

08/0564

Intertidal eelgrass: Dynamics in time and space

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Abstract

Eelgrass beds can promote local biodiversity within coastal ecosystems and are protected habitats of worldwide conservation importance. Contributions of eelgrass to coastal ecosystem functioning are varied, for example they provide refugia for fish and invertebrates; form a potential food source for marine organisms and birds; are vital primary producers acting as natural CO₂ sinks; and can improve sediment stability.

Eelgrass beds can be subjected to a range of anthropogenic pressures and monitoring their health and extent is of prime importance. Relatively few surveys, however, have been conducted within Europe to document inter-annual variability in these systems, especially within the intertidal zone. This presentation will discuss results of a four-year monitoring programme of two intertidal species of eelgrass (*Zostera noltii* and *Zostera marina* var *angustifolia*) at Roosecote Sands, Cumbria. Detailed quantitative surveys were undertaken via a combination of high resolution aerial photography and comprehensive ground truthing across four consecutive years. Changes in percentage cover and spatial extent were found to be notable across years with evidence of both retreat and expansion. Factors potentially influencing eelgrass growth, the distinct variation in the patterns observed for the two eelgrass species and implications for eelgrass survey design will be discussed.

08/0573

Small-scale distribution spatial variability of benthic invertebrate larvae

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Abstract

Plankton "patches", or spatial heterogeneity, affects the detected patterns in the distribution of planktonic larvae, and the detection of "erroneous" data is often attributed to this patchiness. This study was designed to quantify the spatial scale of variability in the distributions of different species of benthic invertebrate larvae and relate this variability to that in physical and biological characteristics of the water column. Larvae were sampled using contiguous net tows every 500 m, along two perpendicular 10 km transects in St. George's Bay, Nova Scotia, Canada. Density, temperature, salinity, fluorescence, and currents were also measured at each station. Gastropod, bivalve and, to a lesser extent, bryozoan larvae had similar spatial distributions and variograms revealed that the spatial scale of variation in abundance was ~4 km. However, the distribution of decapod larvae differed from that of other groups. These data suggest that taxonomic groups with functionally similar larvae (e.g. bivalves and gastropods) have similar dispersal properties (distribution and spatial variability) while the opposite is true of functionally dissimilar larvae (e.g. bivalves and decapods). Collectively, these findings are significant as patchiness affects both the detection of planktonic biodiversity patterns. Consequently, they are directly relevant to the spatial planning of marine reserves.

08/0585

Zooplankton diversity patterns along a latitudinal gradient in the Atlantic Ocean

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Abstract

Zooplankton samples have been collected during a number of scientific campaigns within the framework of the Atlantic Meridional Transect (AMT), a multidisciplinary programme which undertakes biological, chemical and physical oceanographic research during an annual voyage between the UK and destinations in the South Atlantic since 1995, covering a distance of up to 13,500 km. This transect crosses a range of ecosystems from sub-polar to tropical and from euphotic shelf seas and upwelling systems to oligotrophic mid-ocean gyres. We compare zooplankton diversity in integrated vertical samples taken during selected cruises in the early 1990s with samples from 2010, spanning a period of 15 years. In addition to comparisons of community structure and composition between the euphotic zone (200-0 m) and the surface community in these systems, long-term changes are analysed and discussed in the light of ongoing environmental change.

08/0605

Large-Scale Spatial Distribution Patterns of Gastropod assemblages in rocky shores

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Abstract

Large scale gastropod assemblages from nearshore rocky habitats were studied to (1) describe broad scale patterns, (2) identify latitudinal pattern of richness and abundance of gastropods and/or regional hotspots, and (3) identify environmental and anthropogenic drivers of these assemblages. Gastropods were sampled from 45 globally-distributed sites within 12 regions (based on Large Marine Ecosystems or LMEs) following the NaGISA standard protocol (www.nagisa.coml.org). A total of 394 gastropod taxa from 106 families were collected (121 taxa exclusive to the intertidal, 171 taxa exclusive to the subtidal, 102 taxa present in both). In all regions, assemblages were dominated by few species, herbivores being the most diverse and abundant group. No latitudinal gradients were evident in relation to species richness or densities across sampling sites. Highest diversity was found in the Mediterranean and in the Gulf of Alaska, while highest densities were found at different latitudes and represented by few species within one genus (e.g. *Afrolittorina* in the Agulhas Current, *Littorina* in the Scotian Shelf, and *Zebina* in the Gulf of Alaska). Correlation of the matrices between the biological and the 14 environmental variables was low (≤ 0.355). Variables explaining this correlation were incidence of invasive species, inorganic pollution, SST anomalies, and chlorophyll-a anomalies.

08/0633

Recovery of benthic nematode assemblages after a major collapse of *Zostera noltii* seagrass beds.

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Abstract

During 2008, *Zostera noltii* seagrass beds of the Mira estuary (SW coast of Portugal) suffered a total collapse, though during 2009 slight symptoms of their recovery were already observed. This association of events, in a short period of time, creates a rare opportunity for obtaining new knowledge concerning natural recovery of ecosystems and habitats.

The principal goal is to analyse nematode community responses to the collapse of seagrass beds. Through a comparison of pre- and post-impact data, nematode assemblage recovery and resilience will be assessed. Additionally, the carbon resources utilized by nematodes will be examined, in order to better understand the importance of seagrass detritus as a potential resource for meiobenthic organisms.

Significant differences were observed in the community patterns and trophic composition of nematode assemblages before and after the *Zostera* collapse. The dominant genera of the pre-collapse community were *Terschellingia*, *Odontophora* and *Linhomoeus*, generally considered microbivorous and/or deposit-feeding nematodes. Immediately after the collapse, they were replaced by *Ptycholaimus*, *Paracomesoma* and *Metachromadora*, all of which are herbivores feeding on diatoms and other microalgae.

08/0647

Benthic macrofauna of the Canadian Arctic shelf: how seafloor characteristics may govern their biodiversity

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Abstract

Although in the recent past regional sea surface hotspots of primary productivity have been monitored to follow the impact of climate change on the Arctic food webs, some studies failed in finding a link between benthic distribution patterns and presumably hotspots of food availability. Then seabed features, because of their relatively stable character, might be major control factors affecting benthic biodiversity. Through the Canadian networks ArcticNet and CHONe, a habitat topographic heterogeneity index, sediment food supply proxies (e.g., organic carbon, pigment concentration) and various environmental variables (e.g., depth, oxygen, particle grain size, salinity, temperature, water mass) are used to partition macrobenthic diversity variability across the Canadian Arctic shelf. Furthermore, distinct responses of macrobenthic epi- and infauna against habitat heterogeneity and productivity are discussed in order to evaluate the form and the strength of the relations in the Arctic. Because there is an urgent need for the establishment of baseline for monitoring benthic biodiversity in this almost last pristine area of the planet, using geophysical information as a surrogate to describe benthic biodiversity may allow better and rapid understanding of the potential effects of future anthropogenic disturbance and climate-driven impacts in order to support the implementation of marine protected areas.