

## **Intra- and interspecies comparison of energy flow in bivalve species in Dutch coastal waters by means of the Dynamic Energy Budget (DEB) theory**

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### Abstract

The energy flow in various bivalve species (*Macoma balthica*, *Mya arenaria*, *Cerastoderma edule*, *Mytilus edulis* and *Crassostrea gigas*) in different habitats (intertidal, subtidal and offshore areas) of Dutch coastal waters was analysed by comparing growth observations in the field with model simulations by means of the Dynamic Energy Budget (DEB) theory. The reconstruction of the seasonal food conditions suggested that with respect to food consumption, *M. balthica* and *C. edule* are the most successful species, followed by *M. arenaria*, and *M. edulis* and *C. gigas*. Positive growth was correlated with the beginning of the spring bloom in primary production and food limitation between species was lowest during this period. After the spring bloom, severe food limitation during the summer period was found. As a result, negative body growth occurred during most of year. DEB model simulations both on an annual and a seasonal basis also showed that, at the prevailing water temperatures, growth of the different species was not maximal. It remains uncertain whether the suboptimal food conditions were the consequence of food limitation or also of reduced filtration efficiency due to the high sediment load in the water.