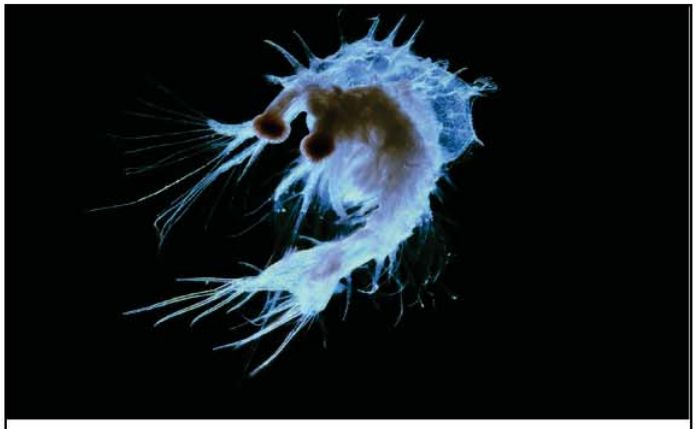

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Above :
Mud shrimp *Solenocera membranacea* larva, caught in the western Bay of Biscay. - Juan Bueno, Instituto Español de Oceanografía (IEO)

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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5.3 Svinøy Transect (Site 18)

Webjørn Melle and Cecilie Broms

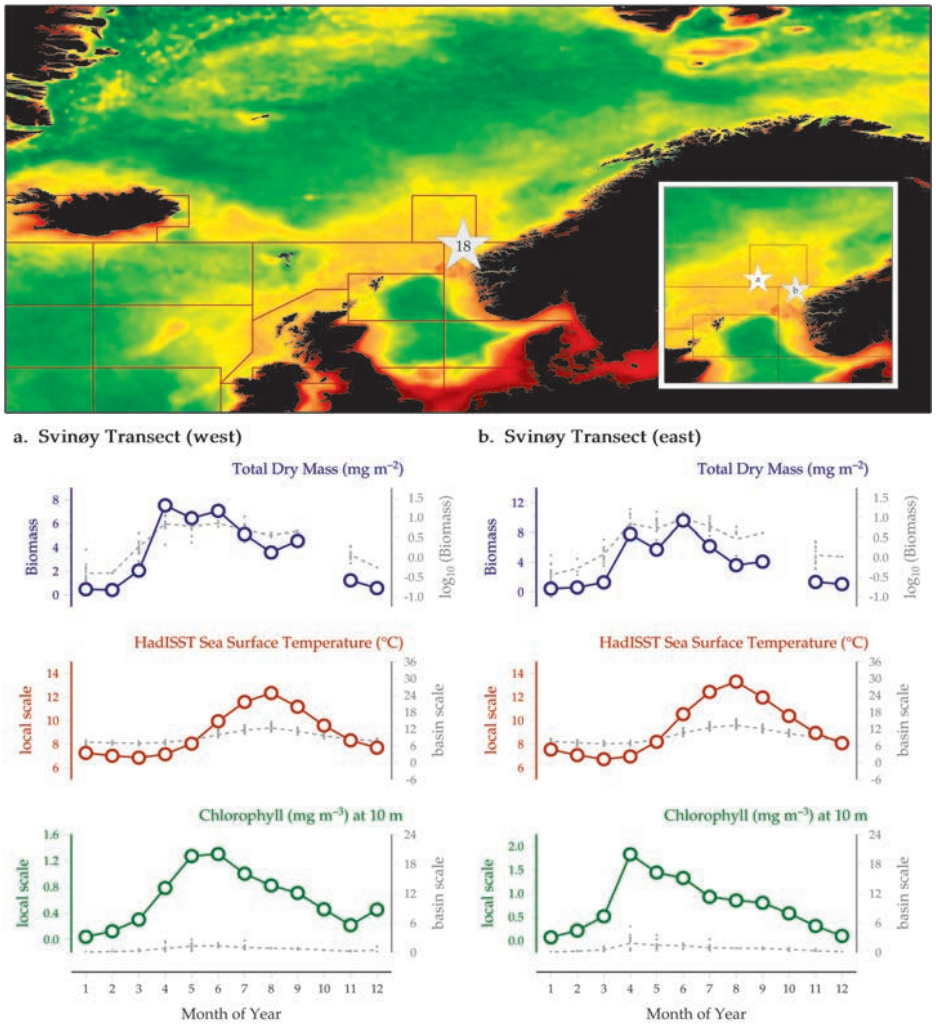

Figure 5.3.1
Location of the Svinøy transect (Site 18) zooplankton monitoring area, plotted on a map of average chlorophyll concentration, and its corresponding environmental summary plots (see Section 2.2.1).

The Institute of Marine Research (IMR) Monitoring Programme samples two fixed transects in the Norwegian Sea: the 15-station Svinøy transect (see Figure 5.3.1, Site 18) and the 10-station Gimsøy transect (not shown). For mesozooplankton, the transects are, by default, sampled four times each year with a WP-2 net (56 cm diameter, 180 µm mesh) from a 200 m depth to the surface. Additionally, the Norwegian Sea is surveyed in May and July/August, both surveys covering approximately 50–100 stations. Data are stored in the local database at IMR, with annual reports made to the Ministry of Fisheries and in the IMR Annual Report on Marine Ecosystems. For the present report, the Svinøy transect is split into two sections called West and East. The western part is generally stations located in Atlantic water, while the eastern part mostly covers coastal water on the shallow shelf.

Seasonal and interannual trends (Figure 5.3.2)

The dominant contributor to mesozooplankton biomass of the southern Norwegian Sea is *Calanus finmarchicus* (Melle *et al*., 2004). In the Atlantic Water and coastal water, seasonal dynamics of the species is closely related to the phytoplankton development. There is a tendency for the earlier production of this species in coastal water compared to Atlantic water (Broms and Melle, 2007; Broms *et al*., 2009; Bagøien *et al*., 2012). Although *C. finmarchicus* is the dominant species, this difference in timing is not revealed in the seasonal cycles of total zooplankton biomass in the eastern and western parts of the Svinøy section. However, the increase in chlorophyll occurs, on average, as much as one month earlier in the east than the west. The development (timing) of zooplankton biomass in spring at the Svinøy transect does not indicate any shifts in seasonality over the sampling period 1997–2007.

Water temperatures along the Svinøy transect range from 5 to 15°C, with the seasonal high in August and the seasonal low in March/April. A chlorophyll bloom occurs in late April and early May, with a slightly stronger bloom in May along the eastern side of the transect. A protracted post-bloom period persists throughout summer and early autumn along the transect, which is typical for the southern Norwegian Sea.

For the duration of the time-series, chlorophyll concentrations in the eastern part of the transect demonstrate a downward trend, whereas water temperatures have been increasing during the same period in both the east and the west. Chlorophyll concentrations in the western part do not show any trend over the sampling period. Both parts of the transect are currently in a period of lower-than-average biomass, a trend coherent with other zooplankton biomass data from the Norwegian Sea. The downward trend in zooplankton biomass may have leveled off in the east. Zooplankton biomass appears to be positively correlated with chlorophyll (in the east) and negatively correlated with temperature during this period.

The nearest CPR standard area is "B01". Interannual trends within CPR copepod abundance correspond fairly well to zooplankton biomass in both the western and eastern (Figure 5.3.3) sections of the Svinøy transect. Long-term SST values along the transect demonstrate that water temperatures since 2000 have been frequently equal to or greater than any seen in the previous 100 years (Figure 5.3.3, red dashed line).

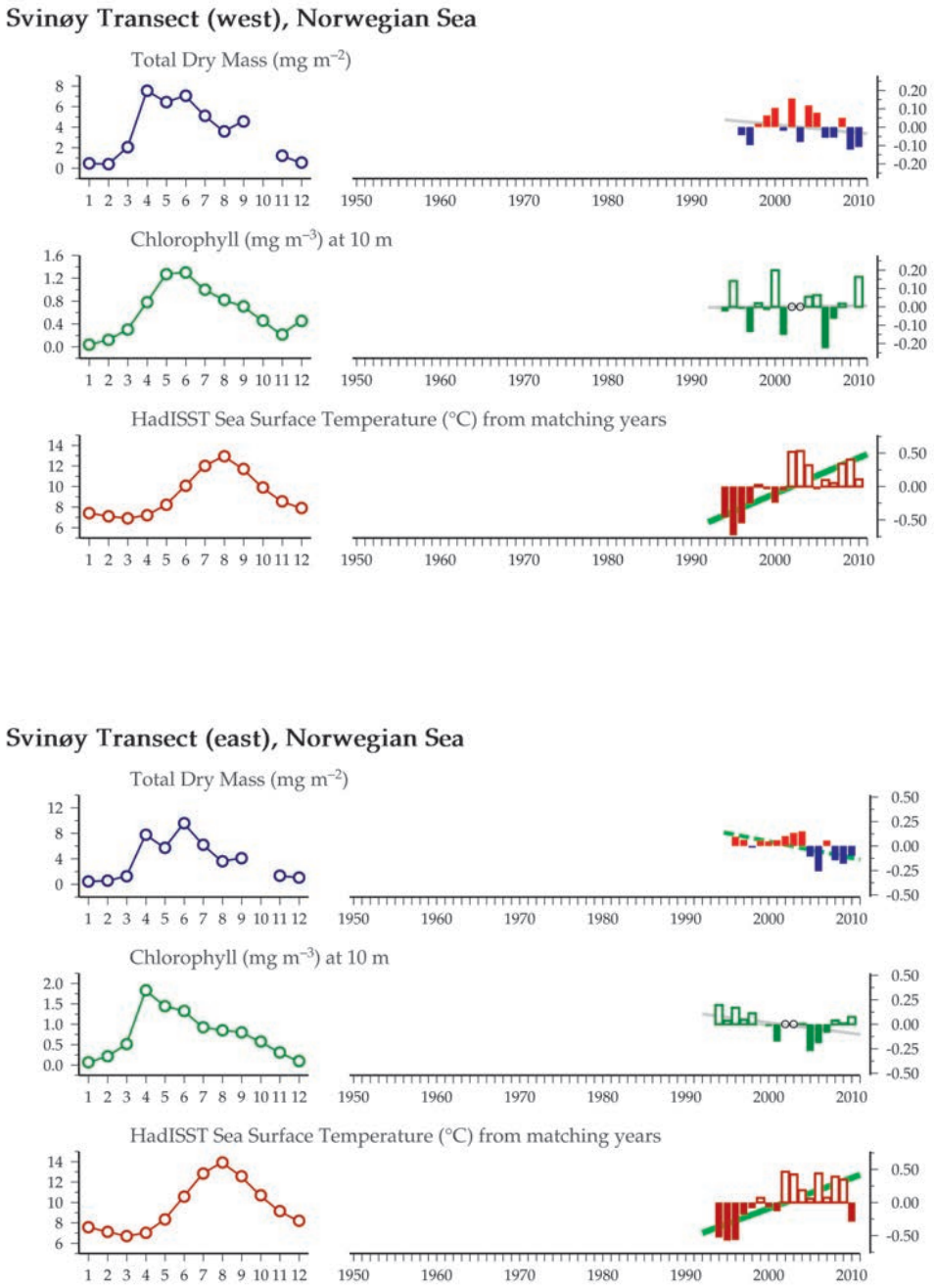

Figure 5.3.2
Multiple-variable comparison plot (see Section 2.2.2) showing the seasonal and inter-annual properties of select cosampled variables along the Svinøy transect.

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

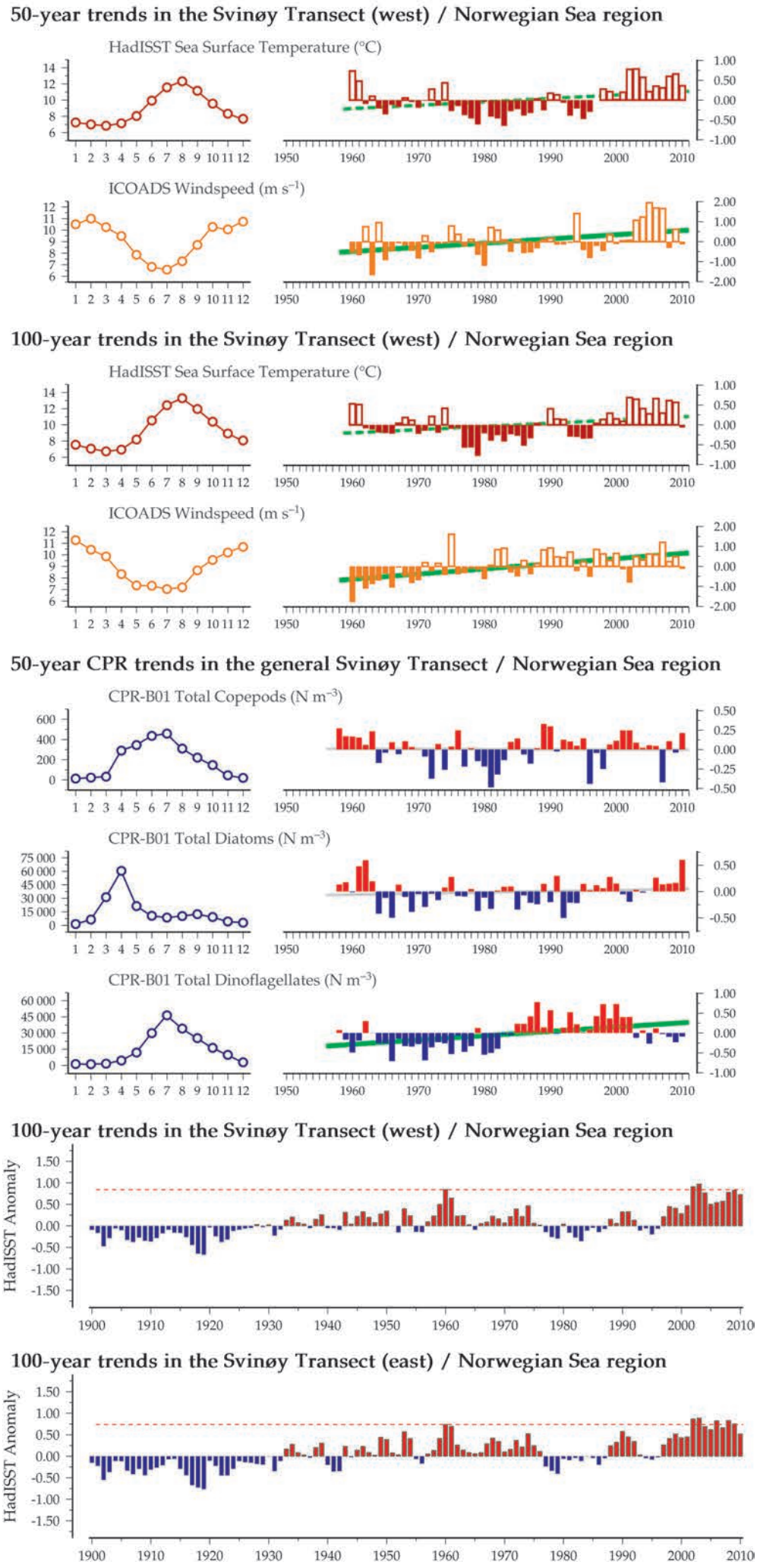

Figure 5.3.3
Regional overview plot (see Section 2.2.3) showing long-term sea surface temperatures and wind speeds in the general region surrounding the Svinøy transect, along with data from the adjacent CPR B01 Standard Area.