

The Variability of Cold-water Coral Growth within the Straits of Florida

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- ### Key Points:
- The two CWC mounds, Matterhorn and Mount Gay, show the following fundamental differences:
- The base of the core from Matterhorn dates back into the Pleistocene (>360kyrs) while the base of Mount Gay core is Holocene (<10kyrs)
 - The mounds have different growth rates despite being within the same carbonate province with a lateral distance of 111 km
 - Matterhorn average mound growth: ~0.75 cm/kyrs
 - Mount Gay average mound growth: ~186.25 cm/kyrs
 - The matrix in the two mounds displays variable grain sizes: fine-grained, mud and silt-sized material make up Mount Gay while the majority of the Matterhorn is made up of a coarse-grained, sand-sized matrix

Study Area:

Cold-water corals (CWCs) develop thick frameworks that, over time, produce bioherms composed of accumulated sediment and coral skeletal fragments. Within the seaway of the Straits of Florida near the Great Bahama Bank (GBB), CWC mounds are developing in a carbonate province.

Mounds within this province:

- Develop on boulders and blocks from submarine land-slides on the slope of the GBB
- Occur at the toe-of-slope of Great Bahama Bank in water depth between ~500 to ~850 m
- Corals grow in water temperatures ranging from ~8°C to ~10°C
- Are highly variable in shape and size

Florida

Gulf of Mexico

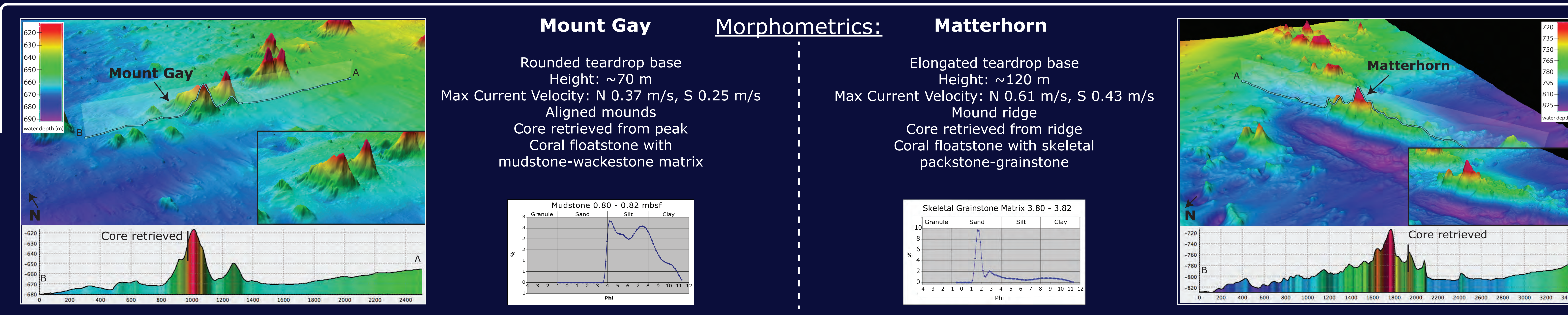
Atlantic Ocean

Cuba

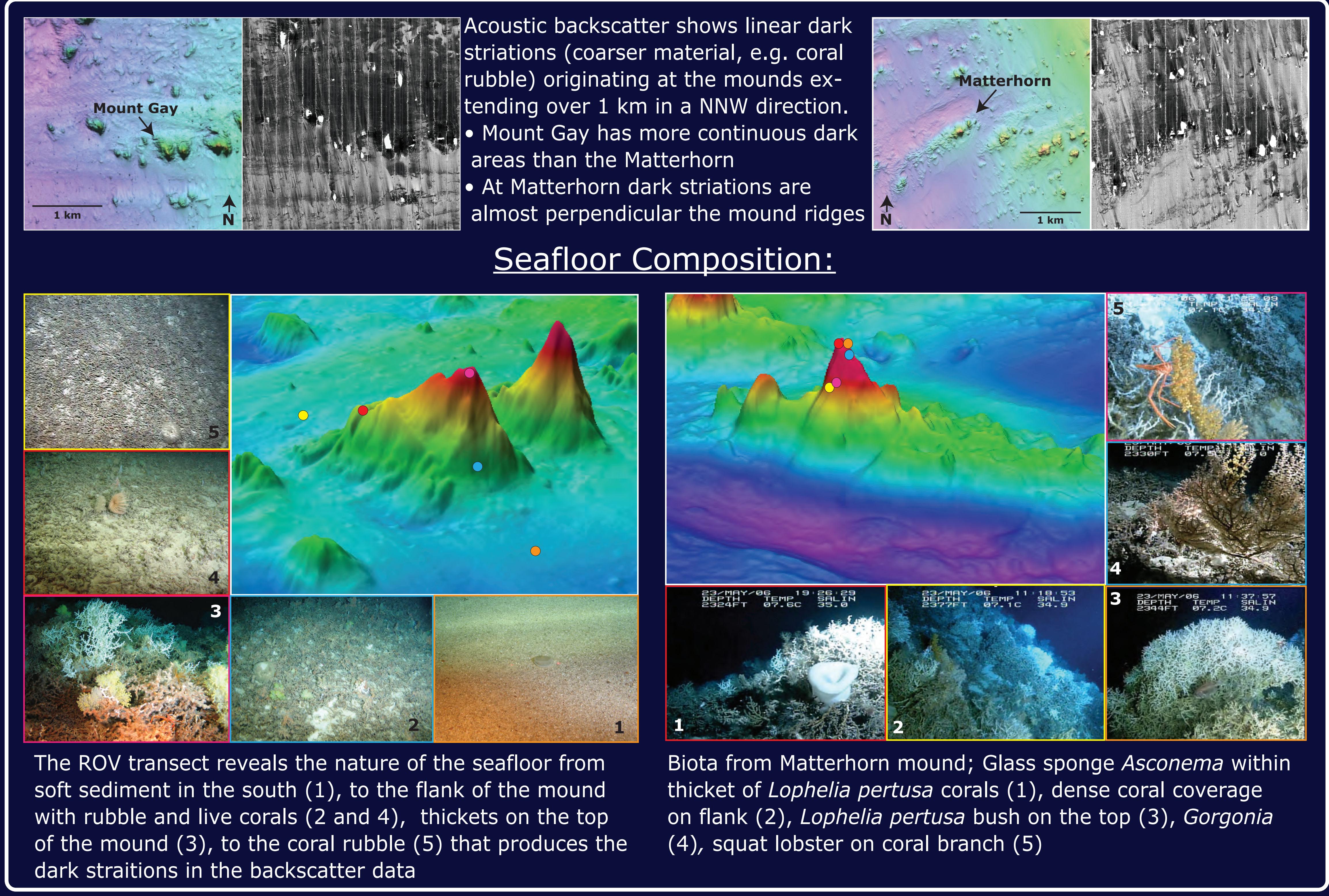
Straits of Florida

Matterhorn

Mount Gay



- A] Mount Gay displays up to 28% corals of the core volume
- B] Coral clast size is ~ 10 cm throughout core
- C] Minor decrease in coral clast size may indicate a 'reworking' phase where corals have been broken
- D] Coral abundance varies gradually in several intervals of the core



- A] Matterhorn mound displays up to 30% corals* of the core volume
*except at top, displays over 50% coral
- B] Where there is coral abundance, fragments of corals are larger
- C] Cases of decreasing coral clast size may indicate a 'reworking' phase where corals have been eroded increases with depth
- D] Spikes in mean matrix density correlate with increases in coral abundance

Subsampling coral fragments proved that the classification based on the high-resolution scans of the core are correct. Fragments above were identified to be *Lophelia pertusa*.

M55-539-SL

Mount Gay - Lophelia pertusa

Depth: 2 m

Wienberg/Hebbeln

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