

Three Examples of Automating NWI

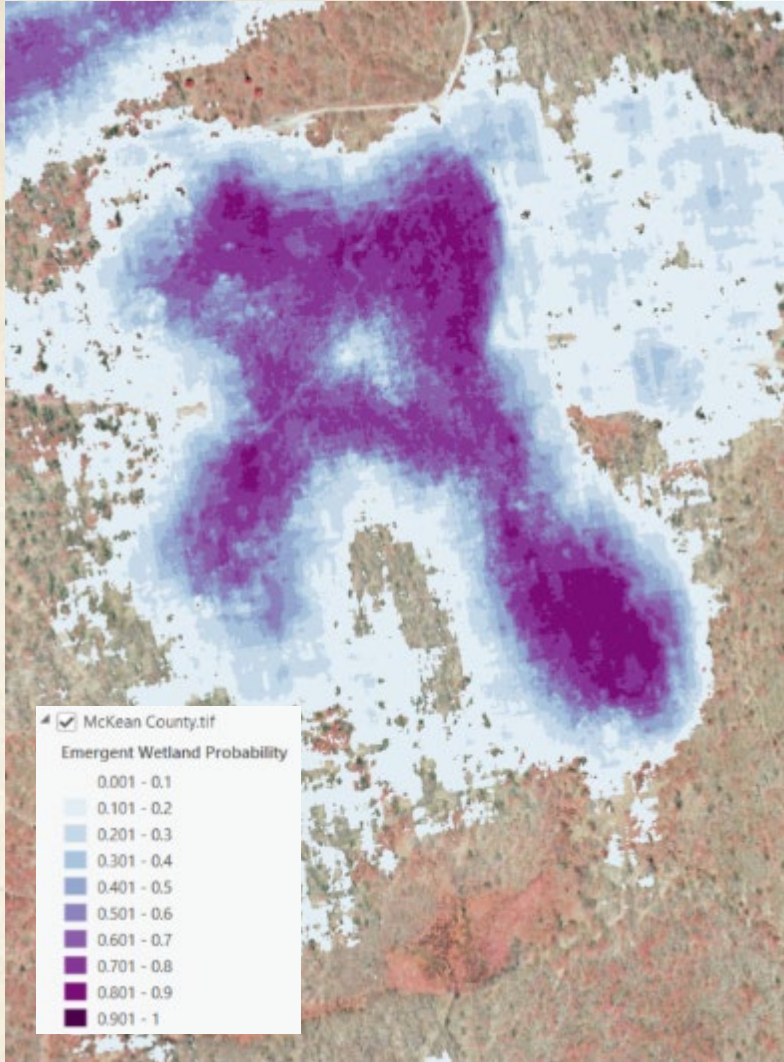
- **Incorporating Chesapeake Conservancy AI-powered wetland probability into NWI process**
- **Incorporating NOAA C-CAP high resolution land cover into NWI process**
- **Using OBIA and Machine Learning to derive a wetland map with UVM Spatial Analysis Lab**

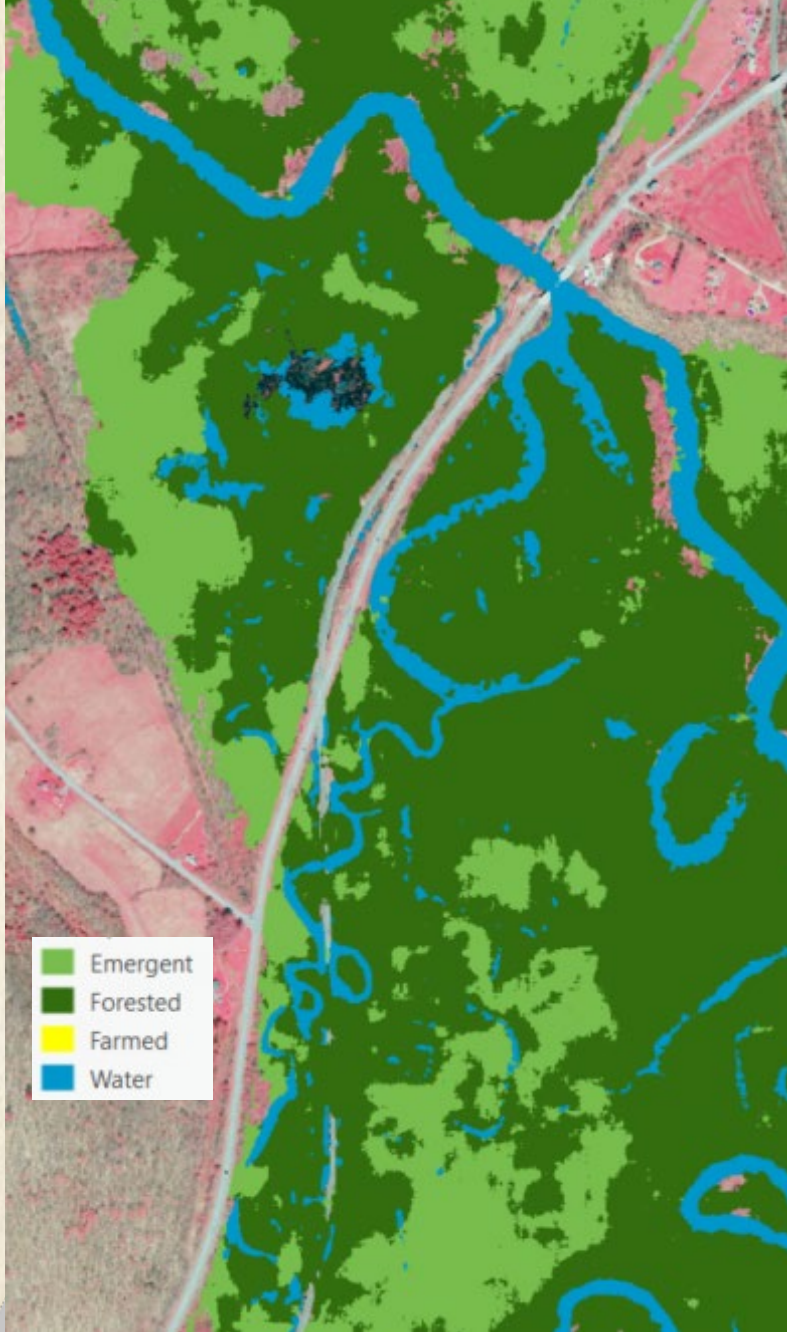


Chesapeake Conservancy Model

- **Machine learning wetland probability of four classes: Open water, Emergent, Forested, Farmed**
- **Study focused on using the wetland probability to make the NWI mapping more efficient**
- **For more details, please see NAWM's past WMC presentation on December 17, 2025**







Chesapeake Bay Model – Highest Ranked Pixels



Traditional NWI Photo Interpretation



McKean County
 716,480.40°E 4,641,821.18°N
 1:10,000

CIR NAIP 2022

Chesapeake Conservancy Model

Conclusions

Model good at detecting wetland complex presence.

Boundaries don't consistently align with NWI standards

Didn't consistently map wetland types accurately for most wetland types except water bodies.

No threshold value consistently aligned with NWI standards.

Lower probability thresholds: Show small wetlands but over-map larger wetland complexes

Higher probability thresholds: Perform better at mapping larger wetland complexes but miss small wetlands



Chesapeake Conservancy Model

Conclusions

No statistically significant difference (in time to digitize water bodies) between methods.

PI's preferred to digitize boundaries rather than edit automated boundaries.

Continuing to work with Chesapeake Conservancy to improve reference data for input and creating products that work better for the NWI process.



NOAA C-CAP High Resolution Land Cover



Evaluating the Utility of
Using C-CAP Landcover
Data in Producing New
NWI Data

**Incorporating NOAA C-CAP High Resolution Land
Cover into the NWI update process**

Two Pilot areas: Tampa and Seattle



Common Issues with Using C-CAP For NWI Updates



Polygons with the same attribute not being a continuous feature



Waterbodies or wetlands being separated by bridges or trees



One waterbody or wetland being separated into multiple

Common Issues with Using C-CAP For NWI Updates



Misidentifying small forested wetlands in urban areas (CCAP in white)



Features overdrawn and include multiple vegetation types and water regimes (CCAP in yellow)



Correct wetland identification mixed with incorrect identification (CCAP in white)



C-CAP Take Aways

WATER BODIES WERE VERY HELPFUL

PI'S MOSTLY USED C-CAP AS REVIEW TO CATCH MISSING WETLANDS BUT PREFERRED TO DIGITIZE THE WETLANDS BY HAND BECAUSE OF THE TIME NEEDED TO EDIT C-CAP BOUNDARIES SO THAT THEY MEET NWI STANDARDS



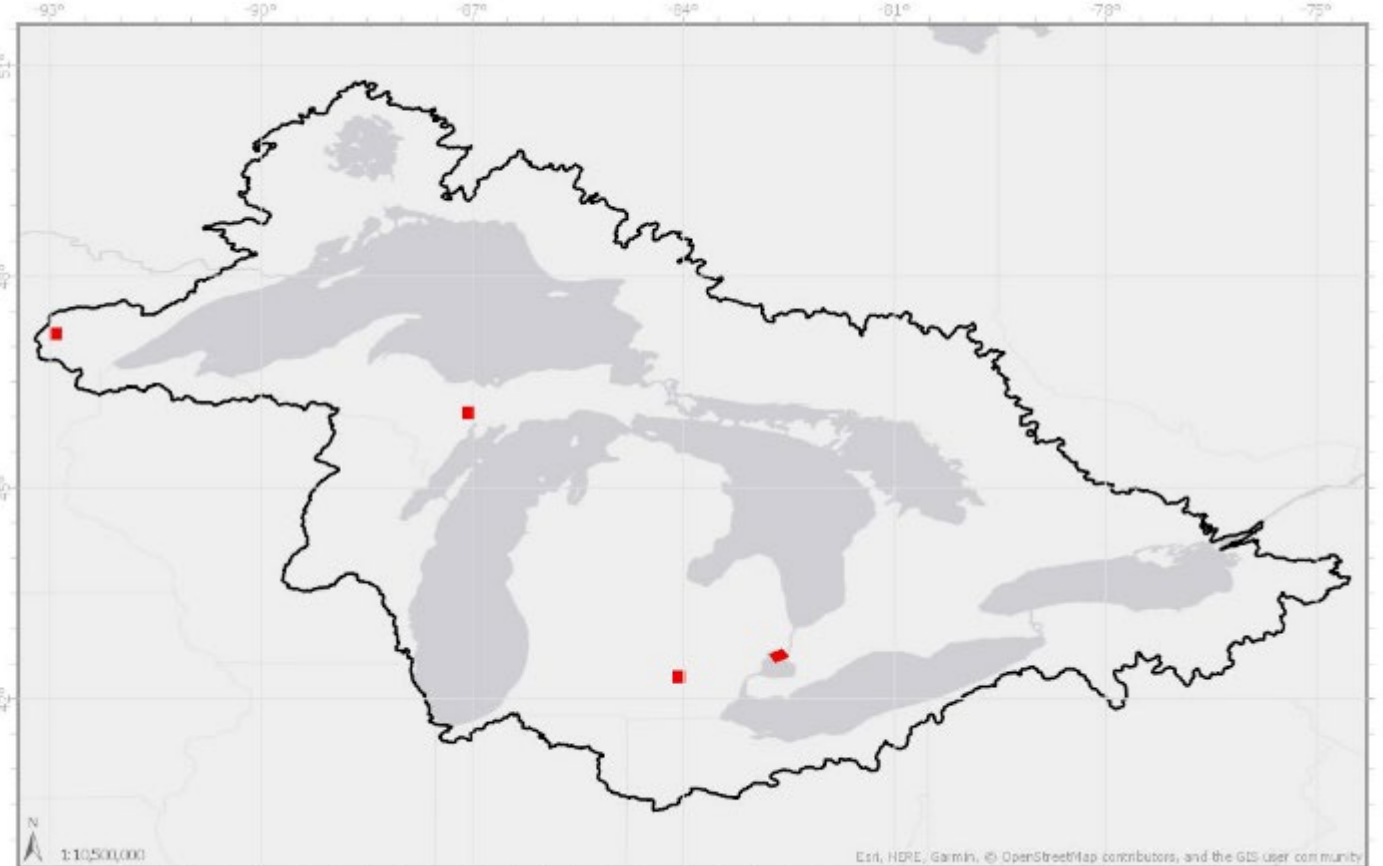
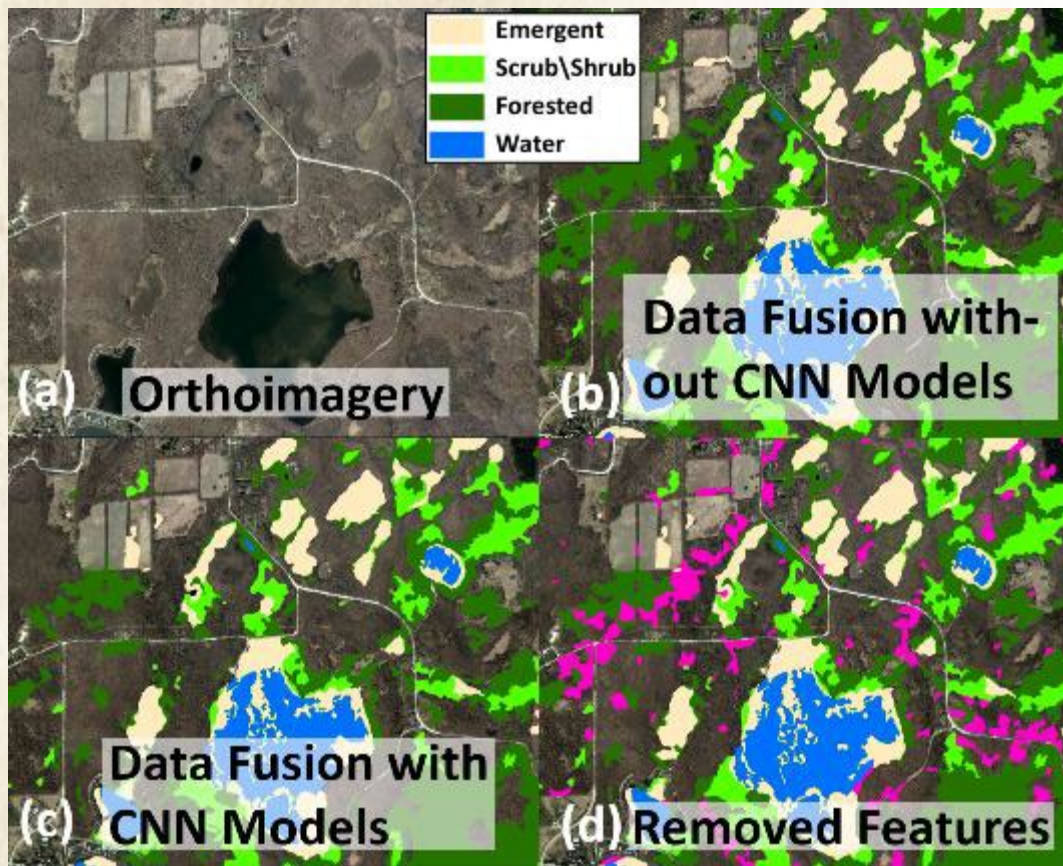
Automated OBIA and CNN

Worked with UVM Spatial Analysis Lab

Four Study areas in Great Lakes – full updated NWI, 4 band leaf off and leaf on imagery, Lidar data

Utilized OBIA to automate wetland classification and a CNN probability layer to identify commission errors in the OBIA classification





While the classification of the models tested can reach accuracies as high as 92%, evaluating the similarity of feature boundaries between the validation datasets and the model outputs revealed that, on average, between 58% and 97% of the boundaries would likely need revision to comply with the cartographic standards of the NWI.



Conclusions

- **Automated wetland mapping techniques continue to improve and get better, but the largest hurdle is NWI compliant geometry and classification complexity.**
- **Incorporating automated wetland mapping outputs are helpful but have not saved a lot of time in creating an NWI compliant dataset – at least not yet.**
- **All models are wrong, but some are useful.**

