

Review of the Department's New Methods for Assessing Water Supplies and Water Demands

Presented to the
UNL Water Symposium
Changes: Climate, Water and Life on the Great Plains

October 15, 2013

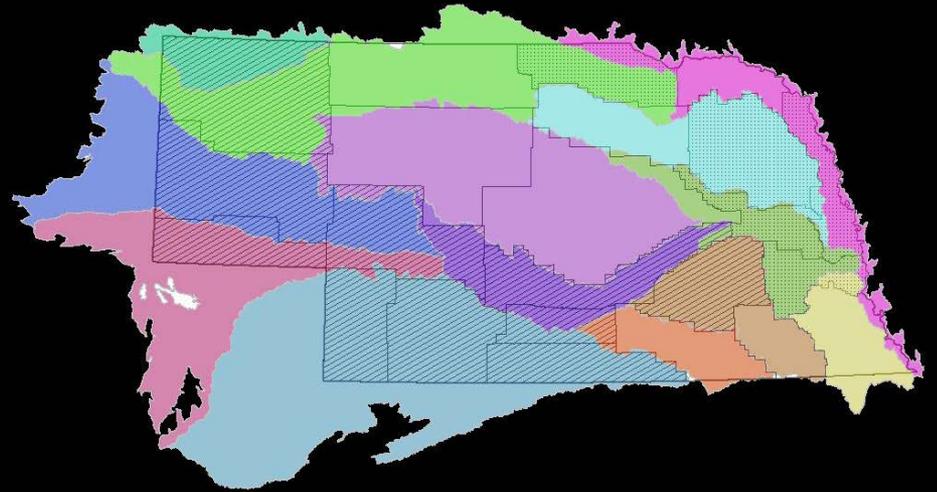
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Outline

- Development of the new methods
- Concepts behind the methods
- Example of the methods



Timeline

- Platte Basin NRDs and Department initiate methodology study (2009)
- Release of Literature Review and Initial Recommendations (2010)
- Stakeholder Meetings and Initial Reports by Consultants (2011)
- Final Stakeholder Meetings Final Report (2013) <http://dnr.ne.gov/website/MainPage.aspx>

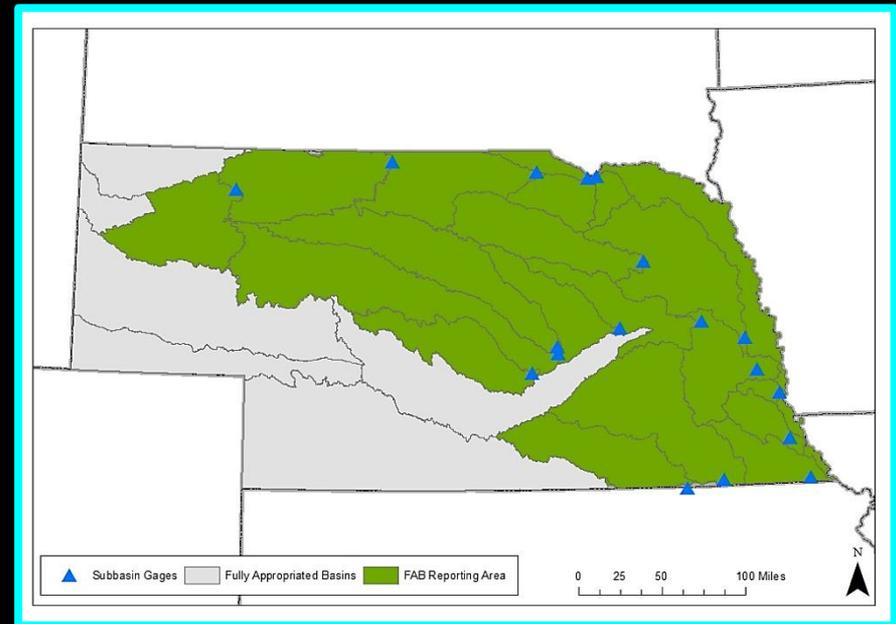
Concepts

■ Basin Water Supplies

- Streamflow
- Groundwater Depletions
- Surface Water Consumption

■ Total Water Uses

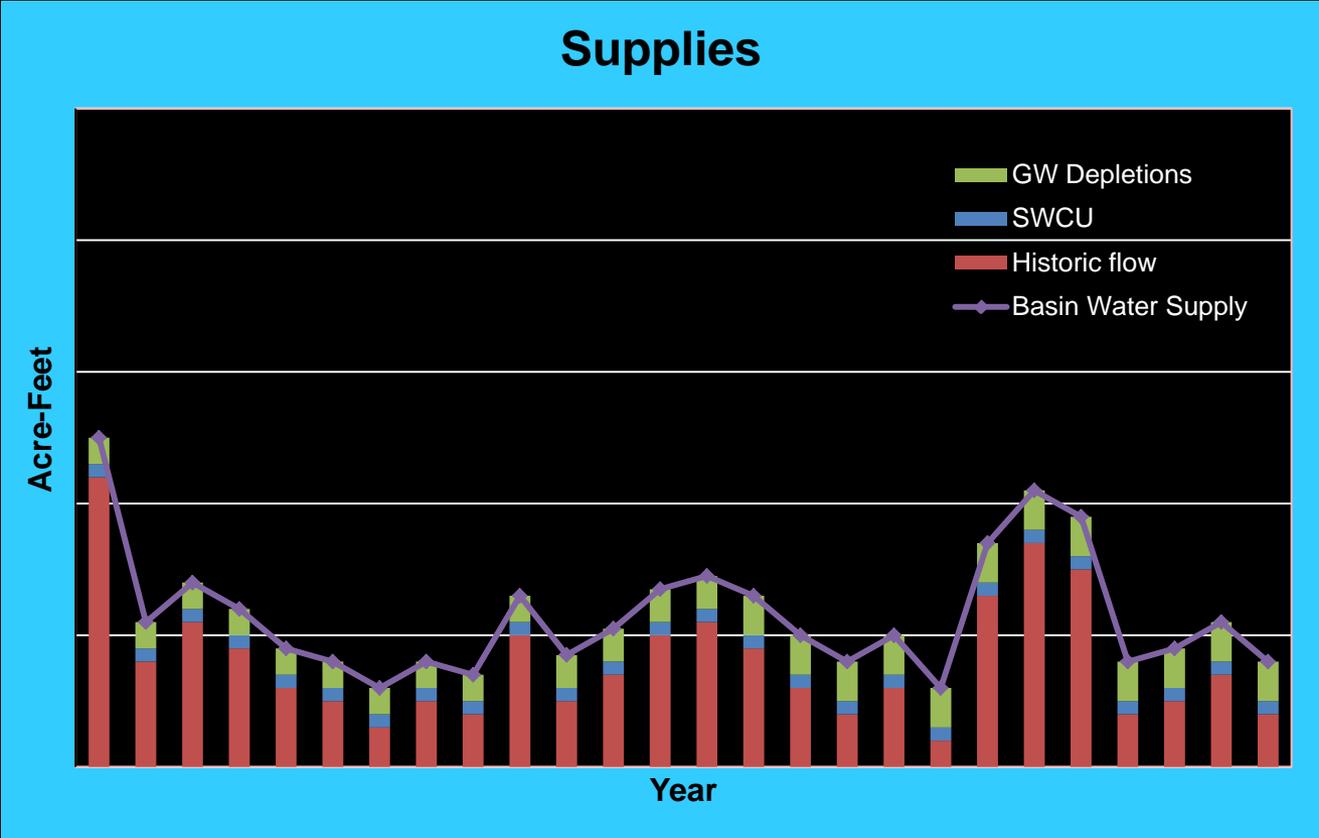
- Groundwater Consumption
- Surface Water Consumption
- Water for Canal Deliveries
- Instream Flow Demands
- Hydropower Demands
- Downstream Water Demands



Concepts

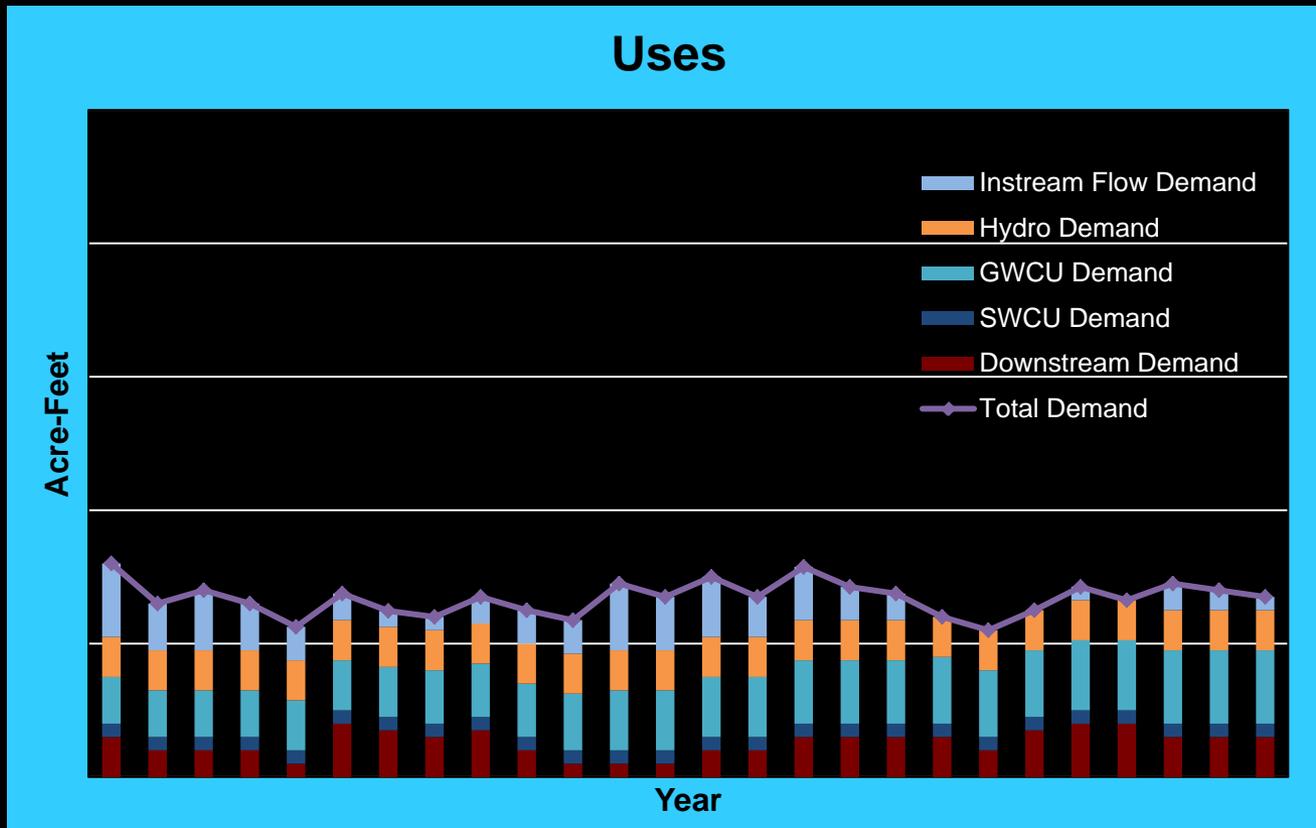
- Representative Period
 - Statistical analysis of appropriate period
- June – August (peak demand)
- September – May (non-peak demand)
- Near-term and long-term

Concepts



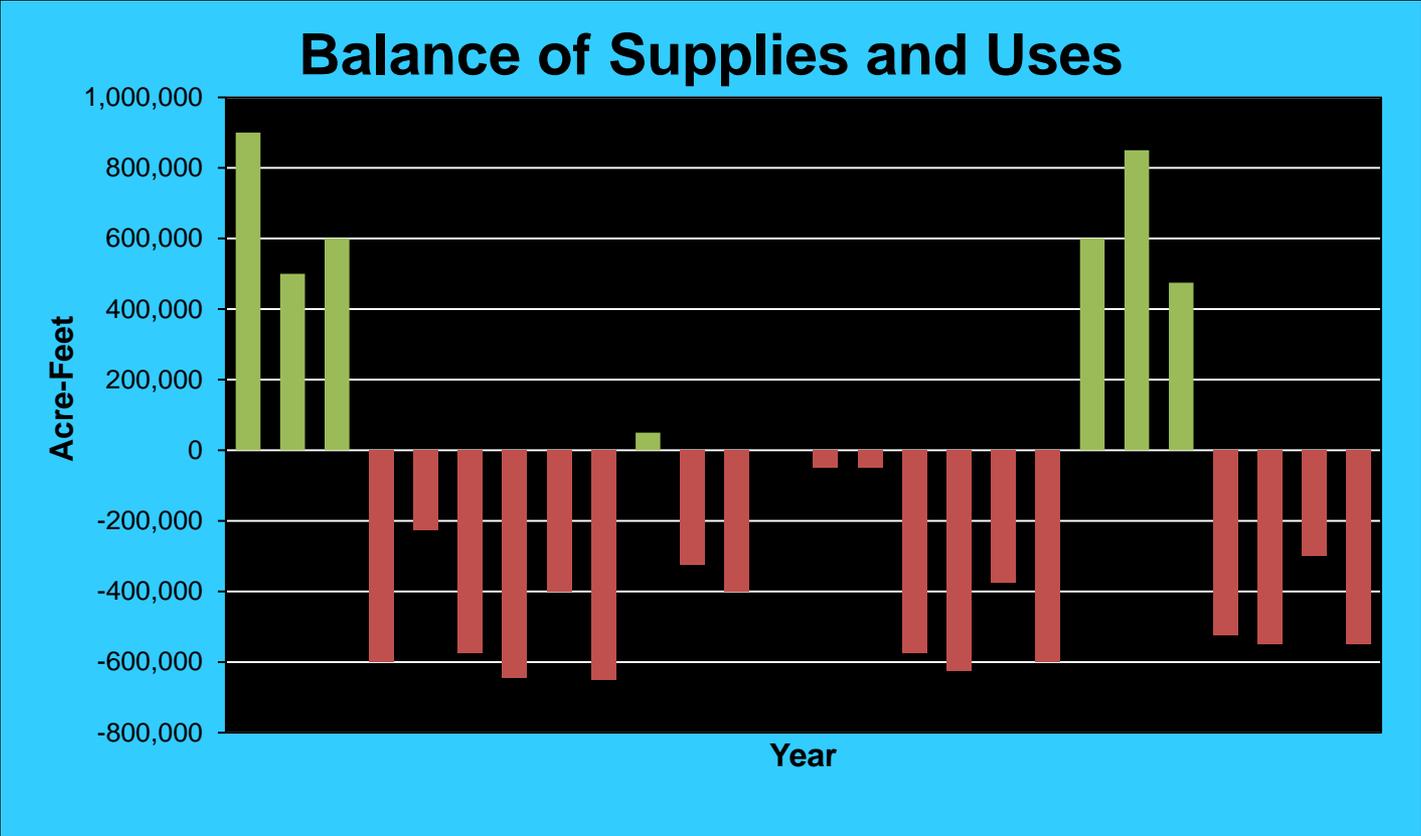
The chart on this slide depicts fictitious data.

Concepts



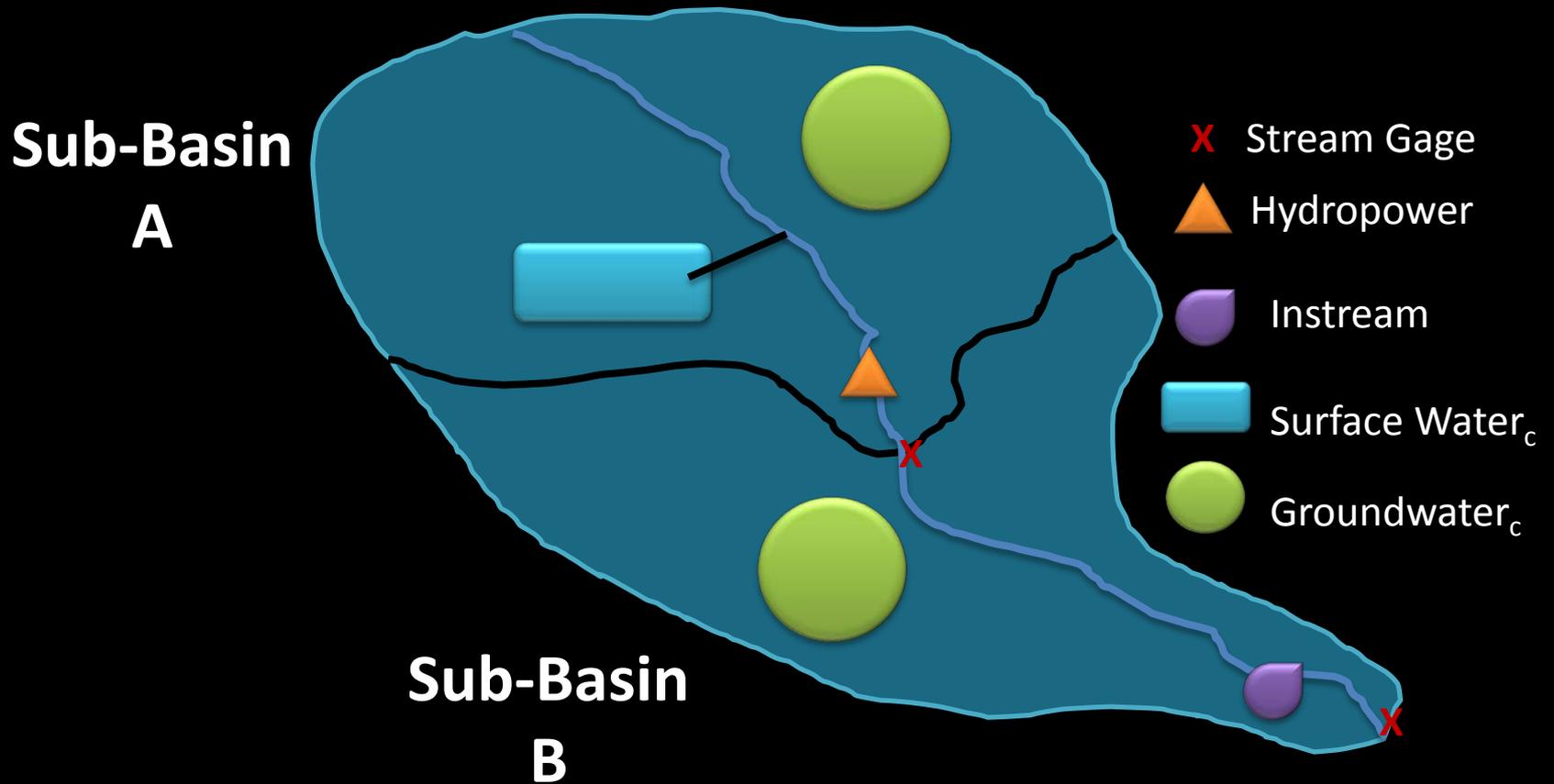
The chart on this slide depicts fictitious data.

Concepts



The chart on this slide depicts fictitious data.

Example



Example (Supply)

$$BWS = \text{Stream Gage} + \text{Surface Water}_c + \text{Groundwater}_D$$

Stream Gage = 400

Surface Water_c = 100

Groundwater_D = 300

A Total BWS = 800

Proportion of Total = 40%

Stream Gage = 1300

Surface Water_c = 100

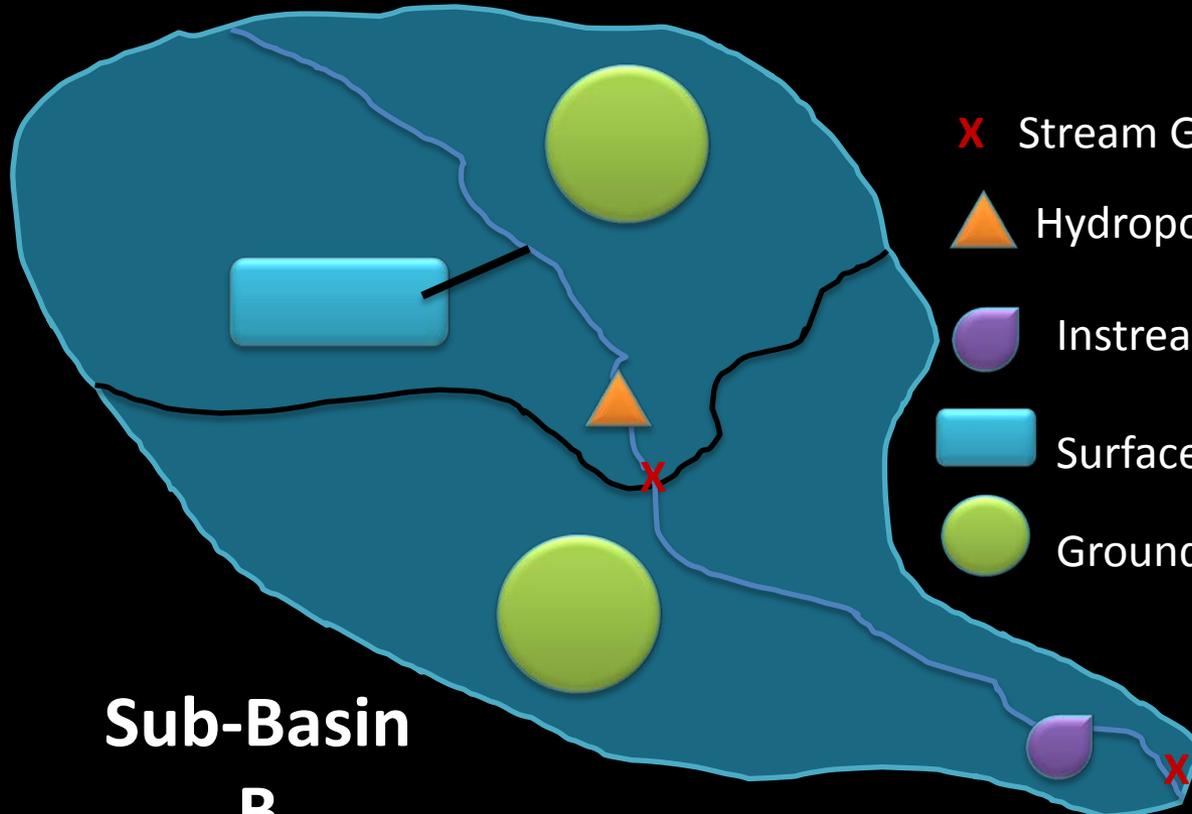
Groundwater_D = 600

Total = 2000 (1200 exclusive to B)

Proportion of Total = 60%

Sub-Basin

A



X Stream Gage

▲ Hydropower

◡ Instream

▭ Surface Water_c

● Groundwater_c

Sub-Basin

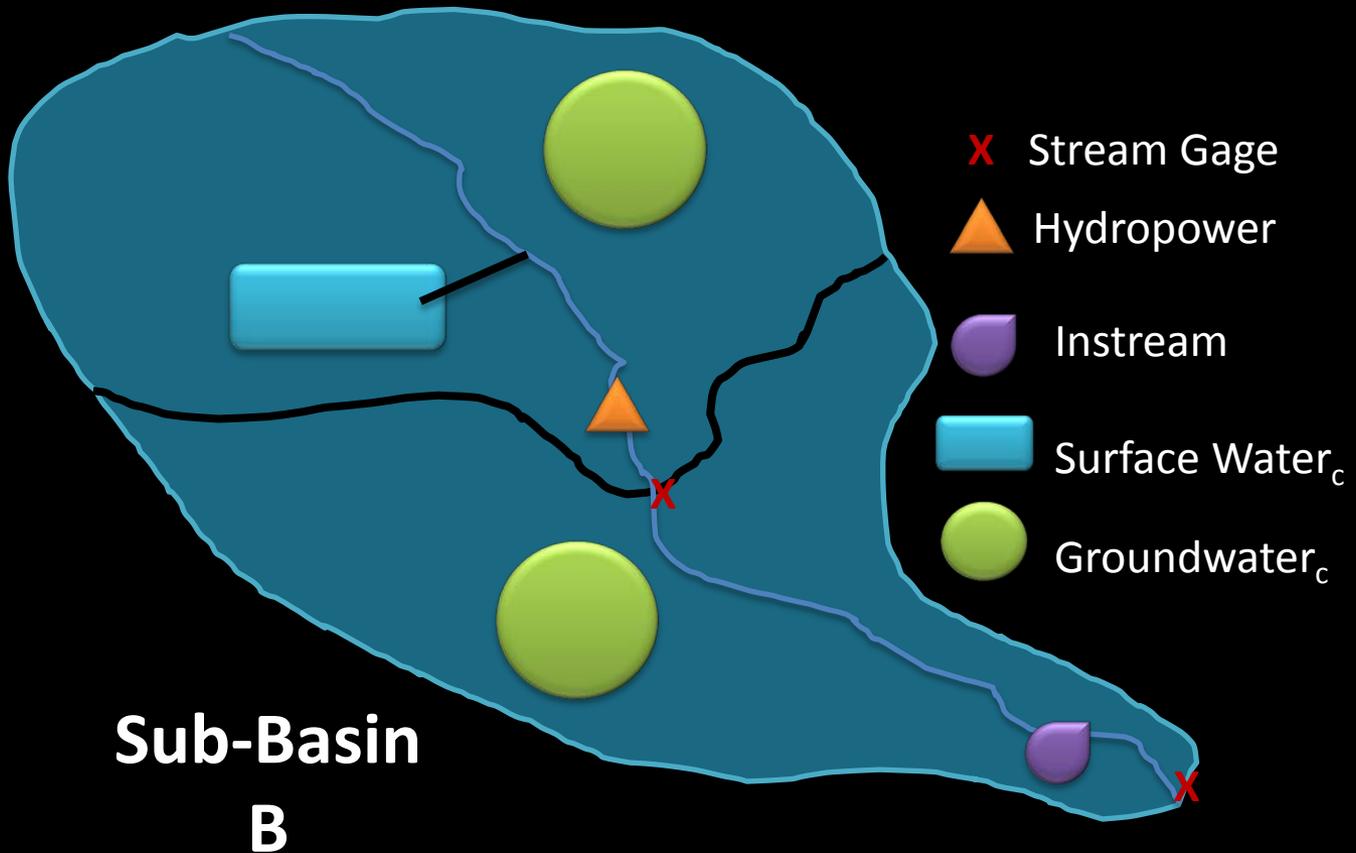
B

Example (Demand)

Near Term Demand = Groundwater_D + Surface Water_C + Hydropower + Instream + Downstream Demand

Long Term Demand = Groundwater_C + Surface Water_C + Hydropower + Instream + Downstream Demand

Sub-Basin
A



Example (Demand cont.)

Groundwater_c = 500

Surface Water_c = 100

Hydropower = 300

Total Demands in A = 900

40% * 400 = 160

40% * 500 = 200

Downstream Demand = ~~360~~ = 60

A Total = 500 + 100 + 300 + 60 = 960

Groundwater_c = 400 (mainstem) 200 (tributary)

Surface Water_c = 0

Instream = 500 (mainstem)

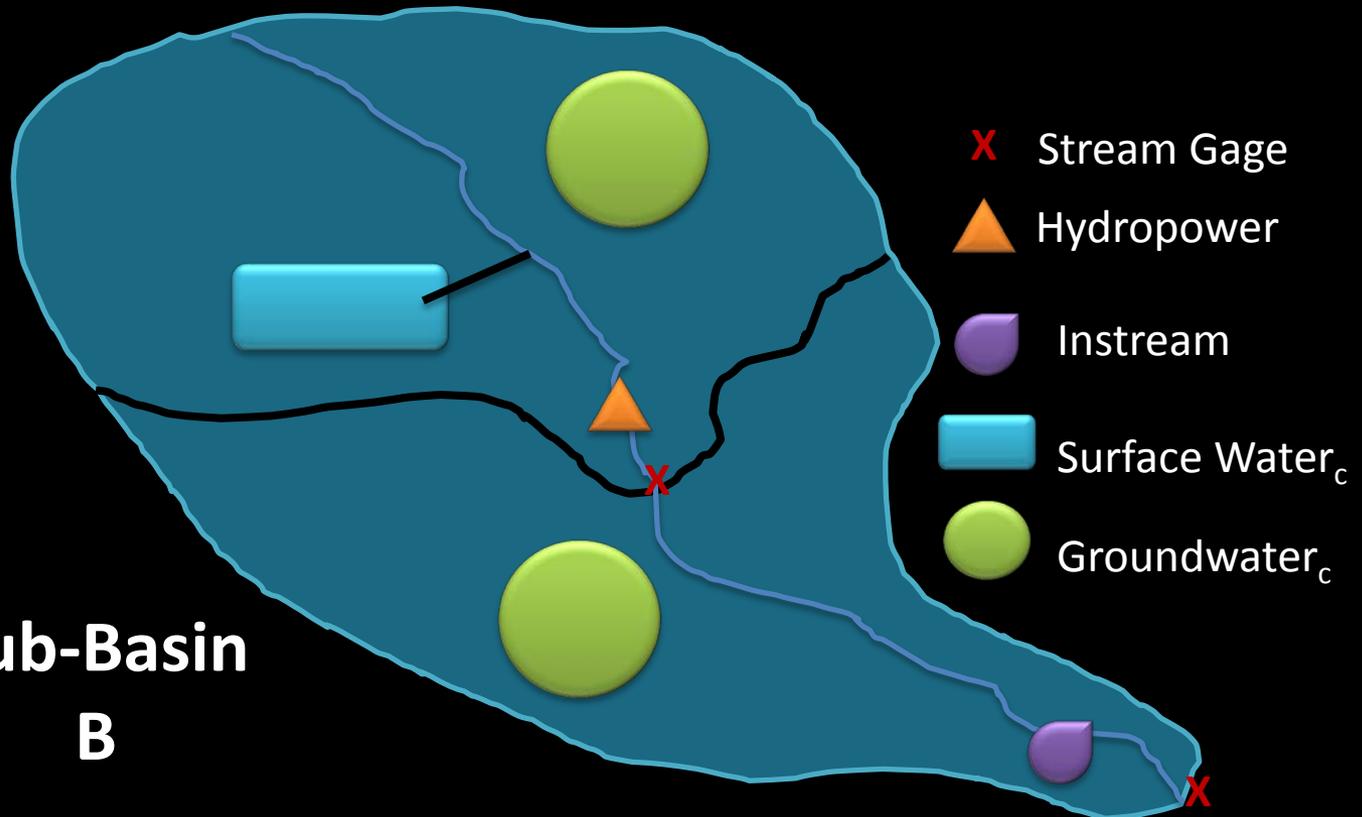
Total Demands in B = 1100

Assigned as Downstream Demand to Sub-basin A = 360

B Total = 400 + 200 + 500 - 360 = 740

**Sub-Basin
A**

**Sub-Basin
B**



Example (*Balance*)

Sub-basin A

BWS = 800

Total Long-term Demand = 960

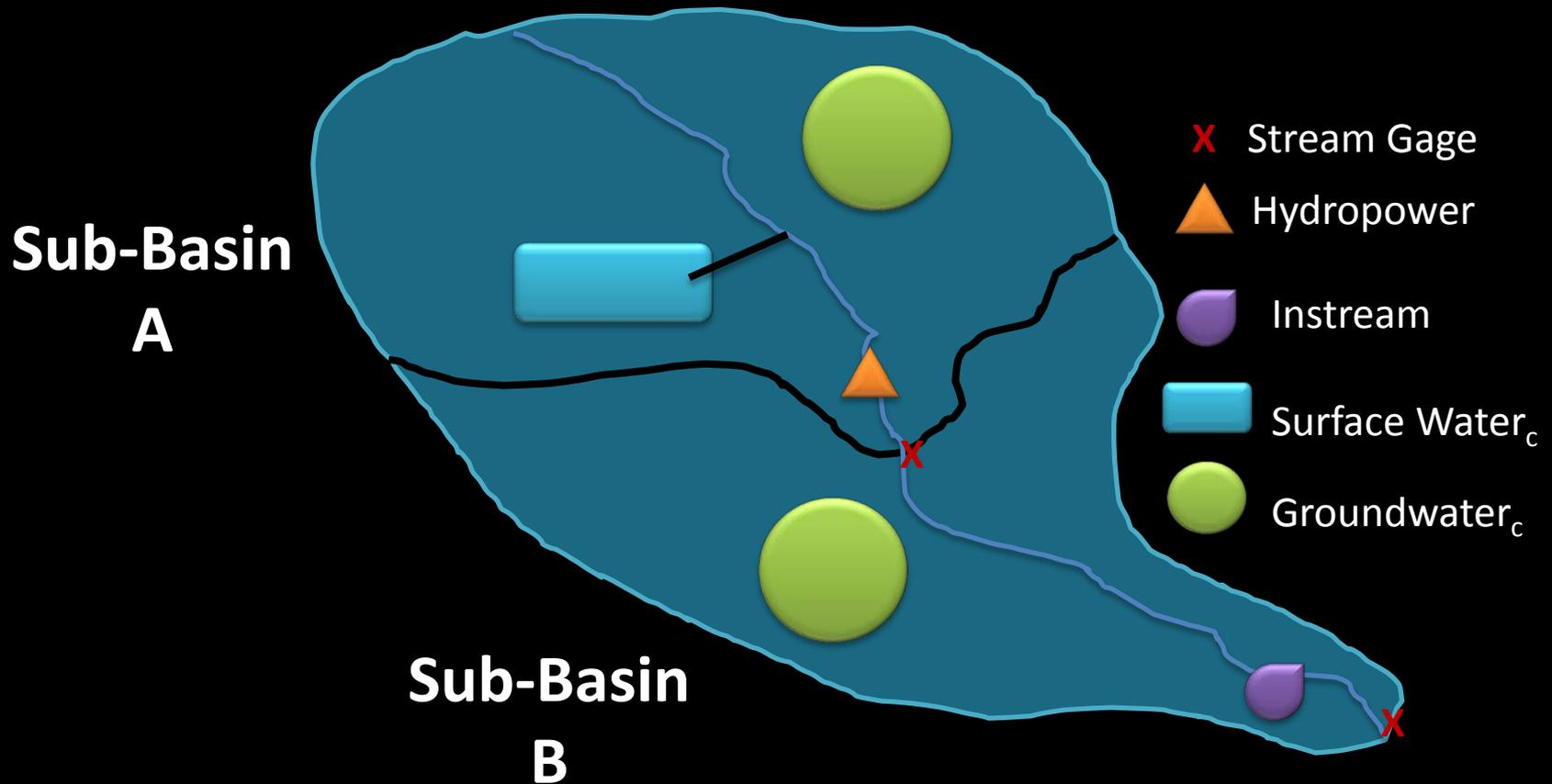
Balance = - 160

Sub-basin B

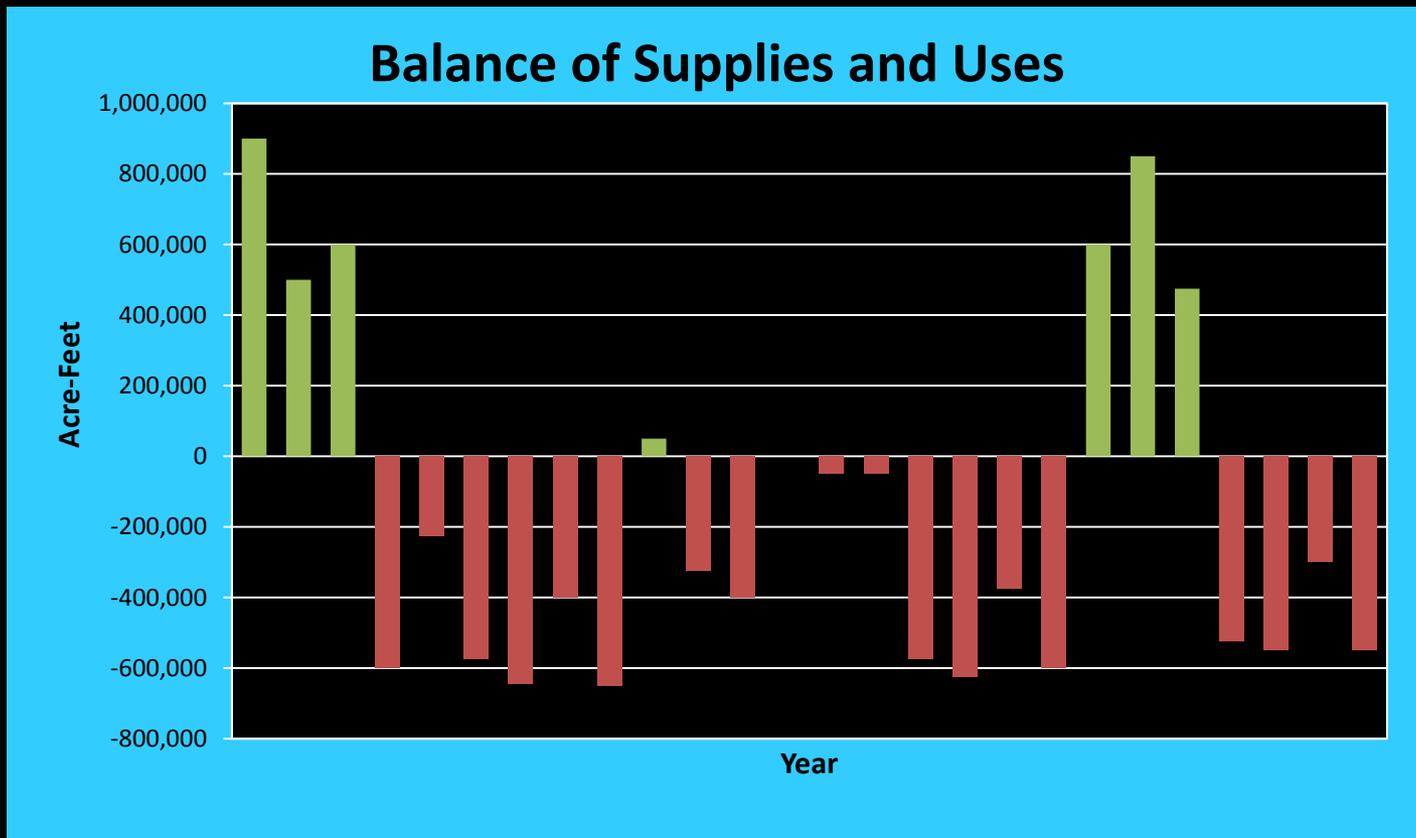
BWS = 1200

Total Long-term Demand = 740

Balance = + 460



Concepts



The table on this slide depicts fictitious data.

Summary

- Methods and tools developed support unique setting within each basin, sub-basin, or reach
- New methods provide comprehensive assessment of hydrologically connected water supplies and demands on those supplies

Thank you

Questions?

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