Mapping Project

By:
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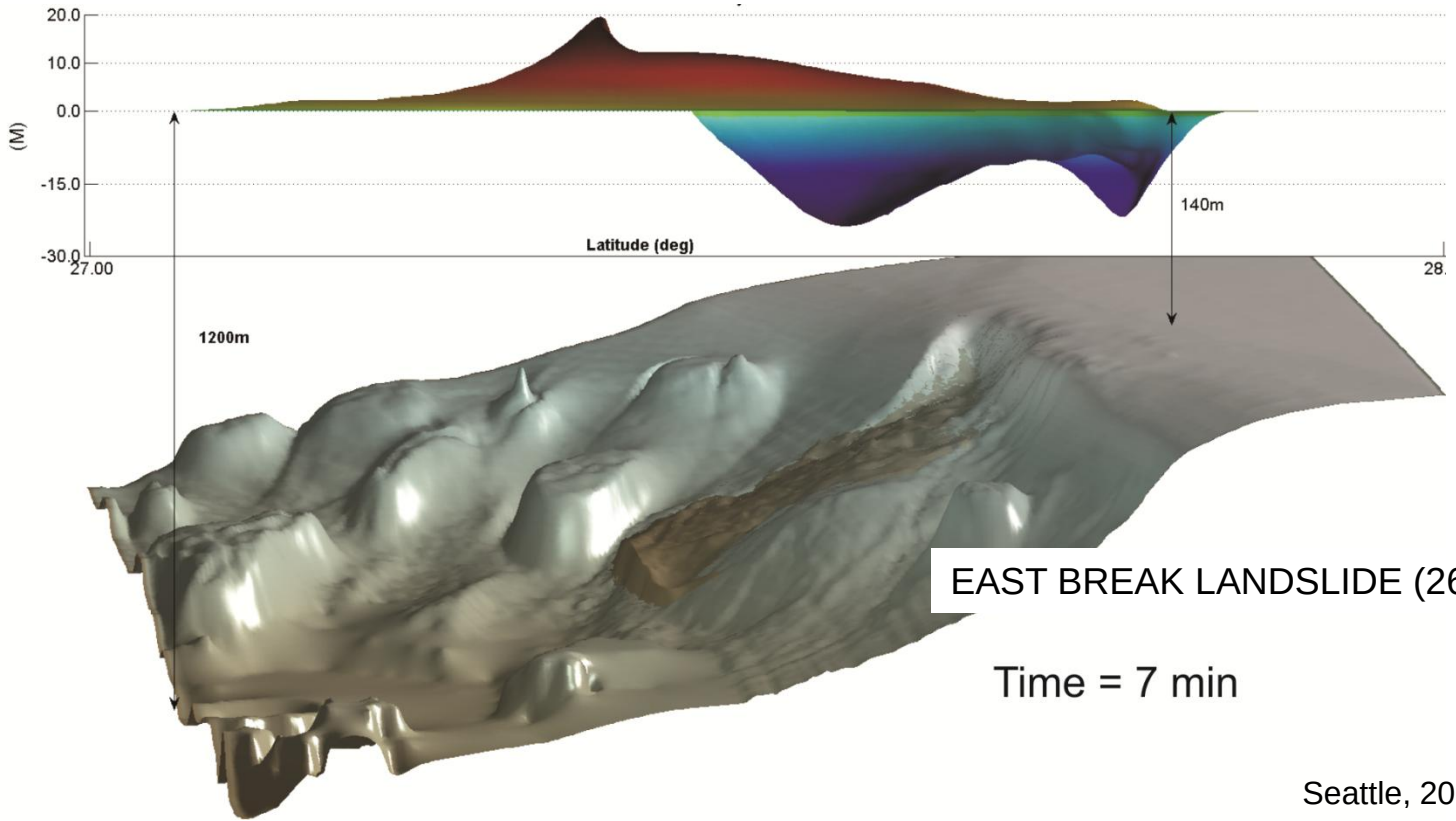
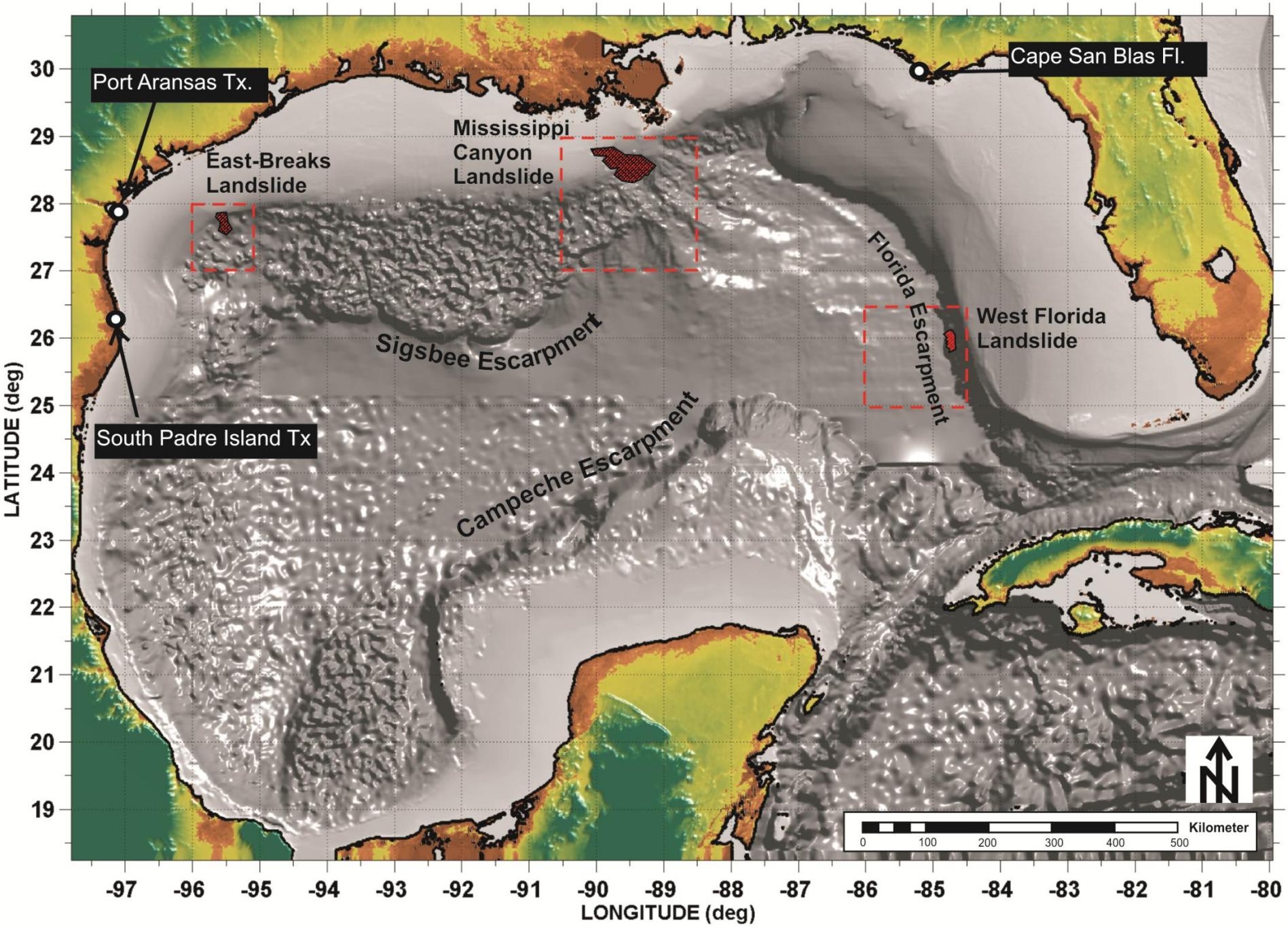
Charles Williams
Collaborators: Bill Knight, Zygmunt Kowalik



Seattle, 2012


Port Aransas Tx.
Cape San Blas Fl.
East-Breaks Landslide
Mississippi Canyon Landslide
Florida Escarpment
West Florida Landslide
Sigsbee Escarpment
South Padre Island Tx
Campeche Escarpment
Kilometer
0
100
200
300
400
500
LATITUDE (deg)
LONGITUDE (deg)
30
29
28
27
26
25
24
23
22
21
20
19
-97
-96
-95
-94
-93
-92
-91
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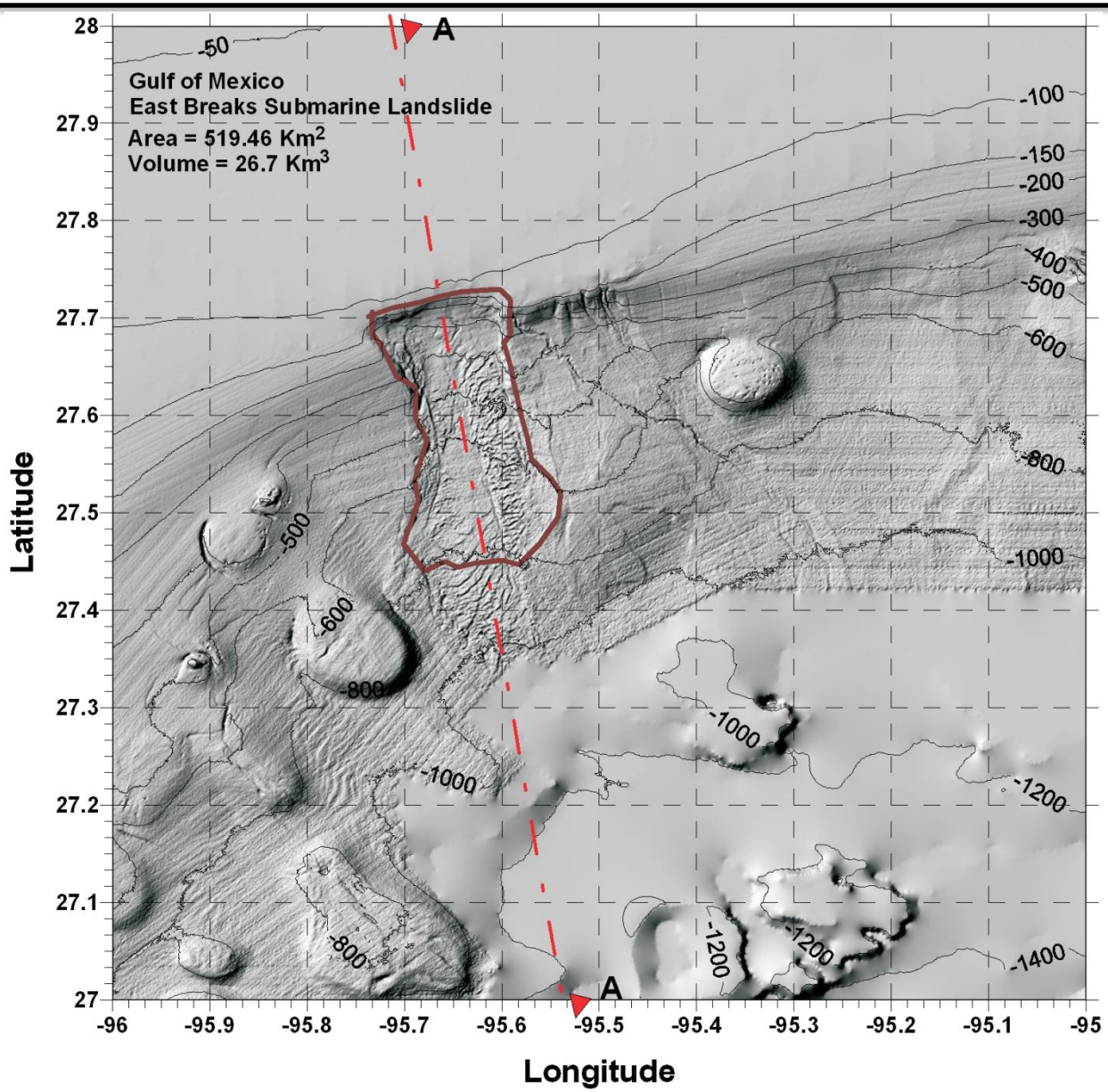
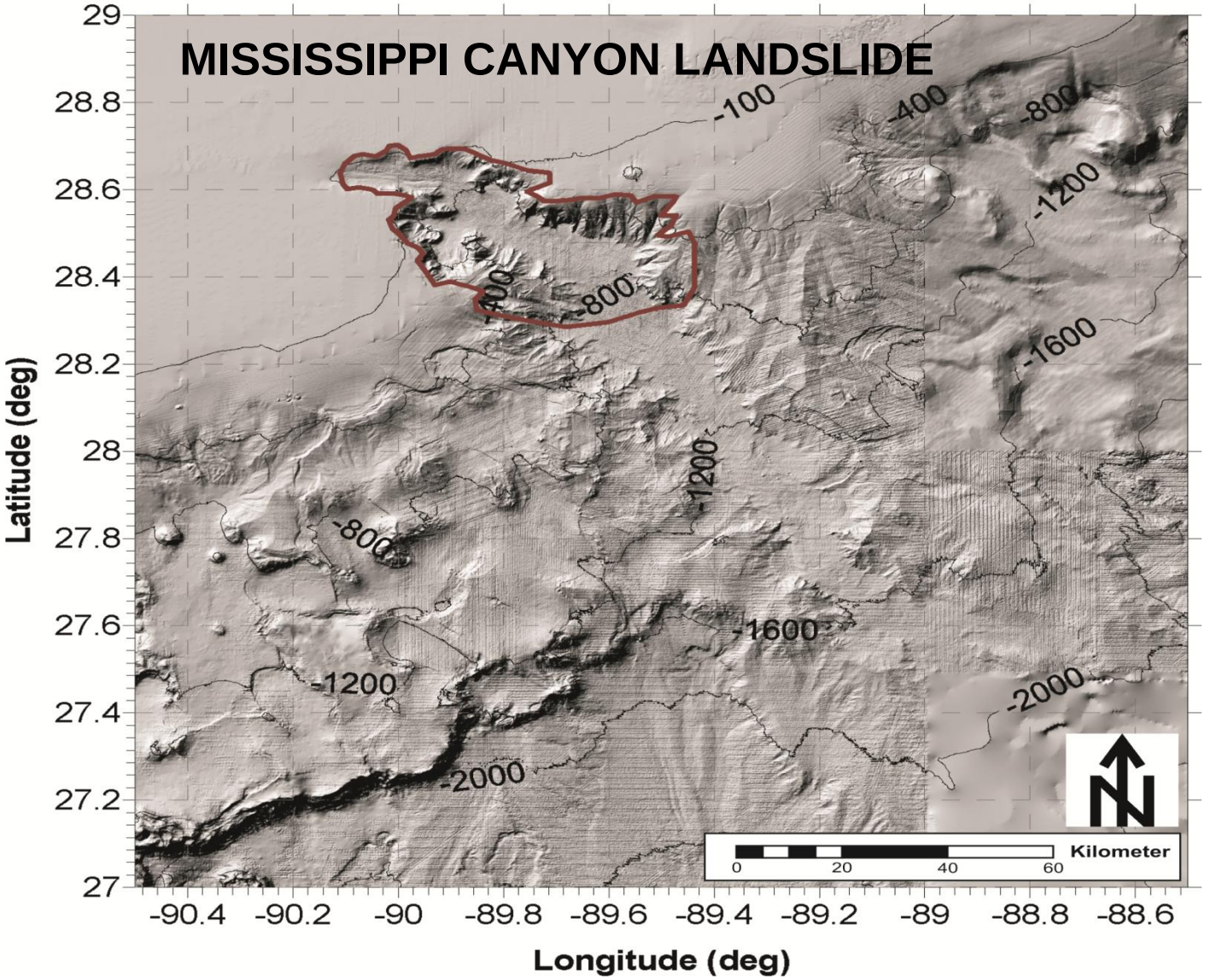
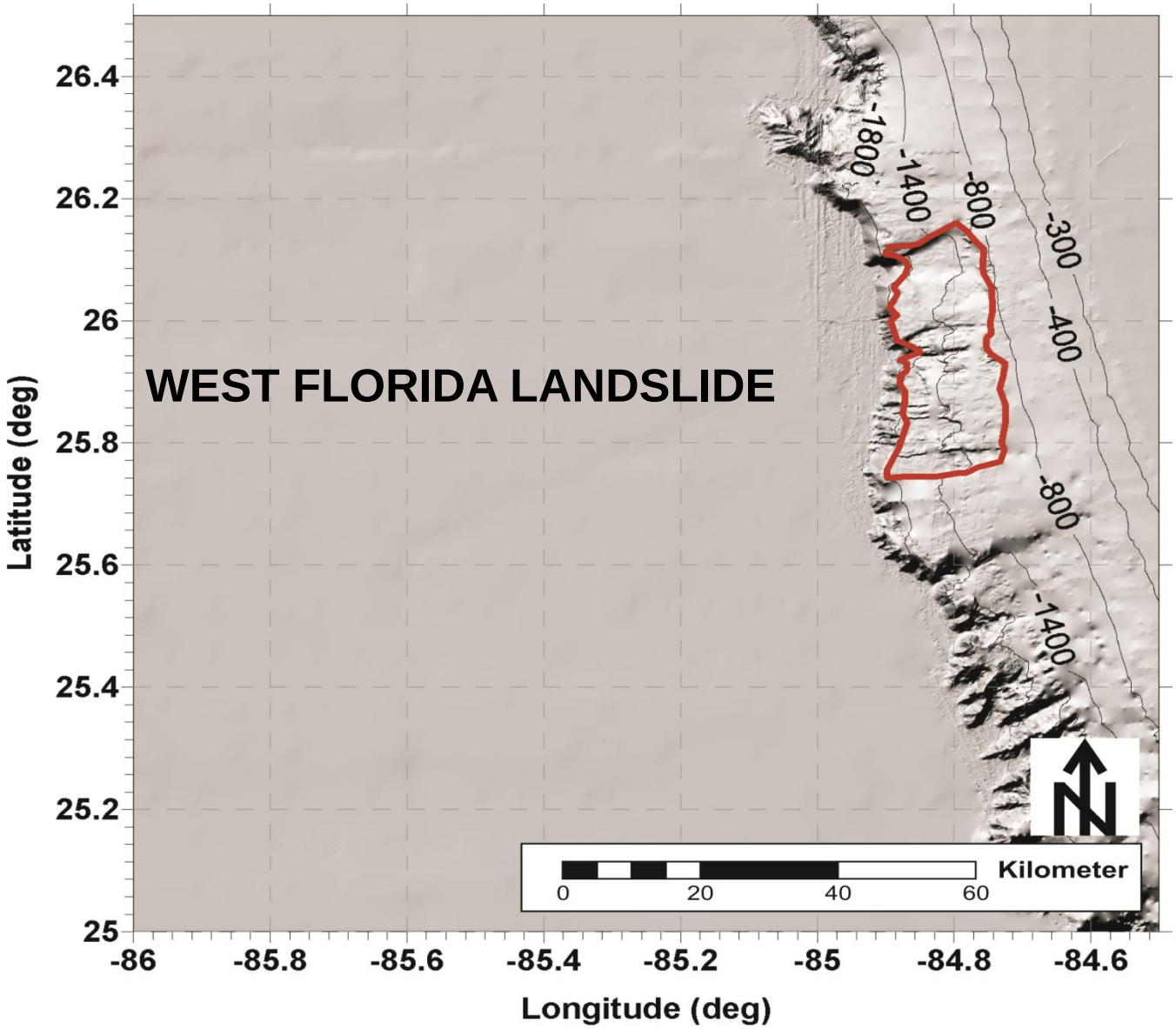
-84
-83
-82
-81
-80

Practical 3D numerical simulation comparison with FLOW3D





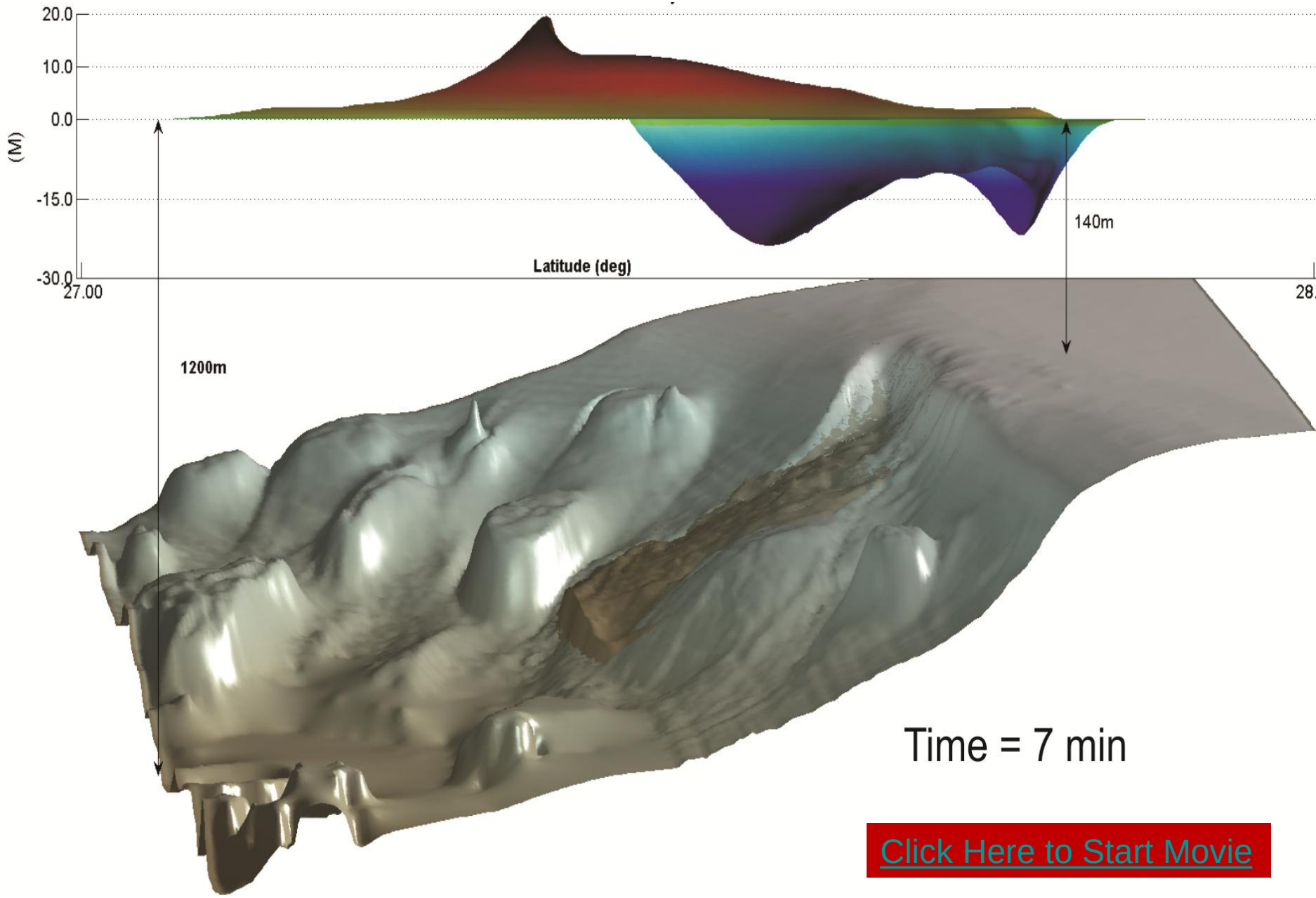
Mississippi Canyon submarine landslide, excavation limits and surrounding bathymetry (in meters).



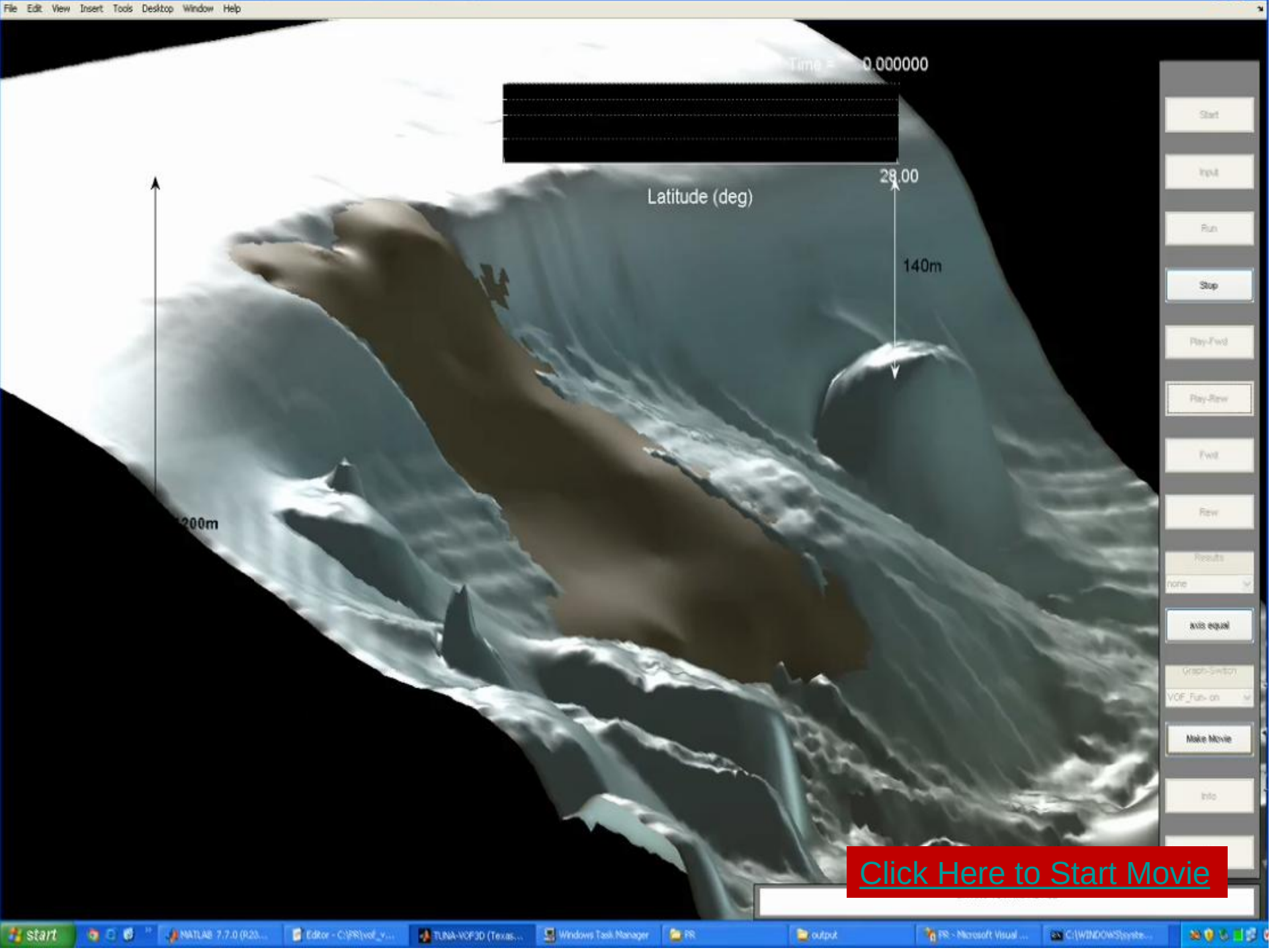
West Florida submarine landslide location,
excavation limits and surrounding bathymetry (in meters).

EAST BREAKS LANDSLIDE MODEL

EAST BREAKS LANDSLIDE MOVIE (SIDE)



Click Here to Start Movie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200m
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Input
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Stop
Play-Fwd
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Click Here to Start Movie
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Editor - C:\PR\vof_v...
TUNA-VOF3D (Texas...
Windows Task Manager
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output
PR - Microsoft Visual ...
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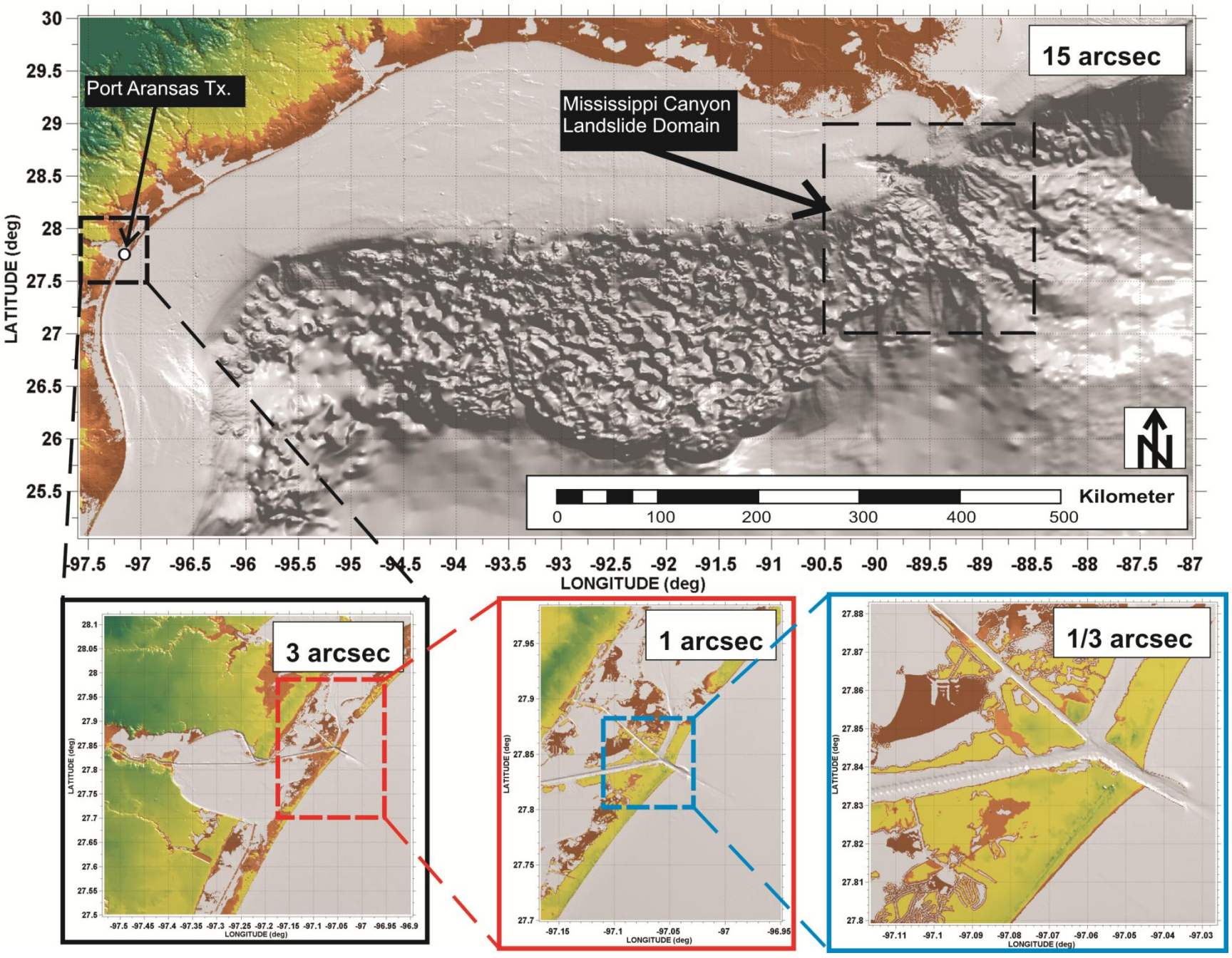
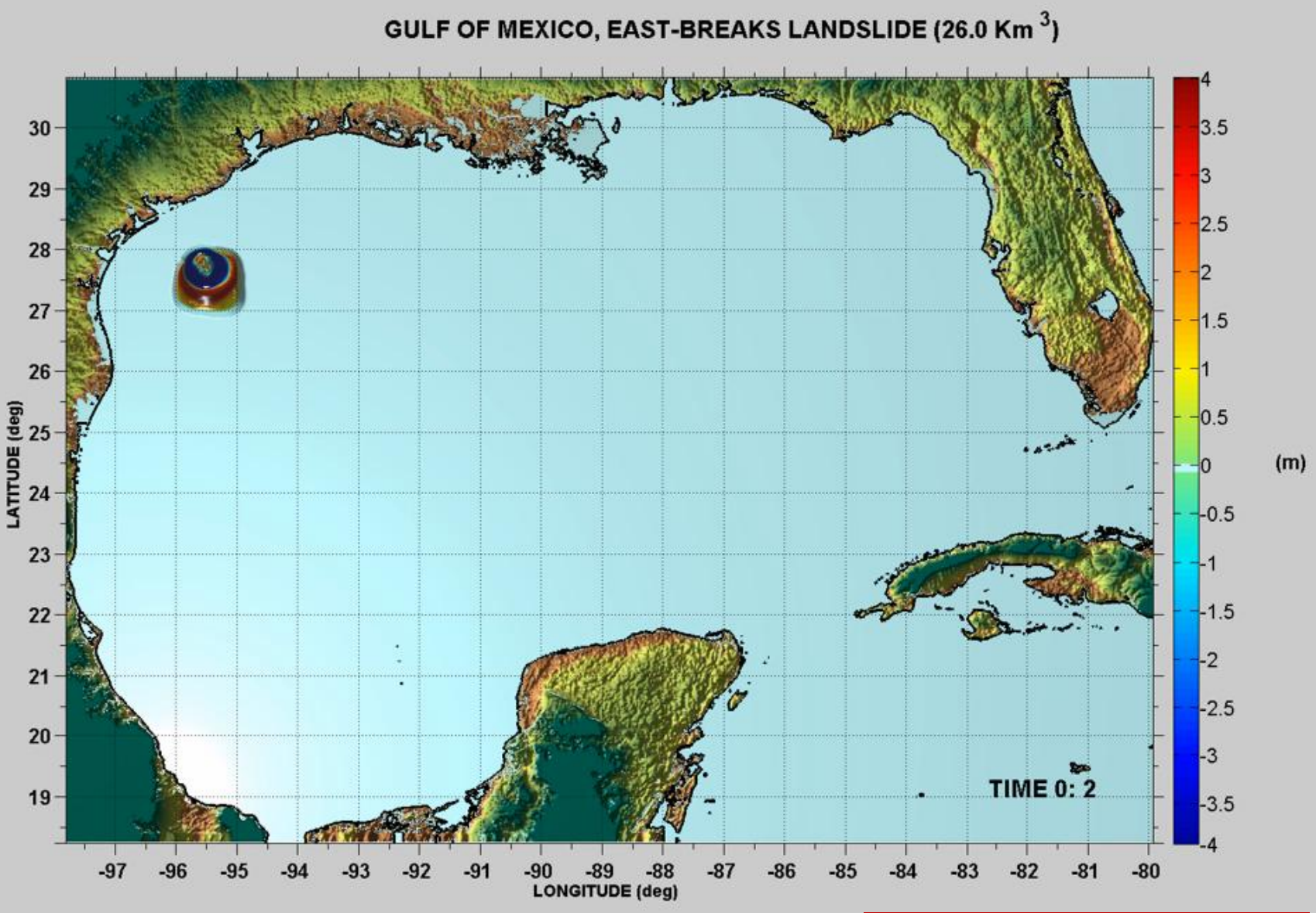
TYPICAL NESTED MODEL





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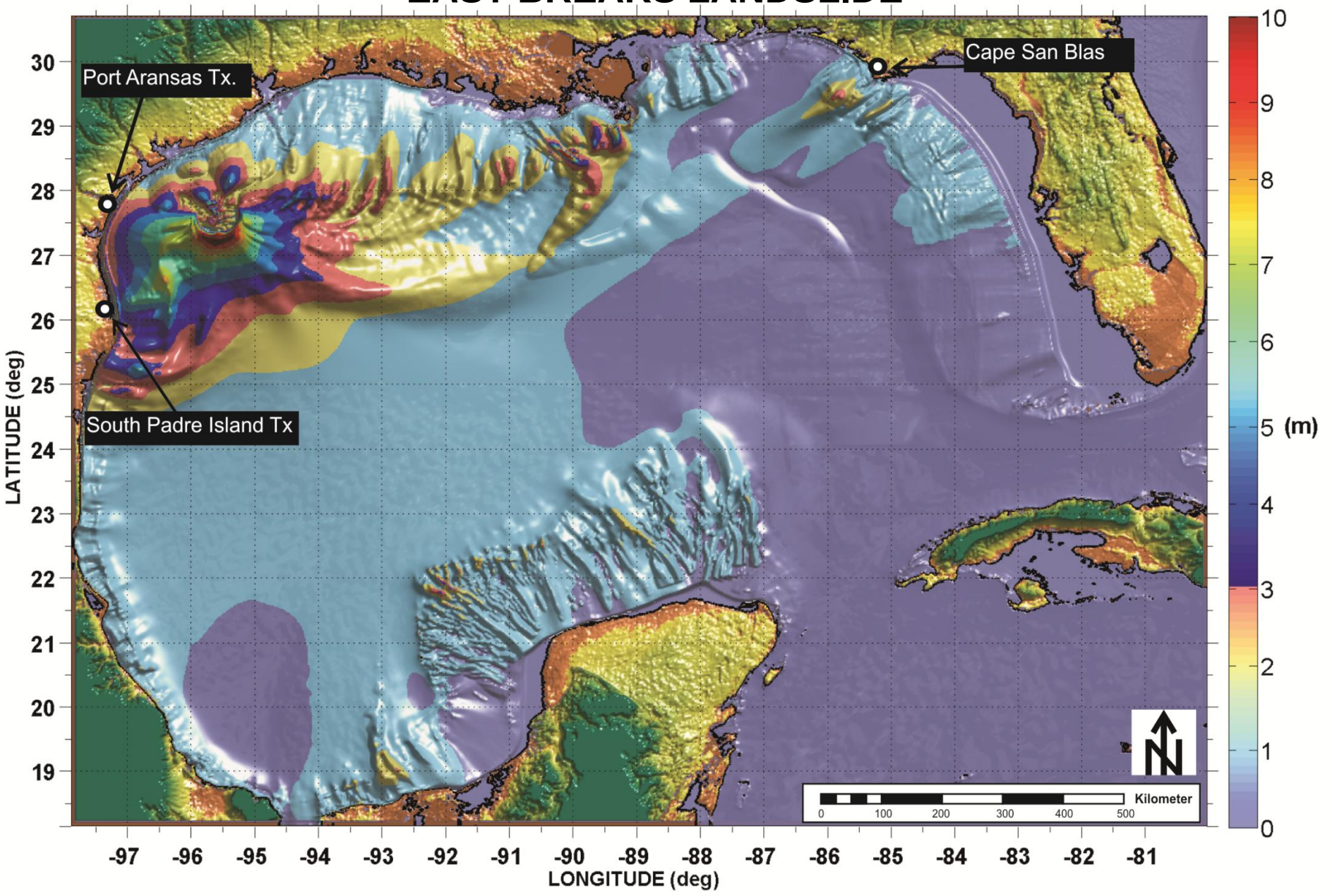
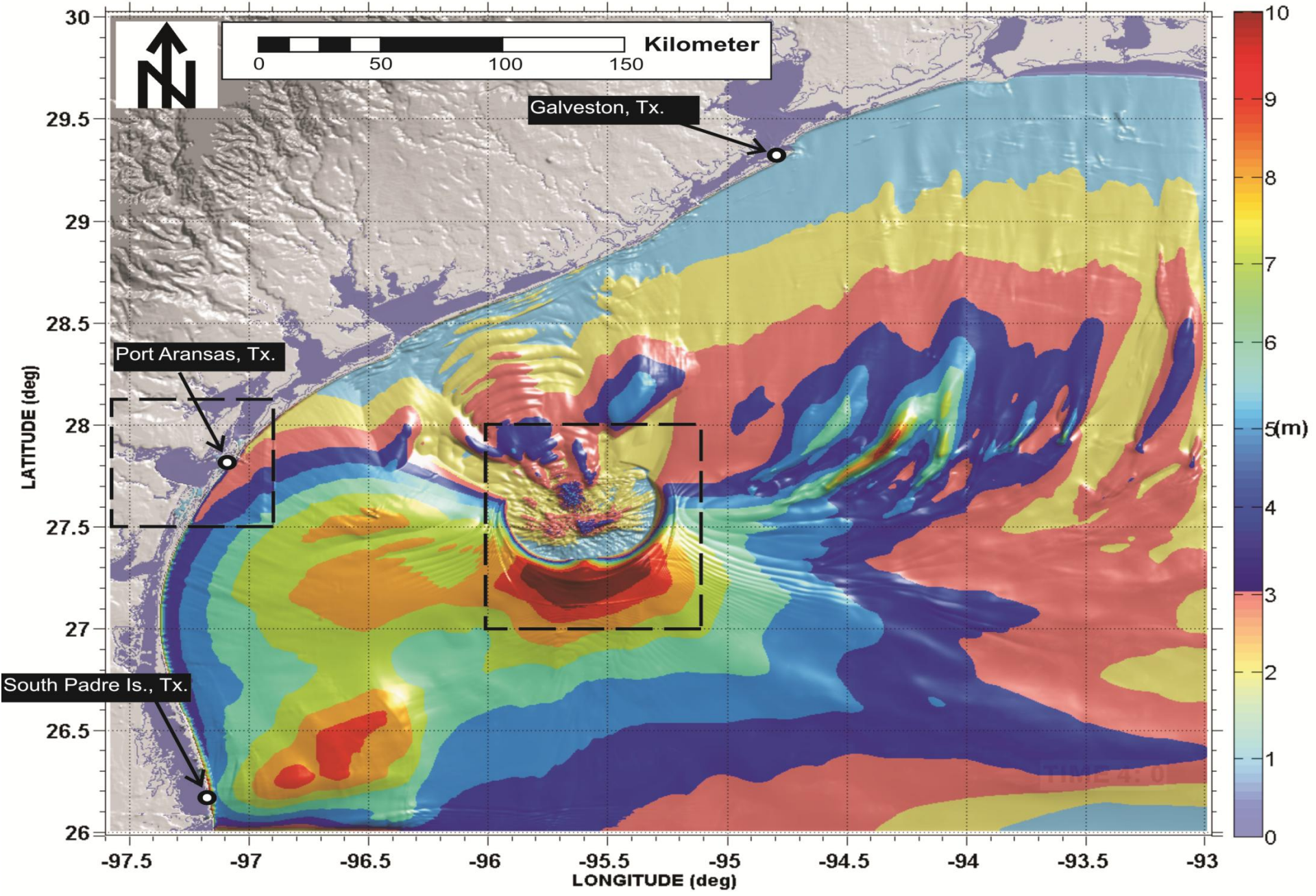
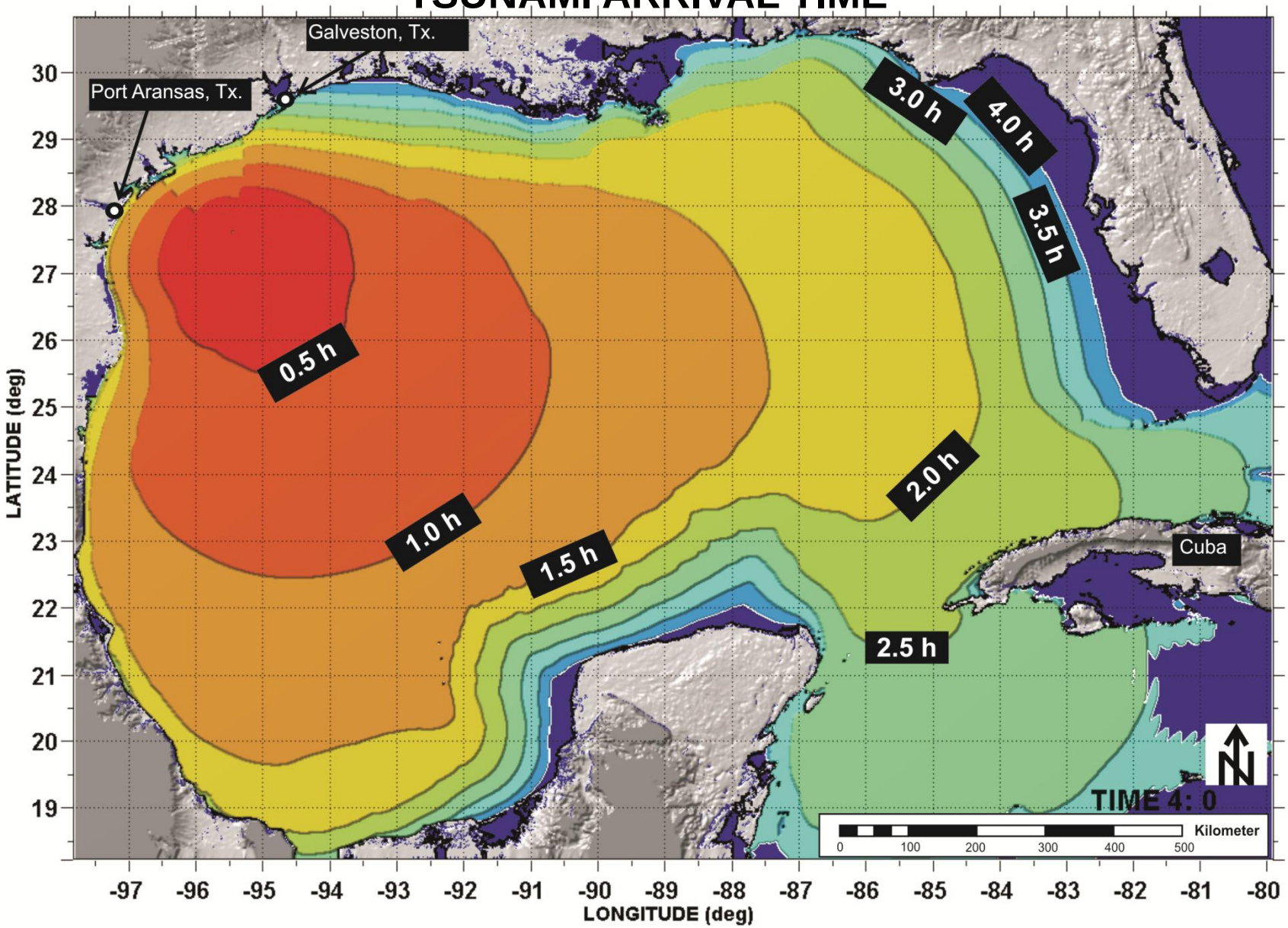
EAST BREAKS LANDSLIDE



EAST BREAKS LANDSLIDE - ZOOM UP - MAXIMUM WAVE AMPLITUDE

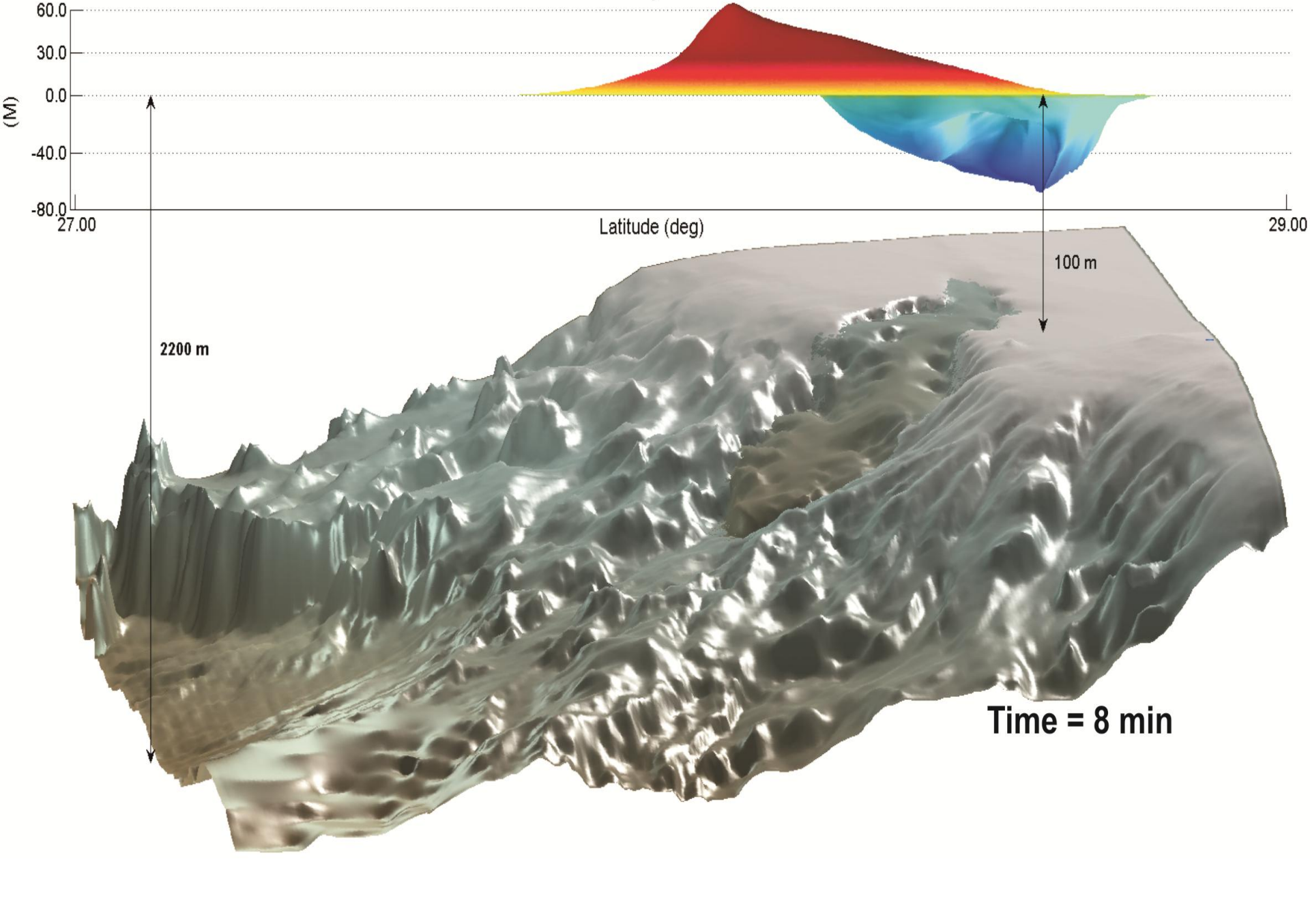


EAST BREAKS LANDSLIDE
TSUNAMI ARRIVAL TIME

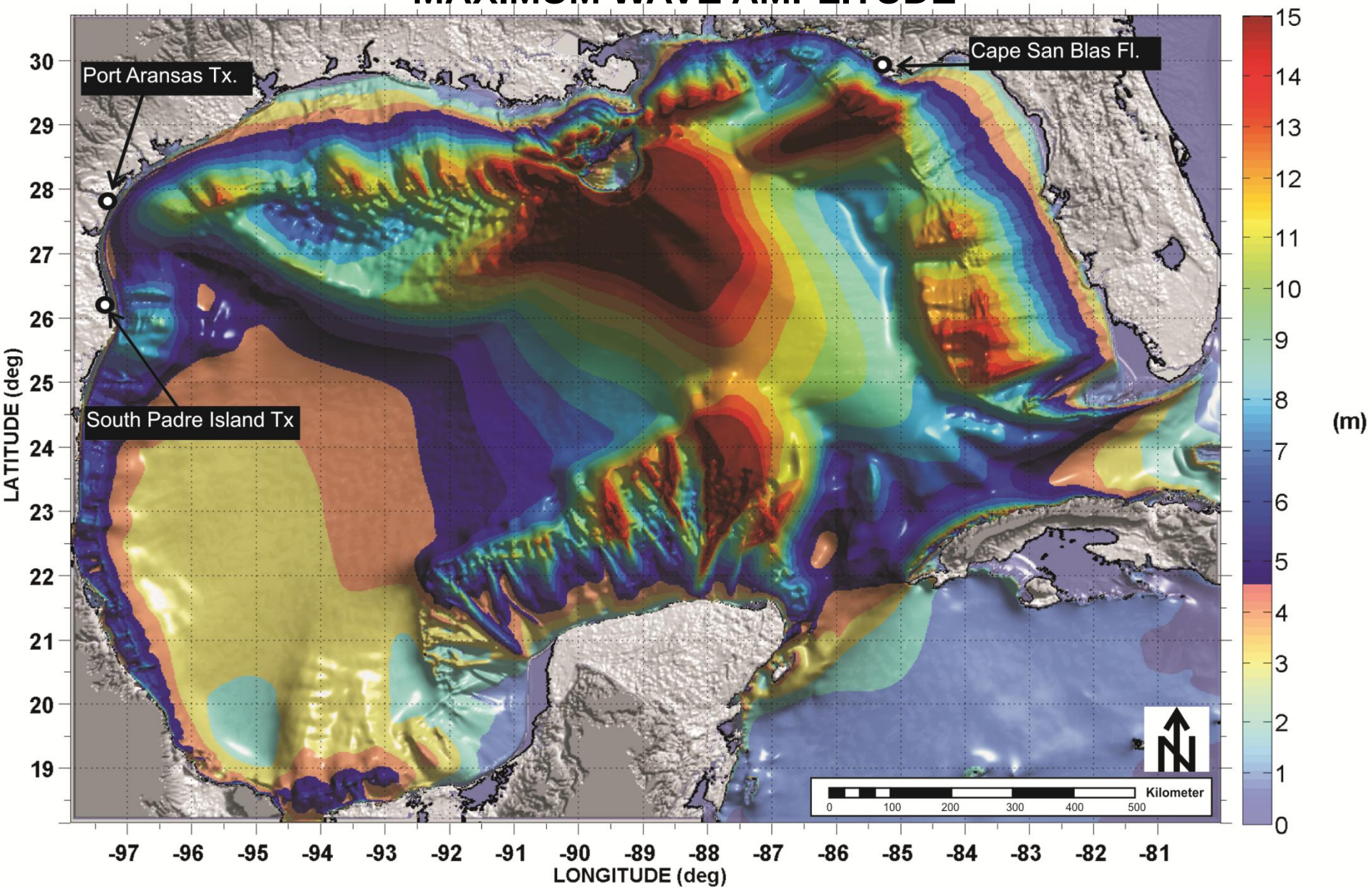


MISSISSIPPI CANYON LANDSLIDE MODEL

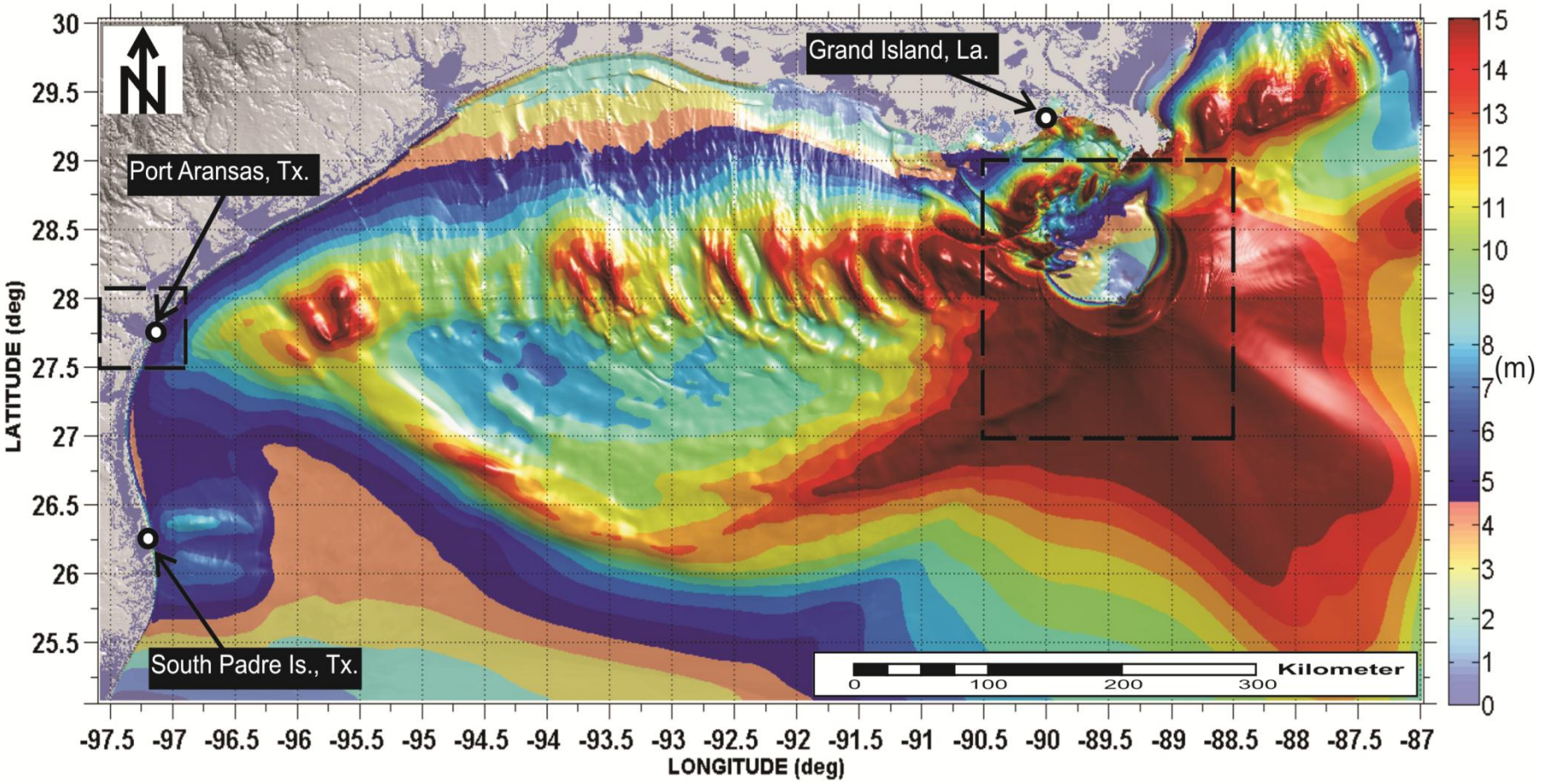
MISSISSIPPI CANYON LANDSLIDE



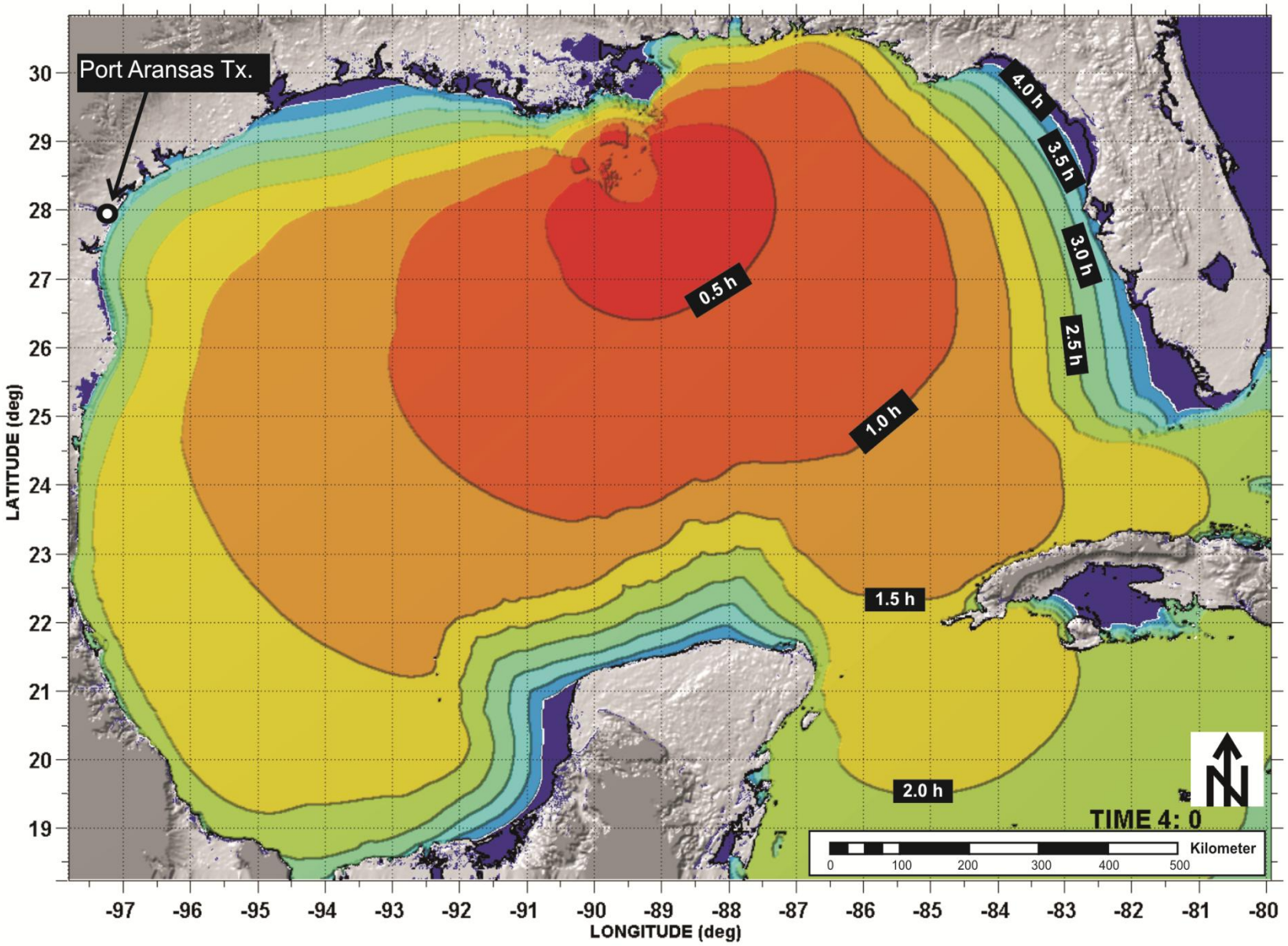
MISSISSIPPI CANYON LANDSLIDE
MAXIMUM WAVE AMPLITUDE



MISSISSIPPI CANYON LANDSLIDE - ZOOM UP - MAXIMUM WAVE AMPLITUDE

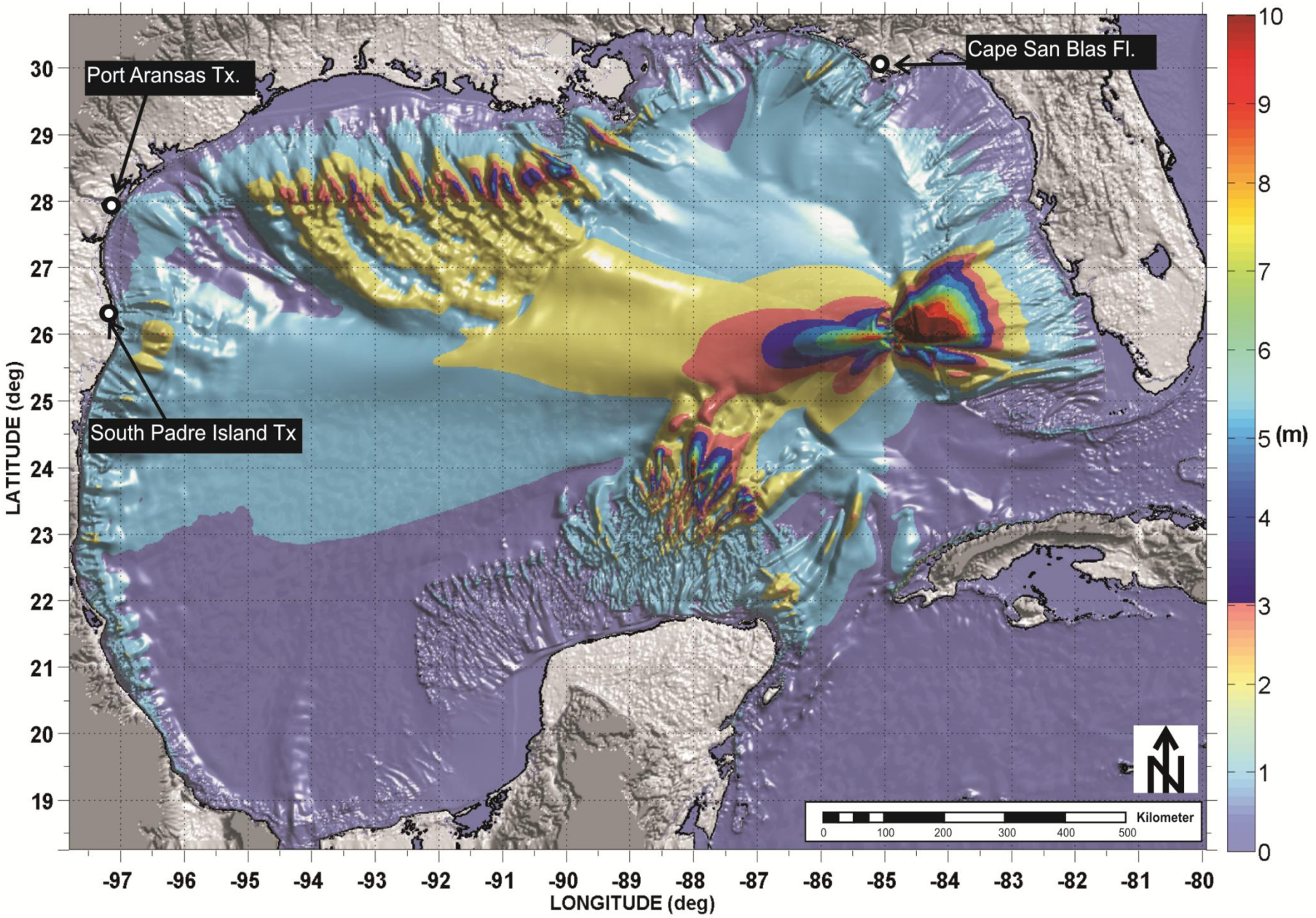


- MISSISSIPPI CANYON LANDSLIDE -
TSUNAMI ARRIVAL TIME

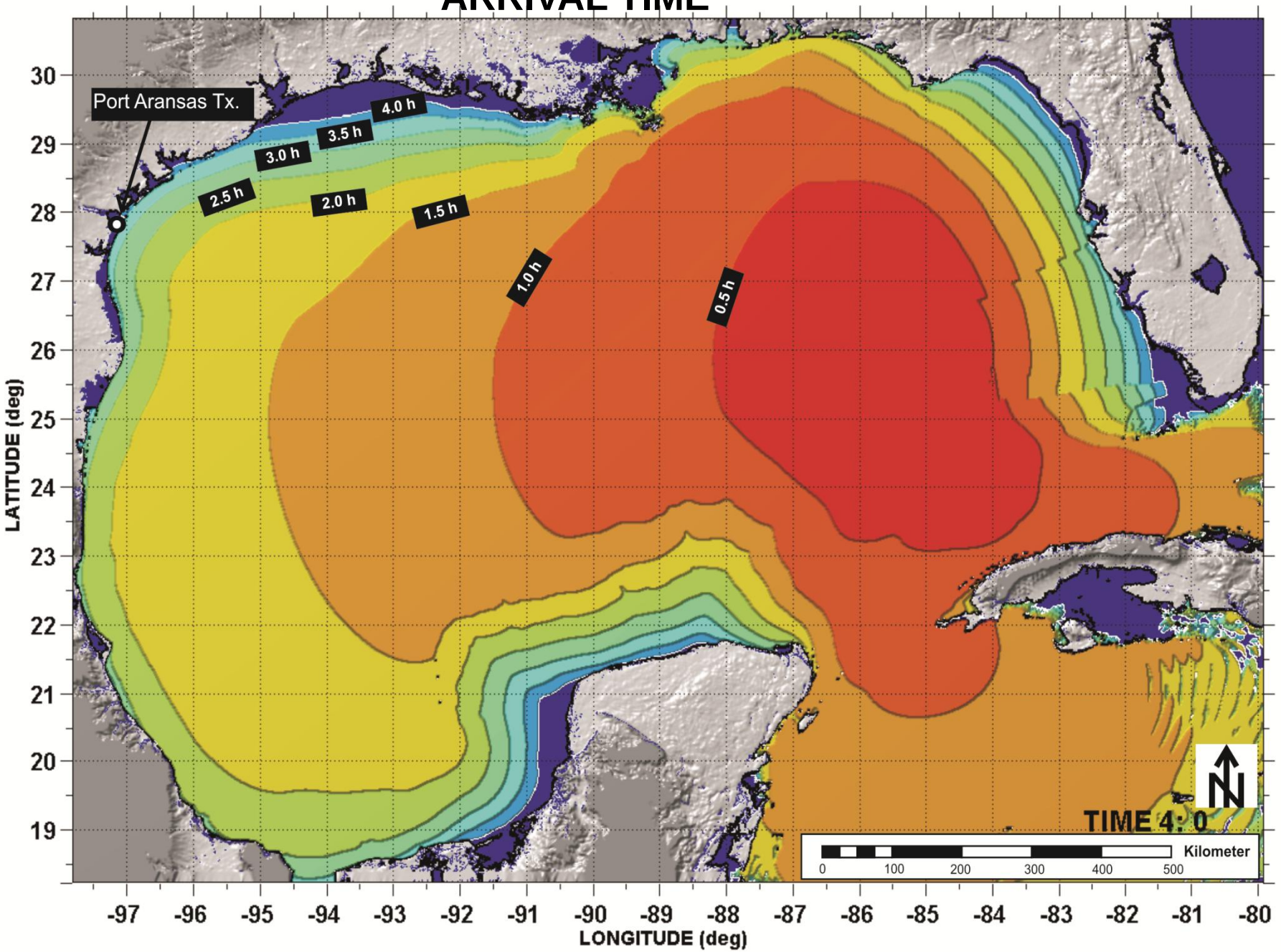


WEST FLORIDA LANDSLIDE MODEL

WEST FLORIDA LANDSLIDE
MAXIMUM WAVE AMPLITUDE

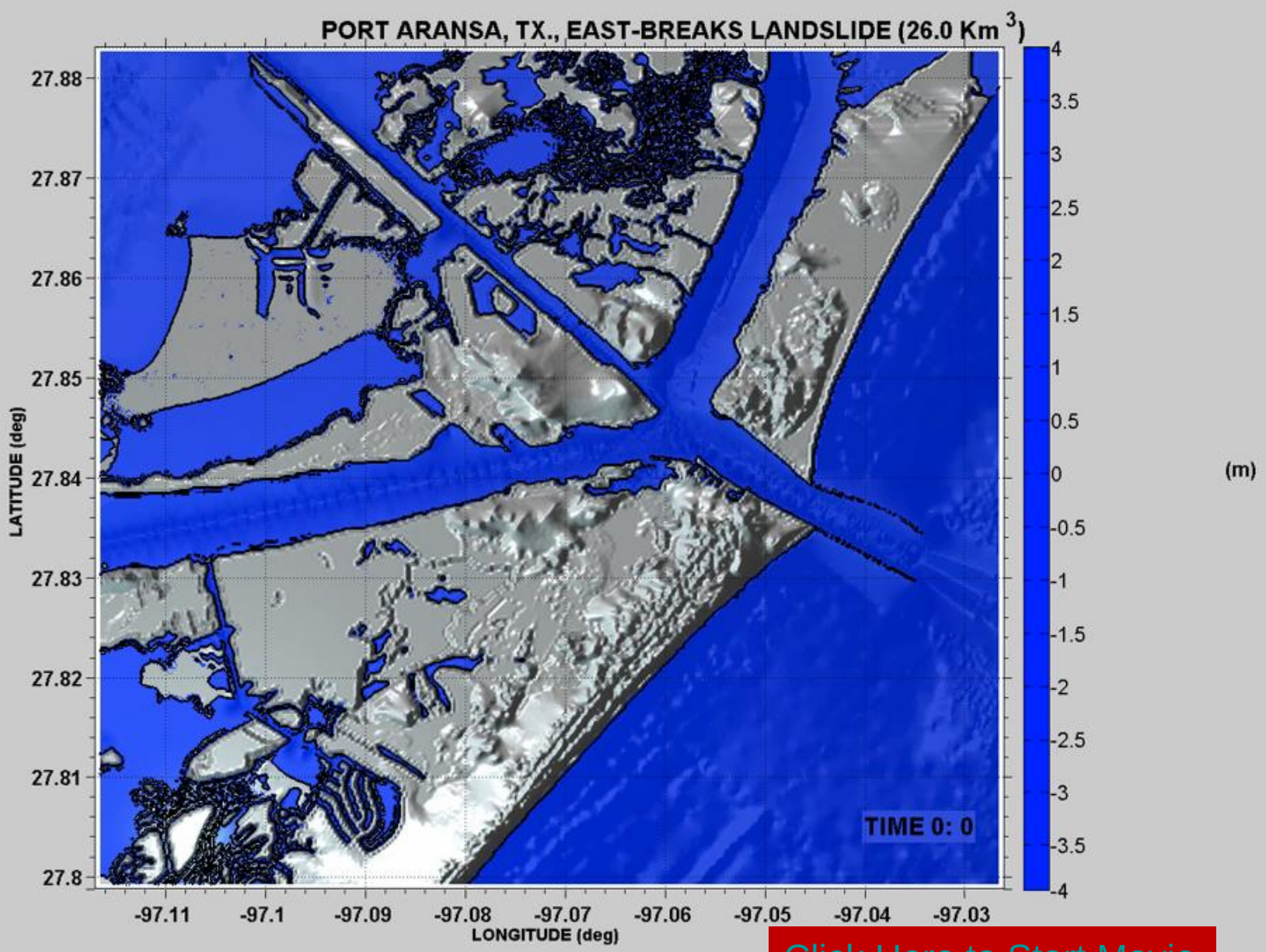


- WEST FLORIDA LANDSLIDE -
ARRIVAL TIME



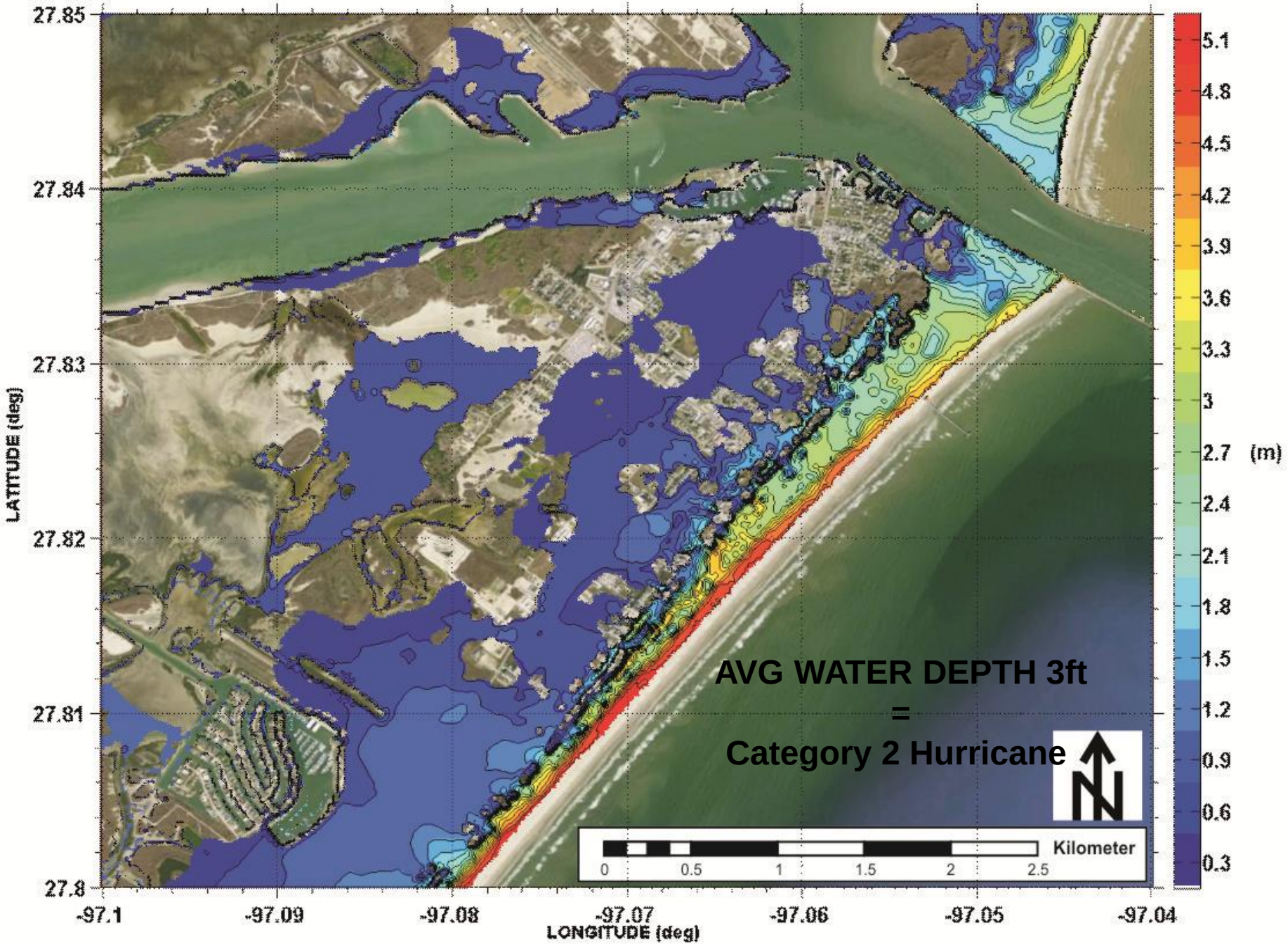
EAST BREAKS LANDSLIDE RESULTS

Note new toolbar buttons: data brushing & linked plots Play video

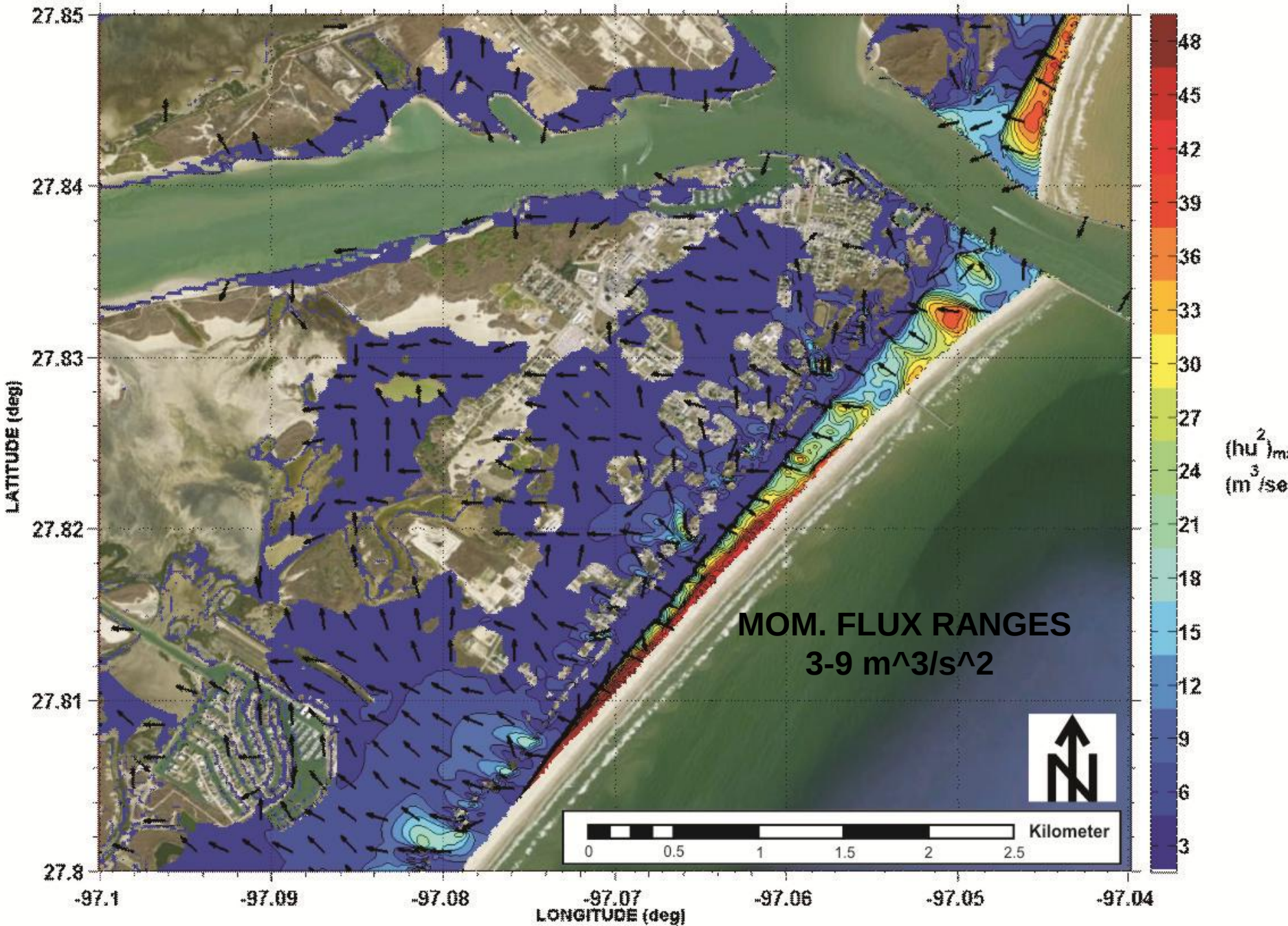


Click Here to Start Movie

EAST BREAKS INUNDATION DEPTH

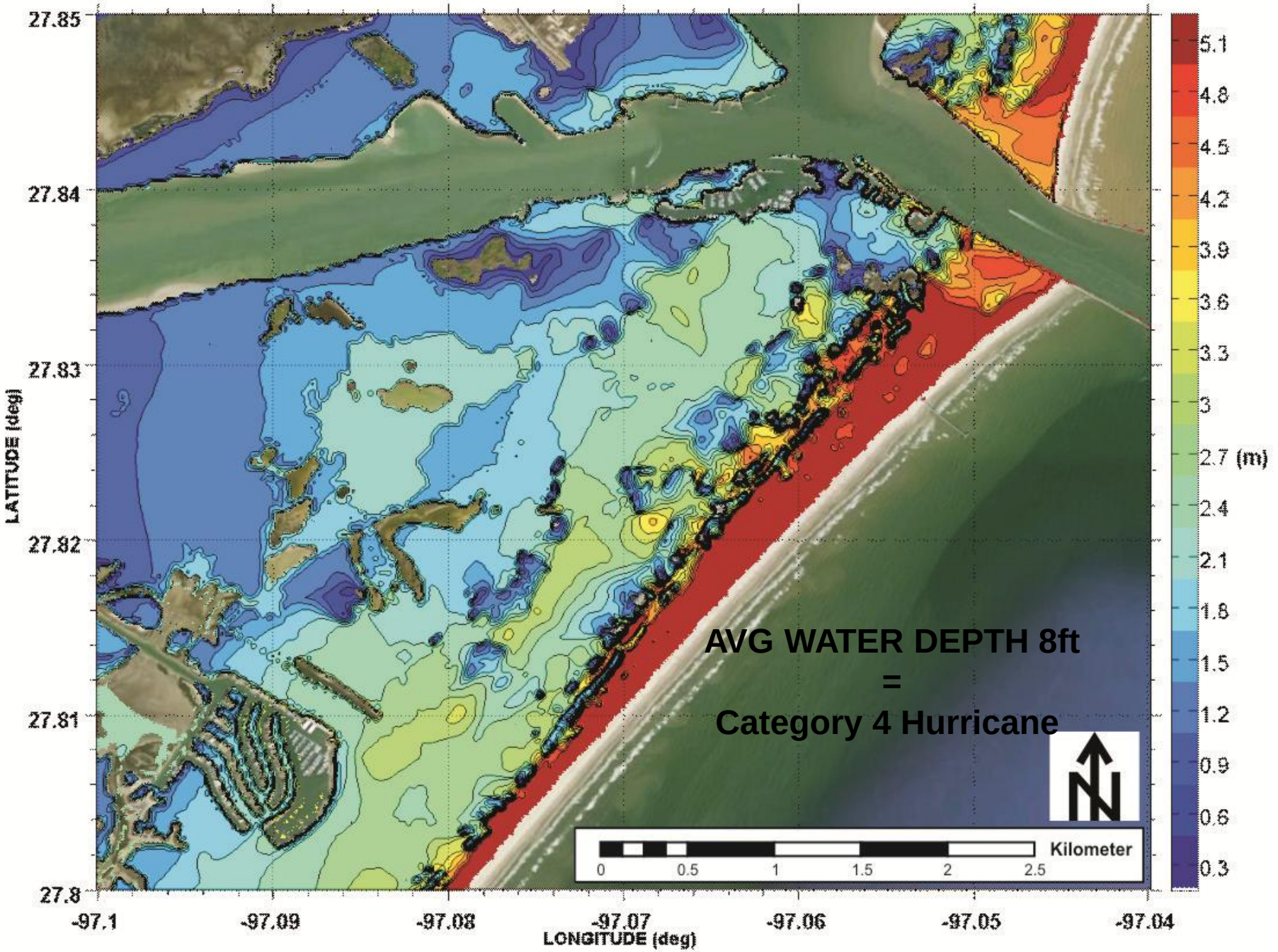


EAST BREAKS MOMEMTUM FLUX

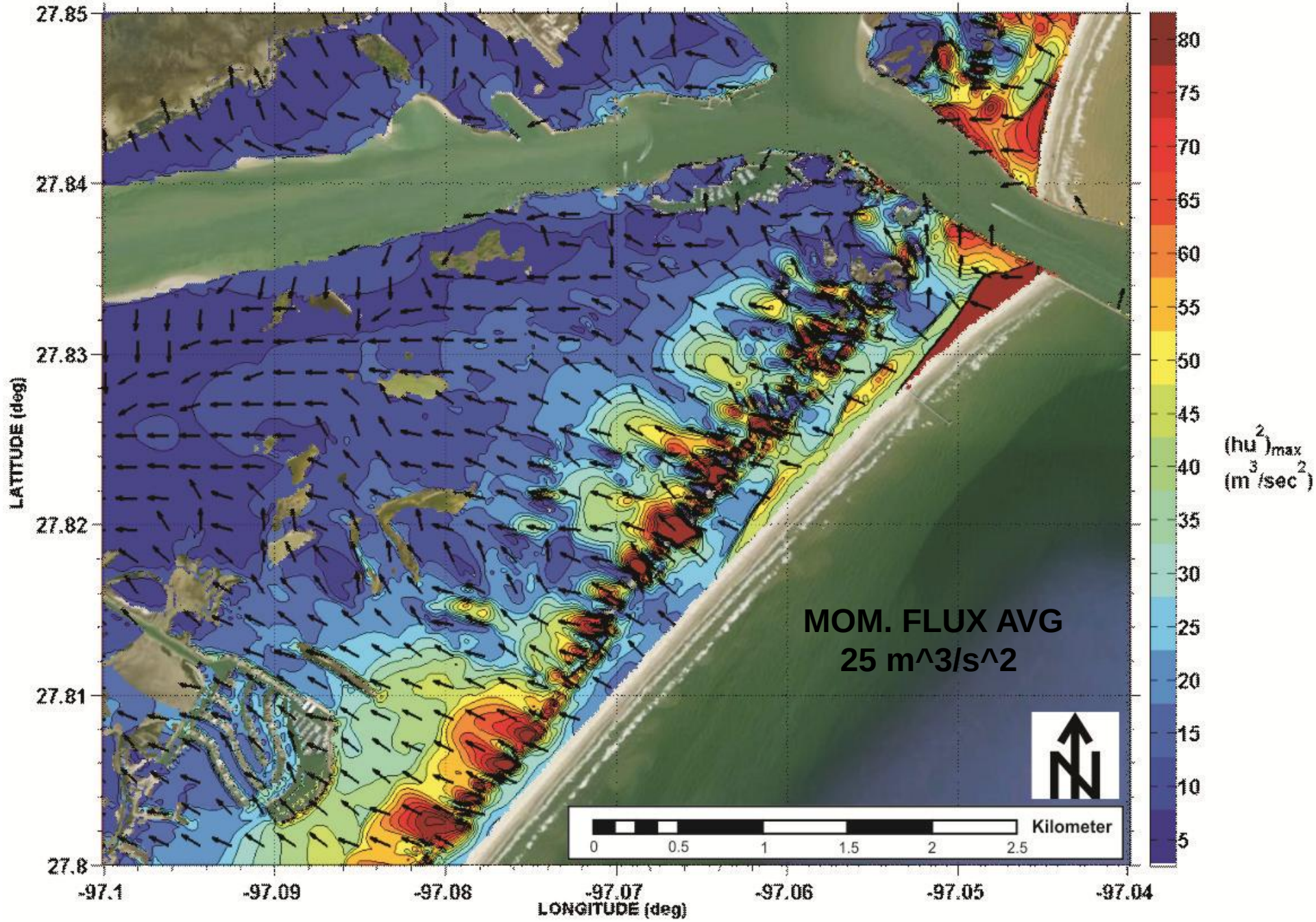


MISSISSIPPI CANYON LANDSLIDE RESULTS

MISSISSIPPI CANYON INUNDATION DEPTH



EAST BREAKS MOMEMTUM FLUX



CONCLUSIONS

These landslide scenarios have the potential to cause severe flooding and damage to the GOM coastal communities and oil infrastructure. Such landslide sources can flood Port Aransas with an:

Avg. water depth of 3 - 8ft (0.9 - 2.4m)

In term of flooding the tsunamis generated by these landslide are comparable to storm surges originated **by hurricanes of category 2 to 4**.

Table 1. Maximum Water Elevation for hurricane of a given category in Port Aransas TX.

Hurricane Category	Maximum Water Elevation Range (ft)	Numerical Model Result
1	4.3-4.9	
2	7.3-7.6	East-Breaks
3	9.6-10.3	
4	13-13.2	Mississippi Canyon
5	16.3-16.6	

By Thomas LeBlanc

National Tsunami Hazard Mitigation Program
Construction of tsunami inundation maps in the Gulf of Mexico

CONCLUSIONS

Tsunami energy focusing is identified in several regions along the GOM coastline

<u>Regions most impacted are:</u>

1- southern tip of South Padre Island, TX.,
2- Grand Island, LA,
3- Fort Walton Beach-to-Cape San Blas, FL,
4- Tamaulipas, Mexico.