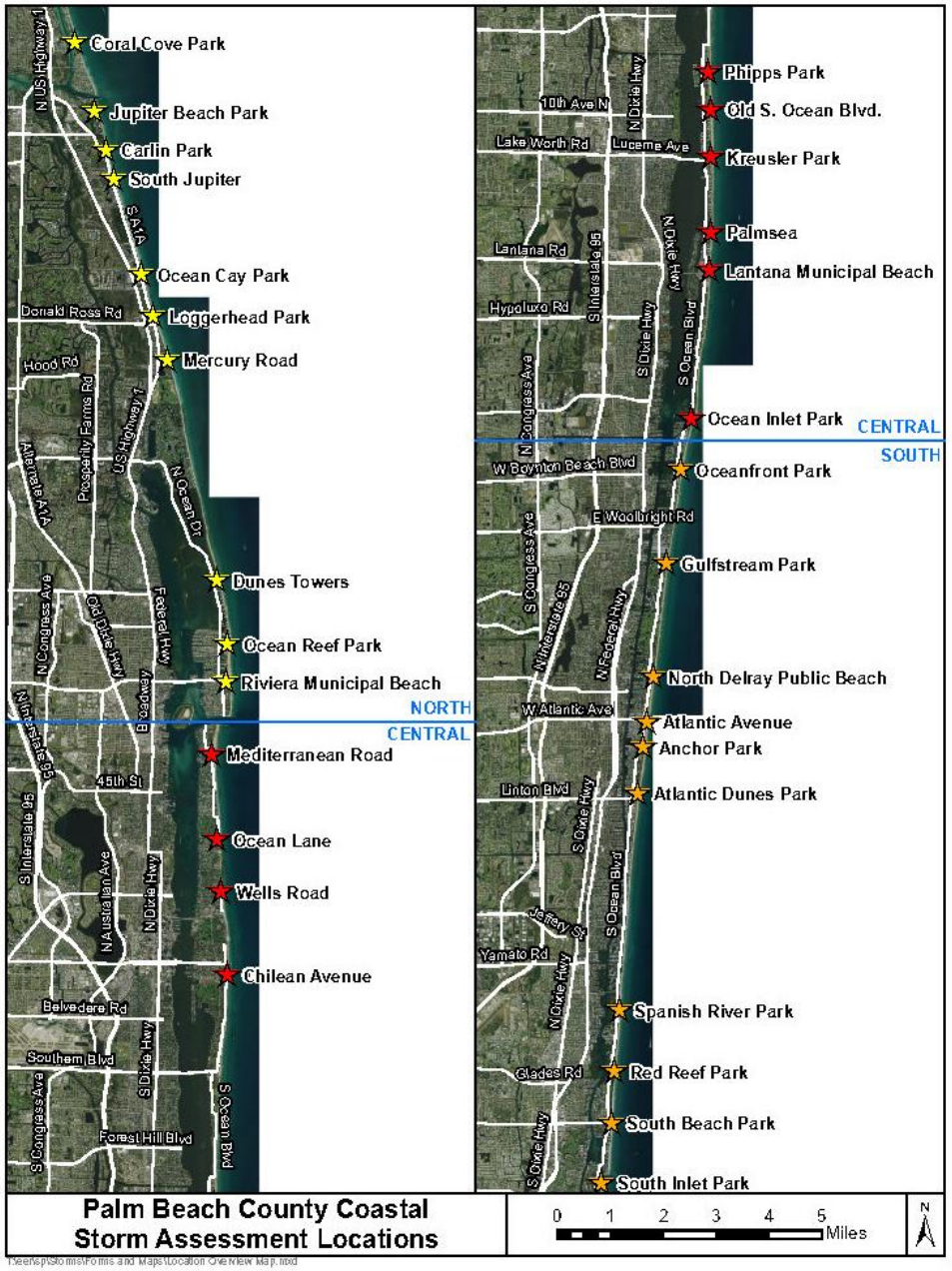
Survey123 and Drone Applications for Post-Storm Impact Data Collection

Palm Beach County - Coastal Resources Management

Hailey Wilson & Dani Tabilo



Pre and Post Storm Assessments

Pre-Storm Assessment measurements for baseline condition

30 predetermined locations along Palm Beach County coastline
- 3 teams with 10 sites each

Immediately following a storm, County staff take preliminary surveys to identify need of professional engineering surveys

PBC ERM Beach Erosion Team

Storm Survey Worksheet

Storm:	Surveyor Names:								
	Pre-Storm Date:					Post-Storm Date:			
Location	Time	TOD	MHW	MBD	REF	Time	TOD	MHW	REF

TOD: Toe of Dune (if no post-storm change, just copy the pre-storm number)
MHW: Mean High Water (where a flat ocean would intersect the beach at high tide)
MBD: Mid-Berm Distance (half of the pre-storm MHW distance)
REF: Elevation Reference (elevation measurements + reference marker description if changed)

Measurements taken with survey wheel, survey pole, bubble level, and stationary marker

Storm Assessments

PBC ERM Beach Erosion Team
Storm Survey Worksheet

Storm:	Surveyor Names:								
	Pre-Storm Date:					Post-Storm Date:			
Location	Time	TOD	MHW	MBD	REF	Time	TOD	MHW	REF

TOD: Toe of Dune (if no post-storm change, just copy the pre-storm number)
MHW: Mean High Water (where a flat ocean would intersect the beach at high tide)
MBD: Mid-Berm Distance (half of the pre-storm MHW distance)
REF: Elevation Reference (elevation measurements + reference marker description if changed)

BEFORE Survey123:

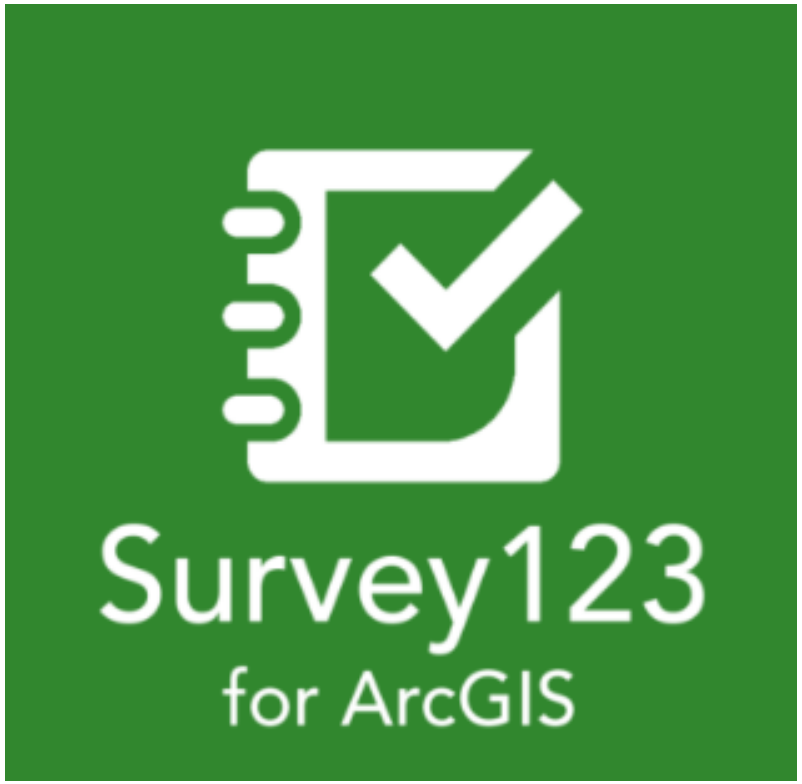
Paper Worksheet filled out in the field
- Pre/Post storm on one sheet

Scanned and emailed back to engineer to analyze field data

Potential Problems:

-Handwriting -Wind/Rain -Lost Document

-Timely to input data twice



Survey123

Damage Assessment Worksheet/Storm Survey

Damage Assessment and Storm Survey
PRE-STORM

Date and Time*

MM/DD/YYYY -- : -- --

Storm Name*

- Erin
- Imelda

Region*

- North
- Central
- South

Toe of Dune (TOD)*

Edge of Vegetation (EOV)*

Mean High Water (MHW)*

Where a flat ocean would intersect the beach at high tide

Mid-Berm Distance (MBD)*

Half of the pre-storm MHW distance

Elevation Reference (REF)*

Half of the pre-storm MHW distance

Damage Assessment Notes*

Describe: Dune Overwash, Dune Plant Loss, Structure Damage, Debris, Sea Turtle Nest Impacts, Tide/Wind/Sea Conditions, Etc.
Include: Location and Size of Damage Area, Severity, Number of Washed Out Nests/Eggs, Etc.

1000

Photos

N, S, E, W at TOD/EOV
N, S, E, W at MHW
Any additional points of interest

1 Drop image here or select image (number of files allowed: 1 - 99)

Submit

Region*

- (•) North
- ( ) Central
- ( ) South

Location*

North

Coral Cove Park ▾

Coral Cove Survey Site

Surveyors*

North

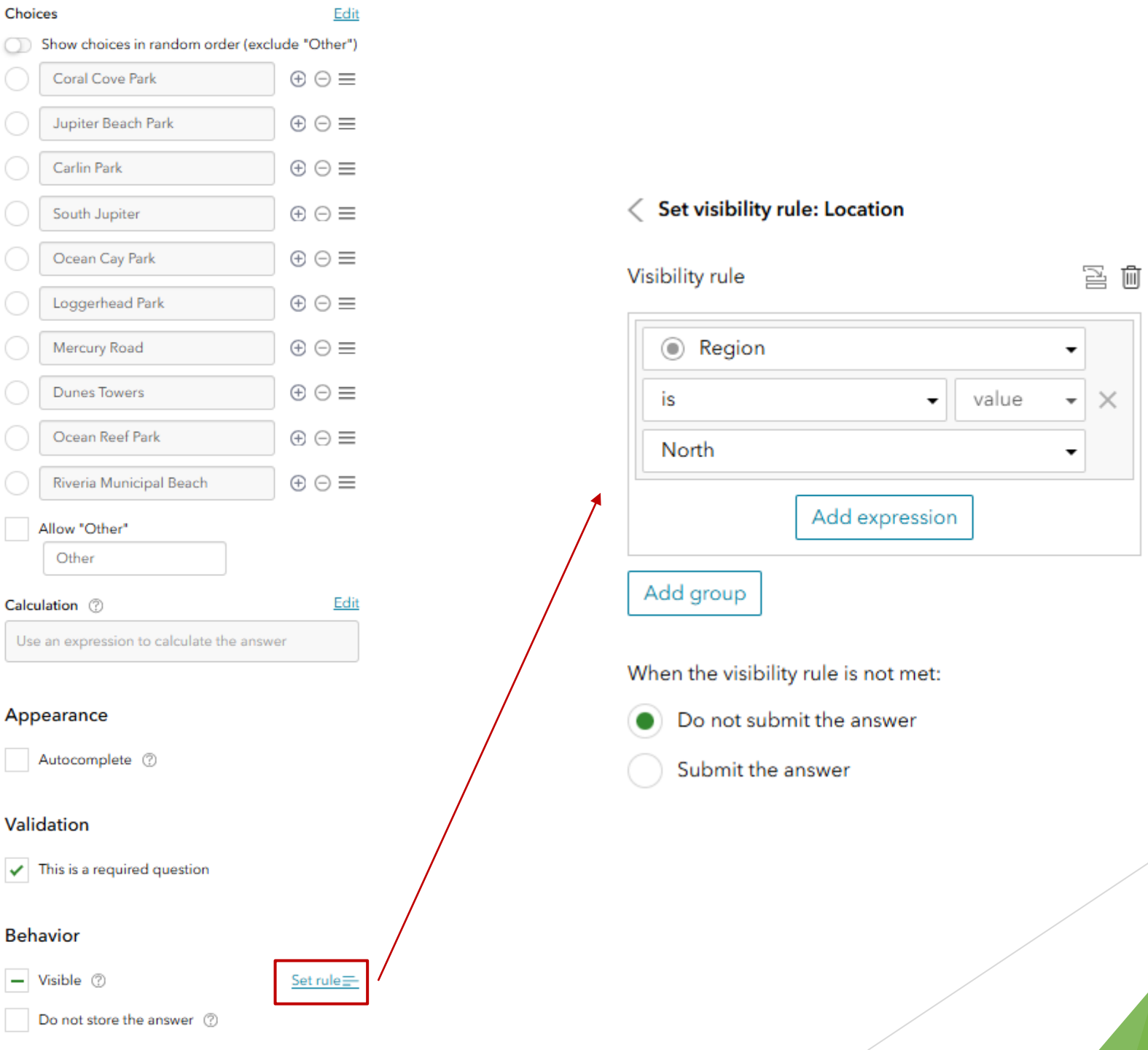
- [ ] Andy Studt
- [ ] Mike Stahl
- [ ] Dave Swigler
- [ ] Other

This is a required question.

Choices Edit

Show choices in random order (exclude "Other")

- Coral Cove Park
- Jupiter Beach Park
- Carlin Park
- South Jupiter
- Ocean Cay Park
- Loggerhead Park
- Mercury Road
- Dunes Towers
- Ocean Reef Park
- Riveria Municipal Beach


Choices
Edit
Show choices in random order (exclude "Other")
Coral Cove Park
Jupiter Beach Park
Carlin Park
South Jupiter
Ocean Cay Park
Loggerhead Park
Mercury Road
Dunes Towers
Ocean Reef Park
Riveria Municipal Beach
Allow "Other"
Other
Calculation
Edit
Use an expression to calculate the answer
Appearance
Autocomplete
Validation
This is a required question
Behavior
Visible
Set rule
Do not store the answer
Set visibility rule: Location
Visibility rule
Region
is
value
North
Add expression
Add group
When the visibility rule is not met:
Do not submit the answer
Submit the answer

Region*

- North
- Central
- South

Location*

Central

-Please select-

- Mediterranean Road
- Ocean Lane
- Wells Road
- Chilean Ave

- Katie Steinhoff
- Kayla Harris
- Other

This is a required question.

Mediterranean Road Survey Site

Ocean Lane Survey Site

Wells Road Survey Site

Chilean Ave Survey Site

Note

Label

Mediterranean Road Survey Site

Description

Font size x-small

Calculation Edit

Use an expression to calculate the answer

Behavior

Visible Set rule

Set visibility rule: Mediterranean Road Survey Site

Visibility rule

Location

is value

Mediterranean Road

Add expression

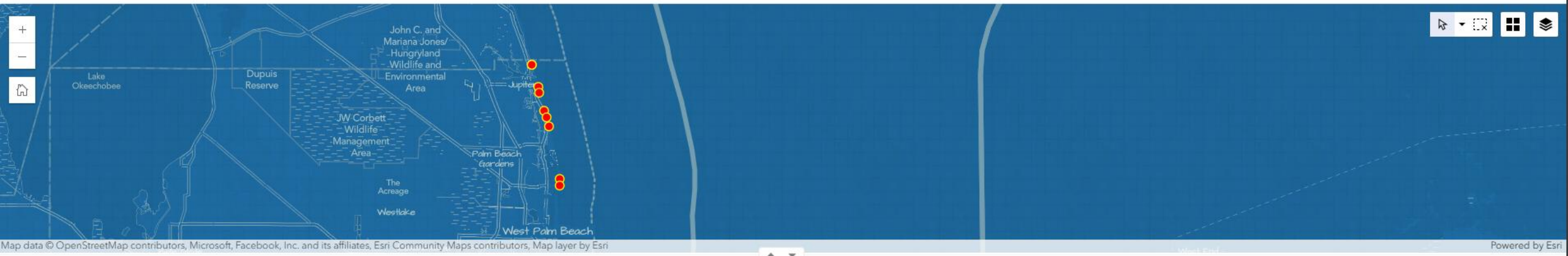
Add group

ArcGIS Survey123 My surveys

HWilson

PBC ERM Beach Erosion - PRE-STORM | Overview | Design | Collaborate | Analyze | Data | Settings

8/19/25 - 1/6/26 | Filter | Report | Export | Open in Map Viewer | Form view | 19/19



PBC ERM Beach Erosion - ...

EditDate	Date and Time	Location	Surveyors	Other - Surveyors	Toe of Dune (TOD)	Mean High Water (...	Mid-Berm Distanc...	Elevation Referenc...	Damage Asse
9/29/25, 2:22 PM	9/29/25, 2:15 PM	Riveria Municipal Beach	other	CS HW	180′	384′6″	192′3″	-1′	Double red fla
9/29/25, 2:08 PM	9/29/25, 1:57 PM	Ocean Reef Park	other	CS HW	84′	125′6″	63′	-2′	Severe berm s
9/29/25, 1:31 PM	9/29/25, 1:19 PM	Mercury Road	other	CS HW	18′4″	39′6″	19′9″	-1′	Narrow beach
9/29/25, 1:11 PM	9/29/25, 1:04 PM	Loggerhead Park	other	CS HW	97′2″	173′8″	87′	-4.5′	Red marker fe
9/29/25, 12:43 PM	9/29/25, 12:34 PM	Ocean Cay Park	other	CS HW	53′4″	189′7″	98′4″	-3′	Wind and wav
9/29/25, 12:30 PM	9/29/25, 12:15 PM	South Jupiter	other	CS HW	24′4″	91′4″	45′8″	-2.5′	No visible dar
9/29/25, 12:14 PM	9/29/25, 12:04 PM	Carlin Park	other	CS HW	19′10″	96′	48′	-2.5′	Steep scarp at
9/29/25, 11:55 AM	9/29/25, 11:47 AM	Jupiter Beach Park	other	Hailey Wilson Caroline skae	5′6″	211′3″	105′7″	-1′	3 hours to hig
9/29/25, 11:35 AM	9/29/25, 11:21 AM	Coral Cove Park	other	CS HW	28′6″	59′	29′6″	-4′	3 hours until h

PBC ERM Beach Erosion - PRE-STORM

Submitted by: HWilson_PBCGOV

Submitted time: Sep 29, 2025, 12:14:25 PM

Date and Time

Sep 29, 2025, 12:04:03 PM

Storm Name

Imelda

Region

North

Location

Carlin Park

Surveyors

- **CS HW**

Toe of Dune (TOD)

19'10"

Edge of Vegetation (EOV)

19'10"

Mean High Water (MHW)

96'

Mid-Berm Distance (MBD)

48'

Elevation Reference (REF)

-2.5'

Damage Assessment Notes

Steep scarp at MHW gusts up to 30 choppy surf

Photos

photos-20250929-160746.jpg

photos-20250929-160731.jpg

photos-20250929-160722.jpg

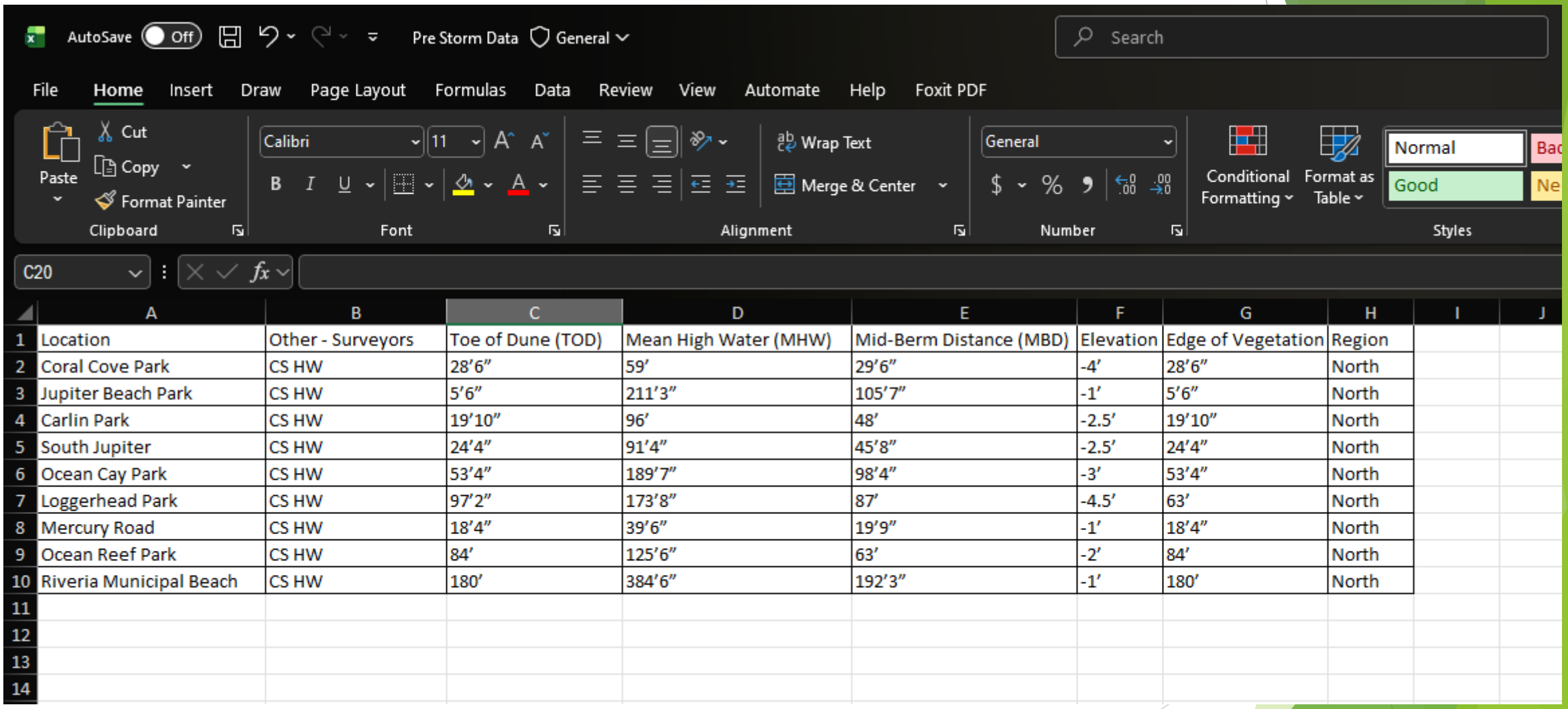
photos-20250929-160716.jpg

photos-20250929-160707.jpg

photos-20250929-160654.jpg

photos-20250929-160525.jpg

photos-20250929-160515.jpg



	A	B	C	D	E	F	G	H	I	J
1	Location	Other - Surveyors	Toe of Dune (TOD)	Mean High Water (MHW)	Mid-Berm Distance (MBD)	Elevation	Edge of Vegetation	Region		
2	Coral Cove Park	CS HW	28’6”	59’	29’6”	-4’	28’6”	North		
3	Jupiter Beach Park	CS HW	5’6”	211’3”	105’7”	-1’	5’6”	North		
4	Carlin Park	CS HW	19’10”	96’	48’	-2.5’	19’10”	North		
5	South Jupiter	CS HW	24’4”	91’4”	45’8”	-2.5’	24’4”	North		
6	Ocean Cay Park	CS HW	53’4”	189’7”	98’4”	-3’	53’4”	North		
7	Loggerhead Park	CS HW	97’2”	173’8”	87’	-4.5’	63’	North		
8	Mercury Road	CS HW	18’4”	39’6”	19’9”	-1’	18’4”	North		
9	Ocean Reef Park	CS HW	84’	125’6”	63’	-2’	84’	North		
10	Riveria Municipal Beach	CS HW	180’	384’6”	192’3”	-1’	180’	North		
11										
12										
13										
14										

Caroline Skae

UAV Applications in Coastal Resources

- Photogrammetry for approximate volume calculations
- Shoreline profile analysis
  - Cover more ground than walking surveys
- Need for Before and After's
  - Storms, Wave events, construction, etc.
- Need for repeatable images with multiple pilots
- Target hotspots where we anticipate impacts
- Goal: Program flights for multiple pilots to gather nearly identical aerials to create a “timelapse”

Available Technology and Limitations

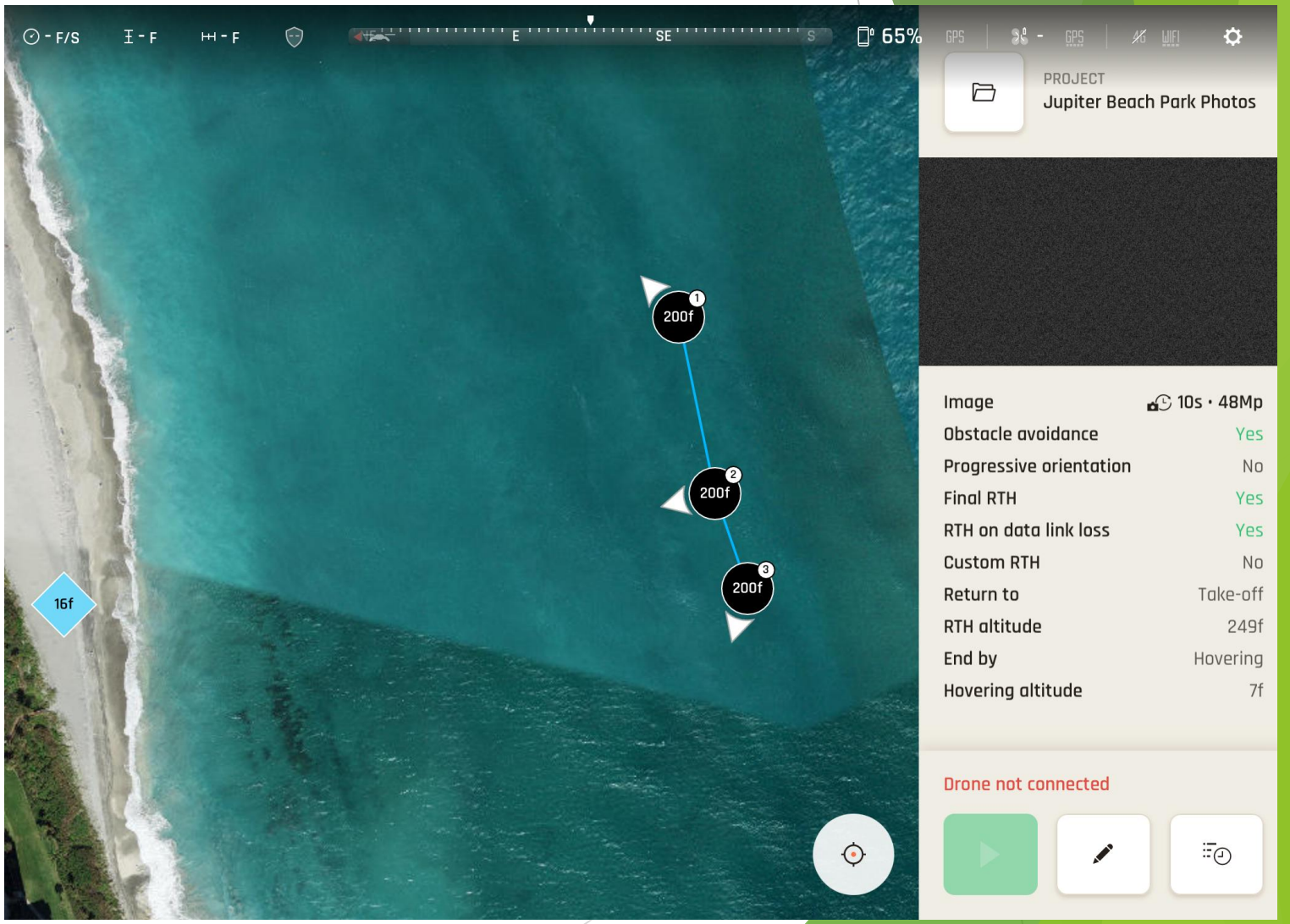
- Palm Beach County Policies and Procedures Manual CW-O-090: Requirements for Unmanned Aerial Vehicles
  - 14 C.F.R. §§ 107.1-107.205
  - Art. I, § 23, Fla. Const.
  - § 119.07, Fla. Stat.
  - § 330.41, Fla. Stat.
  - § 934.50, Fla. Stat.
- Previously used Drone Deploy

Skydio 2+

Parrot Anafi AI

Waypoint Programming

- Parrot Waypoints
- Programmed flights to capture video
  - Can pull frames from specific time in video for nearly identical images
- Programmed Timelapse Photos
  - Settings
    - Altitude: 200 feet
    - Duration: 10 seconds
    - 3 points looking NW at camera angle of 0 degrees, W at 5 degrees and SW at 0 degrees




Ocean Reef Park 09/26/2025
Singer Island, Florida


Ocean Reef Park 10/20/2025
Singer Island, Florida

Dunes Towers 10/20/2025
Singer Island, Florida


Dunes Towers 11/07/2025
Singer Island, Florida

Dunes Towers 01/23/2026
Singer Island, Florida

Looking Ahead

Storm Season 2026

Routine Flights at 10 high priority storm points

- Critical points with construction
- Erosion Hot Spots

Timelapses for project areas

Pre, during, post construction

Future Goals

Incorporate tidal data, weather conditions

We're Hiring!

Thank you!

Questions?