

FEATURE ARTICLES

**VARIATION IN EGG SIZE AND LAYING DATE IN THICK-BILLED MURRE  
POPULATIONS BREEDING IN THE LOW ARCTIC AND HIGH ARCTIC**

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*Abstract.* We used data collected across 28 years (1975–2002) to compare how timing of laying and egg size respond to environmental variability in two low-arctic and two high-arctic Thick-billed Murre (*Uria lomvia*) populations. Ice conditions strongly affect food availability to marine birds in the Arctic, and the percentage of the sea's surface covered by ice within 300 km of the breeding colony varied more among years near the start of laying at our high-arctic study colonies (Prince Leopold and Coburg Islands, Nunavut, Canada) than at our low-arctic study colonies (Coats and Digges Islands, Nunavut). However, mean values differed little. These results indicate that Thick-billed Murres breeding in the High Arctic experience more variable ice conditions, but not necessarily more severe ice conditions, during the period of egg formation. In response, both median laying date and mean egg size varied more among years at high-arctic than at low-arctic colonies. Several lines of evidence suggested that the variation was a result of within-female effects, i.e., phenotypic plasticity rather than different individuals breeding in years in which environmental conditions differed. Previous studies have shown that Thick-billed Murres lay eggs later in years of heavier ice coverage, especially in the High Arctic where ice conditions can be severe, and only in the High Arctic was later laying associated with reduced egg size. The relationship tended towards a negative asymptote suggesting that each female may have her own minimum egg size. Our results show that Thick-billed Murres that inhabit a more variable environment display greater variability in life-history traits. More generally, they offer insight into mechanisms linking environmental heterogeneity to phenotypic variation in life-history traits.

*Key words:* egg size, environmental conditions, laying date, plasticity, Thick-billed Murre, *Uria lomvia*.