Table 1.1. LTER Annual Cruise Core Data Online (Dec01)

	93jan	94jan	95jan	96jan	97jan	98jan	99jan
OVERVIEW							
report	x	x	x	x	x	x	x
participants	x	x	x	x	x	x	x
eventlog	x	x	x	x	x	x	x
cruisemap	x	x	x	x	x	x	x
ZOOPLANKTON							
bioacoustics	x	x	x	x	x	x	x
trawl2m	x	x	-*	-	x	na	x
trawlgen	x	x	x	x	x	x	x
krillgrowth	x	x	x	x	x	x	x
spf	x	x	x	x	x	x	x
PHYTOPLANKTON							
chn	x	x	x	x	x	x	x
nutrientsdi	x	x	x	x	x	x	x
pigmhplc	x	x	x	x	x	x	x
prprodpi	x	x	na	x	na	na	na
prprodsis	na	na	x	x	x	x	x
MICROBIAL							
nutsdo	na	d	d	d	d	x	d
carbon	x	x	x	x	x	x	x
leucine	x	x	x	x	x	x	x
oxygen	x	x	x	x	x	x	x
h2o2	x	x	x	x	x	x	x
enzyme	-	x	x	-	x	x	x
sedelements	-	x	x	x	x	x	x
lps	x	x	x	x	x	x	x
BIO-OPTICS							
bopsts	x	x	x	x	x	na	na
bopsoptnoon	x	x	x	x	x	na	na
bopsoxy	x	x	x	x	x	na	na
chl	x	x	x	x	x	x	x
MODELING							
ctd	na	na	na	x	x	x	x
BIRDS							
brcensus	x	x	x	x	x	x	x

WHERE

na=not applicable

d=derived data, in progress, depends upon synthesis of multiple datasets (ie inorg nuts)

nutsdo will occasionally be posted but depend on qa/qc and inorganic nuts

x=data available

93mar-chn-analysis transfered from phyto to management (to be completed but priority low)

95jan-trawl2m wet weight/total length relationship continues but length frequency dropped

NOTES

All measurments are discrete unless preceeded by 'bops' or 'ctd'

carbon=dic/alk

nutrientsdi-inorganic nutrients, ie nitrate,silicate

nutrientssdo-dissolved organic nutrients carbon DOC, nitrogen DON,phosphorus DOP

chn-particulate organic nutrients carbon POC and nitrogen PON

Table 1.2. LTER Season Core Data Online (Dec01)

	9192	9293	9394	9495	9596	9697	9798	9899
OVERVIEW								
report	x	x	x	x	x	x	x	d
participants	x	x	x	x	x	x	x	x
eventlog	x	x	x	x	x	x	x	x
weather	x	x	x	x	x	x	x	x
BIRDS								
adforage	x	x	x	x	x	x	x	x
adtelem	x	x	x	x	x	x	x	x
adbreed	x	x	x	x	x	x	x	x
addemog	x	x	x	x	x	x	x	x
ZOOPLANKTON								
bioacoustics	x	x	x	x	x	x	x	x
krillgrowth	x	x	x	x	x	x	x	x
zodtrawl	x	x	x	x	x	x	x	x
PHYTOPLANKTON								
chn	x	x	x	x	x	x	x	x
nutrientsdi	x	x	x	x	x	x	x	x
pigmhplc	x	x	x	x	x	x	x	x
prprodpi	x	x	x	-	x	na	na	na
prprodsis	na	na	na	x	x	x	x	x
BIO OPTICS								
chl	x	x	x	x	x	x	x	x
ctdts	na	x	x	x	x	x	x	d
SEDIMENT TRAPS								
nutrientspo	na	-	-	-	-	-	-	-
sedbiomass	na	x	x	x	x	-	-	-
	9192	9293	9394	9495	9596	9697	9798	9899

WHERE

na = not applicable

x = data available

d = derived, in progress

NOTE

adforage=krill,diet,prey,fish,time

krillgrowth=igr

nutrientsdi-dissolved inorganic nutrients, ie nitrate,silicate

nutrientspo-particulate organic carbon, nitrogen, phosphorus, silica

chn-particulate organic nutrients carbon POC and nitrogen PON

sedbiomass-total dry weight

bopsts-temperature,salinity from profiling CTD

Table 2.1. Palmer LTER Objectives.

(1) document the interannual variability of annual sea ice and the corresponding physics, chemistry, optics, primary production and the life-history parameters of secondary producers and apex predators within the PAL area,
(2) create a legacy of critical data for understanding ecological phenomena and processes within the Antarctic marine ecosystem,
(3) identify the processes that cause variation in physical forcing and the subsequent biological response among the representative trophic levels,
(4) construct models that link ecosystem processes to environmental variables, which simulate spatial/temporal ecosystem relationships, and employ such models to predict and validate ice ecosystem dynamics.

Table 2.2. PAL components and linkage to LTER core research areas[1].

Component (PI)	**Primary Core areas** (secondary areas)
Physical oceanogarphy, modeling (Martinson)	C, D (A, B)
Bio-Optics, remote sensing and sea ice (Smith)	A, B, E (D)
Phytoplankton ecology (Vernet)	A, B (C, D)
Zooplankton & micronekton ecology (Ross & Quetin)	B (A, C, E)
Apex predators (Fraser)	B, E
Microbes & biogeochemistry (Ducklow)	B, C (D, E)
Benthos and Rothera Station (A. Clarke, BAS)	B (D, E)
Data management (Baker)	(A-E)

[1] **Core areas:** A, Pattern and control of primary production; B, Spatial and temporal distribution of populations selected to represent trophic structures; C, Pattern and control of organic matter accumulation and decomposition in surface layers and sediments; D, Patterns of inorganic inputs and movements of nutrients through soils, groundwater and surface waters; E, Patterns and frequency of disturbances

Table 2.3. Timeline of field studies. Past and proposed LTER cruise schedule (indicated by month and year) and field seasons at Palmer Station (indicated by x's). January cruises are to study physical and biological parameters associated with seabird breeding season. Nov91, Nov92, Mar93, Aug93 are special process cruises to study ecosystem seasonality. Jun99 and Sep01 are special process cruises focused on sea ice studies. Cruises extending several weeks beyond one month are indicated by '•'. The ' T ' are short December cruises to replace/turn around sediment traps. The 'I' and 'G' are related cruises (Icecolors and GLOBEC).

Field Season	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
LTER CYCLE 1												
90/91	-	-	I	•	•	-	-	-	-	-	-	-
91/92	-	-	-	x	Nov-91	x	x	x	-	-	-	-
92/93	-	-	-	x	Nov-92	x	Jan-93	x	Mar-93/T	•	•	-
93/94	-	Aug-93	•	I	•	T	Jan-94/T	x	x	-	-	-
94/95	-	-	-	x	x	Dec-95	Jan-95	x	-	-	-	-
95/96	-	-	-	x	x	x	Jan-96/T	x	x	-	-	-
LTER CYCLE 2												
96/97	-	-	-	-	x	T	Jan-97	x	x	-	-	-
97/98	-	-	-	-	x	x	Jan-98/T	x	x	-	-	-
98/99	-	-	-	x	x	x	Jan-99/T	x	x	-	-	Jun-99
99/00	•	-	-	-	x	x	Jan-00	x	x	-	-	-
00/01	-	-	-	-	x	x	Jan-01/T	x	x	G1	•	•
01/02	G2	•	Sep-01/T	•	x	x	Jan-02	x	x	G3	•	-
LTER CYCLE 3												
02/03	G4	•	•	-	x	x	Jan-03	x	x	-	-	-
03/04	-	-	-	-	Nov-93	•	Jan-04	x	x	-	-	-
04/05	-	-	-	-	x	x	Jan-05	x	x	-	-	-
05/06	-	-	-	-	x	x	Jan-06	x	x	-	-	-
06/07	-	-	-	-	x	x	Jan-07	x	x	-	-	-
07/08	-	-	-	-	x	x	Jan-08	x	x	-	-	-

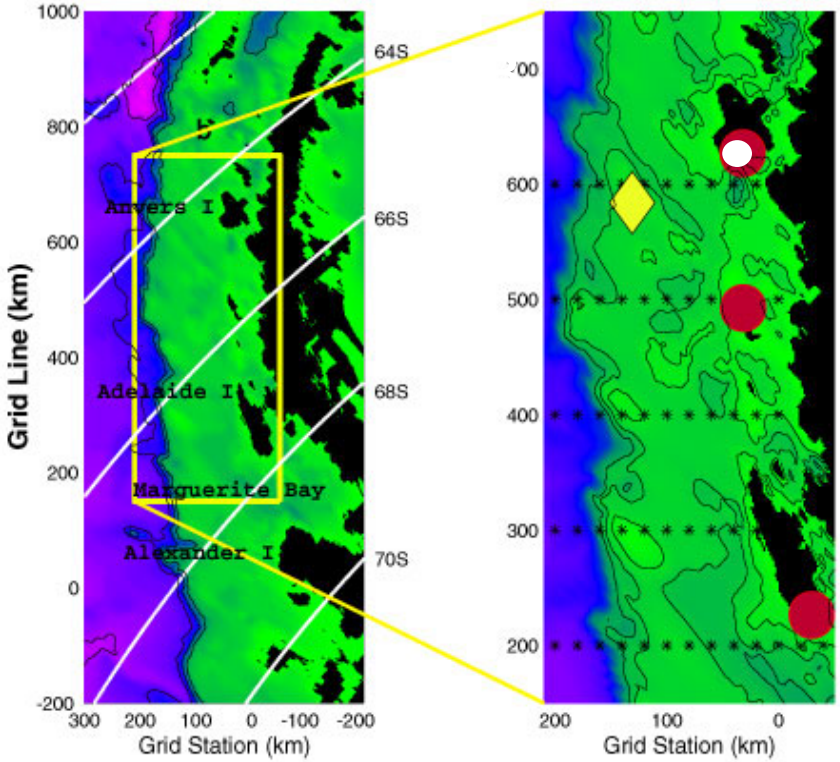

Figure 2.1a. A: Topographic map of WAP region with 1000 m depth contours (black lines) and latitude (white). B: detailed map with 250, 500, 750 m contours (black) and Adélie penguin colonies (red circles). The diamond is the sediment trap mooring. The small white circle in the red circle is Palmer Station on Anvers Island.

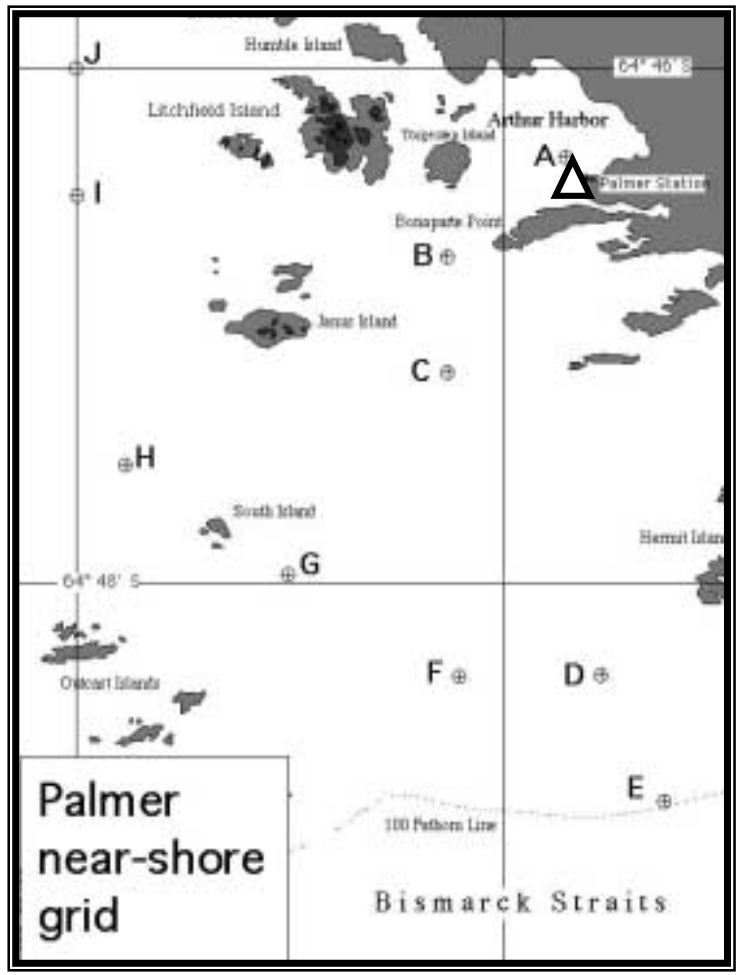

Fig. 2.1b. Palmer Station on Anvers I, Antarctica, (white triangle) showing the local, fine-scale sampling stations employed for biweekly seasonal sampling. See also Fig. 4.1

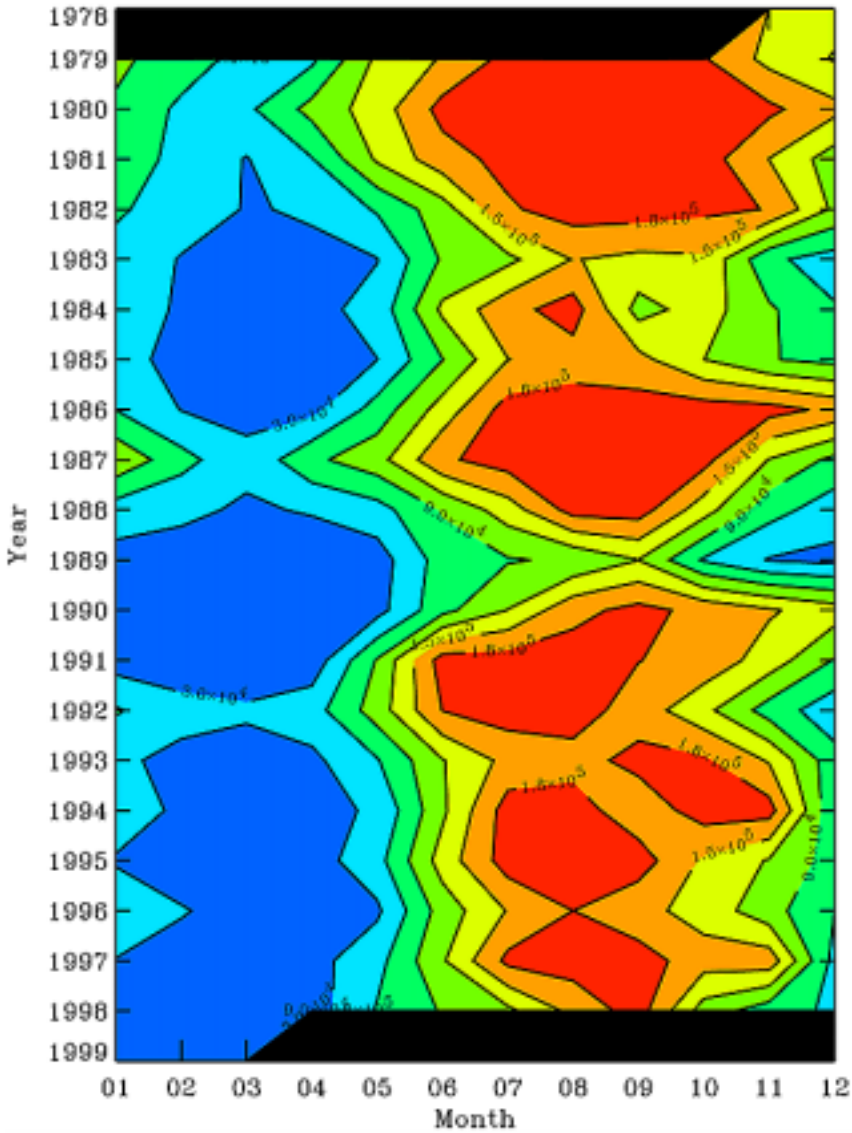

Figure 2.2a. Interannual variations in monthly sea ice extent in the PAL region. Note the difference in winter ice extent between the 70's-80's and 90's (decade of PAL observations).

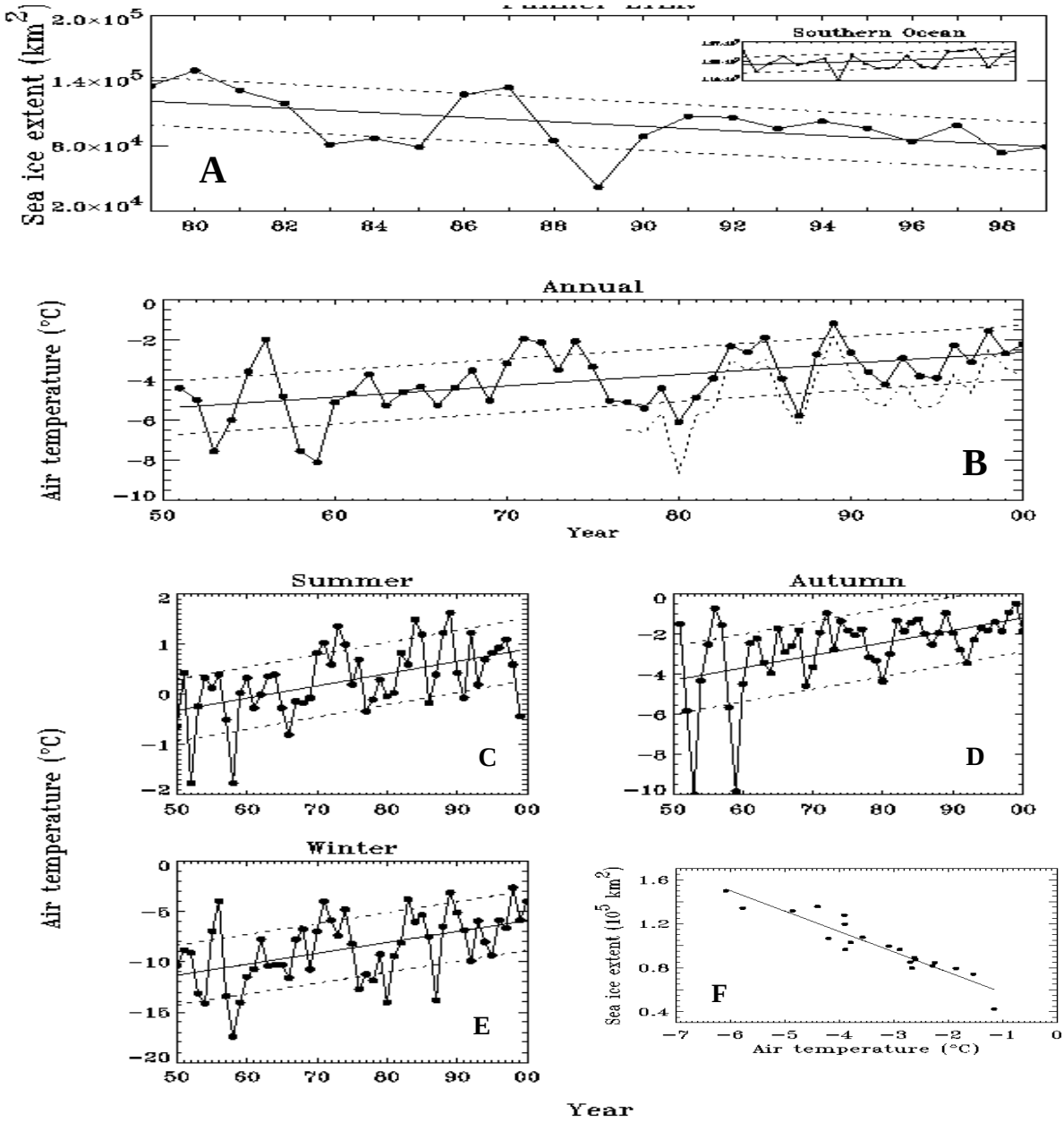

Figure 2.2b. A: Sea ice extent, **B:** annual and **C-E**, seasonal air temperature trends in the West Antarctic Peninsula. **F:** negative correlation between temperature and sea ice extent (Smith & Stammerjohn, 2000).

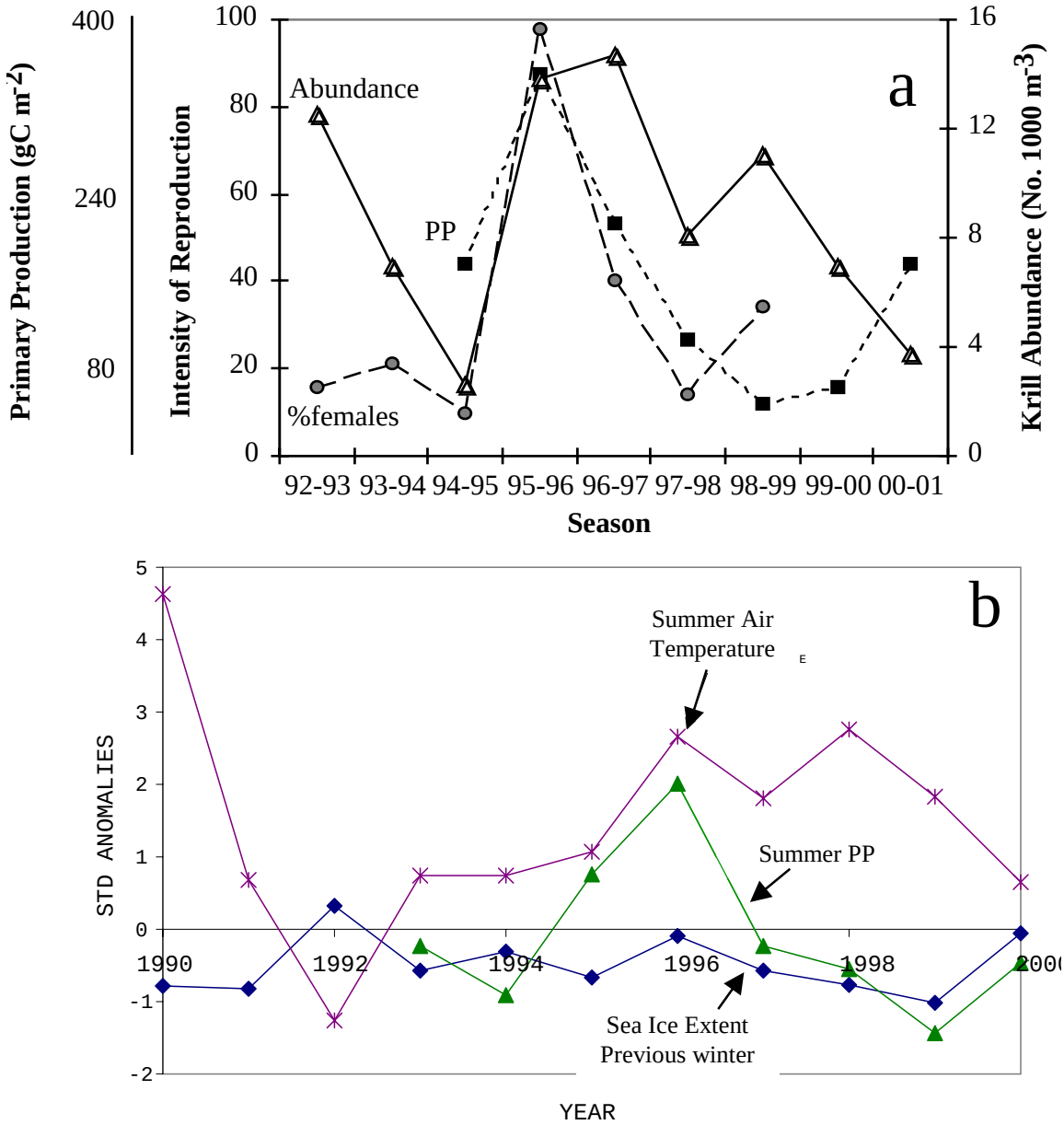

Figure 2.3a. Interannual variations in mean annual primary production, intensity of krill reproduction (% of females reproducing based on ovarian analysis) and abundance in Antarctic krill over the last decade. **b**. Interannual variations in mean annual primary production, sea ice extent and air temperature (as standard anomalies to long term mean).

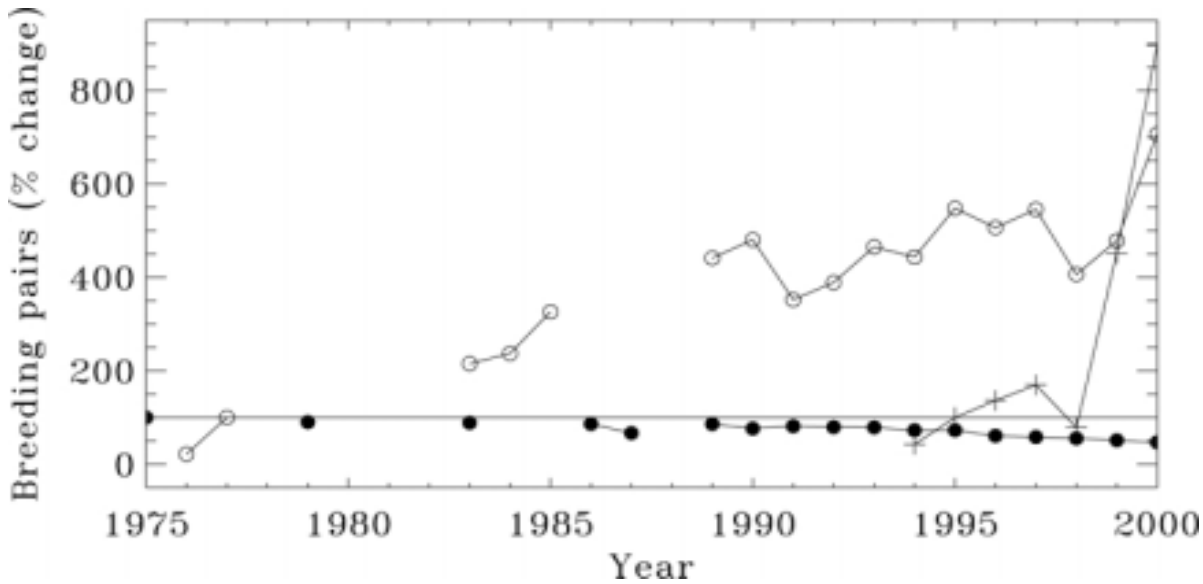

Figure 2.4. Changes in penguin breeding pairs in WAP region. Closed circles: Adélies. Open circles, Chinstrap penguins; crosses, Gentoo.

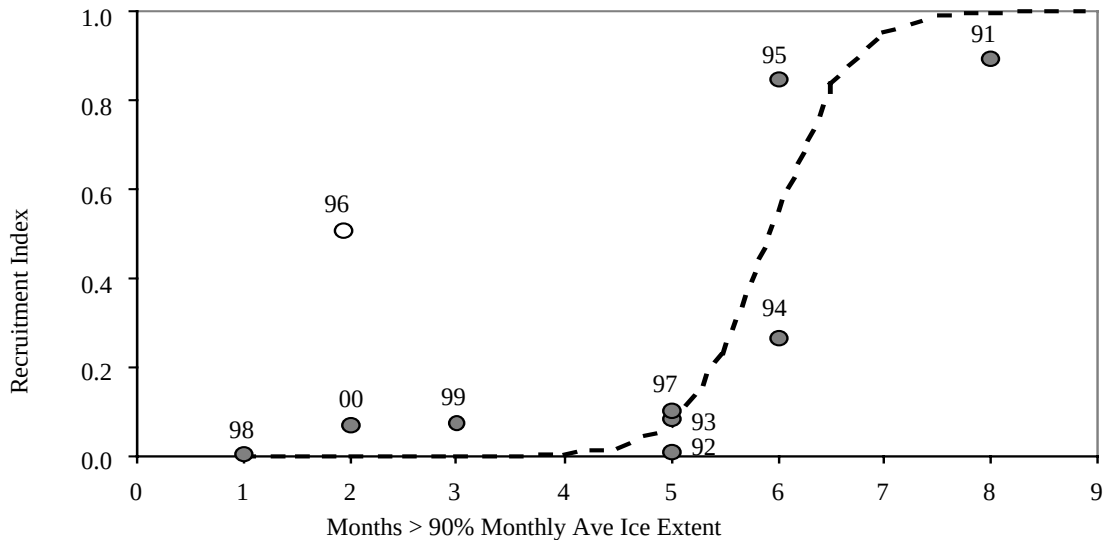

Figure 2.5. The krill recruitment index, plotted against the number of months between Apr and Dec when the sea ice extent for each month is +/- 10% of the 22-yr mean for that month. Symbols show year classes. The line is a sigmoidal response curve, r2 = 0.88. The strong '96 year class was a consequence of a high % females reproducing.

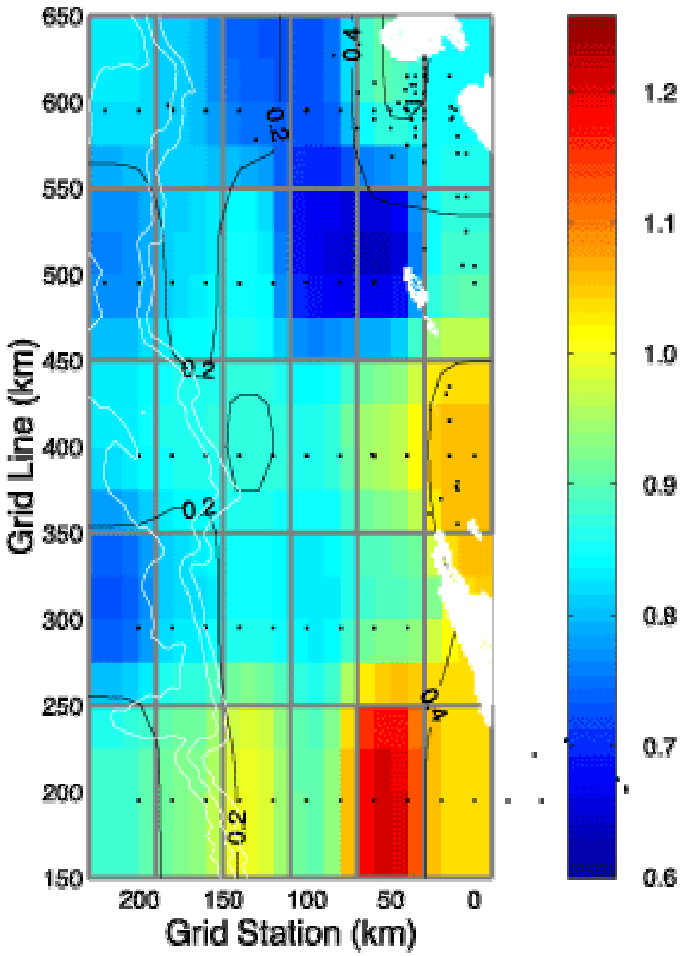

Figure 2.6 Average distribution (climatology, color) and st. dev. (black contour lines) of diatom abundance, from fucoxanthin, a characteristic carotenoid pigment used as a biomarker, within the PAL grid.

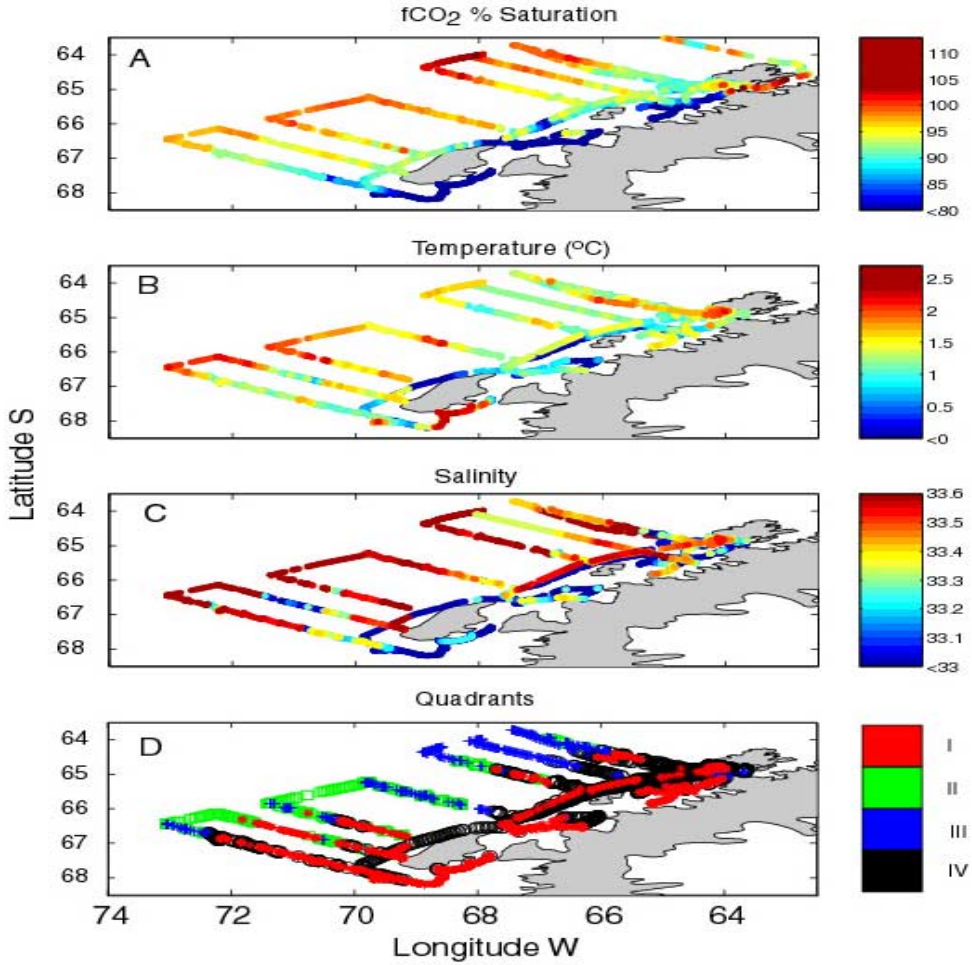

Fig 2.7 – Alongtrack, underway measurements of A: fCO2 saturation, B: temperature, C: salinity and D: locations in each phase quadrant of gas solubility diagram (see Fig. 2.9), within PAL grid.

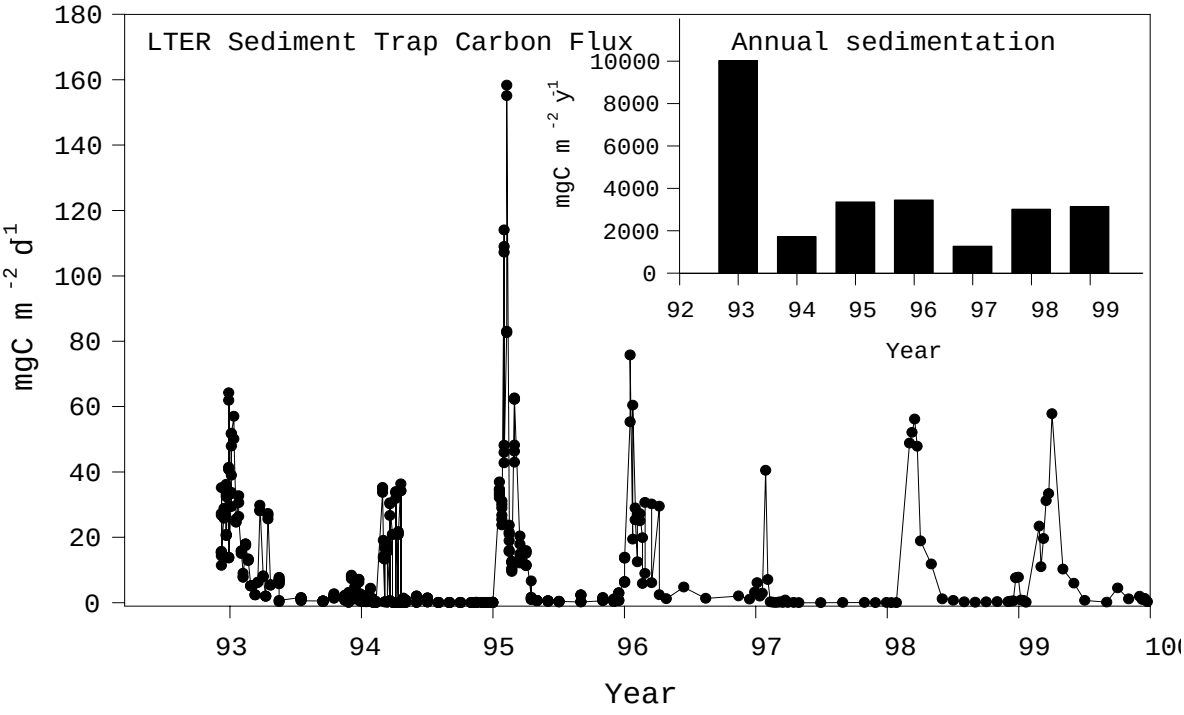

Fig 2.8 – Annual cycle and interannual variability of particle flux determined by PAL moored sediment trap (see Fig. 2.1a).

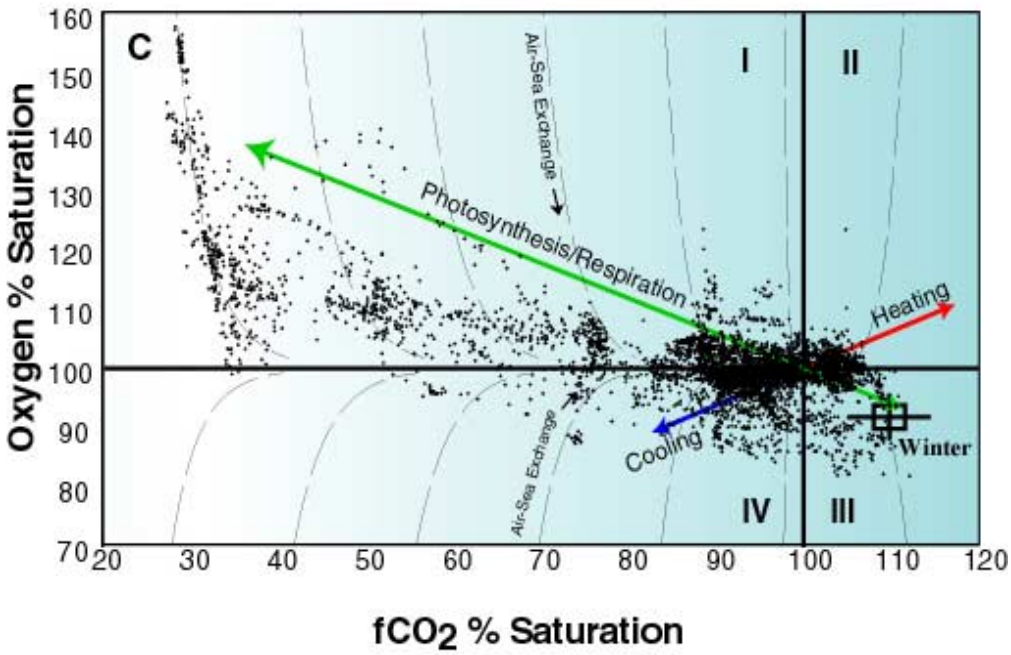

Fig 2.9 – Dissolved oxygen and CO2 saturation in PAL region, and physical and biological processes producing patterns of differential saturation. Quadrants are mapped in space in Fig. 2.7d.

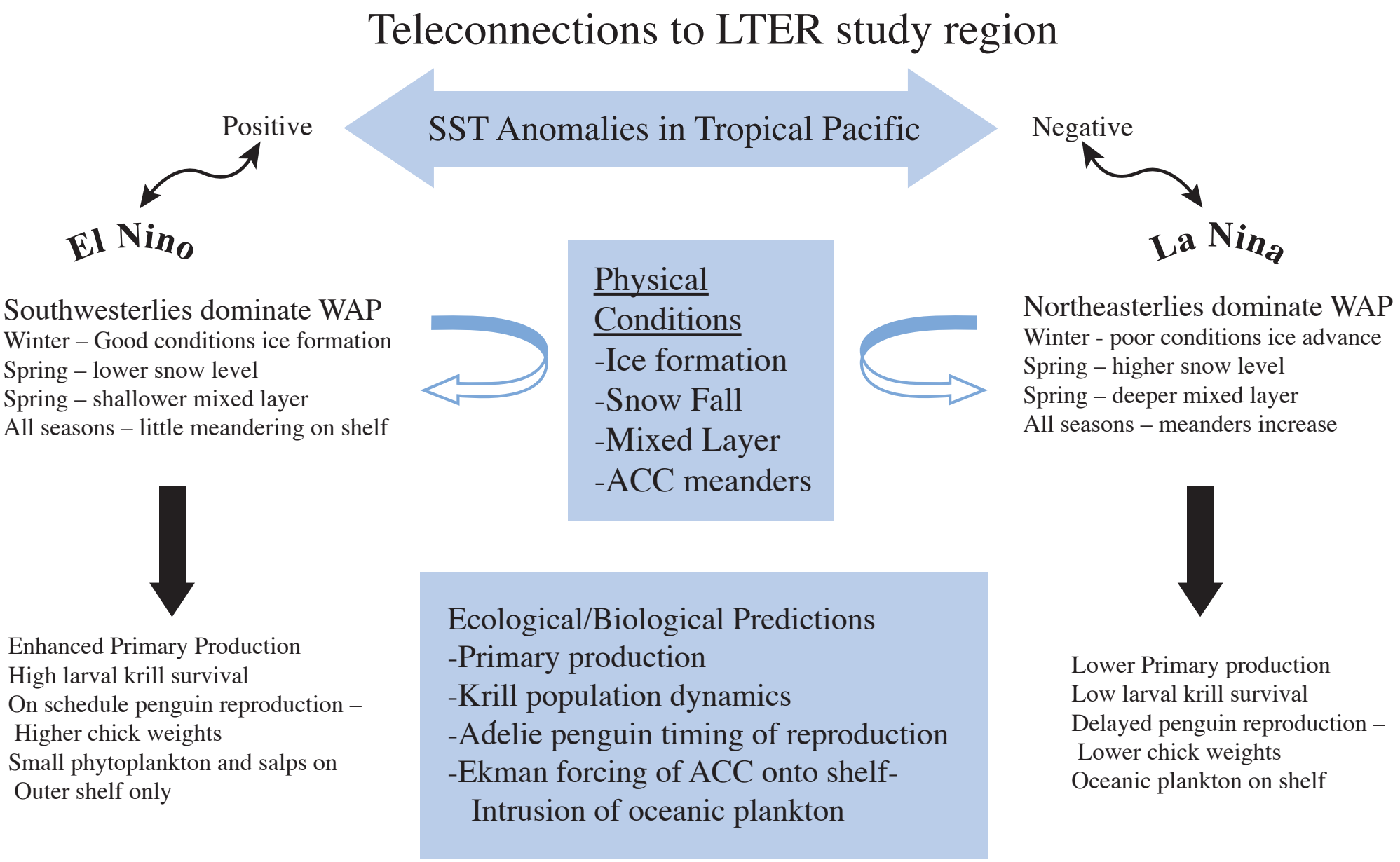

Fig 2.10 – Conceptual model linking ENSO-frequency variability in the tropical Pacific with Sea Ice and related ecological cycles in the Antarctic marine ecosystem.

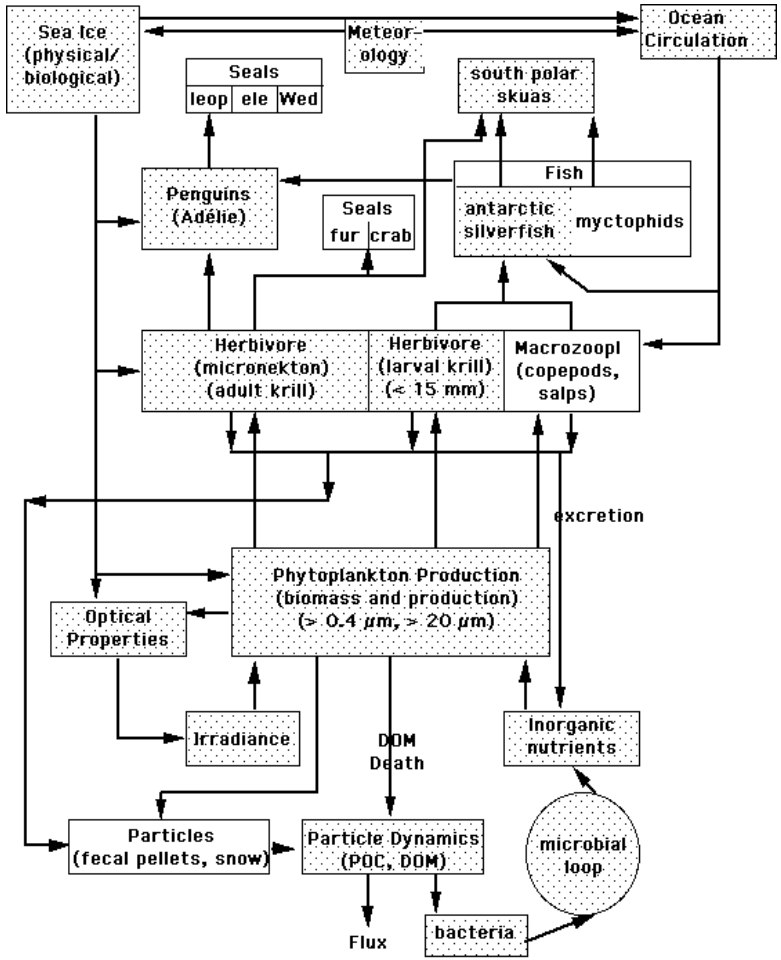

Fig 2.11 – The marine foodweb studied in PAL. Shaded boxes highlight the compartments studied currently.

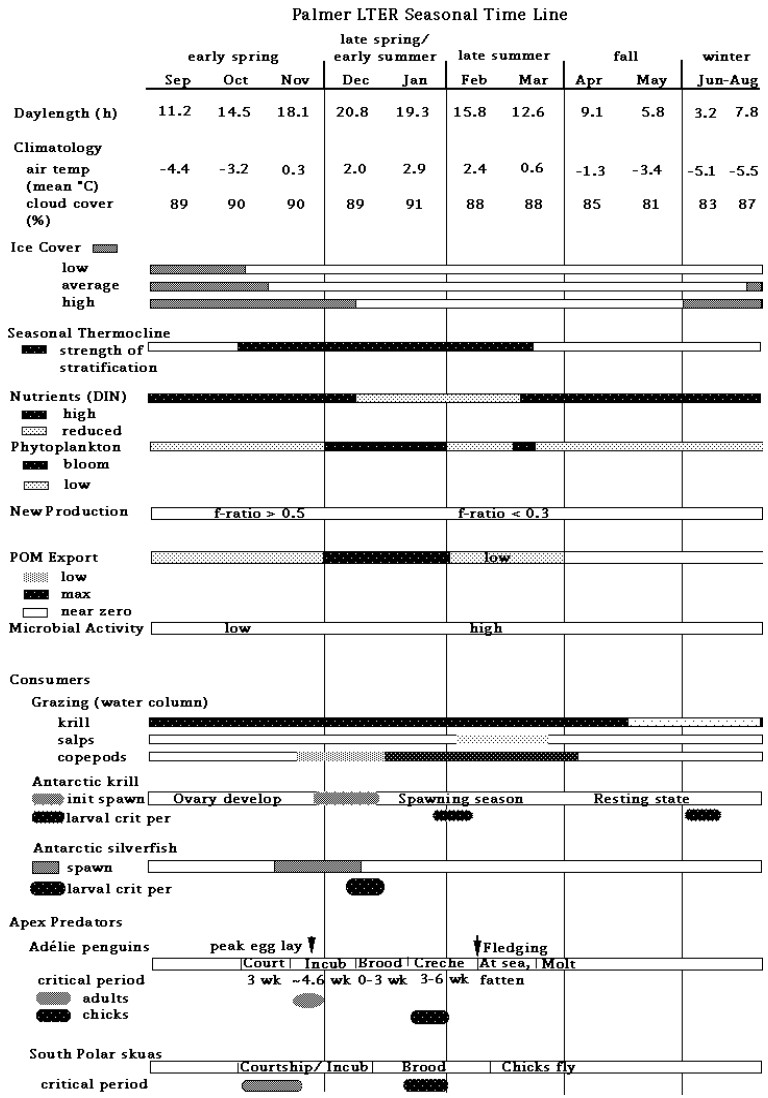

Fig 2.12 – Seasonal timeline of key processes and sampling activity in PAL.