Brief Overview of Sturgeon & Dredge Interaction Research in the James River, VA

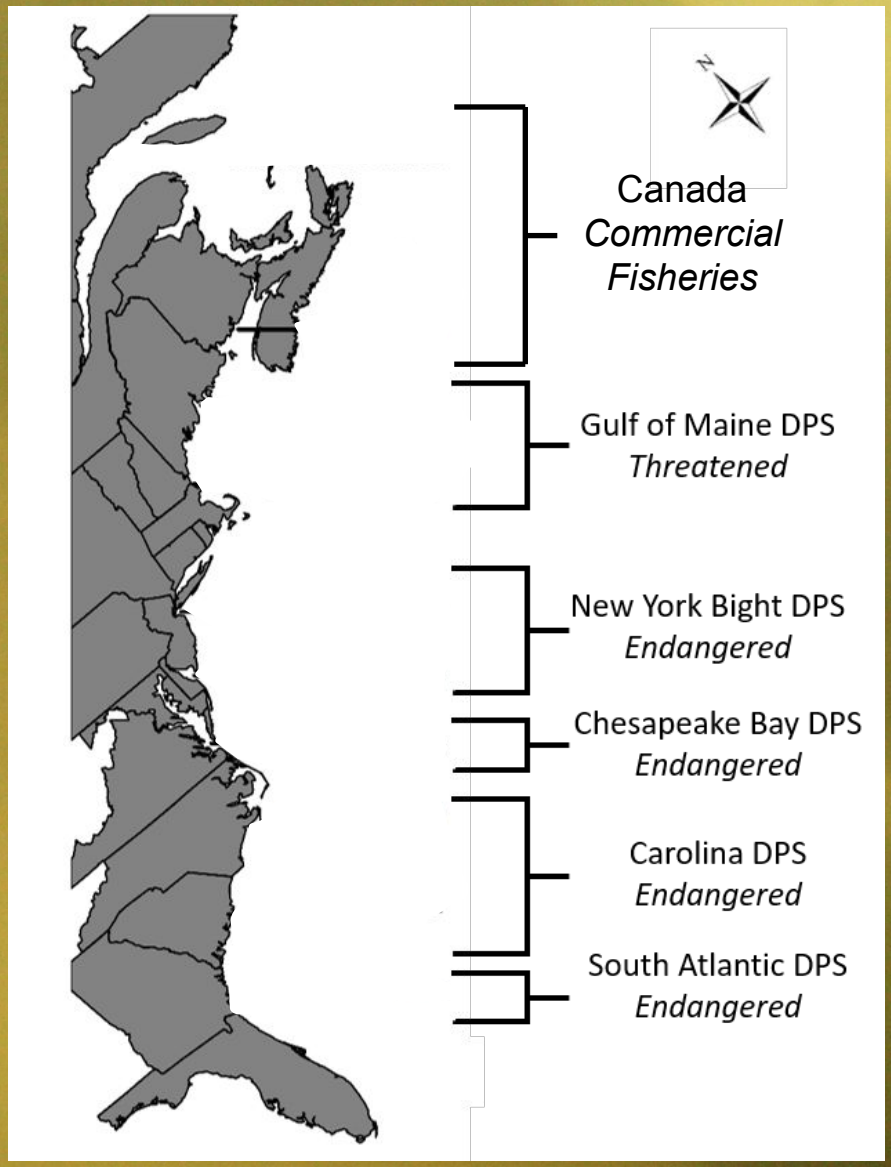
James River Atlantic Sturgeon (ATS) Partnership

Overview

- 2017 VPS Study (Published)
- 2020 VPS Study
- 2019-2020 Juvenile Study
- 2020-2021 Juvenile Future Study

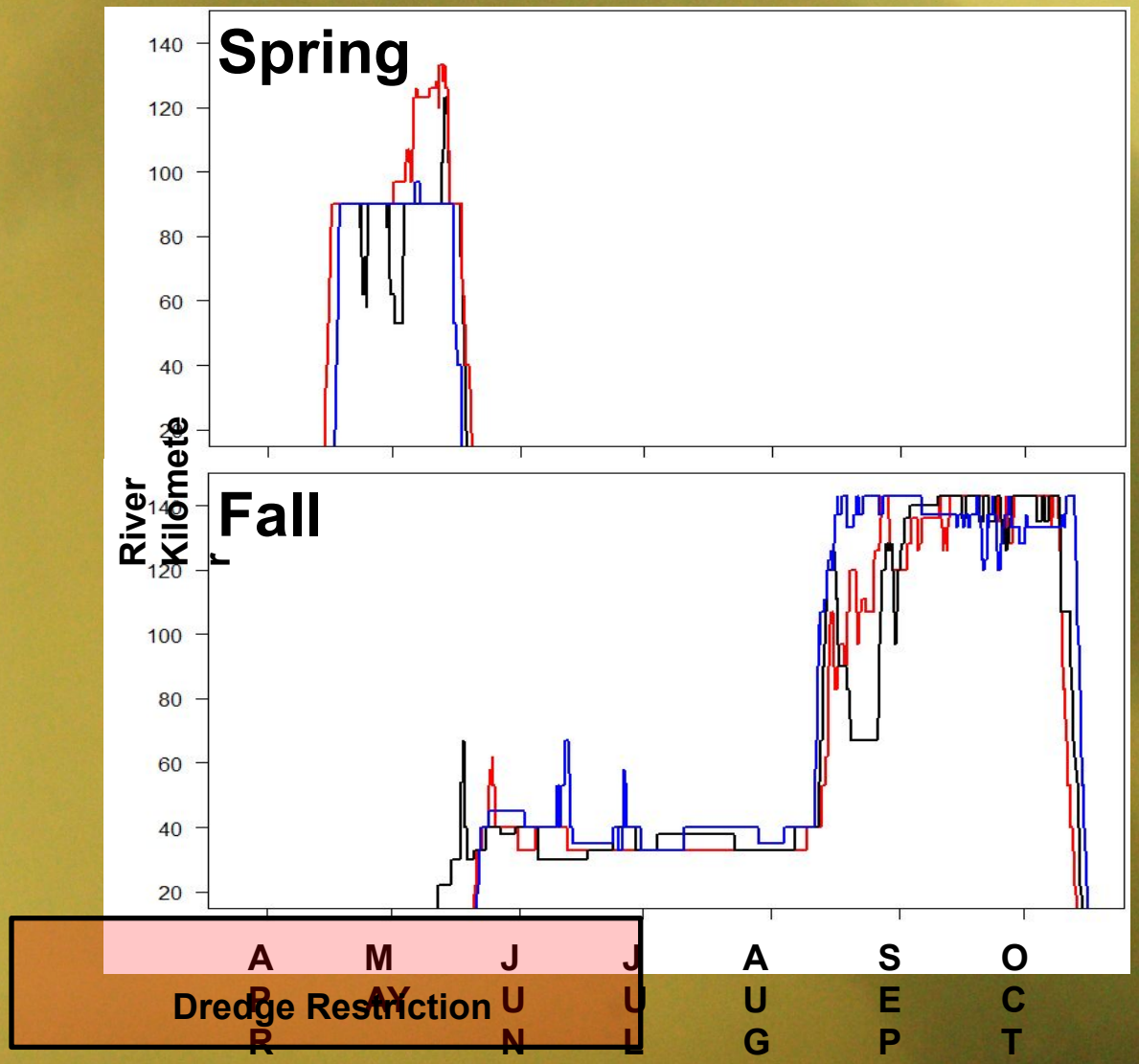
ATS Status in VA

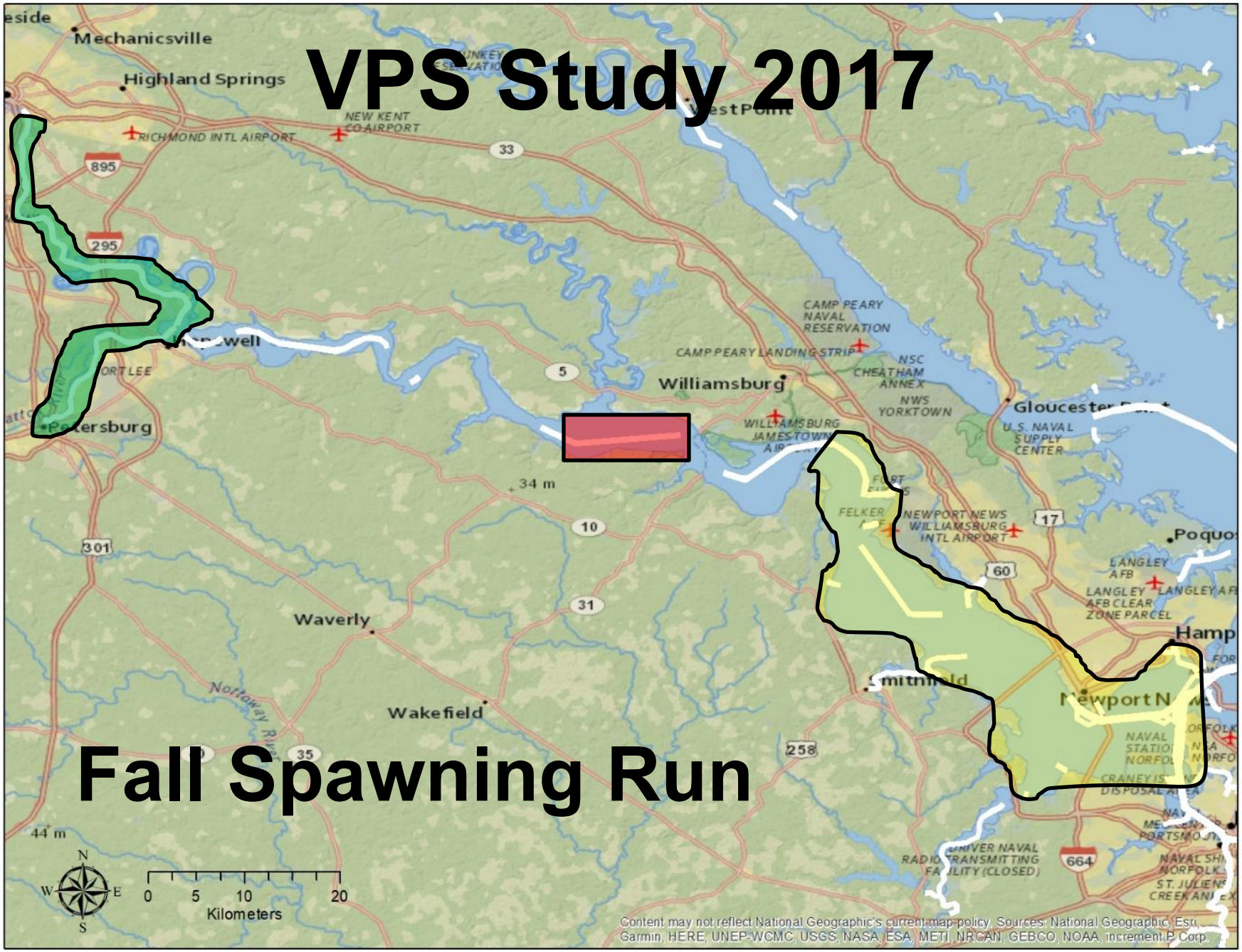
- Heavily Exploited in 1800s
- 1974 VA Moratorium
- 1998 ASMFC Moratorium
- 2012 DPS Listed as Endangered
- Dredging Listed as Threat to Recovery in VA



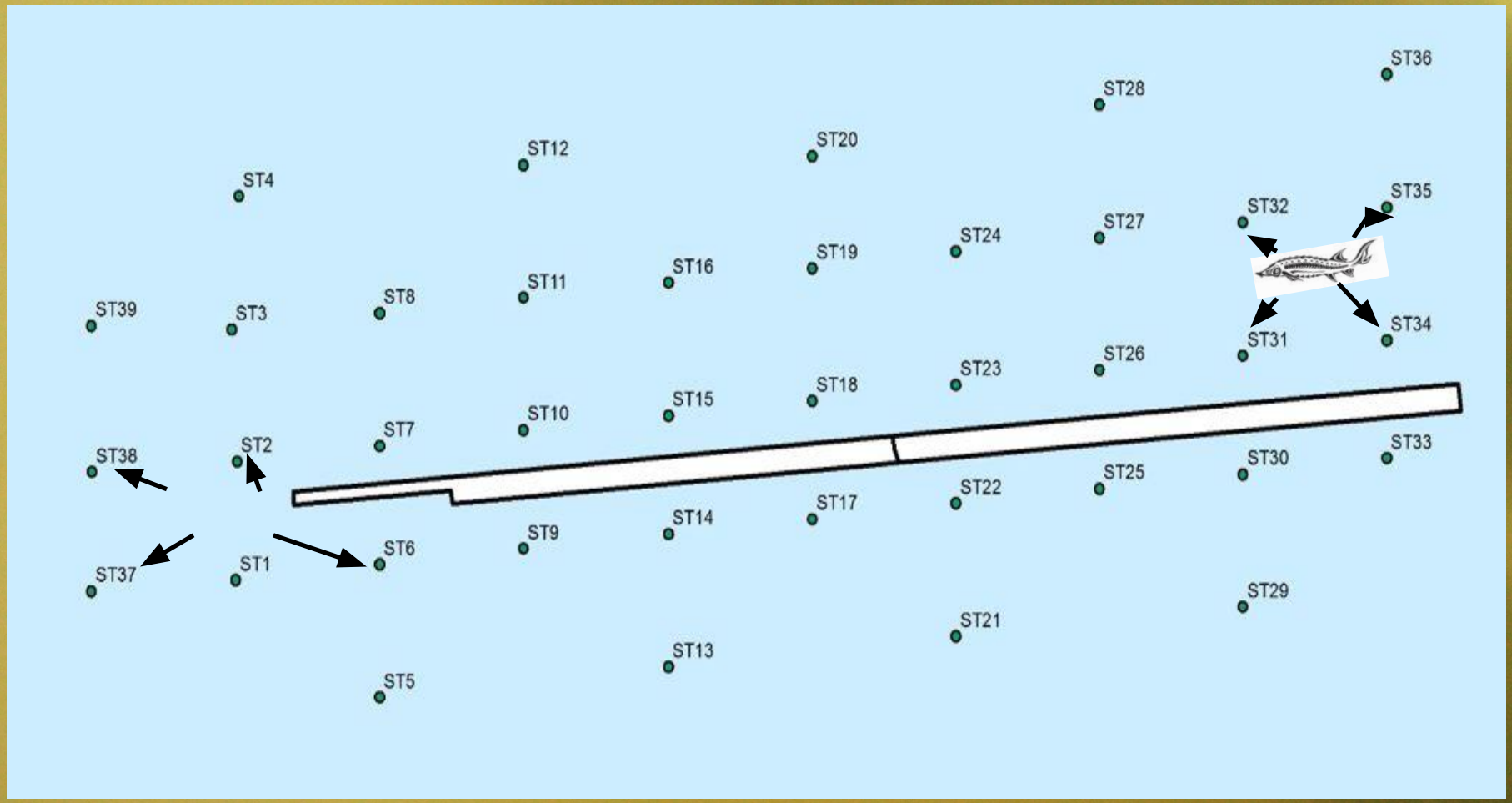
Concern

- Dredge Restrictions
- In the James River Feb 15 through July for Spring Anadromous Fish Run
- Spring Run, Not Fall Run




VPS Study 2017
Fall Spawning Run
Mechanicsville
Highland Springs
RICHMOND INTL AIRPORT
NEW KENT CO AIRPORT
West Point
Petersburg
Williamsburg
CAMP PEARY NAVAL RESERVATION
CAMP PEARY LANDING STRIP
NSC CHEATHAM ANNEX
NWS YORKTOWN
WILLIAMSBURG JAMESTOWN AIRPORT
U.S. NAVAL SUPPLY CENTER
Gloucester Point
FELKER AAF
NEWPORT NEWS WILLIAMSBURG INTL AIRPORT
Poquoson
LANGLEY AFB
LANGLEY AFB CLEAR ZONE PARCEL
Hampton
Smithfield
Newport News
NAVAL STATION NORFOLK
CRANEY ISLAND DISPOSAL AREA
NAVAL SHIPYARD PORTSMOUTH
NAVAL SHIPYARD NORFOLK
ST. JULIENS CREEK ANNEX
DIVER NAVAL RADIO TRANSMITTING FACILITY (CLOSED)
Waverly
Wakefield
Nottoway River
34 m
44 m
Kilometers
0 5 10 20
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Vemco Positioning System (VPS)



Dredge VPS (2017)

What we need:

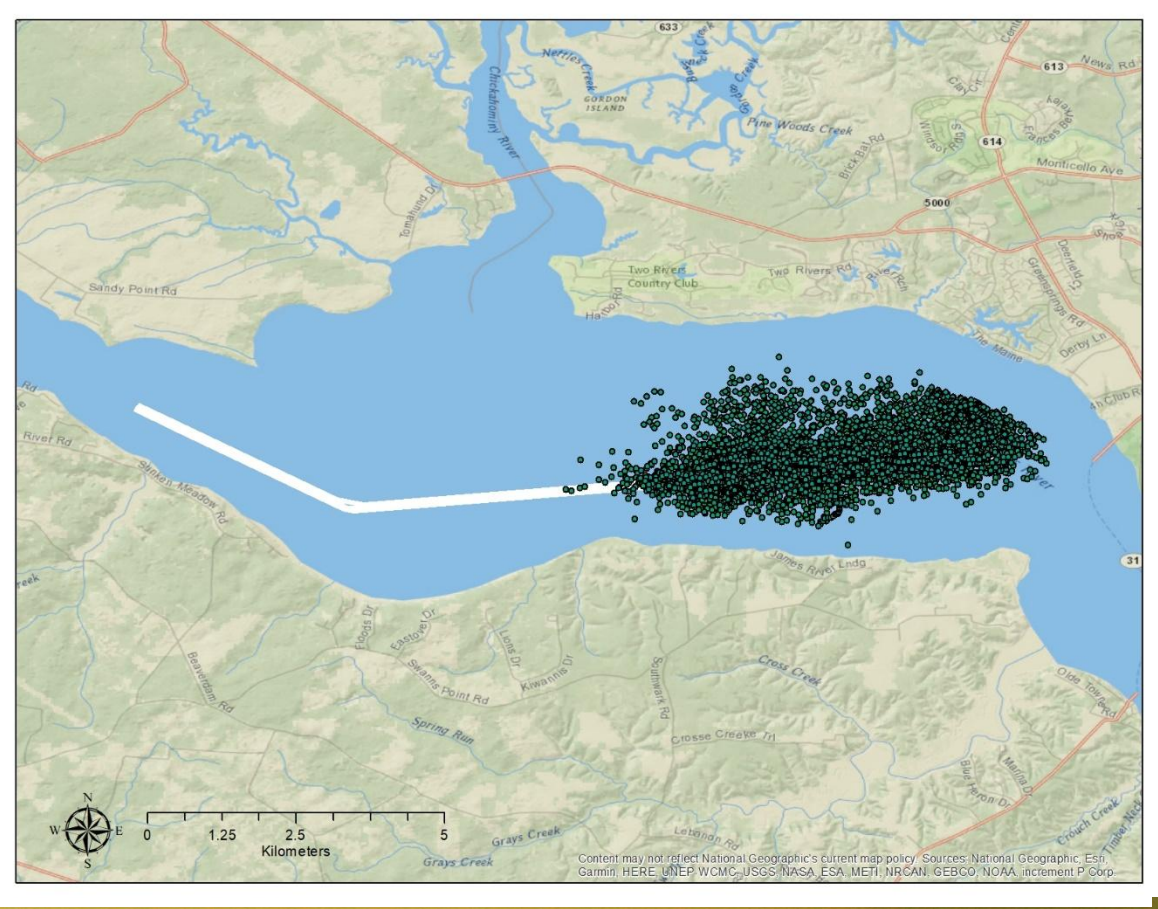
Telemetered Fish:
VCU tagging fish since 2011:
~130 fall adults (106 Detected in Study)

VPS Receiver Array:
37 receiver Vemco Positioning Array with two reference tags deployed August through November 2017.

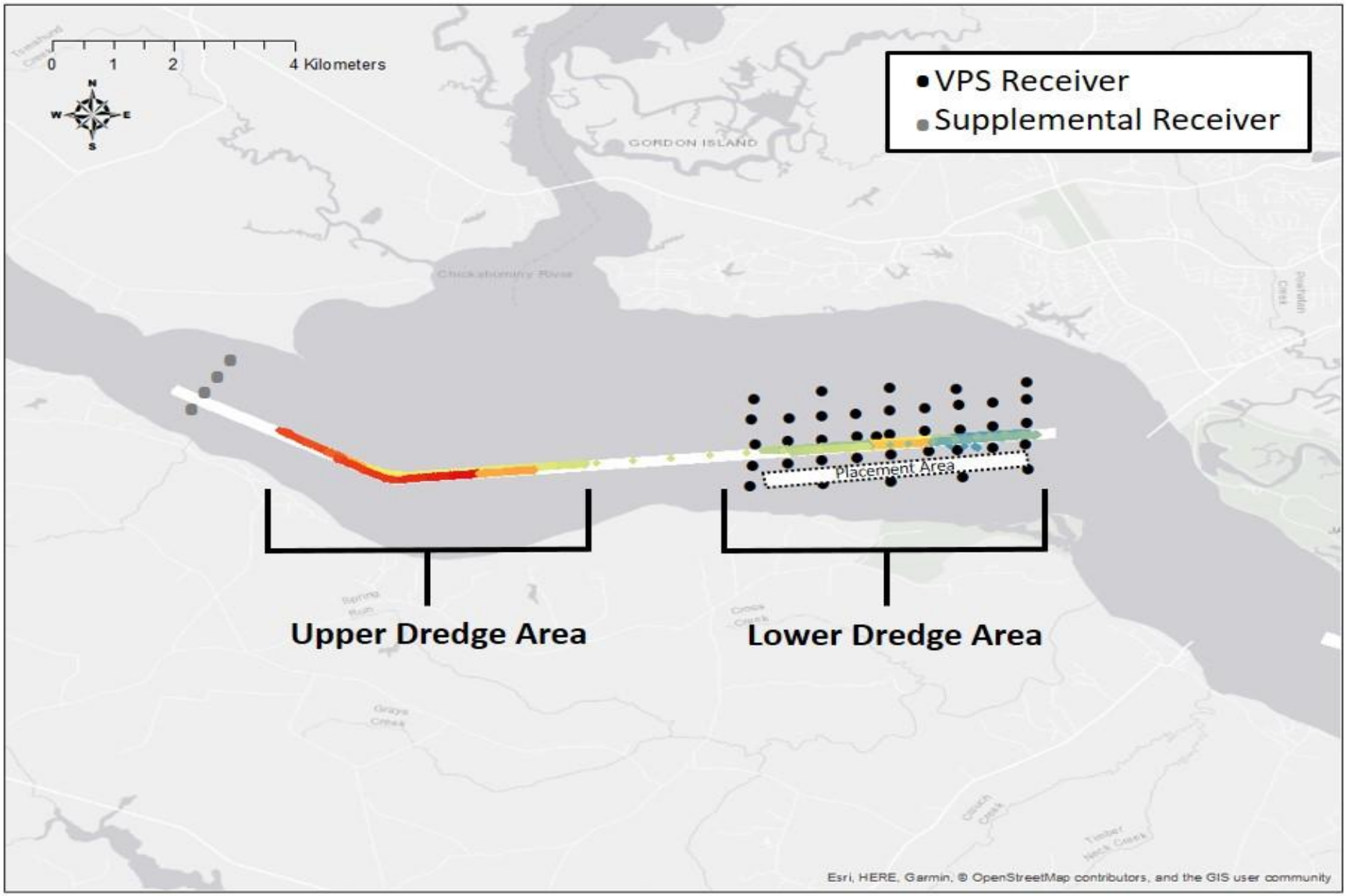
Dredge and Dredge Positions:
Dredge Lexington
The AISAP tool maintained by USACE was used for dredge position data.

Fish to cooperate. (Clockwork)

Funding:
NOAA/VDGIF Section 6 Grant #NA13NMF4720037
USACE DOER Grant Project #17-10



Dredge VPS (2017)



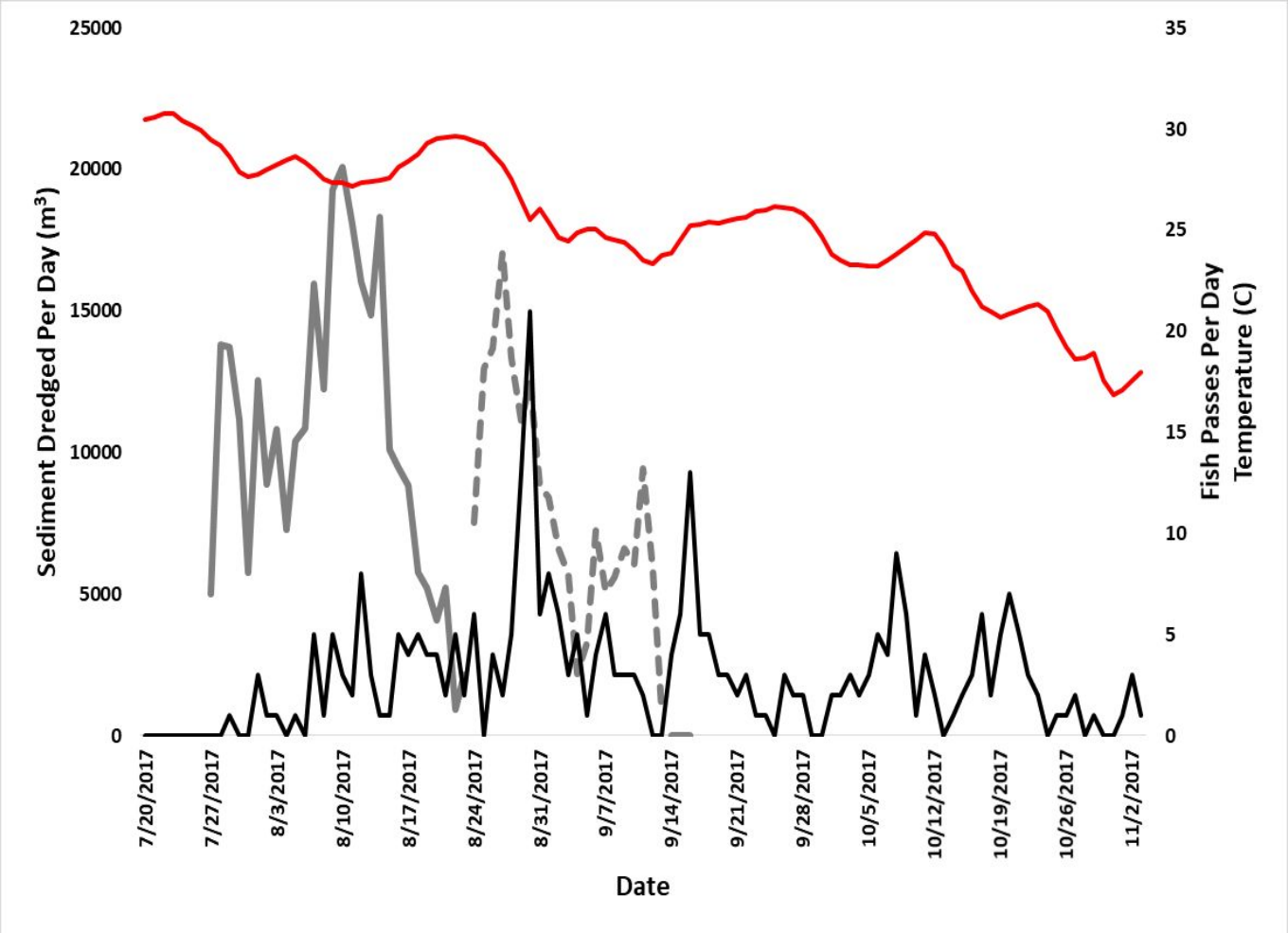
Dredge VPS (2017)

Overview:

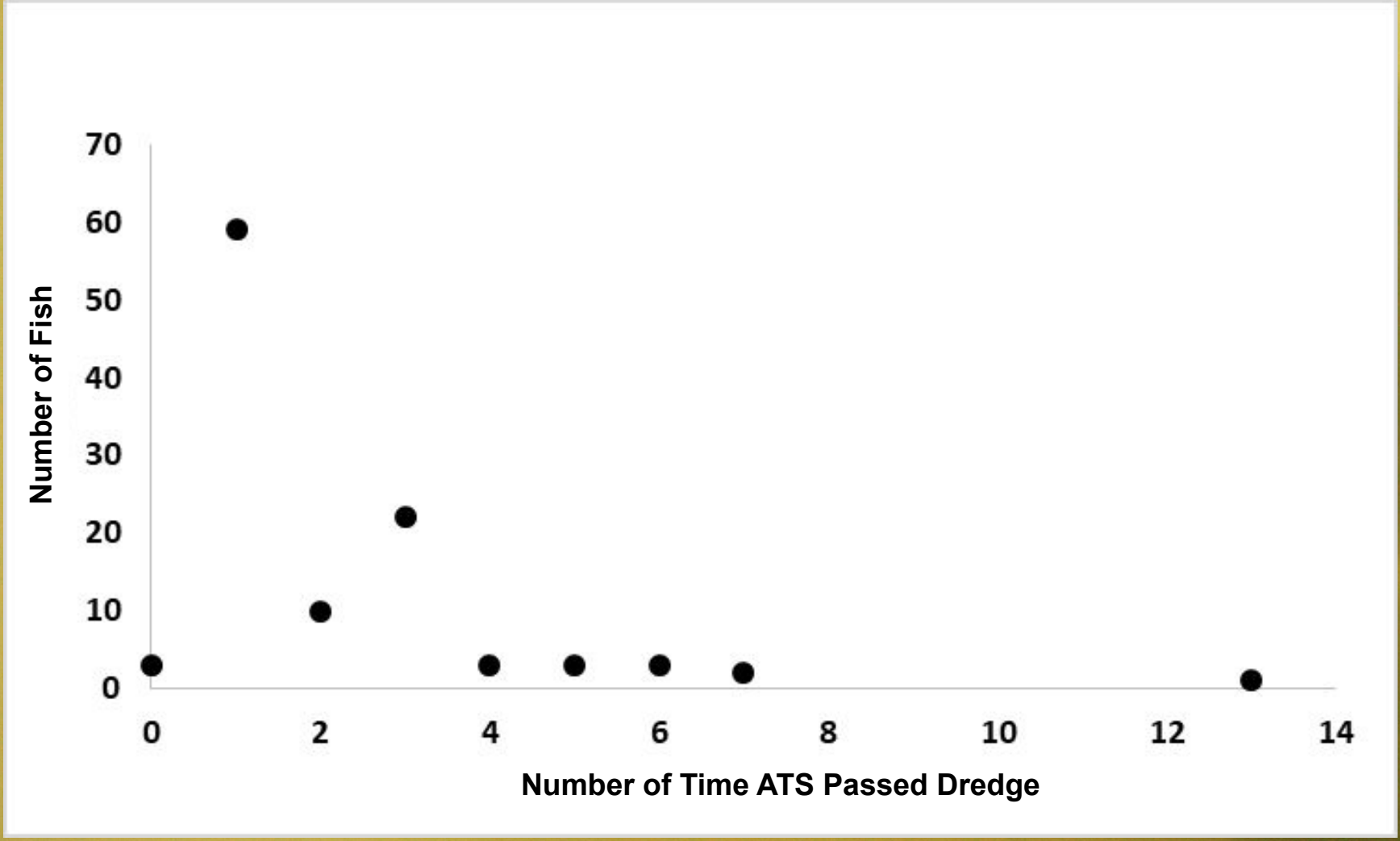
Red Line: water temperature (right y axis).

Grey Line: Material dredged per day, solid line lower area, dashed line upper area (left y axis).

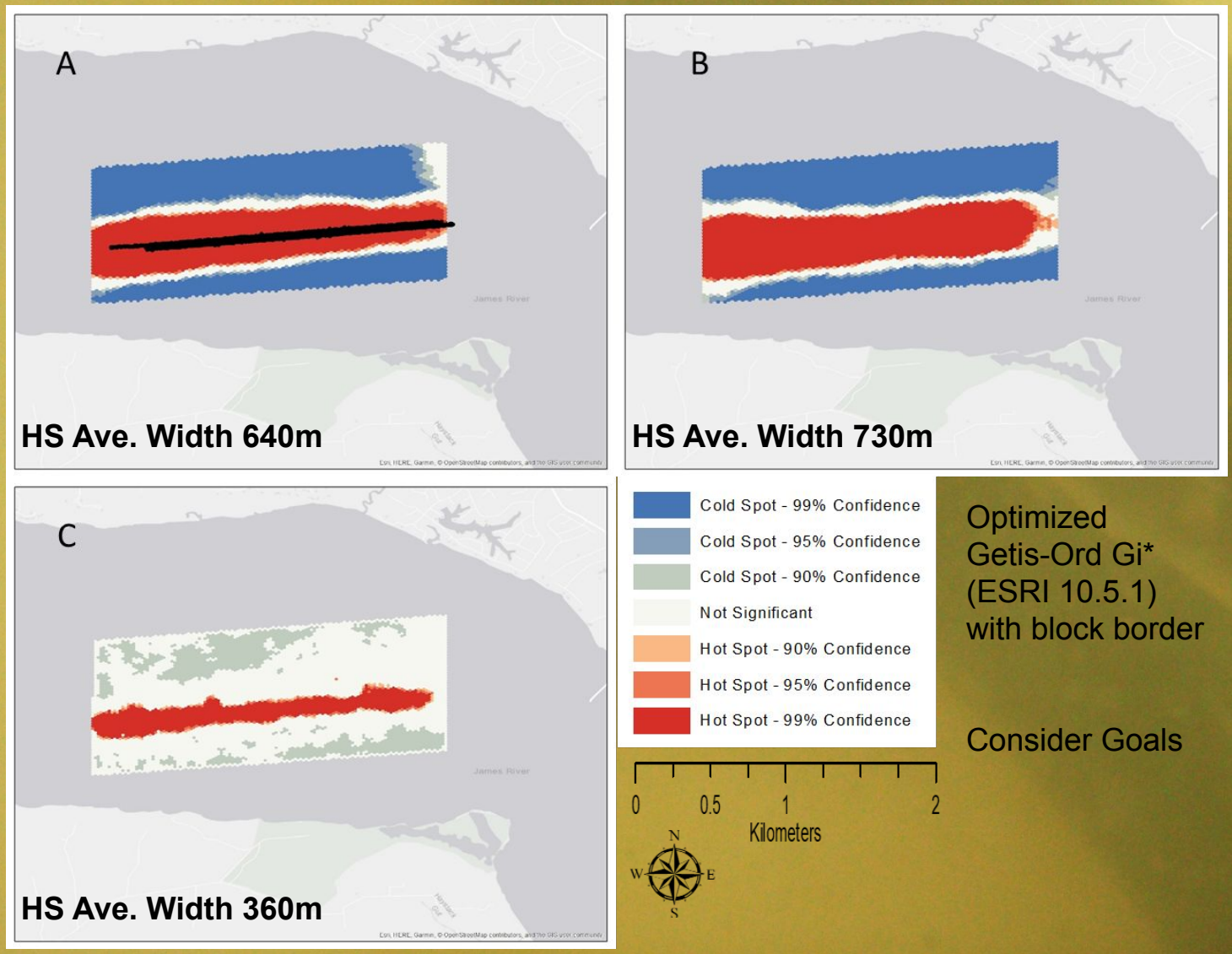
Black Line: number of times ATS moved passed the study area per day (right y axis).



Dredge VPS (2017)



Dredge VPS (2017)



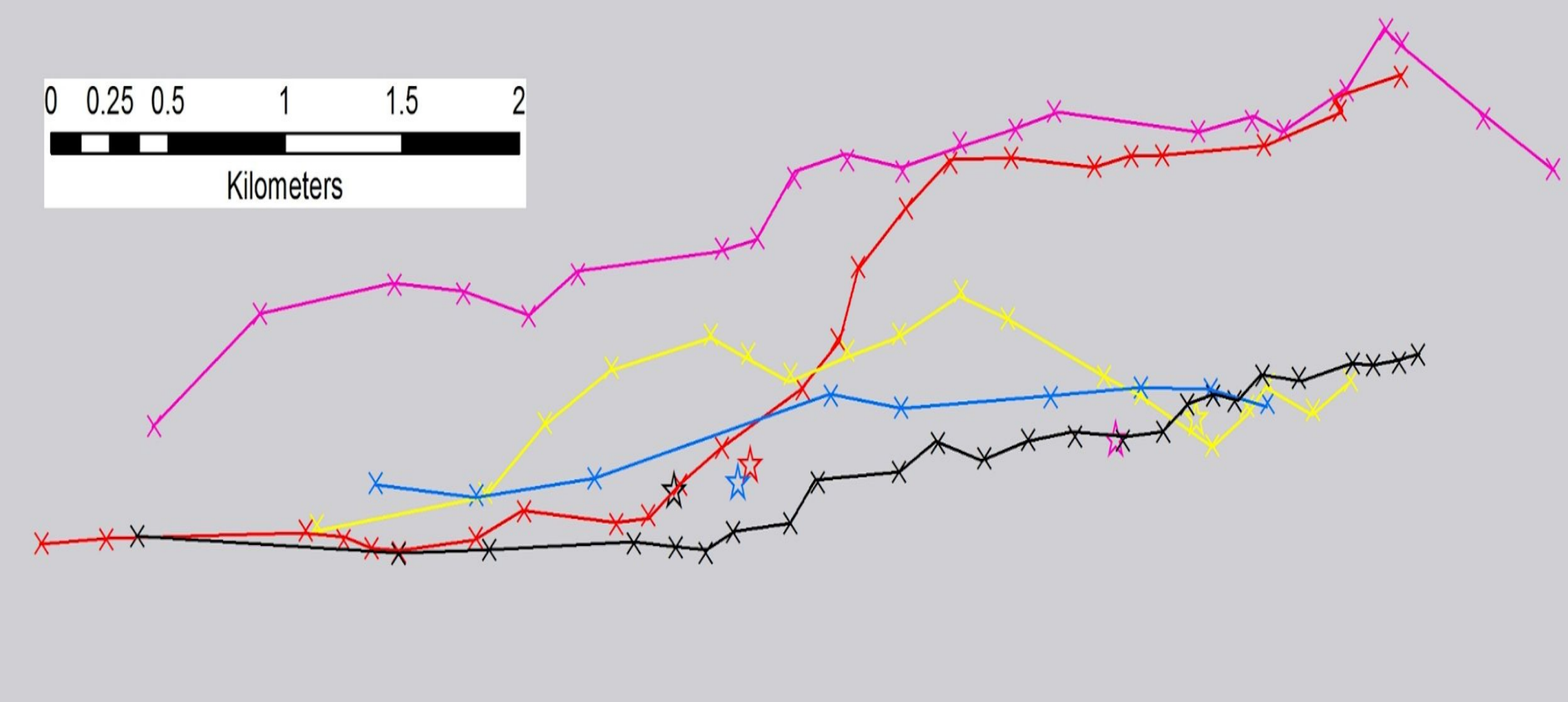
Optimized Getis-Ord Gi* (ESRI 10.5.1) with block border

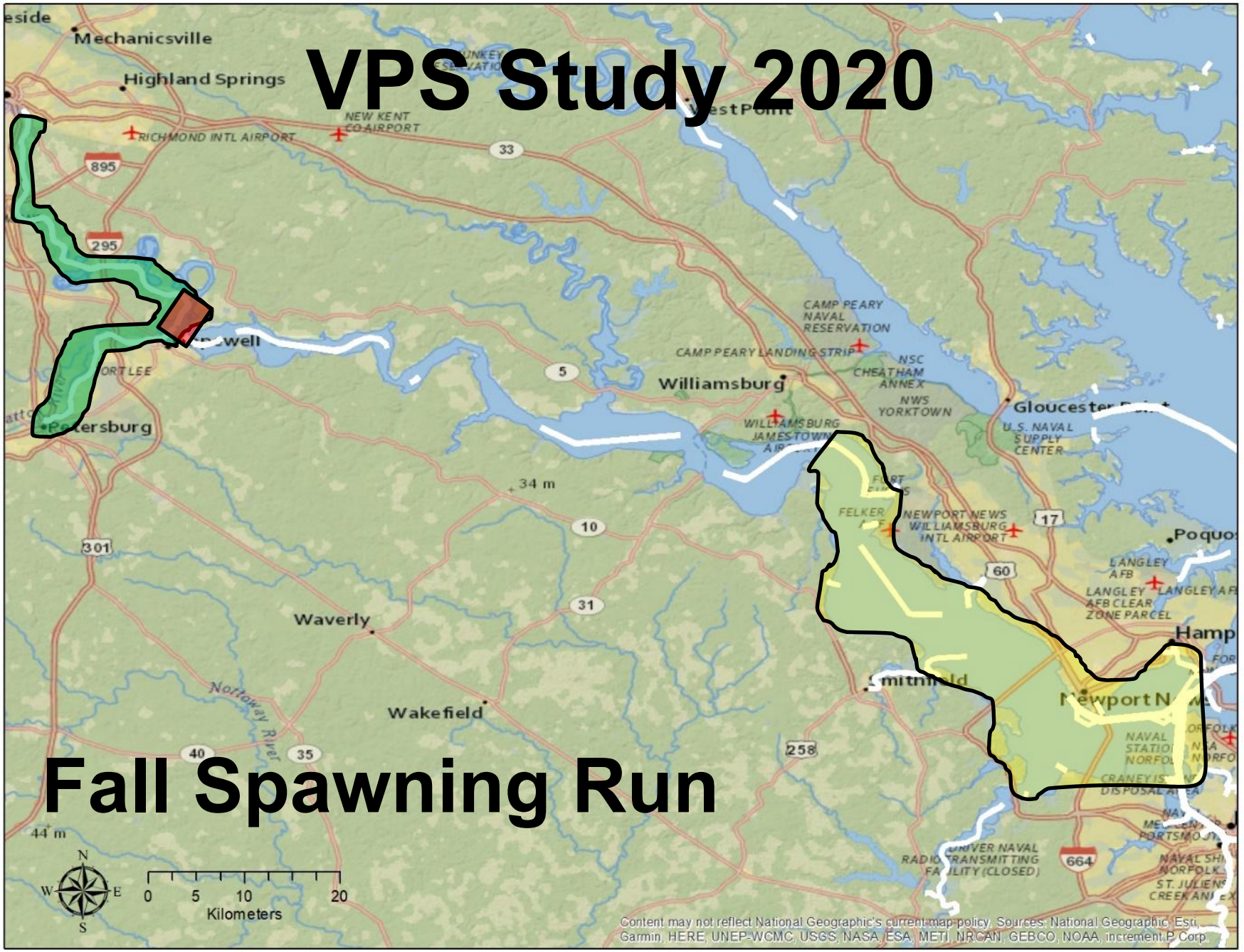
Consider Goals

Dredge VPS (2017)

Summary: In this situation, data show active dredging did NOT cause noticeable problems for adults migrating to spawning habitat.

Published in PLOS1: https://doi.org/10.1371/journal.pone.0230029



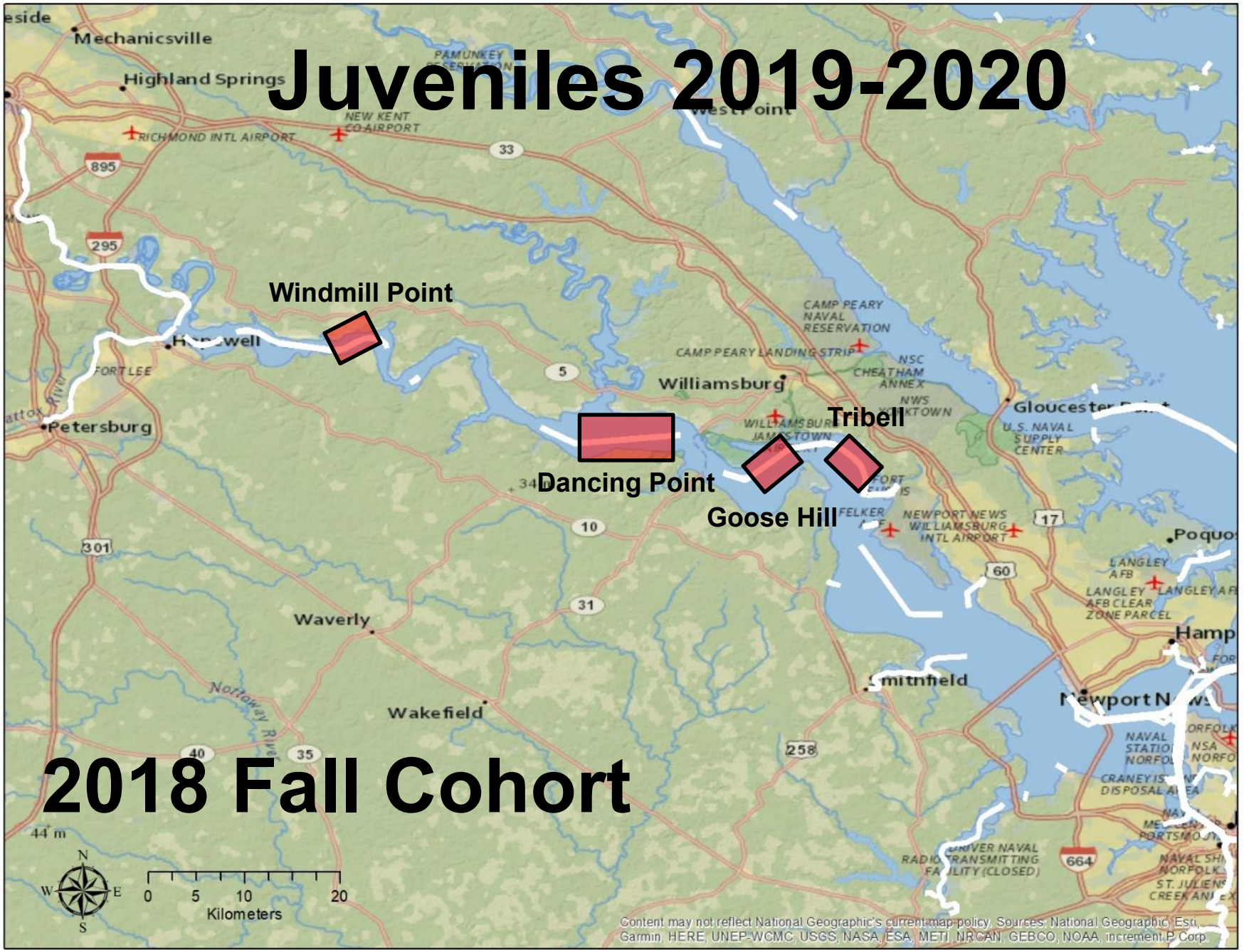

VPS Study 2020
Fall Spawning Run
Mechanicsville
Highland Springs
RICHMOND INTL AIRPORT
NEW KENT CO AIRPORT
West Point
Petersburg
Williamsburg
CAMP PEARY NAVAL RESERVATION
CAMP PEARY LANDING STRIP
NSC CHEATHAM ANNEX
NWS YORKTOWN
WILLIAMSBURG JAMESTOWN AIRPORT
U.S. NAVAL SUPPLY CENTER
Gloucester Point
FELKER AAF
NEWPORT NEWS WILLIAMSBURG INTL AIRPORT
LANGLEY AFB
LANGLEY AFB CLEAR ZONE PARCEL
Poquoson
Hampton
Newport News
Smithfield
Waverly
Wakefield
Nottoway River
NAVAL STATION NORFOLK
CRANEY ISLAND DISPOSAL AREA
NAVAL SHIPYARD PORTSMOUTH
NAVAL SHIP NORFOLK
ST. JULIENS CREEK ANNEX
RADIO TRANSMITTING FACILITY (CLOSED)
895
295
33
5
10
31
301
40
35
258
17
60
664
34 m
44 m
N
S
E
W
0 5 10 20
Kilometers
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

VPS Study 2020

- Aug 11- Sept 26
- 84 Fish
  - 83 Adults
  - 1 Juvenile
- ~20K Positions
- Dredge Marion Done August 22

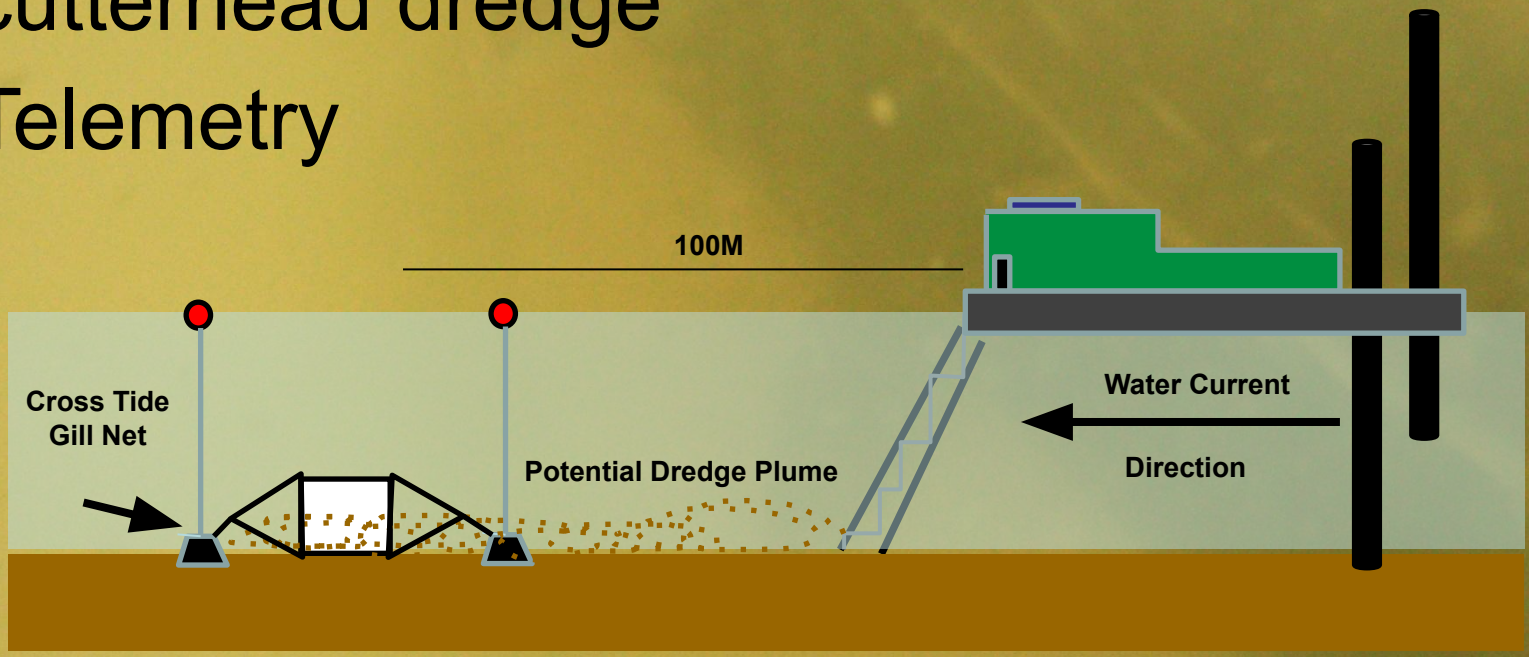
VPS Study 2020

Summary: Data analysis underway. Data are not as robust as the 2017 study; however while limited, data showed that adult fish swam past the active cutterhead dredge.


Juveniles 2019-2020
Windmill Point
Tribell
Dancing Point
Goose Hill
2018 Fall Cohort
Mechanicsville
Highland Springs
Petersburg
Williamsburg
Waverly
Wakefield
Smithfield
Newport News
Poquoson
Hampton
West Point
RICHMOND INTL AIRPORT
NEW KENT COAIRPORT
CAMP PEARY NAVAL RESERVATION
CAMP PEARY LANDING STRIP
NEWPORT NEWS WILLIAMSBURG INTL AIRPORT
LANGLEY AFB
U.S. NAVAL SUPPLY CENTER
FORT LEE
Nottoway River
0 5 10 20
Kilometers
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Juveniles 2019-2020

- Catch/tag juveniles around active cutterhead dredge
- Telemetry



NOT DRAWN TO SCALE

Juveniles (Windmill Point)

- November 4 – December 5 2019
- 105 (30-47cm FL)
  - Gill Net (n=34)
  - Trawl (n=71)
- Telemetry Tags (n=18)
  - Typical Array
    - Not VPS
    - Gates Up and Downstream

Juveniles (Dancing Point)

- October 11 – October 21 2020
- N=36 (50-64cm FL)
- Telemetry Tags (n=4)

Juveniles (Goose Hill)

- October 23 – November 29 2020
- N=159 (45-71cm FL)
- Telemetry Tags (n=5)

Juveniles (Tribell)

- December 7 2020
- N=12 (57-66cm FL)
- Cancelled!!

Juveniles

Summary: Ongoing but it seems cutterhead dredging does not cause juveniles to flee the area. Seem to be actively feeding within a few hundred meters of active dredging.

Juveniles (Future)

- Dancing Point
  - Dec 2020-Feb 2021
- Pre/during/post C-P-U-E
- Last Telemetry Tags
- Open for Group Discussion
- Want Feedback from all Groups

Conclusions

- 2017 VPS Study resulted in robust data showing that adult sturgeon pass the cutterhead dredge closely without incident
- 2020 VPS Study also supports conclusion that adults swim past cutterhead dredge without incident, even in a narrow channel
- Juvenile Studies show that juvenile sturgeon also swim and even feed near dredge without incident
- These studies support the conclusion that cutterhead dredge operations do not seem to adversely affect sturgeon behavior.

Acknowledgements

- Funding
  - Multiple NOAA/VDGIF Section 6 Grants
  - USACE DOER 17-10
  - USACE Norfolk District
- James River Atlantic Sturgeon Restoration Partnership
- **THANKS AND QUESTIONS**