

iSAS/IODP Proposal Cover Sheet

☐ New☒ Revised☐ Addendum**581-Full2**

Please fill out information in all gray boxes

Above For Official Use Only

Title:

Latest Pleistocene drowned coralgall banks and mounds along the edge of the South Texas and Mississippi continental shelves

Proponent(s):

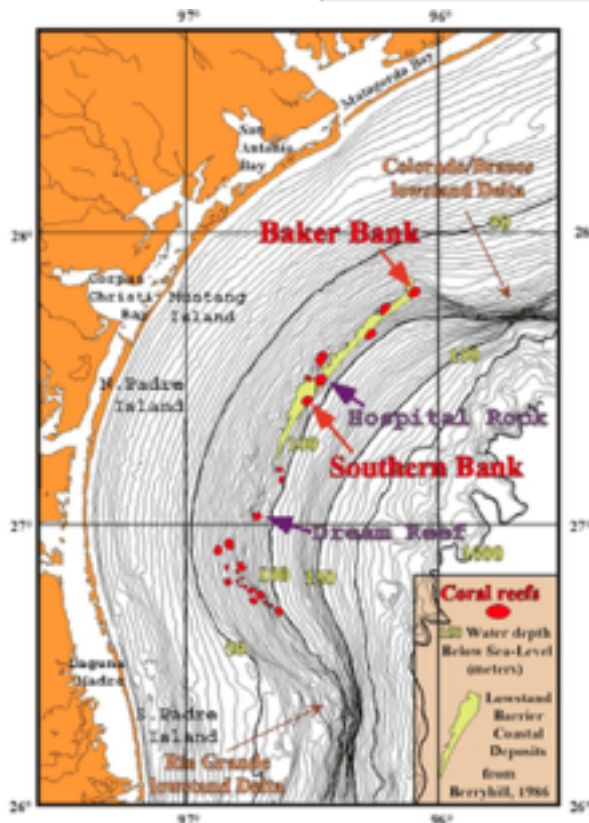
André W. Droxler (Rice University) and William W. Sager (Texas A&M)

Keywords:
(5 or less)

Coralgal Reefs and Sea Level, Sea Level History, Last Deglaciation, Carbonate Drowning

Area:

Northern Gulf of Mexico



Southern and Baker Banks are currently **drowned coralgall reefs about 40 to 50 m thick** on the edge of the South Texas Shelf 55 km offshore Corpus Christi.

They are interpreted to have grown during the first half of the last sea level transgression on top of topographic highs occurring along a **lowstand siliciclastic paleo-coastline at the Last Glacial Maximum**.

Drilling plan:

A total of **7 drill holes, each 80 to 100 m deep**, consisting of an array of 5 boreholes through Southern Bank and a 2 borehole-transect through Baker Bank and their siliciclastic substratum.

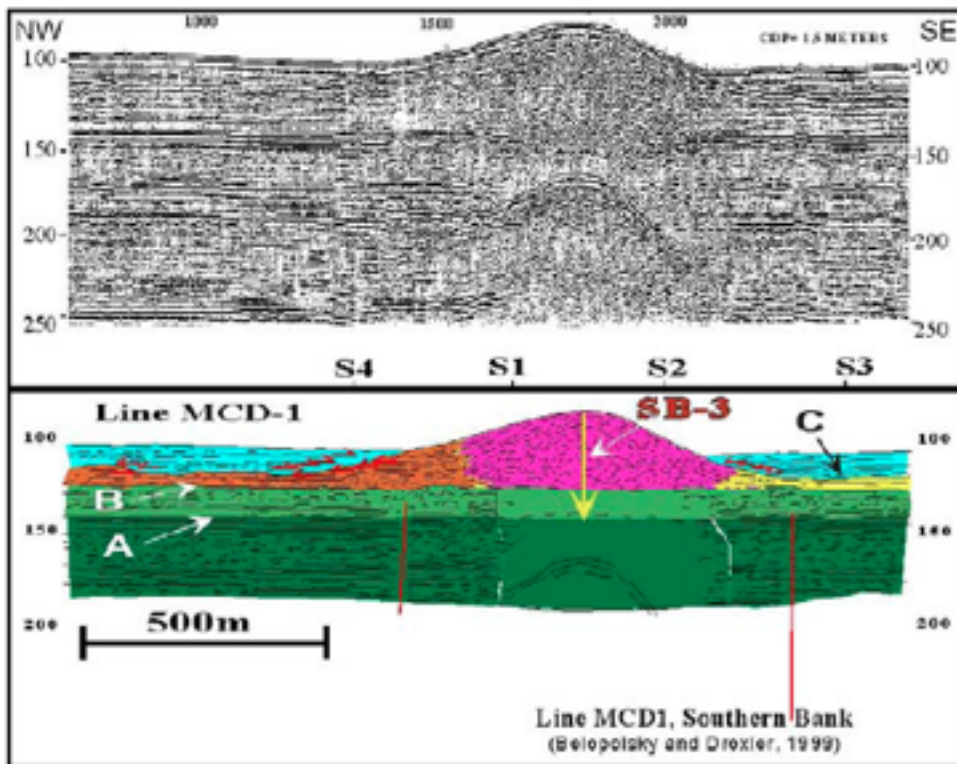
WD 60-70 m

Each borehole will include at least two of the three following sedimentary packages:

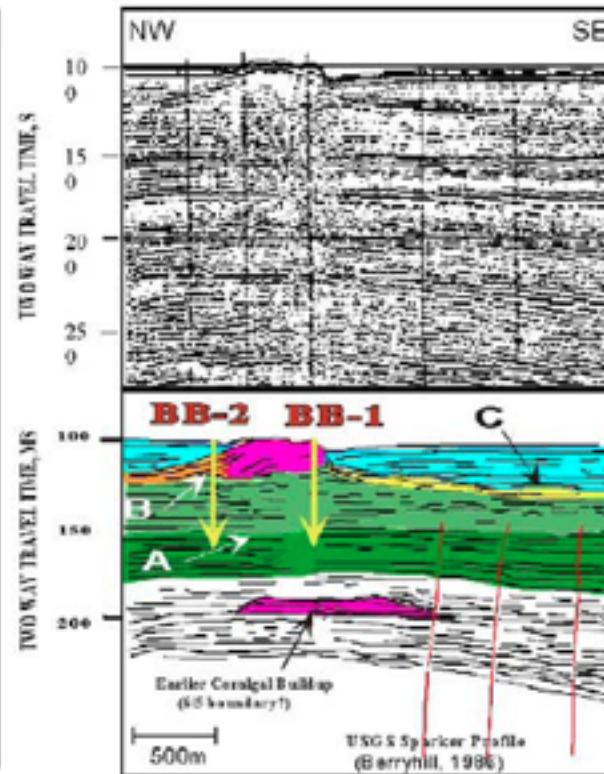
- (1) the **siliciclastic substratum** of the reefal edifice,
- (2) the **coralgall sequence** itself,
- (3) the **mud blanket** that partially covers the reefal edifices.

In addition a 2 borehole-transect across similar transgressive banks observed at the edge of the Mississippi-Alabama continental shelf has been integrated to this drilling proposal.

A. Southern Bank



B. Baker Bank



- IV: Highstand and mud blanket
- III: Transgressive coralgal sediments, late glacial – younger Dryas reef

- II: Lowstand coastal siliciclastics, Stage 3 - LGM
- I: Faulted Stage 5 clayey sediments (?)

Summarized objectives:

- (1) Shed new light on the enigmatic findings that **coralgal edifices flourished** on the edge of the South Texas and Mississippi-Alabama shelves during the **first part of last deglaciation**, an interval of time when conditions of **sea surface temperature and sea surface salinity were expected to be lower** in the Gulf of Mexico, and **rates of eustatic sea-level rise much faster** than they are today.
- (2) Drilled material will **improve the resolution of the last deglacial sea-level history from late Glacial to the Younger Dryas**, including the interval of the melt-water pulse 1A, from a passive margin environment less influenced by discontinuous tectonic activity as in the offshore Barbados.
- (3) Drilled material will help better understand the sedimentary and biological processes involved with the **origin (initial establishment), growth, and demise of carbonate reef tracts** along the edge of siliciclastic shelves.
- (4) The latest Pleistocene transgressive coralgal reefs on the edge of the South Texas Shelf can be studied as **recent analogs for reefal reservoirs buried in siliciclastic shelves**.

Decision and recommendation at EFB meeting in March 2013:

- > Not scheduled, but proponents were asked if they can lower penetration depths and still achieve most of their objectives.

Development since March 2013:

- > Discussions on using seabed drilling system from research vessel; penetration depth of up to 80 m may address almost all objectives
- > Proponents have been in contact with ESO

EFB letter to proponents after last EFB meeting in 2015:

- Proponents were asked to stay proactively in contact with ESO regarding the availability of research vessel for the Gulf of Mexico region (ideally as an in-kind contribution) and a seabed drill.
- Proponents must provide missing site survey data to the SSDB. Without the digital data (seismics in particular) in the SSDB, the EFB will be forced to remove the proposal from the holding bin at the next EFB meeting.

ESO cost estimates (incl ESO expedition costs)

with seabed drill and research vessel IKC: 2.4 – 4.0 M US\$

with geotechnical drill: 4.6 – 6.8 M US\$