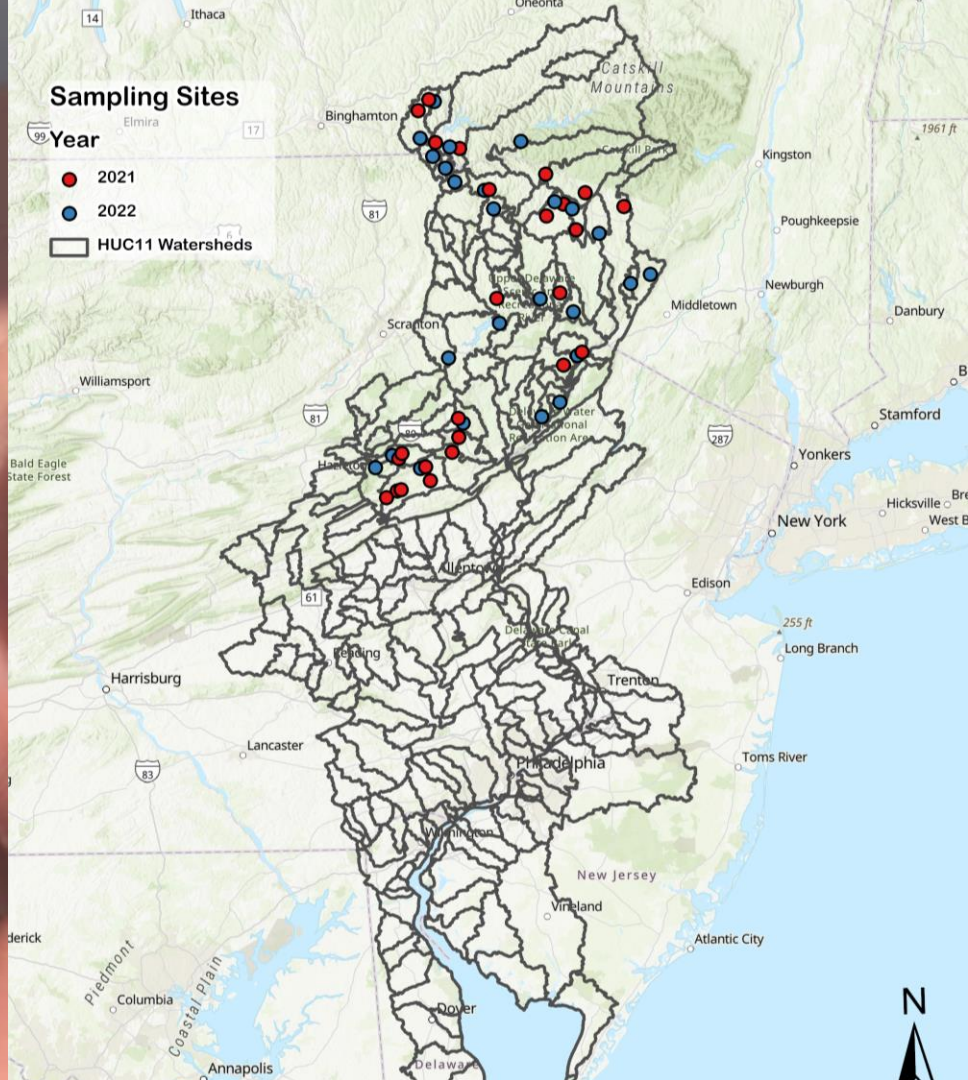


Headwaters of the Delaware River



Climate change and the role of headwater streams

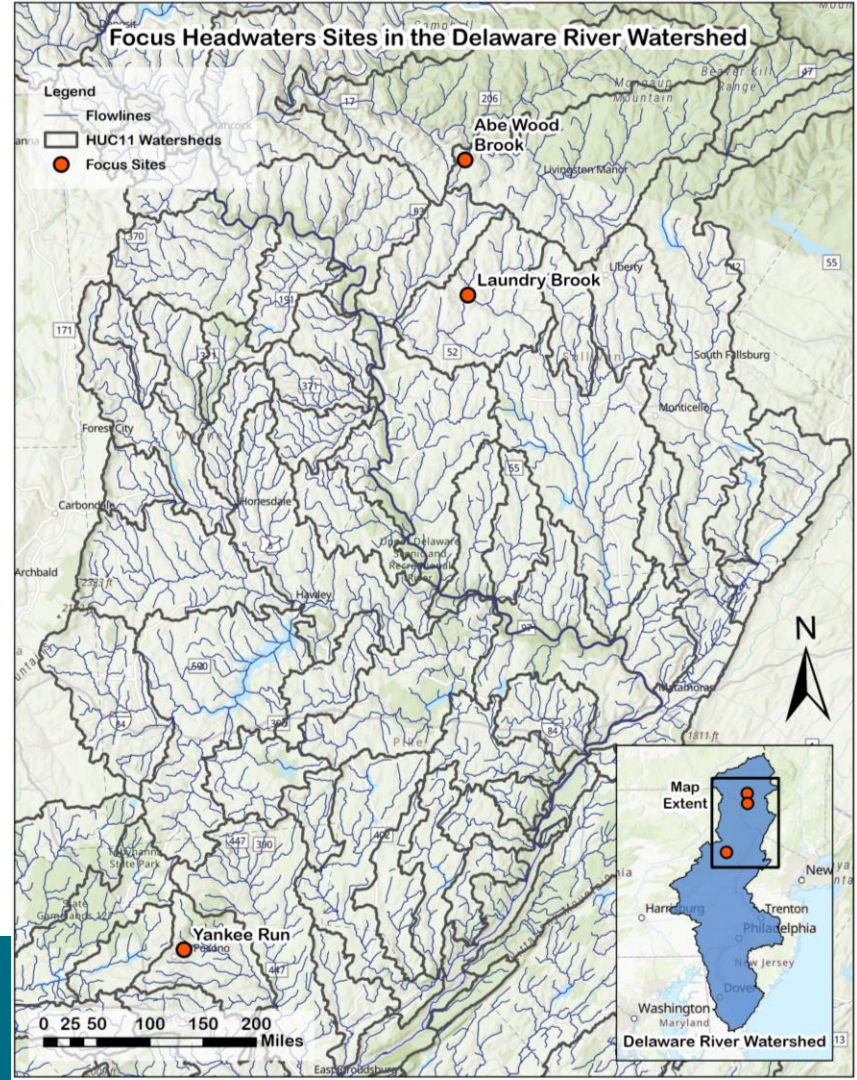


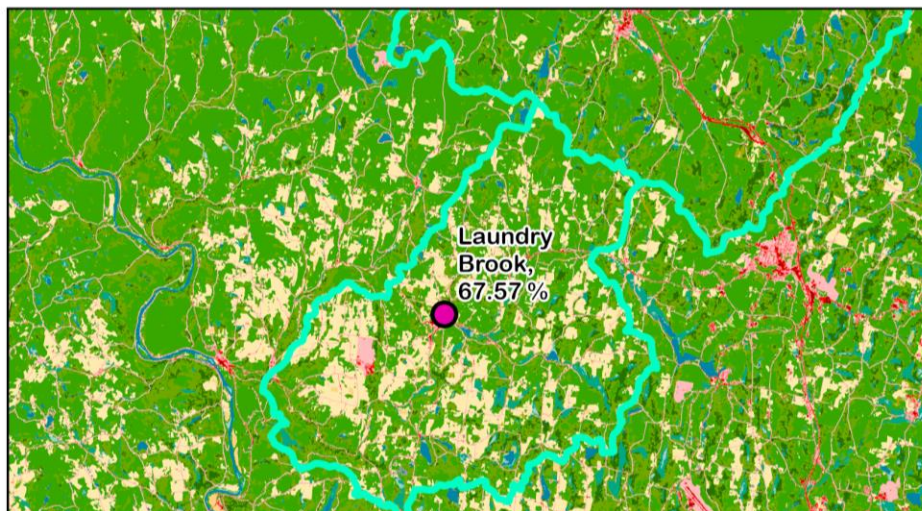
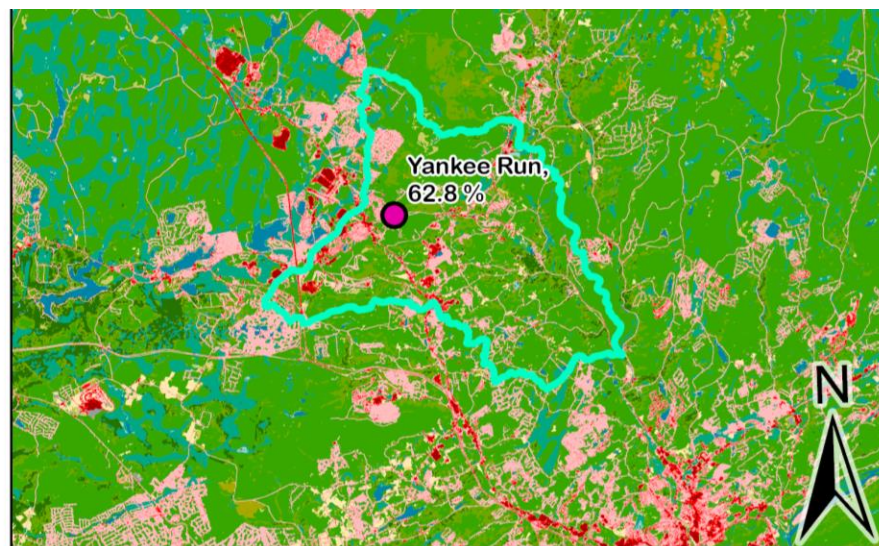



















3 Focus Sites

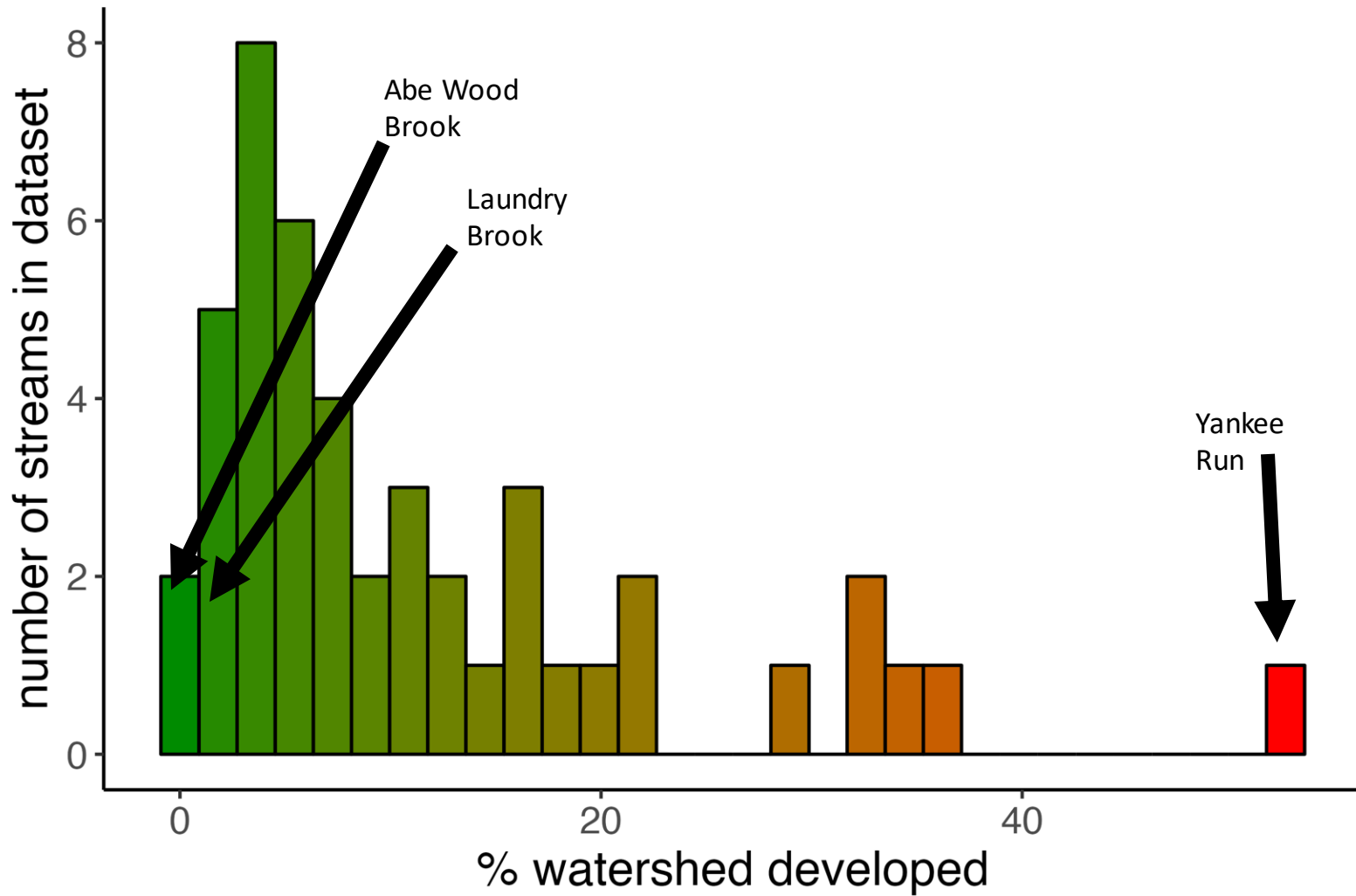
- Yankee Run
- Abe Wood Brook
- Laundry Brook

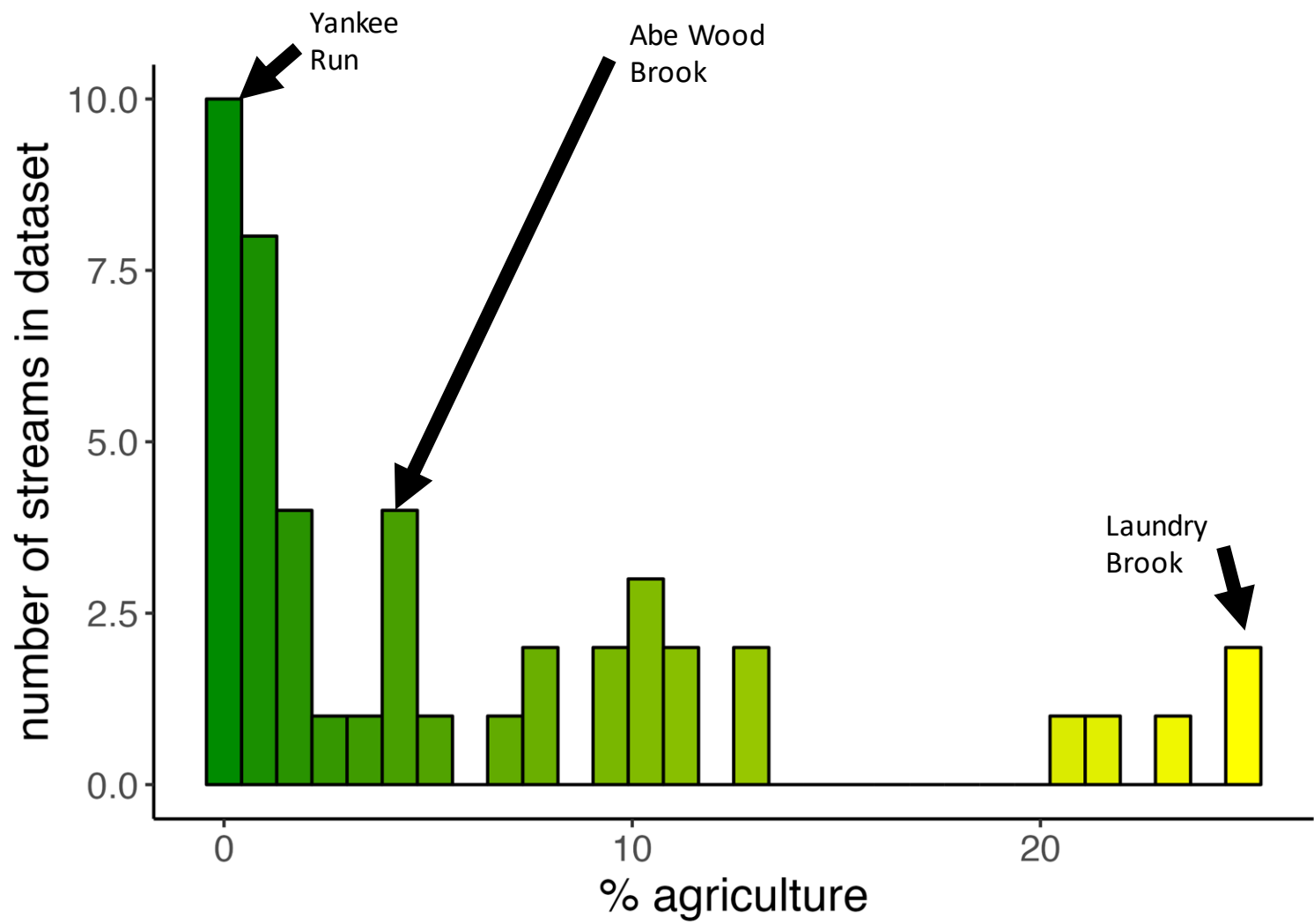




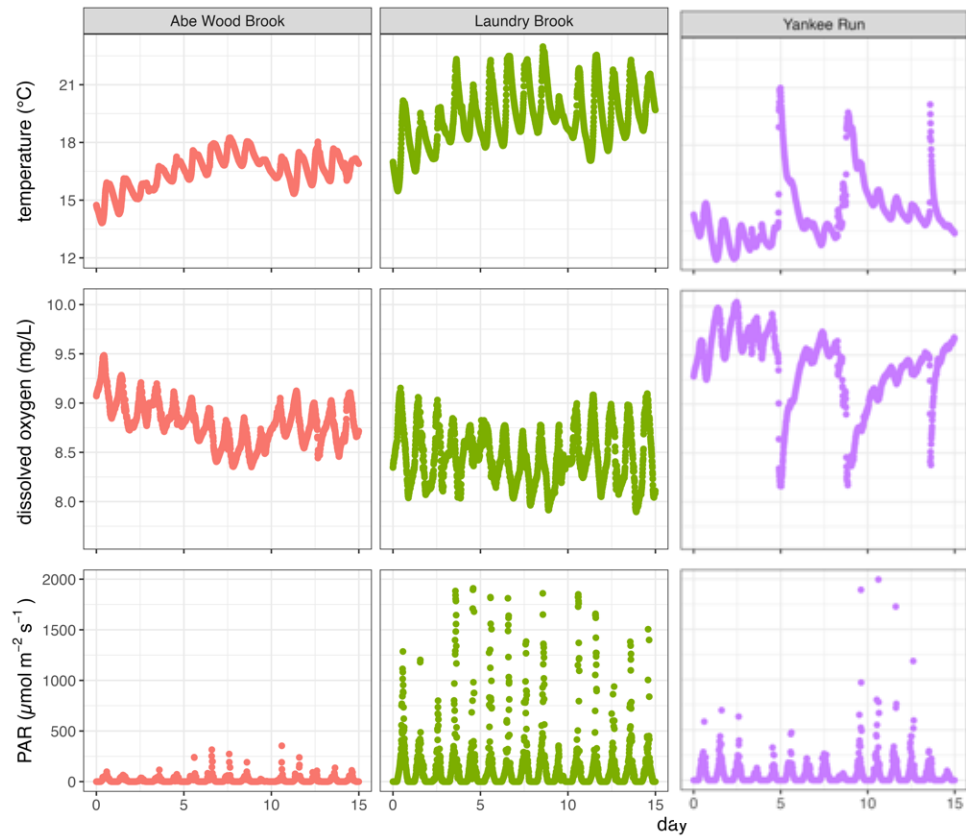
Legend

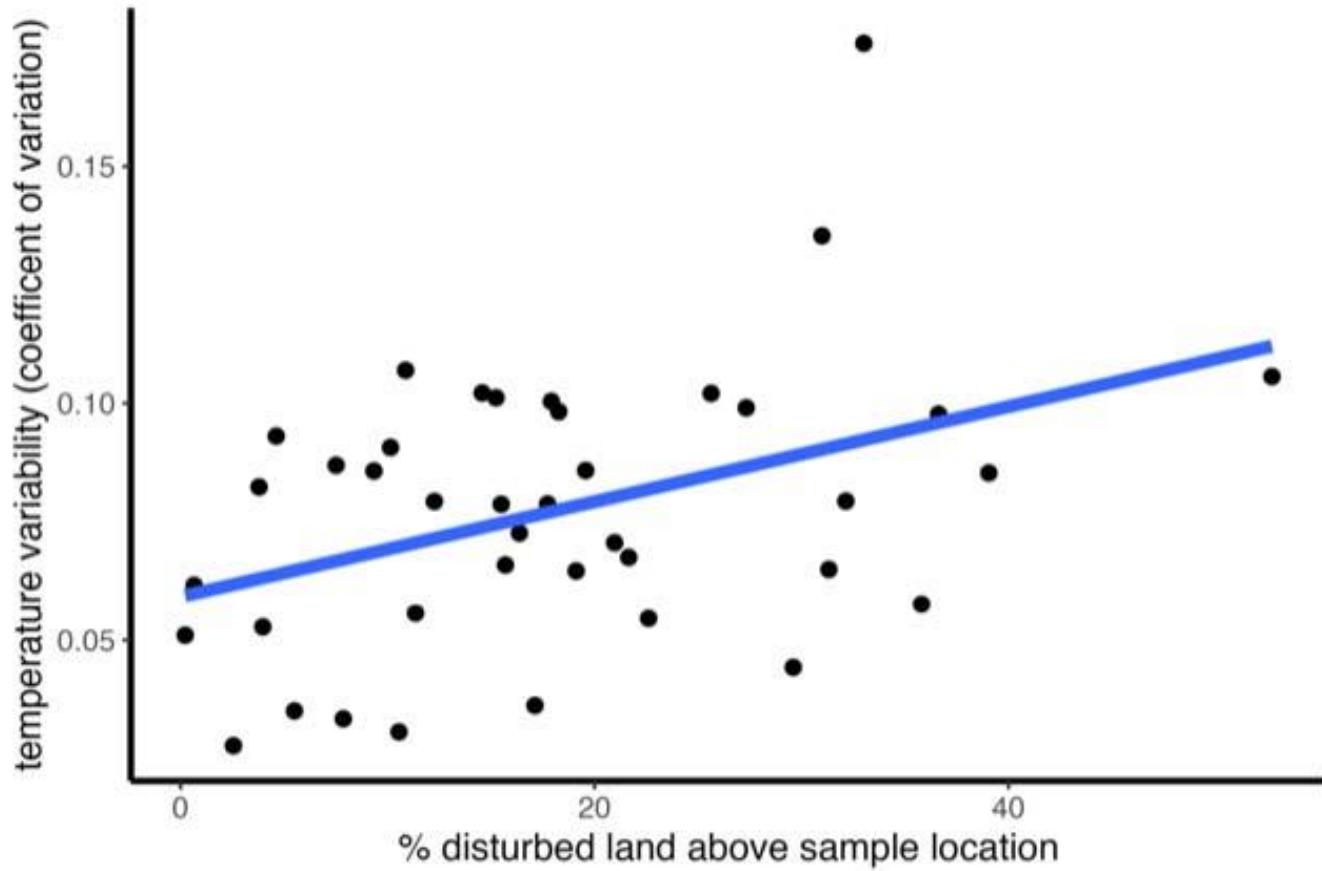
- | | | | |
|---|-----------------------------|---|-----------------------------|
|  | Focus Sites |  | Deciduous Forest |
|  | Focus Watershed |  | Evergreen Forest |
|  | Open Water |  | Mixed Forest |
|  | Developed, Open Space |  | Shrub/Scrub |
|  | Developed, Low Intensity |  | Herbaceous |
|  | Developed, Medium Intensity |  | Hay/Pasture |
|  | Developed, High Intensity |  | Cultivated Crops |
|  | Barren Land |  | Woody Wetlands |
| | |  | Emergent Herbaceous Wetland |



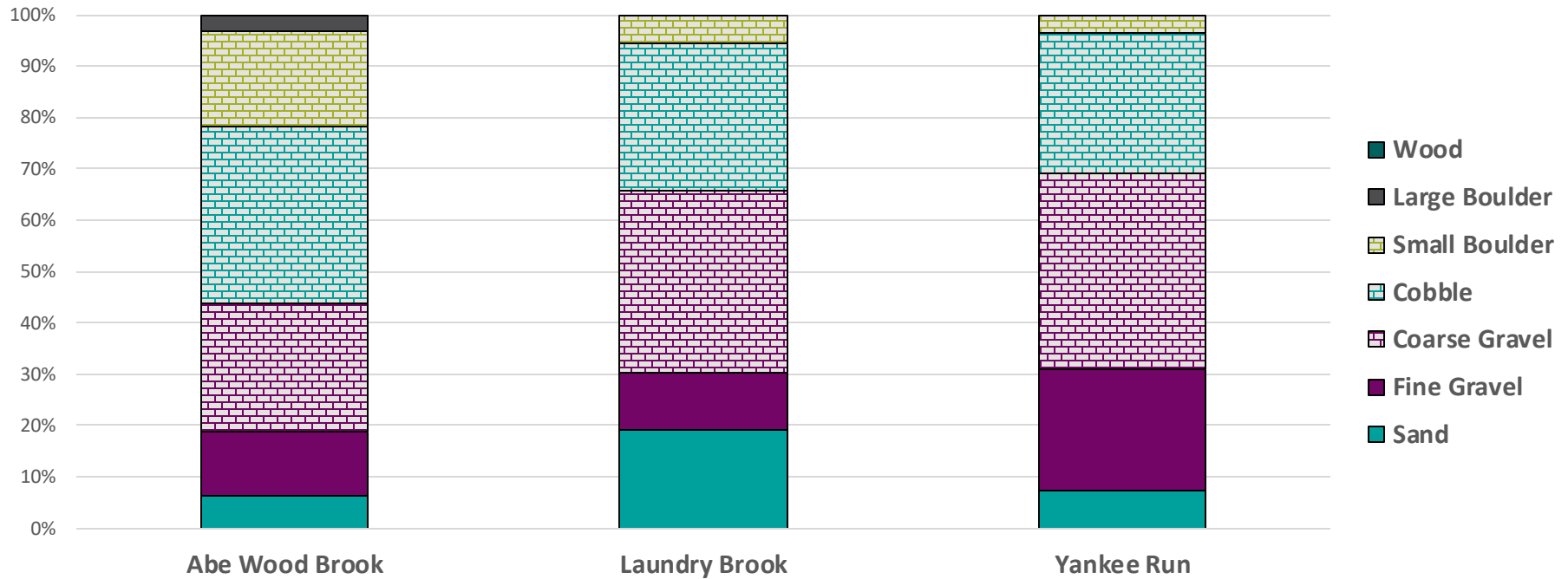


Logger data



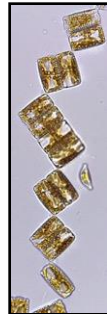
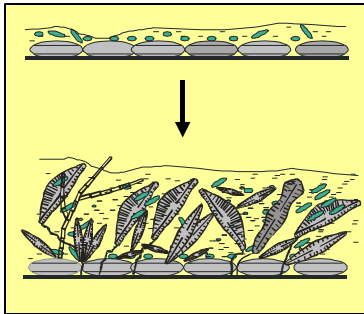


Habitat



Algal community parameters

Parameter	Abe Wood Brook	Laundry Brook	Yankee Run
Algal biomass ($\mu\text{g Chlorophyll a/cm}^2$)	2.18	7.46	0.58
Diatom multimetric index	5.0	1	6.4



What is EPT?

E = Ephemeroptera
MAYFLIES



P = Plecoptera
STONEFLIES



T = Trichoptera
CADDISFLIES



Percent EPT Taxa

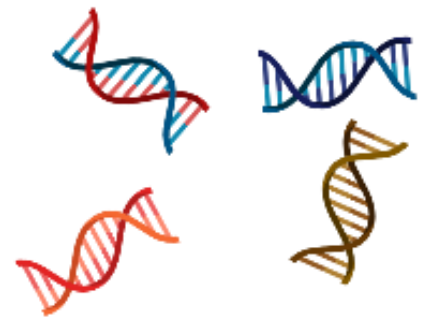
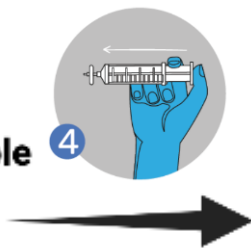
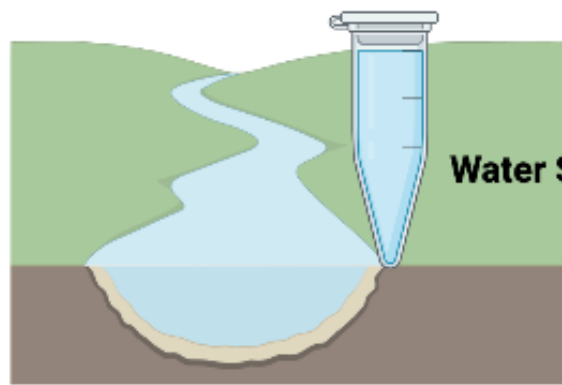


Macroinvertebrate IBI Scores





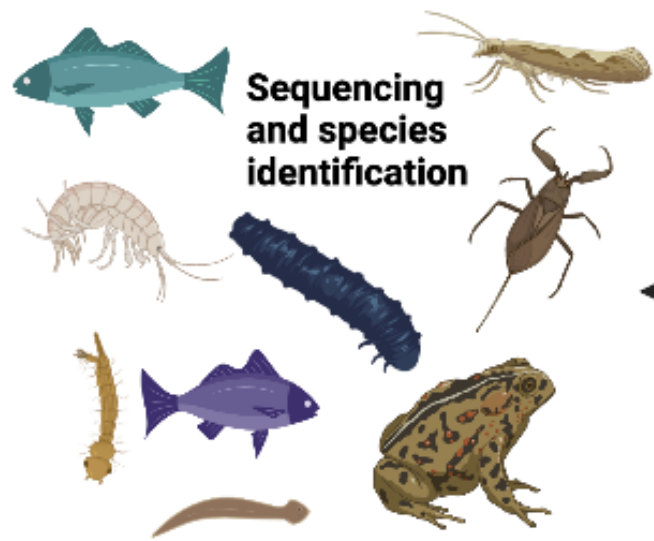
Land Use and IBI Scores



DNA extraction



PCR Amplification



Sequencing and species identification

Total number of species detected from eDNA water and detritus











Biota	Barcoding	Traditional
Worms	36	2
Non-Insect Arthropods	31	10
Fish	21	15
Insects	351	188
Amphibians	6	5
Mollusks	12	3
Other	20	1



Boyeria grafiana



State/Provincial Conservation Status

-  Presumed Extirpated (SX)
-  Possibly Extirpated (SH)
-  Critically Imperiled (S1)
-  Imperiled (S2)
-  Vulnerable (S3)
-  Apparently Secure (S4)
-  Secure (S5)
-  No Status Rank (SNR/SU/SNA)
-  Exotic
-  Hybrid

Main Take Aways



The Academy of
Natural Sciences
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Questions?