

Marine Heat Wave Increased Variance and Decreased Productivity at Bering Strait during 2015–2016 [†]

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Abstract: Planktivorous auklets registered changes across two years of a marine heat wave (2015–2016). Colony attendance of crested auklets (*Aethia cristatella*) was reduced (35–50%) at Little Diomedede I., AK in latter June 2016 compared to 2015. The pattern was similar for least auklets (*A. pusilla*). An anomalous marine distribution and anomalous consumption pattern were noted for crested auklets. A plot of $\delta^{15}\text{N}/\delta^{13}\text{C}$ spanned three times the range in 2016 vs. 2015. Crested auklet RBC's had lower $\delta^{13}\text{C}$ values and higher $\delta^{15}\text{N}$ in 2016. Least auklet growing primaries showed the same pattern. Advected production is important, but $\delta^{13}\text{C}$ enrichment may have occurred later in 2016. Julian Date of sampling was more strongly correlated with $\delta^{13}\text{C}$ of crested auklet RBCs in 2016 ($r = 0.47$, $p < 0.001$) than 2015 ($r = 0.31$, $p = 0.01$). Crested auklets had higher baseline corticosterone ($t_{0.05(2)27} = 2.56$, $p < 0.05$) and higher variances in 2016. The crested auklet's citrus-like odorant was less evident in 2016 and ceased earlier in the summer. Bill pigmentation was incomplete in 11% of crested auklets ($n = 82$) in 2016. Planktivorous auklets are proxies for the marine ecosystem. Increased marine heat content may have imposed additive costs that decreased productivity of some top predators.

Keywords: marine heat wave; crested auklet; stable isotopes; corticosterone; foraging ecology

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