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Mar 24, 2010



Horn Point Laboratory is located on 856 acres along the south bank of the Choptank River five miles downriver from the Hyatt. Our research areas include: Aquaculture, Nutrient Cycling, Oyster Biology, Physical Oceanography, Plankton Ecology, Restoration & Wetland Ecology. In addition, we have a program in Environmental Science Education. HPL is among the top ten U.S. Ocean Science laboratories in the receipt of federal grants.





December 1606, the *Susan Constant* (120 T), *Discovery* (20 T), *Godspeed* (40 T), set sail from London. Five months later, Capt. Christopher Newport delivered 104 men and boys to VA.



Soon after their arrival the men constructed a fort at Jamestown (Sidney King painting,NPS)



Thought the earliest successful English colony, Jamestown was plagued with early problems, including disease, starvation, and political unrest. In 1609 John Smith disperse the colonists around the James River for survival, they almost left entirely in 1610. It is still a matter of debate why the beginning at Jamestown Is. was so tenuous.



Carville V. Earle suggested salty drinking water as the problem, others suggest drought!

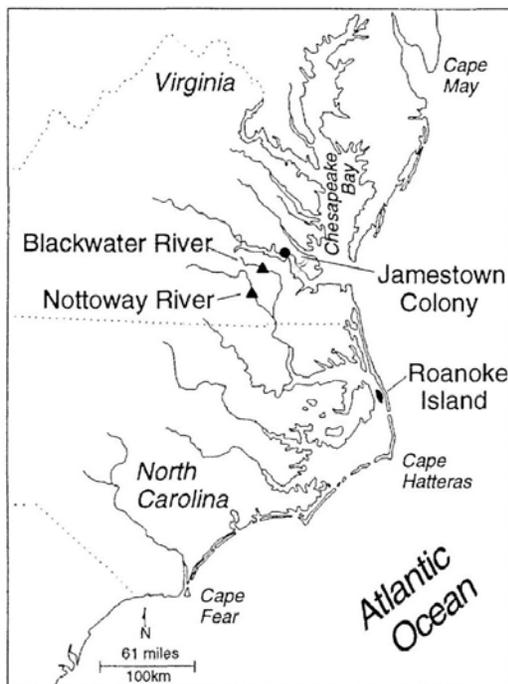


Dr. William Kelso's excavations found the Jamestown fort was largely intact; only the SW bastion was eroded into the James River.

The Lost Colony and Jamestown Droughts

David W. Stahle,* Malcolm K. Cleaveland, Dennis B. Blanton,
Matthew D. Therrell, David A. Gay

Tree-ring data from Virginia indicate that the Lost Colony of Roanoke Island disappeared during the most extreme drought in 800 years (1587–1589) and that the alarming mortality and the near abandonment of Jamestown Colony occurred during the driest 7-year episode in 770 years (1606–1612). These extraordinary droughts can now be implicated in the fate of the Lost Colony and in the appalling death rate during the early occupations at Jamestown, the first permanent English settlement in America. [**Science 280: 564-7**]



**Bald
Cypress
in Cat
Swamp
LA is the
world's
largest.**

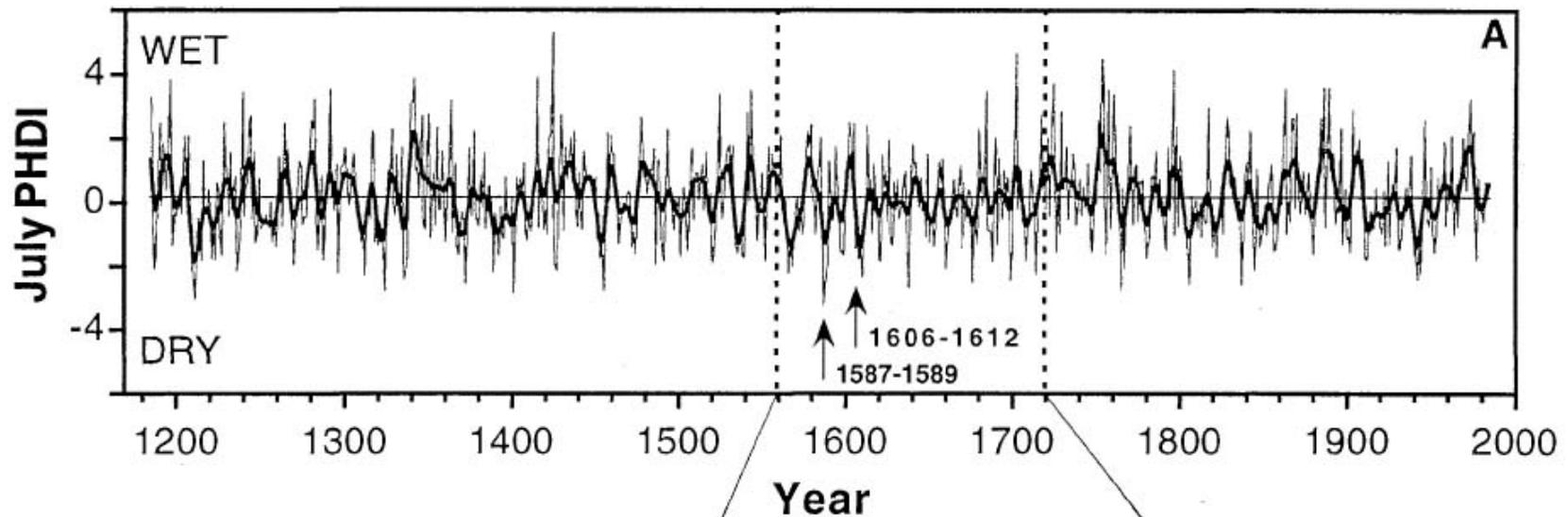
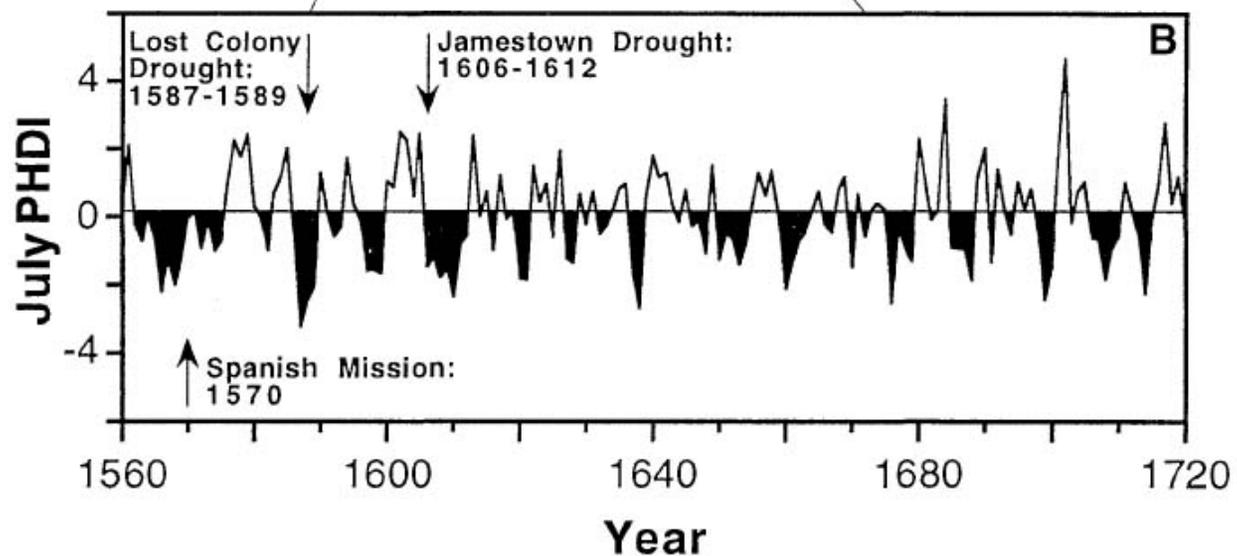
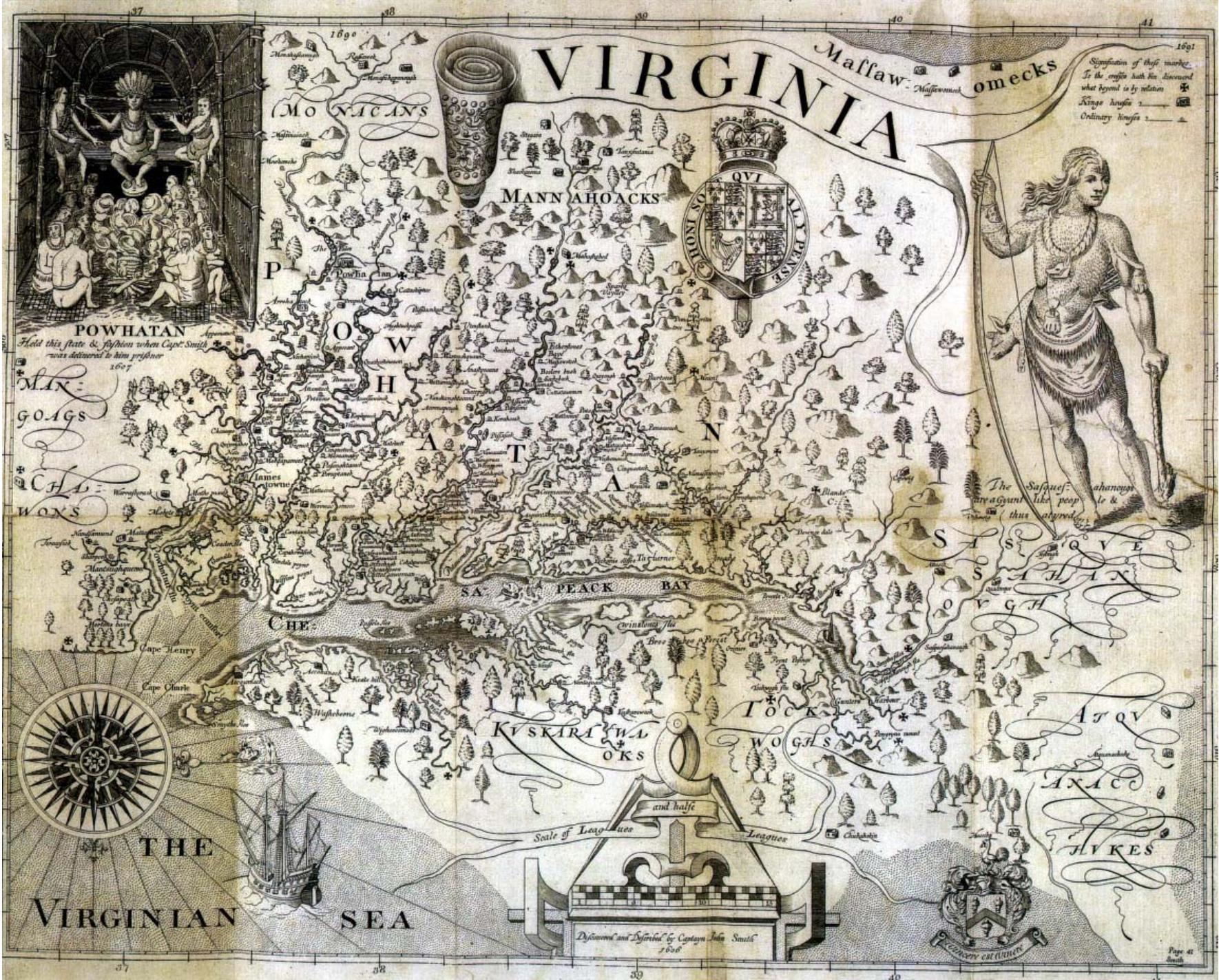


Fig. 3. Tree-ring-reconstructed July PHDI for the Tidewater region of Virginia and North Carolina from 1185 to 1984 (A) and for the early colonial period from 1560 to 1720 (B). The most extreme growing-season drought of the past 800 years was reconstructed for 1587, the year the colonists on Roanoke Island disappeared. The Lost Colony drought of 1587–1589 was the most extreme 3-year episode in the entire 800-year reconstruction. The prolonged Jamestown drought lasted from 1606 to 1612 and was the worst 7-year drought reconstructed for 770 years (from 1215 to 1984).



[From: Stahle et al. 1998, Science 280:564-7.]



VIRGINIA

Maffaw-omecks

Signification of these marks
 Is the English hath his discovery
 what beyond is by relation
 Kings discovery
 Ordinary discovery



POWHATAN

Hold this state & fashion when Capt. Smith was delivered to him prisoner 1607

MAX GOAGS

CHAWONS

MANN AHOACKS



The Sasquahanna are a gun like people & thus attired



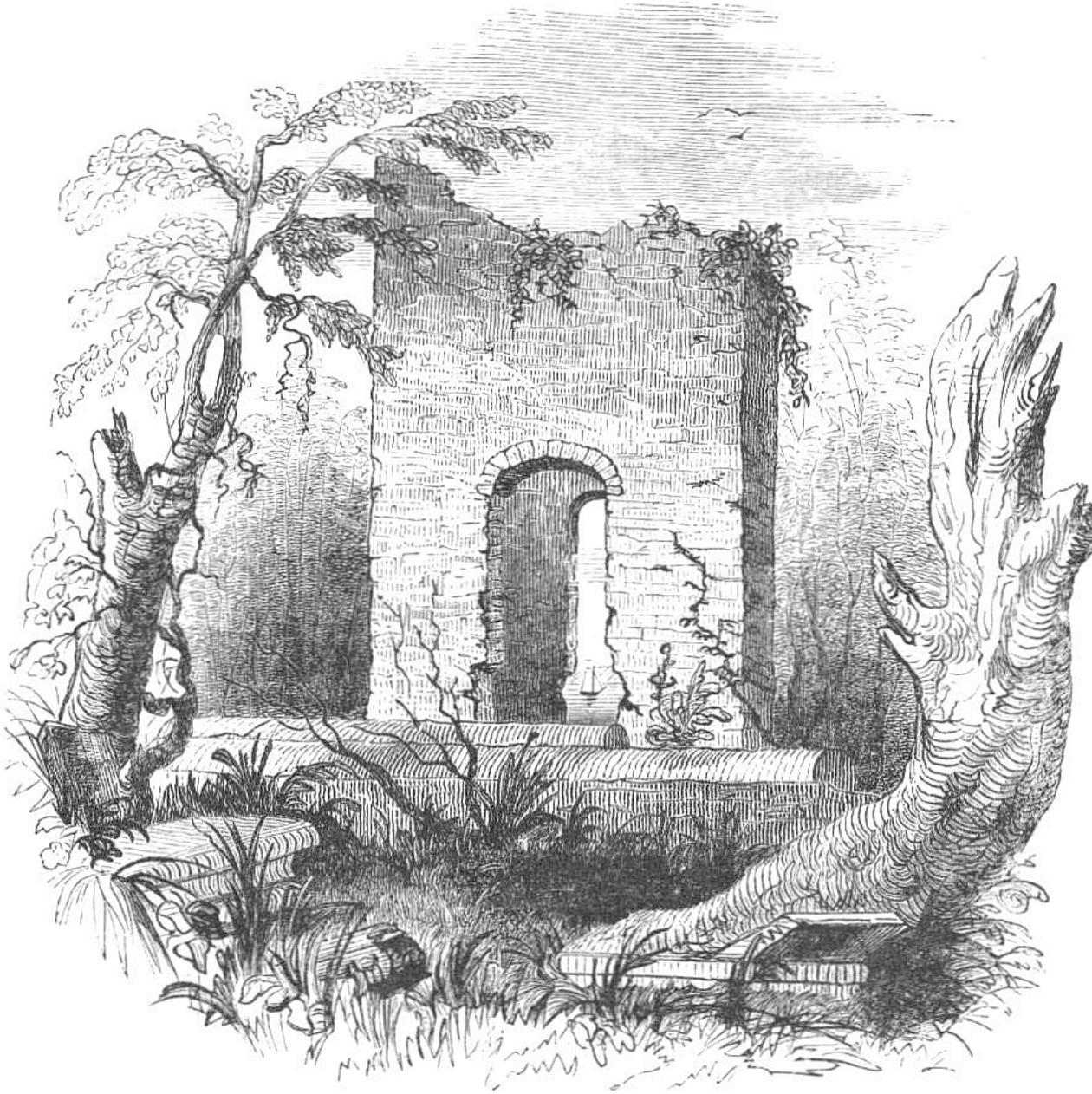
THE VIRGINIAN SEA



Discovered and Inhabited by Capt. John Smith 1606



BENSON J. LOSSING. 1850. PICTORIAL FIELD BOOK OF THE REVOLUTION. VOLUME II.

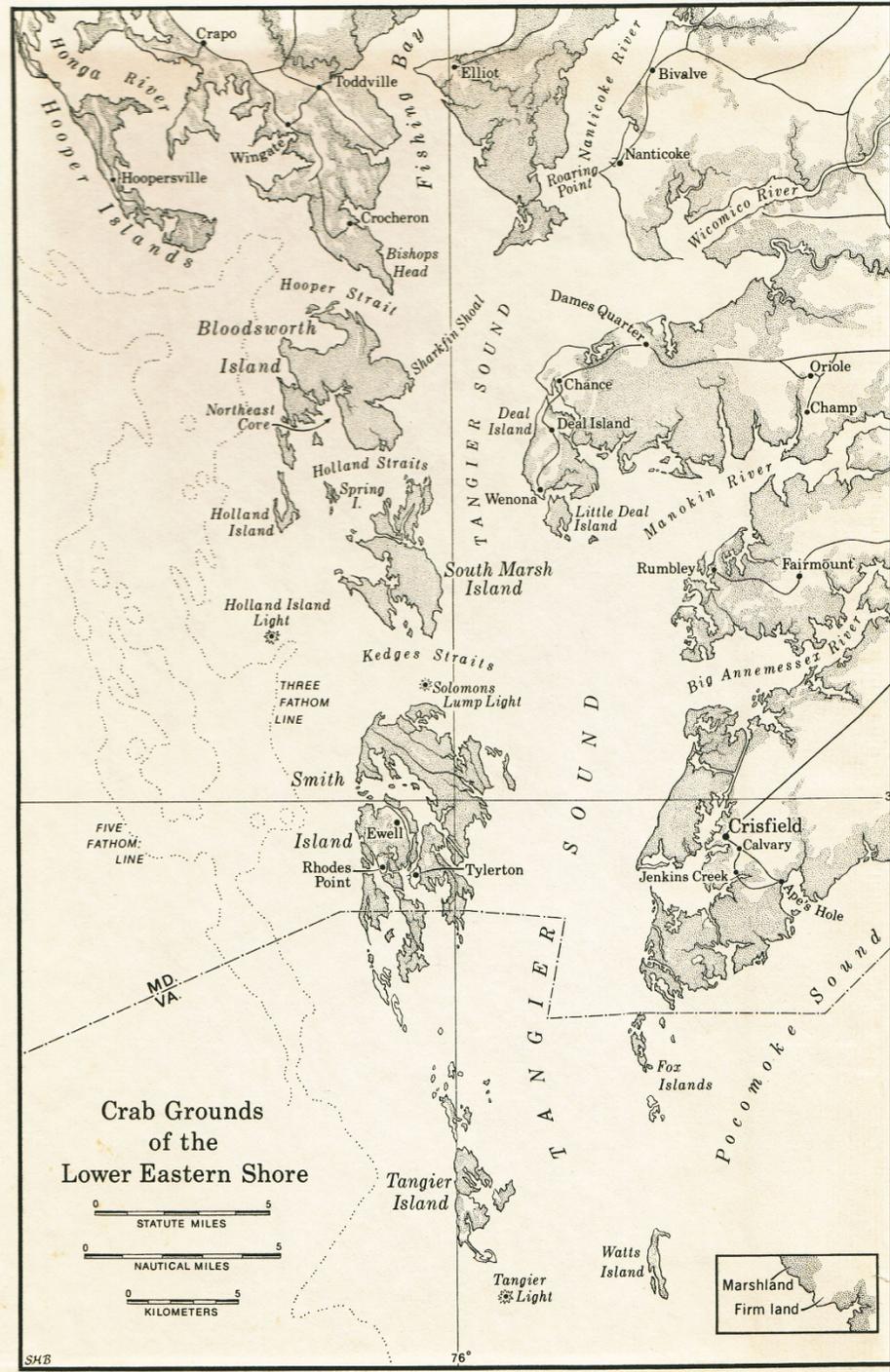
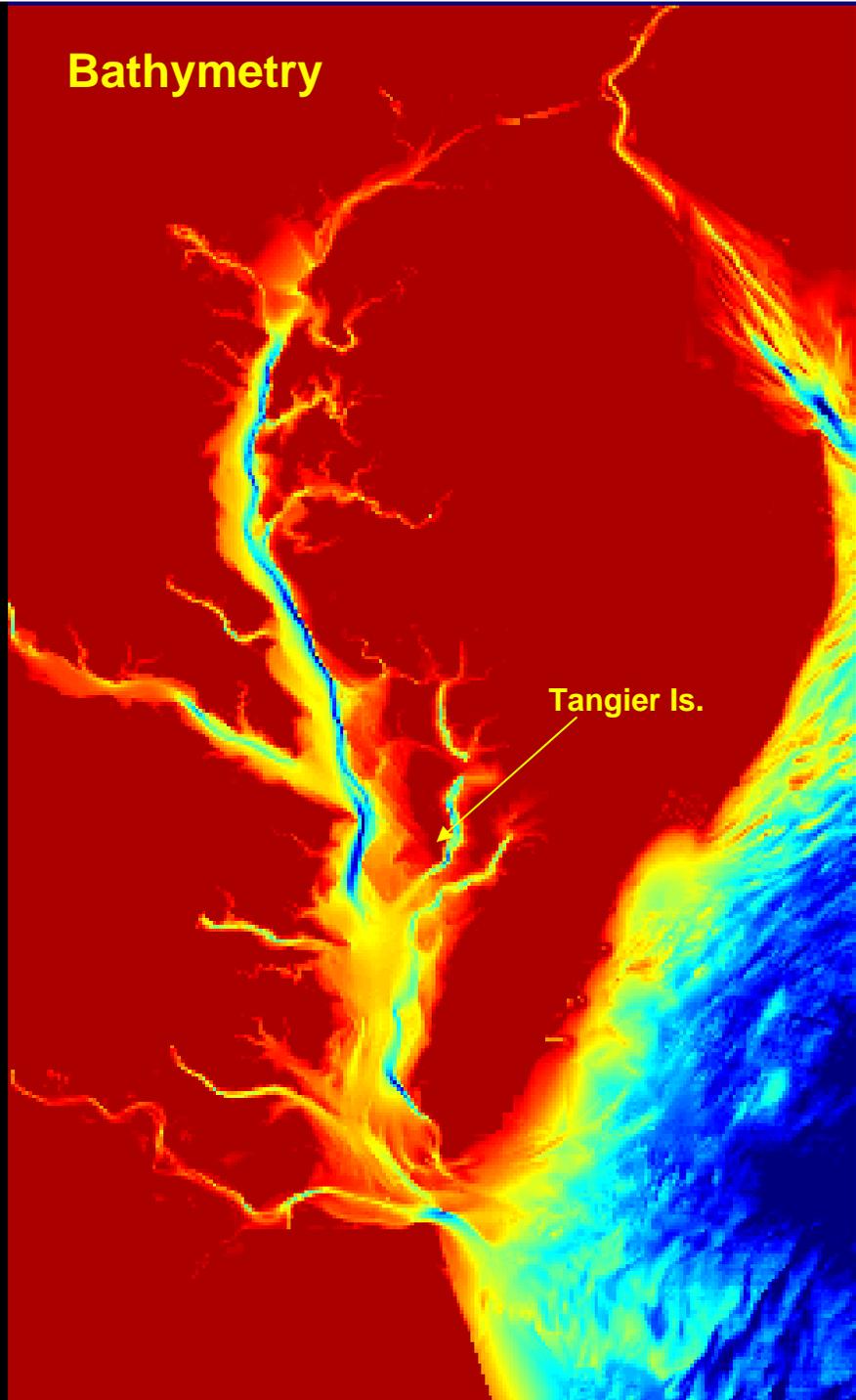


“Every year the current of James River is changing its margins in this region, and within a few years Jamestown Island, made so only by a marsh on the land side, will have a navigable channel around it. Already a large portion of it, whereon the ancient town was erected, has been washed away; and I was informed that a cypress-tree, now many yards from the shore, stood at the end of a carriage-way to the wharf, sixty yards from the water’s edge, only sixteen years ago. The destructive flood is gradually approaching the old church tower, and if the hand of man shall not arrest its sure progress, that too will be swept away, and not a vestige of Jamestown will remain.”



The accuracy of John Smith's map (in red) is impressive when overlaid over a modern digital map; curiously it shows Bay islands were larger, but there were no Indian villages!

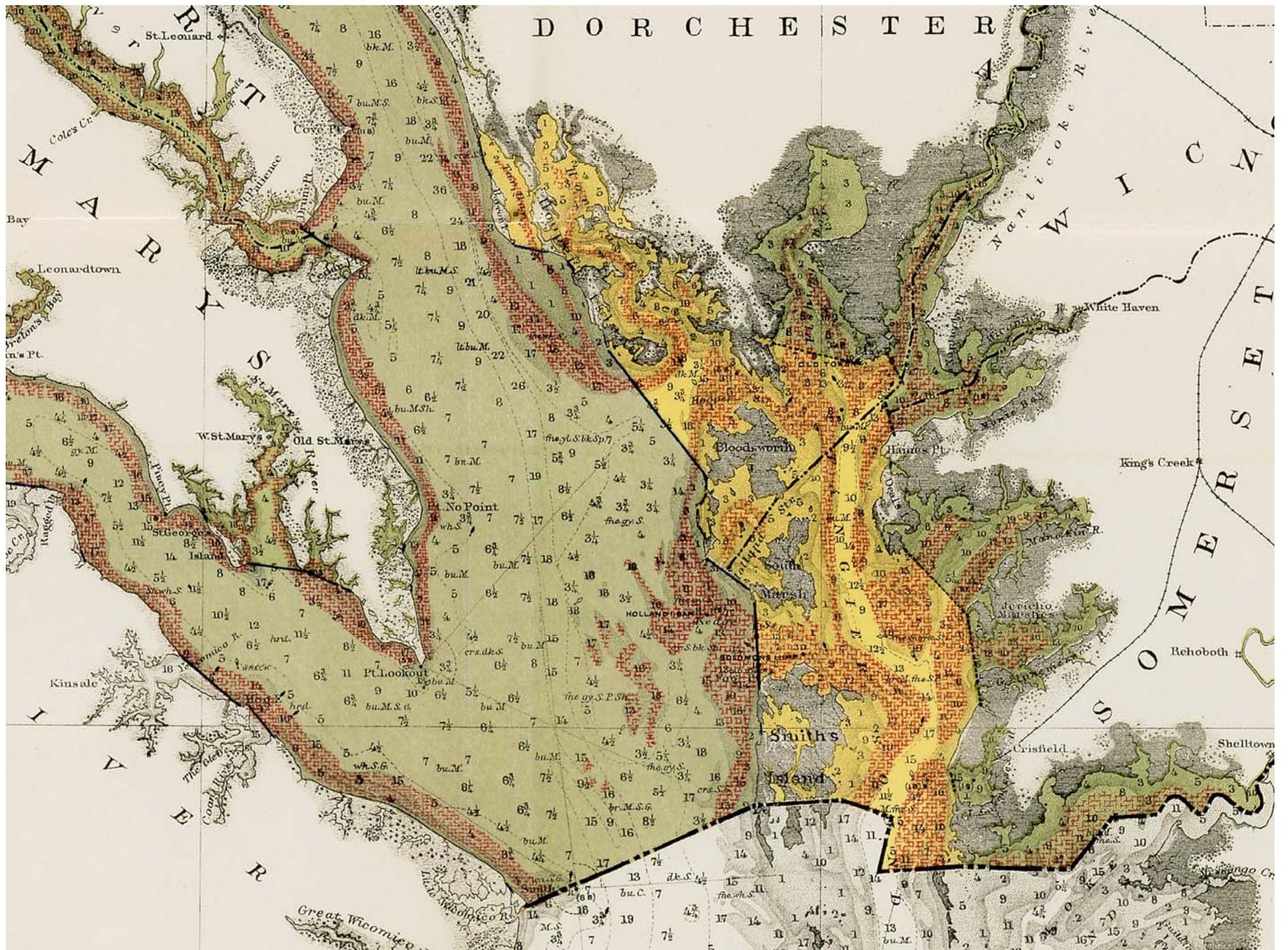
Bathymetry

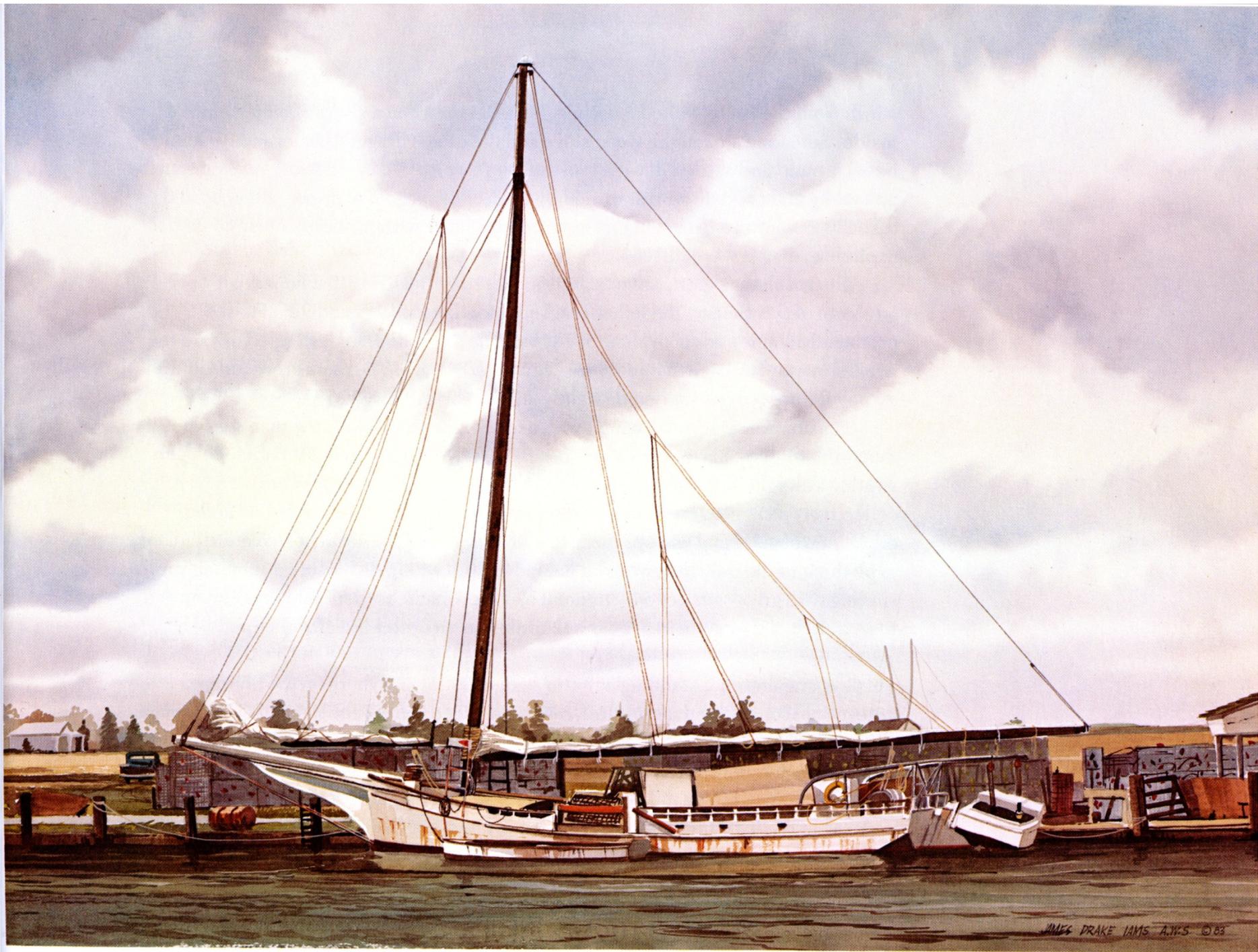




Originally called Russel's Isles by John Smith, Tangier Island VA has a population of 604 (99% white) in the 2000 Census (compared to 1064 in 1900). It has its own power plant and airstrip. The main island has three ridges, called Main Ridge, Canton, and West Ridge by the inhabitants, who speak a dialect of Old English, comparable to Smith Is. MD, six miles to the north. Supposedly, John Crockett settled the island in 1686. Many of the inhabitants still have the surname Crockett, but Pruitt, Thomas, Marshall, Charnock, Dise, and Parks are other common names on the island.

North of Tangier is an island which was abandoned as the thorofare (Oyster creek) between them widened. This northernmost area is called Uppards, and originally had a neighborhood called Canaan. The only structures left on Uppards are duck hunting lodges from 1928. A few of the homes on Main Ridge were moved from Uppards before flooding became a major problem. Two recent hurricanes, Isabel (2003) and Ernesto (2006), flooded much of the island. A few houses have been abandoned while several others are being elevated on new foundations.





A History of Oyster Harvests and Laws in Maryland

2001 = 347,968 bu.

2002 = 148,155 bu.

2003 = 55,840 bu.

2004 = 26,471 bu.

2005 = 72,218 bu.

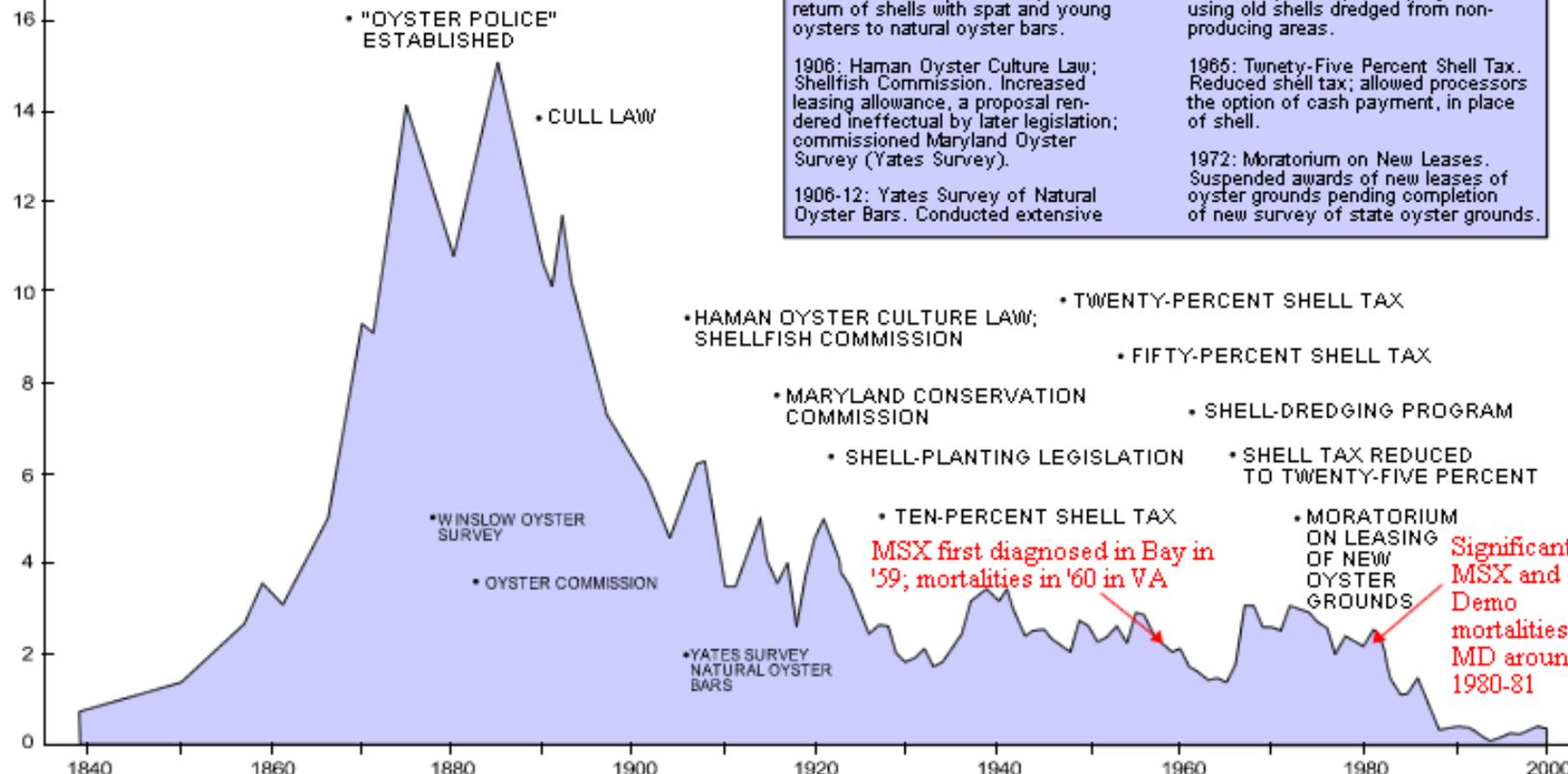
• BALTIMORE & OHIO R.R. REACHES OHIO RIVER

• GENERAL LICENSE SYSTEM;
5-ACRE LAW

• "OYSTER POLICE"
ESTABLISHED

• CULL LAW

MARYLAND BUSHELS (MILLIONS)



c. 1852: Baltimore & Ohio Railroad Reaches Ohio River. Expanded the oyster market to western communities; northern oyster packers opened plants in Baltimore.

1865: General License System; Five-Acre Law. State-wide license system regulated oystermen; leasing law allowed oyster planting on five-acre plots.

1888: "Oyster Police." Collected license fees, enforced fishing restrictions, and protected private grounds.

1877-79: Winslow Oyster Survey. Documented expansion of oyster beds and decline in numbers of oysters in Pocomoke and Tangier Sounds.

1882: Oyster Commission. Surveyed Maryland oyster beds; recommended conservation measures and oyster farming.

1890: Cull Law. Set minimum legal size for market oysters; required return of shells with spat and young oysters to natural oyster bars.

1906: Haman Oyster Culture Law; Shellfish Commission. Increased leasing allowance, a proposal rendered ineffectual by later legislation; commissioned Maryland Oyster Survey (Yates Survey).

1906-12: Yates Survey of Natural Oyster Bars. Conducted extensive

biological and environmental surveys of Maryland's oyster bars.

1916: Maryland Conservation Commission. Consolidated Shell Fish Commission, Fish Commissioners, State Game Warden, and State Fishery Force (Oyster Police) into one agency.

1922: Shell-Planting Legislation. Initiated annual placement of shell as catch for depleted oyster bars.

1927: Ten-Percent Shell Tax. Required oyster processors to make 10 percent of their shucked shell available for state use in planting.

1947: Twenty-Percent Shell Tax. Increased shell tax on processors.

1953: Fifty-Percent Shell Tax. Increased shell tax again, but the supply still proved insufficient.

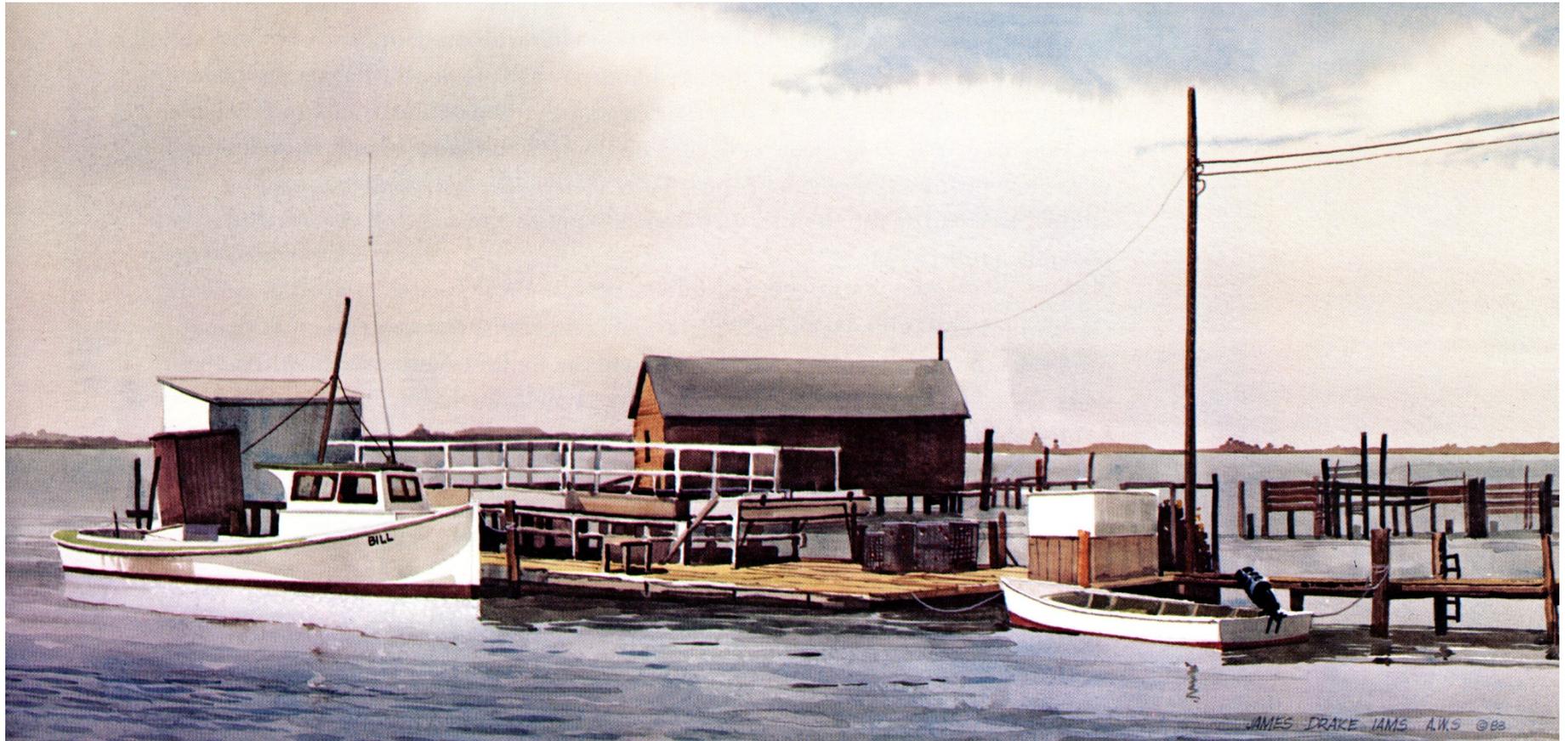
1961: Shell-Dredging Program. Initiated new oyster repletion program using old shells dredged from non-producing areas.

1965: Twenty-Five Percent Shell Tax. Reduced shell tax; allowed processors the option of cash payment, in place of shell.

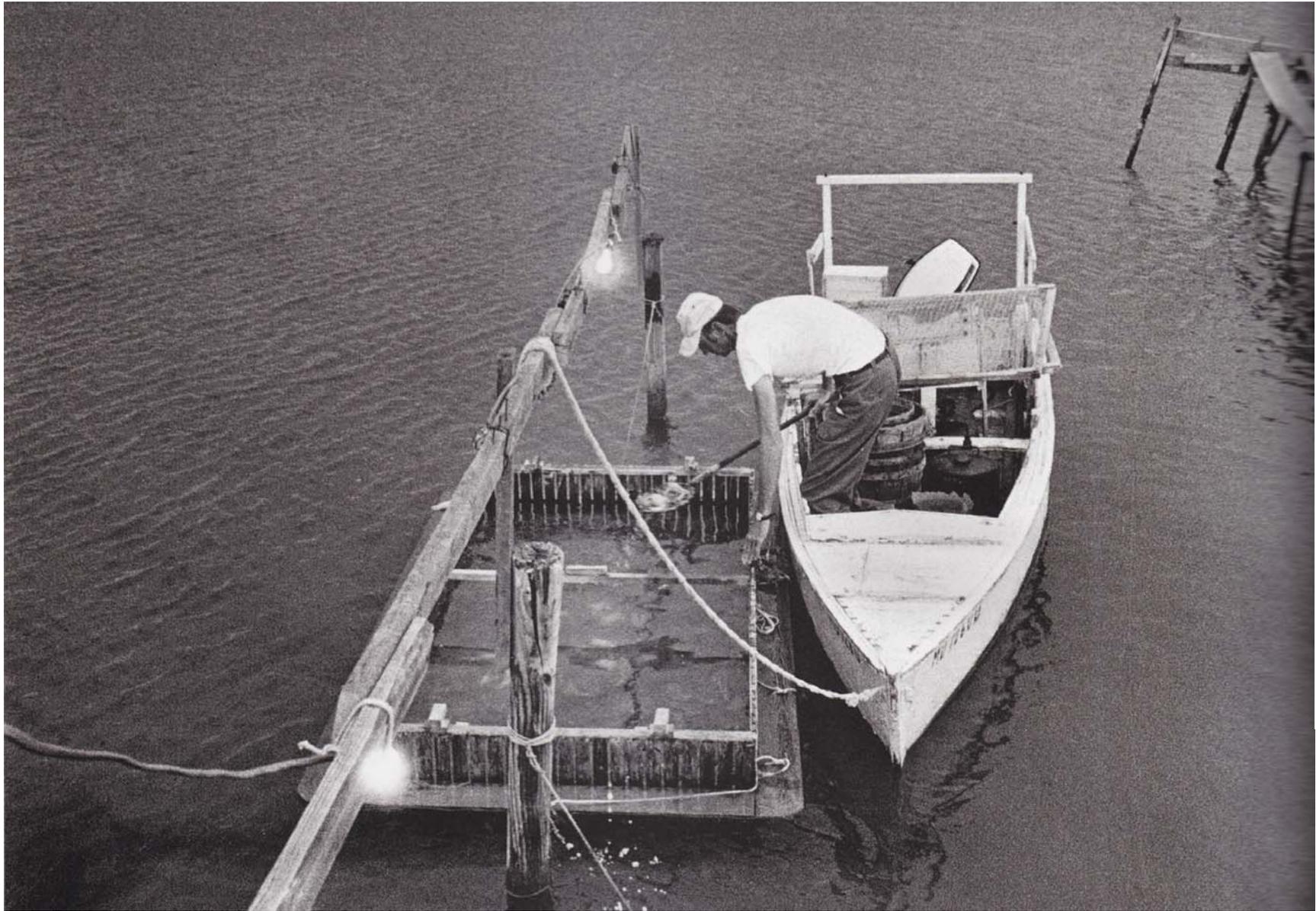
1972: Moratorium on New Leases. Suspended awards of new leases of oyster grounds pending completion of new survey of state oyster grounds.

MSX first diagnosed in Bay in '59; mortalities in '60 in VA

Significant MSX and Demo mortalities in MD around 1980-81



“Near Tyleton, Smith Island” 1983 painting by James Drake Iam



Jesse Brimer checking a “slough box” on Smith Island to see if “peeler crabs” have shed their shells to become more valuable “soft crabs” (photo by Bob Grieser, 1990)



Boat on the lift at Rhodes (Rogue's) Pt, Smith Island across from Tylerton -- 2001, May 1

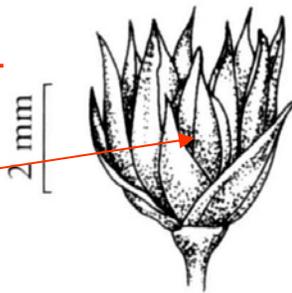
**Town of Ewell, “capital” of Smith Island,
MD.**



"Black Needle Rush" *Juncus roemerianus* Scheele *Juncaceae*



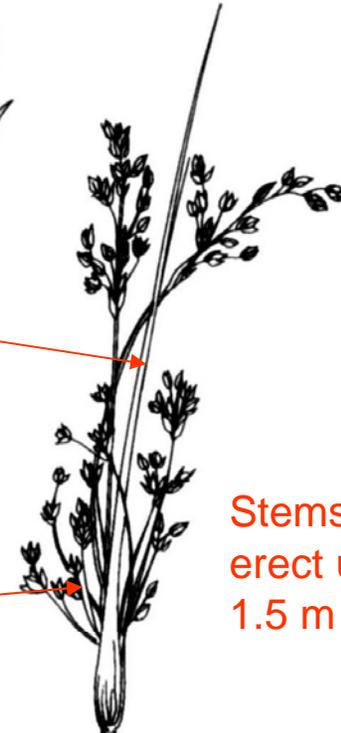
Glomerule with 2-6 perfect or pistillate flowers with brown tepals



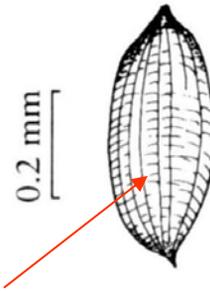
Primary bract terete --longer than inflorescence



Cyme appearing lateral or pseudo-lateral



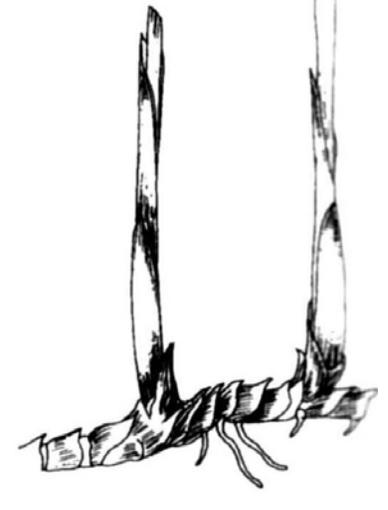
Stems stiff erect up to 1.5 m tall



Seeds finely ribbed, 0.5 mm long, no tails

Extends from Texas to Florida & North to Delaware- appears to be moving northward.

2 cm





Men shooting the breeze in front of Middleton & Dize General Store in 1965 at Ewell, Smith Island. Photo by Marion Warren. 1994. *Bringing Back the Bay*, JHU Press



Camp Meeting at Smith Island – Marion Warren. 1994. *Bringing Back the Bay*, JHU Press



Frances Kitching fixing crab cakes at her boarding house at Ewell (Bob Gieser, 1990)

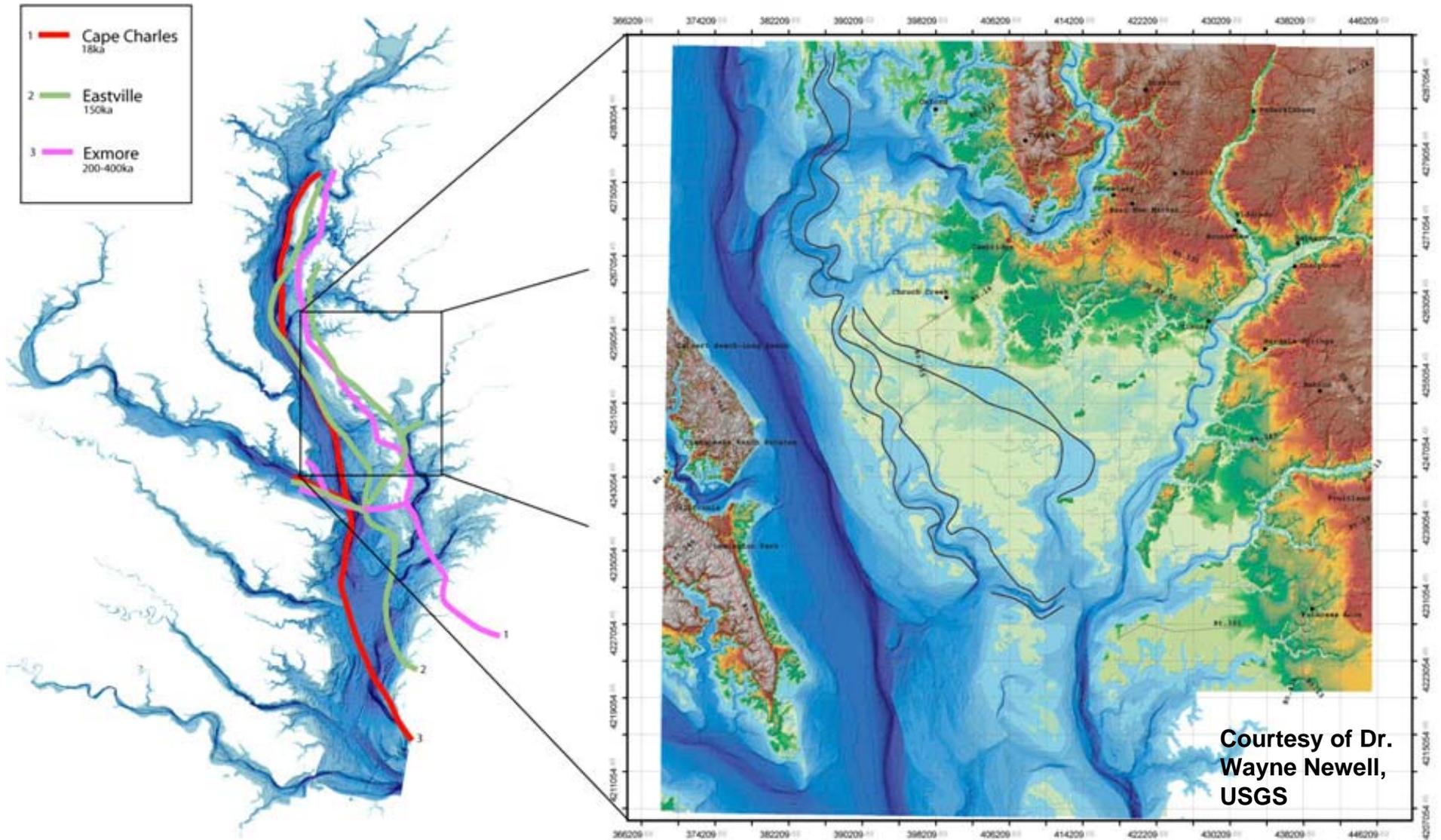


Smith Is. Cake has been designated as the “State Cake” of MD (Jane Thomas, UMCES)



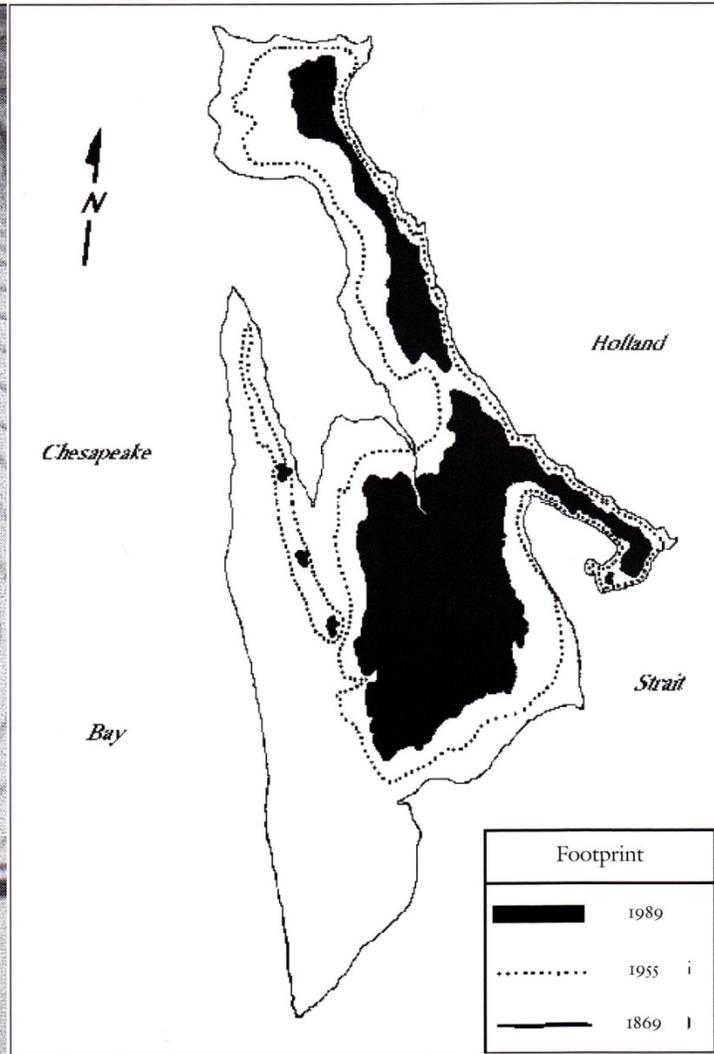
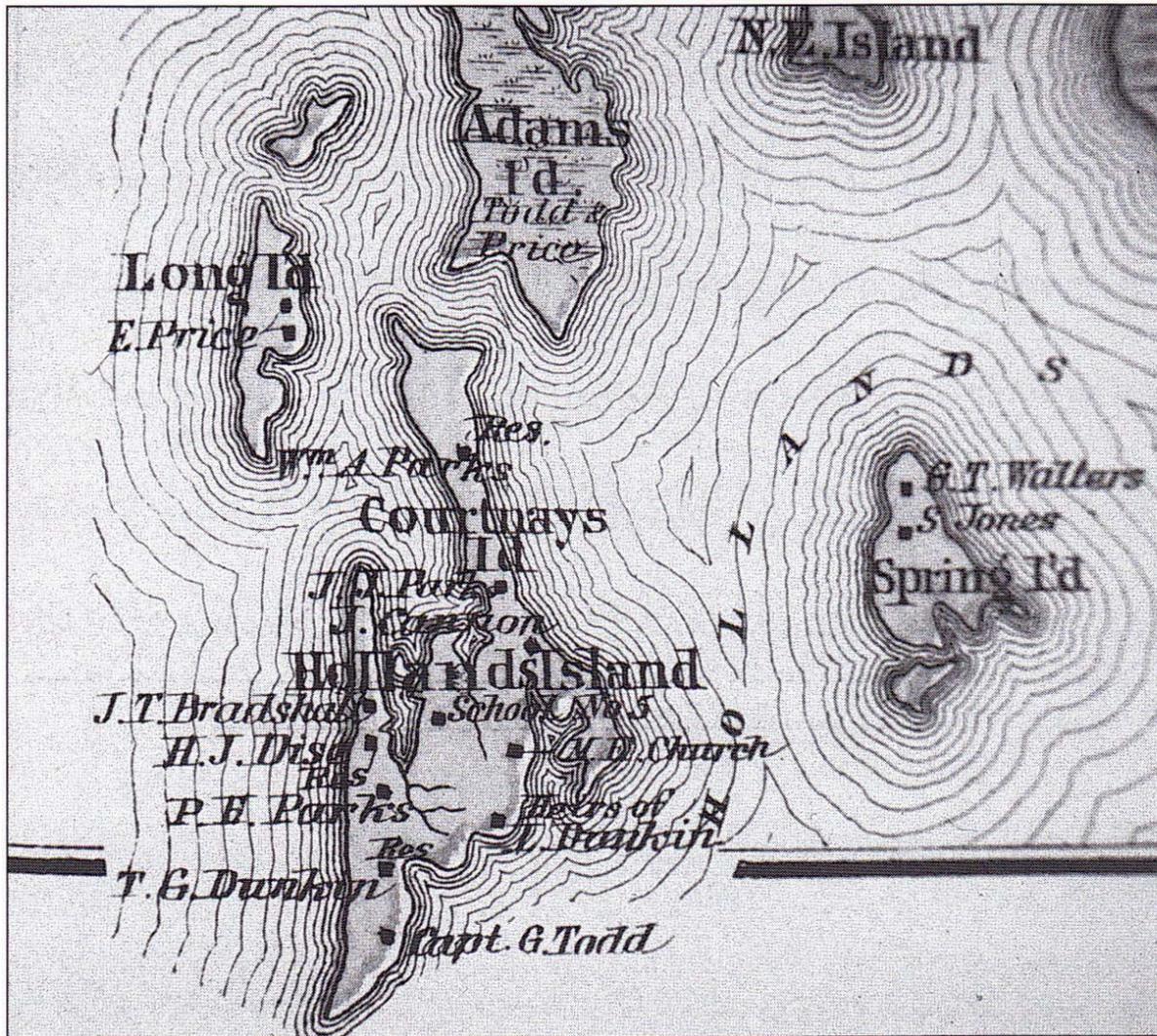
1902 map showing the north end of Smith Is. (upper right) which is now Martin NWR to James Is. (on the north side of Taylor Is.) [Maryland Geological Survey]

Most of the mid-Bay Islands were formed between the various paleo-channels of the Chesapeake Bay.





In the 1890s Holland Island had a thriving community with houses situated along a long ridge, but about 1914 most residents decided to leave for the mainland. Most families moved their houses to Cambridge or Chrisfield paying \$1 per day per man to barge them.



Hurricane 8

Dates: 08/17 - 08/26 1933

Maximum Wind Speed: 120 mph

Minimum Pressure: - mb

US Landfall Category: Category 2 Hurricane

Deaths: 0

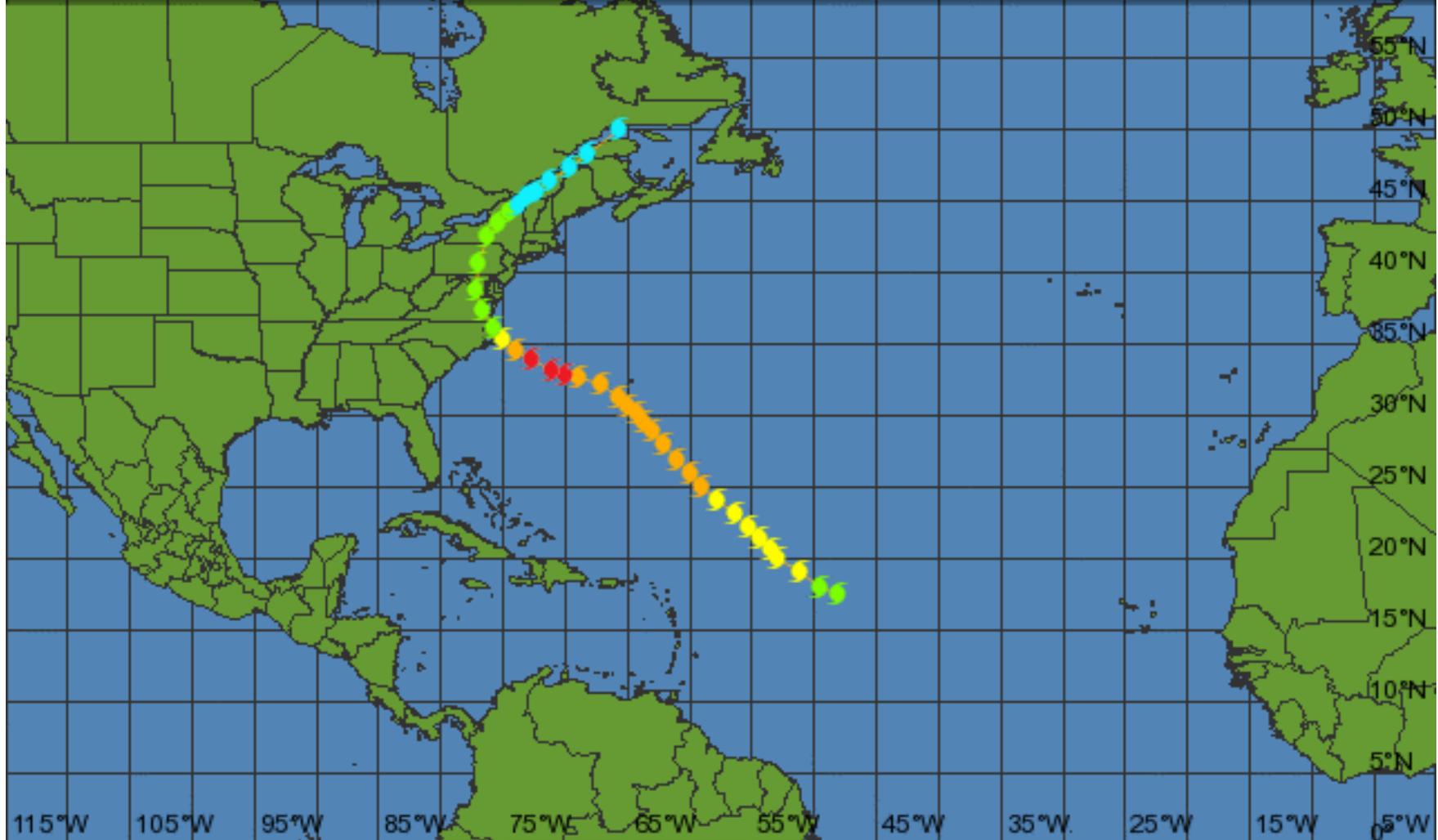
US Damage (Millions US \$): 17

Storm Category



Weather Underground®
wunderground.com

Tropical Depression	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
< 39 mph	39-73 mph	74-95 mph	96-110 mph	111-130 mph	131-155 mph	156+ mph



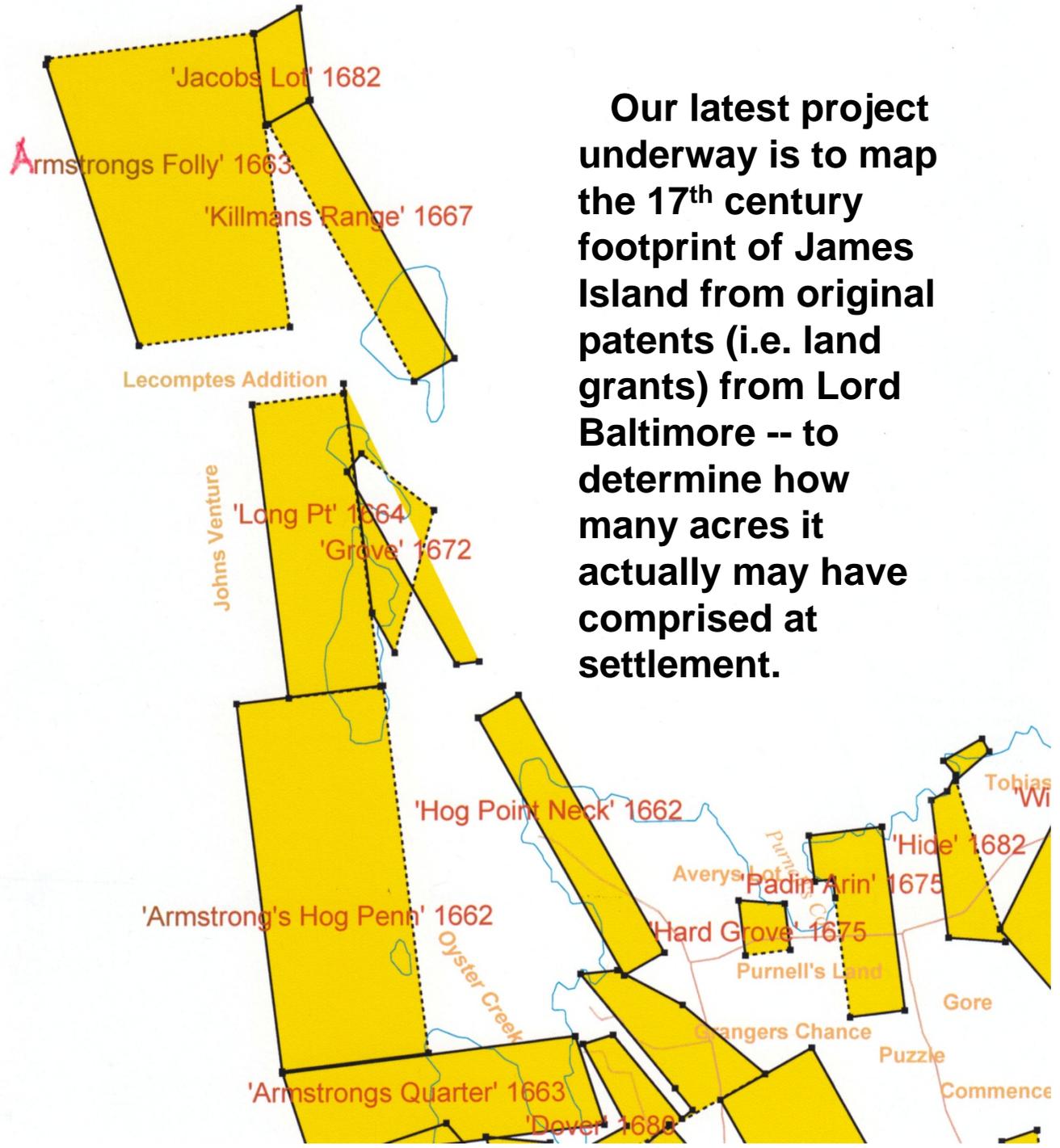
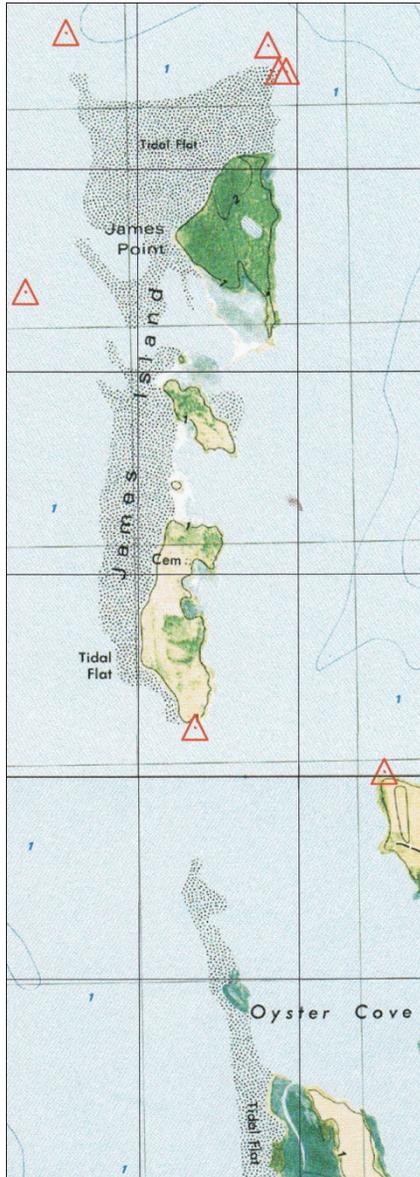


Hooper Memorial Methodist Church on Middle Hooper Island has bare areas to the south where grass has died during previous high tides [J. Court Stevenson 2000].



Lake Todd & his son Phil Todd tonging for oysters off Hoopers Island from their V- hull dead rise work boat (photo by of Rebecca Shockly, 1965)

James Island ~1970



Our latest project underway is to map the 17th century footprint of James Island from original patents (i.e. land grants) from Lord Baltimore -- to determine how many acres it actually may have comprised at settlement.



James Island: old plank road across the marsh to a boat landing (Bodine)

MAP OF
TALBOT COUNTY,

MARYLAND.

FROM BASS' COUNTY

BY
WILLIAM H. BASS,

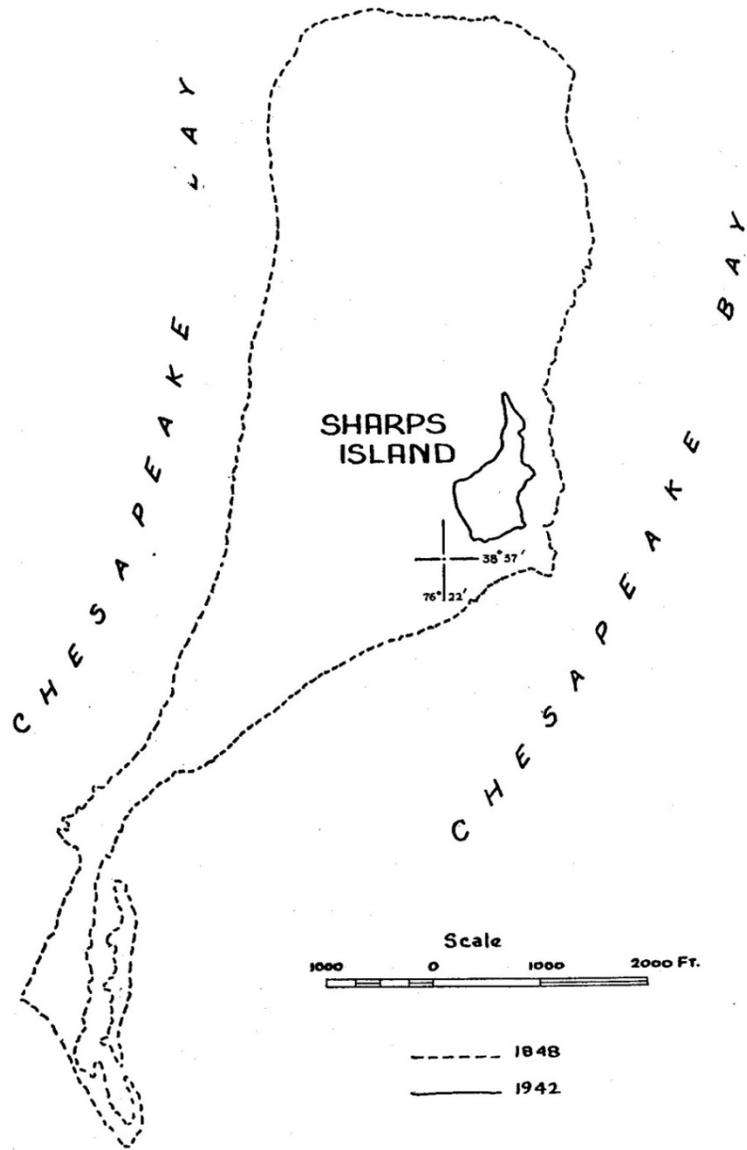
1850.





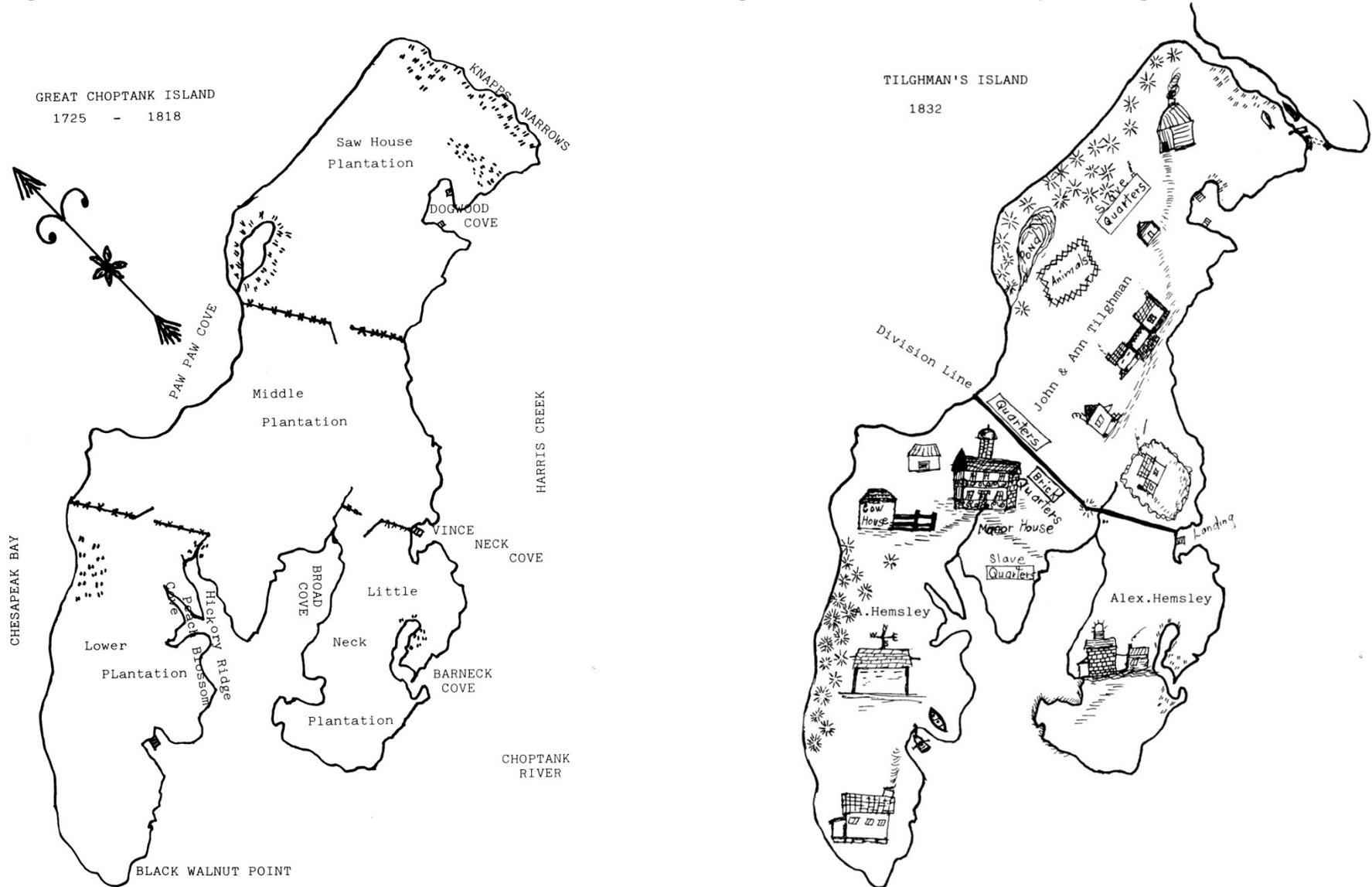
This hotel was built on Sharpe's Island by the Young, Creighton & Diggs, Boot & Shore Co. in Baltimore -- which went out of business by 1900. (Preston, 1983)

The first screw-pile lighthouse was taken out by ice flows in the winter of 1881

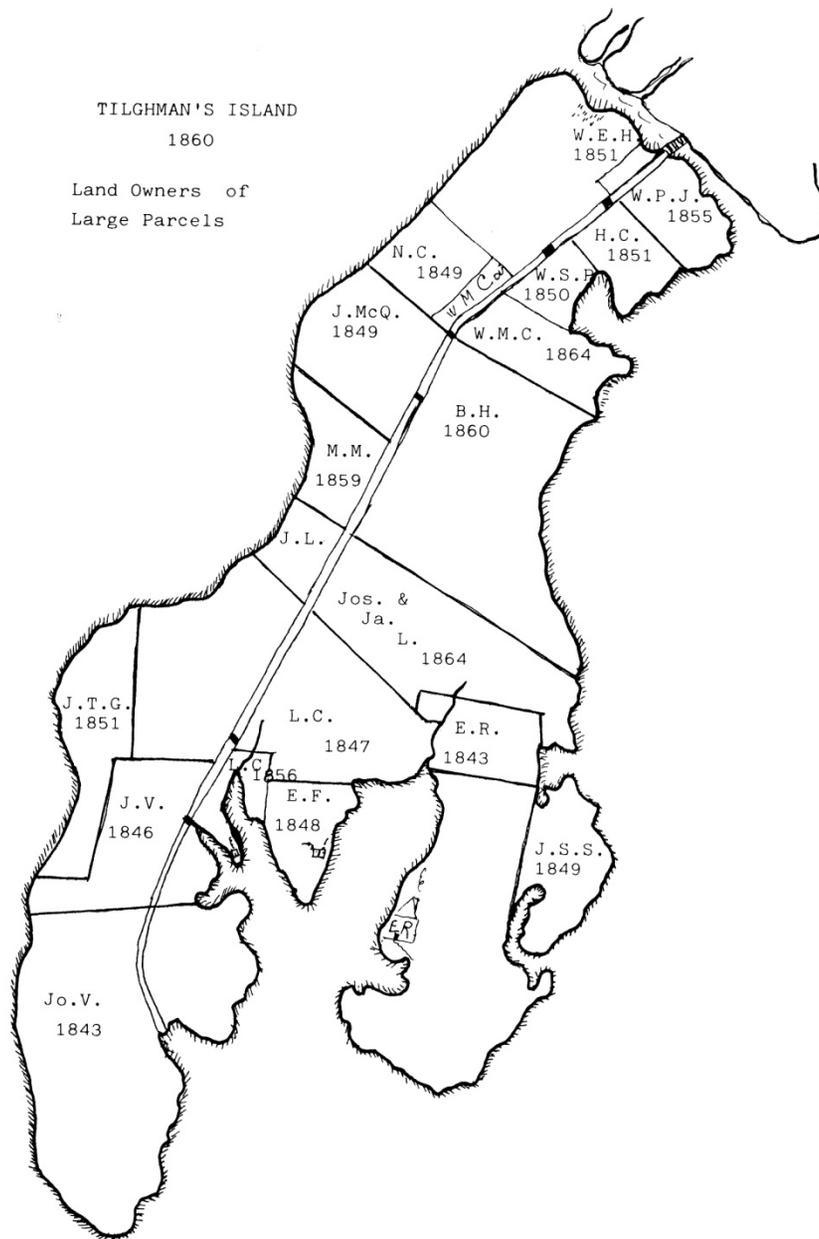


Land Loss of Sharpe's Is. (Singewald & Slaughter, 1949) & Present Lighthouse

Matthew Tilghman Ward bequeathed Choptank Island to his cousin Matthew Tilghman in 1741 who died in 1790 -- leaving it to his son Lloyd Tilghman (d-1811).

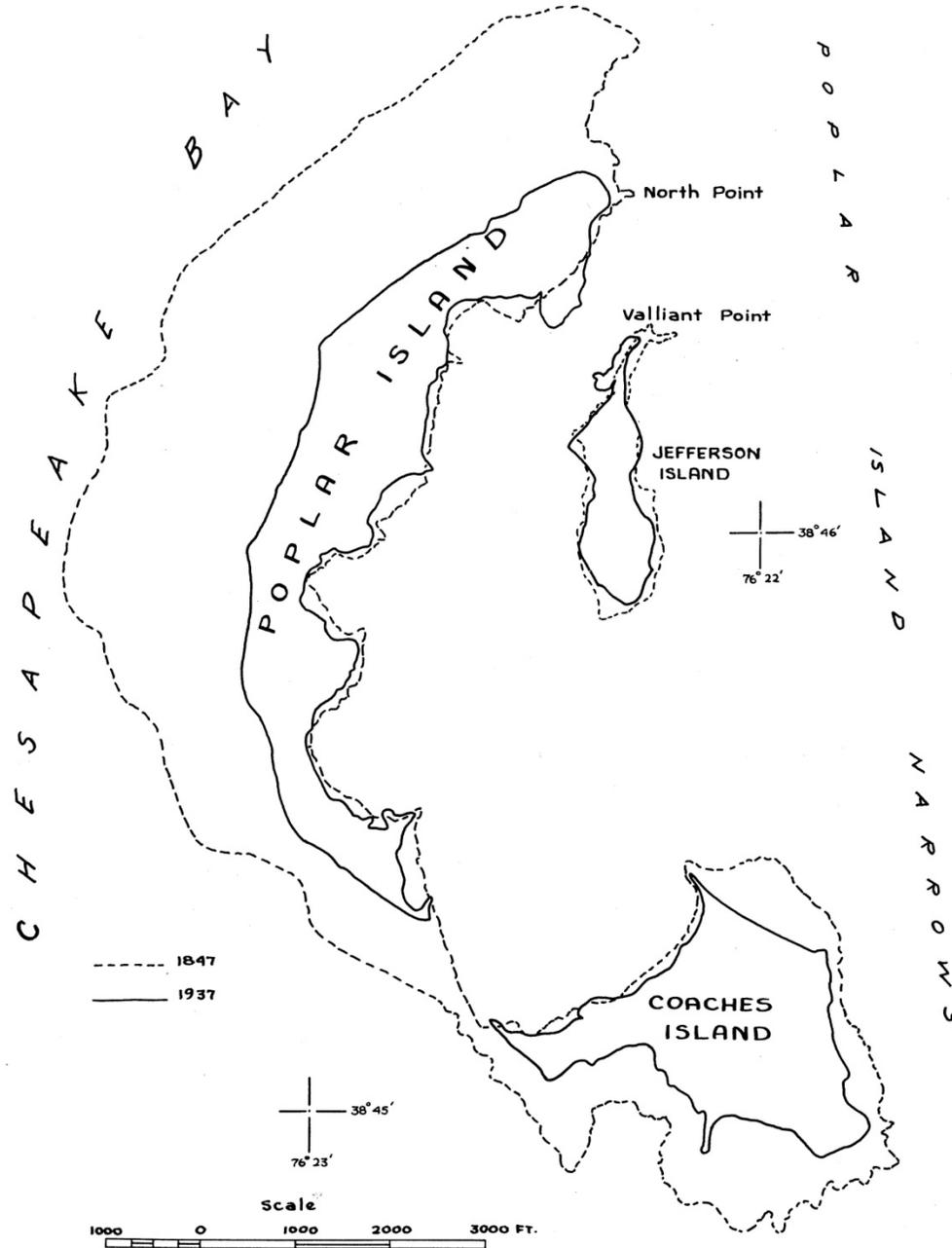


From: Antoinette Covington 1981. *Tilghman Island Capers*. AC&H Enterprises.





1932



First called “Popley’s Isles”, they were settled in the 1630s by Richard Thompson who was a cousin of Wm. Claiborne. This was the site of an Indian massacre in 1637 and the island passed into the hands of Thomas Hawkins who sold half to Seth Foster of Great Choptank Is. At Hawkin’s death it passed to his son Thomas Jr. & his daughter who sold it, in 1669, to Alexander D’Hinosa.

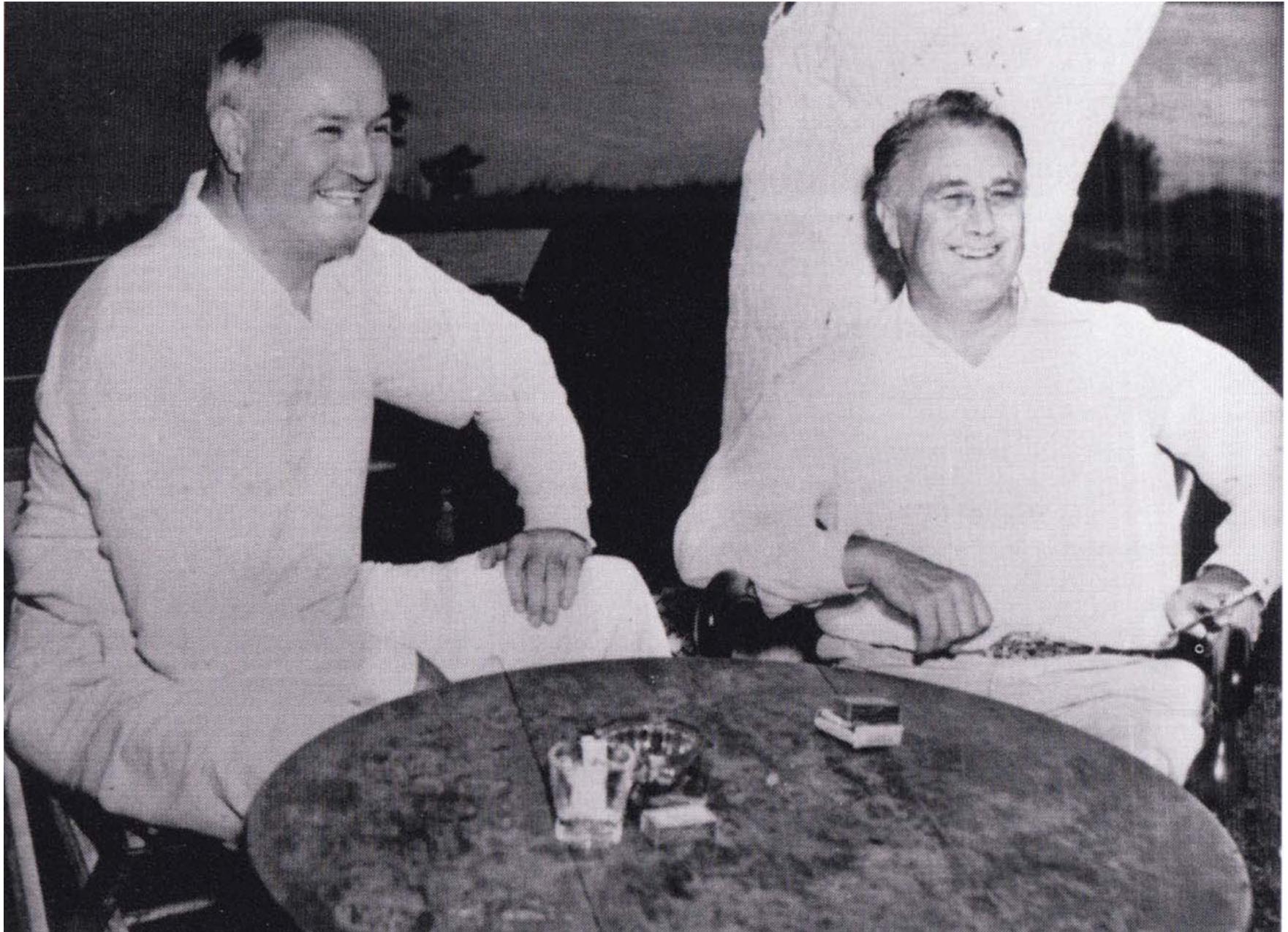
Then known as Poplar Island, it was owned by the Carroll family until the mid-19th Century. Grandson of “The signer”, Charles Carroll directed R.O. Ridgeway to advertize in 1847 for black cats to be shipped to China—but when the Bay froze that winter the cats simply walked over the ice to the mainland.



Poplar Island split apart into three islands. This is a 1929 view of looking west at Jefferson Island (and the northern remnant of Poplar Is.) The island was largely abandoned between 1910-20, the school was closed in 1918 and was used as a hunting property in the 1920s & making illegal whisky — 21,500 gallons were confiscated. In 1929 the democratic Jefferson Club built a new 2 ½ story clubhouse for their visits which lasted until a fire in 1946.



Jefferson Island Club from the SE (Bailey 1996 --photo by Mary Jane Faibank)



James A. Farley & FDR at Jefferson Island in the 1930s (Chesapeake Bay Maritime Museum)

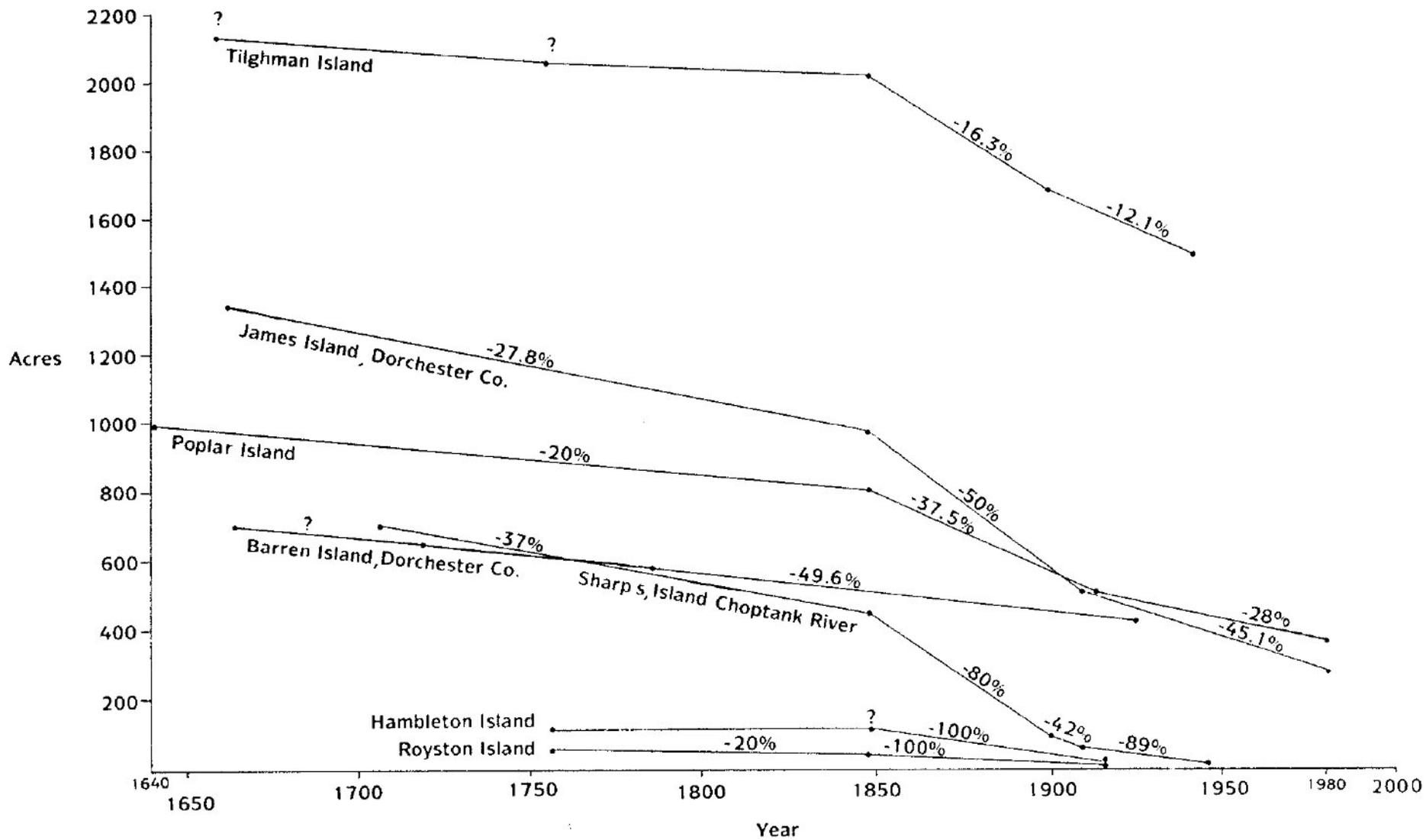




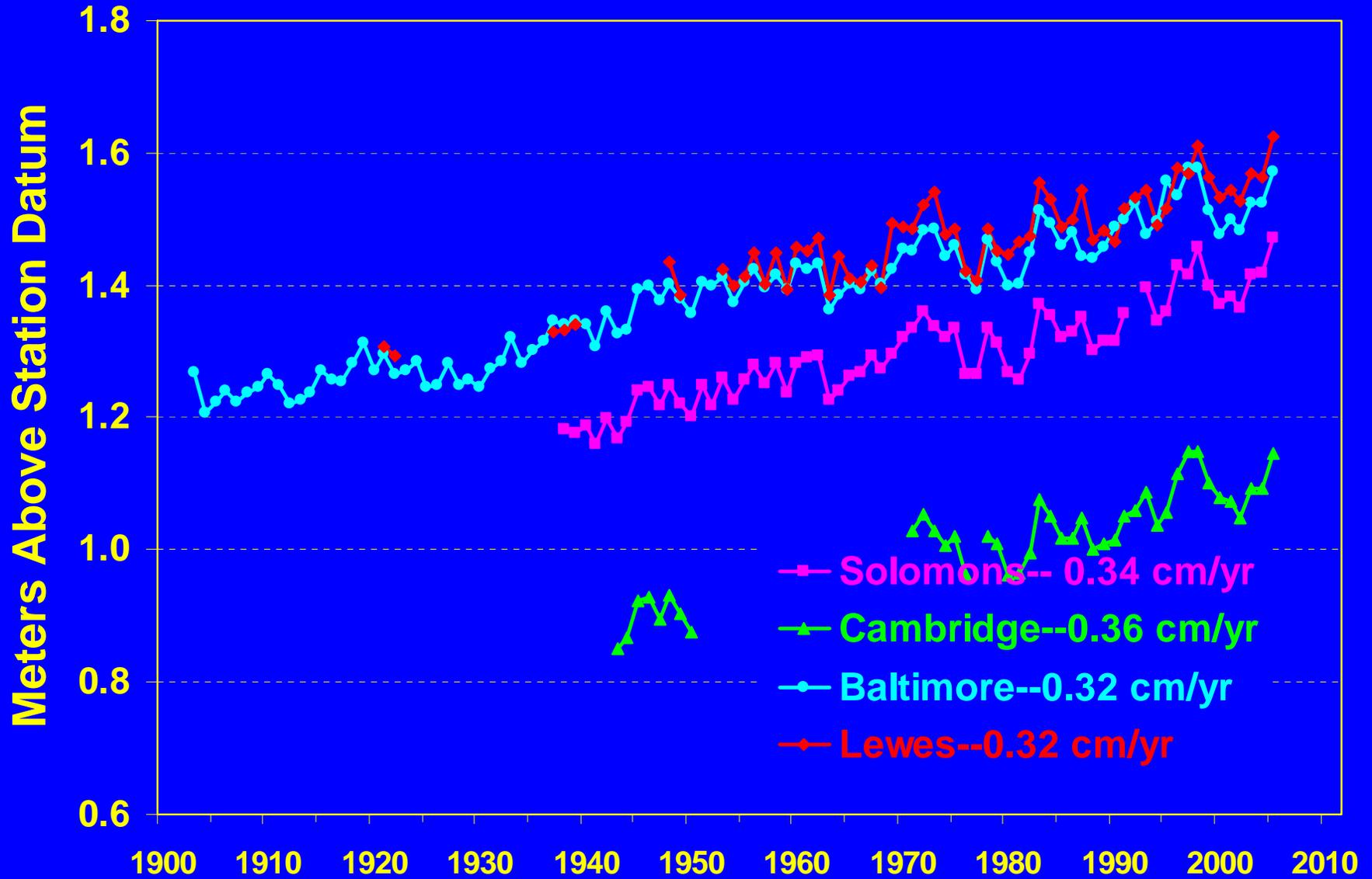
After the fire of 1946, the Jefferson Club moved to St Catherine's. Island in the Potomac River and put their property on Poplar up for sale. It was purchased in 1948 by George K. and Marion Bailey who built this "new lodge" and moved to Jefferson with their four children. The Baileys operated the "Poplar Island Lodge" for fishing and ducking -- until George's death in 1951. His youngest son, Peter Bailey published: *"Poplar Island: My Memories as a Boy,"* in 1996.



Peter Bailey crabbing near the “Pot” at Jefferson Island circa 1950, drawing by Peter Hanks



Annual Mean Sea Level in Chesapeake and Delaware Bays

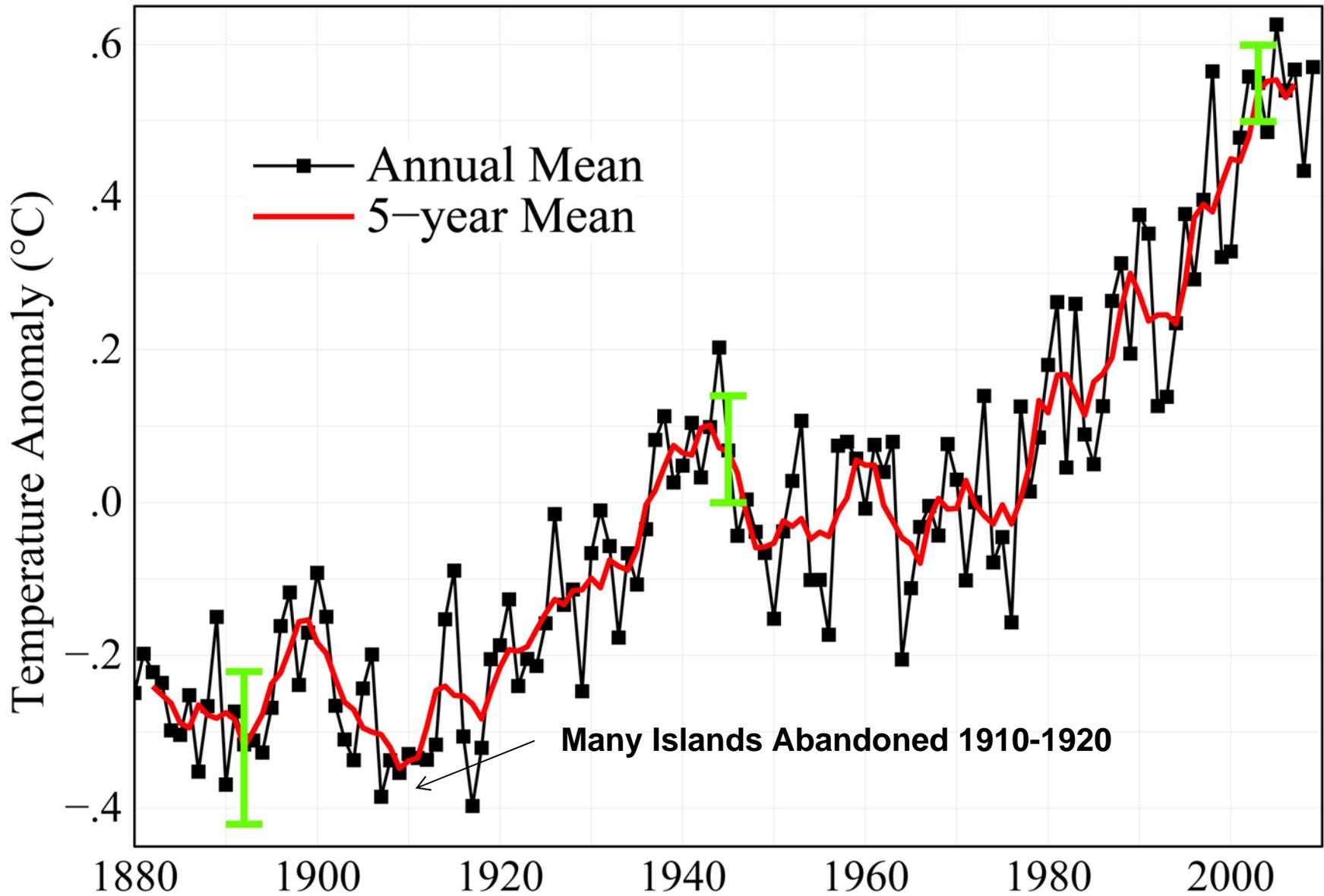


Island Land Loss and Marsh Vertical Accretion Rate Evidence for Historical Sea-Level Changes in Chesapeake Bay¹

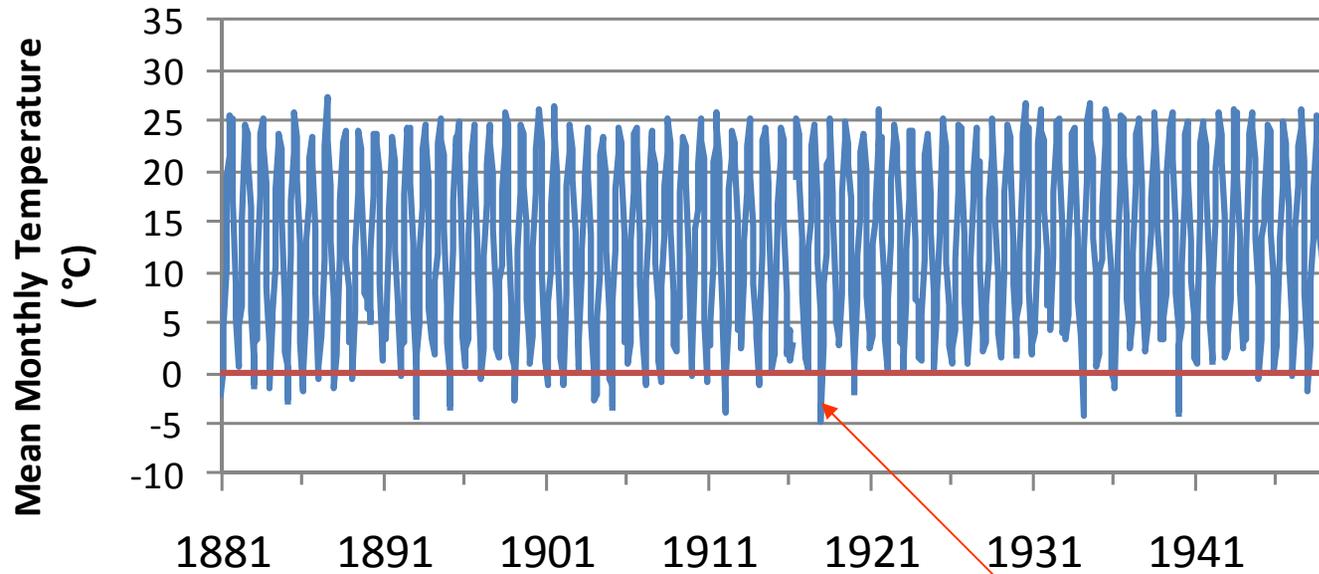
Michael S. Kearney[†] and J. Court Stevenson[‡]

ABSTRACT- Long-term changes in marsh accretion rates based on pollen and radionuclide geo-chronologies and historical reconstruction of land loss in bay islands were used to investigate changes in sea level in Chesapeake Bay from colonial times. These records suggest that the rapid submergence of the Bay region documented in local tide-gauge records essentially dates from only the early nineteenth century; whereas, rates of sea-level rise throughout the seventeenth and eighteenth centuries were relatively slow. Land loss and marsh vertical accretion rates further accelerated since the late nineteenth century. This pattern of sea-level changes in the Chesapeake corresponds with the general changes in global climate of the last several centuries associated with the Little Ice Age. Nevertheless, global eustasy cannot account for a large percentage of the present sea-level trend in the Bay. We hypothesize that enhanced land subsidence rates from anthropogenic groundwater withdrawal and sediment loading are other major factors which may account for the high rate of submergence in especially the mid-Chesapeake region.

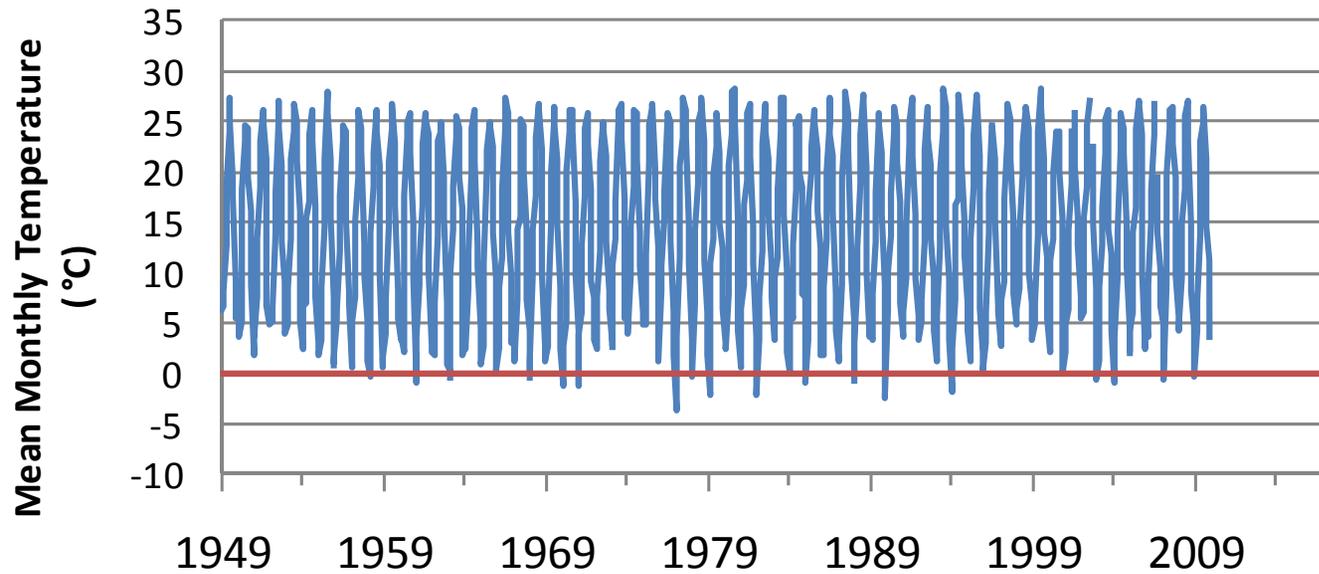
Global Land–Ocean Temperature Index



Mean Monthly Temperatures at Washington DC (data from NOAA)



1918 was lowest on record!



Background- Poplar Is. was been reconstructed to its approx. size in 1847 using ~29 mill m³ dredged material from Upper Chesapeake Bay



Island Aerials



1998 (Pre-construction)



September 2008

Cell 4 DX at Poplar Island after transplanting in late summer of 2003 showing *Spartina alterniflora* & *S. patens* zones

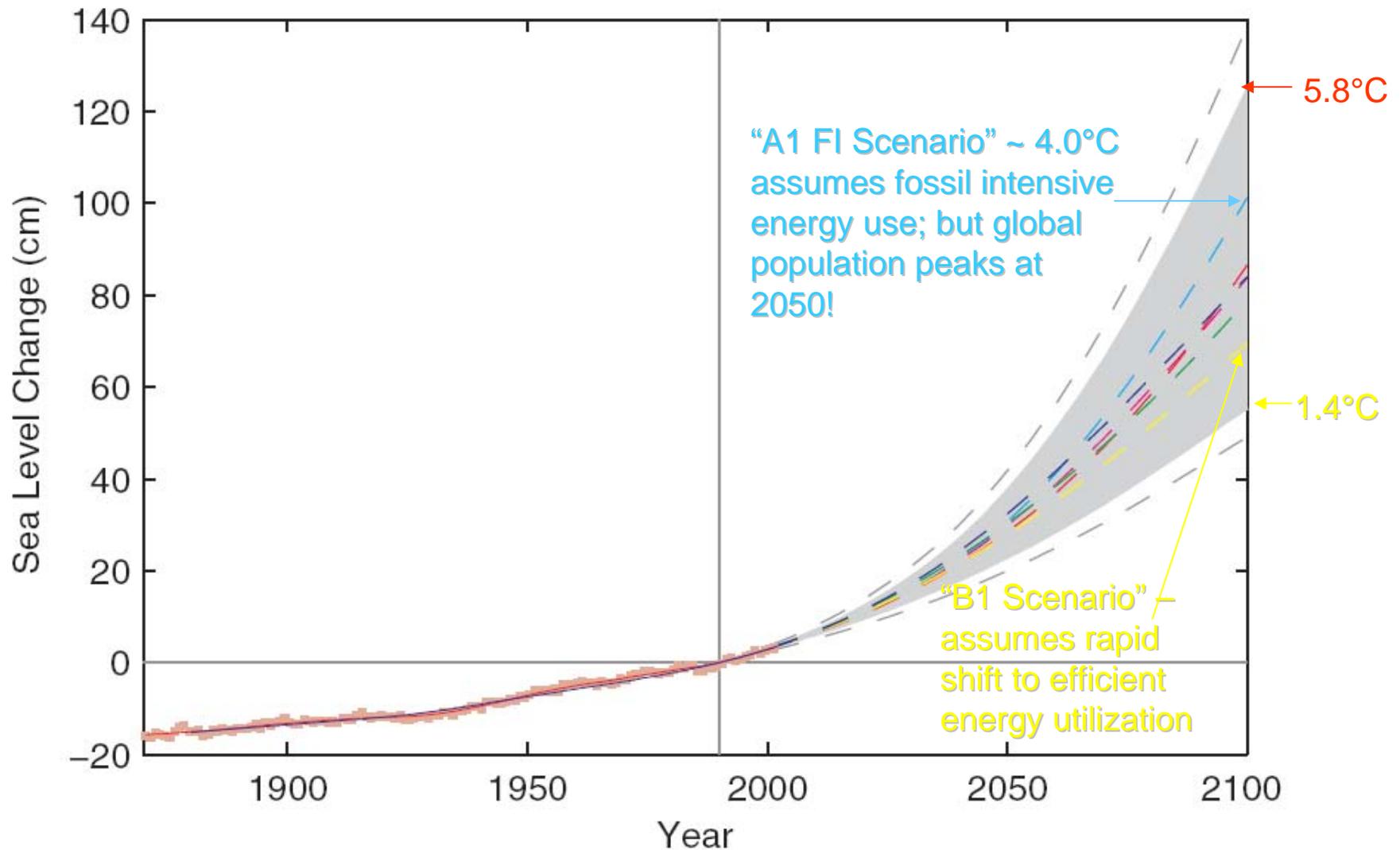




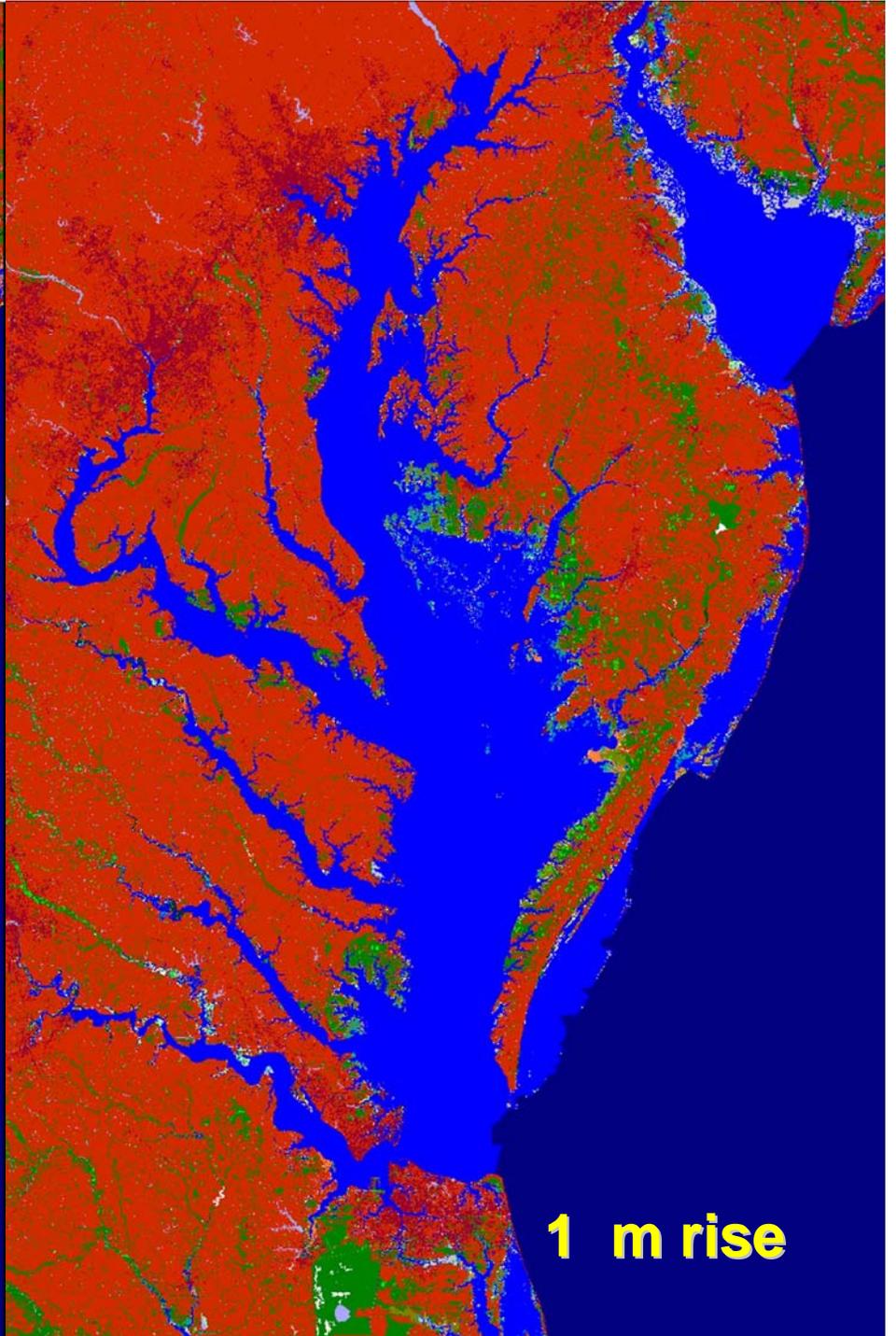
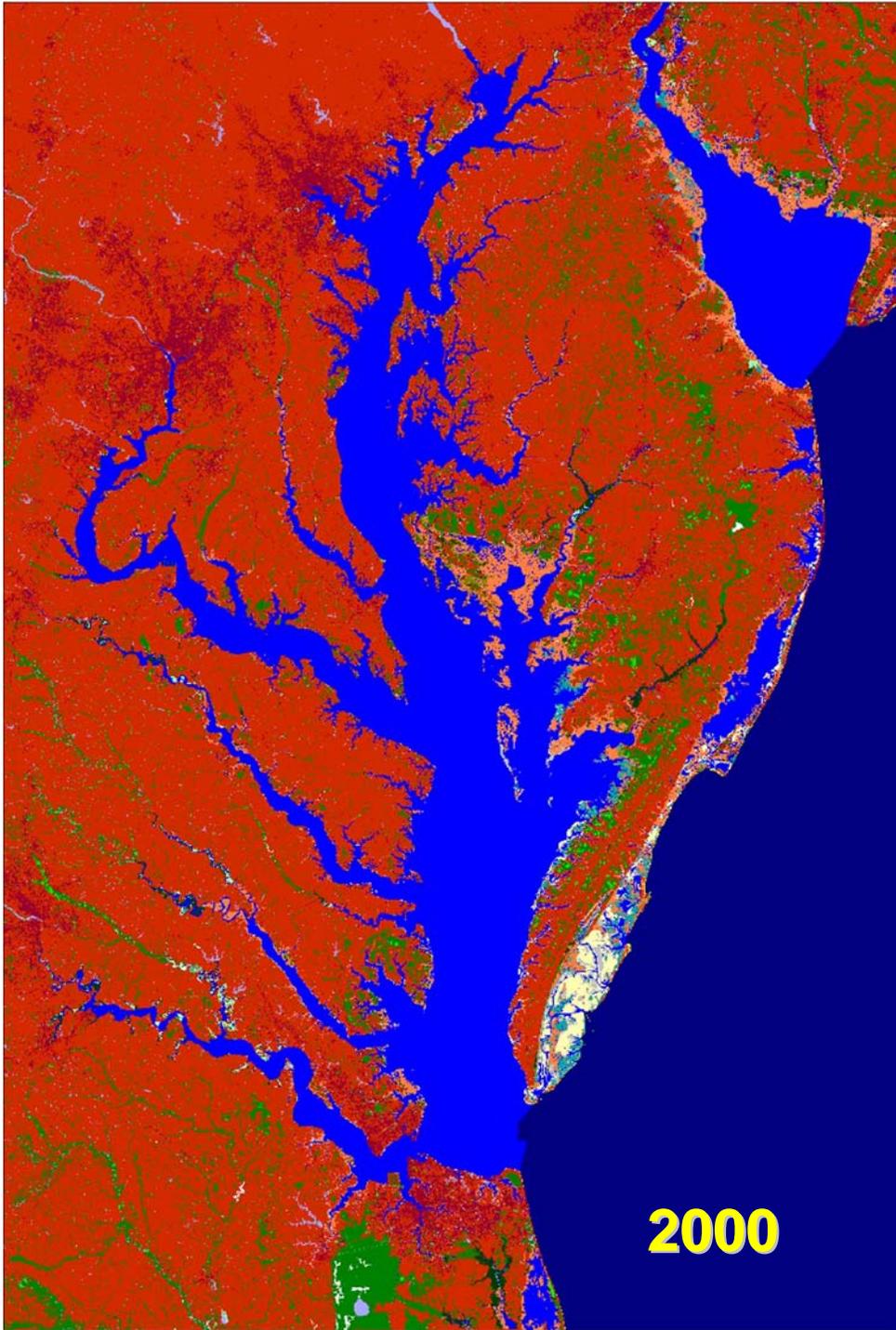
Poplar Island – July 2006

Photo by Jane Thomas
UMCES

IPCC (2007) Estimates Global Sea-Level Rise (SLR) 19 - 58 cm by 2100



Using a proportionality of 3.4 mm/yr per 1°C rise, Rahmstorf (2007 - Science 315: 368-370) estimated global sea level rise could be 1.4 m by 2100 & could be higher on the East coast of US (Hu et al. 2009)!

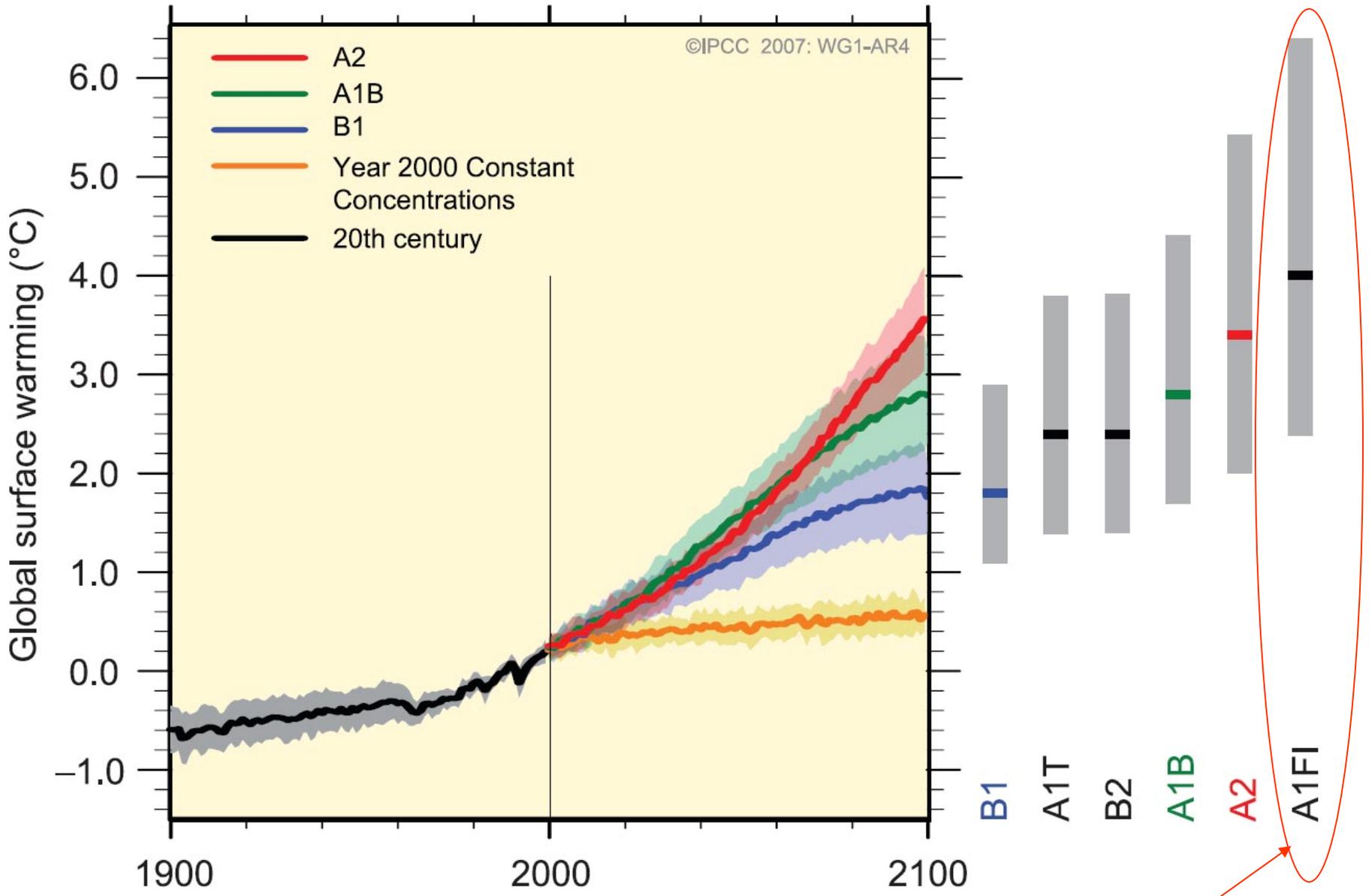


The End



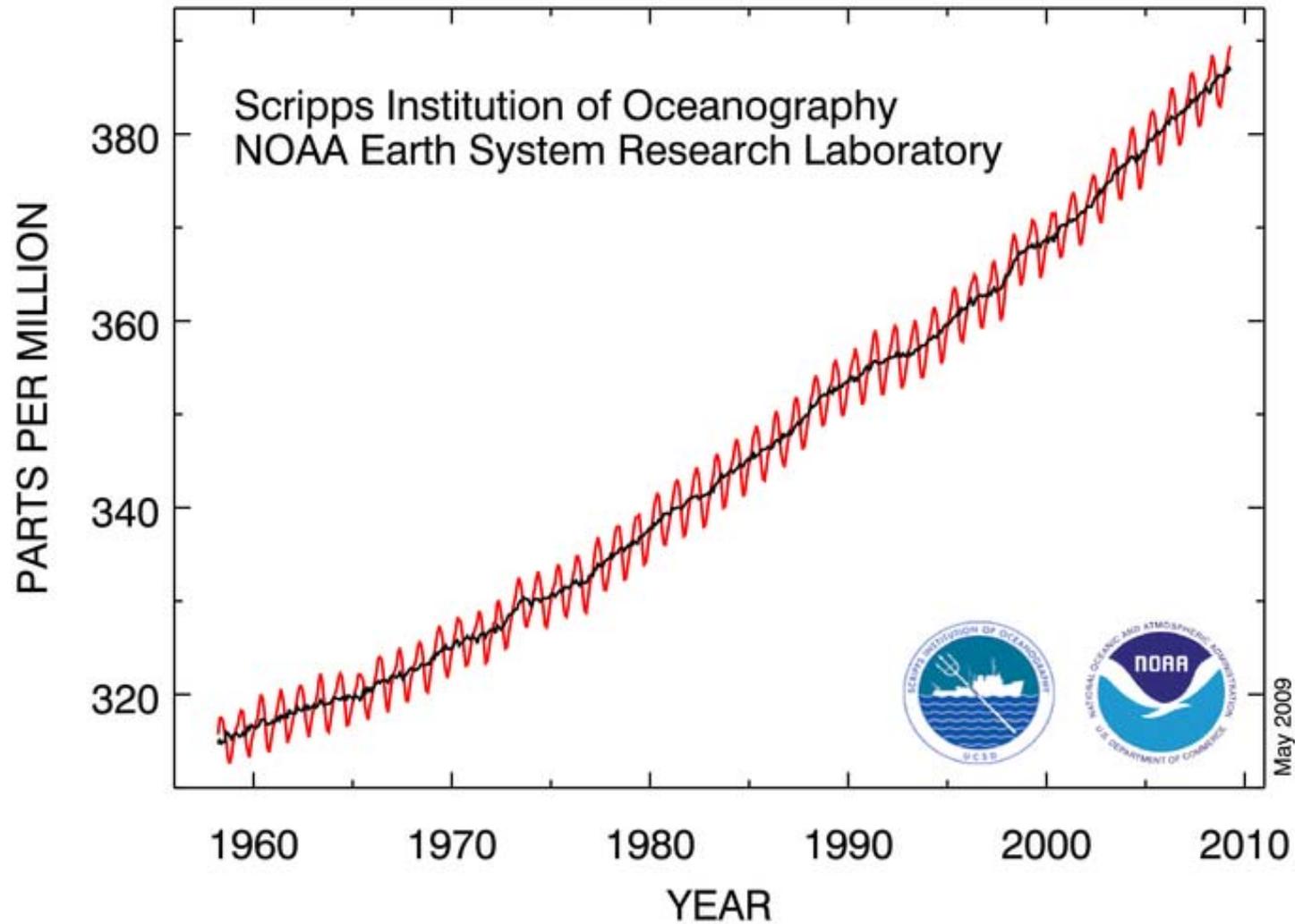
For more information, email me at: court@umces.edu

MULTI-MODEL AVERAGES AND ASSESSED RANGES FOR SURFACE WARMING



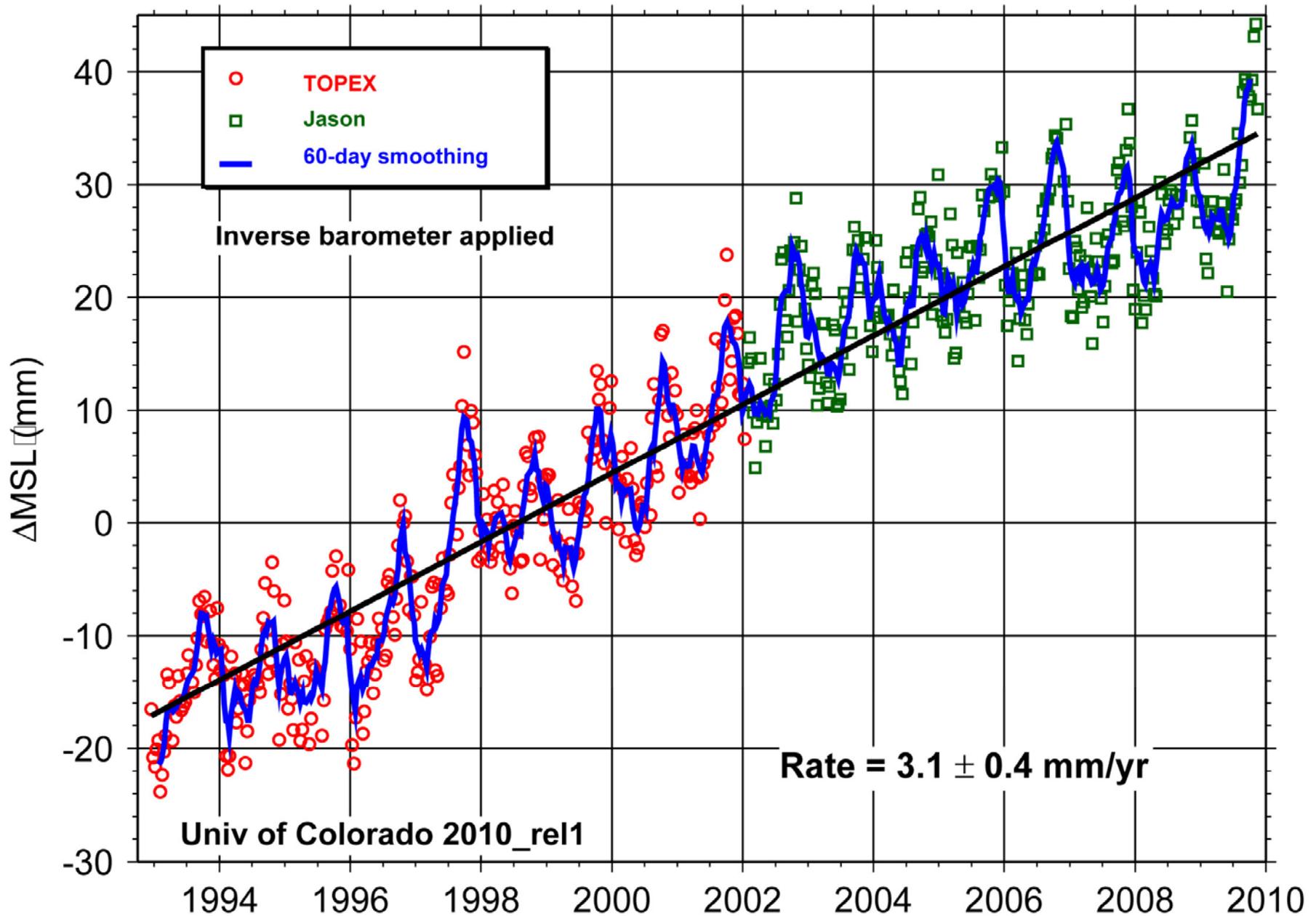
A1FI "fossil intensive" scenario could produce ~ 4°C by 2100

Atmospheric CO₂ at Mauna Loa Observatory

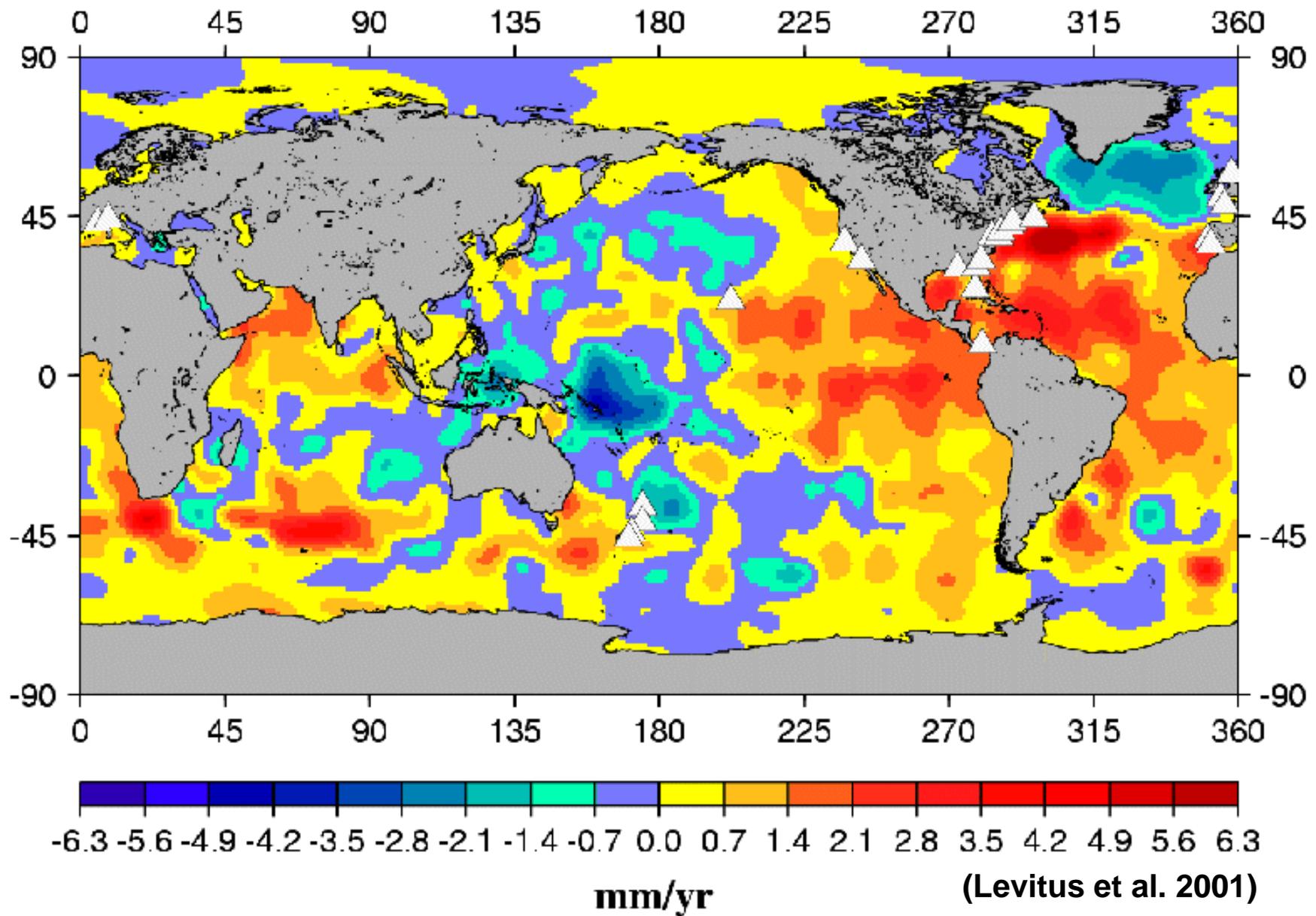


CO₂ increased ~1.4 ppm per yr for fifty years; 2007 was the highest rise yet -- 2.2!

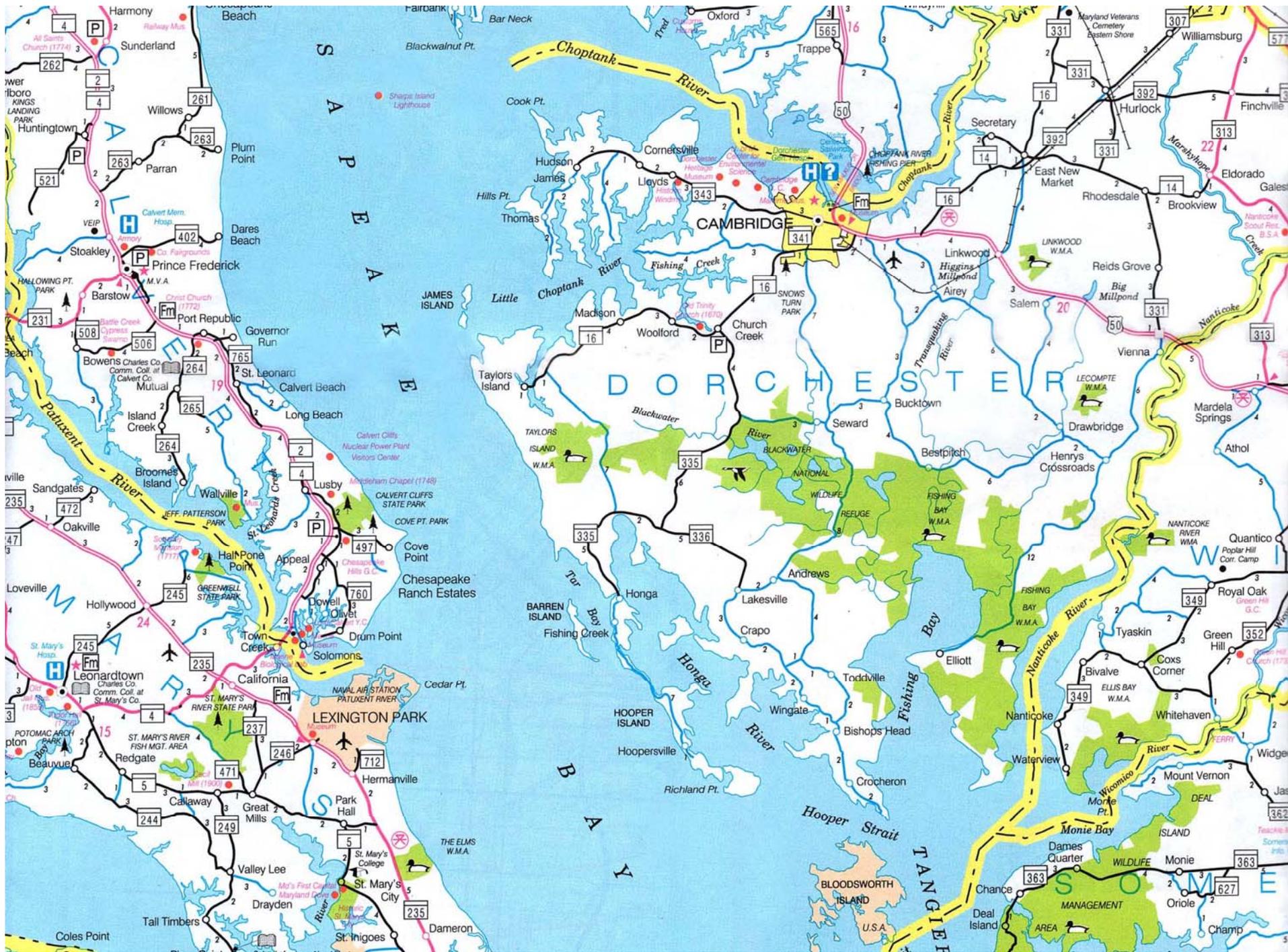
Record is close to a 18.6 yr -- minimum considered reliable for analysis of sea level trends



Steric Sea Level Trends for the upper 3000m (1955-1996)











WINDY OFFSHORE—SIGHTING OF THE FISHBOATS—(See Page 10.)

Hurricane 13

Dates: 09/08 - 09/21 1933

Maximum Wind Speed: 120 mph

Minimum Pressure: - mb

US Landfall Category: Category 3 Hurricane

Deaths: 0

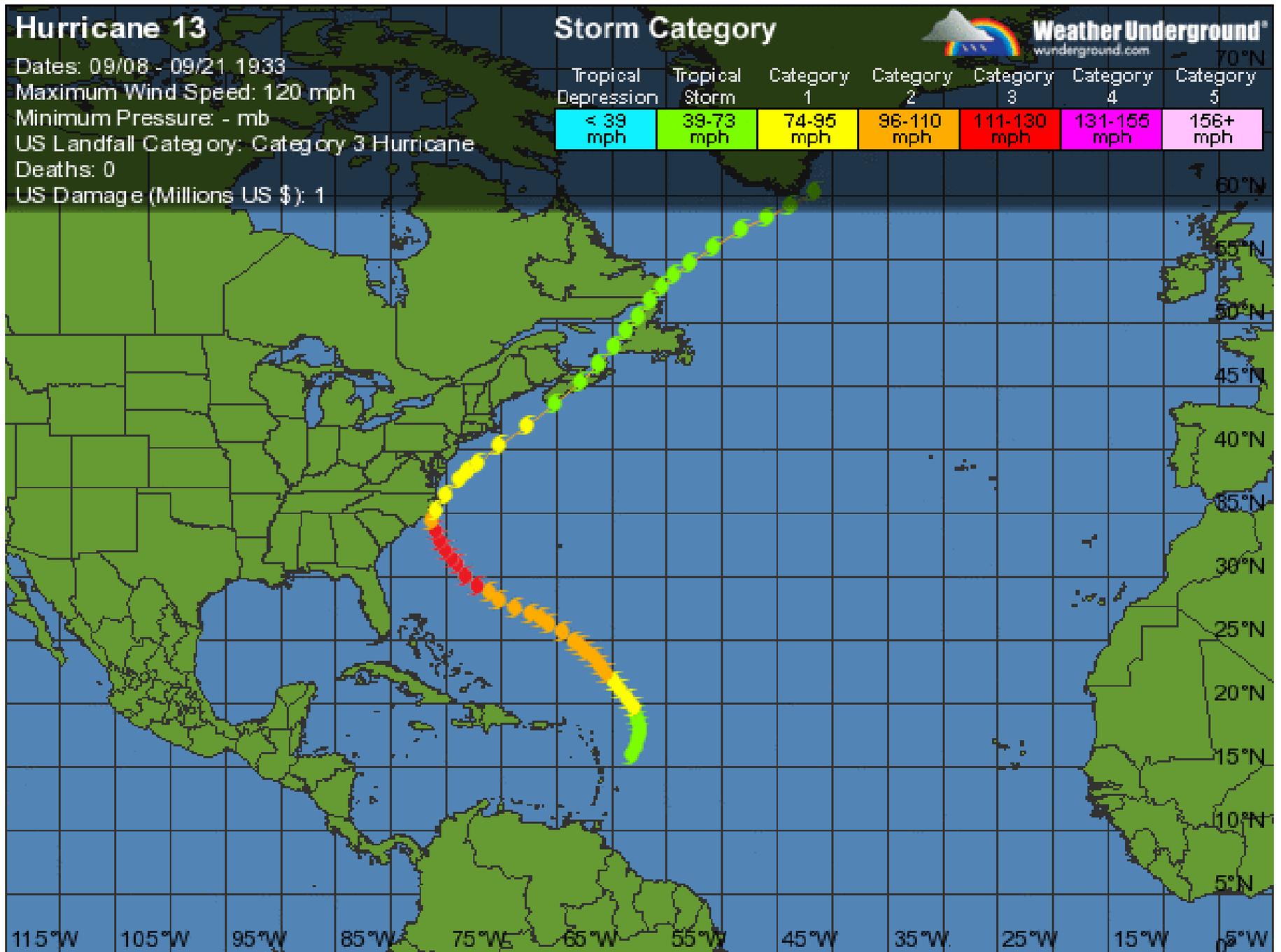
US Damage (Millions US \$): 1

Storm Category



Weather Underground®
wunderground.com

Tropical Depression	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
< 39 mph	39-73 mph	74-95 mph	96-110 mph	111-130 mph	131-155 mph	156+ mph



In 1612 John Rolfe brought South American tobacco to Jamestown and thereafter it was cultivated in all available locations.





19 Slaves were imported to Jamestown in 1619 and would eventually solve the labor problem of Chesapeake planters later in the 17th century. Most of the early work of planting, worming, weeding, harvesting, curing and packing of tobacco in casks called hogsheads was carried out by indentured servants from England. Jamestown never became a major port city, but remained the administrative center of Virginia government until 1699.





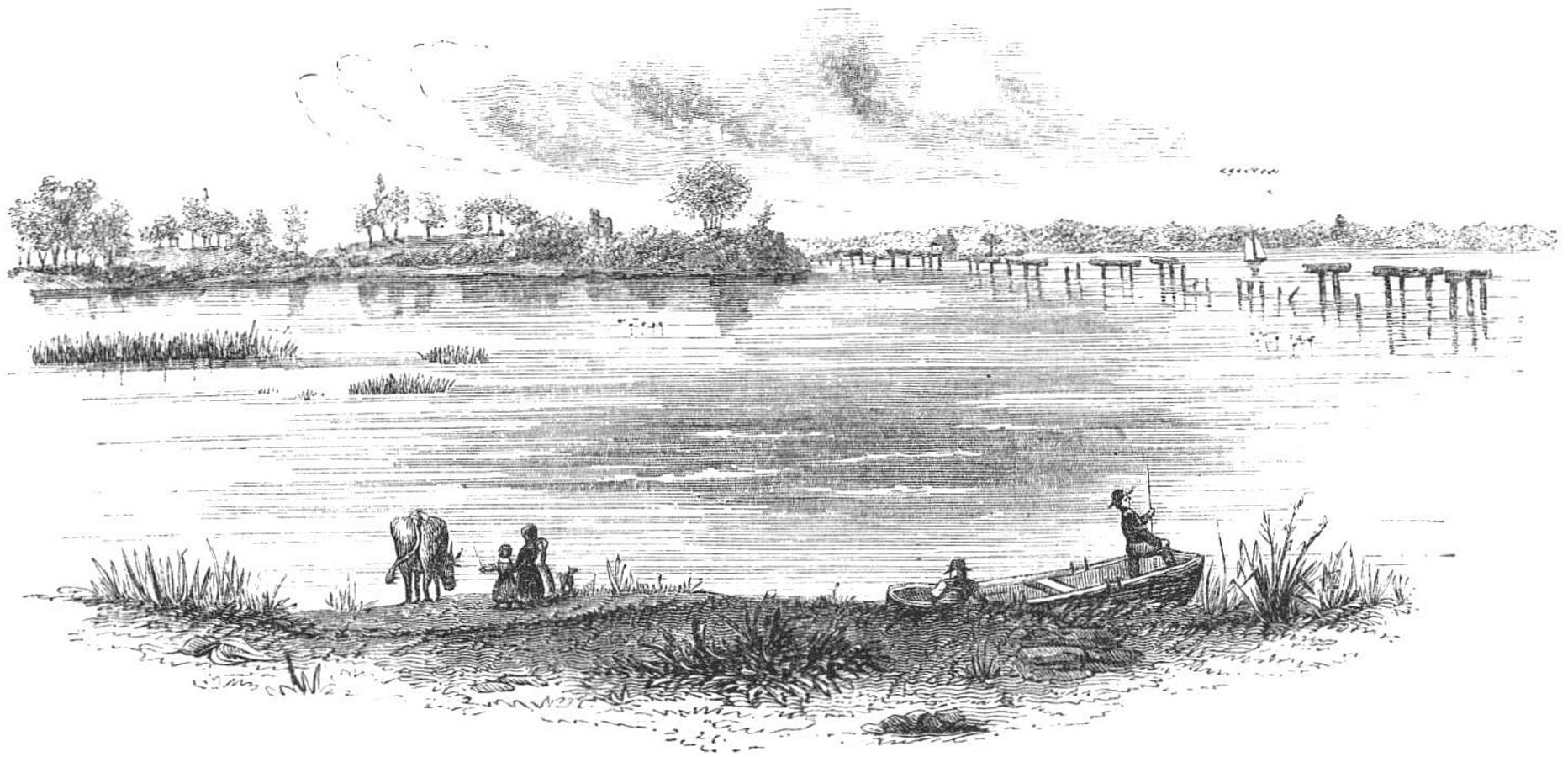
The massacre in 1622, helped to undermine the Virginia Company which lost its patent.



Educated at Oxford Univ., Sir William Berkeley succeeded Governor Wyatt in 1649. During the English Civil Wars, he was loyal to King Charles. When the latter lost his head in 1649, Berkeley declared that Virginia remained loyal to the Prince of Wales. Berkeley also persecuted the Puritans who had a stronghold around the Lower James River and forced them to migrate to Maryland. Cromwell sent out a fleet in 1651 and forced Berkeley's dismissal, but he was re-instated in 1660 -- when Charles II regained the throne.

In the 1670s, Berkeley's had become a tyrant & Charles II observed: "*The old fool has taken more lives in that naked country than I have taken for the murder of my father.*" Nathaniel Bacon fomented a rebellion and burned Jamestown in Nov. 1676.





BENSON J. LOSSING (1850): "This view [of Jamestown Island] is from the north side of what was once a marsh, but now a deep bay, four hundred yards wide. On the left is seen the remains of a bridge, destroyed by a gale and high tide a few years ago; and beyond is the James River. Near the point of the island, toward the end of the bridge, are the remains of an ancient church.

Mr. Coke resided upon the island when the tempest occurred which destroyed the bridge. The island was submerged, and for three days himself and family were prisoners. It was in winter, and he was obliged to cut the branches of ornamental trees that were close to his house, for fuel."