

RECLAMATION

Managing Water in the West

Hood River Basin Study

Groundwater Modeling

27Sep2013

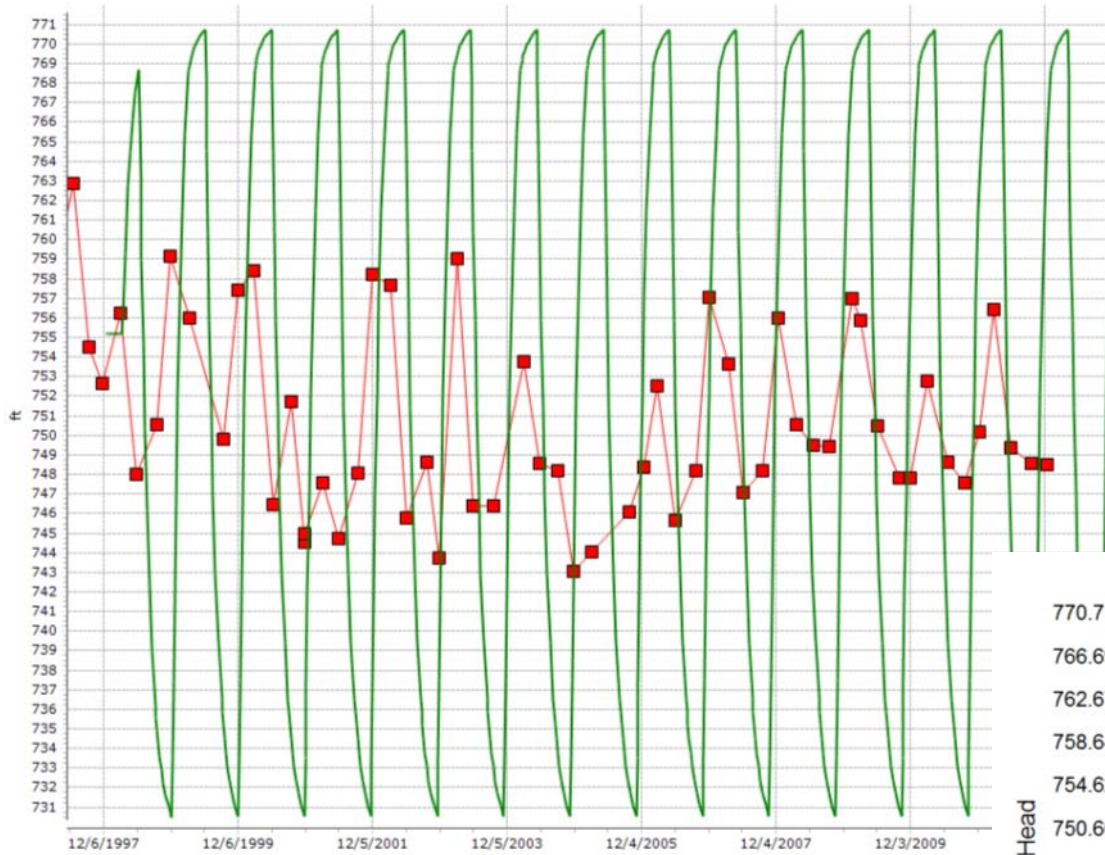


U.S. Department of the Interior
Bureau of Reclamation

Climate Change Conditions

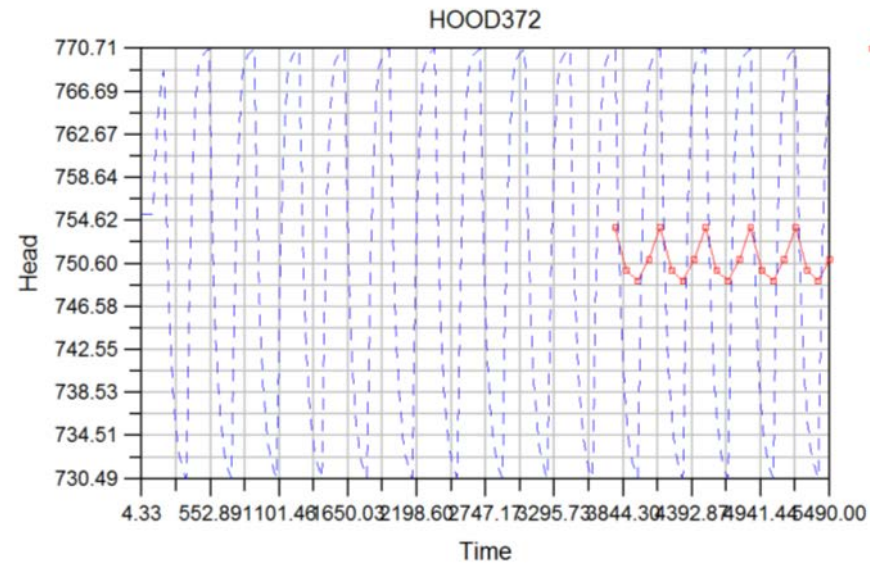
- Simulation of climate change conditions mimic procedures and strategies used in other Reclamation studies.
 - Projection Selection & Characterization
 - *3 Climate signals with 10 Projections each using the 20th, 50th, and 80th percentiles. **Climate signals are currently being evaluated***
 - Temporal Extent Selection
 - *Period Change: 1980 – 2009 vs. 2030 – 2059*
 - Projection Processing Methodology
 - *Hybrid Delta Ensemble*
 - Dataset Selection
 - *CMIP3*

HOOD 372 well372:pisces:stuff2.xlsx



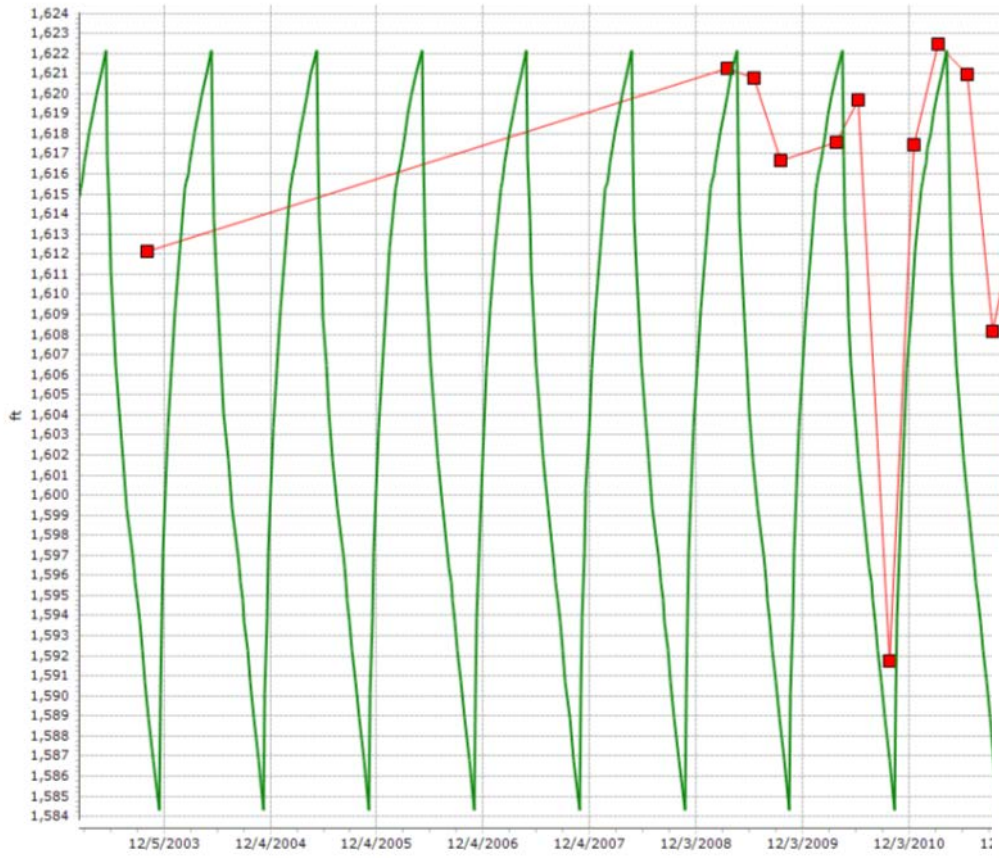
Modeled
Observed

Modeled
Simulated Observed



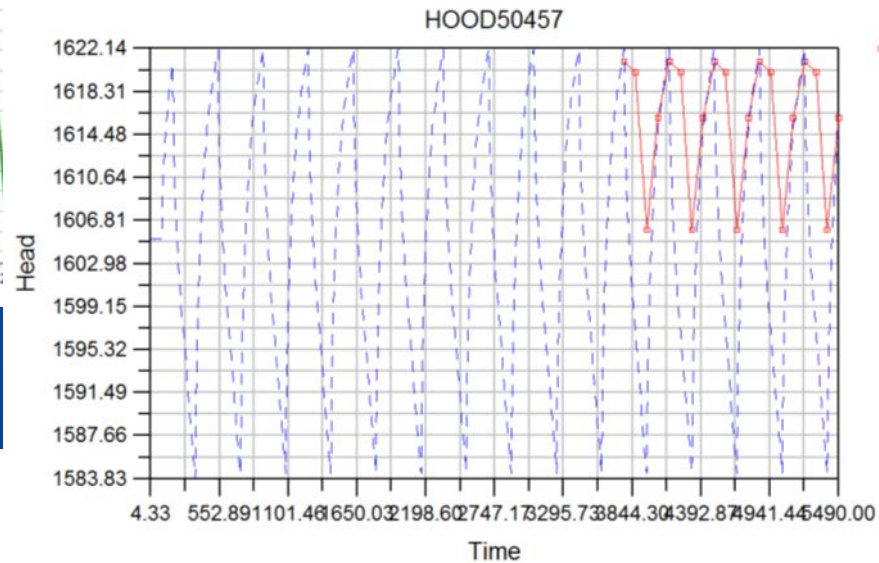
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HOOD 50457 well50457:pisces:stuff2.xlsx

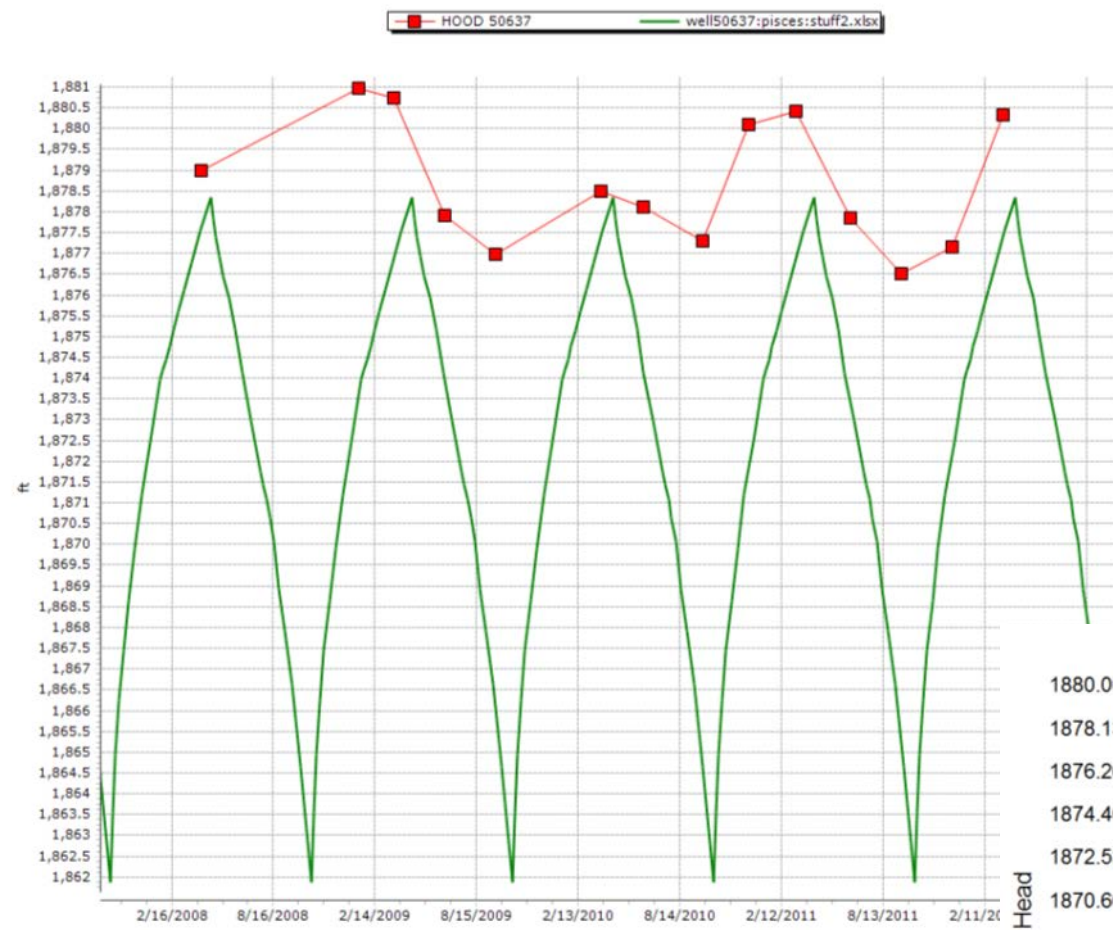


Modeled
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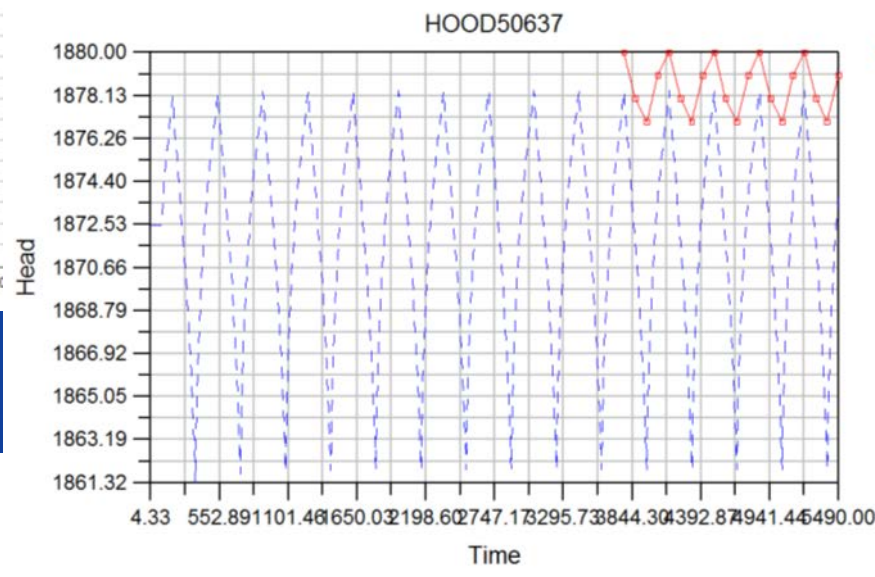


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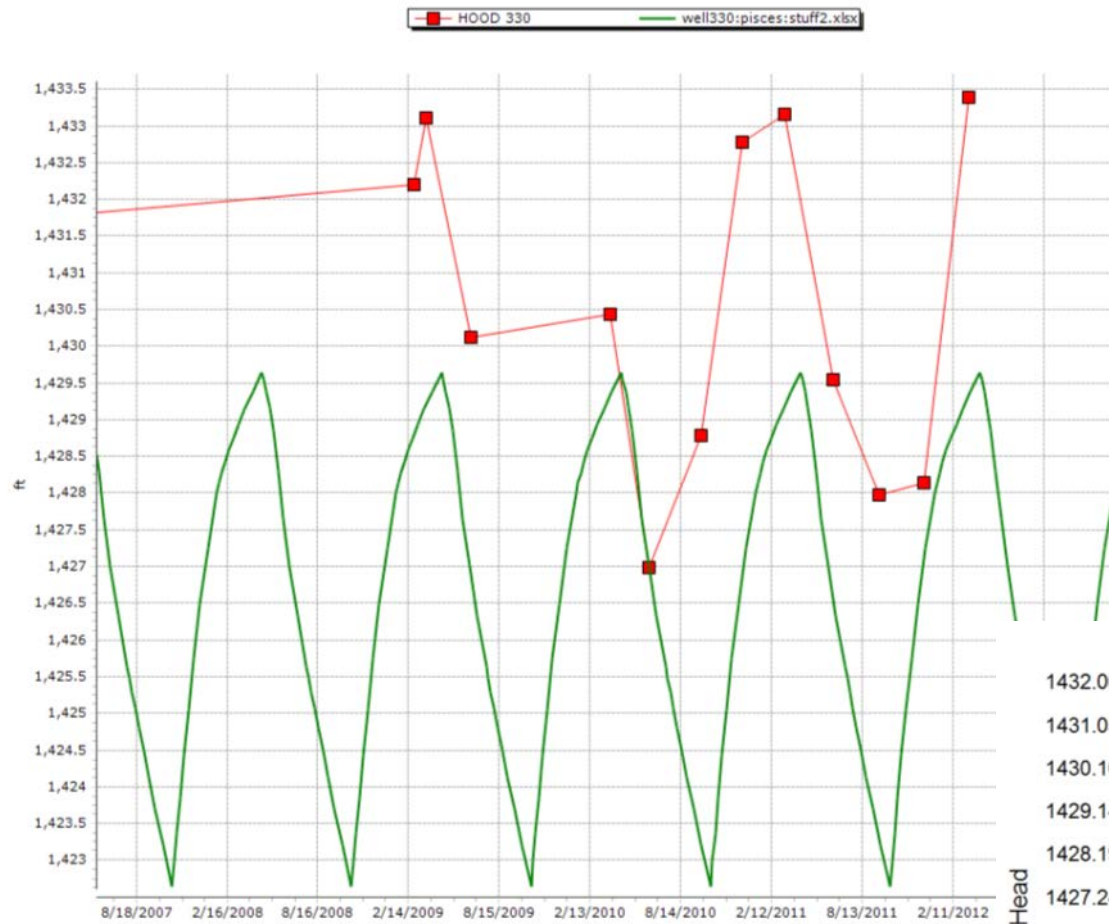


Modeled
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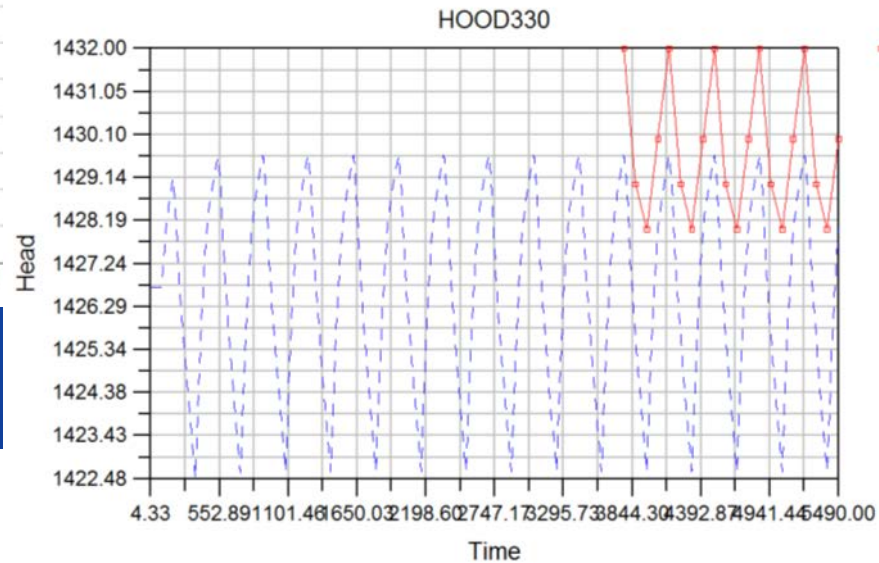


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Modeled
Observed

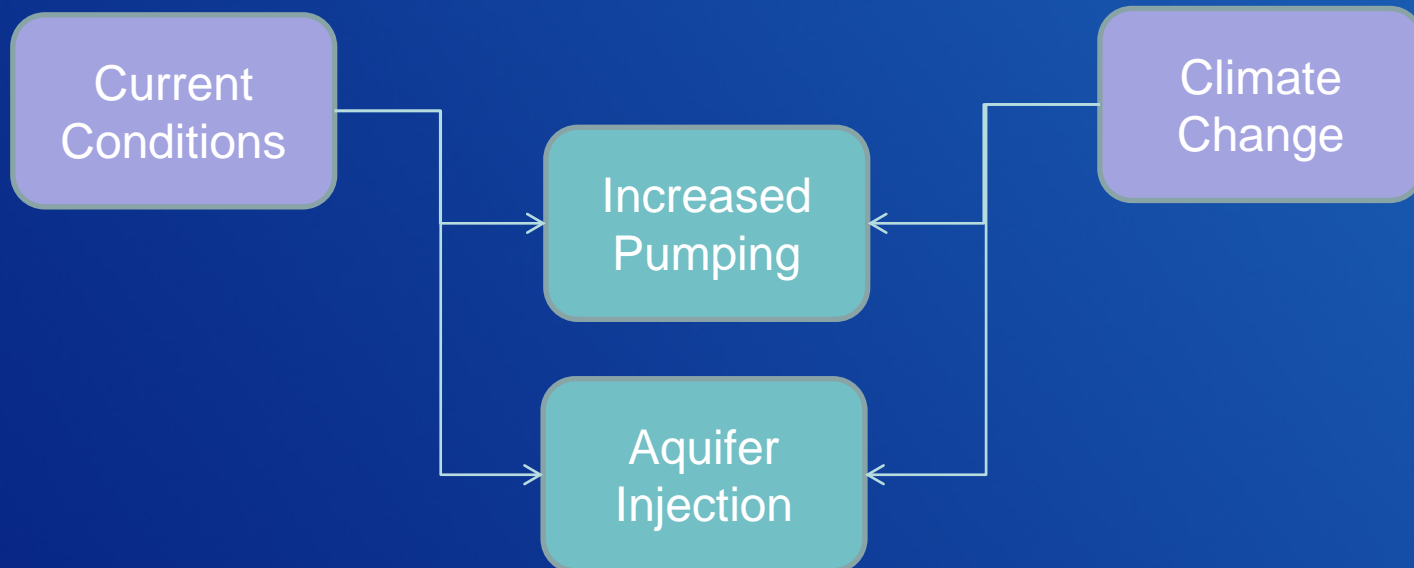
Modeled
Simulated Observed



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Model Scenarios

- Two underlying conditions each with two different scenarios
 - Conditions:
 - Current conditions
 - Climate change conditions
 - Scenarios:
 - Increased pumping
 - Aquifer injection



Scenario: Increased Pumping

- **Maintain DMCI use**

- < 1% Domestic & Municipal, ~29% Commercial & Industrial, 70% Irrigation

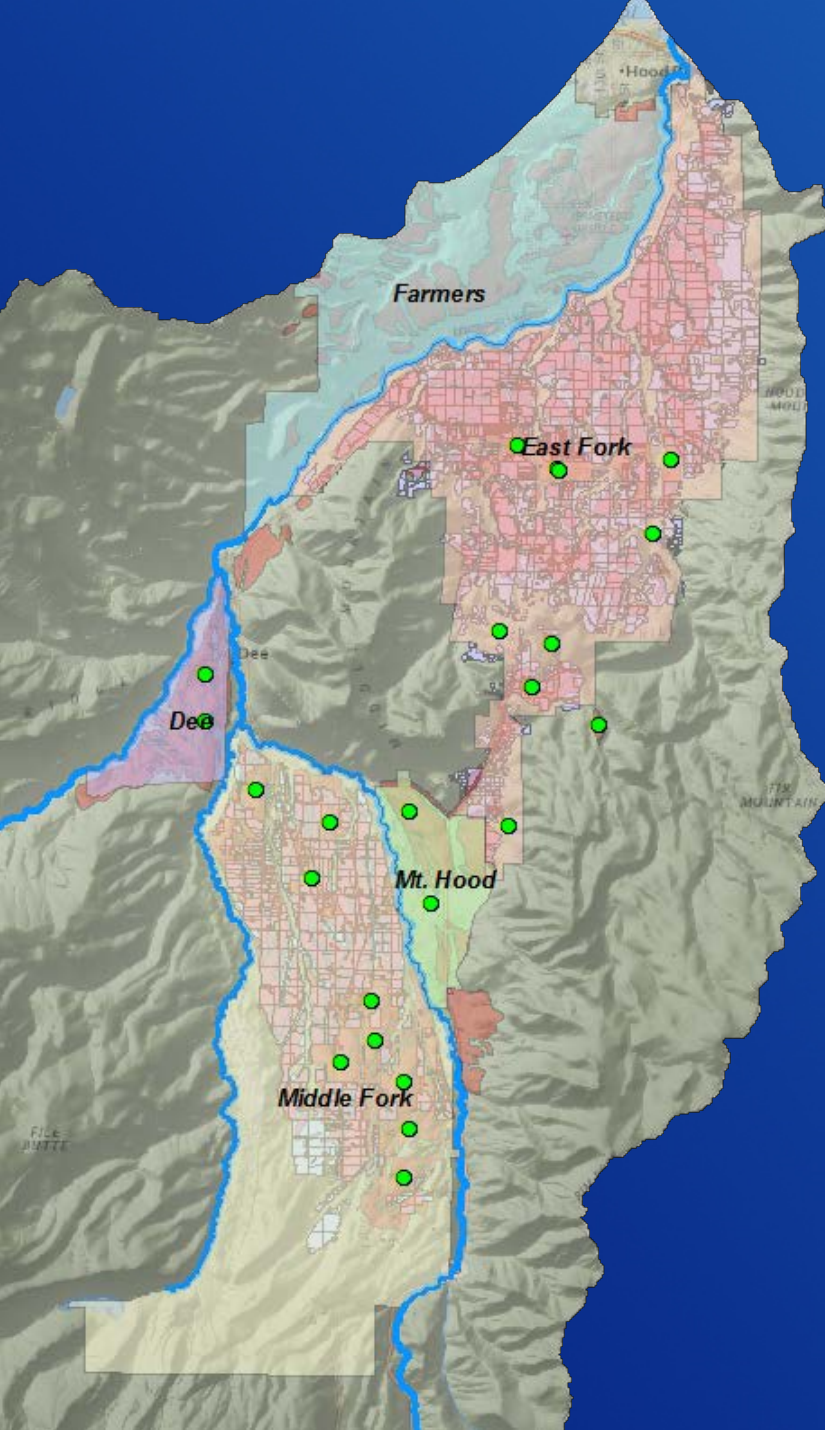
- **Increase irrigation use based on available irrigable acreage**

ACREAGE IN HOOD RIVER COUNTY IRRIGATION DISTRICTS						
District	Irrigable (acres)	Irrigated (acres)	Available (acres)	Qreqd (af/acre)	Wells Now	Needed Wells
DID	1297	951	346	2	0	2
EFID	10400	8525	1875	2	8	10
FID	7033	7033	0	2	6	
MFID	8000	6373	1627	2	2	9
MHID	1331	1090	241	2	0	2
SUM	28061	23972	4089			acres per well
Source: Hood River Soil & Water Conservation District, 1978.						200

Source: <http://www.co.hood-river.or.us/vertical/Sites/%7B4BB5BFDA-3709-449E-9B16-B62A0A0DD6E4%7D/uploads/%7B1A759675-F44C-4224-A1E2-311BC2003587%7D.PDF>

Scenario: Increased Pumping

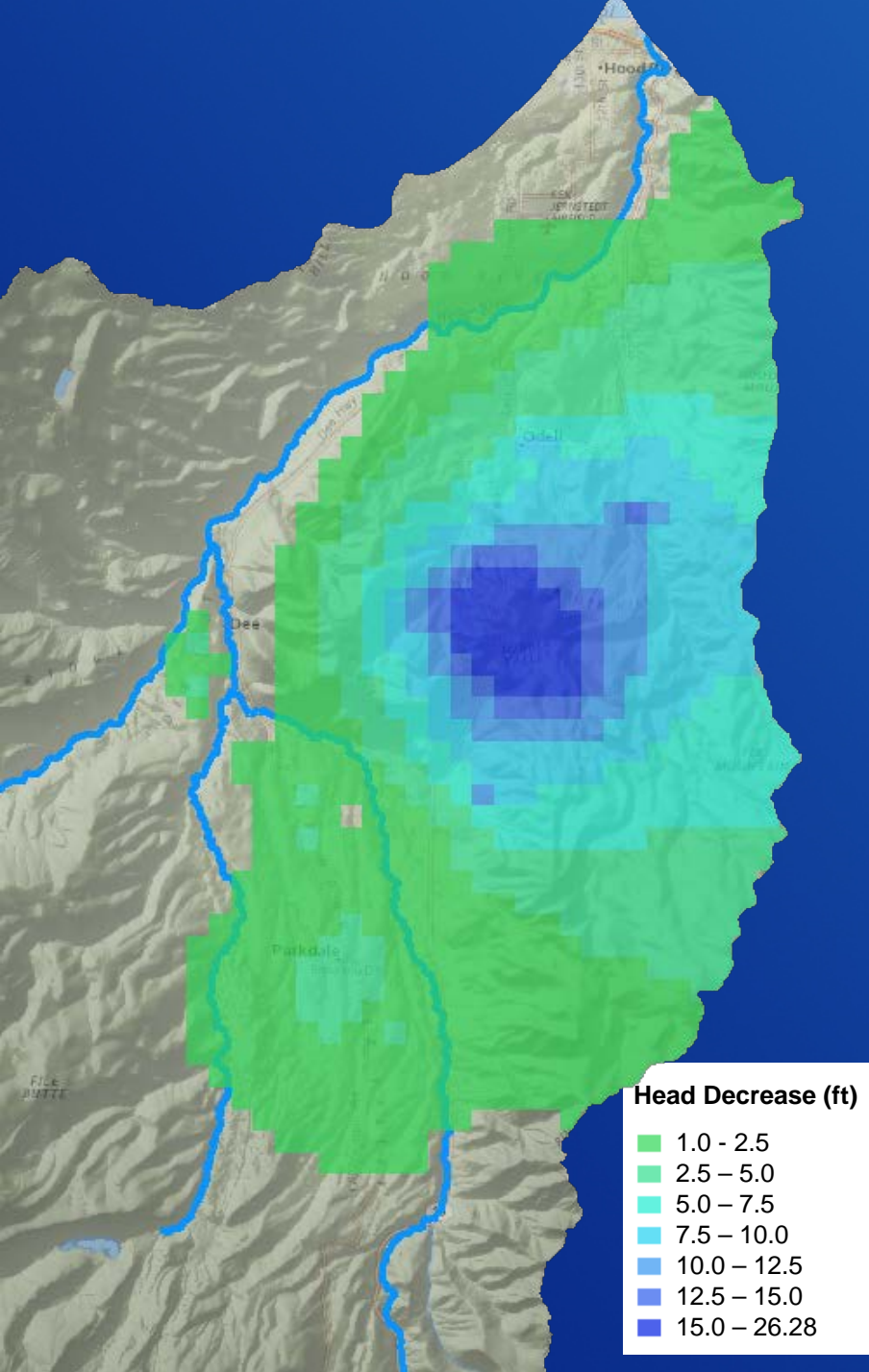
- Pumps added to irrigate prime farmlands within ID boundaries that are currently not irrigated



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Scenario: Increased Pumping

- Greatest head difference between Baseline and the scenario shown here
 - End of summer



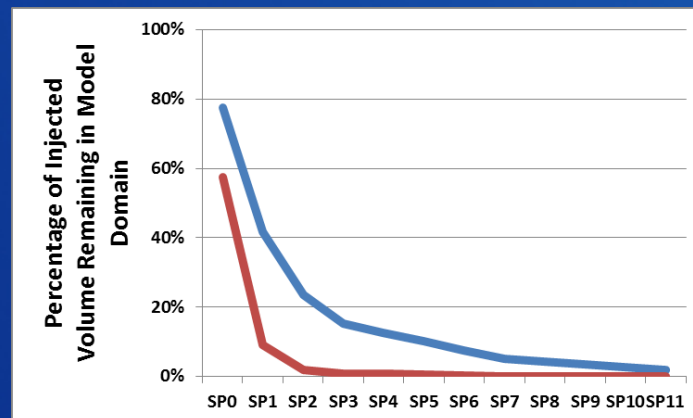
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Scenario: Aquifer Injection

- Injection wells were iteratively added to each model cell and response for the entire model domain was evaluated and compared to the Baseline.



ASR for Streamflow Augmentation

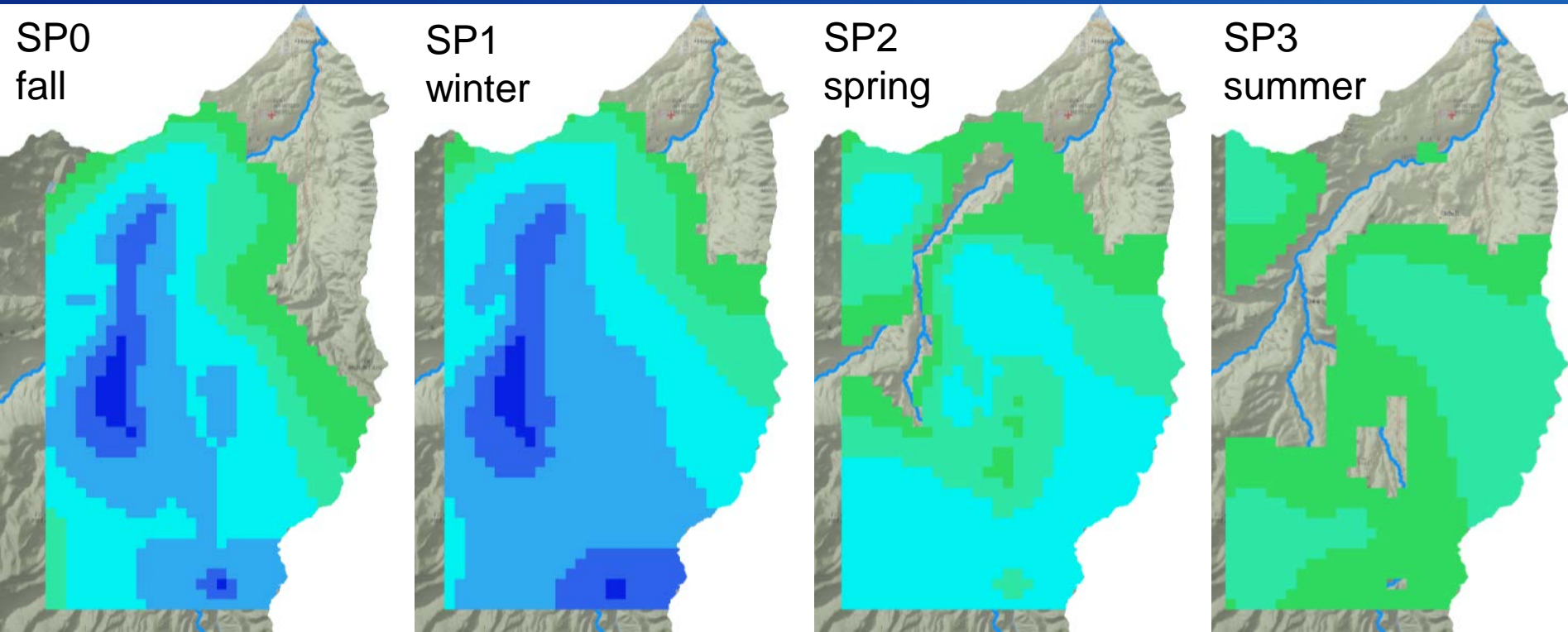
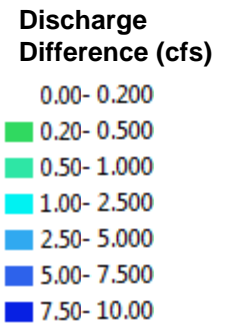


ASR for Irrigation Withdrawal

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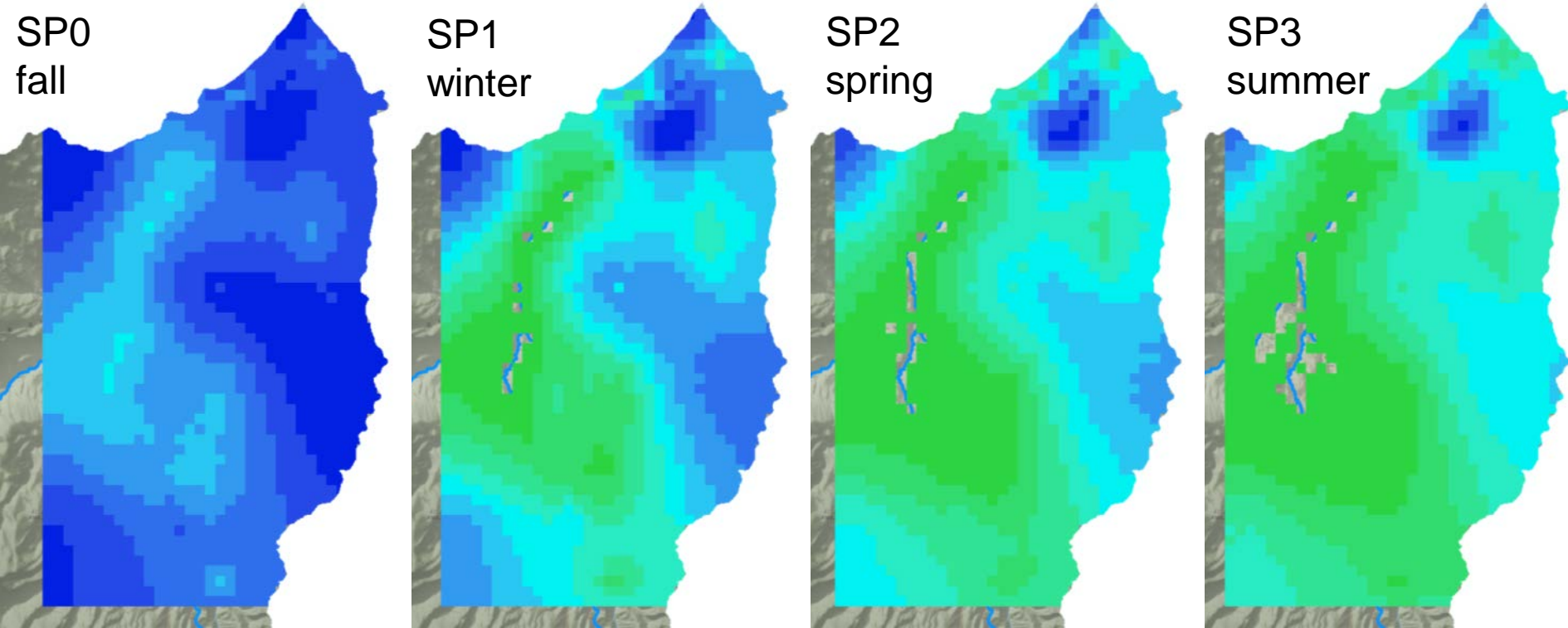
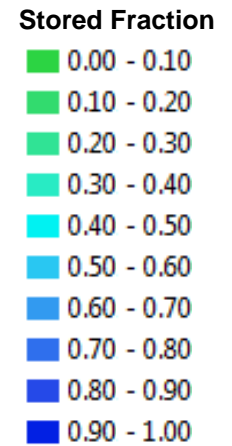
Scenario: Injection for Streamflow Augmentation

- Model response pertaining to the difference in stream gains for the Hood River at Tucker Bridge is mapped



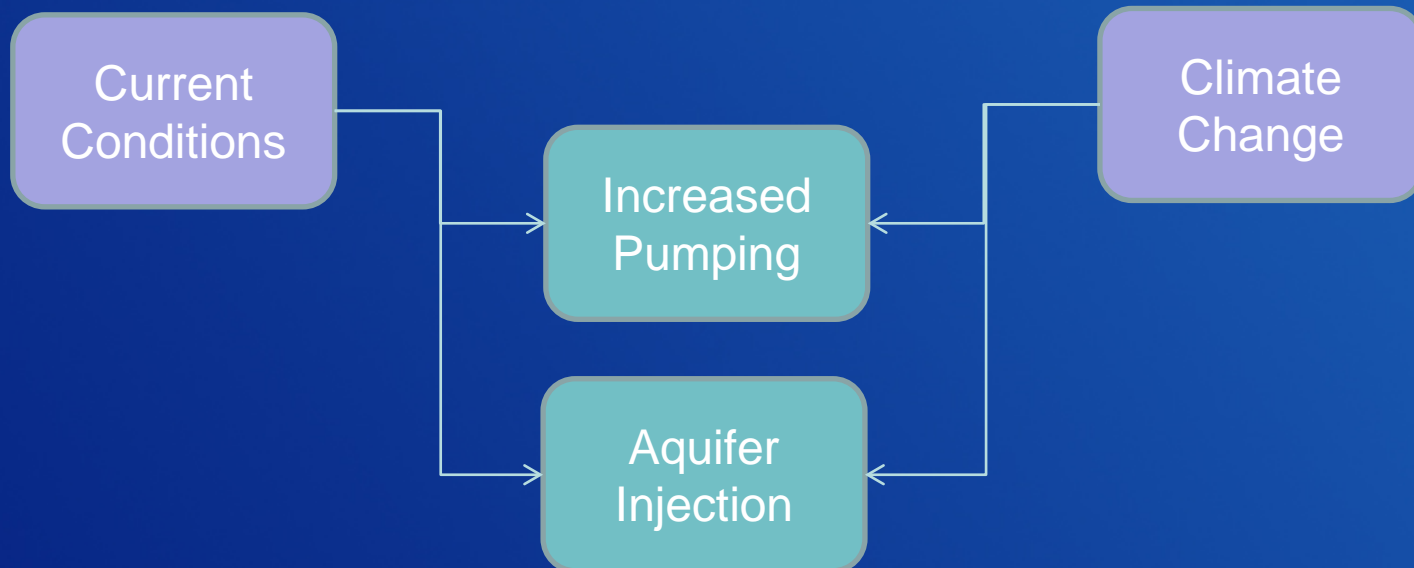
Scenario: Injection for Irrigation Withdrawal

- Model response pertaining to the volume of injected water that is retained within the model domain is mapped

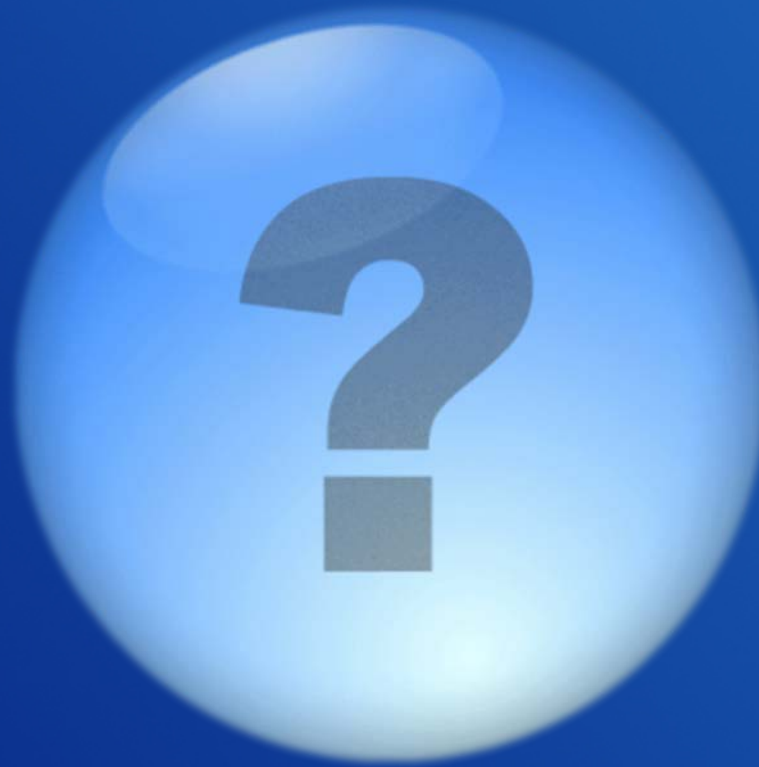


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Questions



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