



SWIFT capacity context

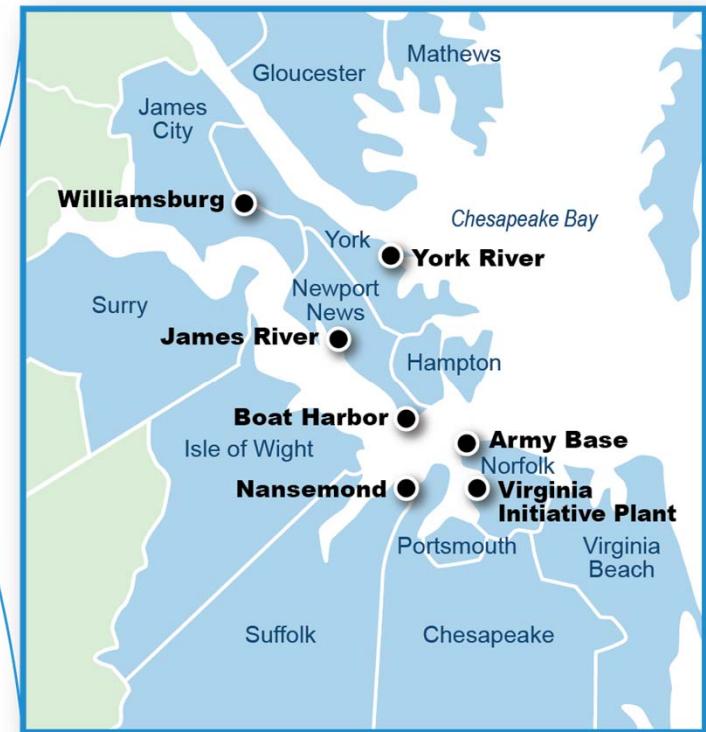
June 23, 2022



Hampton Roads Sanitation District



HRSD provides service to 20 cities and counties of southeastern Virginia, an area of over 4,998 square miles.



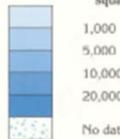
**1.9 million people served
150 million gallons per day**

North Atlantic Coastal Plain Aquifer System: Potomac Aquifer

Figure 54. The top of the Potomac aquifer is above sea level along its western and northwestern limit from northernmost North Carolina to New Jersey but slopes to more than 2,500 feet below sea level along the coast of New Jersey and to more than 4,500 feet below sea level near Cape Hatteras in easternmost North Carolina. The transmissivity of the aquifer is highest near Chesapeake Bay and in central New Jersey.

EXPLANATION

Estimated transmissivity of Potomac aquifer based on aquifer tests, geology, and simulation, in feet squared per day



1,000

5,000

10,000

20,000

No data

Potomac aquifer absent

— - - - Approximate up-dip limit of water containing 10,000 milligrams per liter dissolved chloride

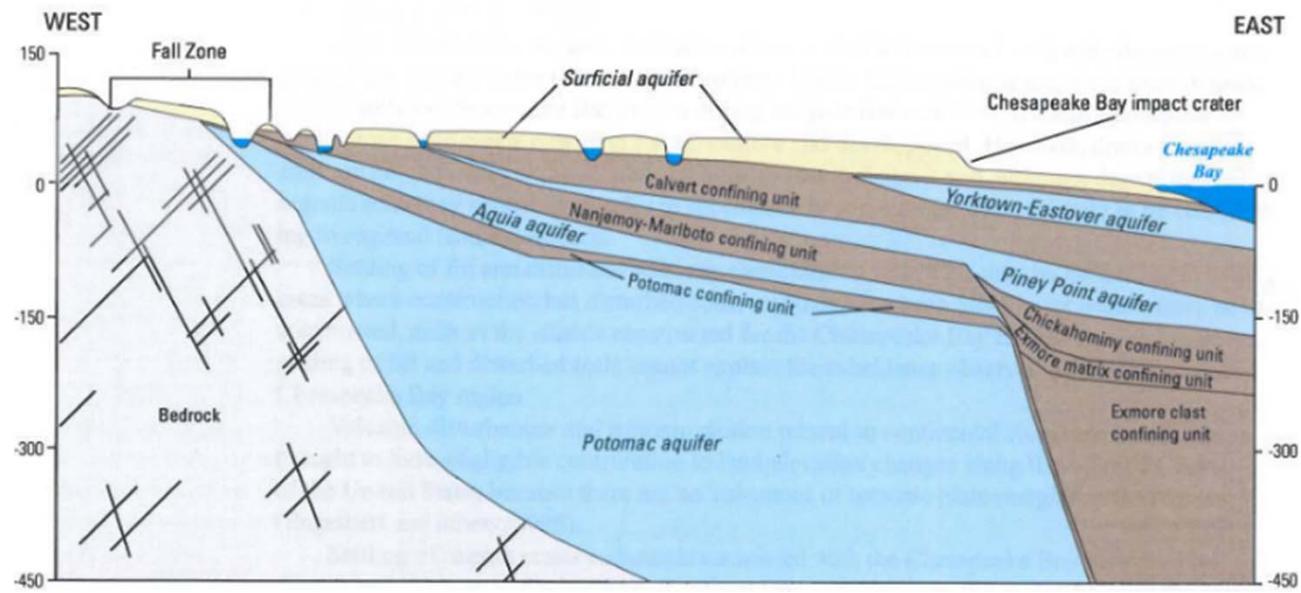
— - - - Top-of-aquifer contour—Shows altitude of top of Potomac aquifer. Dashed where approximately located. Contour interval 500 feet. Datum is sea level

Base modified from U.S. Geological Survey digital data, 1:2,000,000, 1972
Modified from Meissner, 1969; Trapp, 1992; Trapp and Meissner, 1992; and Leahy and Martin, 1993

SCALE 1:5,000,000
0 50 MILES
0 50 KILOMETERS

75° 41° 39° 37° 35° 33° 31° 29° 27° 25° 23° 21° 19° 17° 15° 13° 11° 9° 7° 5° 3° 1°

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Source: USGS Groundwater Atlas of the US

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Orange County Coastal Plain Aquifer System

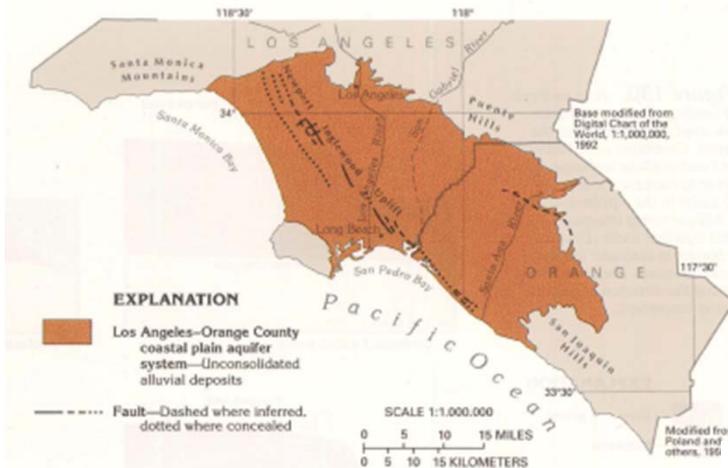
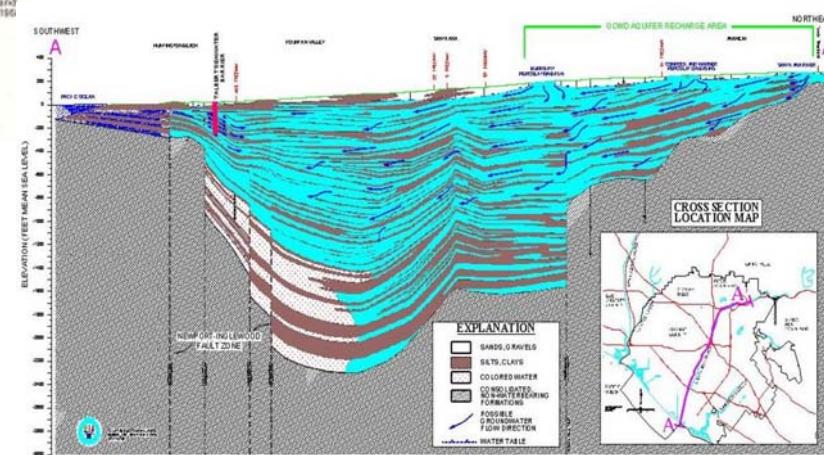


Figure 125. The Los Angeles-Orange County coastal plain basin is bounded on the west by the Pacific Ocean and on all other sides by mountains. The Newport-Inglewood Uplift, which is a prominent structural feature, extends nearly the length of the basin.

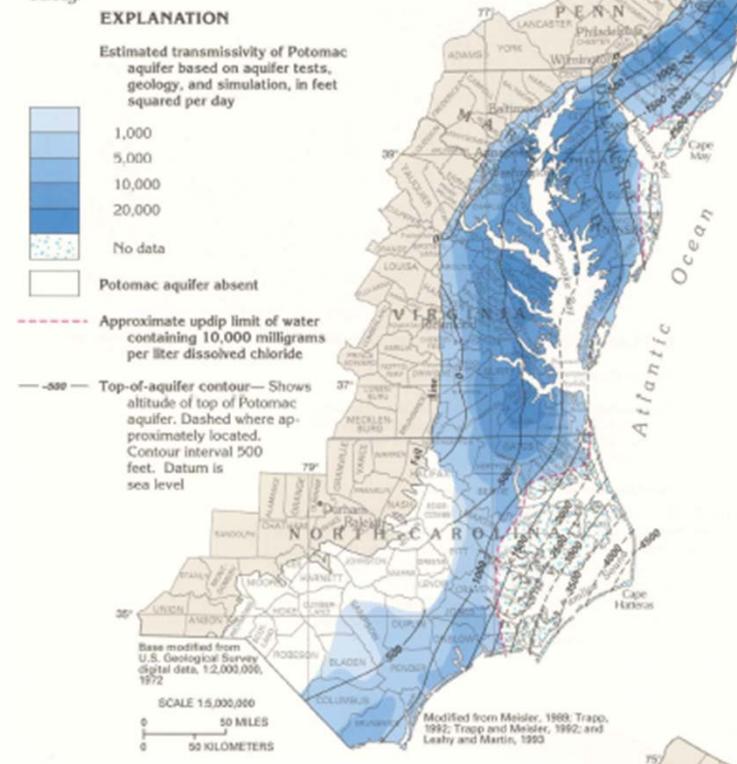
Source: USGS Groundwater Atlas of the US



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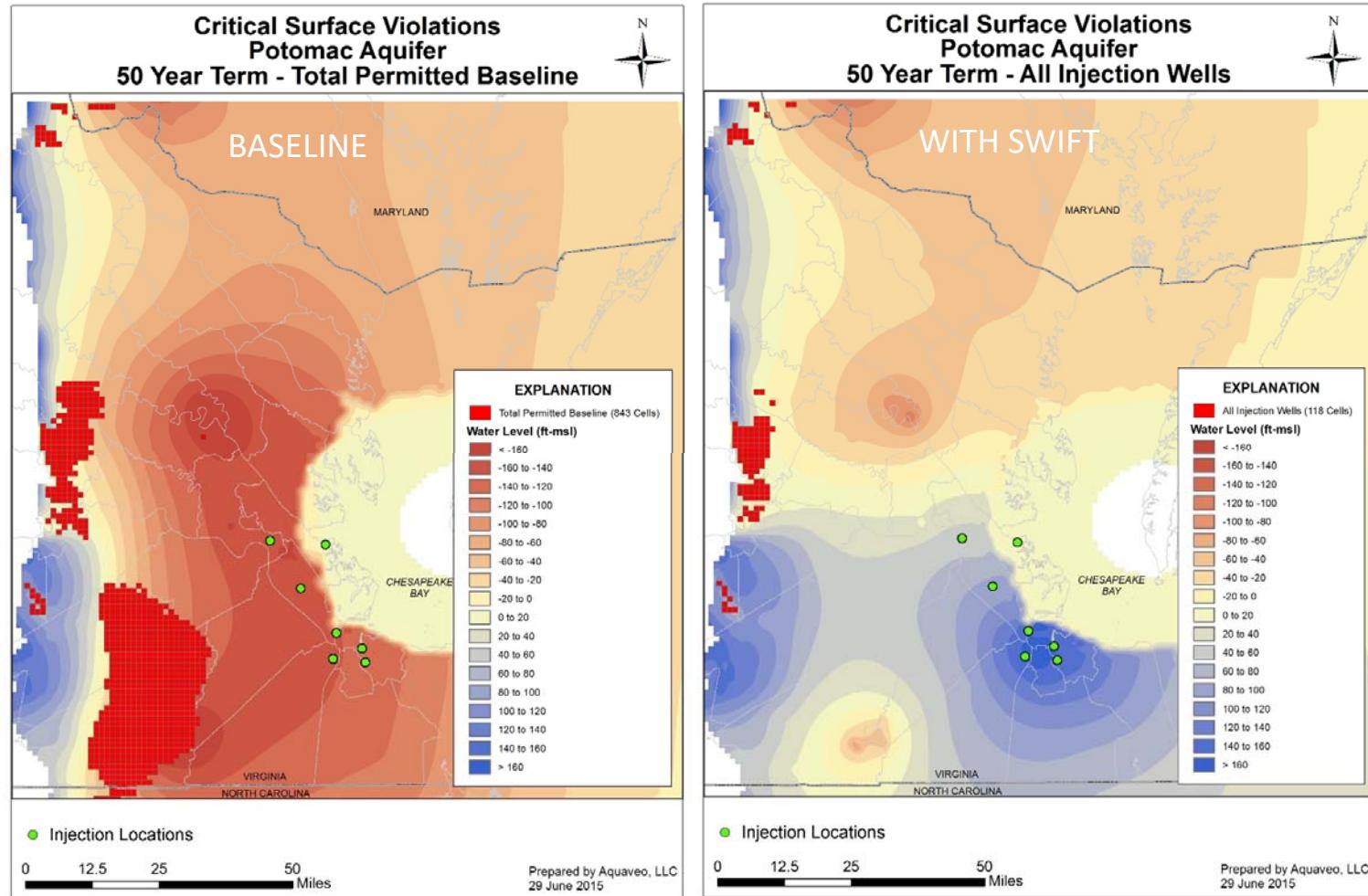
Relative Size Comparison

Figure 54. The top of the Potomac aquifer is above sea level along its western and northwestern limit from northernmost North Carolina to New Jersey but slopes to more than 2,500 feet below sea level along the coast of New Jersey and to more than 4,500 feet below sea level near Cape Hatteras in easternmost North Carolina. The transmissivity of the aquifer is highest near Chesapeake Bay and in central New Jersey.

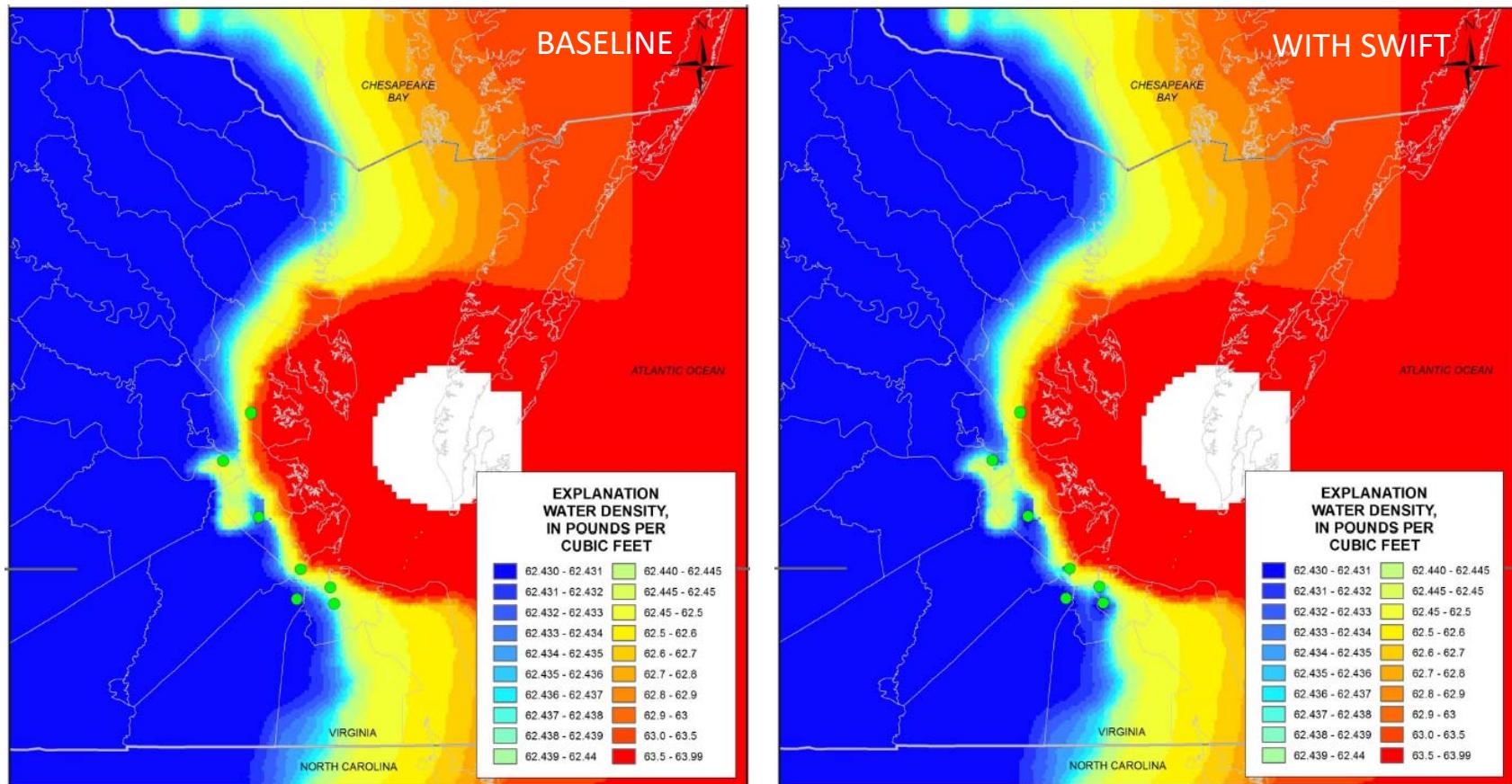


Source: USGS Groundwater Atlas of the US

Modeled impact of SWIFT on the aquifer system

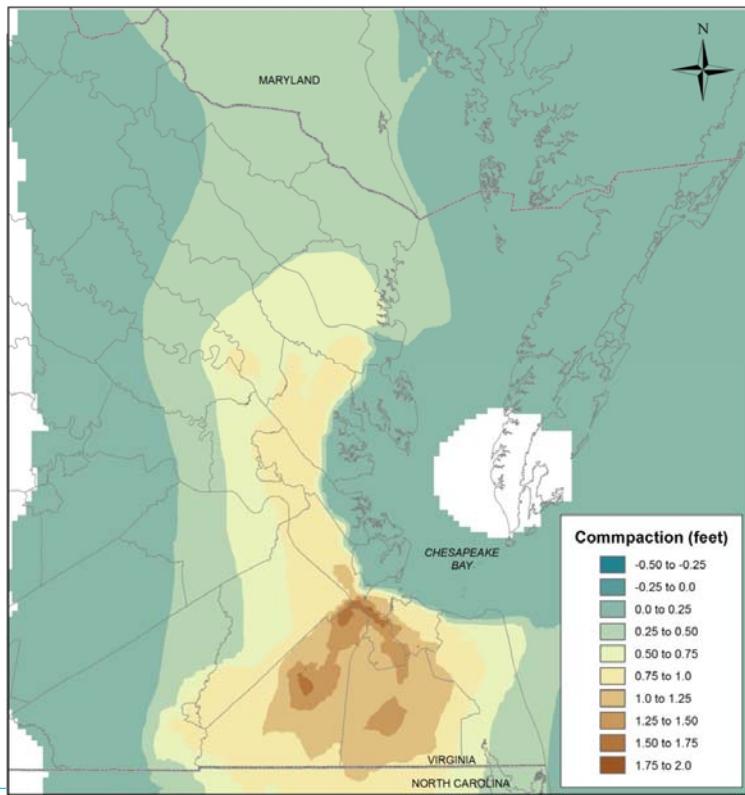


SWIFT Water Movement – how far how fast???

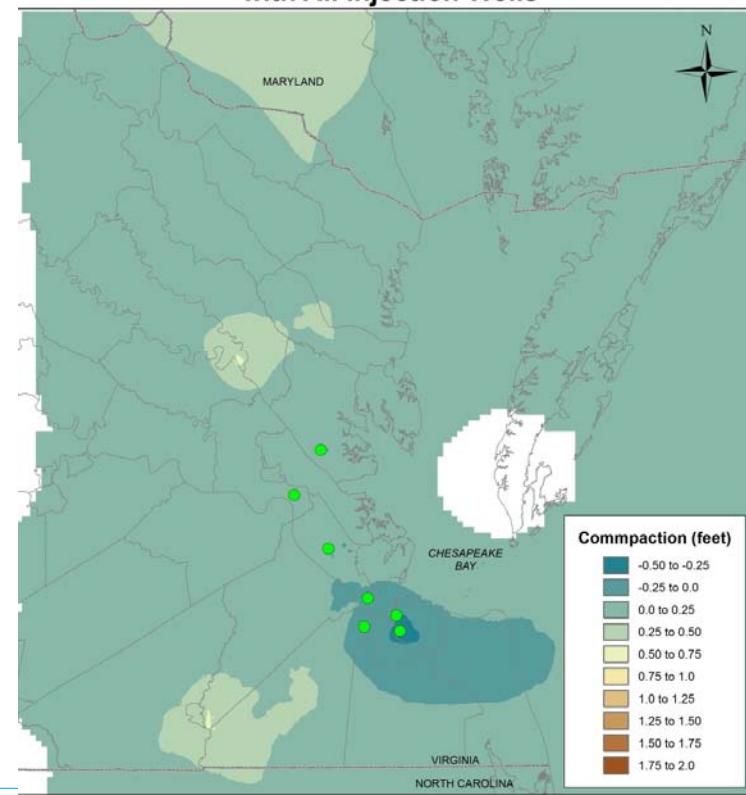


SWIFT Aquifer Compaction, modeled impact

Simulated Total Aquifer System Compaction
from 1890 to 2064 - Total Permitted

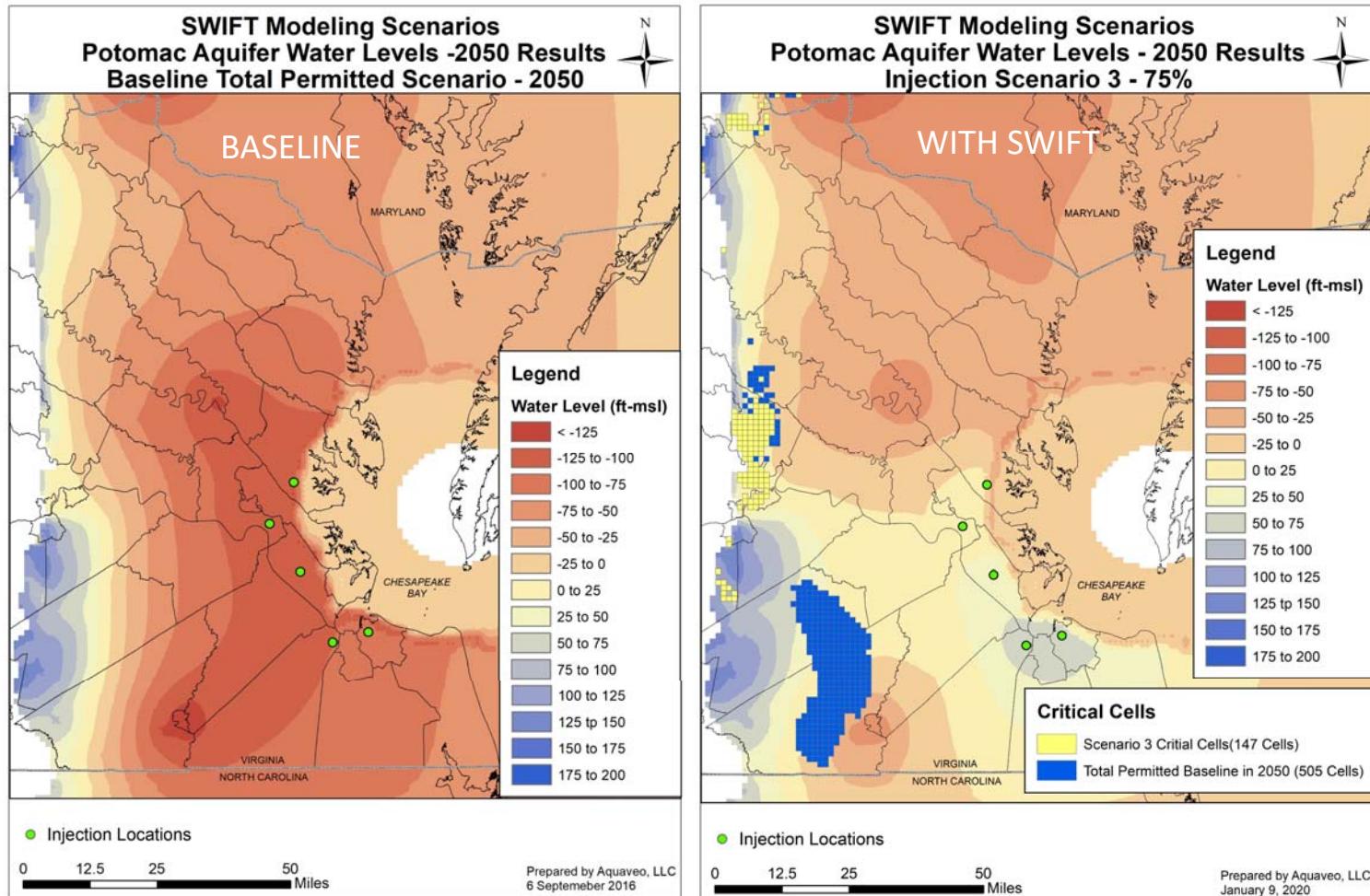


Simulated Total Aquifer System Compaction
from 1890 to 2064 - Total Permitted
with All Injection Wells



Latest modeling (2019)

- Most recent model calibration
- Phased start-up
- 75% target up-time
- Include 2016 permit reductions

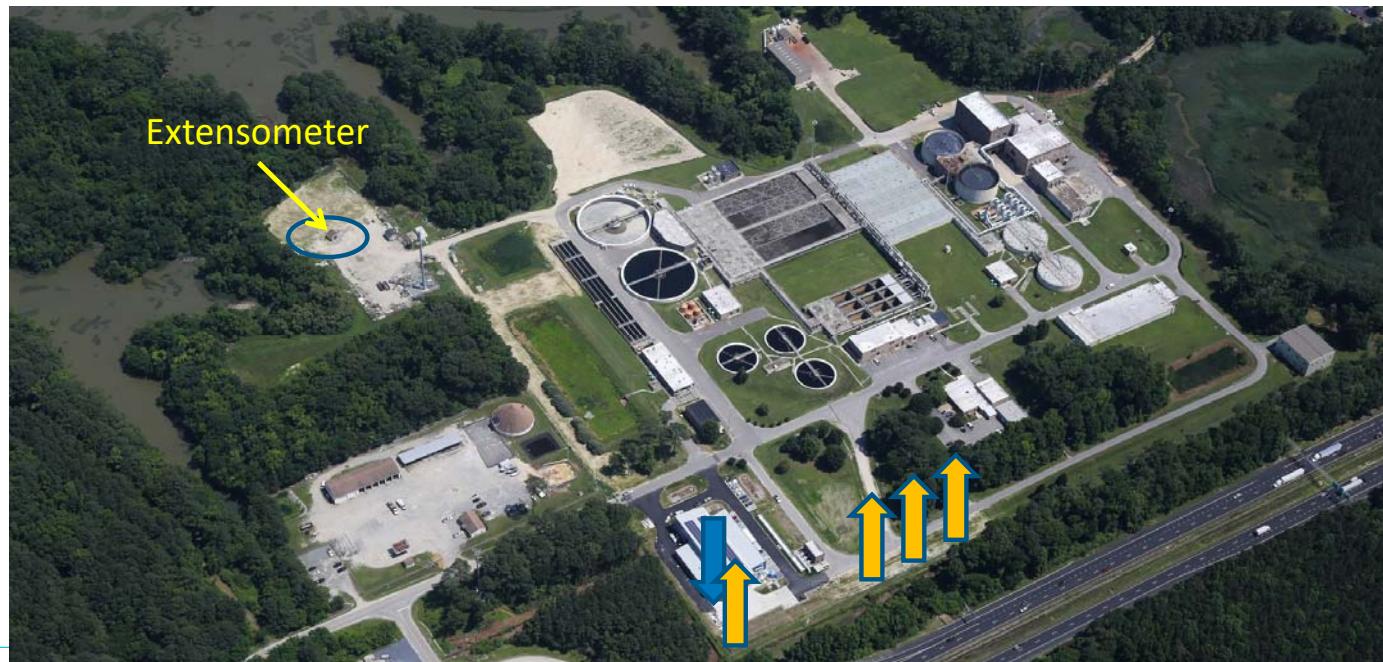




SWIFT Research Center at Nansemond

1.0 MGD Demonstration Facility

AWT +
recharge well(s) +
monitoring wells +
public outreach and education
center +
research facilities



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Nansemond SRC Wells





SWIFT RC Monitoring wells

Extensometer

1000'

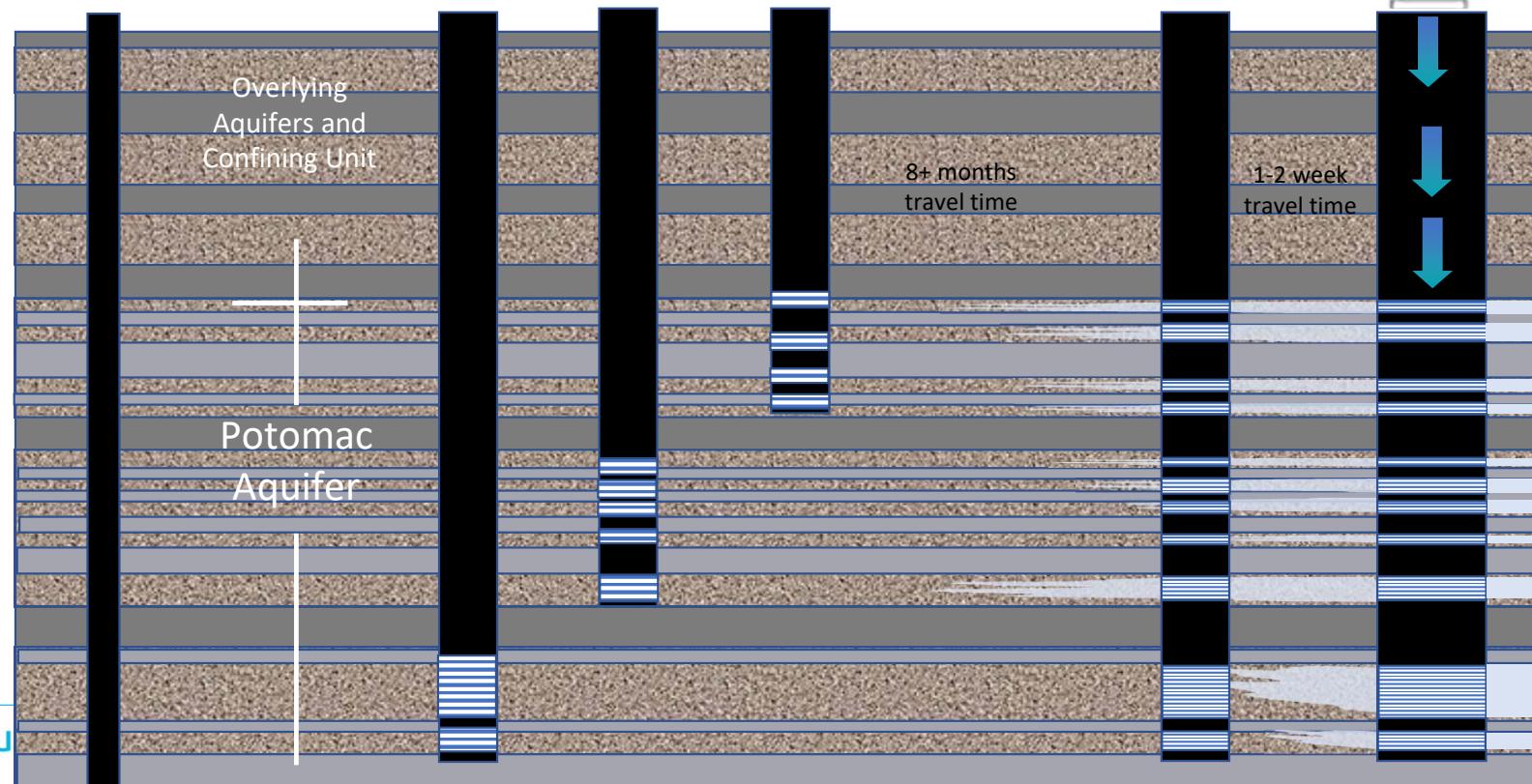
MW-LPA
500'

MW-MPA
450'

MW-UPA
400'

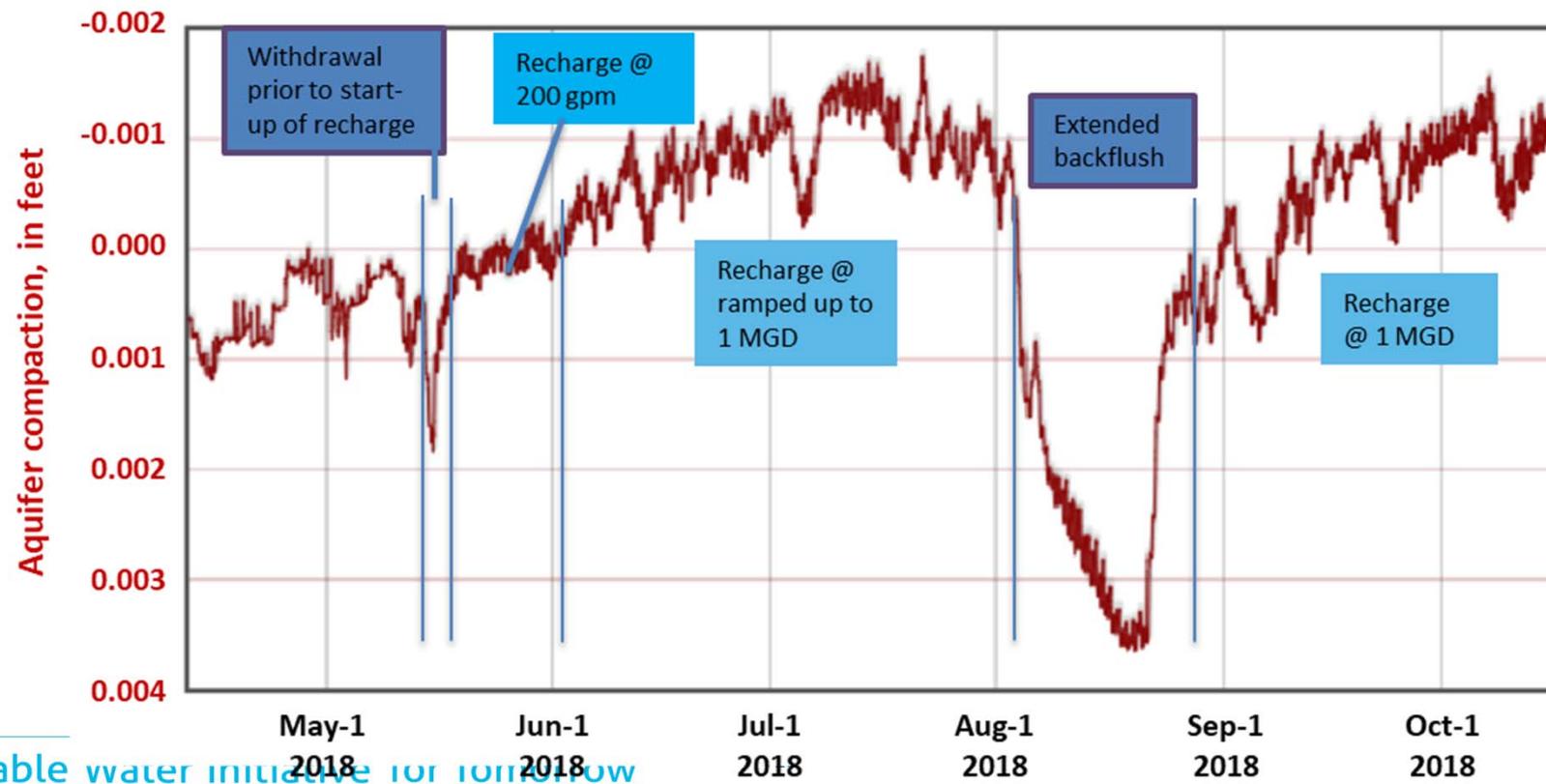
MW-SAT
50'

MAR Well TW-1 (and soon NP_MAR_01)



Aquifer compaction at the SRC/Nansemond Extensometer

First three months of operation



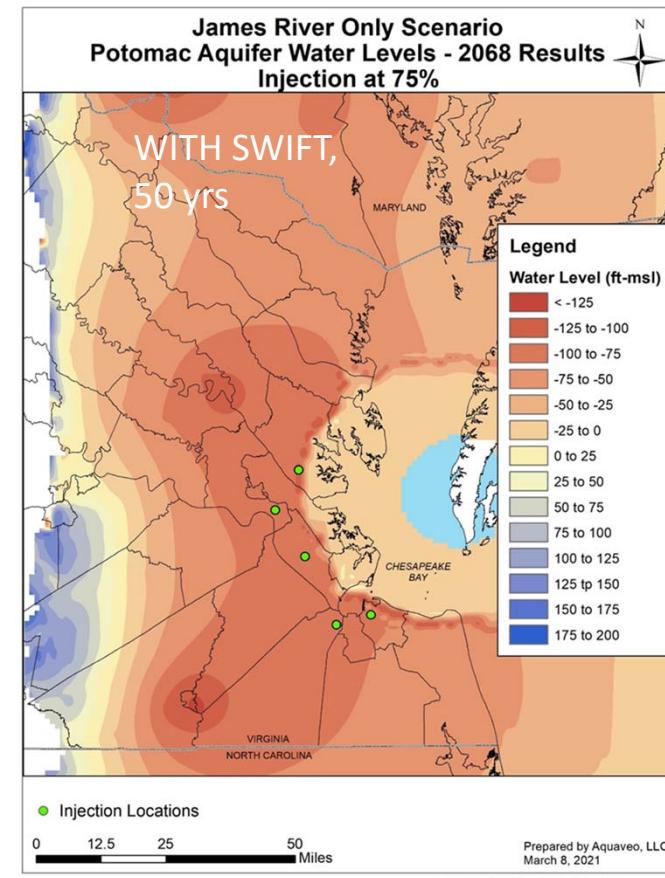
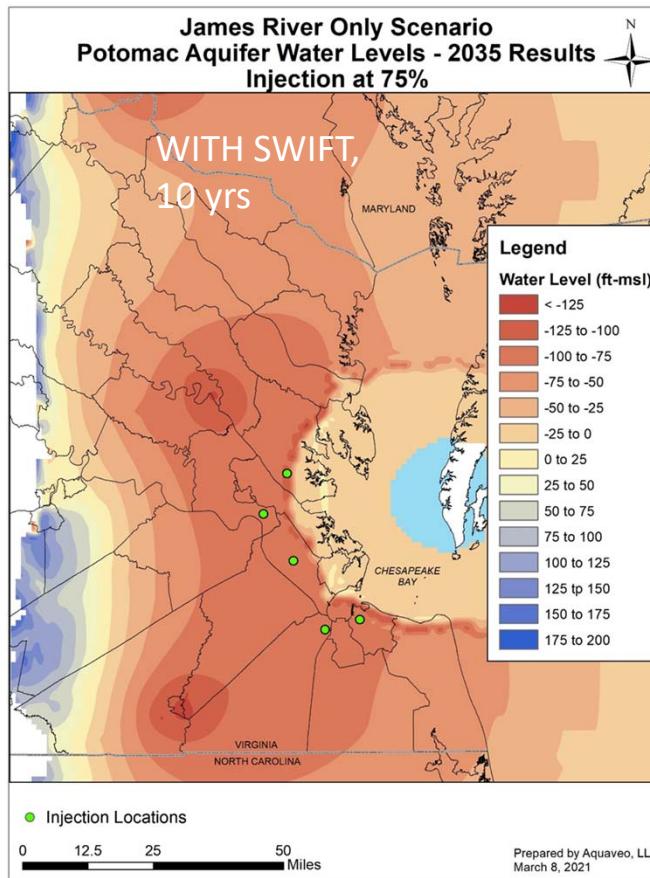
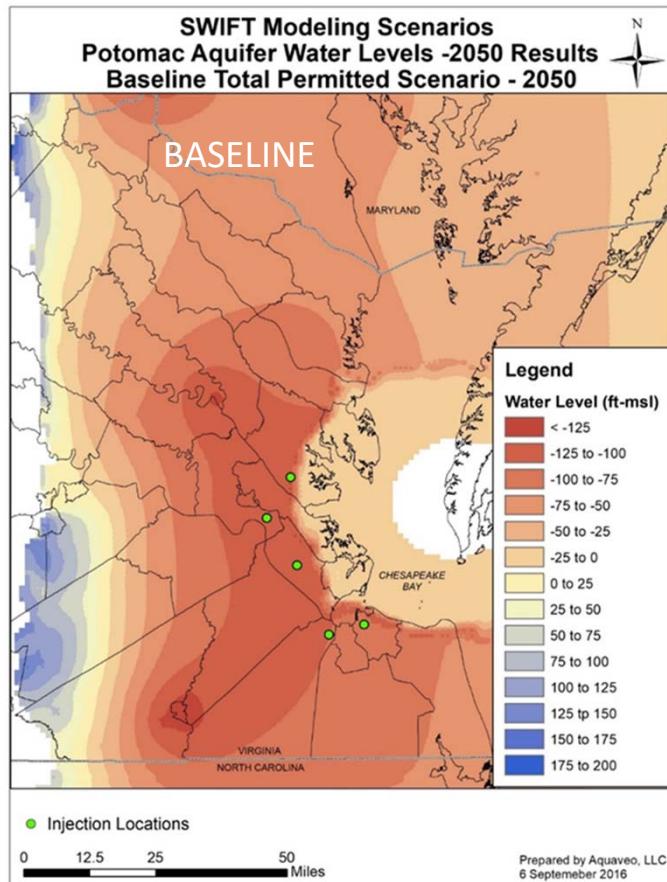
James River SWIFT

- 16 Million Gallons per Day target flow rate
- First full-scale SWIFT Facility
- 75% target up-time (12 MGD average)
- Well installation ongoing
- DB for AWT, breaking ground July
- Start-up in early 2026





James River SWIFT, modeled impact



Sustainable Water Initiative for Tomorrow



SWIFT Facility Capacities

- James River SWIFT: 16 MGD
- Nansemond/Boat Harbor SWIFT: 30 MGD
- VIP/Army Base SWIFT: 34 MGD
- York River SWIFT: 11 MGD
- Williamsburg SWIFT: 8-13 MGD
- **Total ~ 100 MGD**

