

EMAGE-APIS campaigns I - V, 1996 - 2001

EMAGE-APIS I - V research platform

Aircraft	Dornier DO 228-101 <i>Polar-2</i>
Altitude	500 feet (152 m)
Speed	130 knots (240 km/h)
Ground speed	70 m/s
Transect spacing	ca 10 km between within survey boxes

EMAGE-APIS I - V census strip-widths

Campaign	Flight leg	Direction	Census strip-width
EMAGE-APIS I	3-6 7		120 m 80 m
EMAGE-APIS II	3 3 4-12 13 14-16	outbound inbound	50 m 30 m 70 m 50 m 70 m
EMAGE-APIS III	all flights		70 m
EMAGE-APIS IV	all flights		70 m
EMAGE-APIS V	all flights		70 m

EMAGE-APIS I - V survey boxes

Campaign	Season	Transect above sea ice [km]	Seals [n]
EMAGE-APIS I	1996/97	2757	373
EMAGE-APIS II	1997/98	2892	233
EMAGE-APIS III	1998/99	1652	*1063
EMAGE-APIS IV	1999/00	1227	107
EMAGE-APIS V	2000/01	4462	600
		Σ 13080	Σ 2376

* 910 in inlets

Labelling of events and special parameters

Events within the data collection represent single flight transects, i.e. EMAGE-APIS-I/3 denotes flight transect 3 within the first EMAGE-APIS campaign. The parameter "Flight leg orientation" provides the perpendicular flight direction relative to coast. The parameter "Census strip-width" denotes the horizontal dimension of the counted "window" within the continuous footage.

Comments on EMAGE-APIS II

The strip-widths of Flight 3 (50 m outbound / 30 m inbound) and Flight 13 (50 m) were just narrow enough to distinguish seal species from video footage. The flights were made from 3–23 January 1998. During this season seal censuses were carried out from 23 January–22 February also along the eastern Weddell Sea coast using the BO 105 helicopter from RV *Polarstern*. For further information see:

Bester MN & Odendaal PN (1999) Abundance and distribution of Antarctic pack ice seals in the Weddell Sea. In: [The Expedition ANTARKTIS XV/3 \(EASIZ II\) of "Polarstern" in 1998](#). In: W.E. Arntz & J. Gutt (eds), Alfred-Wegener-Institut für Polar- und Meeresforschung. Berichte zur Polarforschung 301: 102-107

Bester MN & Odendaal PN (2000) Abundance and distribution of Antarctic pack ice seals in the Weddell Sea. In: Antarctic Ecosystems: Models for Wider Ecological Understanding. W. Davison, C. Howard-Williams & P. Broady (eds), Caxton Press, Christchurch, New Zealand. Pp. 51-55.

During the same time (28 January - 6 February), 15 crabeater seals and 14 Weddell seals were equipped with satellite transmitters and biologging units respectively at the Drescher Inlet 72°52'S, 19°26'W.

For data see [DRE1998](#), for further information see:

Bornemann H & Plötz J. Satellite tracking of crabeater seals, and Plötz J & Bornemann H (1999) Diving and foraging behaviour of Weddell seals, in: [The Expedition ANTARKTIS XV/3 \(EASIZ II\) of "Polarstern" in 1998](#). W.E. Arntz & J. Gutt (eds), Alfred-Wegener-Institut für Polar- und Meeresforschung. Berichte zur Polarforschung 301: 94-101.

Comments on EMAGE-APIS III

For some flights of APIS III, calculation of the transect length was difficult. This is particularly the case in those flights, where the outer pack ice edge – because of the overall sparse ice situation - could not be identified (see Flights 36 – 43).

Flight 41 (10 Feb 1999): Apart from a few fields of brash and small ice floes, this flight was made over open water. It is suggested to exclude this flight from further analyses (total transect length, seal density etc) since no seals were observed.

Flight 42 (same day): 60 seals were counted in an inlet within 2 seconds. Then, zero seals during ca. 2.5 hours flown over open water, i.e. on a ca. 600 km-transect starting and ending at the ice-shelf-edge.

Flight 43 (11 Feb 1999). 60 seals were counted in an inlet within 9 seconds. Then, only 6 seals were counted during the return-flight (over ice fields) on a 107 km-track back to the ice-shelf-edge while the major part of the transect (ca 500 km) was flown over open water. Here again the same problem was obvious as with Flight 42 – a lot of seals aggregated in the inlet and no or low numbers of seals were observed off the ice coast.

It is recommended to put all seals which were counted in inlets on an extra list – otherwise this would bring the seal density statistic upside-down.

Of the total 1063 seals counted during EMAGE-APIS III, 153 seals (see list above) were counted during tracks flown perpendicular to the coastline of a total transect-length of 1367 km over ice covered water. The remainder 910 seals were encountered in inlets during a total flight-time of 7 minutes and 54 seconds. That would mean: 32 km transect-length over inlets x 0.07 km census strip-width = 2.24 km² = 406.25 seals/km² – and all that without using the haulout correction factor. Almost all of these seals were supposed to be crabeater seals – although there were uncertainties especially when seals were lying motionless on the ice. The body shape of Weddell seals is not necessarily podgy, and Ross seals are pumping up their big throat only from time to time. When using the haulout correction factor to improve the accuracy of census data obtained during the EMAGE-APIS campaigns, one may get round about 2 seals/km² - or even more - because some flights were made during night-time or early morning hours.

Further information on the [Antarctic Pack Ice Seals Programme](#) (pp 1-3, 20-25)

Further information on the [East Antarctic Margin Aeromagnetic and Gravity Experiment](#)