



# Collier MCD use of UAS platforms in areas of Salt Marsh Mosquitoes

Peter Brake  
*Director of Technical Development*  
*Collier Mosquito Control District, Naples, FL, USA*  
[pbrake@cmcd.org](mailto:pbrake@cmcd.org)



# Collier County, FL

Florida

Largest county in the State of Florida

Surrounded by 5 Counties and Gulf of Mexico

~383,000 year-round residents

~460,000 people in during peak tourist season

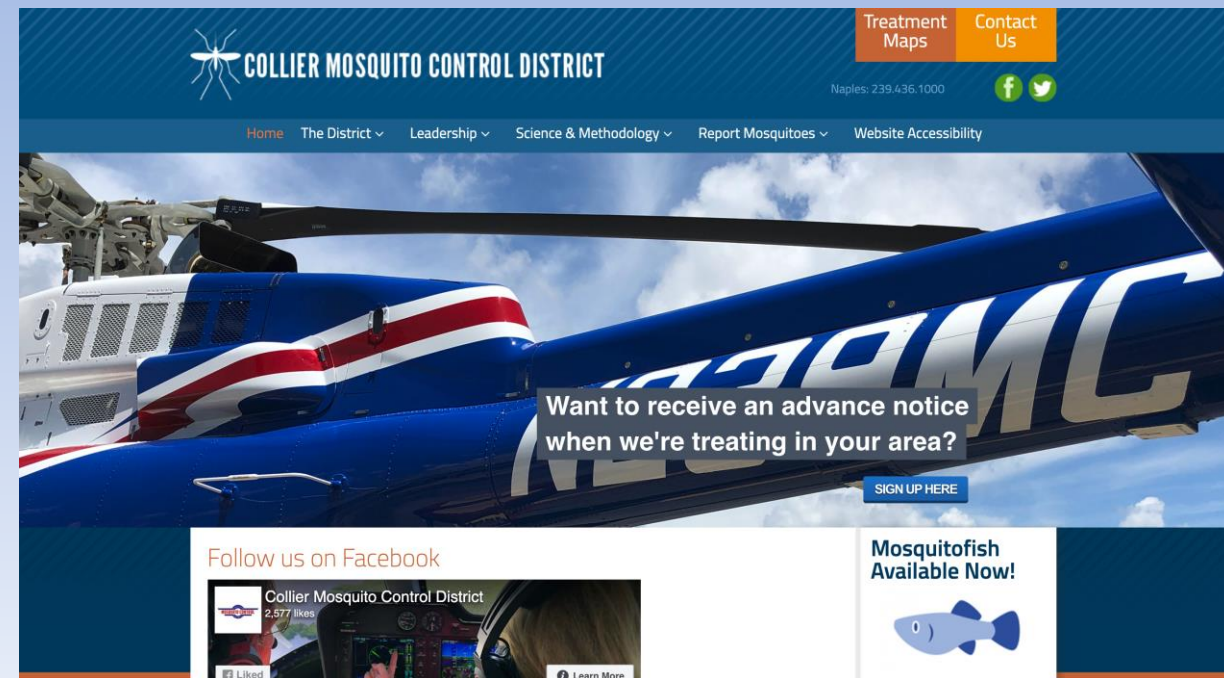
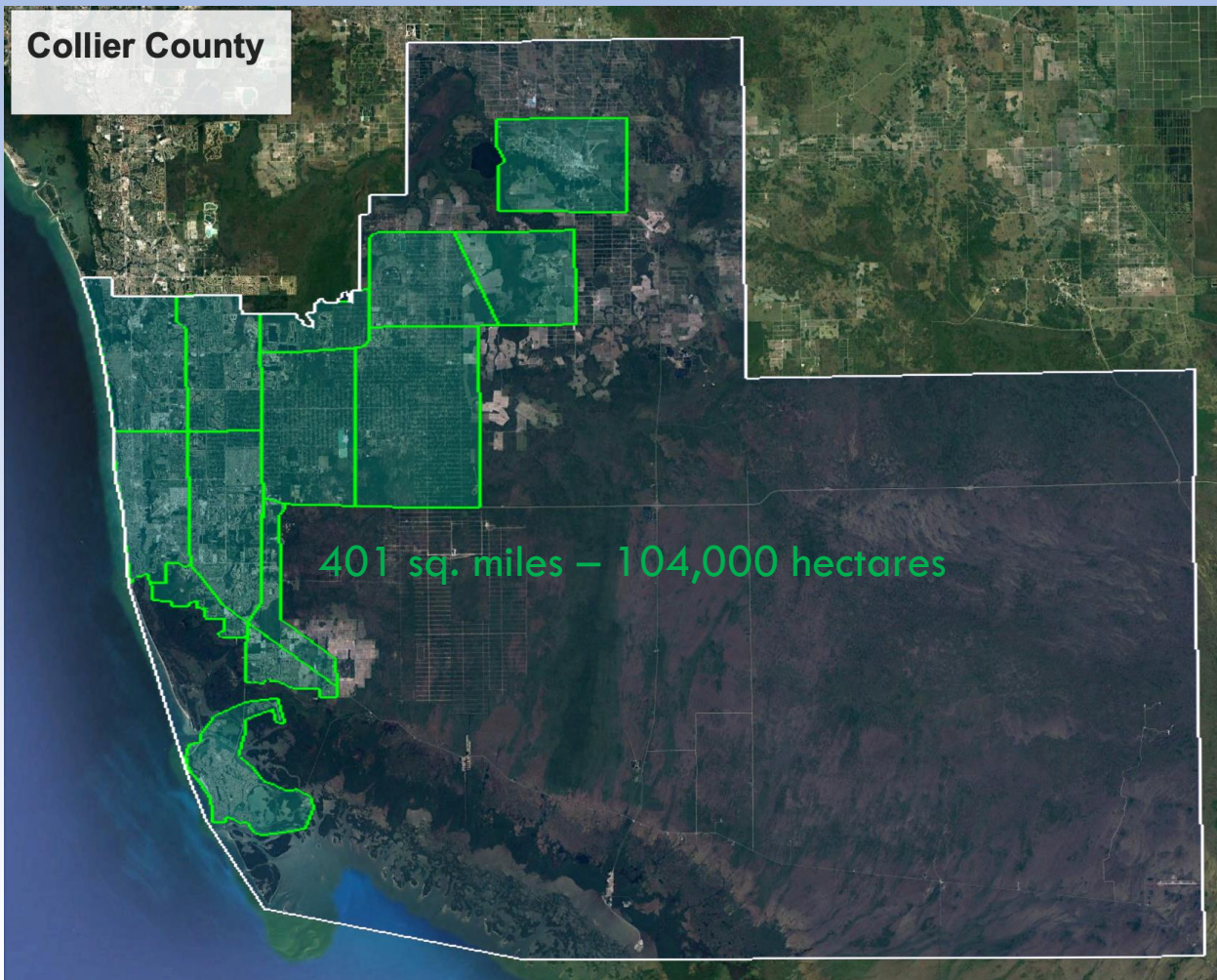
Collier County

2,305 sq. miles (5,970 km<sup>2</sup>) total land mass

1,500 sq. miles (3,866 km<sup>2</sup>) of protected land



# District Boundaries within Collier County, FL



- \$27 Mil budget
- Founded 1950
- [www.cmcd.org](http://www.cmcd.org)
- 401 sq. miles – 104,000 hectares
- Regulated by FL Dept. of Agriculture
- Complies with regulations from the U.S. Environmental Protection Agency (EPA) and the Federal Aviation Administration (FAA) Public Aircraft Operations





# Aerial fleet



3 - Shorts Skyvan



1 - Bell 407



3 - MD 500



# Current UAS Fleet



Matrice 600 (PV13)



Phantom 4 NDVI



SwellPro Splash Drone



Mavic Pro Platinum



Quantum Systems Trinity

# DJI Mavic Pro Platinum

- Wetland areas inspection
- Increased efficiency and safety in the field
- Post flight weather data
- VARI information – Visible Atmospherically Resistant Index





# Increased Mapping Precision



Drone image from 300 feet



Satellite image from 22 miles

# Quantum Systems Trinity



- 90-minute flight time
- 11.0 lbs. max take off weight
- 7.5 ft wingspan
- 20 MP camera (RGB)
- NDVI camera capable
- Max range of 3-5 miles



# Increased Mapping Precision



Area mapped with QS Trinity: 115 acres  
12-minute flight time

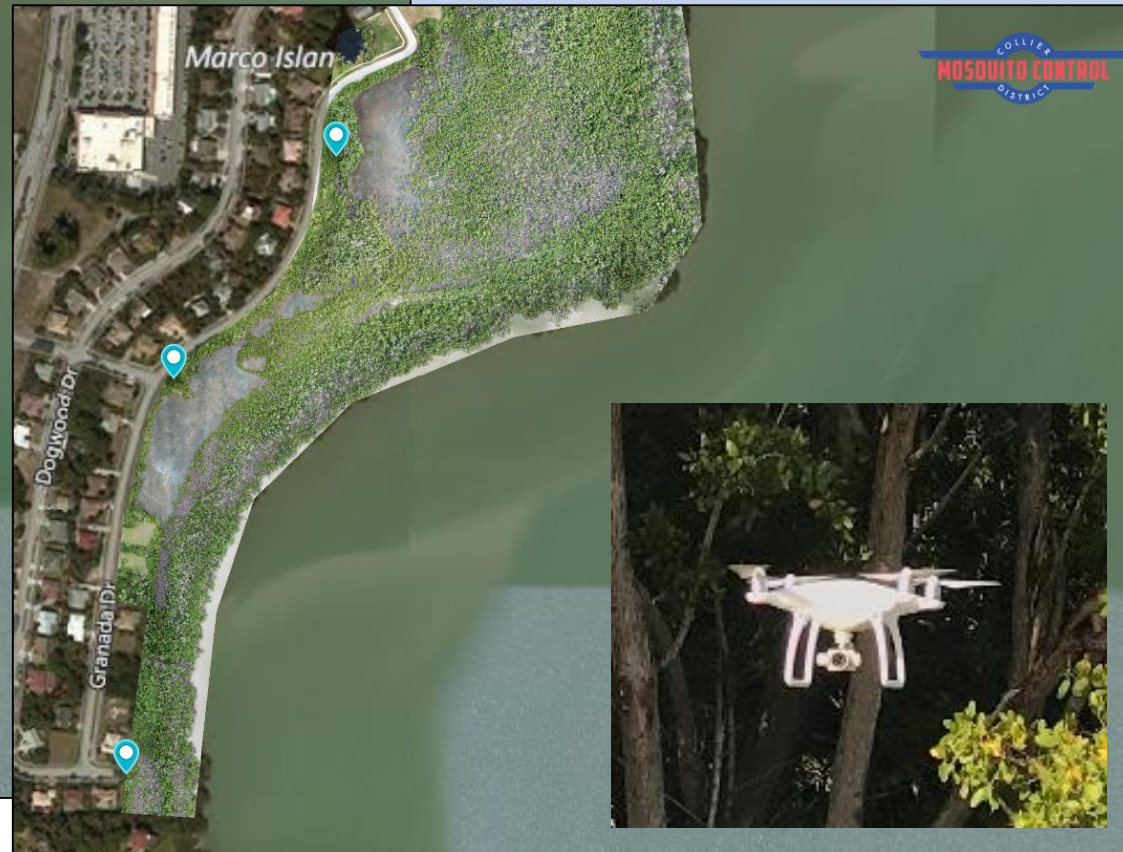


# Tactical Improvements

## NDVI (Normalized Differential Vegetation Index)



VARI – Visible Atmospherically Resistant Index





# Larvicide Treatment Block

Organic pesticide – Natular G30

\$125 per acre

8lbs./ac

326 acres - 2018 map

$326 \text{ acres} \times \$125 = \$40,750$

3 treatments per year = \$122,250

239 acres - 2019 map

$239 \text{ acres} \times \$125 = \$29,875$

3 treatments per year = \$89,625

27% reduction  
in area =  
\$10,875  
savings per  
mission

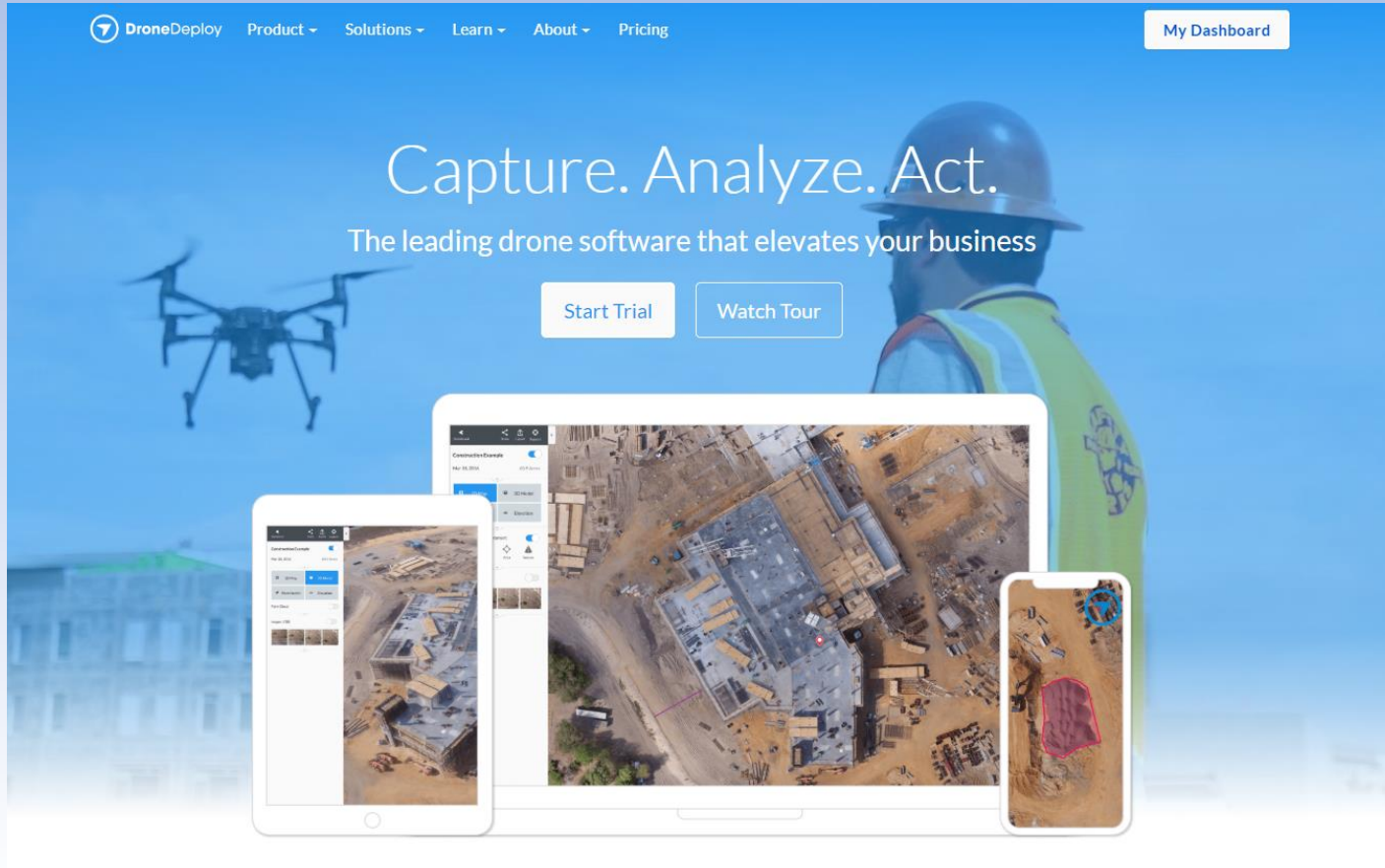
2018 pre UAS flight

Google Earth

2019 post UAS flight

Google Earth

# Mapping Software



[www.dronedeploy.com](http://www.dronedeploy.com)

- Various import and export file formats
- Unlimited maps
- \$3600 per year
- 2D maps, 3D models, VARI, Elevation models



# Matrice 600P (PV13) – Liquid Application



- 13 pounds material
- 0.4 – 1 acre a minute
- 40-foot swath (WDG)
- 8-16 M.P.H. application speed



# Matrice 600P (PV13) – Granular Application

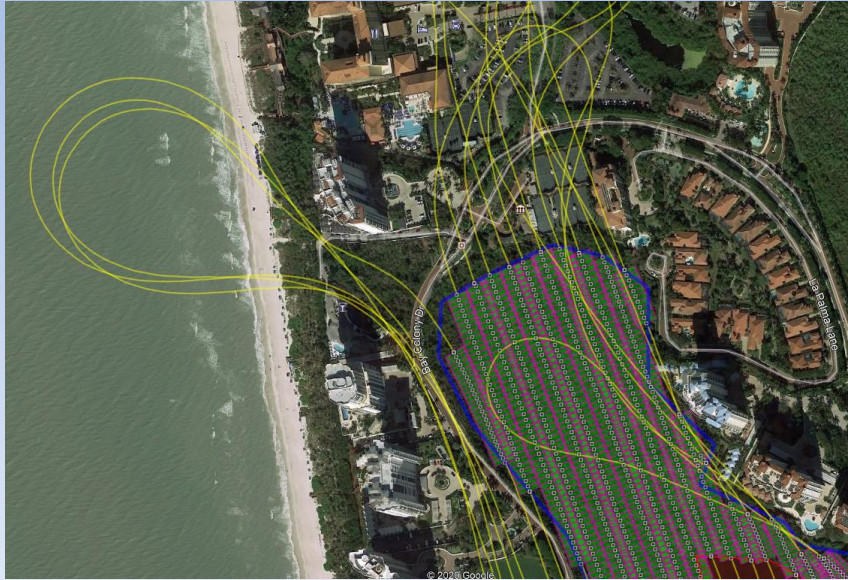


- 13 pounds material
- 0.4 – 1 acre a minute
- 3-4 loads per battery set
- 1-10 acres per load
- 30-foot swath (G30)
- 8-16 M.P.H. application speed



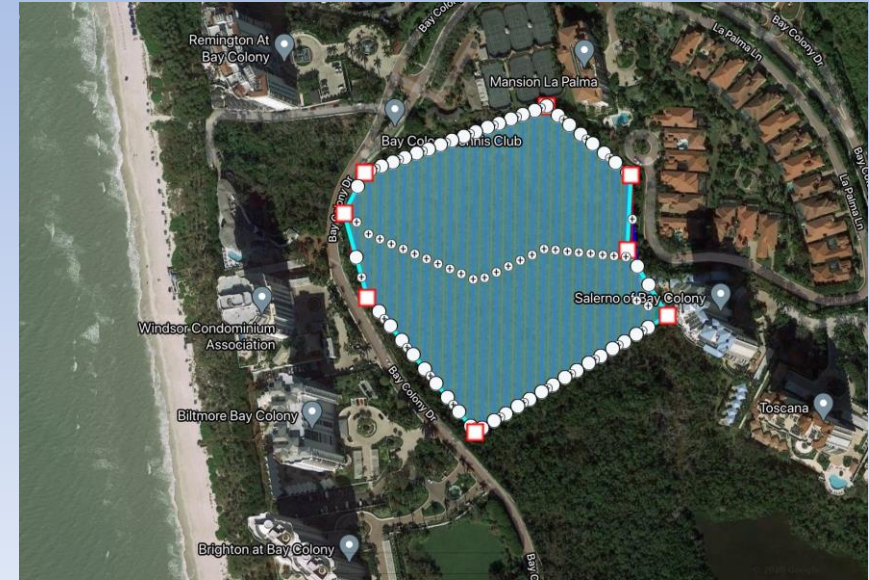


# Safety Improvements



Helicopter Application

- Flights in between buildings
- Over high population areas
- High noise impact (98dBa)
- More complaints
- Short duration (aircraft speed)



Drone Application

- Flights only over intended area
- Only habitat
- Minimal noise (65dBa)
- More curiosity
- In the area longer (less payload)

# Thank you

Peter Brake  
Director of Technical Development  
[pbrake@cmcd.org](mailto:pbrake@cmcd.org)

## Collier Mosquito Control District

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- Research Department:  
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Rachel Bales
- Communications Department:  
Robin King, Andrea McKinney
- Flight Department



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