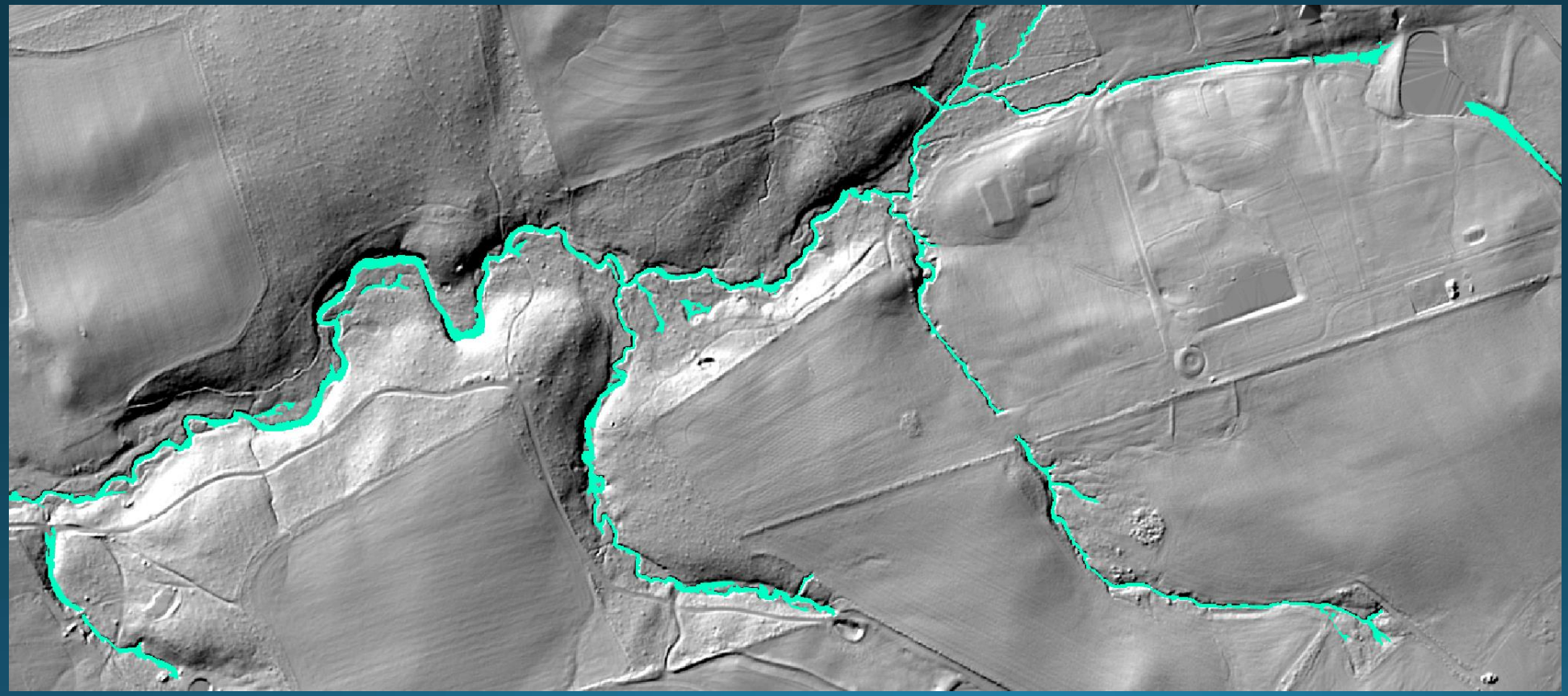
High-resolution hydrography: Ongoing data development

Presentation to PAMAGIC Workshop

David Saavedra, Matt Baker – January 28, 2020



Overview

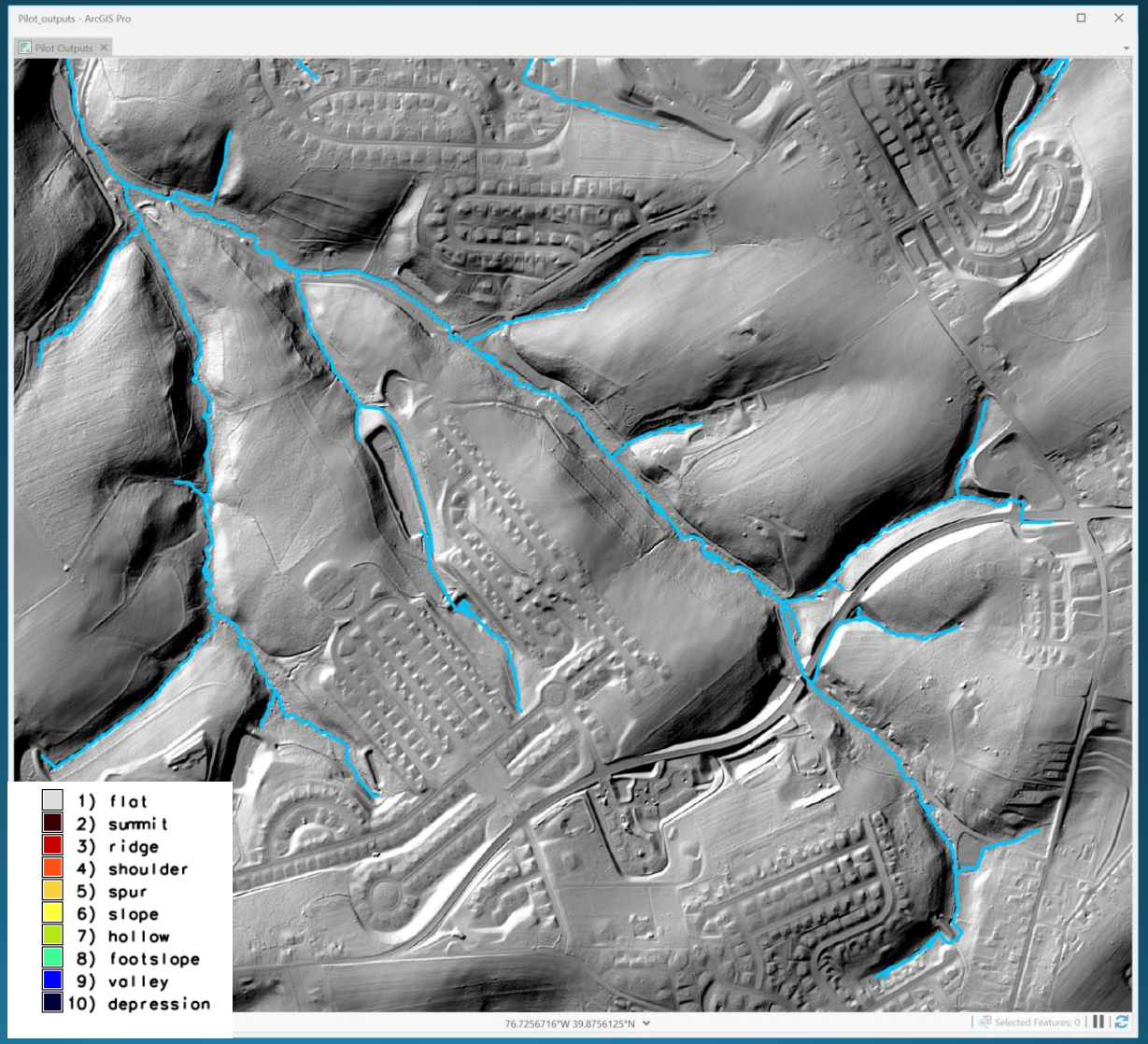
- Project background
- Methods
- Data products
- Lower Susquehanna pilot
- Feedback and revisions
- Next steps

Project background

- 6-year cooperative agreement
  - Objective 1: High-res LU/LC and change product
    - Partners: University of Vermont Spatial Analysis Lab
  - Objective 2: High-res hydrography dataset
    - Partners: University of Maryland Baltimore County
  - Objective 3: BMP mapping and tracking
    - Partners: Drexel University and Chesapeake Commons
  - Objective 4: Geospatial support
    - Partners: Chesapeake Bay Program
- Currently halfway through Year 2

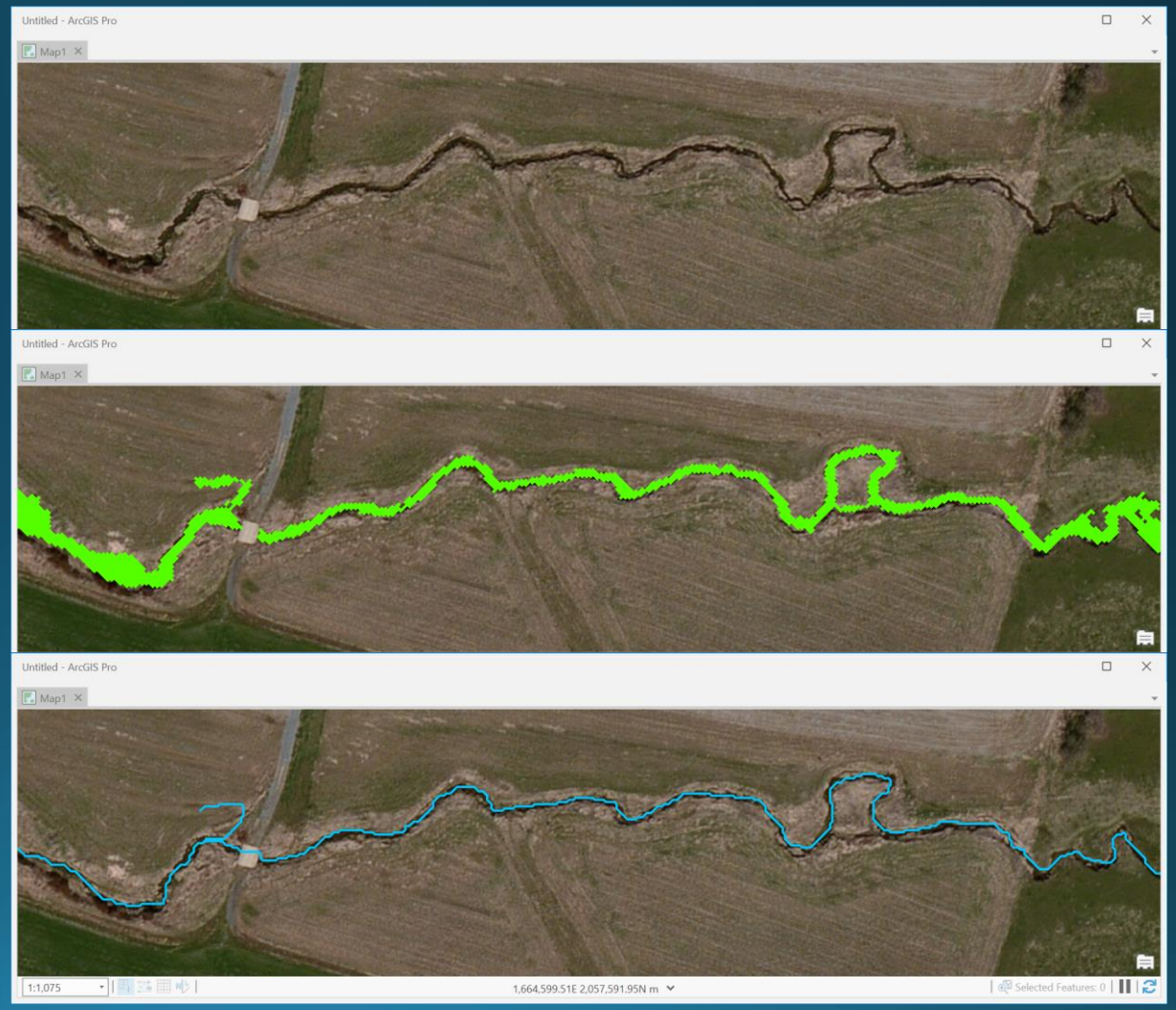
Methods

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



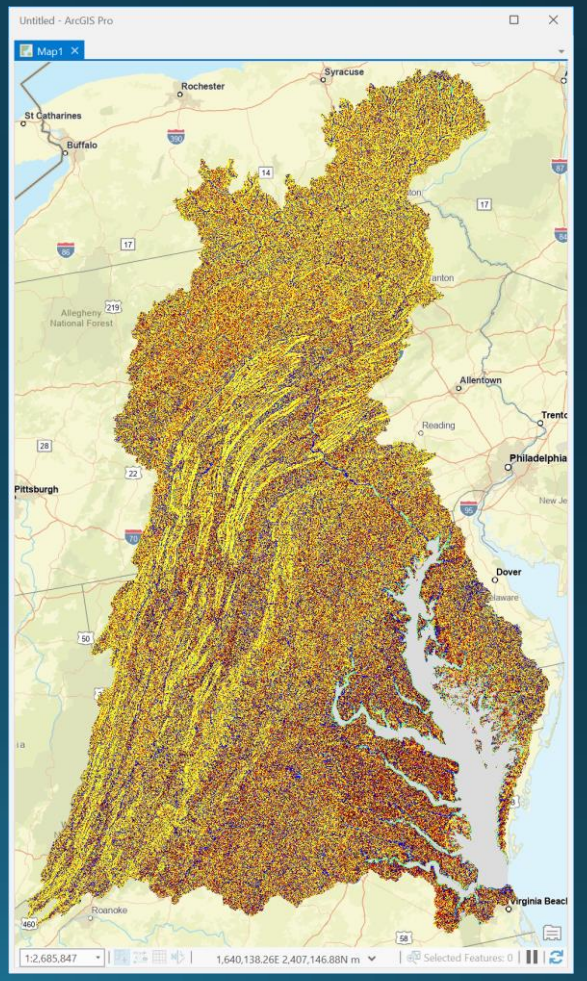
Data products

- Raster channel skeleton
  - 2-D representation of channels
  - Includes discontinuities (e.g. karst, road crossings)
  - Meshes well with high-res LU/LC
- Polyline stream network
  - 1-D linear representation of channels
  - Connects the channel skeleton
  - Reach-scale attributes:
    - Length
    - Width
    - Bank height
    - Stream order
    - Others?



Intermediate products

- Considered “intermediates” but could be released as products if users would find them useful
- Valley network
  - Full Bay watershed coverage (NED-based)
  - Also produced at HUC8 level (LiDAR-based)
- Landform classification
  - “Valley scale” and “channel scale”
  - Interest from PADEP and PSU for mapping valley bottoms and altered landscapes



Lower Susquehanna pilot

- Completed first draft map in Sept. 2019
  - 73 HUC12s
  - Automated valley & channel extraction
  - Manual QAQC
  - Automated connection algorithm
- Technical briefing and data distribution to Advisory Committee
- Iterative feedback and adjustments for second draft

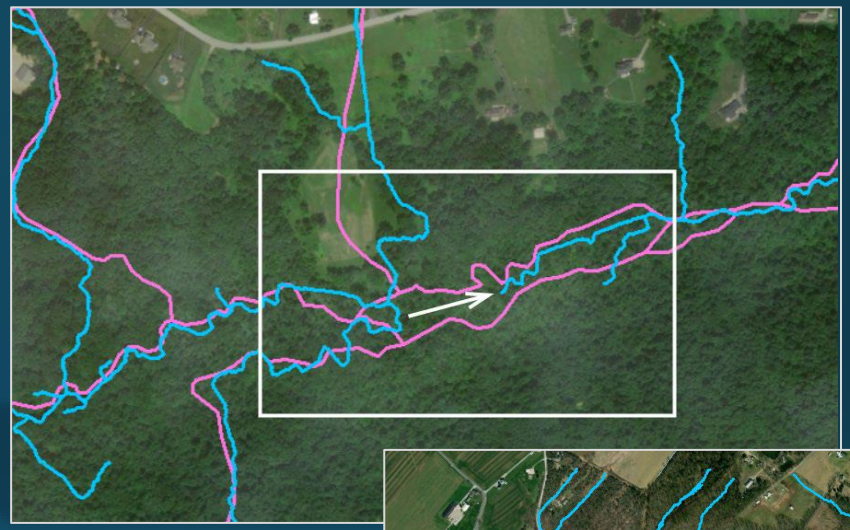
Feedback

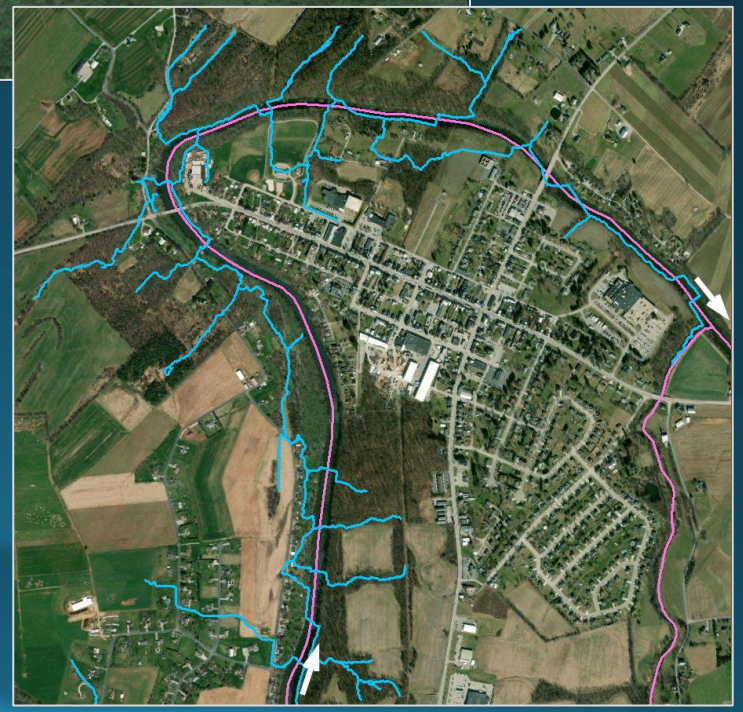
- Small headwater tributaries mapped more accurately and comprehensively than 1:24K NHD in most cases

Images: Eliza Gross, USGS – review of Lower Susquehanna pilot

Feedback

- Some issues in *connected polyline network* surrounding road crossings, open water, and areas lacking prevalent surface channels (e.g. urban areas with underground conveyance, dense vegetation)
- Some inconsistencies in QAQC were noted





Images: Eliza Gross, USGS – review of Lower Susquehanna pilot

Revisions

red = pilot data, green = revised data

- Improved handling of open water
- Reduced valley network omission
- Improved polyline connections across roads and over land
- Developing systematic and consistent QAQC procedures

Next steps

- 2nd draft maps for Lower Susquehanna incorporating revisions
  - Produced at HUC8 scale – 1 map per layer versus previous 73 maps per layer
  - Automated portions complete, pending QAQC over coming weeks
- Mapping additional watersheds (Nanticoke, Choptank, Patuxent, Patapsco)
- Further mapping based on LiDAR collection (newer, better LiDAR first)

Questions?

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