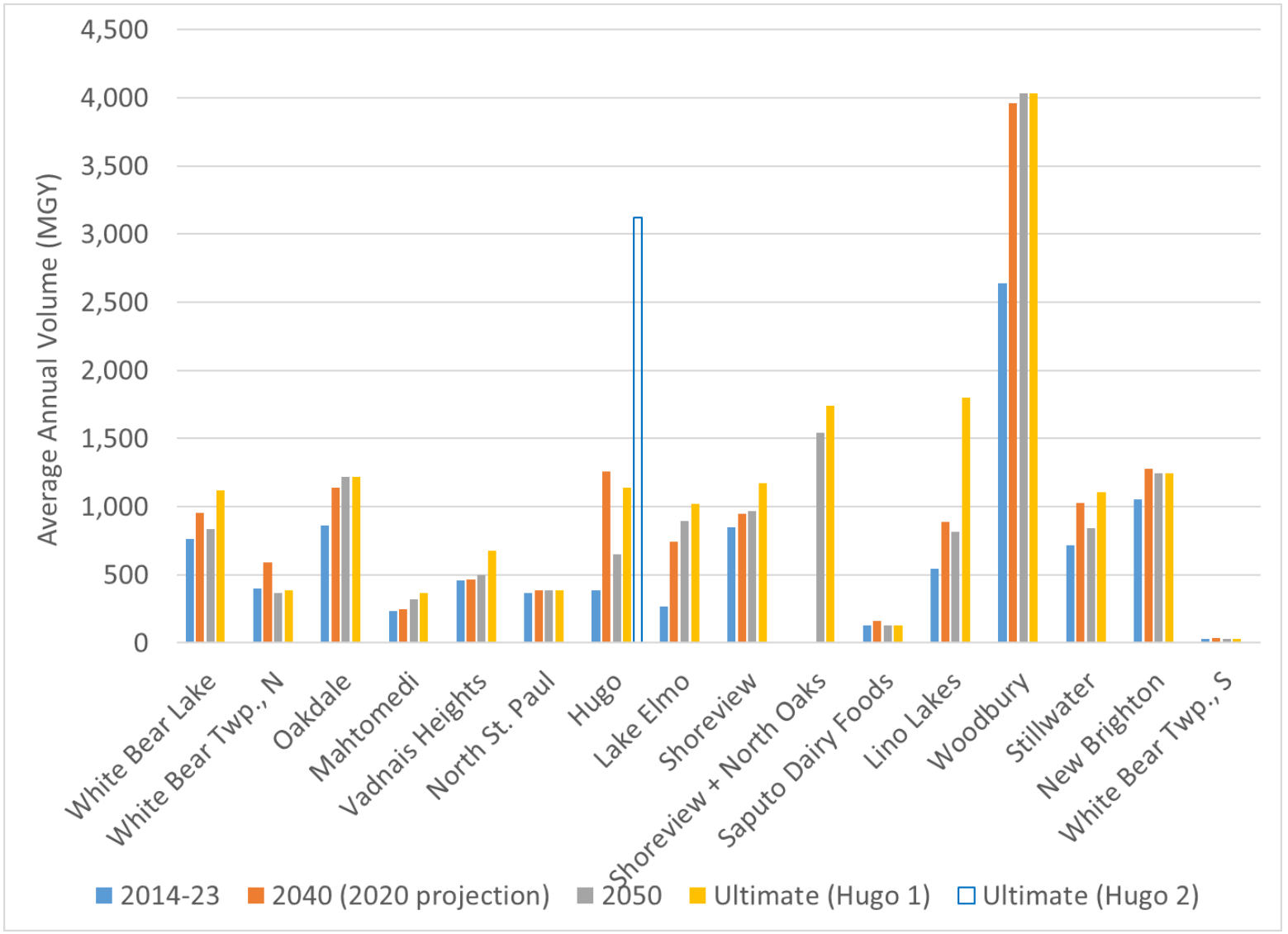
Modeling Approach

- Scenario pumping projected onto 1988-2016 period
  - Assess lake-stage impacts of long-term pumping varying around defined average rates
  - Approach does *not* predict trajectory of lake levels as populations/demands increase over time

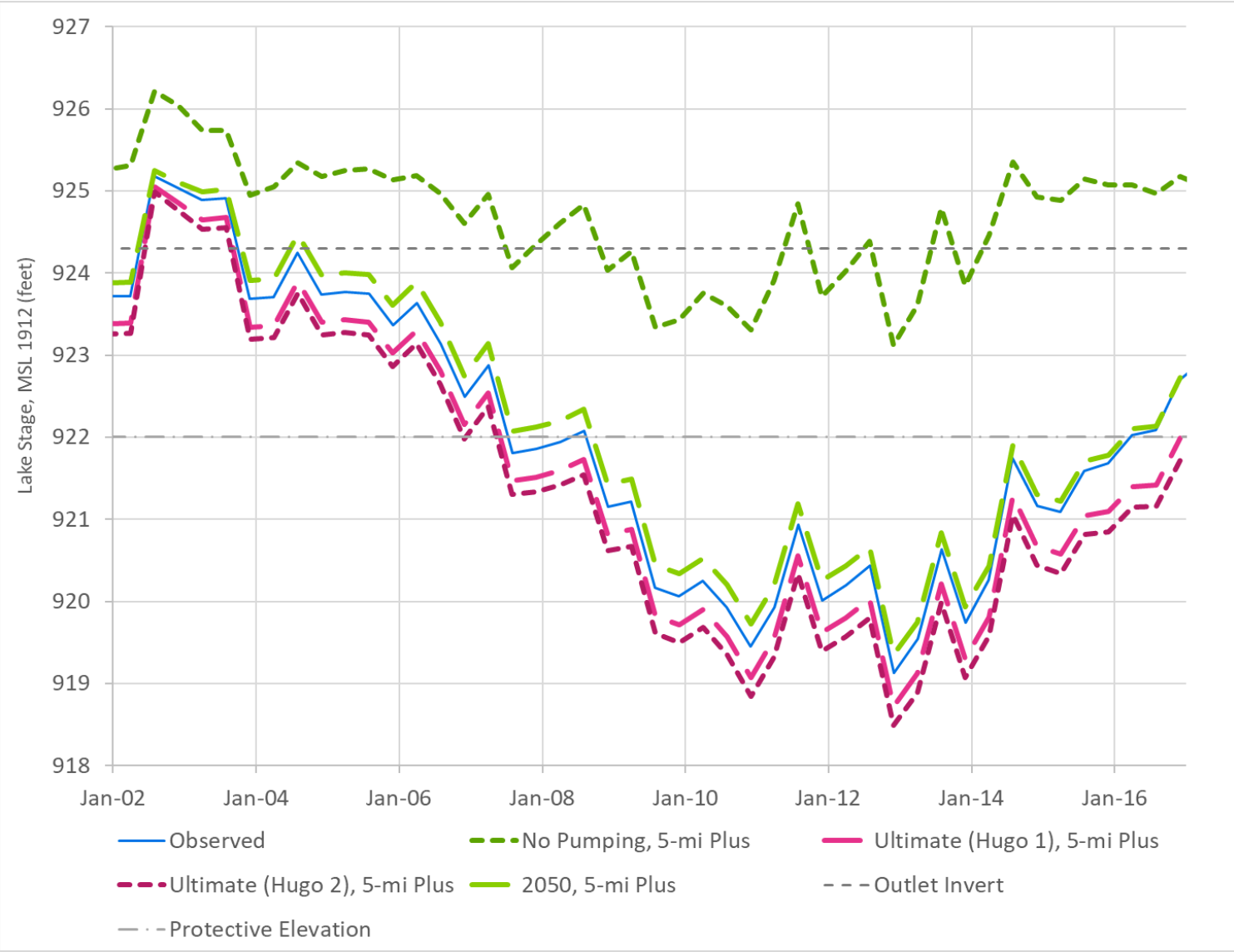
Summary of Scenarios

Scenario	Description
2050	Long-term groundwater use at projected 2050 demands
Ultimate (Hugo 1)	Long-term groundwater use at projected Ultimate demands (2030/2040 MUSA in Hugo)
Ultimate (Hugo 2)	Long-term groundwater use at projected Ultimate demands (expanded MUSA in Hugo)

Average Annual Volume of Water Use – Recent and Projected



Results


927
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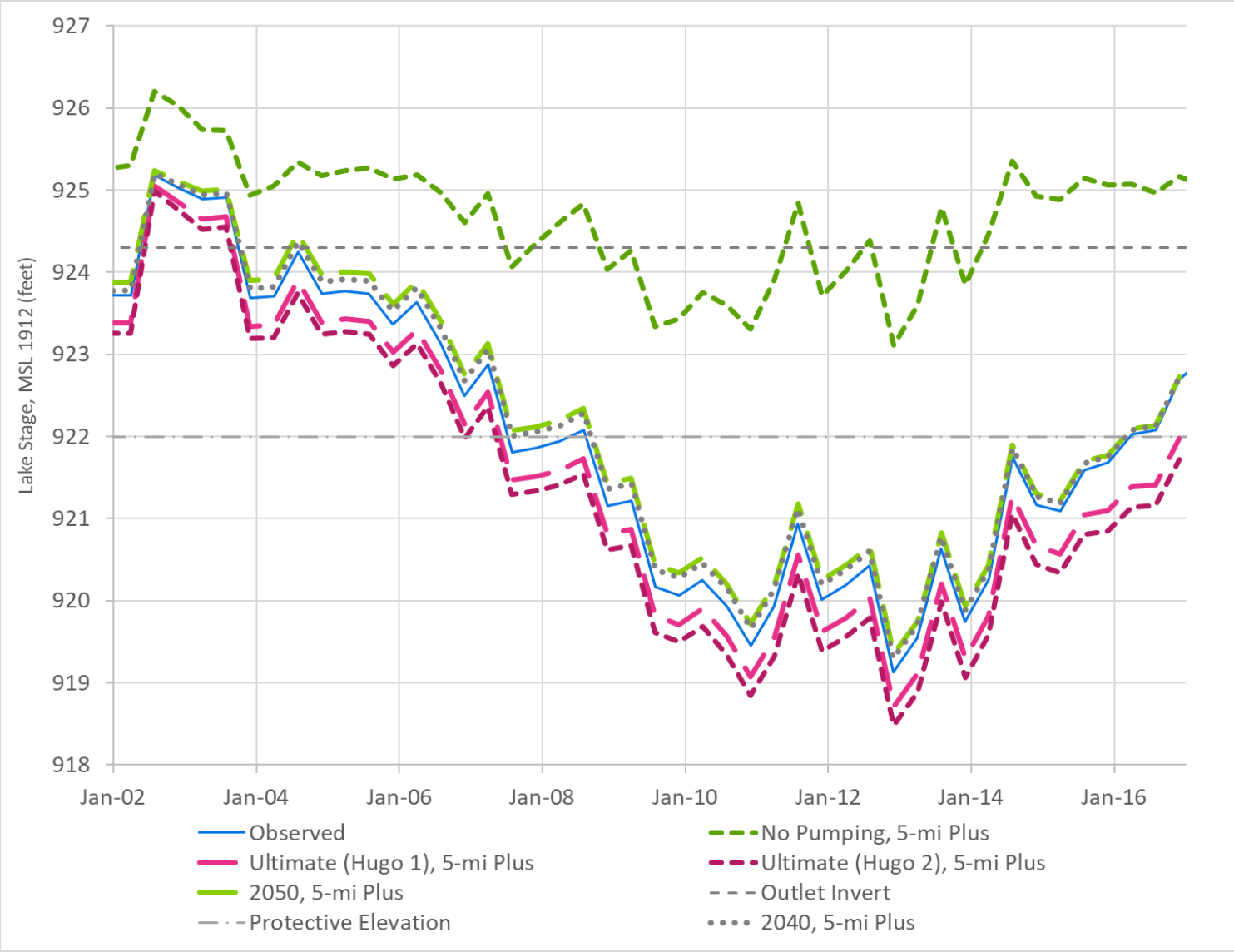
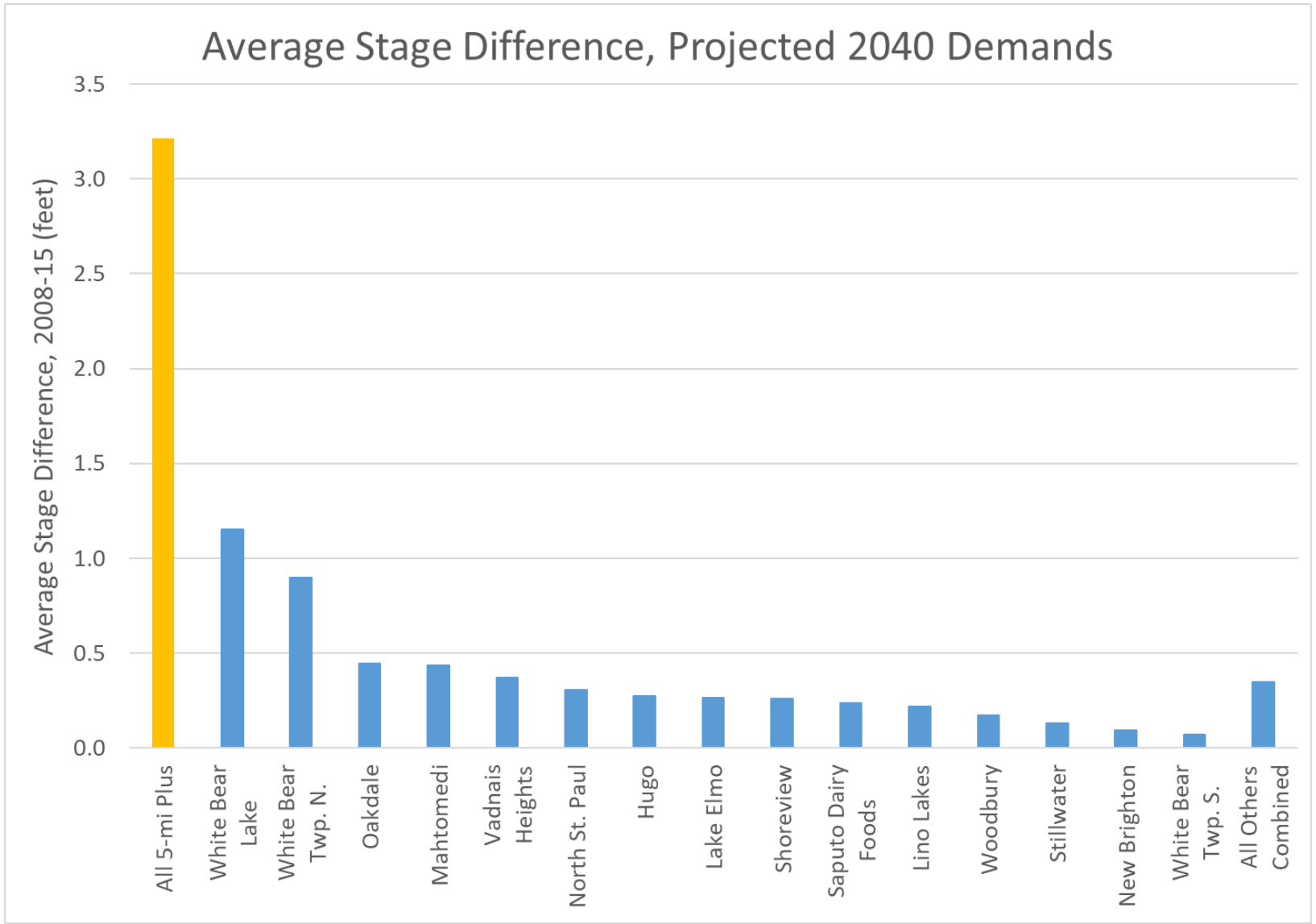
Lake Stage, MSL 1912 (feet)
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Observed
No Pumping, 5-mi Plus
Ultimate (Hugo 1), 5-mi Plus
Ultimate (Hugo 2), 5-mi Plus
2050, 5-mi Plus
Outlet Invert
Protective Elevation

Results Comparison



Next Modeling Steps – Re-Rank at Ultimate Demand



Next Modeling Steps – Test Scenarios

- Test model scenarios at Ultimate demands:
  - Several (> 4) communities supplied by surface-water source(s) (Hugo 1)
  - Several (> 4) communities supplied by surface-water source(s) (Hugo 2)
  - Lake augmentation with surface-water source (surface water needed for X municipal supplies?)
  - Project 1007 configurations that supply treated water to Oakdale and/or Lake Elmo?

Next Modeling Steps – Select Scenarios

- Select ~4 scenarios expected to maintain White Bear Lake levels above the Protective Elevation for the model-analysis period conditions

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Thank You!

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Supplemental Slides

Permits and Wells w/in 5 Mile Area