

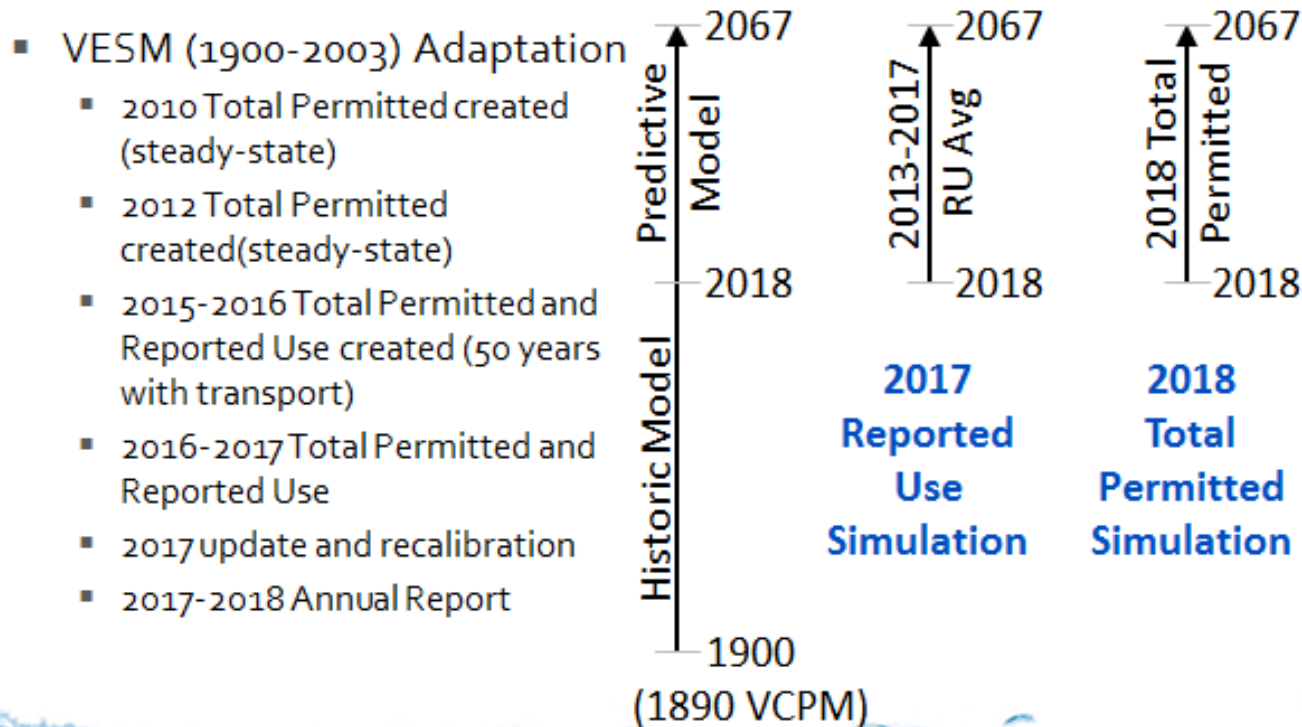
# DRAFT ANNUAL DEQ GROUNDWATER STAKEHOLDER MEETING

October 2018

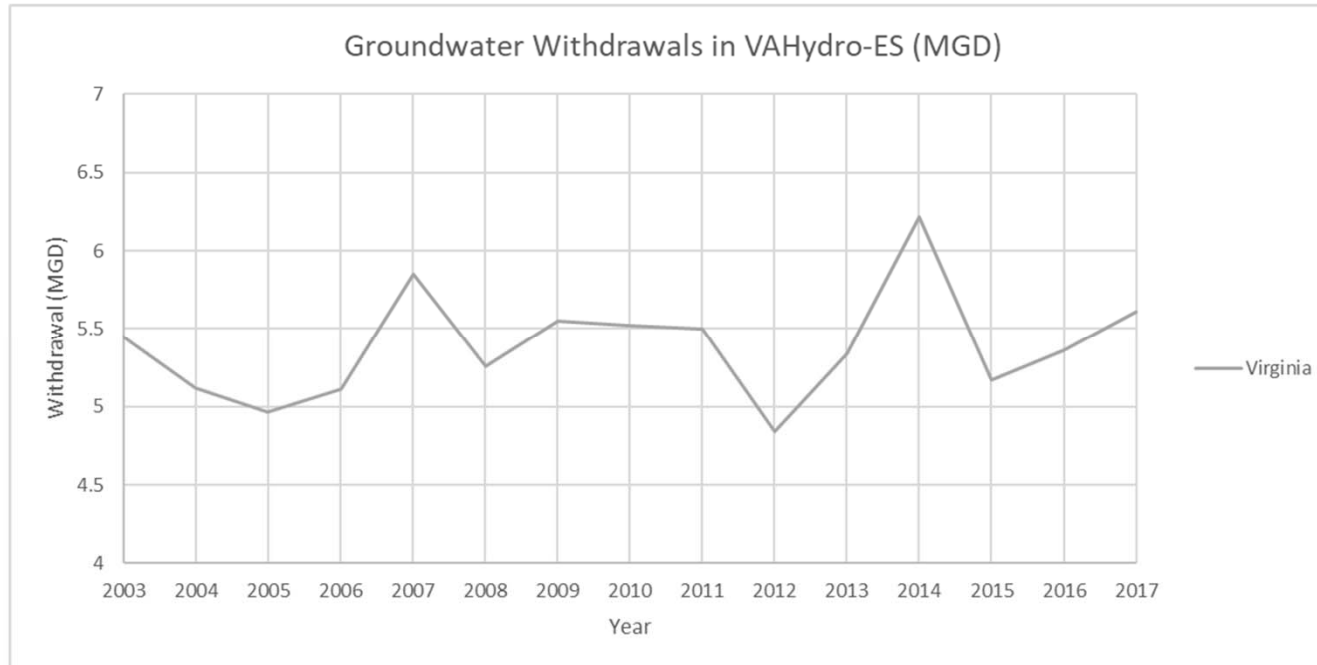
## DEQ / Aquaveo 2017-2017 Annual Model Simulation Update




VESM Groundwater Simulations



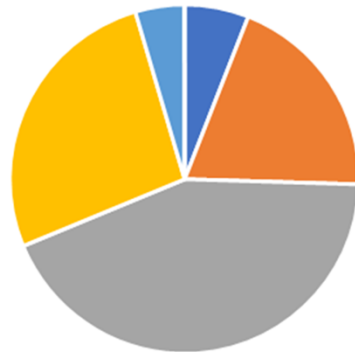
Provides background on groundwater use included in the model. This is more of an informational slide.



**Reported annual use over the past 14-years has averaged around 5.5 MGD**

# VA Hydro-ES – Reported Use VA Aquifer Allocation

Aquifer	2015 Reported Use (MGD)	2016 Reported Use (MGD)	2017 Reported Use (MGD)
Surficial	0.28	0.38	0.34
Upper Yorktown-Eastover	1.14	0.83	1.12
Middle Yorktown-Eastover	2.15	2.53	2.48
Lower Yorktown-Eastover	1.4	1.42	1.53
Exmore Paleochannel	0.2	0.2	0.26
Eastville Paleochannel	0.001	0.001	0.001
<b>TOTAL:</b>	<b>5.17</b>	<b>5.36</b>	<b>5.72</b>



- Surficial - 5.9%
- Upper Yorktown-Eastover - 19.6%
- Middle Yorktown-Eastover - 43.4%
- Lower Yorktown-Eastover - 26.7%
- Exmore Paleochannel - 4.5%
- Eastville Paleochannel - 0.02%



**Almost 90% of the use is from the Yorktown-Eastover aquifers. The 10% remainder is shallow.**

## VA Hydro-ES – Total Permitted AQ Allocation

Aquifer	2017 Total Permitted (MGD)	2018 Total Permitted (MGD)
Surficial	1.09	1.05
Upper Yorktown-Eastover	3.06	2.96
Middle Yorktown-Eastover	3.25	3.52
Lower Yorktown-Eastover	1.42	1.54
Exmore Paleochannel	0.24	0.70
Eastville Paleochannel	0.07	0.07
<b>TOTAL:</b>	<b>9.13</b>	<b>9.8</b>



- Surficial - 10.7%
- Upper Yorktown-Eastover - 30.1%
- Middle Yorktown-Eastover - 35.8%
- Lower Yorktown-Eastover - 15.6%
- Exmore Paleochannel - 7.1%
- Eastville Paleochannel - 0.7%



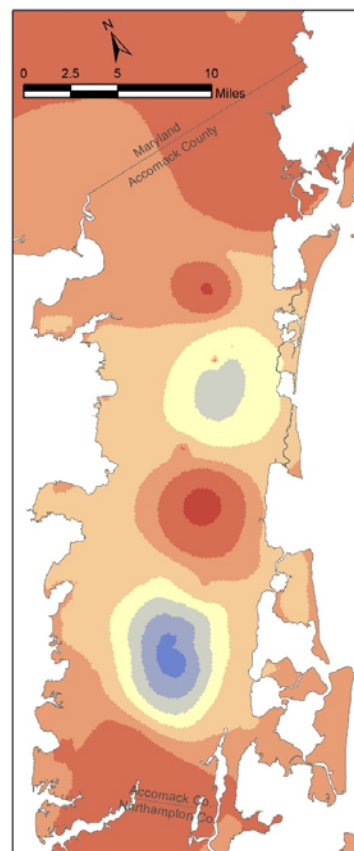
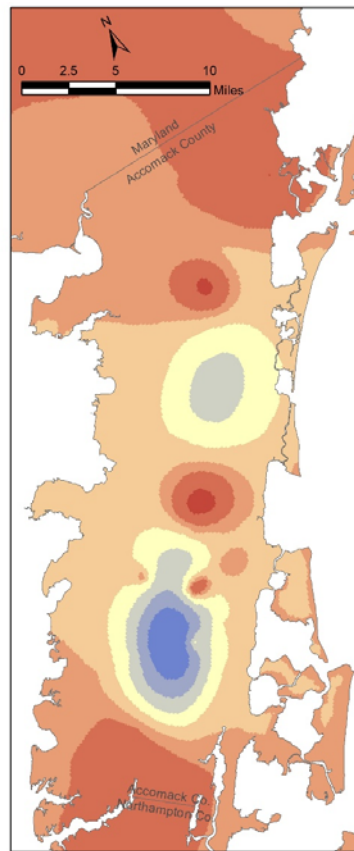
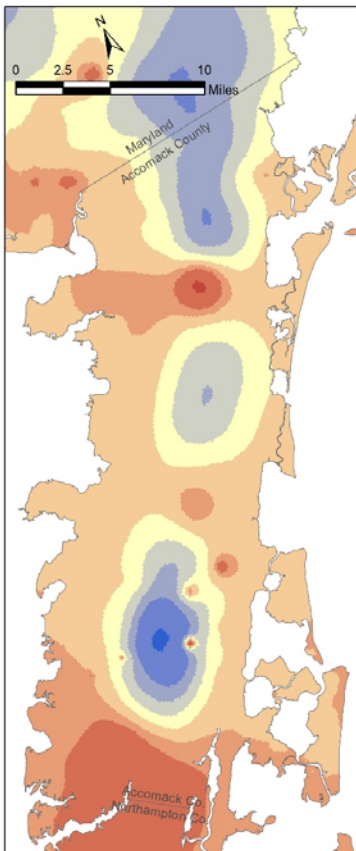
**82% of the total permitted is from Yorktown-Eastover. Higher permitted amounts by agricultural withdrawals account for the difference between reported and permitted use.**

# Permitted Use Simulated Drawdown

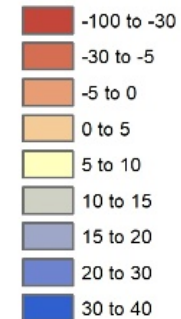
Upper YT

Middle YT

Lower YT



**EXPLANATION**  
Water level  
relative to  
sea level (ft)



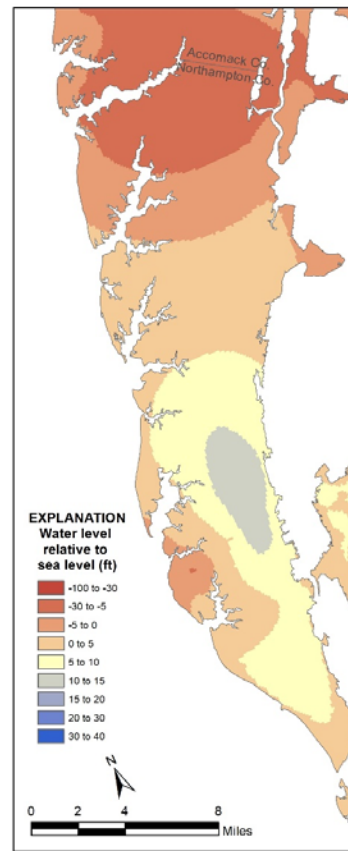
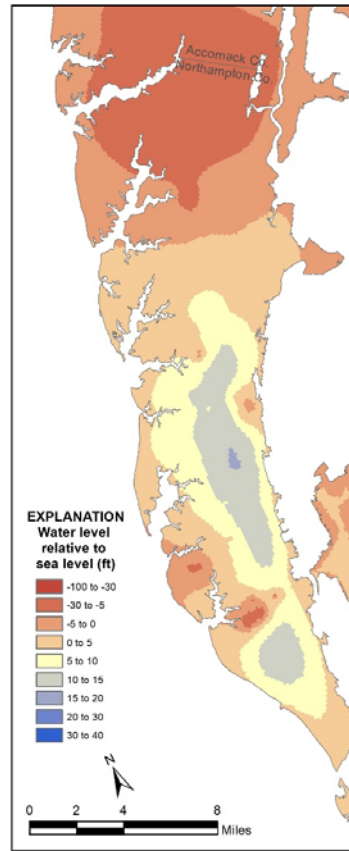
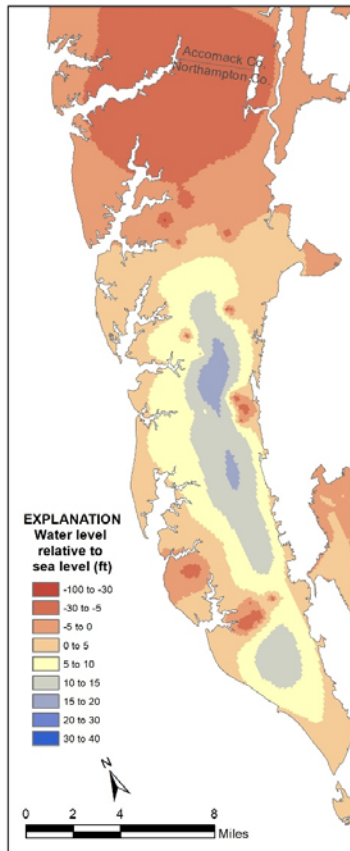
The area where water levels are within -100 to -30 for the Upper Yorktown are most likely to approach or exceed the 80% criterion (near Tyson Foods). This does not include any poultry house withdrawals.

# Permitted Use Simulated Drawdown

Upper YT

Middle YT

Lower YT



**EXPLANATION**  
Water level relative to sea level (ft)

- 100 to -30
- 30 to -5
- 5 to 0
- 0 to 5
- 5 to 10
- 10 to 15
- 15 to 20
- 20 to 30
- 30 to 40

Drawdown in the northern portion of Northampton County is principally from agricultural withdrawals. This does not include any poultry house withdrawals.

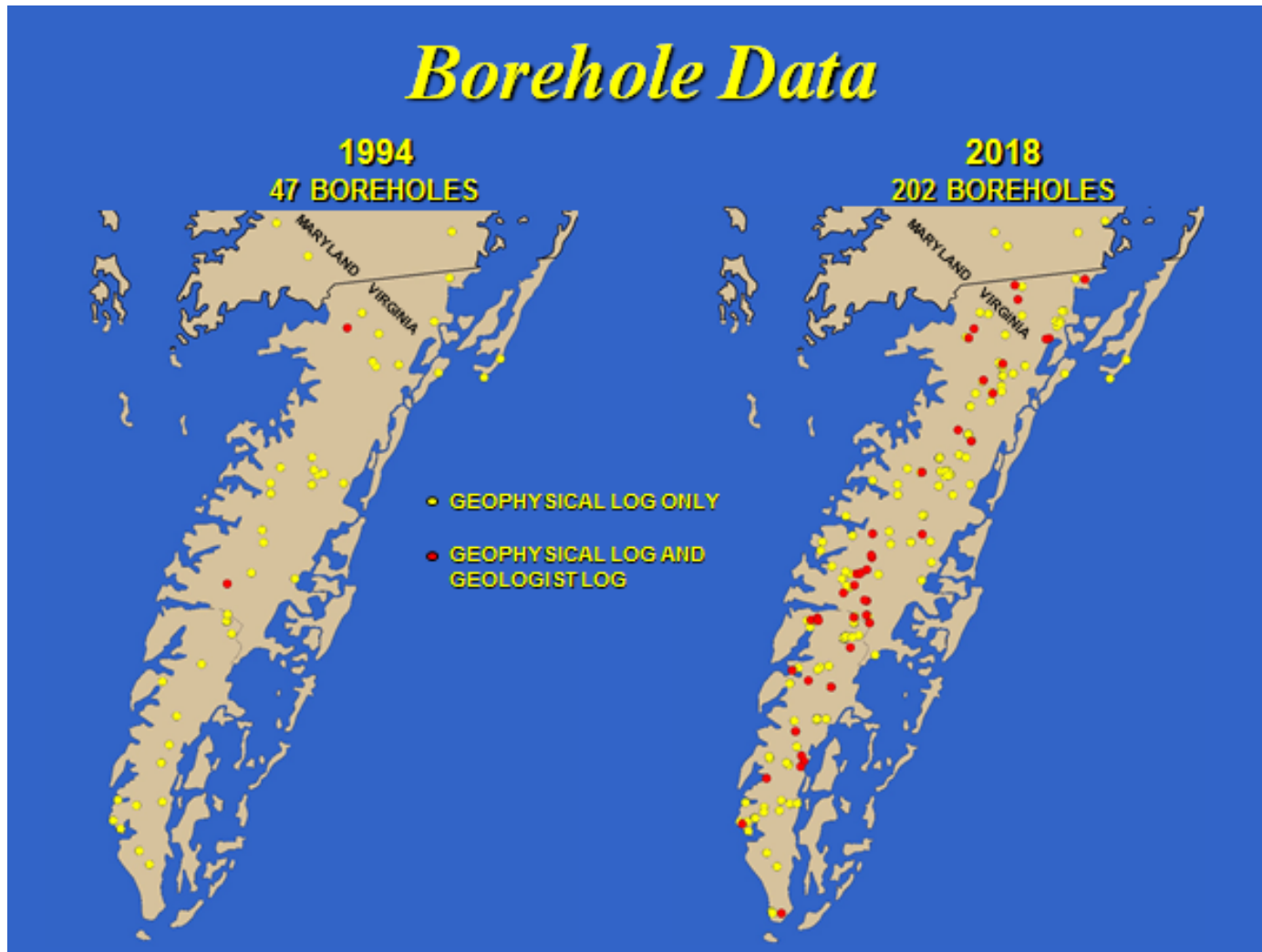
## USGS Eastern Shore Study (Randy McFarland)

### *USGS Eastern Shore Study*

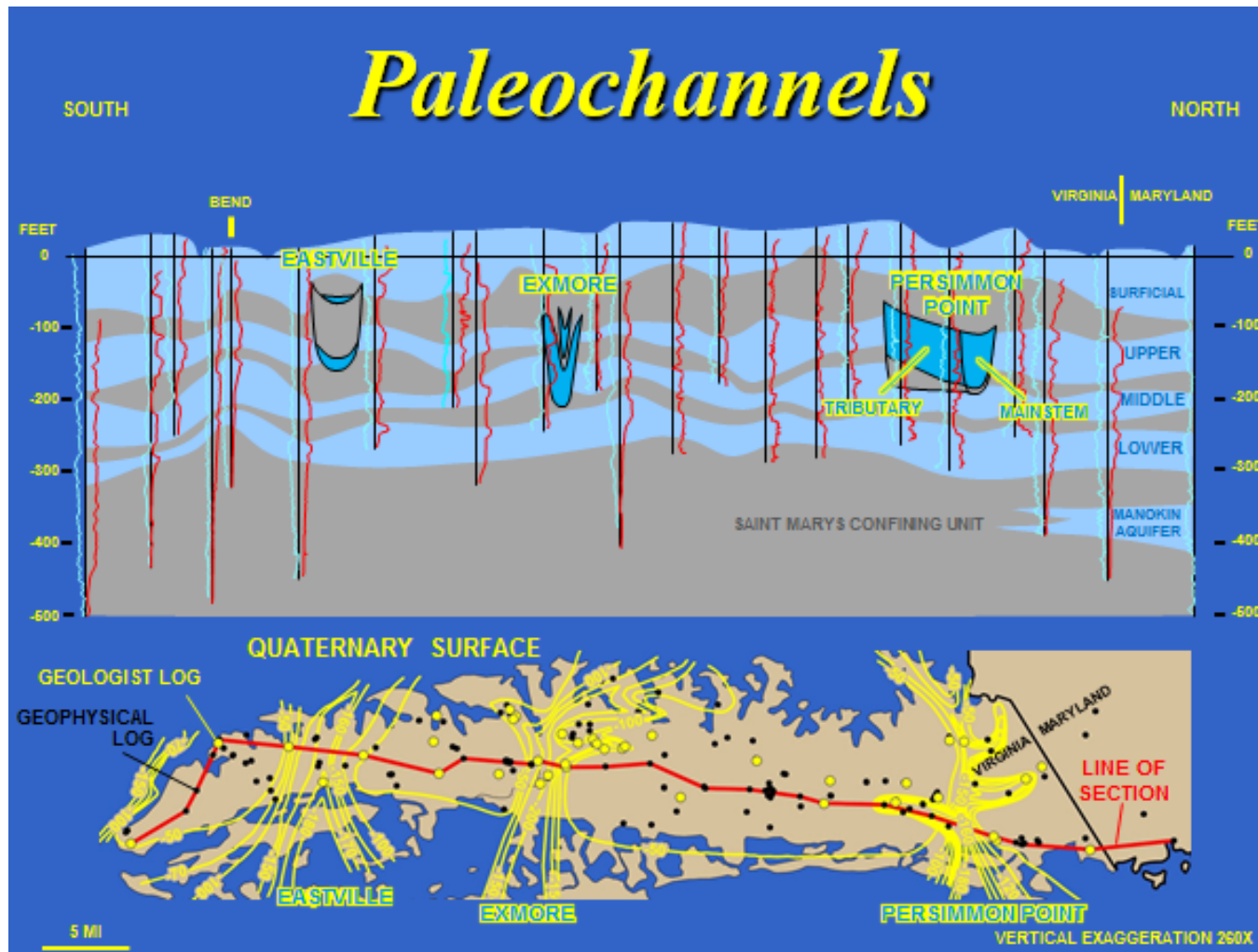
- *2017 “scoping effort”*
  1. *coop with VA DEQ*
  2. *compile/summarize existing data*
  3. *evaluate technical issues*
  4. *identify future needs*
- *2018 revision of hydrogeologic framework*
  1. *update aquifer-system configuration*
  2. *characterize paleochannels*
  3. *update configuration of saltwater boundary*
- *2019 - 2020 publication*

Identifies initial and current scope of studies for DEQ

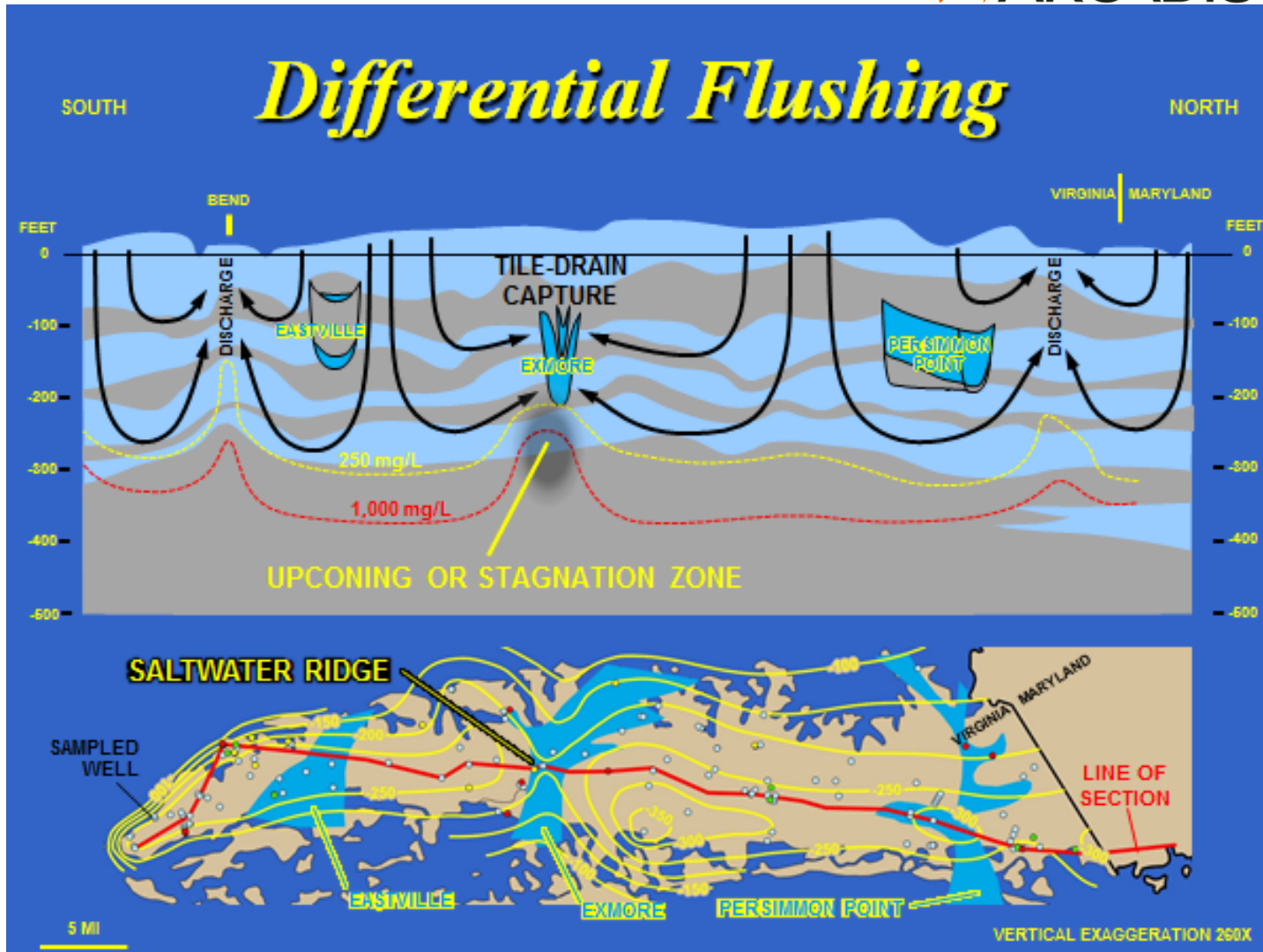




**Significantly more information available (and quality of information has improved).**



Provides far more detail and greatly improves our understanding of the aquifer system including the paleochannel systems.



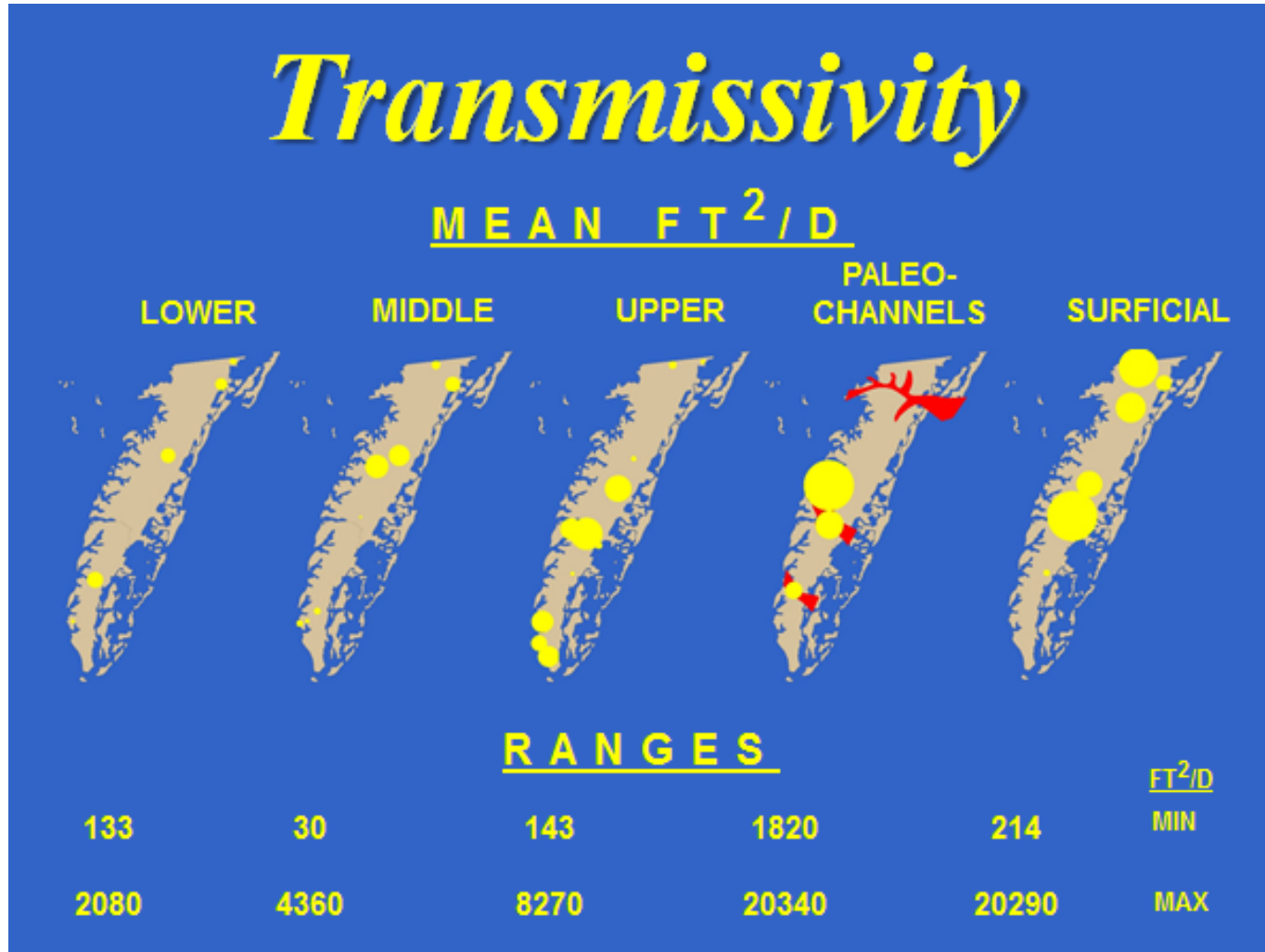
Research provides insight distribution of the freshwater/saltwater interface.

## *Aquifer Tests*

- VA DEQ permit files
- 36 tests
- 58 wells
- 133 analyses



**USGS also evaluated available aquifer test information.**



Consistent with Groundwater Committee findings, the Columbia (surficial) aquifer can highly productive with some of the highest transmissivities.

# ***USGS Eastern Shore Study***

- ***2017 “scoping effort”***
  1. *coop with VA DEQ*
  2. *compile/summarize existing data*
  3. *evaluate technical issues*
  4. *identify future needs*
- ***2018 revision of hydrogeologic framework***
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- ***2019-2020 publication***

**Results will be published within the next t**