

SWOT Wetlands Validation



SWOT Science Team Meeting
June 19, 2024

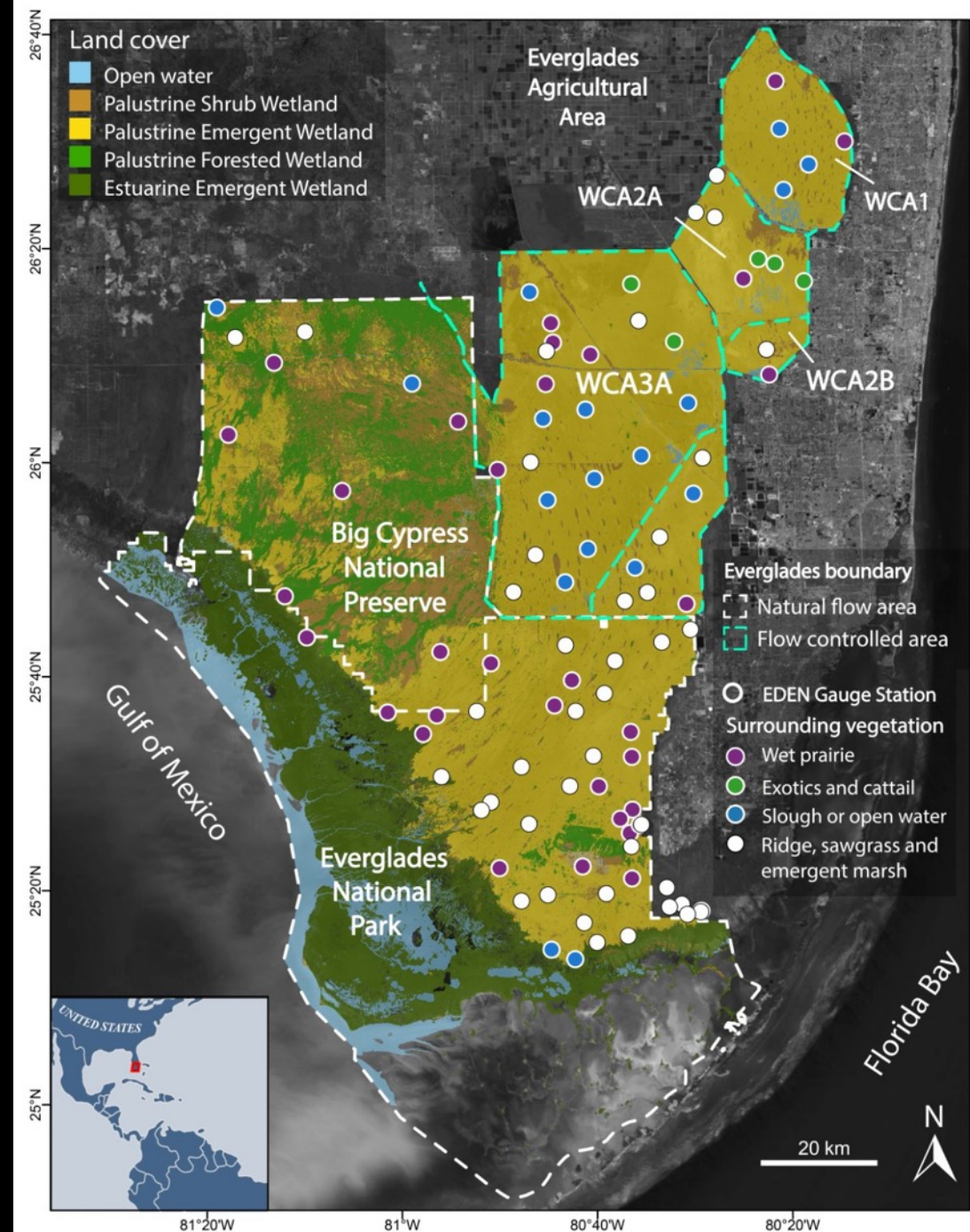
Tamlin Pavelsky
Solomon Kica

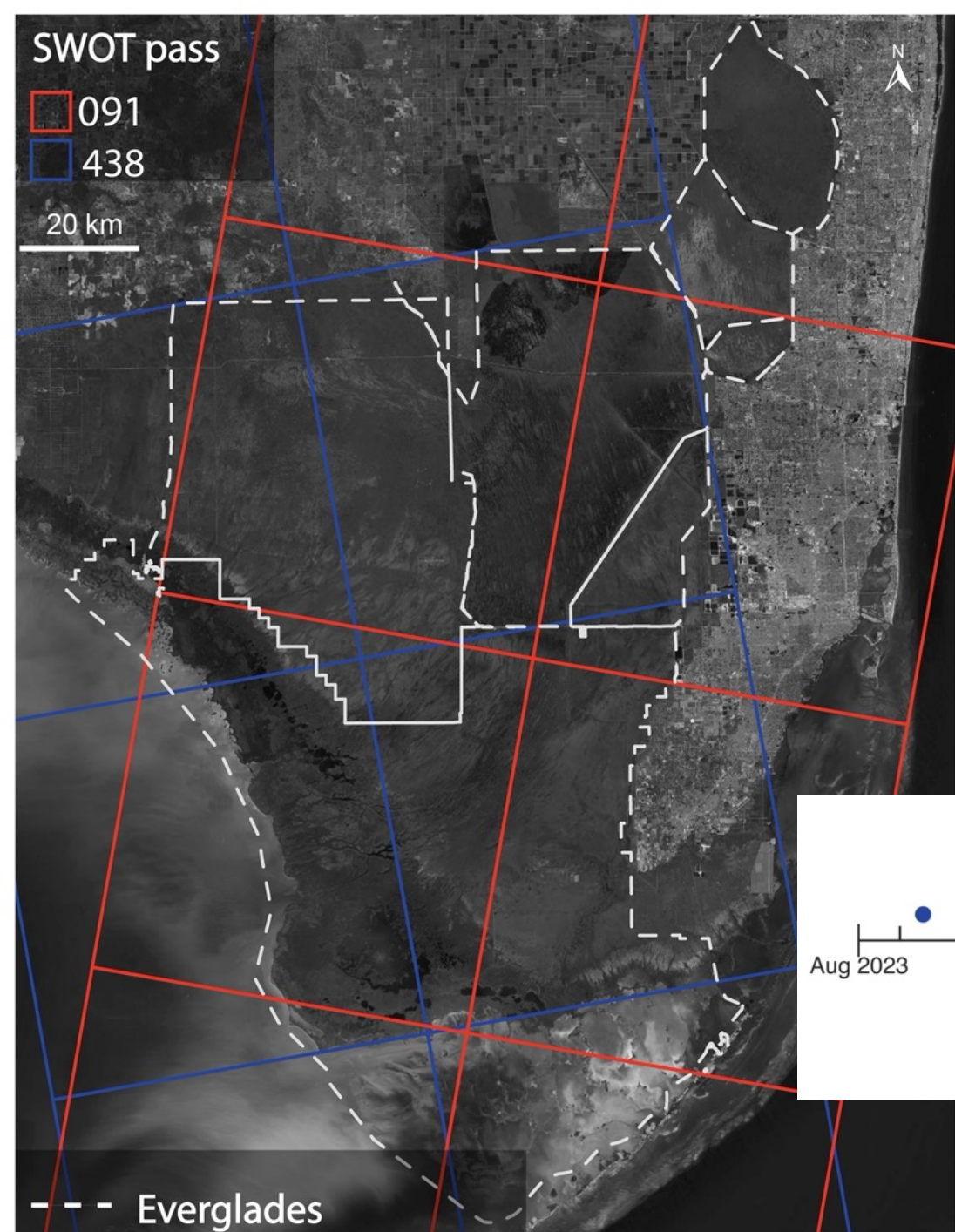


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at CHAPEL HILL

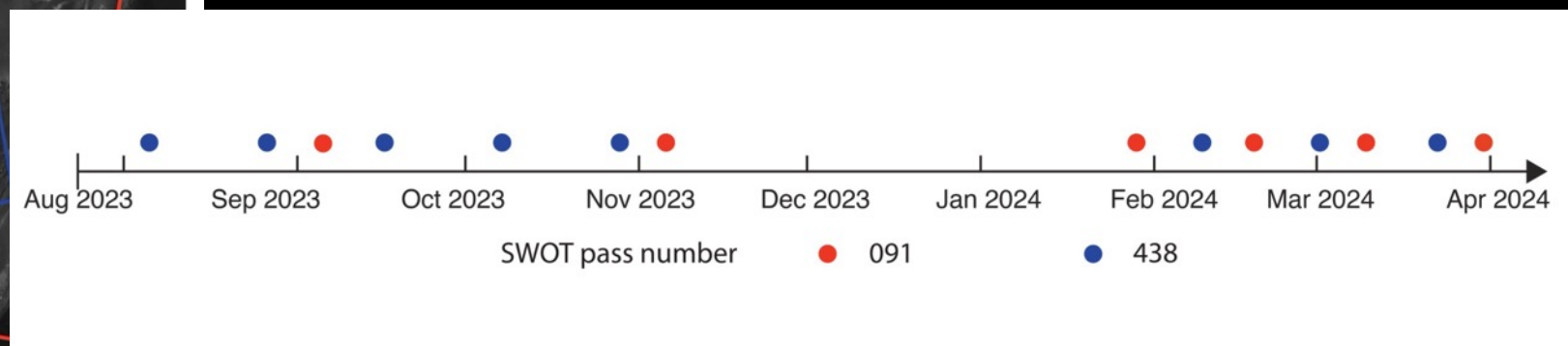
Goals

- Conduct a first exploration of SWOT's capabilities in vegetated wetlands
- Not a final analysis, just a starting point
- Focus is on one particular region with a very good gauge network: The Everglades in Florida
- Land cover classified using the NOAA C-CAP coastal land cover data product

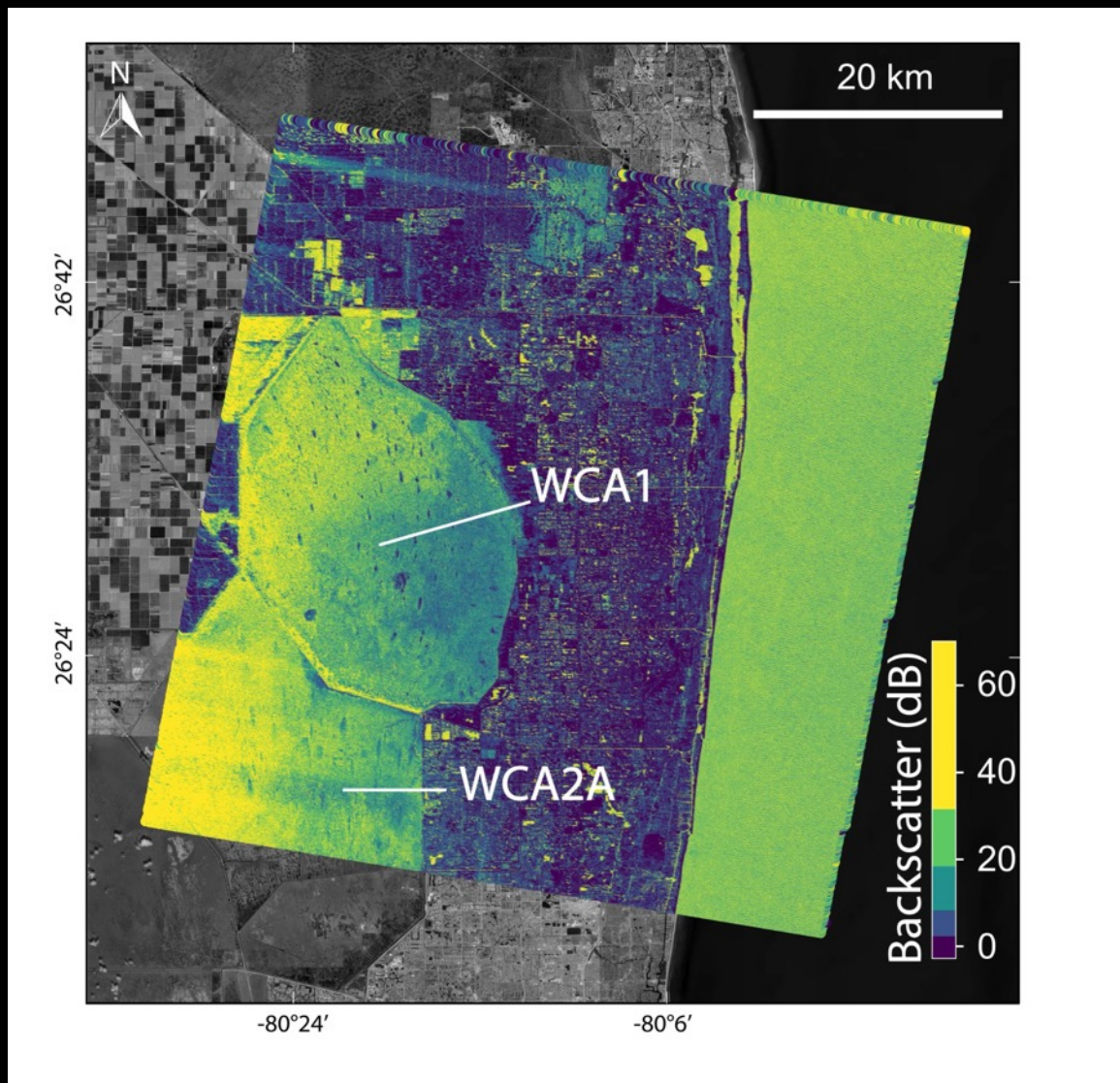




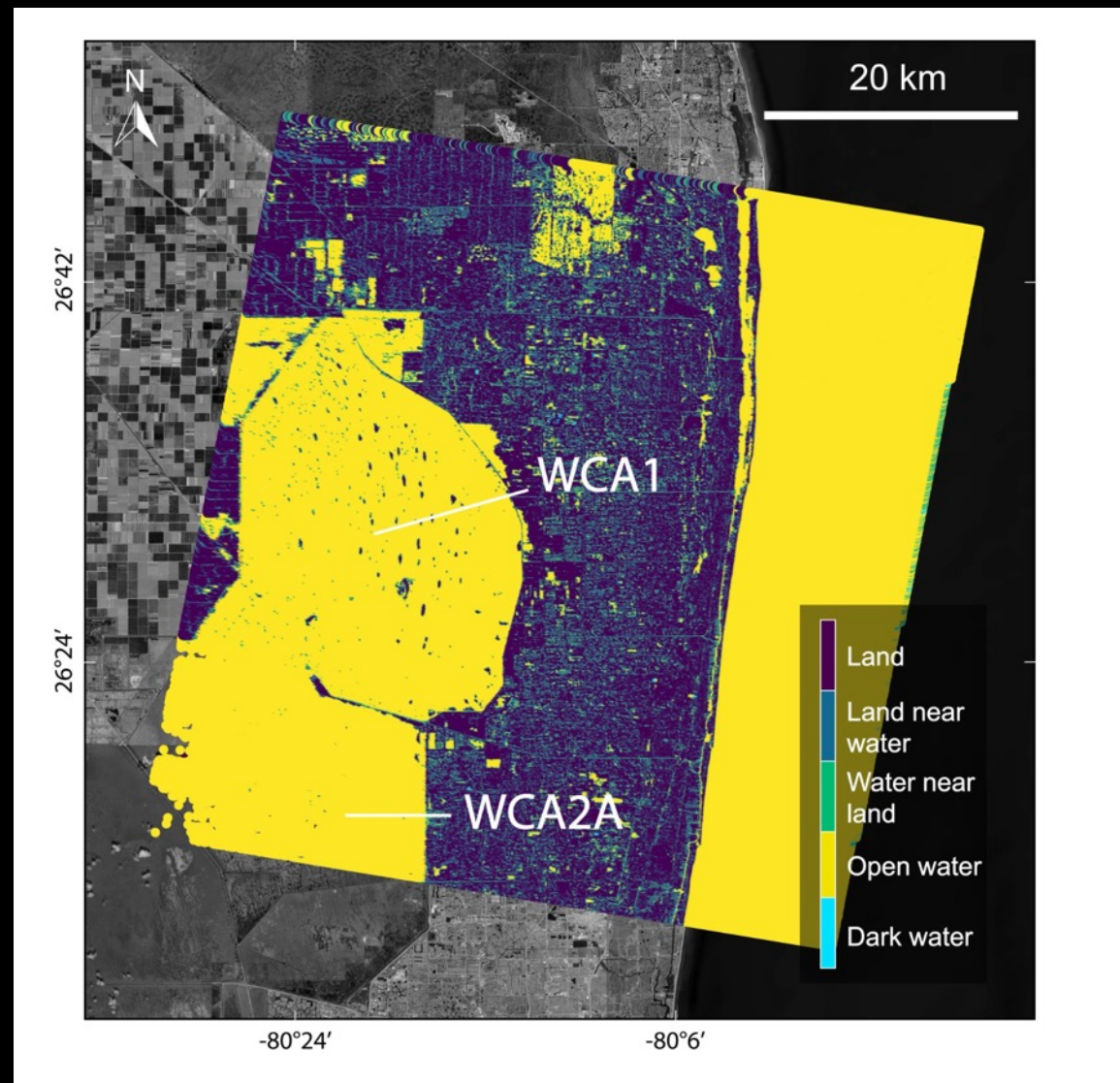
- Two SWOT overpasses analyzed
- One ascending, one descending
- Time period: Aug 2023-Apr 2024
- 14 total overpasses
- 54 pixel cloud tiles



Example SWOT Data (March 30th, 2024)

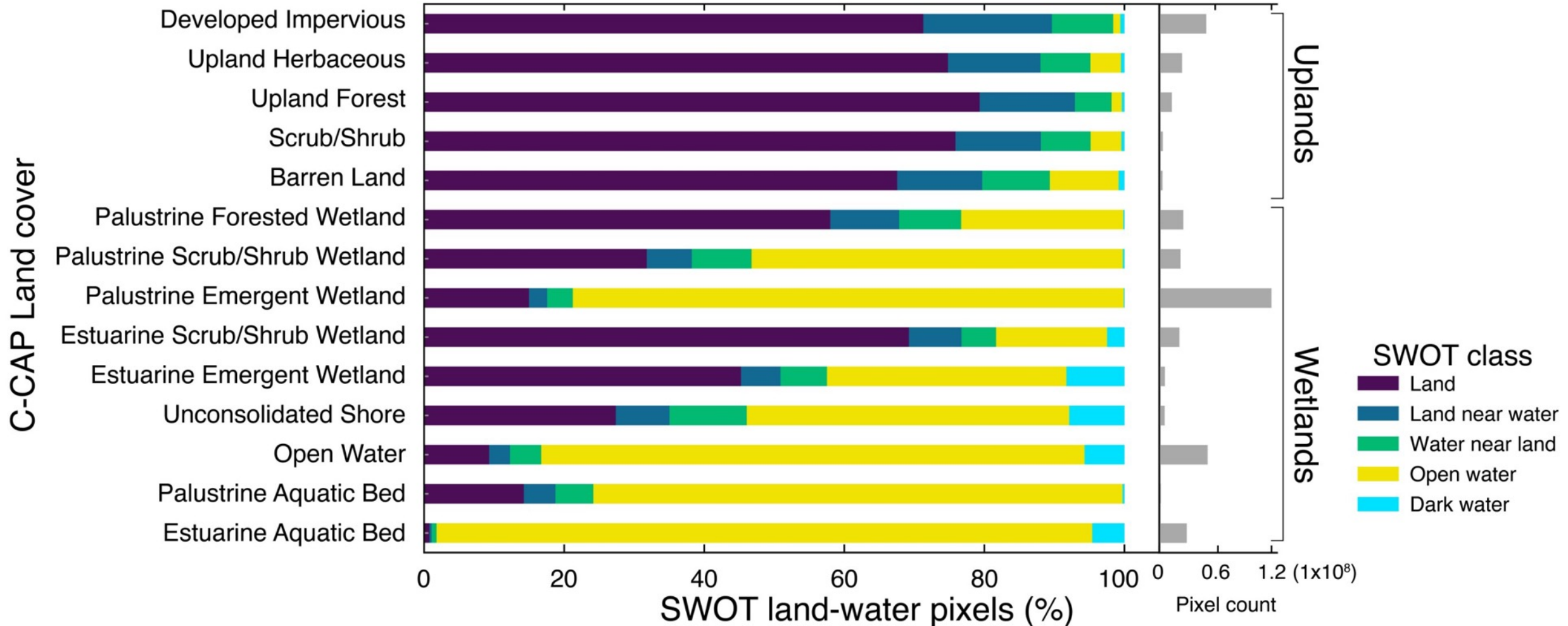


Sigma0



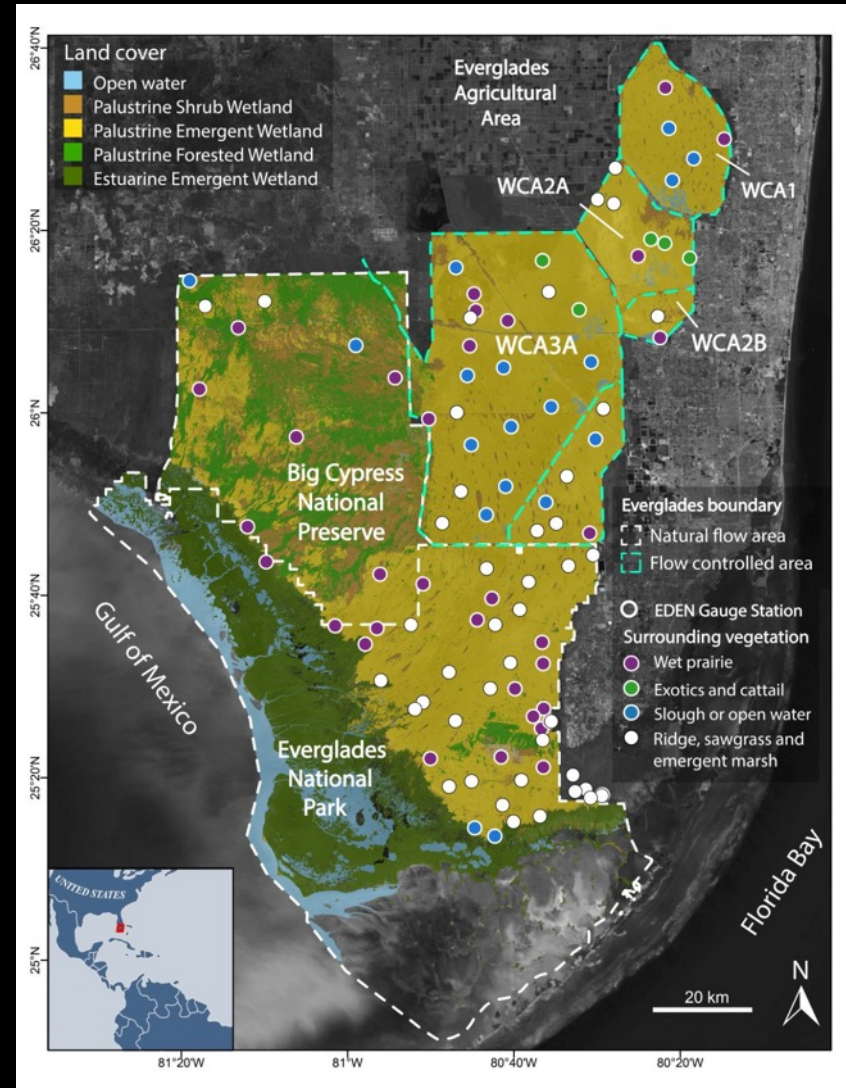
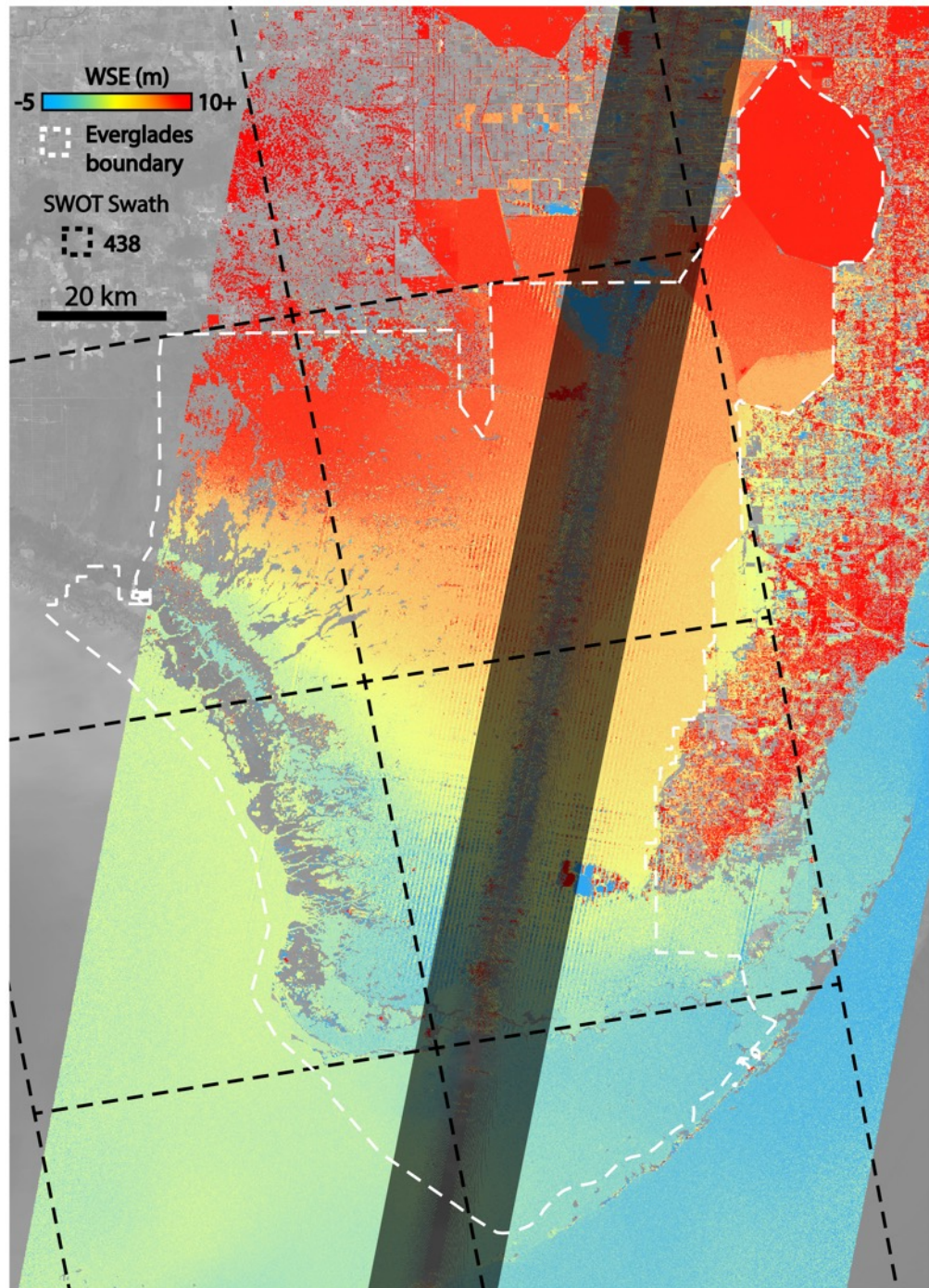
Classification

SWOT Pixel Cloud Class vs. C-CAP Classification



For all 54 scenes included in study

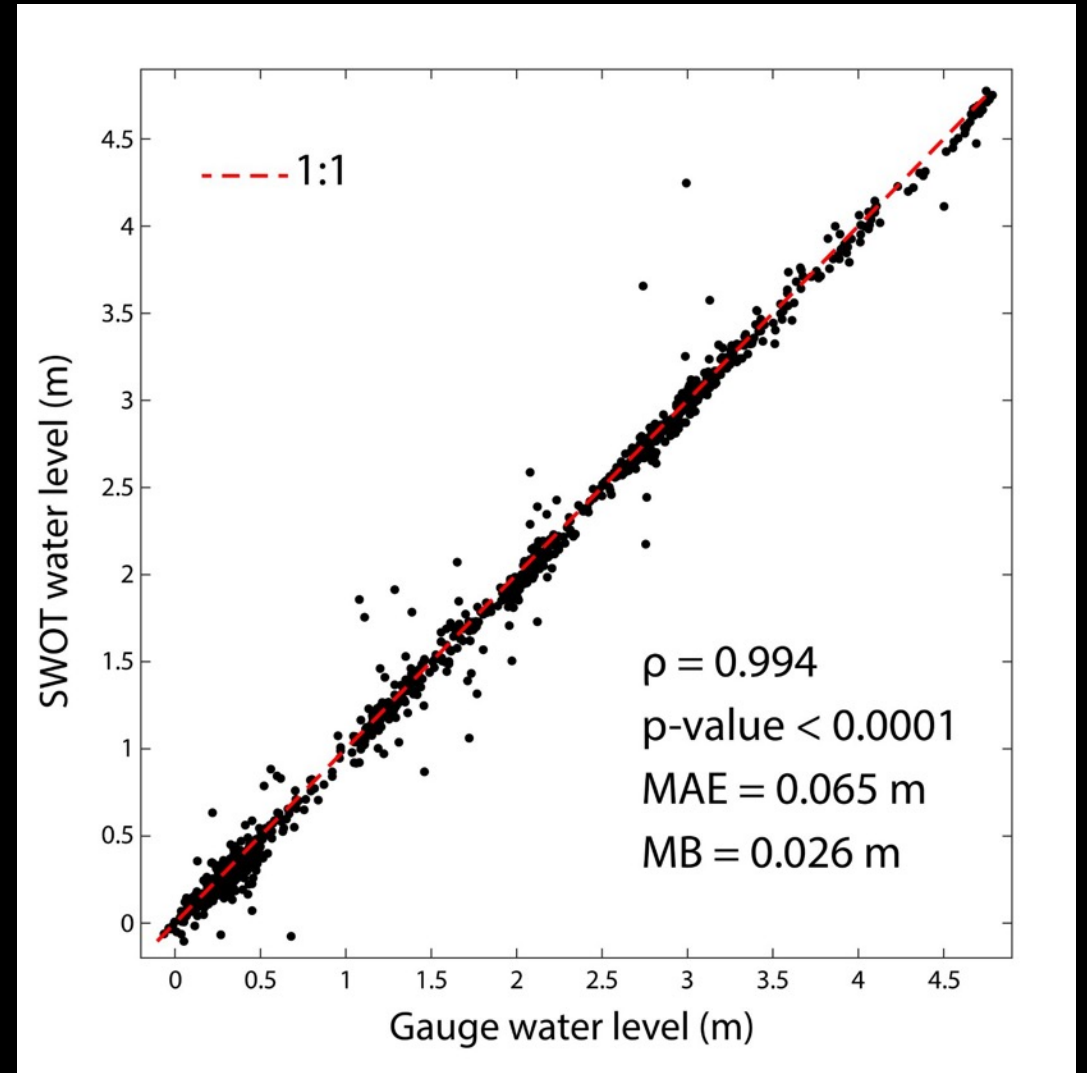
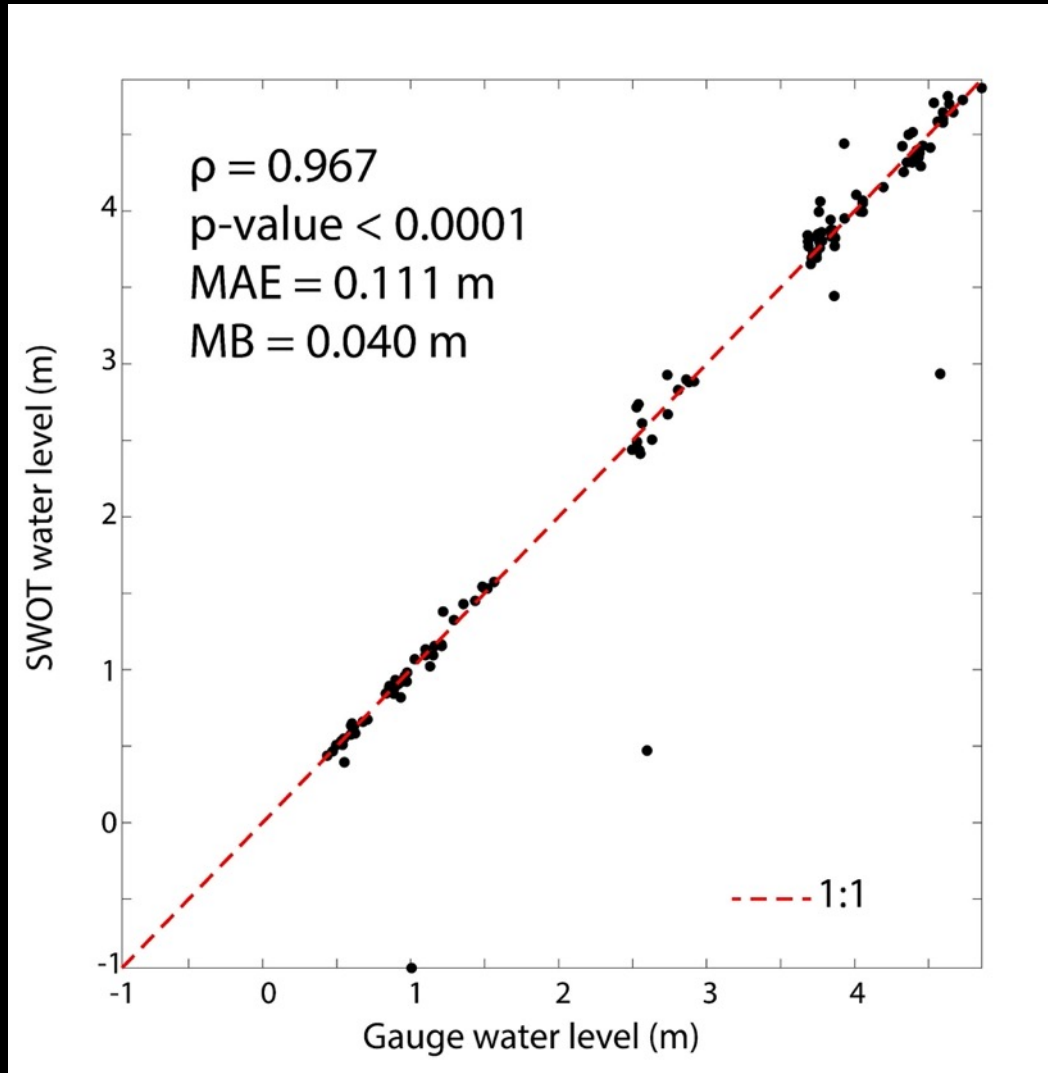
Example of SWOT WSE Data over the full Everglades.



SWOT WSE Performance

Scrub/Shrub Wetlands

Grassy Wetlands

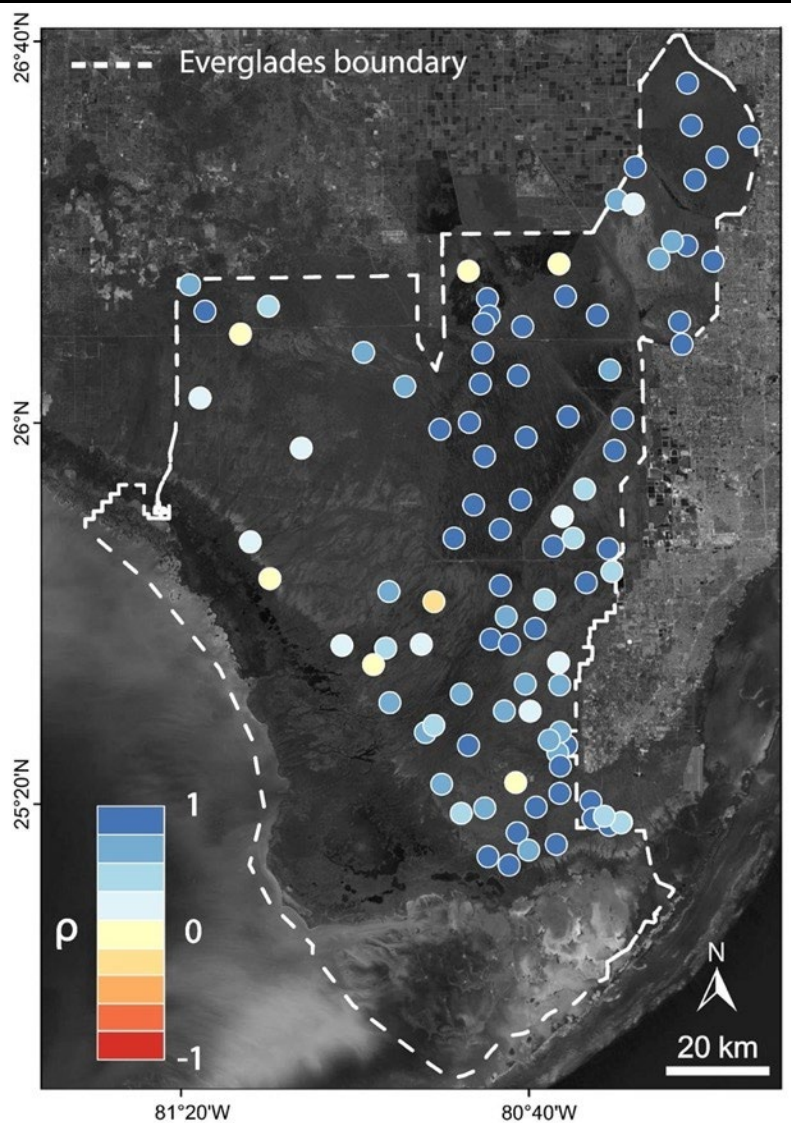


68%ile = 0.064 cm

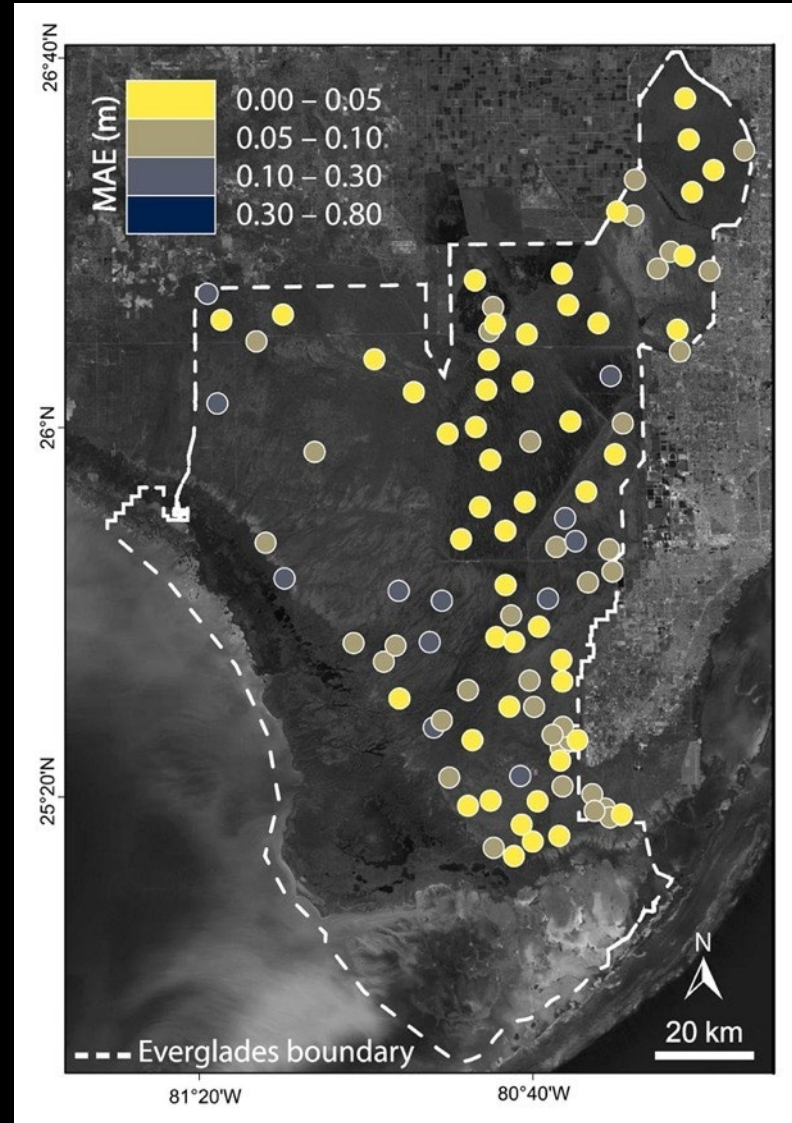
68%ile = 0.063 cm

WSE accuracy level variations grassy wetlands

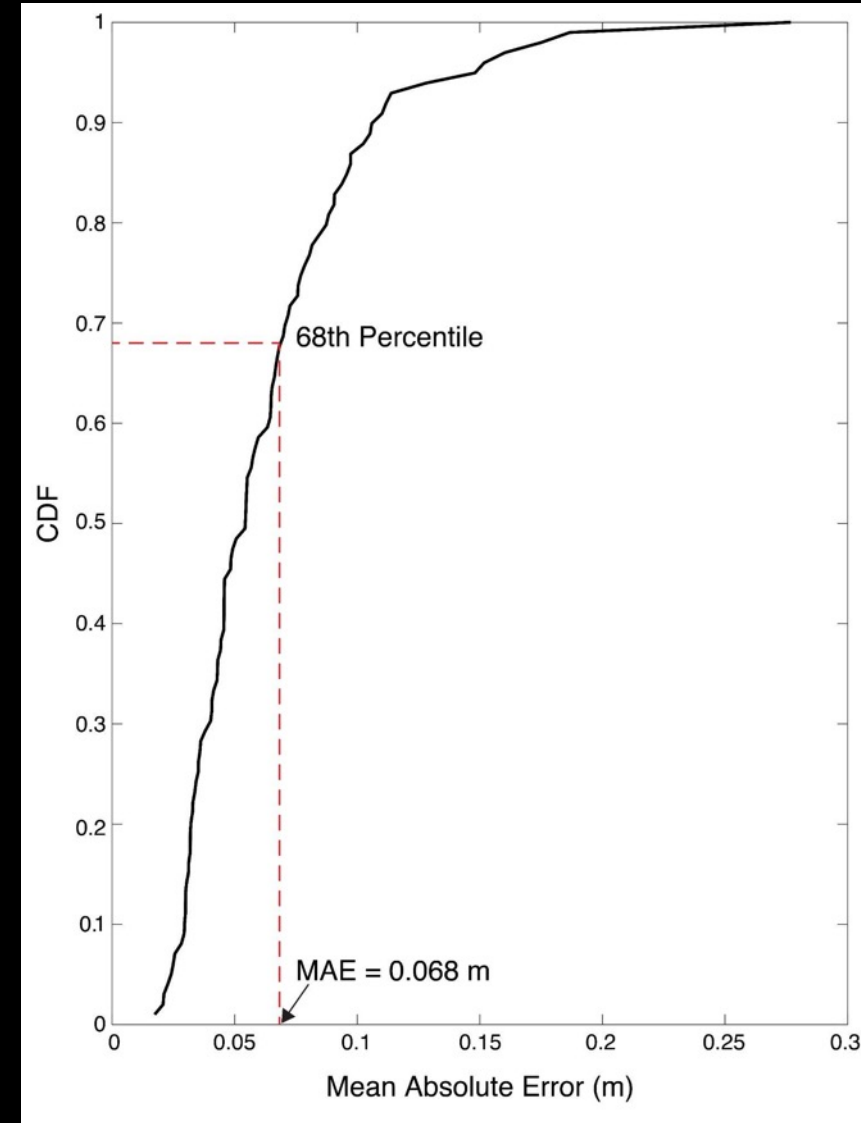
Correlation coefficient



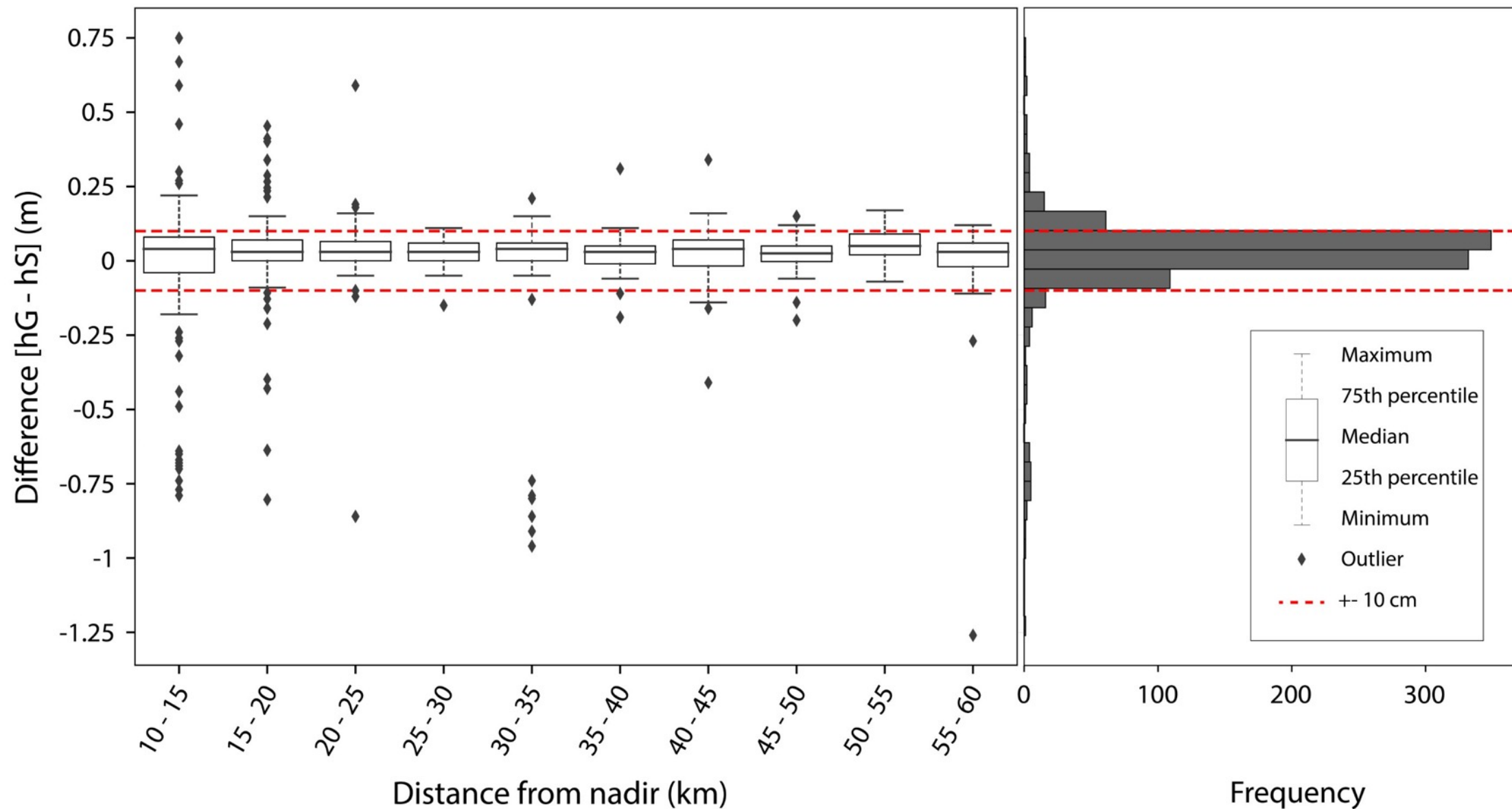
Mean absolute error (MAE)



CDF (MAE)



In Situ – SWOT height vs. Cross-Track Distance



Conclusions

- SWOT appears to be capable of observing inundation in grassy and shrubby wetlands in the Everglades.
 - Forested wetlands may be more problematic
- SWOT water surface elevations in grassy wetlands in the Everglades are very accurate (MAE ~7 cm), and scrub/shrub wetlands (MAE ~11 cm) are only slightly less accurate.
- We have a lot more work to do to fully characterize SWOT performance in wetlands.