

Meiofauna at the Poles - Coping with Change

Maarten Raes, Katja Guilini, Ann Vanreusel

Ghent University, Biology Department, Marine Biology Section
Krijgslaan 281 - Building S8, Gent, Belgium

maarten.raes@ugent.be



BIANZO II

Biodiversity of three representative groups of the Antarctic zoobenthos - Coping with change

Our planet is changing...

Warming of our climate is unequivocal (IPCC 4th Assessment Report). However, the effect of global change on the Antarctic remains uncertain, as inter-annual variability and localized changes make generalizations difficult. On the other hand, it is known that the Antarctic Peninsula (Fig. 1b) is one of the fastest warming regions on earth (+2.5°C in 50 years), which already resulted in the collapse of the Larsen A and B ice shelves (Fig. 1a).

The Belgian BIANZO II project studies three size classes of the Antarctic zoobenthos: meiobenthos, macrobenthos (Amphipoda) and megabenthos (Echinoidea) (Fig. 2). It consists of three work packages:

1. NOWBIO. Characterisation of the Antarctic zoobenthos, focusing on poorly known areas (e.g. abyssal, Larsen area)
2. DYNABIO. This workpackage deals with:
 - 2.1. The trophic position and trophic diversity of the Antarctic zoobenthos
 - 2.2. The ability of the Antarctic zoobenthos to cope with change
3. FOREBIO. Build a model to assess the impact of environmental change on the three benthic taxa

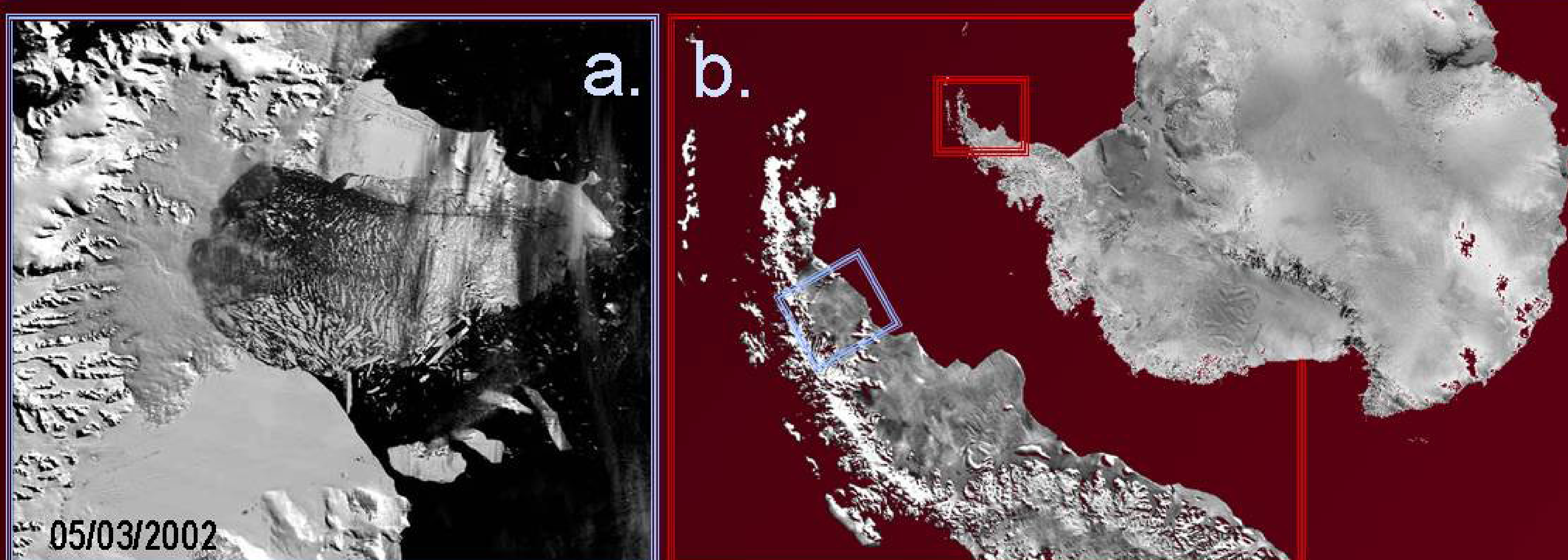


Figure 1. a. The Larsen B area (2002 situation; MODIS images from NASA's Terra satellite, National Snow and Ice Data Center, University of Colorado); b. Antarctic Peninsula (before 1992)



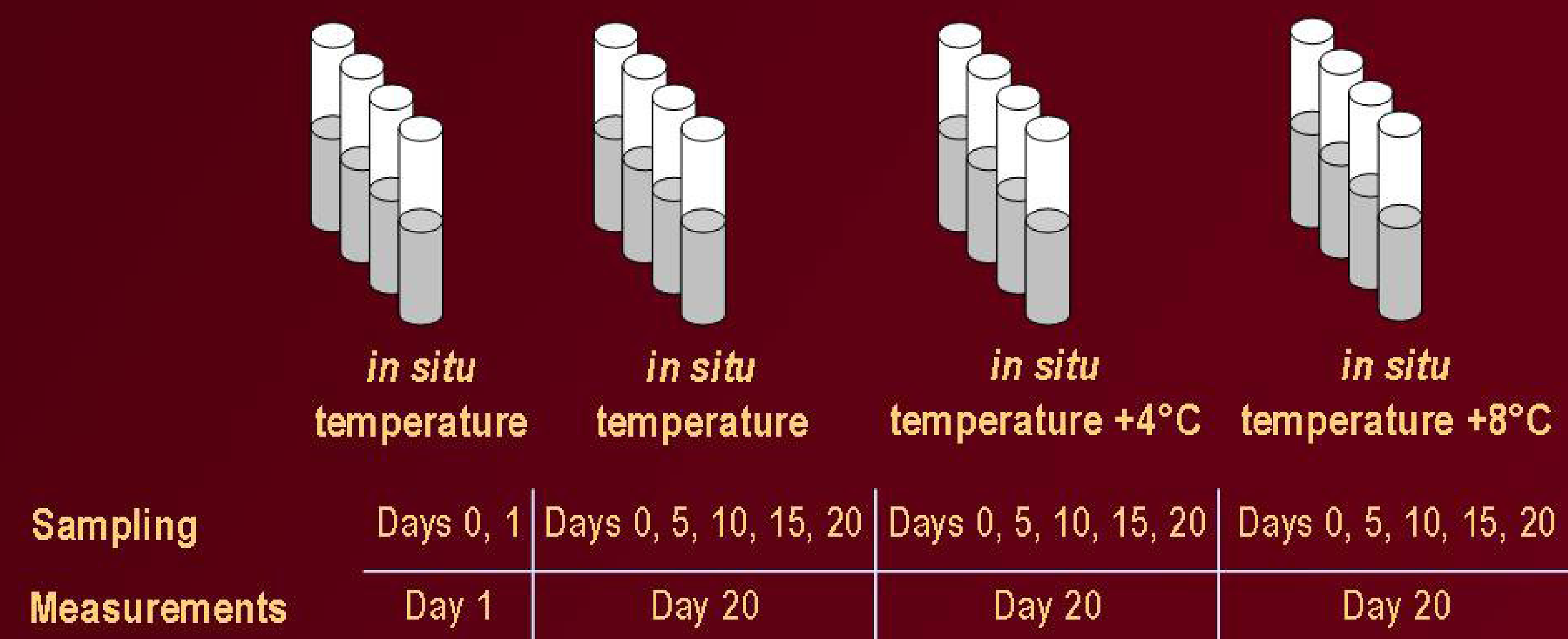
Figure 2. Three representative groups of the Antarctic zoobenthos. a. meiobenthos (Nematoda); b. macrobenthos (Amphipoda); c. megabenthos (Echinoidea)

LABORATORY EXPERIMENTS

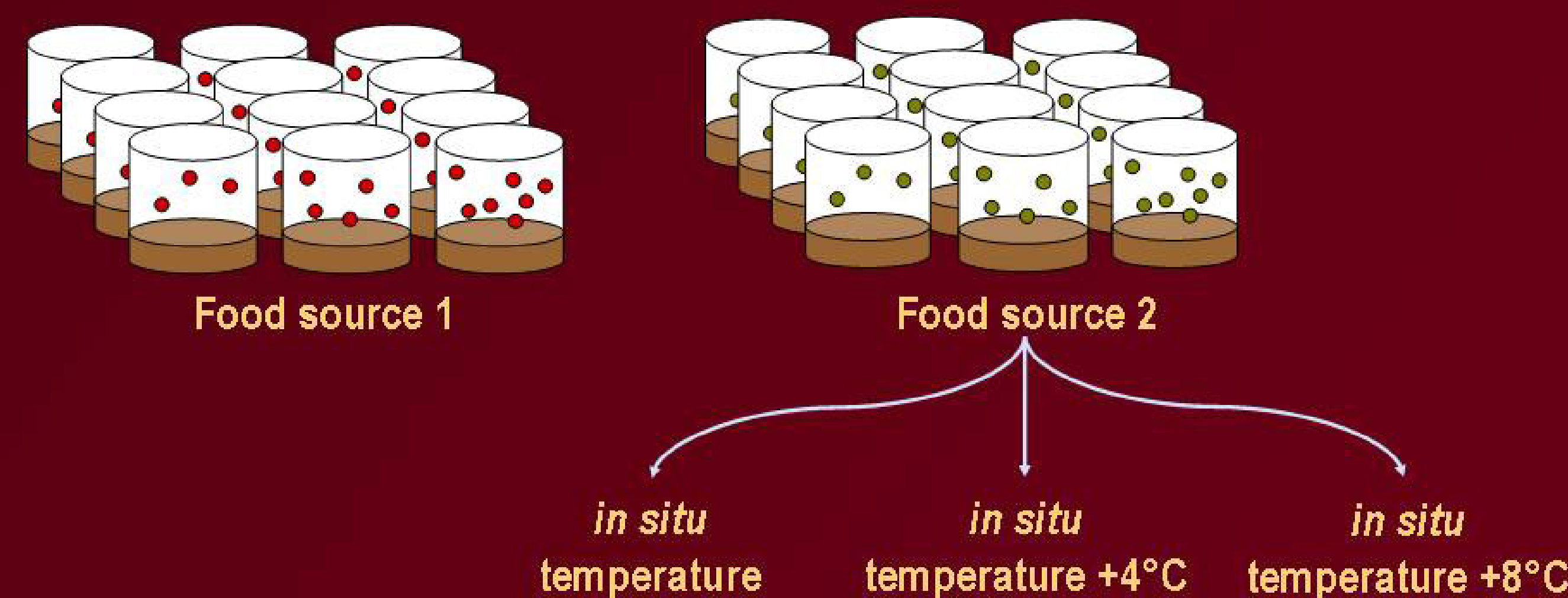
A series of laboratory experiments with incubated sediments will be carried out near the Antarctic Peninsula (Jubany Station). The experimental set-up will first be tested on Spitsbergen (Arctic). The purpose of these experiments is to unravel the meiobenthic trophic position and the ability of the meiobenthos to cope with temperature-related changes, e.g. in food quantity and quality.

Within the framework of both BIANZO II and ANDEEP-SYSTCO, an *in vitro* experiment will also be carried out on board of FS Polarstern, to study the trophic position of the meiobenthos in the Southern Ocean deep sea.

Jubany experiment 1 – What is the effect of an increase in temperature on benthic respiration?



Jubany experiment 2 – How does a change in food quality and quantity affect the meiobenthos?



Measurements and analyses

Experiment 1: nematode densities, biomass and reproduction rates; bacterial densities and biomass.

Experiment 2: nematode densities, biomass and reproduction rates; stable isotopes analysis.

Polarstern experiment 1 – Trophic interactions and potential food selectivity in the Southern Ocean deep sea.

Addition of different ¹³C-labeled food sources for benthic bacteria and meiobenthos.

Analyses: stable isotope and fatty acids analysis on different meiobenthic taxa.



BIANZO II is a cooperation between:



BIANZO II is also involved in:

