

LITTLE SPOKANE RIVER WATER BANK MODELING AND DECISION SUPPORT TOOLS

GRANT APPLICATION

BUREAU OF RECLAMATION

WaterSMART: DROUGHT RESILIENCY PROJECT GRANTS

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EVALUATION CRITERION C-SEVERITY OF ACTUAL OR POTENTIAL DROUGHT IMPACTS TO BE ADDRESSED BY THE PROJECT

What are the ongoing or potential drought impacts to specific sectors in the project area if no action is taken?

Water users are currently curtailed during drought conditions and the water bank will provide a mechanism by which those users who need water can purchase from those who do not. The most significant potential impact, which is becoming increasingly likely as drought conditions occur more frequently, is the impact of water availability on new development and existing water users at risk of curtailment.

Providing water for residential development that relies on individual wells in basins with established instream flow rights has become a significant issue in Washington State. As a result of numerous Washington State Supreme Court Decisions dating back to the mid 1990s instream flow rights in some basins in Washington (Skagit River Basin) now prohibit the use of new individual wells that are not mitigated, which has essentially created a development moratorium in areas without public water supply, or a source of mitigation such as a water bank. Also in some basins owners of residences utilizing wells that are junior to an instream flow right are finding that lending institutions will not provide loans on their property, effectively prohibiting property sales and refinancing. Similar situations are occurring in the Upper Yakima River Basin, and the Dungeness River Basin. A Washington Supreme Court decision (Hirst v. Whatcom County) that will have significant ramifications is expected this spring or summer. This court decision could compel Counties to stop issuing building permits in river basins with instream flow rights, that are not met, such as the Little Spokane River Basin, and call into question the reliability of water supplies to existing residences that are junior to the instream flow right.

There are significant economic consequences if new development is restricted and if junior water supplies are called into question in the Little Spokane River Basin, including:

- According to Spokane County Assessor data there was \$21,564,450 of new construction in 2015 that relied on new individual wells. A restriction on the use of new individual wells could put that economic activity in jeopardy.
- Existing developed property with water use established after January 6, 1976, and junior to the LSR Rule, has an assessed value of 1.39 billion dollars. Economic activity such as property sales and financing related to that property could be significantly restricted.
- The value of undeveloped land is determined by the highest potential use, which is most often residential development that requires a water supply. Undeveloped land that would require a new individual well to be developed has a value of 800 million dollars, and would immediately go down in value significantly if new individual wells were restricted.

Describe existing or potential drought conditions in the project area.

Drought conditions are most notably apparent as reduced stream flow. As described in the preceding background section the Little Spokane River routinely falls below the established minimum flow. Table 2 shows the percentage of times during the period 1993 to 2013 that instream flows fell below minimum flows during each month at the Dartford Gage, the gage that is principally used to manage the basin.

Table 2 Days below minimum flow

Month	Number of Days	Percentage of Days
January	25	4%
February	30	5%
March	20	3%
April	6	1%
May	33	5%
June	33	6%
July	112	18%
August	322	52%
September	329	55%
October	222	36%
November	118	20%
December	47	8%

Is the project in an area that is currently suffering from drought or which has recently suffered from drought?

The Little Spokane Basin suffered from extreme drought in 2015, and routinely has moderate to severe drought during the summer months, as shown in Figure 6 and Figure 7.

Figure 7 – Drought in the Little Spokane River Basin 2000-2016

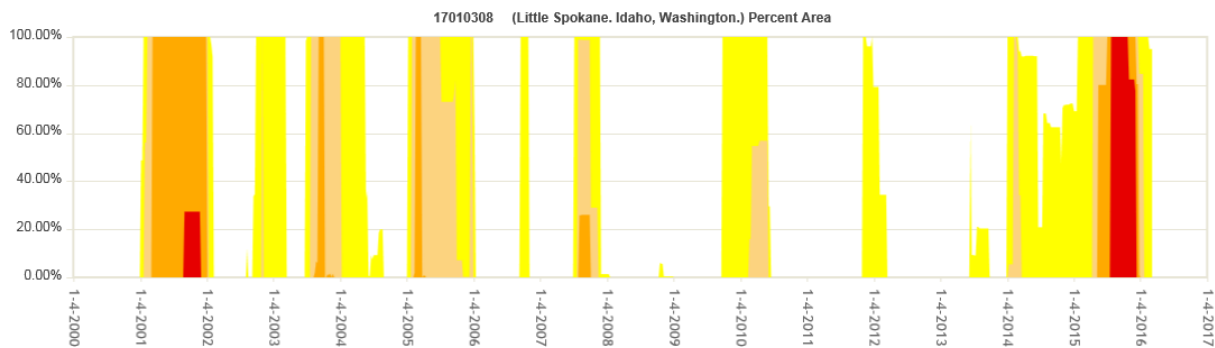
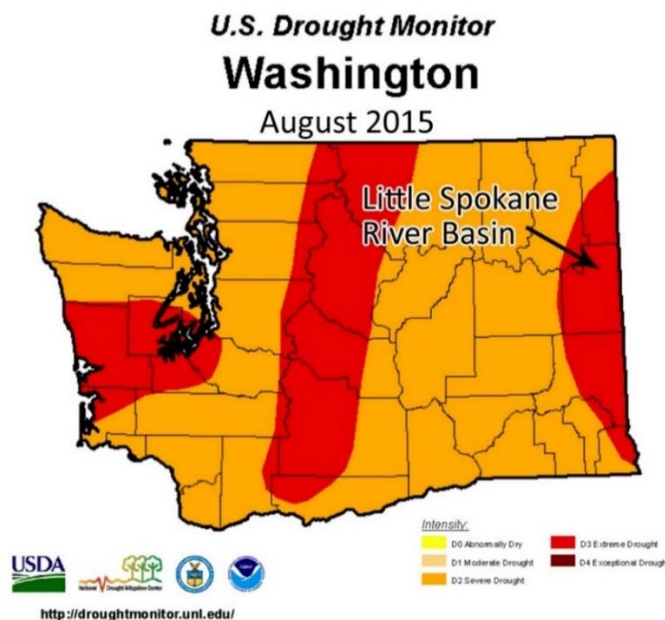


Figure 8 – August 2015 Drought



Describe any projected increases to the severity or duration of drought in the project area resulting from climate change.

As described in the preceding background section the Little Spokane River Basin hydrology is driven by storage of water in the form of snow during the winter months and release of that water during the spring and early summer. Higher temperatures from climate change will cause earlier snowmelt. April 1 snowpack is projected to decline as much as 40% by the 2040s (Payne et al, 2004). This will reduce the amount of water for late summer and early fall stream flow. The development of additional storage, enhanced aquifer recharge, and restoration of wetlands that would be facilitated by the Little Spokane Water Bank supported by the proposed coupled surface water and groundwater model for the basin could mitigate some of the predicted impacts of climate change.

EVALUATION CRITERION D-PROJECT IMPLEMENTATION

Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

Project Schedule

	2016			2017				2018		
	June	Q3*	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Project Award										
Consultant Selection & Contracting										
Technical Advisory Group										
Data Compilation & Formatting										
Model Construction										
Model Calibration										
Model Simulation										
Construct Water Budgets										
Report Preparation & Publication										
Integration into water bank										
Public Meetings										

*Calendar Year Quarters

Describe any permits that will be required, along with the process for obtaining such permits.

No permits will be required for this project

Identify and describe any engineering or design work performed specifically in support of the proposed project.

No engineering or design work will be performed as part of this project.

Describe any new policies or administrative actions required to implement the project.

No new policies or administrative actions are required for implementation of the proposed project.

EVALUATION CRITERION E-NEXUS TO RECLAMATION

The Little Spokane River Basin is tributary to the Bureau of Reclamation’s Columbia Basin Project and increases in flow during critical low flow months that are the result of this project will flow into the Columbia Basin Project. The goal of the proposed project is to provide the technical framework under which water reallocation and supply projects will be developed. Without the technical framework to provide certainty as to the value of the project within the market, investments in these project will not be made, and increases in flow will not be realized.

PERFORMANCE MEASURES

The following performance measures will be used to evaluate the proposed project's effectiveness:

1. Value of water market transactions.
2. Number of water market transactions.
3. Instream flow enhancements as a result of water market activity.
4. Preservation of value of existing development reliant on water junior to the instream flow right.
5. Preservation of value of undeveloped land.
6. New construction activity reliant on water supplies made available through the Little Spokane Water Bank.

REFERENCES

- Aspect Consulting, 2015, Little Spokane Water Bank Feasibility Study, Aspect Consulting, Seattle, WA, variously paginated.
- Aspect Consulting, 2015, Pend Oreille Interbasin Transfer Memo, Aspect Consulting, Seattle, WA, 30 p.
- Chung, S.K., 1975, Water resources management program-Little Spokane River Basin, WRIA 55, Olympia, WA, Department of Ecology Policy Development Section, Water Resources Division, 83 p.
- Ecology Water Resources Program, 1992, Washington State Comprehensive Emergency Management Plan, Drought Contingency Plan, Olympia, WA, 51 p.
- Ecology Water Resources Program, 2014, Setting Instream Flows in Washington State-Frequently Asked Questions, Olympia, WA, 4 p.
- Golder Associates, 2003, Little Spokane (WRIA 55) and Middle Spokane (WRIA 57) watershed planning phase II-Level 1 assessment, data compilation and analysis, Seattle, WA, Golder Associates, variously paginated.
- Golder Associates, 2003, Little Spokane River Basin (WRIA 55) Instream Flow Needs Assessment, Seattle, Golder Associates, variously paginated.
- Golder Associates, 2004, Storage Assessment for Little and Middle Spokane Watershed, Seattle, WA Golder Associates, variously paginated.
- Kahle, S.C., Olsen, T.D., and Fraser, E.T., 2013, Hydrogeology of the Little Spokane River Basin, Spokane, Stevens, and Pend Oreille Counties, Washington: U.S. Geological Survey Scientific Investigations Report 2013-5124, 52 p.
- Markstrom, S.L., Niswonger, R.G., Regan, R.S., Prudic, D.E., and Barlow, P.M., 2008, GSFLOW—Coupled ground-water and surface-water flow model based on the integration of the Precipitation-Runoff Modeling System (PRMS) and the Modular Ground-Water Flow Model (MODFLOW-2005): U.S. Geological Survey Techniques and Methods 6-D1, 240 p.
- Payne, J. T., A. W. Wood, A. F. Hamlet, R. N. Palmer and D. P. Lettenmaier. 2004. Mitigating the effects of climate change on the water resources of the Columbia River basin. *Climatic Change*, 62, 233–256.
- PBS&J, 2009, Surface Water Storage Investigation West Branch Little Spokane River Wetland Restoration and Recharge Opportunities, Missoula, MT PBS&J, variously paginated.
- Smith, Ryan, 2010, "Water Banking; A Free Market Approach To Efficiently Managing And Incentivizing Conservation Of A Natural Resource" Presentation by The Bren School of Environmental Management, University of California, Santa Barbara at A Community on Ecosystem Services Conference, Gila River Indian Community, December 6-9, 2010.
- Spokane County Water Resources, 2013, Spokane County Water Demand Forecast Model-Model 3.0 and 2013 Forecast Update, Spokane, WA, Spokane County Utilities, 19 p.
- Spokane County Water Resources, 2011, Spokane County Water Demand Forecast Model, Spokane, WA, Spokane, Spokane County Utilities, 32 p.
- Stewart, I. T., D. R. Cayan and M. D. Dettinger. 2004. Changes in snowmelt runoff timing in western North America under a "business as usual" climate change scenario. *Climatic Change*, 62, 217–232.
- Stewart, I. T., D. R. Cayan and M. D. Dettinger. 2005. Changes toward earlier streamflow timing across Western North America. *Journal of Climate*, 18, 1136–1155.
- Washington State University, State of Washington Department of Ecology, 2012, Columbia River Basin Long-Term Water Supply and Demand Forecast, Ecology Publication No. 12-12-001, Ecology, Yakima, WA, 411 p.