Integrating Esri Field Maps and Dashboards into Stormwater and Mosquito Control Data Collection

By: Janice Pulver

York County VIRGINIA
America's Future Since 1781

What we are now using

Desktop

Mobile Device

Creators

Mediator

Applications

ArcMap

ArcCatalog

Survey123 Connect

ArcGIS Online (AGOL)

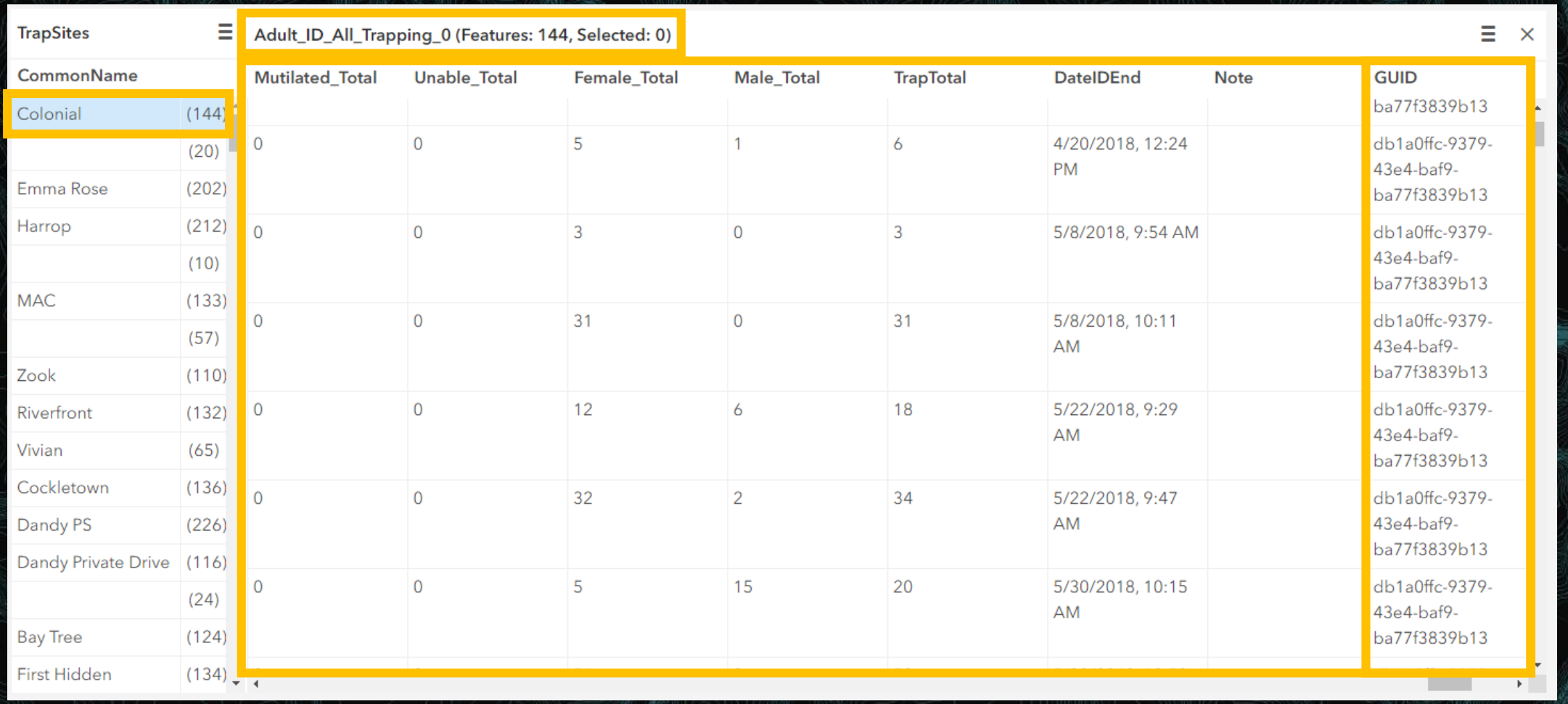
Dashboards

Collector Field Maps

Explorer

Survey123

Relationship Class



TrapSites

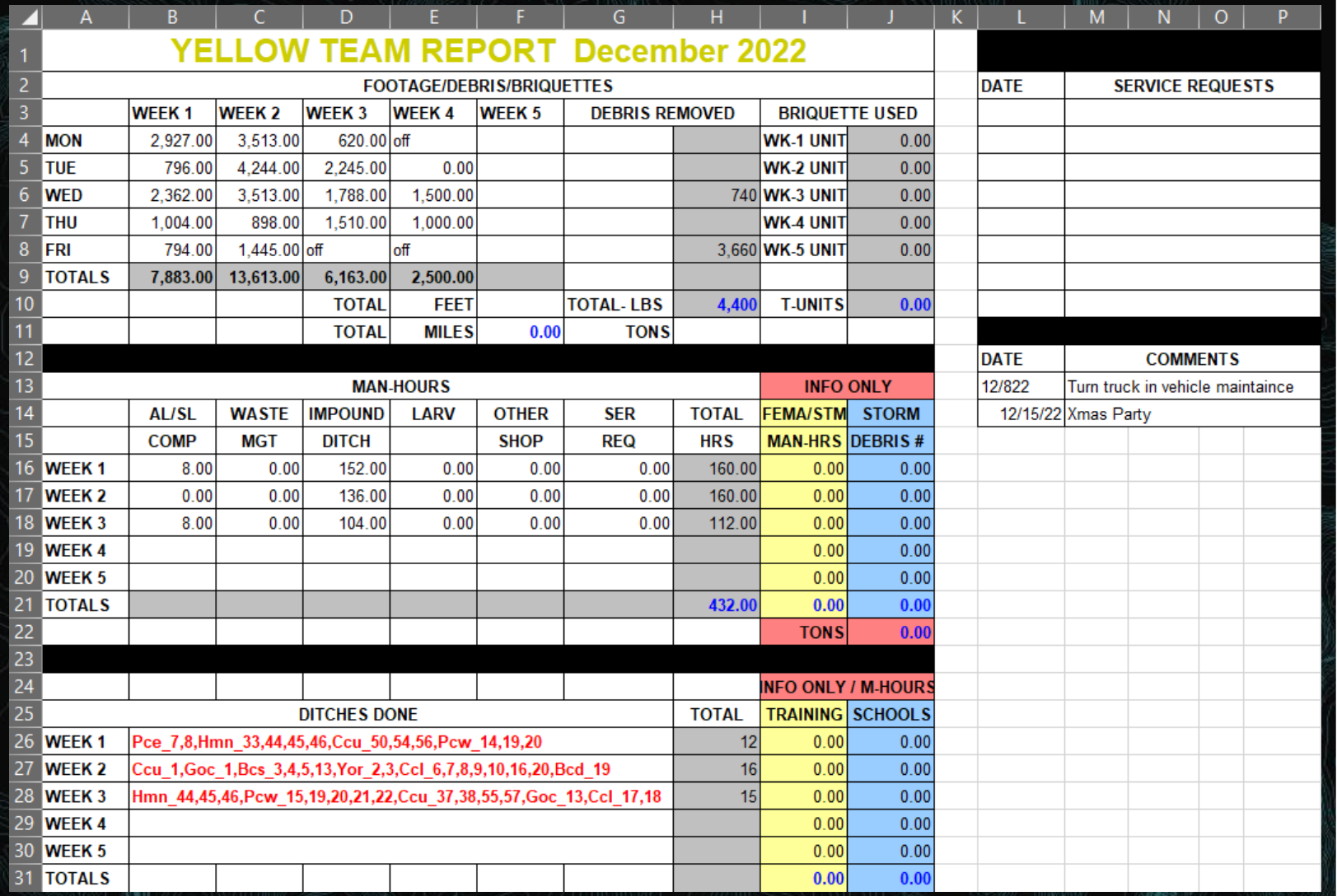
CommonName	
Colonial	(144)
	(20)
Emma Rose	(202)
Harrop	(212)
	(10)
MAC	(133)
	(57)
Zook	(110)
Riverfront	(132)
Vivian	(65)
Cockletown	(136)
Dandy PS	(226)
Dandy Private Drive	(116)
	(24)
Bay Tree	(124)
First Hidden	(134)

Adult_ID_All_Trapping_0 (Features: 144, Selected: 0)

Mutilated_Total	Unable_Total	Female_Total	Male_Total	TrapTotal	DateIDEnd	Note	GUID
							ba77f3839b13
0	0	5	1	6	4/20/2018, 12:24 PM		db1a0ffc-9379-43e4-baf9-ba77f3839b13
0	0	3	0	3	5/8/2018, 9:54 AM		db1a0ffc-9379-43e4-baf9-ba77f3839b13
0	0	31	0	31	5/8/2018, 10:11 AM		db1a0ffc-9379-43e4-baf9-ba77f3839b13
0	0	12	6	18	5/22/2018, 9:29 AM		db1a0ffc-9379-43e4-baf9-ba77f3839b13
0	0	32	2	34	5/22/2018, 9:47 AM		db1a0ffc-9379-43e4-baf9-ba77f3839b13
0	0	5	15	20	5/30/2018, 10:15 AM		db1a0ffc-9379-43e4-baf9-ba77f3839b13

Why change Stormwater data entry?

- Stormwater Maintenance used Explorer to view their ditch layers, but entered it into Excel
- Created the new data entry system in the off season of 2022
  - Rolled it out in January of 2023

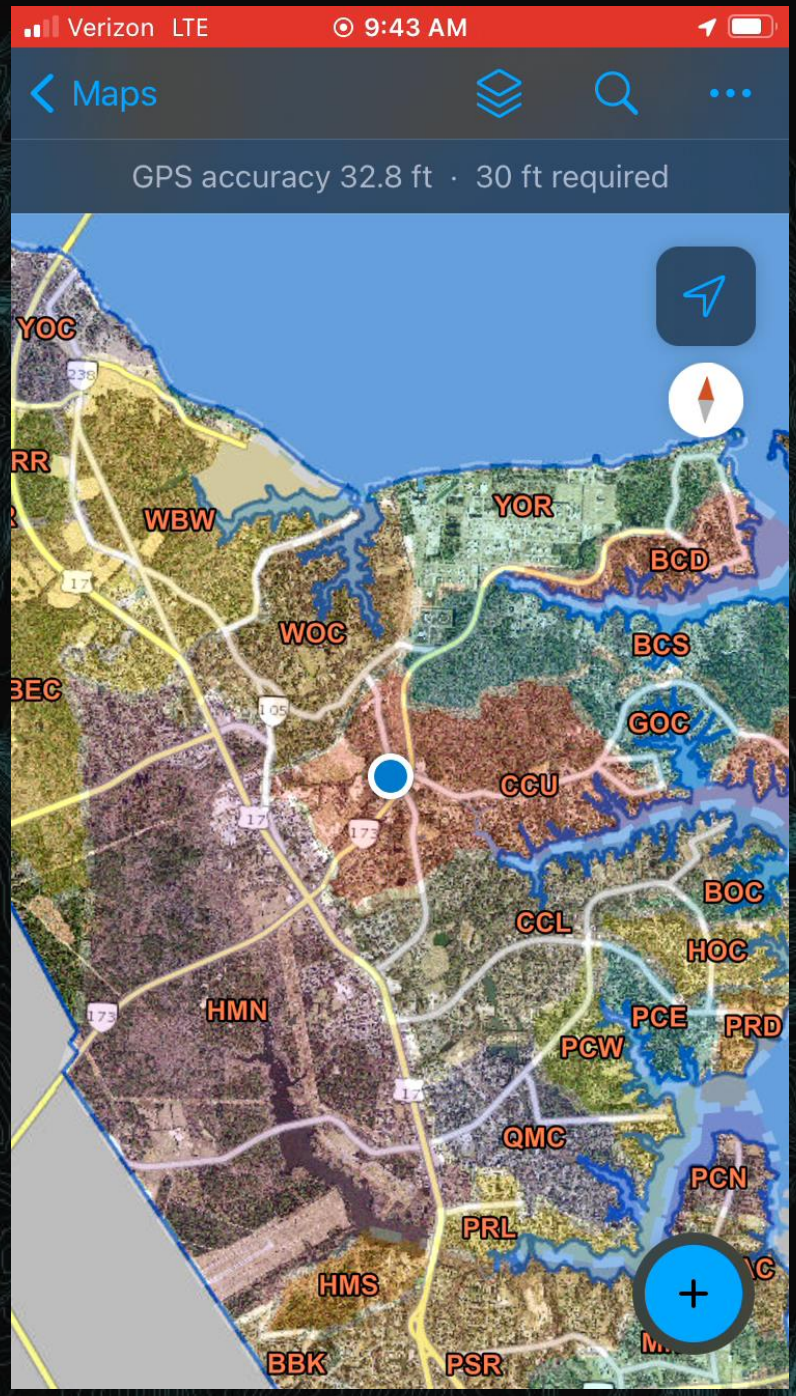


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	YELLOW TEAM REPORT December 2022															
2	FOOTAGE/DEBRIS/BRIQUETTES											DATE	SERVICE REQUESTS			
3		WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	DEBRIS REMOVED		BRIQUETTE USED							
4	MON	2,927.00	3,513.00	620.00	off				WK-1 UNIT	0.00						
5	TUE	796.00	4,244.00	2,245.00	0.00				WK-2 UNIT	0.00						
6	WED	2,362.00	3,513.00	1,788.00	1,500.00			740	WK-3 UNIT	0.00						
7	THU	1,004.00	898.00	1,510.00	1,000.00				WK-4 UNIT	0.00						
8	FRI	794.00	1,445.00	off	off			3,660	WK-5 UNIT	0.00						
9	TOTALS	7,883.00	13,613.00	6,163.00	2,500.00											
10				TOTAL	FEET		TOTAL- LBS	4,400	T-UNITS	0.00						
11				TOTAL	MILES	0.00	TONS									
12												DATE	COMMENTS			
13	MAN-HOURS								INFO ONLY			12/822	Turn truck in vehicle maintaince			
14		AL/SL	WASTE	IMPOUND	LARV	OTHER	SER	TOTAL	FEMA/STM	STORM		12/15/22	Xmas Party			
15		COMP	MGT	DITCH		SHOP	REQ	HRS	MAN-HRS	DEBRIS #						
16	WEEK 1	8.00	0.00	152.00	0.00	0.00	0.00	160.00	0.00	0.00						
17	WEEK 2	0.00	0.00	136.00	0.00	0.00	0.00	160.00	0.00	0.00						
18	WEEK 3	8.00	0.00	104.00	0.00	0.00	0.00	112.00	0.00	0.00						
19	WEEK 4								0.00	0.00						
20	WEEK 5								0.00	0.00						
21	TOTALS							432.00	0.00	0.00						
22									TONS	0.00						
23																
24									INFO ONLY / M-HOURS							
25	DITCHES DONE							TOTAL	TRAINING	SCHOOLS						
26	WEEK 1	Pce_7,8,Hmn_33,44,45,46,Ccu_50,54,56,Pcw_14,19,20						12	0.00	0.00						
27	WEEK 2	Ccu_1,Goc_1,Bcs_3,4,5,13,Yor_2,3,Ccl_6,7,8,9,10,16,20,Bcd_19						16	0.00	0.00						
28	WEEK 3	Hmn_44,45,46,Pcw_15,19,20,21,22,Ccu_37,38,55,57,Goc_13,Ccl_17,18						15	0.00	0.00						
29	WEEK 4								0.00	0.00						
30	WEEK 5								0.00	0.00						
31	TOTALS								0.00	0.00						

Stormwater Data Entry

Ditch Maintenance, Chokepoints, and Easements to Mow

Field Maps



Stormwater Data Entry

Dry Weather Screenings and Debris Collected

Field Maps

Survey123

- Dry Weather Screenings
  - Survey123 entries can be exported into a preformatted report
- Debris Collected
  - The survey helps auto complete ID names
    - Easier to enter and makes cleaner data

YORK COUNTY
STORMWATER OUTFALL INSPECTION REPORT

Section 1: Basic and Environmental Data

Outfall ID: ${NodeNumber}	Latitude: ${Latitude}	Longitude: ${Longitude}
Today's date: ${DateCurrent}	Time (Military): ${TimeCurrent}	
Inspectors: ${Employee}		
Temperature: ${Temperature} °F	Rainfall (in.) Last 24 hours: ${RainfallLast24} Last 48 hours: ${RainfallLast48}	Days ago #: ${RainfallDays}
Seasonal Climatic Conditions: ${Climate}	Standing Water Present: ${WaterPresent}	Mosquito Larvae Present: ${Larva}

Section 2: Outfall Description

LOCATION		MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
Type: ${OutfallType}	Closed Pipe	${PipeMaterial}	${PipeShape}	# of Pipes: ${PipeNumber}	Diameter/Dimensions: ${PipeDiameter}	In Water: ${SubmergedWater} With Sediment: ${SubmergedSediment}
	Open drainage	${DitchMaterial}	${DitchShape}		Depth: ${DitchDepth} Top Width: ${DitchTopWidth} Bottom Width: ${DitchBottomWidth}	
Pipe/Ditch Condition		Satisfactory?: ${OutfallCondition} *If No, Note repair needed:* ${OutfallConditionNo}				
Flow		Present?: ${Flow}			Description if Present: ${FlowDescription}	

Section 3: Characterization

FIELD DATA			OUTFALL PICTURE
FINDINGS		ACTION TAKEN	
Water Color (If water present)	${WaterColor}	${Action}	${OutfallPicture | size:300:200}
Odor	${Odor}		
Debris	Debris Present: ${Debris} Type of Debris if present: ${DebrisType}		

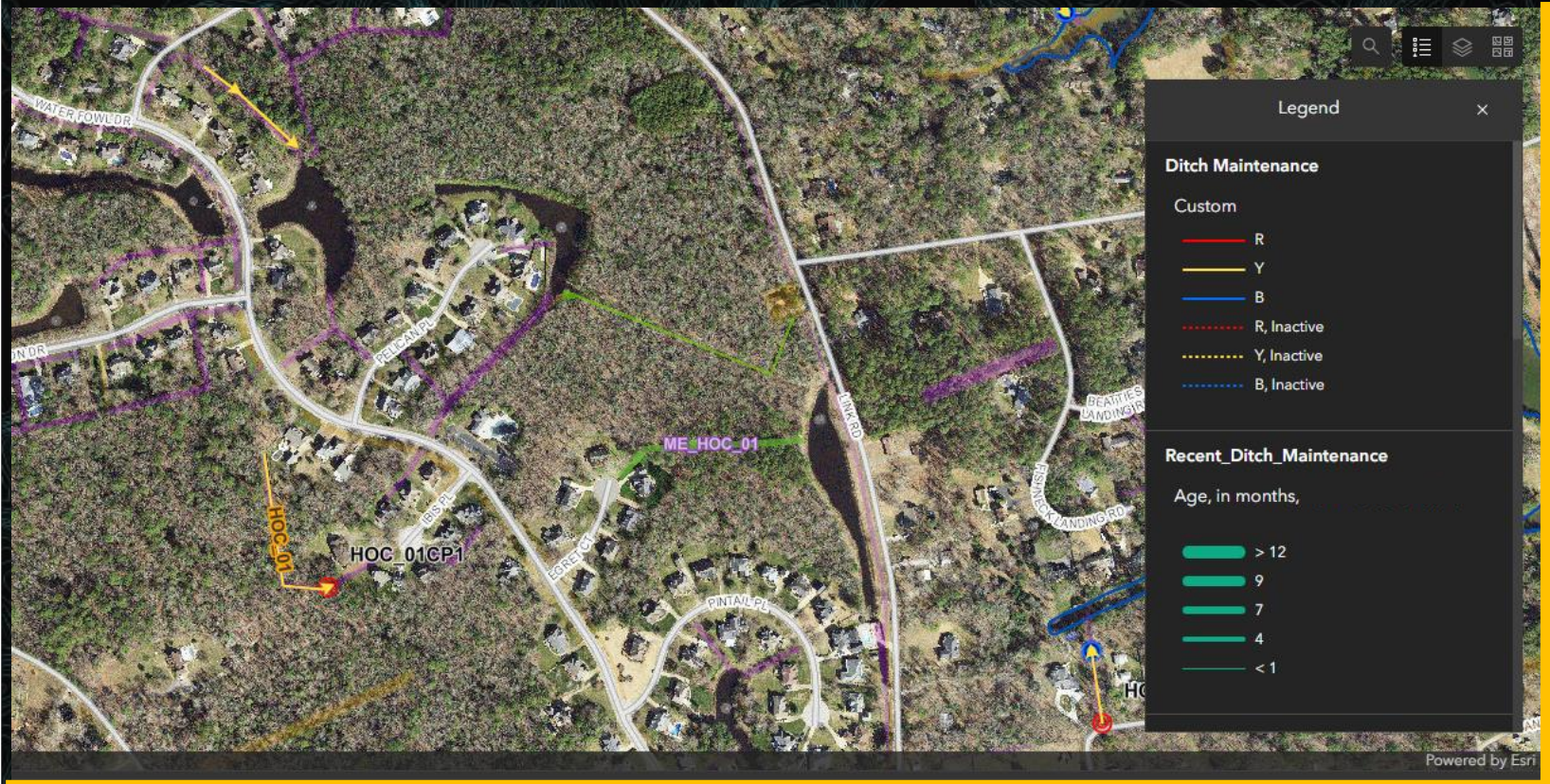
WORK ORDER NUMBER IF APPLICABLE
${WorkorderNumber}

Stormwater Data Entry

Dashboards

Desktop

Superintendents and Supervisors



Ditches to Check

Ditch #: QQL_04
Segment#: S1167
Last Maintained: 4/11/2022, 10:54 AM
Length: 11.28 ft

Ditch #: GRR_04
Segment#: S1036
Last Maintained: 4/18/2022, 11:00 AM
Length: 15.52 ft

Ditch #: QQL_03
Segment#: S1435
Last Maintained: 5/2/2022, 12:18 PM

Ditches to Check

Ditch #: CCU_27
Segment#: S1819
Last Maintained: 2/1/2022, 9:02 AM
Length: 824.55 ft

Ditch #: CCU_07
Segment#: S1579
Last Maintained: 5/9/2022, 8:55 AM
Length: 20.06 ft

Ditch #: CCU_07
Segment#: S0115
Last Maintained: 5/9/2022, 8:55 AM

Ditches to Check

Ditch #: QMC_11
Segment#: S0652
Last Maintained: 3/14/2022, 8:55 AM
Length: 10.71 ft

Ditch #: QMC_11
Segment#: S1801
Last Maintained: 3/14/2022, 8:54 AM
Length: 58.20 ft

Ditch #: PSR_49
Segment#: S1047
Last Maintained: 6/13/2022, 1:28 PM

Done Last Month

Ditch #: QCM_06
Segment#: S1450
Last Maintained: 1/8/2024, 12:39 PM
Length: 762.89 ft

Ditch #: QCM_06
Segment#: S1467
Last Maintained: 1/5/2024, 10:34 AM
Length: 54.98 ft

Ditch #: QCM_06
Segment#: S1189
Last Maintained: 1/5/2024, 10:34 AM

Done Last Month

Ditch #: CCU_07
Segment#: S1577
Last Maintained: 1/8/2024, 12:27 PM
Length: 20.67 ft

Ditch #: CCU_06
Segment#: S1786
Last Maintained: 1/8/2024, 12:26 PM
Length: 312.27 ft

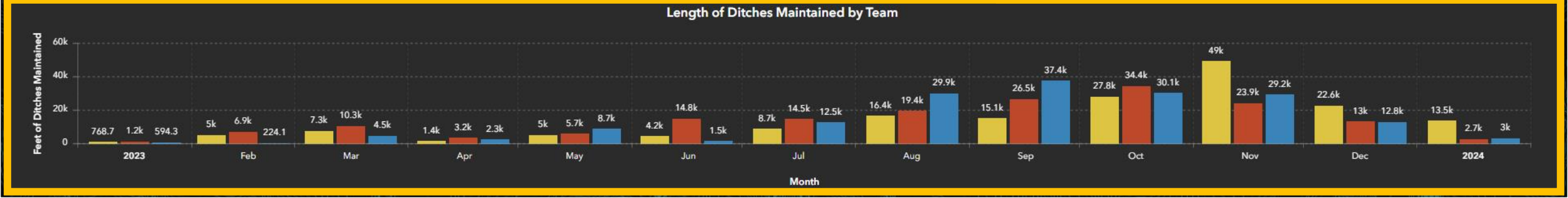
Ditch #: CCU_02
Segment#: S0145
Last Maintained: 1/8/2024, 12:08 PM

Done Last Month

Ditch #: PRL_13
Segment#: S0687
Last Maintained: 1/4/2024, 10:37 AM
Length: 583.86 ft

Ditch #: PRL_12
Segment#: S0676
Last Maintained: 1/4/2024, 10:37 AM
Length: 185.10 ft

Ditch #: PRL_06
Segment#: S0670
Last Maintained: 1/4/2024, 10:36 AM



Stormwater Data Entry

Dashboards

Desktop

Chiefs, Directors, etc.

Length of Ditches Maintained

Team	Ditch Length(ft)
Blue	180,223
Red	181,363
Yellow	180,992
TOTAL	542,578

YTD Ditches Cleaned by Supervisor District

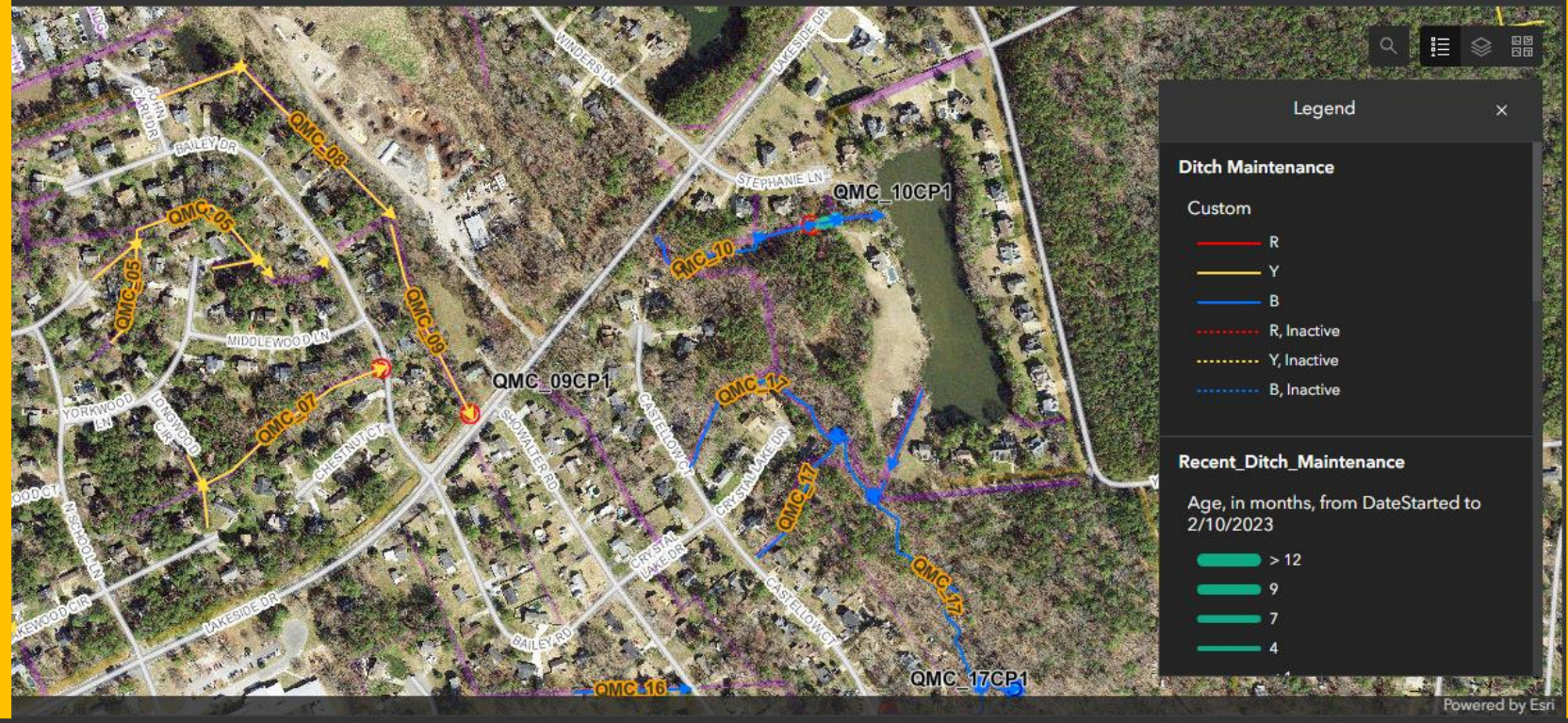
Supervisor District	Ditch Length(ft)	# of Segments
1	4,116	11
2	1,198	8
3	6,883	23
4	12,648	53
5	823	3

YTD Pounds of Debris Removed

28.7k

Doesn't include debris picked up by WM

Convert feet to miles by multiplying by 0.000189394



Ditch Segments Maintained in the Last 7 Days

Search...

Ditch #: QUL_09 Segment #: S1311
Team: R
Last Maintained: 1/11/2024, 9:53 AM
Service Request #: NA

Ditch #: QUL_09 Segment #: S1456
Team: R
Last Maintained: 1/11/2024, 9:52 AM
Service Request #: NA

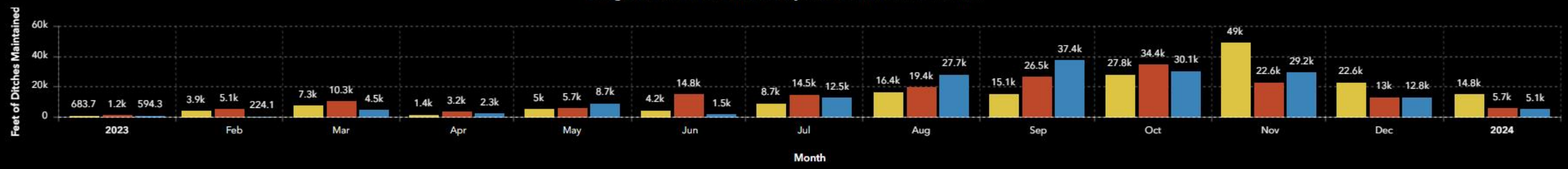
Ditch #: QUL_10 Segment #: S1310
Team: R
Last Maintained: 1/11/2024, 9:50 AM
Service Request #: NA

Ditch #: CCU_18 Segment #: S0475
Team: Y
Last Maintained: 1/11/2024, 9:43 AM
Service Request #: NA

Ditch #: CCU_16 Segment #: S1584
Team: Y
Last Maintained: 1/11/2024, 9:43 AM
Service Request #: NA

Ditch #: CCU_16 Segment #: S0484

Length of Ditches Maintained by Team in the Past 12 Months

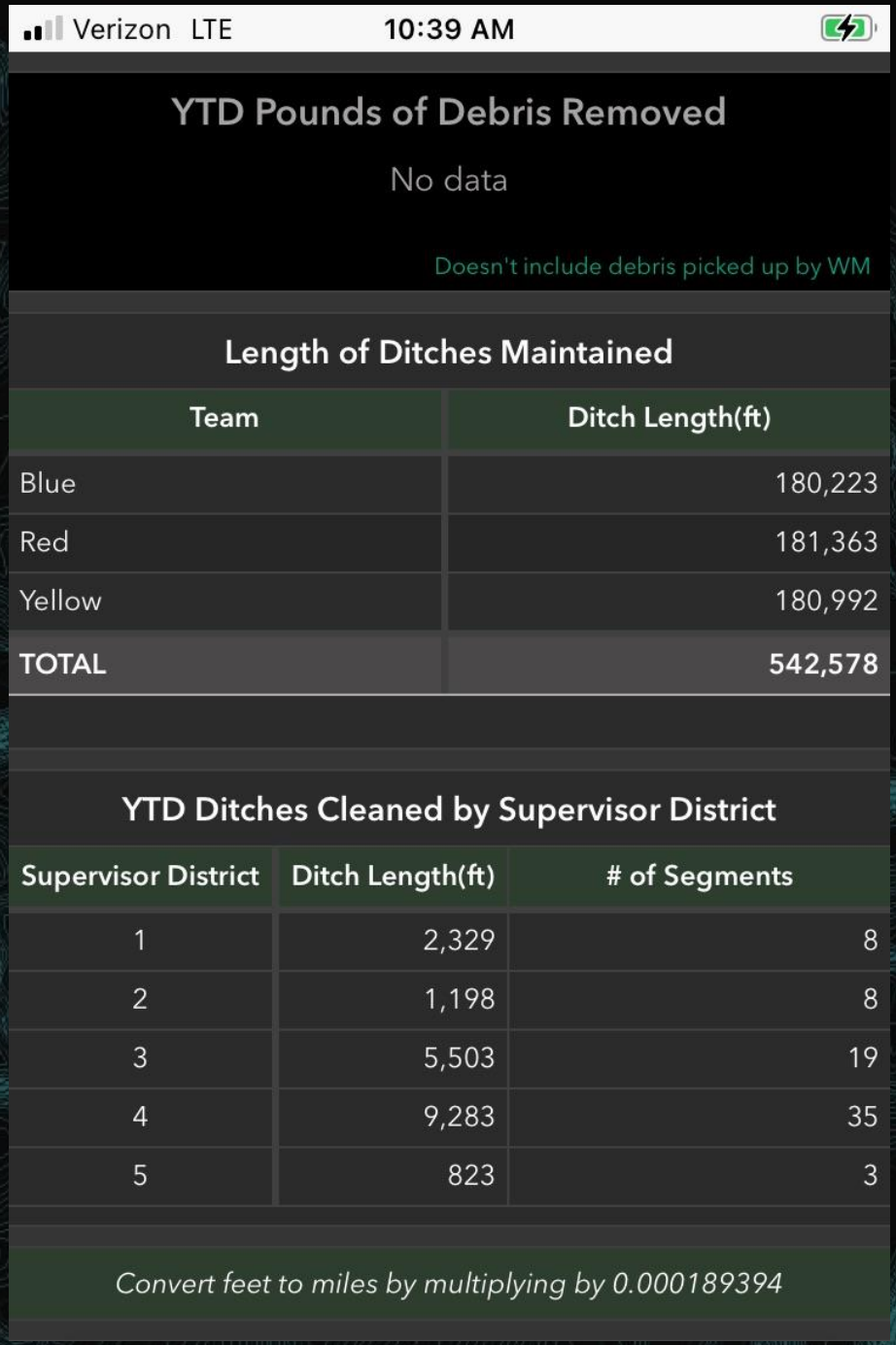


Stormwater Data Entry

Dashboards

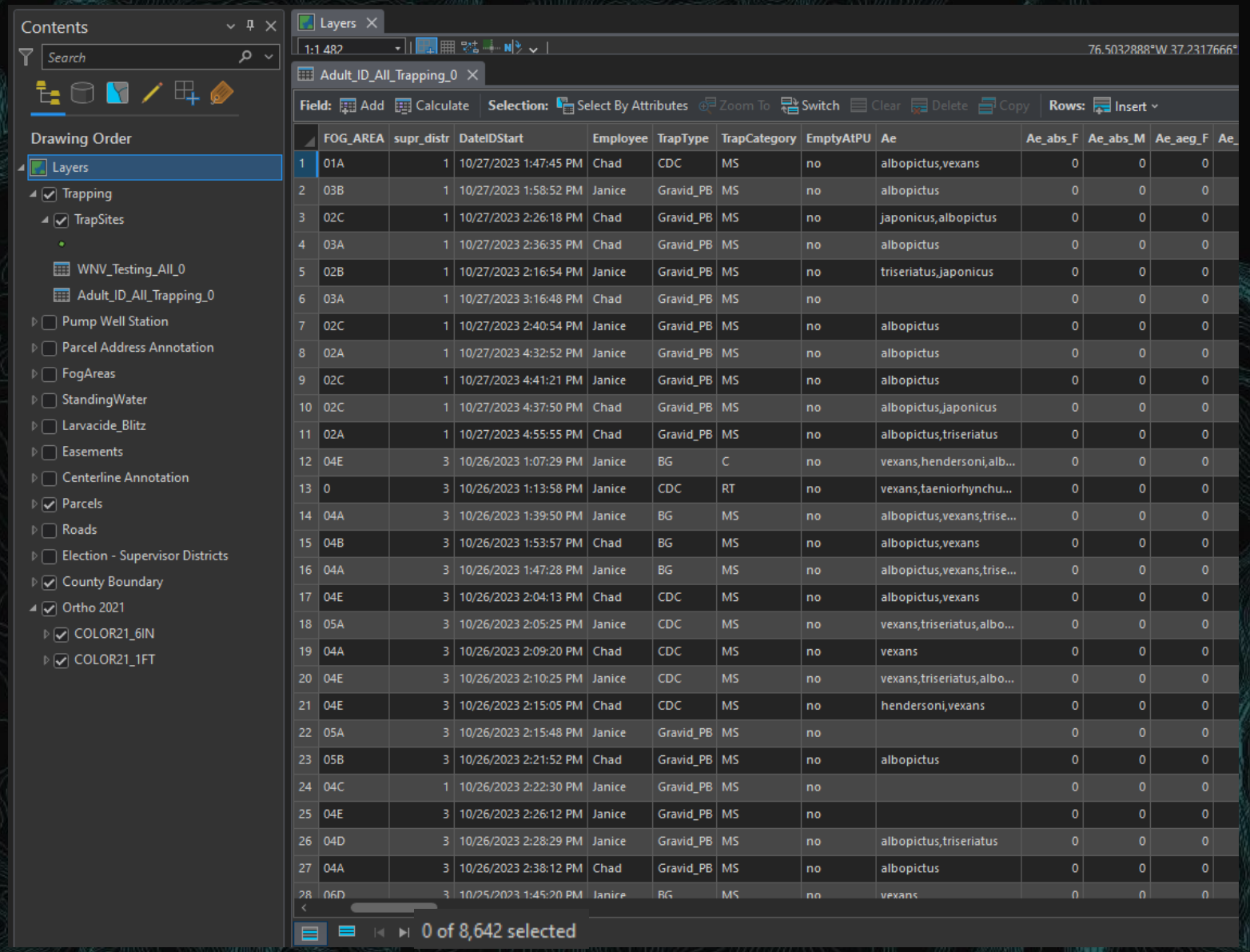
Mobile Device

- Based off a hyperlink, not an app
  - Bookmark or favorite the link on your web browser



Mosquito Control Data Entry

- Updated it this off season
- Wanted to incorporate past trapping, testing, and adulticiding data up to 2018
  - Format and compile everything
  - Figure out how to manually create a relationship class to existing tabular data



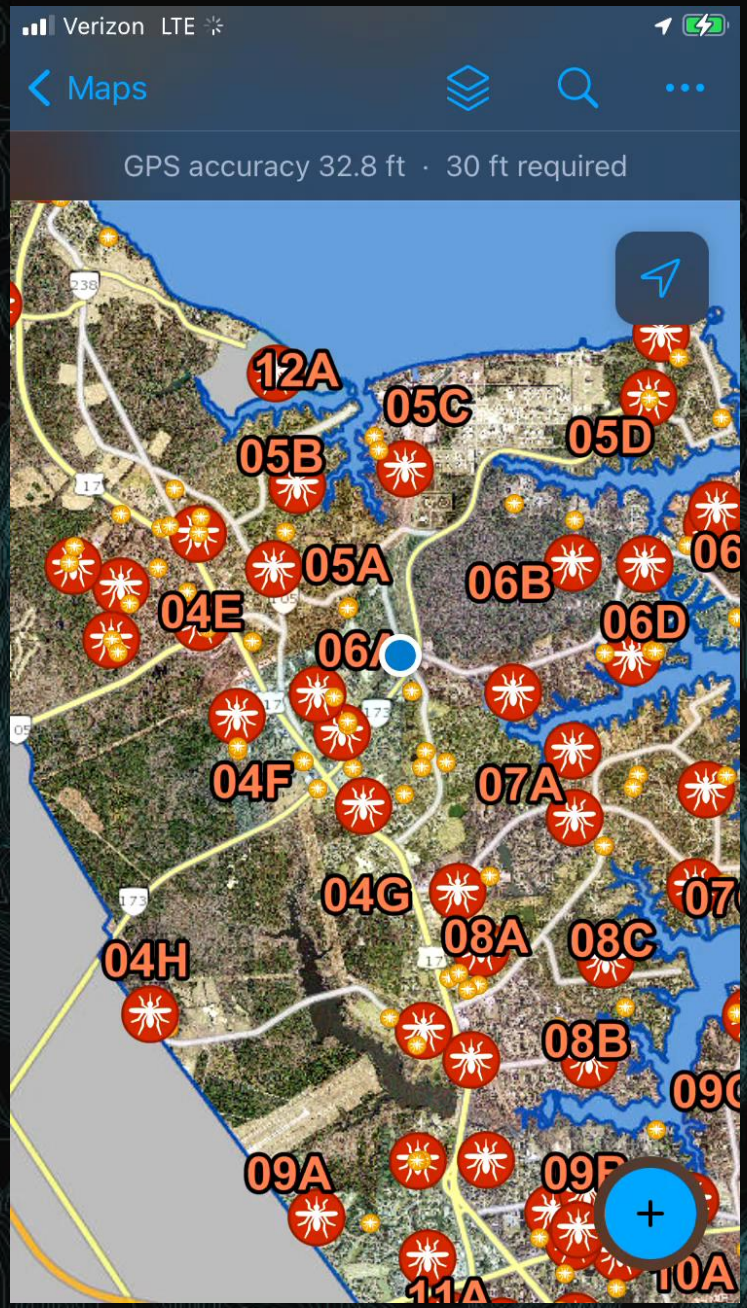
	FOG_AREA	supr_distr	DateIDStart	Employee	TrapType	TrapCategory	EmptyAtPU	Ae	Ae_abs_F	Ae_abs_M	Ae_aeg_F
1	01A	1	10/27/2023 1:47:45 PM	Chad	CDC	MS	no	albopictus,vexans	0	0	0
2	03B	1	10/27/2023 1:58:52 PM	Janice	Gravid_PB	MS	no	albopictus	0	0	0
3	02C	1	10/27/2023 2:26:18 PM	Chad	Gravid_PB	MS	no	japonicus,albopictus	0	0	0
4	03A	1	10/27/2023 2:36:35 PM	Chad	Gravid_PB	MS	no	albopictus	0	0	0
5	02B	1	10/27/2023 2:16:54 PM	Janice	Gravid_PB	MS	no	triseriatus,japonicus	0	0	0
6	03A	1	10/27/2023 3:16:48 PM	Chad	Gravid_PB	MS	no		0	0	0
7	02C	1	10/27/2023 2:40:54 PM	Janice	Gravid_PB	MS	no	albopictus	0	0	0
8	02A	1	10/27/2023 4:32:52 PM	Janice	Gravid_PB	MS	no	albopictus	0	0	0
9	02C	1	10/27/2023 4:41:21 PM	Janice	Gravid_PB	MS	no	albopictus	0	0	0
10	02C	1	10/27/2023 4:37:50 PM	Chad	Gravid_PB	MS	no	albopictus,japonicus	0	0	0
11	02A	1	10/27/2023 4:55:55 PM	Chad	Gravid_PB	MS	no	albopictus,triseriatus	0	0	0
12	04E	3	10/26/2023 1:07:29 PM	Janice	BG	C	no	vexans,hendersoni,alb...	0	0	0
13	0	3	10/26/2023 1:13:58 PM	Janice	CDC	RT	no	vexans,taeniorhynchu...	0	0	0
14	04A	3	10/26/2023 1:39:50 PM	Janice	BG	MS	no	albopictus,vexans,trise...	0	0	0
15	04B	3	10/26/2023 1:53:57 PM	Chad	BG	MS	no	albopictus,vexans	0	0	0
16	04A	3	10/26/2023 1:47:28 PM	Janice	BG	MS	no	albopictus,vexans,trise...	0	0	0
17	04E	3	10/26/2023 2:04:13 PM	Chad	CDC	MS	no	albopictus,vexans	0	0	0
18	05A	3	10/26/2023 2:05:25 PM	Janice	CDC	MS	no	vexans,triseriatus,albo...	0	0	0
19	04A	3	10/26/2023 2:09:20 PM	Chad	CDC	MS	no	vexans	0	0	0
20	04E	3	10/26/2023 2:10:25 PM	Janice	CDC	MS	no	vexans,triseriatus,albo...	0	0	0
21	04E	3	10/26/2023 2:15:05 PM	Chad	CDC	MS	no	hendersoni,vexans	0	0	0
22	05A	3	10/26/2023 2:15:48 PM	Janice	Gravid_PB	MS	no		0	0	0
23	05B	3	10/26/2023 2:21:52 PM	Chad	Gravid_PB	MS	no	albopictus	0	0	0
24	04C	1	10/26/2023 2:22:30 PM	Janice	Gravid_PB	MS	no		0	0	0
25	04E	3	10/26/2023 2:26:12 PM	Janice	Gravid_PB	MS	no		0	0	0
26	04D	3	10/26/2023 2:28:29 PM	Janice	Gravid_PB	MS	no	albopictus,triseriatus	0	0	0
27	04A	3	10/26/2023 2:38:12 PM	Chad	Gravid_PB	MS	no	albopictus	0	0	0
28	06D	3	10/25/2023 1:45:20 PM	Janice	BG	MS	no	vexans	0	0	0

Mosquito Control Data Entry

Fish Deliveries and WNV Testing

Field Maps

- Fish deliveries
  - Add a new point to the map and fill out the associated questions/fields
- Testing
  - The concept is to write it down on paper, as we usually do, then enter it after testing is completed



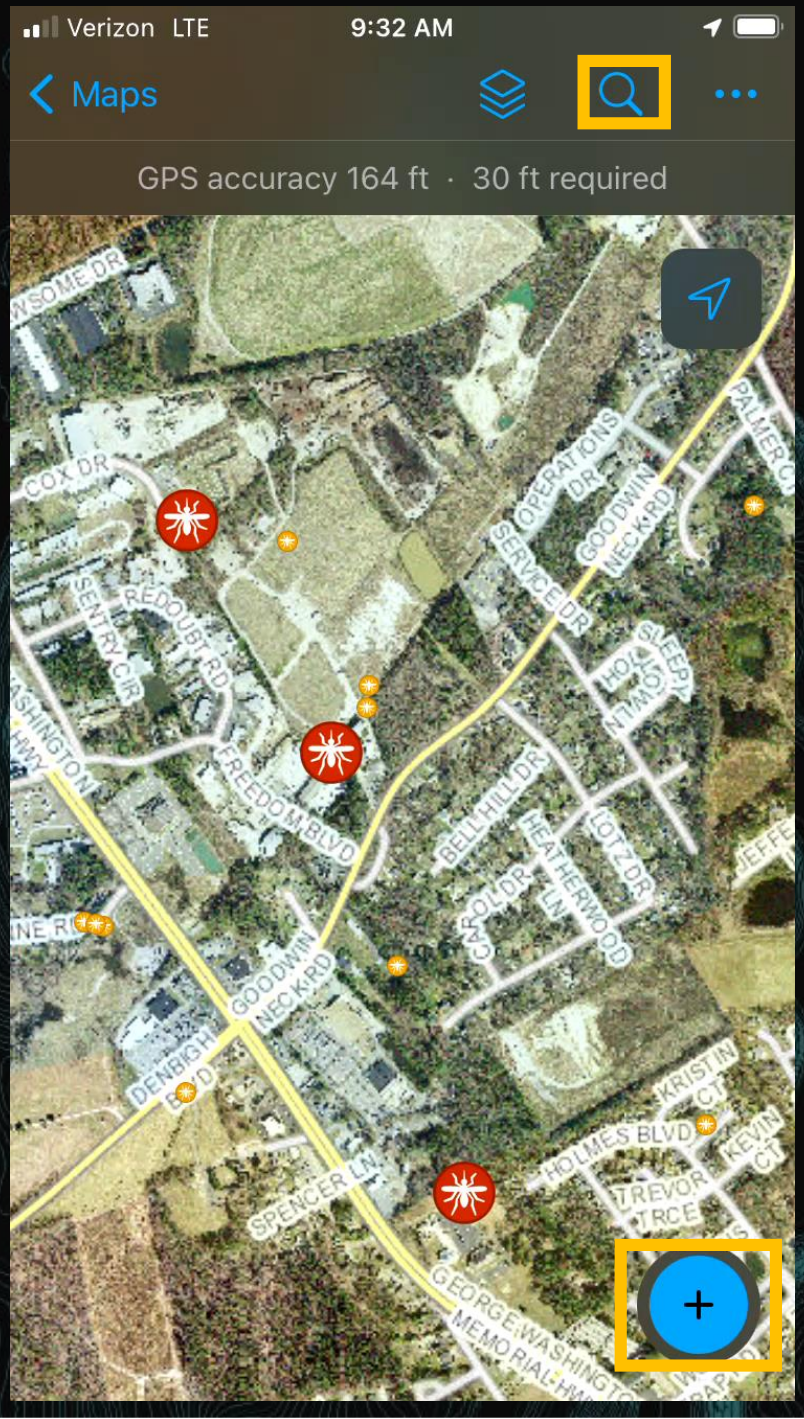
Mosquito Control Data Entry

Trapping

Field Maps

Survey123

- Can pan or search for a trap site or address
- New trap sites and/or non monitoring sites can be added
- Click a site and open Google Maps to navigate to it
- May help interns learn the sites faster visually seeing where sites are instead of on a piece of paper



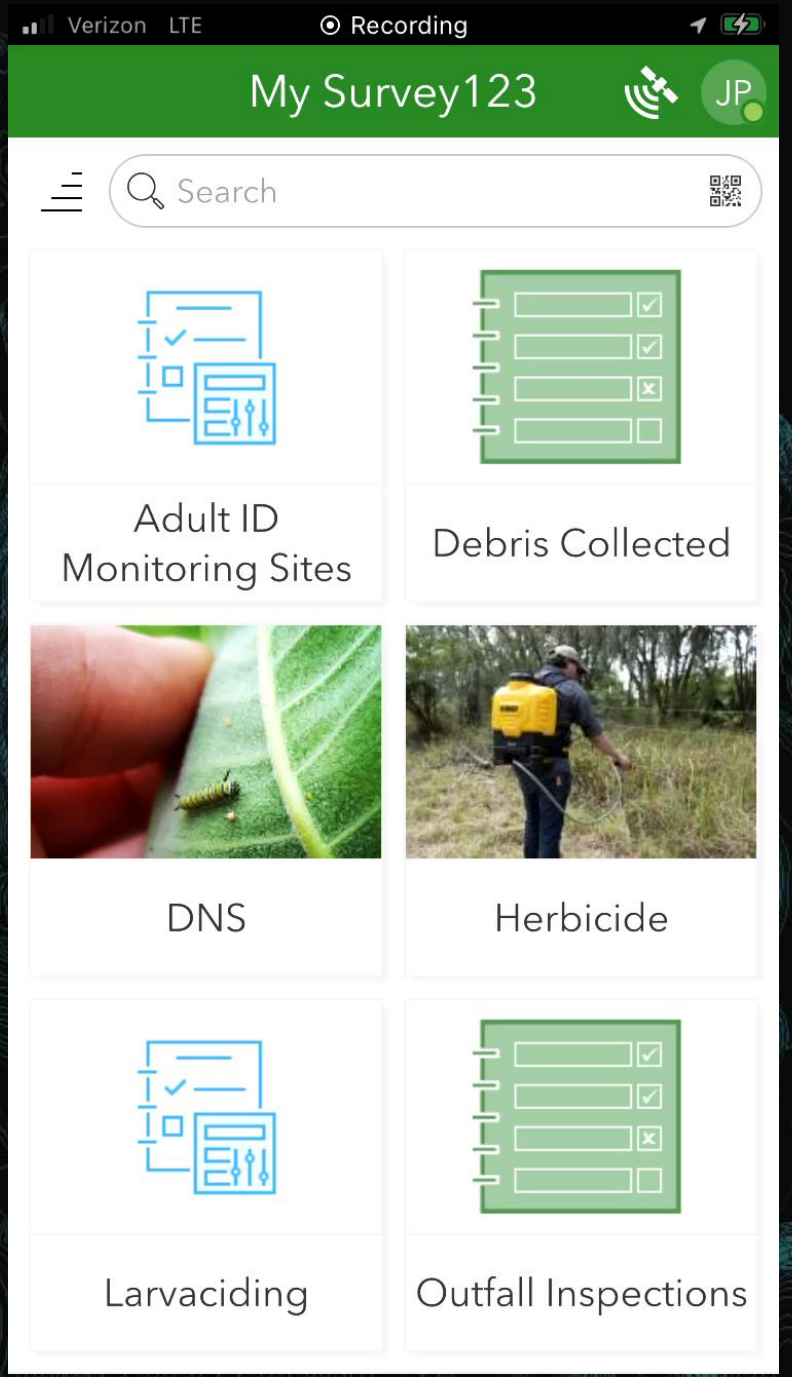
Mosquito Control Data Entry

Yard Inspections and Larvaciding

Field Maps

Survey123

- Larvaciding
  - Combined 4 surveys into 1
- Entries show up on map after submitting



Mosquito Control Data Entry

Dashboards

Desktop

MC Overview

Year to Date Data

Trapping by Supervisor District

Sup Dist	Traps Set	Males	Females	Total
1	200	414	16,093	16,508
2	160	2,220	9,159	11,383
3	489	1,881	27,089	28,954
4	209	1,140	8,293	9,435
5	268	286	10,470	10,760

Trapping by Sup Dist

WNV Pools

709

WNV Positives

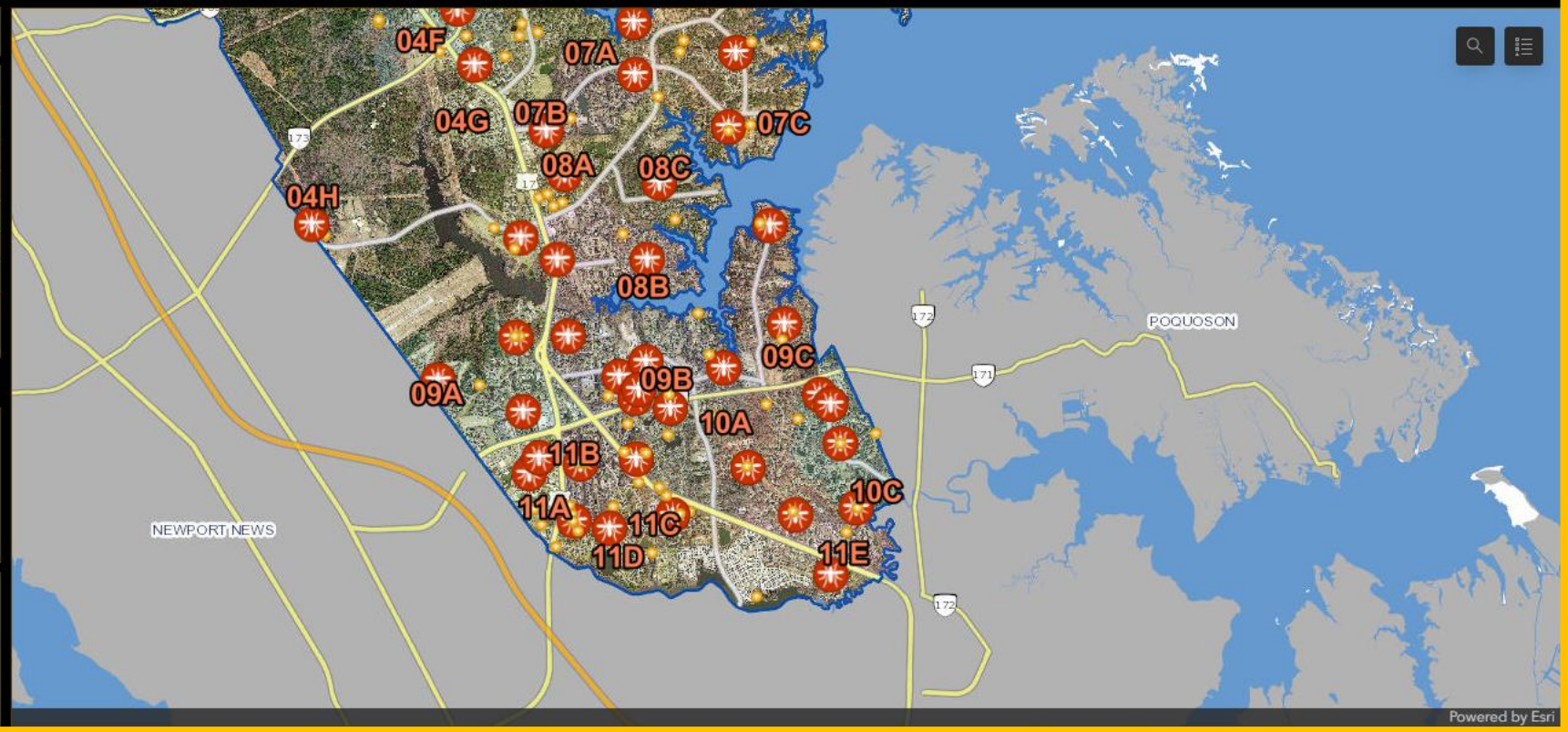
12

Yard Inspections

0

Fish Deliveries

0



WNV Positve Data

Search...

10/8/2023, 8:00 PM **EPI:**41
Trap: T003 **Pool #:** 679

10/4/2023, 8:00 PM **EPI:**40
Trap: T088 **Pool #:** 673

10/2/2023, 8:00 PM **EPI:**40
Trap: T085 **Pool #:** 662

10/1/2023, 8:00 PM **EPI:**40
Trap: T073 **Pool #:** 656

9/24/2023, 8:00 PM **EPI:**39
Trap: T094 **Pool #:** 589

9/10/2023, 8:00 PM **EPI:**37
Trap: T001 **Pool #:** 512

9/10/2023, 8:00 PM **EPI:**37
Trap: T046 **Pool #:** 484

9/6/2023, 8:00 PM **EPI:**36
Trap: T045 **Pool #:** 478

9/6/2023, 8:00 PM **EPI:**36
Trap: T046 **Pool #:** 476

WNV + Data

Deselect selection before moving onto another data list. Ignore time on lists above, it is the default.

WNV Positives by EPI Week 2018-Present

Total Caught | Trapping Avg | WNV Pos

Approximate EPI Weeks by Month: April 13-17 | May 18-22 | June 23-26 | July 27-31 | August 32-35 | September 36-39 | October 40-43

Mosquito Control Data Entry

Dashboards

Desktop

Adulticiding

Area(s) Adulticided

Fog Area: 09B
Treated: 9/13/2023, 8:00 PM
Product: Merus

Fog Area: 09A
Treated: 9/13/2023, 8:00 PM
Product: Merus

Fog Area: 10B
Treated: 9/13/2023, 8:00 PM
Product: Merus

Fog Area: 10C
Treated: 9/13/2023, 8:00 PM
Product: Merus

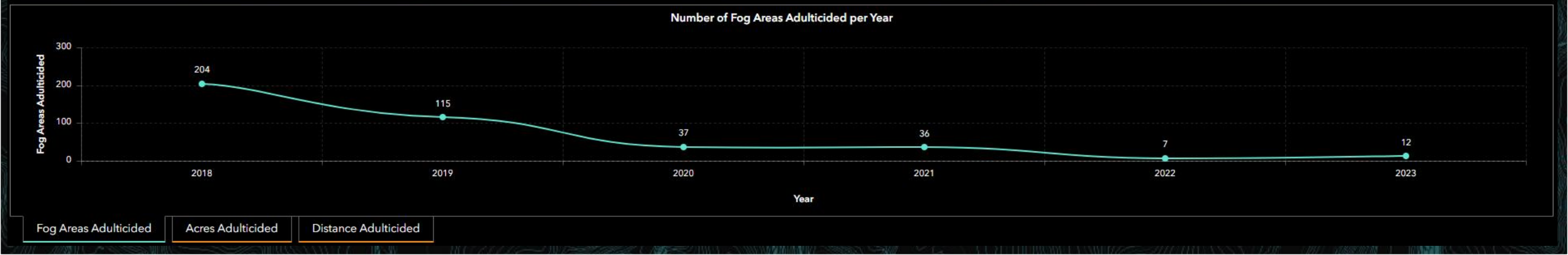
Fog Area: 10B
Treated: 8/10/2023, 8:00 PM
Product: Merus

Fog Area: 10C
Treated: 8/10/2023, 8:00 PM
Product: Merus

Fog Area: 09B
Treated: 8/1/2023, 8:00 PM
Product: Merus

Fog Area: 10C
Treated: 8/1/2023, 8:00 PM
Product: Merus

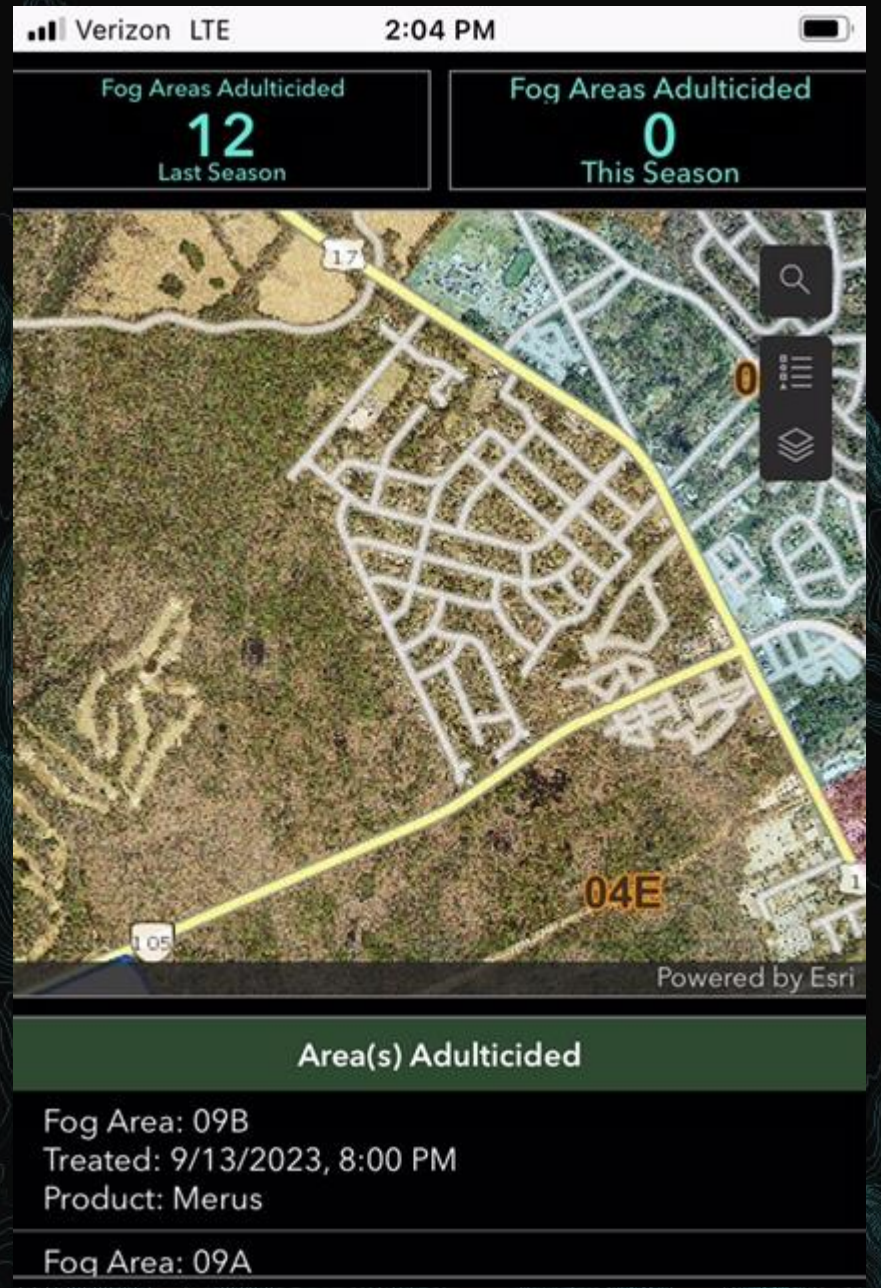
Laster aerial flight was September of 2013



Mosquito Control Data Entry

Dashboards

Mobile Device



Learning Curve

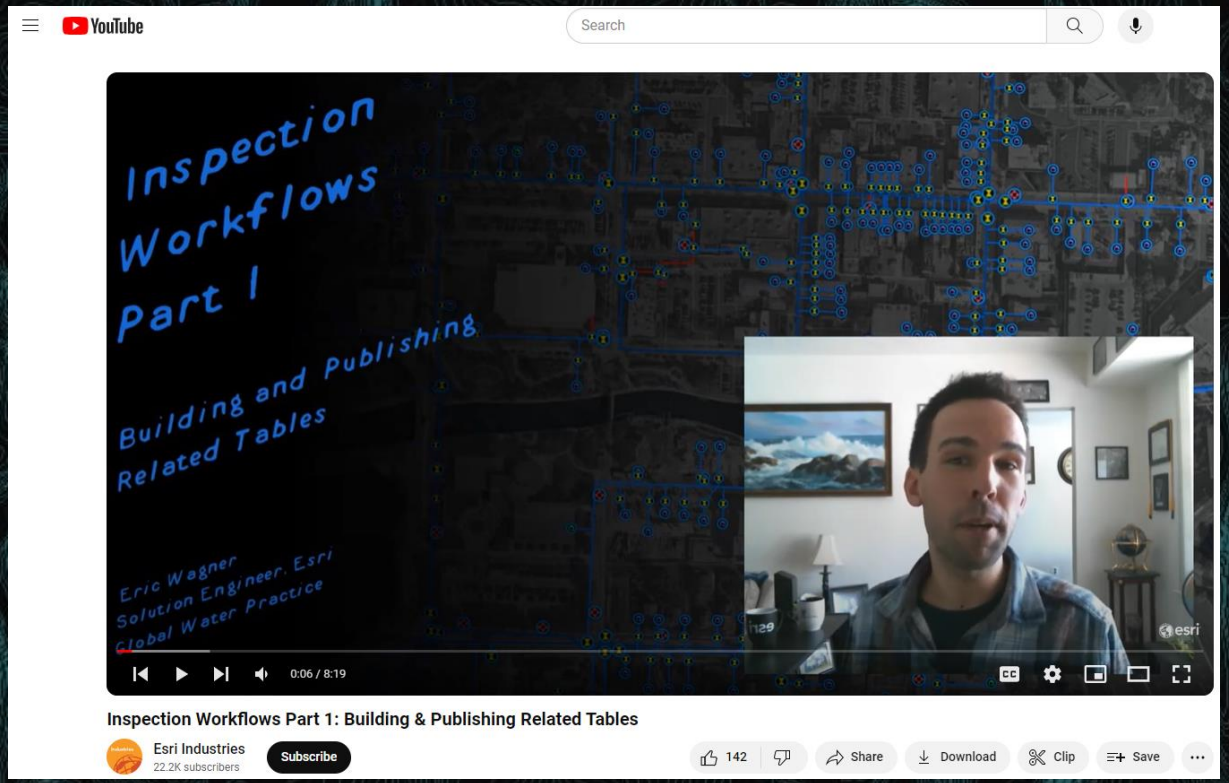
- ArcPro, Field Maps, arcade (like a coding language), and Dashboards are all new programs to me
  - Biggest help:
    - Esri's Eric Wagner step by step tutorial on how to setup Field Maps
    - Esri community forums

- Naming
  - Single digit numbers should be preceded with a "0" for the search function to work well
  - Same length for everything in a field

Fog Area

Run

```
1  if (IsEmpty(Geometry($feature))){
2    return;
3  }
4  else{
5      var parcels_FS = Intersects($feature, FeatureSetByName($map, "Fog Areas"));
6        if (Count(parcels_FS) == 1){
7          return Text(First(parcels_FS).FogArea);
8        }
9  }
```

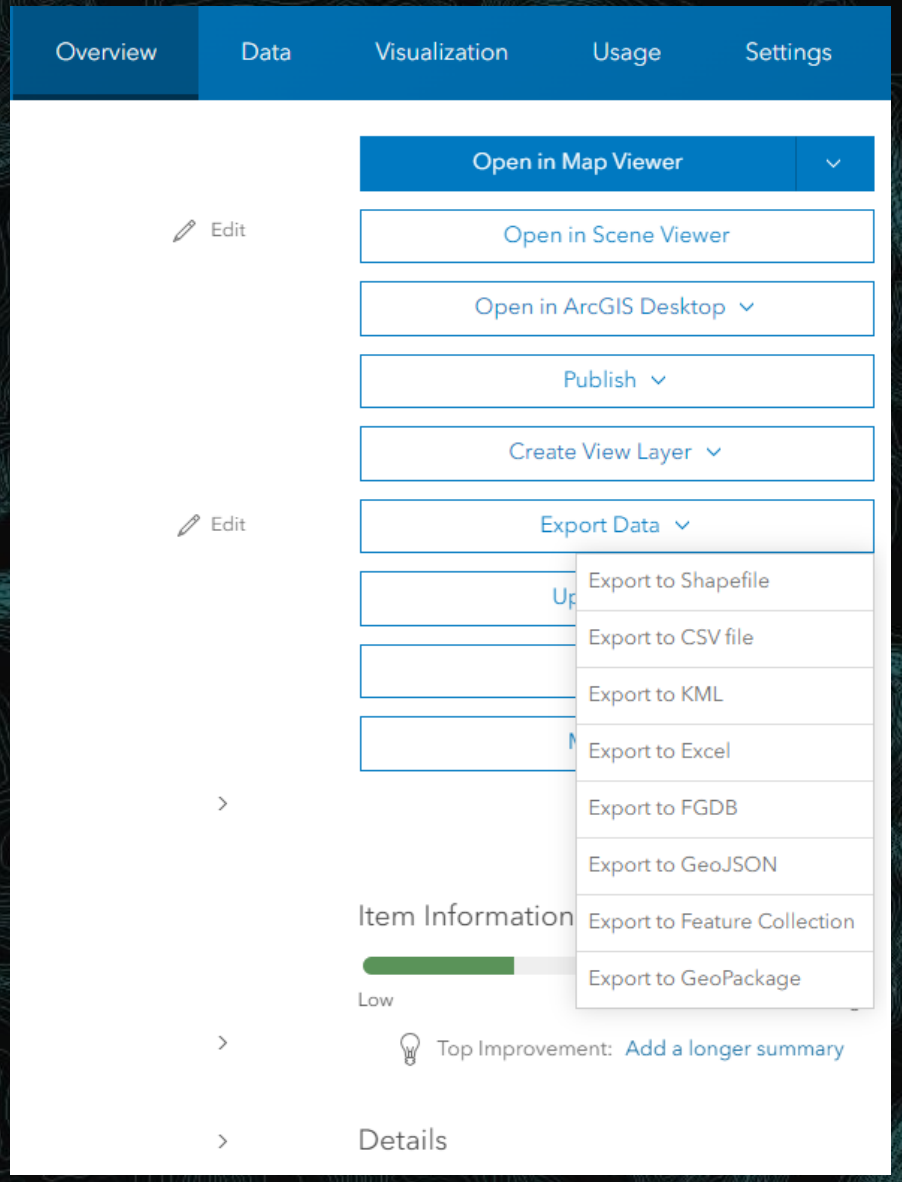


Drawbacks

- Everything is stored on AGOL
  - Data storage or credit issue?
  - May be used to it on a different format, but you can export attribute tables to Excel

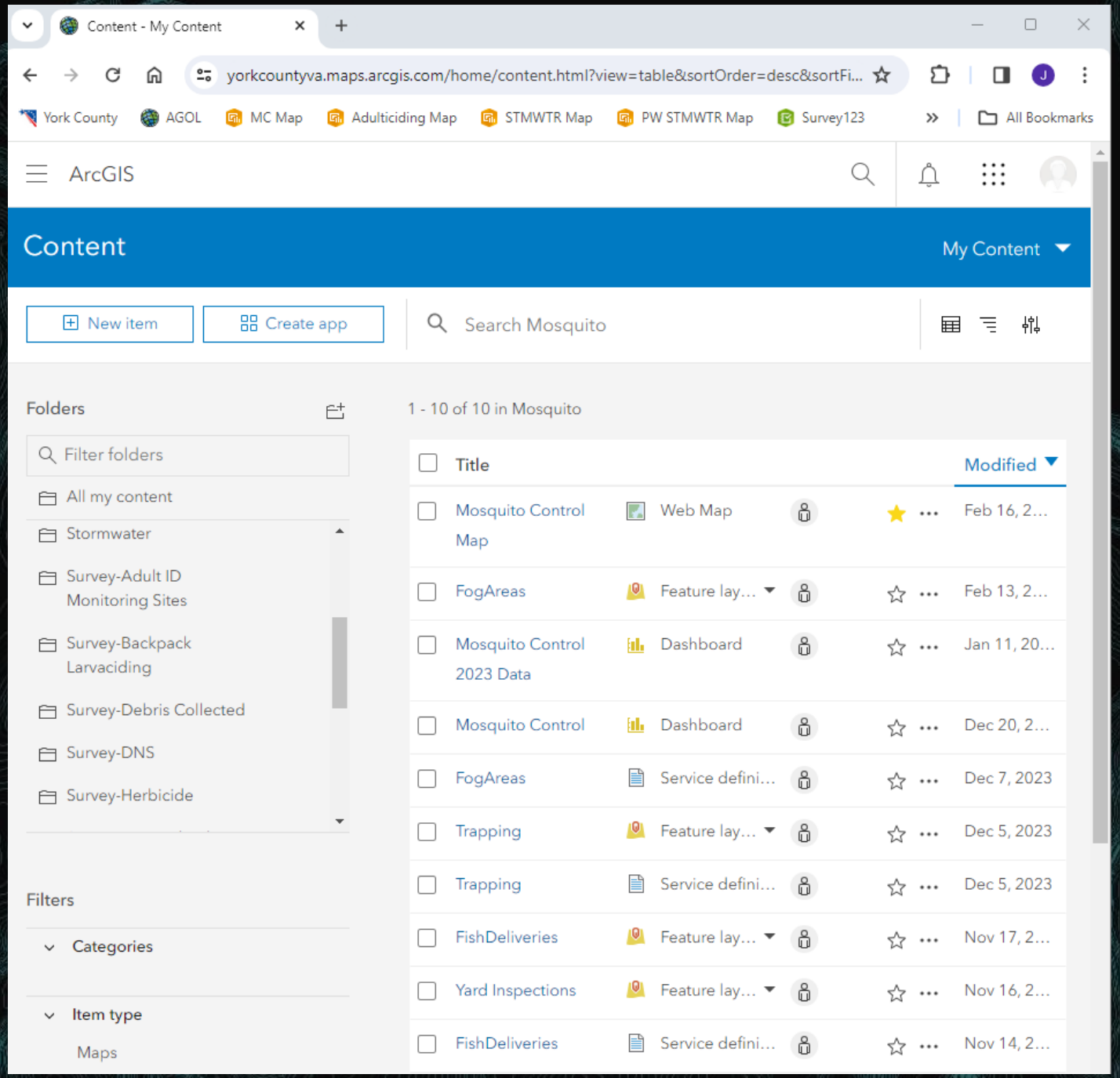
- Access to ArcPro and have a standard license
  - Can't create a relationship class with a basic license, but can have someone with one to

- Learning how to do this
  - Ask your GIS people do it instead?



Benefits

- Totally customizable, within your own ability, and updated on your time
  - Can be designed for any level of worker
- Makes looking up data at your desk or phone very easy and quick
  - Can answer questions out in the field
- Apps are constantly being updated from what users want to see in them, so functionality will get better over time
  - Downside is keeping up with the latest and greatest features



Thank you