

# Using Canine Scent Tracking To Determine Bacteria Source Contamination: A Case Study from the Grand Traverse Bay Watershed, Michigan

### Benefits of Using Canines for Source Tracking

- Trained to detect the presence of human sewage sources and ignore animal waste sources
- Immediate results
- Cover a lot of ground quickly
- Can target hotspots of suspected contamination to pinpoint specific sources of contamination
- Or conduct widespread testing to locate hotspots for future testing
- Reduces the number and expense of water samples traditionally needed to be collected and sent to the lab
- Storm drain sampling can be done in dry weather (wet weather sampling not needed)
- Can use in variety of field situations: urban stormwater systems, rural drainage ditches, and shoreline investigations (on land or via boat)
- Can also take your own samples and ship them to be inspected by canines remotely ("Ship and Sniff")



### Why Do Source Tracking ?

- Important to identify sources of fecal contamination so you can begin to work on next steps to remediate
- Each source requires a different management plan
- Potential sources:
  - Illicit connections?
  - Leaks in Sanitary Sewer?
  - Large congregations of waterfowl?
  - Animals in storm drains?
  - Pet waste?



Essentially... Is it HUMAN or ANIMAL?

### Urban Storm Drain Analysis in Traverse City (2010-2011)

- Sanitary surveys indicated storm drain outlets located near beaches were a source of bacterial contamination
- K9 Unit called in to 'sniff' up storm drain lines to determine if any bacterial input in drains was from human sources
- Used in conjunction with laboratory analyses by partner research organizations (MSU, USGS)

#### Findings Example: Munson Hospital

- K9 hits detected at storm drain outlet to local creek; followed up the line until the source was located
- Leaking dumpster and trash compactor in loading/unloading area at hospital
- County health department and hospital officials notified
- Problem fixed within a week
- Hospital also put new cleaning measures in place (for wayward trash)

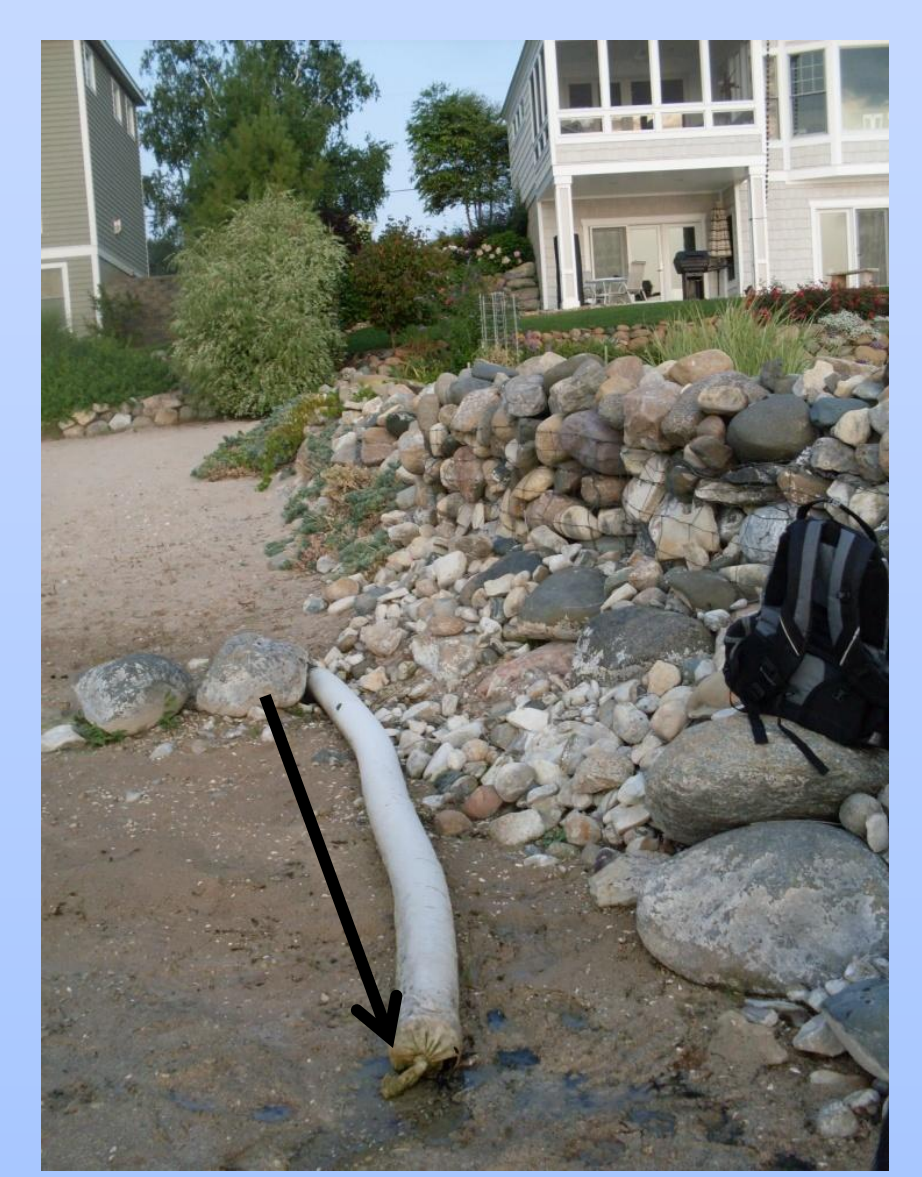
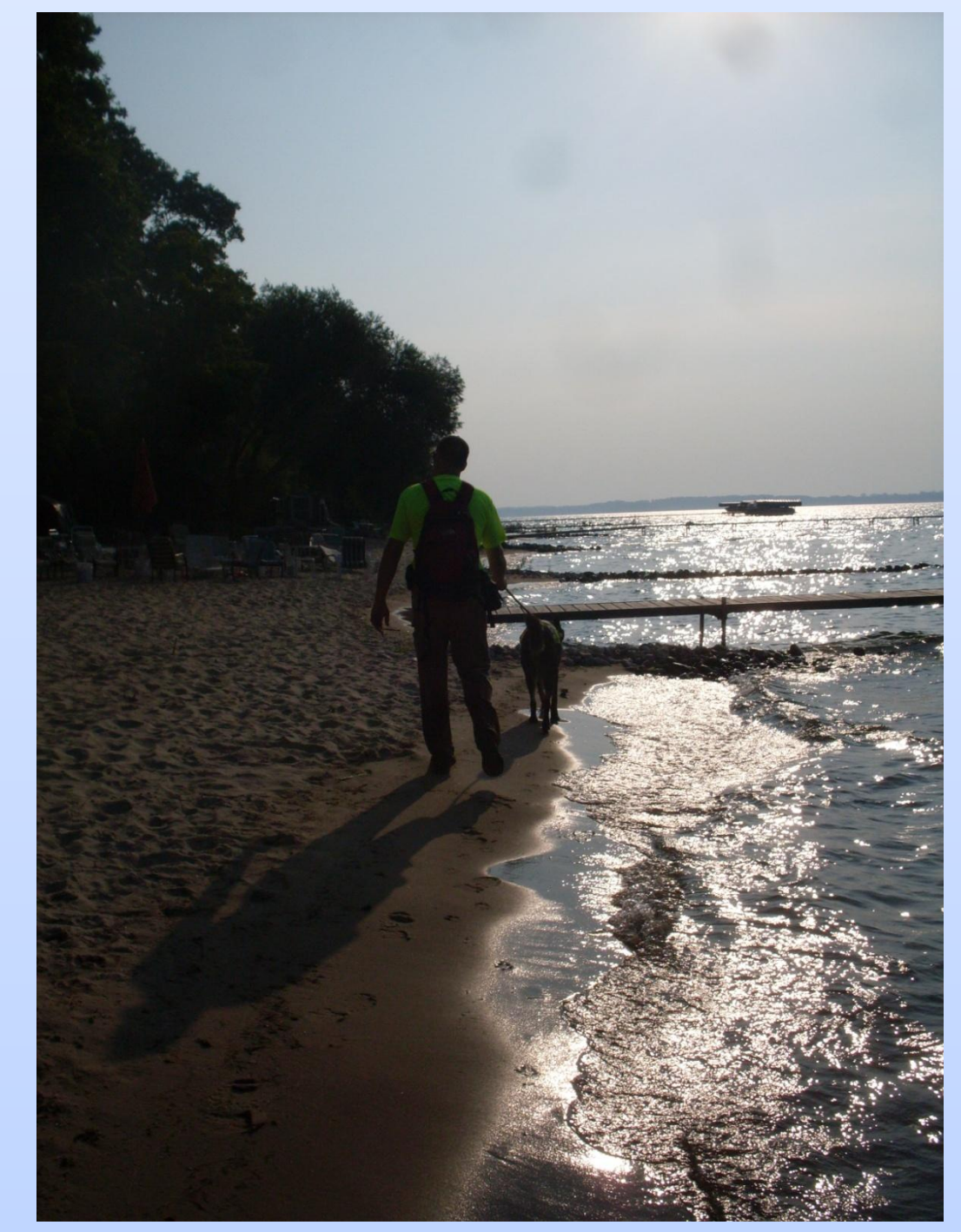


E.coli sample taken from drain greater than 10,000 col/100mL

▲ K9 positive hits  
— Storm drain line

### Old Mission Peninsula Shoreline Survey

- EPA-GLRI grant to conduct source tracking and expanded E.coli testing
- Inspected shoreline for evidence of leaking septic systems, illicit drains, and other potential sources of bacteria contamination
- Alerted at 14 locations
- Contacted local Health Department
- Future: Wet weather testing, dye tests



### Meet the K-9s Used in This Study:



Left: Sable ('barks' when he detects)  
Below: Logan ('sits' when he detects)

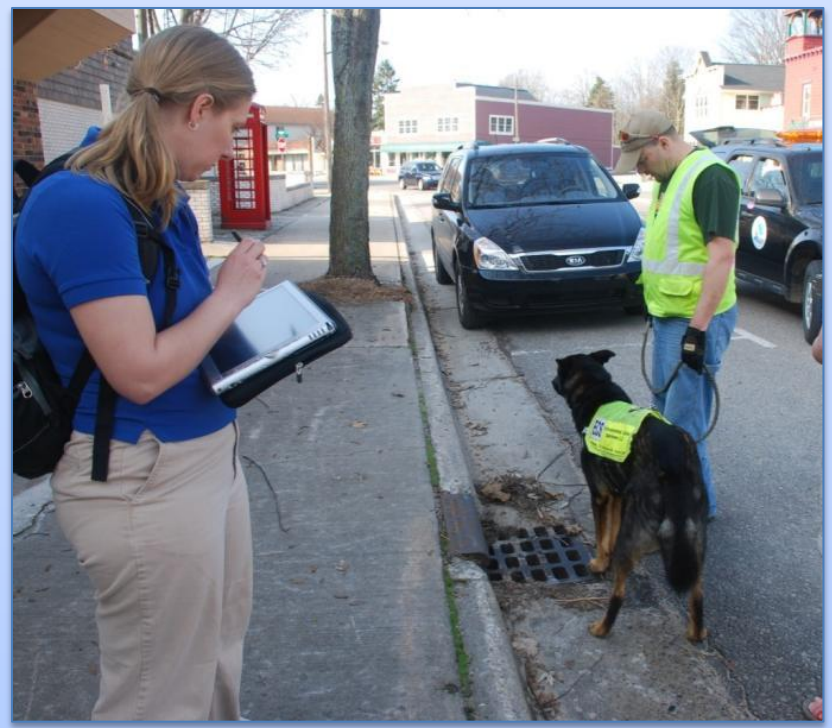
### Environmental Canine Services, LLC

- Takes a year to train
- Shelter dogs, mixed breeds (several others besides Sable and Logan, pictured here)
- Science research supported
- East Coast, West Coast, and Midwest teams
- <http://www.ecsk9s.com>

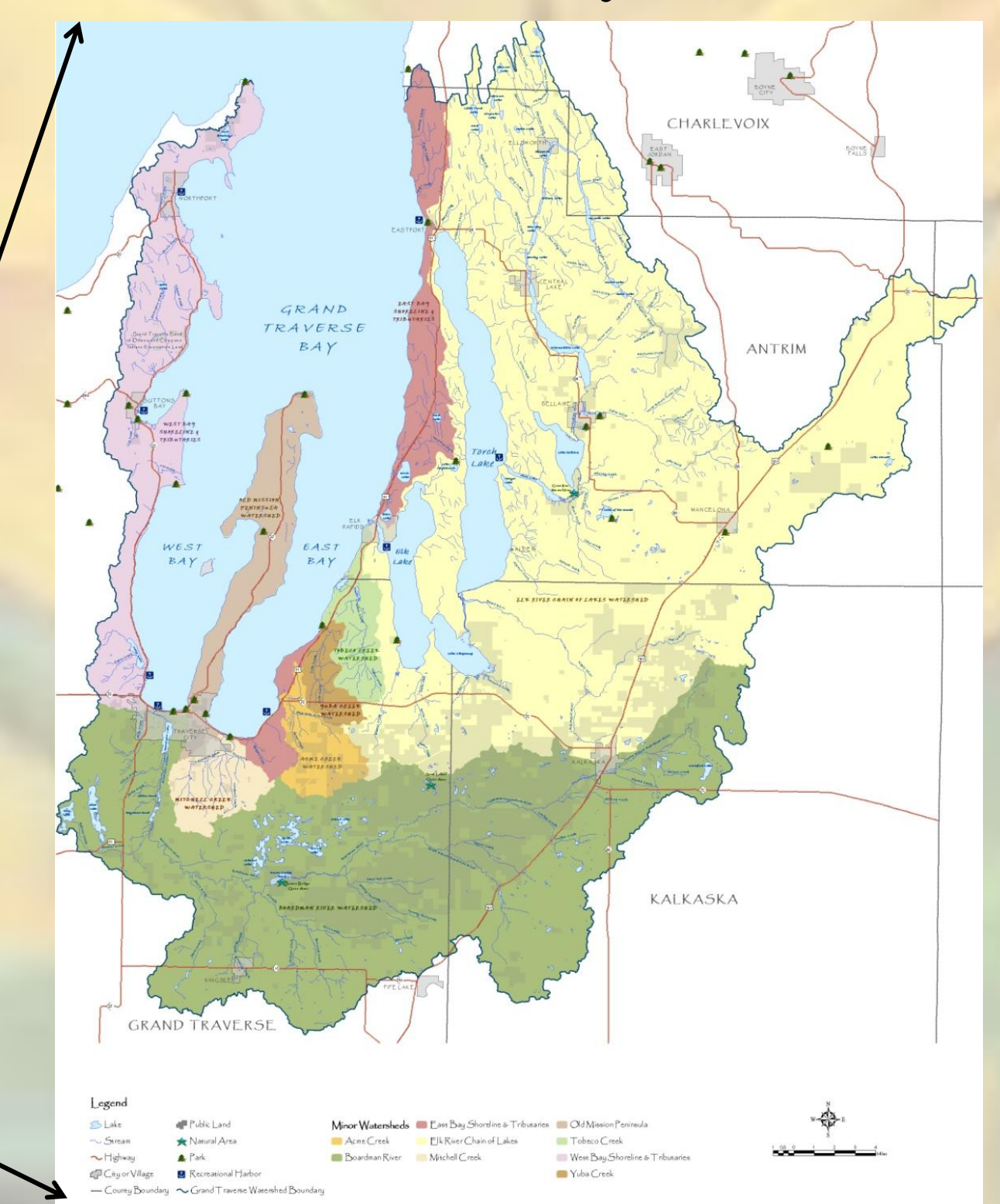


### Village of Suttons Bay Stormwater Remediation Project

- EPA-GLRI grant to protect beach health and improve stormwater quality
- Source tracking - took ONE DAY to complete
- No 'hits' = no human sources of E.coli
- Sanitary sewers and/or illicit connections not the source there
- Remediation project developed BMPs accordingly



### Grand Traverse Bay Watershed



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