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

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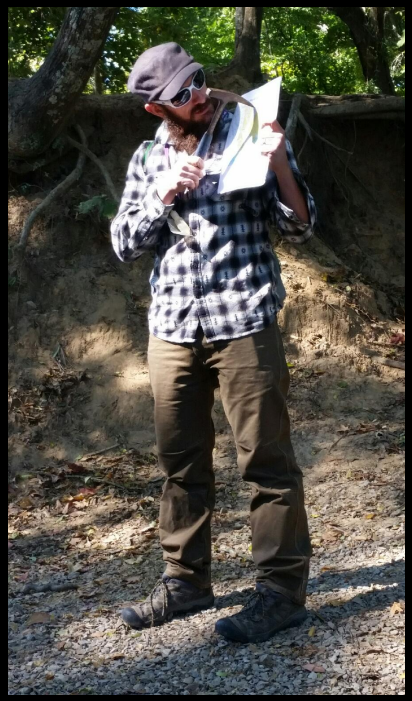
BOEM
Bureau of Ocean Energy Management

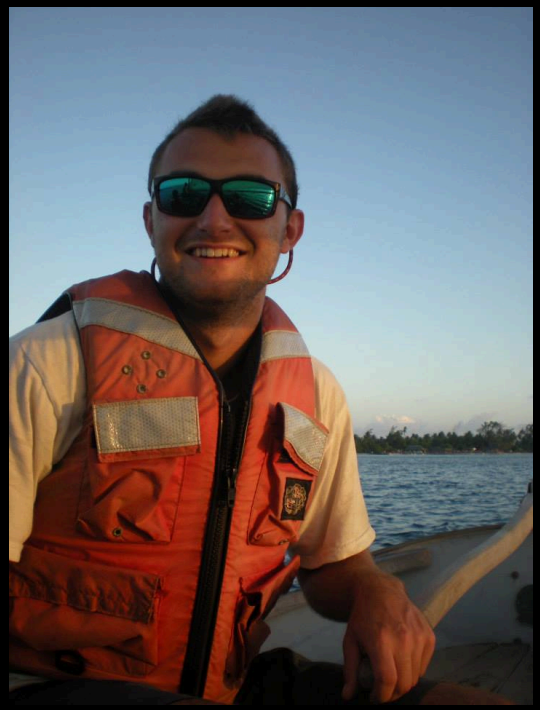
The University of Southern Mississippi

And of course...



Dr. Michael Miner
BOEM

Clayton Dike
Ph.D. Student



Robert Hollis
M.S. Student

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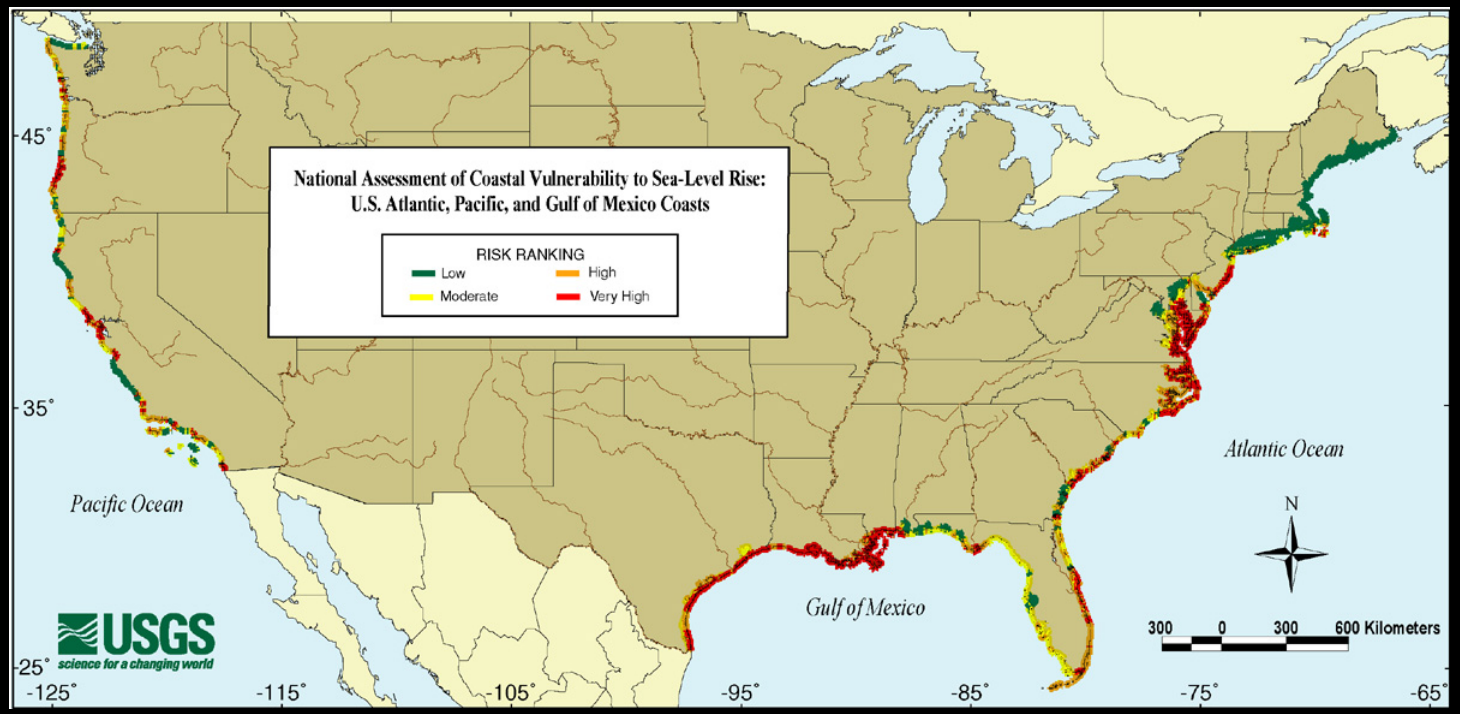
Outline

1. Motivation
2. Study Area
3. Research Tasks
4. Methods
5. Project Examples
6. Progress

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



Motivation

Lowstand (~22-17 ka)

Rivers incise to shelf edge

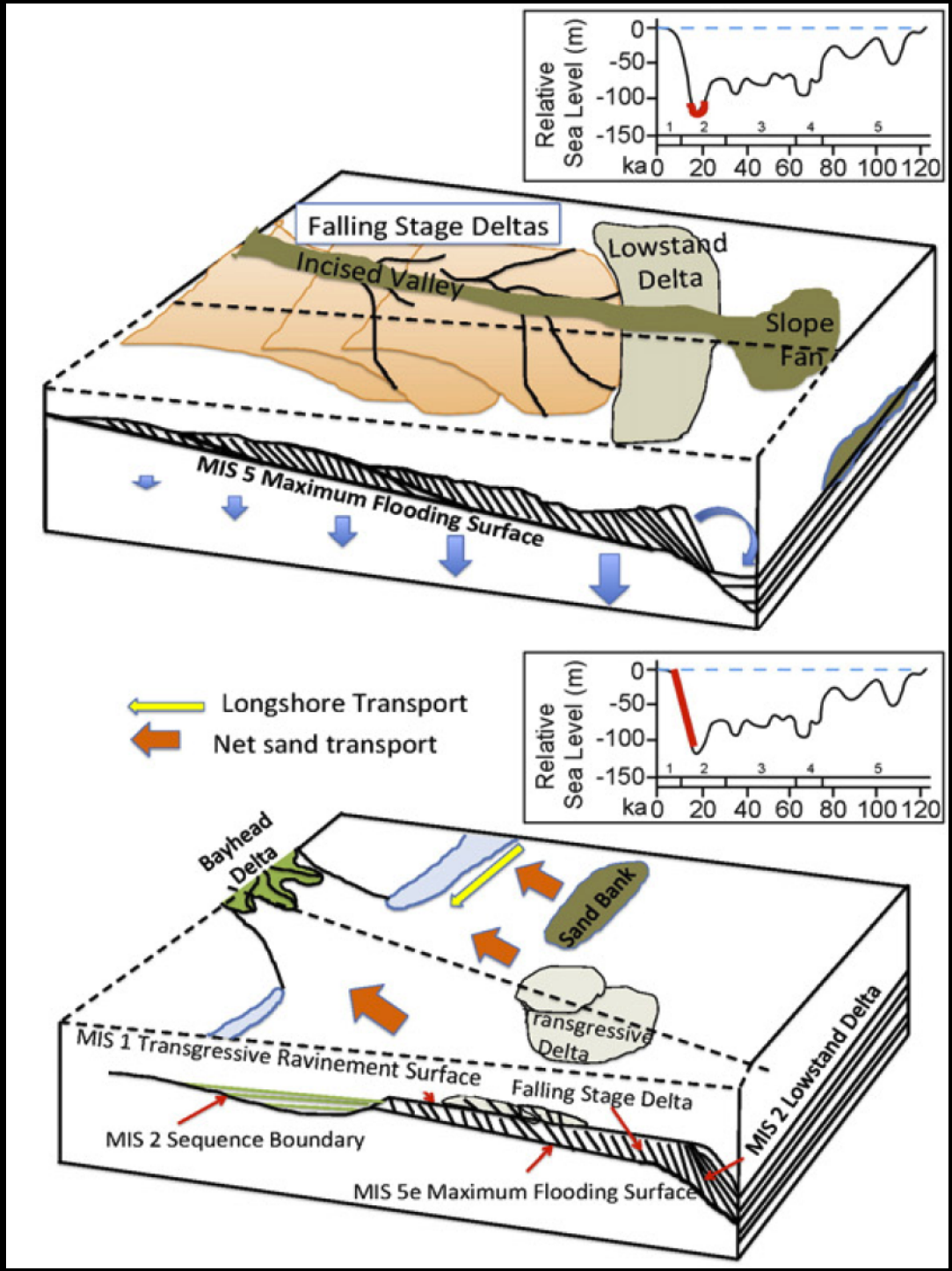
Deltas follow, prograde

Trangression (~17-4 ka)

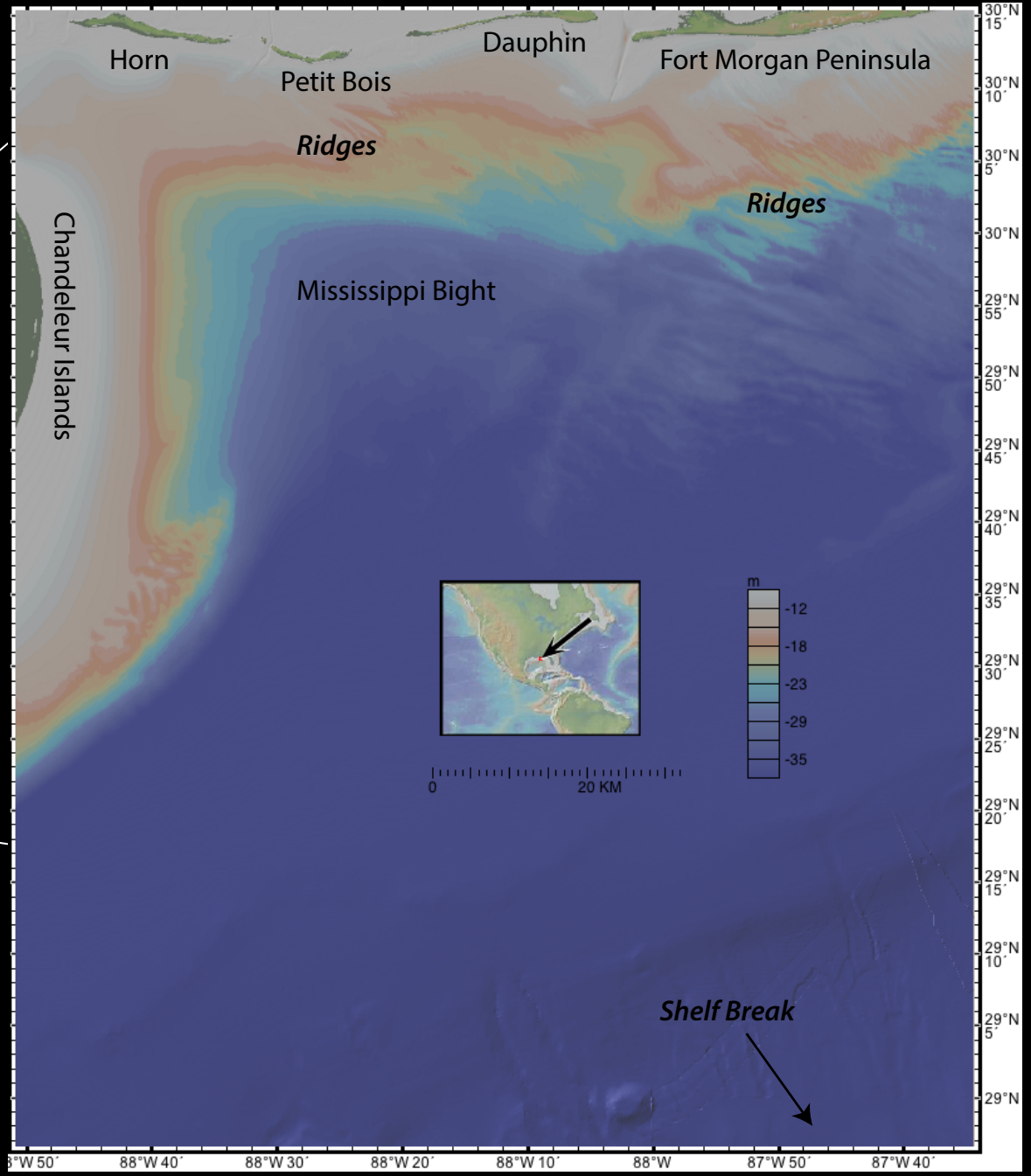
Backstepping environments

Ravinement/erosion

Anderson et al., 2016, Earth-Science Reviews



Study Area NGoM

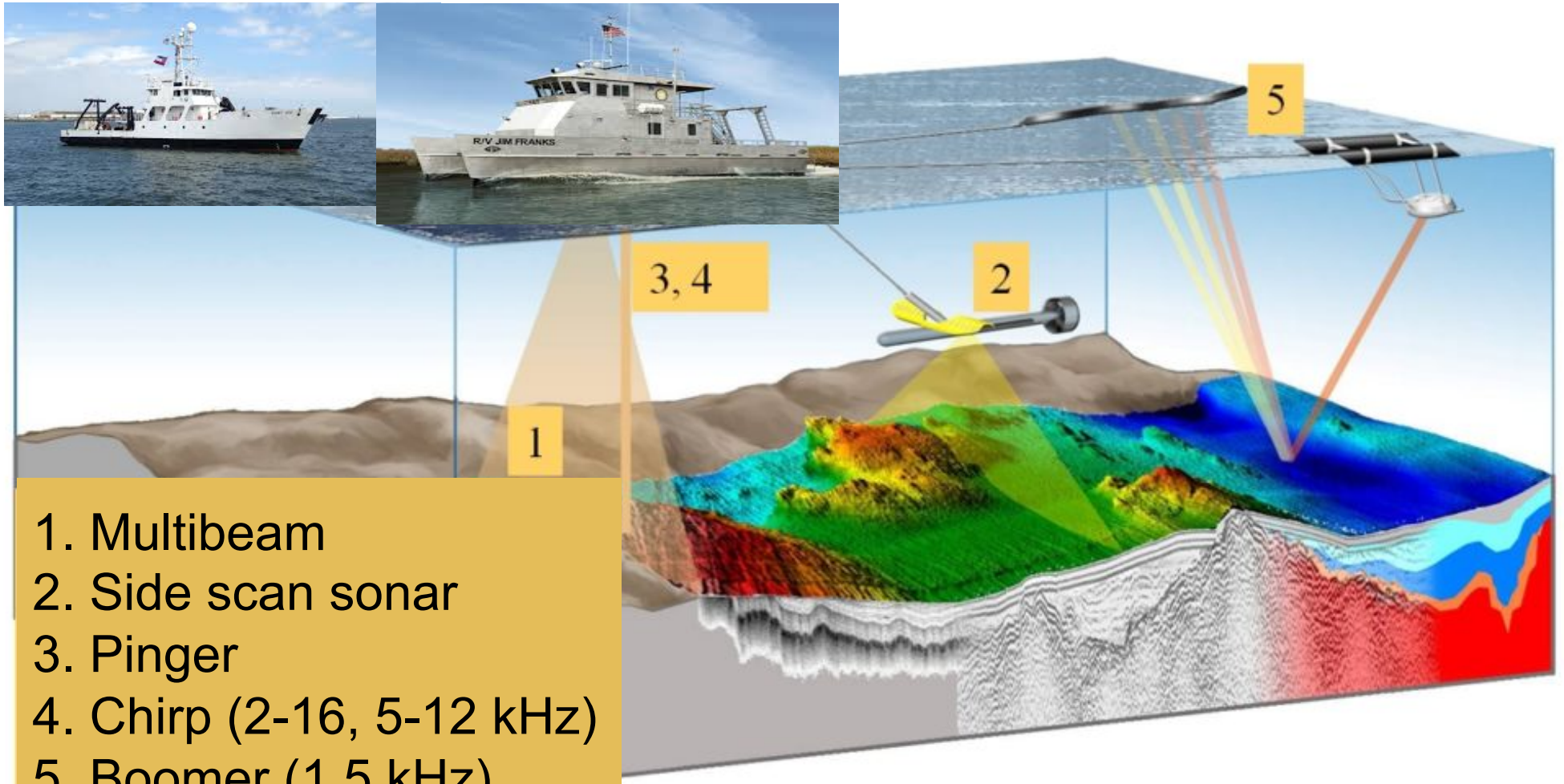


GeoMapApp

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

Marine geological research methods - acoustic



1. Multibeam
2. Side scan sonar
3. Pinger
4. Chirp (2-16, 5-12 kHz)
5. Boomer (1.5 kHz)

Modified from http://geosight.gtk.fi

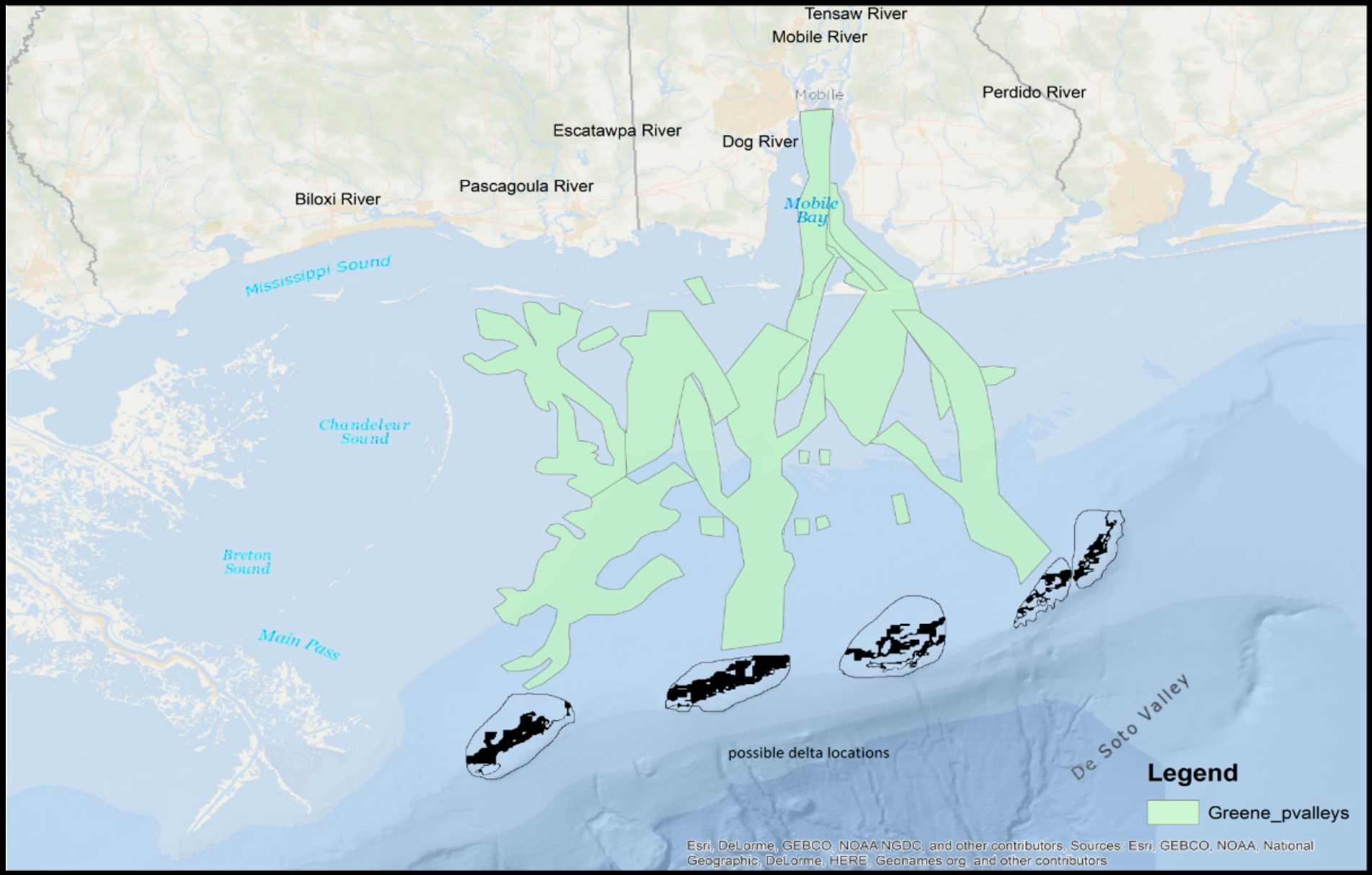
Equipment

Boomer plate

Streamer

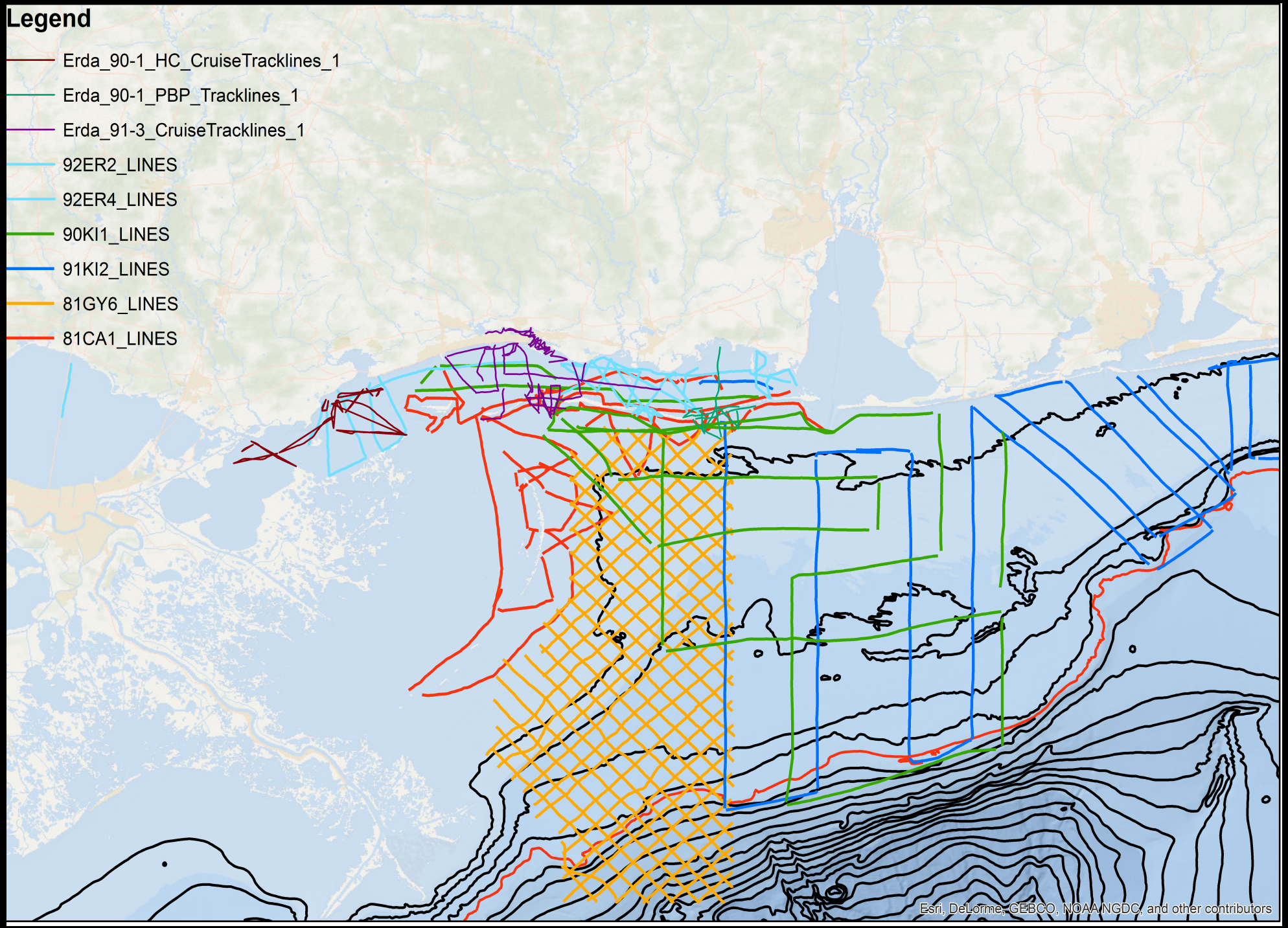
CHIRP

Previous work

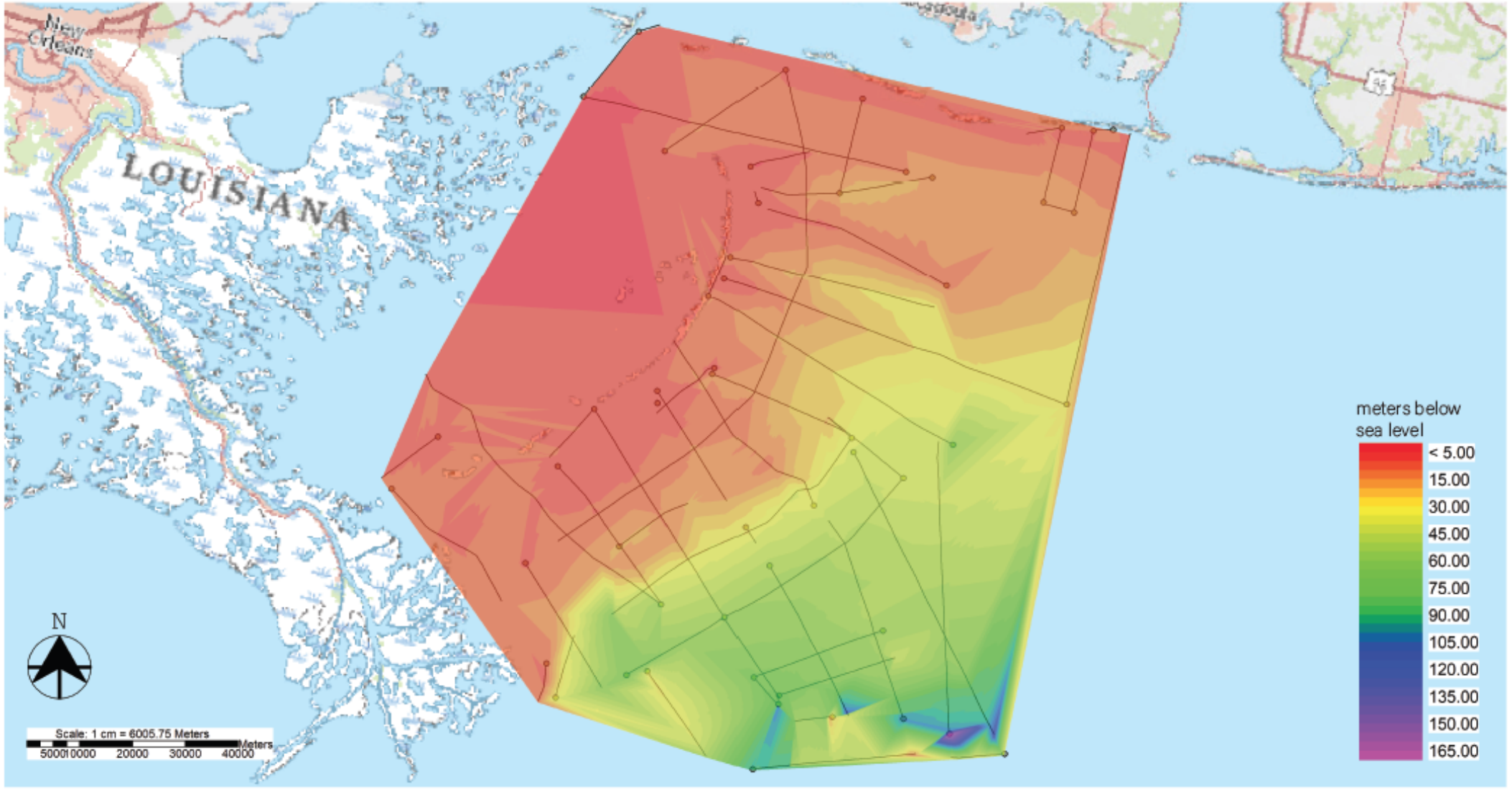


Greene et al., JSR

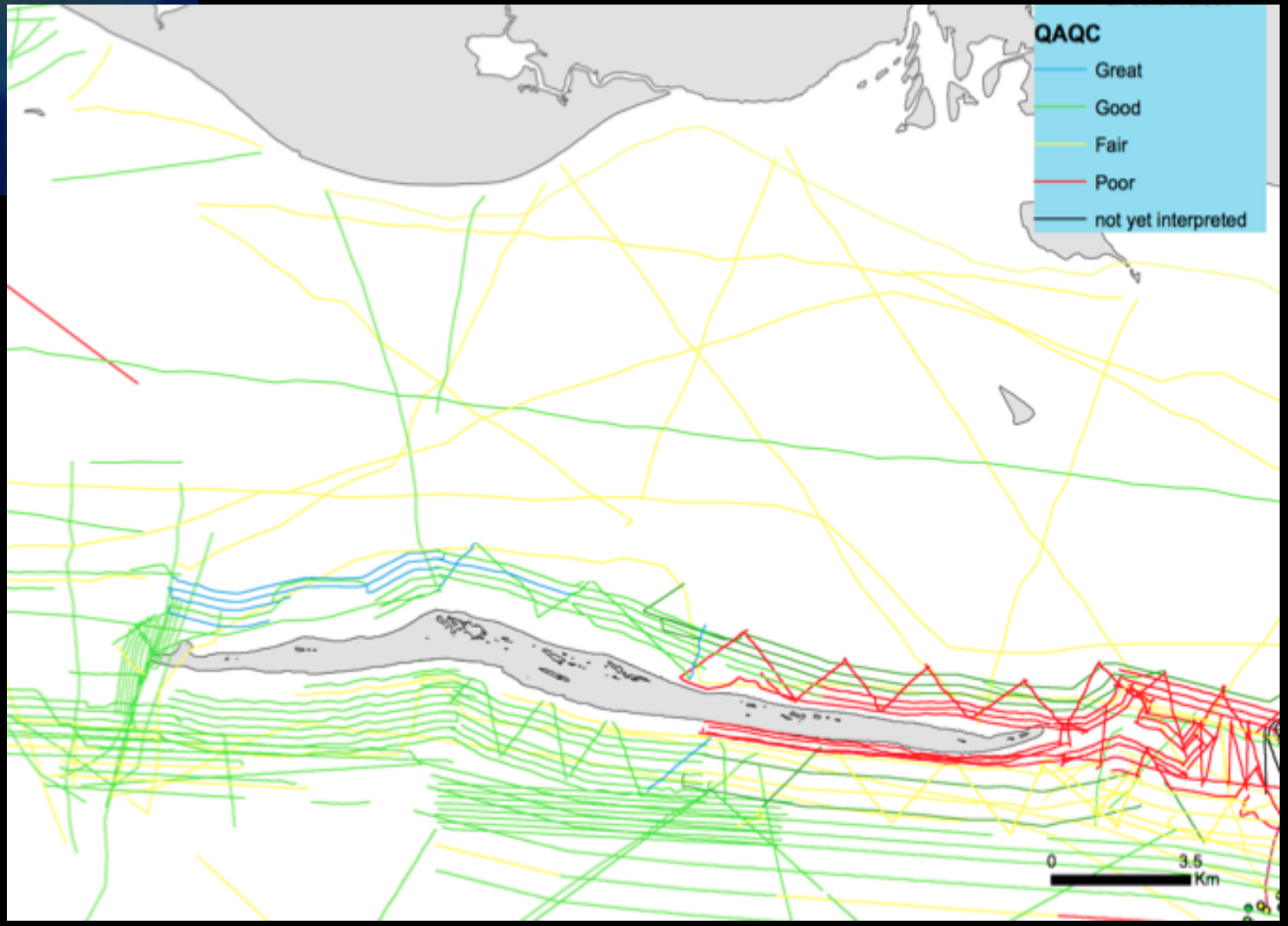
Geophysical Data



Broad scale MIS2 surface

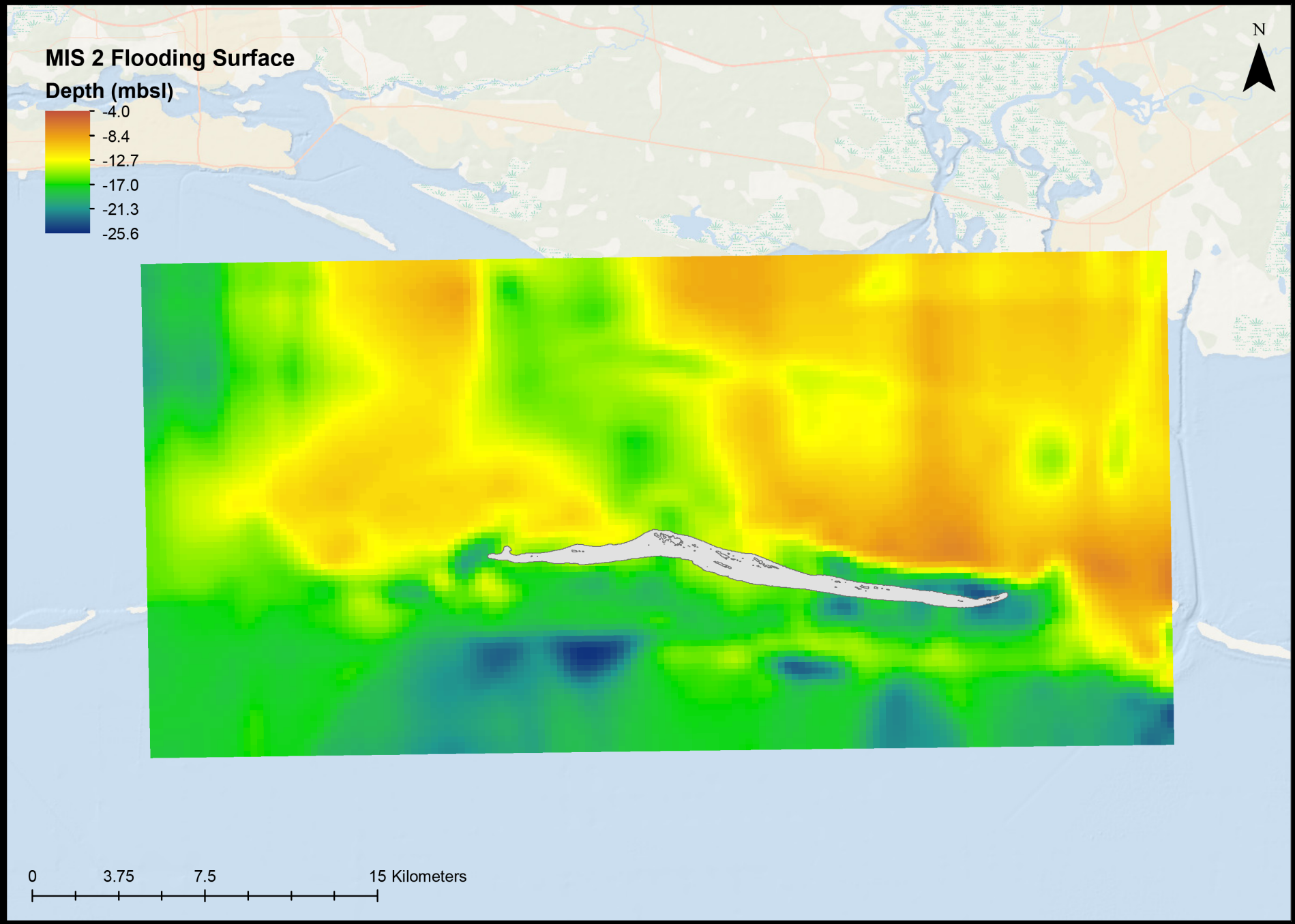


Horn Island/MS Sound

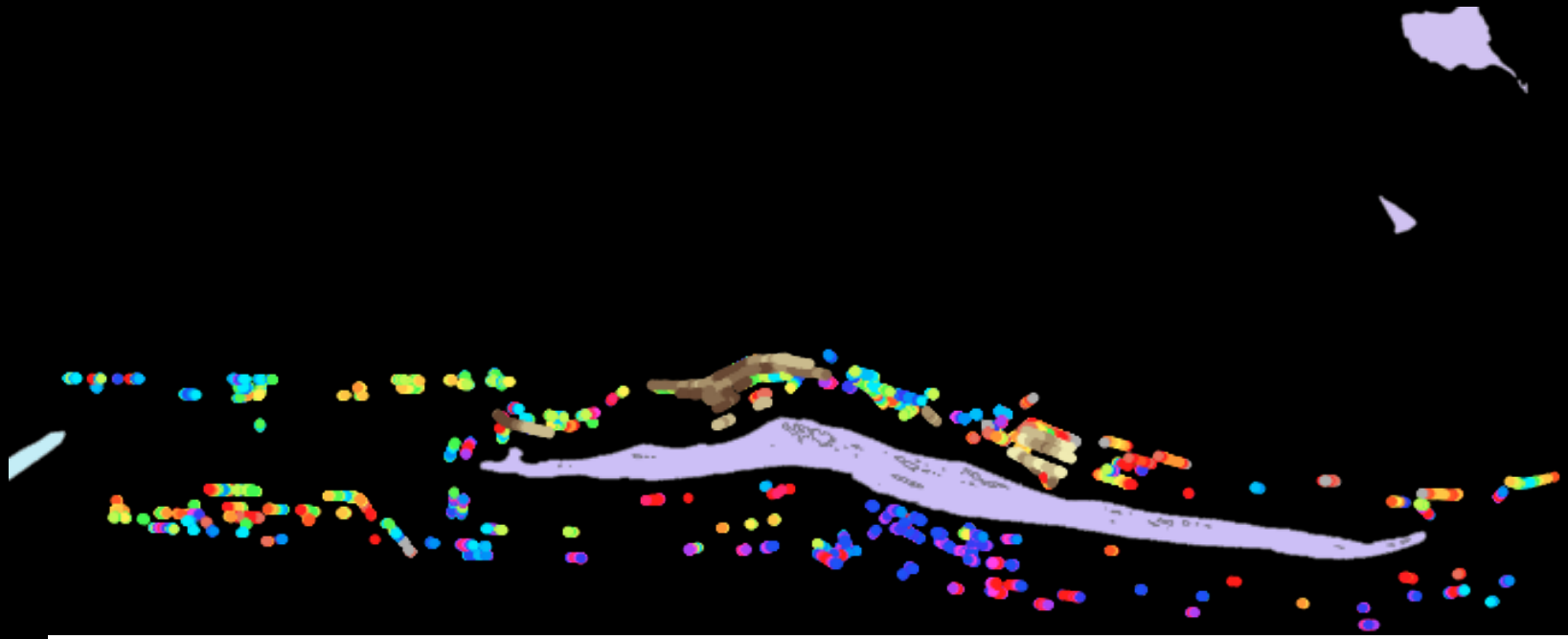


CHIRP data QA/QC

MIS2 Flooding Surface (Holocene Pleistocene Boundary)



H/P Fluvial Channels

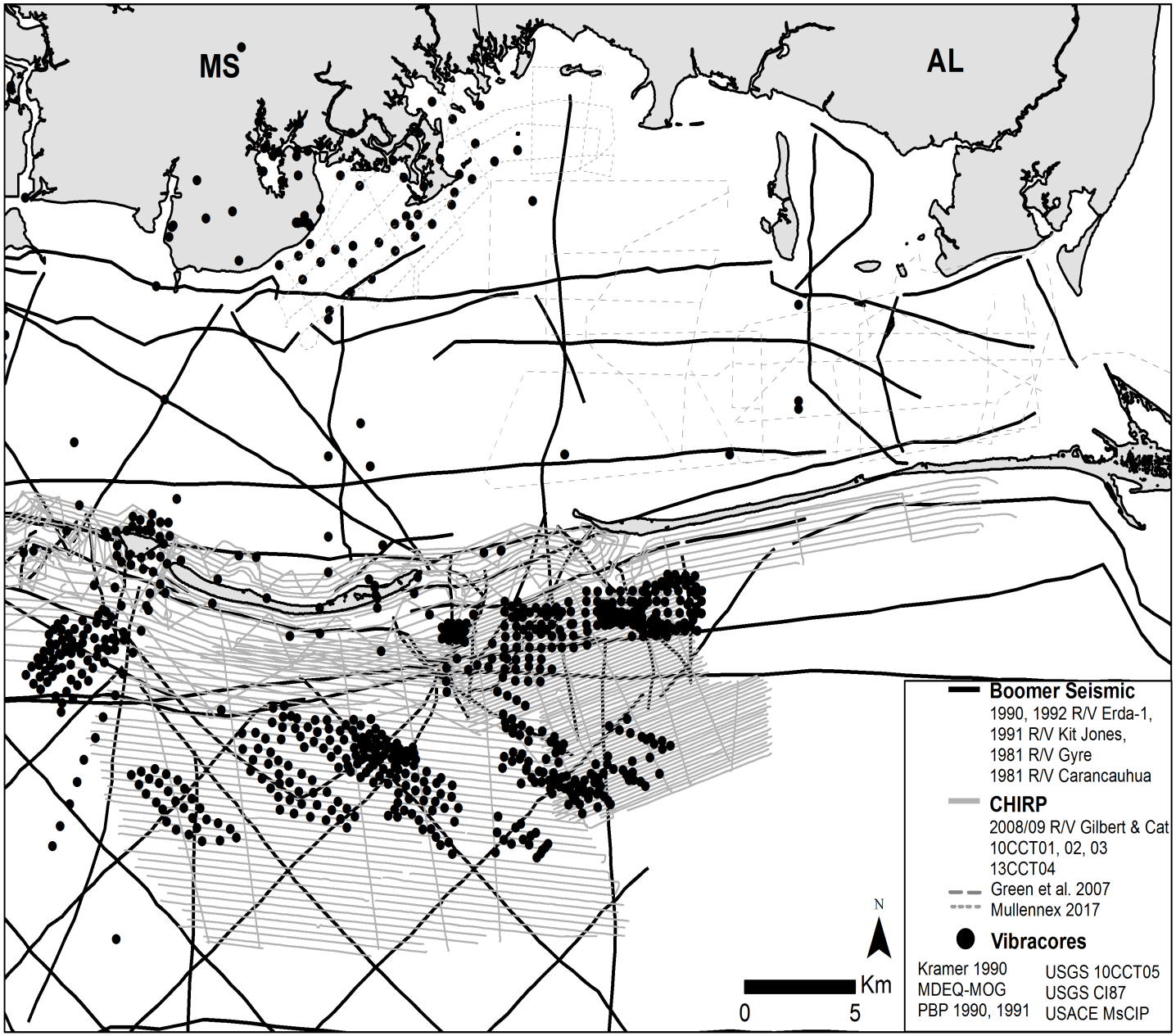


Delta Features
Depth_below_Sea_level_meters
- 4.4 - 6.2
- 6.3 - 7.4
- 7.5 - 8.3
- 8.4 - 9.3
- 9.4 - 12.2

Paleochannels_Sonarwiz_Chirp
Depth_below_Sea_level_meters
- 4.0 - 5.2
- 5.3 - 6.3
- 6.3 - 7.0
- 7.1 - 7.5
- 7.6 - 8.1
- 8.2 - 8.7
- 8.8 - 9.4
- 9.5 - 10.1
- 10.2 - 10.7
- 10.8 - 11.4
- 11.5 - 12.0
- 12.1 - 12.8
- 12.9 - 13.5
- 13.6 - 14.4
- 14.5 - 15.2
- 15.3 - 16.0
- 16.1 - 16.7
- 16.8 - 17.5
- 17.6 - 18.5
- 18.6 - 19.7

0 1.75 3.5 7 Mile

Petit Bois/MS Sound



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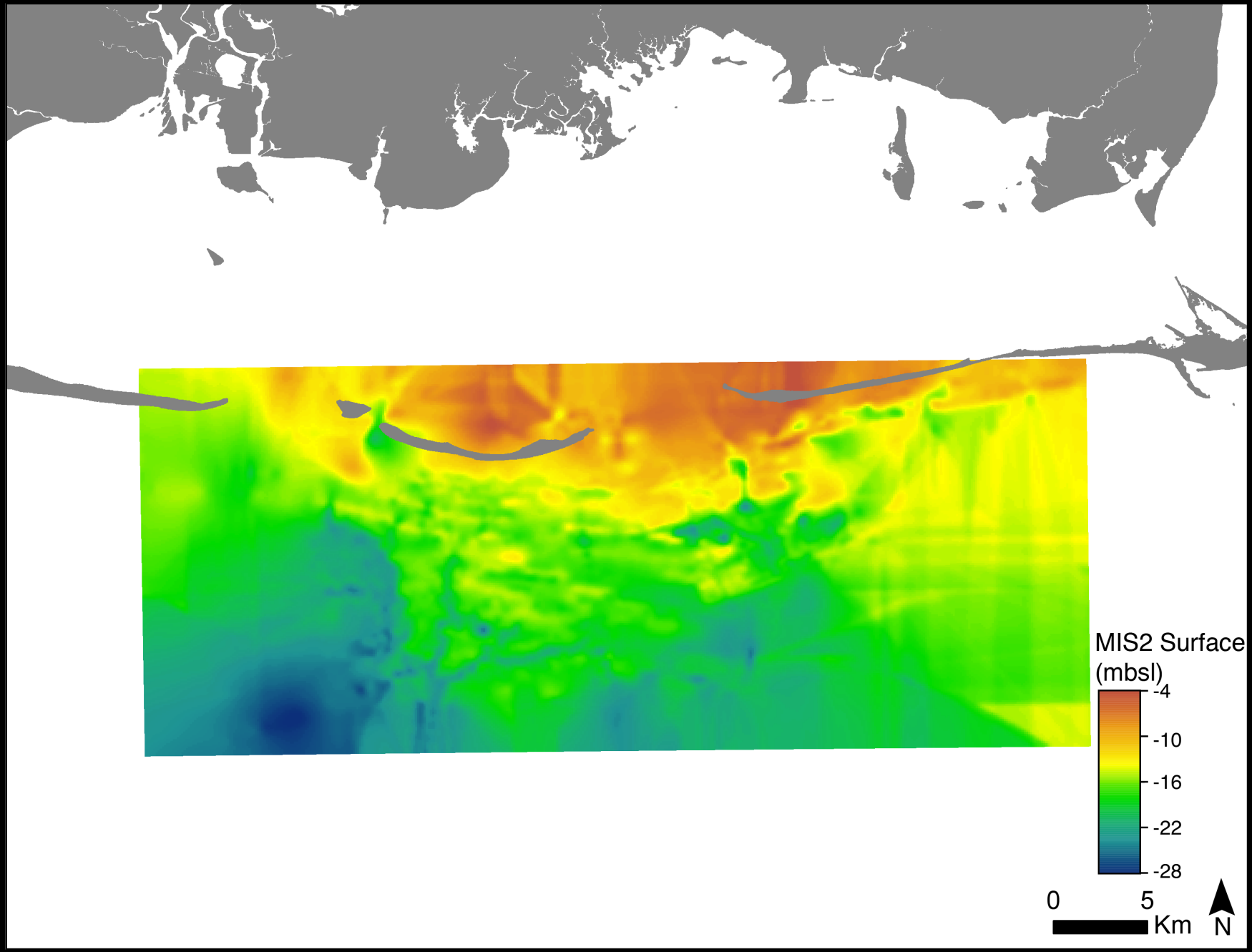
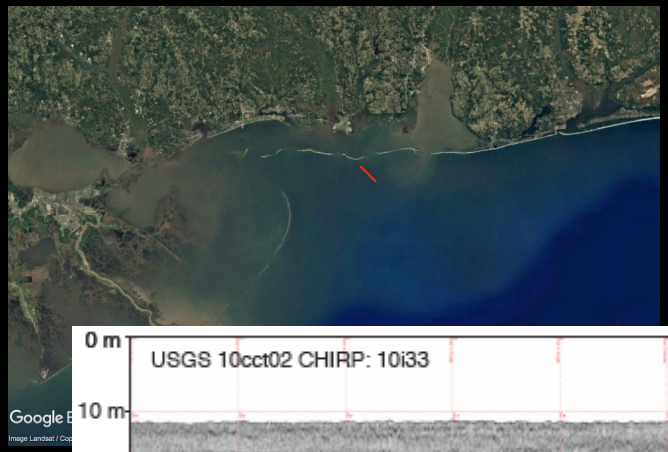
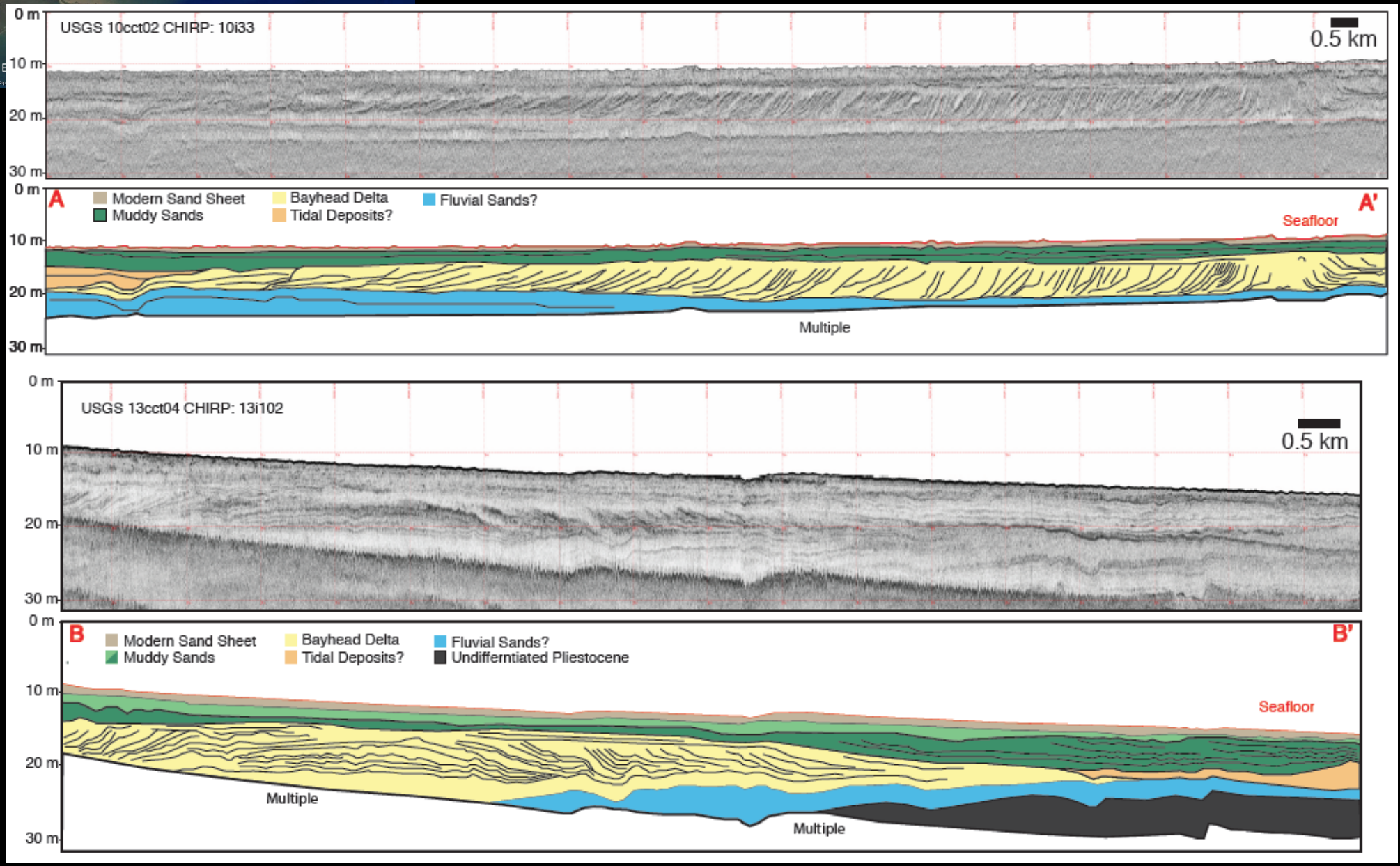




Ravinement processes



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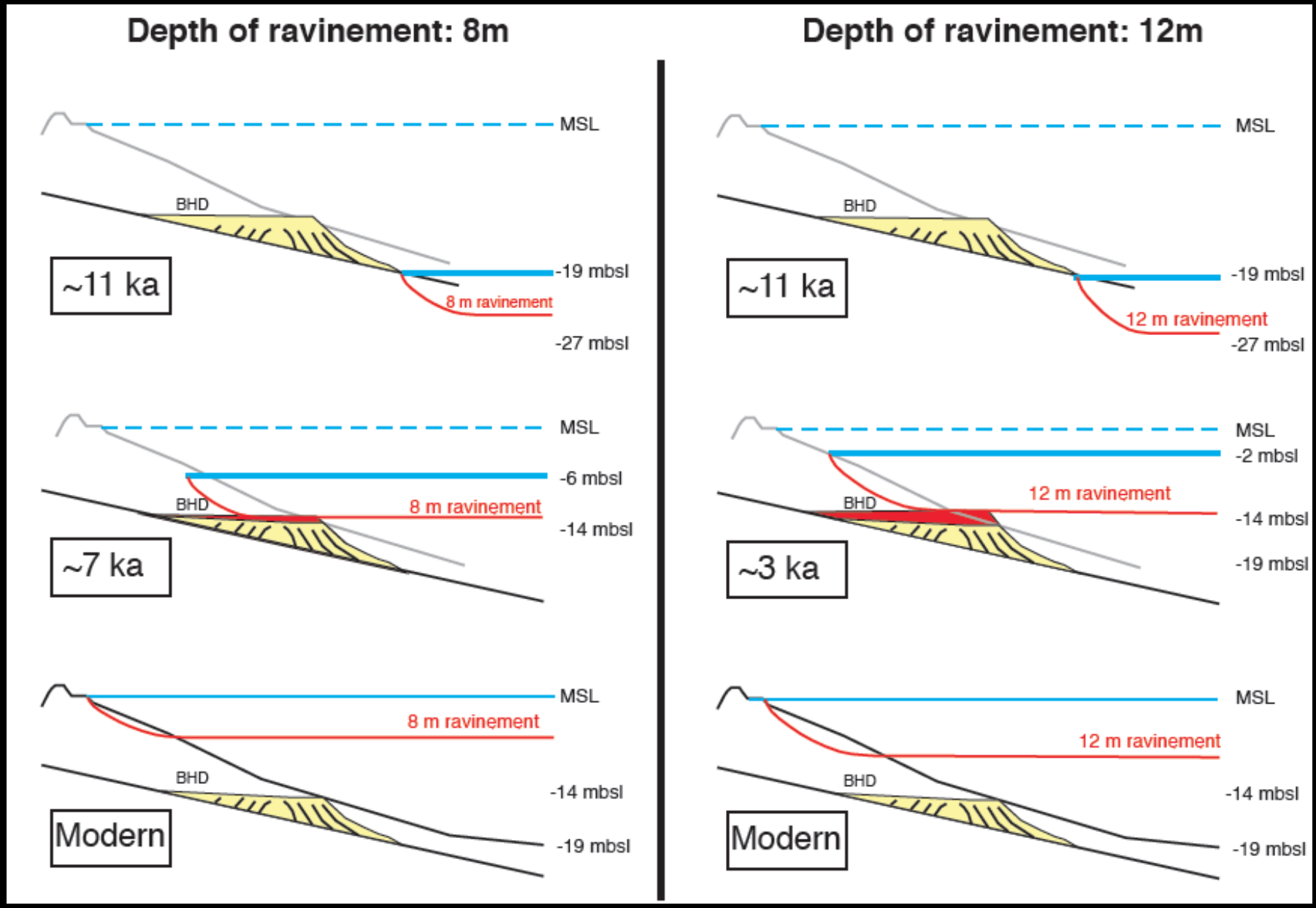

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