Palmer LTER: Annual season sampling at Palmer Station, November 1997–March 1998

Karen S. Baker, Wendy A. Kozlowski, and Maria Vernet, *Marine Research Division, Scripps Institution of Oceanography, University of California at San Diego*

Janice L. Jones, Langdon B. Quetin, Robin M. Ross, and Raymond C. Smith, *Institute for Computational Earth System Science and Marine Science Institute, University of California at Santa Barbara*

William R. Fraser, *Polar Oceans Research Group, Biology Department, Montana State University*

The Palmer Long-Term Ecological Research (LTER) Program (Smith et al. 1995) completed a seventh season of sampling at Palmer Station. The annual cruises, which cover a regional grid along the western Antarctic Peninsula, are part of the overall Palmer LTER sampling strategy. Our sampling strategy includes seasonal time series data from the nearshore Palmer grid and seabird observations from nesting sites near Palmer Station. The LTER January cruises (LMGR98-08 aboard *Abel-J* and LMG98-01 aboard *Lawrence M. Gould*) visited the Palmer Basin inshore stations twice to provide continuity in the seasonal record (Karl, Quetin and Baker, *Antarctic Journal,* this issue).

The table indicates the station sampling plan as modified for the 1997-98 Palmer field season. The season's sampling overview is represented in terms of the standard week defined previously (Smith et al. 1996; Baker et al, 1997). Significant dates include the arrival of research teams at Palmer (30 September and 13 November 1997), first bird observations (1 October 1997), first chlorophyll sample (19 November 1997), first zodiac profiling cast (25 November 1997), first acoustic transect (4 December 1997), start of cruise (18 January 1998), end of cruise (13 February 1998), last profiling cast (10 March 1998), acoustic transect (10 March 1998), and last LTER bird observation (4 April 1998) at Palmer Station. In the table, each line summarizes one cycle of standard sampling. The initial event number, month begun, day begun, day end, and year are given in the first five columns. The sixth column summarizes the types of standard days included in this particular cycle. Following this information are acoustic transects, hydrographic and optical profiling; phytoplankton sampling; targeted krill tows for physiological condition; instantaneous growth rate experiments; and general comments.

LTER Palmer Event Log Overview Season 1997-1998

Event No.	Mo	Day		Yr	Standard Day	bio-ac	ctd/prr/ chl/sal	hplc/ nuts/poc	net Ppi	Psis	tep	krilltarg	phycon	igr	Comments
		Beg	End												
1	11	13	17	97	—	—	—	—	—	—	—	—	—	—	ARRIVE PALMER
6	11	14	24	97	—	—	—	—	—	—	—	—	Hero	H	dive1,2
28	11	24	26	97	123	—	EB	BE	BE	BE	B	—	AH	AH	dive3
68	12	1	3	97	123	—	EB	EB	EB	EB	B	BON,F	—	F	—
105	12	4	12	97	1234	AE,JF	EBH	EB	EB	EB	B	—	—	—	—
163	12	9	14	97	123456	AE,JF	EBpierEHJ	EB	EB	EB	B	BON	Bon	Bon	—
241	12	15	21	97	123456	AE,JF	EBEHJ	EB	EB	EB	B	JAN	—	J	—
323	12	22	25	97	123	AC,AD, AE	EB	EB	EB	EB	B	C,JAN	Jan	J	—
371	12	26	29	97	456	JF	EBHJ	EB	EB	EB	B	pier	—	pier	—
412	12	30	4	97	123456	AE,JF	EBpierEH	EB	EB	EB	B	—	—	—	—
487	1	5	11	98	123456	AE,JF	EBEHJ	EB	EB	EB	B	A	—	A	—
567	1	12	17	98	123456	EA,JF	EBEHJ pier	EB	EB	EB	B	Sp	—	—	—
—	1	18	—	98	—	—	—	—	—	—	—	—	—	—	LTERJAN98 begin
—	2	23	—	98	—	—	—	—	—	—	—	—	—	—	LTERJAN98 end
659	2	18	23	98	1	AE	EB	EB	EB	EB	—	EB	—	—	—
696	2	23	28	98	123456	EA,JF	—	EB	EB	EB	B	SWI,A	A	A	—
780	31	1	6	98	1	—	—	—	—	—	—	BC,Sp	—	Sp	—
	3	2	7	98	123456	AE,JI	EBEHJB	EB	EB	EB	B	pier	pier	pier	—
870	3	10		98	123	AE	EB	EB	EB	EB	B	pier	—	—	—
—			—	98	—	—	—	—	—	—	—	—	—	—	DEPART Palmer waltercolm
—	4	16	—	98	—	—	—	—	—	—	—	—	—	—	DEPART Palmer bird

Palmer LTER: Annual January cruise for 1998 (LMGR98-8; LMG98-1)

Definitions

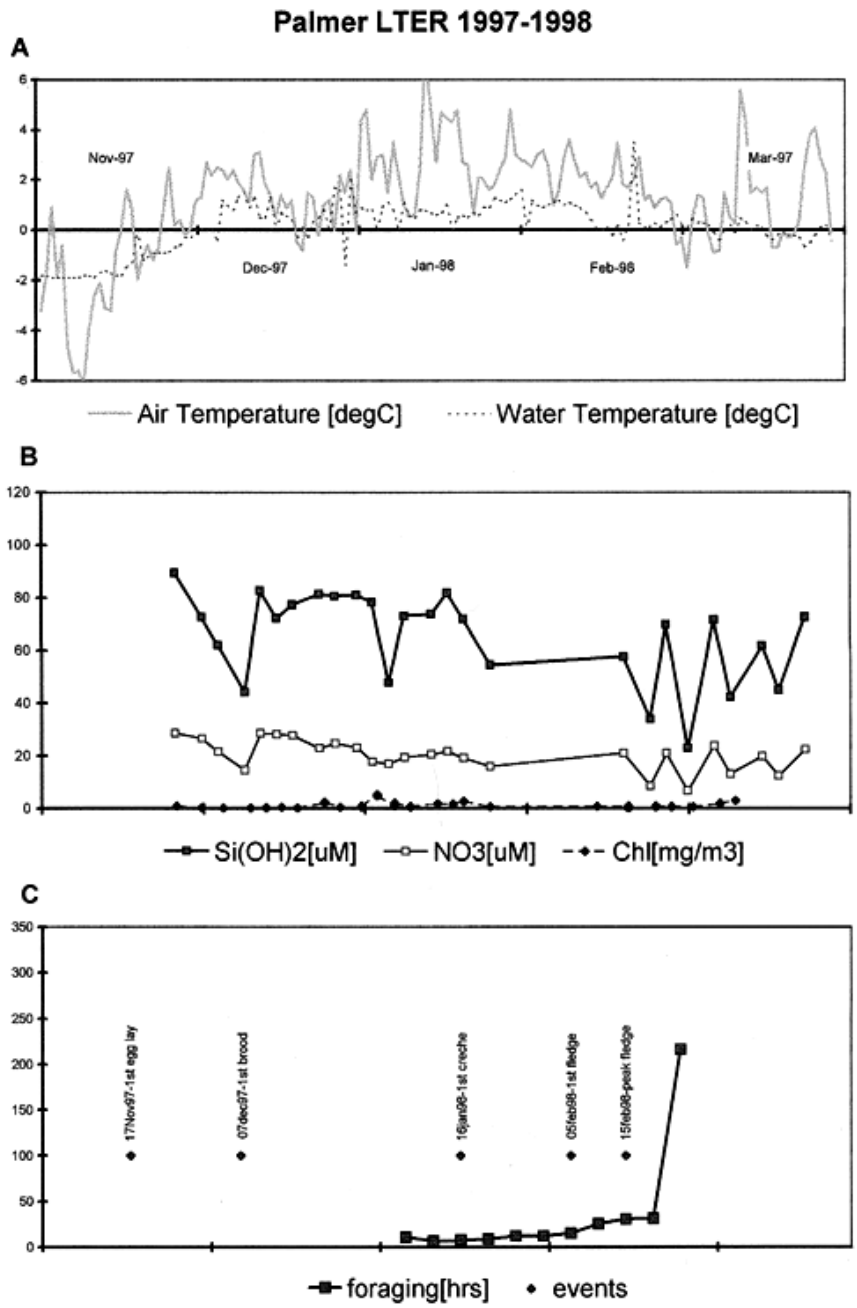
AH=Arthur Harbor	net=microscopic analysis of net plankton (>5um)
bio-ac=accoustics (Biosonics 120KHz)	nuts=inorganic Nutrient analysis
BON=Bonaparte Point	phycon=Physiological Condition of krill
chl=discrete sample for chlorophyll analysis	poc=Particulate Organic Carbon
ctd=Conductivity Temperature Depth (Seabird)	Ppi=Production photosynthesis vs irradiance
Hero=Hero Inlet	Psis=Primary Production simulated-in-situ
hplc=High Performance Liquid Chromotography of phytoplankton pigments	prr=Profiling Radiometer (BSI)
igr=Instantaneous Growth	sal=discrete sample for salinity analysis
JAN=	SWI=station seawater intake
krilltarg=targeted tow for krill	tep=transparent exopolymer particles

The sampling program changed somewhat from previous seasons. With six LTER personnel representing four of the LTER's projects for the 1997-1998 season, the daily sampling week included sampling 4 stations instead of 9 for profiling weekly hydro-bio-optics, 2 stations twice weekly instead of 4 for phytoplankton sampling, growth experiments every 2 weeks instead of weekly, sampling for condition factor of young of the year only, and eliminating standard zooplankton tows. Further, nutrient samples were shipped to the University of California Santa Barbara Analytic Facility for analysis. At Palmer new digital detectors replaced old analog sensors for nutrient hardware, and Alpkem EnviroFLow version 2.1 software was purchased.

The hardware and software for HPLC analysis remained the same as last year. This season the satellite network link with LES9 provided two blocks of about 5 hours of time online per day, making possible FTP file transfer of data and real-time electronic talk communication via electronic chat programs. The ability to transfer data daily allowed us to conduct real-time data analysis at the home institutions and to archive the data timely and efficient. Besides standard chlorophyll samples run in replicate for the greater-than-0.45-micrometer phytoplankton at selected depths, the less-than-20-micrometer fraction was sampled at the 50percent light level (ranging from 3.0 m to 12 m). We also ran hydrographic profiles station Janus (D. Karentz personal communication) and at the pier (A. Amos personal communication). Concurrent deployments last year with the station's STD instrument will permit comparison studies.

During the 1997-1998 austral season, ice conditions changed in September when the fast ice blew out of Arthur Harbor and was replaced a few days later by pack ice, which persisted until the ice broke up in November. The ship, arriving on 13 November 1997, broke up the ice in Arthur Harbor. Ice had cleared from the Palmer basin by 25 November, when the first zodiac work began. Unconstrained by the presence of brash ice, zodiac operations were simplified this season. This spring-summer was preceded by an above average winter of ice similar to that of 1995-1996 when pack ice did not begin to clear from the nearshore Palmer region until November 1995.

Preliminary data show seasonal progression in selected parameters through the spring and summer (figure), providing an overview of the season. During the 1997-1998, low chlorophyll biomass was recorded in November through December, with surface phytoplankton blooms of 2-5 milligrams per cubic meter in January at stations B and E. Between November 22 and March 21, we ran 11 acoustic transects from stations A to E (figure C) and 9 from F to J. We collected krill collected from target tows were measured for length-frequency distributions throughout the season. This season, we saw only a few salps, which were observed at the surface after a cruise from the zodiac. Reproductive events associated with breeding chronology of Adélie penguins on Humble Island (Fraser et al. in press) are noted by arrows in Figure 1c. The Adélie penguin breeding population size, a measure of winter survival, decreased by 3.6 percent relative to the past season, while the per-pair breeding success of these penguins was 1.58 chicks creched per pair, representing an increase of 7.0 percent relative to the 1996-1997 season. The increase in breeding success of 0.11 chicks per pair may be partly attributable to a lack of tick infestations early in the season. The breeding chronology and mean fledging weights were unchanged from last year.



A. ***Air temperature (º C; heavy line) and water temperature (º C; dashed line) at Palmer Station for the 1997-1998 season.*** **B.** ***Surface chlorophyll (in mg/m^3; filled diamonds), nitrate (micromolar; open squares), and silicate (micromolar; filled squares) at Station E for the 1997-1998 season.*** **C.** ***Adélie penguin foraging; filled squares denote hours. Arrows indicate day of first egg laying, first brood, first creche, first fledging, and peak fledging at Humble Island for the 1997-1998 season.***

The LTER seasonal observations of the marine environment, the lower-trophic level abundance and distributions for the area, and the seabird observations at nesting sites near Palmer were recorded from November 1997 to March 1998. The sampling event log, participant list, and other project information for the season are available online (http://www.icess.ucsb.edu/lter).

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