

An aerial photograph of a river network in a mountainous region. The rivers are shown in a light blue color, winding through a landscape of brown and tan terrain. The text is overlaid in white, bold font.

Upstream, Downstream and in the Middle Integrating Water Quantity and Quality

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Integrating Across The Line

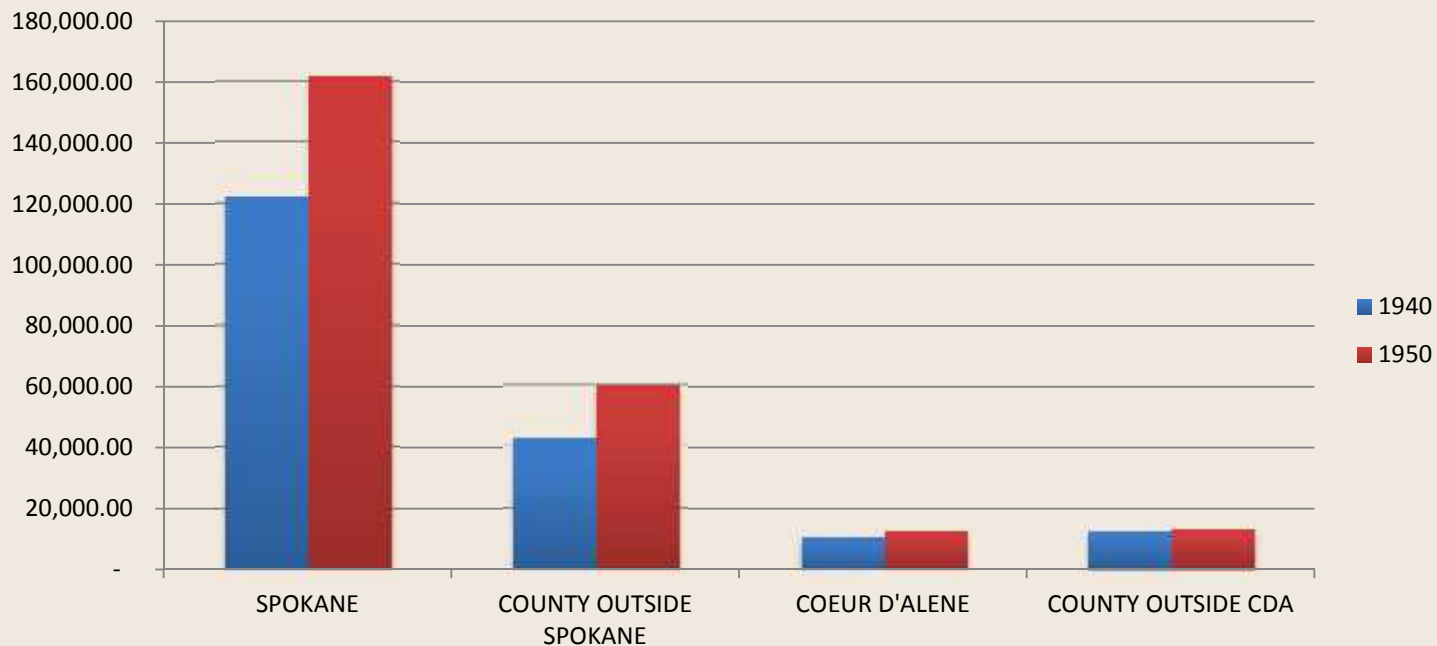


EXPLANATION

- 2005 REVISED EXTENT OF SPOKANE VALLEY – RATHORUM PRAIRIE AQUIFER
- AVERAGE ANNUAL REACH CHARACTERISTICS FROM MacINNIS AND OTHERS, 2004
- Gaining Reach
- Losing Reach
- Transitional Reach
- Minimal Interaction

POPULATION AND WATER RIGHTS

- 1940's: Spokane area population growth > 34% largely resulting from WWII industrial aluminum production
- 1950's: WA awards municipal water rights
- 1970-2010: Rathdrum Prairie population booms
- 2015: Idaho Reasonably Anticipated Future Need rights applied for



Water Quantity

- Aquifer
 - 758,000 acre-foot annual (AFA) recharge in Idaho
 - 85,000 AFA withdrawal in Idaho
 - 663,000 AFA crosses Washington state line
 - Six month response time at Spokane gage
- River
 - DOE Instream Flow Rule
 - Avista FERC License
 - 600 cfs minimum discharge 6/7 until day after Labor Day
 - Reduce to 500 cfs if lake level falls below 2,127.75 feet during summer full-pool period

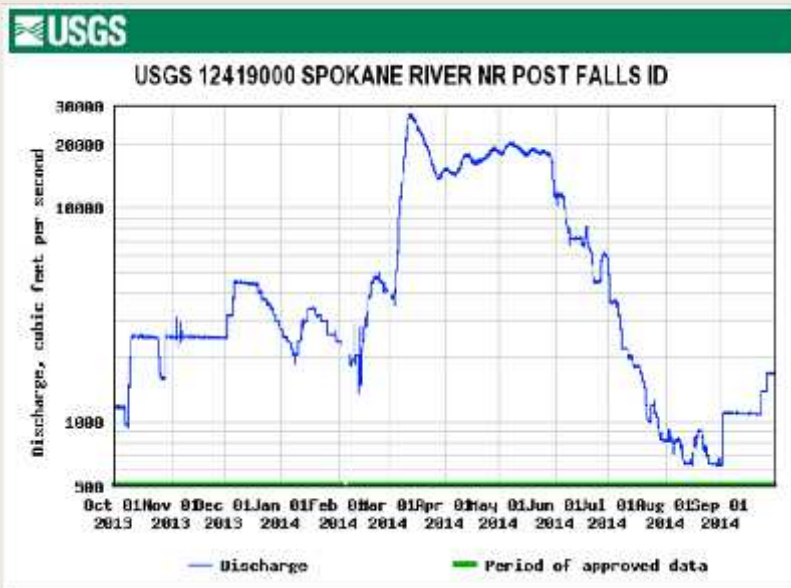
Spokane River at Spokane Gage	
October 1 – March 31	1,700 cfs
April 1 – June 15	6,500 cfs
June 16 – September 30	850 cfs
Spokane River at Greenacres (Barker Road)	
June 16 – September 30	500 cfs



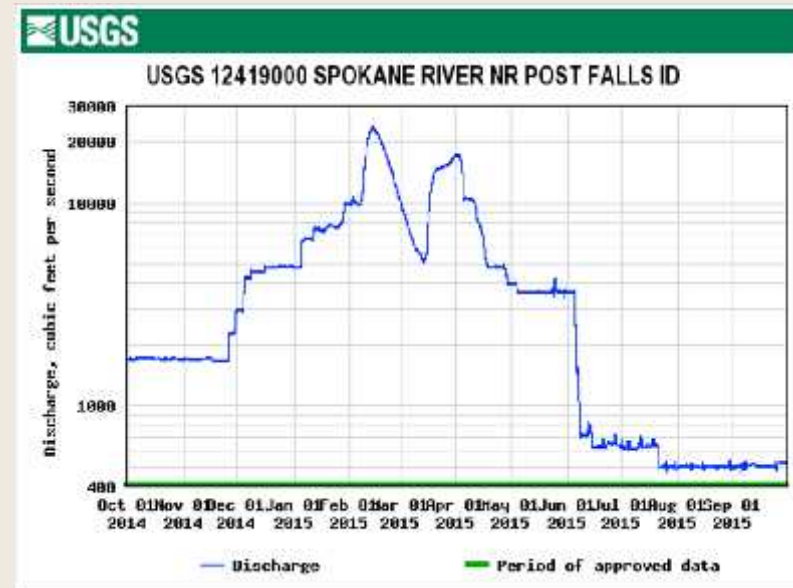
Water Quantity

- Bi-state resource: 11.3% of ID recharge withdrawn
- 2045 Idaho demand increases MDD by 61.55 cfs
 - 70% of new demand in northern reaches of RPA
 - Lake Pend Oreille, Spirit Lake, Twin Lakes recharge zones
- Hydrograph, the new norm?

2014 Water Year



2015 Water Year



Water Quality

- Spokane River common surface water
- Idaho water must meet Washington water quality standards at state line
- Washington water must meet Spokane Tribe water quality standards at reservation boundary
- High RPA water quality, some evidence of human impact
 - Sodium, chloride, nitrate-nitrogen



Potential Regulatory Changes

- Federal court orders WDOE to file work plan and timeline for adopting PCB discharge limits
- PCB TMDL possible outcome
 - Detection limit above Spokane Tribe WQS
 - 7-30 picograms/liter
 - Laboratory blanks 20-30 picograms/liter
 - Idaho PCB sources undetermined
 - Nonpoint infiltration of MWW collection systems?
 - Cost of compliance?



Water Quality

- Legacy mining pollution
 - 75 million tons of lead



Water Quality

- Lead and cadmium normally bound to sediment
- Zinc dissolved
 - Not present in aquifer at levels of regulatory concern
- Zinc in lake suppressing bio-production
 - As upper basin remediation progresses, will:
 - Zinc levels decrease/bio-production increase?
 - Lead and cadmium become mobile/soluble?
 - Enter aquifer?



Integrating Conclusions

- Water availability or competition not a physical issue in Idaho
- Water availability in WA severely limited by Spokane R. flow
 - Instream Flow Rule: 850 cfs June 16 – September 30
 - ~700 cfs at Spokane gage 8/1- 9/5, <800 cfs 9/5-9/26
- Three paths for Spokane dischargers with permitted flow-limited mixing zones
 - Increase river flow
 - Decrease upstream pollutant loading
 - End of pipe compliance



Integrating Conclusions

- Lake Spokane water quality compliance drives future integrated water resource management
- PCB TMDL may shift river discharge to land application/ reuse
- Shift to land application/reuse reduces river flow during critical low flow period



Integrating Conclusions

- Eliminating *all* Idaho irrigation has minimal effect on Spokane gage during critical low flow period (6 month travel time/comparative scale of pumping)
- Decreasing Spokane summer irrigation demand is low-cost/high-benefit to system
- Metals release is the gorilla in the Coeur d'Alene/Spokane system closet

