

UAS Applications in Field Crops

- Small UAS
 - Monitoring and Scouting
 - Management Issues
 - Precision Application Maps
- Large UAS
 - Identification of Management Issues
 - Precision Application Maps
 - Yield Predictions
 - Insect and Disease Movements
 - Elevation Data
 - One More Layer for Big Data



NDSU UAS Research Partners

- Partners providing grant support

- Department of Commerce – Research ND

- 2014 – CREC
- 2015 – All NDSU REC's
- 2016 – RECs + Hillsboro

- Elbit Systems of America

- AeroVironment

- IntelinAir

- LW Survey

- Sentera

- ND Agricultural Experiment Station

- ND Soybean Council

- ND Corn Council

- NDSU Ozbun Fund



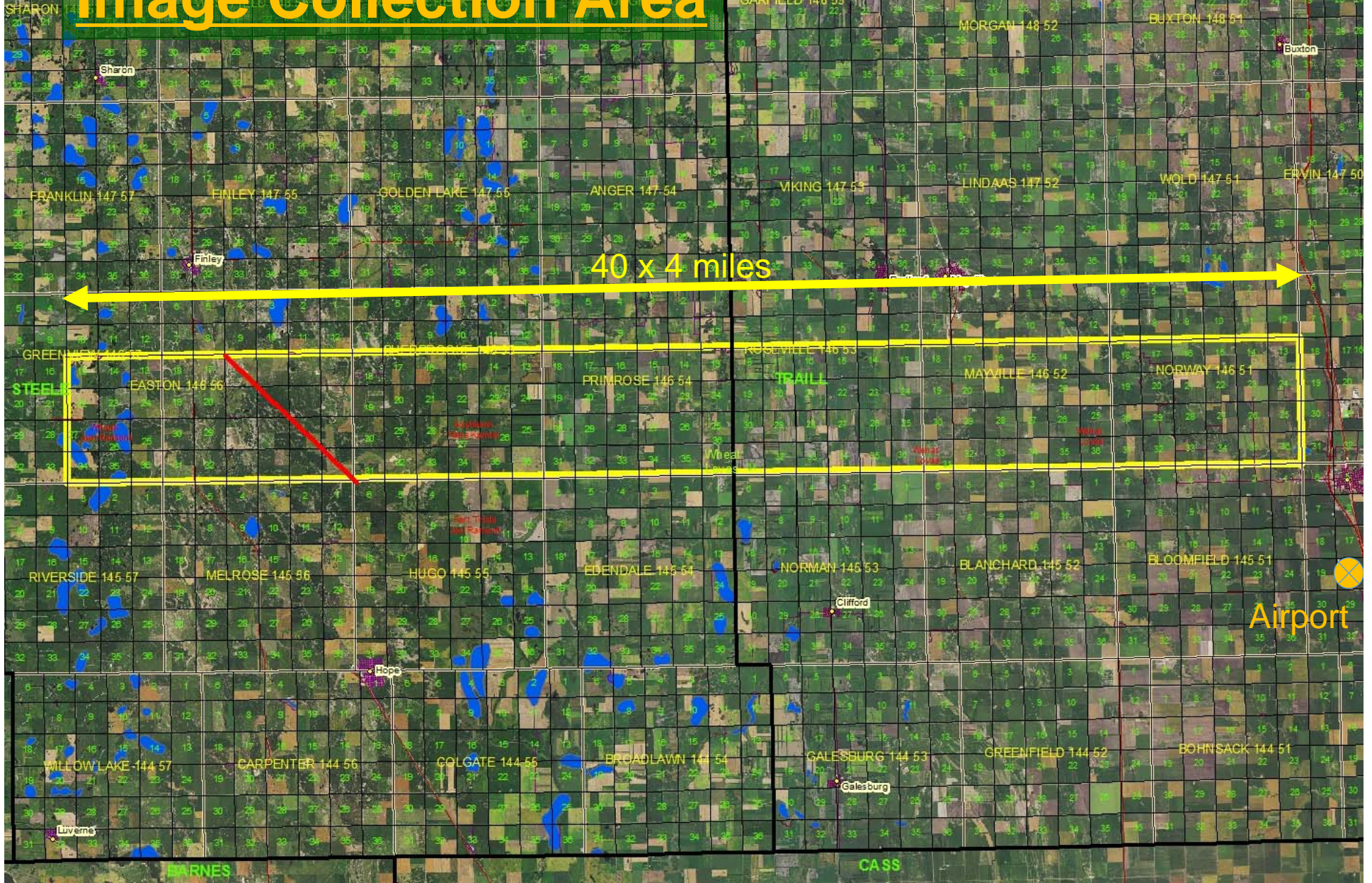
UAS Sensors

Cameras

- ICI 9640 S Thermal camera
- Large area scanning EO/IR/NIR camera
- Sony NEX-5R camera with NIR
- Tetracam ADC
- Sentera dual sensor (4 band)
- Sentera Quad sensor (6 band)
- MicaSense Rededge
- Ximera Hyperspectral sensor
- Rikola Hyperspectral sensor



Image Collection Area



40 x 4 miles

Airport

Engineering

Hermes 450 UAS



Key Personnel



John Nowatzki



Alyssa Scheve



Angie Johnson



Sreekala Bajwa



David Roberts



David Saxowsky



Hans Kandel



Joel Ransom

NDSU Extension Role

- Facilitate
- Collaborate
- Educate



What Has Gone Well

- Collaboration
- FAA and FCC Approval
- NDSU County Extension Agents
- Hillsboro Airport and Airport Authority
- North Dakota Aeronautics Commission
- Image Quality

- Objectives:
 - Identification of Problem Areas
 - Nitrogen Management in Crops
 - Quantifying Crop Hail Damage
 - Correlation to NDSU Research Plots

Remaining Activities

- Image Collection in August
- Research Objectives:
 - Weed Identification
 - Correlate Imagery to Harvested Yield
 - Economic Value to Farmers and Agronomists
 - Economic Opportunity to Industry Partner
- NDSU Extension Education
 - Workshops for NDSU Extension Faculty
 - Workshops for Farmers and Agronomists

Questions - Comments

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