

*UPDATE: Mississippi Offshore Sediment
Resources Inventory: Late Quaternary
Stratigraphic Evolution of the Inner Shelf*

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And of course...



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Clayton Dike
Ph.D. Student



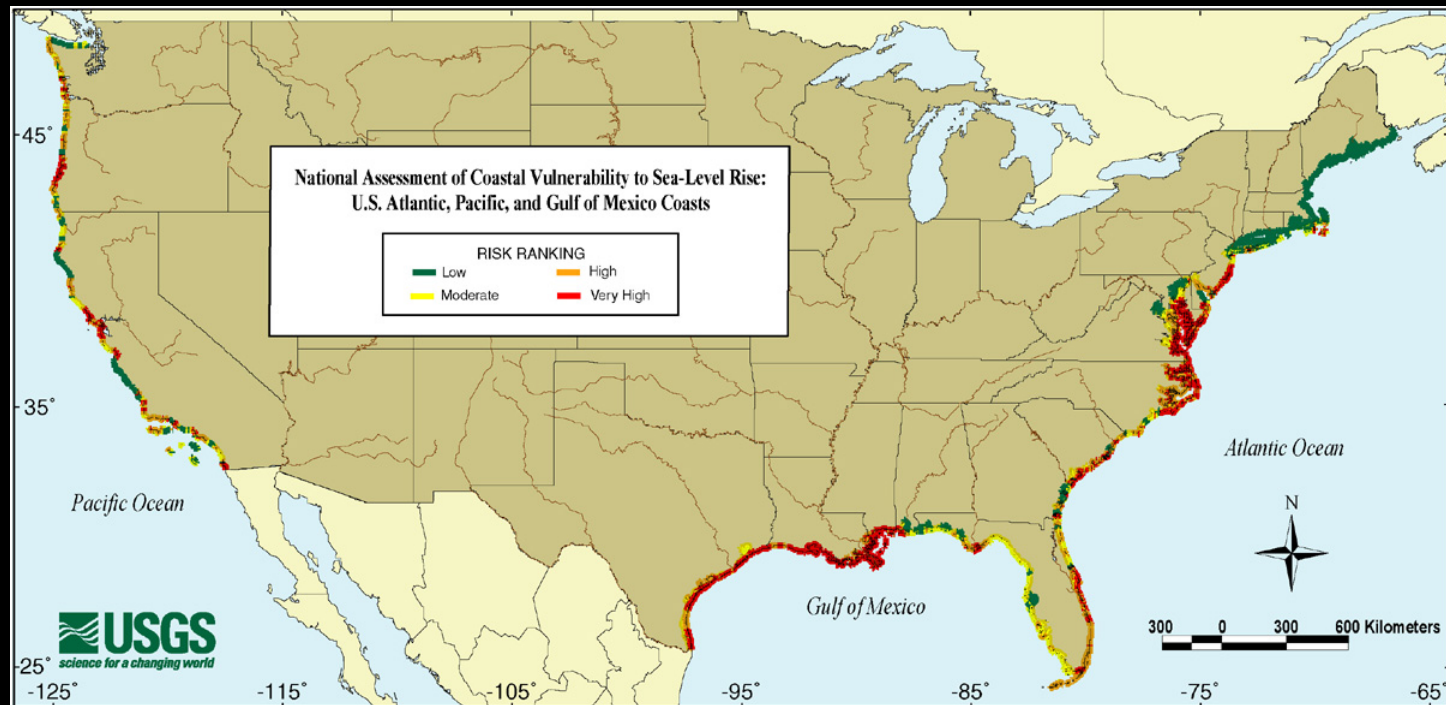
Robert Hollis
M.S. Student



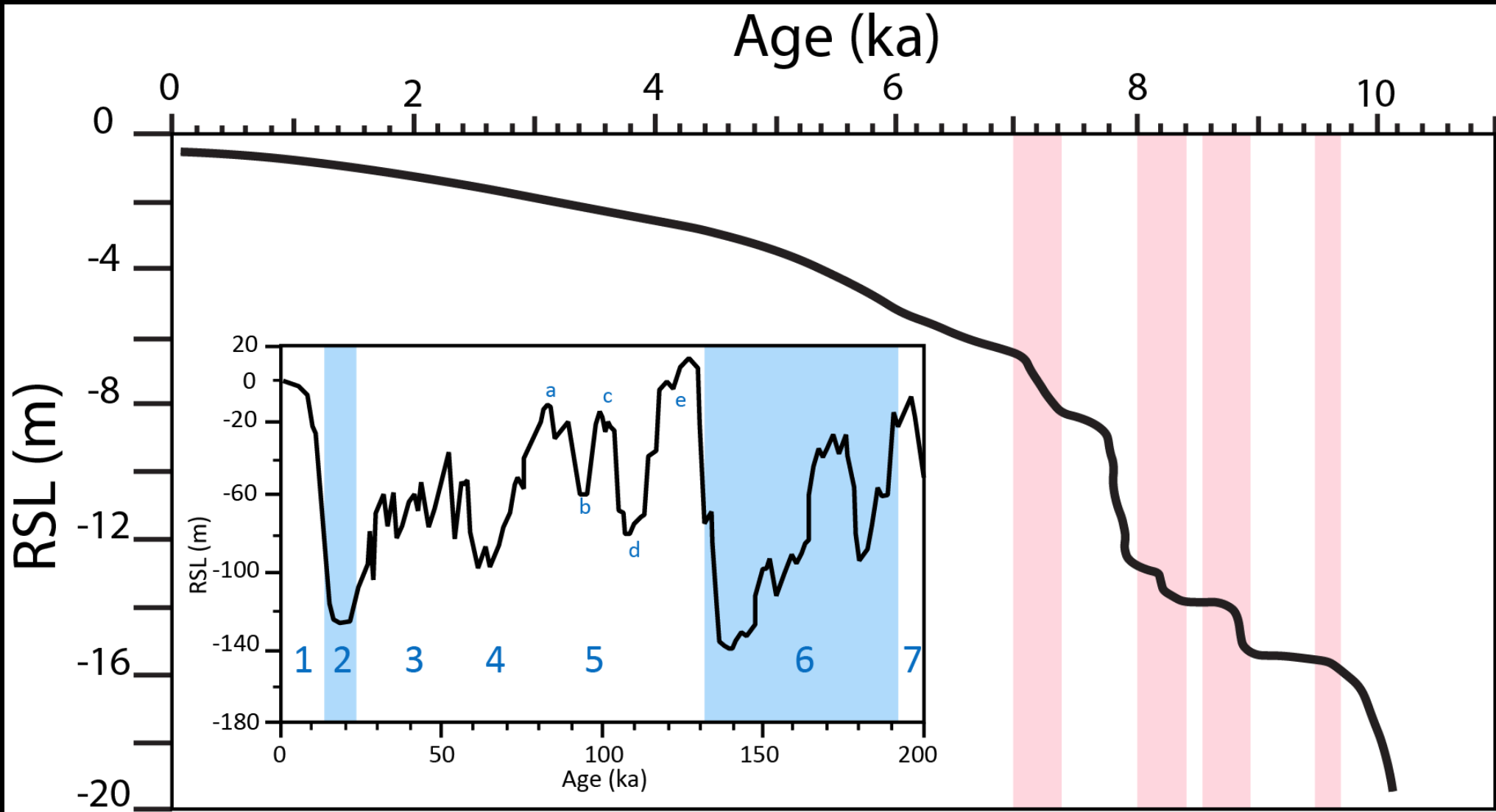
Nina Schulze
M.S. Student

Motivation

- The Gulf coast is among the most eroding and vulnerable coastlines in the United States
- We aim to quantify valuable sand resources on the Outer Continental Shelf in the NGoM
- In doing so, we will also use the geologic record to better understand coastal system response to SLR, storms, and sediment supply variations over geologic and human times
- In tandem, this can help inform coastal management decisions



Sea-level



Hollis et al., in prep

(Anderson et al. 2014, modified from Milliken et al. 2008; Shackleton 2000, 1987)

Motivation

Lowstand (~22-17 ka)

Rivers incise to shelf edge

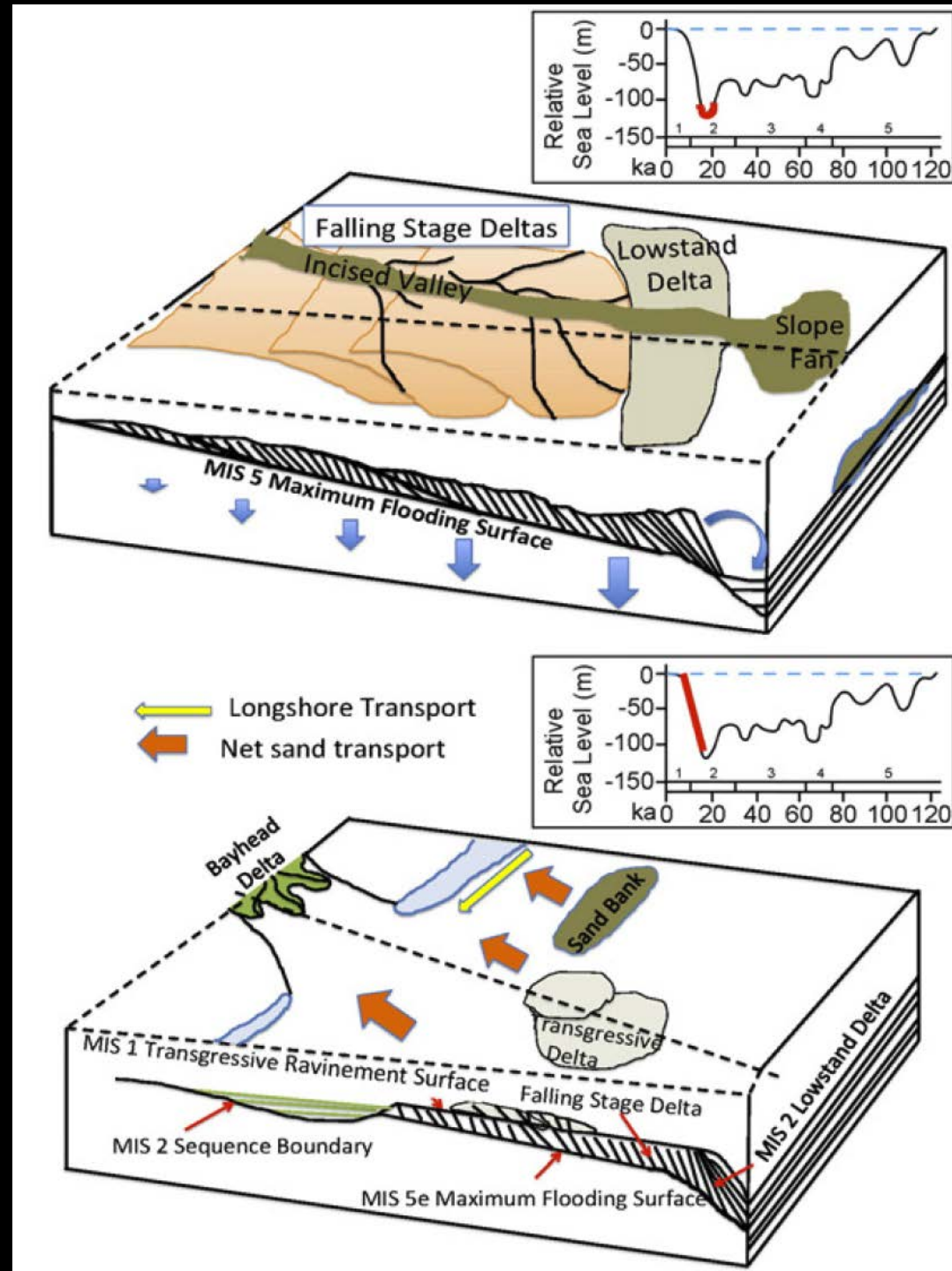
Deltas follow, prograde

Transgression (~17-4 ka)

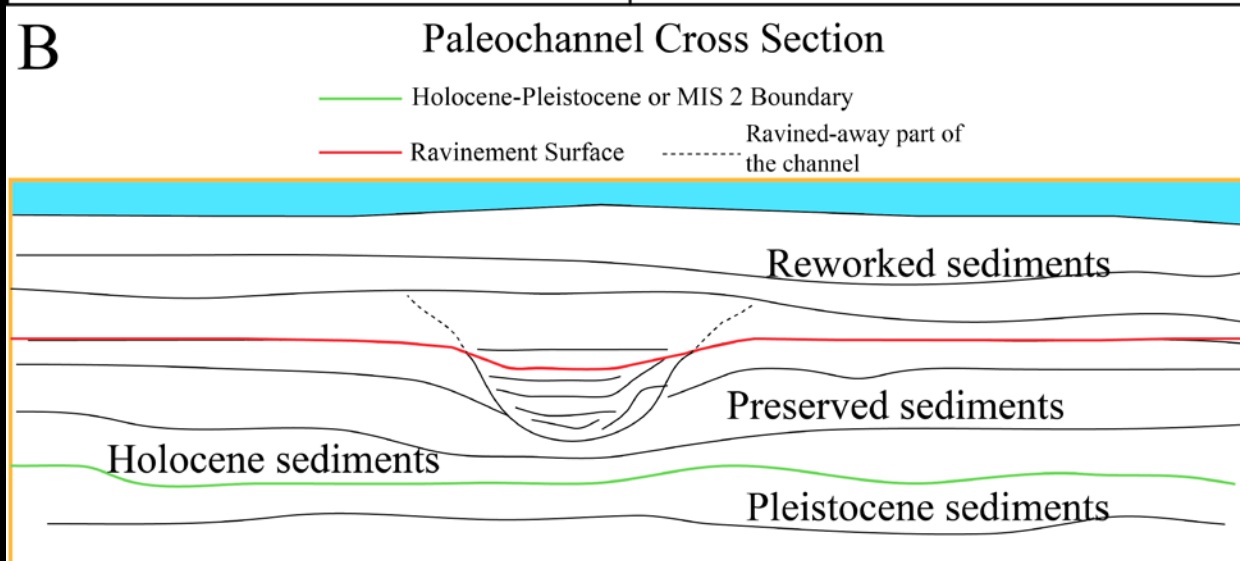
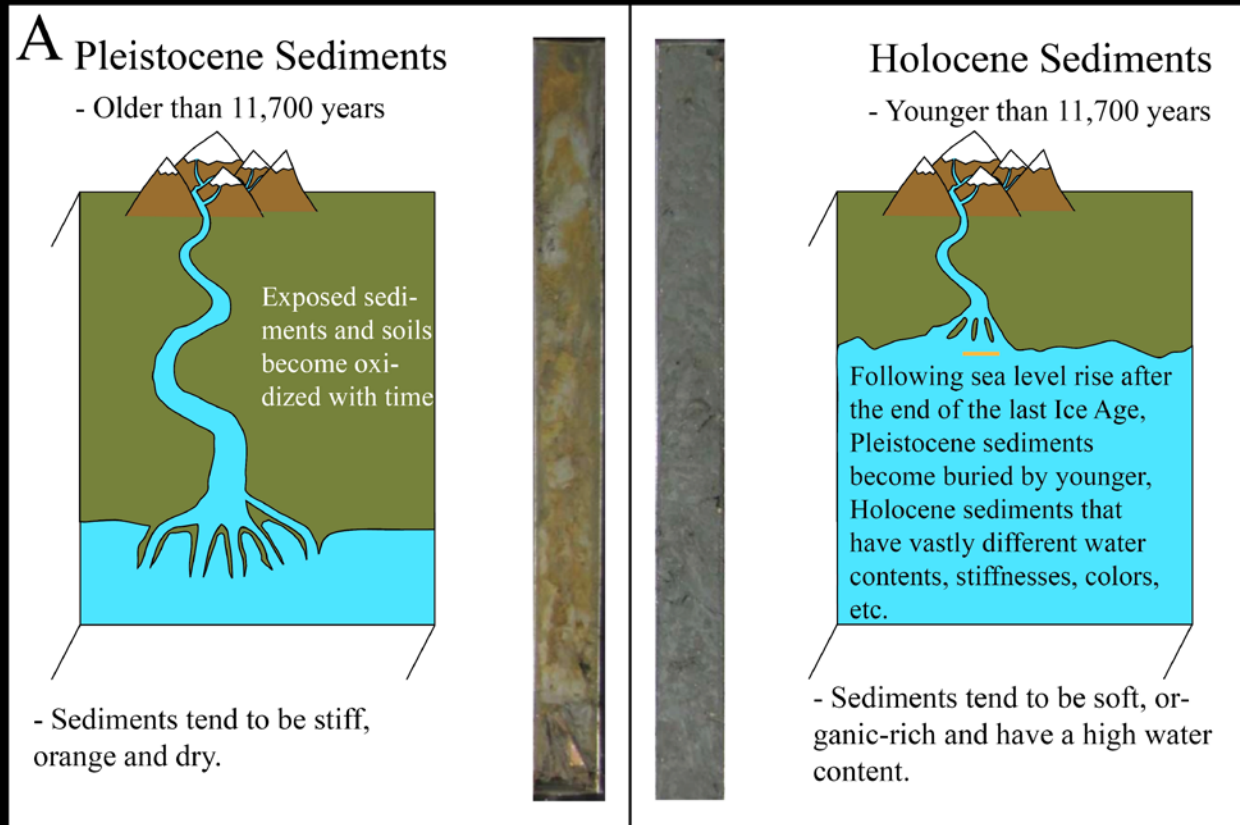
Backstepping environments

Ravinement/erosion

*Anderson et al., 2016,
Earth-Science Reviews*



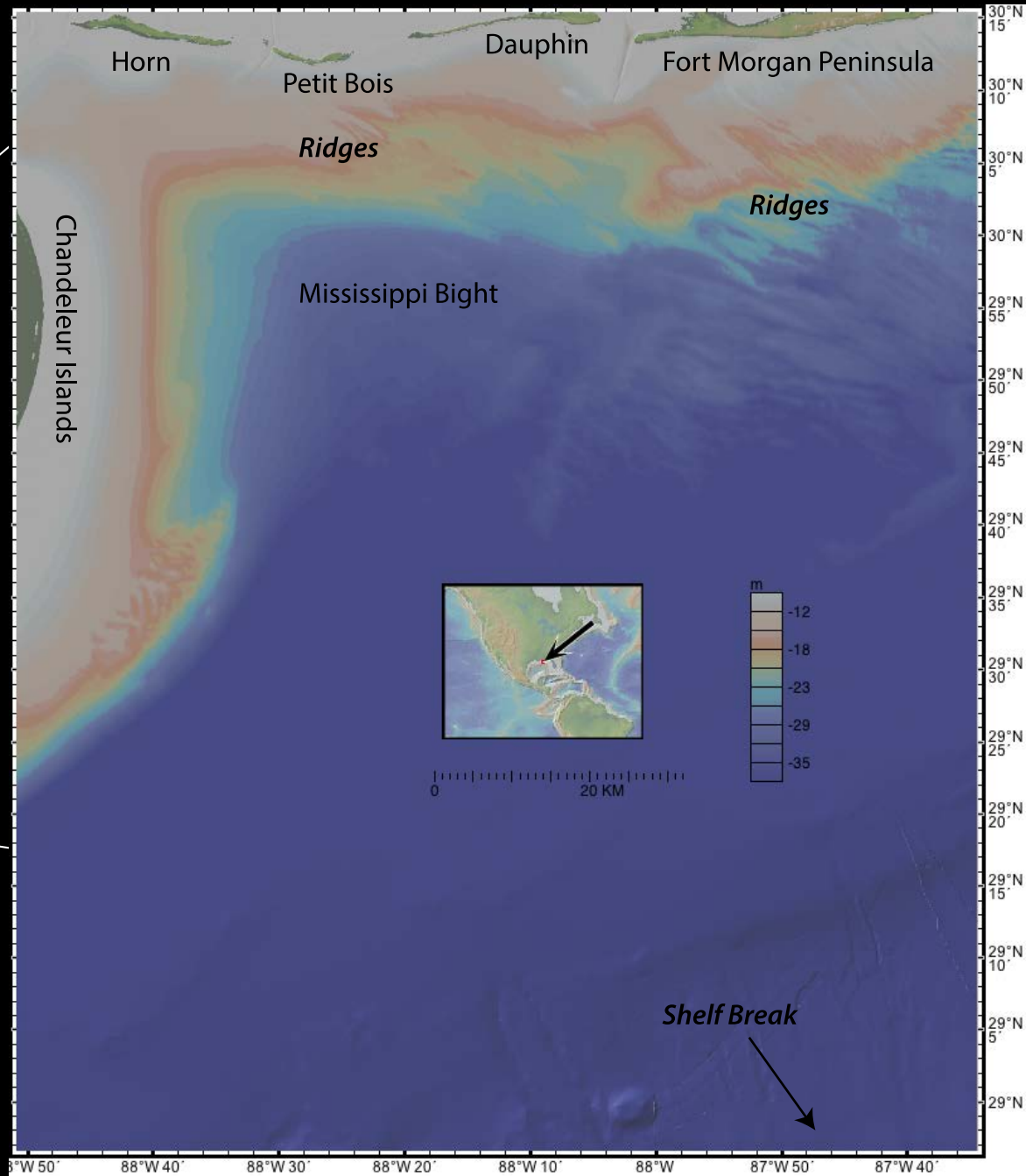
Ravinement Processes



Study Area NGoM



Study Area NGoM

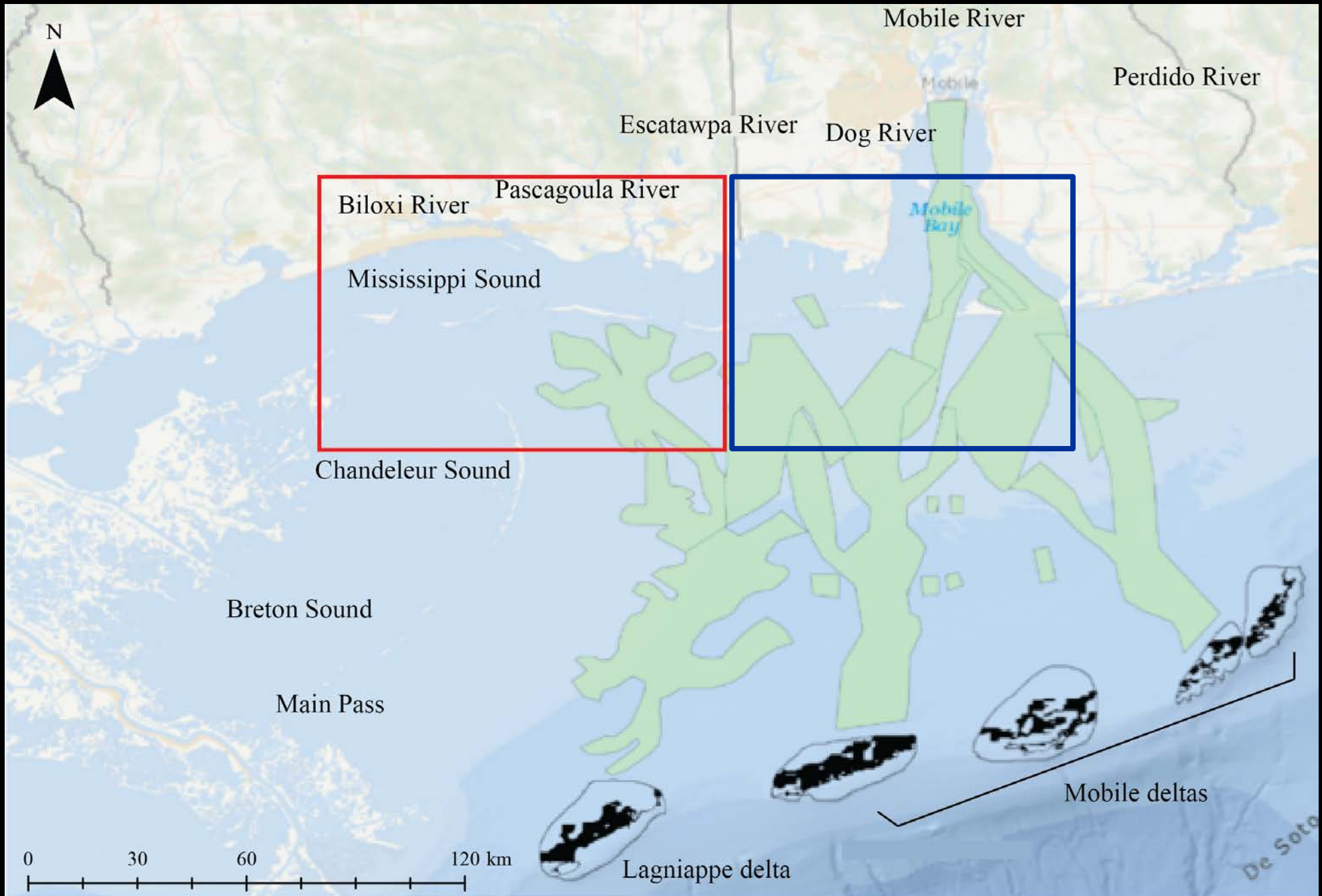


GeoMapApp

Research Tasks

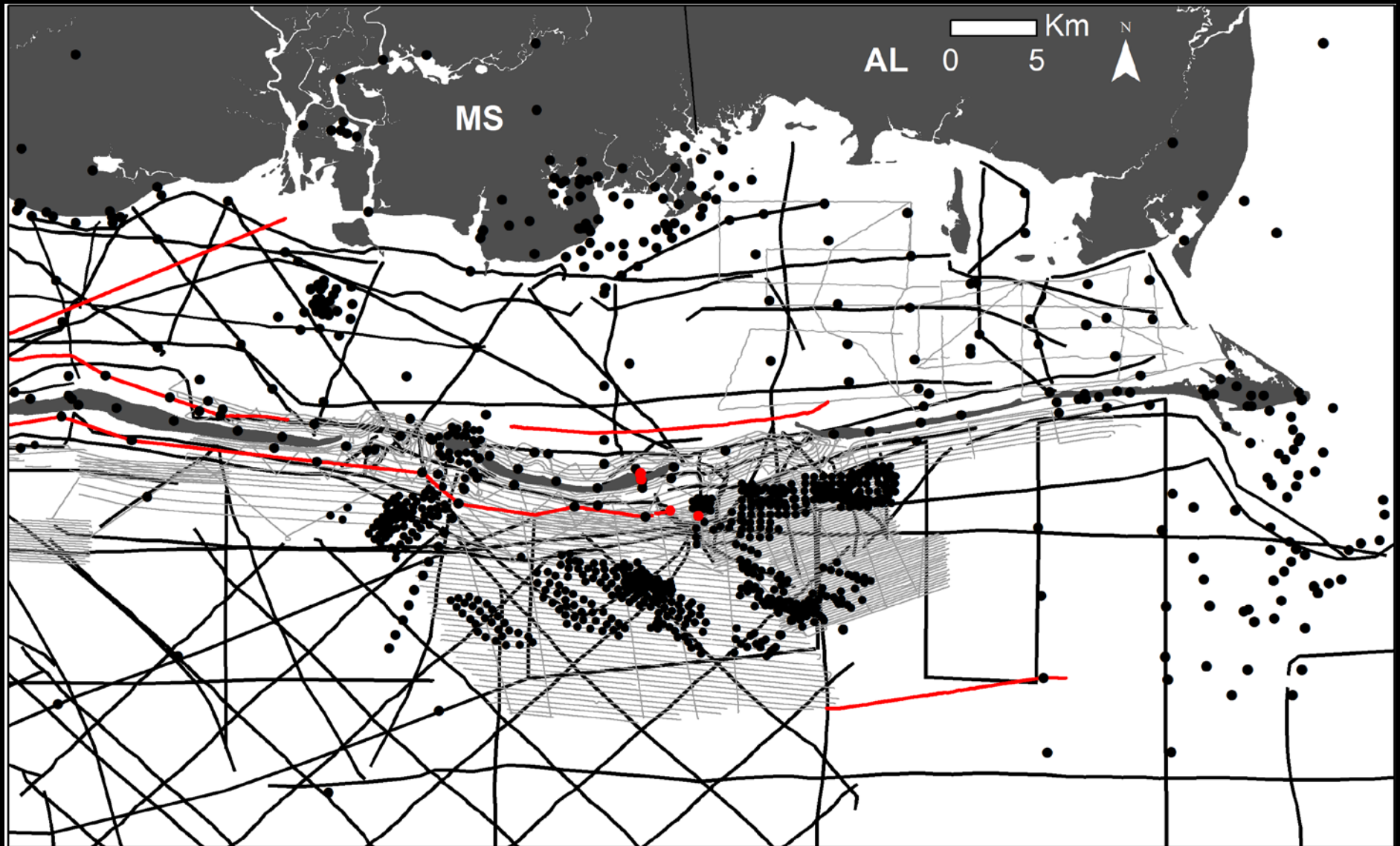
- Collect existing geophysical and geological data (followed by QA/QC)
- Literature review/synthesis/compilation of a reference database
- Develop stratigraphic-based nomenclature and organization scheme for sand-rich lithofacies types
- Collect and analyze new geological and geophysical data
- Develop a conceptual stratigraphic evolutionary model for late Quaternary to recent deposits offshore MS
- Integration of all newly acquired and/or analyzed data, interpretations, and other relevant products into a final spatial database

Previous work (MIS 2 valleys)



From Greene et al., JSR

Geophysical Data



— Seismic

— ● This study

● Sediment Cores

Bosse et al. (2017a)-R/V Erda 91-3 1991
 Bosse et al. (2017b)-R/V Acadiana1987
 Sanford et al. (2016a)-R/V Erda-1 1992
 Sanford et al. (2016b)-R/V Kit Jones 1991,92
 Sanford et al. (2016c)-R/V Gyre 1981
 Sanford et al. (2016c)-R/V Carancahua 1981

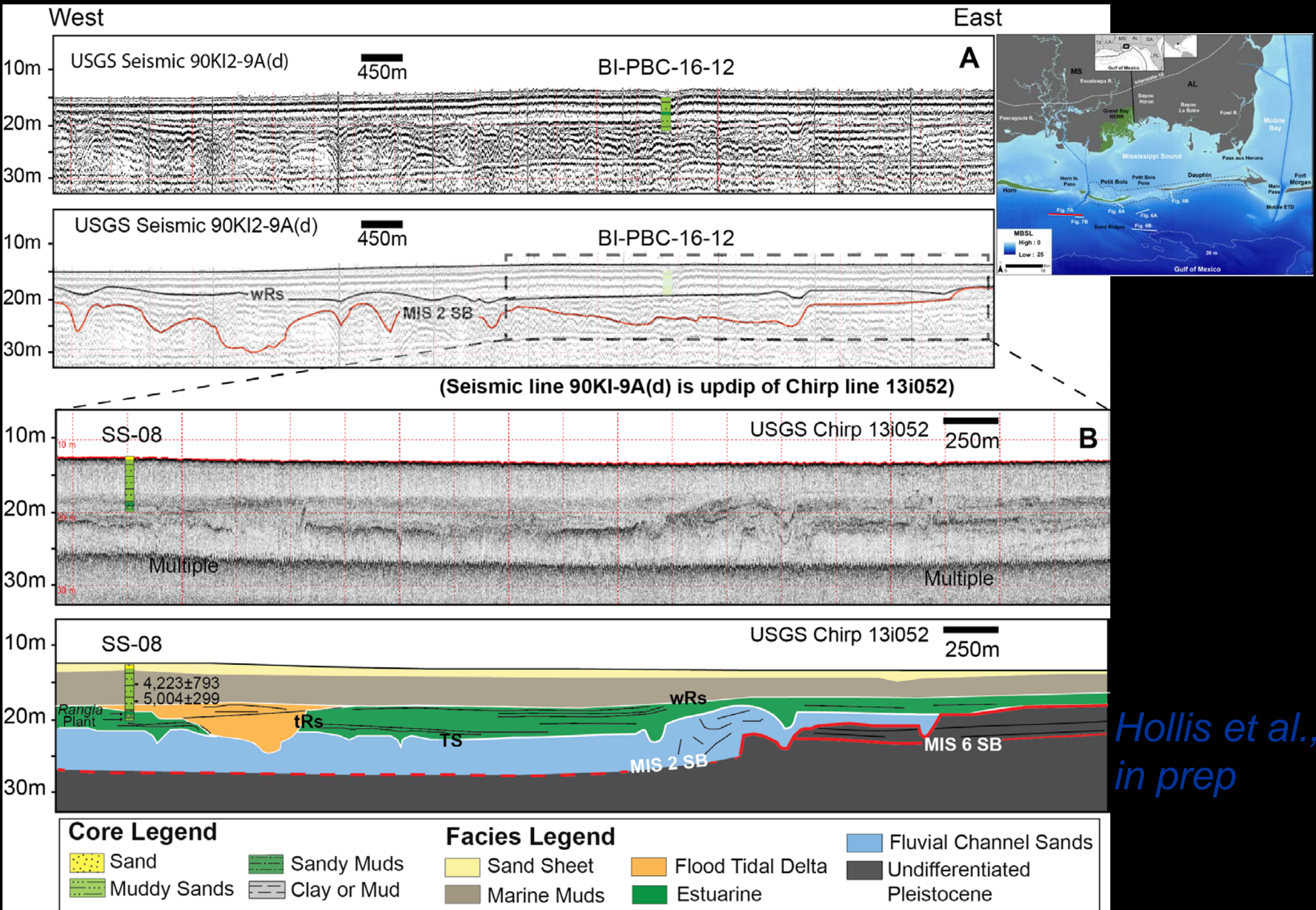
— Chirp

Forde et al. (2011a)-09CCT03,04
 Forde et al. (2011b)-10CCT02, 03
 Forde et al. (2015)-13CCT04
 Greene et al. (2007)

Greene et al. (2007)
 Hummel & Parker (1995)
 Hummel & Smith (1996)
 Kelso & Flocks (2015)

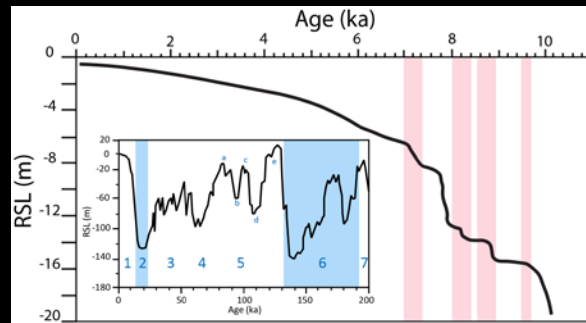
Kramer (1990)
 McBride (1991)
 Otvos (1976)
 Parker (1993)
 USACE (2014)

Geophysical examples

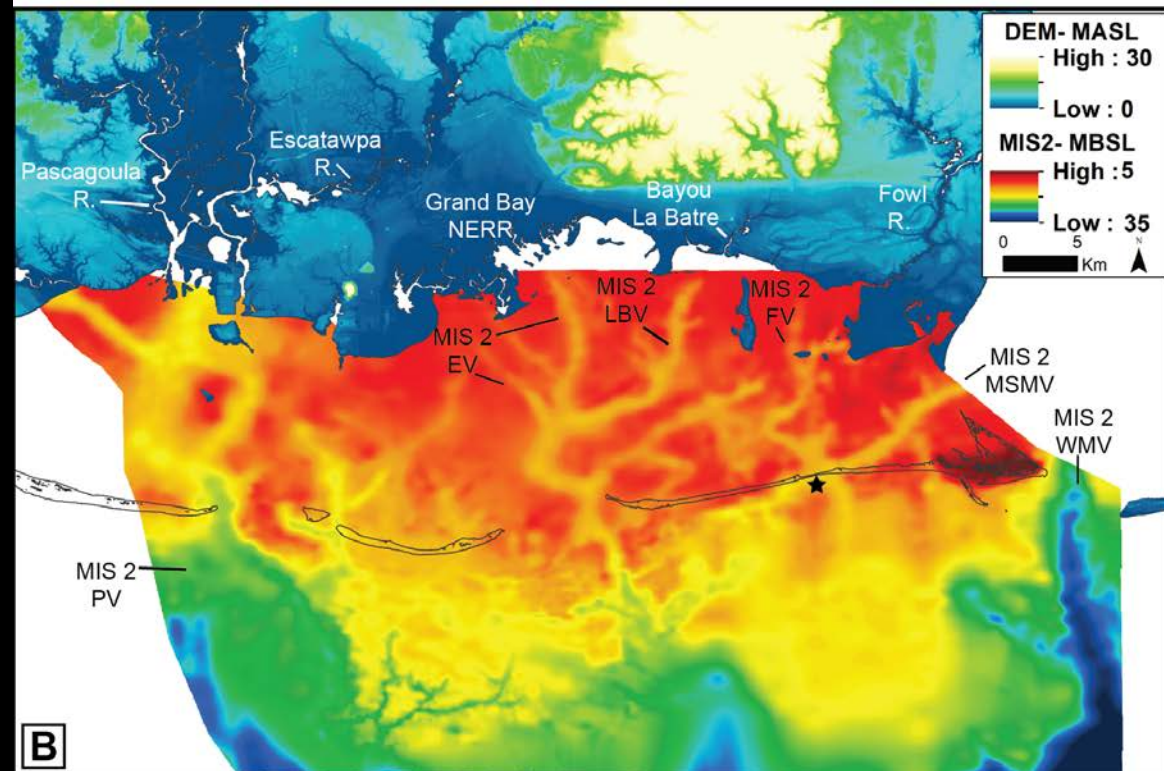
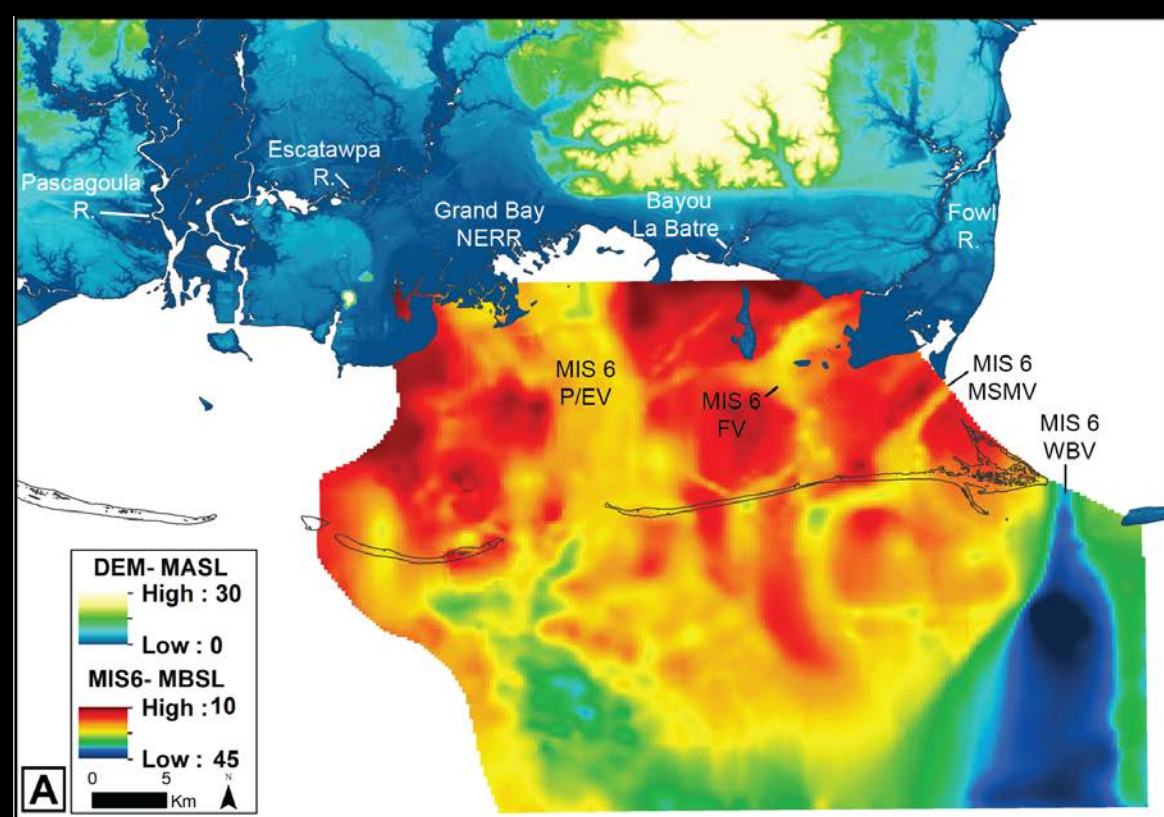
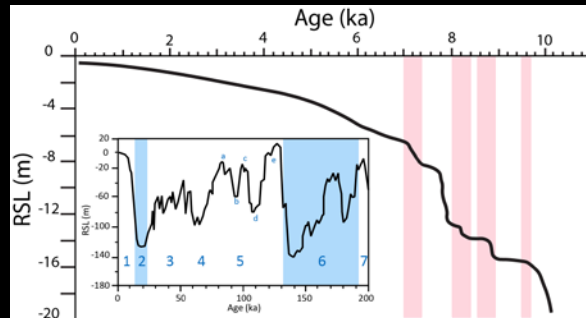


Incised valleys

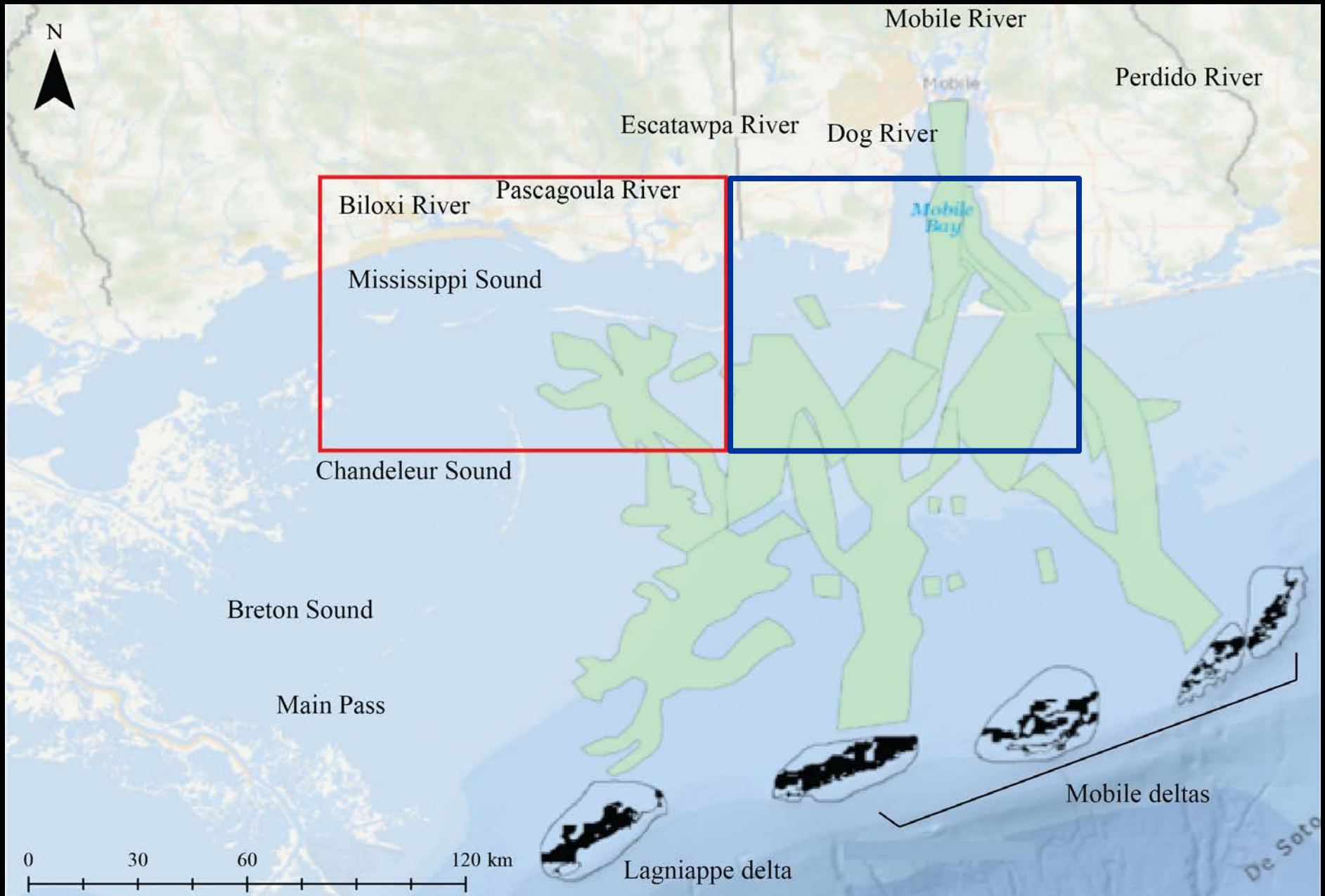
MIS 6



MIS 2

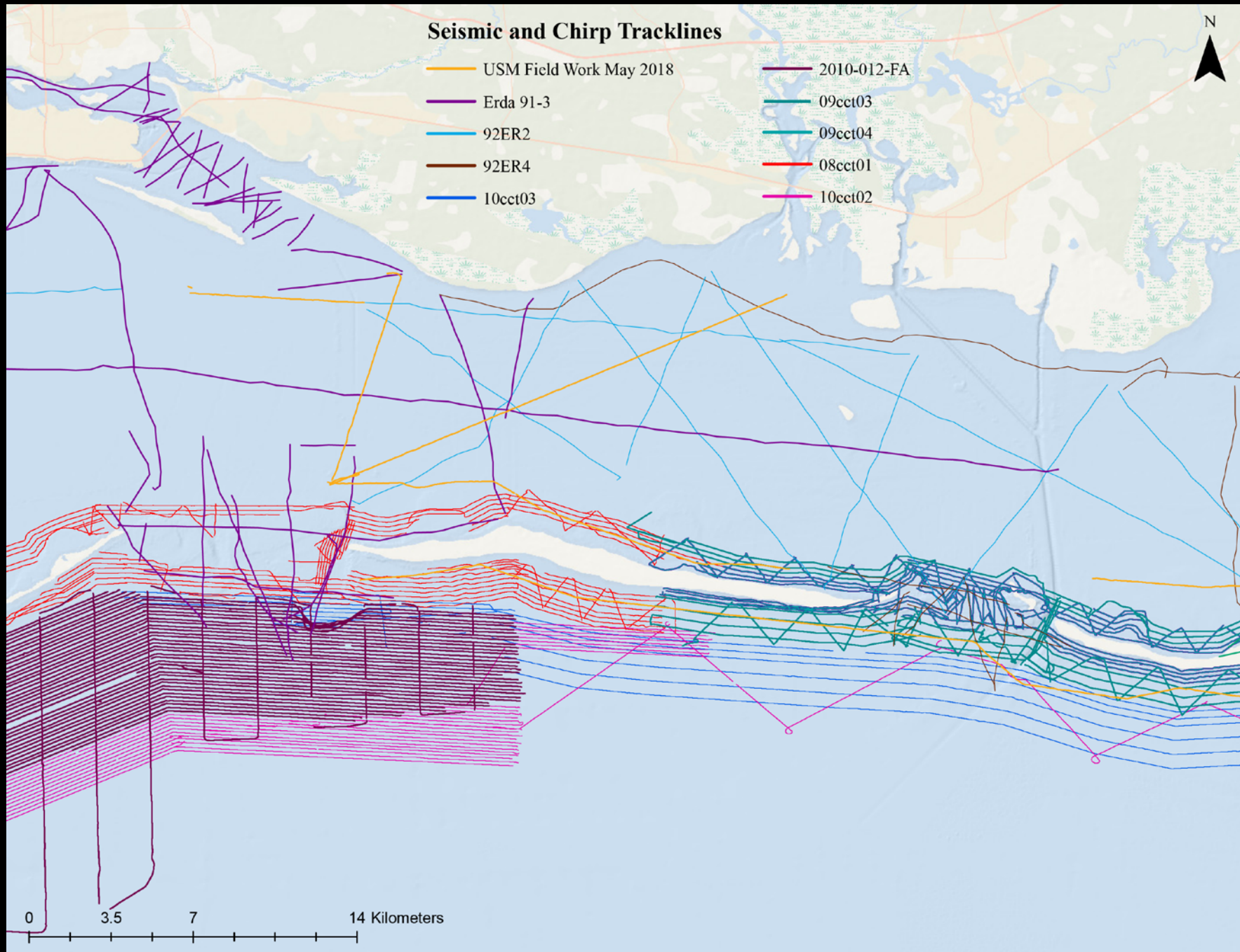


Previous work



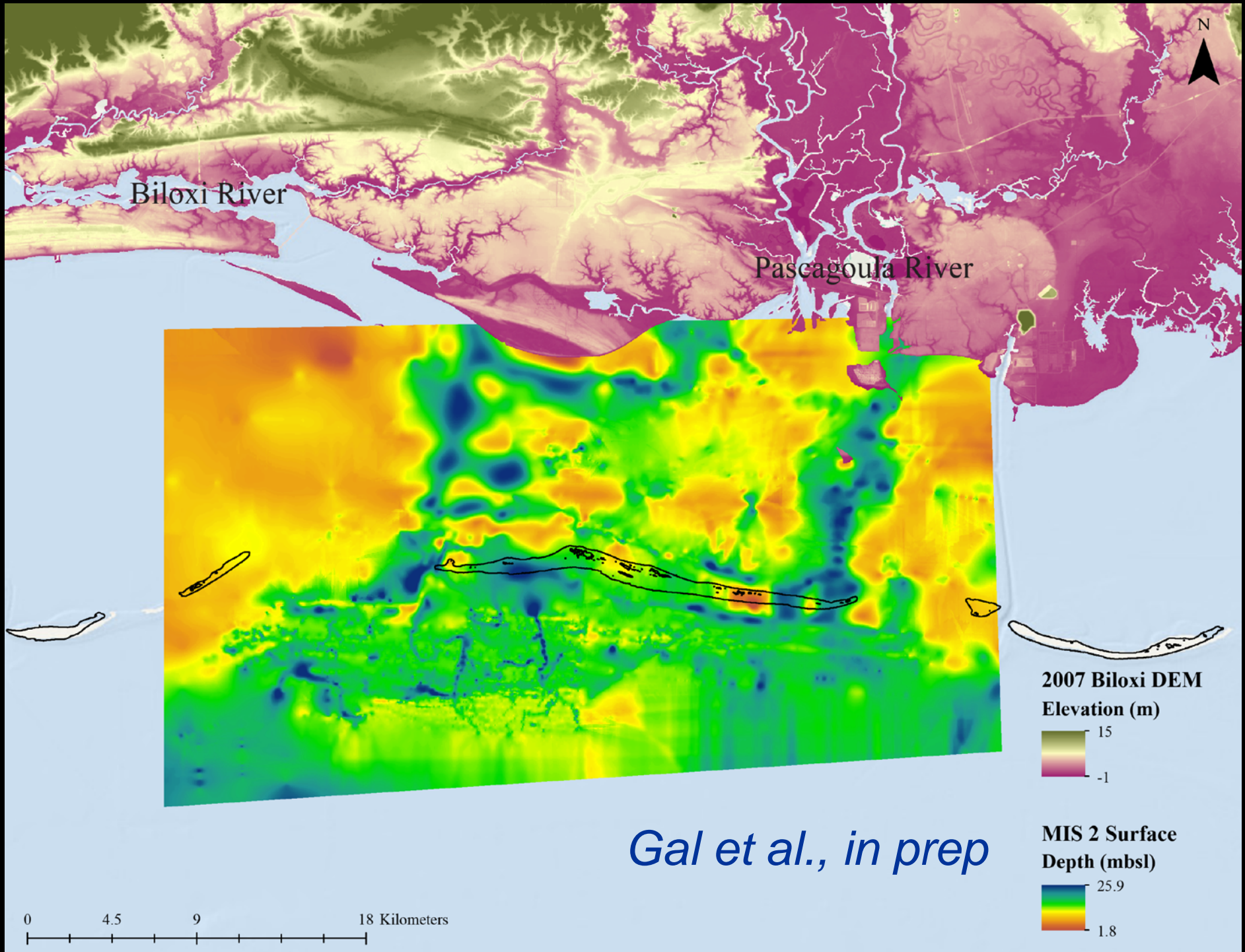
Greene et al., JSR

Geophysical data coverage



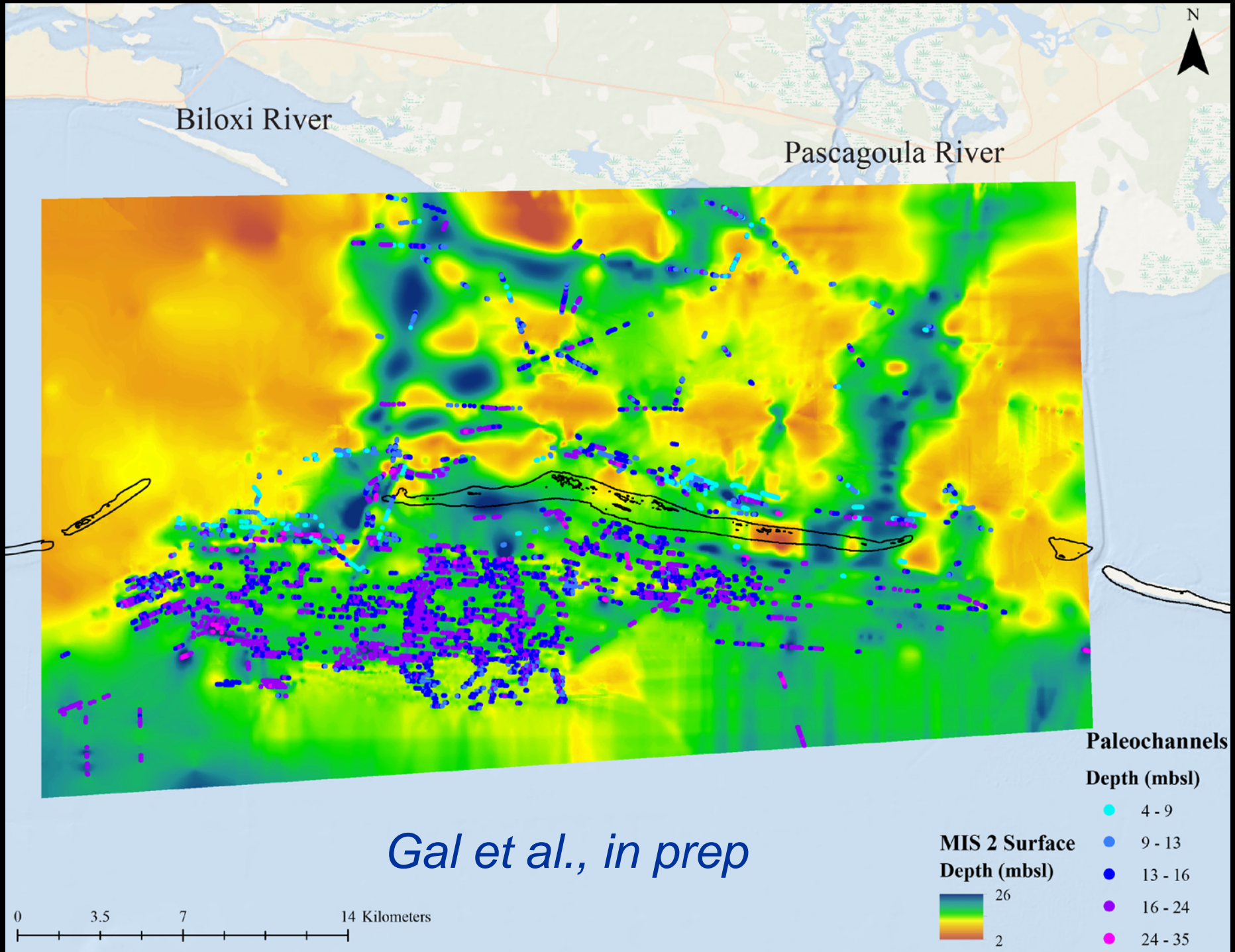
(Bosse et al., 2017, 2018; Sandford et al., 1991; Forde et al., 2011a, 2011b, 2011c; Pendleton et al., 2011)

Biloxi and Pascagoula MIS 2 incised valleys



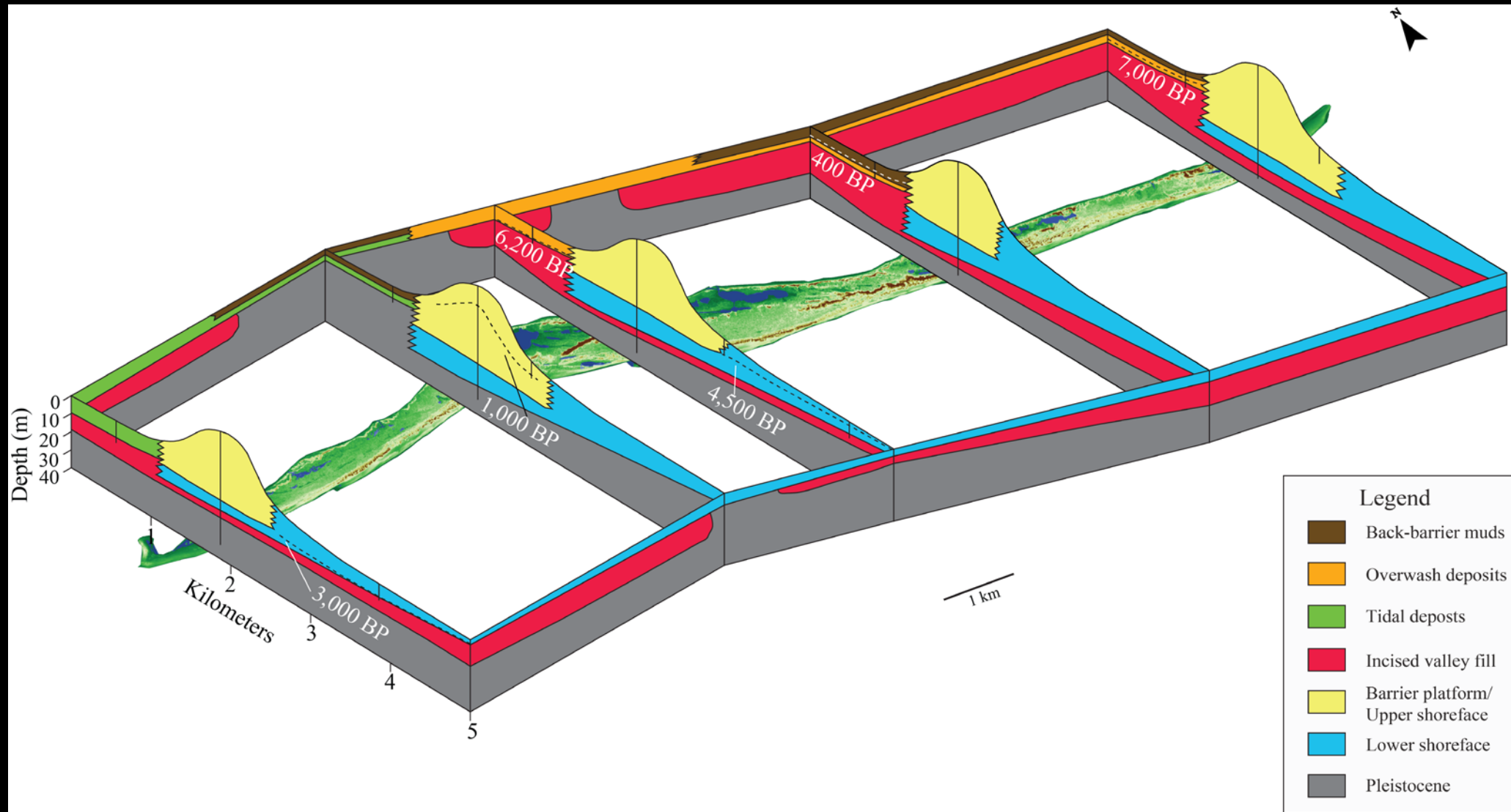
digital elevation model (Taylor et al., 2008)

Biloxi and Pascagoula MIS 2 incised valley fill

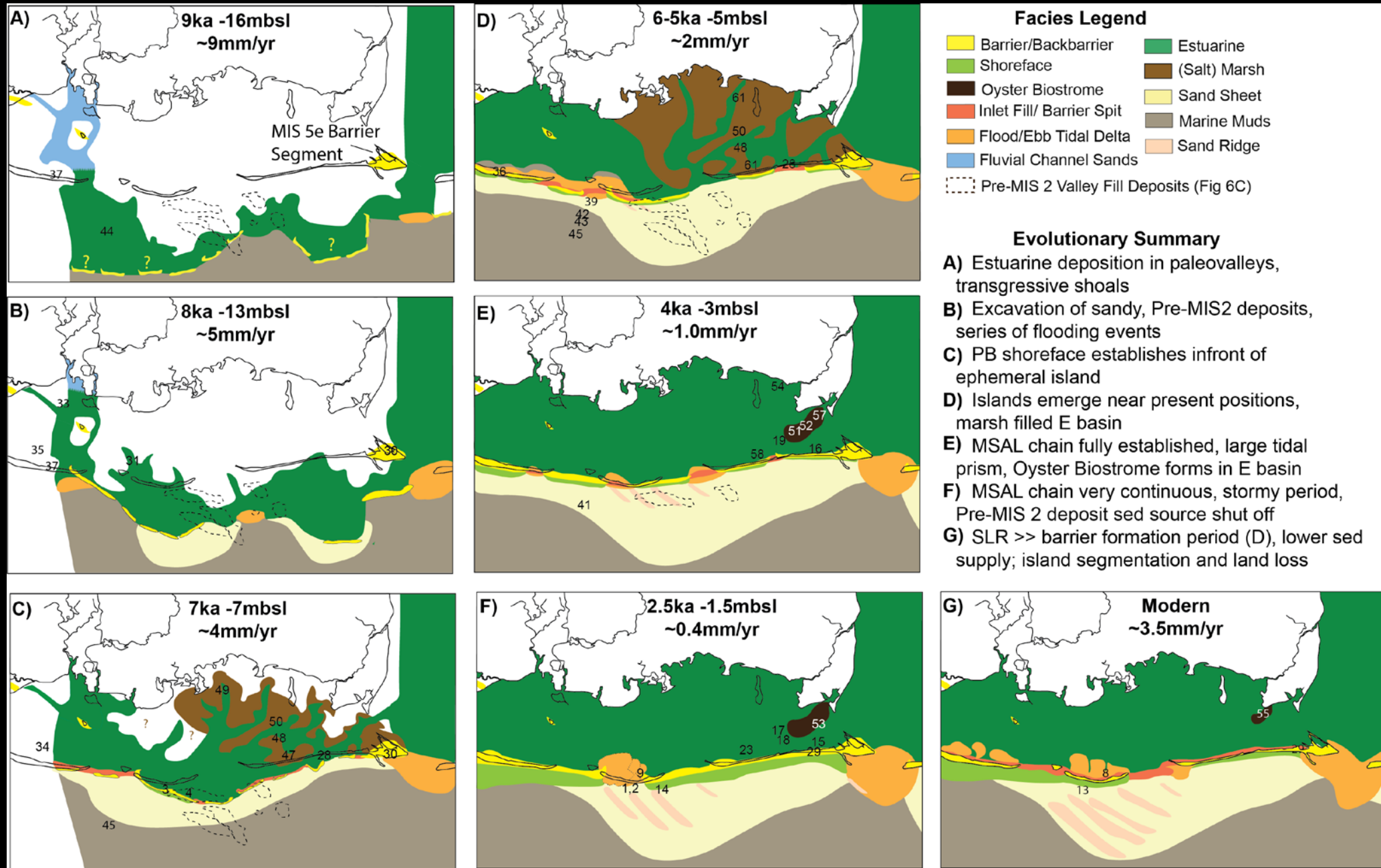


digital elevation model (Taylor et al., 2008)

Horn Island Holocene Evolution



Ravinement Processes



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