

# MobileMap and Spatial Content Management: Integrating Field Data Collection, Document Management and Enterprise GIS for Natural Resources

BRIAN GRASS – MASON, BRUCE & GIRARD



# The Mobile Revolution



Proliferation of mobile devices – portable, powerful, inexpensive

Cloud computing making enterprise systems more accessible

Expectation of uninterrupted data availability

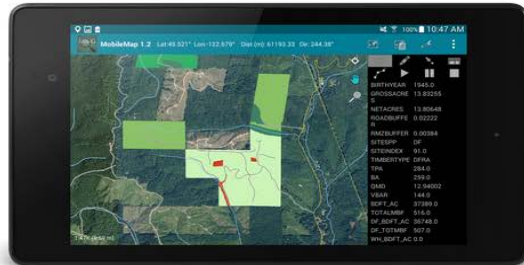
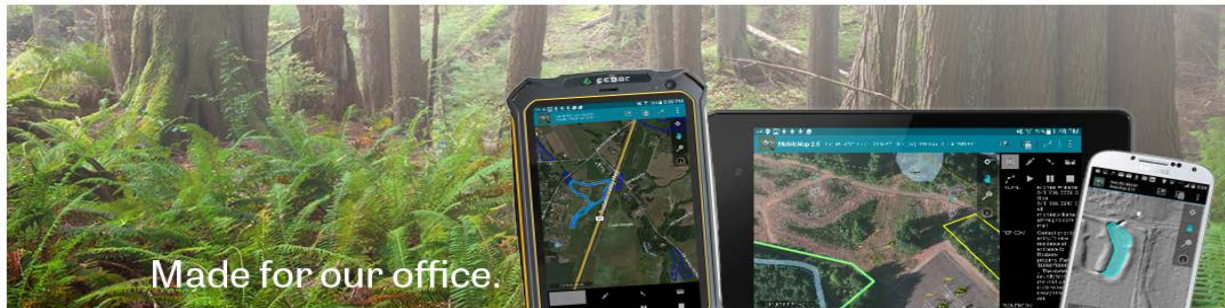
## How can this help with natural resource GIS?

- Enterprise GIS for the masses – you no longer need to buy servers to have a distributed, multi-user GIS
- Collect more data in less time – efficient workflows and ample background data let your staff work quickly and with confidence
- Tighten the link between field data and operational data – make reference datasets available in the field and field data accessible to everyone in near real-time
- Manage spatial and non-spatial data through a common interface

# MB&G's Solution

## MobileMap Mobile GIS and Spatial Content Management System

ABOUT FORESTRY ENVIRONMENTAL GEOSPATIAL TECHNOLOGY NEWS & EVENTS CAREERS



### Mobile Field Data Collection: Offline GIS Capabilities

MobileMap provides real GIS functionality, not just basic maps, to users in the field. This allows field staff to perform complex data visualization, discovery and collection activities. While other mapping applications offer basic offline functionality, none rival MobileMap when it comes to flexibility, capability, and performance.

### Spatial CMS Leverage Your GIS Data

To maximize the rich information in an organization's GIS, it must be combined with other key business data and processes. Mason, Bruce & Girard, Inc. (MB&G) has developed an flexible Spatial Content Management System (Spatial CMS) which integrates with a best-of-breed CMS, providing access to the combined capabilities of within a secure web-based interface.

MS is highly adaptable and supports a wide range of data collection, storage, and sharing workflows. In creating our Spatial CMS platform, MB&G has extensive experience with enterprise GIS, mobile technologies, application and land management to create an enterprise data management solution as an organization's existing investment in hardware, software, data, and training. Backed by Enterprise technologies such as ArcGIS and Drupal, is the most robust, scalable, extensible, and secure CMS available, and is used by many private and institutional organizations.



- Stores and manages large volumes of spatial and non-spatial content
- Implements robust workflows and supports automated processes and notifications
- Maintains strict role-based security for all content
- Maximizes investment in enterprise GIS, mobile technologies, data models, and workflows while implementing currently missing business processes
- Integrates and enhances existing systems into a common management environment
- Produces high-quality and timely information to support effective management
- Supports changes to schemas, custom reports, and revised workflows through a highly extensible and configurable framework
- Provides reliable and consistent access to GIS content using Esri's on-site (ArcGIS for Server) or cloud hosted (ArcGIS Online) platforms
- Utilizes the highly-scalable and extensible Drupal

Spatial CMS

# MB&G MobileMap

Mobile data access and disconnected editing

## Key Features:

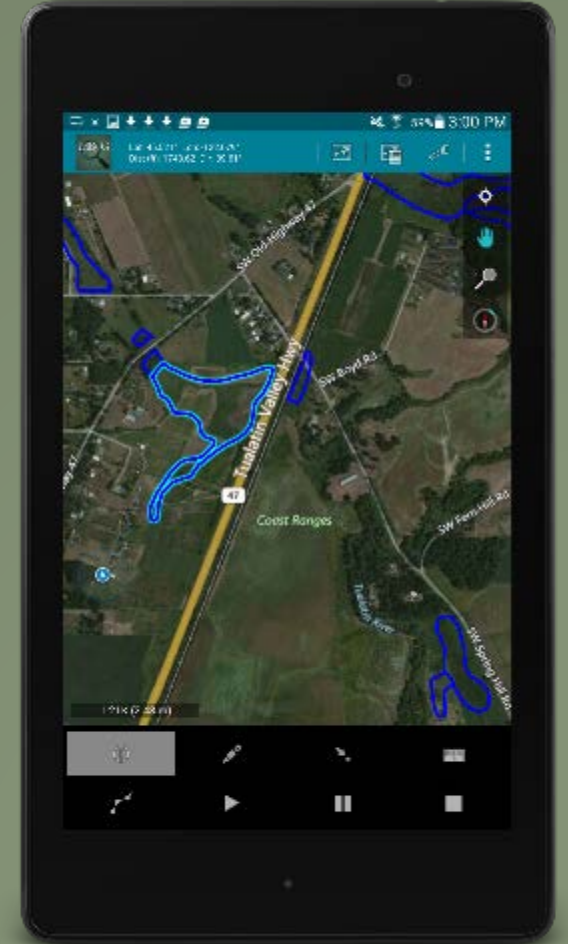
- Supports disconnected editing to allow data collection anywhere
- Field data synced with cloud (ArcGIS Online) or ArcGIS Server via Wi-Fi; facilitates multi-user data collection and collaboration
- Built using ESRI technology to integrate seamlessly with other GIS processes
- Flexible custom forms streamline data collection, reduce errors and respect ESRI data types (domains, non-nullable fields, ranges etc)
- Supports multiple large cached datasets allowing real-time access to high-res imagery, LiDAR and vector reference data
- Authenticates to ArcGIS Online or Server to access secure data layers
- Tabular data support for CSV format, accessible by tapping features in the map



# MB&G MobileMap 2.0

## Added Functionality:

- Advanced cartographic control: Supports multiple basemaps and any number of overlay layers with configurable symbology, toggle on/off and query
- Shapefile support: Easily add shapefiles as read-only, searchable reference layers
- Navigate to selected features with compass, direction indicator, distance to feature and configurable signal when destination is reached
- Photo capture when collecting feature data
- Measure length and area on-screen



# MobileMap – Why Android?



Key advantages:

- Wide range of hardware available from phones to large tablets
- Competitive pricing
- Availability of ruggedized and waterproof devices
- No need to buy more expensive cellular version to get GPS receiver
- External MicroSD cards available on many devices- greatly extends flexibility and storage capacity
- No need for iTunes



# MobileMap Mobile GIS and Spatial Content Management System

## **Case Study:**

### **Wetlands data management system demonstration -**

Step through the field data collection lifecycle:

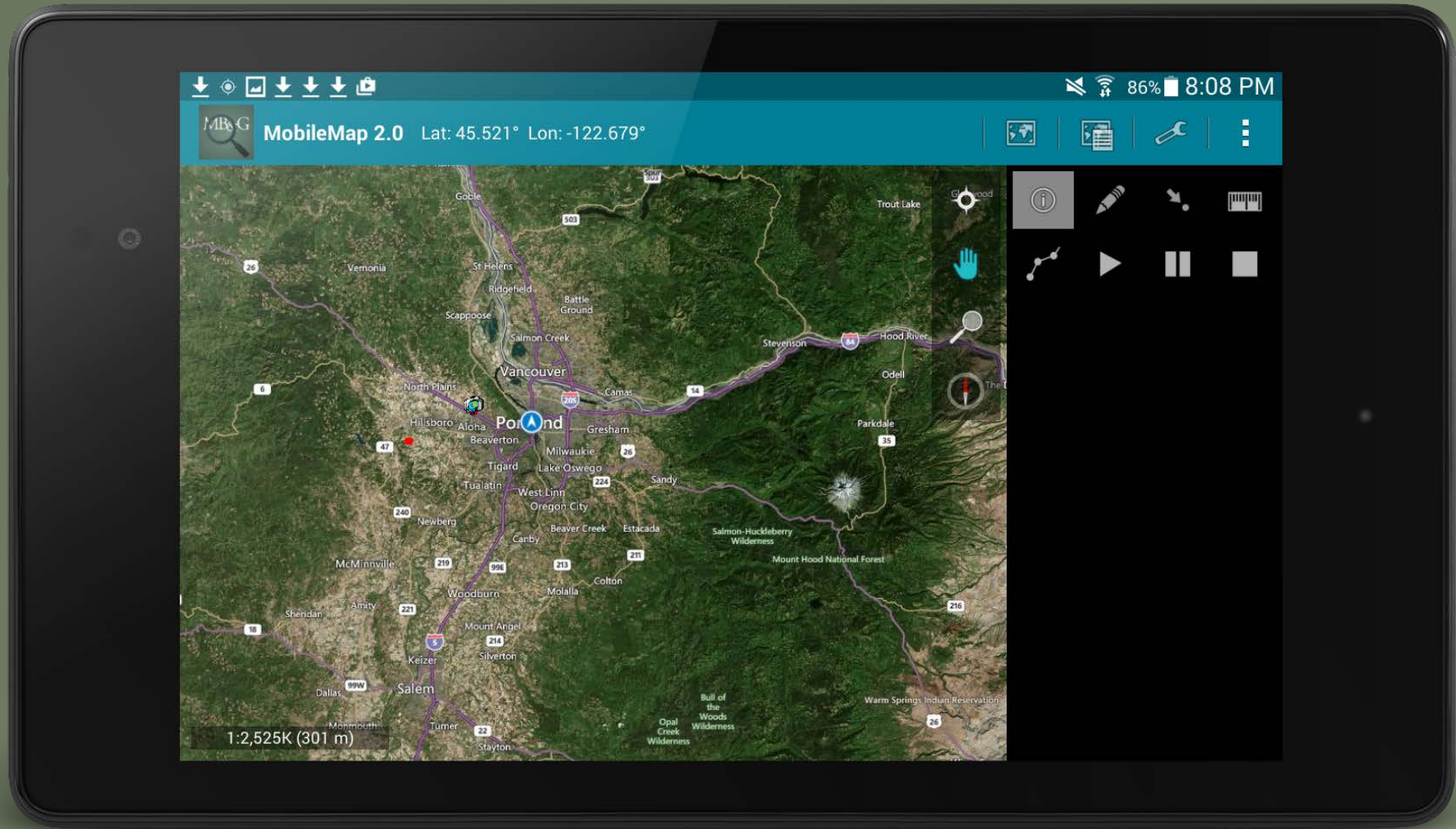
Download existing data to MobileMap from the cloud

Collect / Update data in the field

Sync data back to cloud

Review data through web interface; manage photos and documents

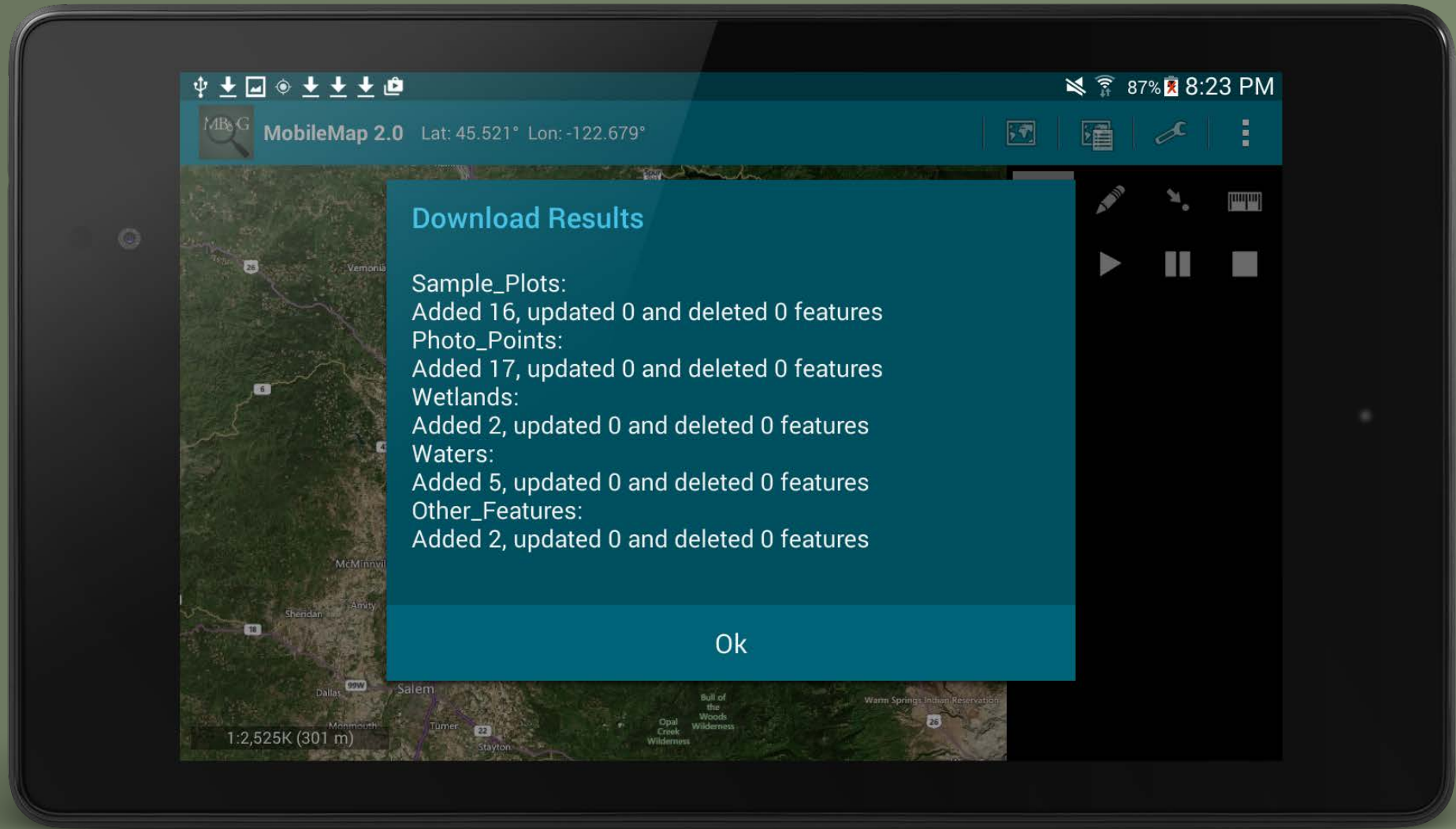
# MB&G MobileMap



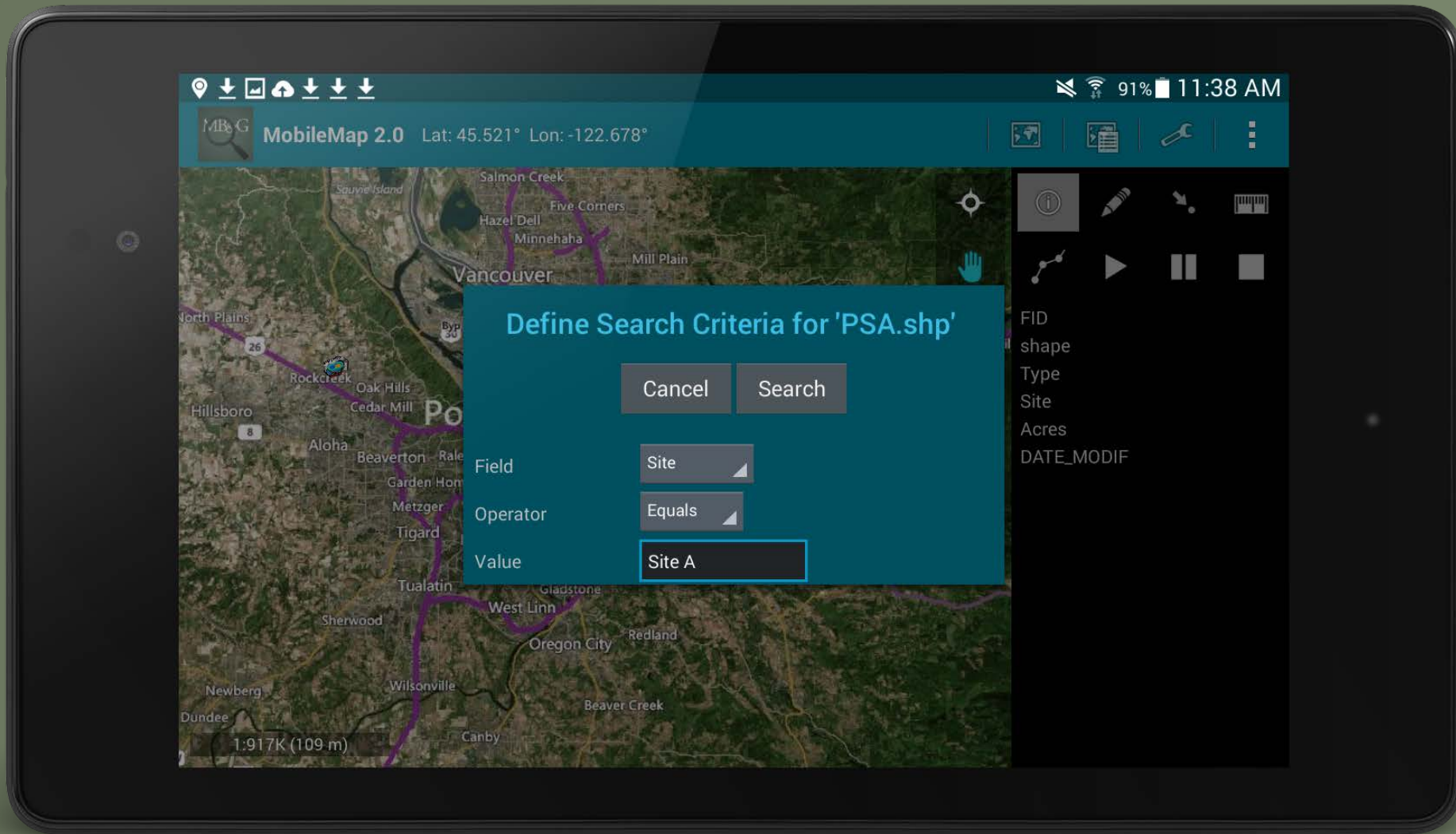
A closer look . . .



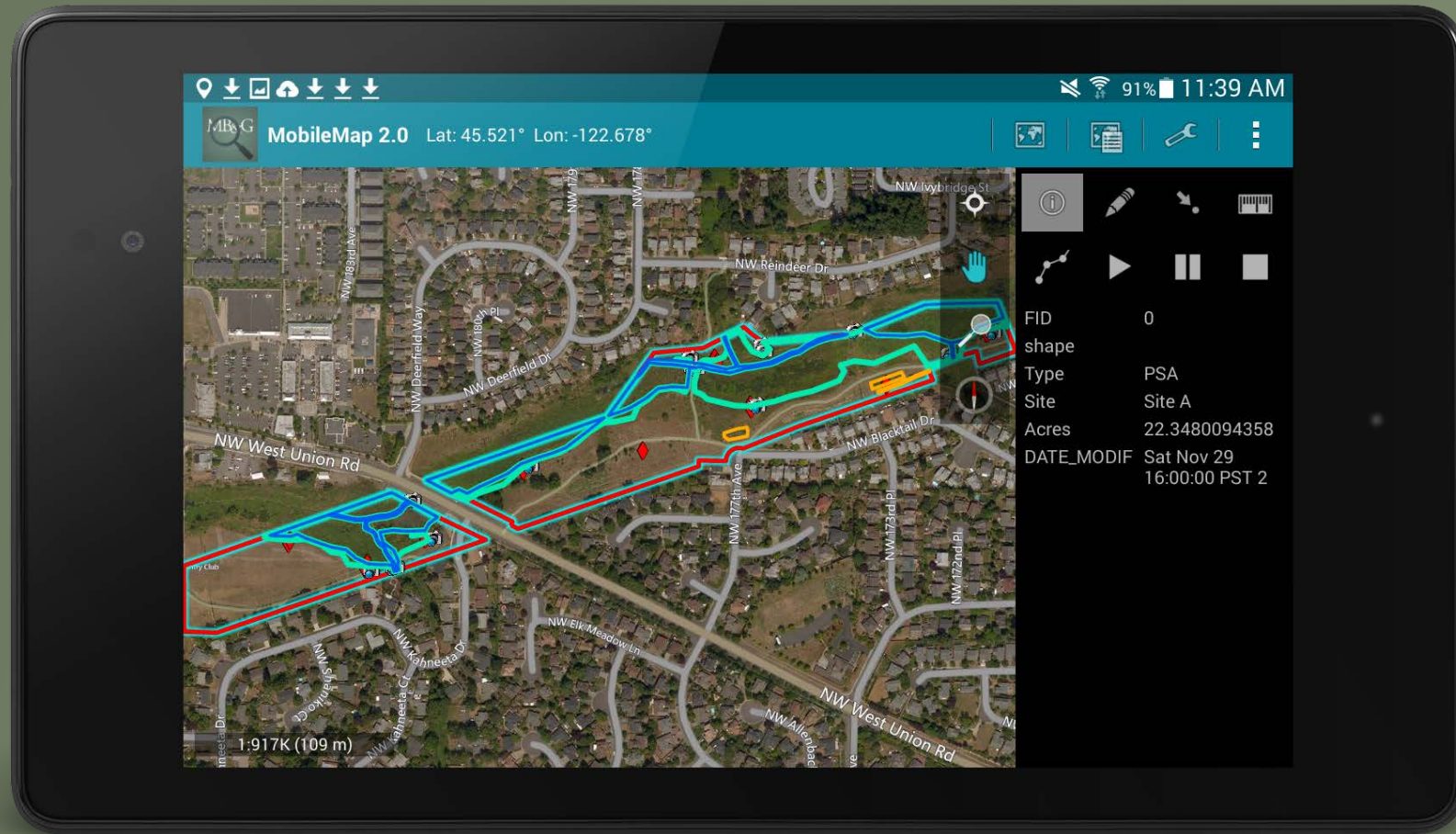
# MB&G MobileMap



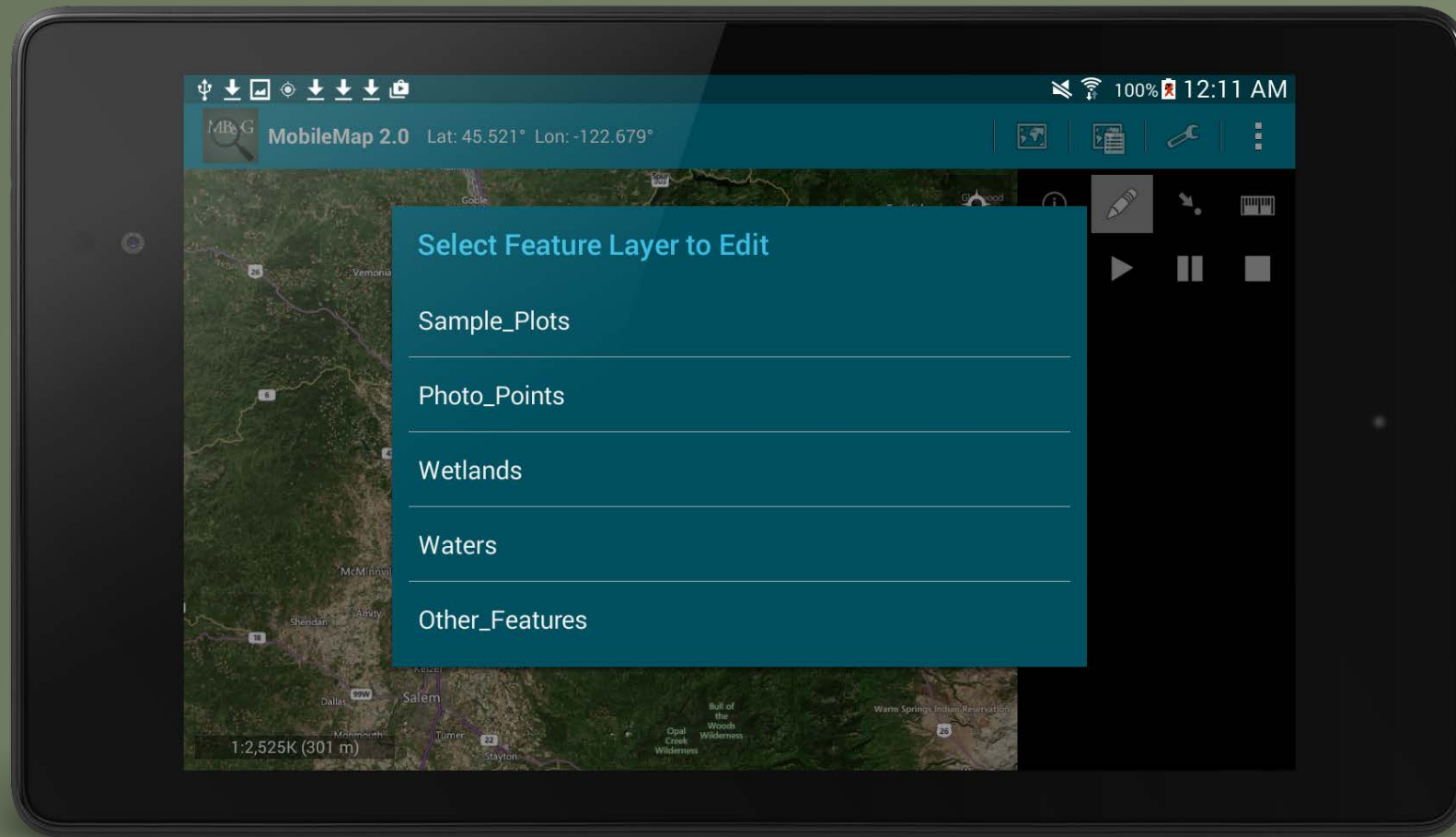
Downloading wetland features from feature service via wi-fi – the start of the field data lifecycle



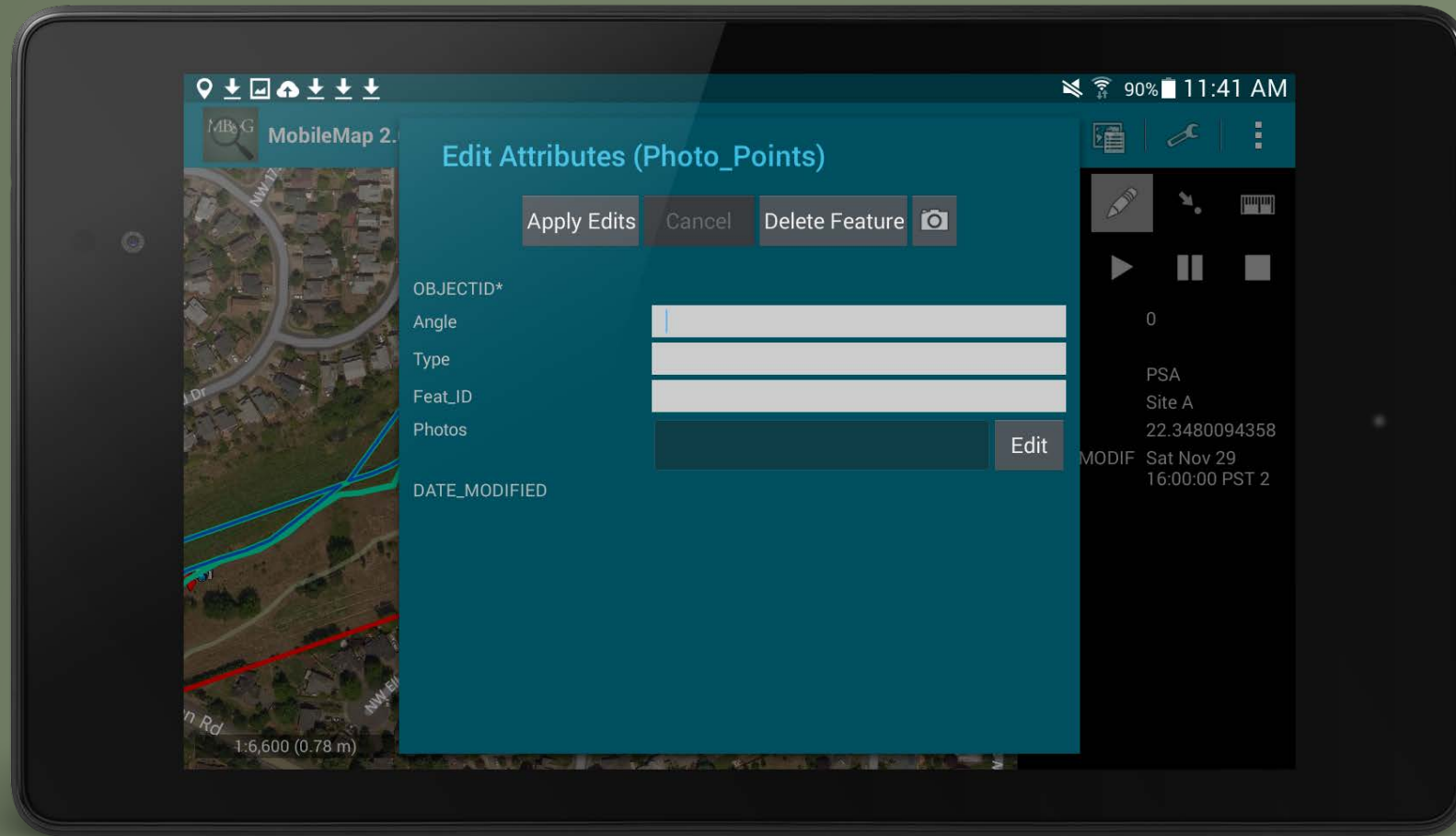
Using Search to locate the wetland site . . .



The map is zoomed to the selected site . . .



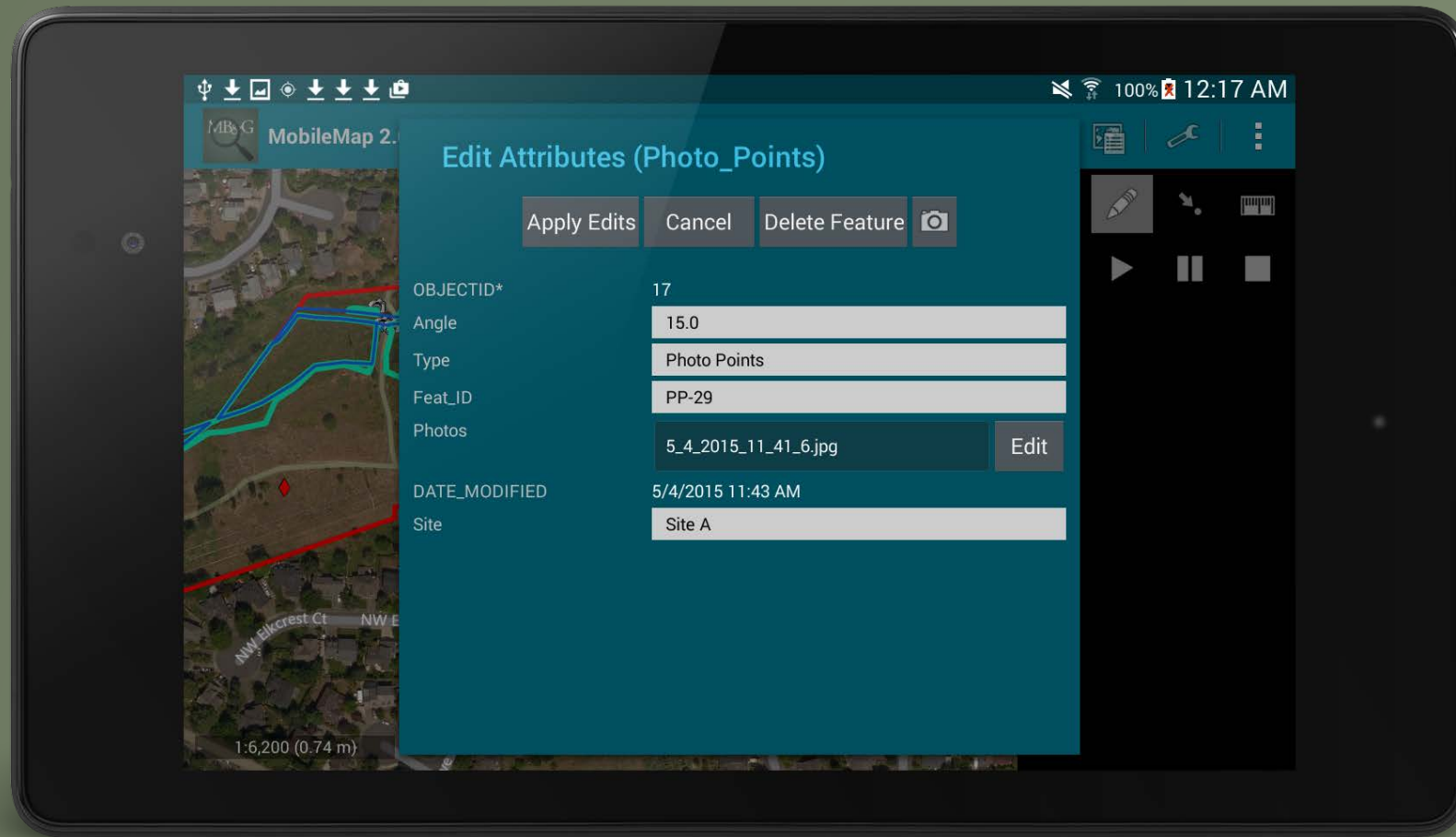
Collecting a new photo point



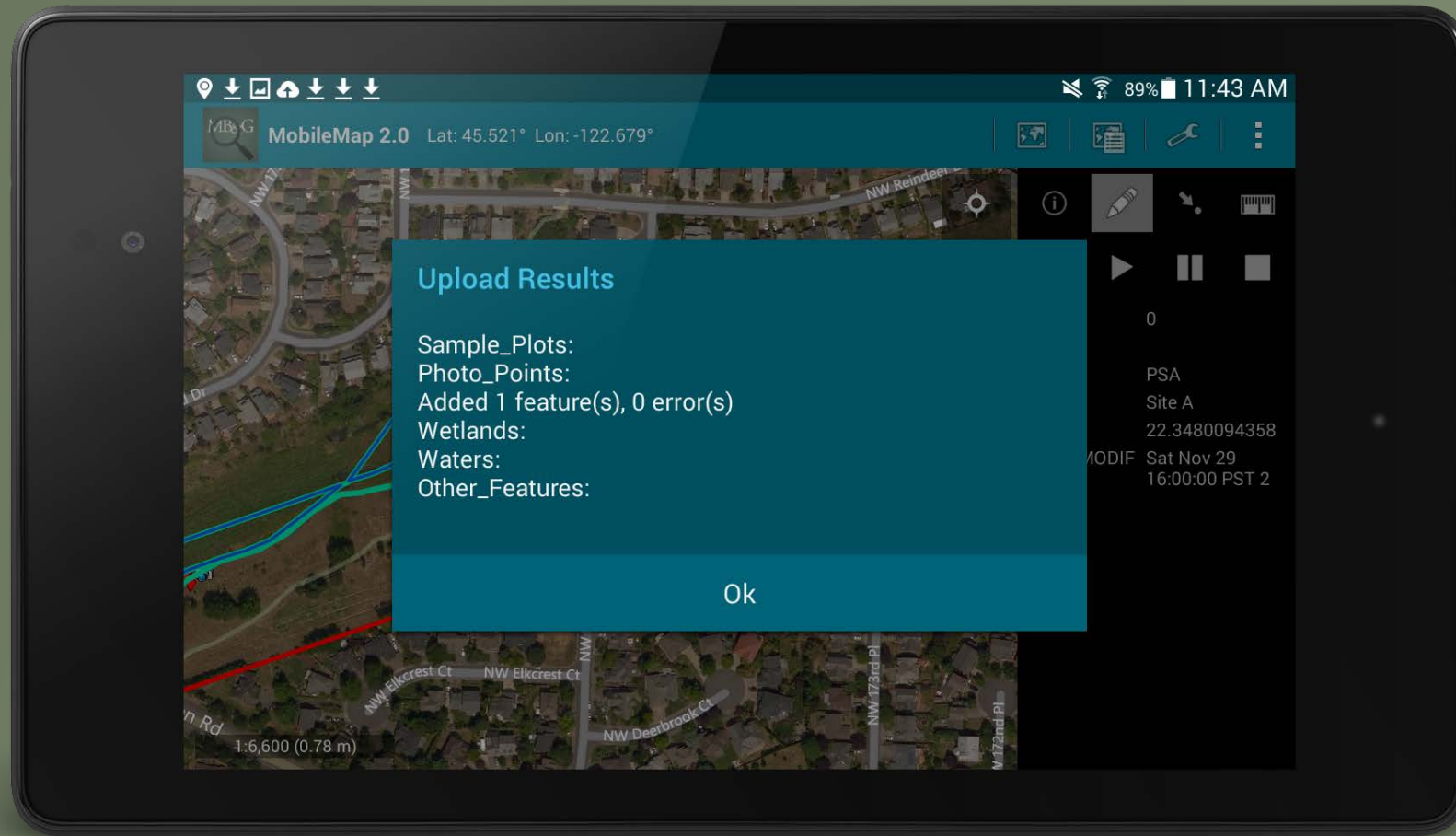
Collect the point and a simple attribute editor opens, click the camera icon to take a photo to associate with this point



Review your photo before saving



Complete the attributes and save feature



Syncing new/modified data back to feature service



Wetlands\_Demo\_FeatureService

masonbruce.maps.arcgis.com/home/webmap/viewer.html?layers=b70dae739bc2458dbaefb9b28790ddd9

HOME Wetlands\_Demo\_FeatureService NEW MAP Brian

Details Add Edit Basemap Save Share Print Directions Measure Bookmarks Find address or place

About Content Legend

Contents

- Wetlands Demo FeatureService - Sample Plots
- Wetlands Demo FeatureService - Photo Points
- Wetlands Demo FeatureService
- Wetlands Demo FeatureService - Waters
- Wetlands Demo FeatureService - Other Features
- Topographic

Photo Points:

Angle	15.00
Type	Photo Points
Feat_ID	PP-29
Photos	5_4_2015_11_41_6.jpg
DATE_MODIFIED	May 4, 2015
Site	Site A

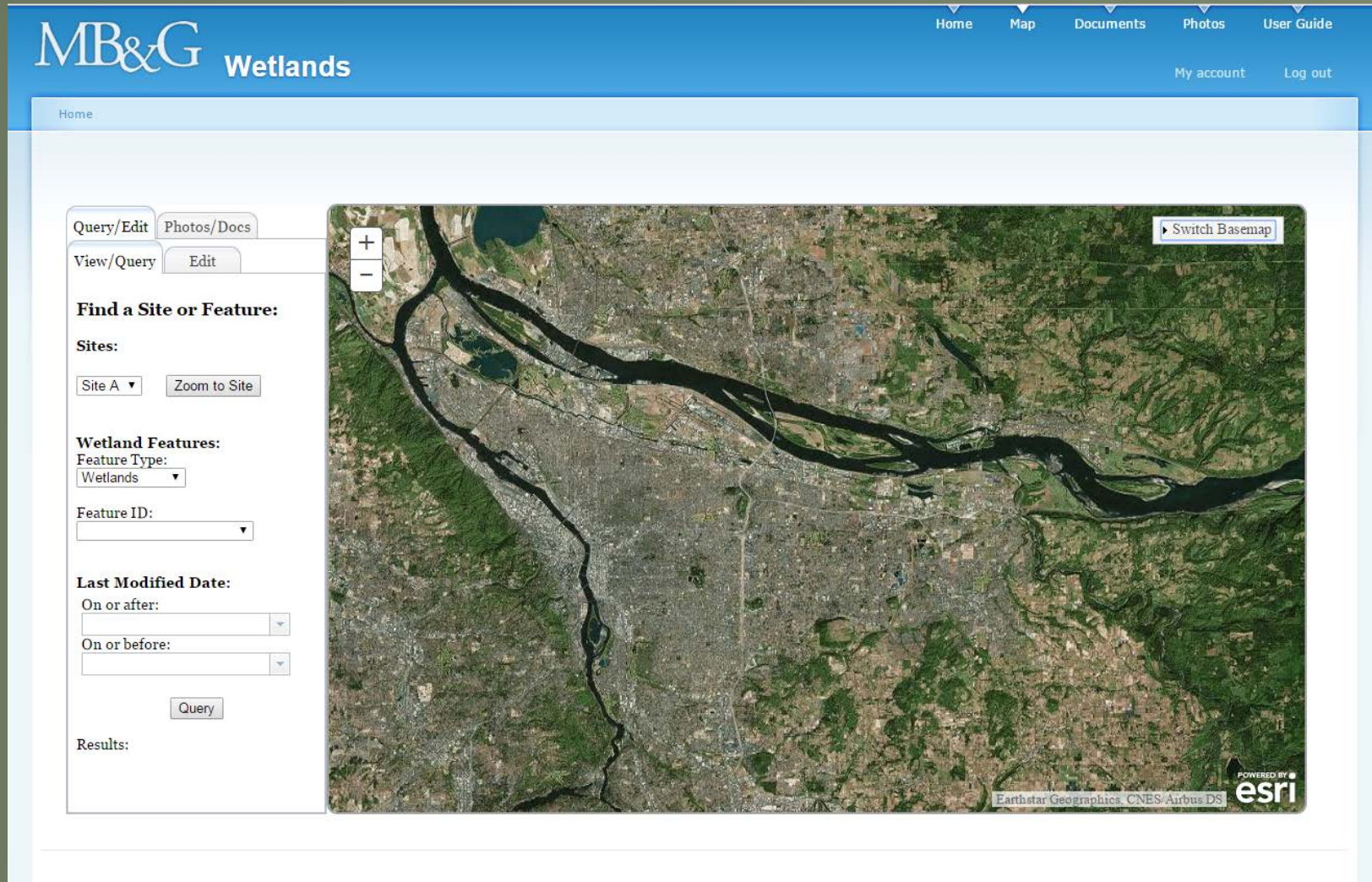
Zoom to Get Directions Edit

Esri.com ArcGIS Marketplace Help Terms of Use Privacy Contact Esri Report Abuse

MRLC, Oregon Metro, State of Oregon, State of Oregon DOT, State of Oregon GEO, Esri, HERE, DeLorme, Inter...

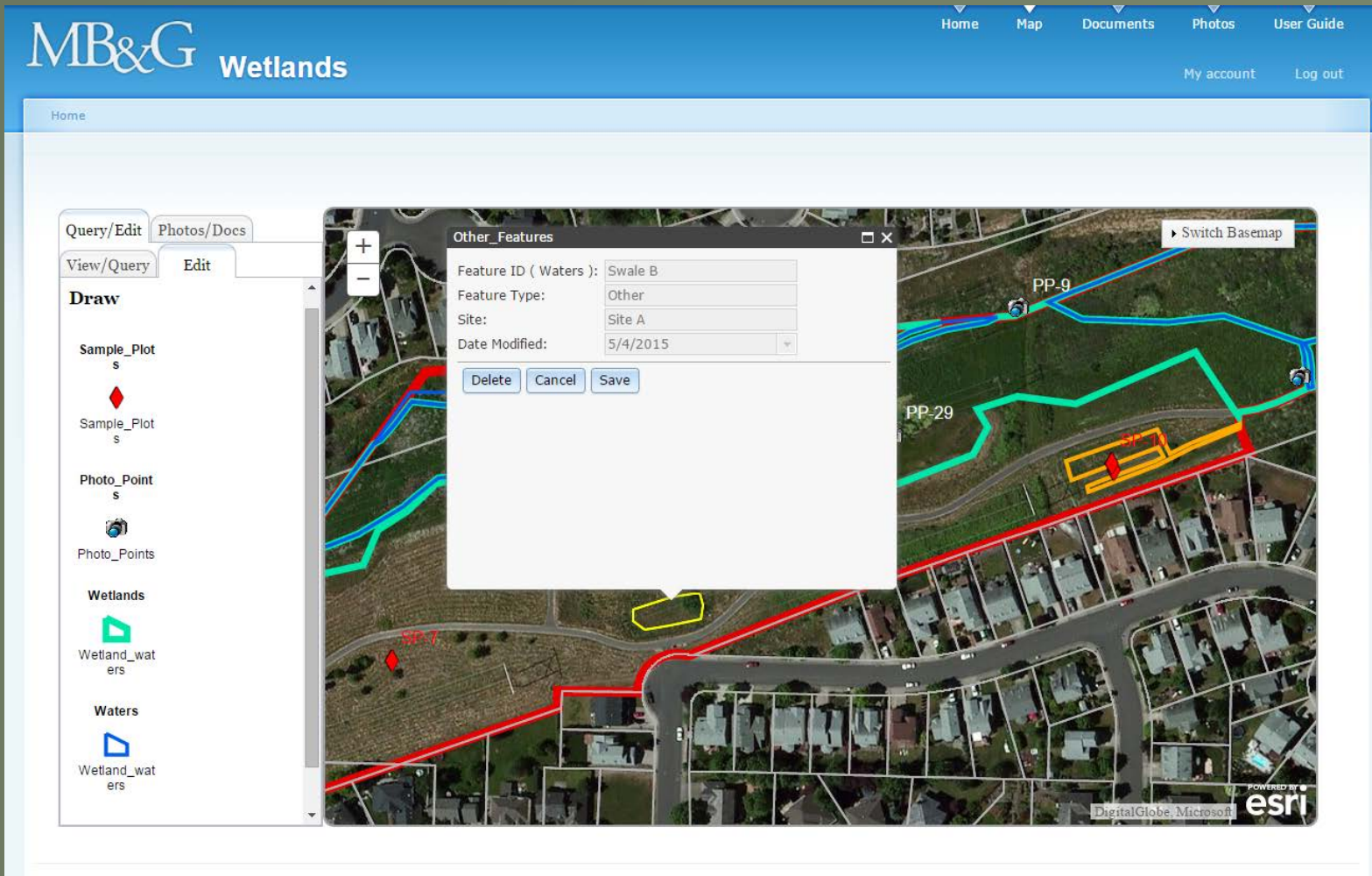
Now it's securely accessible on the Web – ArcGIS Online

# Spatial Content Management System

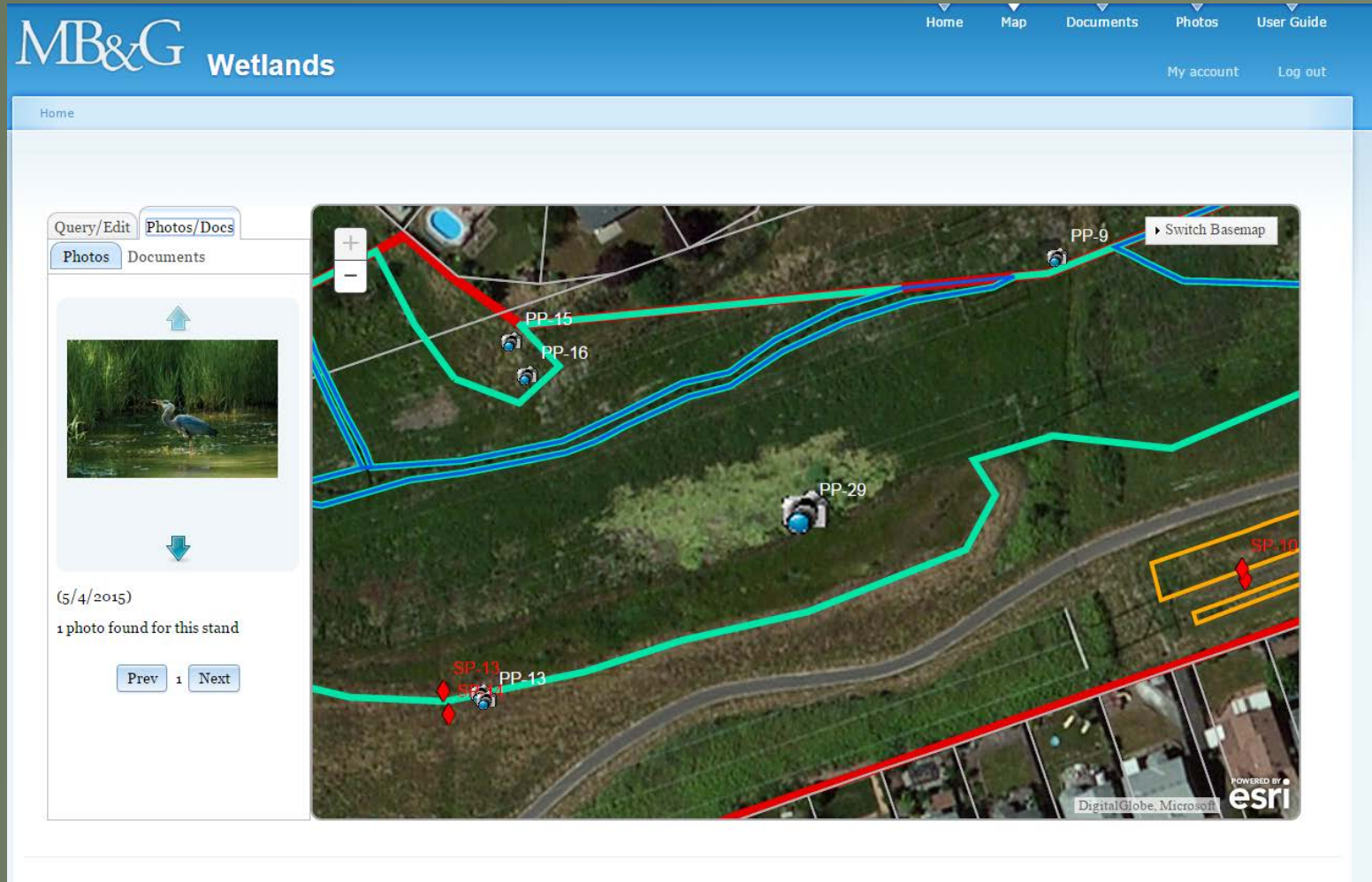


Extending the power of the web map-

All your operational data in one place: geospatial data, documents, photos, reporting and more



Configurable attribute editor and draw toolbar



Checking on the photo point we just collected with MobileMap

**MB&G Wetlands** Home Map Documents Photos User Guide My account Log out

Home

Query/Edit Photos/Docs Photos Documents

(5/4/2015)  
1 photo found for this stand

Prev 1 Next

Accessing a photo associated with Sample Plot # 6

Home

Query/Edit Photos/Docs

Photos Documents

[Sample Plot 6 data form](#)



Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%): 23  
 Subregion (LRR/MLRA): A Lat: 46.5576° Long: -122.8627° Datum: N/A  
 Soil Map Unit Name: 22-Conserv silty clay loam NW/LW/NHD classification: Upland  
 Artificial Y  N  N/A  created in Upland/Wetland (including Ditch Y  N  N/A  (road/railroad/irrigation) >10' wide Y  N  N/A   
 mapped hydric soils);  
 Contains food & game fish Free & Open connection to Waters of the State Abutting/Adjacent/Nexus to RPW (Remarks) N/A   
 Y  N  N/A  Y  N  N/A   
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

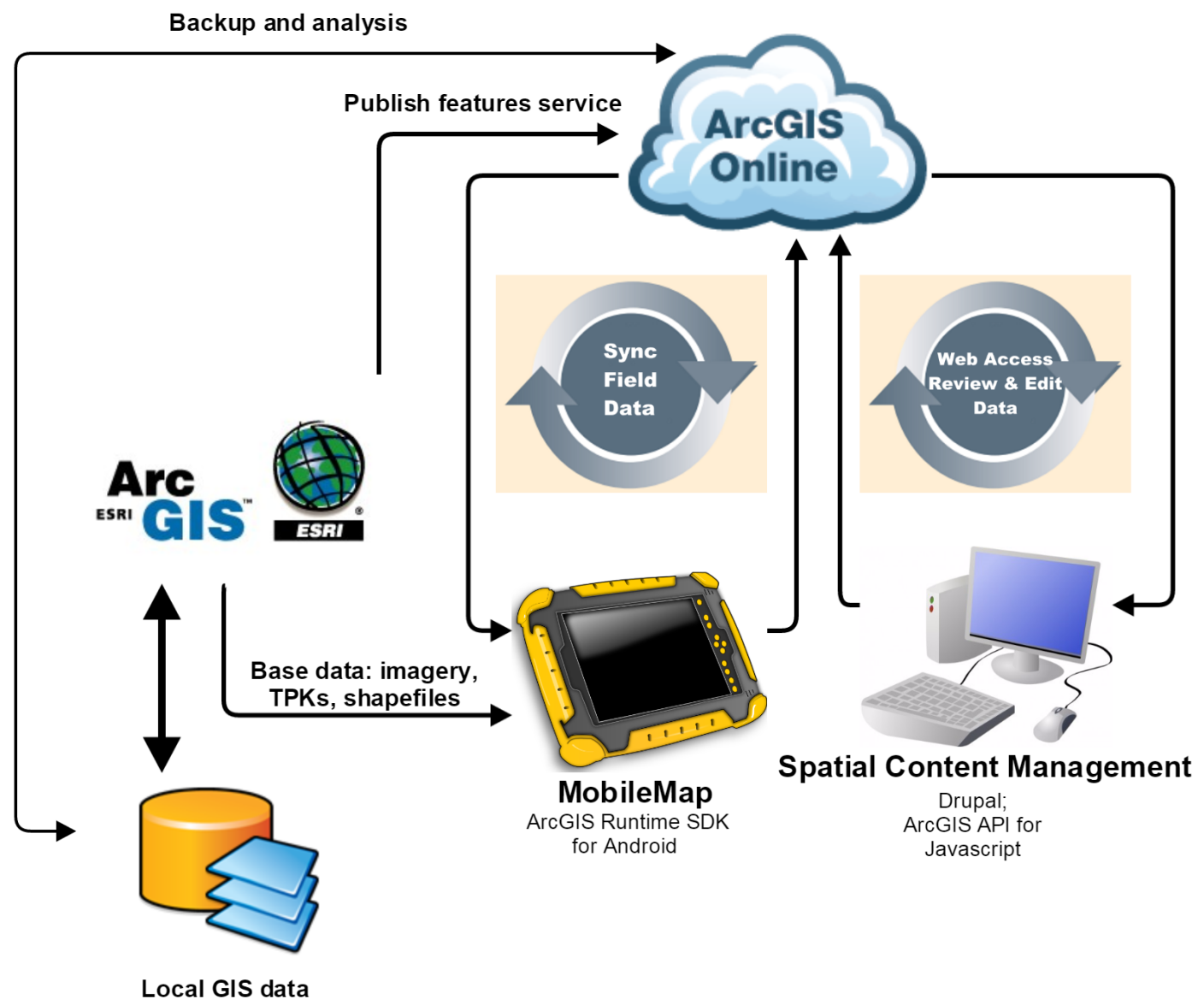
**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Associated Wetland ID #: Wetland A		
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Remarks: plot located 1/4 vertical foot above & 10 horizontal feet southeast of SP-5.		

**VEGETATION**

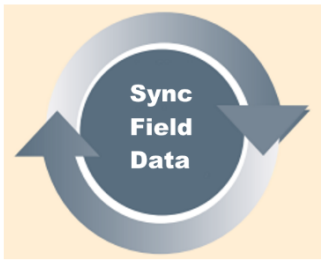
Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. N/A	—	—	—	Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)	
2.	—	—	—	Total Number of Dominant Species Across All Strata: 3 (B)	
3.	—	—	—	Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)	
4.	—	—	—		
Total Cover:	0				
Sapling/Shrub Stratum (Plot size: 5 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:	
1. Crataegus douglasii	5	Y	FAC	Total % Cover of: Multiply by:	
2. Rubus americanus	5	Y	FACU	OBL species	x 1 =
3.	—	—	—	FACW species	x 2 =
4.	—	—	—	FAC species	x 3 =
5.	—	—	—	FACU species	x 4 =
Total Cover:	10			UPL species	x 5 =
				Column Totals:	(A) (B)
Herb Stratum (Plot size: 5 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index = B/A =	
1. Pea secunda	20	Y	FACU	Hydrophytic Vegetation Indicators:	
2. Senecio jacobaea	10	N	FACU	<input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation	
3. Hypochaeris radicata	10	N	FACU	<input type="checkbox"/> 2 – Dominance Test is >50%	
4. Pteris caudata	10	N	FACU	<input type="checkbox"/> 3 – Prevalence Index is <3.0 <sup>1</sup>	
5. Peucedanum vulgare	10	N	FACU	<input type="checkbox"/> 4 – Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
6. Vicia sp.	5	N	FACU(est)	<input type="checkbox"/> 5 – Wetland Non-Vascular Plants	
7.	—	—	—	<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
8.	—	—	—	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Total Cover:	125				
Woody Vine Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status		
1. N/A	—	—	—		
2.	—	—	—		
Total Cover:	0				

Accessing a document associated with Sample Plot # 6



Backup and analysis

Publish features service



Local GIS data



**MobileMap**  
ArcGIS Runtime SDK  
for Android



**Spatial Content Management**

Drupal;  
ArcGIS API for  
Javascript

Base data: imagery,  
TPKs, shapefiles

# Questions ?

Be sure to come by our booth for a hands on demo!

The logo for MB&G is displayed in a white, serif font against a background of colorful, abstract watercolor-like patterns in shades of red, orange, yellow, and green.

MB&G

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