Prehistoric Florida Water

40-million-years of paleohydrology in Deep Time

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UF Distinguished Professor

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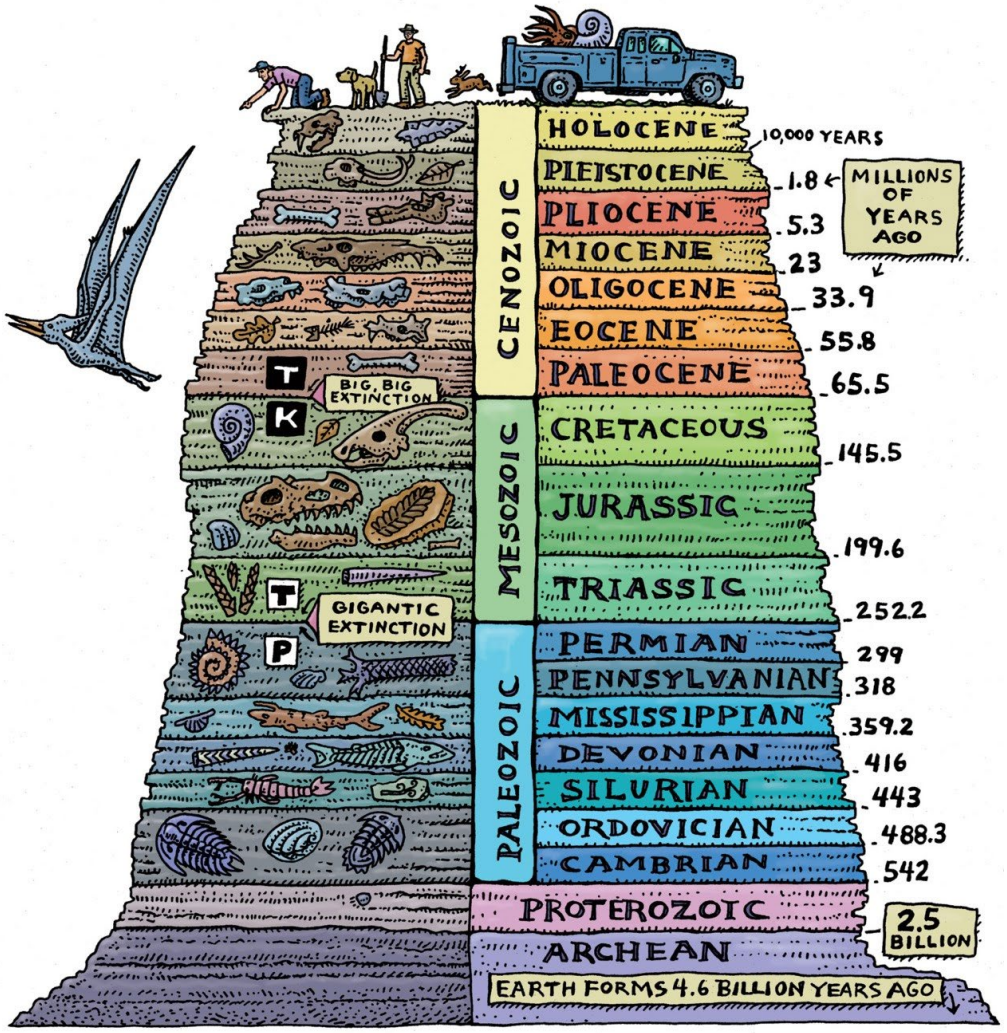
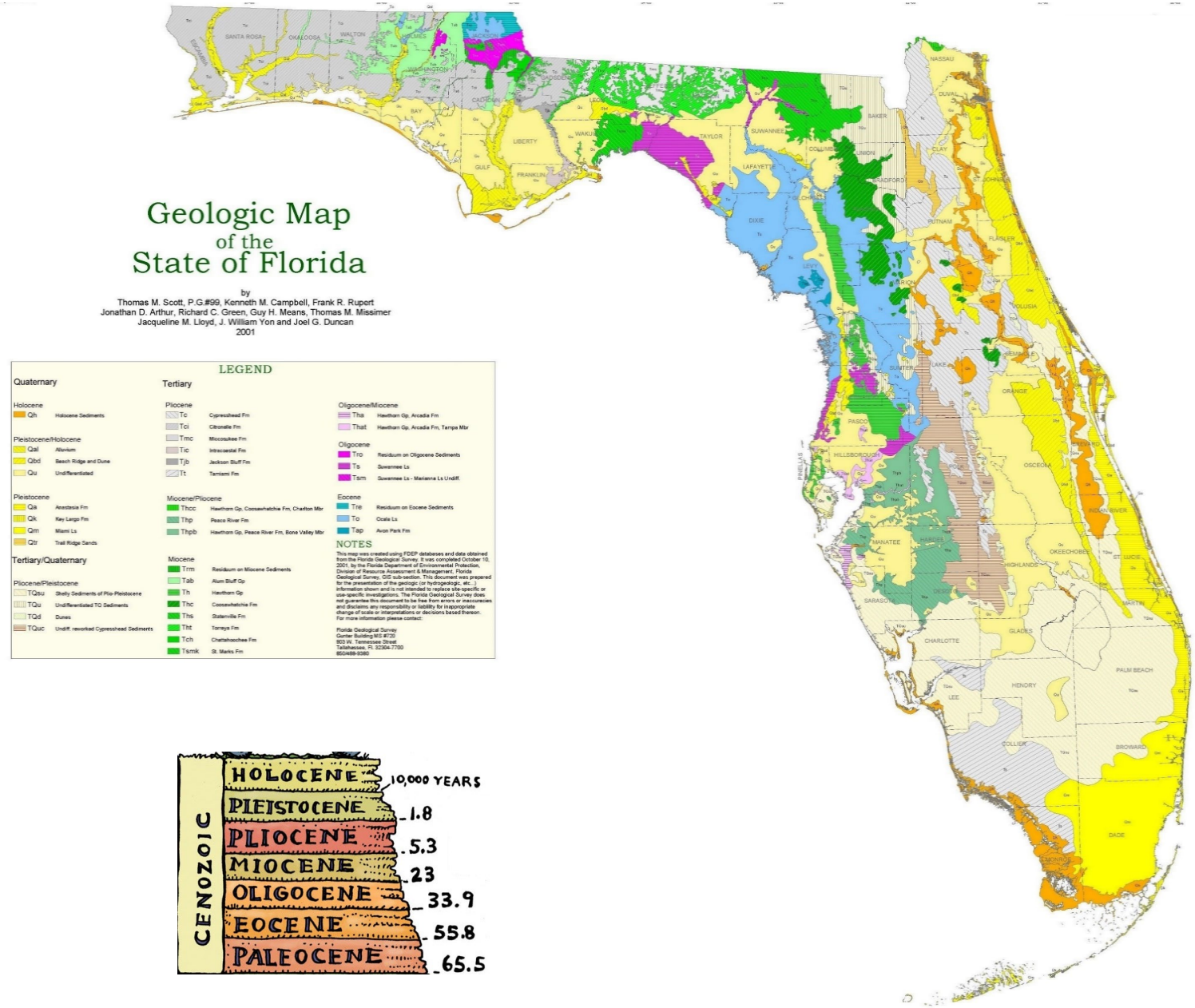
Geology--Deep Time context

"**Deep time**" refers to
the time scale of geologic events,
which is vastly, almost
unimaginably greater than
the time scale of human lives
(John McPhee, *Basin and Range* 1981).



Geologic Map of the State of Florida

by
Thomas M. Scott, P.G.#99, Kenneth M. Campbell, Frank R. Rupert
Jonathan D. Arthur, Richard C. Green, Guy H. Means, Thomas M. Missimer
Jacqueline M. Lloyd, J. William Yon and Joel G. Duncan
2001



LEGEND

Quaternary

Holocene
- Qh — Holocene Sediments

Pleistocene/Holocene
- Qal — Alluvium
- Qbd — Beach Ridge and Dune
- Qu — Undifferentiated

Pleistocene
- Qa — Anastasia Fm
- Qk — Key Largo Fm
- Qm — Miami Ls
- Qtr — Trail Ridge Sands

Tertiary/Quaternary

Pliocene/Pleistocene
- TQsu — Shelly Sediments of Plio-Pleistocene
- TQu — Undifferentiated TQ Sediments
- TQd — Dunes
- TQuc — Undiff. reworked Cypresshead Sediments

Tertiary

Pliocene
- Tc — Cypresshead Fm
- Tci — Citronelle Fm
- Tmc — Miccosukee Fm
- Tic — Intracoastal Fm
- Tjb — Jackson Bluff Fm
- Tt — Tamiami Fm

Miocene/Pliocene
- Thcc — Hawthorn Gp, Cocoawhatchie Fm, Charlton Mbr
- Thp — Peace River Fm
- Thpb — Hawthorn Gp, Peace River Fm, Bone Valley Mbr

Miocene
- Trm — Residuum on Miocene Sediments
- Tab — Alum Bluff Gp
- Th — Hawthorn Gp
- Thc — Cocoawhatchie Fm
- Ths — Statenville Fm
- Tht — Torreya Fm
- Tch — Chattahoochee Fm
- Tsmk — St. Marks Fm

Oligocene/Miocene
- Tha — Hawthorn Gp, Arcadia Fm
- That — Hawthorn Gp, Arcadia Fm, Tampa Mbr

Oligocene
- Tro — Residuum on Oligocene Sediments
- Ts — Suwannee Ls
- Tsm — Suwannee Ls - Marianna Ls Undiff.

Eocene
- Tre — Residuum on Eocene Sediments
- To — Ocala Ls
- Tap — Avon Park Fm

NOTES

This map was created using FDEP databases and data obtained from the Florida Geological Survey. It was completed October 10, 2001, by the Florida Department of Environmental Protection, Division of Resource Assessment & Management, Florida Geological Survey, GIS sub-section. This document was prepared for the presentation of the geologic (or hydrogeologic, etc...) information shown and is not intended to replace site-specific or use-specific investigations. The Florida Geological Survey does not guarantee this document to be free from errors or inaccuracies and disclaims any responsibility or liability for inappropriate change of scale or interpretations or decisions based thereon. For more information please contact:

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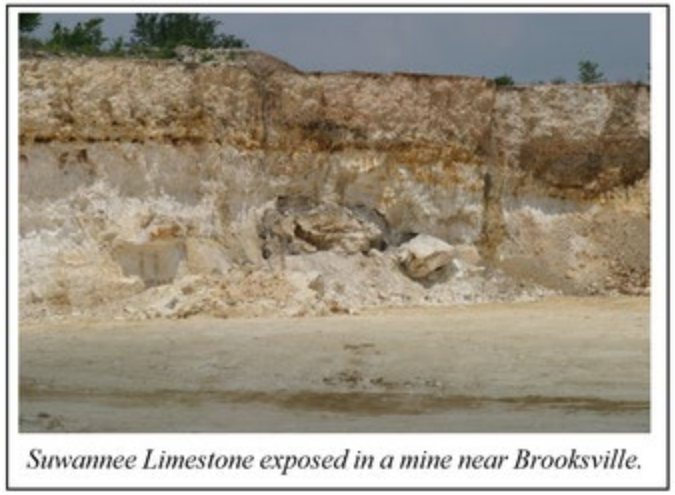
Tallahassee, FL 32304-7700
850/488-2380

How do we know the paleohydrosphere of Florida, when "fossil" water does not exist?

We use "proxy" evidence, for example—

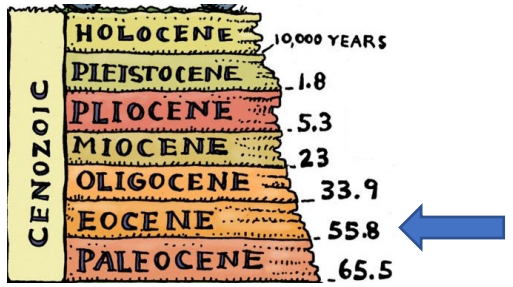
- Rocks found in Florida, i.e., massive limestones, are typically a proxy for marine systems

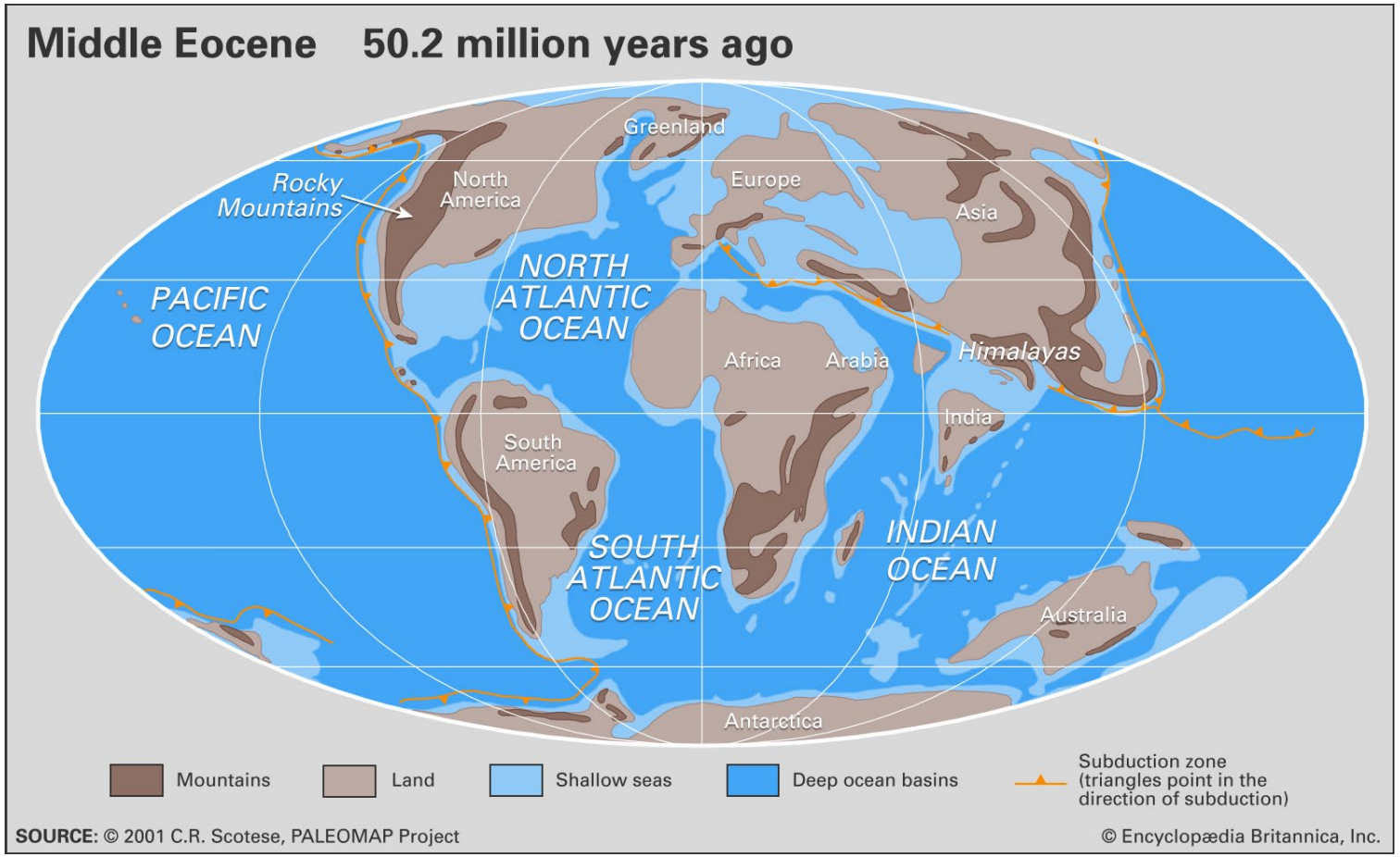


Suwannee Limestone exposed in a mine near Brooksville.

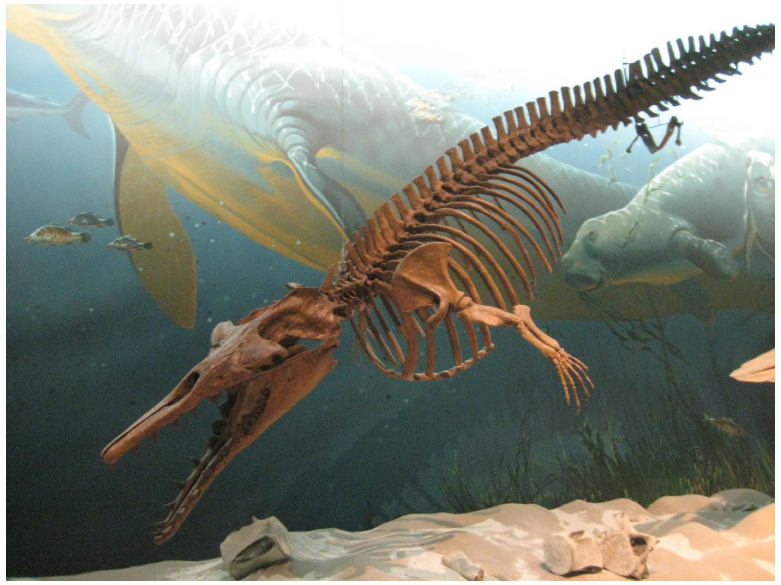
- Fossils found in Florida—alligators indicate freshwater

Eocene paleogeography

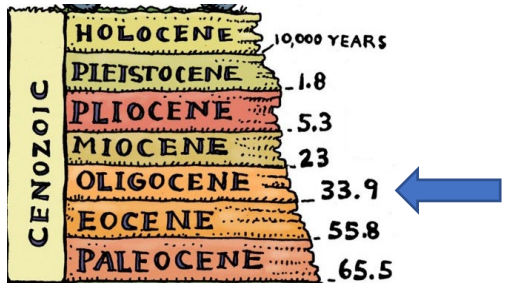


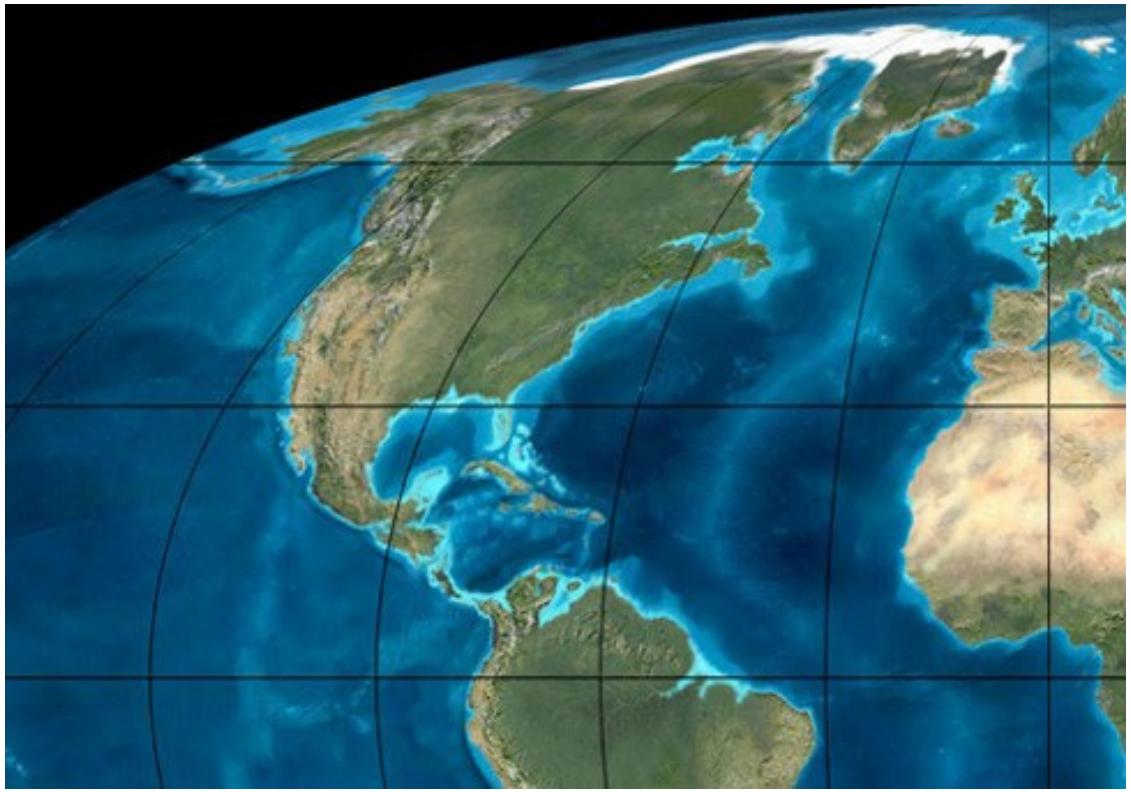


Eocene sea creatures



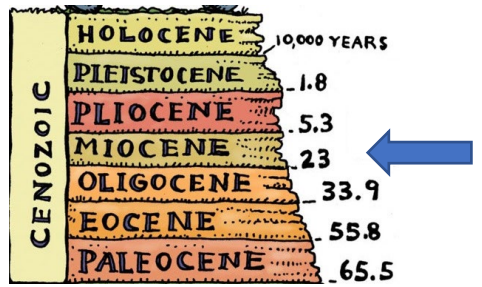
Oligocene –
Origins of FL peninsula





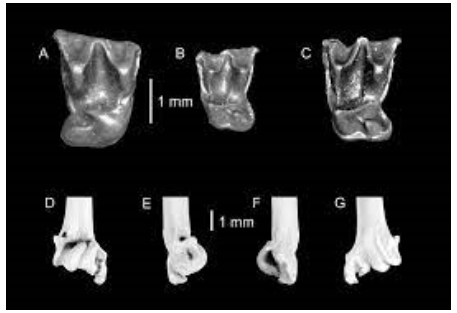
Oligocene land animals--Florida

Miocene—growth of peninsula



Florida Miocene ocean predators

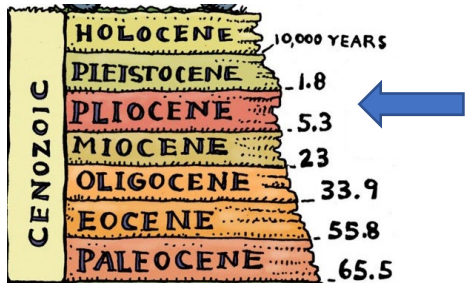
Miocene karst & fossils

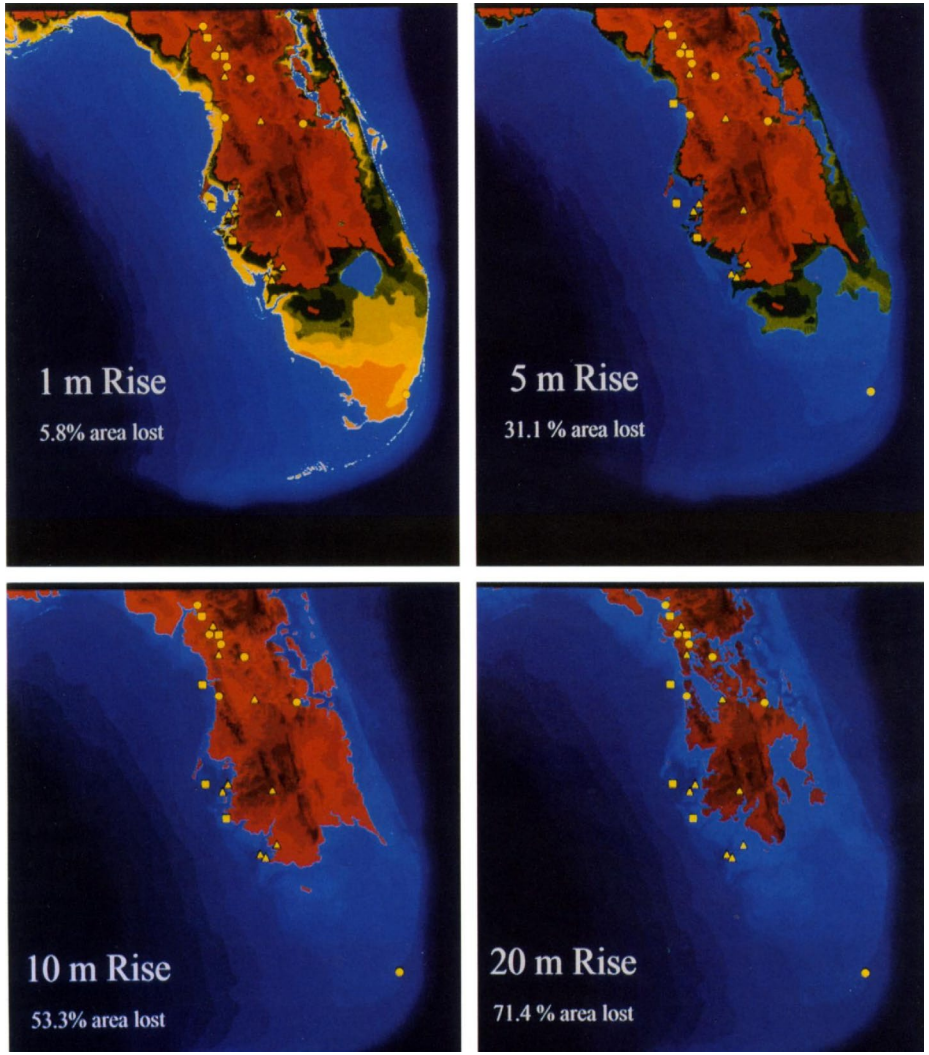


Modern-day FL karst

Miocene rivers & fossils

Pliocene Warm Period (PWP)
3 million years ago





Scientists model PWP:
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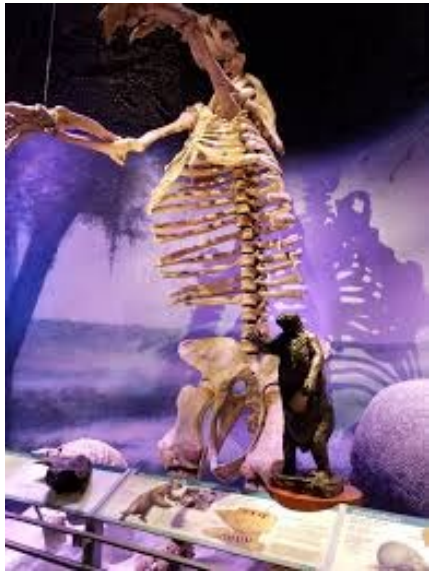
1. Sea-level rise was between 10 to 20 m.

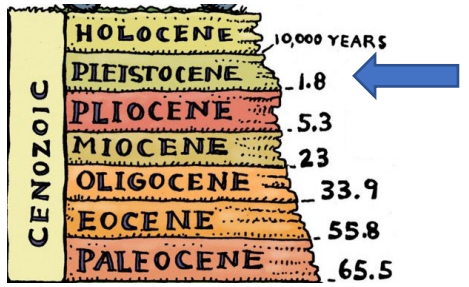
2. Time of increased tropical storms

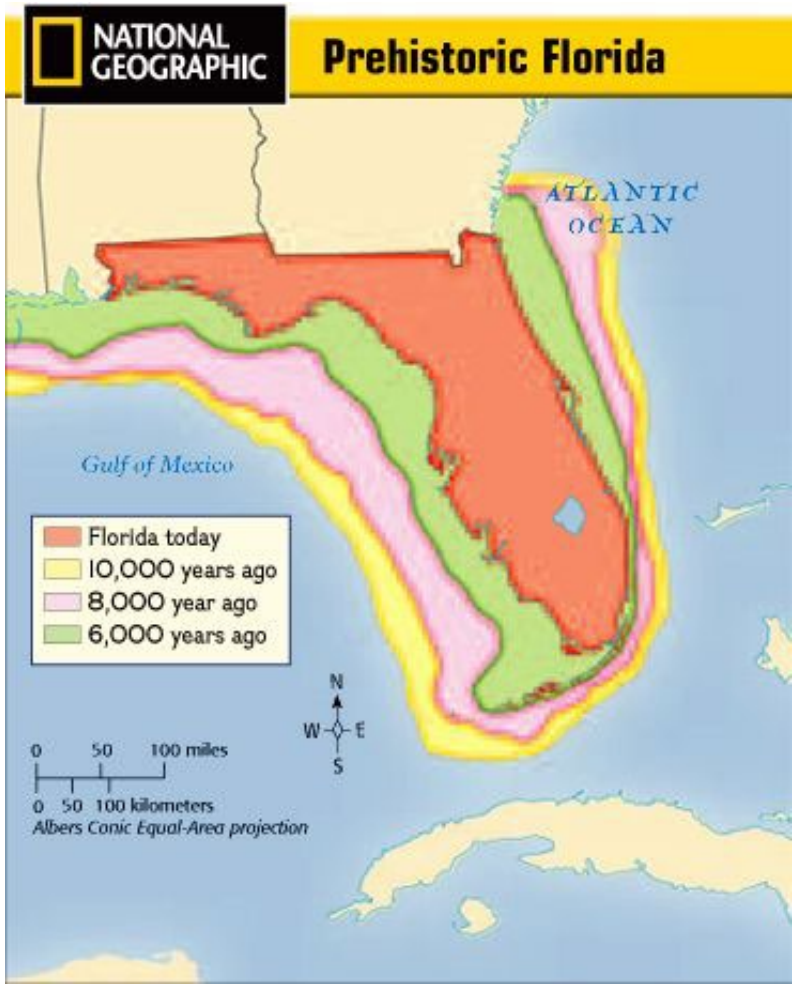
3. Analog to Florida today

Pliocene—sinkholes and rivers



Ice Ages (Pleistocene)





Wrap-up and Take-home messages
Florida's paleohydrosphere

- Value of geological proxy evidence
- Florida started as underwater marine carbonate platform, 40 million years ago
- First freshwater came with beginning of FL peninsula 30 million years ago
- Then combination of marine and freshwater
- Many fluctuations of Florida land and sea
- Pliocene Warm Period a predictive model for today