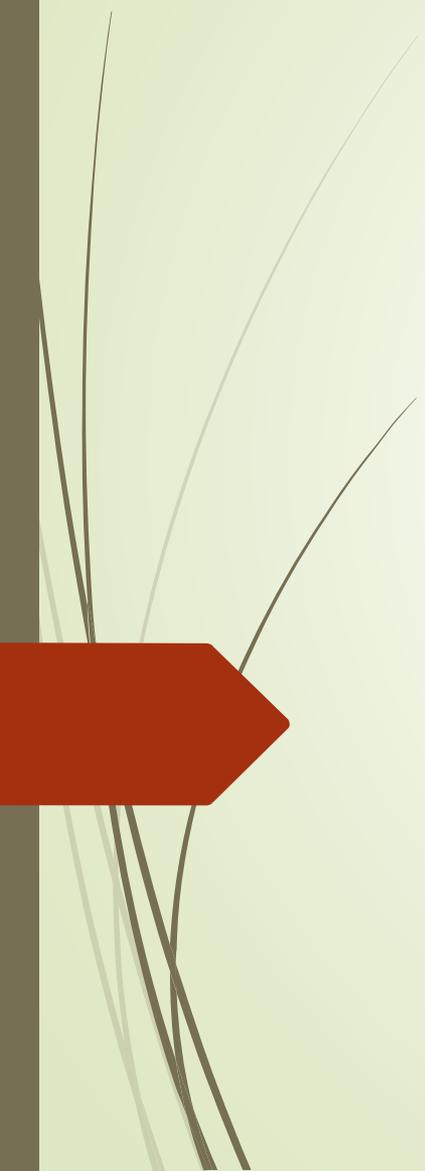


# Low-Cost GIS Apps for Field Data Collection

There are so many solutions to this problem...



Dana Allen  
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# Presentation Outline

## The Bad Old Days

- What we used to do...

## The Other Options

- Using an integrated solution...

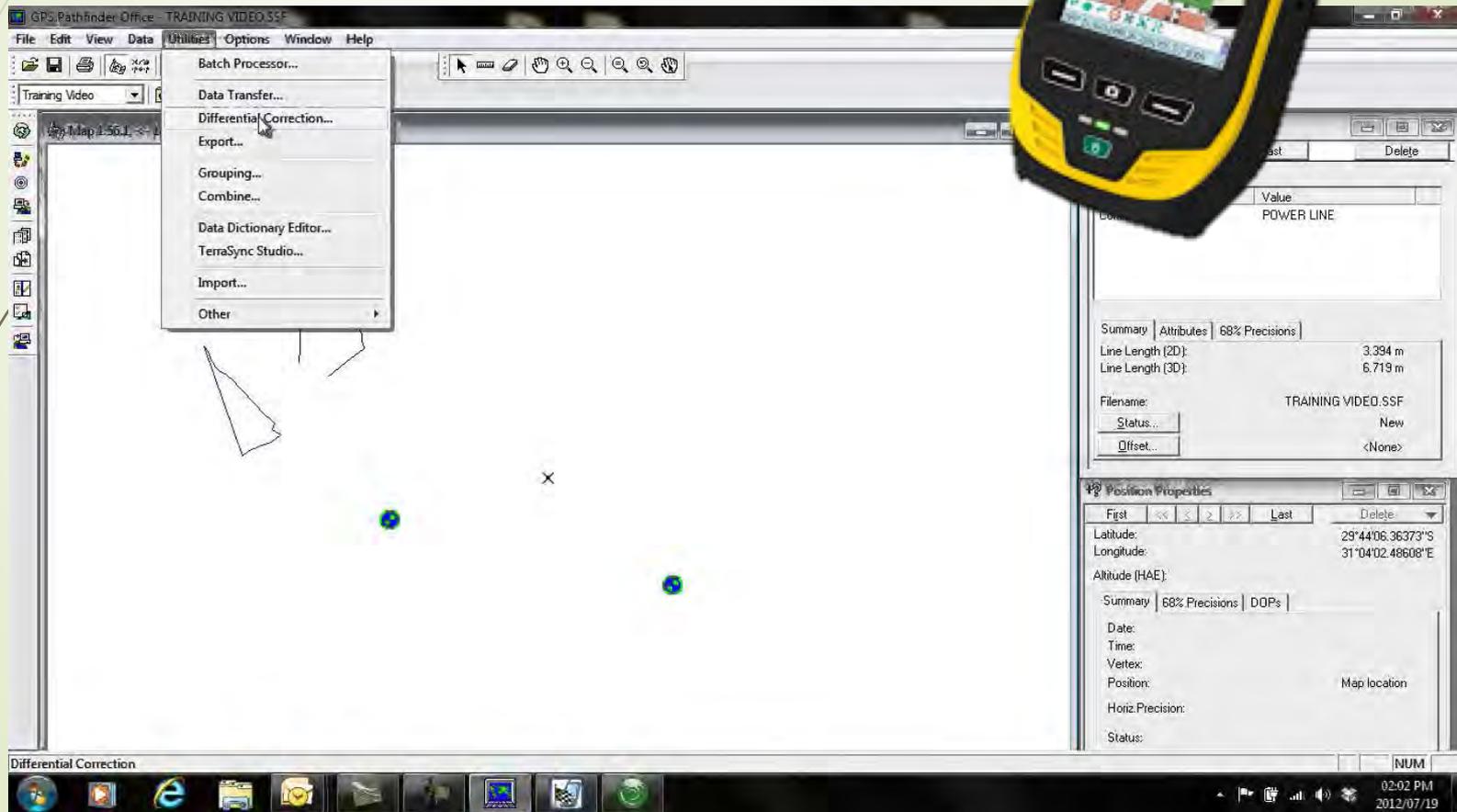
## The New Frontier

- Multiple 3<sup>rd</sup> party apps that are pretty easy...



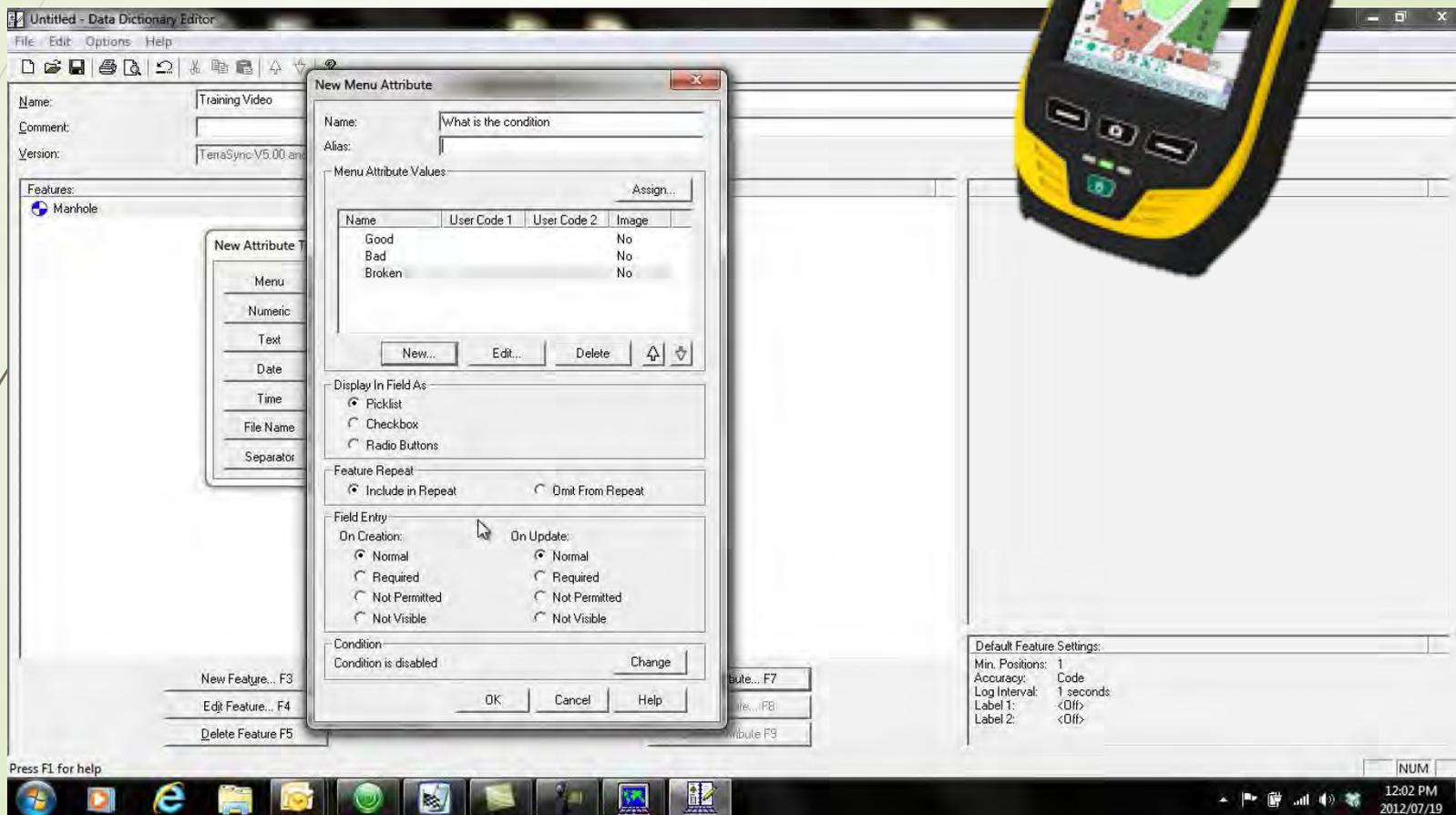
# The Bad Old Days:

- **Trimble Unit** – very accurate, very expensive
- **Pathfinder Office** – also expensive, not very intuitive



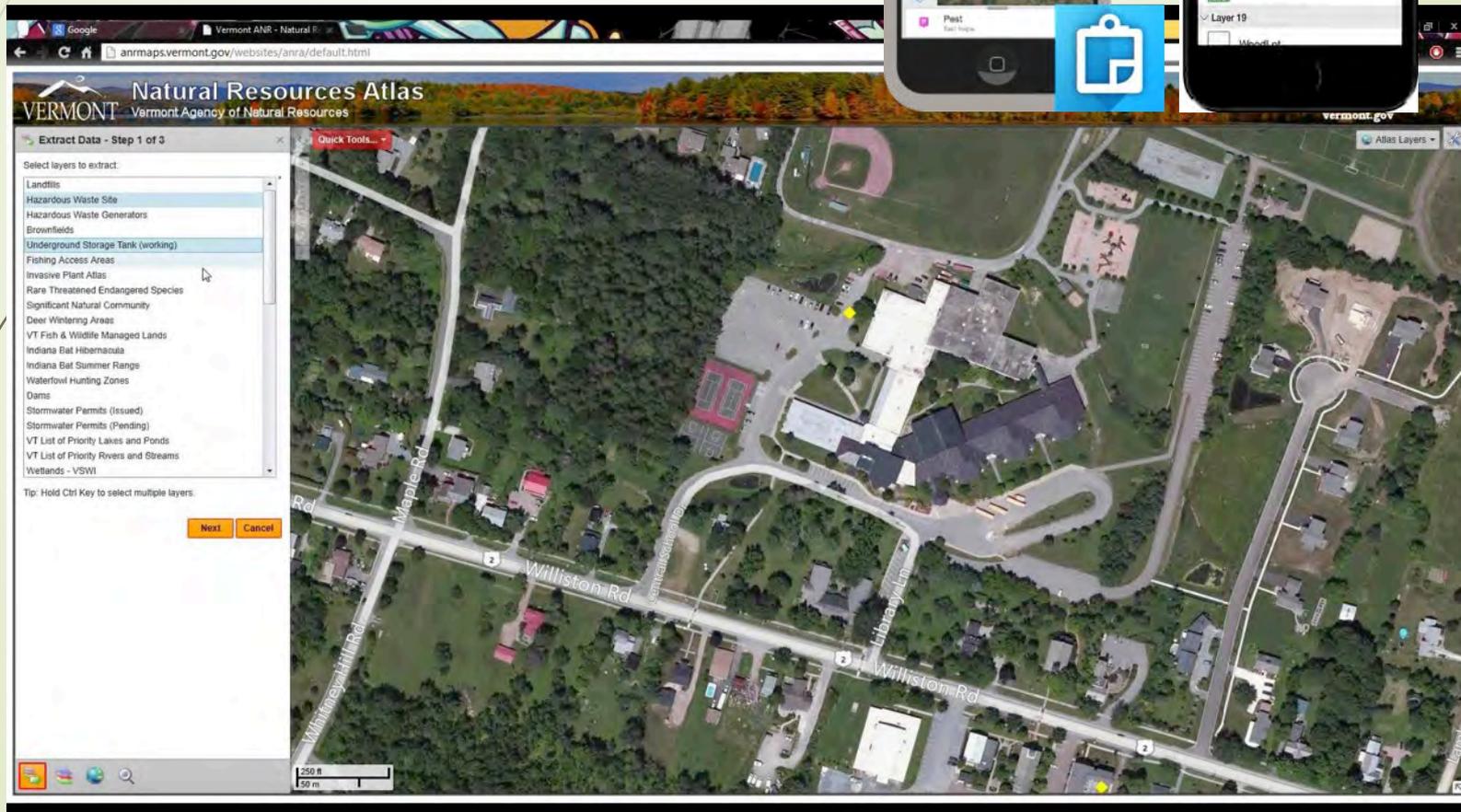
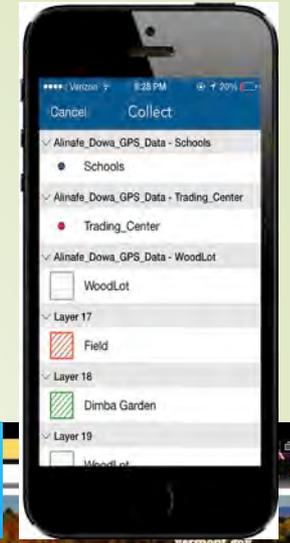
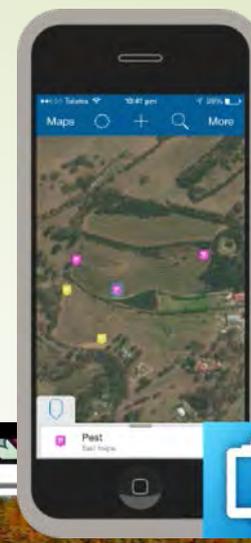
# The Bad Old Days:

- **Data Dictionary** – OK at collecting info, but limited



# The Other Options:

- 'Integrated' Solution – ArcGIS Online and ArcGIS Collector



# The New Frontier:

- 3<sup>rd</sup> Party Apps and Programs -

The logo for Fulcrum, featuring the word "fulcrum" in a bold, lowercase, sans-serif font. A small red triangle is positioned above the letter 'u'.

**Fulcrum App** – Data Collection  
[www.fulcrumapp.com](http://www.fulcrumapp.com)



**Avenza PDF Maps**– Navigation  
[www.avenza.com/pdf-maps](http://www.avenza.com/pdf-maps)



# The New Frontier:

- **Case Study** – Illicit Discharge Detection and Elimination Study in VT
  - **Workflow** –
    - Visit SW Outfalls
    - Collect ~15 different characteristics (average)
    - Multiple Return Visits to Re-assess Outfalls
    - Prep Reports / Tables / Maps





# The New Frontier:

- Put it on a phone!



# The New Frontier:

## First Step – Sign Up for Fulcrum

ESSENTIALS	STANDARD	PROFESSIONAL
\$18/mo	\$22/mo	\$25/mo
<b>Try It Now</b>	<b>Try It Now</b>	<b>Try It Now</b>
Photo Capture ✓	Parent-Child Records ✓	Barcode & QR Code Scanning ✓
Calculation Field ✓	Signature Capture ✓	Webhooks ✓
Data Importer ✓	Data Shares ✓	Record Linking ✓
Custom Online & Offline Maps ✓	Access to Developer API ✓	Geotagged Video & Audio Capture ✓
Media Storage <b>10 GB</b>	Media Storage <b>20 GB</b>	Media Storage <b>30 GB</b>
Export Formats All	Export Formats All	Export Formats All
Data Publishing N/A	Data Publishing 3 links	Data Publishing 5 links
<a href="#">See More Features</a>	<a href="#">See More Features</a>	<a href="#">See More Features</a>



# The New Frontier App Creation

**fulcrum** WRJ IDDE - Beta Test - v2

**Add Fields** **Field Settings**

**Basic**

- Text
- Numeric
- Yes / No
- Date
- Time

**Choice**

- Single Choice
- Multiple Choice
- Classification Field

**Design**

- Section
- Repeatable
- Label

**Media**

- Signature
- Photos
- Videos
- Audio

**Advanced**

- Address
- Hyperlink
- Calculation

**Infrastructure Information**

- Town
- Infrastructure Code
- Outfall ID
- Landuse in Drainage Area
- Infrastructure Type
- Drainage Structure Type
- Pipe Material
- Pipe Shape
- Pipe Submerged
- Submersion Amount
- Pipe Diameter (in)
- Open Drainage Material
- Open Drainage Shape
- Depth (in)
- Top Width (in)
- Bottom Width (in)

**Inspections**

**Add Fields**

**Basic**

- Text
- Numeric
- Yes / No
- Date
- Time

**Choice**

- Single Choice
- Multiple Choice
- Classification Field

**Design**

- Section
- Repeatable
- Label

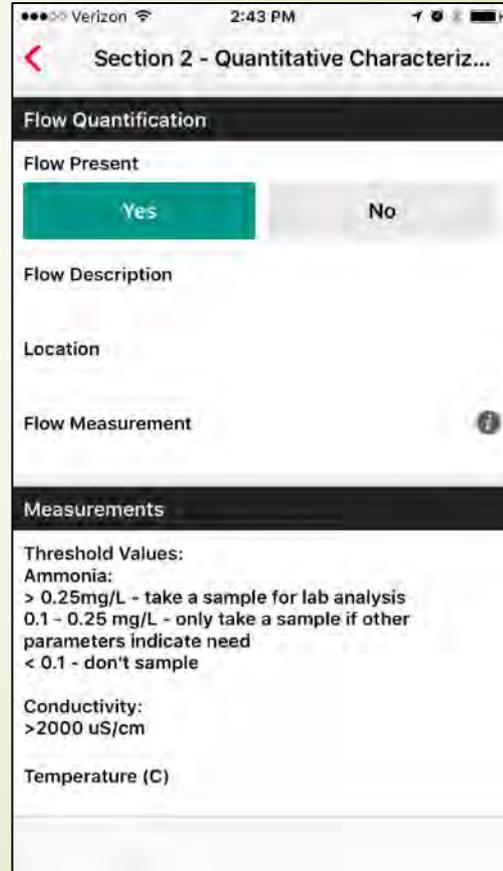
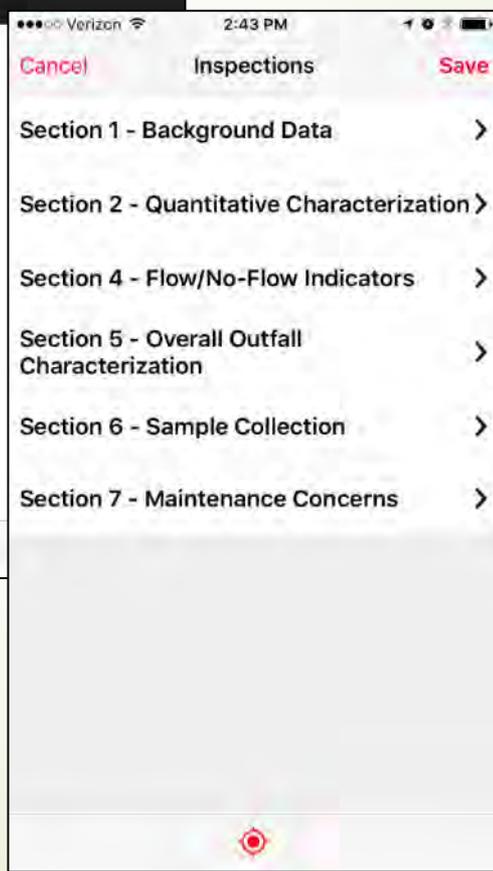
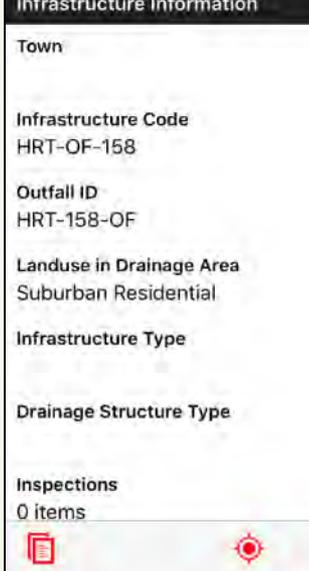
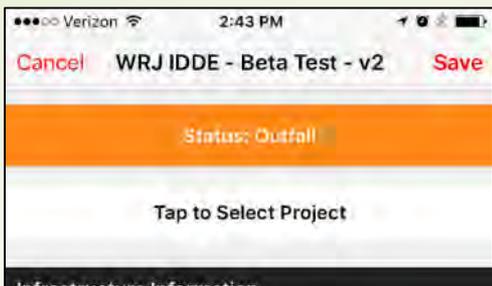
**Media**

- Signature
- Photos
- Videos
- Audio

[Go Back](#) Water

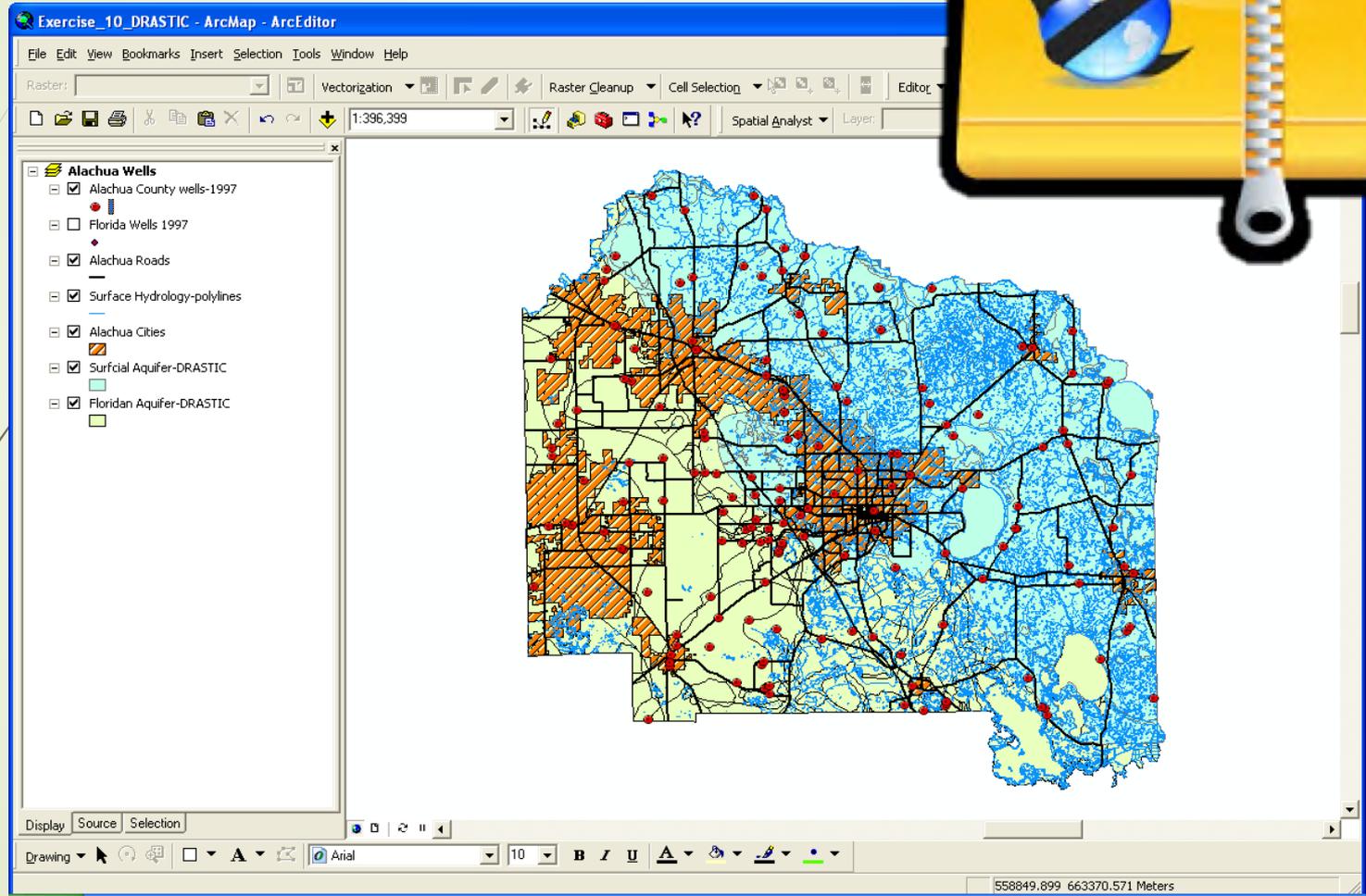


# The New Frontier: App Creation



# The New Frontier:

Once Signed Up:  
Arc to Fulcrum - importing



# The New Frontier App Creation

## OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

### Section 1: Background Data

Subwatershed:		Outfall ID:	
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Temperature (°F):	Rainfall (in.):	Last 24 hours:	Last 48 hours:
Latitude:	Longitude:	GPS Unit:	GPS LMK #:
Camera:		Photo #:	
Land Use in Drainage Area (Check all that apply):			
<input type="checkbox"/> Industrial		<input type="checkbox"/> Open Space	
<input type="checkbox"/> Ultra-Urban Residential		<input type="checkbox"/> Institutional	
<input type="checkbox"/> Suburban Residential		Other: _____	
<input type="checkbox"/> Commercial		Known Industries: _____	
Notes (e.g., origin of outfall, if known):			

### Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED																																																																																																				
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP	<input type="checkbox"/> Circular	<input type="checkbox"/> Single	Diameter/Dimensions: _____	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully																																																																																																				
	<input type="checkbox"/> PVC <input type="checkbox"/> HDPE	<input type="checkbox"/> Elliptical	<input type="checkbox"/> Double																																																																																																						
	<input type="checkbox"/> Steel	<input type="checkbox"/> Box	<input type="checkbox"/> Triple																																																																																																						
	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____		With Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully																																																																																																				
<input type="checkbox"/> Open drainage	<input type="checkbox"/> Concrete	<input type="checkbox"/> Trapezoid		Depth: _____	<table border="1"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																				
	<input type="checkbox"/> Earthen	<input type="checkbox"/> Parabolic		Top Width: _____																																																																																																					
	<input type="checkbox"/> Rip-rap	<input type="checkbox"/> Other: _____		Bottom Width: _____																																																																																																					
	<input type="checkbox"/> Other: _____																																																																																																								
<input type="checkbox"/> In-Stream	(applicable when collecting samples)																																																																																																								
Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>If No, skip to Section 3</i>																																																																																																								
Flow Description (If present)	<input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial																																																																																																								

### Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER	RESULT	UNIT	EQUIPMENT	
<input type="checkbox"/> Flow #1	Volume	Liter	Bottle	
	Time to fill	Sec		
<input type="checkbox"/> Flow #2	Flow depth	In	Tape measure	
	Flow width	Ft. In	Tape measure	
	Measured length	Ft. In	Tape measure	
	Time of travel	S	Stop watch	
Temperature		°F	Thermometer	
pH		pH Units	Test strip/Probe	
Ammonia		mg/L	Test strip	



# The New Frontier: Browser-based data exploration:

**fulcrum** WRJ IDDE - Beta Test - v2

Search Records:

status: **No Status Filter** assigned to: **No Assigned To Filter**

### HRT-CB-2295

[Edit](#) [Print](#) [History](#) [Delete](#) [Close](#)

**Location** 43.6437605, -72.316624

**Status** ■ Catchbasin

**Assigned to**

**Project**

**Created** 2016-03-01 16:06 -05:00 (7 days ago) by Dana Allen

**Updated** 2016-03-01 16:06 -05:00 (7 days ago) by Dana Allen

---

**Infrastructure Information**

**Town**

**Infrastructure Code** ■ HRT-CB-2295

**Outfall ID**

**Landuse in Drainage Area**

**Infrastructure Type**

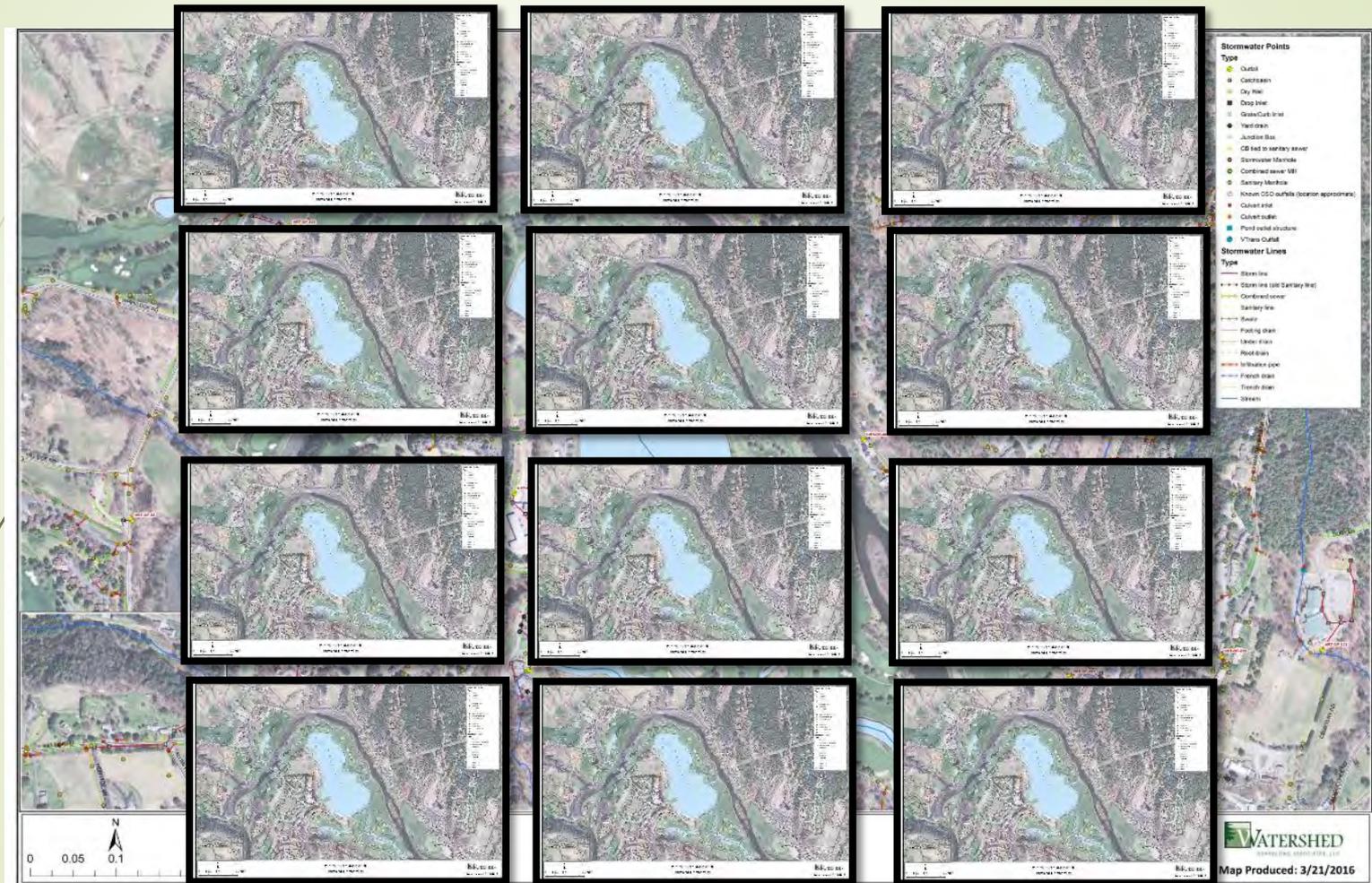
**Drainage Structure Type**

**Inspections** [1 items](#)

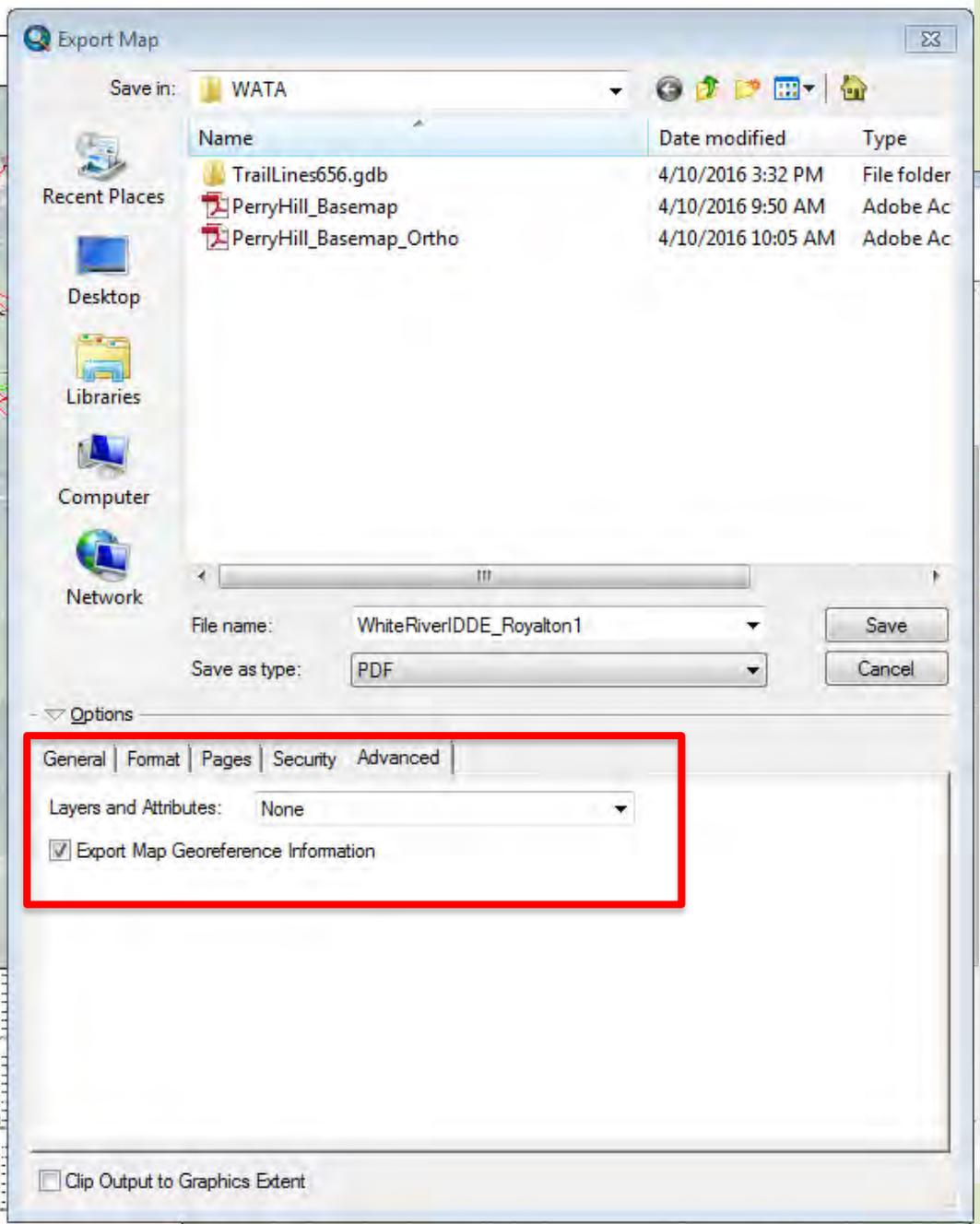
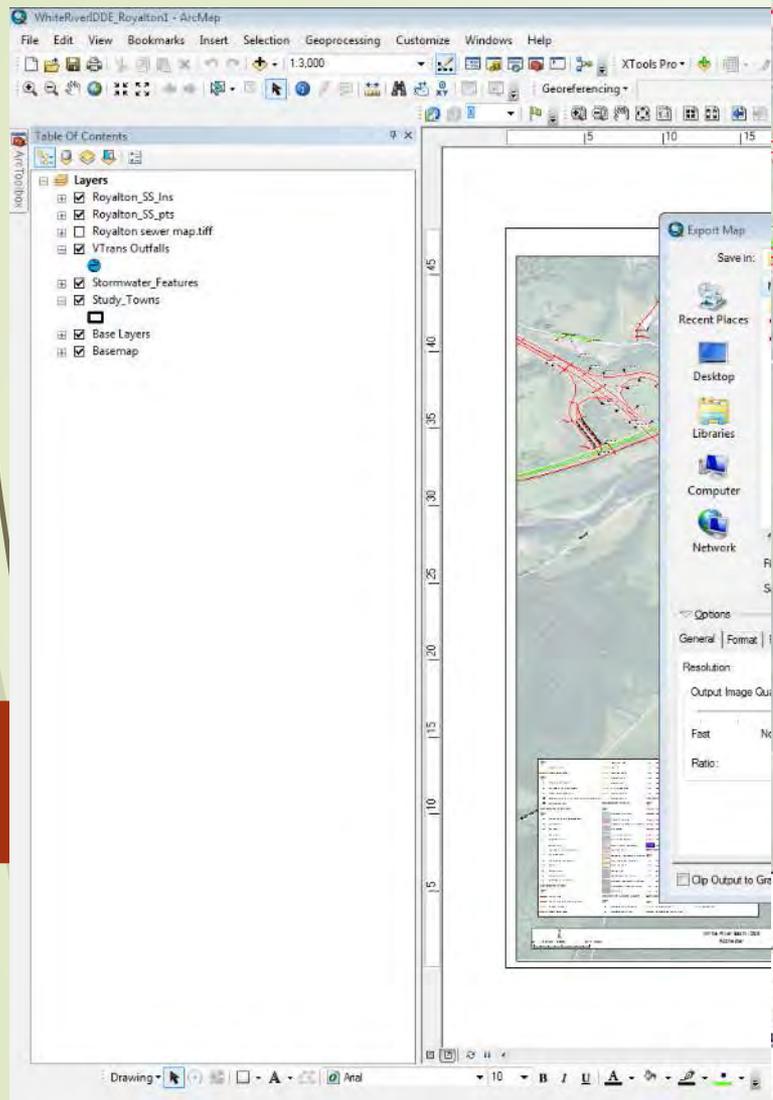
Dana Allen HRT-CSO-3

Status	Version	Created	Updated	Created By
Other	2	2016-03-01 16:06 -05:00	2016-03-02 07:20 -05:00	Dana Allen
Catchbasin	1	2016-03-01 16:06 -05:00	2016-03-01 16:06 -05:00	Dana Allen
Catchbasin	1	2016-03-01 16:06 -05:00	2016-03-01 16:06 -05:00	Dana Allen
Catchbasin	1	2016-03-01 16:06 -05:00	2016-03-01 16:06 -05:00	Dana Allen
Other	1	2016-03-01 16:06 -05:00	2016-03-01 16:06 -05:00	Dana Allen
Combined Sewer Overflow	1	2016-03-01 16:06 -05:00	2016-03-01 16:06 -05:00	Dana Allen
Combined Sewer Overflow	1	2016-03-01 16:06 -05:00	2016-03-01 16:06 -05:00	Dana Allen

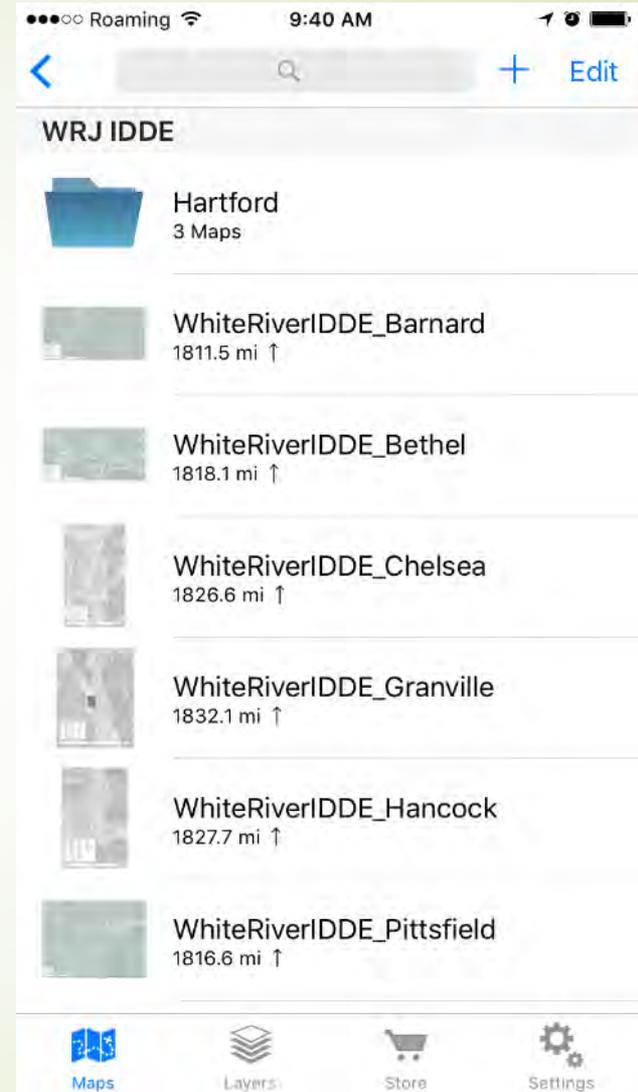
# The New Frontier: Paper Maps to Phone Apps



# The New Frontier: Paper Maps to Phone Apps



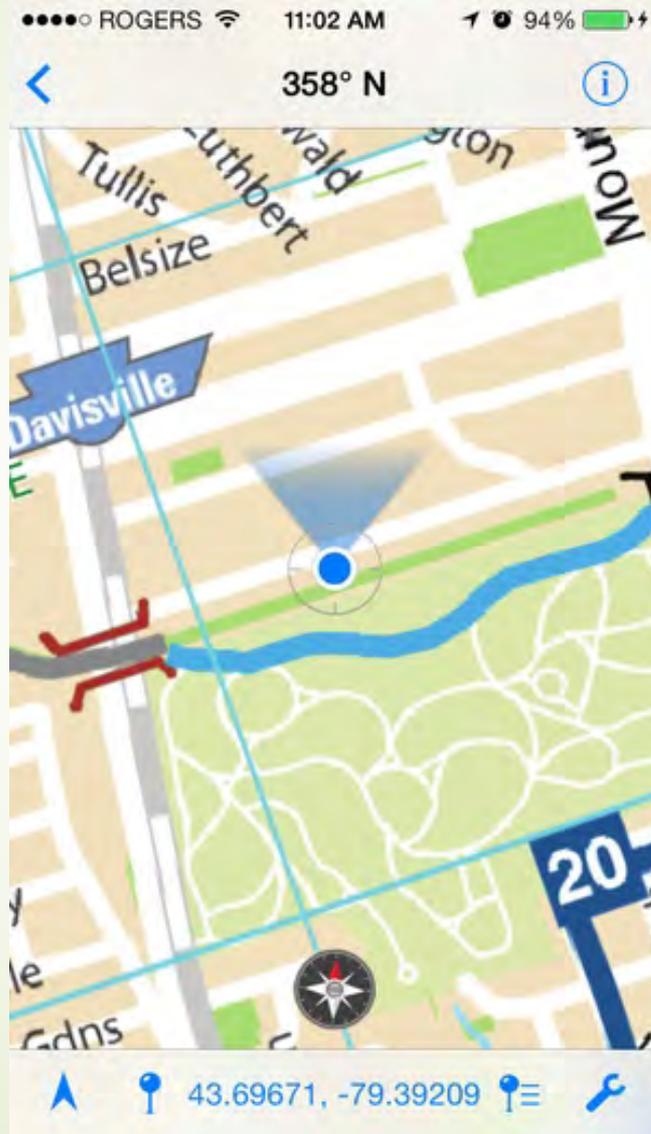
# The New Frontier: Paper Maps to Phone Apps



# The New Frontier: Paper Maps to Phone Apps



# The New Frontier: Paper Maps to Phone Apps





Thanks for Listening!  
Feel free to reach out with any  
further questions:  
[dana@watershedca.com](mailto:dana@watershedca.com)  
[www.watershedca.com](http://www.watershedca.com)