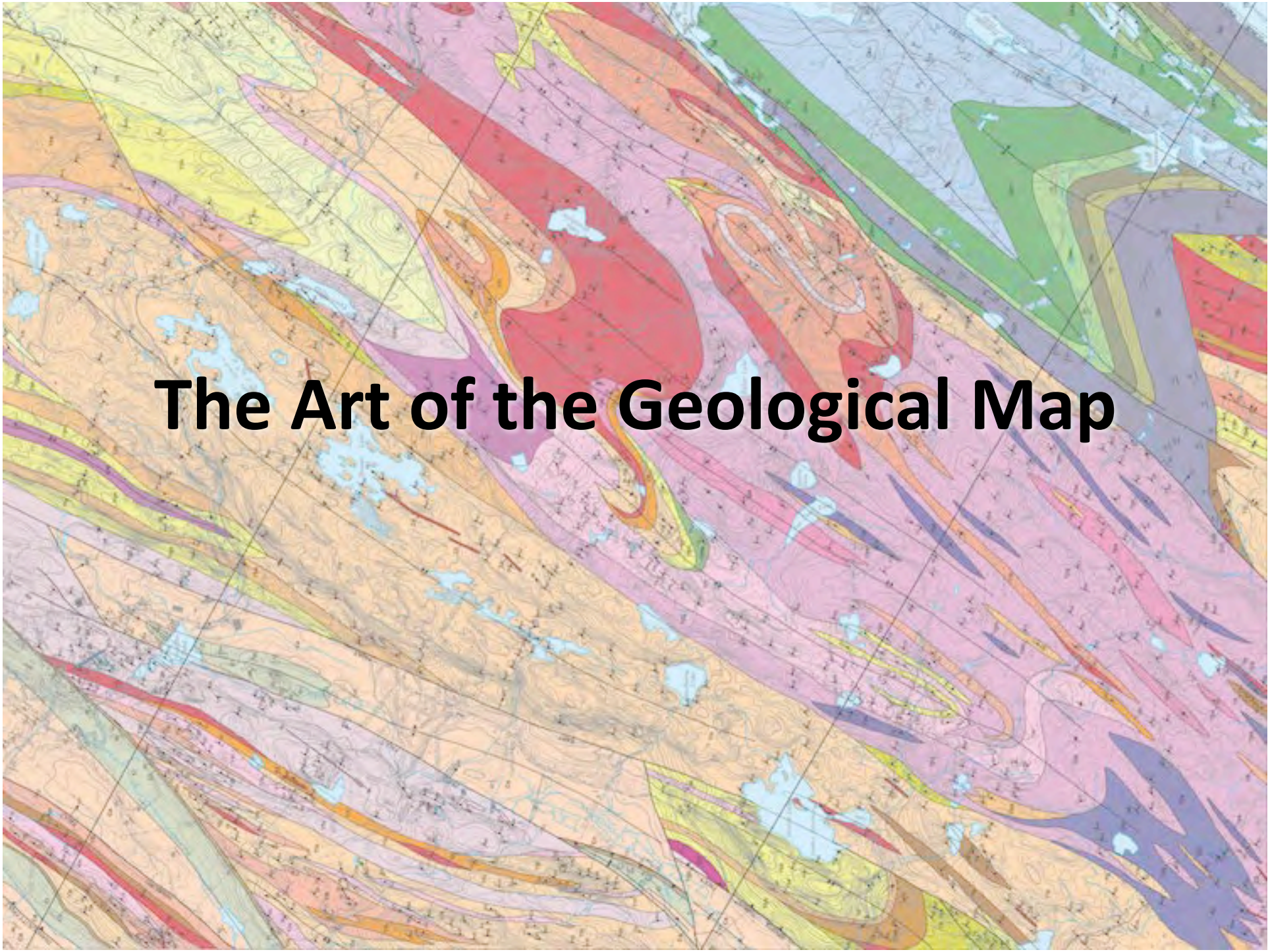
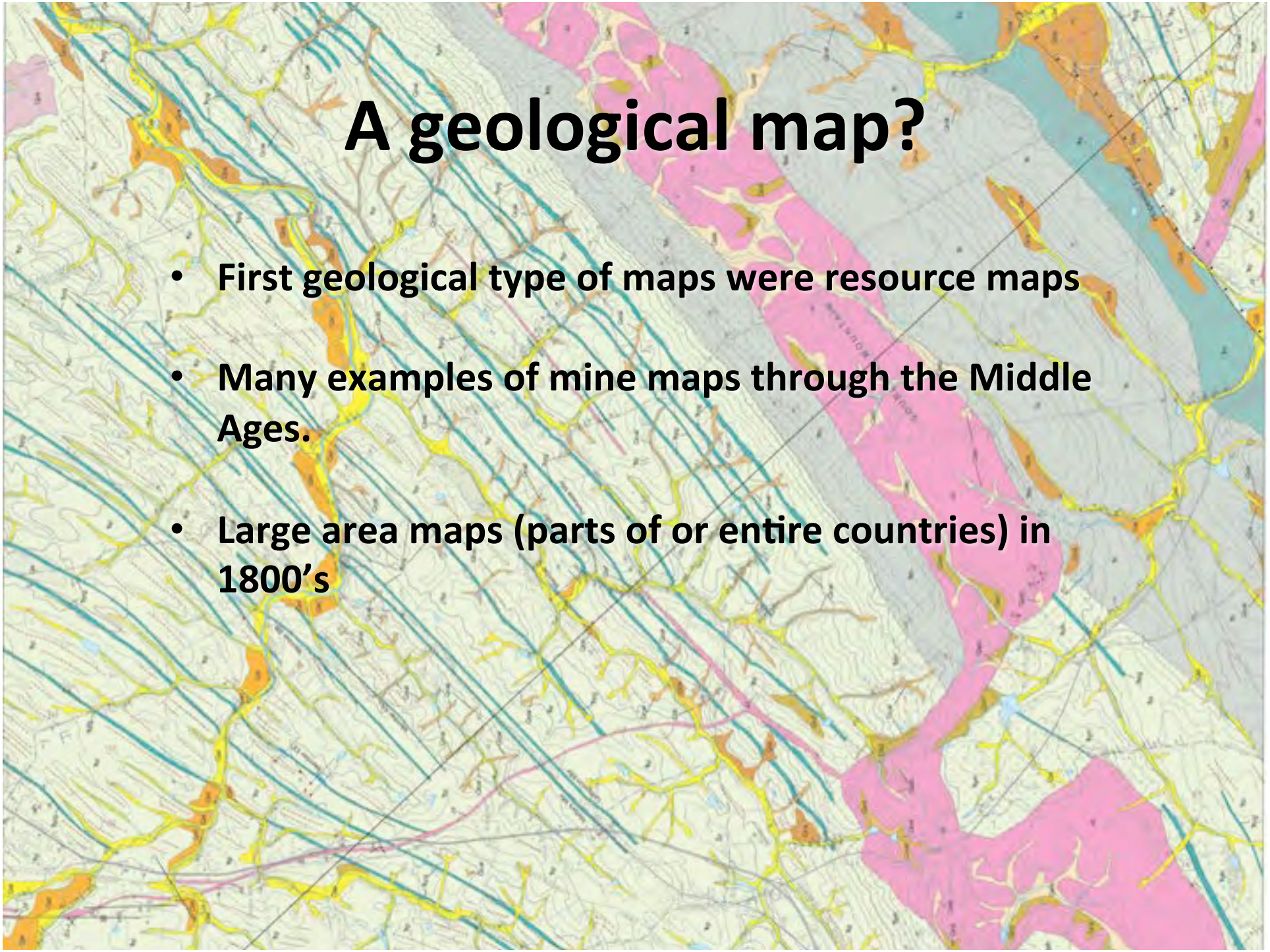

The Art of the Geological Map

What is a geological map?

- Represents location of different types of geological materials such as bedrock and surficial.
- Can depict economic resources, various types of hazards such as landslide potential, sinkholes and ground response to earthquake to name just a few.
- They basically depict the geologist's interpretation of the materials and geologic history beneath your feet.

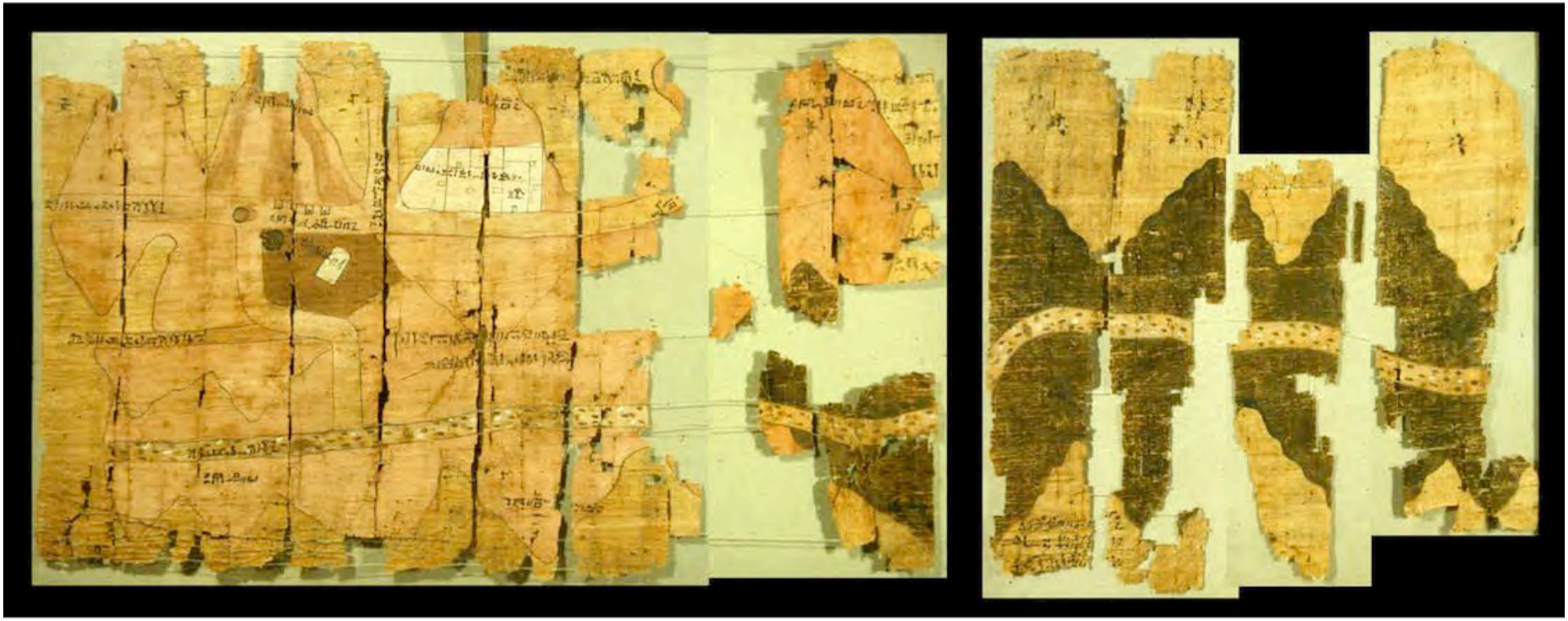


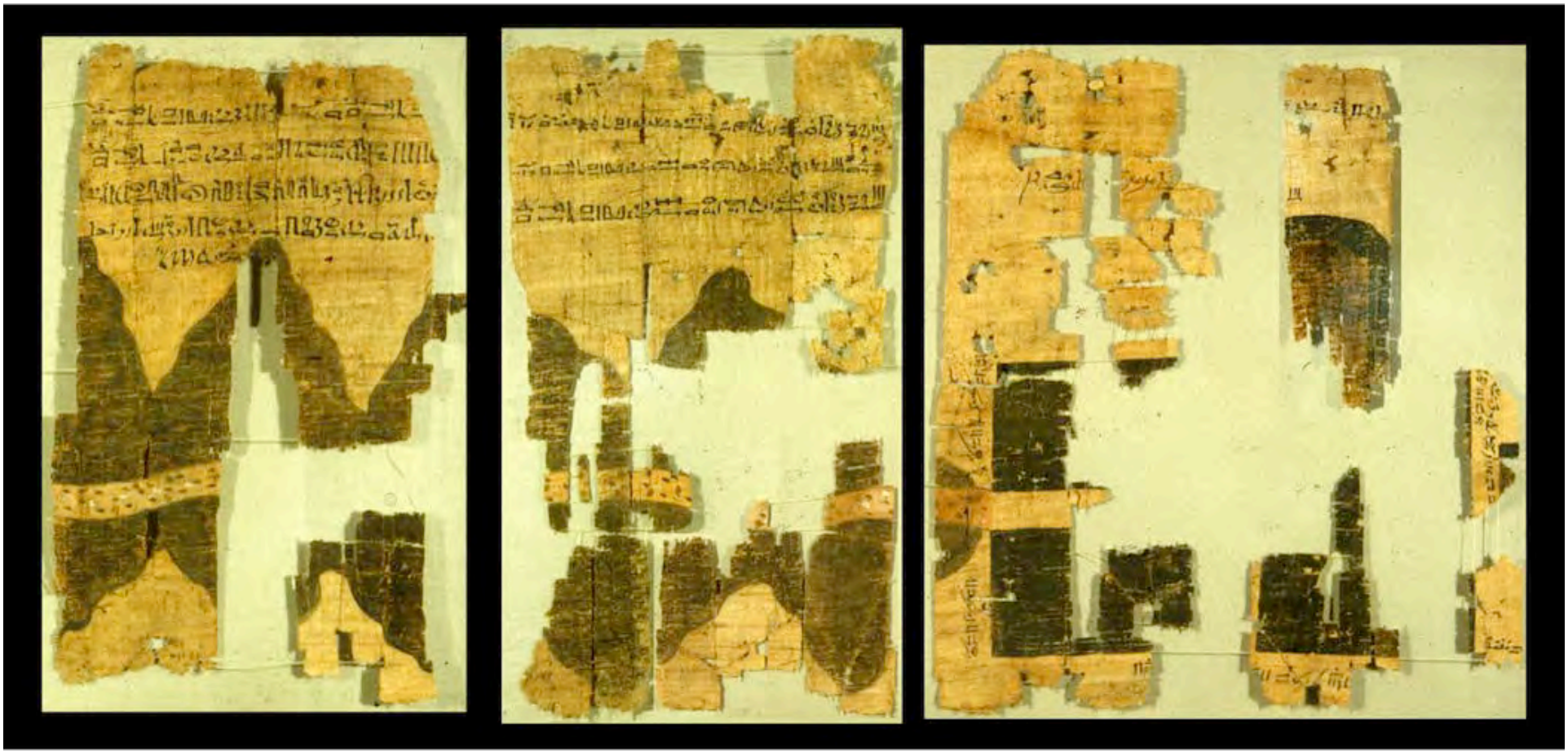
A geological map?

- First geological type of maps were resource maps
- Many examples of mine maps through the Middle Ages.
- Large area maps (parts of or entire countries) in 1800's

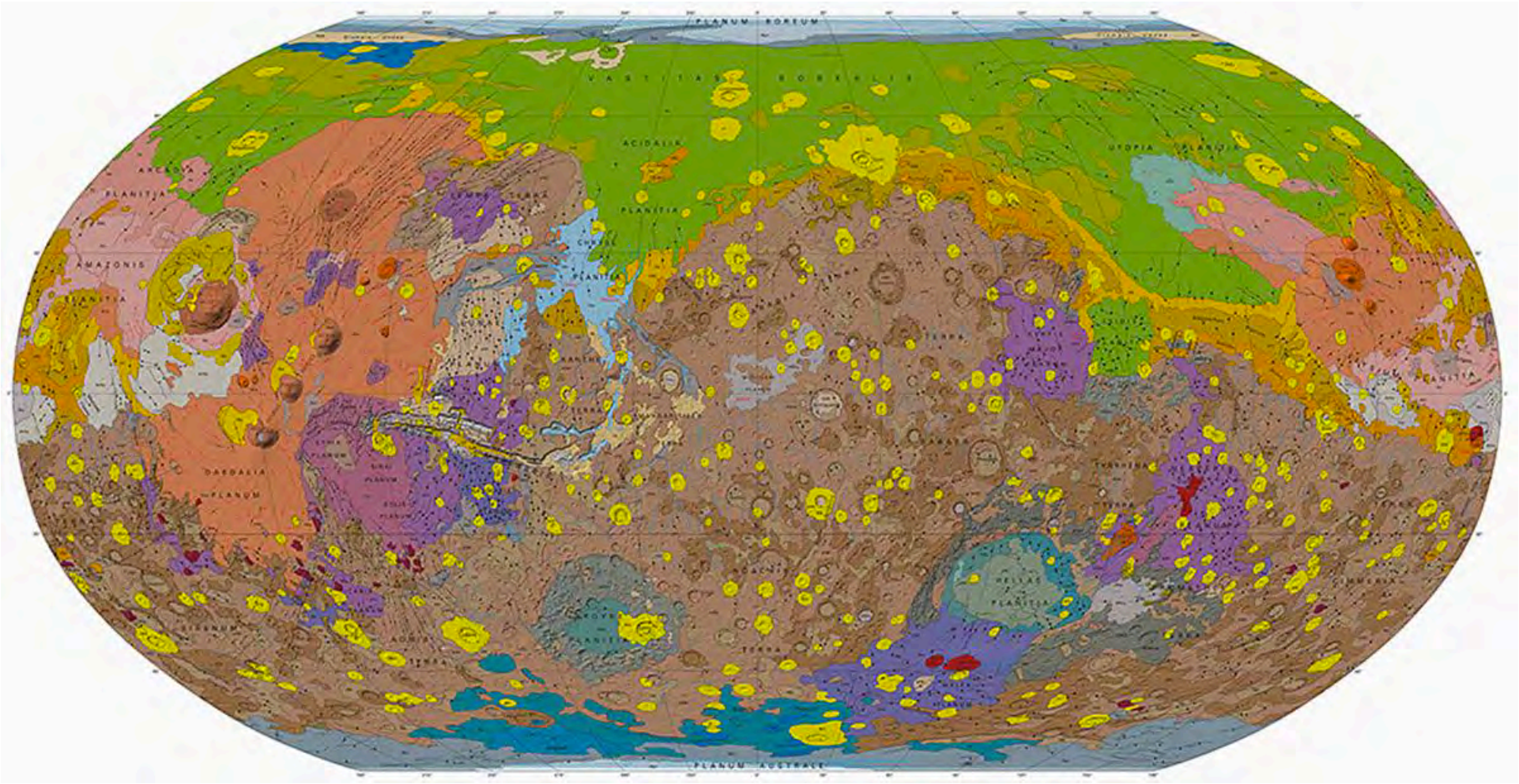
The world's oldest surviving geological map - the 1150 BC

Harrell, J.A. and V.M. Brown, 1992, The world's oldest surviving geological map - the 1150 BC Turin papyrus from Egypt, J Geology, v100, p.3-18.

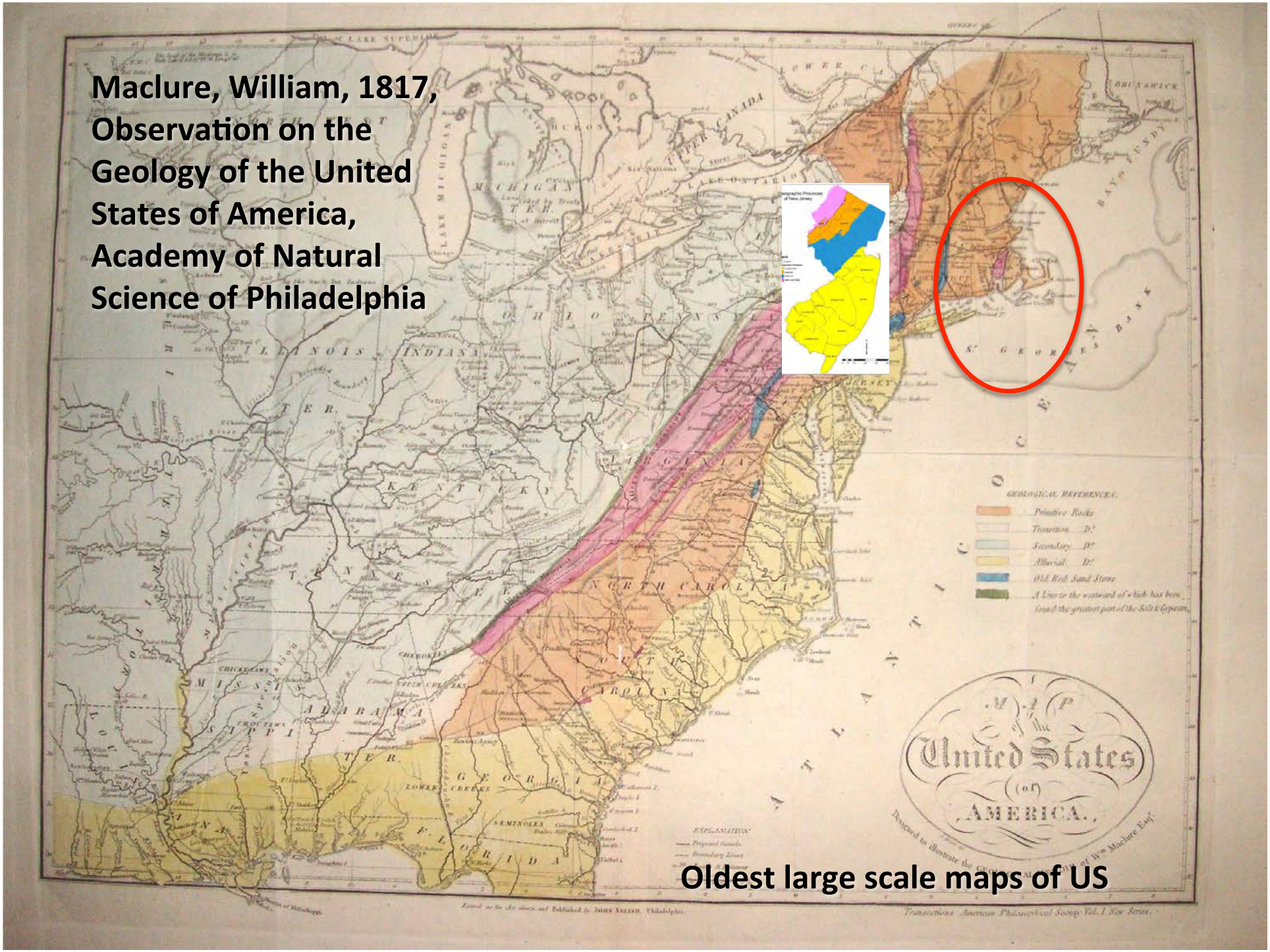


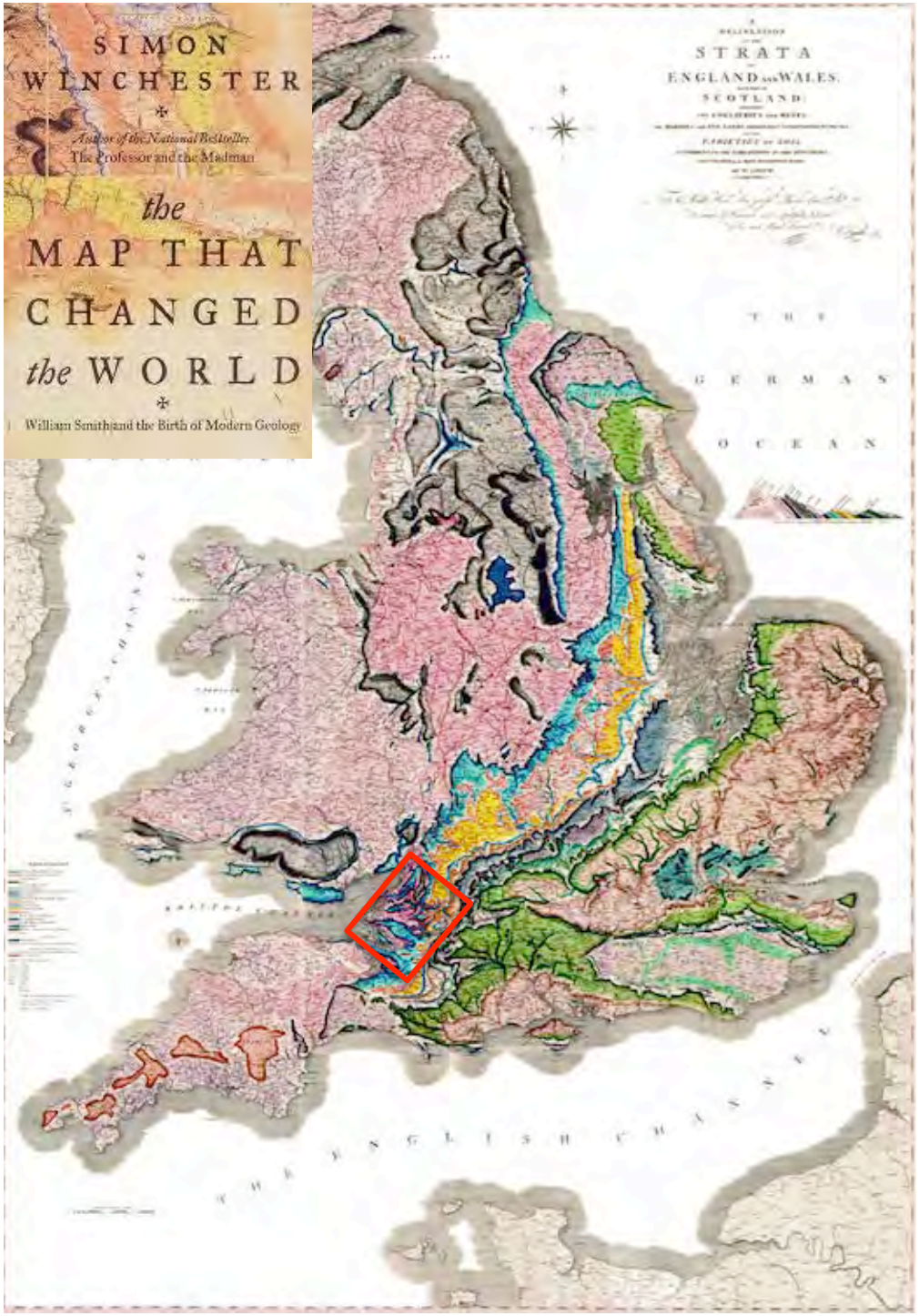


Geologic Map of Mars



K.L. Tanaka, J.A. Skinner, Jr., J.M. Dohm, R.P. Irwin, III, E.J. Kolb, C.M. Fortezzo, Thomas Platz, G.G. Michael, and T.M. Hare, 2014, Geologic Map of Mars, Scale 1:20,000,000, U.S. Geological Survey Scientific Investigations Map SIM 3292. URL: http://pubs.usgs.gov/sim/3292

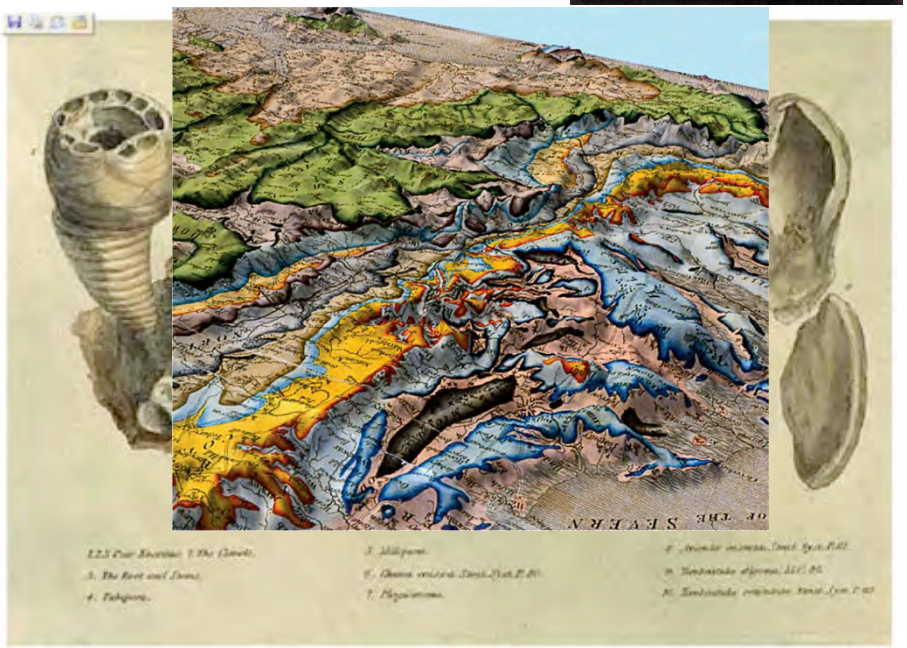

Maclure, William, 1817, Observation on the Geology of the United States of America, Academy of Natural Science of Philadelphia
Oldest large scale maps of US
GEOLOGICAL REFERENCES.
Primitive Rocks
Transition D.°
Secondary D.°
Alluvial D.°
Old Red Sand Stone
A Line to the westward of which has been found the greatest part of the Salt & Gypsum
MAP of the United States (of) AMERICA.
Designed to illustrate the Geological Observations of Wm Maclure Esqr.
Transactions American Philosophical Society Vol. I New Series.

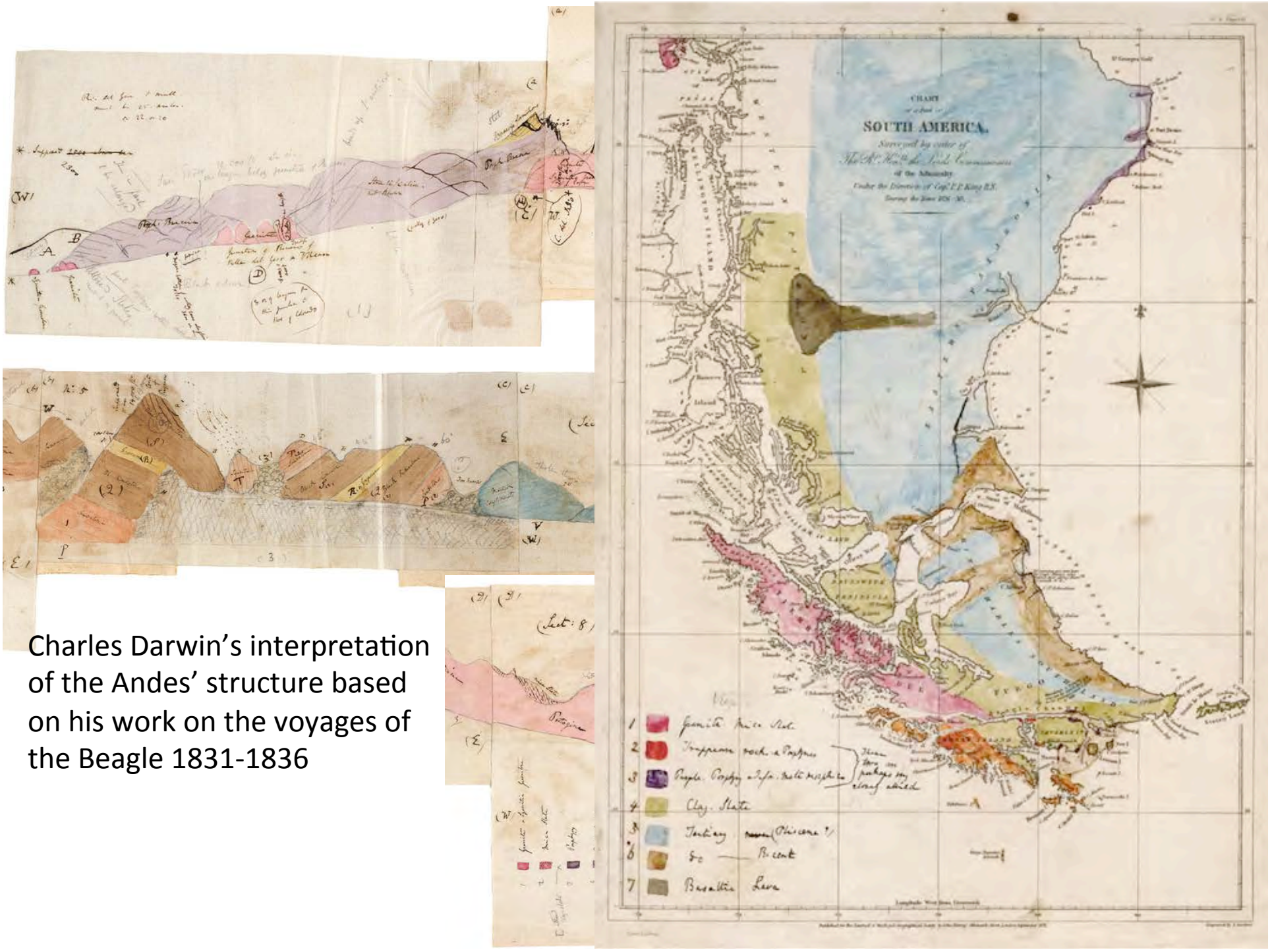


"A Delineation of the Strata of England and Wales with part of Scotland: Representing the Collieres and Mines, the Marshes and Fen Lands originally overflowed by the sea, and the Varieties of Soil according to the variations in the Substrata." 1815

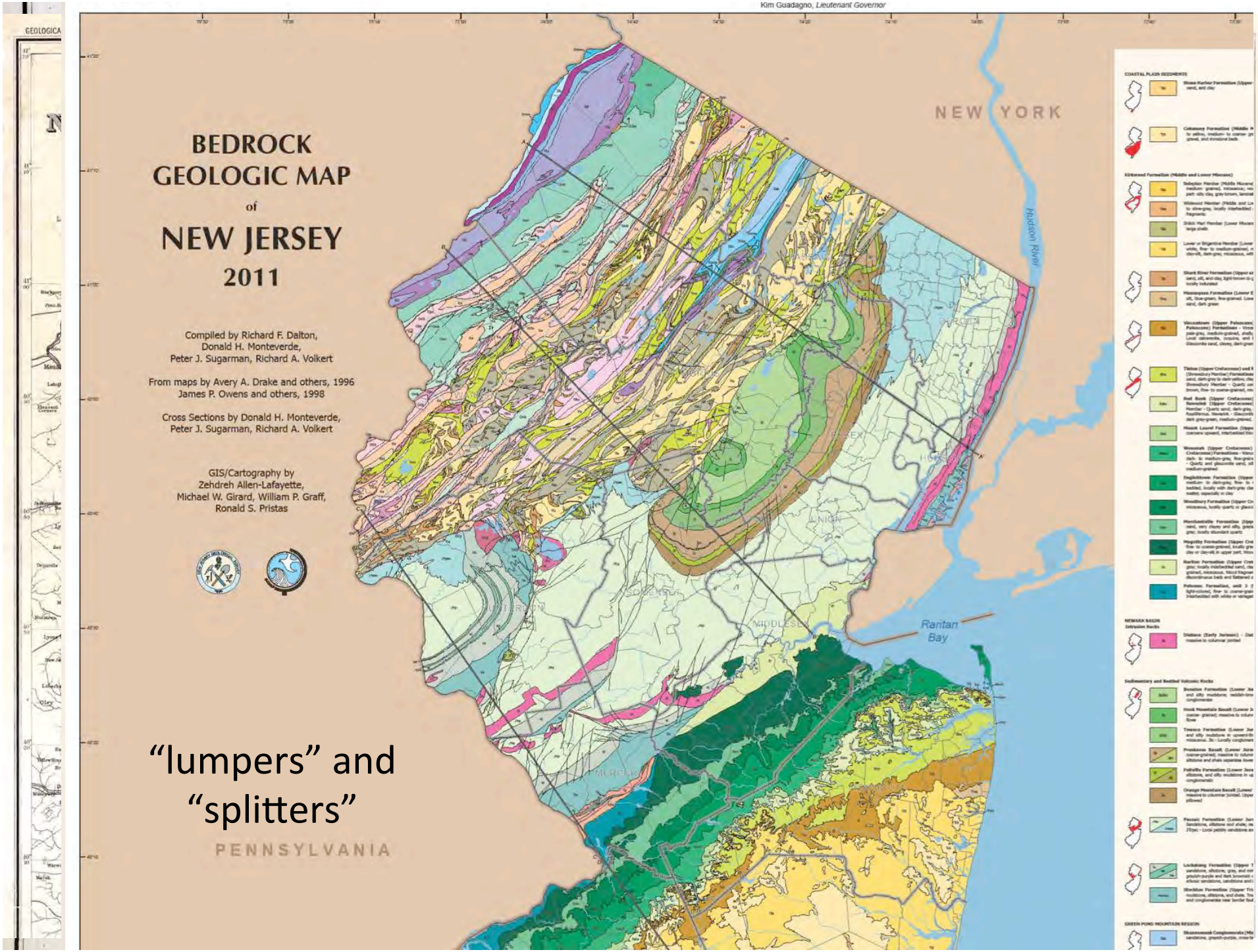
William "Strata" Smith

2015 – two hundredth anniversary





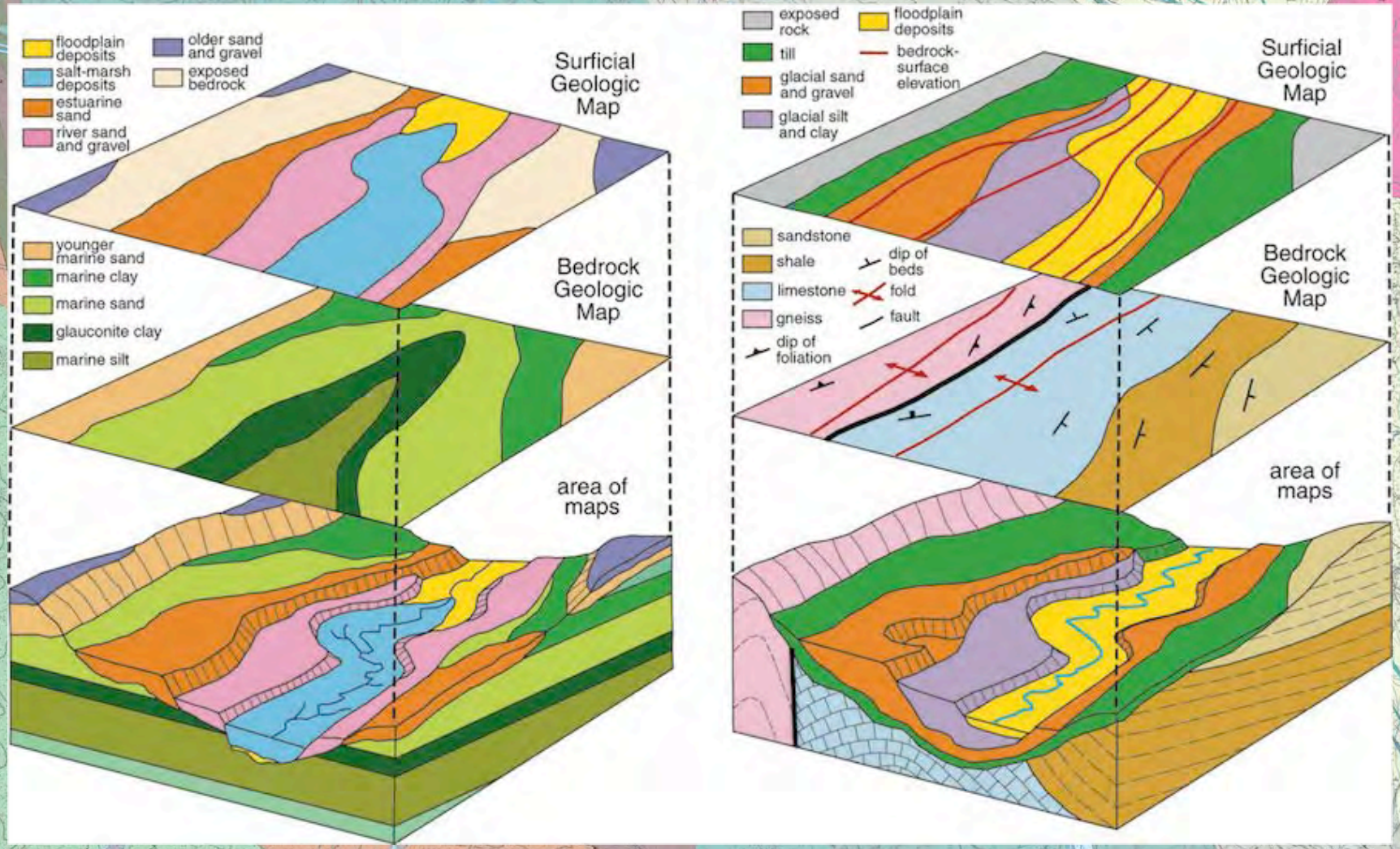
Charles Darwin's interpretation of the Andes' structure based on his work on the voyages of the Beagle 1831-1836


Kim Guadagno, Lieutenant Governor
BEDROCK
GEOLOGIC MAP
of
NEW JERSEY
2011
Compiled by Richard F. Dalton,
Donald H. Monteverde,
Peter J. Sugarman, Richard A. Volkert
From maps by Avery A. Drake and others, 1996
James P. Owens and others, 1998
Cross Sections by Donald H. Monteverde,
Peter J. Sugarman, Richard A. Volkert
GIS/Cartography by
Zehdreh Allen-Lafayette,
Michael W. Girard, William P. Graff,
Ronald S. Pristas
NEW YORK
Hudson River
Raritan Bay
PENNSYLVANIA
"lumpers" and
"splitters"

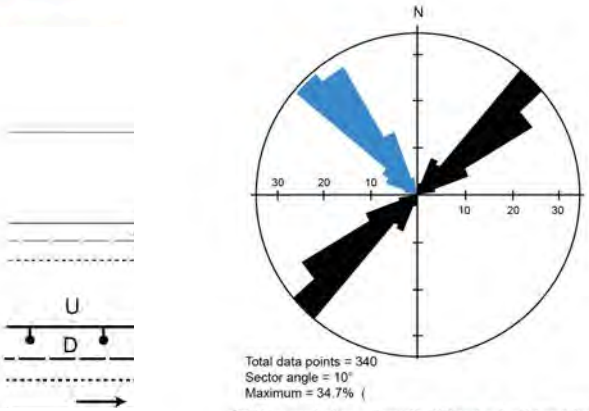
What is a Geological Map?

The Geological Maps of New Jersey

Coastal Plain and Bedrock Sections

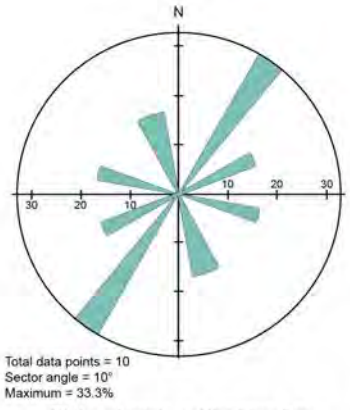


Graphics by Scott D Stanford, NJGWS



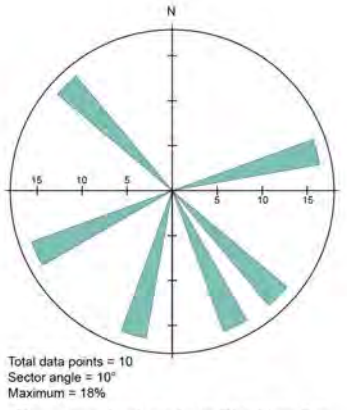
Total data points = 340
Sector angle = 10°
Maximum = 34.7%

Strike and dip azimuth (blue) of all bedding



Total data points = 10
Sector angle = 10°
Maximum = 33.3%

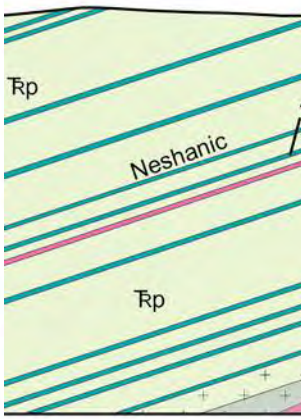
Strike of joints in Stockton Fm

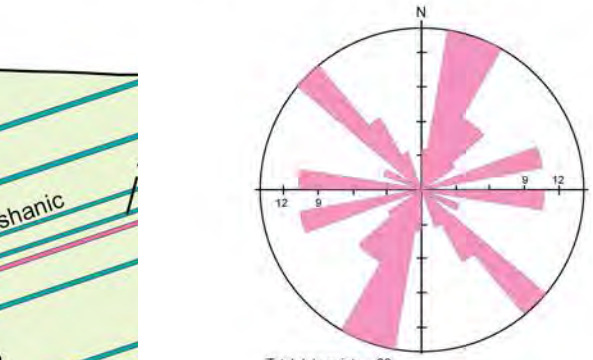


Total data points = 10
Sector angle = 10°
Maximum = 18%

Dip azimuth of joints in Stockton Fm

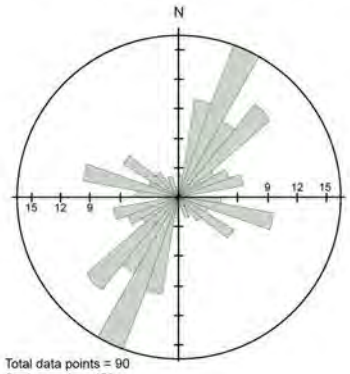
Hunte
Merce
Sourla





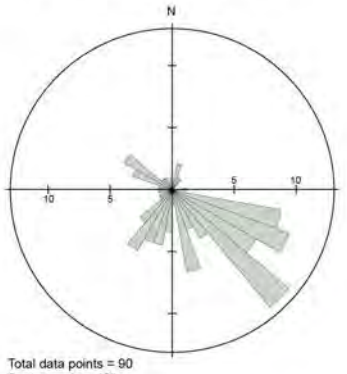
Total data points = 28
Sector angle = 10°
Maximum = 14.3%

Stike of joints in diabase



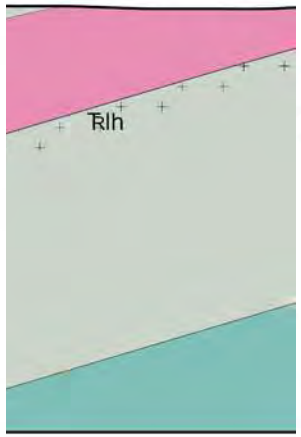
Total data points = 90
Sector angle = 10°
Maximum = 16.7%

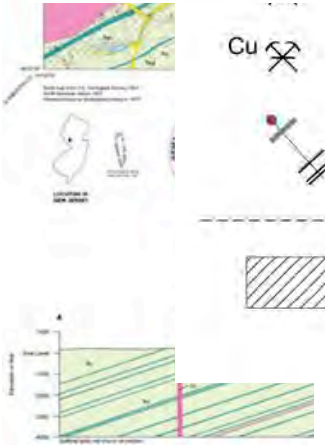
Strike of joints in Lockatong Arg



Total data points = 90
Sector angle = 10°
Maximum = 13%

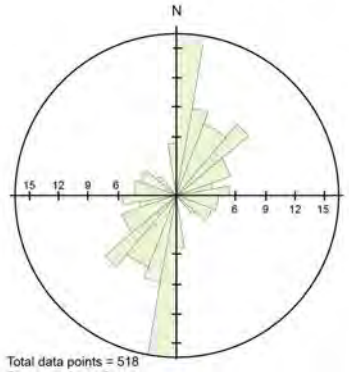
Dip azimuth of joints in Lockatong Arg





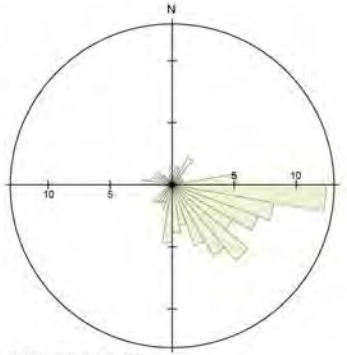
Total data points = 28
Sector angle = 10°
Maximum = 13%

Dip azimuth of joints in diabase



Total data points = 518
Sector angle = 10°
Maximum = 16.6%

Strike of joints in Passaic Fm



Total data points = 518
Sector angle = 10°
Maximum = 13%

Dip azimuth of joints in Passaic Fm

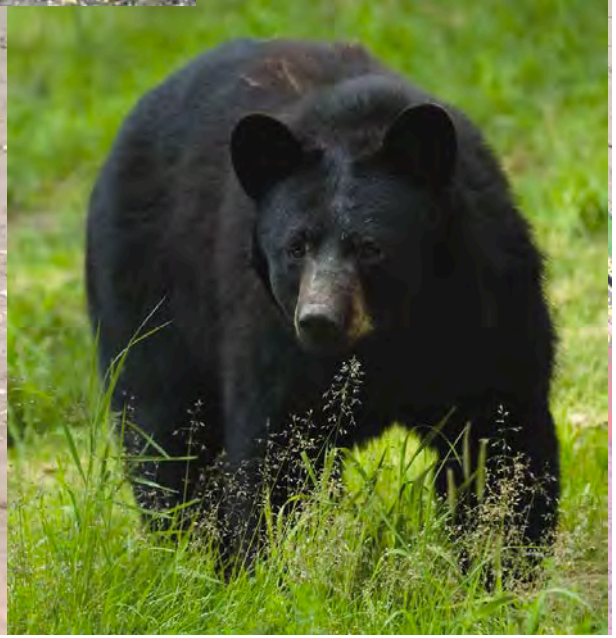
ısing
ion.

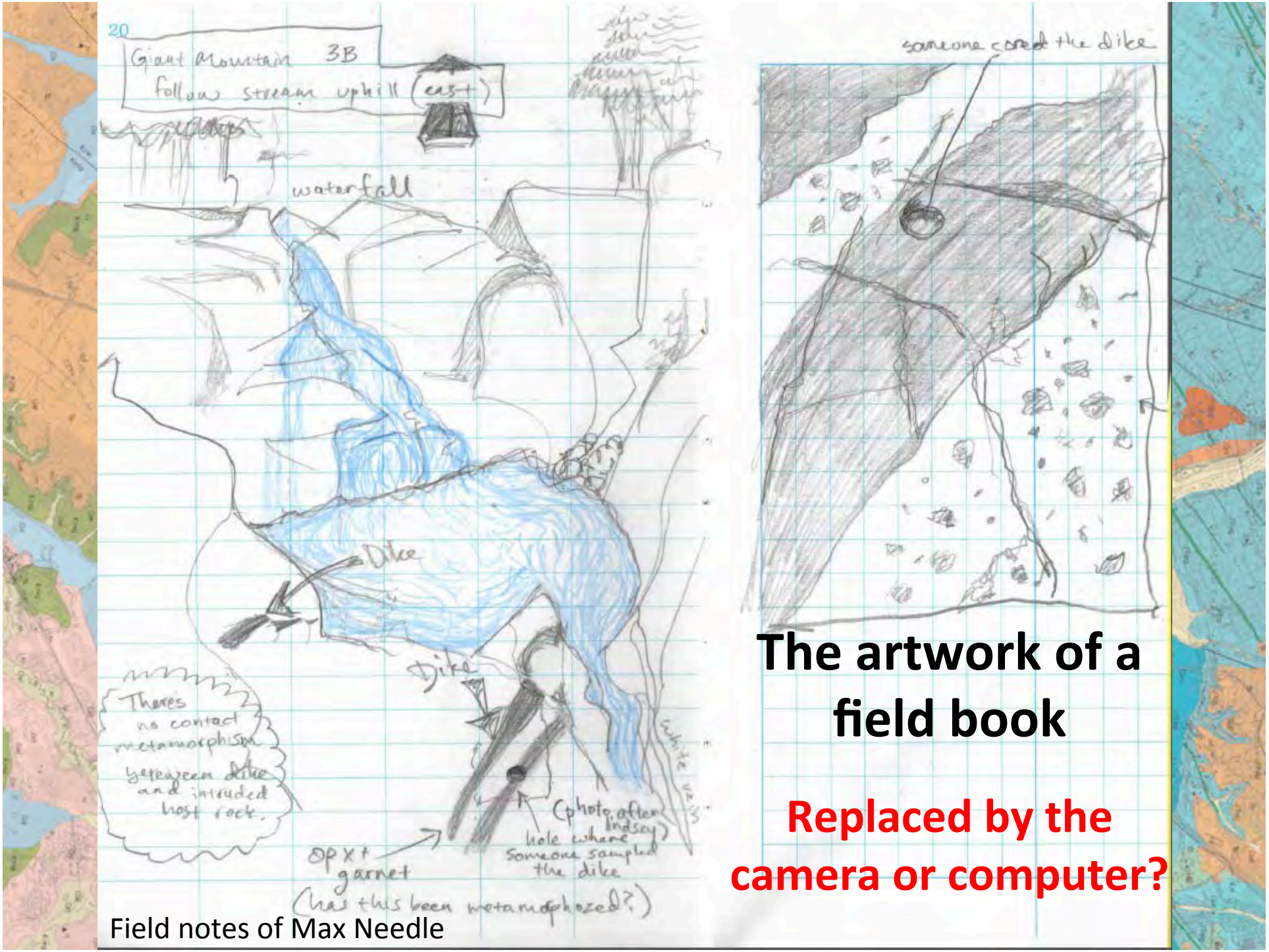
Figure 2. Rose diagrams of structural data.

Geological Equipment Needed for Map Construction in the Field

Map
Acid bottle
Pencils, pens, colored pencils
Field book or clipboard
Compass
Camera
Hand lens
Hammer
Smart phone
Tablet computer

What are we lookin[illegible]ld?





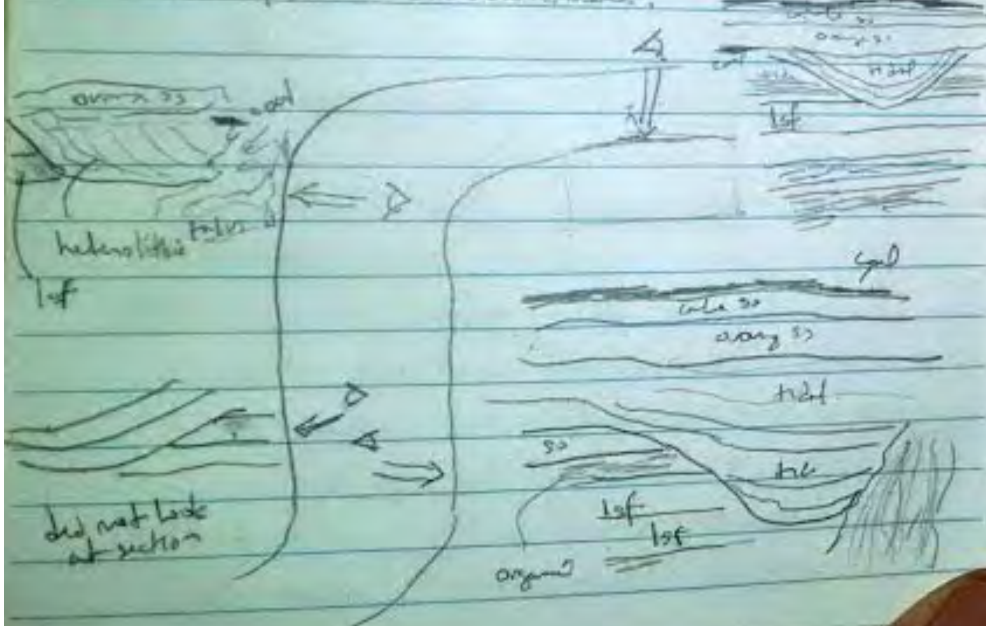
Field notes of Max Needle

The artwork of a field book

Replaced by the camera or computer?

In "shoreface Gentile Wash" model then signature that would be at would be an unconformity between the two and not at the "incised valley". Moving around to the site Brian is evolving with the huge channel as tidally controlled in a paleochannel no longer supplying fluvial material due to a lobe switch.

All this leads to more questions than answers. In all cases the fluvial sand capped by the white sand coal tay show a progression into fluvial environment.



Other info is the hummocky material in the lsf did not look exactly like at Gentile Wash but there was more of a dip section and this in Tucker is a strike section. The features seem more sweeping or gentle swally features. It was not as clear as seen at Gentile wash.

---

maybe twice age of pictographs

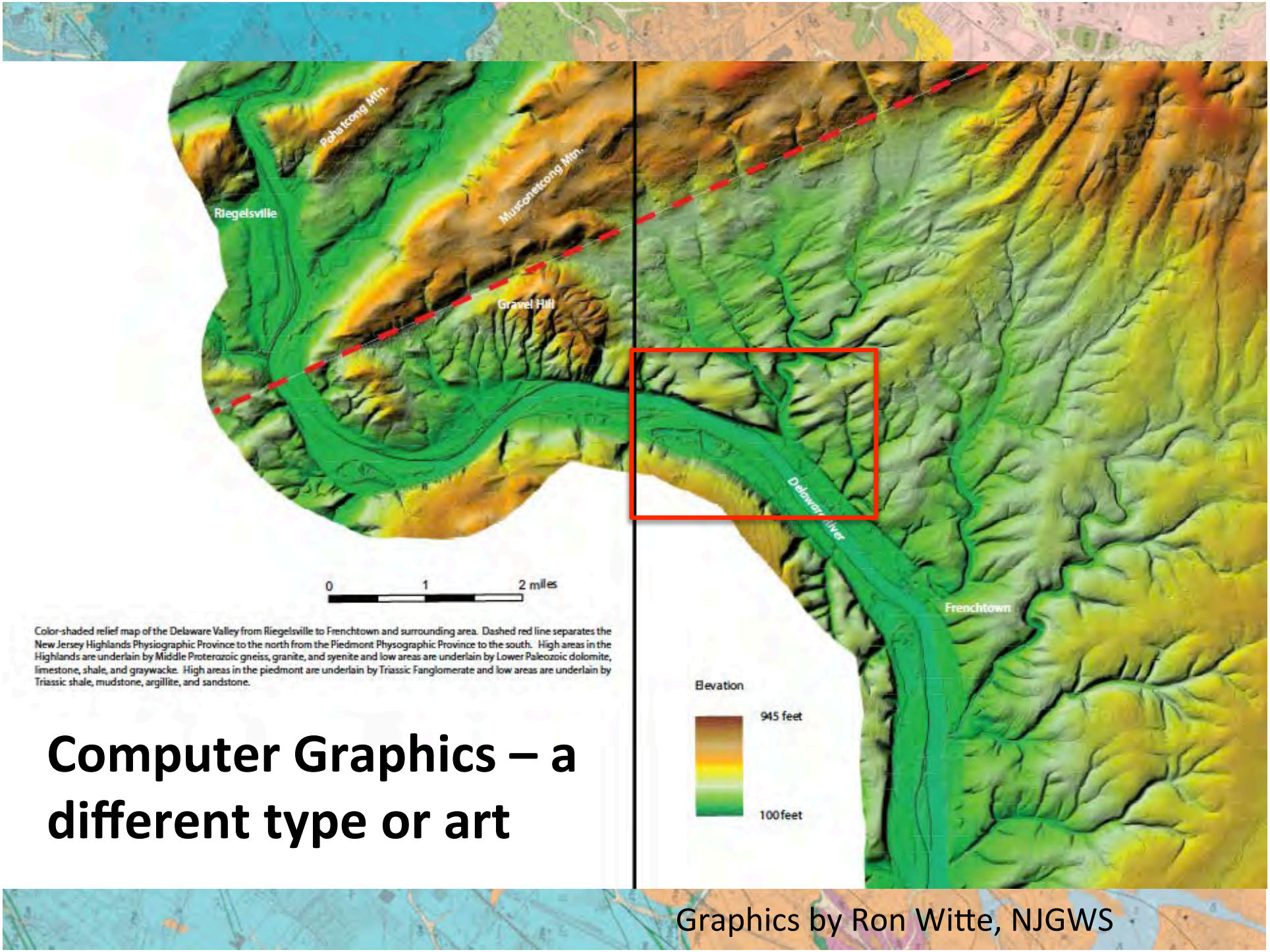
petroglyphs - scraping away varnish
pictographs - painted on - ~500 yrs old

Thompson

4 m of fine sand, well sorted, low angle strat. hummocky

30 cm of fines bld pinch out

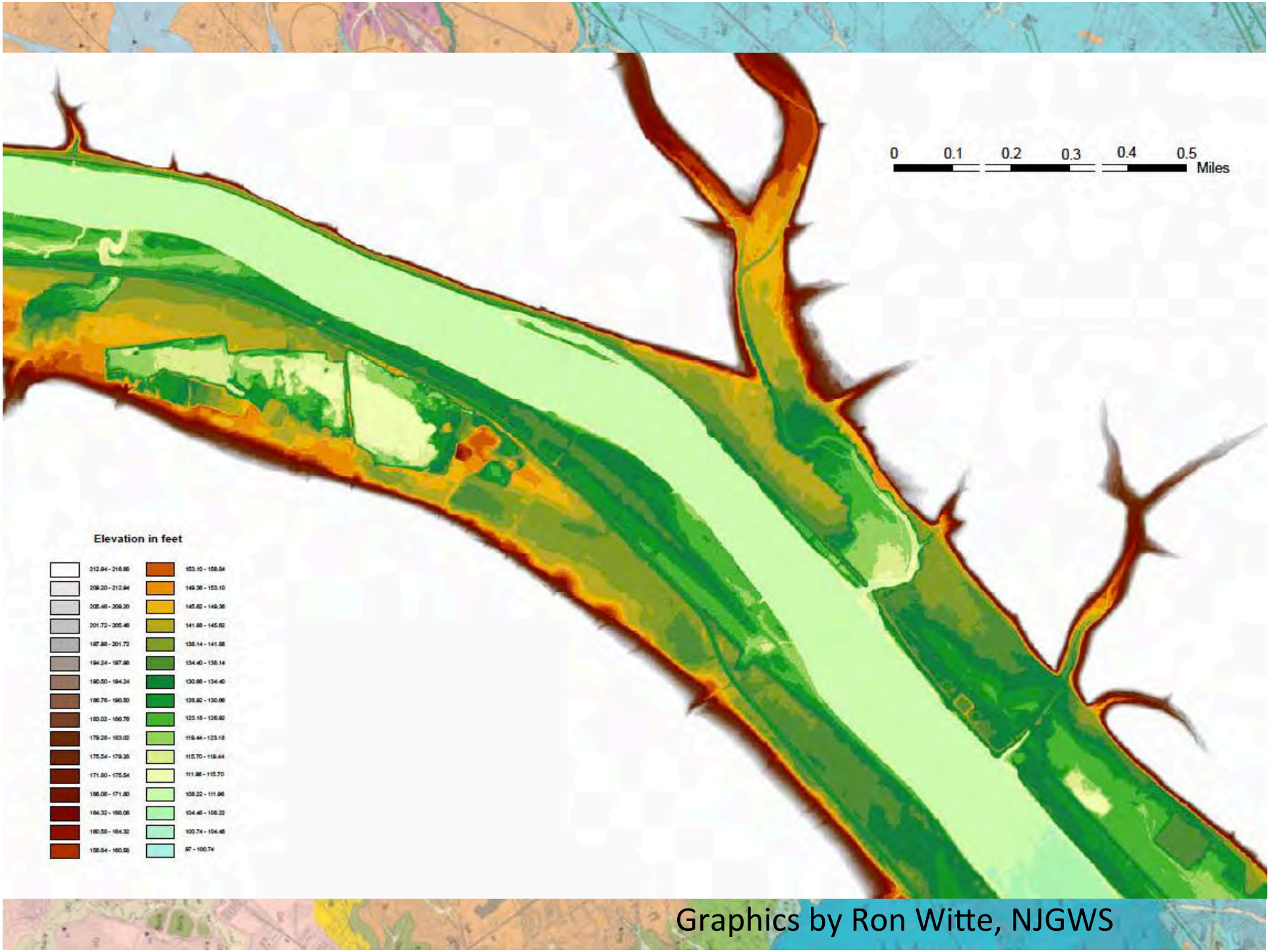
7 m of same more



Color-shaded relief map of the Delaware Valley from Riegelsville to Frenchtown and surrounding area. Dashed red line separates the New Jersey Highlands Physiographic Province to the north from the Piedmont Physographic Province to the south. High areas in the Highlands are underlain by Middle Proterozoic gneiss, granite, and syenite and low areas are underlain by Lower Paleozoic dolomite, limestone, shale, and graywacke. High areas in the piedmont are underlain by Triassic Fanglomerate and low areas are underlain by Triassic shale, mudstone, argillite, and sandstone.

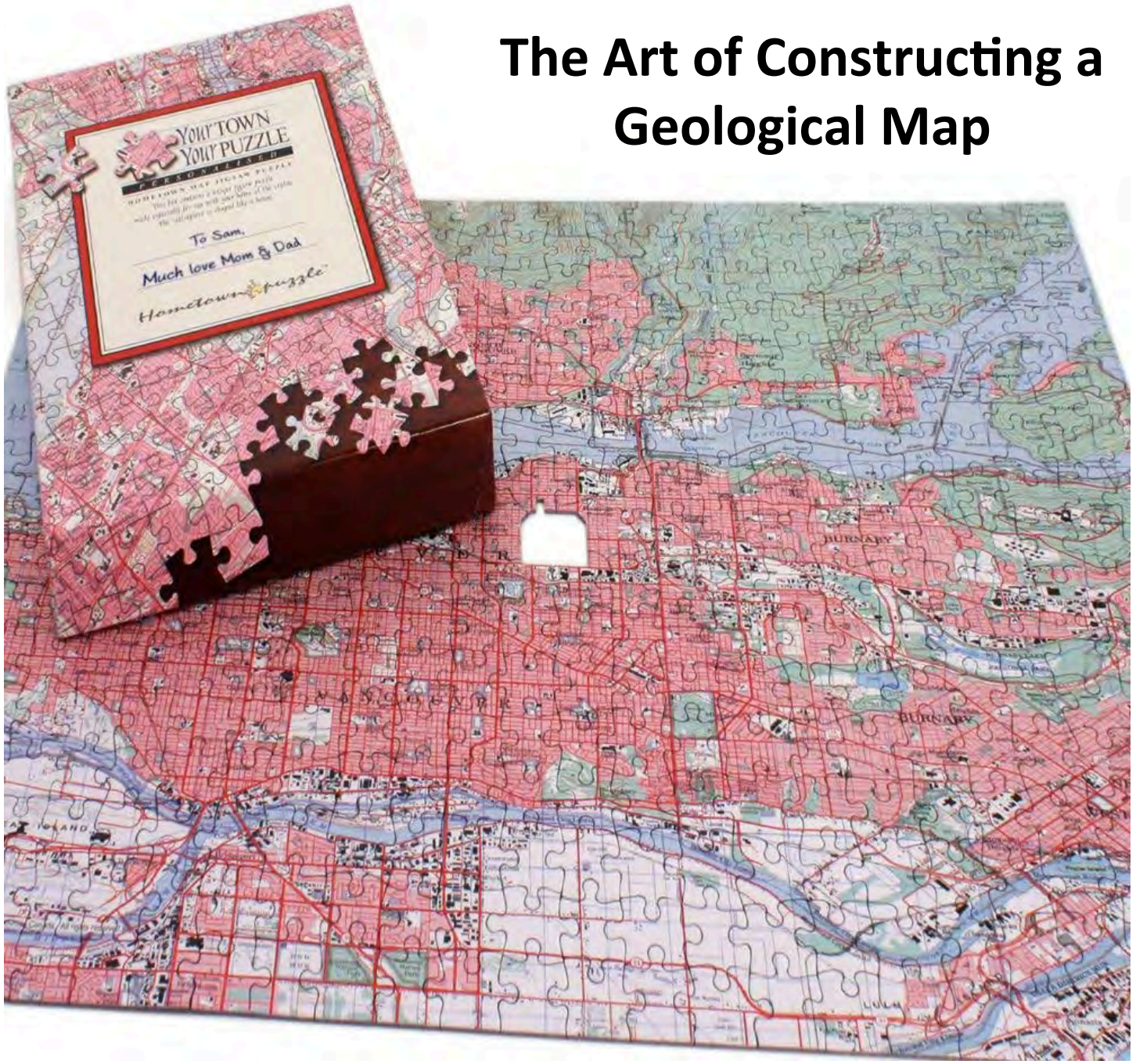
Computer Graphics – a different type or art

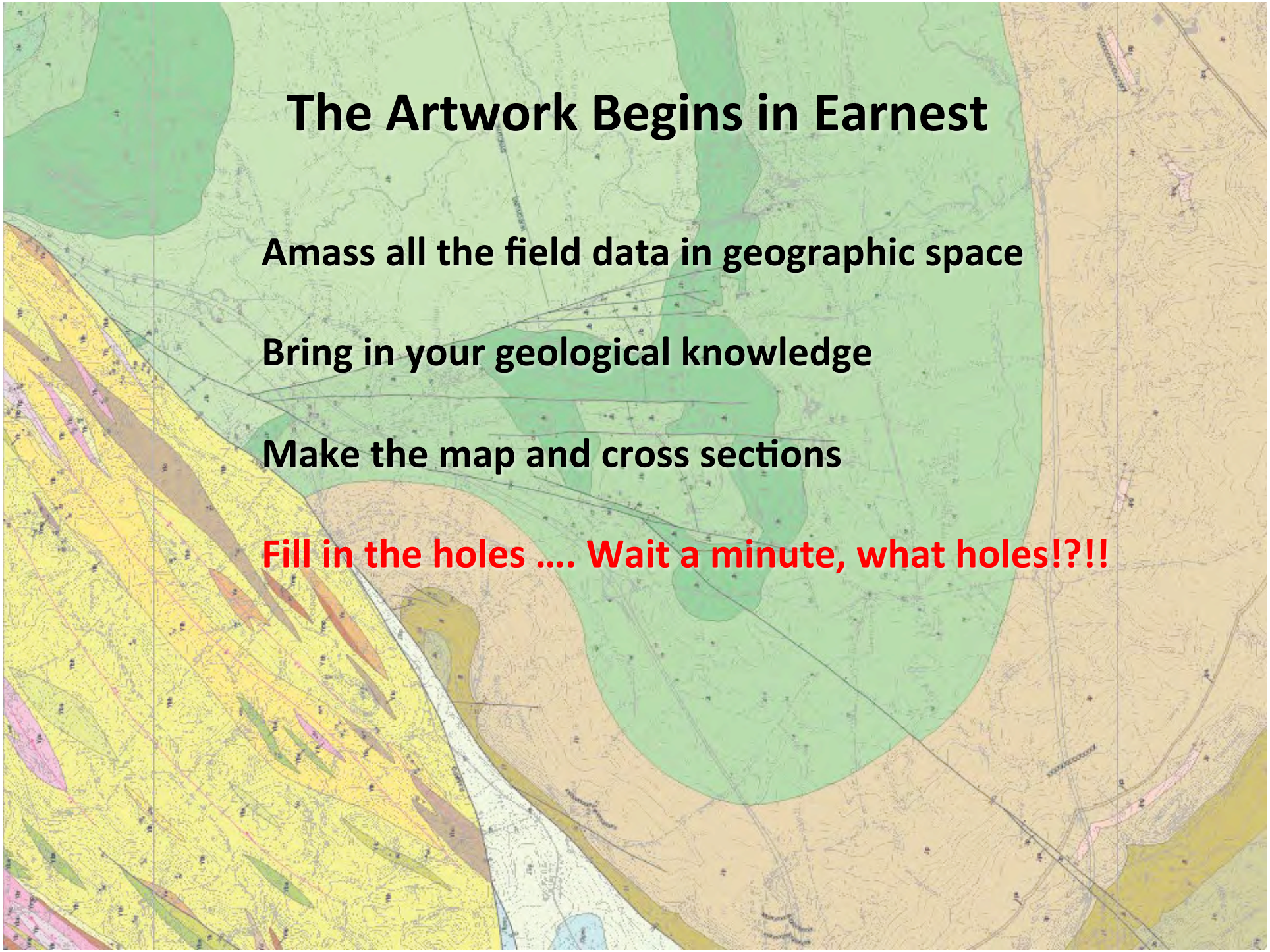
Graphics by Ron Witte, NJGWS



Graphics by Ron Witte, NJGWS

The Art of Constructing a Geological Map





The Artwork Begins in Earnest

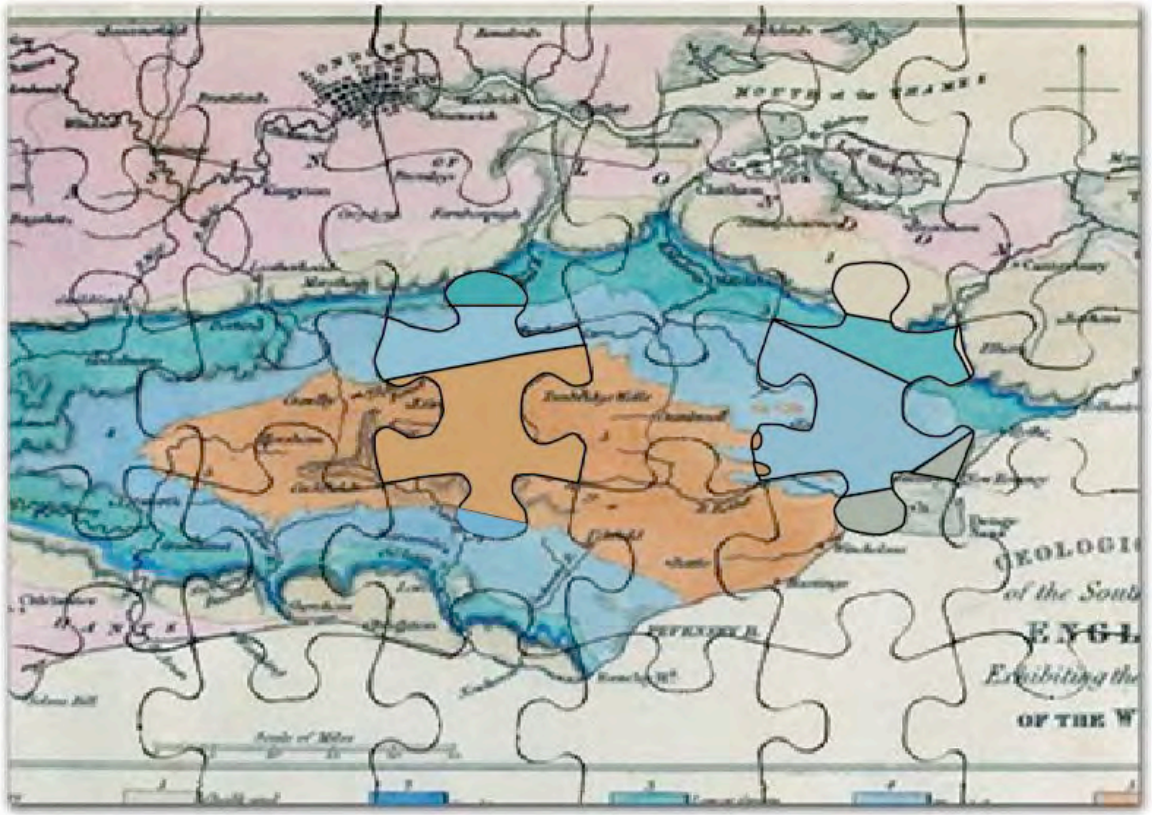
Amass all the field data in geographic space

Bring in your geological knowledge

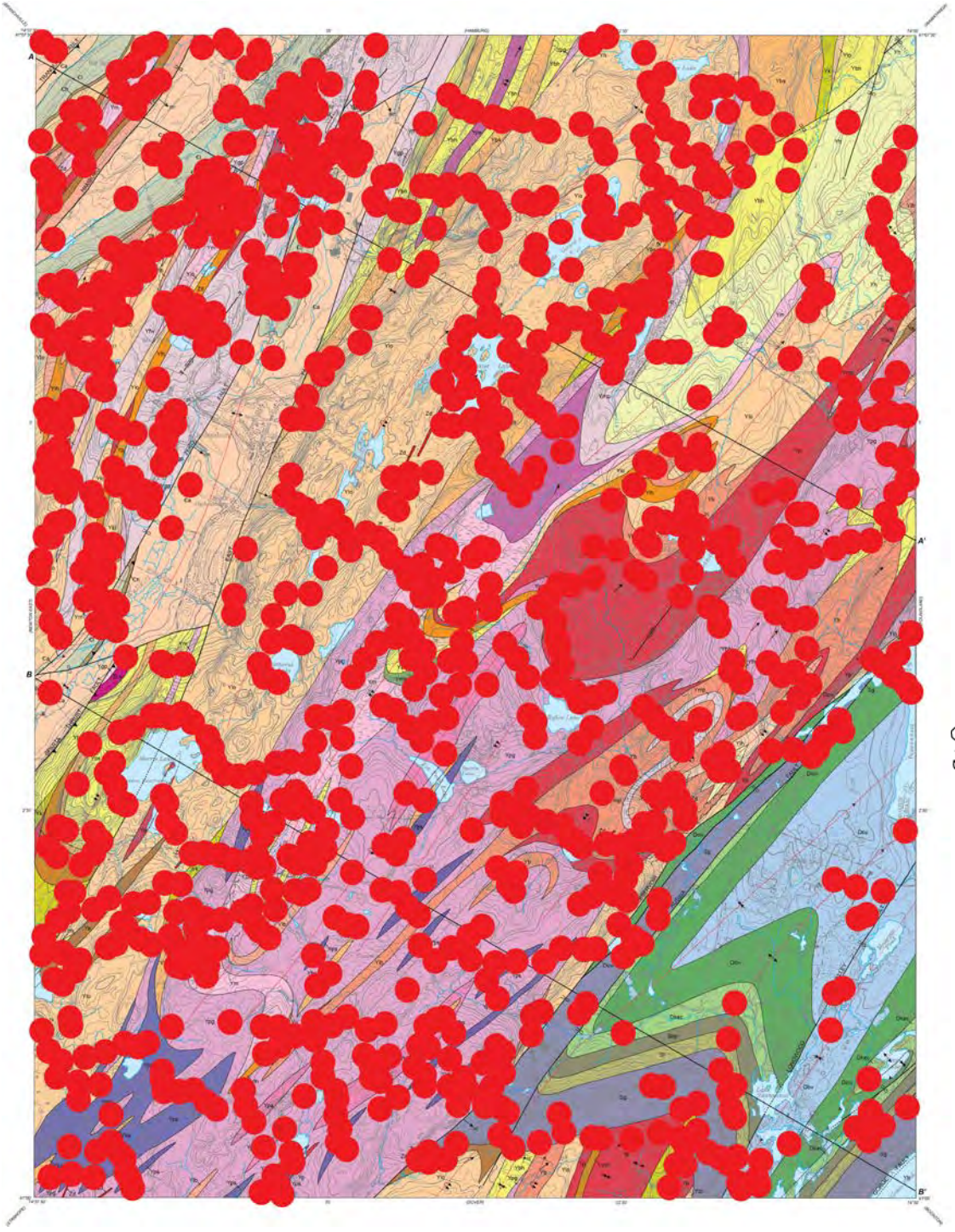
Make the map and cross sections

Fill in the holes …. Wait a minute, what holes!?!!

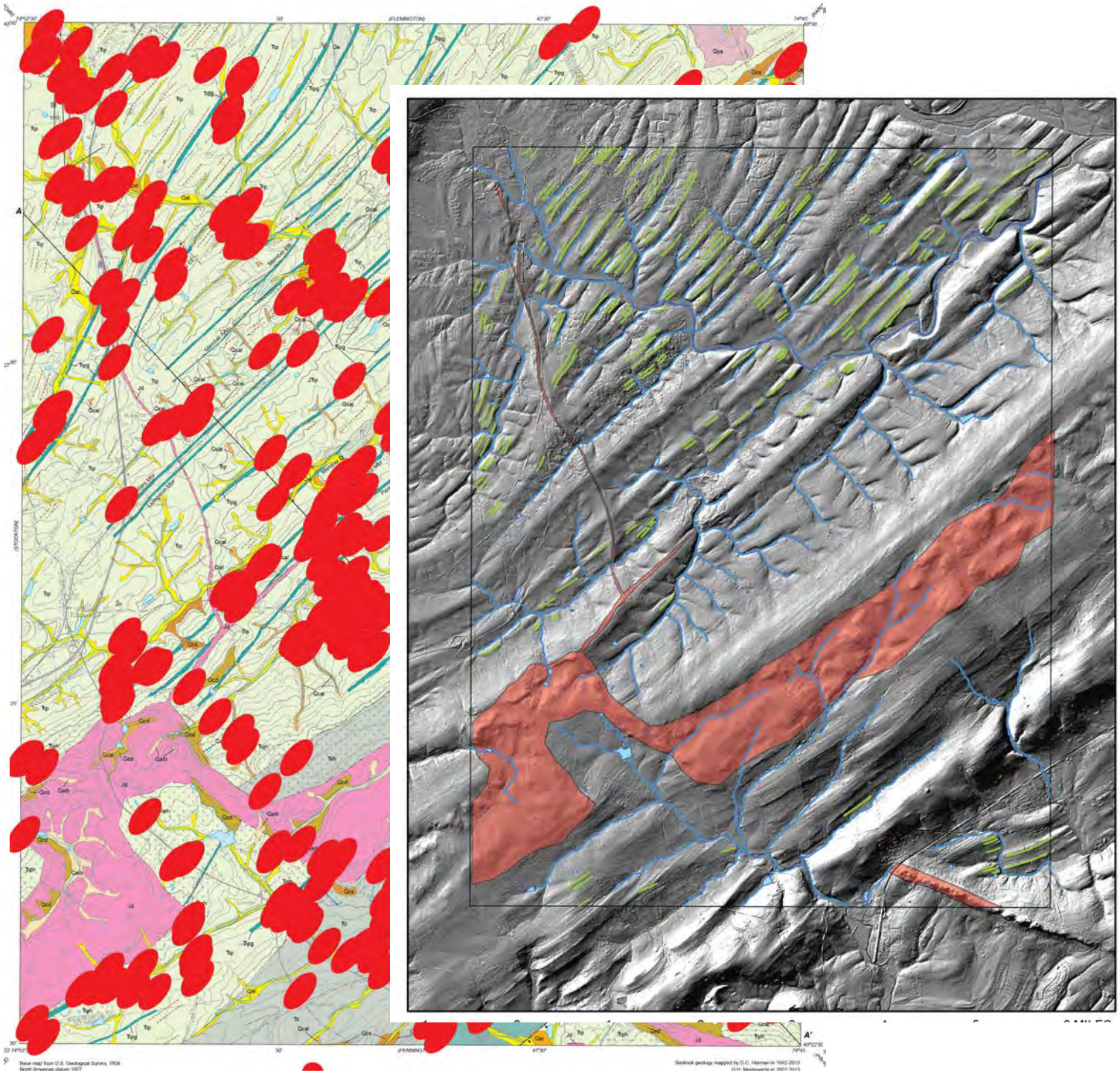
Use your geologic knowledge

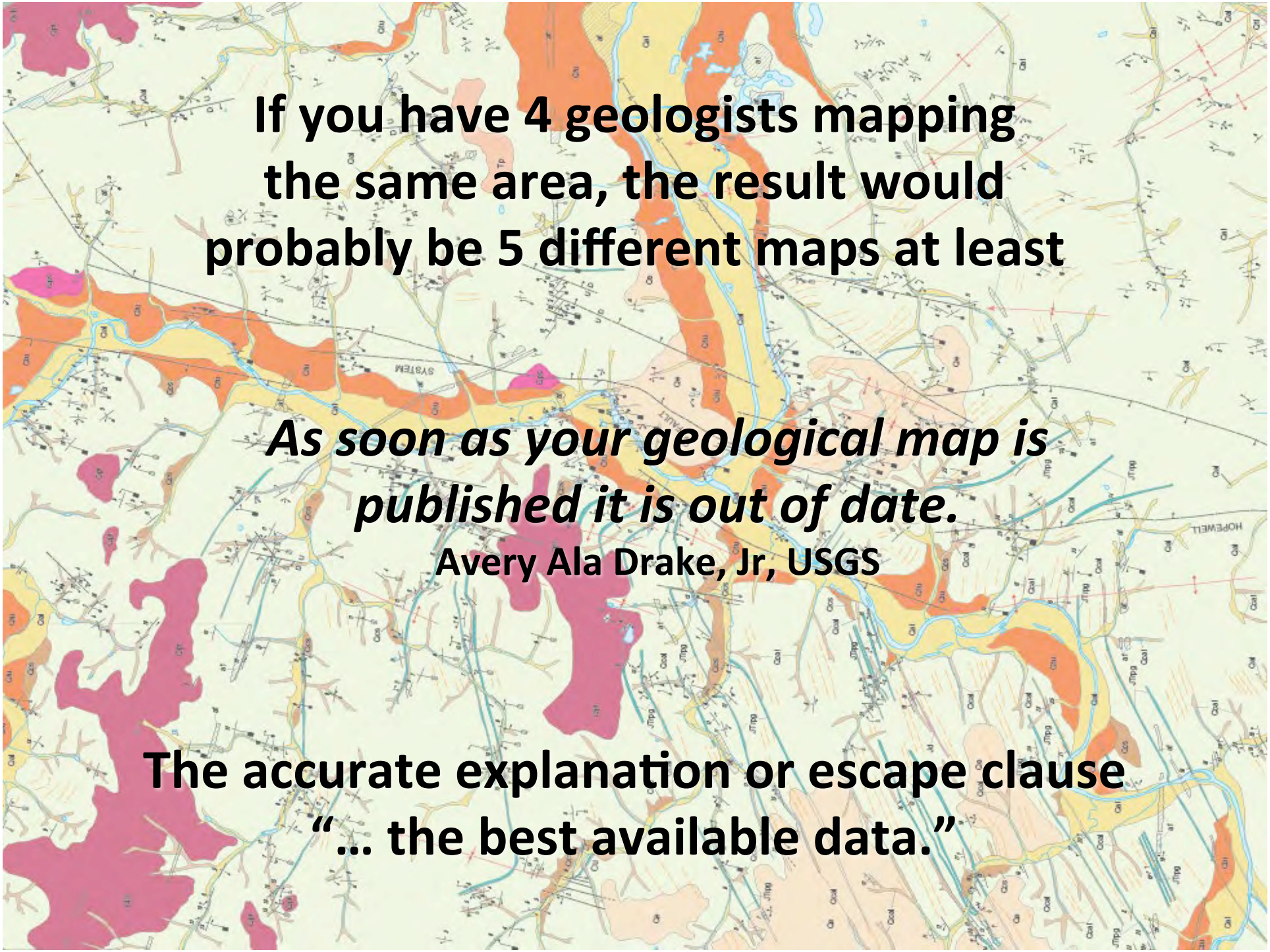


Geological map, South-East England, 1830s



LOCATION IN NEW JERSEY


(FLEMINGTON)
(STOCKTON)
(PENNINGTON)
A
A'
Base map from U.S. Geological Survey, 1954
North American datum 1927
Bedrock geology mapped by G.C. Herman in 1992-2013



If you have 4 geologists mapping the same area, the result would probably be 5 different maps at least

As soon as your geological map is published it is out of date.

Avery Ala Drake, Jr, USGS

The accurate explanation or escape clause "… the best available data."

https://www.etsy.com/listing/107962186/new-jersey-state-geological-design?ref=related-6

Colorado Geological Map Custom Tie

http://www.zazzle.ca/colorado_geological_map_custom_tie-151882890826391207

Geologic cross section tattoo

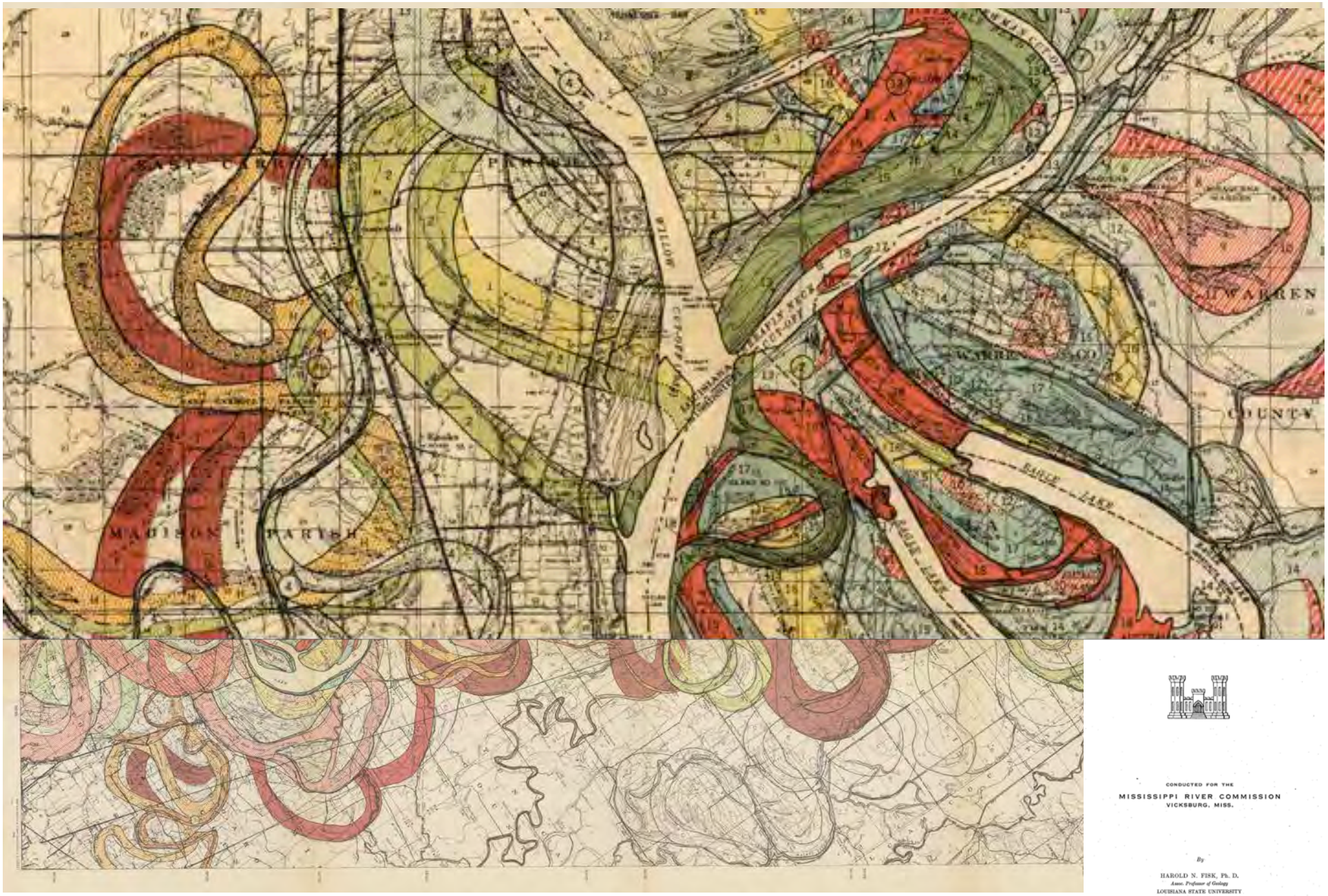
She is currently a Ph.D student

Photo credits: Helen Malenda/Sterling Publishing


http://geologyrocks.tumblr.com/image/89404071224

Clay modeling of deformation features at Rutgers

7 Sept 93
7 Sept 93



CONDUCTED FOR THE

MISSISSIPPI RIVER COMMISSION

VICKSBURG, MISS.

By

HAROLD N. FISK, Ph. D.

Assoc. Professor of Geology

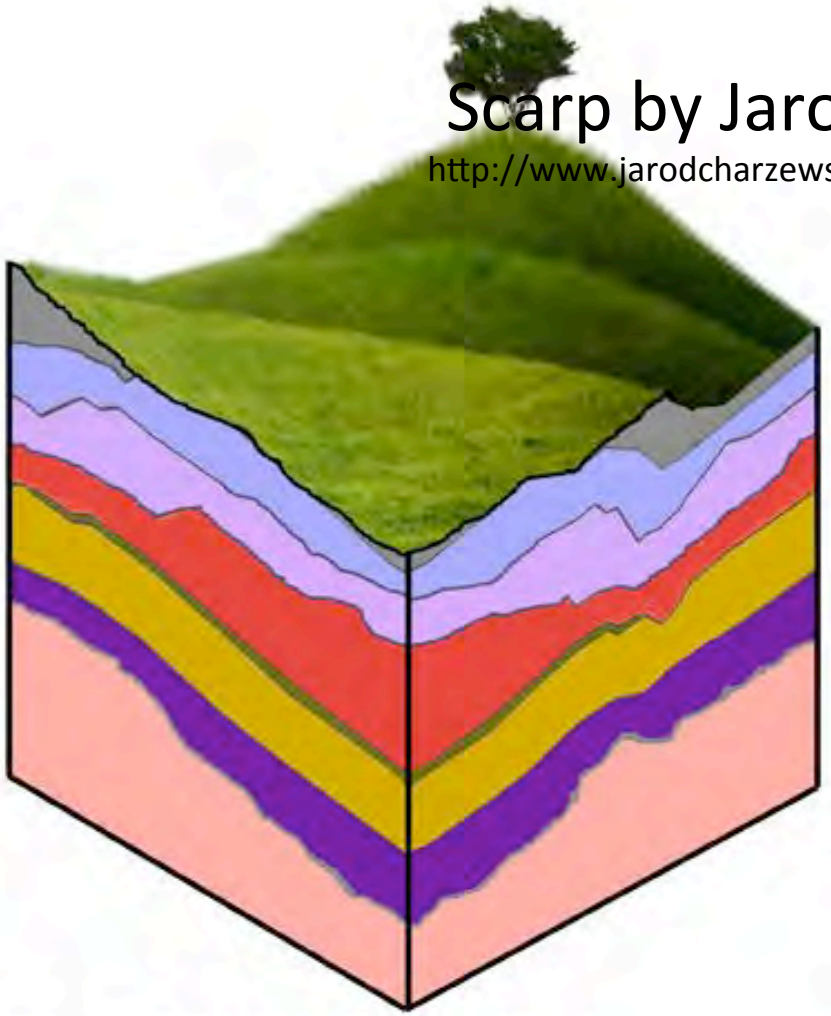
LOUISIANA STATE UNIVERSITY

Consultant

1 December 1944

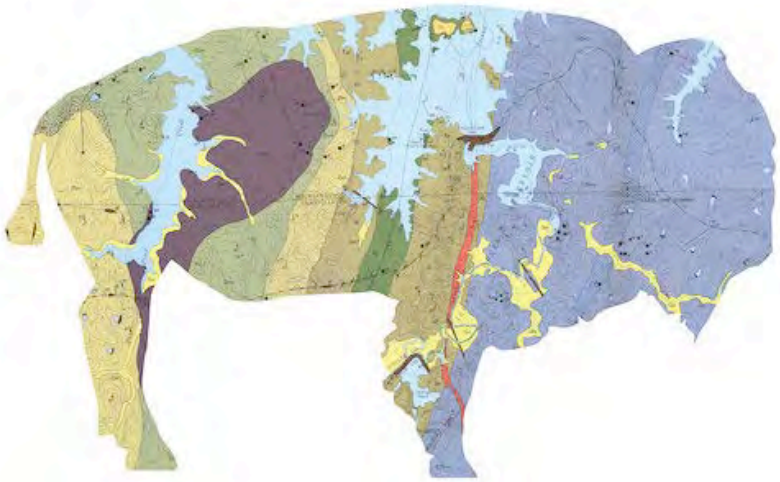
Scarp by Jarod Charzewski

http://www.jarodcharzewski.com/lately/?page_id=154



Chris Drury – (http://chrisdrury.co.uk)
Land artist – making connections

Topographical and geological maps, cut into strips and woven together with a border of Wyoming earth and coal dust. 102 x 126 cm

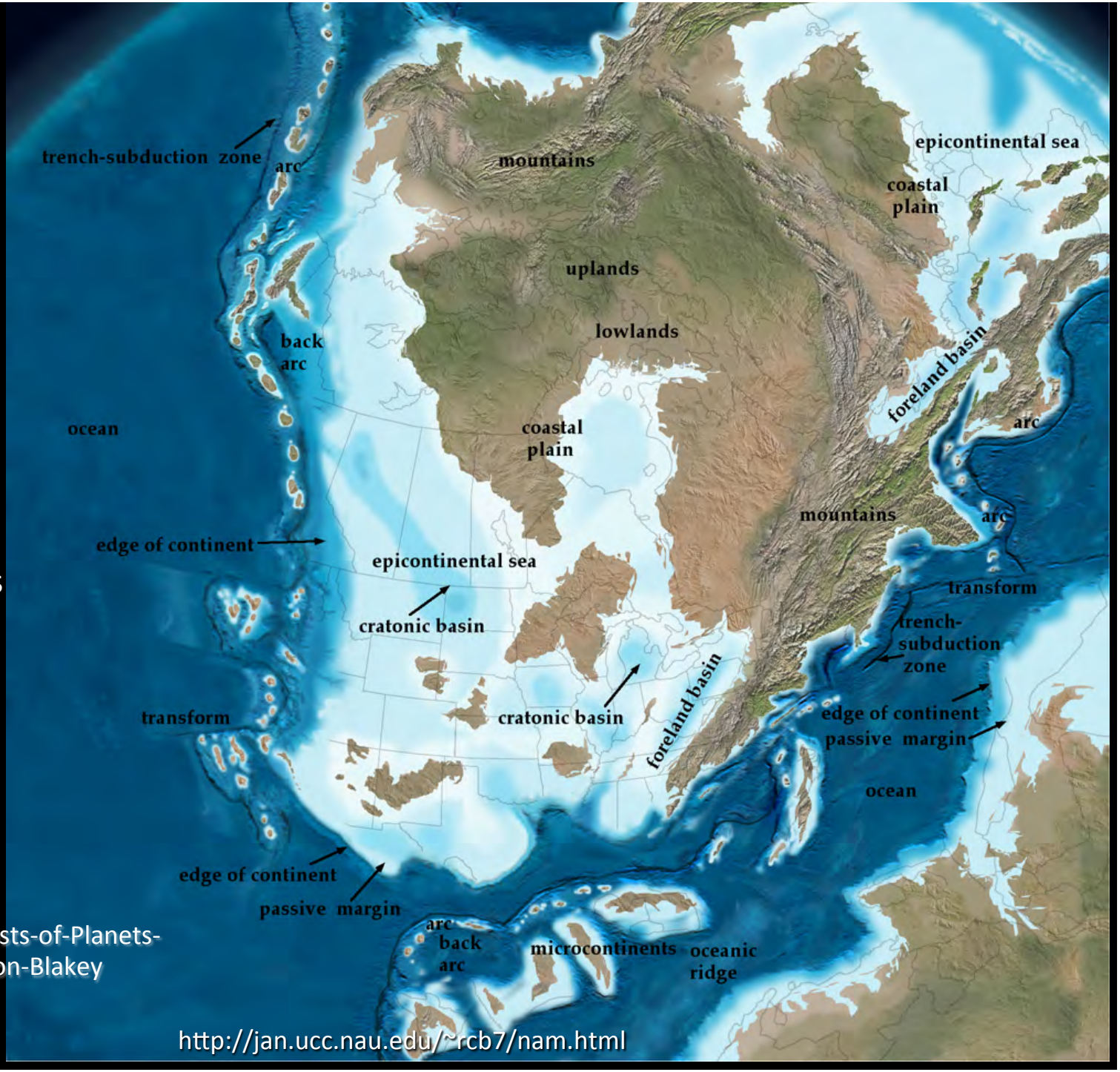


Antler Hill on the popular website Etsy

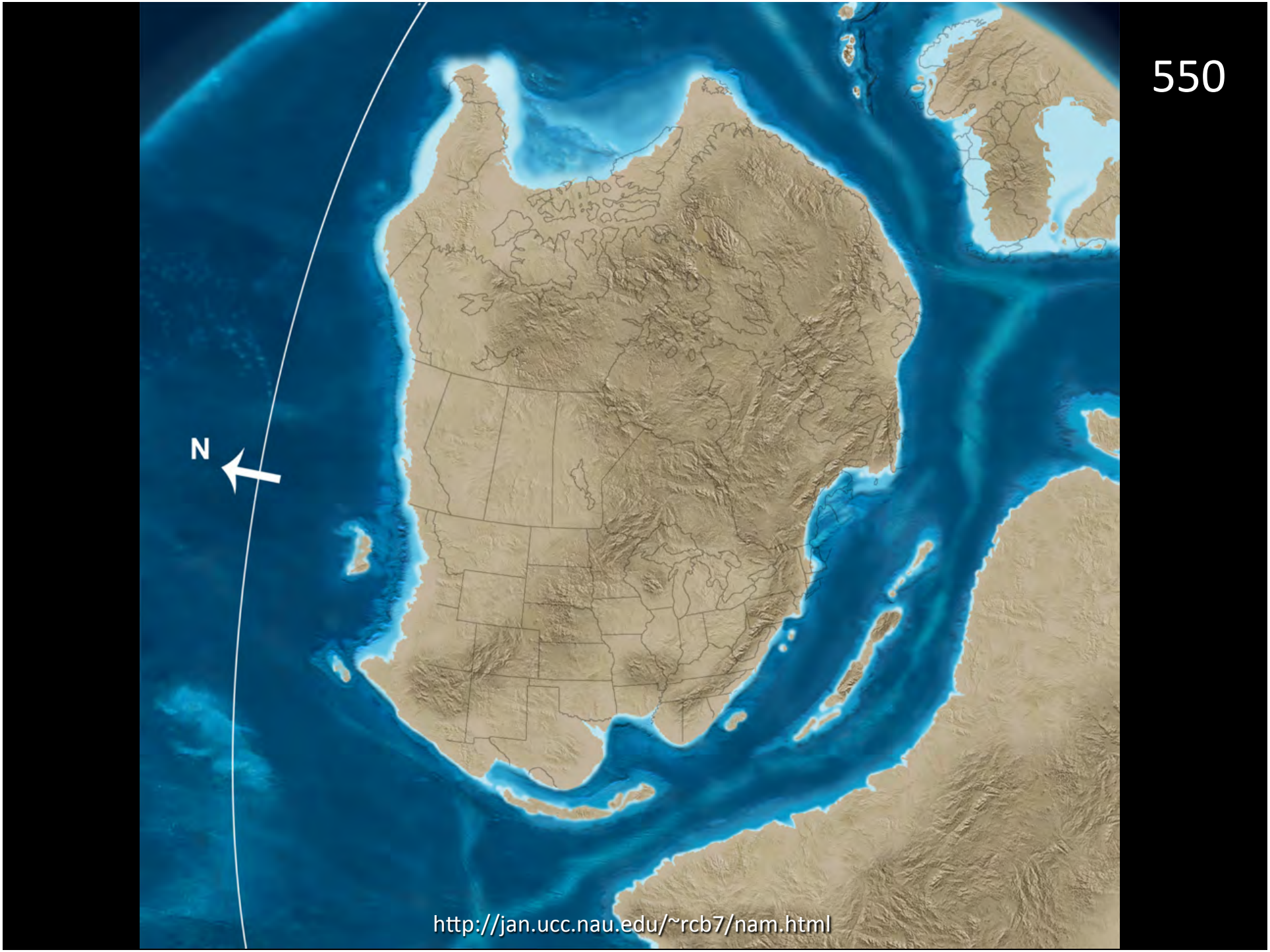
https://www.etsy.com/shop/AntlerHill

Ron Blakey
Professor Emeritus
at Northern
Arizona University

http://v-e-n-u-e.com/Ghosts-of-Planets-Past-An-Interview-with-Ron-Blakey



http://jan.ucc.nau.edu/~rcb7/nam.html


550
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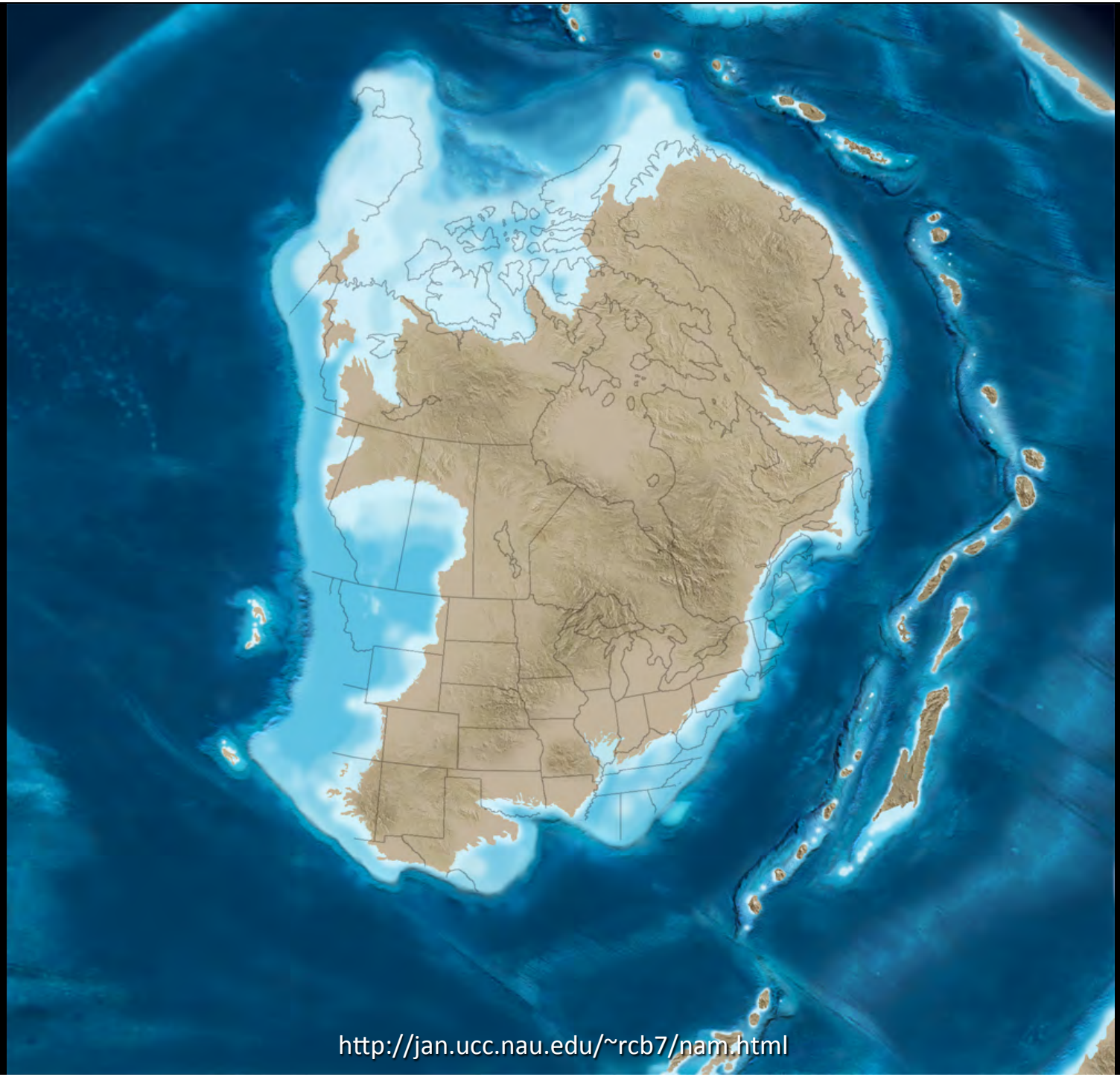
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500
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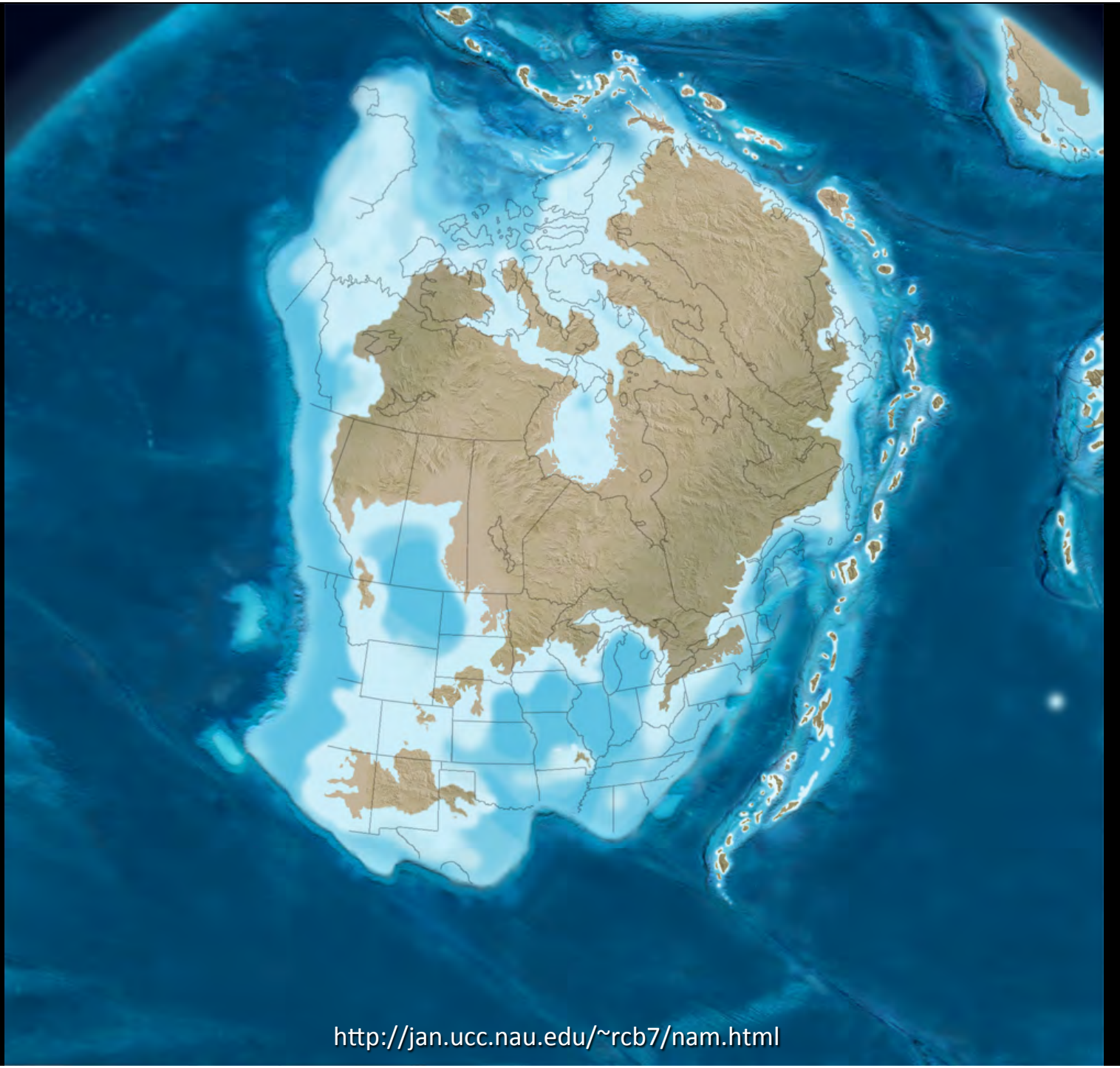
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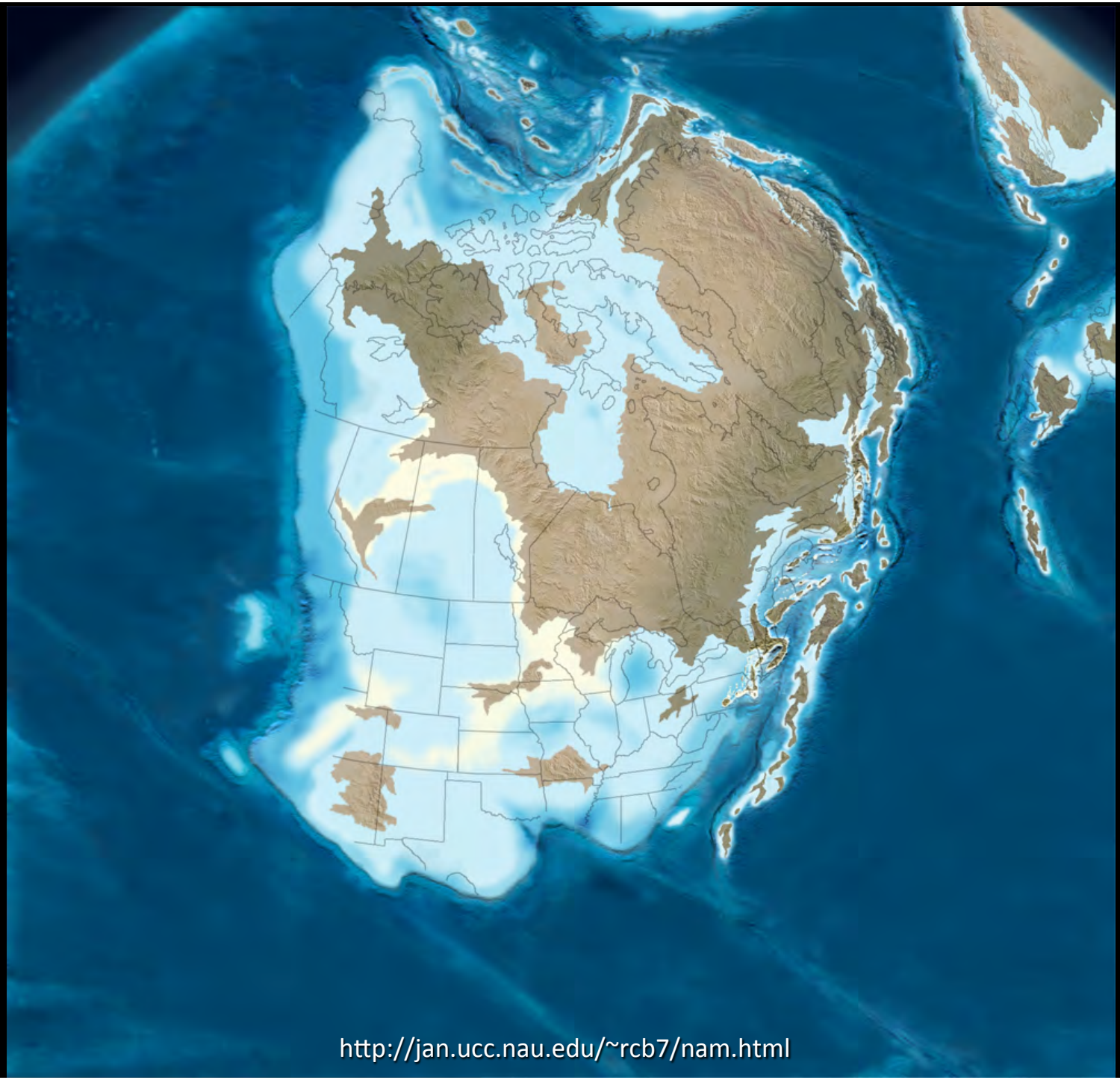
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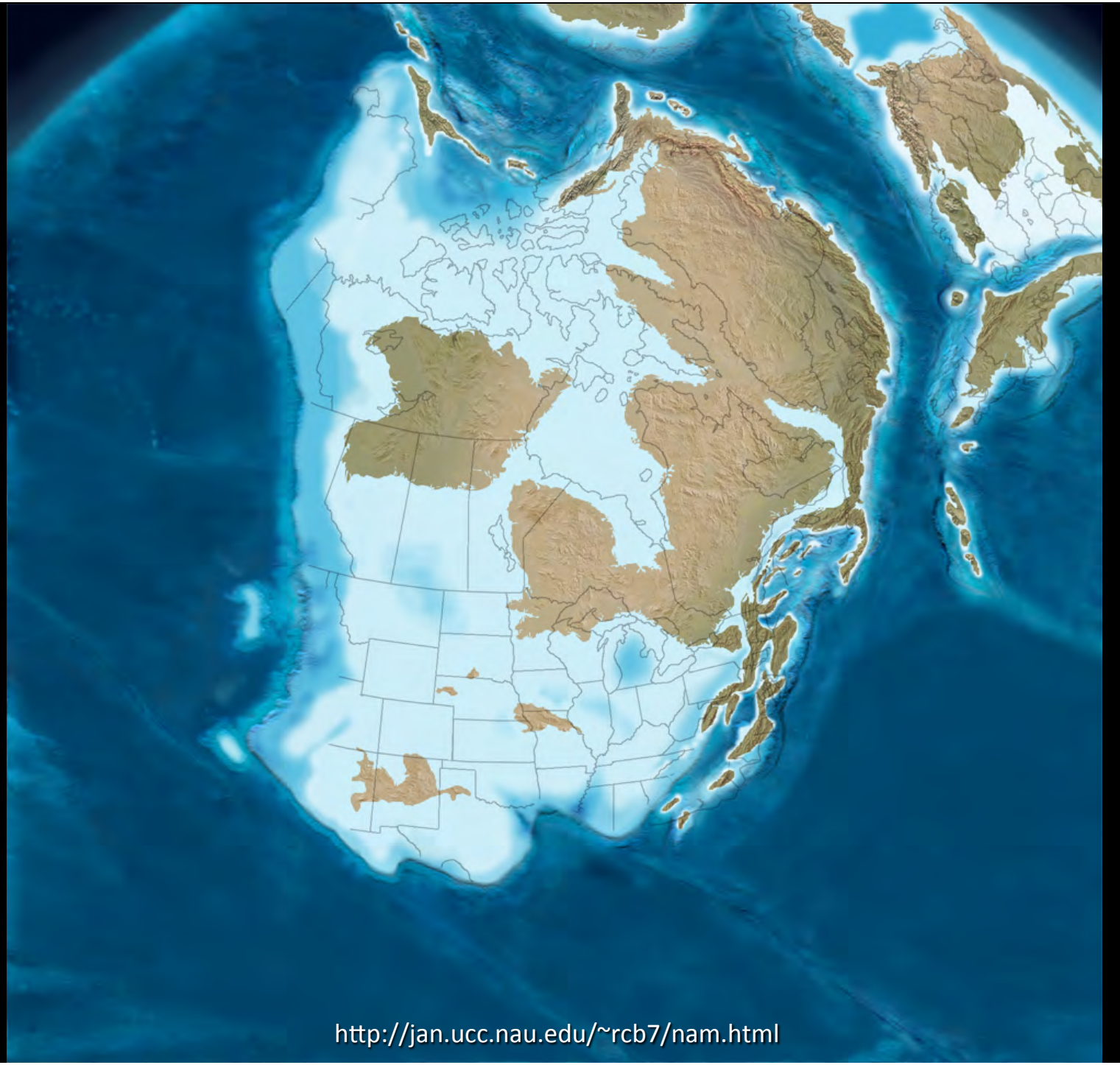
http://jan.ucc.nau.edu/~rcb7/nam.html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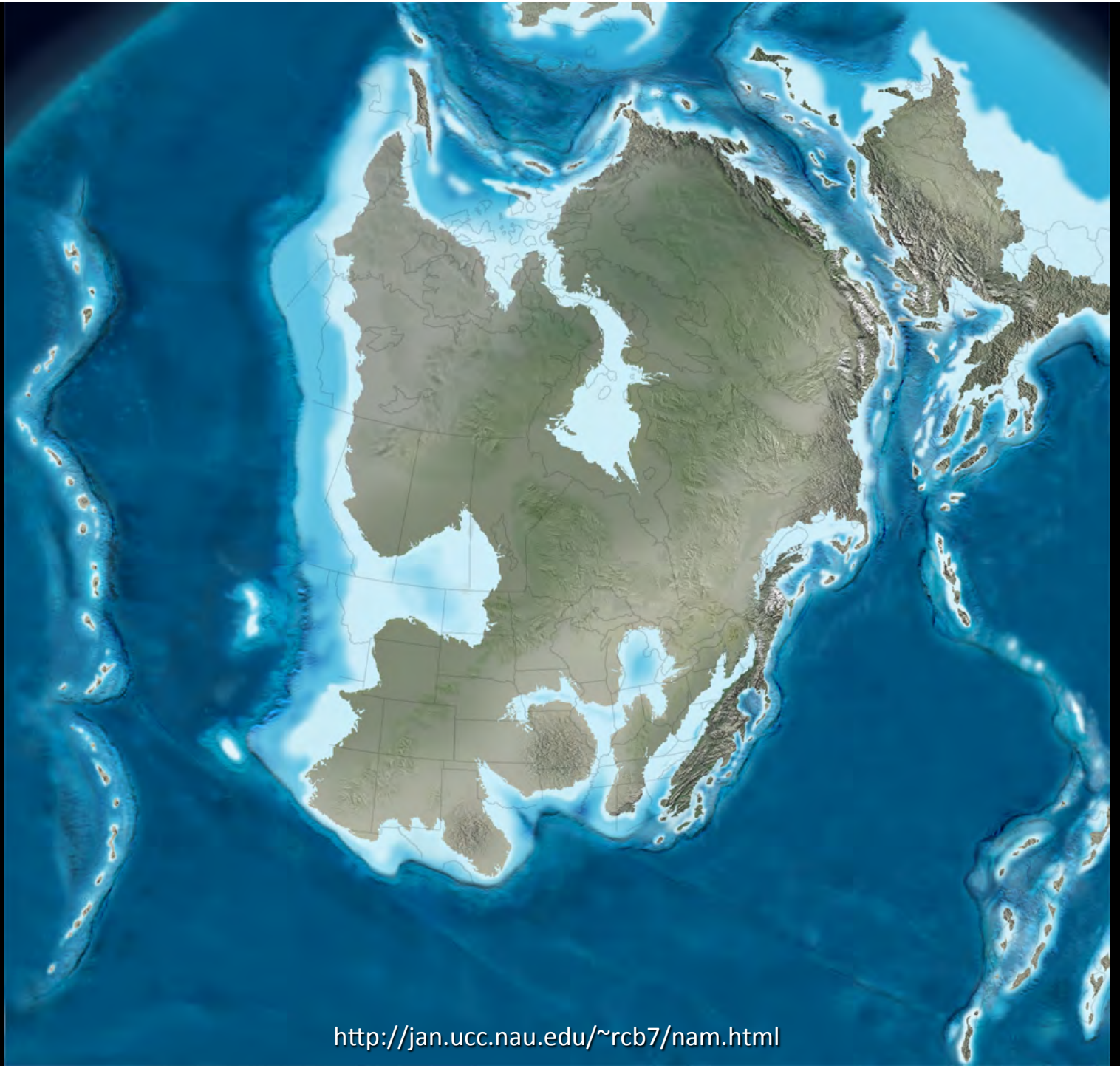
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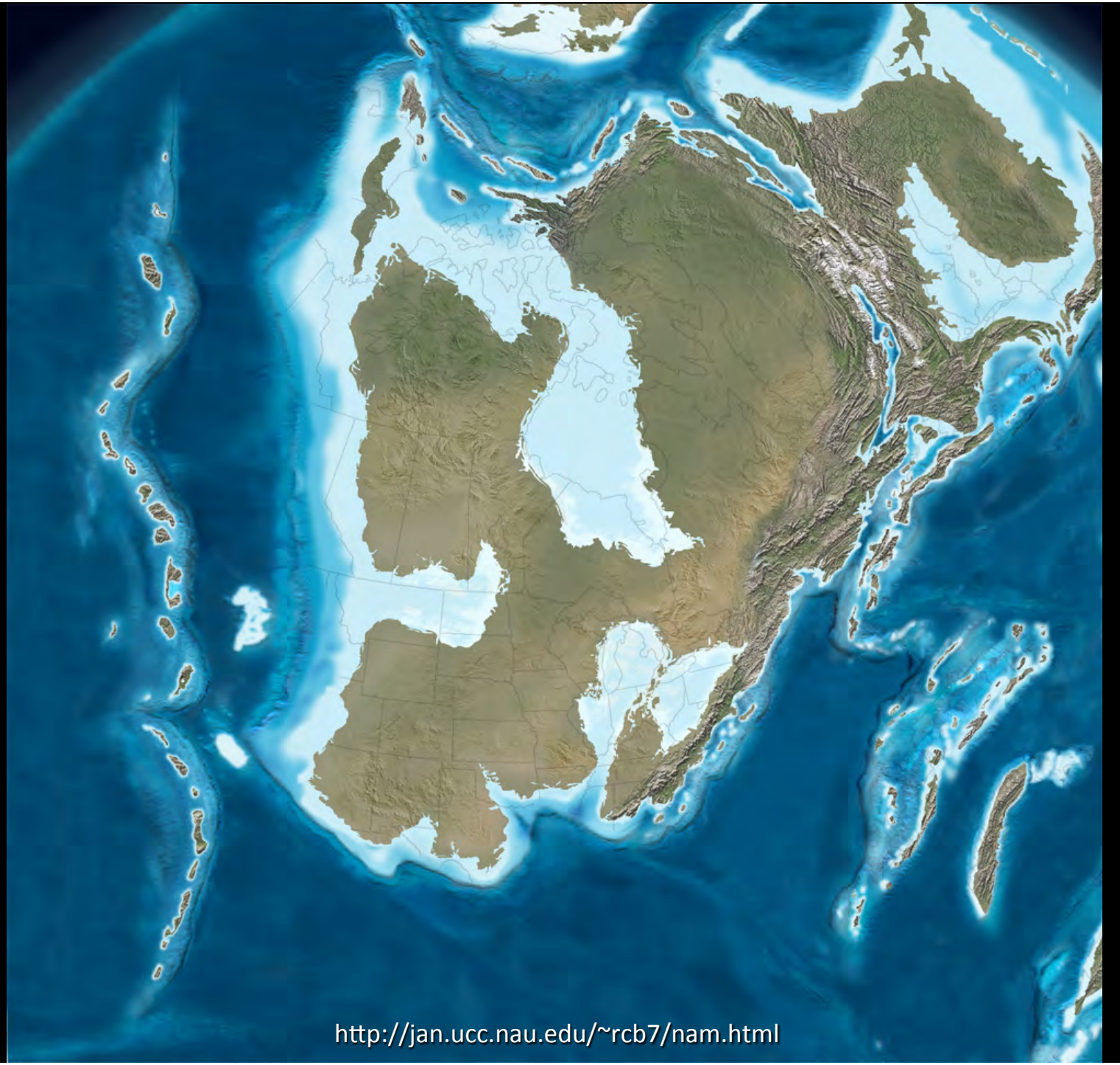
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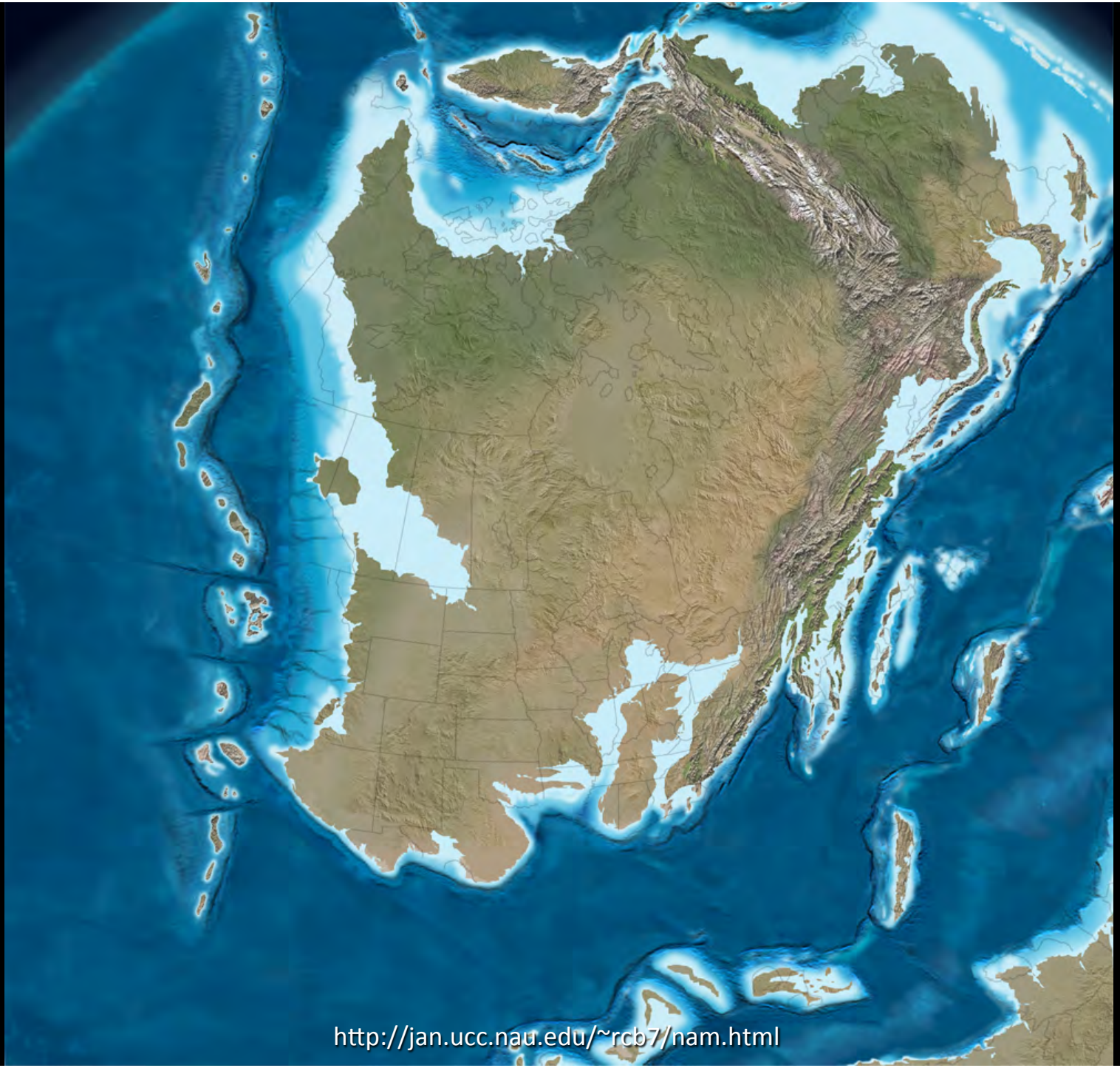
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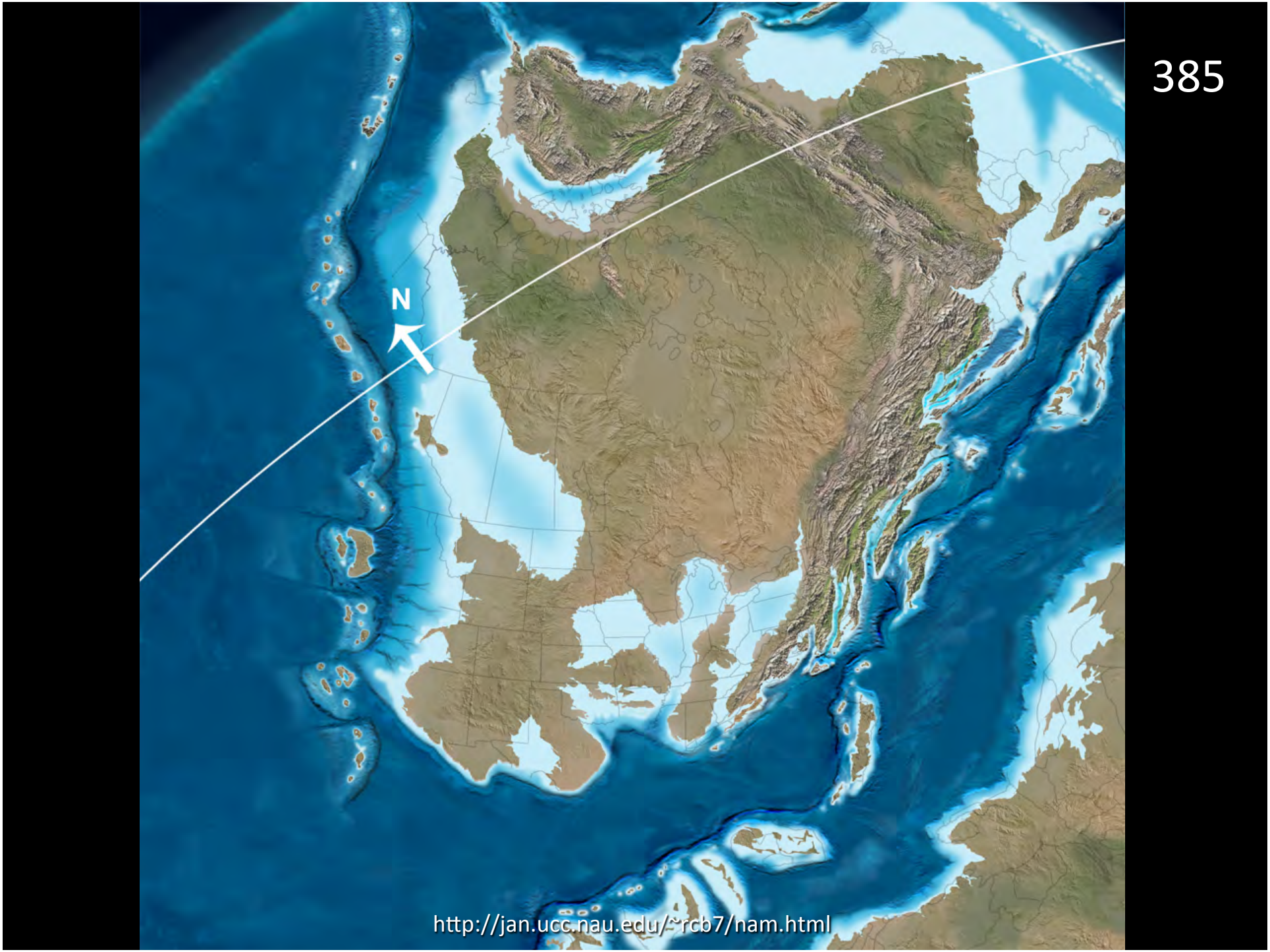
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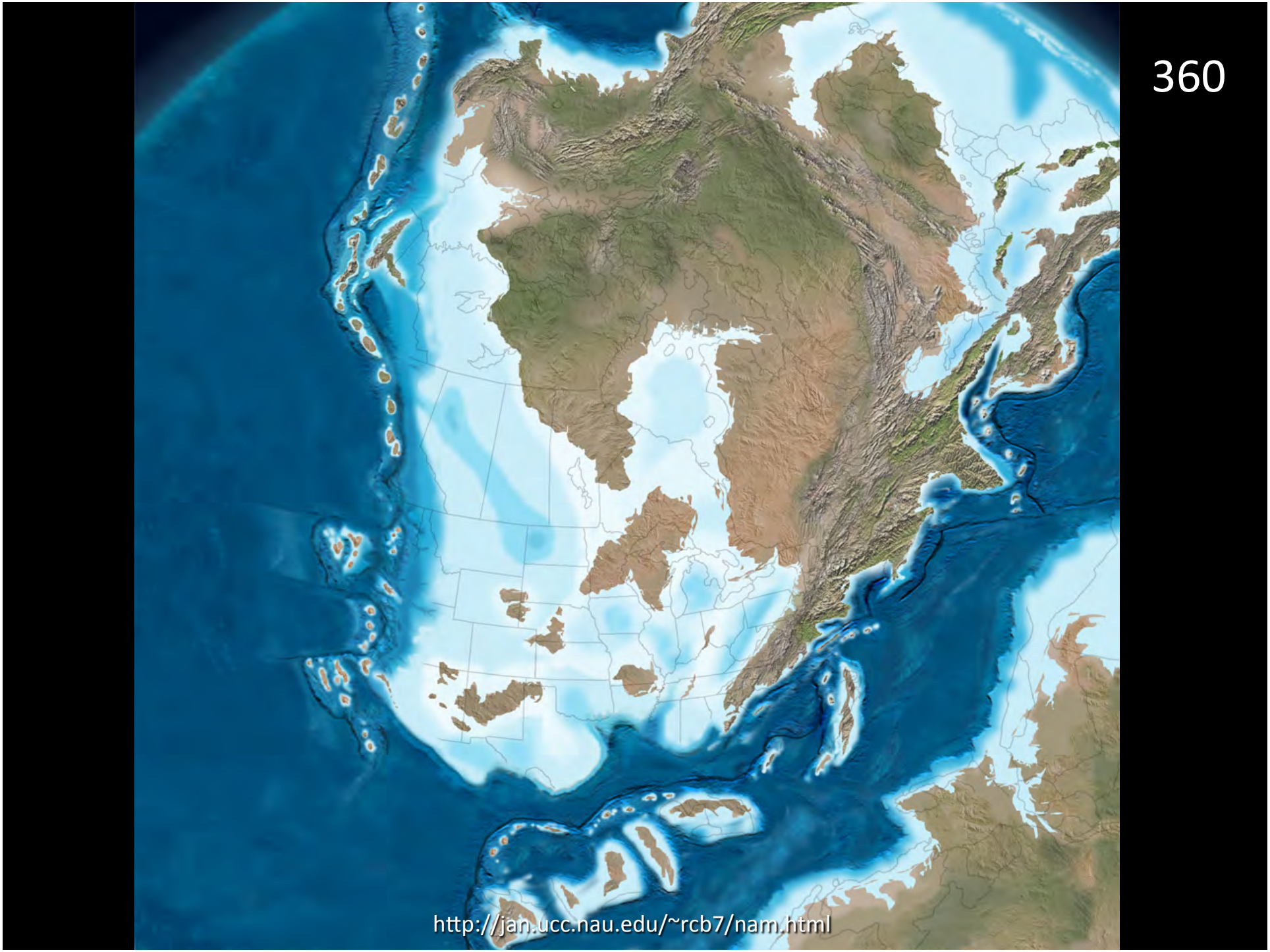
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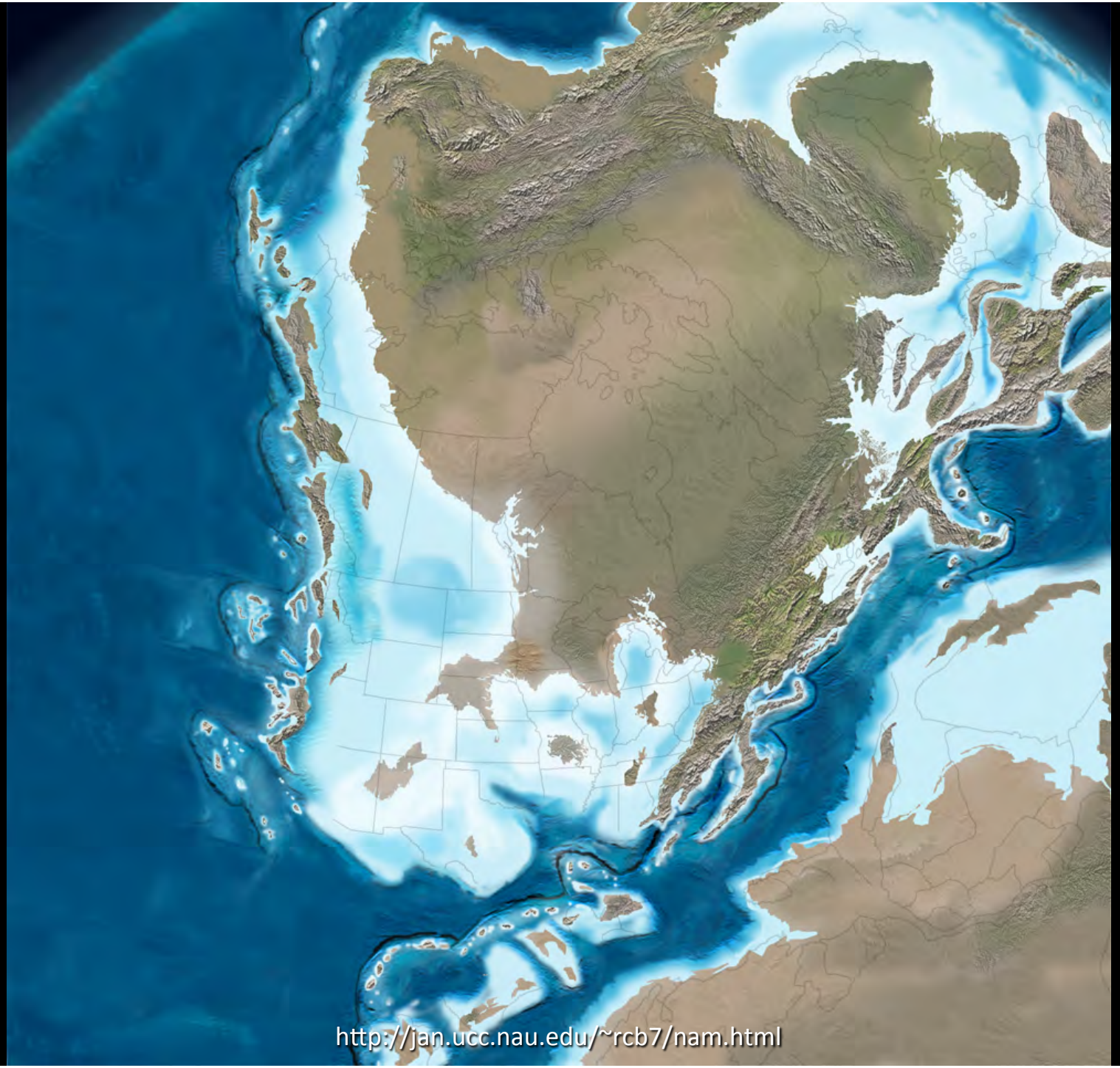
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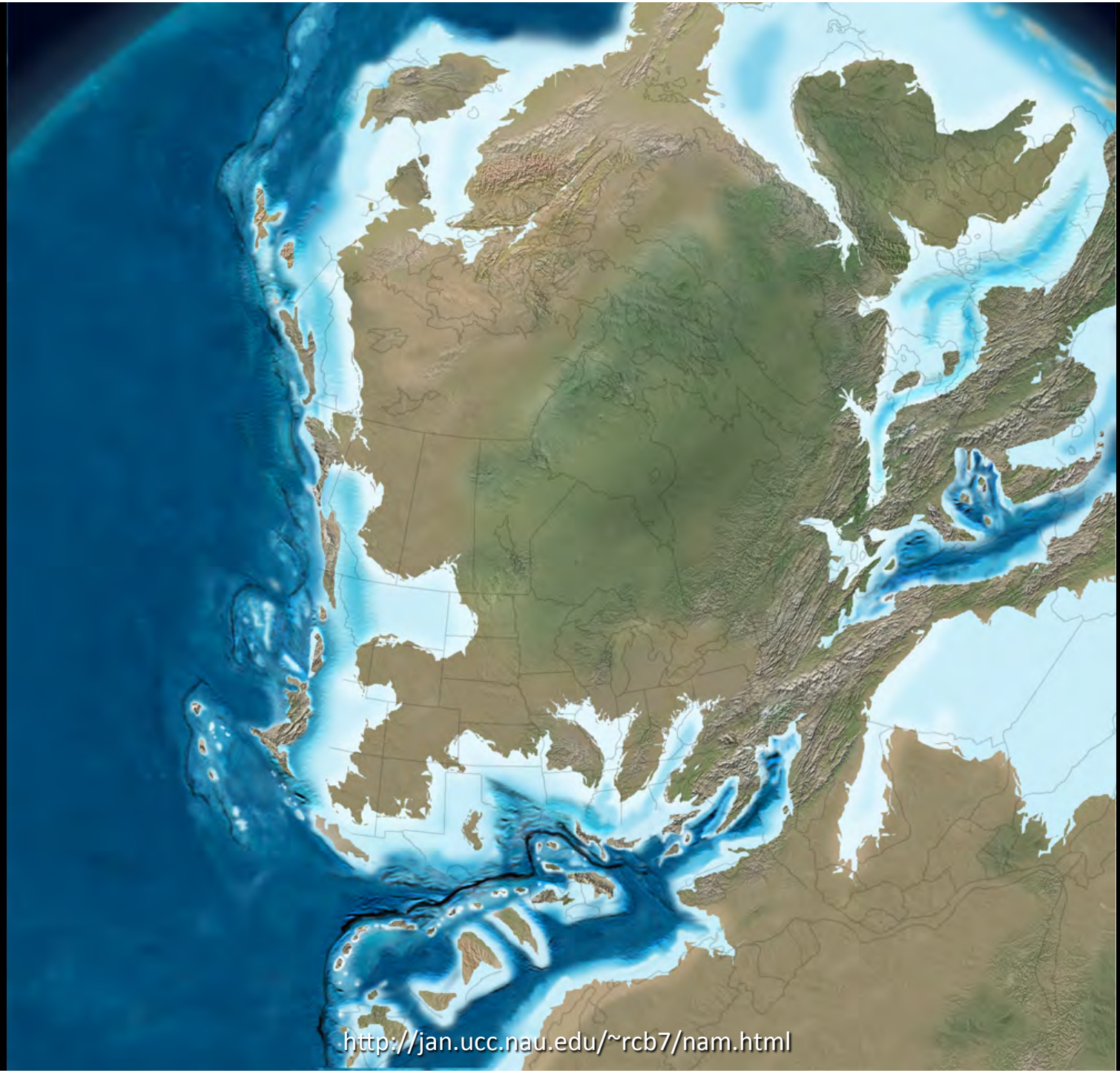
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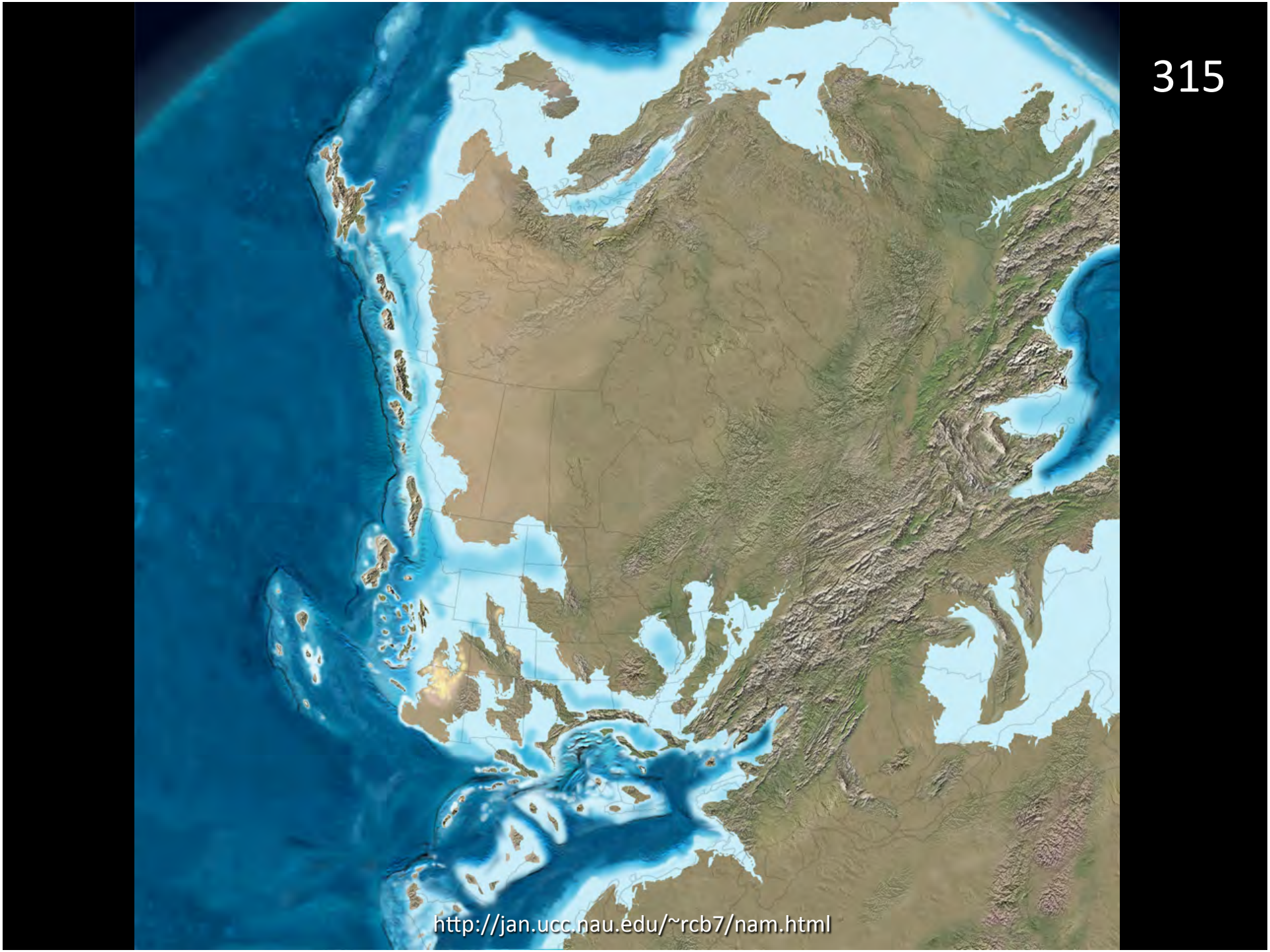
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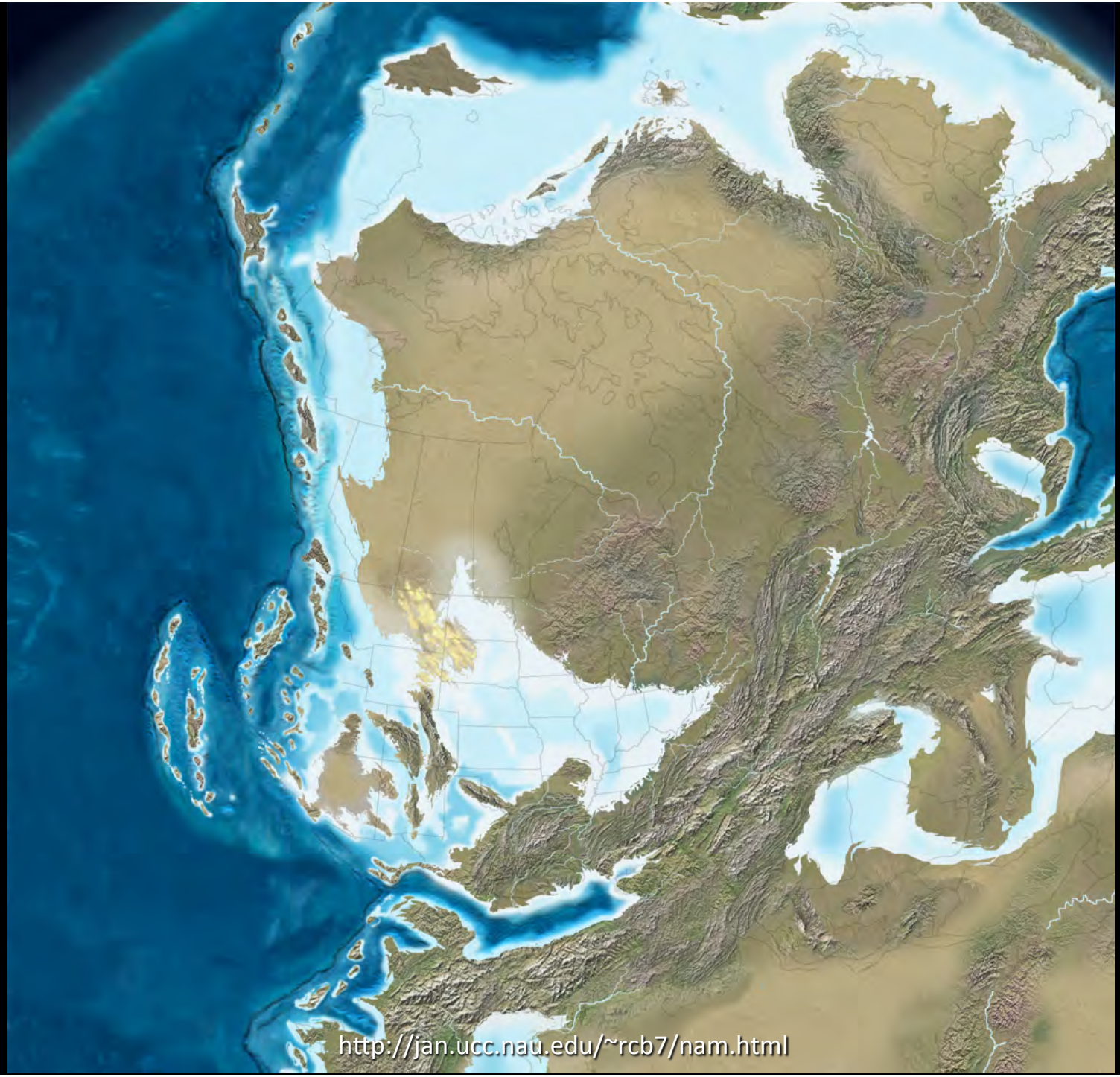
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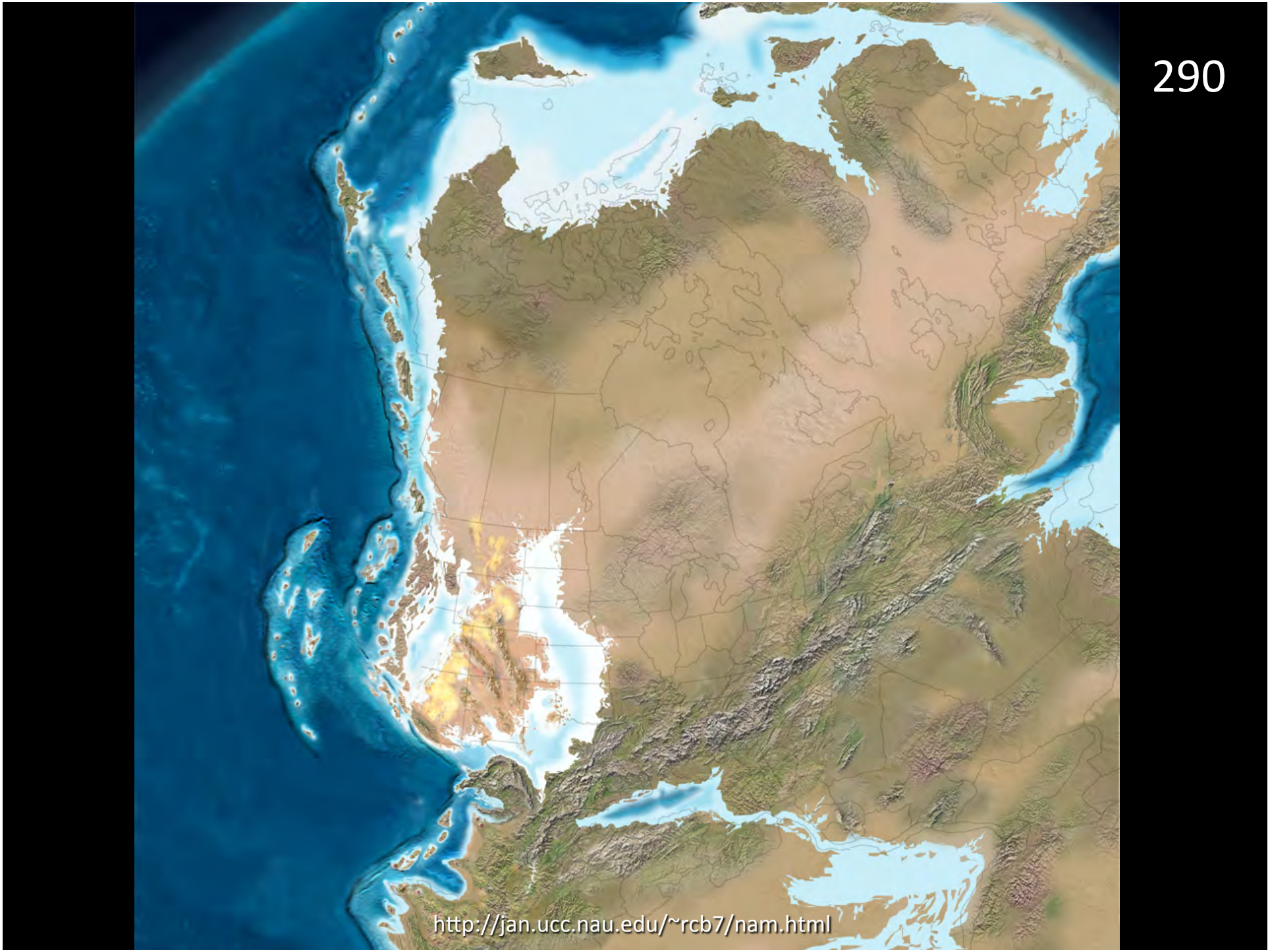
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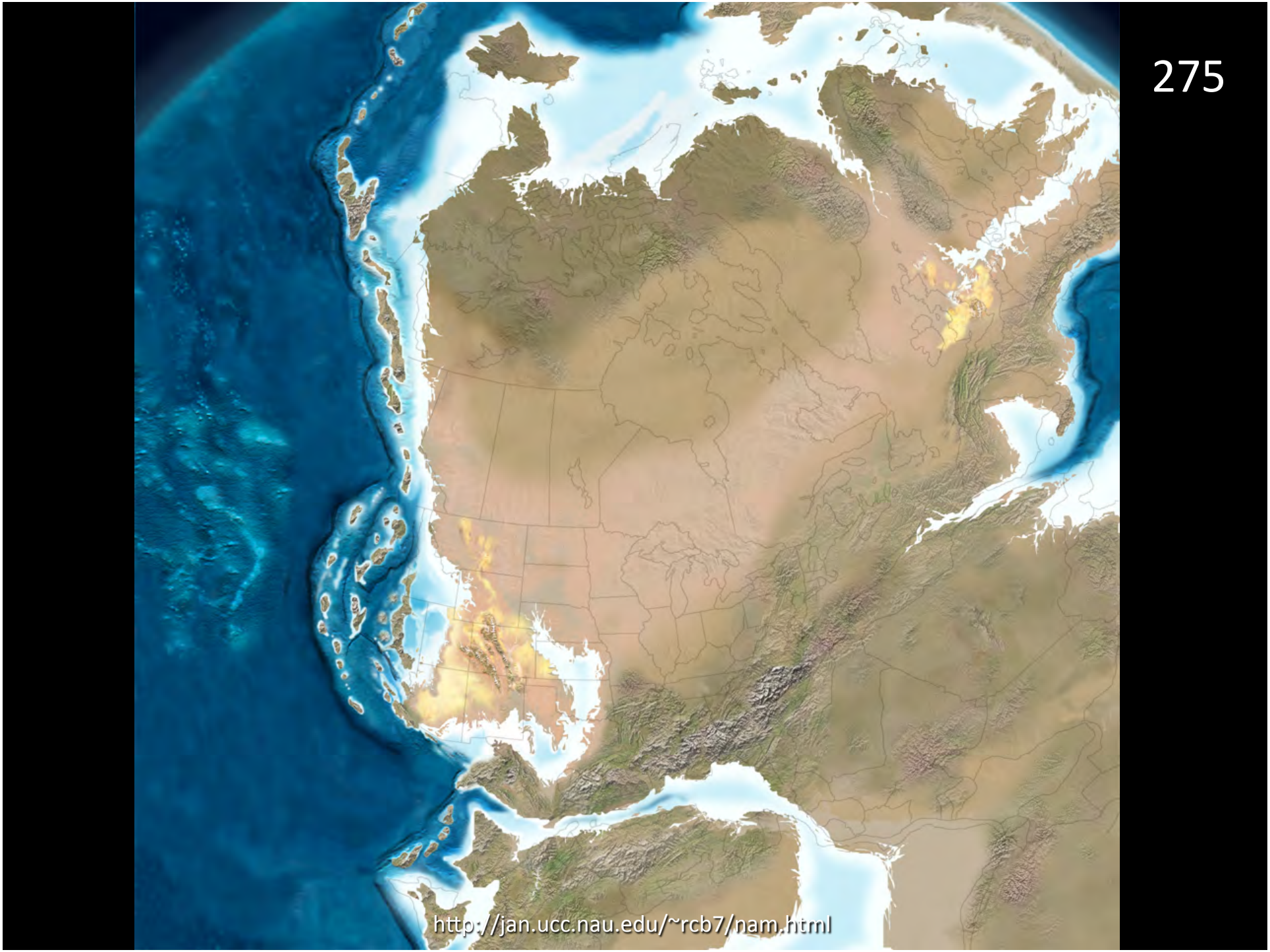
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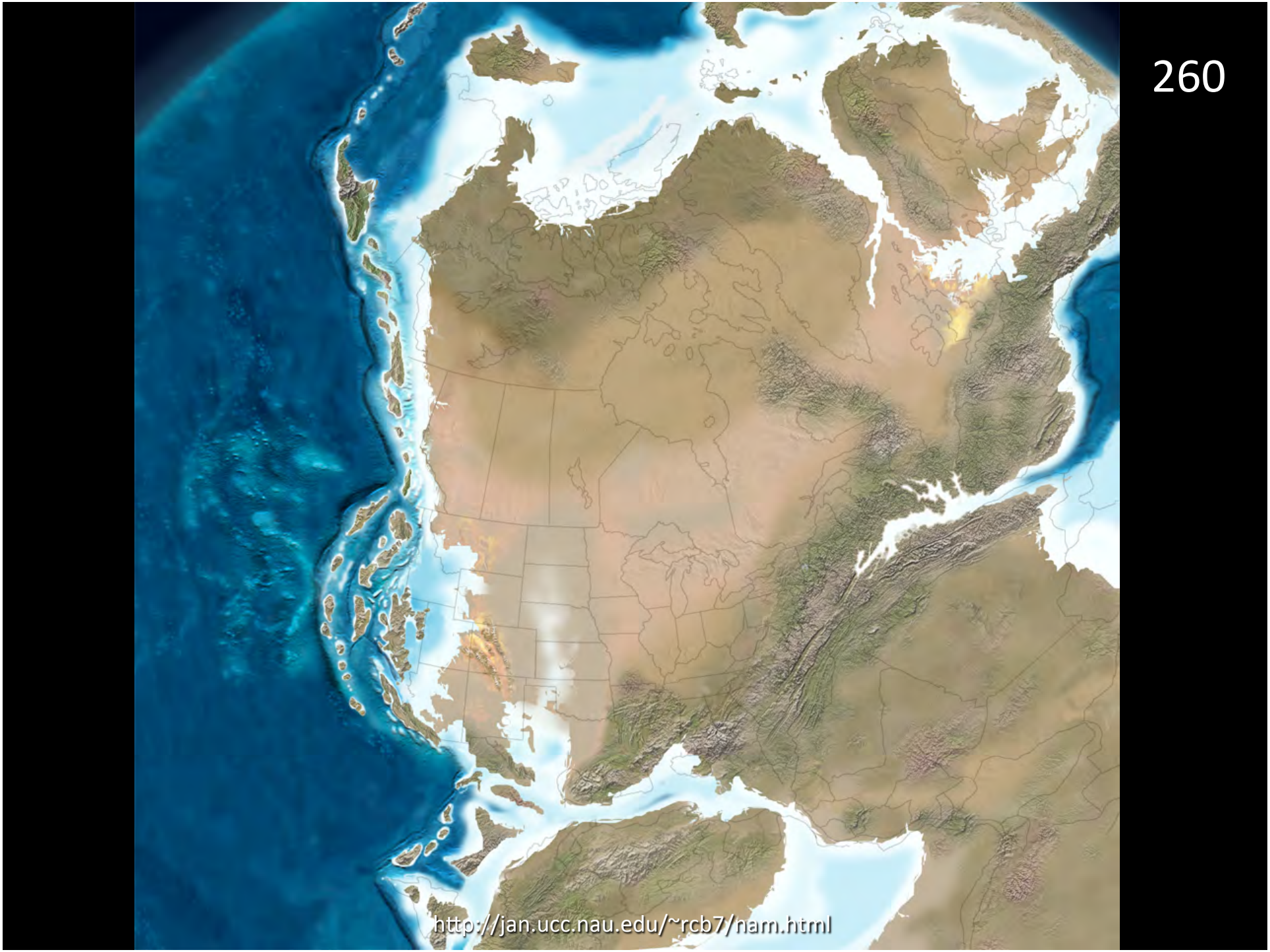
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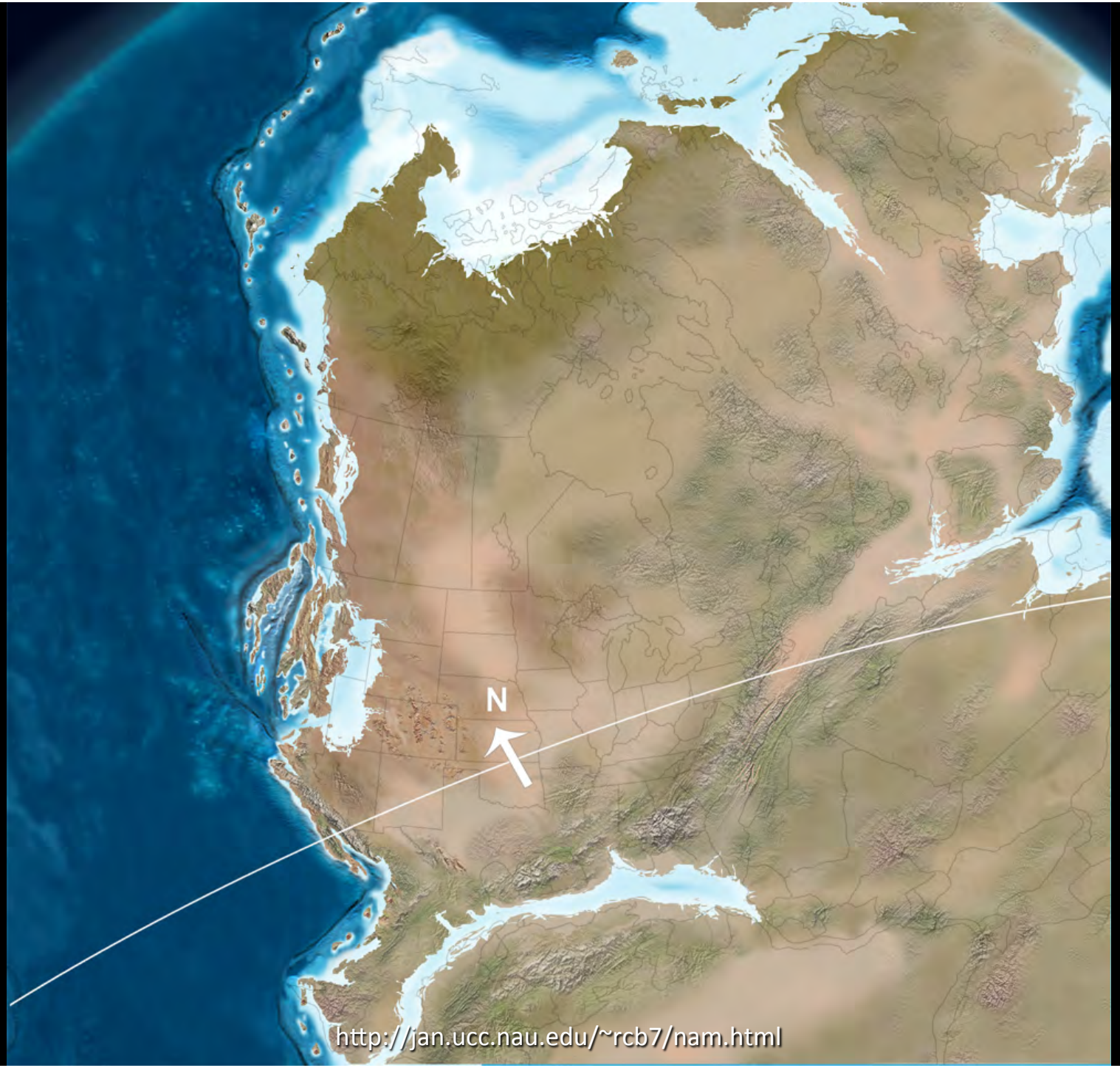
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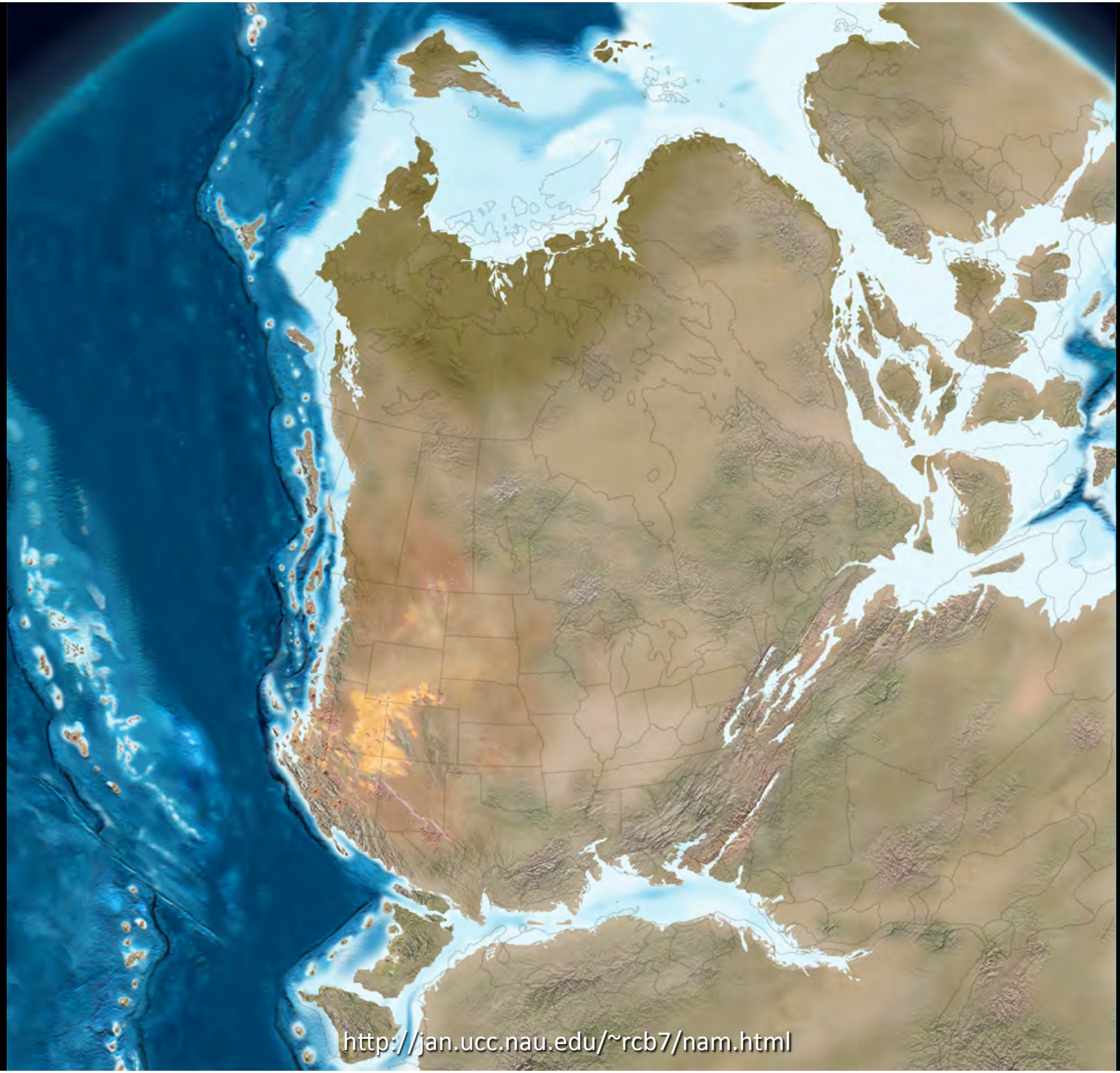
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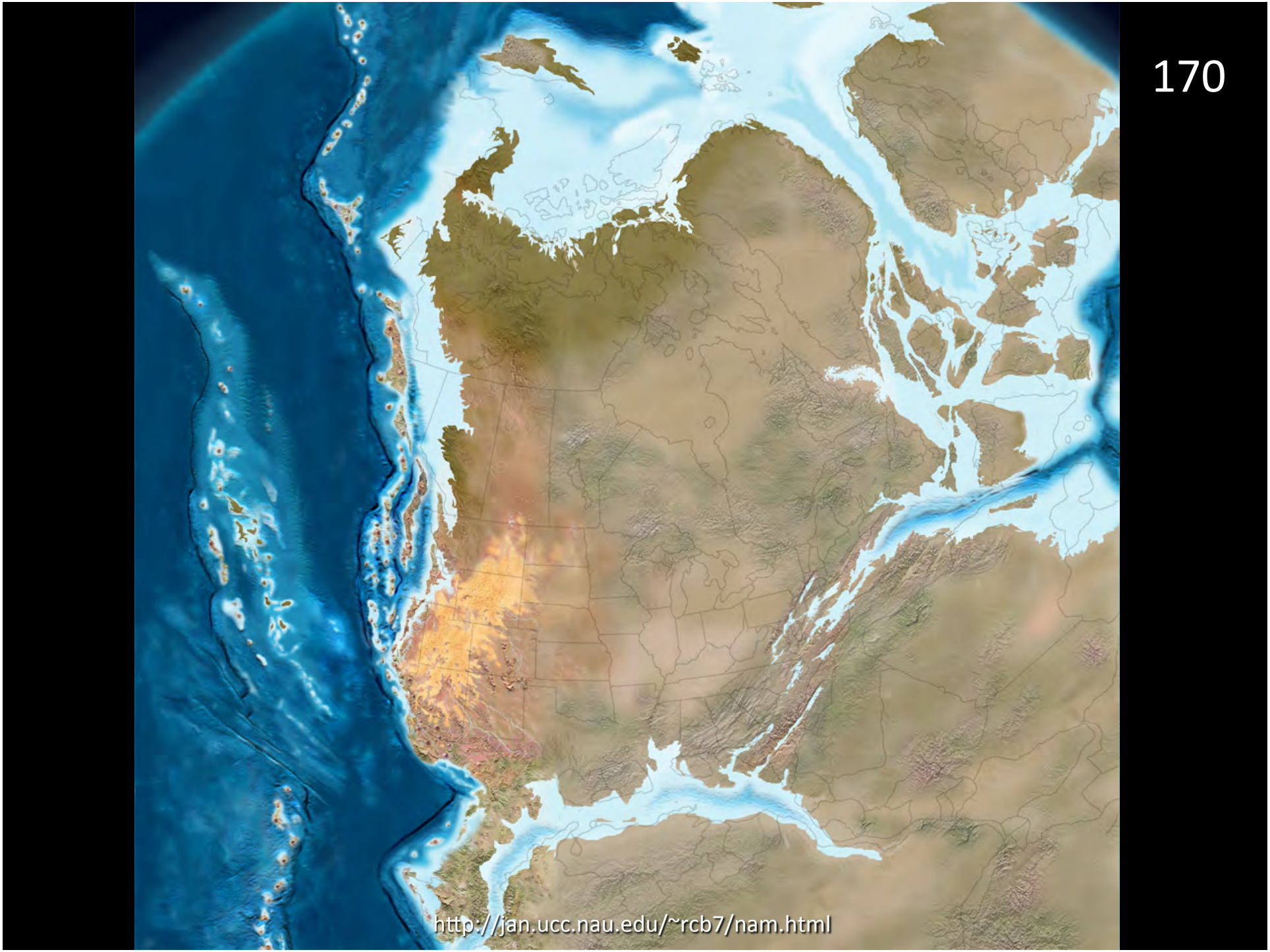
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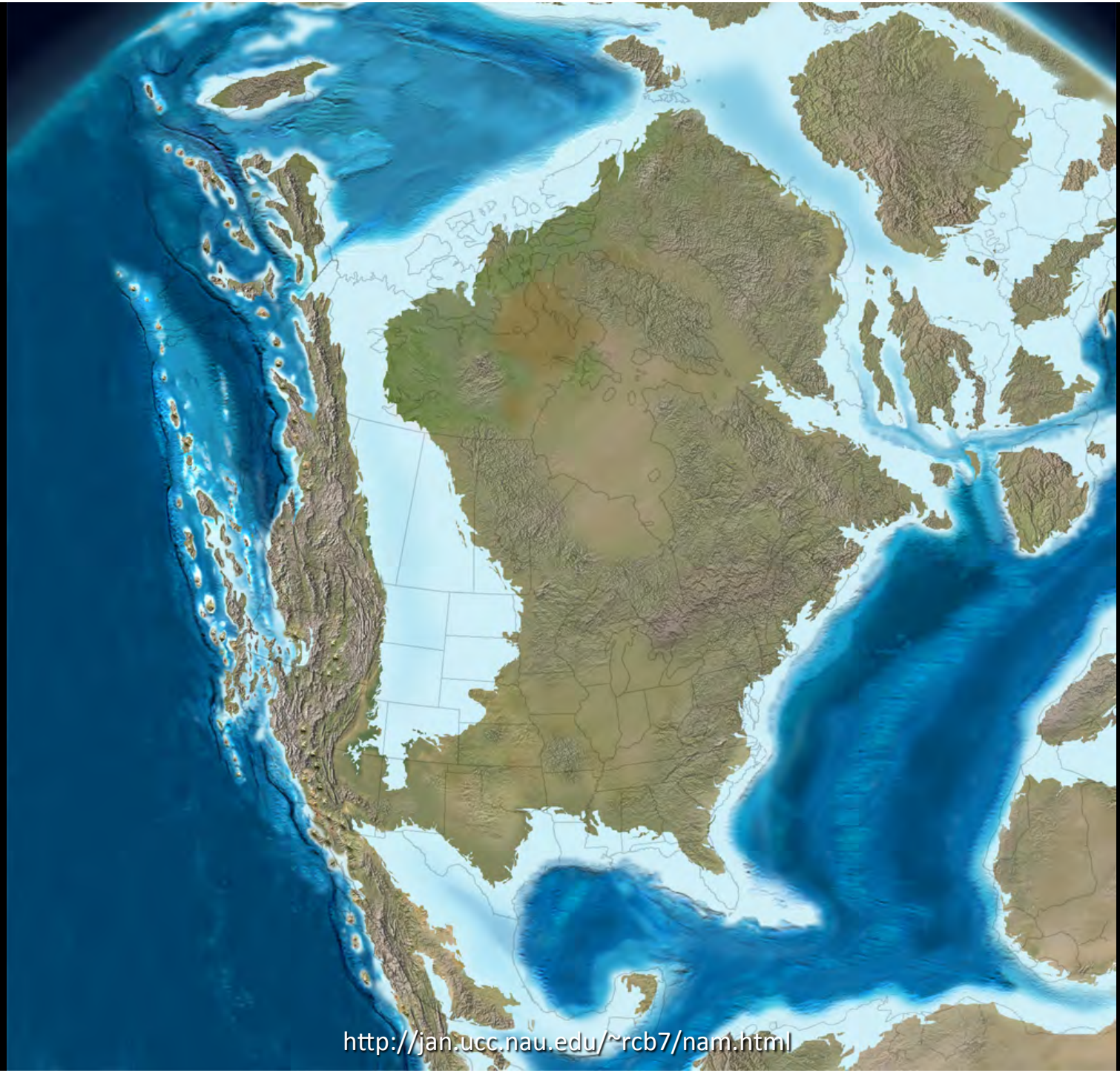
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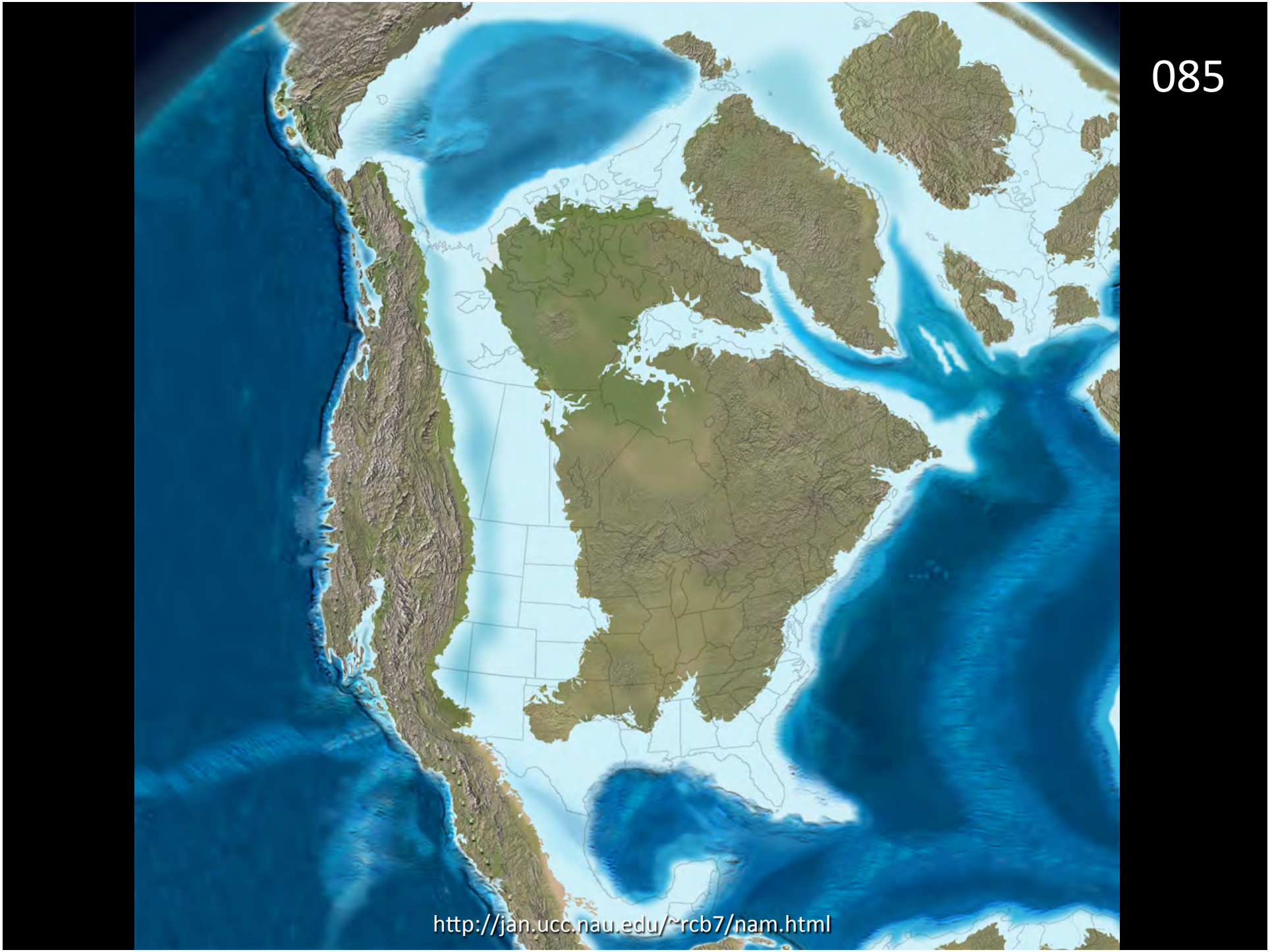
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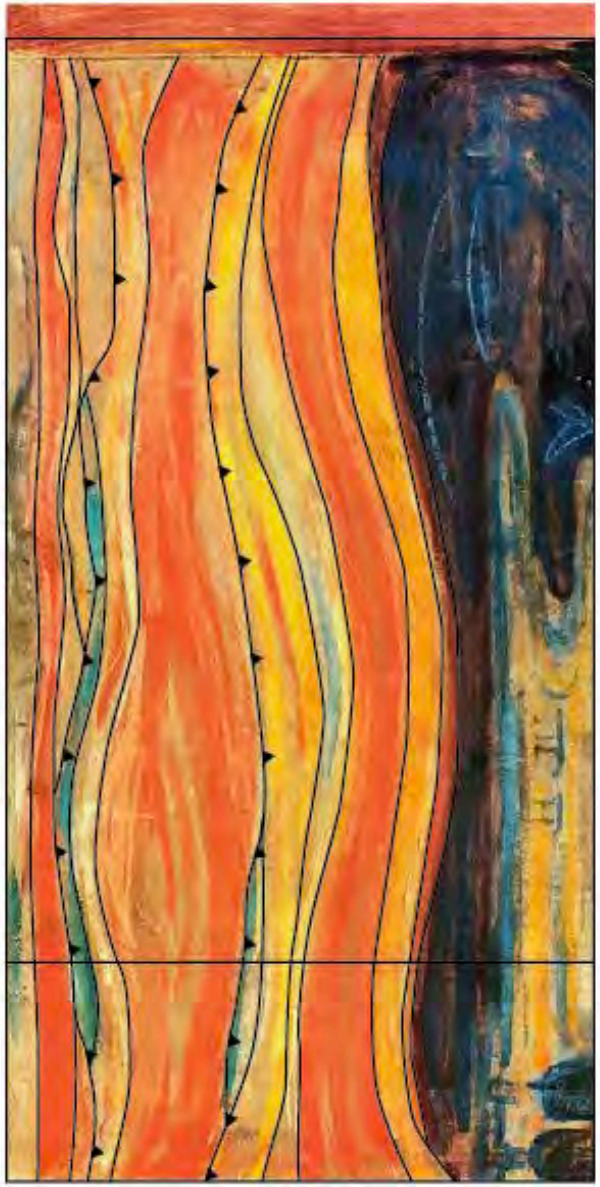

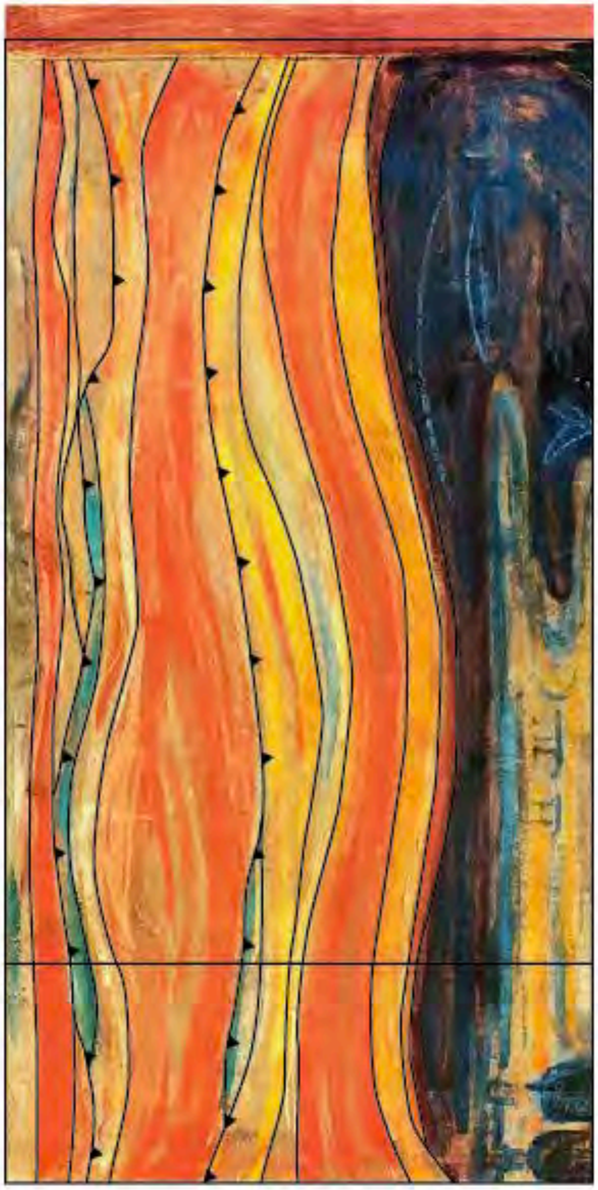

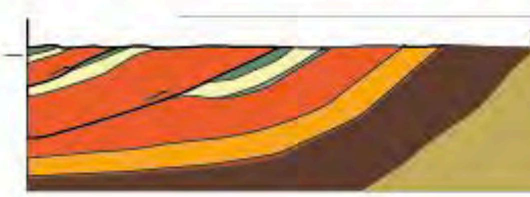

Constructing a geologic map is:

- A rigorous scientific endeavor requiring
  - Strong geologic knowledge
  - Many days in the field
  - Many days in drafting or computer graphics
- Some artistic talent to bring it together

Final product is both an artistic and scientific product

So what else should be in Art Museums?

So maybe next time you inspect a geological map look at the beautiful art that also carries good scientific knowledge