Benthic community energy flow: Is there a latitudinal gradient from the Sub-Antarctic Magellan region to Antarctic?

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Rationale

-Ongoing climate change in southern high latitudes will affect Magellan and Antarctic coastal and shelf ecosystems.

-Magellan and Antarctic benthic communities differ in fauna composition, but it remains unclear whether there is a clear latitudinal gradient in biomass and energy flow.

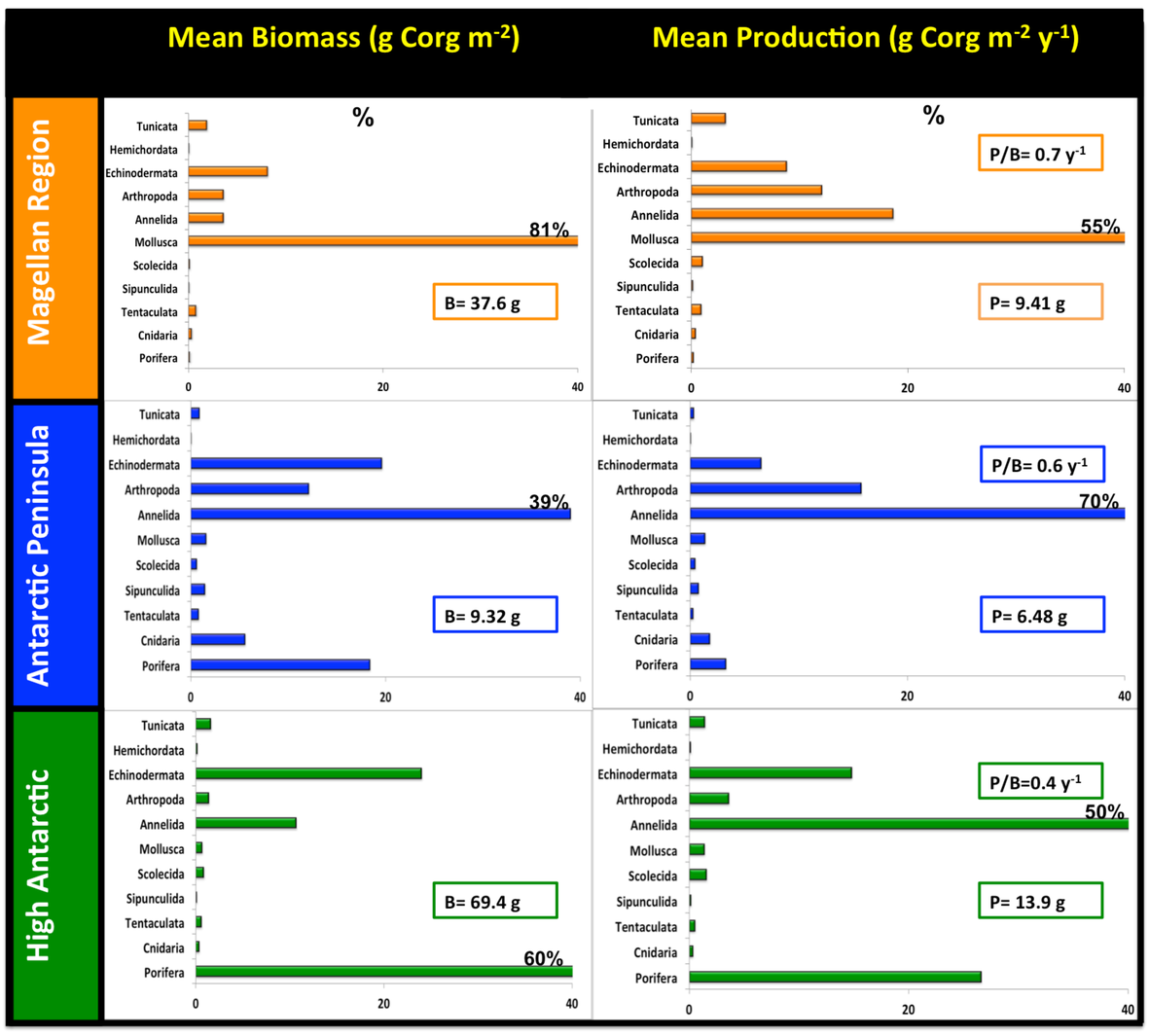
Conclusions

- In the high Antarctic biomass and production are significantly higher and decrease more rapidly with depth compared to Magellan and Antarctic Peninsula regions.

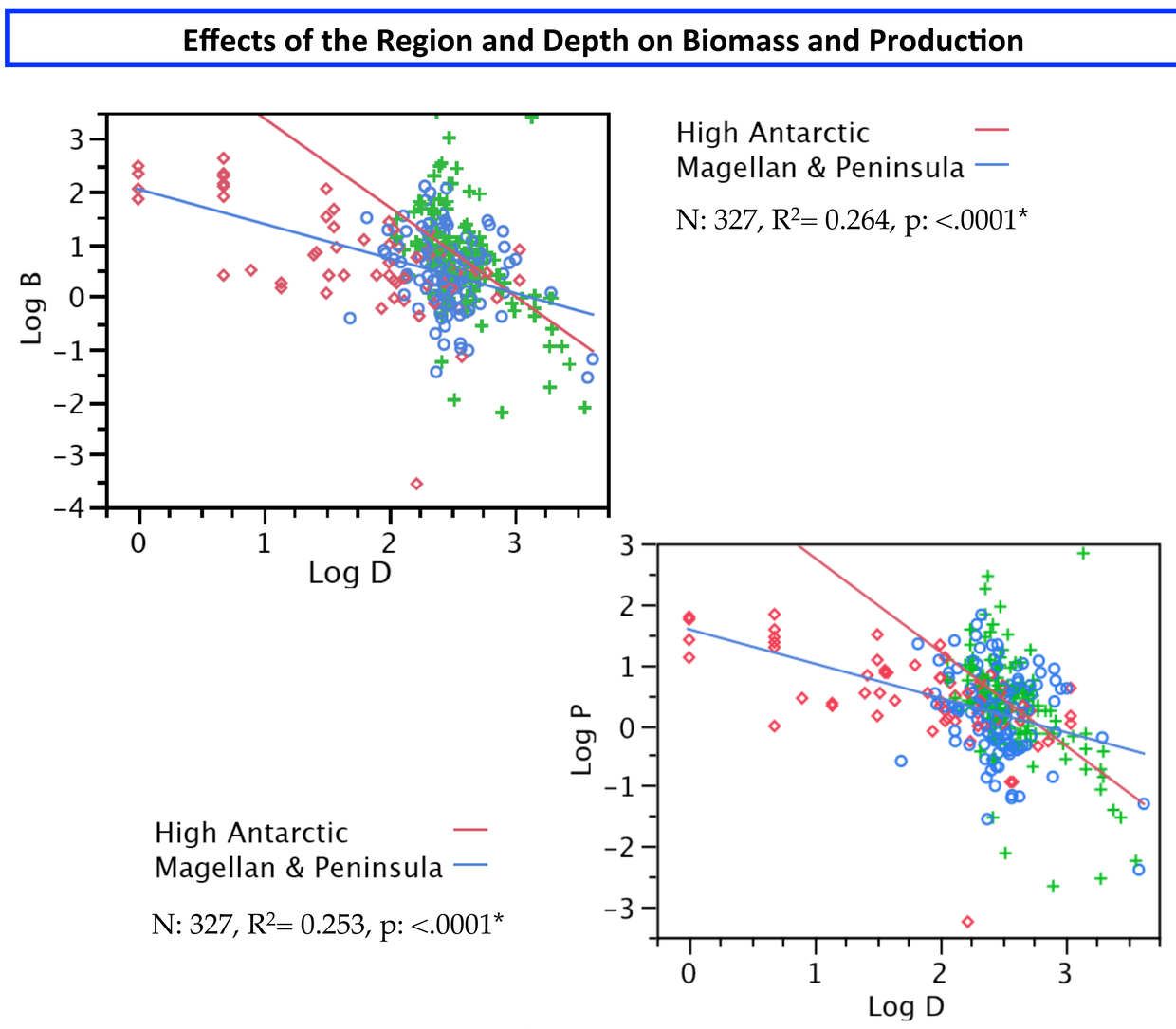
- Biomass and production are dominated by different groups in each region: Mollusca in Magellan Region, Annelida in Antarctic Peninsula and Annelida and Porifera in High Antarctic.

-Spatial variability is high in all three regions with particular hotspots of production: Canal Whiteside in Magellan Region, Western Antarctic Peninsula Shelf and Kapp Norvegia in High Antarctic.

Mean Biomass and Production by Taxonomic Groups and Regions



Effects of the Region and Depth on Biomass and Production



Spatial Distribution of Abundance, Biomass and Production

Data processing

-Our data base consists of 327 quantitative (abundance, biomass) benthic samples (multi-box corer, box corer, VanVeen-grab, quadrat/transects and scuba diving) collected between 1988 and 2011.

-Animals were classified into 11 major taxonomic groups.

-Original wet mass data were converted to Corg (and energy content) using factors of Brey (2010).

-Annual production for each taxonomic group was estimated by ANN (Artificial Neural Network)model of Brey (2012).

Resources for this study

-Joint Chilean - German - Italian Magellan Campaign, RV 'Victor Hensen` 1994 (Strait of Magellan and Beagle Channel).

-Cimar-Fiordo II Expedition, RV 'Vidal Gormaz' 1996 (South Patagonian Icefield).

-Polarstern cruises (Antarctic Peninsula, Weddell Sea, Southern Ocean and Scotia Sea).

-Canal Whiteside, Magellan Region.

-Bernardo O´Higgins National Park, Magellan Region.

References

-Brey T (2001) Populations dynamics in benthic invertebrates. A virtual handbook http://www.thomas-brey.de AWI.

-Brey T (2012) A multi-parameter artificial neural network model to estimate macrobenthic invertebrate productivity and production, Limnology and Oceanography-Methods 581-589.

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