Representation of Small Impoundments in the Phase 7 Watershed Model

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- Schmadel et al., 2019 highlighted importance of small ponds < 0.01 km^2 in water quality
- Mapping lentic (still water) features such as ponds, lakes, reservoirs etc., from the high resolution Land Cover (1-m)
- Authoritative data: National Hydrography Dataset (NHD) 1:24,00 and National Wetlands Inventory (NWI)
- Poor inventory of pond features on the landscape

Mapping Ponds from Land Cover

- University of Vermont creates surface water segments derived from National Agriculture Imagery Program (NAIP) imagery (2017/18) and Light Detection and Ranging (LiDAR) elevation data using supervised image classification
- Pond classification model uses number of ancillary data to spatially identify lentic versus lotic (flowing water) features such as DEM aligned streams with continuous channel widths, NHD area and waterbody etc.,
- The pond land use class will be available in the 2017/18 high resolution land use data (pending 2022)

NHD and NWI are vintage data products with several legacy features.
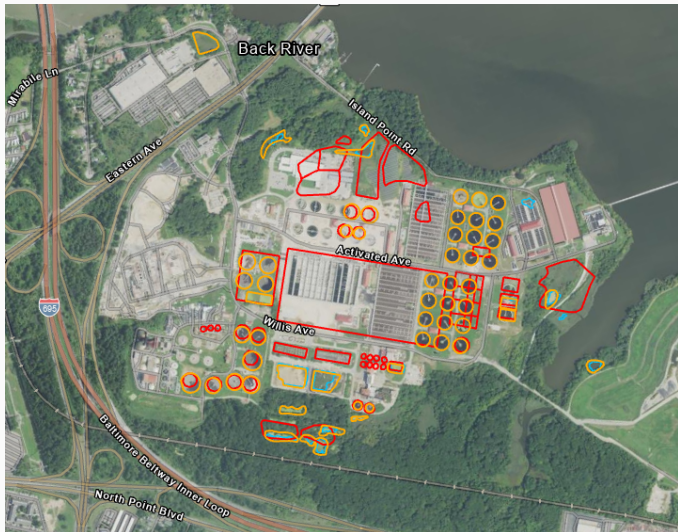NHD (red), NWI (orange) LC Ponds (blue)

NHD 24k, NWI and LC ponds

NHD and NWI have crude geometries that does not align with recent elevation and/or imagery

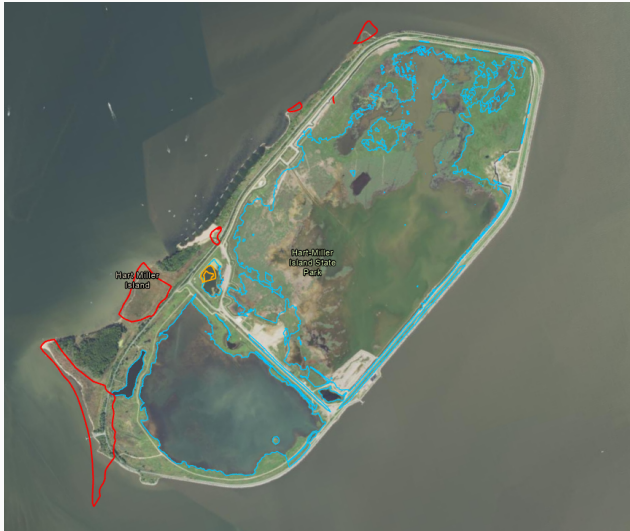Surface water mapping has issues such as shadows (in imagery), eutrophication and tree canopy

Sometimes water treatment facilities are missed or excluded

Capturing man made pond-like features

Capturing farm ponds

Metrics

These data are preliminary and are subject to revision. They are being provided to meet the need for timely 'best science' information. The assessment is provided on the condition that neither the U.S. Geological Survey nor the United States Government may be held liable for any damages resulting from the authorized or unauthorized use of the assessment.

FIPS	State	2017 LC	NHD	NWI
10005	Sussex (DE)	4602	3337	3667
24005	Baltimore (MD)	1531	1109	2031
24035	Queen Annes (MD)	1286	1257	1421
24045	Wicomico (MD)	2254	960	868
36017	Chenango (NY)	4834	911	3146
42015	Bradford (PA)	4587	2725	2785
42033	Clearfield (PA)	3896	2320	2779
42041	Cumberland (PA)	1173	966	674
42071	Lancaster (PA)	2835	2053	2114
51015	Augusta (VA)	842	2583	2559
51073	Gloucester (VA)	724	557	366
51107	Loudoun (VA)	1003	2289	1618
54003	Berkeley (WV)	1822	925	952
54031	Hardy (WV)	1358	618	965

NHD: NHD 24k (column reference). Preliminary results. Subject to change based on final data processing.

Discussion

- Generally, more mapped ponds in LC compared to NHD and NWI
- Wicomico has greater number of ponds because of complex geometry near Black Water Refuge
- Potential issues Augusta and Loudoun (VA) have low pond count compared to NHD and NWI
- Augusta: several ponds from NHD and NWI do not exist anymore
- Loudoun: LC has omission errors sometimes ponds are not mapped as surface water

Questions?

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