

Exploring temporal and spatial variation in growth rates of the scallop *Placopecten magellanicus*.

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Age versus length relationships in exploited fish and shellfish stocks are base requirements for age-based assessments and facilitate estimates of growth and mortality rates. An example of a population level plot of age versus length, one point per individual scallop, is given in Figure 1, n = 5437, period 2018-2023, with a von Bertalanffy fit. Subsumed within a population level plot, especially one that includes multiple years of collection data, are descriptions of spatial and temporal variation that reflect concurrent variation in environmental variables, food availability, predation, parasites, disease, acidification, exploitation pressure, and more. Note the variation about the fitted line in Figure 1. Large data sets allow exploration of this variation at the regional or even individual organism level, and, where annual growth increment measures are available (n = 20417 for this data set), growth by oceanographic area (Figure 2, Gompertz fit). Figure 2 illustrates how area and depth influence age at length. These data can be used to model length at age with Gompertz L_{∞} and K modeled as function of depth and region, and L_{∞} , K and a_{∞} specified to vary due to individual specific physiology. A predictive framework for age at length by SAMS area average depth can thus be developed and is illustrated in Figure 3.

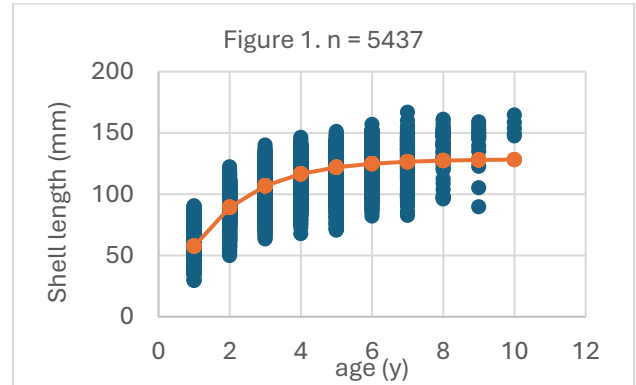


Figure 2: Gompertz fits by area and depth

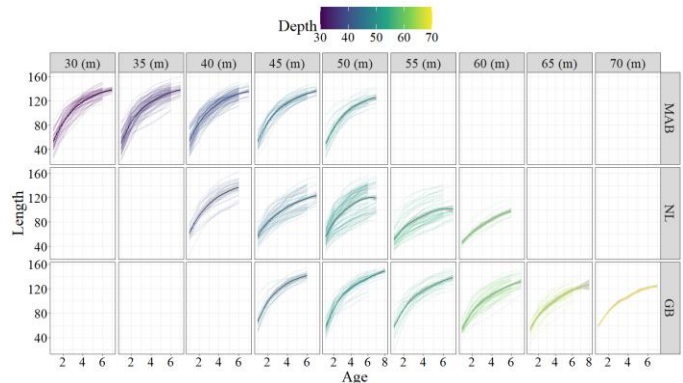
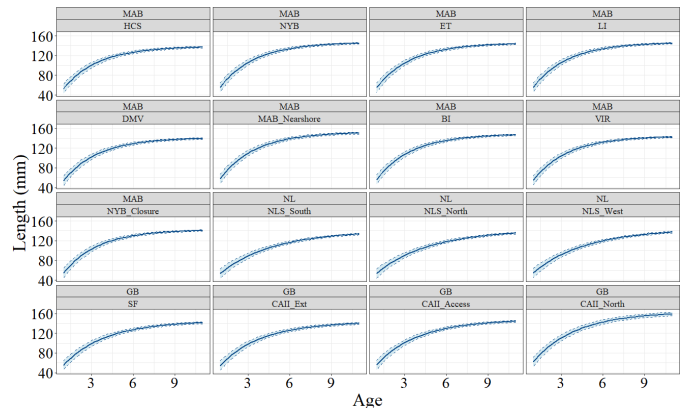


Figure 3: Modeled age at length by SAMS area



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