

Collector for ArcGIS: Working with High Accuracy Data

Kevin Burke

Morgan Zhang

Agenda

- Introduction
- Getting started
- Collector setup for high accuracy data collection
- Field data collection process
- Tools and resources
- Q&A

Field GIS

Taking GIS Beyond the Office



- Planning and Managing Work
- Viewing Maps
- Collecting New Data
- Inspecting Existing Data
- Working as a team

Connecting the Field with the Enterprise

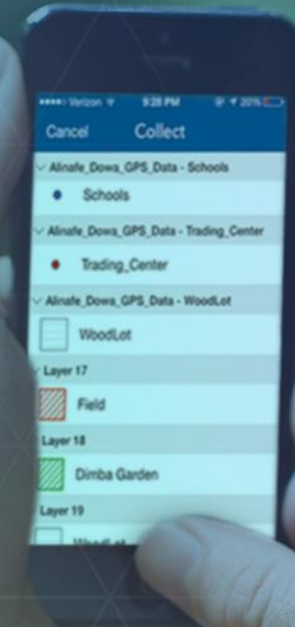


Collector for ArcGIS

Web Maps

Work Offline

High Accuracy GPS



Collector for ArcGIS| How is it being used?



Collect and Maintain Data



Capture Observations



Perform Rapid Assessments

Collector for ArcGIS | Asset Inventory

- Improve accuracy and currency of data
- Modernize field workflows



Sign Inventory



UAV Ground Control



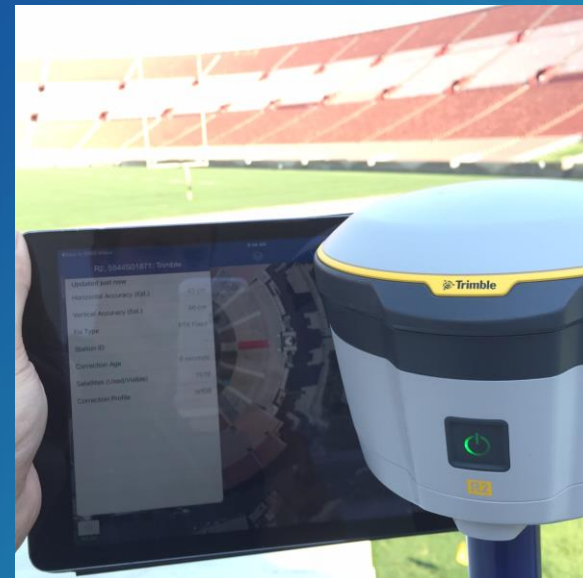
Hydrant Collections

Collector for ArcGIS| Le-Ax Water District

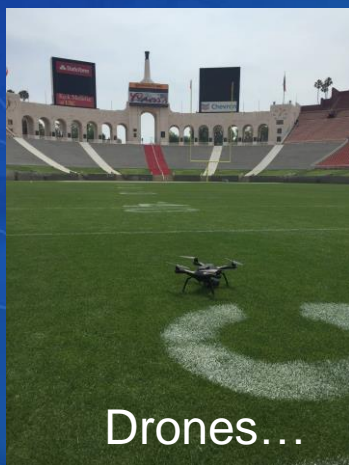


Travis Anderson
Civil Engineer

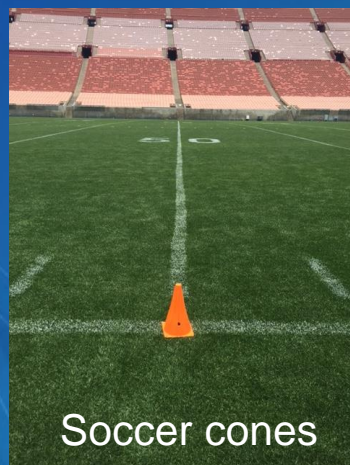
Collector for ArcGIS | Control Points Use Cases (Drones)



Collector + RTK/RTX



Drones...



Soccer cones



Control Points

Getting Started

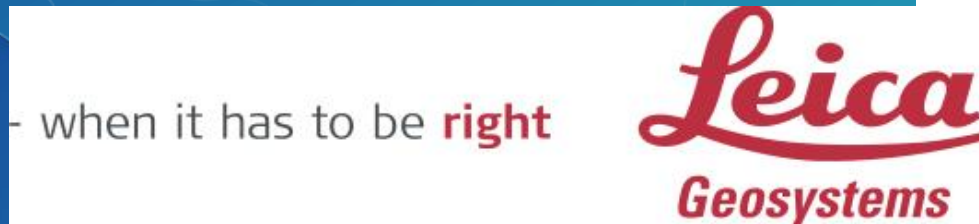
Considerations for high accuracy data collection



Data Collection Considerations

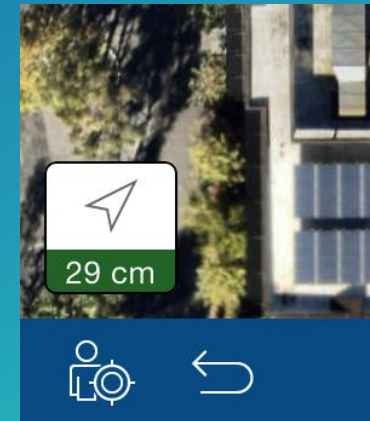
- Project accuracy requirements
- Supported receivers
- Correction services
- Desired basemap for collection
- Datum transformations

Collector for ArcGIS| Lots of Receivers



Collector | Using Real-time Differential Corrections

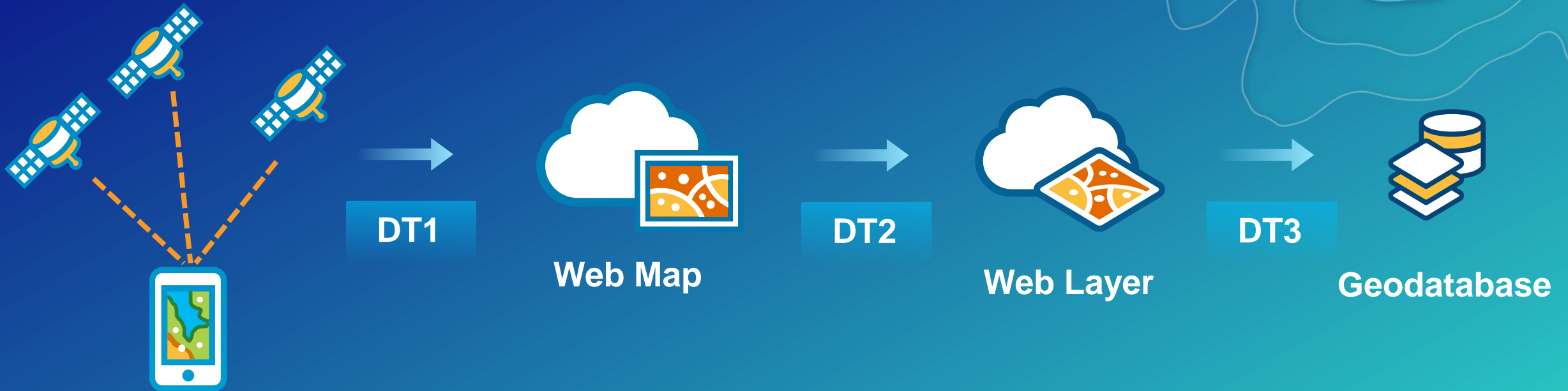
- Improve accuracy from receiver
- Requires a subscription and connection*
- Optionally use 3rd party app to configure
- Need to understand your map's projection and apply a location profile accordingly



Verizon LTE 12:39 PM 77%	
R2, 5544S01871: Trimble Done	
Updated just now	
Horizontal Accuracy (RMS)	31 cm
Vertical Accuracy (RMS)	31 cm
Fix Type	RTK Fixed
Station ID	--
Correction Age	8 seconds
Satellites (Used/Visible)	11/21
Correction Profile	ITRF08

Datum Transformations

Minimize when possible to maintain accuracy



DT1 – Defined in location profile

DT2 – Determined by basemap

DT3 – Determined by storage coordinate system

Geographic Transformation Table

Collector Setup

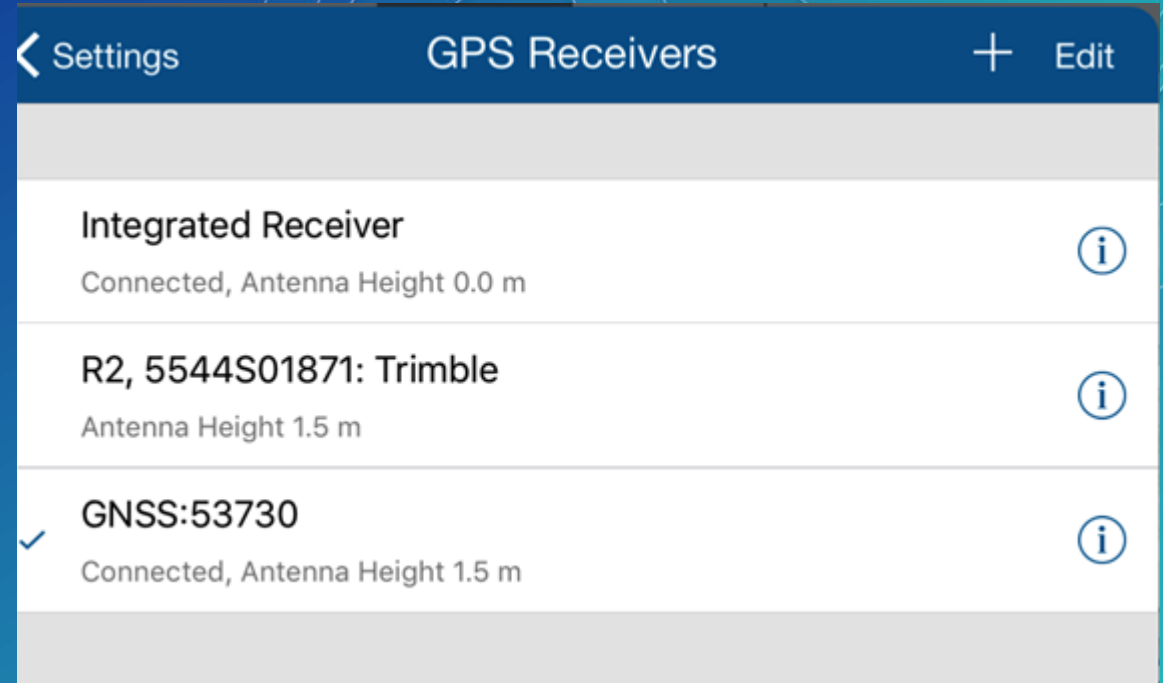
New High Accuracy Capabilities



Demo

Collector | Location Provider

- Located in App Settings
- Support for
 - Integrated receivers
 - Bluetooth receivers
 - Serial receivers on Windows
- Connect to named receiver
- Specify antenna height



iOS White Listed Providers:

- Trimble R1/R2
- Eos Positioning
- Geneq iSxBlue
- CHC
- Bad-Elf
- Aman NMEA-BT Adapter
- Dual GPS
- Garmin GLO

Collector | Location Profile

- Define the transformation used from receiver to map
 - Integrated location sensor or external GNSS receiver

Input: Coordinate System used by GNSS receiver correction service

- Always GCS (example: NAD_1983_2011)

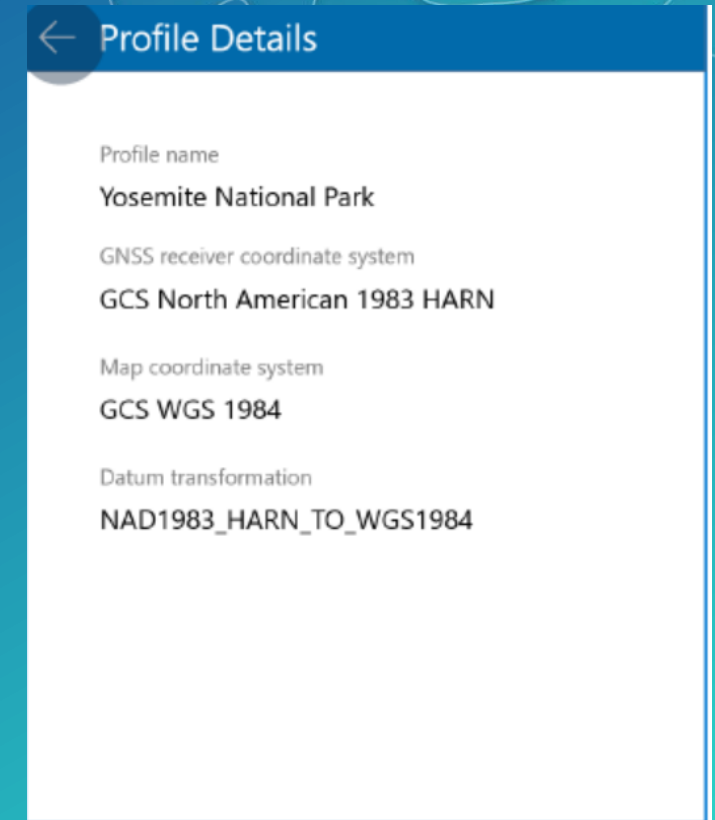
Output: Coordinate System used by Web Map's BaseMap

- GCS or PCS

Method: Datum transformation selection

- Choices by map extent
- Custom and grid-based transformations not supported

Name: Provide a memorable name for the profile



The screenshot shows a mobile application interface for 'Profile Details'. It features a blue header with a back arrow and the title 'Profile Details'. Below the header, the form is organized into sections with labels in a light blue font and user input in a dark blue font. The sections are: 'Profile name' with the value 'Yosemite National Park', 'GNSS receiver coordinate system' with the value 'GCS North American 1983 HARN', 'Map coordinate system' with the value 'GCS WGS 1984', and 'Datum transformation' with the value 'NAD1983_HARN_TO_WGS1984'.

Field	Value
Profile name	Yosemite National Park
GNSS receiver coordinate system	GCS North American 1983 HARN
Map coordinate system	GCS WGS 1984
Datum transformation	NAD1983_HARN_TO_WGS1984

Collector | Location Accuracy

- User-defined accuracy value
 - Match project accuracy requirements
- Specify in imperial or metric units
 - Based on measurement units

Location accuracy
Set required location accuracy

Set required location accuracy for data collection.

Meters
Centimeters

Location accuracy
Set required location accuracy for data collection.

Set required location accuracy

Feet
Inches

Field Data Collection

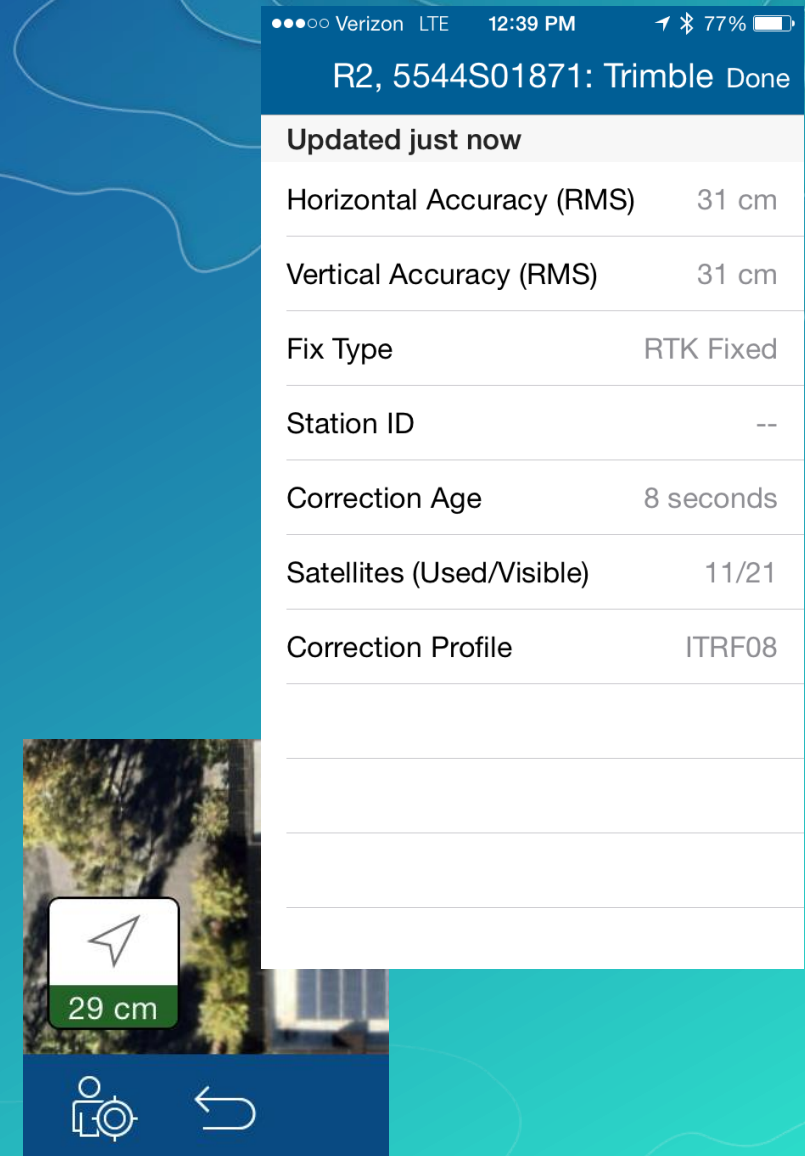
New High Accuracy Capabilities and Use Cases



Demo

Demo Recap

- GPS badge
 - Useful for troubleshooting
- Basemap overzoom
 - Zoom in beyond minimum scale range (resampled)
- GPS Metadata fields
 - Auto-populate accuracy information to point features
 - Based on well-known fields added to your Feature Layer (points only)



Tools and Resources



Demo

Tools and Resources

- New hosted feature layer option for collecting high accuracy metadata
- ArcGIS Solution Deployment Tool in ArcGIS Pro
[Deployment Tool](#)
- Scripts available to help automate attribute creation and popup configuration
[Record metadata fields](#)

New Hosted Feature Layer

Create a new, empty feature layer. A feature layer lets you

Select the layers to include. Click a layer name to edit it.

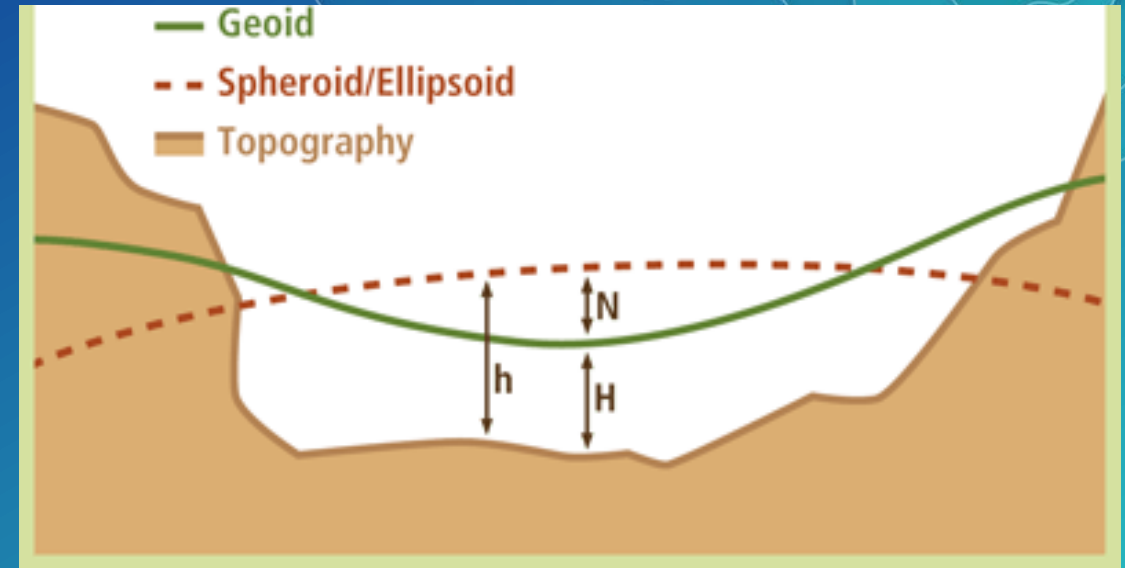
☒ Sewer Manhole

☒ Manhole Inspection

☐ Capture GPS receiver information

Collector | ProjectZ Geoprocessing Tool

- Z-value capture workaround
 - Altitude Stored as an attribute value
 - Capture height above the ellipsoid (HAE)
 - Subtracts antenna height
 - Converted into orthometric height if needed



Note: Editing Z-enabled geometry is not yet supported

Collector | Additional Use of ProjectZ Tool

- Capture Drone ground control points (GCP)
 - Using Ground Control feature template
 - Convert into orthometric heights
 - Import GCP

New Hosted Feature Layer

[From Template](#) [From Existing Layer](#) [From URL](#)

What do you want to do?

Show All


Agriculture

Electric Utilities

Environment

Gas Utilities

Select a feature layer template



Ground Control

Demo

Other Resources

Technical workshops

- Coordinate Systems and Projections: An Introduction
- Coordinate Systems and Datum Transformation in ArcGIS: An Introduction

Other resources

- *Lining Up Data in ArcGIS: A Guide to Map Projections, Second Edition*

What is New



What is new in Collector - June 2017

- **GPS Averaging**
 - Some industry best practice, like USFS
 - Standard deviation metadata field
- **Collector utilities scripts updated**

GPS averaging

GPS averaging with multiple location in some conditions.

☒ On

Number of locations

5

Average horizontal accuracy	Average Horizontal Accuracy (m)	ESRIGNSS_AVG_H_RMS	double	
Average vertical accuracy	Average Vertical Accuracy (m)	ESRIGNSS_AVG_V_RMS	double	
Number of positions averaged	Averaged Positions	ESRIGNSS_AVG_POSITIONS	Long	
Standard deviation	Standard Deviation (m)	ESRIGNSS_H_STDDEV	double	

Collector What's Coming

Q3 2017

- Trimble Catalyst (Android)
- 95% confidence interval

2018

- Z value support



Take Away

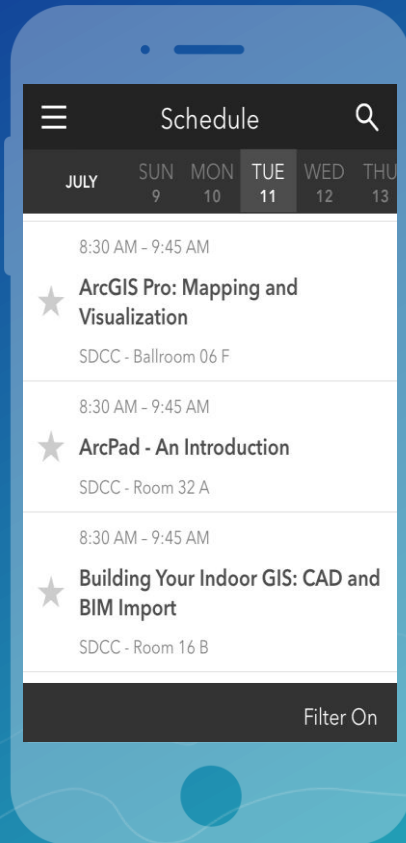
- **Access accurate location reliably**
 - In field: GNSS badge
 - In office: GNSS metadata
- **Data Collection Consideration**
 - Receiver + Correction service choice
 - Datum transformation
- **Use Case**
 - Hydrant collection
 - Ground Control Point for Drone

Please Take Our Survey on the Esri Events App!

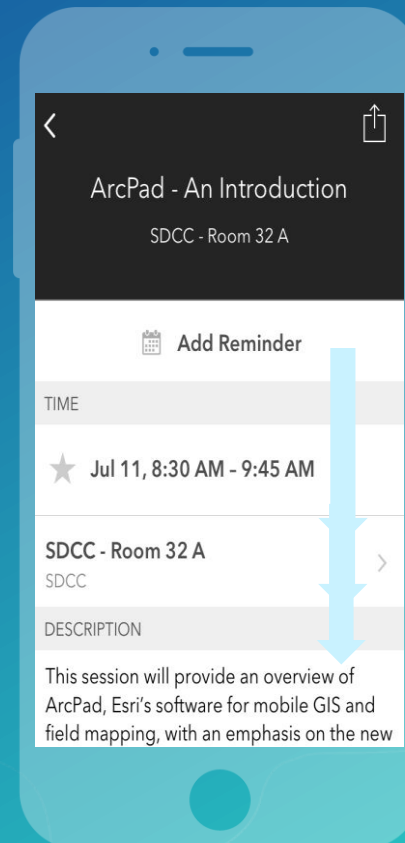
Download the Esri Events app and find your event



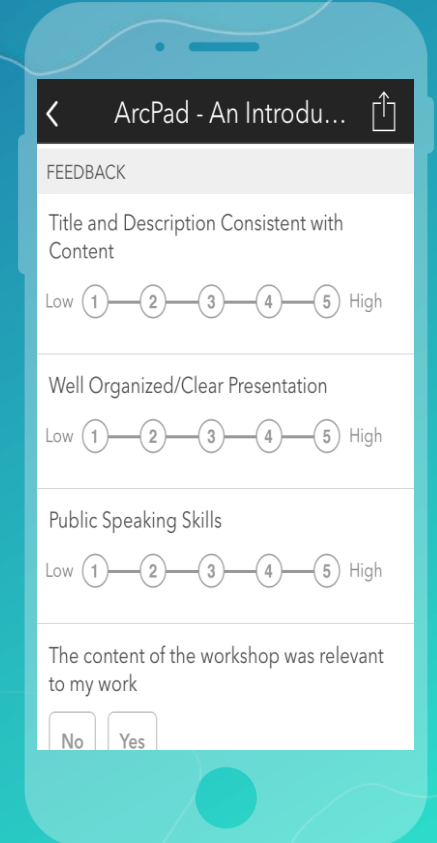
Select the session you attended



Scroll down to find the survey



Complete Answers and Select "Submit"





esri

THE
SCIENCE
OF
WHERE