

Fig 1: A) Map of localities where measured butterfly specimens were collected (blue) and weather stations (red) of Alaska, with regions treated as a random effect. B) Flight periods (number of individuals flying per day of year) for *Colias hecla* (top), *Boloria chariclea* (middle), and *Boloria freija* (bottom) in Alaska from 1970-1995.

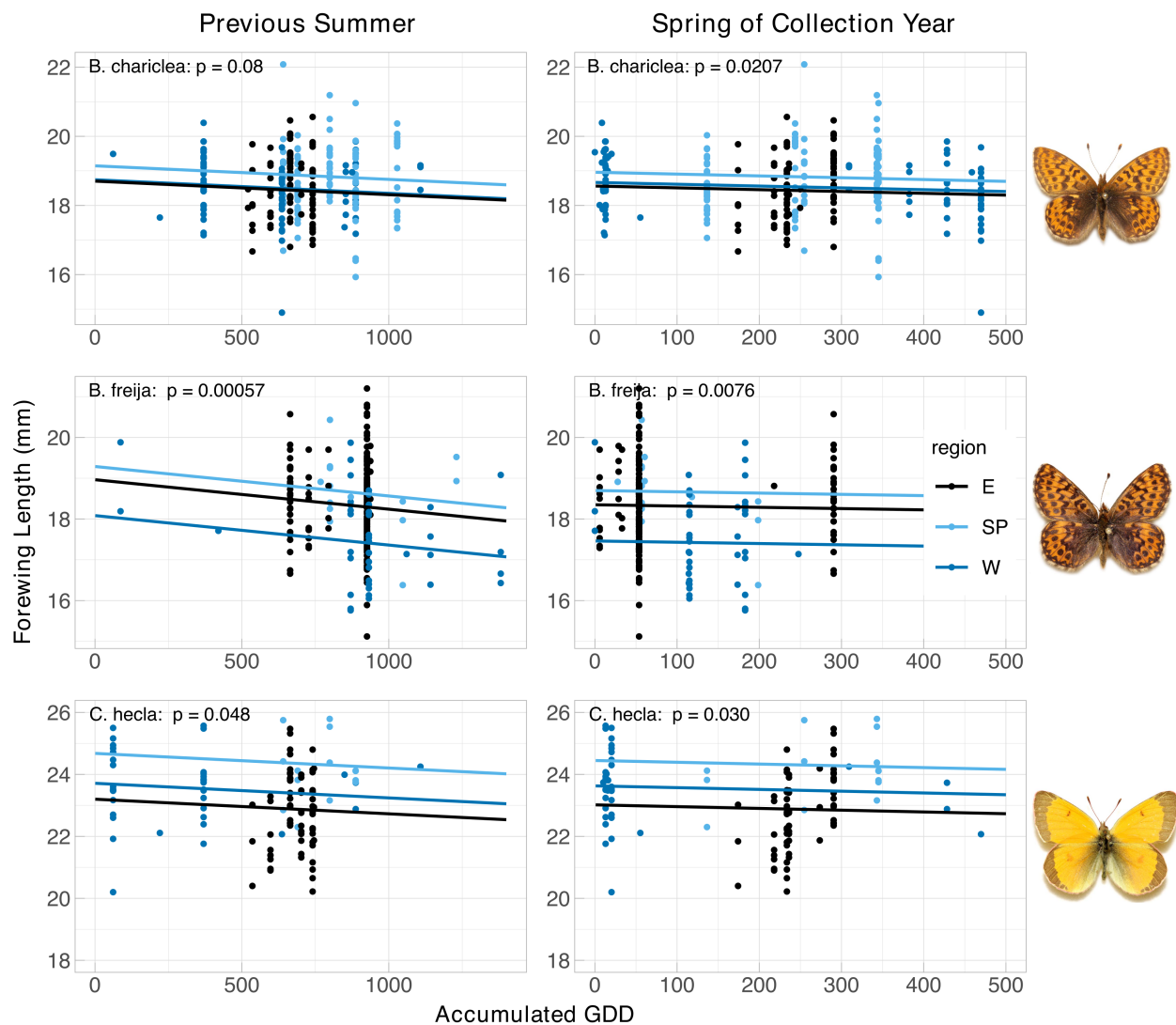


Fig 2: Wing length of female *Boloria chariclea* (top row), *Boloria freija* (middle row) and *Colias hecla* (bottom row) compared to accumulated growing degree days (GDD) experienced during the previous summer (the summer prior to their year of collection; left column) and GDD the spring of collection year (right column). Regional random effects are represented by the three different regression lines, with Seward Peninsula (SP) having larger individuals in all three species, and Eastern (E) and Western (W) North slope having differing random effect on size depending upon species. Males show an identical pattern (not shown).

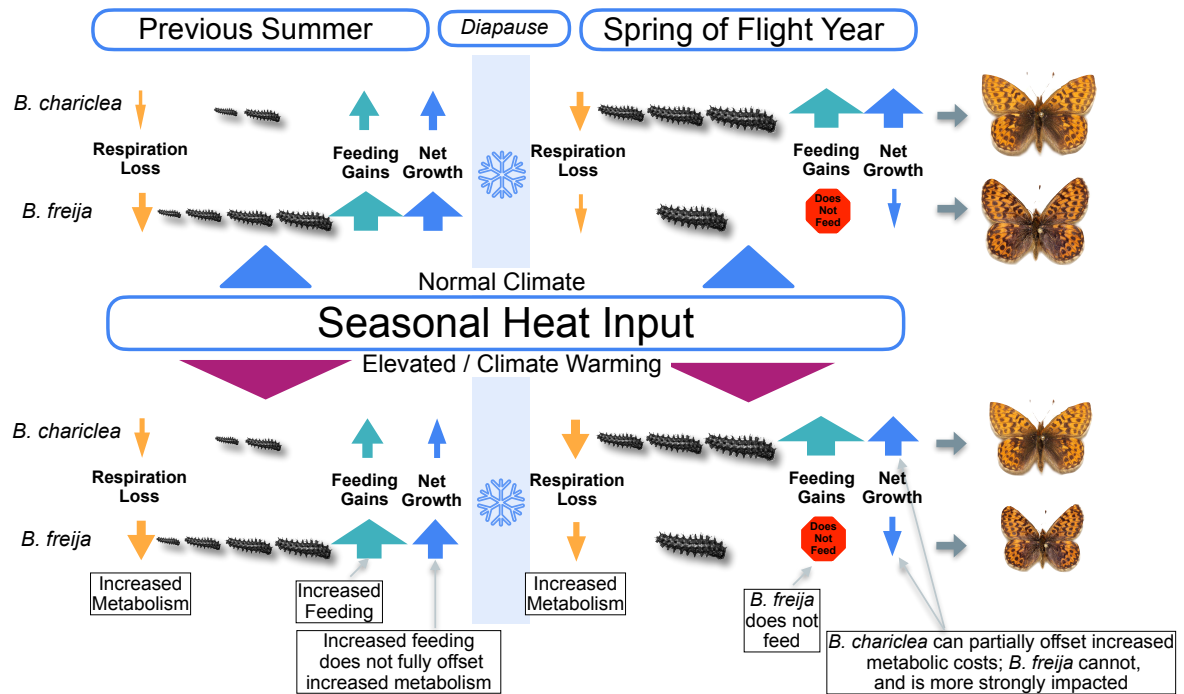


Fig 3: Conceptual figure of the effects of seasonal heat input on *Boloria chariclea* and *Boloria freija* experienced in the summer prior to collection (left) and spring (right). Metabolic rates increase with temperature, which, depending on larval overwintering stage, may not be offset by feeding, resulting in a smaller adult body size (right). The inability of *B. freija* to feed in the fifth instar during the spring of the flight year may make it particularly sensitive to warming the previous year. Feeding immediately prior to pupation may be important for mitigating these effects, and why *B. freija* is more sensitive to warming than *B. chariclea*, which is able to feed after diapause during the spring of the flight year.