

Integrating drone and LiDAR technology into Tribal Wetland Programs



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Overview

- **Shakopee Mdewakanton Sioux Community Wetlands Program**
- **LiDAR & Drone Equipment**
- **Plans to incorporate drone & LiDAR data**



SMSC Wetlands Program

Geospatial Services

Level 1:

GIS-based landscape assessments

Level 2:

Rapid field-based assessments, often based on qualitative measurements

Level 3:

Intensive field-based assessments with specific quantitative measurements

Collect LiDAR (Light Detection And Ranging) data – remote sensing system used to collect high-resolution, accurate topographic, landform data

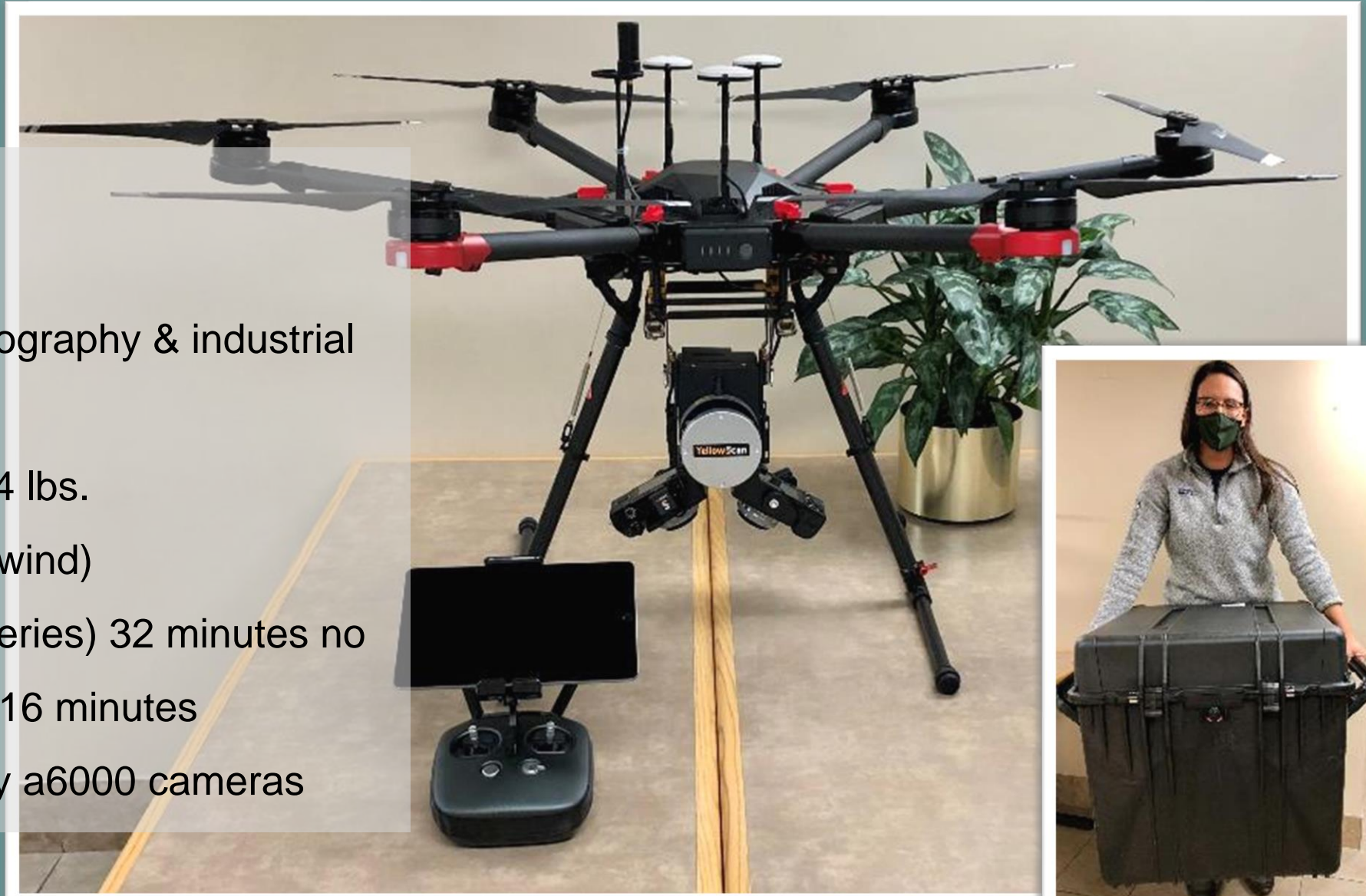
1. Conduct a landscape assessment of wetlands and surrounding areas.
2. Identify critical areas for water quality through GIS-based assessments.
3. Develop and apply a field-based assessment protocol for assessing wetland condition.
4. Develop prioritization and selection criteria for preservation, restoration, and enhancement opportunities.



Drone

DJI Matrice 600 Pro

- \$6,000
- Six-rotor flying platform
- Professional aerial photography & industrial applications
- Max take off weight is 34 lbs.
- Max speed 40 mph (no wind)
- Hovering time (with batteries) 32 minutes no payload/13 lb. payload: 16 minutes
- (2) mounted DSLR Sony a6000 cameras

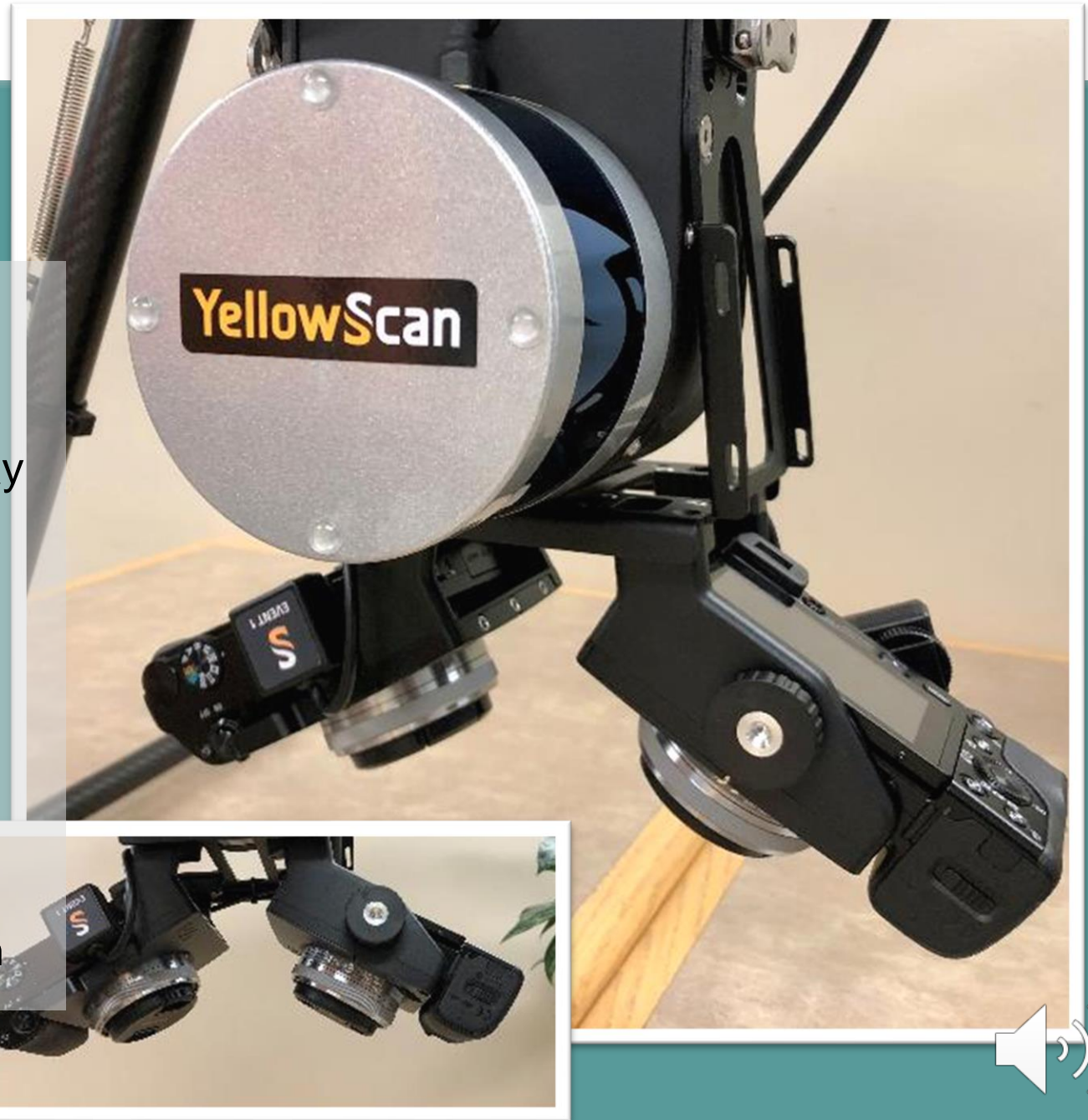




LiDAR

Yellow Scan Surveyor

- \$61,500 (Multi-echo Velodyne Puck Laser Scanner, GNSS antenna & cable, battery, charger, software, correction software, 3-day training)
- Low weight (3.5 lbs.)
- Precision – 4 cm
- Accuracy – 5 cm
- 300k shots per second
- Up to 2 echoes per shot or returns per scan





Incorporating Drone & LiDAR Data

PROS

- Versatile
 - Multi-use
 - Repeat flights
- Can analyze temporal changes
- Accuracy & precision
 - Detect subtle elevation changes
- High-resolution
 - Higher quality imagery
- Many applications
 - Forestry resource inventory
 - Wildlife habitat assessment
 - Infrastructure & construction management

CONS

- Cost prohibitive
- Need technical background to operate drone, post-process data & create derivatives
- Can only collect LiDAR data from limited area (not-landscape level)





Questions

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