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Long-term monitoring of marine ecosystem sentinel species: The French Southern Breeding Seabird Survey

Karine Delord, Yves Cherel, Henry Weimerskirch, Julien Collet, Timothée Bonnet, Christophe Barbraud

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Long-term monitoring of marine ecosystem sentinel species :

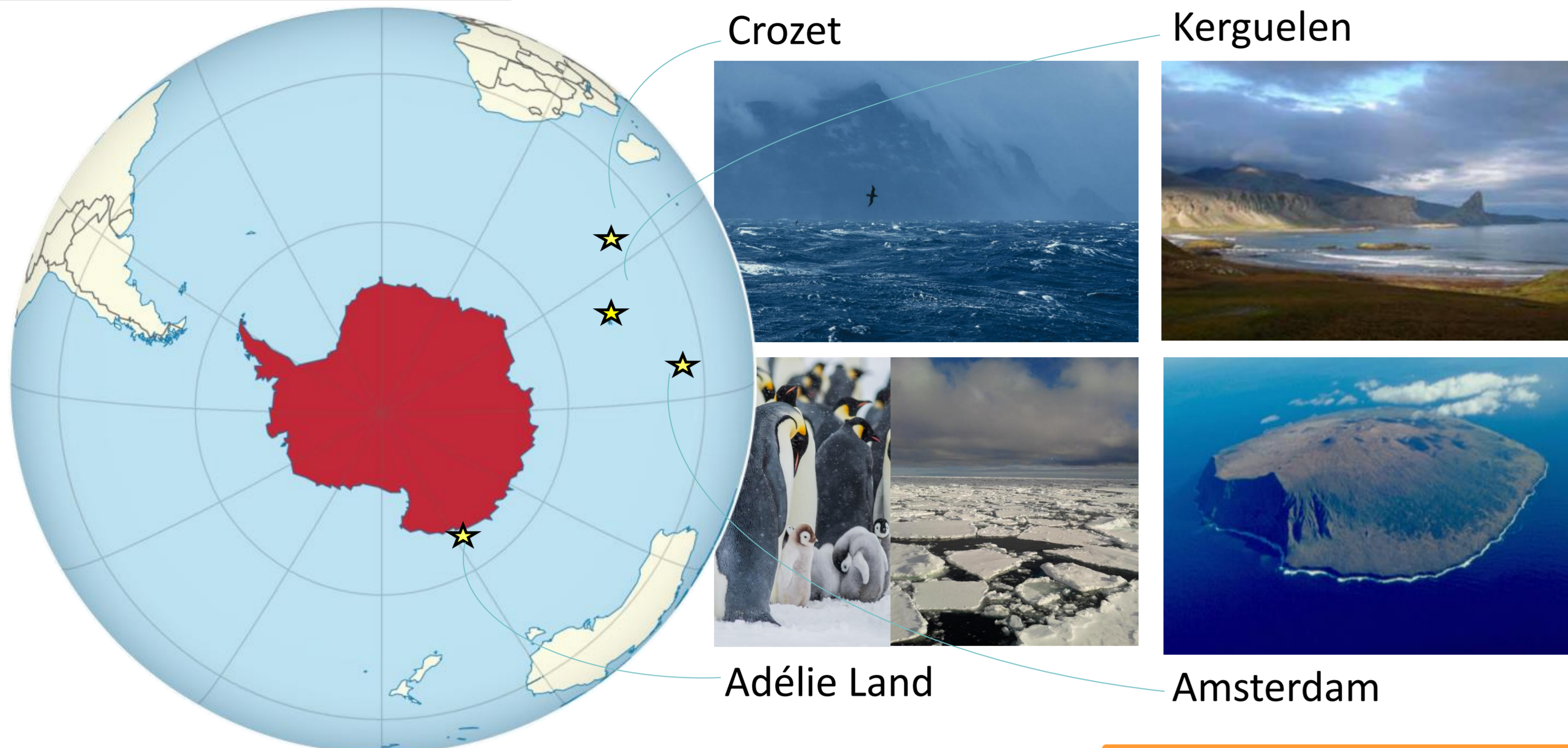
The French Southern Breeding Seabird Survey

Karine Delord, CA Bost, Y Chereil, H Weimerskirch, J Collet, T Bonnet & C Barbraud

Centre d'Etudes Biologiques de Chizé, CNRS UMR7372, 79369 Villiers en Bois, France



Sites and colonies



Individual and population monitoring

Since early 1950's
4 study sites on a latitudinal gradient polar -> subtropical
> 30 species
~ 133,000 marked individuals; ~ 450,000 observations

Breeding survey

Since early 1950's
Partner identity
Reproductive frequency and output
Pedigree
Phenology

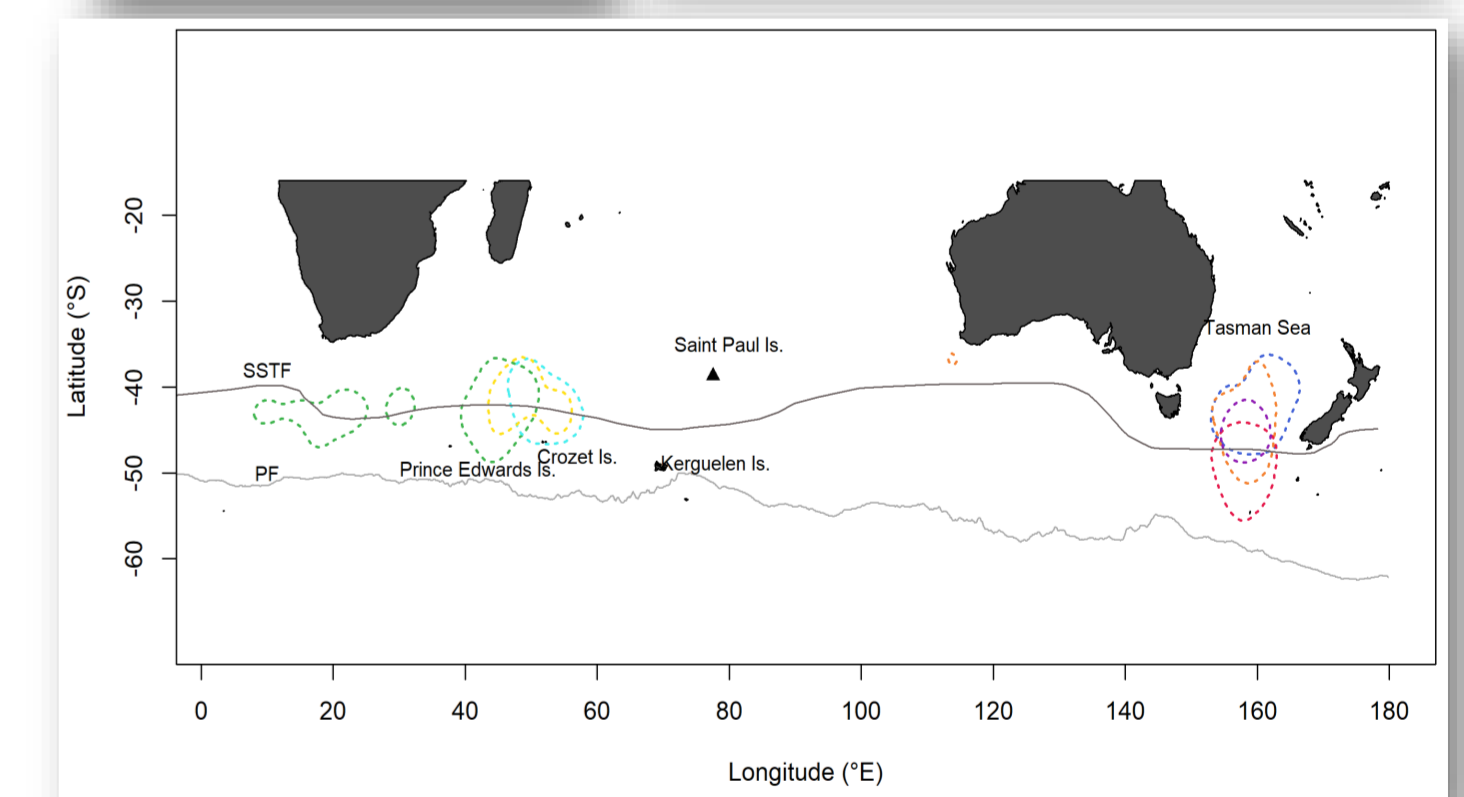
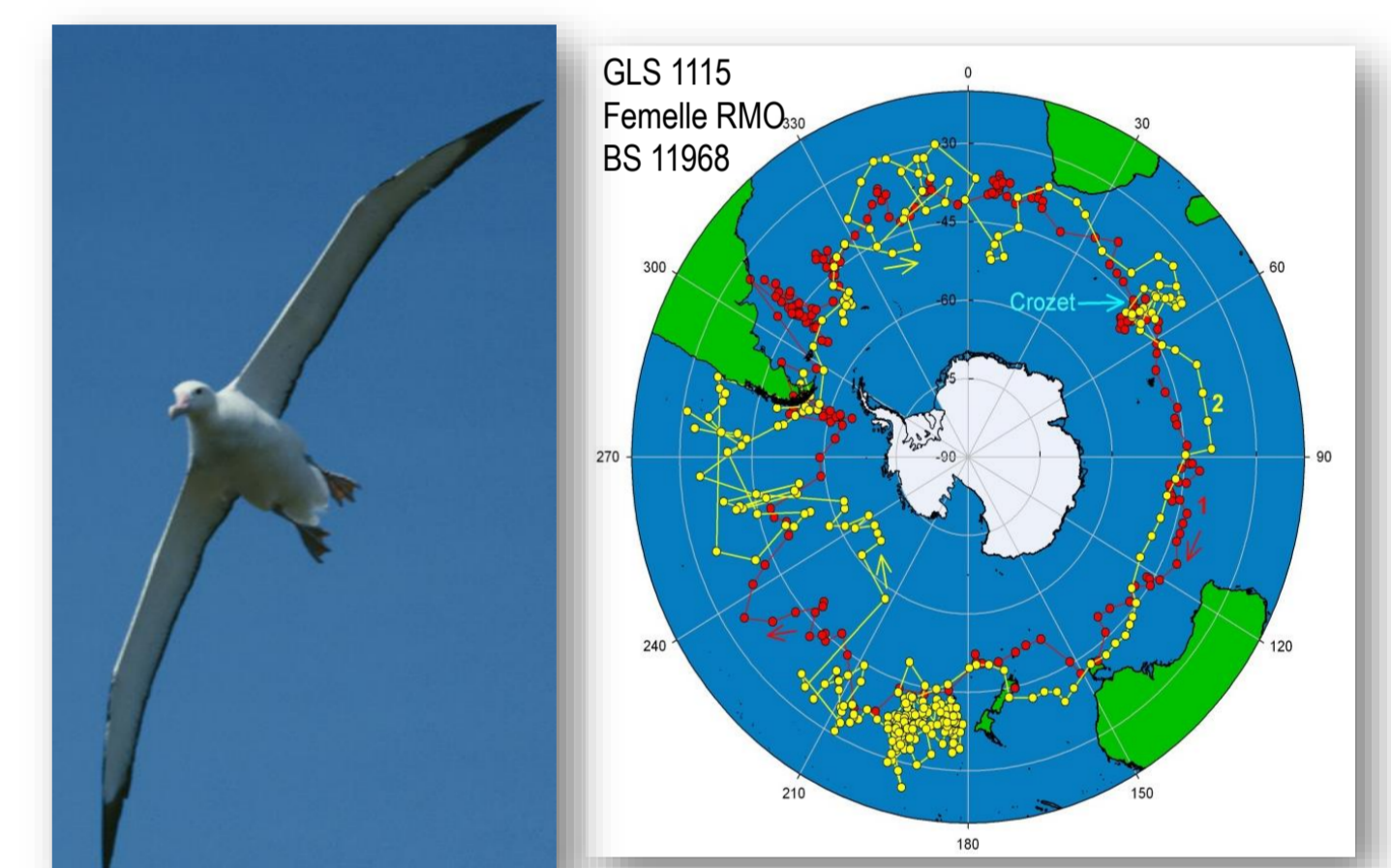
~ 20,000 registration-year
~ 3,000 new identified individuals yearly

Movement at-sea

Foraging behaviour

Since late 1980's
ARGOS, GPS, TDR
Foraging effort
Foraging areas

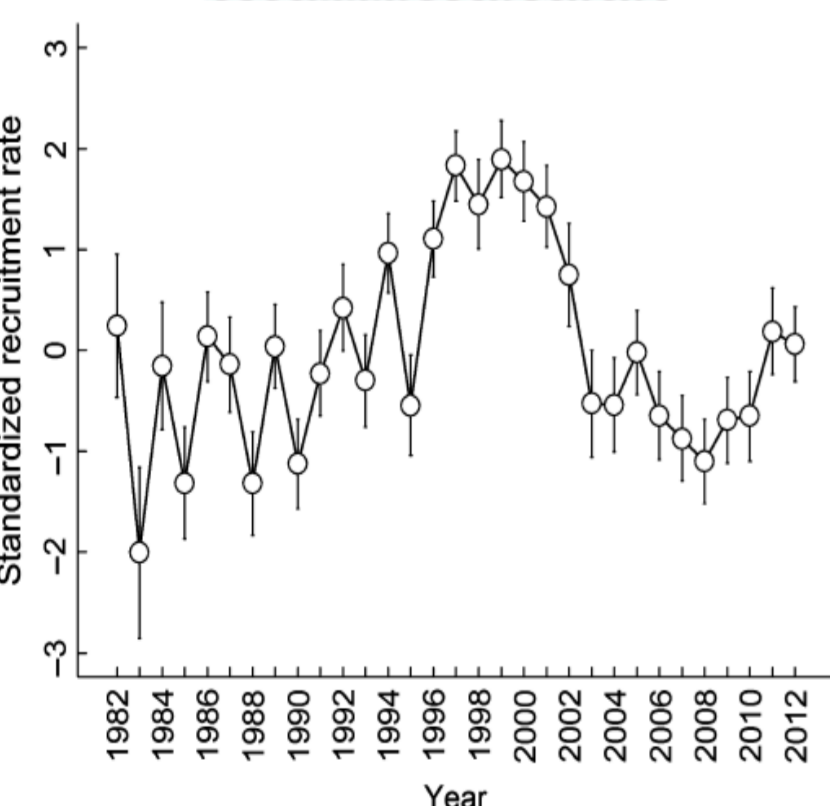
Migratory behaviour



Since late 1990's
Light-level geolocators GLS
Wintering areas
Inter-breeding activity

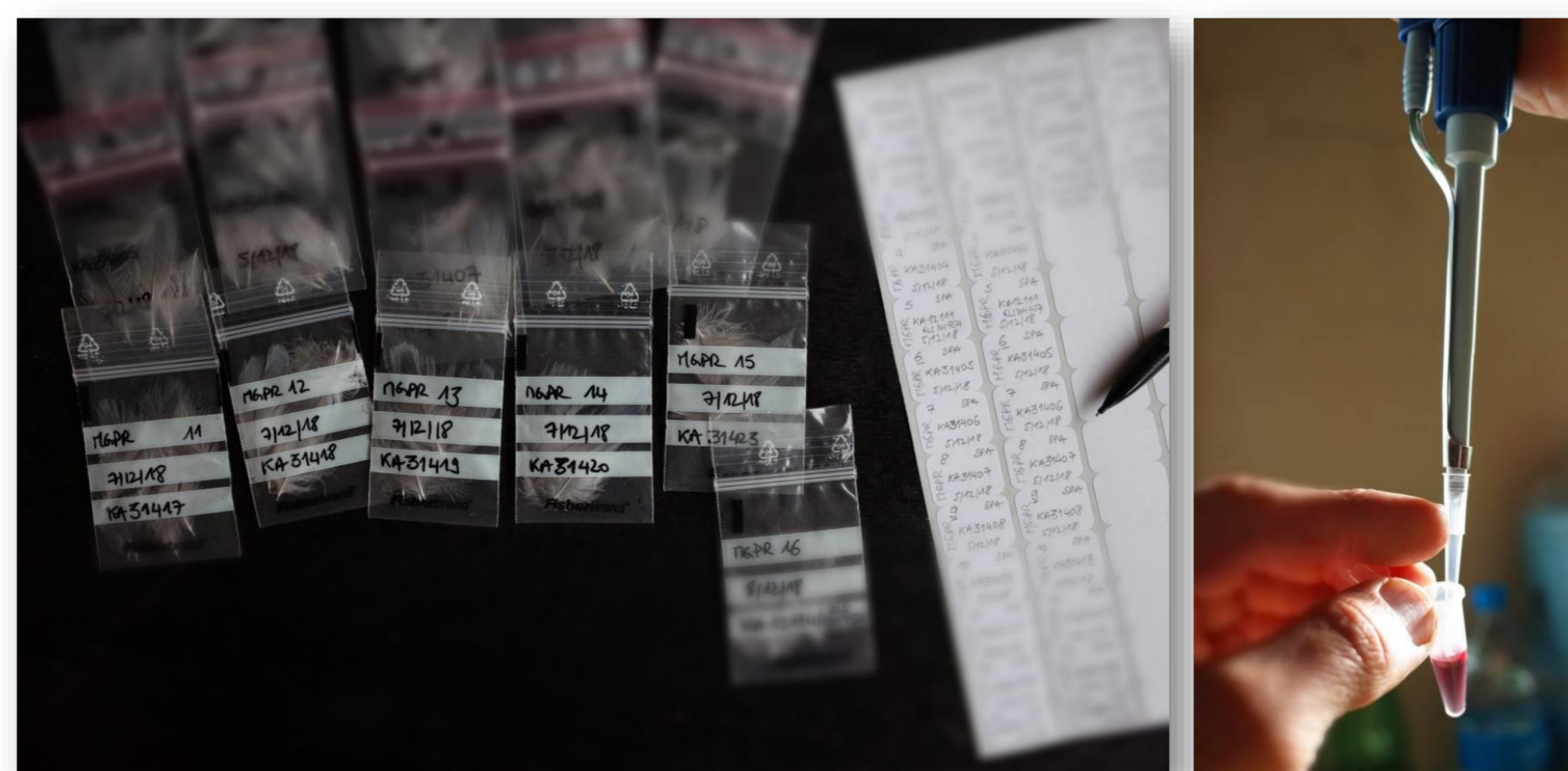
Individual resightings

Since early 1950's
Capture-mark-recapture
Demographic traits
Annual and life-time reproductive success
Body condition
Phenotypic traits



Tissues sampling

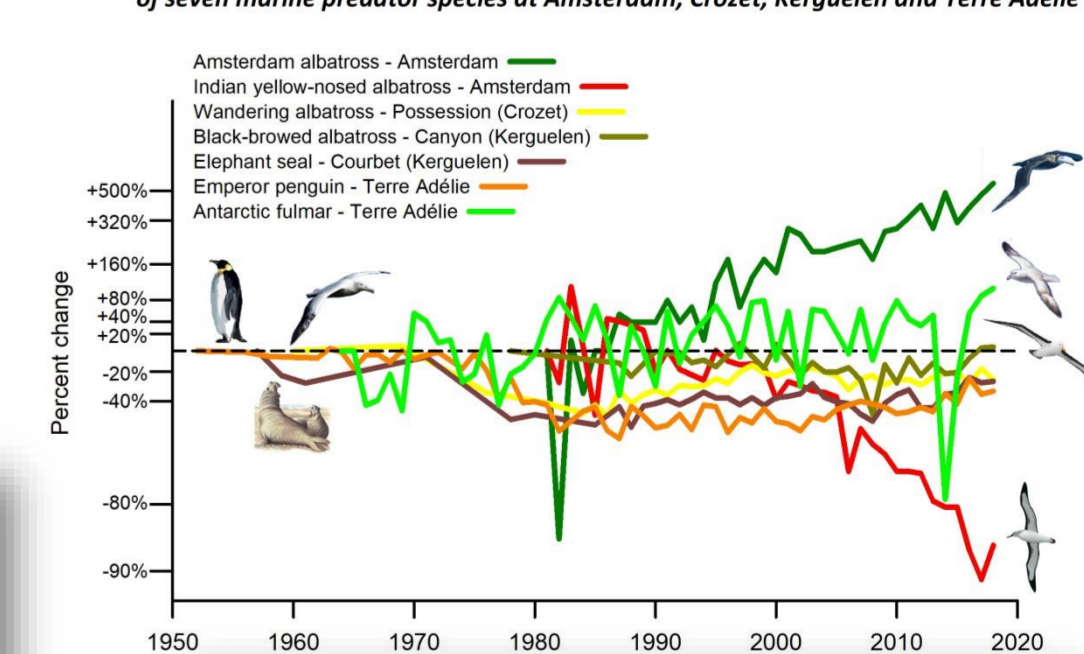
Since late 1990's
Carbon and nitrogen stable isotopes ratios
Pollutants levels
Telomere length
Hormones levels
Pathogens



Population census

Breeding pairs
Trends

Changes in the number of breeding pairs (birds) and breeding females (seals) of seven marine predator species at Amsterdam, Crozet, Kerguelen and Terre Adélie



OUTPUTS

Lifelong studies can unravel how behavioral and life-history patterns emerge in the wild that shape the evolution of species and their adaptation to their environment. Long-term data are essential for understanding the effects of environmental variability and change on populations and in designing conservation efforts.

CONCLUSION

Long-term studies remain challenging to sustain due to the difficulty of obtaining uninterrupted funding and to technical and logistical challenges. "It is never too late to start a long-term monitoring survey, but it is always too early to stop it".

Acknowledgements

~200 Field workers. The study was supported by French Polar Institute IPF, Zone Atelier de Recherches sur l'Environnement Antarctique et Subantarctique (CNRS-INEE), Terres Australes et Antarctiques Françaises

References

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