

LATE WISCONSINAN GLACIATION OF SOUTHERN NEW ENGLAND: TIMING AND DEPOSITS

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EASTERN
CONNECTICUT STATE UNIVERSITY



Timing - Terminology

QUATERNARY PERIOD - Last **2.54 million years** of geologic time

PLEISTOCENE EPOCH – All of Quaternary Period except last **11,500 years**

WISCONSINAN STAGE – Last glacial age of the Pleistocene (**70,000 yBP to 11,500 yBP**).

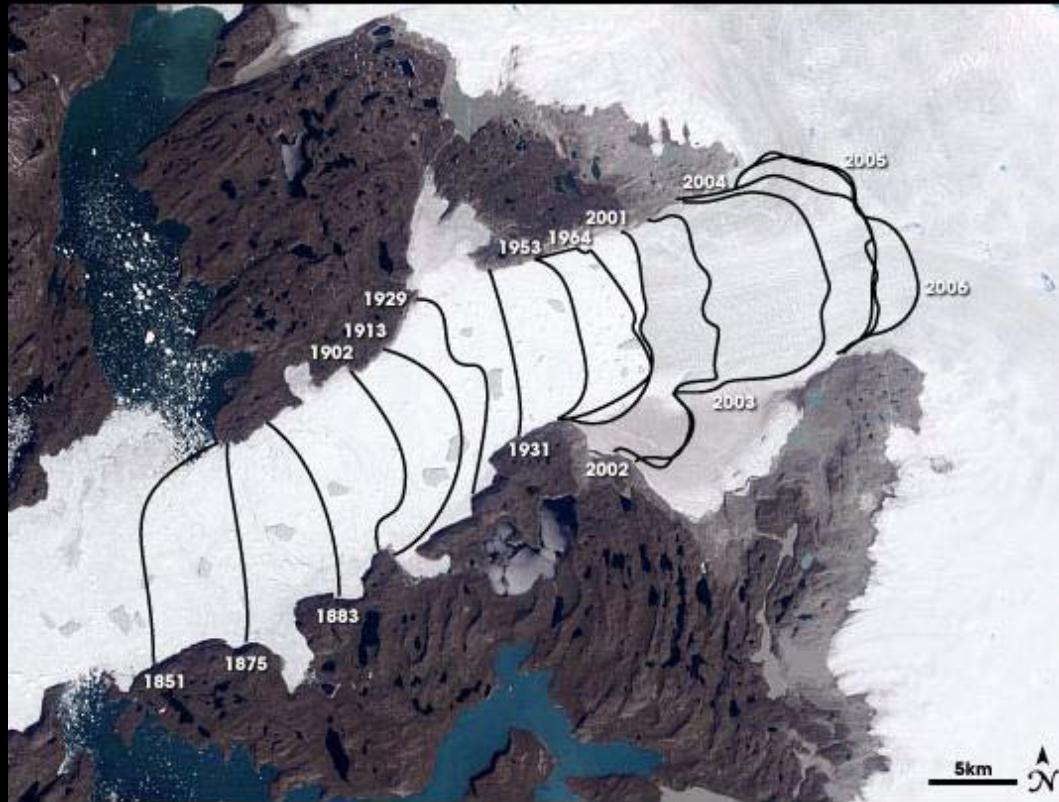
HOLOCENE STAGE – Last **11,500 years**

The Laurentide Ice Sheet



WHY DO WE CARE ABOUT A 20,000 YEAR OLD ICE SHEET ANYWAYS?

Jakobshavn Glacier (Greenland)



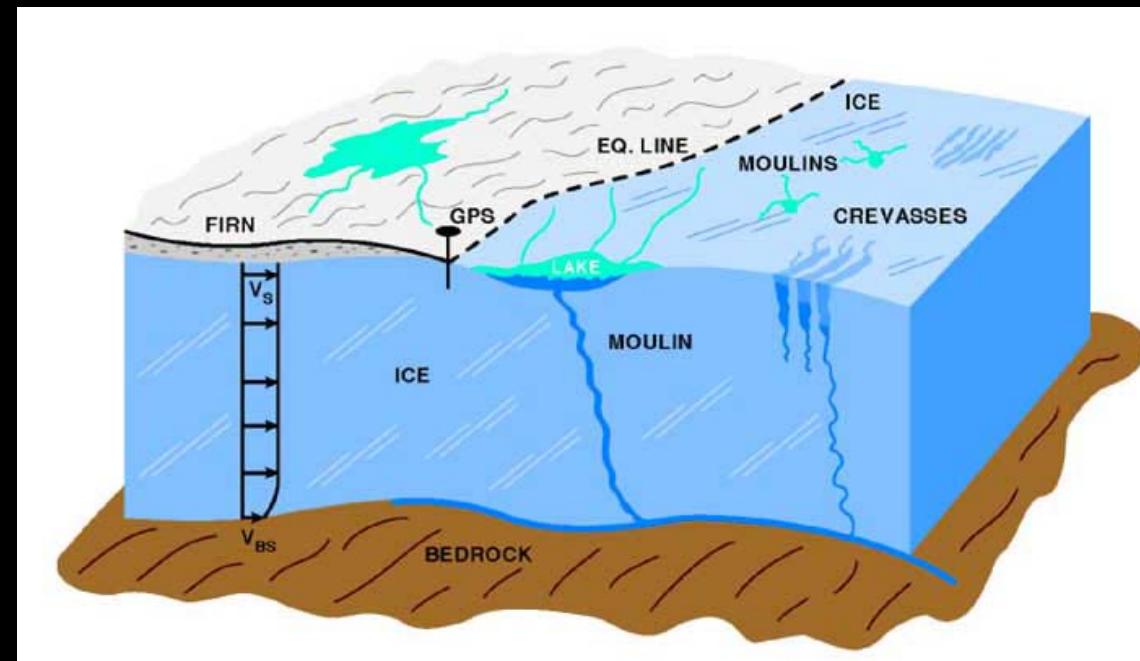
http://ice.nasa.gov/images/Jakobshavn_retreat-1851-2006-590.jpg



www.sflorg.com/

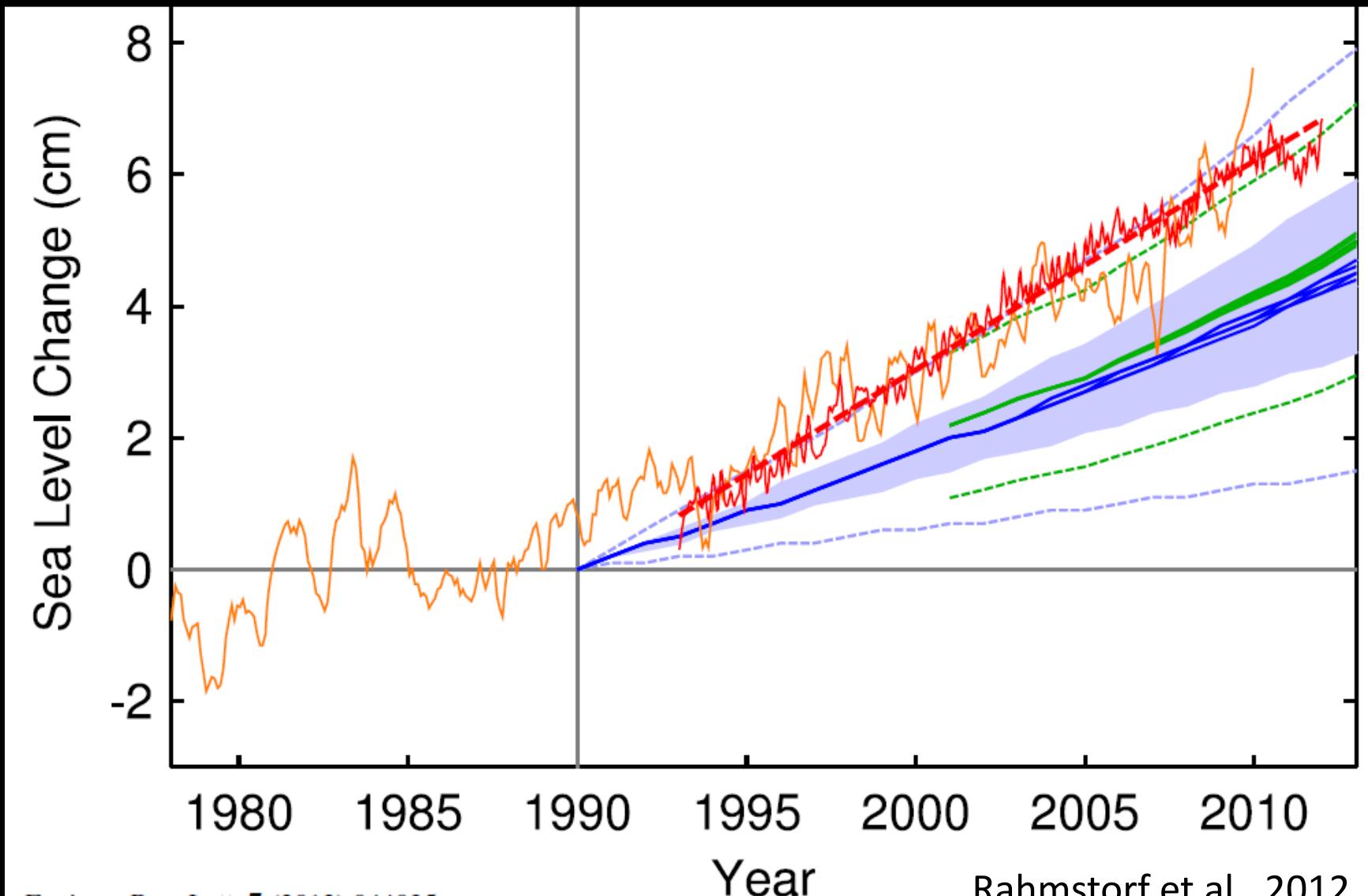
Greenland Outlet Glaciers:

A key to understanding future sea level rise

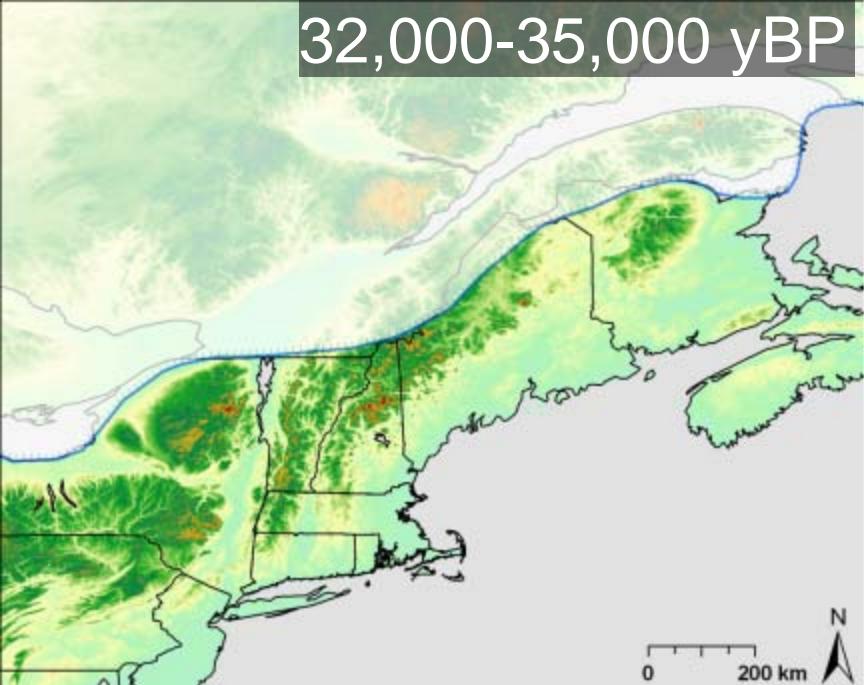


Zwally et al., 2002

Sea level rise 1975 - 2012: About half from Greenland



32,000-35,000 yBP



Duration and extent of the Laurentide Ice Sheet: S. New England

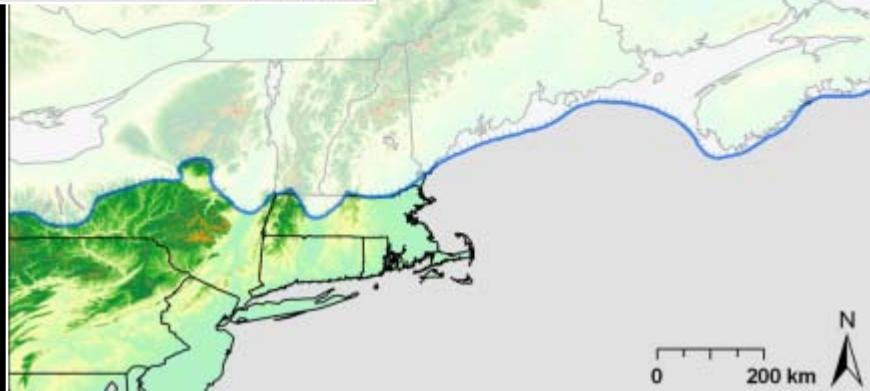
26,000 yBP



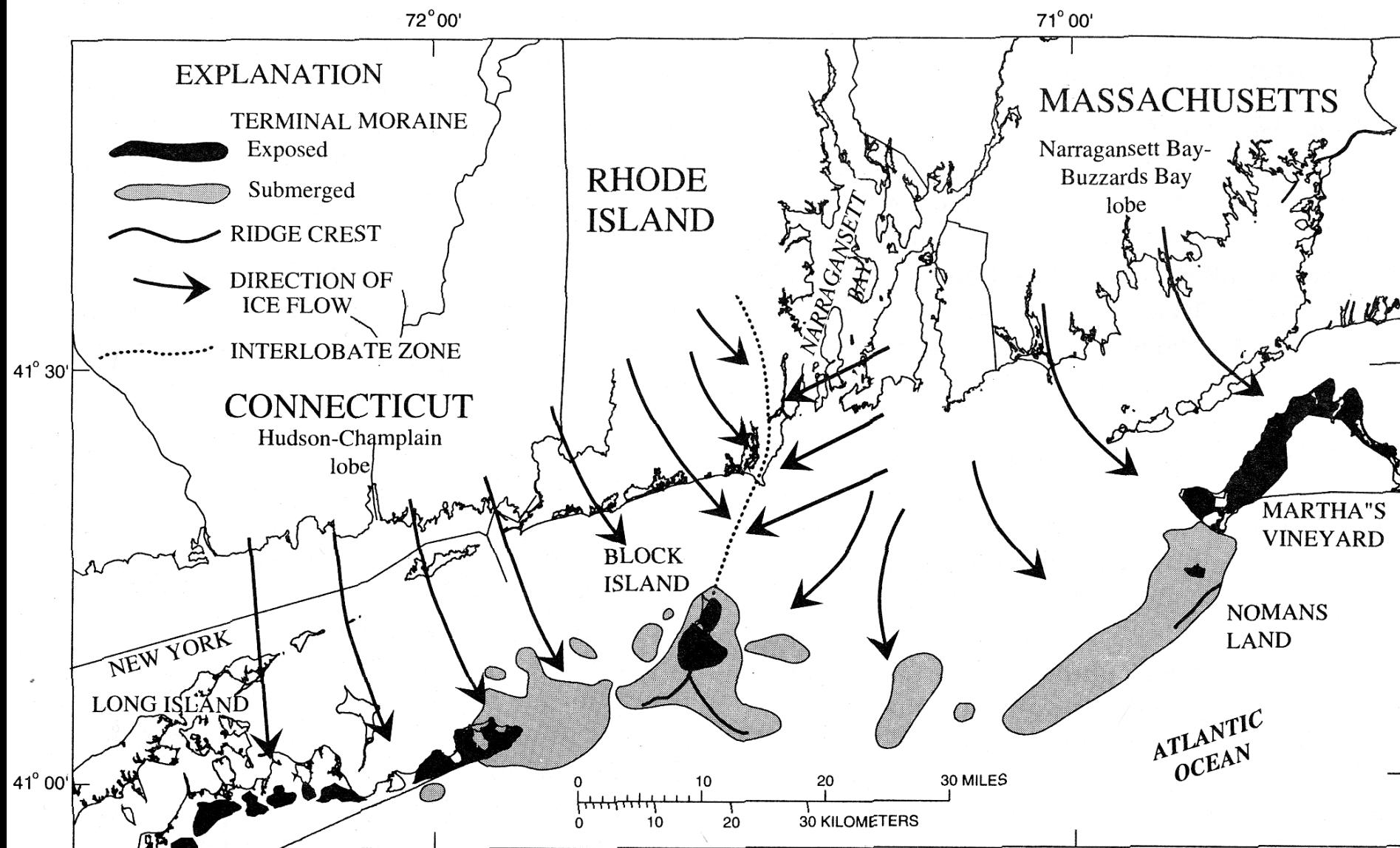
16,000 yBP



After Dyke and Prest, 1987
and Dyke et al., 2002



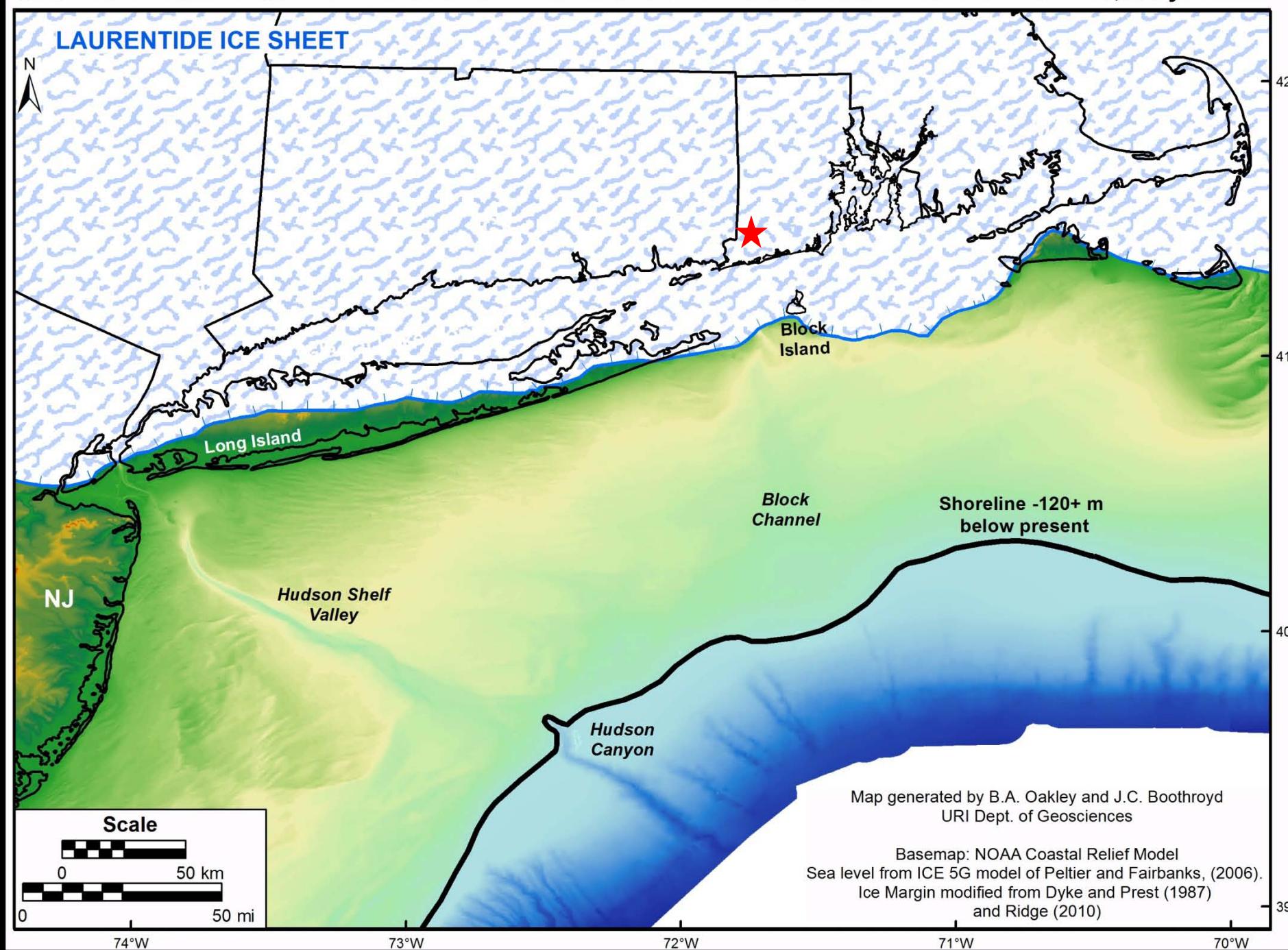
ICE FLOW DIRECTIONS



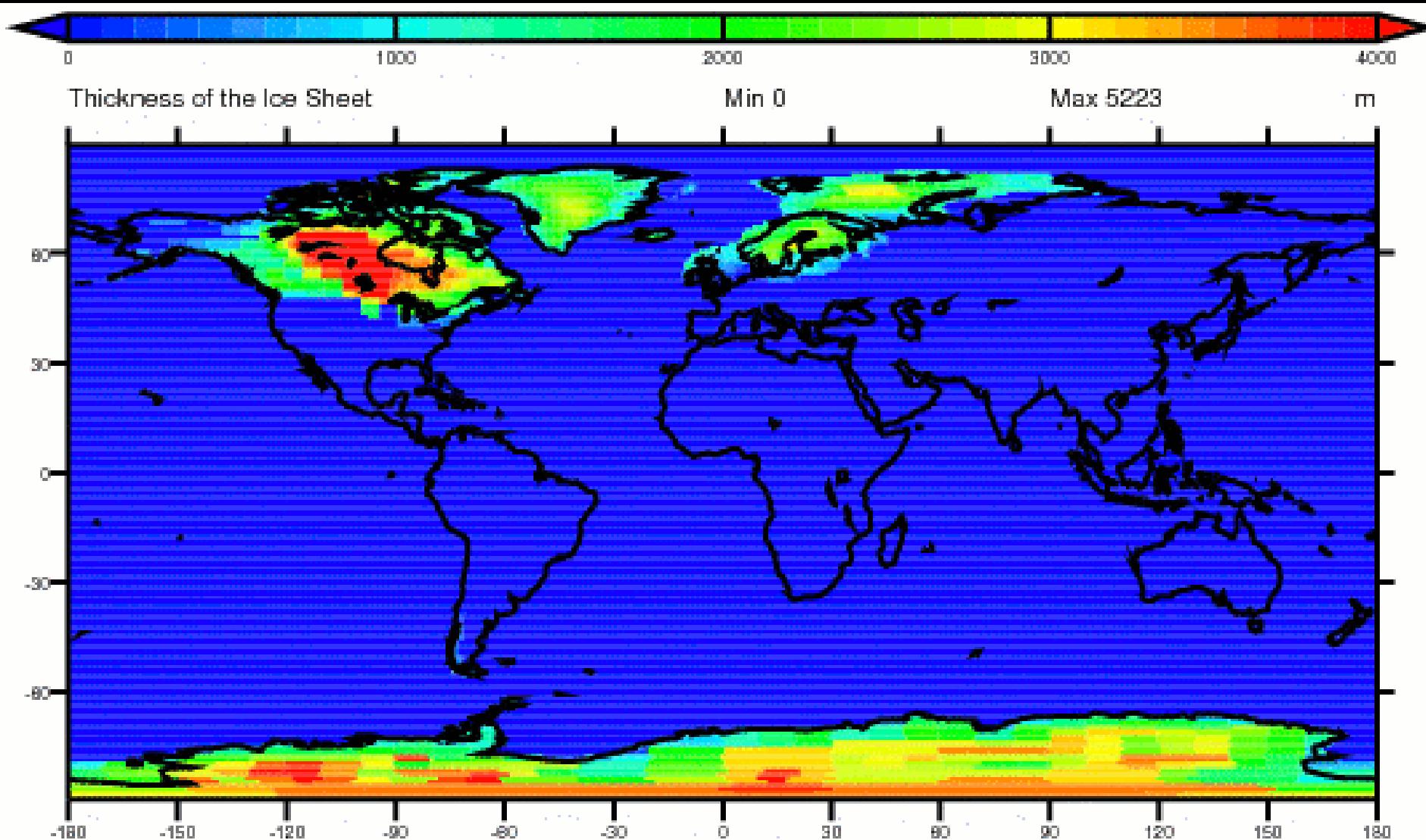
Base from U.S. Geological Survey, Digital Line Graphs, 1:100,000, 1983

Stone and Sirkin, 1996

SOUTHERN NEW ENGLAND AND EASTERN NEW YORK AT THE LAST GLACIAL MAXIMUM: 26,000 yBP



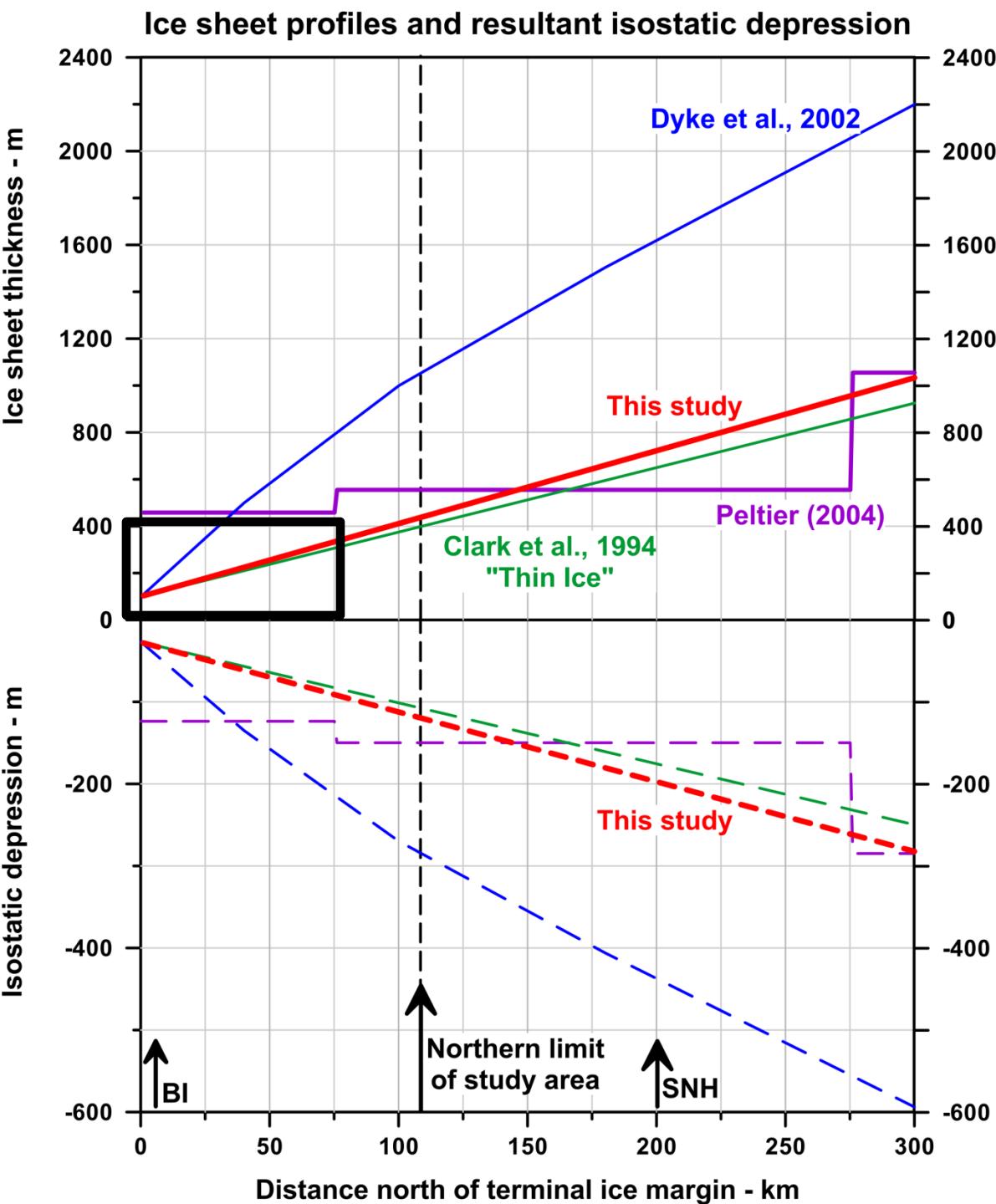
Laurentide Thickness: ICE-5G



What do I think...?

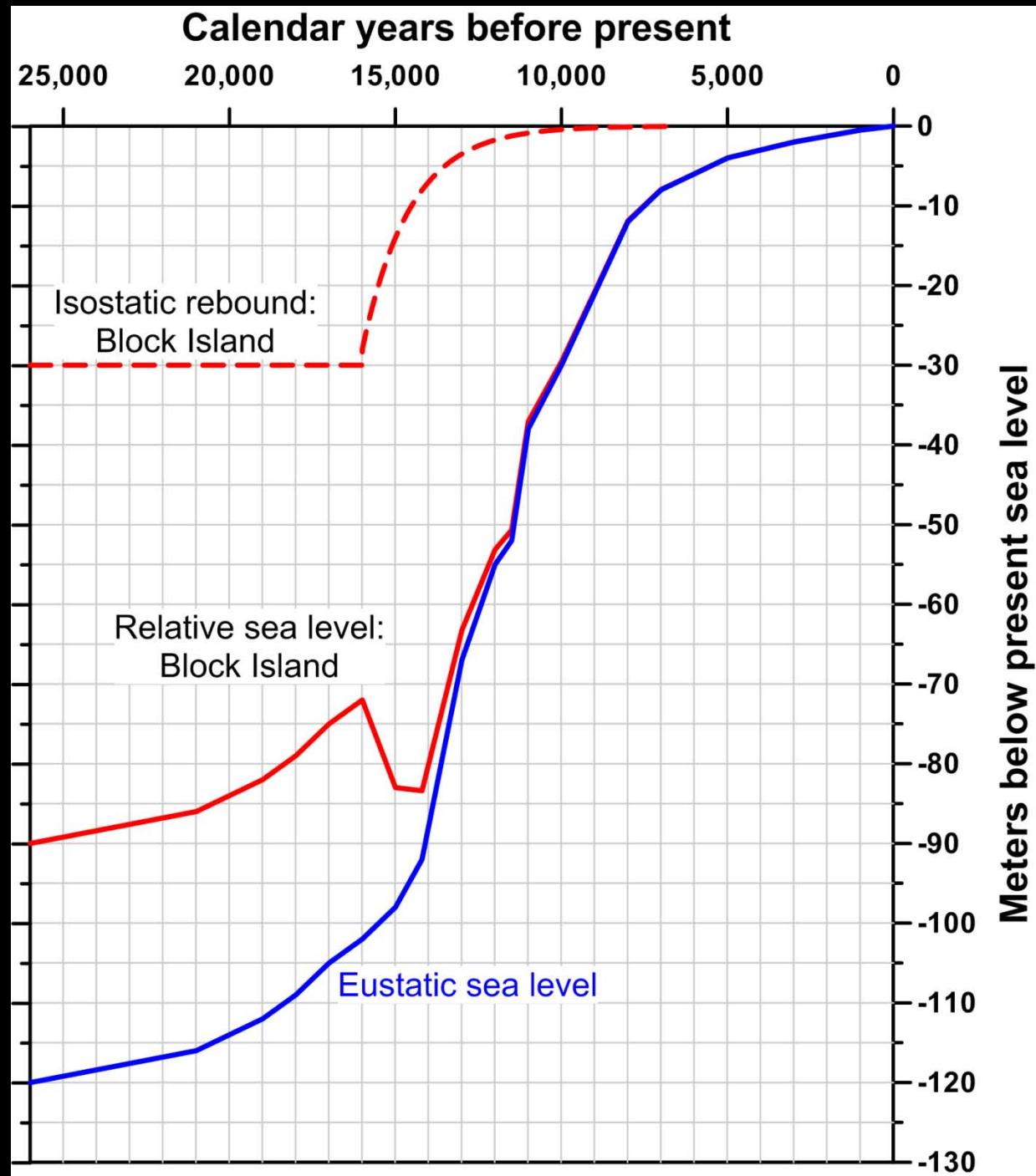
“Thin Ice” in S. NE

~ 1,000 ft thick or
so in W-P
watershed



RELATIVE
SEA LEVEL
Block Island

Eustatic Curve: Peltier and Fairbanks (2008)



END MORAINES OF SOUTHEASTERN NEW ENGLAND

Laurentide was at the
'LGM' by ~26,000 yBP

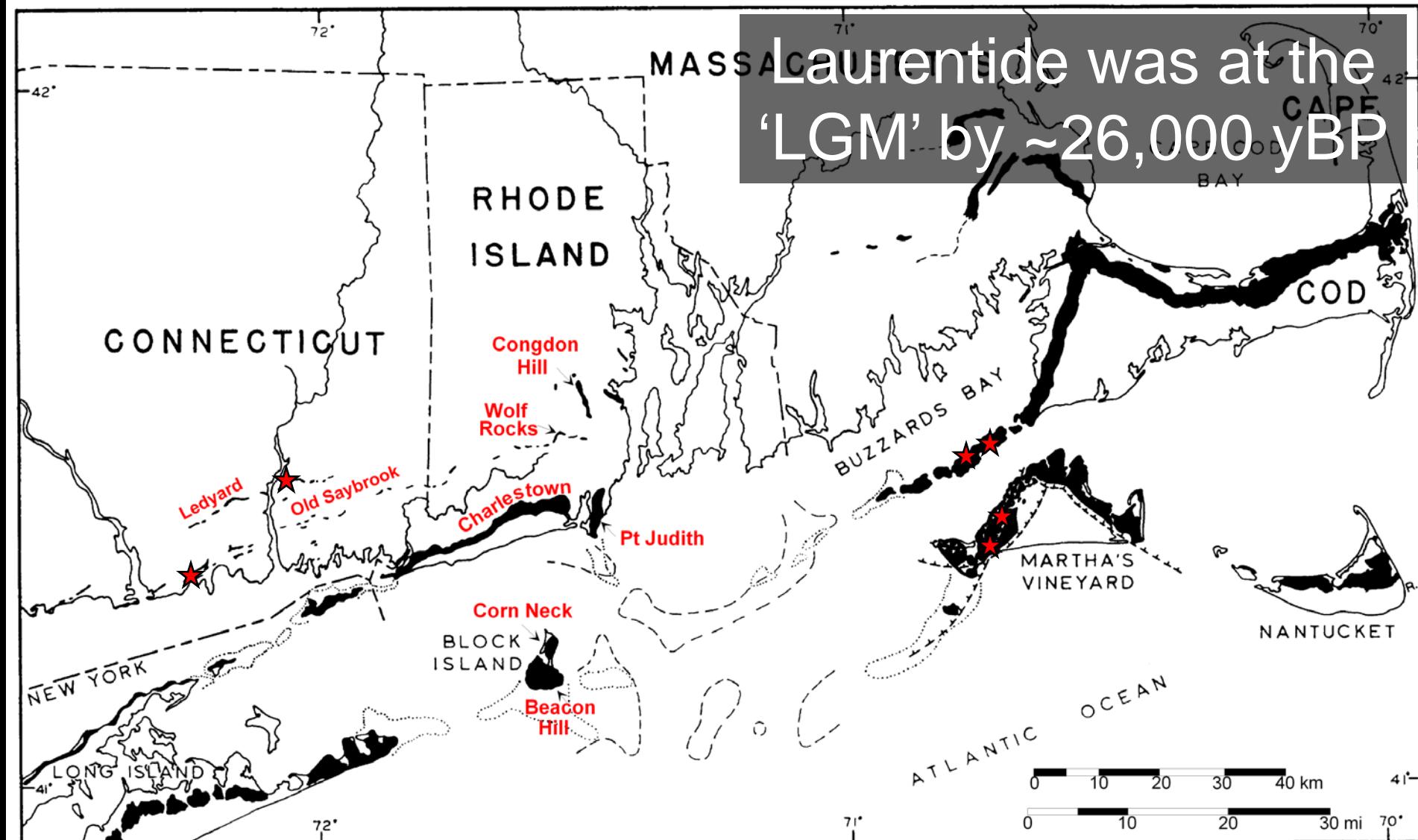
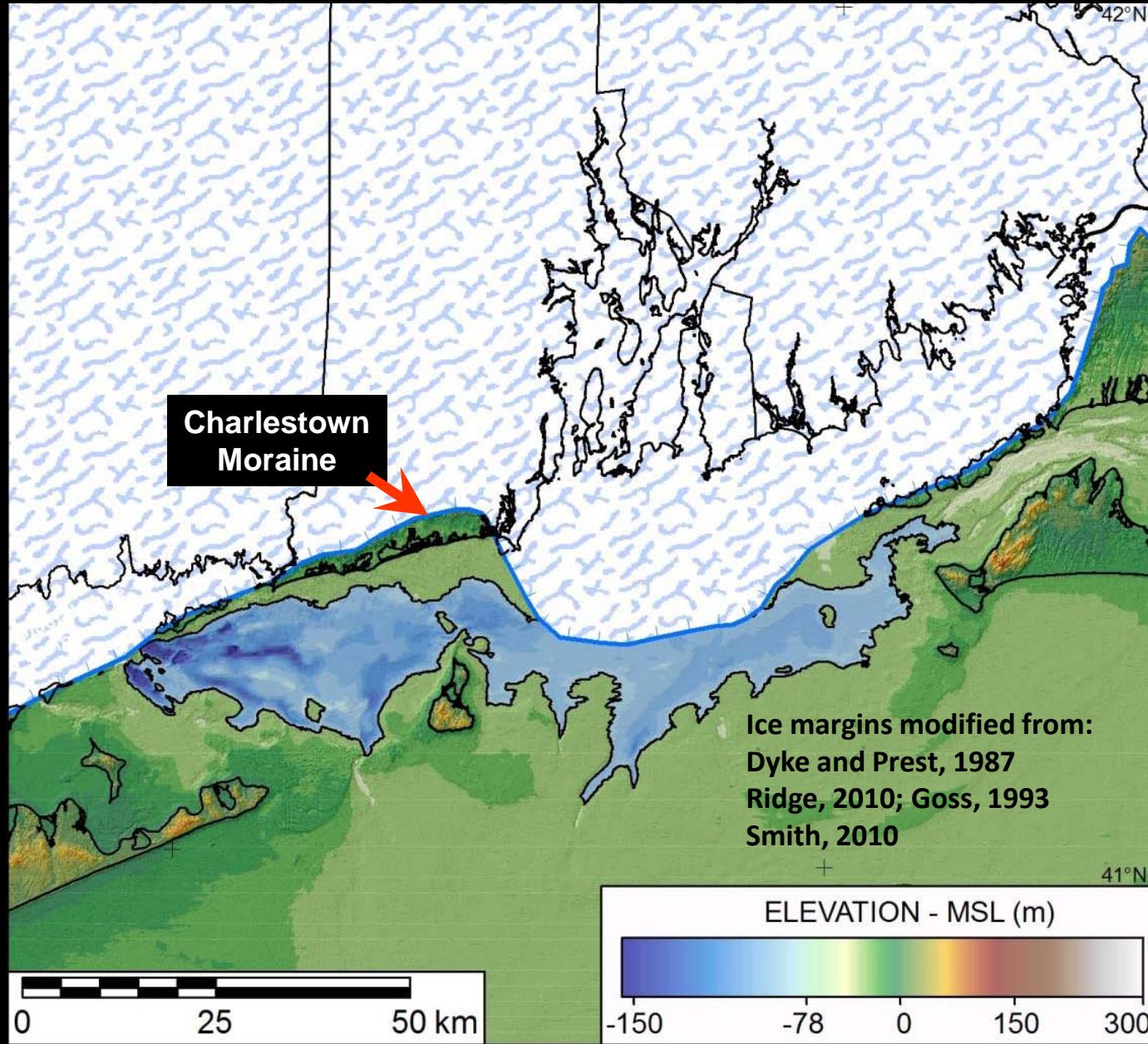
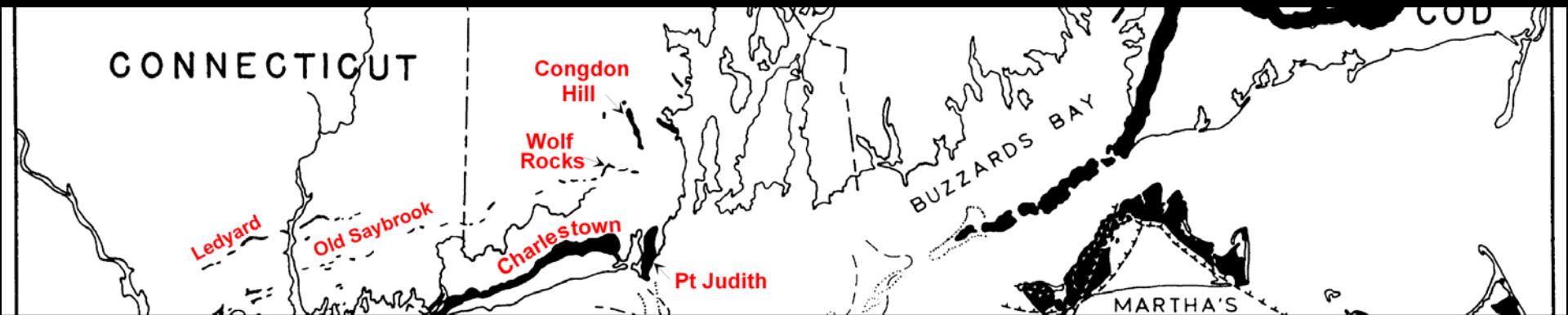


Figure 1. End moraines of southeastern New England. Black polygons are end moraines Adapted from Schafer and Hartshorn (1965) with additions from Sirkin (1982).

Glacial Lakes in Rhode Island and Block Island Sounds, 21,000 yBP

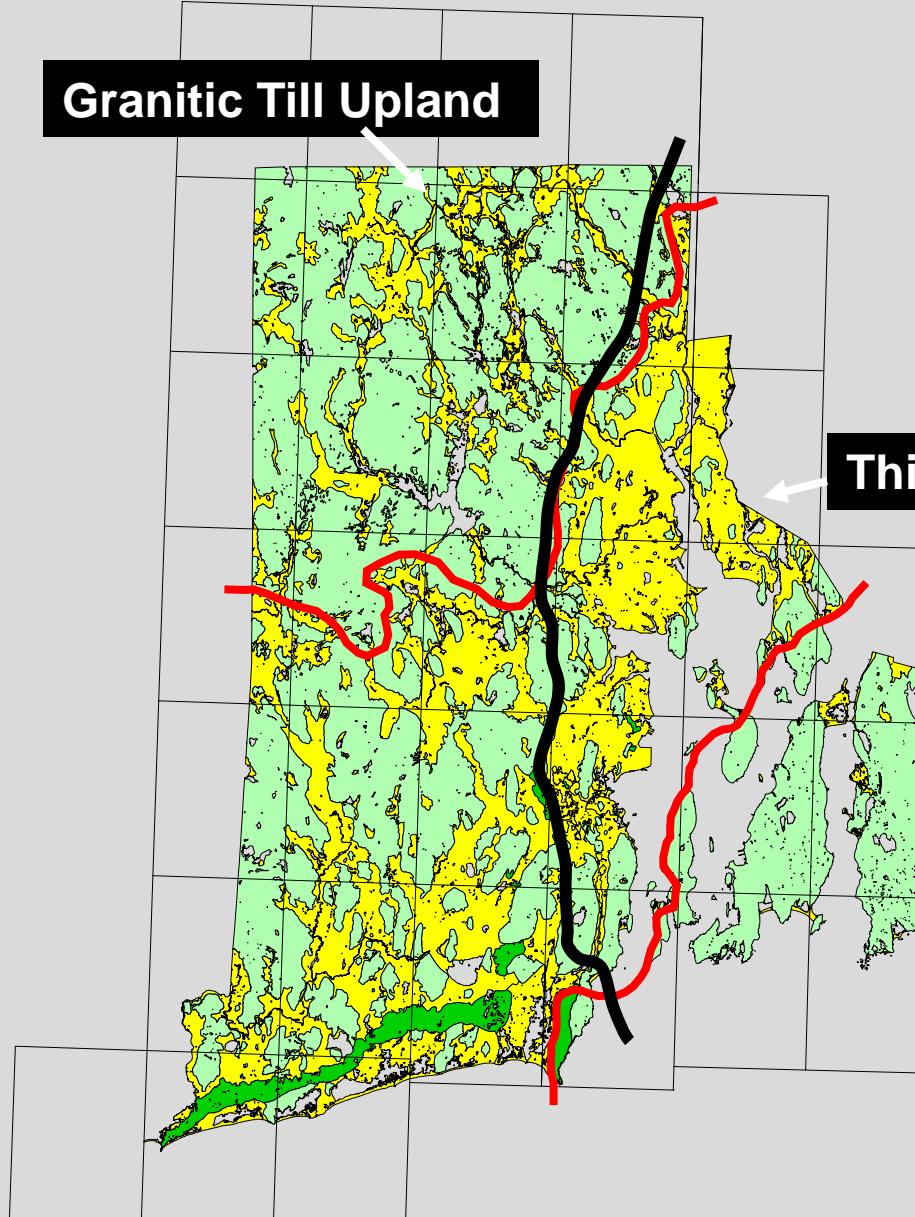


- Charlestown Moraine
 - Tectonic *recessional* end moraine representing a significant still-stand/readvance of the LIS
 - 21,000-ish yBP
- Wolf Rocks/Congdon Hill 20,300/20,200-ish yBP



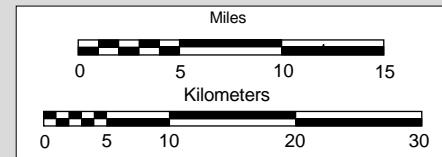
Wood-Pawcatuck Watershed
was “Ice Free” by ~20,000 yBP

QUATERNARY DEPOSITS OF RHODE ISLAND



EXPLANATION

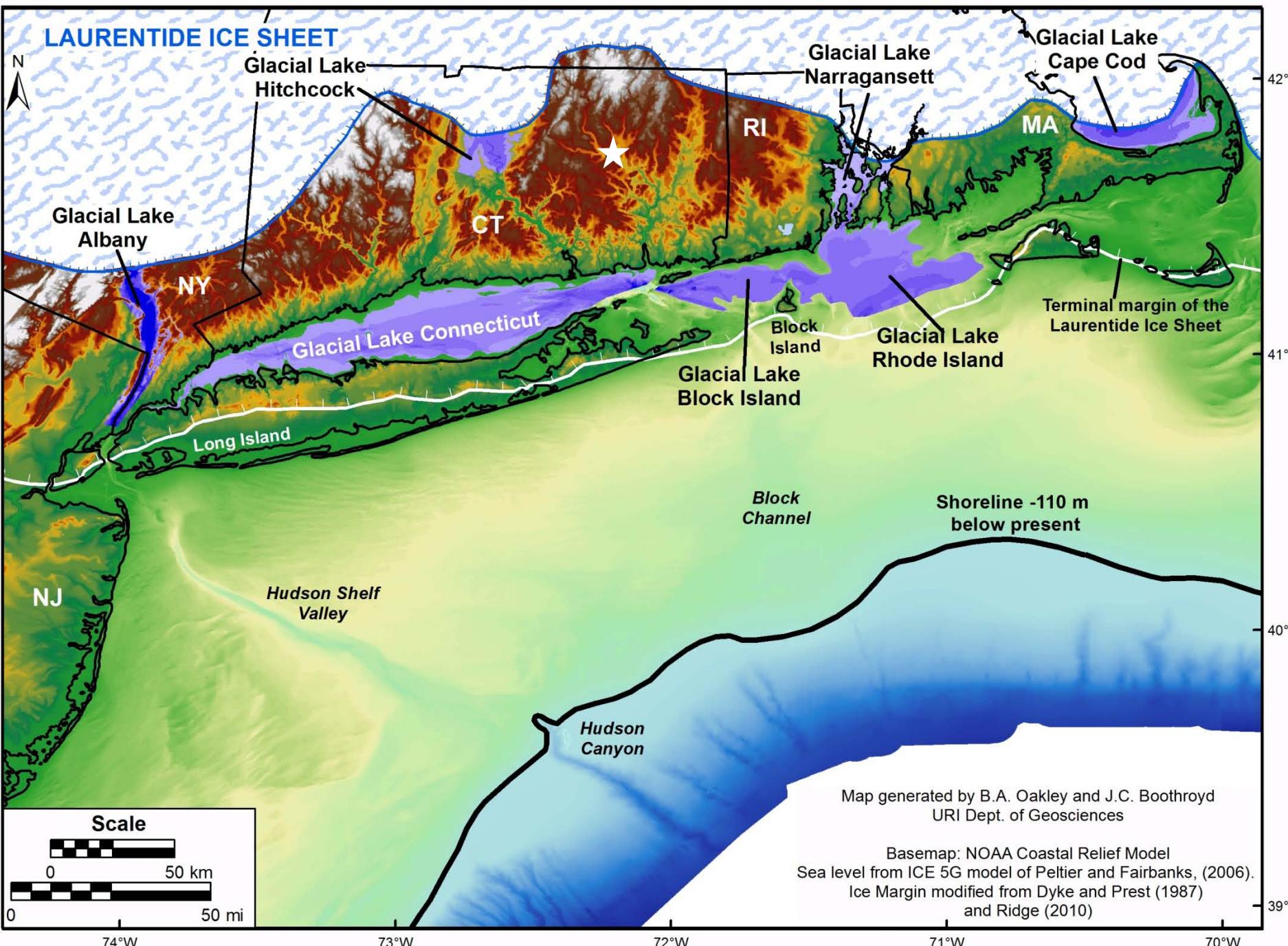
- Stratified Material
- Till
- End Moraine - Till and Stratified Material



Stratified deposits....

- Sediment deposited by meltwater
- Glacial lakes dominated the landscape...

GLACIAL LAKES OF SOUTHERN NEW ENGLAND AND EASTERN NEW YORK



Quaternary Geology of the Carolina – Quonochontaug Quads

Braided River on a Delta Plain



J.C. Boothroyd

"C. Pebby Sand Fluvial Facies" – i.e. Braided River deposits



“C. Pebby Sand Fluvial Facies” – i.e. Braided River deposits

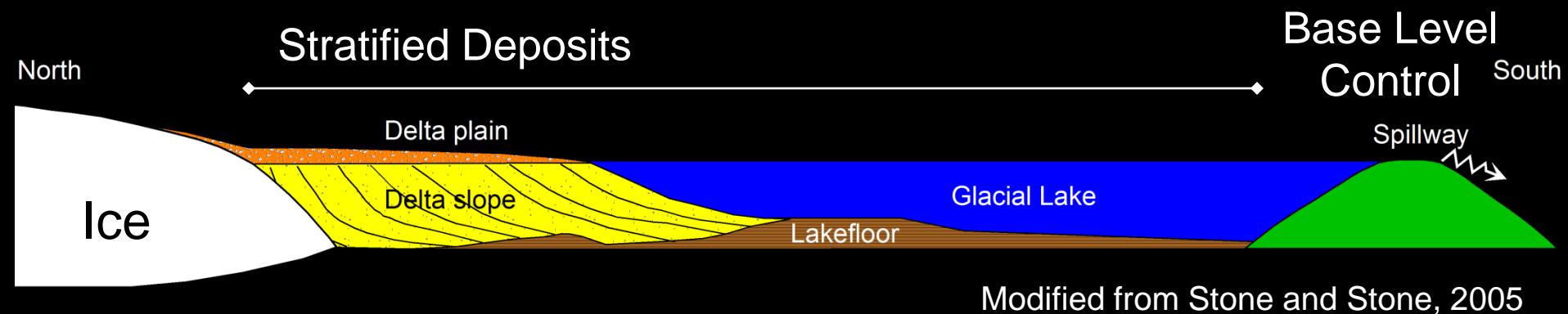


Morphosequence

- Time-equivalent group of landforms that extend from the collapsed former ice margin at the proximal end of the deposit



MORPHOSEQUENCE CHARACTERISTICS



Which is all complicated by isostatic rebound....

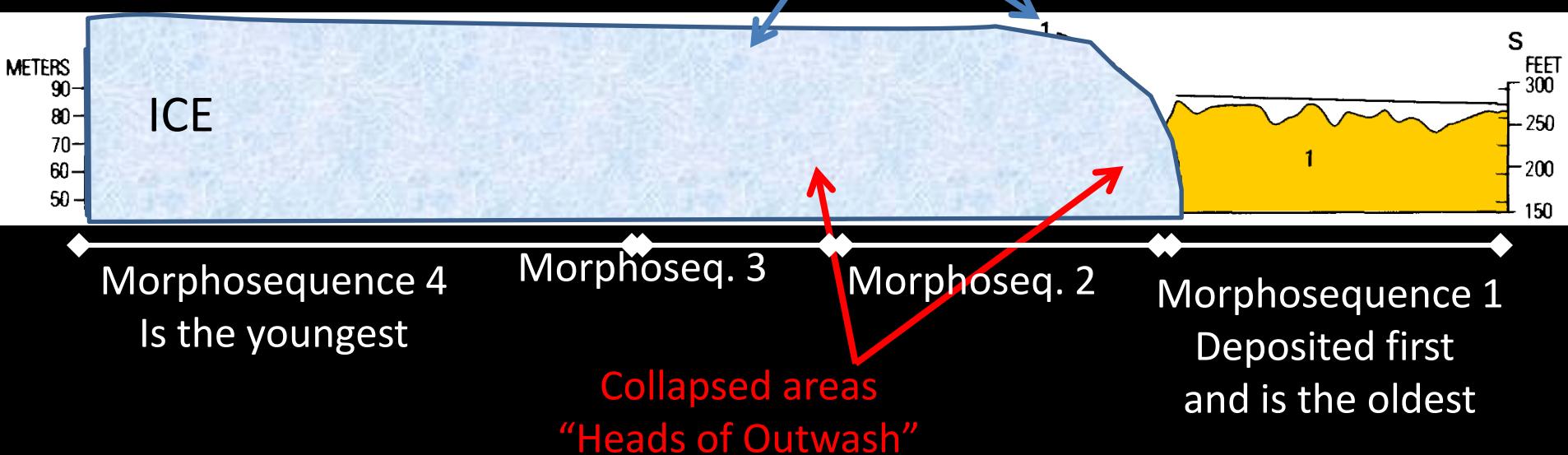
Ice Retreat



Ice Margins

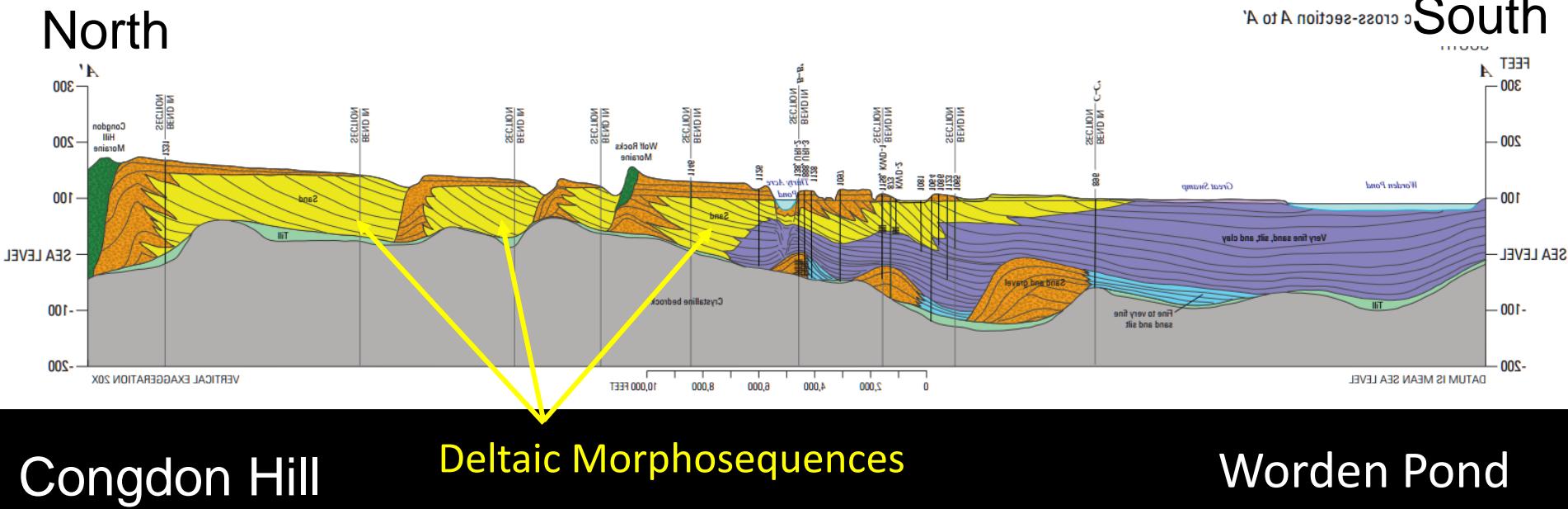
4 = Youngest

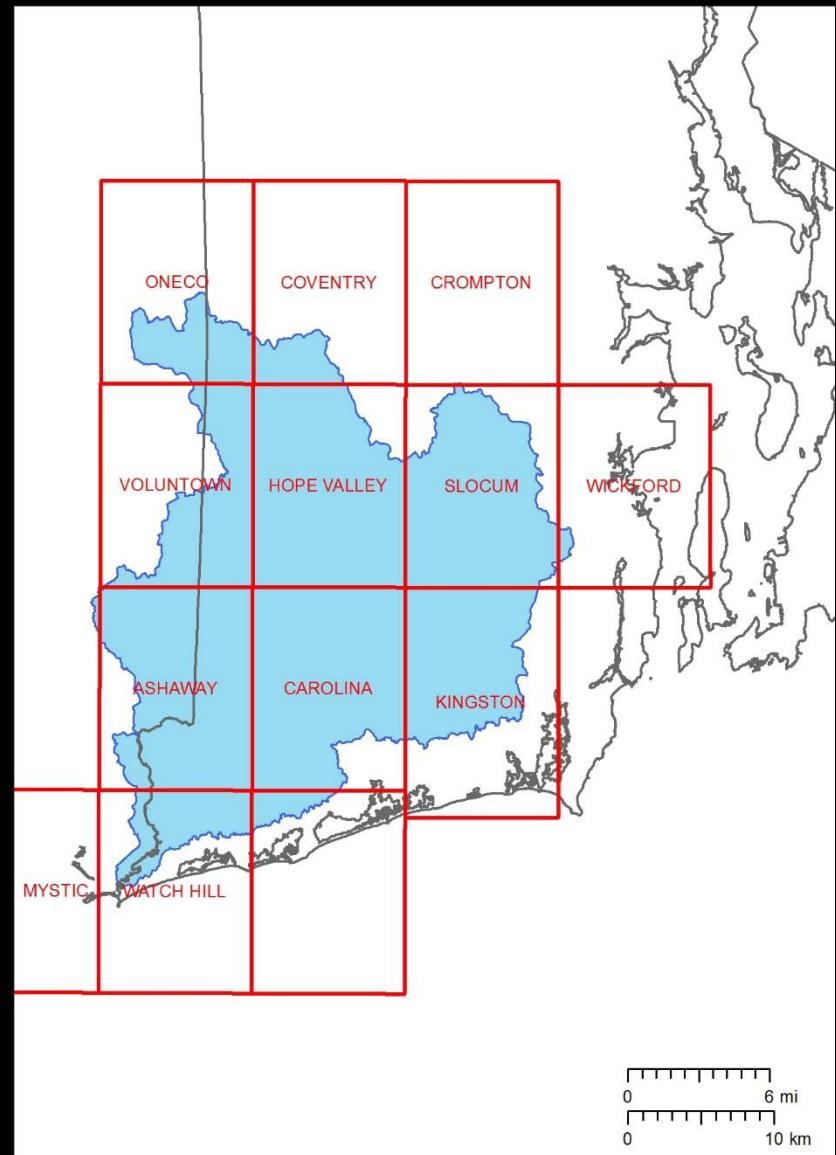
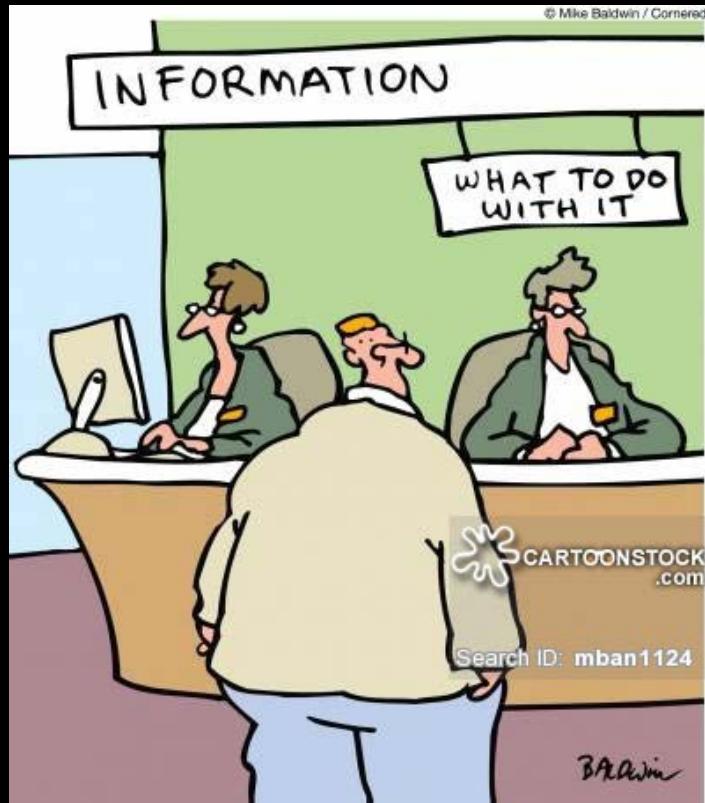
1 = Oldest



After Koteff and Pessl, 1981

Geologic Cross-Section: Congdon Hill to Worden Pond







geothermal.isgs.illinois.edu - /aasggeothermal/rigs/map/

[\[To Parent Directory\]](#)

5/14/2012 11:18 AM	75516040	Ashaway Quad Bedrock Collared RISPF.zip
5/14/2012 11:19 AM	40400470	Ashaway Quad Bedrock RISPF.zip
5/14/2012 11:19 AM	57803864	Ashaway Quad Groundwater Collared RISPF.zip
5/14/2012 11:19 AM	33935043	Ashaway Quad Groundwater RISPF.zip
5/14/2012 11:19 AM	62939660	Ashaway Quad Surficial Map Collared RISPF.zip
5/14/2012 11:19 AM	42741986	Ashaway Quad Surficial Map RISPF.zip
5/14/2012 11:19 AM	41172765	Attleboro Quad Aeromagnetic Map Collared RISPF.zip
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