

Characterizing Water-Related Land Use Differences Across Urban River Reaches

Dusty Pilkington
Weber State University

Research Mentors:

Douglas Jackson-Smith
& Joanna Endter-Wada
Utah State University



Goals

- Describe land uses contributing to water conditions in urban sections of all 3 GAMUTS.
- Investigate different approaches to studying contributing areas.
- Define study areas contributing to water distribution and quality.

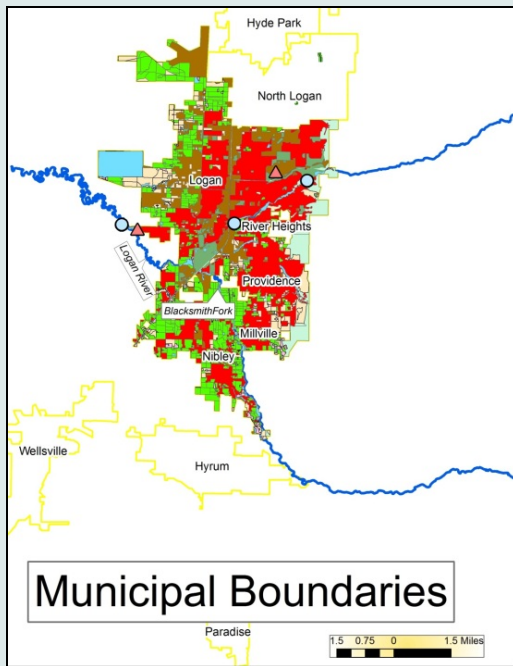
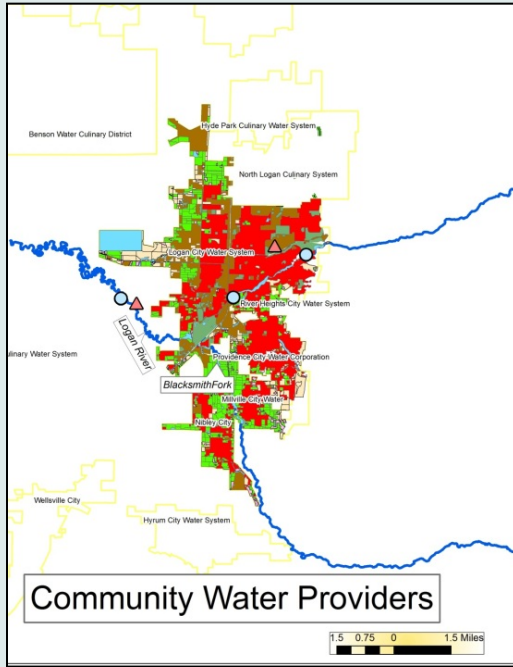


Methods

- Collect data on hydrologic units, land uses, GAMUT research station coordinates, and community water provider boundaries.
- Use ArcGIS geoprocessing tools to map and calculate water-related land use in acres using 3 different geographic perspectives or “windows” for all three GAMUTs.

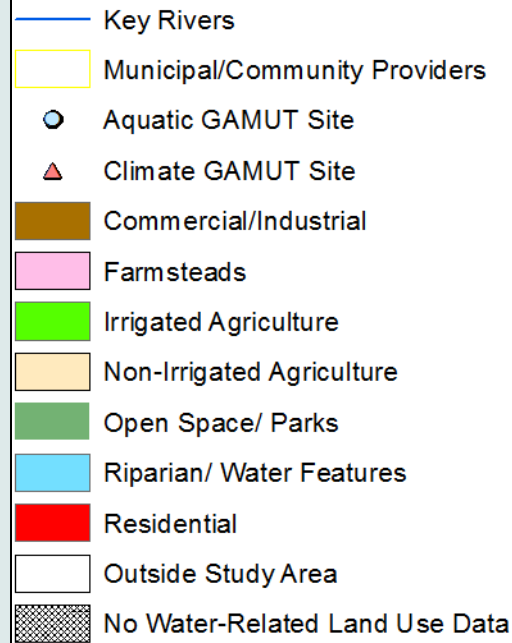


Governance View



Comparative Example: Logan

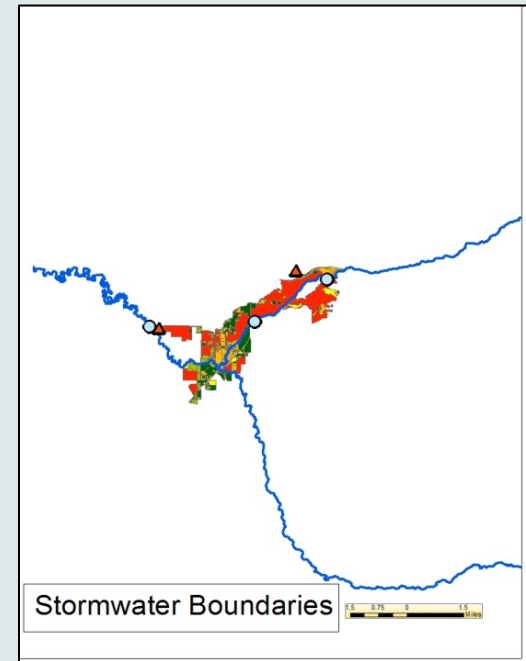
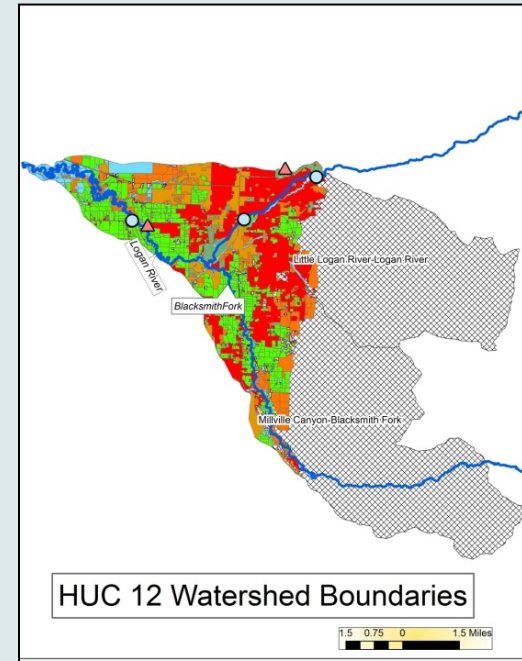
Water-Related Land Use and Key Features



Sources:

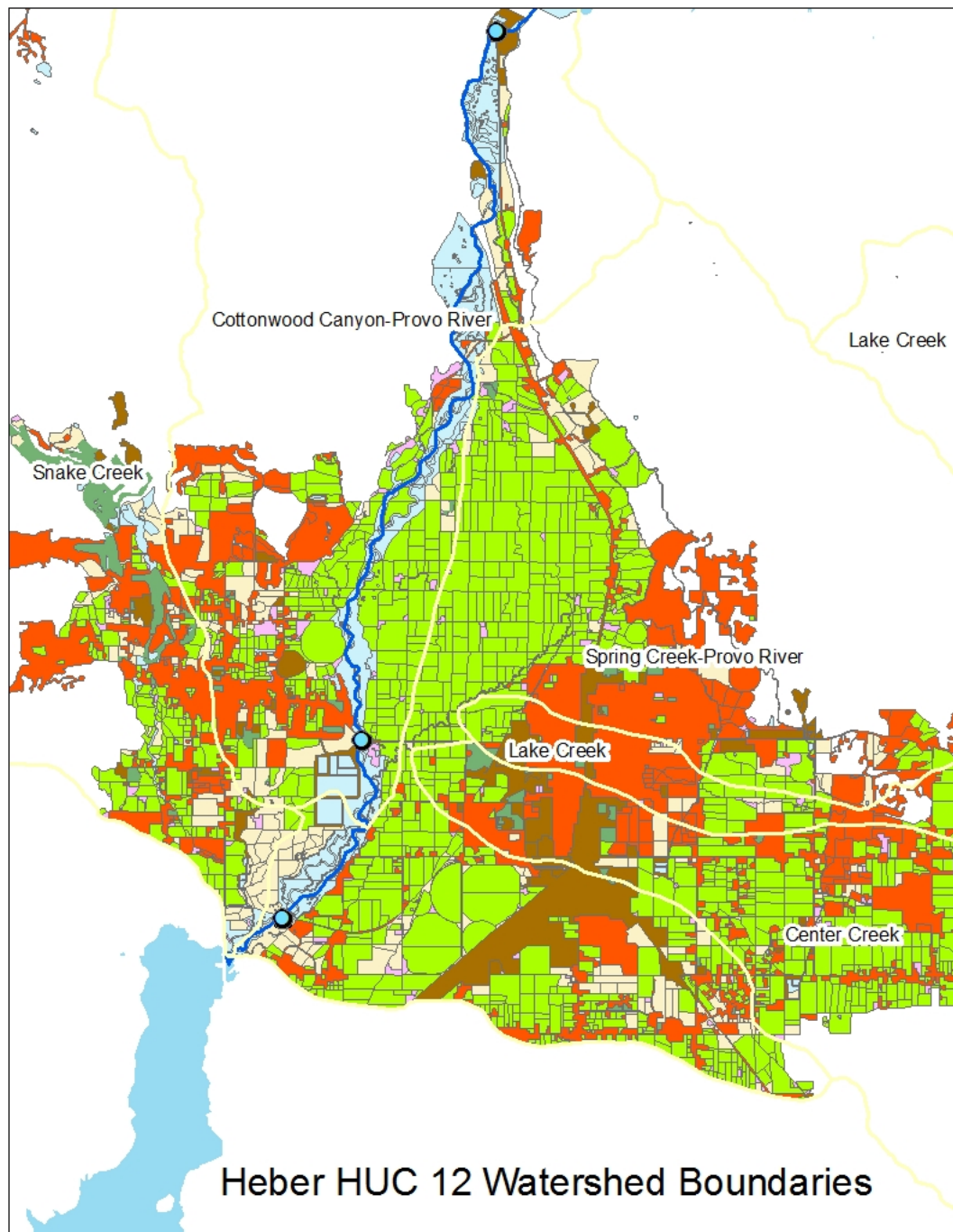
- Utah Automated Geographic Resource Center, Utah State University Environmental Engineering Department
- United States Geologic Survey Hydrologic Unit Code (HUC 12) watershed boundaries

Catchment View



USGS HUC 12

Provo River - Heber

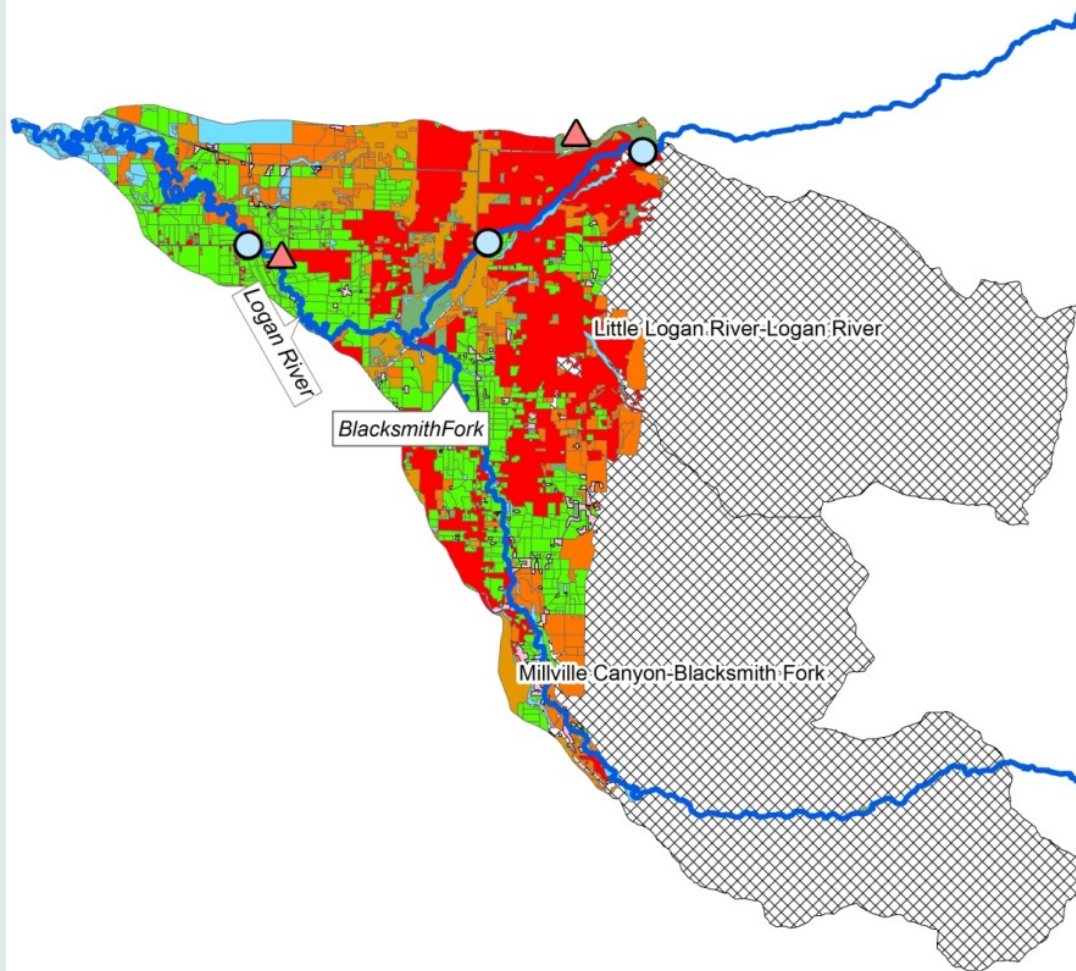


B
O
U
N
D
A
R
I
E
S

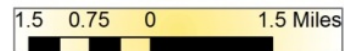


USGS HUC 12

Logan River - Logan

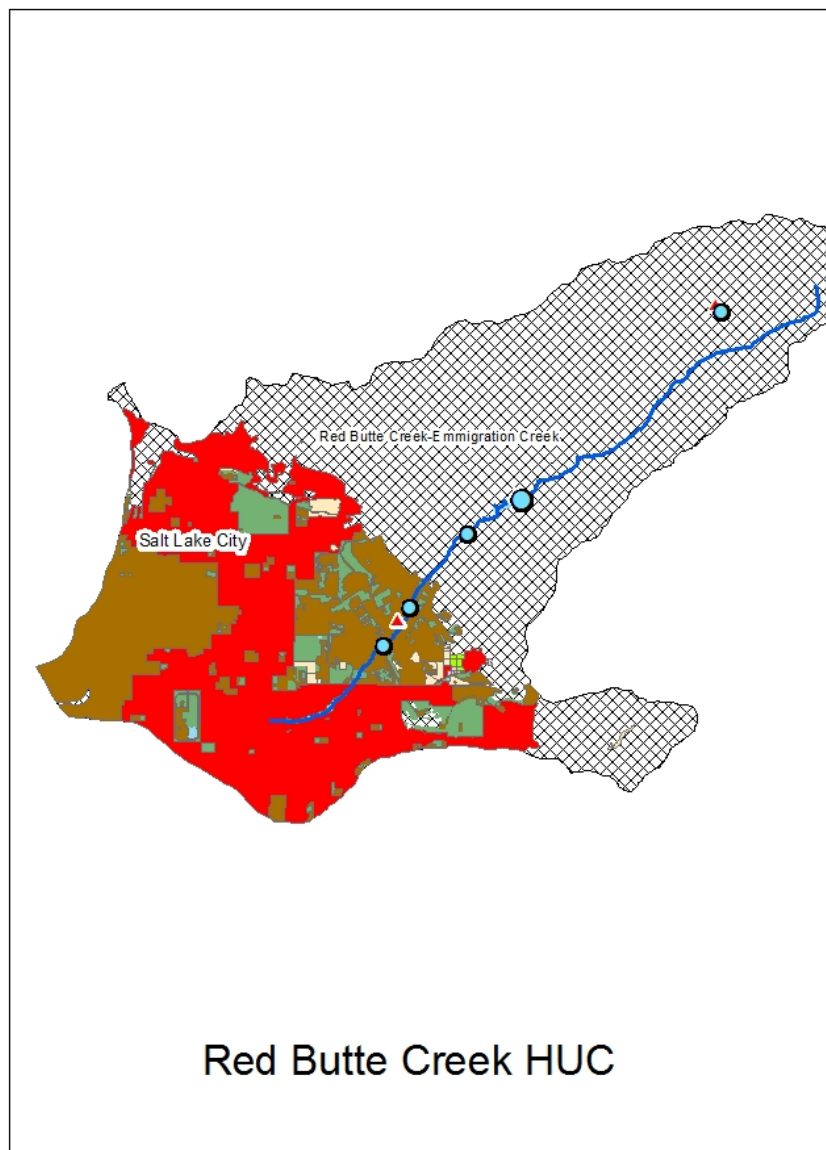


HUC 12 Watershed Boundaries



USGS HUC 12

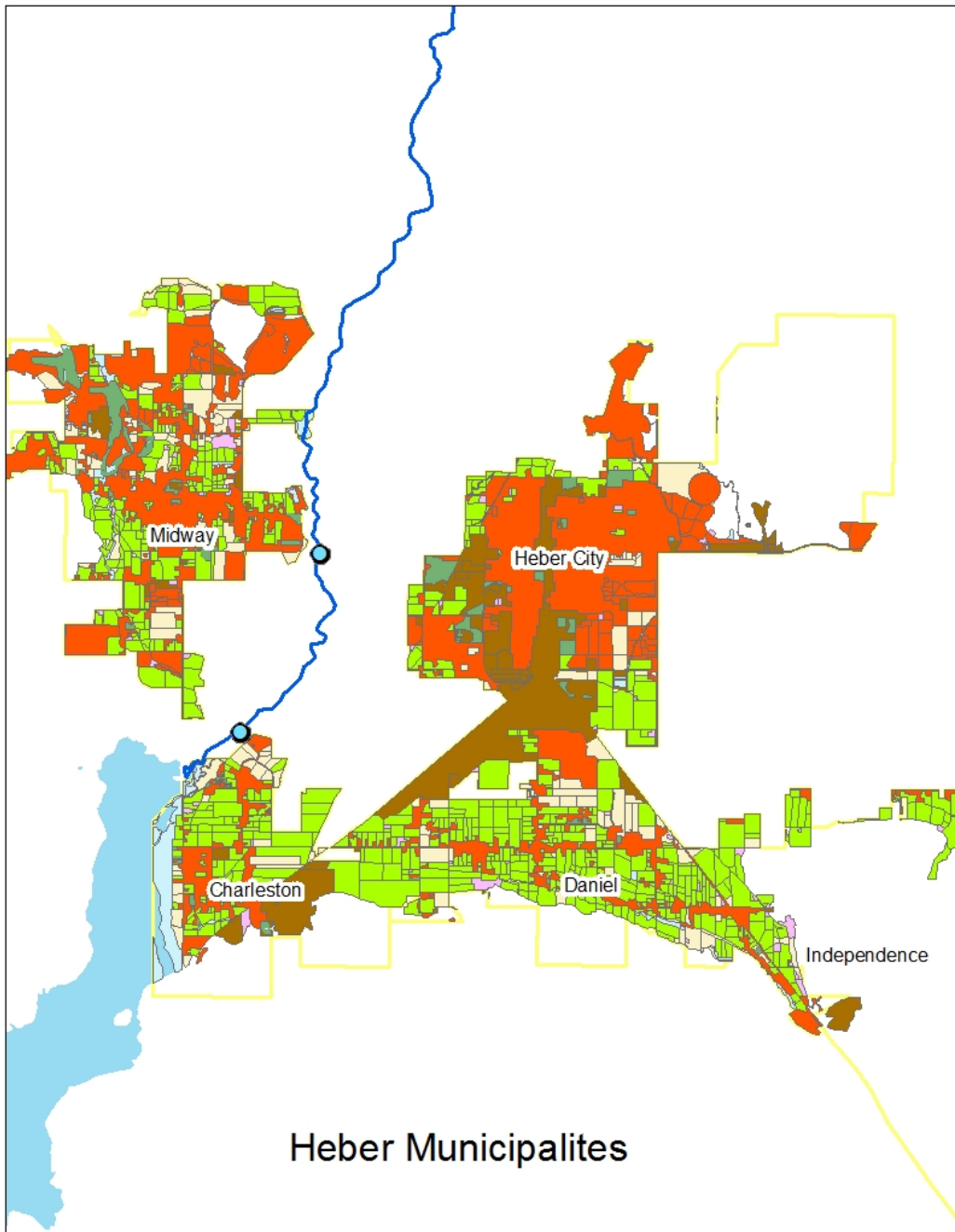
Red Butte - SLC



Municipal

Provo River – Heber Area

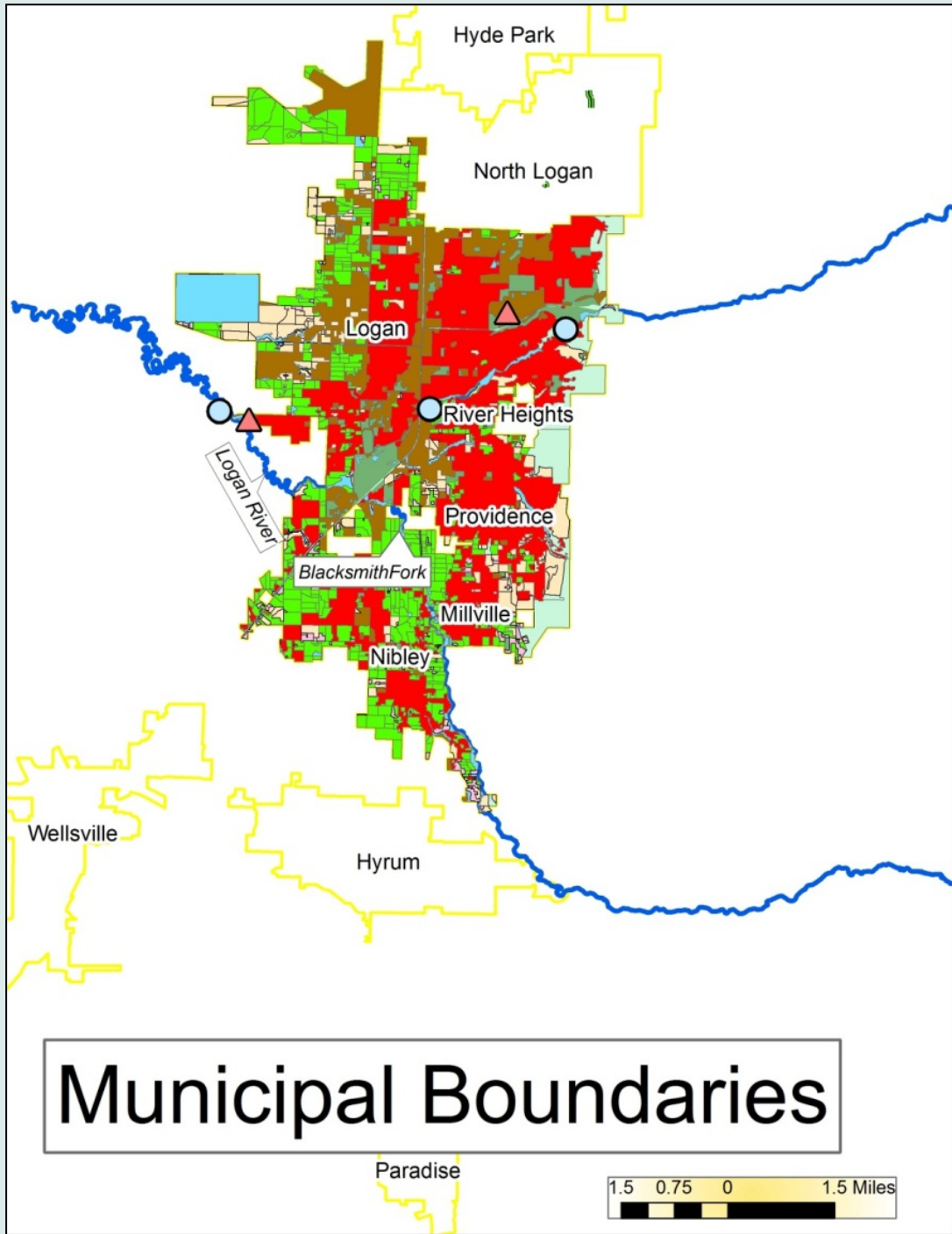
B
O
U
N
D
A
R
I
E
S



Municipal

Logan River - Logan Area

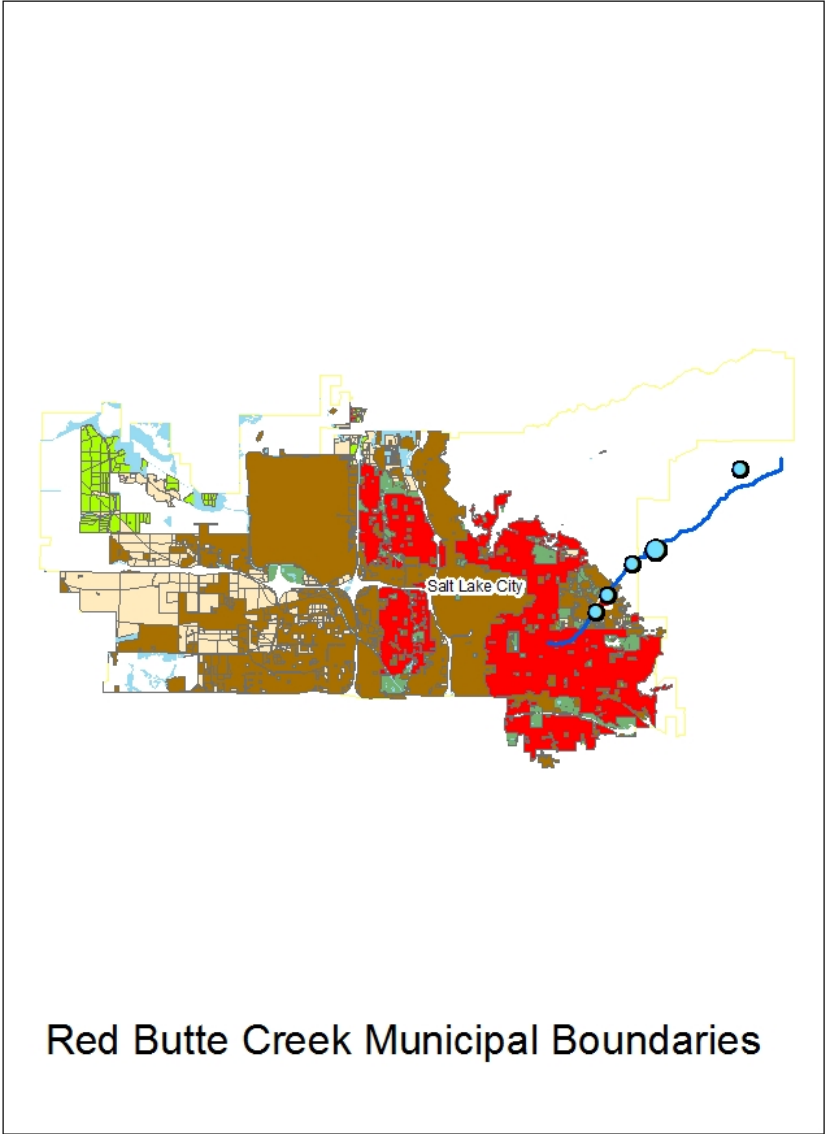
B
O
U
N
D
A
R
I
E
S



Municipal

Red Butte - SLC Area

B
O
U
N
D
A
R
I
E
S

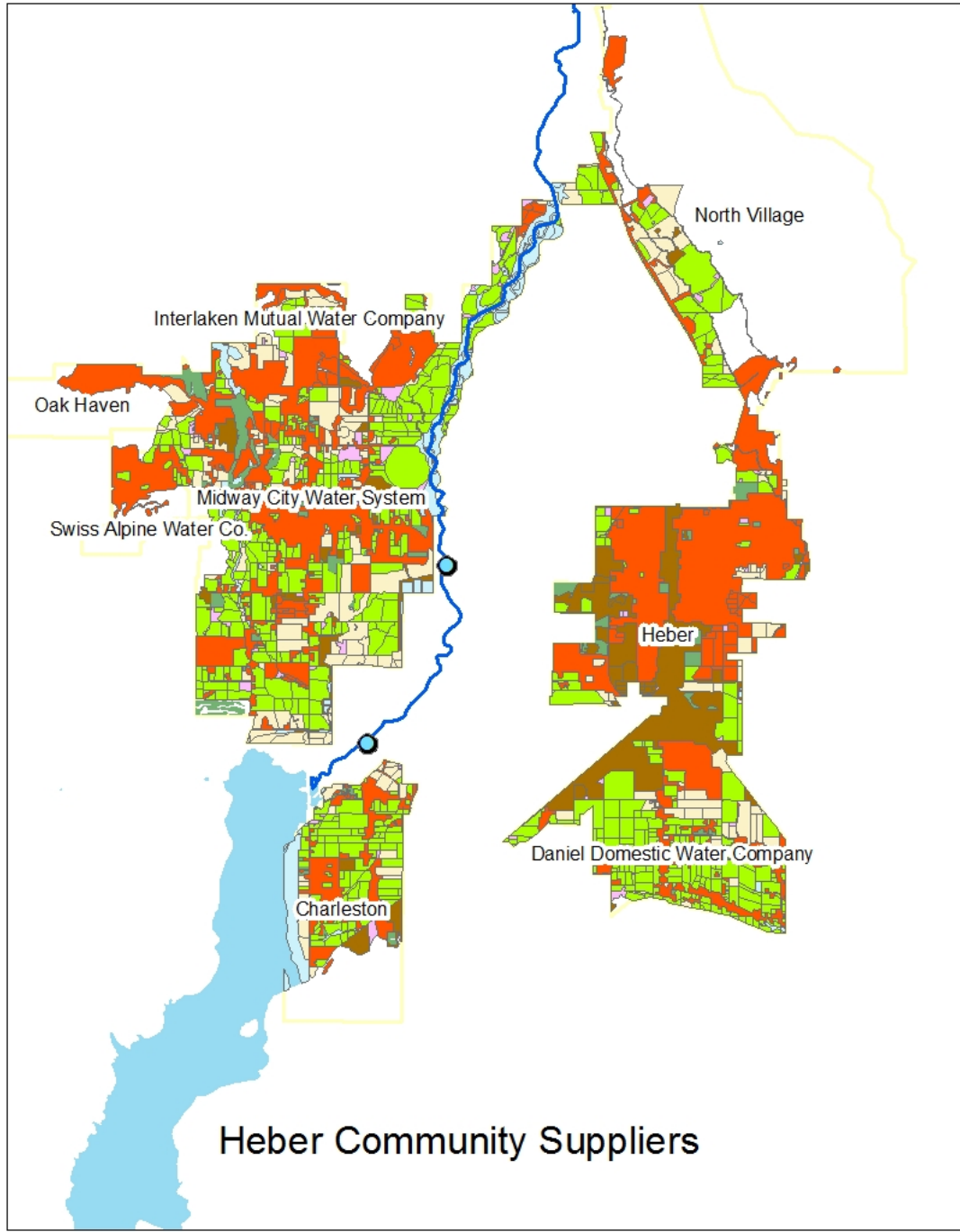


Red Butte Creek Municipal Boundaries



Community Water Providers

Provo River – Heber Area

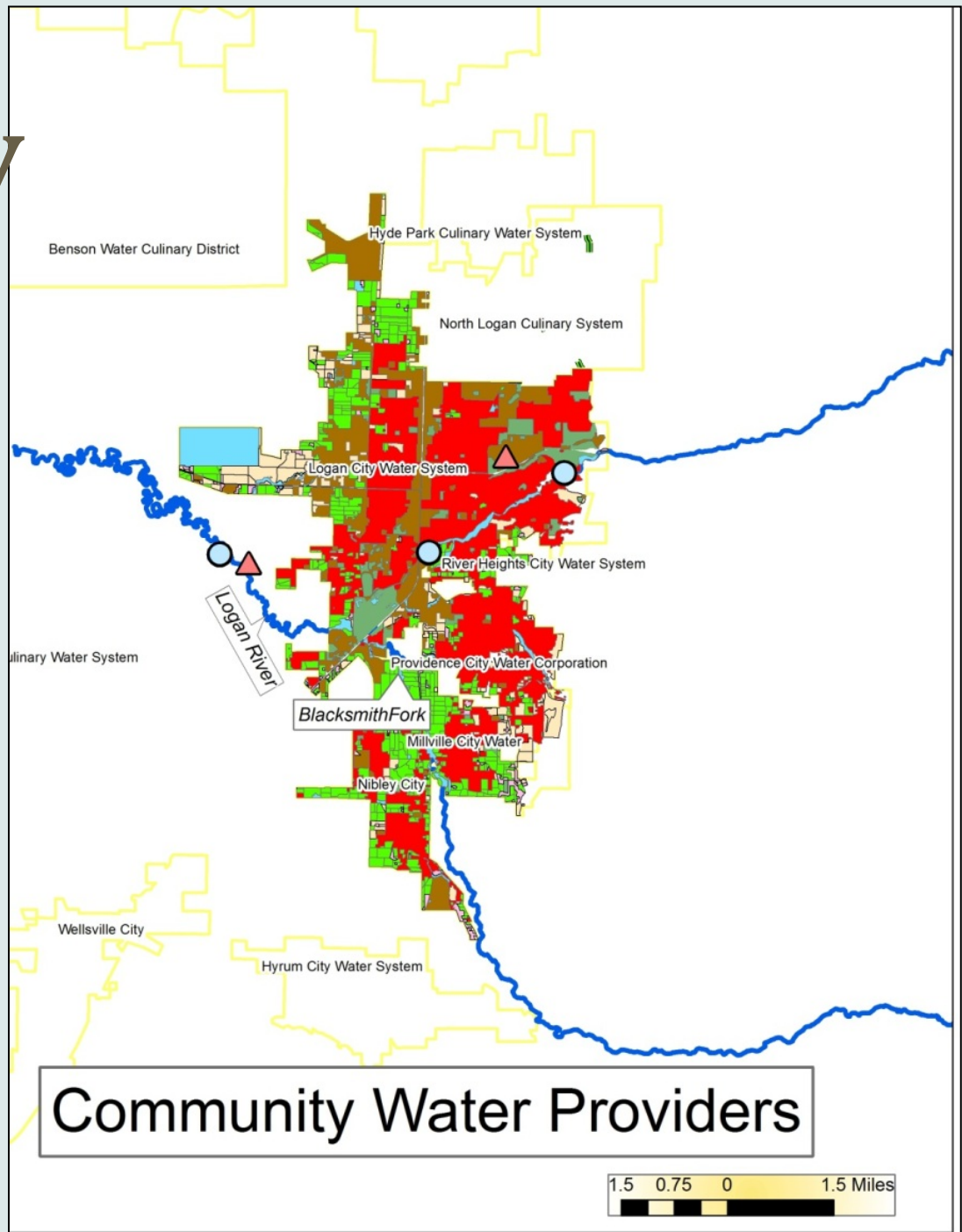


B
O
U
N
D
A
R
I
E
S



Community Water Providers

Logan River – Logan Area

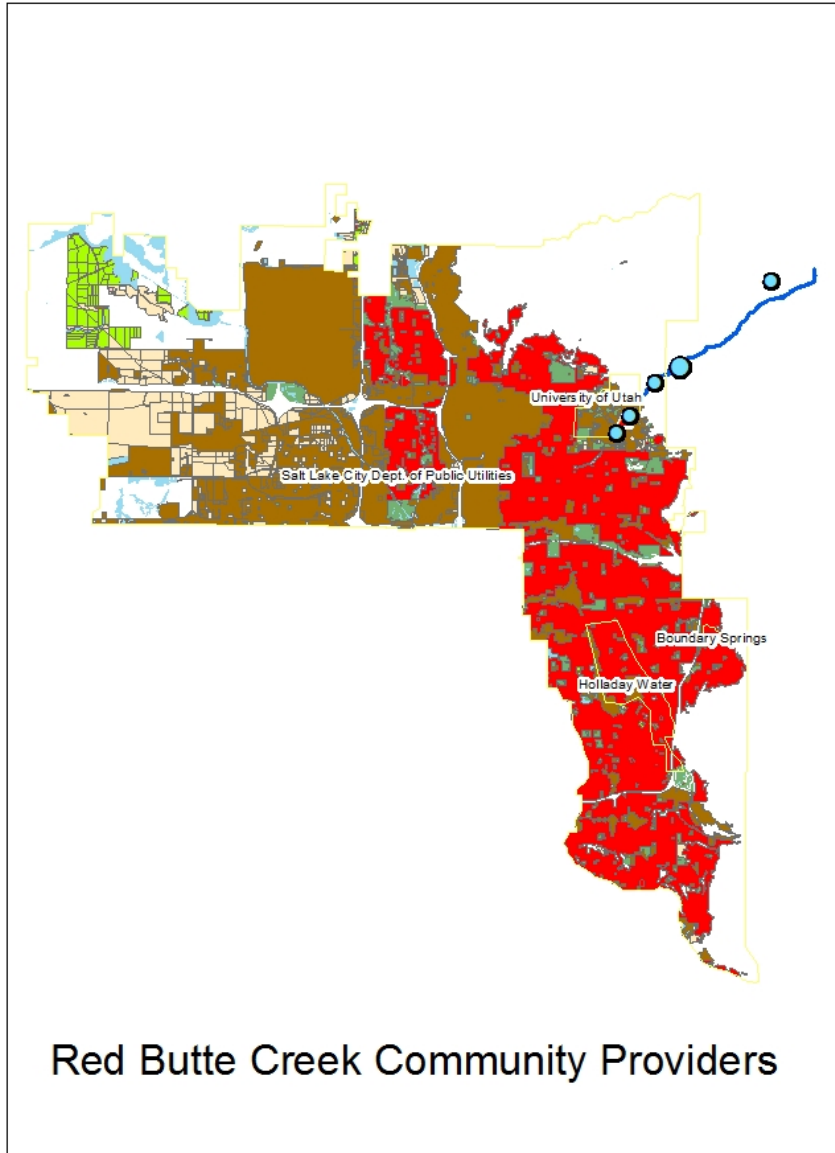


B
O
U
N
D
A
R
I
E
S



Community Water Providers

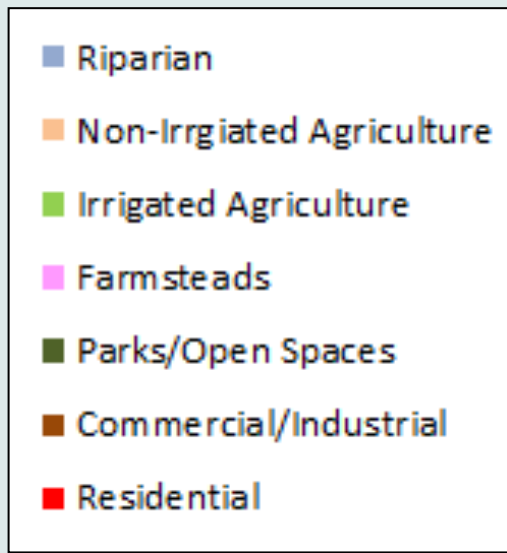
Red Butte – SLC Area



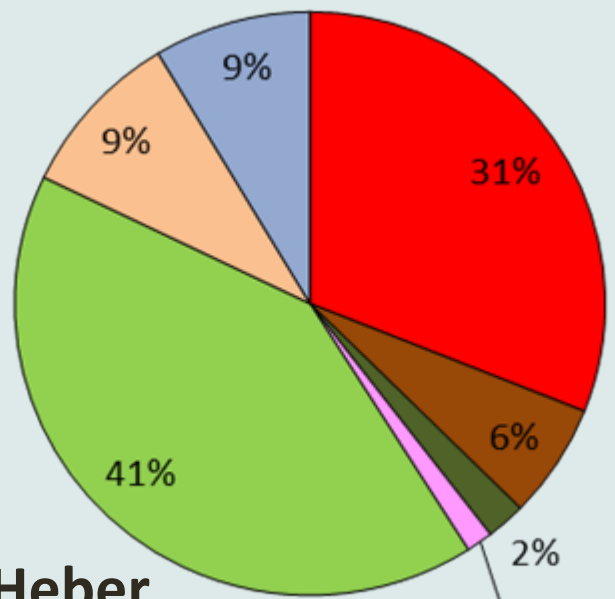
B
O
U
N
D
A
R
I
E
S



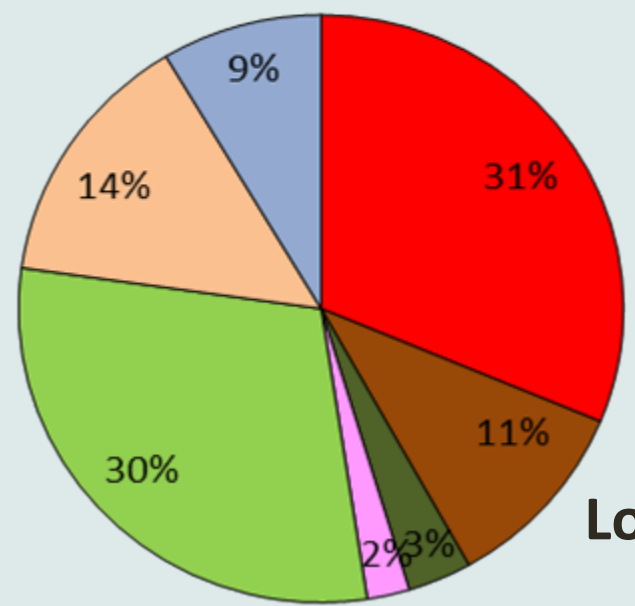
Comparison of HUC 12 Contributing Land Uses by Urban River



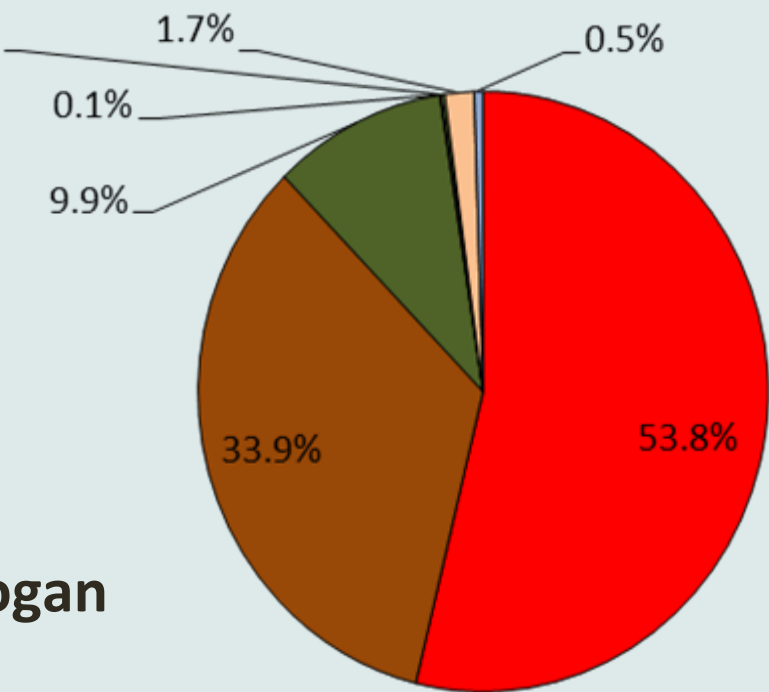
Heber



Logan

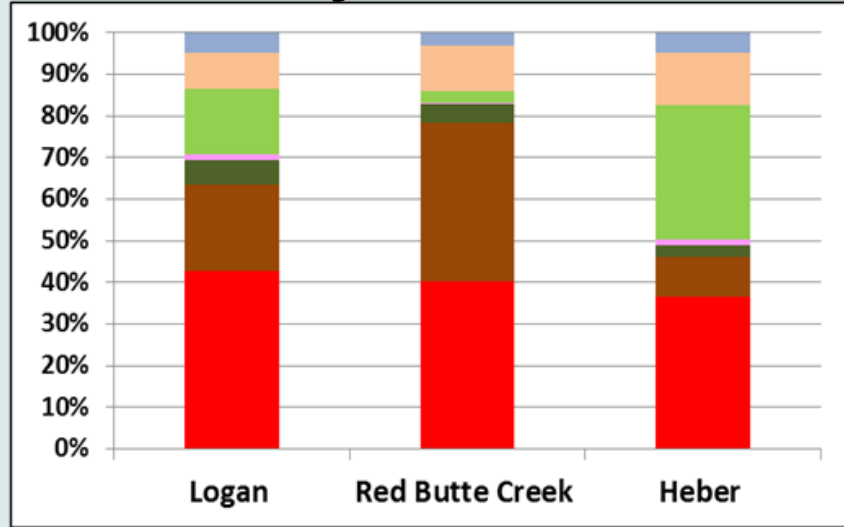
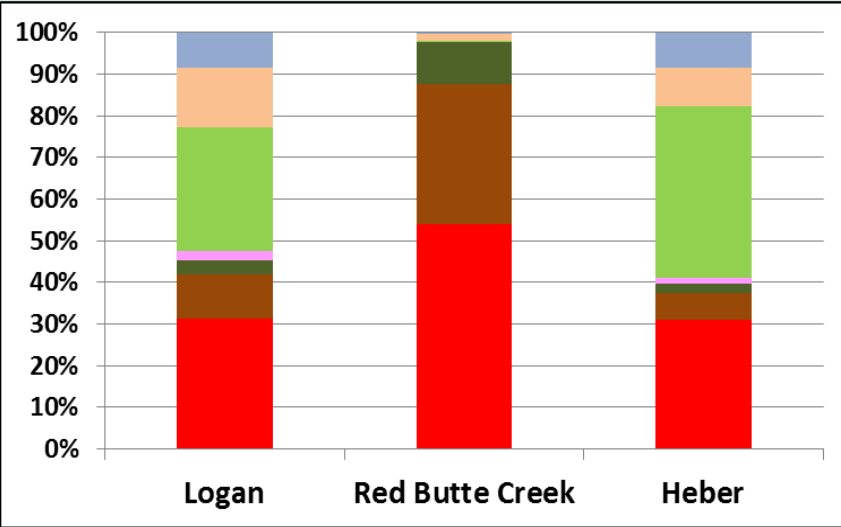


Red Butte Creek

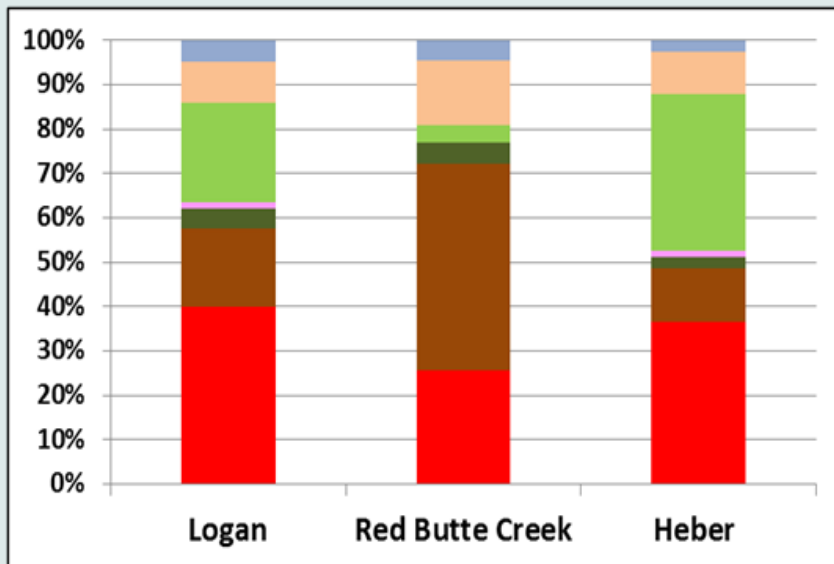


HUC 12 Watersheds

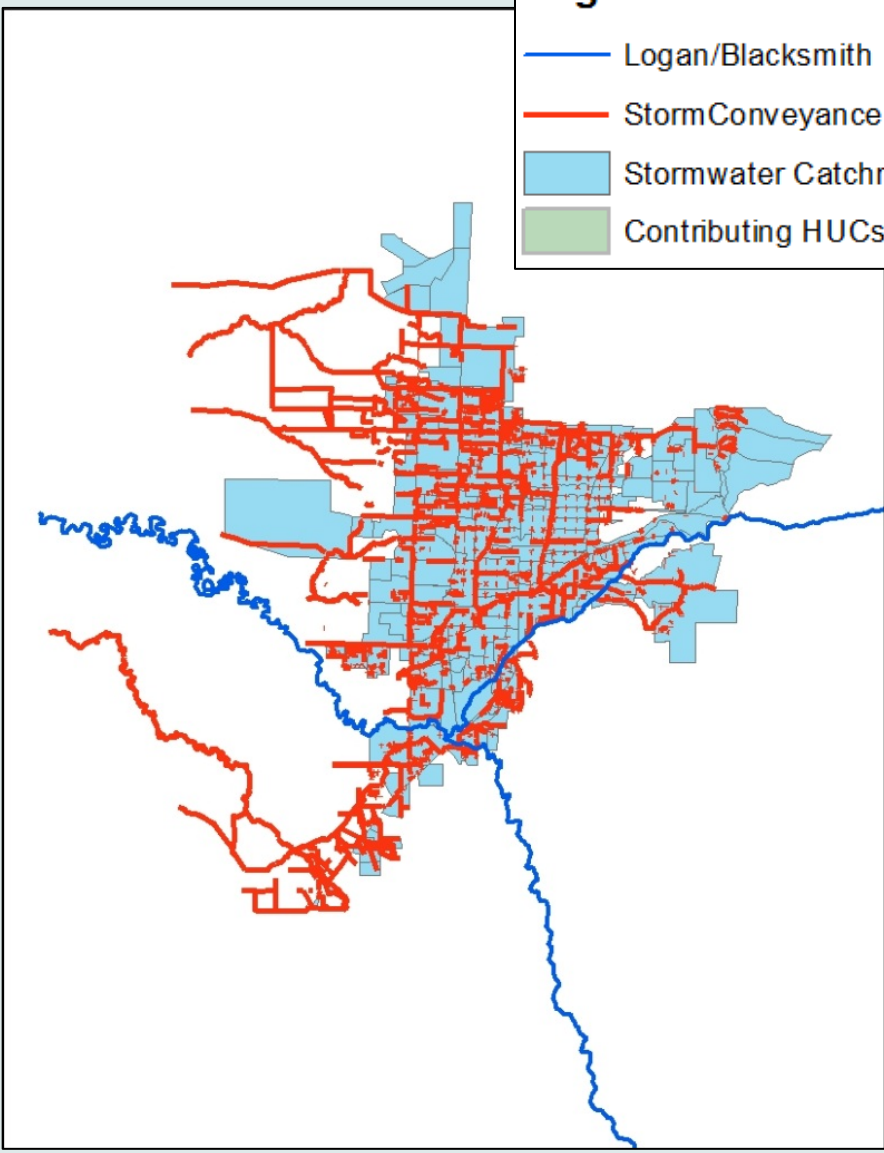
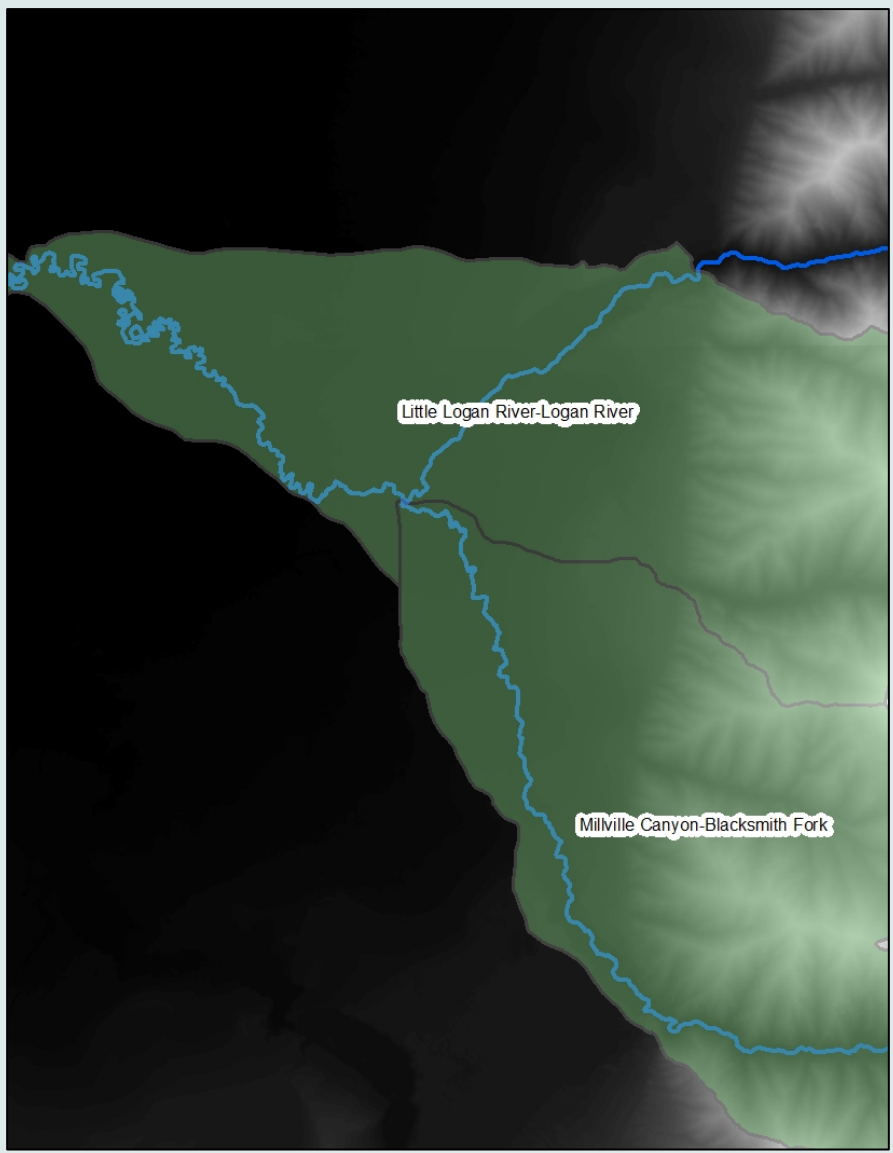
Community Water Providers



Municipal Boundaries



HUC catchments are derived primarily from topography, and can be less accurate in urban GAMUT areas. Storm water catchment data were only available for Logan GAMUT

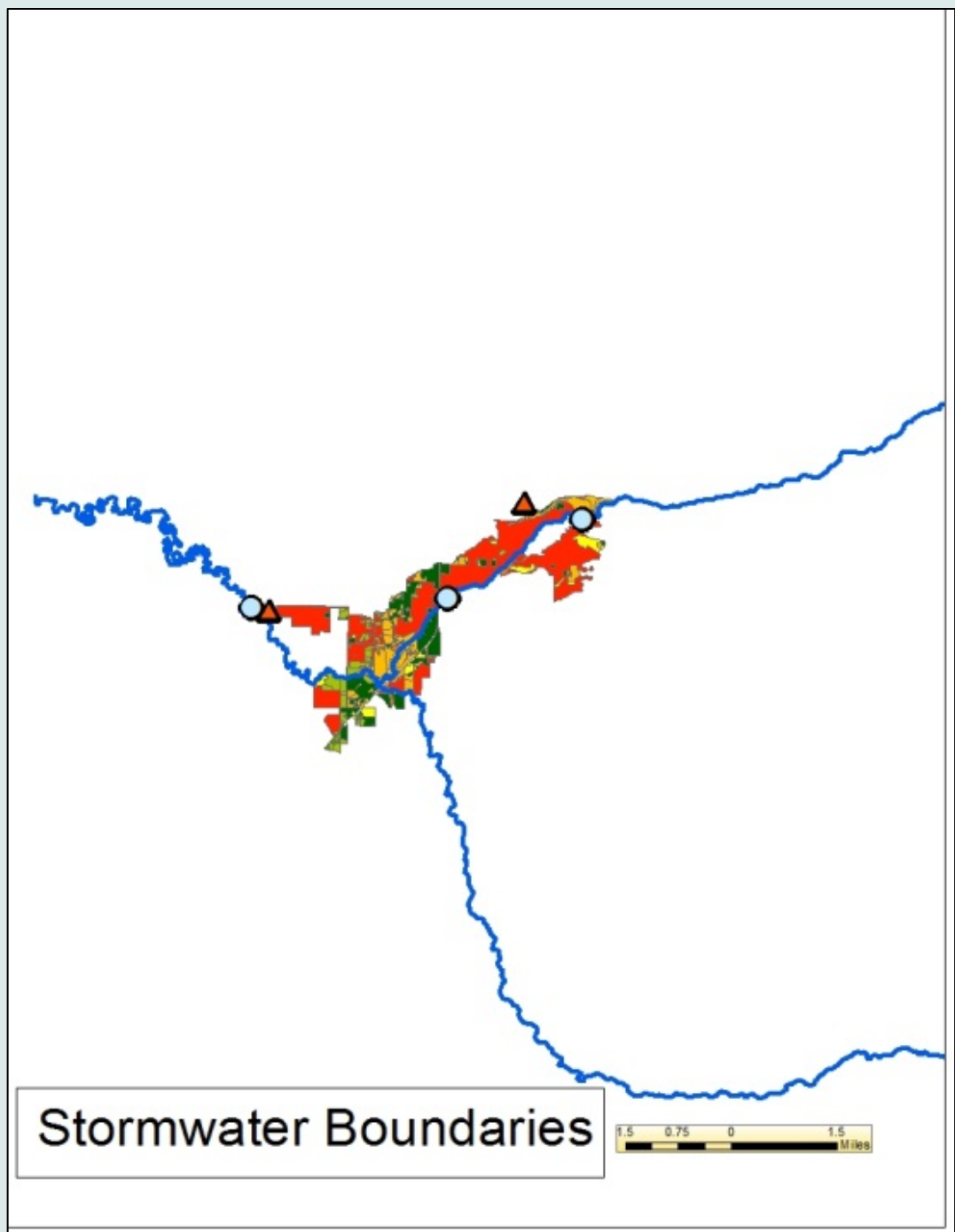


Legend

- Logan/Blacksmith
- StormConveyance
- Stormwater Catchment
- Contributing HUCs



Logan Area Storm Water Catchment Boundaries

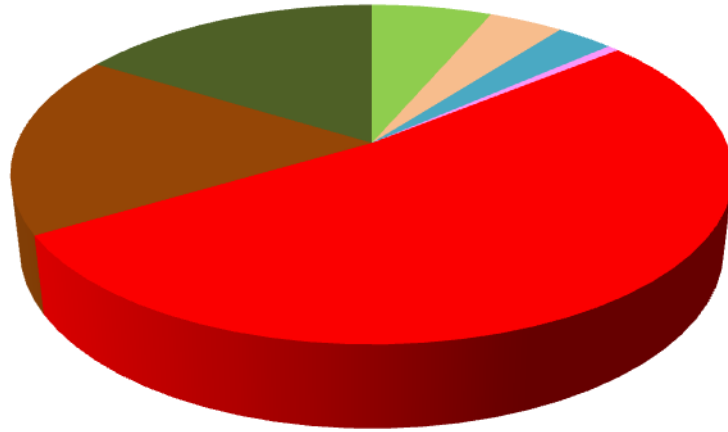


B
O
U
N
D
A
R
I
E
S



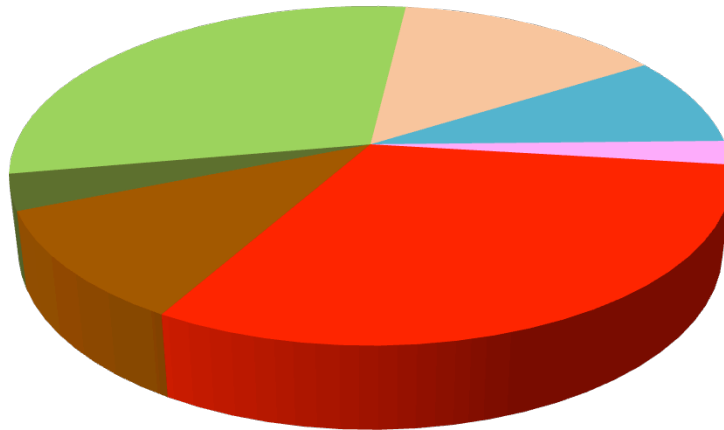
Storm Water: appears to be an important window for studying urban water quality

Logan Stormwater



- IRRIGATED AGRICULTURE
- NON-IRRIGATED AGRICULTURE
- RIPARIAN/WATER
- FARMSTEADS
- RESIDENTIAL
- COMMERCIAL/INDUSTRIAL
- PARKS/OPEN SPACES

Logan HUCs



Conclusions

- Land use in urban GAMUT contributing areas is important to understand human impacts on water quality in GAMUT river reaches.
- “Windows” on bounding these contributing areas include HUC watersheds, storm water catchments, municipal boundaries, and community water providers.



Conclusions

- Water-related land use in GAMUT areas shows a rural to urbanizing to urbanized gradient and we mapped the details.
- Catchment view and Governance view can answer different questions.
- Storm water catchments appear to be an important window into urban water quality.
- Future research should delineate storm water catchments for other GAMUT areas in addition to Logan River.



Thank You iUTAH!

IFELLOWS UNDERGRADUATE RESEARCH PROGRAM



dustypilkington@mail.weber.edu

