

To expedite the project selection process, we ask that any workgroup member who would like to propose one or more research project topics for discussion submit their proposal(s) in advance of the meeting, so they can be shared with the rest of the workgroup members prior to the meeting.

Please provide these proposals in a form similar to that used in the Knowledge Gap page of the Skagit Water Supply and Demand Synthesis Story Map linkable here:

<https://wsuniv.maps.arcgis.com/apps/MapSeries/index.html?appid=1ff96129ebf04d728c56d35c0b04efc5>

The knowledge gaps are generally less than 500 words and have a title and four sections:

Knowledge gap/Research need title

- What [research being proposed],
- Why [what is the value of the research product and/or process]
- How [how would the research be completed]
- Data Uses and Impacts [how would the results be useable to support the contents of the Why section]

Feel free to copy and send a knowledge gap statement as it is stated on the Knowledge Gap Story Map page, or use one as a starting point and modify it as you see fit. Projects can be developed by a single champion or a team of working group members.

These preliminary proposed project topic ideas are due Dec 13 by 11:59pm and should be sent to me at yoder@wsu.edu (which you can do simply by replying to this message). We will then send a link to the full list of proposals to the workgroup as soon as possible. We ask that Workgroup members please review these proposals prior to the meeting, and be prepared with your own preliminary assessment and ranking of the proposals, however tentative these might be. This preparation will hopefully expedite our discussion and deliberations in what will be a very tight schedule.

Here is a link to the draft agenda document:

<https://docs.google.com/document/d/1fwf8F3-Phr4tllOJDDENSuxSAB4Aj1eVcbW5uGxqlMw/edit?usp=sharing>

It contains objectives and a timeline for our work, a meeting agenda, including an introductory section, a proposal presentation and discussion session, a proposal rating and ranking session, and a discussion of next steps. We hope to make substantive progress on ranking proposed projects, and even a preliminary selection if possible.

We will be updating this document directly in preparation to the meeting, so you may want to check back once or twice before the meeting. The link above allows you to add comments (but not edit the text). Please feel free to add comment boxes as you wish. We will resolve them, and may contact you about them in the process.

HDR Inc. – Proposed Project:

Groundwater-Surface Water Interactions & Groundwater Discharge:

What:

- Monitor hydraulic gradients yielding exchanges between groundwater (GW) and surface water (SW) at a selection of streamflow gaging stations.
- Estimate GW discharge (baseflow) across the basin at different scales (reach, subbasin, and basin-wide).
- Assess accuracy and elucidate limitations of existing GW recharge estimates via comparison with estimates of GW discharge established under this proposed project, and other available water budget component data (e.g., precipitation, simulated evapotranspiration and surface runoff).

Why:

- Improves understanding of GW-SW interactions and GW discharge at various times and scales, more generally helping to characterize available Basin water supplies. In other words, this provides fundamental data needed to develop a credible picture of the hydrogeological system function and helps “close” the overall water budget.
- Dynamics of GW-SW interactions, including gradient reversals and strength of exchanges, will be revealed over several seasons during low and high flows.
- Groundwater discharge (baseflow) is currently not well constrained over a large portion of the basin (primarily above Concrete, including the Baker River subbasin), which if accurately known would help with proper system representation via inclusion in hydrological model calibration datasets. This in turn typically improves the accuracy of simulated hydrology, including impacts of changes in climate, land use, and/or groundwater demands on streamflow, stream temperature, and fish habitat.
- Baseflow rates will be used to assess accuracy of previous estimates of GW recharge, thereby testing validity and revealing possible limitations of prior GW recharge estimation methods. Further, this can yield useful information about the relative effects of different environmental variables on recharge, such as geology, soils, land use/cover, plant species, topography, precipitation, etc.

How:

- Establish paired groundwater-level and stream-stage monitoring stations to collect continuous water surface elevation records in order to detect hydraulic gradients and stream-aquifer interactions over time.
- Groundwater baseflow will be examined via hydrograph separation techniques with streamflow gaging data as input, enhanced with reach gains/losses from synoptic streamflow surveys and existing streamflow gage records.
- Compare GW discharge estimates (from this proposed project) with recently developed GW recharge estimates, the latter derived from two sources: 1) precipitation minus evapotranspiration and surface runoff/overland flow from the DHSVM model; and 2) recharge rates established using DHSVM precipitation and simple regression equations, relating recharge to precipitation among groups of hydrogeologic units and land cover classes. This includes providing discussion around the recommended courses of action for new studies to update the DHSVM and/or the regression equations of recharge as they pertain specifically to the Skagit River basin.

Other Data Uses and Impacts:

Ag Demand: While this project may not be focused on agricultural water use, such as within the drainage district systems (e.g., check dams in canals), it would likely provide useful data for agricultural areas near any of the selected monitoring stations.

Residential Demand: This generated information from the proposed project would help water providers and residential well users better understand how use of groundwater is related to streamflow, and thus how they have the potential to influence streamflow in their watershed.

Potential Socio-Economic Impacts: Water management/governance and land use planning relies on the basic GW information collected under this proposed project by providing detailed understanding of hydrologic functioning and a more complete picture of the water cycle in the Basin. In times or areas of the Basin where the overland flow component of streamflow is reduced, perhaps when ice melts early in the season, GW may provide a buffer acting against negative impacts to streams (flows and temperatures). Alternatively, a better understanding of the hydrogeologic system affords the ability to improve forecasts of flooding events.