Cenozoic History Written in a Passive Continental Margin:
It's there for the reading

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You are here
Baltimore Canyon Trough

As much as 16 km of post-rift sediment
Much of it deposited in < 100 m water depths
Long record of margin evolution
Shoreline Strike Line, Baltimore Canyon Trough

Thick Jurassic offshore where subsidence provided ample accommodation
Thick deltaic Cretaceous onlapped landward, prograded seaward
Thin, discontinuous Paleogene leading seaward to carbonate ramp-like shelf
Late Oligocene return to deltaic + shoreface progradation
Undeniable along-strike Neogene variations — the causes deserve our attention!
Sequence Boundaries Divide the Record

Oceanview lower Miocene-Eocene

9+ Miocene, 6-8 Oligocene, 10 Eocene, 3 Paleocene, 14 Late Cretaceous
Lower Miocene sequences

- erosional boundaries
- shoaling upwards
- each ends near shoreline
- Sr isotopic dating ±0.5 Ma
- ~1.5 Ma duration

Coastal Plain Drilling
New Jersey Continental Shelf

- Oligocene
- Early Miocene
- Mid Miocene
- Abundant Pleistocene
Exp313 Located to Test Oligocene-Miocene SL Imprint
Excellent Core Quality / 80% Recovery

clay/silt bands  

storm beds  

shell beds
Lithofacies revealed changes in paleo-water depths as well as alternating storm + river dominated shorelines
Key Stratigraphic Surfaces

transgressive surface  foreshore  sequence boundary
Lithostratigraphy

Flooding surface
Lithostratigraphy

Sequence boundary m5.45
Lithostratigraphy

shoreface
Miocene Isopachs – 24 to 15 Ma

Dueling sediment sources?  See-saw accommodation?  Long-shore reworking?
Sediment Accumulation Has NOT Been Smooth + Steady

- Icehouse
- Deep Freeze

- mid Miocene
- Pleistocene
Passive-Aggressive Tectonics?

NJ – VA Problem (late Miocene-Pliocene)

Following thick lower + mid Miocene, NJ = hiatus in upper Miocene thru Pliocene
VA backstripping yields 20 m sea level rise
Cause? – NJ inversion or VA subsidence
Why the difference in regional stratigraphy?

Fault bounded grabens + wrenching
Fault bounded terranes
“Rolling basins”
Dynamic topography
Variations in intraplate stress

Kulpecz et al. 2009