

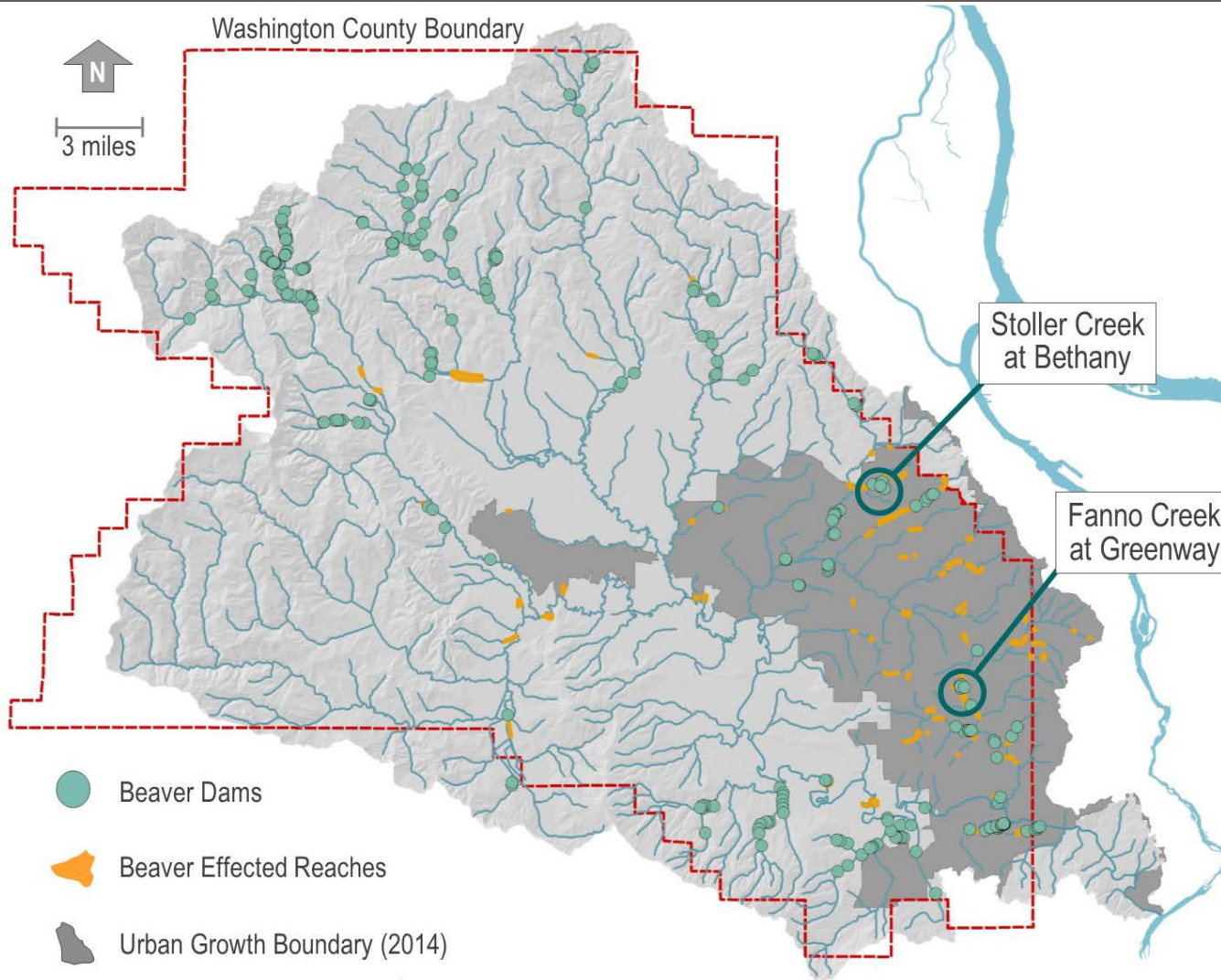


Effects of Beaver Dams on Surface Water Flow During Storm Events in an Urban Landscape



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Project Background



USGS and Clean Water Services – local wastewater and stormwater utility

Urban Growth Boundary: minimize urban encroachment onto farm and forest land

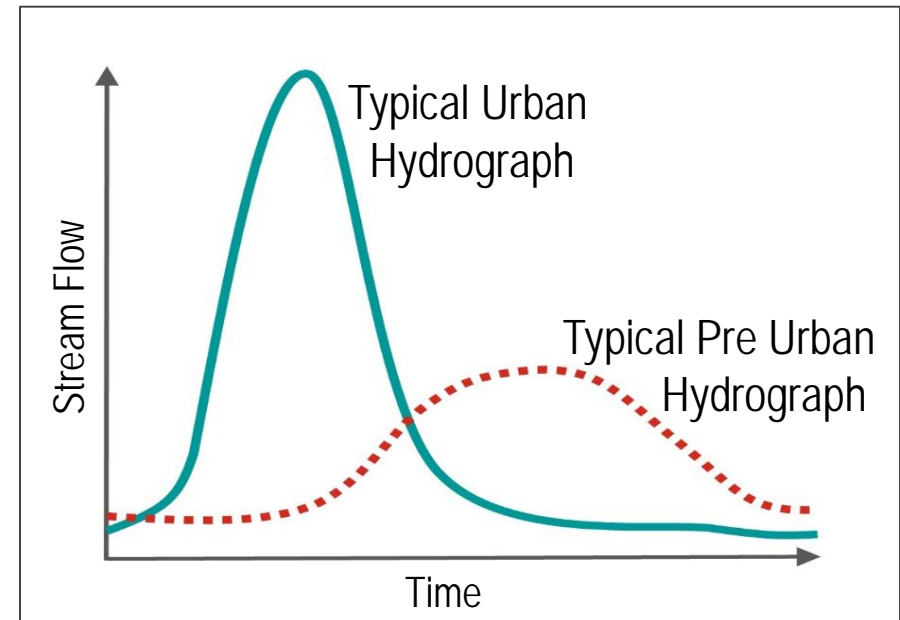
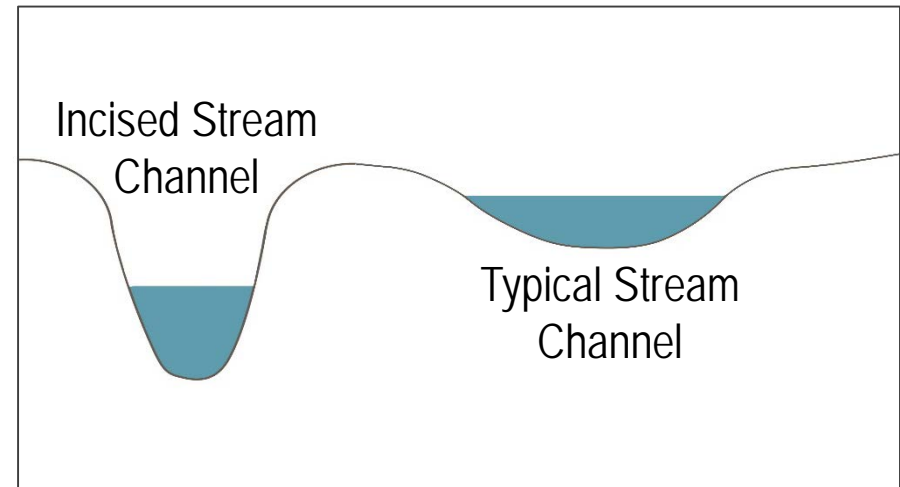
Vast majority of the population of the Tualatin Basin lives within the urban growth boundary

Streams flow through a dense urban landscape, thus inheriting issues typical of urban streams

Urban Streams

Common issues in urban streams:

- ✓ High velocity pulse of water during storm events
- ✓ Stream bank erosion and incision
- ✓ Disconnection from floodplain
- ✓ Straightening of the stream channel
- ✓ Changes in stream temperature, dissolved oxygen and other water quality parameters
- ✓ Degradation of riparian habitat



Management Techniques

Out of stream tools:

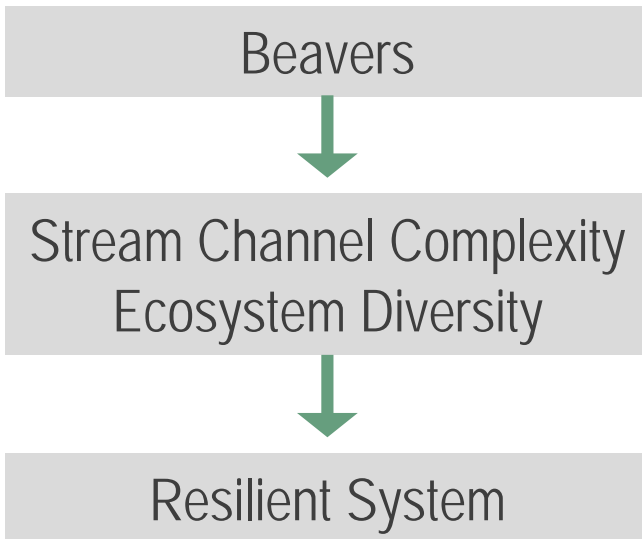
- Upland detention facilities
- On-site stormwater management
- Proper land-use planning
- Low impact development

In-stream tools:

- Floodplain reconnection
- Channel modification
- **BEAVERS?**



Beavers Have Superpowers!

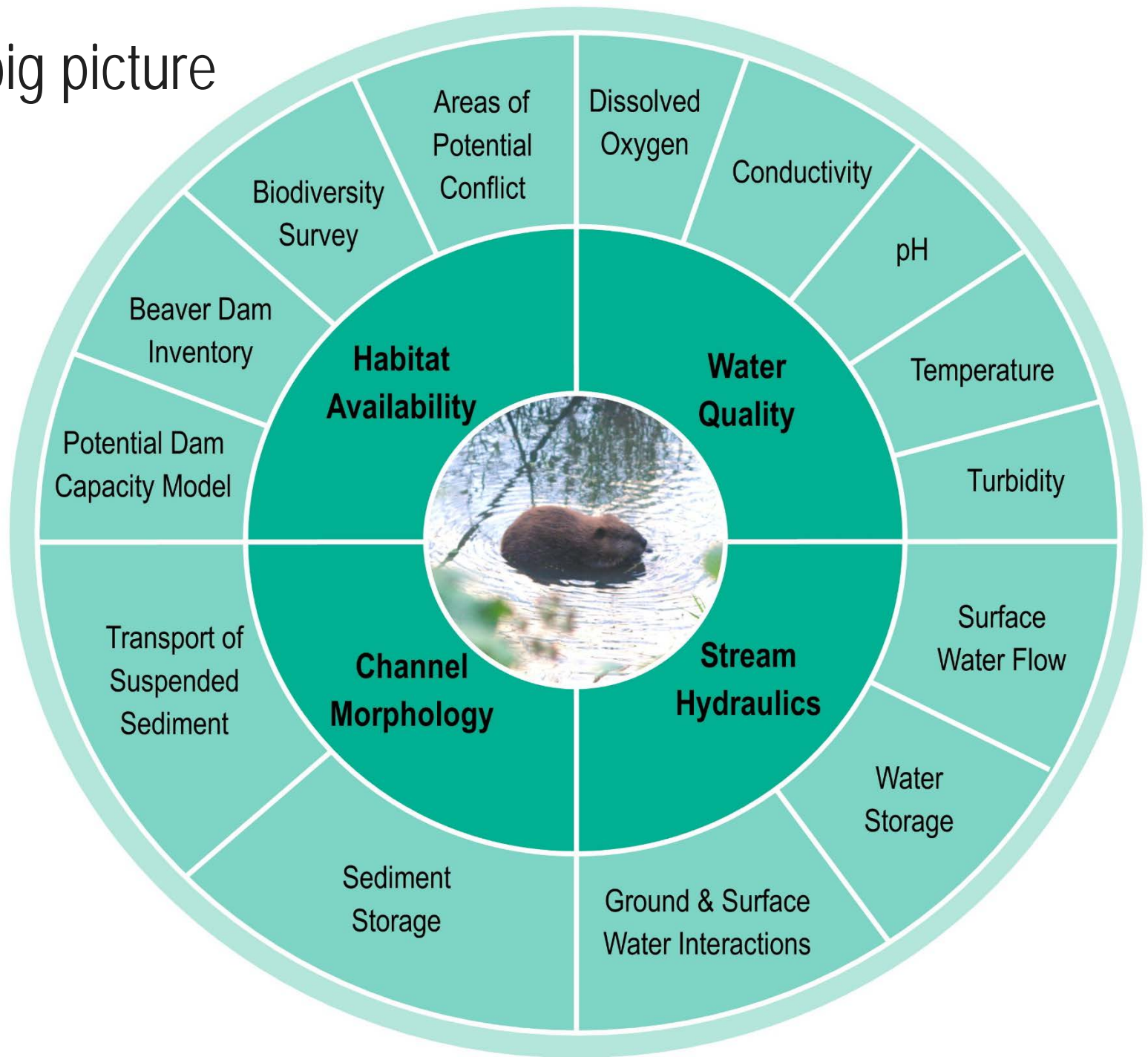


- Impede surface water flow
- Decrease velocity
- Increase water storage
- Disperse water across the landscape
- Trap and store sediment



No published research
on beavers in urban
ecosystems

The big picture



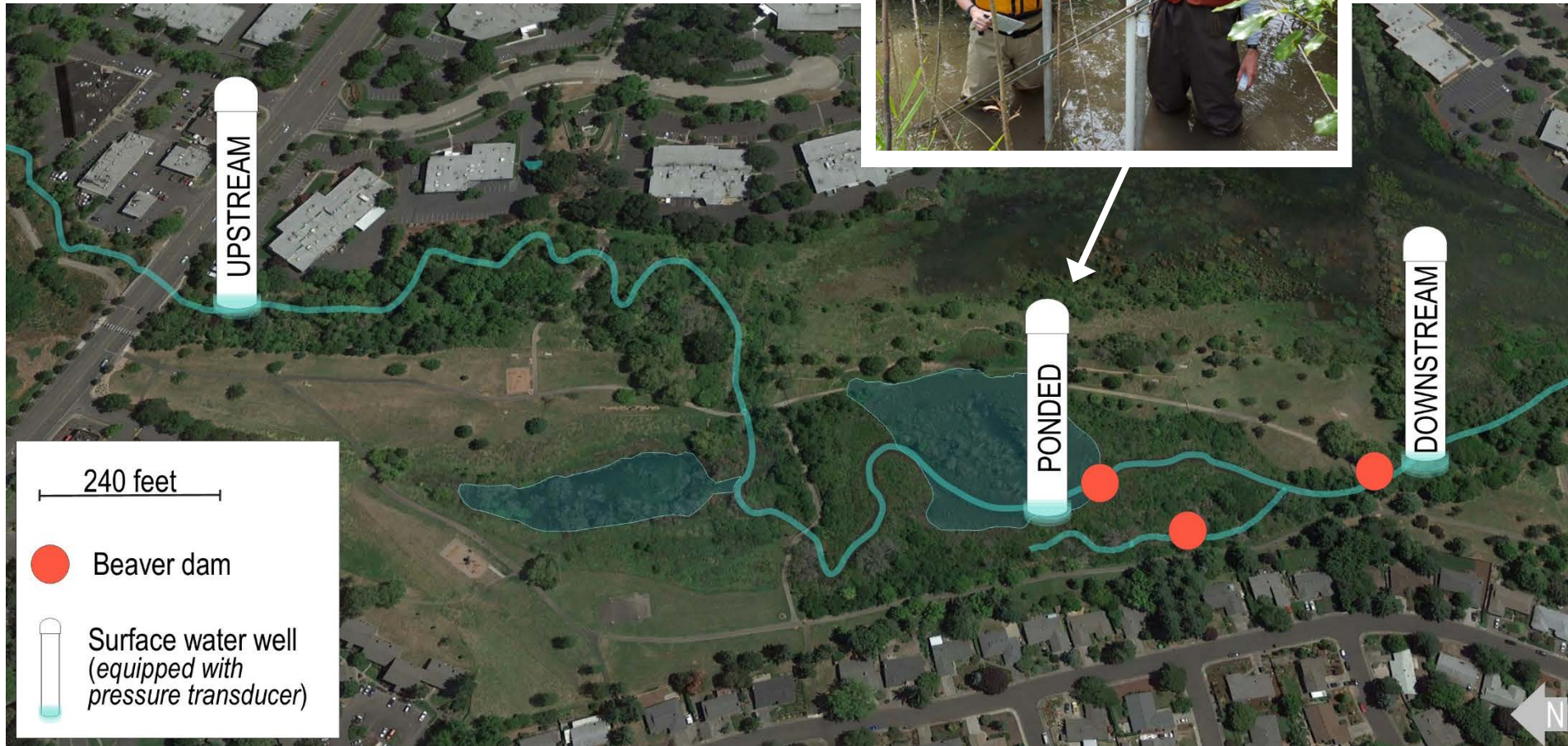


Objective

Determine if the presence of beaver dams and ponds in urban stream reaches in the Tualatin River basin, attenuates surface water flow during storm events

Site 1 – Fanno Creek

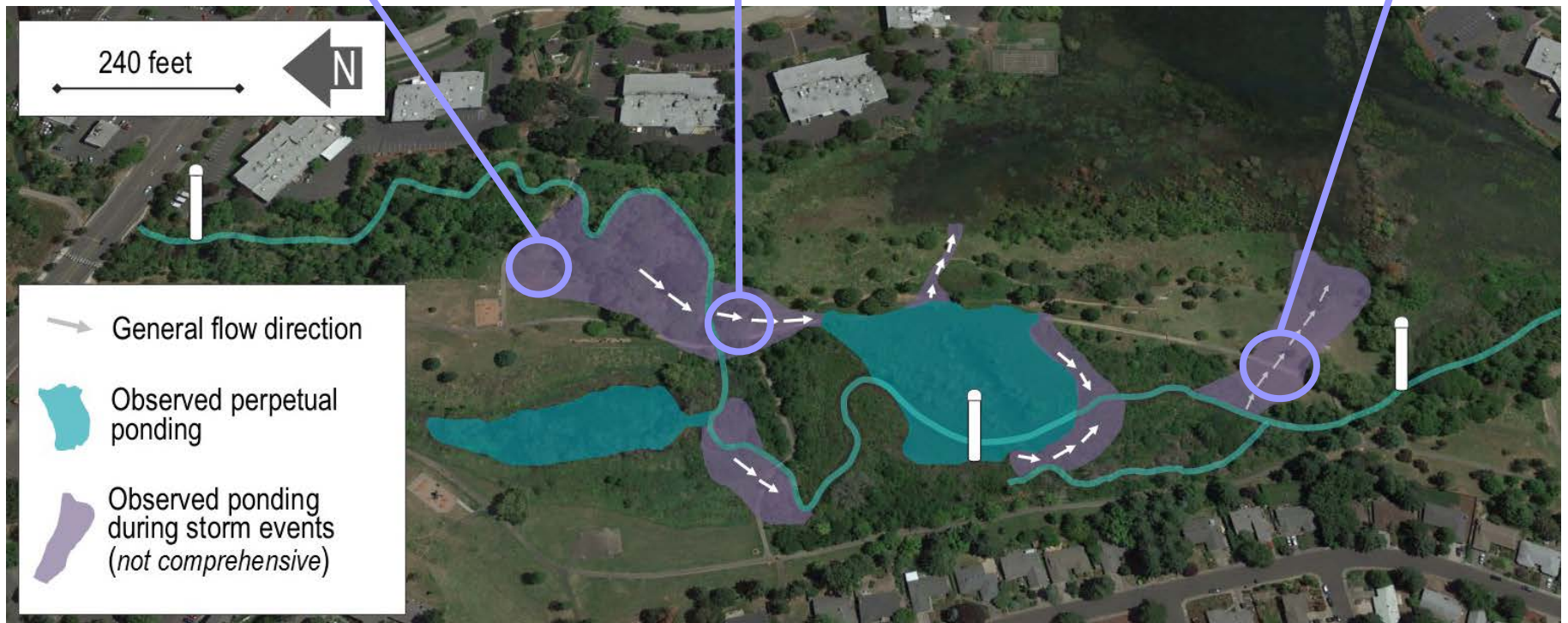
Approximately 0.55 river miles from upstream well to downstream well



Source: Google Earth, 23 July 2016, Greenway Park

Site 1 – Fanno Creek

Source: Google Earth, 23 July 2016, Greenway Park



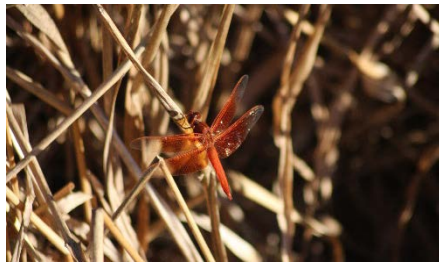
Site 2 - Stoller Creek

Approximately 0.56 river miles from upstream well to downstream well

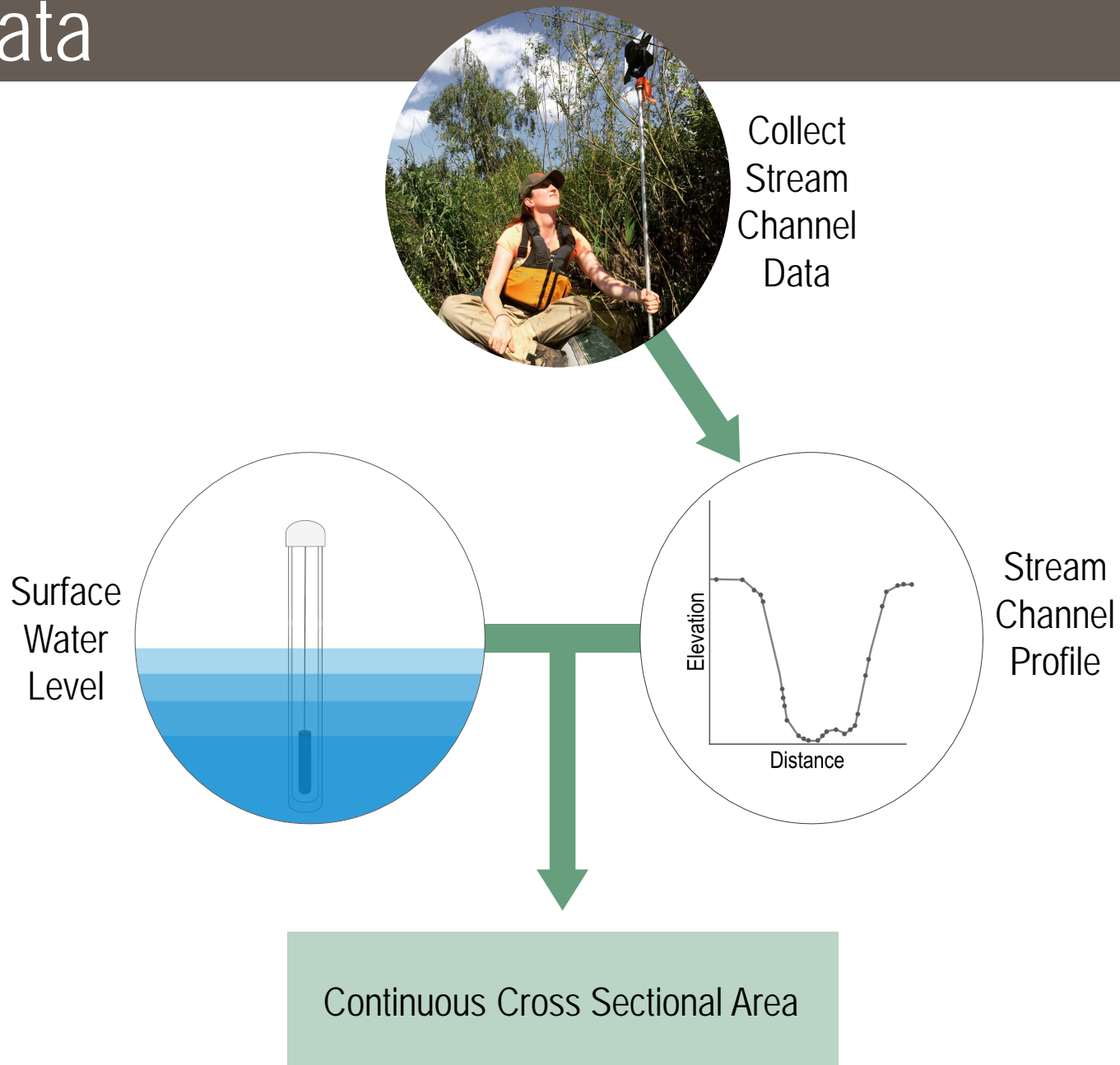
Source: Google Earth, 23 July 2016, Greenway Park



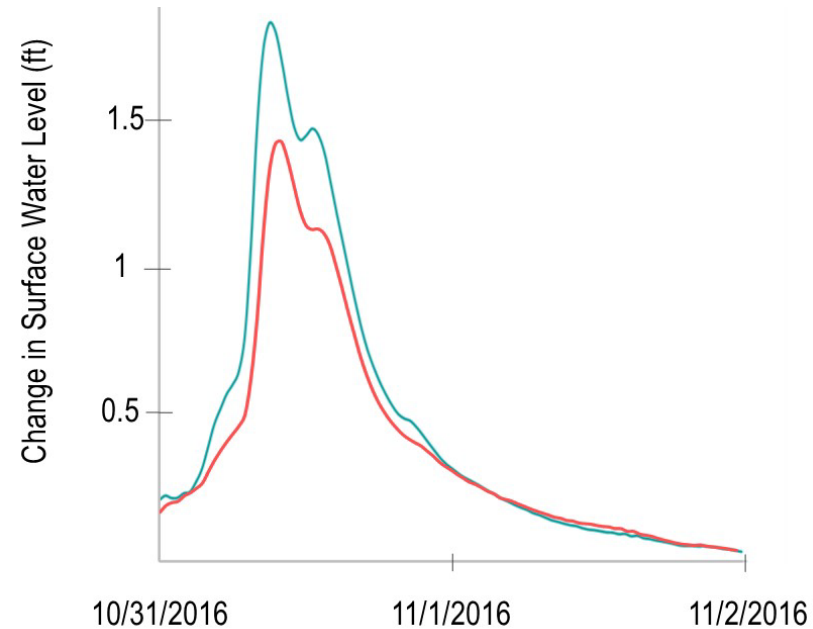
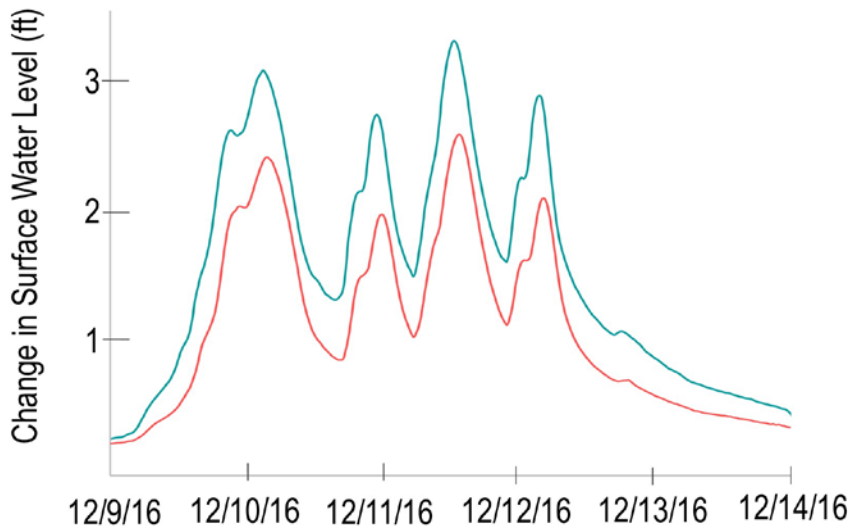
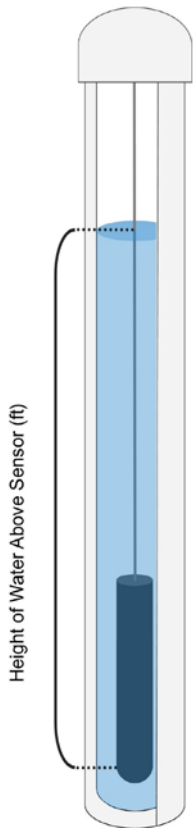
Site 2 – Stoller Creek



Data



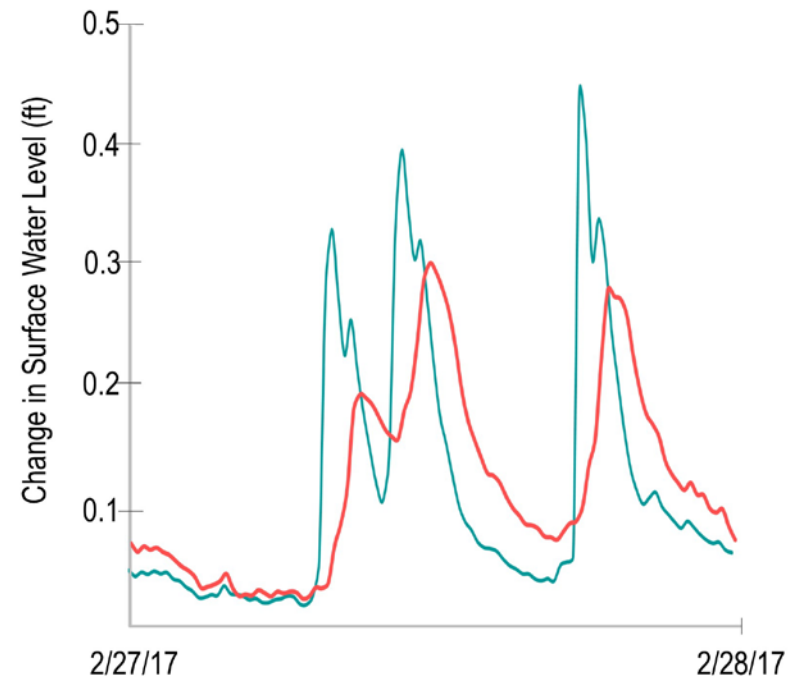
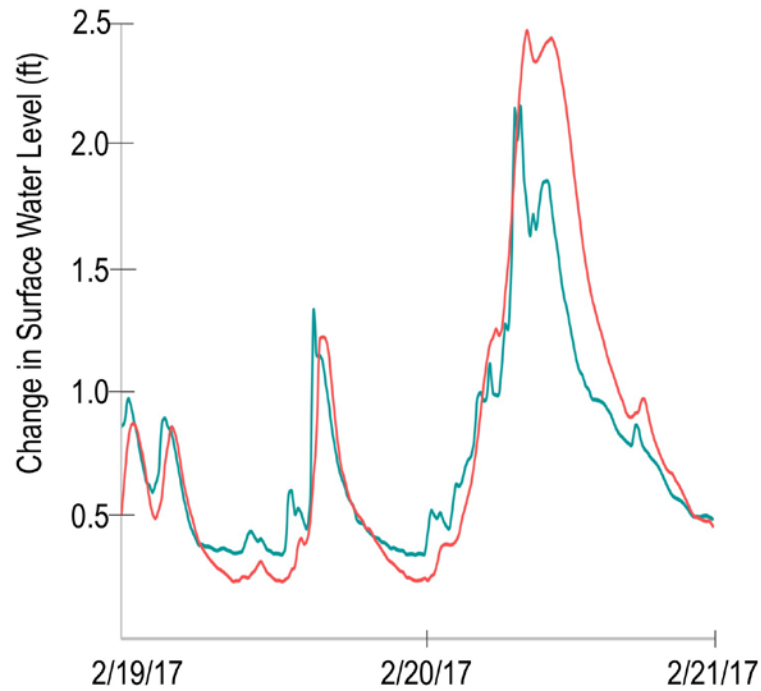
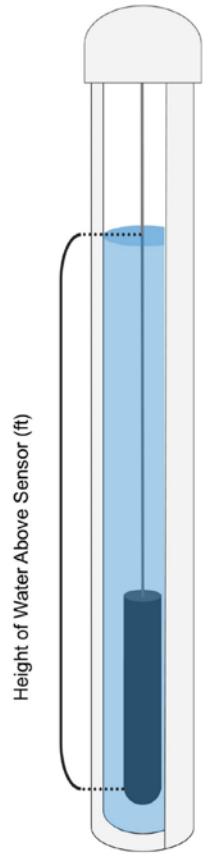
Storm Events at Fanno Creek



Upstream

Downstream

Storm Events at Stoller Creek



Upstream

Downstream

Next...

1

Data collection

- Continue collecting data through Fall 2017

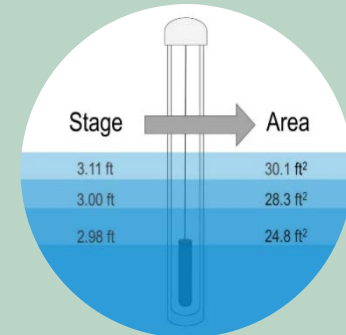


Photo Credit: Steven Murschel

2

Work up data

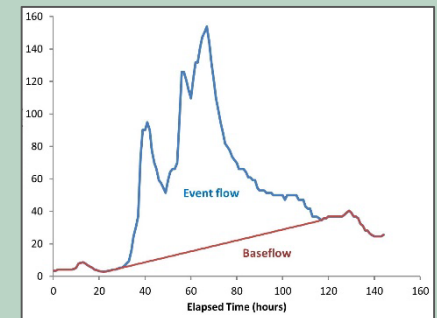
- Continuous area variable as surrogate for discharge



3

Data analysis

- Magnitude/duration of storm events
- Changes in surface water storage
- Stream flashiness throughout the water year





Data from the urban beaver study will...

Provide a better understanding of how beavers influence urban landscape

Support strategic management and planning decisions

Inform where to support or discourage beaver activity



Pregnant Beaver at Stoller Creek



<https://youtu.be/akpn9ps6bFM>

Thanks to my advising professor Jen Morse, my committee members Stewart Rounds and Krista Jones, and my lab mates.



Tall dam at Fanno Creek, Greenway Park