

National Aeronautics and Space Administration



Soil Moisture
Active Passive
Mission
SMAP

Cal/Val
Workshop

November 14-16, 2012

UAVSAR Postprocessing
& Status of Crop
Structure Data

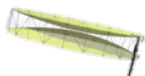
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Narendra Das*, Andreas Colliander*,
Thomas Jackson**, Eni Njoku*

**USDA

(also thanks to Bin Wang, Stacie Westervelt,
Grant Wiseman)

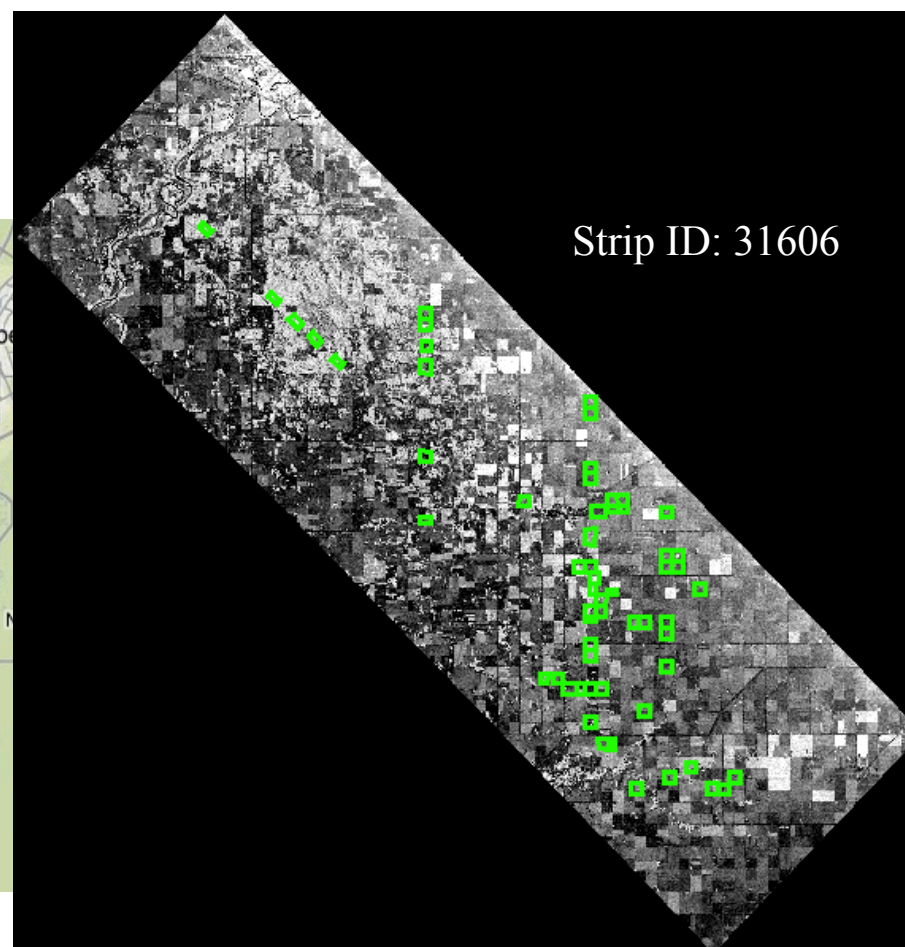
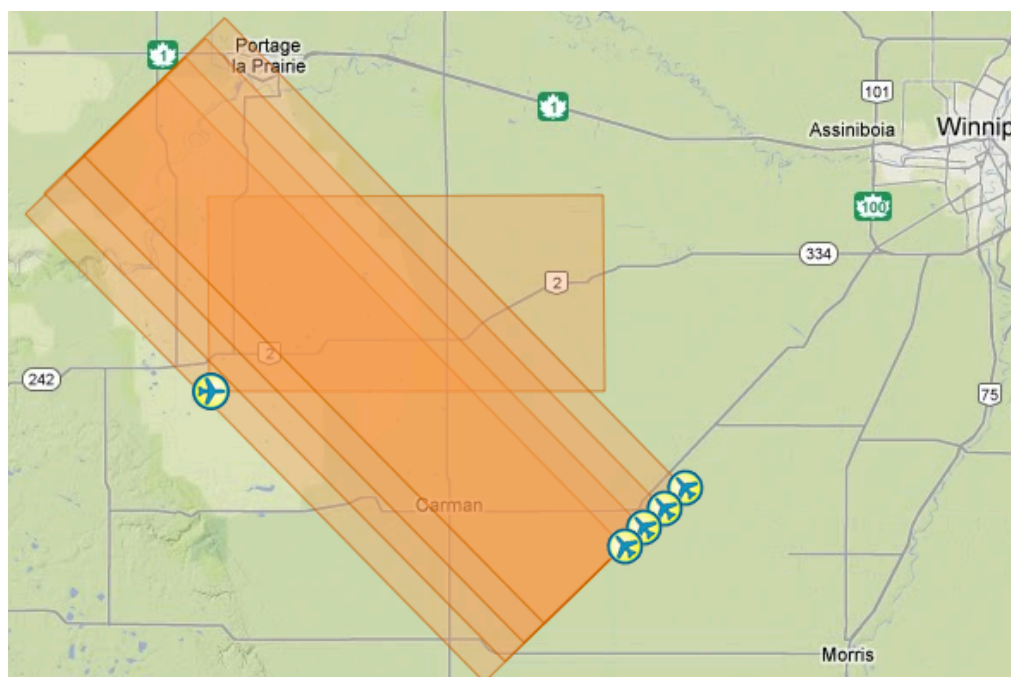
*Jet Propulsion Laboratory
California Institute of Technology.

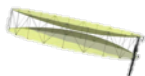
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UAVSAR postprocessing

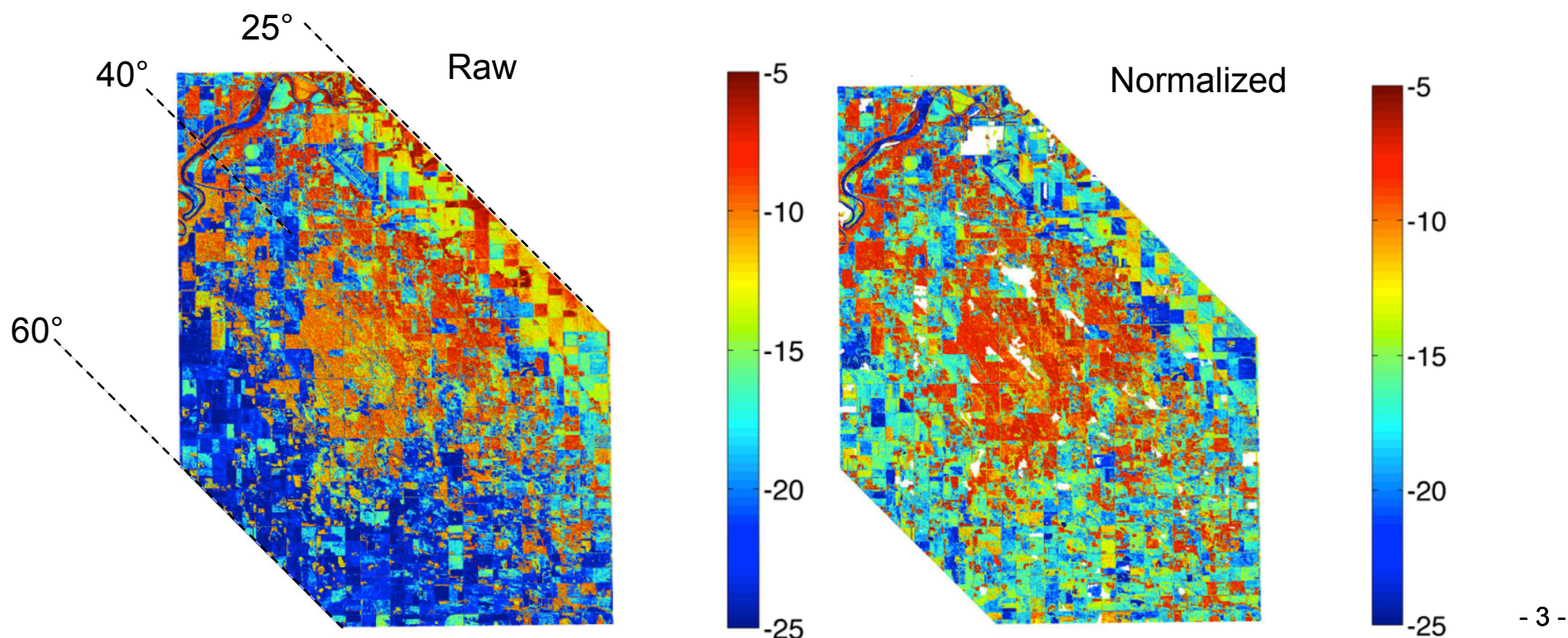
- Incidence angle normalization to 40deg
 - The original incidence angle ranges from 25 to 60 degs
- Removing heterogeneous (man-made) structures
- Matchup with in situ data

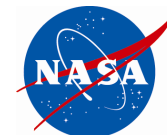
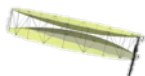




Incidence angle normalization

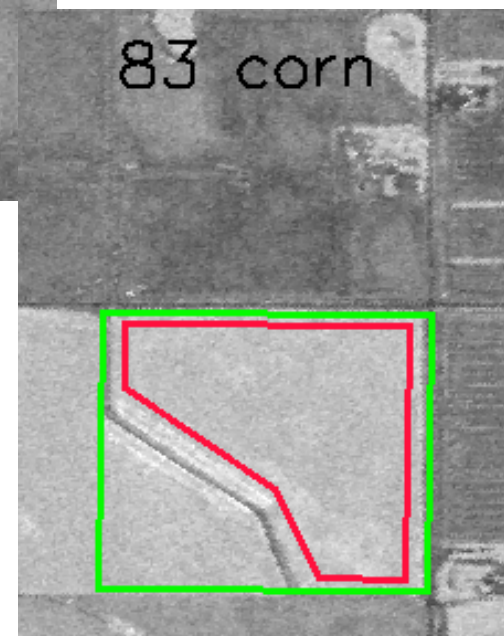
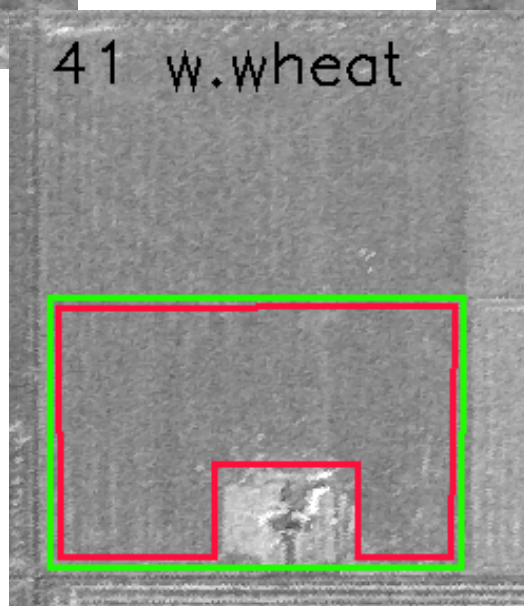
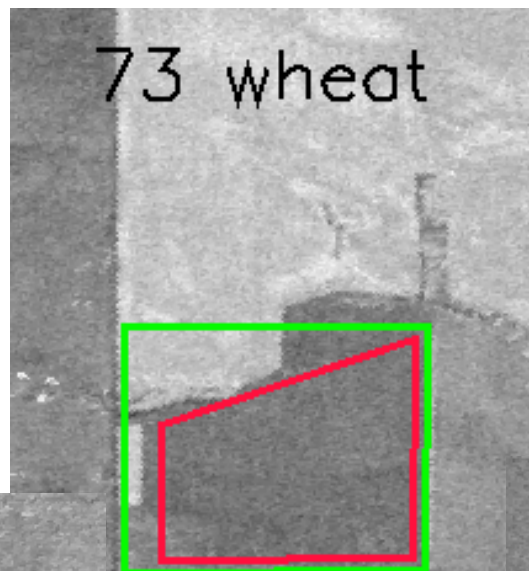
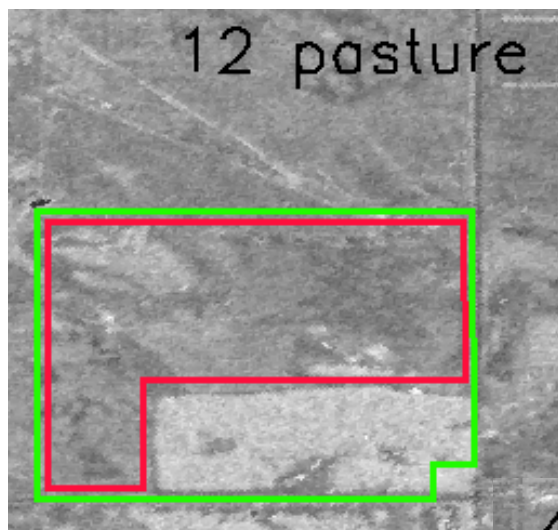
- Objectives
 - To help studies of 40deg angle radar image
 - Intercomparison (with PALS, other UAVSAR strips) pending the accuracy
- Histogram matching developed by Tom Jackson's group
- Status
 - Implemented and tested for forests
 - Requires land cover classification map for non-forests.

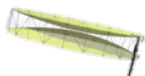




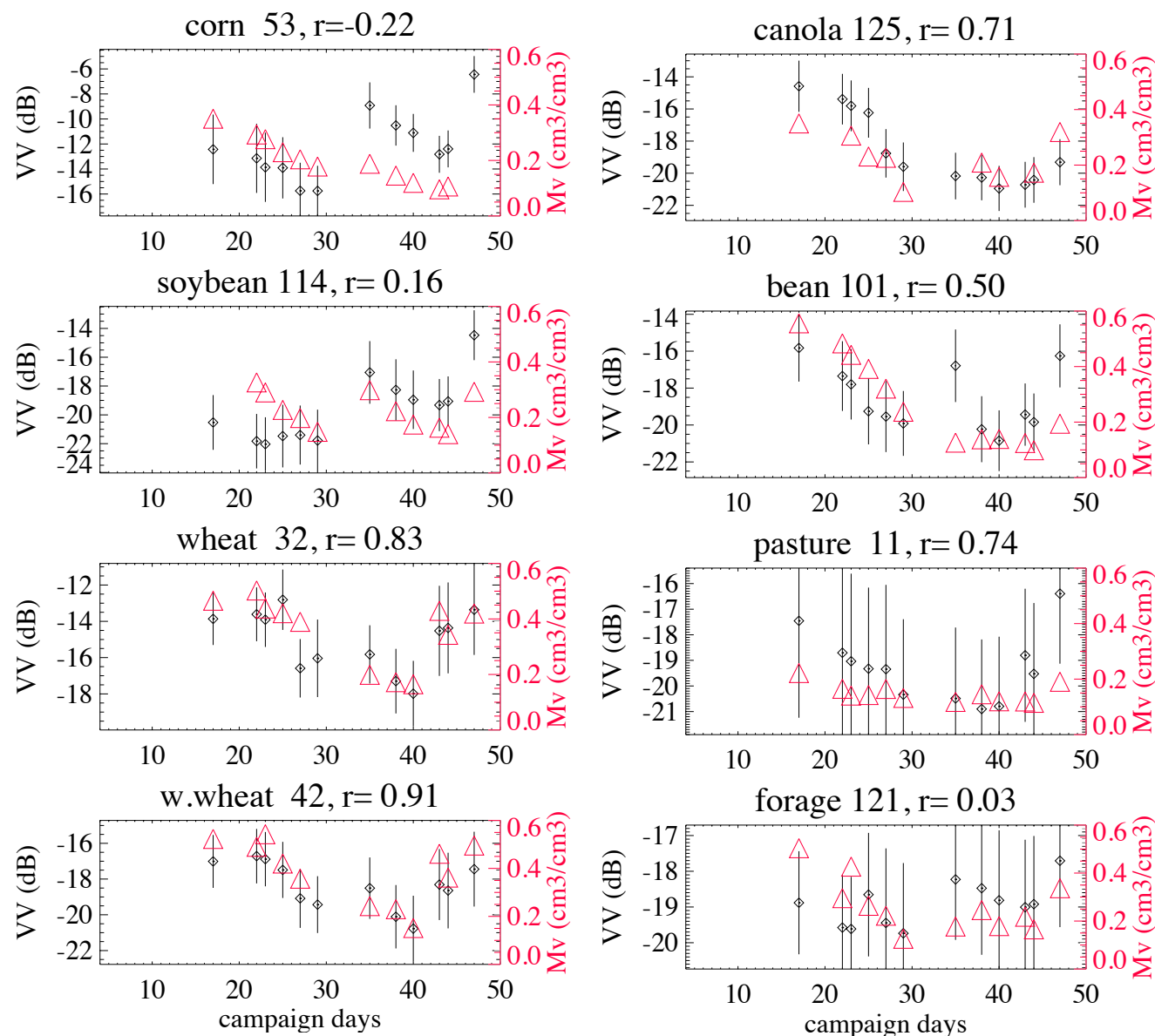
Filtering heterogeneous objects

- Green and red polygons are the field boundaries before and after the filtering, respectively. The number is the field ID.





Matchup with in situ data



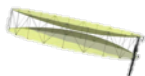
LEGEND

Field type & ID

'r': correlation between
Mv and Wagner index
(effectively, VV).

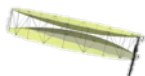
Note: sigma0 are not at
40deg angle (though
close to).

Mv: uncalibrated &
original field boundary



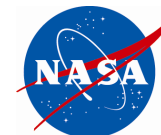
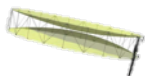
UAVSAR: summary and plans

- (complete) Removing heterogeneous objects
- (complete) Matchup with in situ data.
 - The above two procedures appear to work well.
- Incidence angle normalization
 - Needs the landcover map for 2012
 - Once completed, the following data will be released
 - Normalized UAVSAR data
 - Matchup data between UAVSAR and in situ



Crop structure measurements

- Objectives
 - Help understand radar response
- Measurements
 - Complete characterization of geometry of crops
 - Length: plant, stalk, branch, leaf
 - Angle: stalk, branch, leaf
 - Diameter or thickness: stalk, branch, leaf
 - Density or number: stalk, branch, leaf
 - Collocated & coincident VWC measurements
 - Fast-growing crops were sampled more frequently
- Status
 - Geometry data are complete
 - Some glitches in dry weight records (missing records and mislabels)
- Plan
 - Cross-compare between vegetation teams' VWC and structure team's VWC, as a QC
 - Waiting for vegetation teams' VWC



Crop structure measurements

