Isolated Carbonate Platforms
Lessons learned from Great Bahama Bank

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Great Bahama Bank
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- Steep-sided core platforms
- Asymmetric platform expansion
- Pulsed progradation
sea-level rise

reef

reef

sea-level fall

reef
Bahamas Transect: 7 Drill Sites across Prograding Margin of Great Bahama Bank
Graded bed with lithoclasts and erosive base

Coarse-grained slope deposit with lithoclasts

Hardground in upper slope deposits

Uncemented periplatform ooze

Fine-grained slope deposit dolomitized

Pliocene

Miocene

Karstified Reef dolomitized
Haq Curve

Leg 166
Seismic Sequence Boundary ages
Joulters Cay
Facies architecture

Unfilled accommodation space:
Creates antecedent topography
Controls facies distribution
Summary of lessons from sea level and architecture

- Isolated platforms have enormous lateral growth potential
- Progradation occurs in sea level controlled pulses
- Platforms have unfilled accommodation space
- Facies dependent filling of accommodation space creates topography on platform, which controls facies distribution during next sea level cycle
Cementation Experiment
Results Location BB, 100ft

original

8 months

20 months
Meteoric Diagenesis

Aragonite dissolution
LMC cementation
Moldic porosity
Margin of Great Bahama Bank with drill sites of the Bahamas Transect

From Anselmetti et al. 2000
Aragonite neomorphism
Micritized grains
Calcite cementation
Blocky spar
Minor molds

Aragonite dissolution
Moldic porosity
Dogtooth spar
Minor overgrowth

Melim et al. 1995
Porosity can be created in the marine diagenetic environment.

**Meteoric Mixing Zone**

**Marine Burial Realm**
Summary of diagenetic lessons

• Cementation is occurring within months

• Dolomitization is episodic and by sea water

• Porosity can be created in marine burial environment
Conclusions

• Architecture
  • lateral growth potential
  • sea level controls growth and diagenesis
  • unfilled accommodation space creates facies heterogeneities

• Diagenesis
  • cementation within months
  • episodic dolomitization by sea water
  • marine burial diagenesis is equal to meteoric diagenesis