HRSD

Cleaning wastewater every day for a better Bay.

swift

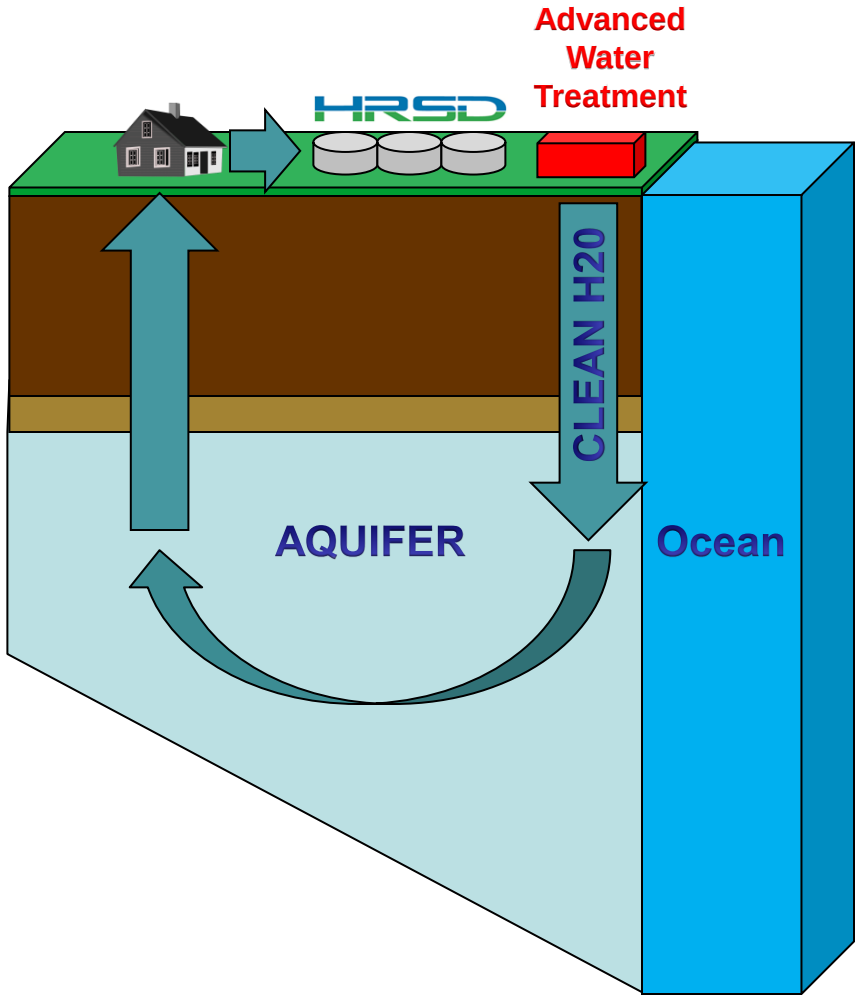
Sustainable
Water Initiative
for Tomorrow

Water issues challenging Virginia and Hampton Roads

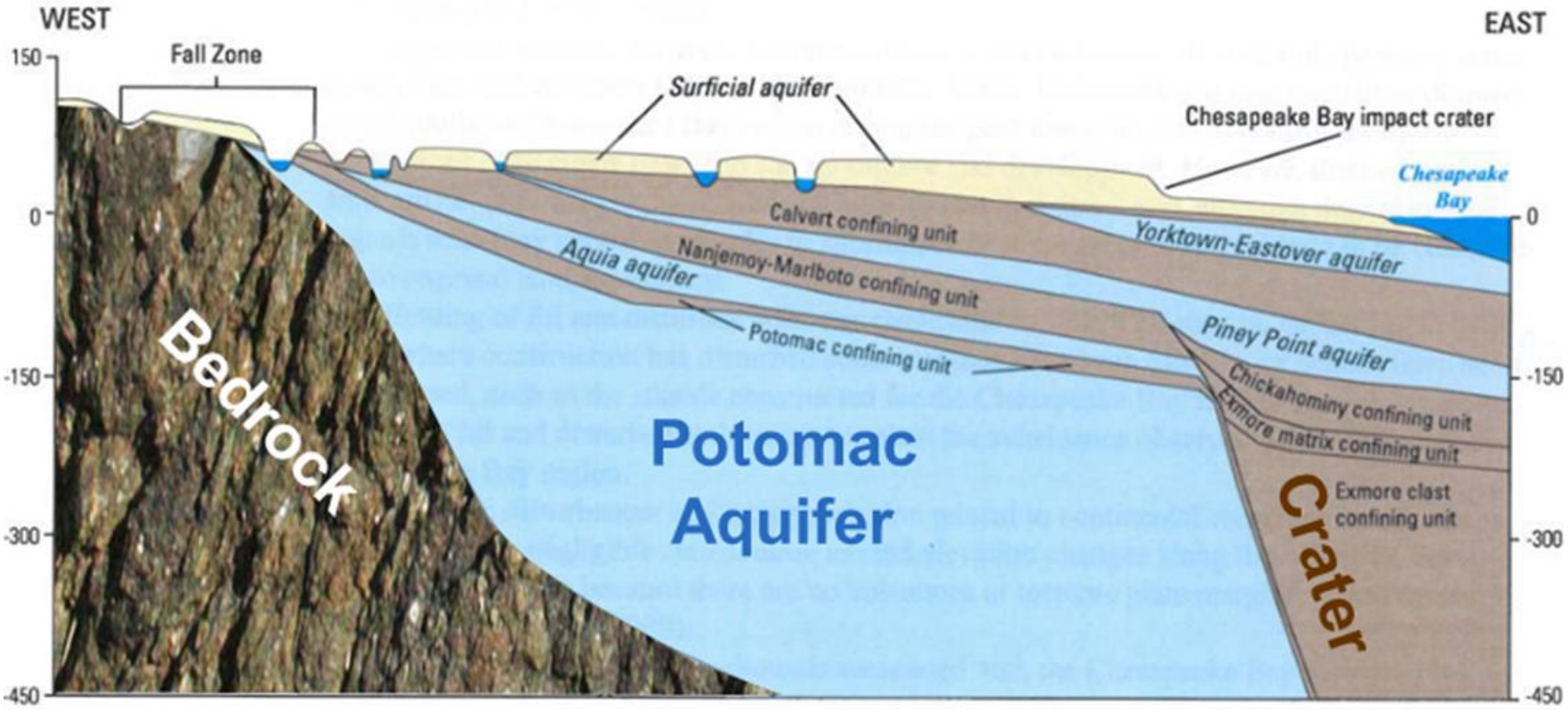
- Restoration of the Chesapeake Bay
  - Harmful Algal Blooms
  - Localized bacteria impairments
  - Urban stormwater retrofits (cost and complexity)
- Depletion of groundwater resources
  - Including protection from saltwater contamination
- **Adaptation to sea level rise**
  - **Recurrent flooding**

SWIFT – Sustainable Water Initiative for Tomorrow

- Treat water to meet drinking water standards and replenish the aquifer with clean water to:
  - Provide regulatory stability for wastewater treatment
  - Reduce nutrient discharges to the Bay
  - Reduce the rate of land subsidence
  - Provide a sustainable supply of groundwater
  - Protect the groundwater from saltwater contamination



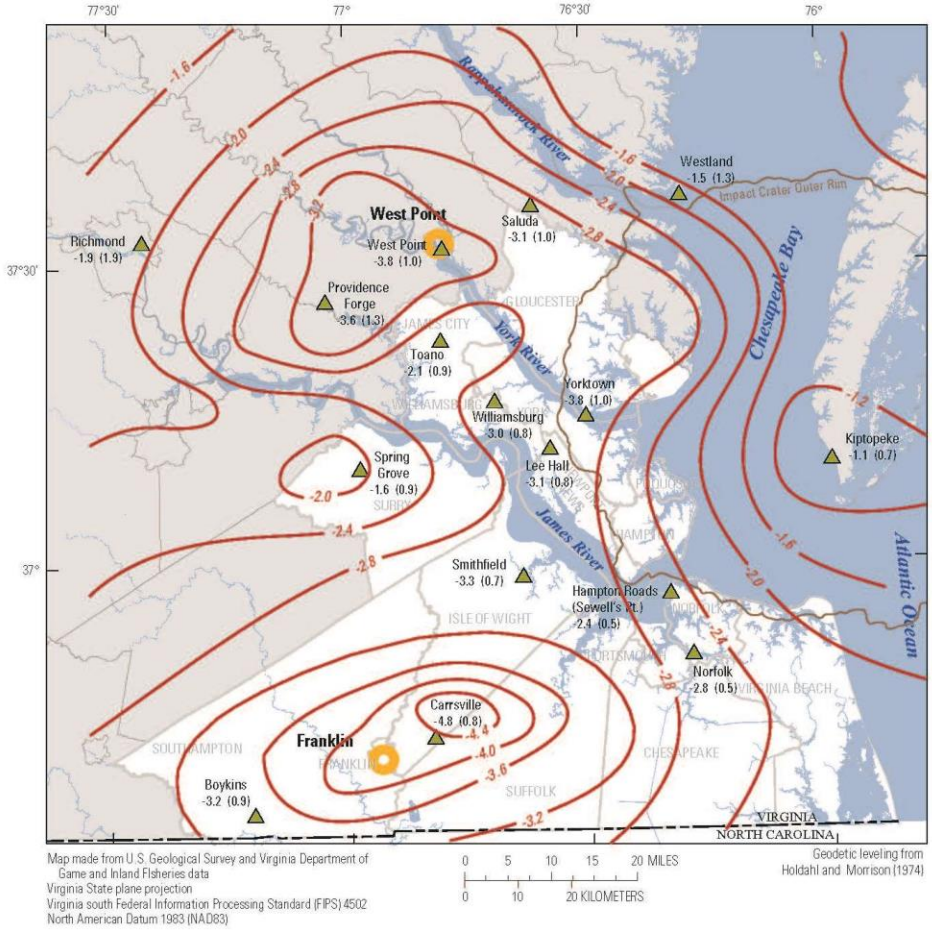
Cross section through Potomac Aquifer



Land subsidence – *we are sinking*

- According to USGS
  - Up to 50% of sea-level rise may be due to land subsidence
  - **Up to 50% of land subsidence may be due to aquifer compaction**
  - 3 to 4 mm/yr or approximately

    0.15 in/yr

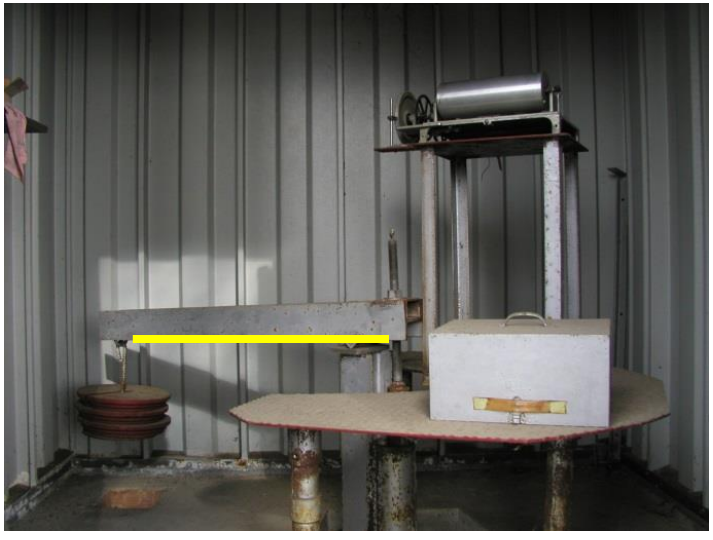


HAMPTON ROADS IS THE #2 LARGEST POPULATION CENTER AT RISK

HRSD

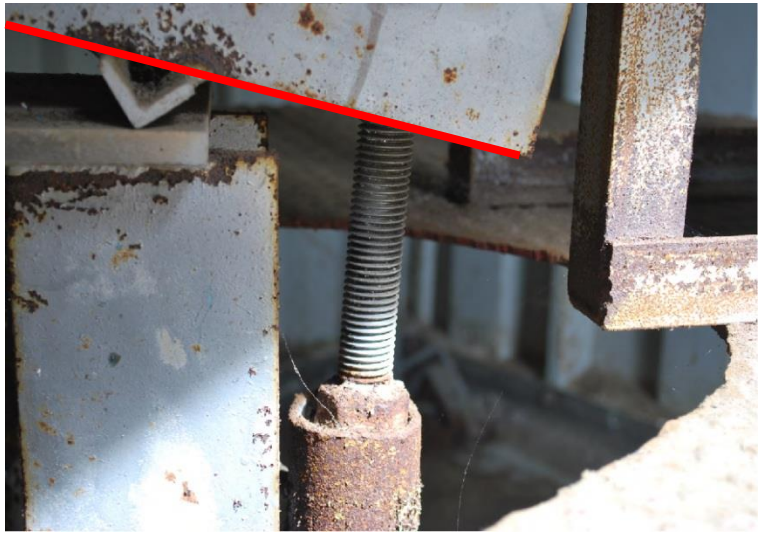
Evidence of groundwater impacts on subsidence

2002



USGS found ground level rose 32 mm (1.25 inches) between 2002 and 2015 coinciding with reduced groundwater withdrawal by Franklin paper mill.

2015

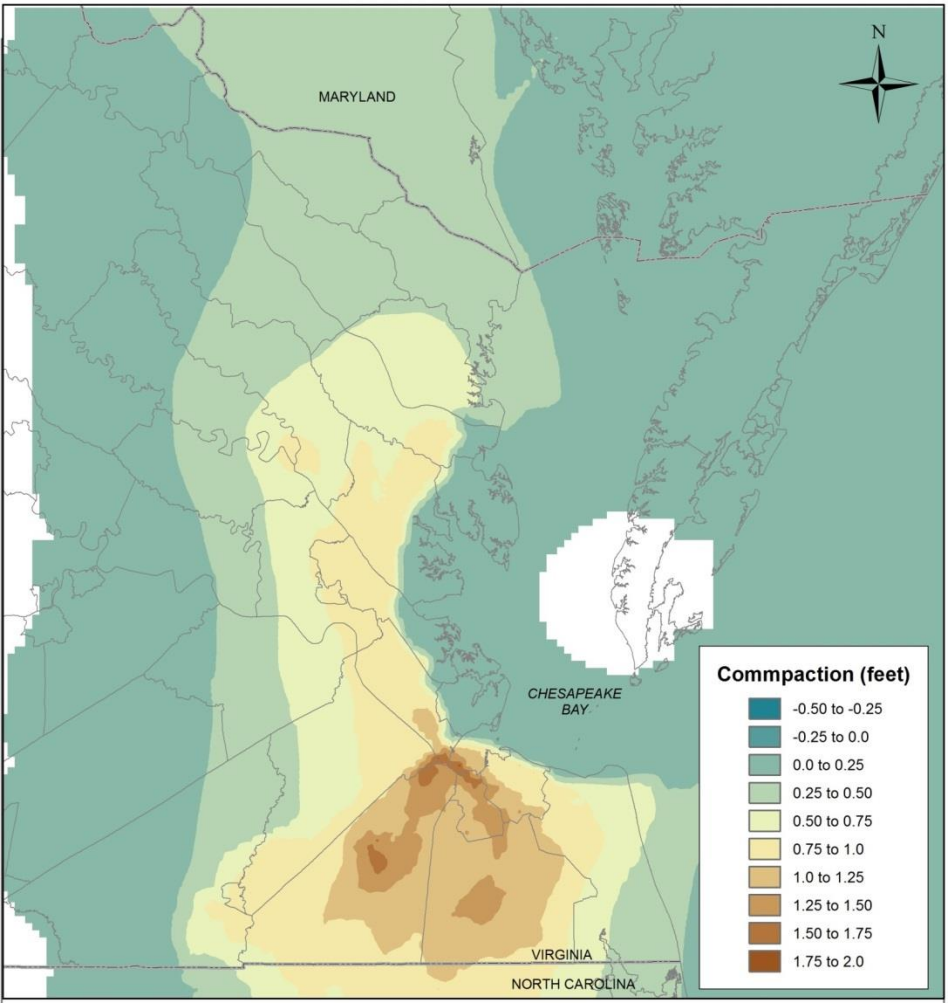


Land subsidence modeling

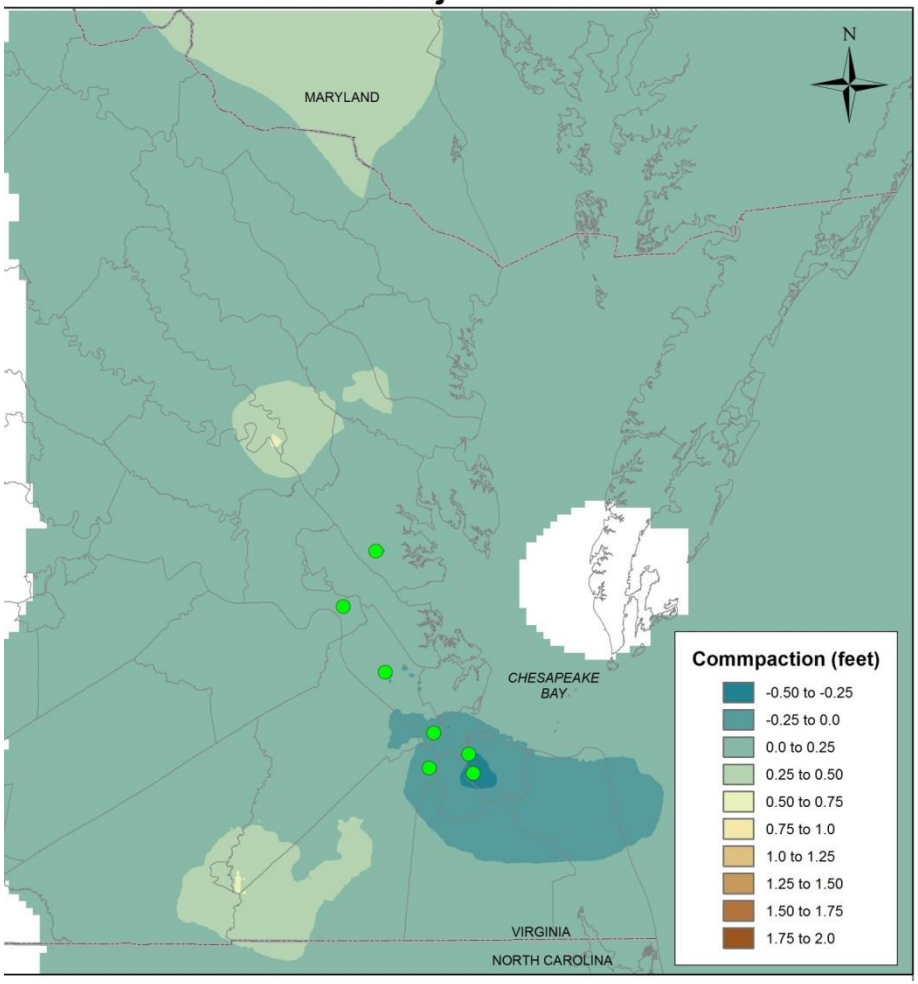
- All models are wrong, some are useful
- DEQ updated the VAHydro-GW model to simulate aquifer compaction
  - Calibrated with aquifer compaction data from the 2 extensometers
  - Model simulations closely matched previous estimates by USGS (contours shown on earlier slide)
  - Model is currently best tool available to estimate land subsidence within the Virginia Coastal Plain
- Virginia needs more data on subsidence
  - USGS recently completed a third extensometer in region – at Nansemond Plant
  - General Assembly funded the extensometer in 2017

Aquifer compaction without and with SWIFT

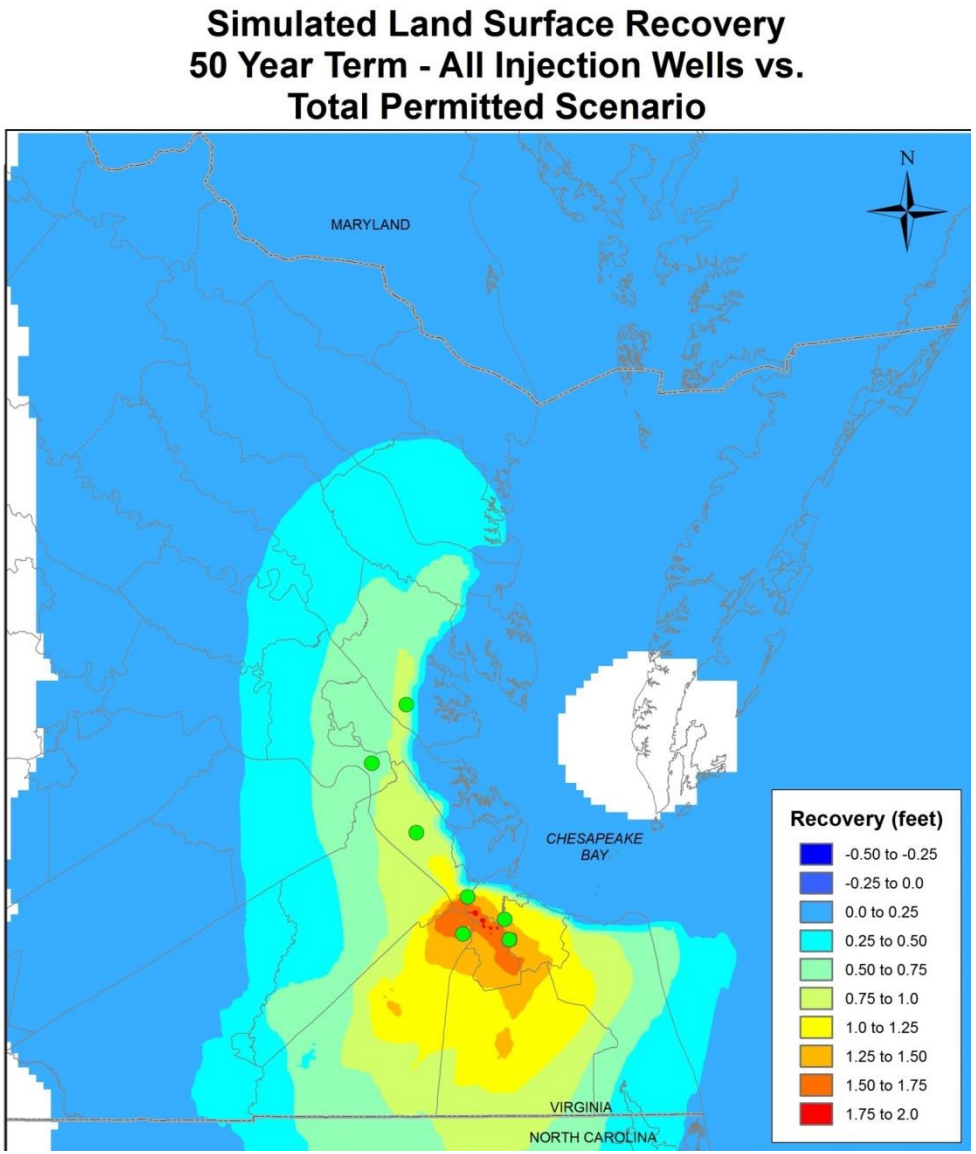
Simulated Total Aquifer System Compaction from 1890 to 2064 - Total Permitted



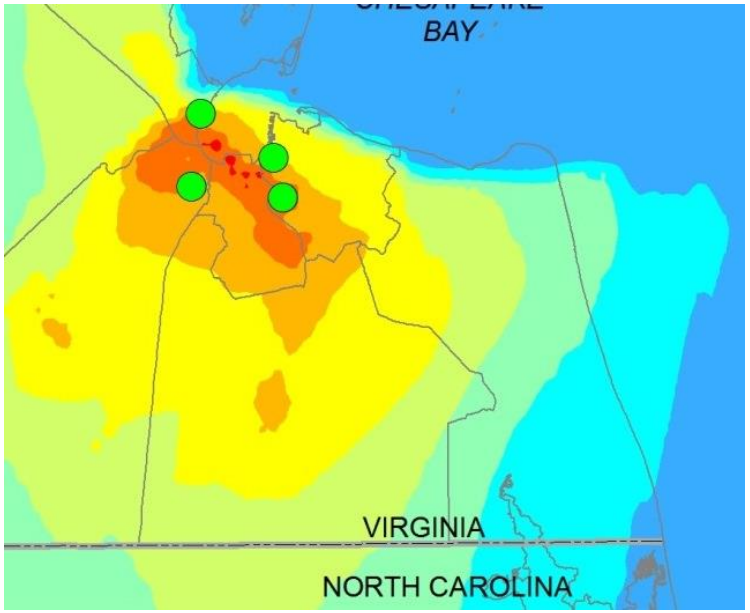
Simulated Total Aquifer System Compaction from 1890 to 2064 - Total Permitted with All Injection Wells



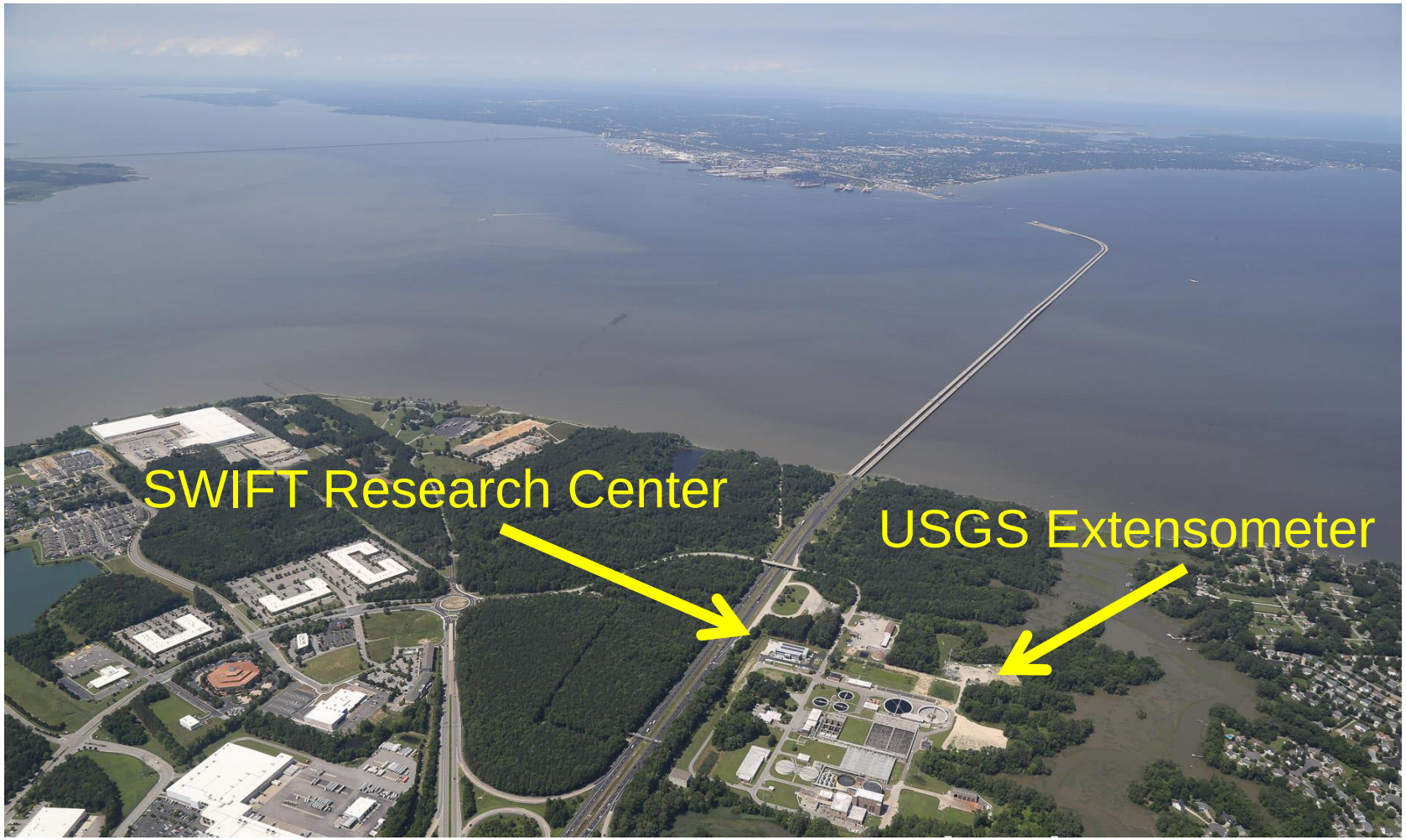
Simulated land surface recovery



Based on modeling results land surface is simulated to be as much as 2 feet higher with SWIFT after 50 years than is simulated with total permitted withdrawals over the same time frame. **That is a net difference.**



SWIFT Research Center – Suffolk VA



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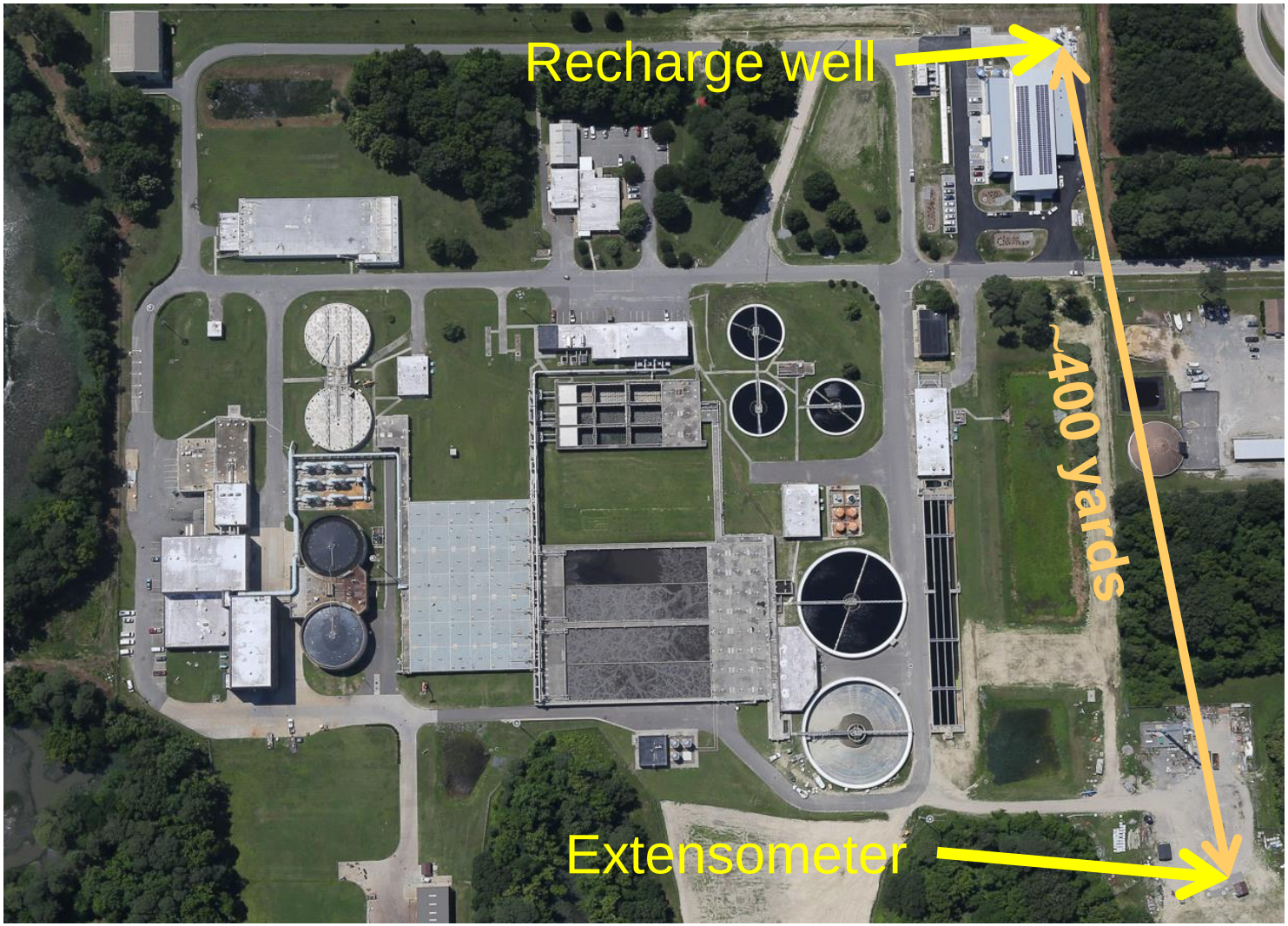
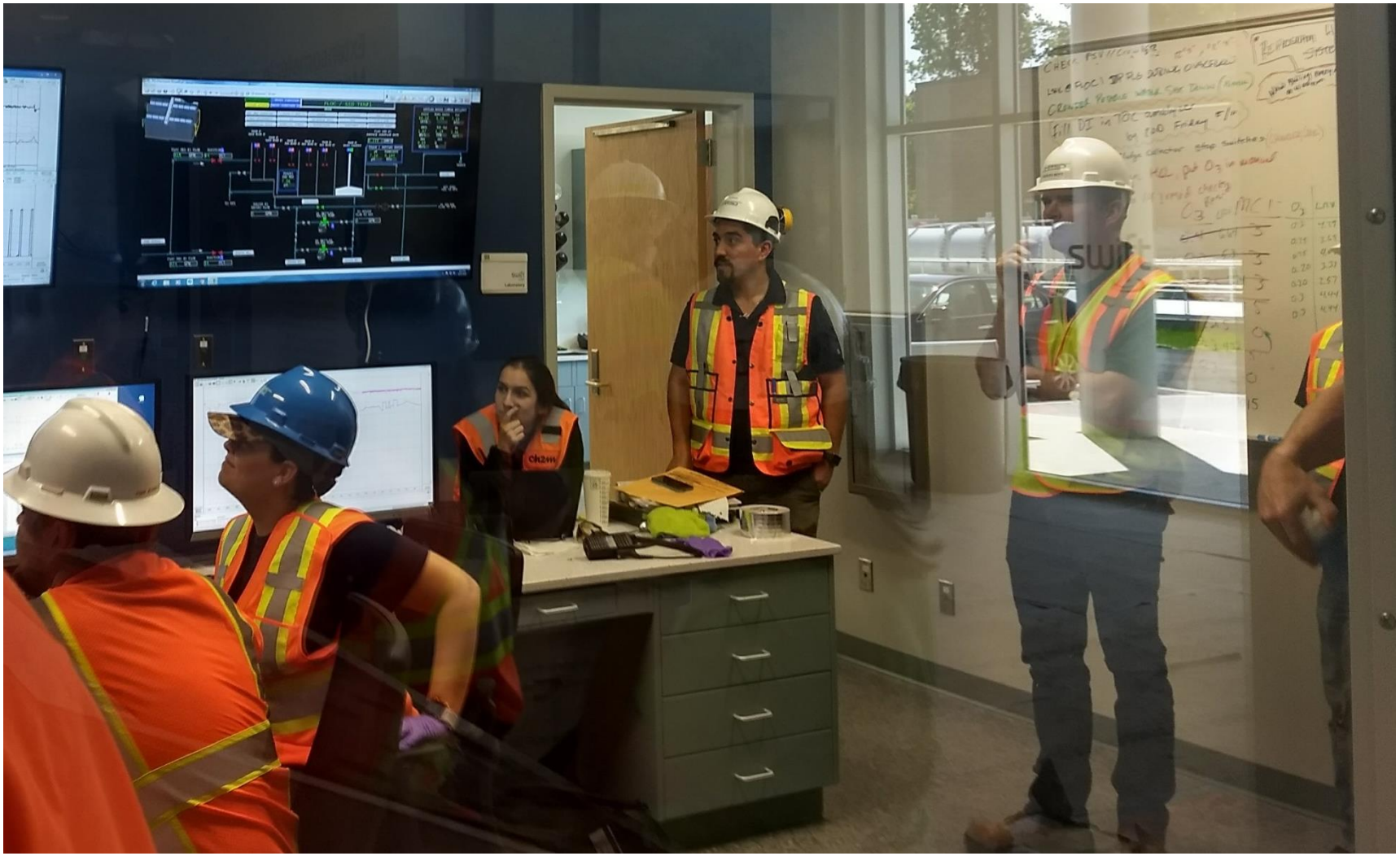


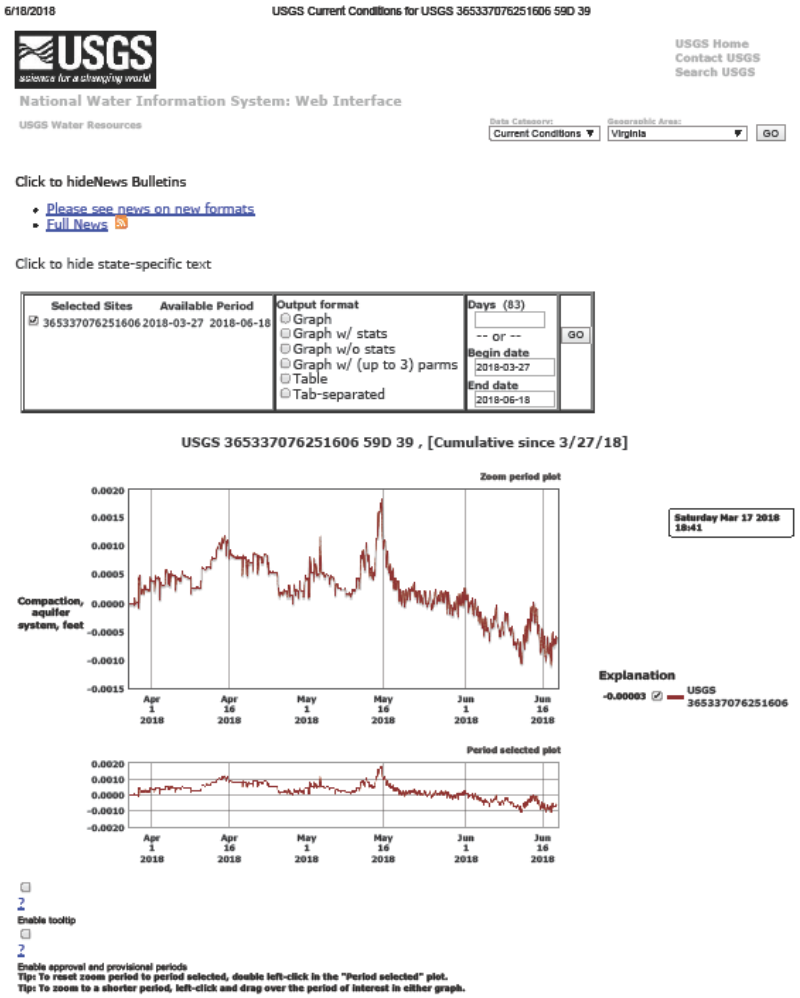
SWIFT Research Center – Suffolk VA

SWIFT Research Center – Control Room



SWIFT Research Center – Education Gallery

SWIFT Research Center – USGS Monitoring Data



Benefits to the Commonwealth

- Initiative produces benefits to Virginians well beyond Hampton Roads
  - “Wireless” solution to provide water for economic development throughout Eastern Virginia
  - Chesapeake Bay nutrient reductions frees up allocation for other uses regionally and helps Virginia meet state obligations under TMDL
    - Reduces need to do cost prohibitive stormwater retrofits in Hampton Roads’ localities - frees up resources to focus on recurrent flooding and other adaptation needs
  - Slowing rate of land subsidence extends the productive use of low lying coastal lands that provide state tax revenues

Time Line

Jul 2014	Started modeling concept
Aug 2015	HRSD Commission authorizes additional study with pilot treatment facilities
Sep 2016	Presented pilot treatment results with tasting event
Nov 2016	Awarded design-build contract for SWIFT Research Center
Mar 2017	Broke ground on Research Center
Feb 2018	Received recharge permit from EPA
May 2018	Cut ribbon, began recharge
June 18, 2018	Recharging rate reached 1 mgd goal
	Hit 10 million gallon mark!

Next Steps

2018-2019	Gather data at Research Center
2018-2019	Establish independent monitoring lab
2019	Obtain permits for full-scale SWIFT
2020	Break ground at Williamsburg
2023	First full-scale facility (Williamsburg) comes on line (10 million gallons per day)
2020-2030	Full scale construction program ($1B)
2030	Build-out complete – 5 to 7 locations
	100+


The Virginian-Pilot
UP TO $148 IN COUPONS
Can your sinks and toilets fight sea-level rise?
Virginia GOP asks state to cancel "loyalty oath"


Daily Press
SUNDAY, OCTOBER 11, 2015
GROUNDWATER DRAIN: A BIG-DOLLAR DILEMMA
PENINSULA CITIES IN ECONOMIC DOLDRUMS
Facing sluggish job growth, defense cuts, region fares poorly in national rankings
Groundwater water level decreases
From 1900 to 2008


HRSD doesn't want to waste wastewater
By Dave Mayfield
The Virginian-Pilot
SEAFORD
Ted Henifin crouched next to a floor drain at the Hampton Roads Sanitation District's York County treatment plant. Into his palm ran a soft stream of clear water – clean enough, probably, to drink. But the lab results aren't back to confirm that. So, Henifin will hold off before he sips.
Waiting isn't exactly Henifin's style these days. He has dived into a project to prove that HRSD can turn what Hampton Roads flushes down
recycled
The sanitation district wants to launch a $1 billion, decadelong project that would refill the region's aquifers with treated wastewater.
See WASTE, PAGE 10


NO WASTING WATER
Following the lead of other regions, local plant tries treating wastewater
By Dave Ress
SEAFORD — With a sip of specially treated wastewater, Hampton Roads Sanitation District general manager Ted Henifin put his mouth where his money is — what could be a $1 billion effort to replenish eastern Virginia's rapidly shrinking pool of groundwater.
A pilot program at the agency's York River Treatment Plant shows it is possible to clean the water Hampton Roads residents flush out of their homes and businesses so that it is safe to drink, he told a gathering of state and local officials.
Not that he expects anyone will be drinking it any time soon. The plan is to eventually inject 180 million gallons a day of treated water deep underground to begin replenishing the wedge of water-logged sand tapped by wells that serve hundreds of thousands of people and businesses.
They're currently drawing about 100 million gallons a day from those wells, resulting in groundwater levels in parts of eastern Virginia dropping 200 feet over the past century.
Online
See more photos and video at dailypress.com.
See WATER/Page 8


Sip shape
Hampton Roads Sanitation District's treated sewage water tastes great, say officials, and could shore up the area's sea level rise and bay cleanup issues
By Dave Mayfield
The Virginian-Pilot
YORK COUNTY
Earlier this year, as the Hampton Roads Sanitation District ramped up plans to make its wastewater clean enough to drink, general manager Ted Henifin vowed he'd take the first gulp.
On Thursday at the HRSD's York County treatment plant, Henifin made good on the promise, leading dozens of employees and invited guests in downing glasses of water that came from a sewage stream fed by sinks and toilets.
"Great!" he proclaimed after his first sip. "Ahhh."
To Henifin, it was no mere stunt. It was an early demonstration of the potential for an ambitious initiative to turn what goes down Hampton Roads'
See HRSD, BACK PAGE

Questions?

Future generations will inherit clean waterways and ***be able to keep them clean****.*

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