

Can Green Stormwater Infrastructure Protect the Creek from Suburbia?

**Katie Holzer
Watershed Scientist
City of Gresham
katie.holzer@greshamoregon.gov**

Stormwater Pollution to Streams

- Runoff from impervious surfaces (roads, roofs, driveways, parking lots, sidewalks):
 - Generally goes directly to streams
 - Delivers extra water to streams
 - Picks up pollutants
 - Nutrients
 - Metals
 - Pesticides/herbicides



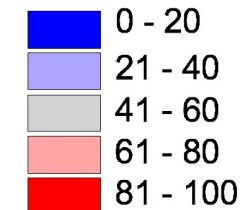
Future Construction in Kelley Creek Basin

Kelley Creek

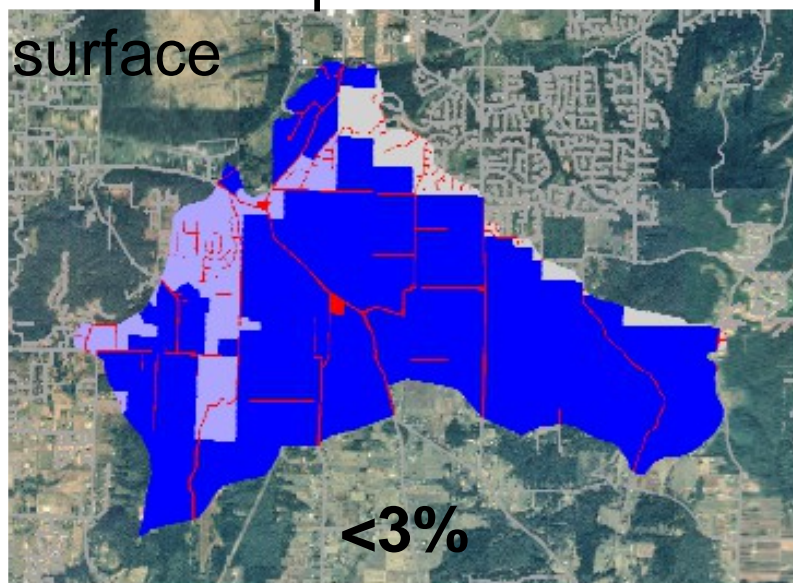


LEGEND

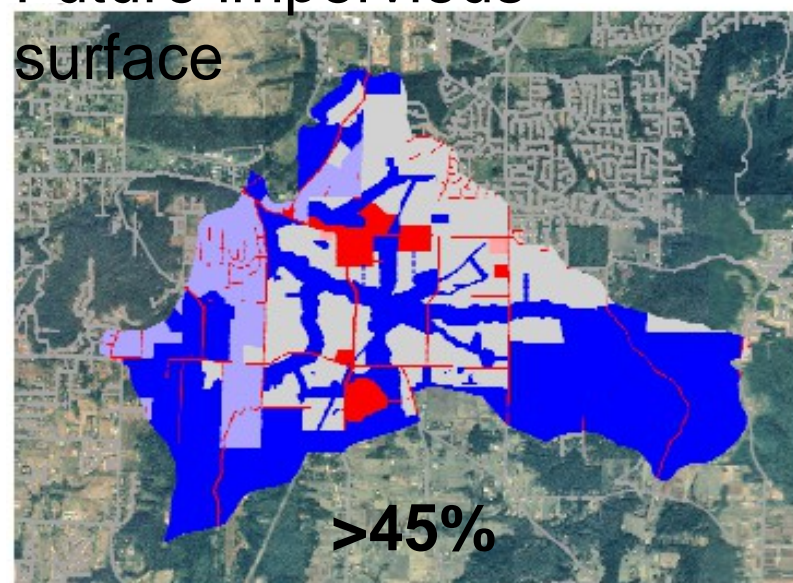
Impervious Percentage



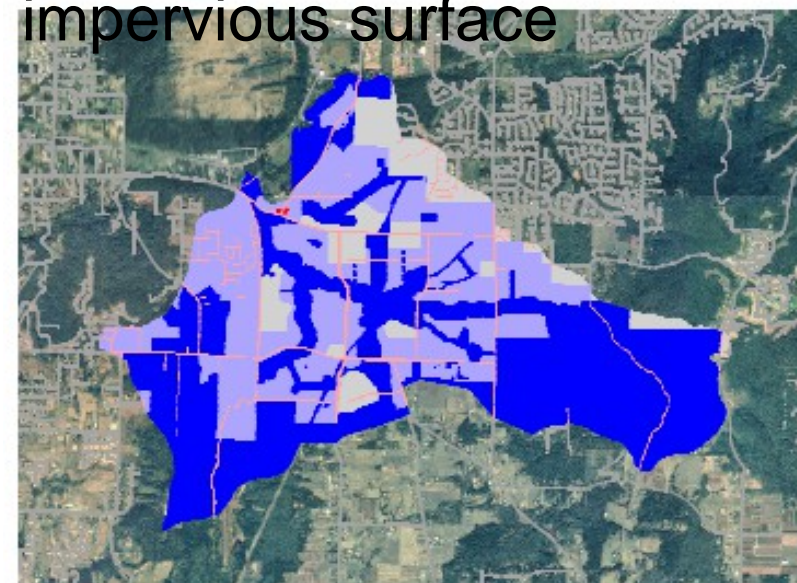
Current impervious surface



Future impervious surface



Future "effective" impervious surface



Green Stormwater Infrastructure

- Street-side stormwater planters (rain gardens)
- Regional vegetated water quality facilities (ponds)

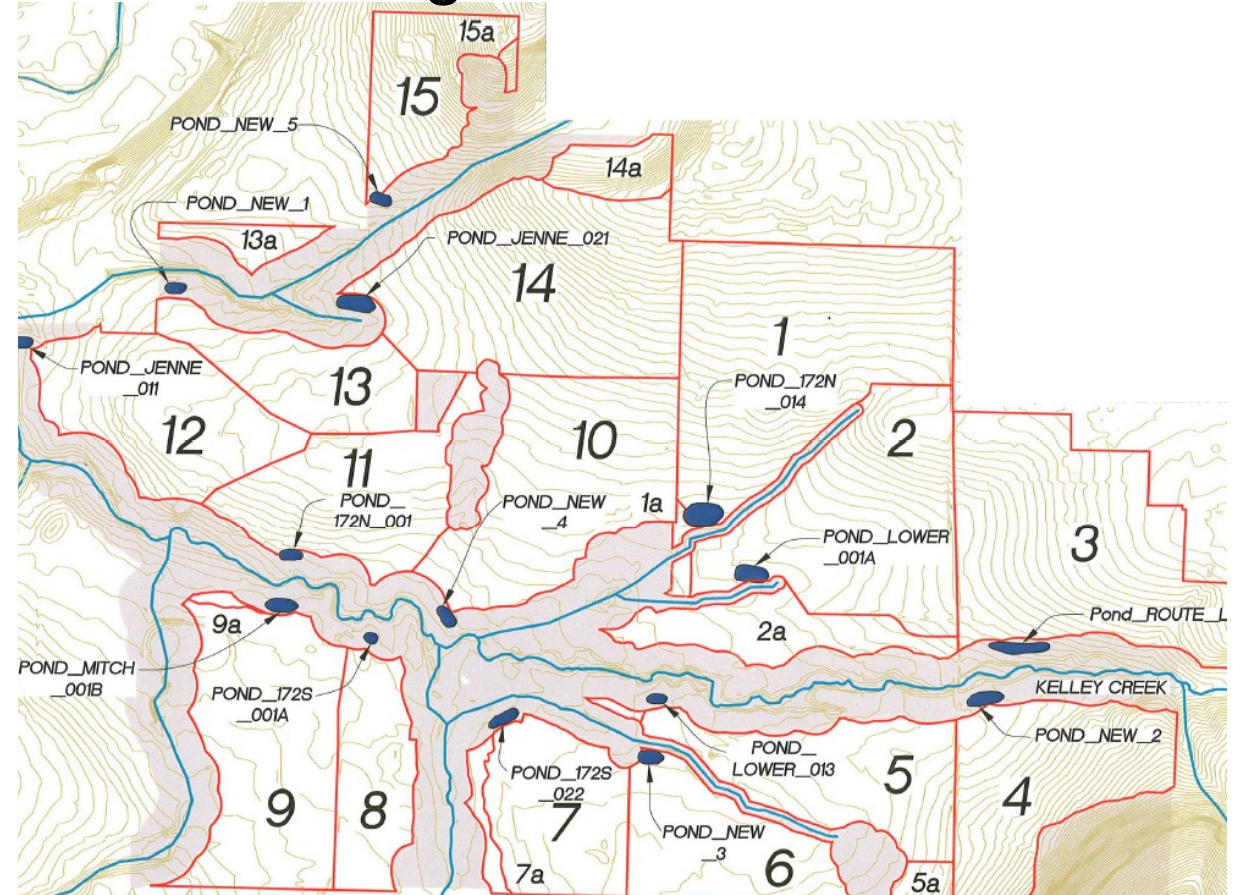


Green Stormwater Infrastructure

Rain gardens in new sub-division
ponds



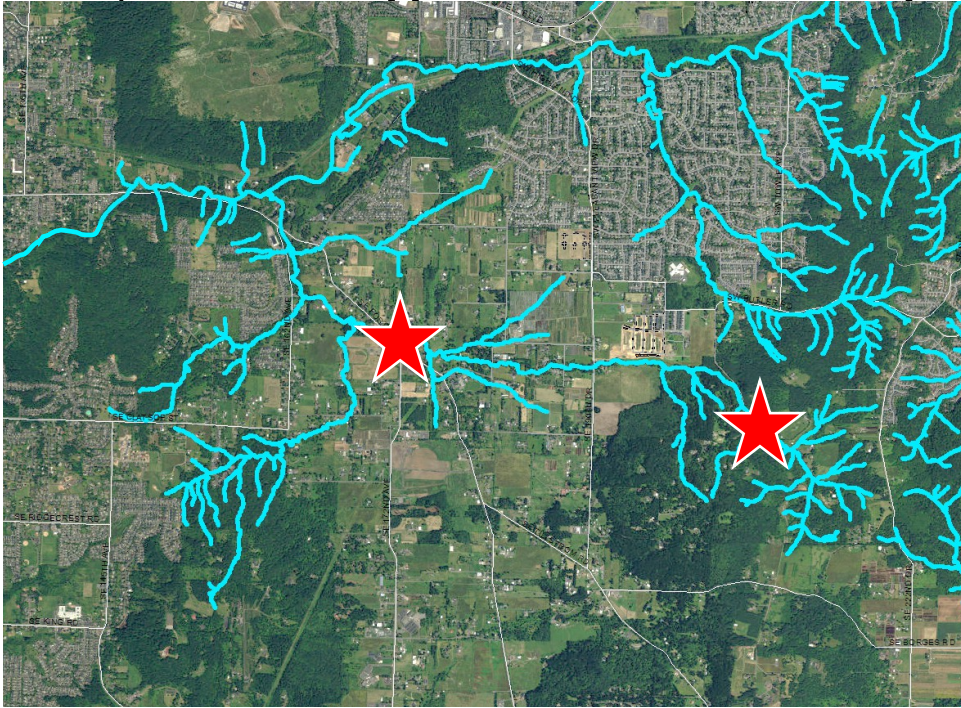
Planned regional stormwater



Studying the Effects of Development and Green Infrastructure

- Types of studies

- 1) Tracking creek over time
- 2) Testing infrastructure performance



Long-term sampling sites



Monitoring equipment

1) Tracking the Creek over Time



1a)
Macroinvertebrates

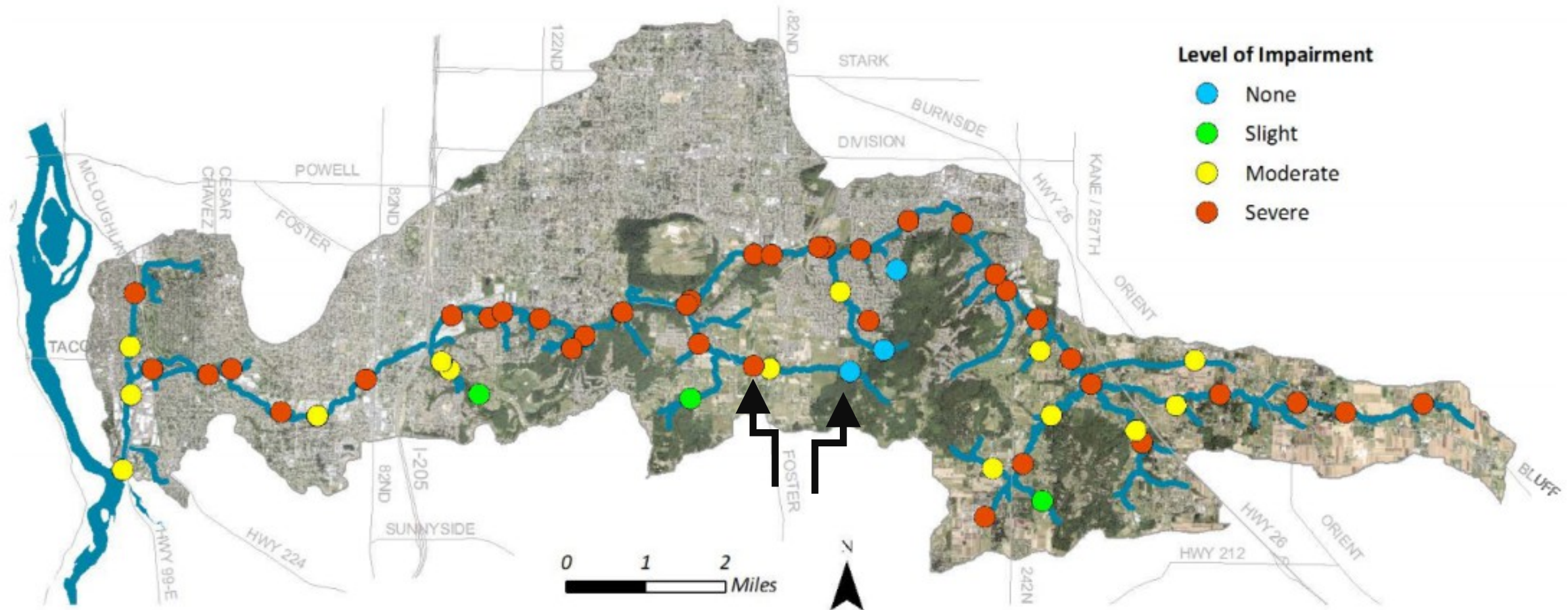


1b)
Pollutants

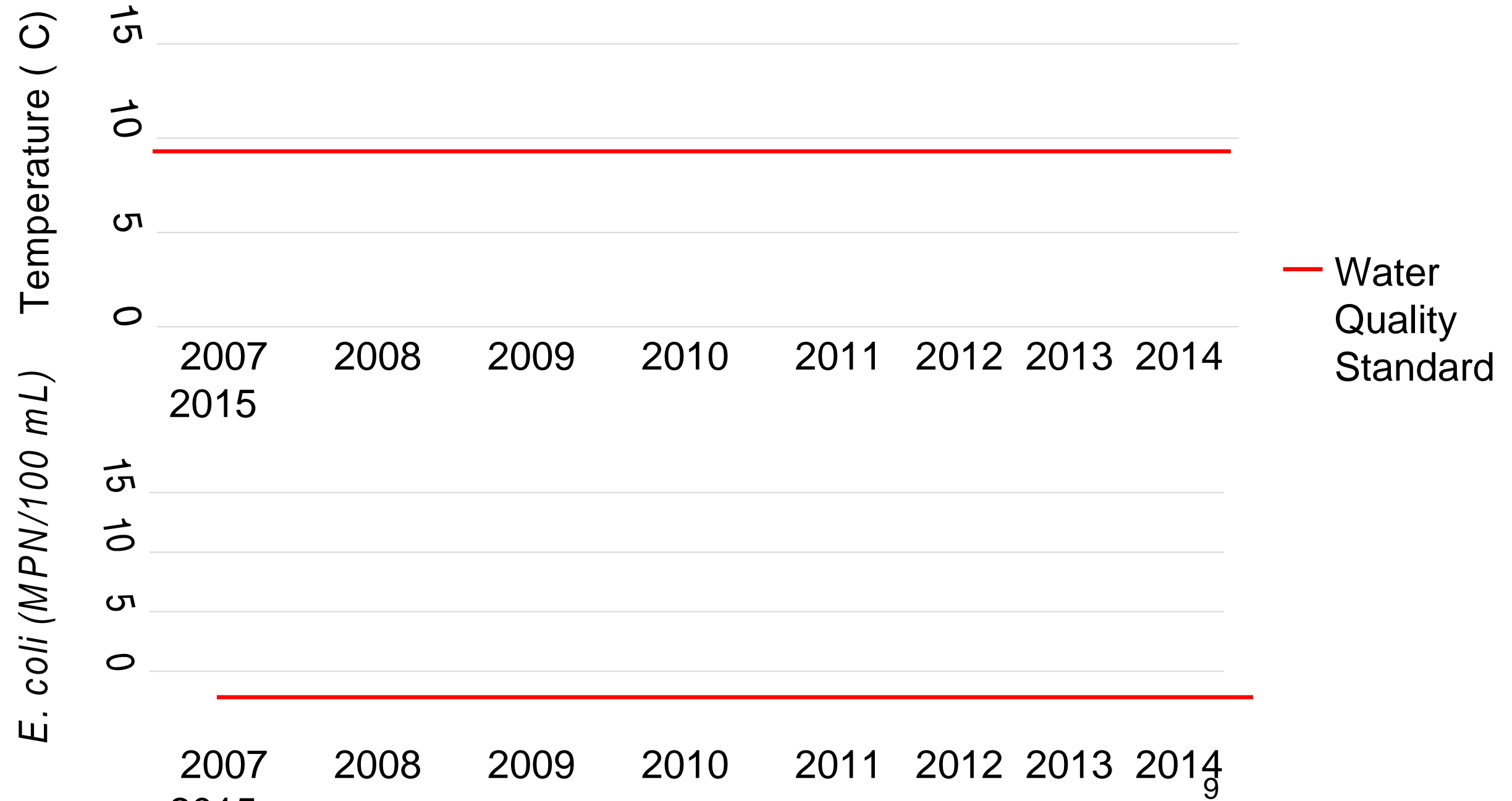


1c) Flow

1a) Long-term Macroinvertebrate Monitoring



1b) Long-term Pollutant Monitoring



2) Testing Infrastructure Performance



2a) Pollutant removal sampling

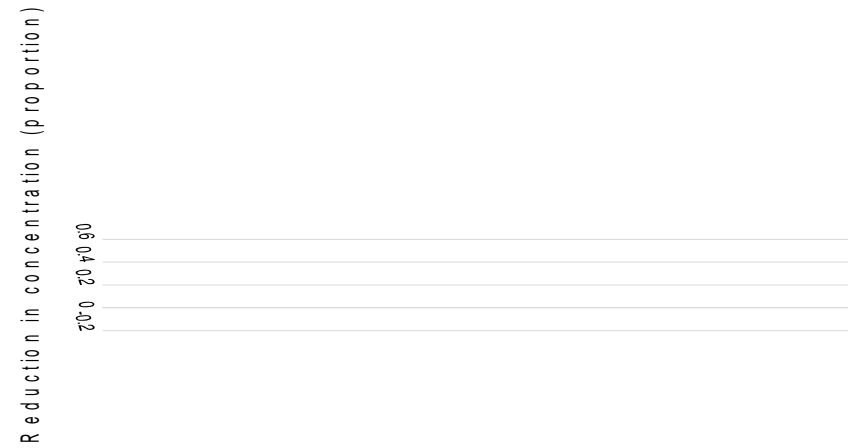


2b) Continuous monitoring of infiltration and retention



2c) Simulated storms

2a) Pollutant Removal Sampling



Fore bay



Detention pond



11 Wetland

2b) Continuous Monitoring of Infiltration and Detention

0

20

40

60

80

100

Rainfall (inches)

Water Level (feet)



Before the storm



During the storm

2c) Simulated Storms

- Small changes in design and implementation can make a big difference



- Most of the rain gardens can handle large storms (or they can't) on steep slopes



Conclusions

- Roads and houses will continue to be built in the Johnson Creek watershed
- Green stormwater infrastructure is also being built to help treat the stormwater runoff
- We are studying how well it is working
- Results show that green stormwater infrastructure will likely play an important role in protecting the health of the creek

