Seafaring, Spear Points, and the Peopling of the Americas: Perspectives from the Pacific Coast

Todd J. Braje
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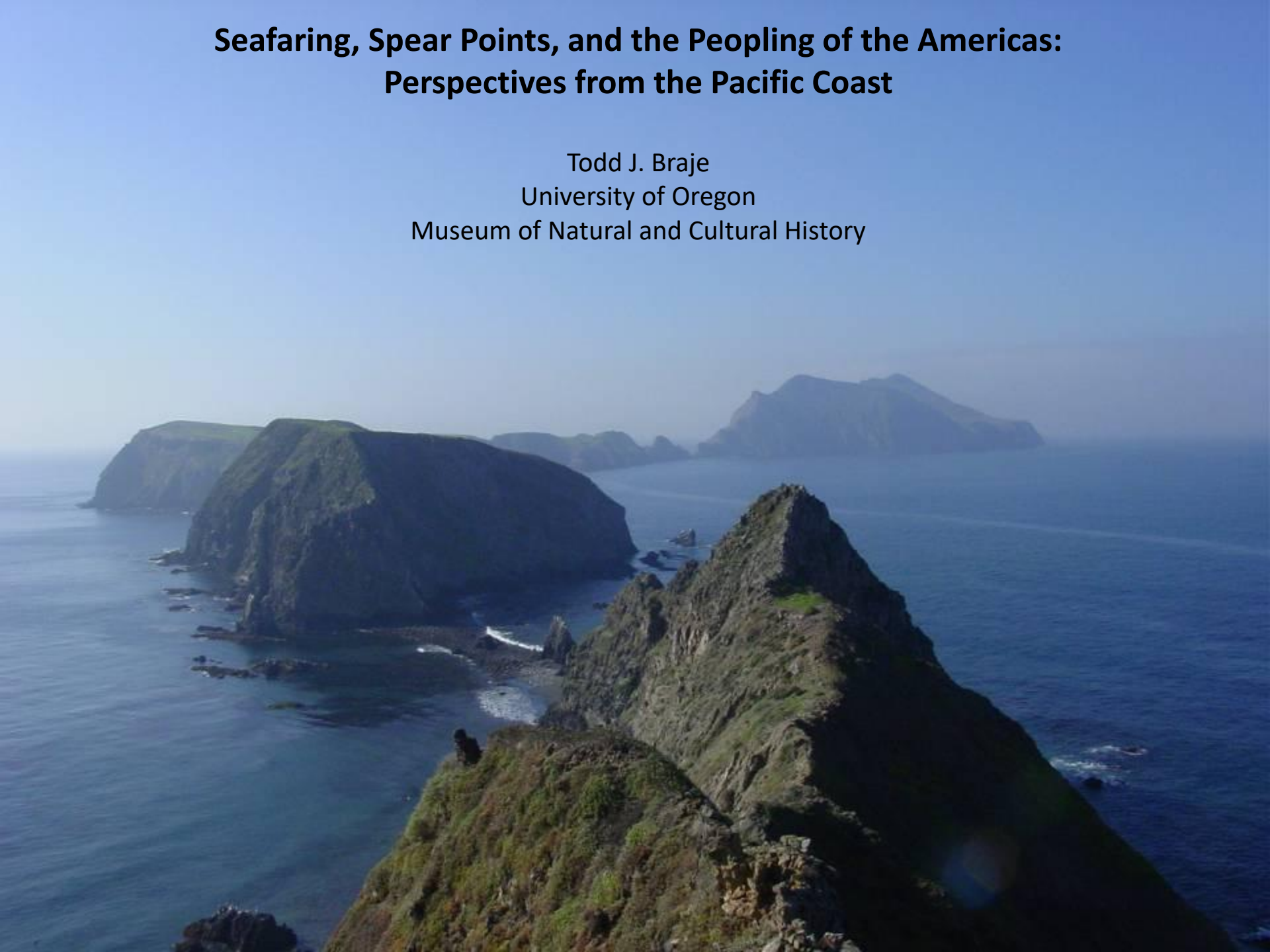
Museum of Natural and Cultural History



Quiz Time

a. Clovis people

b. Clovis ancestors from Siberia

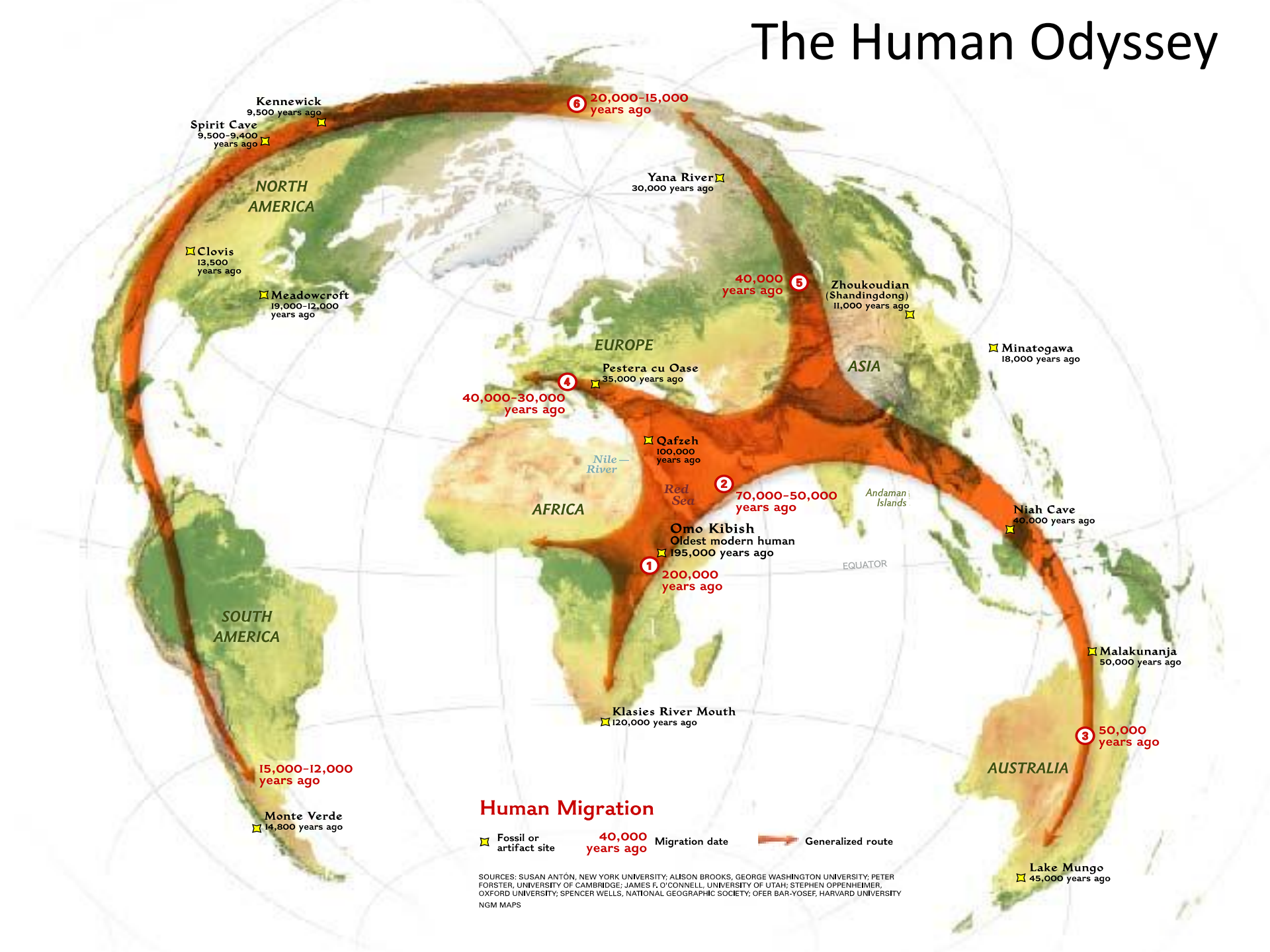
c. Clovis ancestors from Europe

d. People unrelated to Clovis

e. What the heck is Clovis?

f. we just don't know

The Human Odyssey



Pre-Clovis advance into North America from Beringia (see pages 436-7)

CORDILLERAN ICE SHEET

LAURENTIDE ICE SHEET
Extent of glacial ice and lakes about 11,000 years ago

Clovis site
Clovis cache site (numerous points found)

Richey-Roberts Clovis Cache, Washington
Simon Cache, Idaho
Dietz, Oreg.
Anzick Cache, Mont.
Colby, Wyoming
U.P. Mammoth Kill Site, Wyo.
Arizona sites
Sheaman, Wyo.
Dent, Colorado
Drake Cache, Colorado
Shawnee-Minisink, Pa.
Shoop, Pa.
Thunderbird, Va.
Williamson, Va.
Kimmswick, Missouri
Wells Creek, Tenn.
Miami, Texas
Domebo, Okla.
Blackwater Draw (near Clovis, New Mexico)
Mockingbird Gap, New Mexico

0 500 km
0 500 mi

NGS CARTOGRAPHIC DIVISION
DESIGN: CHARLES BERRY
RESEARCH: DAVID B. MILLER
PRODUCTION: ISKANDAR BADAY

20th Century & Clovis First: Traditional (Terrestrial) models left the Pacific Coast marginal to the Peopling of the Americas

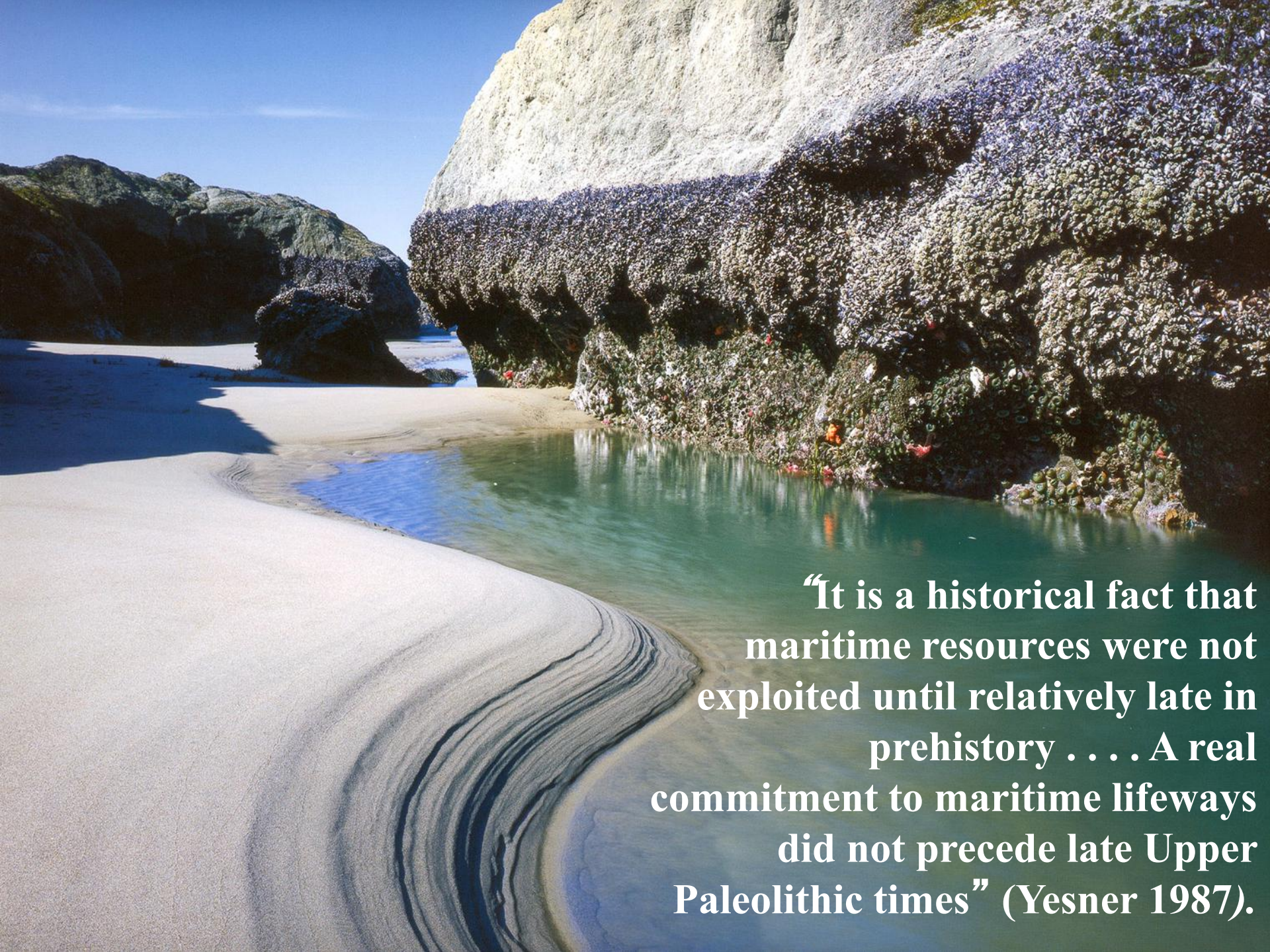
Clovis: What is It?

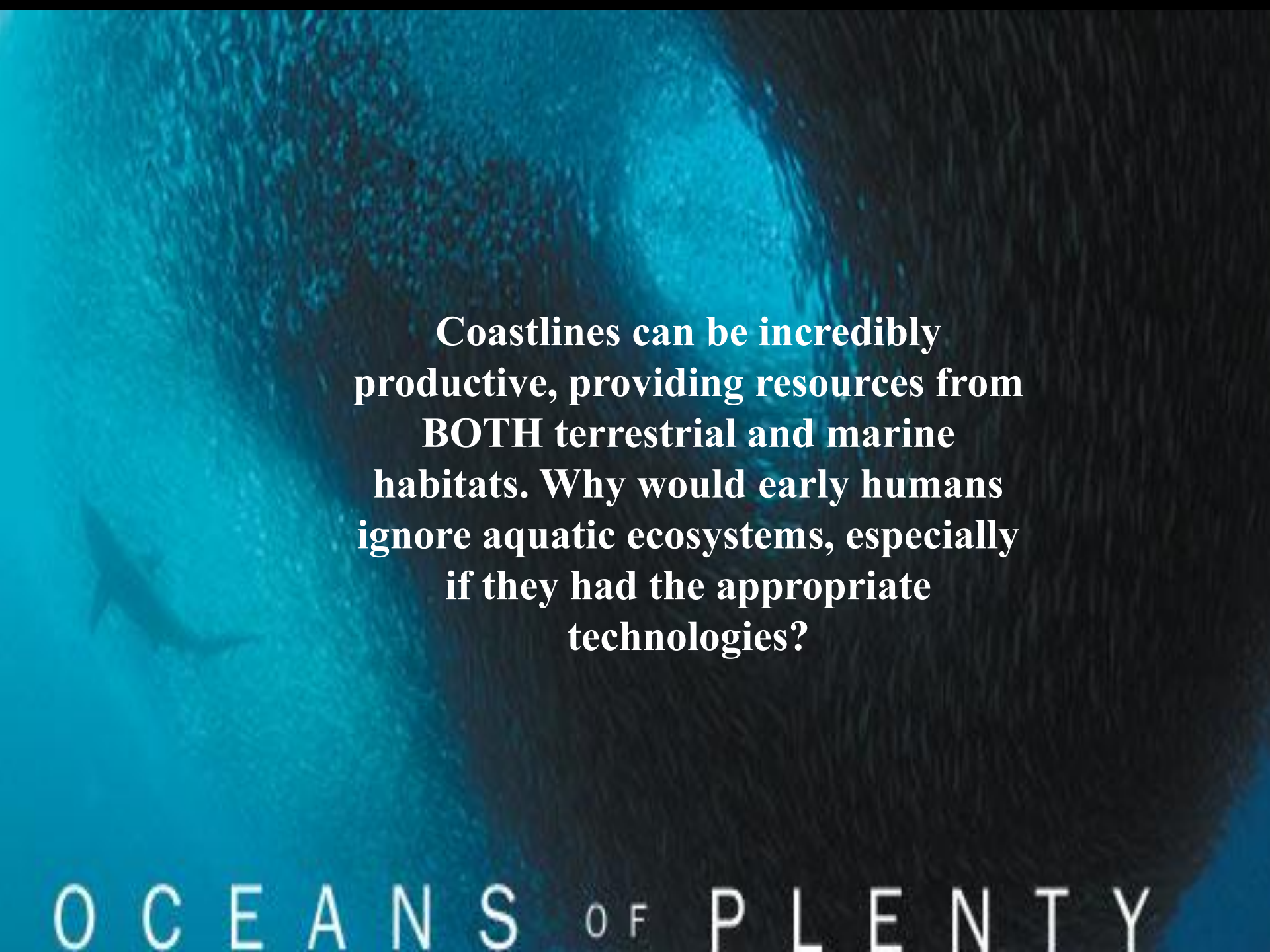
- **Paleoindian Culture(s)**
  - **type site in New Mexico (Blackwater Draw)**
- **Technological Tradition**
  - **oldest of series of fluted point types in America**
- **Archaeological Horizon**
  - **occurs over a relatively short time across much of North America (13,500 - 12,900 cal B.P.)**
- **Late Pleistocene Megafauna Hunting Adaptation**
  - **mammoth and extinct bison**
  - **Paleoindian period ends with extinction of these critters**

Clovis Points from the Rummells-Maske Cache Site, Iowa

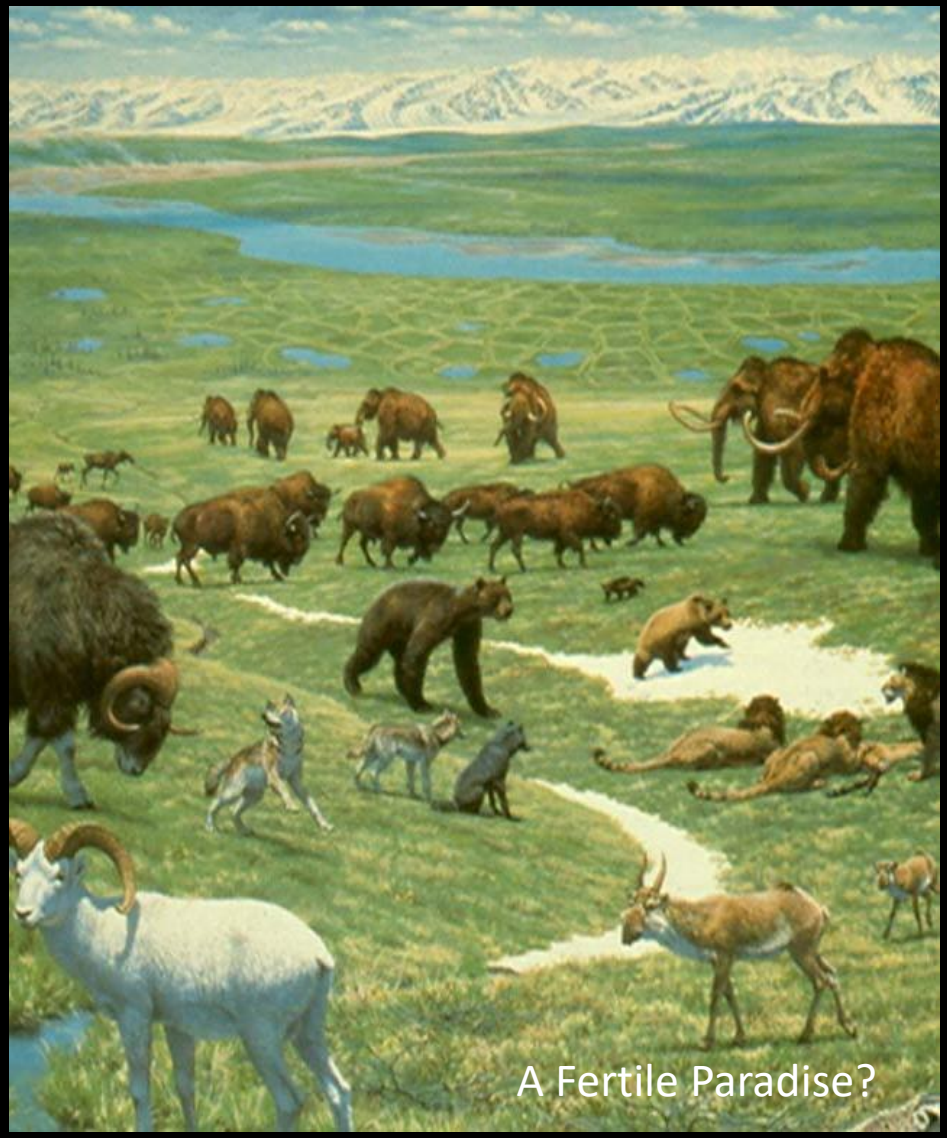
Clovis Culture: 13,500 to 12,900 years before present

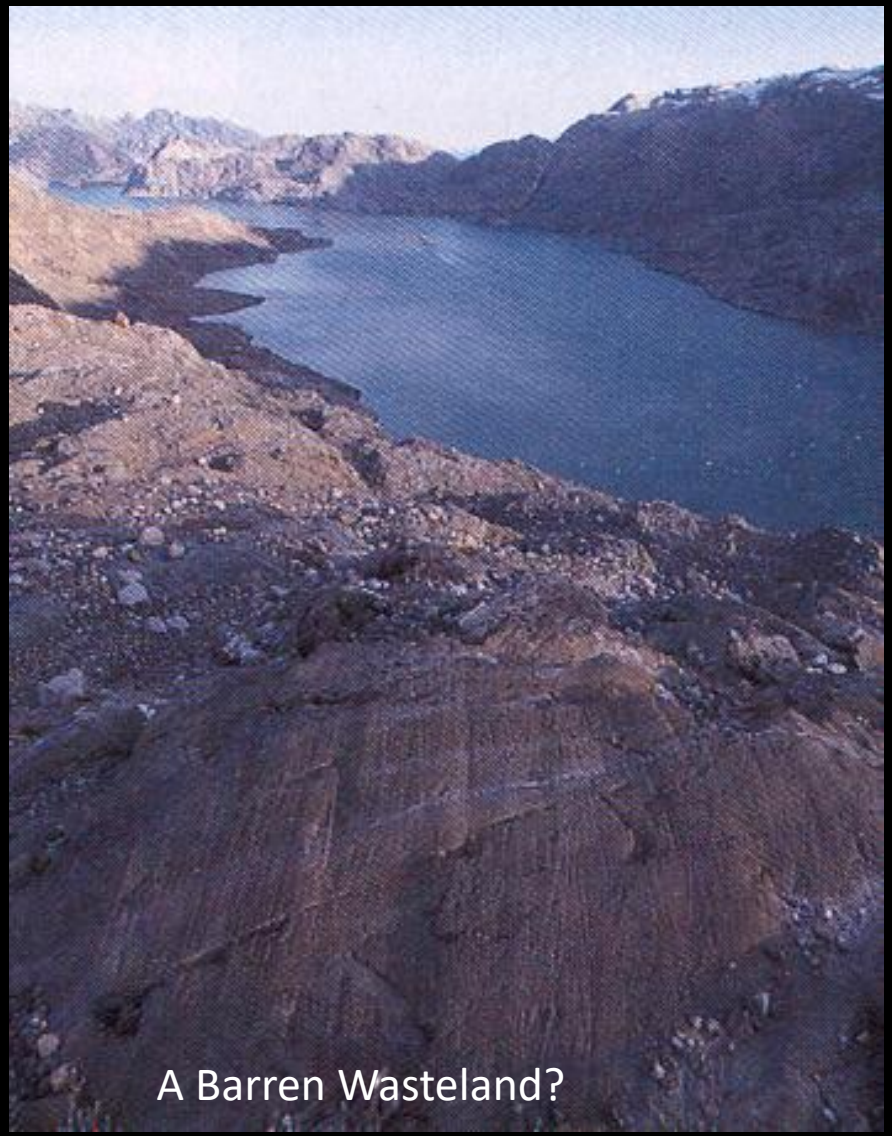
A typical Clovis or Paleoindian tool kit


“It is a historical fact that maritime resources were not exploited until relatively late in prehistory . . . . A real commitment to maritime lifeways did not precede late Upper Paleolithic times” (Yesner 1987).

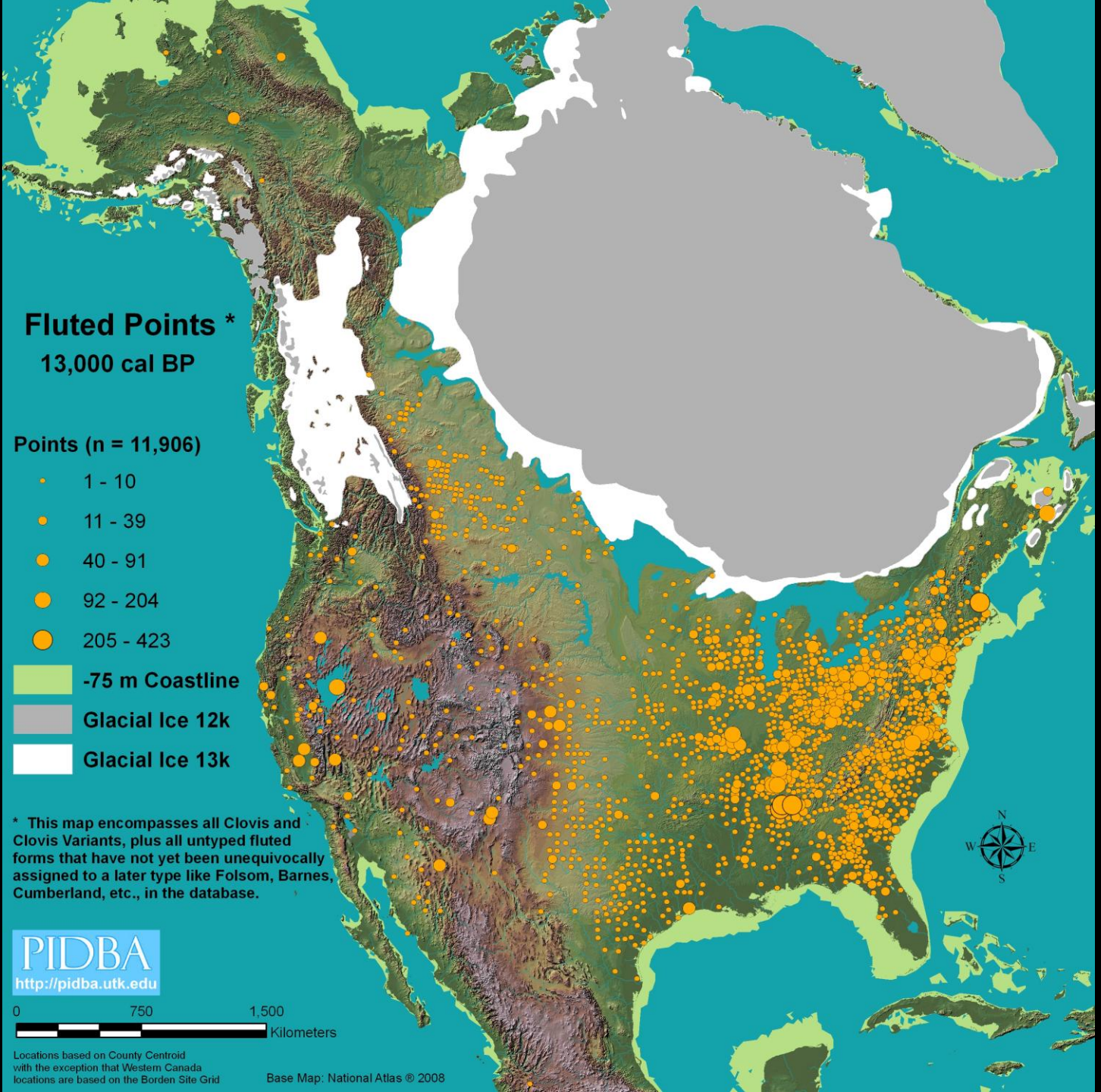

Coastlines can be incredibly productive, providing resources from BOTH terrestrial and marine habitats. Why would early humans ignore aquatic ecosystems, especially if they had the appropriate technologies?
OCEANS OF PLENTY

Problems Begin to Surface for the Clovis-First Model of New World Colonization





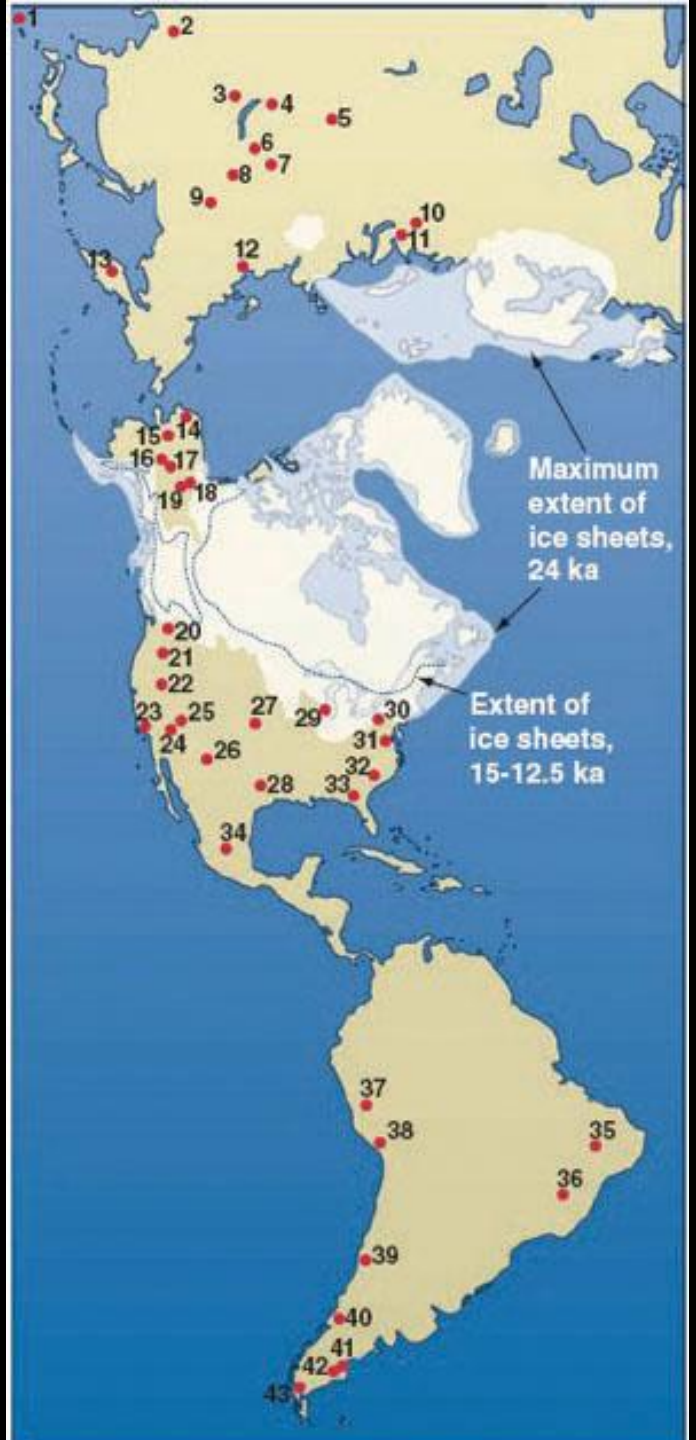
The Ice-Free Corridor



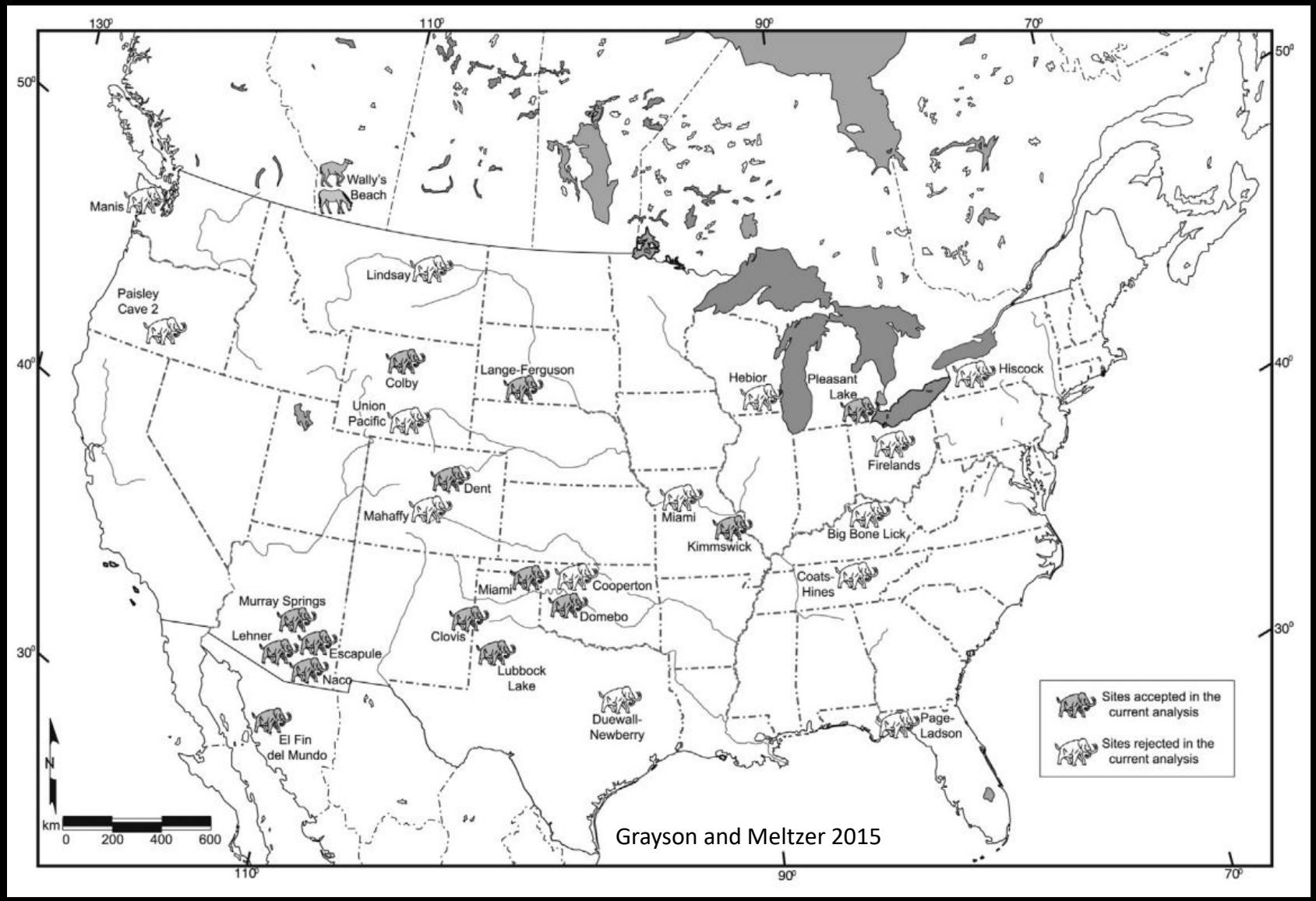
Distribution of all Clovis and Clovis Variants Recovered in North America

Ice Free Corridor Opens just after 15,000 years ago.

But, Clovis sites found in the corridor are YOUNGER than those of the interior US!

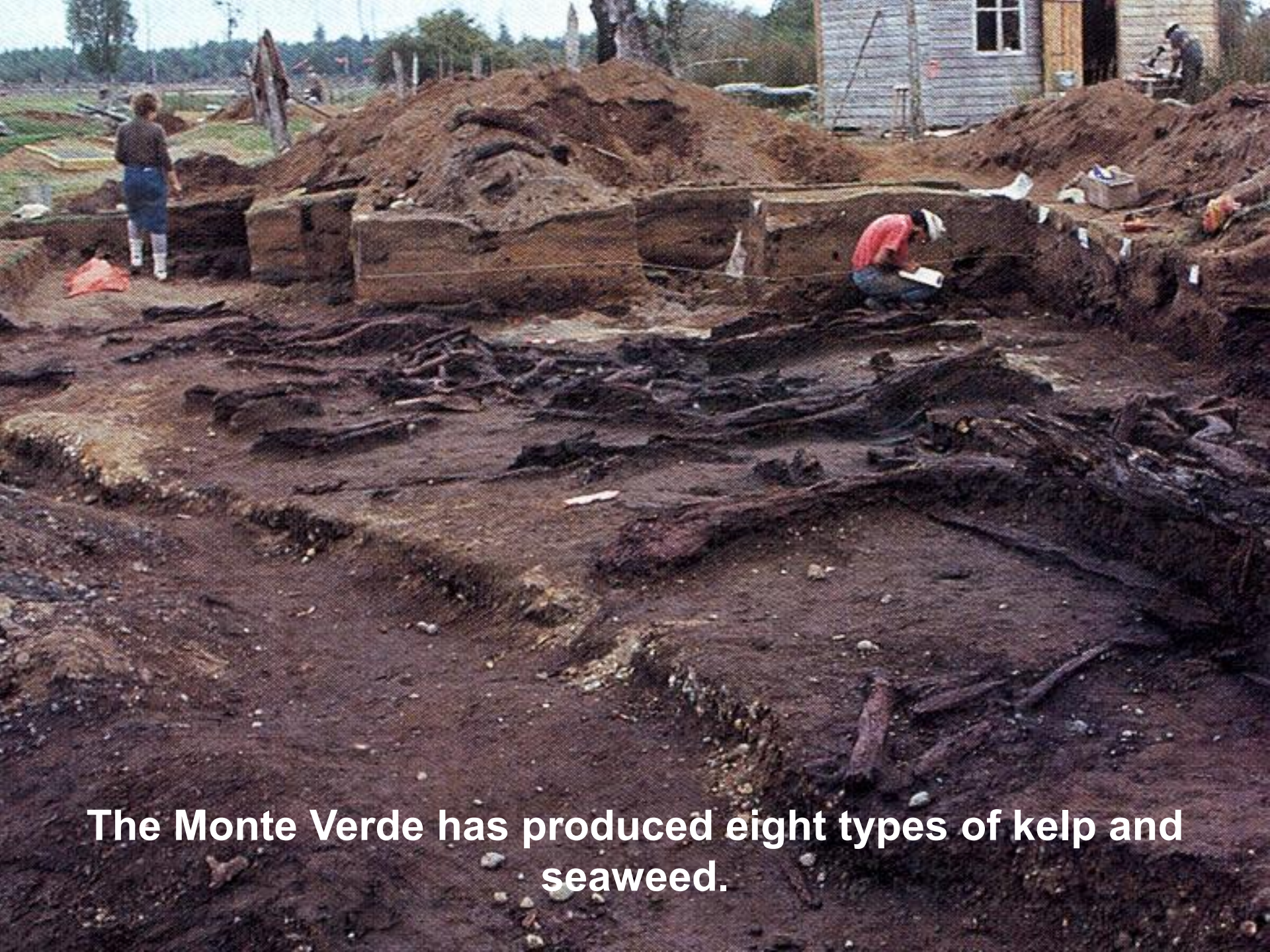


Clovis as Generalized Foragers



Very little archaeological evidence of a big game hunting economy

Monte Verde, Chile (14,500 cal BP) – 16,000 km from Alaska



The Monte Verde has produced eight types of kelp and seaweed.

ALLURE OF THE COAST

Erlandson et al. 2007 *JICA*

Earliest evidence of human habitation from several sites along the Pacific coast of the Americas supports the idea that the first settlers came by sea. They possibly followed a "kelp highway", which back then would have run from Japan to Tierra del Fuego

The Coastal Migration Theory and Kelp Highway Hypothesis

EXTENT OF KELP FOREST TODAY

OKINAWA
~36,000 yrs ago

Kurile Islands

JAPAN

PRINCE OF WALES ISLAND
~11,000 yrs ago

QUEEN CHARLOTTE ISLANDS
~11,000 yrs ago

CHANNEL ISLANDS
~13,000 yrs ago

CEDROS ISLAND
~11,500 yrs ago

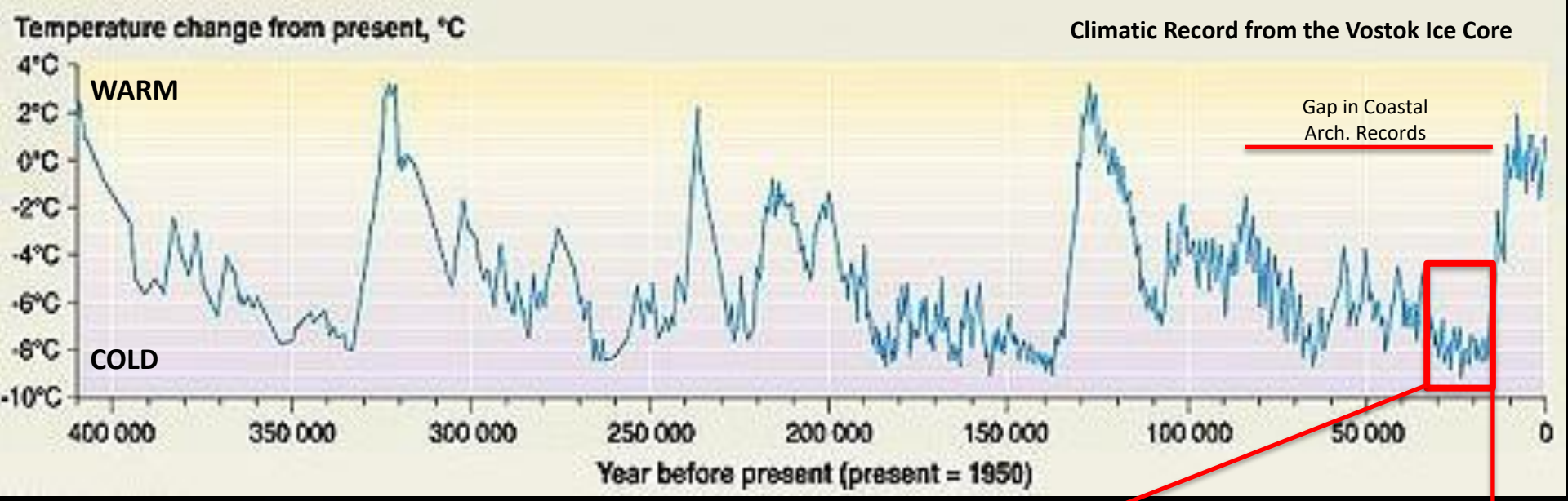
QUEBRADA JAGUAY
~13,000 yrs ago

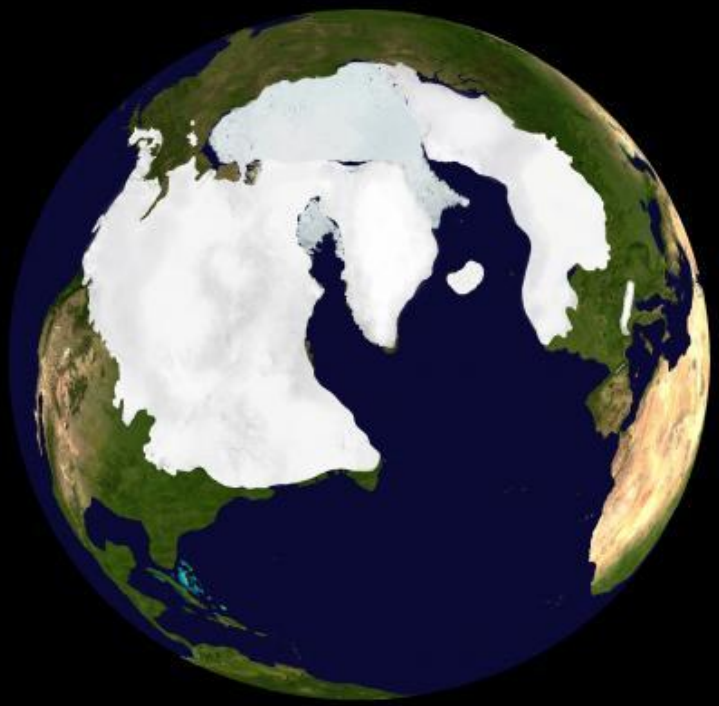
QUEBRADA TACAHUAY
~12,700 yrs ago

MONTE VERDE
~14,850 yrs ago

Tierra del Fuego

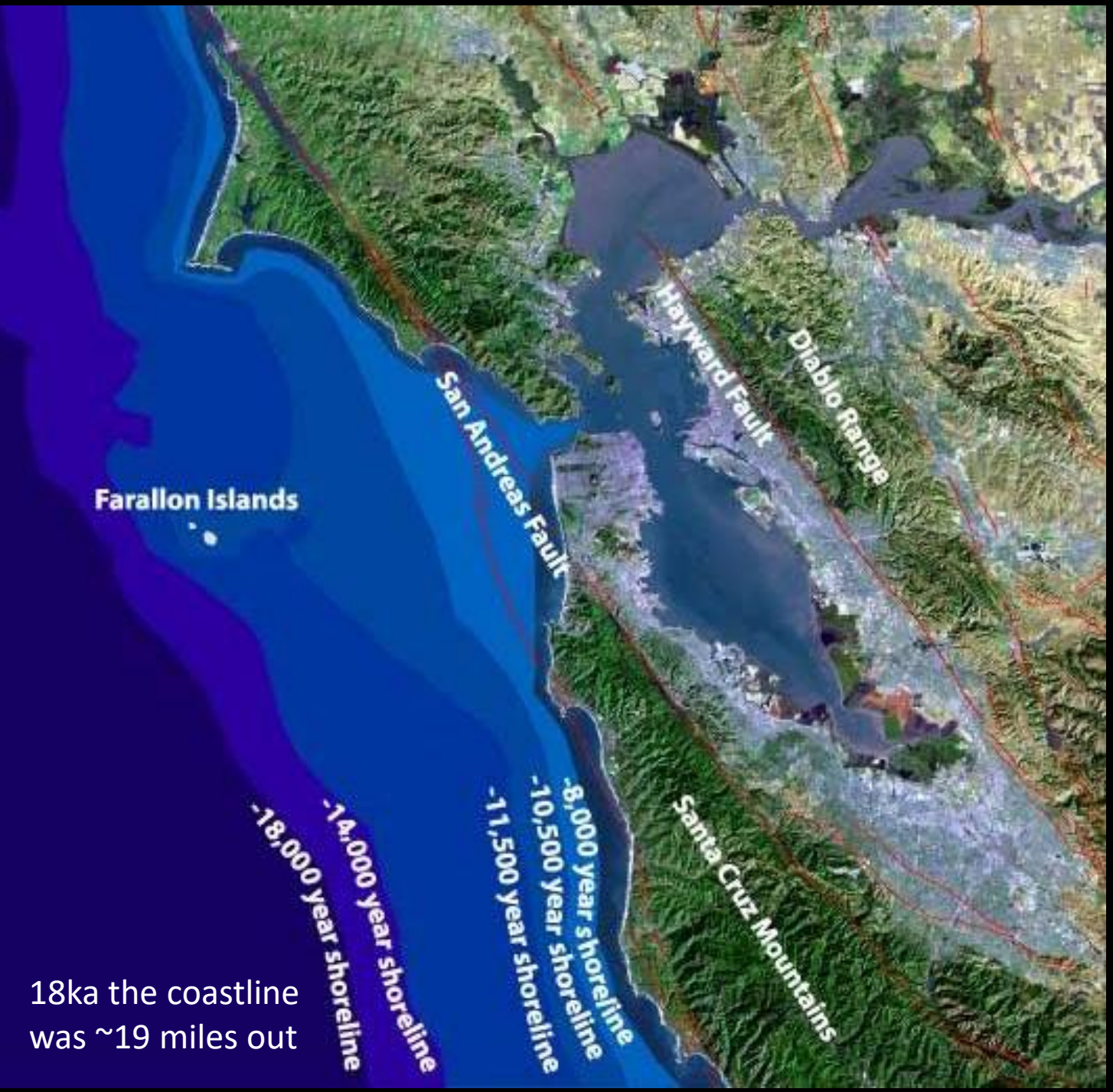
Possible entry routes to the New World





Maximum Ice Distribution on the Northern Hemisphere during the Late Ice Age

Records of early New World coastal occupations and migrations may be submerged by postglacial sea level rise, coastal erosion, and coastal landscape change.



18ka the coastline was ~19 miles out

Problem: Sea level rise of ~120 meters over the past 20,000 years has inundated continental shelves throughout the world, flooding land bridges and ancient coastlines, and hiding or destroying the archaeological record of early coastal occupations

Solution?
Search for sites on the submerged continental shelf.

Giant Kelp (*Macrocystis pyrifera*)

Kelp Forests

1) Grow in rocky near shore habitats, from intertidal to ~30 m deep

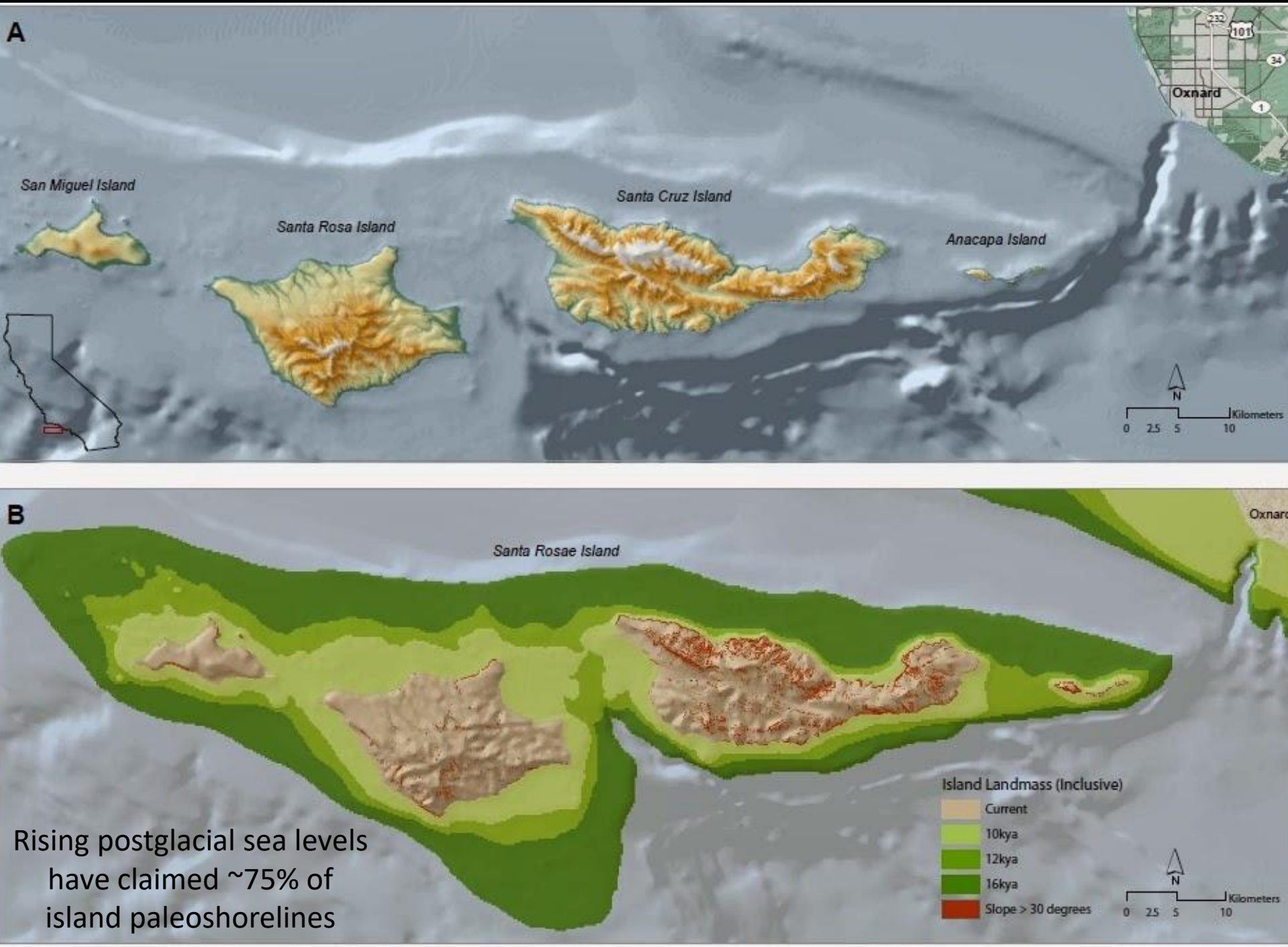
2) Thrive in cool and cold waters (<20^{o} C)

3) Are among the most productive habitats on earth, with high primary productivity and three dimensional structure that shelters a diverse fauna

4) Are associated with some of the earliest coastal archaeological sites in the Americas

Very similar animals and plants—often the same species—were found in kelp forest habitats around the Pacific Rim, along a linear migration route entirely at sea

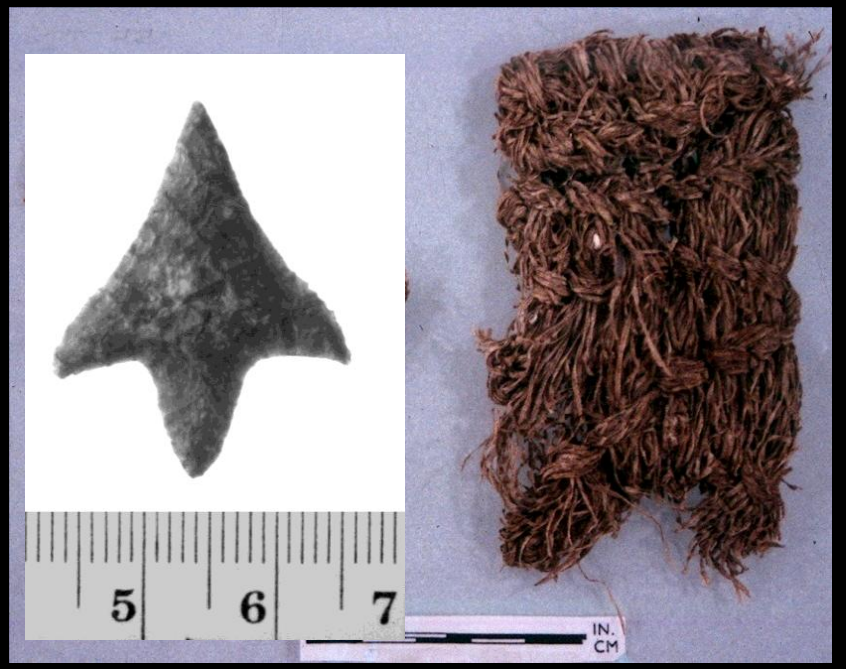
Paleocoastal people on California's Channel Islands



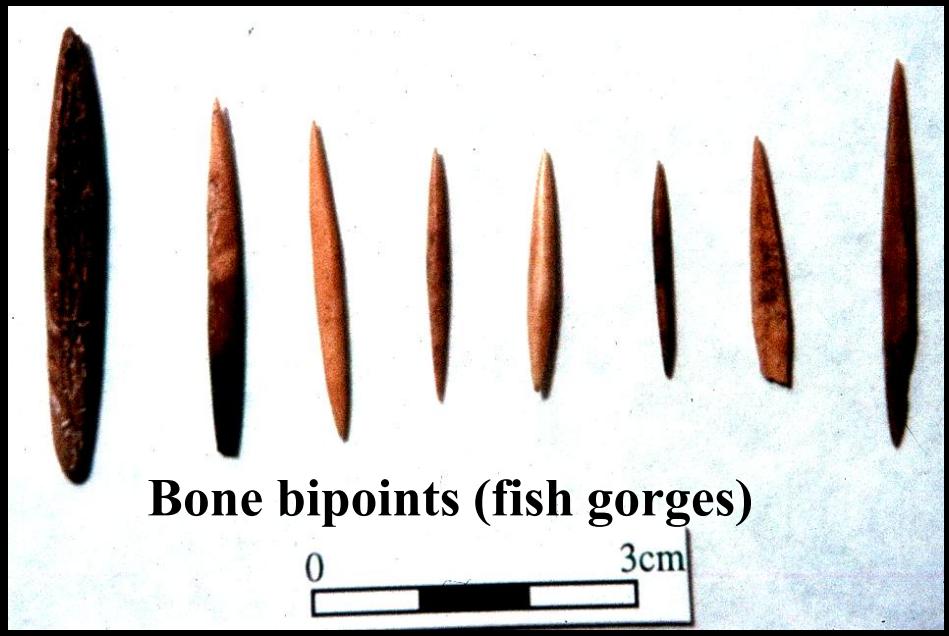
Rising postglacial sea levels have claimed ~75% of island paleoshorelines

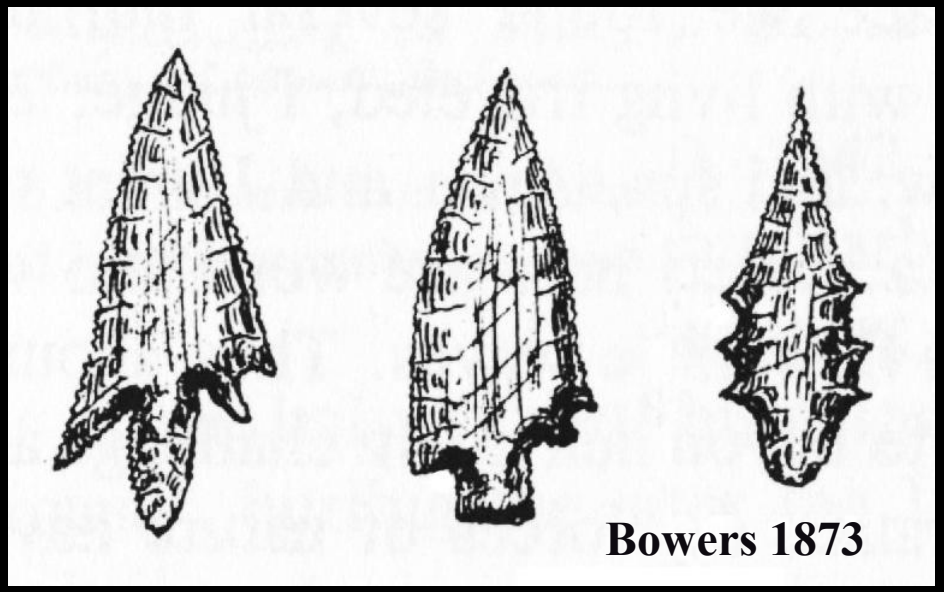
Arlington Springs on Santa Rosa Island, where Orr found human bones in 1959, now dated to ~13,000 cal BP

Daisy Cave shows intensive use of kelp forest resources between ~11,600 and 8600 years ago



Paleocoastal artifacts from Daisy Cave, 11,700 to 8500 cal BP





Bowers 1873

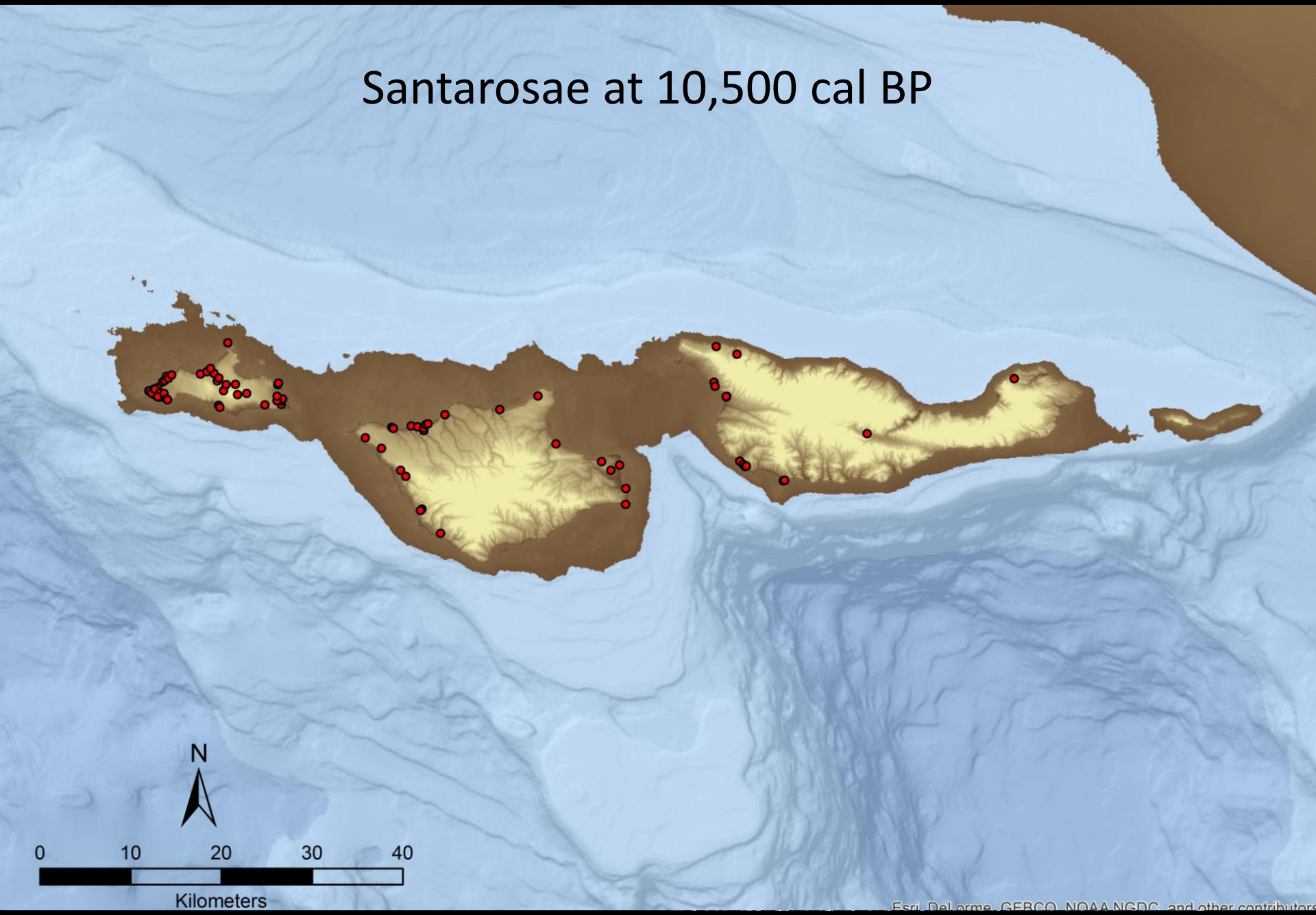
Jones 1901

Glassow et al. 2008

In museum collections, scores of Channel Island Barbed points: once thought to be <2,000 years old. We now know they are all >8000 years old!

Rozaire 1978

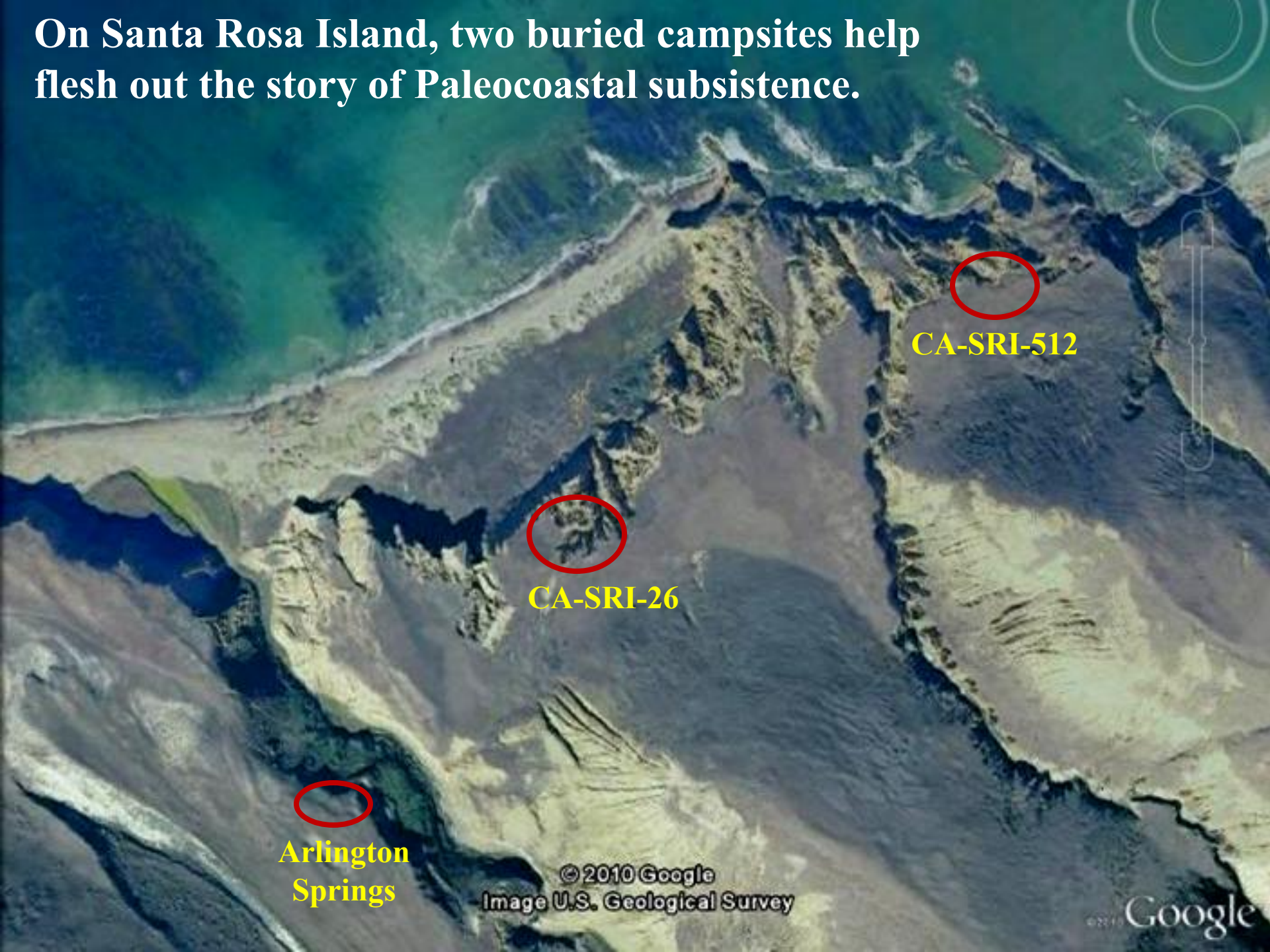
Santarosae at 10,500 cal BP



Maps by Amy Gusick

The large Cardwell Bluff site complex—4 Paleocoastal sites covering a ~600 x 300 m area: quarry, workshop, and shell midden sites dated between ~12,250-11,400 years ago

Has produced several hundred bifaces, but no bone, only shellfish.


On Santa Rosa Island, two buried campsites help flesh out the story of Paleocoastal subsistence.
CA-SRI-512
CA-SRI-26
Arlington Springs
© 2010 Google
Image U.S. Geological Survey
Google

Above: Channel Island Barbed Points, Crescents, and Ochre from CA-SRI-512

Below: bones of Snow goose, Canada goose and the extinct flightless duck, *Chendytes lawi*

Chendytes lawi (burned)


Amol Points
Crescents
Channel Island Barbed

A crescent and Amol point as they may have been t shafts.


Rocky Mountains
United States
Crescent Localities
© 2012 INEGI
© 2012 Google
Image © 2012 TerraMetrics
Google earth

Pacific Flyway

Waterfowl Flyways

Atlantic
Mississippi
Central
Pacific

Moss & Erlandson 2013 “Waterfowl and Lunate Crescents in Western North America: The Archaeology of the Pacific Flyway.” *Journal of World Prehistory*

Charlotte Beck & George Jones (2010)

Which Came First?

Clovis Points?

Stemmed Points?

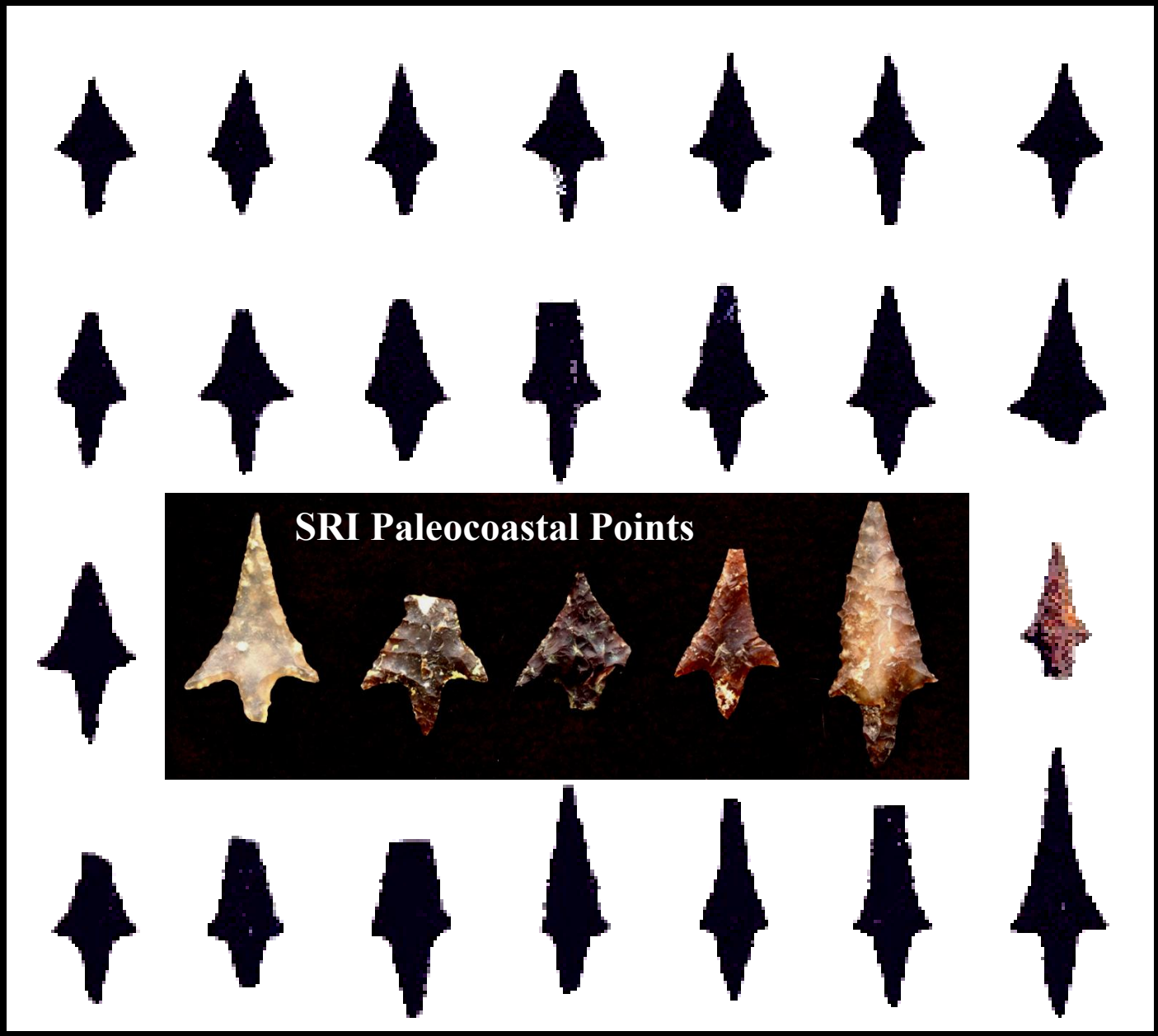
Paisley Caves in Oregon, wave-cut shelters on the margins of a large Late Pleistocene lake.

Camel bone, 14,290 years old

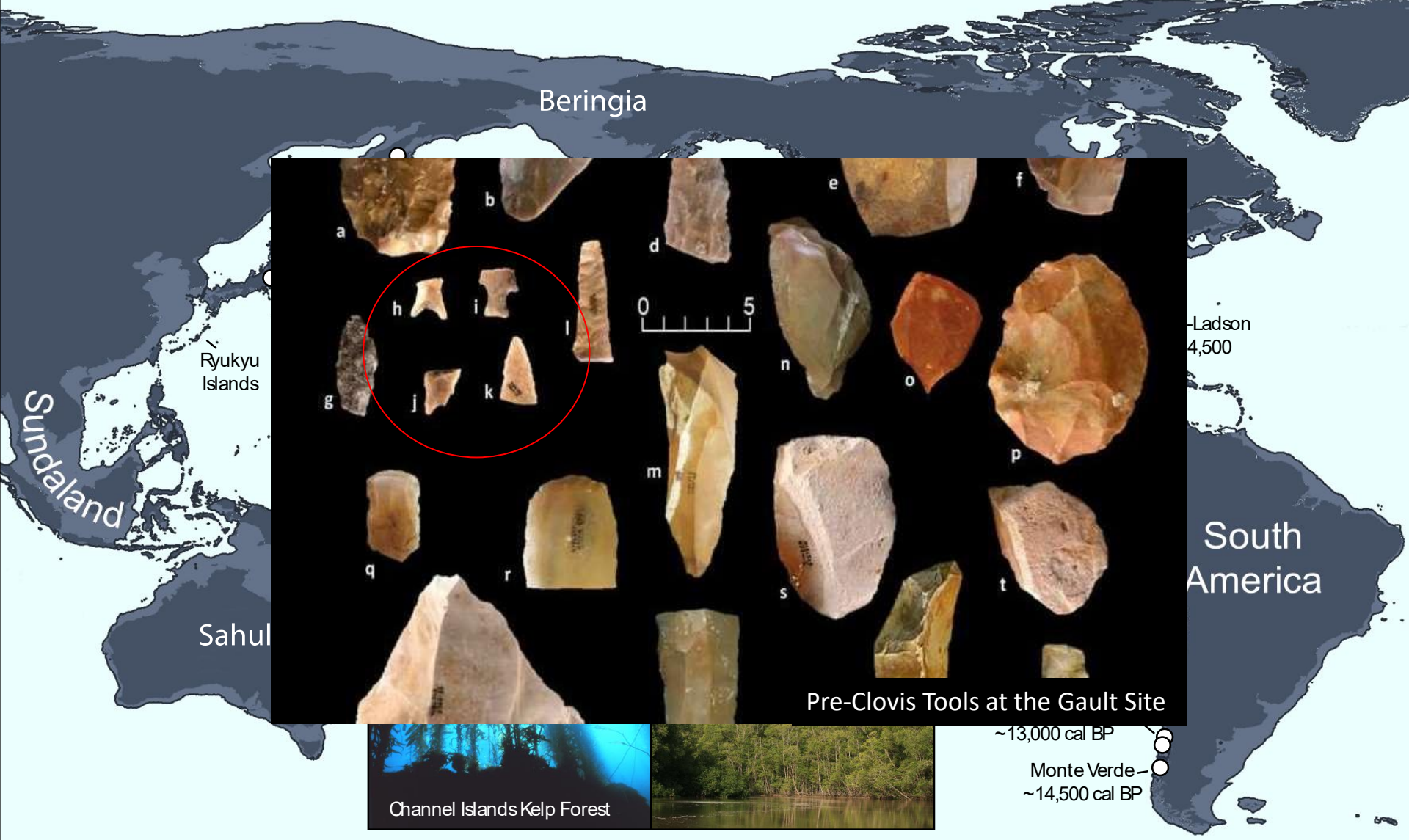
Horse: 13,130 yrs old

Stemmed Pt:
~13,000 yrs old

Human Coprolite, ~14,300 yrs old



“Tanged” Incipient Jomon Points from Japan, ~16,000-13,000 cal BP



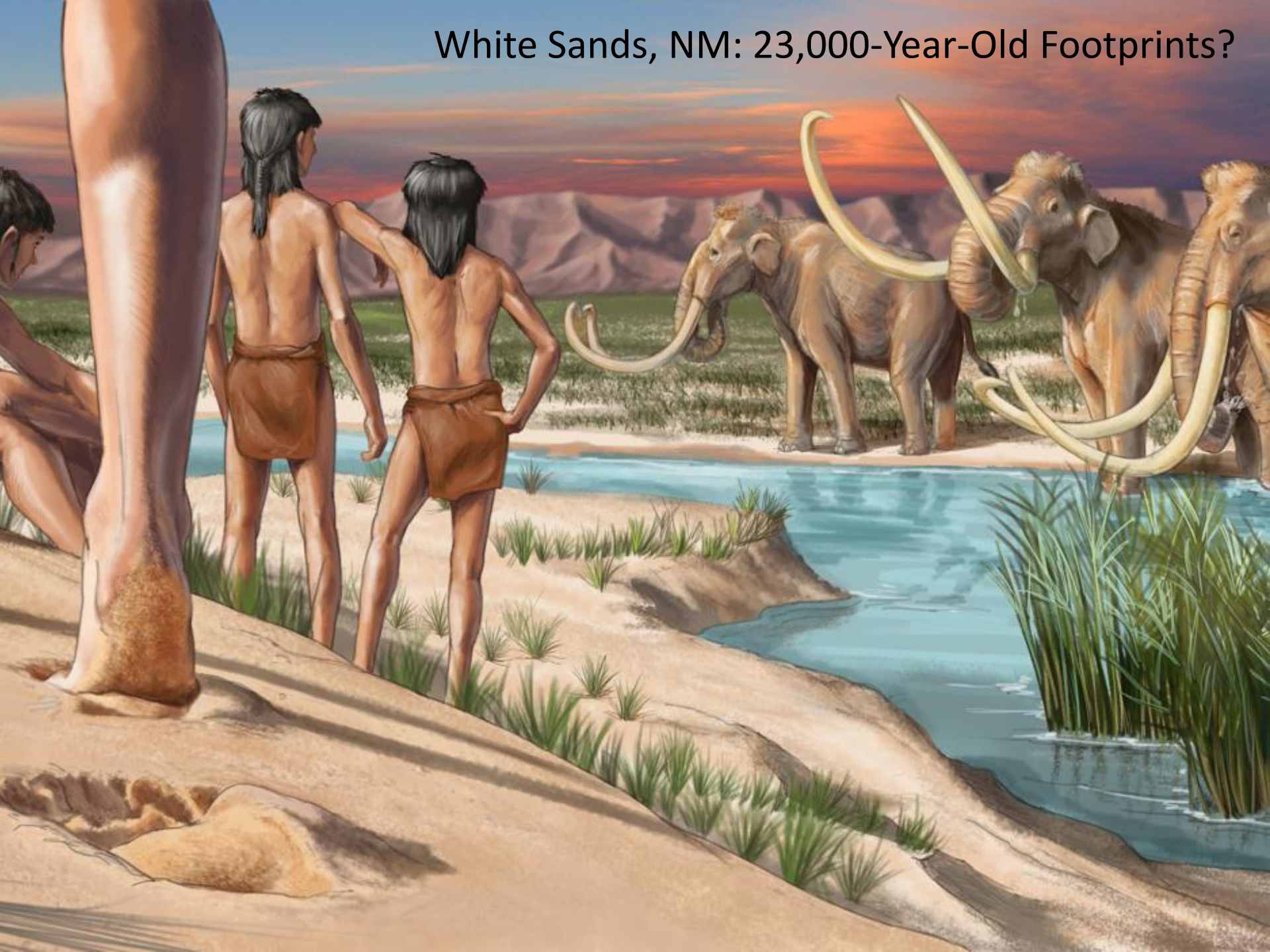
PERSPECTIVE | ARCHAEOLOGY

Finding the first Americans

Todd J. Braje[1], Tom D. Dillehay[2], Jon M. Erlandson[3], Richard G. Klein[4], Torben C. Rick[5]

The Late Pleistocene Distribution of Stemmed Projectile Points Around the Pacific Rim

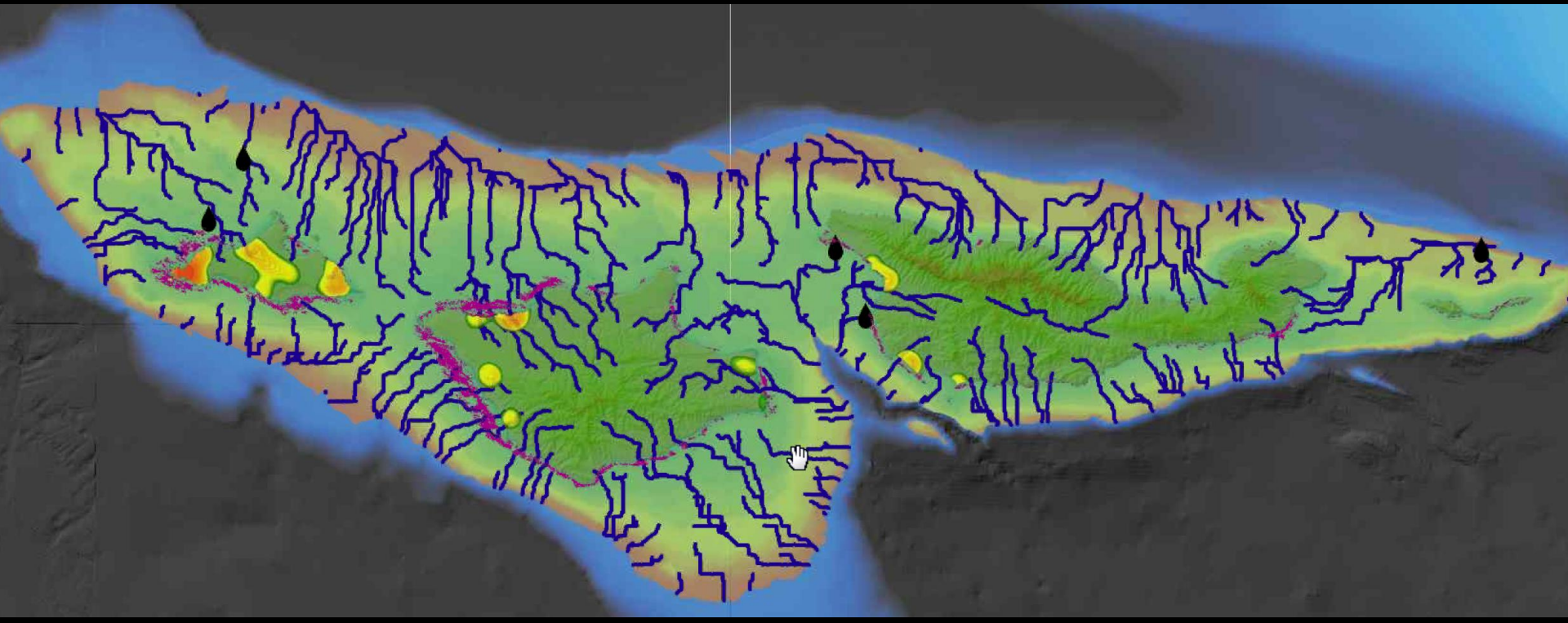
Braje et al. 2017, 2018 *Science*; Erlandson and Braje 2011 *QI*


White Sands, NM: 23,000-Year-Old Footprints?

Archaeology's Last Frontier: Drowned Coastlines and Landscapes of the World.

Monterey Submarine Canyon, California

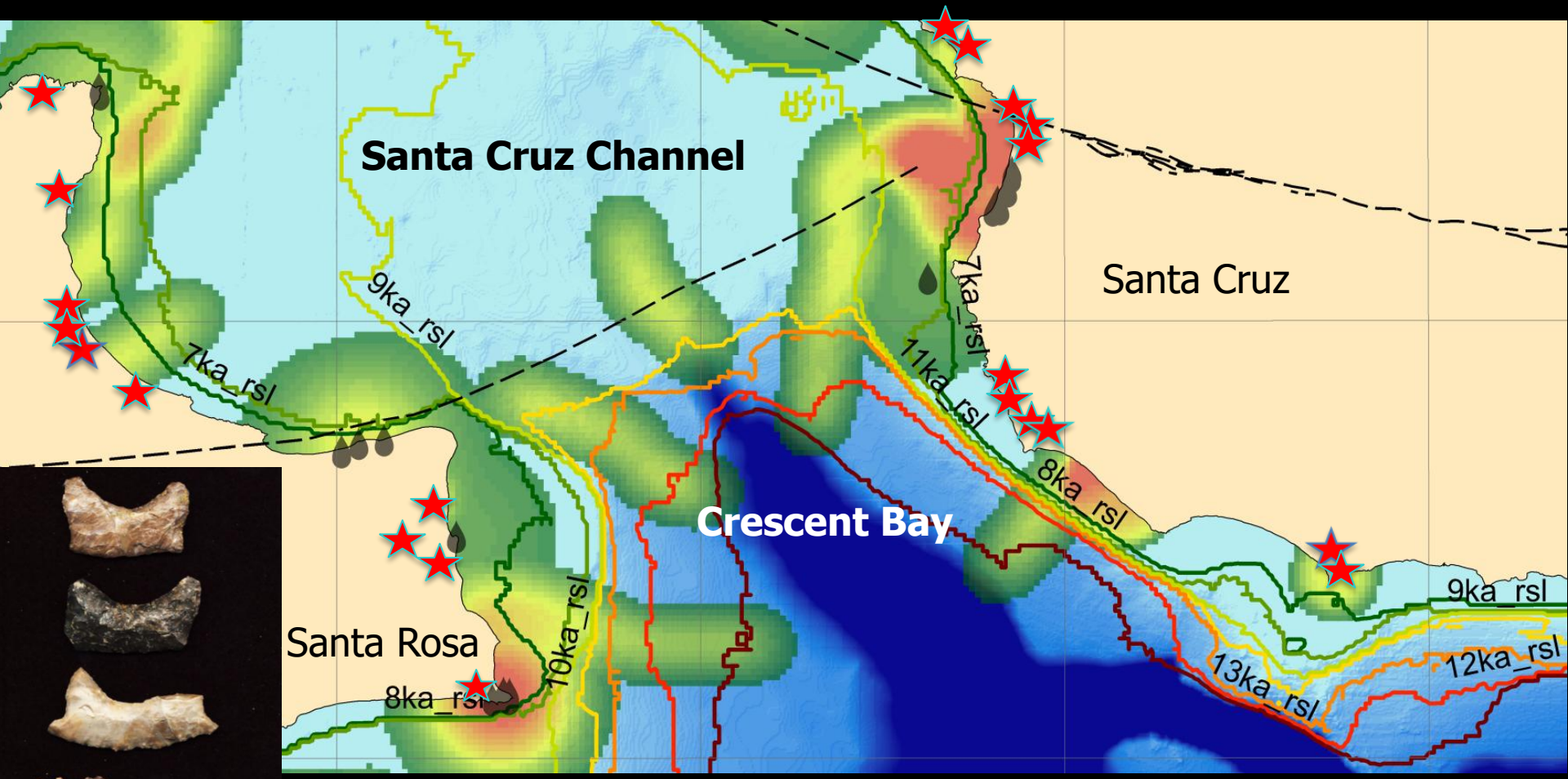
GIS Predictive Model of High Probability Landforms: The NCI as a Model for the Pacific Coast



~1.5 million dollars committed by:

BOEM
Bureau of Ocean Energy Management

~150 data sets, which included: bathymetric, geologic, substrate, sediment cover, sea level curve, hydrology, subaerial site locations, paleoenviro, fault systems data, as well as, previous sonar surveys, nautical charts, hydrographic survey data, fishing maps, benthic habitat studies, and terrestrial envir. data

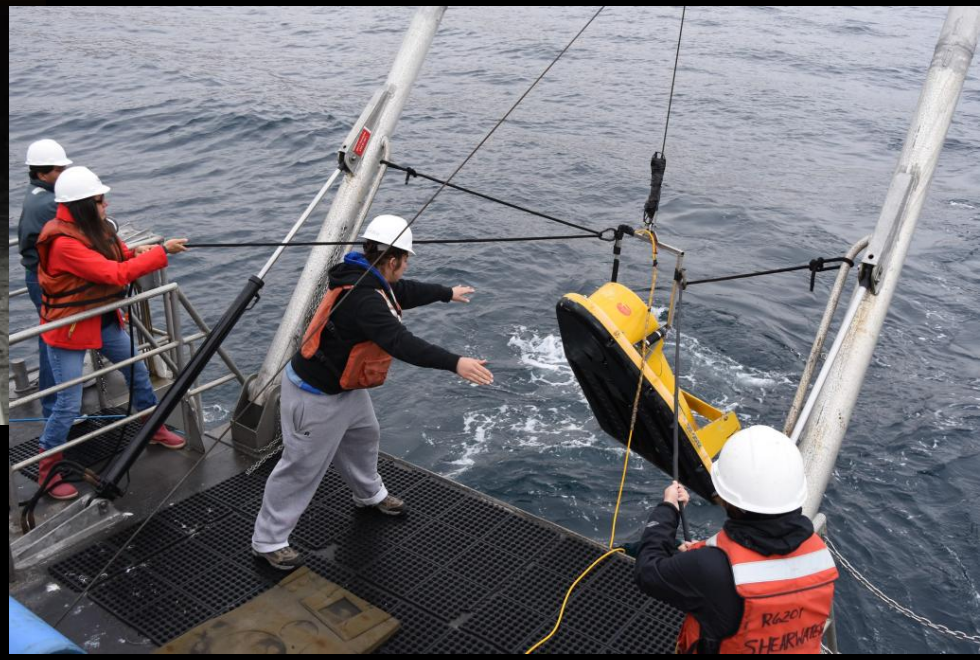


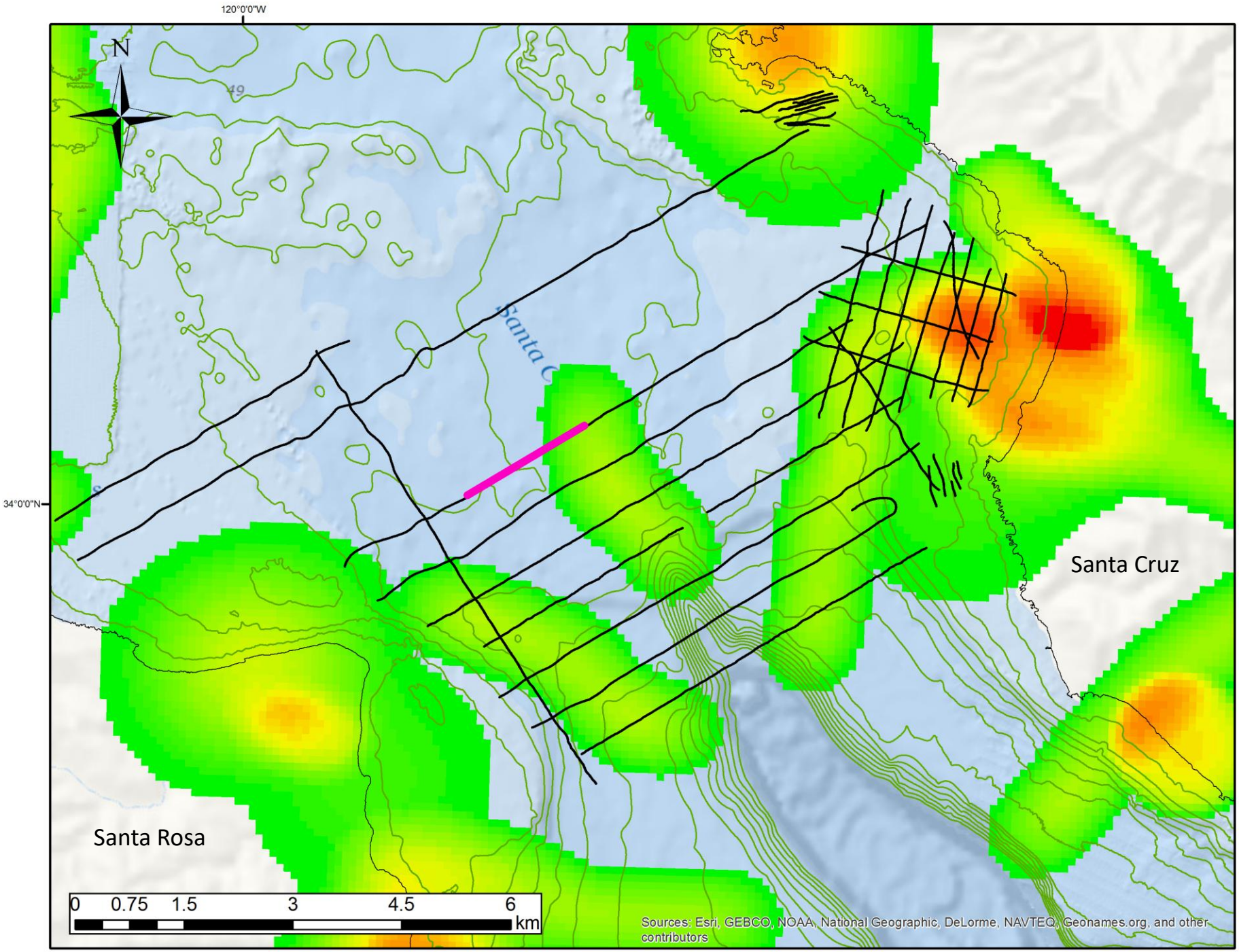
High Probability Areas in Red, Yellow, and Green

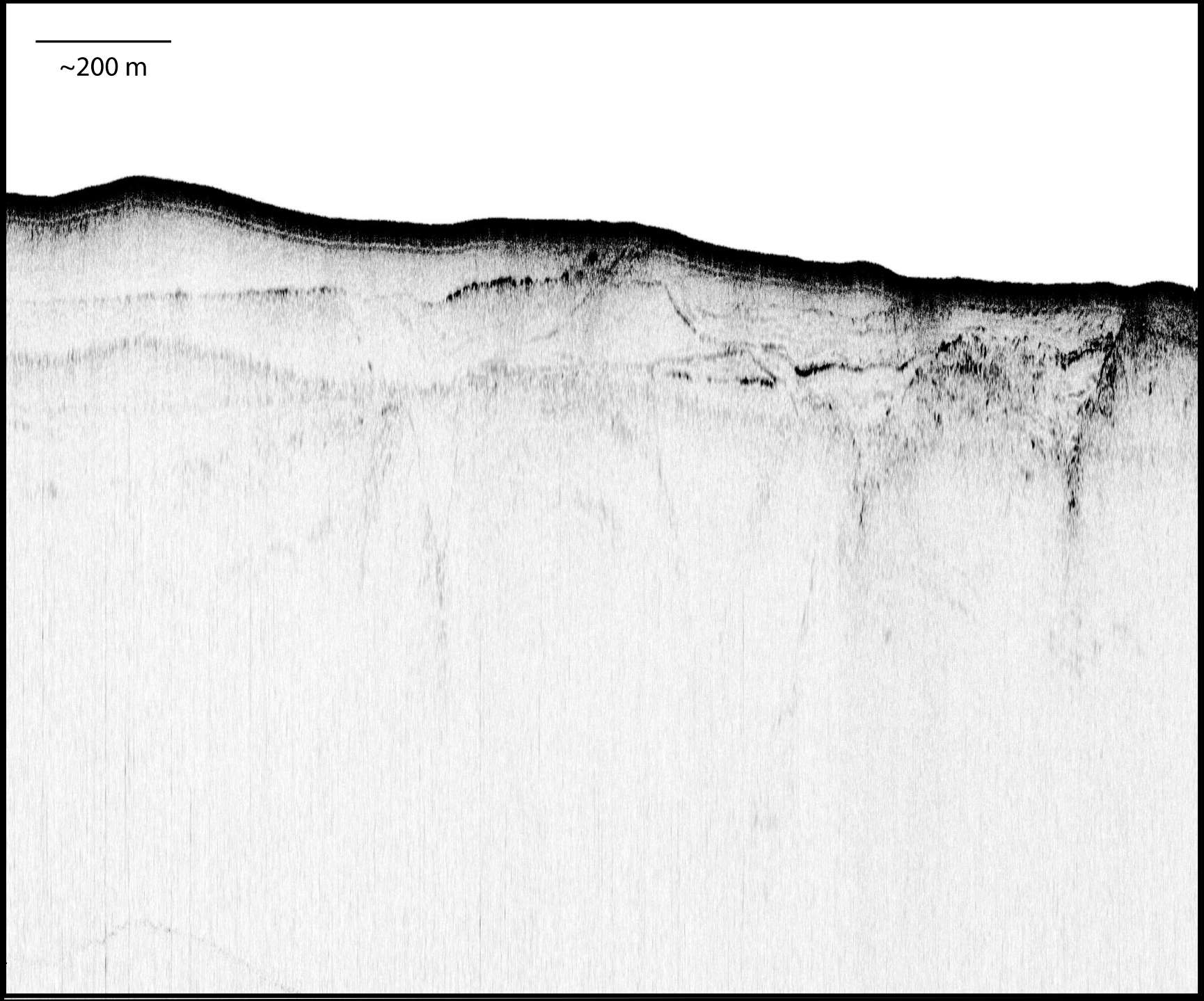
★ Paleocoastal or Early Holocene Site


Progradational units
Transgressive surface
Gas
progradation direction
VAA


EdgeTech Full Spectrum
Full Spectrum




120°0'0"W
34°0'0"N
N
Santa Rosa
Santa Cruz
0 0.75 1.5 3 4.5 6
km
Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, NAVTEQ, Geonames.org, and other contributors


~200 m

~200 m

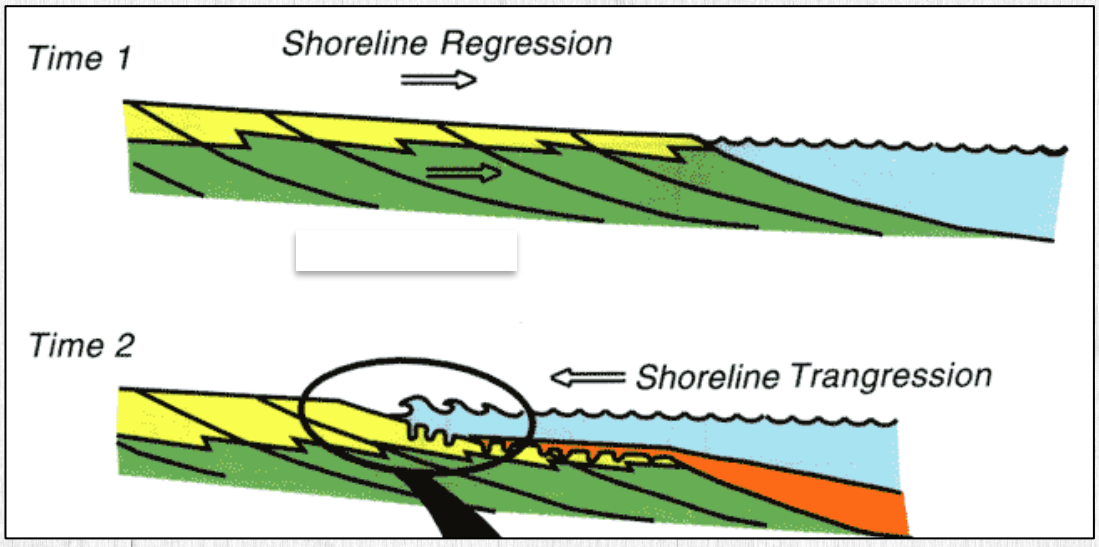
Transparent Holocene sediment

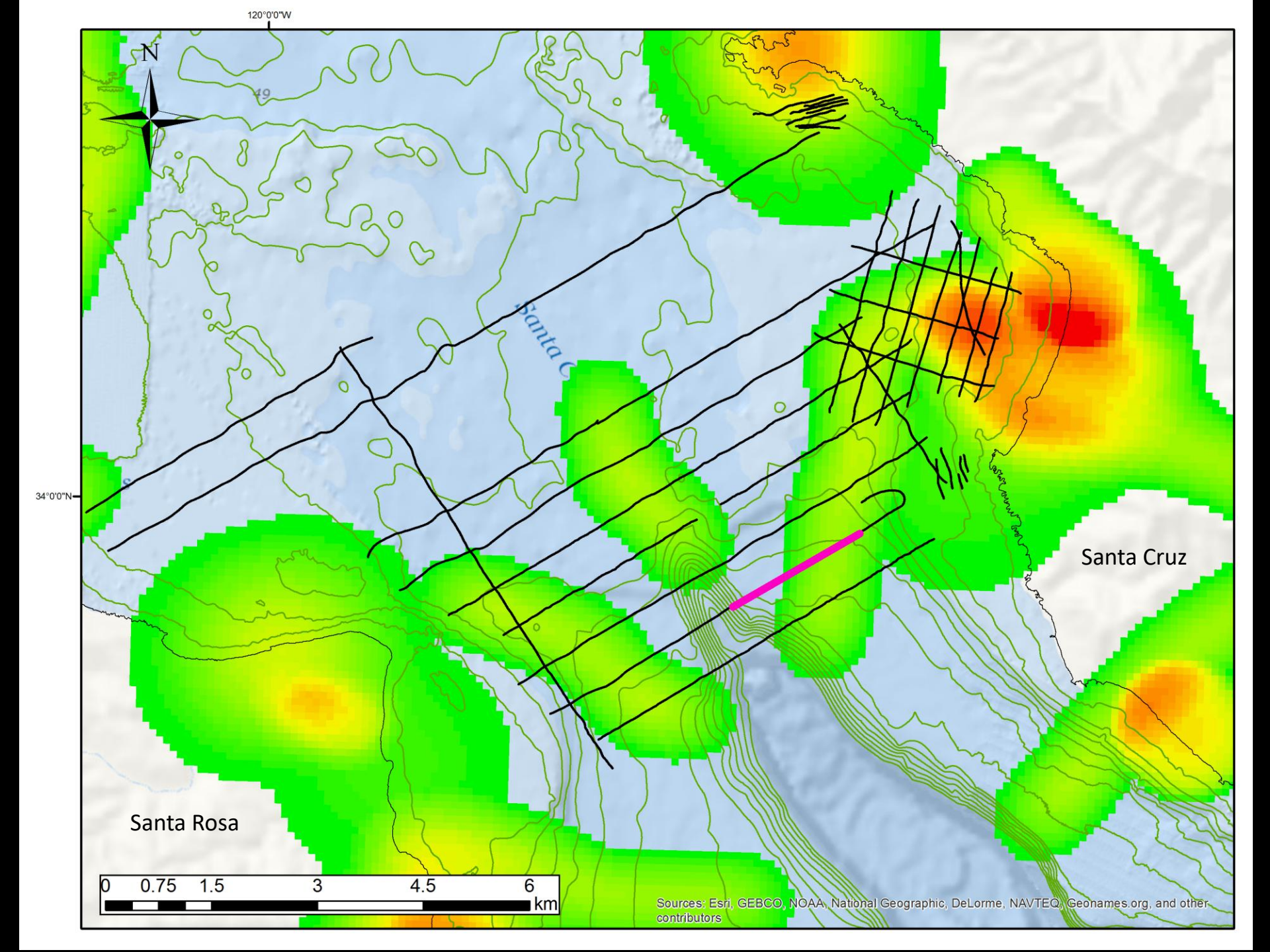
High-amplitude reflectors at levees

Trangressive Surface

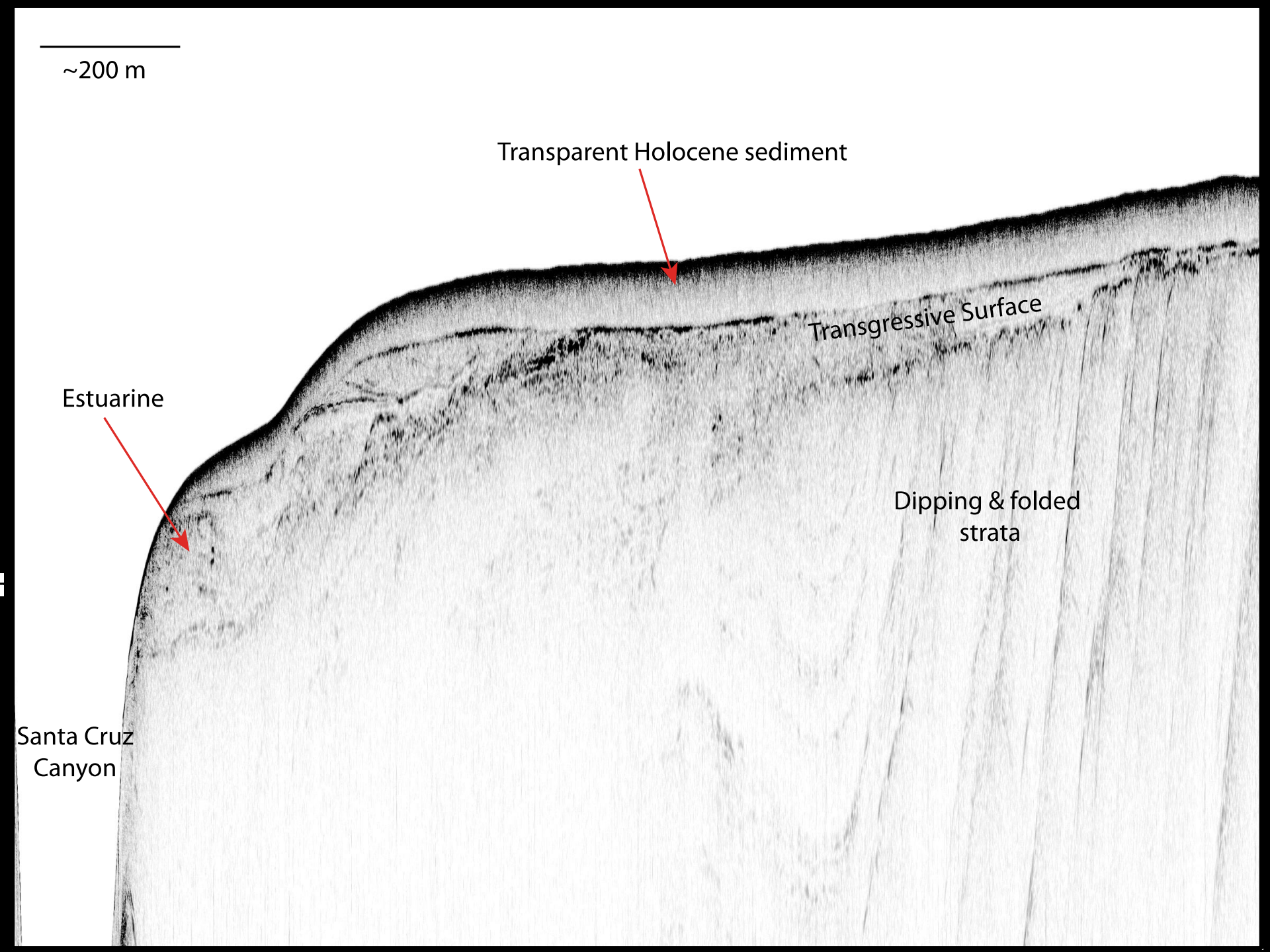
Multiple

Paleochannel



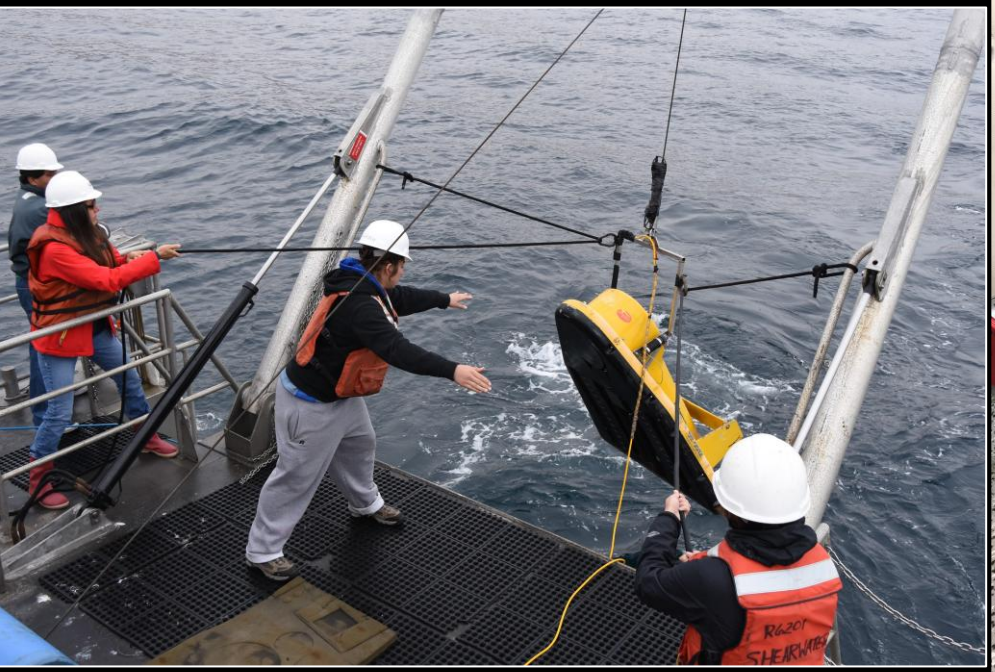

120°0'0"W
N
34°0'0"N
Santa Cruz
Santa Rosa
0 0.75 1.5 3 4.5 6
km
Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, NAVTEQ, Geonames.org, and other contributors


~200 m


~200 m
Transparent Holocene sediment
Transgressive Surface
Estuarine
Dipping & folded strata
Santa Cruz Canyon

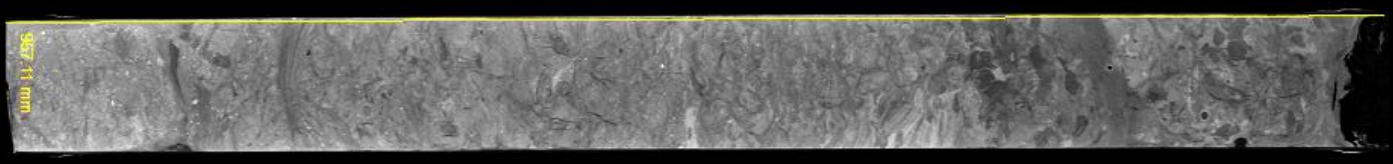
Feb. 2018

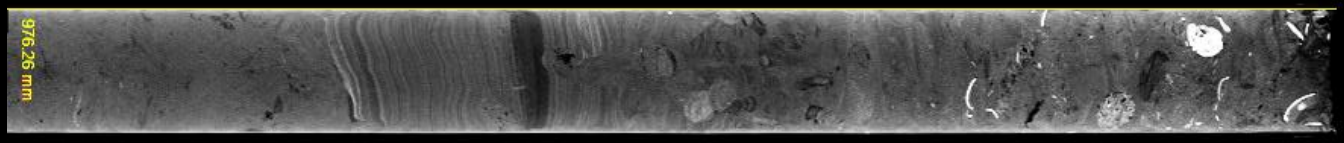
26 Cores; 75 – 25 m depth; Longest core 2.5 m



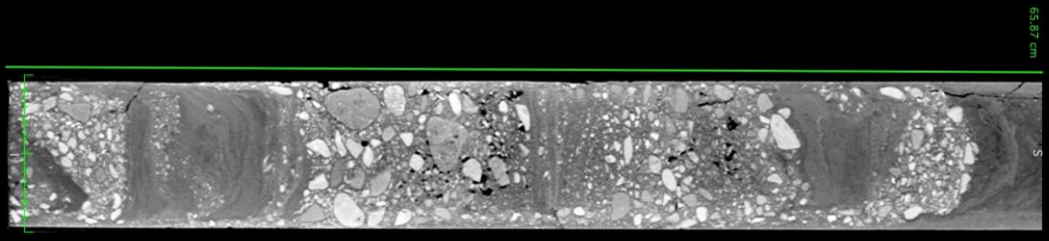
- Physical & chemical properties
- Radiocarbon dates
- Pollen & eDNA

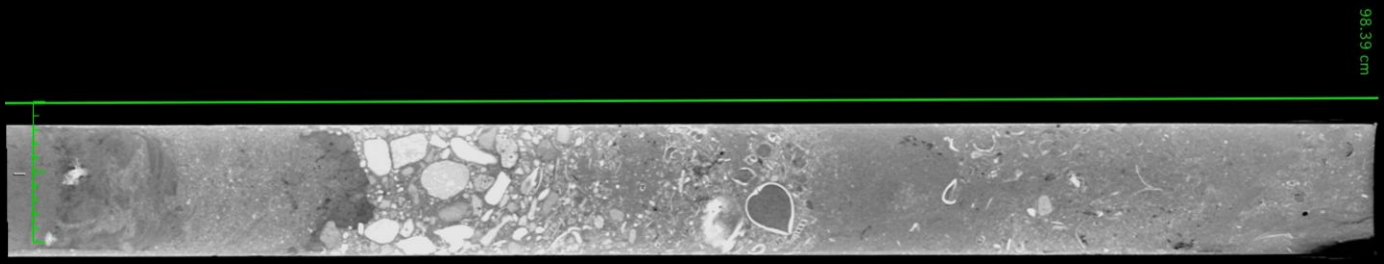
Oregon





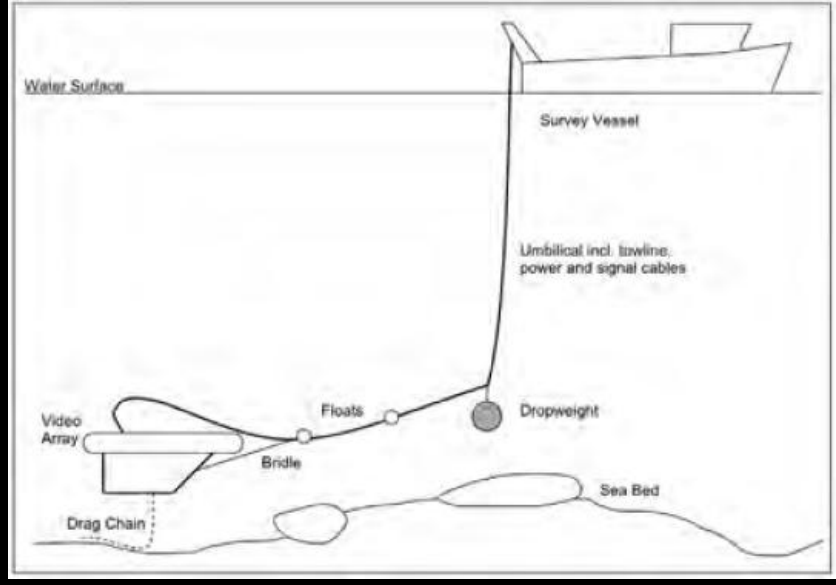
N. Channel Islands

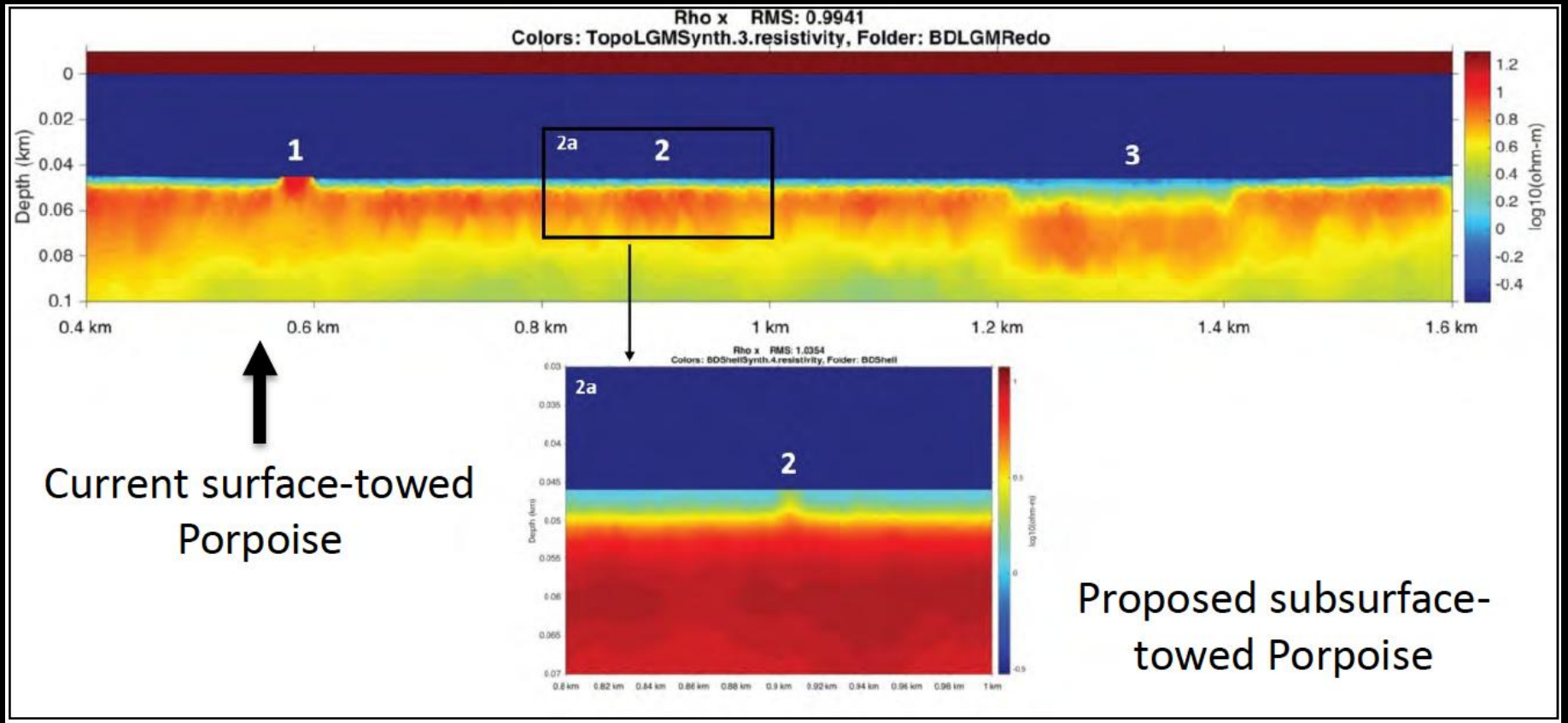




Controlled source electromagnetic (CSEM) equipment

- Porpoise system – SCRIPPS Institution of Oceanography
- Measure different variable
- Reduce viable targets





Conclusions

1) The peopling of the Americas has become REALLY interesting!

2) Early Stemmed Point traditions in the Far West may mark a Pacific Rim migration from NE Asia to the Americas starting ~16,000 years ago (see Erlandson and Braje 2011).

3) Methodological and analytical advances are moving us closer than ever toward understanding when, how, and why people first colonized the Americas.

4) Finding submerged sites is a process (one that has only just begun). Focusing on paleolandforms is the necessary first step.

Project Collaborators

Jillian Maloney, San Diego State University
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Loren Davis, Oregon State University
Robert Miller, UC-Santa Barbara
David Ball and Donna Schroeder, BOEM
Amy Gusick, NHMLAC
Leslie Reeder-Myers, Southern Methodist University
Jenny Dugan and Mark Page, UC-Santa Barbara
Alexander Nyers, Oregon State University
Bert Ho, NPS Submerged Resources

Supporters

BOEM
National Park Service
Channel Islands National Park
Channel Islands Marine Sanctuary
COAST

Thank You!

Questions?

BOEM
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MUSEUM OF NATURAL AND CULTURAL HISTORY

OREGON