

Ontogenetic habitats of *Eurytemora affinis* in the Seine estuary

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Estuarine ecosystems are under numerous environmental, anthropogenic and climatic pressures. Estuarine copepods, such as *Eurytemora affinis* have been affected by those changes including facing competition with invaders or the need to migrate upstream associated with changes in their habitats. Consequently, efforts to define and monitor potential habitats have been enhanced.

Therefore, the present study aims: (i) to determine the main environmental variables shaping the habitat of *E. affinis* within the Seine estuary; (ii) to model the habitat of three groups of *E. affinis* developmental stages (larval, juvenile, and adult groups). For this purpose, data from intensive field studies of zooplankton sampling during 2002-2010 were used. The fine scale data on density and abiotic conditions (salinity, temperature, river outflow) provide inputs for the habitat computation.

The main environmental factors relating to the species abundance are salinity, and temperature. We established regions in salinity-temperature space where the three groups of developmental stages exhibit higher densities. The computed habitats differ between developmental groups. In general, the preferendum of salinity and salinity tolerance range respectively increase and decrease with the developmental stages. The maximum tolerance range to temperature occurred at lower salinities for nauplii and copepodite. These results are in agreement with the physiological specificity of each group of developmental stage.

Our model can be used to determine *E. affinis* functional habitat (i.e. the spatial relation with structuring factors), carry out analysis of retrospective and prospective evolutions, and investigate the effect of restoration on this copepod habitat.