Update on automated seagrass classification efforts

Victoria Hill & Richard Zimmerman

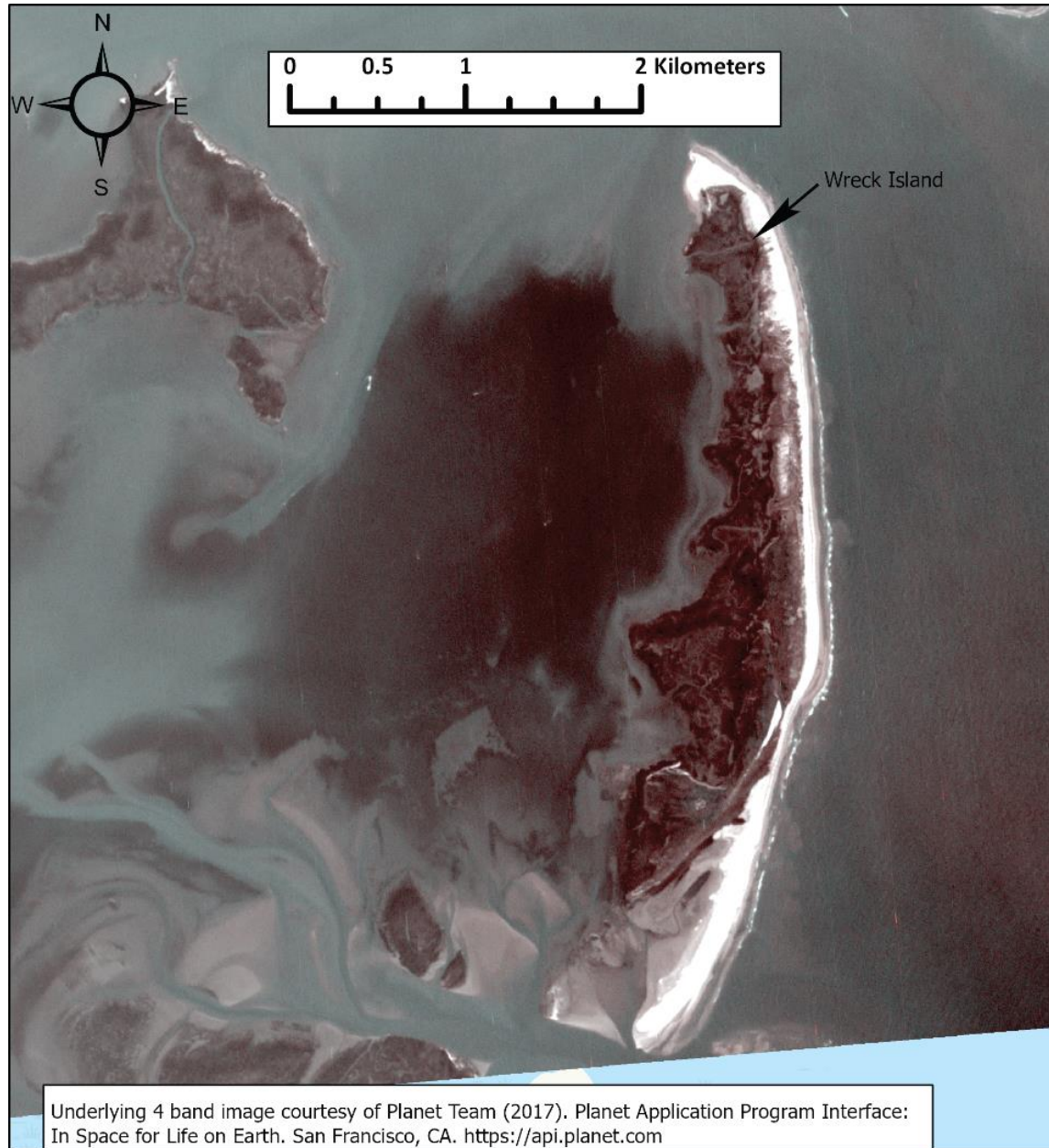Old Dominion University, Department of Ocean and Earth Sciences.

Blake Schaeffer

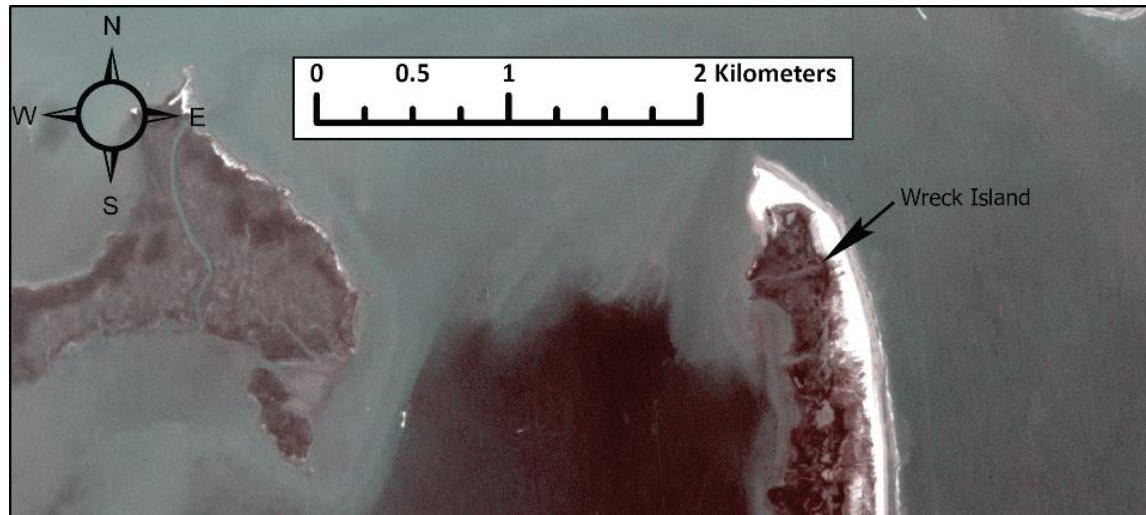U.S. Environmental Protection Agency

Kazi Aminul Islam & Jiang Li

Old Dominion University, Department of Electrical and Computer Engineering.

Testing atmospherically corrected Planetscope image

Underlying 4 band image courtesy of Planet Team (2017). Planet Application Program Interface: In Space for Life on Earth. San Francisco, CA. https://api.planet.com
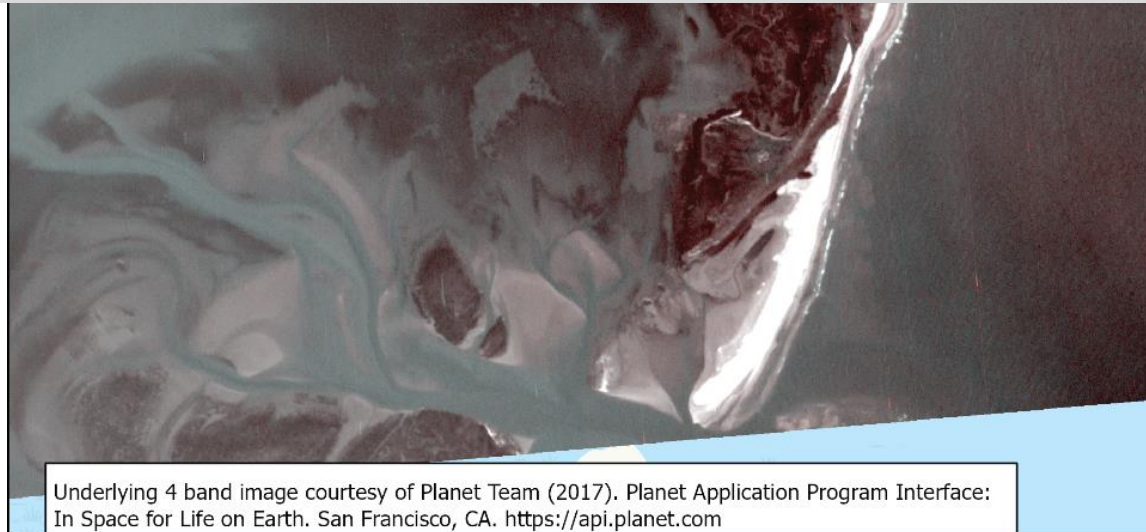
Testing atmospherically corrected Planetscope image
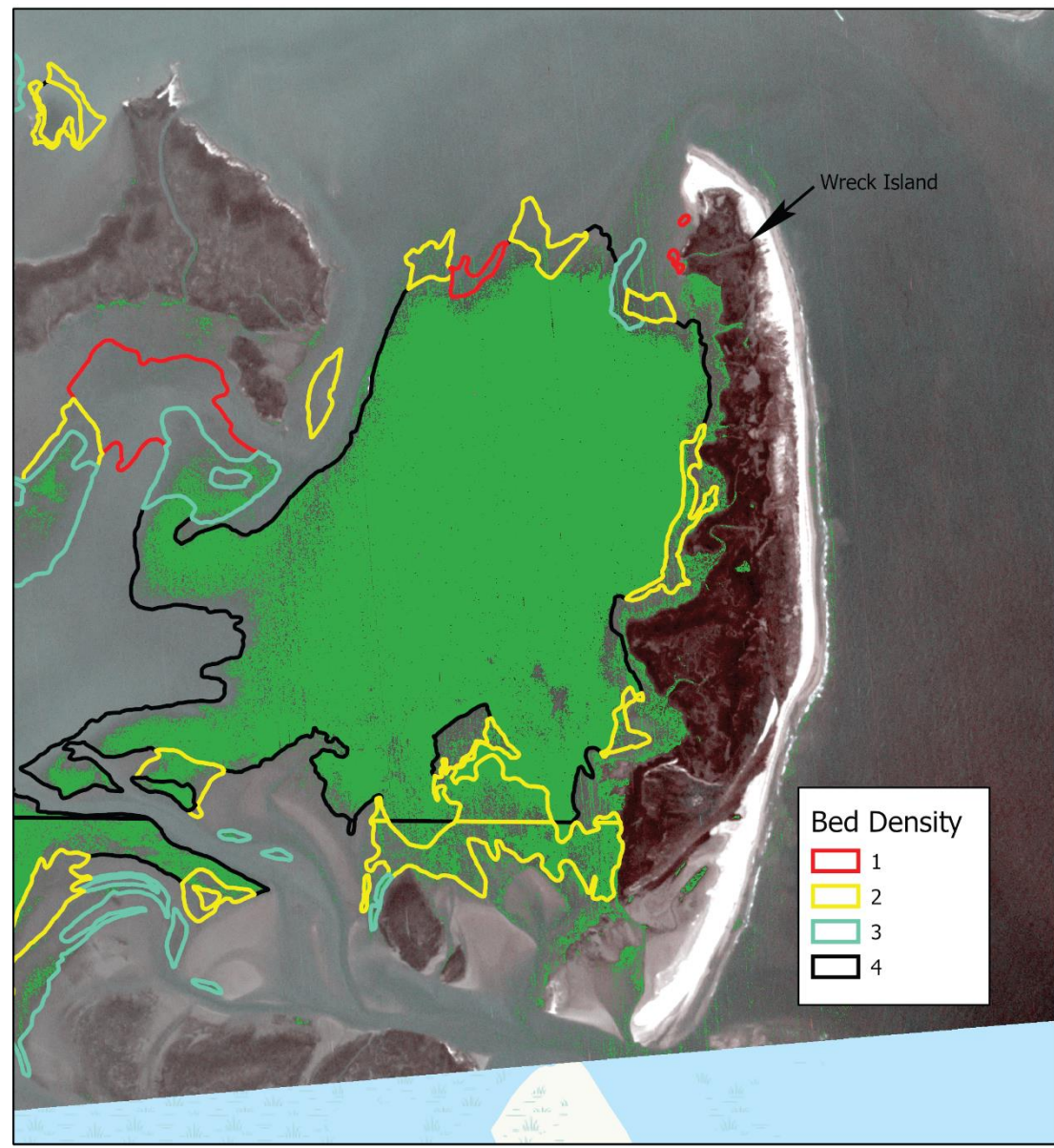

Atmospheric correction is required for:
- Retrieval of seagrass density,
- Development of unsupervised models – model trained once, used on multiple images on temporal and spatial scales.

Underlying 4 band image courtesy of Planet Team (2017). Planet Application Program Interface: In Space for Life on Earth. San Francisco, CA. https://api.planet.com

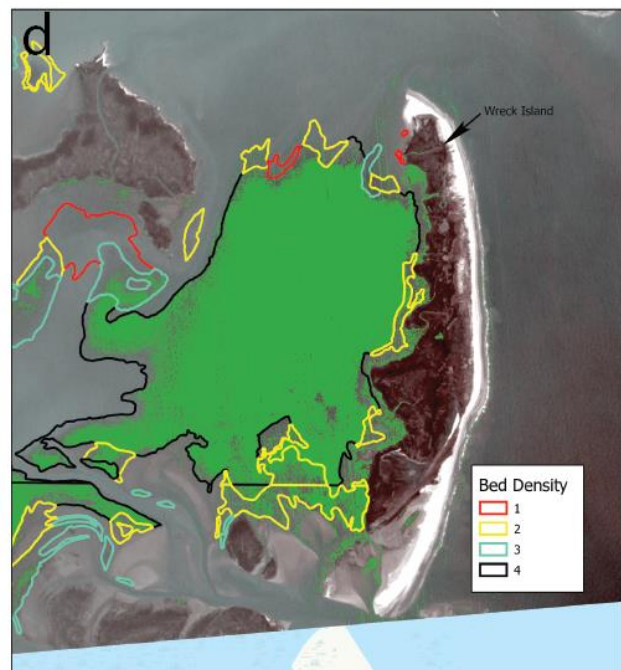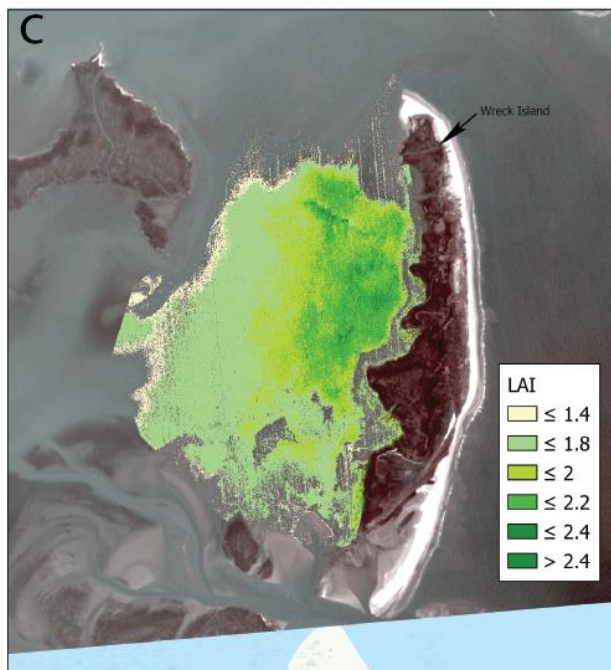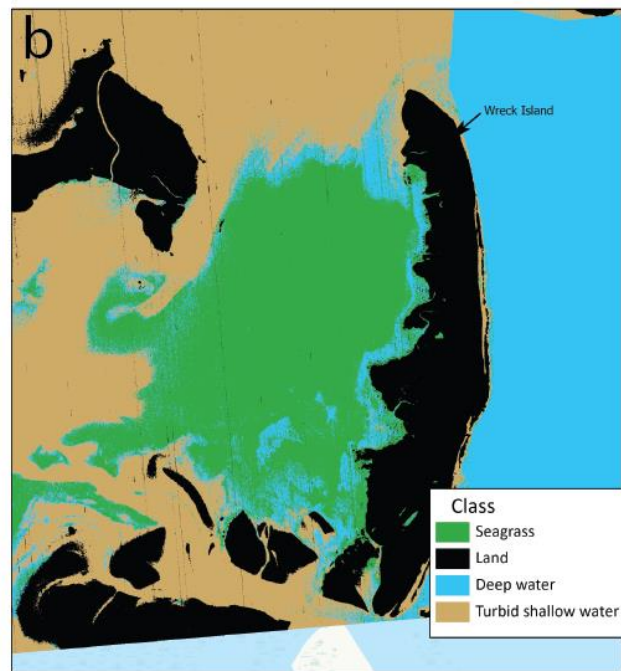# Seagrass classification successful via supervised classification techniques

Seagrass classification matches with VIMS seagrass bed locations

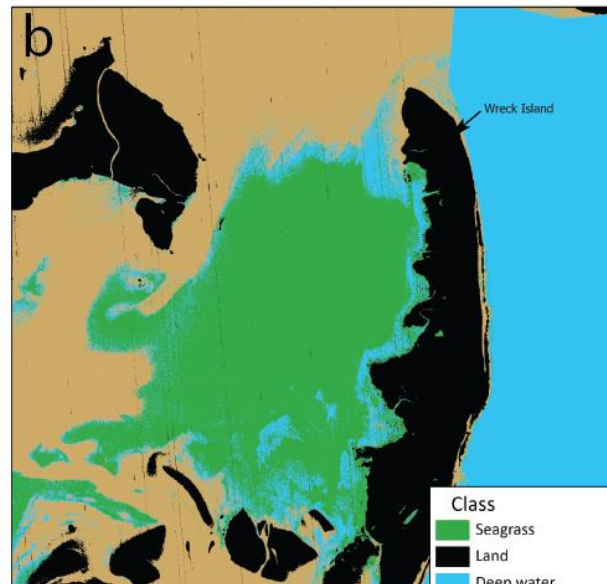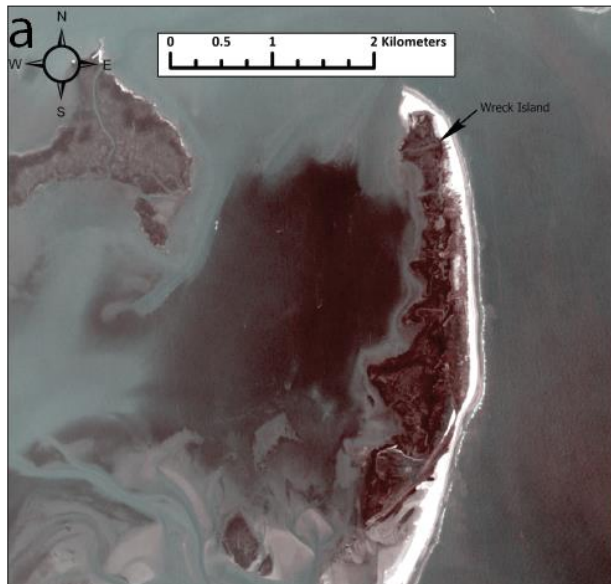

Wreck Island

Bed Density
- 1
- 2
- 3
- 4

Seagrass density successfully retrieved
- Bathymetry & water quality required

a

N

W ← → E

S

0   0.5   1   2 Kilometers

Wreck Island

Underlying 4 band image courtesy of Planet Team (2017). Planet Application Program Interface:
In Space for Life on Earth. San Francisco, CA. https://api.planet.com

b

Wreck Island

Class
- Seagrass
- Land
- Deep water
- Turbid shallow water

c

Wreck Island

LAI
- ≤ 1.4
- ≤ 1.8
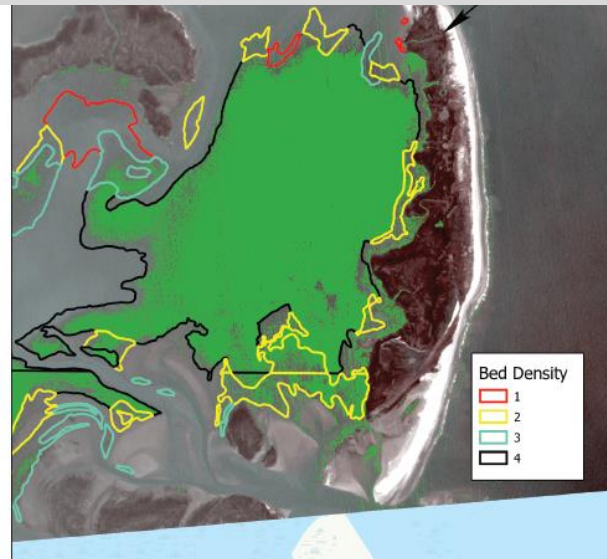- ≤ 2
- ≤ 2.2
- ≤ 2.4
- > 2.4
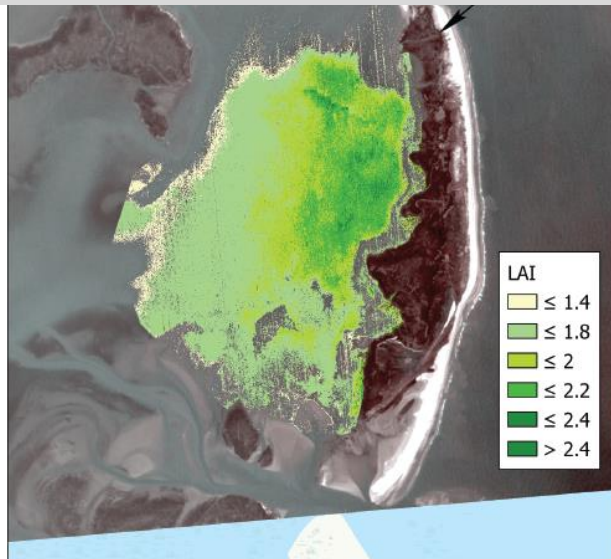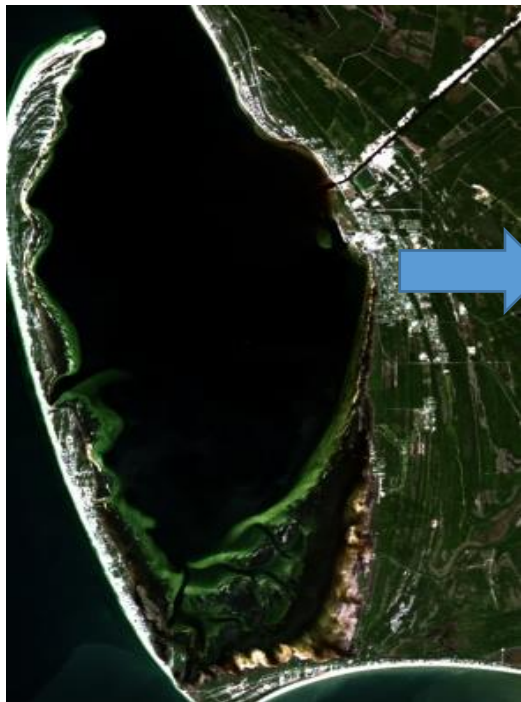
d

Wreck Island

Bed Density
- 1
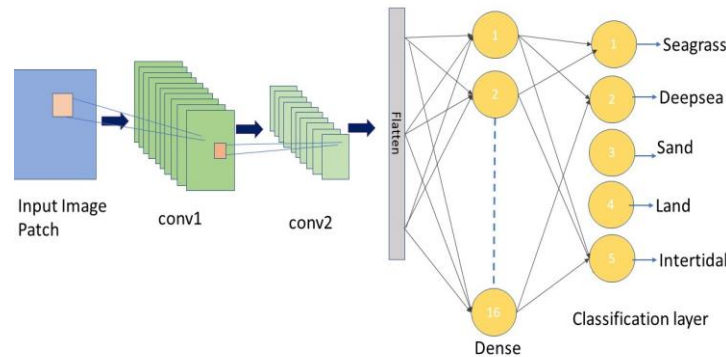- 2
- 3
- 4
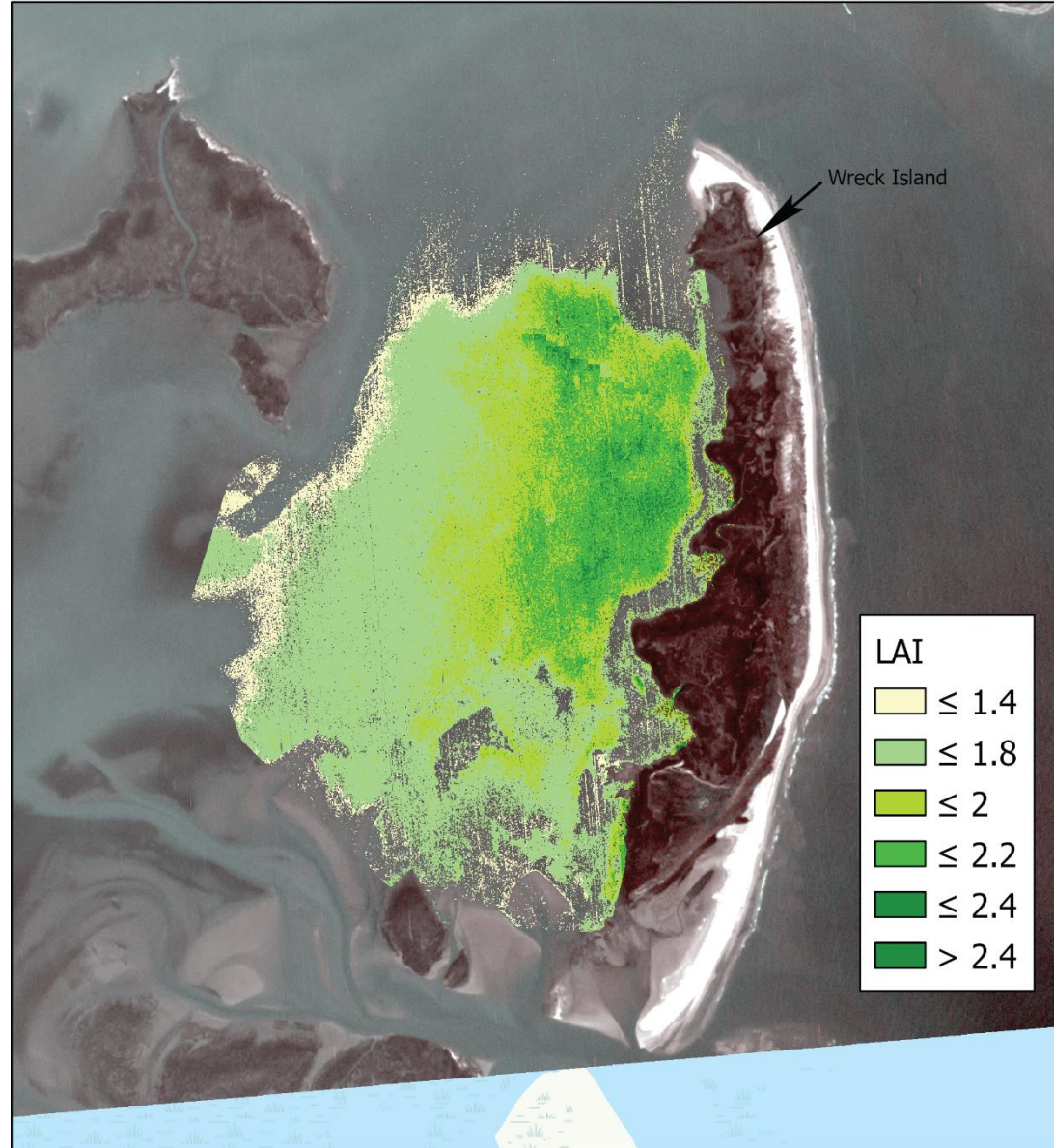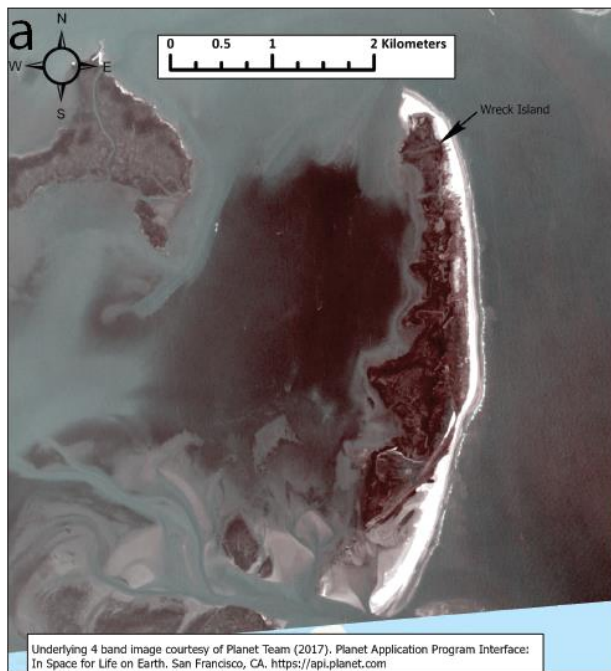
Satellite pass ~every other day.
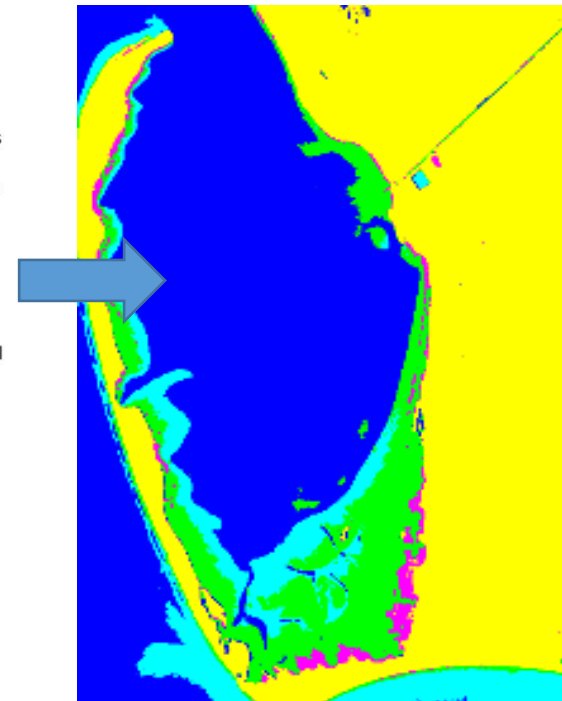PlanetScope and MAXAR

Seagrass Detection Using Deep Convolutional Neural Network (DCNN)

DCNN Classifier

10 Oct 13

Classification Results

Unsupervised Domain Adaptation on Future Temporal Images

| (a)26Oct13 | DCNN (combined all ROIs) as a reference | UDA HR-Net 256 in eval mode last layer | Seagrass area difference between DCNN and UDA (green=agreed, red= False positive, white=false negative) |