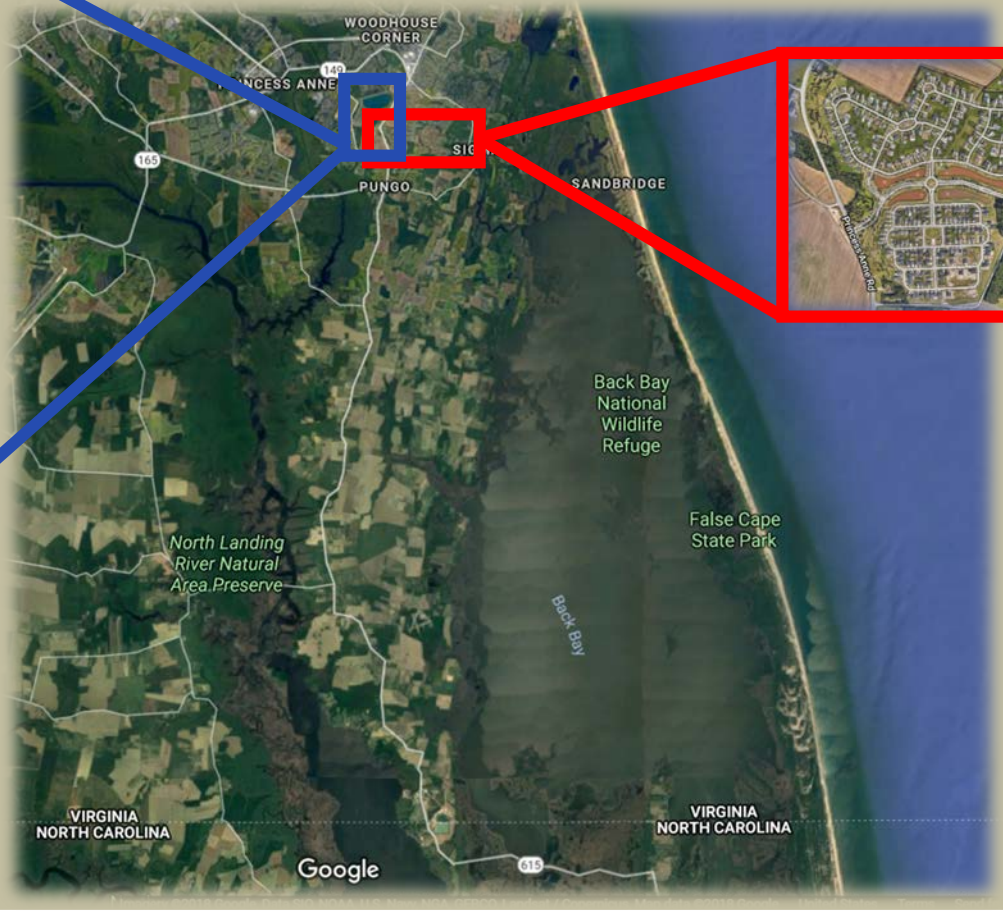
ASHVILLE PARK / SHERWOOD LAKES UPDATE BRIEFING

NOVEMBER 15, 2018

OVERVIEW

- Drainage Patterns – Ashville Park & Sherwood Lakes
- Sherwood Lakes Drainage Improvement Projects
- Ashville Park Drainage Improvements – Phase I
- USGS Rain/Tide Gauges
- Wind Tides vs. Rainfall Events
- Sea Level Rise Information
- Storm Water Quality
- Break-Out Stations

PROJECTS IN RELATION TO BACK BAY



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ASHVILLE PARK DRAINAGE IMPROVEMENTS - PHASE I
CIP 7-047

DRAINAGE BOUNDARY

SHERWOOD LAKES ANALYSIS

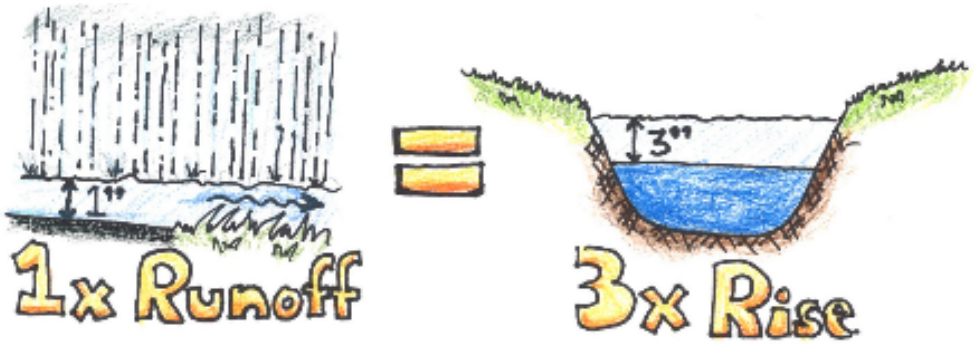
Almost 15 inches of rainfall occurred over a 3 day period between September 19th and 22nd, 2016, raising the North Lake elevation from approximately 4.5 ft to 6.9 ft. Just 16 days later, almost 14 inches of rain fell between October 8th and 9th, 2016. The October 2016 event was greater than the 1000-year, 24-hour storm.

North Sherwood Lake October 10, 2016

SHERWOOD LAKES ANALYSIS

Calculations

- Normal water level of the lakes is elevation 4.0.
- One inch of runoff causes water level in the lakes to rise about 3 inches, so 5.6 inches of runoff can cause roadway flooding.



- Conclusion - Keep normal water surface of lakes between elevations **3.0** and **3.5** to handle more runoff.

Elevations in feet, NAVD88

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SHERWOOD LAKES

PROJECT

- Pump Station, Interconnect Pipe and Outfall Combination

SCHEDULE

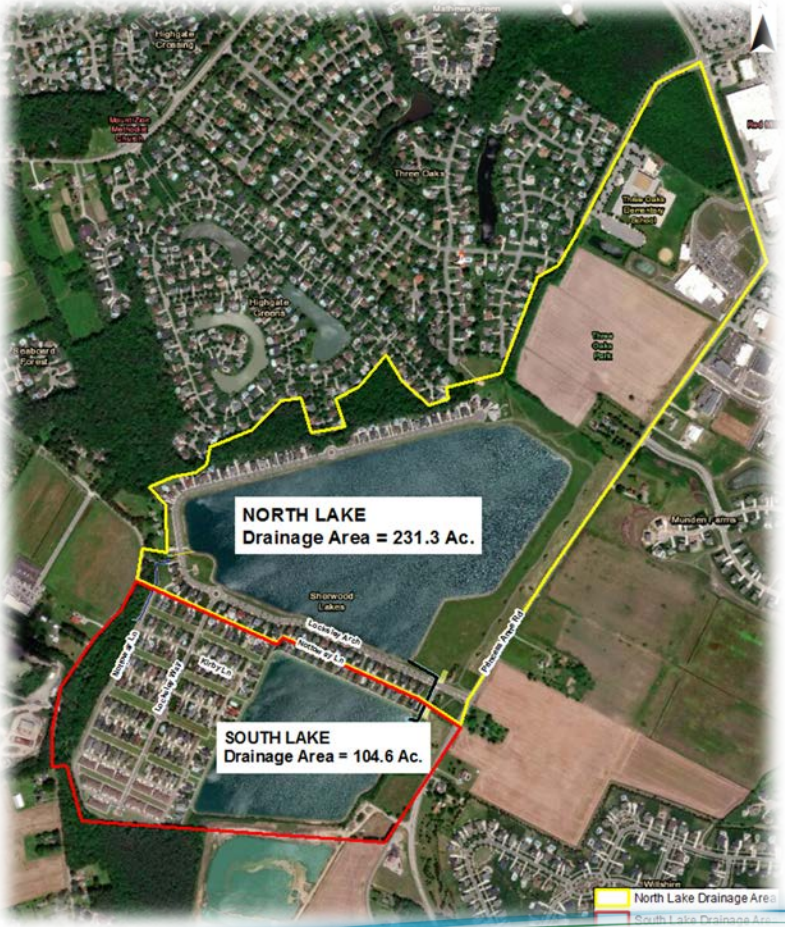
- Construction Dec. 2018 to Nov. 2019 by Kevcor Construction and by Tidewater Utilities (two separate projects)

COSTS

- Project funding
  - Pump Station & outfall = $1.9 M
  - Interconnect pipe = $1.1 M

CONTACTS

- Esther Dornin, PM 385-4131
- John Raper, On Site Inspector 284-5444



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PUMP STATION

Maintains lake elevation 3.0 to 3.5

INTERCONNECT PIPE

42” pipe connects lakes. Only North Lake needs pump station

OUTFALL

Sensors shut off pumps if downstream ditch is at capacity

N. SHERWOOD LAKE PUMP STATION & OUTFALL

SHERWOOD LAKES INTERCONNECT PIPE

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SHERWOOD LAKES PUMPING PROTOCOLS

Temporary pumping (current)

- Manual operation of pumps to maintain elevation between **3.0 to 3.5 ft** (NAVD88 Typ)
- Pumping after rainfall event to maintain elevation

Permanent pumping

- Interconnect pipe maintains same elevation in both lakes
- Water elevation maintained between Elevation **3.0** and **3.5**
- Lakes handle 12” to 14” rainfall
- Pumping after rainfall event to maintain base elevation **3.0** to **3.5**

Ashville Park Drainage Improvements – Phase I 7-047

- 3 new Stormwater Ponds
- Expand an Existing Pond
- Channels Connecting Ponds
- Regrade and Stabilization of Existing Ditches
- Stormwater Pump Station
- Gated Control Structure at Flanagans Lane
- Ditch and Culvert Improvements at New Bridge/Sandbridge Road Intersection

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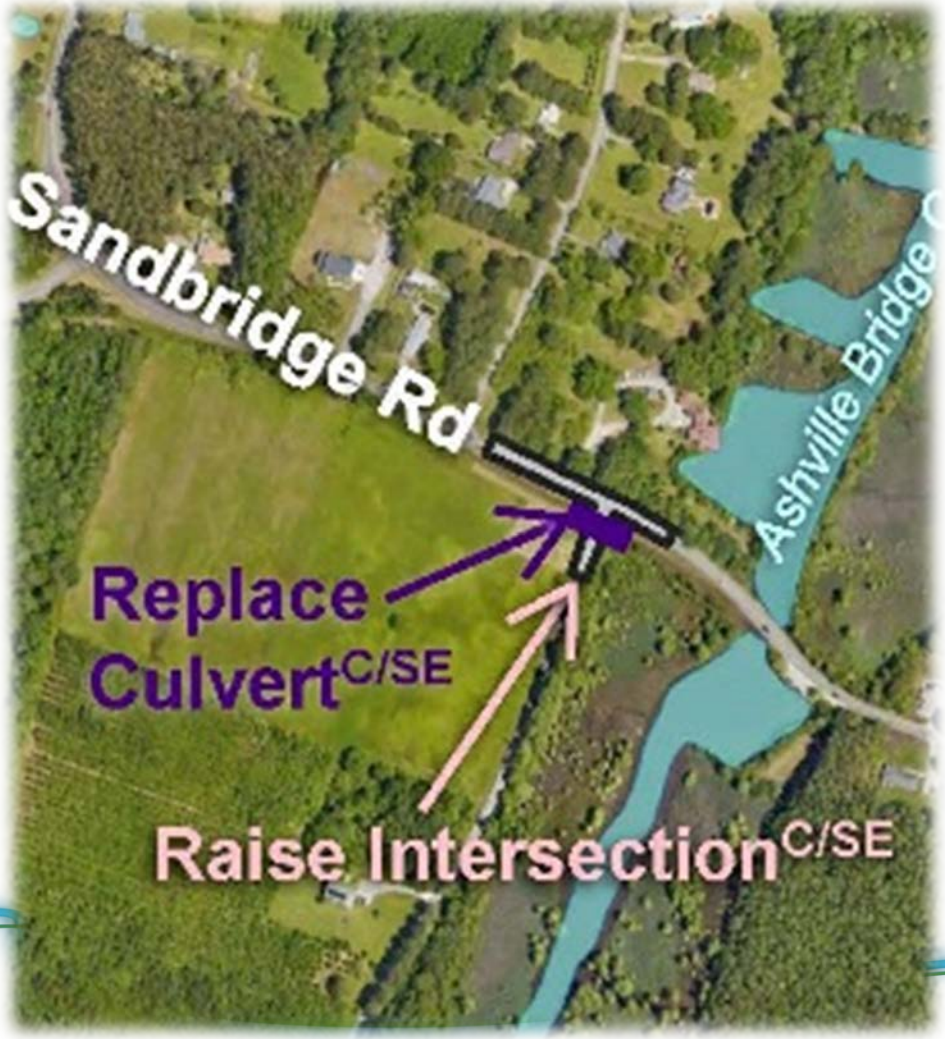

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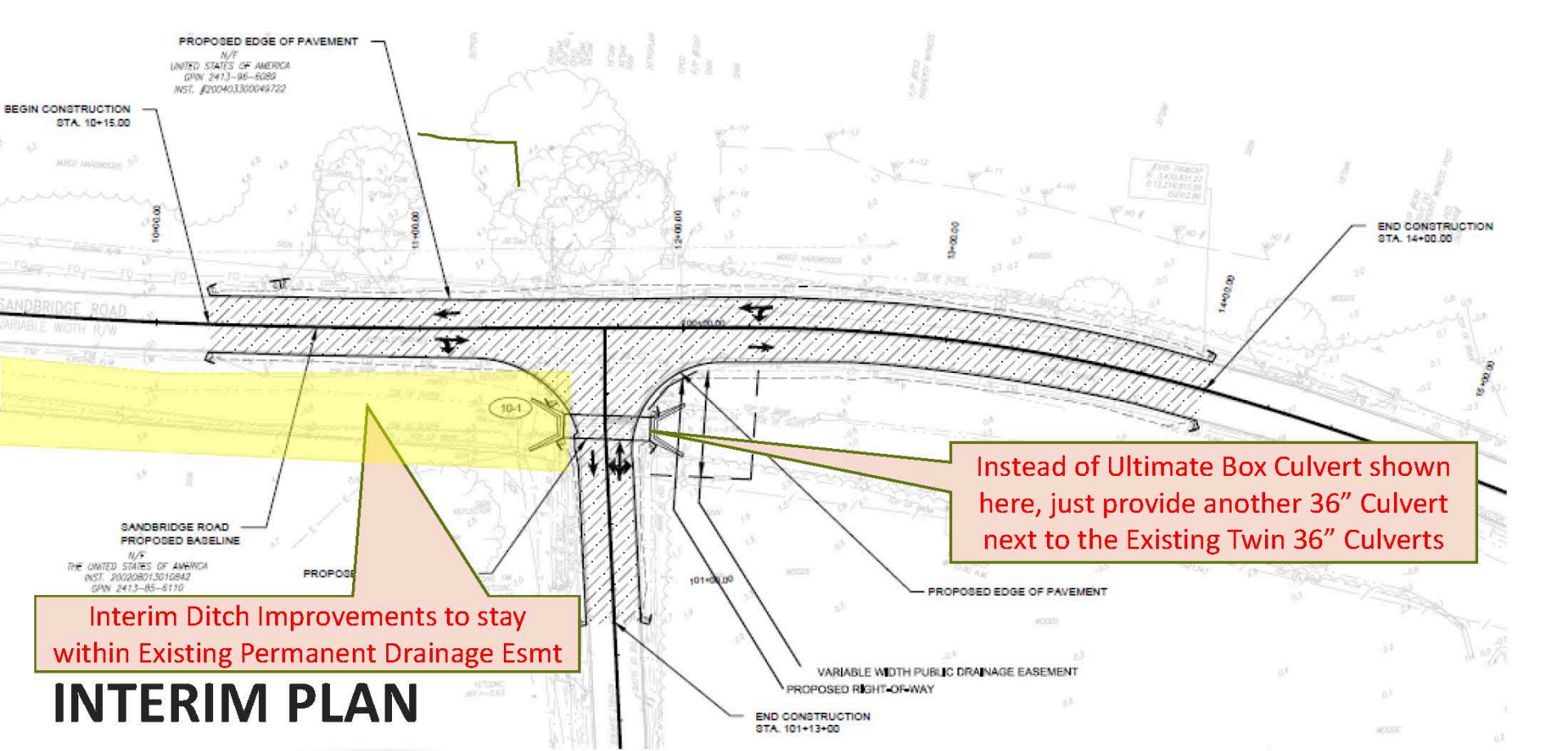

Instead of Ultimate Box Culvert shown here, just provide another 36” Culvert next to the Existing Twin 36” Culverts

Interim Ditch Improvements to stay within Existing Permanent Drainage Esmt

INTERIM PLAN

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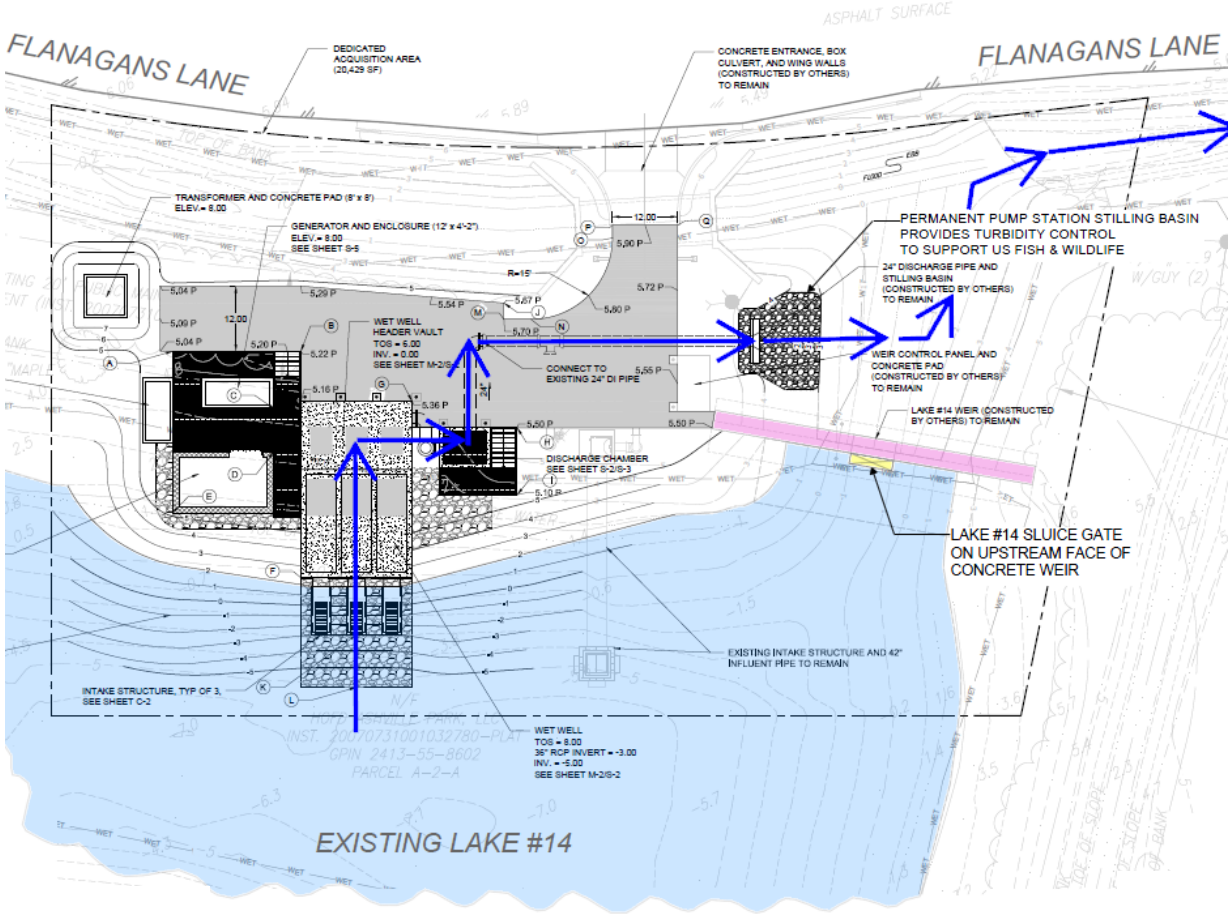
POTENTIAL ULTIMATE ALIGNMENT



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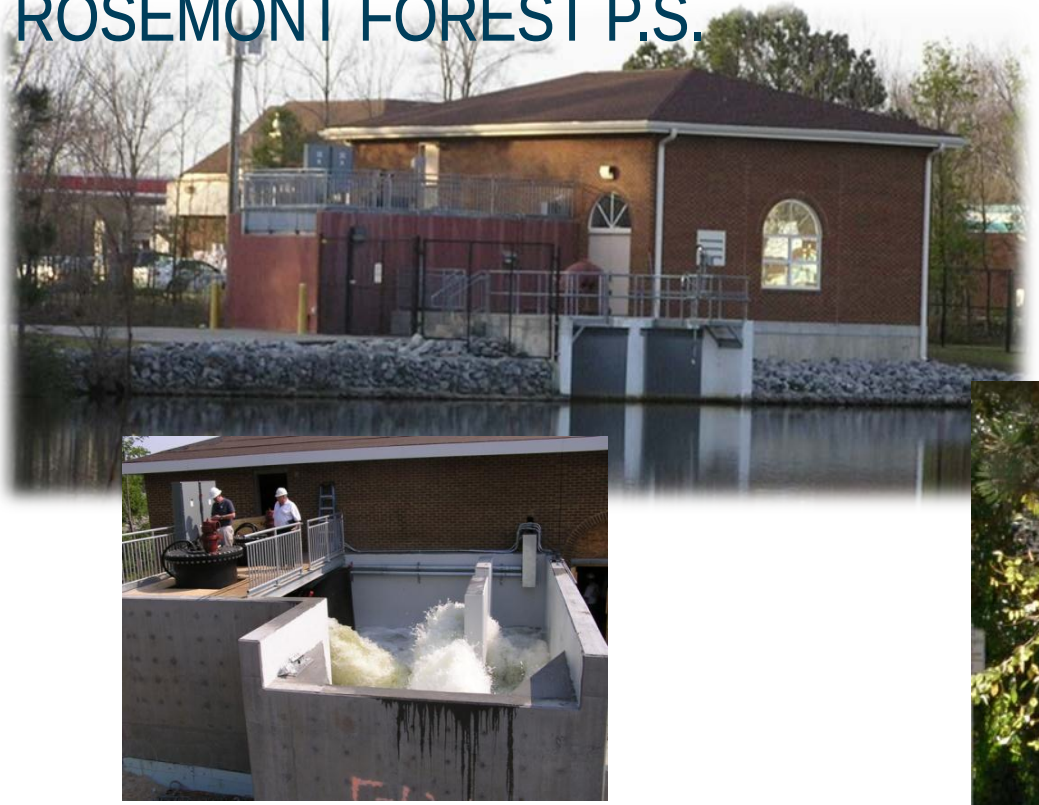
ROSEMONT FOREST P.S.



POINCIANA P.S.

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ASHVILLE PARK OPERATIONS PUMPING PROTOCOLS

- **Temporary Plan (Until Lake #14 Weir is Built):**
  - Manually Operating Pump generally based on a 'significant rainfall event' of 3-inches or greater expected rainfall.
  - As pre-emptive action, attempt drawdown water surface levels in all lakes to Elevation **1.0 ft** ahead of a significant rainfall event.
- **Permanent Plan (After Lake #14 Weir is Built):**
  - Maintaining water surface in lakes at Elevation **2.0 ft**
  - As pre-emptive action, drawdown water surface levels in all lakes to Elevation **1.0 ft** ahead of a significant rainfall event.

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PW OPS - LAKE # 14 WEIR CONSTRUCTION PHOTOS

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PW OPS - LAKE #14 WEIR SCHEDULE OF ACTIVITIES

COMPLETED:

- Weir wall structure is poured and forms stripped
- Sheet piles still in place to facilitate Intake Structure installation
- Intake Structure under way and projected to be complete before the end of the month, including the crane demobilization by the end of November

ITEMS REMAINING:

- Discharge piping
- Discharge channel grading and stabilization
- Roadside ditch regrading/aligning
- Box culvert installation (December / January)
- Electrical and SCADA items

ASHVILLE PARK - CITY SCHEDULE OF ACTIVITIES

- DESIGN:

Stormwater Pump Station and Interim Sandbridge Road/New Bridge Road Intersection and Drainage Improvements	End May 2019
Flanagans Lane/Sandbridge Road Outfall Channel Maintenance	End Nov 2018
Princess Anne Farm Ditch Stabilization	End May 2019

- CONSTRUCTION:

Stormwater Pump Station and Interim Sandbridge Road/New Bridge Road Intersection and Drainage Improvements	June 2019 – December 2020
Flanagans Lane/Sandbridge Road Outfall Channel Maintenance	January 2019 – April 2019
Princess Anne Farm Ditch Stabilization	June 2019 – December 2019

ASHVILLE PARK – DEVELOPER SCHEDULE OF ACTIVITIES

- DESIGN:

Start of Engineering	July 23, 2018
Phase I Improvements Approval Expected	May 1, 2019

- CONSTRUCTION:

Construction	Begins June 1, 2019
Substantial Completion Expected	August 30, 2020

Tropical Storm Julia

Hurricane Matthew

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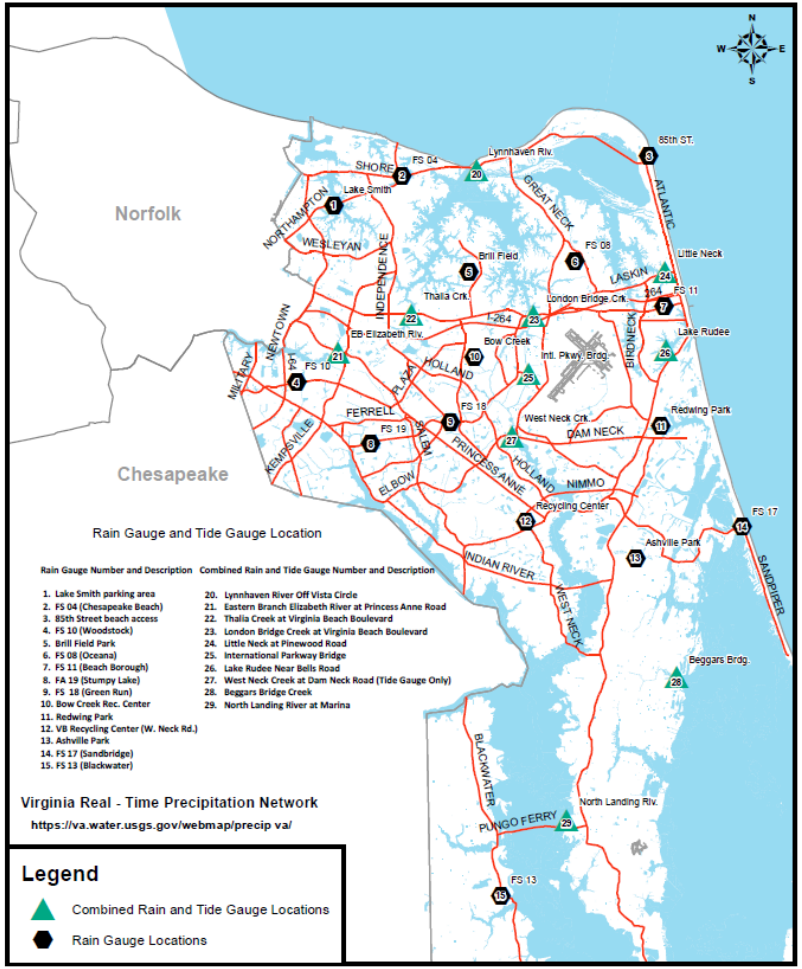
MAJOR RAINFALL INFORMATION

TS Ernesto	08/31/2006 – 09/01/2006 (27-hrs)	10 in. Rain (200-300-yr event)
November ’09	11/11/2009 – 11/13/2009 (30-hrs)	9 – 10 in. Rain (> 100-yr event)
Hurricane Irene	08/26/2011 – 08/28/2011 (24-hrs)	Average 8.5 in. Rain (7-8 inches Coastal, 9-10 in. Inland) (100-200-yr event)
Hurricane Sandy	10/26/2012 – 10/30/2012 (48-hrs)	7.5 in. Rain (25-yr event)
Sept. 8 & 9, 2014	09/08/2014 – 09/09/2014 (24-hrs)	3.23 – 7.16 in. Rain (North Half of City, 2-25-yr event)
June 2, 2015	06/02/2015 4-hr isolated event at Oceanfront	5.4 in. Rain in Beach Borough (50-100-yr event) 3.54 in. Rain in Seatack (10-yr event)
TS Joaquin	09/29/2015 – 10/05/2015 (2-24-hr storms)	4.04 – 8.34 in. Rain (10-100-yr event)
TS Hermine	09/01/2016 – 09/03/2016 (12-hr storm)	3.17 – 4.67 in. Rain (5-10-yr event)
TS Julia	09/19/2016 – 09/22/2016 (72-hr storm)	9.33 – 15.28 in. Rain (50-100-yr event)
Hurricane Matthew	10/08/2016 – 10/09/2016 (20-hr storm)	8.19 – 14.1 in. Rain (100-1000-yr event)



https://va.water.usgs.gov/webmap/precip va/

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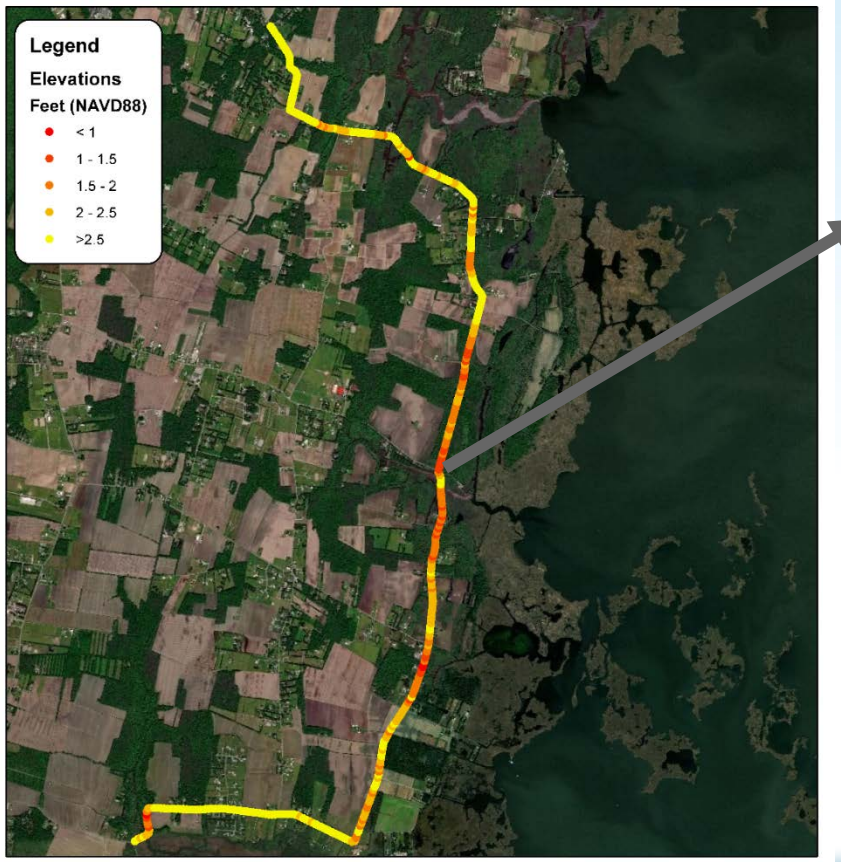
ASHVILLE PARK/BACK BAY WIND TIDE FACTS

- The USGS gauge at Back Bay indicates that it has rained 170 inches in the last two years. Normal would be about 94 inches. All rainfall and water elevation data discussed herein are from USGS measurements and gauges
- All of the combined pumping from Ashville Park since July (193 acre-feet) is less than one-tenth of one-inch of rainfall on Back Bay
- It has rained 35 inches since July and that equates to about 106,000 acre-feet of inflow to Back Bay from its 100 square mile watershed. Again, Public Works pumped 193 acre-feet in that same period (0.18% of Volume)
- During and after wind tide events, water flows in and out of Back Bay at 9,000 to 11,000 cfs. It is not possible for 10 cfs – regardless of where it flows into Back Bay – to impact wind tides in Back Bay
- Ashville Park drained to Back Bay via Ashville Bridge Creek before and after it was developed. There is no new water going into Back Bay.

WHAT HAVE WE SEEN RECENTLY?



Near Dawley Corners

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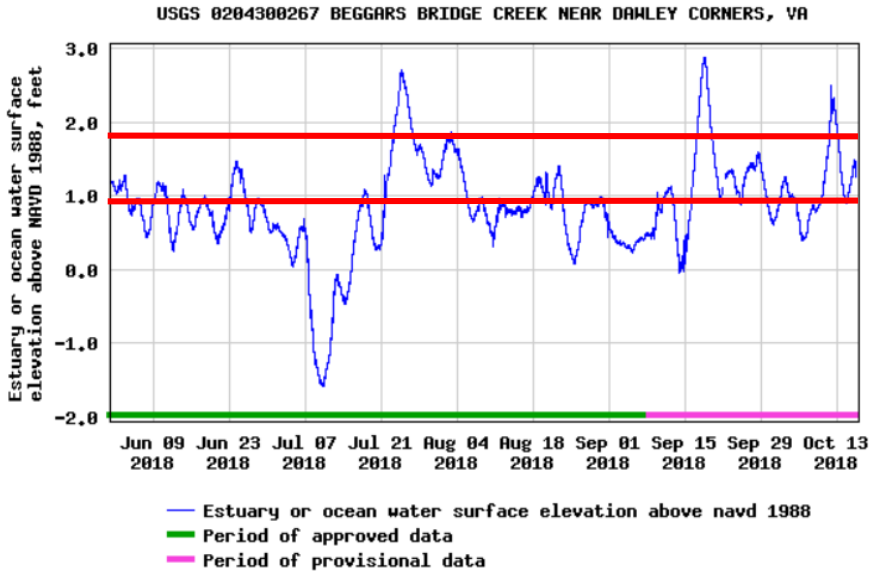
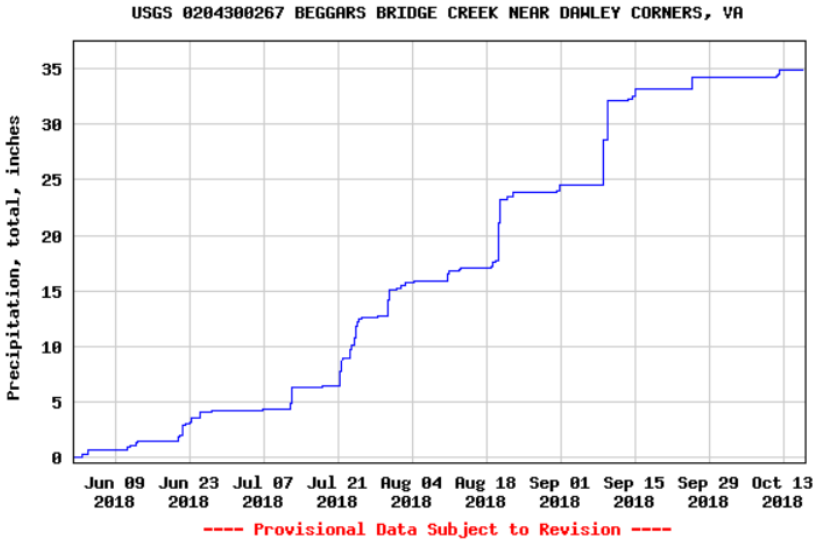
Estuary or ocean water surface elevation above NAVD 1988, feet
Most recent instantaneous value: 1.26 10-16-2018 11:00 EDT



Create presentation-quality / stand-alone graph. Subscribe to WaterAlert

Precipitation, total, inches
Most recent instantaneous value: 0.00 10-16-2018 11:00 EDT



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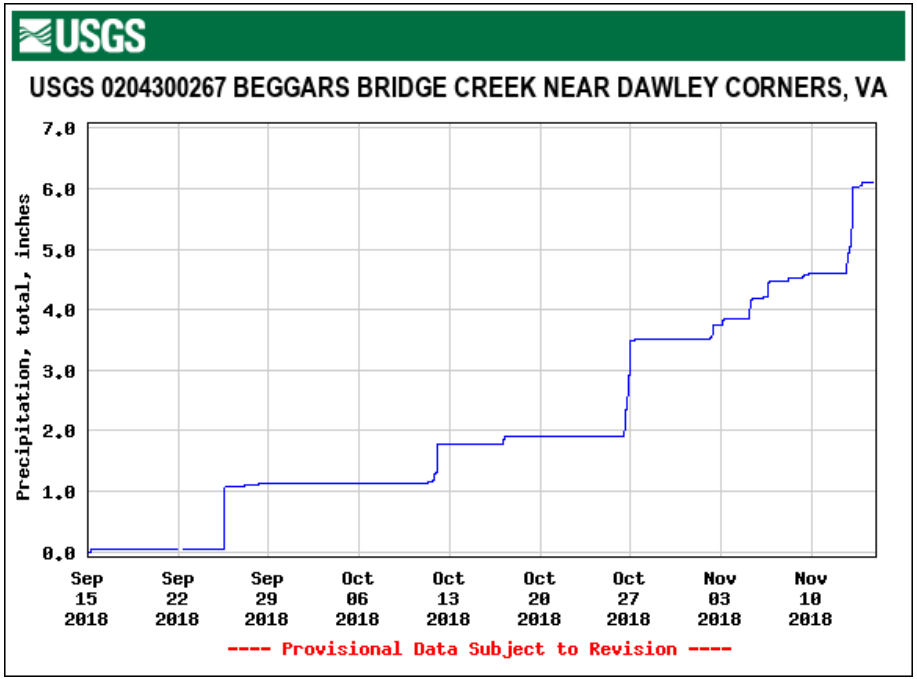

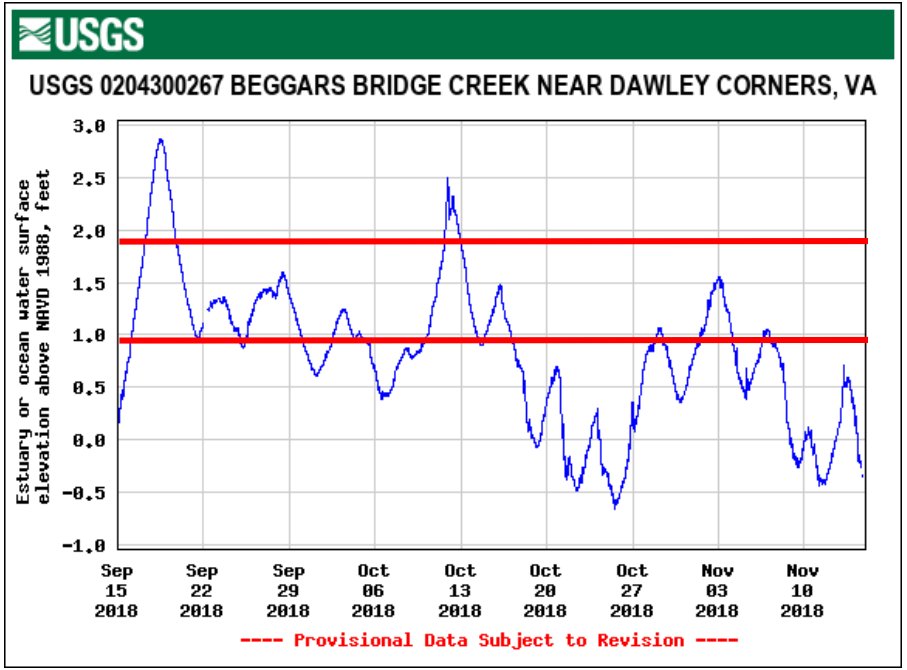

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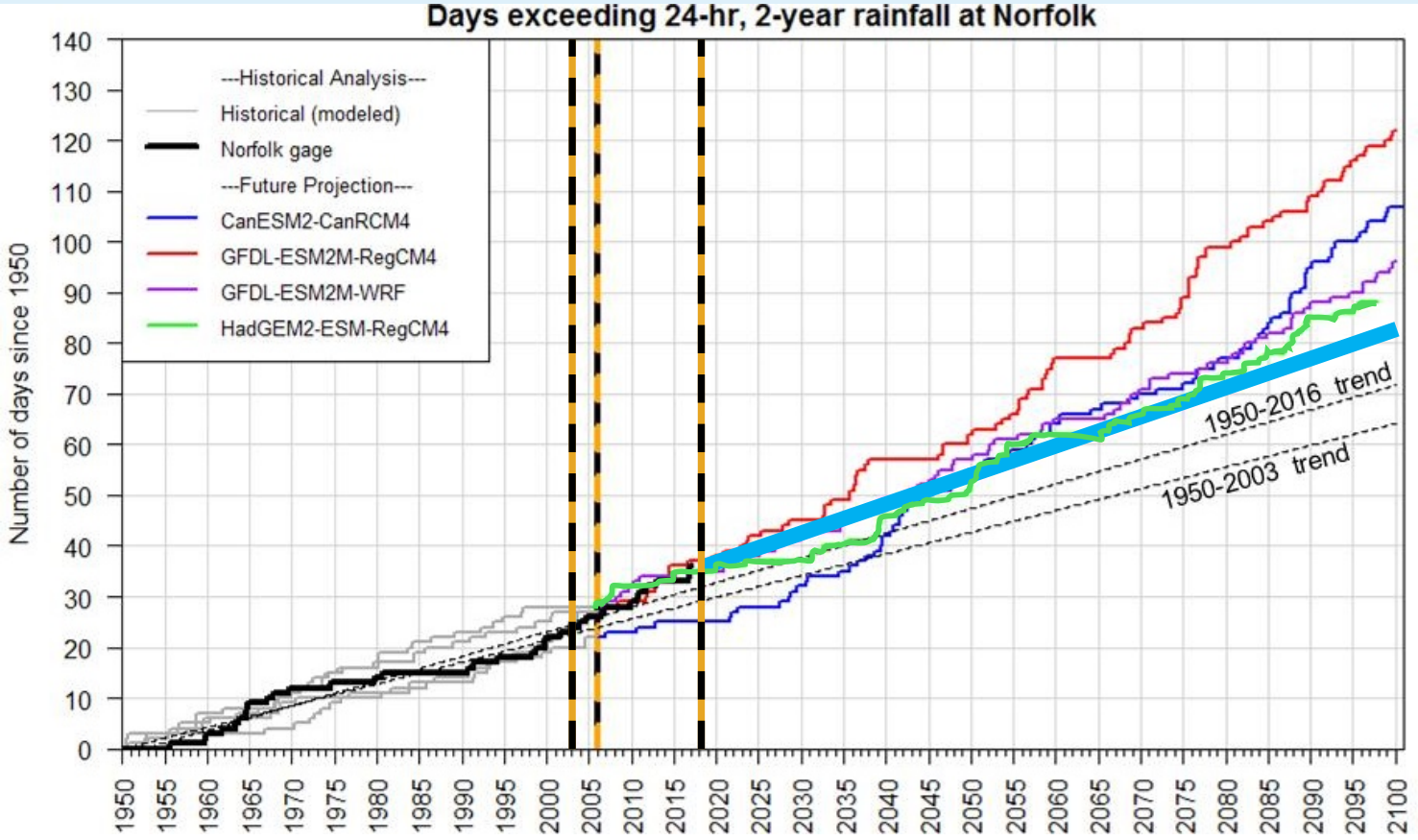
INTENSITIES OF RAINFALL ARE INCREASING



SEA LEVEL RISE INFORMATION

- Sewell's Point: + 0.18 in/yr
- CBBT: + 0.24 in/yr
- Rise last 50 years: ~ 1 ft
- Projected rise next 50 years: 1.5 – 3 ft*

* VIMS Recurrent Flooding Study for Tidewater Virginia, Jan. 2013