**S2. Supplemental Figures**

SF1. Workflow for extraction of two- and three-dimensional data using the Automorph software package, as described in Hsiang et al., 2016 and Hsiang et al., 2017.

SF2. Comparison of umbilical and spiral side values output by 2Dmorph for cross-sectional area and major axis length (a-b), by 3Dmorph for top half volume and surface area measurements (c-d) and elliptical estimates (e-f).

SF3 Cross-plot of pore characteristics, body size estimates, and environmental data for species groups at each locality (latitude, temperature at inferred depth, average sea surface temperature [SST]) in relation to each other. a) porosity, b) average pore size, c) pore density. Regression trend lines are shown in green, r-squared and p values from least-squares linear regression analysis shown in the upper panel.

SF4 Boxplots showing the distribution of pore characteristic values (size normalized by surface area) by species. a) porosity, b) average pore size, c) pore density. Grey bars indicate morphotype as described in Be, 1960.

SF5. Back-chamber porosity (a), pore density (b), and pore size (c) measurements of cultured foraminifera. Numbers on the x-axis refer to chamber number, with “F” being the terminal chamber. The colored bars represent the range of values occupied by each of the treatment groups; orange is the high temperature group, green is the medium temperature group, blue is the low temperature group.

SF6. Average values Distribution of size-normalized porosity (%) values in each locality by species, arranged by SST at location of core top.