GROUNDWATER IN SOUTHEASTERN VIRGINIA: Recent News!

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Bite of Science Event
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The Effects of the Chesapeake Bay Impact Crater on the Geological Framework and Correlation of Hydrogeological Units of the Lower York-James Peninsula, Virginia

David Powars and Scott Bruce 1999
The location of the Chesapeake Bay Impact Crater

Land Subsidence and Relative Sea-Level Rise in the Southern Chesapeake Bay Region

2013
By Jack Eggleston and Jason Pope

Proposed in Cooperation with the Hampton Roads Planning District Commission

U.S. Department of the Interior
U.S. Geological Survey
Coastal flooding even on clear days

Figure 1. Coastal flooding along the shore of the Elizabeth River in the Ghent neighborhood of Norfolk, Virginia, from a minor tide in February 2003. Interaction between water and land in the southern Chesapeake Region affects its renowned estuaries and urban and military infrastructure. Slight increases in water levels or decreases in land-surface elevations can increase the risk of flooding in low-lying areas. Photograph by Yasna Wilson, courtesy of The Virginian-Pilot, used with permission.

from Eggleston and Pope 2013

Groundwater levels in Potomac Aquifer – note cones of depression around large GW users

from Eggleston and Pope 2013
Aquifers (blue) and confining beds (brown) in Coastal Plain sediment beneath southeastern Virginia.

from Eggleston and Pope 2013

Sand and gravel beds in the Potomac Aquifer in the Richmond area
Mud beds are common in the Potomac Aquifer

USGS extensometer used to measure compaction of the Potomac Aquifer

from Eggleston and Pope 2013
Greatest land elevation drops are around Franklin and West Point, sites of large industrial wells fields

Mud beds compact more than sand beds when water is withdrawn from Potomac Aquifer

*from Eggleston and Pope 2013*
SWIFT Project plans to clean HRSD wastewater to drinking water standards then inject it into Potomac Aquifer

Injected water can be used by local industries AND it will restore pressure to aquifer and keep it from compacting more

Predicted pressures in the Potomac Aquifer in 50 years WITHOUT SWIFT treatment

Predicted pressures in the Potomac Aquifer in 50 years WITH SWIFT treatment
GROUNDWATER FLOW IN A TUB

OPEN PIPES

PERFORATED FILM CANNISTERS

BARRIER

TUB w/ HOLE

SAND
Fill with water