



Updating the Texas Colonial Waterbird Rookeries Dataset with UAV and AI



Hank Arnold, Conservation Volunteer
Daniel Gao, Texas General Land Office

Texas General Land Office



Dawn Buckingham, MD, Commissioner







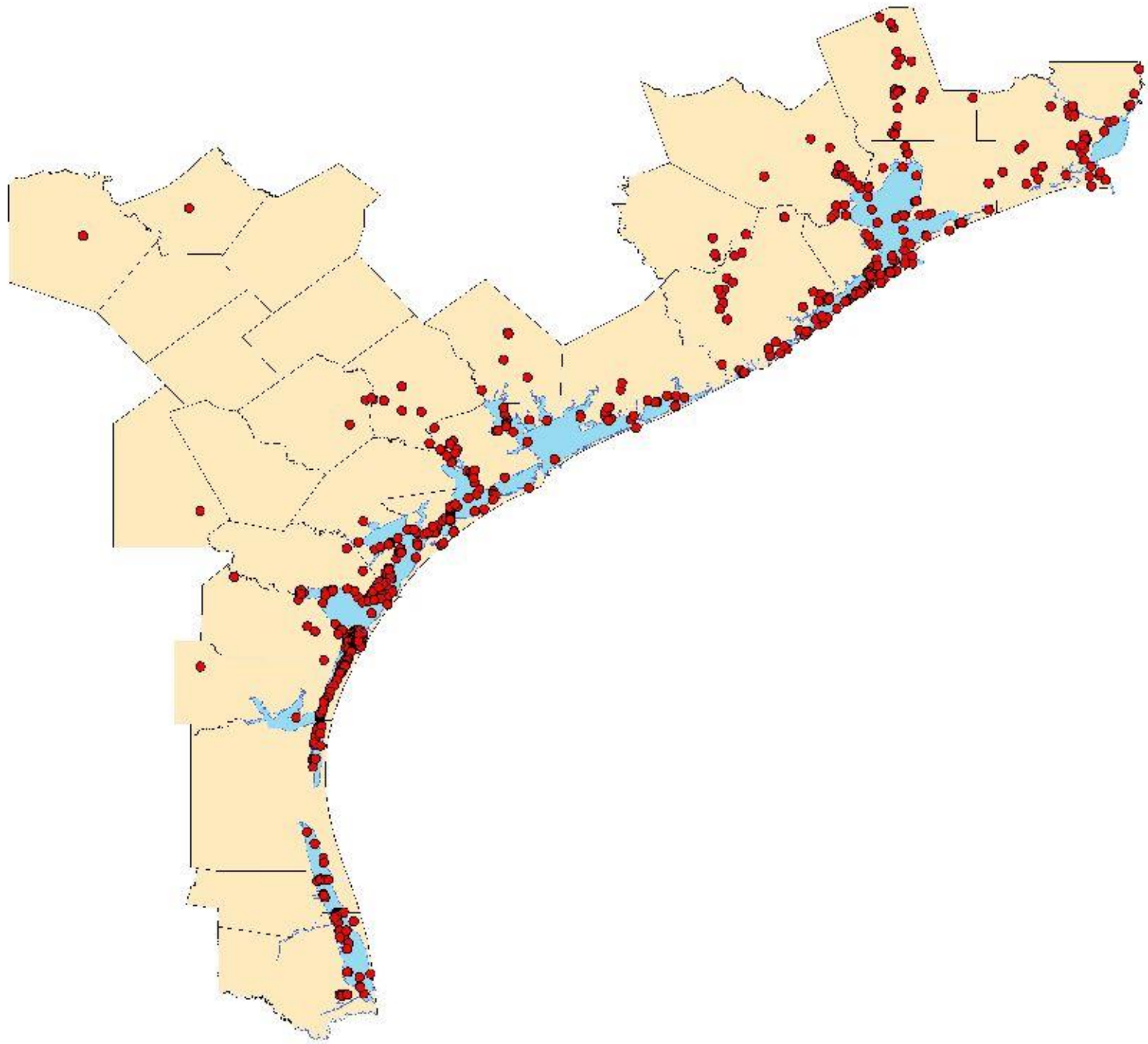


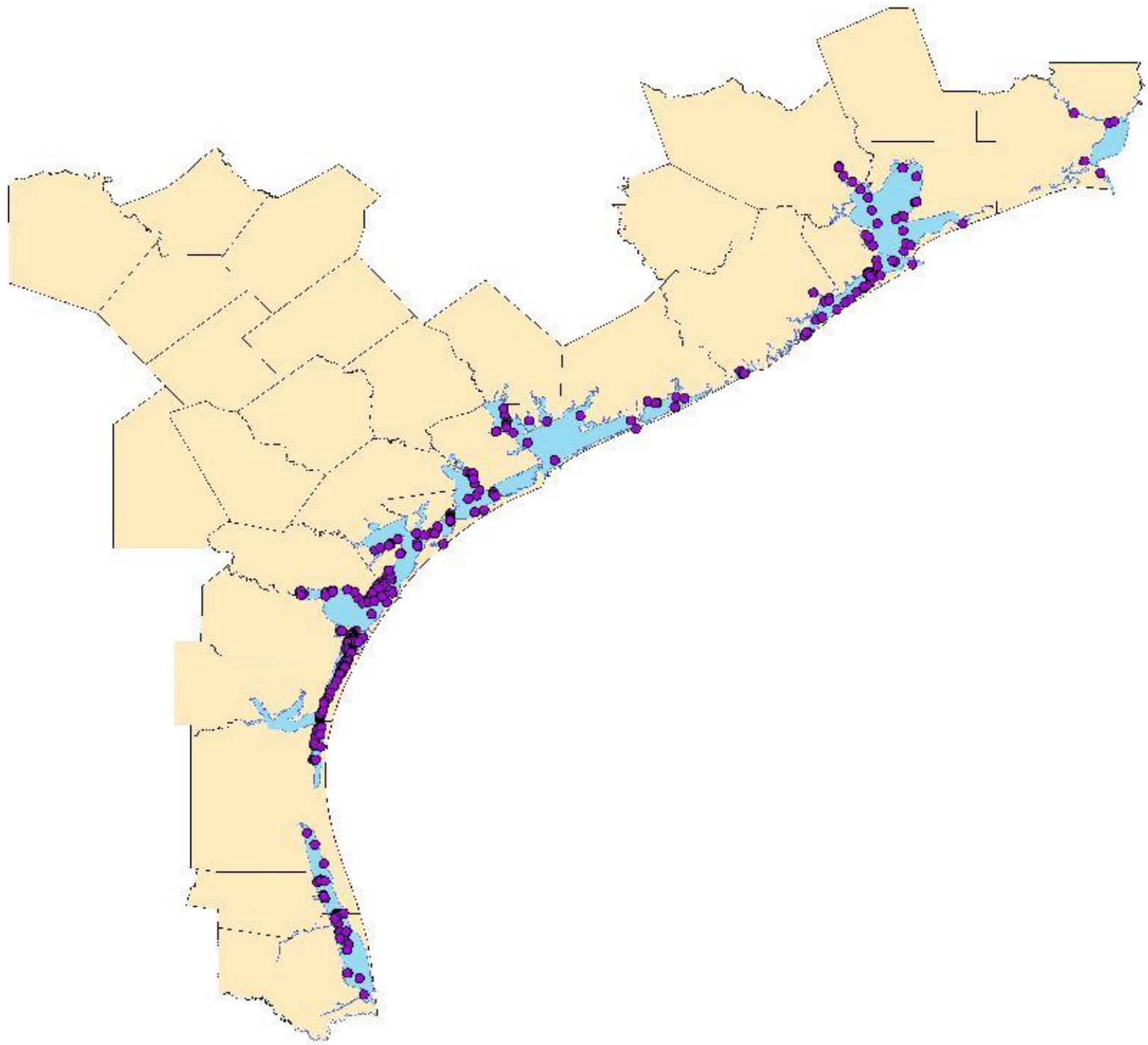




















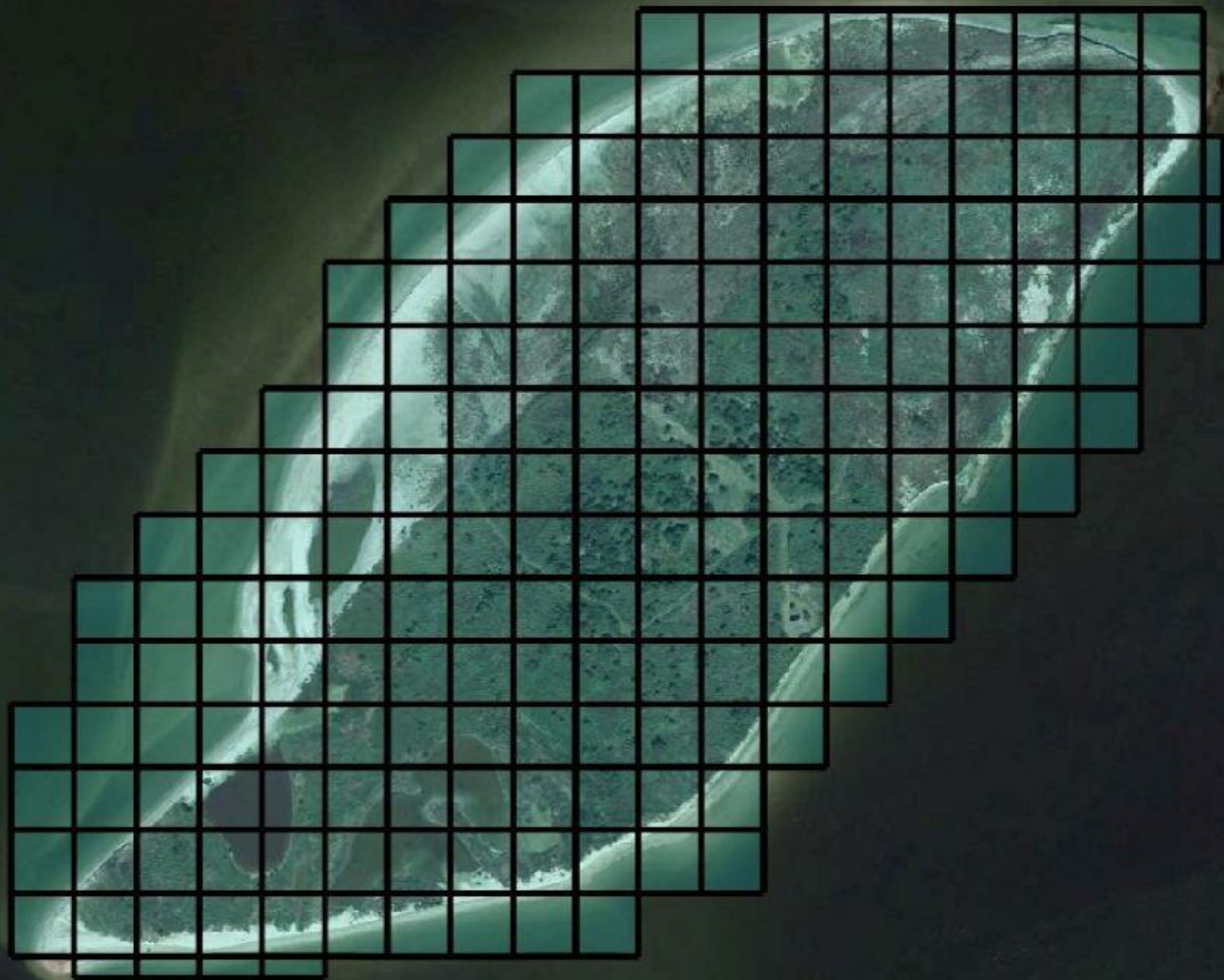






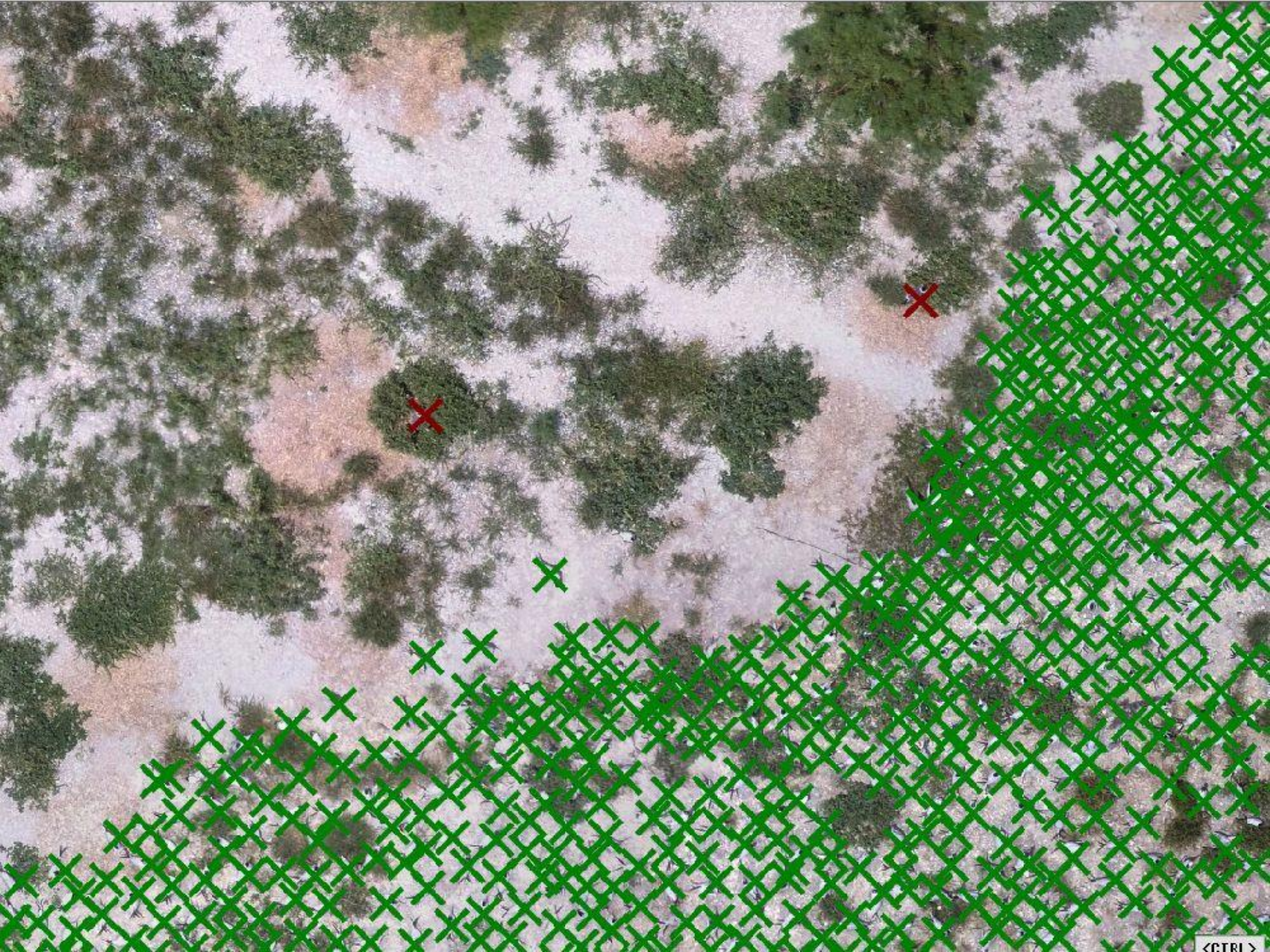


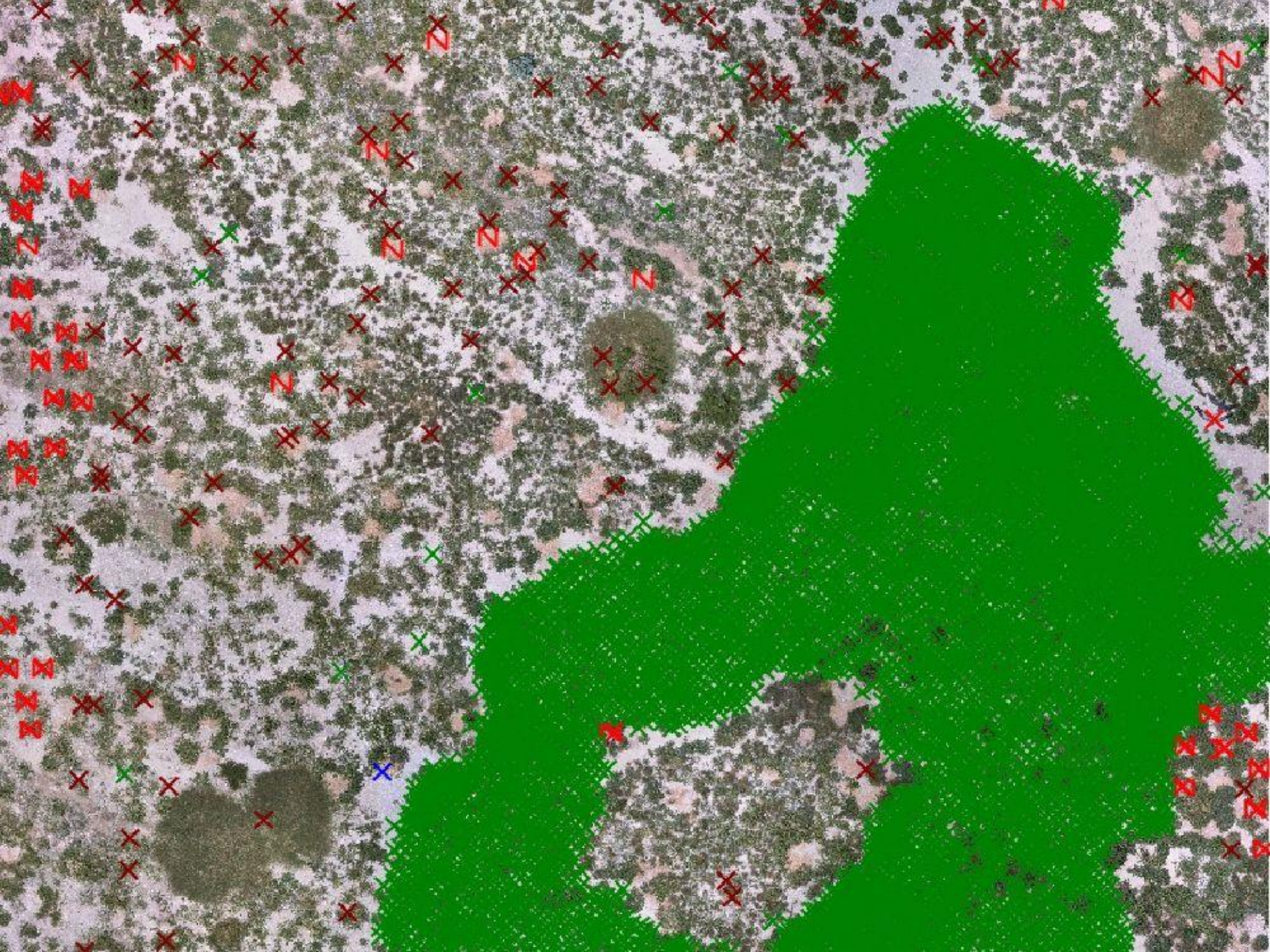


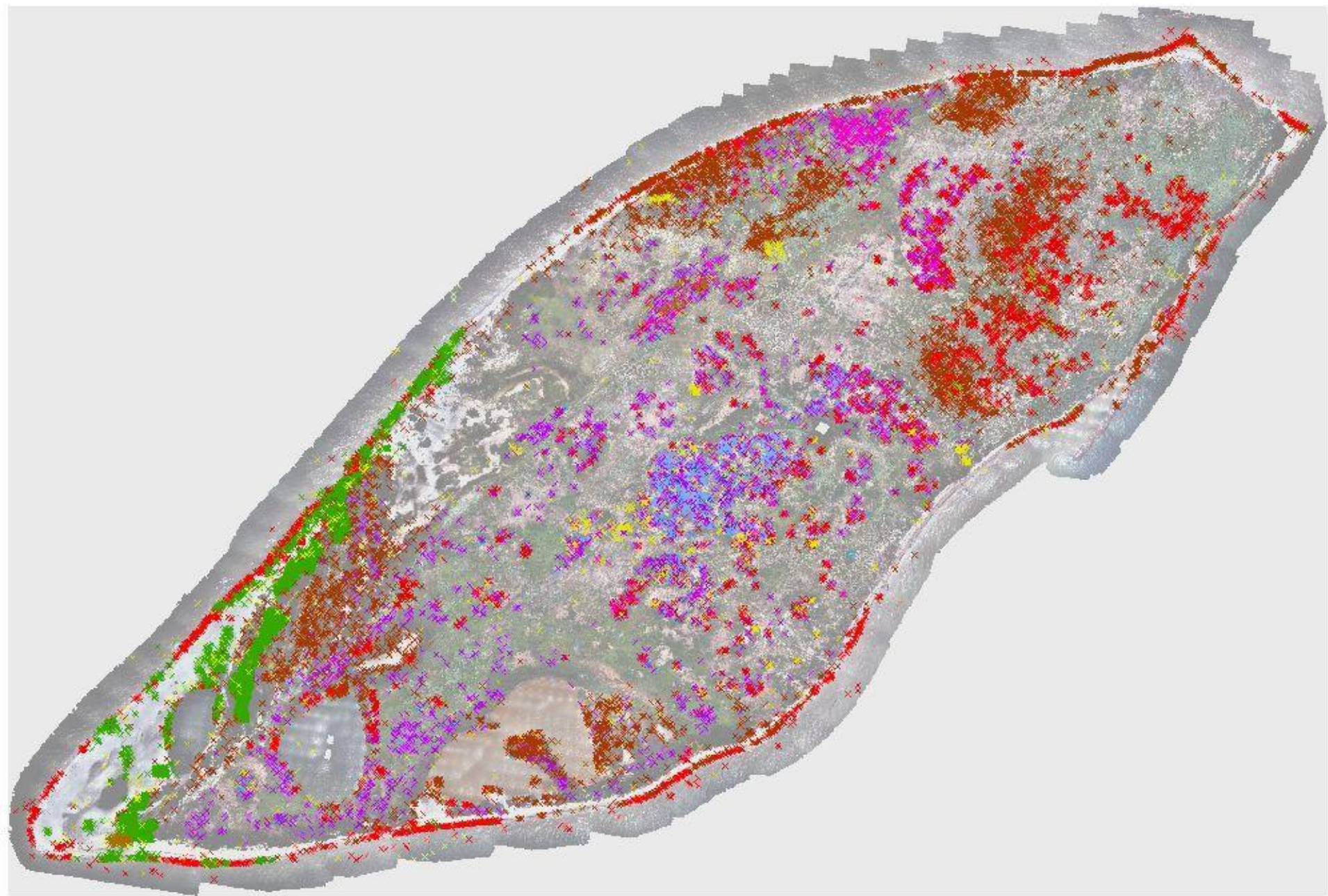


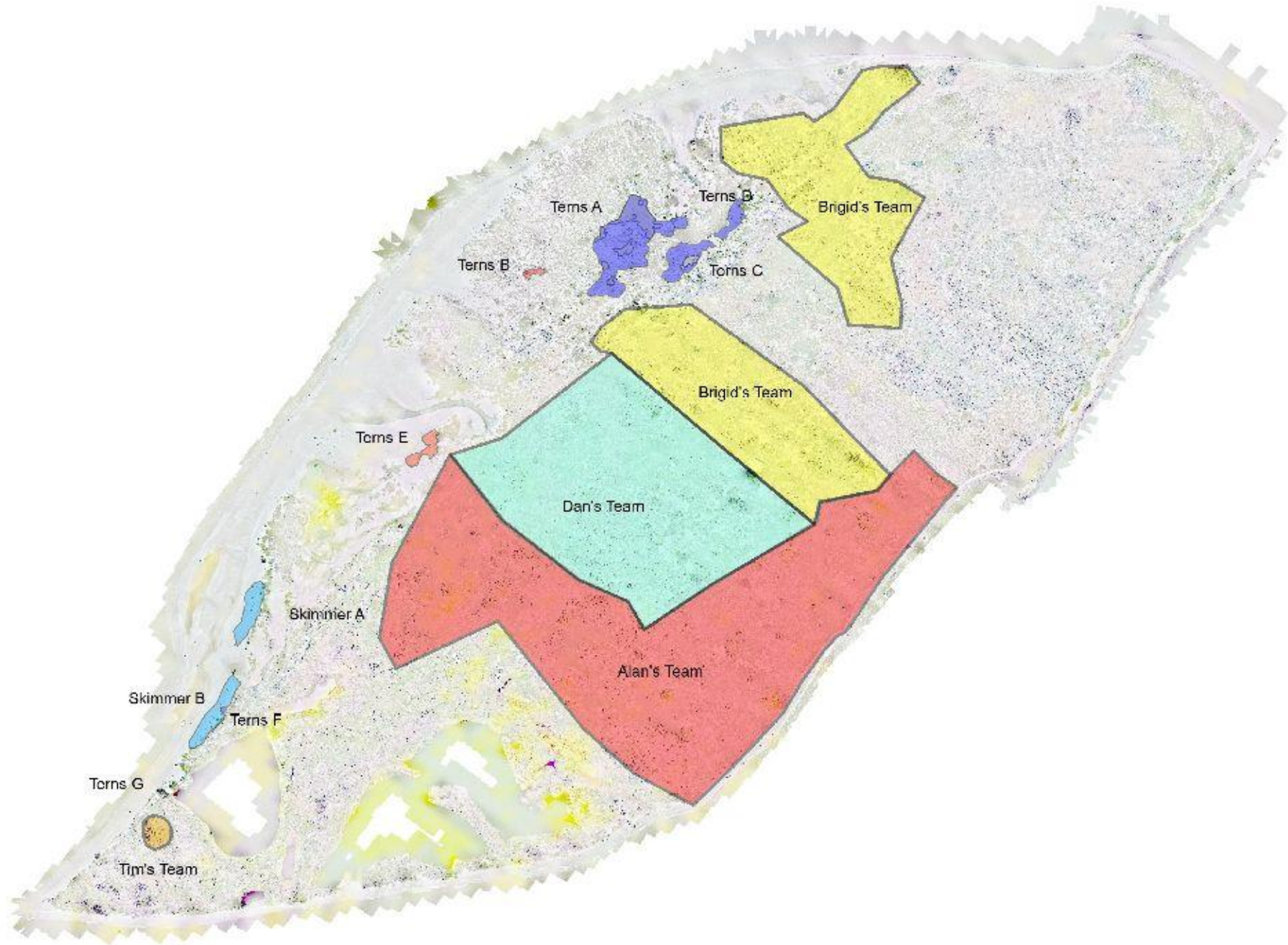


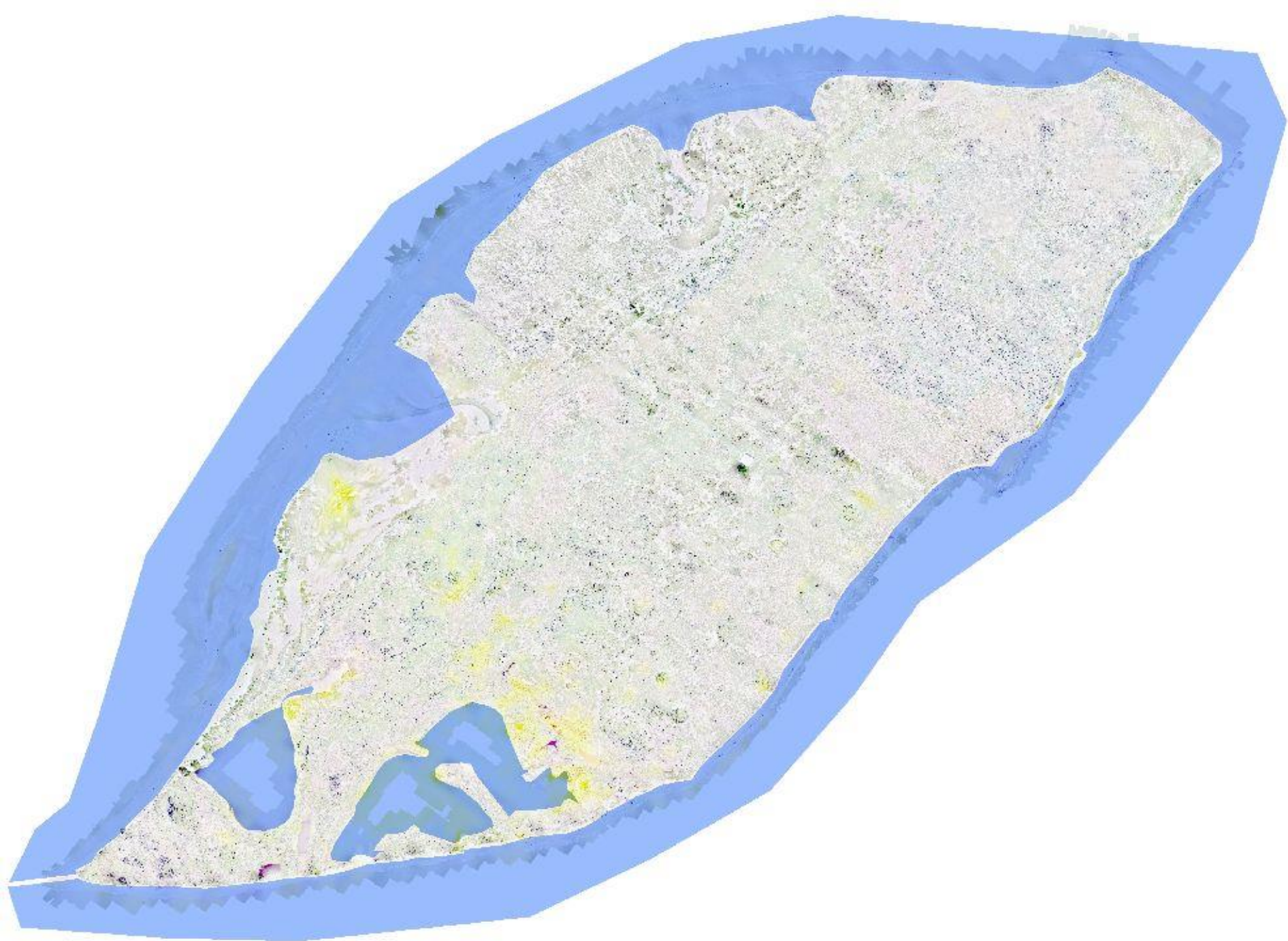


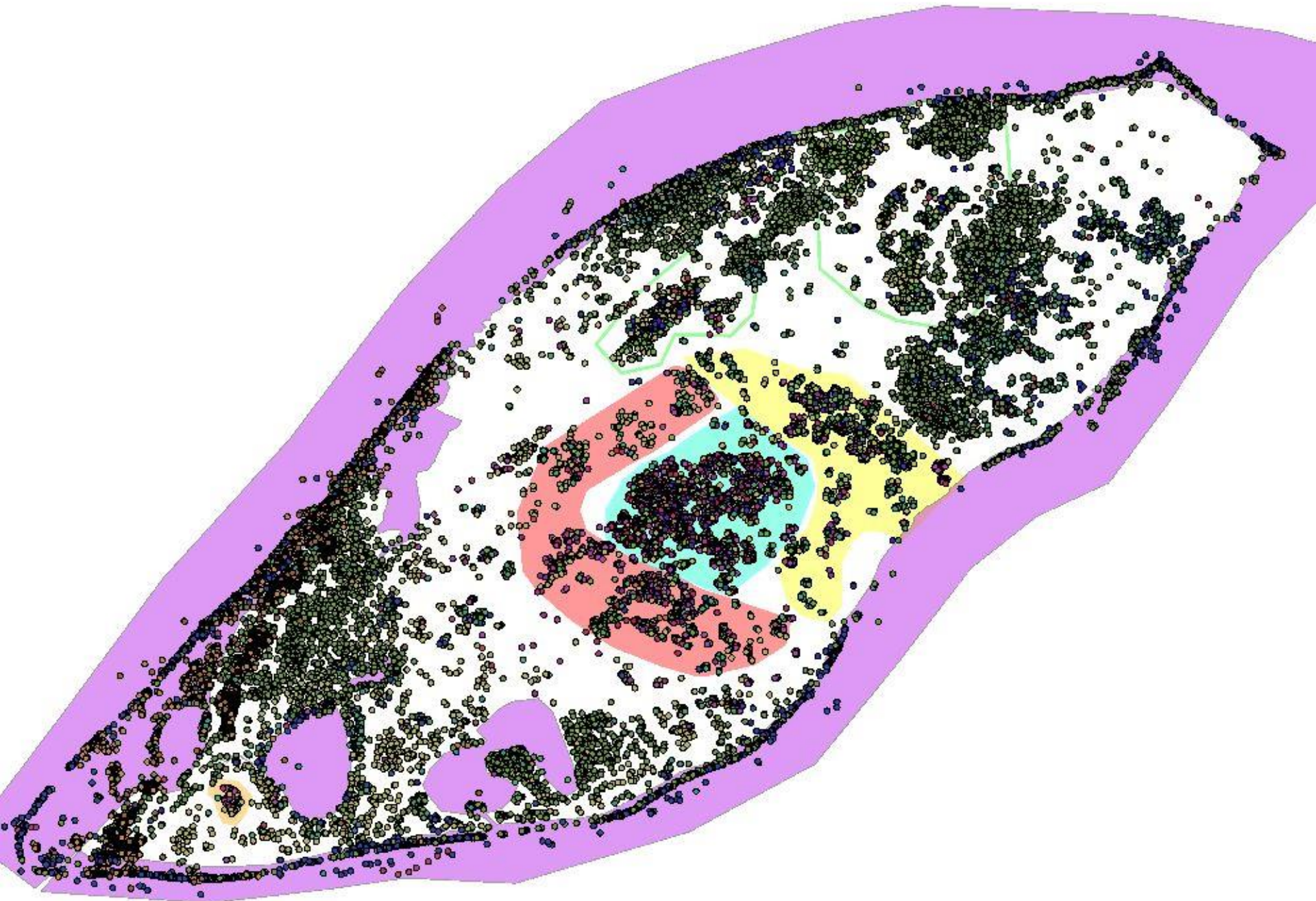












BRPEA: 82%



%

BRPEA: 82%



BRPEA: 77%



BRPEA: 86%



BRPEA: 64%



BRPEA: 75%



BRPEA: 75%



BRPEA: 100%



BRPEA: 100%



BRPEA: 100%



BRPEA: 100%



BRPEA: 100%



BRPEA: 100%



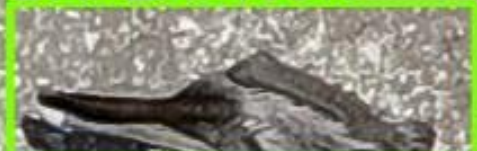
BRPEA: 100%



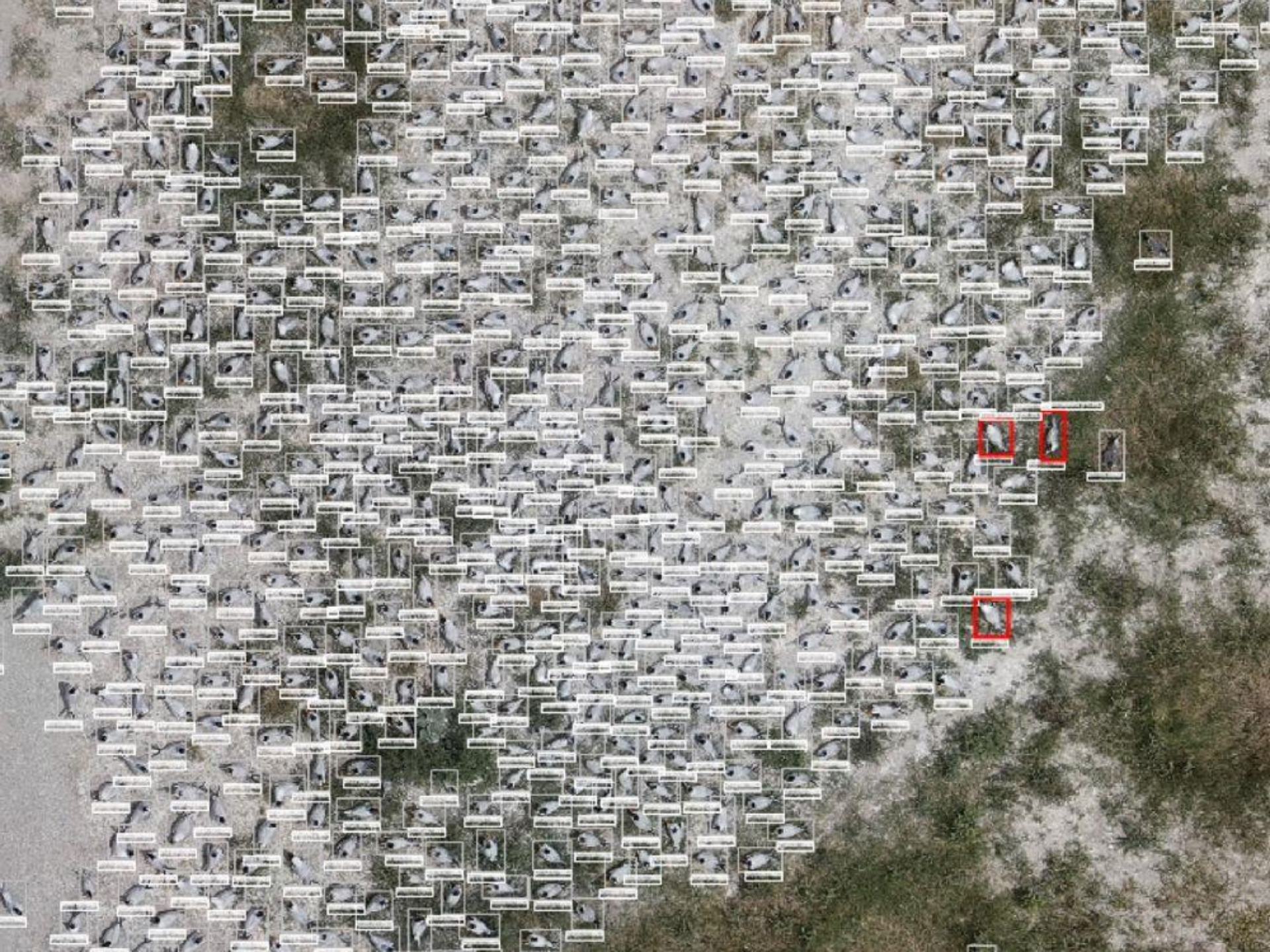
BR



BRPEA: 100%









2391/MTRNA 2004/ROSPA (71.9%)

2379/MTRNA

2385/MTRNA

2386/MTRNA

12008/ROSPA (55.3%)

2355/MTRNA

2351/MTRNA

2340/LAGUA

2341/MTRNA

2330/MTRNA

2324/MTRNA

2333/MTRNA

2314/MTRNA

2307/MTRNA

2288/MTRNA

2286/MTRNA

2281/MTRNA

2268/MTRNA

11881/ROSPA (61.8%)

1998/MTRNA

2249/MTRNA

2251/MTRNA

2419/MTRNA

2413/MTRNA

2412/MTRNA

12004/ROSPA (71.9%)

2391/MTRNA

2386/MTRNA

12008/ROSPA (55.3%)



2355/MTRNA

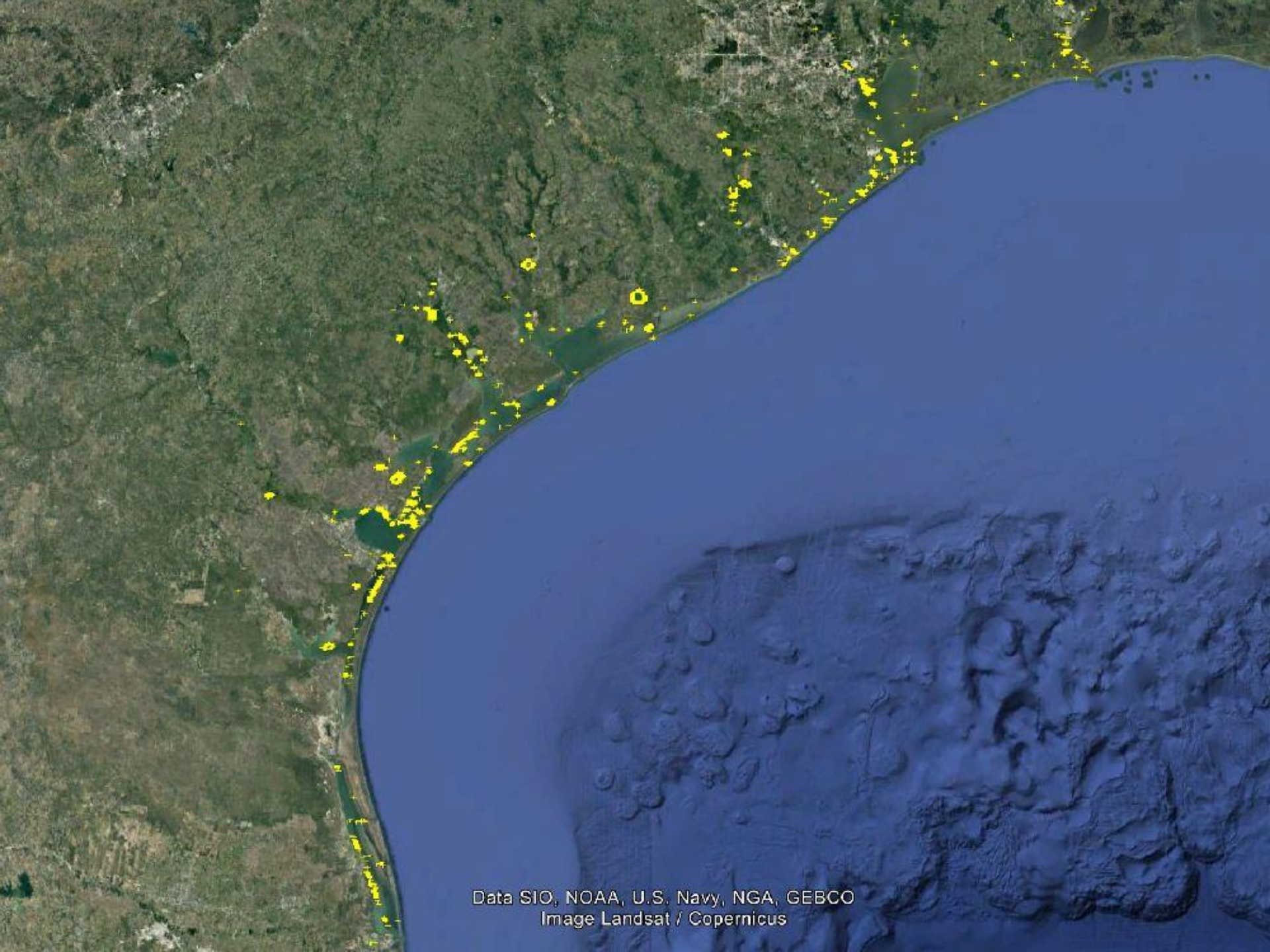
2351/MTRNA



2340/LAGUA

2320/MTRNA





Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus



Chester Island

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

Google Earth





Image Classification

Label Objects : KCImage.tif

Island Training

- Land
- Water

Labeled Objects Export Training Data

Output Folder	C:\ArcGIS Pro\Toolbox\AI\Labels\Objects\KCImage.tif
Mask Polygons Features	
Image Format	TIF Format
Tile Size X	256
Tile Size Y	128
Slide X	128
Slide Y	128
Rotation/Angle	0
Reference System	Map Source
Output No Feature Tiles	<input type="checkbox"/>
Write Data Format	RCCN Masks



Geoprocessing

Train Deep Learning Model

Parameters Environments

Input Training Data

X J1 - training images

Output Model

T AI Model

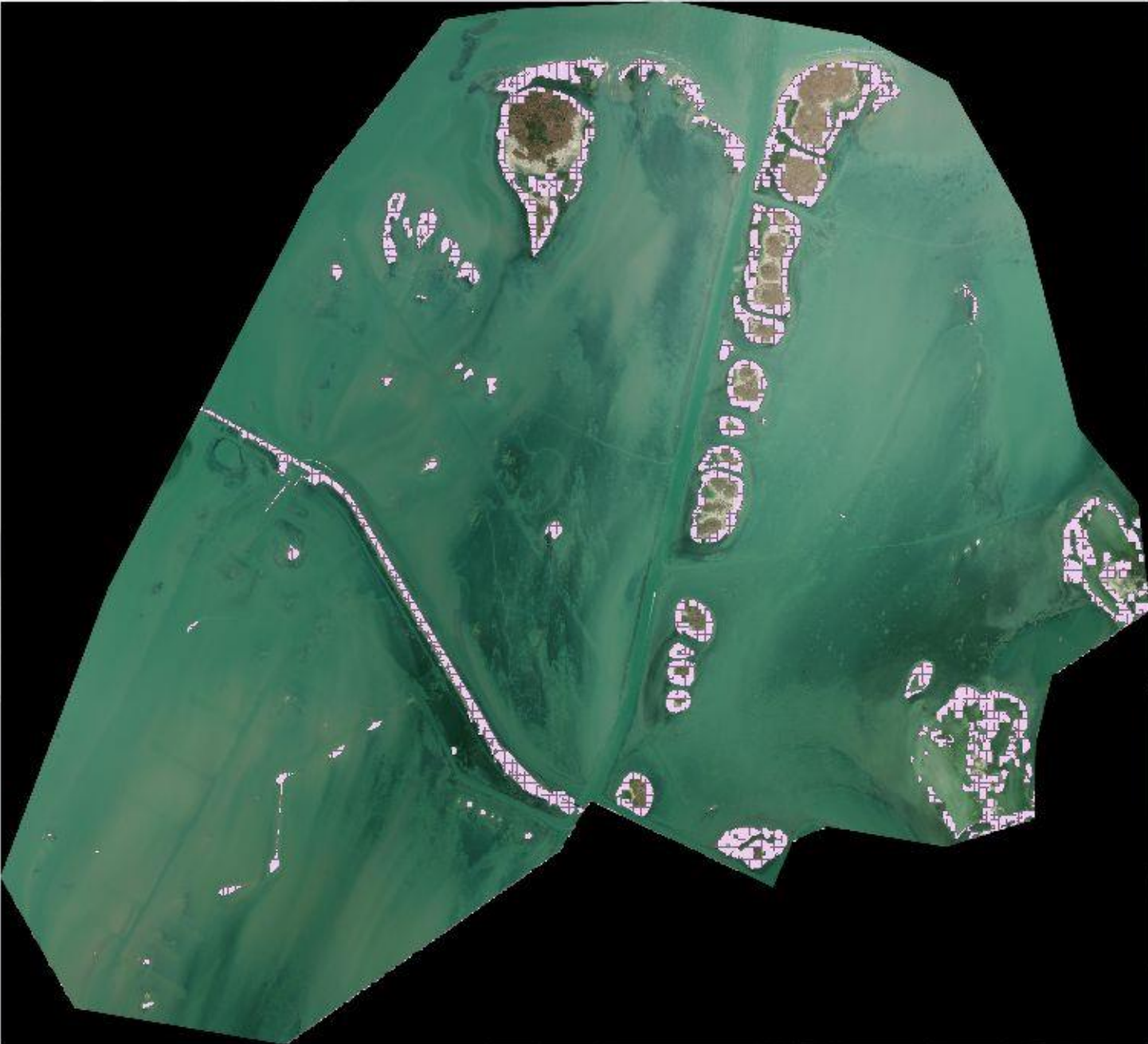
Max Epochs 20

> Model Parameters

> Advanced

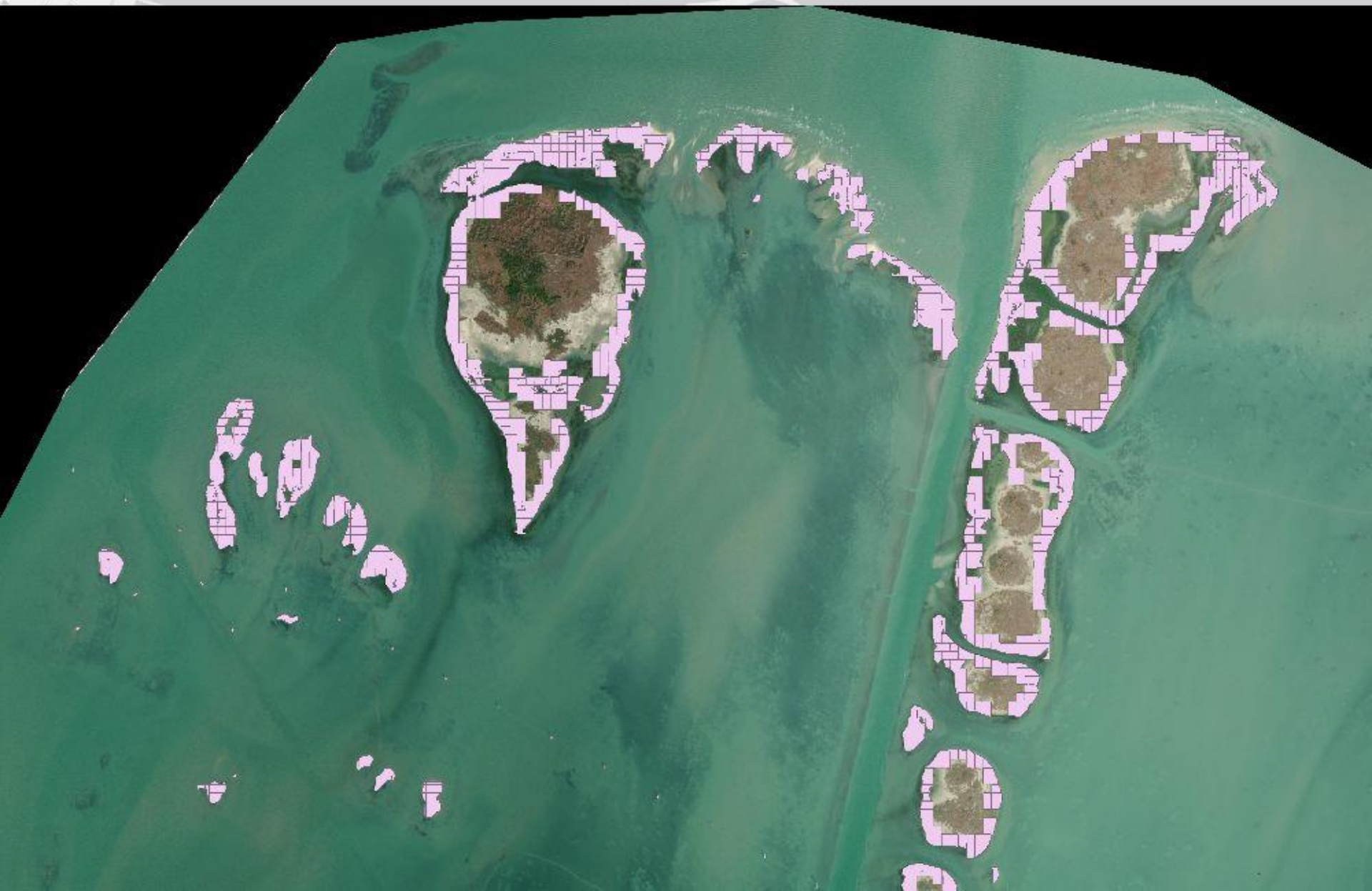
Sancti Features: 1

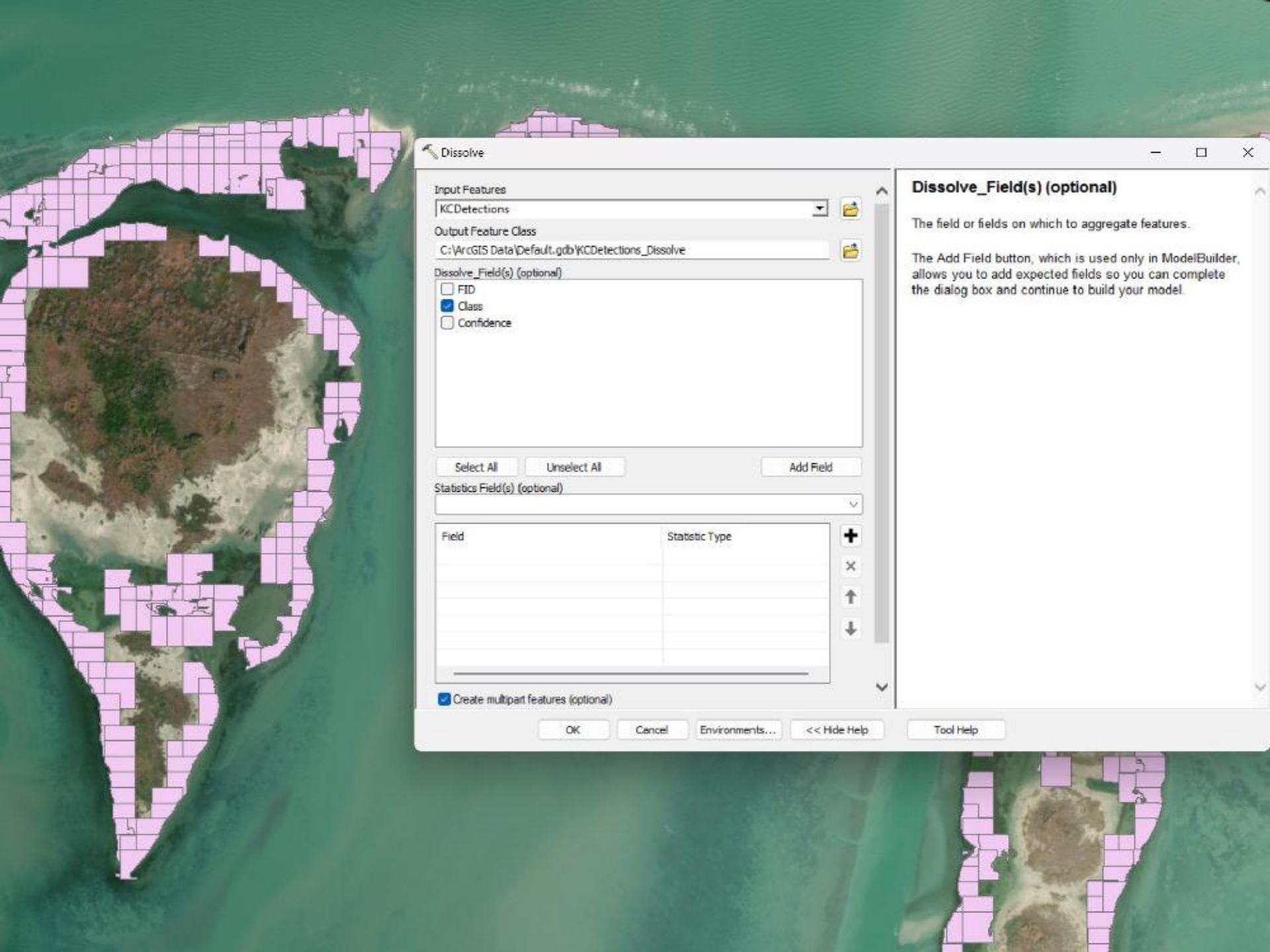
8.10



MUSTANG
ISLAND

LAND





Dissolve

Input Features
KCDetections

Output Feature Class
C:\ArcGIS Data\Default.gdb\KCDetections_Dissolve

Dissolve_Field(s) (optional)

- FID
- Class
- Confidence

Select All Unselect All Add Field

Statistics Field(s) (optional)

Field	Statistic Type

Create multipart features (optional)

OK Cancel Environments... << Hide Help Tool Help

Dissolve_Field(s) (optional)

The field or fields on which to aggregate features.

The Add Field button, which is used only in ModelBuilder, allows you to add expected fields so you can complete the dialog box and continue to build your model.

Aggregate Polygons

Input Features
KCAggrgate

Output Feature Class
C:\ArcGIS Data\Default.gdb\KCAggrgate_AggregatePolygons

Aggregation Distance
100 Meters

Minimum Area (optional)
0 Square Meters

Minimum Hole Size (optional)
0 Square Meters

Preserve orthogonal shape (optional)

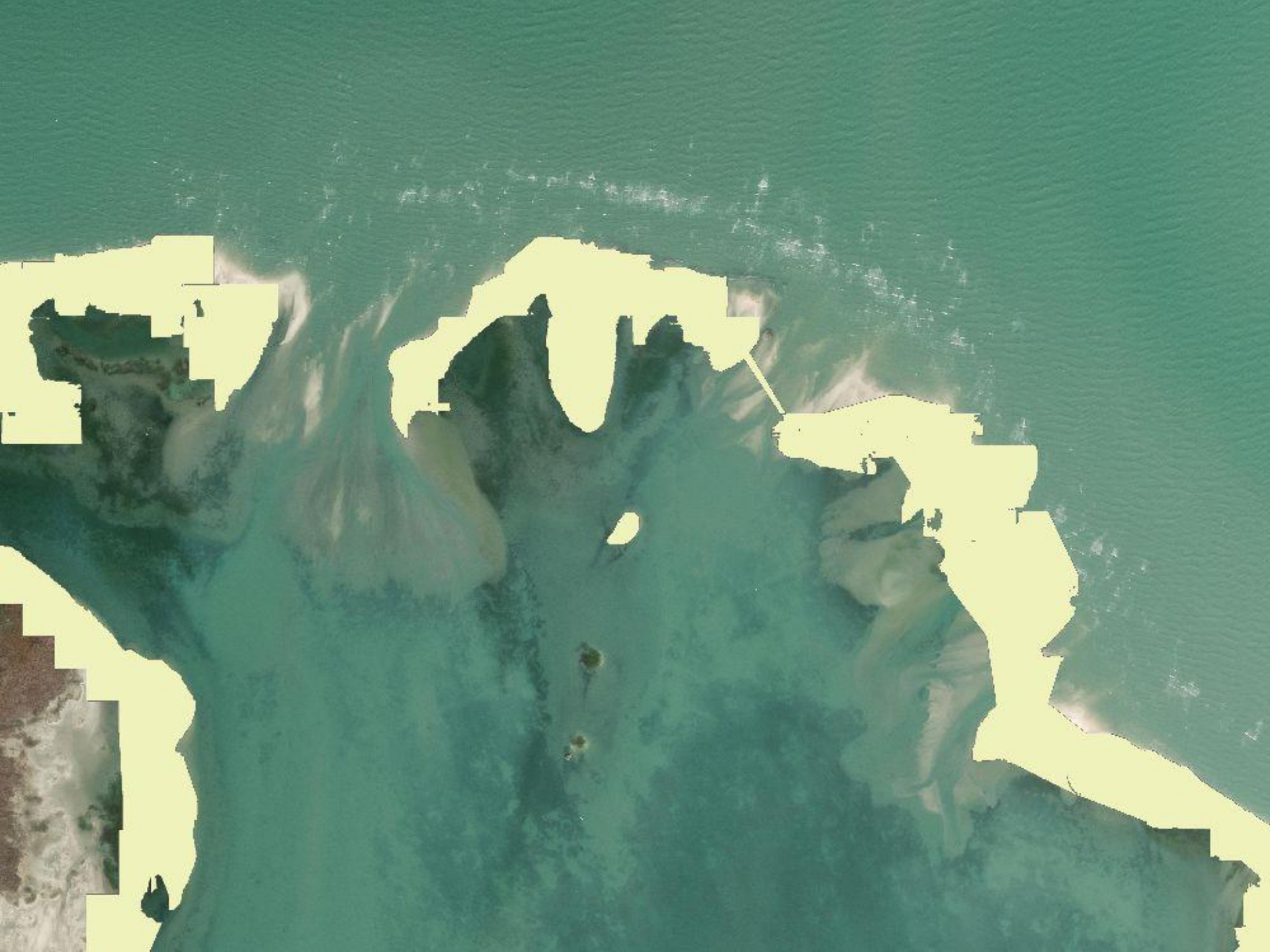
Barrier Features (optional)

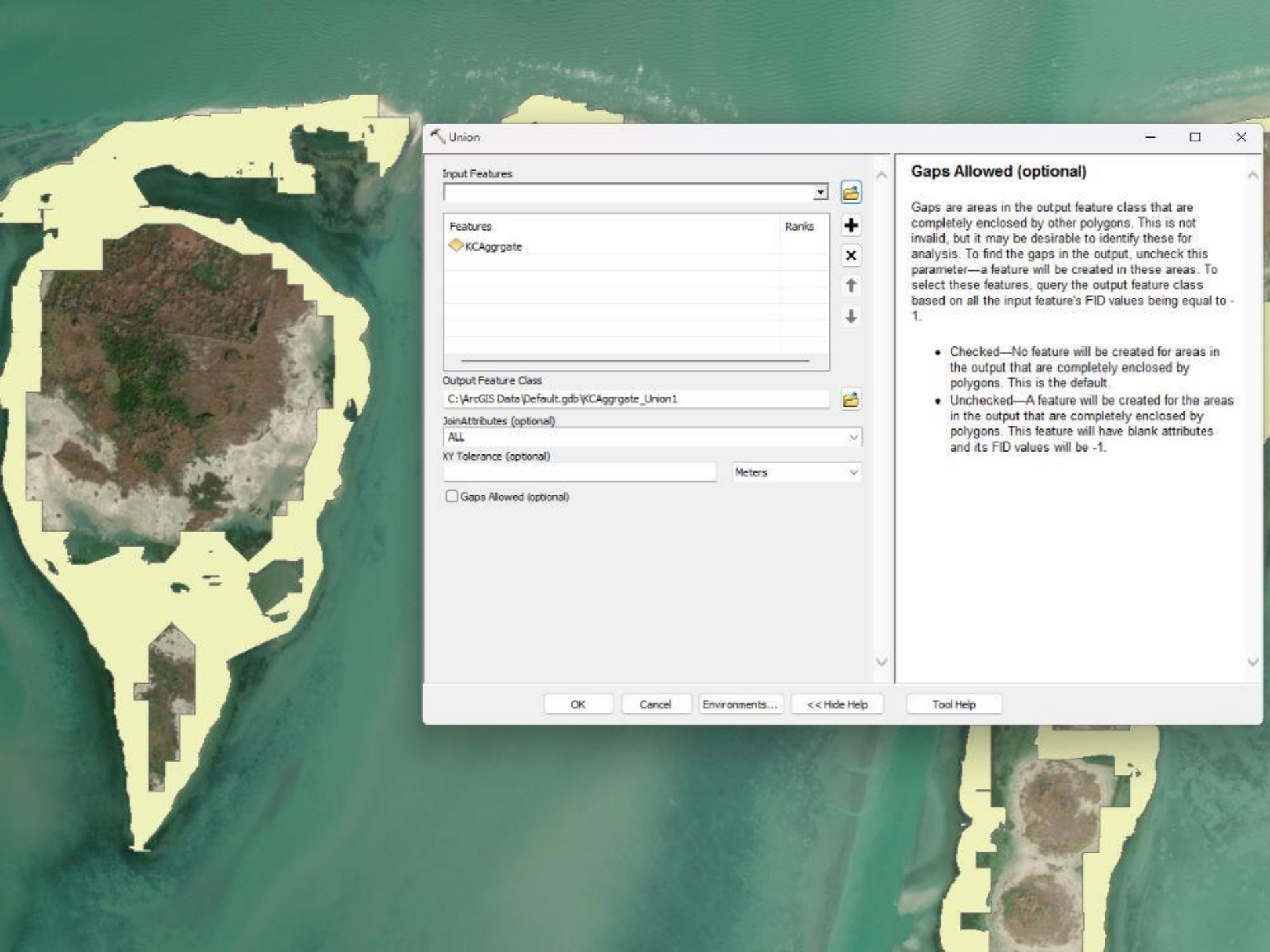
Output Table (optional)
C:\ArcGIS Data\Default.gdb\KCAggrgate_AggregatePolygons_Tbl

Aggregate Polygons

Combines polygons that are within a specified distance of each other into new polygons.

OK Cancel Environments... << Hide Help Tool Help





Union

Input Features

Features

Features	Ranks
KCAggrgate	

Output Feature Class

C:\ArcGIS Data\Default.gdb\KCAggrgate_Union1

JoinAttributes (optional)

ALL

XY Tolerance (optional)

Meters

Gaps Allowed (optional)

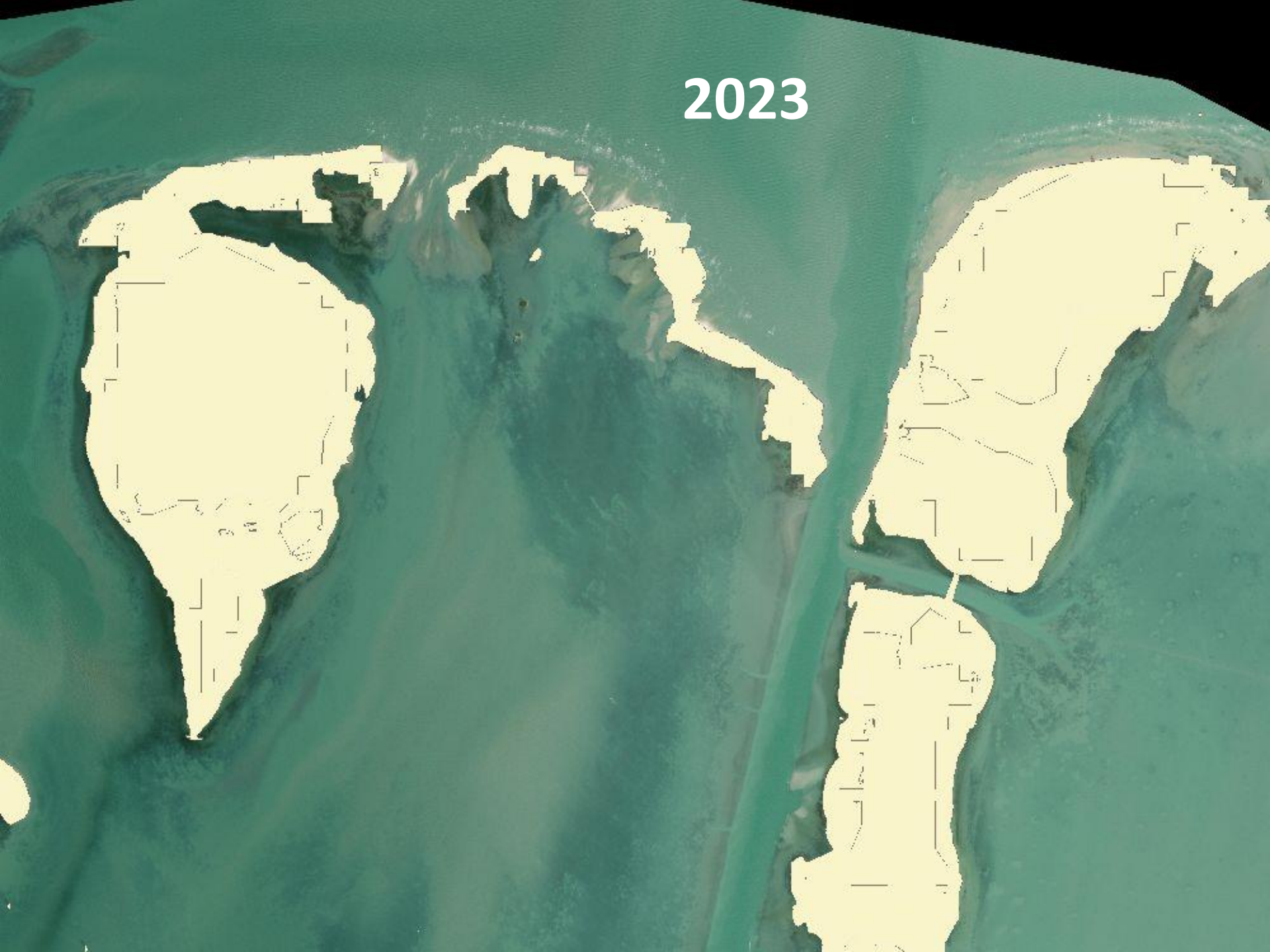
Gaps Allowed (optional)

Gaps are areas in the output feature class that are completely enclosed by other polygons. This is not invalid, but it may be desirable to identify these for analysis. To find the gaps in the output, uncheck this parameter—a feature will be created in these areas. To select these features, query the output feature class based on all the input feature's FID values being equal to -1.

- Checked—No feature will be created for areas in the output that are completely enclosed by polygons. This is the default.
- Unchecked—A feature will be created for the areas in the output that are completely enclosed by polygons. This feature will have blank attributes and its FID values will be -1.

OK Cancel Environments... << Hide Help Tool Help

2023



2021



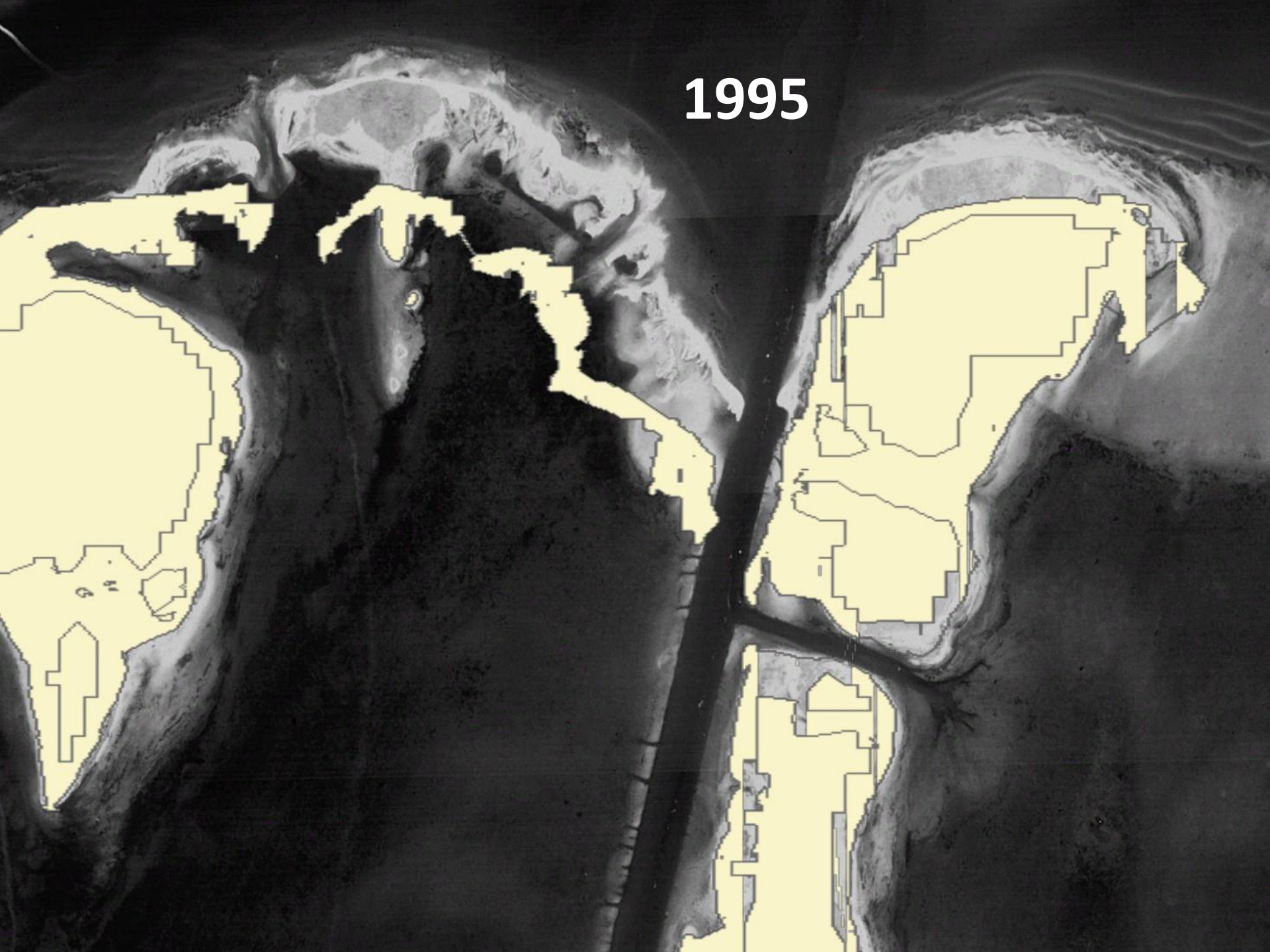
2017



2006



1995

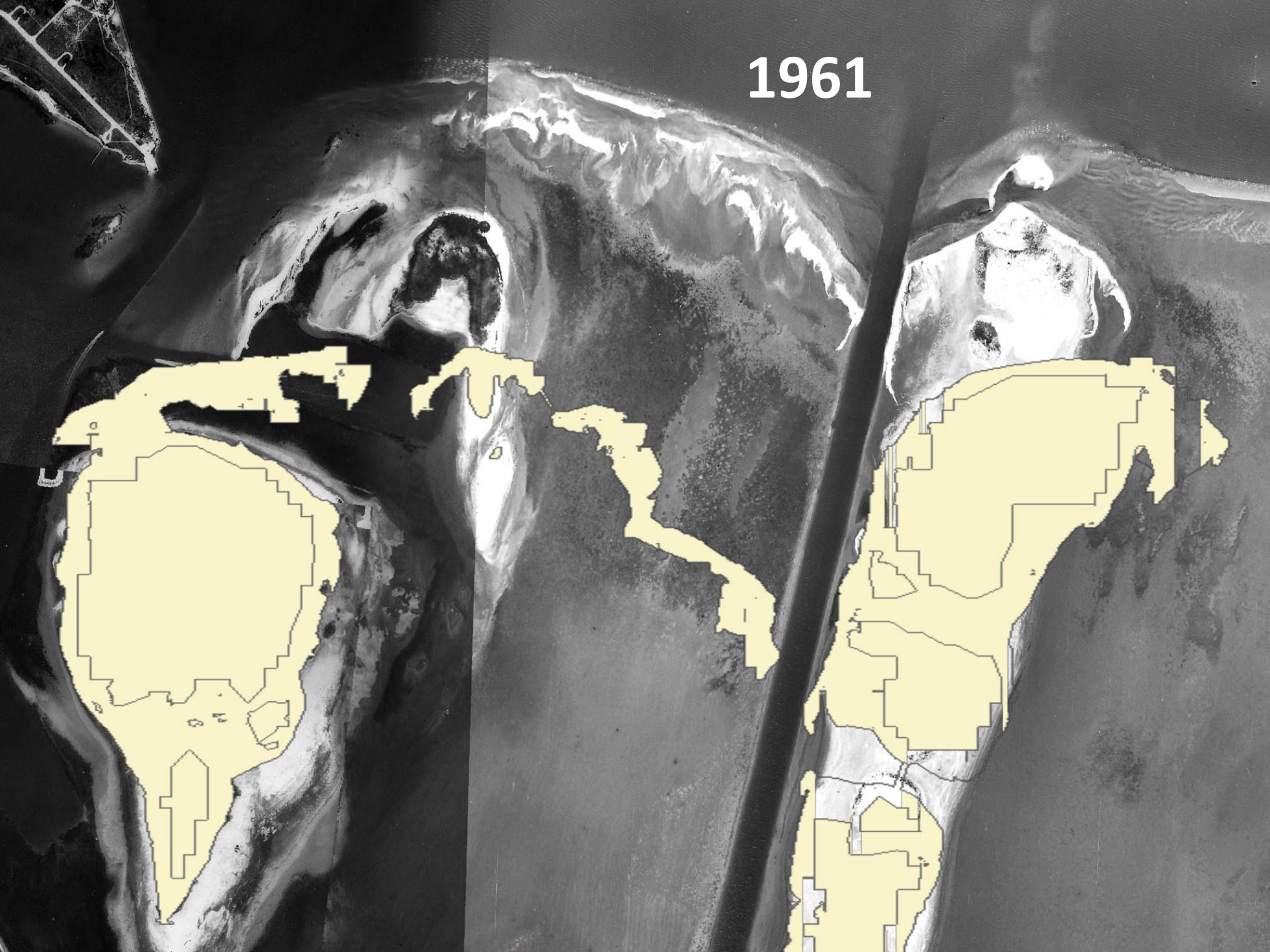


NOVEMBER

1979



1961







Updating the Texas Colonial Waterbird Rookeries Dataset with UAV and AI



Questions?

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daniel.gao@glo.texas.gov

Texas General Land Office



Dawn Buckingham, MD, Commissioner