Integrating a FIMT geodatabase

with ArcGIS Online & Collector



VERSION 2.0

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National Park Service - NIfc

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***Access the digital copy of this Workflow & supporting videos***

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**READ ME**

**It is strongly recommended to familiarize yourself with this workflow before using ArcGIS Online/Collector on an incident. Take your time going through the document start to finish. View videos before starting this document &/or throughout the process.**

**This document is not just a tutorial. It provides recommended steps for managing your incidents FIMT geodatabase, Other geodatabase, AGOL feature services and maps, and use of the Collector App. The workflow will help you keep data in sync between the different platforms. The templates you use while practicing this workflow will be used on an actual incident too. You will be introduced to key AGOL & Collector concepts. Self-motivation is required, if you don’t understand something, google it and dig deeper.**

**\*When you are using this workflow as a tutorial, you need to make a ‘practice’ FIMT incident and make up your own fire data.**

# Introduction

## Objective

This is a wildland fire mapping pilot-project that utilizes ESRI’s ArcGIS Online (AGOL), a web mapping platform, and Collector (10.2.7), an application for mobile devices (iOS 7 or later and Android 4.0 or later). The workflow in this document covers the steps on how to use a Fire Incident Mapping Tool (FIMT) geodatabase (gdb) with AGOL.

What this technology brings to the table:

* **Offline Collection**: The ability to view maps and collect data when there is no cellular service or WiFi. When a device establishes connectivity, changes in a map can be sent and received (synchronization/sync).
* **Real-Time Data Sharing**: Users of Collector will be able to share their data in a real-time manner in connected environments. This will be beneficial for the GIS Specialist (GISS) managing the maps & data and other Incident Management Team (IMT) members will benefit from being able to view these near real-time updates.
* **Security**: Permissions will be given to only select individuals to view and add spatial data to maps. AGOL accounts are required to use Collector and can be issued when needed.
* **Paper Map & Printing Reduction**: Being able to view the most up-to-date maps on a mobile device reduces the amount of paper maps needed.

This document contains a suggested workflow. The goal of this process is to develop a secure and seamless way to share maps with the different types of viewers & users (IMT personnel vs Public). It is also a workflow to allow the GISS to organize and manage: incoming data (QA/QC), the FIMT gdb, users, and permissions.

## Description

There are two main parts to this document:

### Getting started with AGOL & Collector - *Section 2 & Section 3*

* If you are not proficient with AGOL &/or Collector this is where you need to start. Watch the videos and read up on AGOL and Collector capabilities and processes.

### Workflow - *Section 6*

* Here you will go through the process of how FIMT can be integrated and managed with AGOL and Collector.

## Target Audience

GIS Specialists on wildland fire incidents

## Requirements

### Need to be an experienced user of ArcMap

* ArcMap version 10.1 or higher

### Experienced using the Fire Incident Mapping Tool (FIMT)

* Download the tool and documentation [here](http://gis.nwcg.gov/links_tools.html)[[1]](#footnote-1)
* FIMT contains many features that are not necessary for map creation in this workflow. The features that will be used from the FIMT gdb are: FirePolygon, FirePoint, FireLine, & AssignmentBreaks

### AGOL Organizational Account

* This is different from the free-Public Account that anyone can get (more details: Section 2.1)

### [Templates](https://drive.google.com/folderview?id=0B9_PM0mqid5sX3FwNzJLMTdObFk&usp=sharing)[[2]](#footnote-2) folder (Appendix 9.1)

* Save in the documents folder

\*This workflow was developed with ArcMap 10.2. It should work with 10.1, but issues may be encountered in 10.1 and not 10.2. My only suggestion is to upgrade or improvise.

## QA/QC Process

### Work with your Situation Leader (SITL) to develop the process of how data is approved and integrated into the FIMT gdb as it is Collected.

### Integrate GSTOP standards into this process. GSTOP page 57 - Communications

# AGOL :: Getting started

*This section will show the steps that will be necessary to create a map in ArcGIS Online (AGOL). These maps will be able to be shared and used with Collector in connected and disconnected (Offline) environments.*

[\*Overview Video of this Workflow](https://drive.google.com/folderview?id=0B4FY6Y_ZXT8tOGxBcHFJQnRxX0U&usp=sharing)[[[3]](#footnote-3)](https://drive.google.com/folderview?id=0B4FY6Y_ZXT8tOGxBcHFJQnRxX0U&usp=sharing)

## Get an AGOL Account:

* This account is different from the free Public Account you may have used before.
* How can the user request an account? Coming soon.
* Video: [Join an organization](http://video.arcgis.com/watch/1338/joining-an-organization)**[[4]](#footnote-4)**(start at 59secs)
  + Some of the steps mentioned may not be necessary. This will give you the general idea.

## Sign In to an Organizational account: [Sign-In](http://www.arcgis.com/home/signin.html)[[5]](#footnote-5)

* Video: [Join an organization](http://video.arcgis.com/watch/1338/joining-an-organization)**[[6]](#footnote-6)**(start at 59secs)
  + Some of the steps mentioned may not be necessary. This will give you the general idea.

## Feature Service

“The feature service authoring process involves setting up a map document to define the data and symbology that will be exposed by the service” (ESRI Resources). Once this map document (mxd) is published as a feature service it can be utilized to create AGOL maps. Think of the service as the layers in ArcMap, you are bringing these symbolized layers from ArcMap into AGOL.

### **Publish** a feature service from ArcMap

* Videos:
* [Video](http://www.youtube.com/watch?v=uhE3Jx9MKwQ)[[7]](#footnote-7): (start at minute 5:30) **OR**
* [*Publishing a Feature Service*](http://www.youtube.com/watch?v=K19U_HFdooc)*[[8]](#footnote-8)*: (start at minute 6:24 through ~minute 12)

### **Publish** a feature service with a Service Definition file (.sd)

* Another method on how a feature service can be created
* A service definition can be uploaded to AGOL to create a new feature service

### Modify Feature Service Settings

* Section 6.3 for details
* Enabling a map to go offline: [Take maps offline](http://doc.arcgis.com/en/collector/ios/create-maps/offline-map-prep.htm#ESRI_SECTION1_BB7CFF5BFBC847DEA31610A38A510679)[[9]](#footnote-9)

## Creating AGOL Maps

You will create a new map (My Content > Web Map **Create Map)**. Add the feature service you published to this new map (Add LayerAdd > Search for Layers [In: My Organization]). Next you will modify the item details, pop-ups, & sharing. (Section 6.4)

* Video: [Create a Map](http://video.arcgis.com/watch/253/create-a-map)[[10]](#footnote-10)
* Tutorial: [Create and Share a Collector Map](http://doc.arcgis.com/en/collector/ios/create-maps/create-and-share-a-collector-map.htm)[[11]](#footnote-11)

## Sharing / Groups

Maps can be shared as a map in Collector and as a Web Mapping Application. You can share maps with groups, your organization, or the public. *Share the map with a group. Then make sure all the Collector users that you want using this map have been invited to the same group. If necessary create a group.*

### Videos

* + Groups: [Invite Others to Join Your Group](http://video.arcgis.com/watch/251/invite-others-to-join-your-group)[[12]](#footnote-12)
  + Sharing: [Share Maps & Aps with your Org](http://video.arcgis.com/watch/1341/share-maps-and-apps-with-your-organization)[[13]](#footnote-13)

### Tutorials

* + Groups: [What is a Group](http://doc.arcgis.com/en/arcgis-online/share-maps/groups.htm)[[14]](#footnote-14)
  + Sharing: [Share Maps](http://doc.arcgis.com/en/arcgis-online/share-maps/share-maps.htm)[[15]](#footnote-15)

### [Embed a map into a website](http://video.arcgis.com/watch/249/embed-a-map-in-your-website)[[16]](#footnote-16)

* This is how you copy the map applications html code for sharing

### [Create Map Apps](http://doc.arcgis.com/en/arcgis-online/create-maps/create-map-apps.htm)[[17]](#footnote-17)

## Syncing

When edits are made in an Offline map, syncing will need to occur to share those changes and receive updates. These synced edits will be viewable in your AGOL map.

* Section 6.6 for more details
* Tutorial: [Go Offline](http://doc.arcgis.com/en/collector/android/collect-data/offline-use.htm)[[18]](#footnote-18)
* This is a [good read](https://esriaustraliatechblog.wordpress.com/2014/05/30/bringing-your-data-from-the-cloud-back-to-earth-how-to-extract-your-data-from-arcgis-online/?blogsub=confirming#subscribe-blog)[[19]](#footnote-19) to show different ways of getting feature services back to ArcMap.

## Additional Resources

* [Videos](http://doc.arcgis.com/en/arcgis-online/reference/videos.htm)[[20]](#footnote-20)
* [Tutorials](http://doc.arcgis.com/en/arcgis-online/)[[21]](#footnote-21) (Explore: Use, Create, & Share sections)

# Collector :: Getting started

*In this section you will learn how to use the maps you create in AGOL with the Collector App. The interface differs slightly between iOS and Android.*

\*[Quick Reference](http://doc.arcgis.com/en/collector/ios/collect-data/quick-reference.htm)[[22]](#footnote-22) **[\*](https://drive.google.com/folderview?id=0B4FY6Y_ZXT8tOGxBcHFJQnRxX0U&usp=sharing)**[Overview Video of this Workflow](https://drive.google.com/folderview?id=0B4FY6Y_ZXT8tOGxBcHFJQnRxX0U&usp=sharing)[[[23]](#footnote-23)](https://drive.google.com/folderview?id=0B4FY6Y_ZXT8tOGxBcHFJQnRxX0U&usp=sharing)

**Install the Collector Application**

* Go to an [App store](https://itunes.apple.com/us/app/collector-for-arcgis/id589674237)[[24]](#footnote-24) on your device and search ***Collector for ArcGIS***. **Install.**

## Logging into Collector

* Open Collector. Enter your username & password. (You must have an AGOL Organizational Log In to use Collector, see section 2.1)

## Using the Maps

1. The GISS must first share the map with a Group in AGOL. Only the members of the Group can view the map in Collector. If necessary, create a new group.
2. Viewing maps: Once logged in, you will be able to browse for a map. **Tap** the map to open.
3. Downloading maps for Offline use: Maps that have had their settings configured correctly will have the option to download for Offline use. In **All Maps** tap: **Download** *(Android)* or Action *(iOS)*, for the map you choose.
   * Pick a Basemap and the level of map detail. [Video](http://training.esri.com/Courses/ts_OfflineDataColl/player.cfm)[[25]](#footnote-25) (start at 25:09)
   * You will need to select:
     + the Work Area: the box identifying your bounding N/S/E/W extent
     + and Choose Map Detail: the largest scale you can view (e.g. 1:18,000 is the largest scale for a Topo map and Ortho is good to about 1:4,000)
4. Collecting data and editing:
   * You can add a new feature by using the Collect New**Collect New** tool. By default the feature is placed at your current location. Tap the Map map symbol to view and move the new feature to a different location in the map. Fill out the **Collect Attributes** **Collect Attributes  table**, then tap **Done** Done*(Android)* or **Submit** *(iOS)*.

* [Video](http://video.arcgis.com/watch/2194/collector-for-arcgis-damage-assessment-survey)[[26]](#footnote-26)
* [Tutorial](http://doc.arcgis.com/en/collector/ios/collect-data/collect-tutorial.htm)[[27]](#footnote-27)
* Lines can be collected while moving using the Streaming option. Tap ‘Collect a new feature’. Select a line type to add, go to your map, tap **STREAM**. Collection parameters can be adjusted with the **Collect settings** icon. When collection is complete tap **Done**  Done or **Submit.**

1. Syncing
   * When connectivity is established go to the **All Maps** page and tap the **Sync** button to send your edits and receive any updates. You will see the number of changes next to **Sync(6)** (*in Android*) and **** *(in iOS)* this represents the number of edits/changes you performed.

## Additional Resources

* Overview of using Collector with iOS: [video](https://www.youtube.com/watch?v=5nmkHKNs0Ek)[[28]](#footnote-28)

[Tutorials](http://doc.arcgis.com/en/collector/ios/create-maps/create-maps.htm)[[29]](#footnote-29) (Explore: Create Maps & Collect Data)

# Templates

This workflow utilizes an incident’s master FIMT geodatabase, an OTHER geodatabase, ArcGIS Online, and Collector. The GISS will keep the hosted feature service in AGOL synchronized with the layers in the master FIMT and Other geodatabases.

* You will start this workflow by [downloading](https://drive.google.com/folderview?id=0B9_PM0mqid5sX3FwNzJLMTdObFk&usp=sharing)[[30]](#footnote-30) a copy of the templates folder (you should have these already since you are reading this document). Need a universal location to store data that anyone can access. The folder contains:

2014\_GSTOP\_Folder\_Template *– File directory structure required by GSTOP*

 LayerFiles *– Unique symbology used in AGOL*

Tools *– Automation tools used throughout the workflow* (See Appendix 10.5 for details)



Tutorials – *Additional ESRI materials for familiarizing yourself with AGOL & Collector*



 YYYY\_IncidentName\_IncidentNumber\_OTHER\_Arc10.gdb – *Template file geodatabase that can be copied and store non-FIMT fire related data*

AGOL\_PUBLICservice\_YYYY\_IncidentName\_IncidentNumber.mxd – *Template mxd that can be used to create a Public feature service*



AGOL\_IMTservice\_YYYY\_IncidentName\_IncidentNumber.mxd – *Template mxd that can be used to create an IMT service*



AGOL\_IMTservice\_YYYY\_IncidentName\_IncidentNumber.sd - *File that can be added to your AGOL account to create a feature service*

Workflow-v2.pdf – *This document*



 Workflow – FlowChart.pdf (needs to be created) – *Flow chart of steps involved in this workflow*

Save the templates folder to the incident **documents** folder.

The mxds and gdb are setup in WGS84. Feel free to change the projection to your local one.

# Workflow Overview

*These are the main steps that you will be completing.*

Steps completed in ArcMap are highlighted throughout the workflow so it’s clear when you are working in ArcMap or AGOL

## GISS Workflow Overview:

1. *Before leaving for a fire you can complete steps 2-7 (this will allow Operations folks to start collecting fire data immediately)*
2. Log In to AGOL
3. Create feature service by uploading the service definition (AGOL\_IMTservice\_YYYY\_IncidentName\_IncidentNumber.sd)
4. Update the feature service item details with specific fire information
5. Make IncidentName\_Operations map for folks heading to the fire
6. Add whatever spatial data you may have (fire location from Resource Order)
7. Save & Share
8. Check Groups to make sure everyone is added that needs access
9. *Arrive to the fire/ICP*
10. Create FIMT geodatabase
11. Add a copy of the Other geodatabase in the incident\_data folder
12. Run TOOL01
13. Keep the master gdbs (FIMT & Other) in sync with the feature service
14. Create other AGOL maps as time allows

## Maps built in AGOL

*These are the maps that you can create in ArcGIS Online. As time allows, you can start by creating maps in Phase I and continue to Phase III.*

Phase I: Two distinct Operations Groups

* Web Map Operations (Line Operations – group that can edit/add features in Collector)
* Web Map CampOperations (Viewers only, won’t have edit rights)

Phase II:

* Web Map Support (Medical, Communications and Ground Support)

Phase III:

* Web Map Public

# Workflow

## Getting Setup

### You will need to have the file directory structure set up now. A template is provided: 2014\_GSTOP\_Folder\_Template

### Save CollectorPilot\_Workflow\_Templates into the **documents** folder. (Figure 1)

### If you have not already created the master FIMT gdb for your incident, create one now.

### Run the called **TOOL01**. Find this in the Tools folder that you downloaded:

(WorkFlow\_Tools.tbx > TOOL01). It will do a few minor modifications to the FIMT gdb schema.

### Edit/add fire data to the FIMT gdb

### Make a copy of the Other gdb template: YYYY\_IncidentName\_IncidentNumber\_OTHER\_Arc10.gdb Rename and save in your **incident\_data** folder.

### Make copies of the following (& rename), save in the **incident\_data** folder:

* + AGOL\_IMTservice\_YYYY\_IncidentName\_IncidentNumber.sd

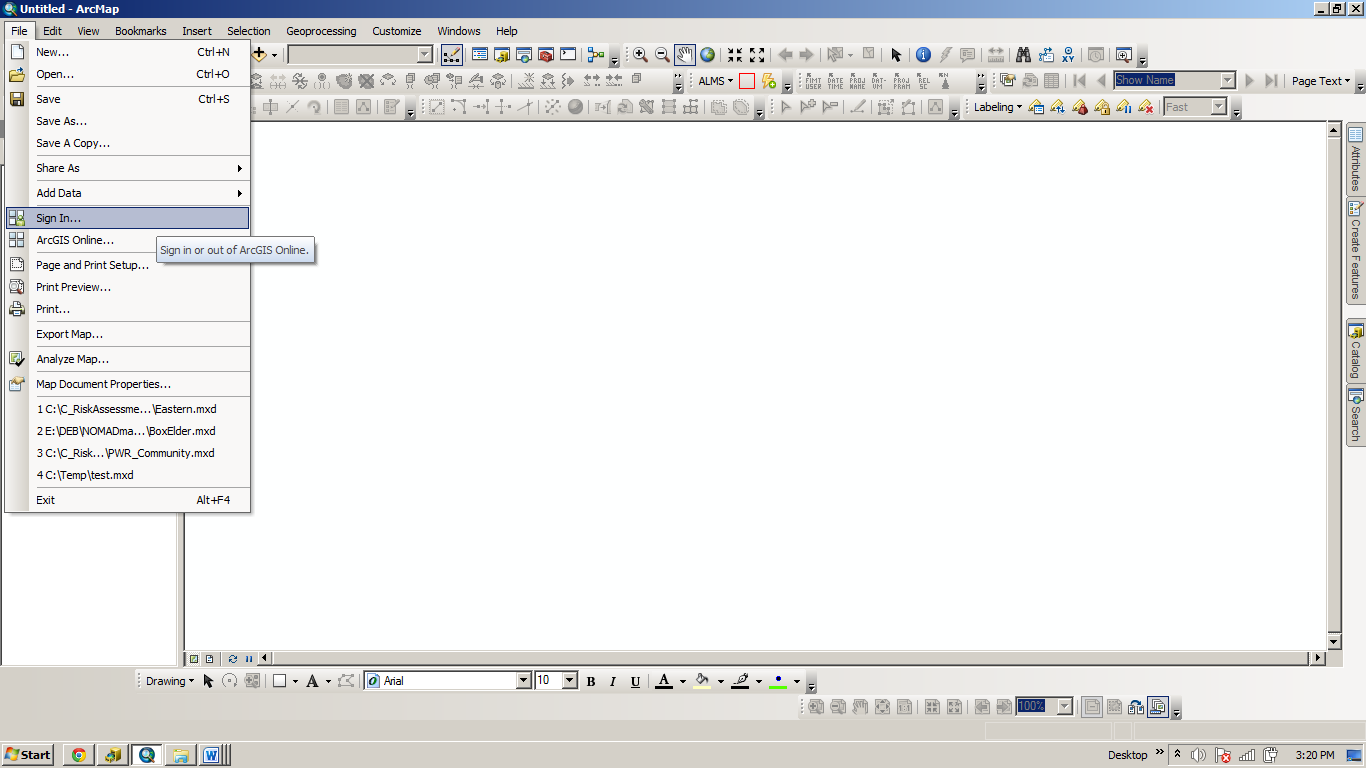
1. Make a copy, save in the **projects** folder, and rename:
   *  AGOL\_IMTservice\_YYYY\_IncidentName\_IncidentNumber.mxd
   *  AGOL\_PUBLICservice\_YYYY\_IncidentName\_IncidentNumber.mxd

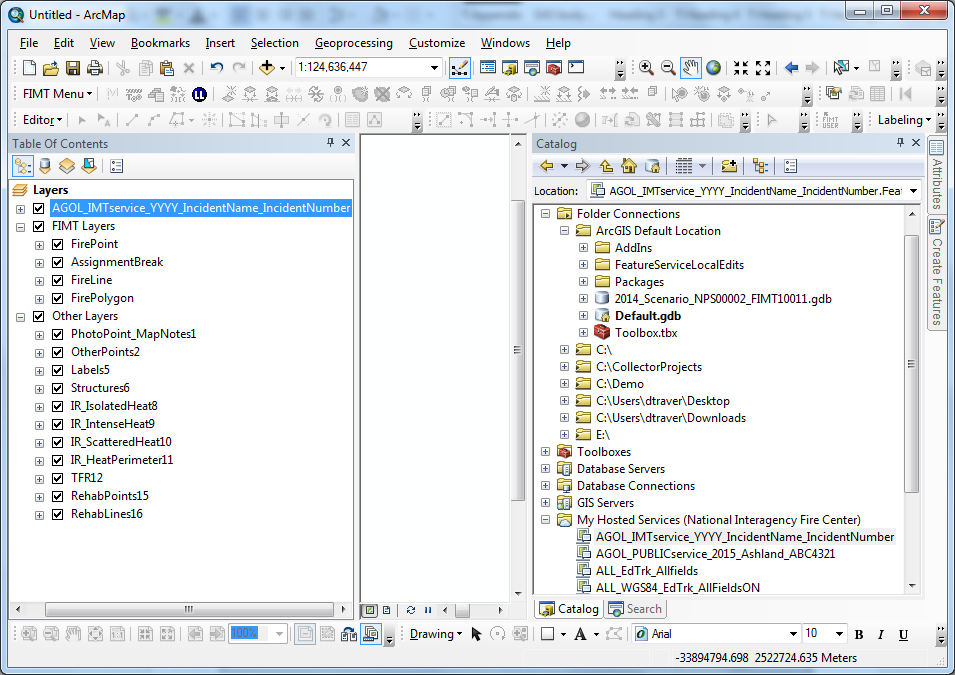
|  |  |
| --- | --- |
| Figure | < Incident Directory Catalog File Names (example) |

## Create the Feature Service

*There are two ways to create a feature service. I recommend creating your feature service with the service definition file (6.2.1). The other option is to use ArcMap to create the feature service (6.2.2). If you want to add additional layers to AGOL, you can publish them this way. You should know how to do both options.*

### **Option #1**: USE A SERVICE DEFINITION FILE TO CREATE A NEW FEATURE SERVICE

1. In a web browser, **Log In** to your AGOL account.
2. Go to **MY CONTENT > > From my computer >** Browse to the (.sd) file: *AGOL\_IMTservice\_YYYY\_IncidentName\_IncidentNumber.sd*
3. While the .sd file is uploading a feature service is automatically created from it.
4. Next, update the feature service information – Go into its **item details** and update the Title, Summary, Description, Tags….
5. Once the feature service is created you will populate it with data to it via ArcMap.
6. In ArcMap, **Sign In** to your ArcGIS Online Account 
7. **Add** the layers from the incident OTHER and FIMT gdbs to the map
8. Open the Catalog window > My Hosted Services > Drag and drop your feature service into ArcMap



1-Drag & Drop

2-Service appears in the TOC

Figure

1. In the Table of Contents (TOC), right click the group header of your feature service > Edit Features > Create Local Copy for Editing (Figure 3)
2. Right click the group header again: Edit Features > Start Editing. Copy & Paste the new features from the FIMT gdb to the feature service
   * Use the last\_edited\_date field to help you identify the changes that need to be added
   * If you want to query with ‘Select by Attribute’ this is the format you would use: "last\_edited\_date" > date '2015-02-06 16:26:11'

|  |  |
| --- | --- |
| Figure : First you will Create a local copy for editing. Then make all of your edits. | Figure : Once all the edits have been completed, you will Synchronize Local Edits with Server |

1. Save and Stop Editing
2. Synchronize Local Edits with Server (Figure 4)
3. Once you are done editing, continue on at section 6.3.1

### **Option #2**: PUBLISH A NEW FEATURE SERVICE FROM ARCMAP

1. **Open** AGOL\_IMTservice\_YYYY\_IncidentName\_IncidentNumber.mxd
2. Repoint layers to your master FIMT & OTHER geodatabases
3. Fill out/modify the Map Document Properties (Figure 5 & Figure 6)

|  |  |  |  |
| --- | --- | --- | --- |
| |  |  | | --- | --- | | Figure : Access Map Document Properties | Figure : Fill in Map Document Properties Form | | |
| Publish a new service through ArcMap:In ArcMap, **Sign In** to your ArcGIS Online account Figure : “Sign In” to your AGOL Account. Enter your Username & Password when prompted.  For Sign In issues see Appendix 8.1.5 |  |

* **Publish** your feature service: Figure 8 thru Figure 15 (Your mxd needs to be in Data View not Layout View)

|  |  |  |  |
| --- | --- | --- | --- |
| Figure 8: In the mxd you just set up:  **File > Share As > Service…** | **Figure 9: For a new feature service, choose “Publish a service”. Click Next.** | | |
| **Figure 10: Name the service (default is the name of the mxd). Click Continue.** | Figure : Select Feature Access and UNCHECK Tiled Mapping | | |
| Figure : Under Feature Access 🗹 check:  **Create, Update, Delete, Query, and Sync (Appendix 10.4 for details about Operations Allowed)** |  | | |
|  | | | |
| Figure 13: Enter Summary, Tags, & Description. Information already included comes from Map Document Properties (Figure 5). | | | Figure : Sharing with groups can be now or later in AGOL. |
| Figure : Analyze & Publish the feature service. It is ok to ignore  warnings.  warnings need to be addressed. | |  | |

## Feature Service in AGOL

*View and modify settings for the new feature service in ArcGIS Online.*

### **Sign In** to your AGOL Organizational Account: [Sign-In](http://www.arcgis.com/home/signin.html)[[31]](#footnote-31) (More information: Section 2.1)

|  |  |
| --- | --- |
| Figure | Feature services you create initially appear under the **My Content** section of your AGOL account.  Create a new folder (YYYY\_IncidentName) and move the new IMT service there.  If you create a Public service, don’t move it. It needs to stay where it is so it can be overwritten. |

### 

### Tour of a feature service – what you need to know:

|  |  |
| --- | --- |
| Figure : Access the feature service item details via the arrow, ‘View Item Details’. | Figure : Share with the appropriate Groups. |

|  |  |  |  |
| --- | --- | --- | --- |
| |  |  | | --- | --- | |  | **Edit the Service** |     Figure 19: You can edit the Title, Summary, and Description. | Figure : This is where you can enable or disable ‘Editing’ & ‘Sync’. There must be one layer in a map with Sync enabled in order for it to go Offline in Collector. |

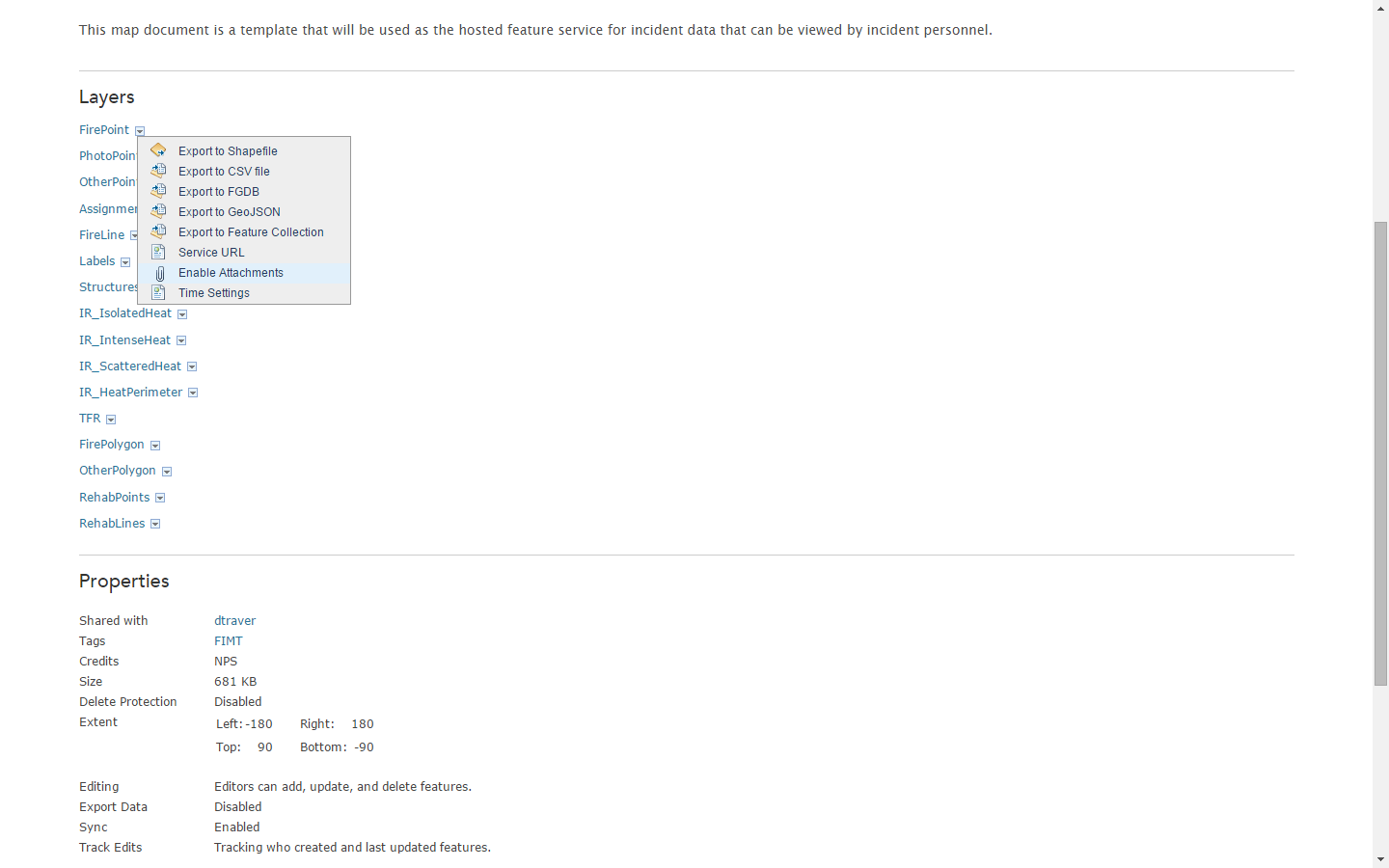


Figure : This is how you enable or disable attachments in AGOL.

In AGOL modify your feature service **Item Details**:

### **My Content** > Map ServiceIncidentName\_service

|  |  |
| --- | --- |
| Modify **Item Details** for the feature service:  * Access the **Item Details** (Figure 17) > Enable **Editing** & **Sync**. * Share with the appropriate group(s). Create a group if necessary. * **Track Edits** should already be enabled   *NOTE: An AGOL map must have at least one layer sync-enabled to be used Offline in Collector.* | Figure : ☑ Enable Editing & Sync |

## Setting up Maps in AGOL

*Once a feature service is created and configured you will be ready to create an AGOL map.*

### Web Map IncidentName – Operations – The first AGOL map you will create.

### *This map is intended to be shared with an Operations group in which members can add data in Collector.*

### Go to **My Content**. Click Web Map Create Map

### **Add**: “Map ServiceAGOL\_IMTservice\_YYYY\_IncidentName\_IncidentNumber” to the map



* + - * Remove any layers you do not wish to use
      * **Add** one additional Basemap as a layer: Add Layer**Add** > Search for Layers [In: ArcGIS Online] > Find: *USA Topo Maps (for export)*

### **Select***: Imagery with Labels* as the Basemap

### **Rename** Layers (Drop the first part of the name), so they look nice in the table of contents

### Reference the table below and incorporate suggestions

### **Add** Bookmarks bookmarks so users can easily navigate to different extents of the fire (e.g., different Divisions or areas of interest)

* + 1. Save **Save As** and **Name** your map (IncidentName\_Operations)

|  |  |  |
| --- | --- | --- |
|  | Note: Any unnecessary layers can be removed from an AGOL map once the feature service is added. |  |

* Ordering & Settings for Contents Contents (TOC) in AGOL:

|  |  |  |  |
| --- | --- | --- | --- |
| Layers (Note some are checked off by default) | Disable Editing | Transparency | Source & Other Options |
| ☑FirePoint |  |  | IMT Service, Create Labels |
| ☑PhotoPoints\_MapNotes |  |  | IMT Service |
| ☑OtherPoints |  |  | IMT Service |
| ☑AssignmentBreak |  |  | IMT Service |
| ☑FireLine |  |  | IMT Service |
| ☑Labels | X |  | IMT Service , Hide in Legend, Remove Pop-Up |
| □Structures |  |  | IMT Service |
| ☑IR Isolated Heat | X |  | IMT Service |
| ☑IR IntenseHeat | X |  | IMT Service |
| ☑IR ScatteredHeat | X | 25% | IMT Service |
| ☑IR HeatPerimeter | X |  | IMT Service |
| ☑TFR | X |  | IMT Service, Remove Pop-Up |
| ☑FirePolygon | X | 50% | IMT Service, Remove Pop-Up |
| □OtherPolygon | X |  | IMT Service |
| □RehabPoints |  |  | IMT Service, Create Labels |
| □Rehab Lines |  |  | IMT Service |
| ☑Retardant Avoidance | X |  | AGOL Layer |
| ☑USA Topo Maps (for Export) |  |  | AGOL Layer |
| Imagery w Labels |  |  | Basemap |

*\*\*Maps cannot go offline with the* Map Service[*US Forest Service Aerial Fire Retardant Avoidance Areas*](http://wildfire.maps.arcgis.com/home/item.html?id=e6c355b3814e487cb14b180b57b51bca) *layer in it. Add the layer into you feature service. Be careful with adding a Directions layer too, when in a map it may disable it from going Offline. Provide feedback of your experience.*

1. **Share** map with Operations group (or other appropriate group(s))

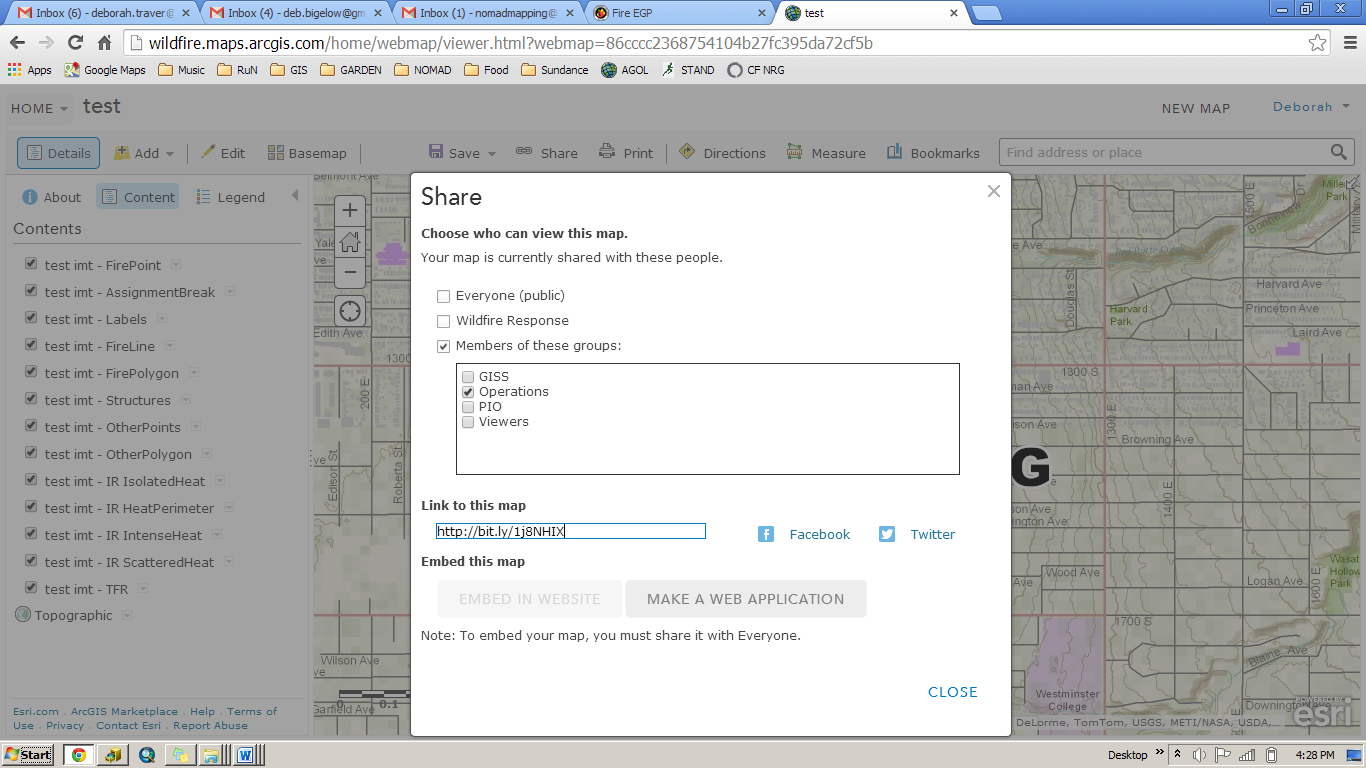
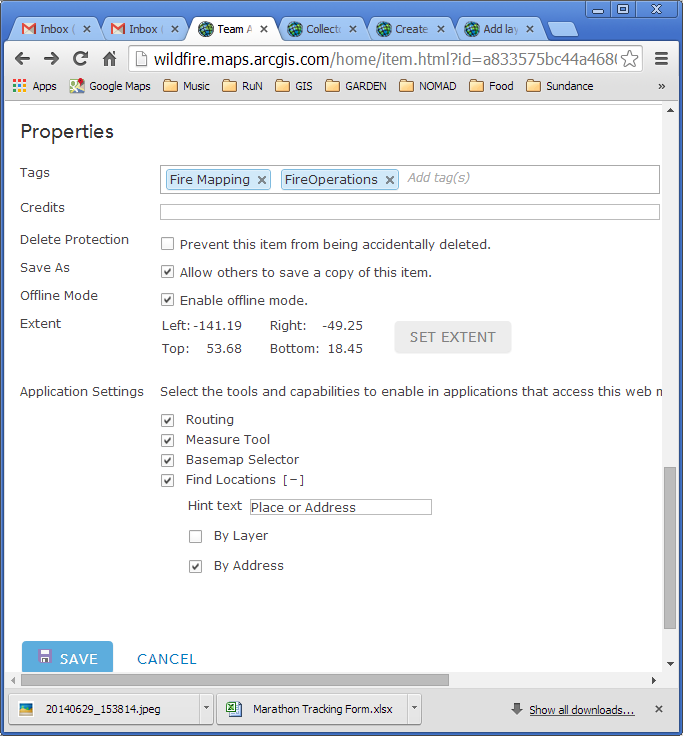


Figure 23: Click the 'Share' button and select the groups to share with.

1. Check the settings of the map and make sure it is set for Offline use



Figure

1. Optional: **Add**  Get Directions Directions
2. Optional: **Add**: Map Service [US Forest Service Aerial Fire Retardant Avoidance Areas](http://wildfire.maps.arcgis.com/home/item.html?id=e6c355b3814e487cb14b180b57b51bca)

*note: this layer disables maps from going Offline*



1. Optional: **Set** a refresh interval for any of the layers in the map.



### Web Map IncidentName\_CampOperations

### *This map is for ‘Camp Operations’ group, viewers of all of the IMT data. These are other individuals that are part of the IMT that will have viewing rights, but no editing rights, and are able to view the map in Collector and go Offline.*

1. Make a **copy** of the Operations map. **Save As**: IncidentName\_CampOperations
2. Disable editing on all of the layers but the PhotoPoints\_MapNotes
3. Share with the Viewer Group
4. Make a web map app (Section 2.5.4). Some folks will want to view the map on their computers. Share with ‘Operations & Support Group’ too?

### Web Map IncidentName\_Support

### *This group’s primary use of the map is to assist in navigating around an incident. A transportation map.*

1. Make a **copy** of the Operations map. **Save As**: IncidentName\_Support
2. Use the table below to make adjustments to the map layers
3. **Share** with the Support Group

Ordering & Settings for Contents Contents (TOC) in AGOL:

|  |  |  |  |
| --- | --- | --- | --- |
| Layers (Note: some are checked off by default) | Disable Editing | Transparency | Source |
| ☑FirePoint | X |  | IMT Service, Create Labels |
| ☑OtherPoints | X |  | IMT Service |
| ☑AssignmentBreak | X |  | IMT Service |
| ☑FireLine | X |  | IMT Service |
| ☑Labels | X |  | IMT Service , Hide in Legend, Remove Pop-Up |
| □PhotoPoints\_MapNotes |  |  | IMT Service |
| □Structures | X |  | IMT Service |
| □TFR | X |  | IMT Service, Remove Pop-Up |
| ☑FirePolygon | X | 50% | IMT Service, Remove Pop-Up |
| □OtherPolygon | X |  | IMT Service |
| ☑ World Street Map (for Export) |  |  | AGOL Layer |
| ☑USA Topo Maps (for Export) |  |  | AGOL Layer |
| Imagery w Labels |  |  | Basemap |

### 

### Web Map IncidentName Fire – Public Map - (Give an intuitive name) *Viewing map for the public.*

1. Open the map template provided:

 AGOL\_PUBLICservice\_YYYY\_IncidentName\_IncidentNumber.mxd

1. Repoint the layers to your gdbs
2. Publish the feature service
   * For the Feature Access option (Figure 12) only check: 🗹Query
3. Once the service is published go to your AGOL account and create a new map
4. In AGOL **Add**: Map Service AGOL\_PUBLICservice\_YYYY\_IncidentName\_IncidentNumber
5. **Disable** pop-ups for all layers except FirePolygon (this pop-up could show the fire name & date). Re-enable pop-ups you see useful or create labels.
6. Choose a Basemap (Topographic or Streets)
7. Optional: Imagery / Topo (**add** as layer)
8. **Sharing**: Everyone (Public)
9. **Create** a web mapping App & share URL (Section 2.5.3 & 2.5.4)

Ordering & Settings for Contents Contents (TOC) in AGOL:

|  |  |  |
| --- | --- | --- |
| Layers | Transparency | Source |
| ☑Controlled Fire Line |  | IMT Service |
| ☑Uncontrolled Fire Edge |  | IMT Service |
| ☑Closure Points |  | IMT Service |
| ☑OtherPolygon | 25-50% | IMT Service |
| ☑FirePolygon | 50% | IMT Service |
| Streets |  | Basemap |

1. Updating the public feature service:
   * Use the same mxd you used to create the public feature service
   * As the master FIMT & Other gdbs are updated, republishing the public feature service will be necessary
   * Open the public mxd > File > Share As > Service….
   * The ‘Share as Service’ window will come up. Choose the third option ‘Overwrite an existing service’ (Figure 25)
   * Select the existing service to overwrite (Figure 26)

|  |  |
| --- | --- |
| Figure | Figure |

* The feature service in your public map should now be updated
* Repeat this process as often as necessary

## Sharing Maps for use in Collector

*Refer to Section 3 for more details.*

* AGOL map is shared with a Group. Collector users must be invited to the same Group to be able to view the map.
* With Editor Tracking enabled through ArcCatalog, editor names and dates are automatically recorded.
* Plan on giving a 5 minute tutorial to new Collector users.
* Have Collectors use their maps in Offline mode so that they will have labels.

## Syncing Data: Updating the FIMT gdb

*How to sync your incident FIMT gdb with the AGOL changes.*

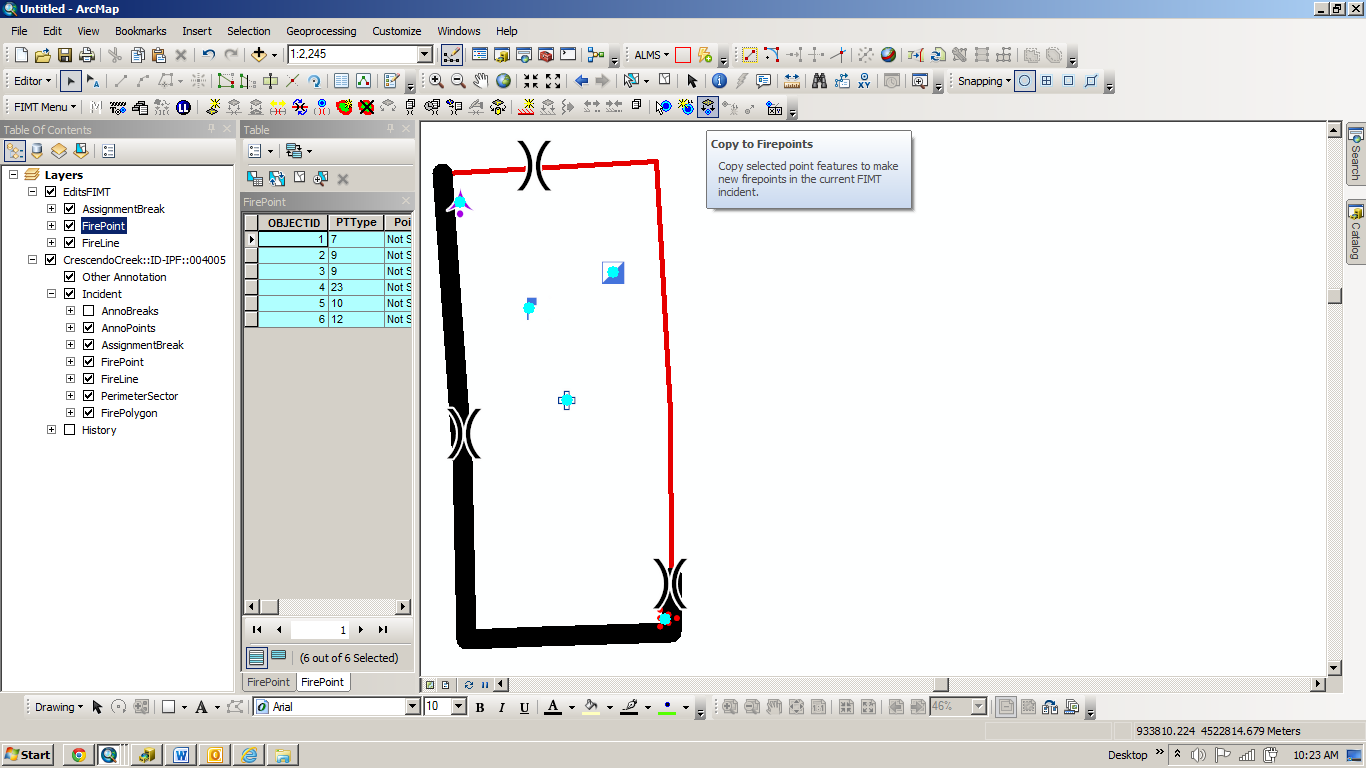
A tool is being created that will automate some of the steps here in sections 6.8 & 6.9.

### **Open** (create) an mxd setup for editing:

|  |  |
| --- | --- |
| Add the master FIMT gdb and Other gdb.  Then drag and drop your feature service here.  Figure : IncidentName\_edits\_wAGOL.mxd |  |

### The following steps show how to **add** the new data/changes to the FIMT gdb (Figure 28-Figure 33).

|  |  |  |
| --- | --- | --- |
| Your Feature Service  Figure : Add your feature service to ArcMap. Do this by dragging and dropping from the ArcCatalog window > My Hosted Services, into ArcMap. | Figure : Edit the Incident through the FIMT toolbar. | Figure : Open the table for the FirePoints feature service. Sort by last\_edited\_date to see what is new. Select new records. *If there are multiple layers with the same names are confusing, give one set a unique name.* |
| Figure : With the editor arrow you will right click the highlighted items in the Data View.    Figure : Copy & Paste.  Select FirePoint as your target. [OK] | Figure : AssignmentBreaks: Add new Breaks manually.  1.Select one new AssignmentBreak at a time & zoom to it.  2.Use the Floating AssignmentBreak FIMT tool to add the new Break. | The sequence used to add the new FirePoints (Figure 26-28) will be used to add new FireLine. |

* When you copy-paste using the FIMT button , the PTType attribute comes across as UNKNOWN, and you have to manually change each field or will have to add each point manually using the FIMT ‘Copy to FirePoints’ button. **Using the steps above (Figure 27-32) allow you to bulk copy-paste.**

## Syncing data: Updating the feature service

*In the last section edits that were made in AGOL/Collector were brought into ArcMap and added to the FIMT gdb. This section shows how to add the changes that were made in ArcMap – in the master FIMT & Other gdbs ⭢ to the feature service.*

|  |  |
| --- | --- |
| Before you edit the feature service as a local copy **create a backup**. The steps follow (A & B). | Figure |

### Right click the group header of your feature service > Edit Features > Create Local Copy for Editing

1. Navigate to your ArcGIS folder:

C:\Users\<Current User>\Documents\ArcGIS\FeatureServiceLocalEdits (If you can’t find it, click the ’Default Geodatabase Icon’ on the Catalog window in ArcMap) You will see a folder:  FeatureServiceLocalEdits. This is where you can get a copy the feature service gdb. (Figure 34)

|  |  |
| --- | --- |
| Figure 35: Archiving a copy of the feature service:  Export service to a dated backup folder. |  |

1. Save the copy to the **backups** folder (Figure 33). Rename with a date and time stamp.

### One last thing to do before you start updating the feature service, is to populate all of the Latitude/Longitude fields in both gdbs (FirePoint, AssignmentBreak, Structures, OtherPoints, RehabPoints) TOOL is under construction to complete this.

### Now, right click a layer in your feature service > Edit Features > Start Editing

1. Use the last\_edited\_date field to find the most recent edits
2. **Copy & Paste** the new features from the FIMT gdb to the feature service
3. **Copy & Paste** the new features from the Other gdb to the feature service (except the FireLine, FirePoint, AssignmentBreak, & FirePolygon)

|  |  |
| --- | --- |
| Figure : First you will Create a local copy for editing. Then make all of your edits. | Figure : Once all the edits have been completed, you will Synchronize Local Edits with Server |

### Once all of the syncing is complete Save & Stop Editing

### Synchronize Local Edits with Server (Figure 37)

### Repeat these steps as often as necessary

## Tile Packages (tpks)

### *Create tpks using Collector or ArcMap in advance. Side load these on to a Collector user’s device.*

### Create a tpk using Collector

* + Make a map in AGOL. Open it in Collector and download for Offline use. During the download process:
    - Download a new basemap
    - Choose your work area: Eye-ball a ~50x50mi area around the fire (or your best judgment according to the direction the fire is burning).
    - Choose map detail (topos go to about 1:18,000 & ortho to about 1:4,000)
  + Once the map is done downloading you will need to connect the device to your computer to retrieve the basemap:
    - For iOS use the iTunes Store
    - For Android, load them to the Collector folder, like your device is an external drive.
  + Rename the tpks
  + Load the basemaps to other devices with the same procedure as when you were retrieving them.
  + **Note**Note: Tile packages are supported from ArcGIS 10.1 for Desktop onwards. Tile package will fail to open with older ArcGIS for Desktop versions (10 or older).
  + More details: [Using Your own Basemaps layers with Collector](http://blogs.esri.com/esri/arcgis/2014/03/23/using-your-own-basemap-layers-with-collector-for-arcgis/)[[32]](#footnote-32)

### Create a tpk through ArcMap.

The only map service you can create a TPK with through ArcMap is OpenStreet. You will need your own DRG or Ortho rasters.

* Add the raster of your choice to ArcMap
* In ArcMap enable: Customize > ArcMap Options > Sharing Tab > 🗹 Enable ArcGIS Runtime Tools.
* Add your imagery or layers to ArcMap
* File > Share As > Tile Package… (Figure 38)
* Tile Package: where to Save; Tile Format: Tiling Scheme, Tile Format, Level of Detail; and Item Description: Summary, Tags, Description (Figure 39)

|  |  |
| --- | --- |
| Figure | Figure |

# Transition

## A plan needs to be made with how AGOL will be transitioned between teams.

When the transition happens (even if the new team is using AGOL) copies should be made of the hosted feature services and they should be placed in the incident data folder. The new GISS should be added to the correct groups for the fire even if they don’t currently plan to use AGOL. This gives them the flexibility to work with it in the future. Changes in services between teams happens all of the time in fire (especially the PIO shop) so this won’t be out of the ordinary.

# Additional Information:

### Request Assistance:

* <http://www.esri.com/services/disaster-response>

### Best Practices :: GPS & Preserving Battery Life

* It is recommend that people turn off location settings for everything except Collector and the camera and that they review fetch/push settings for things like mail, dim the brightness, and turn off notifications.
* Reference these links:
* <http://www.pcmag.com/article2/0,2817,2367542,00.asp>
* <http://ipod.about.com/od/iphone3g/tp/iphone-battery-life.htm>
* <http://www.zdnet.com/pictures/31-ways-to-improve-your-iphones-battery-life/>
* <http://www.cnet.com/how-to/how-to-get-better-battery-life-on-android/>

### Attachments Workflow:

* + Attachments will only be enabled on PhotoPoints\_MapNotes. (a GlobalID field is included in this feature)
  + How do I download attachments out of AGOL? *[ArcGIS for Desktop 10.2 will support "Creating a local copy" of the service that will also contain the attachments. (ESRI Help)]*
  + Python script available to download multiple attachments.

### Things to be aware of:

* If you have downloaded a map on your mobile device and you need to update it with the AGOL copy, go to your main **My Maps** page in Collector and re-sync to get updates.
* If you are out of service and are forced to re-sign back in, you may not be able to.

### Problem Shooting:

* Sign out of Collector App and sign back in.
* Restart App &/or mobile device.
* Issues logging into AGOL:
  + <http://support.esri.com/en/knowledgebase/techarticles/detail/40178>
  + And Icon in task bar: <http://gis.stackexchange.com/questions/108365/arcgis-online-and-sign-in-options-are-greyed-out-in-arcmap-10-2-2>

### Location Tracking:

* + - * Create a Location Tracking feature using the ‘Create Layer’ option
      * Add to a map and disable its Editing
      * You can enable how often it tracks in the settings for the map.

### My Favorites:

* Save different services that you frequently use or that interest you.
* [Item Details](http://doc.arcgis.com/en/arcgis-online/share-maps/item-details.htm) – Add to Favorites[[33]](#footnote-33)
* Consider adding: basemaps (for export), other layers, and templates so you can quickly add them to any map.



### Route/Direction Layer:

If you are signed in with an organizational account, you can use the map viewer to [get directions](http://doc.arcgis.com/en/arcgis-online/use-maps/get-directions.htm)[[34]](#footnote-34) and add the route as a layer in your map. You must have privileges to create items in order to save the map with the route layer. You can configure the layer, create a route map, and perform analysis on the route. Your route map is like any other map you create with the map viewer—you can configure it, share it through a web app, story template, blog, and so on, and use it in a map client such as an iOS device, Android phone, and ArcGIS for Desktop.

1. Open the map viewer and click **Directions** Get Directions to display the **Directions** panel to the left of the map.
2. [Get directions](http://doc.arcgis.com/en/arcgis-online/use-maps/get-directions.htm)[[35]](#footnote-35) by adding an origin and one or more destinations.
3. Once you get your directions, click **Add as Layer**.
4. To add an additional route, create a new set of directions and add that layer to your map. Each route appears as a layer in the **Contents** of your map.
5. If you have privileges to create items, save your map.

The route layer is stored in the map; it is not an independent layer you can reuse in other maps. If you [perform analysis on the route](http://doc.arcgis.com/en/arcgis-online/use-maps/perform-analysis.htm)[[36]](#footnote-36), you create a hosted feature layer as a result of the analysis. This hosted feature layer is an independent layer you can reuse in other maps.

### Dashboard – discover more at: <http://doc.arcgis.com/en/operations-dashboard/windows-desktop/author/create-a-map.htm>

### Explorer App – discover more at: <http://doc.arcgis.com/en/explorer/>

# Glossary/Terminology:

* AGOL: ArcGIS Online
* FIMT: Fire Incident Mapping Tool, <http://gis.nwcg.gov/links_tools.html>
* GISS: Geographic Information Systems Specialist
* GSTOP: GIS Standard Operating Procedure, <http://gis.nwcg.gov/gstop_sop.html>
* IMT: Incident Management Team
* Hosted Feature Service: also referred to as ‘feature service’ or ‘service’
* Local Copy: feature service in ArcMap after you right click the header and create a Local Copy (Figure 2)
* Rest End Point
* Service Definition

# Appendix

## A zipped folder contains the needed templates:



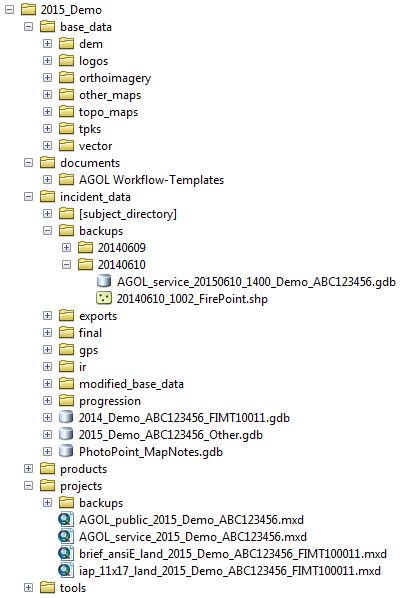
Figure : Screen shot of templates folder that will be downloaded.

|  |  |
| --- | --- |
|  |  |

## Features in the ‘Other’ feature dataset:

|  |  |  |
| --- | --- | --- |
|  |  | *This structures layer is for collecting structure information on an incident. Structure datasets acquired from other sources would be separate from this.* |

## GSTOP Compliant File Structure



Backup of feature service

Map documents used to create feature services

Template\_Other.gdb

Where to save the templates folder you downloaded

TilePackages

## Figure 8 Notes

Choose what level of access connecting users should have to the features in the feature service. You can choose as many of the following options as apply:

* + **Query**: Connecting users can view and select features from the feature classes in the feature service.
  + **Create**: Connecting users who have the necessary database privileges can add features to feature classes in the feature service.
  + **Delete**: Connecting users who have the necessary database privileges can delete features from feature classes in the feature service.
  + **Update**: Connecting users who have the necessary database privileges can edit existing features in the feature classes in the feature service. (ESRI Resources)

## Tools

Tools



Attachments-arcgis-rest-toolbox-master

DownloadAttachments\_fromAGOL.pyt



Pull Attachments: *this tool can be run to batch download attachments from AGOL*

Replicate Feature Service: *this will download a copy of your feature service as gdb in a zipped folder*



ExportAttachments\_from\_FGDB.tbx

ExportAttachments: *this will pull the attachments out of a file geodatabase stored locally and put copies into a folder of your choice*

WildfireGISS\_Tools



WildfireGISS\_Tools.tbx: *view the document ‘WildlandFire Mapping Toolkit.pdf’ for more information*

Batch – Change Source of GDB

Batch Acreage Change

Batch Change Source of GDB

Batch Date Change

Batch Export MXDs to PDF

Wildland Fire Mapping Toolkit.pdf



Workflow\_Tools: *tools specifically created to automate parts of this workflow*



SubModel: *a submodel that does not get ran. It is a component of TOOL01*

TOOL01: *this tool is ran to modify the FIMT gdb schema at the beginning part of the workflow*

RehabLine.csv



## Disclaimer

This is an example of a Sensitive Data Map Disclaimer. It may be duplicated for use or modified to meet the needs of the incident.

PROTECTED INFORMATION - NOT FOR PUBLIC RELEASE

This map contains information about historic and/or prehistoric cultural resources that may be withheld under section 304 of the National Historic Preservation Act of 1966, or under section 9 of the Archaeological Resources Protection Act of 1979. Do not copy or distribute this information. Abuse may result in fines and/or imprisonment.

1. [gis.nwcg.gov/links\_tools.html](http://gis.nwcg.gov/links_tools.html) [↑](#footnote-ref-1)
2. https://drive.google.com/folderview?id=0B9\_PM0mqid5sX3FwNzJLMTdObFk&usp=sharing [↑](#footnote-ref-2)
3. <https://drive.google.com/folderview?id=0B4FY6Y_ZXT8tOGxBcHFJQnRxX0U&usp=sharing> [↑](#footnote-ref-3)
4. <http://video.arcgis.com/watch/1338/joining-an-organization> [↑](#footnote-ref-4)
5. <http://www.arcgis.com/home/signin.html> [↑](#footnote-ref-5)
6. <http://video.arcgis.com/watch/1338/joining-an-organization> [↑](#footnote-ref-6)
7. <http://www.youtube.com/watch?v=uhE3Jx9MKwQ> [↑](#footnote-ref-7)
8. <http://www.youtube.com/watch?v=K19U_HFdooc> [↑](#footnote-ref-8)
9. [http://doc.arcgis.com/en/collector/ios/create-maps/offline-map-prep.htm#ESRI\_SECTION1\_BB7CFF5BFBC847DEA31610A38A510679](http://doc.arcgis.com/en/collector/ios/create-maps/offline-map-prep.htm%23ESRI_SECTION1_BB7CFF5BFBC847DEA31610A38A510679) [↑](#footnote-ref-9)
10. <http://video.arcgis.com/watch/253/create-a-map> [↑](#footnote-ref-10)
11. <http://doc.arcgis.com/en/collector/ios/create-maps/create-and-share-a-collector-map.htm> [↑](#footnote-ref-11)
12. <http://video.arcgis.com/watch/251/invite-others-to-join-your-group> [↑](#footnote-ref-12)
13. <http://video.arcgis.com/watch/1341/share-maps-and-apps-with-your-organization> [↑](#footnote-ref-13)
14. <http://doc.arcgis.com/en/arcgis-online/share-maps/groups.htm> [↑](#footnote-ref-14)
15. <http://doc.arcgis.com/en/arcgis-online/share-maps/share-maps.htm> [↑](#footnote-ref-15)
16. <http://video.arcgis.com/watch/249/embed-a-map-in-your-website> [↑](#footnote-ref-16)
17. <http://doc.arcgis.com/en/arcgis-online/create-maps/create-map-apps.htm> [↑](#footnote-ref-17)
18. <http://doc.arcgis.com/en/collector/android/collect-data/offline-use.htm> [↑](#footnote-ref-18)
19. [https://esriaustraliatechblog.wordpress.com/2014/05/30/bringing-your-data-from-the-cloud-back-to-earth-how-to-](https://esriaustraliatechblog.wordpress.com/2014/05/30/bringing-your-data-from-the-cloud-back-to-earth-how-to-extract-your-data-from-arcgis-online/?blogsub=confirming#subscribe-blog)extract-your-data-from-arcgis-online/?blogsub=confirming#subscribe-blog [↑](#footnote-ref-19)
20. <http://doc.arcgis.com/en/arcgis-online/reference/videos.htm> [↑](#footnote-ref-20)
21. <http://doc.arcgis.com/en/arcgis-online/> [↑](#footnote-ref-21)
22. <http://doc.arcgis.com/en/collector/ios/collect-data/quick-reference.htm> [↑](#footnote-ref-22)
23. <https://drive.google.com/folderview?id=0B4FY6Y_ZXT8tOGxBcHFJQnRxX0U&usp=sharing> [↑](#footnote-ref-23)
24. <https://itunes.apple.com/us/app/collector-for-arcgis/id589674237> [↑](#footnote-ref-24)
25. <http://training.esri.com/Courses/ts_OfflineDataColl/player.cfm> [↑](#footnote-ref-25)
26. <http://video.arcgis.com/watch/2194/collector-for-arcgis-damage-assessment-survey> [↑](#footnote-ref-26)
27. <http://doc.arcgis.com/en/collector/ios/collect-data/collect-tutorial.htm> [↑](#footnote-ref-27)
28. <https://www.youtube.com/watch?v=5nmkHKNs0Ek> [↑](#footnote-ref-28)
29. <http://doc.arcgis.com/en/collector/ios/create-maps/create-maps.htm> [↑](#footnote-ref-29)
30. https://drive.google.com/folderview?id=0B9\_PM0mqid5sX3FwNzJLMTdObFk&usp=sharing [↑](#footnote-ref-30)
31. <http://www.arcgis.com/home/signin.html> [↑](#footnote-ref-31)
32. <http://blogs.esri.com/esri/arcgis/2014/03/23/using-your-own-basemap-layers-with-collector-for-arcgis/> [↑](#footnote-ref-32)
33. <http://doc.arcgis.com/en/arcgis-online/share-maps/item-details.htm> [↑](#footnote-ref-33)
34. <http://doc.arcgis.com/en/arcgis-online/use-maps/get-directions.htm> [↑](#footnote-ref-34)
35. <http://doc.arcgis.com/en/arcgis-online/use-maps/get-directions.htm> [↑](#footnote-ref-35)
36. <http://doc.arcgis.com/en/arcgis-online/use-maps/perform-analysis.htm> [↑](#footnote-ref-36)