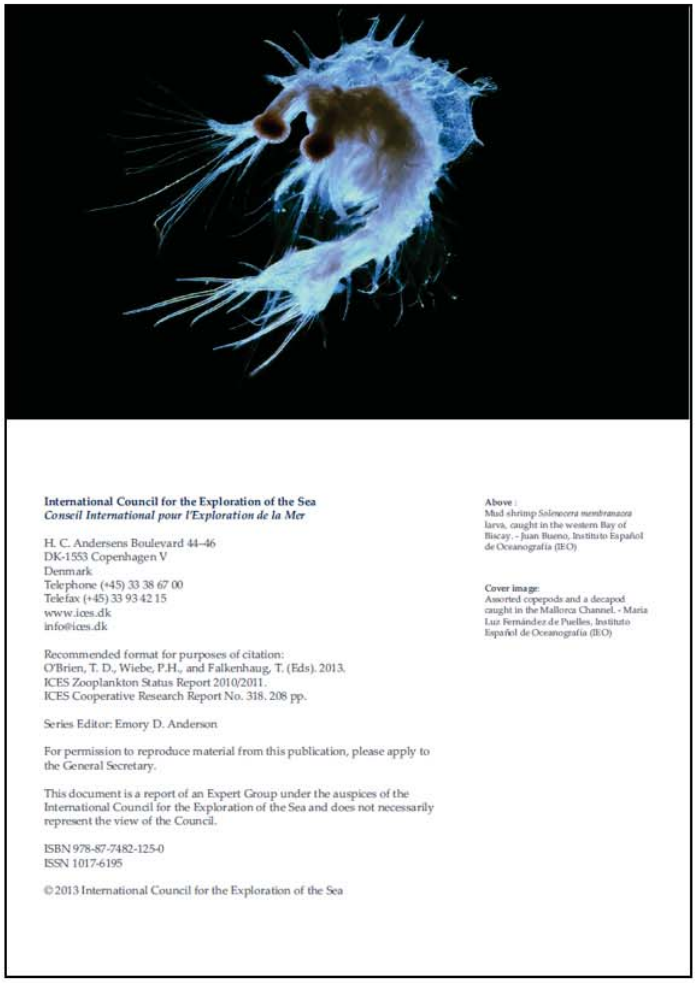

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Above :
Mud shrimp *Solenocera membranacea* larva, caught in the western Bay of Biscay. - Juan Bueno, Instituto Español de Oceanografía (IEO)

Cover image:
Assorted copepods and a decapod caught in the Mallorca Channel. - María Luz Fernández de Puelles, Instituto Español de Oceanografía (IEO)

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5.1 Selvogsbanki and Siglunes Transects (Sites 15–16)

Astthor Gislason

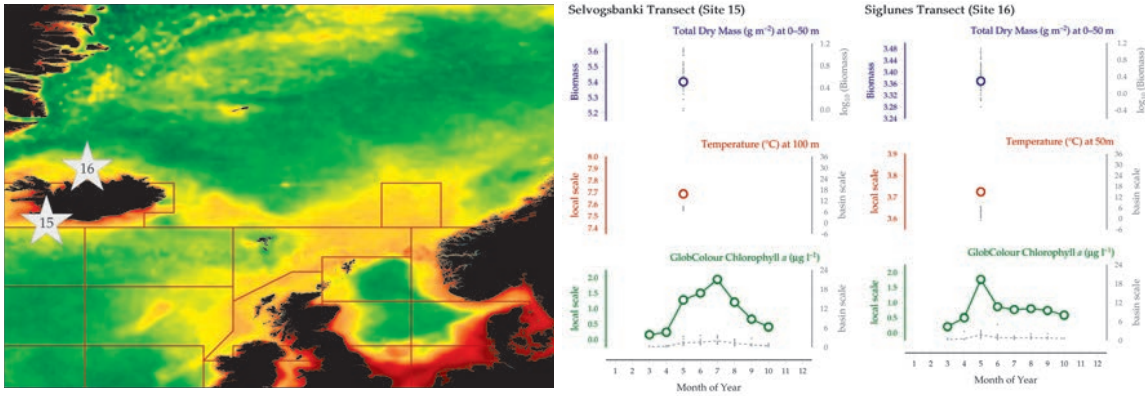


Figure 5.1.1
Locations of the Selvogsbanki and Siglunes transects (Sites 15–16) on a map of average chlorophyll concentration, and their corresponding seasonal summary plots (see Section 2.2.1).

The Icelandic monitoring programme for zooplankton consists of a series of standard transects around Iceland perpendicular to the coastline. In the 1960s, sampling was started at stations along the transects north and east of Iceland. Additional section lines south and west were added in the 1970s. Currently, there are approximately 90 stations. Zooplankton investigations are carried out at these stations every year in May and June. In this summary, long-term changes in zooplankton biomass are examined at the Selvogsbanki (Figure 5.1.1, Site 15) and Siglunes transects (Figure 5.1.1, Site 16). Values for Selvogsbanki are calculated from an average of five stations, whereas values for Siglunes are from an average of eight stations.

At Selvogsbanki, zooplankton biomass has fluctuated rather irregularly, with maxima being observed at 5 - to 10-year intervals (Figure 5.1.2). In spring 2010, zooplankton biomass on the Selvogsbanki transect was higher than the long-term average.

In waters off northern Iceland (Siglunes transect), the high values of zooplankton at the beginning of the time-series dropped drastically with the onset of the Great Salinity Anomaly (GSA) of the 1960s (Figure 5.1.3). Since then, zooplankton biomass has varied, with highs at intervals of approximately 7–10 years. As in the south (Selvogsbanki), zooplankton biomass on the Siglunes transect was above the long-term average in spring 2010.

Copepods (mainly *Calanus finmarchicus* and *Oithona* spp.) generally dominate the zooplankton, comprising >60–70% of the plankton in most years (Gislason *et al.*, 2009). Among the copepods, *C. finmarchicus* tends to be more abundant south of Iceland (~20–70%) than in the north (~10–60%). Temperature and salinity are the most important environmental variables, in terms of explaining the differences in species composition north and south of Iceland, with species and groups such as *Podon leuckarti* and cirripede larvae being relatively abundant south and *C. hyperboreus* abundant north of Iceland. Contrary to results from more southern areas in the North Atlantic (e.g. Beaugrand, 2005), no long-term northward displacement of zooplankton communities is observed around Iceland (Gislason *et al.*, 2009). However, significant interannual variability in community structure is observed both south and north of Iceland, reflecting oscillations of water masses that characterize the system, with salinity and the nitrate concentrations (an index of phytoplankton production) dictating variability in the south, whereas temperature is the main factor in the north (Gislason *et al.*, 2009).

Zooplankton biomass north of Iceland is influenced by the inflow of warm Atlantic Water (AW). Thus, in warm years, when the flow of higher salinity AW onto the northern shelf is high, zooplankton biomass can be almost twice as high as in cold years, when this inflow is not as evident (Astthorsson and Gislason, 1998; Astthorsson and Vilhjalmsson, 2002). This trend is visible in the annual anomalies (Figure 5.1.3). The reasons for this are probably mainly related to increased advection of zooplankton with AW from the south in warm years. Thus, during both 2000 and 2001, when zooplankton biomass north of Iceland was particularly high, the inflow of warm AW onto the northern shelf was also high. South of Iceland, the links between climate and zooplankton biomass are not as evident as those north of Iceland. Most probably, variability off the south and west coasts is related to the timing and magnitude of primary productivity on the banks, which, in turn, are influenced by freshwater from rivers and by wind force and direction, influencing the mixing regime and nutrient supply.

Currently, sea surface temperature values at both Siglunes and Selvogsbanki are higher than the 100-year averages for each region (Figures 5.1.4 and 5.1.5). The temperatures in both regions appear to follow a 50- to 60-year cycle.

Figure 5.1.2
Multiple-variable comparison plot (see Section 2.2.2) showing the seasonal and interannual properties of select cosampled variables at the Selvogsbanki monitoring area.

Additional variables are available online at: http://WGZE.net/time-series.

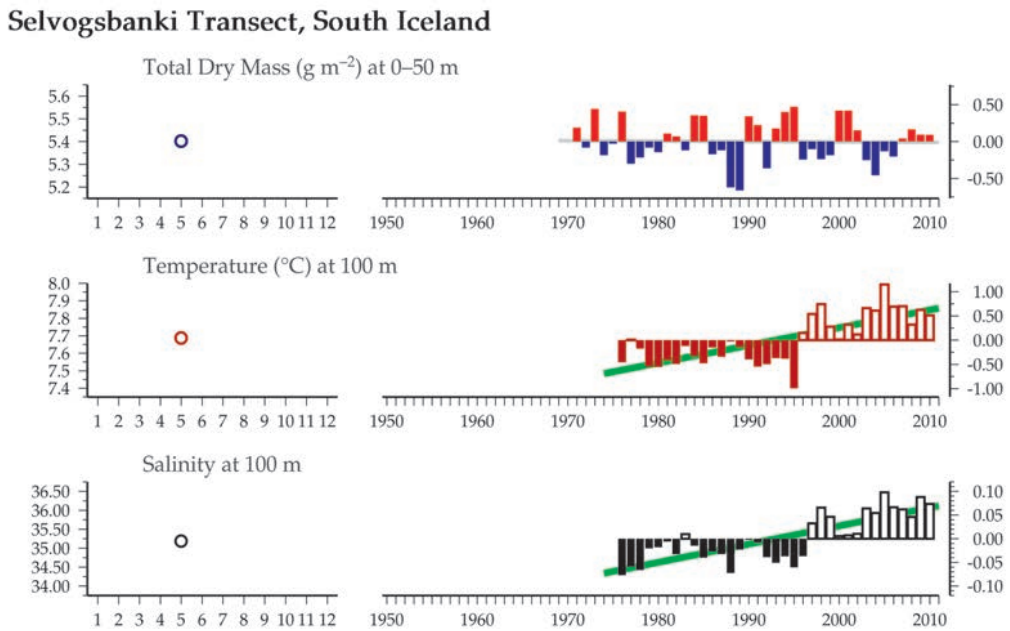


Figure 5.1.3
Multiple-variable comparison plot (see Section 2.2.2) showing the seasonal and interannual properties of select cosampled variables at the Siglunes monitoring area.

Additional variables are available online at: http://WGZE.net/time-series.

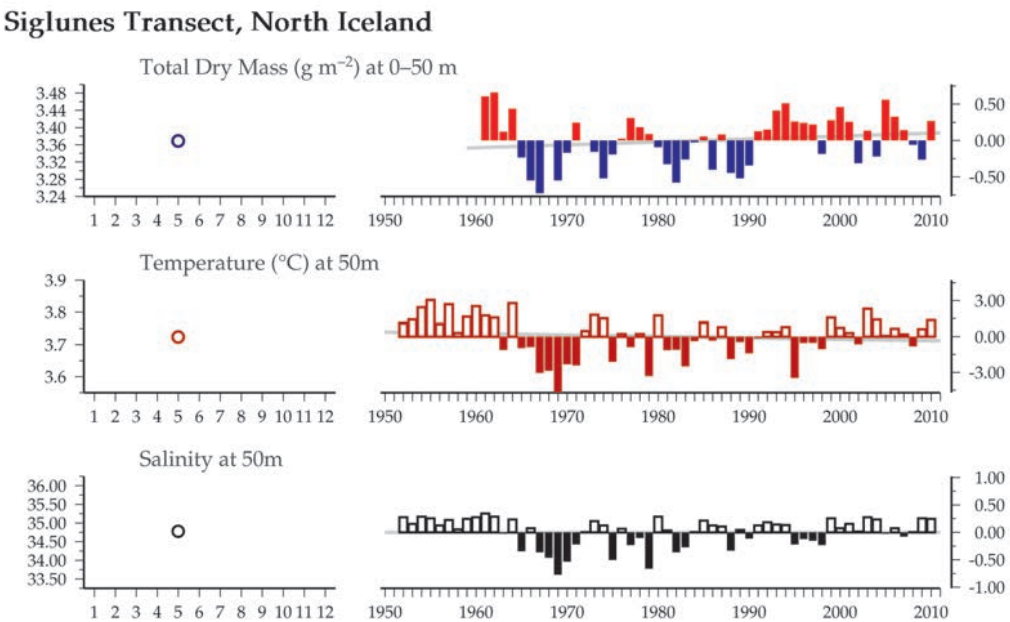
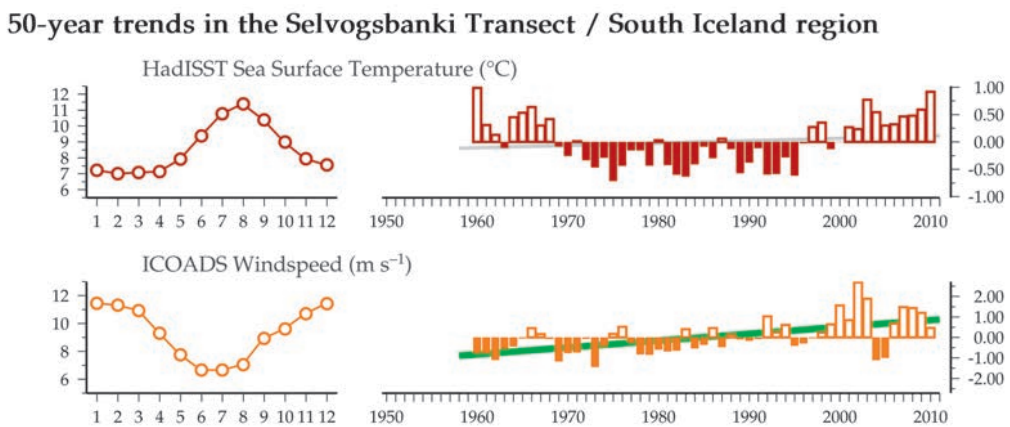


Figure 5.1.4
Regional overview plot (see Section 2.2.3) showing long-term sea surface temperatures and wind speeds in the general region surrounding the Selvogsbanki transect monitoring area, along with data from the adjacent CPR A06 Standard Area.



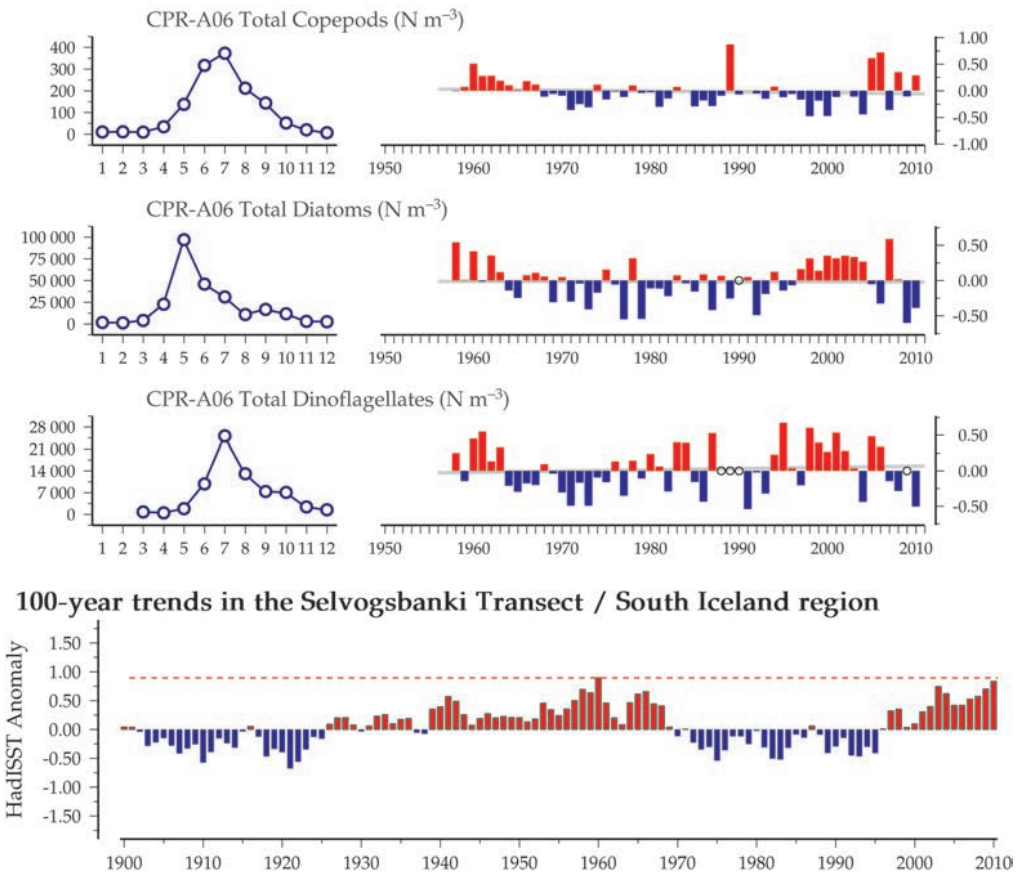


Figure 5.1.4
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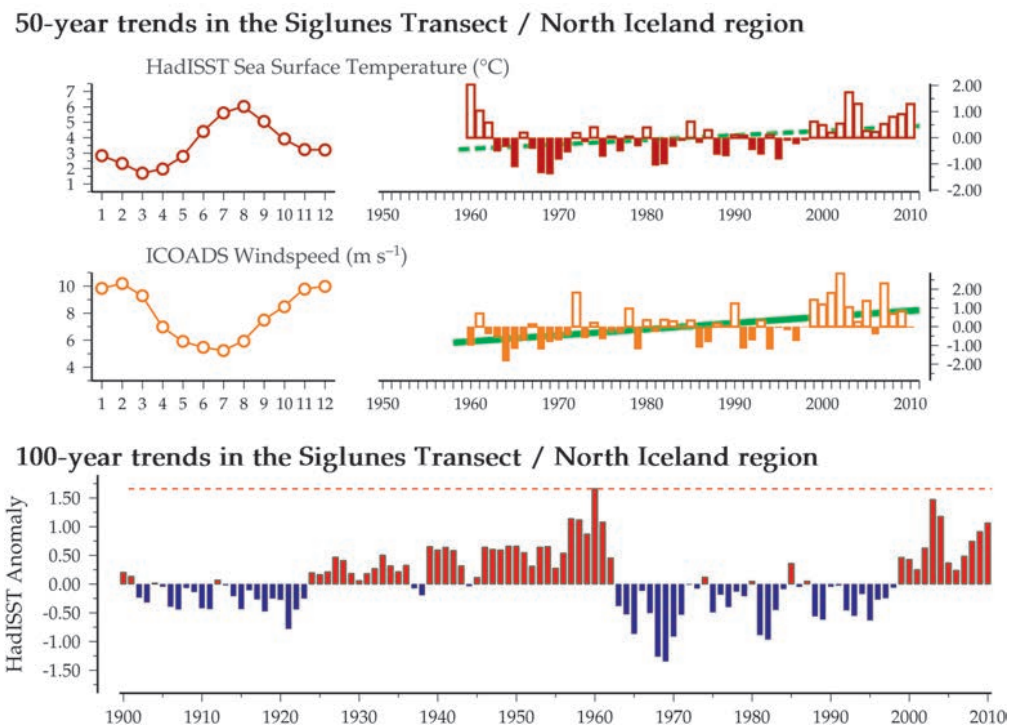

Figure 5.1.5
Regional overview plot (see Section 2.2.3) showing long-term sea surface temperatures and wind speeds in the general region surrounding the Siglunes transect monitoring area.