

GIS Field Data Collection using Trimble GPS Unit

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May 19th, 2021

Introduction

- Pre-Data Collection Planning in the Office (Scott)
- Data Collection in the Field (John)
- Post Processing Data in the Office (Scott)
- Q&A - Recommended Future Topics

Poll Question

- Do you currently use GIS in work related to water utility management?

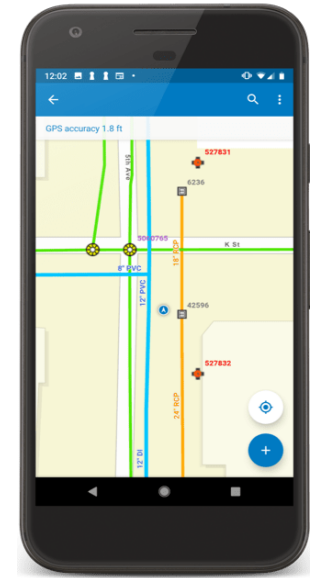
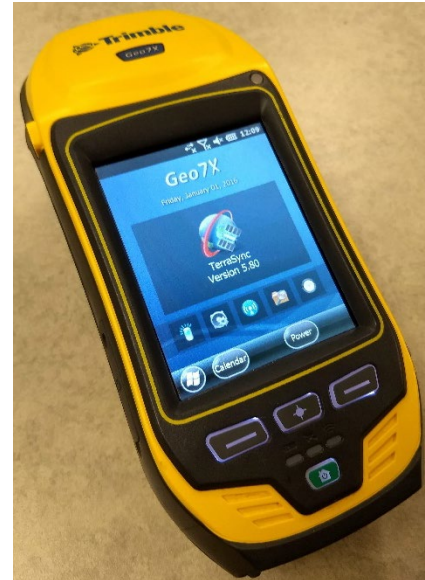


Pre-Data Collection Planning

- Know what you want before you start collecting data
 - Asset management?
 - Improvements/replacement/maintenance?
 - Regulatory requirements?
 - Modeling?

Pre-Data Collection Planning

- Choose your device and how you will store your data.
 - GPS data logger and desktop GIS
 - Trimble Geo 7X
 - TerraSync or ArcPad
 - ArcMap or QGIS
 - Cell phone and app
 - Cupss Mobile App
 - ArcGIS Collector
 - Other commercial apps



System Comparisons

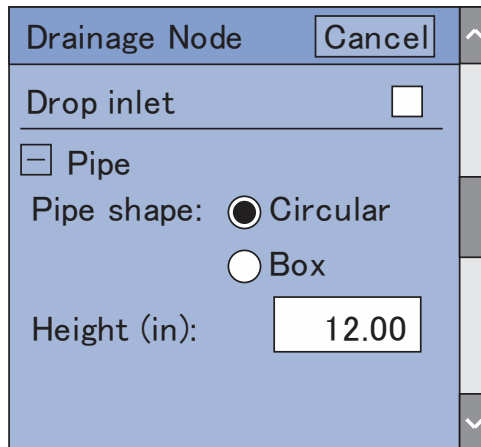
Factor	System	
	<i>GPS Data Logger/ GIS</i>	<i>Phone / App</i>
Initial Cost	Buy – Expensive Rent – Less Expensive	Low
Monthly Costs	None	None to Moderate
Ease of Initial Setup	Involved	Moderate
Field Crew Training	Moderate	Easier
Data Customization	Very Customizable	Some Customization
Data Storage	By You	By Others
GPS Accuracy	High to Very High	Low
Elevation Data	Good	Poor/None
Needs Cell Coverage	No	Yes / No with Limitations

Poll Question

- Do you have prior experience with GIS or Trimble GPS units?

Pre-Data Collection Planning

- Data Dictionary
 - Used to organize and store data collected in the field
 - Customizable user interface
 - Can hide or show inputs based on previous entries



Drainage Node ^

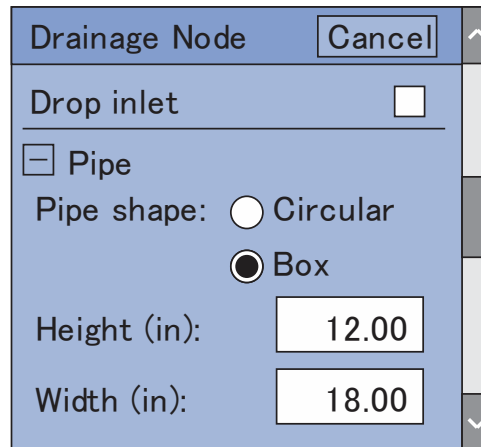
Drop inlet

Pipe

Pipe shape: Circular
 Box

Height (in):

▼



Drainage Node ^

Drop inlet

Pipe

Pipe shape: Circular
 Box

Height (in):

Width (in):

▼

Pre-Data Collection Planning

- Data Dictionary
 - Try to make inputs a check box, drop down, radio button etc.
 - Use text only as a last resort
 - Notes should only be used to indicate problems, not store data

Drainage Node [Cancel] ^

Drop inlet

Pipe

Pipe shape: Circular
 Box

Height (in):

▼

Drainage Node [Cancel] ^

Drop inlet

Pipe

Pipe shape: Circular
 Box

Height (in):

Width (in):

▼

Pre-Data Collection Planning

- Have a unique ID for all features (pipes, valves, etc.)
- Get all the data you need on the first round
- Updates can be difficult
- Take more photos than you think you need
- Miscellaneous Points, Lines, and Areas
 - Useful, but dangerous

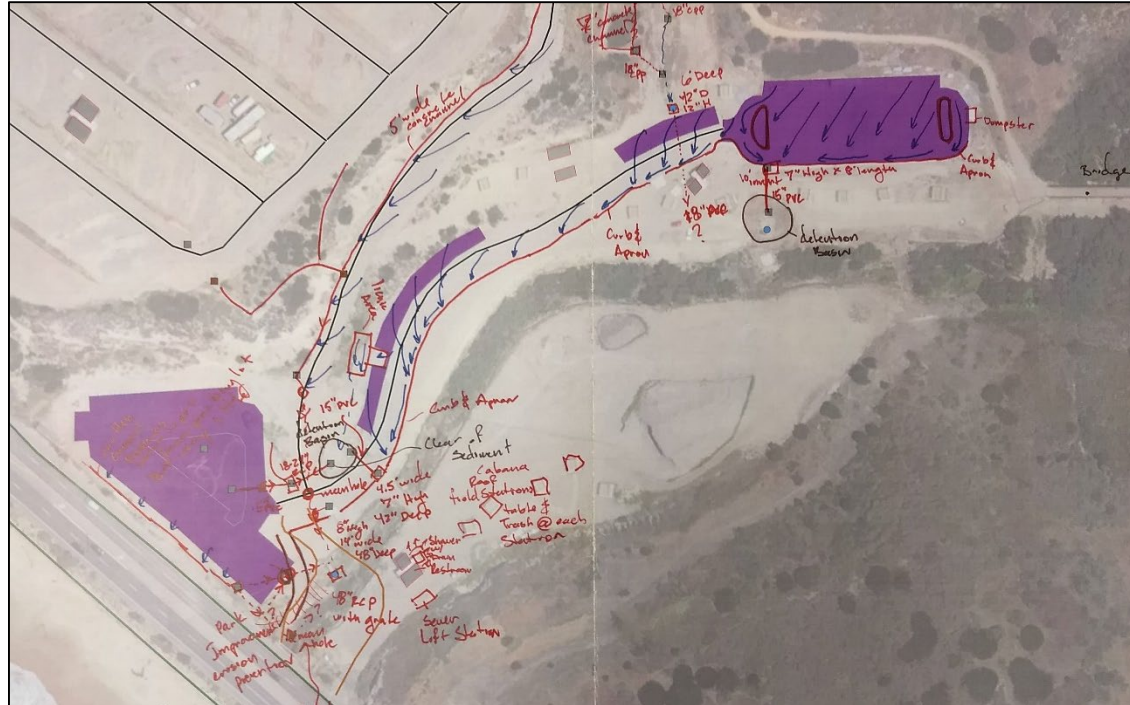
Pre-Data Collection Planning

- Pre-load data in GIS where possible
 - Buildings
 - Roads
 - Visible utilities



Pre-Data Collection Planning

- Printed maps & field notes
 - Useful, but also dangerous



Data Collection in the Field

- Field Guide
 - Familiarize Staff with Equipment
 - Data Collection Process

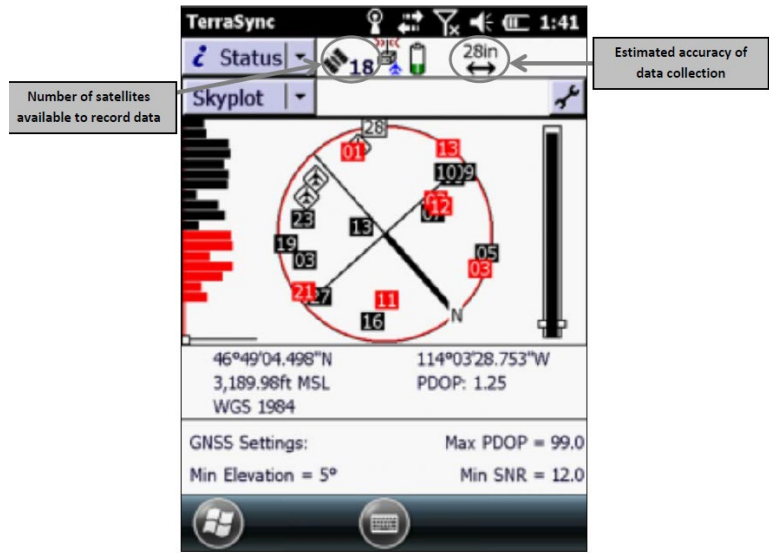
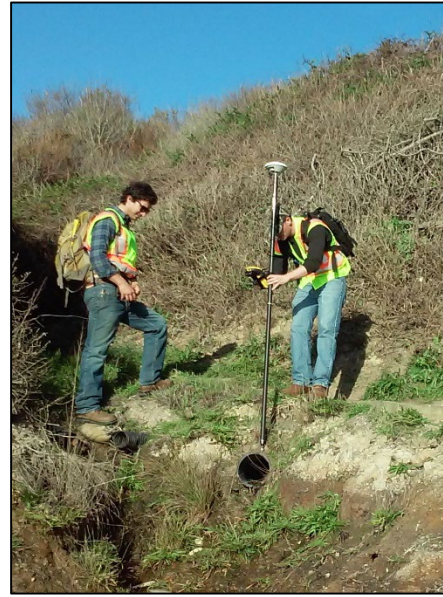


Figure 2 Satellite Sky Plot



Feature Collection (Point Features)

- Point Features

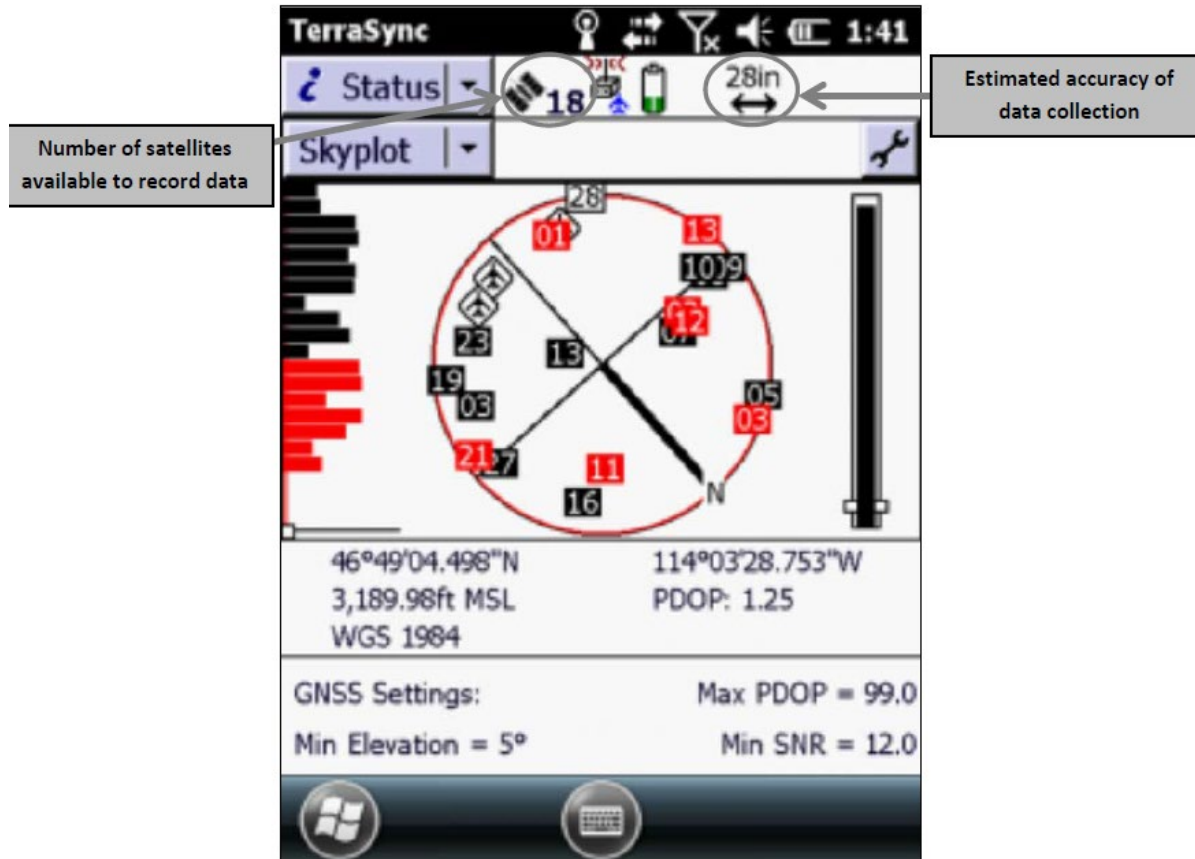
- Water Meters

- Valves

- PRVs



Data Logging Accuracy

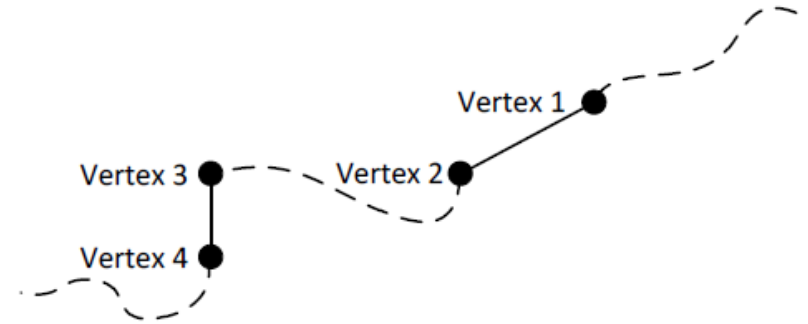


Sample Data Dictionary (Point Features)

Characteristic	
Size	
Material Type	
Age	
Manufacturer	
Notes	
Photo	

Feature Collection (Line Features)

- Line Features
 - Water Line
 - Canals/Ditches



Sample Data Dictionary (Line Features)

Characteristic	
Size	
Material Type	
Age	
Depth (if known)	
Condition	
Notes	
Photo	

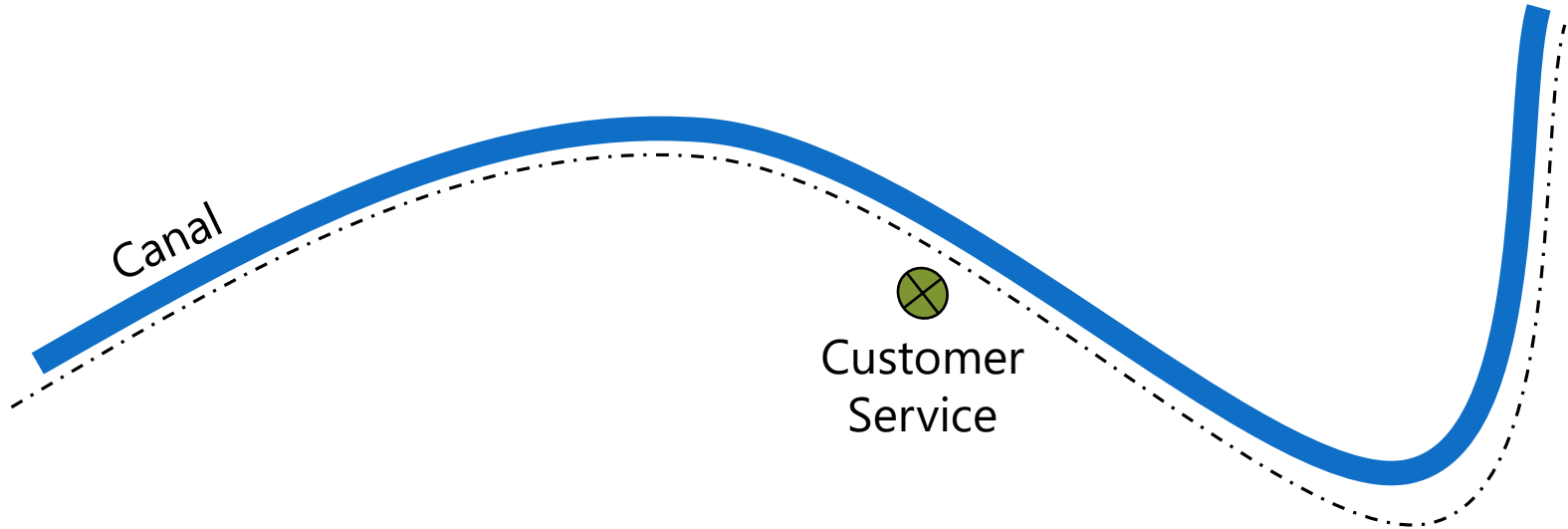
Feature Collection (Area Features)

- Area Features
 - Buildings
 - Property Boundaries



Trimble GPS Unit Sample Features

- Scenario 1: Nested Point Feature



Trimble GPS Unit Sample Features

- Scenario 1: Offset Point Feature



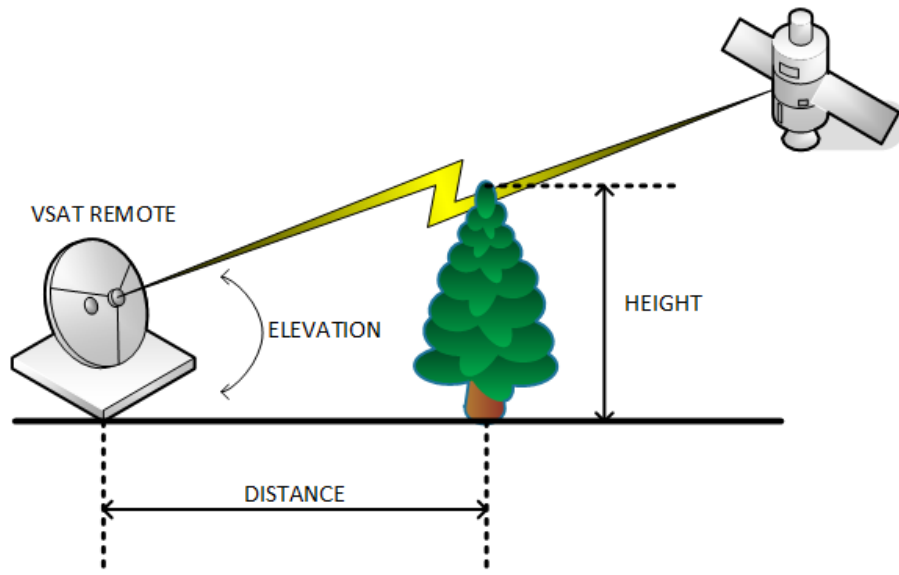
Camera/laser button



- Some areas may be unsafe to access
- May not have reception due to thick tree canopy

Field Data Collection Challenges

- Reception (Clear line of sight)



Adapting to Field Conditions

- Hard copy Maps
- Notes
- Photographs
- Videos

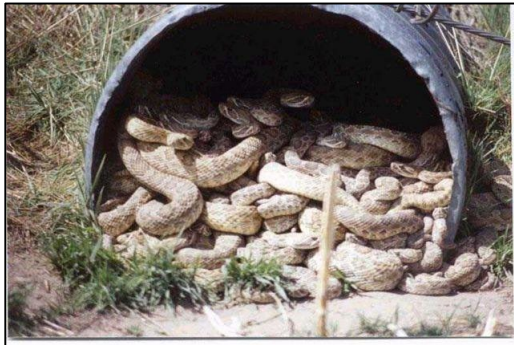


Communication with Property Owners

- Communicate to Property Owners in advance of field work.
- Field Crew should have:
 - Proper ID
 - Copy of Contract (if Applicable)
 - Business Card/Office Contact

Access/Safety Concerns

- Wild Animals
- Ticks
- Poison Oak/Ivy
- Pets



Post Data Collection for Field Crews

- Daily Data Back up
- Review Field notes
- Save Photos/Videos
- Take note of any missing data/priorities for following day

Post Processing

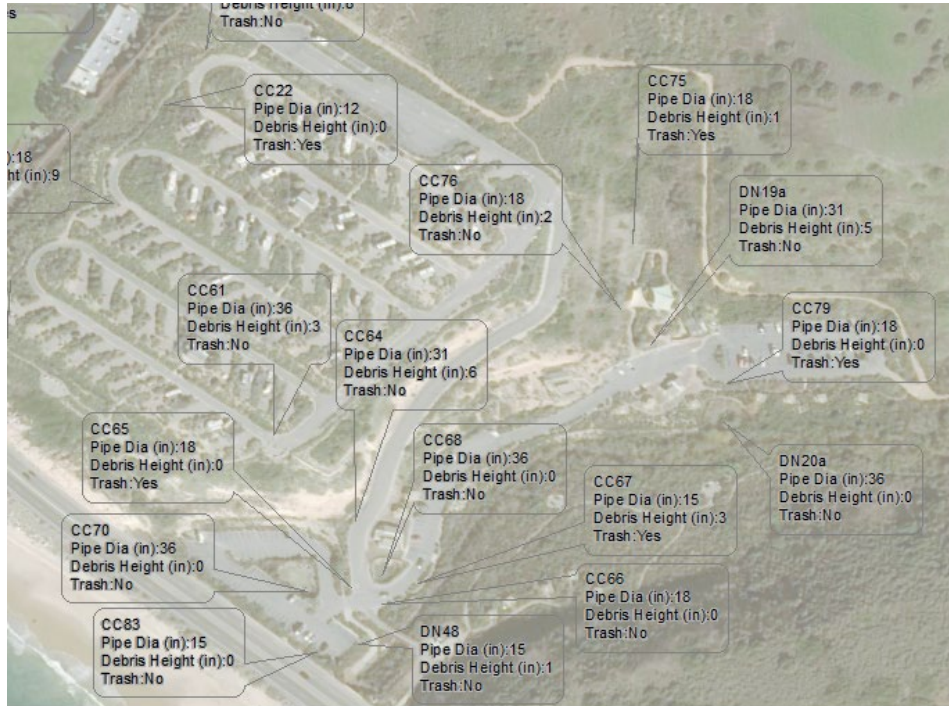
- Download, process, and examine the data as soon as possible
 - Look for missing data
 - Look for features in the wrong location
 - Check text input
 - Clean up field mapped buildings and walked lines
 - Merge field notes
- Differential correction must be done within 2 weeks
- Talk to field crews about issues
- Photos can answer many questions

Updating Features

- Upload data from GIS/database to device
- Update data with device in the field
- Download updated data from device to database
- Merge features in GIS/database

Updating Features

- Use printed maps for updates
- Only update features that have changed



Questions?/Future Presentation Topics

Links

EPA Region 9 Environmental Finance Center:

<http://www.efc.csus.edu>

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