

Connecting Land, Water, and People

To Promote Natural Resource
Protection in Kittery



Laura Diemer & Amanda Gavin
FB Environmental Associates
KLT Meeting on November 4, 2019



FEB environmental

PROTECTING LAKE WARREN

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1. Human activities within the watershed can increase the amount of sediment, nutrients, and pesticides that enter the lake and can increase the risk of algal blooms. Design practices to reduce sediment and nutrient runoff are essential.
2. Pollution enters the water through runoff from roads, lawns, and other areas. This runoff can carry sediment, nutrients, and pesticides into the lake. Algal blooms and uncontrolled sediment erosion along the shoreline can decrease water clarity, which can reduce shoreline property values.
3. Pollution, most especially phosphorus, that enters Lake Warren can create imbalances in the lake's ecosystem that negatively impact water quality.

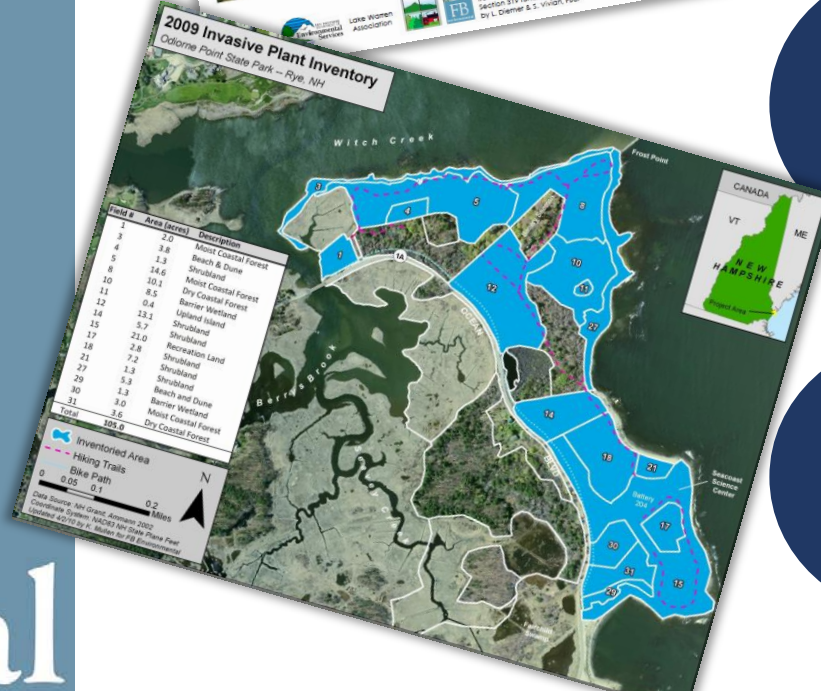
POLLUTED RUNOFF CAN CONTAIN PHOSPHORUS, A KEY NUTRIENT THAT STIMULATES ALGAL BLOOMS & EXCESSIVE PLANT GROWTH.

WAYS WE CAN PROTECT OUR LAKE

- Reduce, divert, and infiltrate surface runoff.
- Stabilize eroding slopes through vegetation or riprap.
- Maintain streambanks and riparian buffers.
- Minimize and define parking areas and pathways.
- Minimize pollutants in stormwater, septic, and other phosphorus-based products.

Photo credit: FEEL, AWWA, SOAK Up the Rain, Open Clipart

Funding for this project was provided in part by a Watershed Assistance Grant from the US Department of Environmental Services with Clean Water Act Section 319 funds from the U.S. Environmental Protection Agency. Developed by J. Diemer & S. Vivian, FEEL.



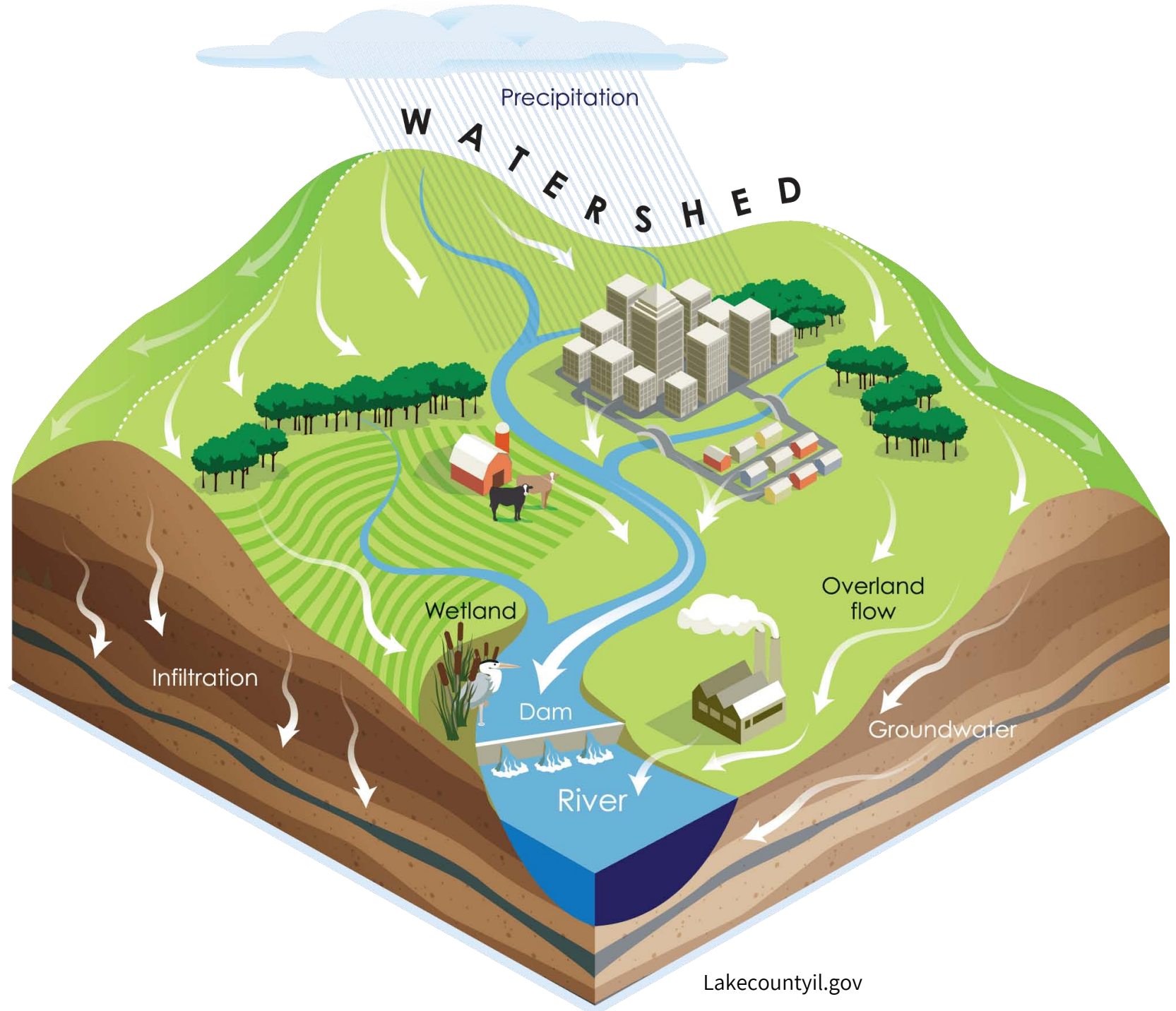
Ecological Services

Watershed Planning & Stormwater

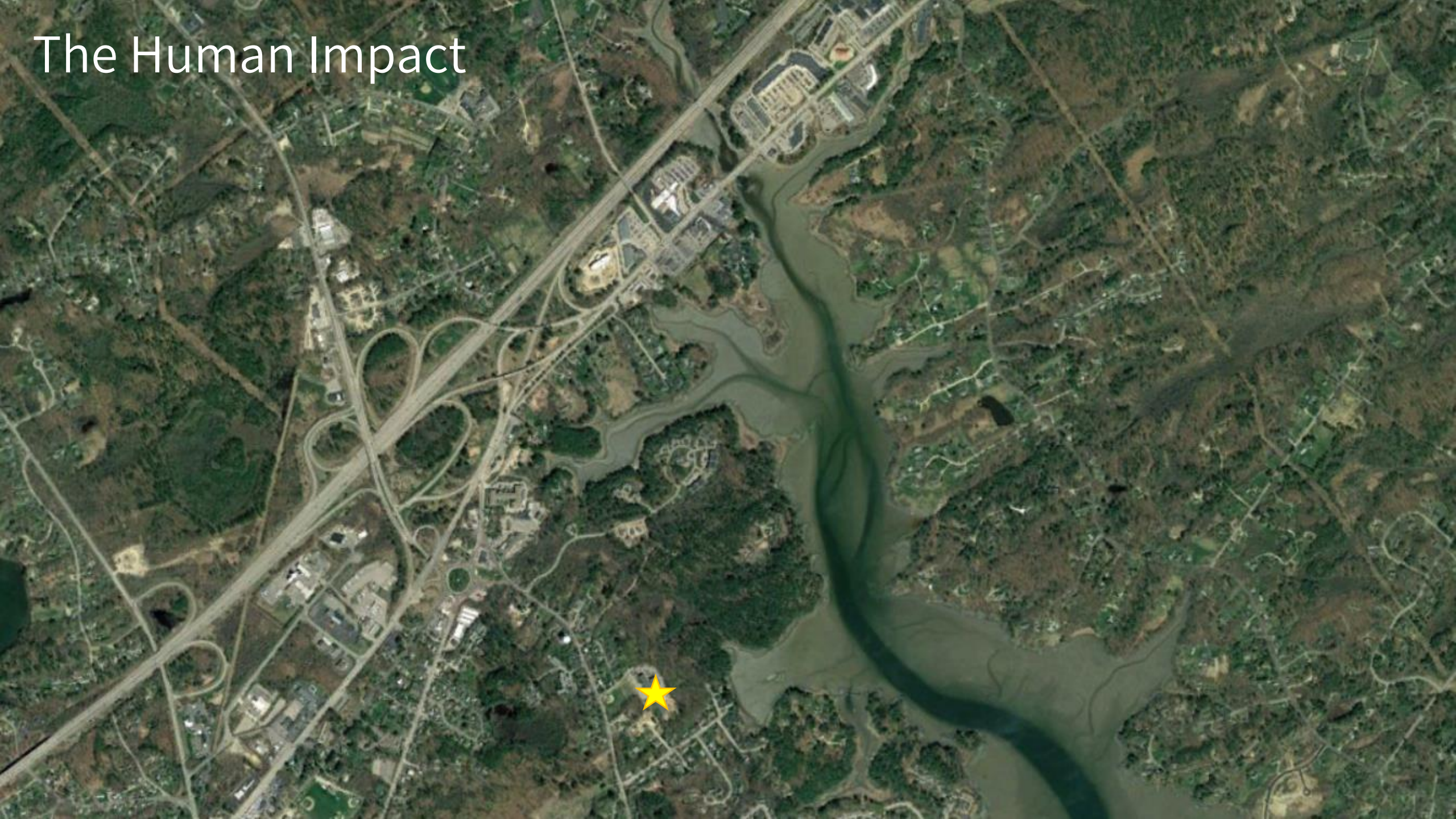
Monitoring & Assessment

Marine Sciences





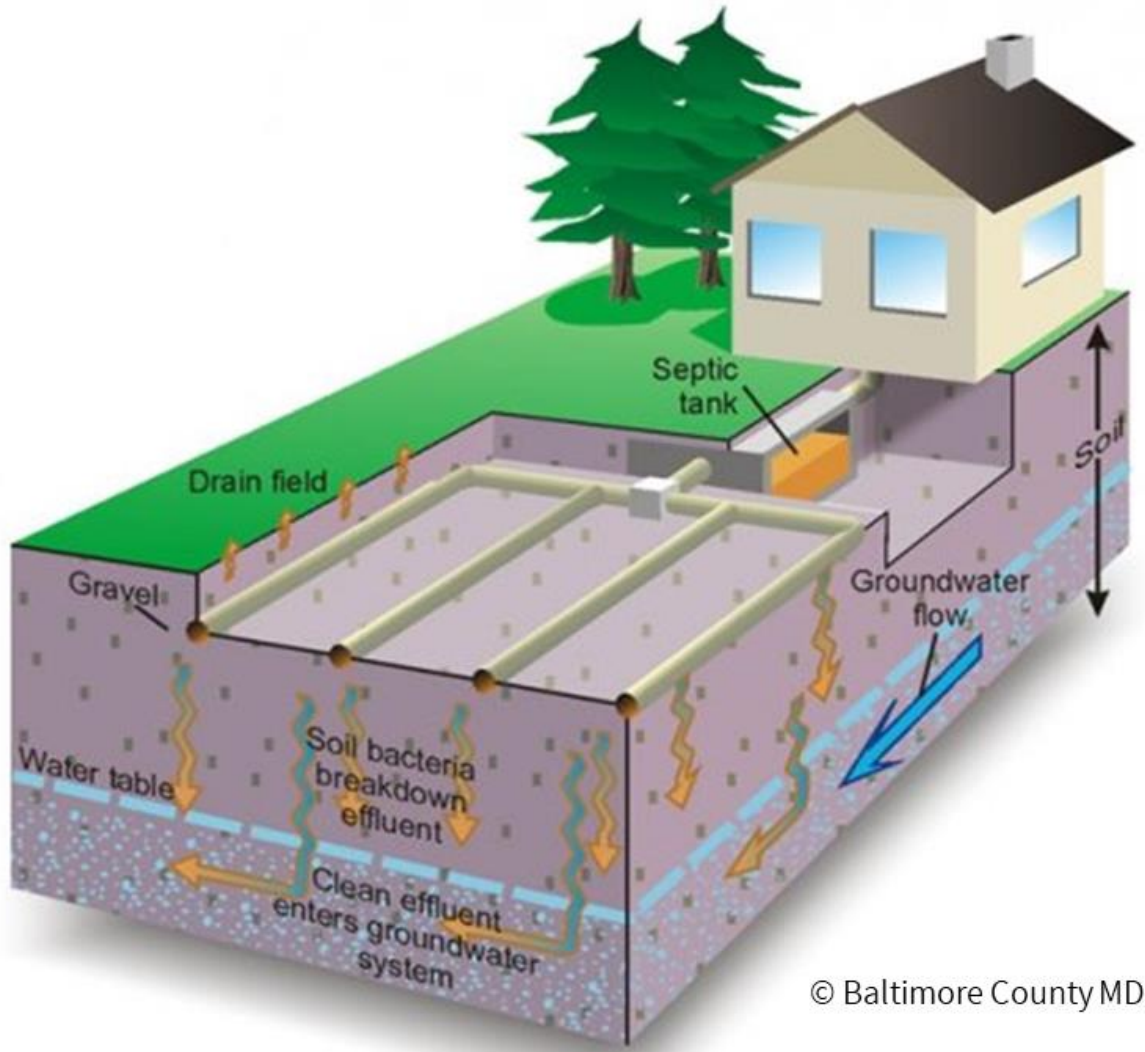
The Human Impact











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Kittery

- Fecal Source Tracking & Remediation
- Stormwater Management & Treatment
- Water Quality Monitoring
- Invasive Species Mapping & Removal

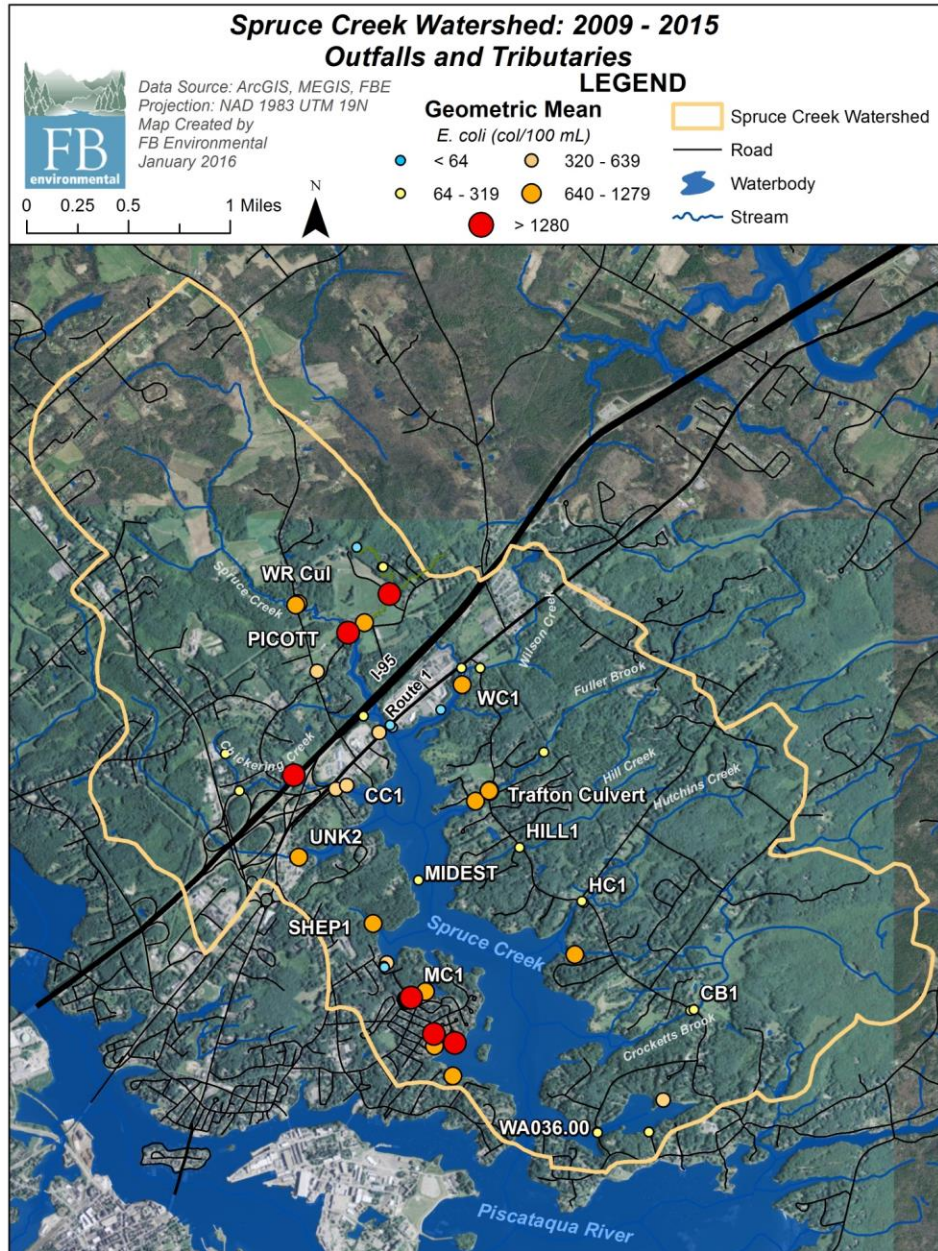


KEEP IT CLEAN



DRAINS TO SPRUCE CREEK!
WWW.SAVEKITTERYWATERS.ORG

Fecal Source Tracking



Baseline Sampling

– magnitude of sources (wet/dry), FIB/nutrients

Bracket Sampling

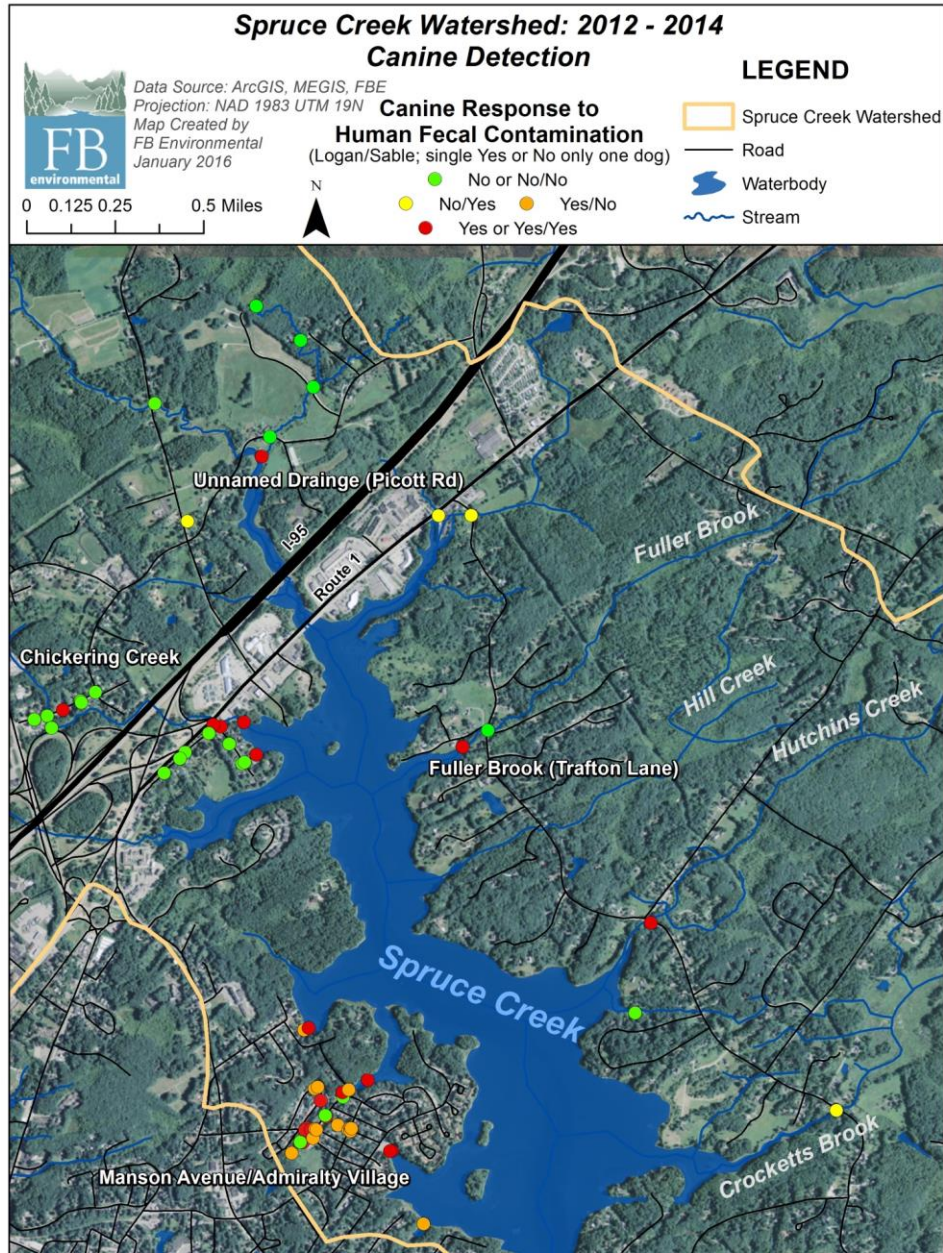
– tracing hotspot areas upstream to target sources

Watershed Investigations – land survey

Canine detection – identify human sources



Fecal Source Tracking



Baseline Sampling

– magnitude of sources (wet/dry), FIB/nutrients

Bracket Sampling

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Watershed Investigations –

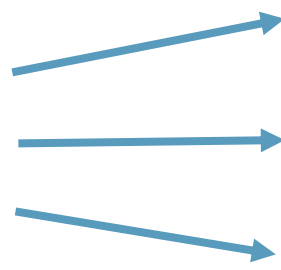
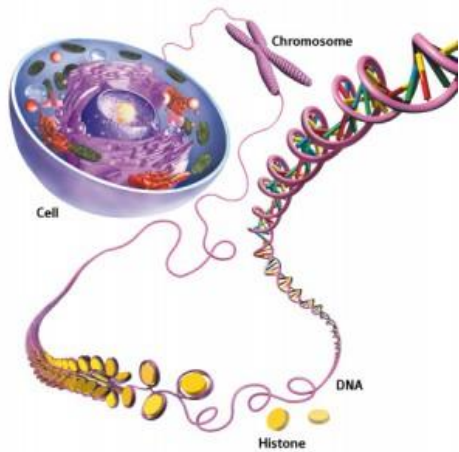
land survey

Canine detection –

identify human sources



Fecal Source Tracking - mtDNA



HUMAN 

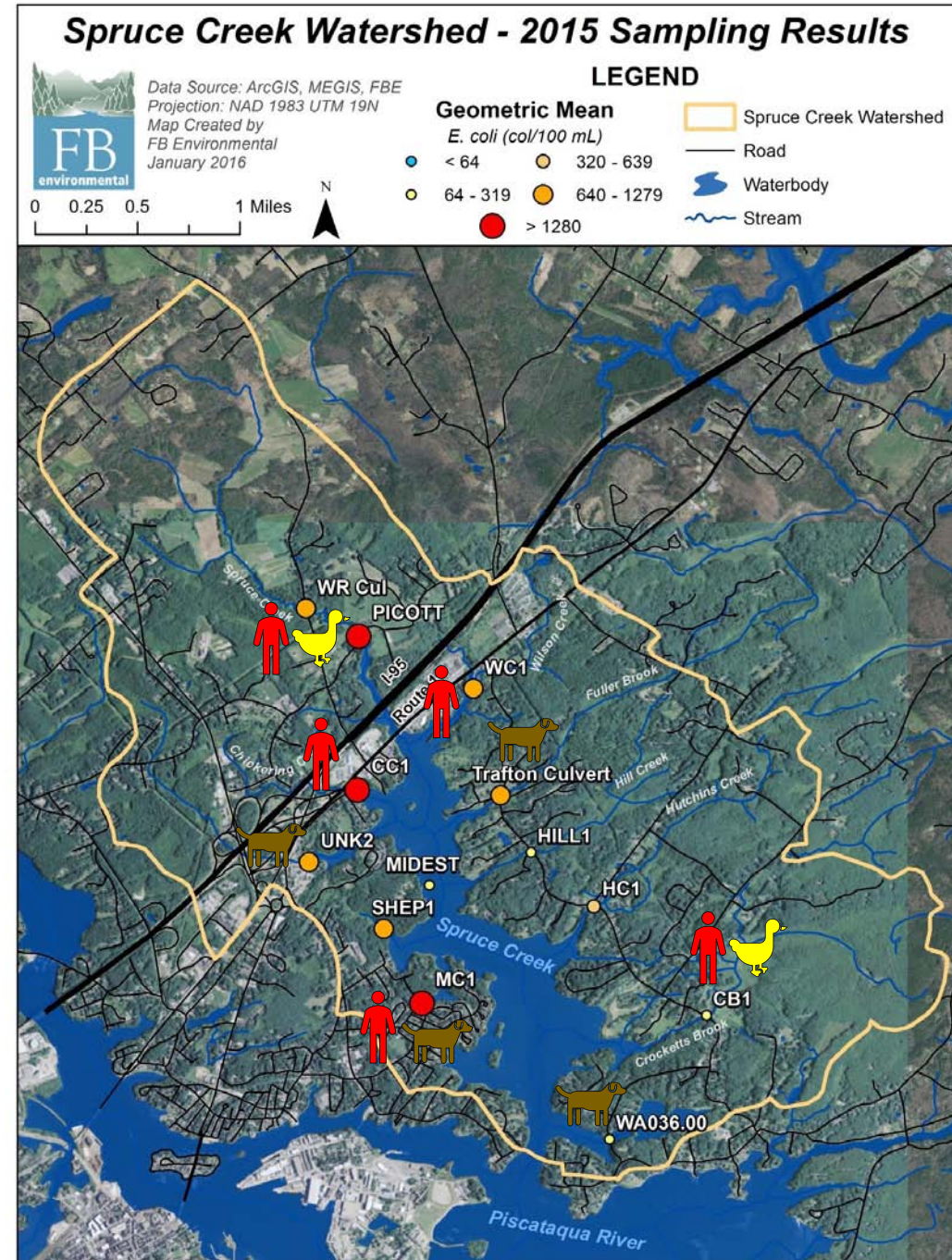
BIRD 

CANINE 

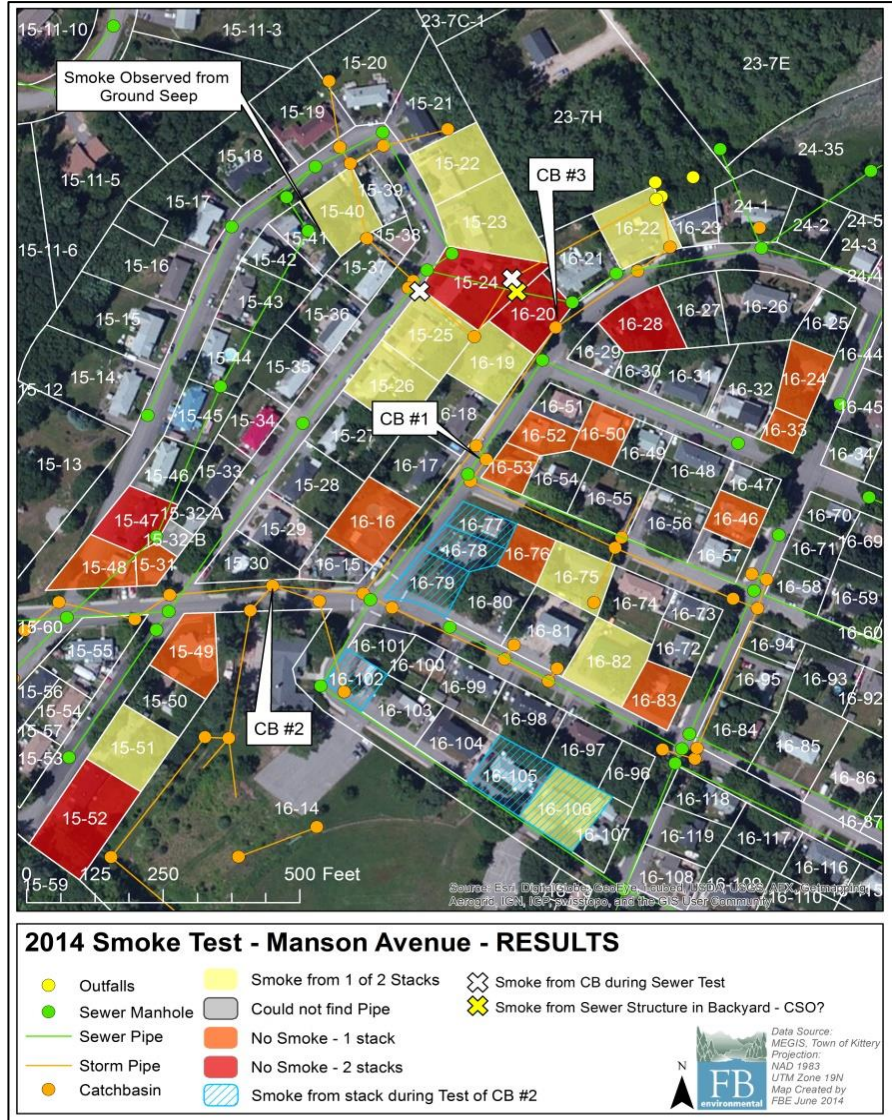


J. Bucci, UNH

Site ID	2015 Geo mean	2015 DNA Analysis	
		8/11/15 WET	8/31/15 DRY
CB1	282	Human, Goose	
CC1	1,501	Human	Human
HC1	370		
HILL1	150		
MC1	3,437	Human, Canine	Human
PICOTT	1,886	Goose	
SHEP1	1,018		
Trafton Culvert	946	Canine	Canine
UNK2	1,201	Canine	
WA036.00	100	Canine	
WC1	903	Human	
WR Cul	1,170	Human	



Stormwater Management & Treatment

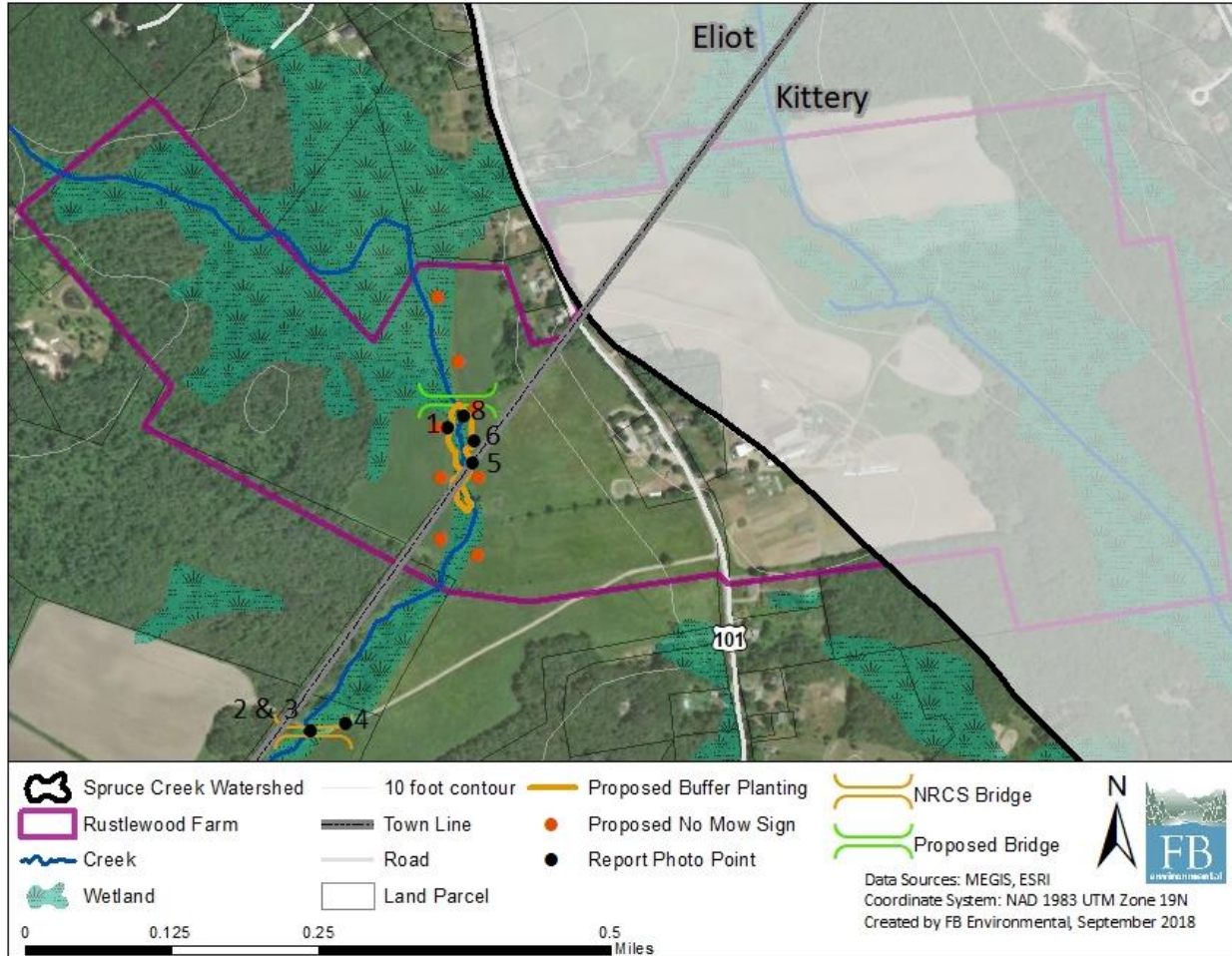


NPS Pollution Surveys (2005, 2013)
 Spruce Creek Watershed Based Plan (2008, 2014)
 Ph I-V 319 Grants, (2008-present)

Smoke/dye testing of sewer/stormwater network (2013)
 Septic/sewer database and priority risk mapping (2016)
 Outreach and education (socials, booths, brochures, website, public presentations)
 Citizen pledge program (small-scale BMPs)
 BMP Implementation (64 projects)



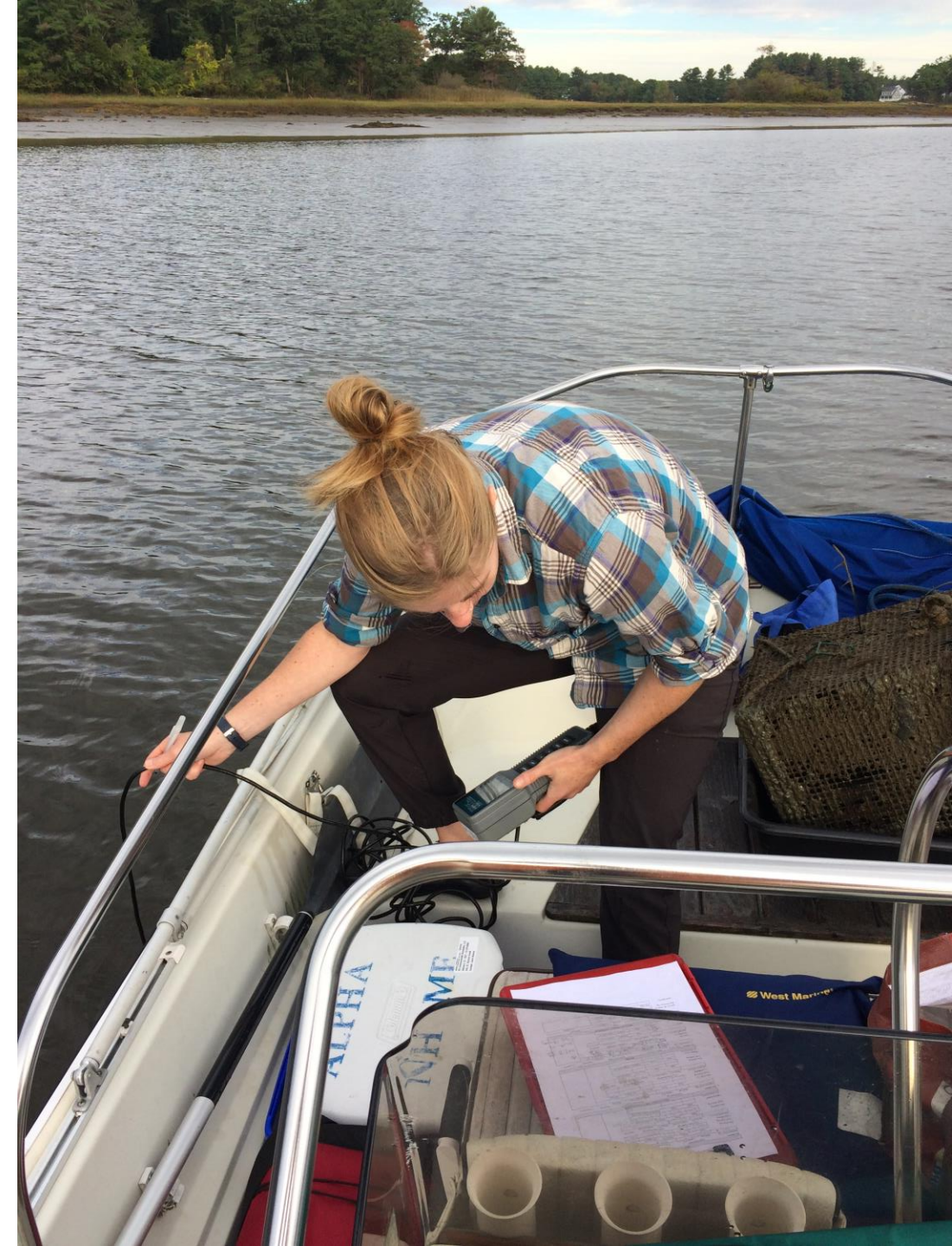
Buffer Planting – Local Farm Partnership



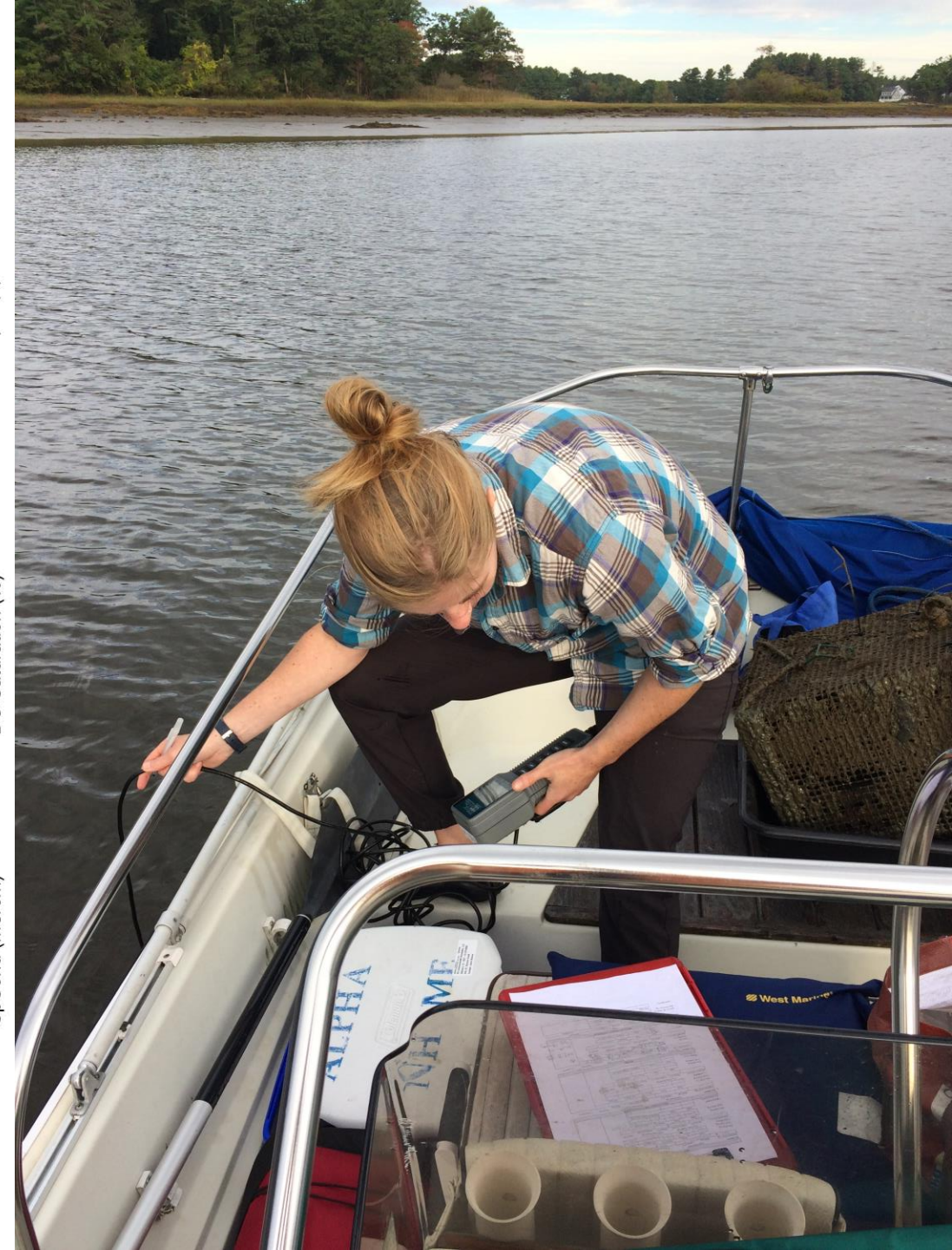
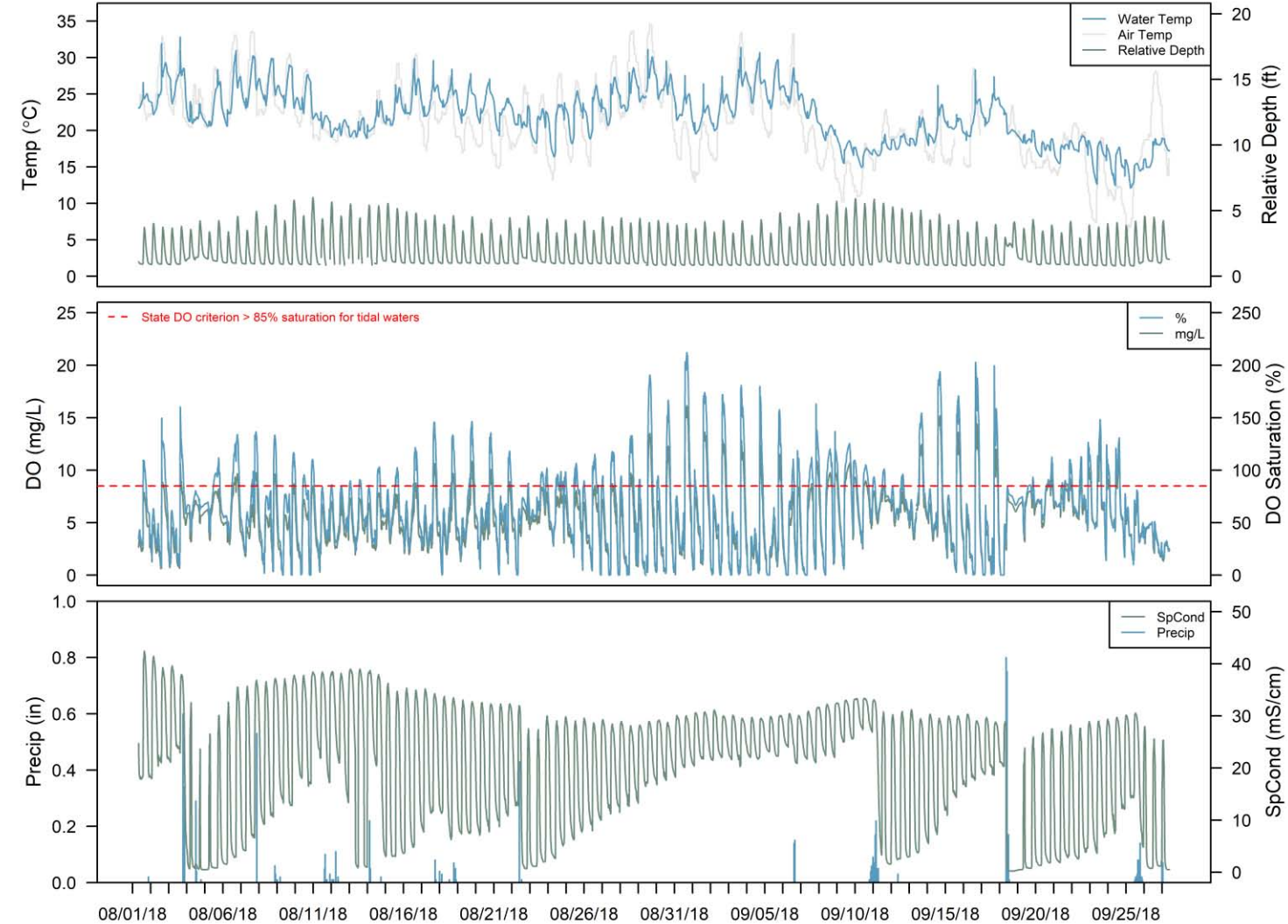
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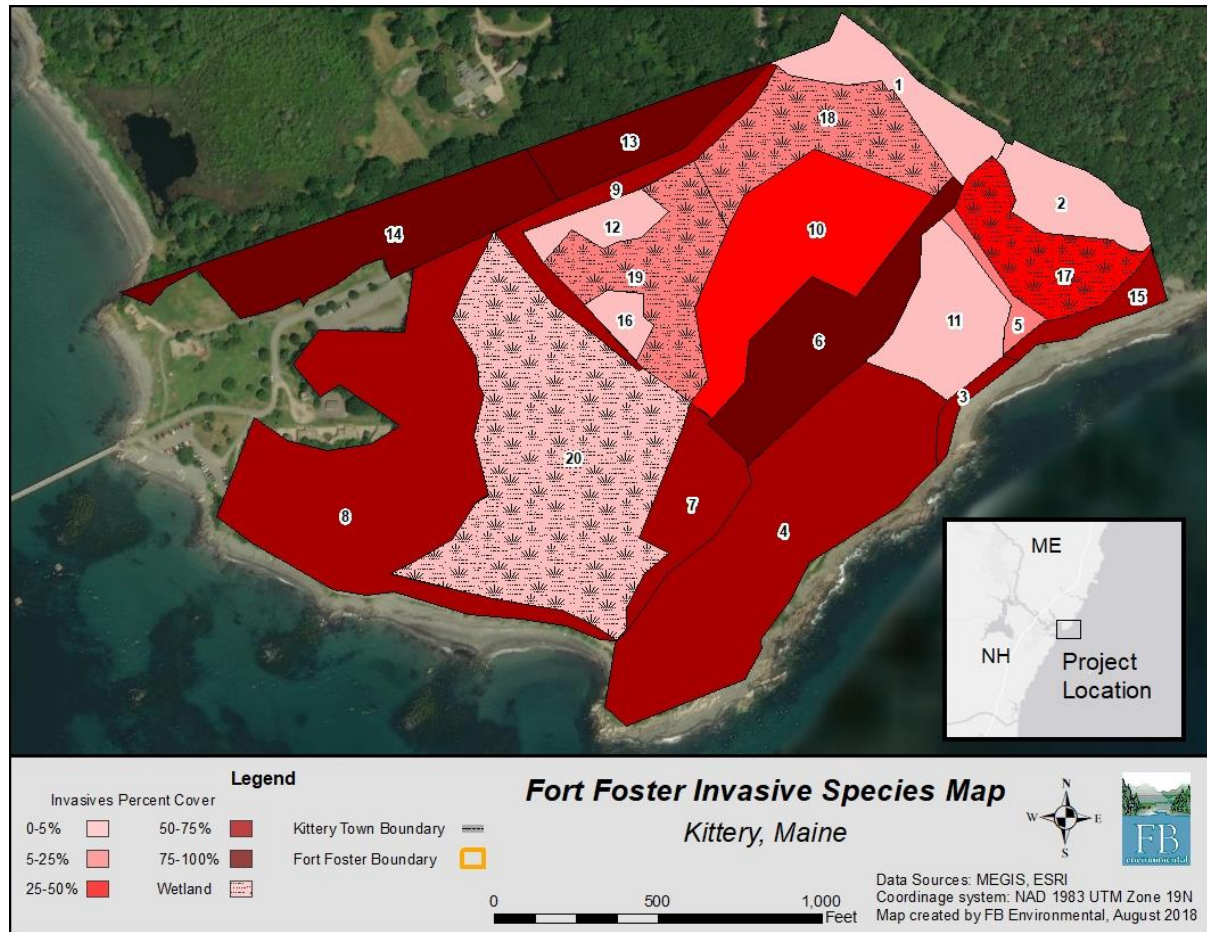
Water Quality Monitoring



Water Quality Monitoring



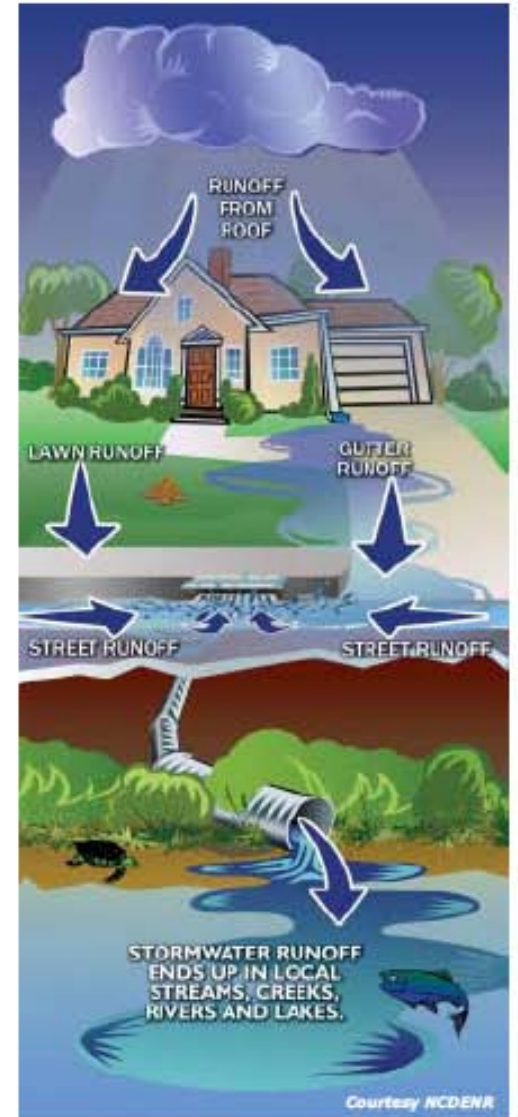
Invasive Species Mapping & Removal





Spruce Creek Needs You

YOU Make All the Difference



Thank you! Questions?



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