# Illicit Discharge Detection and Elimination:

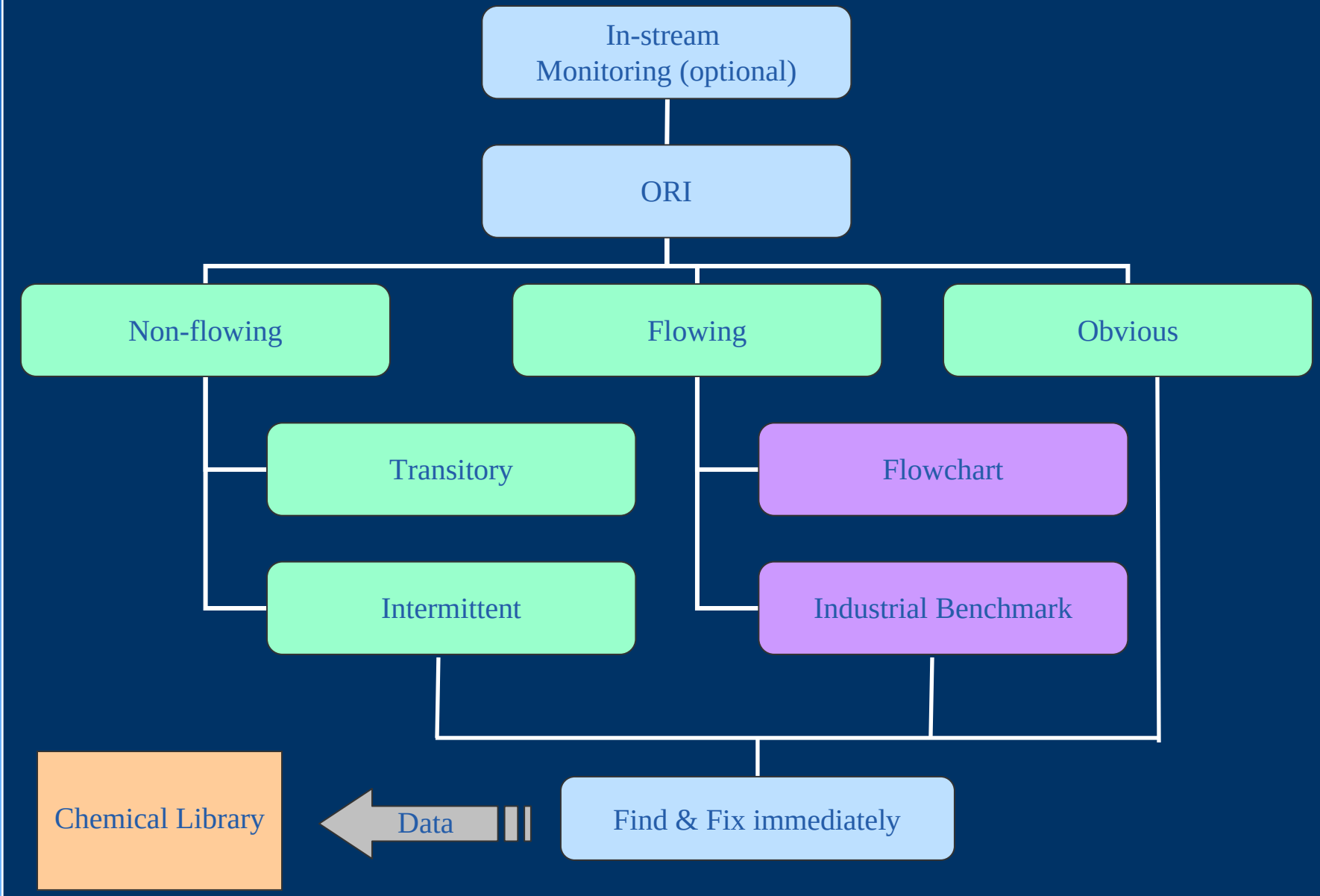
## Preparing for Field Investigations

# Conduct Field & Lab Work to Identify Illicit Discharges

- Purpose:
  - Conduct rapid field screening to identify & track suspected outfalls & stream segments in priority subwatersheds
  - Conduct investigatory sampling & analysis to establish flow types & likely sources
- Elements:
  - Outfall Reconnaissance Inventory (ORI)
  - Field data analysis (Update IDP/Desktop Assessment)
  - Indicator Monitoring

# Conduct Field & Lab Work to Identify Illicit Discharges

- Desired Product or Outcome(s):
  - Locations & physical characterizations of all outfalls incorporated into tracking system
  - Strategy on how to conduct & pursue chemical analysis
  - Indicator monitoring for suspect outfalls
- Budget and/or Staff Resources Required:
  - Extent & number of outfalls influences level of effort
  - Extent & complexity of observed problems dictates level of effort
  - An MS4 that screens 10 stream miles can expect an annual budget between $6,000 to $13,000


In-stream
Monitoring (optional)
ORI
Non-flowing
Flowing
Obvious
Transitory
Flowchart
Intermittent
Industrial Benchmark
Chemical Library
Data
Find & Fix immediately

# Field Assessments
## The Basics

- Time of year considerations
- Supplies
- Staffing requirements
- Safety considerations

# Outfall Reconnaissance Inventory (ORI) Map, Mark & Photograph Outfalls

- Assign unique ID to each outfall
- Physically mark each outfall
- Use a GPS unit to record outfall locations
- Take a photograph

# Outfall Reconnaissance Inventory (ORI)
## Record Basic Characteristics

- Dimensions
- Material
- Whether or not outfall is flowing

# Outfall Reconnaissance Inventory (ORI)

## Simple Monitoring at Flowing Outfalls

- Flow
- pH
- Temperature
- Ammonia

# Outfall Reconnaissance Inventory (ORI)
## Physical Indicators for Flowing Outfalls

- Odor
- Color
- Turbidity
- Floatables

Source: Fort Worth DEM

# Outfall Reconnaissance Inventory (ORI)

## What to do when obvious illicit discharge encountered?

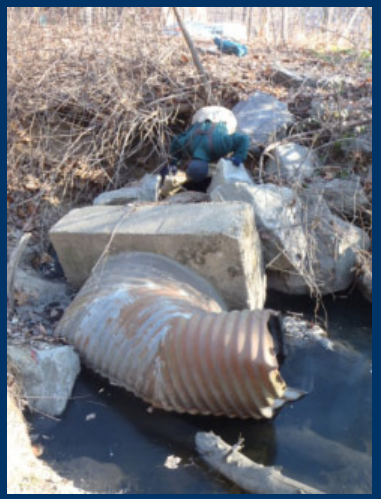
- STOP the ORI
- Track the source
- Contact appropriate water pollution agency
- Photo document, estimate flow, and collect a sample – if safe


Photo Source: R. Frymire

# Outfall Reconnaissance Inventory (ORI)

## Physical Indicators for Flowing and Non-Flowing Outfalls

- Outfall Damage
- Deposits/Stains
- Abnormal Vegetation
- Poor Pool Quality
- Pipe Benthic Growth



# ORI Cost Considerations

- Equipment (relatively minor)
- Crew size (2 to 3 people per crew)
- Stream miles (~ 2-3 miles per crew per day)
- Pre- and post-processing data management (~ 3 person-days for for each day spent in field)

# Quick and Dirty ORI Exercise

(Pardon the pun!)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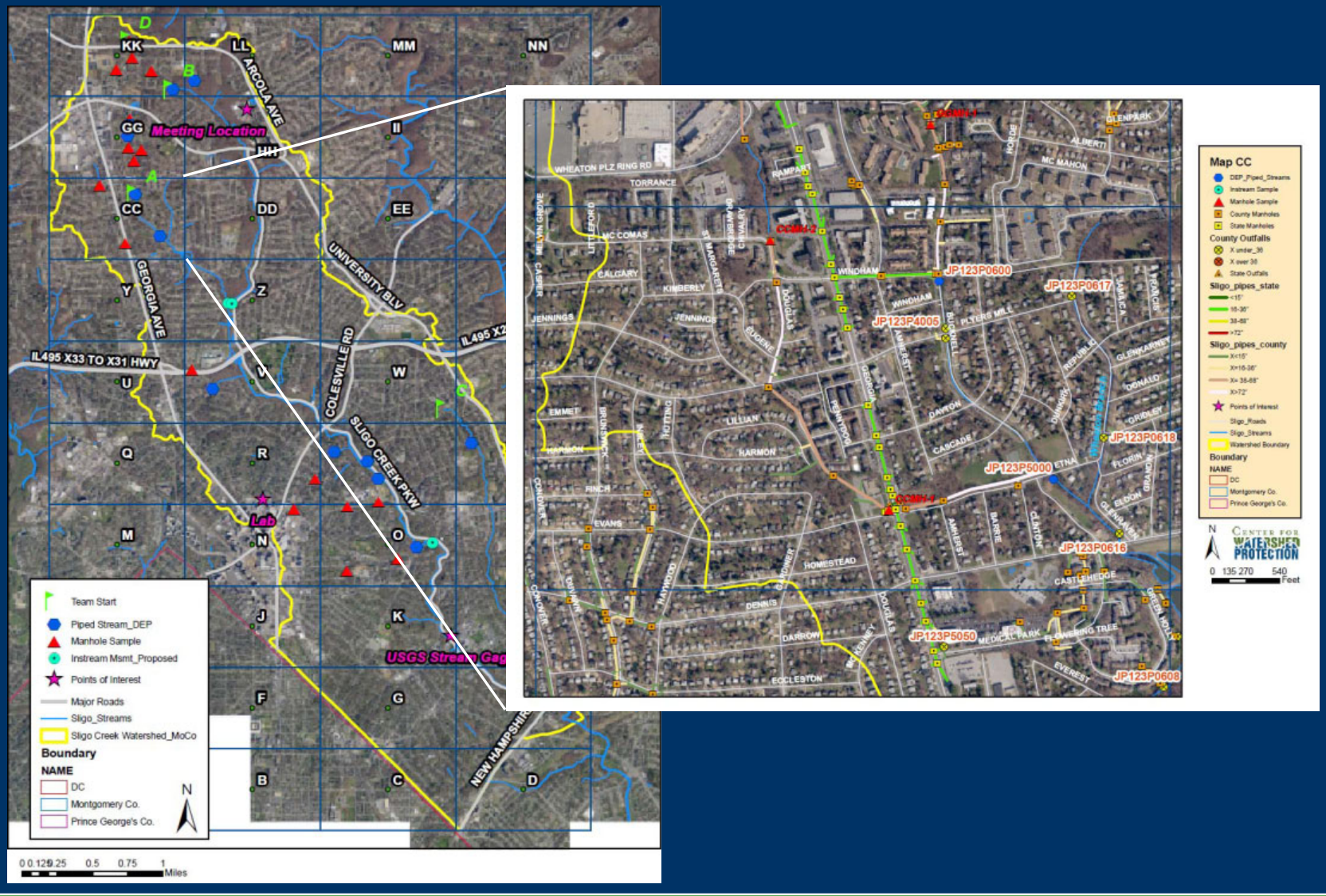
Center for Watershed Protection

# The ORI Cannot:

- Find all discharges (can sometimes lead to a “false positive” as well)
- Detect intermittent flows that leave no trace
- Quantify impacts definitively (no direct measure of relative problem)
- Define sources (except for some obvious indicators)

# Preparing for the Field…

# Field Maps


Meeting Location
Lab
IL495 X33 TO X31 HWY
GEORGIA AVE
COLESVILLE RD
UNIVERSITY BLV
SLIGO CREEK PKW
ARCOLA AVE
NEW HAMPSHIRE
Team Start
Piped Stream_DEP
Manhole Sample
Instream Msmt_Proposed
Points of Interest
Major Roads
Sligo_Streams
Sligo Creek Watershed_MoCo
Boundary
NAME
DC
Montgomery Co.
Prince George's Co.
N
0 0.125 0.25 0.5 0.75 1 Miles
JP123P0600
JP123P0617
JP123P4005
JP123P0618
JP123P5000
JP123P0616
JP123P5050
JP123P0608
Map CC
County Outfalls
Sligo_pipes_state
Sligo_pipes_county
Points of Interest
Boundary
0 135 270 540 Feet

# Field Binder Checklist

- Contact Numbers for Field Crews (i.e. cell phone number)
- Field Maps
- Chain-of-Custody Form
- Outfall Reconnaissance Inventory Forms
- Cheat Sheet or Pocket Field Guide
- Dry outfall locator form, if desired
- Stream Discharge Form, if needed
- Hotspot Inventory Form, if desired
- Retrofit Reconnaissance Inventory Form, if desired

# Field Supply List

- GPS unit
- Camera
- Measuring tape
- Stopwatch
- Ping pong ball
- Graduated container
- Safety gloves
- Sample bottles (clean)
- Cooler / ice packs
- First Aid kit
- Pencils / sharpies
- Outfall marker
- Calculator
- Flashlight
- Dipper
- Digital level
- Waders

# Safety Guidance

**Field safety**

- Wear waders, with good grip
- Wear rubber gloves when collecting samples
- Hand sanitizer is your best friend
- If working in manholes, wear steel toed boots and use a pick (not your fingers)

**Lab safety**

- Wear latex gloves when processing samples
- Dispose of materials properly, according to MSDS sheets
- Bacteria plates can be soaked in bleach after counting
- Use a hood, if / when necessary

# Q/A