



Water Supply Planning for Hampton Roads

Water Supply Plan Compliance and Regional Cumulative Impact Analysis

September 7, 2016



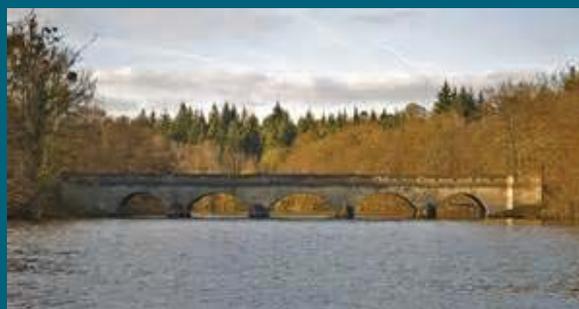
Objectives for Today

- Water supply planning review and status update
- Review population projections, projected deficits, and alternatives
- Outstanding compliance items due December 2018
- Discuss WSP five-year update process and format
- State Water Resources Plan findings
- Review cumulative impact analysis results
- Next steps



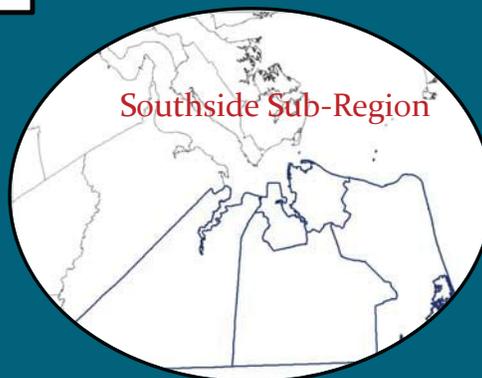
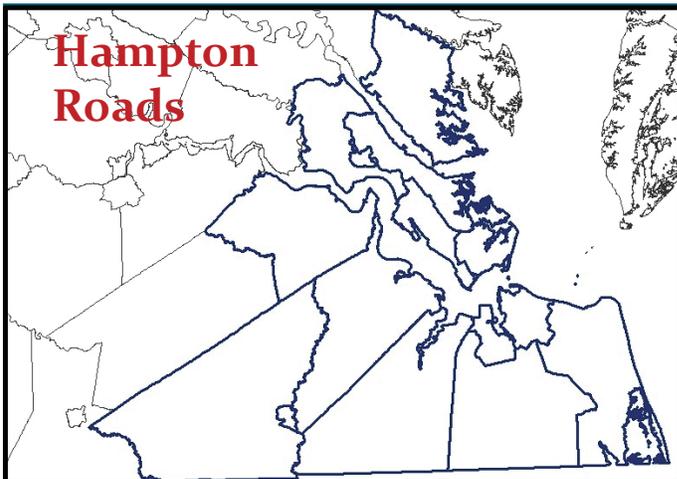
How did we get here?

- 1998-2002 Drought
- 2003-2005 Water Supply Planning legislation/regulation
- 2008-2011 Water Supply Plans Submitted
- 2012-2013 WSP Compliance Review
- 2014-2015 State Water Resources Plan
- Continuous comprehensive planning; collaborative effort
- Informs the permitting process



Required WSP Data

- Existing Water Sources
- Existing Water Uses
- Water Demand Management
- Projected Water Demand
- Statement of Need and Alternatives
- Drought Response and Contingency Plan



Population Projections





Peninsula Sub-Region Population Projections

Locality	2010 (WSP)	2010 (SWRP)	2040 (WSP)	2040 (SWRP)	Weldon Cooper Est. 7/15/2015
Hampton	146,960	137,436	156,698	139,663	138,626
Newport News	185,760	180,719	221,836	193,838	183,454
Poquoson	12,258	12,150	15,777	16,604	12,359
Williamsburg	16,600	14,068	19,000	17,820	14,860
Gloucester County	38,217	36,858	60,561	45,222	37,072
James City County	64,374	67,009	125,190	136,736	73,325
York County	66,176	65,464	98,145	97,627	69,466



Southside Sub-Region Population Projections

Locality	2010 (WSP)	2010 (SWRP)	2040 (WSP)	2040 (SWRP)	Weldon Cooper Est. 7/15/2015
Chesapeake	272,826	222,209	412,948	318,488	238,283
Norfolk	236,703	242,803	241,333	260,689	247,189
Portsmouth	99,537	95,535	105,779	99,916	96,874
Suffolk	95,791	84,585	190,620	132,187	90,426
Virginia Beach	438,471	437,994	462,213	419,103	453,500



Western Tidewater Sub-Region Population Projections

Locality	2010 (WSP)	2010 (SWRP)	2040 (WSP)	2040 (SWRP)	Weldon Cooper Est. 7/15/2015
Franklin City	8,678	8,582	12,071	10,661	8,535
Isle of Wight County	27,680	35,270	56,229	44,922	36,438
Southampton County	19,750	18,570	27,850	18,412	18,551
Surry County	7,150	7,058	10,370	8,086	6,819



Reported
Withdrawals



Projected
Demand



Peninsula Sub-Region

Locality/Type	2010 Reported Withdrawals (MGD)	2040 Projected Withdrawals (MGD)	Percent Change 2010 - 2040
Hampton			
CWS	Provided by NNW		
Large SSU	0.094	0.094	0%
Small SSU	0	0	0%
Agricultural SSU	0	0	0%
Newport News			
CWS	51.625	61.51	19%
Large SSU	8.557	8.557	0%
Small SSU	0	0	0%
Agricultural SSU	0	0	0%
Poquoson			
CWS	Provided by NNW		
Large SSU	0	0	0%
Small SSU	0	0	0%
Agricultural SSU	0	0	0%
Williamsburg			
CWS	3.34	4.971	49%
Large SSU	0.7	0.7	0%
Small SSU	0	0	0%
Agricultural SSU	0	0	0%

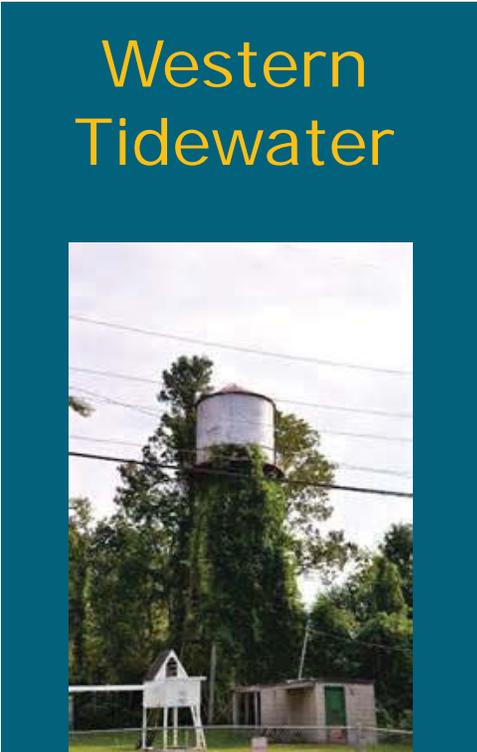
Locality/Type	2010 Reported Withdrawals (MGD)	2040 Projected Withdrawals (MGD)	Percent Change 2010 - 2040
Gloucester County			
CWS	1.398	2.796	100%
Large SSU	0	0	0%
Small SSU	1.837	2.321	26%
Agricultural SSU	0	0	0%
James City County			
CWS	5.139	10.862	110%
Large SSU	0.496	0.496	0%
Small SSU	0.826	0.991	20%
Agricultural SSU	0	0	0%
York County			
CWS	0.326	0.391	20%
Large SSU	8.221	8.221	0%
Small SSU	0.306	0.366	20%
Agricultural SSU	0	0	0%



Southside Sub-Region

Locality/Type	2010 Reported Withdrawals (MGD)	2040 Projected Withdrawals (MGD)	Percent Change 2010-2040
Chesapeake			
CWS	11.643	19.268	65%
Large SSU	1.491	1.491	0%
Small SSU	2.552	2.472	-3%
Agricultural SSU	0.285	0.471	65%
Norfolk			
CWS	19.435	19.435	0%
Large SSU	0.355	0.355	0%
Small SSU	0	0	0%
Agricultural SSU	0	0	0%
Portsmouth			
CWS	13.969	14.833	7.50%
Large SSU	2.185	2.185	0%
Small SSU	0	0	0%
Agricultural SSU	0	0	0%
Suffolk			
CWS	7.752	16.519	114%
Large SSU	0.187	0.187	0%
Small SSU	1.575	1.525	-3%
Agricultural SSU	0.246	0.526	114%
Virginia Beach			
CWS	73.064	100.534	38%
Large SSU	1.23	1.23	0%
Small SSU	0.664	0.643	-3%
Agricultural SSU	0.019	0.026	37%





Locality/Type	2010 Reported Withdrawals (MGD)	2040 Projected Withdrawals (MGD)	Percent Change 2010-2040
Franklin			
CWS	1.164	1.855	59%
Large SSU	0	0	0%
Small SSU	0.04	0.056	40%
Agricultural SSU	0	0	0%
Isle of Wight			
CWS	2.999	10.295	243%
Large SSU	38.477	38.477	0%
Small SSU	1.369	1.9	39%
Agricultural SSU	0.95	4.326	355%
Southampton County			
CWS	0.894	1.302	46%
Large SSU	5.383	5.383	0%
Small SSU	1.014	1.408	39%
Agricultural SSU	0.78	0.862	11%
Surry County			
CWS	0.135	0.196	45%
Large SSU	17.752	17.752	0%
Small SSU	0.463	0.643	39%
Agricultural SSU	0.24	0.349	45%

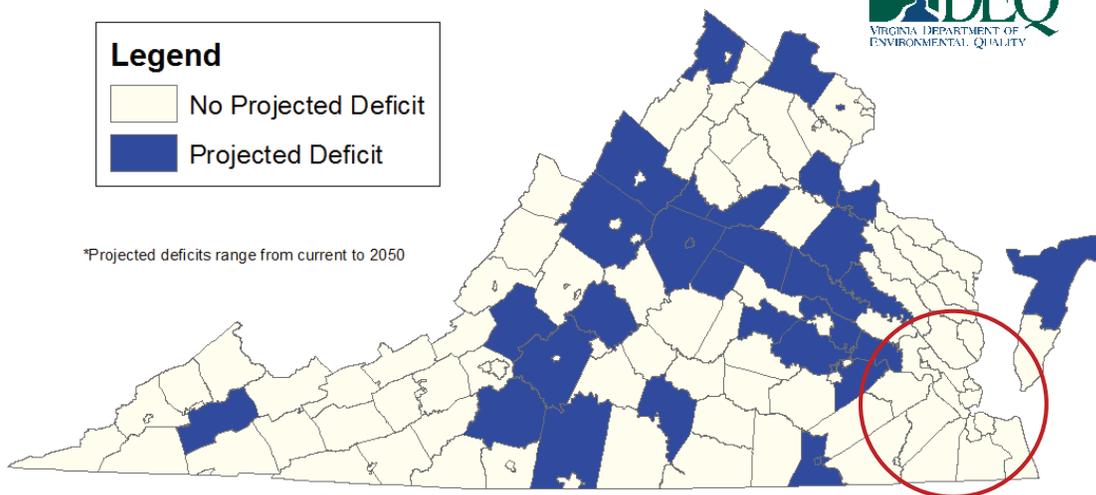
Projected Water Supply Deficits by County*

Legend

- No Projected Deficit
- Projected Deficit



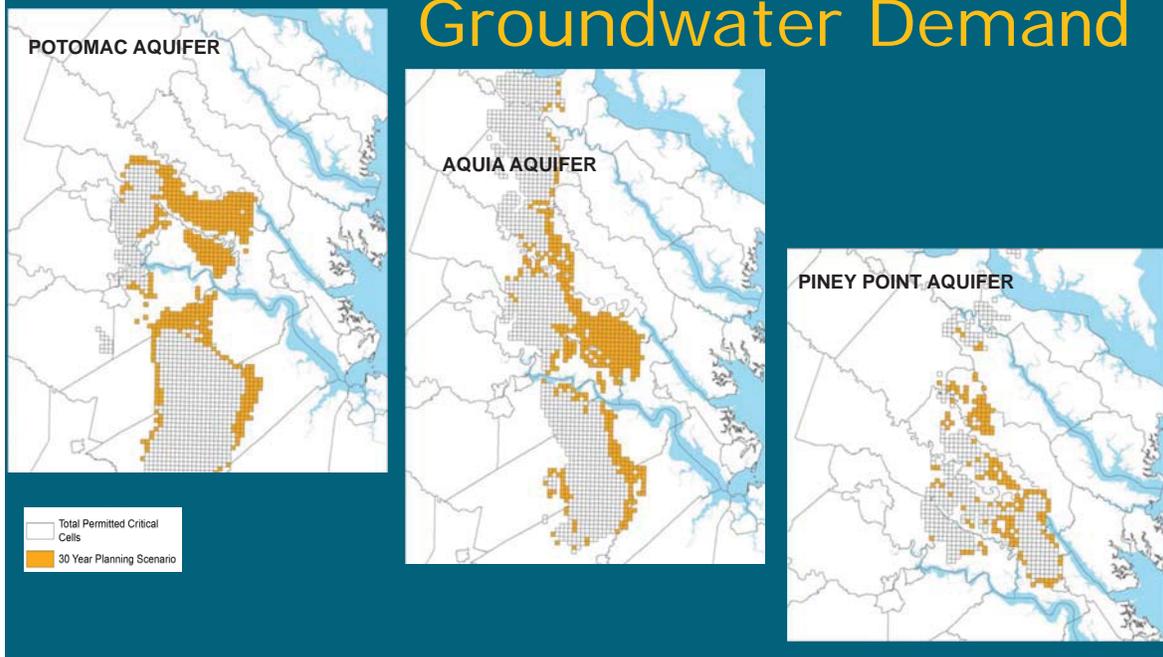
*Projected deficits range from current to 2050



Source: Local and Regional Water Supply Plans submitted to DEQ



Potential Impacts of Projected Groundwater Demand

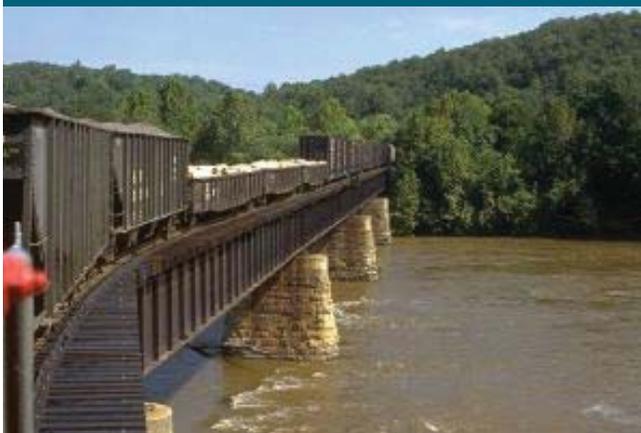


Alternatives

- Water demand management and conservation measures
- Reservoir, increased surface water storage
- Additional groundwater withdrawals
- Desalination, interconnection, reuse, system optimization
- Aquifer storage and recovery



Five-year Update of Plan

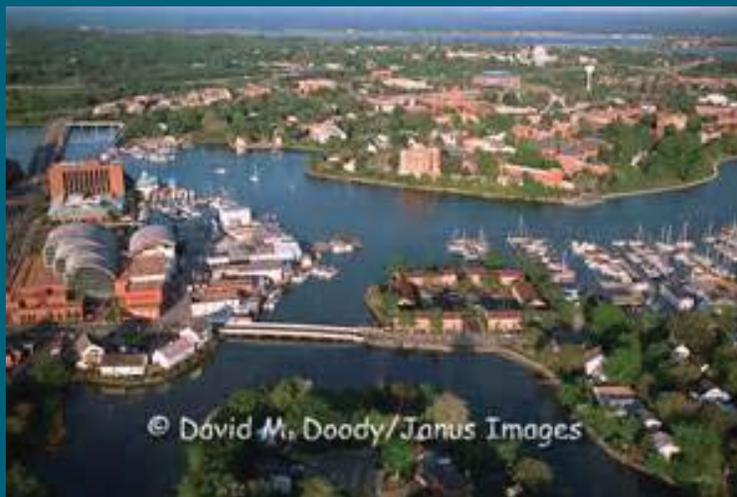


- Due December 2018
- Outstanding compliance items
- Changed circumstances or new information impacting water demands not met by proposed alternatives



Outstanding Compliance Items

- Provide all source data required for all community water systems and self-supplied users for all localities
- Provide all use data required for privately-owned water systems





Review/Update information Submitted in 2011

- Population and water demand projections
- Anticipated deficits and anticipated dates
- Additional consideration of short-term alternatives:
 - Water conservation
 - Water demand management
- Review Drought Response and Contingency Plan



Status of DEQ Tasks

- ✓ Guidance to aid localities; Online tool for use by localities
- ✓ Improve participation in water withdrawal reporting
- ✓ Inventory of DEQ permitted surface water and groundwater withdrawals
- ✓ Inventory of groundwater sources (wells and springs)
- ✓ Implementing new well registration law in cooperation with VDH and Water Well Association



Format of Five-year Update

- VA Hydro
 - Pilot Project
 - Public Launch
- Narrative submission
 - Alternatives update
 - Water demand management activities
 - Drought Response and Contingency Plan/emergency declaration



State Water Resources Plan



- Information from water supply plans and additional sources
- Cumulative Impact Assessment
- Challenges and Recommendations
- VA Hydro – online, interactive modeling and analysis tool
- Public Education and Outreach



Statewide Findings

- Additional 450 MGD water needed to meet 2040 projected demand
- Surface Water Sources = 77%
- Demands are concentrated
 - Most (97%) surface water withdrawals predicted in ~ 25% of stream reaches
- Most (75%) groundwater withdrawals anticipated are outside Groundwater Management Areas



Challenges & Recommendations

- Gaps in water withdrawal reporting
- Consumptive use
- Threats to water quality
- Conservation
- Conflict Resolution
- Reservoir Site Development





Challenges & Recommendations

- Understanding the impact of unpermitted surface water withdrawals
- Current and future risks to groundwater availability



Challenges & Recommendations

- Critical Infrastructure Deficiencies
- Source Water Protection
- Sea level rise, changes in precipitation patterns, etc.
- Public education and outreach





Key Surface Water Indicators

Changes in August
Low Flow
(decrease in ALF of
 $\geq 10\%$)

Withdrawals as a % of
Sept. Drought Warning
Flows
(withdrawals $\geq 25\%$ of
SDW flows)

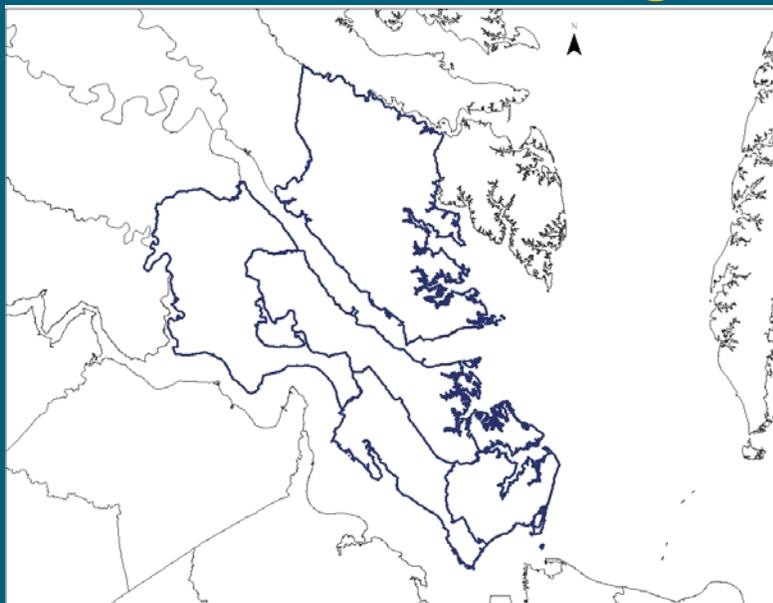
Changes in Drought
of Record Flow
(decrease in DoR flow
 $> 5\%$)

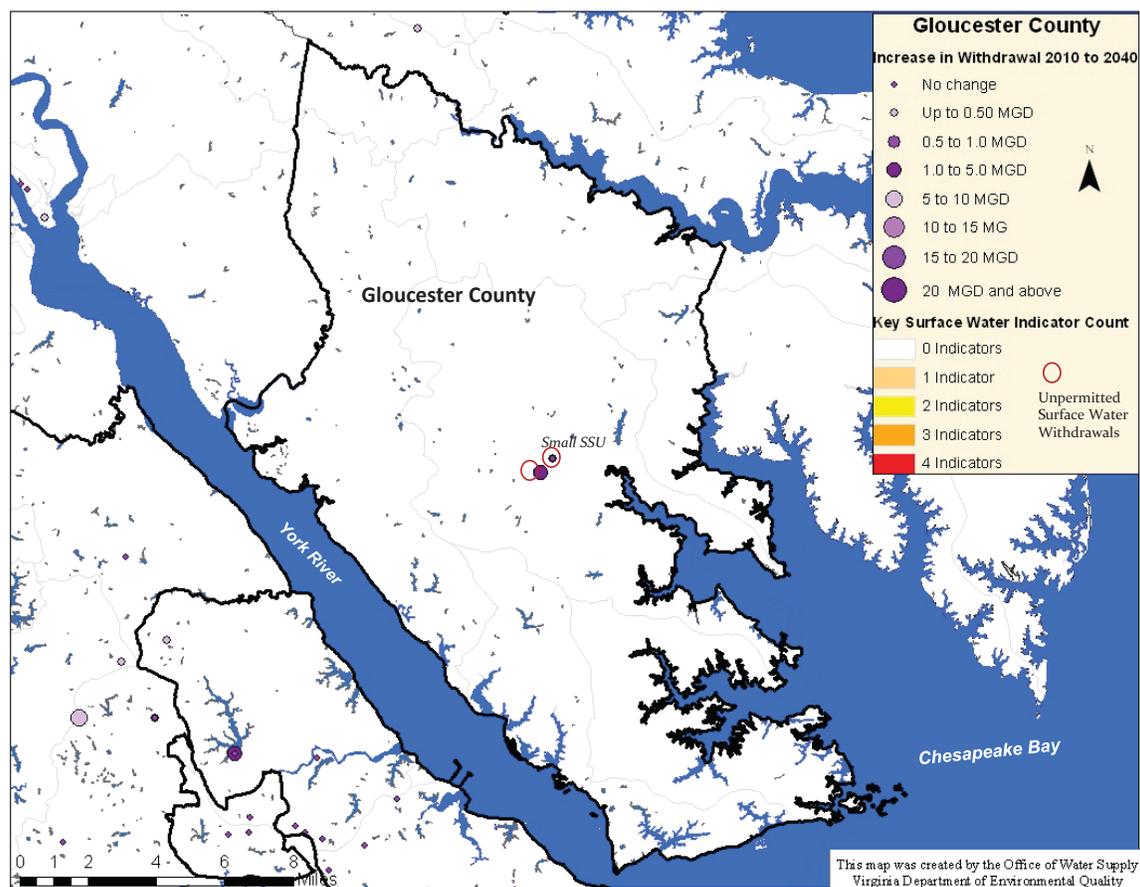
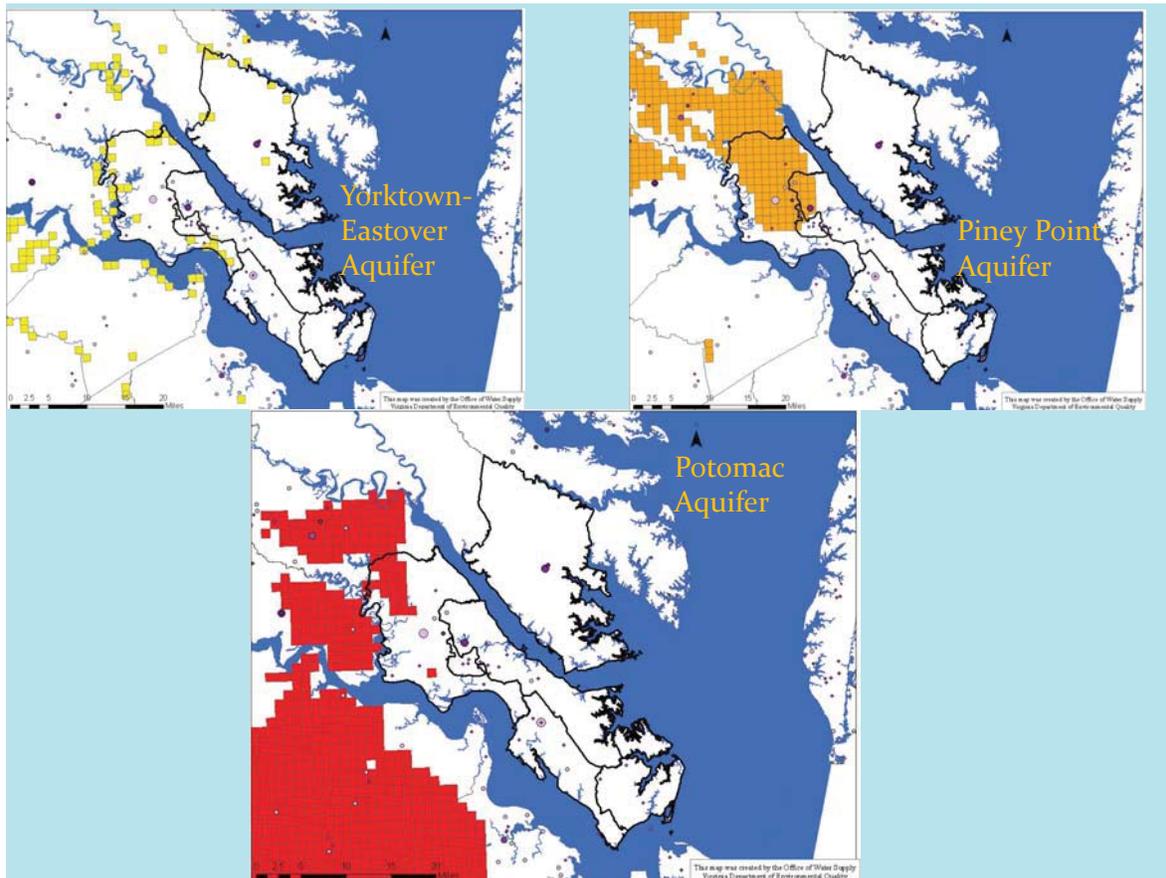
Changes in 7Q10
(decrease in 7Q10 of
 $\geq 5\%$)

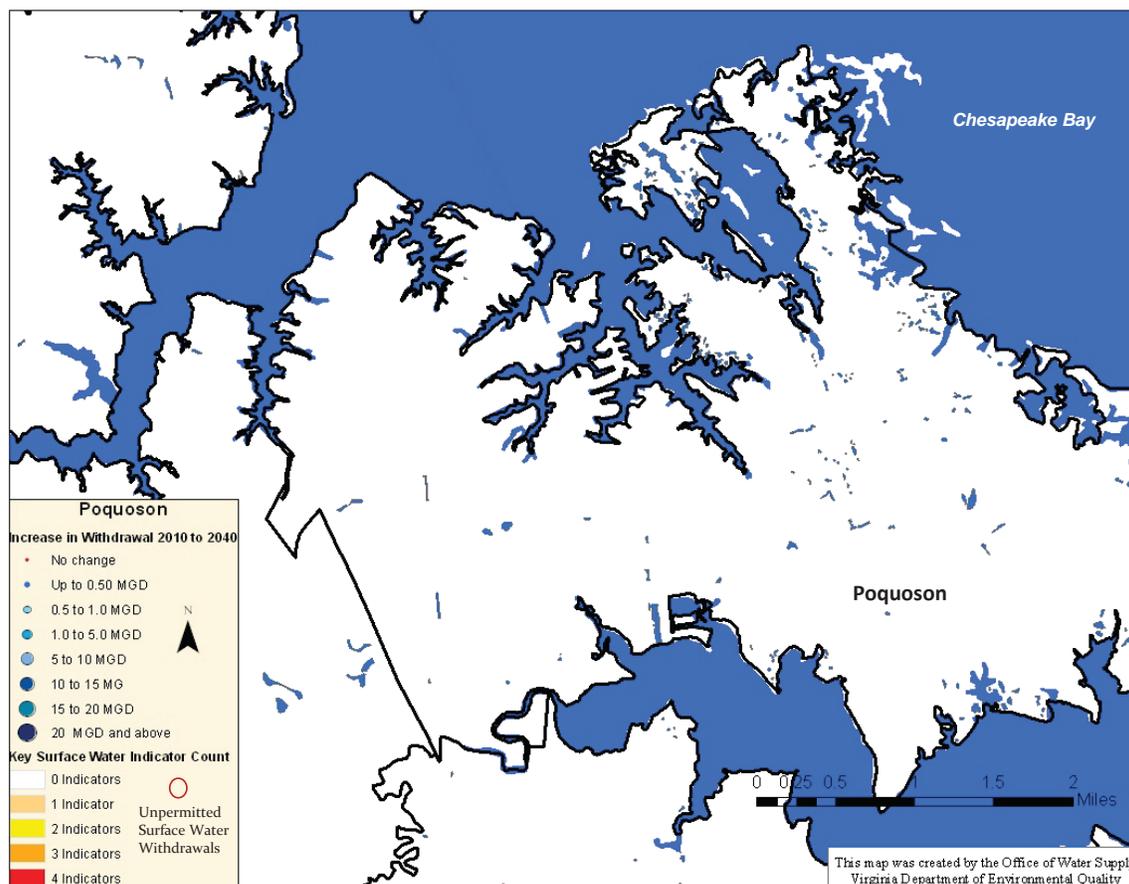
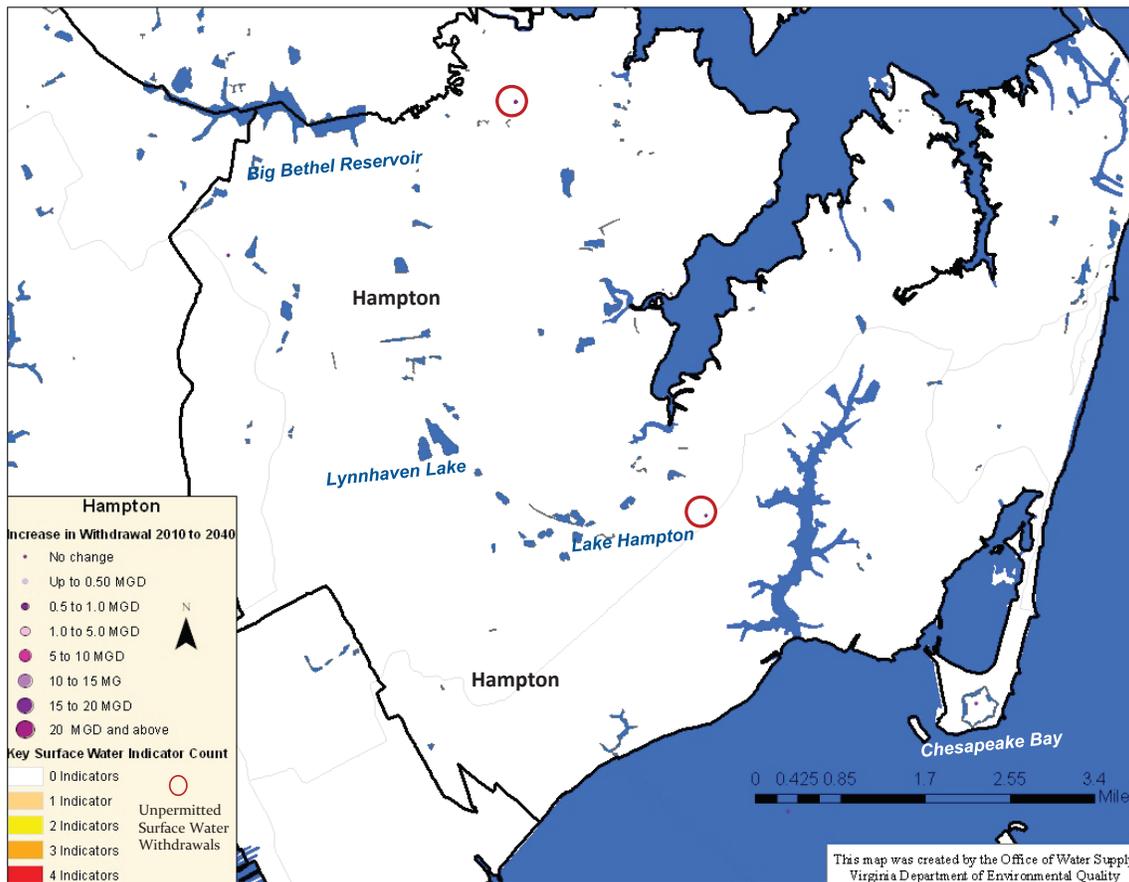
** NOTE: if a screening threshold is met or exceeded, then beneficial uses in that sub-watershed are considered to be at high risk for impacts during times of low flow.

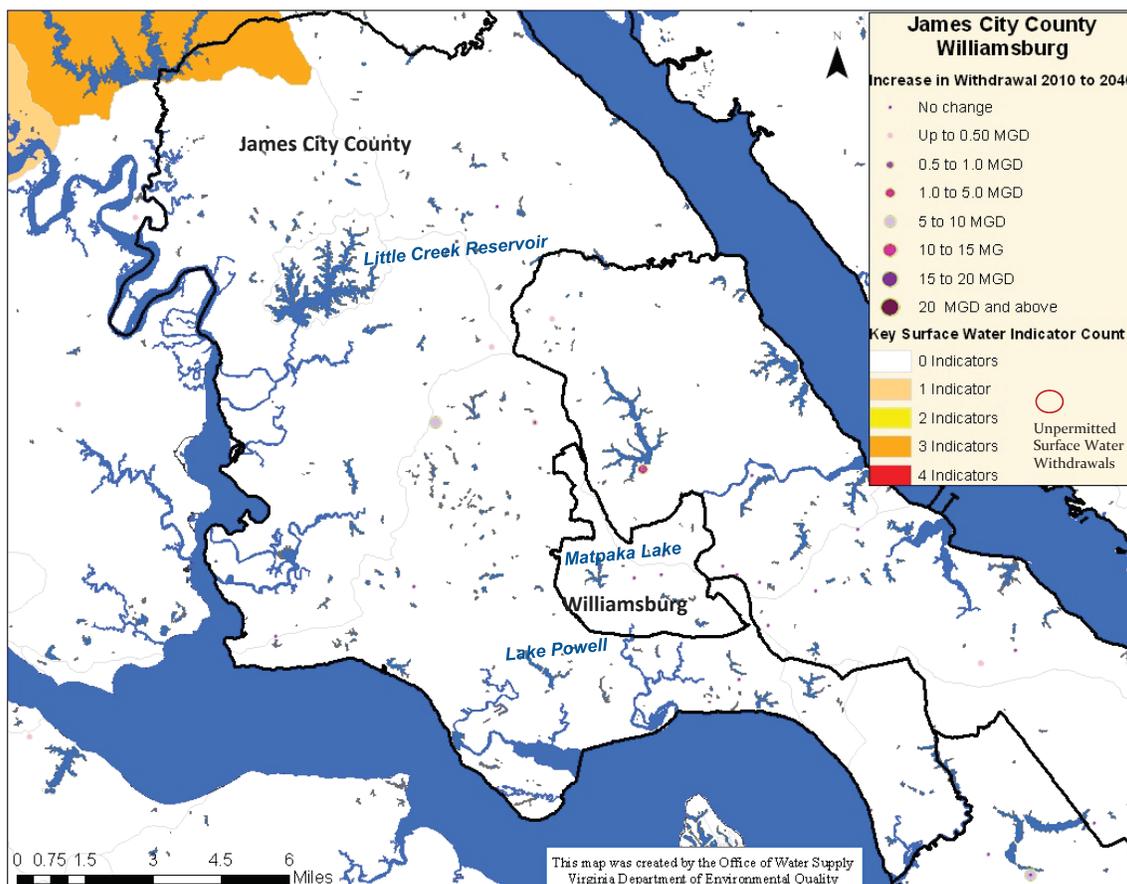
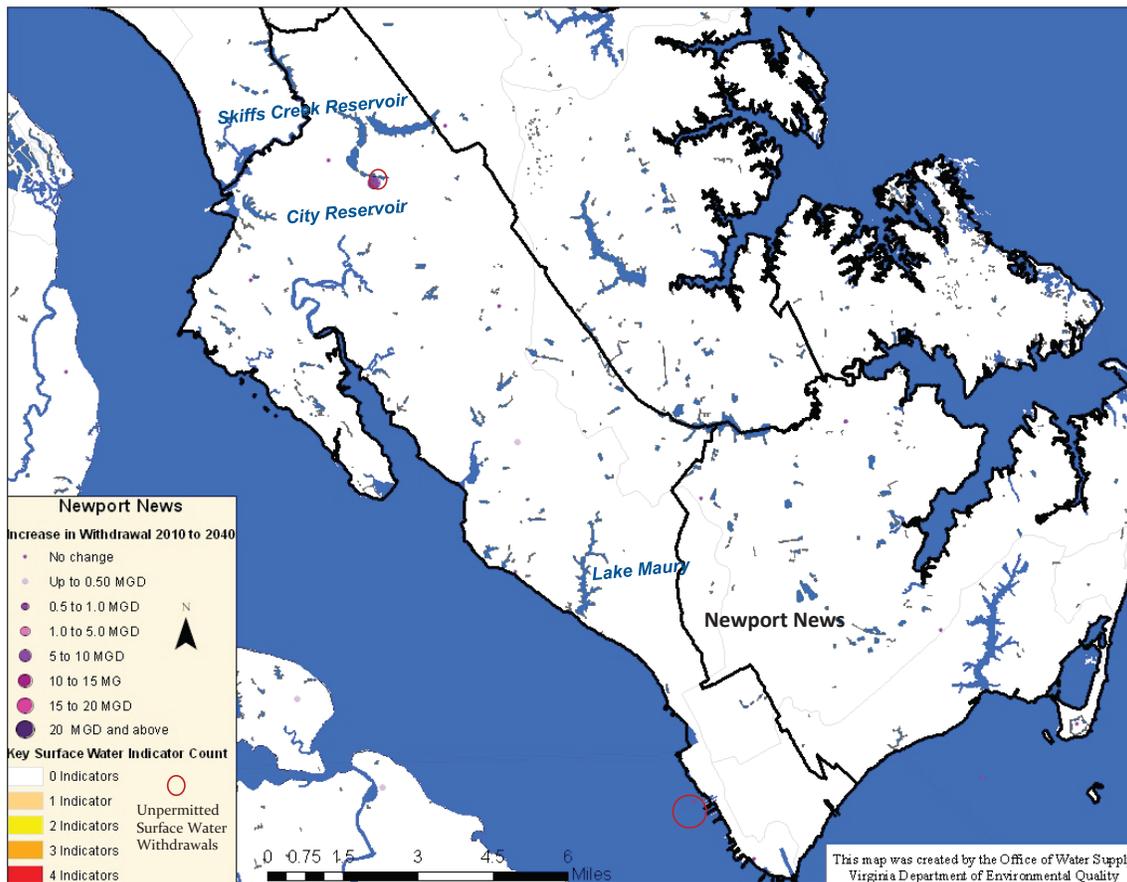


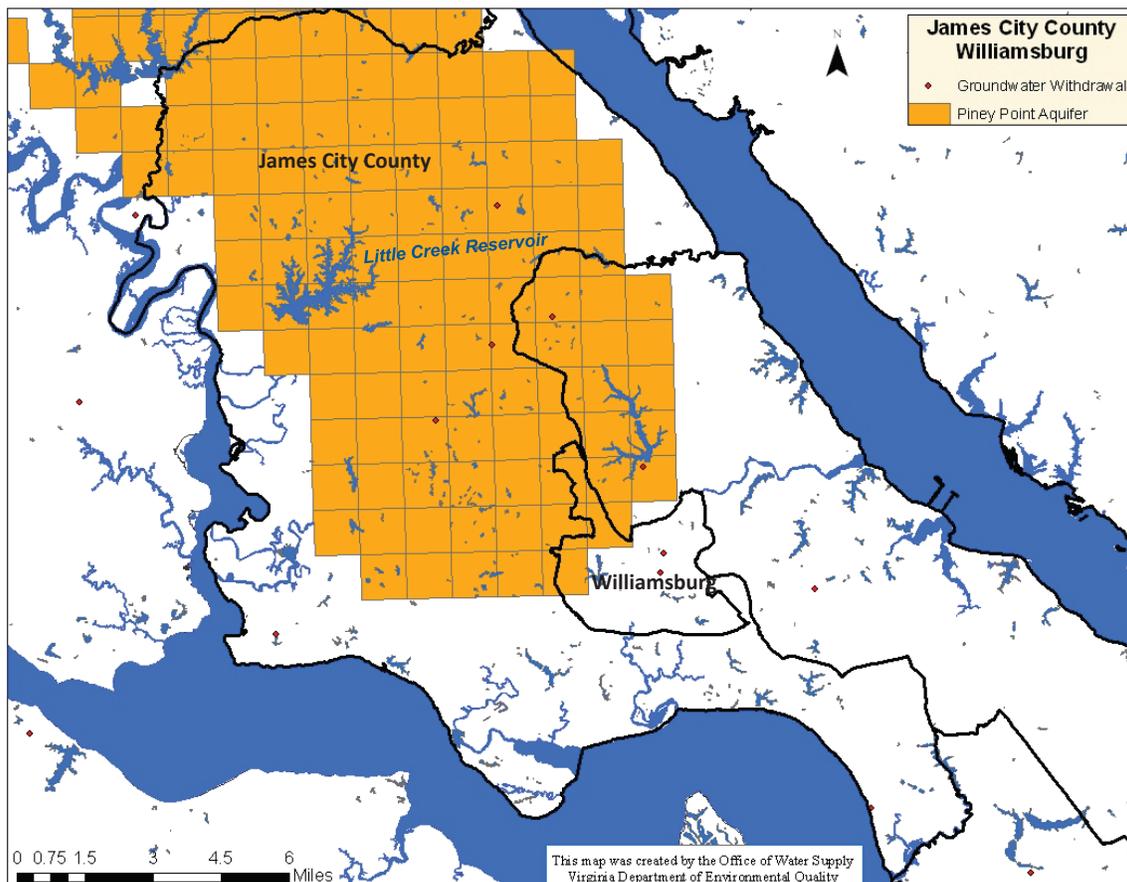
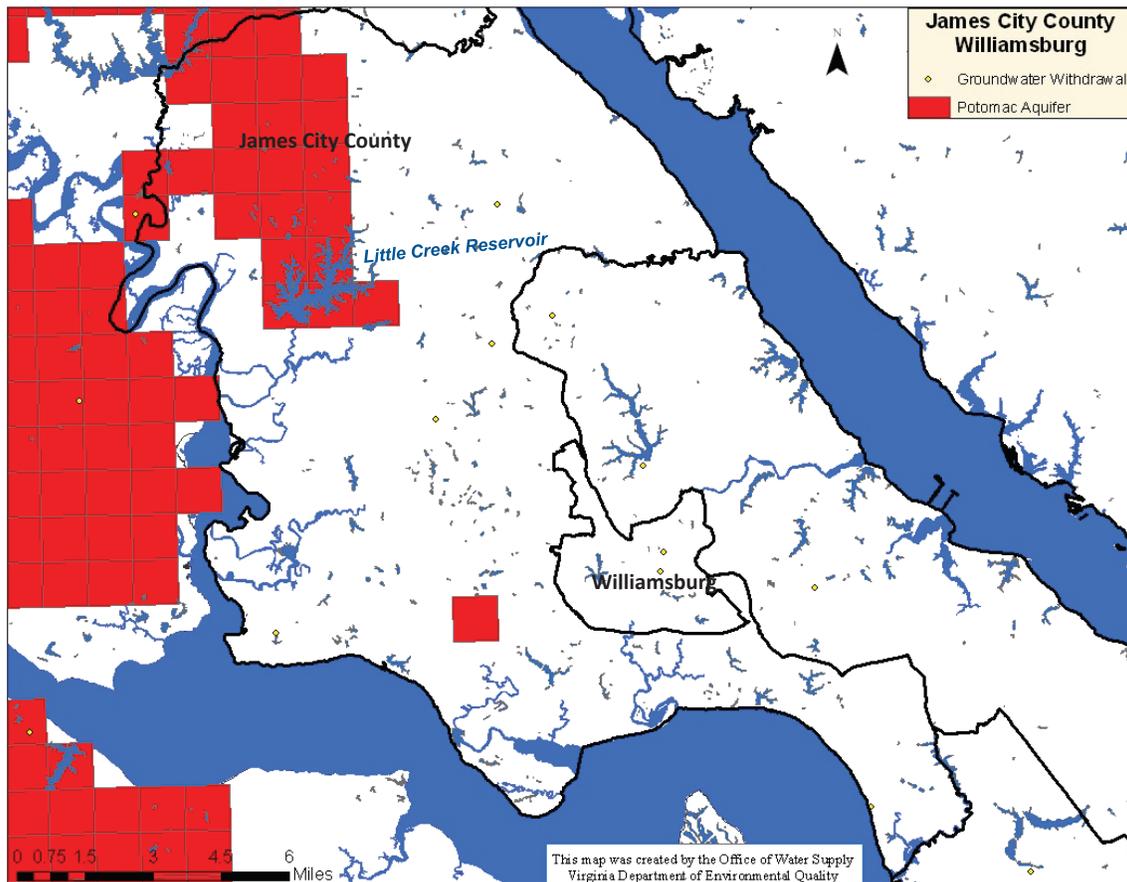
Peninsula Sub-Region

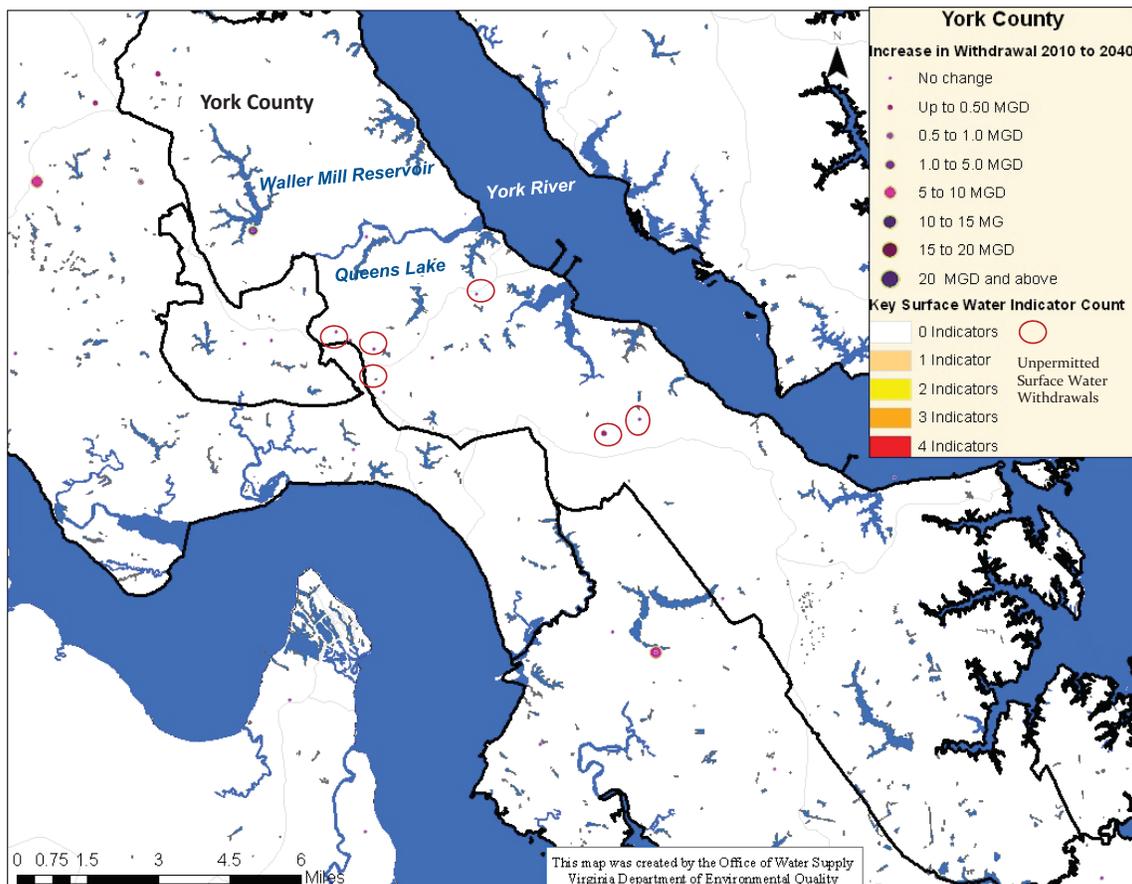
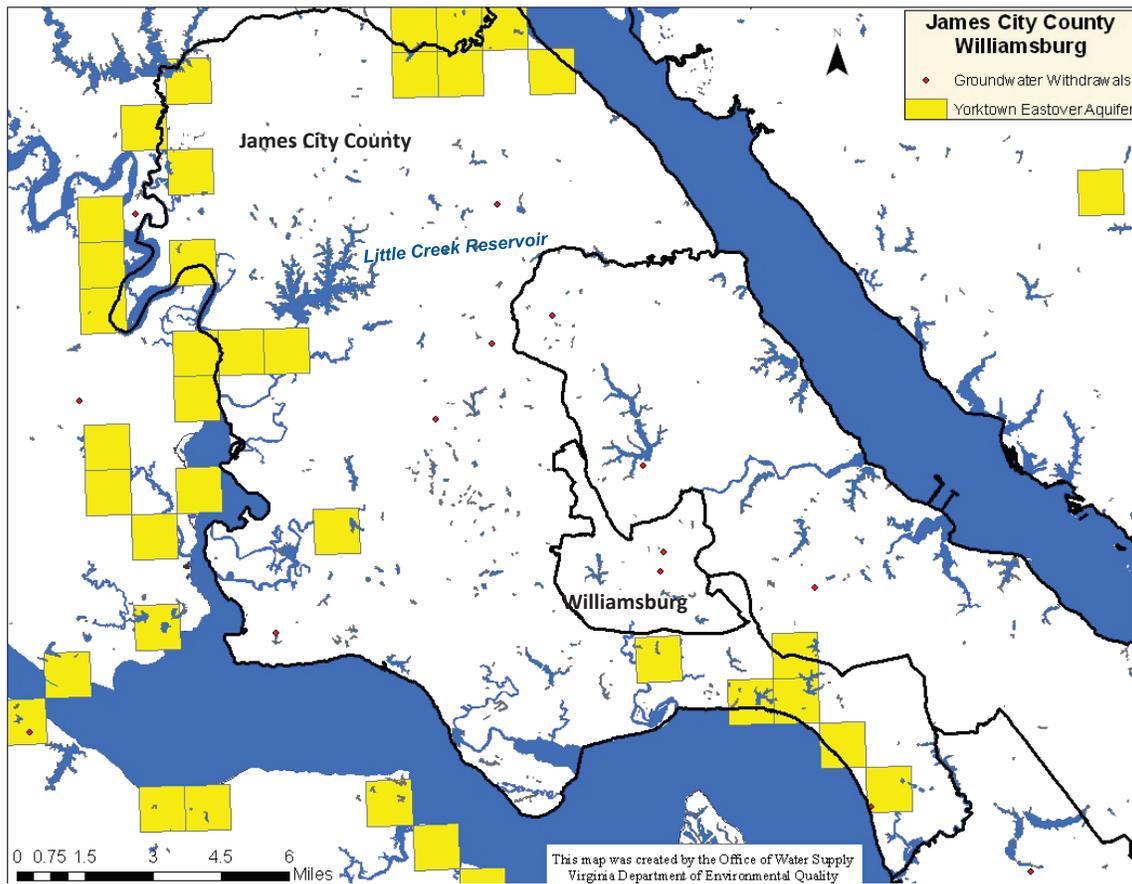


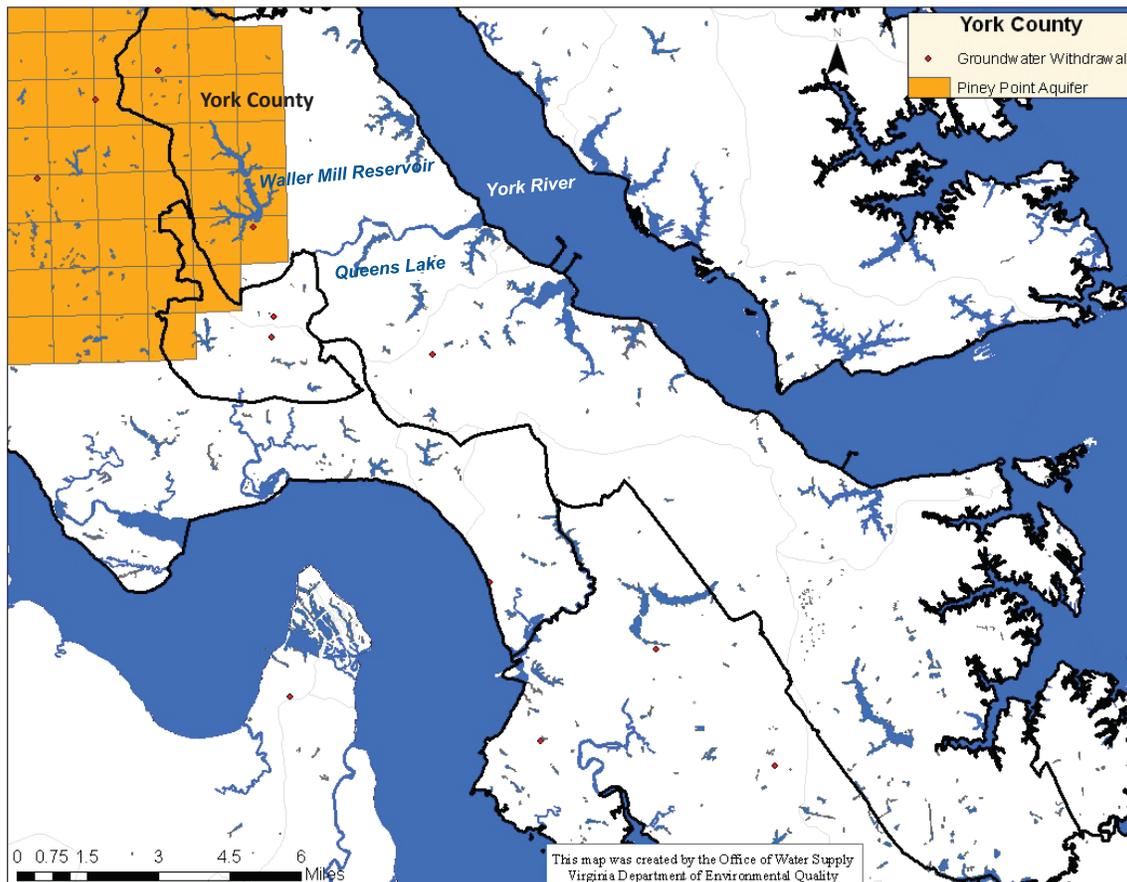






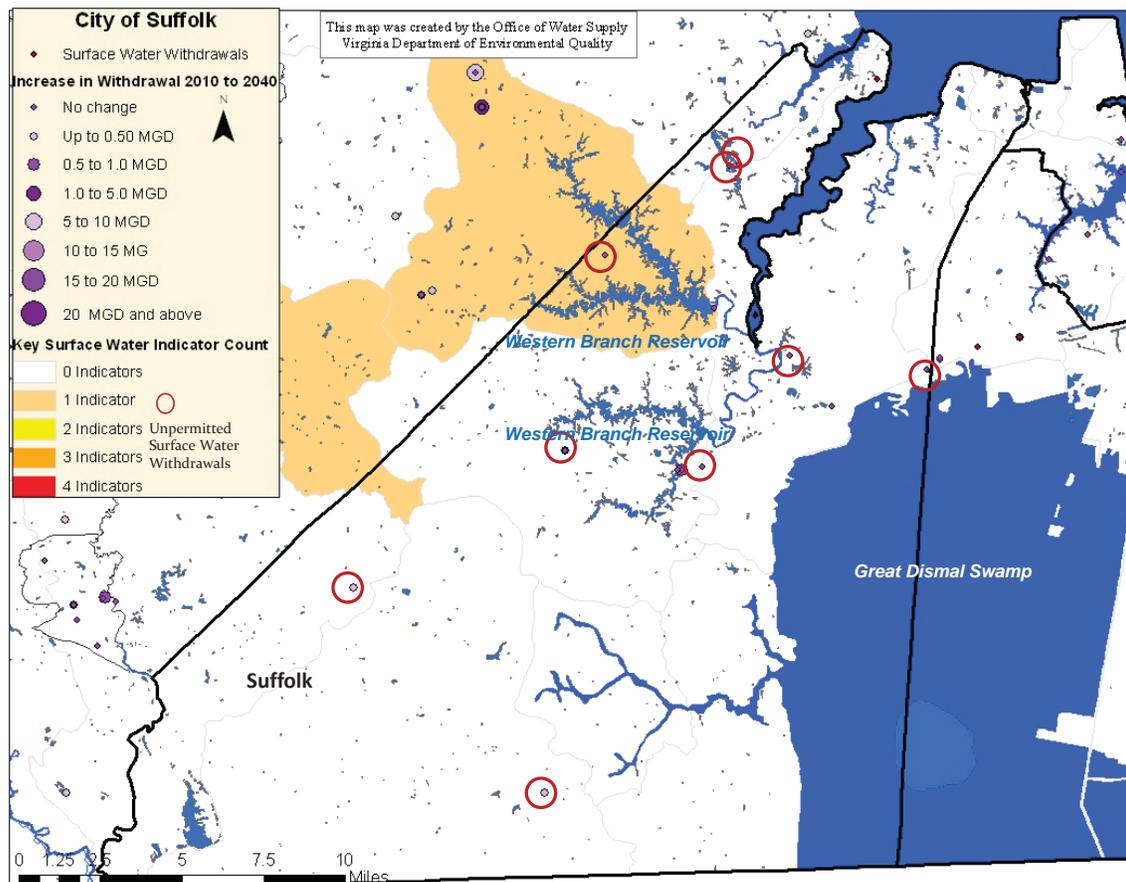
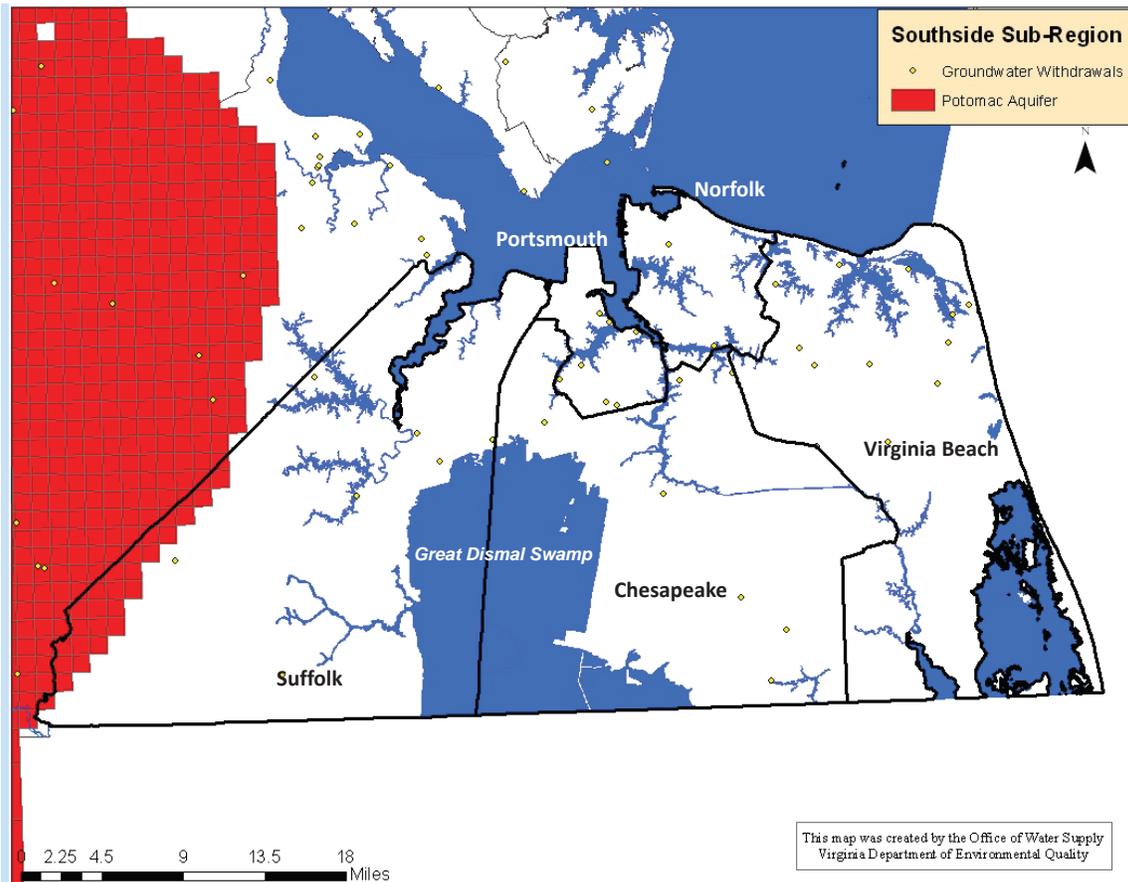


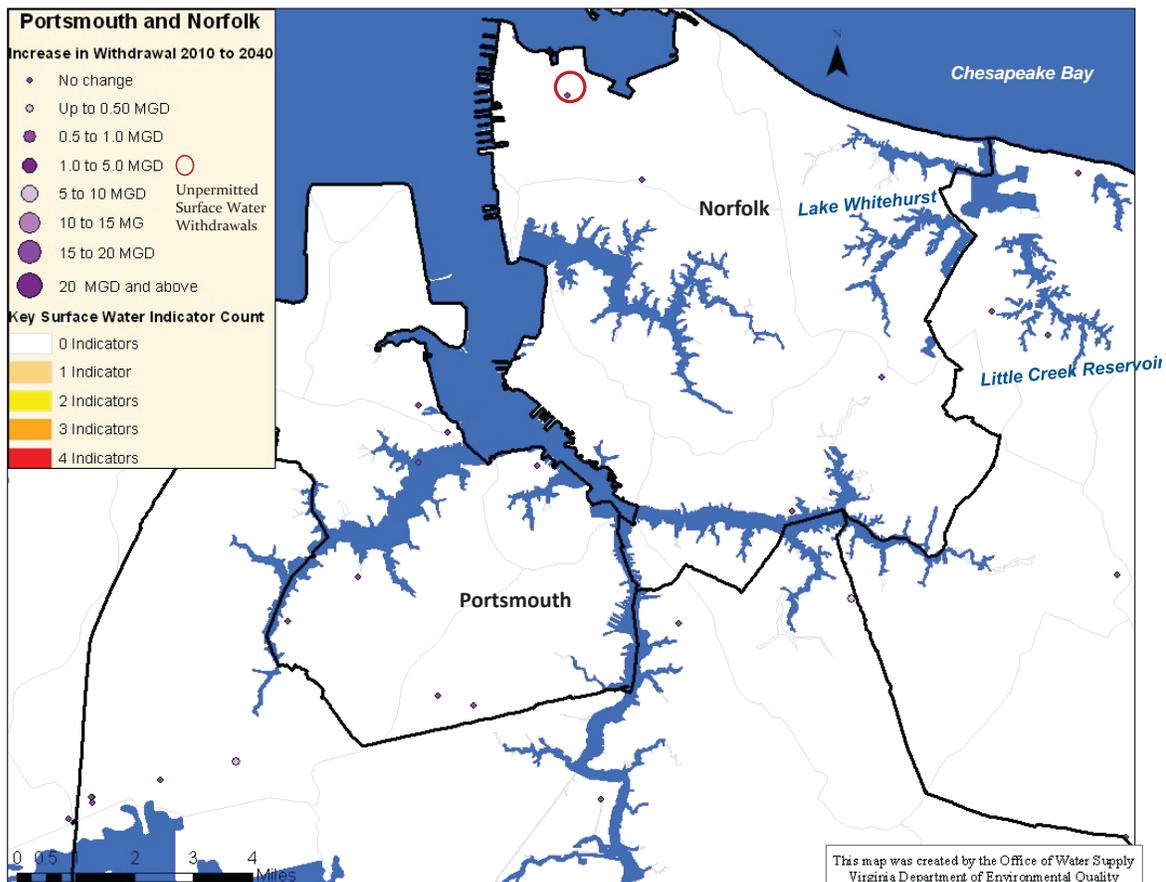
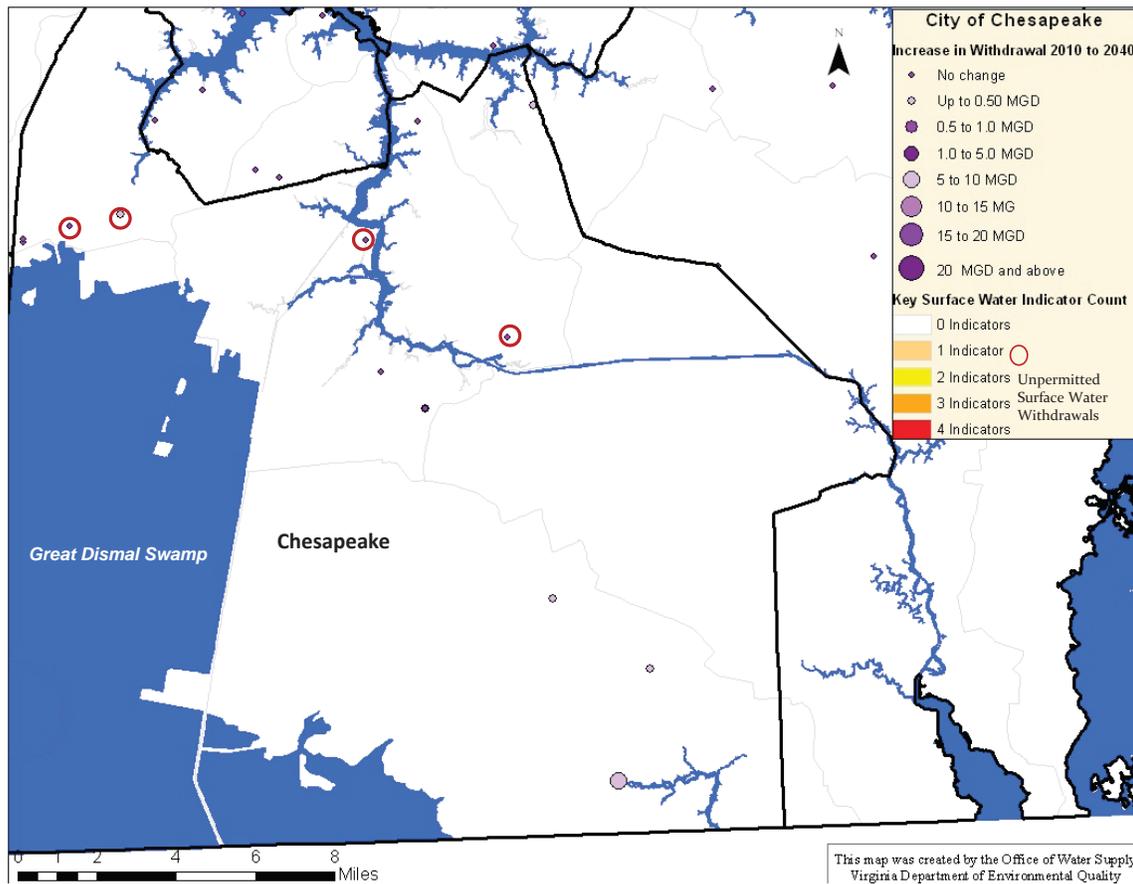


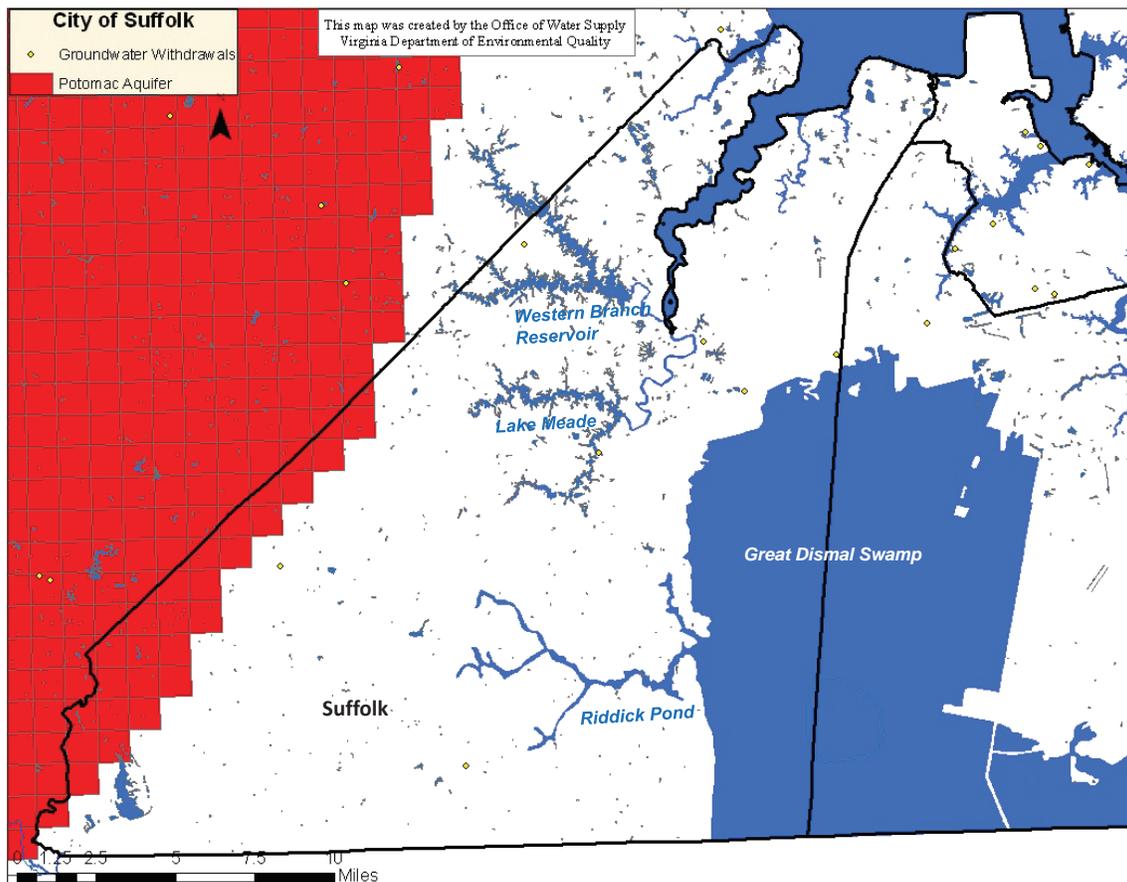
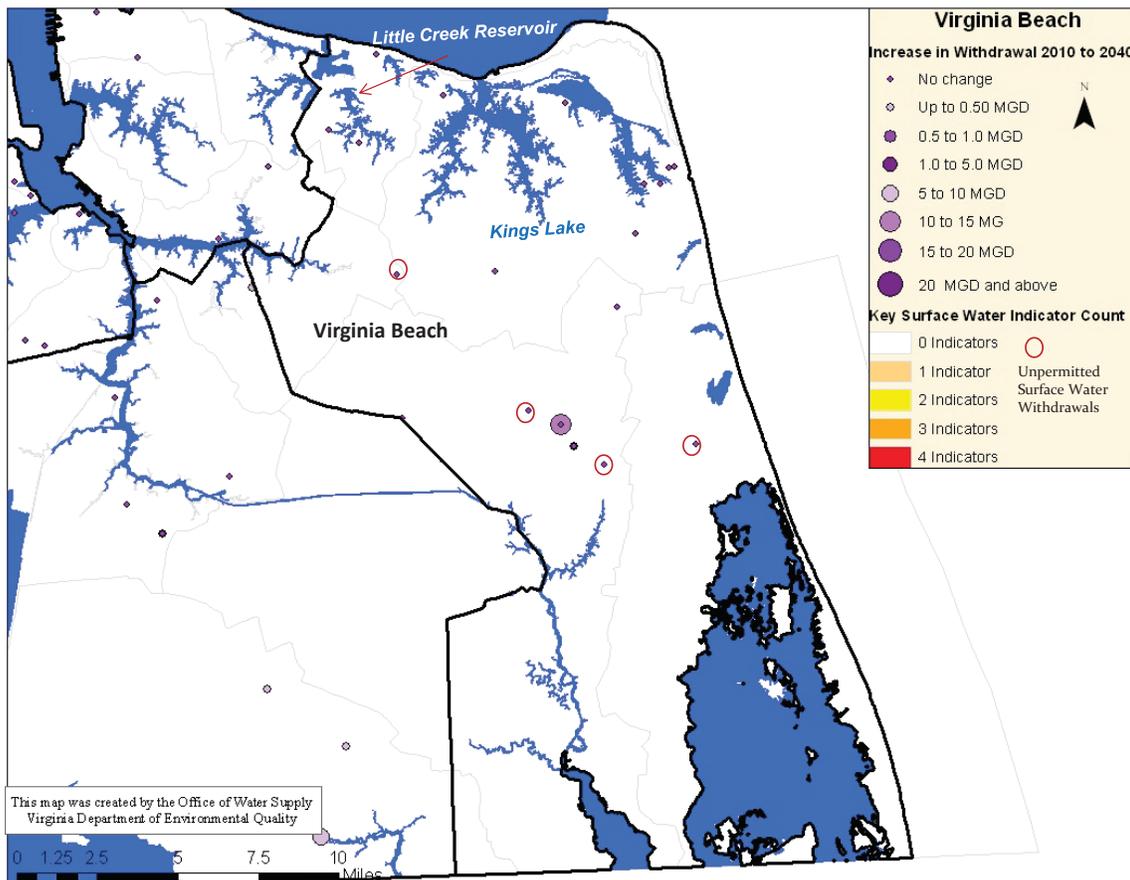


Southside Sub-Region



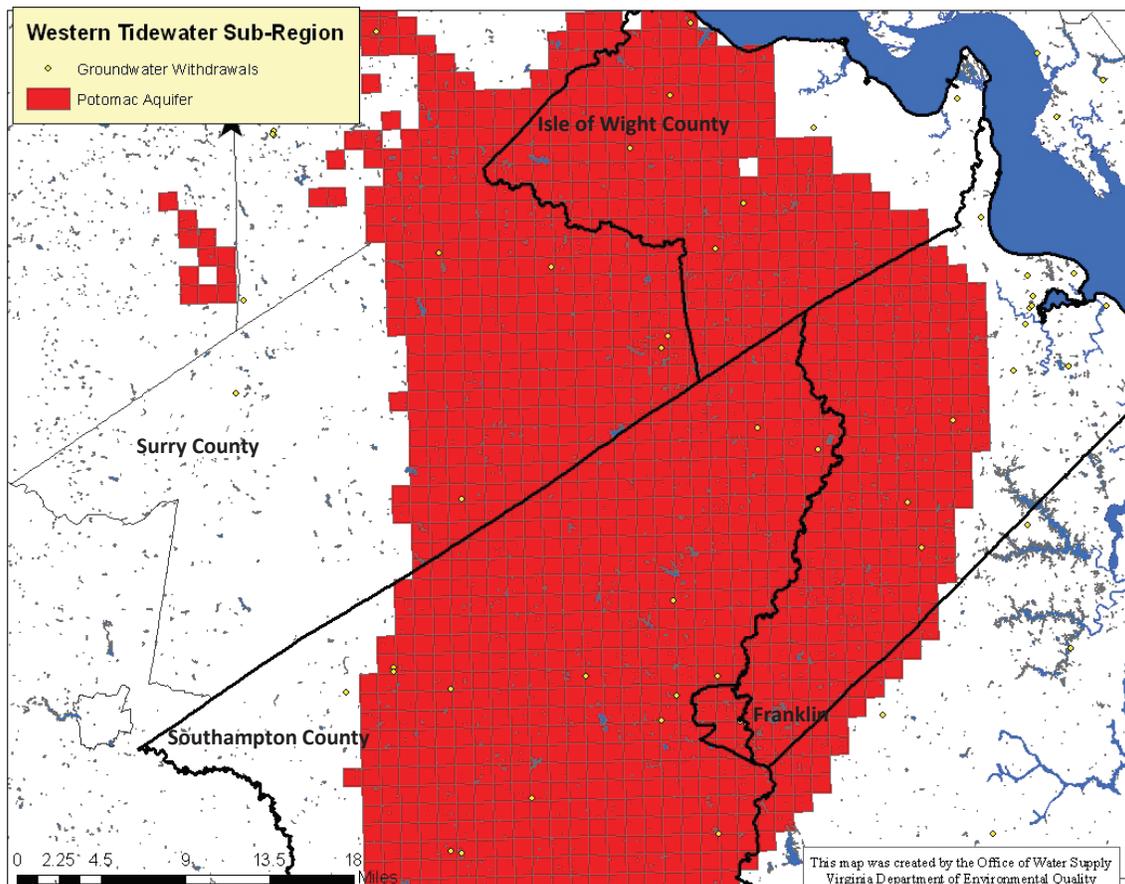
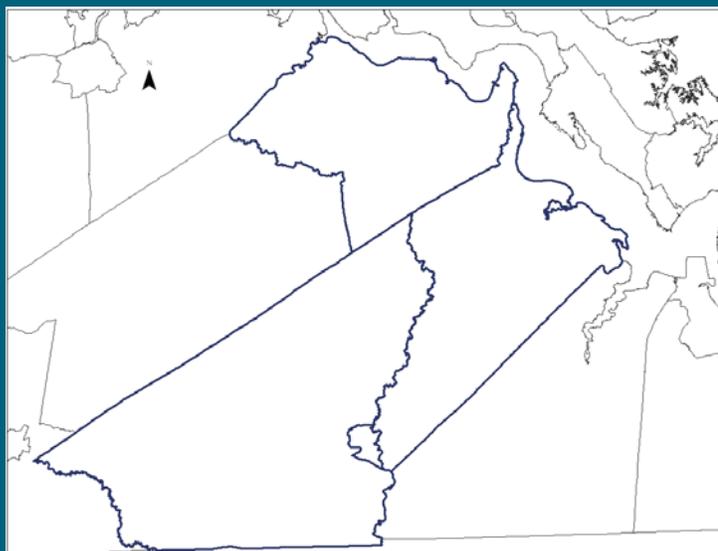


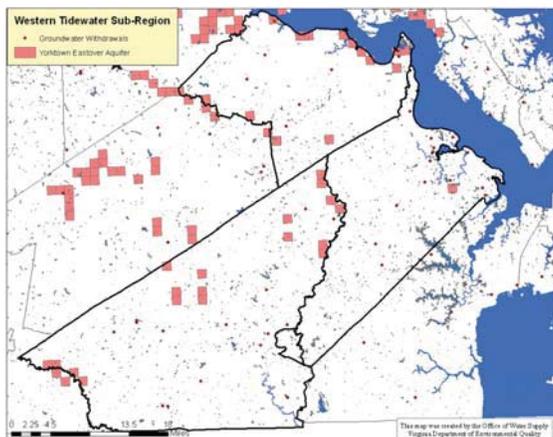
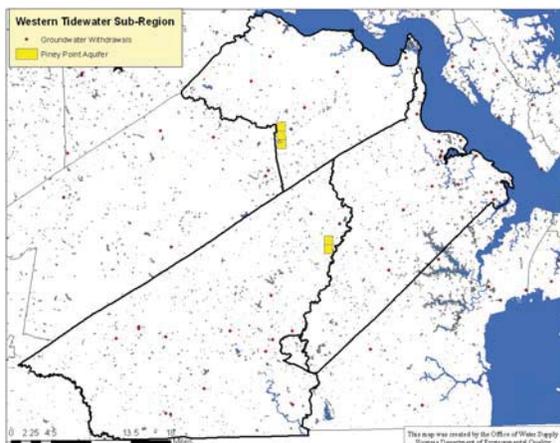
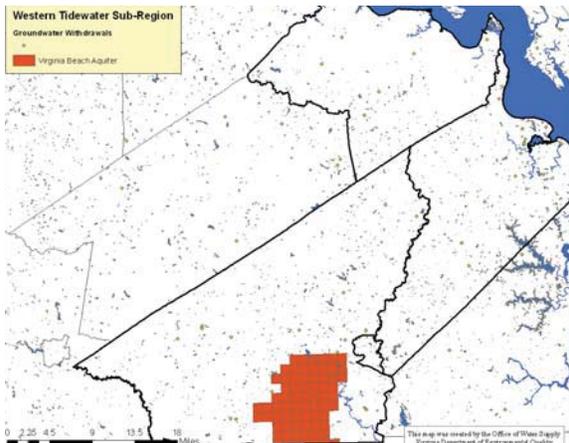
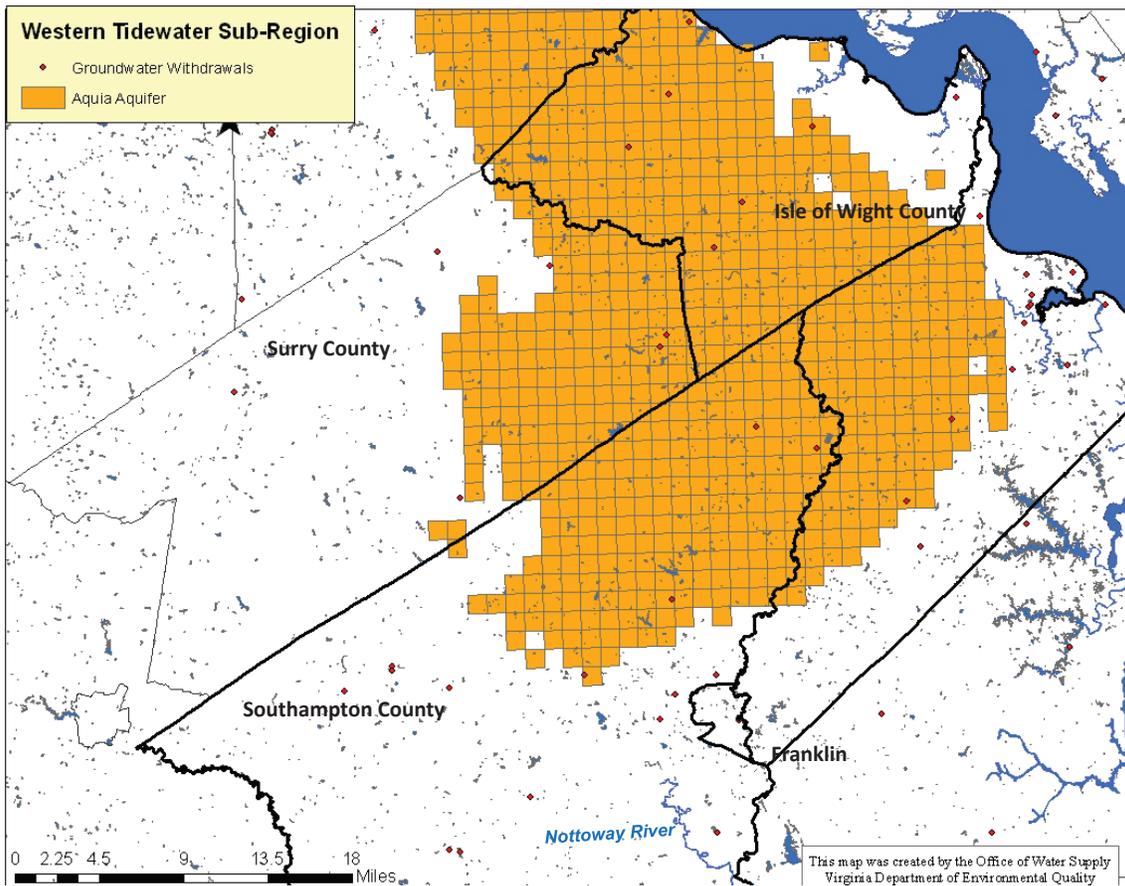


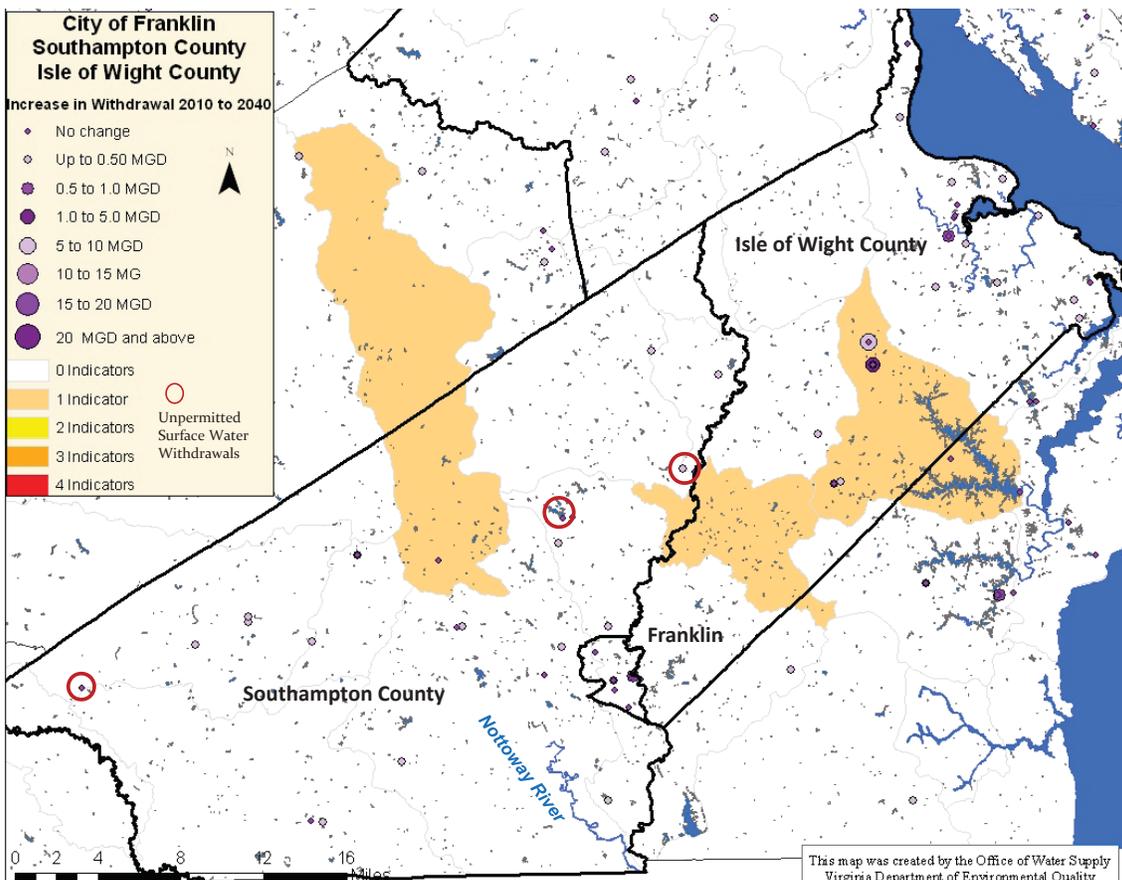
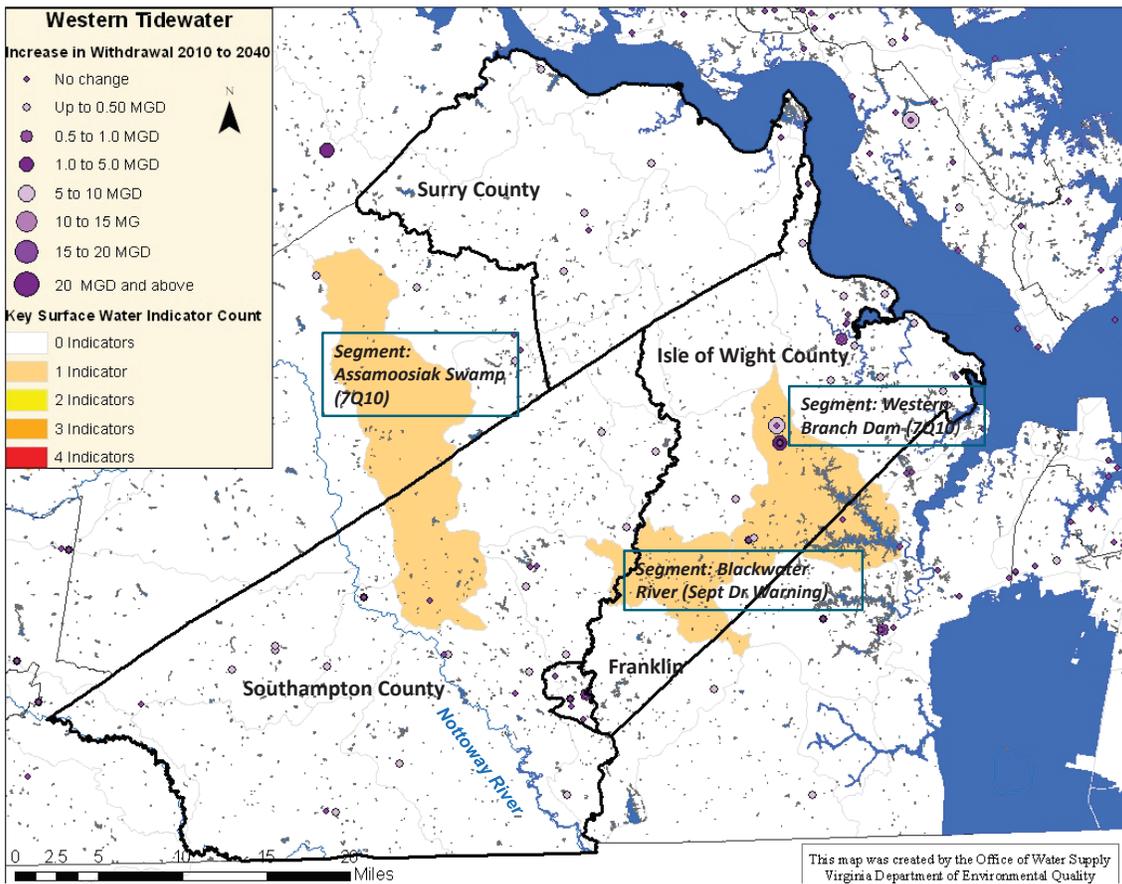


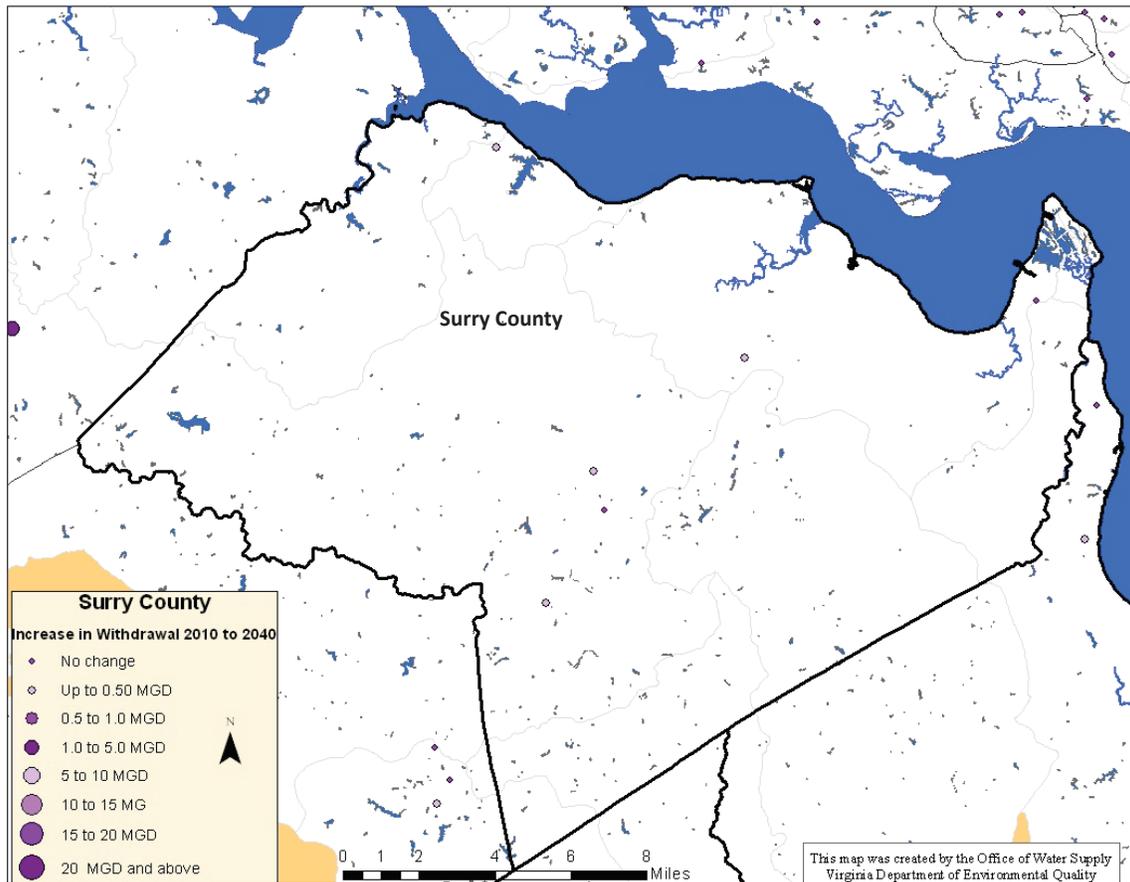


Western Tidewater Sub-Region









Next Steps

- Individual locality visits to:
 - Discuss outstanding compliance items
 - Review projections and alternatives
 - Location information for withdrawals
 - Drought Response and Contingency Plan
- VA Hydro interactive to update information





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