

Mapping Your World Using Drones



Dirk Charlson, Ph.D., CCA-PA Sp
Statewide Extension Educator-Digital Agriculture
University of Nebraska-Lincoln
Email: dirk.charlson@unl.edu
Cell: 402-460-0742
FAA-Certified Remote Pilot, Certificate Number: 3973348



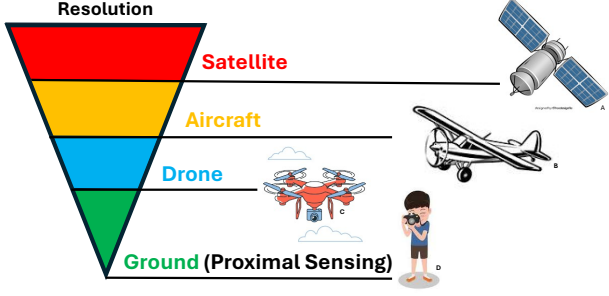
© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

1

1

Remote Sensing Platforms

Resolution



Satellite (A)

Aircraft (B)

Drone (C)

Ground (Proximal Sensing) (D)

Image Source: A-freedigital, B-shutterstock.com, C-Freepik, D-Angela VDO



© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

2

2

Uncrewed Aerial Systems



Quad-Copter

Fixed Wing

Vertical Take Off and Landing (VTOL)



© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

3

3

Remote Sensing Systems

RGB

Spectral

Multispectral

Hyperspectral

https://commons.wikimedia.org/wiki/File:Spectral_RGB_multispectral_hyperspectral_imaging.jpg. CC-BY-SA 4.0

© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

4

4

Remote Sensing Systems

Thermal

LiDAR (Light Detection And Ranging)

© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

5

5

RGB Photo-Grammetry

STEP 1: Program Flight Plan

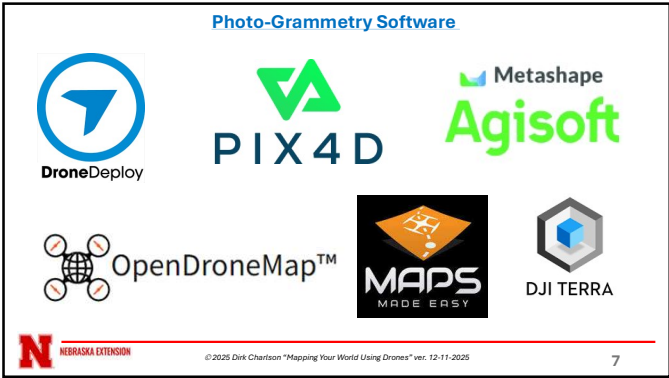
STEP 2: Collect Images

STEP 3: Create Ortho-mosaic

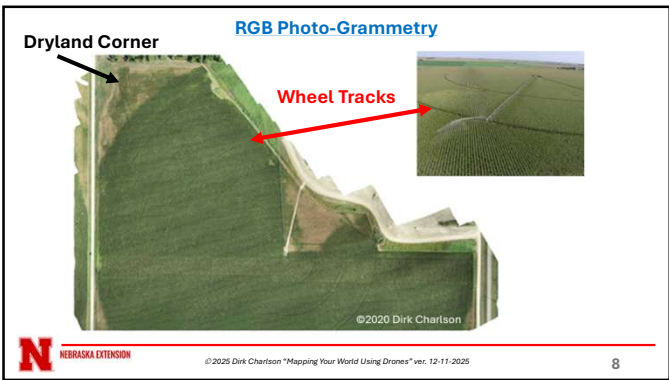
© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

6

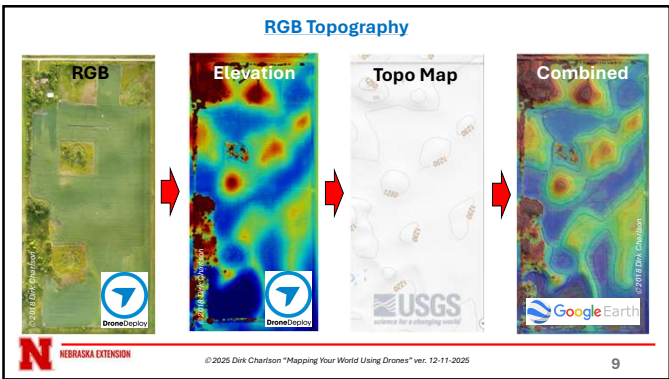
6



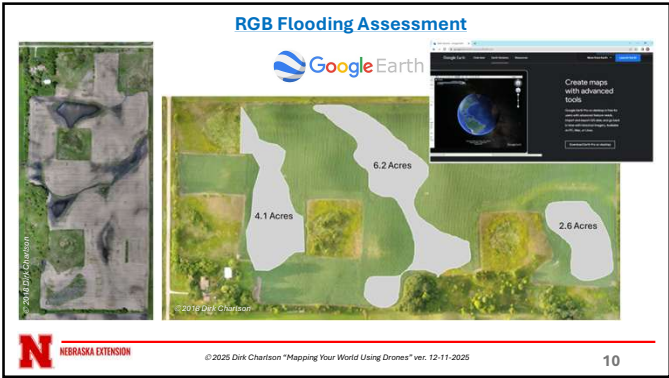
7



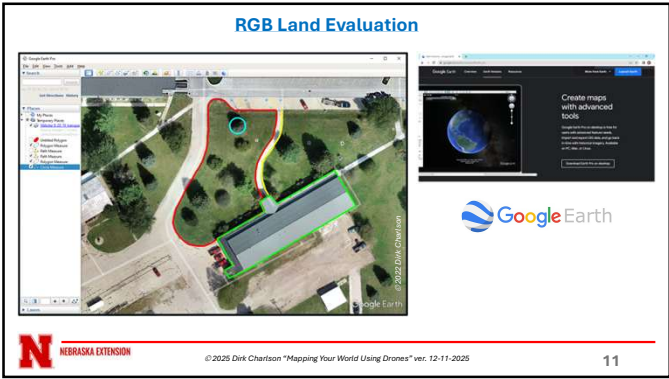
8



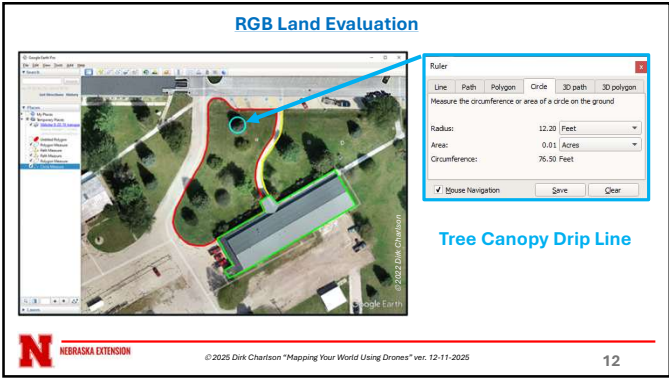
9



10

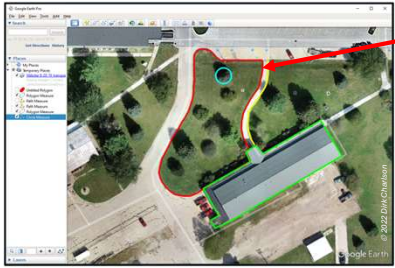


11



12

RGB Land Evaluation



Ruler

Line Path Polygon Circle 3D path 3D polygon

Measure the distance or area of a geometric shape on the ground

Perimeter: 650.68 Feet

Area: 0.50 Acres

☒ Show Navigation

Save Clear

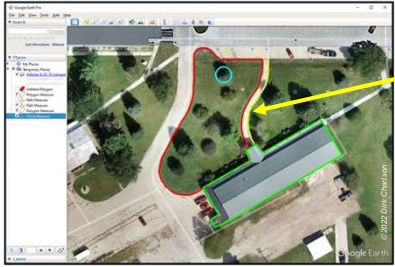
NEBRASKA EXTENSION

© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

13

13

RGB Land Evaluation



Ruler

Line Path Polygon Circle 3D path 3D polygon

Measure the distance between multiple points on the ground

Length: 143.02 Feet

☐ Show Elevation Profile

☒ Show Navigation

Save Clear

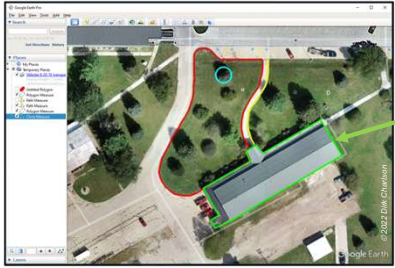
NEBRASKA EXTENSION

© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

14

14

RGB Land Evaluation



Ruler

Line Path Polygon Circle 3D path 3D polygon

Measure the distance or area of a geometric shape on the ground

Perimeter: 608.60 Feet

Area: 0.33 Acres

☒ Show Navigation

Save Clear

NEBRASKA EXTENSION

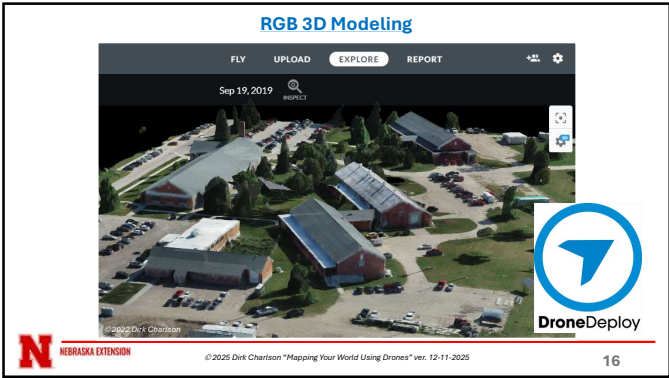
© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

15

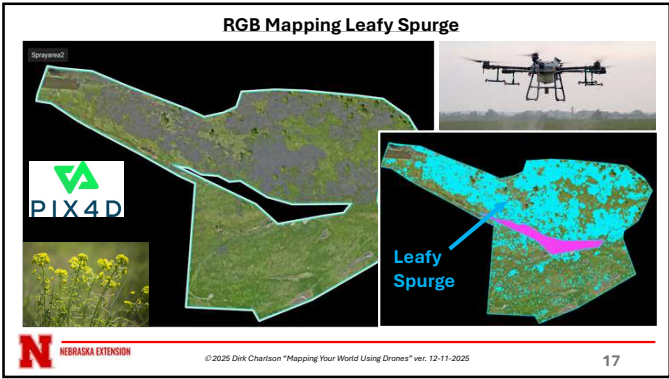
15

The archived presentation is available at:
<https://lpelc.org/archived-webinars/a-view-from-above-application-of-drones-and-remote-sensing-for-air-and-water-quality-measures-around-livestock-farms>

5



16



17



18

Thank You!



Dirk Charlson, Ph.D., CCA-PA Sp
Statewide Extension Educator-Digital Agriculture
University of Nebraska-Lincoln
Email: dirk.charlson@unl.edu
Cell: 402-460-0742
FAA-Certified Remote Pilot, Certificate Number: 3973348

 NEBRASKA EXTENSION

© 2025 Dirk Charlson "Mapping Your World Using Drones" ver. 12-11-2025

19
