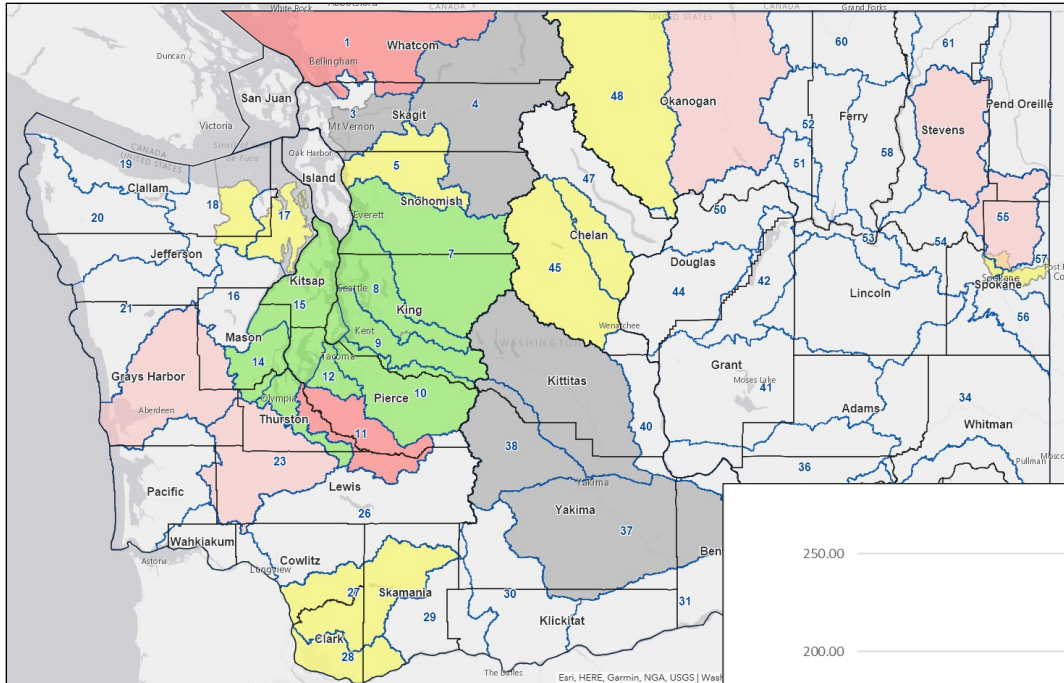




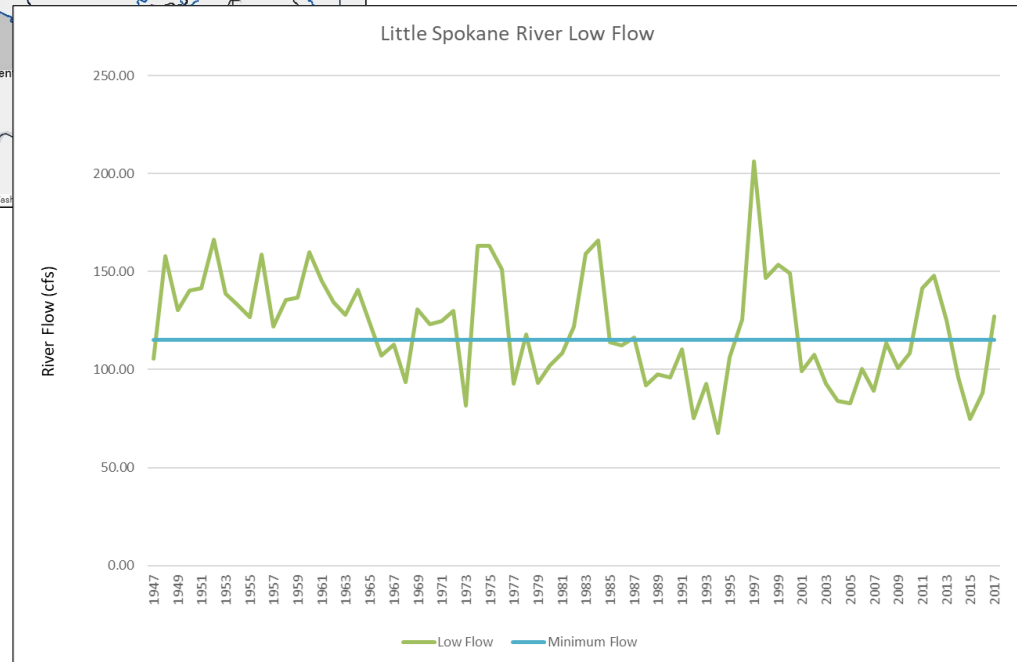
# WRIA 55 RCW 90.94 Watershed Plan Update

Mike Hermanson  
Spokane County Water Resources Manager  
AWRA 2018 Conference – October 16, 2018

# WRIA 55 - Little Spokane Watershed



- 1976 Instream Flow Rule
- Based on 80% Exceedance
- Below minimum 27 of 42 years since adoption



# 90.94 Watershed Plan Update

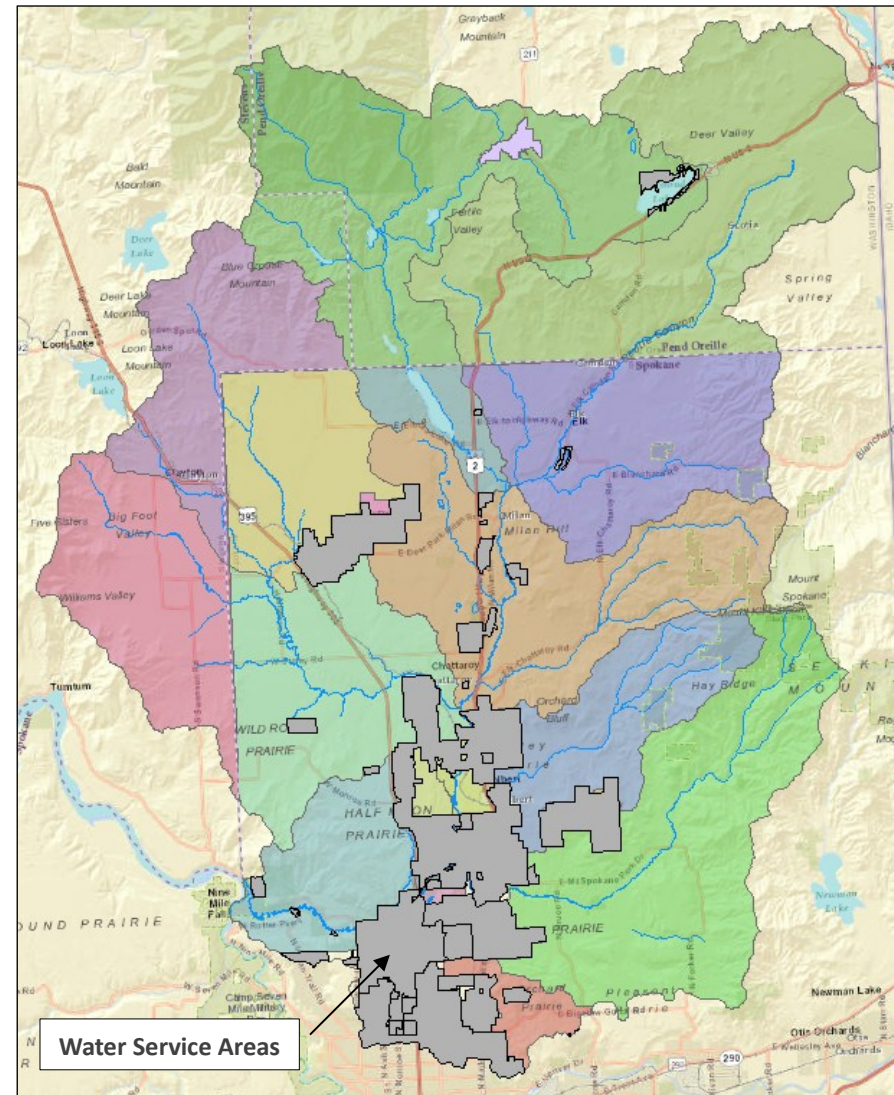
- 90.94.020 (4)(b) At a minimum, the watershed plan must include those actions that the planning units determine to be necessary to offset potential impacts to instream flows associated with permit-exempt domestic water use.
  1. Estimate 20 year water demand from permit exempt wells
  2. Evaluate impact on stream flows from those demands
  3. Evaluate supply options
  4. Determine if those supply options offset the estimated impact and result in a Net Ecological Benefit
  
- Previous and ongoing work that supports plan development
  - Spokane County Water Demand Forecast Model – 2011 & 2013
  - Integrated Ground and Surface Water Model - 2018
  - Little Spokane Water Bank Feasibility Study – 2015



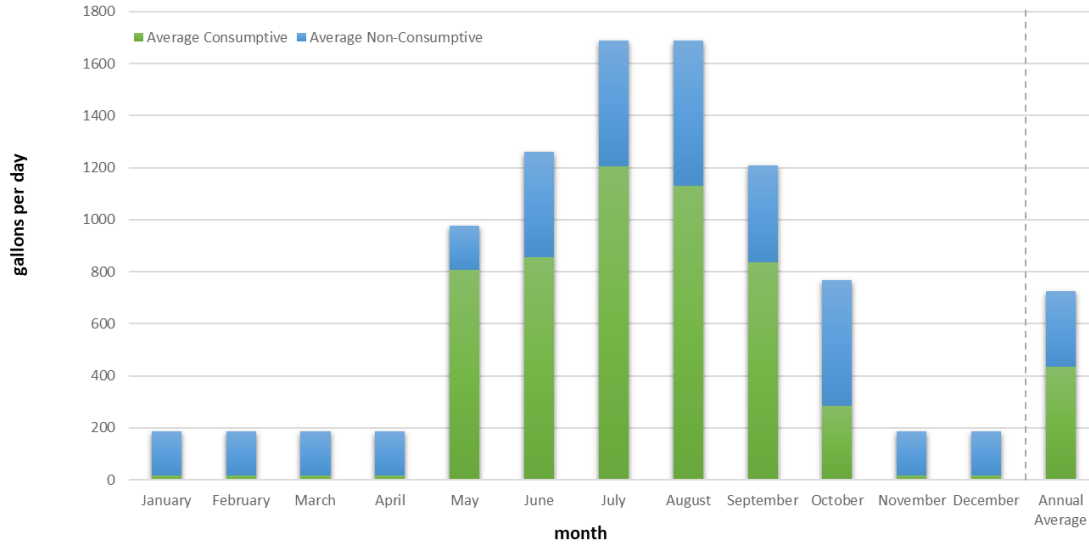


# Estimate Permit Exempt Water Demand

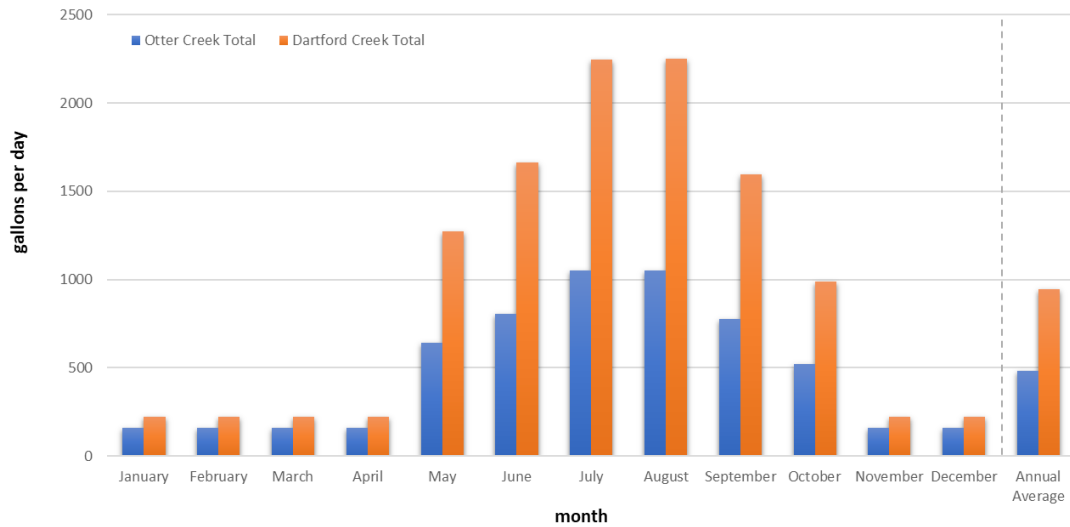
- Spokane County Water Demand Forecast Model
  - Forecasts water use per subbasin
  - Per household use is unique for each subbasin based on subbasin characteristics
  - Projected residential units by subbasin from Spokane Regional Transportation Council and OFM projections to 2040
  - Forecast includes:
    - Monthly consumptive water use
    - Monthly non-consumptive water use
    - Return flows from septic
    - Return flows from landscape irrigation



### Modeled WRIA 55 Permit Exempt Domestic Use Consumptive & Nonconsumptive Average



### Modeled WRIA 55 Permit Exempt Domestic Use Dartford Creek Subbasin and Otter Creek Subbasin



# Estimate Permit Exempt Water Demand

	2015	2040	Increase
Consumptive Use	<b>6,277</b>	<b>7,975</b>	<b>1,697</b>
Non-Consumptive Use	4,414	5,578	1,164
Total Use	10,691	13,553	2,861
Residential Units	12,436	15,683	3,247

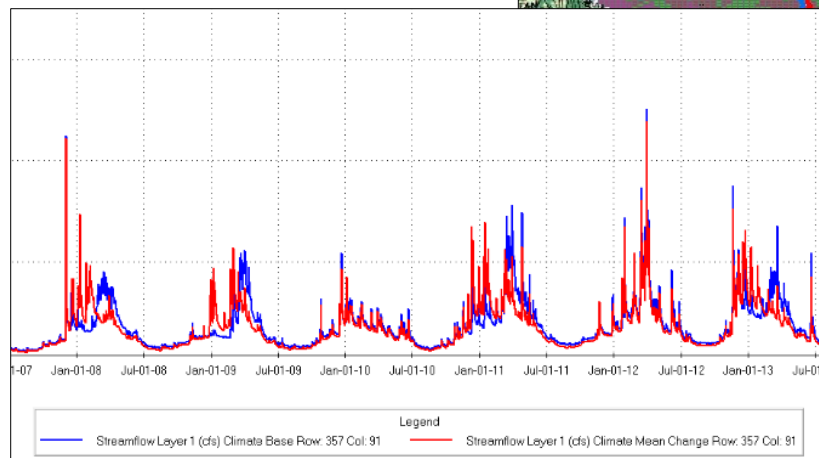
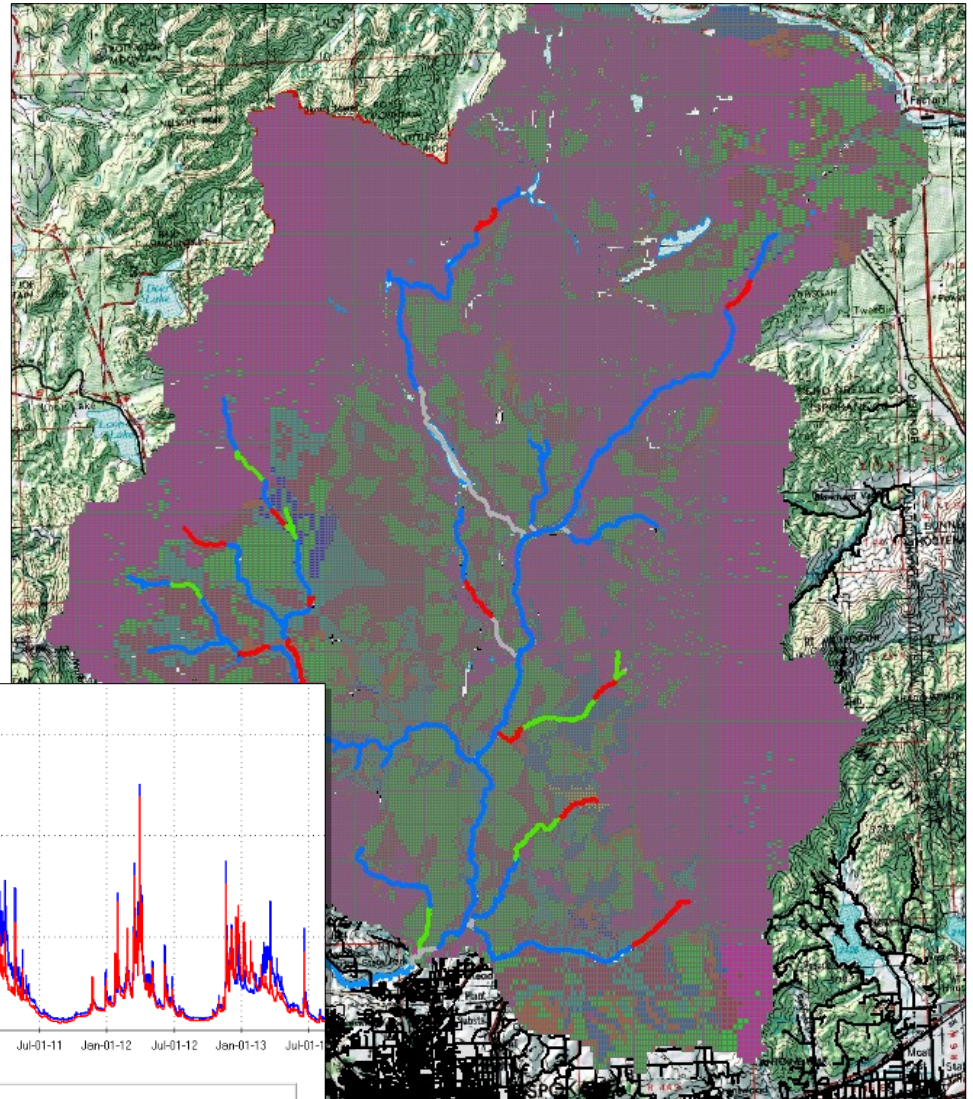
Water Use in acre-feet per year

Estimates based on 2013 Forecast. Awaiting updated 2017 data.



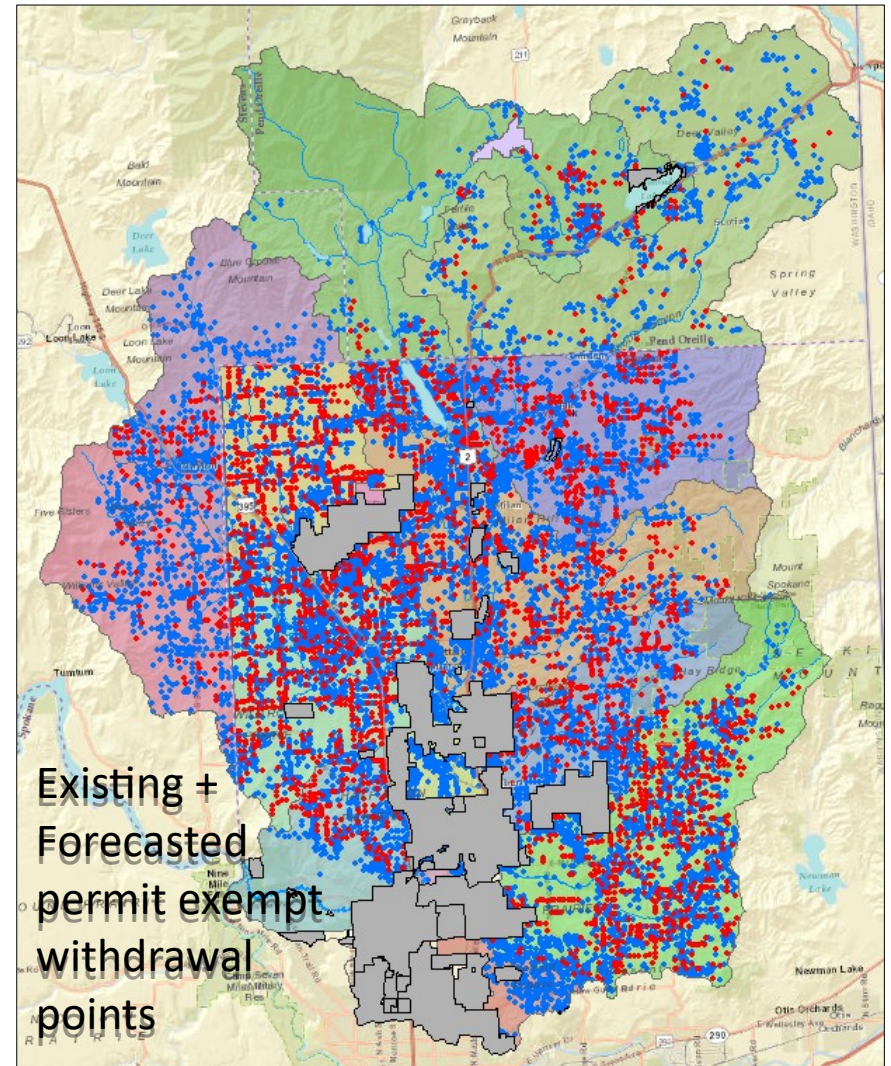
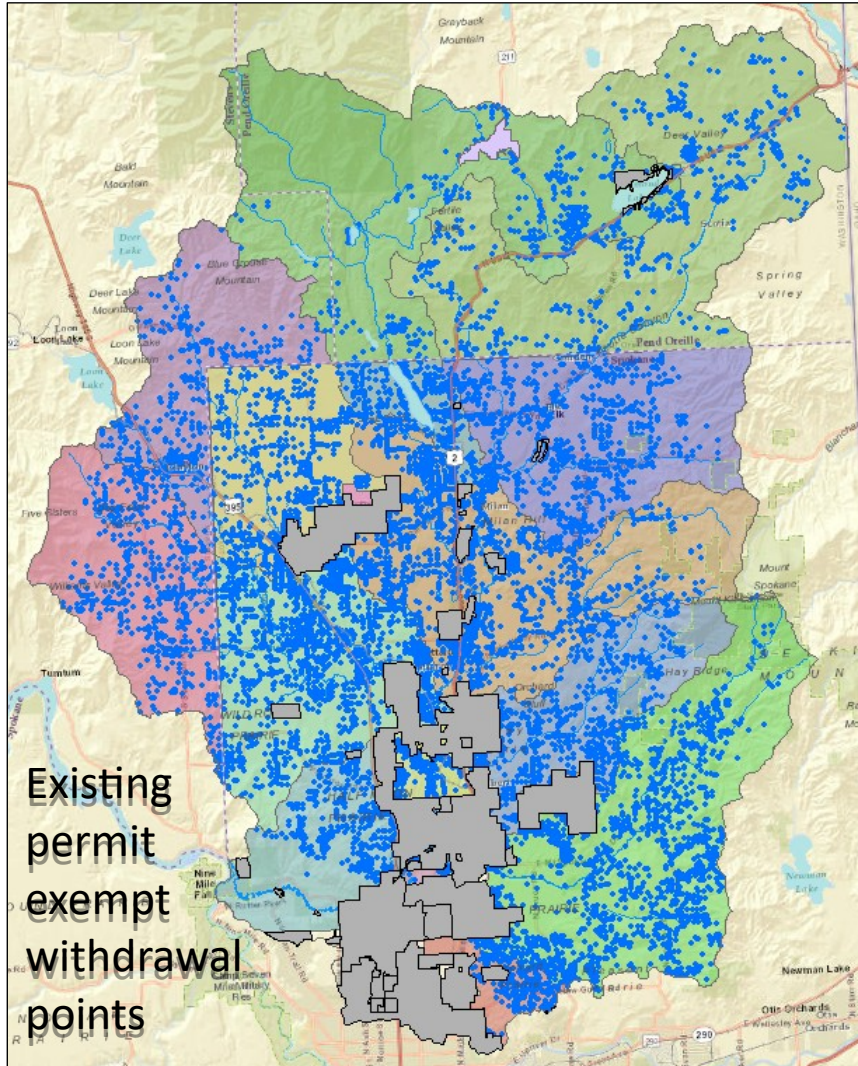
# Impacts of permit exempt use on stream flow

- Transient integrated ground and surface water model
  - GSFLOW – combination of USGS surface water model (PRMS) and groundwater model (MODFLOW)
  - Models the entire hydrologic system





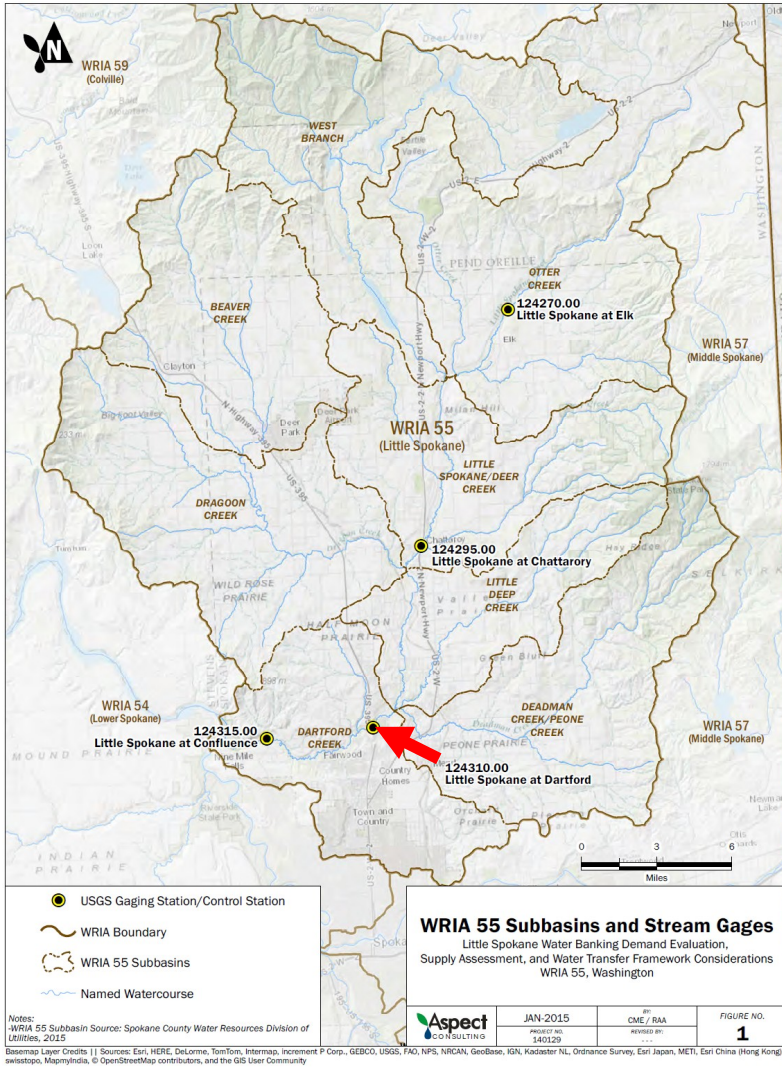
# Impacts of permit exempt use on stream flow





# Impacts of permit exempt use on stream flow

Modeled average reduction in flow (cfs)  
during July, August, September at  
Dartford Gage

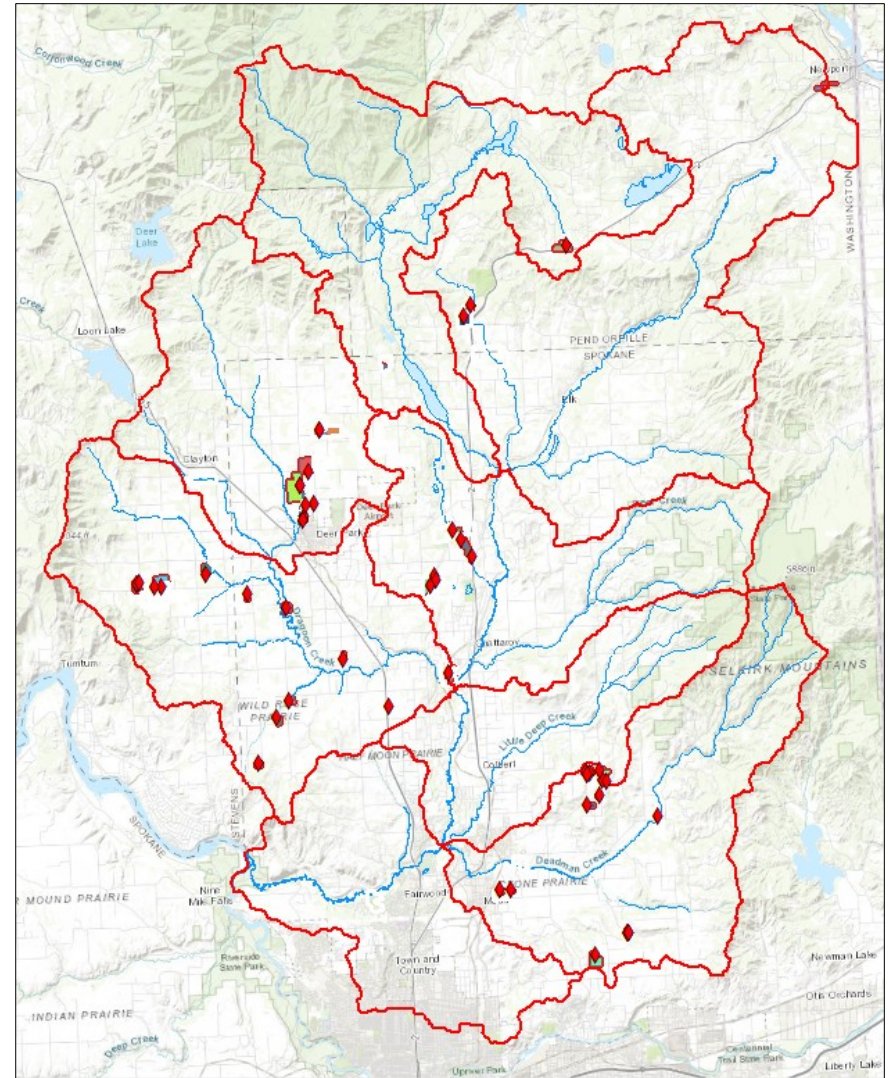


Year	2040 Permit Exempt Demand	2050 Climate Change No Additional Demand
2005	-0.26	-14.5
2006	-1.42	-13.4
2007	-0.44	-14.4
2008	-1.72	-21.8
2009	-2.35	-24.6
2010	-1.08	-19.6
2011	-1.01	-30.7
2012	-0.56	-27.3
2013	-0.58	-29.4

# Offset to impacts of permit exempt use on stream flow

- Little Spokane Water Bank Feasibility Study Water Right Review
  - Spokane County has acquired two water rights – 280 acre-ft/year
  - Additional 420 acre-ft/year with interested sellers.
  - Other water right holders do not currently have an interest
- We need more water or less demand

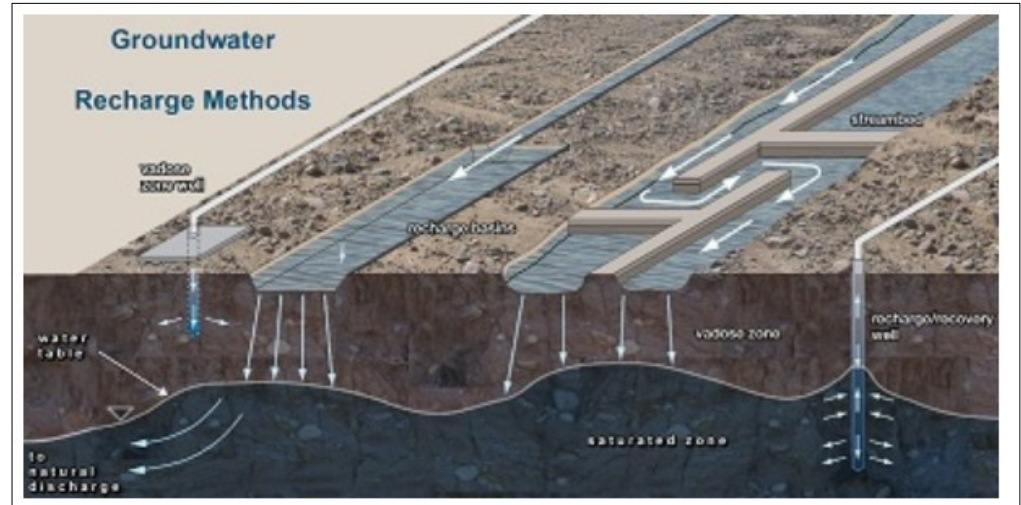
700 acre-ft water right acquisition  
- 1,600 acre-ft demand  
- 900 acre-ft





# Offset impacts of permit exempt use on stream flow

- Managed Aquifer Recharge
  - Infiltrate water during high flow
  - Increase groundwater level
  - Increase flow during low flow periods





# Opportunities and Challenges

- **Opportunities**

- Water rights acquisition
- managed aquifer recharge (MAR)

- **Challenges**

- Obtaining the necessary information in a timely manner with the available funding
- Need to evaluate whether MAR will work and is feasible
  - Where and when can we expect to see the flow benefits
  - Can we find locations to implement
  - Can we find a sustainable O&M funding source
- Need information to meet offset requirements in RCW 90.94, NEB Guidance, and apply for project funding



# Contact Information

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