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Water-column Thermal Structure in the Middle Atlantic Bight and Gulf of Maine during 1978-92

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ABSTRACT

This report presents water-column temperature data for the Middle Atlantic Bight and Gulf of Maine during 1978-92. Data were collected by expendable bathythermographs deployed by merchant ships during monthly transects of both bodies of water. Data are presented as contoured vertical sections. Methods of data collection, management, and portrayal are discussed.

INTRODUCTION

In 1970, the National Marine Fisheries Service (NMFS) and the Maritime Administration (MARAD) initiated a cooperative expendable bathythermograph (XBT) survey to identify and describe seasonal and year-to-year variations of temperature, salinity, and circulation in major currents of the Gulf of Mexico and western North Atlantic. This survey, conducted in support of NMFS's Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP), used merchant ships -- cooperating in MARAD's Ship of Opportunity Program (SOOP) -- as inexpensive collection platforms, and relied on Kings Point Maritime Academy cadets to gather the XBT.

In the mid-1970s, the continuous plankton recorder (CPR) survey (Glover 1967; Jossi *et al.* 1982), also using ships of opportunity, merged with the XBT survey. The combined surveys concentrated on water masses, circulation, and plankton of the Middle Atlantic Bight and Gulf of Maine, with particular interest in continental shelf and slope waters.

Our report portrays monthly water-column thermal conditions along MARMAP Routes MB (Middle Atlantic Bight) and MC (Gulf of Maine) for 1978-92. CPR station locations also are shown on the temperature portrayals. Analyses of SOOP data regarding long-term mean conditions and interannual variability in surface temperature, surface salinity, and bottom temperature have been presented in Benway *et al.* (1993).

METHODS

STUDY AREAS

Ship routes were selected in regions of interest to fisheries research to provide regular sampling and to allow the characterization of oceanographic conditions. Repeated coverage is important for comparative analyses, so ships with the most regular schedules were chosen whenever possible. MARMAP ships of opportunity included research, commercial, and U.S. Coast Guard vessels outfitted with data sampling hardware and software from the National Marine Fisheries Service.

The track lines of the ships of opportunity varied on different occupations of a route. This variability made it necessary to develop route polygons with shapes such that only variations along the long axis of the polygon were

considered significant relative to program goals (Figures 1a and 1b).

The Middle Atlantic Bight sampling originates at Ambrose Light (40°27.5'N, 73°49.6'W) and extends offshore 500 km (270 nautical miles) towards Bermuda (Figure 1a). The route polygon is termed MARMAP Route MB, the corners of which are: 40°34'N, 74°00'W; 40°20'N, 74°00'W; 38°30'N, 69°00'W; and 36°44'N, 70°30'W. This route traverses waters of the continental shelf, continental slope, and Gulf Stream.

The Gulf of Maine sampling extends from Boston, Massachusetts, to Cape Sable, Nova Scotia (Figure 1b), for a distance of approximately 452 km (244 nautical miles). This route polygon is termed MARMAP Route MC, the corners of which are: 43°30'N, 71°00'W; 43°30'N, 65°37'W; 43°00'N, 65°37'W; and 42°00'N, 71°00'W. This route traverses waters of Massachusetts Bay, Wilkinson Basin, the central gulf ledges, Crowell Basin, southern Jordan Basin, and western Scotian Shelf.

DATA AND SAMPLE PROCESSING

On all SOOP vessels, XBT and meteorological data were recorded and logged following the methods of Benway *et al.* (1993) (Tables 1 and 2). Middle Atlantic Bight SOOP vessels cast XBT's at 1-hr intervals (about 26 km or 14 nautical miles), whereas Gulf of Maine SOOP vessels dropped XBT's at 2-hr intervals (about 44 km or 24 nautical miles). In both regions, surface temperature was recorded hourly via bucket thermometer, and surface salinity was sampled whenever an XBT was deployed.

All XBT and meteorological data were sent via Geostationary Operational Environmental Satellite (GOES) transmitter to the Command and Data Acquisition System ground station at Wallops Island, Virginia, and relayed to the National Environmental Satellite, Data, and Information Service computer in Washington, D.C., for distribution to outside users. Transmissions were every 3 hr from Middle Atlantic Bight SOOP vessels, and every 6 hr from Gulf of Maine SOOP vessels. Temperature data transmitted via GOES were considered to be "real time."

Temperature and depth data collected aboard SOOP vessels were processed and quality controlled by personnel at the NMFS Narragansett (Rhode Island) Laboratory, following the methods of Benway *et al.* (1993).

CPR data were collected and processed following the methods of Thomas (1992). In brief, CPR's (Hardy 1939; Hardy 1944) were towed at a fixed depth of 10 m. Seawater

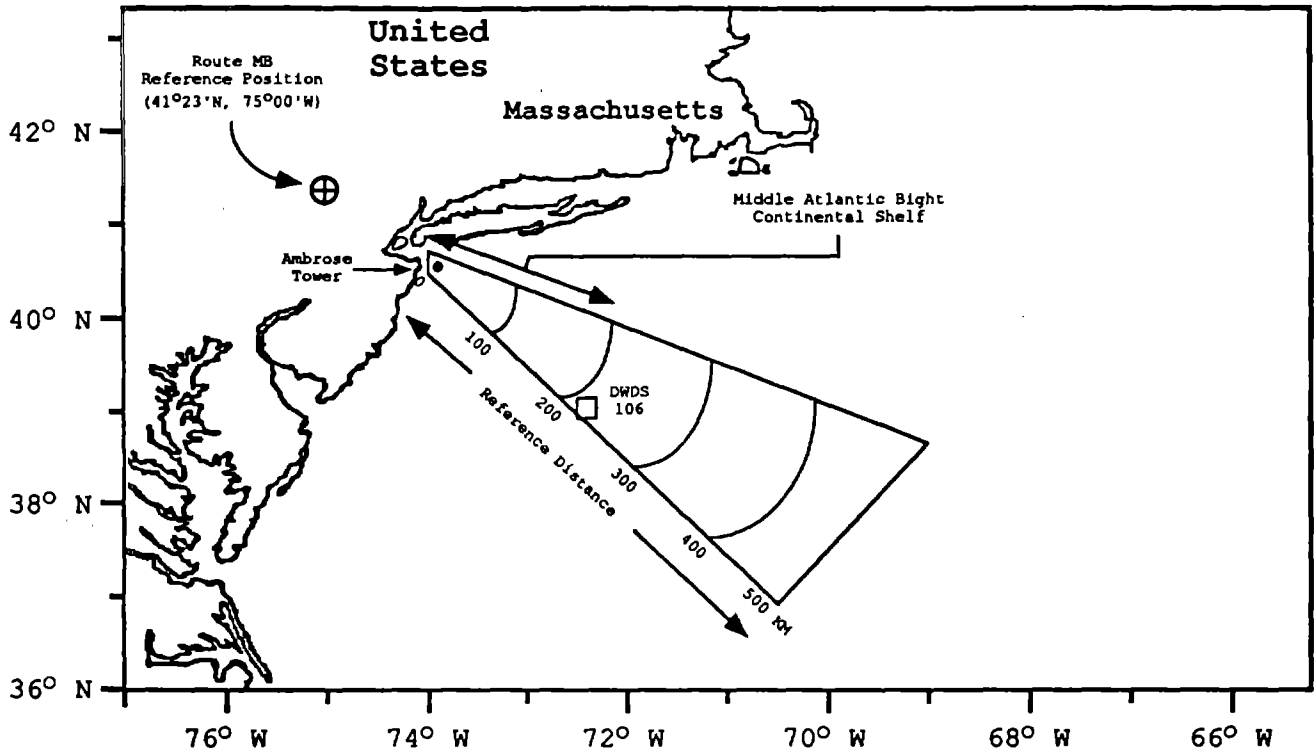


Figure 1a. Middle Atlantic Bight (Route MB) polygon, within which monitoring transects occurred, showing reference position and distance and major geophysical features.

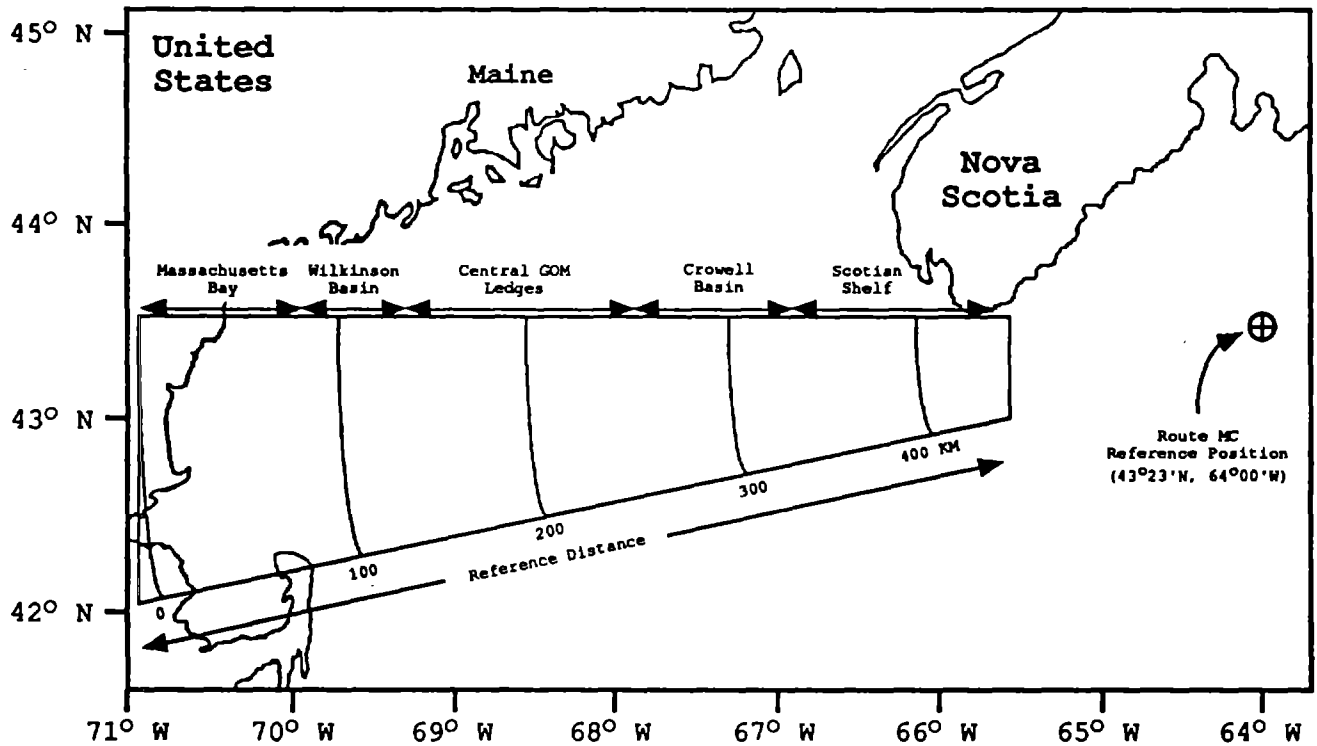


Figure 1b. Gulf of Maine (Route MC) polygon, within which monitoring transects occurred, showing reference position and distance and major geophysical features.

entered the front of the CPR and was filtered through a mechanically driven belt of Swiss bolting silk with a wet-mesh aperture of 225 m x 234 m. In the laboratory, the silk was divided into sections ("stations") corresponding to 10-nautical-mile (18.52-km) intervals. Geographic position and reference distance were calculated for the geometric center of each silk section, and successive silk sections were assigned sequential station numbers. The NMFS Narragansett Laboratory will publish CPR methods and data in future atlases.

GENERATION OF CONTOURED VERTICAL SECTIONS

The method of generating contoured vertical sections, or grids, was designed at the NMFS Narragansett Laboratory to overcome problems associated with irregular sampling in time and space (Thomas 1992; Benway *et al.* 1993; Goulet, pers. comm.¹). To create a contoured grid of monthly interpolated water-column temperatures, all XBT and bucket data from a single ship-of-opportunity cruise were used. Whenever possible, cruises were chosen that deployed XBT probes and towed a CPR.

All contoured sections of water-column temperatures (in degrees Celsius) have been constructed with route-polygon reference distances (in kilometers) along the x-axis, and water-column depths (in meters) along the y-axis. Grid intersections were chosen at intervals of 17.38 km and 10 m.

A search was performed of the elliptical space (100 km by 50 m) around every grid intersection, and all raw data values within the search ellipses were fitted to the grid by interpolation, thereby producing a temperature "map" by reference distance and depth. In the event of fewer than four raw data values within the search ellipse at a given grid intersection, no interpolation was performed, resulting in a blank region within the interpolated surface.

Note that data from cruises YC8505 and YC8506 were combined to calculate the March 1985 temperature map; data from cruise CU7904 were used to compute the July 1979 temperature map (Table 2).

RESULTS

During 1978-92, the total number of cruises conducted were 306 in the Middle Atlantic Bight (averaging approximately 20 per year) and 221 in the Gulf of Maine (averaging approximately 16 per year). Listings of the cruises are shown in Table 1 (Route MB, Middle Atlantic Bight) and Table 2 (Route MC, Gulf of Maine), along with information

on the types of data collected on each cruise. No XBT's were collected in the Gulf of Maine during 1986.

Portrayals of monthly water-column temperatures for the Middle Atlantic Bight (Route MB) are shown in Figures 2-91, and for the Gulf of Maine (Route MC) in Figures 92-147. Included in the portrayals are the locations of concomitant CPR stations.

Temperature data for any transect are available from the National Oceanographic Data Center (NODC) in a variety of forms. The complete SOOP hydrographic data base, collected on MARMAP Routes MB and MC during 1978-90, is described by Benway *et al.* (1993). Requests for, or inquiries about, SOOP XBT data held by NODC, as well as data products, should be directed to:

National Oceanographic Data Center
National Environmental Satellite, Data,
and Information Service
1825 Connecticut Ave., N.W.
Washington, DC 20235
U.S.A.

Inquiries concerning these data may also be made to:

Fisheries Climatology Investigation
Northeast Fisheries Science Center
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¹Goulet, J.R.; National Marine Fisheries Service, 28 Tarzwell Dr., Narragansett, RI 02882-1199; October 1991 - May 1992.

Table 1. MARMAP ship-of-opportunity cruises through the Middle Atlantic Bight (Route MB) polygon during 1978-92 which are portrayed in this report. An "X" indicates collection of a particular data type (CPR = continuous plankton recorder tow; XBT = expendable bathythermograph drop; SST = sea-surface temperature bucket sample; and SSS = sea-surface salinity sample).

Cruise	Date	CPR	XBT	SST/SSS	Cruise	Date	CPR	XBT	SST/SSS
1978					1982				
TA7801	01 Jan 1978	X	X	X	OL8201	15 Jan 1982	X	X	X
TA7802	16 Feb 1978	X	X	X	OL8203	19 Feb 1982	X	X	X
TA7803	23 Mar 1978	X	X	X	OL8205	12 Mar 1982	X	X	X
TA7805	10 May 1978	X	X	X	OL8207	17 Apr 1982	X	X	X
TA7806	08 Jun 1978	X	X	X	OL8209	14 May 1982	X	X	X
GL7807	27 Jul 1978	X	X	X	OL8211	11 Jun 1982	X	X	X
MR7809	23 Sep 1978	-	X	X	OL8213	16 Jul 1982	-	X	X
TA7811	07 Nov 1978	X	X	X	OL8216	13 Aug 1982	X	X	X
GL7812	17 Dec 1978	X	X	X	OL8218	11 Sep 1982	X	X	X
1979					OL8220	15 Oct 1982	X	X	X
TA7901	30 Jan 1979	-	X	X	OL8222	12 Nov 1982	X	X	X
MA7901	25 Feb 1979	-	X	X	OL8224	10 Dec 1982	X	X	X
MA7902	23 Mar 1979	-	X	X	1983				
WH7901	08 May 1979	X	X	X	OL8302	28 Jan 1983	X	X	X
MR7903	07 Jun 1979	-	X	X	OL8304	18 Feb 1983	X	X	X
TA7904	18 Jul 1979	X	X	X	OL8305	11 Mar 1983	X	X	X
TA7905	23 Aug 1979	X	X	X	OL8307	16 Apr 1983	X	X	X
MR7906	23 Sep 1979	-	X	X	OL8308	14 May 1983	X	X	X
VG7901	05 Oct 1979	X	X	X	OL8310	10 Jun 1983	X	X	X
MA7908	03 Nov 1979	-	X	X	OL8313	08 Jul 1983	X	X	X
MA7910	14 Dec 1979	-	X	X	OL8315	10 Aug 1983	X	X	X
1980					OL8316	23 Sep 1983	X	X	X
MR8001	03 Feb 1980	-	X	X	OL8317	14 Oct 1983	X	X	X
GL8003	09 Mar 1980	-	X	X	OL8319	18 Nov 1983	X	X	X
MR8003	06 Apr 1980	-	X	X	OL8321	02 Dec 1983	X	X	X
KE8002	16 May 1980	-	X	X	1984				
MR8004	17 May 1980	-	X	X	OL8401	06 Jan 1984	X	X	X
MA8007	12 Jun 1980	-	X	X	OL8403	03 Feb 1984	X	X	X
MA8008	01 Jul 1980	-	X	X	OL8405	02 Mar 1984	-	X	X
MR8005	16 Aug 1980	-	X	X	OL8407	06 Apr 1984	X	X	X
TA8002	16 Sep 1980	X	X	X	OL8409	11 May 1984	X	X	X
MR8006	11 Oct 1980	X	X	X	OL8411	08 Jun 1984	X	X	X
TA8004	02 Dec 1980	X	X	X	OL8413	07 Jul 1984	X	X	X
1981					OL8415	10 Aug 1984	-	X	X
OL8102	10 Apr 1981	X	X	X	OL8417	07 Sep 1984	X	X	X
OL8104	09 May 1981	-	X	X	OL8419	21 Oct 1984	X	X	X
OL8105	05 Jun 1981	X	X	X	OL8422	09 Nov 1984	X	X	X
OL8107	10 Jul 1981	X	X	X	OL8424	11 Dec 1984	X	X	X
OL8109	14 Aug 1981	X	X	X	1985				
OL8111	18 Sep 1981	X	X	X	OL8502	30 Jan 1985	X	X	X
OL8113	16 Oct 1981	-	X	X	OL8503	15 Feb 1985	X	X	X
OL8116	13 Nov 1981	X	X	X	OL8505	23 Mar 1985	X	X	X
OL8118	12 Dec 1981	X	X	X	OL8506	26 Apr 1985	-	X	X
					OL8508	17 May 1985	X	X	X
					OL8510	21 Jun 1985	X	X	X
					OL8511	12 Jul 1985	X	X	X
					OL8512	09 Aug 1985	X	X	X
					OL8516	20 Sep 1985	X	X	X
					OL8518	16 Oct 1985	-	X	X
					OL8519	08 Nov 1985	X	X	X

Table 1. Continued

Cruise	Date	CPR	XBT	SST/SSS	Cruise	Date	CPR	XBT	SST/SSS
1986					1990				
OL8601	10 Jan 1986	X	X	X	OL9001	05 Jan 1990	X	X	X
OL8602	07 Feb 1986	X	X	X	OL9002	02 Feb 1990	-	X	X
OL8603	07 Mar 1986	-	X	X	OL9003	02 Mar 1990	X	X	X
OL8605	04 Apr 1986	X	X	X	OL9004	06 Apr 1990	X	X	X
OL8606	02 May 1986	X	X	X	OL9009	30 May 1990	X	X	X
OL8607	06 Jun 1986	X	X	X	OL9010	08 Jun 1990	X	X	X
OL8608	04 Jul 1986	X	X	X	OL9014	06 Jul 1990	X	X	X
OL8609	08 Aug 1986	X	X	X	OL9 19	08 Aug 1990	-	X	X
OL8610	19 Sep 1986	X	X	X	OL9022	14 Sep 1990	X	X	X
OL8611	10 Oct 1986	X	X	X	OL9024	05 Oct 1990	X	X	X
OL8613	07 Nov 1986	X	X	X	OL9028	09 Nov 1990	X	X	X
OL8616	10 Dec 1986	-	X	X	OL9033	13 Dec 1990	-	X	X
1987					1991				
OL8701	09 Jan 1987	X	X	X	OL9101	11 Jan 1991	X	X	X
OL8702	06 Feb 1987	X	X	X	OL9105	08 Feb 1991	X	X	X
OL8703	06 Mar 1987	X	X	X	OL9106	08 Mar 1991	X	X	X
OL8704	10 Apr 1987	X	X	X	OL9110	06 Apr 1991	X	X	X
OL8705	08 May 1987	X	X	X	OL9116	18 May 1991	-	X	X
OL8707	05 Jun 1987	X	X	X	OL9118	08 Jun 1991	X	X	X
OL8709	15 Jul 1987	-	X	X	OL9119	13 Jul 1991	X	X	X
OL8711	19 Aug 1987	X	X	X	OL9123	03 Aug 1991	X	X	X
OL8712	04 Sep 1987	X	X	X	OL9128	11 Sep 1991	X	X	X
OL8713	02 Oct 1987	X	X	X	OL9130	13 Oct 1991	X	X	X
OL8716	13 Nov 1987	X	X	X	OL9132	08 Nov 1991	X	X	X
OL8718	09 Dec 1987	X	X	X	OL9136	06 Dec 1991	X	X	X
1988					1992				
OL8801	08 Jan 1988	X	X	X	OL9201	11 Jan 1992	-	X	X
OL8802	05 Feb 1988	X	X	X	OL9203	02 Feb 1992	X	X	X
OL8803	18 Mar 1988	X	X	X	OL9205	07 Mar 1992	X	X	X
OL8804	08 Apr 1988	X	X	X	OL9207	03 Apr 1992	X	X	X
OL8806	06 May 1988	X	X	X	OL9208	01 May 1992	X	X	X
OL8807	10 Jun 1988	X	X	X	OL9210	05 Jun 1992	X	X	X
OL8809	08 Jul 1988	X	X	X	OL9212	09 Jul 1992	-	X	X
OL8810	19 Aug 1988	-	X	X	OL9213	07 Aug 1992	X	X	X
OL8812	09 Sep 1988	X	X	X	OL9214	04 Sep 1992	-	X	X
OL8813	14 Oct 1988	X	X	X	OL9216	16 Oct 1992	-	X	X
OL8815	04 Nov 1988	X	X	X	OL9217	06 Nov 1992	X	X	X
OL8816	02 Dec 1988	X	X	X	OL9219	17 Dec 1992	X	X	X
1989									
OL8901	07 Jan 1989	X	X	X					
OL8902	03 Feb 1989	X	X	X					
OL8903	03 Mar 1989	X	X	X					
OL8904	07 Apr 1989	X	X	X					
OL8906	13 May 1989	X	X	X					
OL8907	09 Jun 1989	X	X	X					
OL8908	07 Jul 1989	X	X	X					
OL8909	04 Aug 1989	X	X	X					
OL8910	01 Sep 1989	X	X	X					
OL8912	11 Oct 1989	-	X	X					
OL8913	10 Nov 1989	X	X	X					
OL8914	15 Dec 1989	X	X	X					

Table 2. MARMAP ship-of-opportunity cruises through the Gulf of Maine (Route MC) polygon during 1978-85 and 1987-92, which are portrayed in this report. An "X" indicates collection of a particular data type (CPR = continuous plankton recorder tow; XBT = expendable bathythermograph drop; SST = sea-surface temperature bucket sample; and SSS = sea-surface salinity sample).

Cruise	Date	CPR	XBT	SST/SSS	Cruise	Date	CPR	XBT	SST/SSS
1978					1982				
CU7803	12 Mar 1978	X	X	X	DW8201	26 Mar 1982	-	X	X
CU7804	13 Apr 1978	X	X	X	DE8201	25 Apr 1982	-	X	X
CU7805	07 May 1978	X	X	X	YC8202	21 May 1982	-	X	X
CU7806	02 Jun 1978	X	X	X	YC8203	11 Jun 1982	-	X	X
CU7807	23 Jul 1978	-	X	X	YC8206	16 Jul 1982	X	X	X
CU7888	18 Aug 1978	-	X	X	YC8207	13 Aug 1982	-	X	X
CU7809	30 Sep 1978	X	X	X	YC8209	10 Sep 1982	X	X	X
CU7810	11 Oct 1978	X	X	X	YC8210	19 Oct 1982	X	X	X
CU7811	10 Nov 1978	-	X	X	YC8212	20 Nov 1982	X	X	X
					YC8213	11 Dec 1982	X	X	X
1979					1983				
DE7901	23 Jan 1979	X	X	X	YC8303	29 Jan 1983	X	X	X
AC7901	01 Mar 1979	X	X	X	YC8304	19 Feb 1983	X	X	X
AC7902	01 Apr 1979	X	X	X	YC8306	15 Mar 1983	X	X	X
CU7902	03 Jun 1979	X	X	X	YC8307	05 Apr 1983	X	X	X
CU7904	03 Aug 1979	-	X	X	YC8310	09 May 1983	-	X	X
CU7905	17 Aug 1979	X	X	X	YC8313	11 Jun 1983	X	X	X
CU7906	16 Sep 1979	X	X	X	YC8315	08 Jul 1983	X	X	X
CU7907	31 Oct 1979	X	X	X	YC8317	03 Aug 1983	X	X	X
CU7908	21 Nov 1979	X	X	X	YC8319	09 Sep 1983	X	X	X
					YC8321	15 Oct 1983	X	X	X
1980					1984				
CU8001	01 Jan 1980	-	X	X	YC8401	07 Jan 1984	X	X	X
DE8001	09 Feb 1980	X	X	X	YC8402	12 Feb 1984	X	X	X
CU8002	20 Mar 1980	-	X	X	YC8404	10 Mar 1984	-	X	X
CU8004	04 Apr 1980	X	X	X	YC8408	21 Apr 1984	X	X	X
CU8005	05 May 1980	X	X	X	YC8409	16 May 1984	-	X	X
CU8008	21 Jul 1980	X	X	X	YC8411	09 Jun 1984	X	X	X
CU8009	20 Aug 1980	-	X	X	YC8412	14 Jul 1984	X	X	X
CU8010	02 Sep 1980	-	X	X	YC8413	03 Aug 1984	-	X	X
CU8011	20 Oct 1980	-	X	X	YC8417	21 Sep 1984	-	X	X
CU8014	13 Nov 1980	X	X	X	YC8418	12 Oct 1984	X	X	X
CU8015	14 Dec 1980	X	X	X	YC8419	03 Nov 1984	X	X	X
					YC8421	15 Dec 1984	-	X	X
1981									
CU8103	24 Feb 1981	-	X	X					
CU8105	22 Mar 1981	X	X	X					
CU8106	08 Apr 1981	-	X	X					
CU8107	30 May 1981	X	X	X					
CU8108	10 Jun 1981	X	X	X					
CU8109	22 Jul 1981	X	X	X					
CU8111	22 Aug 1981	X	X	X					
CU8112	06 Sep 1981	X	X	X					

Table 2. Continued

Cruise	Date	CPR	XBT	SST/SSS	Cruise	Date	CPR	XBT	SST/SSS
1985					1990				
YC8502	19 Jan 1985	-	X	X	YC9001	01 Jan 1990	X	X	X
YC8503	02 Feb 1985	X	X	X	YC9002	12 Feb 1990	X	X	X
YC8505	12 Mar 1985	-	X	X	YC9003	05 Mar 1990	X	X	X
YC8506	16 Mar 1985	-	X	X	YC9004	20 Apr 1990	X	X	X
YC8507	09 Apr 1985	X	X	X	YC9005	11 May 1990	-	X	X
YC8508	11 May 1985	-	X	X	YC9006	19 May 1990	X	-	X
YC8510	07 Jun 1985	-	X	X	YC9007	08 Jun 1990	X	X	X
YC8512	19 Jul 1985	X	X	X	YC9008	06 Jul 1990	X	X	X
YC8513	13 Aug 1985	X	X	X	YC9009	04 Aug 1990	X	X	X
YC8514	07 Sep 1985	X	X	X	YC9010	08 Sep 1990	X	X	X
YC8515	05 Oct 1985	X	X	X	YC9011	05 Oct 1990	X	X	X
YC8516	02 Nov 1985	-	X	X	YC9012	09 Nov 1990	X	X	X
YC8518	17 Dec 1985	X	X	X	YC9013	08 Dec 1990	X	X	X
1987					1991				
YC8703	14 Mar 1987	X	X	X	YC9102	16 Jan 1991	-	X	X
YC8704	11 Apr 1987	X	X	X	YC9103	02 Feb 1991	X	X	X
YC8705	09 May 1987	X	X	X	YC9104	02 Mar 1991	-	X	X
YC8706	06 Jun 1987	X	X	X	YC9106	06 Apr 1991	X	X	X
YC8707	11 Jul 1987	X	X	X	YC9107	04 May 1991	X	X	X
YC8708	08 Aug 1987	X	X	X	YC9108	02 Jun 1991	X	X	X
YC8709	12 Sep 1987	X	X	X	YC9109	05 Jul 1991	X	X	X
YC8710	03 Oct 1987	X	X	X	YC9110	16 Aug 1991	-	X	X
YC8711	14 Nov 1987	X	X	X	YC9112	13 Sep 1991	X	X	X
YC8712	12 Dec 1987	X	X	X	YC9113	04 Oct 1991	X	X	X
1988					YC9114	09 Nov 1991	X	X	X
YC8801	21 Jan 1988	X	X	X	YC9115	07 Dec 1991	X	X	X
YC8802	15 Feb 1988	X	X	X	1992				
YC8803	19 Mar 1988	X	X	X	YC9201	18 Jan 1992	X	X	X
YC8804	16 Apr 1988	X	X	X	YC9203	08 Feb 1992	X	X	X
YC8805	10 May 1988	X	X	X	YC9204	14 Mar 1992	X	X	X
YC8806	11 Jun 1988	X	X	X	YC9205	12 Apr 1992	X	X	X
YC8807	08 Jul 1988	X	X	X	YC9207	16 May 1992	X	X	X
YC8808	12 Aug 1988	X	X	X	YC9208	12 Jun 1992	X	X	X
YC8809	09 Sep 1988	X	X	X	YC9209	24 Jul 1992	X	X	X
YC8810	24 Oct 1988	X	X	X	YC9210	14 Aug 1992	X	X	X
YC8811	19 Nov 1988	X	X	X	YC9211	04 Sep 1992	X	X	X
YC8812	10 Dec 1988	X	X	X	YC9213	17 Oct 1992	-	X	X
1989					YC9215	27 Nov 1992	-	X	-
YC8901	04 Jan 1989	X	X	X	YC9216	19 Dec 1992	X	X	X
YC8902	04 Feb 1989	X	X	X					
YC8903	06 Mar 1989	X	X	X					
YC8904	07 Apr 1989	X	X	X					
YC8905	06 May 1989	X	X	X					
YC8906	17 Jun 1989	X	X	X					
YC8907	08 Jul 1989	X	X	X					
YC8908	05 Aug 1989	X	X	X					
YC8909	01 Sep 1989	X	X	X					
YC8910	07 Oct 1989	X	X	X					
YC8911	04 Nov 1989	X	X	X					
YC8912	09 Dec 1989	X	X	X					

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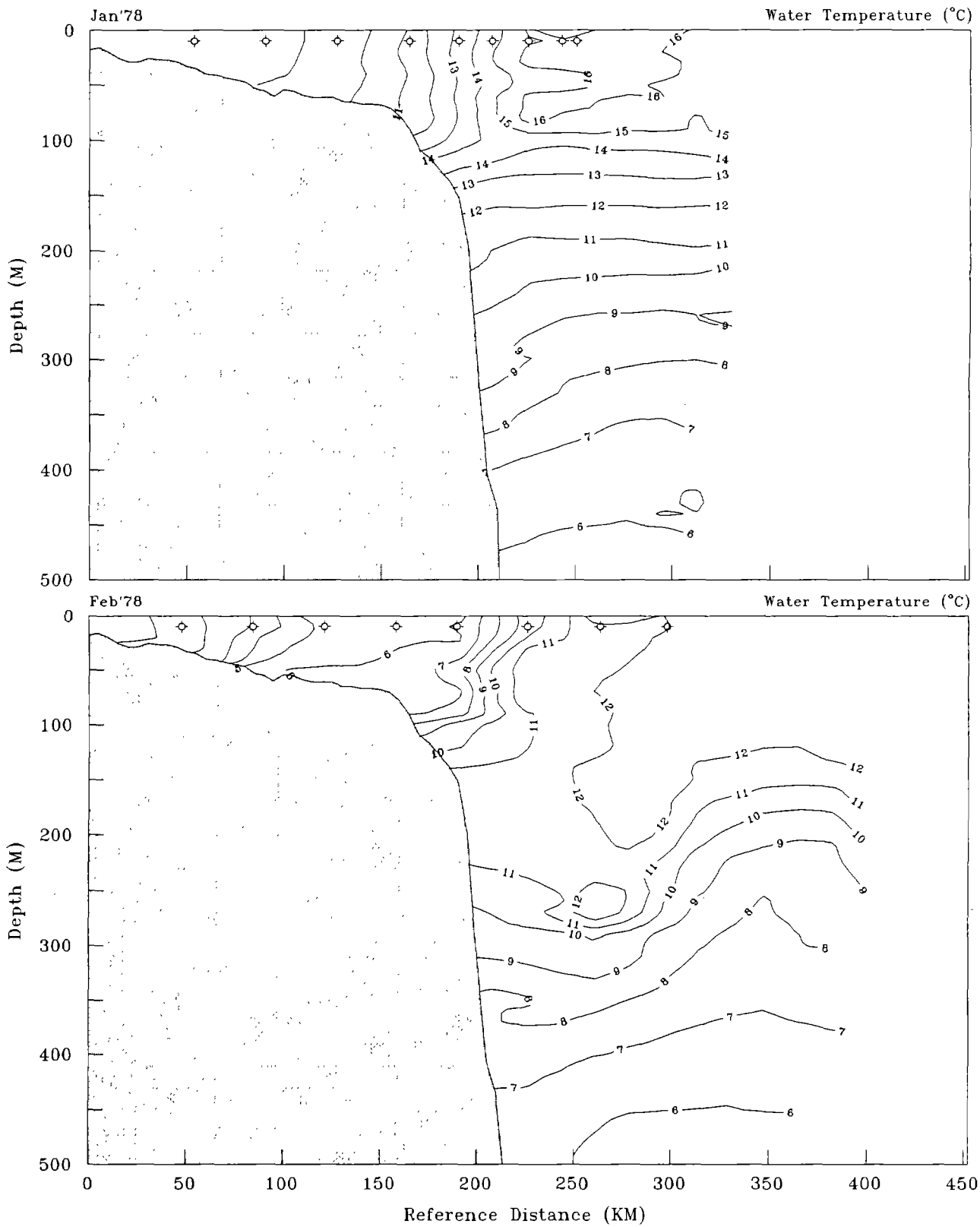


Figure 2. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during January and February 1978.

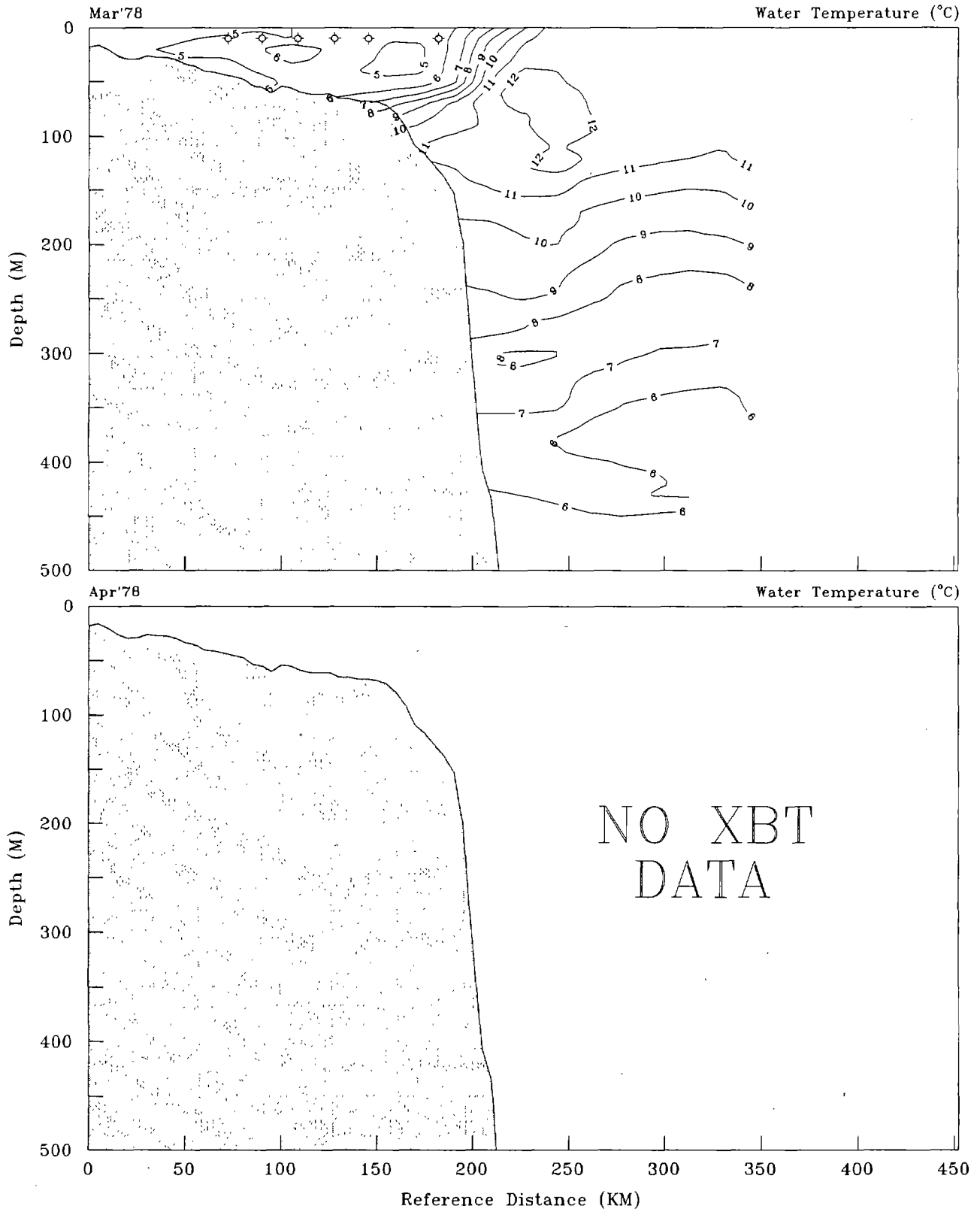


Figure 3. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during March and April 1978.

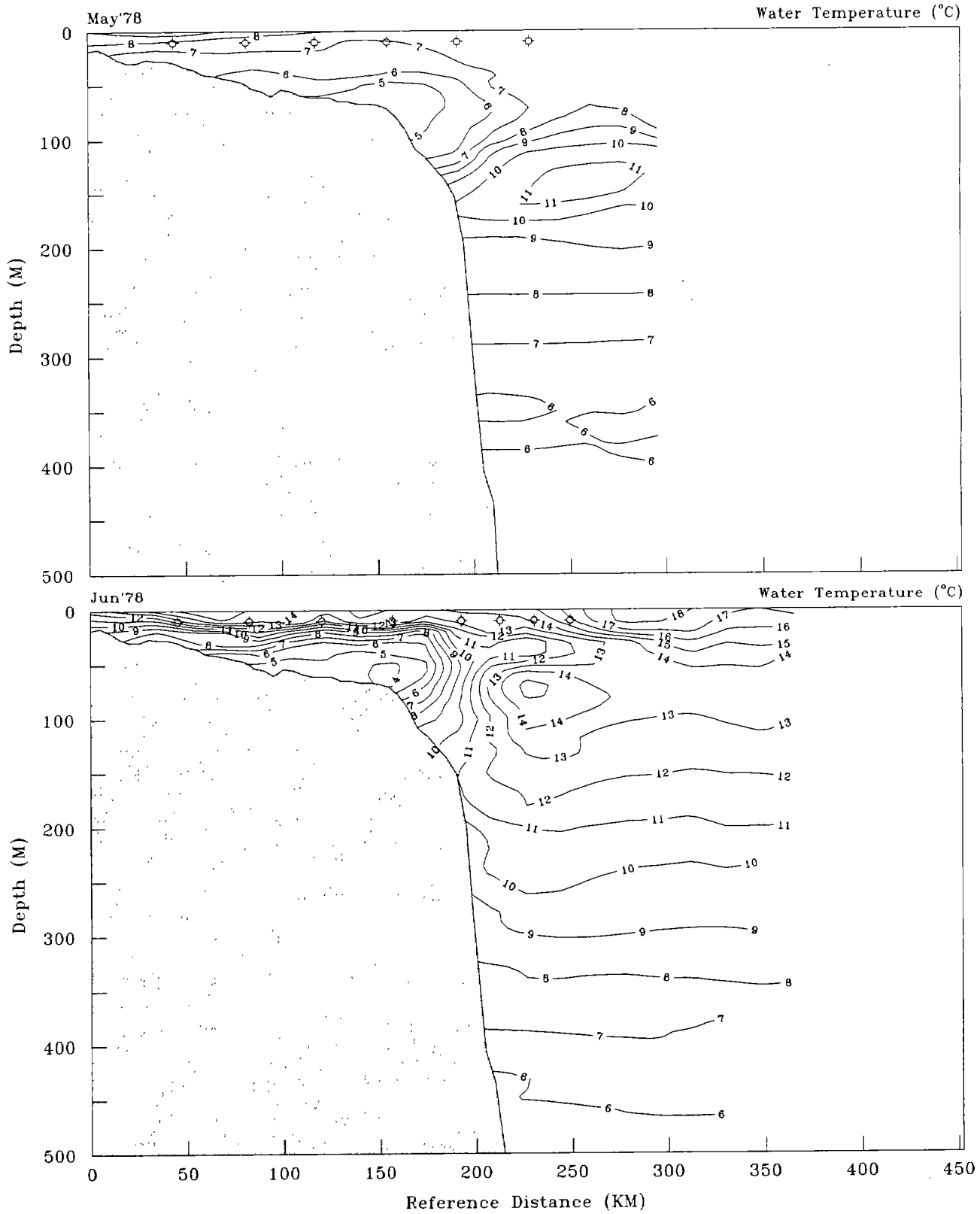


Figure 4. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (α) along the Middle Atlantic Bight transect during May and June 1978.

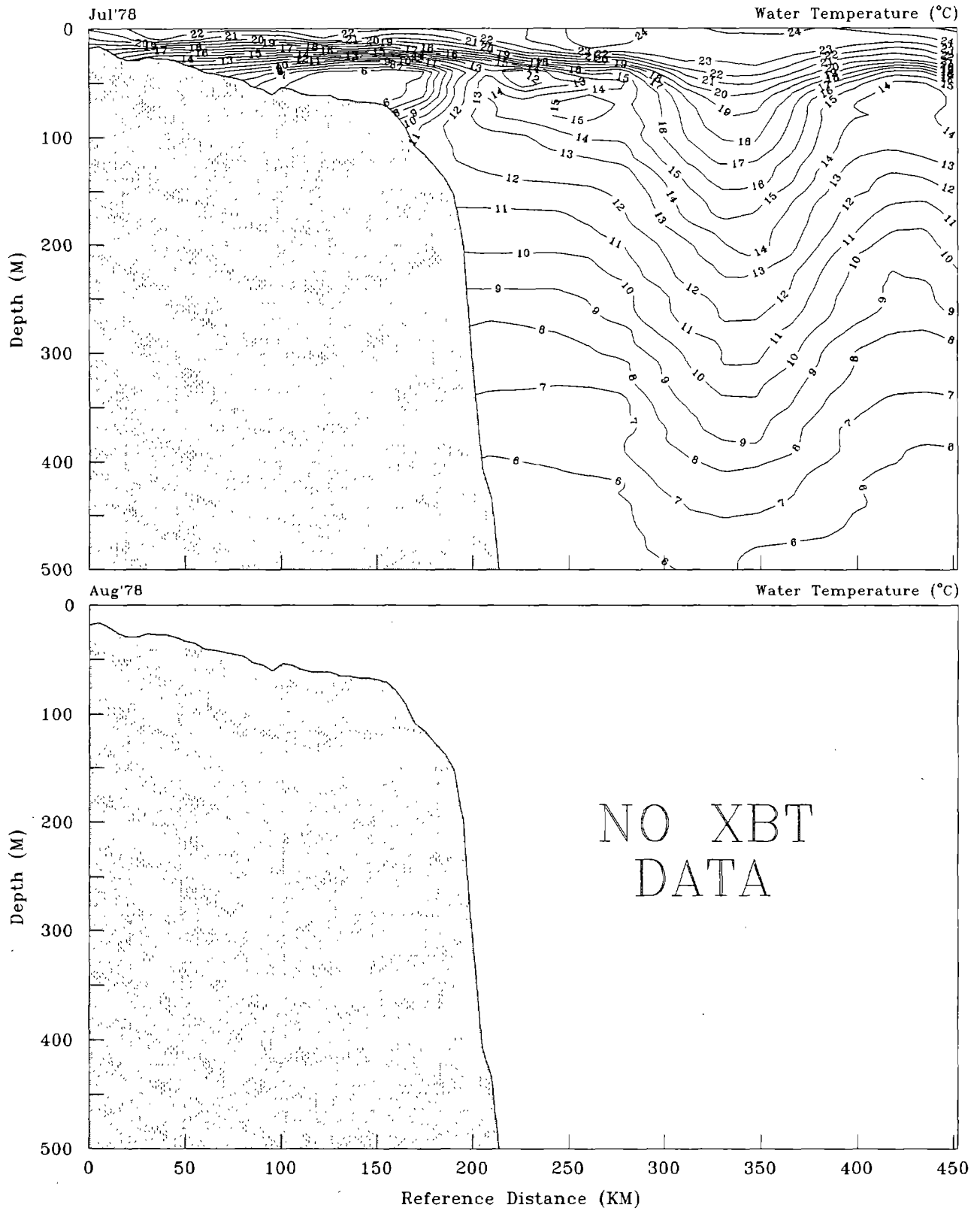


Figure 5. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (v) along the Middle Atlantic Bight transect during July and August 1978.

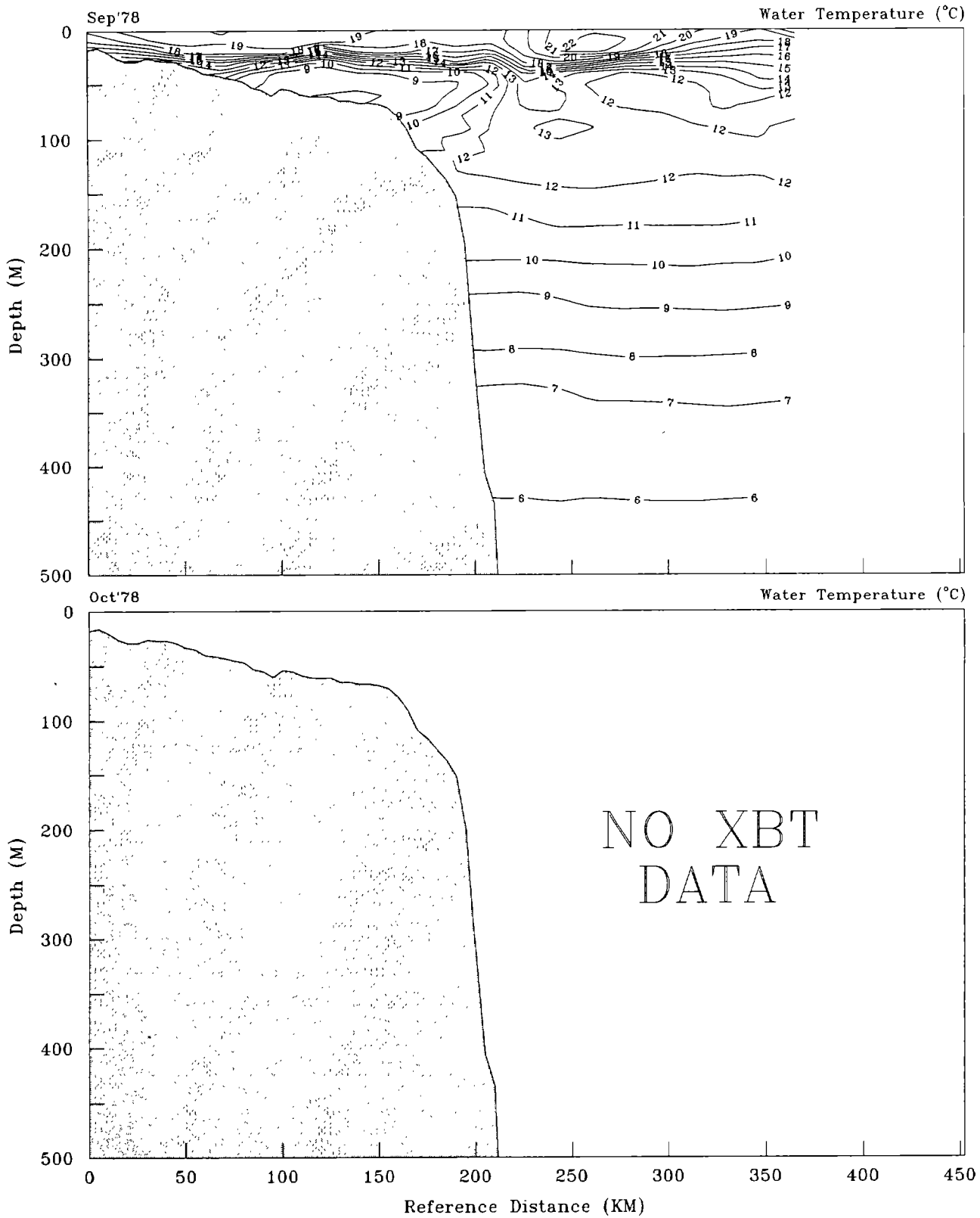


Figure 6. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1978.

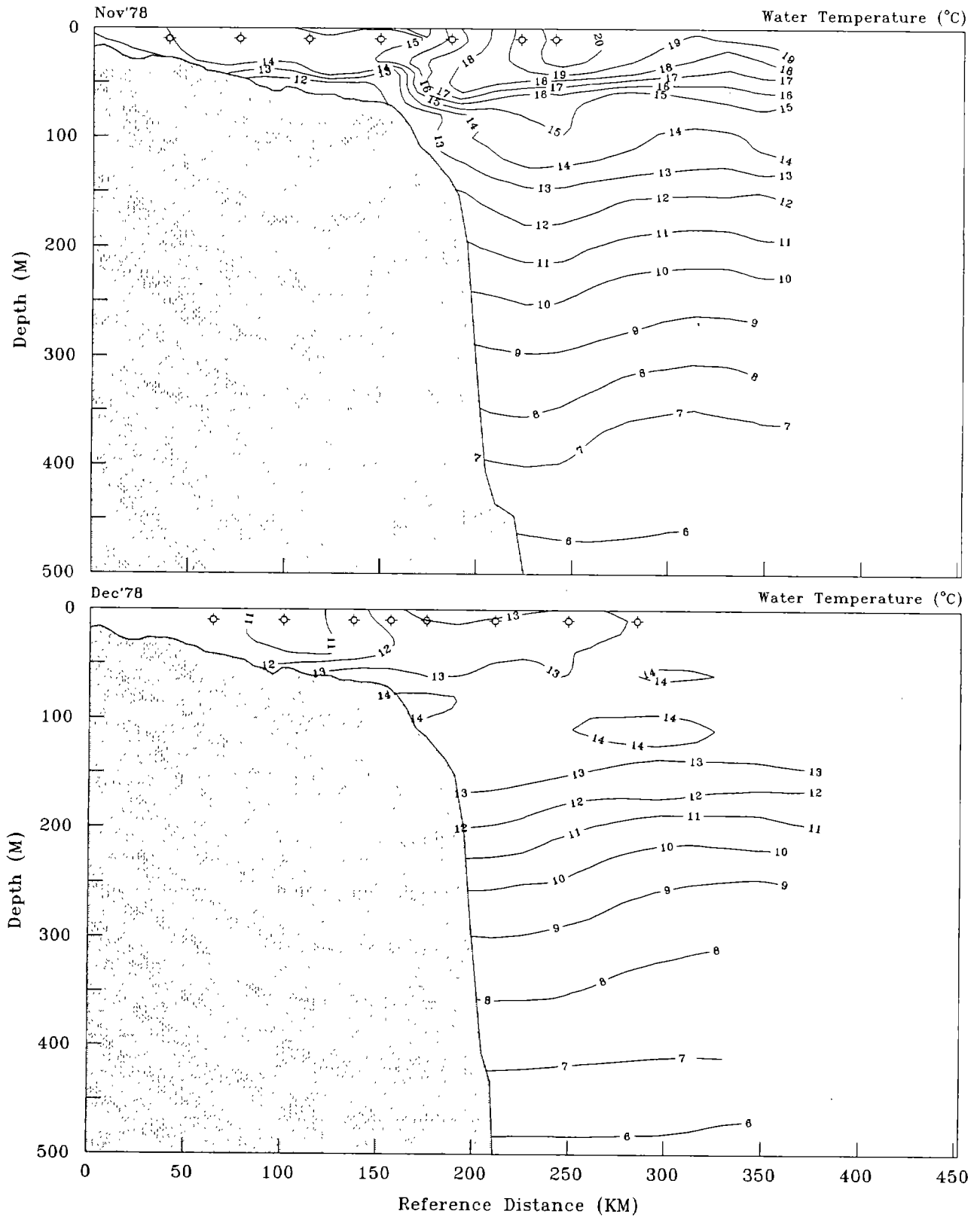


Figure 7. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (⊠) along the Middle Atlantic Bight transect during November and December 1978.

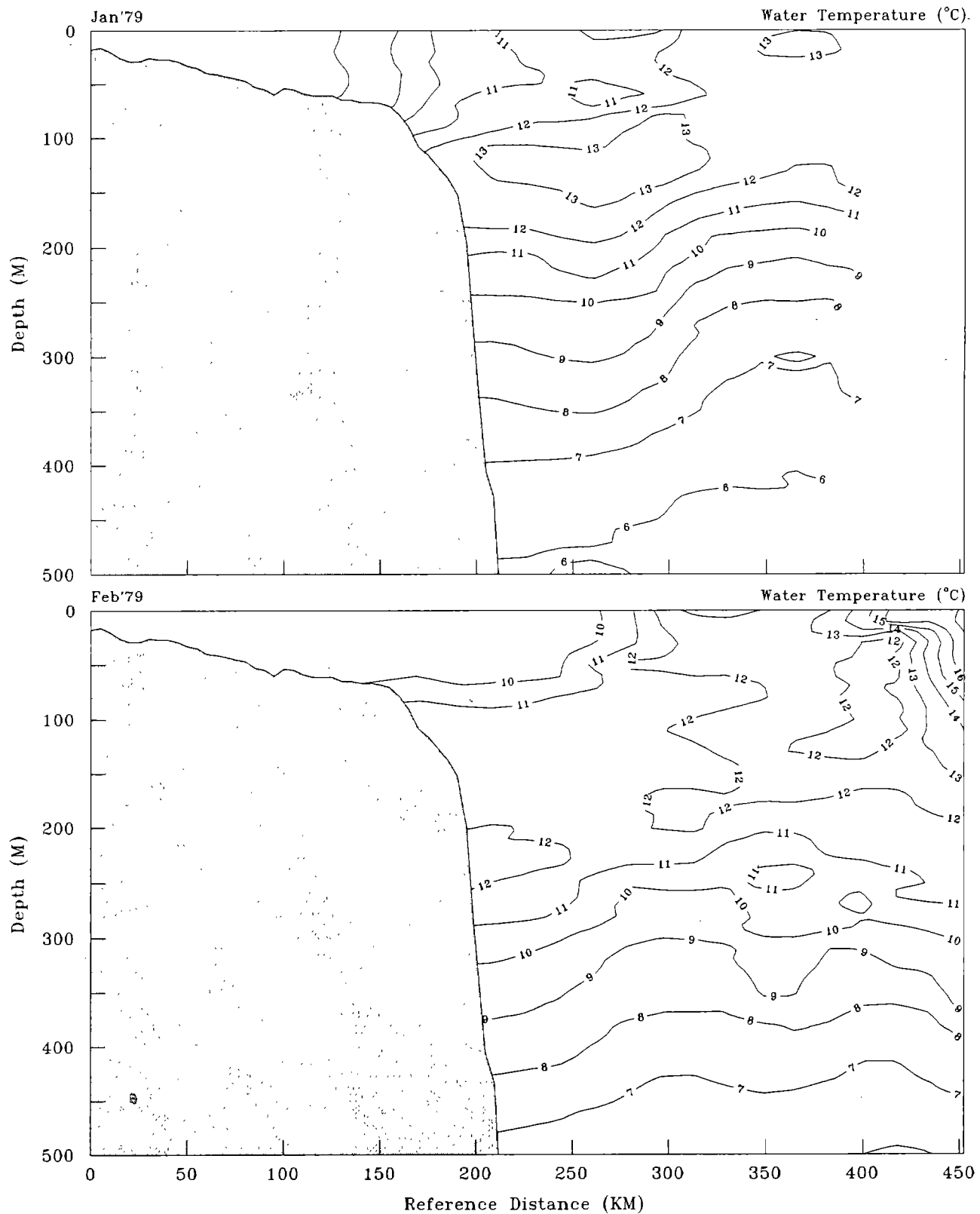


Figure 8. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during January and February 1979.

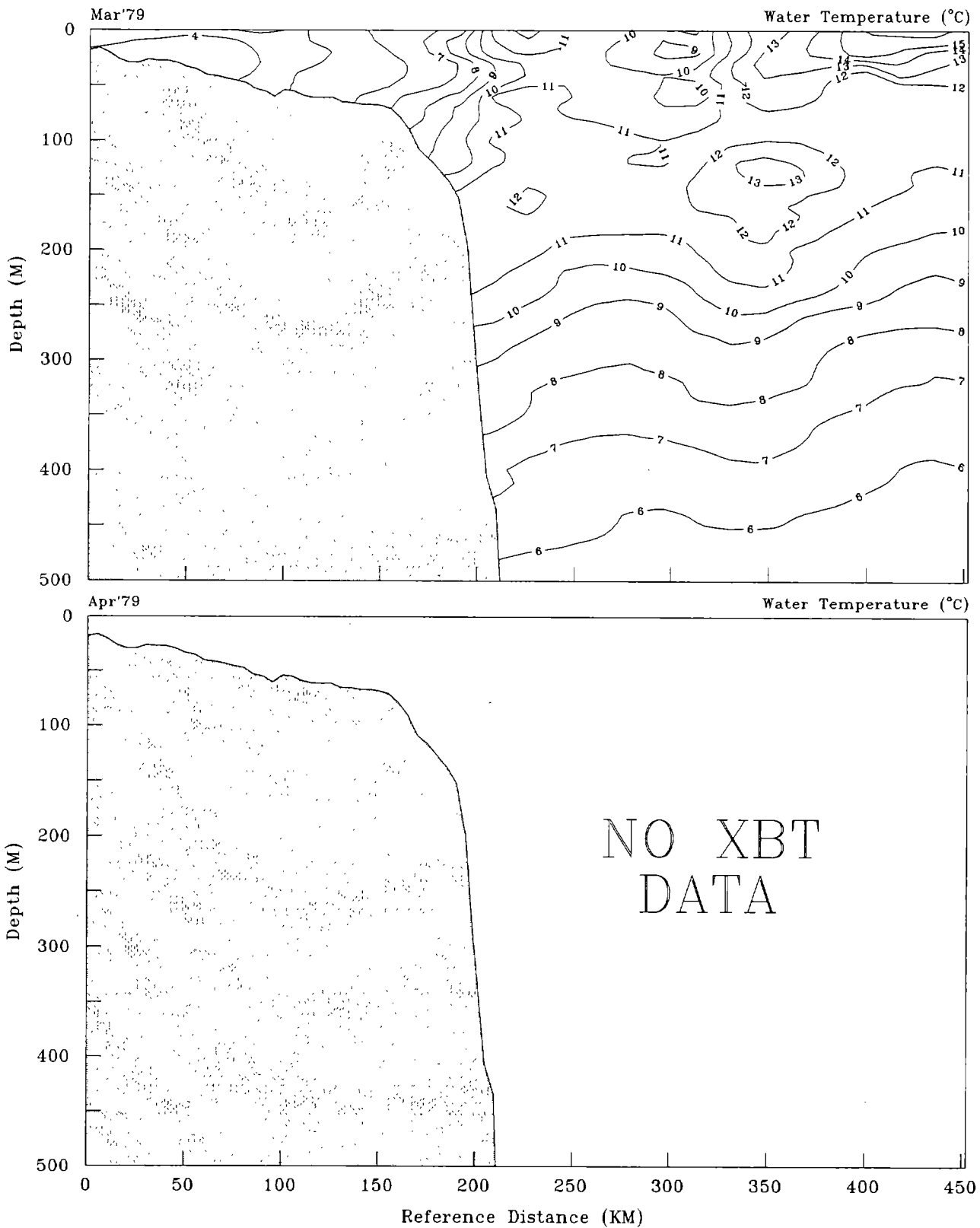


Figure 9. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during March and April 1979.

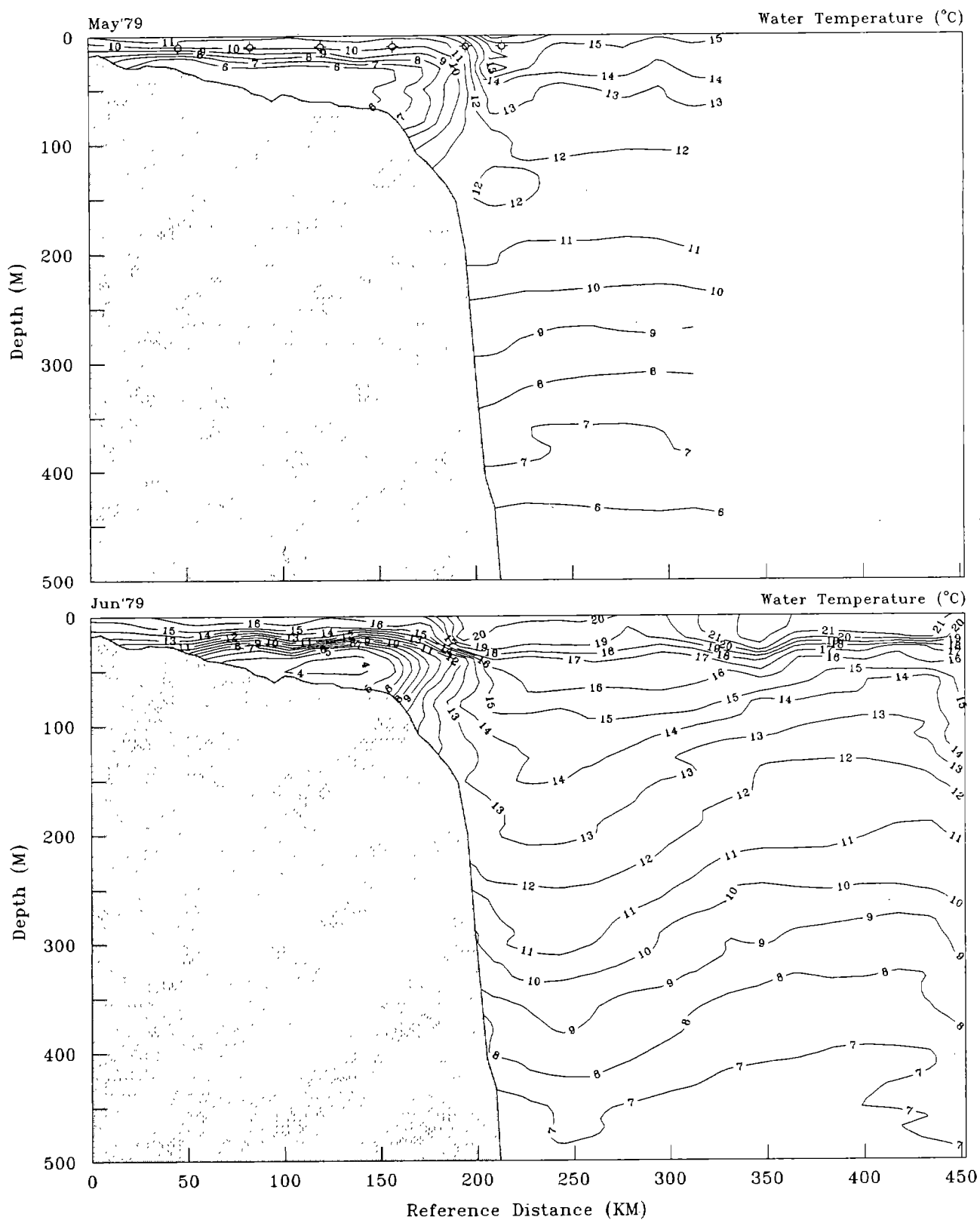


Figure 10. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1979.

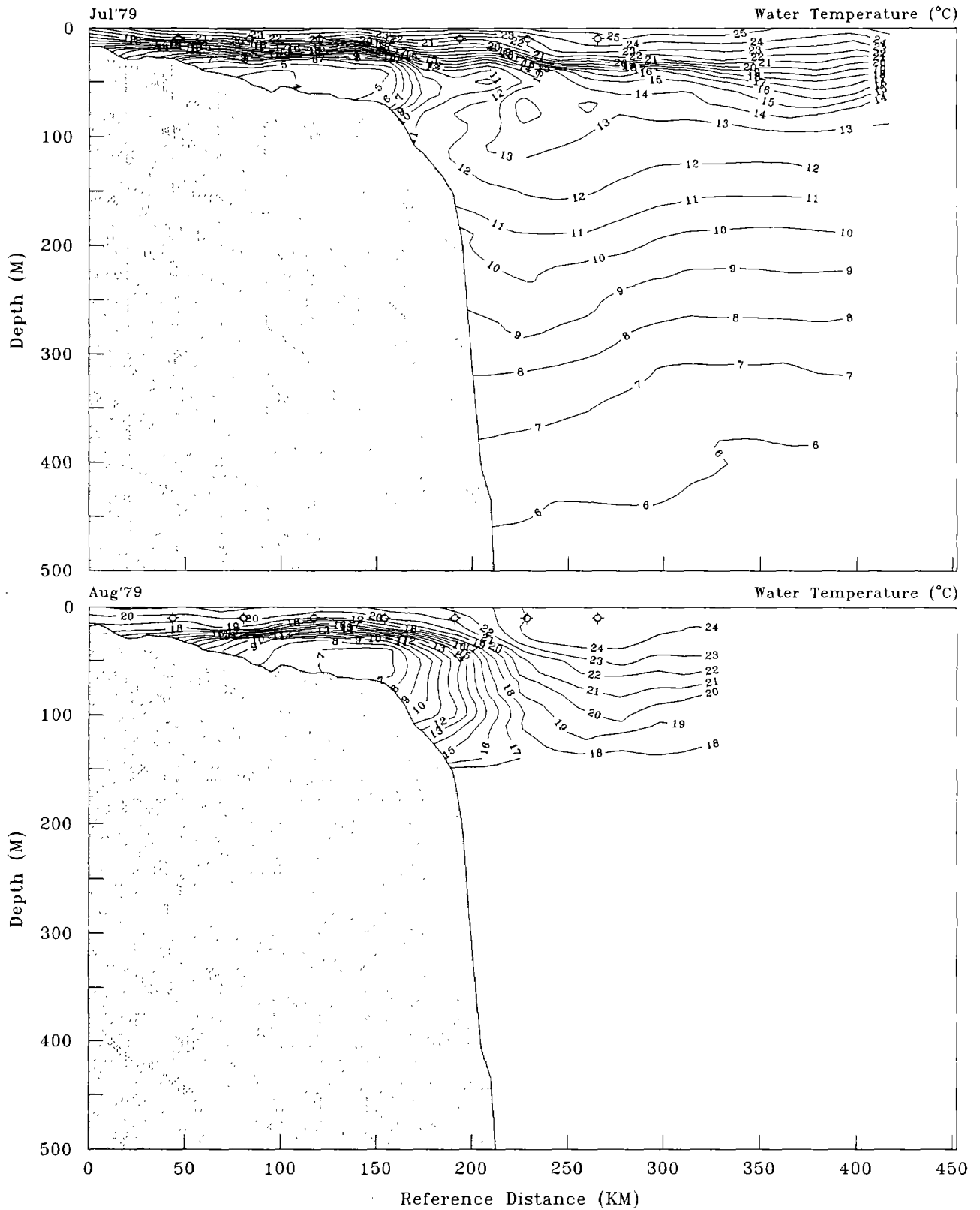


Figure 11. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during July and August 1979.

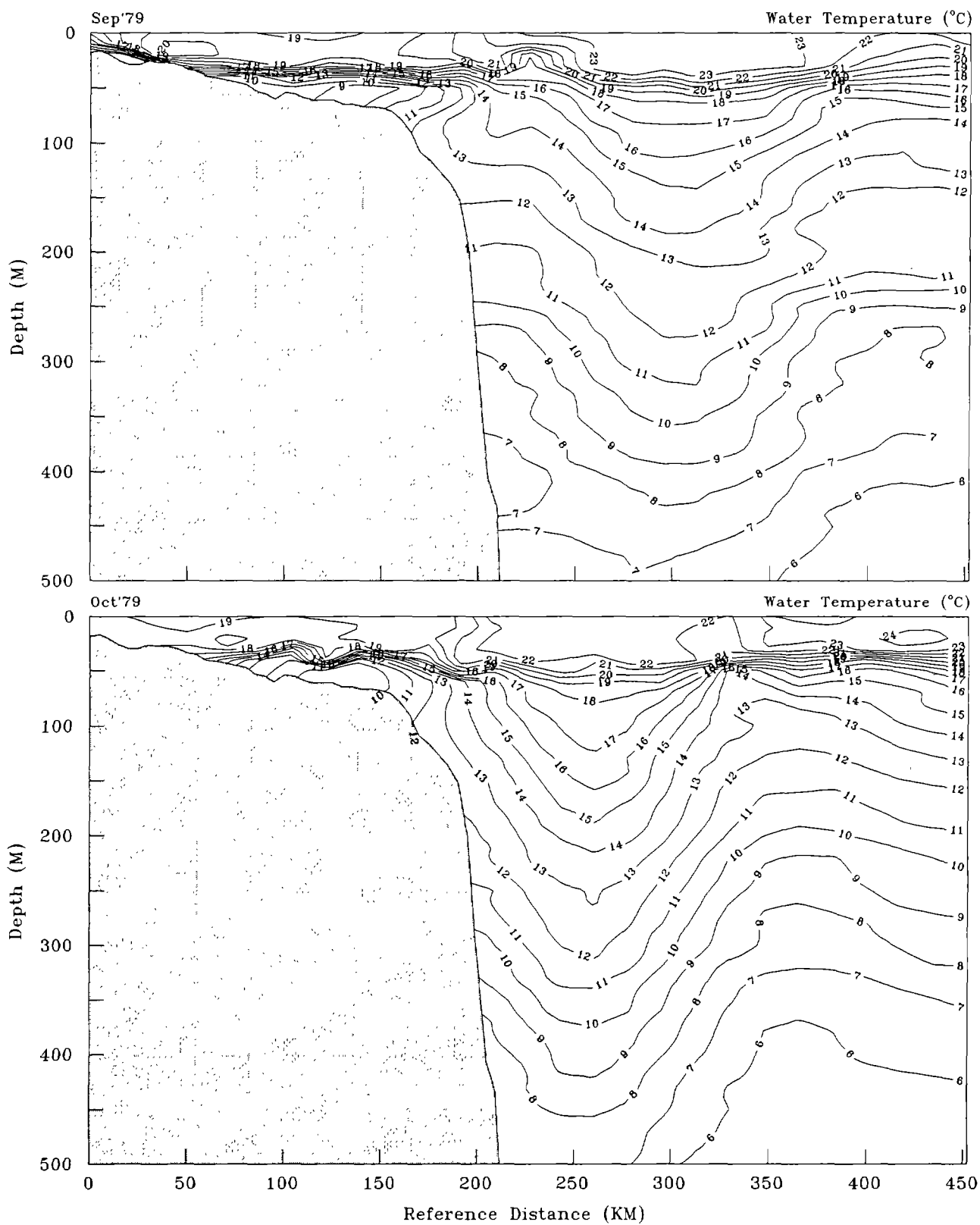


Figure 12. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1979.

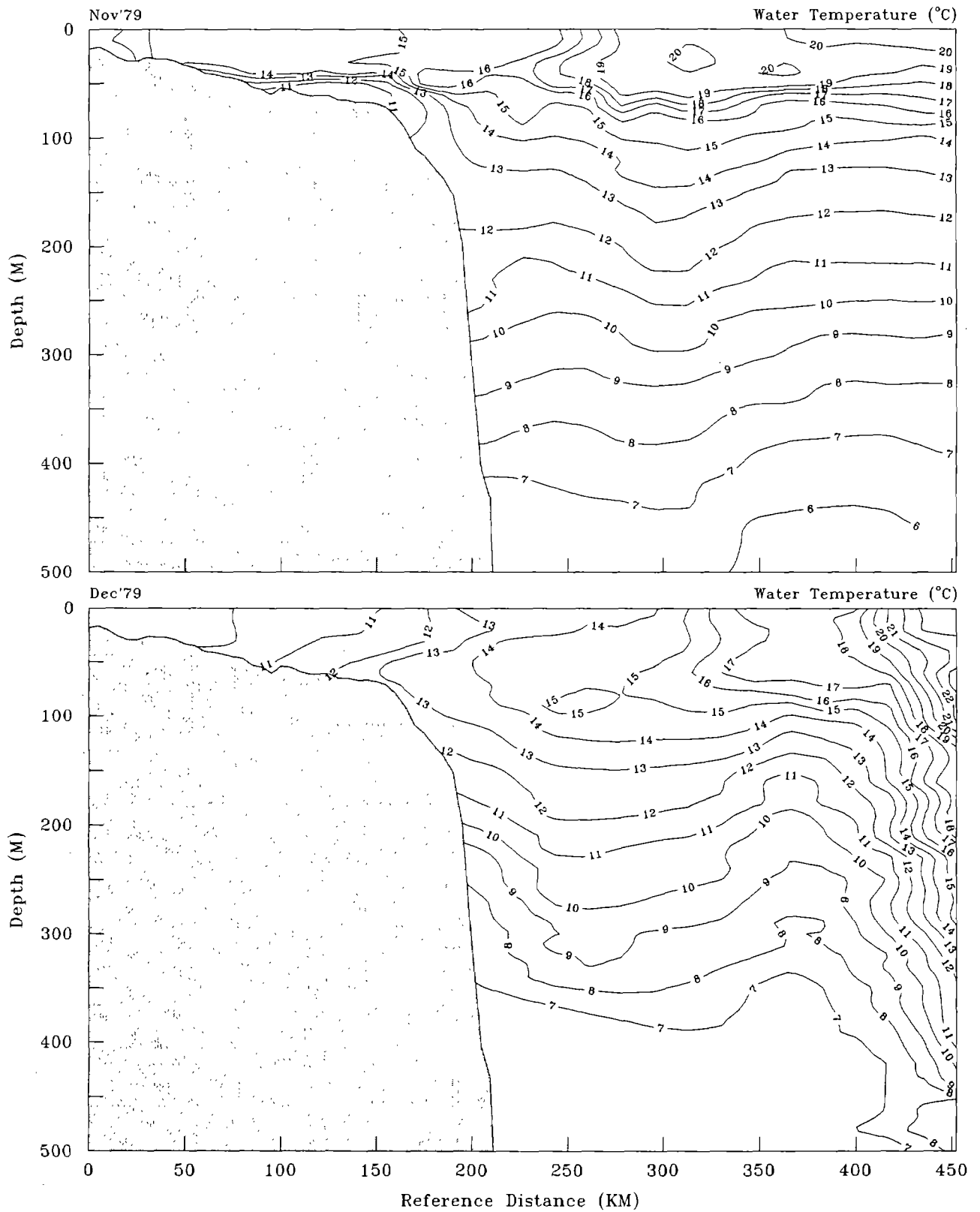


Figure 13. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Middle Atlantic Bight transect during November and December 1979.

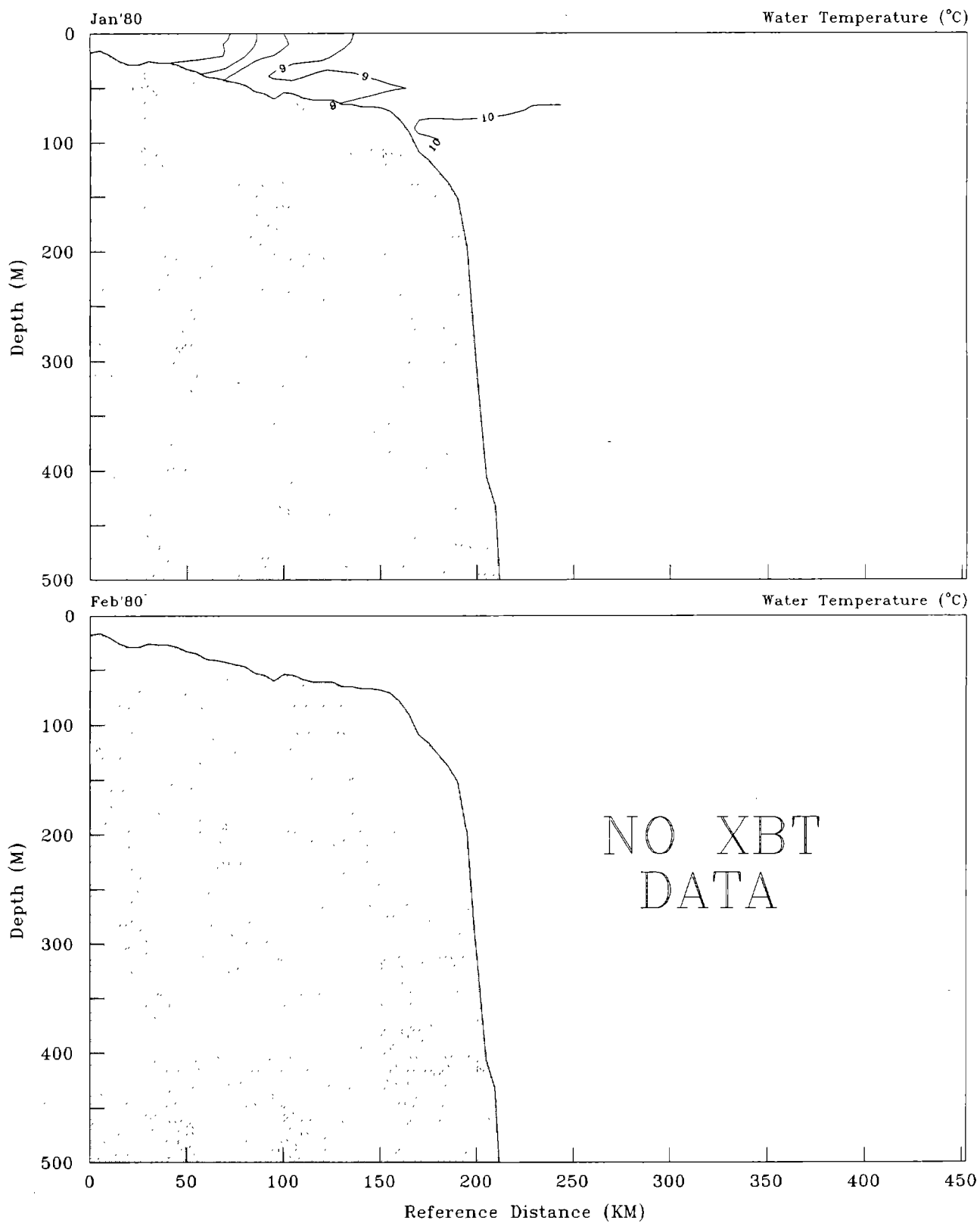


Figure 14. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during January and February 1980.

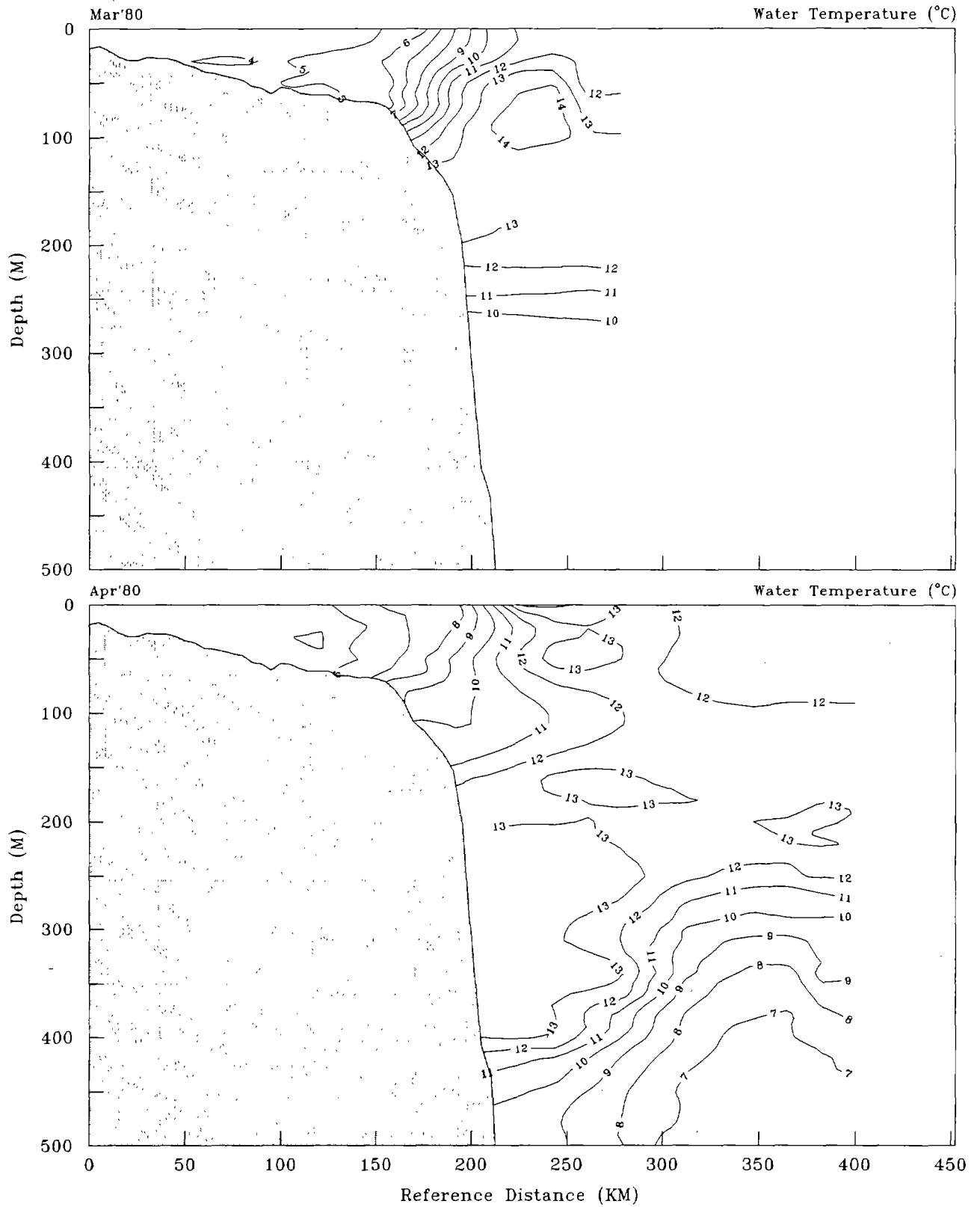


Figure 15. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during March and April 1980.

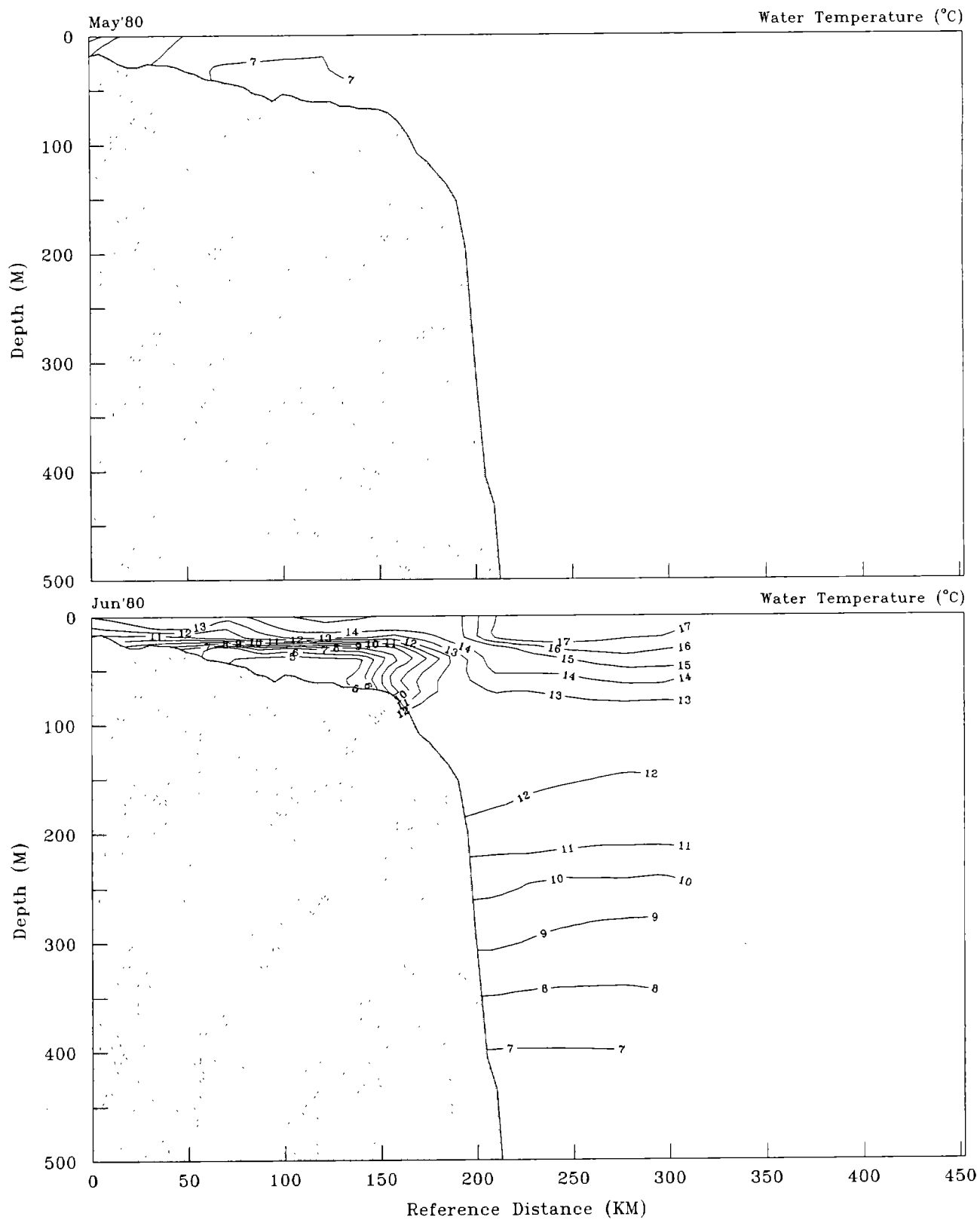


Figure 16. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1980.

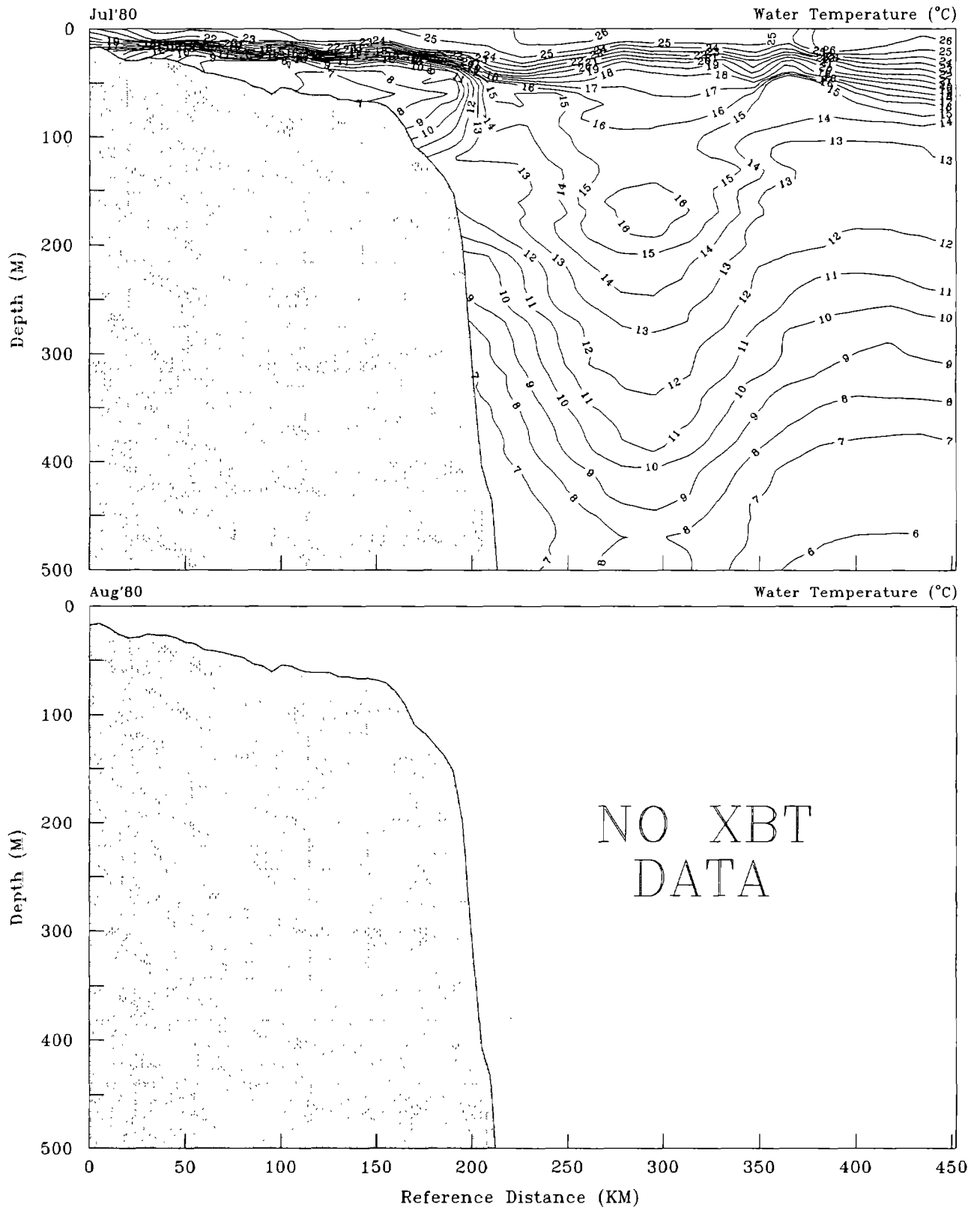


Figure 17. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during July and August 1980.

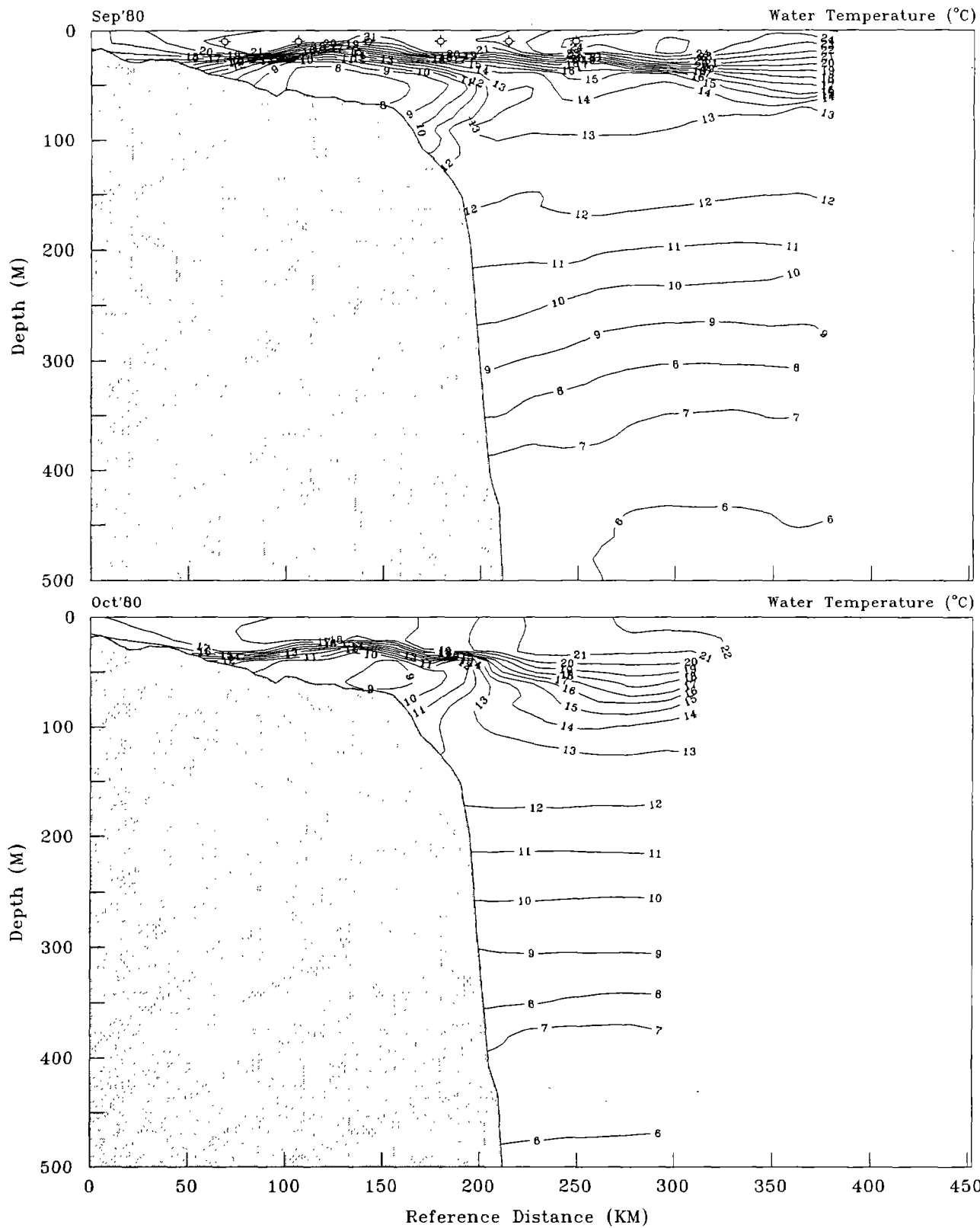


Figure 18. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1980.

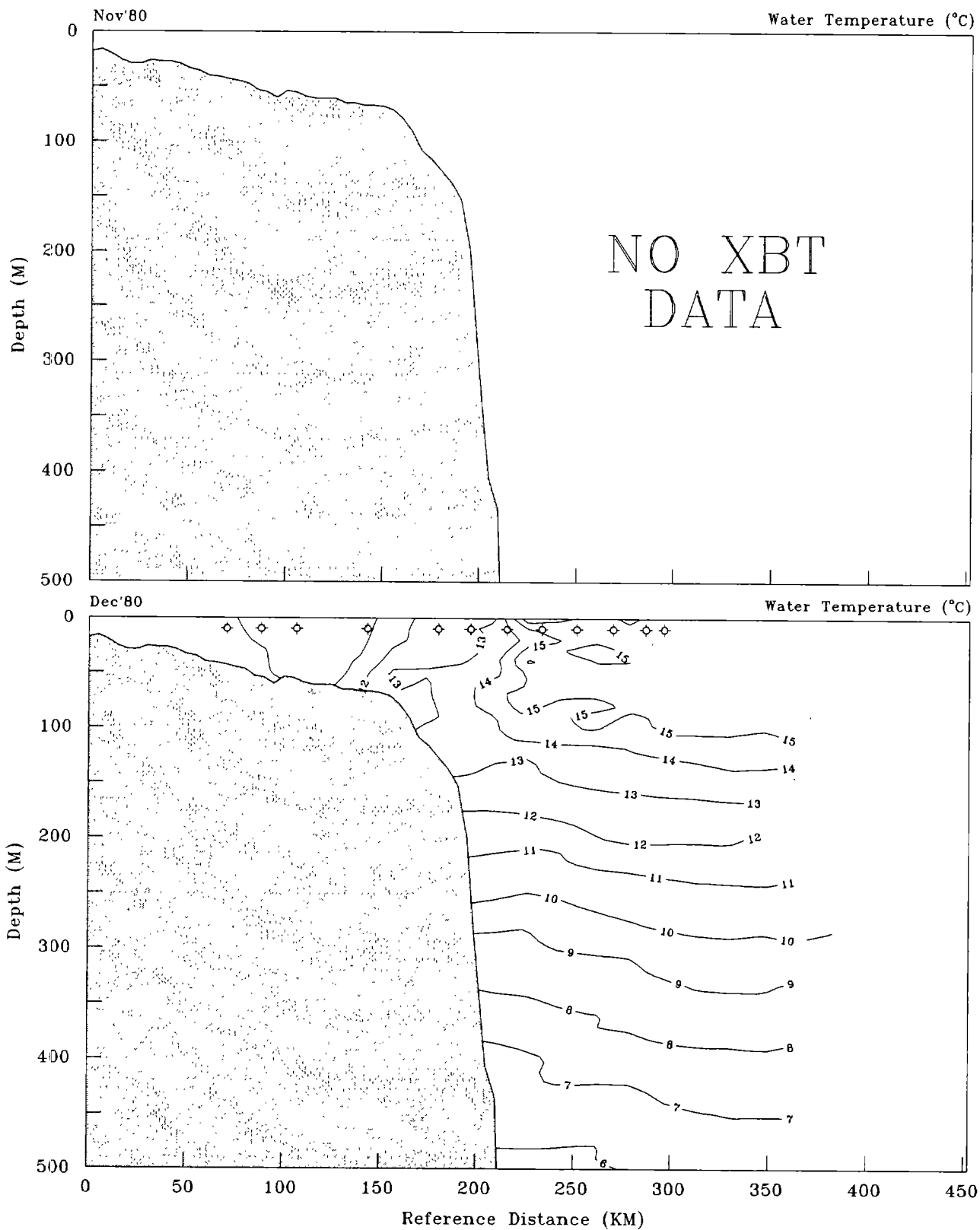


Figure 19. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1980.

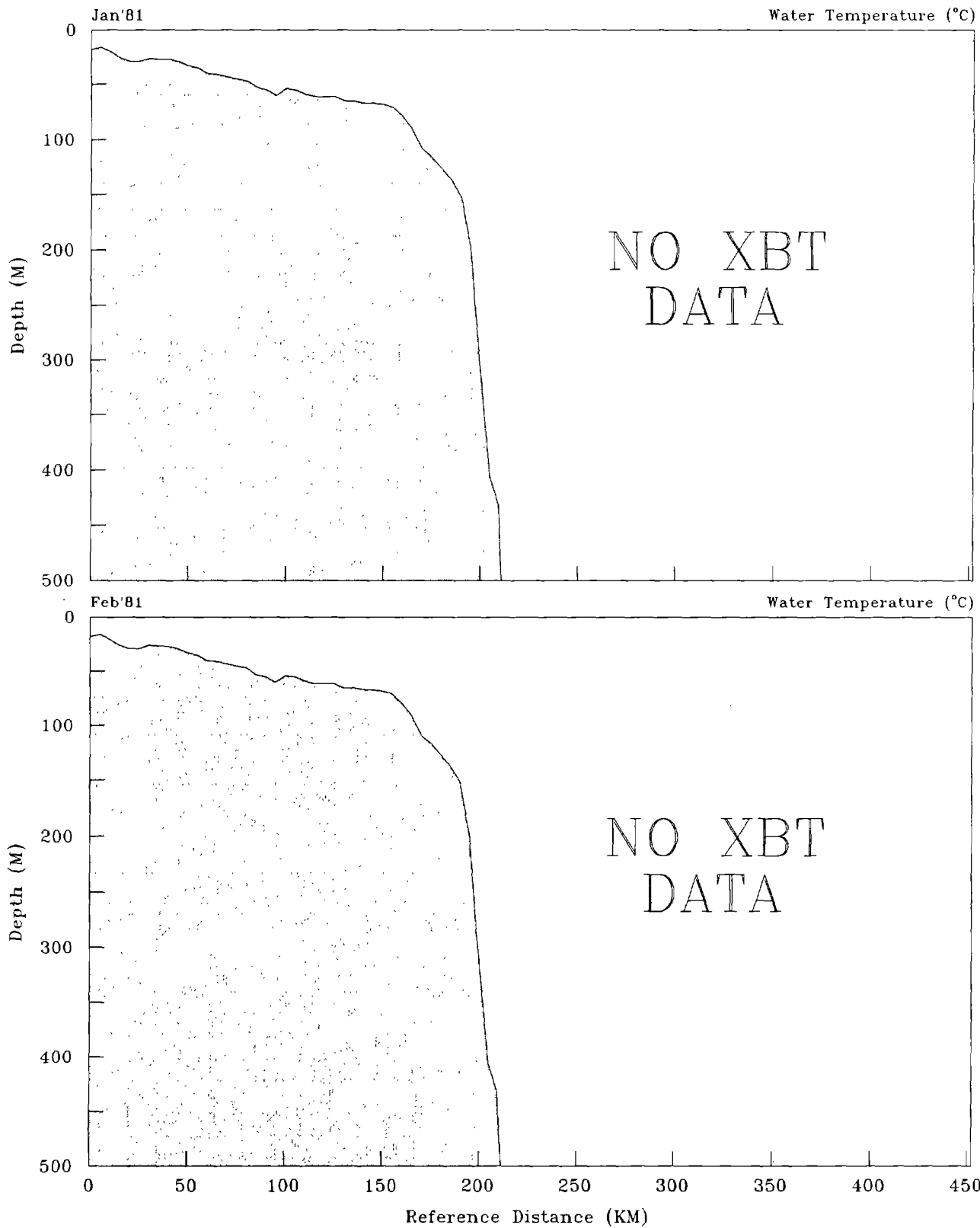


Figure 20. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (•) along the Middle Atlantic Bight transect during January and February 1981.

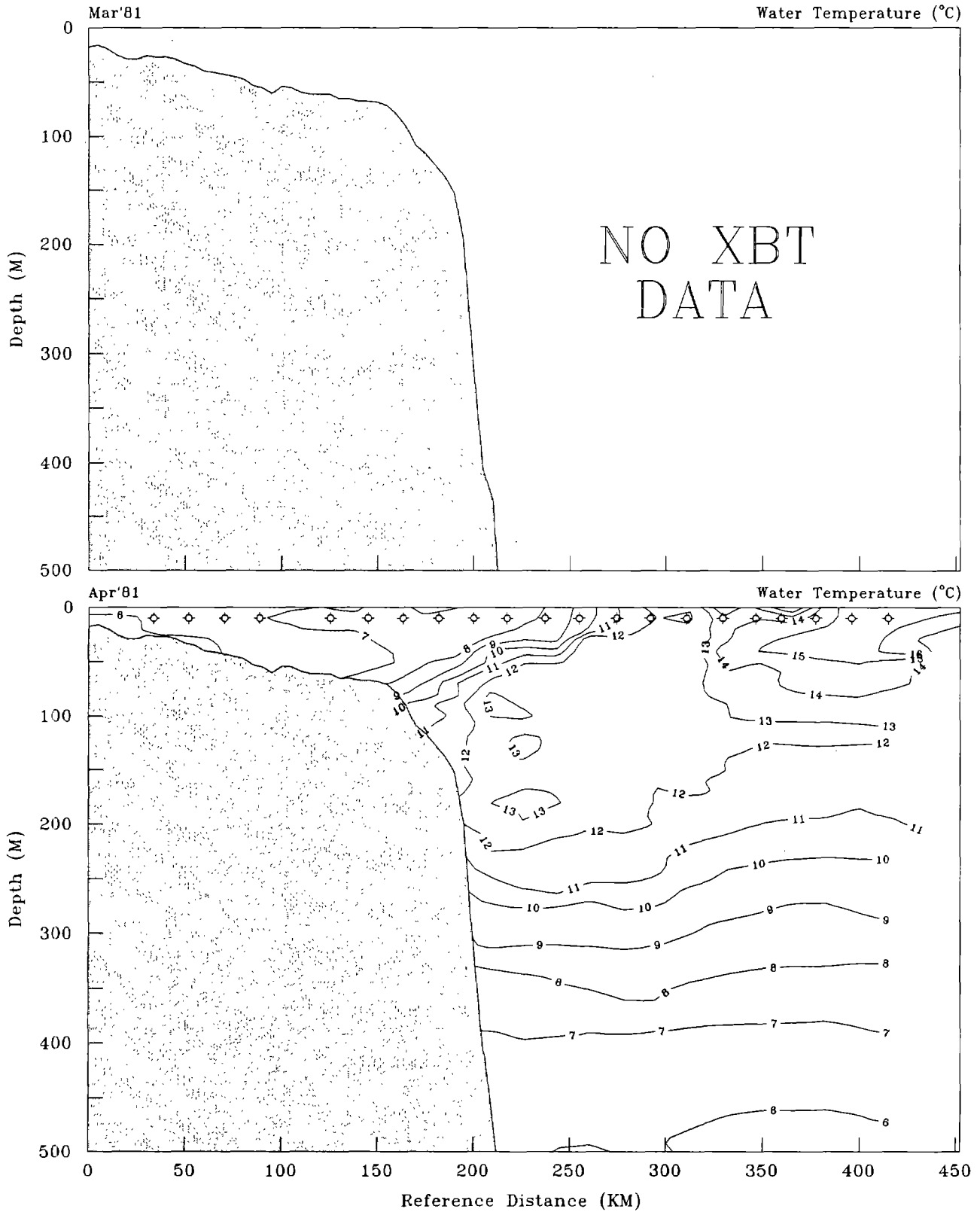


Figure 21. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (◻) along the Middle Atlantic Bight transect during March and April 1981.

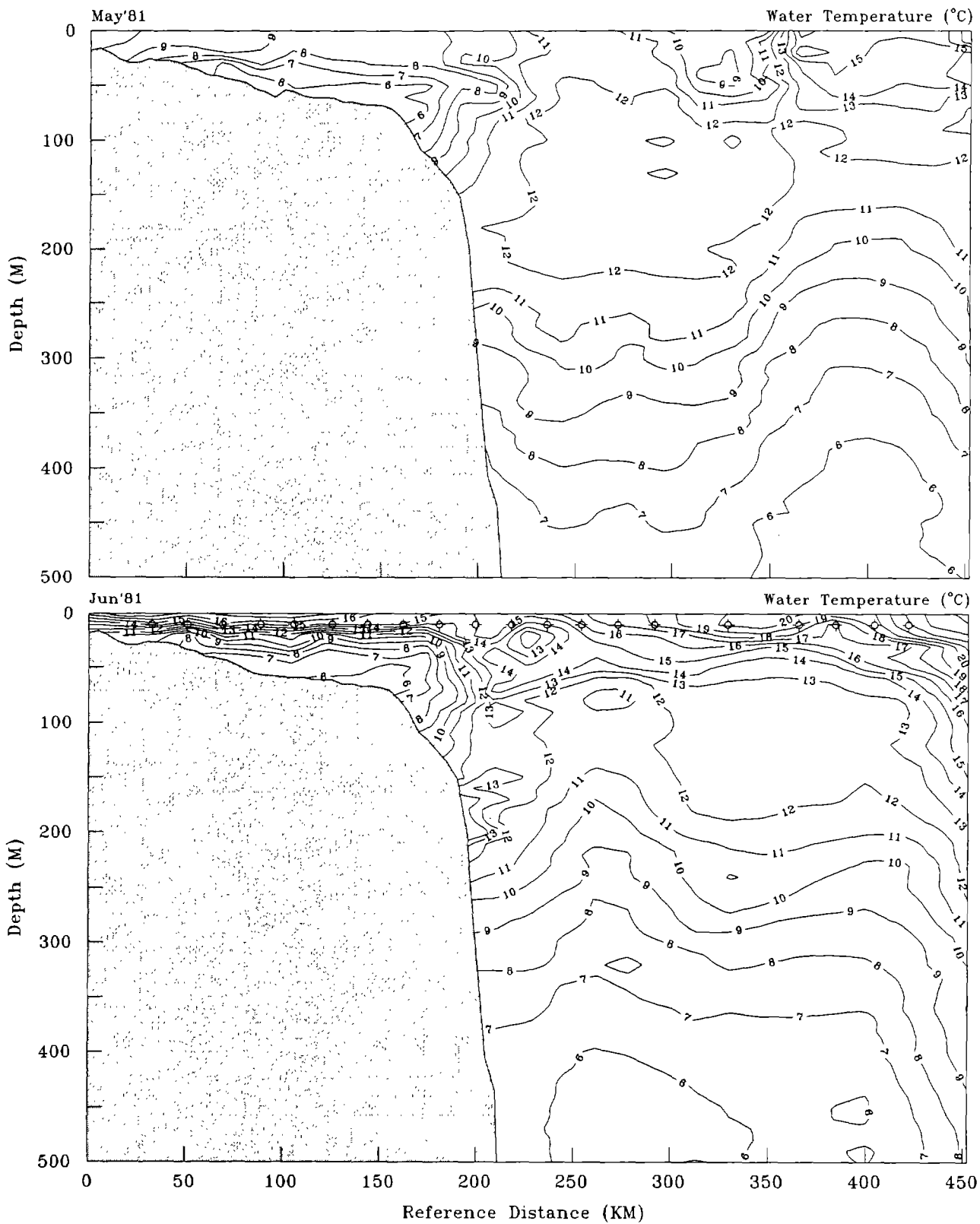


Figure 22. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1981.

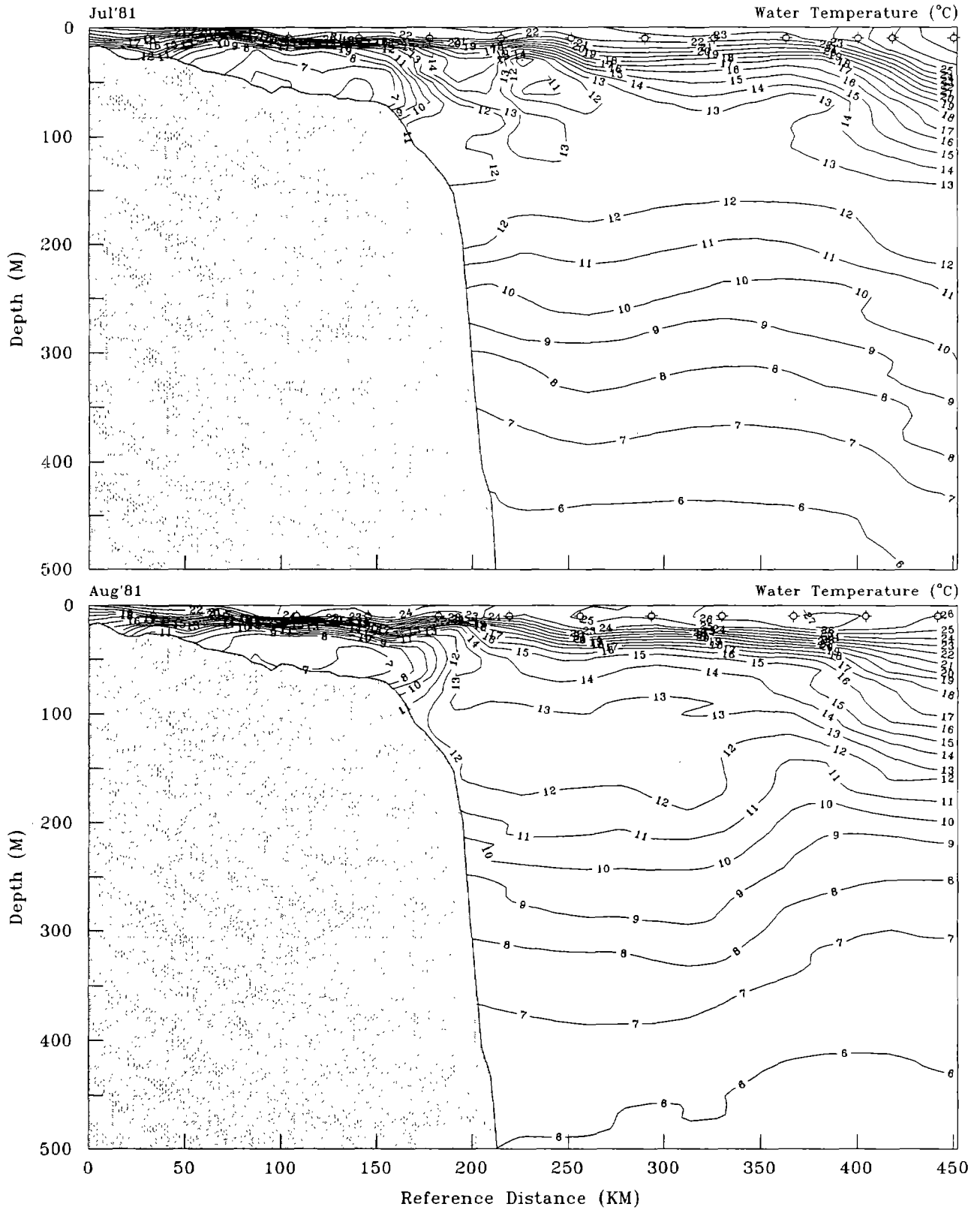


Figure 23. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (σ) along the Middle Atlantic Bight transect during July and August 1981.

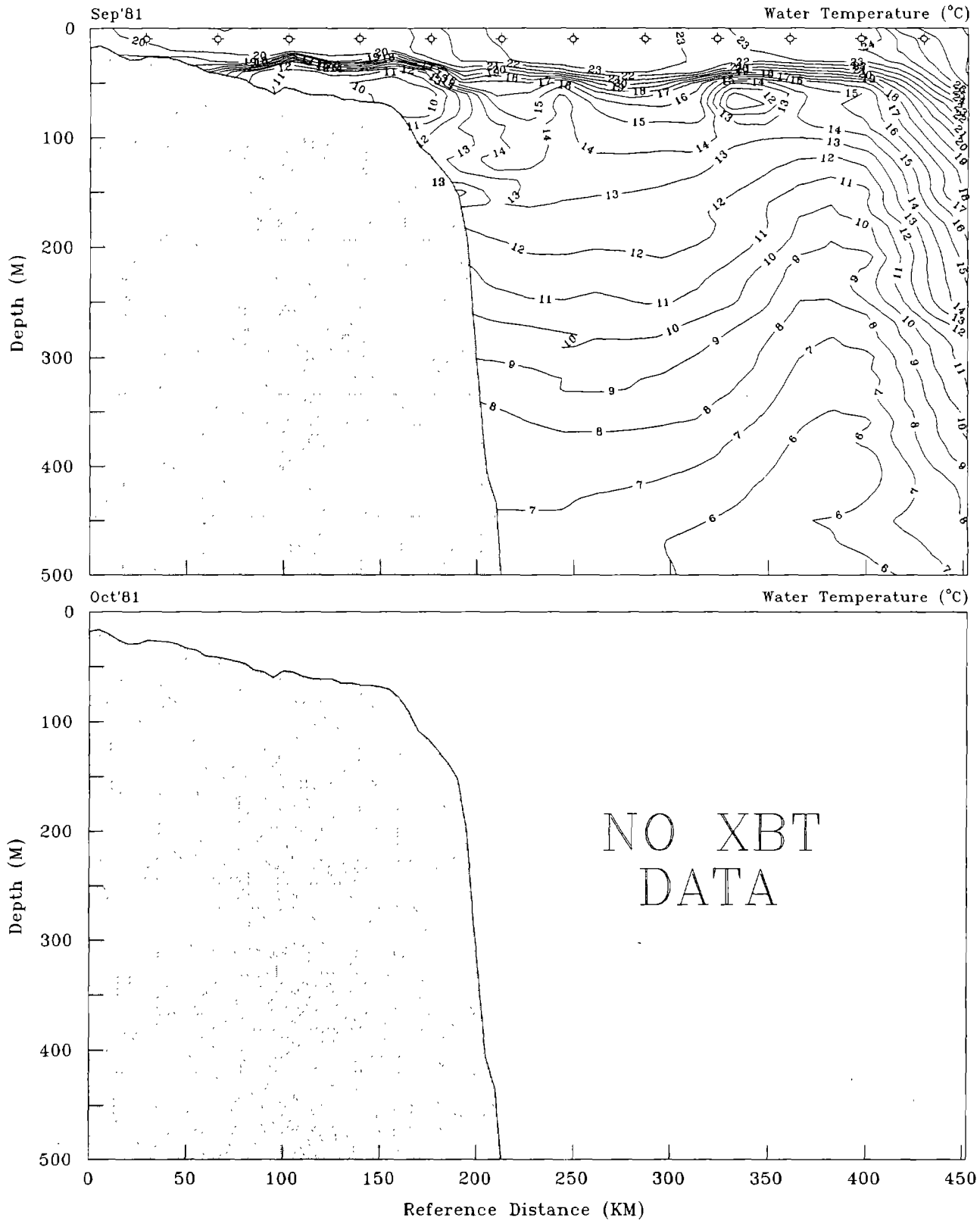


Figure 24. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1981.

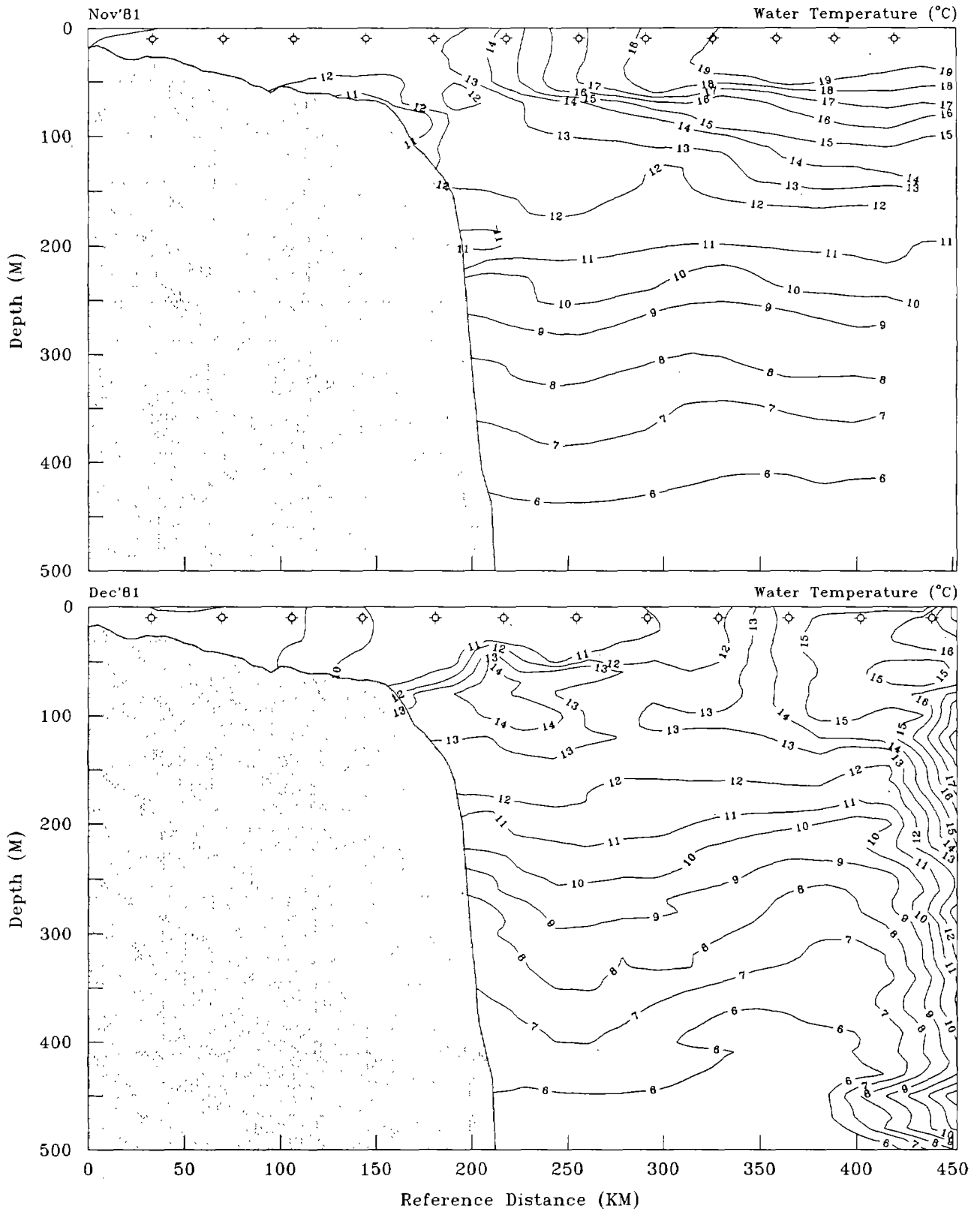


Figure 25. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1981.

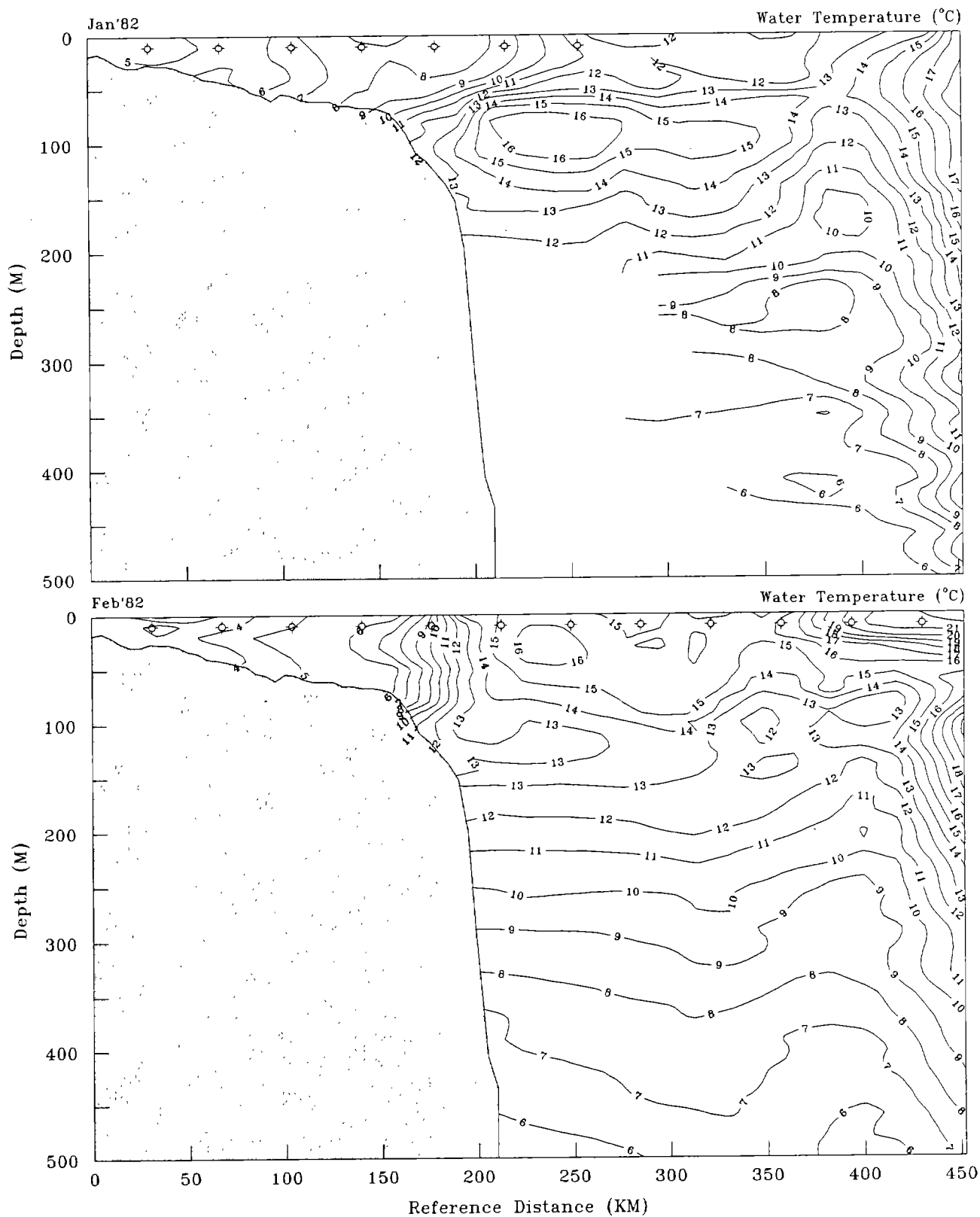


Figure 26. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during January and February 1982.

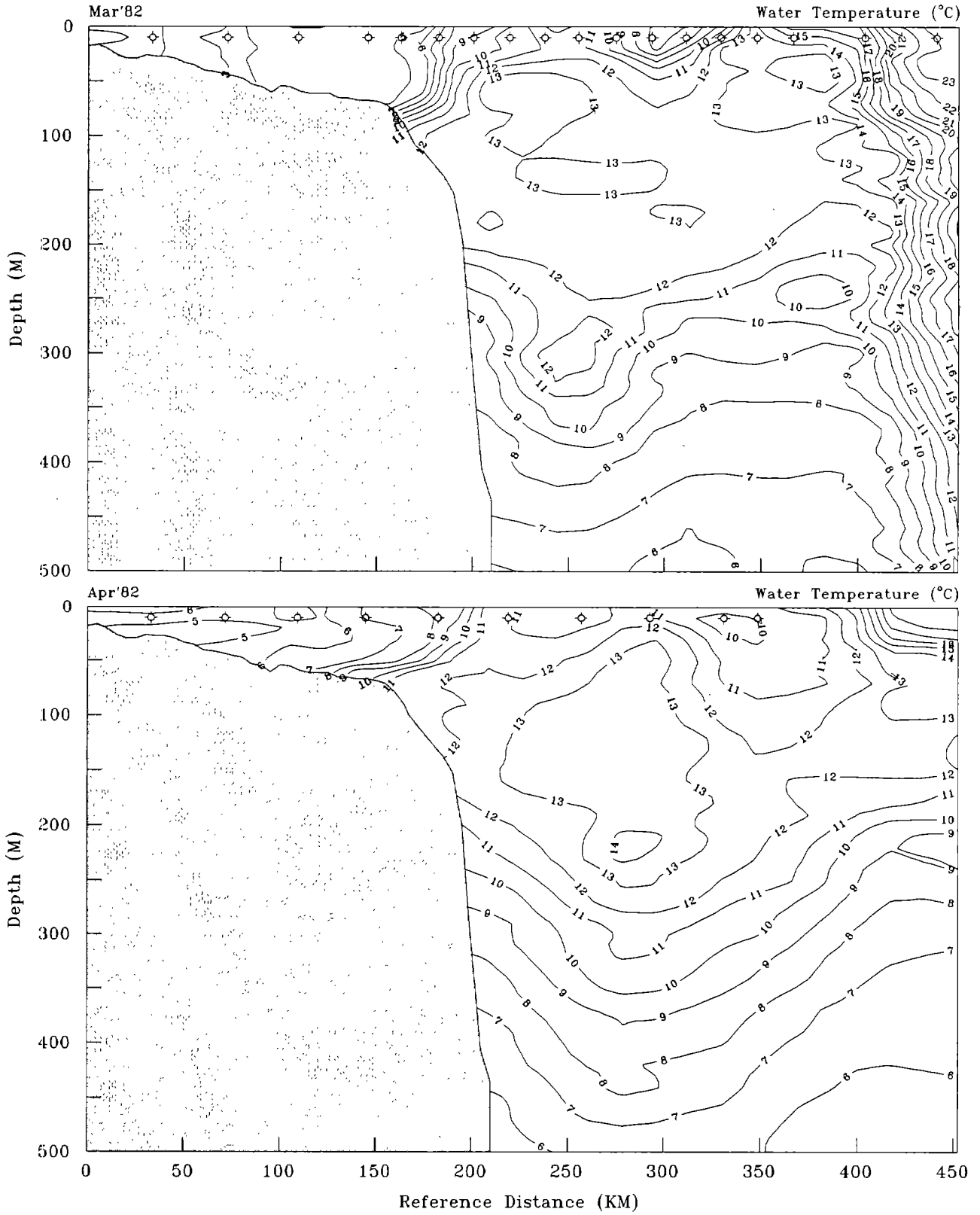


Figure 27. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (♠) along the Middle Atlantic Bight transect during March and April 1982.

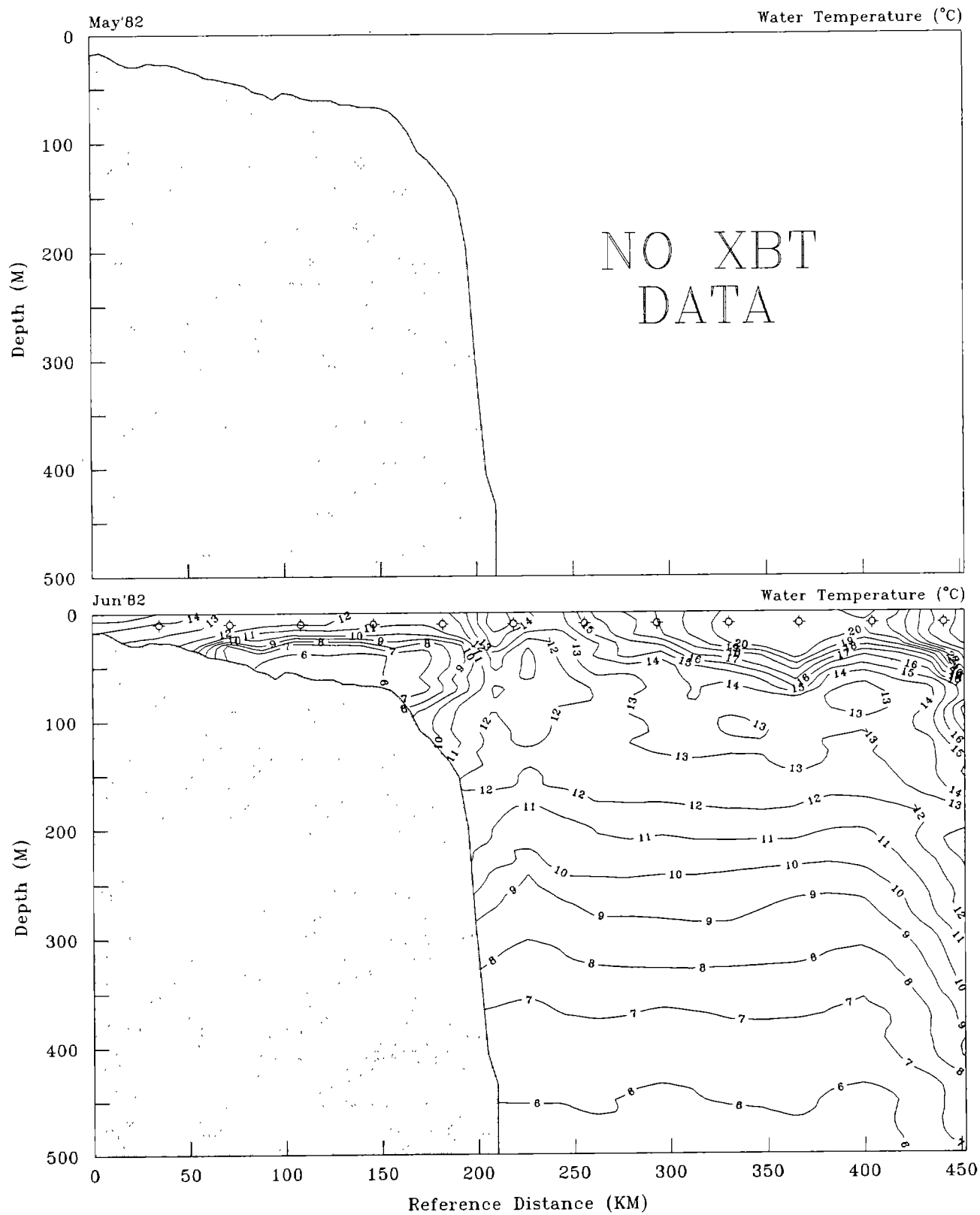


Figure 28. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Middle Atlantic Bight transect during May and June 1982.

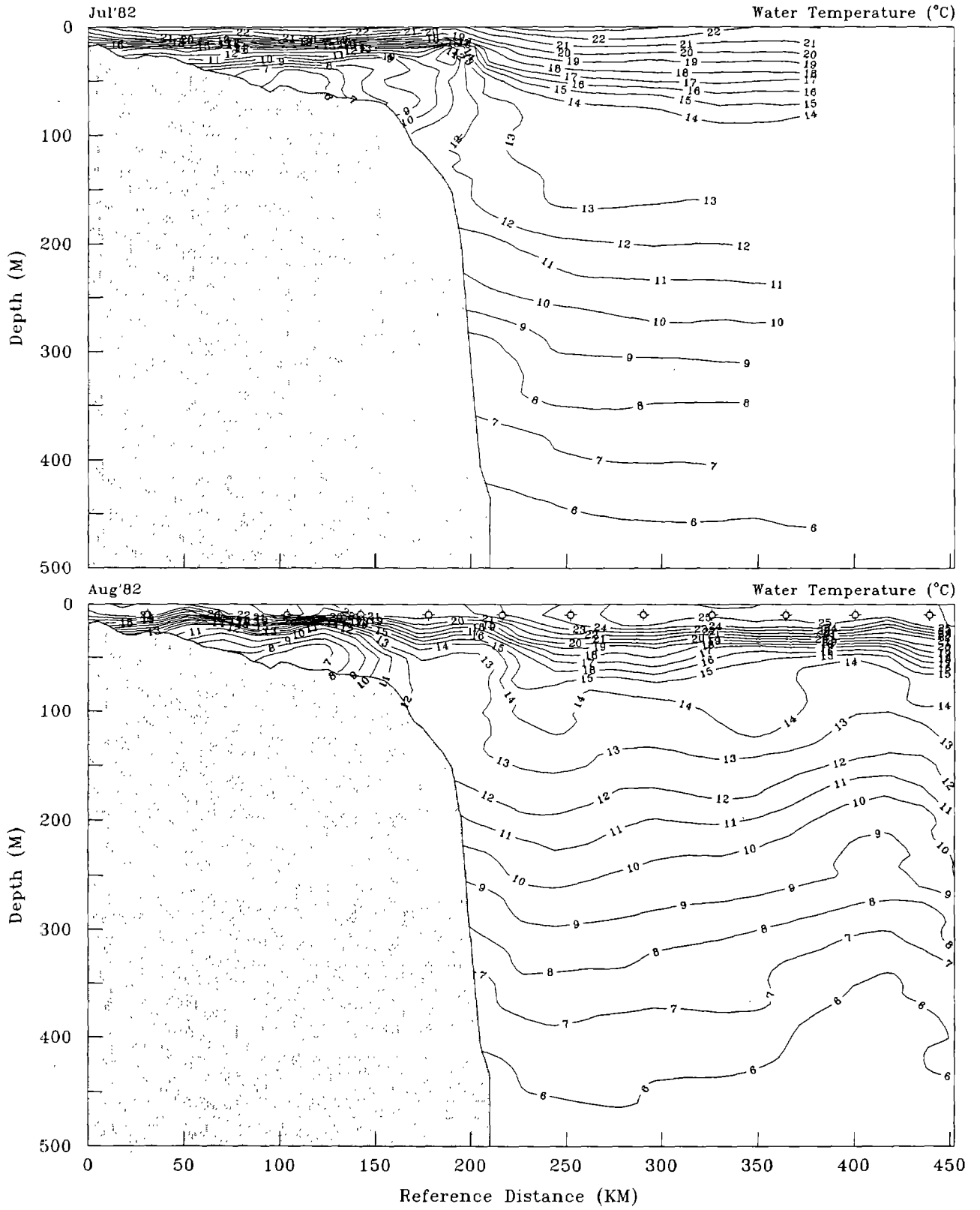


Figure 29. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during July and August 1982.

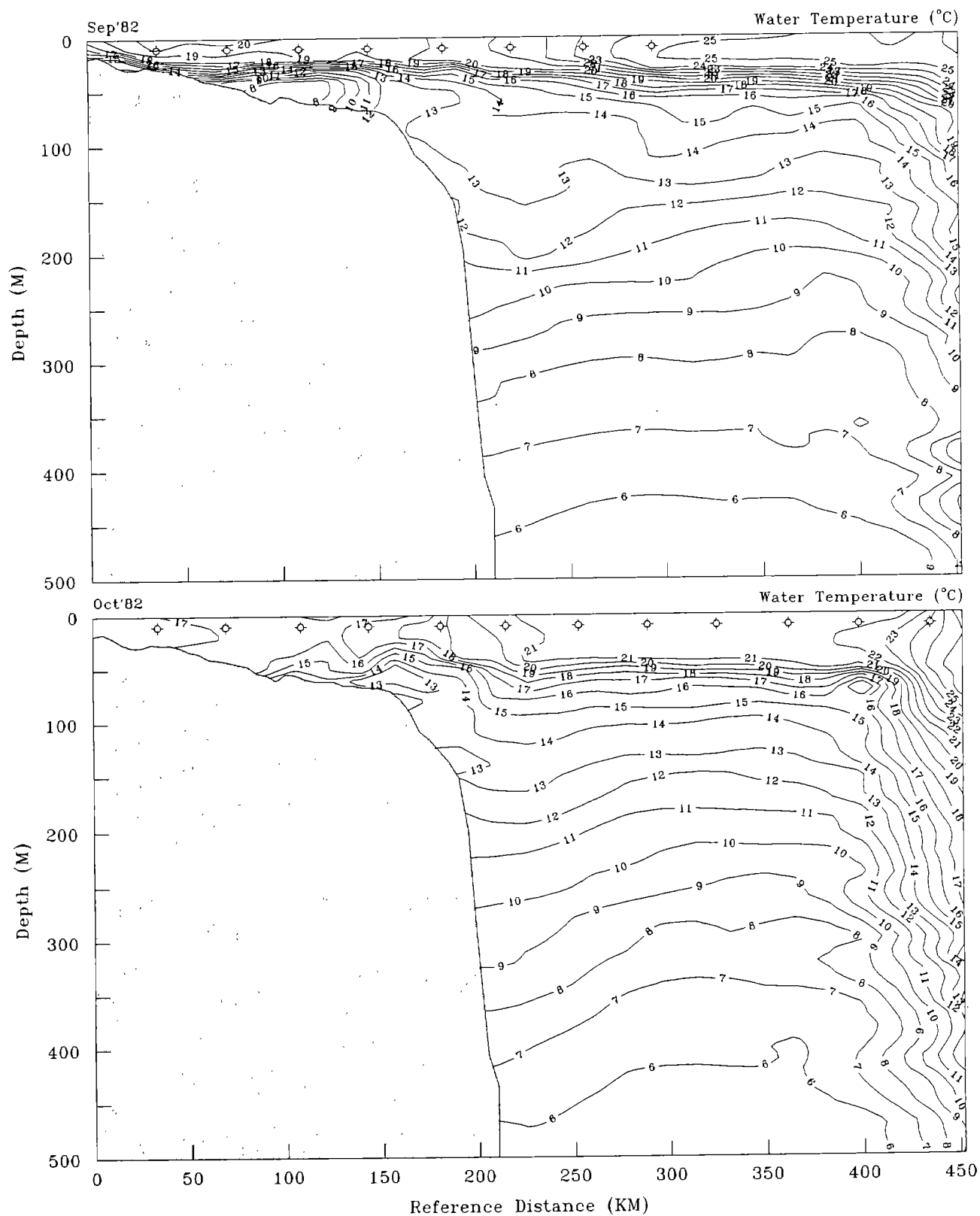


Figure 30. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1982.

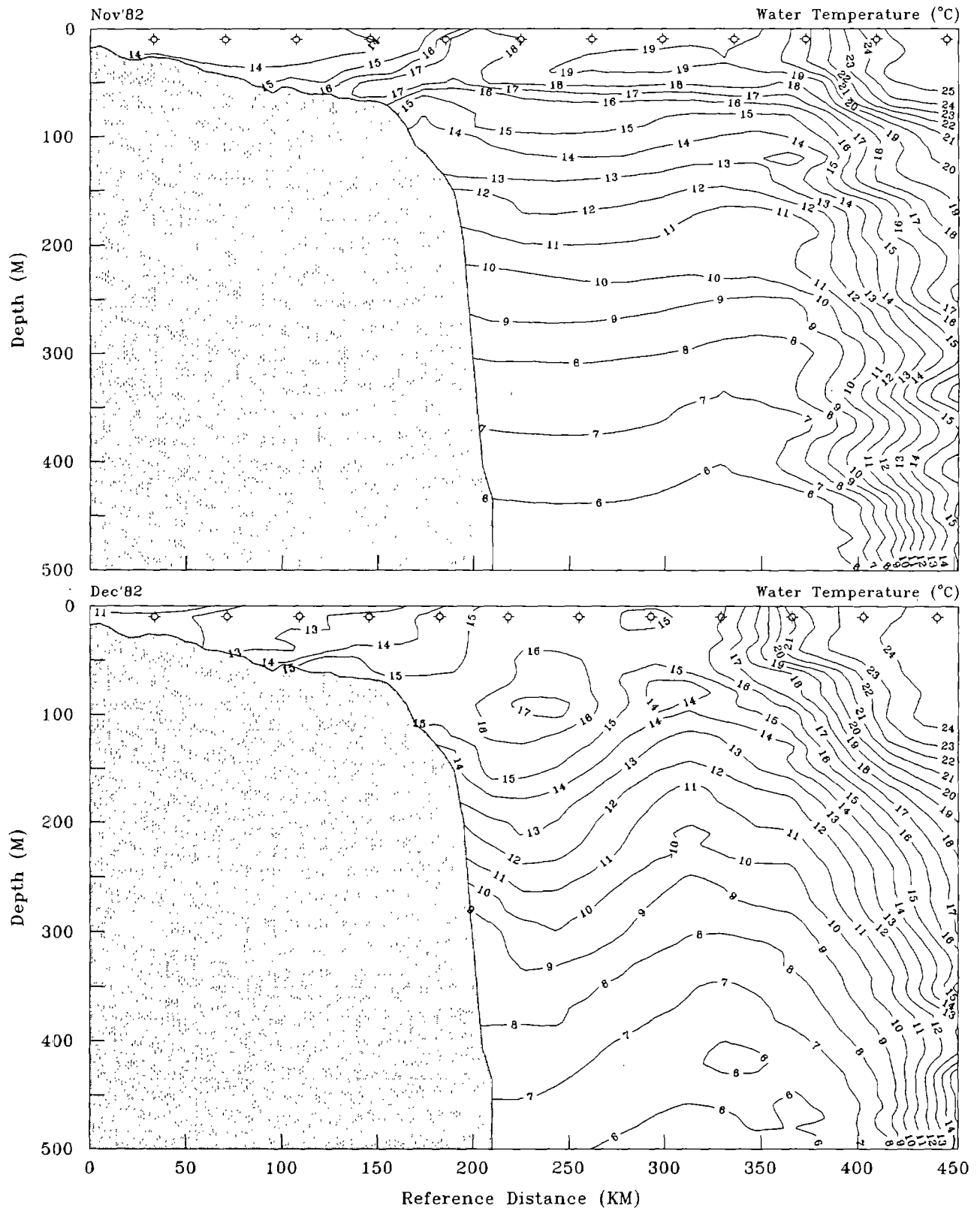


Figure 31. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1982.

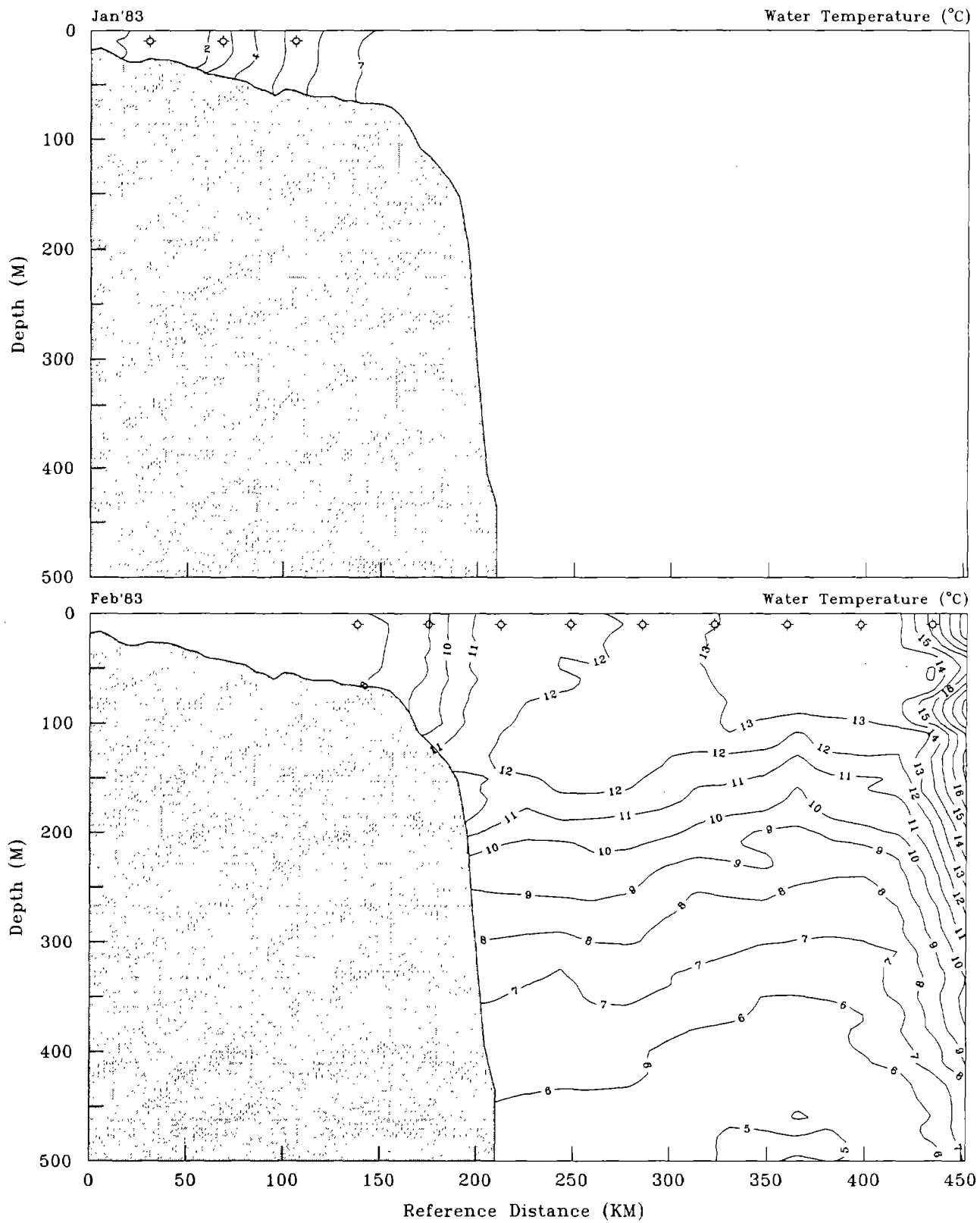


Figure 32. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (\square) along the Middle Atlantic Bight transect during January and February 1983.

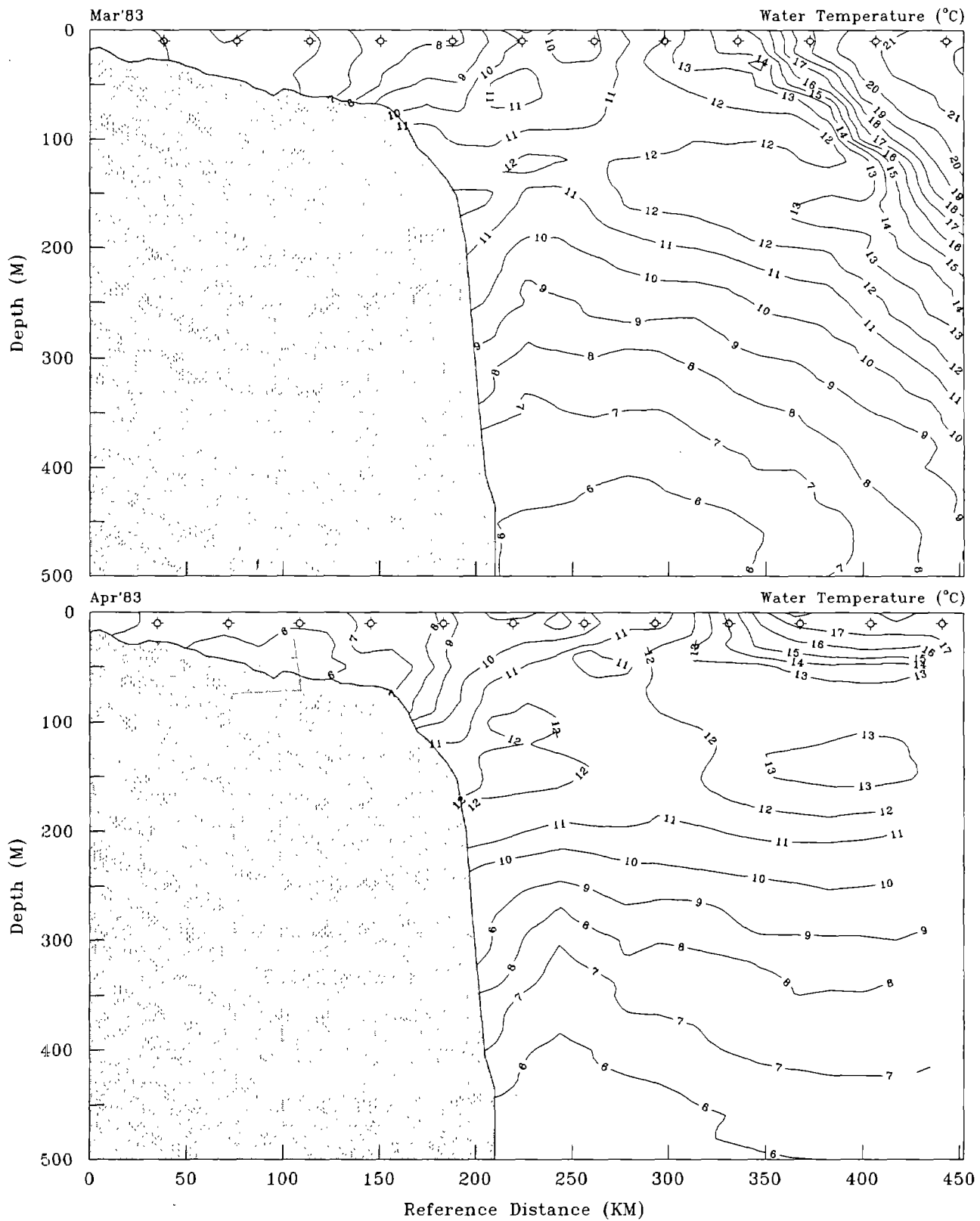


Figure 33. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during March and April 1983.

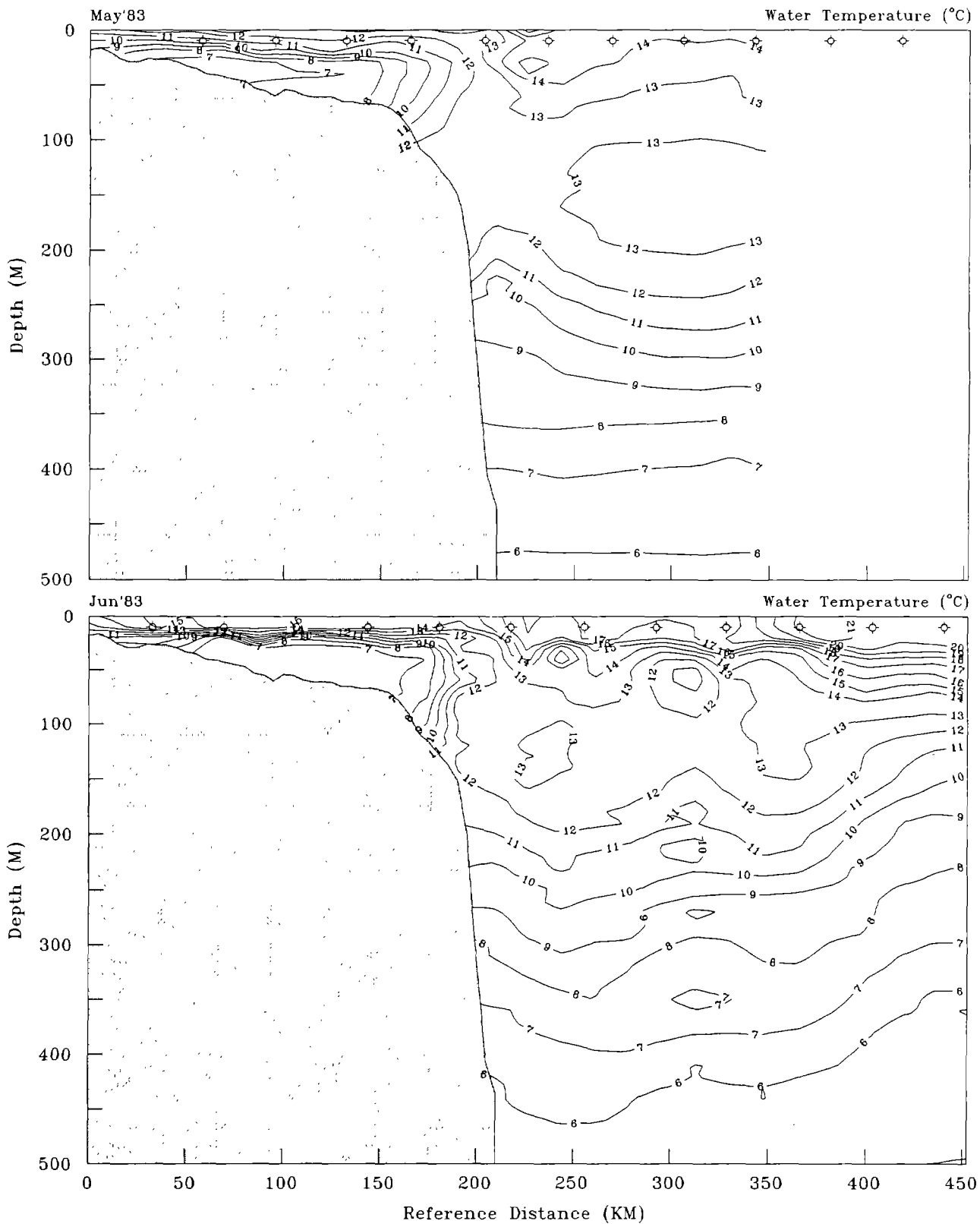


Figure 34. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1983.

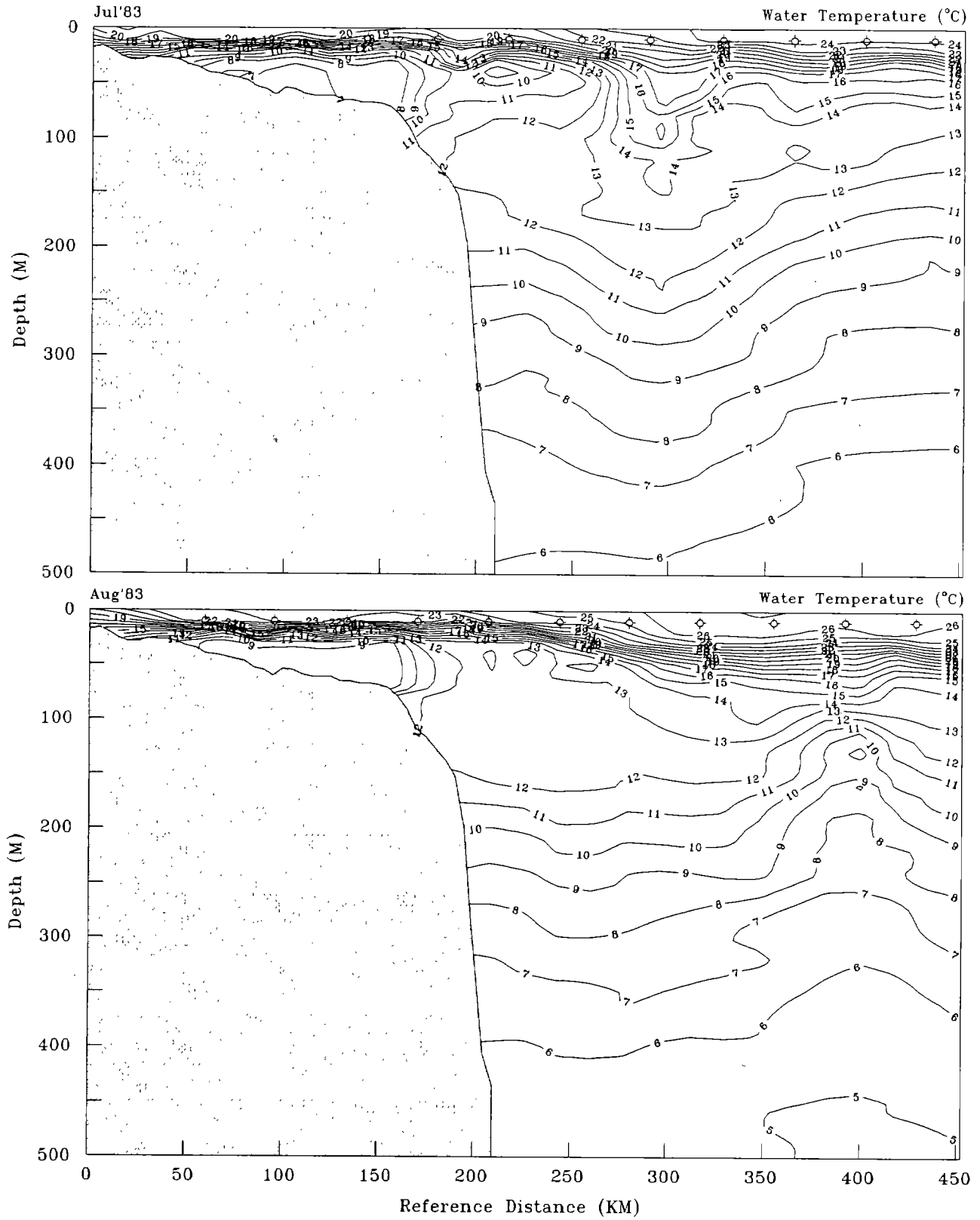


Figure 35. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during July and August 1983.

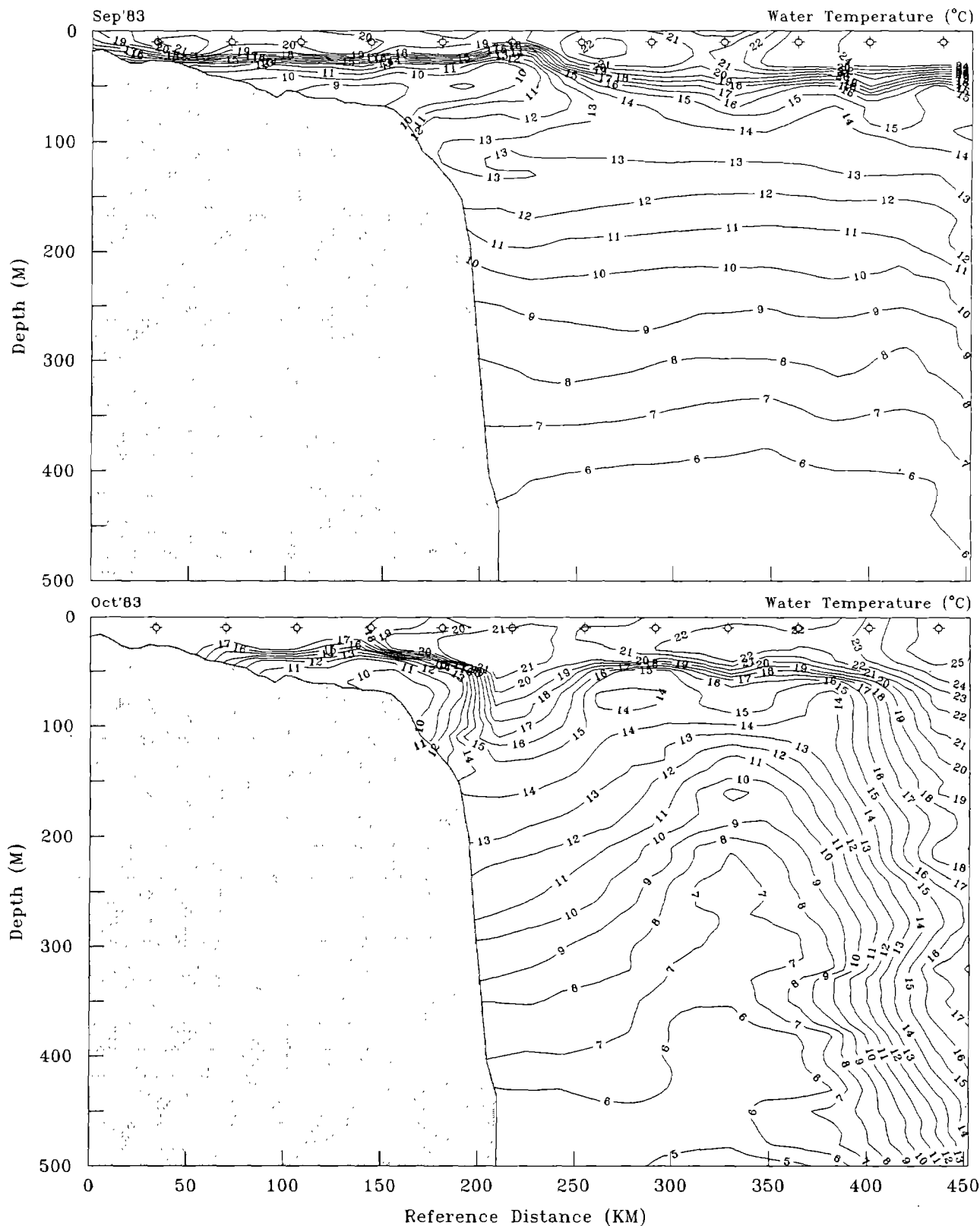


Figure 36. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1983.

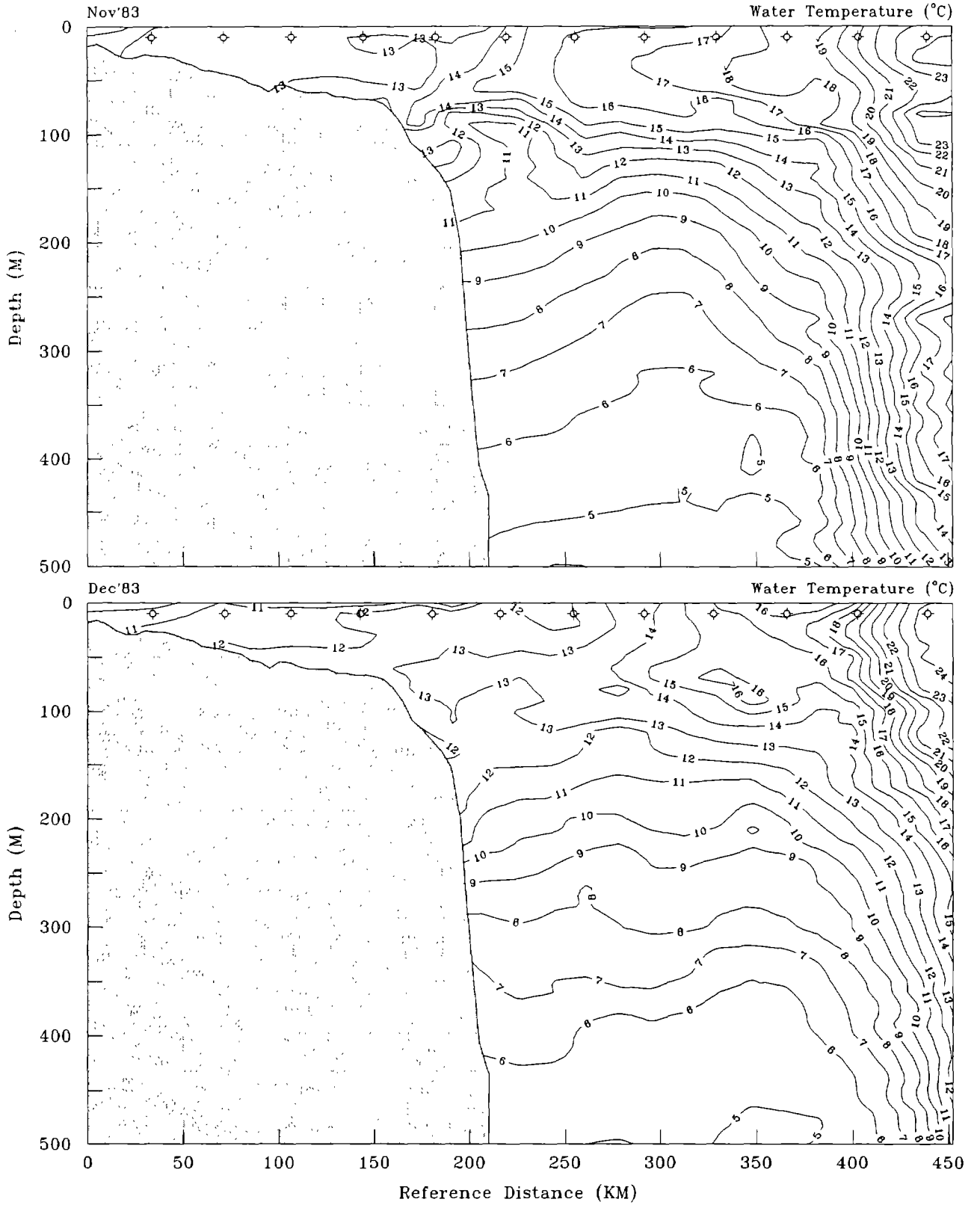


Figure 37. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1983.

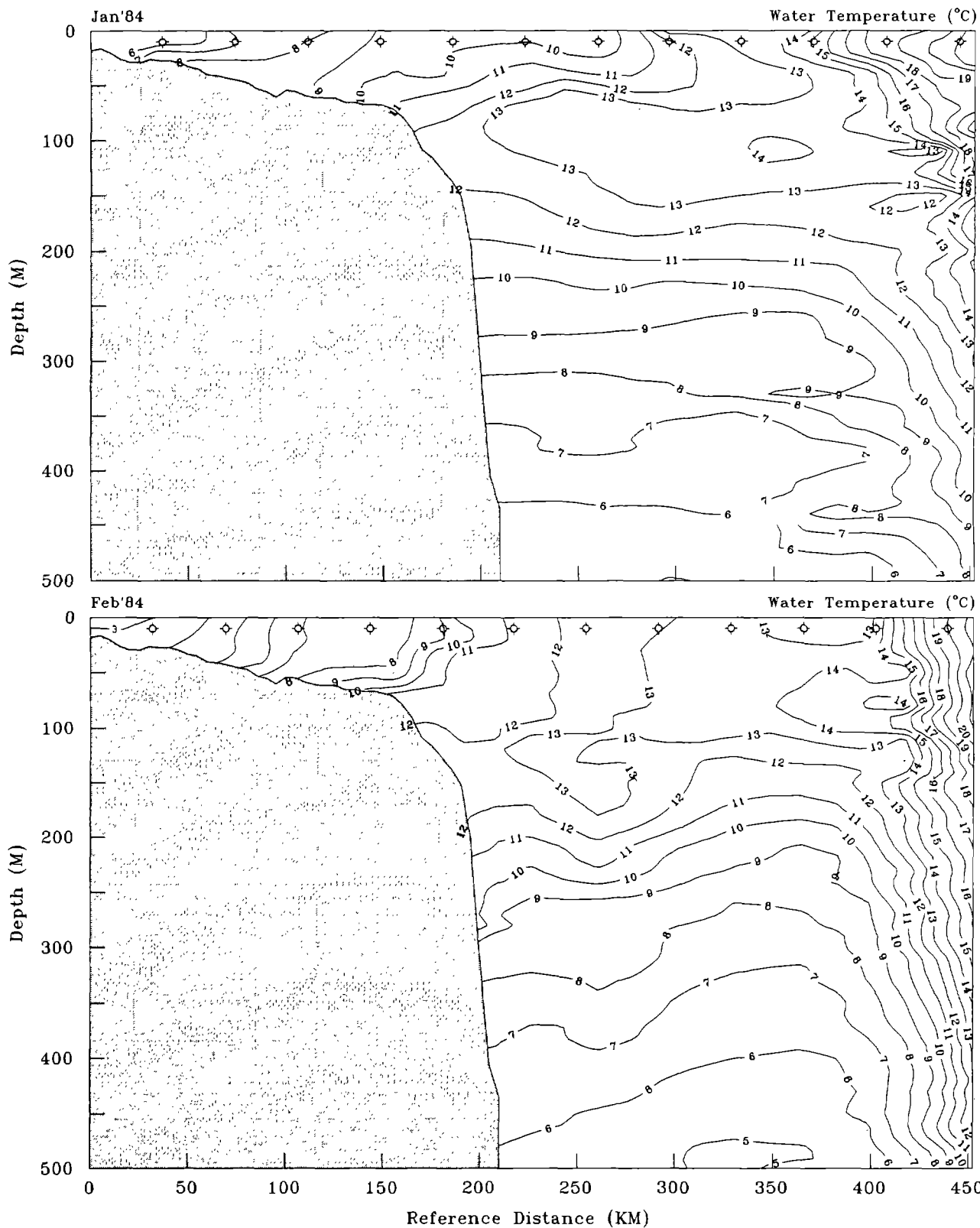


Figure 38. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during January and February 1984.

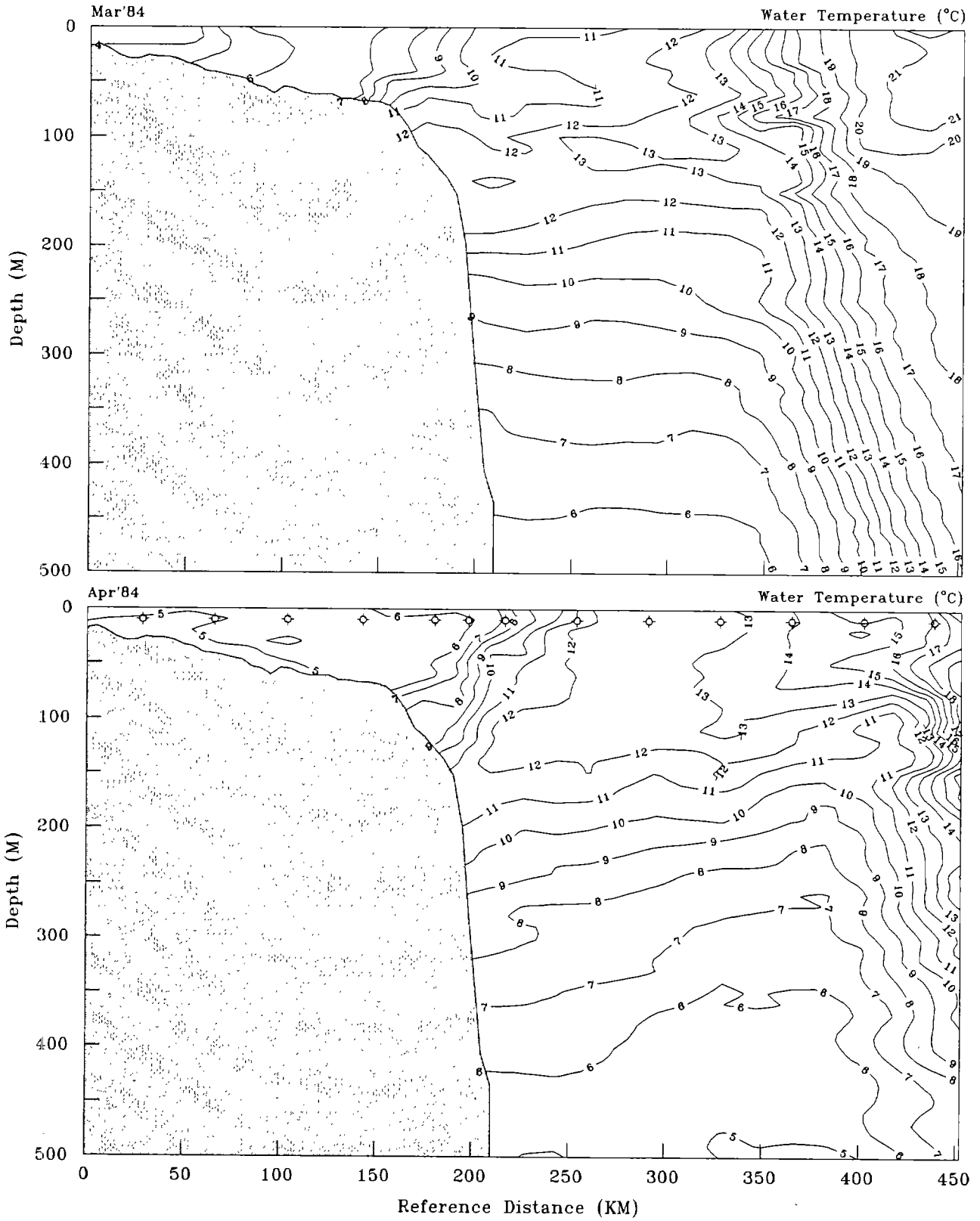


Figure 39. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during March and April 1984.

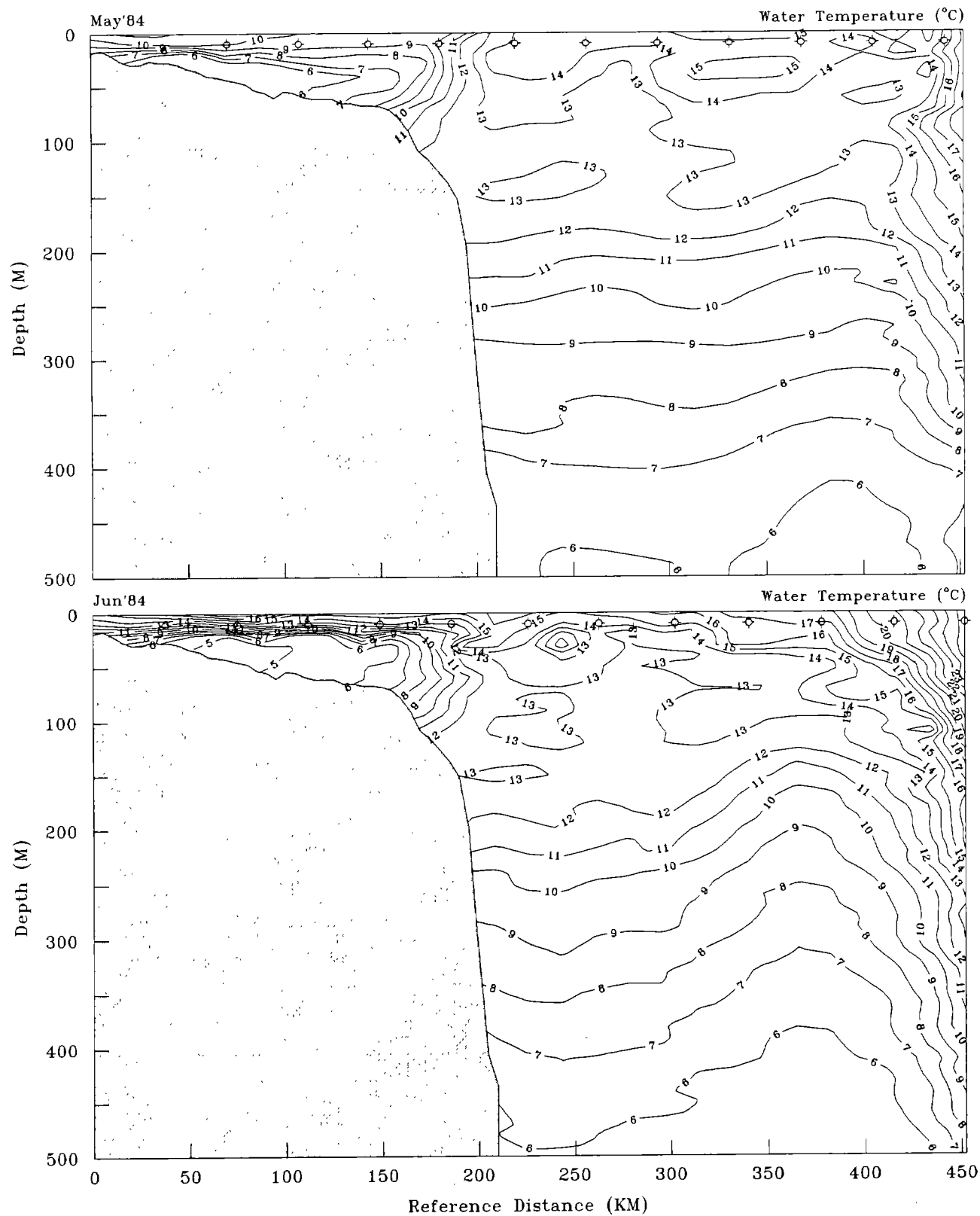


Figure 40. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (⊕) along the Middle Atlantic Bight transect during May and June 1984.

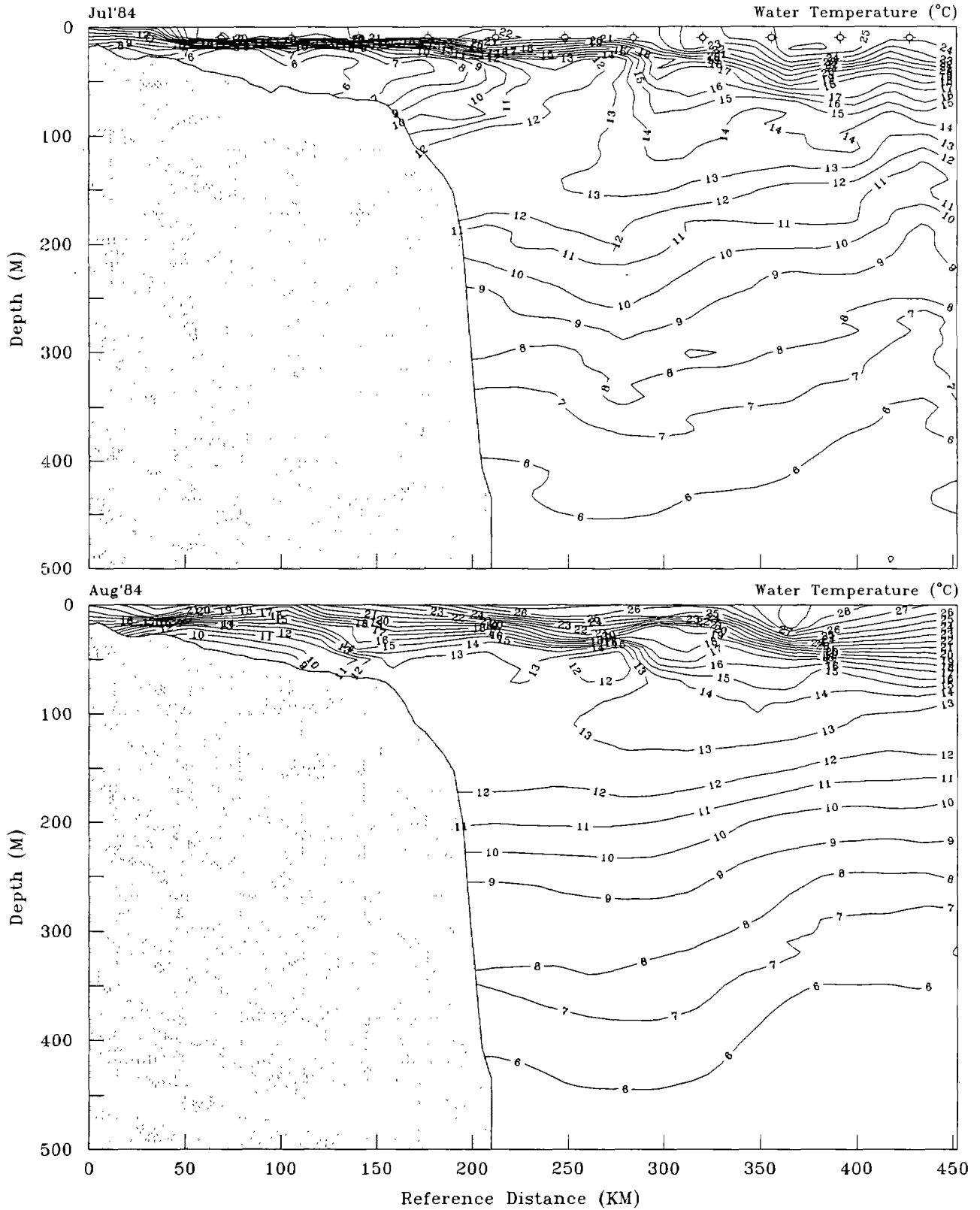


Figure 41. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Middle Atlantic Bight transect during July and August 1984.

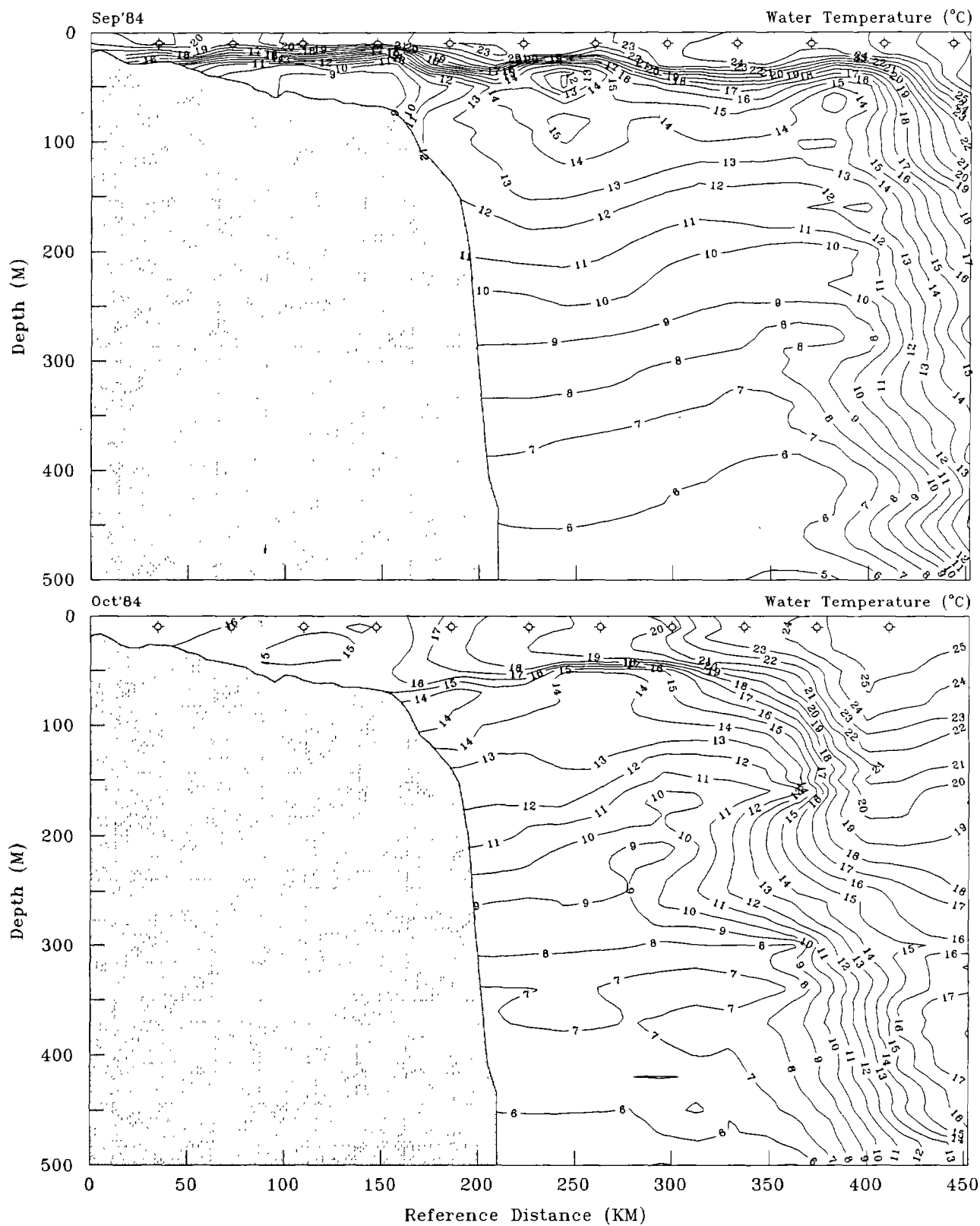


Figure 42. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1984.

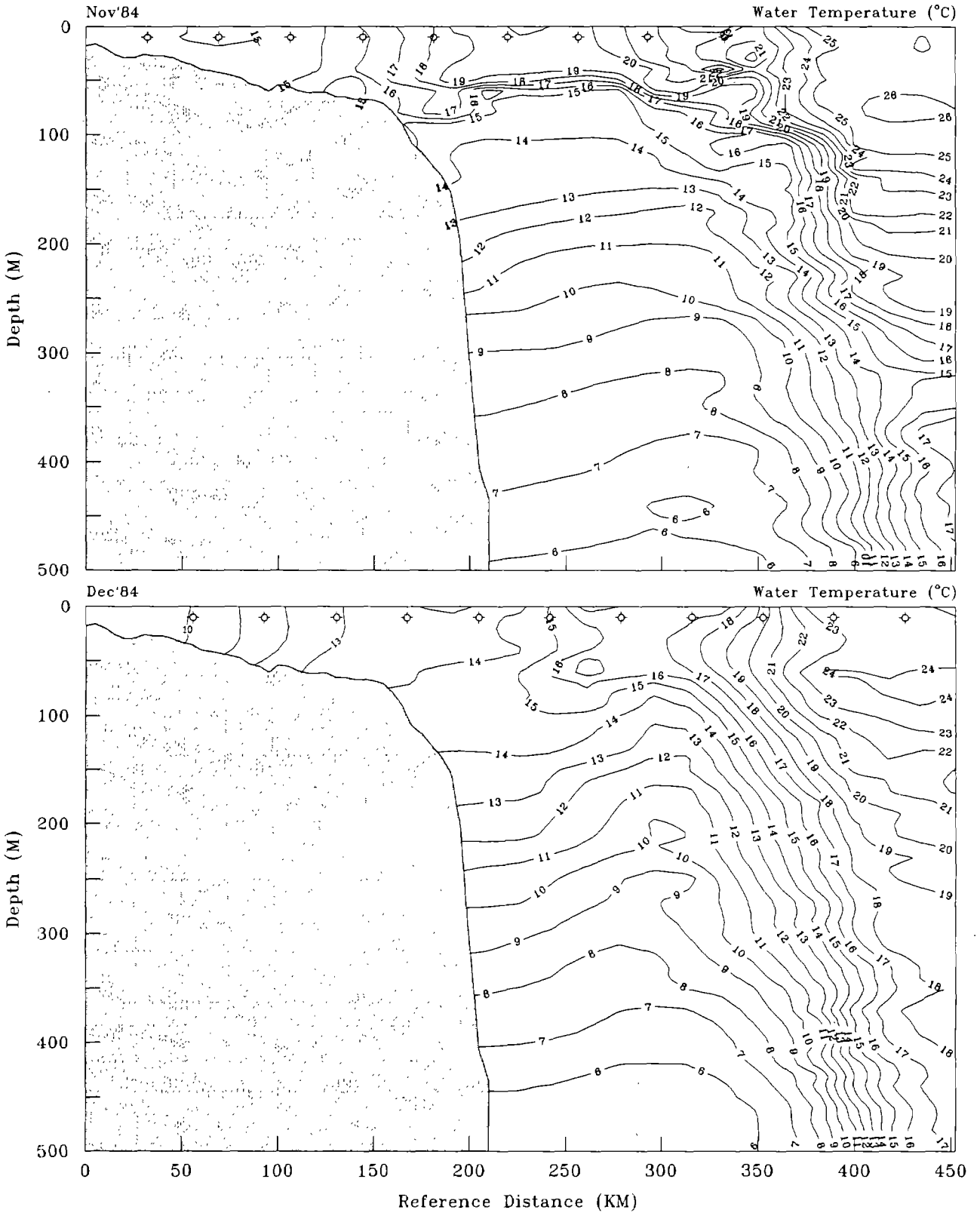


Figure 43. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1984.

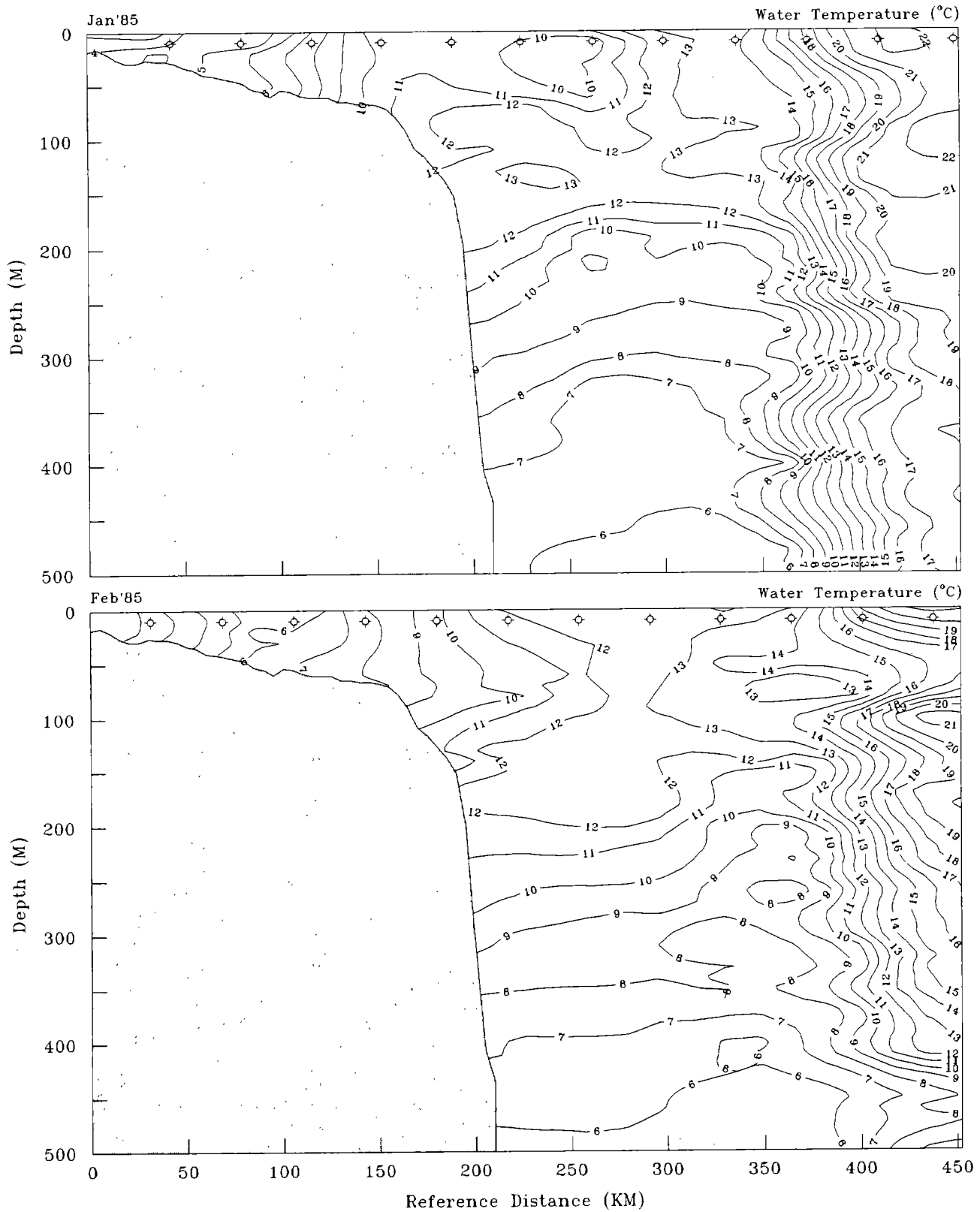


Figure 44. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (\square) along the Middle Atlantic Bight transect during January and February 1985.

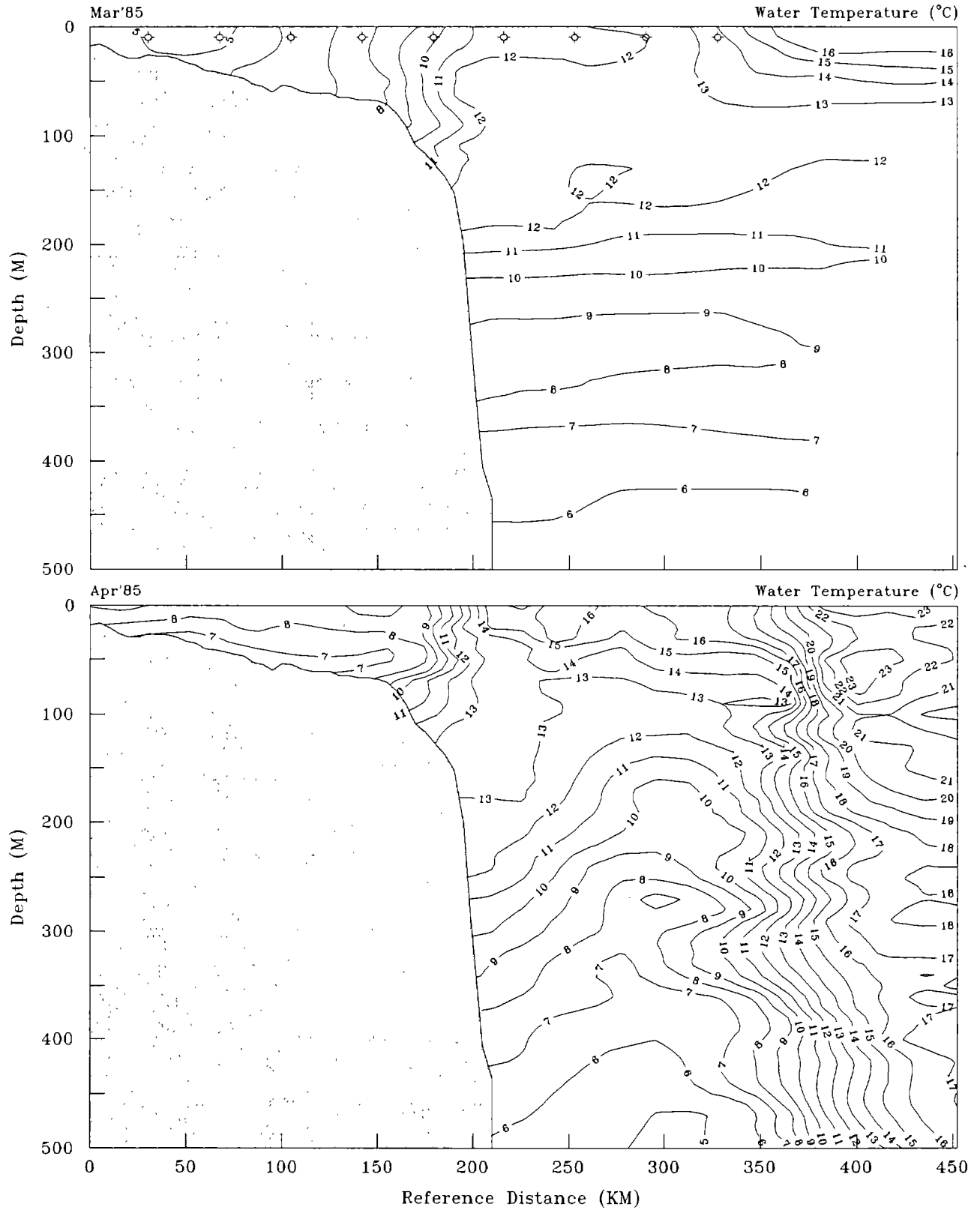


Figure 45. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (◊) along the Middle Atlantic Bight transect during March and April 1985.

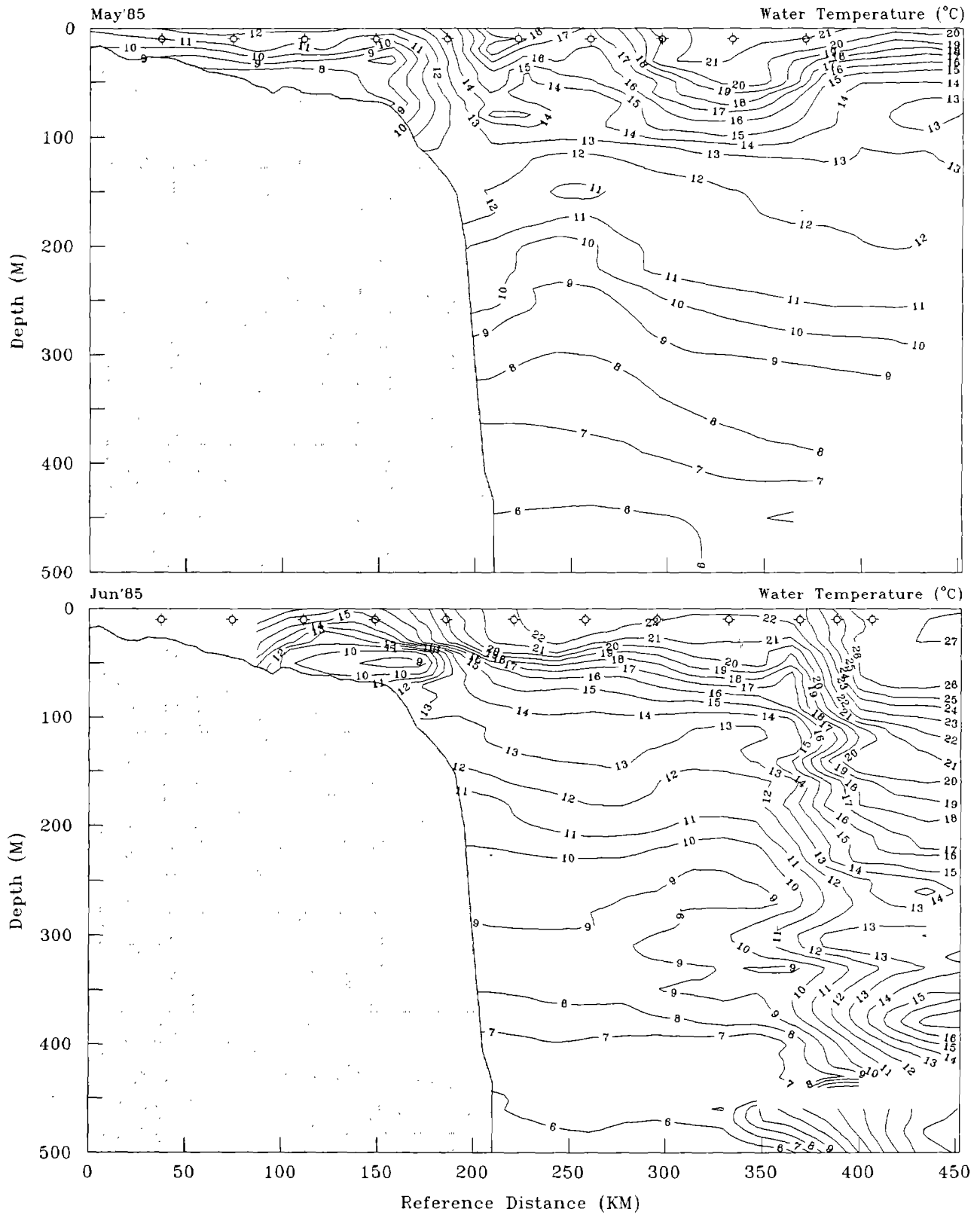


Figure 46. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1985.

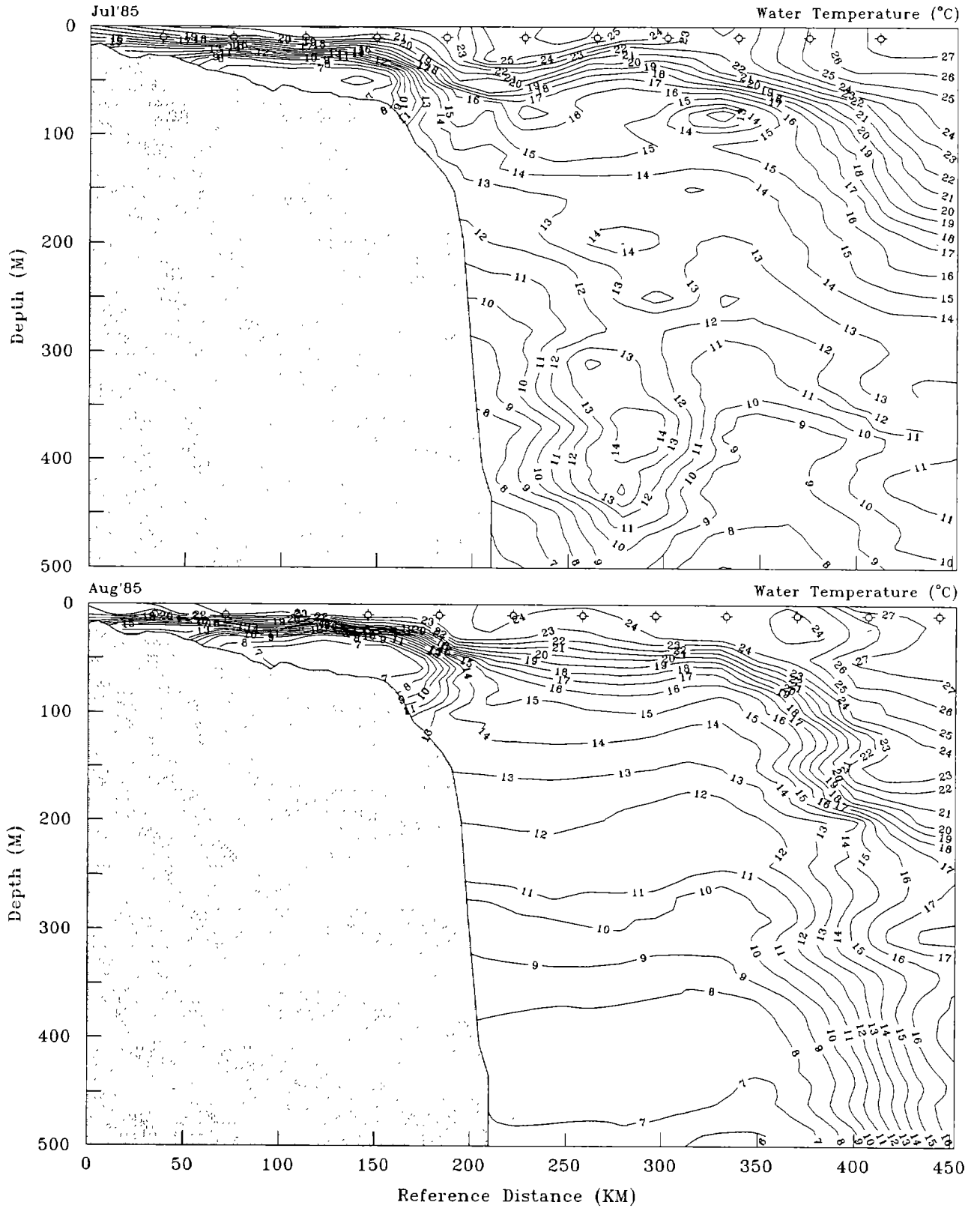


Figure 47. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during July and August 1985.

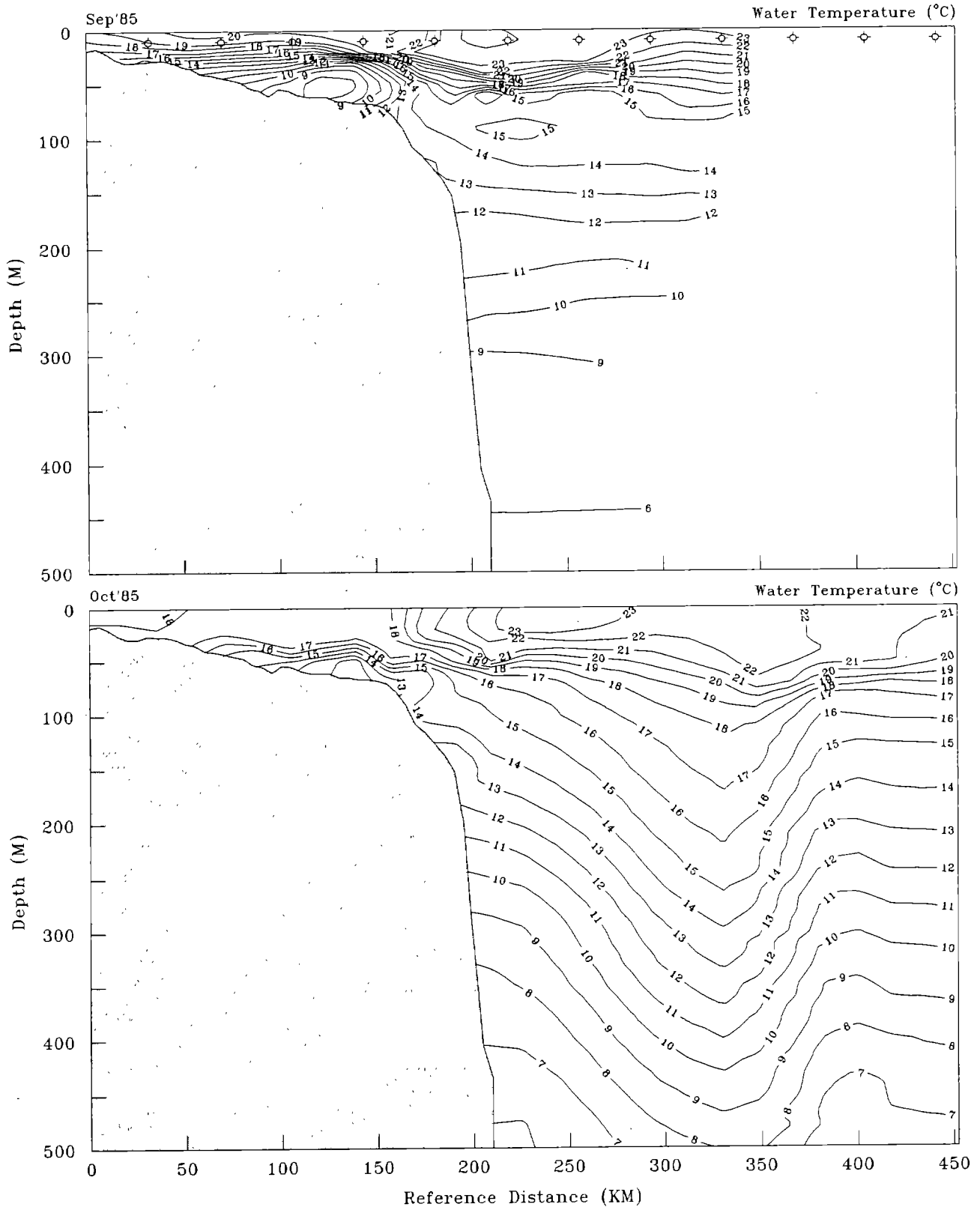


Figure 48. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during September and October 1985.

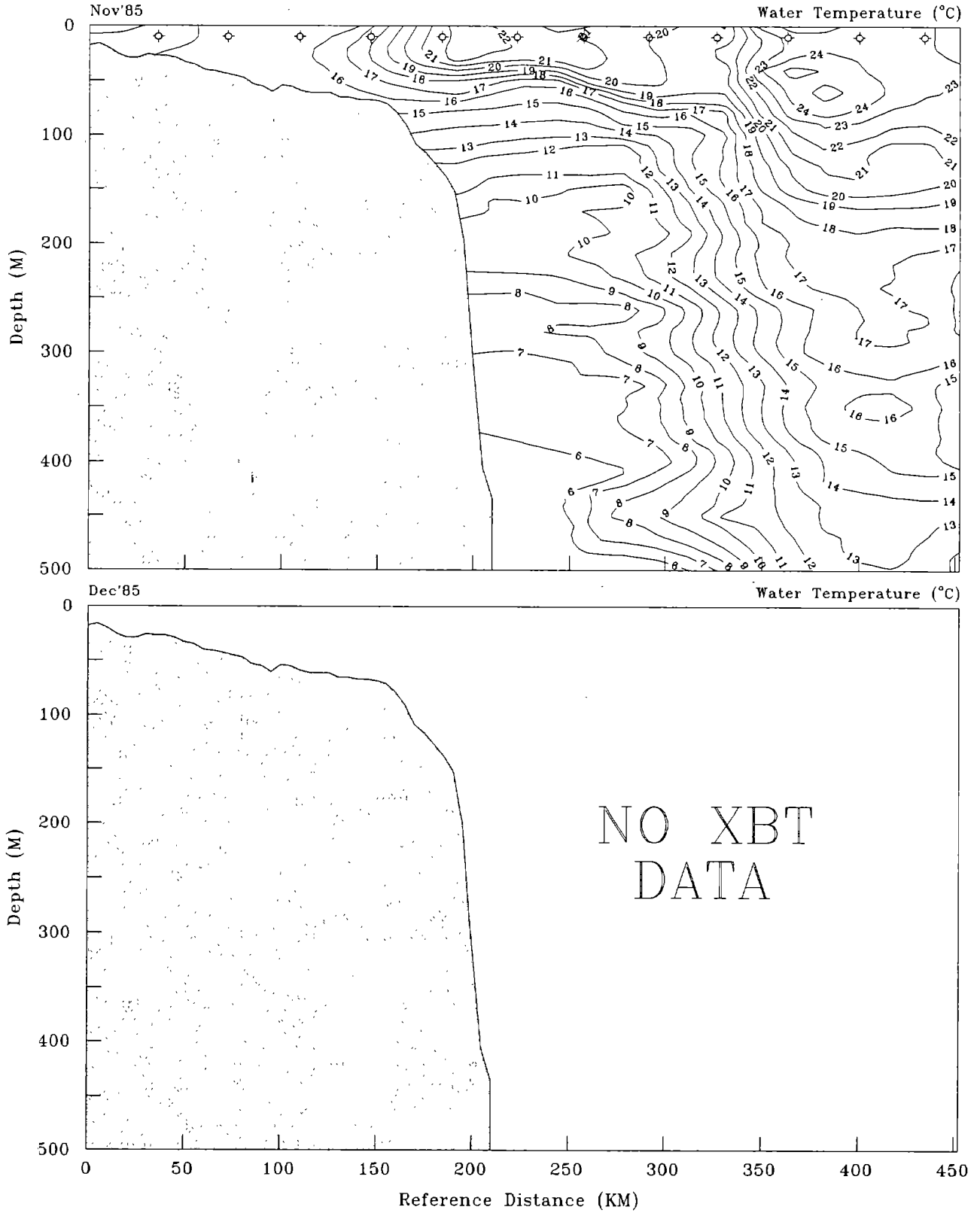


Figure 49. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1985.

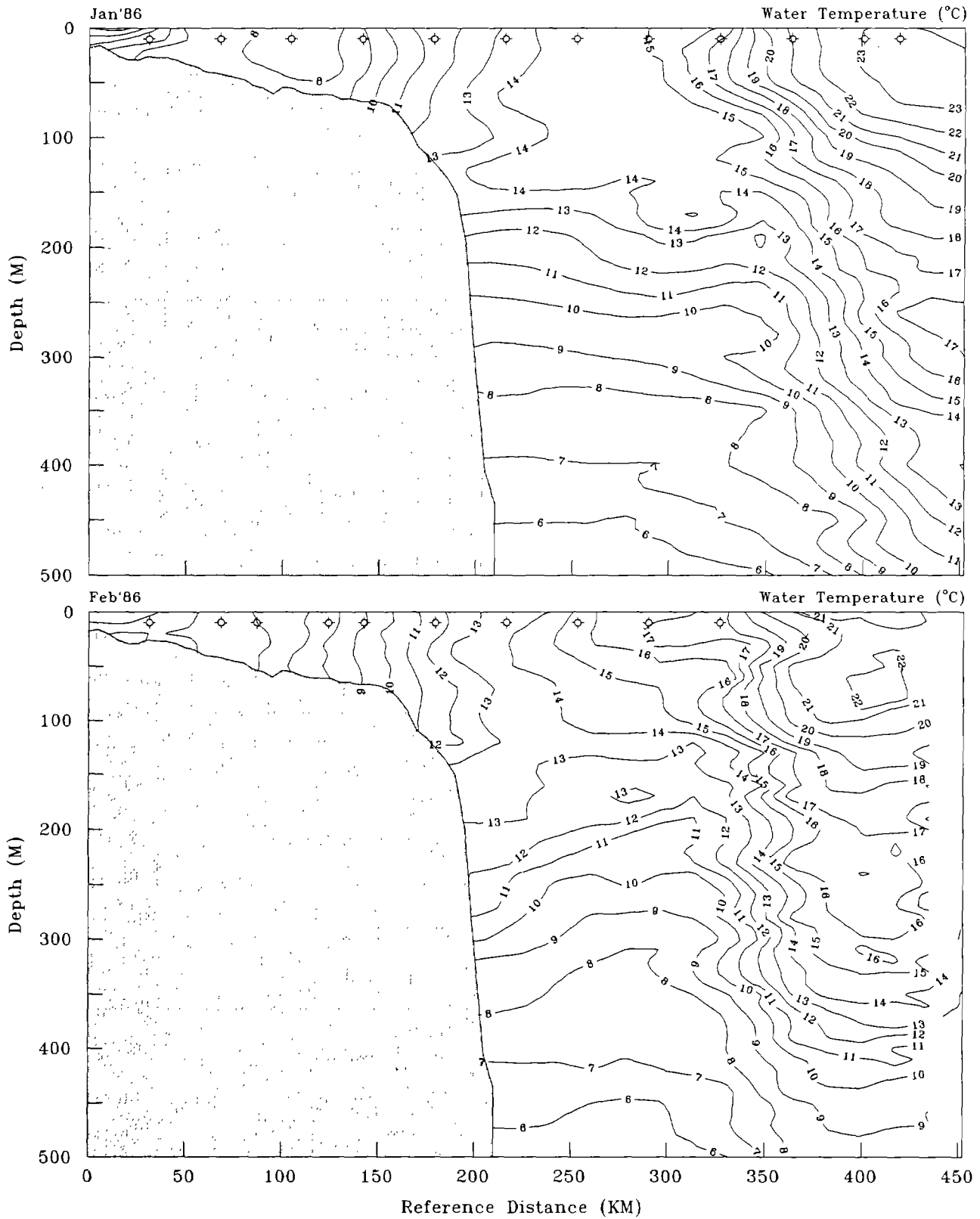


Figure 50. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (◻) along the Middle Atlantic Bight transect during January and February 1986.

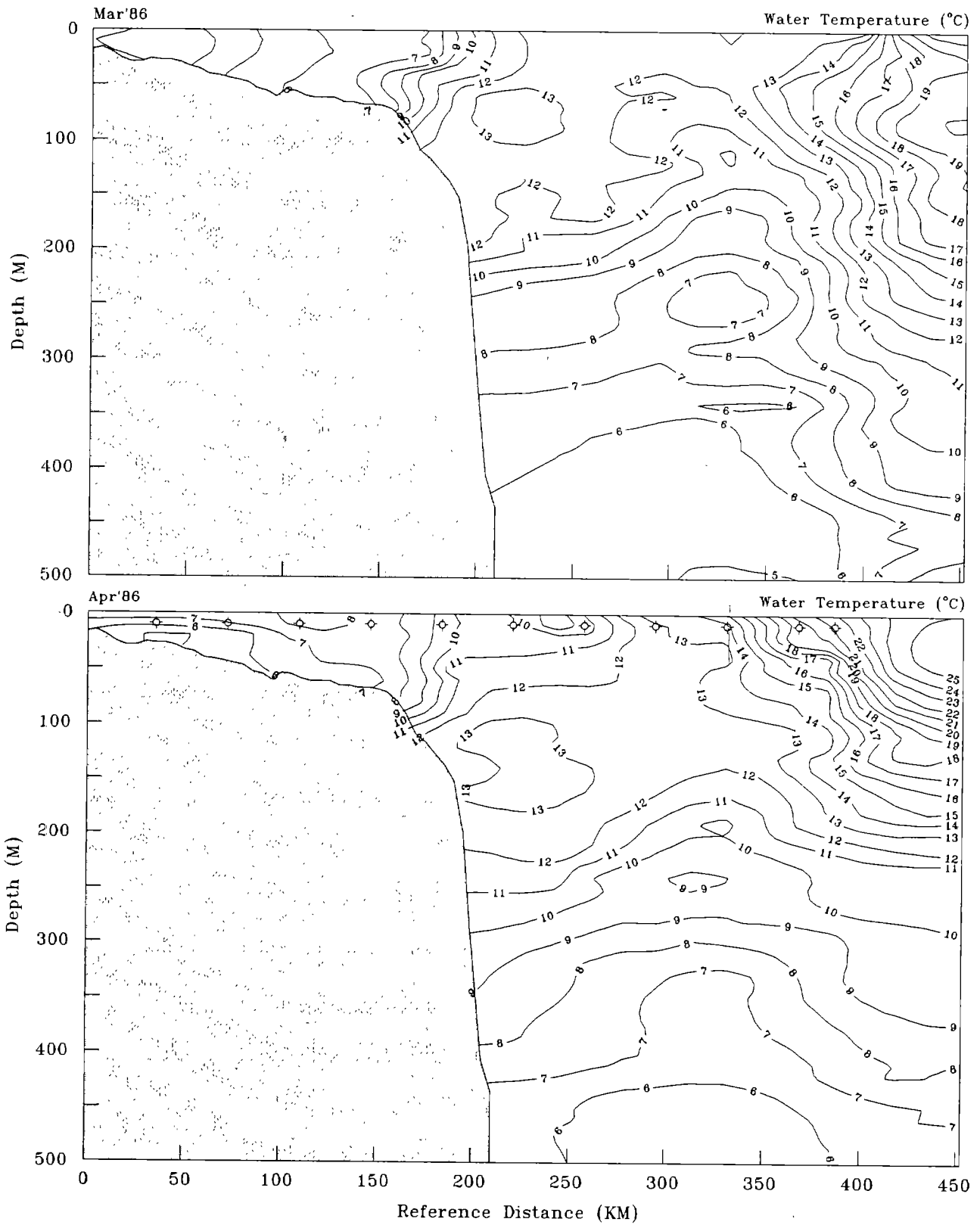


Figure 51. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during March and April 1986.

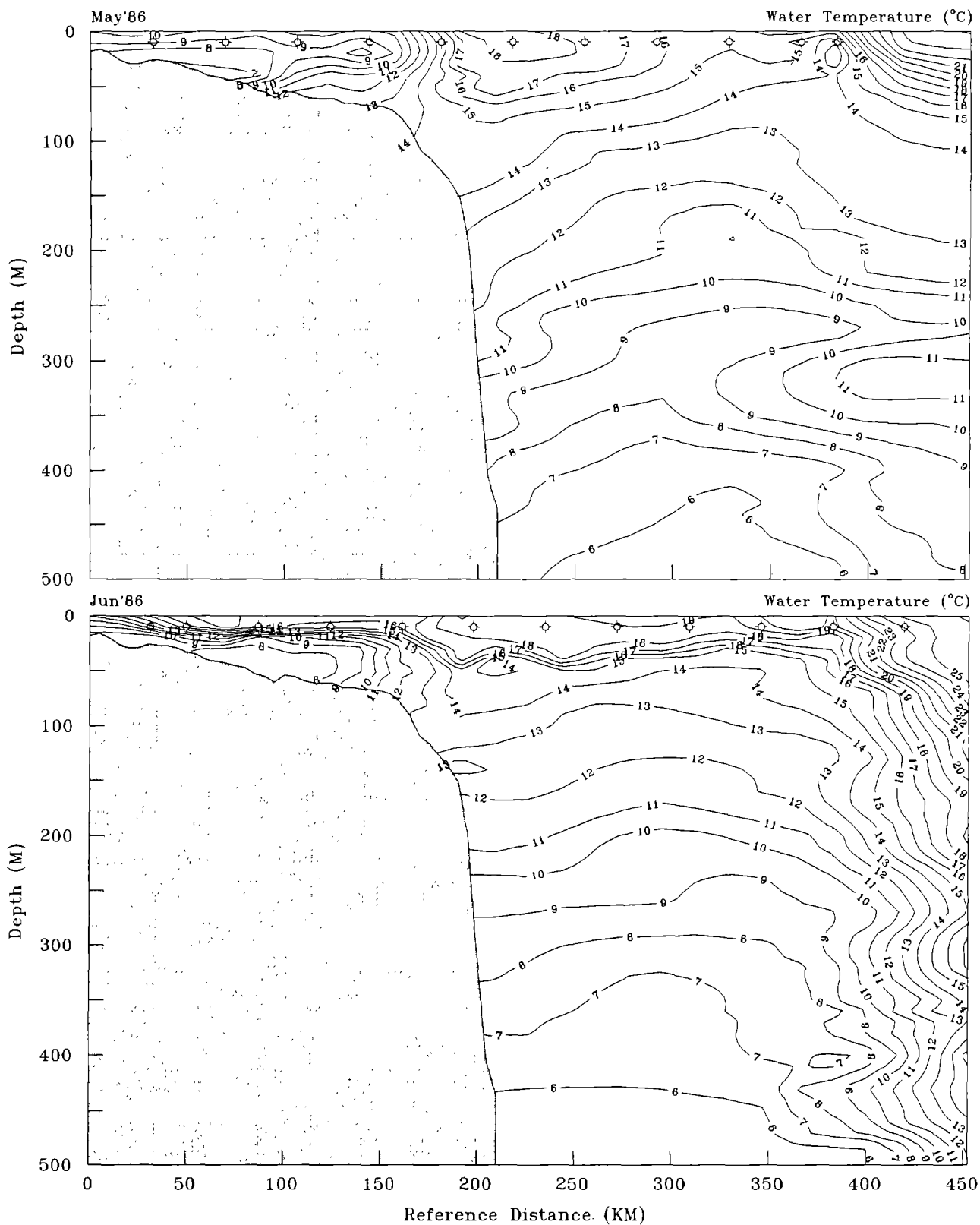


Figure 52. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1986.

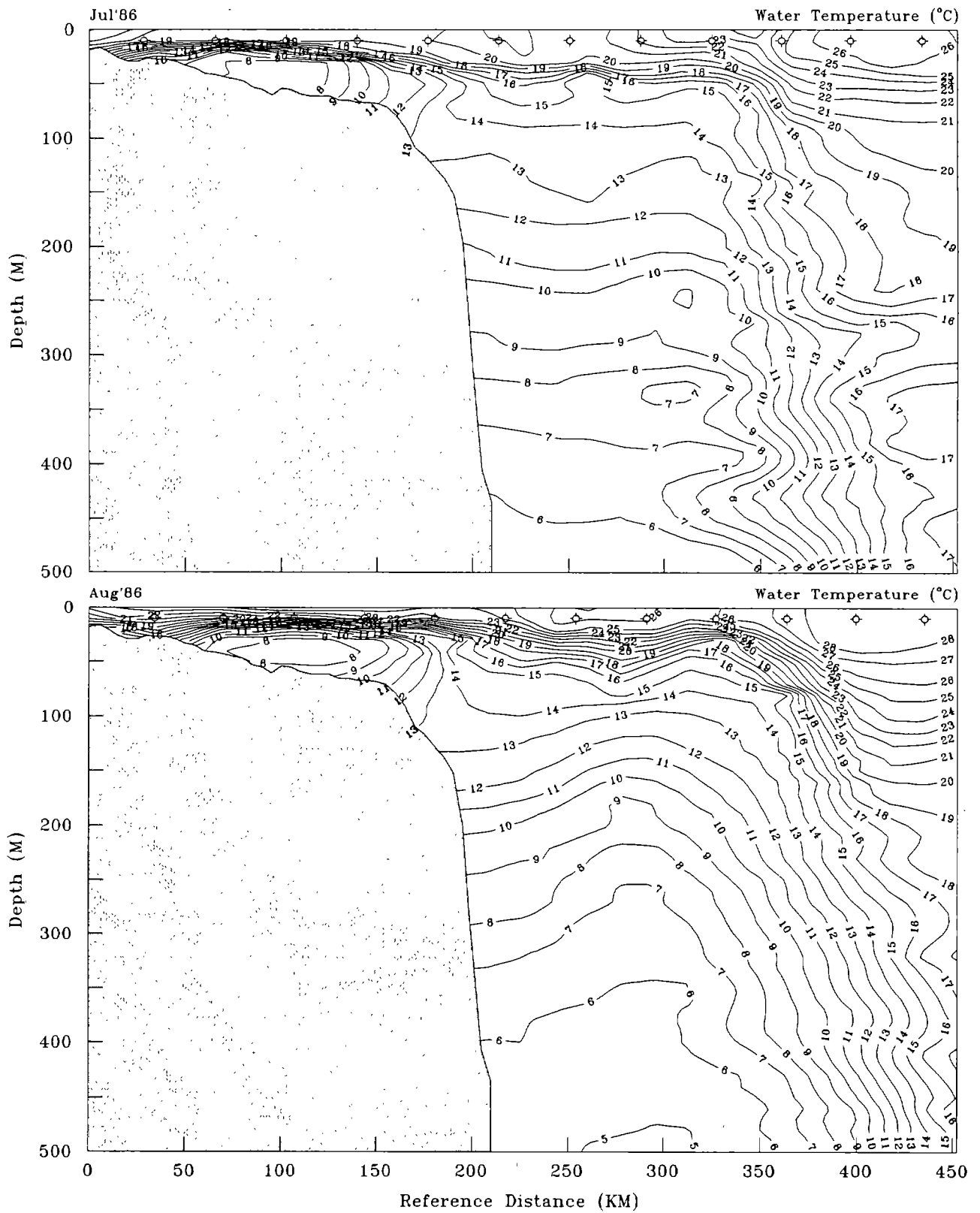


Figure 53. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (α) along the Middle Atlantic Bight transect during July and August 1986.

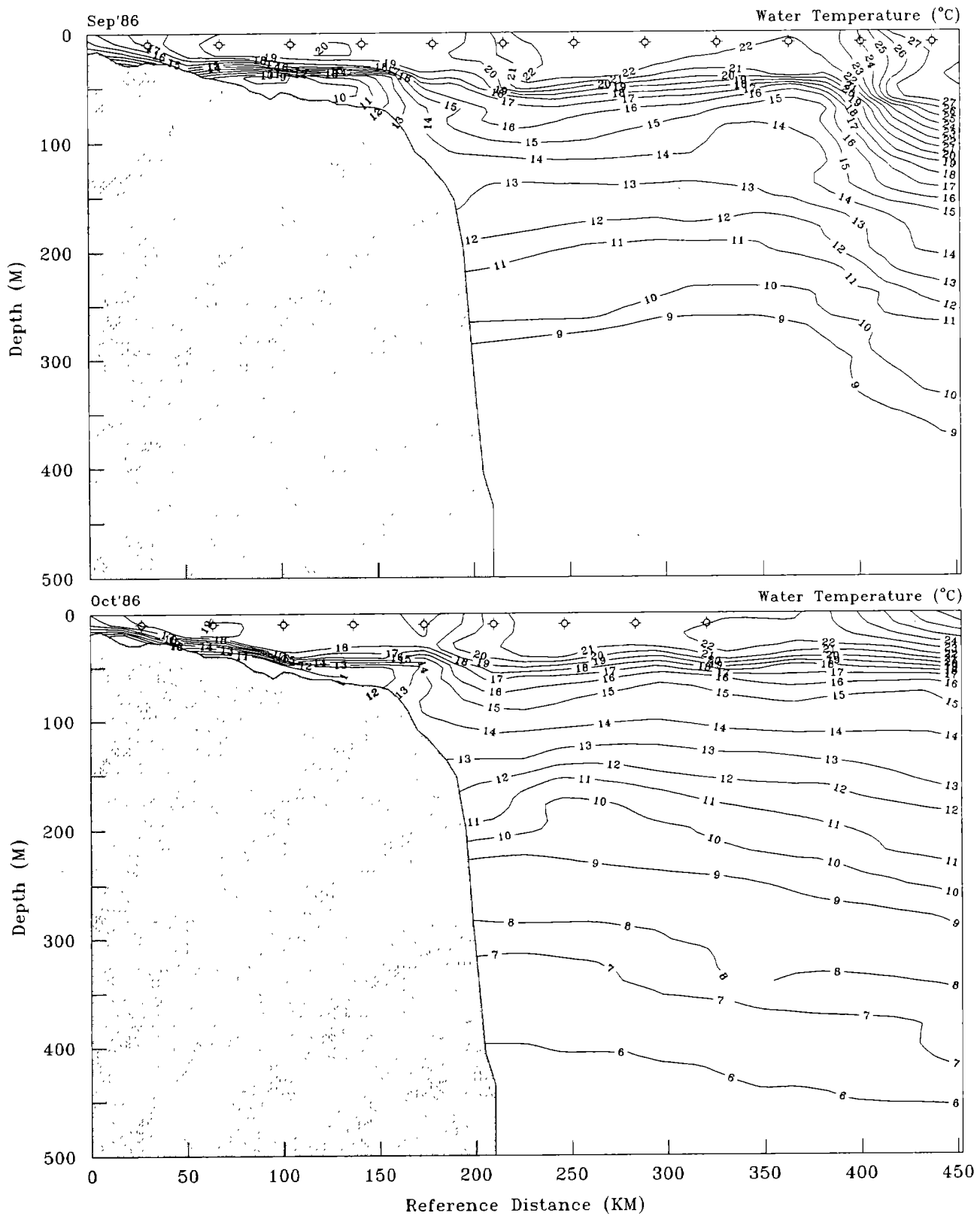


Figure 54. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1986.

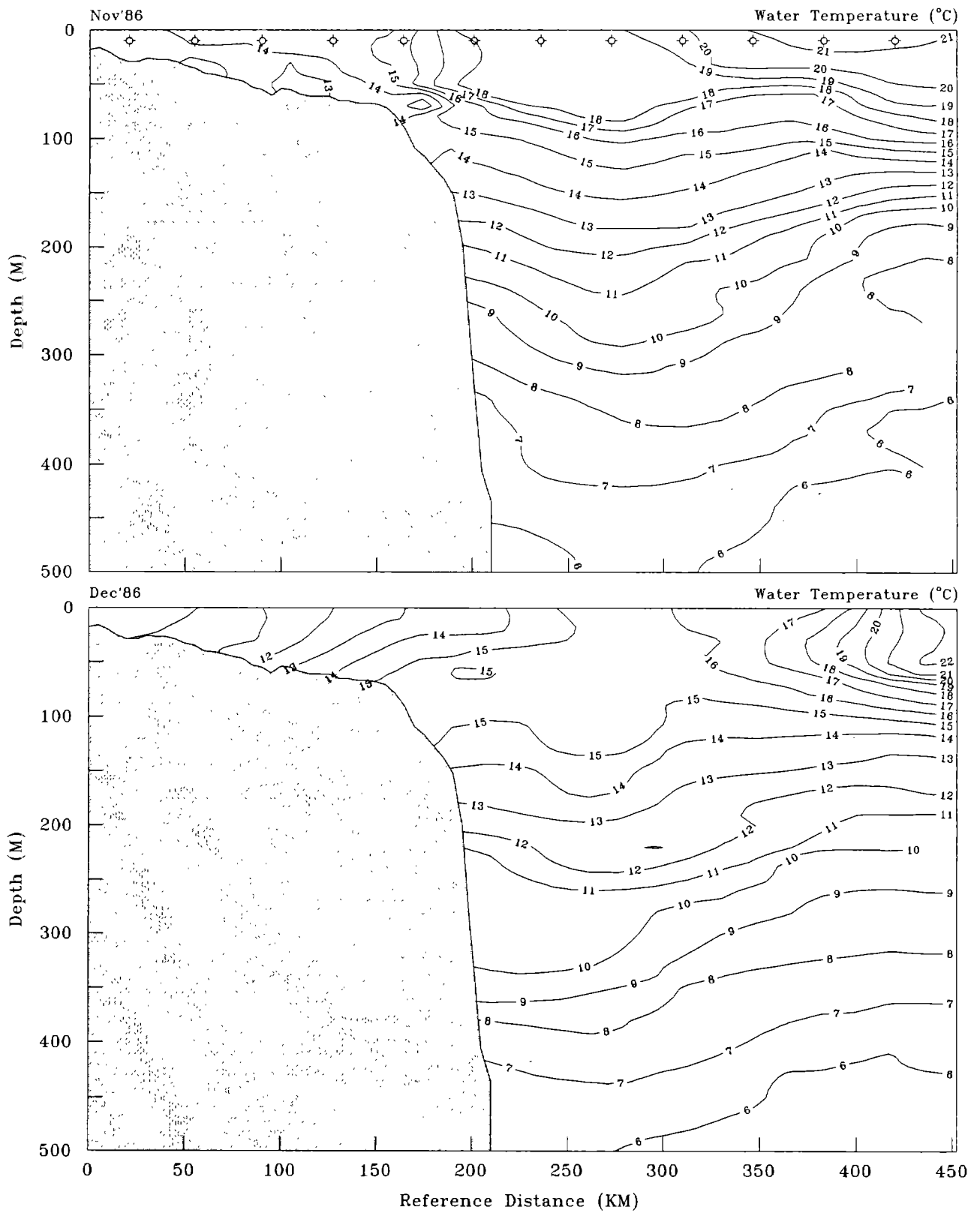


Figure 55. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1986.

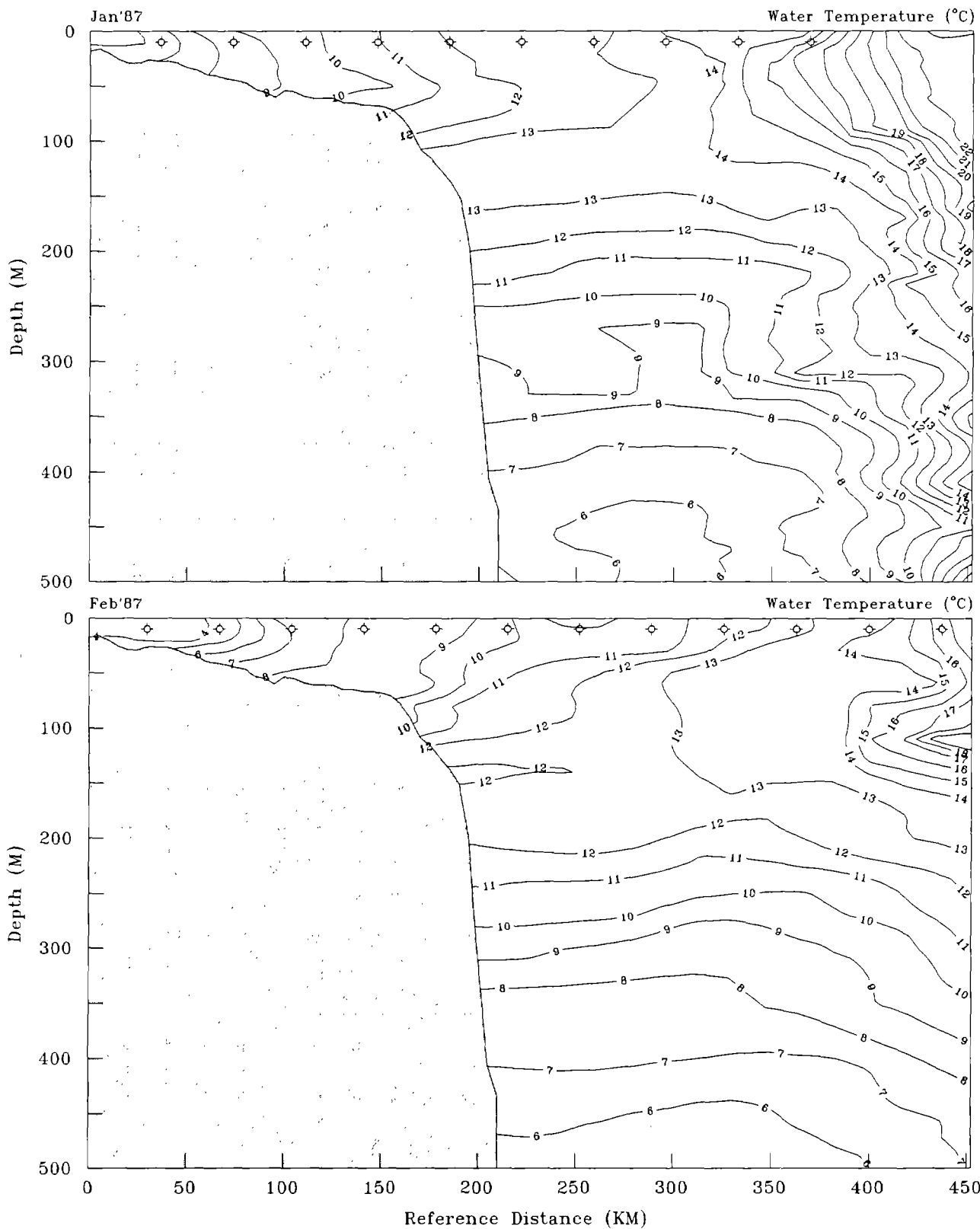


Figure 56. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during January and February 1987.

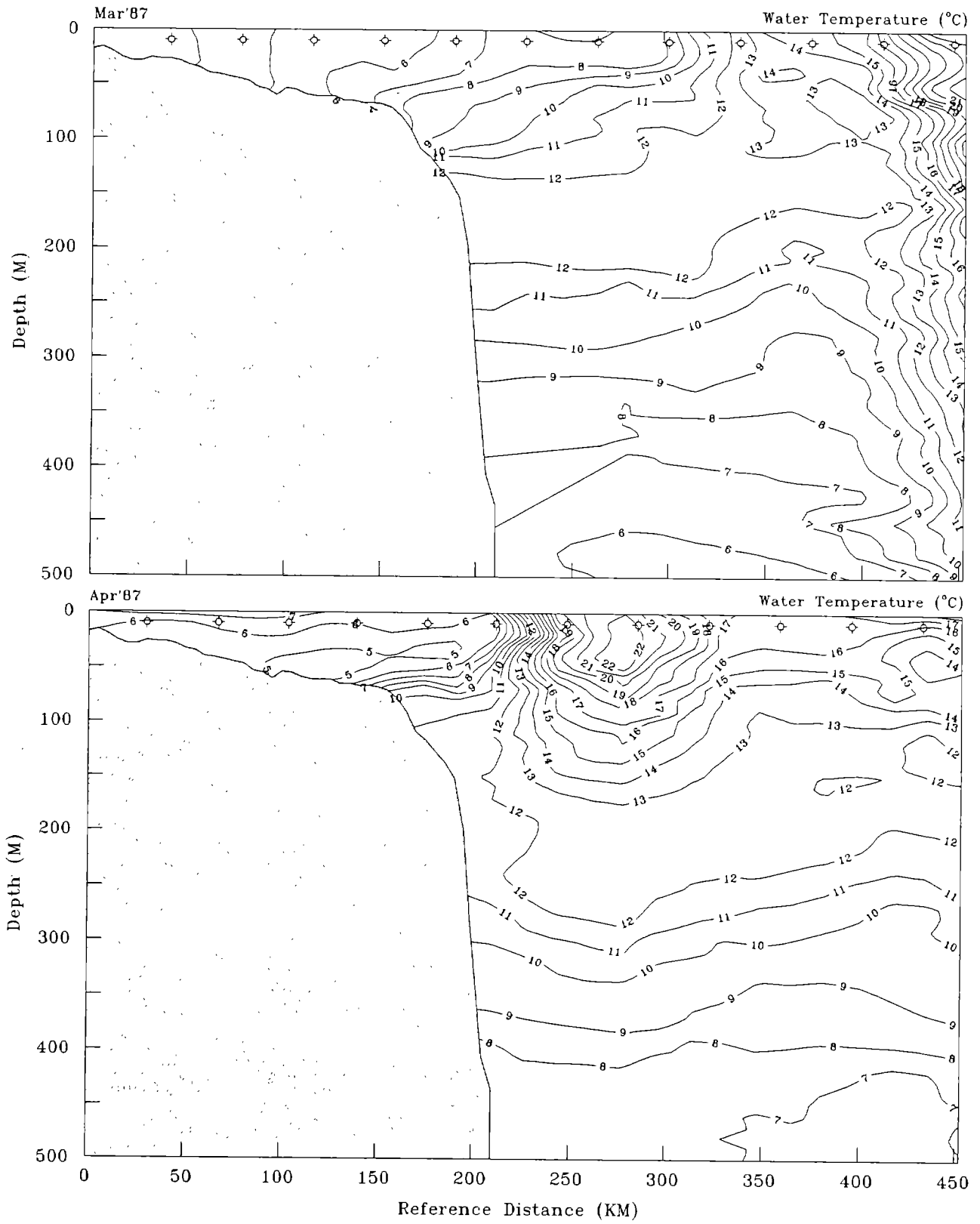


Figure 57. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during March and April 1987.

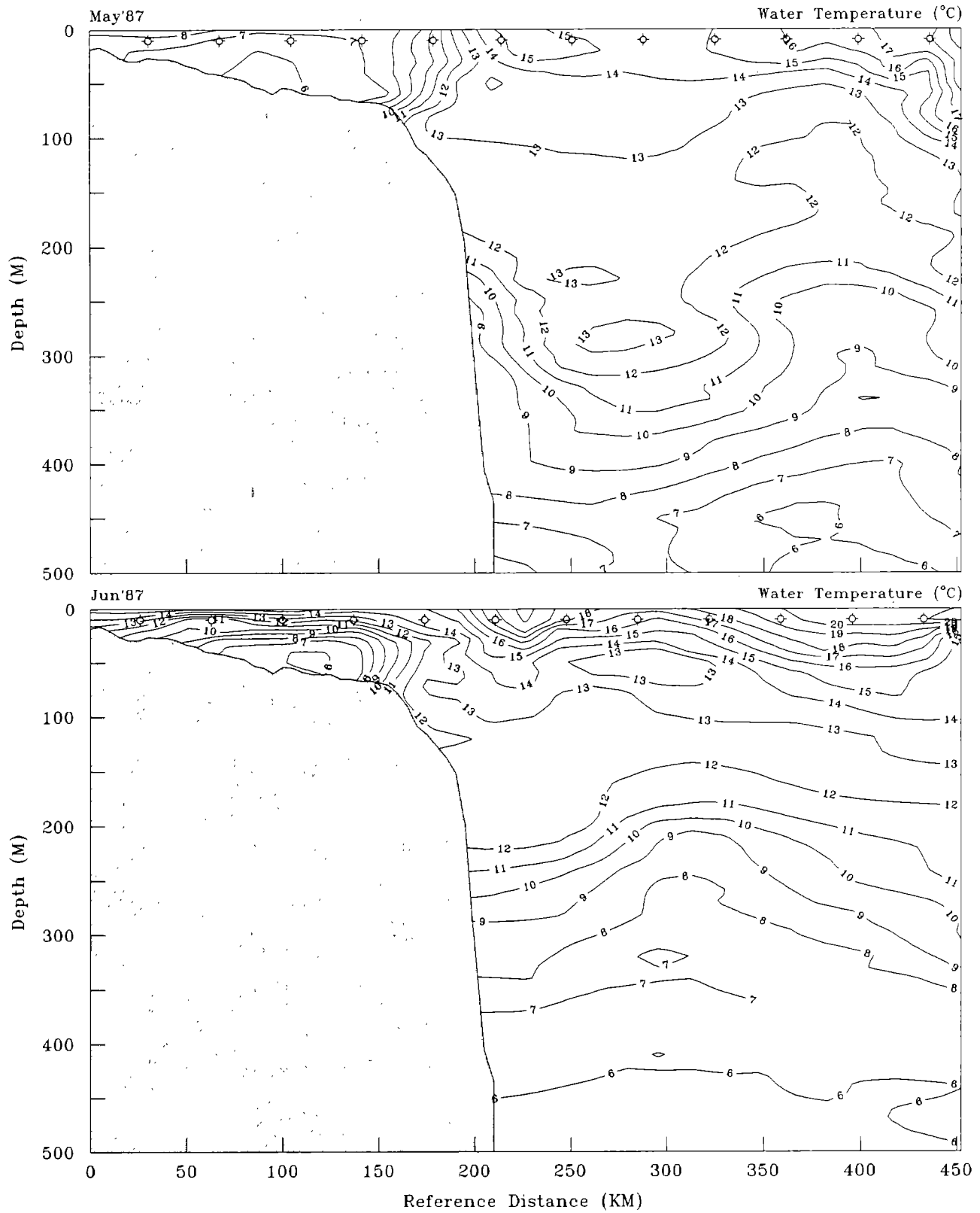


Figure 58. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1987.

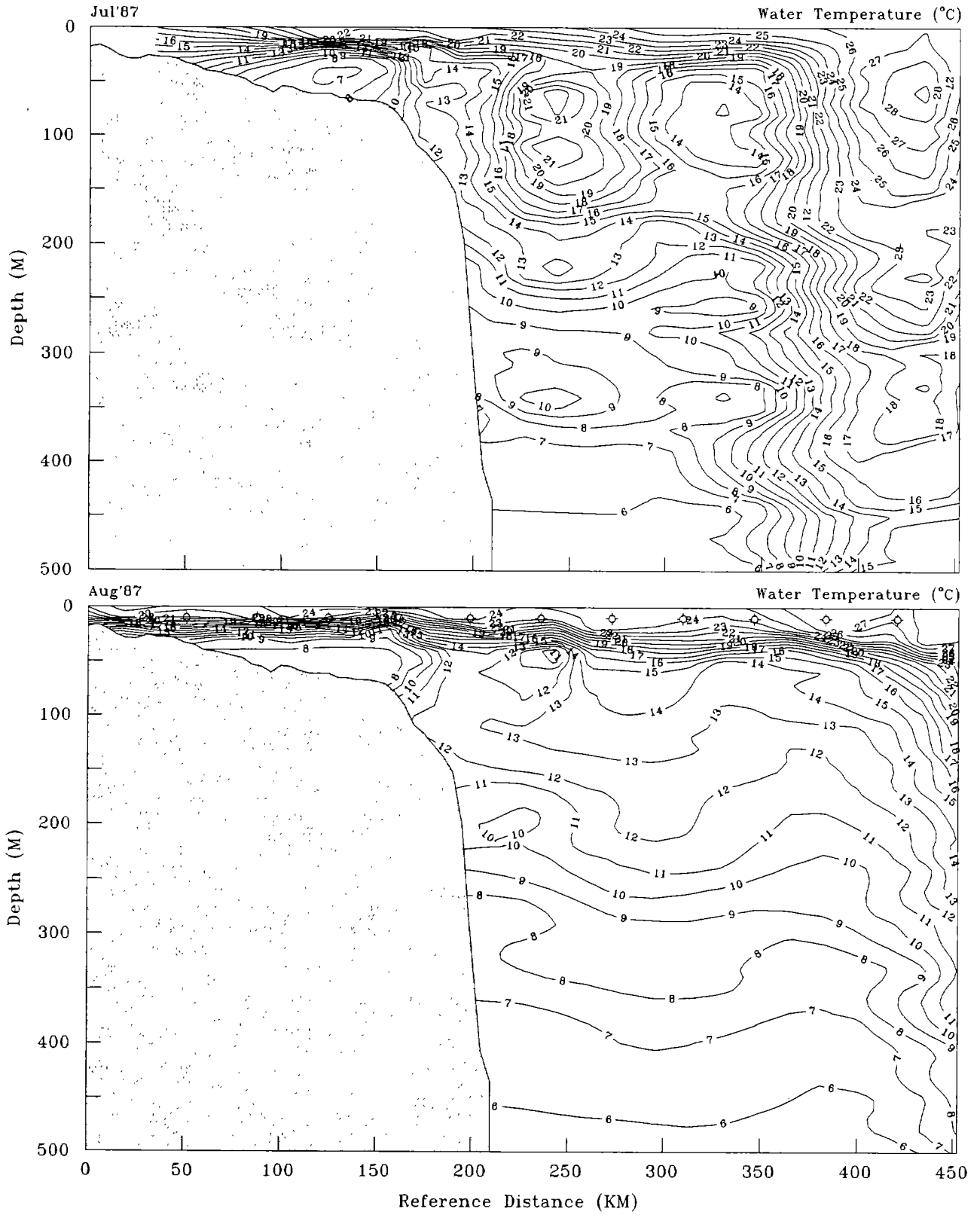


Figure 59. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Middle Atlantic Bight transect during July and August 1987.

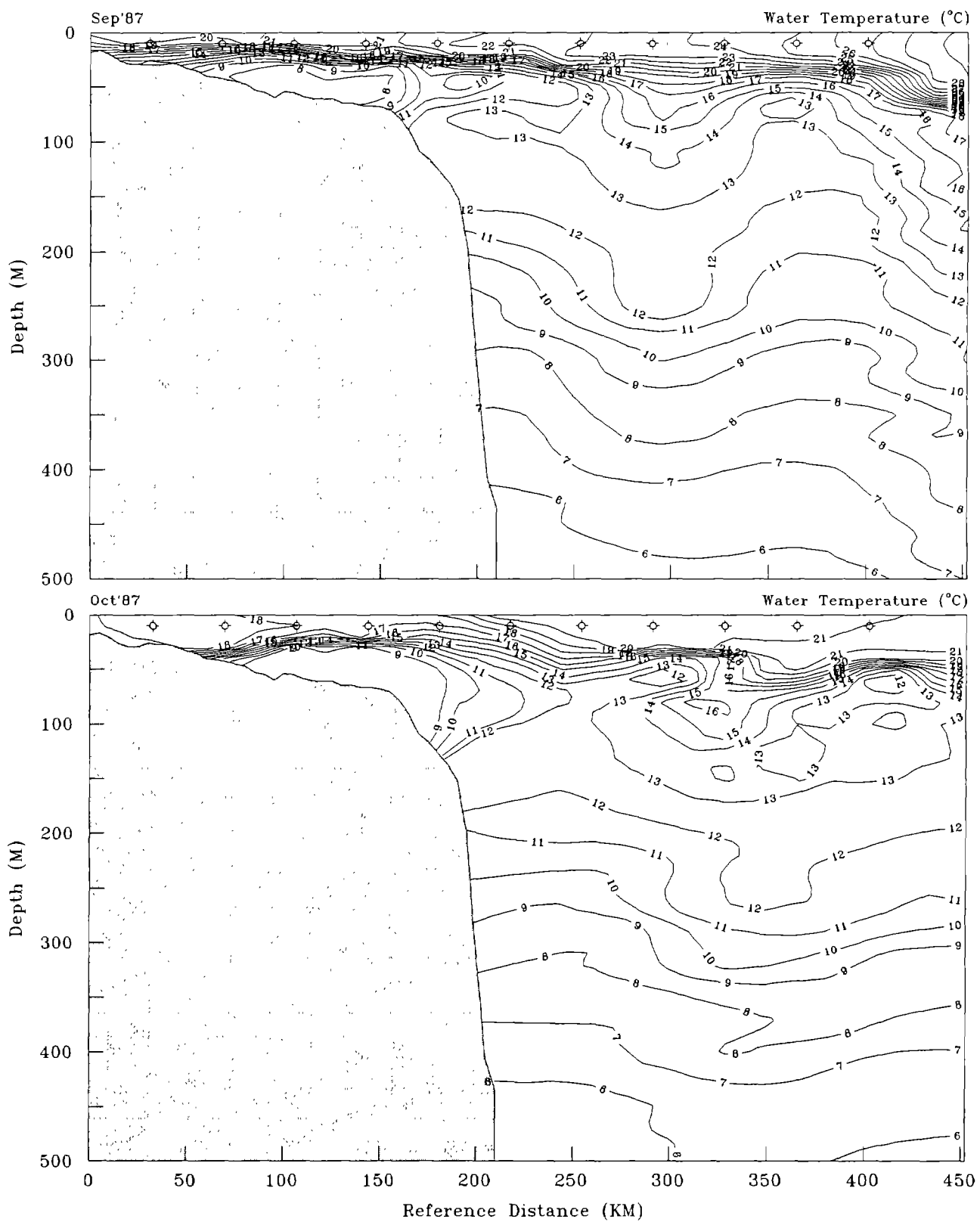


Figure 60. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (σ) along the Middle Atlantic Bight transect during September and October 1987.

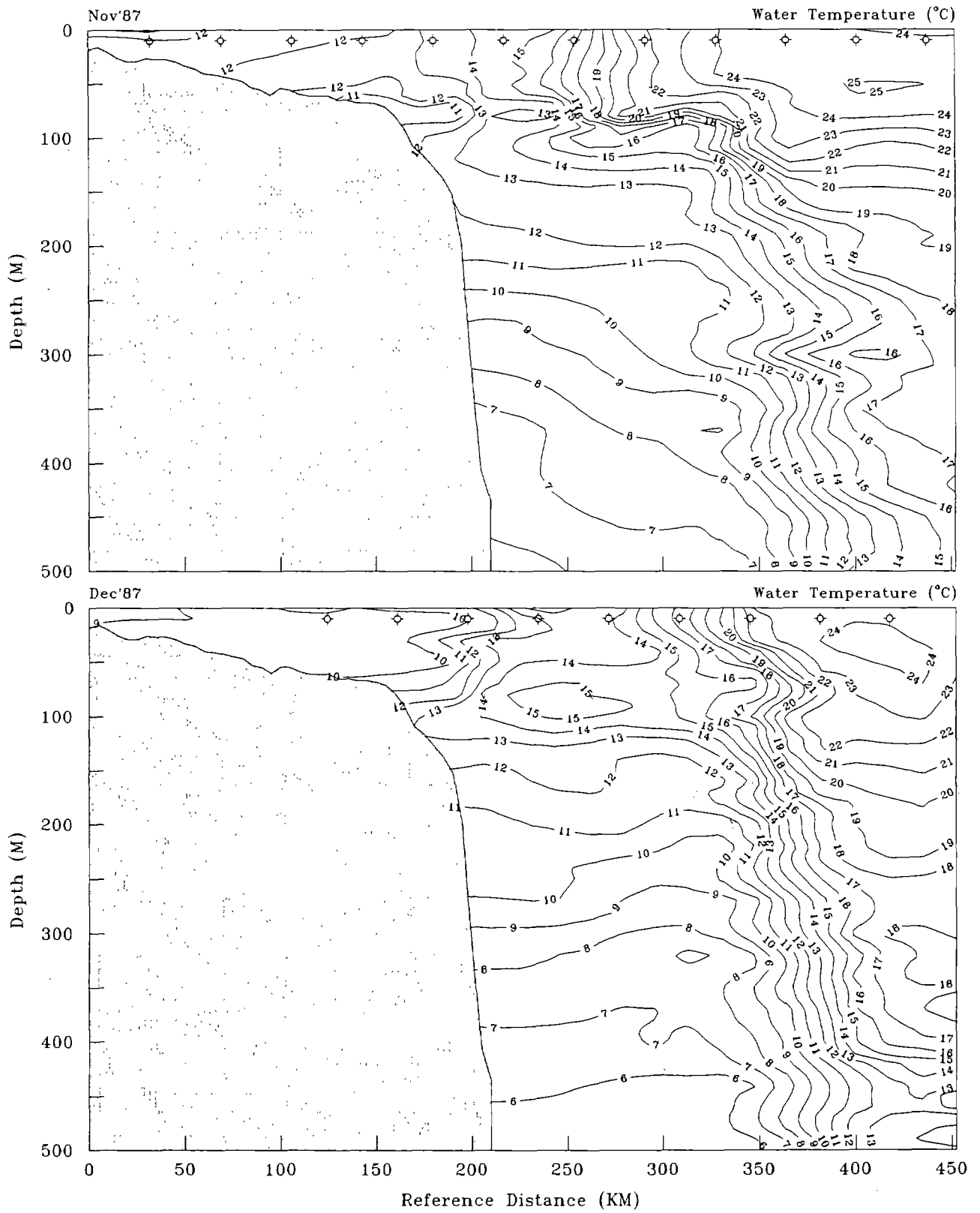


Figure 61. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (⊠) along the Middle Atlantic Bight transect during November and December 1987.

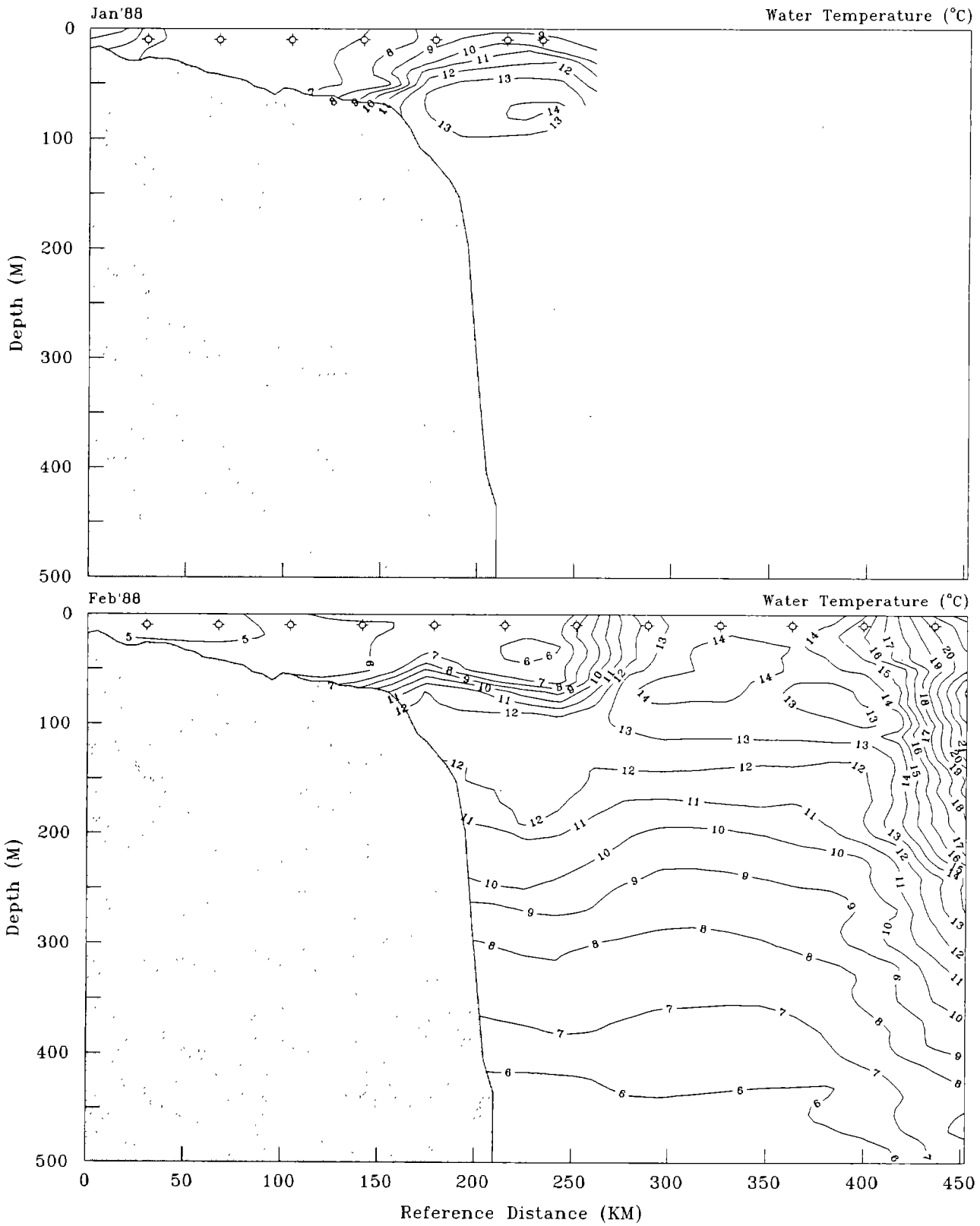


Figure 62. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (◻) along the Middle Atlantic Bight transect during January and February 1988.

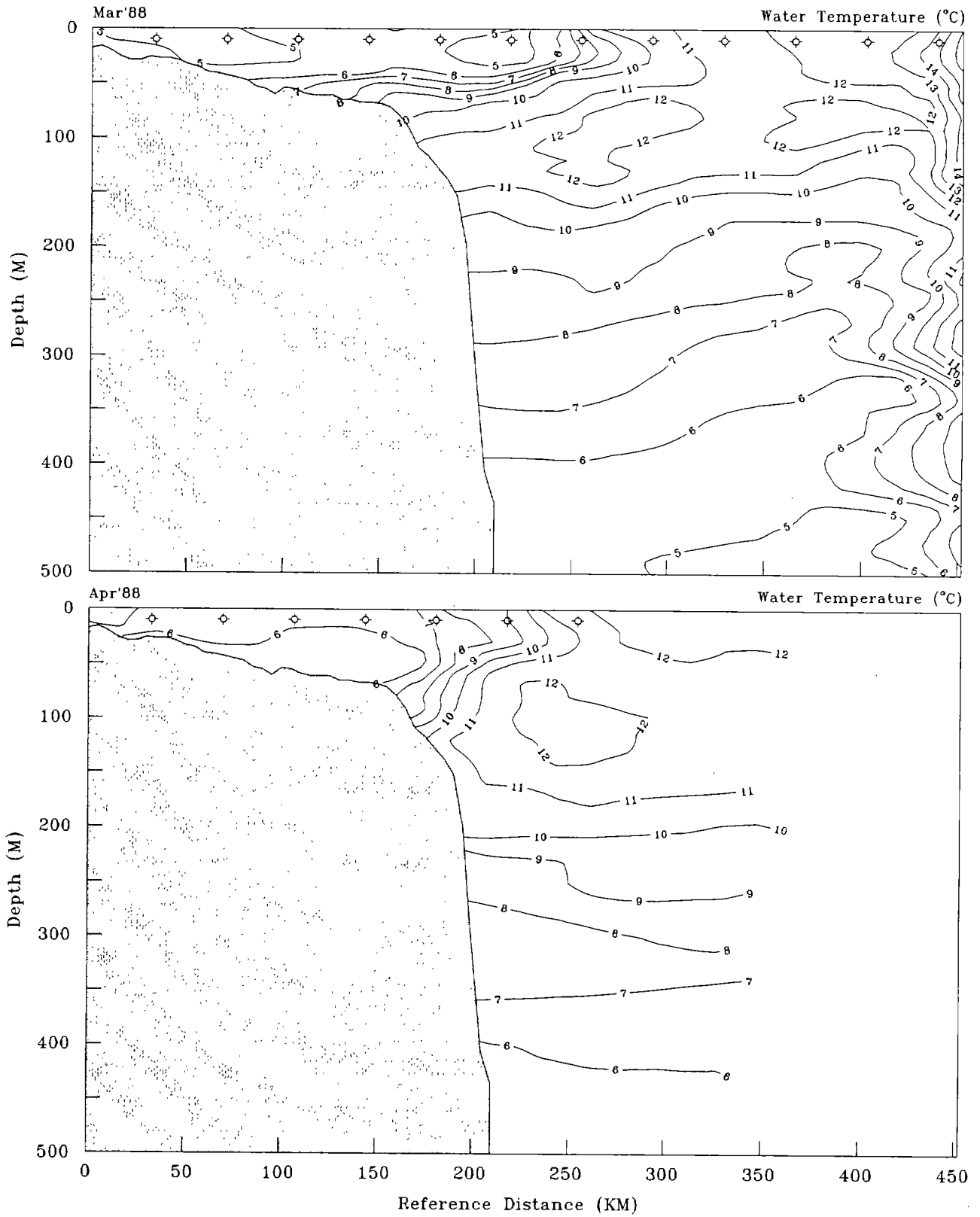


Figure 63. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during March and April 1988.

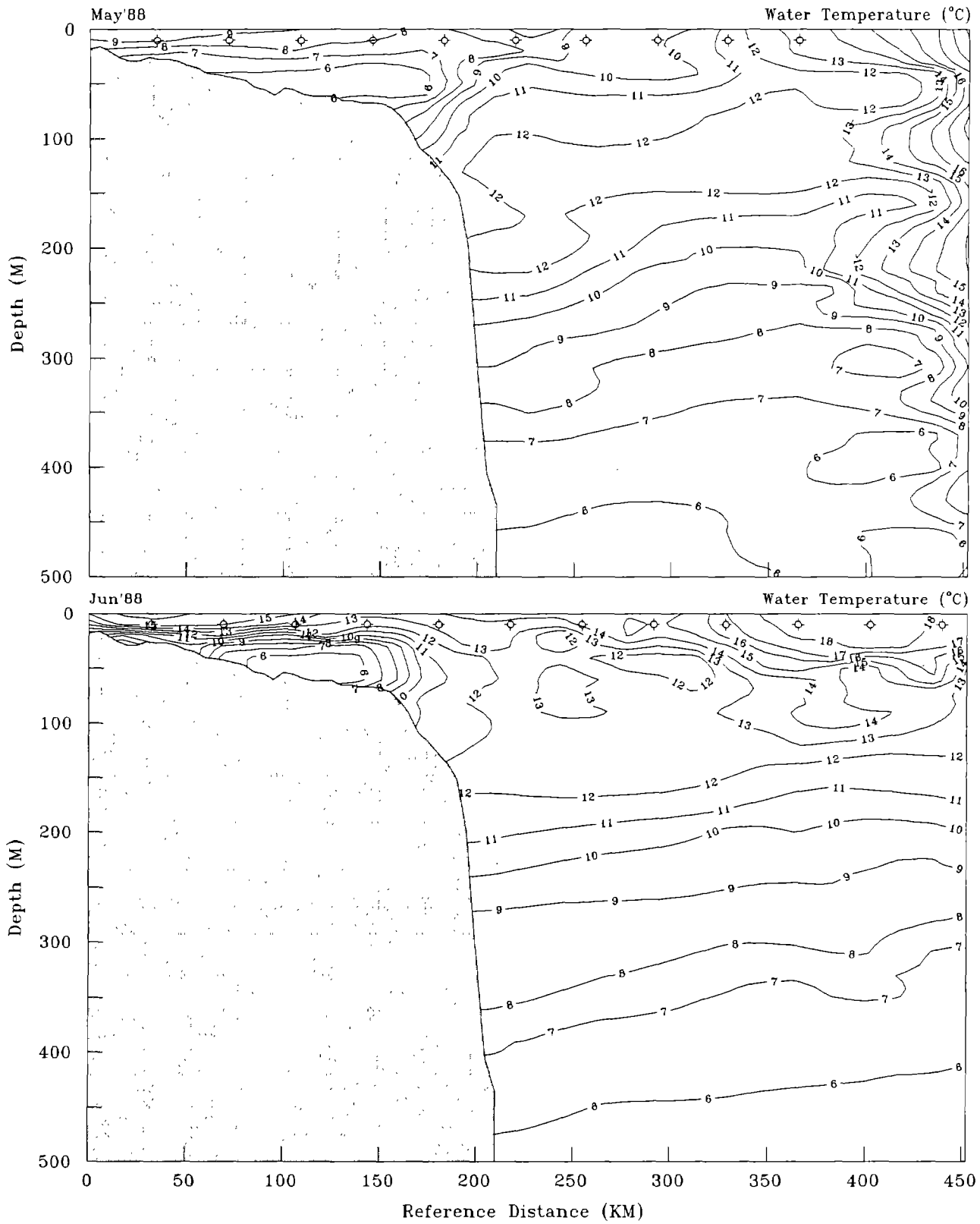


Figure 64. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1988.

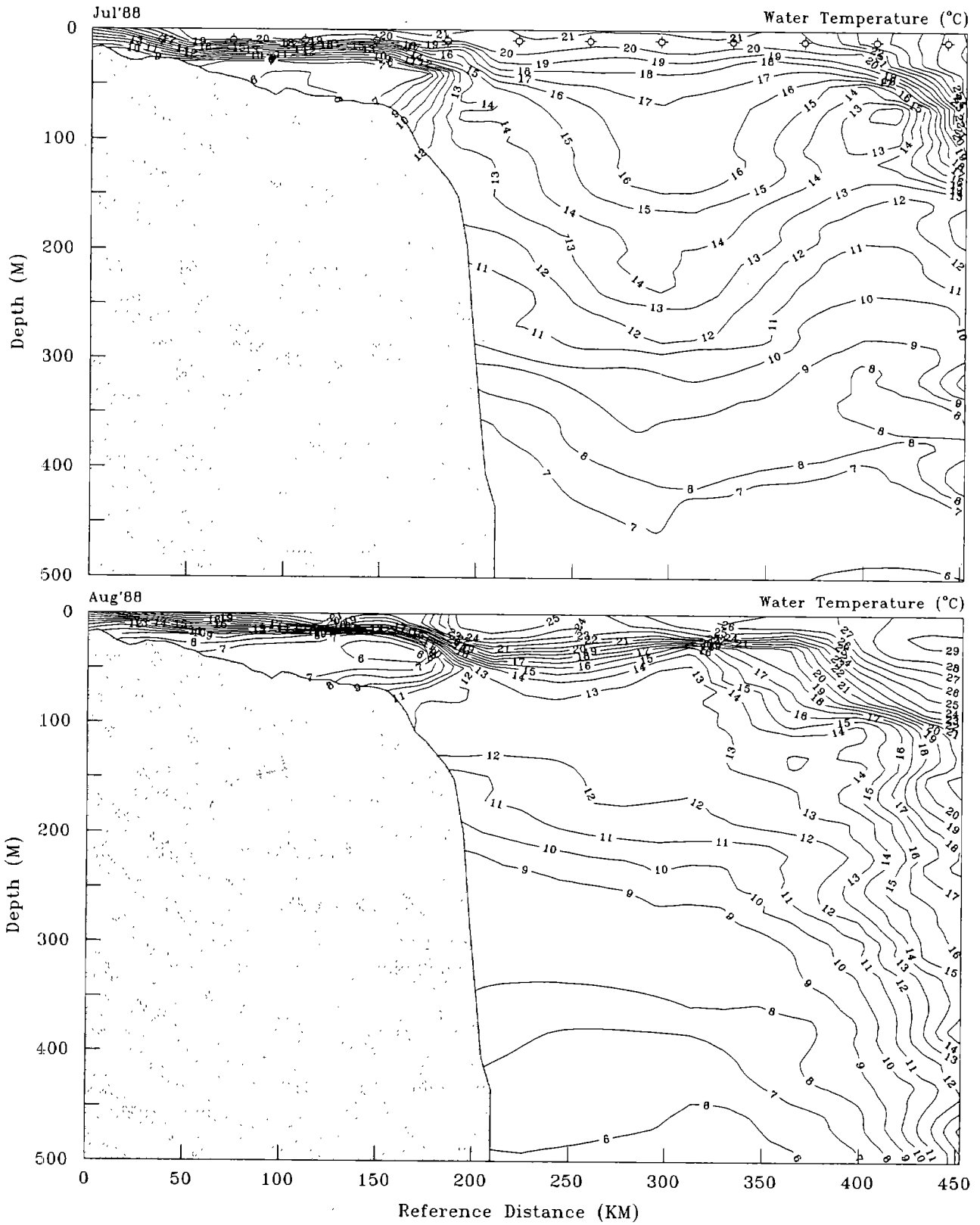


Figure 65. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during July and August 1988.

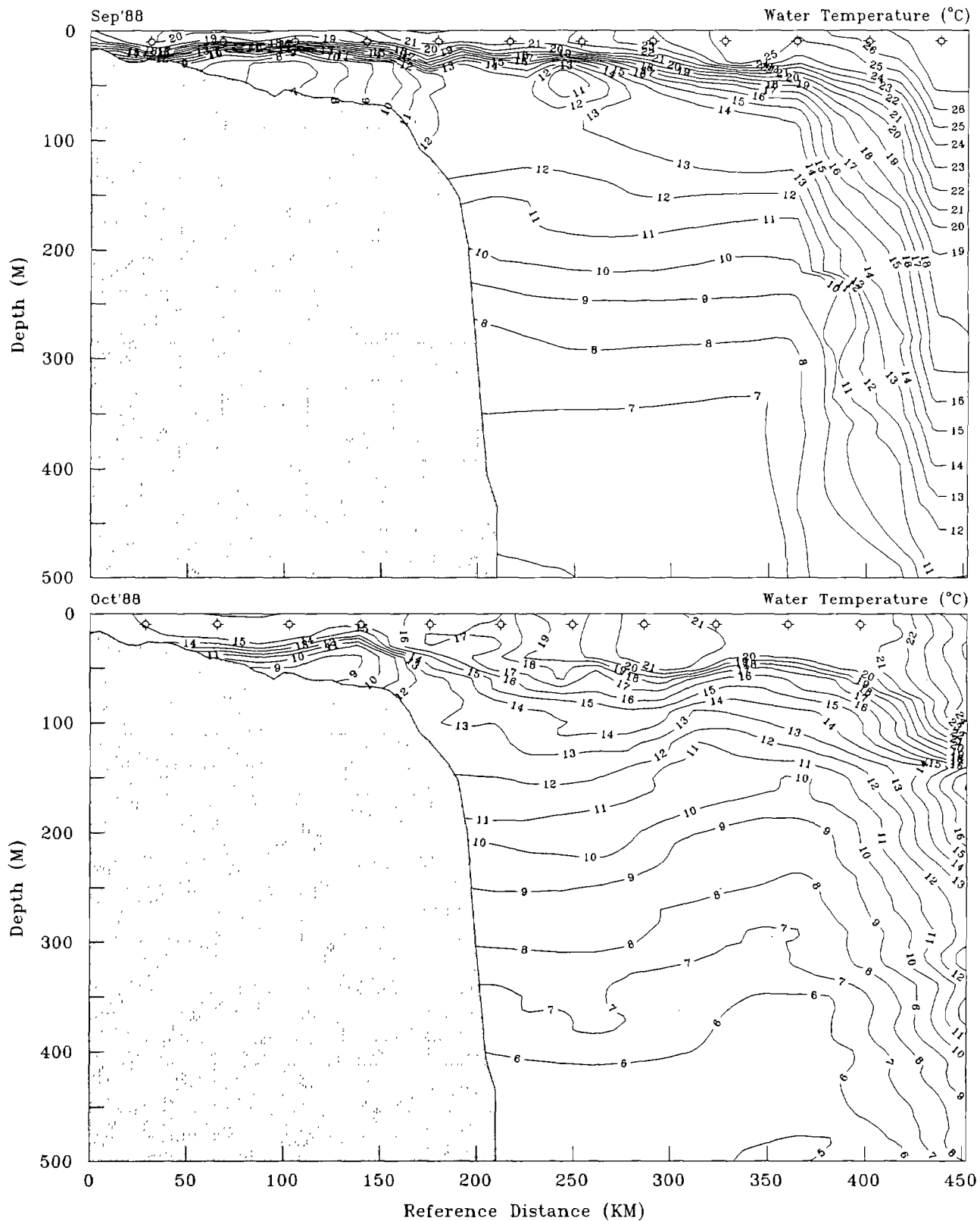


Figure 66. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1988.

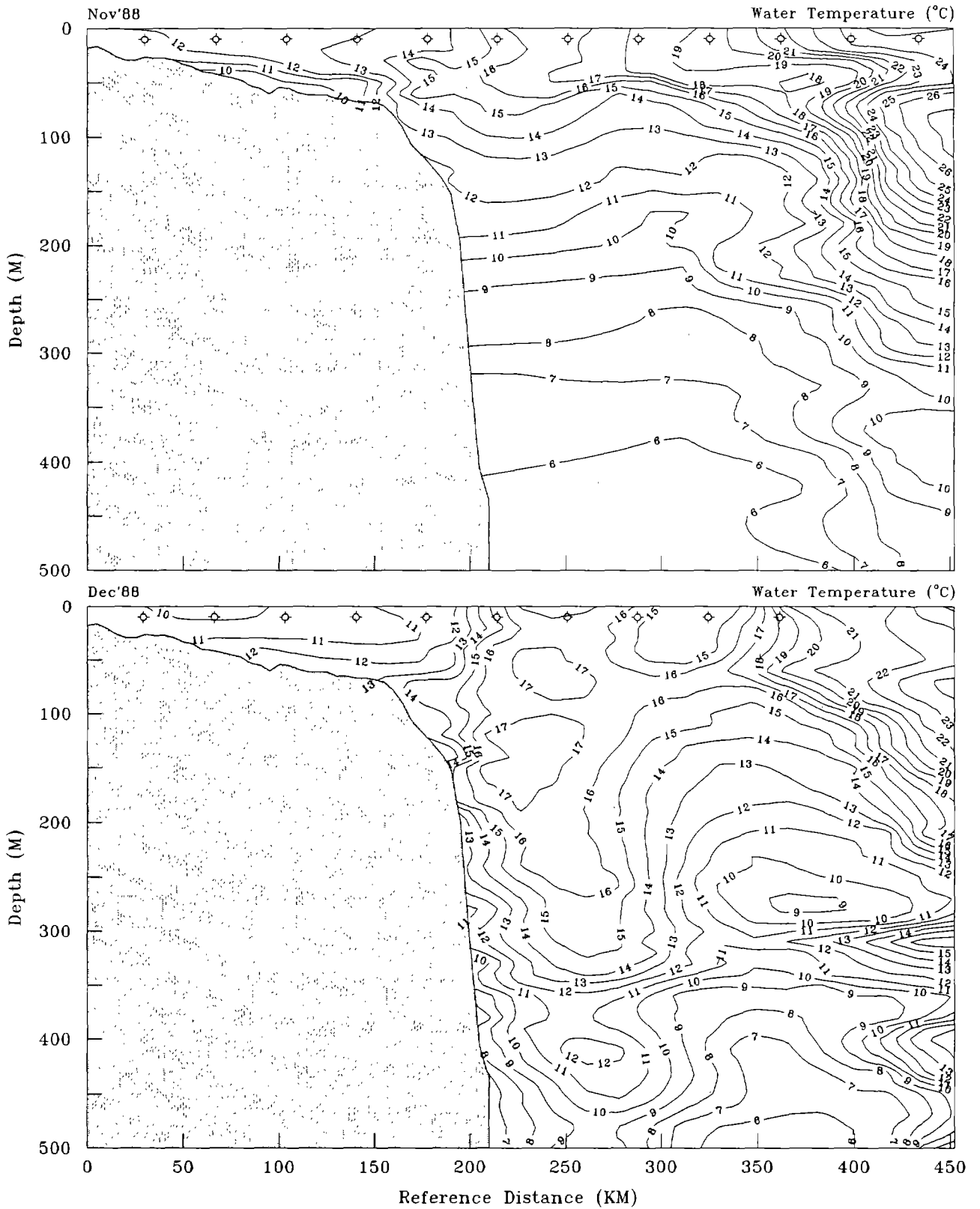


Figure 67. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1988.

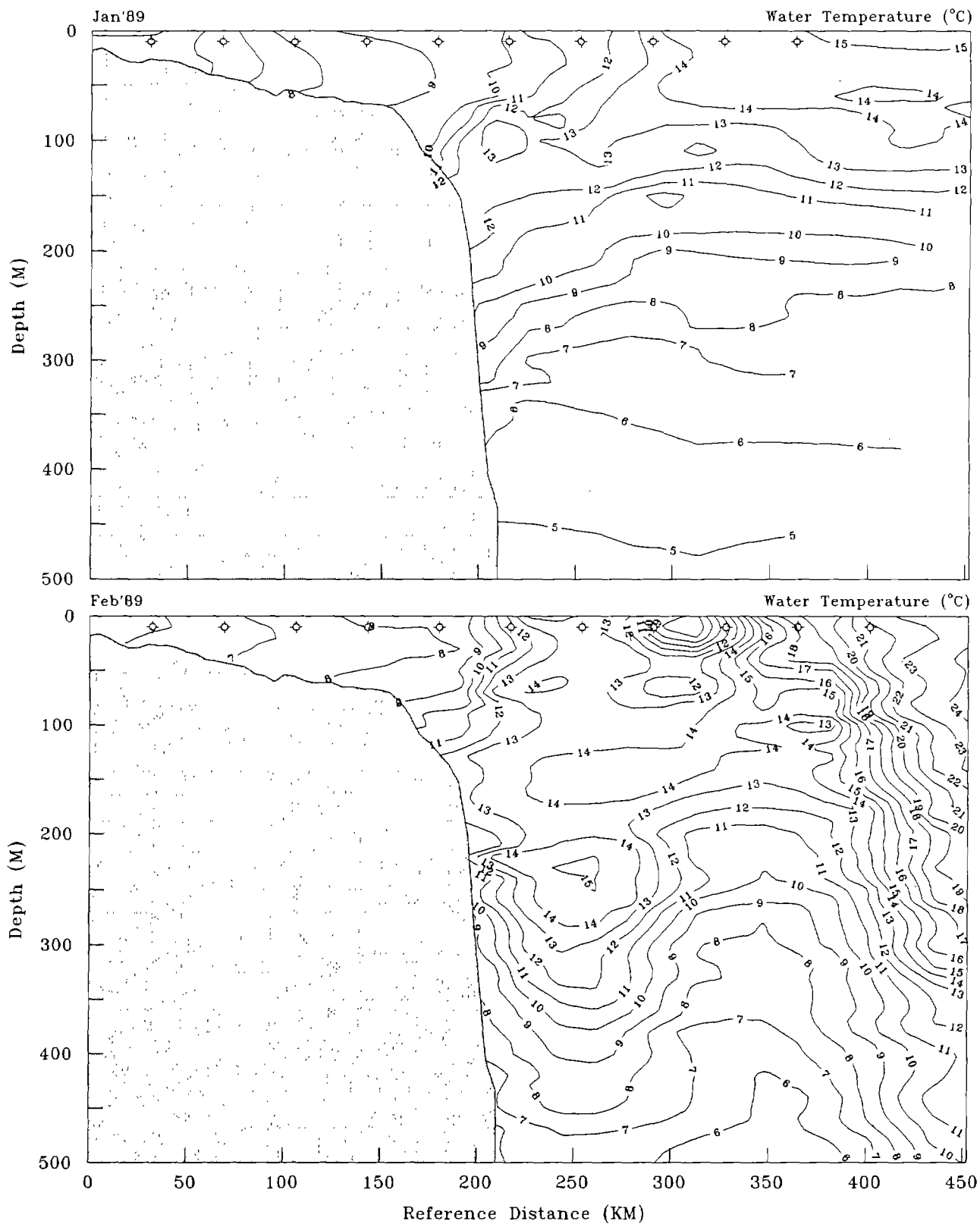


Figure 68. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (⊠) along the Middle Atlantic Bight transect during January and February 1989.

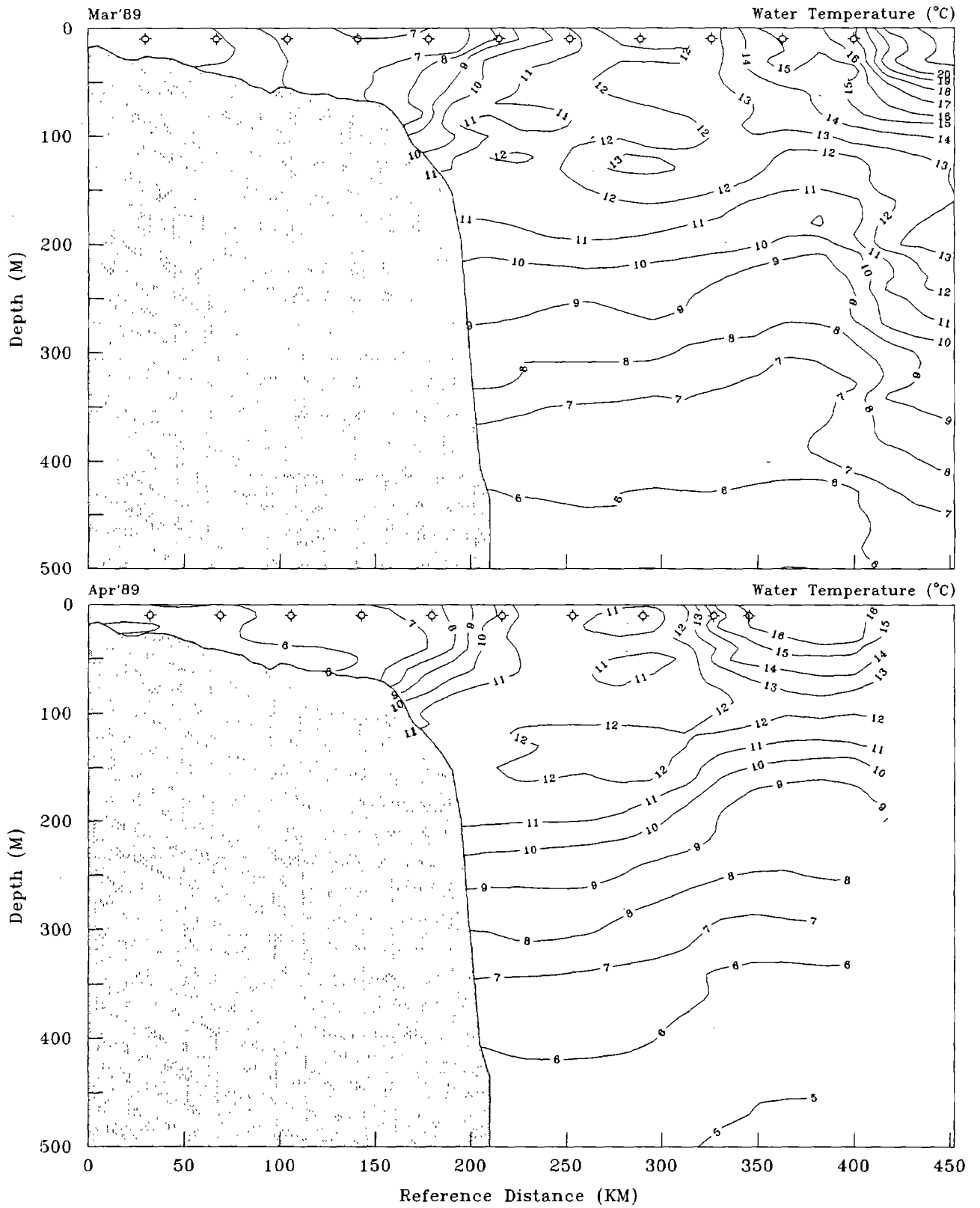


Figure 69. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (◊) along the Middle Atlantic Bight transect during March and April 1989.

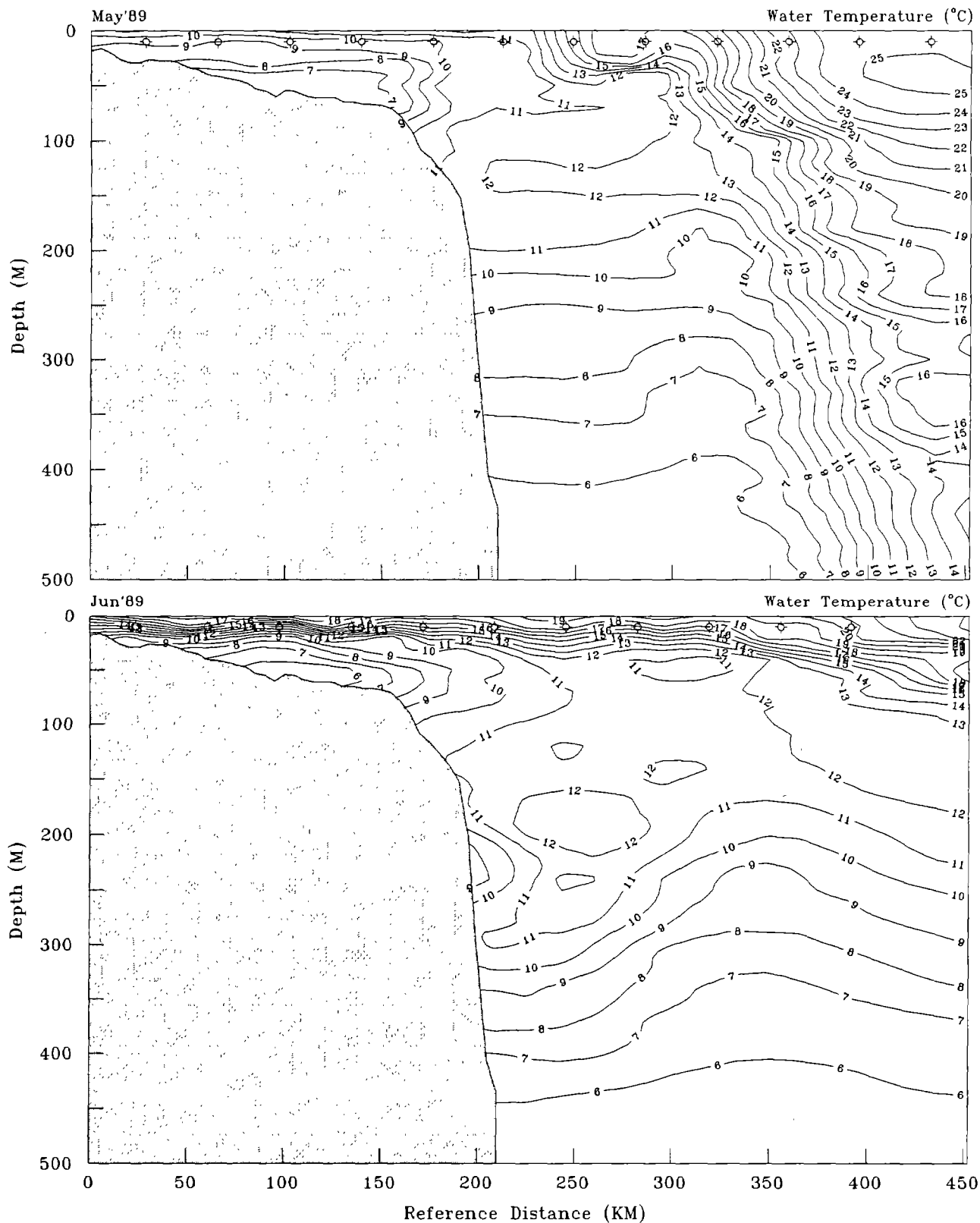


Figure 70. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (α) along the Middle Atlantic Bight transect during May and June 1989.

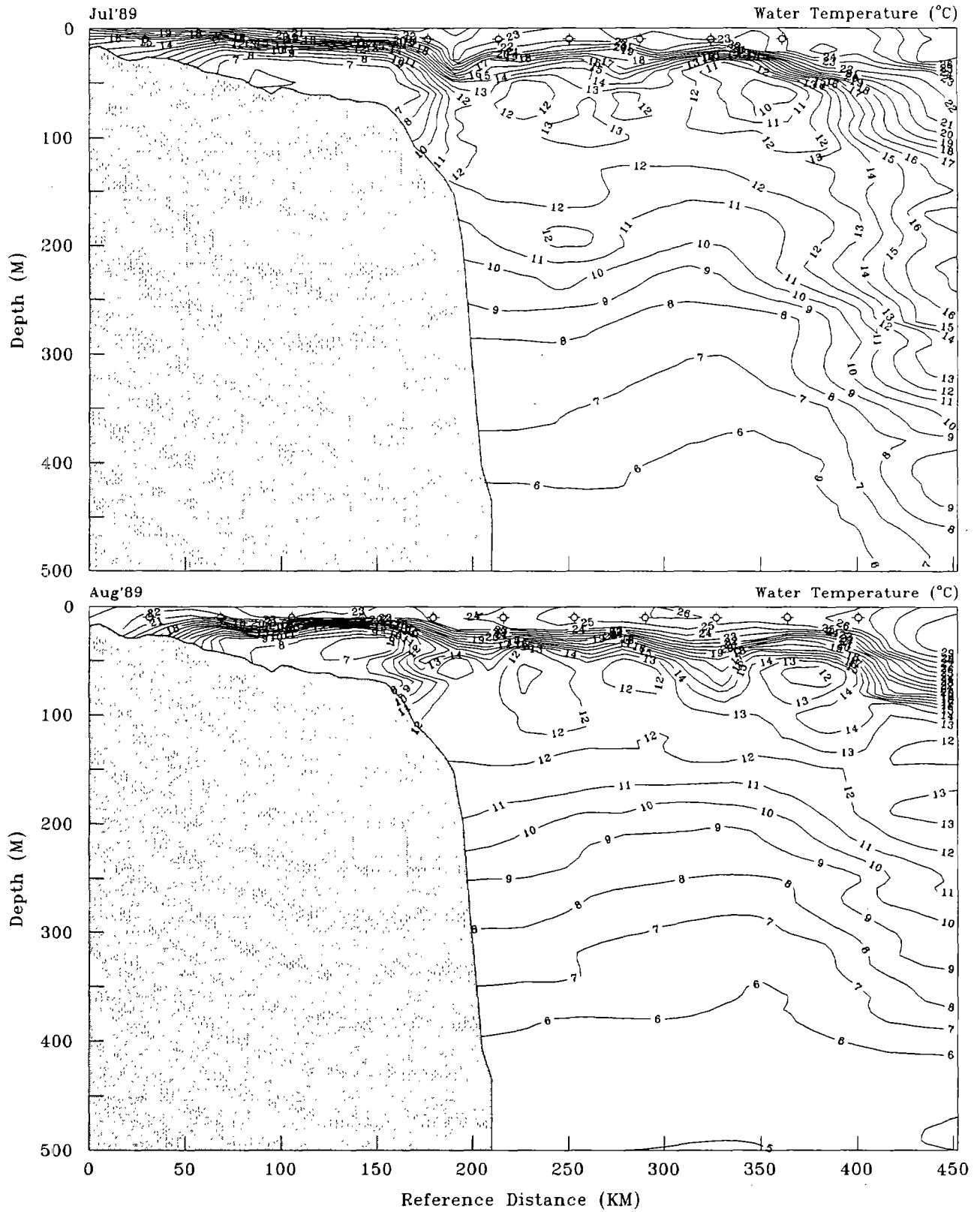


Figure 71. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during July and August 1989.

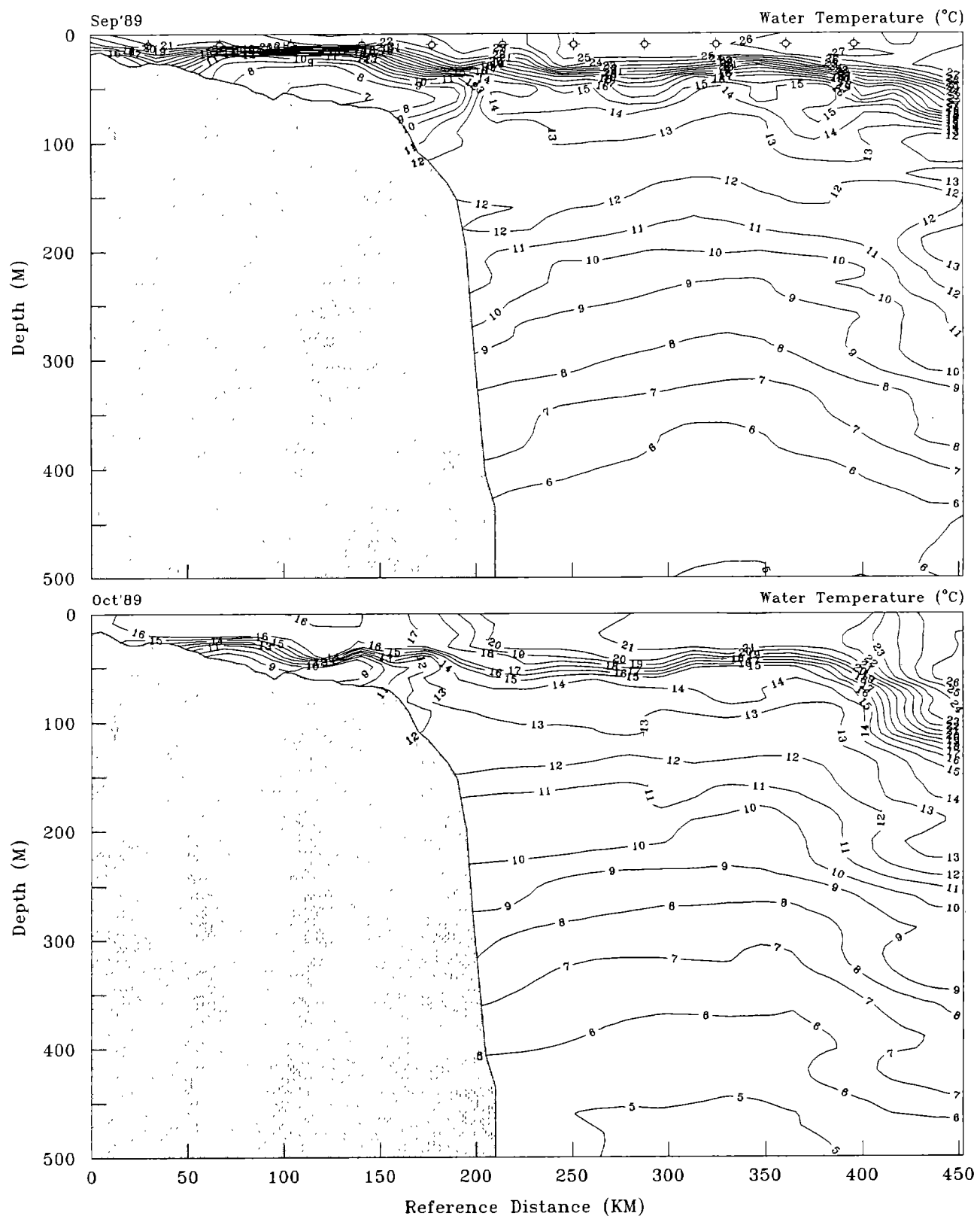


Figure 72. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1989.

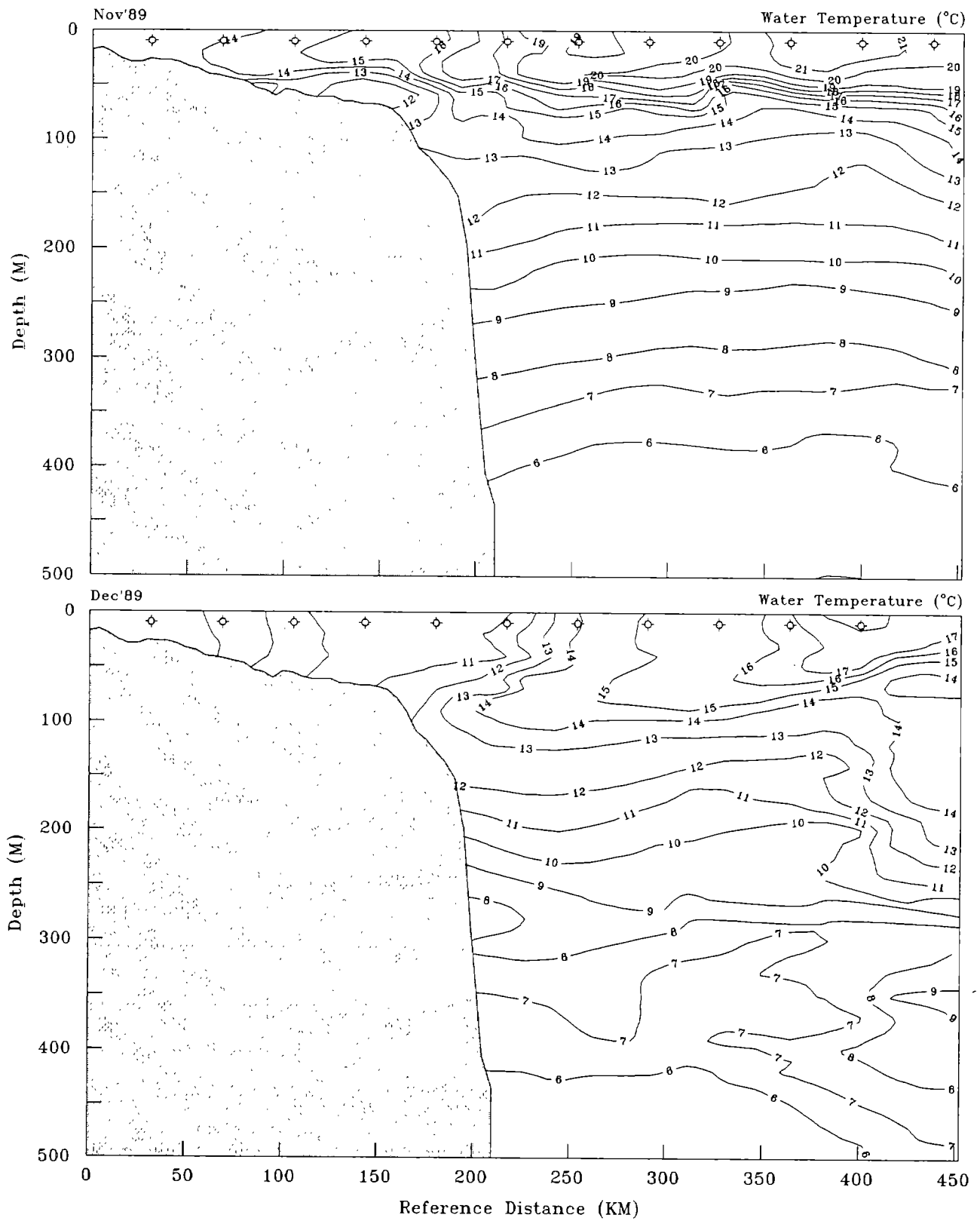


Figure 73. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1989.

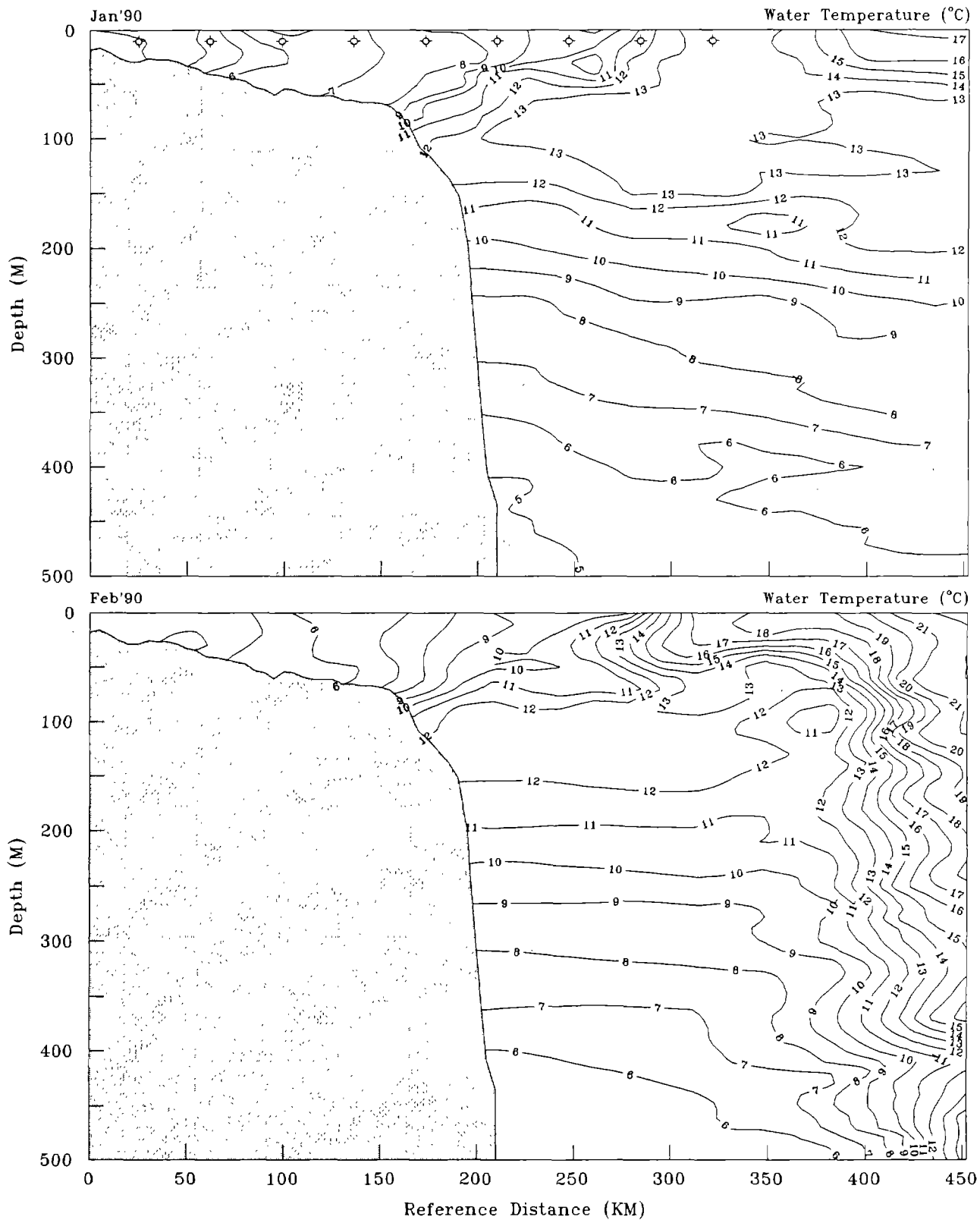


Figure 74. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during January and February 1990.

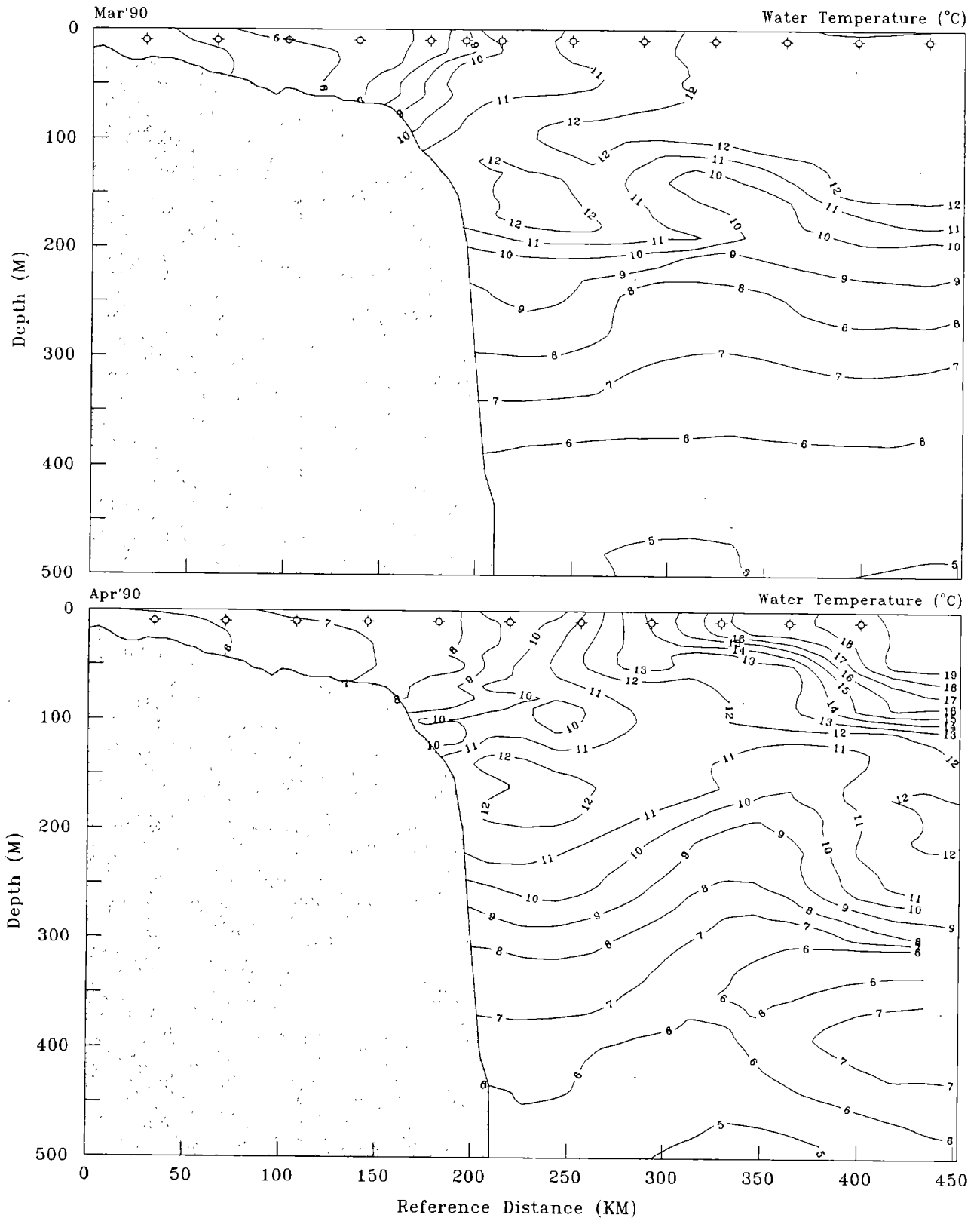


Figure 75. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during March and April 1990.

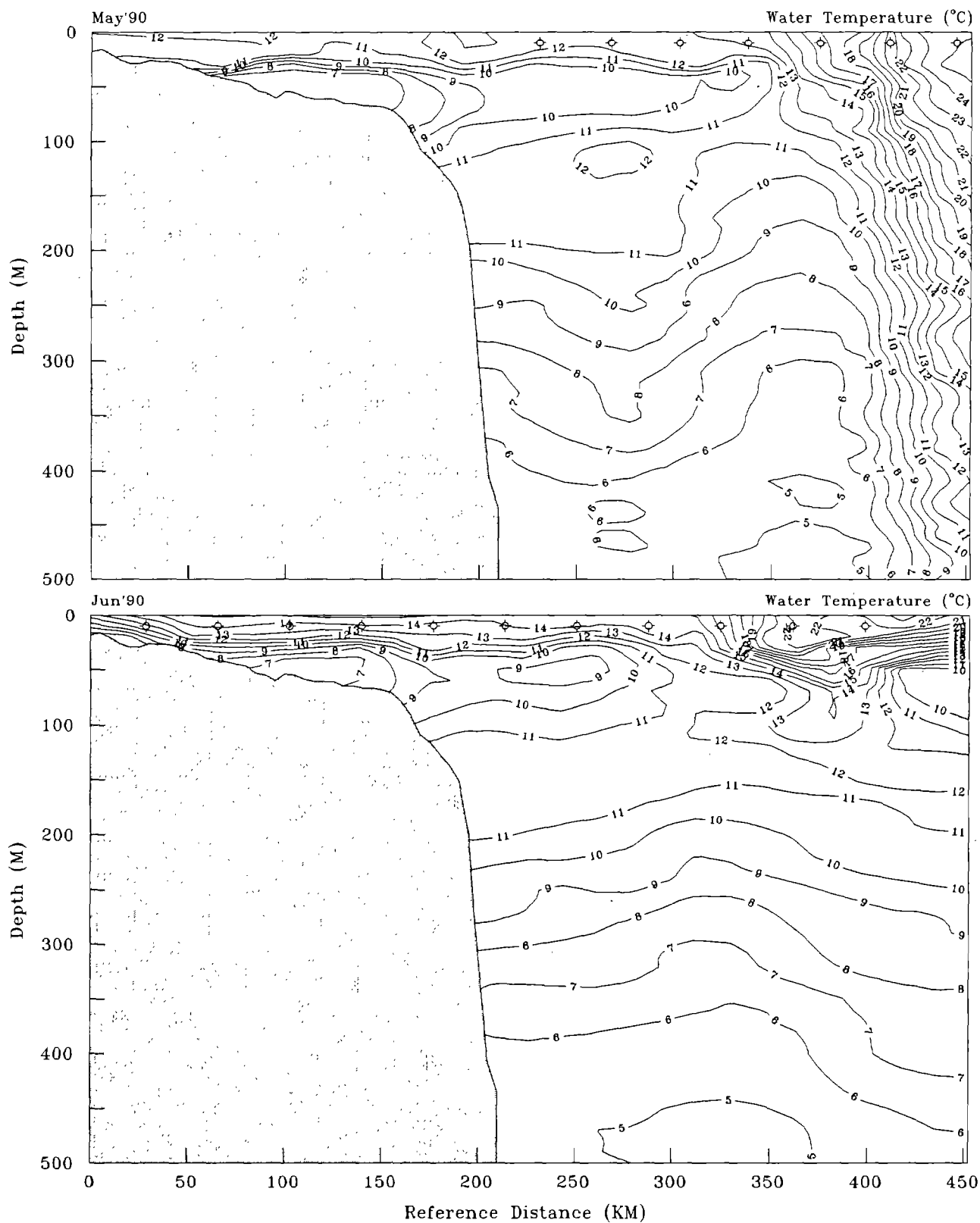


Figure 76. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during May and June 1990.

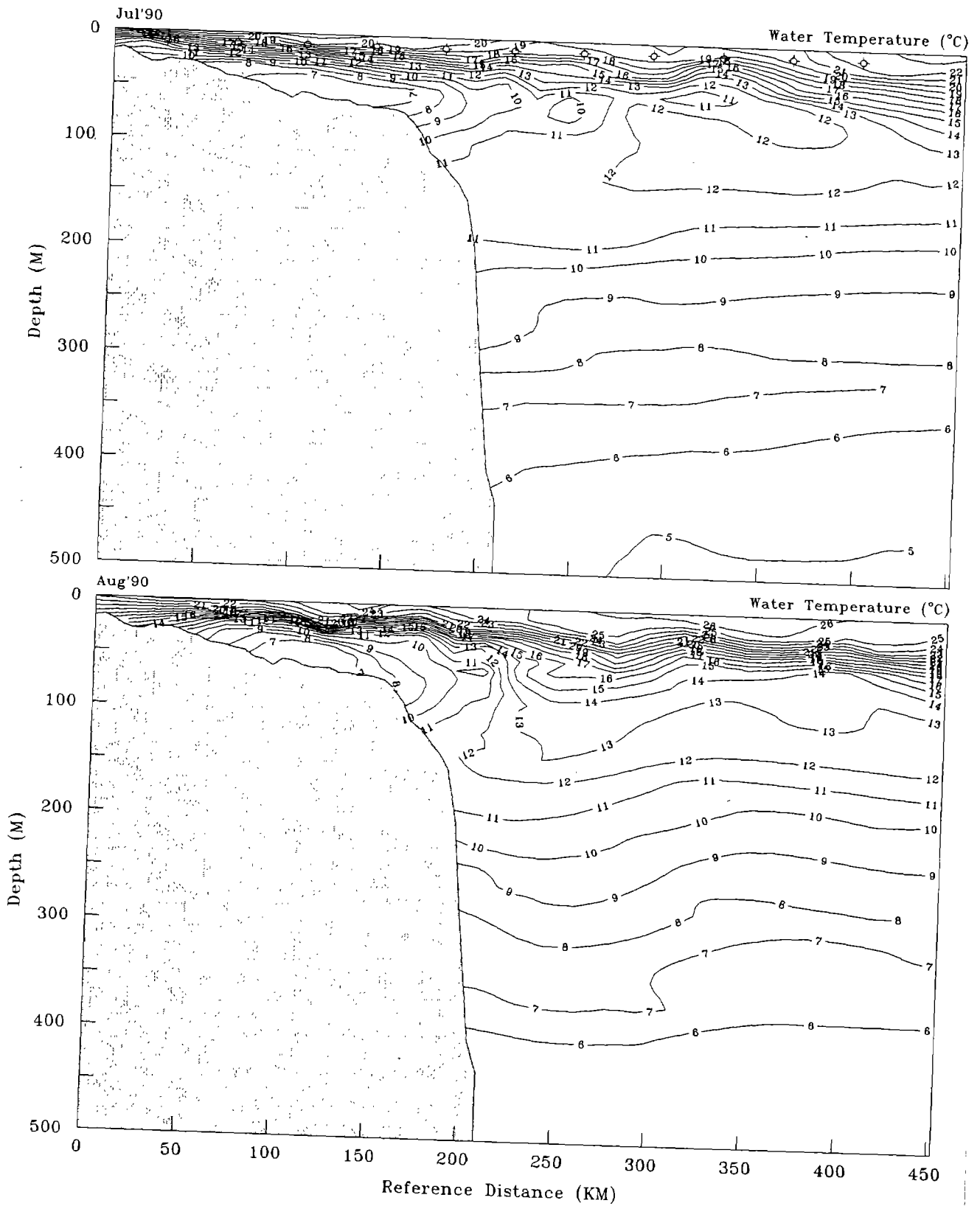


Figure 77. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (•) along the Middle Atlantic Bight transect during July and August 1990.

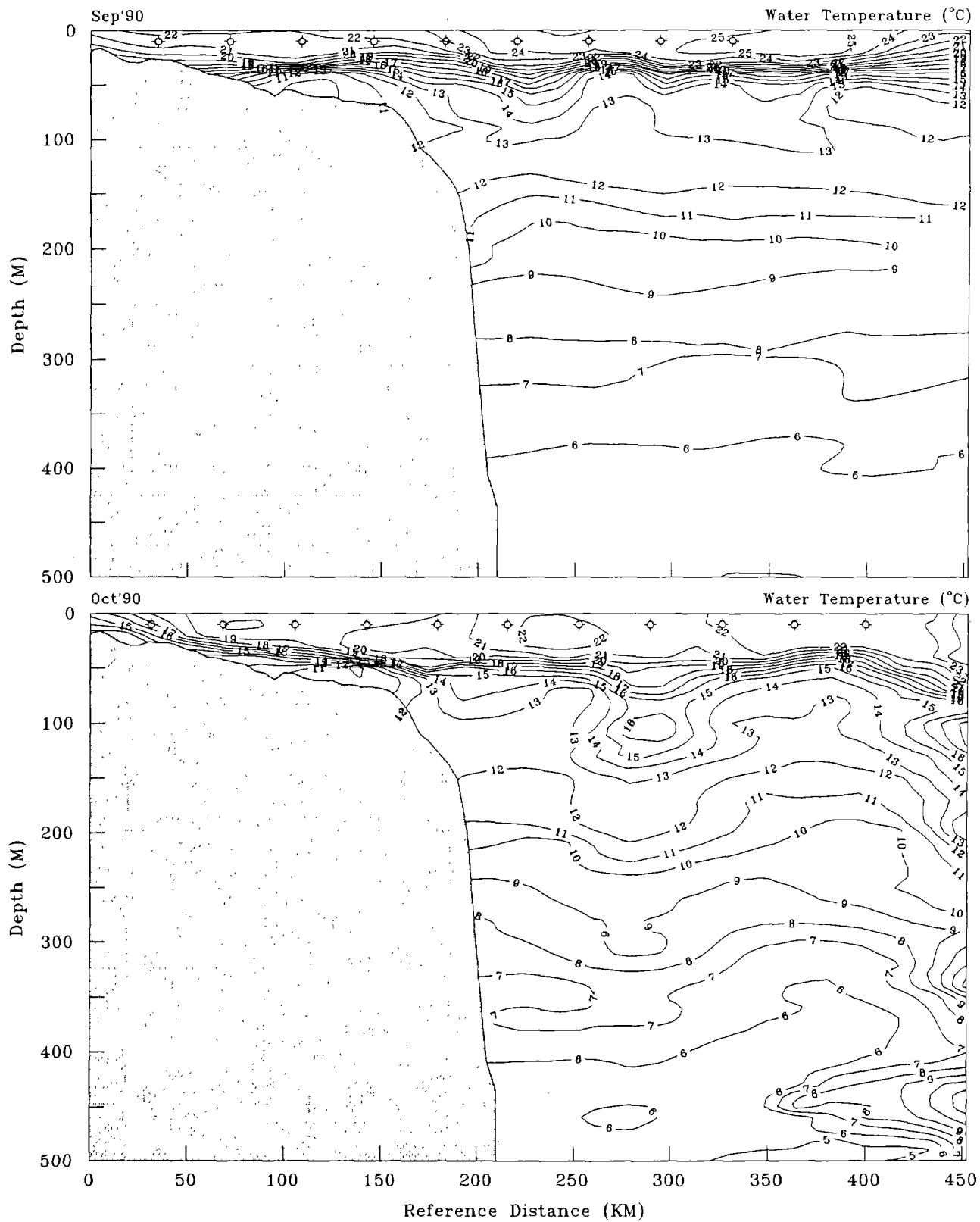


Figure 78. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1990.

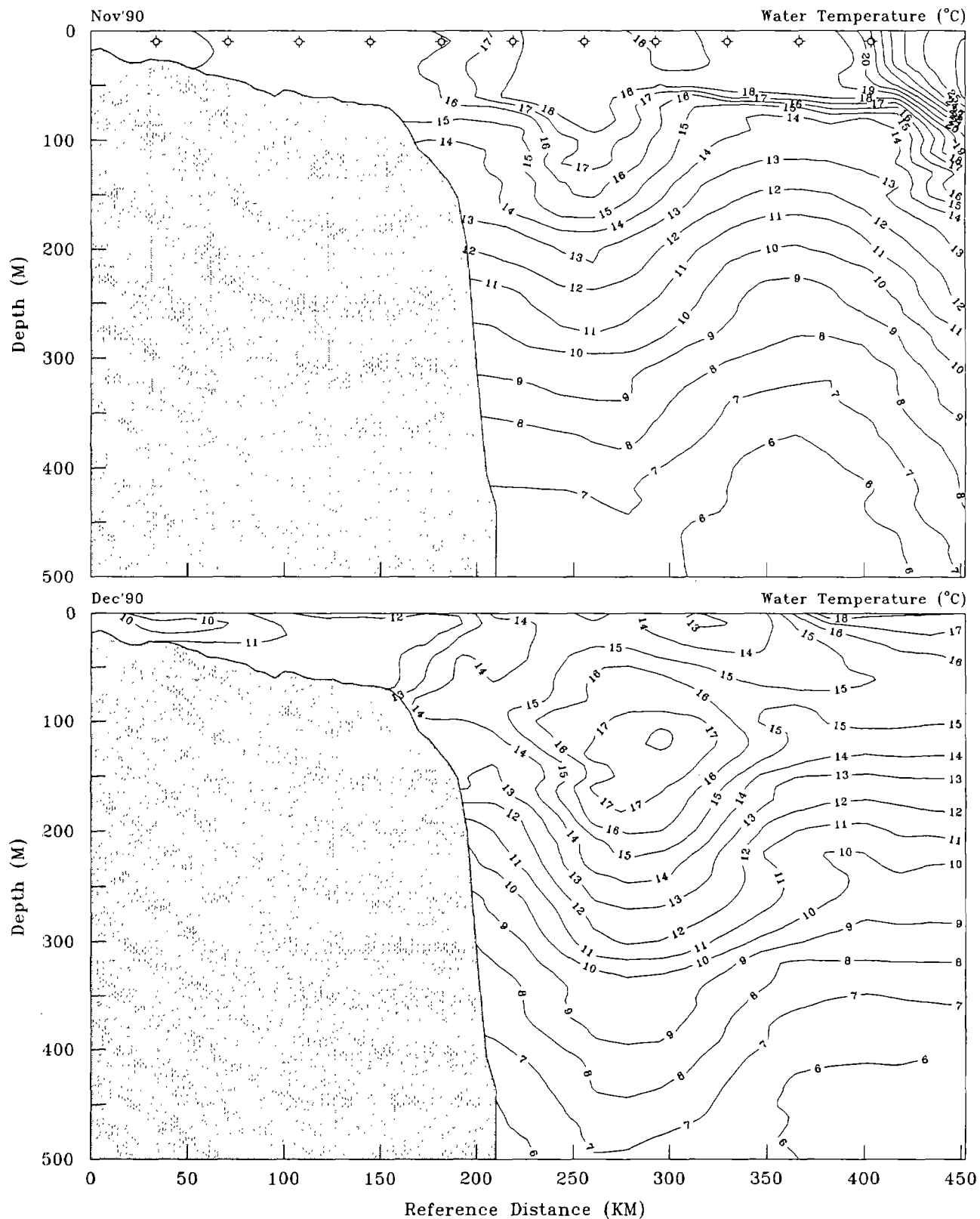


Figure 79. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1990.

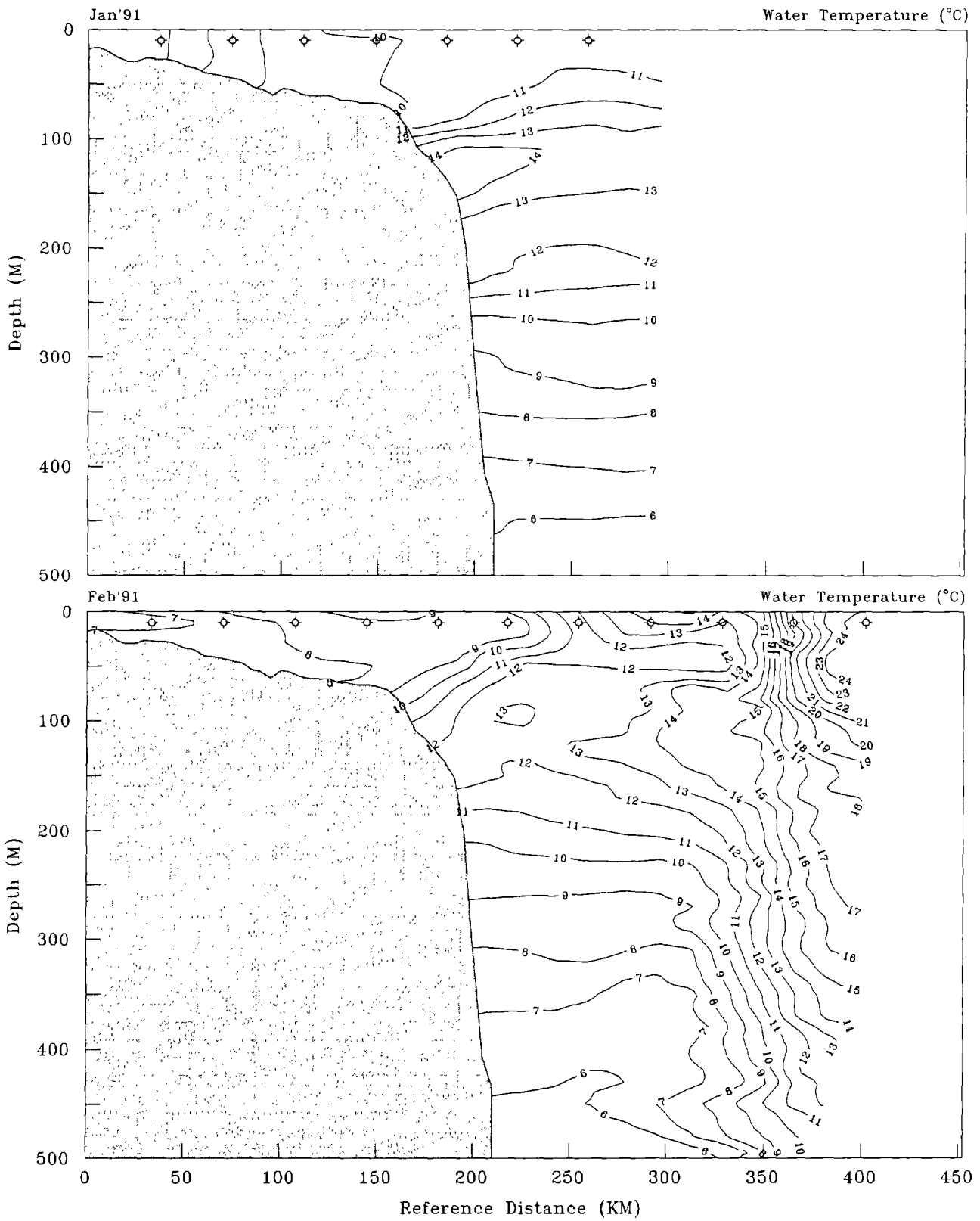


Figure 80. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Middle Atlantic Bight transect during January and February 1991.

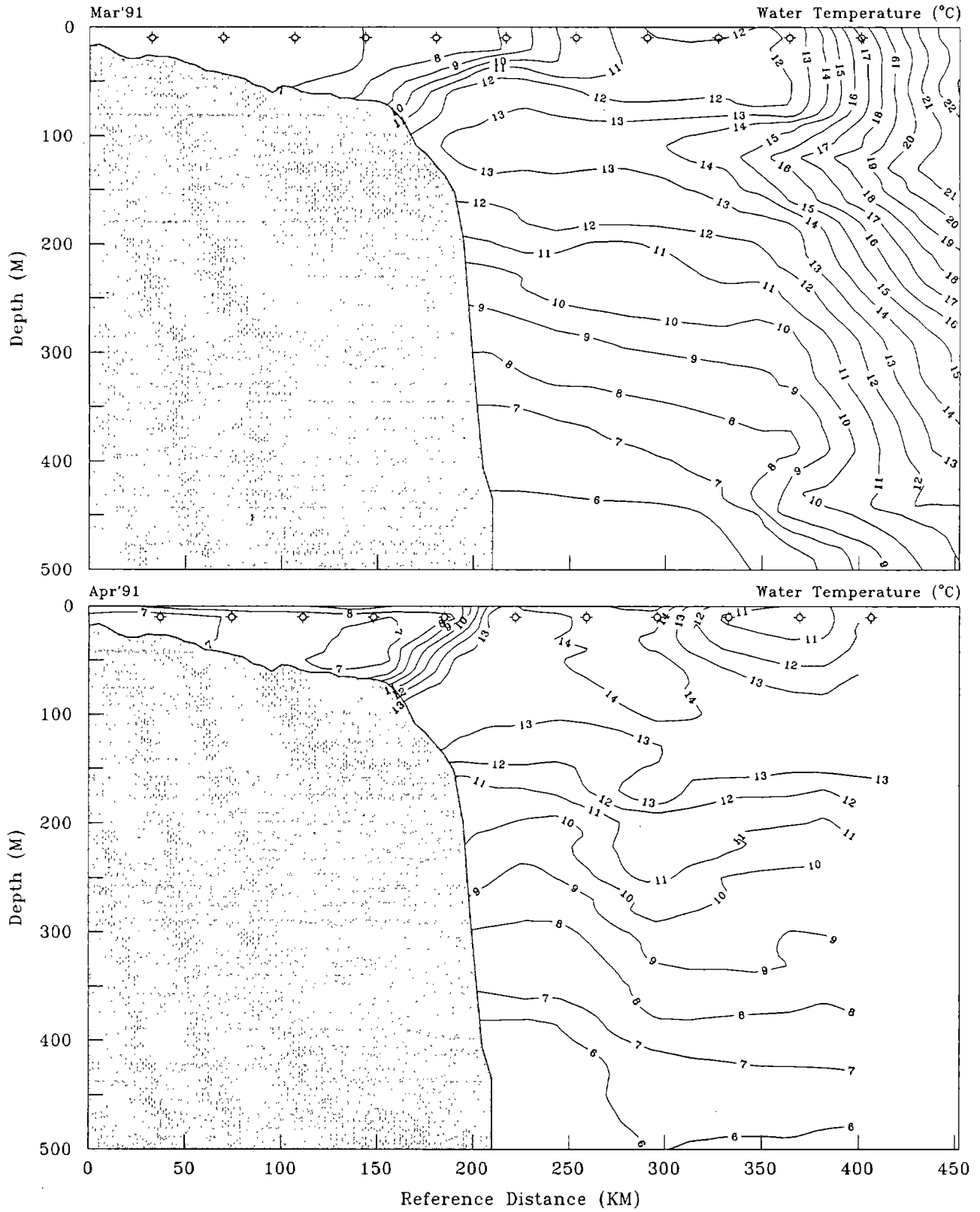


Figure 81. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (◻) along the Middle Atlantic Bight transect during March and April 1991.

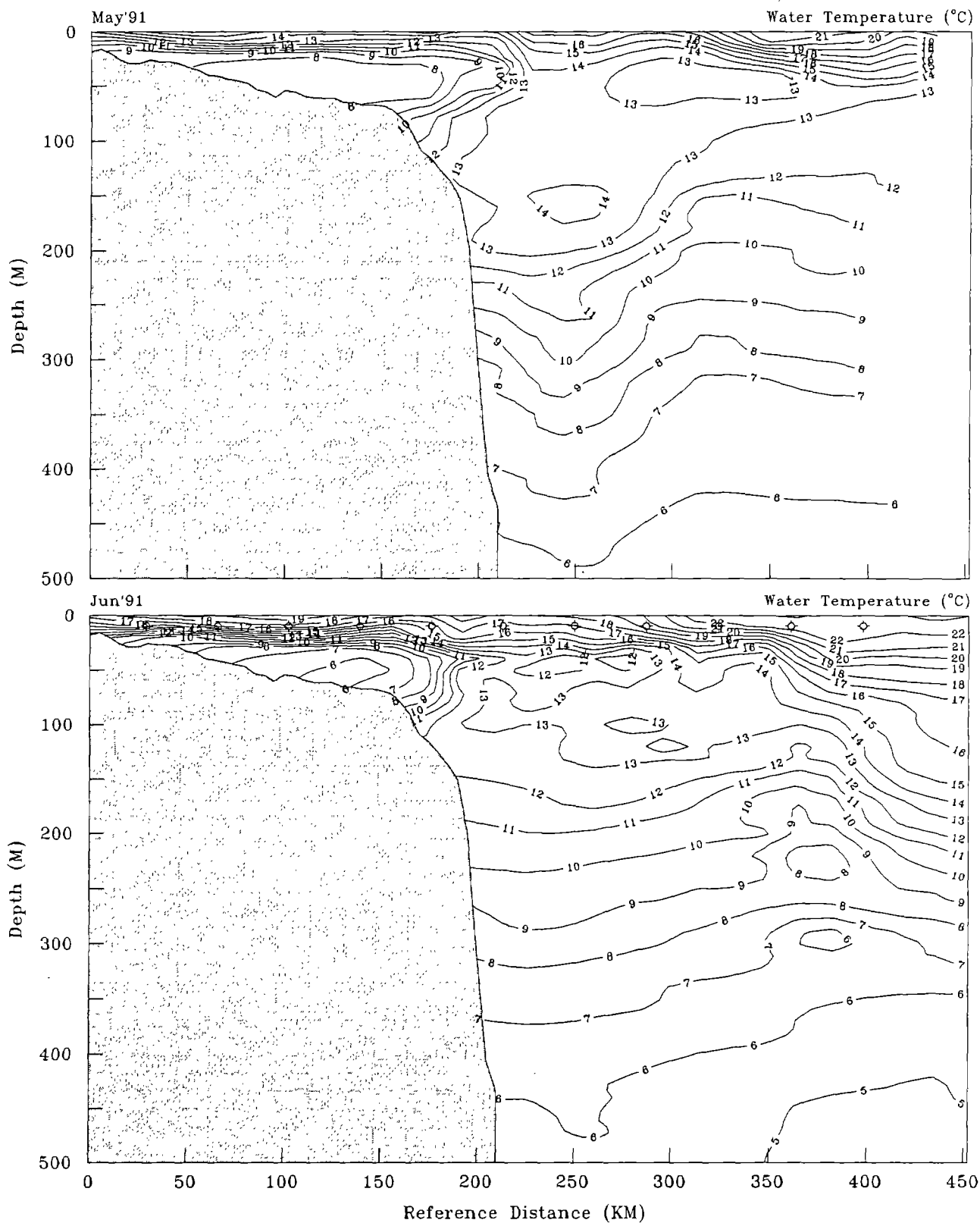


Figure 82. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (σ) along the Middle Atlantic Bight transect during May and June 1991.

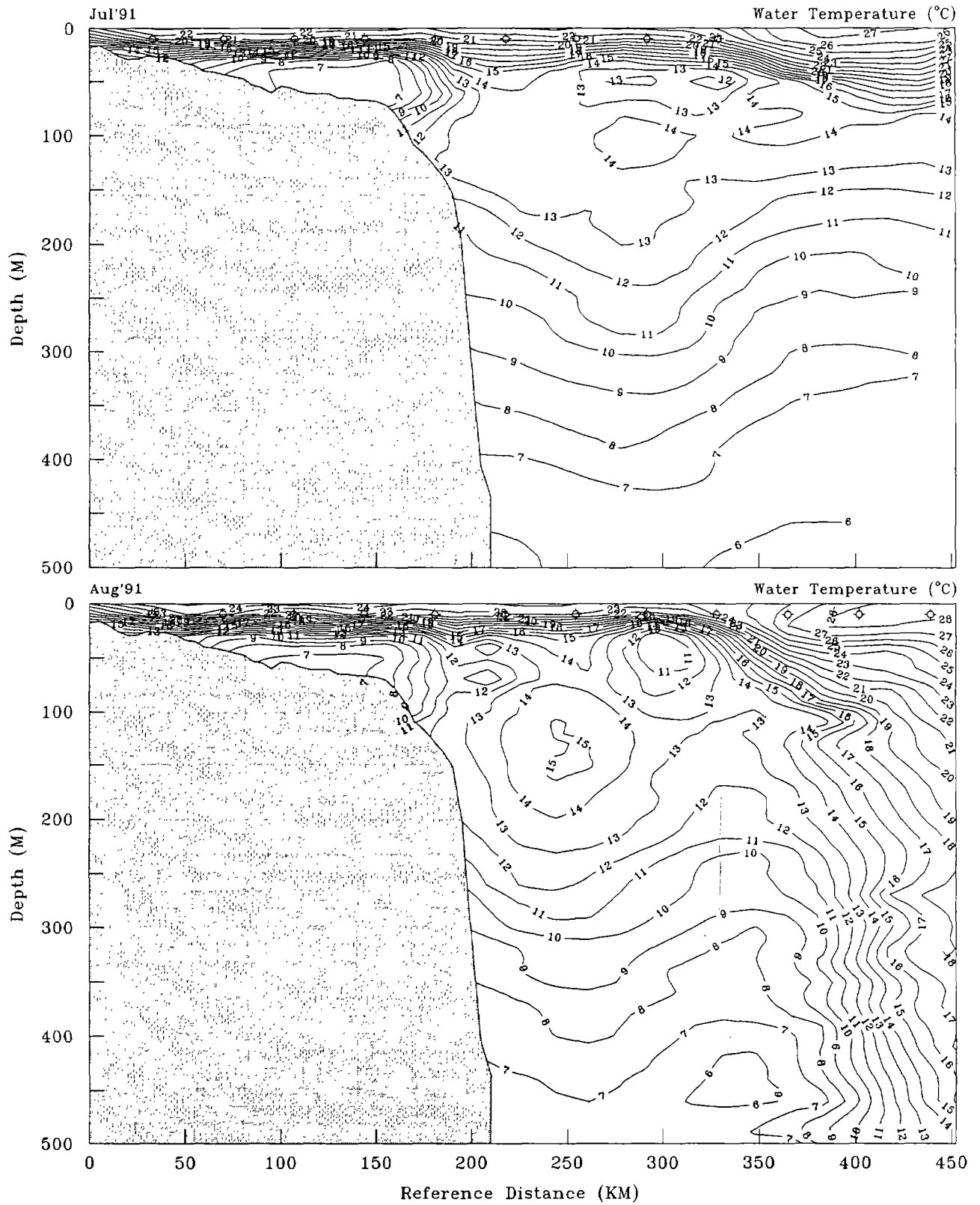


Figure 83. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during July and August 1991.

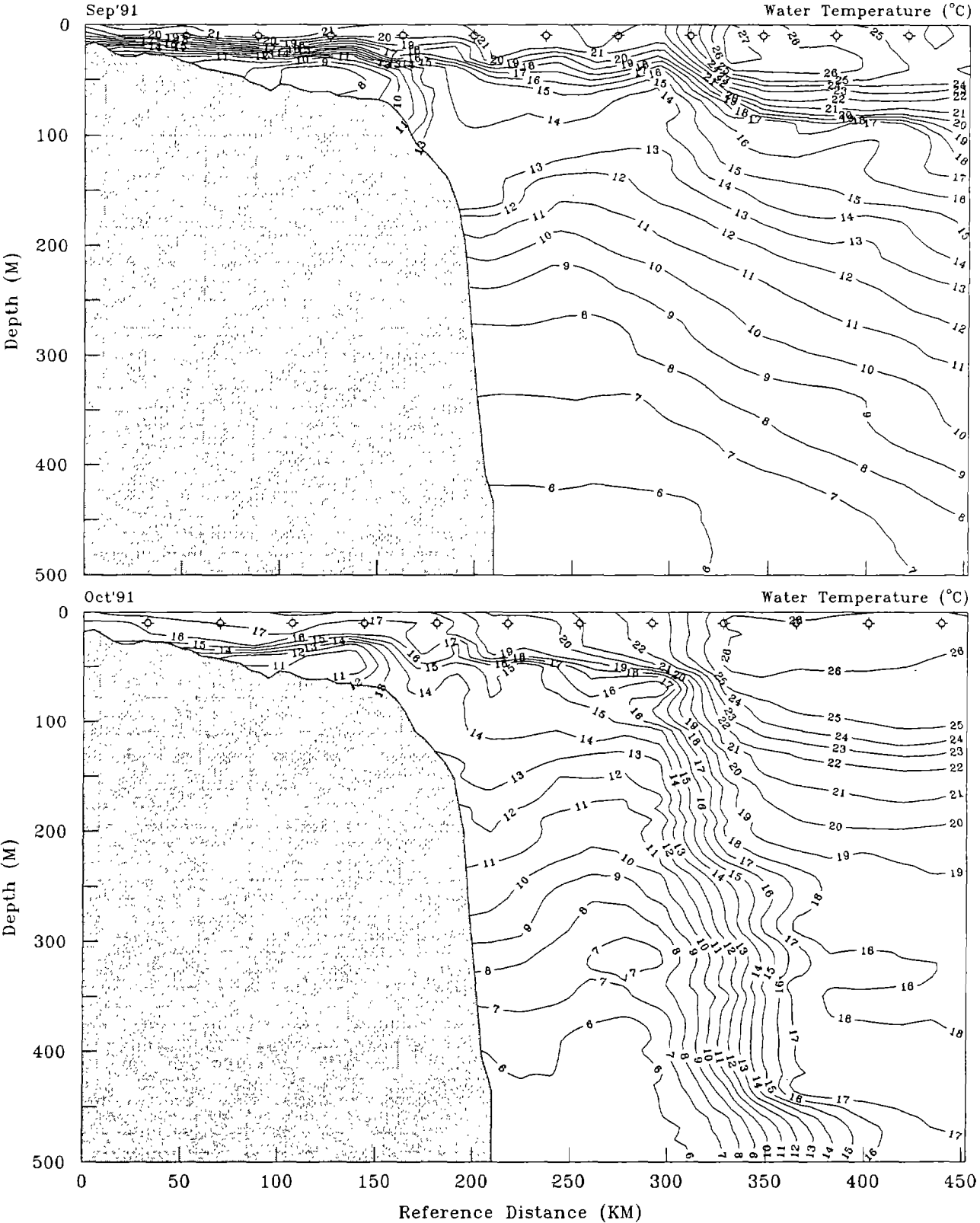


Figure 84. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during September and October 1991.

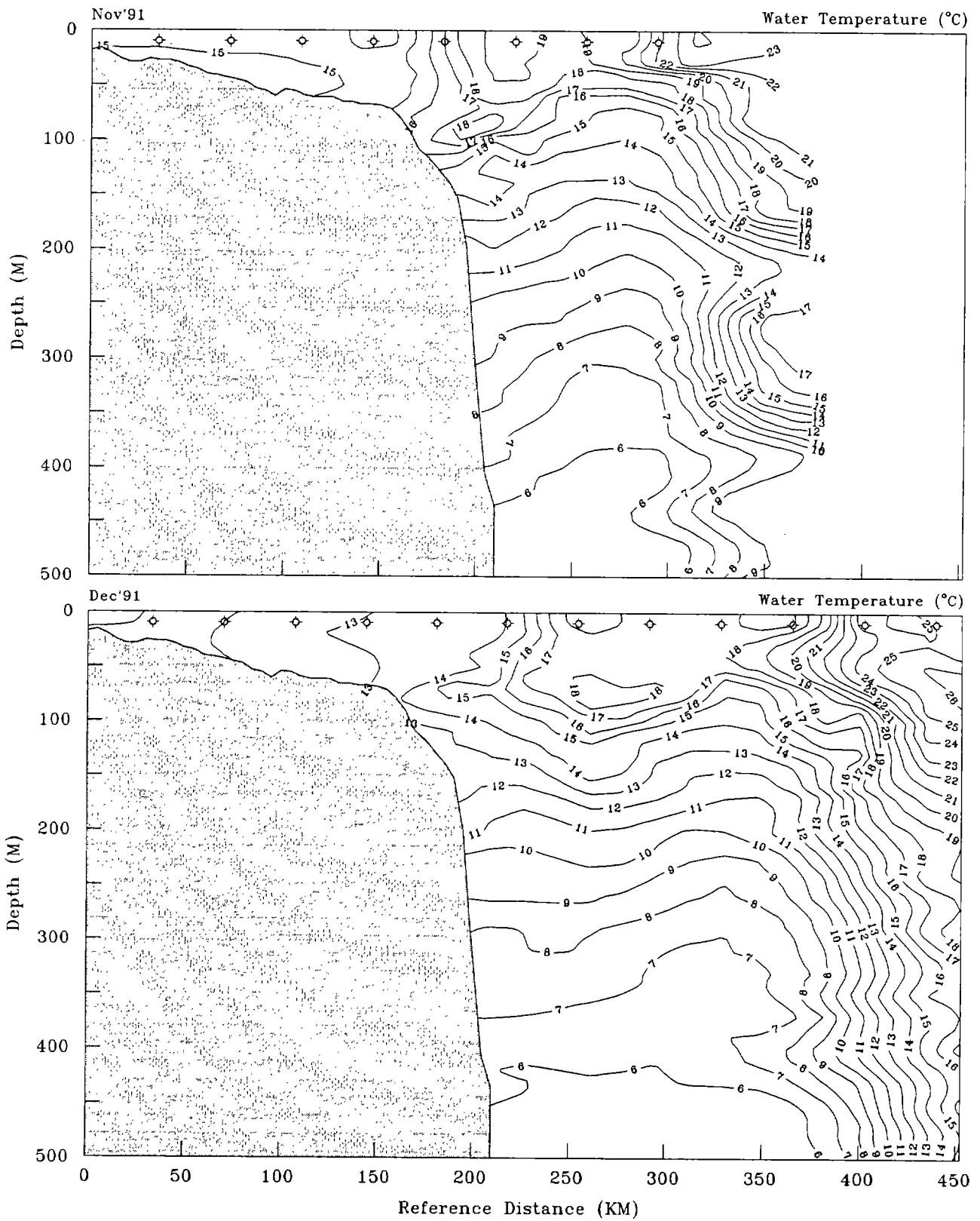


Figure 85. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during November and December 1991.

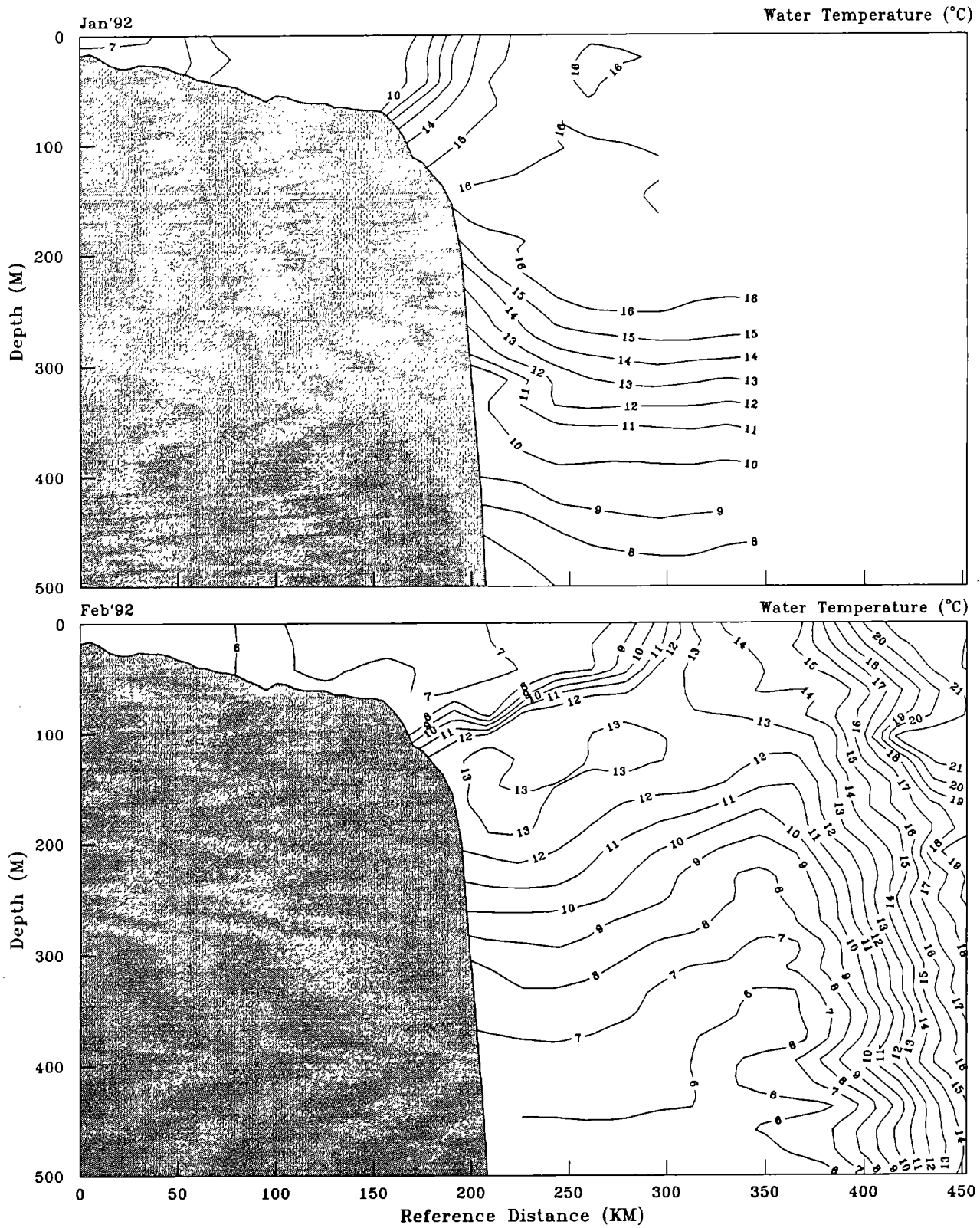


Figure 86. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during January and February 1992.

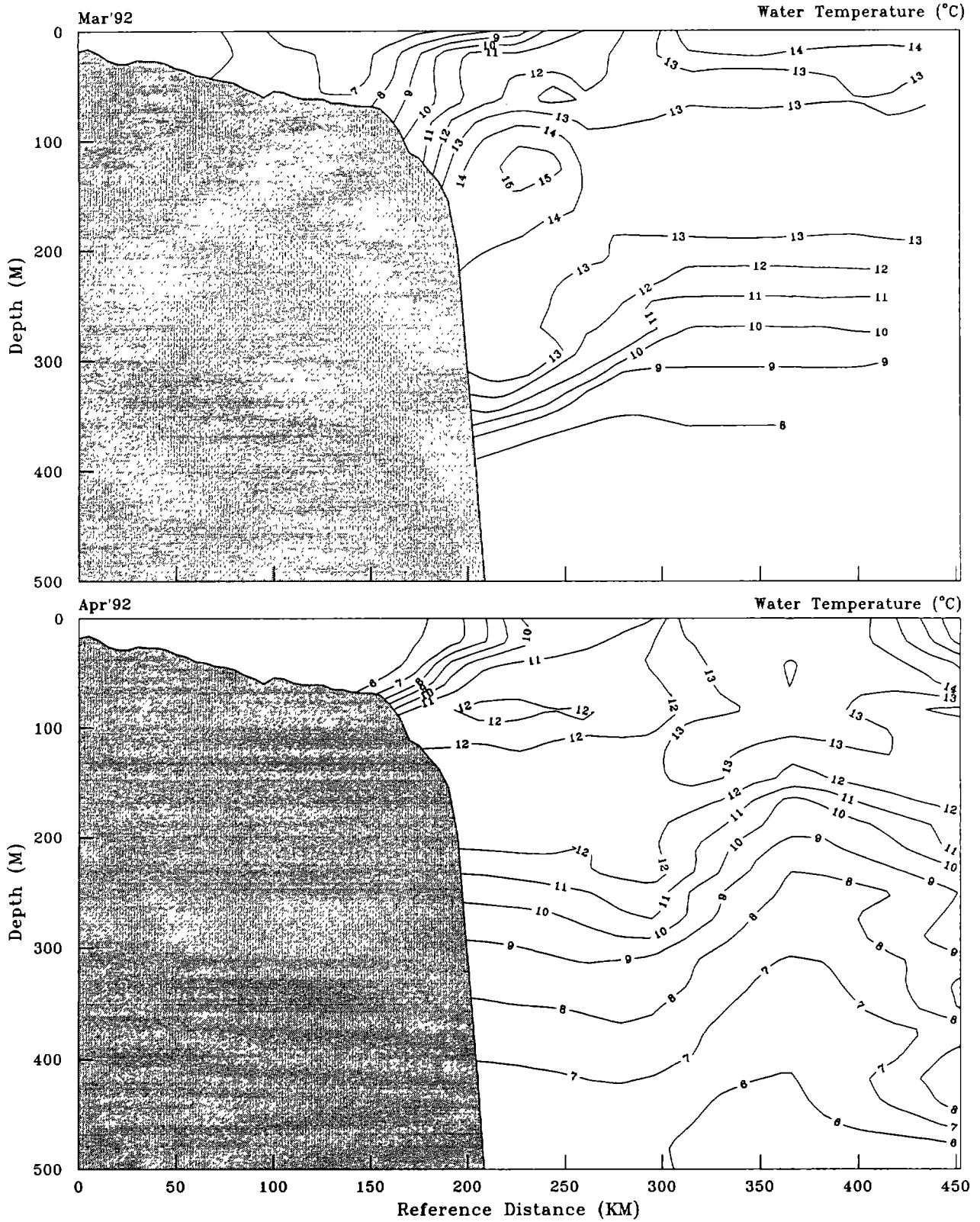


Figure 87. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Middle Atlantic Bight transect during March and April 1992.

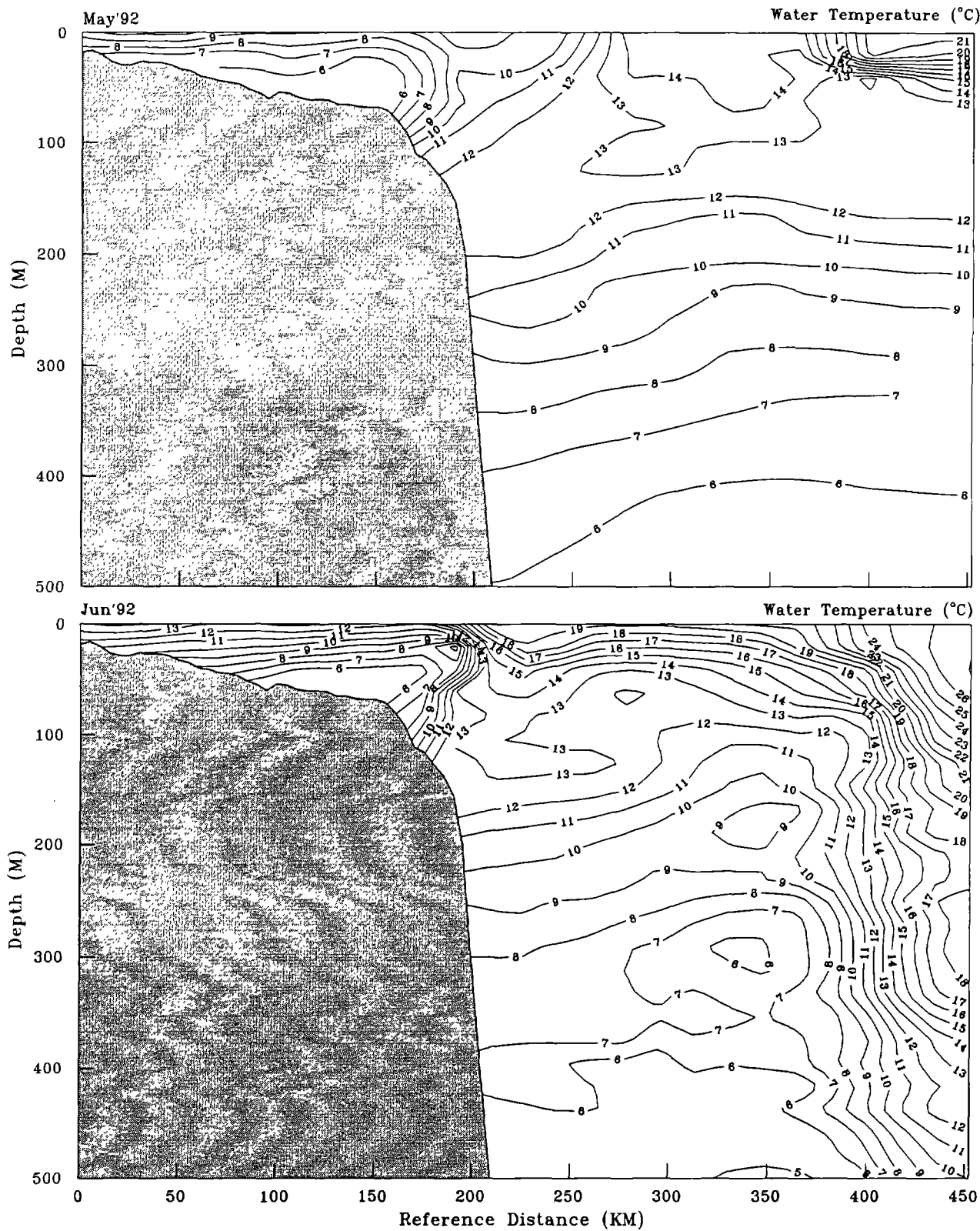


Figure 88. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Middle Atlantic Bight transect during May and June 1992.

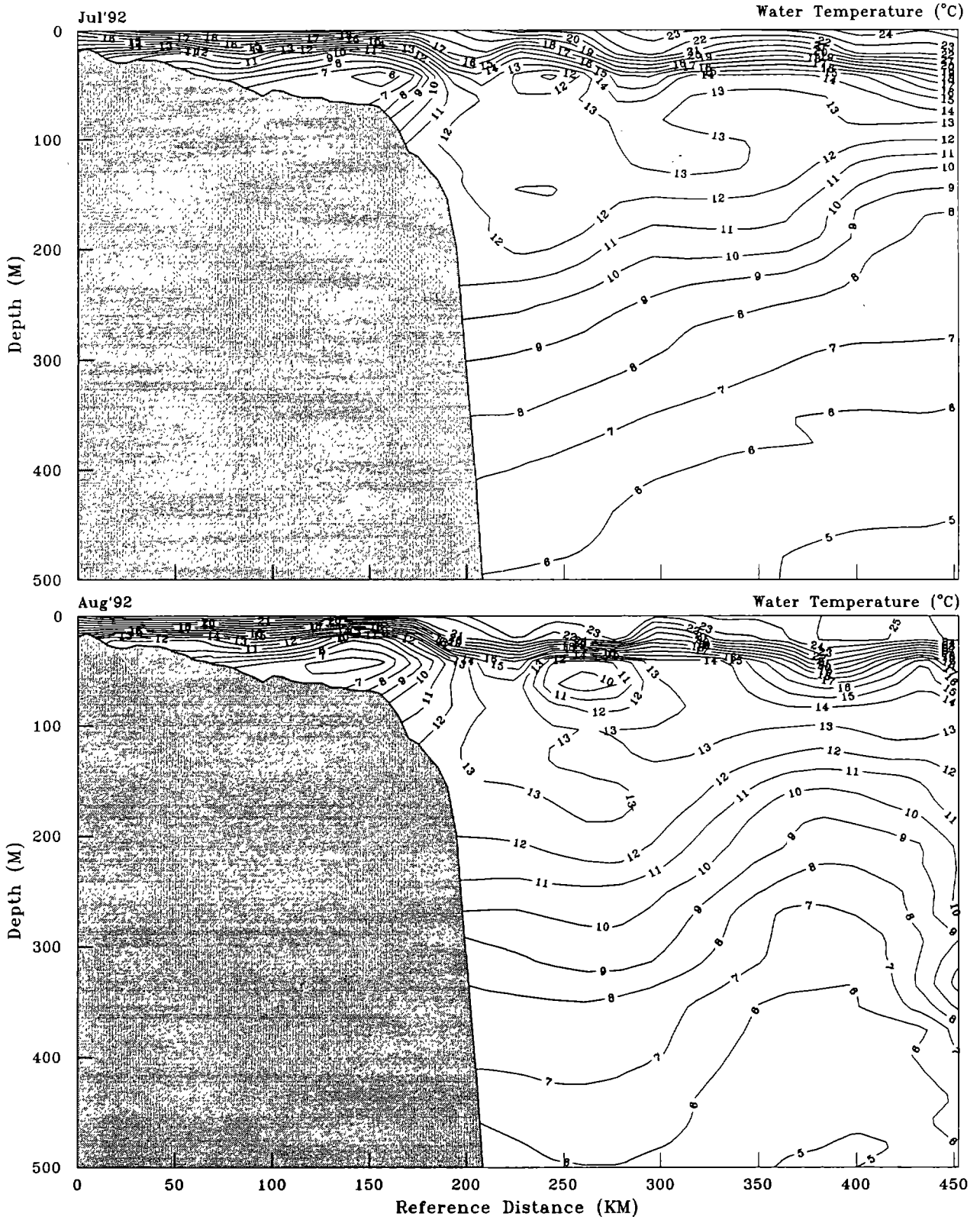


Figure 89. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during July and August 1992.

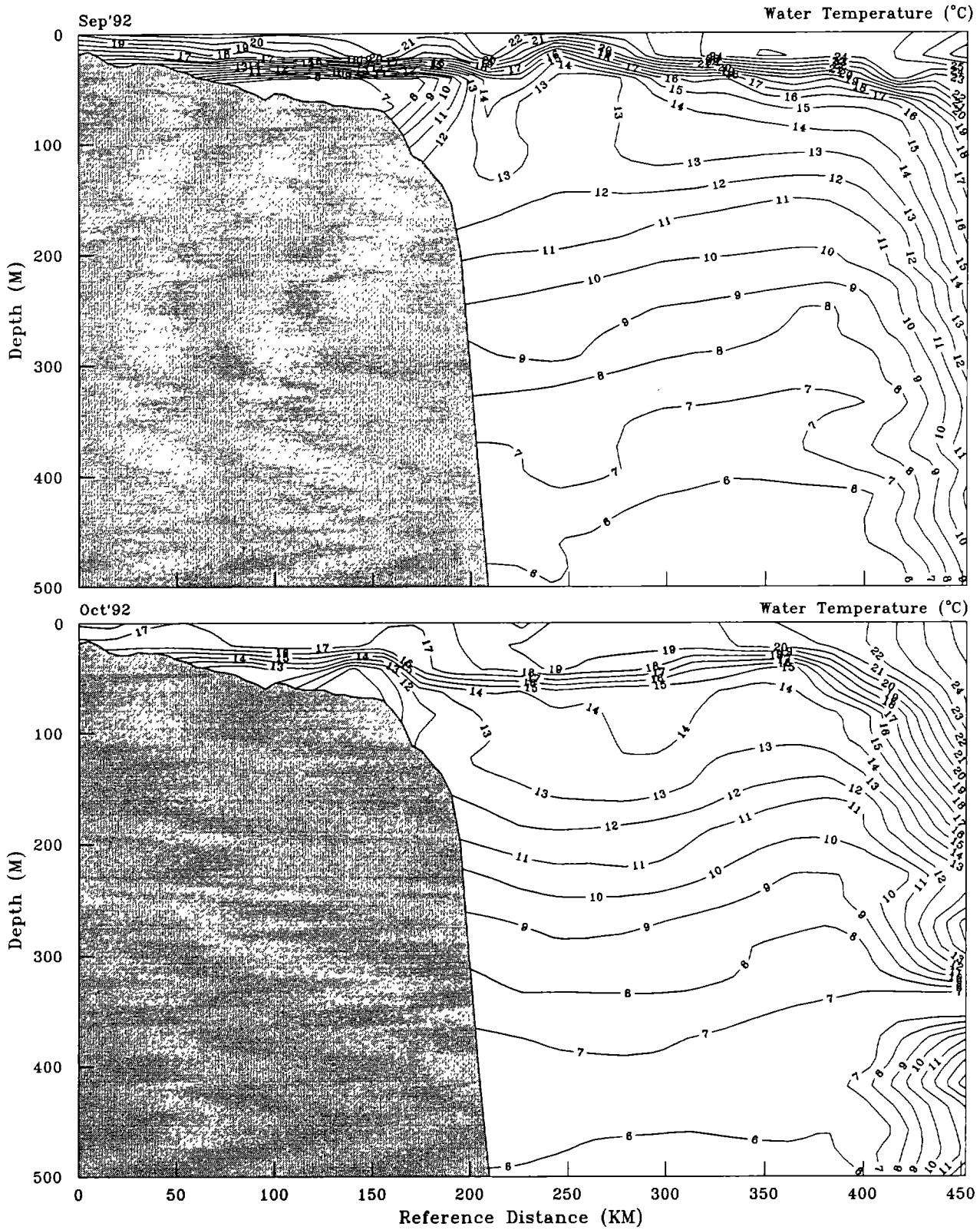


Figure 90. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Middle Atlantic Bight transect during September and October 1992.

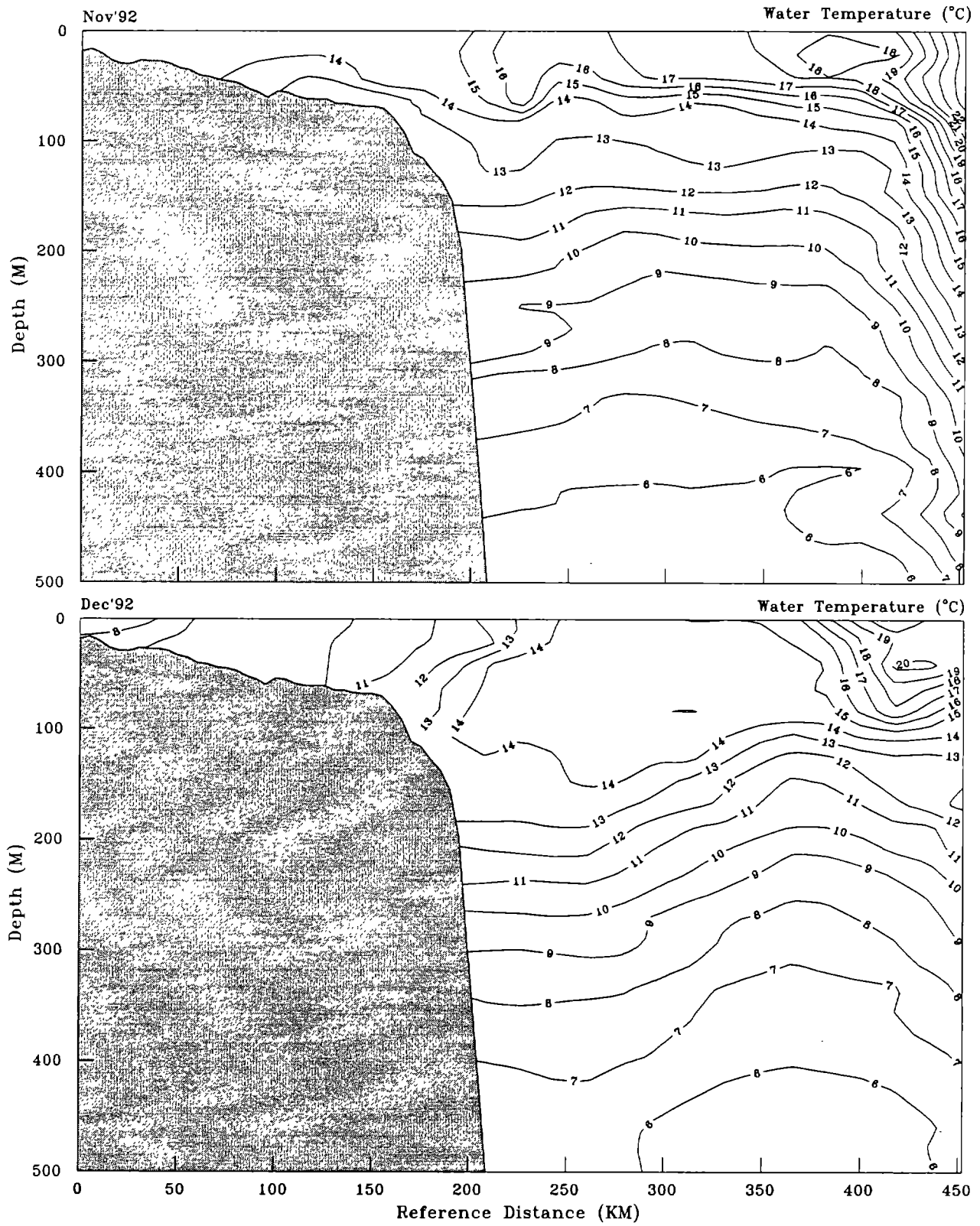


Figure 91. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Middle Atlantic Bight transect during November and December 1992.

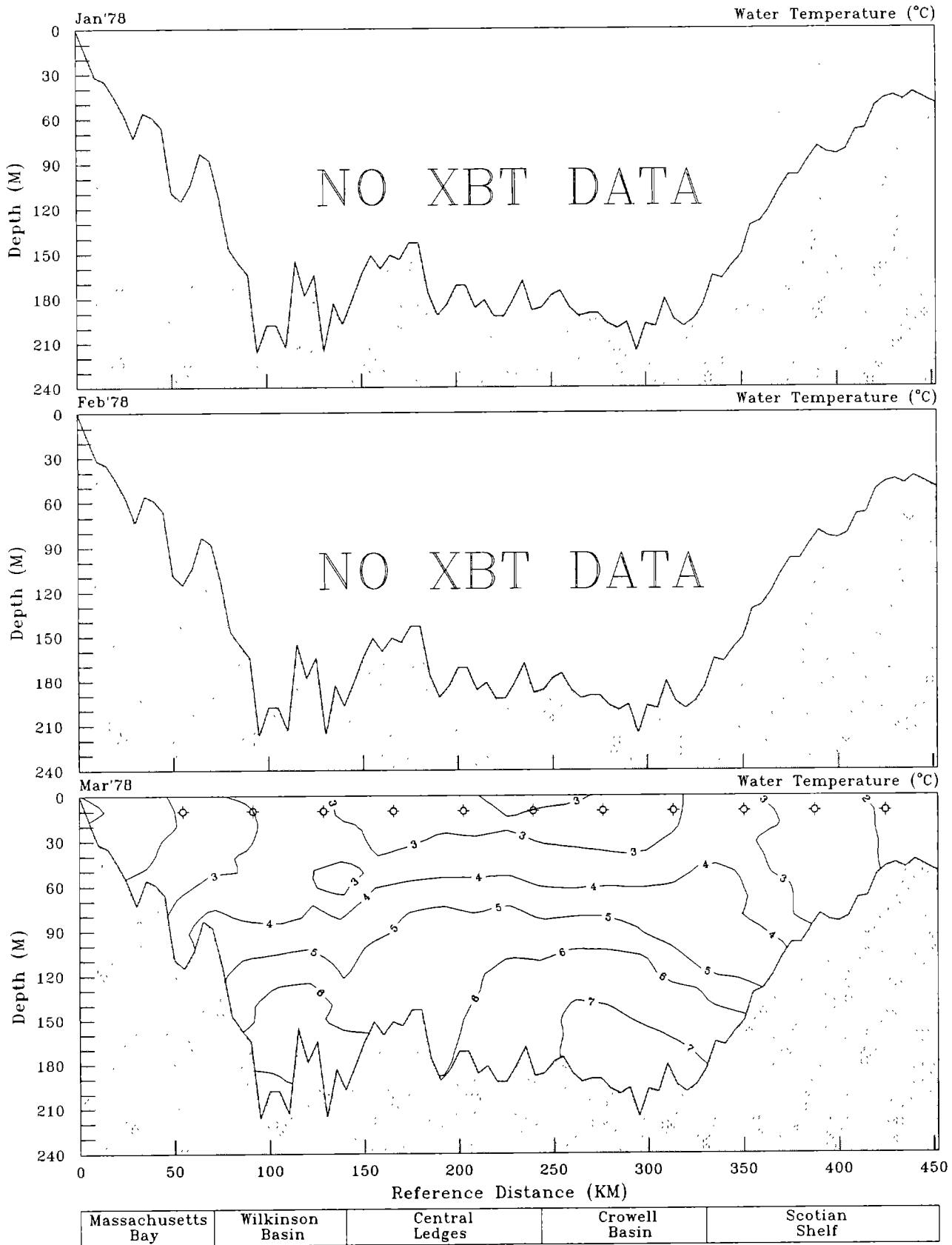


Figure 92. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1978.

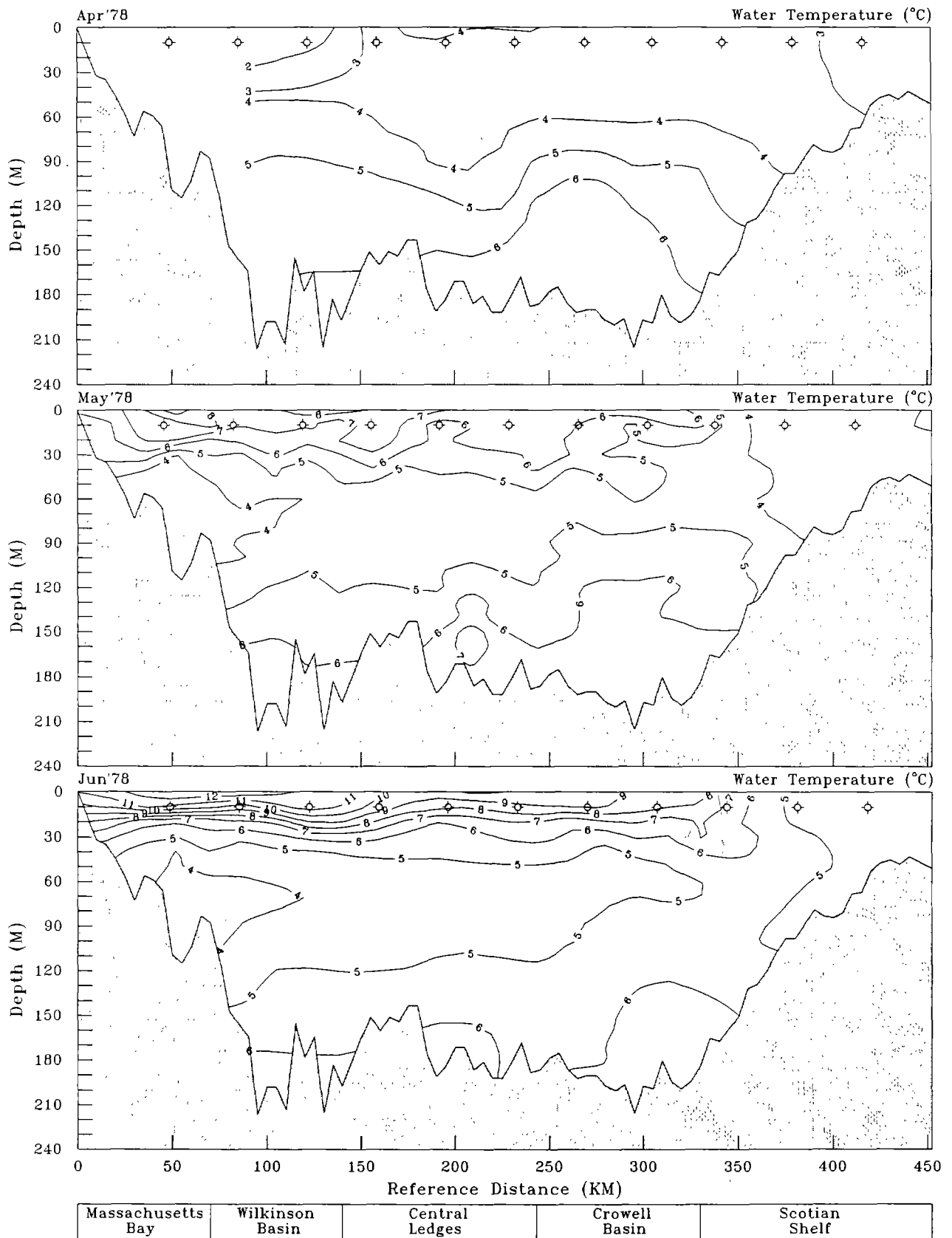


Figure 93. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Gulf of Maine transect during April, May, and June 1978.

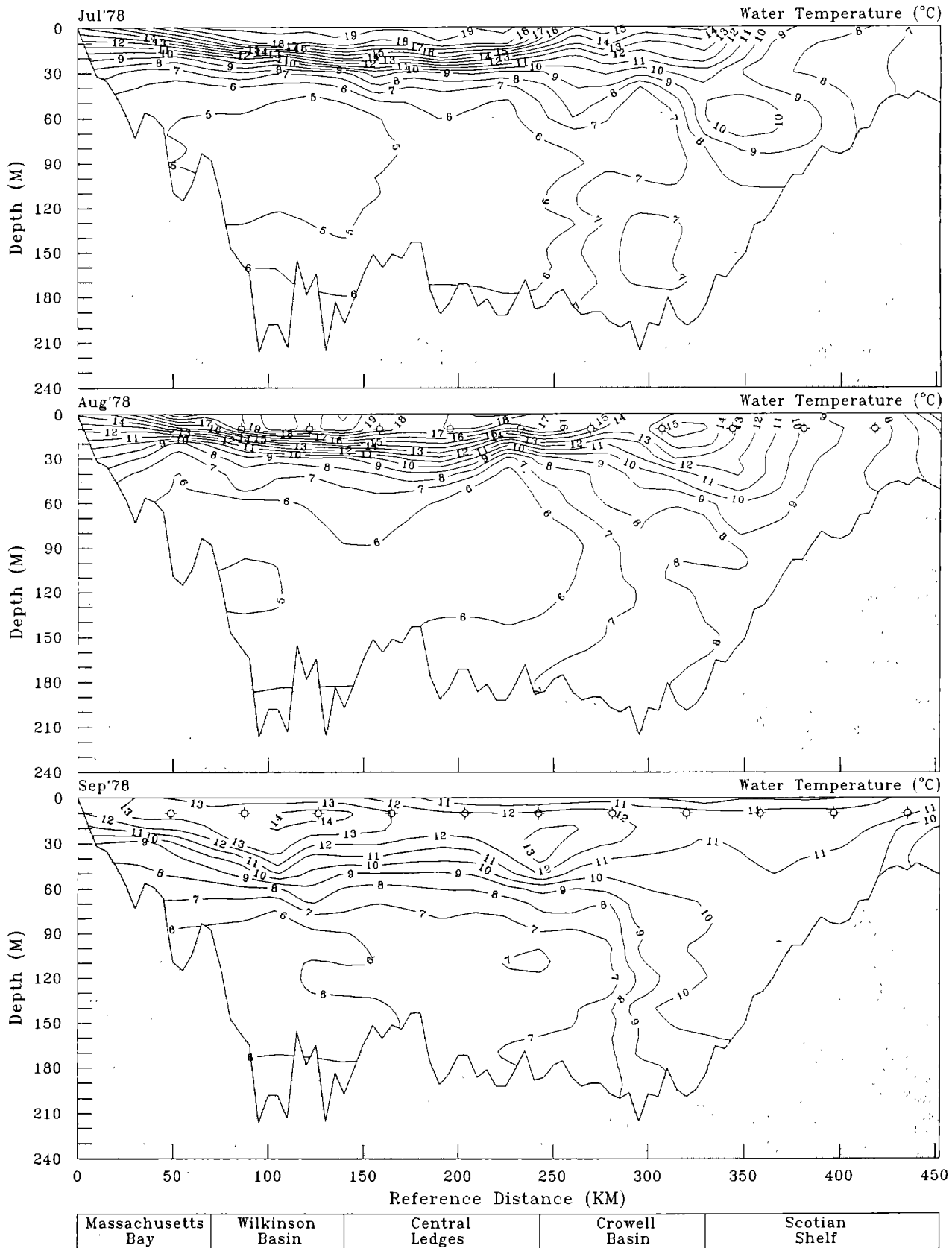


Figure 94. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1978.

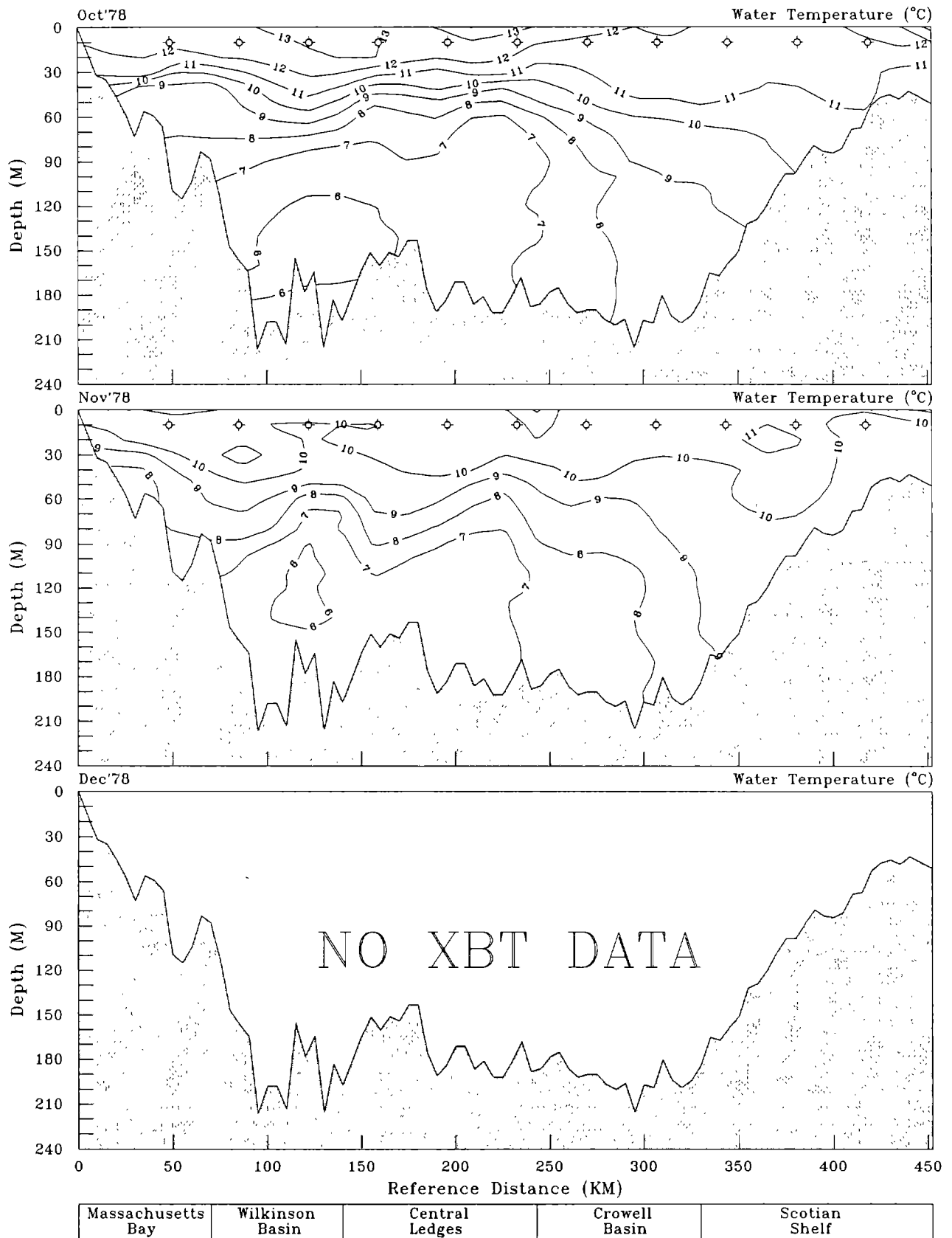


Figure 95. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during October, November, and December 1978.

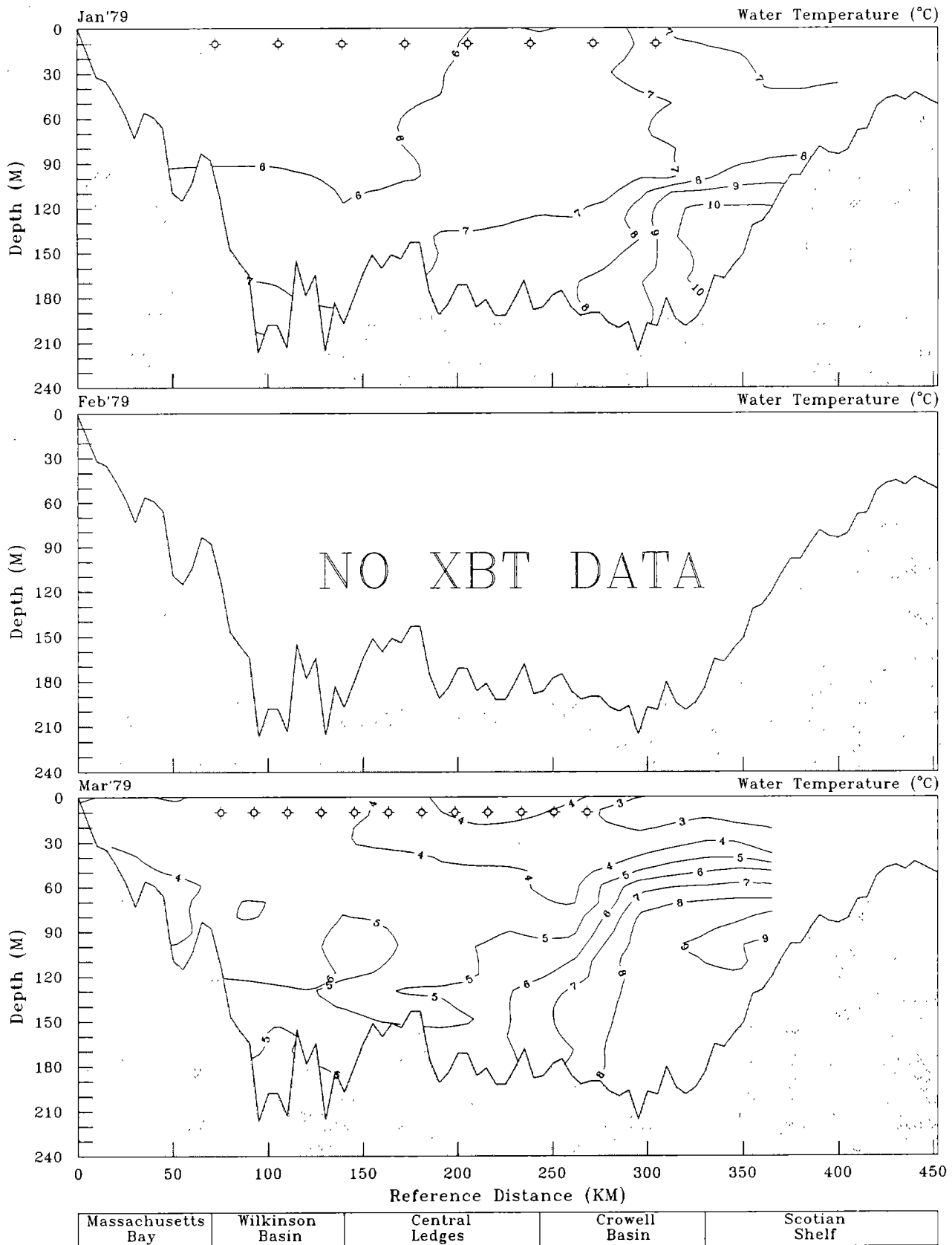


Figure 96. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1979.

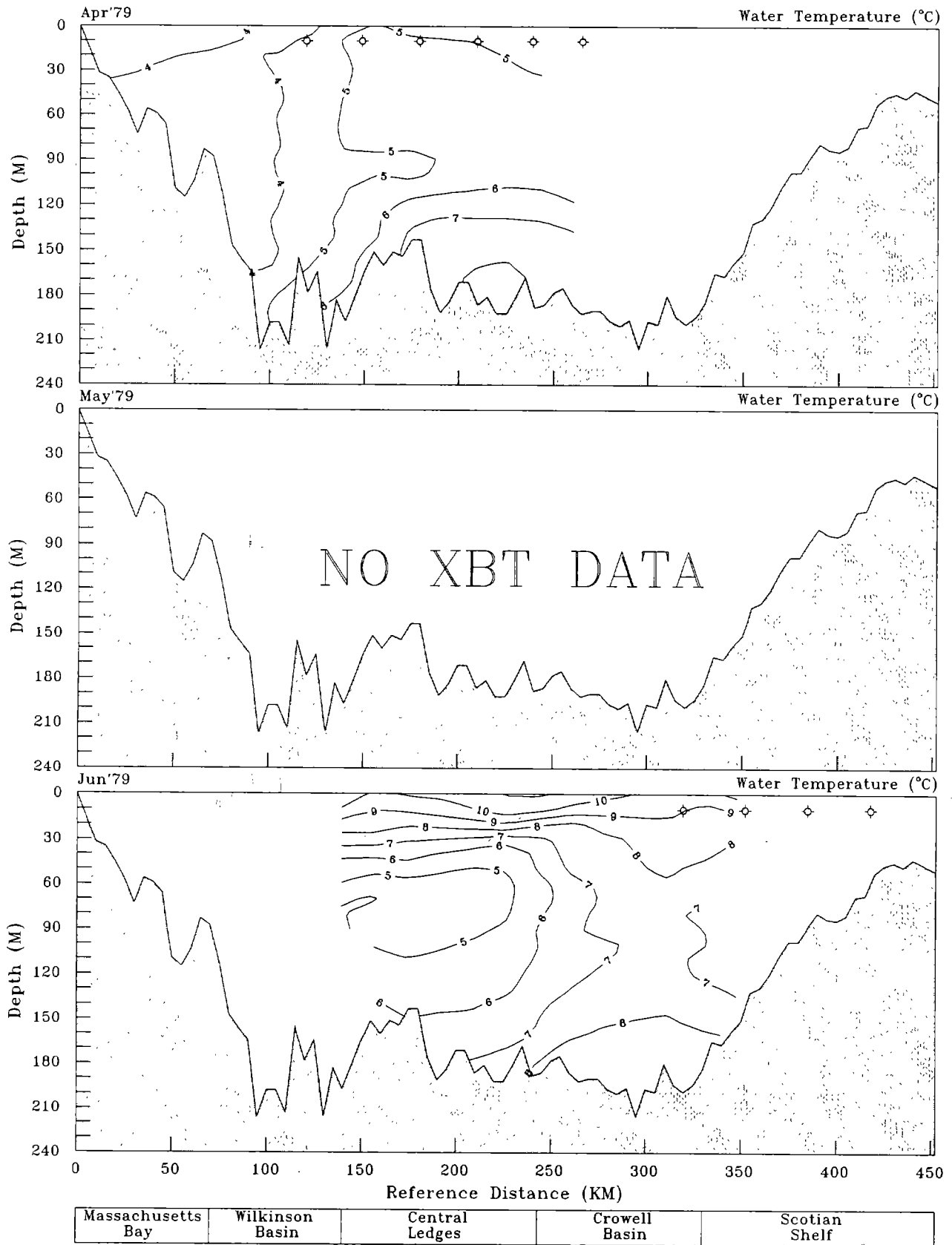


Figure 97. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during April, May, and June 1979.

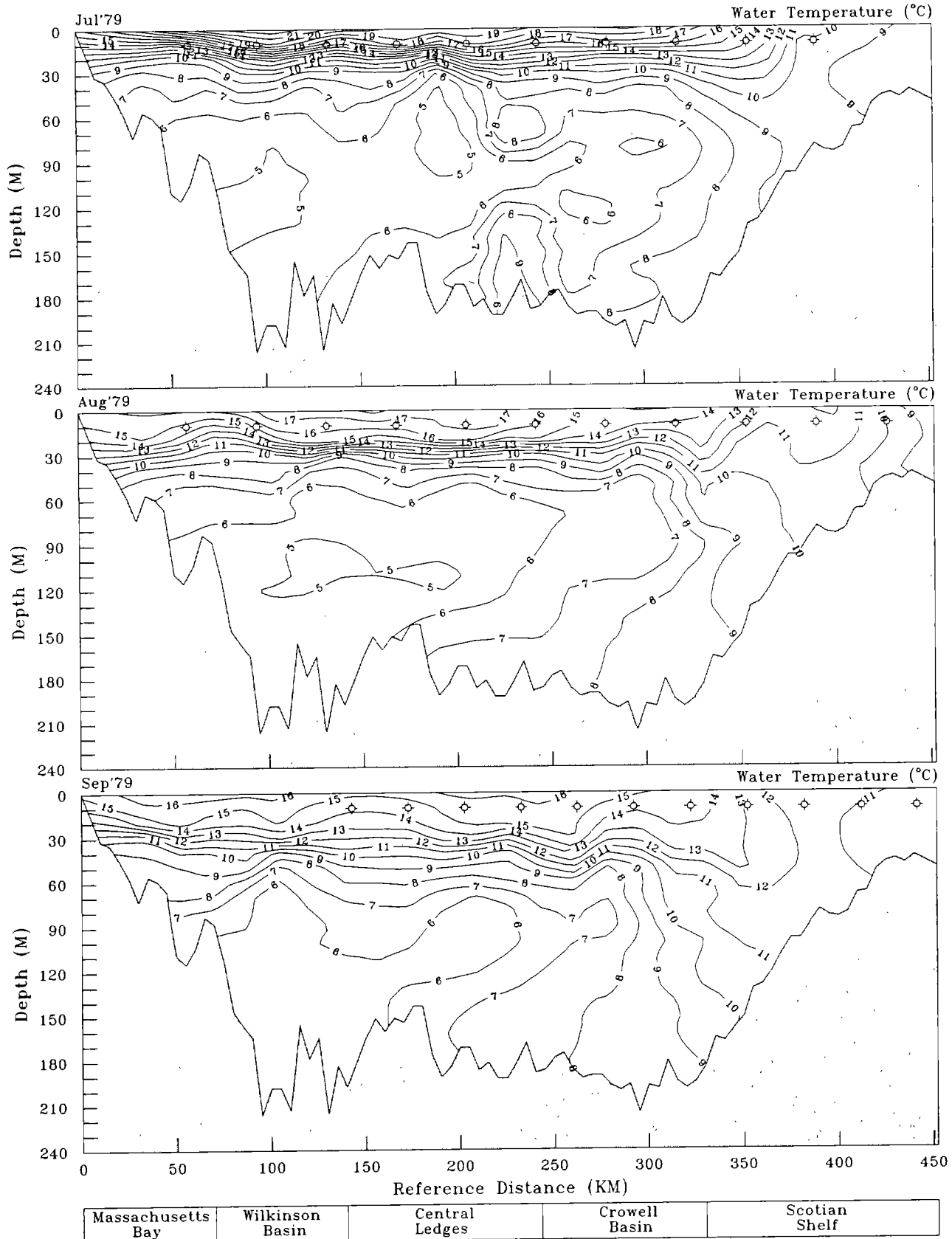


Figure 98. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (a) along the Gulf of Maine transect during July, August, and September 1979.

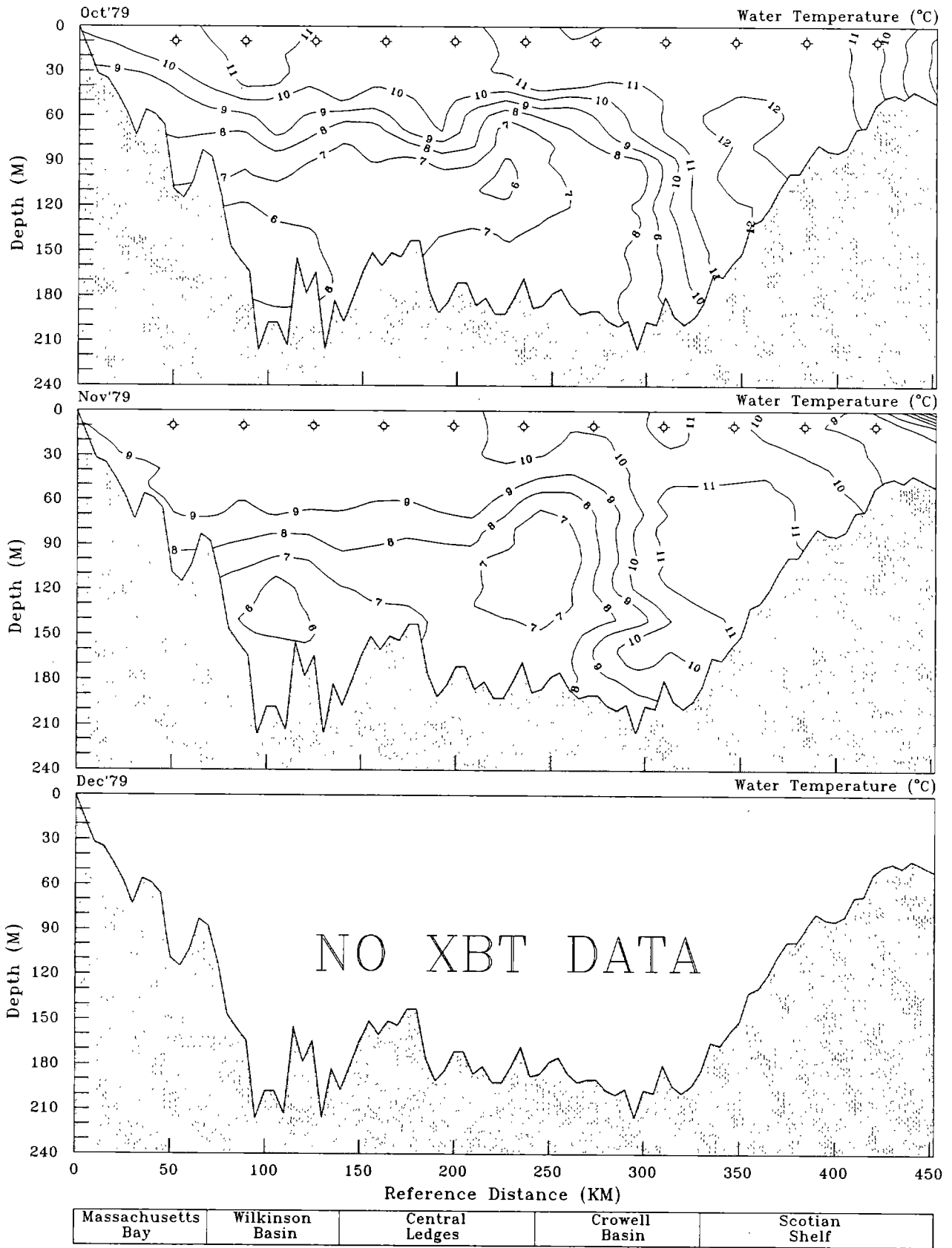


Figure 99. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (σ) along the Gulf of Maine transect during October, November, and December 1979.

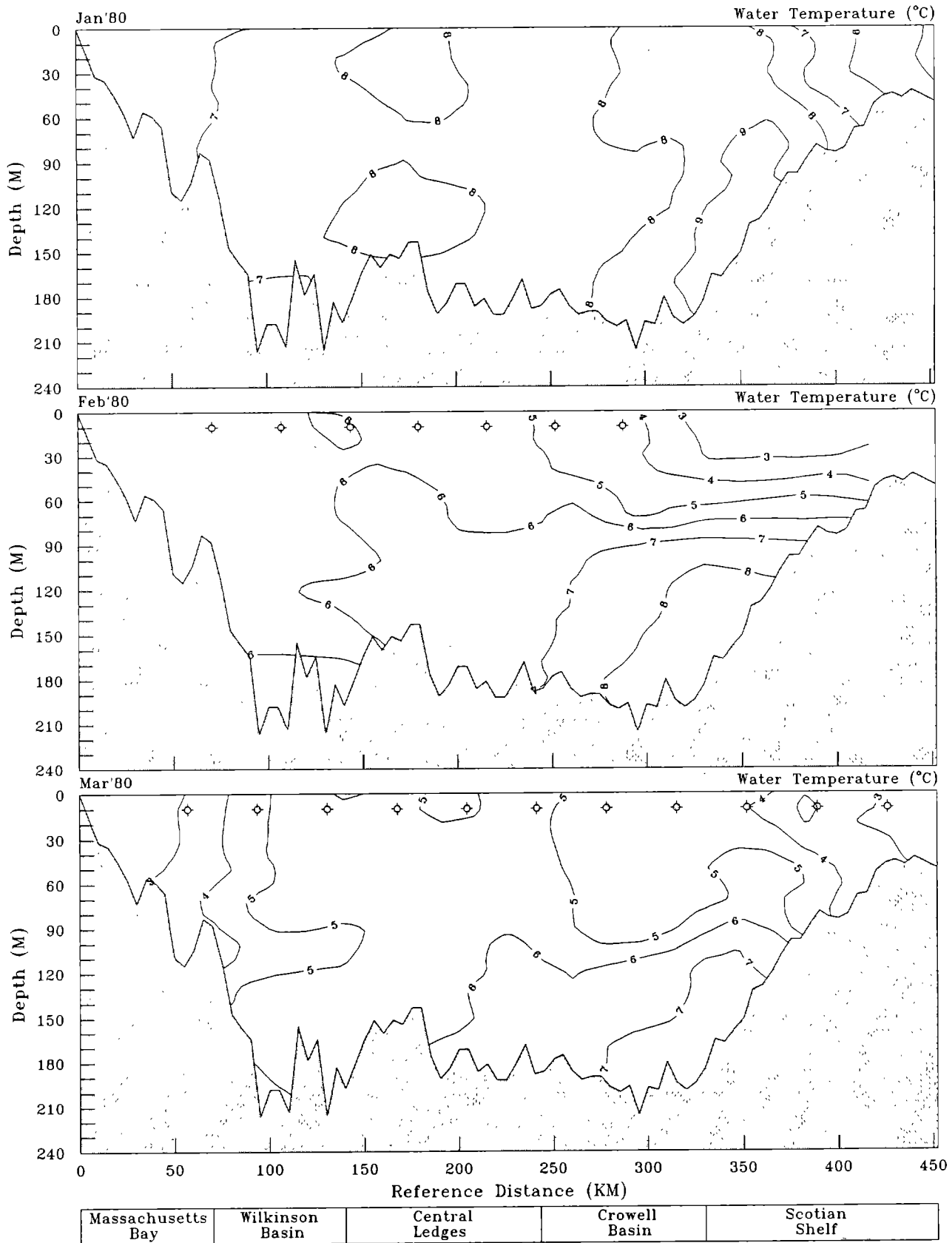


Figure 100. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1980.

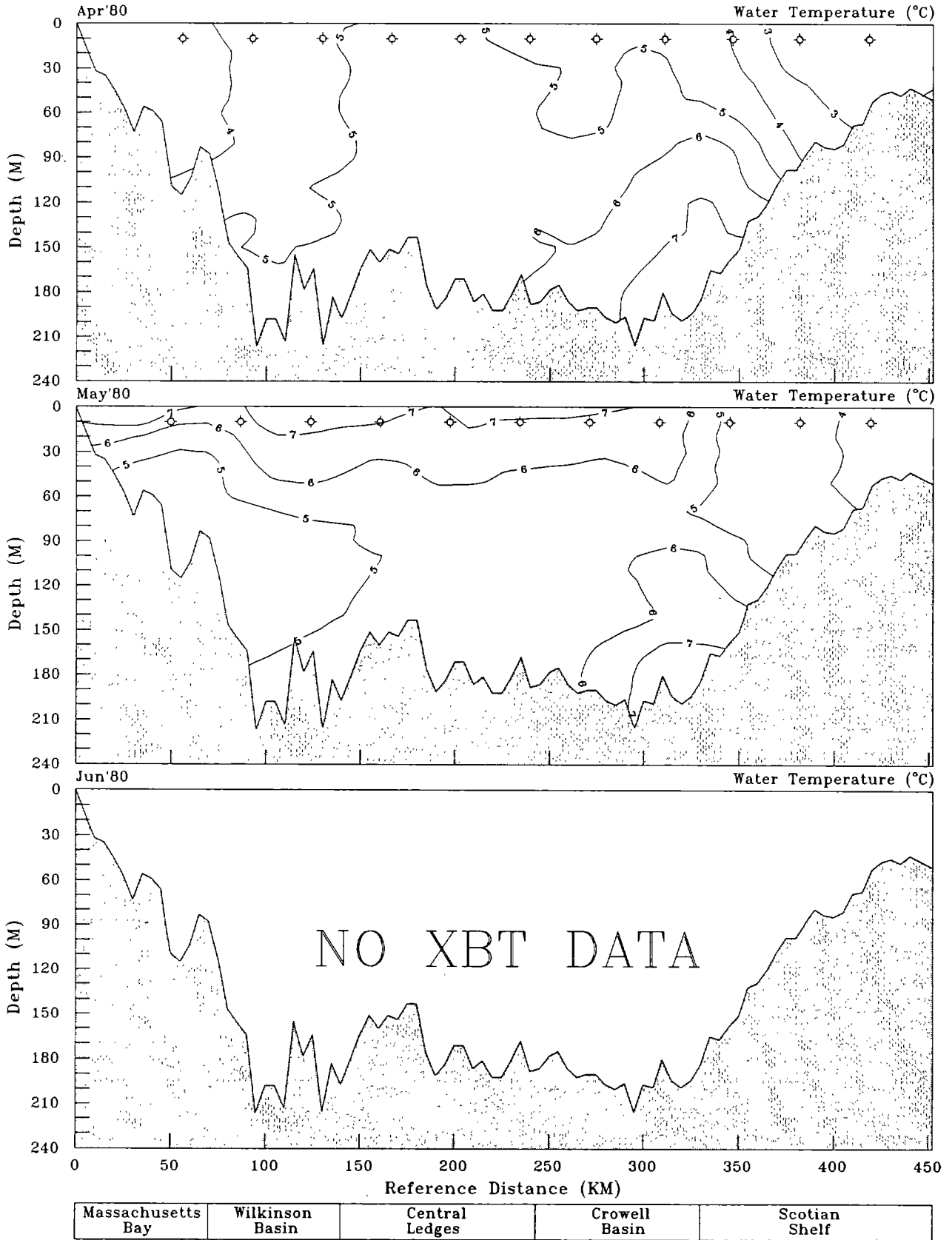


Figure 101. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during April, May, and June 1980.

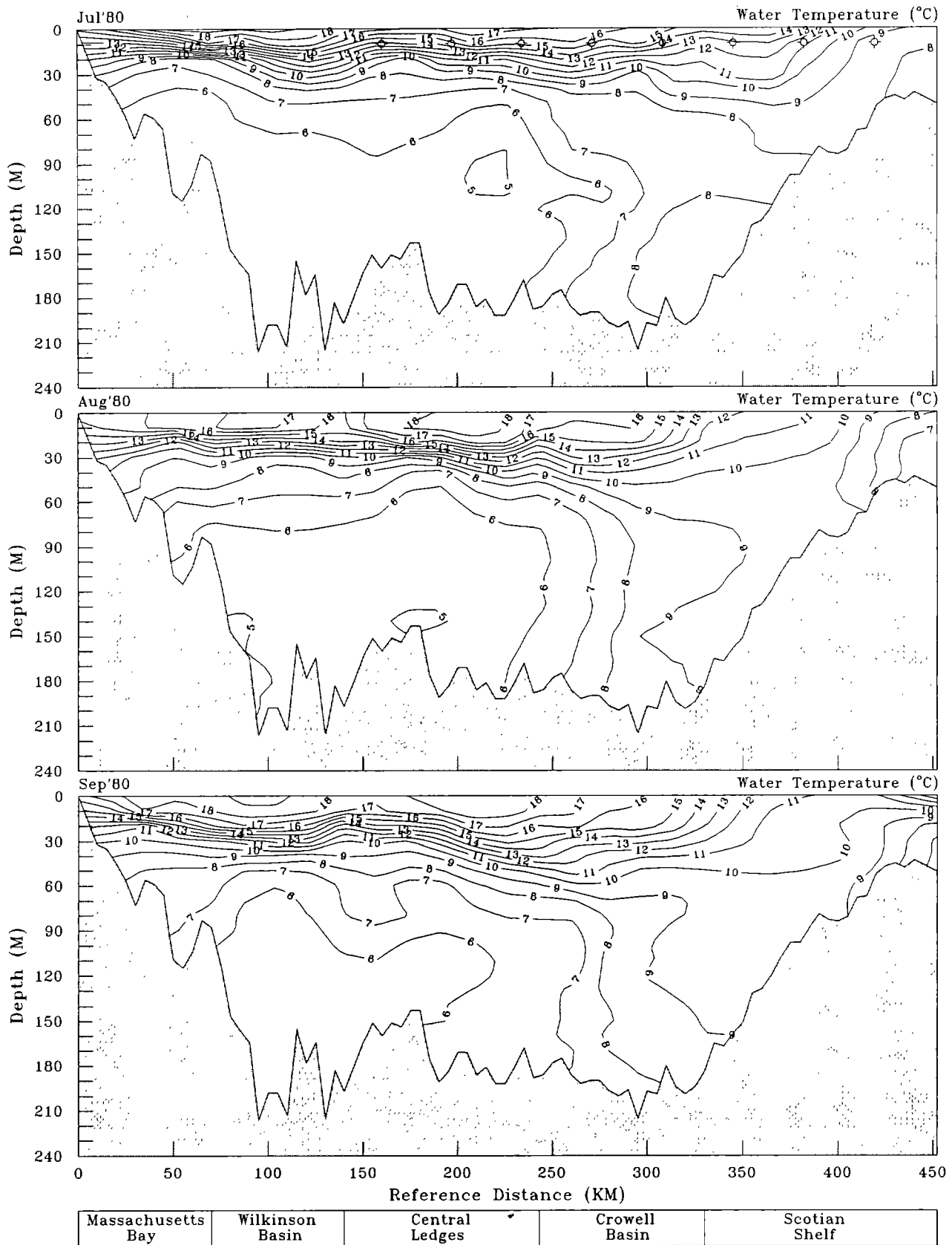


Figure 102. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1980.

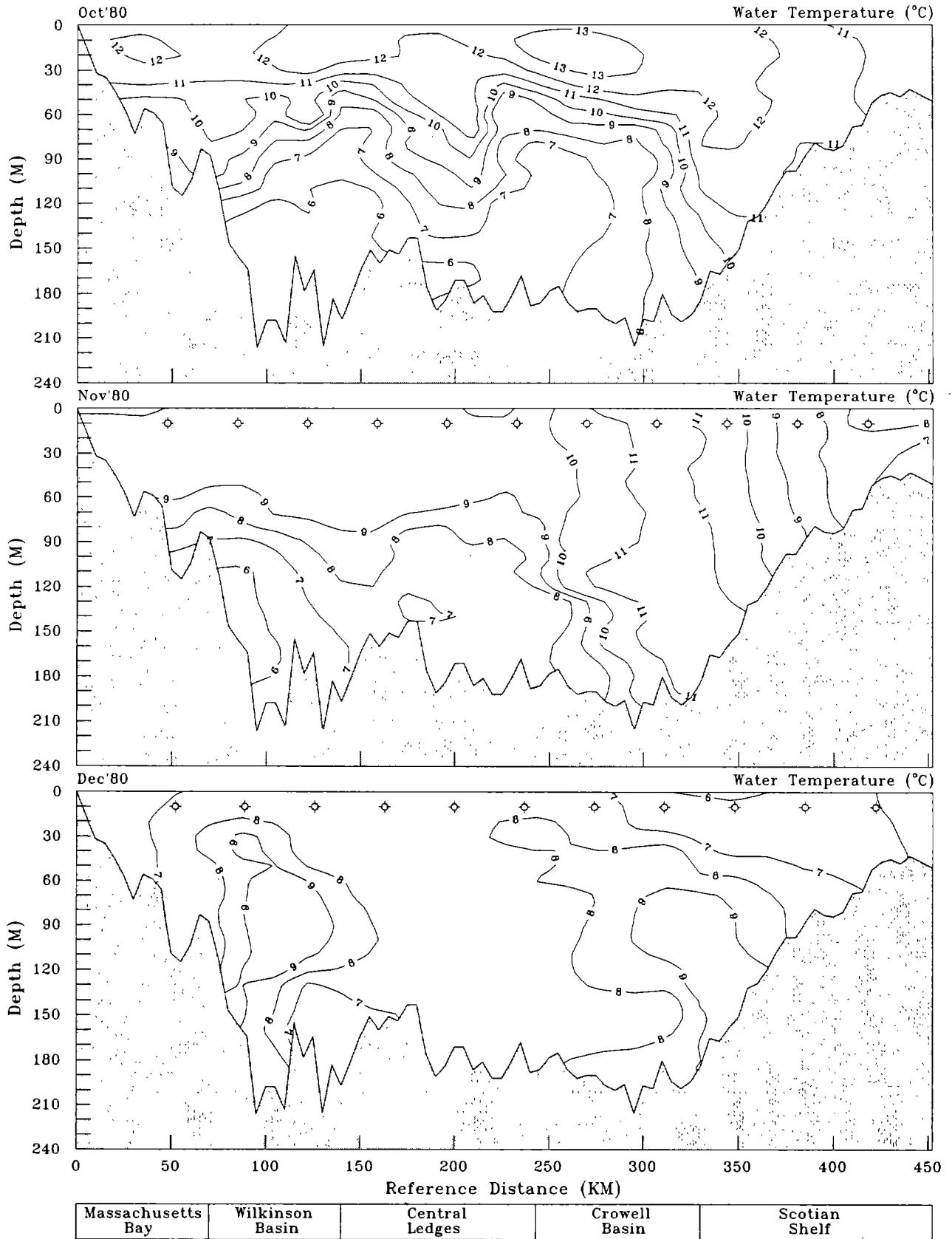


Figure 103. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during October, November, and December 1980.

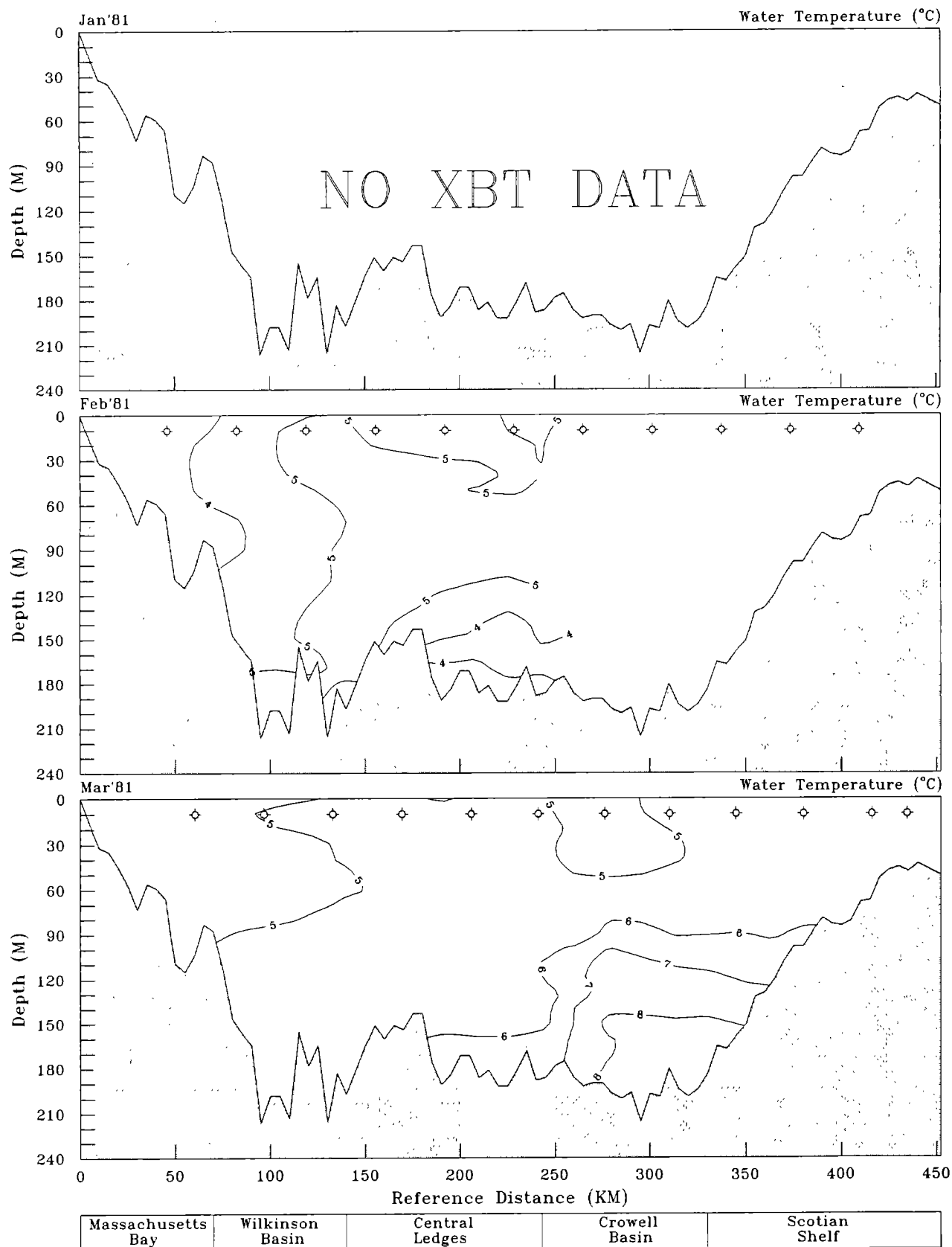


Figure 104. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (a) along the Gulf of Maine transect during January, February, and March 1981.

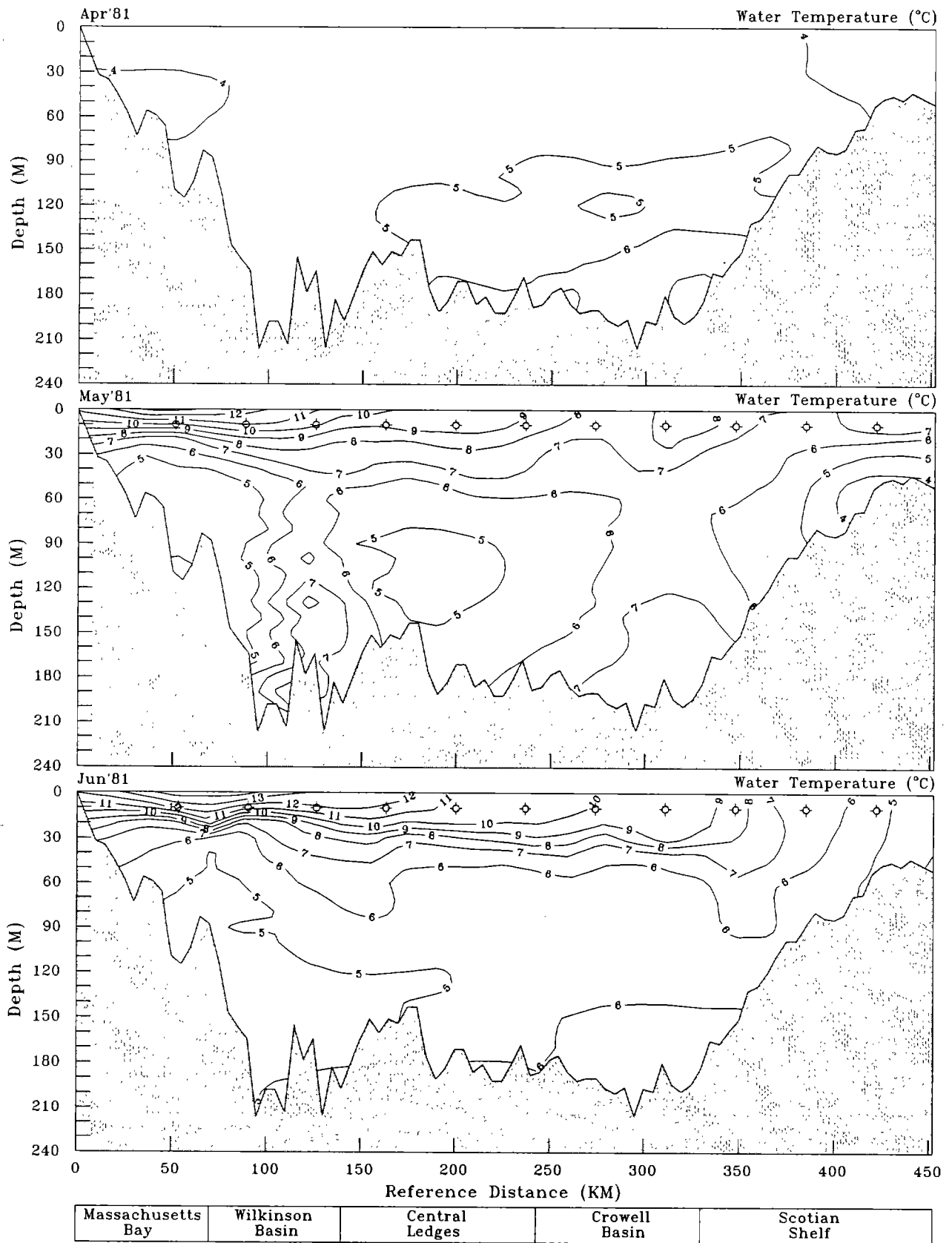


Figure 105. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Gulf of Maine transect during April, May, and June 1981.

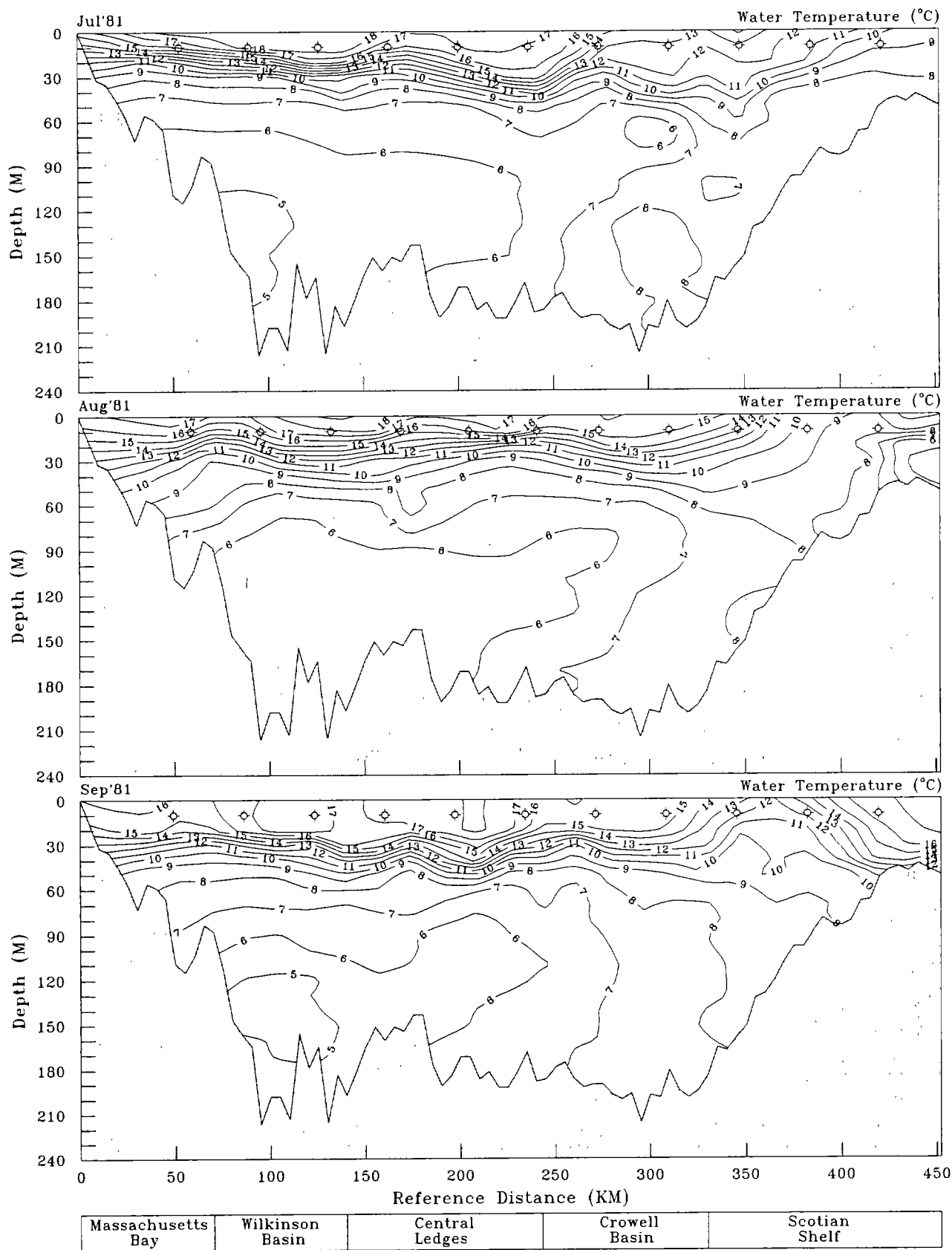


Figure 106. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1981.

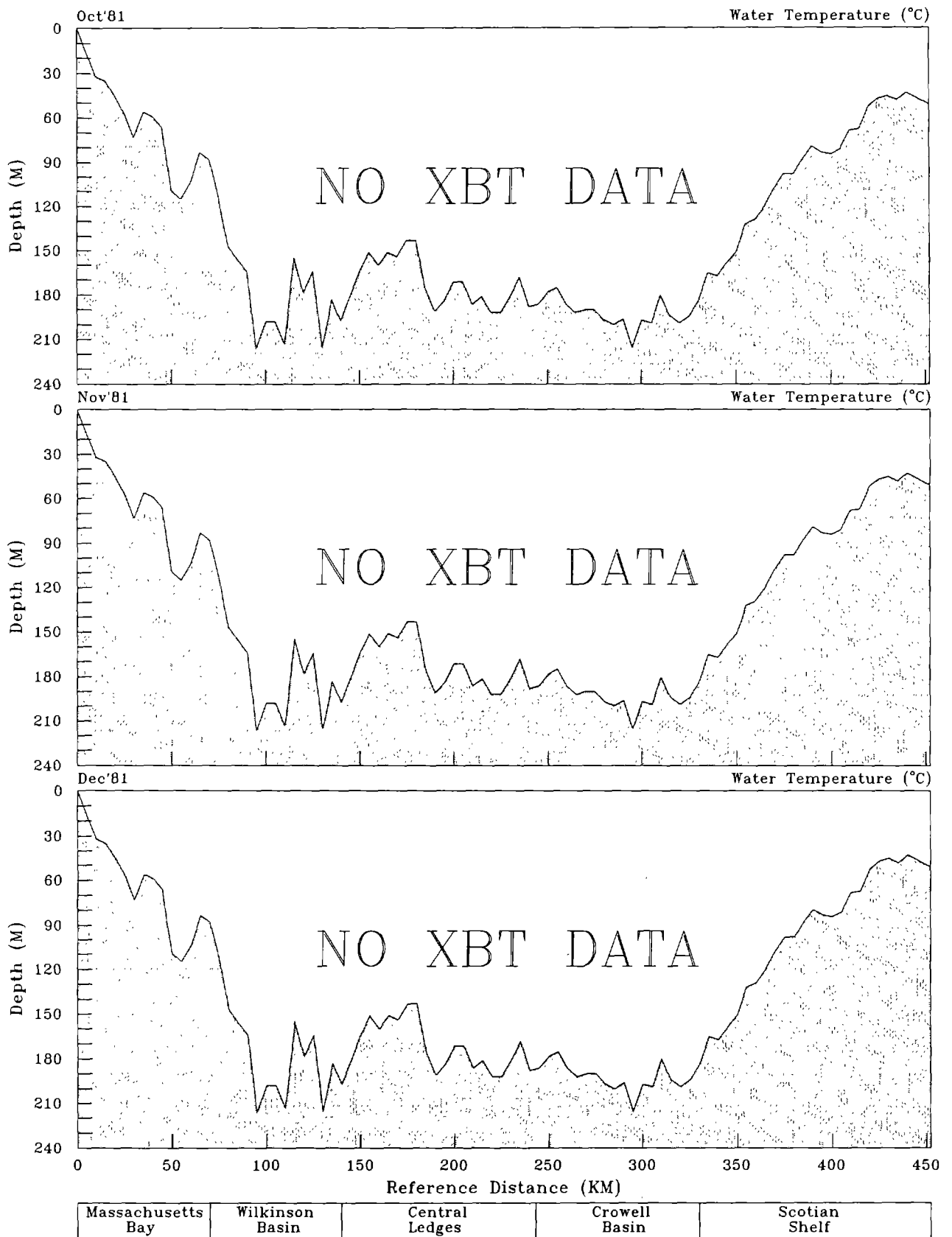


Figure 107. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Gulf of Maine transect during October, November, and December 1981.

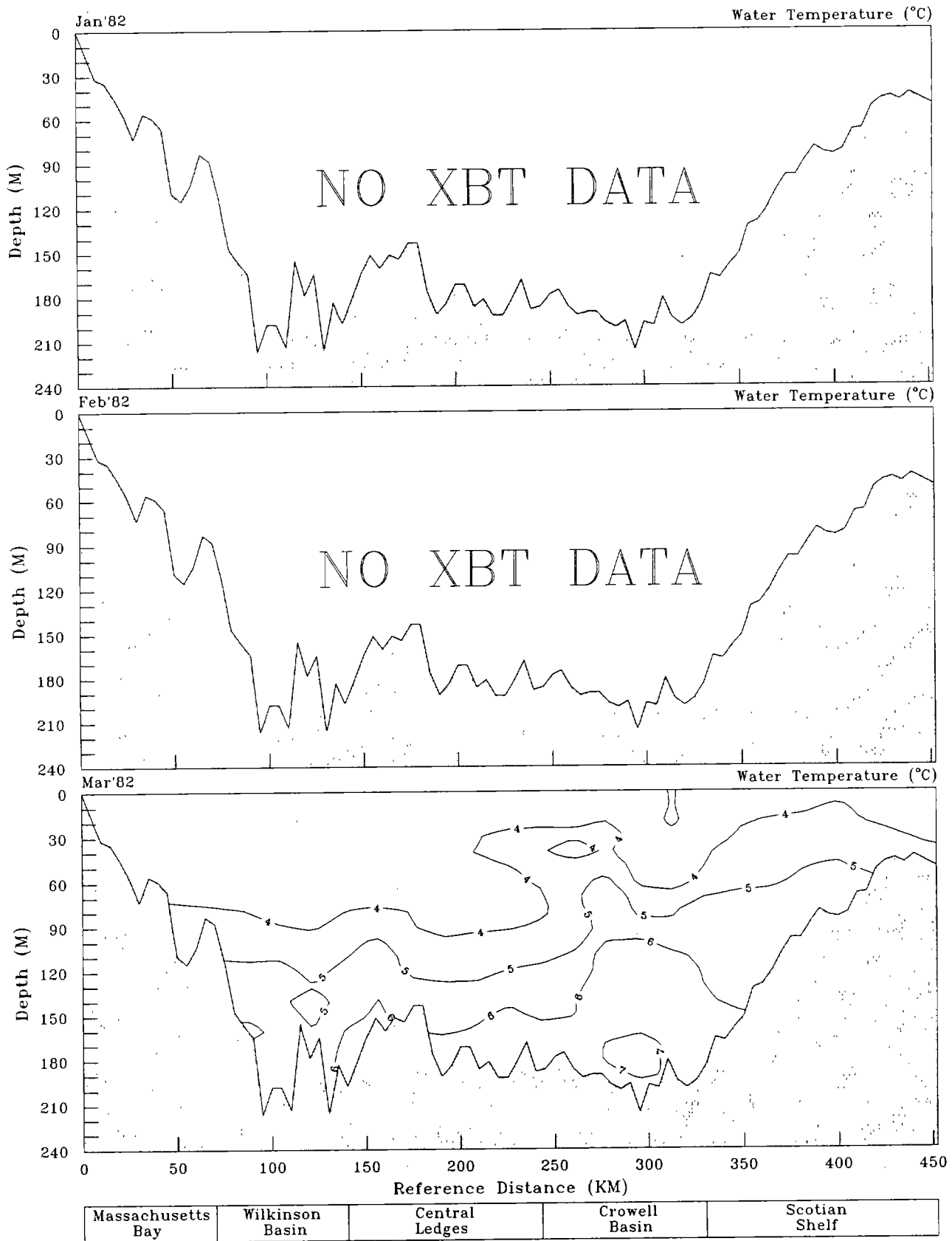


Figure 108. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1982.

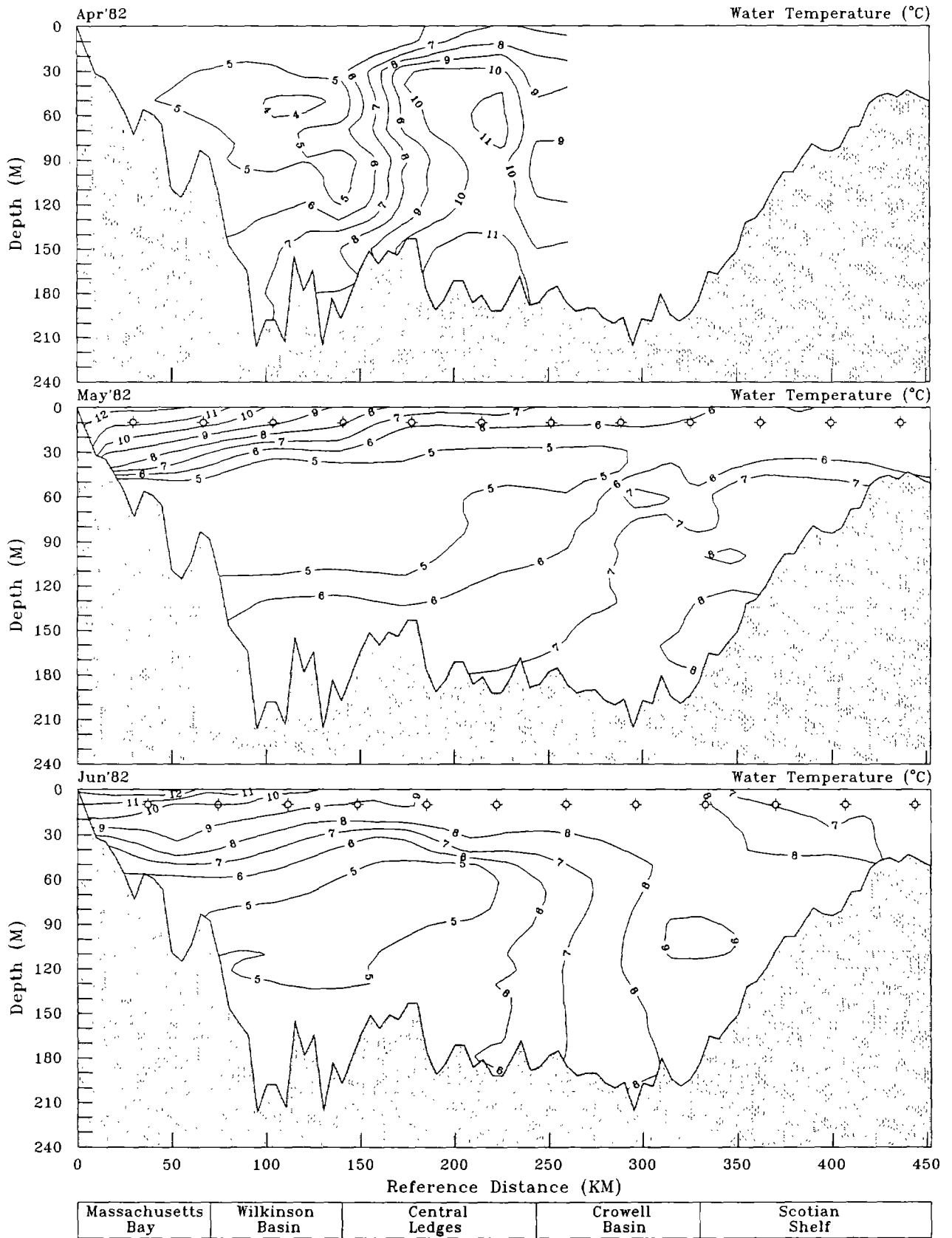


Figure 109. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth along the Gulf of Maine transect during April, May, and June 1982.

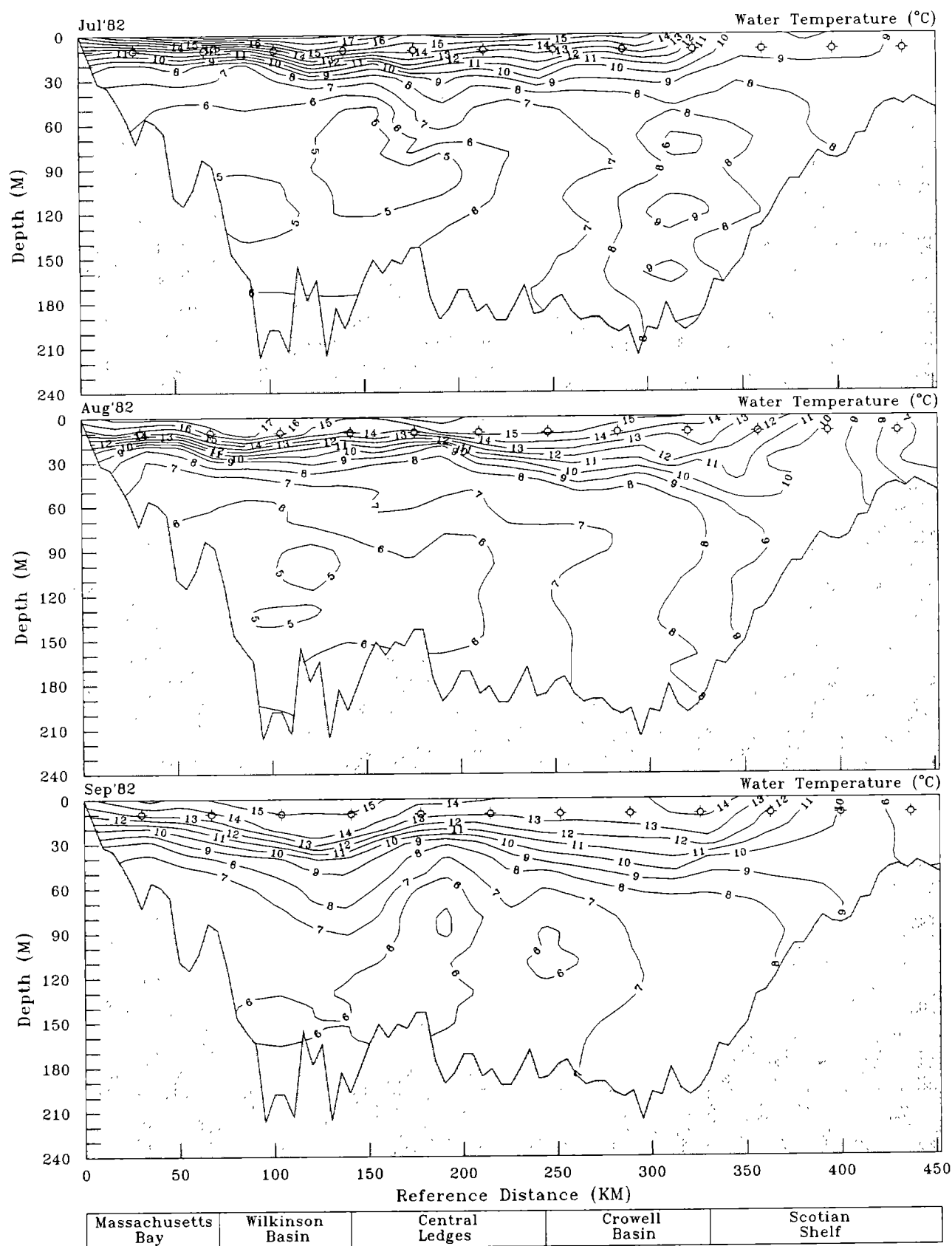


Figure 110. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1982.

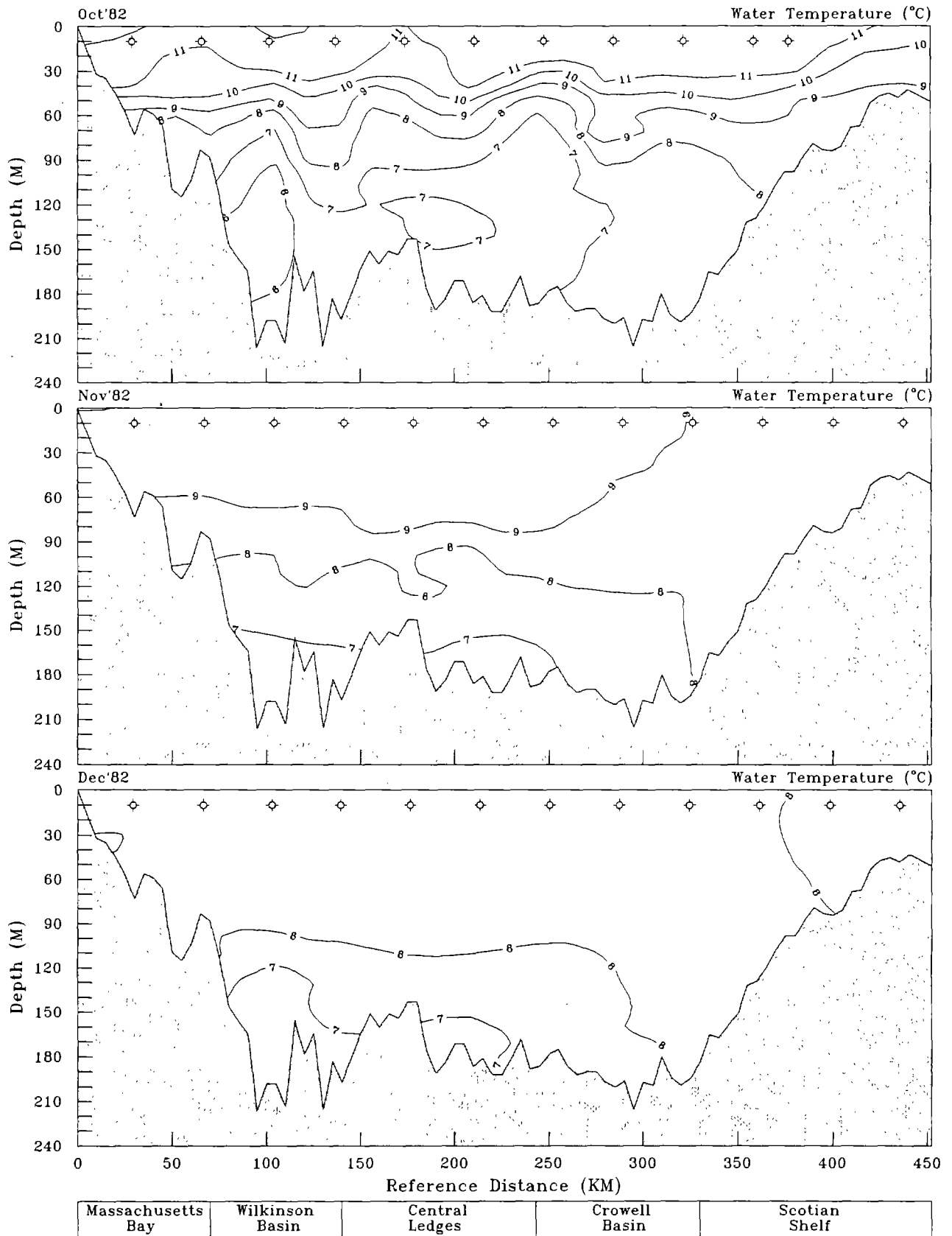


Figure 111. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during October, November, and December 1982.

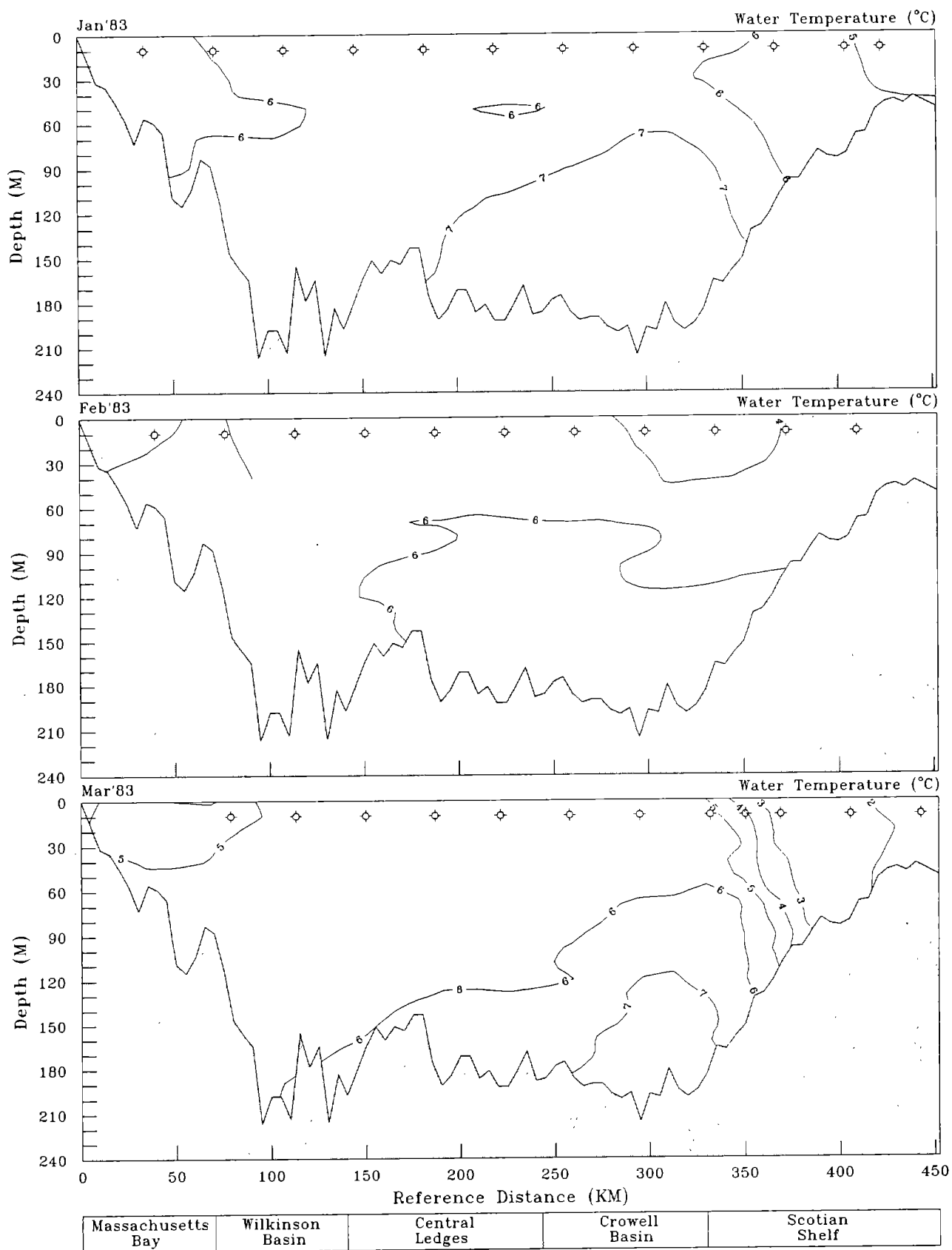


Figure 112. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1983.

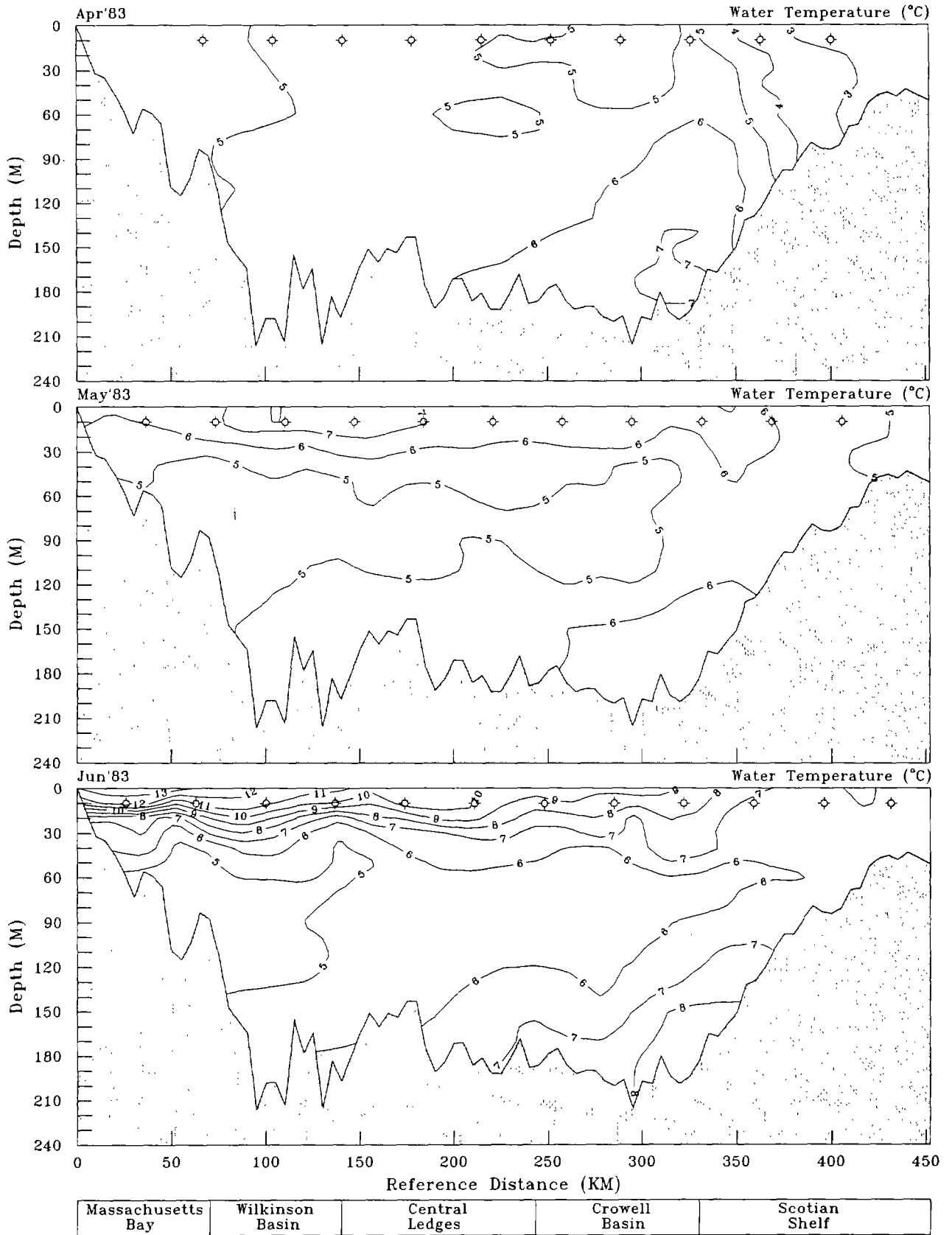


Figure 113. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Gulf of Maine transect during April, May, and June 1983.

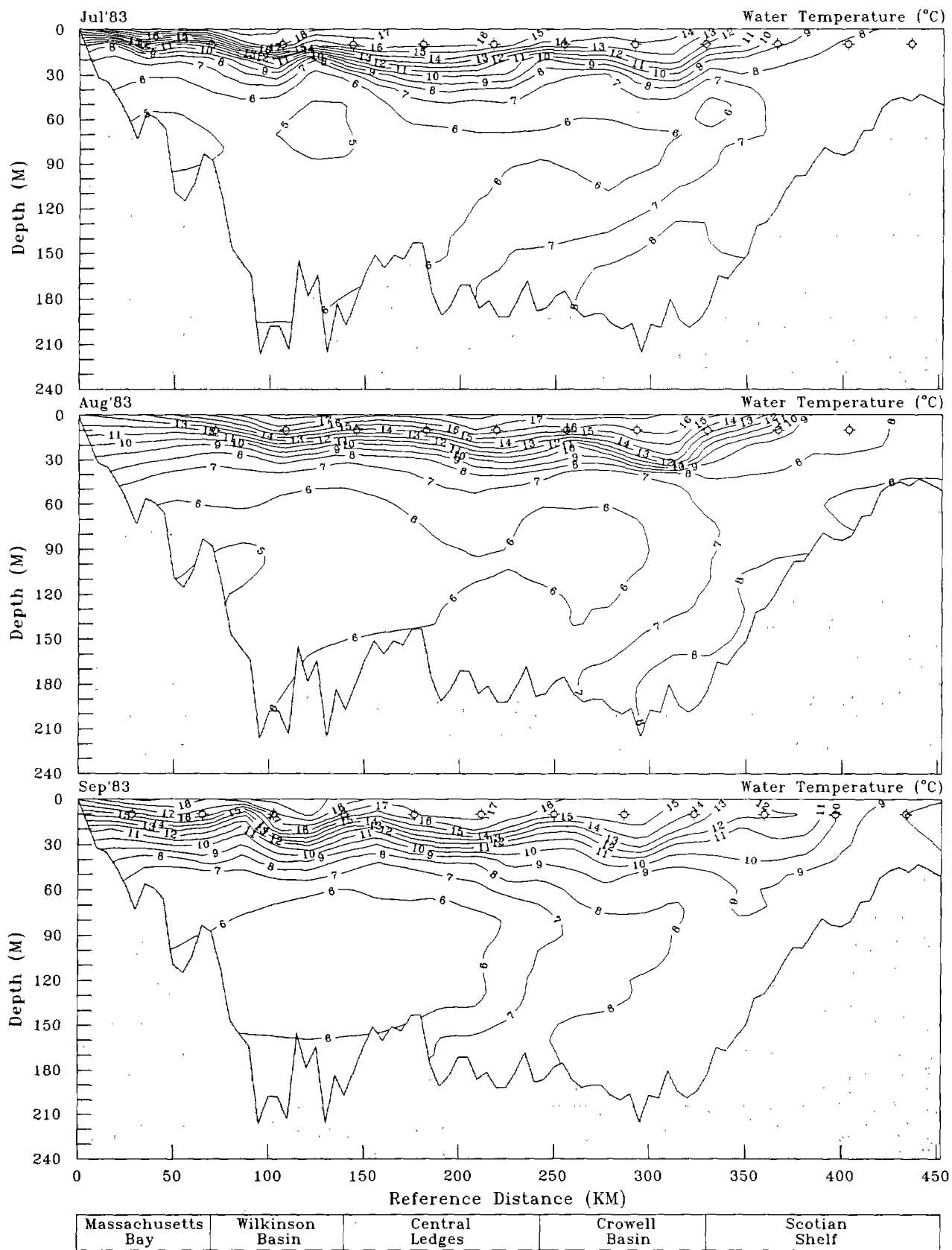


Figure 114. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (⊖) along the Gulf of Maine transect during July, August, and September 1983.

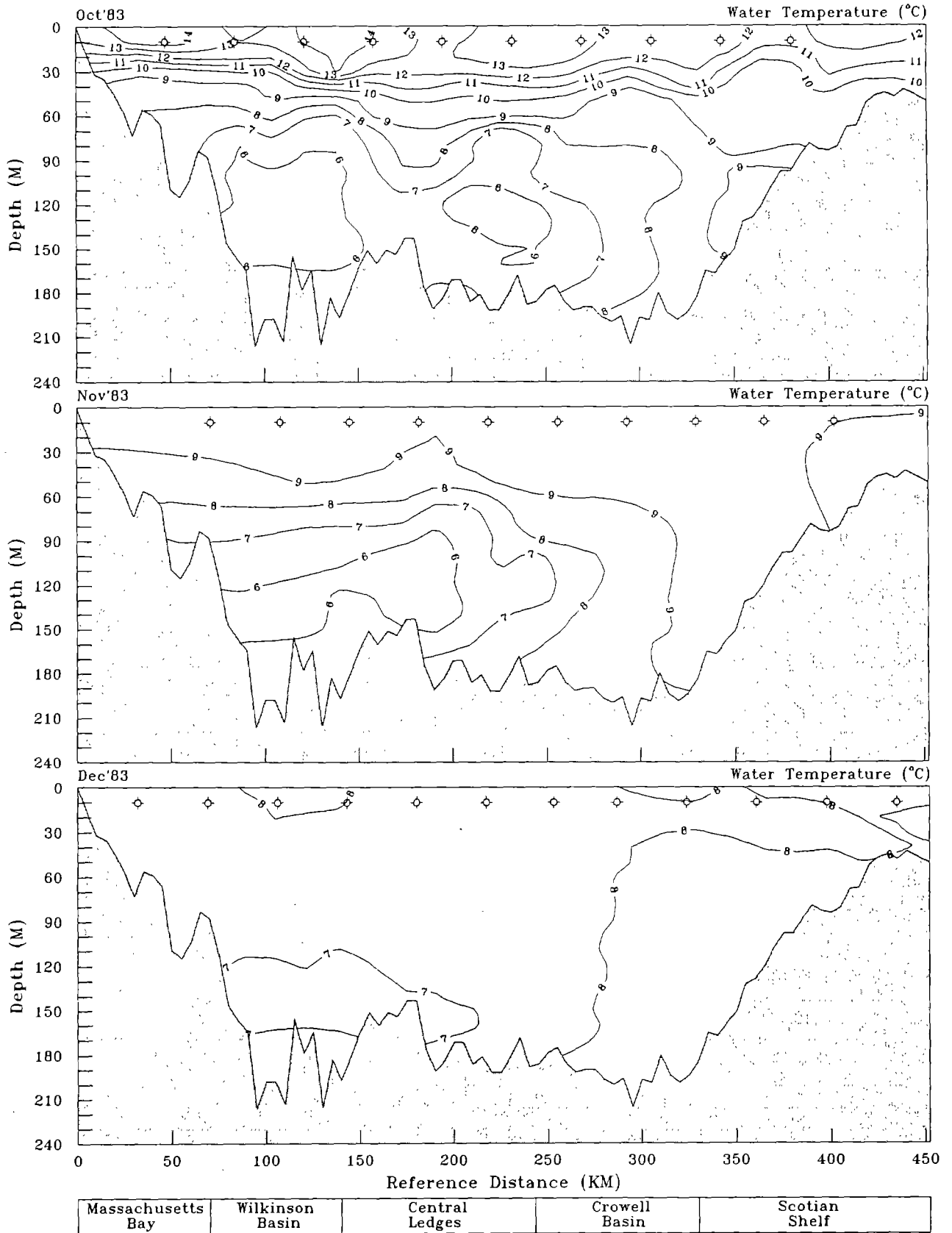


Figure 115. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Gulf of Maine transect during October, November, and December 1983.

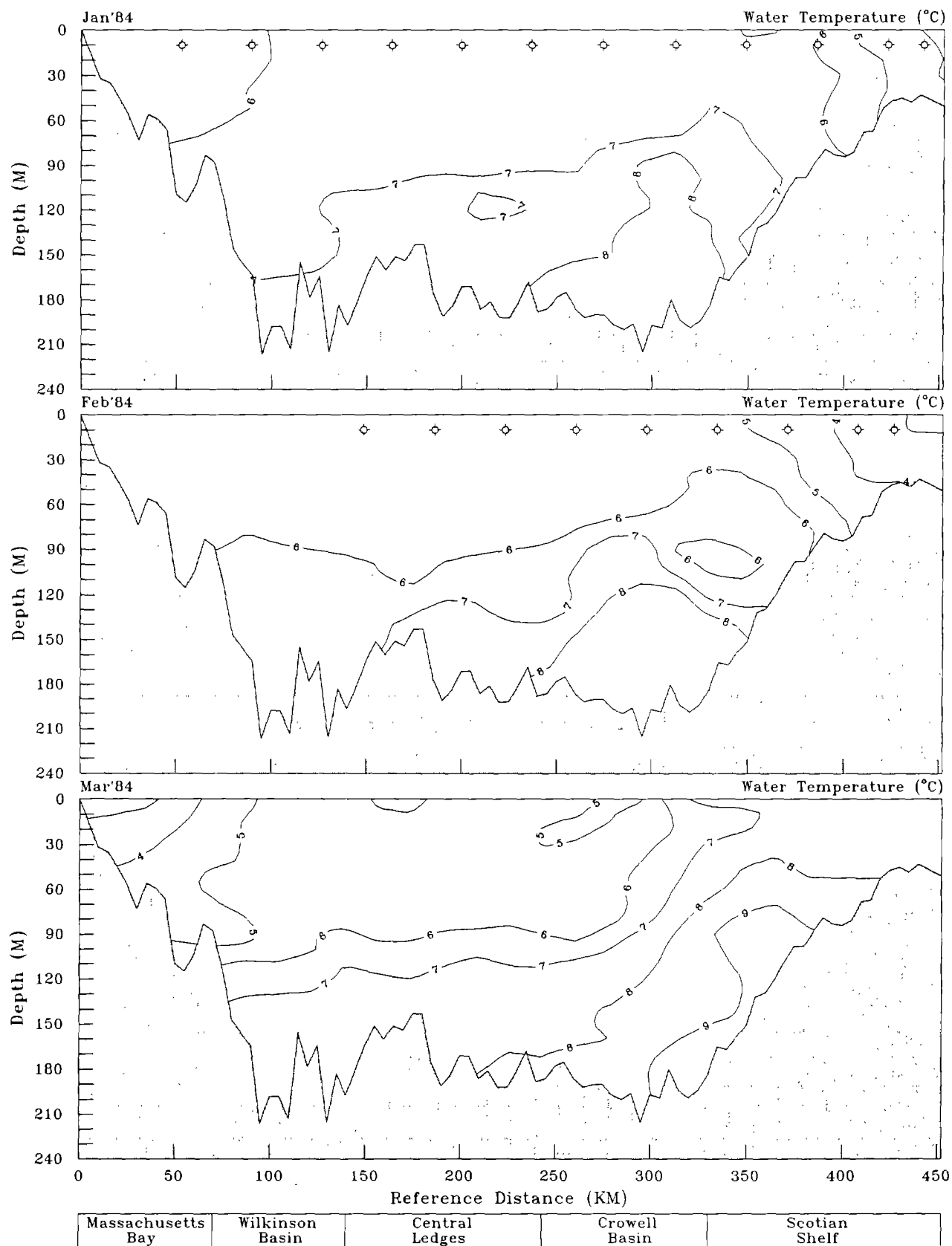


Figure 116. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Gulf of Maine transect during January, February, and March 1984.

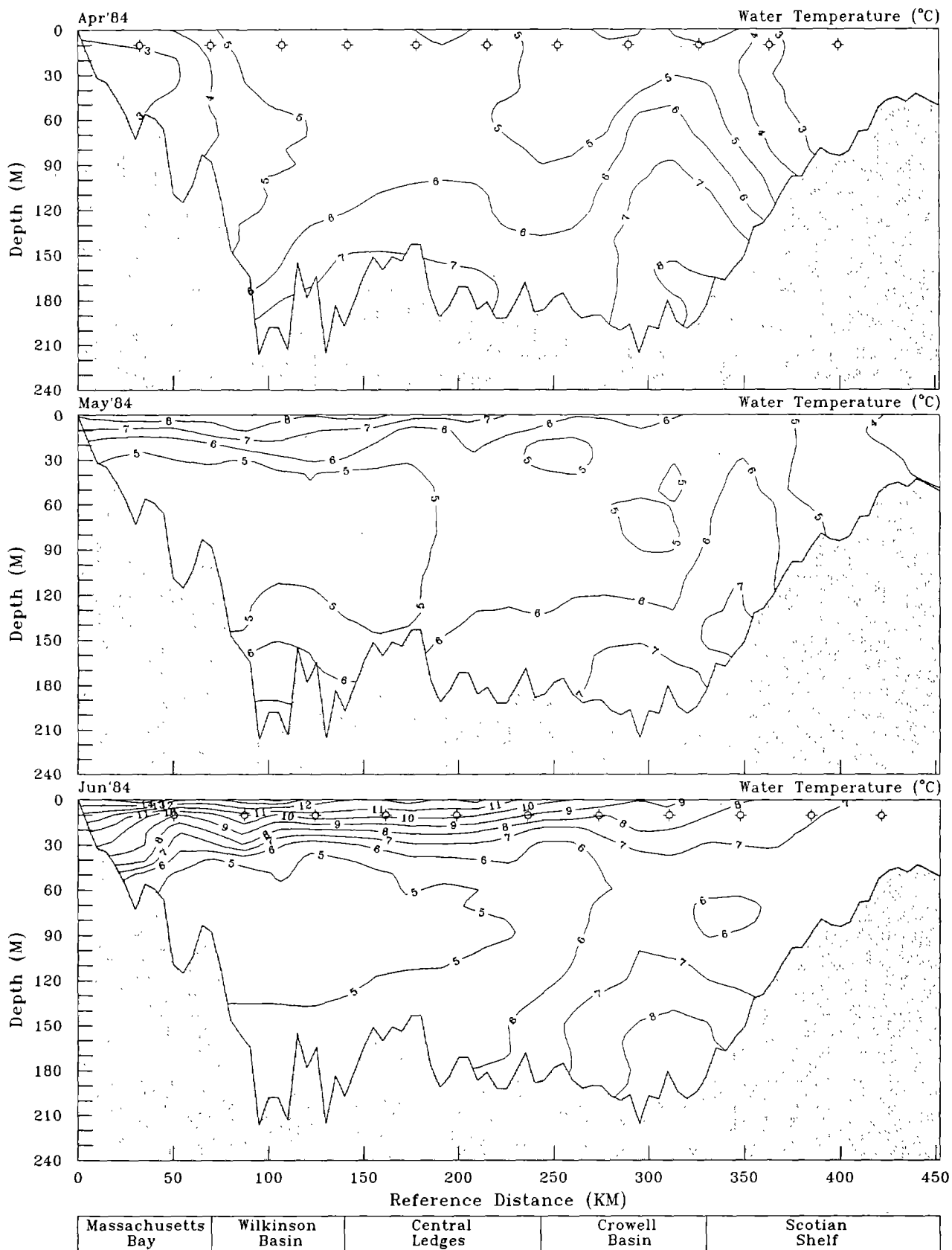


Figure 117. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during April, May, and June 1984.

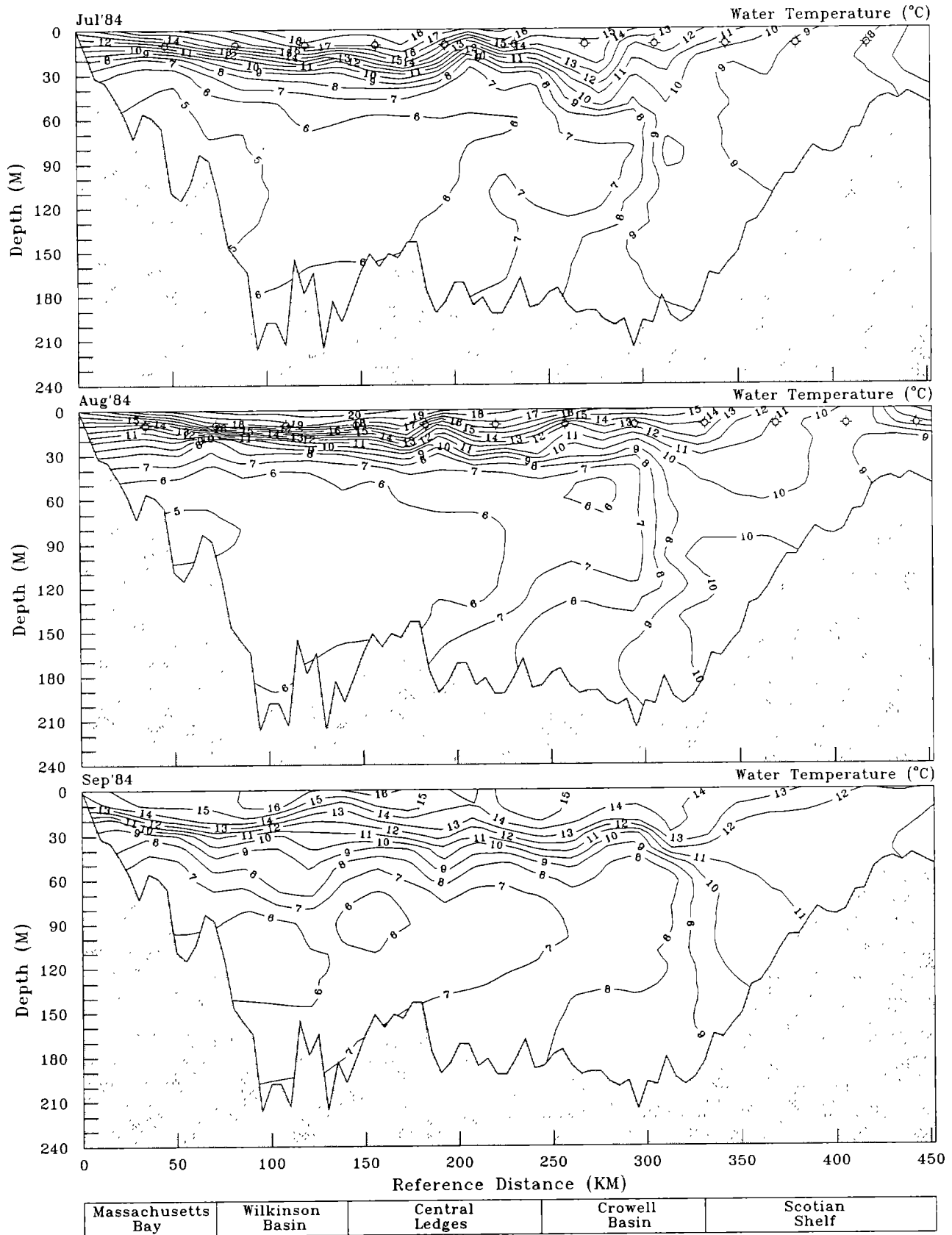


Figure 118. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1984.

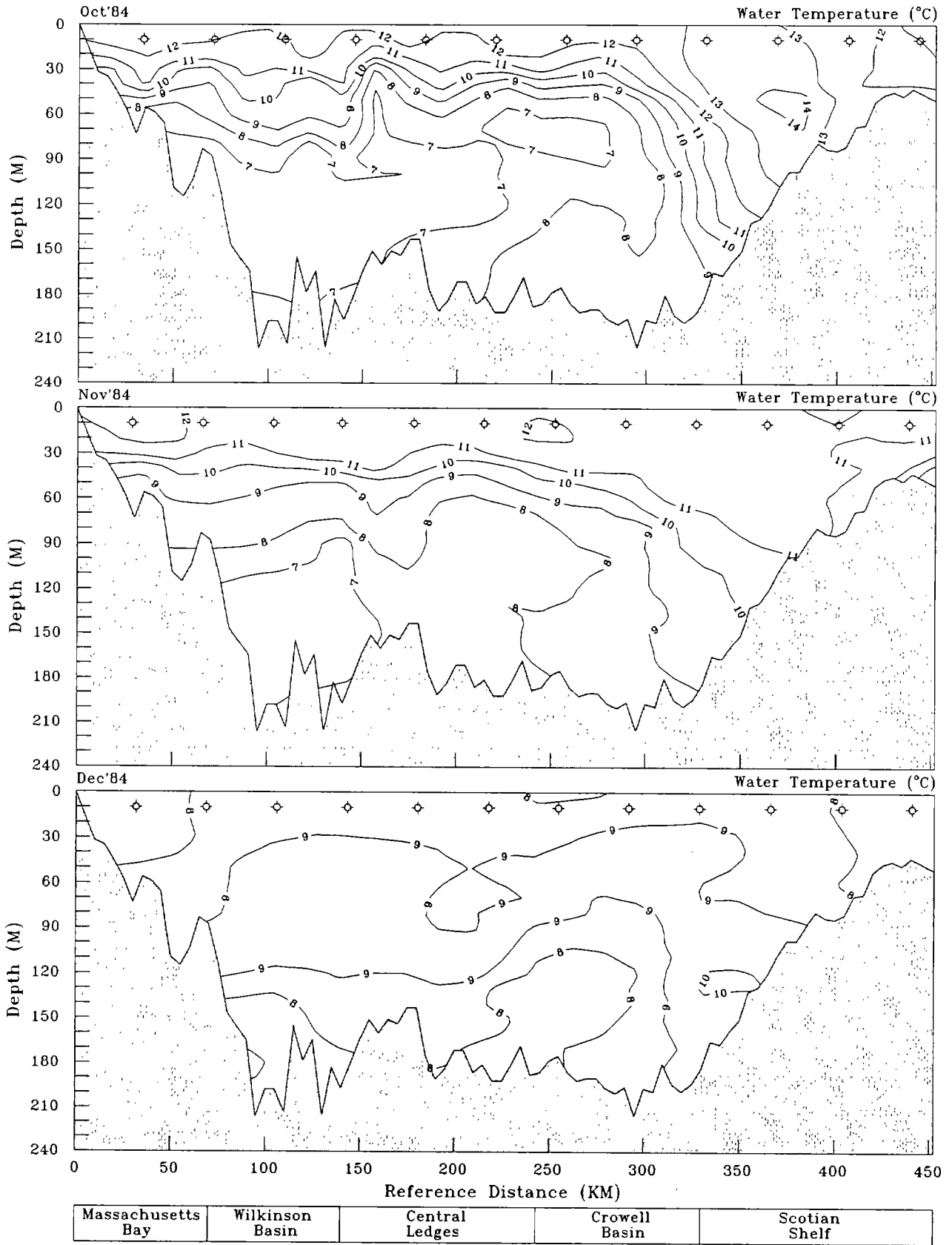


Figure 119. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during October, November, and December 1984.

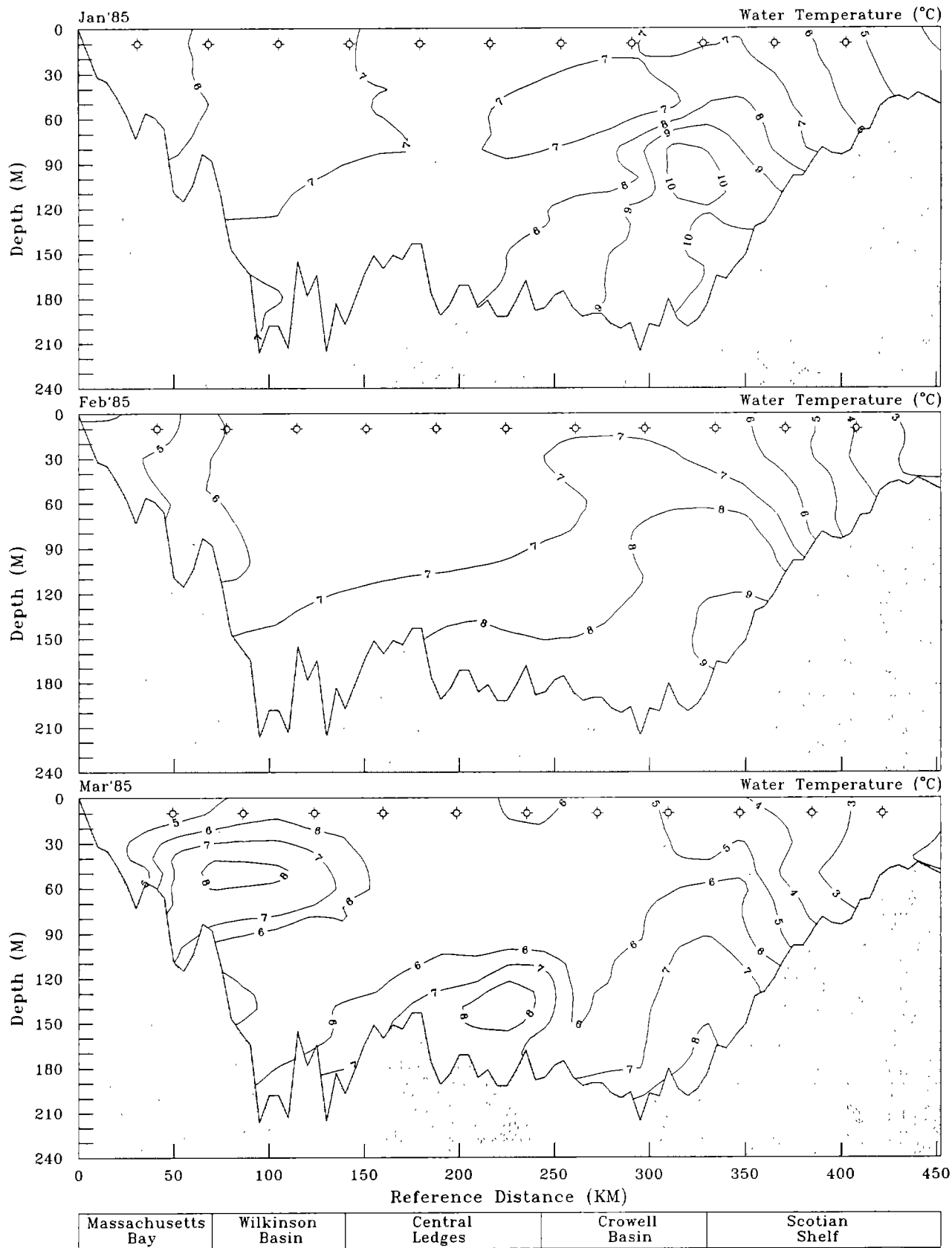


Figure 120. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1985.

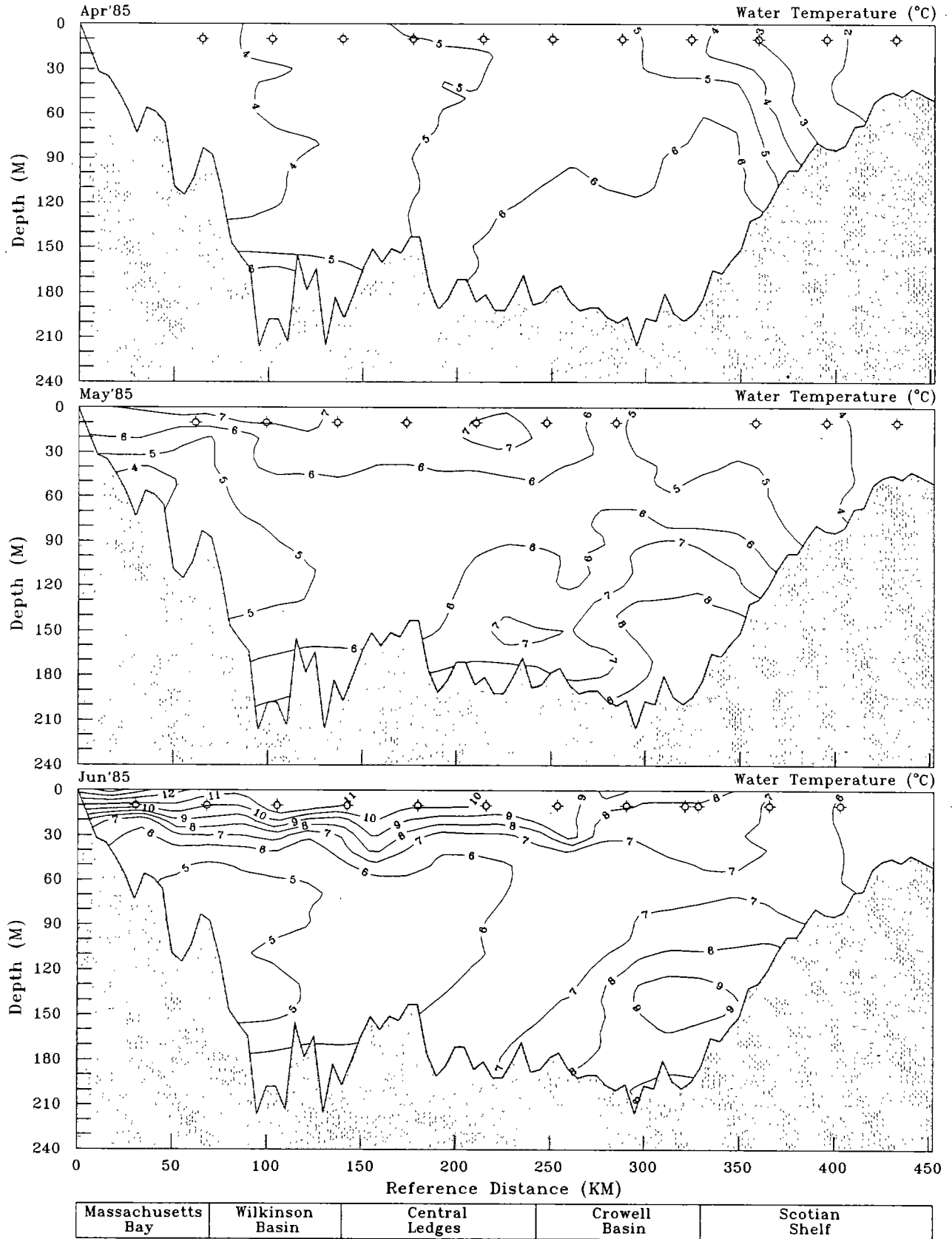


Figure 121. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during April, May, and June 1985.

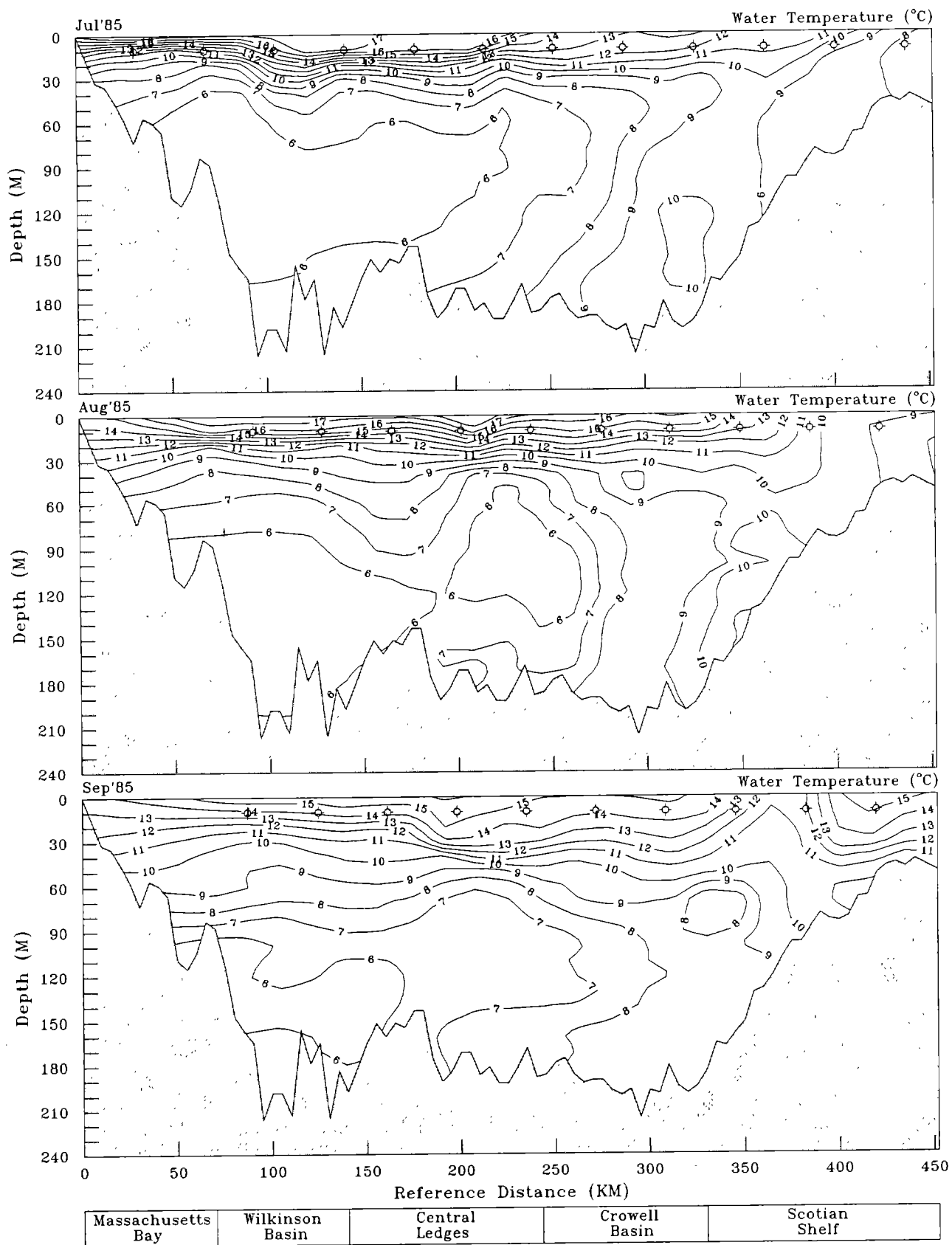


Figure 122. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (•) along the Gulf of Maine transect during July, August, and September 1985.

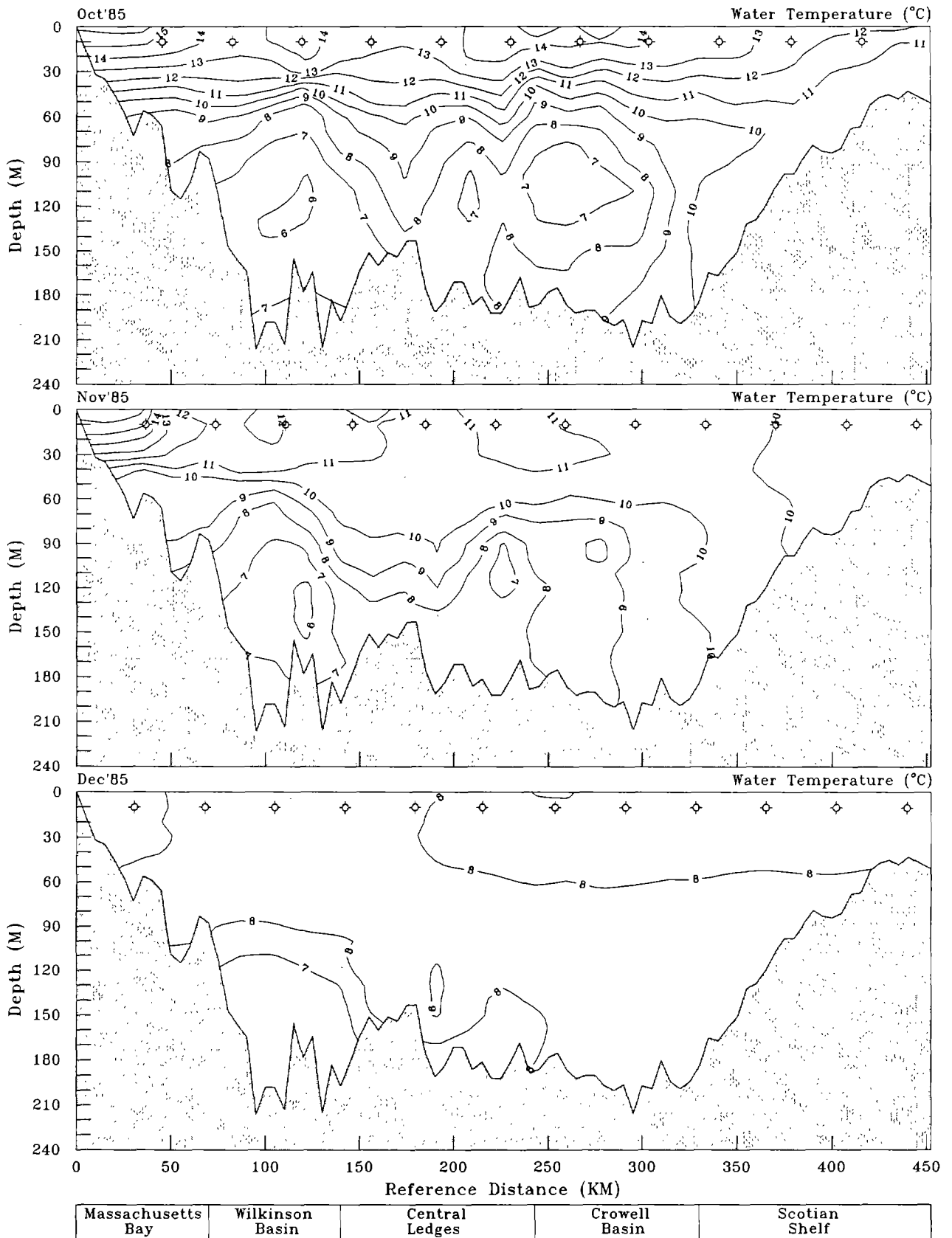


Figure 123. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (♠) along the Gulf of Maine transect during October, November, and December 1985.

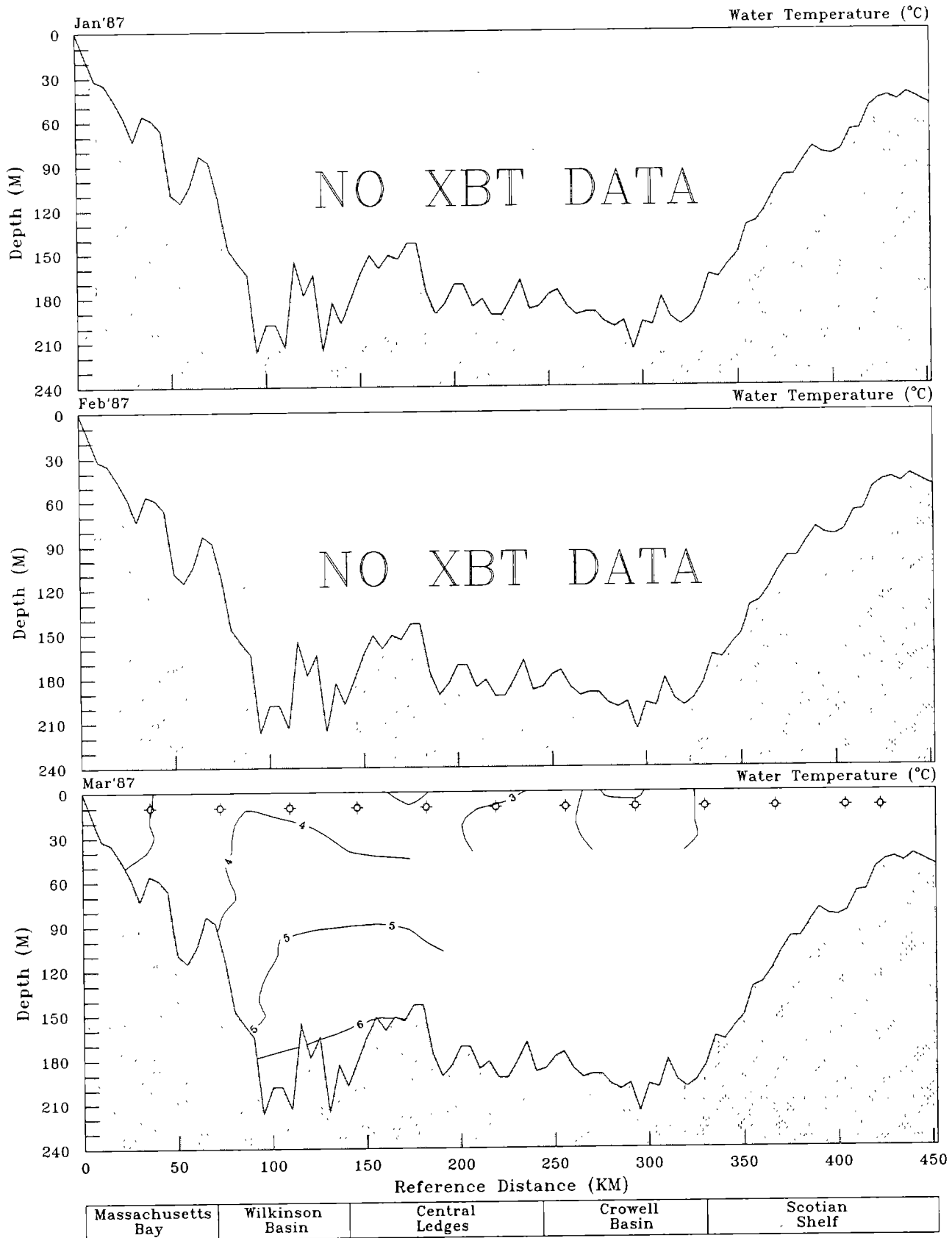


Figure 124. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1987.

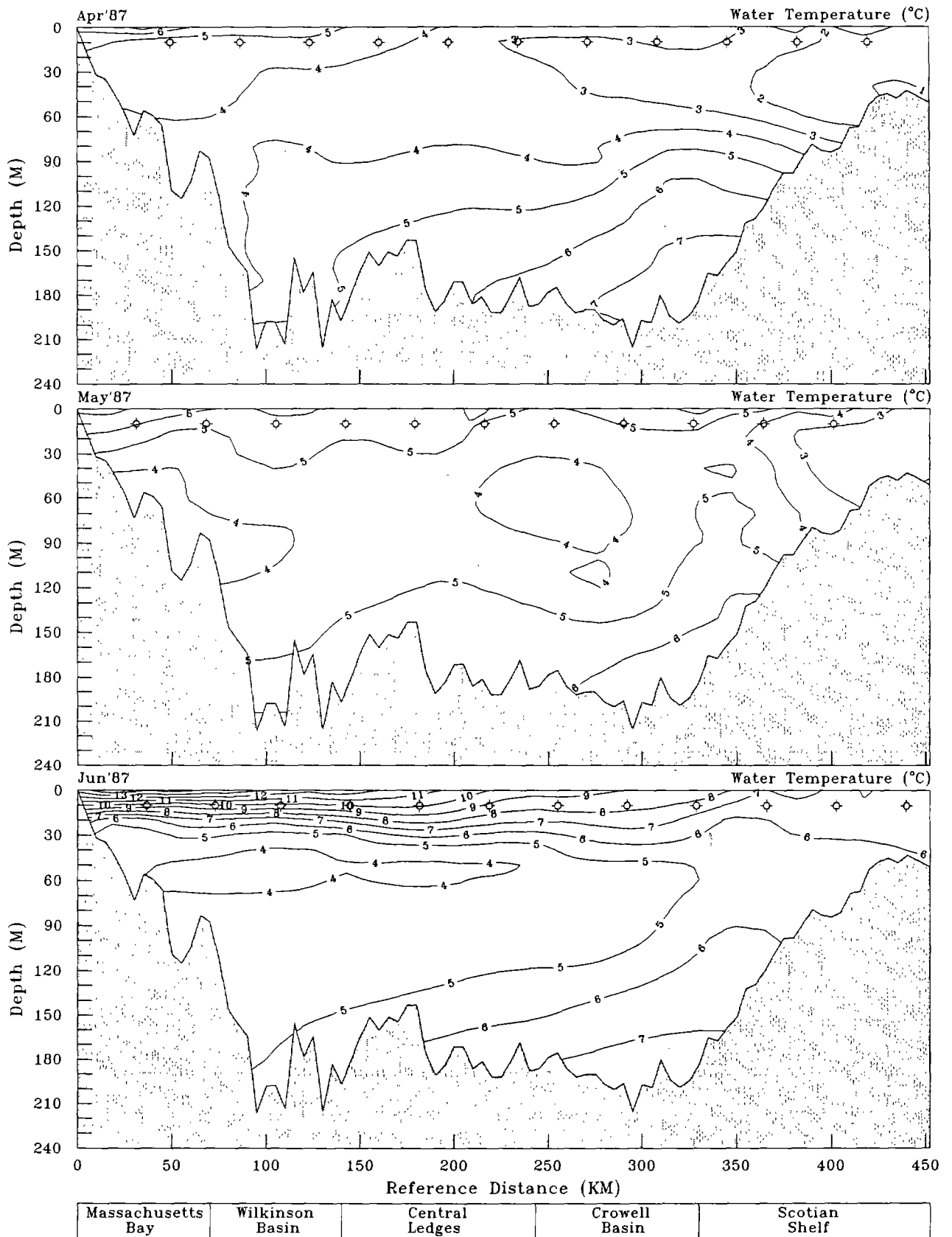


Figure 125. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth along the Gulf of Maine transect during April, May, and June 1987.

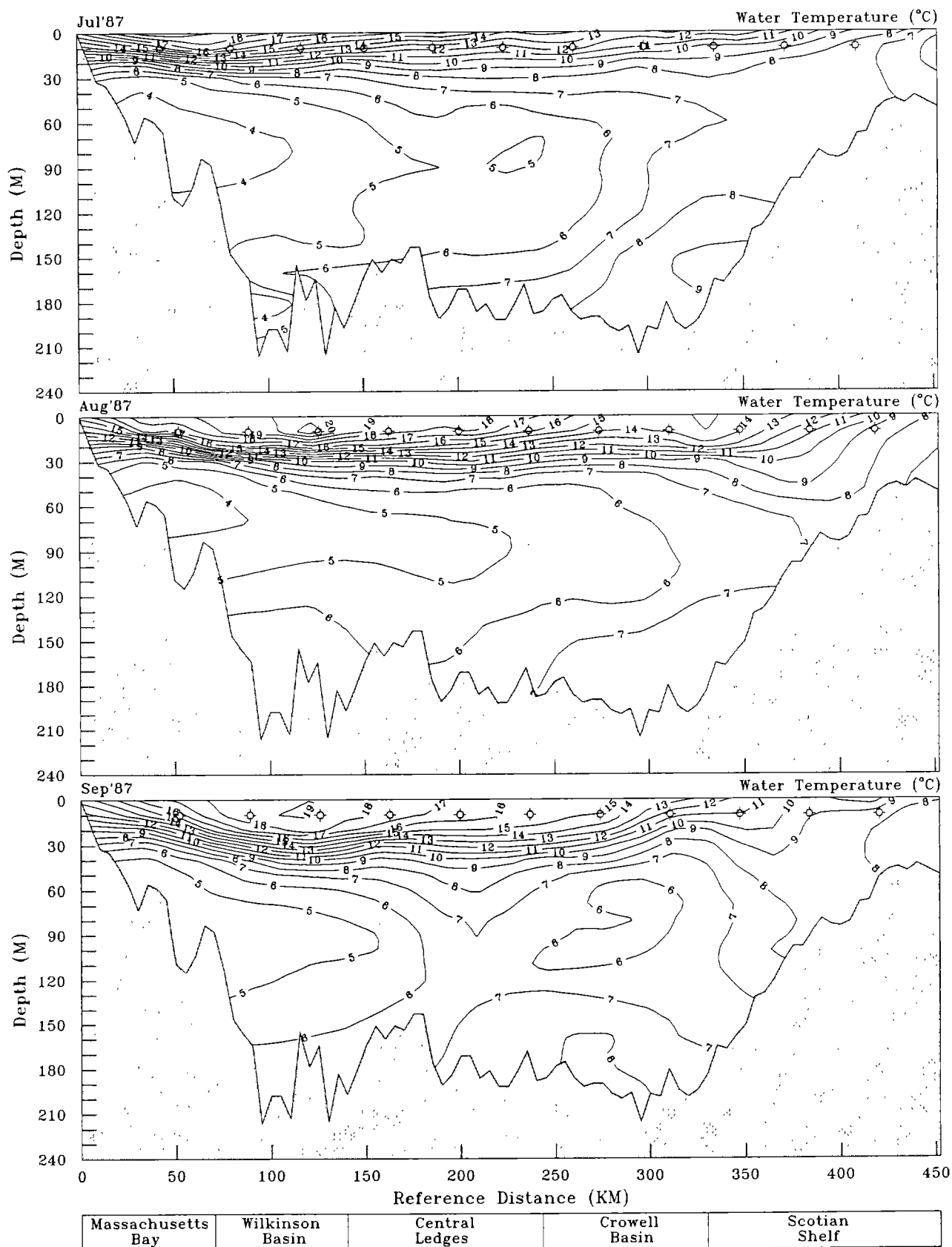


Figure 126. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1987.

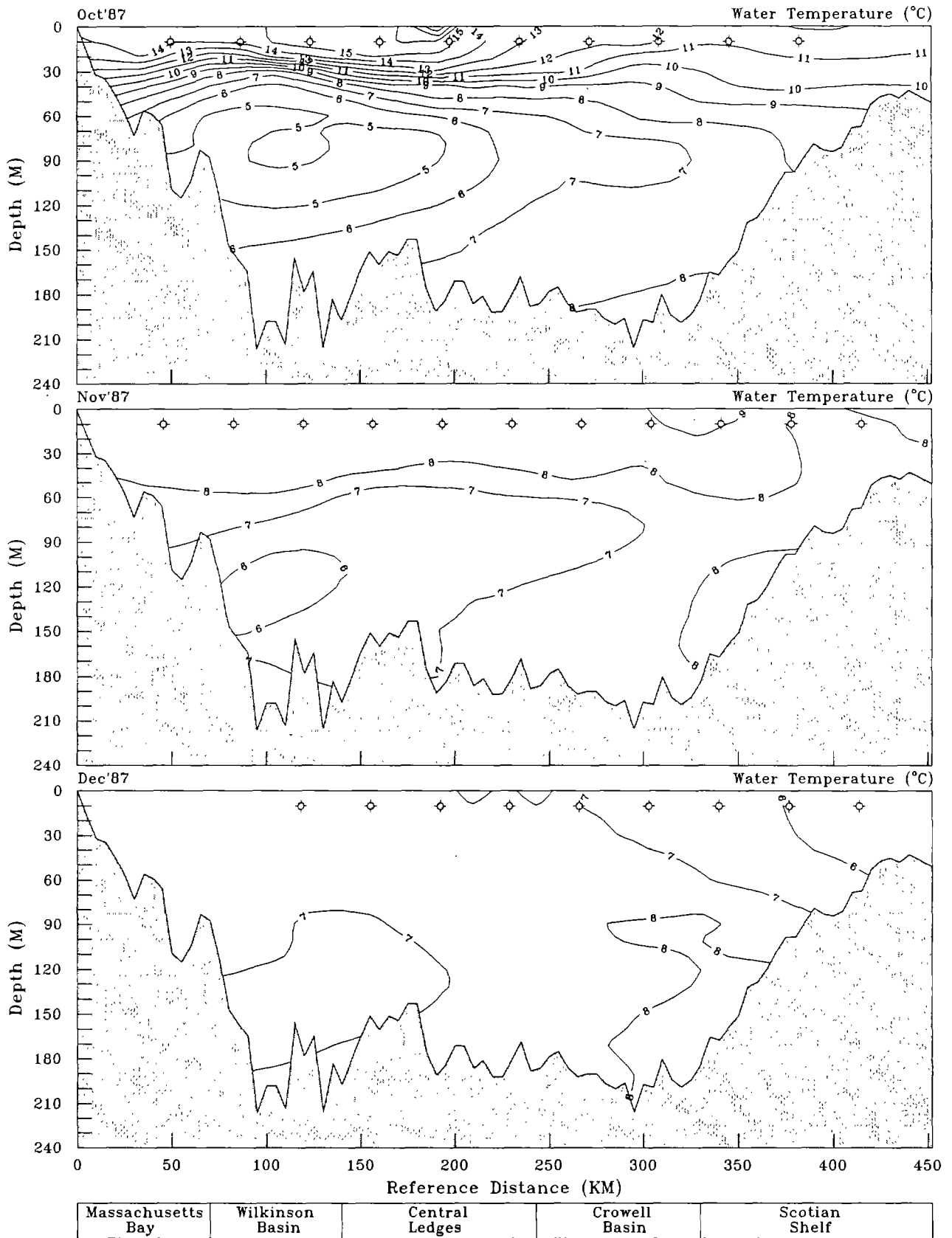


Figure 127. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during October, November, and December 1987.

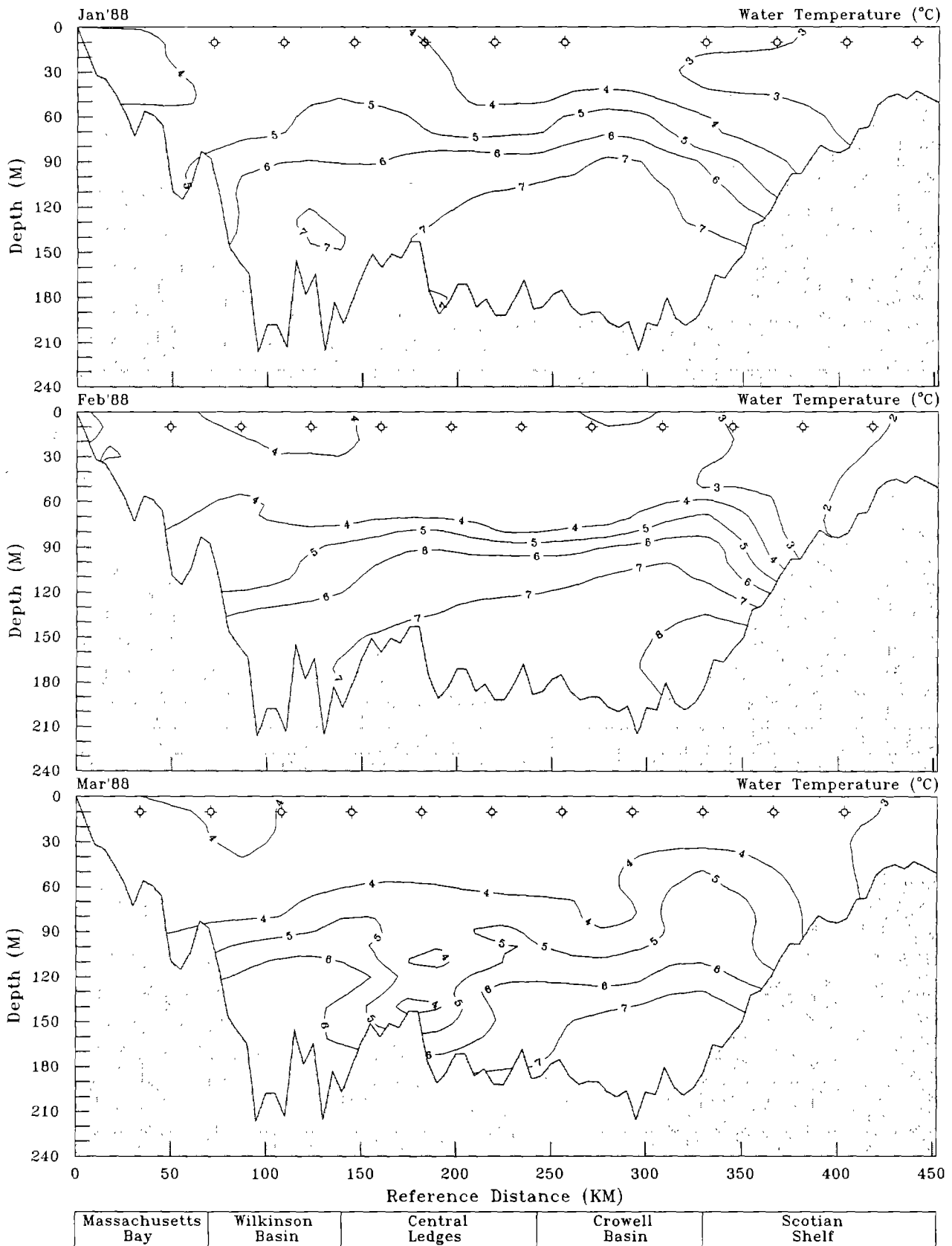


Figure 128. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (σ) along the Gulf of Maine transect during January, February, and March 1988.

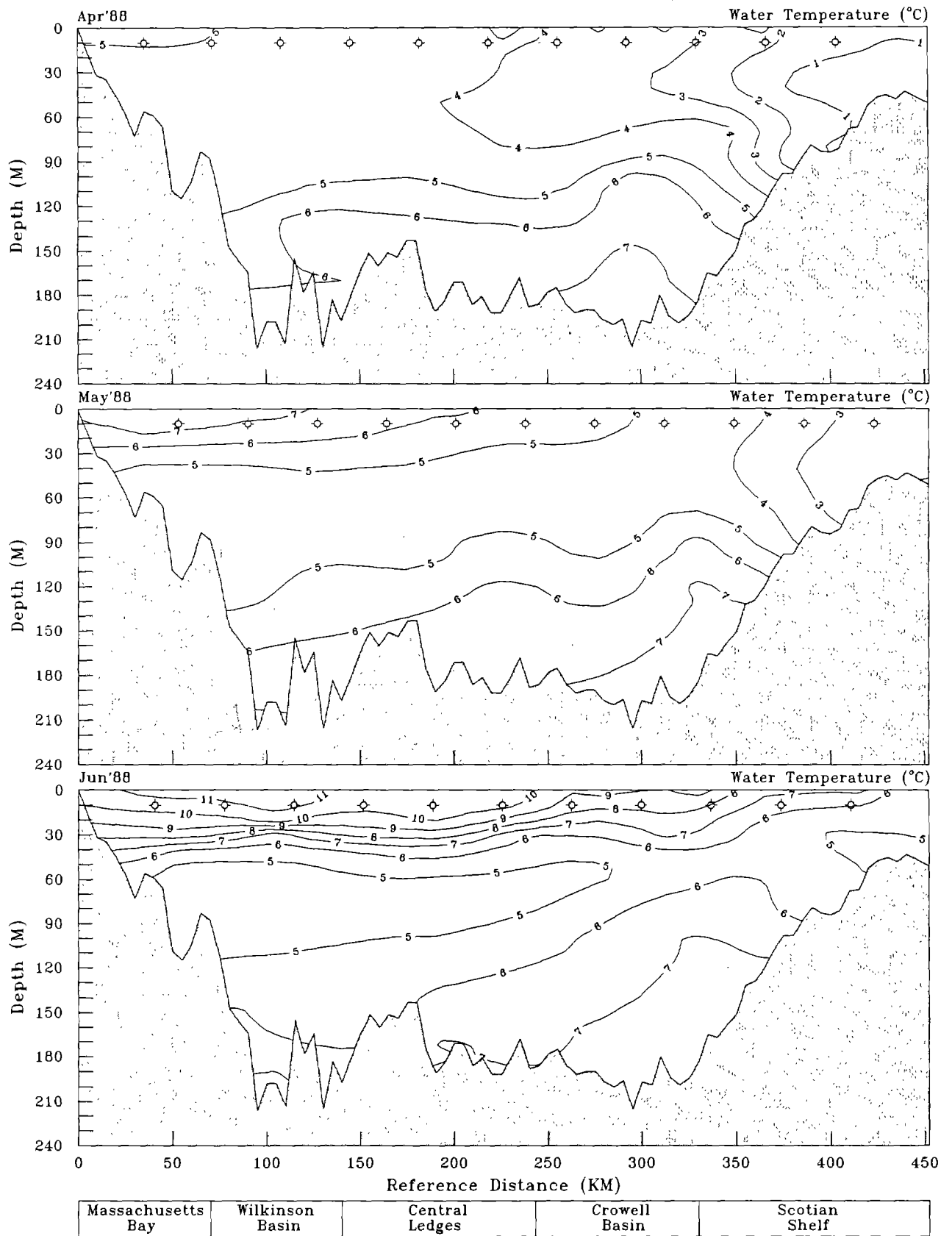


Figure 129. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during April, May, and June 1988.

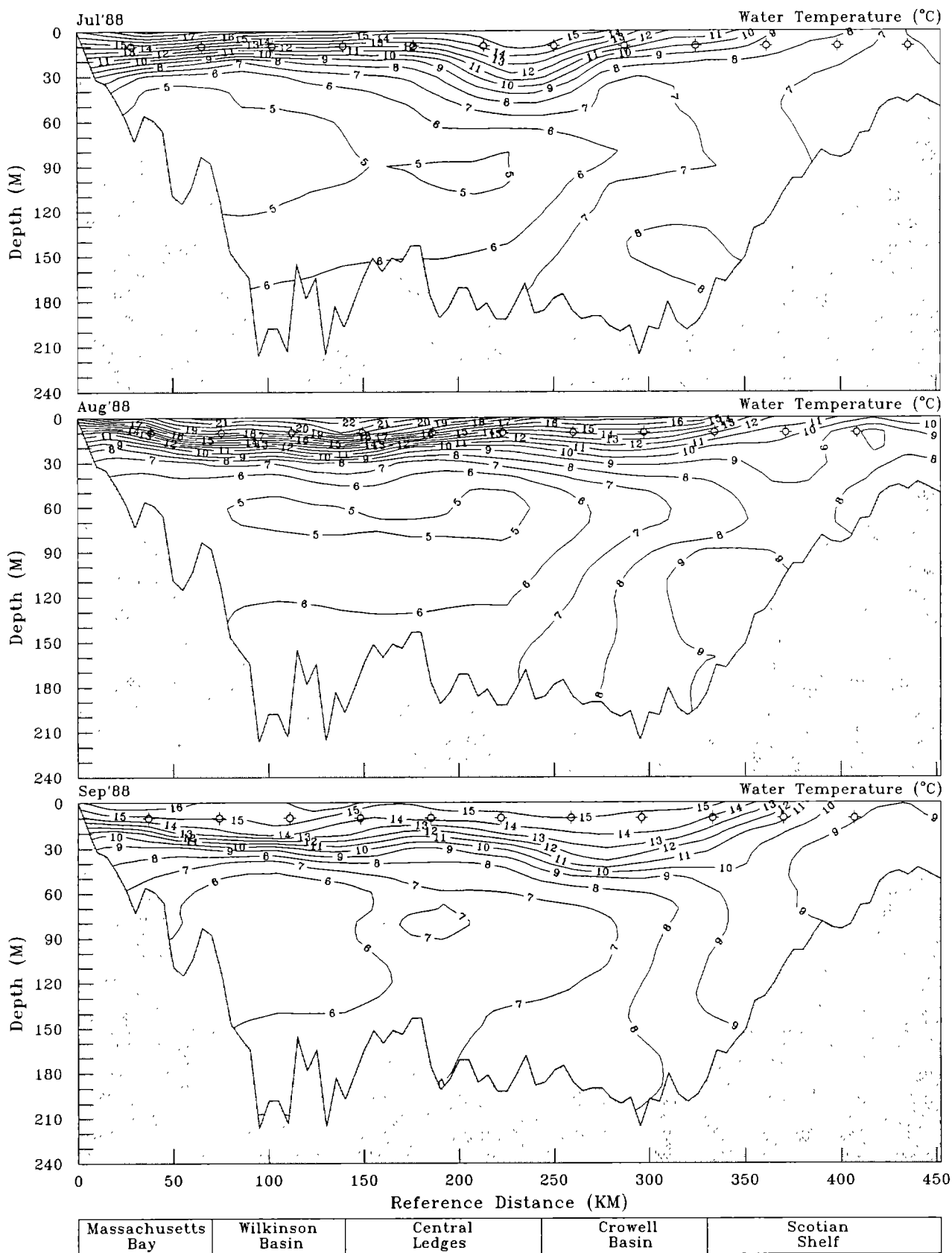


Figure 130. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1988.

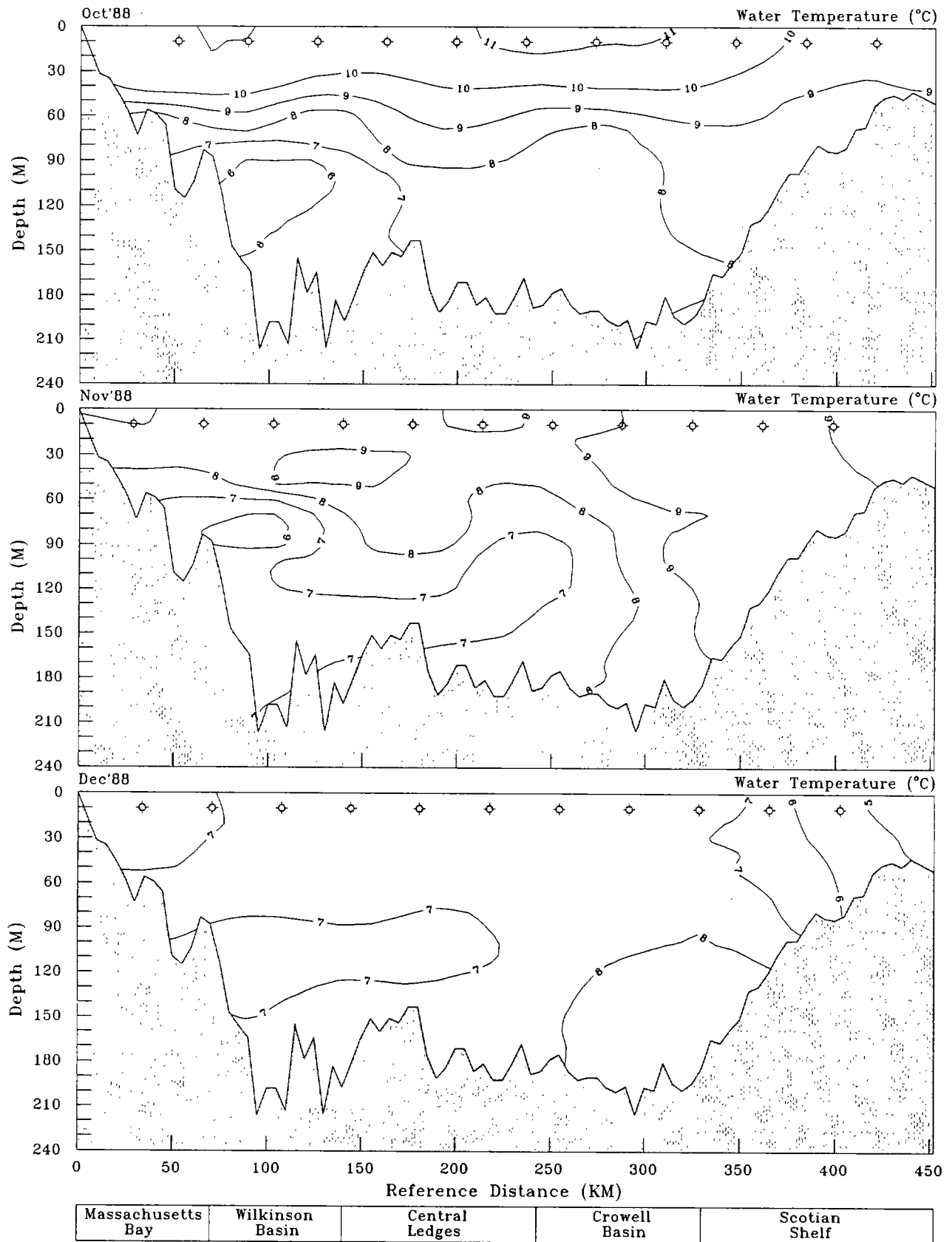


Figure 131. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during October, November, and December 1988.

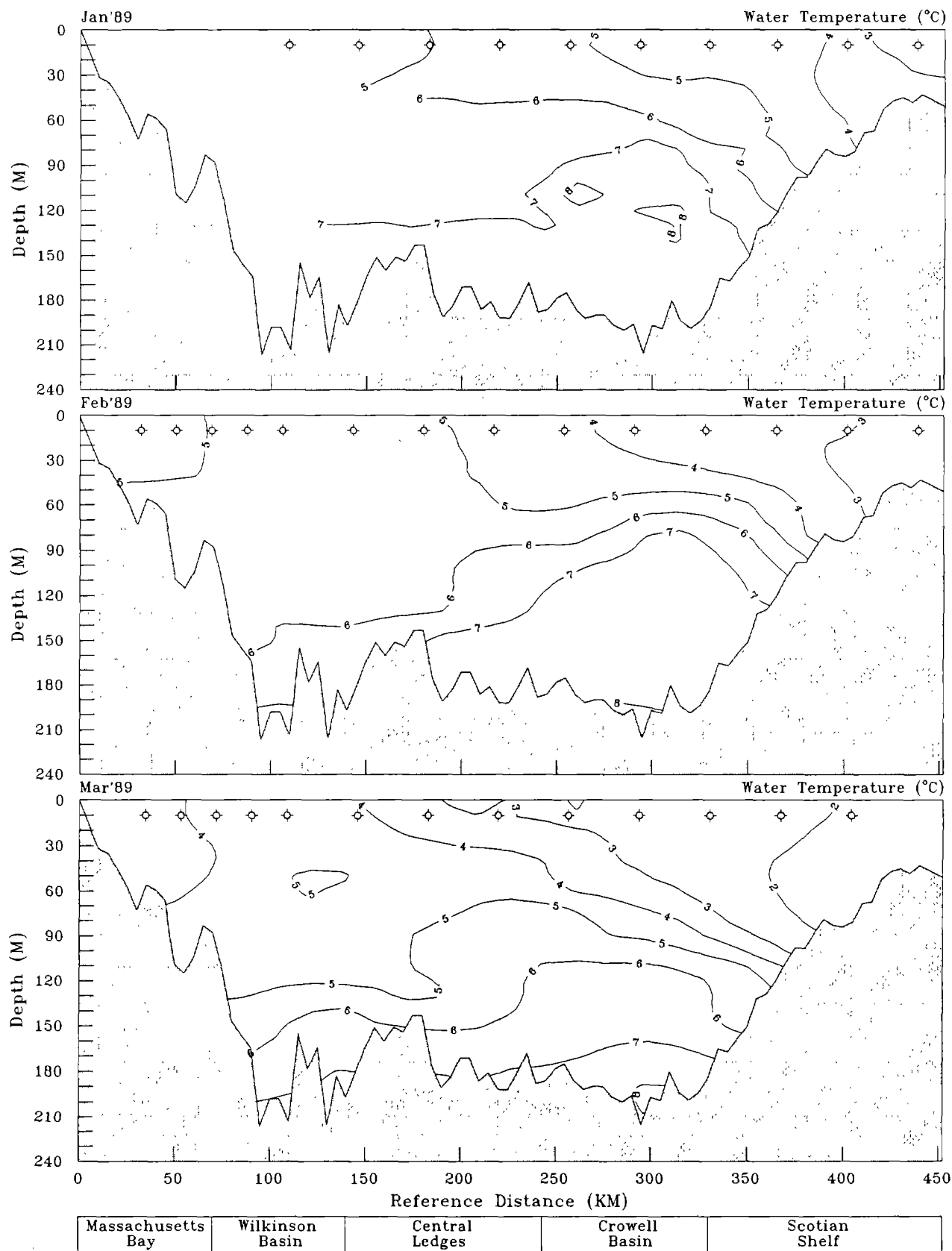


Figure 132. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1989.

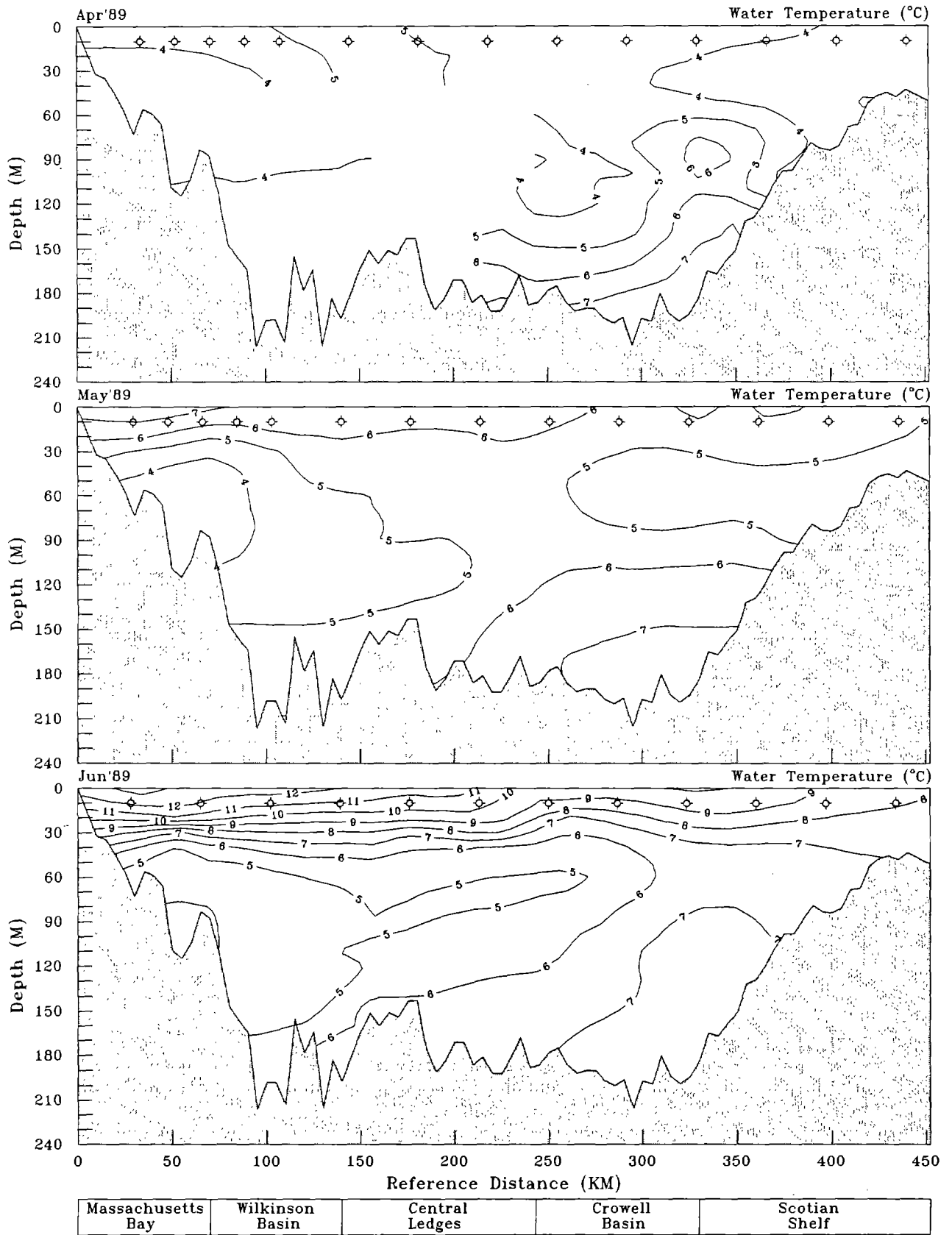


Figure 133. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during April, May, and June 1989.

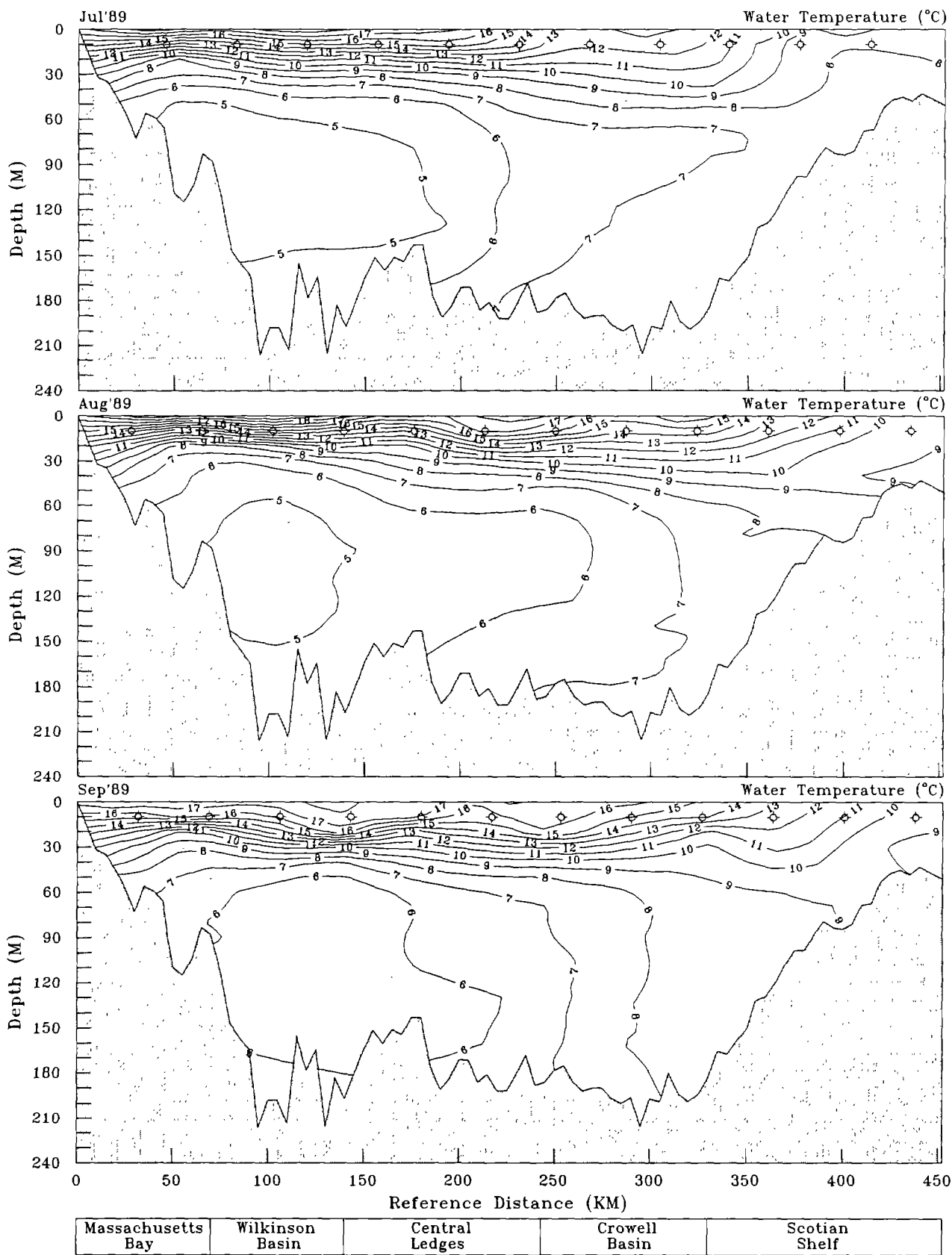


Figure 134. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1989.

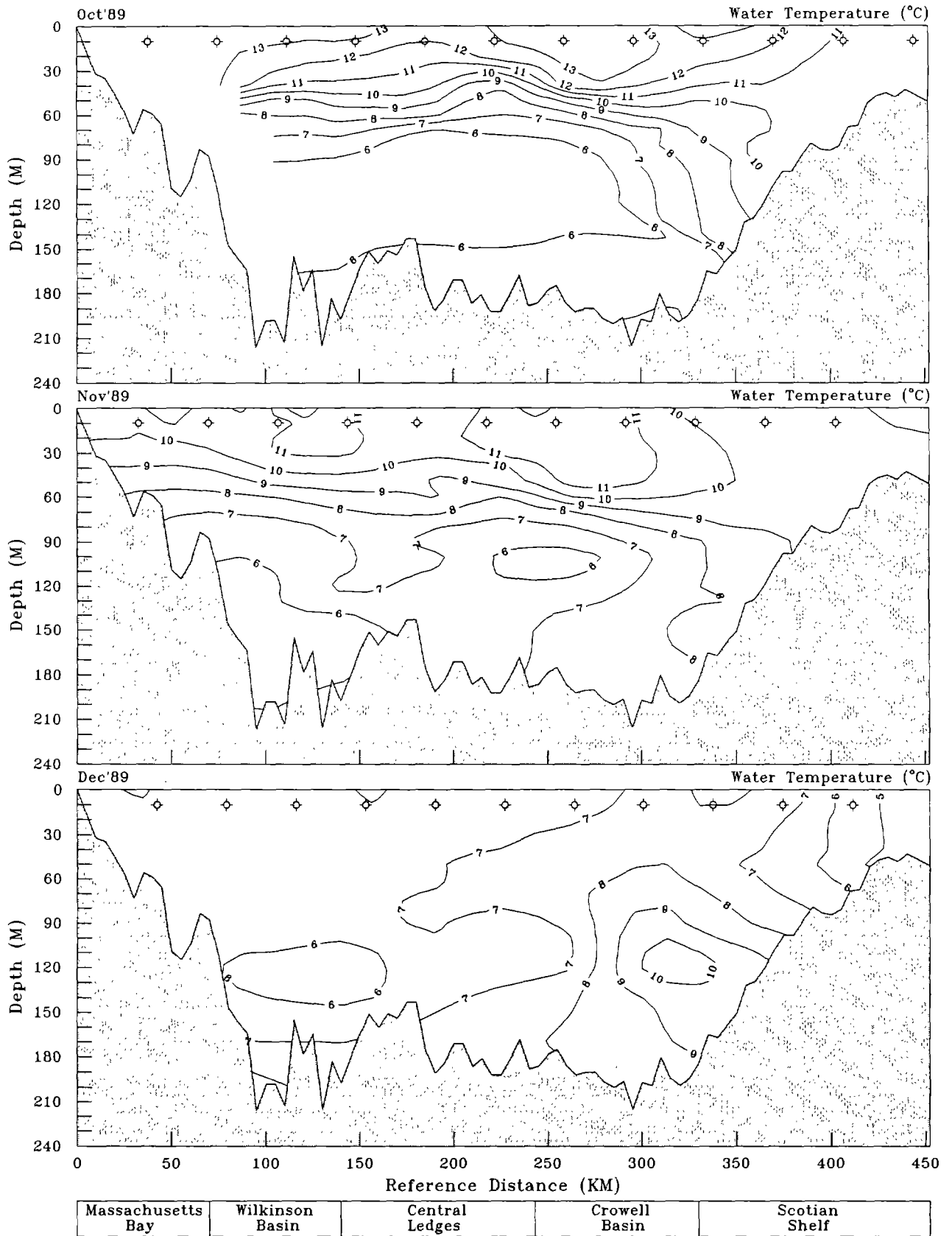


Figure 135. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during October, November, and December 1989.

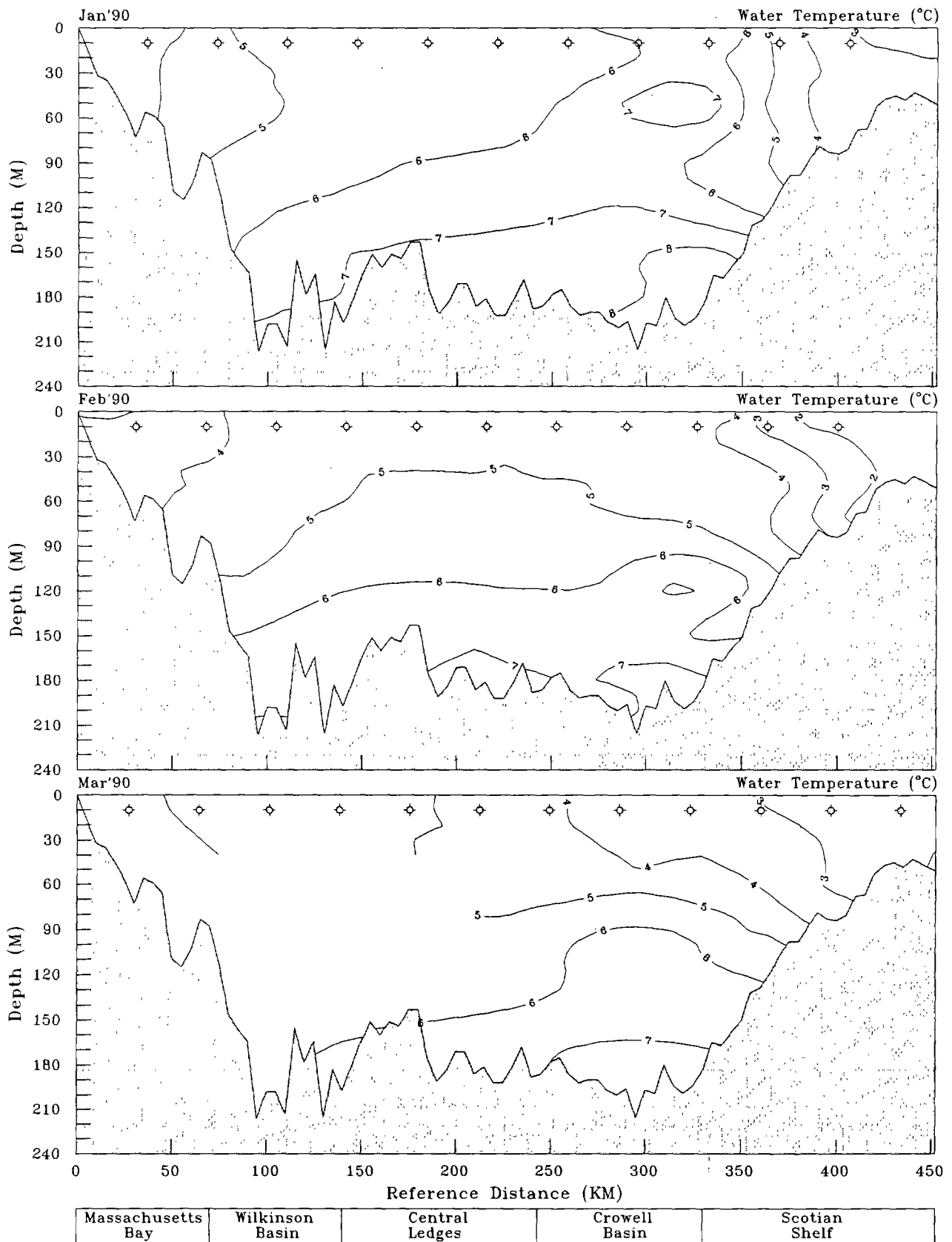


Figure 136. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (♠) along the Gulf of Maine transect during January, February, and March 1990.

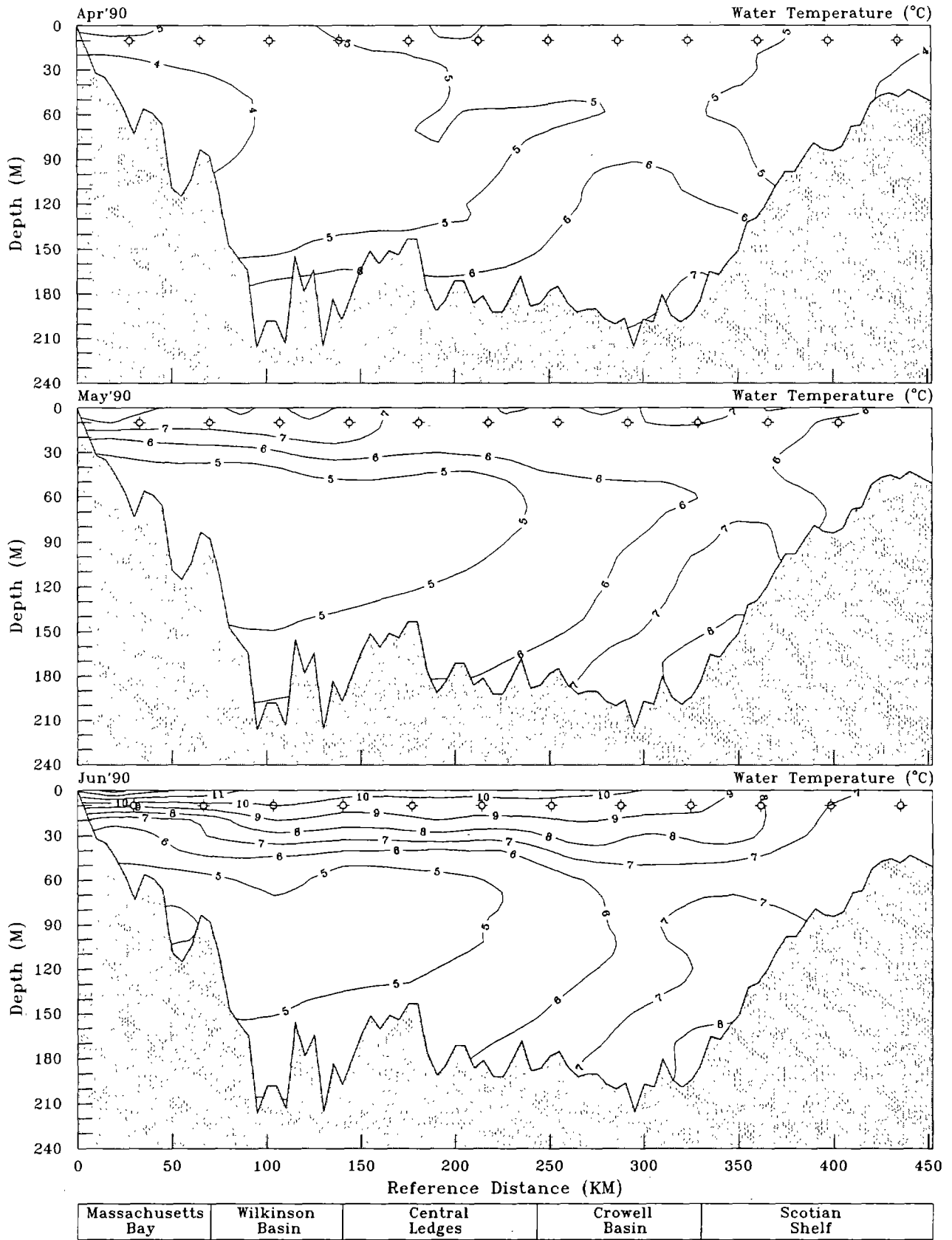


Figure 137. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (α) along the Gulf of Maine transect during April, May, and June 1990.

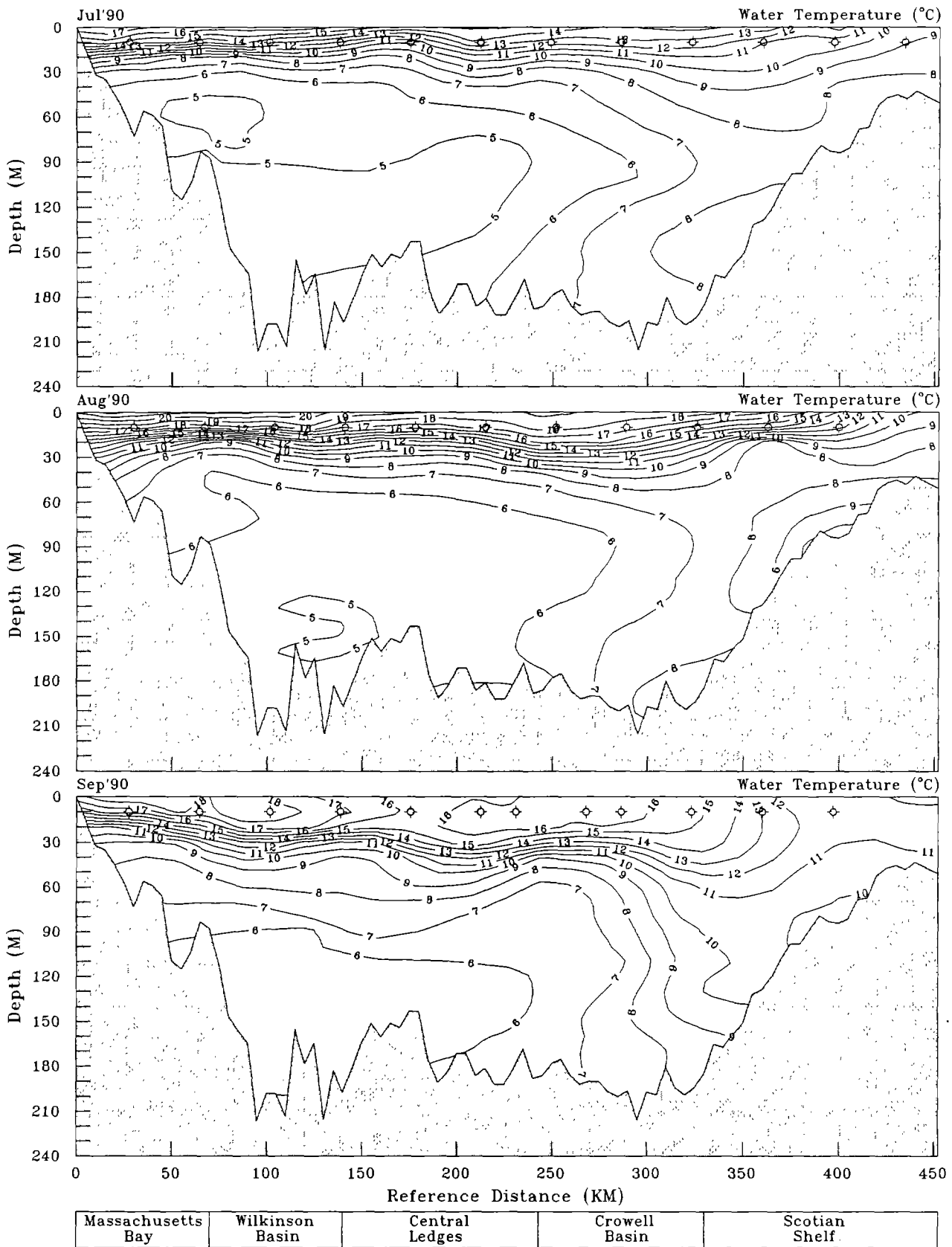


Figure 138. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during July, August, and September 1990.

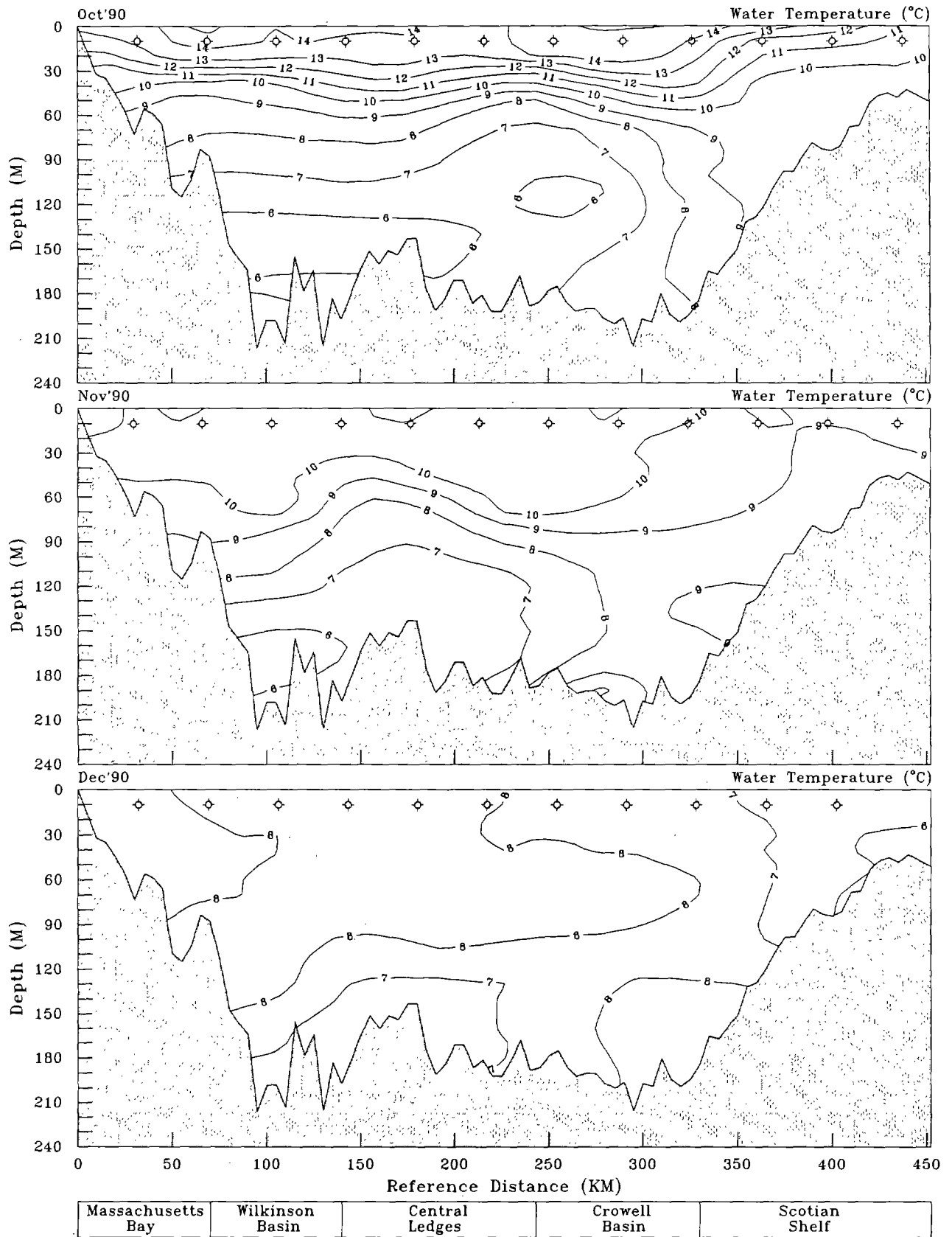


Figure 139. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during October, November, and December 1990.

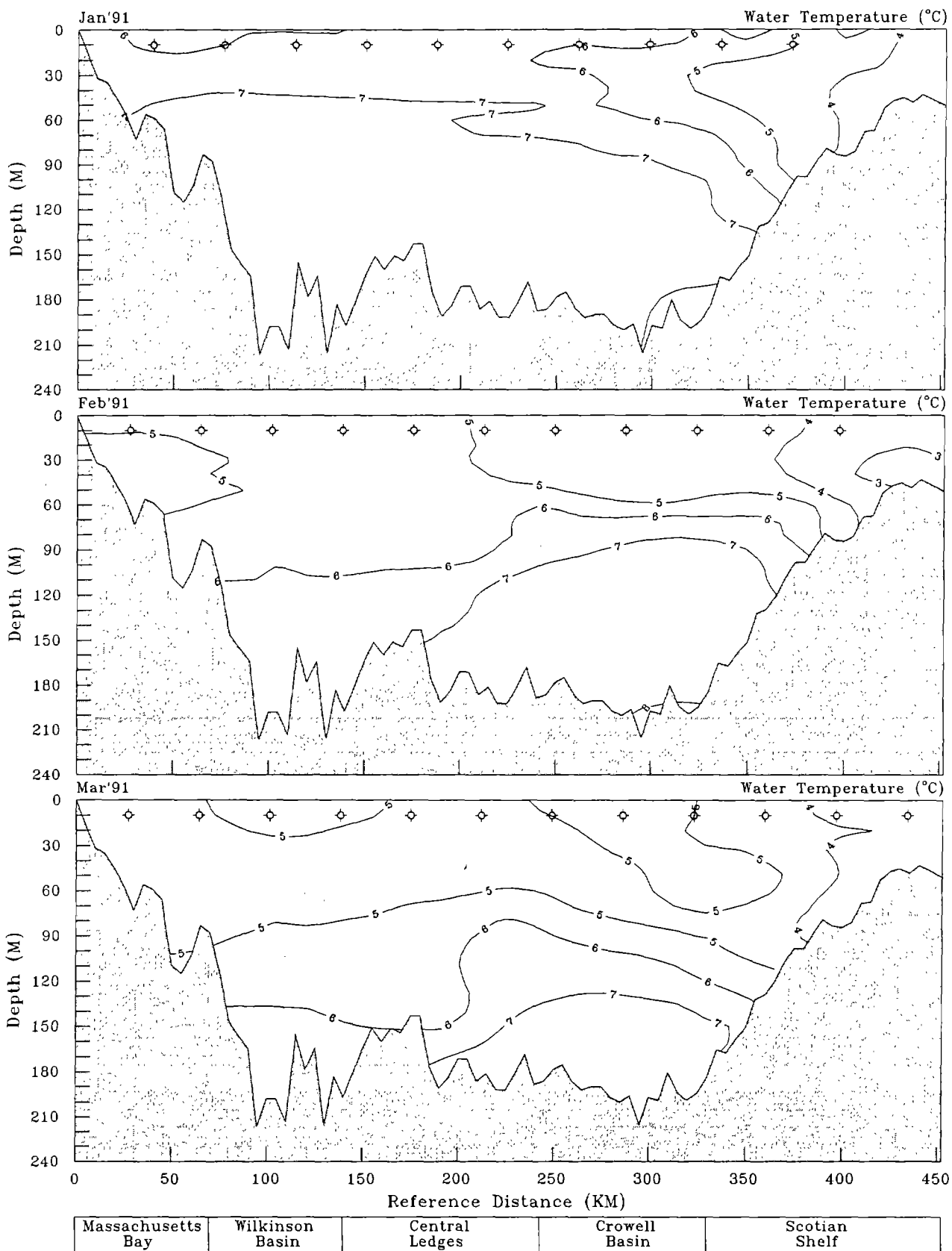


Figure 140. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1991.

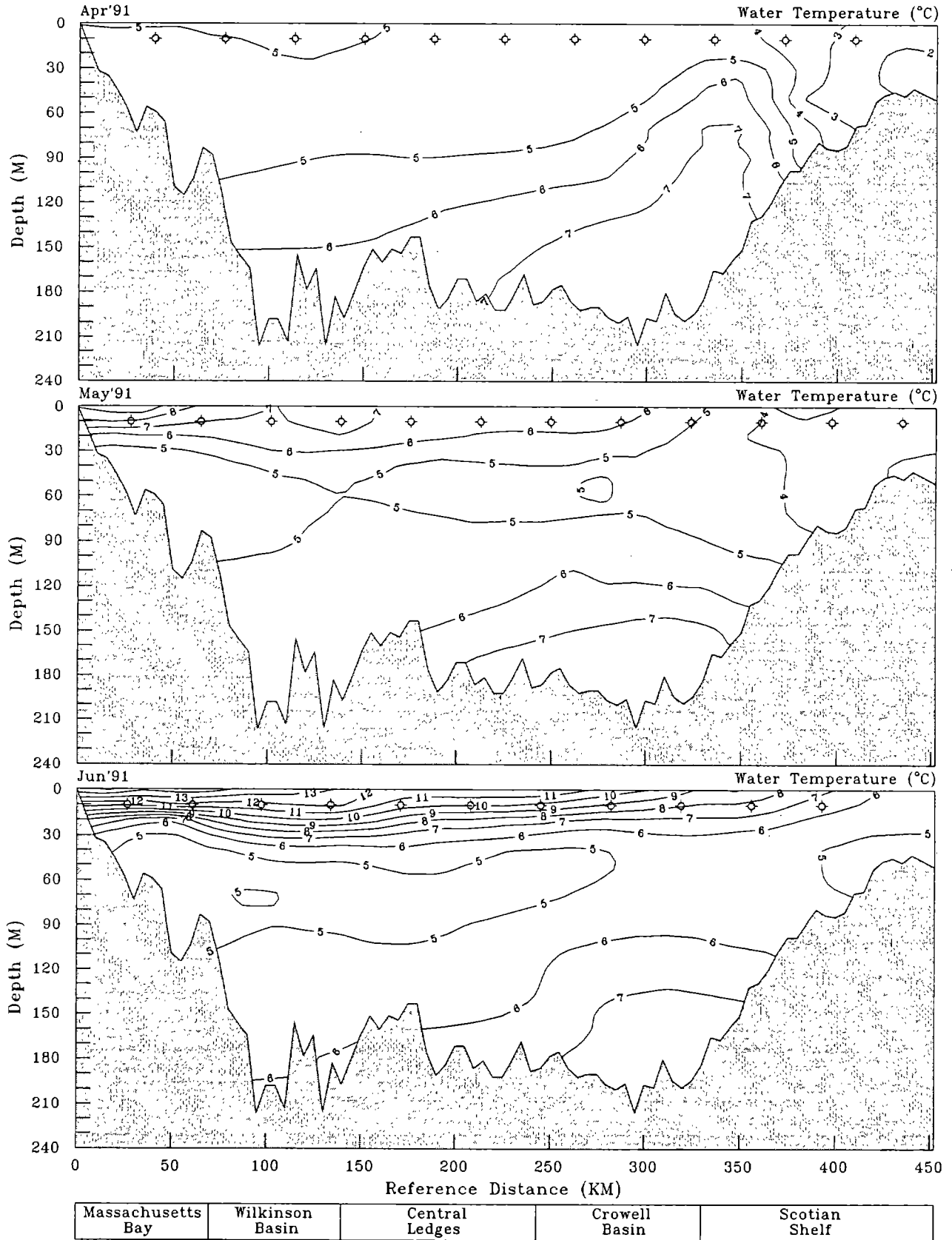


Figure 141. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during April, May, and June 1991.

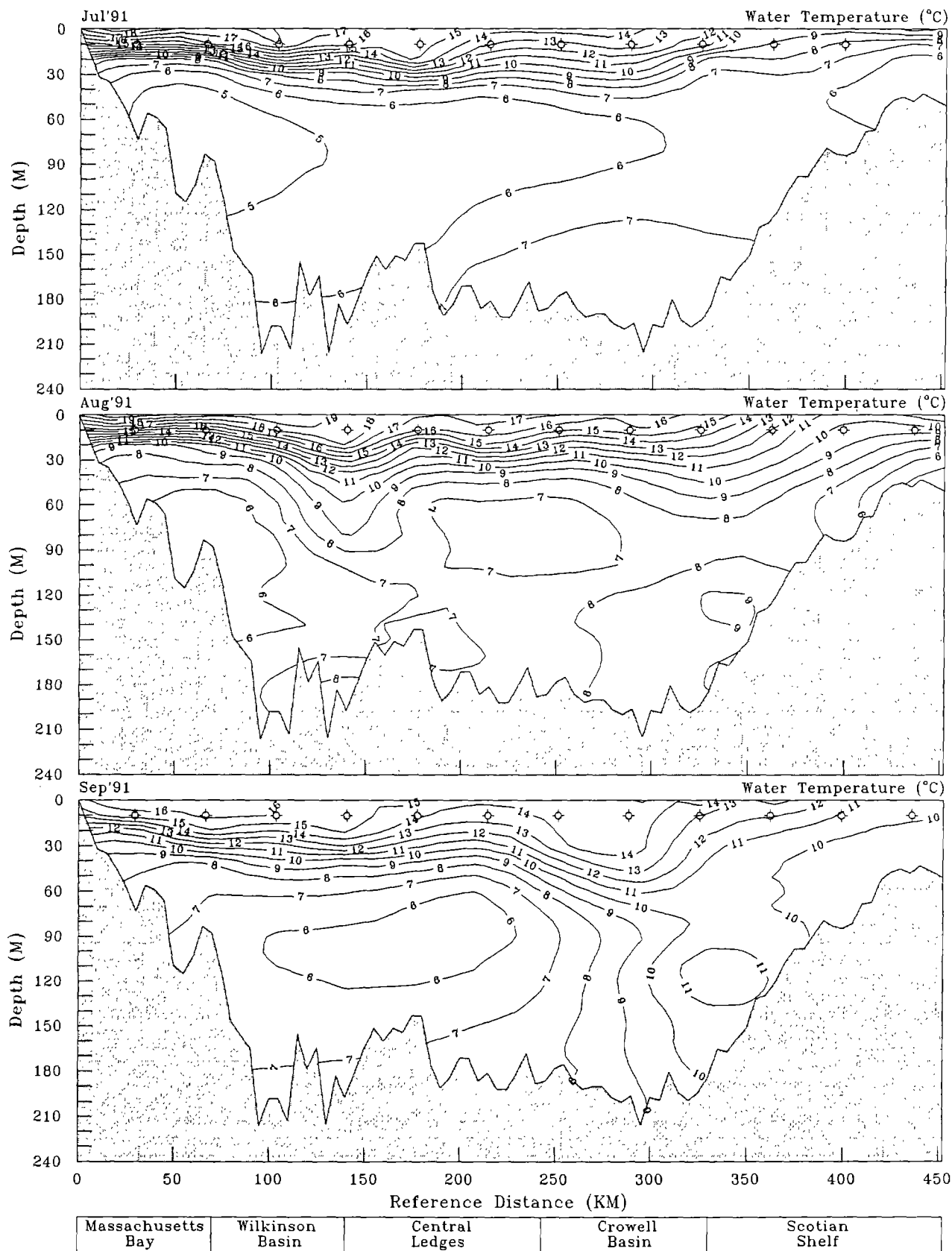


Figure 142. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (■) along the Gulf of Maine transect during July, August, and September 1991.

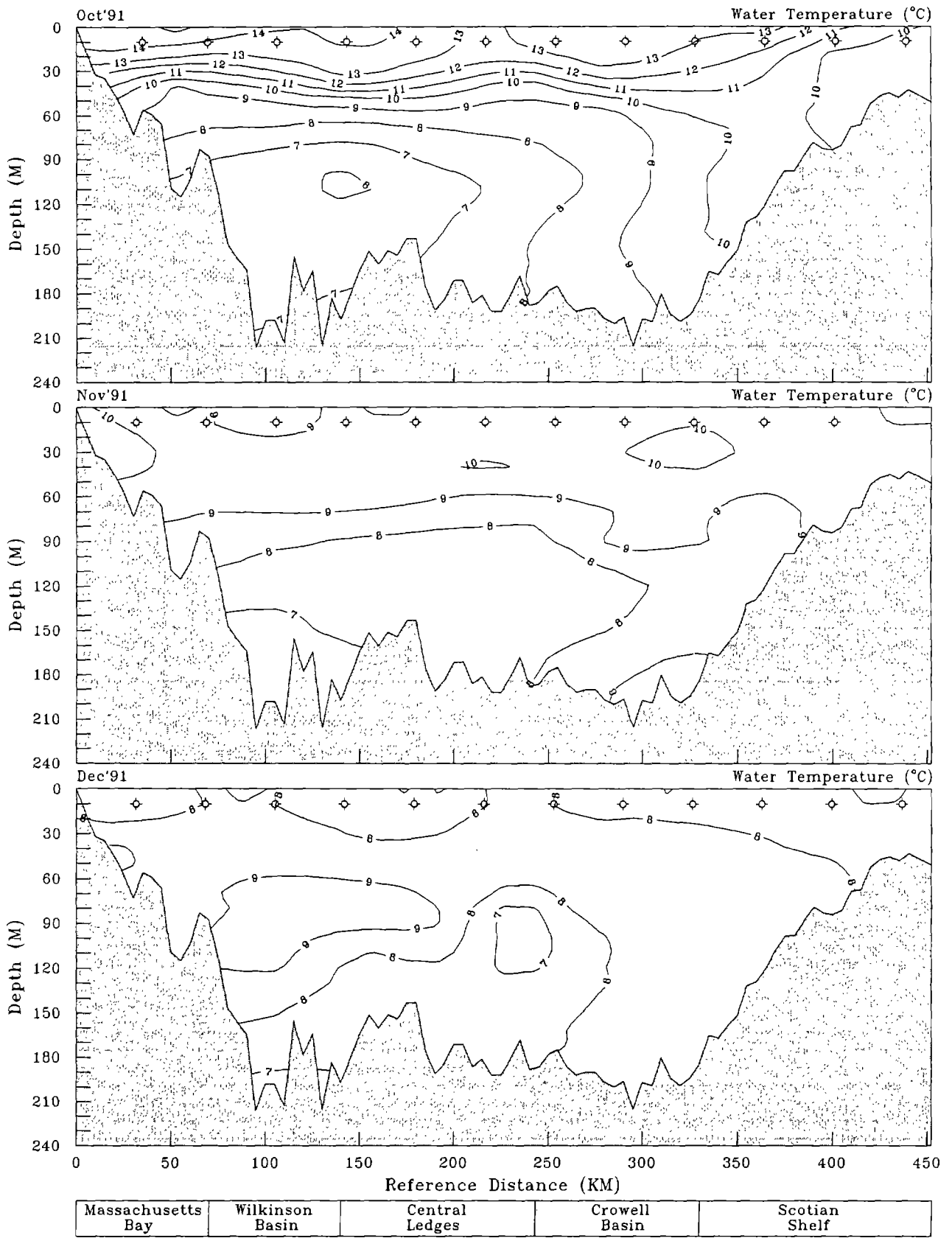


Figure 143. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (x) along the Gulf of Maine transect during October, November, and December 1991.

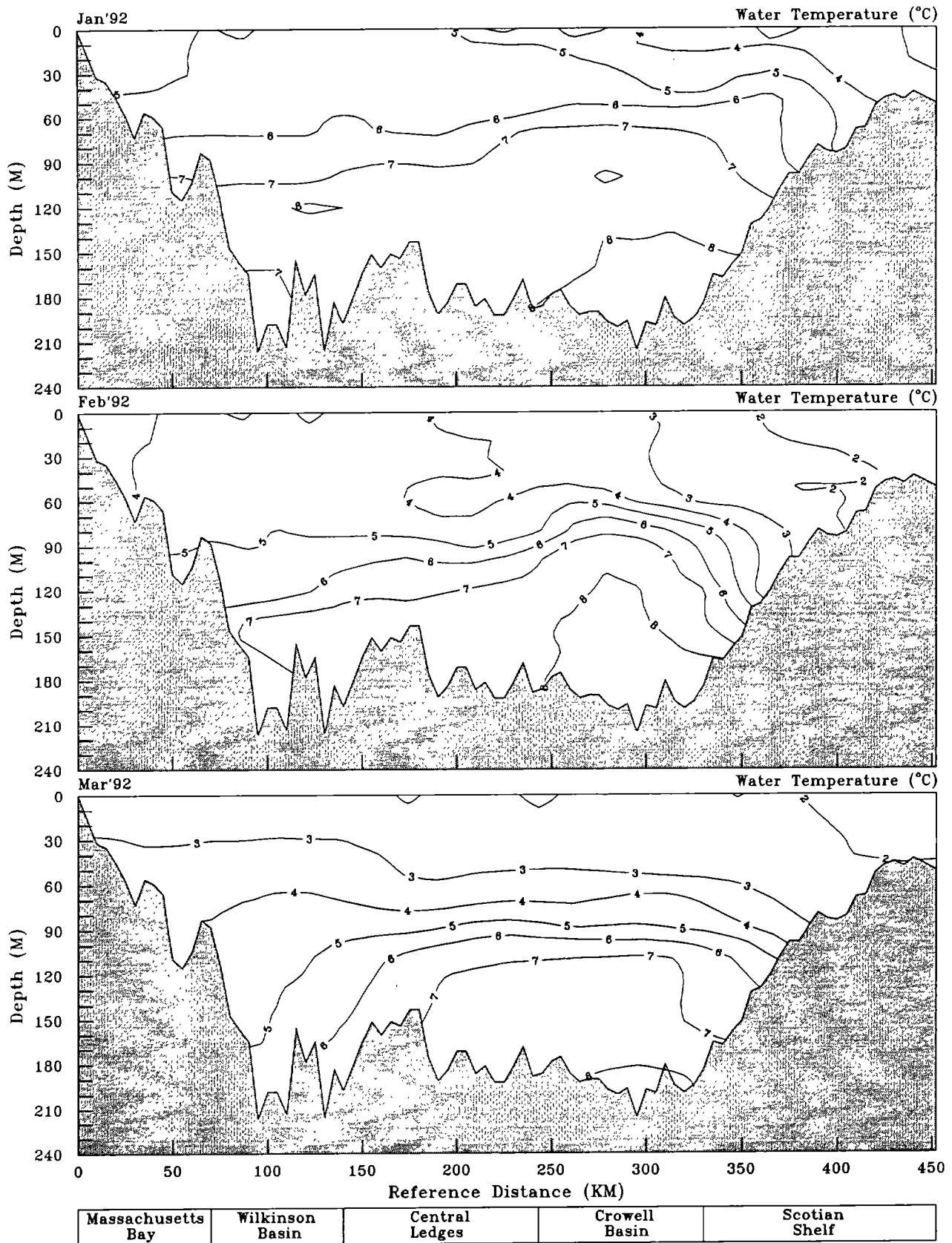


Figure 144. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (□) along the Gulf of Maine transect during January, February, and March 1992.

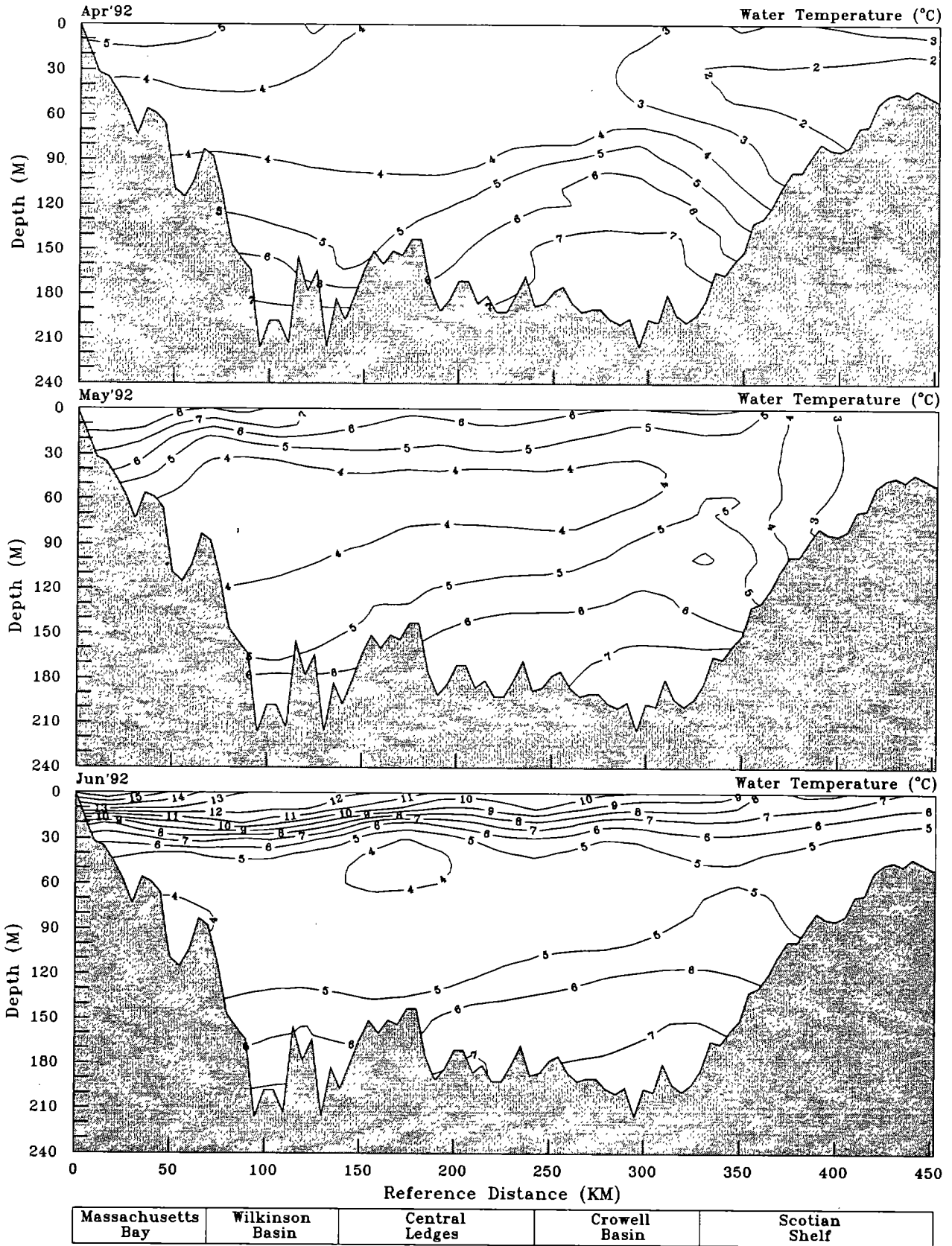


Figure 145. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Gulf of Maine transect during April, May, and June 1992.

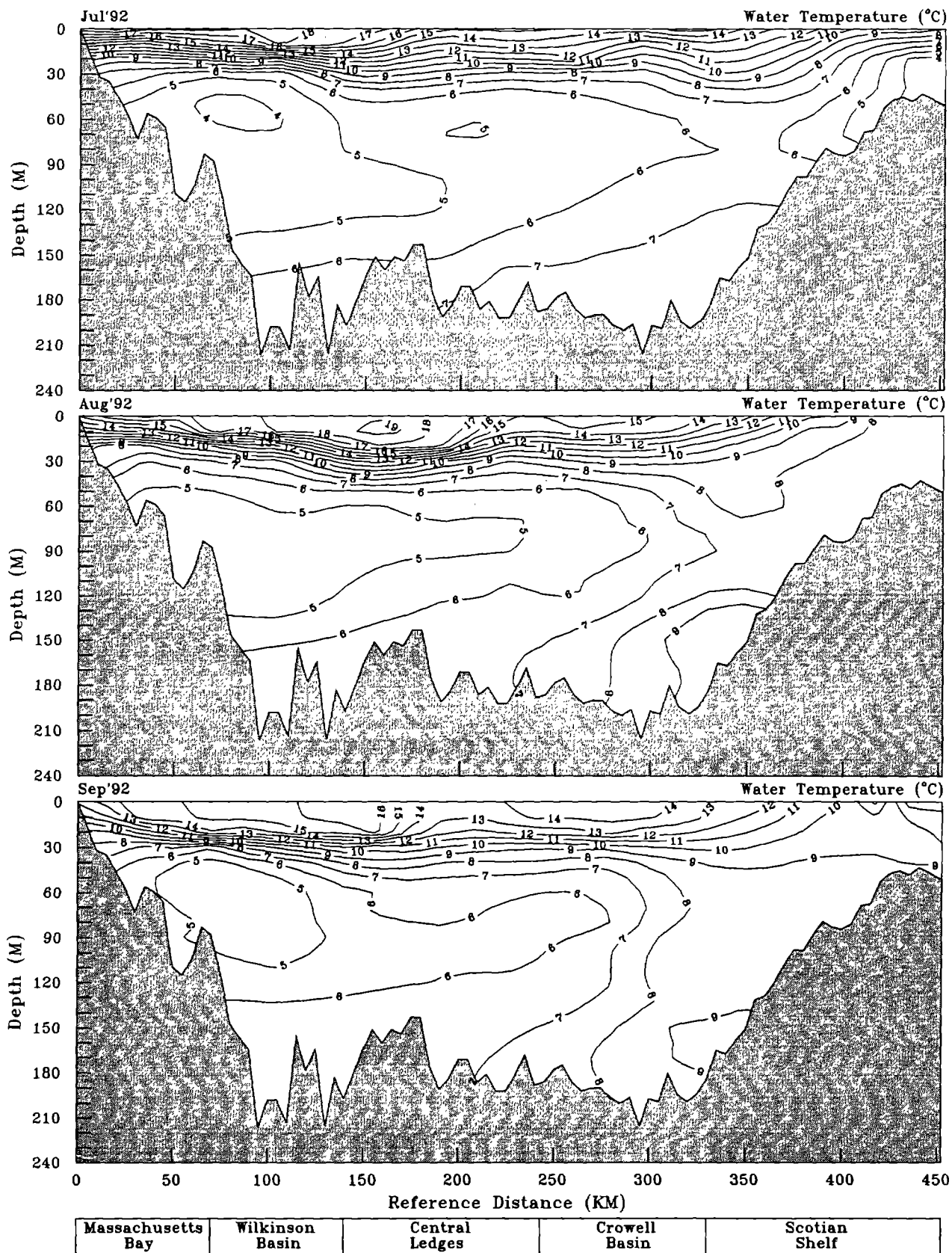


Figure 146. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (⊕) along the Gulf of Maine transect during July, August, and September 1992.

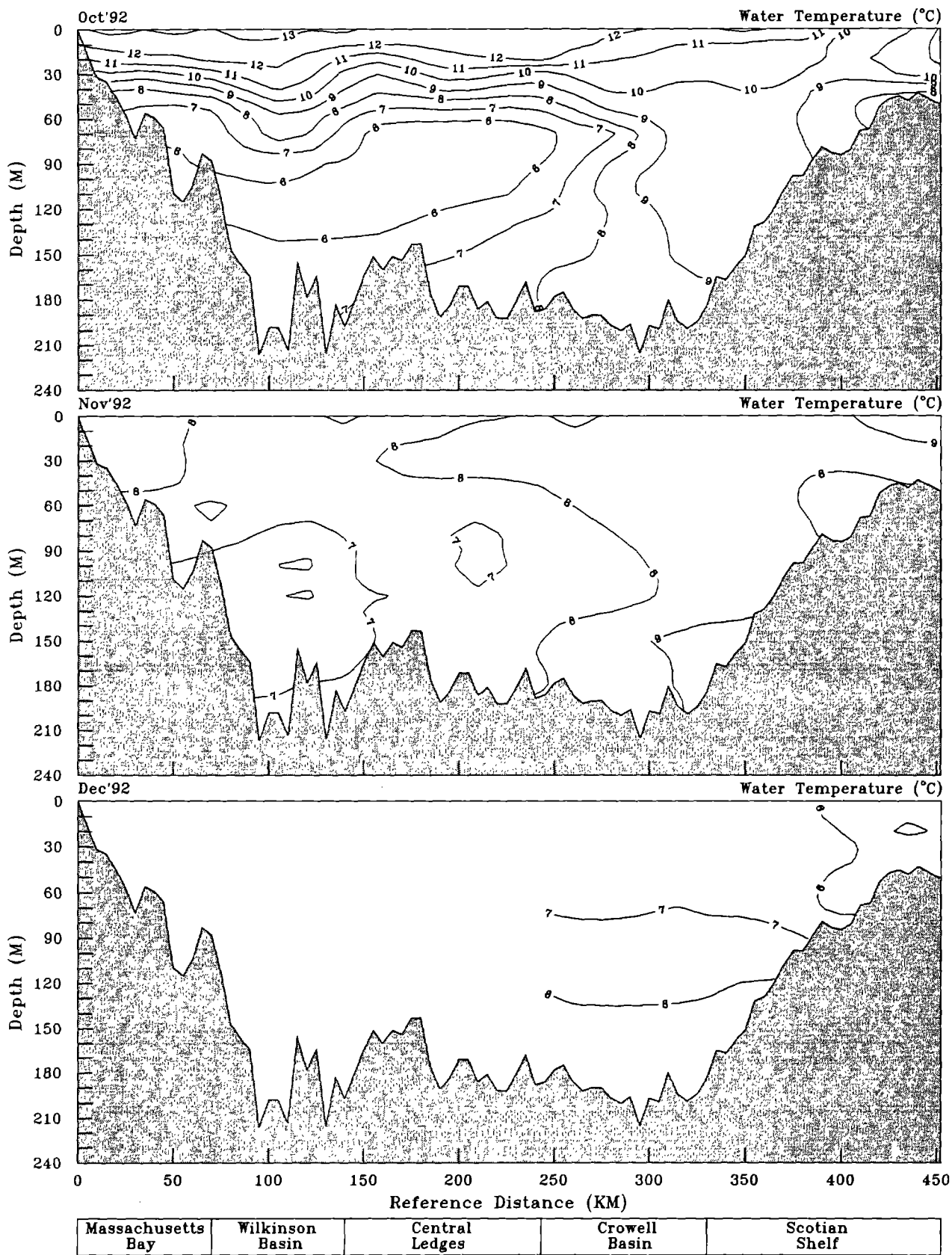


Figure 147. Water-column thermal structure (degrees Celsius) and CPR station locations at the 10-m depth (π) along the Gulf of Maine transect during October, November, and December 1992.