Urban Forest Strike Team

ArcMap, ArcCatalog, ArcToolbox, ArcGIS Pro and ArcGIS Online

Setup, Processing, and Reporting

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Examples in this document are based on initial data collected by the Texas A&M Forest Service in Rockport, Texas following Hurricane Harvey (DR-4332 23Aug17) and Urban Forestry South AGOL setup for Hurricane Irma (DR-4337 04Sep17) in Florida.

Technical Support and Review for this Document

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How to use this manual...

This manual outlines steps needed for the setup, processing, and reporting of Urban Forest Strike Team (UFST) data collected through *ESRI Collector* and *ArcGIS Online*. It is intended for individuals with intermediate *ArcGIS* skills, but could be used by novice *ArcGIS* users that can follow step-by-step instructions. Intermediate *ArcGIS* experience should include: *ArcMap* or *ArcGIS Pro, ArcCatalog, ArcGIS Online (AGOL)*, and *Collector*.

Users without a basic knowledge of the UFST protocol should probably read the manual in its entirety, or refer to the resources section that includes current UFST objectives, status, procedures, and data dictionary. For all others, this manual will provide chapters of varying length that address specific topics of interest (e.g. installing from USDA FS, processing, FEMA documentation, or reporting).

Some screen captures are faint when the document is printed, so it may be best used by viewing on-screen.

Survey123 is not discussed in the manual, but could be substituted for *Collector* with appropriate changes to the *AGOL* publication process and data management.

Symbols and Notations:

[RC] OR ↑↓ INDICATES A **RIGHT-CLICK** ON THE MOUSE

ightarrow or $ightarrow \uparrow$ indicates a **Left-Click** on the mouse

A procedure or task that progresses through successive menus. For example:

ARCTOOLBOX → DATA MANAGEMENT → DOMAINS → TABLE TO DOMAIN

MEANS: OPEN ARCTOOLBOX, CLICK DATA MANAGEMENT, CLICK DOMAINS, AND CLICK TABLE TO DOMAIN

FGDB FOLDER [RC] → NEW → FILE GEODAtabase

MEANS: RIGHT-CLICK ON THE FGDB FOLDER, CLICK NEW, AND THEN CLICK FILE GEODATABASE

The formatting **BOLD**, **UC/LC**, **SMALL CAPS** (e.g. **HOME FOLDER**) will usually refer to a dialog keyword prompt, key word in *ArcG/S*, or menu selection item.

Abbreviations and Short Definitions:

AGOL	ArcGIS Online
ArcCatalog	ArcGIS resource organization and management application
ArcGIS	ESRI's desktop and online GIS components
ArcGIS Pro	ESRI's desktop GIS with integrated AGOL connection
ArcMap	ESRI's desktop GIS that communicates with AGOL
ArcToolbox	ArcGIS geoprocessing tools
FEMA	Federal Emergency Management Agency
FGDB	ArcGIS File Geodatabase
NAASF	Northeastern Area Association of State Foresters
РА	FEMA Public Assistance (Category A Debris Management)
PAPPG	FEMA Public Assistance Program and Policy Guide (April 2017)
Python	Programming language with ArcPy interface to ArcGIS components
SGSF	Southern Group of State Forester
State agency	Refers to state forestry agencies, SGSF, and NAASF
тос	
UCF or U&CF	Urban and Community Forestry
UFST	Urban Forest Strike Team
USDA FS	US Department of Agriculture, Forest Service
USNG	US National Grid





A Short Introduction

- 2 Urban Forest Strike Teams (UFST) are a disaster response and recovery project initiated by the Urban &
- Community Forestry (U&CF) programs in USDA Forest Service Region 8 (Southeastern US) and supported
- by the Southern Group of State Foresters (SGSF). UFST has adopted ANSI A300 Part 9 and the
- 5 International Society of Arboriculture (ISA) BMP for Tree Risk assessment, provides ISA's TRAQ training
- 6 for Team Leaders, and supports an ISA designated TRAQ instructor.
- 7 UFST is developing and uses an ArcGIS Online data collection system for all deployments.
- A deployment may be any of the following events sponsored or co-sponsored by the Region 8 UFST
 Advisory Group or participating state forestry agencies:
 - intrastate or interstate deployments,
 - ✓ federally declared disaster response or recovery
 - ✓ state or local disaster response or recovery
 - disaster exercises,
 - training workshops
- 15 The UFST Interstate Smartdevice Network (ISDN) consists of smart devices and accessories distributed
- throughout the region that support the SGSF's Urban Forest Strike Team initiative and the current
- 17 ArcGIS Online (AGOL) data collection protocol for deployments. ISDN is operated as a bring your own
 - device (BYOD) system to ensure operational status and availability of equipment for disaster recovery
- 19 deployments.

14

- 20 UFST's AGOL system was developed by the Georgia Forestry Commission at a Savannah USFT training
- workshop (2014) and was moved to the USDA Forest Service *AGOL* organizational account and is
- managed by Urban Forestry South with support from state forestry agency GIS Specialists in the region.
- ²³Both Georgia Forestry Commission and Texas Forest Service have the UFST data collection installed on
- their agency AGOL organizational accounts. The SGSF AGOL organizational account will also be used to
- support UFST by mid-2018.
- ²⁶ This document outlines the steps needed to move the USDA Forest Service implementation of UFST to
- other organizational accounts as states have a need and are able to support UFST deployments. It also
- includes suggestions and sample code and procedures for QC, data processing, and reporting.



Urban Forest Strike Team - On Your AGOL Organizational Account



Thursday, September 14, 2017

UFST File Geodatabase (FGDB) with Tables & Domains

- Principal Components of the UFST System (With a little bit of detail)
- File Geodatabase **ArcCataloq** \checkmark Tables to support domain creation (ArcTools -> DATA MANAGEMENT -> DOMAINS -> TABLE TO DOMAIN) \checkmark Local deployment species table UFST template FGDB has several species domains and tables ٠ 34 Point feature class for trees¹ (current UFST data dictionary) Use domains for all attributes except DBH and Field Notes ٠ ArcCatalog Domains become the drop-down menus in Collector • ALLOW NULL VALUES set to No except DBH and Field Notes ArcCatalog If DBH is set to NULL = Yes, the data form in *Collector* will be populated with a zero (0), and UFST ISDNs will have to erase it to enter the actual DBH 40



41	 Other feature classes as needed for hosted feature publication to AGOL for each 	ach specific
42	deployment	
43	City boundaries	
44	Parks	
45	Trails	
46	Points of Interest	
47	✓ Deployment data	
48	 Incremental (daily) and/or cumulative tree assessment data 	
49	 Map document(s) 	ArcMap or ArcGIS Pro
50	 Use either 1 map document with 2 (or more) dataframes 	
51	 Dataframe for PUBLISHING the trees (point feature class) 	
52	 Dataframe for PUBLISHING supporting feature classes 	
53	Emergency Operations Center (EOC)	
54	 Medical Facilities (hospitals and urgent care) 	
55	Boundaries	
56	Trails	
57	• Parks	
58	Hotel	
59	• etc.	
60	 Activate and publish each individual dataframe 	

¹ This hosted feature layer is the only layer that needs to be editable.

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61	 Dataframe for processing data from the hosted layer
62	• Dataframe for processing and reporting daily "snapshots" of the AGOL data
63	✓ Or create a separate map document for trees and supporting feature classes
64	 Map document for the trees (only one feature class in this document)
65	 Map document for auxiliary feature classes (e.g. city boundary, trails, parks, etc.)
66	 Publish each map document (feature layer(s)) needed for Collector
67	✓ Deployment products
68	 Incremental (daily) and cumulative tree assessment maps and datasets
69	 Group ArcGIS Online (AGOL)
70	 Folder (optional)
71	✓ Other deployment products
72	Exported data
73	Reports and lists
74	 Hosted Feature Layer(s)
75	 Web Map
76	 Web Map App (optional)
77	 Operations Dashboard (optional, but is a good Crew daily briefing tool) <u>AGOL</u>
78	 ESRI Collector
79	 Organizational User Names (1 for each data collection device) <u>AGOL</u>
80	The USDA Forest Service in a national "partnership" support program has designated AGOL usernames on their

organizational account for use with *AGOL* and ESRI *Collector*. These consist in a series of usernames for UFST Task

82 Specialists, UFST Team Leaders, state U&CF Coordinators, and a GIS administrator. This series includes:

UFST_Crew01_Partner through UFST_Crew10_Partner, UFST_GIS01_Partner (Admin), UFST_Team01_Partner,
 USFT_Team02_Partner, and UFST_UCF01_Partner.

In addition, there is a separate series of usernames to support the Interstate Smartdevice Network (ISDN). This
 series includes: UFST_ISDN01_Partner through UFST_ISDN20_Partner.

87 State agency AGOL usernames can be easily incorporated (i.e. shared within the deployment group) into the UFST

88 AGOL data collection system on the USDA FS organizational account. And, UFST installed on state agency

organizational accounts can easily incorporate USDA FS usernames via shared groups.



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Creating Desktop Folder and File Structure for UFST (An example)

- Adopt a folder and file structure to support ArcGIS Online publication and reporting of UFST data. The folder and
- file naming standards should support the typical UFST data collection and processing workflow:
 - ArcGIS Desktop (ArcMap or ArcGIS Pro) → ArcGIS Online (AGOL)
 - ESRI Collector on smartdevices
- ArcGIS Online (AGOL) → ArcGIS Desktop (ArcMap or ArcGIS Pro) Post-processing, reporting, and
 archiving

97 ArcGIS Pro v1.5

- ⁹⁸ "The ArcGIS Pro application allows you to assemble all the resources required to complete a project in one place. A
- ⁹⁹ project contains maps, layouts, tasks, and connections to servers, databases, Toolboxes, folders, styles, and so on.
- It can also incorporate content from your organization's portal or ArcGIS Online. Projects can be created on your
- local file system, and shared online as a project package. Online projects can be downloaded to complete work
- locally on any computer." This describes the general workflow needed for UFST.
- In ArcGIS Pro, your project will create a default set of folders at
 your "Location" directory level identified when creating a new
- 105 project.

Create a	a New Project	×
Name	20170904_UFST_TFS_ Harvey_Coastal	
Location	C:\Users\dhartel\Documents\ArcGIS\Projects	**
	✓ Create a new folder for this project	
	OK Can	el

106 When the project is opened, the file and folder structure can be seen in *PROJECT* \rightarrow *OPTION* \rightarrow *CURRENT SETTINGS*.

Project	Change settings for the surrent project	
Current Settings	change settings for the current project.	
Units	Name	
Tasks	20170904_UFST_TFS_ Harvey_Coastal	
Application	Location	
General	C:\Users\dhartel\Documents\ArcGIS\Projects\20170904_UFST_TFS_ Harvey_Coastal\20170904_UFST_TFS_ Harvey_Coastal.aprx	
Map and Scene	Home folder	
Navigation	Cill (sers) (darta) Documents) ArcGIS) Projects) 2017/00/04 LIEST, TES, Hanvey Coastal	
Selection	C-[03613/01881/61/D0C01116113/FRC012/F10]6C13/2017/0304_0131_113_181769_C083/81	
Editing	Default geodatabase	
Geoprocessing	C:\Users\dhartel\Documents\ArcGIS\Projects\20170904_UFST_TFS_Harvey_Coastal\20170904_UFST_TFS_Harvey_Coastal.gdb	
Raster and Imagery	Default toolbox	
CAD	C:\Users\dhartel\Documents\ArcGIS\Projects\20170904_UFST_TFS_ Harvey_Coastal\20170904_UFST_TFS_ Harvey_Coastal.tbx	
Display		
Layout		
Metadata		
Indexing		
Location Referencing		
Language		
Customize the Ribbon	Learn more about changing a project's settings	

- 107 The project, home folder, geodatabase, and Toolbox are all created based on the project name specified.
- Additional folders may be created as needed under the **HOME FOLDER**. *ArcGIS Pro* **TASKS** may be useful for semi-automation of processing and reporting steps that follow.

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C:\USERS\DHARTEL\DOCUMENTS\UFST\2017 ACTIVITY\20170901 UFST FGDB AND AGOL SUPPORT FOR DATA AND REPORTING (14SEP17 REVISION v1.5). DOCX





110 ArcMap v10.3.1

In *ArcMap* the user must create all folders, map documents, and geodatabases manually. An example similar to the *ArcGIS Pro* might look like this:

113	Folder for the project:	C:\Users\dhartel\Do	cuments\GIS Projects\
114	Project Home Folder:	20170904_UFST_TF	5_Harvey_Coastal\
115	Sub-folders ² :	Base_Data	[Holds imagery, vector files, TPKs]
116		Deployment_Project	[Map documents]
117		Documents	[Misc. project documents like the species list]
118		Incident_Data	[Holds cumulative data collected and processed; FGDB]
119		FGDB	20170823_UFST_TFS_HARVEY_DR-4332 ³ _COASTAL.GDB
120		Products	[Maps, reports, and exported data (FEMA documentation)]
121		Tools	[Python scripts]

An example UFST folder structure created at: C:\Users\DHARTEL\DOCUMENTS\GIS PROJECTS\

20170905_UFST_TFS_Harvey_DR4332_Coastal
🛛 📙 Base_Data
👢 Deployment_Projects
🛛 📙 Documents
👢 Other
👢 Screen Captures
1. Workflow and Instructions
> 👢 Incident_Data
Products
EEMA and Community Data
👢 Maps
👢 Reports and Lists
👢 Tools

123 *ModelBuilder* may be useful for semi-automation of processing and reporting steps that follow.

² Based on 2014 GSTOP Template for *ArcMap* until the *ArcGIS Pro* & *AGOL* template is available.

³ The "DR" designation is the FEMA Federal Declaration umber for the disaster (e.g. DR-4332). Should be in FGDB Name and/or all levels of metadata (i.e. Projects (*ArcGIS Pro*), **MAP DOCUMENTS**, **Dataframes**, **FEATURE LAYERS** (all in *ArcMap*), and **FEATURE CLASSES** in *ArcCatalog*)



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Steps for Transferring UFST from USDA FS Organizational Account Once a folder structure has been created, proceed with building the current UFST file geodatabase from the current XML export and map document (or project in ArcGIS Pro). 1. Create a new FGDB for this deployment (or as an initial template) ArcCatalog a. FGDB FOLDER [RC] \rightarrow New \rightarrow FILE GEODAtabase Use a FGDB naming convention required for your organization, follow NWCG GISS standards for b. folder and file naming, or create a descriptive FGDB name i. e.g. 20170823_UFST_TFS_HURRICANE_HARVEY_DR-4332.GDB Import the UFST workspace 2. **ArcCatalog** Provided as an XML file (20170905 UFST COLLECTOR TEMPLATE.xml) b. FGDB NAME [RC] → IMPORT → XML WORKSPACE DOCUMENT 3. Verify and set the dpesies domain 4. Create a map document ArcMap or ArcGIS Pro Follow all standard AcrGIS Online publishing standards (metadata) for you organization a. i. **MAP DOCUMENT** properties X Map Document Properties 1. Title 2. Summary File: 3. Description Title: UEST - Tevas Forest Service - Hurricane Harvey - Co 4. Author 5. Credits UFST tree risk feature class as hosted law Descript 6. Tags 7. Store relative pathnames Dudley Harte After you build the map, you can come back 8. Credits USDA FS, FEMA, US Censu and create a thumbnail AGOL, UFST, risk, Texas, Harvey Tags: ii. For all dataframes (properties) Hyperlink I Coordinate: 1. Last Save 9/1/2017 11:24:37 AM Last Printed WGS_1984_WEB_MERCATOR_AUXILIARY_SPHERE Last Exported 2. Set extent C:\Users\dhartel\Documents\GIS GDB\UFST_Col Store relative pathna mes to data sou 3. Set reference scale (try 1:xx,xxx) Make Thumbnail Delete Thur For all feature classes (properties) OK Cancel Set scale range (try 1:xx,xxx) In the "event" dataframe⁴ b. i. Add the point feature class from the FGDB (trees) ii. Currently: UFST Tree Risk CommonName NoNulls NoAttach Event or ... UFST_Tree_Risk_CommonName_NoNulls_WithAttach_Event iii. Symbolize iv. Add a basemap to set the extent for your deployment v. Remove the basemap before publishing to AGOL In the "base or auxiliary data" dataframe⁴ c. i. Add all additional feature classes to support field data collection 5. Sign in to your AGOL username (FILE → SIGN IN) ArcMap 6. Activate each dataframe (DATAFRAME [RC] \rightarrow ACTIVATE) ArcMap or ArcGIS Pro Publish the map dataframe (FILE \rightarrow SHARE AS \rightarrow SERVICE) a. i. PUBLISH A SERVICE OF OVERWRITE AN EXISTING SERVICE Overwriting will delete all existing data on AGOL in that hosted feature layer! 2. Got backups?

⁴ Or separate Map Document if not using multiple dataframes in a single Map Document.



b.

FOREST SERVICE

<u>AGOL</u>

<u>AGOL</u>

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170 171 ii. Set parameters as needed

Probably set export by anyone in group

iii. Add metadata



177	9.	Create	a Web Map	AGOL
178		a.	Add the hosted feature layers needed	
179		b.	Adjust symbols if necessary	
180			i. Once all AGOL users have entered at least 1 tree r	ecord the symbolization for the map
181			can be set to display UFST ISDN (i.e. username) if	desired – Also see item 12a, Testing
182		с.	Set visible range	
183		d.	Set pop-ups and labels	
184	10.	Create	Operations Dashboard(s) as needed	Desktop Operations Dashboard
185	11.	Create	Web Map App(s) as needed	<u>AGOL</u>
186	12.	Share a	II maps, feature layers, web map apps, and dashboards to th	e group <u>AGOL</u>
			/@ben x	
			← + 0, 0, 0, 16 No.9 (The Information proceeding on the Information Control (Information Control (Information)) (Information) (Information	<u>, , , , , , , , , , , , , , , , , , , </u>

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187	13.	Open <i>Collector</i> on a smartdevice, sign in and test the data collection app <u>Smartdev</u>	<u>ice</u>
188		a. If each anticipated AGOL username can be tested then the symbolization for the map can be se	ŧt
189		to display UFST ISDN (i.e. username); test data should be deleted at the end of the first day or	
190		once all users have collected some data	
191	Steps f	or Using Excel to Create a New Species Domain	
192	1)	In Excel, create your species list with a code and description attribute	
193		a. Code can be short integer or text	
194		b. Use text (length 8) if using i-Tree Eco species codes	
195	2)	In ArcMap	
196		a. Create a MAP DOCUMENT for the project (or a temporary one for this step)	
197		b. Set the default FGDB	
198		c. Set coordinate system to Mercator Auxiliary (AGOL)	
199		d. Enter metadata	
200	3)	In ArcToolbox	
201		a. Conversion Tools \rightarrow Excel \rightarrow Excel to Table	
202		b. Place table into MAP DOCUMENT	
203	4)	In XTools Pro	
204		a. Restructure ³ the table to correct attribute data type as necessary	
205		b. Table Operations Table Restructure	
206		c. Code	
207		i. If using Eco species codes set to Text 8	
208		II. If using integers (i.e. U n) set to Short Integer	
209		a. Description	
210	5)	n. Set to text 32 (usually more than enough for common or Latin)	
211	5)	a Data Management Tools Domains Table to Domain	
212		<i>i</i> Table must be in the man document TOC	
213		h Ontionally in ArcCatalog	
214		<i>i</i> Right-click \rightarrow Domain Manager (XTools Pro) \rightarrow Import	
215	6)	In ArcCataloa	
217	0)	a. UFST point Feature Class [RC] \rightarrow Properties \rightarrow Fields	
		Faith Class Toporties Toporties To	

- 218
- b. Change the species domain to your new species domain

⁵ Excel conversion will set all text attributes to 255 character and all numeric to real.

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C:\Users\dhartel\Documents\UFST\2017 Activity\20170901 UFST FGDB and AGOL Support for Data and Reporting (14Sep17 Revision v1.5). bocx





20 Generalized Workflow for Managing Data for Reporting

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- The AGOL system of Web Map, Web Map Apps, and Operational Dashboards provide a cursory reporting system
- for the UFST Team Leader(s), U&CF Coordinator, community liaison (e.g. City Arborist), local Emergency Management.
- However, once field data collection starts, the GIS manager can capture "snap shots" of that data for post-
- processing and interim reports and datasets to support specific users and cooperators (e.g. FEMA Field Debris
- Representative). Post-processing for UFST includes (when using *Collector*) calculation of the risk rating from the
- three components (LOF, LOI, COFI), joining the species code to the table of common and Latin genus and species names, and conversion of the Mercator coordinate system to the US National Grid for FEMA documentation and
- other optional processing.
- The general data workflow for downloading, processing, and reporting includes:

231	1.	Open the hosted	l feature layer into ArcGIS Desktop an	nd export a copy <u>AGOL</u>
232	2.	Processing		ArcMap, Toolbox ⁶ , Field Calculator, and Python Window ⁷
233		a. Add pro	ocessing attributes needed and make	calculations
234		i.	MapID	Field Calculator
235		ii.	RiskRating	<u>Toolbox or Python Window</u>
236		iii.	xDD_Longitude	<u>Calculate Geometry</u>
237		iv.	yDD_Latitude	<u>Calculate Geometry</u>
238		٧.	Calculate USNG	Convert Coordinate Notation
239		vi.	Area_Identifier (e.g. county, city)	<u>Identity</u>
240		vii.	Subarea_Identifier (e.g. park, facility	ry) <u>Identity</u>
241	3.	Selection by loca	ition (community) and attributes	<u>ArcMap</u>
242	4.	Export data (Exc	el or CSV)	
243	5.	Generate lists ar	nd reports	

Suggested Data Processing to Support Communities

Adding Additional Feature Layer Attributes Needed for Reporting

Python code⁸ like this can be used in the *ArcMap* Python window to create any new attributes needed for
 reporting (use "cut & paste"). <UFST TREES would be replaced with the feature class name or feature layer alias
 like "UFST_TREE_RISK_HARVEY_DAY01"

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⁶ In development is a UFST Toolbox that accomplishes all of these processing tasks.

⁷ <u>http://pro.arcgis.com/en/pro-app/arcpy/get-started/python-window.htm</u>

⁸ Python code is case sensitive and also must follow indentation requirements.

⁹ Where **<UFST_TREES>** is the feature layer in ArcMap.





The Python Window

In ArcMap (and ArcGIS Pro) the Python window is opened with Geoprocessing \rightarrow Python.



258 Joining Species Latin and Common Names¹⁰

- The species domain has been created with i-Tree Eco species codes Latin and common names (see species table).
- 260 While screen display of the species common name is handled by the domain, when data is exported as a shapefile
- or is used in a report, the species code will be used. To get either Latin or common names for reporting and data
- export to Excel, CSV, or shapefile a **JOIN** must be made to the species table in the FGDB prior to your processing operation.
- FEATURE LAYER IN TOC [RC] → JOINS AND RELATES → JOIN
 Field:.....Species
 Table:.....<Species Table Used >
 Field in Table:SpCode (or usually some form like this)
 In feature classes provided with two attributes that have similar name (e.g. SpCode and SpCodeX), use the
- attribute with the "X" appended to the attribute name. Merely means that some attribute type transformation
- was made.

¹⁰ Performing this step AFTER the USNG process eliminates a conversion problem in the Change Notation process.





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loin Data	Joined attributes are not permanent
Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data. What do you want to join to this layer?	
Join attributes from a table	Laver Properties
1. Choose the field in this layer that the join will be based on:	General Source Selection Display Symbology Fields Jefinition Query Labels XCallout Joins & Relates Time HTML Po
Species	III I ↑ ▼ ↓ ▼ Options ▼
Choose the table to join to this layer, or load the table from disk:	Choose which fields will be visible
TES Harvey Coastal Species	created_user Alias OID
Show the attribute tables of lavers in this list	last_edited_user
• Show the database ables of layers in ans list	Data Type Object ID
3. Choose the field in the table to base the join on:	GlobalD Name UFST_Tree_Risk_Harvey_Da
SpCodeX	VISING Allow NULL Values No
	XDD_Longitude
Join Options	
All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table.	Control Spoche CommonName CommonName Species ■
C Keep only matching records	✓ SpCodeX
If a record in the target table doesn't have a match in the join table, that record is removed from the resulting target table.	Latin Name
Validate Join	
About joining data OK Cancel	OK Cancel Appl

271 272 273	After the join, the feature layer has additional attributes from the joined table available for reporting and exporting. In this example: Genus, Common Name and Latin Name (and others) are available for processing and reporting.
274 275	To make these attributes a permanent part of the feature class, use Feature Layer [RC] \Rightarrow DATA \Rightarrow EXPORT DATA to save a new feature layer without the join.
276	In ArcCatalog you can delete attributes that are not needed from this join and export.
277	Set MapID
278	Using FIELD CALCULATOR (or a ArcToolbox tool) set the MAPID value:
279	MAPID = 10000 + ObjectID (for example)
280	Python Processing for Risk Rating
281	The risk rating attribute is assigned with the following Python code in FIELD CALCULATOR ¹¹ :
282	def ClassRisk(LOF,LOI,COFI):
283	
284	nLOF = int(LOF[0])
285	nLOI = int(LOI[0])
286	nCOFI = int(COFI[0])
287	
288	if $(nLOF == 0 \text{ or } nLOI == 0 \text{ or } nCOFI == 0)$:
289	return "Not Rated"
290	
291	M1 = nLOF * nLOI

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¹¹ The file *RIskRatingCalculationHarvey.Cal* can be loaded into Field Calculator. File *RIskRatingCalculationHarvey.PY* is commented.





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292	
293	if (M1 <= 6):
294	M1 = 1
295	elif (M1 >= 8 and M1 <=9):
296	M1 = 2
297	elif (M1 == 12):
298	M1 = 3
299	elif (M1 == 16):
300	M1 = 4
301	
302	M2 = M1 * nCOFI
303	
304	if (M2 <= 4):
305	return "Low"
306	elif (M2 >= 6 and M2 <=8):
307	return "Moderate"
308	elif (M2 >= 9 and M2 <=12):
309	return "High"
310	elif (M2 == 16):
311	return "Extreme"
312	The function call is:
313	ClassRisk (!Failure_LOF!, !Impact_LOI!, !Conseq_COFI!)
314	Geocoding Tree Locations

If tree lists will be provided by street and block, then the tree feature layer should be reverse geocoded. Use ArcToolbox \rightarrow Geocoding Tool \rightarrow Reverse Geocode.

Neverse Geocode	a al		
Input Features		*	·
UFST_Tree_Risk_USNG		- 🖻	ADDRESS— Deturns street
Input Address Locator			addresses or in
Address Locators\MGRS		- 🖻	the format defined
Output Feature Class			address locator
C:\Users\dhartel\Documents\GIS GDB\UFST_Collector_Harvey_TFS_31Aug17.gdb\UFST_Tree_Risk_H	larvey_Geocode	2	This is the default
Address Type (optional)			option.
ADDRESS		-	INTERSECTION— Returns
Within	10 Motors		intersection
	meters	•	addresses. This
		-	•
OK Cancel	Environments	<< Hide Help	Tool Help

317

This should add a street name and an address (to determine block) for producing tree lists by street and block.

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- US. National Grid (USNG Location)
- In the ESRI *Collector* and *ArcGIS Online* (*AGOL*) the hosted feature layer is typically set to:

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- 22 Coordinate system: Mercator_Auxiliary_Sphere
- 323 Datum: WGS84
- Linear Units: Meter
- This is set either in *ArcCatalog* in the feature class properties, or at the Map document or dataframe
- properties dialogs. Properties → Coordinate System Tab → Projected Coordinate Systems → World →
- 327 WGS 1984 WEB MERCATOR (AUXILIARY SPHERE).
- Start by creating an X (Longitude) and Y (Latitude) attribute in the feature class (see Python above).
- Then calculate Mercator decimal degrees (DD) into the yDD_Latitude and xDD_Longitude fields.
- Open the attribute table and right-click on **BOTH** XY attributes and select CALCULATE GEOMETRY...

Tal	ble							□ ×
3	21 · 1 翰 · 1 翰 预 □ 孝 ×							
UF	UFST_Tree_Risk_USNG ×							
	Species	DBH	FEMA Guide	Mitigation	xDD_Longitude	yDD_Latitude	USNG	MapID
•	FRPE	99	Limb Removal (>2")	Limb Removal (FEMA)	-97.047469	28.029615	14R PS 91946 02020	10001
П	PYCA	99	Remove (>50% loss)	Remove (FEMA)	-97.039232	28.046975	14R PS 92725 03957	10002
	FRVE	99	Limb Removal (>2")	Limb Removal (FEMA)	-97.048197	28.040906	14R PS 91855 03270	10003
	FRVE	99	Remove (>50% loss)	Remove (FEMA)	-97.029709	28.042061	14R PS 93670 03428	10004
П	QUVI	99	Remove (Heartwood)	Remove (FEMA)	-97.036114	28.036066	14R PS 93051 02753	10005
	QULY	99	Remove (Heartwood)	Remove (FEMA)	-97.027383	28.034719	14R PS 93912 02618	10006
	ULAM	99	Remove (>30° Lean)	Remove (FEMA)	-97.0284	28.041337	14R PS 93800 03349	10007
	PYCA	99	Remove (Heartwood)	Remove (FEMA)	-91.123391	30.383178	15R XP 80311 62740	10008
П	CELA	99	Remove (>50% loss)	Remove (FEMA)	-97.030579	28.033334	14R PS 93600 02459	10009
II UF	1 ST_Tree_Risk	USNG	(0 out of 9 Selected)					

331

Set **PROPERTY:** to either X coordinate Point or Y Coordinate Point.

Set **UNITS** to Decimal Degrees. Longitude example Calculate Geometry X Coordinate of Point Property: Coordinate System Our coordinate system of the data source: PCS: WGS 1984 Web Mercator Auxiliary Sphere O Use coordinate system of the data frame: PCS: WGS 1984 Web Mercator Auxiliary Sphere Units: Decimal Degrees Ŧ Create decimal Calculate selected records only degrees (DD) About calculating geometry OK Cancel

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- 333 Once the DD attributes are created and calculated, the conversion to USNG uses the ArcToolbox \rightarrow
- 334 DATA MANAGEMENT TOOLS → PROJECTIONS AND TRANSFORMATION → CONVERT COORDINATE NOTATION tool.



335 Convert Coordinate Notation Dialog:

Convert Coordinate Notation		
Input Table	^	Output Coordinate
UFST_Tree_Risk_USNG		Format 📲
Input Coordinate System (optional)		
WGS_1984_Web_Mercator_Auxiliary_Sphere		Coordinate format to
Output Feature Class		will be converted. The
C:\Users\dharte\\Documents\GIS GDB\UFST Collector Happy TFS 31Aug17.gdb\UFST Tree Risk USNG Assigned		default is DD 2.
		-
Output Coroninate System (optional)		
GCS_WGS_1984		Select USING
Input Coordinate Format		latitude values are
DD_2 •		in a single field.
X Field (Longitude)		Two values are
xDD_Longitude		separated by a
Y Field (Latitude)		space, a comma,
yDD_Latitude		
Output Coordinate Format		 DD_2—Longitude and latitude values
		are in two
ID (optional)		separate fields.
		DD NUMERIC—
	-	Longitude and
OK Cancel Environments << Hide Help	ר	Tool Help
		F

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Creates the new feature class with USGN and adds to the **TOC**:



The new feature layer added to the **TOC** will have the attribute USNG (text) with the US National Grid notation for FEMA.

J	[] - [월 -] 唱 및 🖸 🖉 🗶							
FS	T_Tree_Risk	_Harve	y_Day01_USNG					
T	Species	DBH	Mitigation	created_user	RiskRating	xDD_Longitude	yDD_Latitude	USNG
T	FRPE	99	Inspect (Non-FEMA)	ssrinivasan_tfsgis	Low	-97.047469	28.029615	14R PS 91946 02020
Г	PYCA	99	Limb Removal (FEMA)	ssrinivasan_tfsgis	Low	-97.039232	28.046975	14R PS 92725 03957
1	FRVE	99	Remove (FEMA)	ssrinivasan tfsgis	Low	-97.048197	28.040906	14R PS 91855 03270
1	FRVE	99	Restorative Prune (Non-FEMA)	ssrinivasan_tfsgis	Low	-97.029709	28.042061	14R PS 93670 03428
T	QUVI	99	Remove (FEMA)	dhartel_usfs	Low	-97.036114	28.036066	14R PS 93051 02753
1	QULY	99	Limb Removal (FEMA)	dhartel usfs	Low	-97.027383	28.034719	14R PS 93912 02618
1	ULAM	99	Limb Removal (FEMA)	dhartel usfs	Moderate	-97.0284	28.041337	14R PS 93800 03349
1	PYCA	99	Remove (FEMA)	dhartel_usfs	High	-91.123391	30.383178	15R XP 80311 62740
1	CELA	99	Remove (FEMA)	dhartel usfs	Low	-97.030579	28.033334	14R PS 93600 02459

Basic US National Grid¹² for the Lower 48 States



¹² http://earth-info.nga.mil/GandG/coordsys/grids/1Sheet_USNGInstruct_v3.pdf

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Assigning Area Names to the Tree Feature Class

- ³⁴¹ When data is being collected for multiple communities into a common hosted feature layer the identity
- of those communities can be assigned to each tree record based on its location (latitude/longitude).
- This process can be repeated for multiple areas (e.g. park, city, county, and/or state) if desired.
- 344 Use ArcToolbox \rightarrow Analysis Tools \rightarrow Overlay \rightarrow Identity.

↓ Identity	
Input Features	JoinAttributes 🄶
UFST_Tree_Risk_Harvey_Day02_USNG	(optional)
Identity Features	
Texas Communities (DR-4332)	attributes will be
Output Feature Class	transferred to the output
C:\Users\dhartel\Documents\GIS Projects\20170905_UFST_TFS_Harvey_DR4332_Coastal\Incident Data\UFST_Collector_Harvey_T	feature class.
JoinAttributes (optional)	
NO_FID	ALL—All the attributes
XY Tolerance (optional)	(including FIDs)
	from the input
Keep relationships (optional)	as the identity
	features, will be
	transferred to the
	no intersection is
	found the identity
+	teature values will
OK Cancel Environments << Hide Help	
	roundp

- The identity information transferred uses the attribute names from the IDENTITY FEATURE. If additional attributes
- were specifically added for area identification (e.g. **AREA_IDENTIFIER**) then *Field Calculator* can be used to transfer
- those values and the IDENTITY FEATURE attribute(s) can be deleted from your OUTPUT FEATURE CLASS.





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ArcMap or ArcGIS Pro

Hosted Feature Layer Processing Steps

There are two methods for opening hosted feature layer in ArcGIS Desktop (ArcMap or ArcGIS Pro).

350	1.	Start an ArcGIS Desktop program, sign in to AGOL,	
351		and open a new or existing MAP DOCUMENT	ArcGIS Desktop
352		a. Add basemap (for reference, optional)	ArcMap or ArcGIS Pro
353		b. Open the hosted feature layer details screen at AGOL	<u>AGOL</u>
354		c. Select Open in ArcGIS Desktop	<u>AGOL</u>
355		i. The hosted feature layer will be added to the ACTIVE dataframe	ArcMap or ArcGIS Pro

Export feature layer to the project FGDB d.



358

Added hosted feature layer to ArcGIS Desktop (from details in AGOL)





Open the attribute table to check for expected record (tree) count.

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)	FEATURE LAYER IN TOC [RC]	➔ DATA ➔ EXPORT DATA	New feature class in FGDB
	Export Data		Saving Data

xport Data	Saving Data
Export: All features	Look in: 🚺 UFST_Collector_Harvey_TFS_3: 🗸 🏠 🏠 🎲 🗮 🕇 🖆 🖆
Use the same coordinate system as: this layer's source data this layer's source data the feature dataset you export the data into (only applies if you export to a feature dataset in a geodatables) Output feature class: C:\Users\dharte\Documents\GIS GDB\UFST_Collector_Harvey.	I Texas_4332_Counties_FEMA Texas_4332_Places_TFS_Selected Texas_4332_Roads_TFS_4332Bexar UFST_TFS_Harvey_Day1Test UFST_Tree_Risk_CN_NN_NP_Event_Ordered UFST_Tree_Risk_Geocode UFST_Tree_Risk_Harvey_Day01_Rockport_Test UFST_Tree_Risk_Harvey_Day01_USNG UFST_Tree_Risk_Harvey_Geocode
OK Cancel	Name: UFST_Tree_Risk_Harvey_Day01_Rockport Save as type: File and Personal Geodatabase feature classes Can

Creates a desktop copy (today's "snapshot") of the linked hosted feature layer

Save it into your project file geodatabase (FGDB)

2. Or the URL of the hosted service can be copied for use in ArcCatalog (ArcGIS Server¹³).

Home Gallery Map Scer	ne Groups Content Organization	 □ Dudley ∨ O
R8_UFST_TFS	S_Hurricane_Harvey_5Sep17 ^{altation}	
* Add to Fevorites Description	FEature layer to aupport UFST deployment for Hurricane Harvey by Texas A&M Forest Service. by strinkasan_flagis Last Modified: September 5, 2017 Feature Layer	Open in Map Viewer Open in Scene Viewer Open in ArcGIS Desktop Export Deta
UFST tree risk feature class	s as a hosted layer.	Details * * * * * (0) b2 views:86 Source: Feature Service Created from: R8_UFST_TFS_Hurricane_Harvey_SSep17. Source Definition
Copen In 👻 🍄 Export To Access and Use Co	▼ 23 Service URL	Created: September 5, 2017 Data Last Updated: Sep 6, 2017, 6:35:09 PM Size: 272 K8
No special restrictions or I Comments (0)	imitations on using the item's content have been provided.	Owner
Leave a comment.	ent. Comment	Tags AGOL UFST, Risk, Taxaa, Harvey Credin (Attribution) USDA FS: Terror Samo:M Forest Service, US Census, FEMA
		URL 🖄 View https://services5.arcgis.com/ELI1UkCz

The copied URL is used in ArcCatalog.

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¹³ Ownership and sharing level may make this method unavailable.



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ArcCatalog \rightarrow GIS Servers \rightarrow Add ArcGIS Server \rightarrow Use GIS services



In ArcCatalog the ArcGIS Server's hosted feature layers are available. Hosted feature layers must be shared PUBLIC in order to show up in the ArcGIS Server URL link. The advantage of this method of hosted feature layer access is that it is a real-time link.

Catalog	□×
(+ ▼ →) ▲ 🔓 @ # ▼ 22 % E	
Location: 🖺 R8_UFST_FFS_Hurricane_Irma_DR4337_Trees_12Sep17.FeatureServer	•
R8_Mobile_AEMA_AFC_Exercise_08May17_Base_Layers	
R8_Mobile_AEMA_Exercise_Tree_Features_27Apr17	
R8_Mobile_AEMA_Exercise_Tree_Features_28Apr17	
R8_Mobile_AEMA_ExerciseArea	
R8_UFS_Oklahoma_UCF_Inventories_14Jun17	
R8_UFS_Oklahoma_UCF_OK_Boundary_17Jul17	
R8_UFST_FFS_Hurricane_Irma_DR4337_Trees_12Sep17	
R8_UFST_FFS_Hurricane_Irma_DR4337_Trees_Tallahassee	Ħ
🖺 R8_UFST_FFS_Hurricane_Irma_DR4337_Trees_Tampa	
R8_UFST_Mobile_AEMA_Exercise_BaseLayers_06May17	
R8_UFST_Ohio_Toledo_MockExercise	-
ArcToolbox Table Of Contents Catalog	

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Regardless of how you link to the *AGOL* feature layer, export a "snapshot" of the cumulative data into your default FGDB. Remove the linked hosted feature layer (if you didn't use *ArcGIS Server* method) to leave only copies of the data in your desktop *ArcMap* map document. Processing and reporting will be on this new feature class in your FGDB.

	Hosted feature layer link	
Table Of Contents	Table Of Contents	
Se 🔍 🔍 🧶 🖾	🗽 😣 🗇 📮 🗉	
E S UFST-TFS-Harvey-Trees	Generation UFST-TFS-Harvey-Trees	
□ UFST_Tree_Risk_Harvey_Day01_Rockport	□ UFST_Tree_Risk_Harvey_Day01_Rockport	
□ ☑ R8_UFST_TFS_Hurricane_Harvey_5Sep17	□ ☑ Basemap	
UFST Tree Risk Assessments (CN NN NP)	🗄 🗹 World Street Map	
Reseman		New feature class added
		as laver, the "snapshet"
		as layer, the shapshot
ArcToolbox 🔚 Table Of Contents 🗊 Catalog	ArcToolbox Table Of Contents J Catalog	

Remove the hosted service feature layer

Use the local "snapshot" for processing and reporting

- These screen captures are showing the OPEN IN ARCGIS DESKTOP method of accessing AGOL hosted feature layer
- 372 data.
- 373 An ArcGIS Server connection would look like this:

Table Of Contents		□ ×
8: 🔍 🗇 🦊 I 🗉		
🖃 🍠 UFST - Florida - Processing and Reporting		
Image:	est/services/R8_UFST_FFS_Hurricane_Irma_DR4337_Trees_12Sep17/FeatureServer	
UFST Tree Risk Assessments (CN NN NP)	A	
+		
C:\Users\dhartel\Documents\GIS Projects\20170912_UFST	F_FFS_Irma_DR4337\Incident_Data\UFST_Collector_Tallahassee_DI_4337_12Sep17.gdb	
Florida_Selected_Counties_Census_2016		
		=
Florida_Counties_Census_2016		
	ArcCIS Server feature	
Florida_Places_Census_2016	Arcors server realure	
0	layer link	
Florida_Boundary_Census_2016		
🗄 🗹 World Street Map		
		~
ArcToolbox 🔚 Table Of Contents 🗔 Catalog		

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Feature Class ObjectID

UFST Species



374 Suggested Reporting to Communities to Support FEMA PA Application

- Minimum Required Data for FEMA Public Assistance
- The FEMA Public Assistance Program and Policy Guide (PAPPG) issued in April 2017 requires vegetative debris documentation for Public Assistance Category A that includes:

378	1.	Spec	cifics of the immediate threat	UFST FEMA Guide	UFST Mitigation
379		\checkmark	Limb Removal (Broken >2")	Limb removal (>2″)	<u>Limb Removal (FEMA)</u>
380		\checkmark	Tree Removal (Broken Canopy)	Remove (>50% Loss)	<u>Remove (FEMA)</u>
381		\checkmark	Tree Removal (Trunk Split)	Remove (Heartwood)	<u>Remove (FEMA)</u>
382		\checkmark	Tree Removal (>30° Lean)	Remove (>30° Lean)	<u>Remove (FEMA)</u>
383		\checkmark	Stump Removal	Stump (Uprooted)	<u>Stump (FEMA)</u>
384		\checkmark	Stump Flushcut	Stump (Not Attached)	<u>Stump (FEMA)</u>
385	2.	Dian	neter (at 4.5' for trees, 2' for stumps)		<u>UFST DBH</u>
386	3.	US. I	National Grid (USNG Location)		UFST latitude/longitude in DD converted

- That's it! Just 3 pieces of information to document tree, limb, and stump removals. Plus photos.
- Typically, to assist the community with the FEMA documentation, we also include:
 - Unique Map ID
 - Species (as common name or species code)
- When all data has been collected for a community, a paper (PDF) report that matches an export of the data collected might look like this:

Tree Removals ¹⁴										
MapID	Species	Diameter	Threat ¹⁵	USNG						
Tree Removals (Leaning) with Attached Roots ≥50% Exposed as a Cost Unit										
MapID	Species	Diameter	Threat	USNG						
	•	•	•	•						
Limb Removals										
MapID	Species	Diameter	Threat	USNG						
Stump Removal and	Fill (Uprooted ≥50%)									
MapID	Species	Diameter	Threat	USNG						
Stump Flush Cut (Upr	Stump Flush Cut (Uprooted <50%)									
MapID	Species	Diameter	Threat	USNG						

¹⁴ Table header title reflects the UFST **MITIGATION** attribute.

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¹⁵ Threat is the USFT **FEMA Guide**.





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- The Excel spreadsheet or CSV file provided would have the same attributes. FEMA doesn't need a map showing
- 394 MapID's but that could be provided to the community.
- Do NOT provide the following attributes to FEMA:

396	 Public Tree (the issue of public vs. private is imbedded into the FEMA guidelines)
397	 Tree Part
398	 Failure (LOF)
399	 Impact (LOI)
400	 Consequences (COFI)
401	 Residual Defect (or PreStorm Defect)
402	 Hangers (unless FEMA limb removal payment is based on number of limbs)
403	Field Notes
404	Corrections to Domain Descriptions (Special Characters)
405 406	Special characters used in the Domain Tables and Domains like degree (°) do not transfer properly when exported in Excel spreadsheets (either DBF or CSV).
407 408	Minor editing in the <i>Excel</i> spreadsheet should be completed before [proving the data to the community for FEMA PA documentation.
409	Data Selection for FEMA Documentation
410	The general SQL-like selection criteria for the five FEMA datasets and documentation:
411	Tree removals
412	Select * FROM < UFST_TREES> WHERE Mitigation = "Remove (FEMA)"
413	[Or an alternative that provides additional QC]
414 415	Select * FROM < UFST_TREES> WHERE (Mitigation = "Remove (FEMA)" and (FEMAGuide = "Remove (>50% Loss)" or FEMAGuide = "Remove (Heartwood)" or FEMAGUide = "Remove (>30° Lean)"))
416	<u>Tree removals with attached roots (>50% exposed) as a single cost unit as specified in PAPPG</u>
417	These are leaning trees WITH roots >50% exposed that are defined "For contracted removal of a tree with
418	a root-ball, FEMA will not reimburse two separate unit costs to remove the tree and its root-ball. PAPPG
419	April 2017".
420	Select * FROM <uest_trees></uest_trees> WHERE FEMAGuide = "Remove (>30° Lean)" and Mitigation = "Remove
421	(FEMA)"
422	Limb removals
423	Select * FROM < UFST_TREES> WHERE Mitigation = "Limb Removal (FEMA)"
424	Stump Removal (≥50% Uprooted)
425	Select * FROM < UFST_TREES> WHERE (Mitigation = "Stump (FEMA)" and FEMAGuide = "Stump
426	(Uprooted)")
427	Stump Flush Cut (<50% Uprooted)
428	Select * FROM < UFST_TREES> WHERE (Mitigation = "Stump (FEMA)" and FEMAGuide = "Stump (Not
429	Attached)")

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- All stumps could be selected and exported to a DBF for use in Excel with this selection: 430
- Select * FROM <UFST_TREES> WHERE (Mitigation = "Stump (FEMA)" and (FEMAGuide = "Stump (Not 431 Attached OR FEMAGuide = "Stump (Uprooted)" 432
- Use SELECTION -> SELECT BY ATTRIBUTES... or a Toolbox tool to select and export the data for FEMA 433
- documentation. Separate datasets may be created for tree removals and limb removals, or they can be 434 combined. 435

Select By Attributes
Layer. VIFST_Tree_Risk_Harvey_Day01_USNG
Only show selectable layers in this list
Method: Create a new selection
MapID
Species
DBH
FEMA Guide Mitigation
TIONO T
= <> Like
> >= And
<
_% () Not
Is In Null Get Unique Values Go To:
SELECT * FROM UFST_Tree_Risk_Harvey_Day01_USNG WHERE:
Mitigation = 'Remove (FEMA)'
Clear Verify Help Load Save
OK Apply Close

Tab	fable 🗆 🗆											
:	II - 御 - 『 m m a fer a											
UFS	UFST_Tree_Risk_Harvey_Day01_USNG ×											
	MapID Species DBH FEMA Guide Mitigation USNG xDD_Longitude yDD_Latitude											
	10001	FRPE	99	Limb Removal (>2")	Limb Removal (FEMA)	14R PS 91946 02020	-97.047469	28.029615	1			
	10002	PYCA	99	Remove (>50% loss)	Remove (FEMA)	14R PS 92725 03957	-97.039232	28.046975				
•	10003	FRVE	99	Limb Removal (>2")	Limb Removal (FEMA)	14R PS 91855 03270	-97.048197	28.040906				
	10004	FRVE	99	Remove (>50% loss)	Remove (FEMA)	14R PS 93670 03428	-97.029709	28.042061				
	10005	QUVI	99	Remove (Heartwood)	Remove (FEMA)	14R PS 93051 02753	-97.036114	28.036066				
	10006	QULY	99	Remove (Heartwood)	Remove (FEMA)	14R PS 93912 02618	-97.027383	28.034719				
	10007	ULAM	99	Remove (>30° Lean)	Remove (FEMA)	14R PS 93800 03349	-97.0284	28.041337				
	10008	PYCA	99	Remove (Heartwood)	Remove (FEMA)	15R XP 80311 62740	-91.123391	30.383178				
	10009	CELA	99	Remove (>50% loss)	Remove (FEMA)	14R PS 93600 02459	-97.030579	28.033334				
14	If 4 3 ▶ II ■ (7 out of 9 Selected)											
UF	T_Tree_Risk_H	larvey_Day0	1_USN	3								

- A combined selection would use: 436
- Select * FROM <UFST Trees> WHERE Mitigation = 'Remove (FEMA)' AND Mitigation = 'Limb 437 Removal (FEMA)' 438





439 After selection, use Attribute Table → Export to a DBF or text (CSV) file to assemble the needed FEMA

documentation.

ble	е									
1.	P1	- 🕒 😪 🖸 🖓 🗙								
FS	89	Find and Replace								
П	-	Select By Attributes		Species	DBH	Tree Part	FEMA Guide	Failure (LOF)	Impact (LOI)	Consequ
Ť.		Clear Selection	- 1	OTHR	24	Crown	Remove (>50% loss)	4.Imminent	4.High	4.Severe
Π.	-		- 1	OTHR	14	Root Plate	Remove (>50% loss)	4.Imminent	3.Medium	3.Significant
Ħ.	22	Switch Selection		AGOLSS	18	Root Plate	Remove (>50% loss)	4.Imminent	4.High	4.Severe
11	Y	Select All		QUVI	18	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
1			-	QUVI	18	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
		Add Field		QUVI	15	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
1	:	Turn All Fields On		QUVI	14	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
		CL		QUVI	22	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
1	~	Show Field Allases		QUVI	15	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
1		Arrange Tables	•	QUVI	27	Root Plate	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
1			-	QUVI	21	Stump (Not Attached)	Stump (Not Attached)	4.Imminent	4.High	2.Minor
		Restore Default Column Widths		QUVI	18	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
T.		Restore Default Field Order		OTHR	8	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
Ħ.		Restore benautrield order	-1	QUVI	21	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
Ħ.		Joins and Relates	- F [OTHR	20	Crown	Remove (>50% loss)	3.Probable	3.Medium	2.Minor
Ħ.		Related Tables	ъŤ	OTHR	21	Root Plate	Remove (>50% loss)	4.Imminent	4.High	4.Severe
Ħ.		Related Tables	-	FRBE	17	Crown	Remove (>50% loss)	4.Imminent	4.High	4.Severe
Ħ.	dia	Create Graph		OTHR	15	Root Plate	Remove (>50% loss)	4.Imminent	4.High	4.Severe
Ħ.		Add Table to Lavout	- 1	OTHR	17	Root Plate	Remove (>50% loss)	4.Imminent	4.High	4.Severe
Ħ.		Add Table to Layout	-1	QUVI	16	Crown	Limb Removal (>2")	4.Imminent	4.High	3.Significant
Ħ.	2	Reload Cache		OTHR	20	Crown	Remove (>50% loss)	4.Imminent	4.High	3.Significant
ti.			-1	QUVI	18	Crown	Remove (>50% loss)	4 Imminent	4 High	4 Severe
1	8	Print	- 1							P.
1		Reports		Le sta all						
'	_		P	lected)						
FS		Export								
		Appear Export	~	- /						
	_									
		Exports the table to a n	ew							
		table.		+ / 7						
_		L	_		_					

Attribute table export of selected records (trees)

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Urban Forestry South

Additional Community Reports and Data



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442	ArcGIS rep	ort templates can be used with ArcMap selections.
443	■ Ma	ap(s) with MapID's
444	\checkmark	Tree Removals
445	\checkmark	Limb Removals
446	\checkmark	Stumps (by type)
447	■ Sh	apefile or FGDB with feature class data (pre-processed)
448	\checkmark	If using shapefiles provide the species table from the FGDB
449	■ Ar	nore detailed data listing with attributes NOT included with the FEMA PDF and Excel data or CSV
450	\checkmark	FEMA tree removal list – With detailed FEMA Guide and prioritized by Risk Rating
451	\checkmark	FEMA tree limb removal (pruning) list – Prioritized by Risk Rating
452	\checkmark	FEMA stumps – Uprooted and Attached
453	\checkmark	Mitigation that differs from the FEMA Guide classification
454		 These represent viable trees retained (by species and risk rating)
455		 FEMAGuide[0:5] = "Remove" AND Mitigation = "Limb Removal (FEMA)"
456	\checkmark	FEMA mitigation (debris management) by street and block – For the community or debris contractor
457	\checkmark	FEMA mitigation by area – Parks, trails, etc.
458	\checkmark	FEMA Guide or Mitigation frequency by Genus and/or Species
459	\checkmark	Remaining Trees (non-FEMA Remove) with residual defect – for post-recovery management
460	\checkmark	Restoration Pruning (non-FEMA) – for post-recovery management





461 Mitigation that Differs from the FEMA Guide Classification

These will be mitigation of "Limb Removals" that have a FEMA Guide of "Remove".

MapID	Species	Diameter	Threat	Mitigation	Risk Rating	Crew	Notes	Date

⁴⁶³ Select * FROM *<UFST Trees>* WHERE FEMAGuide[0:5] = "Remove" AND Mitigation = "Limb Removal (FEMA)"¹⁶

464 **FEMA Guide or Mitigation Frequency by Genus or Species**

55 Create a table that can be opened in Excel or other analysis package. Sorted in descending order of percent.

Genus/Species	Mitigation	Number	Percent	Cumulative %	

466 ARCTOOLBOX \rightarrow ANALYSIS TOOLS \rightarrow FREQUENCY.

467 <u>Trees with Residual Defect</u>

Trees remaining that have pre-storm or residual defect identified.

MapID	Species	Diameter	Risk Rating	Residual	Notes	Crew	Date

Select * FROM *UFST Trees>* WHERE Mitigation = "Limb Removal (FEMA)" AND (PreStormDefect <> "None Selected" AND PreStormDefect <> "NA/None")

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 $^{^{\}rm 16}$ Reporting SQL statements that follow have not been tested.



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Urban Forestry South Urban Forest Strike Team – On Your AGOL Organizational Account



- 471 Quality Assurance and Quality Control (QA/QC)
- 472 Quality Assurance (QA)
- ⁴⁷³ UFST training workshops, disaster exercises, and ad hoc in-state deployment for data collection using the current UFST protocol.
- Domains are created at the FDGB level and then can be used by attributes in any feature classes within that FDGB. Domains provide quality
- 475 control in data collection by restricting the user to a set of values (for text or numeric fields) or a range (for numeric fields). When domains are
- created with a list of acceptable entries (i.e. "coded values") they become the dropdown menus in *Collector*.
- 477 Drop-down menus used for all but 2 attributes in the data dictionary
 - ✓ DBH is integer entry
 - ✓ Field Notes is 36 character freeform entry
- 480 Quality Control (QC)
- 481 When data is saved to the *ArcGIS Desktop* (*ArcMap* or *ArcGIS Pro*)
- 1. Look for *AGOL*SS in the species (SpCode) attribute indicates that the attribute was not set this is the default
 - a. If correction is not possible and the number of these is small, enter OTHR (Other)
- 2. Look for 0 in DBH indicates that the attribute was not set this is the default
 - a. If correction is not possible consider setting to 6", or if you know the species then the species average in that area of the city
- 3. Look for "None Selected" in all other attributes which is the default
 - a. Leave "as-is", or select "None/NA" if that is an option
- 488 4. FEMA Guide (FEMAGuide) of "Stump (Uprooted)" or "Stump (Not Attached)" should have Mitigation of "Stump (FEMA)"
- 5. FEMA Guide (FEMAGuide) of "Limb Removal (>2")" should have Mitigation of "Limb Removal (FEMA)"



495



490 CloudVault Downloads

491 Supporting code and documents for UFST setup, processing and reporting.

- 492 URL: <u>https://www.cloudvault.usda.gov/index.php/s/8WET9IEbkvRWSzw</u>
- RiskRatingCalculationHarvey.py (includes comments)
 - RiskRatingCalculationHarvey.cal
 - UFST_Processing_Attributes_Added.txt
 - Identity for Assigning Area Name.txt
 - 20170905_UFST_COLLECTOR_TEMPLATE.XML
- For .CAL, .TXT, .PY files a good programmers editor is helpful.
- **NOTEPAD++** is a good free application available that will make it easier to maintain Python indentation requirements.
- Syntax Highlighting and Syntax Folding
- User Defined Syntax Highlighting and Folding
- PCRE (Perl Compatible Regular Expression) Search/Replace
- GUI entirely customizable: minimalist, tab with close button, multi-line tab, vertical tab and vertical document list
- 4 Document Map
- Auto-completion: Word completion, Function completion and Function parameters hint
- Multi-Document (Tab interface)
- 7 Multi-View
- WYSIWYG (Printing)
- Zoom in and zoom out
- Multi-Language environment supported
- Bookmark
- Macro recording and playback
- Launch with different arguments
- 514 Developer: <u>https://notepad-plus-plus.org/</u> Version 7.5.1 is current and available for 32 and 64 bit Windows.

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- 515 UFST Toolbox for ArcGIS and ArcGIS Pro
- 516 Under development.

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517 Other UFST Resources

- ⁵¹⁸ General documents that describe details of the UFST protocol, procedures, and objectives.
- UFST Overview and Status (01Jun16).pdf
- UFST When UCF Coordinators Talk to Communities (10Sep17).pdf
- UFST Tree Risk Data Uses (30Aug17).pdf
- UFST GIS Layers for Response (05Sep17).pdf
- UFST Event_UCF_City_GIS_EMAC_Events and Workflow (02Sep16 v1.02).pdf
- UFST Data Dictionary AGOL with Summary (10Octt17.pdf
- A300 Risk Rating Calculation Quick Guide (31Mar17).pdf
- UFST Setting Collector GPS Averaging (28Jul17).pdf
- UFST AGOL Partner Quick Guide (Unabridged iOS Android v1.06m Mobile 10Feb17).pdf
- 528 These can all be found by searching <u>www.UFST.org</u> or <u>www.UrbanForestrySouth.org</u>





529 Comments About Daily vs. Cumulative Data Processing

- 530 When the hosted feature layer (see page 16) is linked (OPEN IN ARCGIS DESKTOP from AGOL) to ArcMap usually all cumulative data collected to-date will be
- in the feature layer (basically the default). Once in an ArcMap MAP DOCUMENT and exported to the FGDB, the GIS specialist can maintain the data for
- processing and reporting as a cumulative feature class, or keep incremental (e.g. daily) sets of data in the FGDB for processing and reporting.

There are advantages and disadvantages to both, and all disadvantages can be overcome with some additional process steps. Maintaining a

cumulative vs. incremental feature layer in your processing and reporting **MAP DOCUMENT** is probably one of persona preference with proper

535 precautions.

Daily		Cumulative		
Advantages	Disadvantages	Advantages	Disadvantages	
Each incremental feature layer can be edited and those edits will be easy to maintain for the final cumulative feature layer for FEMA and community reporting.	As each export is made with <i>OPEN IN</i> <i>ARCGIS DESKTOP</i> the previously exported data will need to be deleted so that only unique records (trees) remain in the incremental (daily) feature layer created. The CREATIONDATE attribute can be used to make those determinations.	Cumulative and final reporting can be accomplished at any time without merges (not a big advantage).	If editing had been done in any previously exported data, then that editing would have to be applied to the most recent cumulative feature layer.	
Daily summaries would be slightly easier (but not much since CREATIONDATA is available).	A separate "log" of beginning and ending CREATIONDATE(s) would have to be maintained.		Daily processing will have to replace the most recent copy of cumulative data with any previously edited data. So each cumulative "Snapshot" always has final edits.	
	An additional QC step may be warranted to look for CREATIONDATE/CREATOR duplications that would represent double counting.		Daily summaries would be slightly more difficult but possible as long as CREATIONDATE is in the attribute list.	
	For final reporting to FEMA or community, the incremental feature layers will have to be merged.			

Some UFST tools are being designed to make this process and decision easier.

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Edit Tracking on Copies of Hosted Feature Layers

ArcCatalog – Feature Class Properties – Consider (test) edit tracking on copies of downloaded hosted feature layers.

eature Class	Properties	1110	1000	1.00	X
Fields	Indexes Subty	pes Feature	Extent F	Relationships	Representations
Enable	e editor tracking	X1 Cooldinat	System	Domain, Resold	
Update	these fields when a fea	ture is created			
Create	pr Field:	<none></none>		•	
Create	e Date Field:	<none></none>		•	
- Update	these fields when a fea	ture is edited			
Edit D	ate Field:	<none></none>		•	
Record	Dates in:	O UTC	🔘 Database	Time	
the spe on-line	cified time zone. UTC is help for more informati	recommended if t	there are no da	tes. See the	
			ОК	Cance	I Apply

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