Climate change: Impact of the increase of iceberg scouring frequency on Antarctic benthic suspension-feeding communities.

Maria Montseny. Grau en Biologia Ambiental. Facultat de Biociències UAB. 2013

Introduction

Antarctic benthic suspension-feeding communities are complex, dense, highly structured, mature, multi-specific and they have high diversity with high endemism levels.

Sponges, anemones, ascidians, gorgonians corals, hydroids, bryozoans are typical suspension Antarctic feeders. They have slow reproduction and growth rates.

Ice scouring damages benthic fauna and begins a succession process → mosaic of different stages.

Iceberg scouring is one of the dominant structuring forces along the continental shelf (>800m).

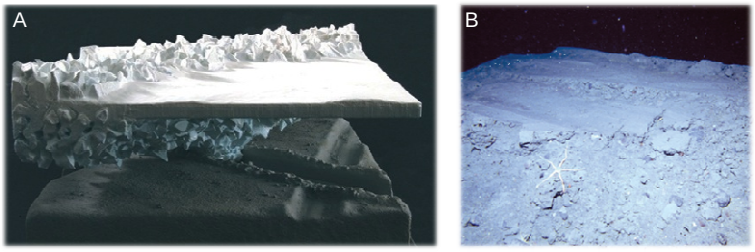

Fig.1: (A) Impact of iceberg scouring on the antartic seabed. Source: Teixidó (2004). (B) Seafloor recently scoured by iceberg in SE Weddell Sea shelf . Source: Gutt i Piepenburg (2003).

State of the art:

Climate change

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Increase of icebergs load

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↑ Probability of ice scouring in areas where more ice movement is registered

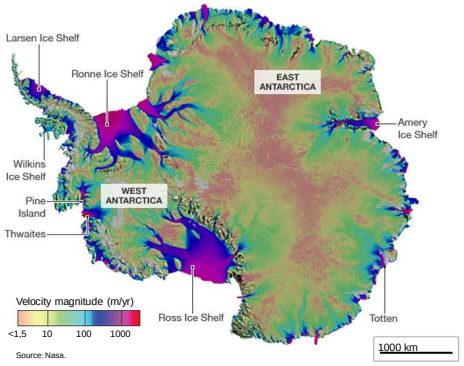

Fig.2: Ice movement registered between 1996-2009. Source: Ringot et al (2011).

The aim: is determine the effects of the increase of ice scouring frequency on the Antarctic benthic suspension-feeding communities and on the ecosystem associated. .

Discussion

If ice scouring frequency increases: 340 → < 250 years → ↑Loss of final stages of succession; it causes :

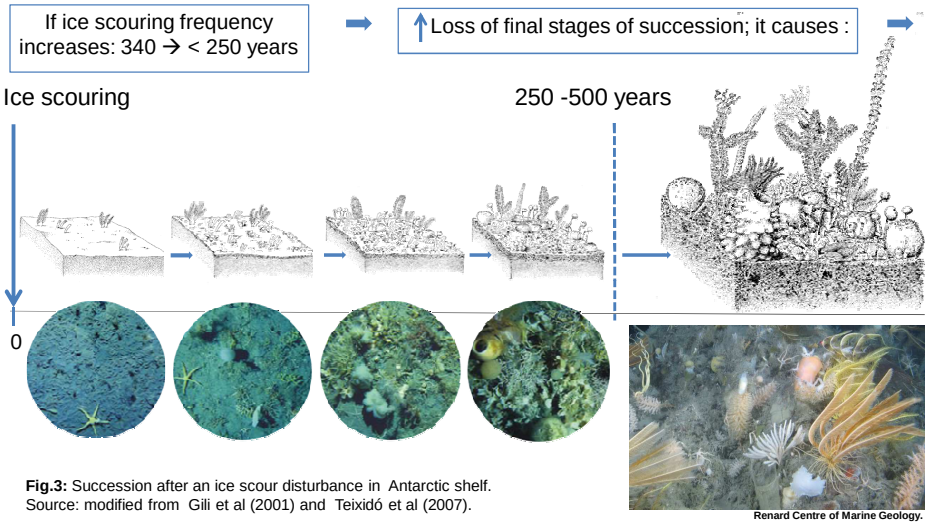

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Fig.3: Succession after an ice scour disturbance in Antarctic shelf. Source: modified from Gili et al (2001) and Teixidó et al (2007).

1. Loss of benthic suspension feeders.
   - Modification of the ecological role:
     - ↓ Recycling of pelagic production
     - ↑ Sedimentation rate
   - ↓ Structural complexity
   - ↓ Diversity and richness → loss of endemisms

   Loss of epibiotic species.

2. Selection of opportunistic and pioneering species, typical of early stages of succession.

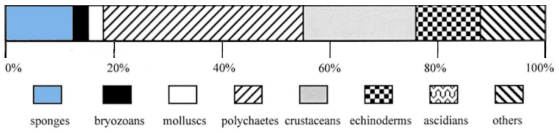

Fig.4: Typical taxonomic composition of an early stage of succession (wet biomass proportions) Source: modified from Gerdes et al (2003).

3. Loss of the mosaic → ↓ heterogeneity at regional scale.

Conclusions

Increase of ice scouring frequency are likely to have significant effects on the **diversity** and **composition** of the benthic fauna, with associated changes in **ecosystem function**.

For a recent future, is important to continue determining how these exceptional communities will respond in fort of increase climate change consequences.