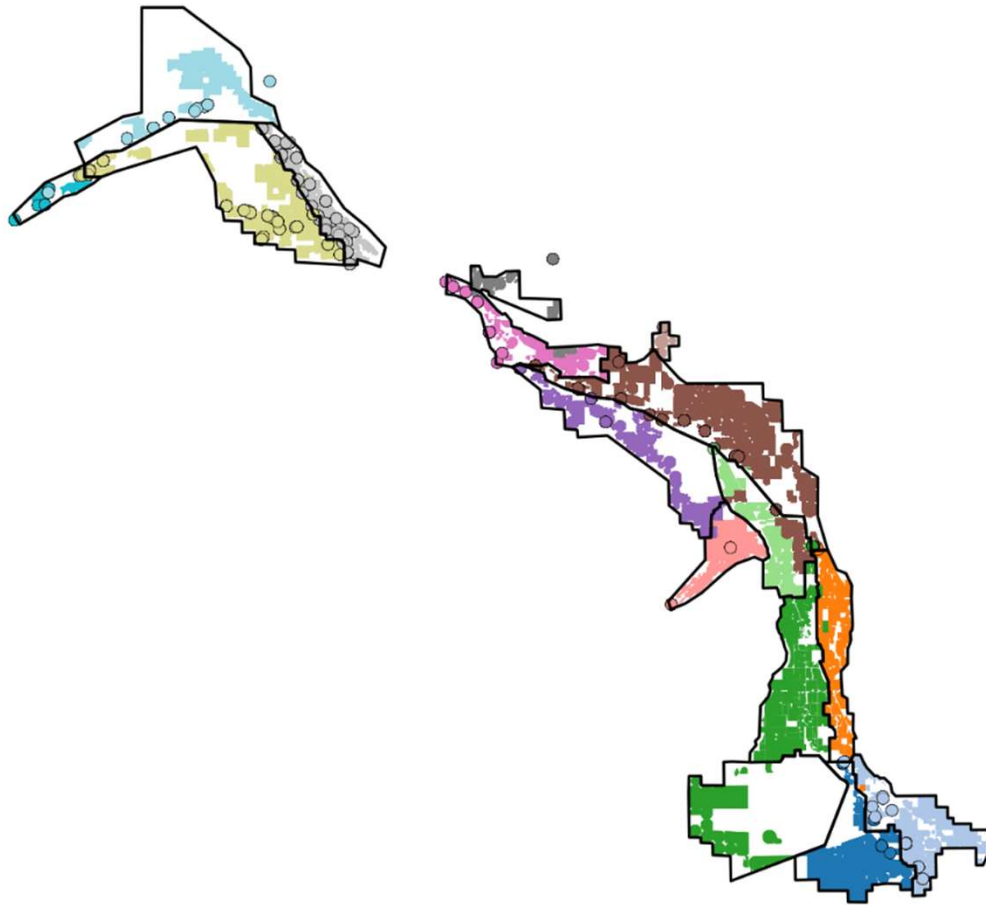


Service Area Calculator checkup

MTAC #7 Status Update
2024.05.15

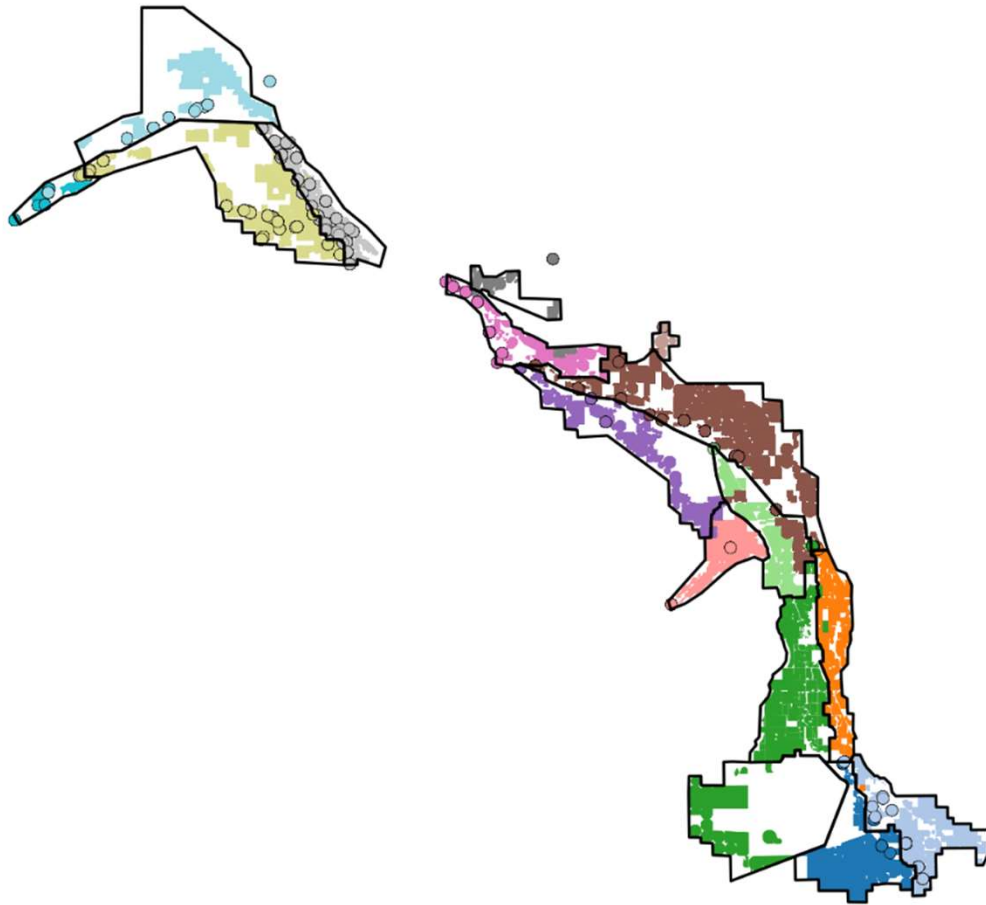
Service Area Calculator Discussion

- Purpose and scope
- Service areas defined
- Inputs and outputs
- Request for stakeholder feedback



Purpose and Scope

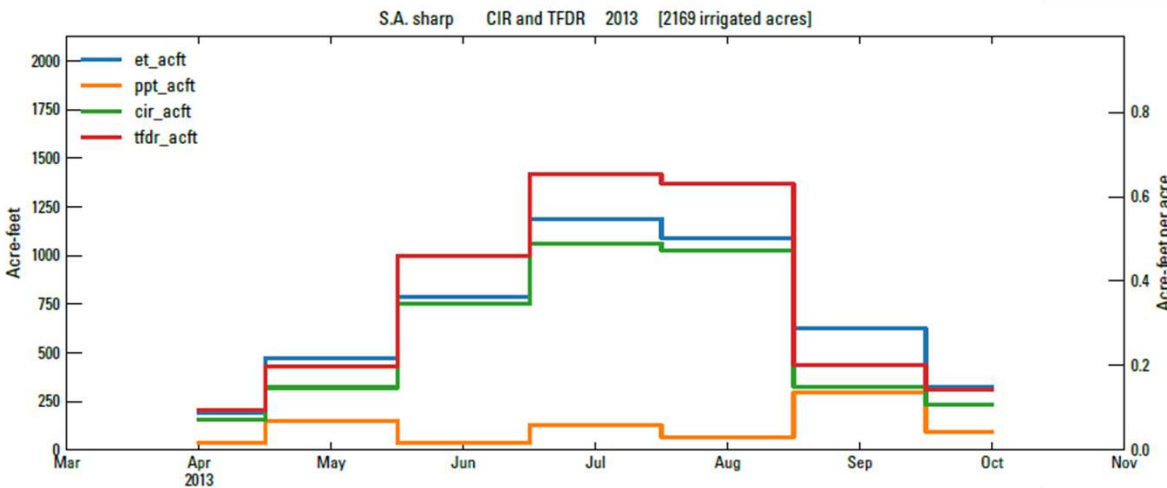
- Agriculture is a major component of the groundwater budget, but we do not have the data or computational ability to simulate each individual fields
- By combining irrigated lands into groups, we can make reasonable calculations of supply and demand based on available data
- Supply and demand calculations are performed before running the groundwater model simulation. The results of the calculator are “hard wired” into the simulation.



Service Areas Defined

- Service areas are artificial groupings of irrigated lands, used to simulate spatially-averaged fluxes into and out of the groundwater system
- BLRM service areas were identified as areas containing clustered or overlapping Points of Use (POU) polygons that are all linked to one or more surface water Point of Diversion (POD).
- Demand and supply is calculated for each service area individually. Shortages or excesses of water are not spread over multiple service areas
- Calculations are performed for each month Apr-Oct, 2003-2022

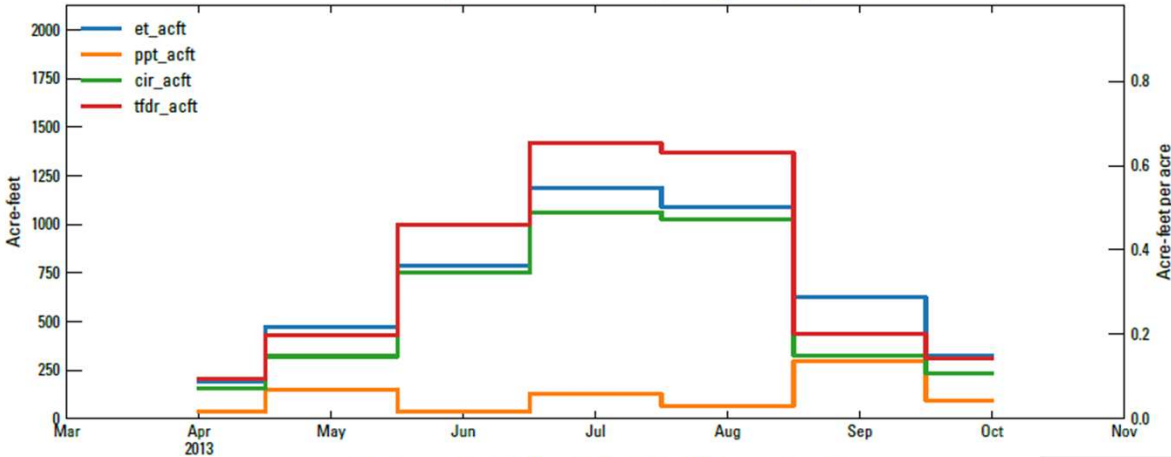
Calculator inputs



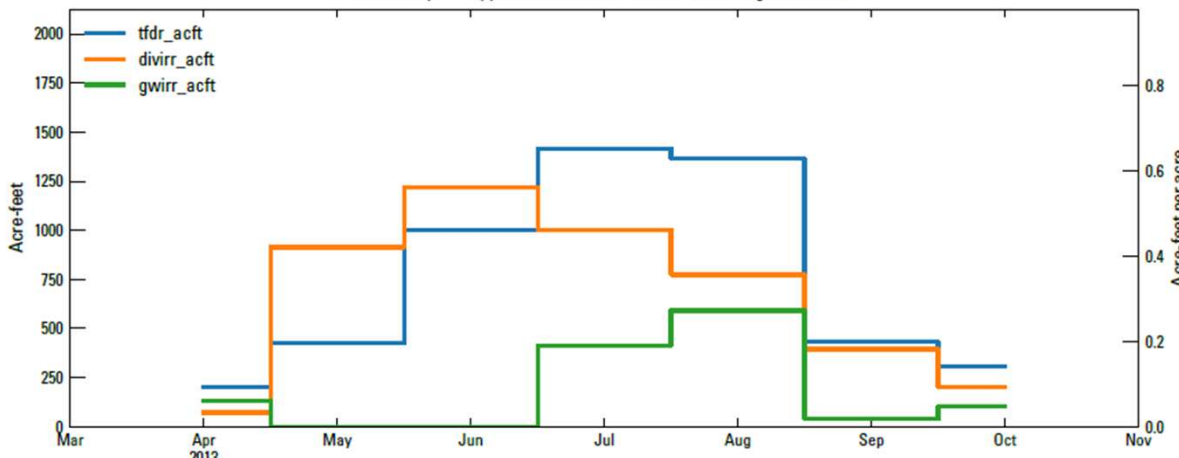
- IDWR Irrigated Lands shapefiles are used to mask out non-irrigated land each year of the simulation
- METRIC ET gridded monthly data is used to calculate average ET rates for the irrigated lands in each service area
- WD34 diversion data for the POD(s) of each service area is used to calculate monthly supply of surface water.
- PRISM gridded monthly precipitation data is used to calculate average rainfall on irrigated lands

Calculator outputs

S.A. sharp CIR and TFDR 2013 [2169 irrigated acres]

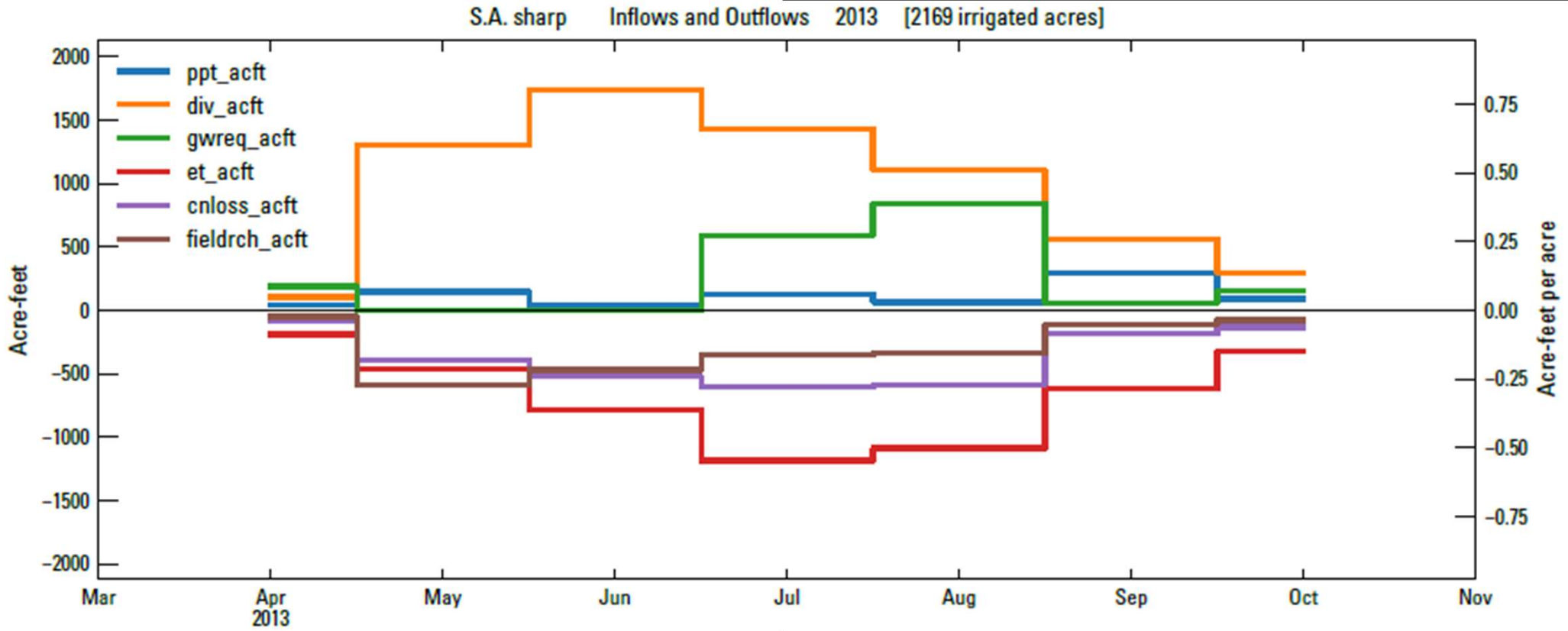


S.A. sharp Applied SW and GW 2013 [2169 irrigated acres]



- ET demand is reduced by precip, then increased by a factor to account for on-farm irrigation efficiency
- Resulting Total Farm Delivery Requirement (TFDR) is satisfied by available surface water diversions and supplemented as needed with groundwater pumping
- Surface water and groundwater deliveries are reduced by a canal loss factor

Calculator outputs

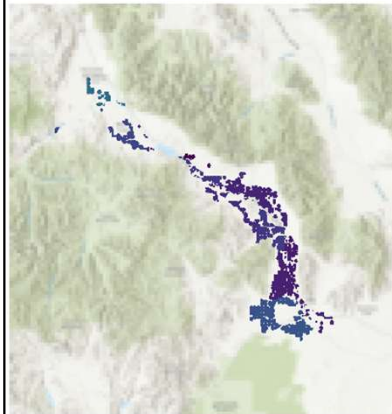


April
2005

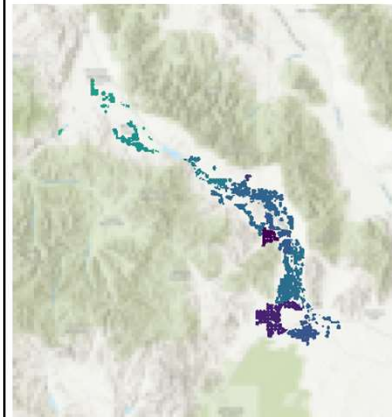
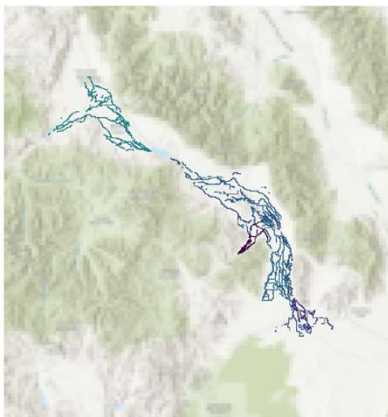
canal loss



incidental recharge



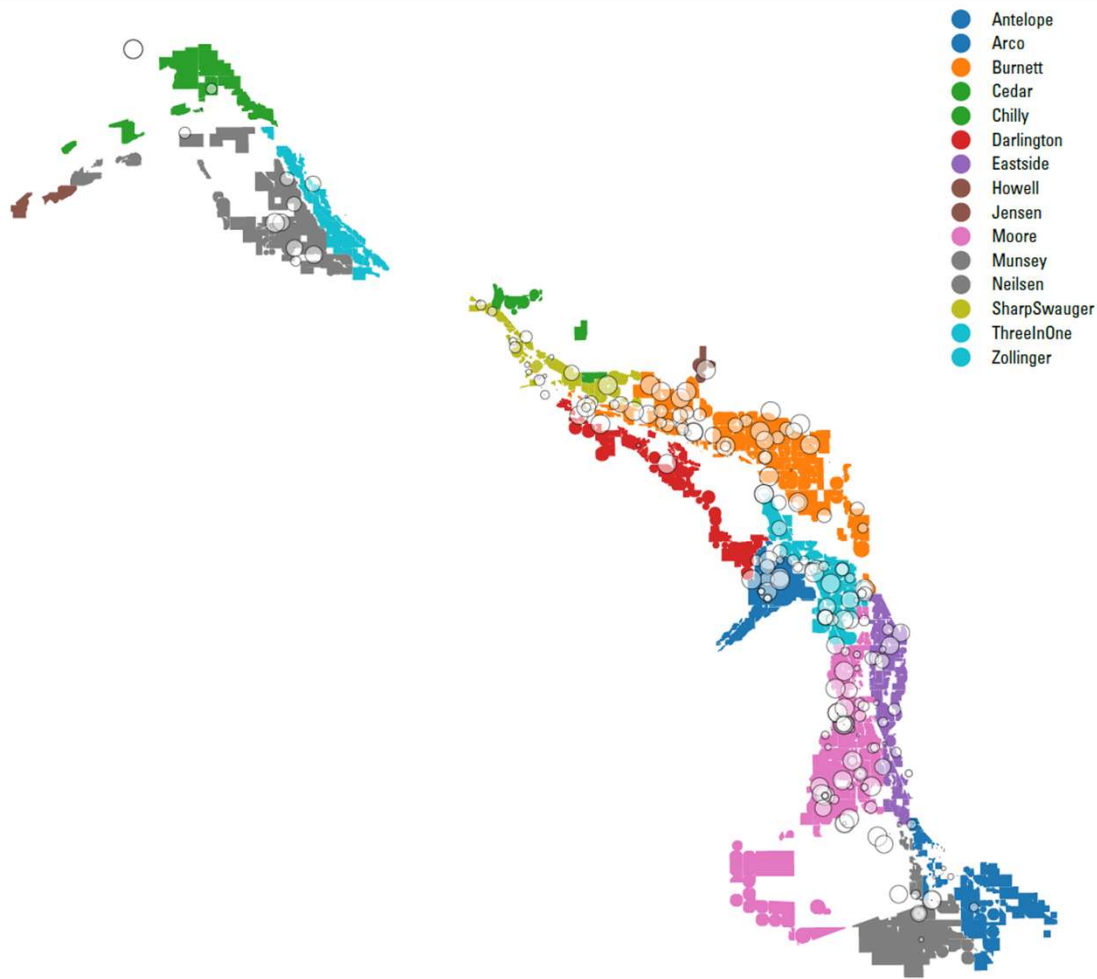
May
2005



Calculator outputs

- Canal losses are applied evenly among model cells crossed by canals
- Incidental recharge is applied evenly among model cells underlying irrigated lands
- Supplemental pumping is extracted from model cells containing wells linked to POU in the service area

simulated pumping 2012-06



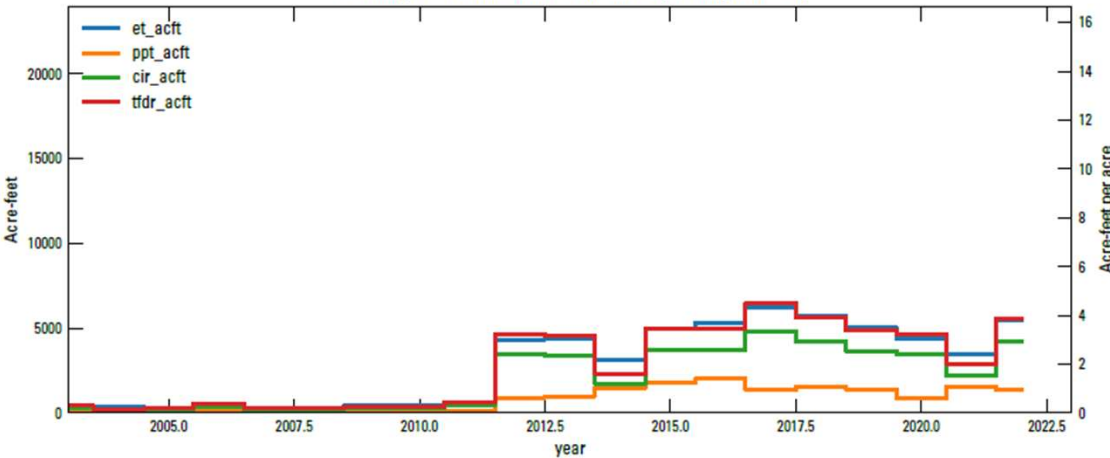
Calculator outputs

- Supplemental pumping is extracted from model cells containing wells linked to POU in the service area

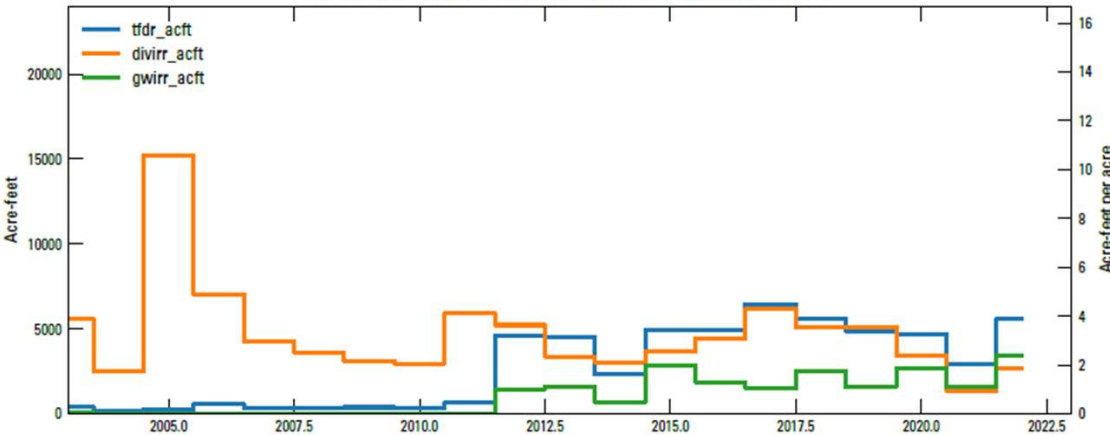
Upper Basin Complexities

- SW diversions associated with water rights grouped into the upper basin service areas appear high compared to the mapped irrigated areas
- Are we under-counting irrigated lands, or mis-allocating SW diversions that are not used for irrigation?

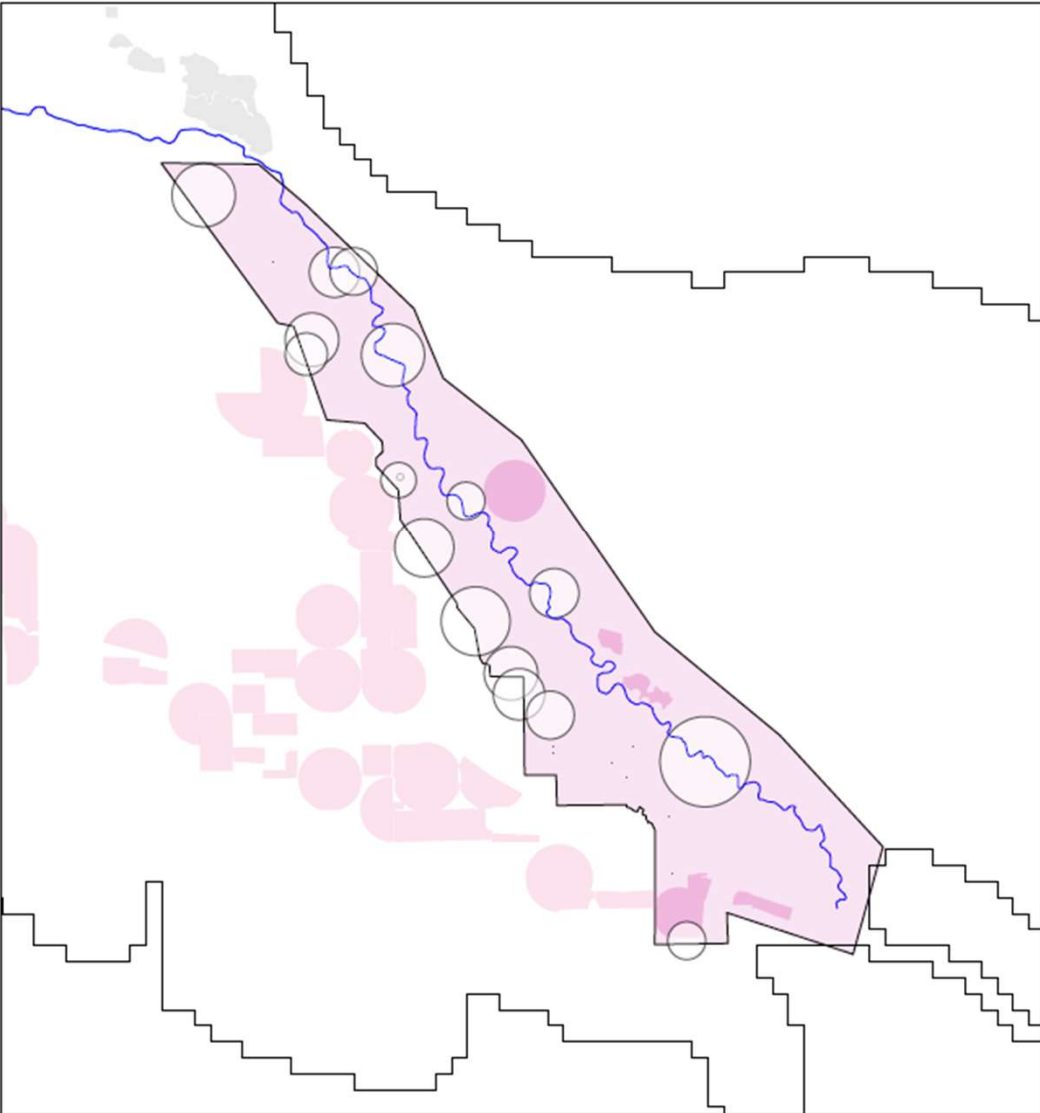
S.A. zollinger CIR and TFDR 2003 - 2023 [1439 irrigated acres]



S.A. zollinger Applied SW and GW 2003 - 2023 [1439 irrigated acres]



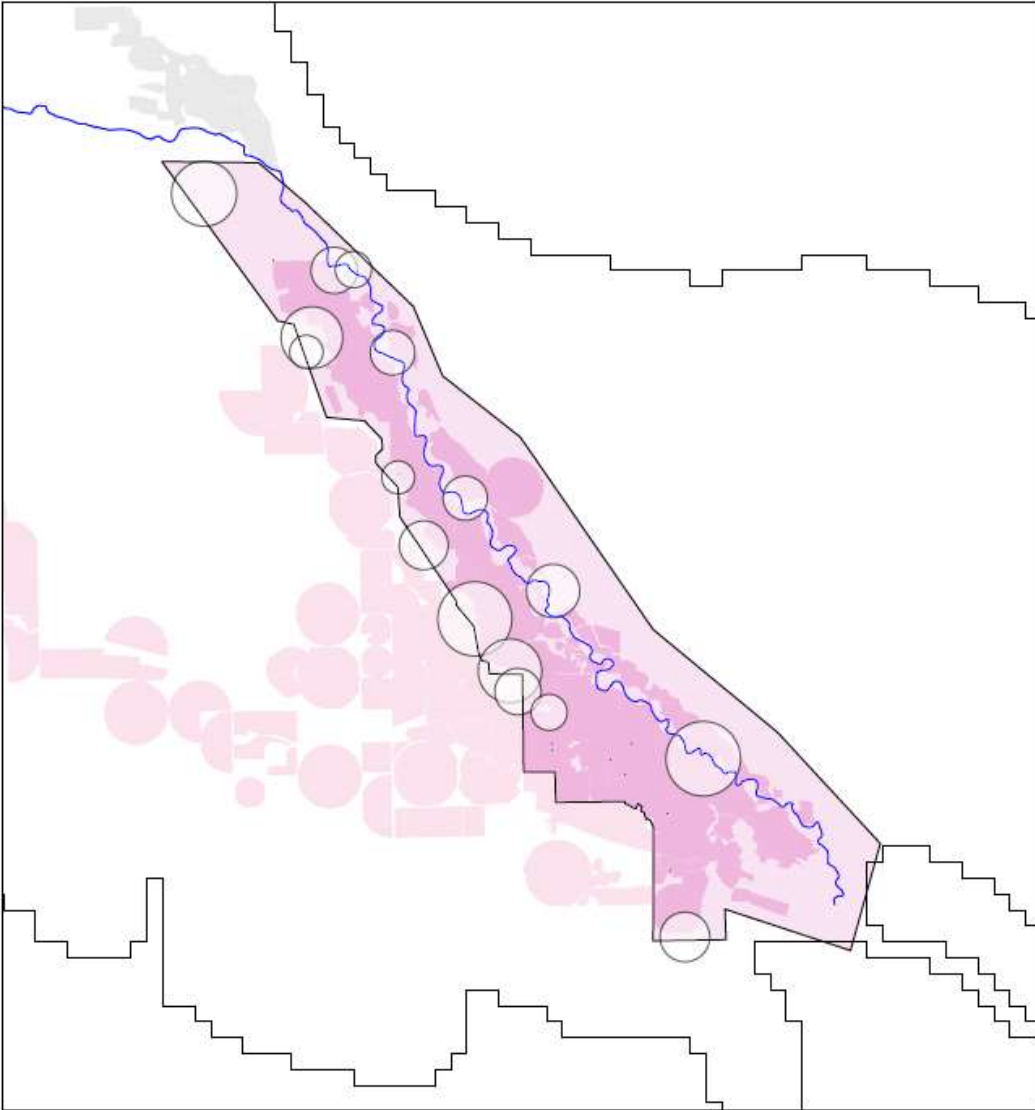
service area 13: zollinger
year: 2011 (920 acres)



Upper Basin Complexities

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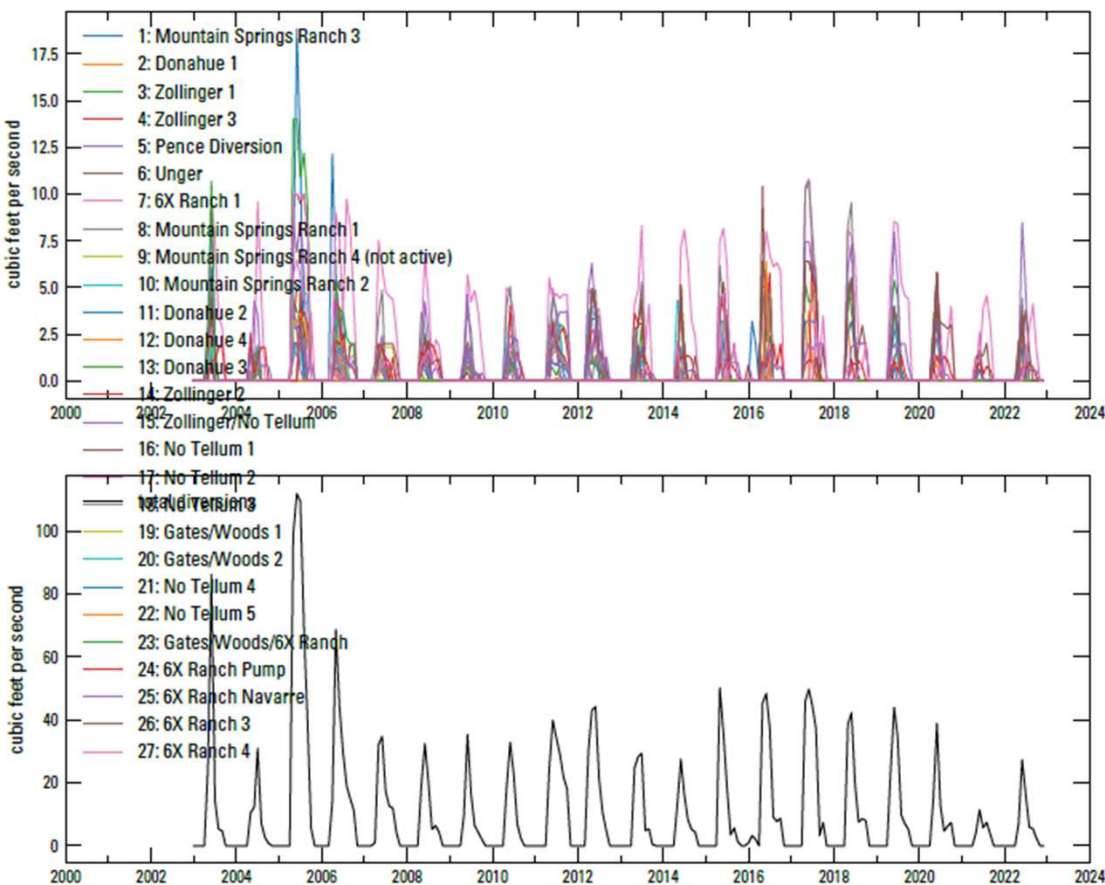
service area 13: zollinger
year: 2012 (8422 acres)



Upper Basin Complexities

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- **Potential issue with irrigated lands shapefile pre-2012?**

service area 13: zollinger
MONTHLY



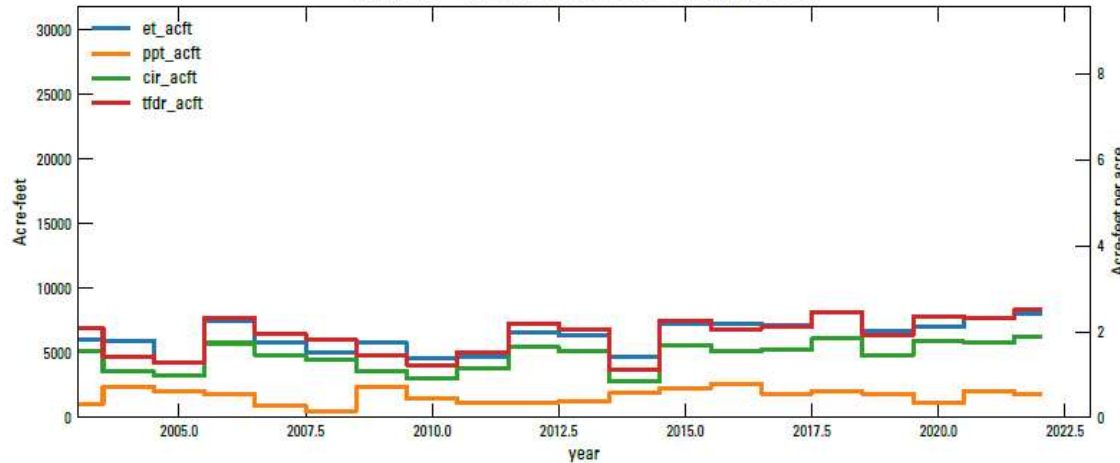
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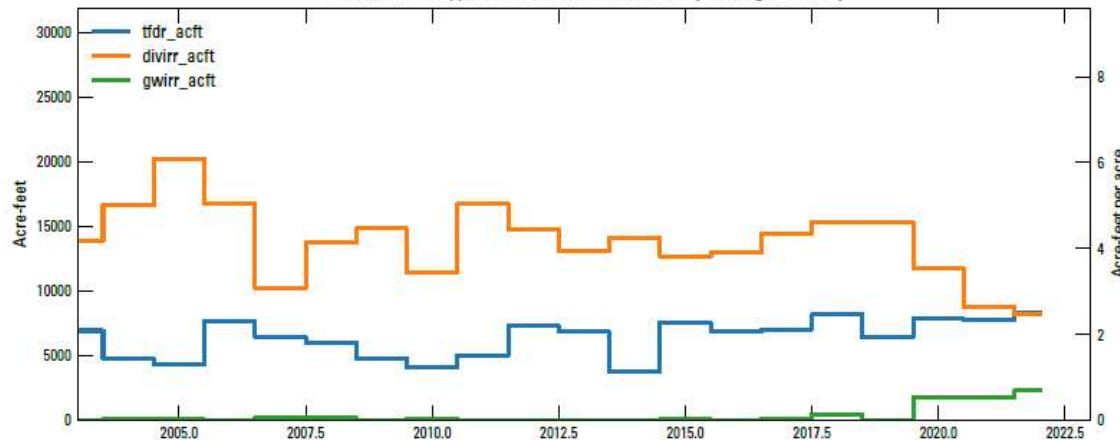
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S.A. neilsen CIR and TFDR 2003 - 2023 [3323 irrigated acres]

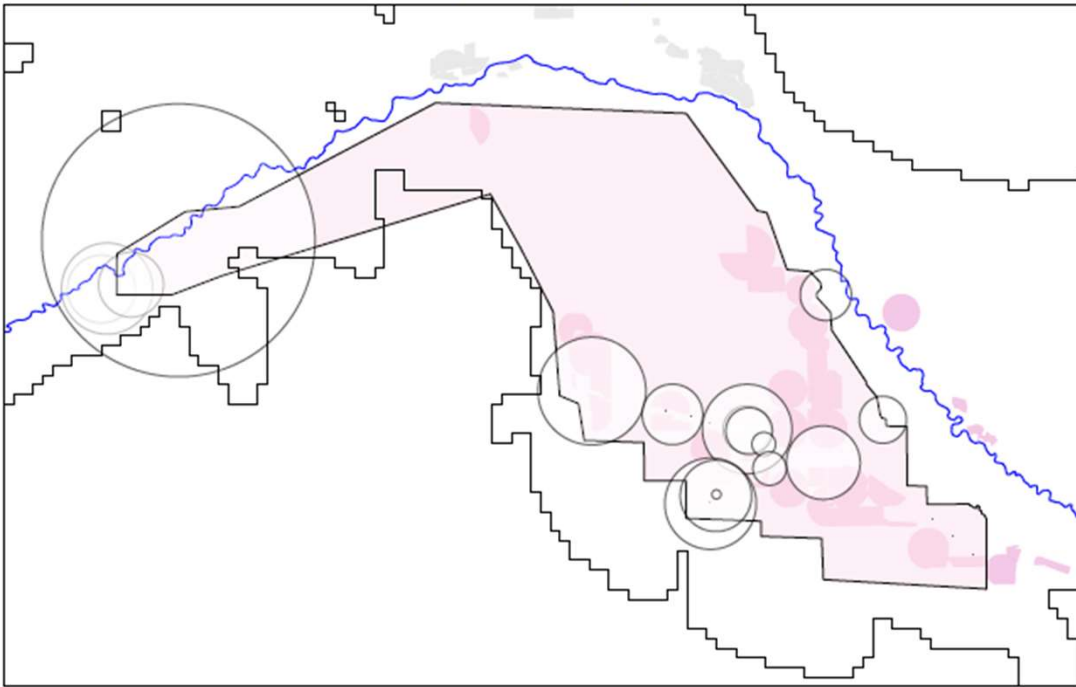


S.A. neilsen Applied SW and GW 2003 - 2023 [3323 irrigated acres]



Upper Basin Complexities

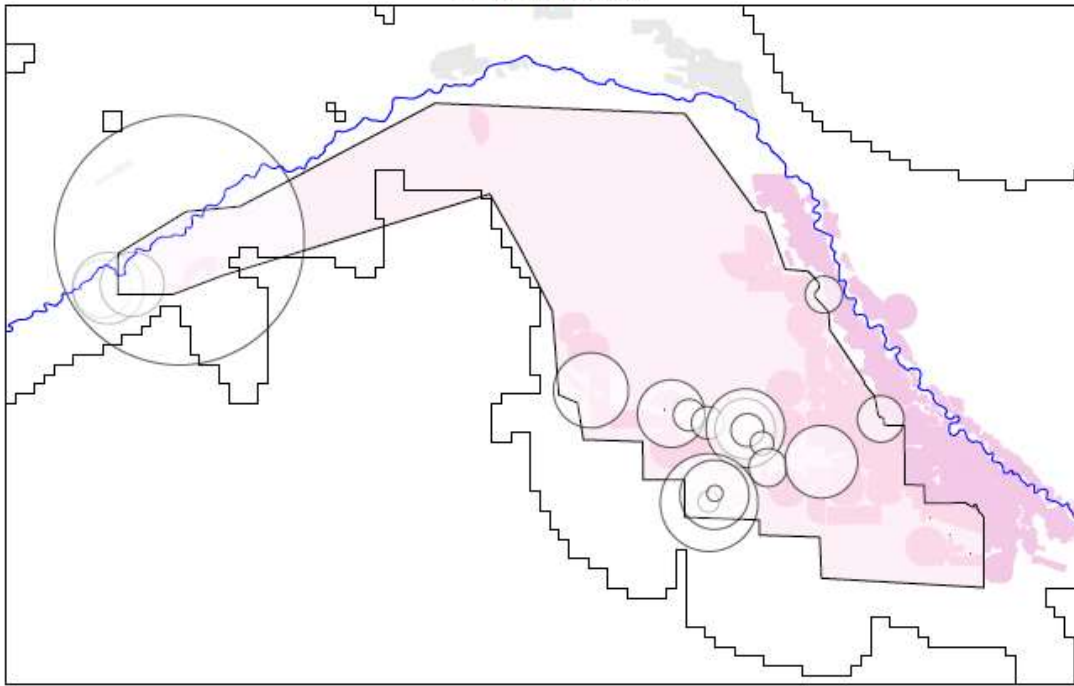
service area 14: neilsen
year: 2011 (8601 acres)



- SW diversions associated with water rights grouped into the upper basin service areas appear high compared to the mapped irrigated areas
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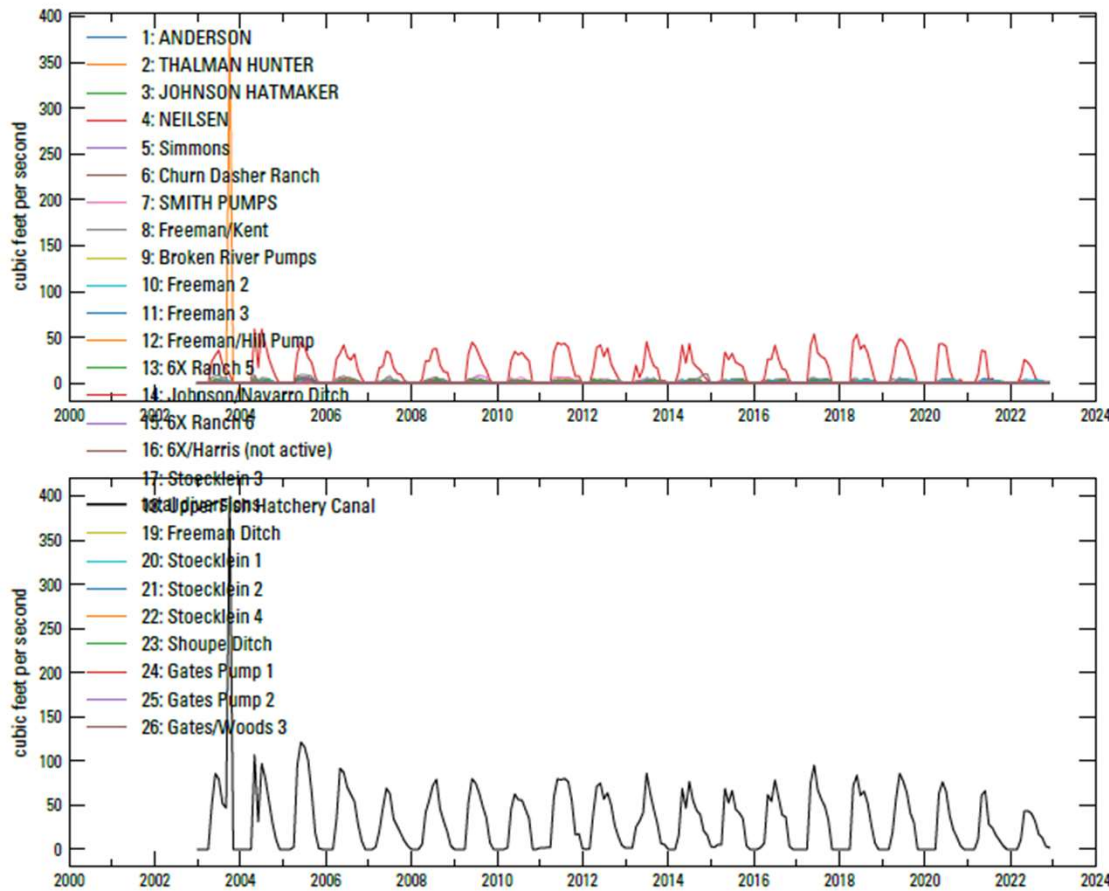
Upper Basin Complexities

service area 14: neilsen
year: 2012 (11631 acres)



- SW diversions associated with water rights grouped into the upper basin service areas appear high compared to the mapped irrigated areas
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- **Potential issue with irrigated lands shapefile pre-2012?**

service area 14: neilsen
MONTHLY



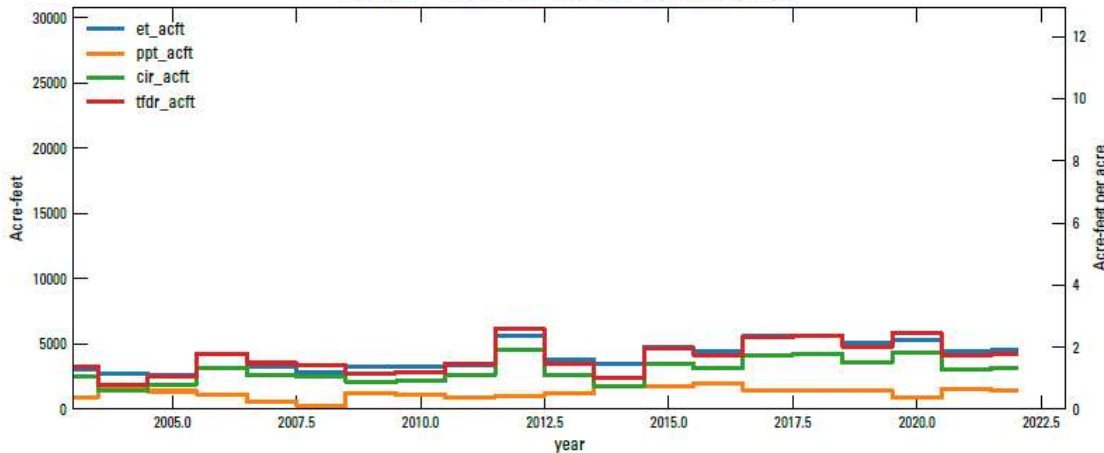
Upper Basin Complexities

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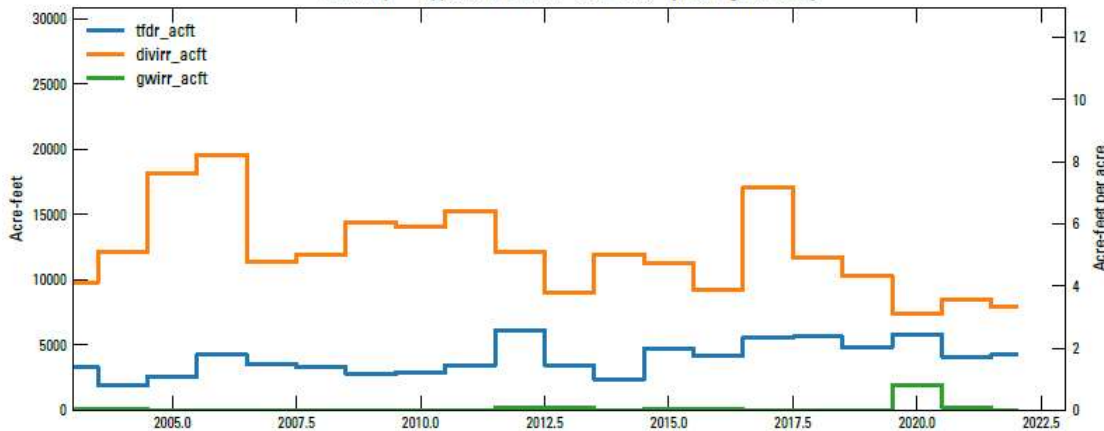
Upper Basin Complexities

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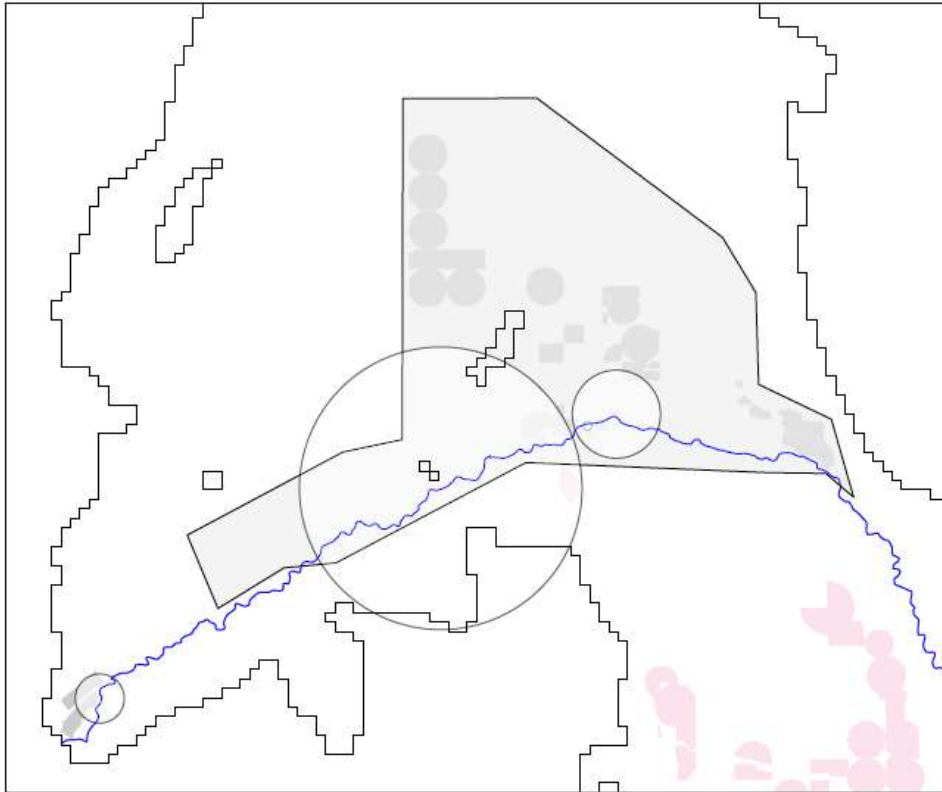
S.A. chilly CIR and TFDR 2003 - 2023 [2380 irrigated acres]



S.A. chilly Applied SW and GW 2003 - 2023 [2380 irrigated acres]



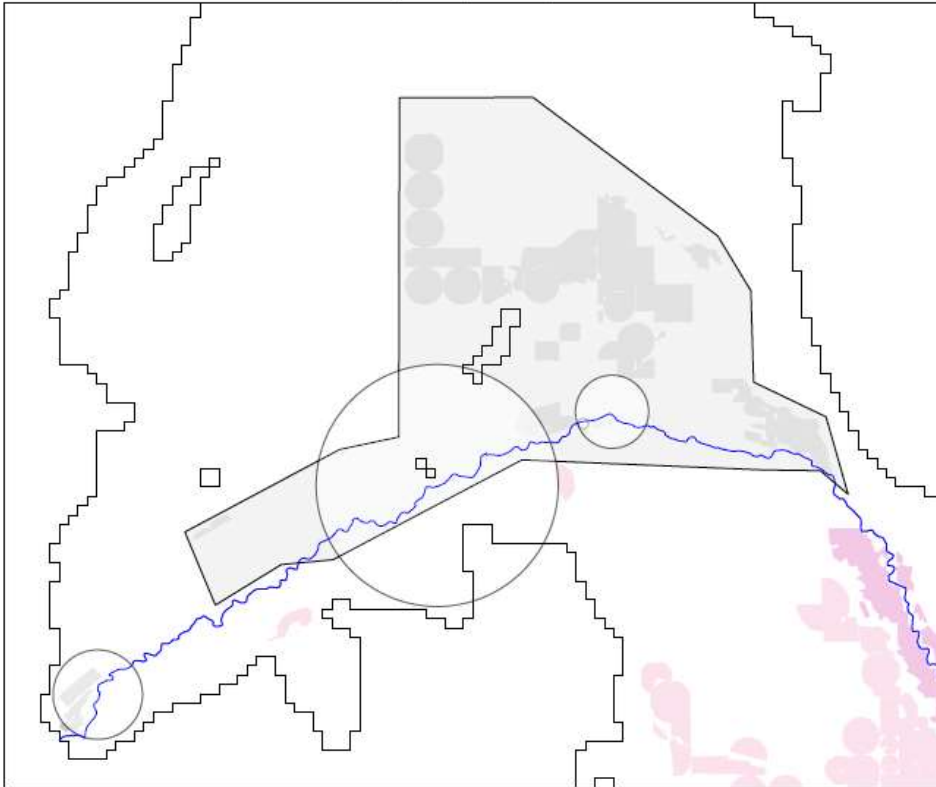
service area 16: chilly
year: 2011 (5770 acres)



Upper Basin Complexities

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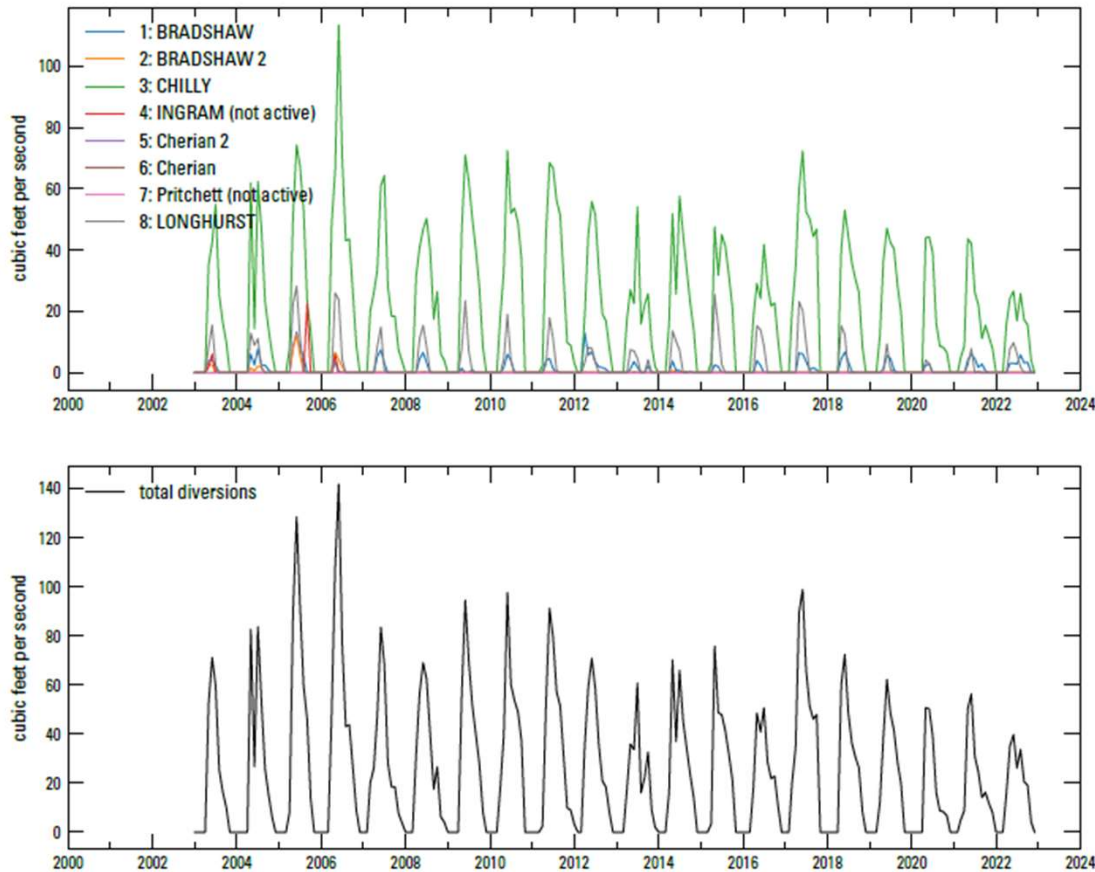
service area 16: chilly
year: 2012 (9990 acres)



Upper Basin Complexities

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- **Potential issue with irrigated lands shapefile pre-2012?**

service area 16: chilly
MONTHLY



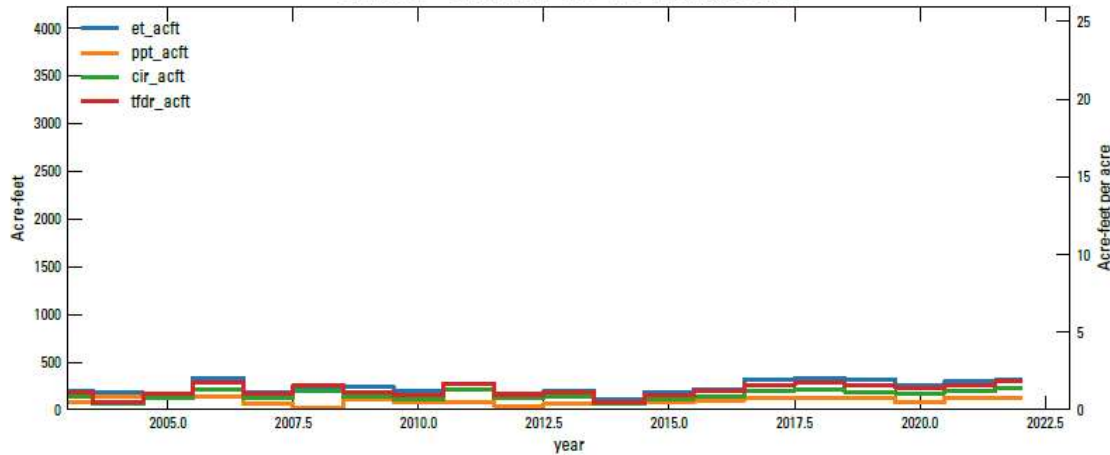
Upper Basin Complexities

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- **Potential issue with irrigated lands shapefile pre-2012?**

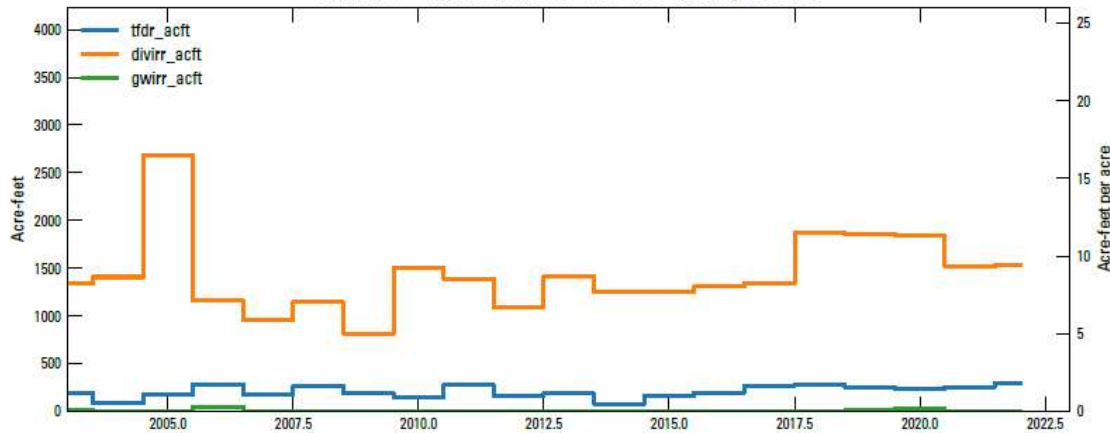
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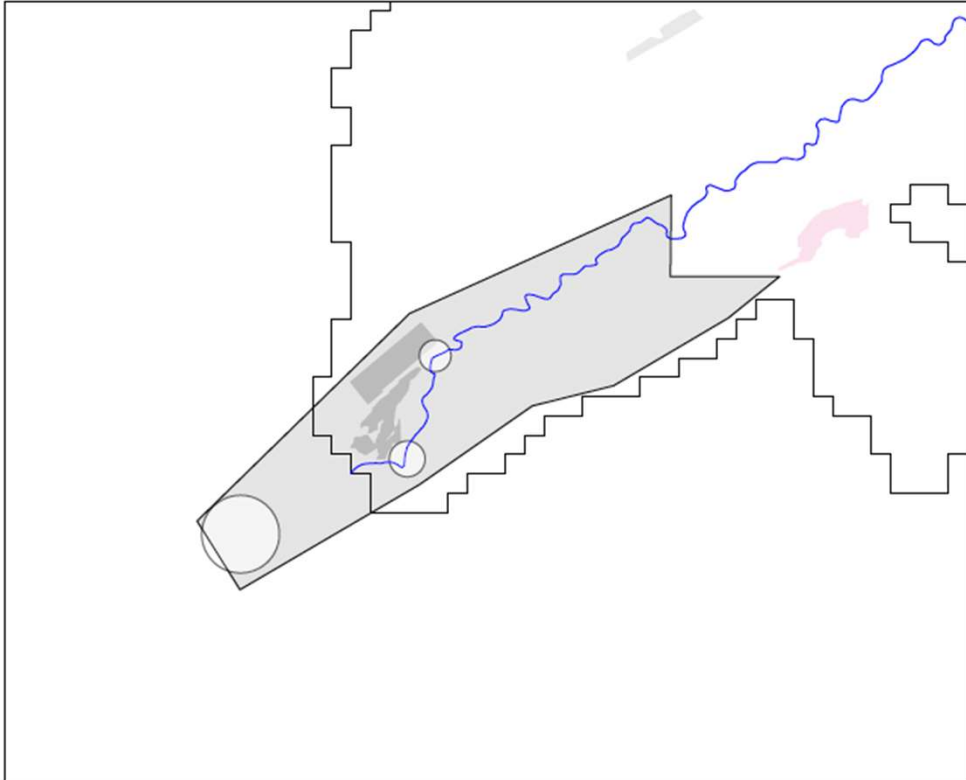
S.A. howell CIR and TFDR 2003 - 2023 [163 irrigated acres]



S.A. howell Applied SW and GW 2003 - 2023 [163 irrigated acres]



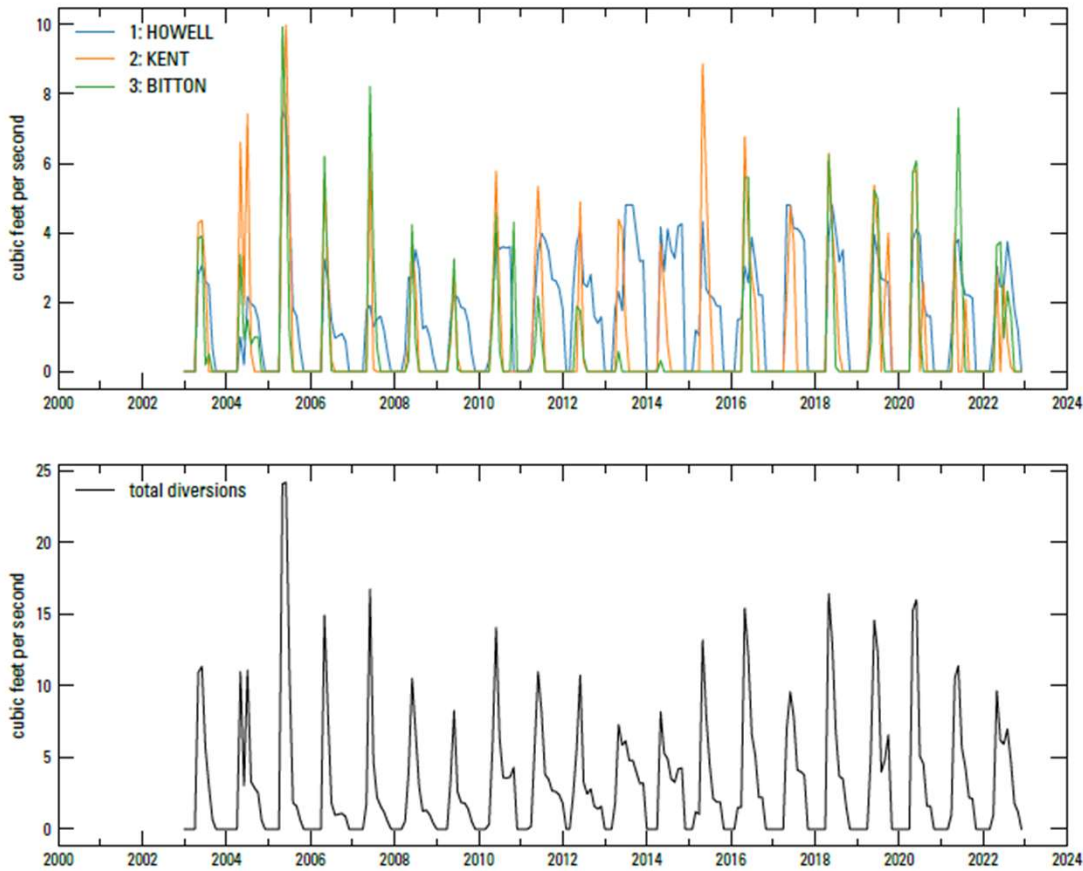
service area 15: howell
year: 2012 (394 acres)



Upper Basin Complexities

- SW diversions associated with water rights grouped into the upper basin service areas appear high compared to the mapped irrigated areas
- Are we under-counting irrigated lands, or mis-allocating SW diversions that are not used for irrigation?

service area 15: howell
MONTHLY



Upper Basin Complexities

- SW diversions associated with water rights grouped into the upper basin service areas appear high compared to the mapped irrigated areas
- Are we under-counting irrigated lands, or mis-allocating SW diversions that are not used for irrigation?

Thanks!

jknight@usgs.gov