Shoreline Condition - Percentage Hardened Shoreline in Chesapeake Bay

Zhaoying “Angie” Wei
GIS Analyst, Chesapeake Bay Program

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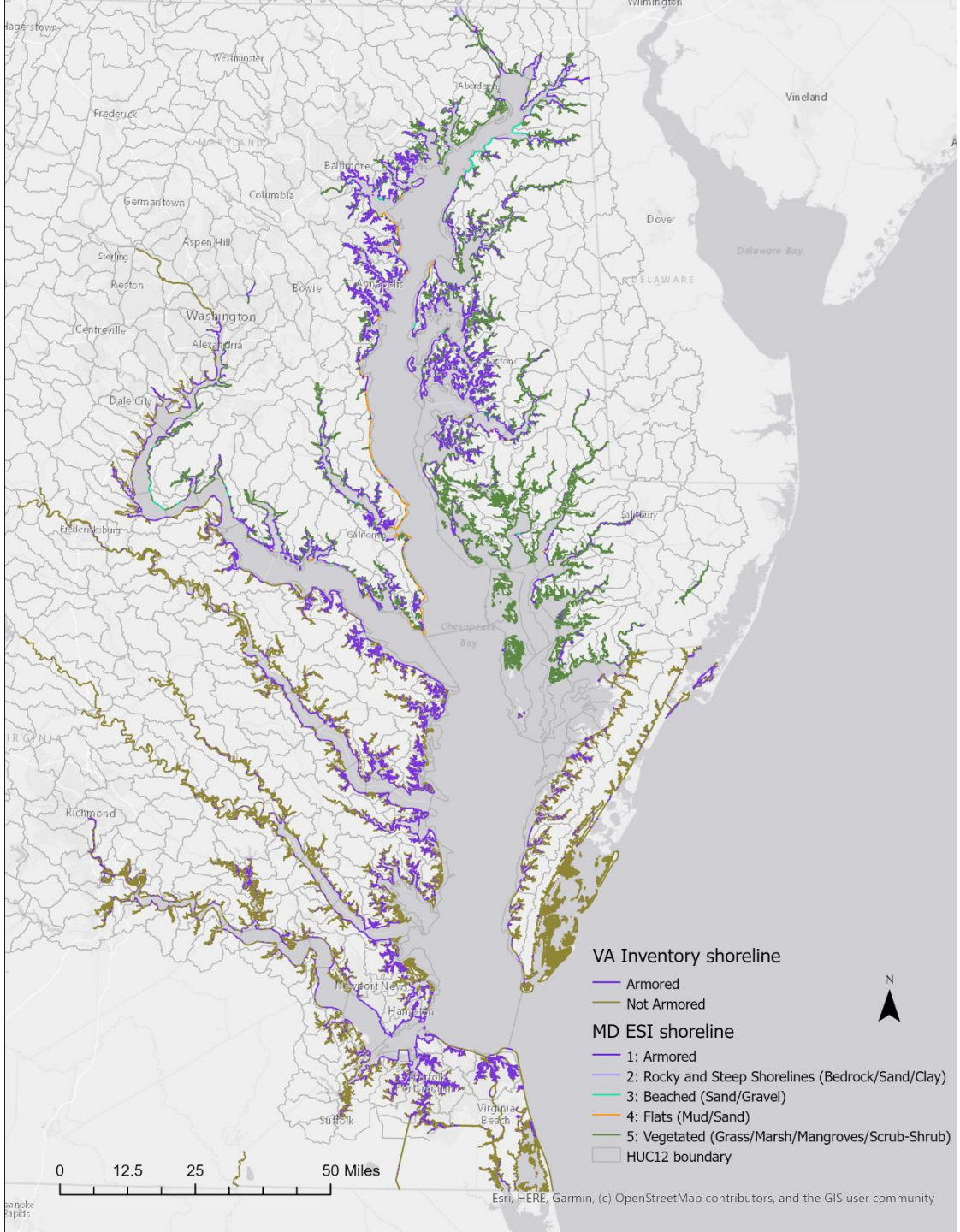
Shoreline Data

- VA – VIMS Shoreline Inventory Data 2018

- MD – NOAA Environmental Sensitivity Index (ESI) Data 2016

	MD	VA
Total Length (mi)	6,531.747	10,728.827
Armored Length (mi)	1,117.266	973.894
%Armored	17.11%	9.08%

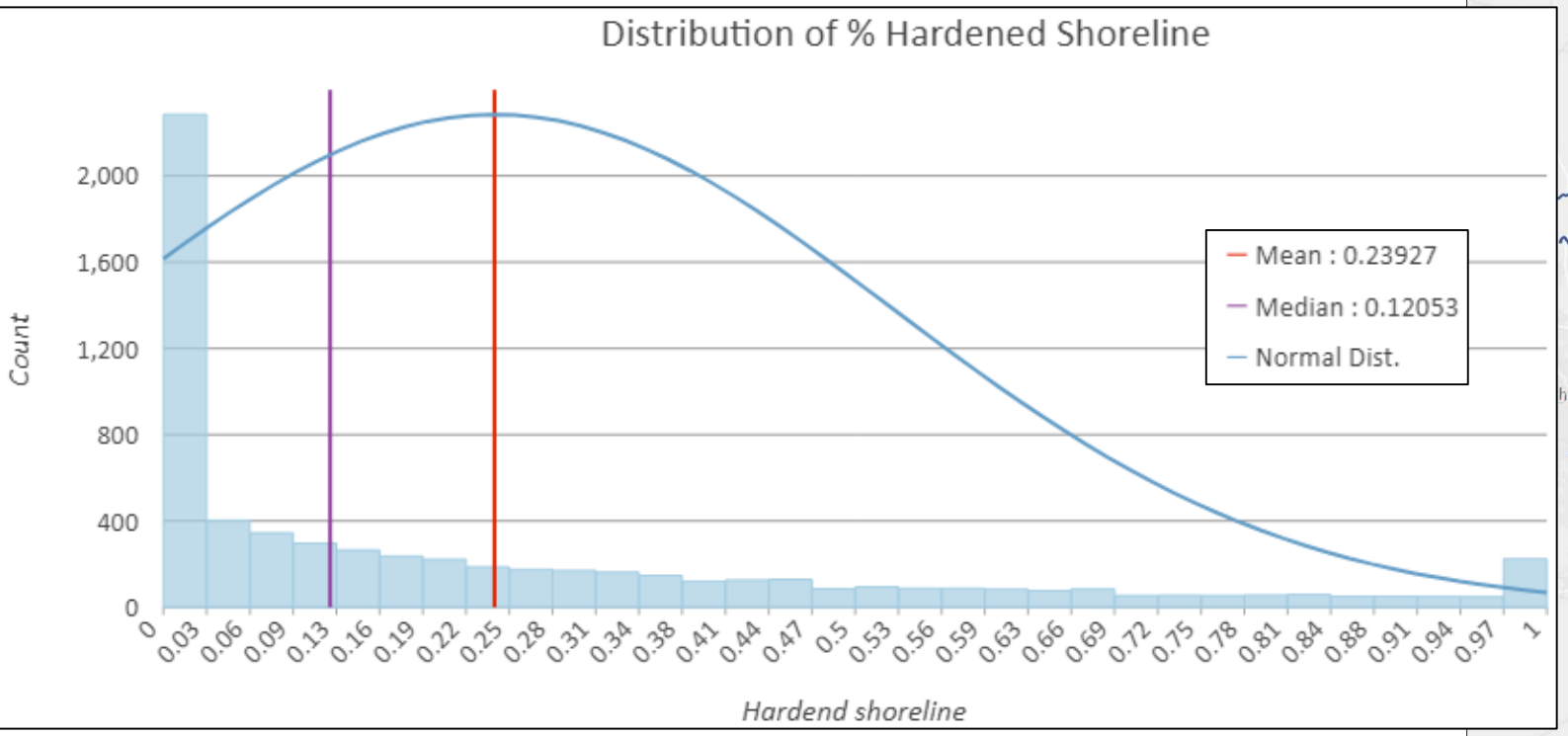


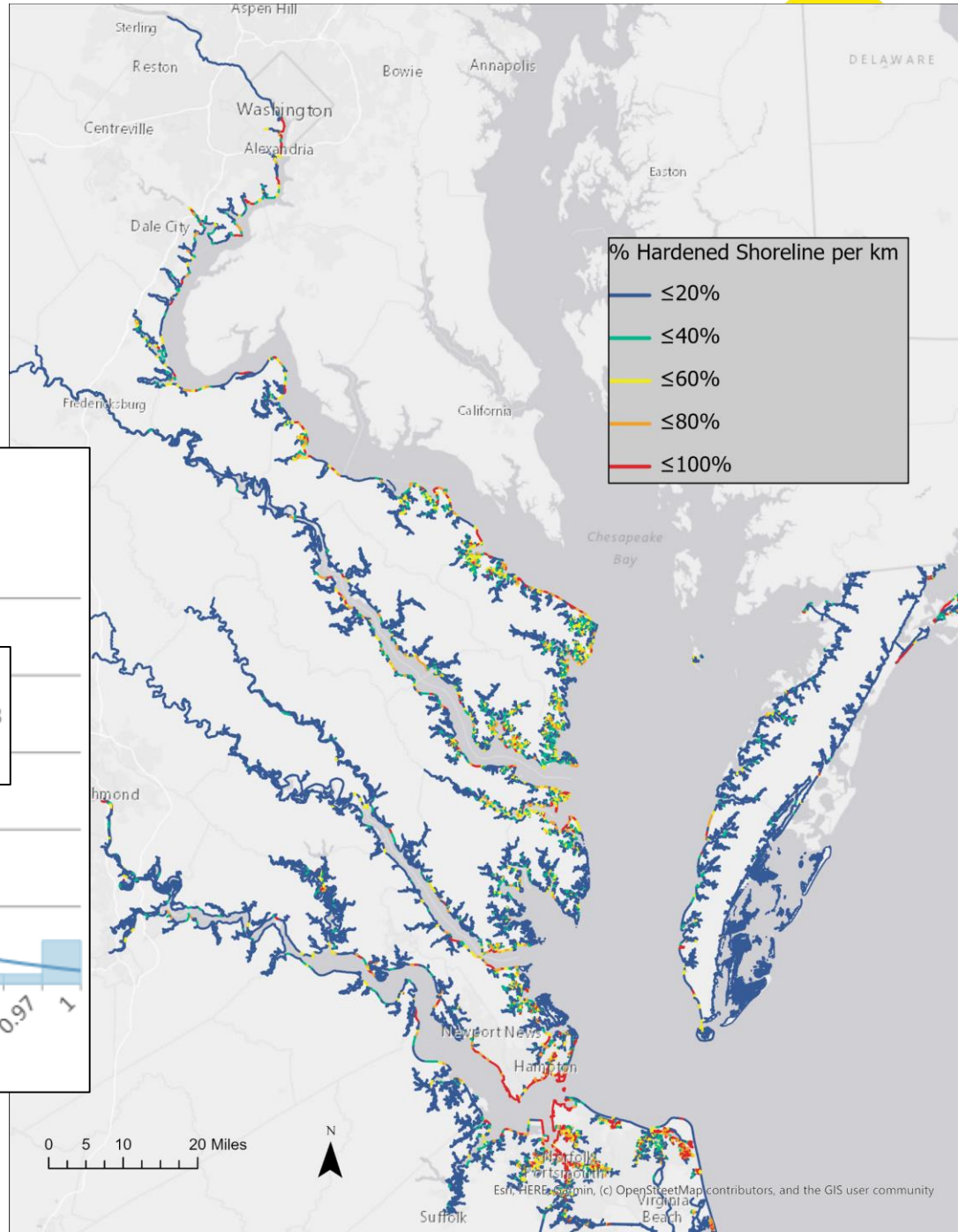
Method

$$\%\ \boldsymbol{Hardened\ Shoreline\ per\ 1km} = \frac{\boldsymbol{Total\ Length\ of\ Hardened\ structures\ in\ meter}}{\boldsymbol{Total\ Length\ of\ all\ shorelines\ in\ meter}} \rightarrow 1000$$

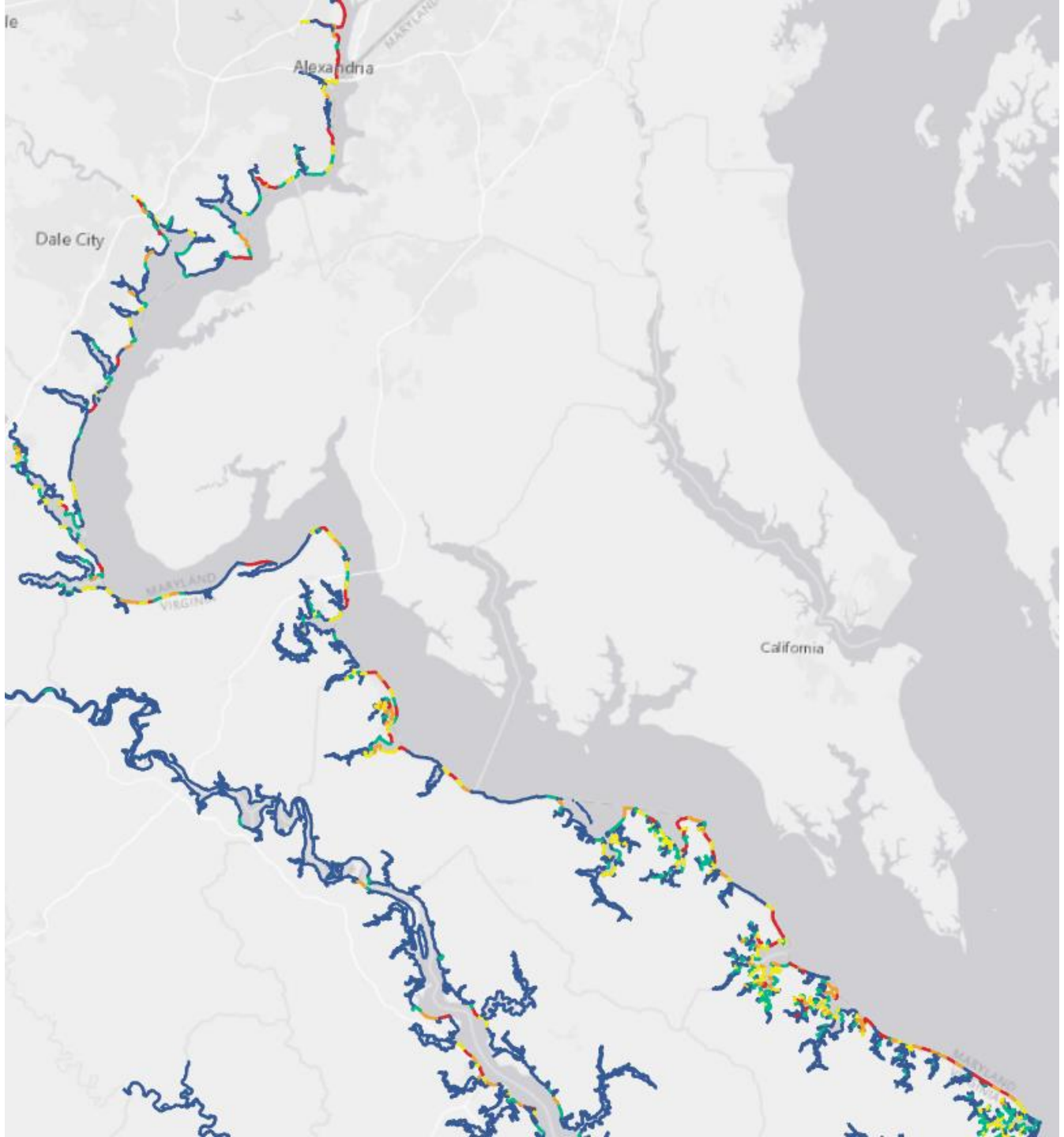
- Armoring Structure type
  - Included: Bulkhead, Debris, Dilapidated bulkhead, Marina, Riprap, Unconventional, Wharf
  - Excluded structure: Breakwater, Groinfield, Marsh Toe Revetment, Jetty
- Scale 1 : 1000 m
  - Calculate Prct Hardened shoreline every 1km
  - Much finer than County or HUC12
  - Aggregating up as needed
  - Compatible with the next generation tidal models

Result – VA shorelines





Result – Potomac



% Hardened Shoreline per km

- ≤20%
- ≤40%
- ≤60%
- ≤80%
- ≤100%

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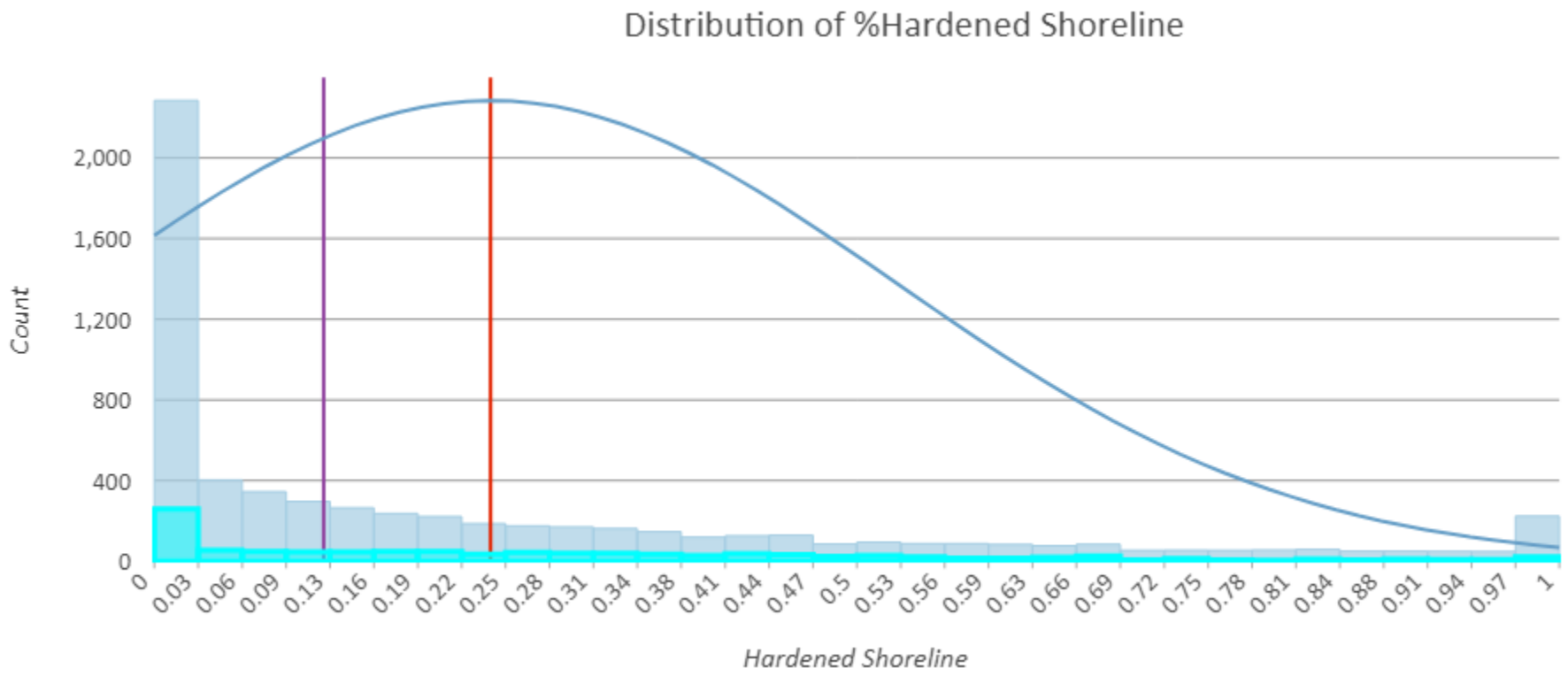
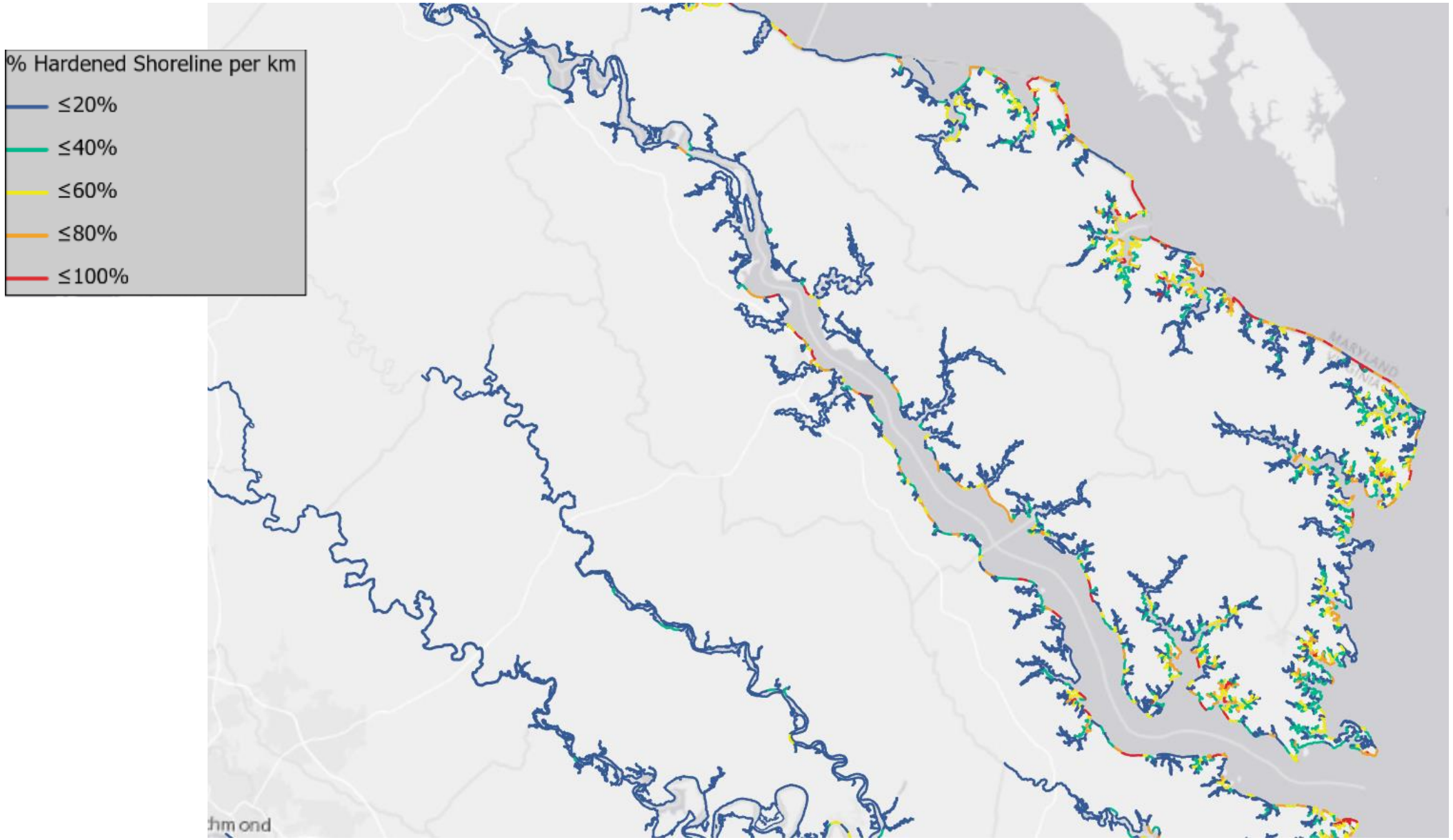
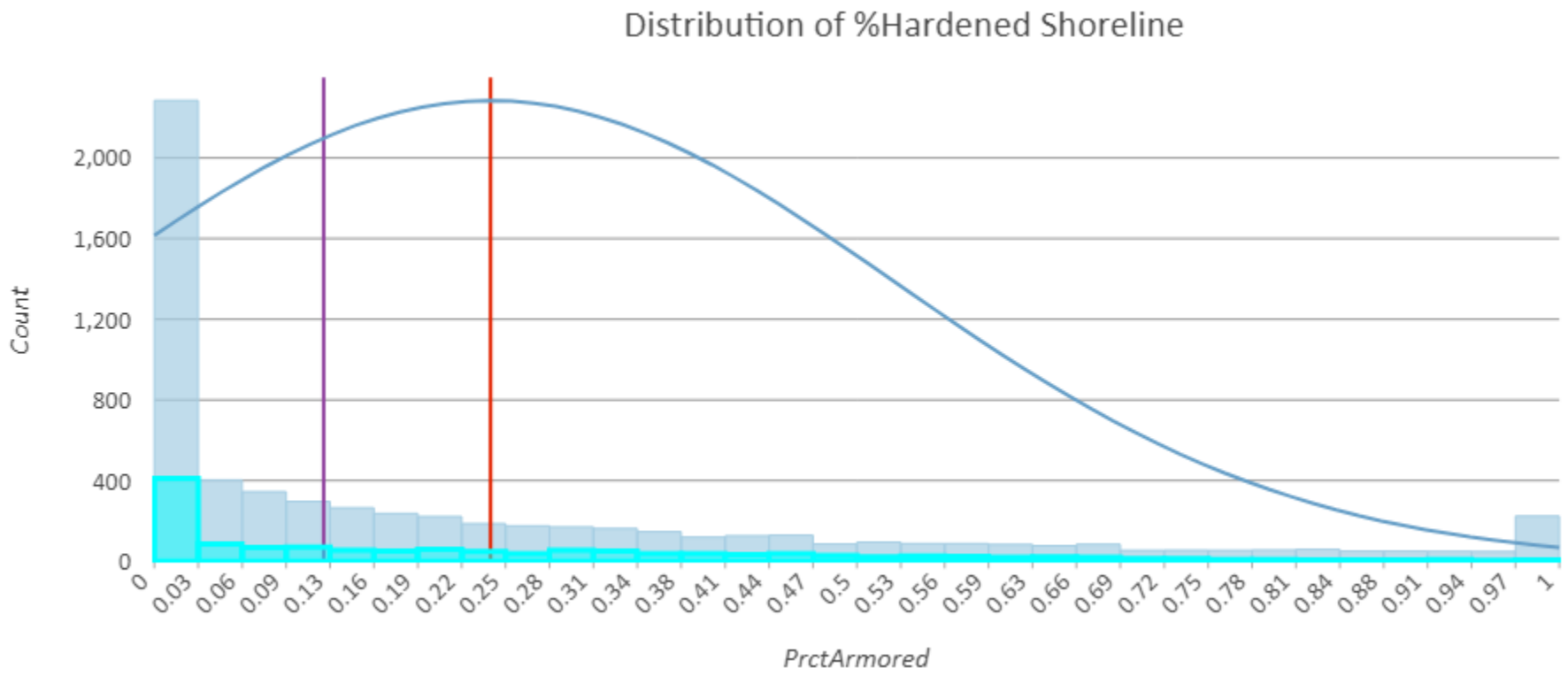
Result – Potomac



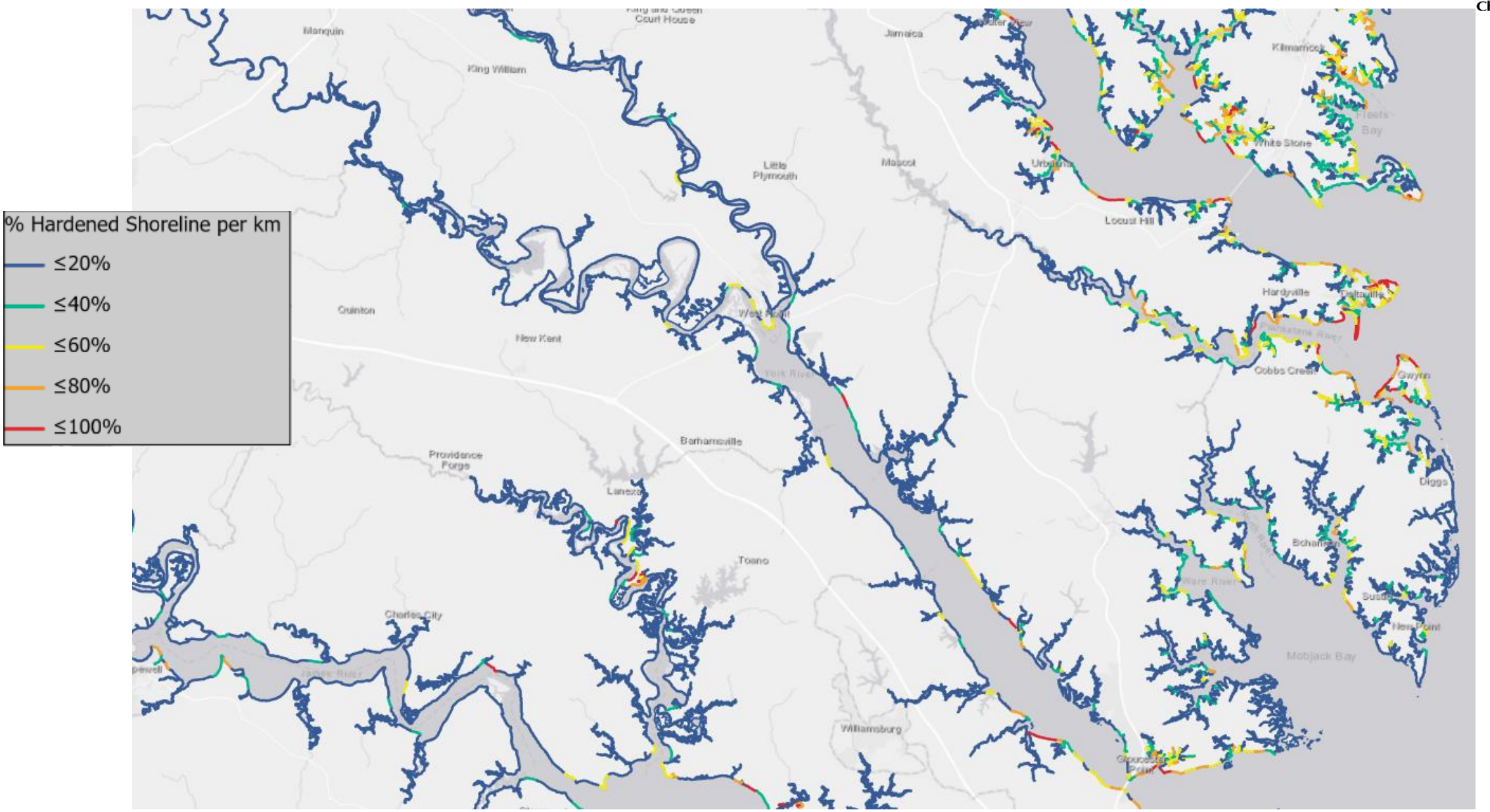
Result – Rappahannock



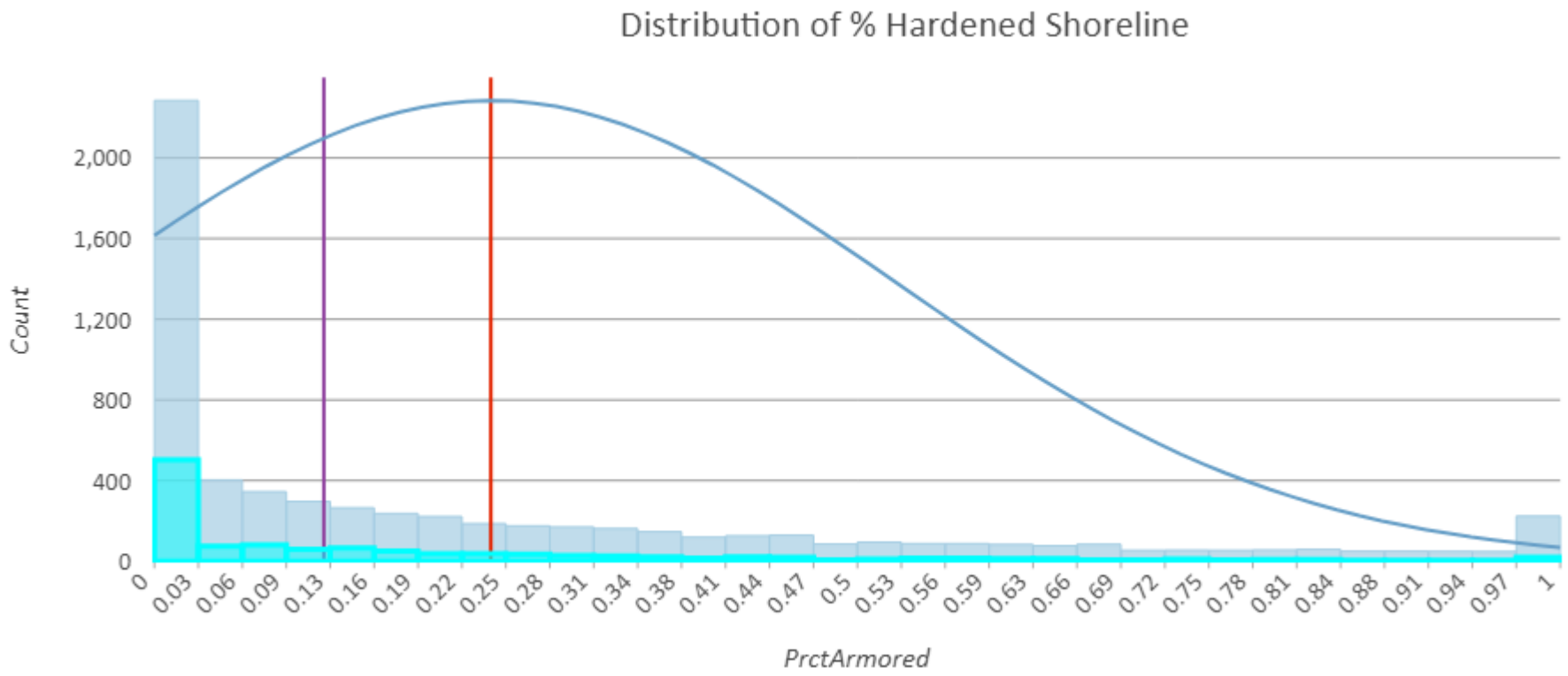
Result – Rappahannock



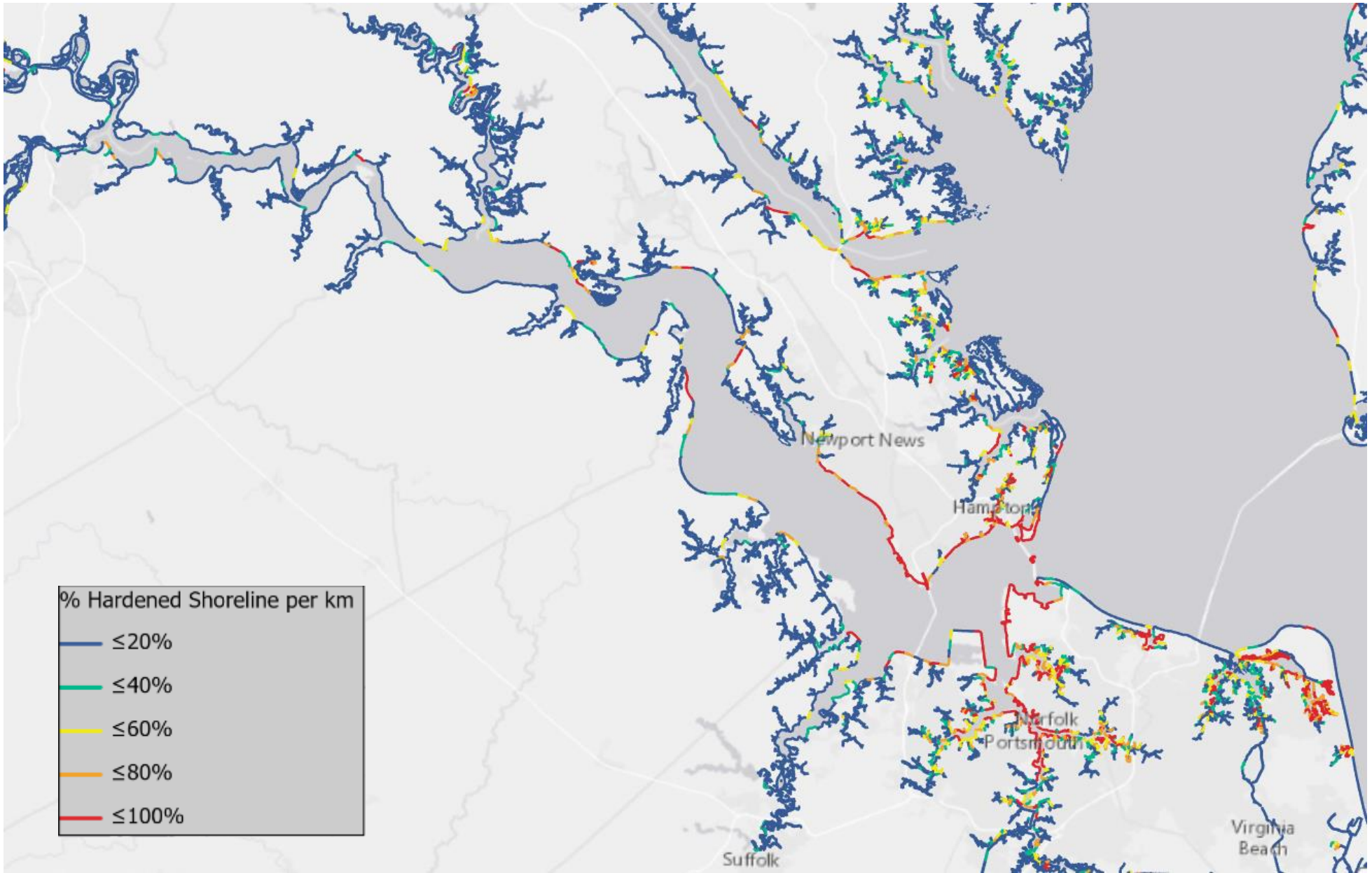
Result – York


% Hardened Shoreline per km
≤20%
≤40%
≤60%
≤80%
≤100%
Manquin
King William
Court House
Jamaica
Kilmarnock
White Stone
Little Plymouth
Mascot
Locust Hill
Hardyville
Gwynn
Quinton
New Kent
West Point
Barhamsville
Providence Forge
Toano
Charles City
Williamsburg
Diggs
Mobjack Bay
New Point

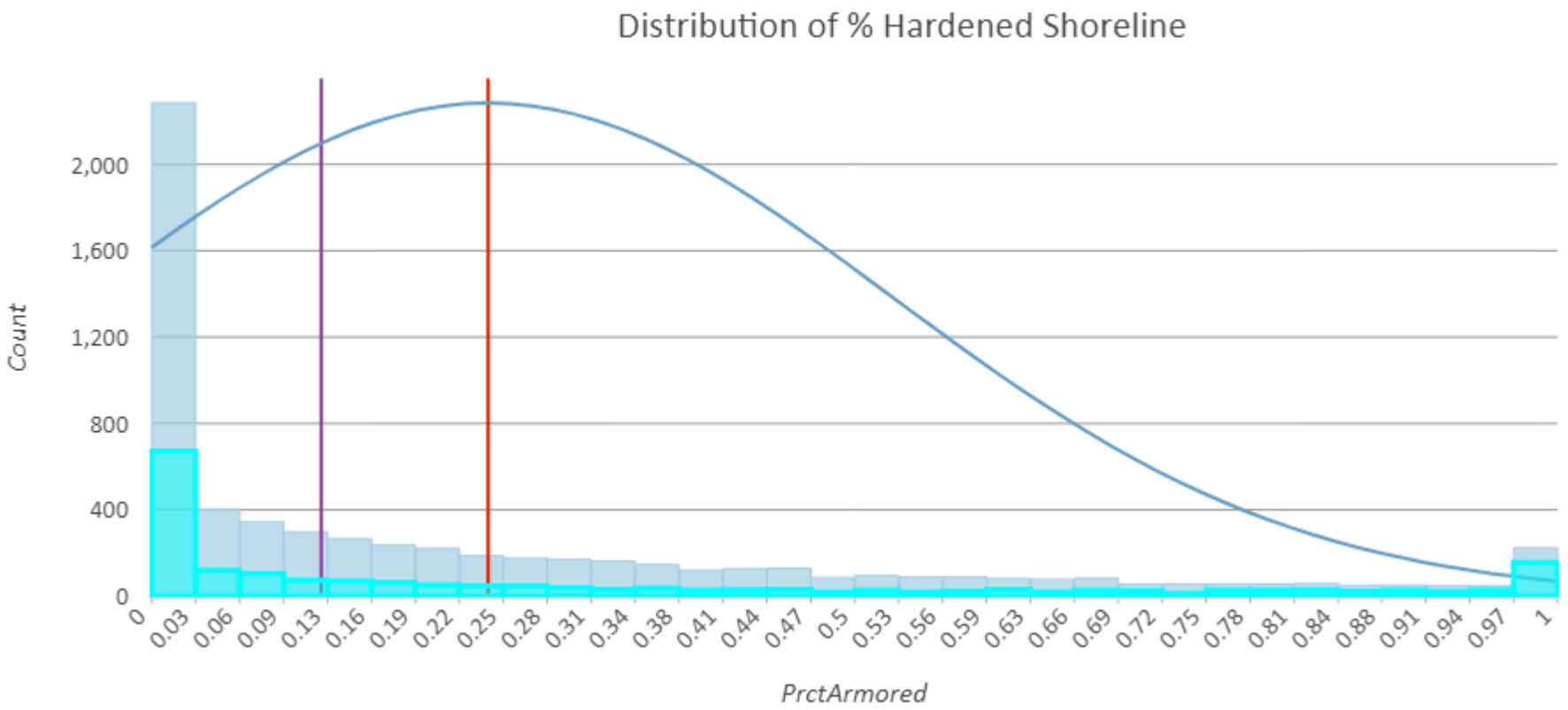
Result – York


Distribution of % Hardened Shoreline
Count
2,000
1,600
1,200
800
400
0
0
0.03
0.06
0.09
0.13
0.16
0.19
0.22
0.25
0.28
0.31
0.34
0.38
0.41
0.44
0.47
0.5
0.53
0.56
0.59
0.63
0.66
0.69
0.72
0.75
0.78
0.81
0.84
0.88
0.91
0.94
0.97
1
PrctArmored

Result – James



Result – James



Next step and Discussion

- Continue calculation for MD shoreline
- What's the best MD shoreline source?
  - VIMS MD inventory shoreline coming in 2020
  - NOAA Environmental Sensitivity Index (ESI) Data 2016
- Potential to apply forage abundance thresholds