

Influence of Antarctic sea ice dynamic and coastal polynyas on emperor penguin populations : From individual tracking to population demography

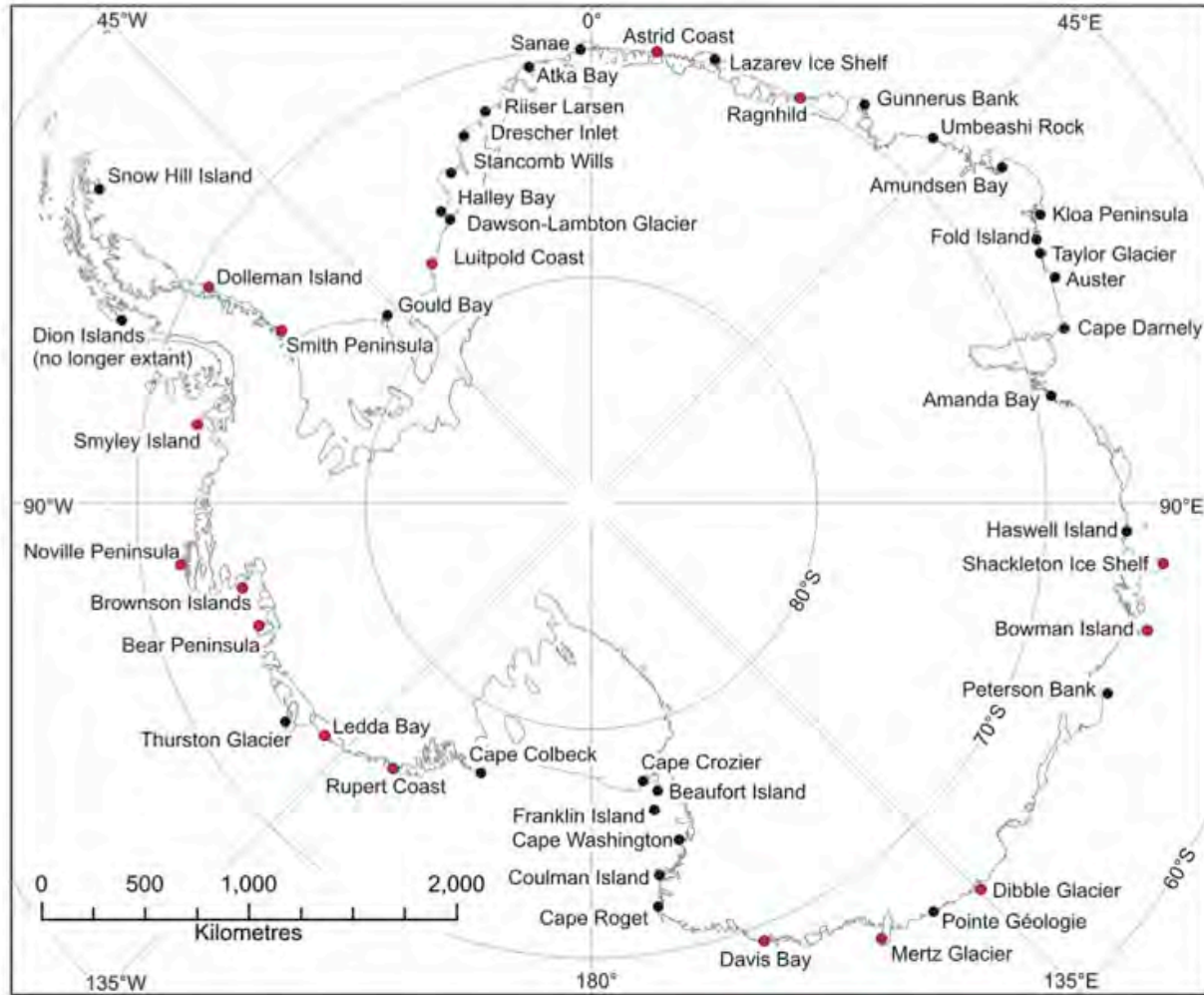
Sara Labrousse, A. D. Fraser, M. Sumner, T. Tamura, D. Pinaud, B. Wienecke, R. Kirkwood, Y. Ropert-Coudert, R. Reisinger, I. Jonsen, R. Porter-Smith, C. Barbraud, C.-A. Bost, R. Ji, and S. Jenouvrier

INTRODUCTION



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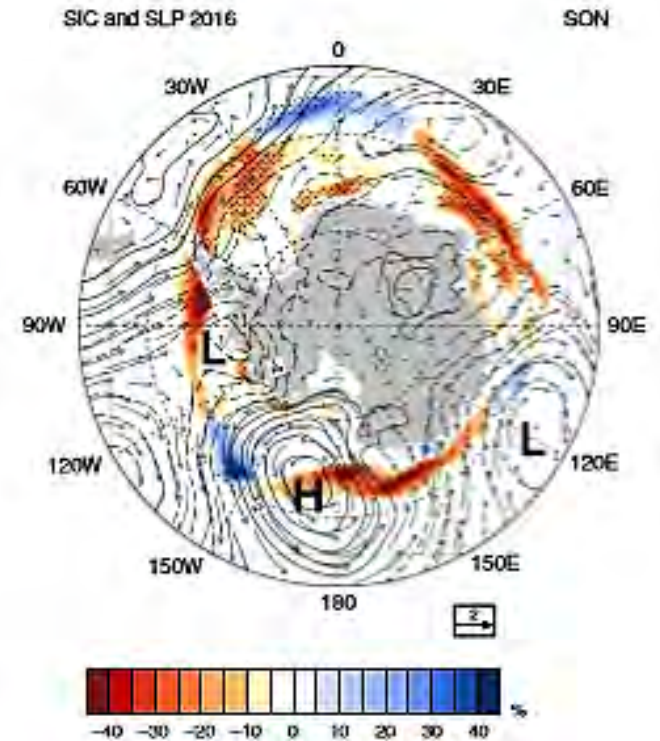
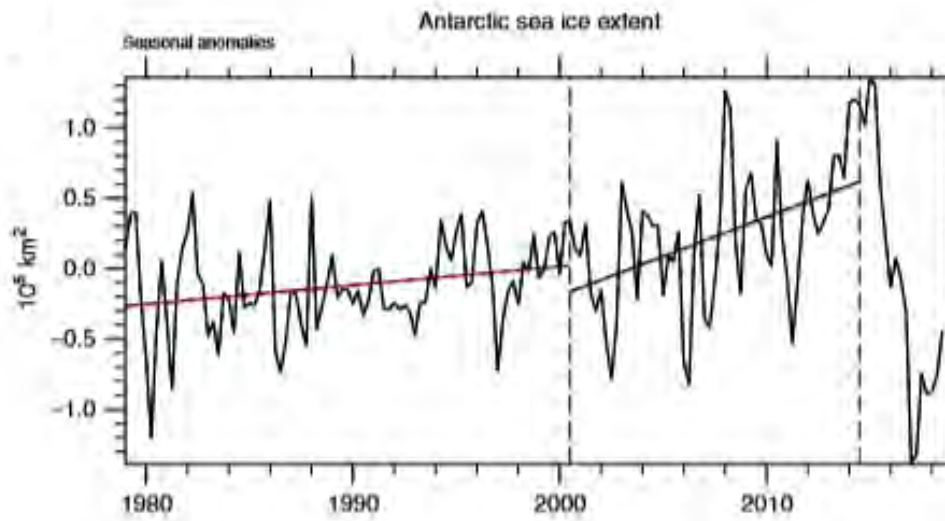


Fretwell et al. (2012)



Bruno Jourdain/IGE-UGA/IPEV

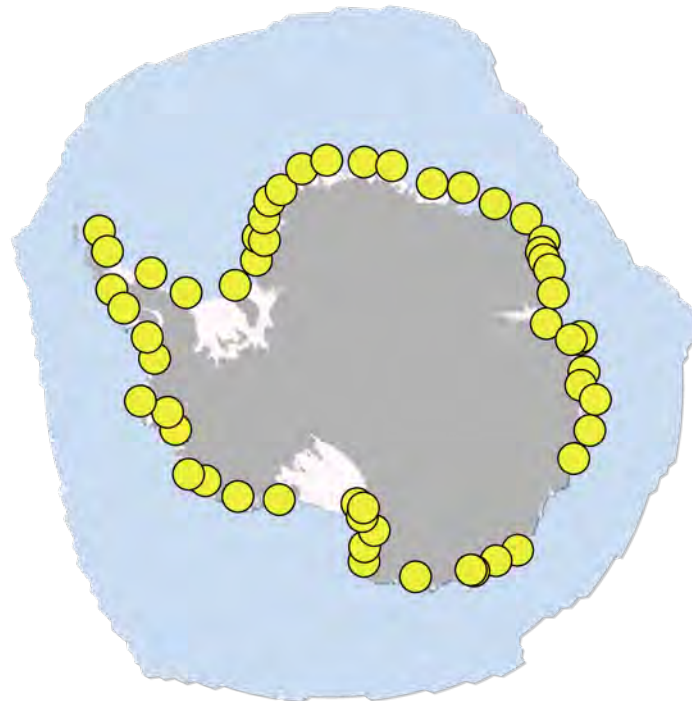
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Mehl et al. (2019)

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TODAY

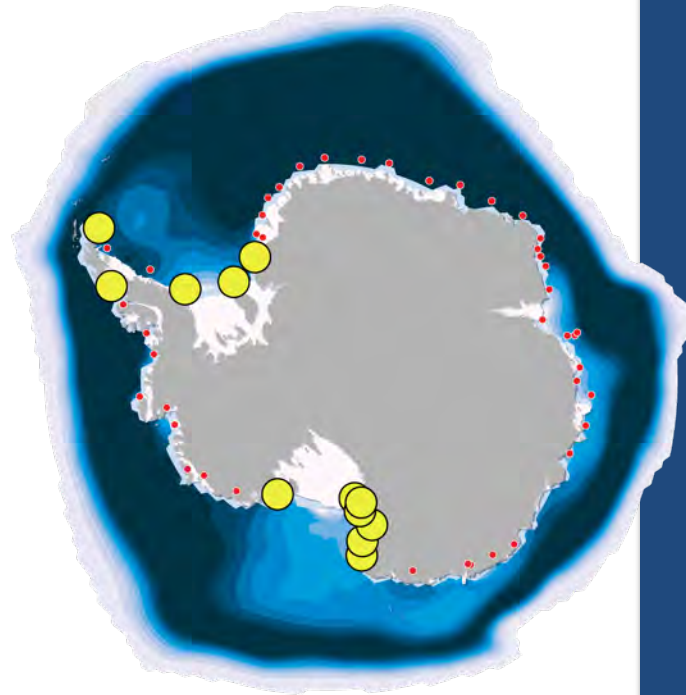


Jenouvrier et al. (2019)

INTRODUCTION

BUSINESS
AS USUAL

80 % LOSS



~ 950ppm CO₂ in
the atmosphere

Colony ●

Extinct colony (< 90%) ●

Sea Ice /
Habitat Loss

0%

-10%

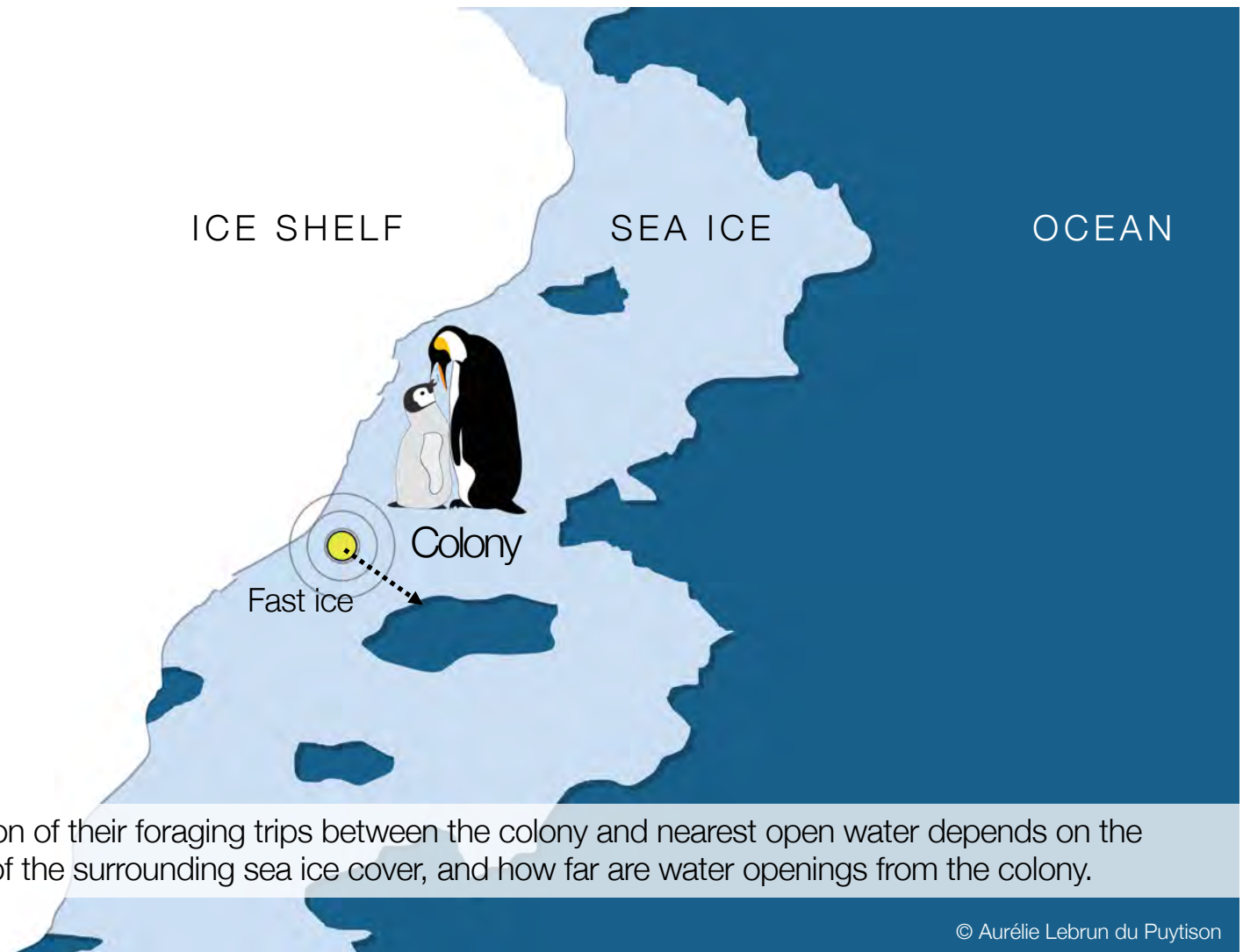
-15%

-20%

-25%

Jenouvrier et al. (2019)

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The duration of their foraging trips between the colony and nearest open water depends on the extent of the surrounding sea ice cover, and how far are water openings from the colony.

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WHAT IS THE ROLE OF POLYNYAS FOR ADULT EMPEROR PENGUINS DURING THE BREEDING SEASON

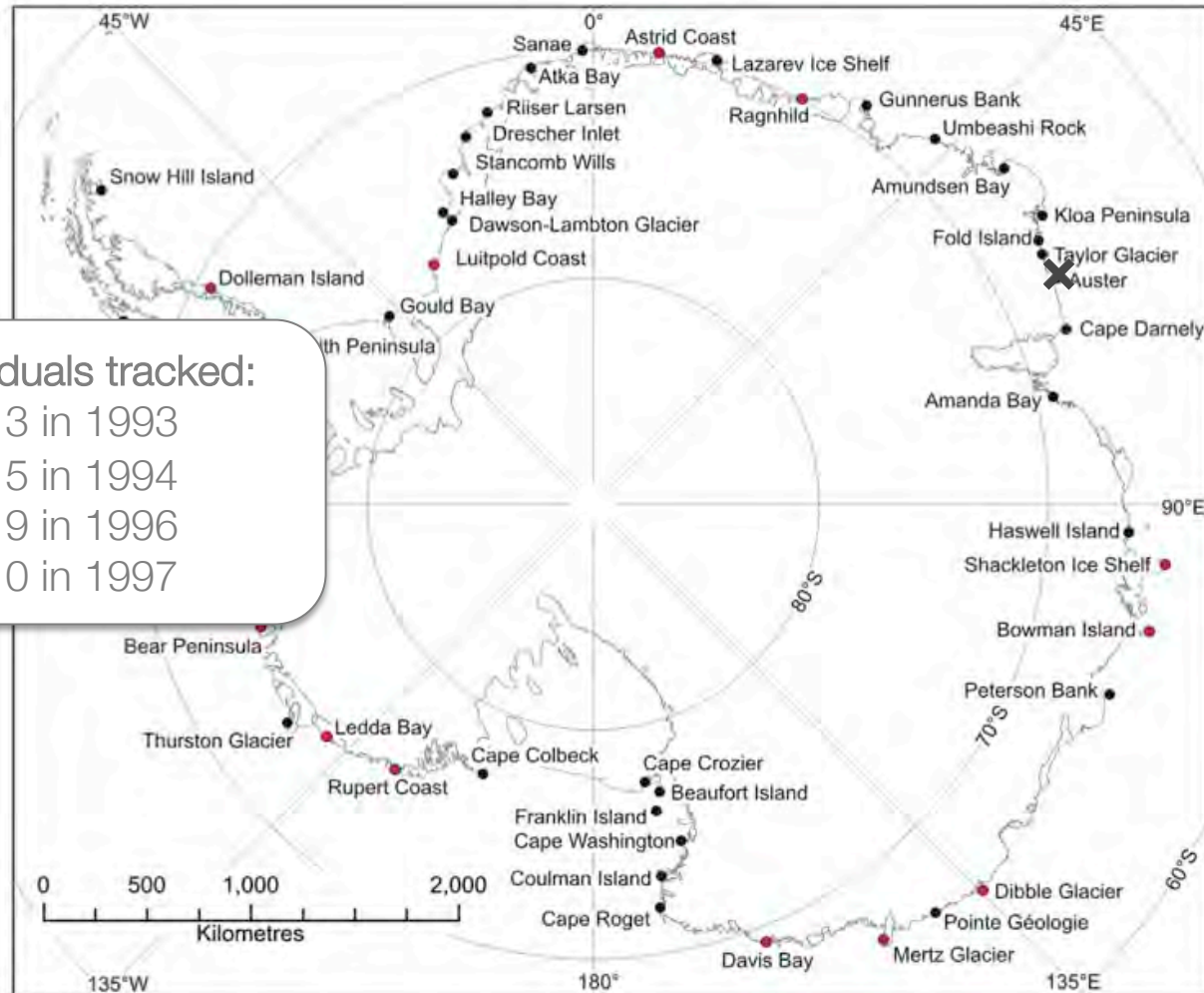
Labrousse, S., Fraser, A. D., Sumner, M., Tamura, T., Pinaud, D., Wienecke, B., et al. (2019).
Dynamic fine-scale sea icescape shapes adult emperor penguin foraging habitat in East Antarctica.
Geophysical Research Letters, 46.

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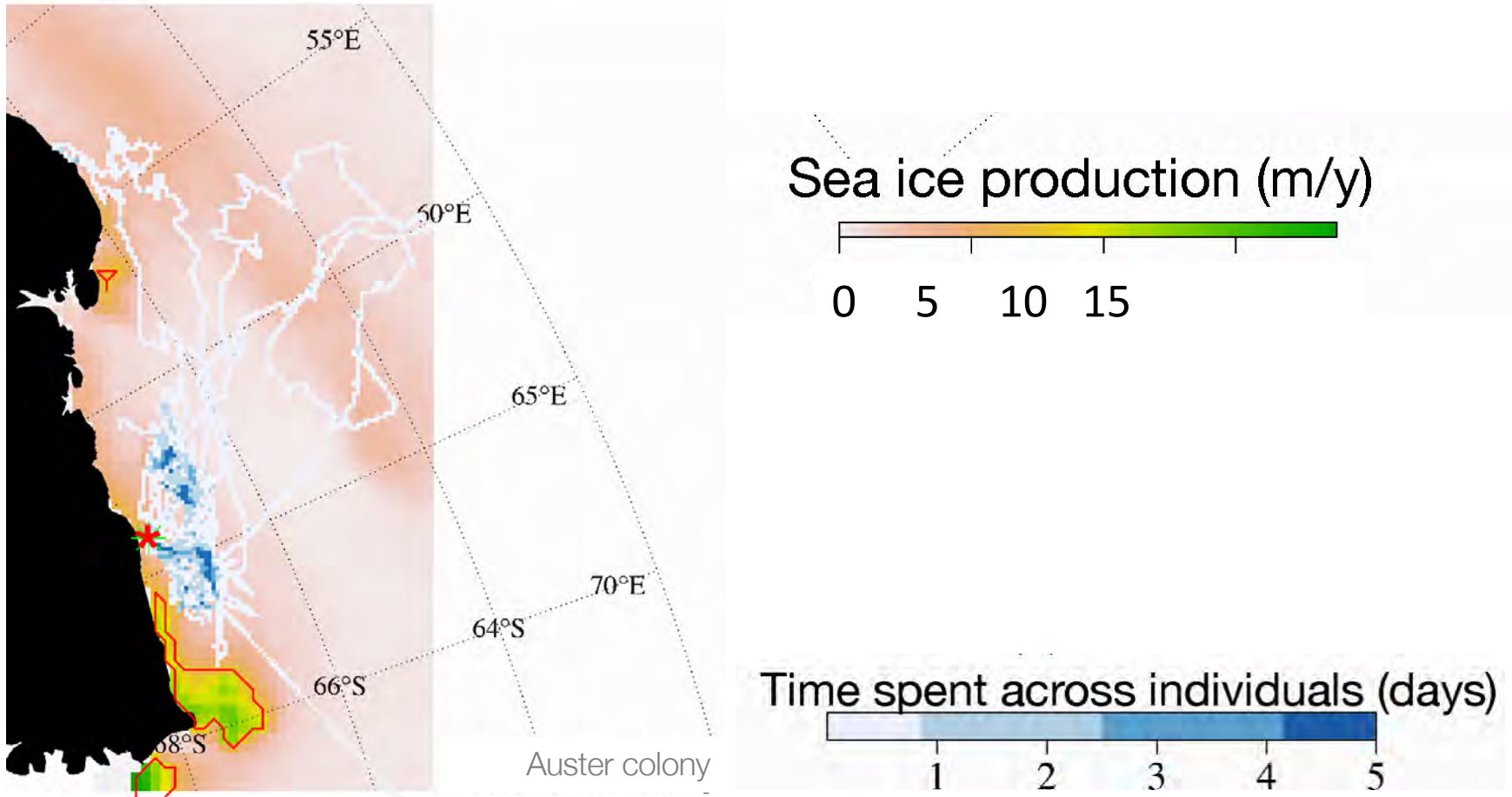
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Fretwell et al. (2012)

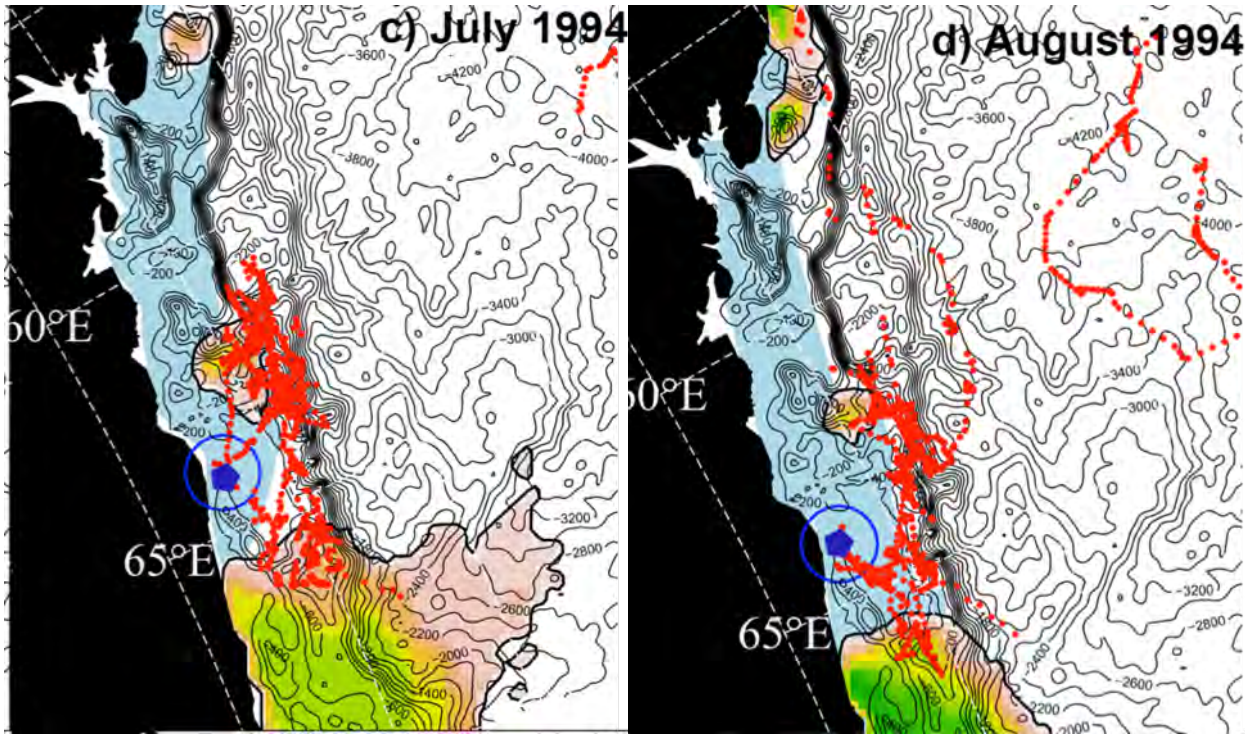
Results

Penguins do not use large, yearly persistent polynya



Results

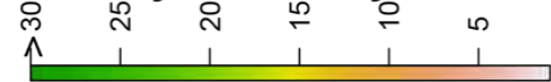
Penguins use cracks, flaw leads and ephemeral short-term polynyas



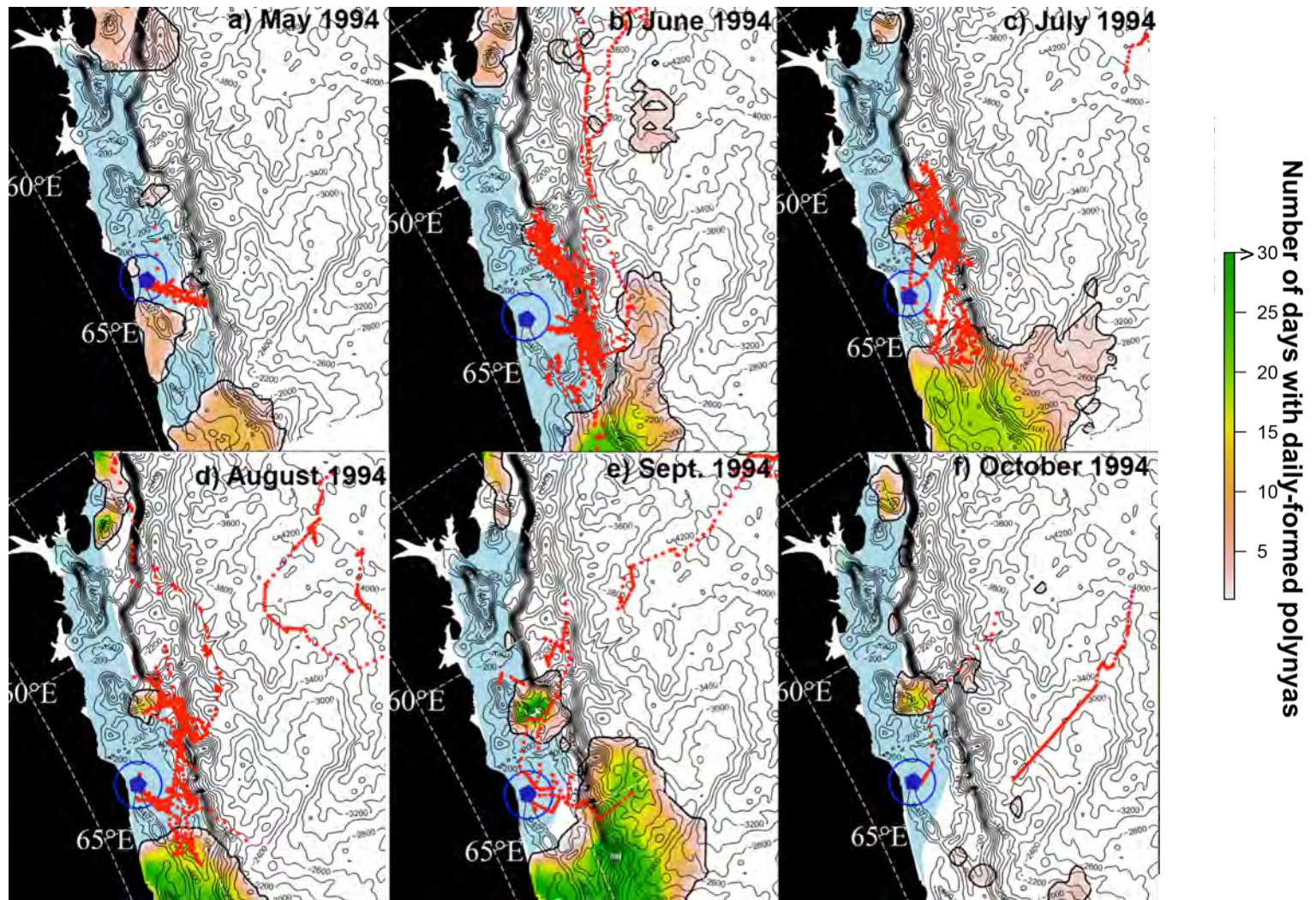
Auster colony



Number of days with daily-formed polynyas

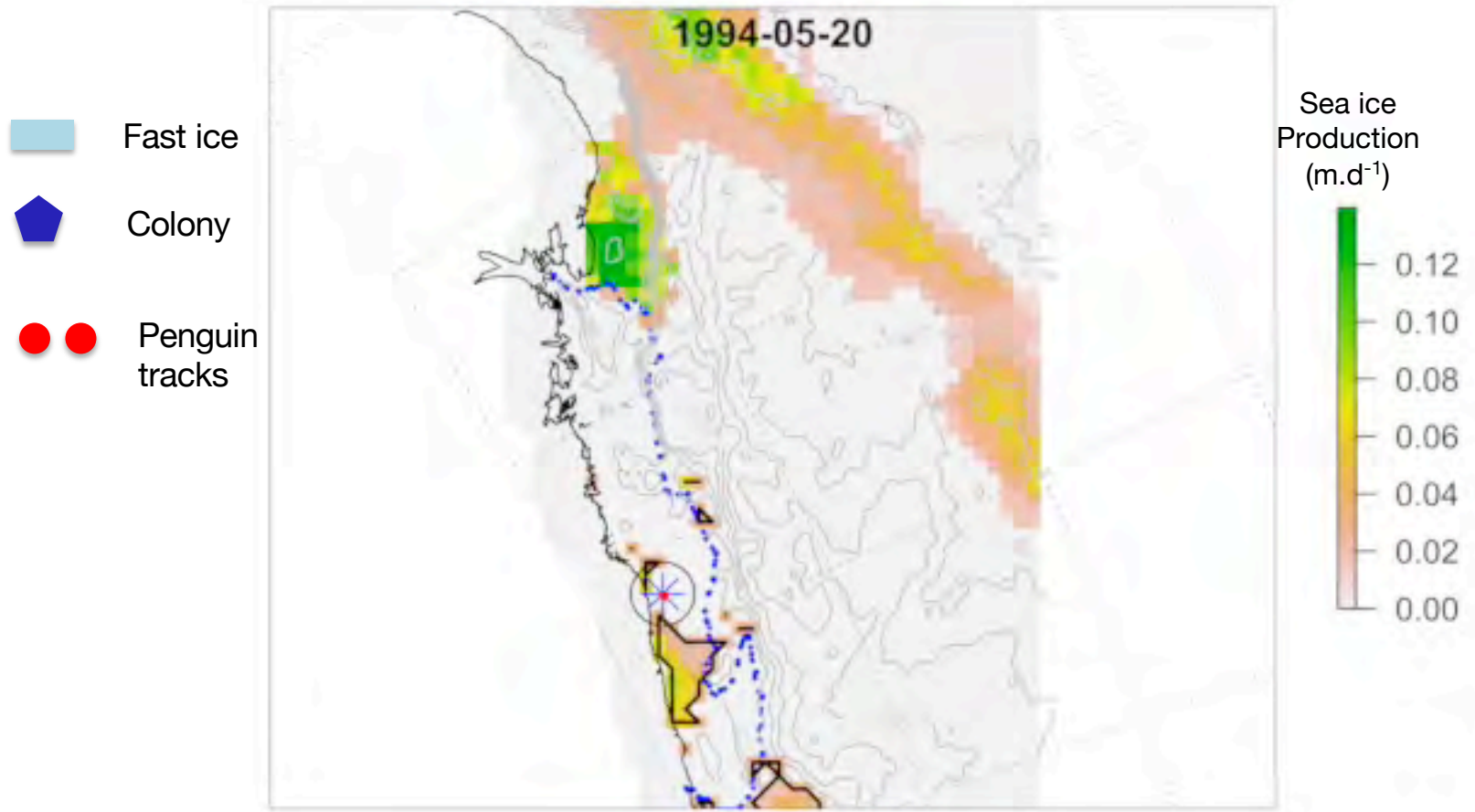


Results



Results

Penguins forage in a highly dynamic sea ice environment at the edge of fast ice and within ephemeral short-term polynyas



Results

Why ephemeral polynya : closer / seascape of fear / different food web ?

What is the role of ephemeral polynya in structuring Antarctic ecosystems?



Thank you for your attention

Special thanks go to

**all my collaborators in
LOCEAN, CEBC, WHOI, UMN, IMAS,
AAD, NIPR, IPEV and**

**all colleagues and volunteers
involved in the research on emperor
penguins in Terre Adélie**

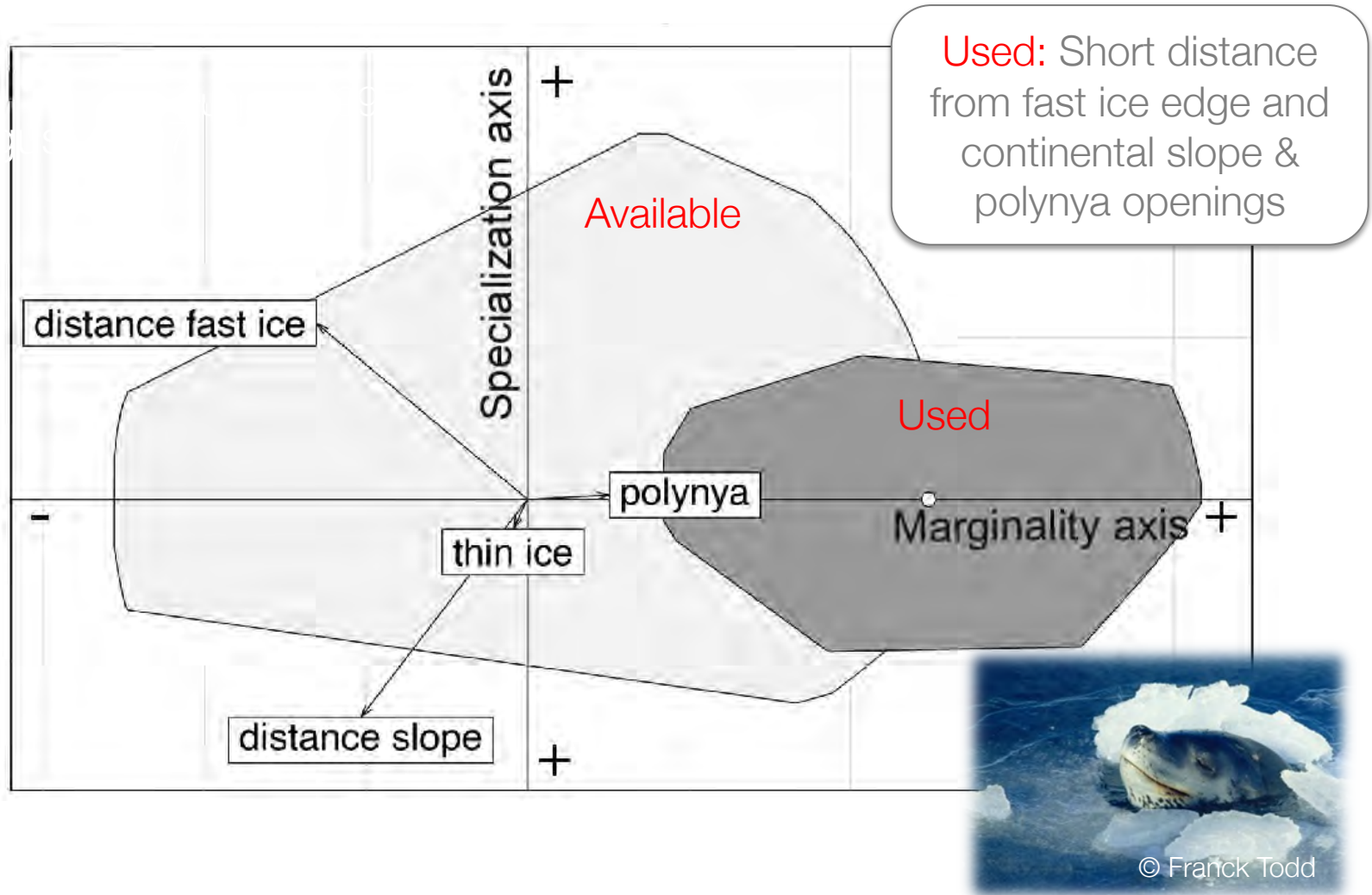
**NSF-OPP awards
154331 and 1744794**



Any questions?

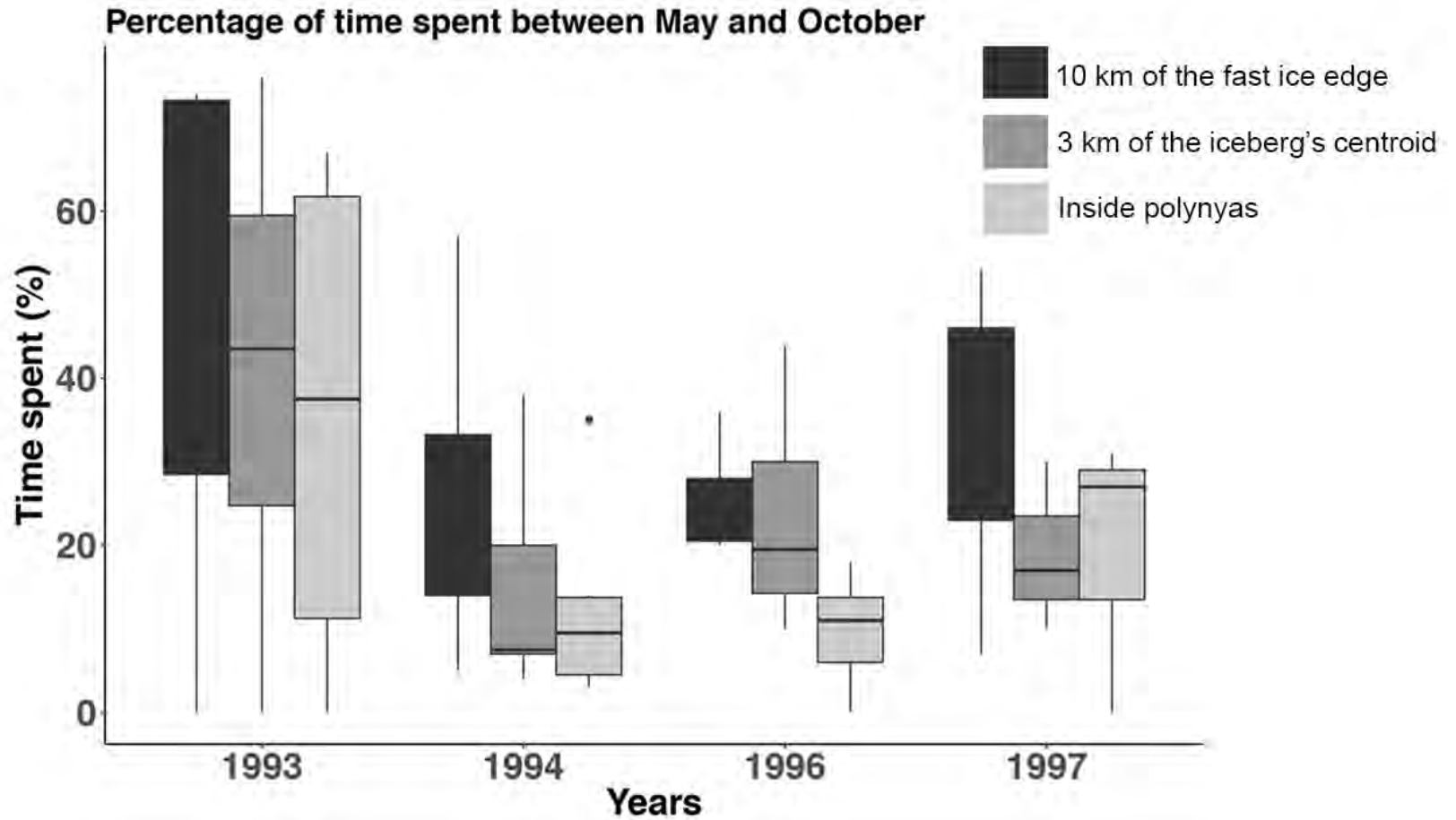
Results

Ecological niche factor analysis - ENFA

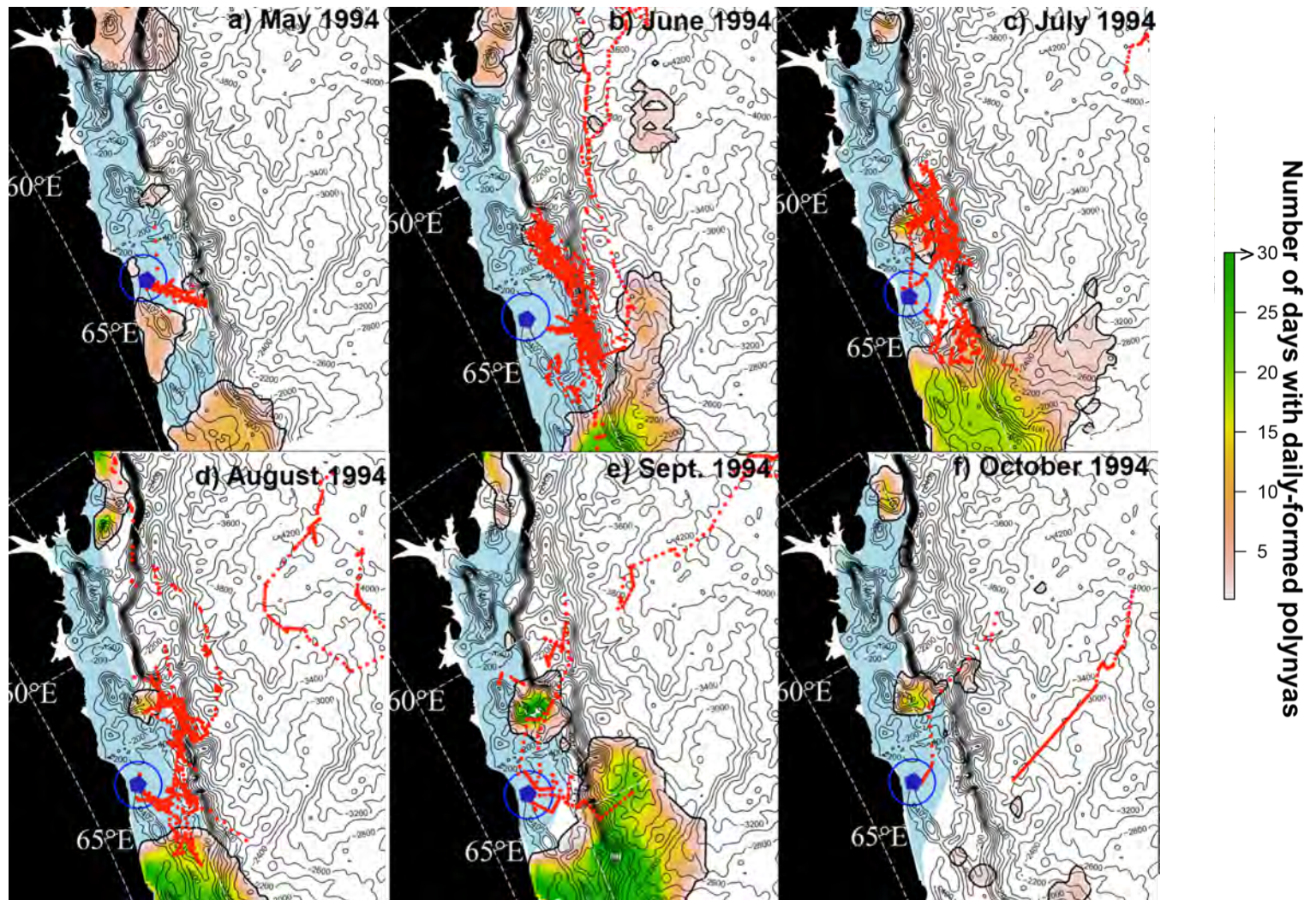


Results

Time spent in the different habitat

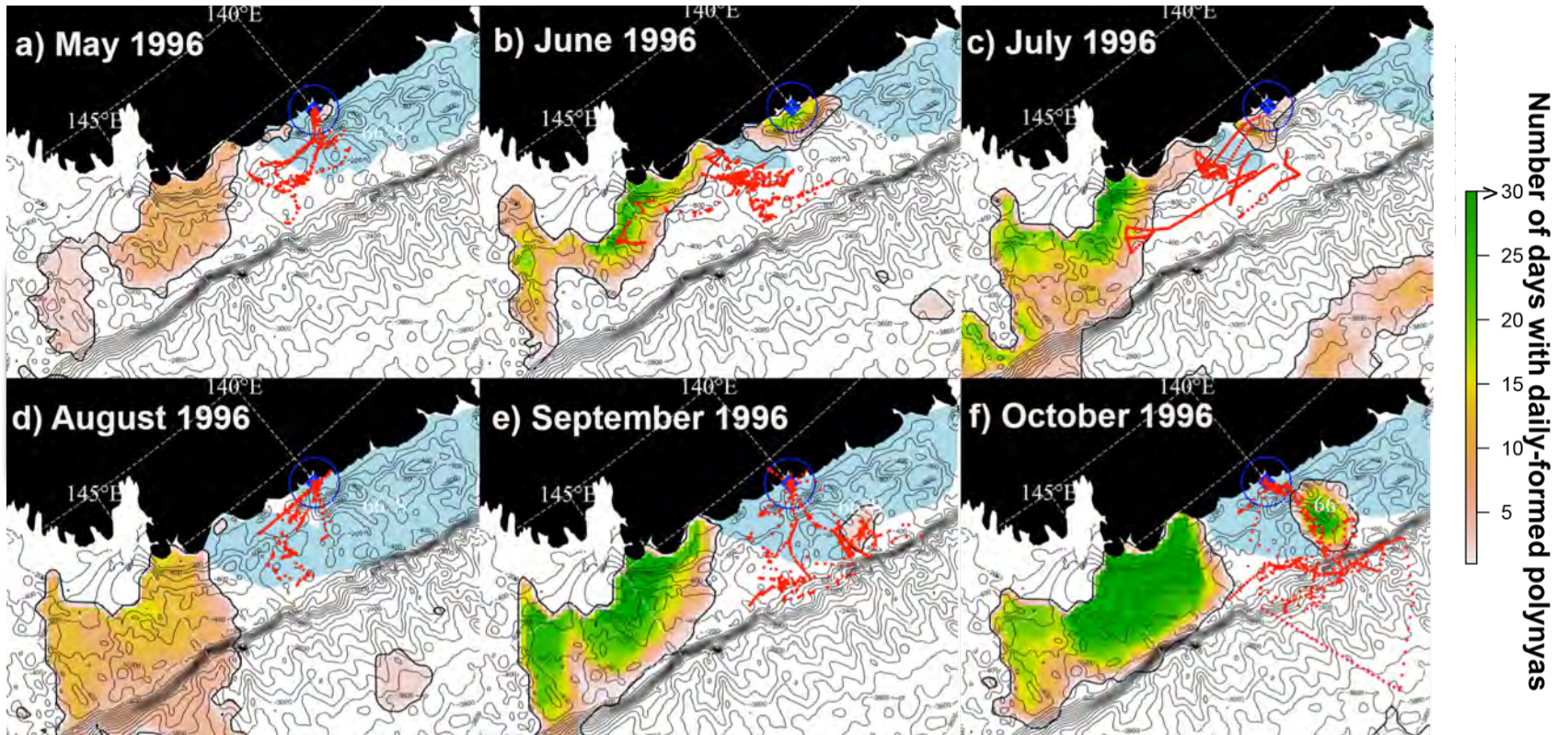


POLYNYAS



Results

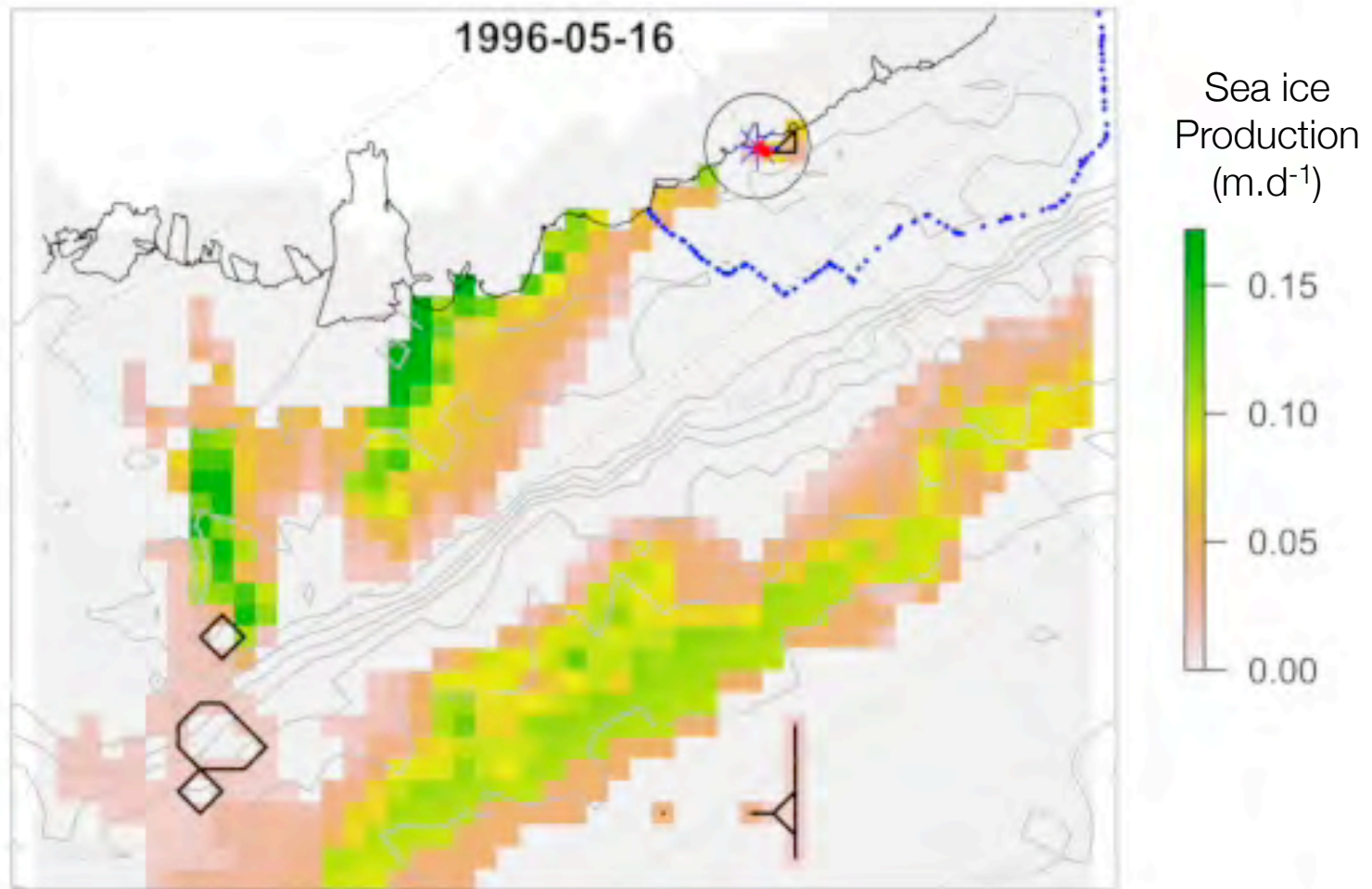
Fast ice, polynyas and adult tracking data



Pointe Geologie colony

Results

Fast ice, polynyas and adult tracking data



Pointe Geologie colony