

Summary of the “Drone Platforms and Sensors for DITCZ CoP” survey

July 2026

This document summarizes the responses to the Drones in the Coastal Zone (DITCZ) Community of Practice Drone Platform Survey, which was developed to document the drone platforms and sensor technologies currently used for coastal research, monitoring, and management across the community. The survey collected information on drone platforms, sensor payloads, primary applications, and organizational affiliations.

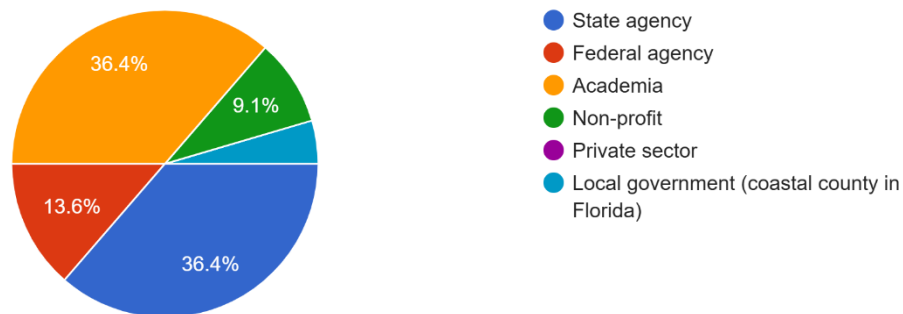
The purpose of this summary is to provide an overview of the current capabilities within the DITCZ Community of Practice, facilitate knowledge sharing among members, and help identify the best options for drone systems in coastal research. The following sections summarize the demographic information provided by respondents and describe each reported drone platform and sensor combination, including its applications and users’ feedback.

If you would like the contact information of specific platform users for more information, email ditz@secoora.org

Section 1 – Demographics

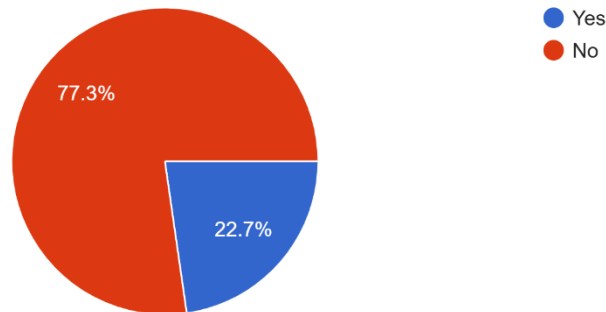
What best describes your current position (check the most appropriate)?

22 responses



Are you affiliated with a National Estuarine Research Reserve (NERR)?

22 responses



Includes ACE, North Inlet-Winyah Bay, Rookery Bay, and South Slough NERRs

Section 2 - Platform and Sensor Inventory

This section summarizes the responses organized by category. Every reported platform/sensor combination is presented as a separate entry, with the accompanying information provided by the respondent.

2.1 RGB Platforms

1. DJI M350 RTK

Payload: DJI P1

NDAA compliant: No

Blue List: No

Reported application(s): Mapping and monitoring change in coastal habitats, primarily salt marsh, oyster reefs and barrier island beach-dune habitats.

Reported benefits/limitations: highly reliable, user-friendly, and affordable, noting that it has consistently met their operational needs. However, concerns were expressed regarding future regulatory restrictions that may prevent continued use or replacement of the platform, despite its excellent performance.

2. IF800 Tomcat

Payload: Sony LR1-ILX

NDAA compliant: Yes

Blue List: Yes

Reported application(s): Monitoring coastal change through aerial surveys (oblique shots and photogrammetry) and to create high-definition communication material keys for meetings and local planning documents

Reported benefits/limitations: Early deployment of the platform was affected by several hardware and software issues, including instability of the ArduPilot-based flight application and occasional crashes of the Herelink controller. In addition, the camera experienced overheating, resulting in signal loss during longer survey flights, and some original batteries required replacement to improve performance and service life.

Respondents indicated that firmware updates, hardware improvements, and battery replacements have largely resolved these issues. Overall, the platform has matured into a reliable and functional system, and the manufacturer has been responsive in addressing the initial challenges, resulting in increased user confidence.

3. DJI Phantom 4 RTK and ProPlus

Payload: standard on drone - 20 MP

NDAA compliant: No

Blue List: No

Reported application(s): aerial photogrammetry and teaching

Reported benefits/limitations: not allowed on federal lands

4. DJI Matrice 3M

Payload: Integrated 20 MP RGB camera

NDAA compliant: No

Blue List: No

Reported application(s): RGB imagery collection, site documentation, coastal surveys, and supplemental photogrammetry products

Reported benefits/limitations: Easy to deploy in the field with a user-friendly workflow and good image quality

5. Quantum Systems - Trinity Pro

Payload: Sony ILX-LR1

NDAA compliant: Yes

Blue List: Yes

Reported application(s): not reported

Reported benefits/limitations: not reported

6. IF800

Payload: Sony LR1

NDAA compliant: Unsure

Blue List: Yes

Reported application(s): habitat mapping, pre & post prescribed fire, wildlife surveys, disaster response

Reported benefits/limitations: The workflow of using it for autonomous missions is not as user-friendly as DJI, and the pilot experienced user error and some malfunctions.

7. DJI Matrices 210

Payload: Zenmuse X5S

NDAA compliant: No

Blue List: No

Reported application(s): When we were able to use it from 2019 to 2024, was used for research of coastal dune vegetation monitoring

Reported benefits/limitations: No issues. Was easy to use and collect data with

8. DJI Mavic 3 E

Payload: integrated

NDAA compliant: No

Blue List: No

Reported application(s): mapping

Reported benefits/limitations: ease of operation and effectiveness, reliable tool for routine data collection. The primary limitation is the uncertainty surrounding the continued use of DJI platforms due to evolving U.S. government policies and restrictions

9. DJI Phantom 4 Pro

Payload: standard

NDAA compliant: No

Blue List: No

Reported application(s): surveying using Structure from Motion

Reported benefits/limitations: platform has performed well for their current applications and has effectively supported their project needs. However, its long-term use is limited by its status as a DJI platform and by the fact that it is no longer supported by the manufacturer.

10. DJI M100, M300RTK, Inspire1 – the respondent did not specify unique combinations of these platforms/sensors

Payload: DJI Zenmuse P1, L1, Z30T, X5

NDAA compliant: No

Blue List: No

Reported application(s): Mapping of coastal habitat and species monitoring

Reported benefits/limitations: M300RTK is currently the most used; ease of use, battery life, LiDAR, and RTK are benefits. Limitation not compliant and looking for a new ecosystem.

11. SkydioX10

Payload: VT300-L

NDAA compliant: Yes

Blue List: Yes

Reported application(s): collecting imagery pre- and post-restoration

Reported benefits/limitations: Although the platform is limited to RGB data collection, respondents indicated that it adequately supports their current operational needs.

12. DJI Mavic 3, DJI Mini, Skydio X10

Payload: pre-installed cameras

NDAA compliant: Yes

Blue List: Yes

Reported application(s): Creating imagery and digital elevation models of habitat restoration sites, before and after construction. DEMs and 3D modeling are generally limited to dunes and living shorelines. Imagery and orthomosaics are generated on a variety of restoration sites, including reforestation, wetland and meadow habitats, and stormwater treatment trains.

DJI Mavic 3 and Mini reported benefits/limitations: user-friendly interface and intuitive flight planning workflow. The DJI Mini was specifically noted as an effective tool for

collecting communication imagery and video. The primary limitation is that organizational restrictions related to NDAA compliance limit which pilots are authorized to operate DJI aircraft.

Skydio reported benefits/limitations: while its mapping performance is still being assessed, concerns were raised regarding the potential effects of the rolling shutter on data quality. Additional limitations included the inability to access flight planning functions on the controller without being connected to the aircraft, as well as the perceived fragility and high replacement cost of the propellers.

13. eBee X

Payload: Aeria X

NDAA compliant: No

Blue List: No

Reported application(s): Mapping of all environments

Reported benefits/limitations: Hard to fly in forests (requires a clear approach corridor), easy RTK/PPK workflow

14. Parrot Anafi AI

Payload: pre-installed camera

NDAA compliant: No

Blue List: No

Reported application(s): locating marine debris in coastal environments, including mangrove forests; monitoring manatees in freshwater springs; counting wood stork nests; locating sea turtles during cold-stunning response efforts; and supporting volunteer-based horseshoe crab monitoring surveys.

Reported benefits/limitations: relatively short communication range when relying solely on the built-in Wi-Fi connection. multiple aircraft losses due to failures in manual control override, resulting in drones landing in the water. Battery reliability was also identified as a concern, with several batteries malfunctioning before reaching their expected service life.

15. DJI Mavic Pro

Payload: DJI Mavic Pro

NDAA compliant: No

Blue List: Unsure

Reported application(s): Mapping study sites, videos

Reported benefits/limitations: Not compliant with federal regulations, could use multispectral for more in-depth vegetation classifications

16. RTsys NemoSens AUV

Payload: Arctic Rays Swordfish

NDAA compliant: No

Blue List: No

Reported application(s): Underwater image collection and ground validation of habitat models

Reported benefits/limitations: not reported

17. DJI Mavic 3 multispec (switching to Freefly Astro)

Payload: stock sensor with Mavic 3; Sony LRI with Astro

NDAA compliant: Yes

Blue List: Unsure

Reported application(s): monitoring, mapping, and assessment of intertidal coastal habitats.

Reported benefits/limitations: reliability and effectiveness for data collection. No significant limitations were identified with Astro yet.

18. Mavic 2 Pro, Mavic 3T, Matrice 350, Matrice 4E. Phantom 2 Pro

Payload: P1 Sensor

NDAA compliant: No

Blue List: No

Reported application(s): Coastal Habitat mapping, water quality, Fisheries related projects

Reported benefits/limitations: not reported

19. Raptor - Anzu Robotics

Payload: Integrated

NDAA compliant: Yes

Blue List: No

Reported application(s): seagrass - coral reef mosaic mapping

Reported benefits/limitations: very reliable, great battery time, portable, affordable, RTK capabilities. No complaints

20. Mavic 2 Pro

Payload: Mavic 2 Pro camera

NDAA compliant: No

Blue List: No

Reported application(s): RGB orthomosaics, photos, videos, mapping, outreach items

Reported benefits/limitations: compact size and portability, it can be easily transported in a backpack for surveys in remote locations. A limitation is that flight planning requires a separate application (UGCS), requiring users to plan and execute missions outside the manufacturer's native software.

2.2 Multispectral platforms

1. DJI M350 RTK

Payload: Micasense Altum-PT

NDAA compliant: No

Blue List: No

Reported application(s): Mapping and monitoring change in select areas of salt marsh using NDVI (and occasionally other vegetation reflectance indices).

Reported benefits/limitations: the reported NDAA and Blue List status applies to the drone platform rather than the sensor payload, which should be compliant. The MicaSense Altum-PT is a key strength of the system due to its integrated downwelling light sensor, which enables spectral reflectance measurements to be corrected for temporal variations in incoming solar irradiance during and between flights. This capability is essential for producing repeatable, quantitative measurements of marsh vegetation condition over time. Additionally, the Altum-PT can be integrated with other medium-lift drone platforms, providing flexibility for future operations should a transition away from DJI aircraft become necessary.

2. DJI Matrice 3M

Payload: Integrated multispectral camera system

NDAA compliant: No

Blue List: No

Reported application(s): dune and beach morphology surveys, marsh monitoring, and environmental change detection.

Reported benefits/limitations: Simple setup and easy mission planning with reliable multispectral data collection. Useful for rapid coastal mapping and vegetation analysis. Limitations include sensitivity to lighting conditions and the platform not being NDAA-compliant or on the Blue UAS list. Does not interface with DJI- so you can't see what is being mapped.

3. IF 800

Payload: Micasense Rededge-P

NDAA compliant: Unsure

Blue List: Yes

Reported application(s): habitat mapping

Reported benefits/limitations: not reported

4. DJI Matrices 210

Payload: DJI Zenmuse X5S Blue Edge

NDAA compliant: No

Blue List: No

Reported application(s): it was used from 2019 to 2024 for research of coastal dune vegetation monitoring

Reported benefits/limitations: easy to use and reliable

5. DJI Mavic 3M

Payload: pre-installed camera

NDAA compliant: No

Blue List: No

Reported application(s): monitoring vegetation health and supporting management activities at habitat restoration sites, early-season detection of invasive plant species as a potential future application.

Reported benefits/limitations: data processing and analysis require remote sensing experts

6. eBee X

Payload: RedEdge MX

NDAA compliant: No

Blue List: No

Reported application(s): environmental mapping

7. DJI Mavic 3 multispectral (switching to Freefly Astro)

Payload: Mavic 3m stock multispectral sensor; Sentra 6x multispectral with Astro

NDAA compliant: Yes

Blue List: Unsure

Reported application(s): monitoring, mapping, and assessment of intertidal coastal habitats.

2.3 LiDAR platforms

1. DJI M300/M350 RTK

Payload: DJI L1/L2

NDAA compliant: No

Blue List: No

Reported application(s): mapping salt marsh bare-earth elevation, coastal deposits change monitoring, coastal dune vegetation monitoring, elevation mapping of tidal, restoration of lowlands, forestry canopy.

Reported benefits/limitations: affordable and easy to use for data collection. Difficulties in detecting the ground in dense vegetation. Not allowed over federal lands.

2. IF800 Tomcat

Payload: GeoCue TrueView 535

NDAA compliant: Yes

Blue List: Unsure

Reported application(s): High-resolution topographic mapping, dune elevation surveys, coastal morphology analysis, and vegetation penetration in marsh and beach environments.

Reported benefits/limitations: provides accurate elevation data and performs well in vegetated coastal environments. High system cost, larger transport and setup requirements, a less user-friendly graphical user interface (GUI), lower build quality, and shorter flight times when operating with the LiDAR payload.

3. Harris H6 Hybrid

Payload: Geocue Geocue - True View 625

NDAA compliant: Yes

Blue List: No

Reported application(s): surveying beaches and marshes - DEM creation

Reported benefits/limitations: not reported

4. Remus 620 AUV

Payload: Voyis Recon LS

NDAA compliant: No

Blue List: No

Reported application(s): Imaging and laser point clouds of the seafloor up to 600m deep

Reported benefits/limitations: not reported