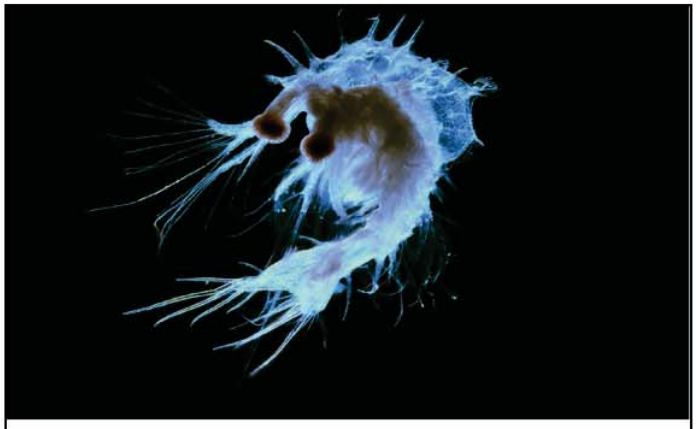

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Above :
Mud shrimp *Solenocera membranacea* larva, caught in the western Bay of Biscay. - Juan Bueno, Instituto Español de Oceanografía (IEO)

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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5.4 Fugløya–Bjørnøya and Vardø–Nord Transects (Sites 19–20)

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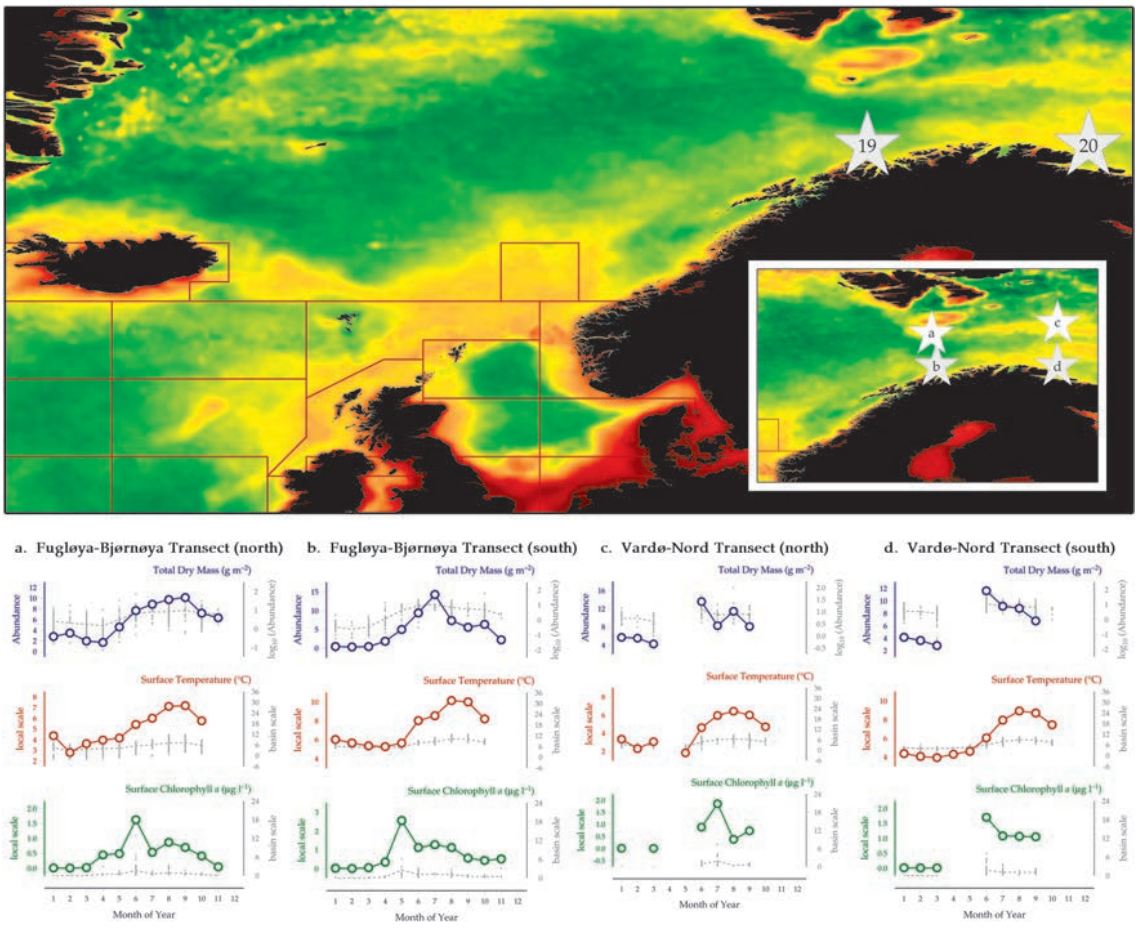

Figure 5.4.1
Location of the Fugløya–Bjørnøya and Vardø–Nord transects (Sites 19 and 20) zooplankton monitoring areas, plotted on a map of average chlorophyll concentration, and their corresponding environmental summary plots (see Section 2.2.1).

The Norwegian Institute of Marine Research (IMR) Monitoring Programme samples two standard sections in the Barents Sea: the Fugløya–Bjørnøya (FB) transect (Figure 5.4.1, Site 19) and the Vardø–Nord (VN) transect (Figure 5.4.1, Site 20). In addition, the Barents Sea is surveyed in August–September on a basin scale. Data are held within local databases at the IMR, and annual reports are made to the Ministry of Fisheries, in the IMR Annual Report on Marine Ecosystems, and in joint Norwegian/Russian reports. In this report, the FB transect is split into two sections, north (>72.00°N) and south (>72.00°N), which are each sampled up to 6 times a year with WP-2 plankton net (56 cm diameter, 180 µm mesh) from 100 m and/or from the bottom to the surface in two separate net hauls. The VN transect is also split into two sections: north (>73.50°N) and south (>73.50°N). The data in this report are from the bottom-to-surface hauls. The zooplankton catch of the net hauls is divided into two halves using a Motoda Splitter. One half is fixed in buffered 4% formaldehyde for subsequent taxonomical analyses and the other half is dried and weighed for dry weight determination. In addition, temperature, salinity, nutrients, and chlorophyll are measured at all sampling stations.

Seasonal and interannual trends along the Fugløya–Bjørnøya transect (Figures 5.4.2–5.4.4)

Zooplankton biomass begins to increase in spring (March–April) in both the northern and the southern sections of the Fugløya–Bjørnøya transect. Peak zooplankton biomass is reached later in the season and extends for a longer period (June–September) in the northern section (Figure 5.4.2), while a strong June/July peak is found in the southern section (Figure 5.4.3). Zooplankton biomass has been steadily decreasing over the duration of the time-series, most noticeably in the >2000 µm biomass size fraction. The contribution of colder-water zooplankton species in the biomass is associated with the extent of mixing of the Atlantic and Arctic water masses within the FB section. Surface water temperatures in the northern part of the FB section range from 2 to 8°C, with a seasonal high in August–September and a seasonal low in February. In the southern part of the FB section, surface temperatures are warming, ranging from 5 to 10°C, with a seasonal low occurring later in March/April.

Long-term water temperatures along the transect reveal that these temperatures are slightly below the 100-year maximum (Figure 5.4.4, red dashed line). The 50-year trend for the northern part of the FB section shows a strong increase in surface water temperatures, while the southern

part of the section only shows a slight (non-significant) increase.

Seasonal and interannual trends along the Vardø–Nord transect (Figures 5.4.5–5.4.7)

The monthly sampling coverage for the VN transect has large periods of no sampling, making it somewhat difficult to interpret the seasonal dynamics of zooplankton and chlorophyll along the section. Zooplankton biomass along the VN section seems to begin sometime between April and June, peaking in June. Zooplankton biomass has been steadily decreasing over the duration of the time-series, most noticeably in the >2000 µm biomass size fraction. Lower biomass (during the past four years of sampling) and an overall decreasing trend are common among all sampling sites in the Norwegian and Barents seas. Water temperatures along the Vardø–Nord transect range from 2 to 9°C, with a seasonal high in August in both sections, and a seasonal low in March in the southern section and in April in the northern section. Water temperatures are slightly increasing in both sections and correspond to a slight decrease in both chlorophyll and zooplankton biomass. Although temperatures in the northern section are currently at or near the 100-year maximum for this region (Figure 5.4.7, red dashed line), they are significantly lower than the 100-year maximum for the southern section.

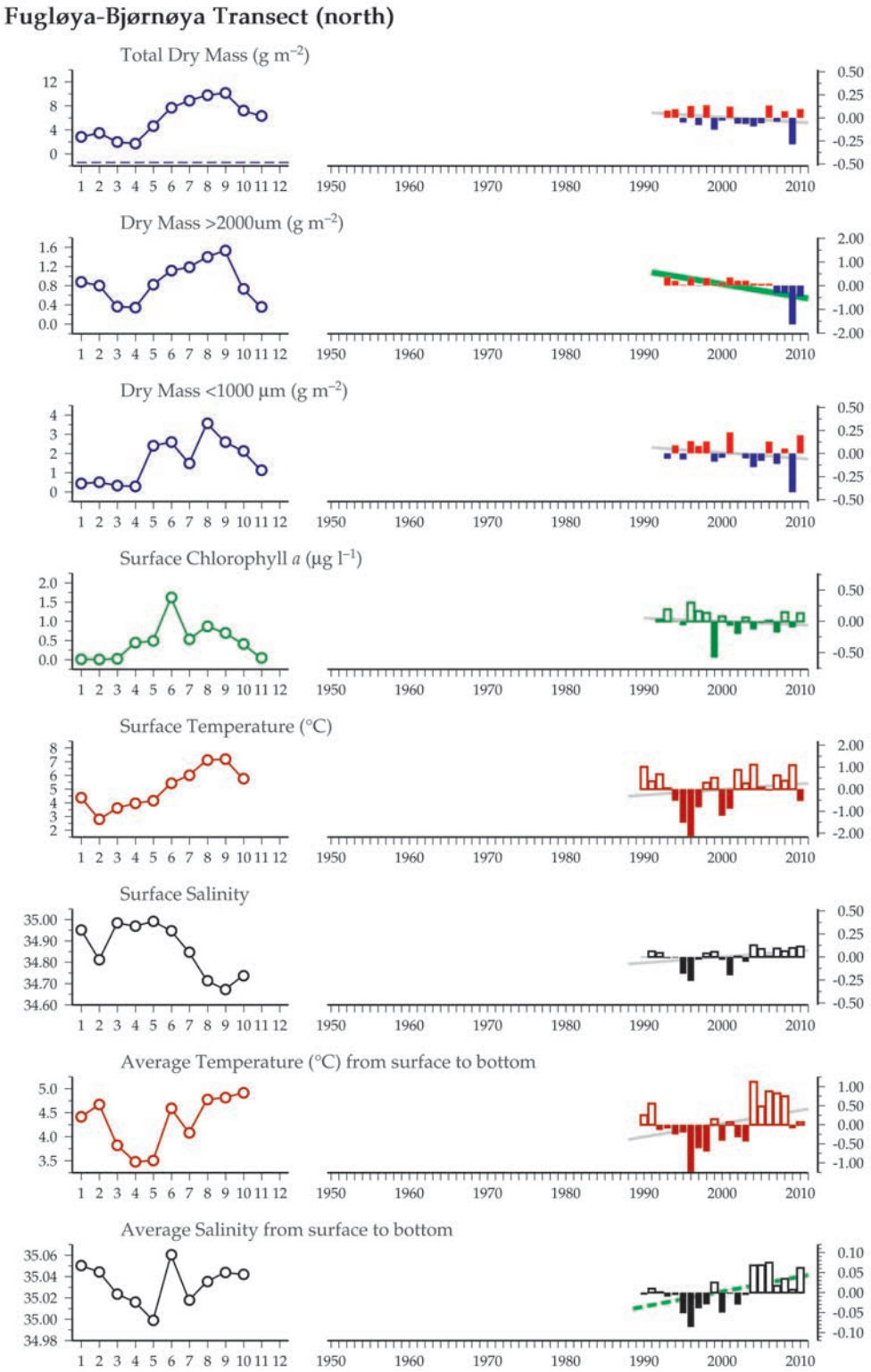

Figure 5.4.2
Multiple-variable comparison plot (see Section 2.2.2) showing the seasonal and interannual properties of select cosampled variables at the Fugløya–Bjørnøya transect (north) zooplankton monitoring site.

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

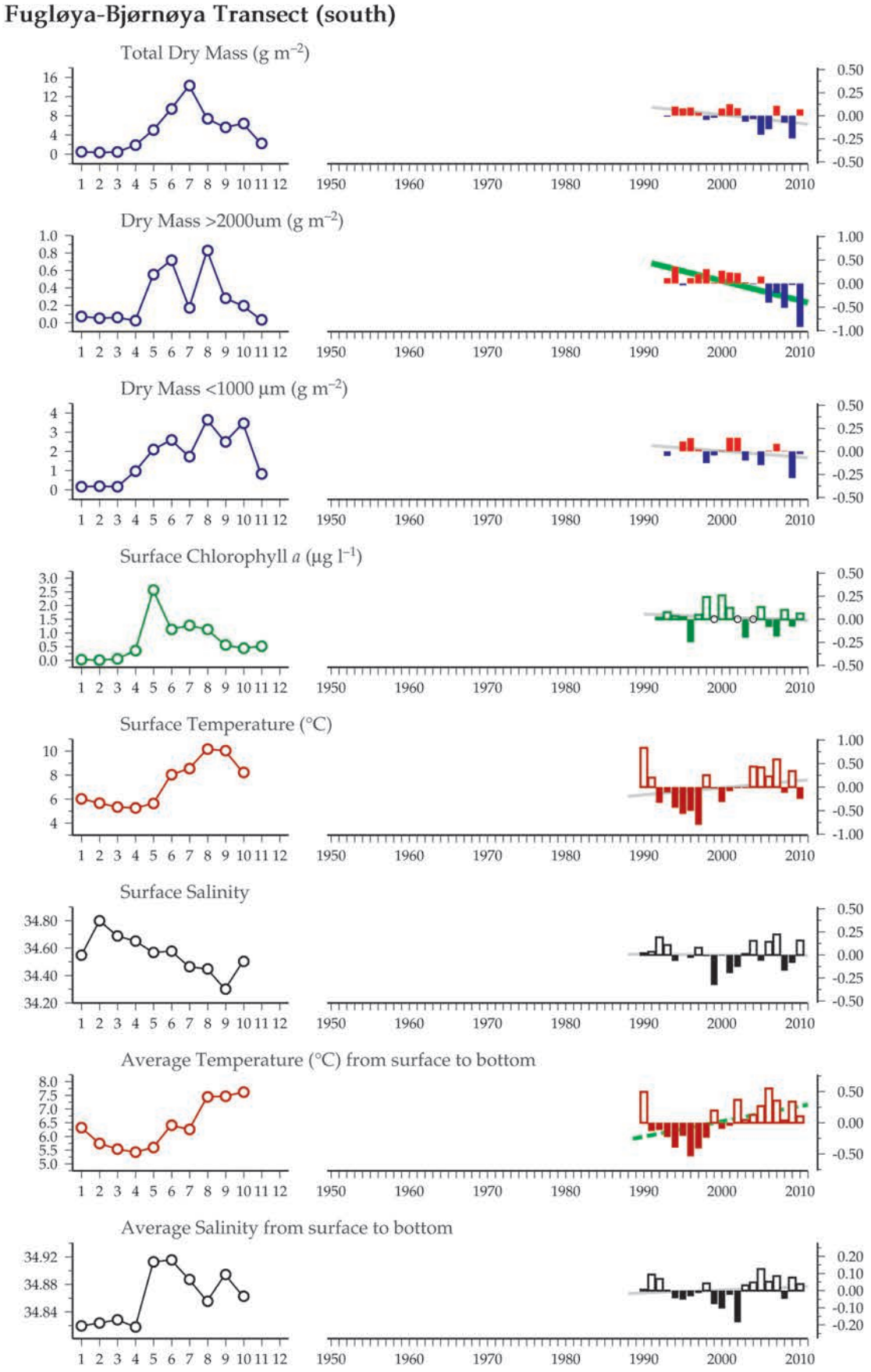

Figure 5.4.3
Multiple-variable comparison plot (see Section 2.2.2) showing the seasonal and interannual properties of select cosampled variables at the Fugløya–Bjørnøya transect (south) zooplankton monitoring site.

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

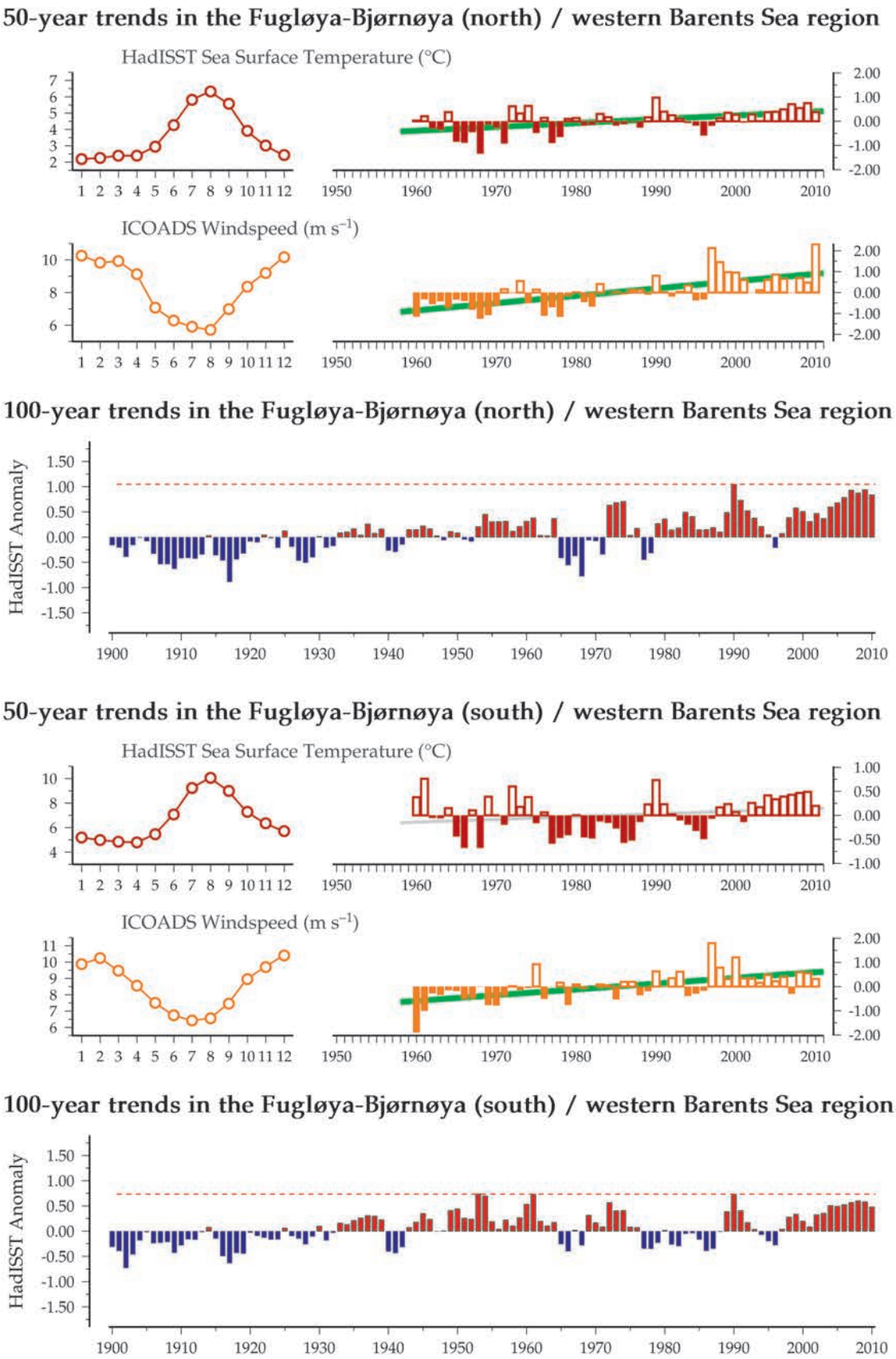

Figure 5.4.4
Regional overview plot (see Section 2.2.3) showing long-term sea surface temperatures and wind speeds in the general region surrounding the northern and southern Fugløya–Bjørnøya transect monitoring areas.

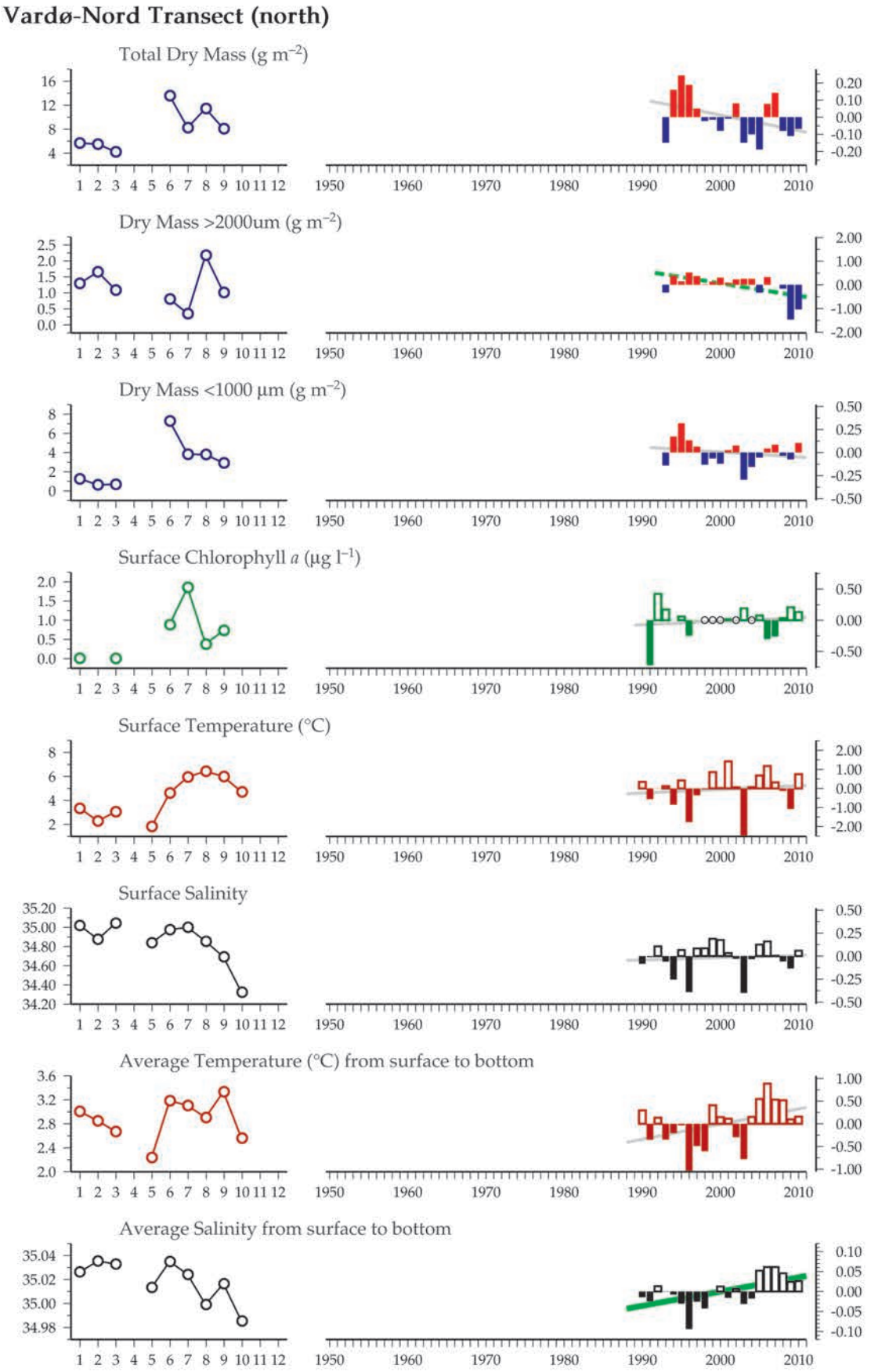

Figure 5.4.5
Multiple-variable comparison plot (see Section 2.2.2) showing the seasonal and interannual properties of select cosampled variables at the Vardø–Nord transect (north) zooplankton monitoring site.

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

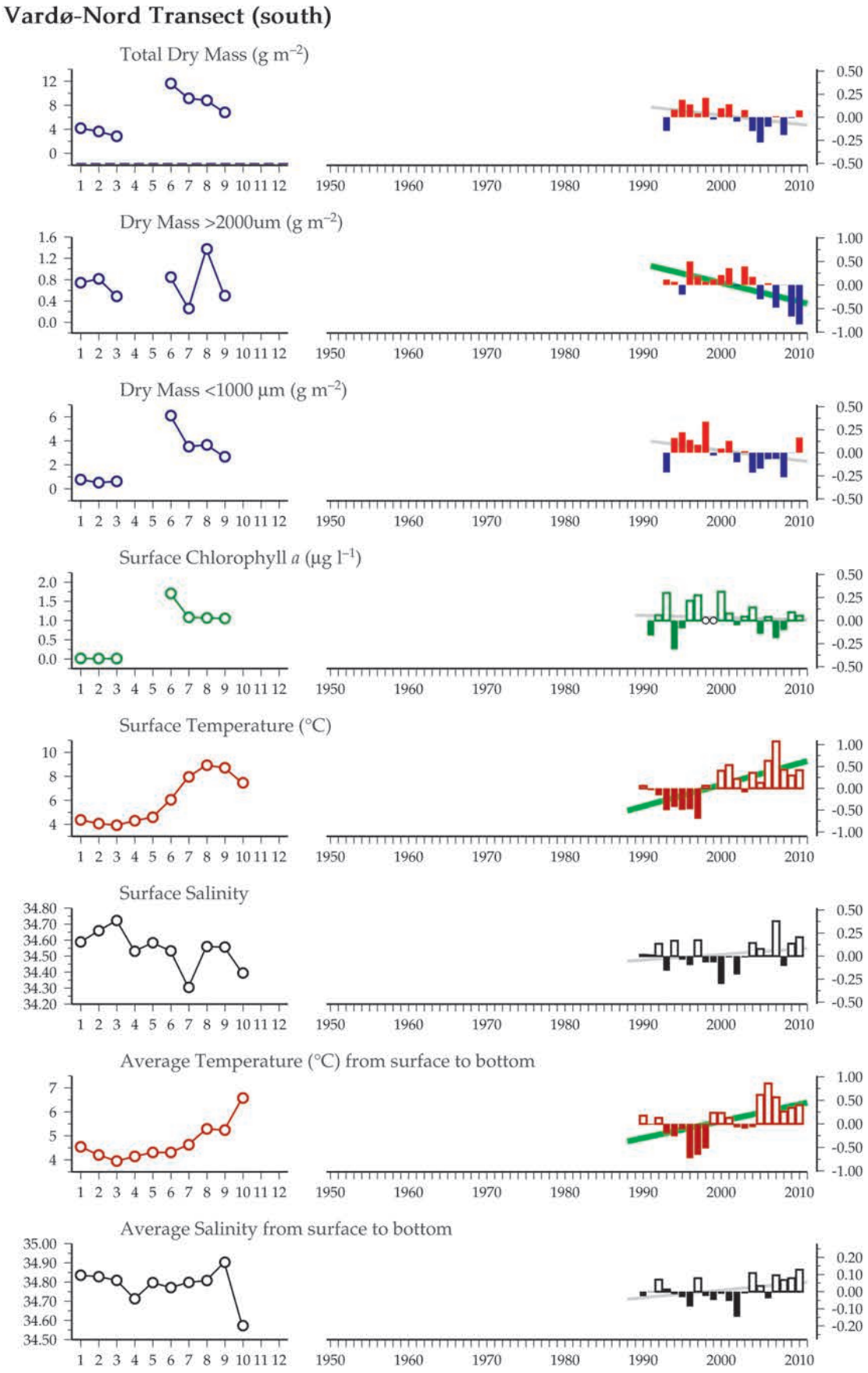

Figure 5.4.6
Multiple-variable comparison plot (see Section 2.2.2) showing the seasonal and interannual properties of select cosampled variables at the Vardø–Nord transect (south) zooplankton monitoring site.

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

Figure 5.4.7
Regional overview plot (see Section 2.2.3) showing long-term sea surface temperatures and wind speeds in the general region surrounding the northern and southern Vardø–Nord transect monitoring areas.