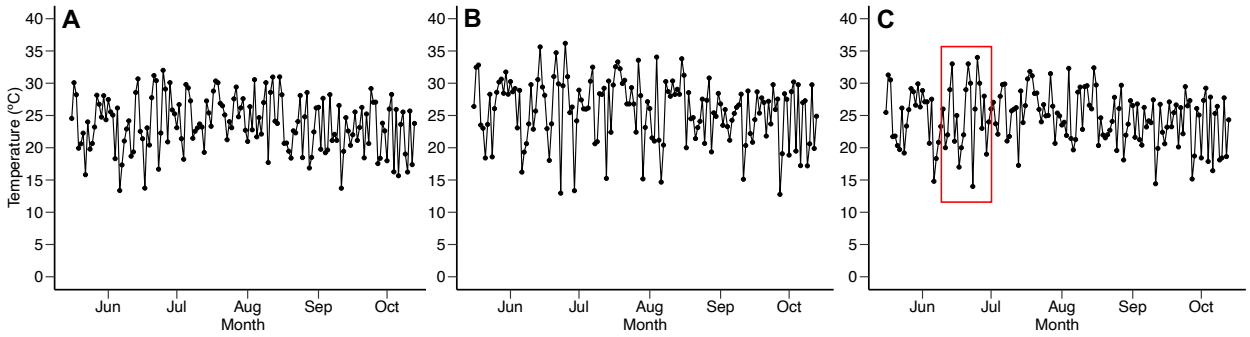


**Figure S1.** Maximum temperatures for each day from the robomussels situated in a tidepool (A) and attached to tidally-exposed rock (B). Temperature data from both the tidepool and tidally-exposed logger were combined to create the master temperature profile (C). The red outline on the master profile represents the section on logger data that was use to inform the unpredictable thermal regime.

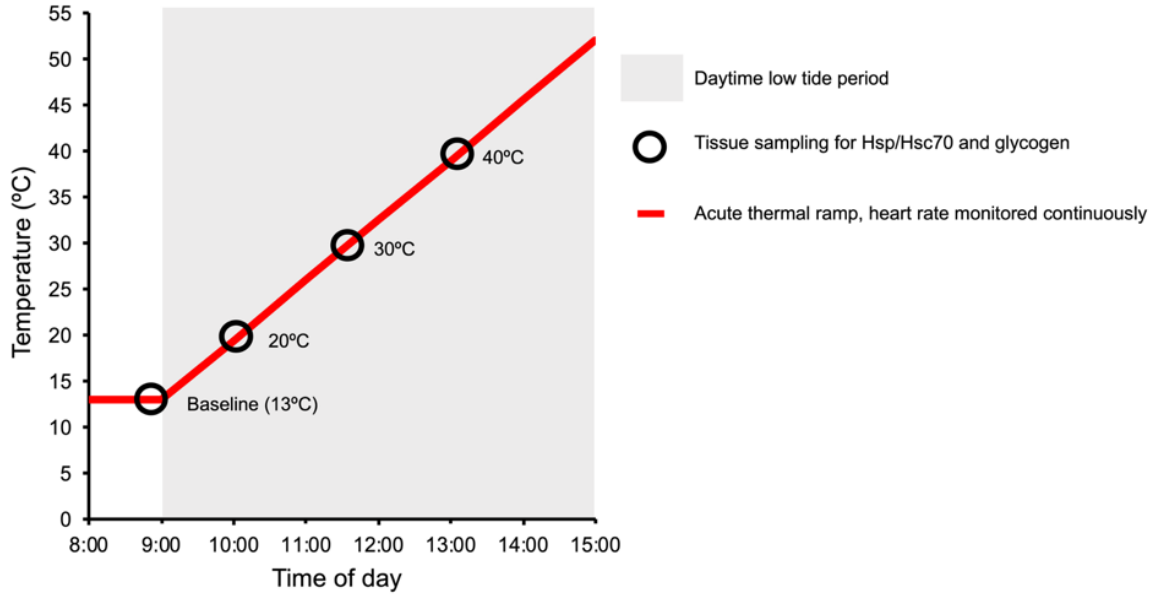


**Figure S2.** Diagrammatic schematic of the acute thermal ramp experiment. During daytime low tide, tidepool mussels were submerged whereas tidally-exposed mussels were exposed to air. During the acute thermal ramp (temperature increased at a rate of 6.5°C $h^{-1}$), heart rate was monitored continuously over the entire warming period (13°C-52°C), and this data was used to assess cardiac performance during the acute thermal ramp by creating thermal performance curves, as well as assessing Final Breakpoint temperature (BPT), Flatline temperature (FLT) and Maximum Heart rate (MHR). Tissue samples for Hsp/Hsc70 and glycogen analysis were taken just before the daytime low tide period at ambient temperature (baseline:13°C) and used to understand preparedness for anticipated period of stress. During the acute thermal ramp, tissues samples were also taken at 20°C, 30°C and 40°C, and were used with the baseline (13°C) samples to understand how Hsp/Hsc70 and glycogen levels changed as temperature increased.