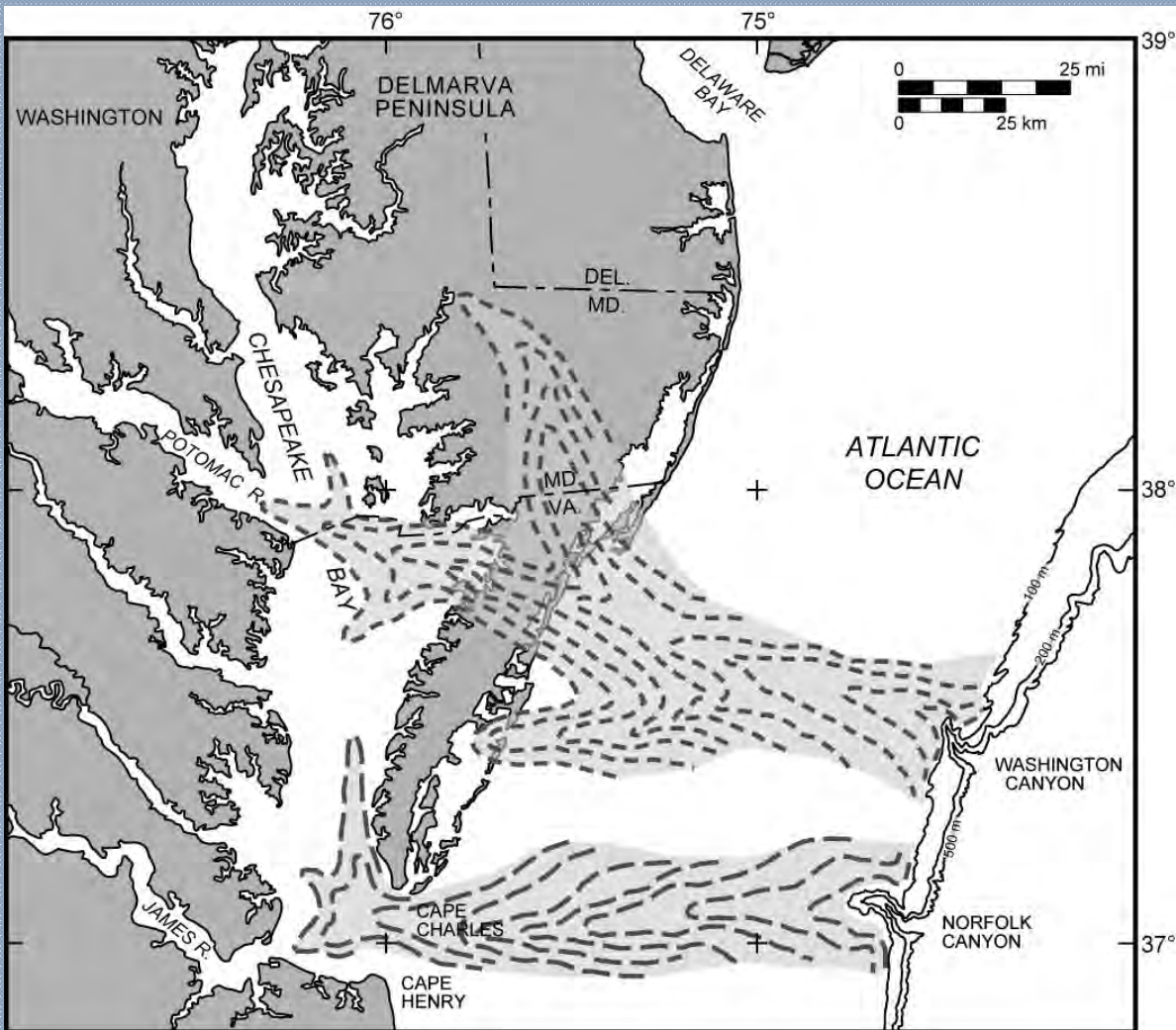


# Glaciation Creates the Eastern Shore



Inference by Harrison (1972) of a paleovalley of the Potomac River crossing the northern section of the modern Virginia Eastern Shore, and heading to Washington Canyon. His interpretation included the recently discovered Salisbury (Maryland) paleochannel as a tributary to the Potomac River, and also connected the ancestral James River with Norfolk Canyon.

South

EARLY INTERGLACIAL

Glacial ice North

Glacial forebulge collapses

LS end of Stage 6

LS during Stage 5e

Present SL

Stage 5e SL (+8 m)

LS end of Stage 6

Post-glacial rebound

LGM SL (-125 m)

LATE INTERGLACIAL

Continued subsidence

LS end of Stage 6

LS during Stage 5e

LS during Stages 5a & 3

Present SL

Stage 5a SL (-20 m)

Continued rebound

LGM SL (-125 m)

Georgia Bight (FL-GA-SC)

Mid-Atlantic (NC-VA-MD-DE)

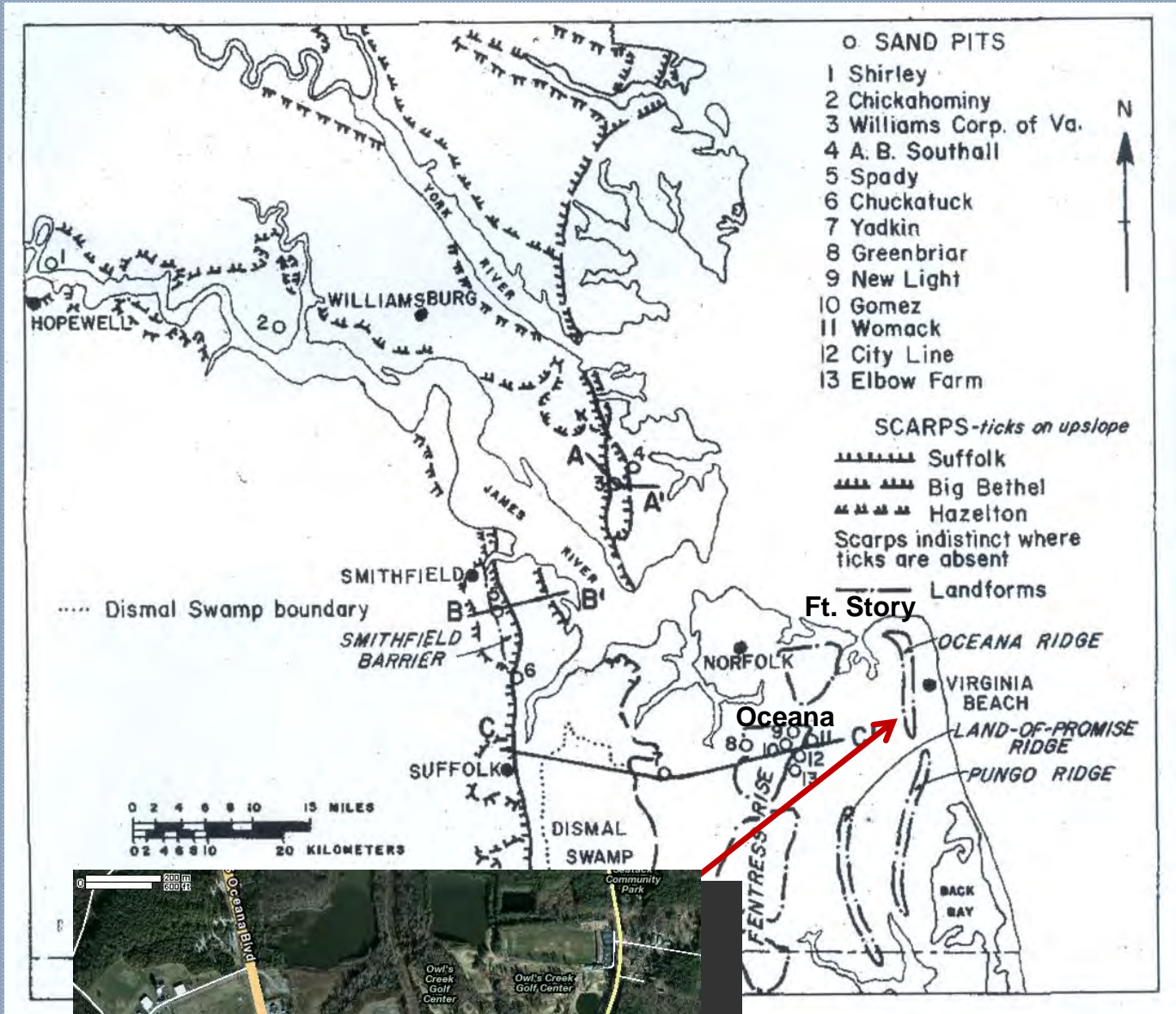
Transition (NJ-NY)

New England & Gulf of Maine

Regional isostatic response of the Atlantic coast after the Illinoian glaciation. This model follows from recent findings by Wehmiller *et al* (2004) and Mallinson *et al.* (2008) of late stage 5 and stage 3 highstand shorelines preserved on the outer coastal plain of Virginia and North Carolina approximately 22 to 26 m higher than expected from records of global ice volume



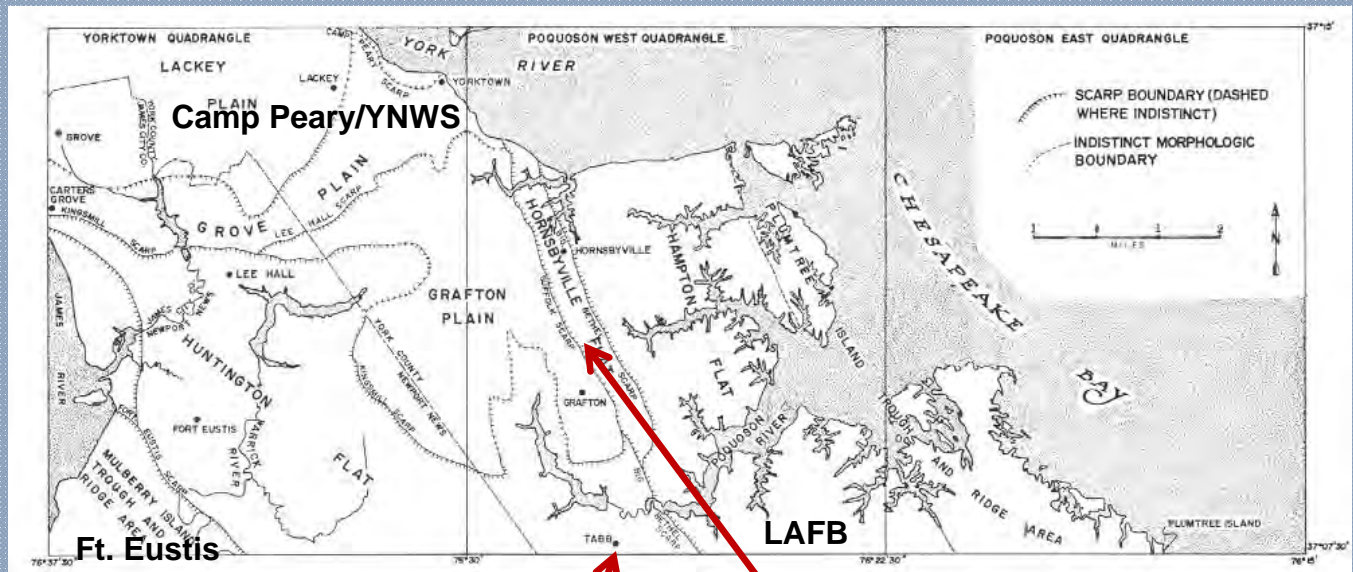
# Glaciation Creates the modern landscape: Economic Benefit



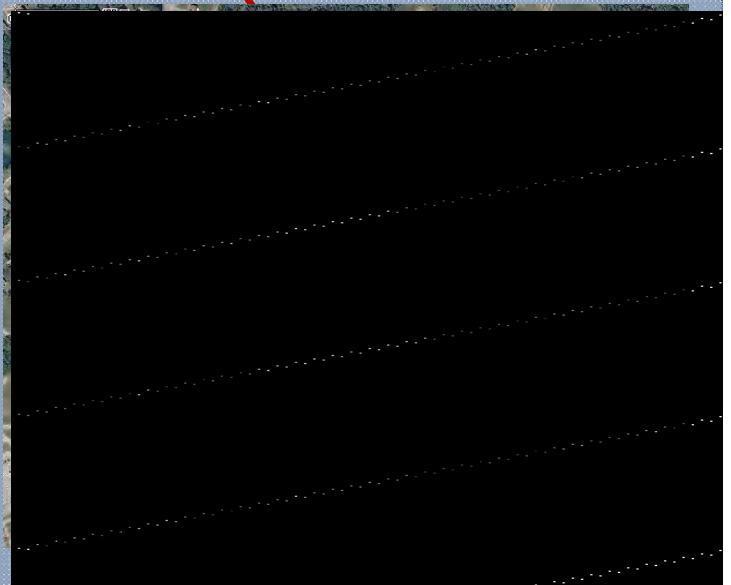
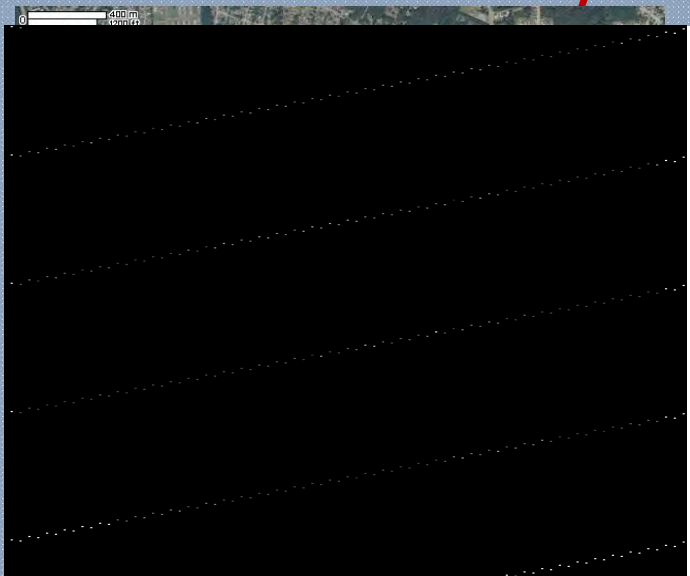
Oakes and Coch



# Glaciation Creates the modern landscape: Economic Benefit

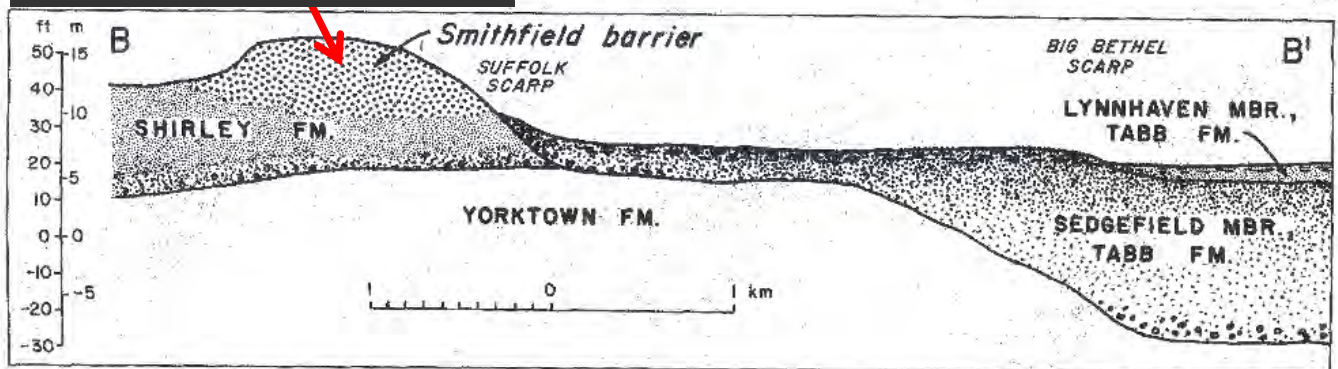
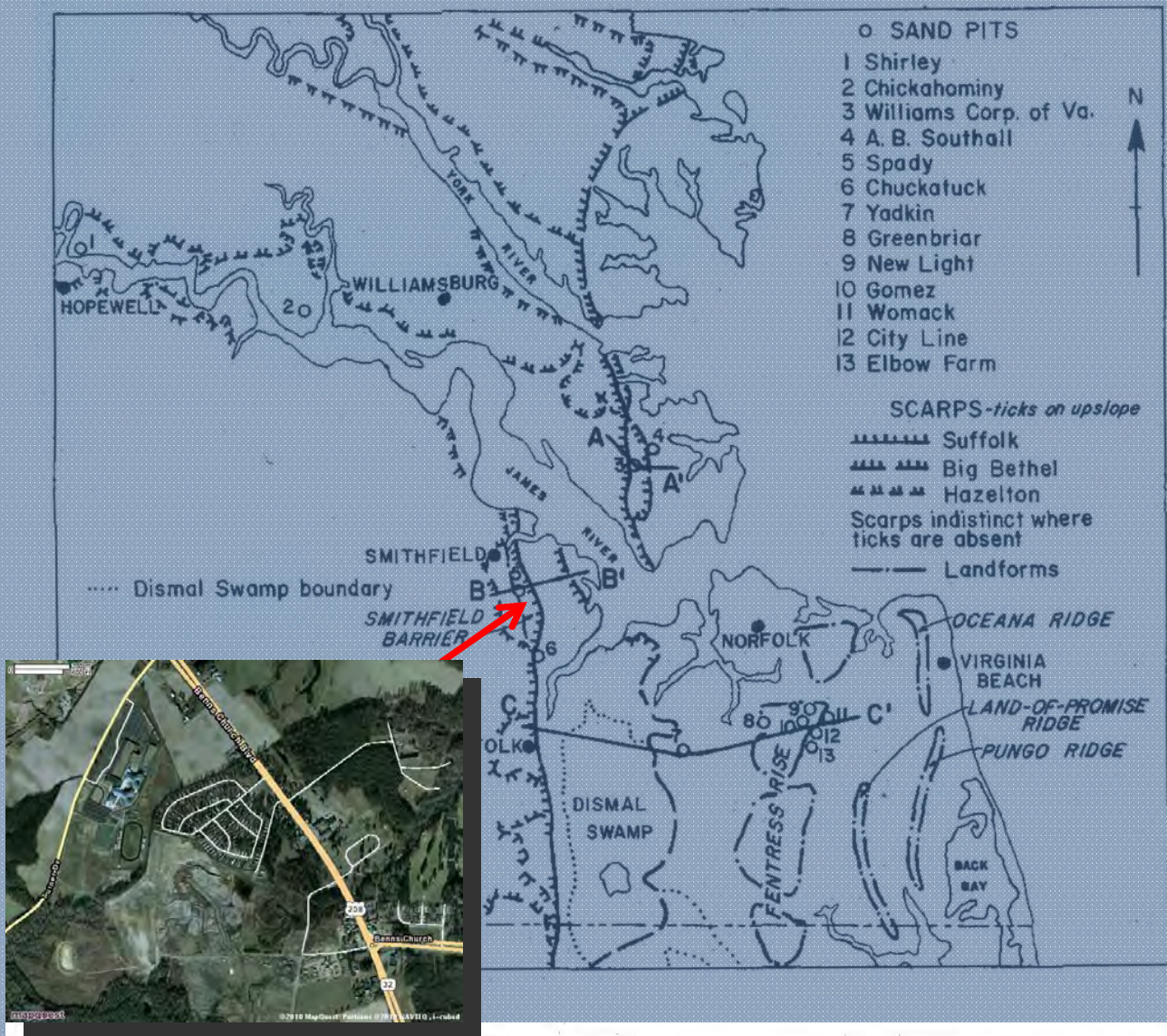


Oakes and Coch





# Glaciation Creates the modern landscape: Economic Benefit





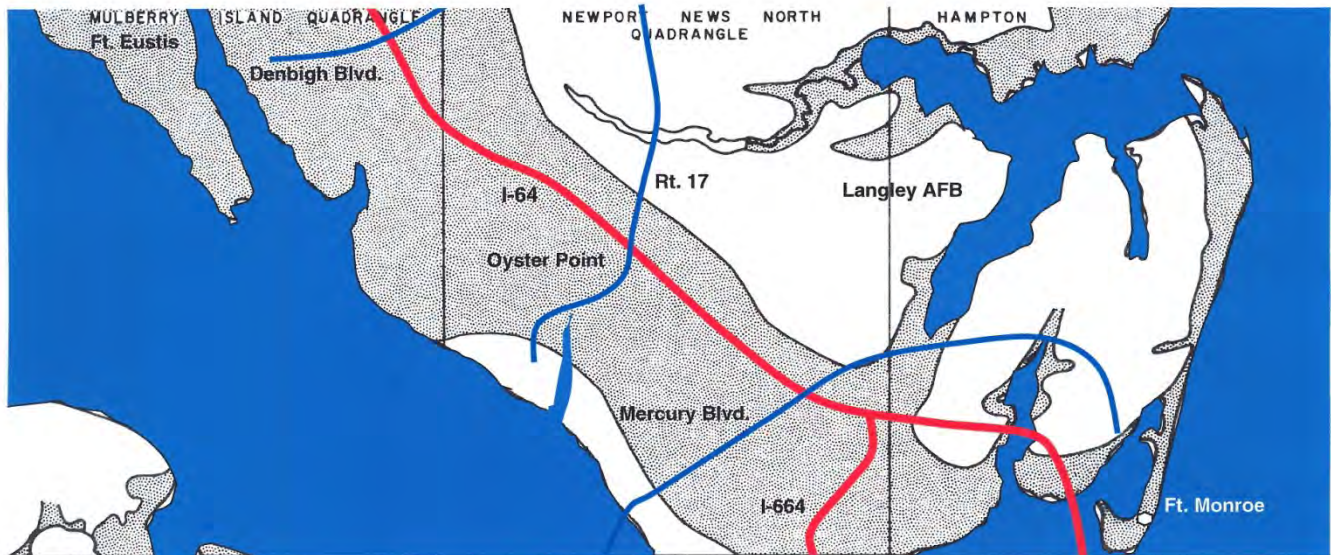
# Glaciation Creates the modern landscape - Scarps



Scarps in the making in Surry County



# Glaciation Creates the modern landscape – Sporadic Peat



Shaded areas are underlain by late Pleistocene and Holocene sporadic Peat (Pt), Organic SILT (OH), and normally consolidated plastic CLAY (CL and CH) deposited before the Wisconsin Stage glaciation. This latest in a series of glacial advances and retreats began possibly 70,000 years ago and ended only 10,000 years ago. In fact, we can't even be certain that we are not still in the Ice Age and merely enjoying a warm period between two glacial advances.

CLIENT	JOB #	BORING #	SHEET
PROJECT NAME	07:10547	B-90	1 OF 2
SITE LOCATION	ARCHITECT-ENGINEER		
Newport News, Virginia			

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVEL ELEVATION (FT)
0	1	SS	24	Clayey Fine SAND, Orangish Brown and Tan, Wet, Loose, (SC)		22.5
2	2	SS	24	Poorly Graded Fine to Coarse SAND, Light Gray, Saturated, Loose, (SP-SM)		
3	3	SS	24	Silty Fine SAND, Light Brown to Gray to Light Brown, Saturated, Loose to Very Loose, (SM)		
4	4	SS	24			
5	5	SS	24			
6	6	SS	24	Lean CLAY, With Fine Sand, Dark Gray, Saturated, Very Soft, (CL)		
7	7	SS	24	Lean CLAY, With Fine Sand, Trace Marine Shell Fragments, Light Gray and Brownish Gray, Wet, Stiff, (CL)		
8	8	SS	24			
9	9	SS	24	Clayey Fine SAND, Gray, Wet, Medium Dense, (SC)		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL.	WS OR (D) BORING STARTED	1/29/10	CAGE IN DEPTH	None
WL (BGR) WL (ACK)	BORING COMPLETED	1/29/10	RIG	ATV FOREMAN ROSS
WL			DRILLING METHOD	Mud

CLIENT	JOB #	BORING #	SHEET
PROJECT NAME	07:10547	B-90	2 OF 2
SITE LOCATION	ARCHITECT-ENGINEER		
Newport News, Virginia			

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVEL ELEVATION (FT)
30				Clayey Fine SAND, Gray, Wet, Medium Dense, (SC)		
35				Poorly Graded Fine to Coarse SAND, Light Gray, Wet, Medium Dense, (SP)		
40				Silty Fine SAND, Trace Organics and Wood Fragments, Light Gray and Dark Gray, Wet, Medium Dense to Very Loose, (SM)		
45						
50				Clayey Fine SAND, Trace Organics and Wood Fragments, Light Gray, Gray and Black, Saturated, Loose, (SC)		
55				Silty Fine SAND, Light Gray and Gray, Saturated, Medium Dense, (SM)		
60						

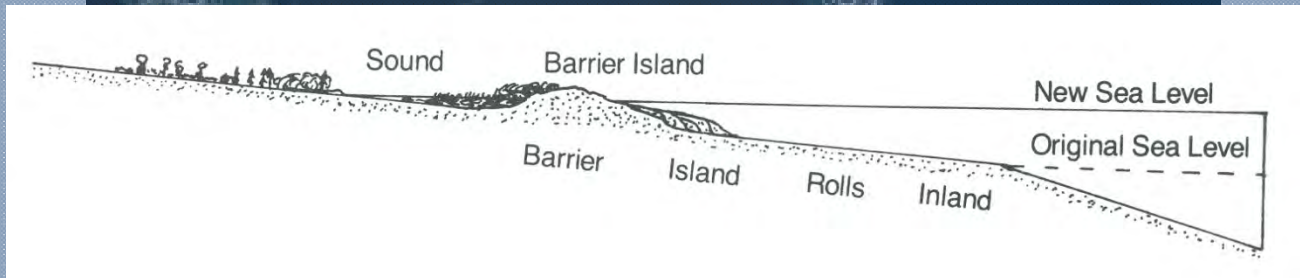
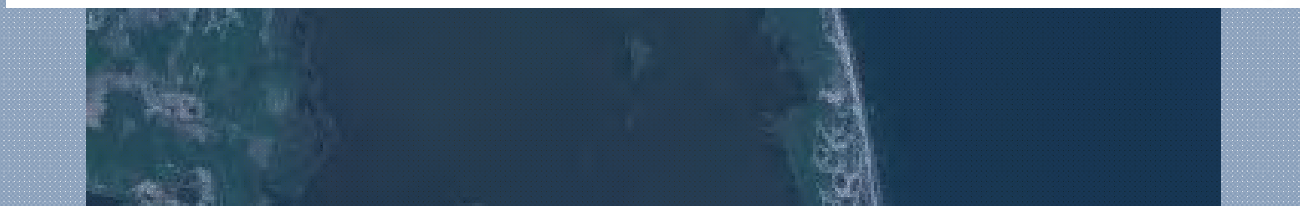
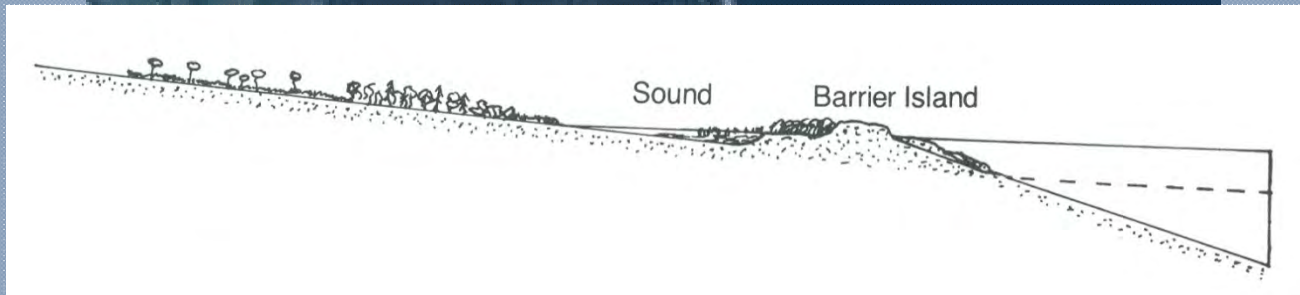
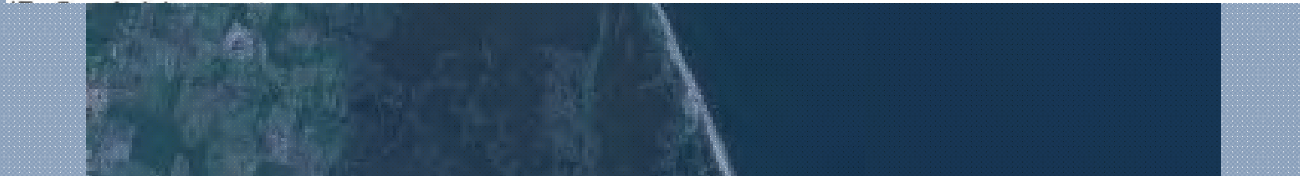
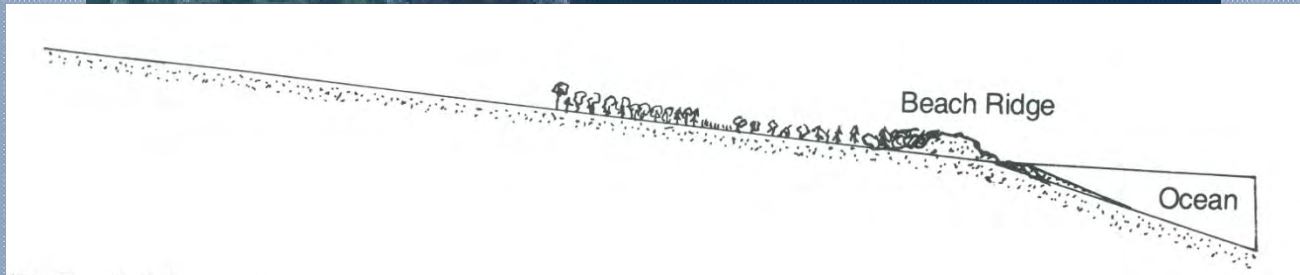
  

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL.	WS OR (D) BORING STARTED	1/29/10	CAGE IN DEPTH	None
WL (BGR) WL (ACK)	BORING COMPLETED	1/29/10	RIG	ATV FOREMAN ROSS
WL			DRILLING METHOD	Mud



# Barrier Islands

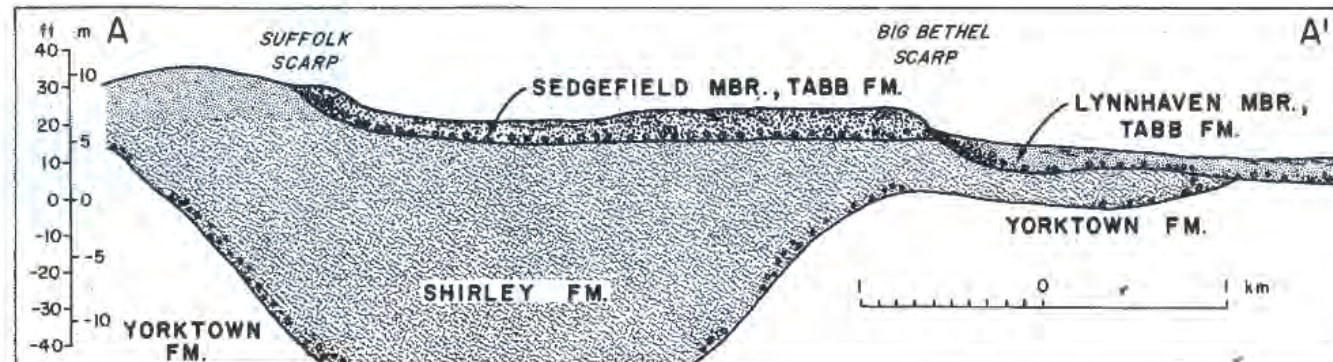
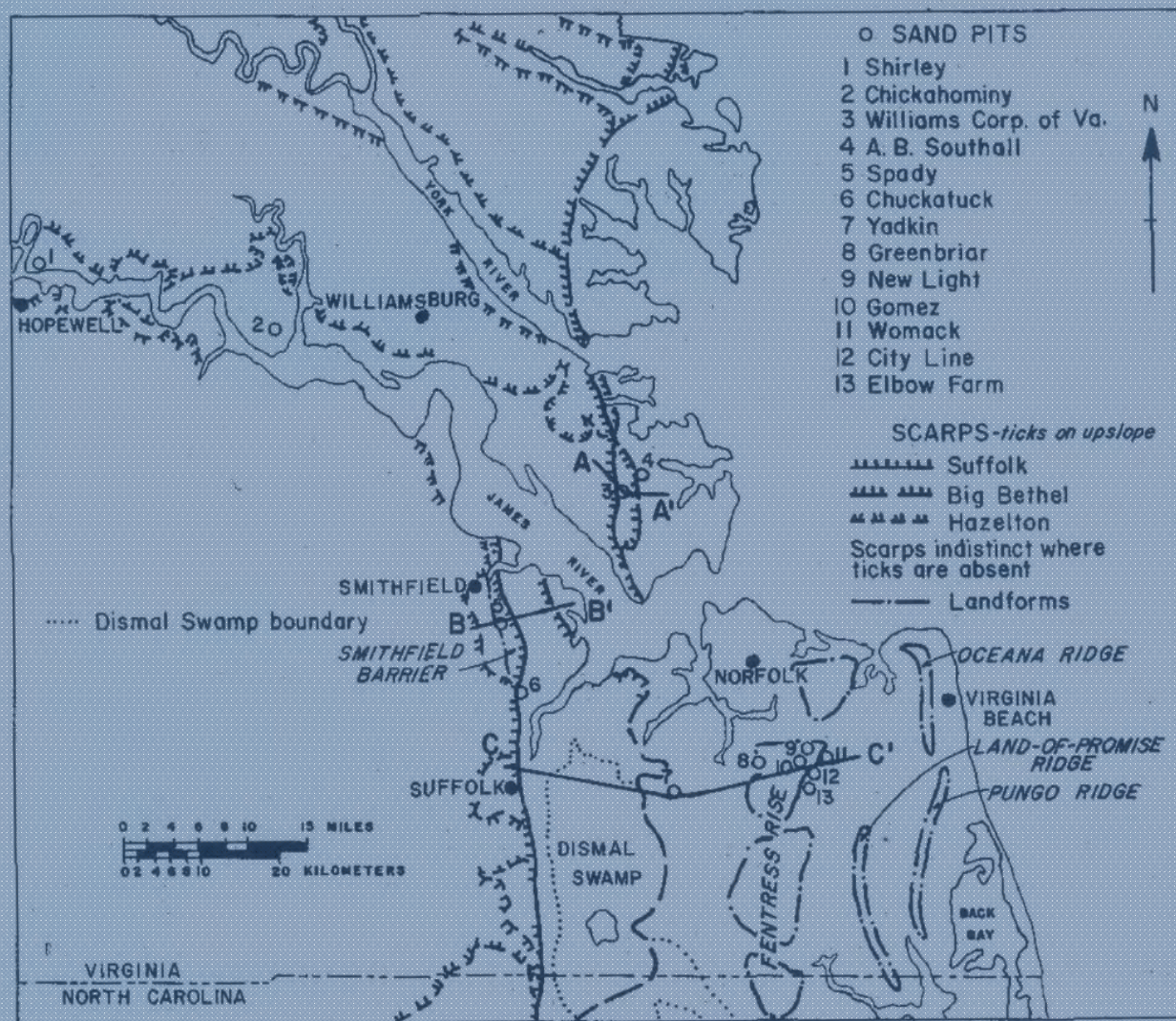
Began forming about 18,000 ya as coastal sand ridges, probably near the continental shelf, and have been rolling landward ever since



From *North Carolina: The Years Before Man* by Fred Beyer

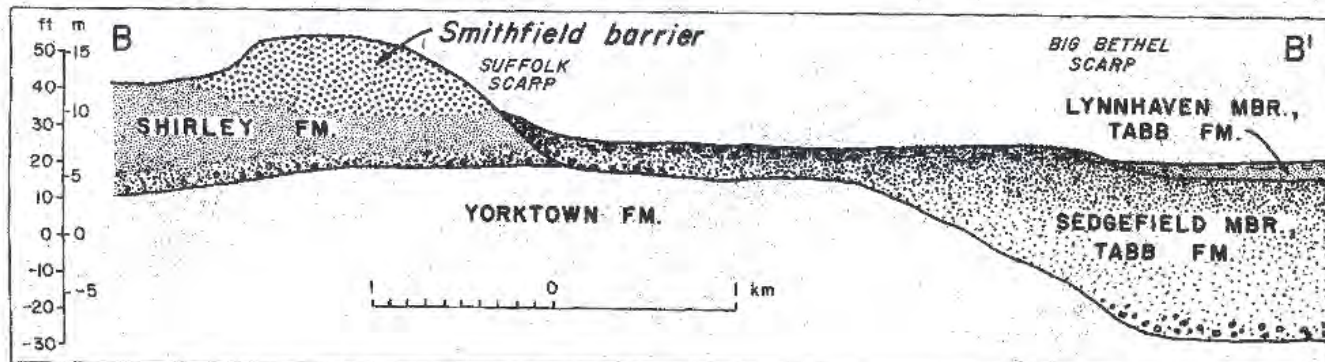
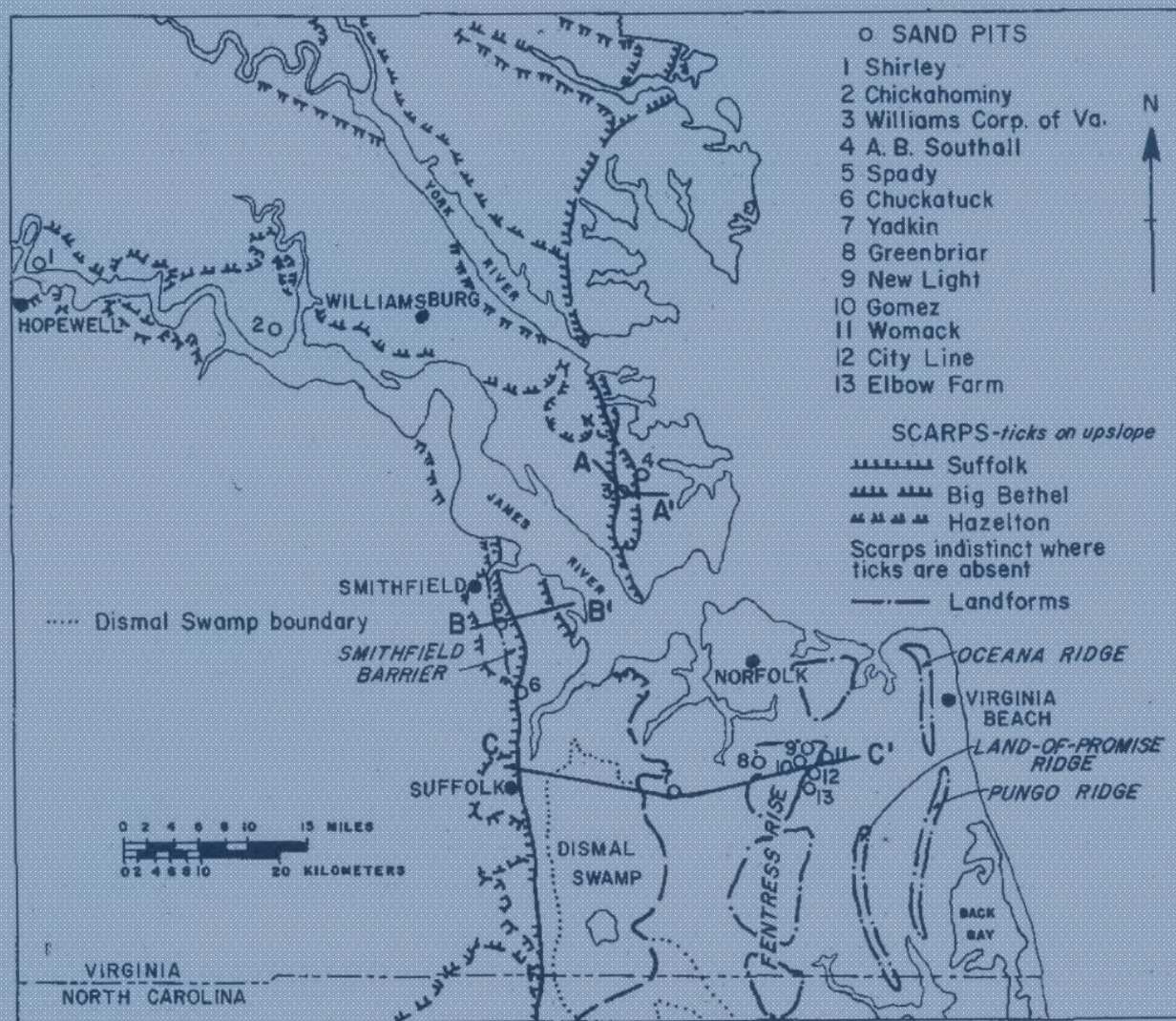


# The Tidewater Cross Section Hampton-Newport News



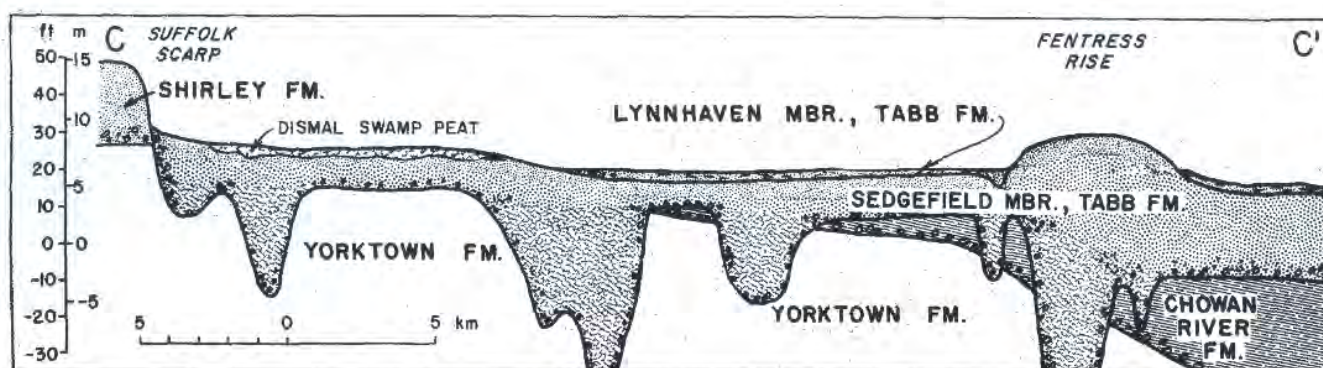
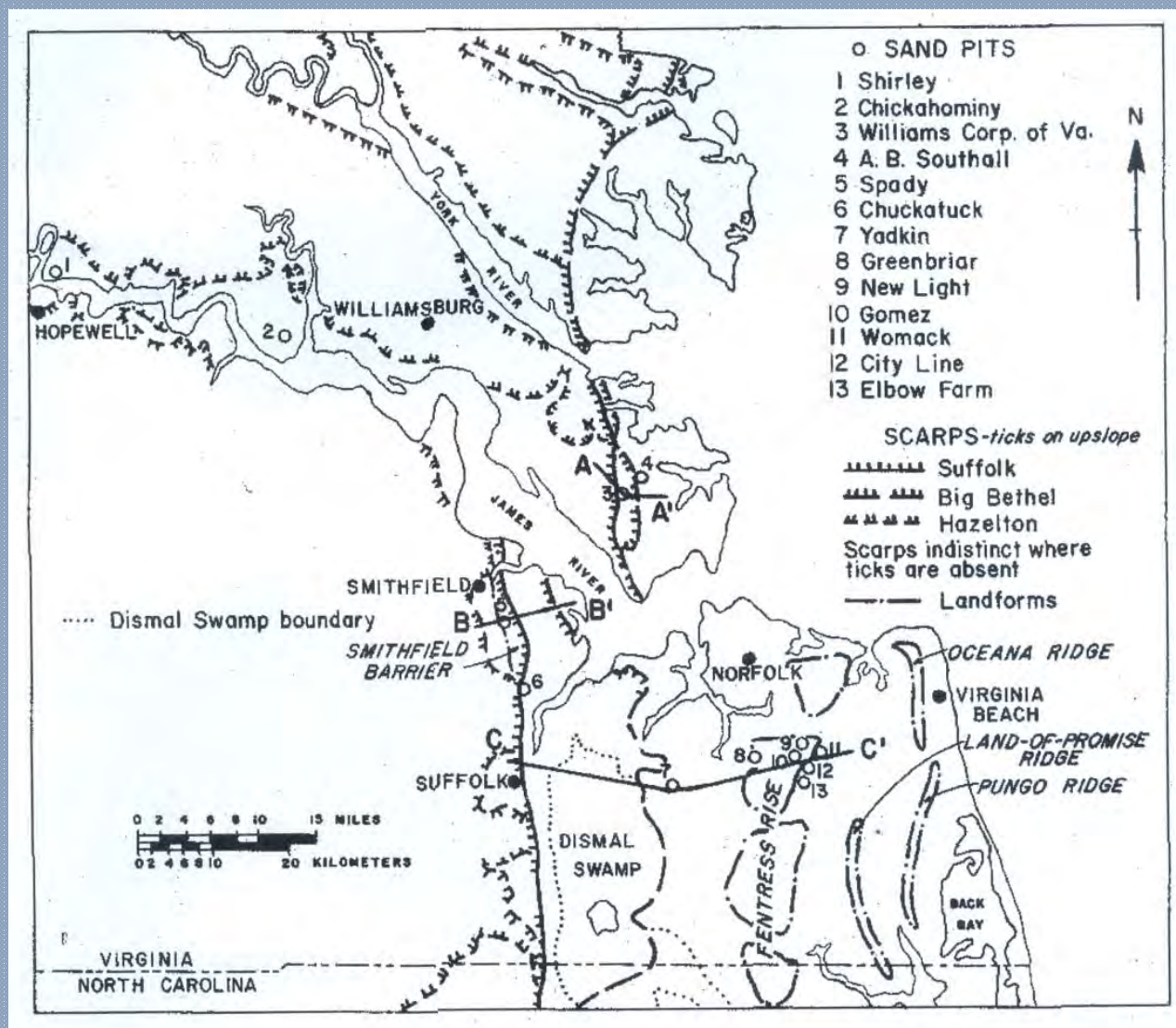


# The Tidewater Cross Section Isle of Wight



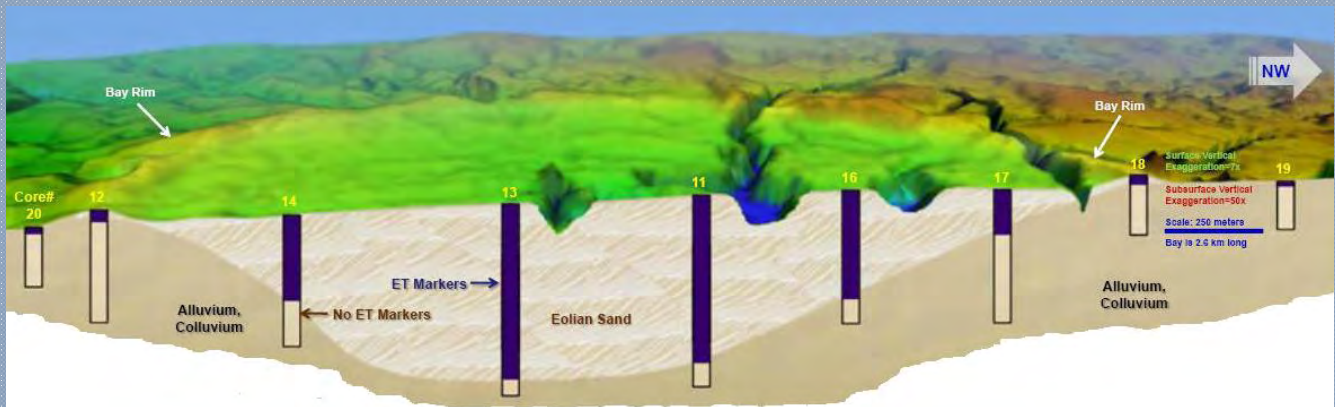


# The Tidewater Cross Section Virginia Beach-Suffolk





# Carolina Bays – A Geologic Mystery



Because the bays are depressions, they tend to be wetlands. Indians called them pocosins. They came to be known as bay swamps because of the trees that grew there: sweet bay and loblolly bay and red bay. Then, because they were first noticed in North and South Carolina, they began to be called Carolina bays.

zonemapcolor.pdf

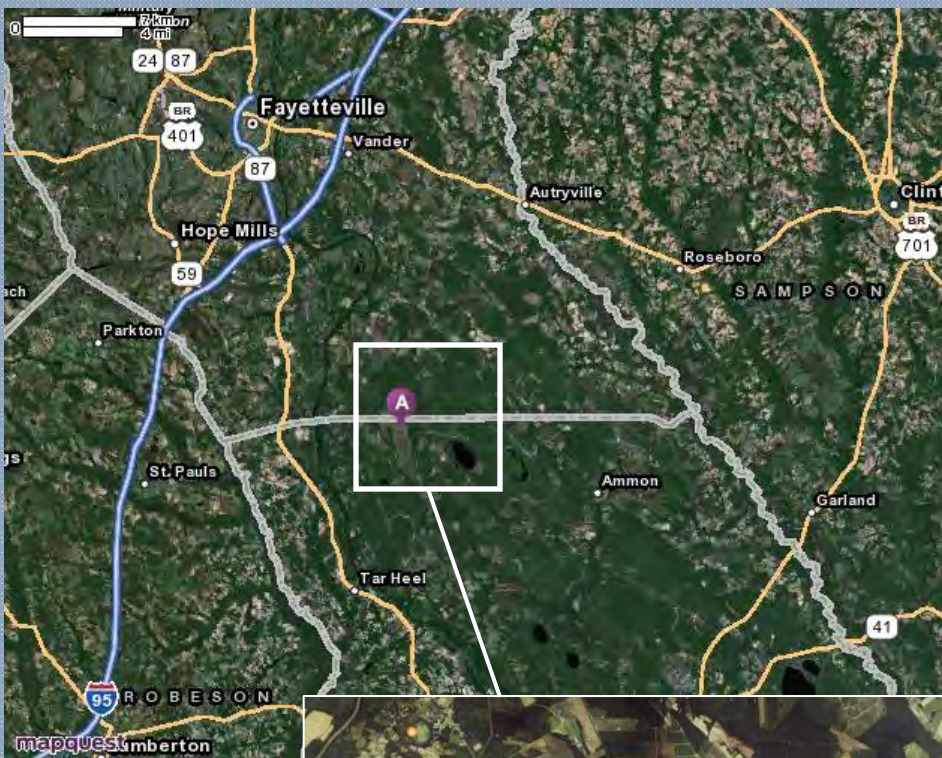
They are generally elliptical in shape, although those from Virginia in the north to Georgia in the south tend to be a little rounder. They are oriented in the same direction, roughly northwest, although again, there are caveats: the ones from Virginia north tend to point a little more to the west, while the southern ones tend to point a little more north.

They have white sand rims, thicker on the southeast edge, that stand anywhere from a few inches to several feet in height. Some bays overlap others, and where they do, the rim of the top bay is in place, and the bottom rim obliterated.

Bays are found by the hundreds on the Eastern Shore, by the tens in Currituck and Chowan counties in North Carolina, and a very few near Richmond. There may even be a few right outside Washington, D.C.

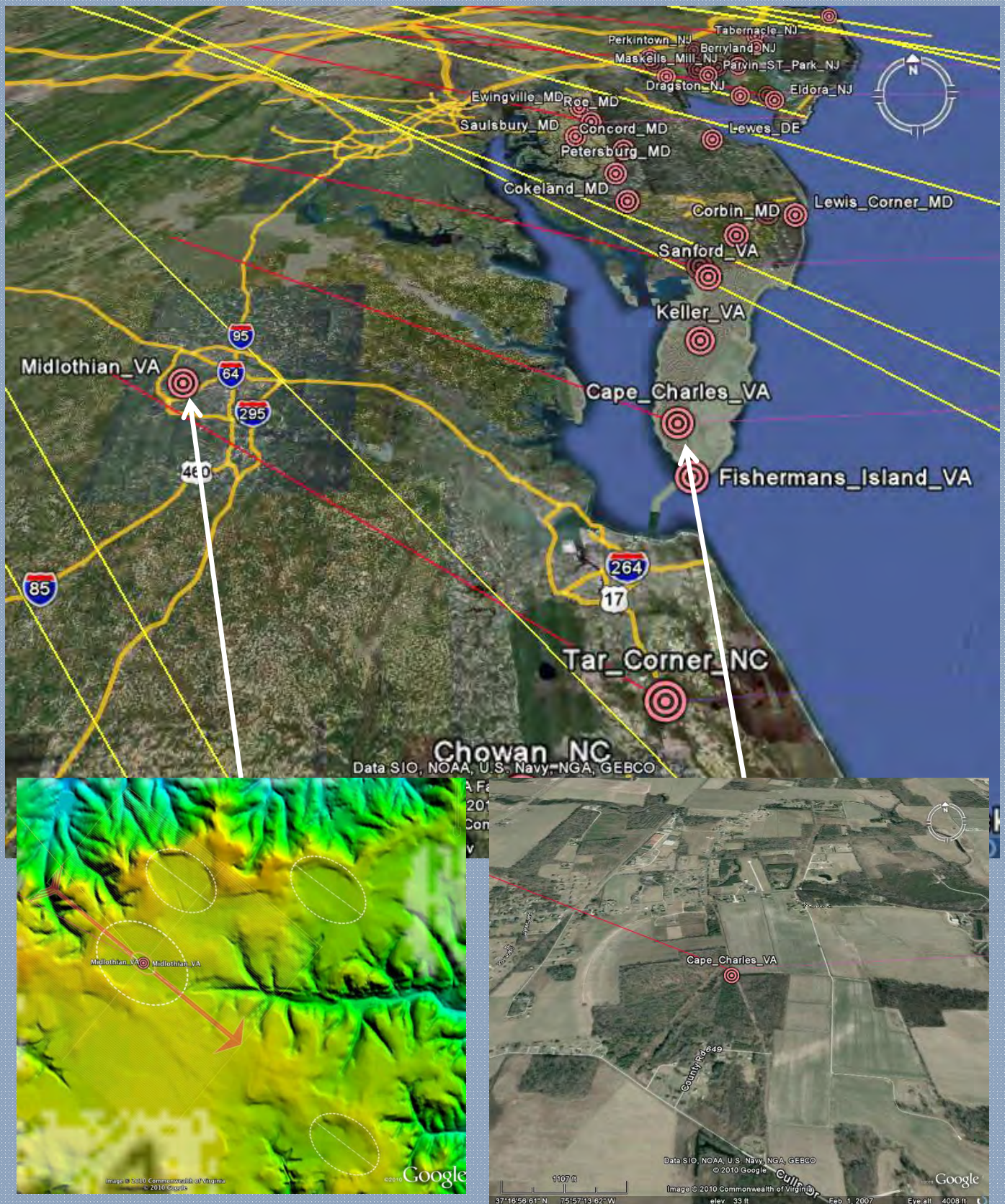


# Carolina Bays – A Geologic Mystery



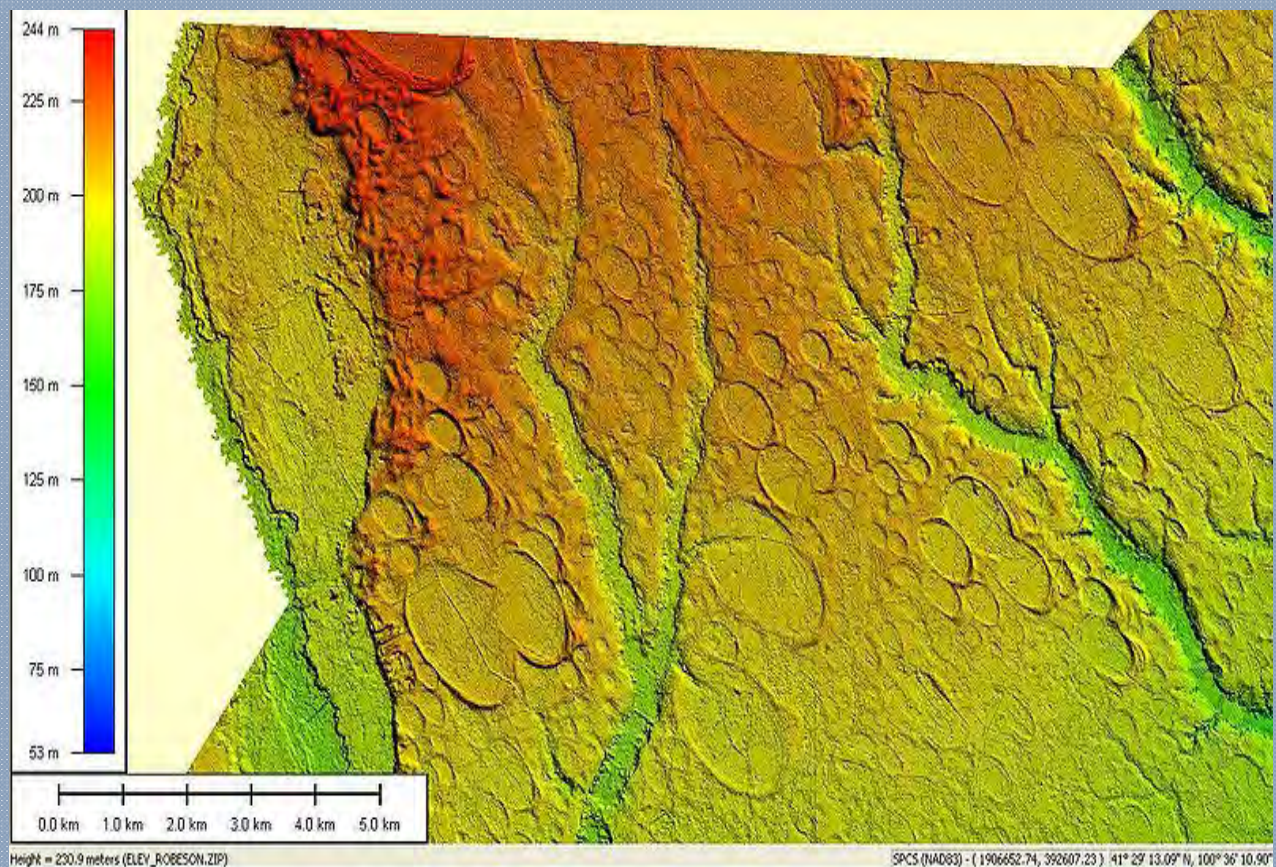


# Carolina Bays – A Geologic Mystery





# Carolina Bays – A Geologic Mystery

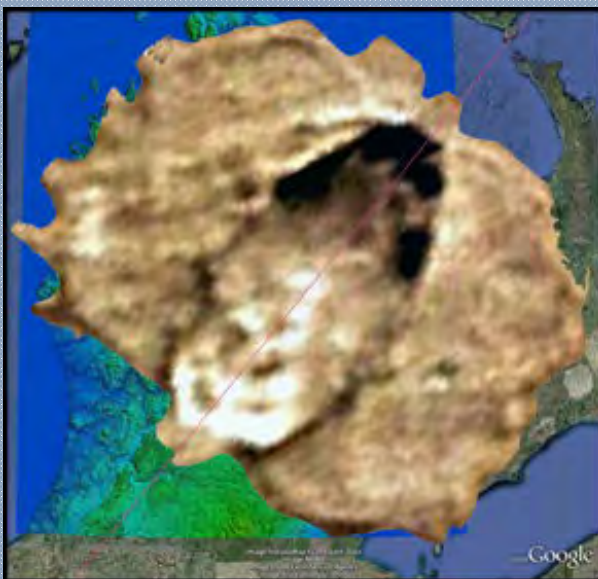
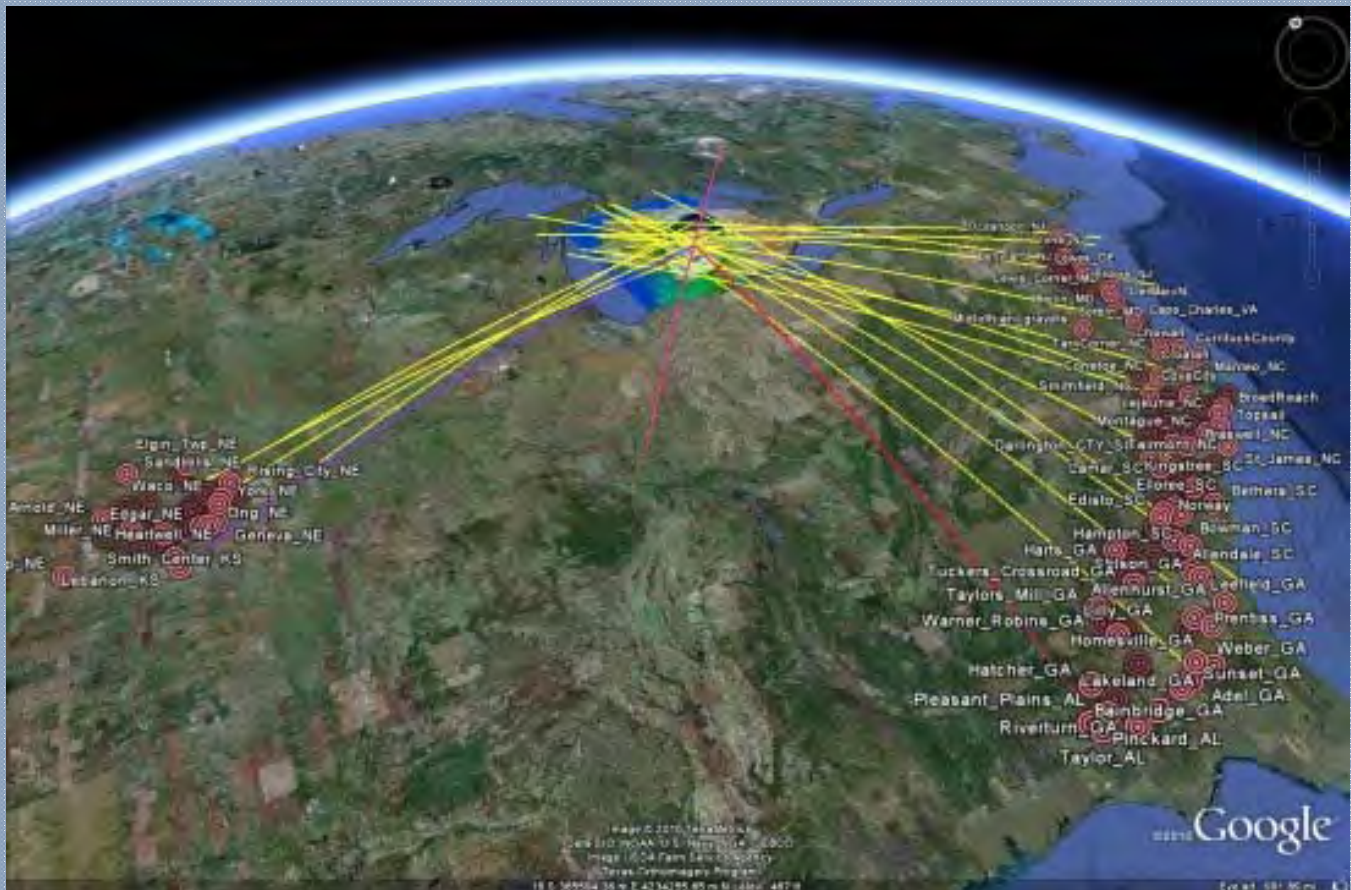


## LIDAR elevation data –Robeson Co., NC NCDOT

1. Spring basins
2. Sandbar dams of drowned valleys
3. Depressions dammed by giant sand ripples
4. Craters from a meteor swarm
5. Submarine scour by eddies, currents, or undertow
6. Segmentation of lagoons and formation of crescentic keys
7. Lakes in sand elongated in the direction of maximum wind velocity
8. Solution depressions, with wind-drift sand forming the rims
9. Solution depressions, with magnetic highs near bays due to redeposition of iron compounds leached from basins
10. Basins scoured out by confined gyroscopic eddies
11. Solution basins of artesian springs with lee dunes
12. Eolian blowouts (deflation)
13. Fish nests made by giant schools of fish waving their fins in unison



# Carolina Bays – A Geologic Mystery



A mean average of all optimum trajectories was used to generate a proposed single point loci for an impact point. The location at 43 6259 North Latitude and 89 7043 West Longitude was computed.....  
Manitoba, Michigan

Michael Davias  
cintos org





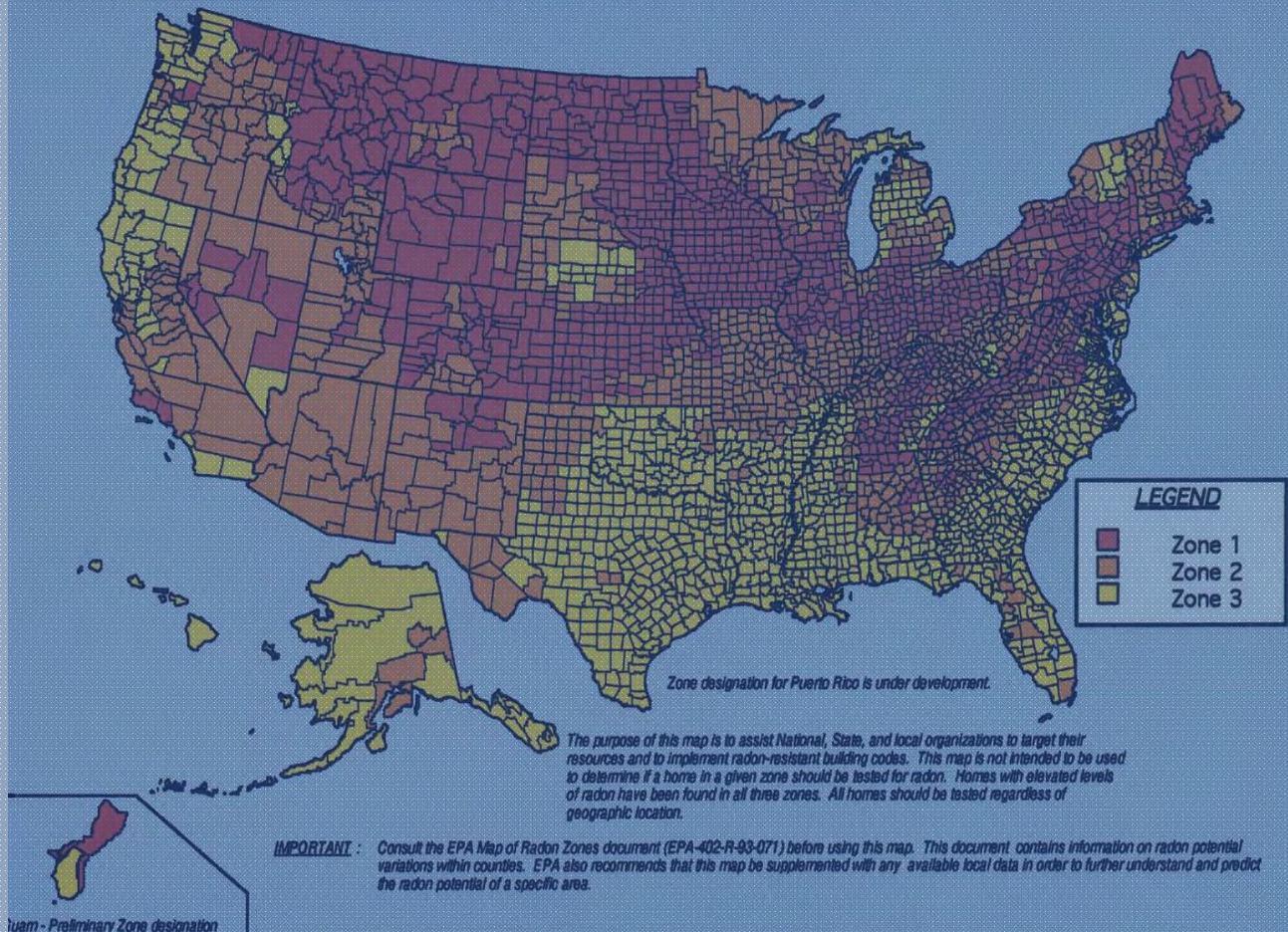
**Digging a footing in a Carolina Bay  
Midlothian, VA**



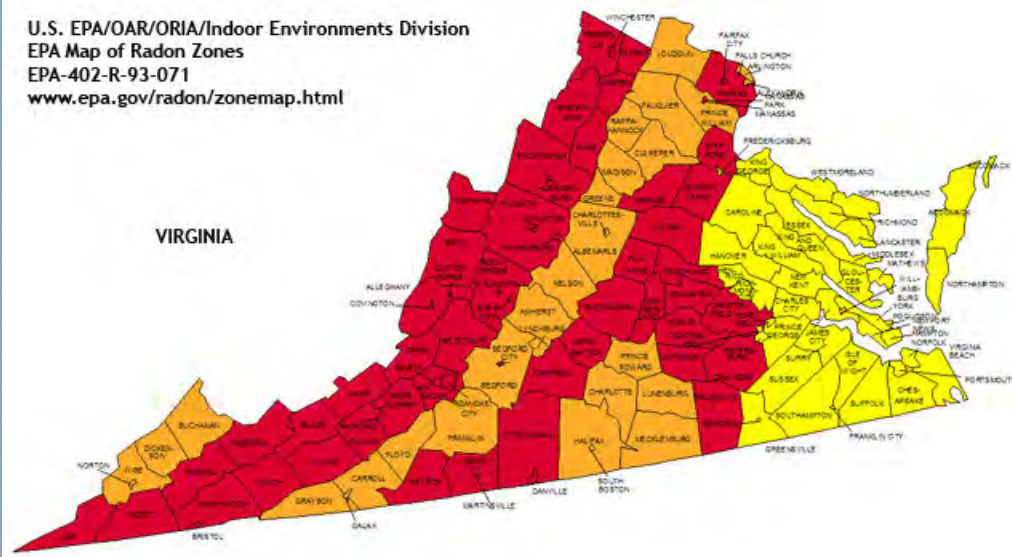
# Radon

All rock/soil contains radon. It's the mechanism of delivery that determines the hazard; depth to rock/sedimentary cover groundwater table, foundation exposure

## EPA Map of Radon Zones

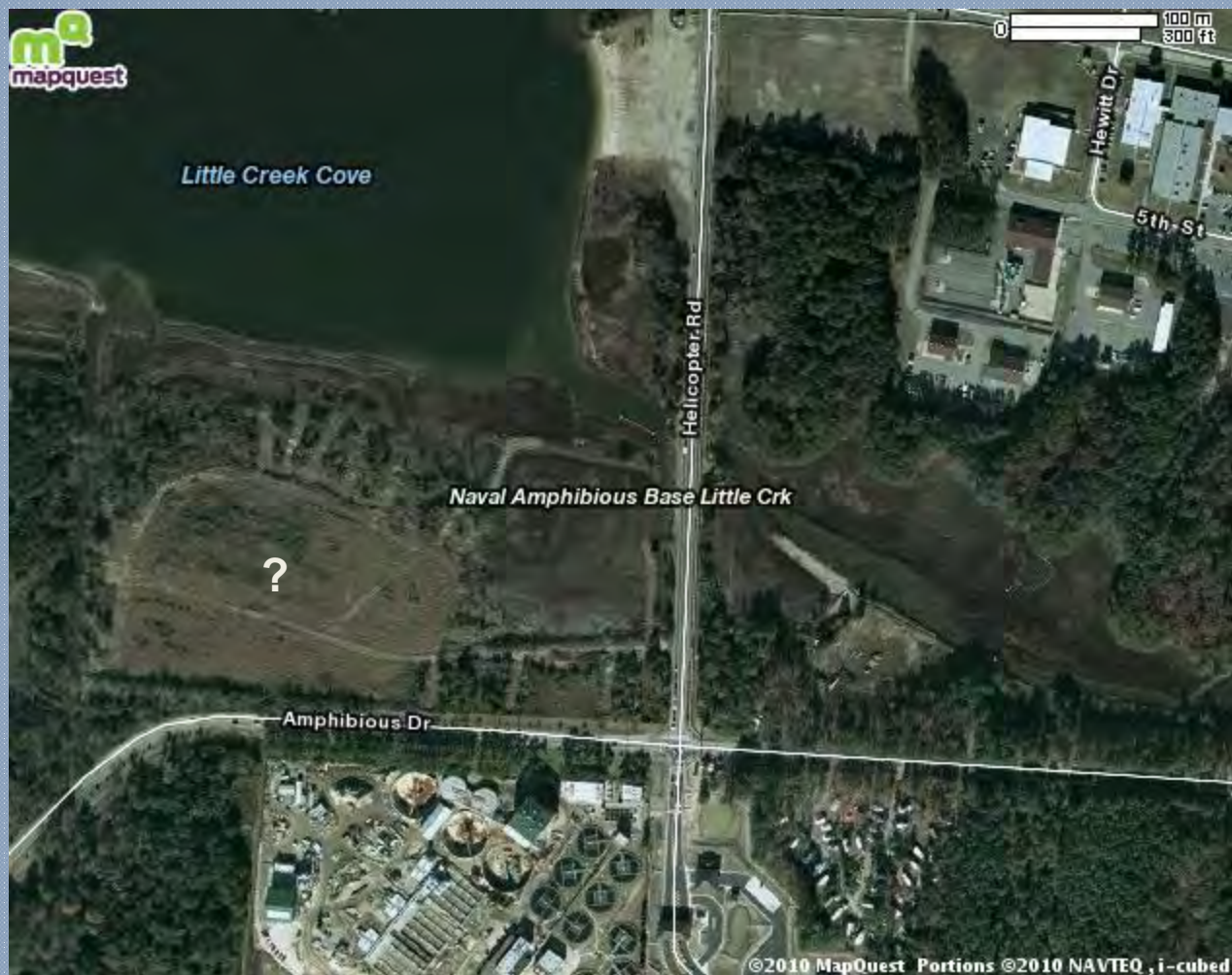


U.S. EPA/OAR/ORIA/Indoor Environments Division  
EPA Map of Radon Zones  
EPA-402-R-93-071  
[www.epa.gov/radon/zonemap.html](http://www.epa.gov/radon/zonemap.html)





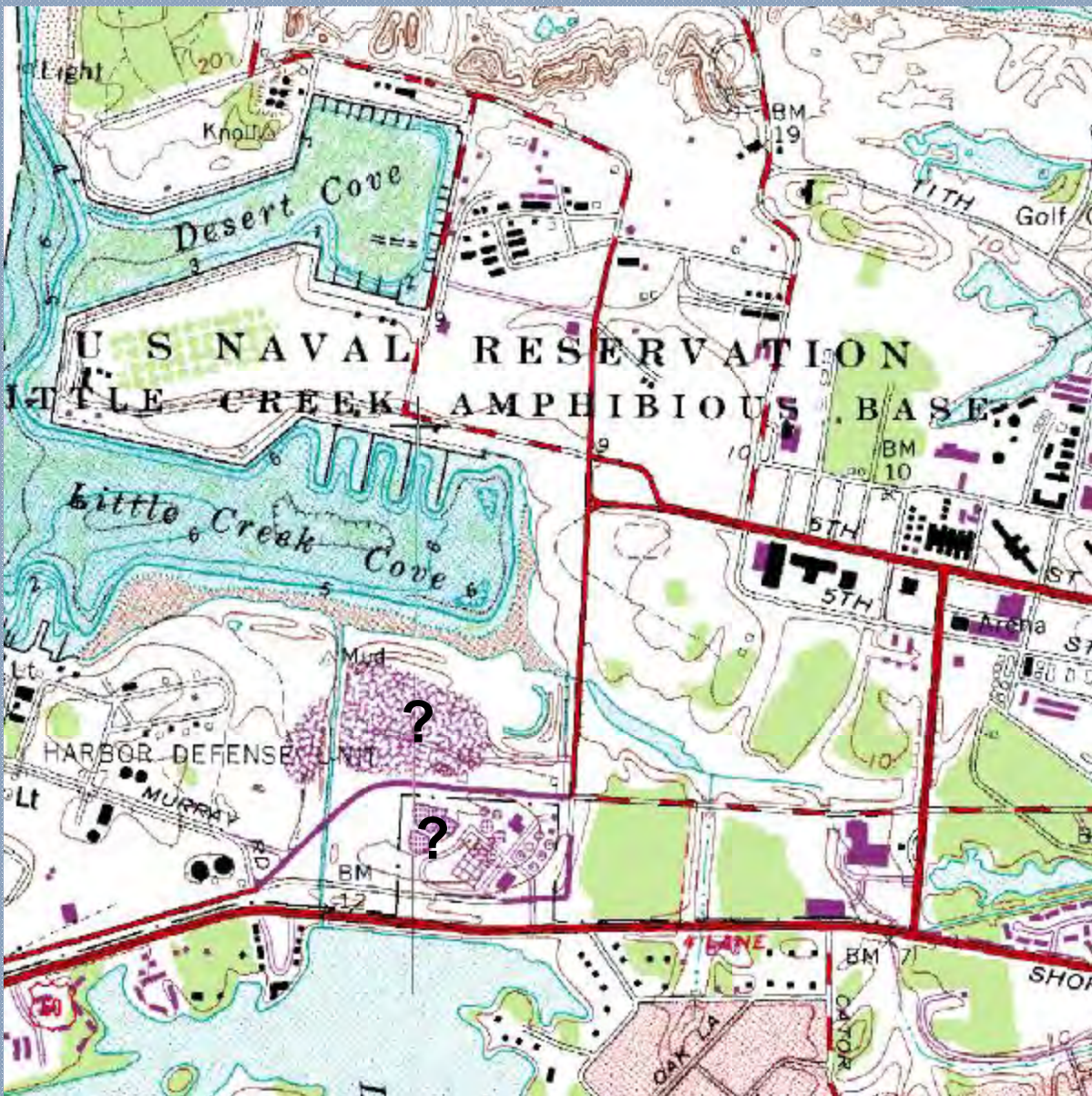
# Tools for Chairborne Site Investigation: Aerial Photography



- <http://terraserver-usa.com/>
- <http://www.mapquest.com/>
- <http://earth.google.com/>



# Tools for Site Investigation: U.S. G.S. Topo



- <http://msrmaps.com/>



# Tools for Site Investigation: USDA Soil Survey



- <http://websoilsurvey.nrcs.usda.gov/>



# Tools for Site Investigation: Geologic Mapping



<http://geology.er.usgs.gov/>  
<http://web.wm.edu/geology/virginia/>



**Please, that's enough  
geology for one day.**

