

SGSSI MPA Review Science Symposium

13-14 June 2023
Aurora Conference Centre
Cambridge, UK



**Hosted by the Government of South
Georgia & the South Sandwich Islands**



Long Term Monitoring Sites



- **King Edward Point Science.** *Martin Collins (BAS)*
- **Long Term Monitoring of Higher Predators at Bird Island.** *Ash Bennison (BAS)*

Martin Collins

British Antarctic Survey



ESA



Sue G



Katie Brigden

King Edward Point: Science in Support of Marine Management

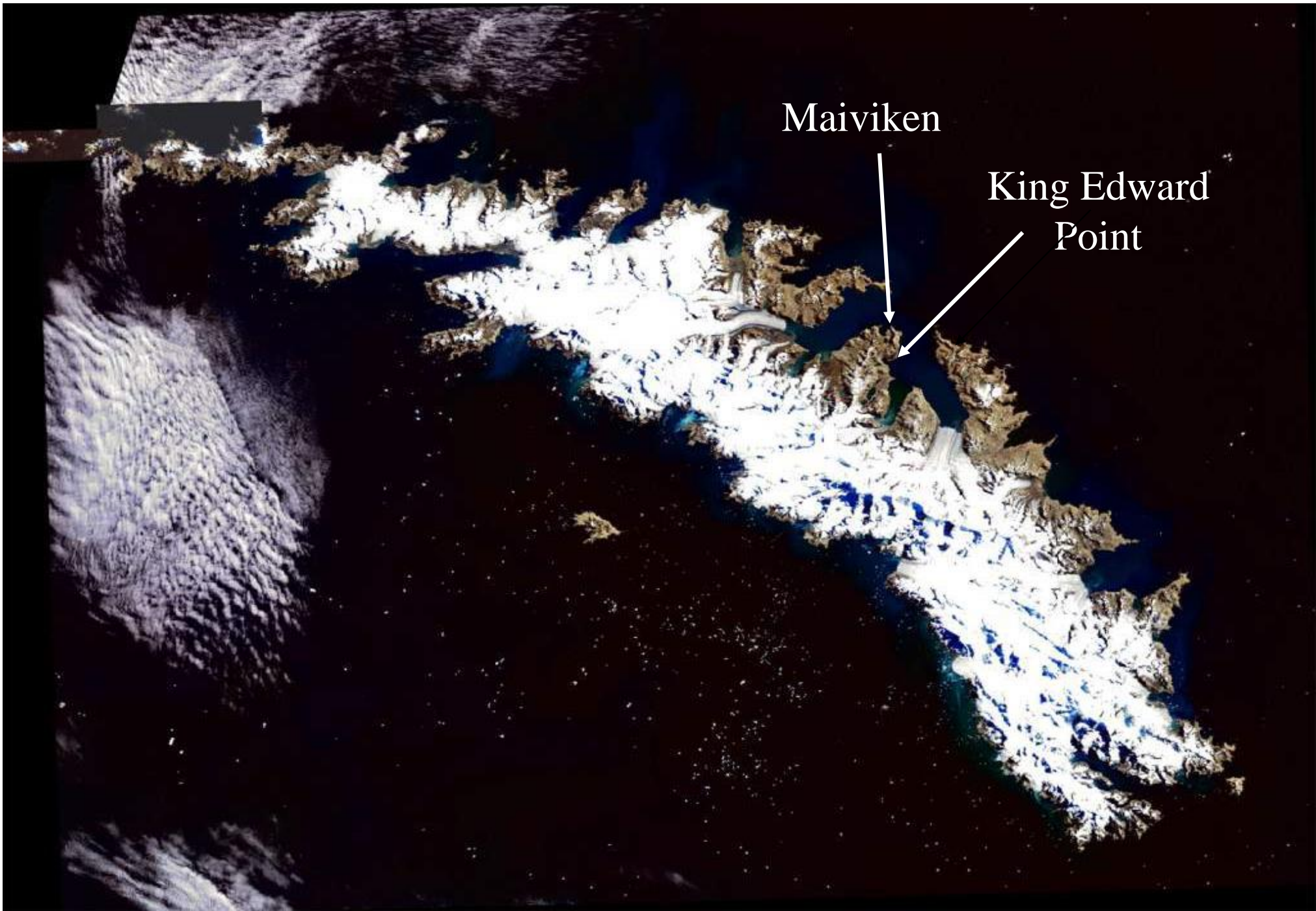


British Antarctic Survey: South Georgia Project
Science Plan 2019-2024



October 2019 v 2.7 (May 2020)

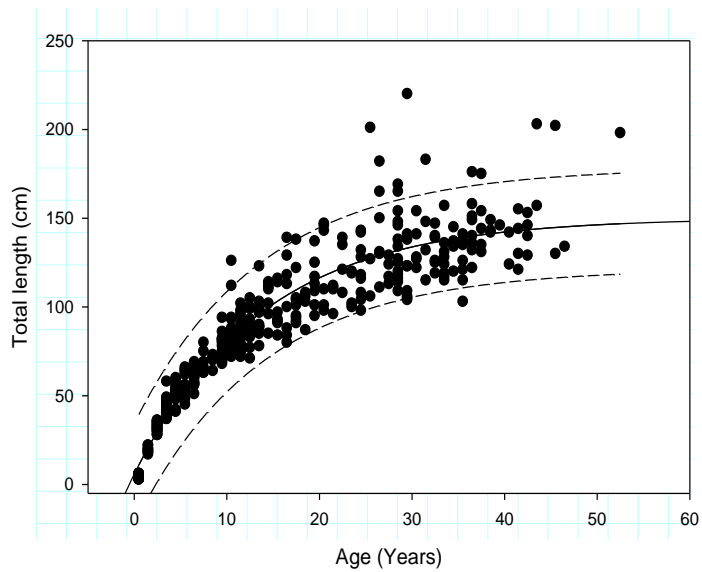
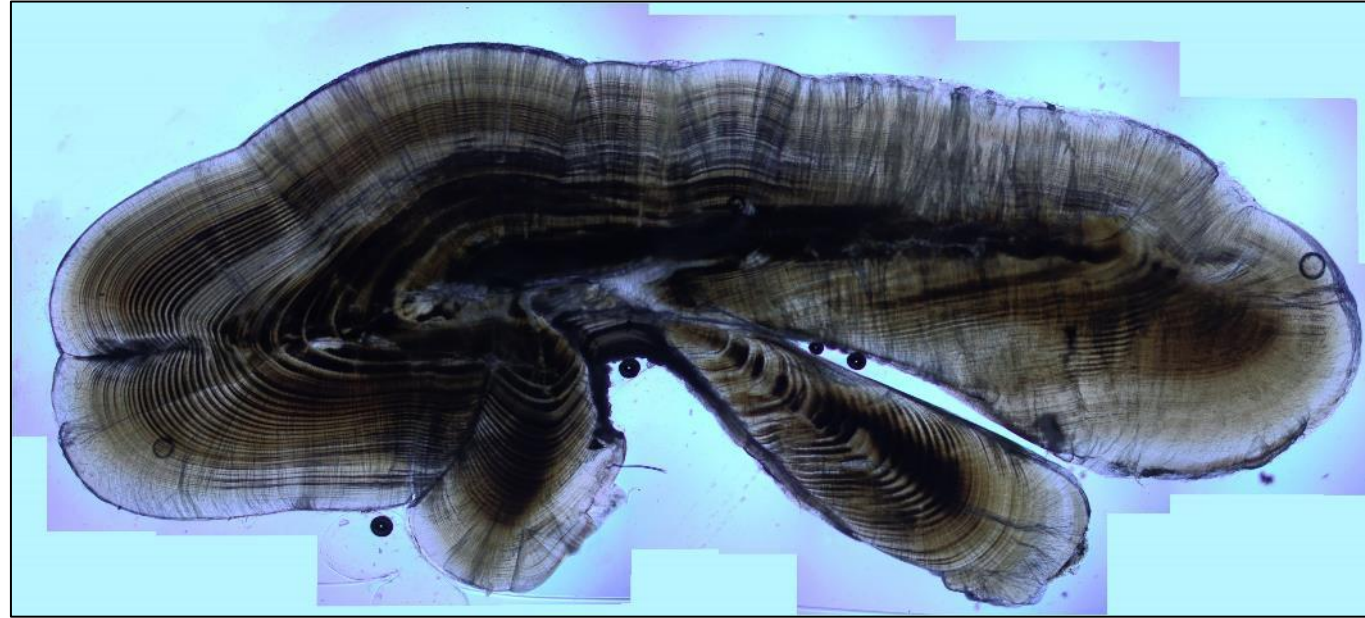
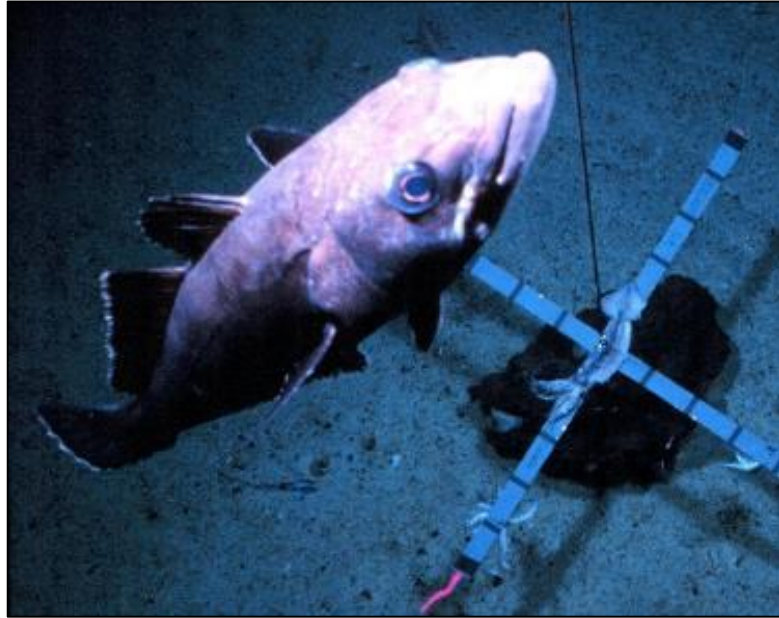




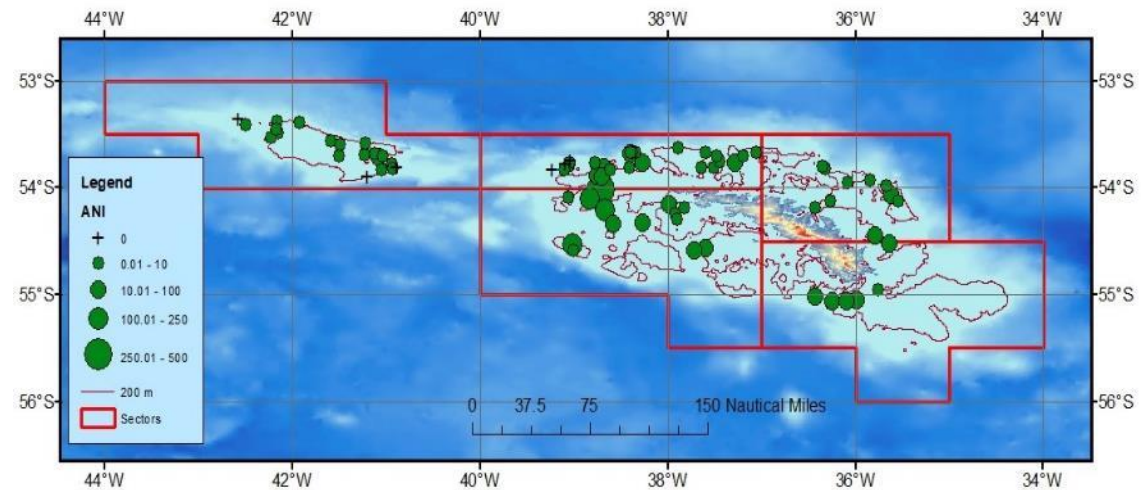
Science in support of fisheries management



Toothfish studies



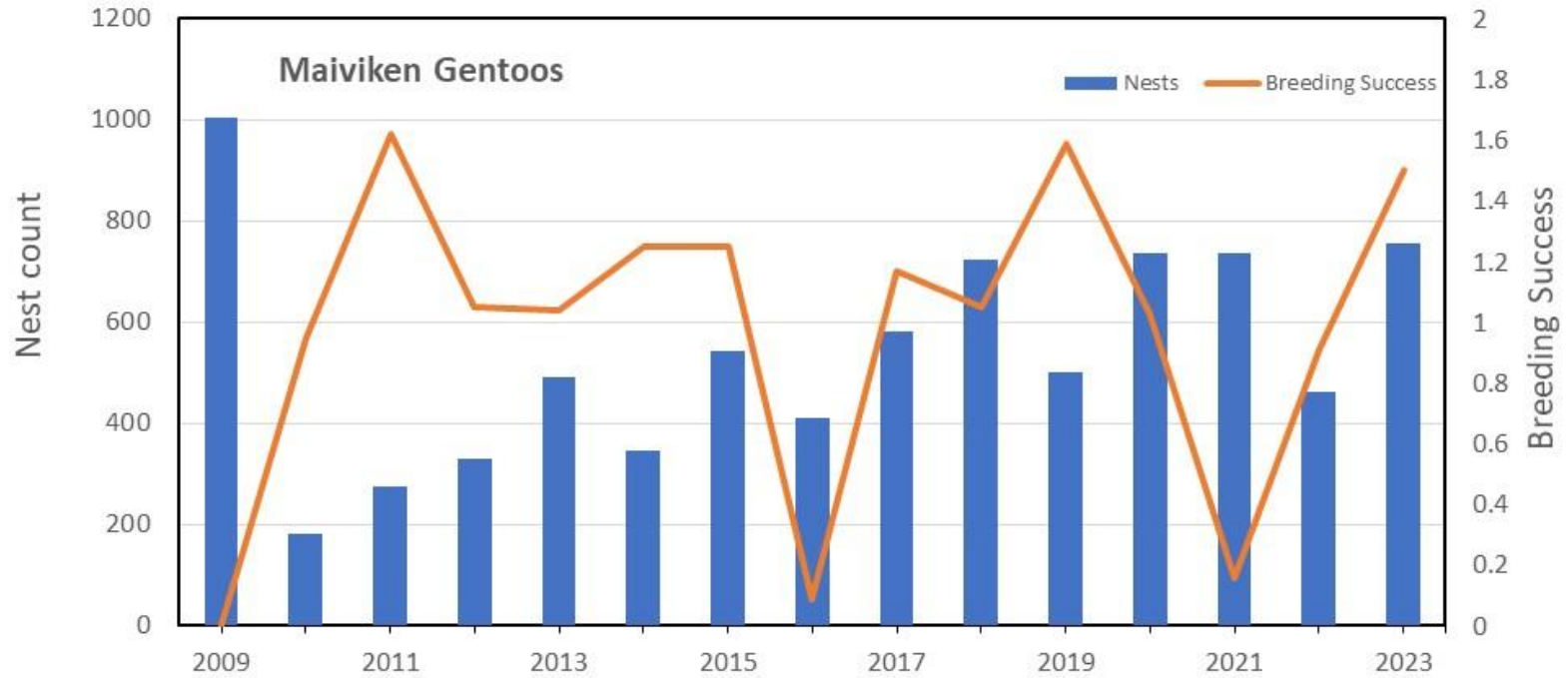
South Georgia Groundfish Survey



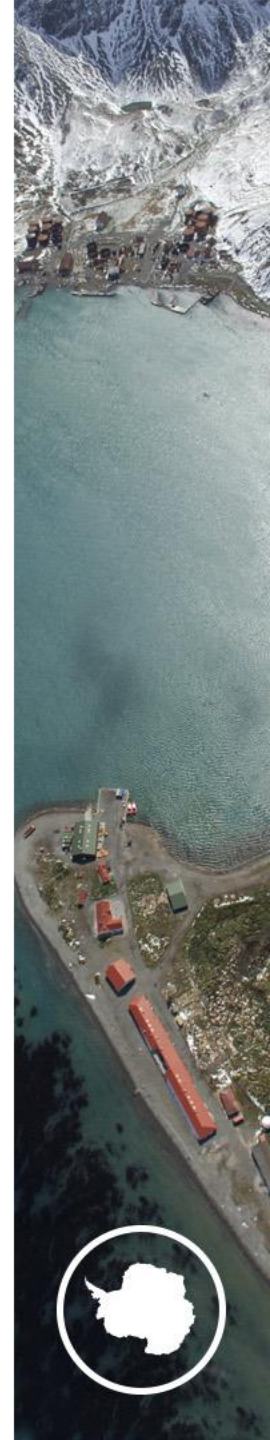
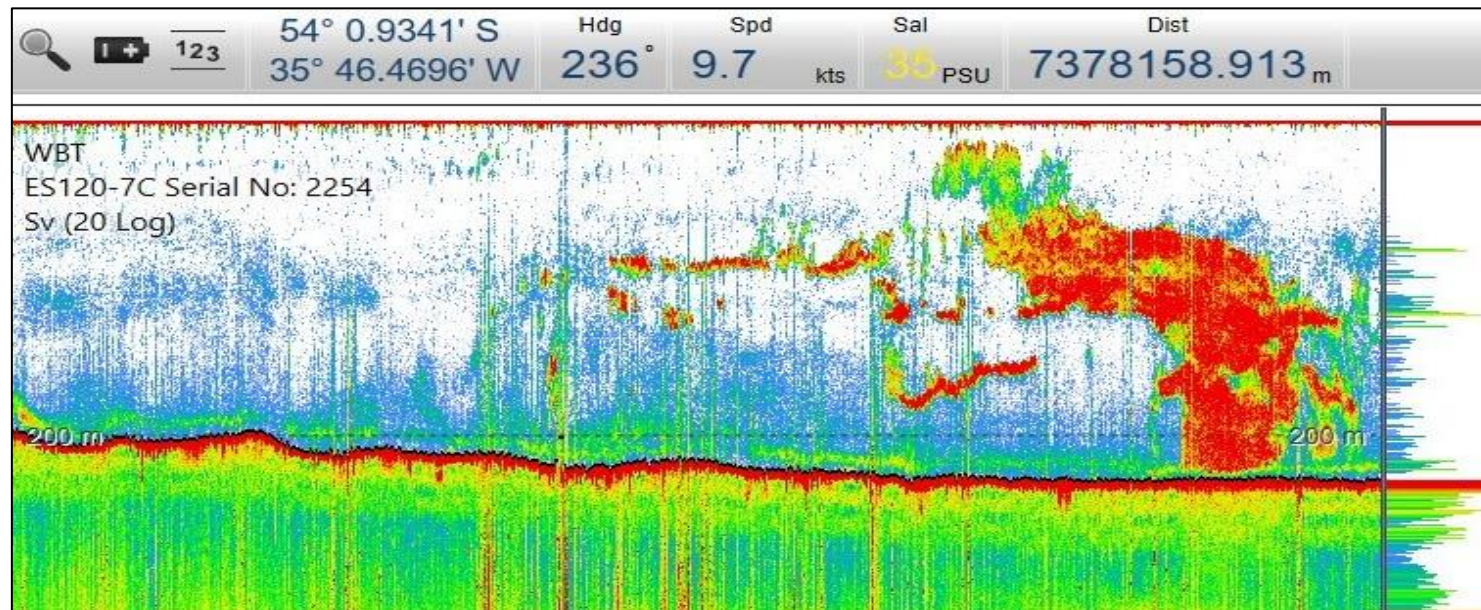
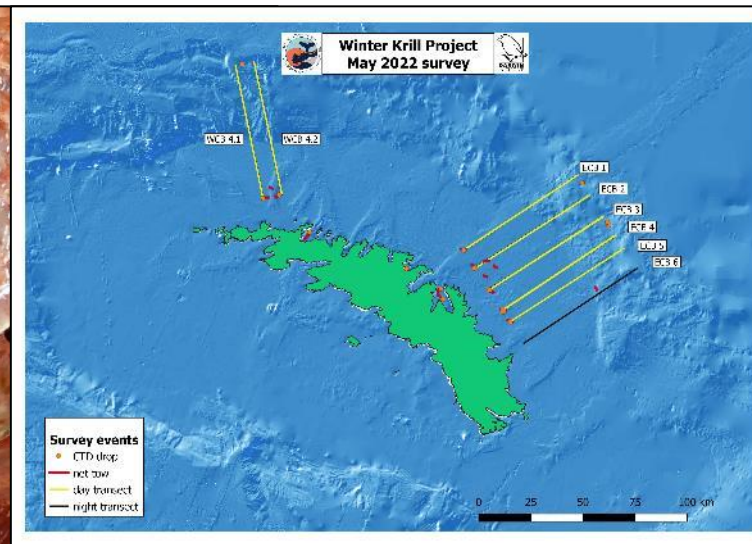
Predator monitoring



Predator monitoring



Krill & Plankton







Ash Bennison

British Antarctic Survey



ESA



Sue G



Rod Long

Long-Term Monitoring at Bird Island

Ashley Bennison
ashben@bas.ac.uk



**British
Antarctic Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH



A brief summary...

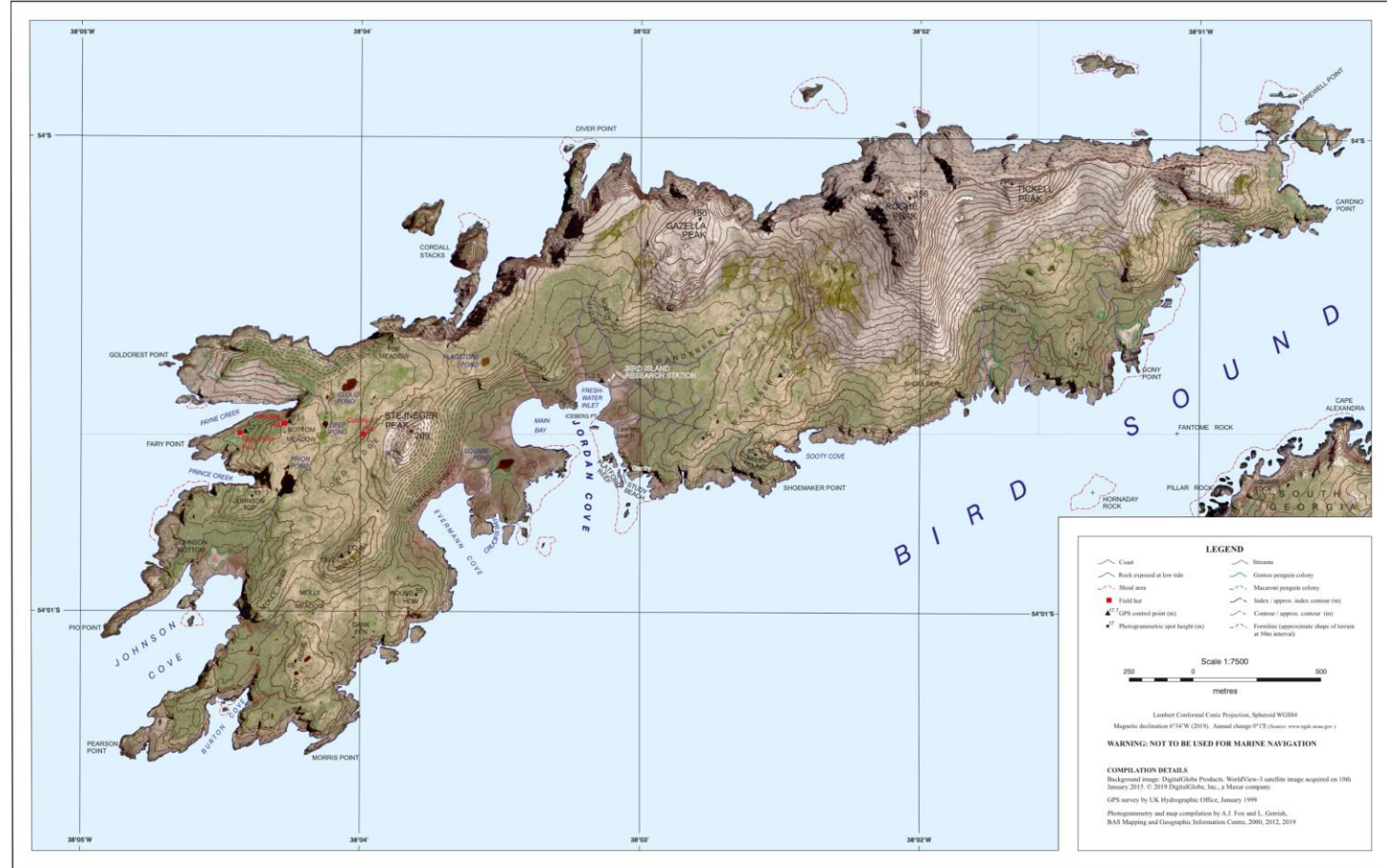
Monitoring since 1957

14 key species

Often multiple projects for each species...

Other sightings recorded

Year-round presence on Bird Island to capture full breeding cycles



Antarctic fur seal
Leopard Seal
Gentoo Penguin
Macaroni Penguin
Black-browed albatross
Grey-headed albatross
Wandering albatross

Light-mantled albatross
Northern giant petrel
Southern giant petrel
Brown skua
Antarctic prion
Blue petrel
White-chinned petrel



What is long-term monitoring?

Four key dates:

Arrival

Lay dates

Hatch dates

Fledge dates

Breeding success/productivity

More data:

Growth rates

Foraging information

Location and tracking (**nest and individuals**)

Diet



Long term monitoring may be all or only some of these

The key is interpreting trends and data!



Why do we do it?

One big ocean system

Biomass removal

How much?!

Indicators of change



Why do we do it?

Legal responsibility and conservation measures

Data to CCAMLR

Penguins

Albatross

Fur seals

Large proportions of data used by ACAP

Conservation measures and response to fisheries



Albatross Ecology

Four species on Bird Island

Socially monogamous
Breed for life

Differing breeding cycles:
Annual
Sabbatical years
Longer?

Start breeding season in September
Varying hatch dates

Widely varying diet...





Phenology

Timing

Individual level study

Lifetime breeding

Colony level

Breeding

Numbers

Chick growth

Dietary studies

Bolus

Vomit

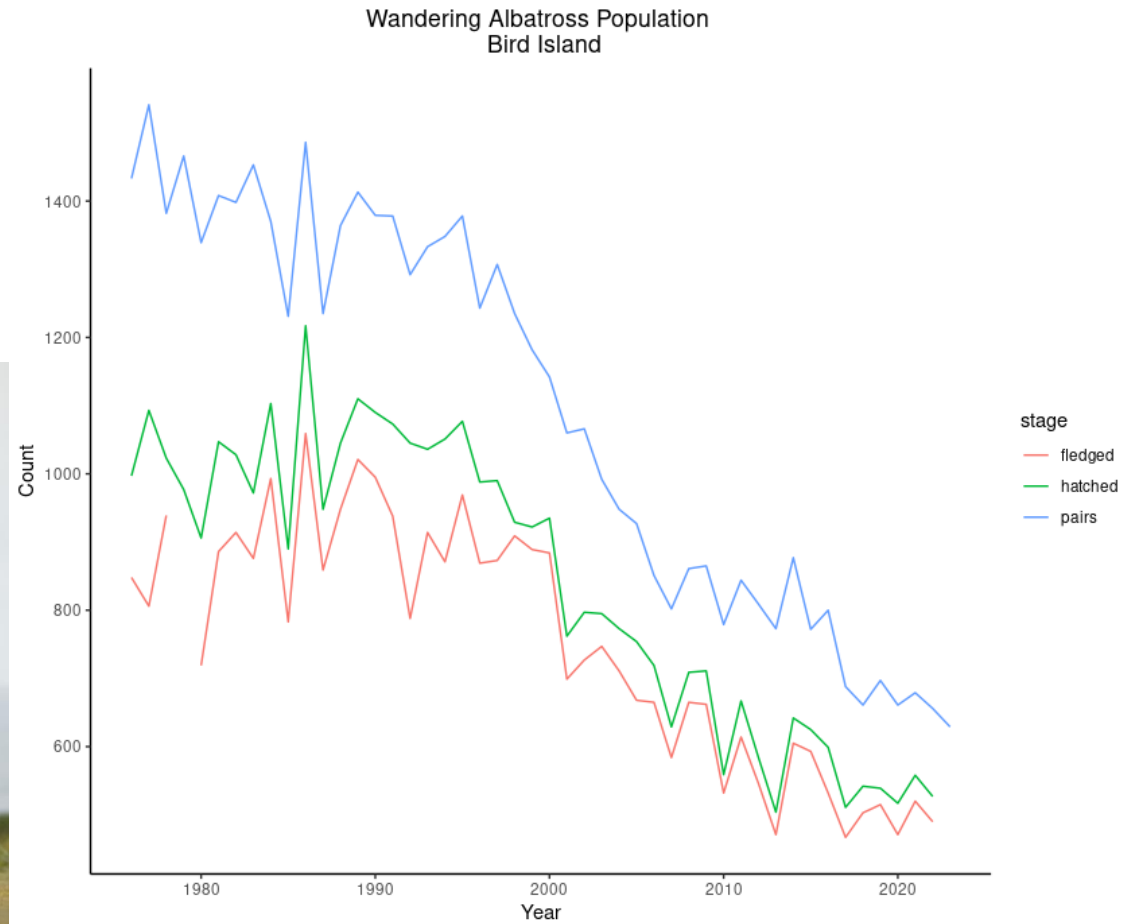
Tracking

Geolocators
(GPS etc)



Wandering albatross

Whole Island in decline
60.7% decrease since 1972



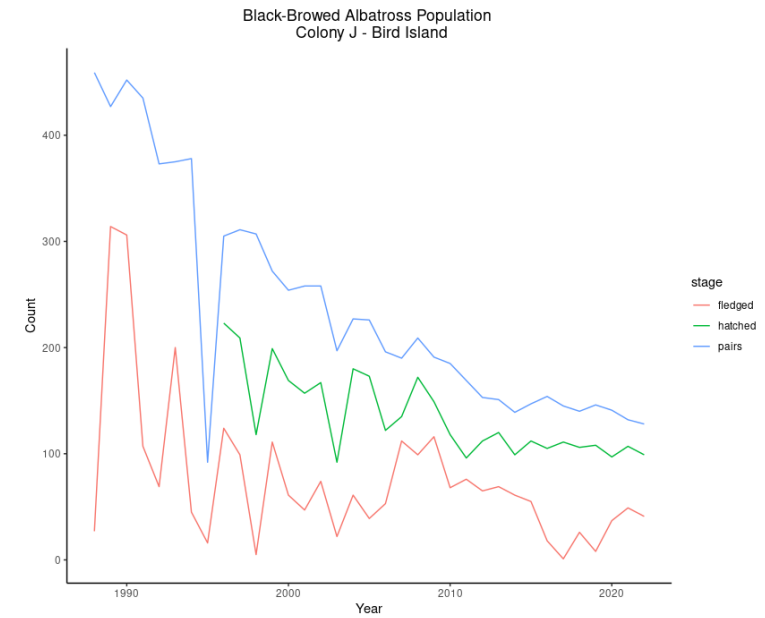
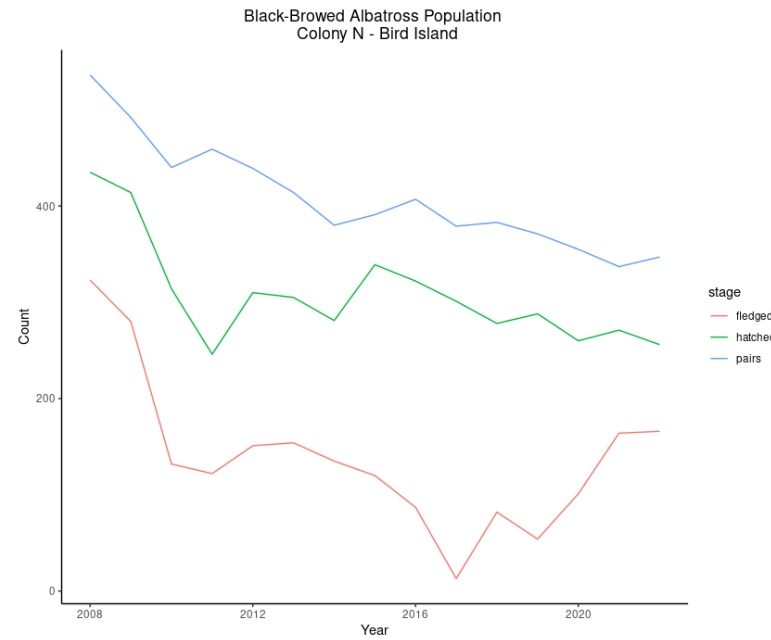
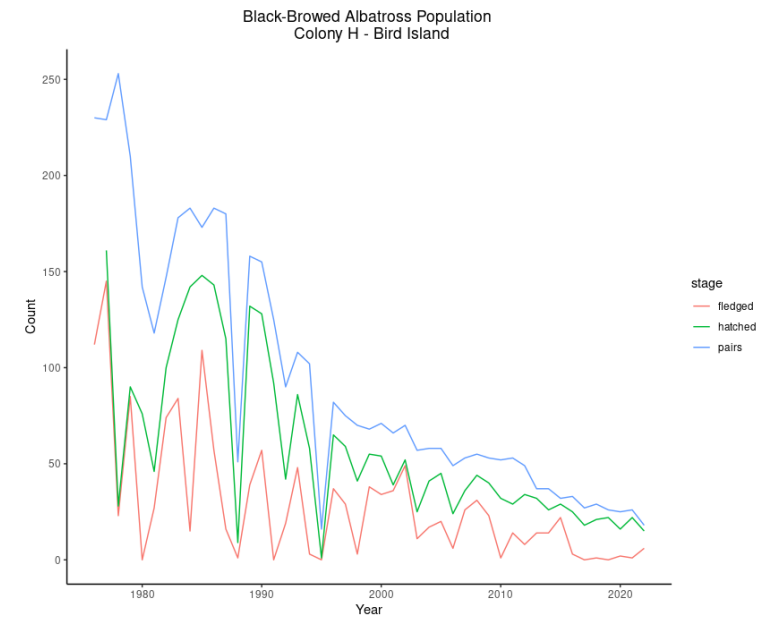
Black-browed albatross

All monitored colonies in decline

Colony H 92.17% since 1975

Colony J 72.10% since 1987

Colony N 35.26% since 2008

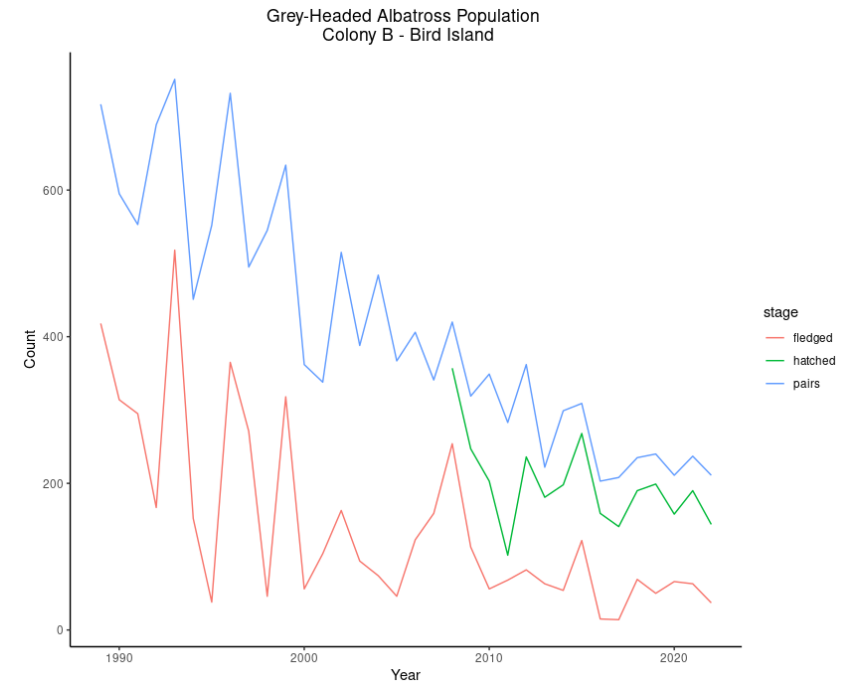
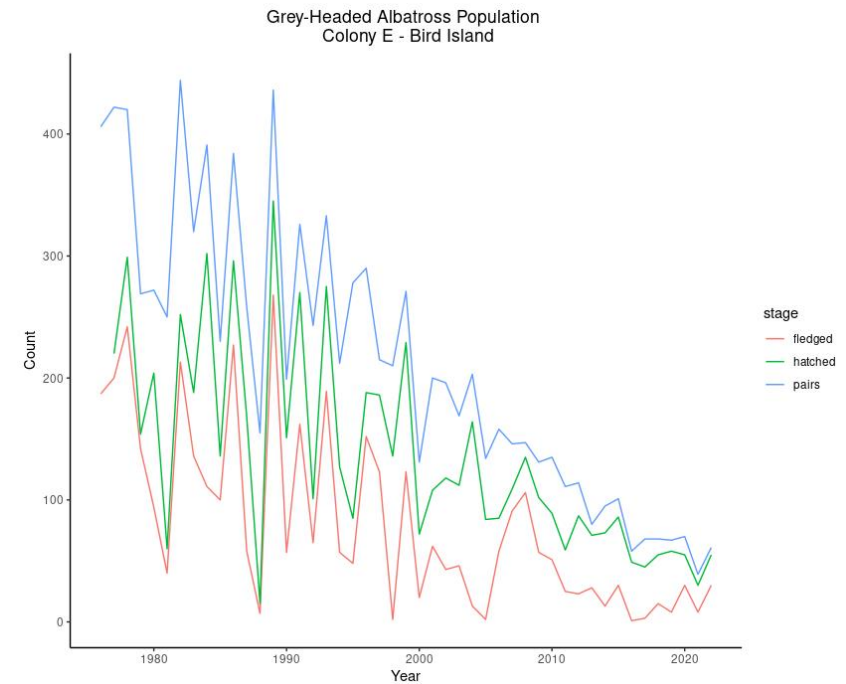


Grey-headed albatross

All monitored colonies in decline

Colony E 84.97% since 1976

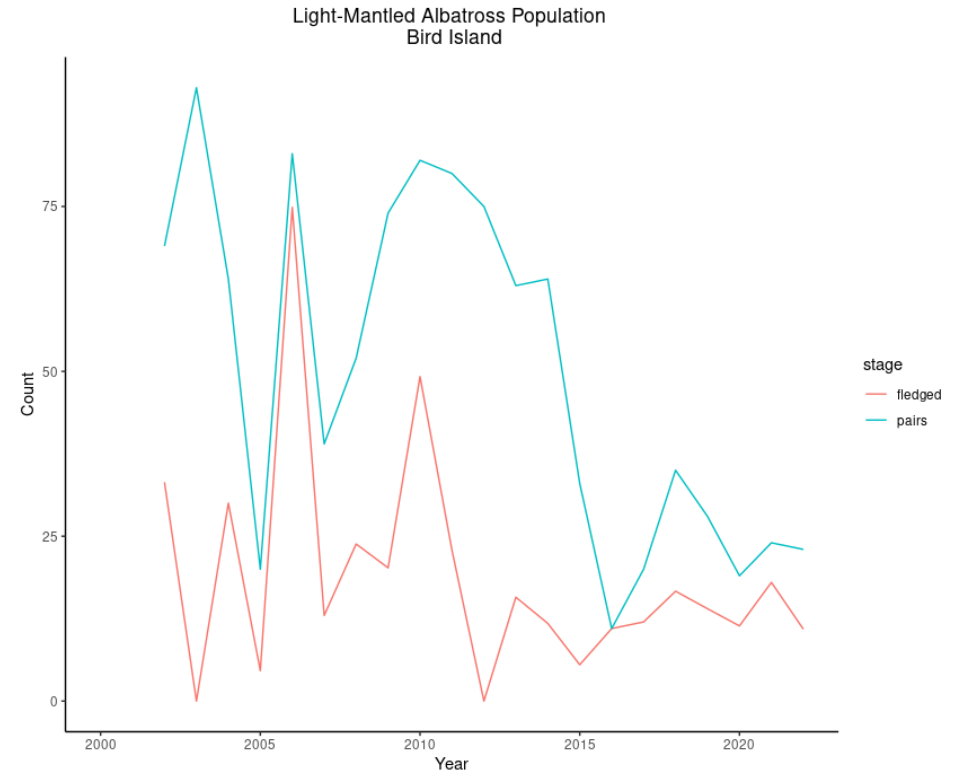
Colony B 70.57% since 1989



Light-mantled albatross

Population in decline
57.4% since 2000

More complicated...



Penguin Ecology

Two (Three) species on Bird Island

Socially monogamous (that we know of!)

Annual breeders

Mac's later than gentoos

Gentoos start hatching from October

Macaroni from December

Varied diet – some specialists, some generalists



Macaroni penguins

Two colonies: Big Mac and Little Mac

Little Mac -> penguin weighbridge

Big Mac:

Arrival weights

Diet sampling

Survey along transects through Big Mac:

Egg counts

Hatch counts

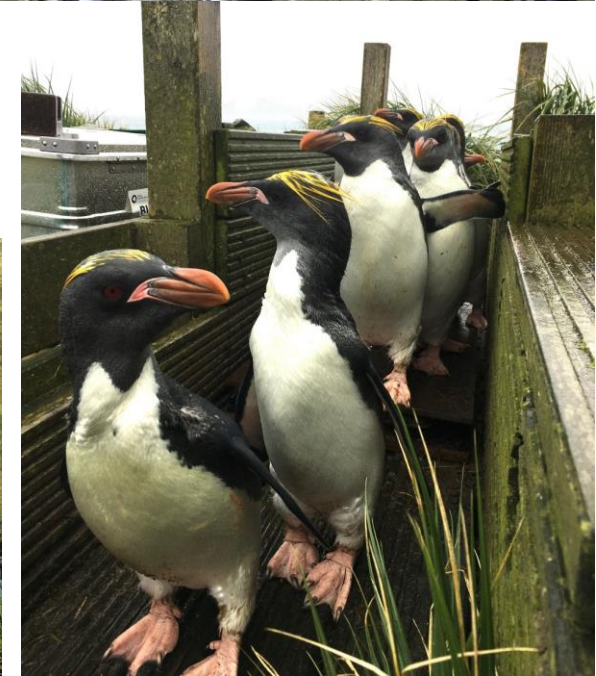
Little Mac

Counts of chicks

Weighbridge

Breeding success

Chick fledge weights

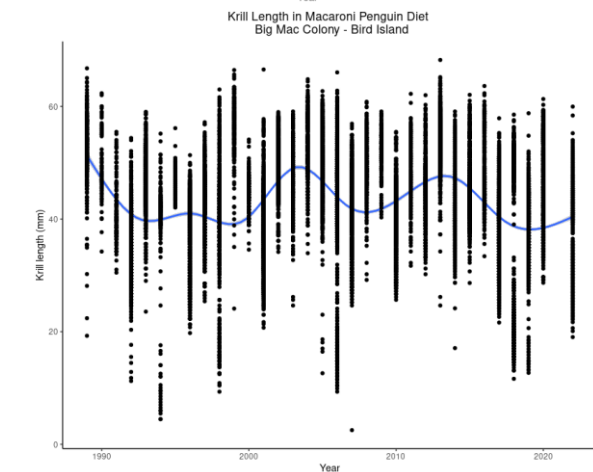
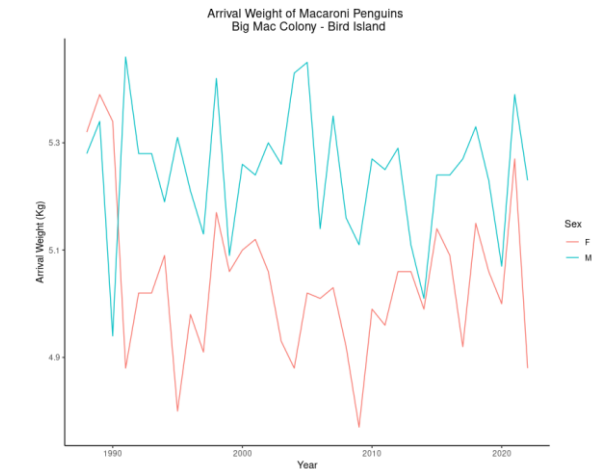
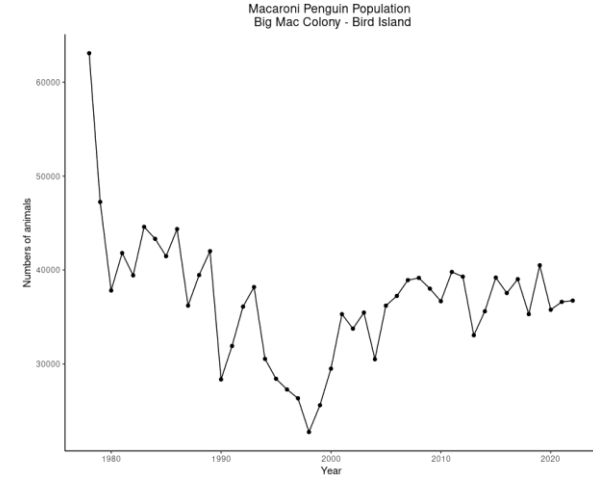


Macaroni penguins

Relatively stable population...

Variation in arrival weights...

Varied diet – krill preferential



Gentoo penguins

Whole Island population estimate

Egg lay dates

All colony egg count

All colony chick count

Breeding success

Chick weights

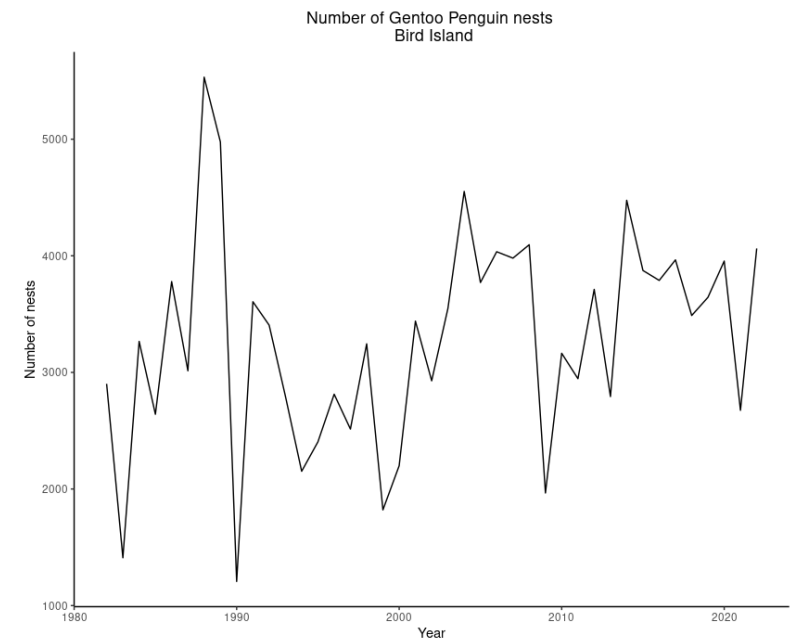
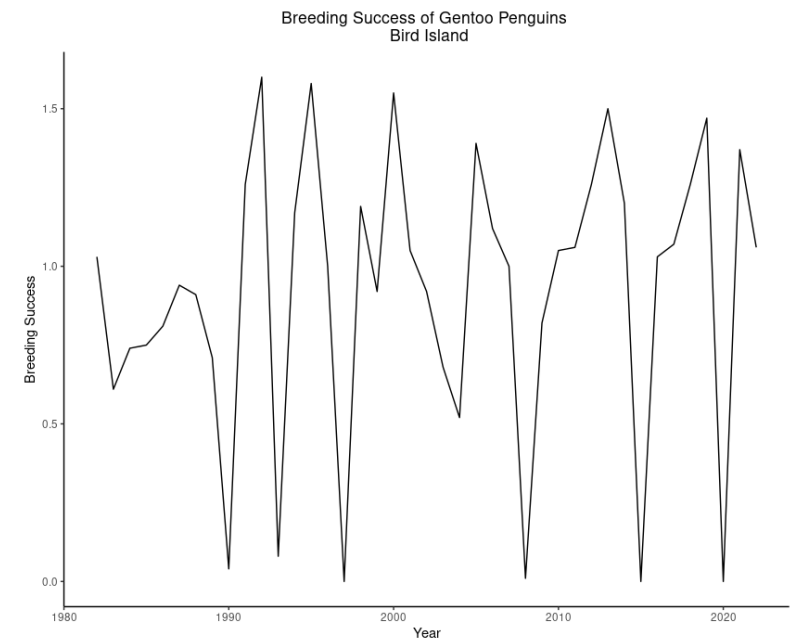
Faecal sampling during creche



Gentoo penguins

Widely varying breeding success?!

Increasing (?) population on Bird Island



Fur Seal Ecology

Slightly more complicated breeding biology...

Males arrive September and hold territory

Females arrive from early October

Pupping begins December

Mating

Everyone begins to leave from End of December

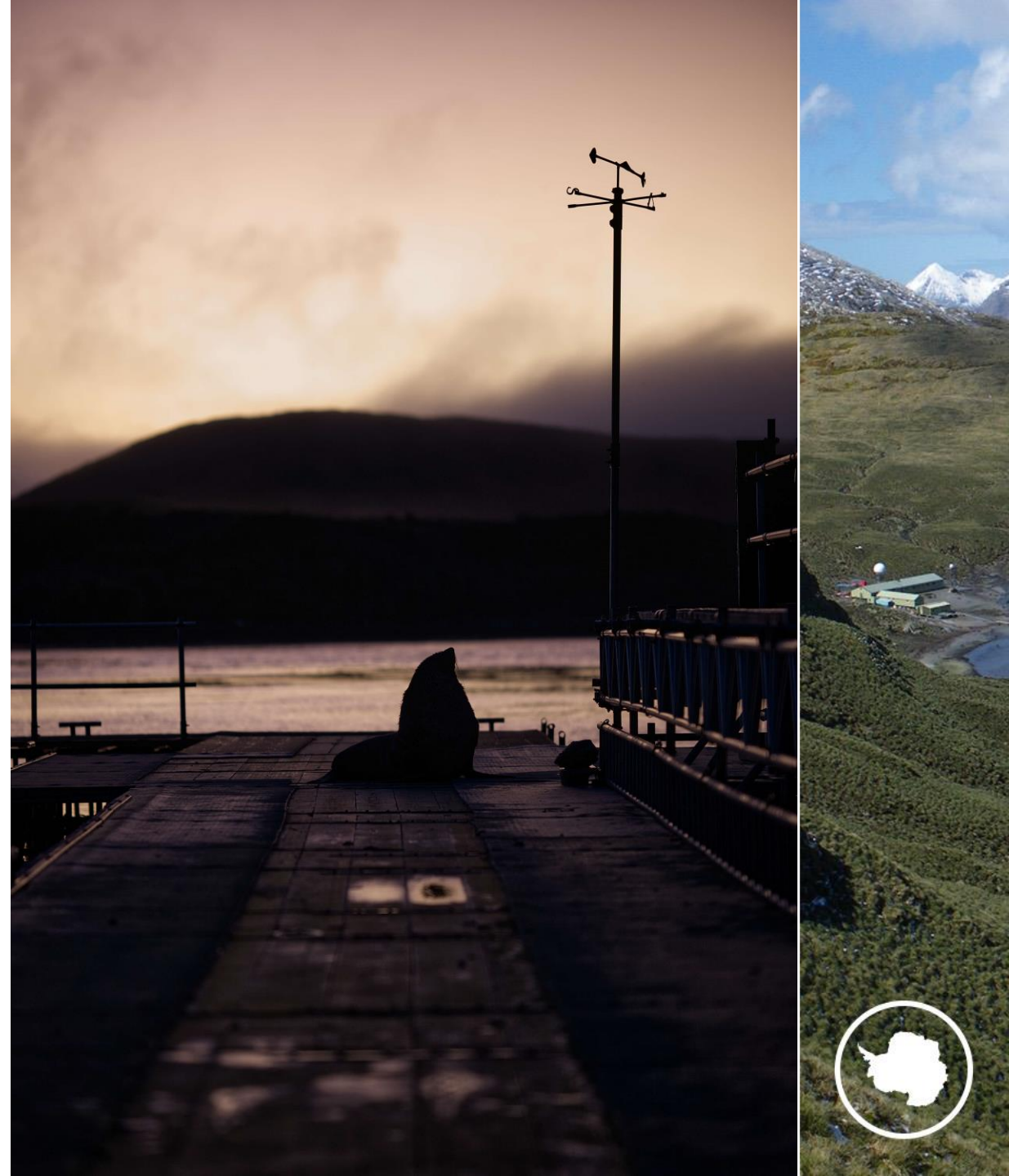
Males repeatable to territory location

Females also?!

Females breed from 2-3 years

Males much later (7+)

Krill and fish diet...



Fur seals

- Special Study Beach (Since early 90's)
- During early breeding season:
 - Male territories
 - Female counts (flipper ID tag and PIT tag)
 - Key dates (arrival, pupping)
 - Newborn counts
 - Daily pup weighings
- Later breeding season:
 - Foraging trip duration (VHF)
 - Main bay pup weighing
 - Scat sampling
- Non breeding:
 - Scat sampling
 - Individual presence
 - Deaths

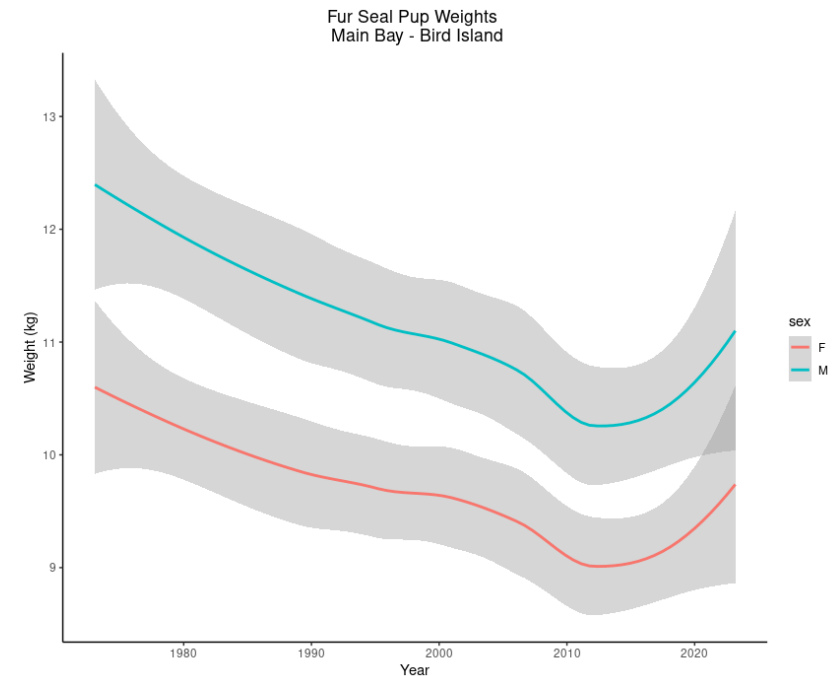


Fur seals

Decline documented at SSB

Peaks and troughs

Pup weights – decreasing?



What next?!

A need to understand why we are seeing population trends...

An incredible amount of data...





Government of South Georgia & the South Sandwich Islands



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Paul Carrol, Unsplash