**S3. Supplemental Data Tables**

**ST1.** Metadata: information on the origin, preparation and identification of all core-top specimens. This includes the Yale Peabody Museum (YPM) Division of Invertebrate Paleontology specimen catalog number, cruise information and data on the sample locality, sieve size fraction of the individual specimens, internal specimen identification number, and species assignment for all specimens used in the study.

**ST2.** 2dMorph: AutoMorph outputs from 2Dmorph software from spiral and umbilical views. “Segment ID” refers to the object number automatically assigned to each specimen by the Segment program.

**ST3.** 3dMorph: AutoMorph outputs from 3Dmorph software from spiral and umbilical views. “Segment ID” refers to the object number automatically assigned to each specimen by the Segment program. Volume and surface area values included are whole-test estimates based on hypothetical dome, cylinder and cone shaped back-sides, top-half measurements, and elliptical estimates. Height measurements from AutoMorph as well as height estimates corrected for missing or extraneous planes are also shown.

**ST4.** Porosity: pore measurements taken from SEM images of test walls. “Crop Area” refers to the size of the cropped section of the test wall, and scale is the number of microns per pixel in the SEM image.

**ST5.** Cultured - Chambers: Pore measurements from individual chambers from CT scans of cultured specimens.

**ST6.** Cultured – Whole Tests: Measurements of whole test dimensions from CT scanned cultured specimens.

**ST7.**  Core-top Habitat Data: environmental data used in the random forest models for each species group from each locality.