High-Resolution Geologic Investigations In Tampa Bay: Advances and Limitations

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Objectives

- Organic-rich mud buildups in Safety Harbor
  - Source(s)
  - Distribution patterns
  - Accumulation rate(s)
  - Timing of events - - - Controlling processes
  - Alterations due to human activities?
Multidisciplinary Approach

- Bottom type classification/mapping
- Sedimentology/Geochronology ($^{210}\text{Pb}$, $^{137}\text{Cs}$, $^{7}\text{Be}$)
- Geochemistry - - - Biomarkers
- Biology - - - Microscopic analysis
Core Sites

- Fine-grained sediments
- Rapid accumulation
- Stratigraphic Integrity
**SH-08-PC-16**

- **METERS**
  - 0.00-0.10 m: dark greenish gray muddy sand/sandy mud with few to no shells.
  - 0.10 m gradational contact.
  - 0.10-1.24 m: greenish gray muddy sand with shell fragments.

**0.75-0.79 large shell fragment (crown conch).**

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**SH-08-PC-30**

- **METERS**
  - 0.00-2.45 m: dark greenish gray sandy mud with few to no shell fragments.

**2.45 m sharp contact.**

**2.45-2.82 m:** dark brown/black organic mud with some whole shells and shell fragments.

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**LITHOLOGY**
- muddy sand
- muddy sand/sandy mud

**CONTACTS**
- Gradational
- Shell Fragments
- Gastropods

**LITHOLOGY**
- sandy mud
- organic mud

**CONTACTS**
- Sharp
- Shell Fragments
Core 30  Pb-210/Cs-137
LTOC Source For Organic-rich Muds?

Not so fast!!!

Geochemical/microscopic analysis points to in situ organic production.
CONCLUSIONS

• Fine-grained sediments accumulating for 1,000’s of years

• Distribution – Low energy, depressions, proximity to source

• Accumulation – Steady increase – last 100 ybp – Anthropogenic?
  – Since 1960’s – significant increase (LTOC?)
    – Shift in depositional pattern

• Source(s) – Clastic muds – consistent with LTOC source
  – Organics – in situ production

Importance of multidisciplinary approach!
Depth (mm)

Scan 1

% Al

% Ca

Pb-210 Storm Records

Year

2008

2007 T-Low Noel
2007 TS Olga

2005

2004

2001 TS Dean

2000

2000 Cat 1-2 Debbie
1999 Cat 1-2 Jose

1998

1995

1996 TS/Cat 1-2 Bertha
1995 Cat 1-2 Marilyn

1992

1989 Cat 3-4 Hugo

1988

1984

1984 TS Kaus