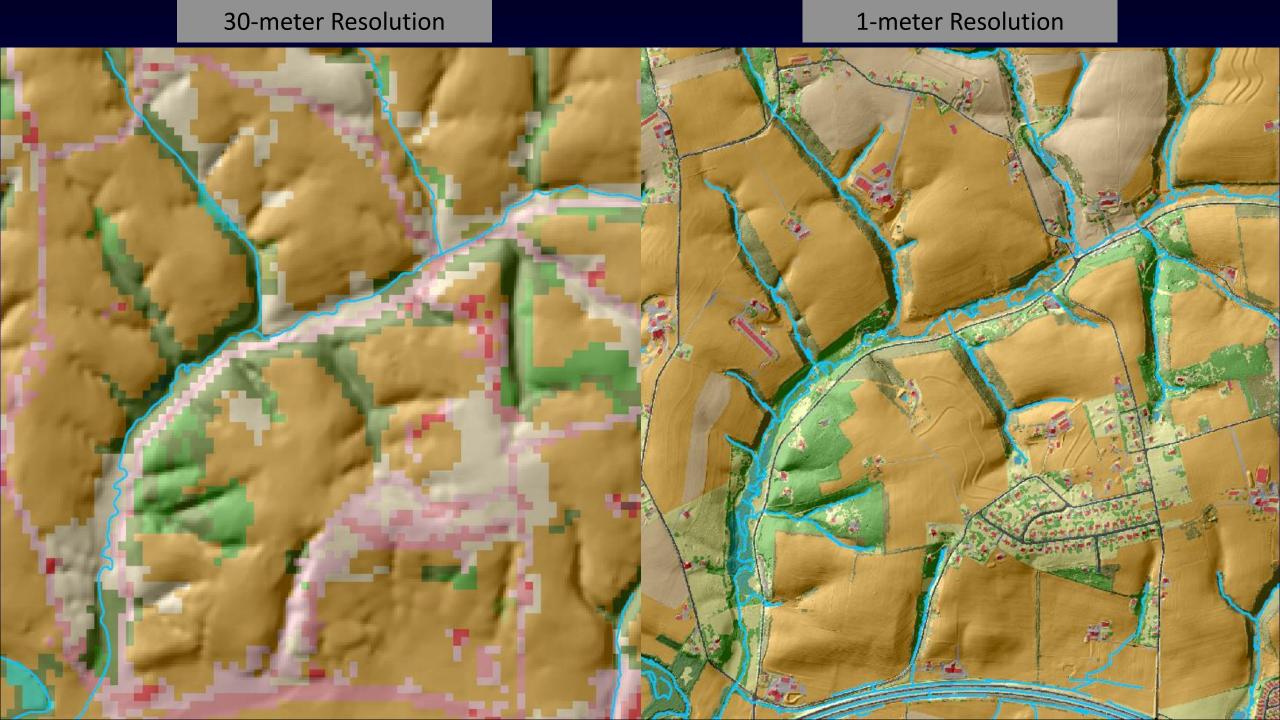


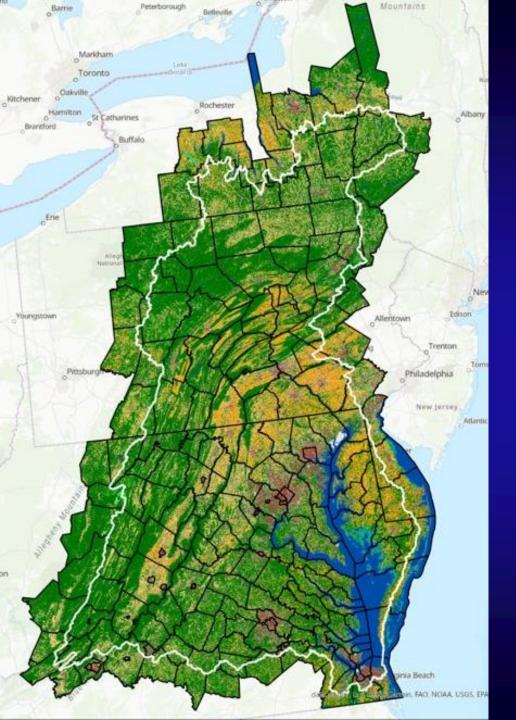
## **Mapping Riparian Buffers with Better Data**

Peter Claggett, Labeeb Ahmed, and Sarah McDonald

U.S. Geological Survey, Lower Mississippi-Gulf Water Science Center, Chesapeake Bay Program Office

Joint Land Use and Forestry Workgroup Meeting December 7, 2022







# Chesapeake Bay 1-Meter Products for a 100,000 mi<sup>2</sup> Region

Land Cover (12-classes): 2013/14, 2017/18, 2021/22

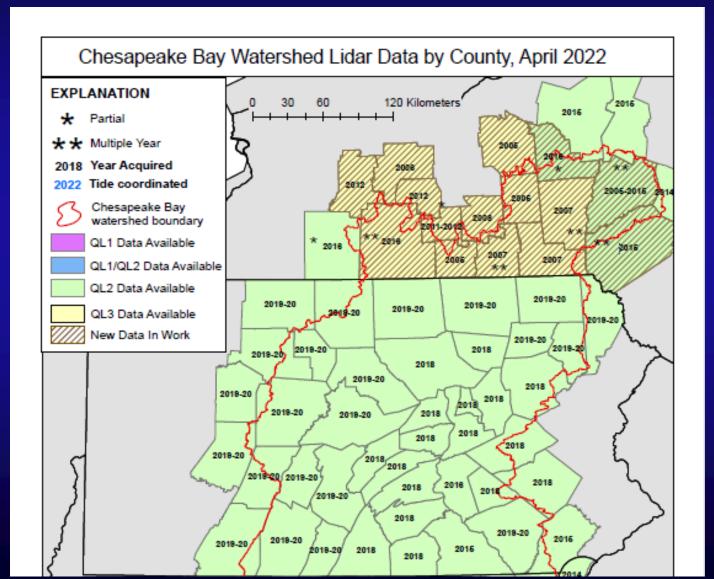
Land Use (54-classes): 2013/14, 2017/18, 2021/22

Streams, ditches, and gullies (from LiDAR imagery)

Watershed only (white boundary)

# Lidar pulses-Lidar returns

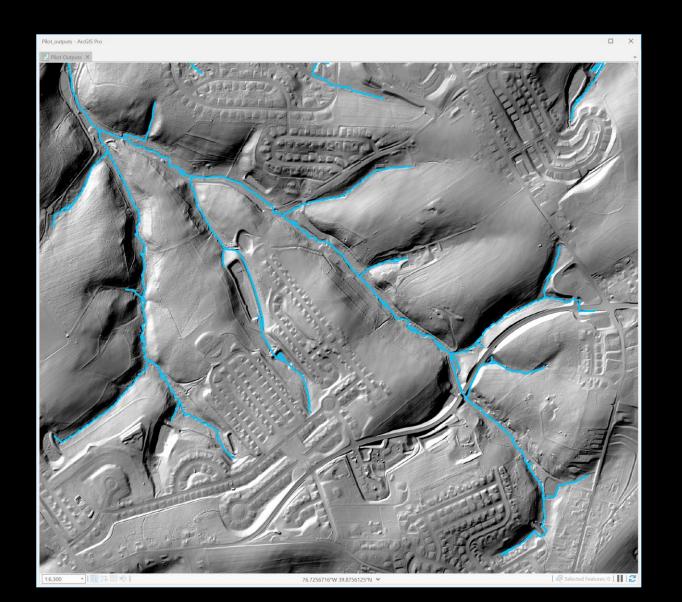
## Light Detection And Ranging (LiDAR)



#### **Hyper-Resolution\* Hydrography**

- 1. Lidar elevation
- 2. Valley-scale geomorphons
- 3. Channel-scale geomorphons
- 4. Extract valley network
- 5. Extract channels using valley network
- 6. QAQC channel skeleton
- 7. Connect stream network

Attributed with channel length, width, and depth.

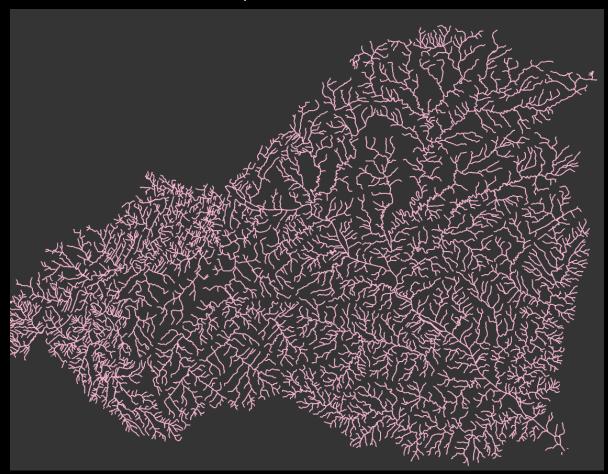


<sup>\* 1-</sup>meter raster, 1:2000 scale

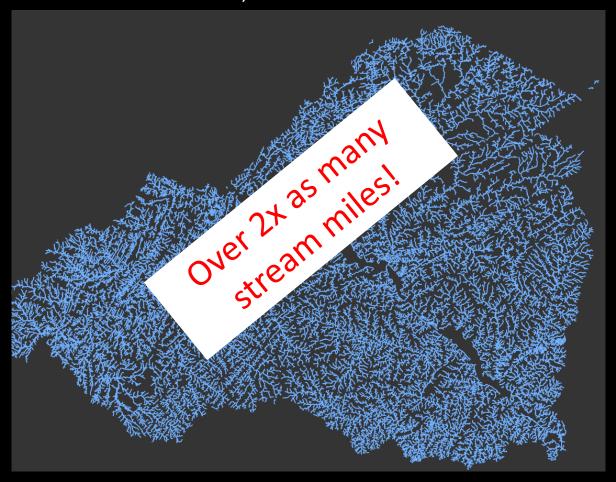
## New Hyper-res Streams (1:2000 scale)

Lower Susquehanna Example

National Hydrography Dataset, 1:24,000 6,923.6 km



CBP Hyper-Resolution Streams, 1:2000 16,784.6 km





National Hydrography Dataset – High Resolution (1:24,000 scale)

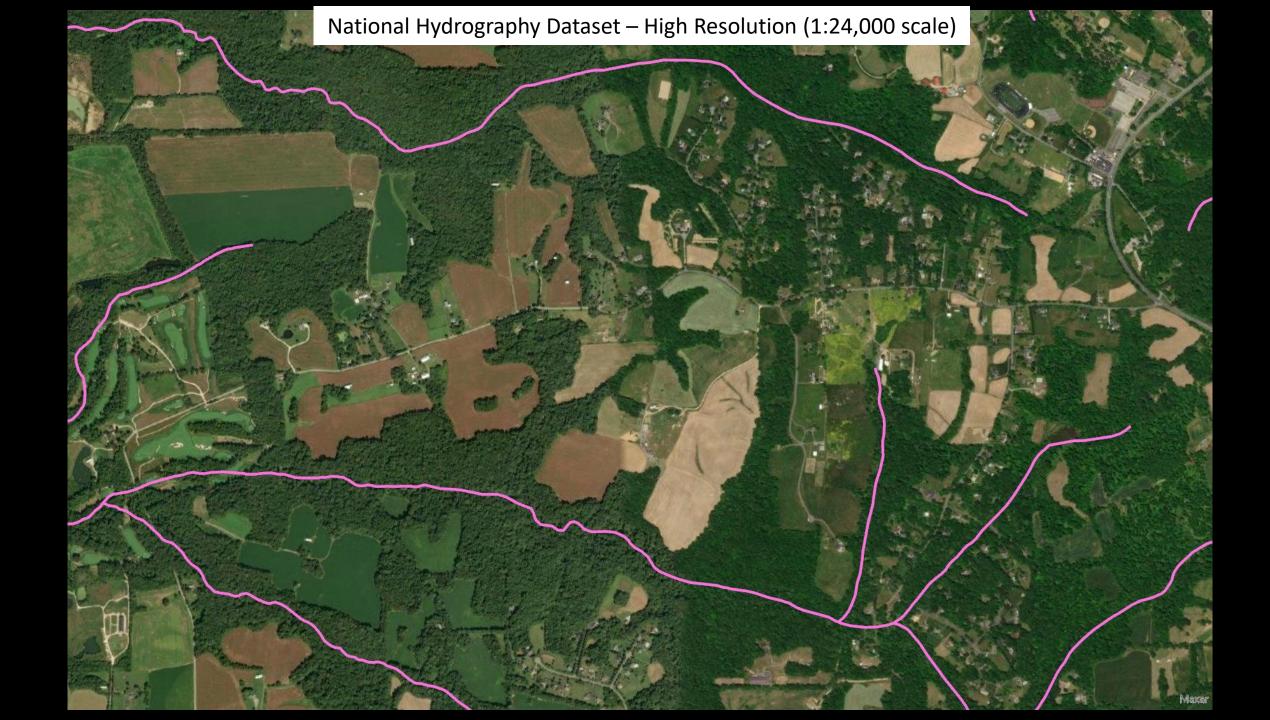
#### **Notes:**

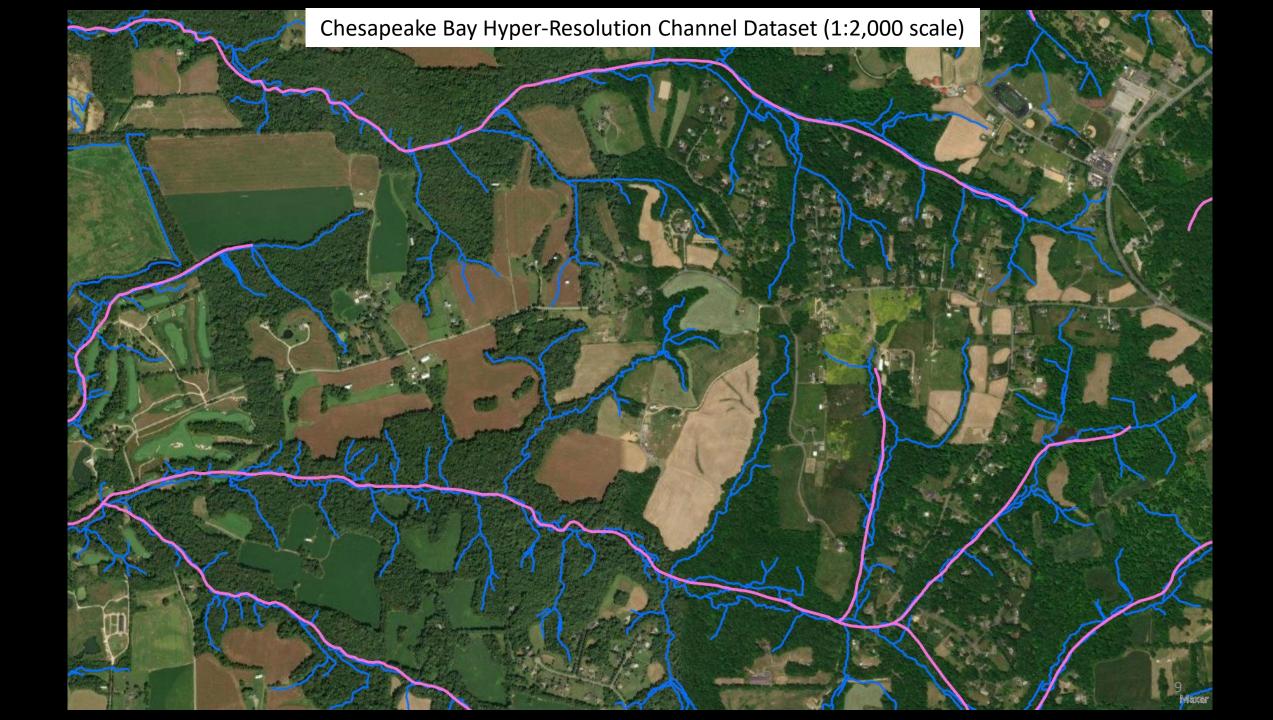
- NHD-HR is the highest resolution nationally available hydrography data
- Derived from 7.5" topography quadrangle maps produced mostly in the 1970's through the 1990's which relied on manual interpretation of photos and paper maps.
- Estimates of flow permanence (e.g., perennial, intermittent, ephemeral) derived in the field or from local interviews at the original time of mapping.

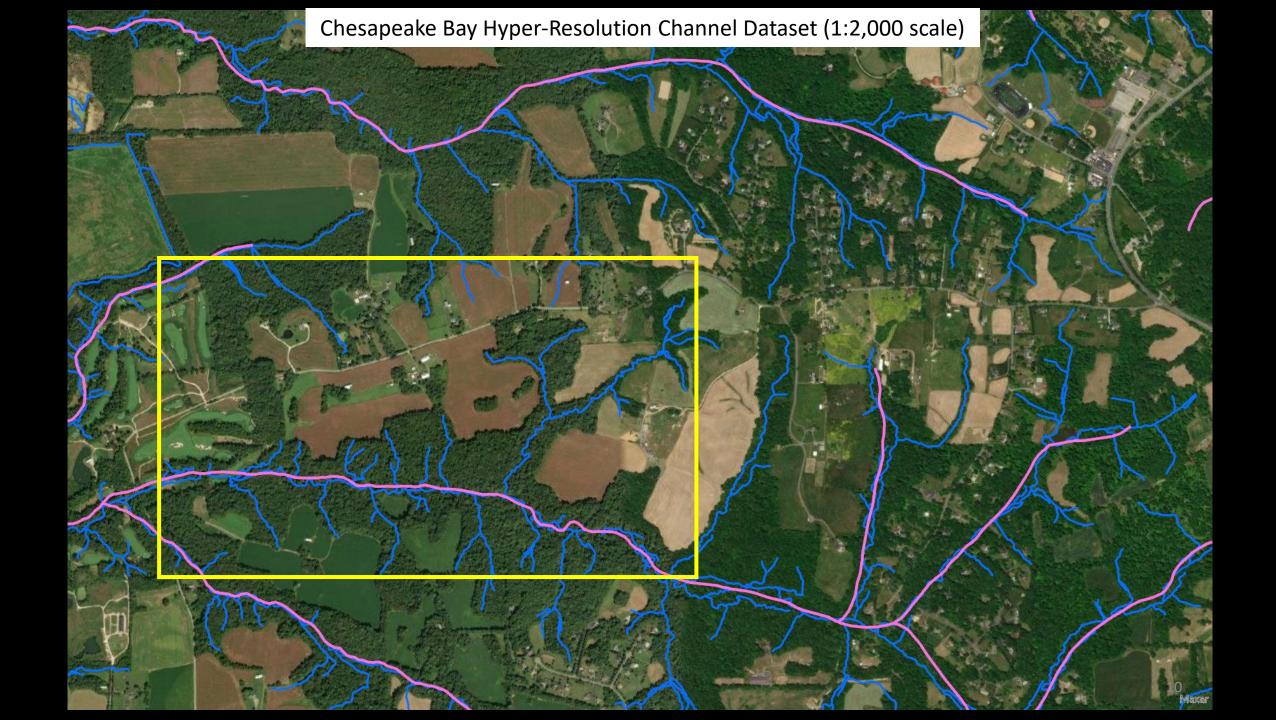
#### **Issues:**

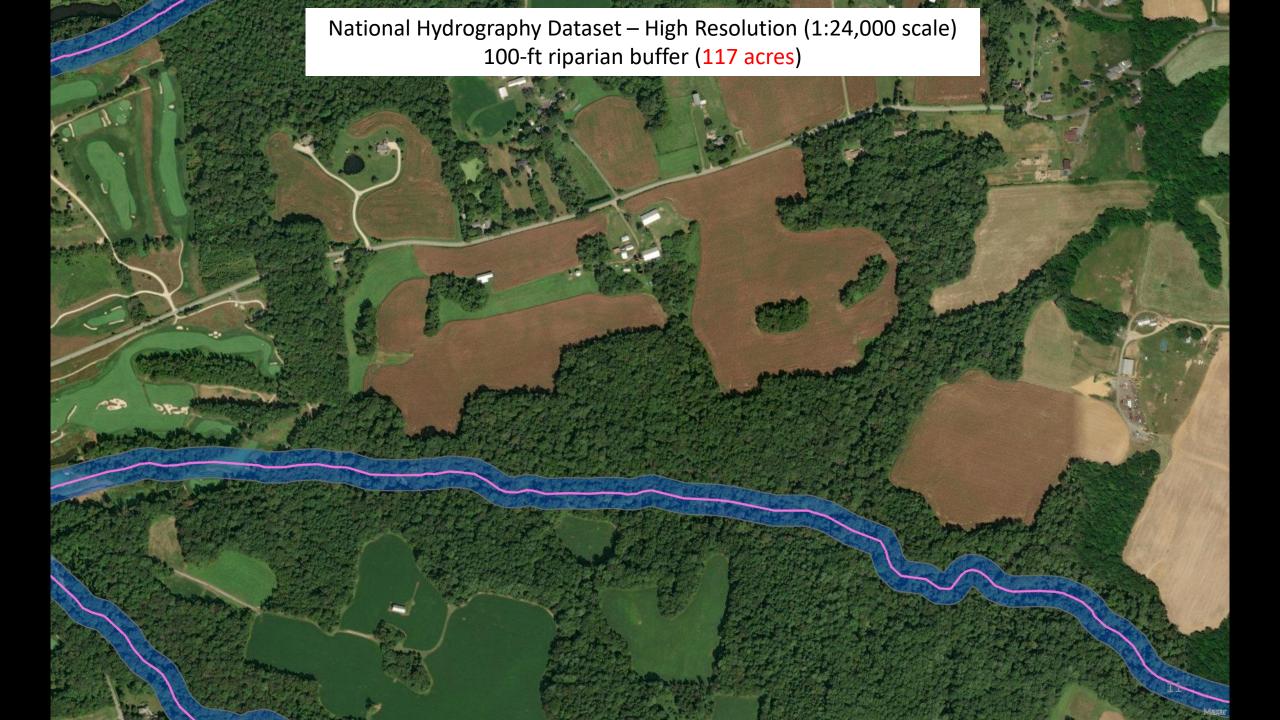
Mapped NHD "streams" are 25-50 years old and did not capture all headwater streams.

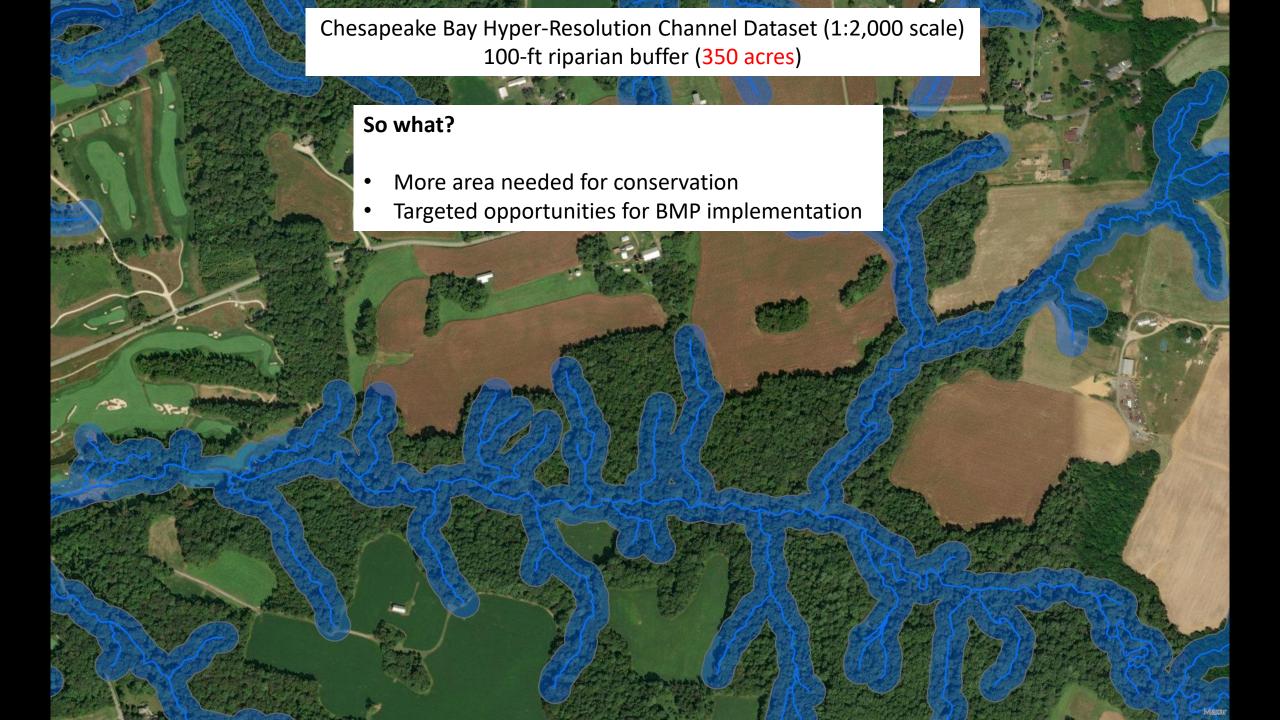
Since their original mapping, channels and their characteristics have changed due to natural causes amplified in places by changes in land use and climate.

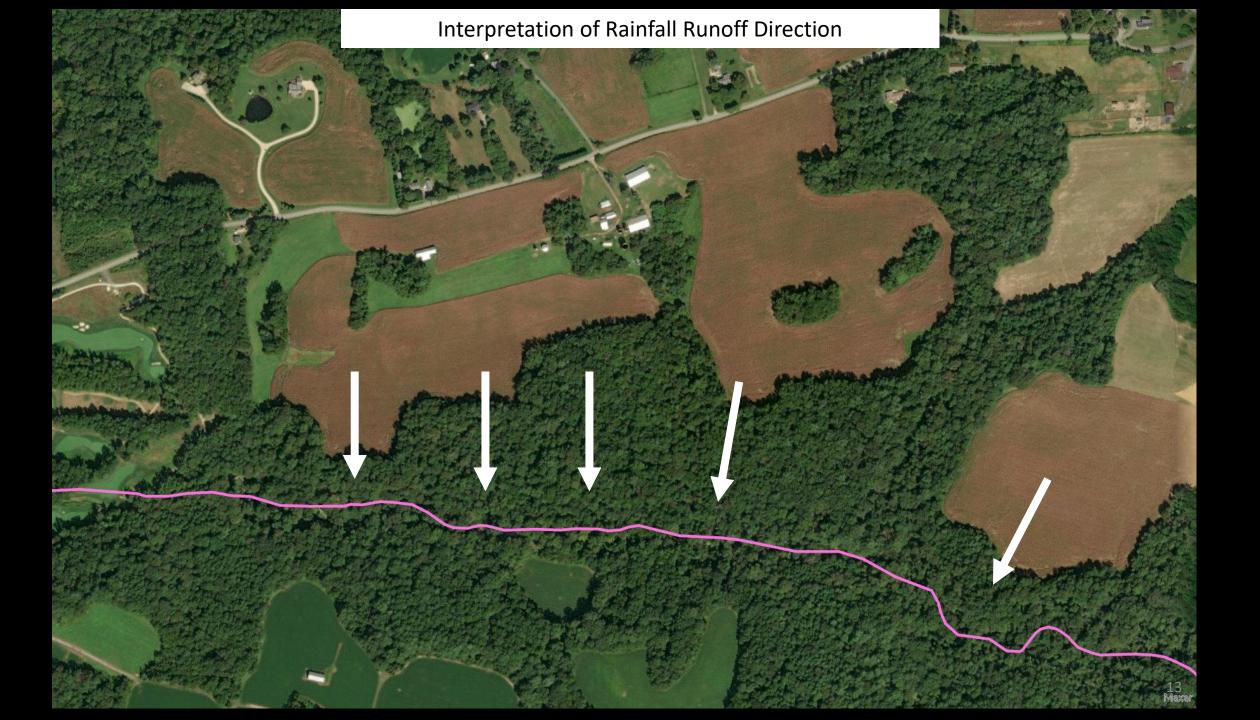


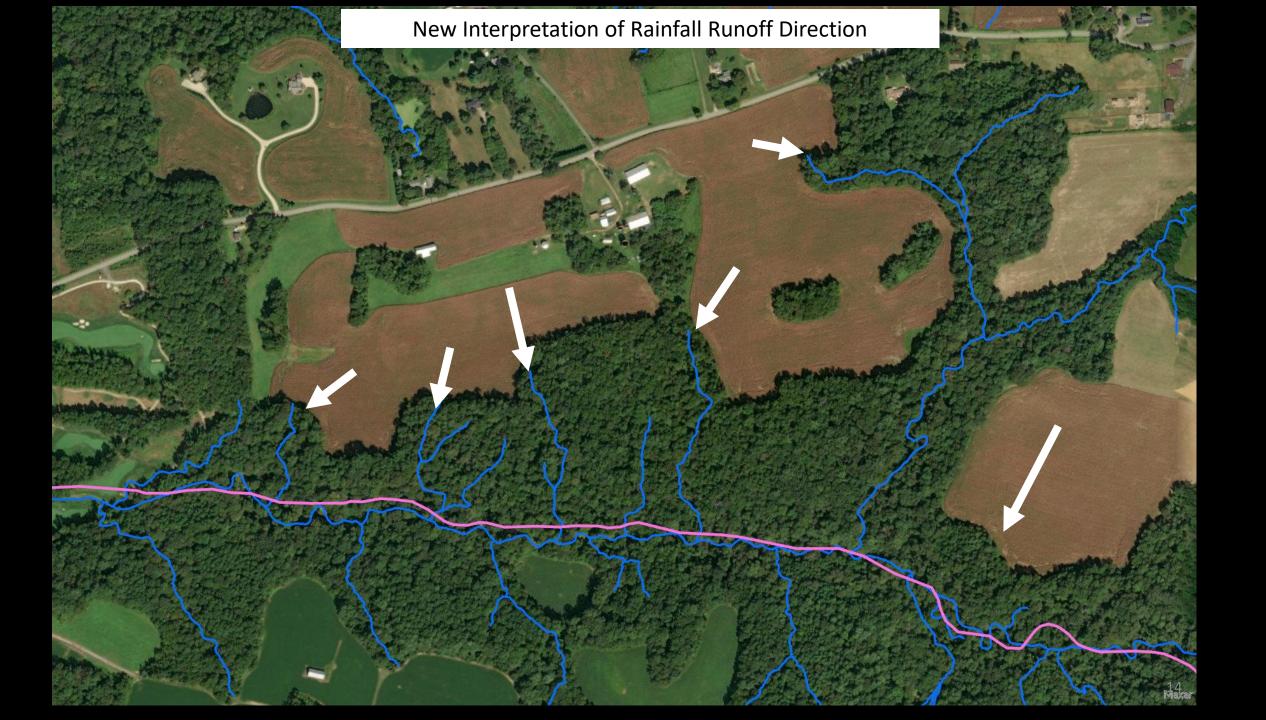


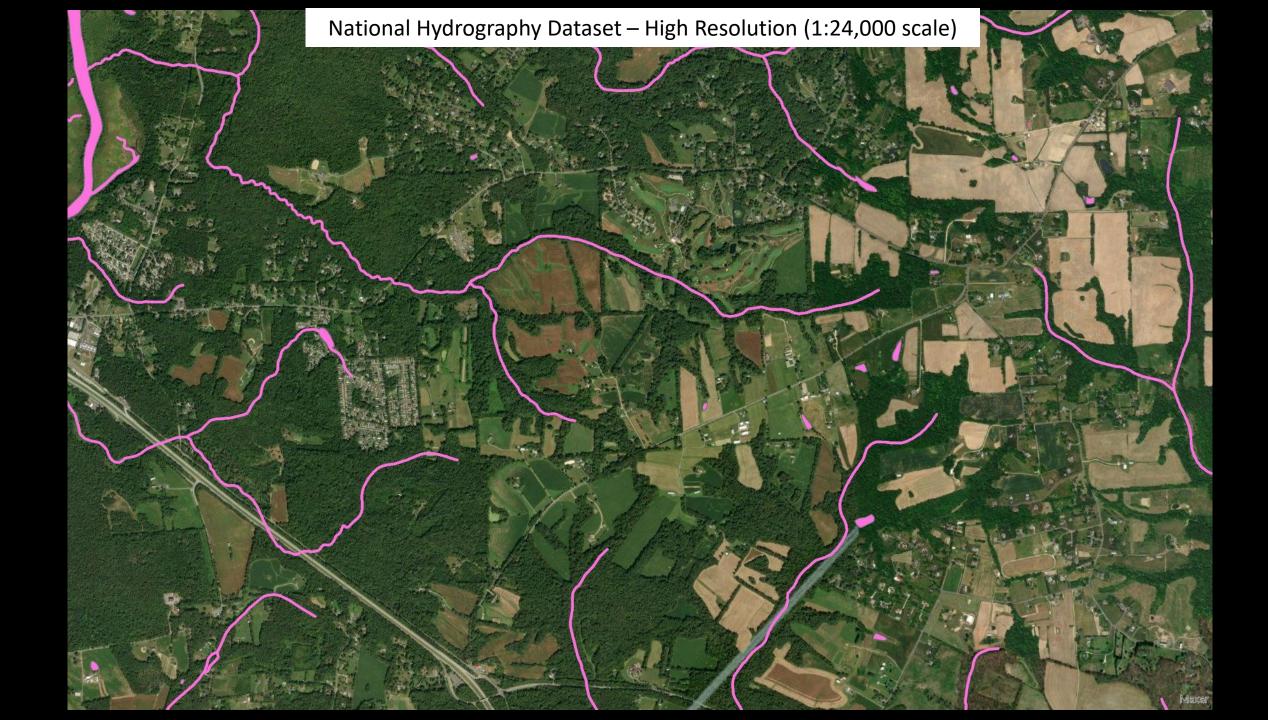


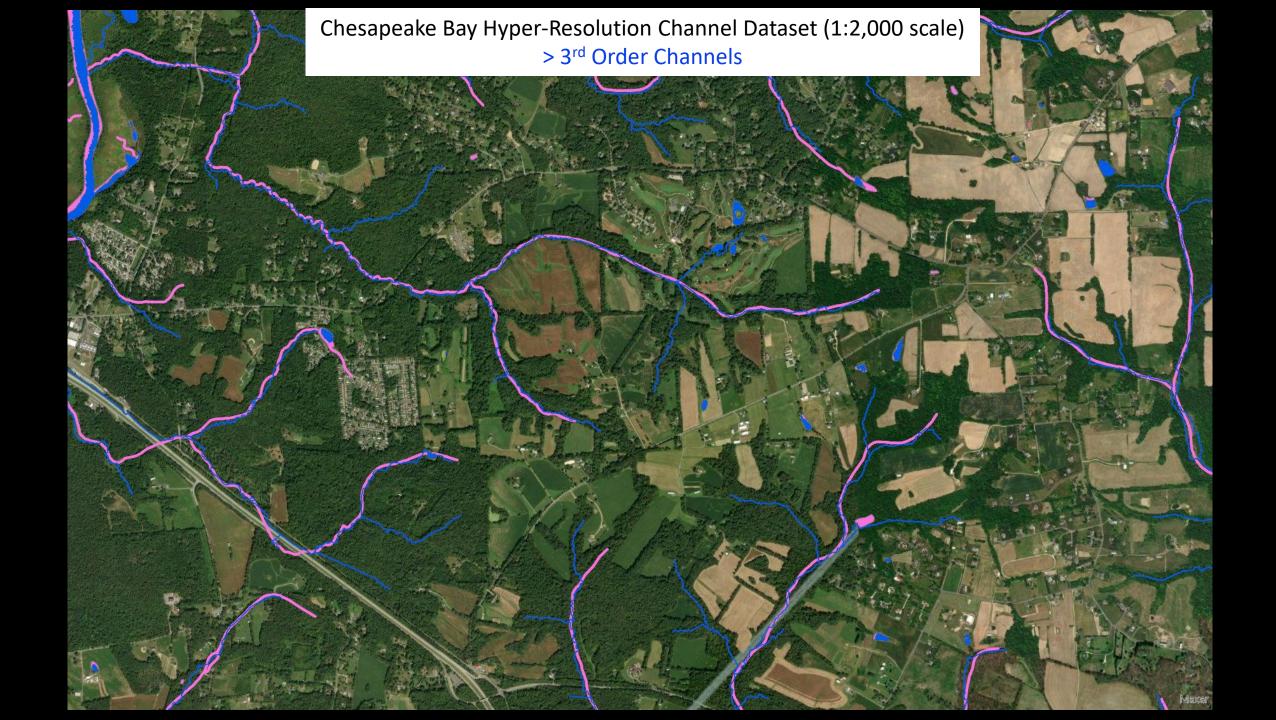


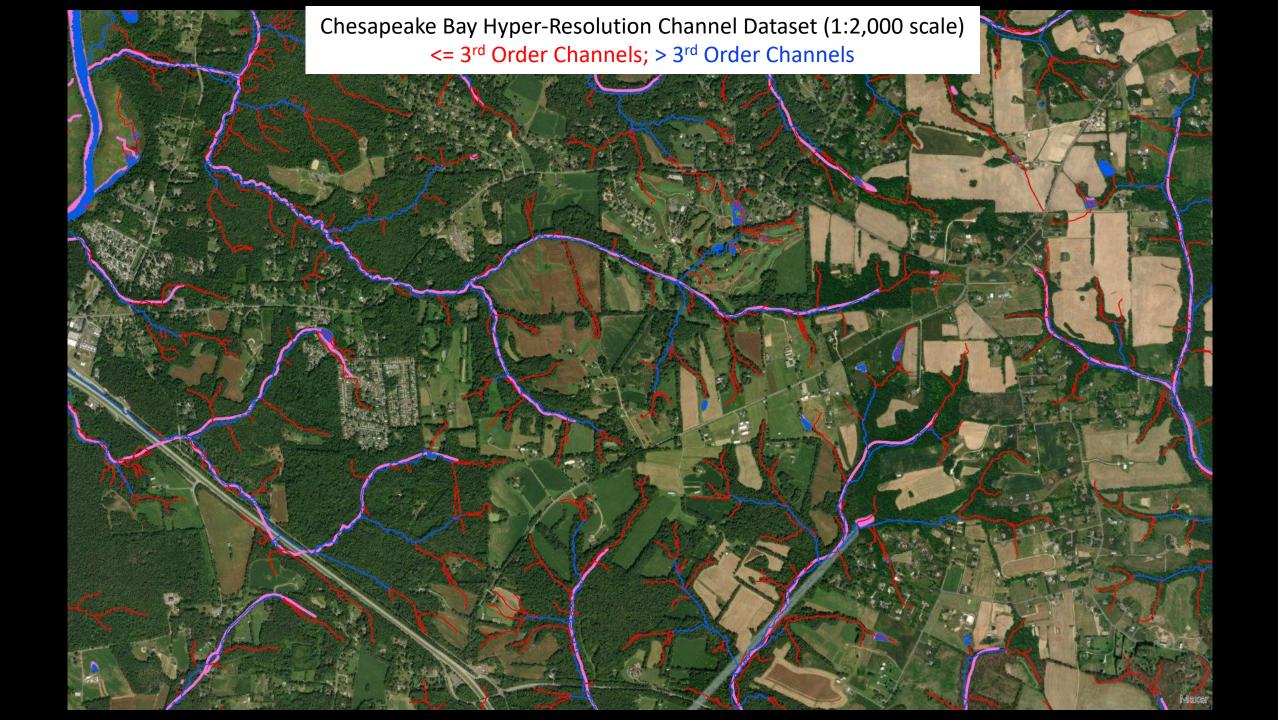


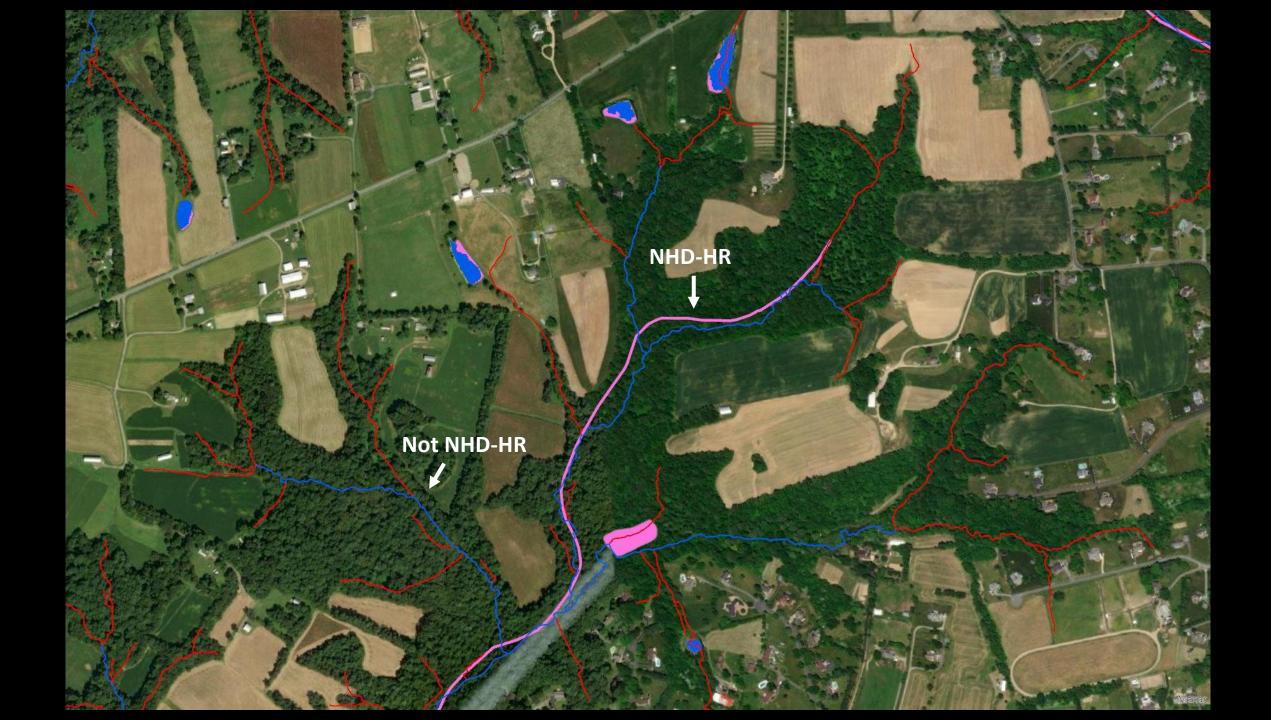


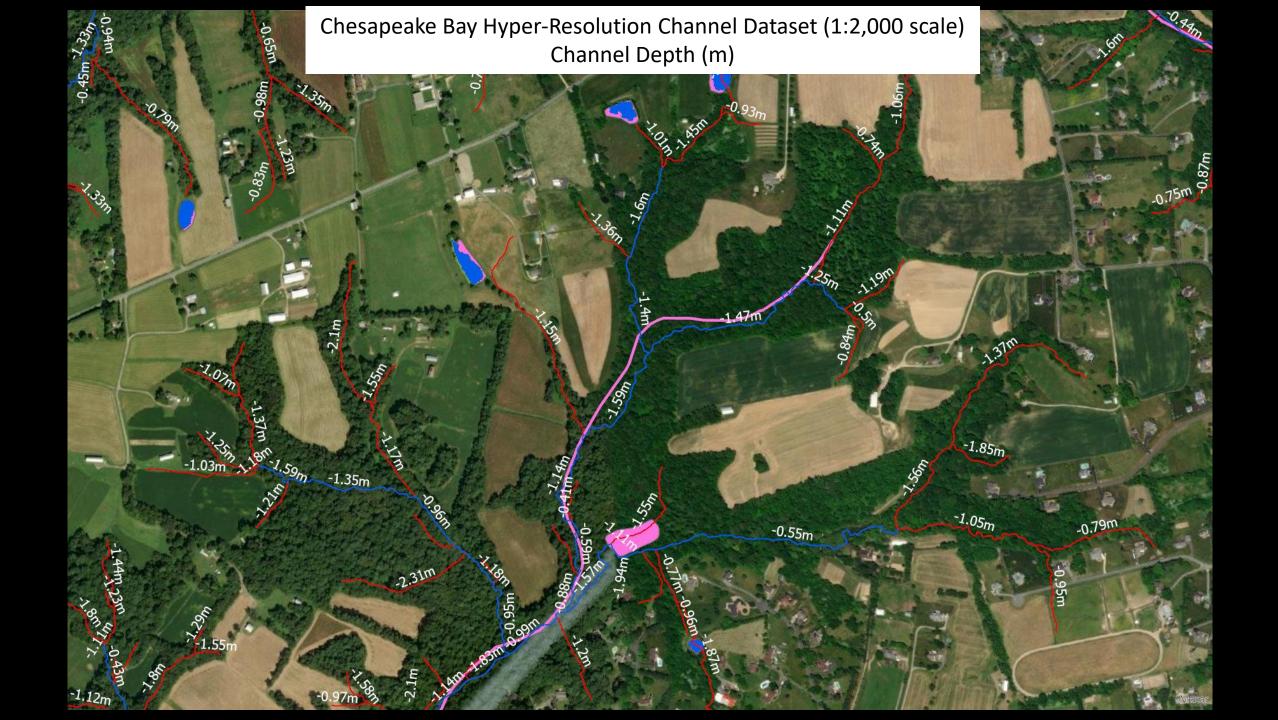


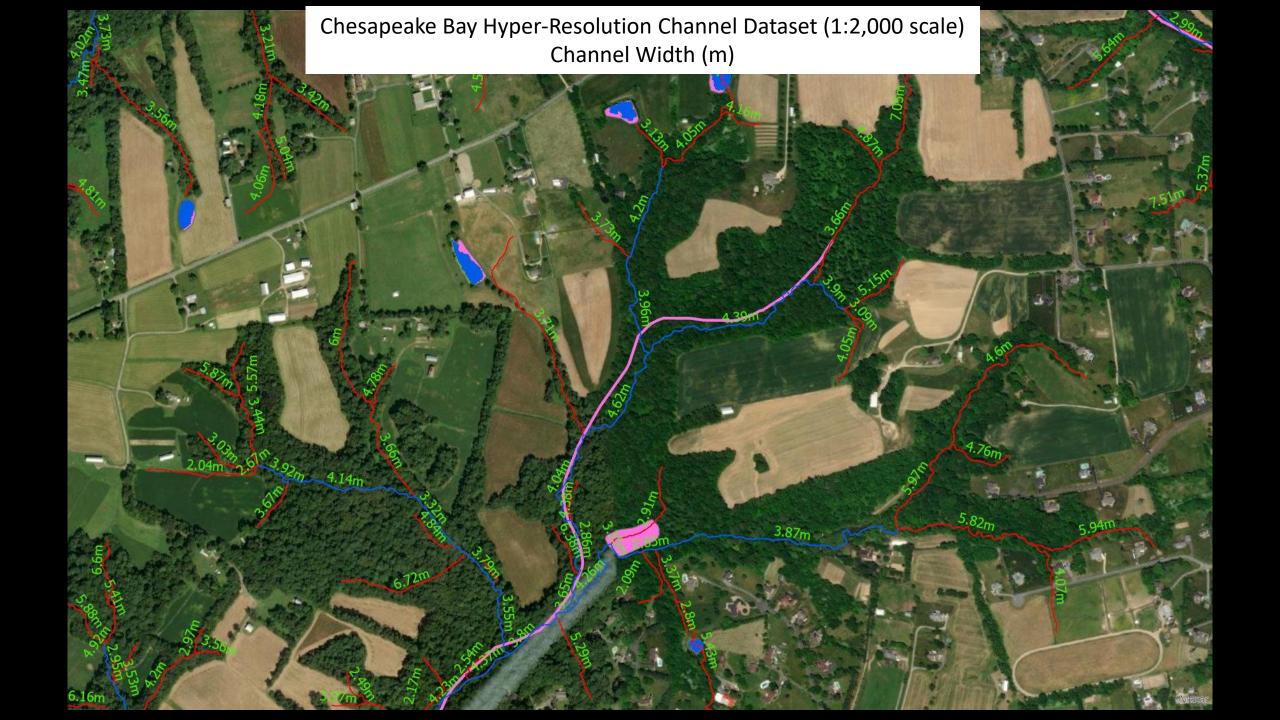


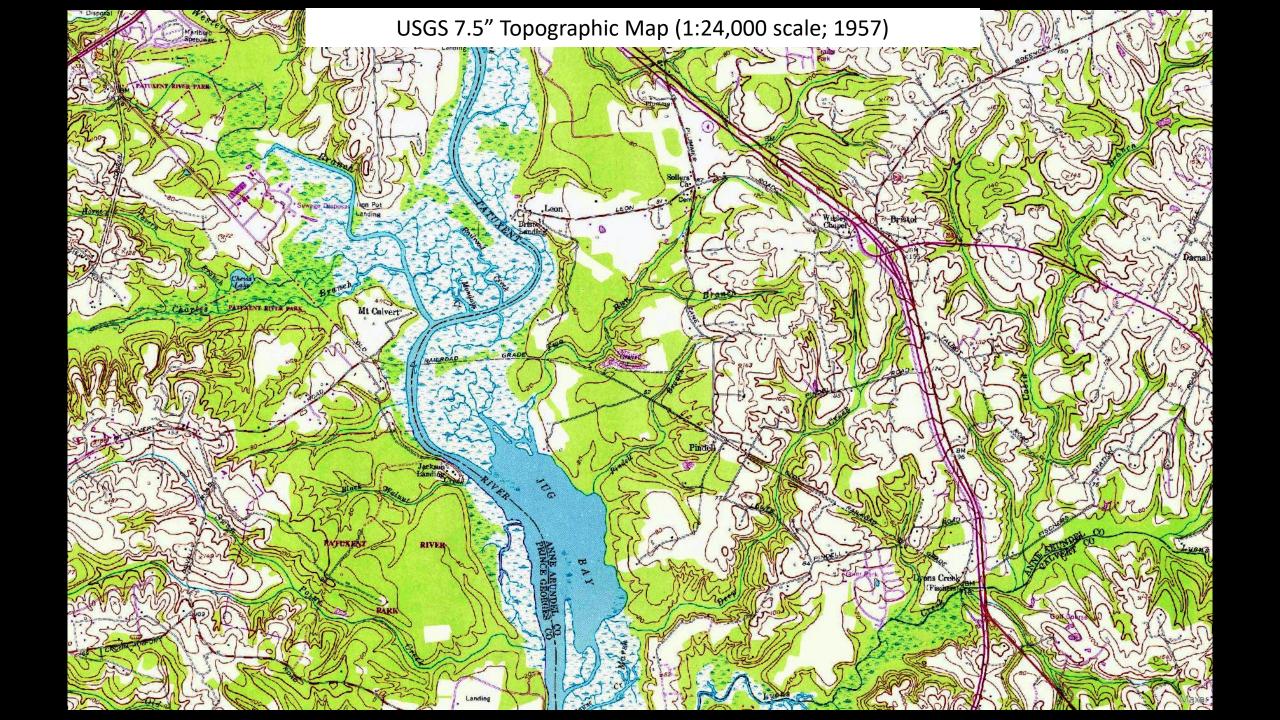


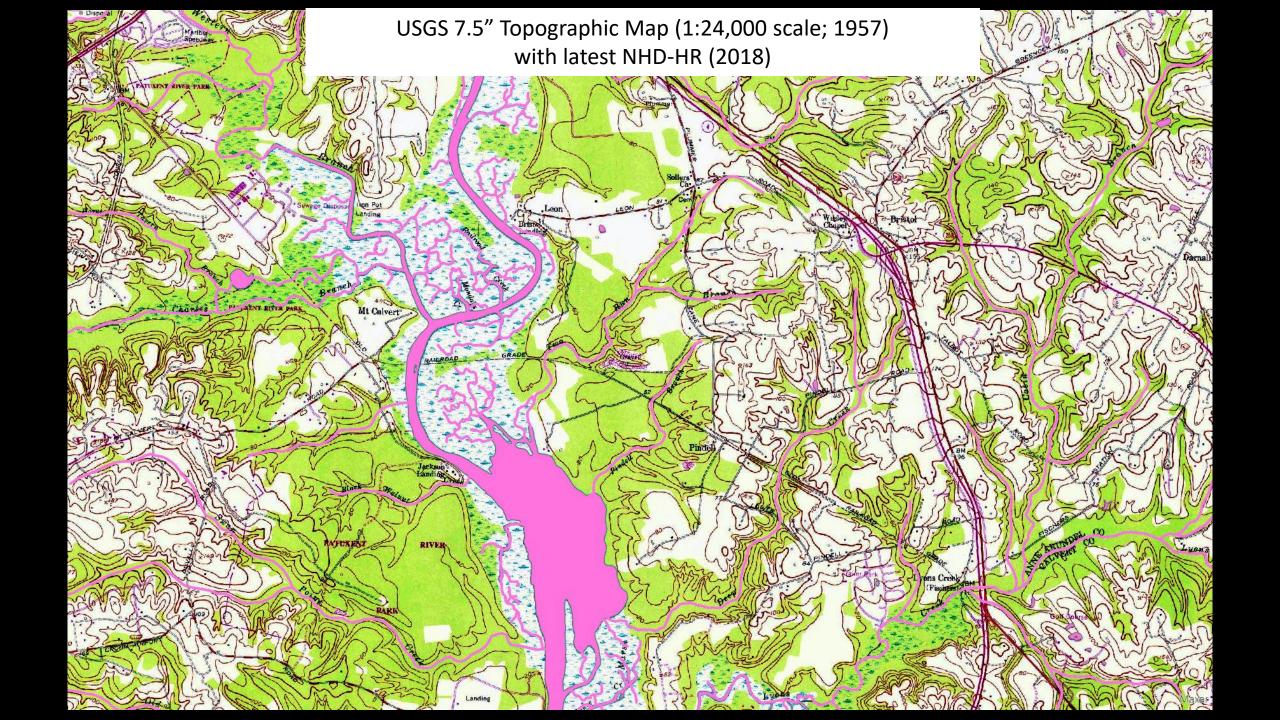


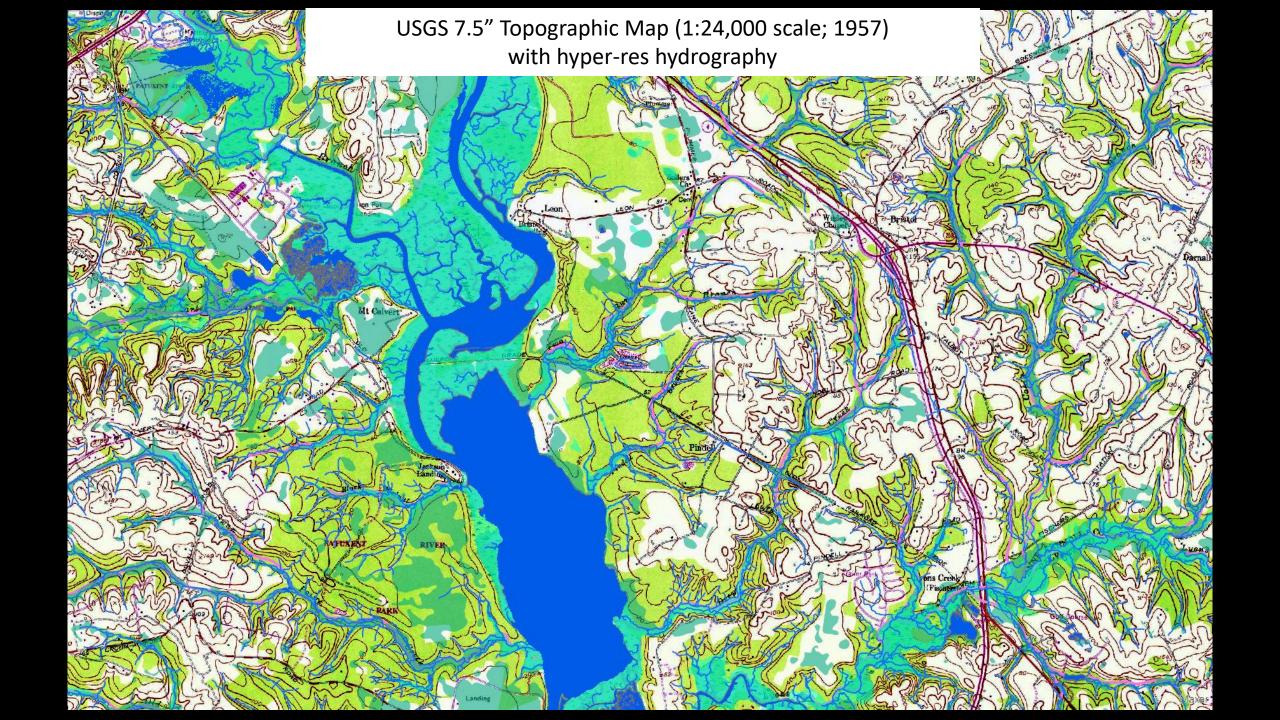












#### **Summary Points**

The nation's best available flowline data and attributes are outdated and provide an imperfect baseline for evaluating new stream products.

What criteria should determine whether a channel is bufferable for assessing and setting riparian forest buffer goals?

- Width and depth?
- Stream order?
- Drainage area?
- Flow permanence?

