Water Modeling Solutions

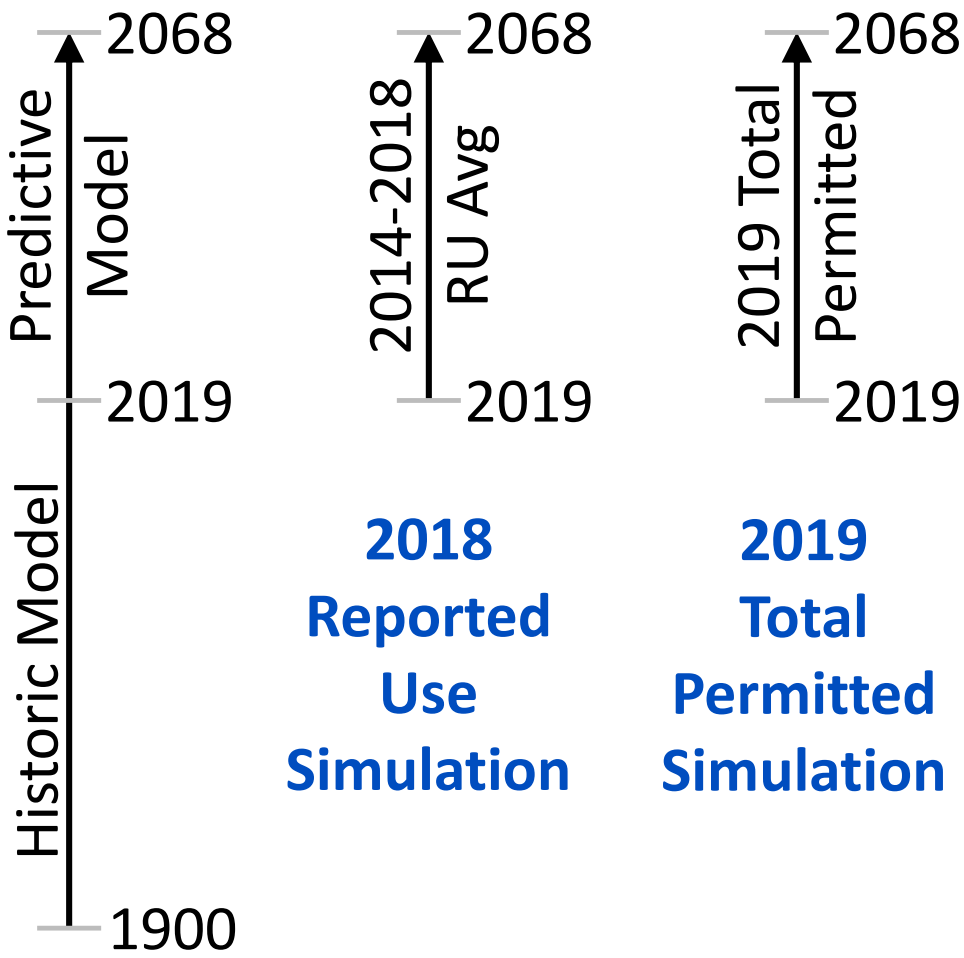
DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

# VAHYDROGW-ES: 2018-2019 ANNUAL SIMULATION OF REPORTED AND TOTAL PERMITTED USE

# STARTING AT 12:50PM

# VESM Groundwater Simulations

- VESM Adaptation
  - 2010 Total Permitted created (steady-state)
  - 2012 Total Permitted created(steady-state)
  - 2015-2016 Total Permitted and Reported Use created (50 years with transport)
  - 2017 update and recalibration
  - 2016-2017 Total Permitted and Reported Use
  - 2017-2018 Total Permitted and Reported Use
  - 2018-2019 Total Permitted and Reported Use



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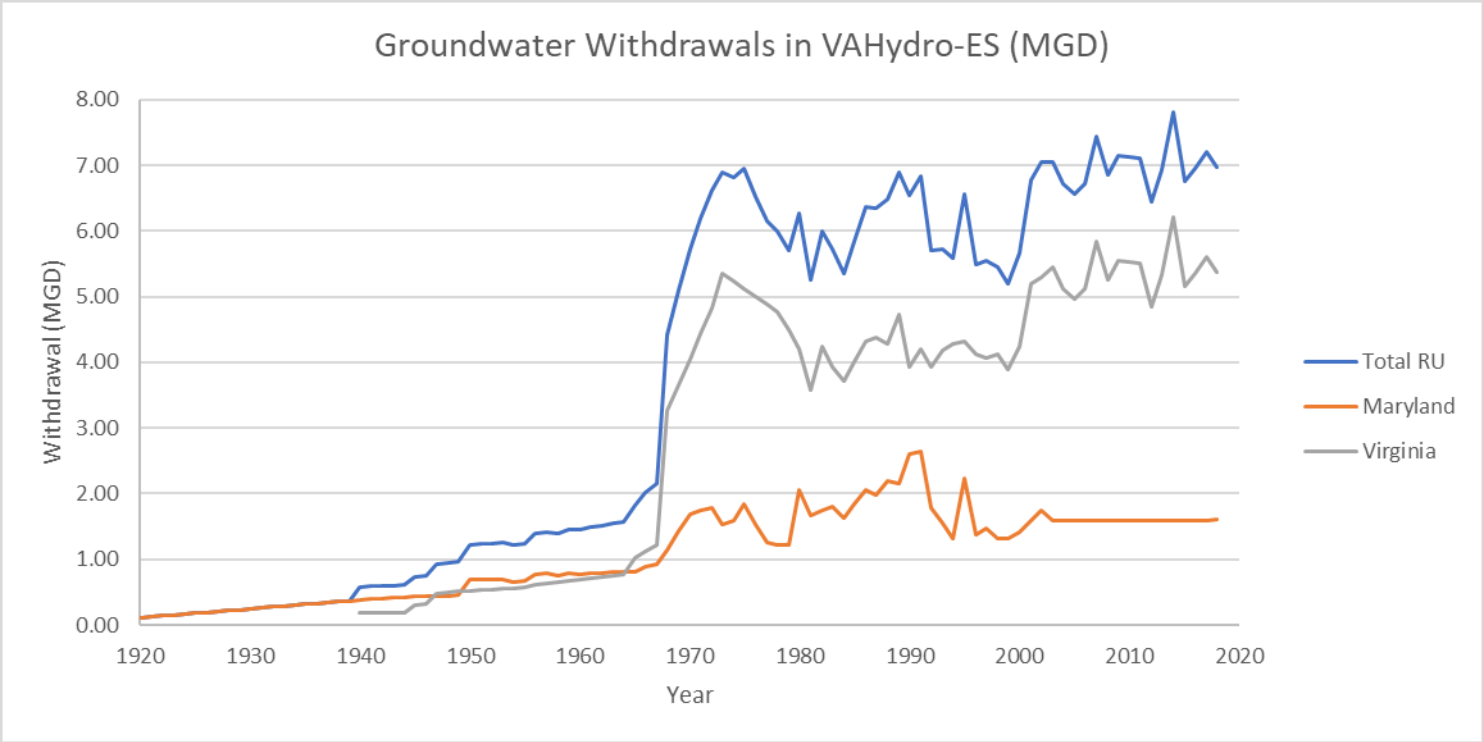
# VAHydroGW-ES – Reported Use




| County | 2016 Reported Use (MGD) | 2017 Reported Use (MGD) | 2018 Reported Use (MGD) |
|---|---|---|---|
| Accomack | 4.44 | 4.76 | 4.56 |
| Northampton | 0.92 | 0.96 | 0.81 |
| Maryland | 1.6 | 1.6 | 1.6 |
| **TOTAL:** | **6.96** | **7.32** | **6.97** |

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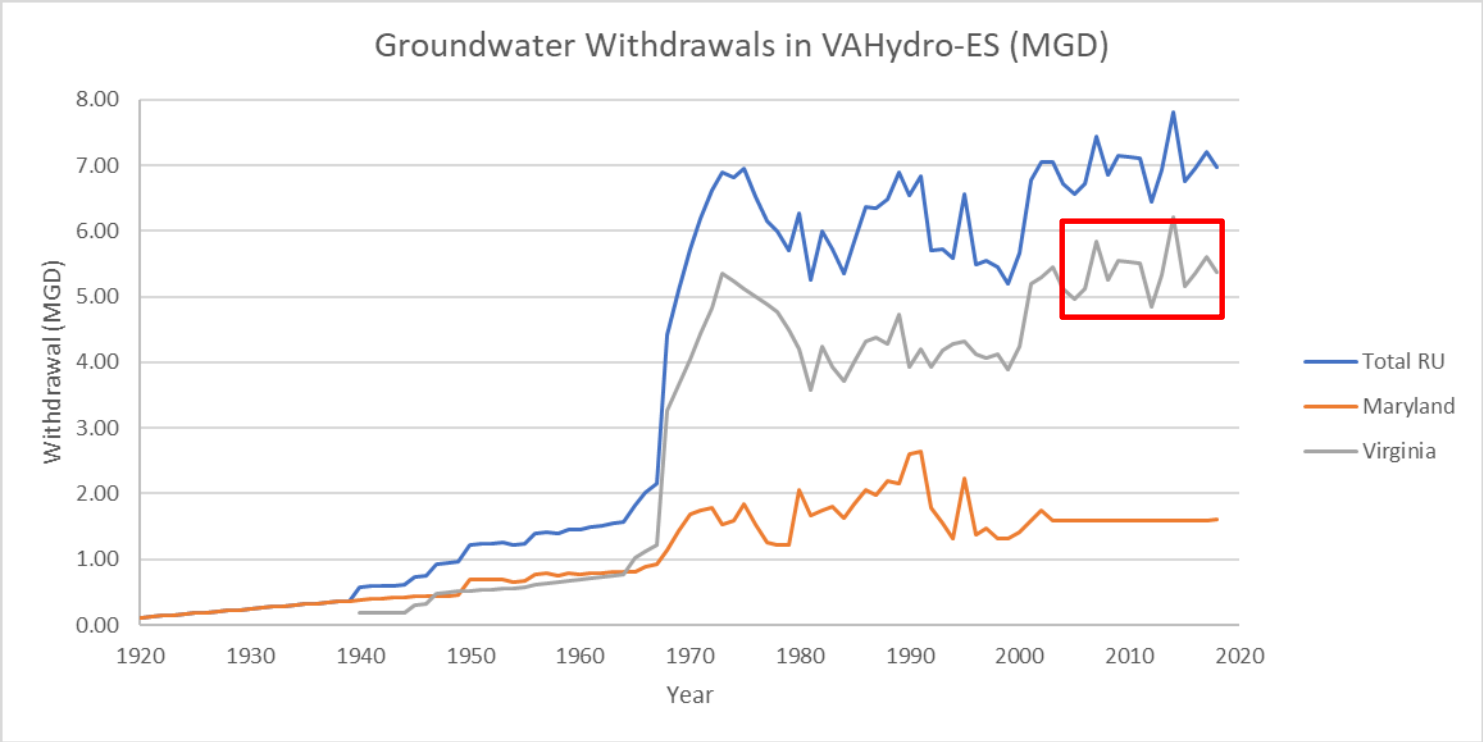
# VAHydroGW-ES – Reported Use

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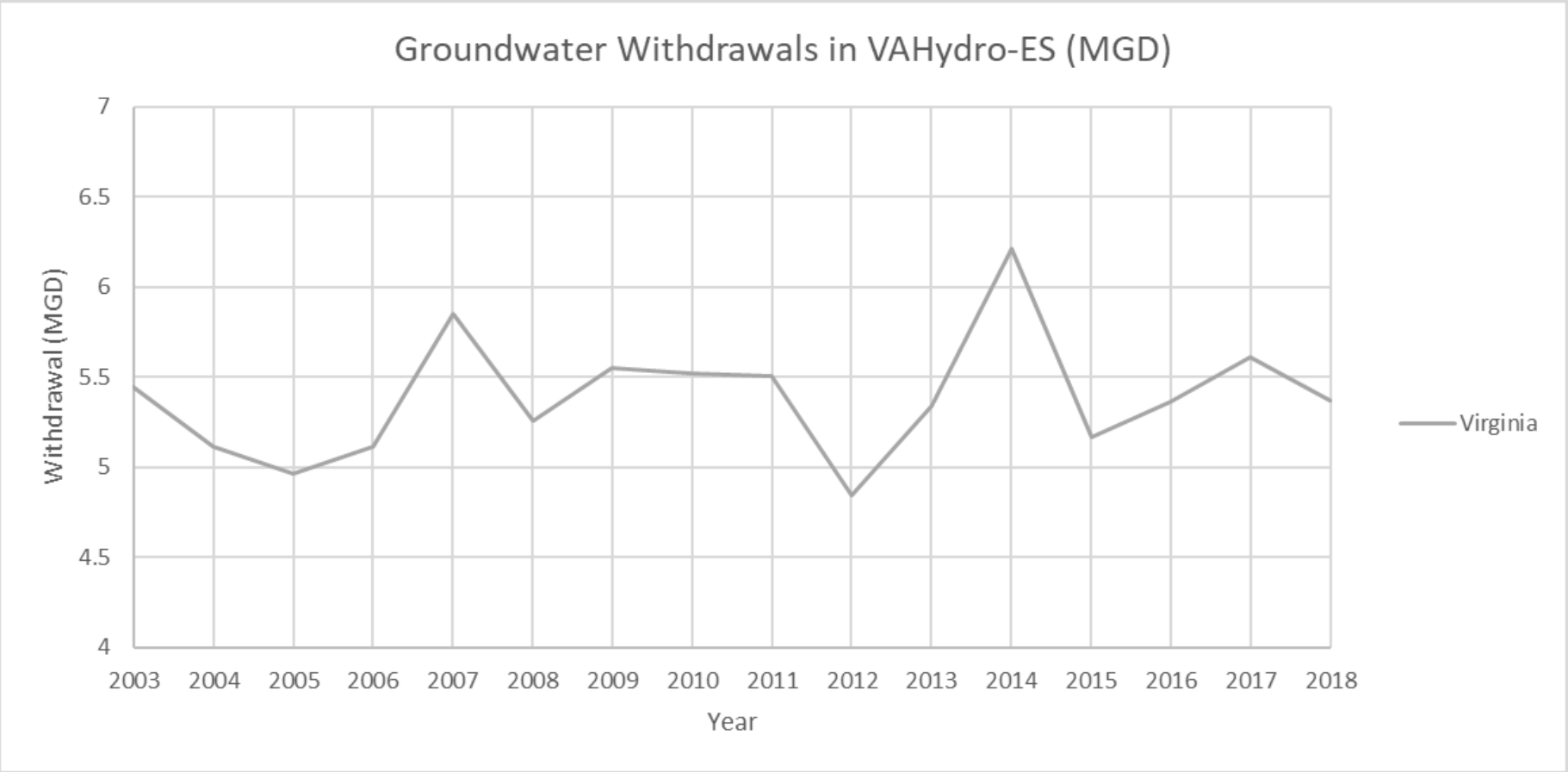
# VAHydroGW-ES – Reported Use



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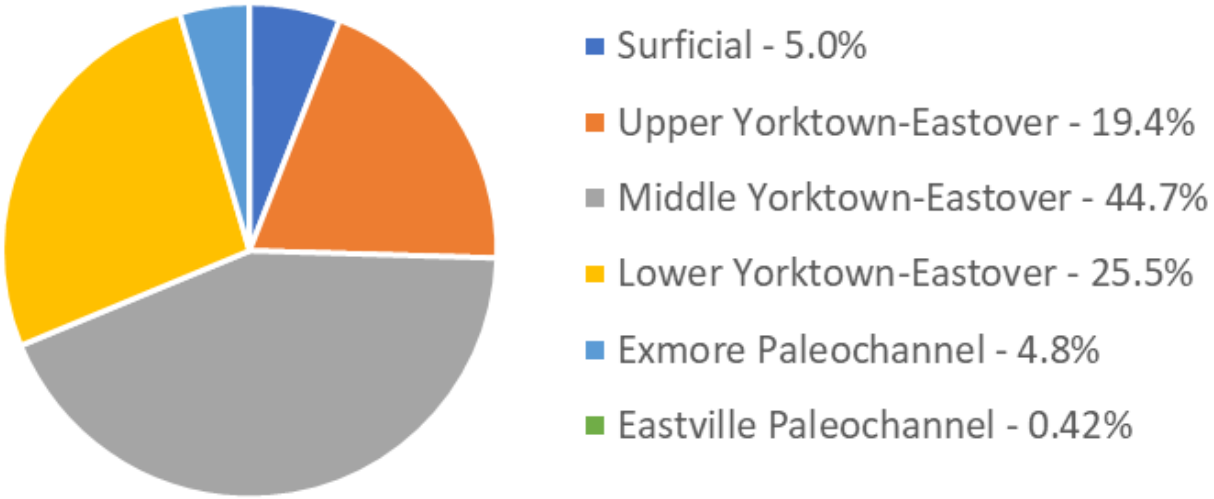
# VAHydroGW-ES – RU Aquifer Allocation in VA

| Aquifer | 2016 Reported Use (MGD) | 2017 Reported Use (MGD) | 2018 Reported Use (MGD) |
|---|---|---|---|
| Surficial | 0.38 | 0.34 | 0.27 |
| Upper Yorktown-Eastover | 0.83 | 1.12 | 1.04 |
| Middle Yorktown-Eastover | 2.53 | 2.48 | 2.4 |
| Lower Yorktown-Eastover | 1.42 | 1.53 | 1.37 |
| Exmore Paleochannel | 0.2 | 0.26 | 0.26 |
| Eastville Paleochannel | 0.001 | 0.001 | 0.024 |
| **TOTAL:** | **5.36** | **5.72** | **5.37** |



# VAHydroGW-ES – Reported Use Water Levels

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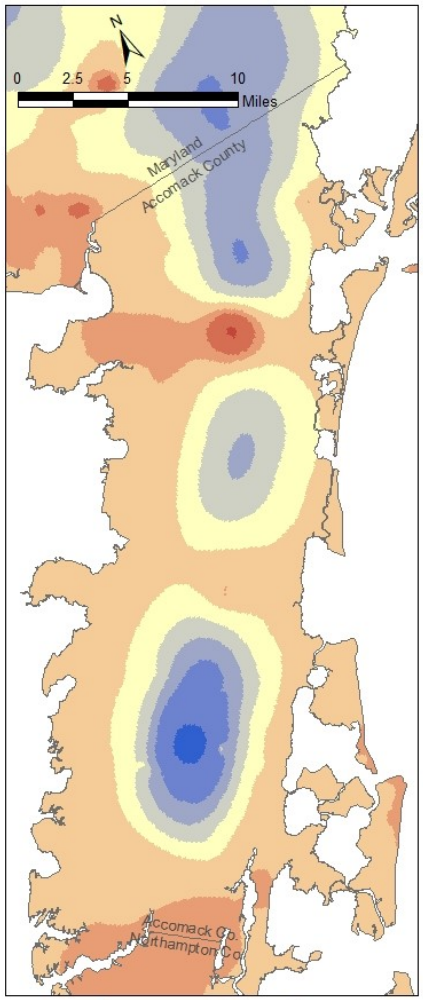
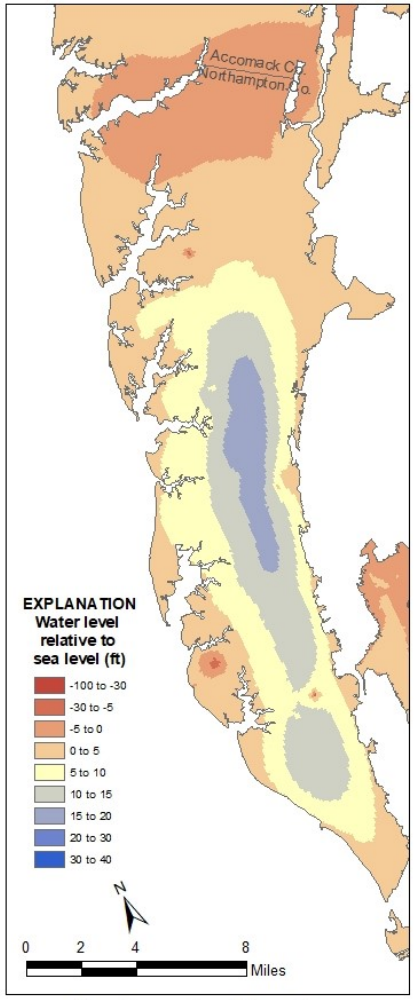
DEQ Virginia Department of Environmental Quality

**VAHydro-ES 2018 Reported Use Simulation**
**Upper Yorktown-Eastover Water Levels**

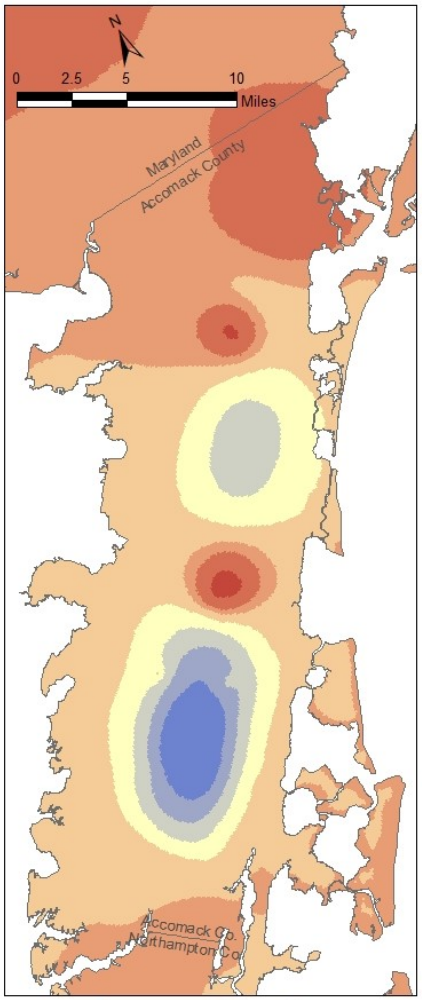



Accomack County

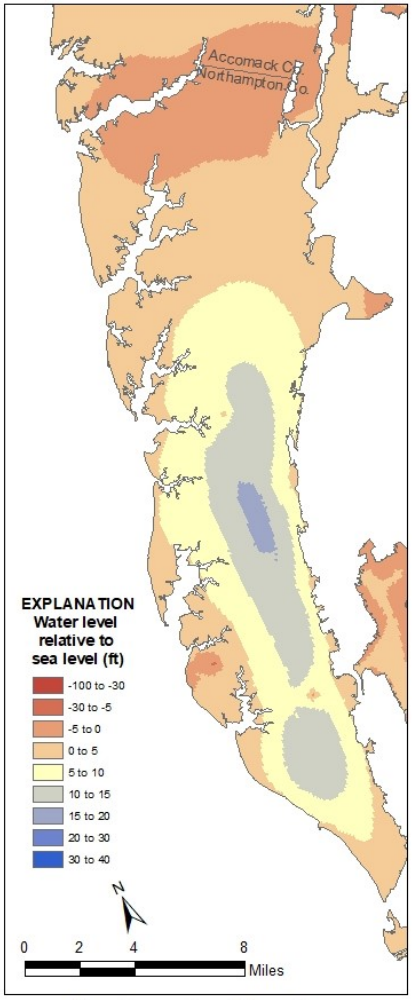



Northampton County

**VAHydro-ES 2018 Reported Use Simulation**
**Middle Yorktown-Eastover Water Levels**



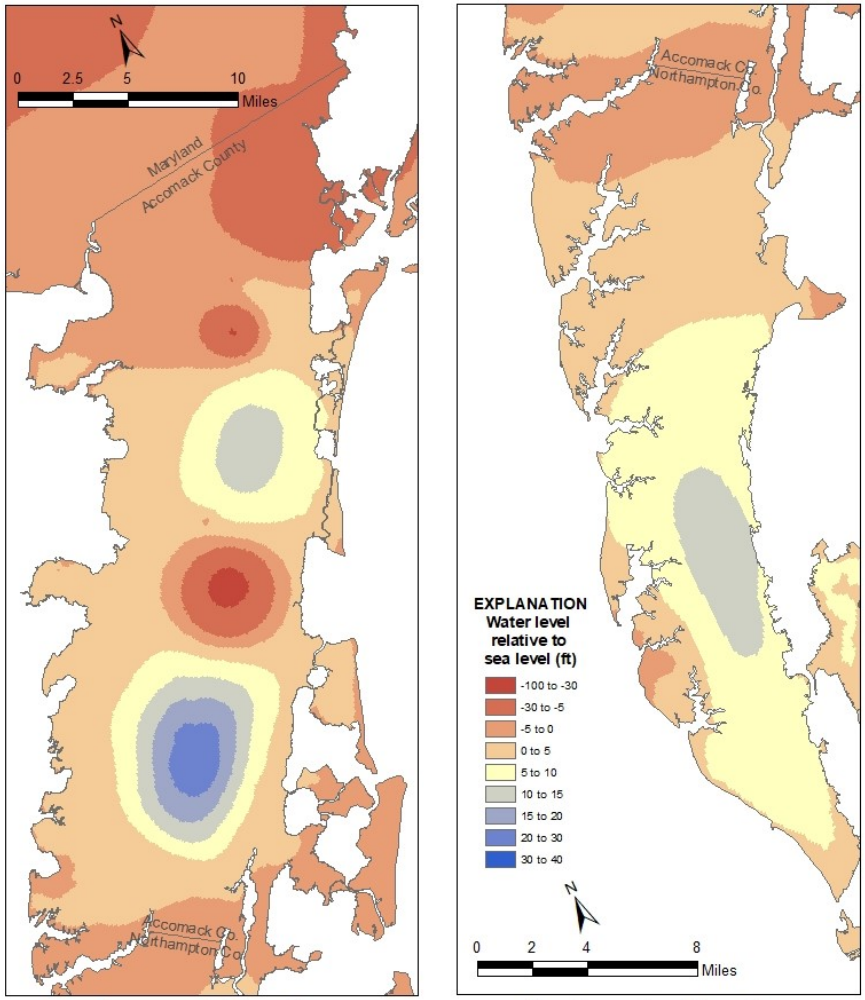

Accomack County




Northampton County

# VAHydroGW-ES – Reported Use Water Levels

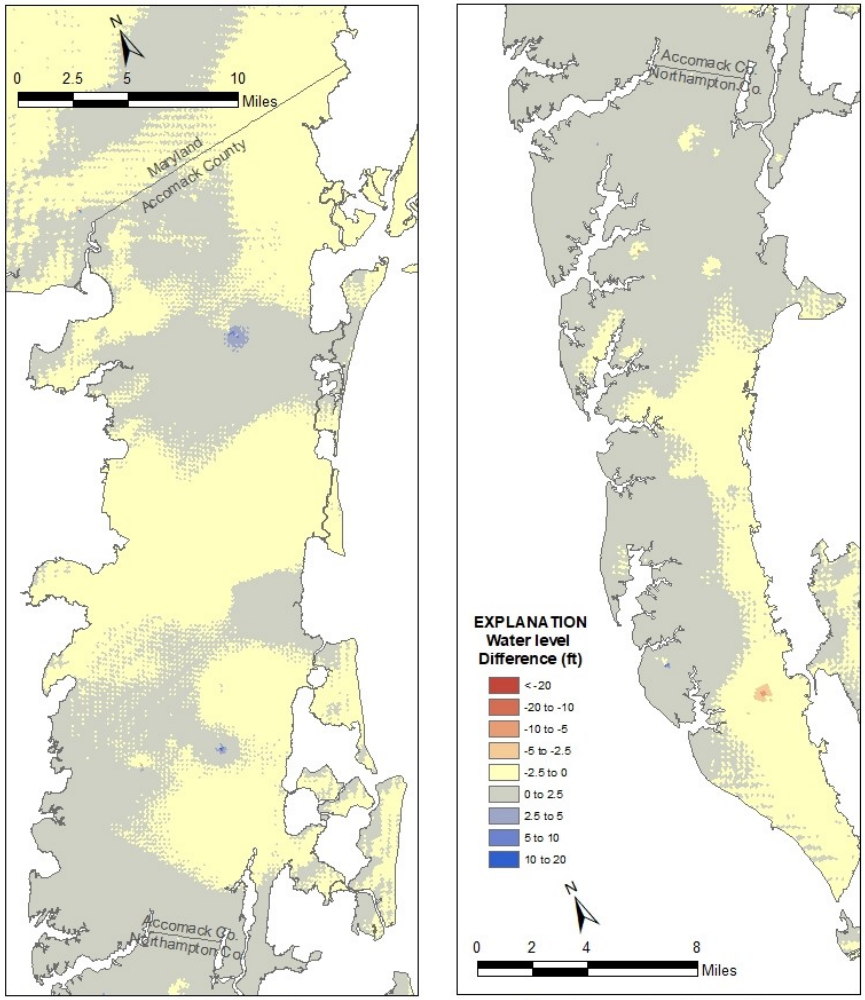
**VAHydro-ES 2018 Reported Use Simulation**
**Lower Yorktown-Eastover Water Levels**




Accomack County | Northampton County

# VAHydroGW-ES – Reported Use Water Levels

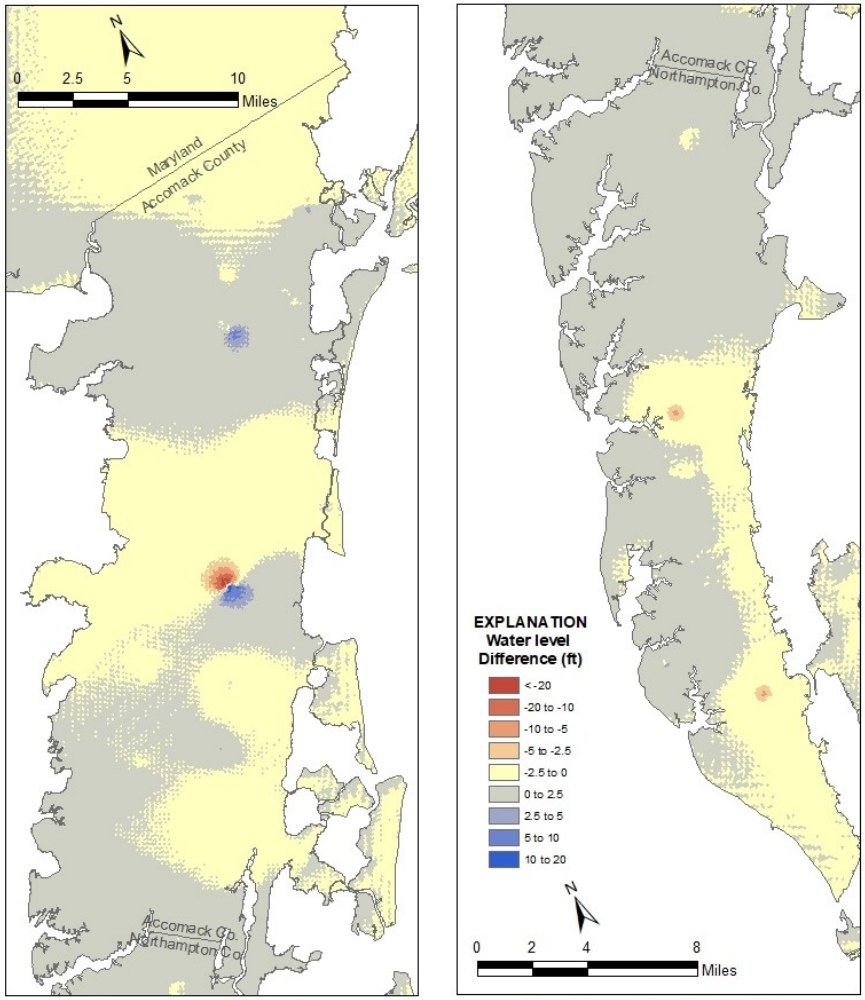
**VAHydro-ES 2018 Minus 2017 RU Simulation**
**Upper Yorktown-Eastover Water Levels**




**Accomack County** **Northampton County**

# VAHydroGW-ES – Reported Use Water Levels

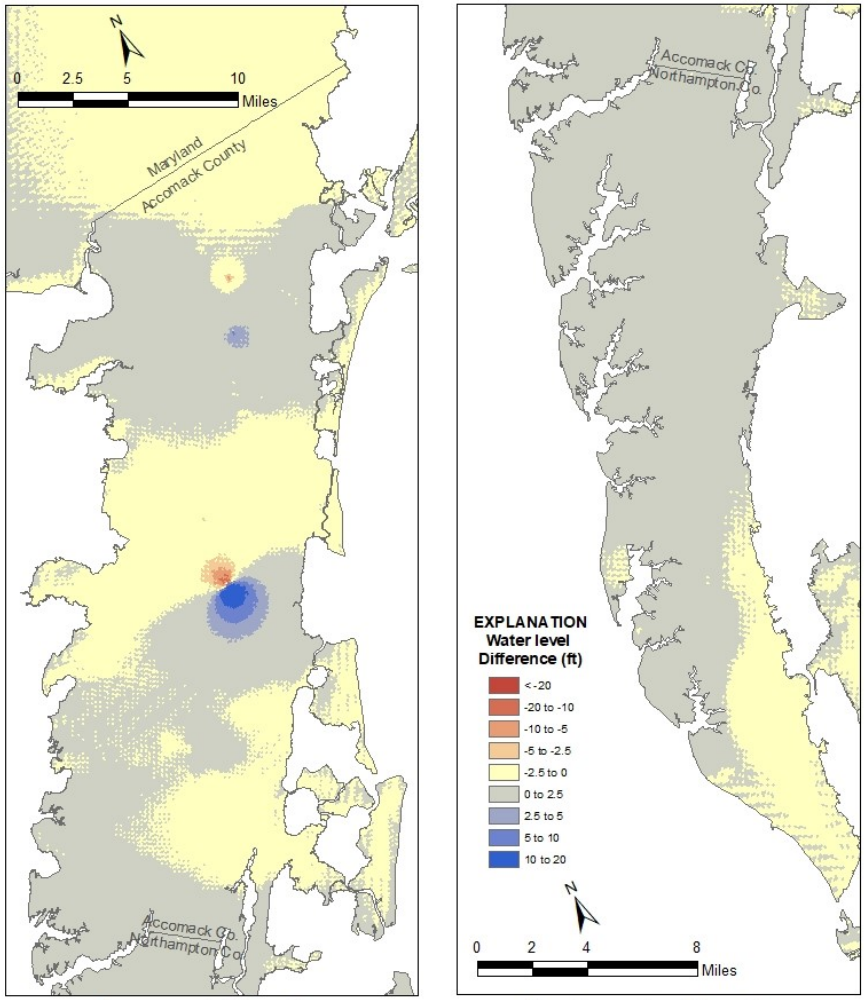
**VAHydro-ES 2018 Minus 2017 RU Simulation**
**Middle Yorktown-Eastover Water Levels**




**Accomack County** **Northampton County**

# VAHydroGW-ES – Reported Use Water Levels

**VAHydro-ES 2018 Minus 2017 RU Simulation**
**Lower Yorktown-Eastover Water Levels**




Accomack County

Northampton County

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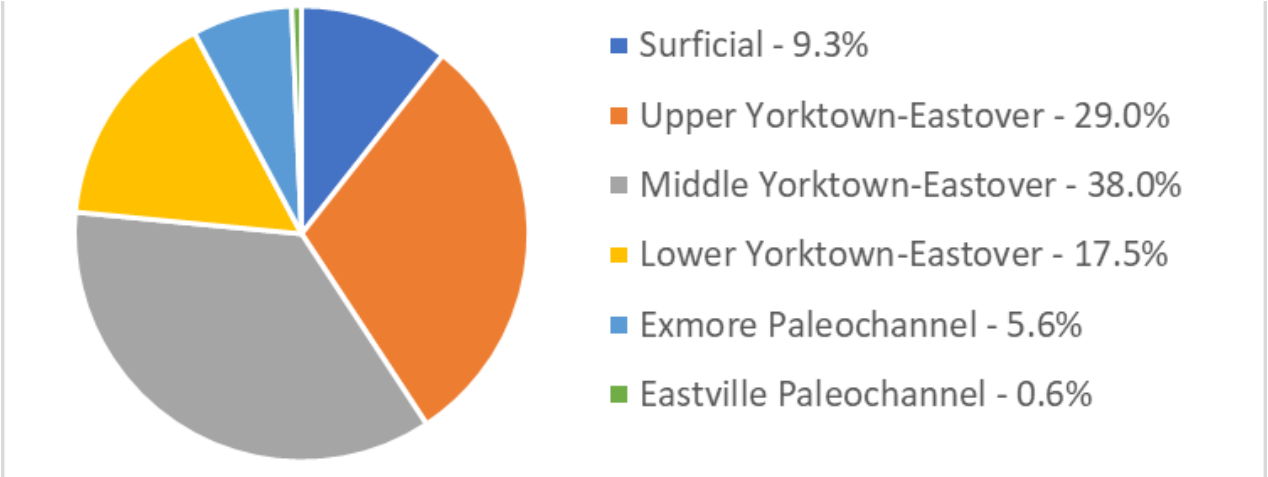
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

# VAHydroGW-ES – Total Permitted AQ Allocation

| Aquifer | 2018 Total Permitted (MGD) | 2019 Total Permitted (MGD) |
|---|---|---|
| Surficial | 1.05 | 0.99 |
| Upper Yorktown-Eastover | 2.96 | 3.03 |
| Middle Yorktown-Eastover | 3.52 | 3.92 |
| Lower Yorktown-Eastover | 1.54 | 1.78 |
| Exmore Paleochannel | 0.70 | 0.60 |
| Eastville Paleochannel | 0.07 | 0.07 |
| **TOTAL:** | **9.8** | **10.38** |



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VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

# VAHydroGW-ES – Total Permitted AQ Allocation

| County | 2018 Reported Use (MGD) | 2019 Total Permitted (MGD) | RU/TP |
|---|---|---|---|
| Accomack | 4.56 | 7.61 | 59.9% |
| Northampton | 0.81 | 2.77 | 29.2% |
| **TOTAL:** | **5.37** | **10.38** | **51.7%** |

# VAHydroGW-ES – Total Permitted Water Levels

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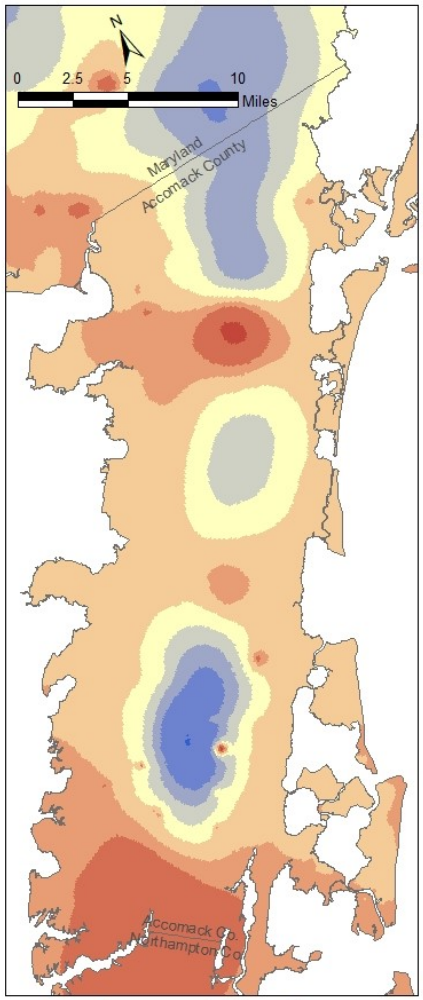
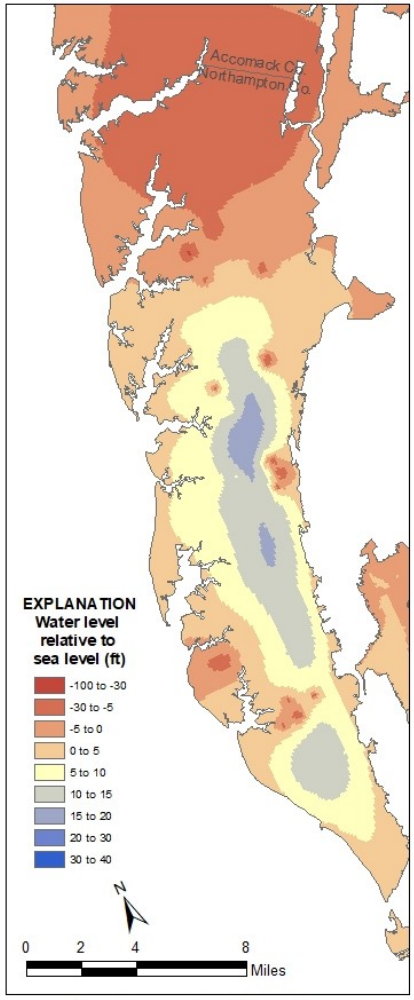
DEQ Virginia Department of Environmental Quality

## VAHydro-ES 2019 Total Permitted Simulation Upper Yorktown-Eastover Water Levels

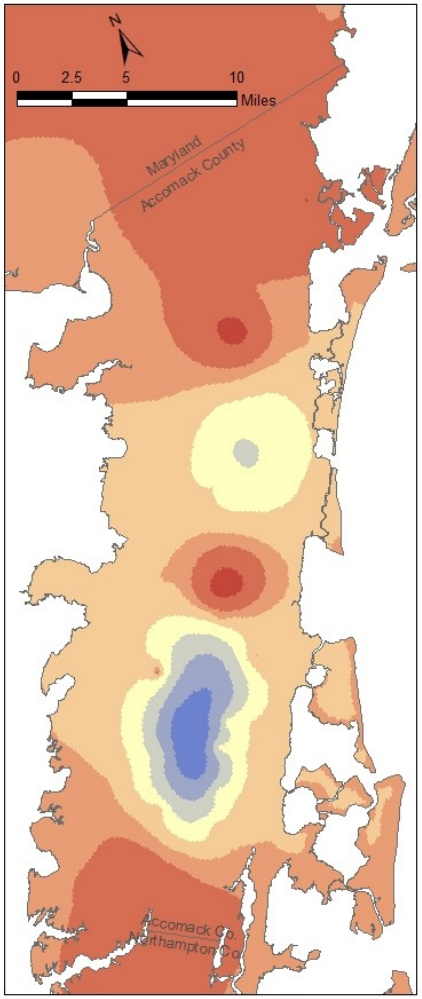



Accomack County

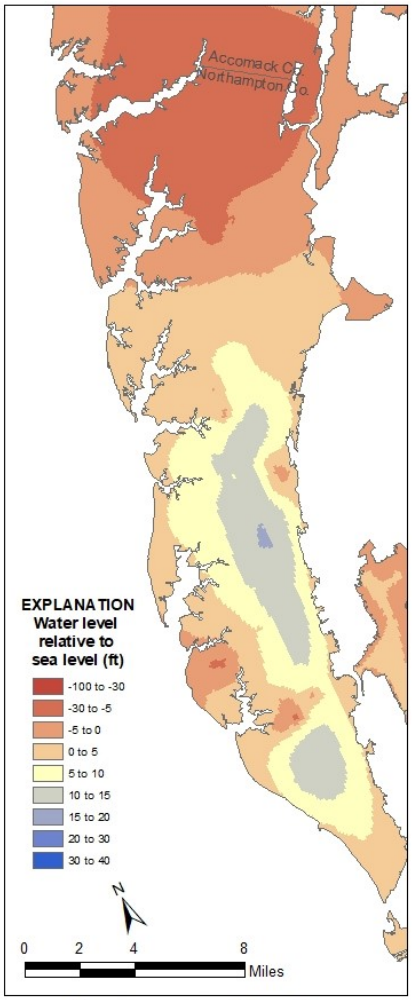



Northampton County

## VAHydro-ES 2019 Total Permitted Simulation Middle Yorktown-Eastover Water Levels



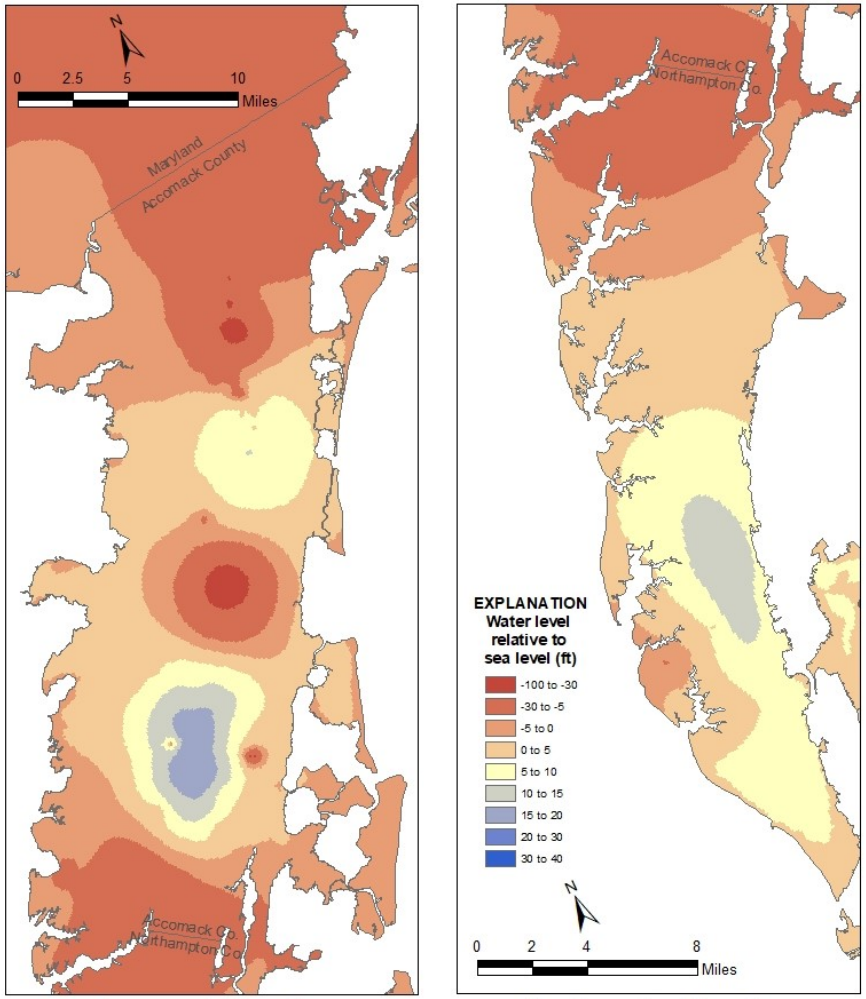

Accomack County




Northampton County

# VAHydroGW-ES – Total Permitted Water Levels

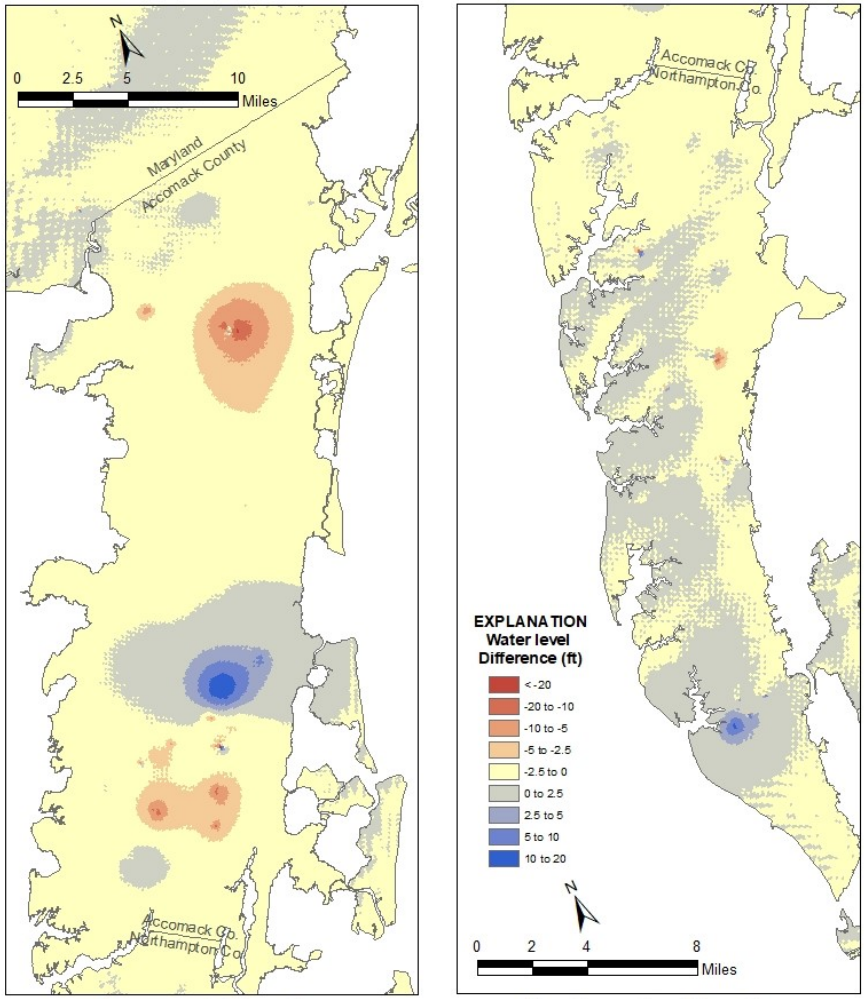
**VAHydro-ES 2019 Total Permitted Simulation**
**Lower Yorktown-Eastover Water Levels**




**Accomack County** **Northampton County**

# VAHydroGW-ES – Total Permitted Water Levels

**VAHydro-ES 2019 Minus 2018 TP Simulation**
**Upper Yorktown-Eastover Water Levels**




**Accomack County** **Northampton County**

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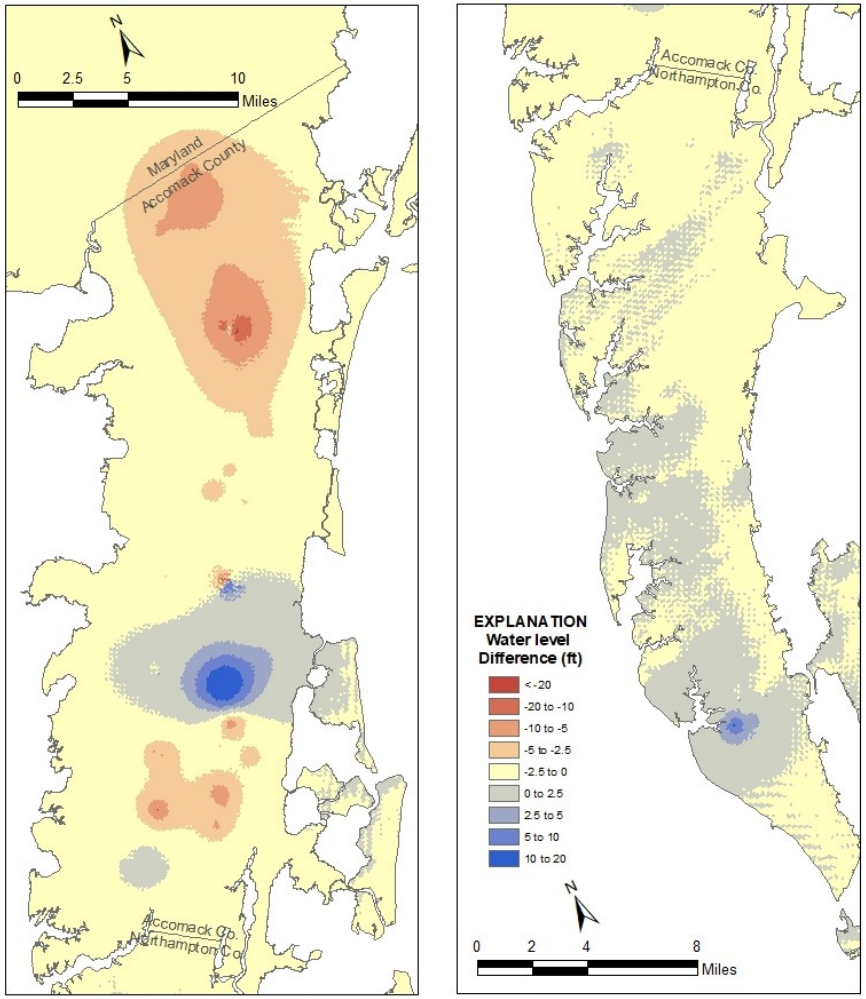
**VAHydro-ES 2019 Minus 2018 TP Simulation**
**Middle Yorktown-Eastover Water Levels**




**Accomack County** **Northampton County**

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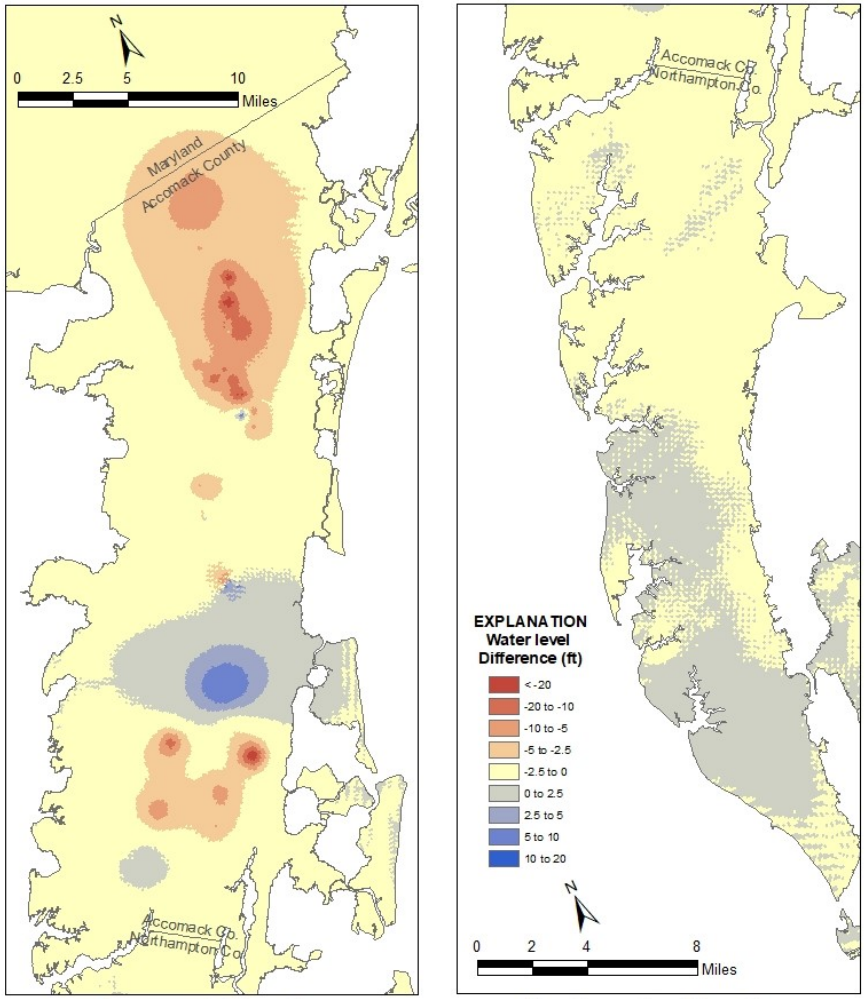
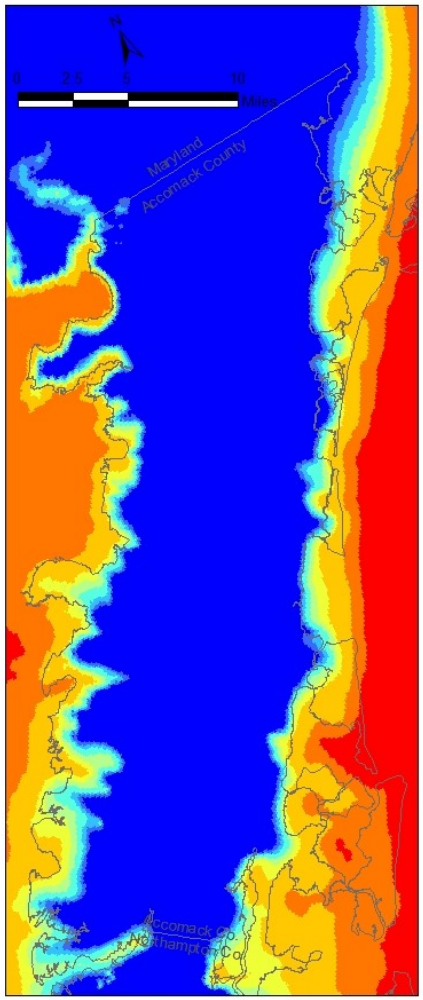
**Lower Yorktown-Eastover Water Levels**



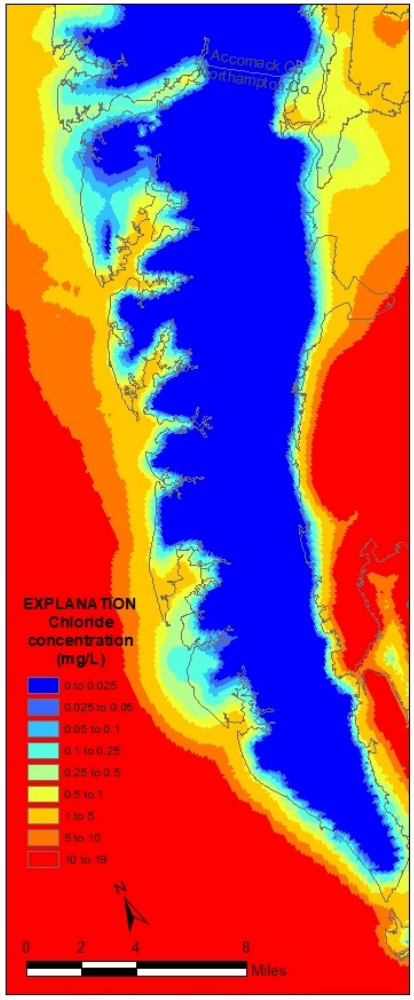

**Accomack County** **Northampton County**

# VAHydroGW-ES – TP Chloride Concentrations

**VAHydro-ES 2019 Total Permitted Simulation**
**Upper Yorktown-Eastover Chloride Concentrations**

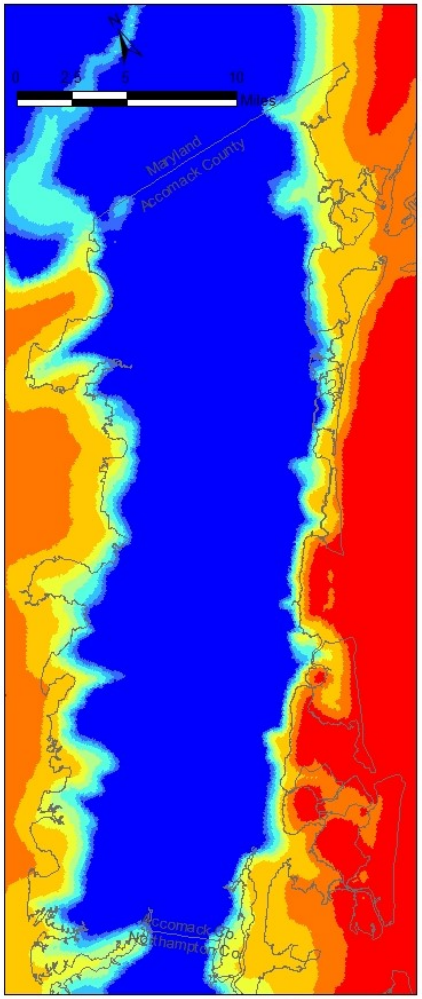



Accomack County

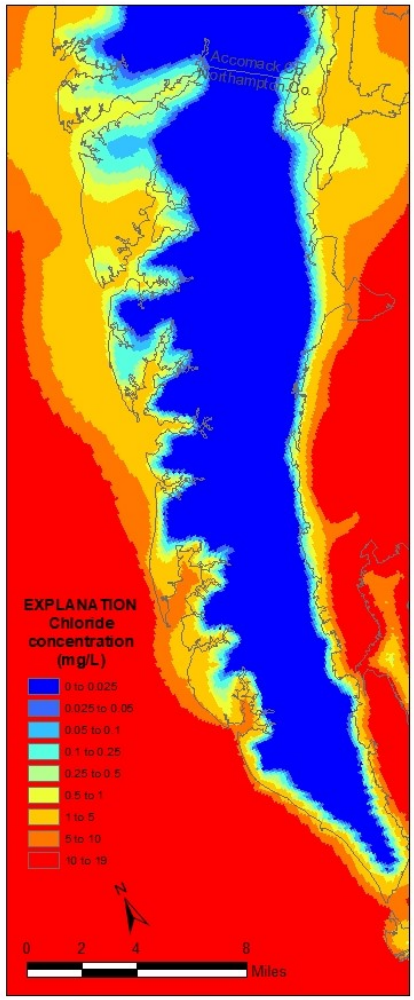



Northampton County

**VAHydro-ES 2019 Total Permitted Simulation**
**Middle Yorktown-Eastover Chloride Concentrations**




Accomack County




Northampton County

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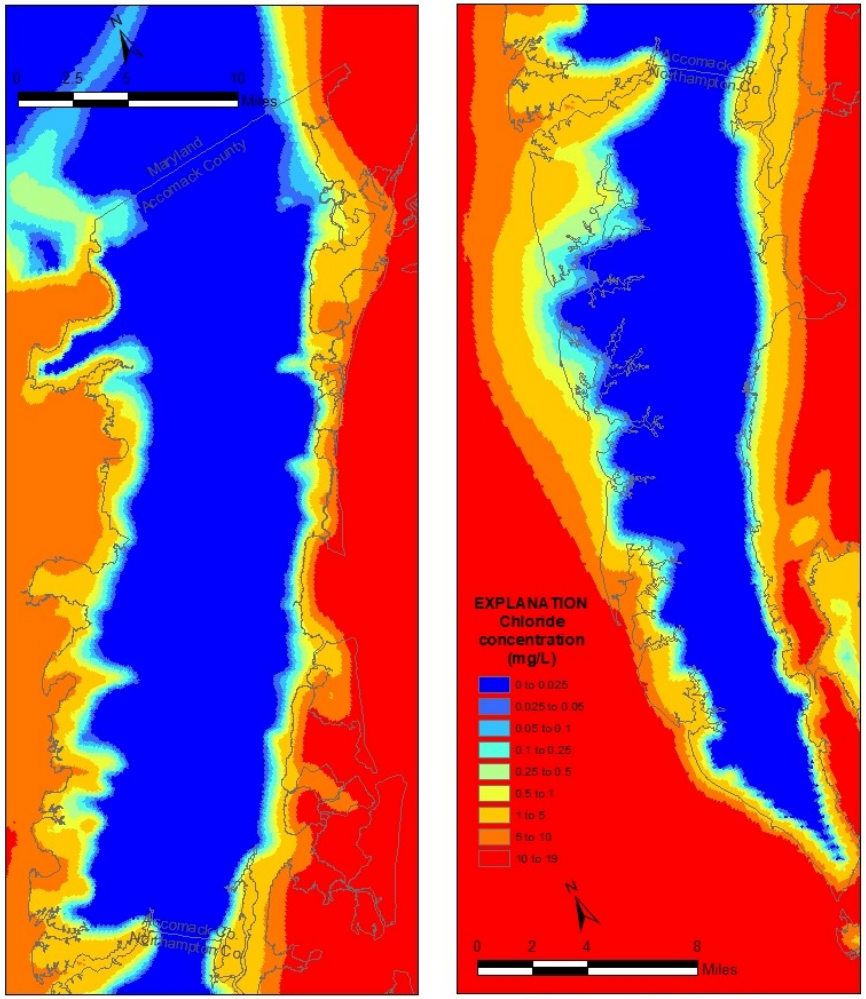


Accomack County

Northampton County