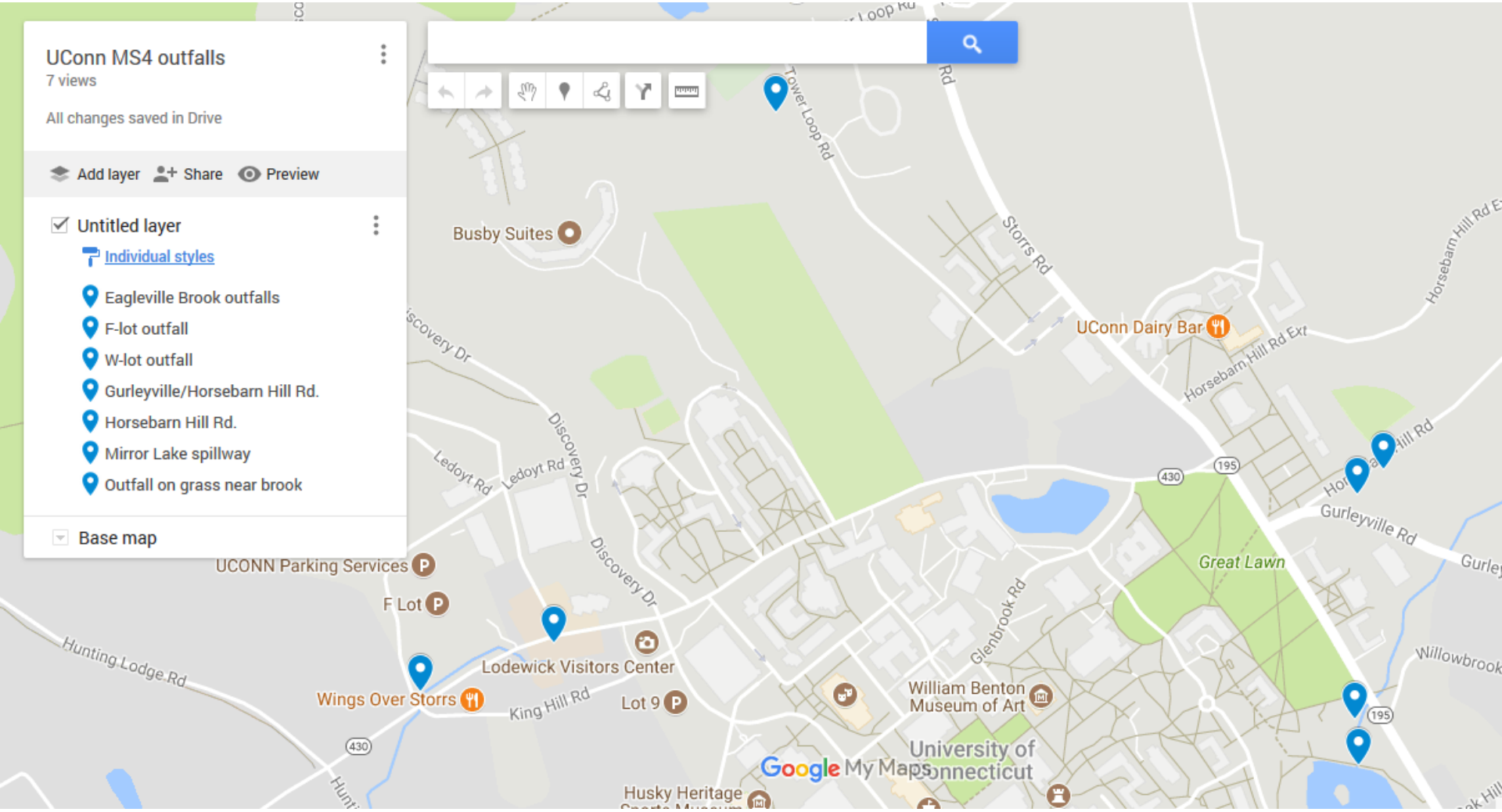
Case Study: MS4 sampling at UConn

Michael Dietz

UConn CLEAR

9/27/17

Outfall sampling locations



Who will be doing the work?

- Utilizing students on campus
- Dual benefit-
  - Cheap labor…
  - Provides an educational opportunity and resume builder
- Salary support (part of me and students) provided by UConn Office of Environmental Policy
- I will oversee work in collaboration with Jack Clausen


Aspen
BOX #
19,888

Field sheet/checklist

Outfall/Catchment Screening Form

Catchment ID: _____ **Town:** _____

Inspector: _____ **Date:** _____

Street Name: _____

Last rainfall event (date and amount): _____

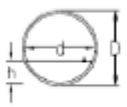
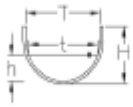
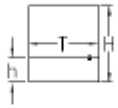
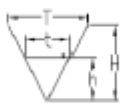
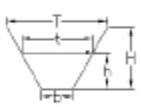
Type of Sampling Event ☐ Dry Weather Screening ☐ Wet Weather Sampling

Location: ☐ Outfall ☐ Manhole ☐ Catch Basin ☐ Interconnection

Is outfall submerged/inundated ? ☐ Yes ☐ No If YES screen/sample at 1st non-influenced structure: ☐ MH ☐ CB

Location ID: **Latitude:** **Longitude:**

Shape of Pipe/Swale (check one)

 ☐	 ☐	 ☐	 ☐	 ☐
Rounded Pipe	**Rounded Swale**	**Rectangular Pipe/Swale**	**Triangular Swale**	**Trapezoidal Swale**

Outfall Material:	**Pipe Measurements:**	**Swale Measurements:**
☐Concrete ☐HDPE ☐Corrugated Metal Pipe (CMP) ☐ Ductile Iron ☐ Clay ☐ PVC ☐ Other	Inner Dia. (in): d = Outer Dia. (in.): D = Pipe Width (in.): W = Pipe Height (in.): H =	Swale Width (in): T = Flow Width (in.): t = Swale Height (in.): H = Flow Depth (in.): h =
Outfall/Manhole/Catchbasin Condition: ☐ Good ☐ Fair ☐ Poor ☐Crumbling	Flow Depth (in.): h =	Bottom Width (in.): b =

Evidence of Flow: ☐ Yes ☐ No **If Yes, Description of Flow:** ☐ Damp ☐ Trickle ☐ Moderate ☐ High

Visual Evidence of Illicit Discharge

Visual Inspection: ☐ None ☐ Floatables ☐ Pet Waste ☐Oily Sheen ☐ Sanitary Waste ☐ Algae ☐ Foam

Olfactory Evidence of Illicit Discharge

Olfactory Inspection: ☐ None ☐ Sewage Smell ☐ Musty ☐ Rotten Eggs ☐ Ammonia ☐ Petroleum

Samples Taken and Sampling Results

Temp.	Conductivity	Salinity	Chlorine
Ammonia	Surfactants	Bacteria	Pollutant of Concern

Field sampling

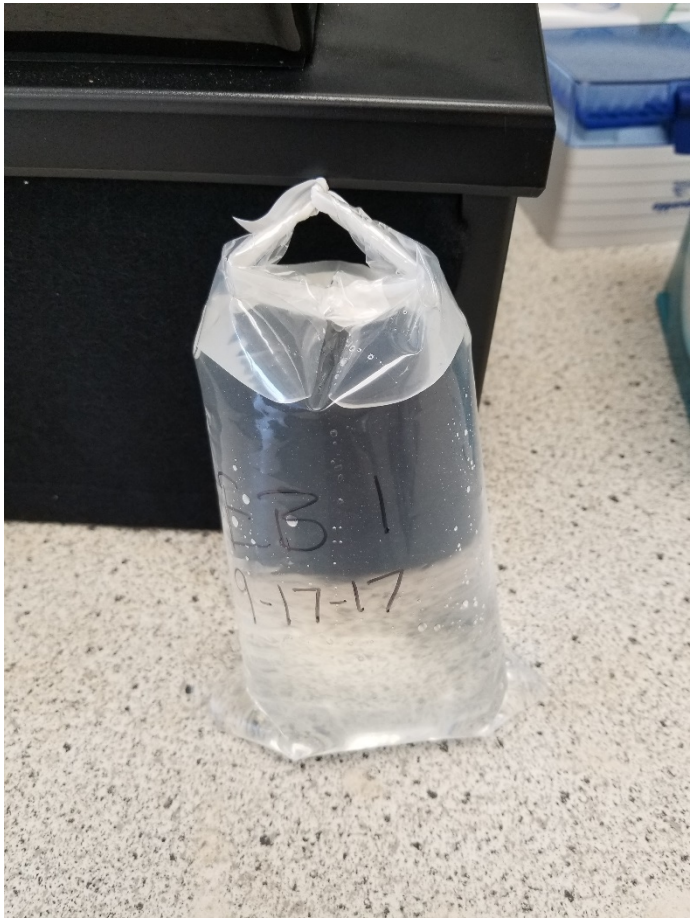
Chain of custody sheet

UCONN MS4 MONITORING PROJECT
Chain of Custody form

Lab ID	Field ID	Date collected	Person checking in	Turbidity (NTU)	Surfactants (mg/L)	Chlorine (mg/L)	NH_3-N (mg/L)	E. coli (col/100 mL)	Cond. (μS/cm)	Salinity (mg/L)	Temp. (^{o}F)

E. coli testing

- Sample must be taken in sterile container
- 6 hour holding time



IDDE sampling

- Pollutant associated with impairment, PLUS:
  - Ammonia
  - Chlorine
  - Surfactants

  → **Test kits**

  - Conductivity
  - Salinity
  - Temperature

  → **Meters**

  - *E. coli* (freshwater) or enterococcus (saline or brackish receiving waters)

Test kits

- IDDE parameters are manageable
- For other monitoring, no easy Hach kit for total nitrogen (TN) or total phosphorus (TP)
- Meters exist, but it requires digestion with a block heater, special reagents, and they are not cheap.
- Until DEEP provides other guidance, we suggest sending to a lab for TN, TP

Info on NEMO MS4 website

Portable Meter vs Lab Cost Estimates

Pollutant	Test Kit/Meter	Price	Samples per kit	Cost per sample	Comments	Commercial lab cost per sample (estimate)
Ammonia	Hach N1-8	$88	100	$0.88	Reagent for this kit contains mercury	$9.00
Surfactants	Hach DE-2	$307	32	$9.59		$16.00
Chlorine	Hach CN-66F	$55	100	$0.55		$3.00
Chloride	Hach 8-P	$56	100	$0.56		$5.00
Turbidity	Hach 2100Q	$1180	n/a			TBD
	LaMotte 2020we	$980	n/a			
	HF Scientific MicroTPW	$799	n/a			
Nitrogen, phosphorus	Lamotte Smart3 (Requires Heater Block for TN/TP)	$999 + $779 (heater block) = $1778	$123 (TN) $89(TP)	$4.90 (TN) $7.56 (TP)	• Reagents also need to be purchased. • Samples need to be digested in heater block prior to analysis (can't be done in field) • *Per sample costs do not include cost of meter and heater block	$8 (TP) $23 (TN)

http://nemo.uconn.edu/ms4/implement/monitoring.htm

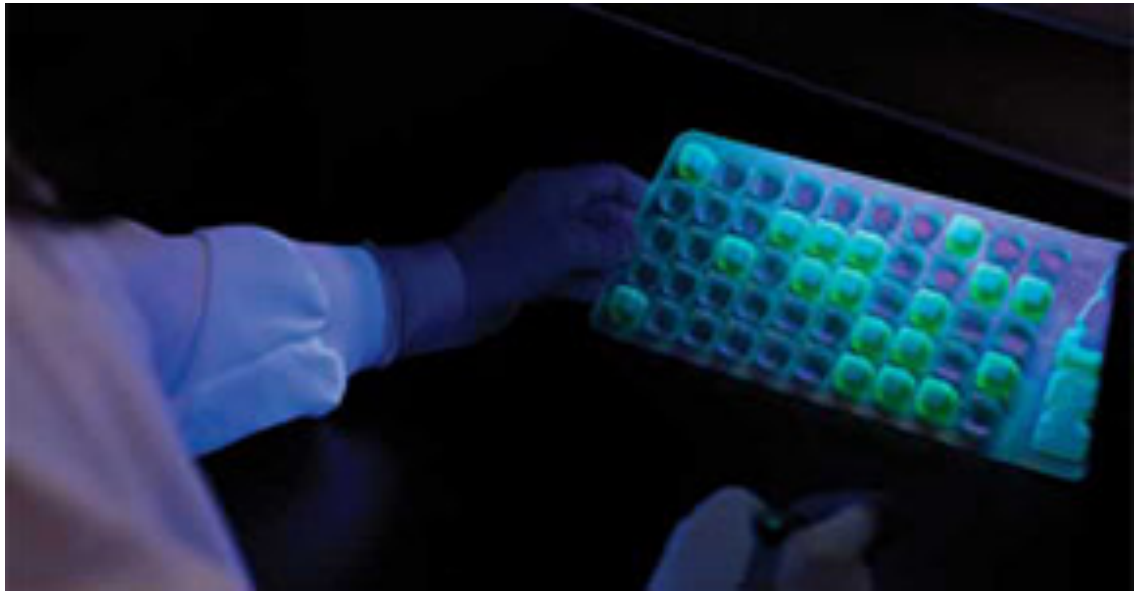
Conductivity/Salinity/Temperature meter - $150

- Available at Amazon (of course…)

Water Quality lab

E. coli testing

- Colilert method (consistent with commercial labs)
- Unless you have access to a lab, you will need to send samples out for E. coli



Summary

- UConn case may be different than other institutions or municipalities
- It still takes planning, organization, and funding support
- We will be resource for others going through process

Thanks!

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