

Expendable Bathythermograph Observations from the NMFS MARMAP/ Ship of Opportunity Program for 1991

by

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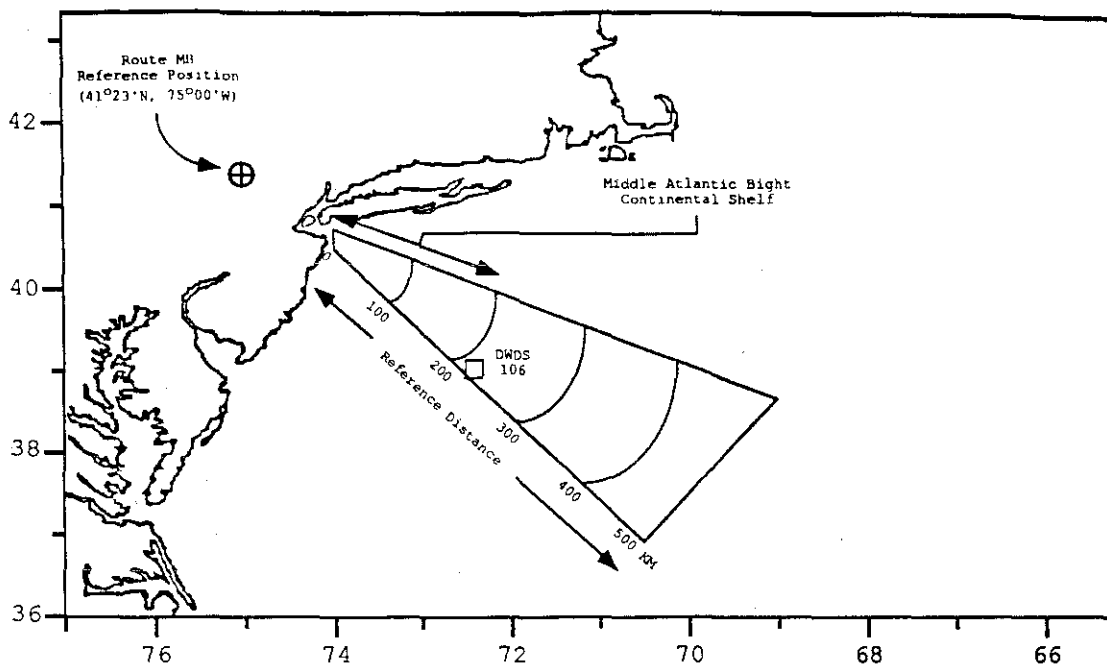
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Figure 1. M/V *Oleander* (Bermuda Container Line).

A



B

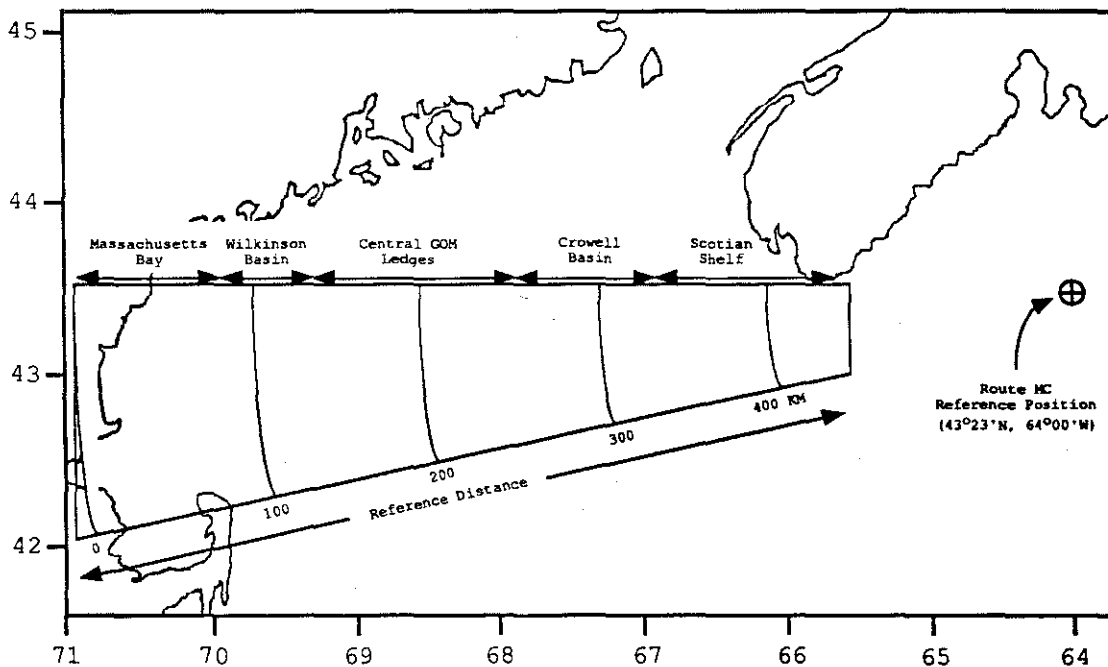


Figure 2. Polygons within which monitoring transects occurred, showing reference distance positions and distances, location of Deep Water Dumpsite 106 (DWDS 106), and geophysical features through which sampling took place. A: The Middle Atlantic Bight - Route MB; B: Gulf of Maine - Route MC.

Shipboard XBT and Weather Data In Real-Time via GOES Satellite

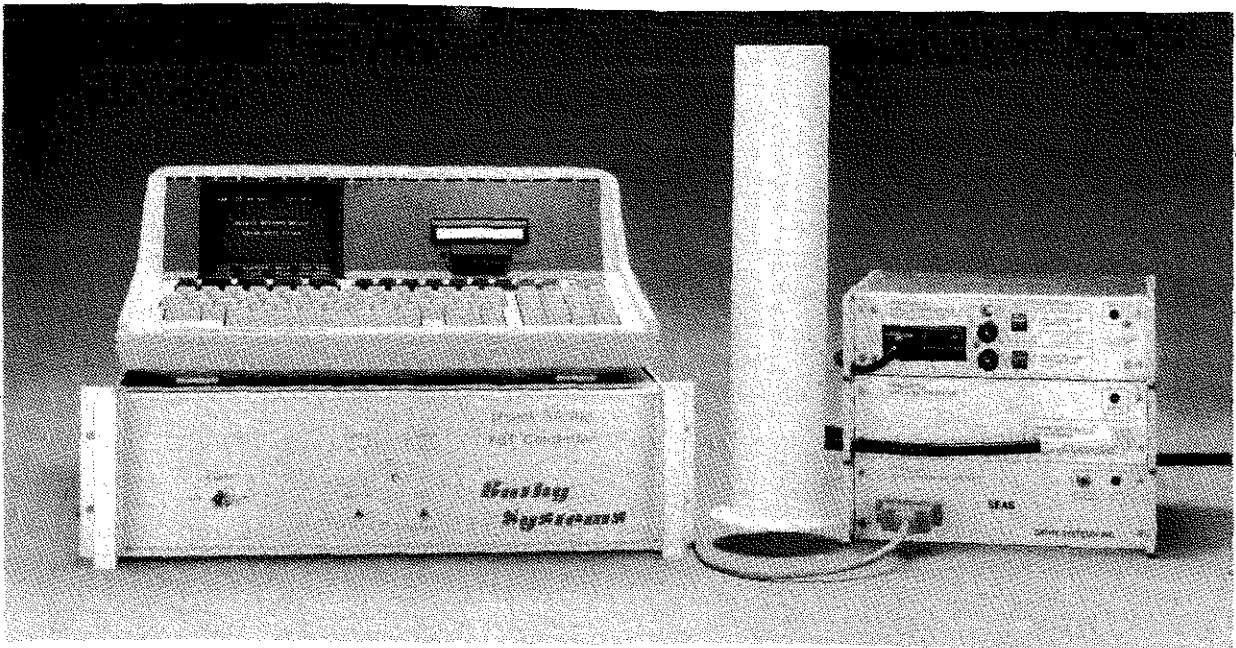
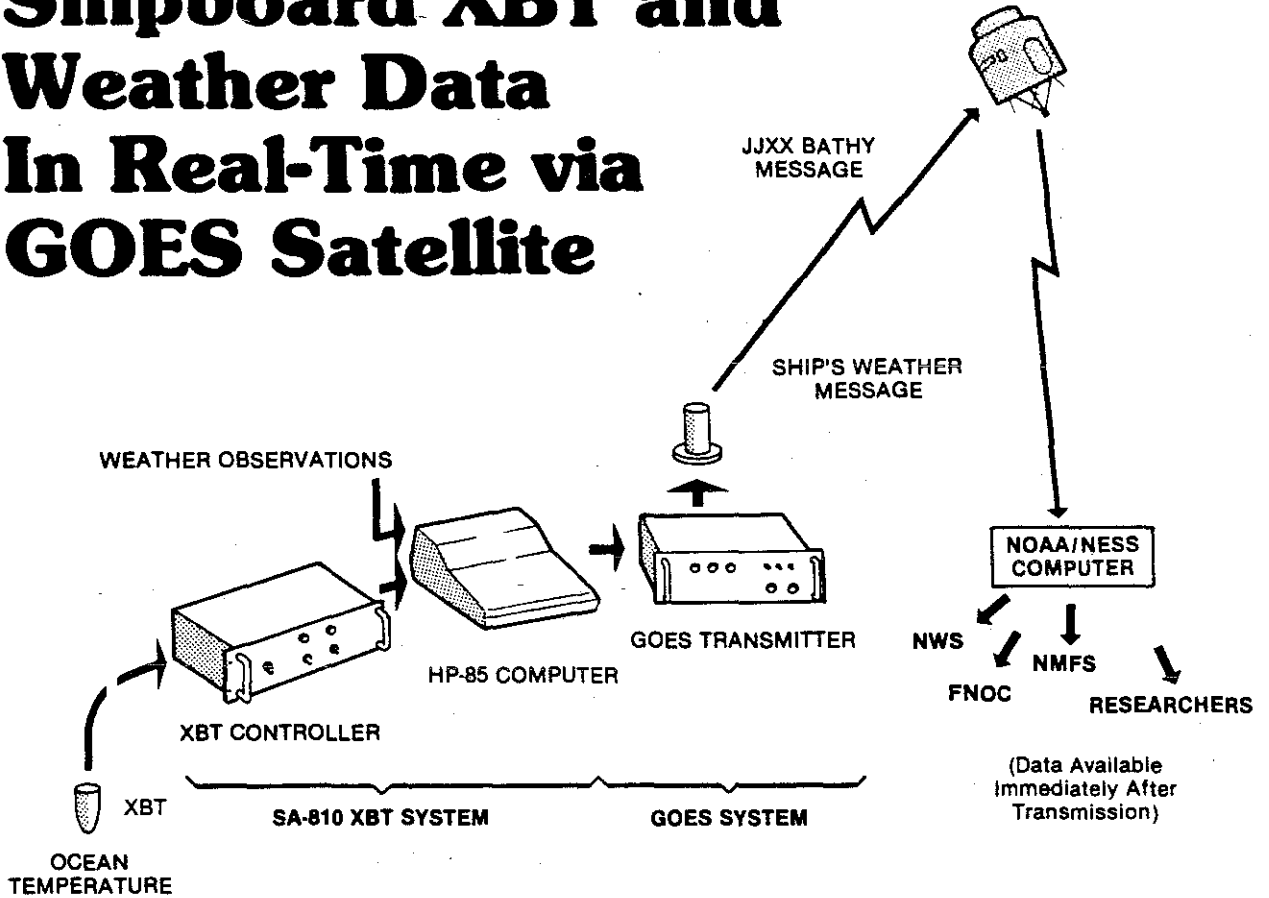


Figure 3. System presently in use onboard the Northeast Fisheries Science Center Ships of Opportunity.

XBT DATA PROCESSING FLOW DIAGRAM COLLECTION TO AVAILABILITY

XBT DATA FLOW FOR THE NEFC
SHIP OF OPPORTUNITY PROGRAM

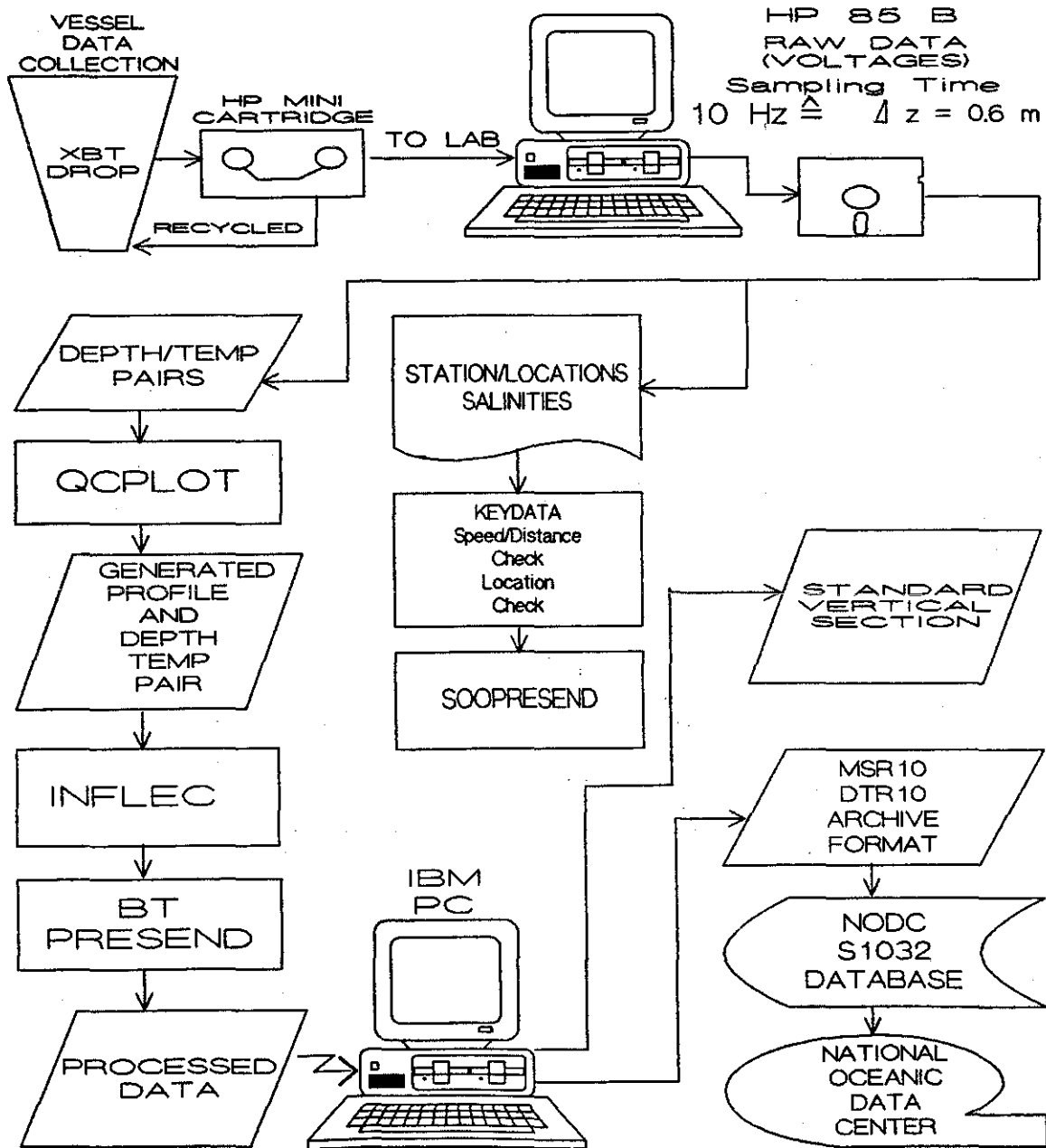


Figure 4. XBT data processing flow diagram.

RESULTS

Table 1 lists 1991 cruises in the Middle Atlantic Bight, along with the kinds of data collected. Those cruises marked with an asterisk are presented as monthly depth vs distance portrayals (Figures 5 through 10). At a depth of 10 m, station locations for concomitant continuous plankton records are plotted.

Table 2 lists 1991 cruises in the Gulf of Maine, along with the data types collected. Those cruises marked with an asterisk are presented as monthly depth vs distance portrayals (Figures 11 through 14). At a depth of 10 m, station locations for concomitant continuous plankton records are plotted.

Surface and bottom temperature, and surface salinity conditions and anomalies during 1991, in a time/space format, are shown in Figures 15-20. Methods used in generating these portrayals can be found in Benway *et al.* [1992].

Bathythermograph data for any transect are available from NODC in a variety of forms. Requests for, or inquiries about Ship of Opportunity XBT data held by NODC, as well as data products, should be directed to:

National Oceanographic Data Center (D761)
National Environmental Satellite
Data and Information Service, NOAA
Washington DC 20235

Bathythermograph and continuous plankton record data can also be requested through:

Director, Science and Research
U.S. Department of Commerce
NOAA/NMFS
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543-1097

ACKNOWLEDGEMENTS

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- Glover, R. S. 1967. The continuous plankton recorder survey of the North Atlantic. *Symp. Zool. Soc. Lond.* 19:189-210.
- Jossi, J. W., D. E. Smith, and G. A. White. 1982. Continuous plankton records: the sampling program of the U.S. National Marine Fisheries Service. *Annals biol.* 38:66-68.

Table 1. 1991 Middle Atlantic Bight transect data from the vessel *Oleander*

Cruise Number	Dates	XBT	CPR	Surf T	Surf S
* 91-01	January 11	X	X	X	X
91-02	January 16	X		X	X
91-03	January 25	X		X	X
91-04	January 30	X		X	X
* 91-05	February 08	X	X	X	X
* 91-06	March 03	X	X	X	X
91-07	March 14	X		X	X
91-08	March 23	X		X	X
91-09	March 29	X		X	X
* 91-10	April 06	X	X	X	X
91-11	April 11	X		X	X
91-12	April 19	X		X	X
91-13	April 25	X	X	X	X
91-14	May 05	Limited	X	X	X
91-15	May 09	Limited		X	X
* 91-16	May 18	X		X	X
91-17	May 23	X		X	X
* 91-18	June 08	X	X	X	X
* 91-19	July 13	X	X	X	X
91-20	July 18	X		X	X
91-21	July 26	X		X	X
91-22	July 31	X		X	X
* 91-23	August 03	X	X	X	X
91-24	August 07	X		X	X
91-25	August 23	X		X	X
91-26	August 28	X		X	X
91-27	September 06	X		X	X
* 91-28	September 11	X	X	X	X
91-29	September 20	X		X	X
* 91-30	October 18	X	X	X	X
91-31	October 23	X		X	X
* 91-32	November 08	X	X	X	X
91-33	November 14	X		X	X
91-34	November 22	X		X	X
91-35	November 27	X		X	X
* 91-36	December 06	X	X	X	X
91-37	December 11	X	X	X	X

* Denotes those transects portrayed in this report.

Table 2. 1991 Gulf of Maine transect data from the vessel *Yankee Clipper*

Cruise Number	Dates	XBT	CPR	Surf T	Surf S
* 91-01	January 05	X	X	X	X
91-02	January 16	X		X	X
* 91-03	February 02	X	X	X	X
* 91-04	March 02	X		X	X
91-05	March 16		X		
* 91-06	April 06	X	X	X	X
* 91-07	May 04	X	X	X	X
* 91-08	June 01	X	X	X	X
* 91-09	July 05	X	X	X	X
* 91-10	August 16	X		X	X
91-11	August 23		X		
* 91-12	September 13	X	X	X	X
* 91-13	October 04	X	X	X	X
* 91-14	November 09	X	X	X	X
* 91-15	December 07	X	X	X	X

*Denotes transect data portrayed in this report.

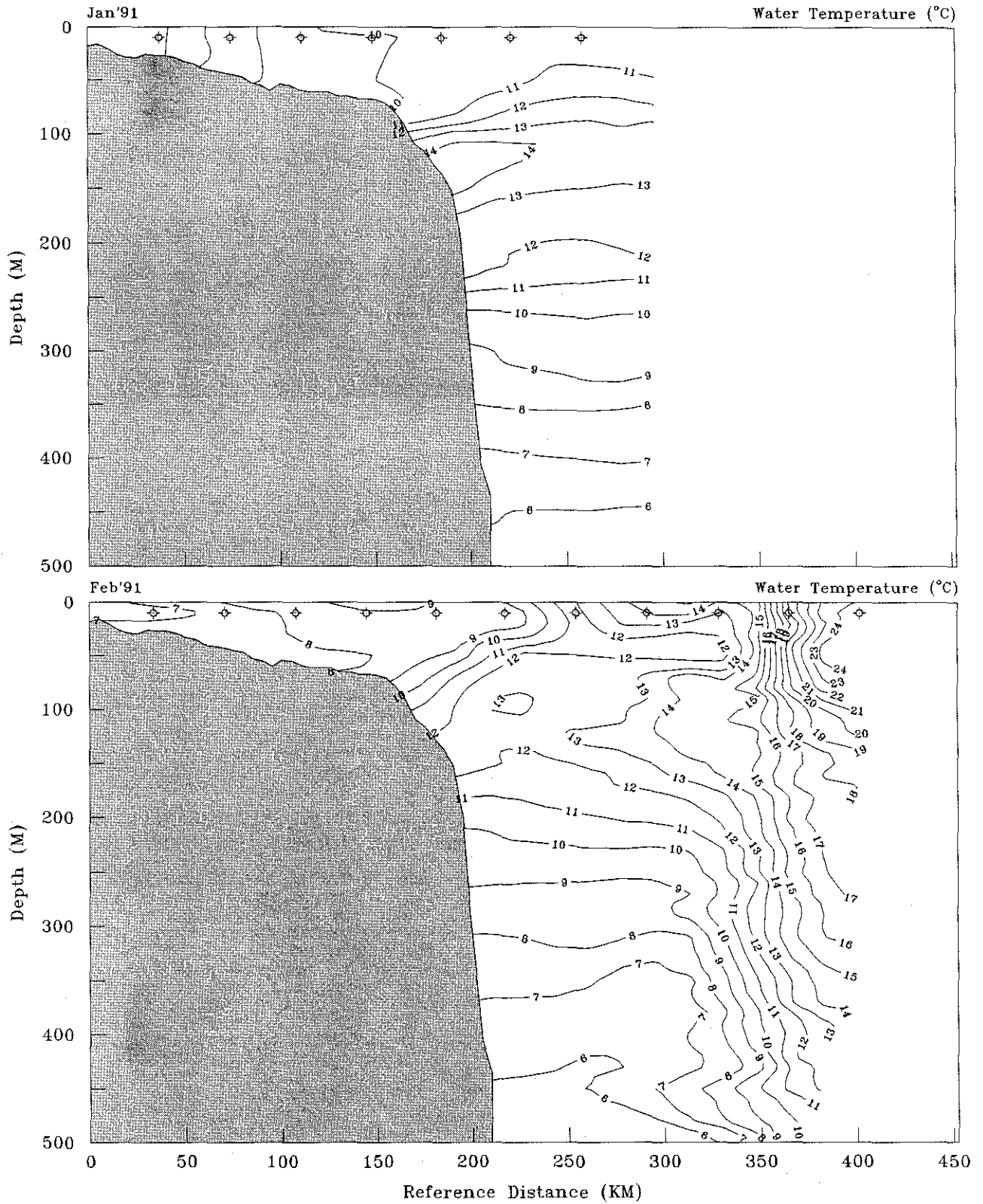


Figure 5. Water column thermal structure ($^{\circ}\text{C}$), and continuous plankton station locations (symbols) at 10 m along the Middle Atlantic Bight transect during January and February 1991.

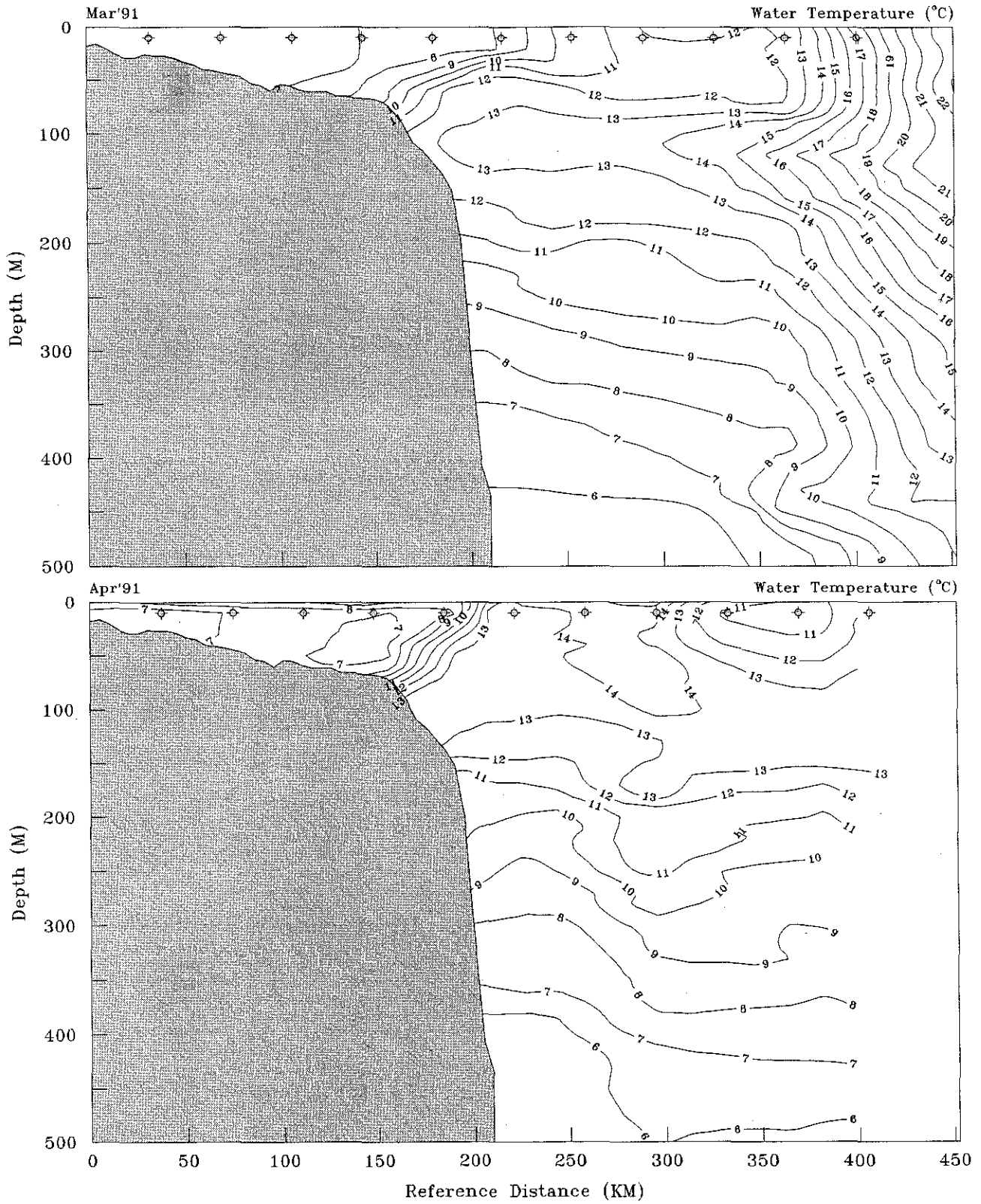


Figure 6. Water column thermal structure (°C), and continuous plankton station locations (symbols) at 10 m along the Middle Atlantic Bight transect during March and April 1991.

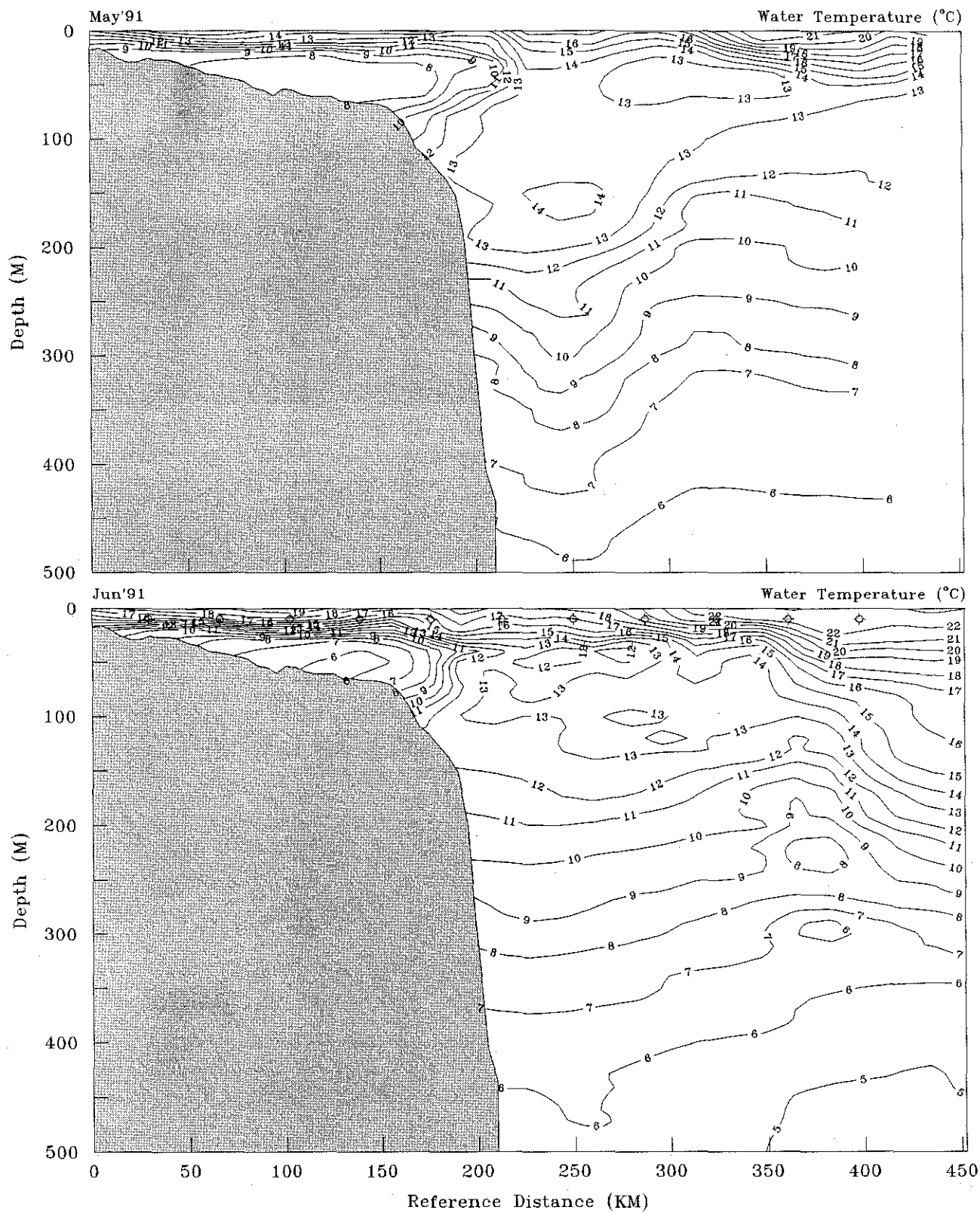


Figure 7. Water column thermal structure ($^{\circ}\text{C}$), and continuous plankton station locations (symbols) at 10 m along the Middle Atlantic Bight transect during May and June 1991.

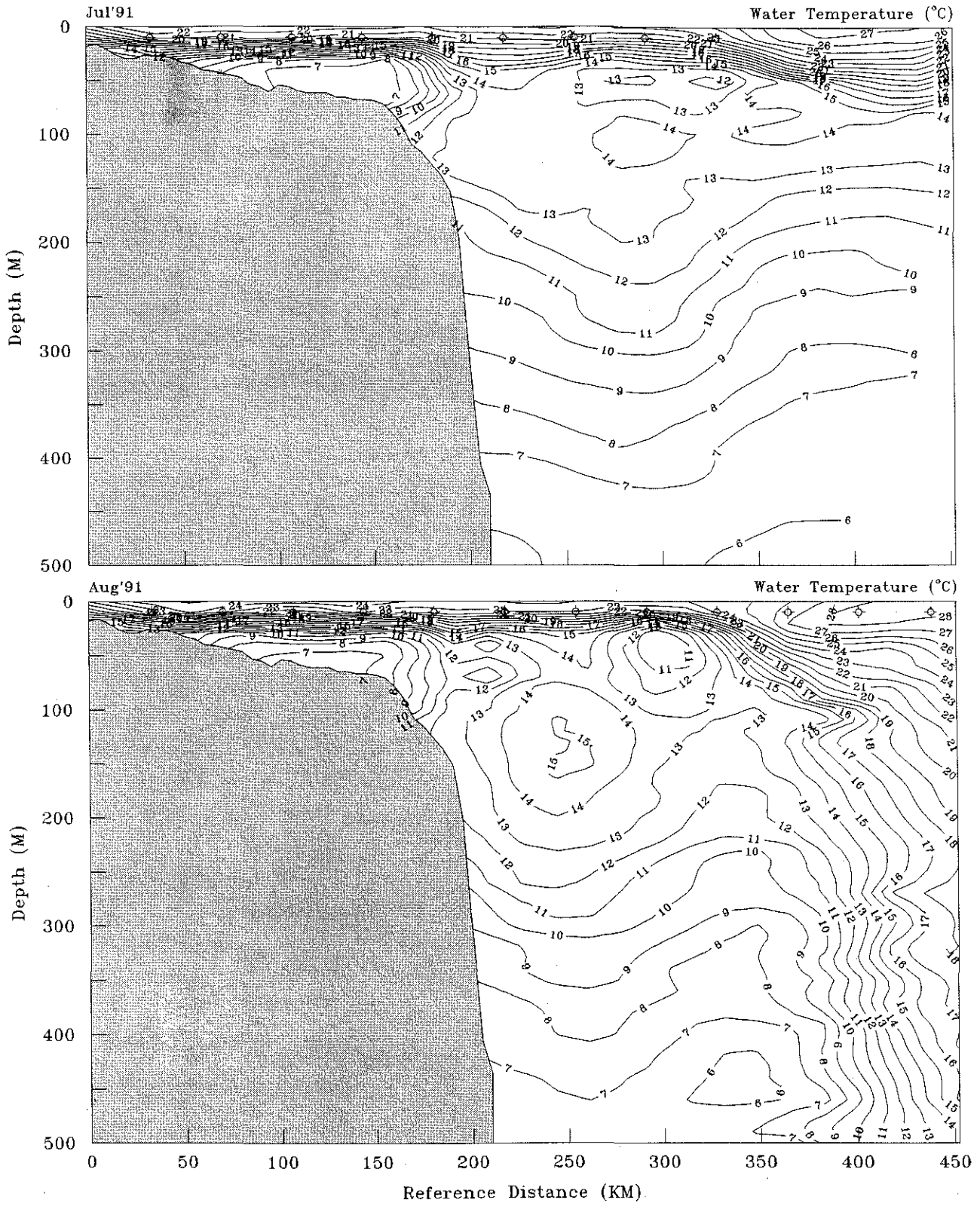


Figure 8. Water column thermal structure (°C), and continuous plankton station locations (symbols) at 10 m along the Middle Atlantic Bight transect during July and August 1991.

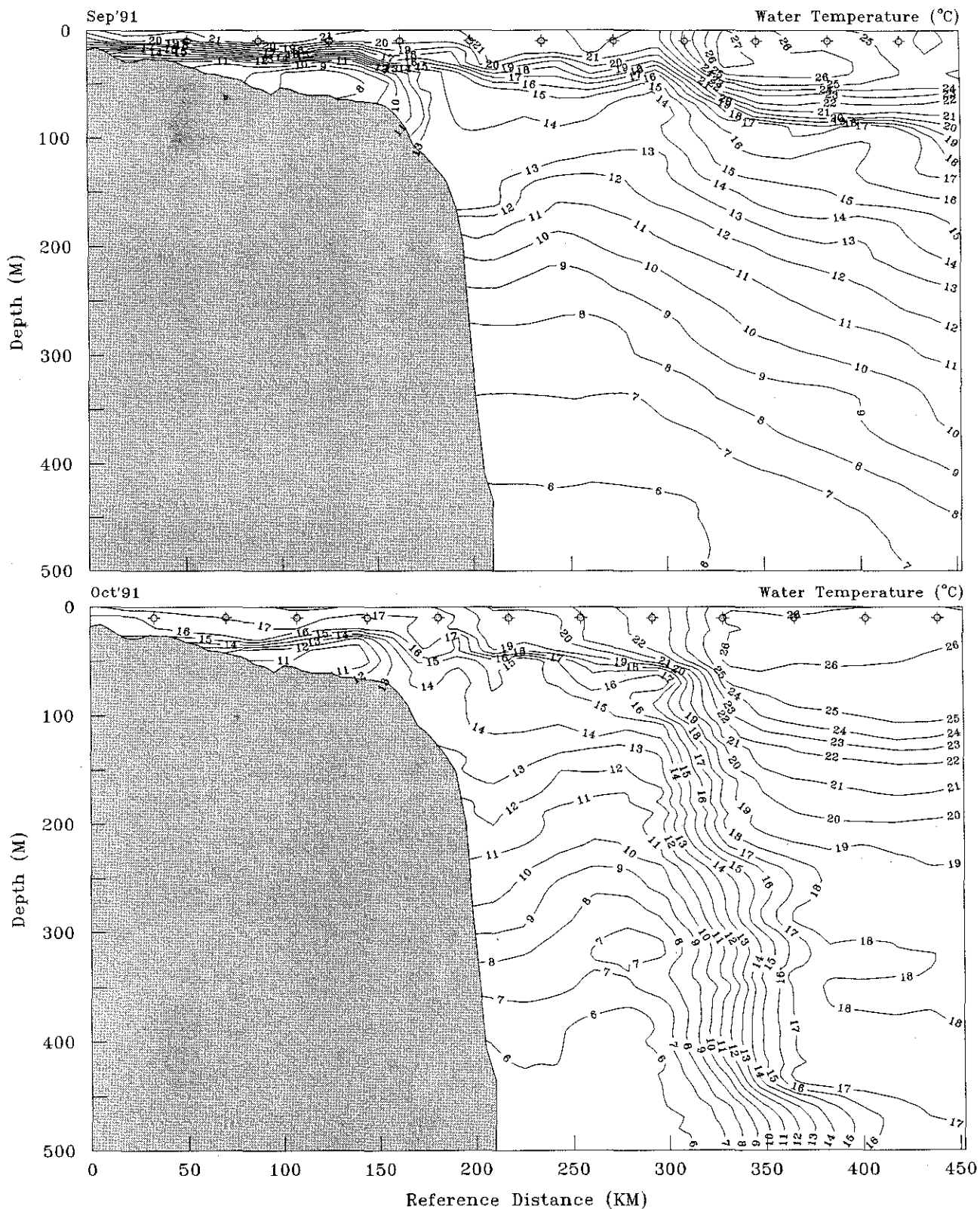


Figure 9. Water column thermal structure ($^{\circ}\text{C}$), and continuous plankton station locations (symbols) at 10 m along the Middle Atlantic Bight transect during September and October 1991.

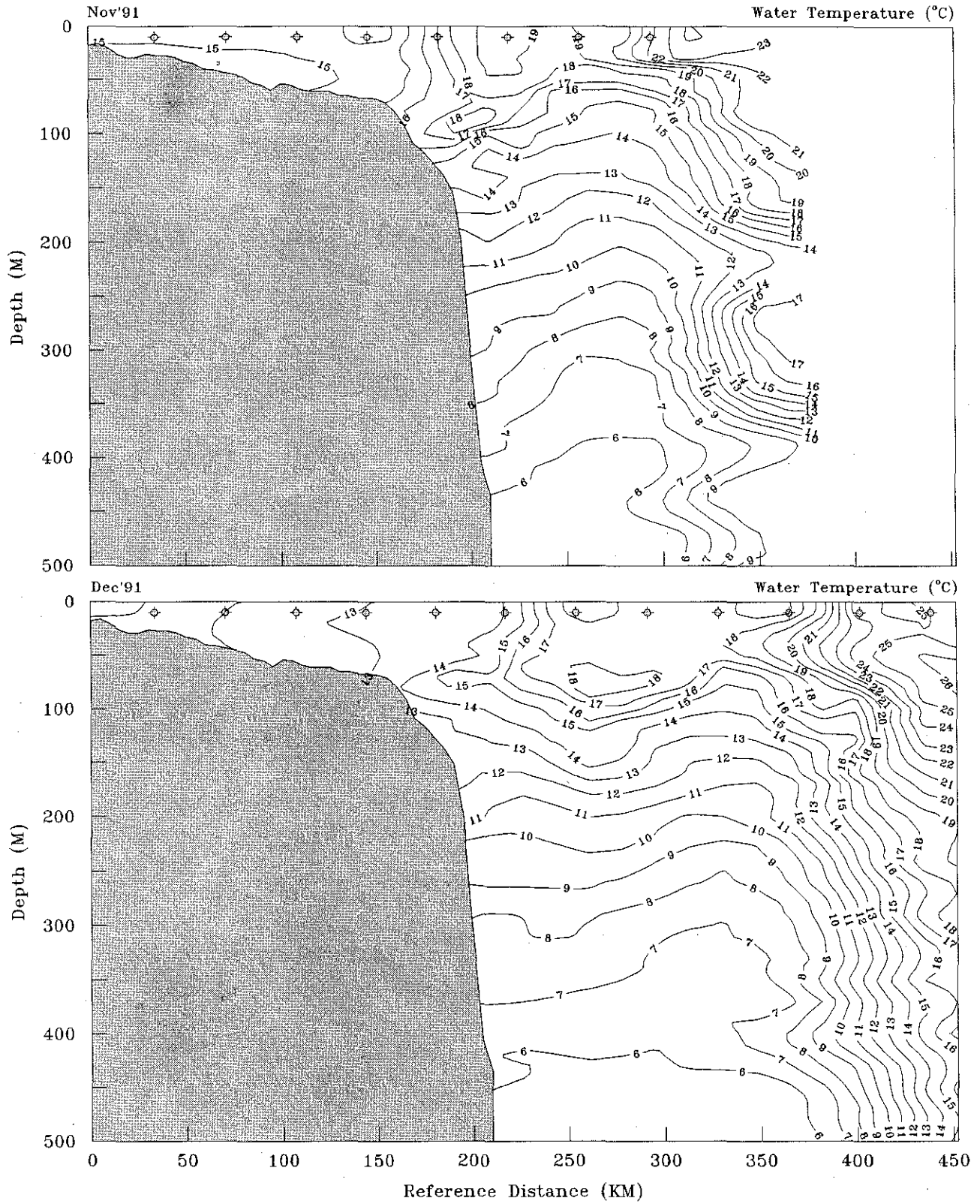


Figure 10. Water column thermal structure (°C), and continuous plankton station locations (symbols) at 10 m along the Middle Atlantic Bight transect during November and December 1991.

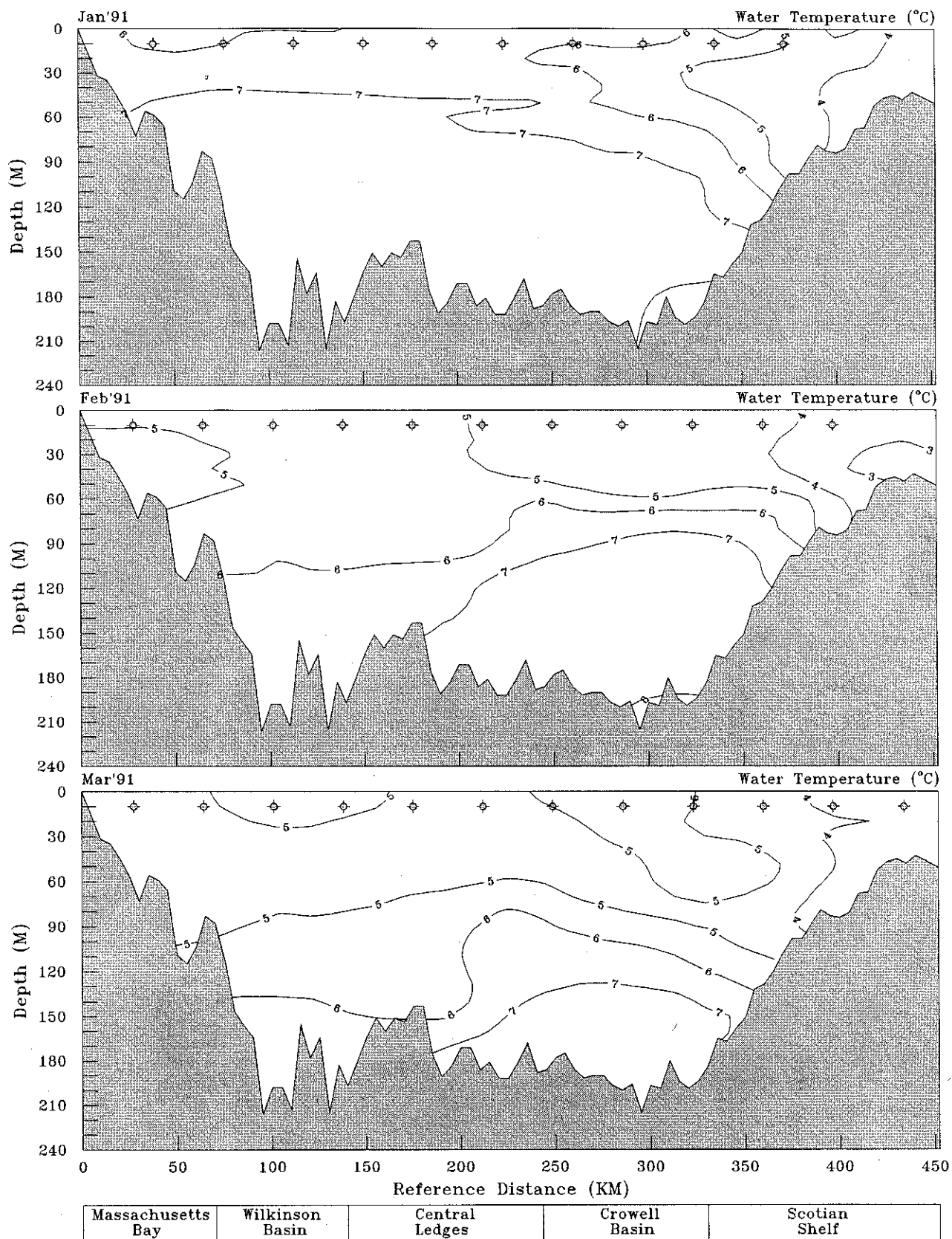


Figure 11. Water column thermal structure (°C), and continuous plankton station locations (symbols) at 10 m along the Gulf of Maine transect during January, February, and March 1991.

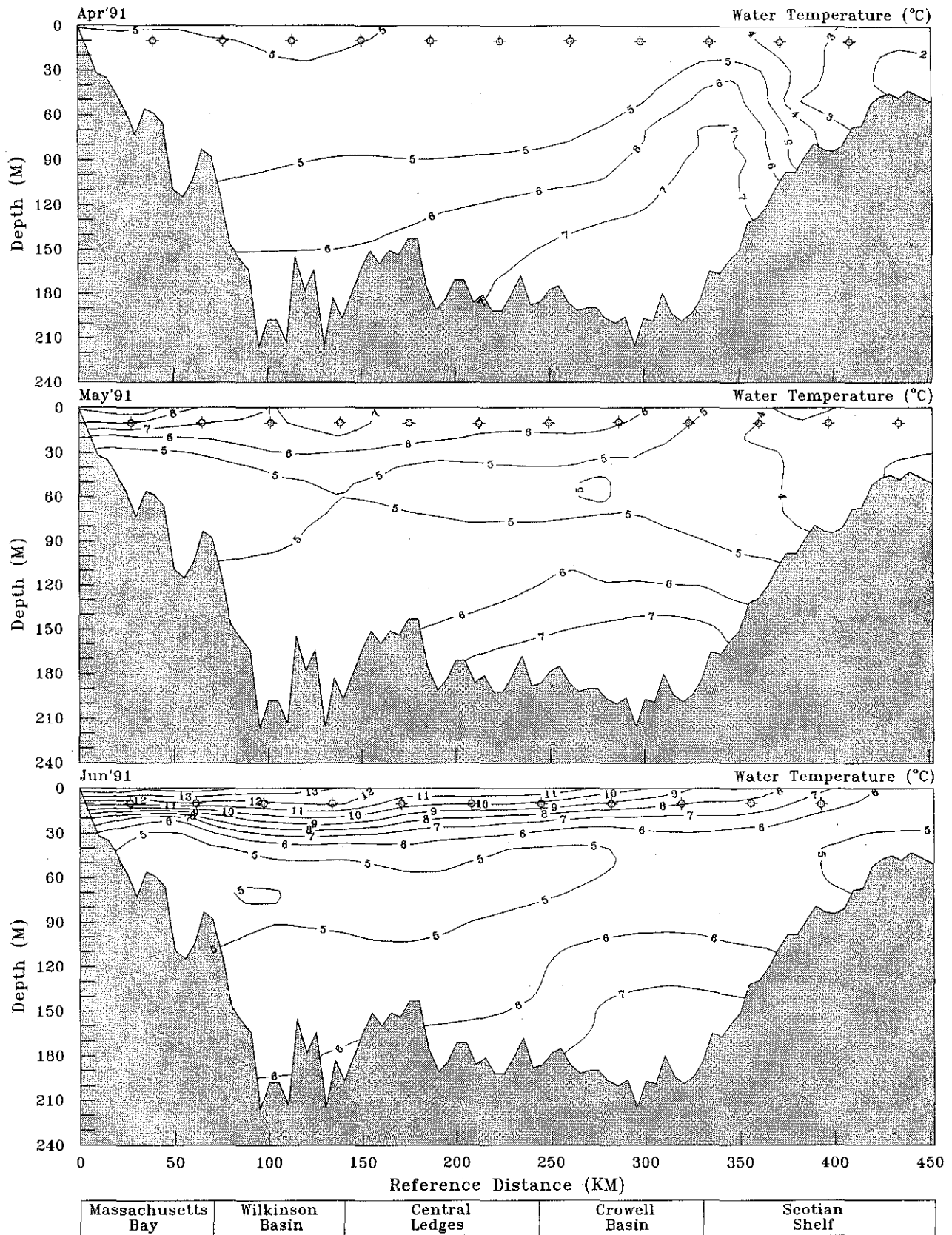


Figure 12. Water column thermal structure (°C), and continuous plankton station locations (symbols) at 10 m along the Gulf of Maine transect during April, May, and June 1991.

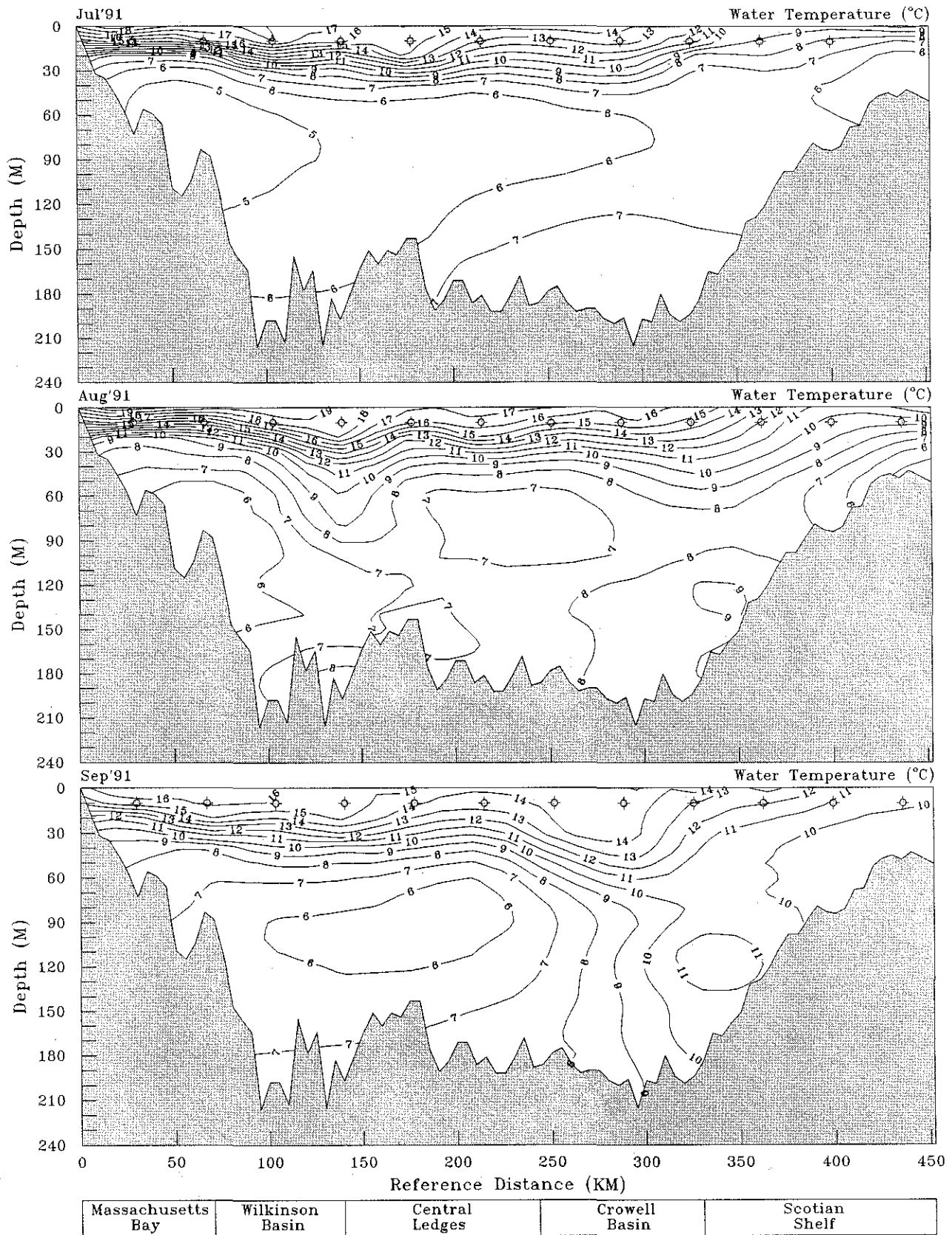


Figure 13. Water column thermal structure (°C), and continuous plankton station locations (symbols) at 10 m along the Gulf of Maine transect during July, August, and September 1991.

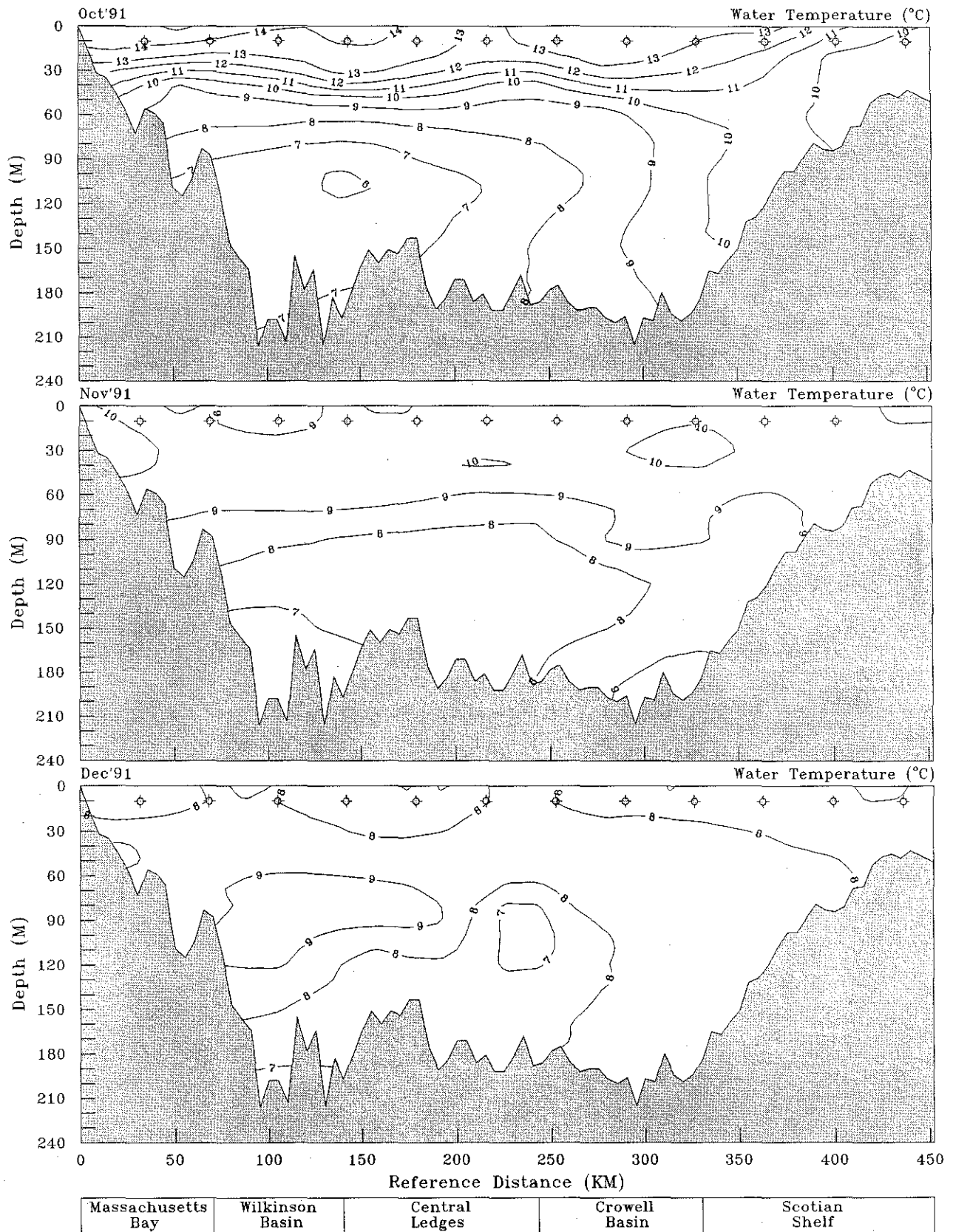


Figure 14. Water column thermal structure ($^{\circ}\text{C}$), and continuous plankton station locations (symbols) at 10 m along the Gulf of Maine transect during October, November, and December 1991.

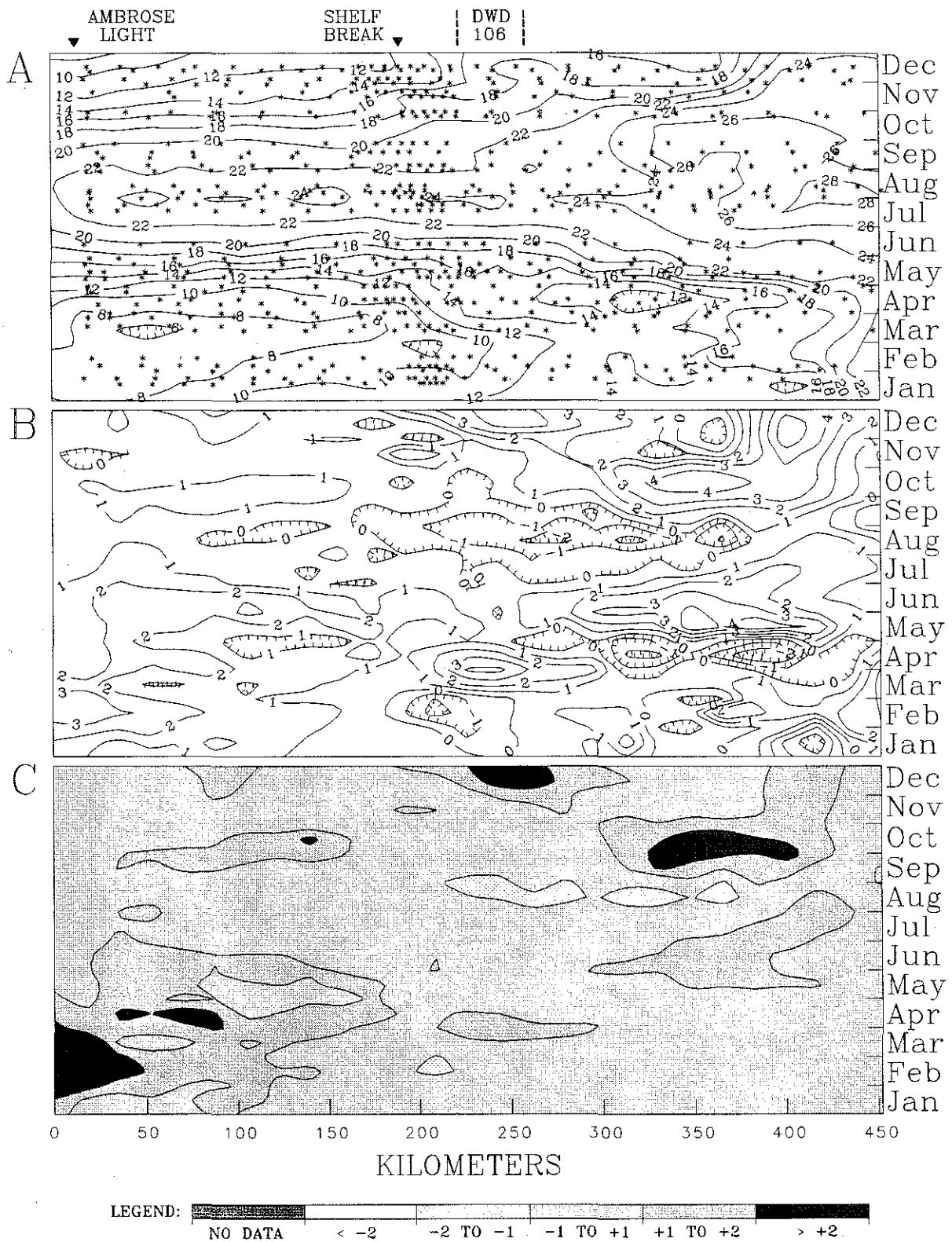


Figure 15. Surface temperature conditions along the Middle Atlantic Bight route during 1991. A: measured values ($^{\circ}\text{C}$) in time and space. Dots indicate sampling locations. B: anomalies in time and space based on 1978-1990 means. C: standardized anomalies (standard deviations) in time and space based on 1978-1990 means and variances. In panels A and B, values decline on those sides of contour lines with hachures.

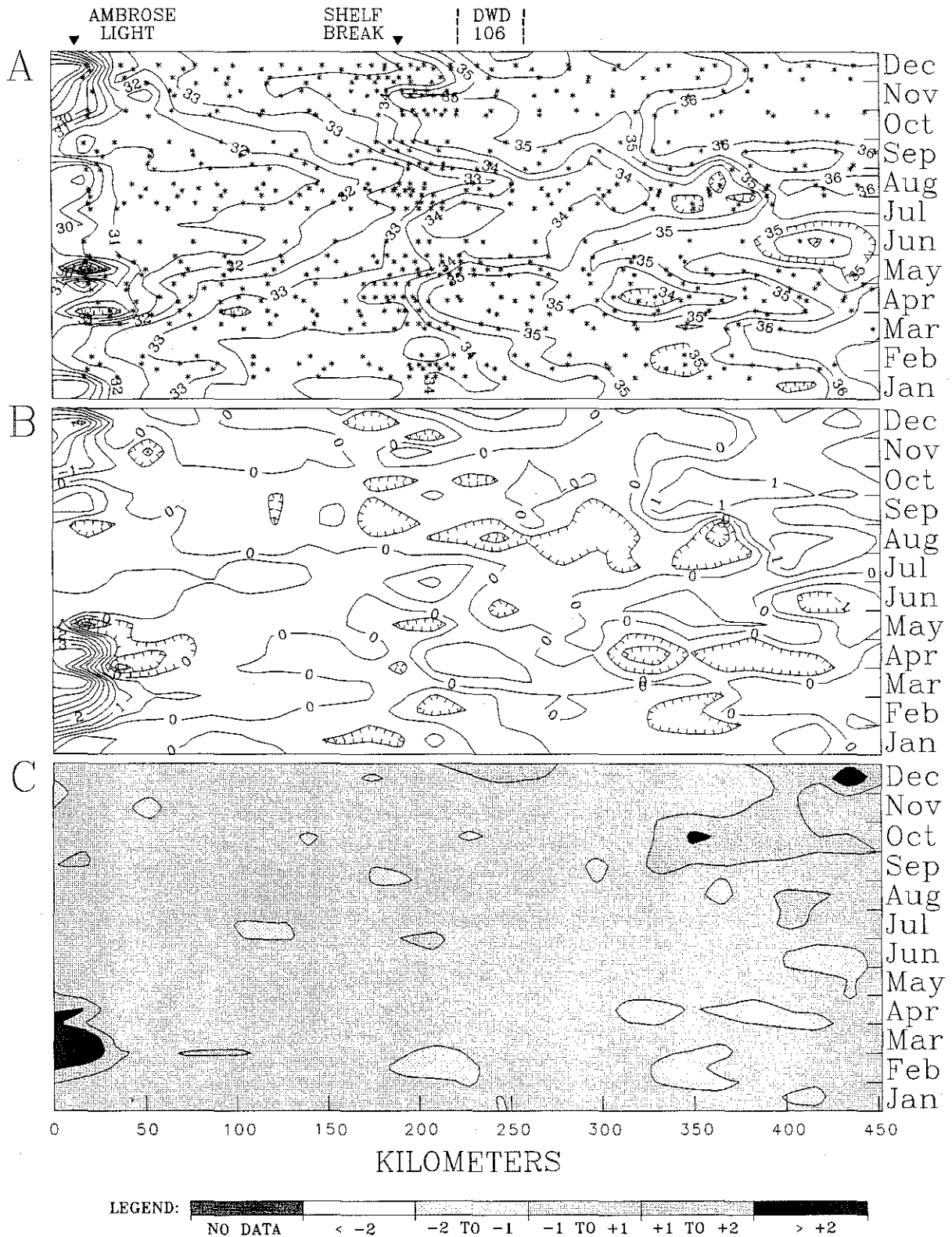


Figure 16. Surface salinity conditions along the Middle Atlantic Bight route during 1991. A: measured values (parts per thousand) in time and space. Dots indicate sampling locations. B: anomalies in time and space based on 1978-1990 means. C: standardized anomalies (standard deviations) in time and space based on 1978-1990 means and variances. In panels A and B, values decline on those sides of contour lines with hachures.

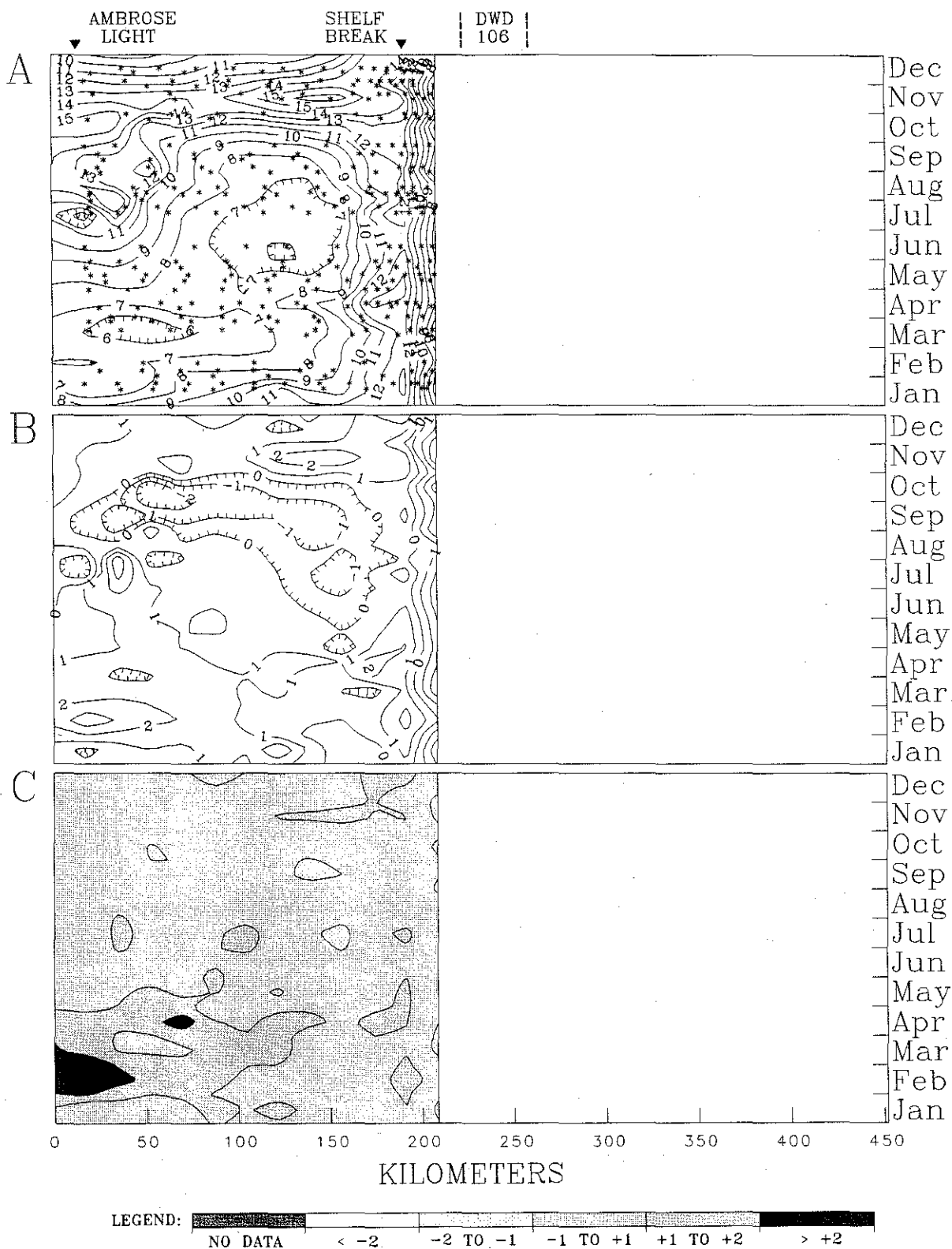


Figure 17. Bottom temperature conditions along the Middle Atlantic Bight route during 1991. A: measured values (°C) in time and space. Dots indicate sampling locations. B: anomalies in time and space based on 1978-1990 means. C: standardized anomalies (standard deviations) in time and space based on 1978-1990 means and variances. In panels A and B, values decline on those sides of contour lines with hachures.

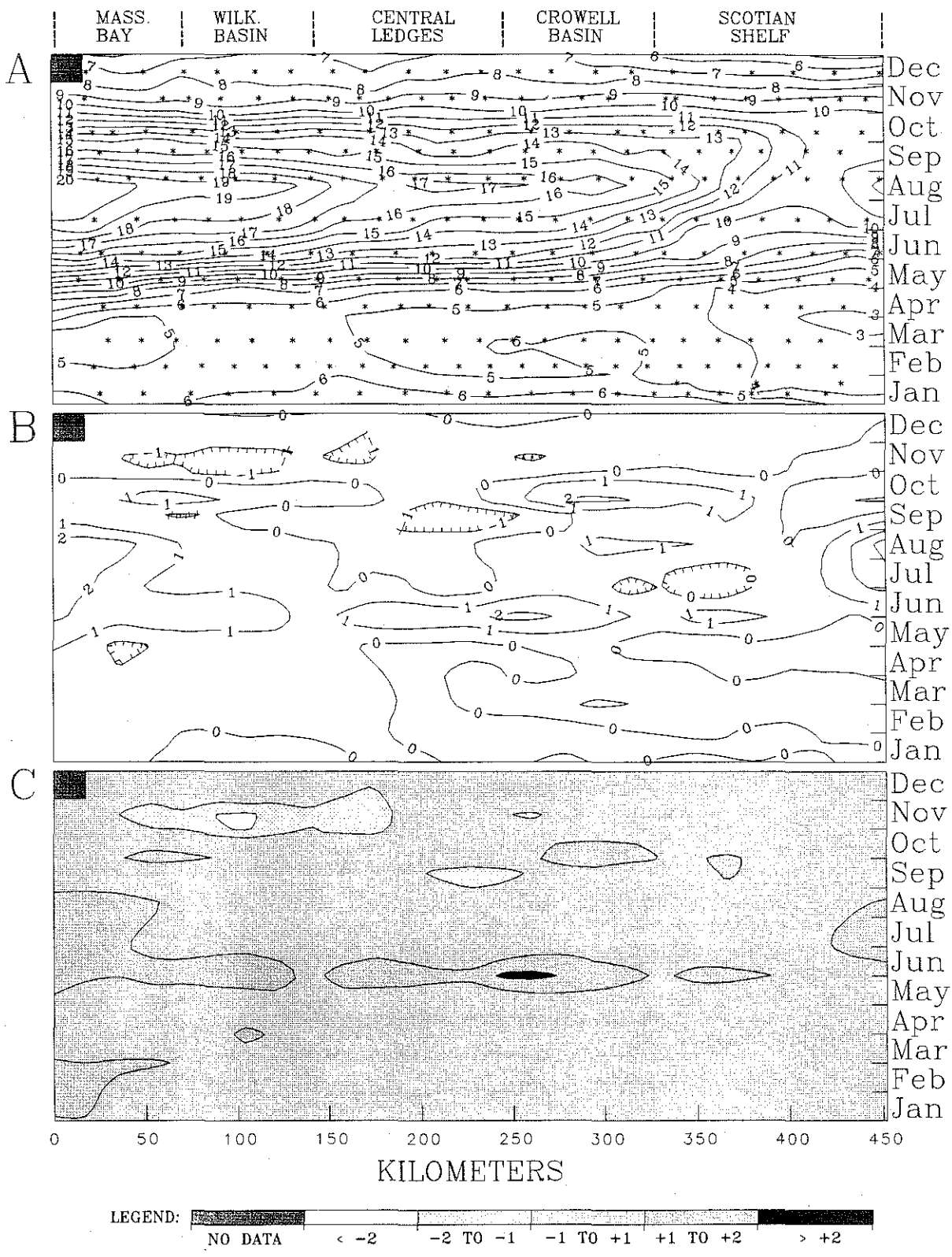


Figure 18. Surface temperature conditions along the Gulf of Maine route during 1991. A: measured values (°C) in time and space. Dots indicate sampling locations. B: anomalies in time and space based on 1978-1990 means. C: standardized anomalies (standard deviations) in time and space based on 1978-1990 means and variances. In panels A and B, values decline on those sides of contour lines with hachures.

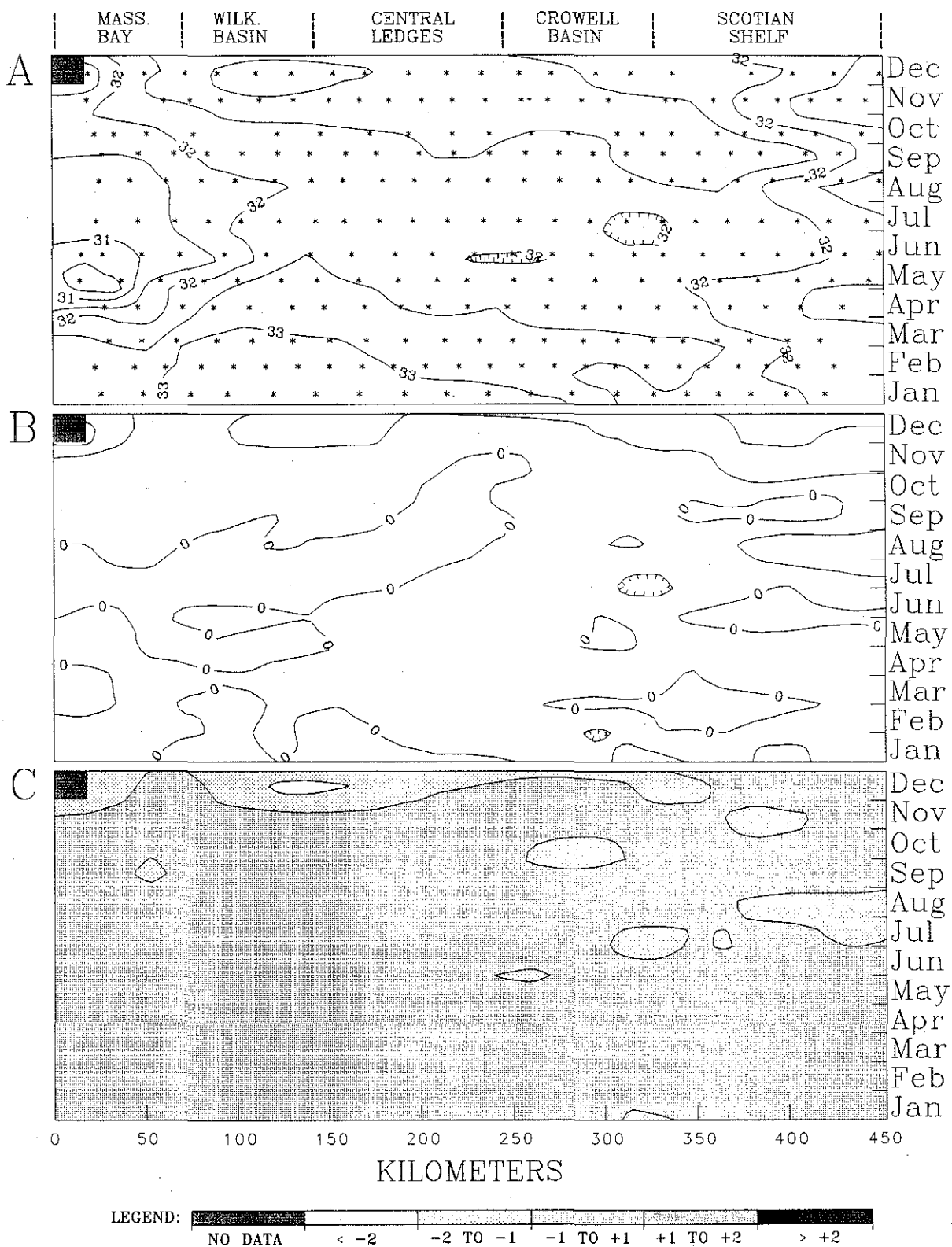


Figure 19. Surface salinity conditions along the Gulf of Maine route during 1991. A: measured values (parts per thousand) in time and space. Dots indicate sampling locations. B: anomalies in time and space based on 1978-1990 means. C: standardized anomalies (standard deviations) in time and space based on 1978-1990 means and variances. In panels A and B, values decline on those sides of contour lines with hachures.

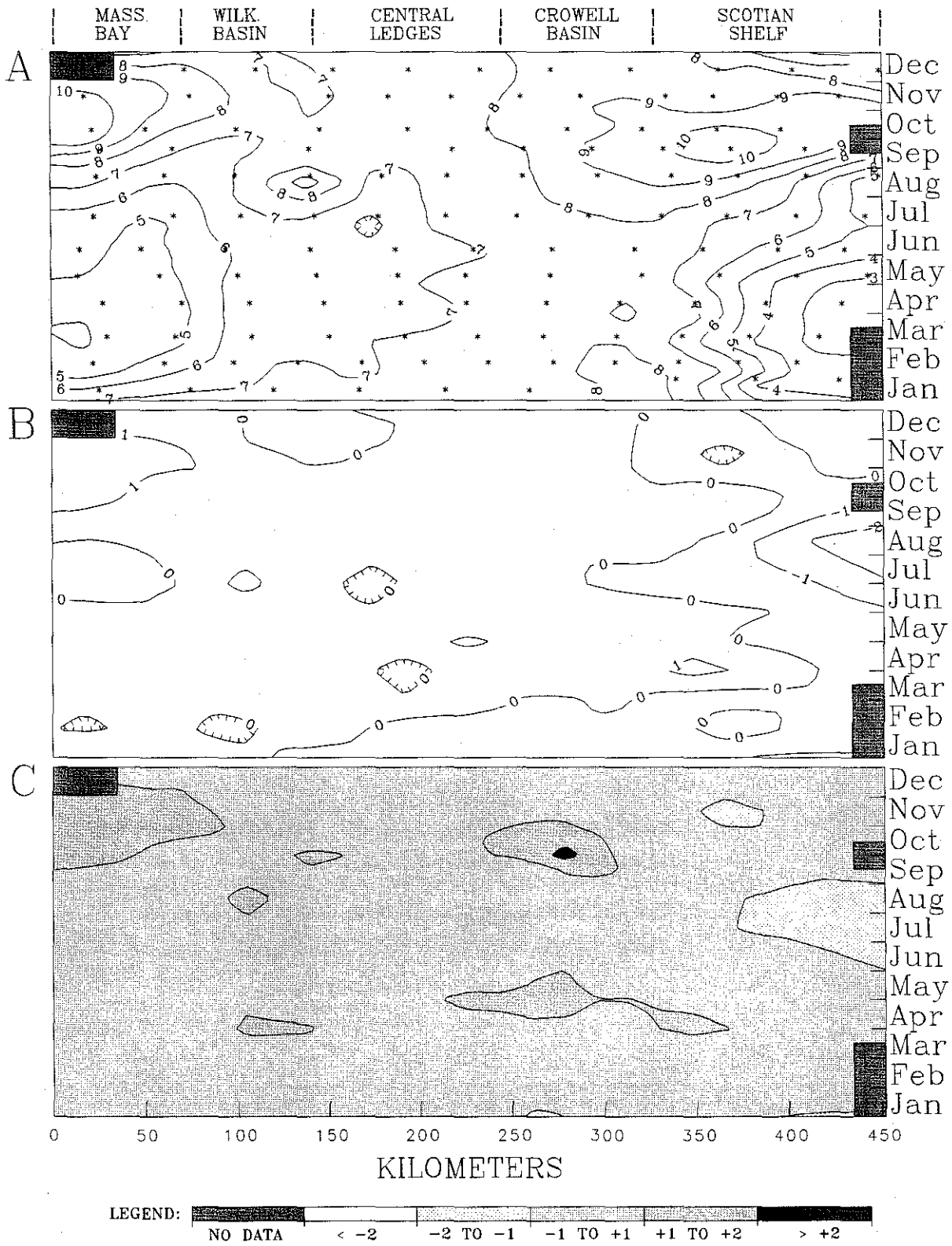


Figure 20. Bottom temperature conditions along the Gulf of Maine route during 1991. A: measured values ($^{\circ}\text{C}$) in time and space. Dots indicate sampling locations. B: anomalies in time and space based on 1978-1990 means. C: standardized anomalies (standard deviations) in time and space based on 1978-1990 means and variances. In panels A and B, values decline on those sides of contour lines with hachures.