Coupling New Technologies With Existing Methods:

A Unified Stream Assessment Example

Prepared and Presented By:
Matthew J. Moffitt, P.E., CFM

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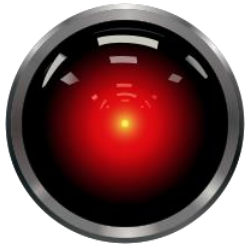
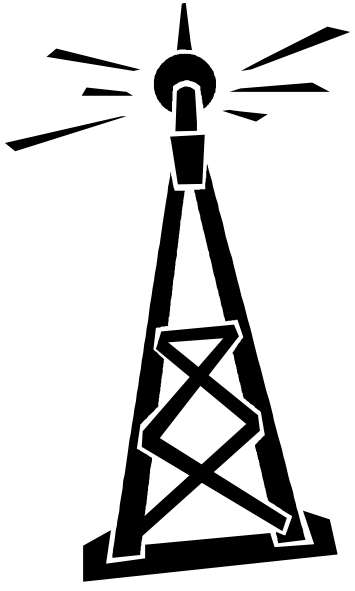
Mobile Technology

- Cell Phones
- Smart Phones
- Tablets
- The “Cloud”
- Interconnectivity
- ~~*Bionic Engineers*~~





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There's An App For That!

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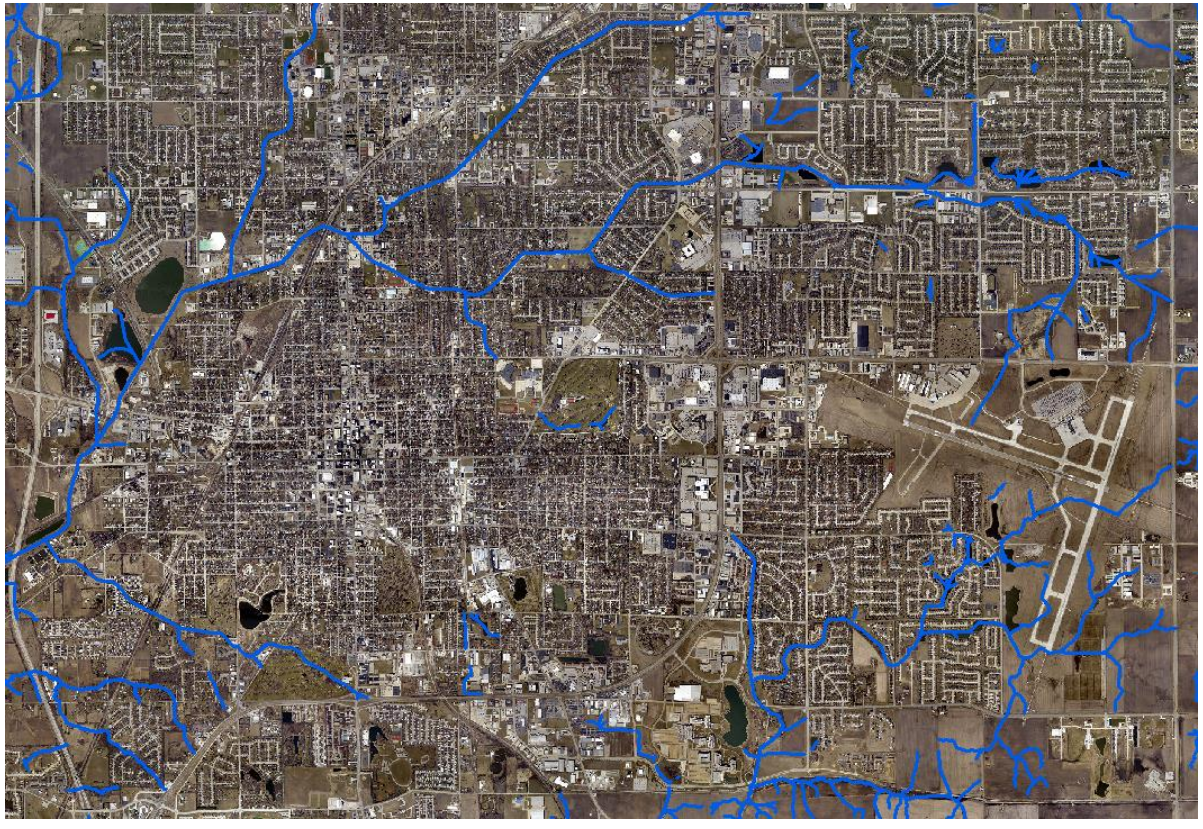
Task at Hand?

Bloomington, IL Stormwater Master Plan



- Stream Inventory
- Unified Stream Assessment

How can we use mobile tech?

- Data Collection
- Data Processing
- Data Conversion

Unified Stream Assessment to iPad

- Foth already created iPad applications for several other data collections processes.
- Understood the task of the Unified Stream Assessment method to be cumbersome in data collection and processing.
- Decided to create a new iPad application specifically for the Unified Stream Assessment Method.

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Preview

- **Introduction to Unified Stream Assessment**
- Traditional Data Processing
- Geographical Information Systems
- iPad App – StreamSites
- StreamSites Data Processing
- Wrap Up

Unified Stream Assessment

- Developed by The Center for Watershed Protection under the U.S. Environmental Protection Agency
- Rapid technique to locate and evaluate problems and restoration opportunities within the urban stream corridor

Unified Stream Assessment

- A tool that provides a systematic approach to assessing and inventorying urban streams. This inventory may then be used to analyze urban streams as a network and easily differentiate the areas of poor conditions versus the areas of good conditions.
- Divides urban streams into reaches and defines 8 common occurrences within each reach.

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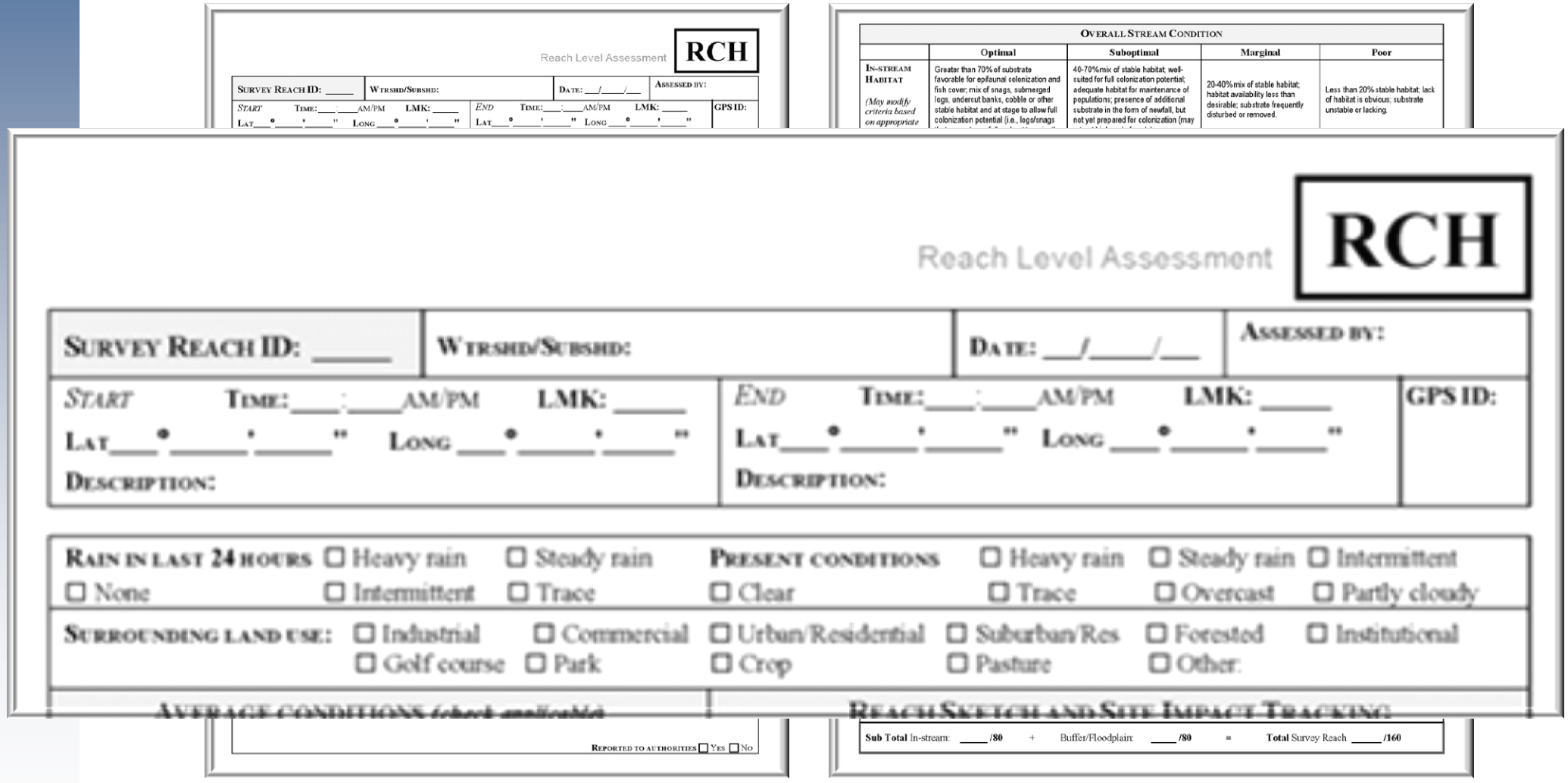
Unified Stream Assessment Collection Equipment

- Chest Waders
- Walking Stick
- 200’ Tape
- Handheld GPS
- Clipboard
- Worksheets (keep them dry)
- Field Manual

U.S.A. – Reach Level Assessment



Reach Level Assessment **RCH**

Survey Reach ID: _____	Wtrshd/Subshd:	Date: __/____/__	Assessed by:
Start Time: ___:____AM/PM LMK: _____ Lat___°____'____" Long___°____'____"	*End* Time: ___:____AM/PM LMK: _____ Lat___°____'____" Long___°____'____"		GPS ID:

Overall Stream Condition

	Optimal	Suboptimal	Marginal	Poor
In-stream Habitat *(May modify criteria based on appropriate*	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.

Reach Level Assessment **RCH**

Survey Reach ID: _____	Wtrshd/Subshd:	Date: __/____/__	Assessed by:
Start Time: ___:____AM/PM LMK: _____ Lat___°____'____" Long___°____'____" Description:	*End* Time: ___:____AM/PM LMK: _____ Lat___°____'____" Long___°____'____" Description:		GPS ID:

Rain in last 24 hours ☐ Heavy rain ☐ Steady rain ☐ None ☐ Intermittent ☐ Trace

Present conditions ☐ Heavy rain ☐ Steady rain ☐ Intermittent ☐ Clear ☐ Trace ☐ Overcast ☐ Partly cloudy

Surrounding land use: ☐ Industrial ☐ Commercial ☐ Urban/Residential ☐ Suburban/Res ☐ Forested ☐ Institutional ☐ Golf course ☐ Park ☐ Crop ☐ Pasture ☐ Other:

Average conditions *(check one/col)*

Reach Sketch and Site Impact Tracking:

Reported to authorities ☐ Yes ☐ No

Sub Total In-stream: ____/80 + Buffer/Floodplain: ____/80 = **Total** Survey Reach ____/160

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U.S.A - Outfalls

Storm Water Outfalls **OT**

Watershed/Subshed:		**Date:** ___/___/___	**Assessed by:**
Survey Reach ID:	**Time:** ___:___ AM/PM	**Photo ID:** *(Camera-Pic #)*	/#
Site ID *(Condition-#)*: OT-____	**Lat** ___° ___' ___" **Long** ___° ___' ___"	**LMK**____	**GPS:** *(Unit ID)*

Bank: ☐ LT ☐ RT ☐ Head

Flow: ☐ None ☐ Trickle ☐ Moderate ☐ Substantial ☐ Other:

Type: ☐ Closed pipe ☐ Open channel

Material: ☐ Concrete ☐ Metal ☐ PVC/Plastic ☐ Brick ☐ Other: ☐ Concrete ☐ Earthen ☐ Other:

Shape: ☐ Single ☐ Circular ☐ Double ☐ Elliptical ☐ Triple ☐ Other: ☐ Trapezoid ☐ Parabolic ☐ Other:

Dimensions: Diameter: ____ (in) Depth: ____ (in) Width (Top): ____ (in) * (Bottom): ____ (in) *NOT APPLICABLE*

Submerged: ☐ No ☐ Partially ☐ Fully

Condition: ☐ None ☐ Chip/Cracked ☐ Peeling Paint ☐ Corrosion ☐ Other:

Odor: ☐ No ☐ Gas ☐ Sewage ☐ Rancid/Sour ☐ Sulfide ☐ Other:

Deposits/Stains: ☐ None ☐ Oily ☐ Flow Line ☐ Paint ☐ Other:

Veggie Density: ☐ None ☐ Normal ☐ Inhibited ☐ Excessive ☐ Other:

Pipe Benthic Growth: ☐ None ☐ Brown ☐ Orange ☐ Green ☐ Other:

Pool Quality: ☐ No pool ☐ Good ☐ Odors ☐ Colors ☐ Oils ☐ Suds ☐ Algae ☐ Floatables ☐ Other:

For Flowing Only	**Color:**	☐ Clear	☐ Brown	☐ Grey	☐ Yellow	☐ Green	☐ Orange	☐ Red	☐ Other:	
	Turbidity:	☐ None	☐ Slight Cloudiness	☐ Cloudy	☐ Opaque					
	Floatables:	☐ None	☐ Sewage (toilet paper, etc.)	☐ Petroleum (oil sheen)	☐ Other:					
Other Concerns:	☐ Excess Trash (paper/plastic bags)	☐ Dumping (bulk)	☐ Excessive Sedimentation	☐ Needs Regular Maintenance	☐ Bank Erosion	☐ Other:				

Potential Restoration Candidate ☐ Discharge investigation ☐ Stream daylighting ☐ Local stream repair/outfall stabilization ☐ no ☐ Storm water retrofit ☐ Other:

If yes for daylighting:
Length of vegetative cover from outfall: _____ ft Type of existing vegetation: _____ Slope: _____ °

If yes for stormwater:
Is stormwater currently controlled? ☐ Yes ☐ No ☐ Not investigated
Land Use description: _____
Area available: _____

Outfall Severity: *(circle #)*	Heavy discharge with a distinct color and/or a strong smell. The amount of discharge is significant compared to the amount of normal flow in receiving stream; discharge appears to be having a significant impact downstream.		Small discharge; flow mostly clear and odorless. If the discharge has a color and/or odor, the amount of discharge is very small compared to the stream's base flow and any impact appears to be minor / localized.		Outfall does not have dry weather discharge, staining, or appearance of causing any erosion problems.
	5	4	3	2	1

Sketch/Notes:

Reported to authorities: ☐ yes ☐ no

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U.S.A – Severe Bank Erosion

Severe Bank Erosion **ER**

WATERSHED/SUBSHED:		DATE: ___/___/___	ASSESSED BY:
SURVEY REACH:	TIME: ___:___AM/PM	PHOTO ID (CAMERA-PIC #):	/#
SITE ID: (*Condition-#*) ER-____	START LAT ___° ___' ___" LONG ___° ___' ___" LMK____		GPS: (*Unit ID*)
	END LAT ___° ___' ___" LONG ___° ___' ___" LMK____		

PROCESS: ☐ Currently unknown

☐ Downcutting ☐ Bed scour
☐ Widening ☐ Bank failure
☐ Headcutting ☐ Bank scour
☐ Aggrading ☐ Slope failure
☐ Sed. deposition ☐ Channelized

BANK OF CONCERN: ☐ LT ☐ RT ☐ Both (*looking downstream*)
LOCATION: ☐ Meander bend ☐ Straight section ☐ Steep slope/valley wall ☐ Other:

DIMENSIONS:

Length (*if no GPS*)	LT_____ft and/or RT_____ft	Bottom width	_____ft
Bank Ht	LT_____ft and/or RT_____ft	Top width	_____ft
Bank Angle	LT_____° and/or RT_____°	Wetted Width	_____ft

LAND OWNERSHIP: ☐ Private ☐ Public ☐ Unknown LAND COVER: ☐ Forest ☐ Field/Ag ☐ Developed:

POTENTIAL RESTORATION CANDIDATE: ☐ Grade control ☐ Bank stabilization ☐ No ☐ Other:

THREAT TO PROPERTY/INFRASTRUCTURE: ☐ No ☐ Yes (Describe):

EXISTING RIPARIAN WIDTH: ☐ ≤25 ft ☐ 25 - 50 ft ☐ 50-75ft ☐ 75-100ft ☐ >100ft

EROSION SEVERITY (*circle #*) Channelized= ☐ 1	Active downcutting; tall banks on both sides of the stream eroding at a fast rate, erosion contributing significant amount of sediment to stream; obvious threat to property or infrastructure.		Pat downcutting evident, active stream widening, banks actively eroding at a moderate rate; no threat to property or infrastructure	Grade and width stable; isolated areas of bank failure/erosion; likely caused by a pipe outfall, local scour, impaired riparian vegetation or adjacent use.
	5	4	3	2 1
ACCESS:	Good access: Open area in public ownership, sufficient room to stockpile materials, easy stream channel access for heavy equipment using existing roads or trails.		Fair access: Forested or developed area adjacent to stream. Access requires tree removal or impact to landscaped areas. Stockpile areas small or distant from stream.	Difficult access. Must cross wetland, steep slope or other sensitive areas to access stream. Minimal stockpile areas available and/or located a great distance from stream section. Specialized heavy equipment required.
	5	4	3	2 1

NOTES/CROSS SECTION SKETCH:

REPORTED TO AUTHORITIES ☐ YES ☐ NO

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U.S.A. – Impacted Buffer

Impacted Buffer **IB**

WATERSHED/SUBSHED:	DATE: ___/___/___	ASSESSED BY:
SURVEY REACH:	TIME: ___:___ AM/PM	PHOTO ID: (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) IB-_____	START LAT ___° ___' ___" LONG ___° ___' ___" LMK_____	GPS: (*Unit ID*)
	END LAT ___° ___' ___" LONG ___° ___' ___" LMK_____	

IMPACTED BANK: ☐ LT ☐ RT ☐ Both

REASON INADEQUATE: ☐ Lack of vegetation ☐ Too narrow ☐ Widespread invasive plants ☐ Recently planted ☐ Other:

LAND USE: (*Facing downstream*)

	Private	Institutional	Golf Course	Park	Other Public
LT Bank	☐	☐	☐	☐	☐:
RT Bank	☐	☐	☐	☐	☐:

DOMINANT LAND COVER:

	Paved	Bare ground	Turf/lawn	Tall grass	Shrub/scrub	Trees	Other
LT Bank	☐	☐	☐	☐	☐	☐	☐:
RT Bank	☐	☐	☐	☐	☐	☐	☐:

INVASIVE PLANTS: ☐ None ☐ Rare ☐ Partial coverage ☐ Extensive coverage ☐ unknown

STREAM SHADE PROVIDED? ☐ None ☐ Partial ☐ Full

WETLANDS PRESENT? ☐ No ☐ Yes ☐ Unknown

POTENTIAL RESTORATION CANDIDATE ☐ Active reforestation ☐ Greenway design ☐ Natural regeneration ☐ Invasives removal ☐ no ☐ Other:

RESTORABLE AREA

	LT BANK	RT
Length (ft):		
Width (ft):		

REFORESTATION POTENTIAL: (*Circle #*)

Impacted area on public land where the riparian area does not appear to be used for any specific purpose; plenty of area available for planting	Impacted area on either public or private land that is presently used for a specific purpose; available area for planting adequate	Impacted area on private land where road; building encroachment or other feature significantly limits available area for planting
5	4 3	2 1

POTENTIAL CONFLICTS WITH REFORESTATION ☐ Widespread invasive plants ☐ Potential contamination ☐ Lack of sun ☐ Poor/unsafe access to site ☐ Existing impervious cover ☐ Severe animal impacts (deer, beaver) ☐ Other:

NOTES:

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U.S.A. – Stream Crossing

Stream Crossing **SC**

WATERSHED/SUBSHED: | DATE: ___/___/___ | ASSESSED BY:

SURVEY REACH ID: | TIME: ___:___AM/PM | PHOTO ID: (*Camera-Pic #*) /#

SITE ID: (*Condition-#*) SC-____ | LAT ___° ___' ___" LONG ___° ___' ___" | LMK____ | GPS (*Unit ID*)

TYPE: ☐ Road Crossing ☐ Railroad Crossing ☐ Manmade Dam ☐ Beaver Dam ☐ Geological Formation ☐ Other:

FOR ROAD/ RAILROAD CROSSINGS ONLY

SHAPE:	# BARRELS:	MATERIAL:	ALIGNMENT:	DIMENSIONS: (*if variable, sketch*)
☐ Arch ☐ Bottomless ☐ Box ☐ Elliptical ☐ Circular ☐ Other:	☐ Single ☐ Double ☐ Triple ☐ Other:	☐ Concrete ☐ Metal ☐ Other:	☐ Flow-aligned ☐ Not flow-aligned ☐ Do not know	Barrel diameter: _____(ft) Height: _____(ft) Culvert length: _____(ft) Width: _____(ft) Roadway elevation: _____(ft)

CONDITION: (*Evidence of…*)
☐ Cracking/chipping/corrosion ☐ Downstream scour hole
☐ Sediment deposition ☐ Failing embankment
☐ Other (*describe*):

CULVERT SLOPE:
☐ Flat
☐ Slight (2° – 5°)
☐ Obvious (>5°)

POTENTIAL RESTORATION CANDIDATE ☐ Fish barrier removal ☐ Culvert repair/replacement ☐ Upstream storage retrofit
☐ no ☐ Local stream repair ☐ Other:

IS SC ACTING AS GRADE CONTROL ☐ No ☐ Yes ☐ Unknown

If yes for fish barrier

EXTENT OF PHYSICAL BLOCKAGE:
☐ Total ☐ Partial
☐ Temporary ☐ Unknown

CAUSE:
☐ Drop too high Water Drop: _____ (in)
☐ Flow too shallow Water Depth: _____ (in)
☐ Other:

BLOCKAGE SEVERITY: (*circle #*)

5	4	3	2	1
A structure such as a dam or road culvert on a 3rd order or greater stream blocking the upstream movement of anadromous fish; no fish passage device present.		A total fish blockage on a tributary that would isolate a significant reach of stream, or partial blockage that may interfere with the migration of anadromous fish.		A temporary barrier such as a beaver dam or a blockage at the very head of a stream with very little viable fish habitat above it; natural barriers such as waterfalls.

NOTES/SKETCH:

REPORTED TO AUTHORITIES ☐ YES ☐ NO

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U.S.A. – Channel Modification

Channel Modification **CM**

WATERSHED/SUBSHED:		DATE: ___/___/___	ASSESSED BY:
SURVEY REACH ID:	TIME: ___:___AM/PM	PHOTO ID: (*Camera-Pic #*)	#
SITE ID: (*Condition-#*) CM-____	*START* LAT ___°___'___" LONG ___°___'___" LMK____		GPS: (*Unit ID*)
	END LAT ___°___'___" LONG ___°___'___" LMK____		

TYPE: ☐ Channelization ☐ Bank armoring ☐ concrete channel ☐ Floodplain encroachment ☐ Other:

MATERIAL:		DIMENSIONS:
☐ Concrete ☐ Gabion ☐ Rip Rap ☐ Earthen ☐ Metal ☐ Other:	Does channel have perennial flow? ☐ Yes ☐ No	Height ____(ft)
	Is there evidence of sediment deposition? ☐ Yes ☐ No	Bottom Width ____(ft)
	Is vegetation growing in channel? ☐ Yes ☐ No	Top Width: ____(ft)
	Is channel connected to floodplain? ☐ Yes ☐ No	Length: ____(ft)

BASE FLOW CHANNEL
Depth of flow ____(in)
Defined low flow channel? ☐ Yes ☐ No
% of channel bottom ____%

ADJACENT STREAM CORRIDOR
Available width LT____(ft) RT____(ft)
Utilities Present? ☐ Yes ☐ No
Fill in floodplain? ☐ Yes ☐ No

POTENTIAL RESTORATION CANDIDATE ☐ Structural repair ☐ Base flow channel creation ☐ Natural channel design ☐ Can't tell ☐ no ☐ De-channelization ☐ Fish barrier removal ☐ Bioengineering

CHANNELIZATION SEVERITY: (*Circle #*)				
	A long section of concrete stream (>500') channel where water is very shallow (<1" deep) with no natural sediments present in the channel.		A moderate length (> 200'), but channel stabilized and beginning to function as a natural stream channel. Vegetated bars may have formed in channel.	An earthen channel less than 100 ft with good water depth, a natural sediment bottom, and size and shape similar to the unchannelized stream reaches above and below impacted area.
	5	4	3	2 1

NOTES:

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U.S.A. – Trash and Debris

Trash and Debris **TR**

WATERSHED/SUBSHED:	DATE: ___/____/___	ASSESSED BY:
SURVEY REACH ID: TIME: ___ ___AM/PM	PHOTO ID: (*Camera-Pic #*) /#	
SITE ID: (*Condition-#*) TR-____ LAT ___°____'____" LONG ___°____'____" LMK____		GPS: (*Unit ID*)

TYPE:	MATERIAL:	SOURCE:	LOCATION:	LAND OWNERSHIP:
☐ Industrial ☐ Commercial ☐ Residential	☐ Plastic ☐ Paper ☐ Metal ☐ Tires ☐ Construction ☐ Medical ☐ Appliances ☐ Yard Waste ☐ Automotive ☐ Other:	☐ Unknown ☐ Flooding ☐ Illegal dump ☐ Local outfall	☐ Stream ☐ Riparian Area ☐ Lt bank ☐ Rt bank	☐ Public ☐ Unknown ☐ Private AMOUNT (*# Pickup truck loads*):

POTENTIAL RESTORATION CANDIDATE ☐ Stream cleanup ☐ Stream adoption segment ☐ Removal/prevention of dumping
☐ no ☐ Other:

If yes for trash or debris removal

EQUIPMENT NEEDED : ☐ Heavy equipment ☐ Trash bags ☐ Unknown
WHO CAN DO IT: ☐ Volunteers ☐ Local Gov ☐ Hazmat Team ☐ Other
DUMPSTER WITHIN 100 FT: ☐ Yes ☐ No ☐ Unknown

CLEAN-UP POTENTIAL: (*Circle #*)				
	A small amount of trash (i.e., less than two pickup truck loads) located inside a park with easy access	A large amount of trash, or bulk items, in a small area with easy access. Trash may have been dumped over a long period of time but it could be cleaned up in a few days, possibly with a small backhoe.	A large amount of trash or debris scattered over a large area, where access is very difficult. Or presence of drums or indications of hazardous materials	
	5	4 3	2	1

NOTES:

REPORTED TO AUTHORITIES ☐ YES ☐ NO

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U.S.A. – Utility Impacts

Utility Impacts **UT**

WATERSHED/SUBSHED:	DATE: ___/____/___	ASSESSED BY:
SURVEY REACH ID:	TIME: ___:___AM/PM	PHOTO ID: (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) UT-____	LAT___°____'____" LONG___°____'____"	LMK: ____ GPS: (*Unit ID*)

TYPE:	MATERIAL:	LOCATION:	POTENTIAL FISH BARRIER:	PIPE DIMENSIONS:
☐ Leaking sewer ☐ Exposed pipe ☐ Exposed manhole ☐ Other:	☐ Concrete ☐ Corrugated metal ☐ Smooth metal ☐ PVC ☐ Other:	☐ Floodplain ☐ Stream bank ☐ Above stream ☐ Stream bottom ☐ Other:	☐ Yes ☐ No CONDITION: ☐ Joint failure ☐ Pipe corrosion/cracking ☐ Protective covering broken ☐ Manhole cover absent ☐ Other:	Diameter: ____in Length exposed: ____ft

EVIDENCE OF DISCHARGE:		
	COLOR	☐ None ☐ Clear ☐ Dark Brown ☐ Lt Brown ☐ Yellowish ☐ Greenish ☐ Other:
	ODOR	☐ None ☐ Sewage ☐ Oily ☐ Sulfide ☐ Chlorine ☐ Other:
	DEPOSITS	☐ None ☐ Tampons/Toilet Paper ☐ Lime ☐ Surface oils ☐ Stains ☐ Other:

POTENTIAL RESTORATION CANDIDATE ☐ Structural repairs ☐ Pipe testing ☐ Citizen hotlines ☐ Dry weather sampling
☐ no ☐ Fish barrier removal ☐ Other:

If yes to fish barrier, Water Drop: _____ (in)

UTILITY IMPACT SEVERITY: (*Circle #*)	5	4	3	2	1
Leaking= ☐ 5	Section of pipe undermined by erosion and could collapse in the near future; a pipe running across the bed or suspended above the stream; a long section along the edge of the stream where nearly the entire side of the pipe is exposed; or a manhole stack that is located in the center of the stream channel and there is evidence of stack failure.	A moderately long section of pipe is partially exposed but there is no immediate threat that the pipe will be undermined and break in the immediate future. The primary concern is that the pipe may be punctured by large debris during a large storm event.			Small section of exposed pipe, stream bank near the pipe is stable; the pipe is across the bottom of the stream but only a small portion of the top of the pipe exposed; the pipe is exposed but is reinforced with concrete and it is not causing a blockage to upstream fish movement; a manhole stack that is at the edge of the stream and does not extend very far out into the active stream channel.

NOTES:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

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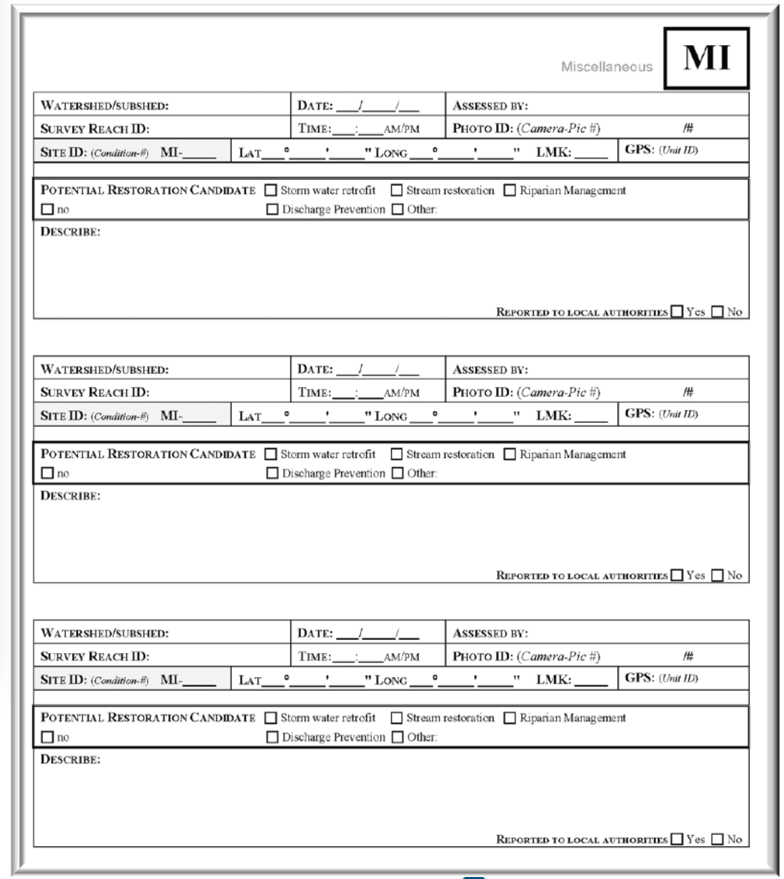
U.S.A. – Miscellaneous



Miscellaneous **MI**

WATERSHED/SUBSHED: | DATE: ___/____/___ | ASSESSED BY:
SURVEY REACH ID: | TIME:___:___AM/PM | PHOTO ID: (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) MI-_____ | LAT___°_____'_____" LONG___°_____'_____" LMK: _____ | GPS: (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☐ Other:

DESCRIBE:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

WATERSHED/SUBSHED: | DATE: ___/____/___ | ASSESSED BY:
SURVEY REACH ID: | TIME:___:___AM/PM | PHOTO ID: (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) MI-_____ | LAT___°_____'_____" LONG___°_____'_____" LMK: _____ | GPS: (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☐ Other:

DESCRIBE:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

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SURVEY REACH ID: | TIME:___:___AM/PM | PHOTO ID: (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) MI-_____ | LAT___°_____'_____" LONG___°_____'_____" LMK: _____ | GPS: (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☐ Other:

DESCRIBE:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

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U.S.A. – Photo Log

Date	Stream/ Reach	Location ID	Photo #	Description

Comments:

(BACK)

Preview

- Introduction to Unified Stream Assessment
- **Traditional Data Processing**
- Geographical Information Systems
- iPad App – StreamSites
- StreamSites Data Processing
- Wrap Up

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Traditional Data Processing

- Need to store it
  - Organized
  - Intelligent
  - Sortable
  - Searchable
- U.S.A. Field Sheet Database – Microsoft Access
- Manual Data Entry

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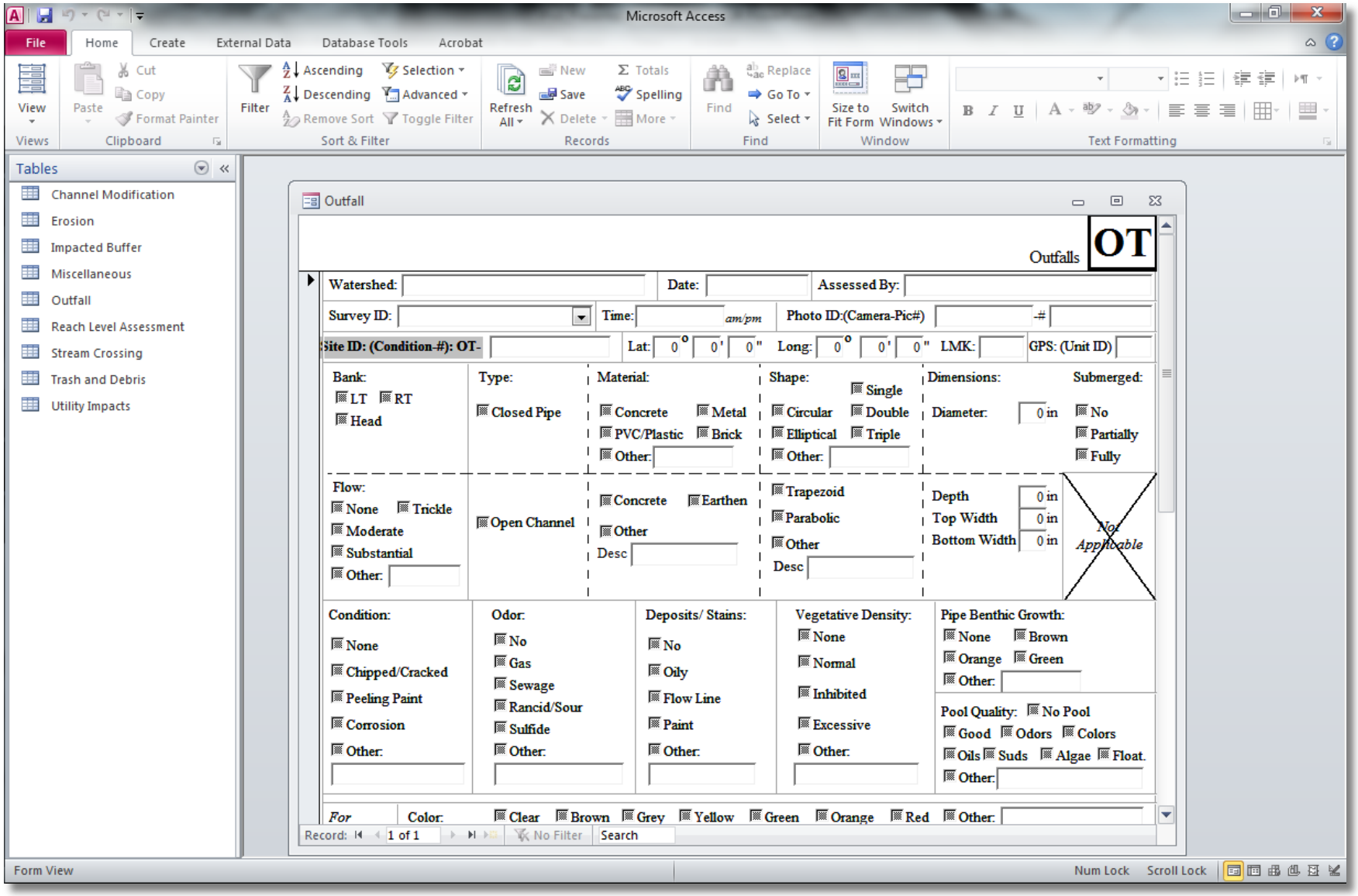
Microsoft Access
File
Home
Create
External Data
Database Tools
Acrobat
Tables
Channel Modification
Erosion
Impacted Buffer
Miscellaneous
Outfall
Reach Level Assessment
Stream Crossing
Trash and Debris
Utility Impacts
Switchboard
USA Field Sheet Database
Reach Level Assesment
Must be filled in first
Impacted Buffer
Stormwater Outfall
Channel Modification
Stream Crossing
Severe Bank Erosion
Trash and Debris
Utility Impacts
Miscellaneous
Record: 1 of 1
No Filter
Search
Form View
Num Lock
Scroll Lock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Utility Impacts
Outfall
Outfalls
OT
Watershed:
Date:
Assessed By:
Survey ID:
Time:
am/pm
Photo ID:(Camera-Pic#)
Site ID: (Condition-#): OT-
Lat:
Long:
LMK:
GPS: (Unit ID)
Bank:
LT
RT
Head
Type:
Closed Pipe
Material:
Concrete
Metal
PVC/Plastic
Brick
Other:
Shape:
Single
Circular
Double
Elliptical
Triple
Other:
Dimensions:
Diameter:
Submerged:
No
Partially
Fully
Flow:
None
Trickle
Moderate
Substantial
Other:
Open Channel
Concrete
Earthen
Other
Desc
Trapezoid
Parabolic
Other
Desc
Depth
Top Width
Bottom Width
Not Applicable
Condition:
None
Chipped/Cracked
Peeling Paint
Corrosion
Other:
Odor:
No
Gas
Sewage
Rancid/Sour
Sulfide
Other:
Deposits/ Stains:
No
Oily
Flow Line
Paint
Other:
Vegetative Density:
None
Normal
Inhibited
Excessive
Other:
Pipe Benthic Growth:
None
Brown
Orange
Green
Other:
Pool Quality:
No Pool
Good
Odors
Colors
Oils
Suds
Algae
Float.
Other:
Color:
Clear
Brown
Grey
Yellow
Green
Orange
Red
Other:
Record:
1 of 1
No Filter
Search
Form View
Num Lock
Scroll Lock

Preview

- Introduction to Unified Stream Assessment
- Traditional Data Processing
- **Geographical Information Systems**
- iPad App – StreamSites
- StreamSites Data Processing
- Wrap Up

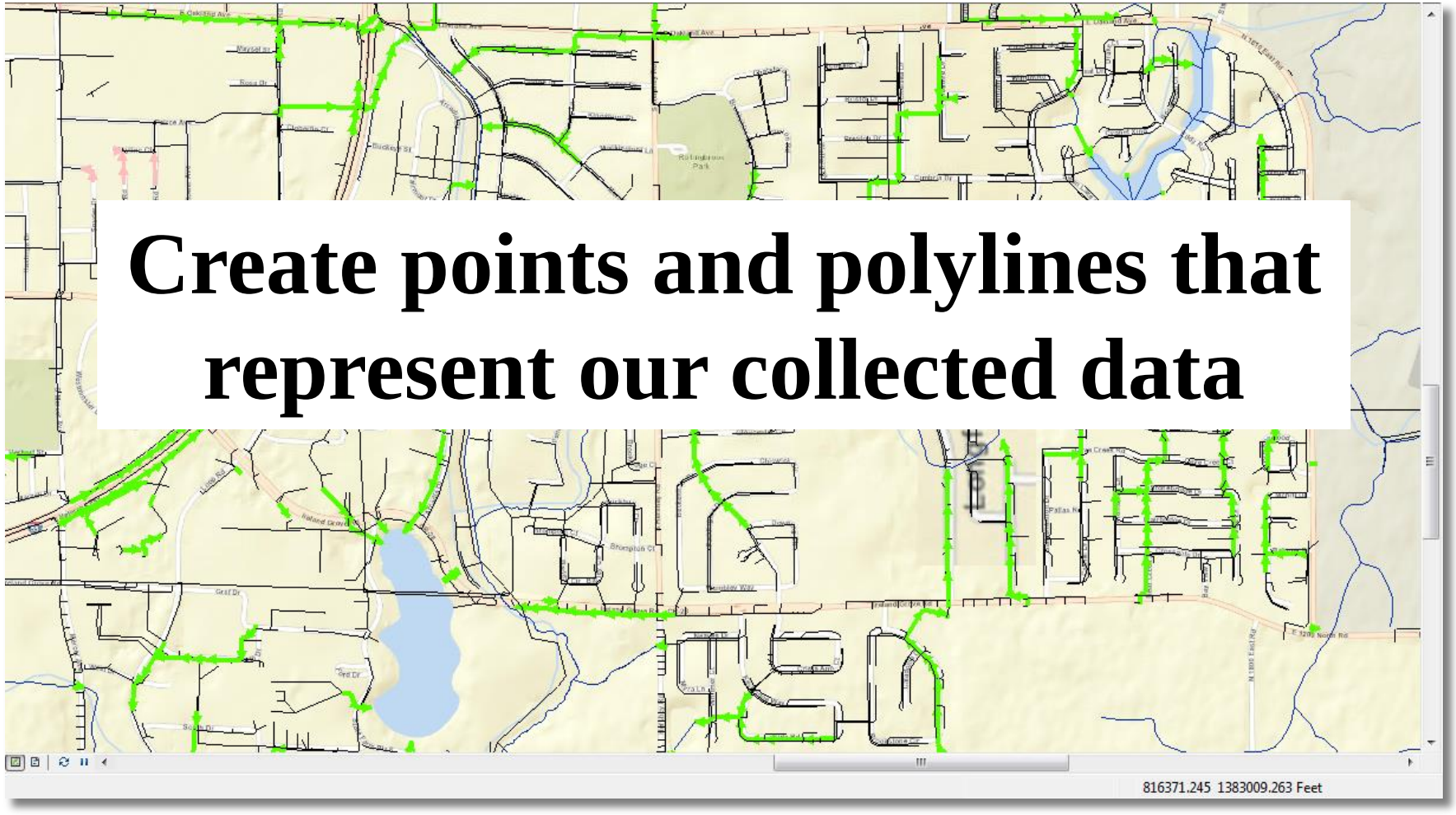
Foth

GIS

- What is GIS?
  - Spatial Database
- What can it do with the info that Access can’t?
  - Visually see dots/lines/shapes/objects on a map representing various elements
  - Can represent data based on various properties
  - Define algorithms to manipulate data to more accurately represent key data

Foth

Geographical Information System



Preview

- Introduction to Unified Stream Assessment
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Foth

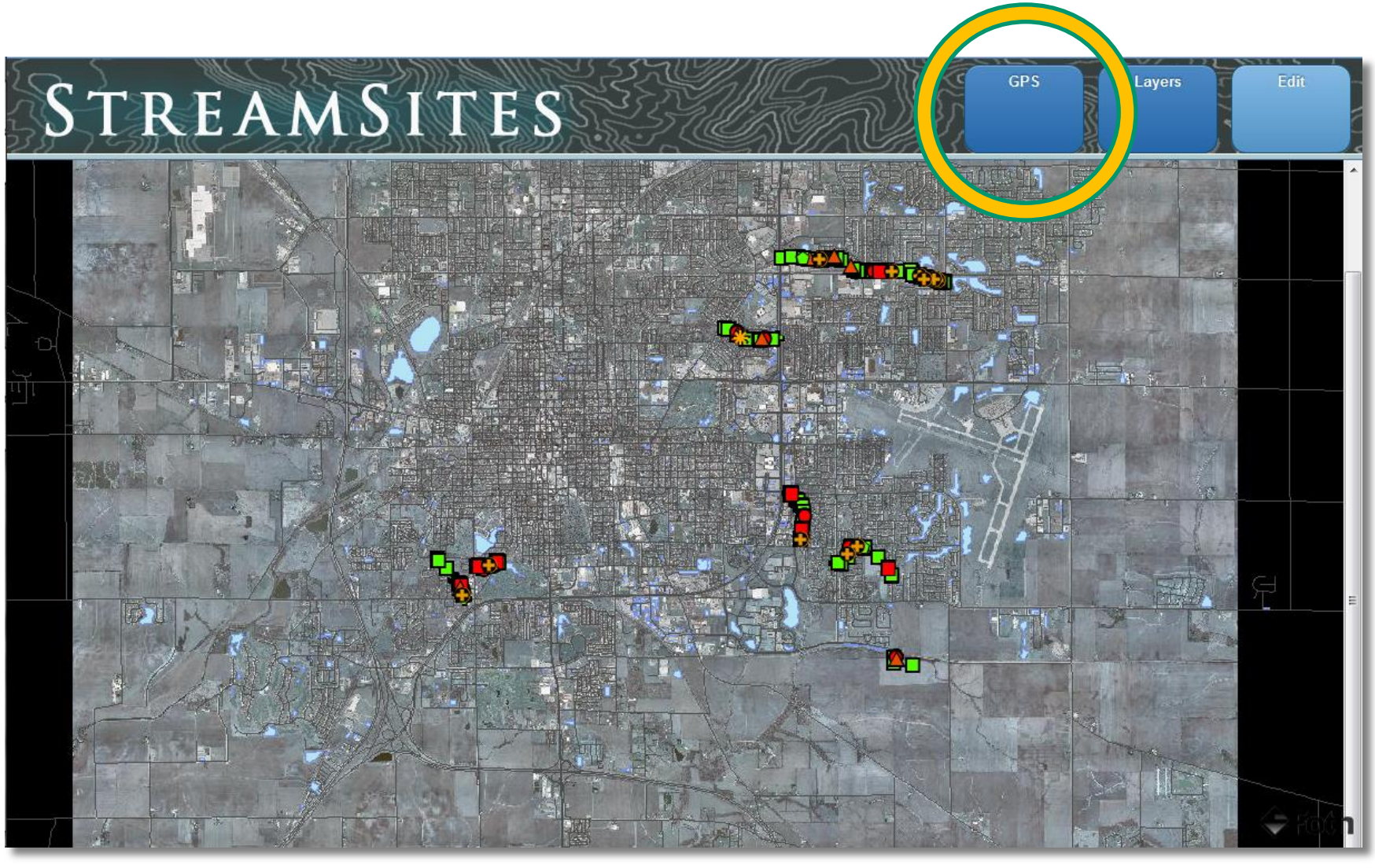
Development of StreamSites

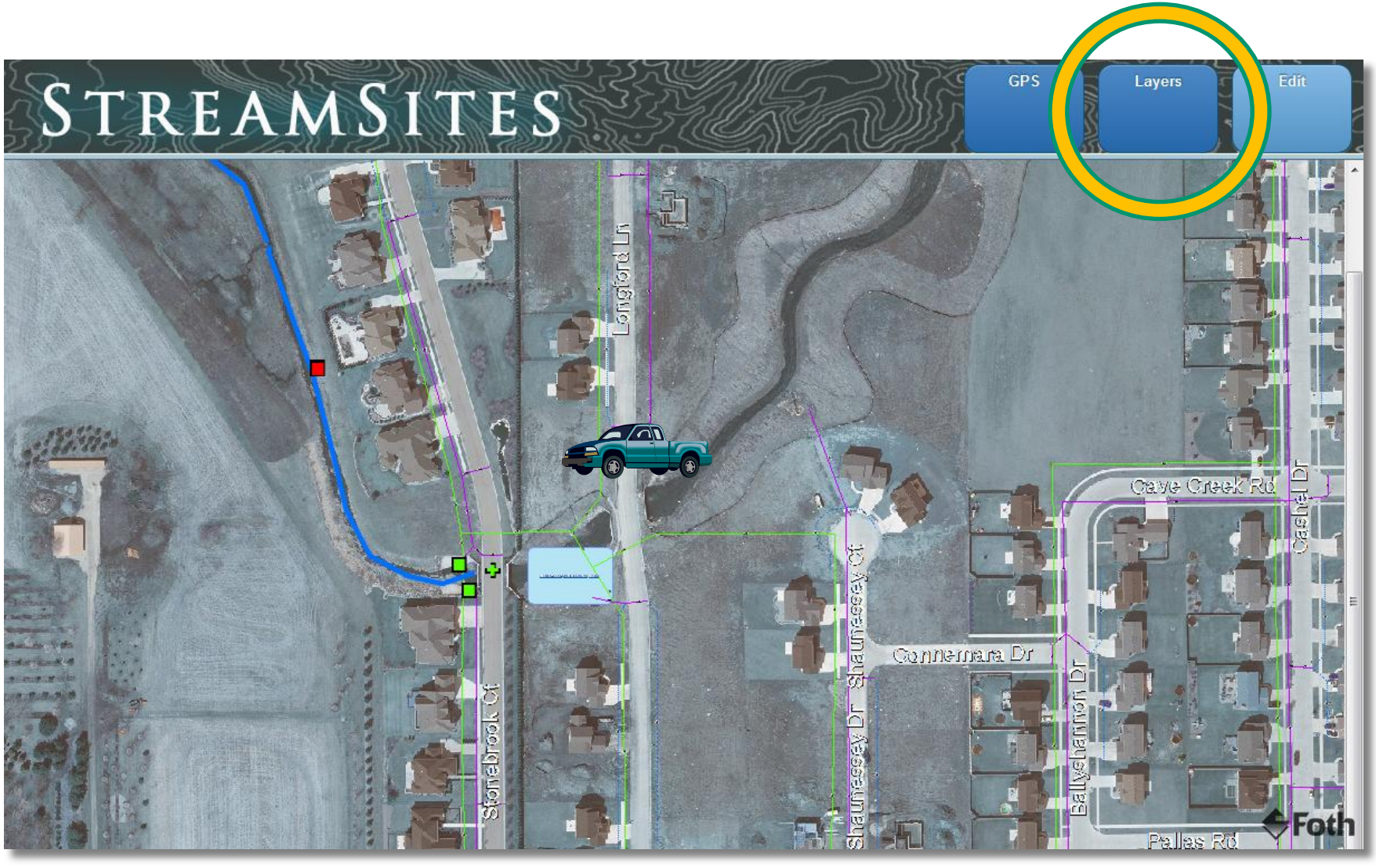
- Who
- What
- **Why**
- Where
- When
- How

StreamSites Collection Equipment

- Chest Waders
- Walking Stick
- 200’ Tape
- iPad

Foth

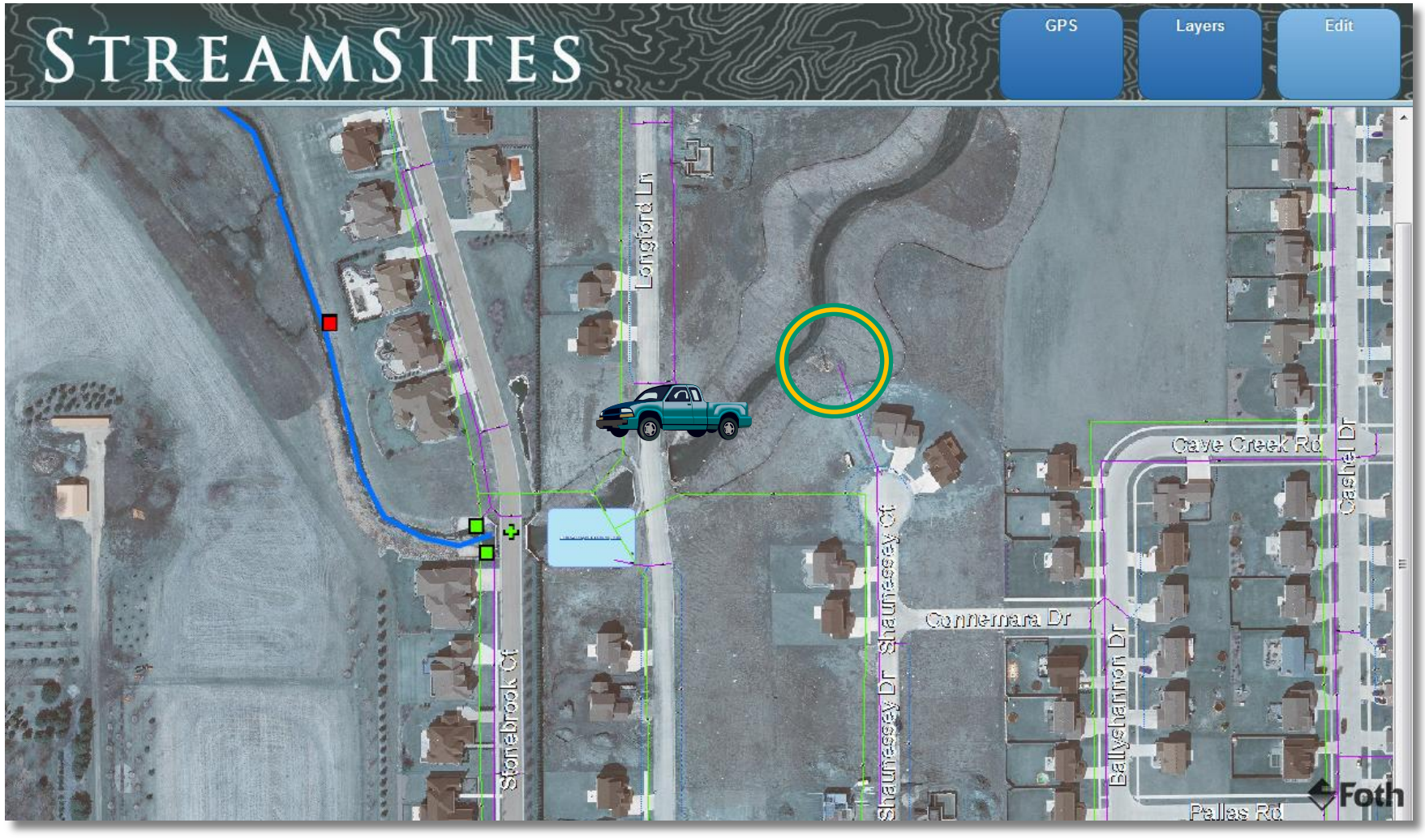

StreamSites
GPS
Layers
Edit


StreamSites
GPS
Layers
Edit
Longford Ln
Stonebrook Ct
Shaunassey Dr
Shaunassey Ct
Connemara Dr
Ballyshannon Dr
Cave Creek Rd
Cashel Dr
Pallas Rd
Foth

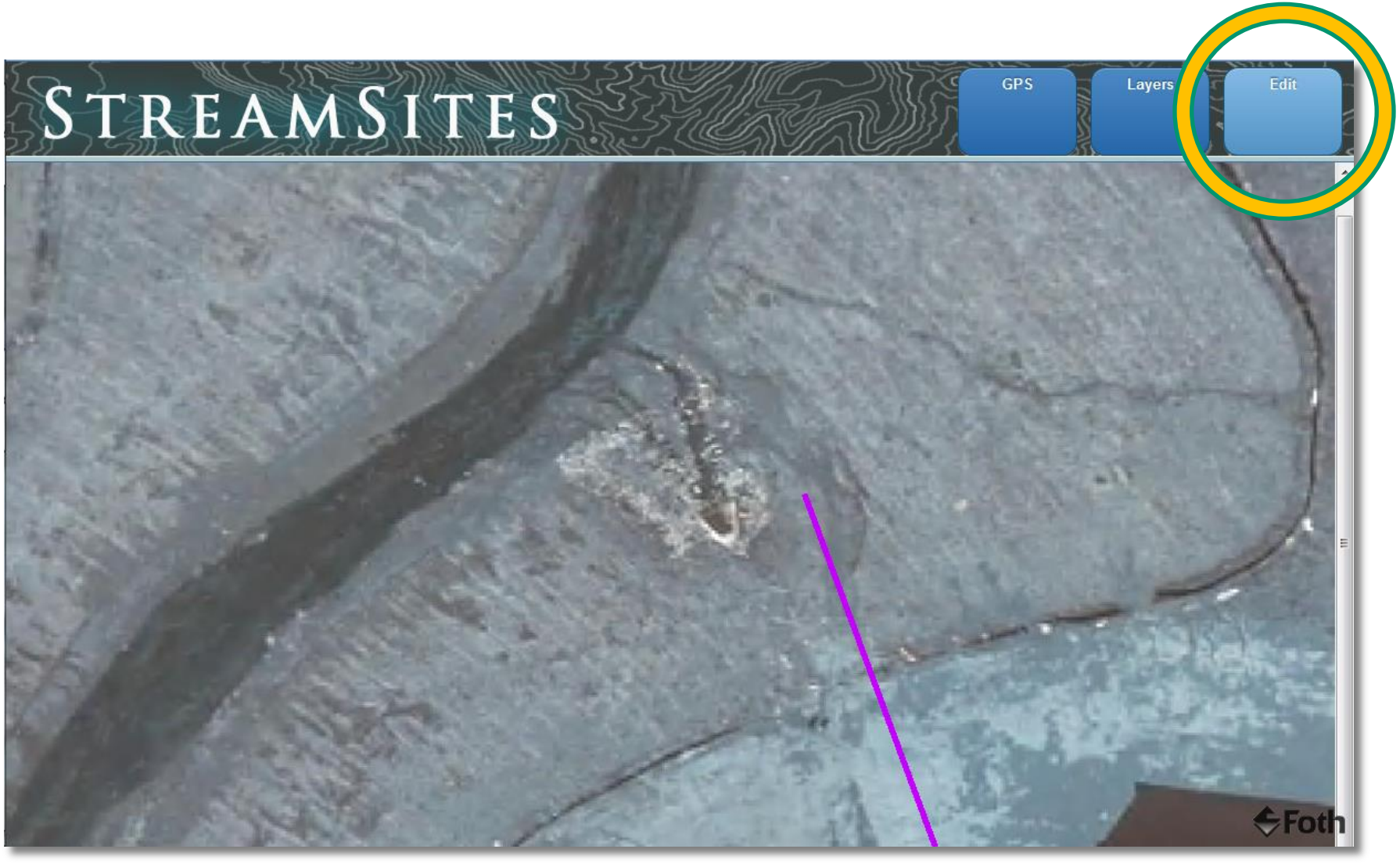
Foth

StreamSites

Foth


StreamSites
GPS
Layers
Edit
Longford Ln
Stonebrook Ct
Shaunessey Dr
Shaunessey Ct
Connemara Dr
Ballyshannon Dr
Cave Creek Rd
Cashel Dr
Pallas Rd
Foth

Foth



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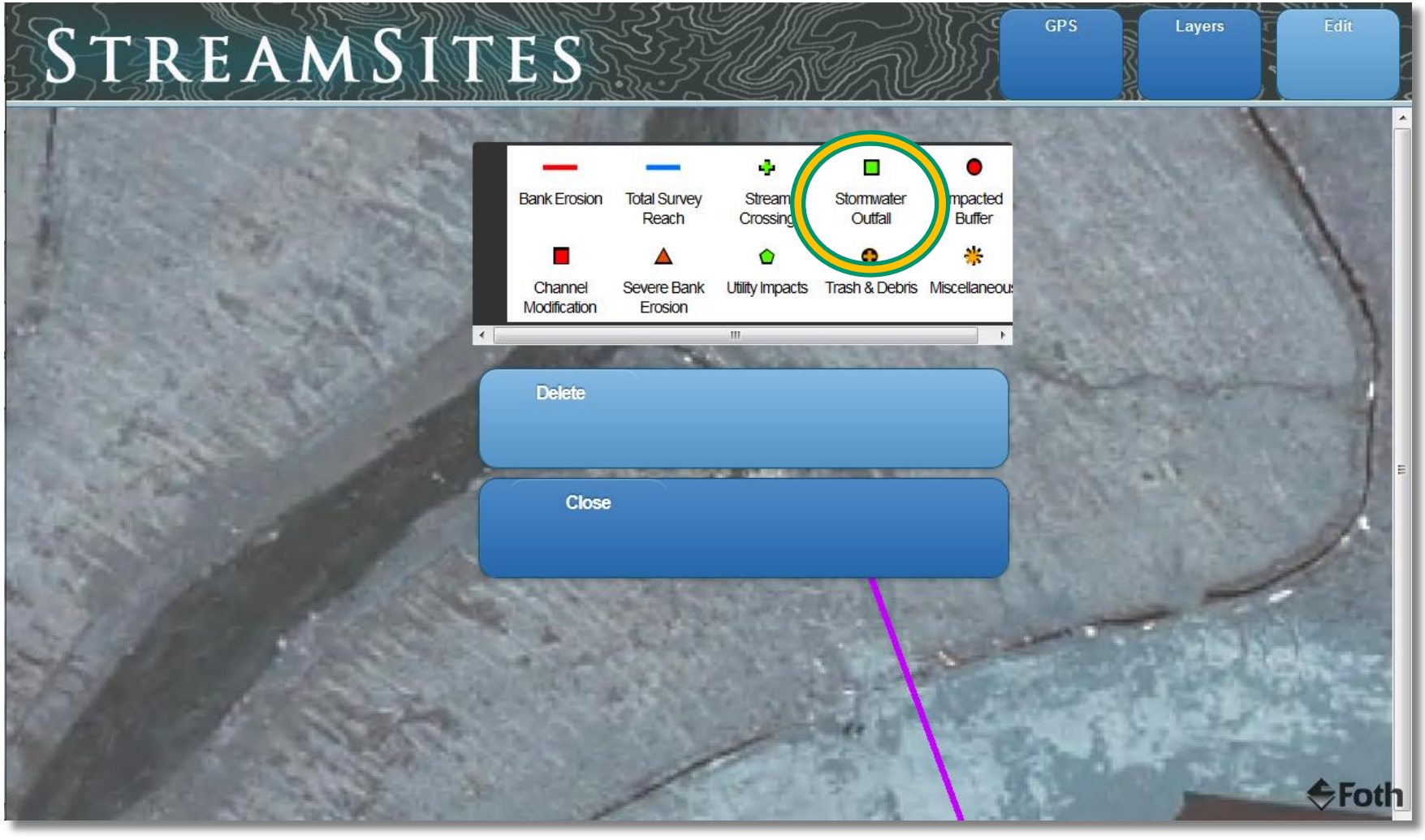
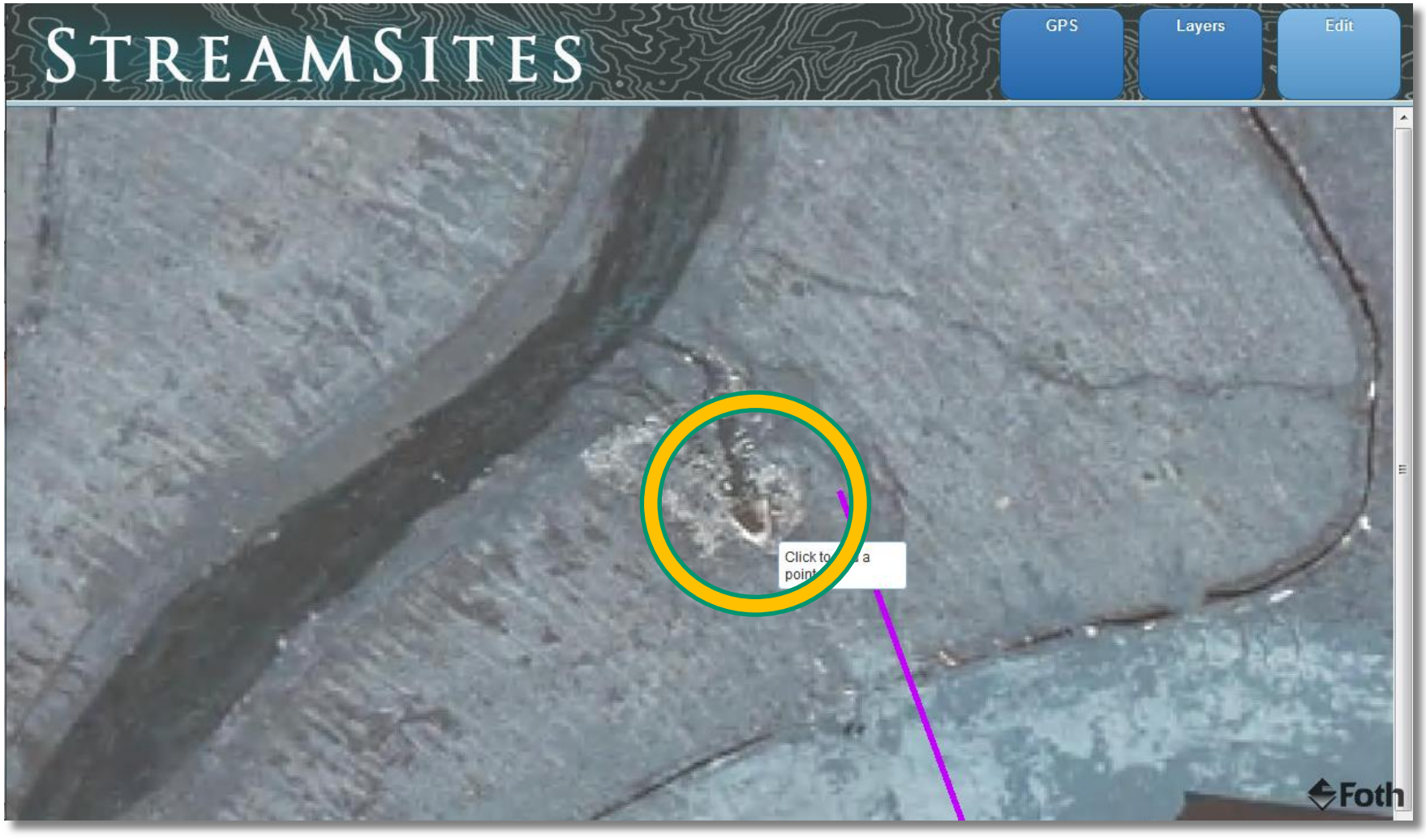

StreamSites
GPS
Layers
Edit
Bank Erosion
Total Survey Reach
Stream Crossing
Stormwater Outfall
Impacted Buffer
Channel Modification
Severe Bank Erosion
Utility Impacts
Trash & Debris
Miscellaneous
Delete
Close
Foth

Foth



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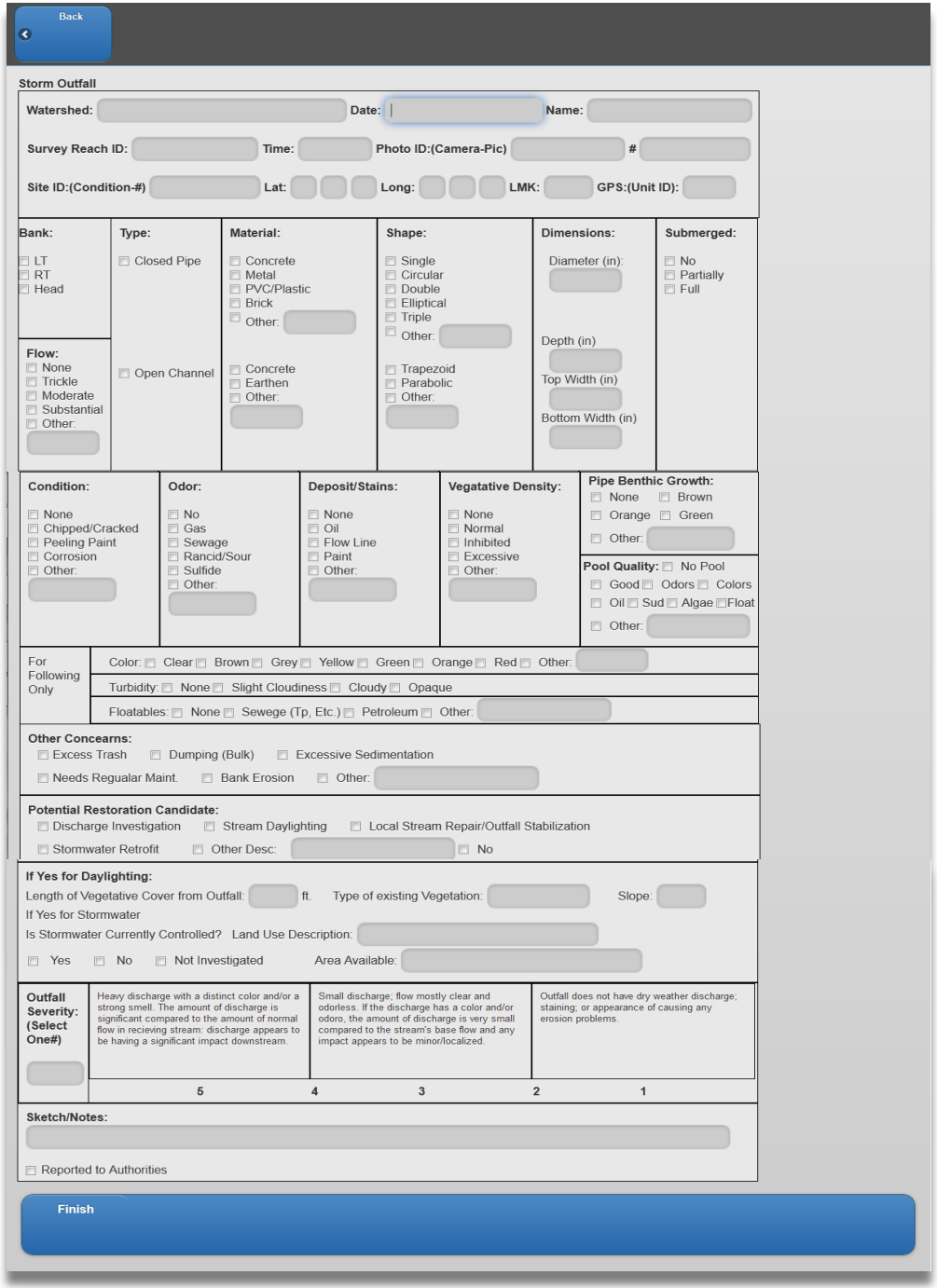


Back

Storm Outfall

Watershed: Date: Name:

Survey Reach ID: Time: Photo ID:(Camera-Pic) #

Site ID:(Condition-#) Lat: Long: LMK: GPS:(Unit ID):

Bank:
- LT
- RT
- Head

Flow:
- None
- Trickle
- Moderate
- Substantial
- Other:

Type:
- Closed Pipe
- Open Channel

Material:
- Concrete
- Metal
- PVC/Plastic
- Brick
- Other:

- Concrete
- Earthen
- Other:

Shape:
- Single
- Circular
- Double
- Elliptical
- Triple
- Other:

- Trapezoid
- Parabolic
- Other:

Dimensions:
- Diameter (in):
- Depth (in)
- Top Width (in)
- Bottom Width (in)

Submerged:
- No
- Partially
- Full

Condition:
- None
- Chipped/Cracked
- Peeling Paint
- Corrosion
- Other:

Odor:
- No
- Gas
- Sewage
- Rancid/Sour
- Sulfide
- Other:

Deposit/Stains:
- None
- Oil
- Flow Line
- Paint
- Other:

Vegatative Density:
- None
- Normal
- Inhibited
- Excessive
- Other:

Pipe Benthic Growth:
- None
- Brown
- Orange
- Green
- Other:

Pool Quality: No Pool
- Good
- Odors
- Colors
- Oil
- Sud
- Algae
- Float
- Other:

For Following Only

Color: Clear Brown Grey Yellow Green Orange Red Other:

Turbidity: None Slight Cloudiness Cloudy Opaque

Floatables: None Sewege (Tp, Etc.) Petroleum Other:

Other Concearns:
- Excess Trash
- Dumping (Bulk)
- Excessive Sedimentation
- Needs Regualar Maint.
- Bank Erosion
- Other:

Potential Restoration Candidate:
- Discharge Investigation
- Stream Daylighting
- Local Stream Repair/Outfall Stabilization
- Stormwater Retrofit
- Other Desc:
- No

If Yes for Daylighting:

Length of Vegetative Cover from Outfall: ft. Type of existing Vegetation: Slope:

If Yes for Stormwater

Is Stormwater Currently Controlled? Land Use Description:

Yes No Not Investigated Area Available:

Outfall Severity: (Select One#)

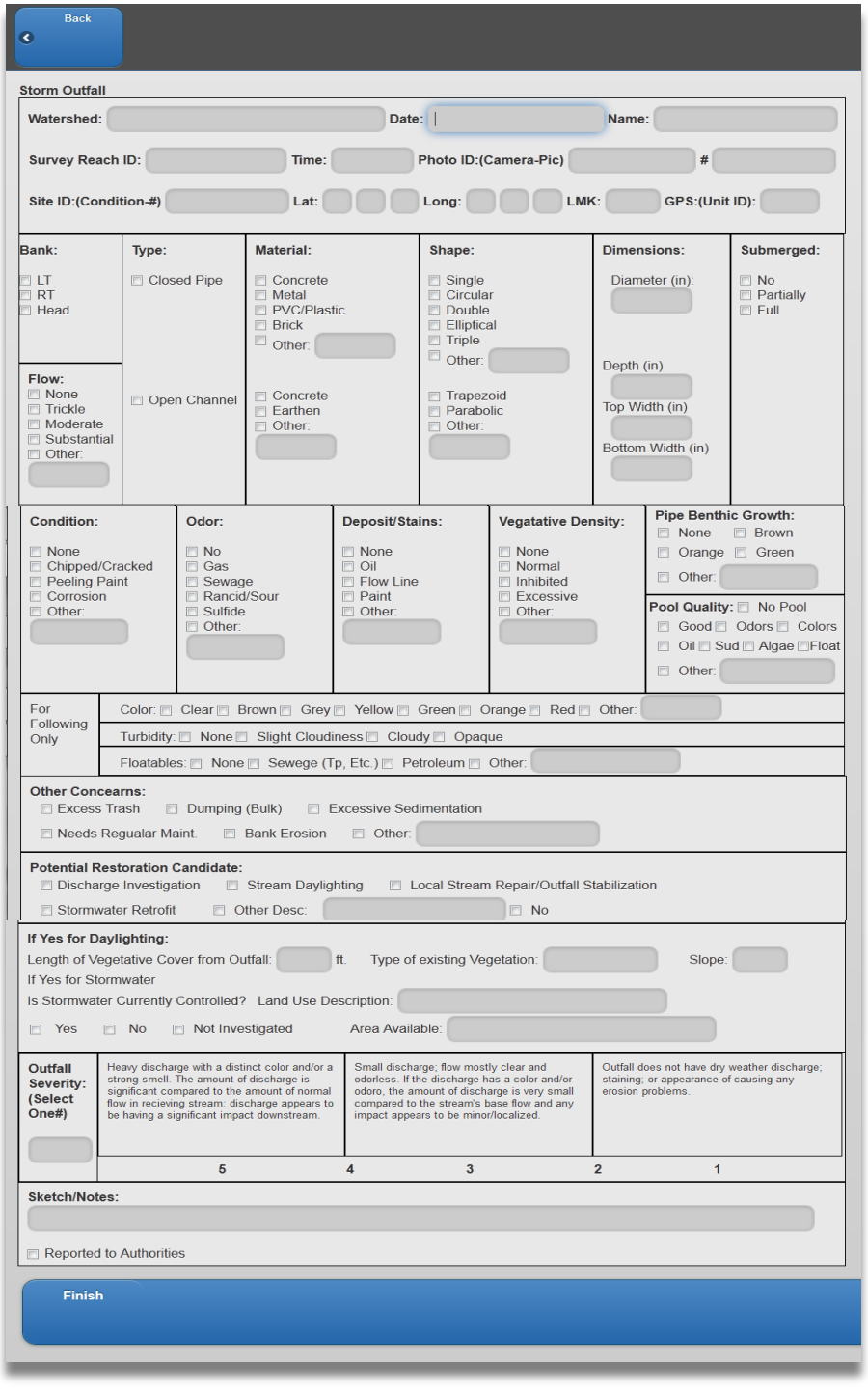
5	4	3	2	1
Heavy discharge with a distinct color and/or a strong smell. The amount of discharge is significant compared to the amount of normal flow in recieving stream: discharge appears to be having a significant impact downstream.	Small discharge; flow mostly clear and odorless. If the discharge has a color and/or odoro, the amount of discharge is very small compared to the stream's base flow and any impact appears to be minor/localized.	Outfall does not have dry weather discharge; staining; or appearance of causing any erosion problems.		

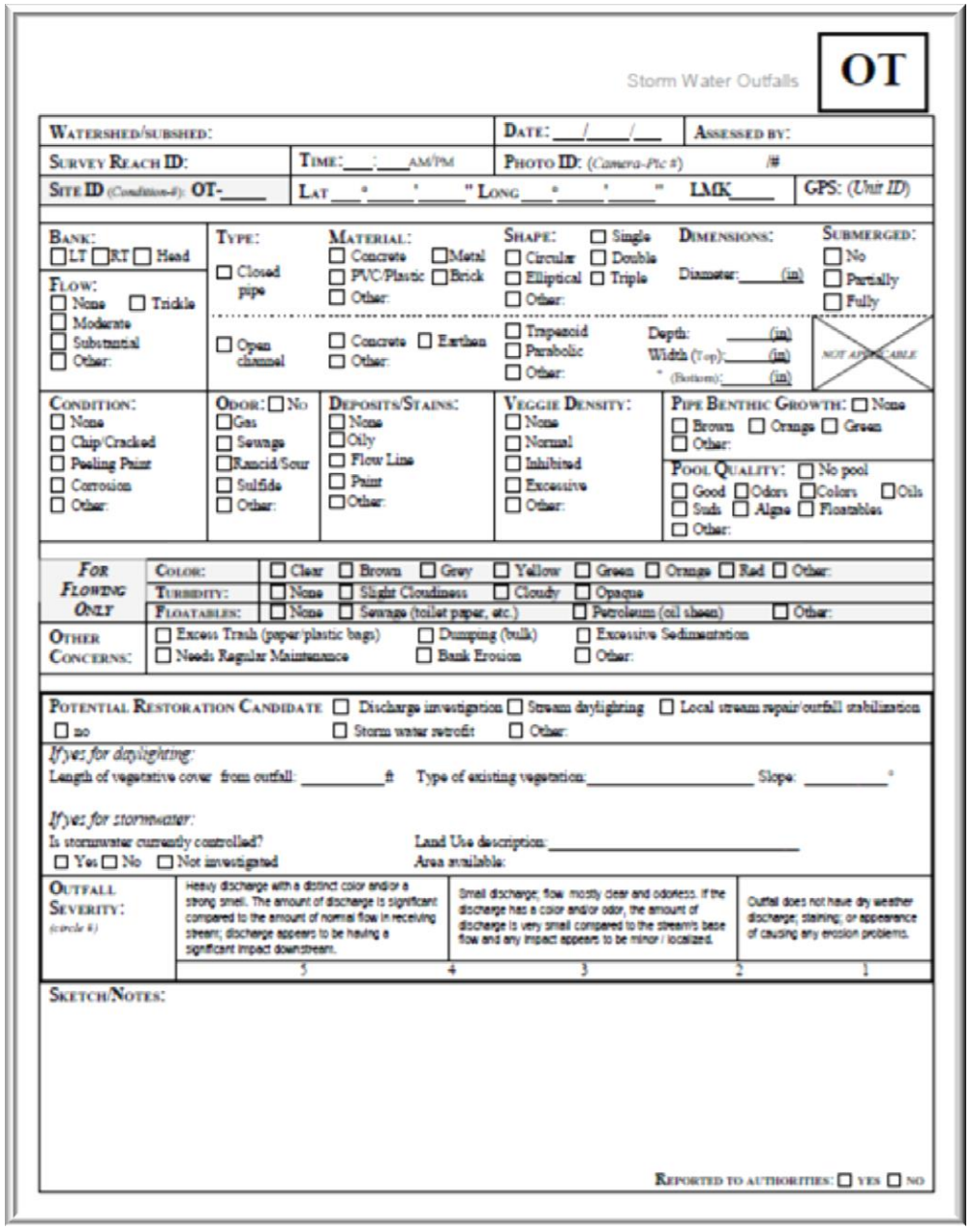
Sketch/Notes:

Reported to Authorities

Finish

Foth


Back
Storm Outfall
Watershed:
Date:
Name:
Survey Reach ID:
Time:
Photo ID:(Camera-Pic)
#
Site ID:(Condition-#)
Lat:
Long:
LMK:
GPS:(Unit ID):
Bank:
LT
RT
Head
Type:
Closed Pipe
Open Channel
Material:
Concrete
Metal
PVC/Plastic
Brick
Other:
Concrete
Earthen
Other:
Shape:
Single
Circular
Double
Elliptical
Triple
Other:
Trapezoid
Parabolic
Other:
Dimensions:
Diameter (in):
Depth (in)
Top Width (in)
Bottom Width (in)
Submerged:
No
Partially
Full
Flow:
None
Trickle
Moderate
Substantial
Other:
Condition:
None
Chipped/Cracked
Peeling Paint
Corrosion
Other:
Odor:
No
Gas
Sewage
Rancid/Sour
Sulfide
Other:
Deposit/Stains:
None
Oil
Flow Line
Paint
Other:
Vegatative Density:
None
Normal
Inhibited
Excessive
Other:
Pipe Benthic Growth:
None
Brown
Orange
Green
Other:
Pool Quality:
No Pool
Good
Odors
Colors
Oil
Sud
Algae
Float
Other:
For Following Only
Color:
Clear
Brown
Grey
Yellow
Green
Orange
Red
Other:
Turbidity:
None
Slight Cloudiness
Cloudy
Opaque
Floatables:
None
Sewege (Tp, Etc.)
Petroleum
Other:
Other Concearns:
Excess Trash
Dumping (Bulk)
Excessive Sedimentation
Needs Regualar Maint.
Bank Erosion
Other:
Potential Restoration Candidate:
Discharge Investigation
Stream Daylighting
Local Stream Repair/Outfall Stabilization
Stormwater Retrofit
Other Desc:
No
If Yes for Daylighting:
Length of Vegetative Cover from Outfall:
ft.
Type of existing Vegetation:
Slope:
If Yes for Stormwater
Is Stormwater Currently Controlled?
Land Use Description:
Yes
No
Not Investigated
Area Available:
Outfall Severity: (Select One#)
Heavy discharge with a distinct color and/or a strong smell. The amount of discharge is significant compared to the amount of normal flow in recieving stream: discharge appears to be having a significant impact downstream.
Small discharge; flow mostly clear and odorless. If the discharge has a color and/or odoro, the amount of discharge is very small compared to the stream's base flow and any impact appears to be minor/localized.
Outfall does not have dry weather discharge; staining; or appearance of causing any erosion problems.
5
4
3
2
1
Sketch/Notes:
Reported to Authorities
Finish


Storm Water Outfalls
OT
Watershed/subshed:
Date: ___/___/___
Assessed by:
Survey Reach ID:
Time: ___:___AM/PM
Photo ID: (Camera-Pic #)
#
Site ID (Condition-#): OT-____
Lat ___ ° ___ ' ___ " Long ___ ° ___ ' ___ "
LMK____
GPS: (Unit ID)
Bank:
LT RT Head
Flow:
None Trickle
Moderate
Substantial
Other:
Type:
Closed pipe
Open channel
Material:
Concrete Metal
PVC/Plastic Brick
Other:
Concrete Earthen
Other:
Shape:
Single
Circular Double
Elliptical Triple
Other:
Trapezoid
Parabolic
Other:
Dimensions:
Diameter: ____(in)
Depth: ____(in)
Width (Top): ____(in)
(Bottom): ____(in)
NOT APPLICABLE
Submerged:
No
Partially
Fully
Condition:
None
Chip/Cracked
Peeling Paint
Corrosion
Other:
Odor: No
Gas
Sewage
Rancid/Sour
Sulfide
Other:
Deposits/Stains:
None
Oily
Flow Line
Paint
Other:
Veggie Density:
None
Normal
Inhibited
Excessive
Other:
Pipe Benthic Growth: None
Brown Orange Green
Other:
Pool Quality: No pool
Good Odors Colors Oils
Suds Algae Floatables
Other:
For Flowing Only
Color: Clear Brown Grey Yellow Green Orange Red Other:
Turbidity: None Slight Cloudiness Cloudy Opaque
Floatables: None Sewage (toilet paper, etc.) Petroleum (oil sheen) Other:
Other Concerns:
Excess Trash (paper/plastic bags)
Dumping (bulk)
Excessive Sedimentation
Needs Regular Maintenance
Bank Erosion
Other:
Potential Restoration Candidate
Discharge investigation
Stream daylighting
Local stream repair/outfall stabilization
no
Storm water retrofit
Other:
If yes for daylighting:
Length of vegetative cover from outfall: _____ft
Type of existing vegetation: _____
Slope: _____°
If yes for stormwater:
Is stormwater currently controlled?
Yes No Not investigated
Land Use description: _____
Area available:
Outfall Severity:
(circle #)
Heavy discharge with a distinct color and/or a strong smell. The amount of discharge is significant compared to the amount of normal flow in receiving stream; discharge appears to be having a significant impact downstream.
Small discharge; flow mostly clear and odorless. If the discharge has a color and/or odor, the amount of discharge is very small compared to the stream's base flow and any impact appears to be minor / localized.
Outfall does not have dry weather discharge; staining; or appearance of causing any erosion problems.
5
4
3
2
1
Sketch/Notes:
Reported to Authorities: YES NO

Foth

Data Collection vs. Data Collection

- iPad

- GPS
- Camera
- Clipboard
- Worksheets
- Pen
- Field Manual

All while trying to walk through the stream and collect data

Foth

Preview

- Introduction to Unified Stream Assessment
- Traditional Data processing
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- iPad App – StreamSites
- **StreamSites Data Processing**
- Wrap Up

Foth

StreamSites

The data is collected, now what?

Nothing!

- Data is collected directly into database
- Database exists in the “cloud”
- Instantaneous in GIS
- Allows multiple users on both ends – simultaneously

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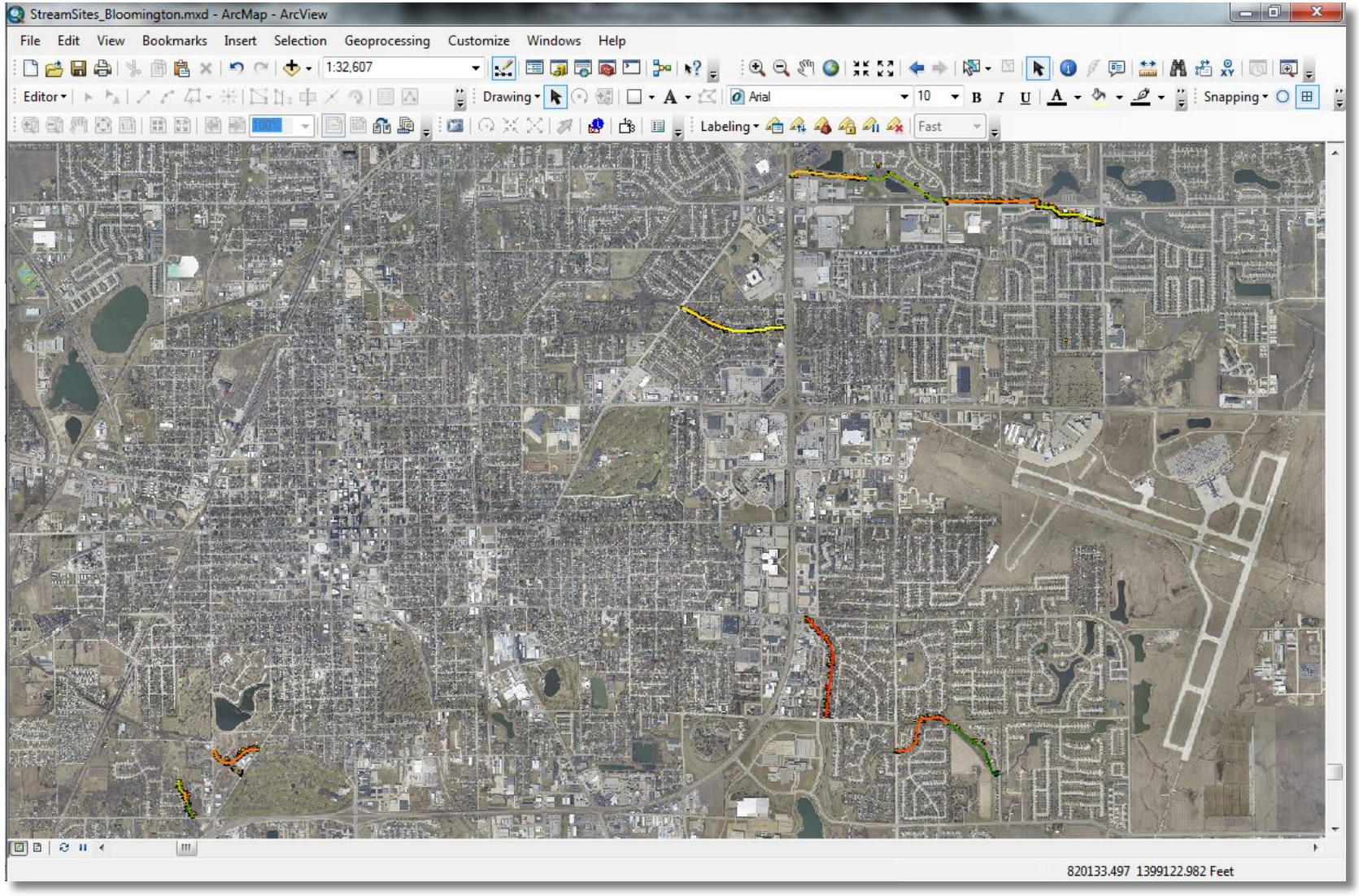
StreamSites in GIS



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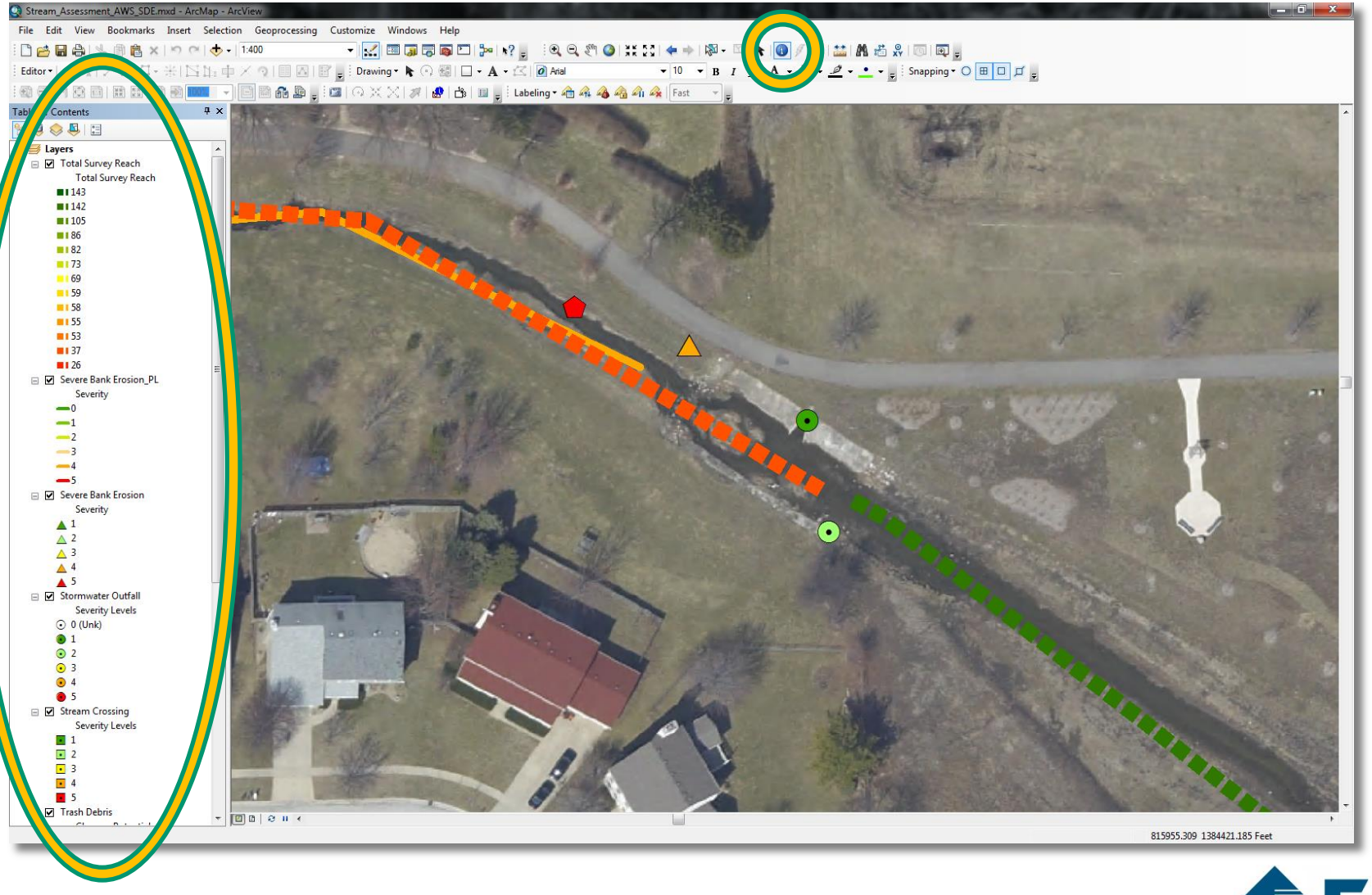
StreamSites in GIS



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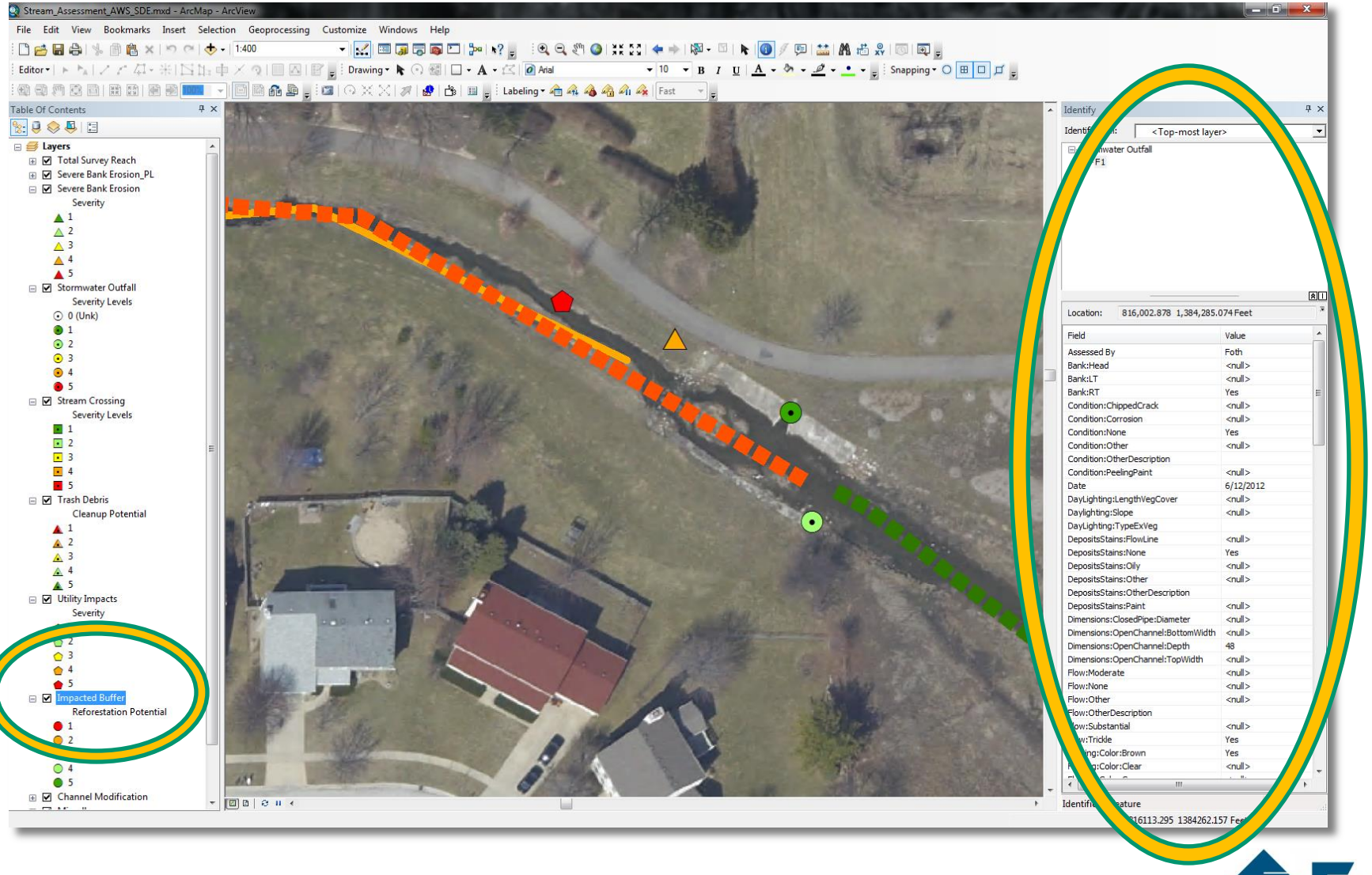
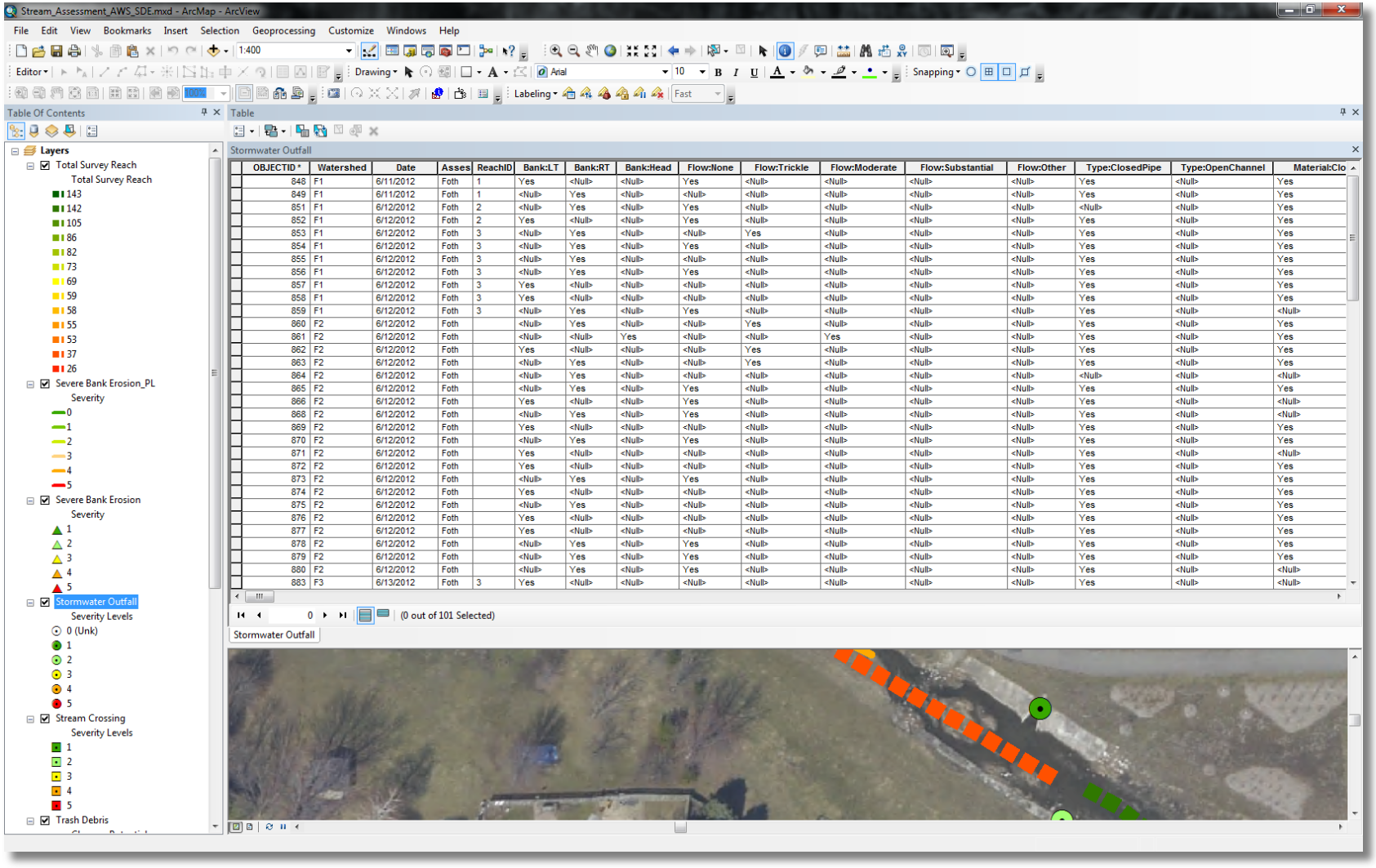
StreamSites in GIS



StreamSites in GIS



Preview

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- Traditional Data processing
- Geographical Information Systems
- iPad App – StreamSites
- StreamSites Data Processing
- **Wrap Up**

Wrap Up

What does this all mean to you?

- Less stuff to carry
- Fewer personnel and shorter collection time
- Automated Data Entry and Processing
- Faster and Easier

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StreamSites vs. Paper

- Collected, Converted, and Processed in 4 days
  - 14 Reaches
  - 12 Bank Erosion
  - 101 Stormwater Outfalls
  - 19 Stream Crossings
  - 11 Trash and Debris
  - 4 Utility Impacts
  - 12 Impacted Buffers
  - 8 Channel Modifications
  - 1 Miscellaneous

Almost 200 sheets of paper!!!

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StreamSites is just one Example

SignSites™

Sign Management at Your Fingertips

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So what else can we do?

The limitations of what can be created, match only the limitations of our imaginations!

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QUESTIONS?


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