ATLAS DEL MAR PATAGÓNICO . *ATLAS OF THE PATAGONIAN SEA*

Atlas ONLINE

www.atlas-marpatagonico.org

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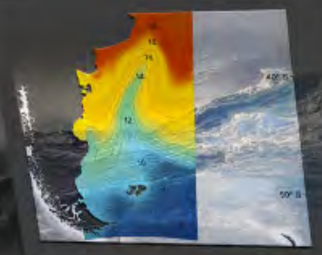
ATLAS OF THE PATAGONIAN SEA

species and spaces



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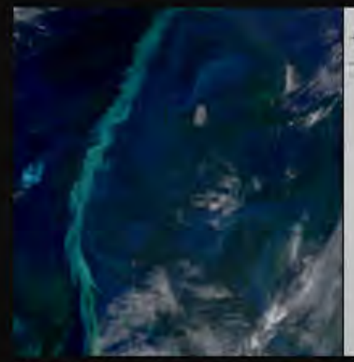

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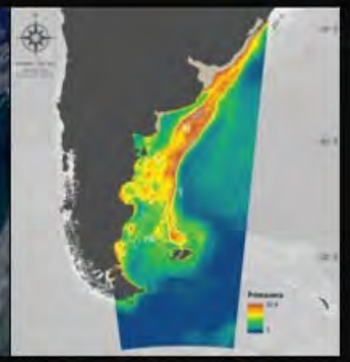
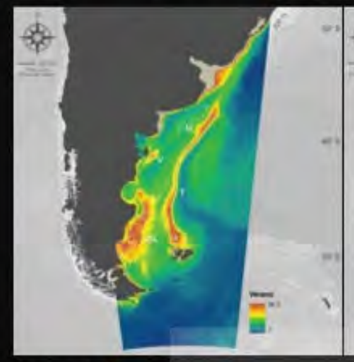
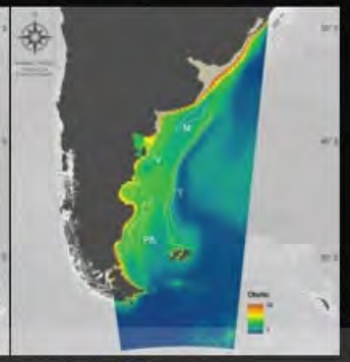


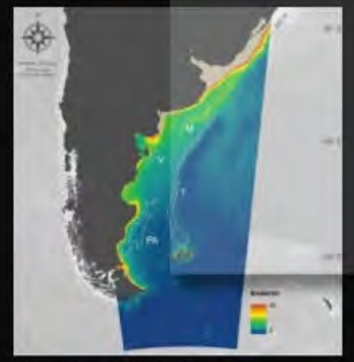
Chlorophyll-a (Spring)



Chlorophyll-a (Summer)



Clorofila-a (Autumn)



Clorofila-a (Winter)

Productivity

Colour satellite images of the ocean can be used to calculate the concentration of chlorophyll-a in phytoplankton and the level of oceanic productivity.

The Patagonian Sea is a highly productive environment with approximately three times greater abundance of phytoplankton than the mean recorded for the world's ocean. Phytoplankton is not distributed homogeneously but there is greater concentration in areas associated with ocean fronts.

Chlorophyll concentrations undergo seasonal variations. However, the location of the fronts is predictable over time and stable in space, due to the fact that they are closely linked to features of the seabed. Ocean fronts reveal maximum productivity values during the spring and summer, especially on the slope (T), mid-shelf (M), Valdés (V), and Patagonia Austral (PA) fronts.

spaces:

main physical characteristics of the Patagonian Sea

Albatrosses
- Wandering Albatross
- Northern Royal Albatross
- Black-browed Albatross
- Grey-headed Albatross
- Light-mantled Albatross

Petrels
- Southern Giant Petrel
- Northern Giant Petrel
- White-chinned Petrel

Penguins
- King Penguin
- Magellanic Penguin
- Southern Rockhopper Penguin
- Gentoo Penguin

Pinnipeds
- Southern Elephant Seal
- South American Sea Lion
- Antarctic Fur Seal
- South American Fur Seal

Integration: Seabirds and Marine Mammals
- Albatrosses
- Petrels
- Penguins
- Pinnipeds
- All species

Marine turtles
- Green Turtle

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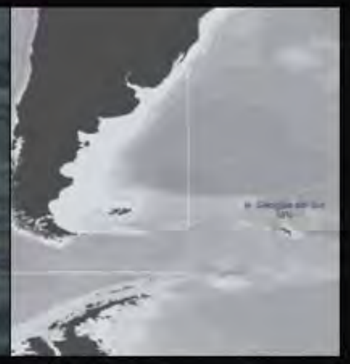
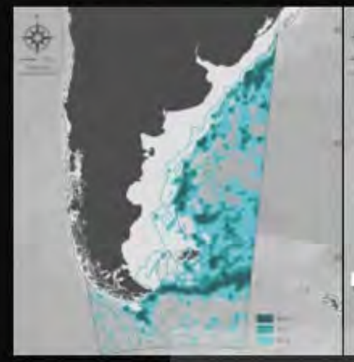


Nesting sites



Principal feeding areas

Spring-Summer (S. Georgia)

Autumn-Winter (S. Georgia)

Wandering Albatross
Diomedea exulans

Regional Nesting Sites: South Georgia, Prince Edward, Marion, Crozet, Kerguelen and Macquarie Islands.

Diet: Squid, fish and very occasionally krill. Wandering albatrosses are very poor divers and never reach depths greater than 60 cm. They follow vessels frequently, competing with other species to take advantage of fishing discards.

World breeding population: Estimated at 8,050 pairs.

Conservation Status: *Vulnerable* (IUCN, 2008).

Main threats: Incidental mortality in longline fisheries.

17 species:

5 albatrosses, 3 petrels, 4 penguins, 4 pinnipeds and 1 marine turtle

species by species

Albatrosses
- Wandering
- Northern Ro
- Black-brow
- Grey-heade
- Light-mantl

Petrels
- Southern G

Penguins
- King Pengu
- Magellanic
- Southern R
  Penguin
- Gentoo Pen

Pinnipeds
- Southern El
- South Amer
  Lion
- Antarctic Fu
- South Amer

Integratio
and Marine
- Albatrosses
- Petrels
- Penguins
- Pinnipeds
- All species

Marine turtle
- Green Turtl

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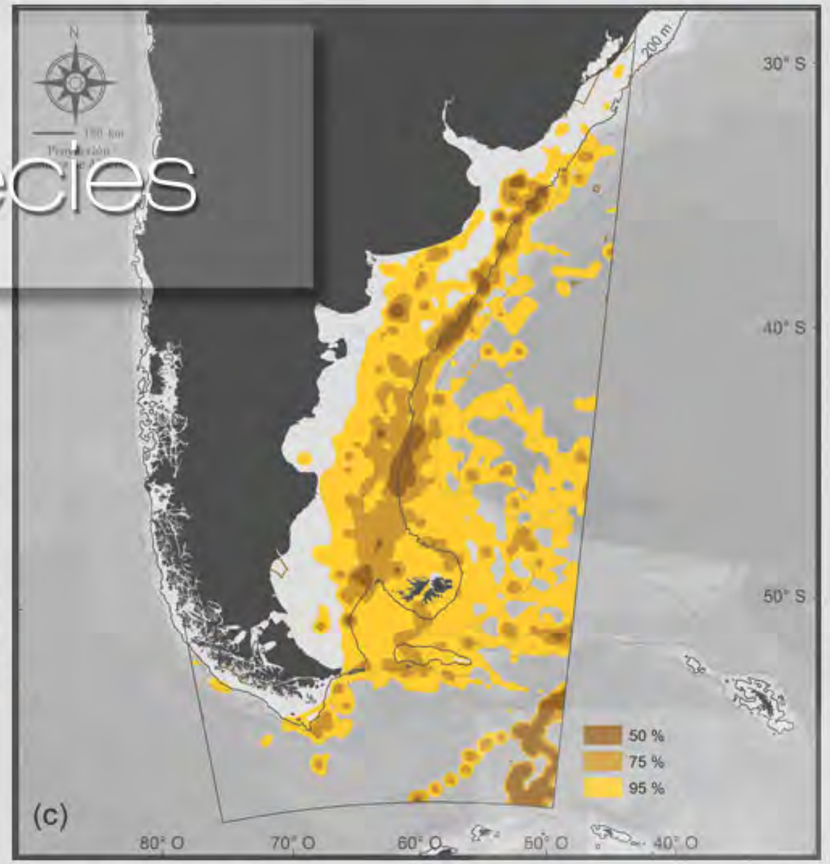

Seasonal Use (Autumn)

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In autumn (April-June) the principal feeding areas for the albatrosses cover different areas of the slope.

Data on 5 species of albatrosses: adults and juveniles of Northern Royal albatross and Black-browed albatross, adults of Wandering albatross, Grey-headed albatross and Light-mantled albatross. All available data, 105 trips in autumn, were used in the analysis.

Dataholders: J. Croxall, R. Phillips and P. Trathan (Wandering albatross); D. Nicholls and C.J.R. Robertson (Northern Royal albatross); J. Croxall, R. Phillips, P. Trathan, J. Arata, C. Moreno and G. Robertson (Grey-headed albatross); J. Croxall, N. Huin, R. Phillips, P. Trathan, J. Arata, C. Moreno and G. Robertson (Black-browed albatross); P. Trathan and R. Phillips (Light-mantled albatross).

Albatrosses

The Patagonian Sea is regularly used by at least 5 albatross species, and visited by other 5 or so species. The Black-browed albatross *(Thalassarche melanophrys)* is the only one that breeds in the area and is resident year-round. The Wandering albatross *(Diomedea exulans)*, the Grey-headed albatross *(Thalassarche chrysostoma)* and the Light-mantled albatross *(Phoebetria palpebrata)*, breed in adjacent islands like South Georgia and southern Chile. The Northern Royal albatross *(Diomedea sanfordi)* migrates from New Zealand to feed in the Patagonian Sea.

Several of these species are in decline and are included on the IUCN Red List as threatened species *(critically endangered, endangered and vulnerable)*, largely due to incidental mortality in trawl and longline fisheries.

colonies, feeding areas, seasonal use of the Patagonian Sea

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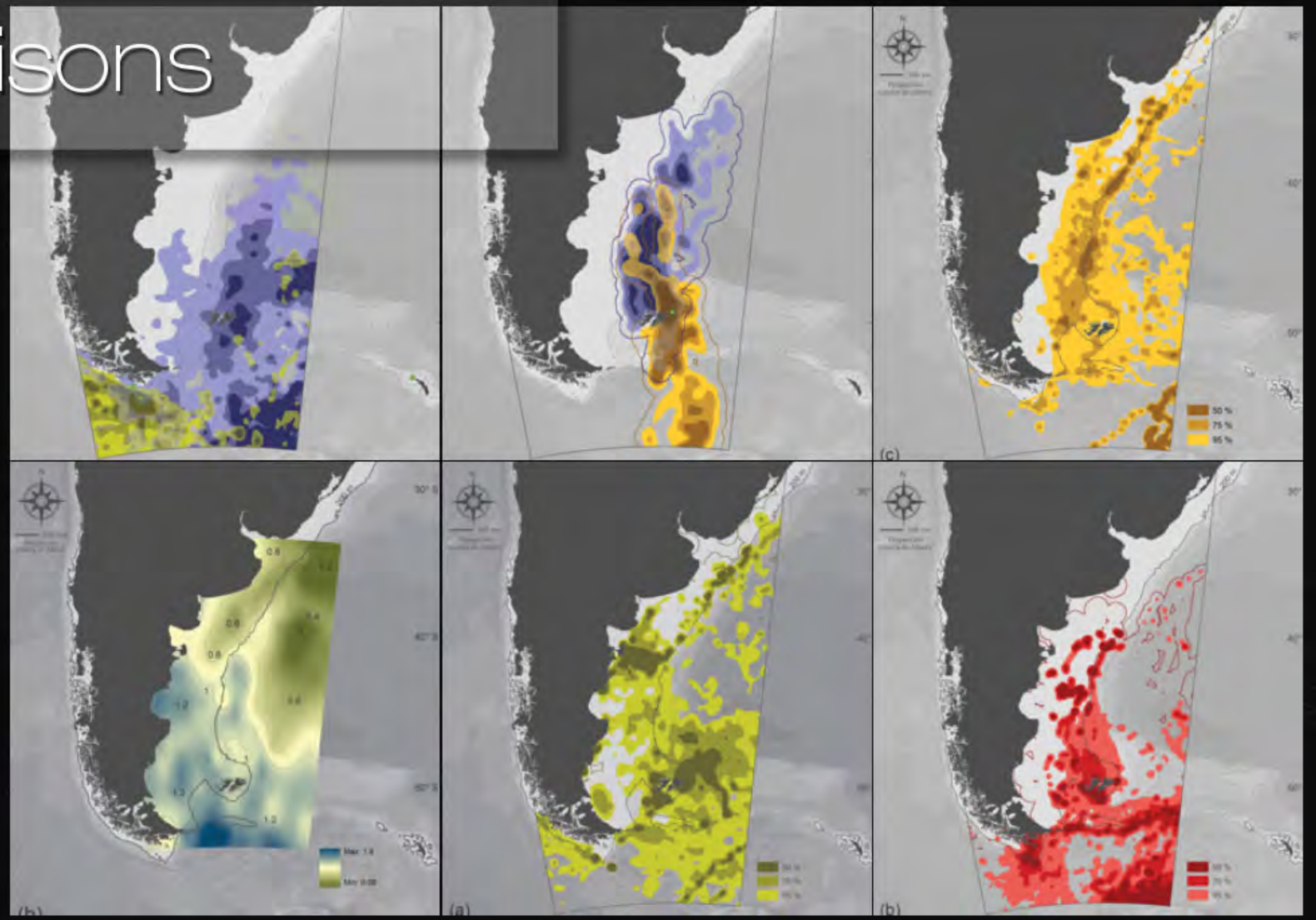
comparisons



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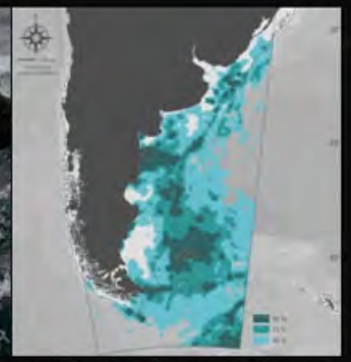
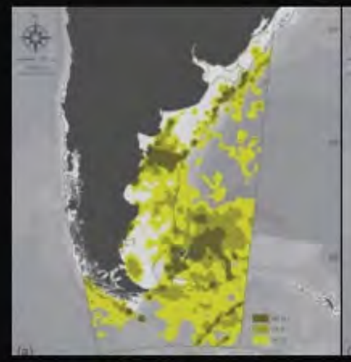
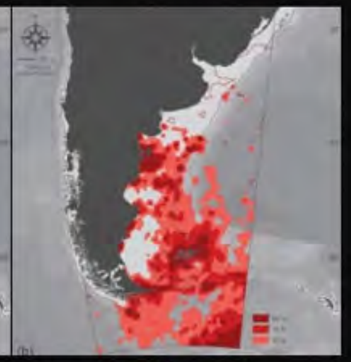


Annual use by Top Predators

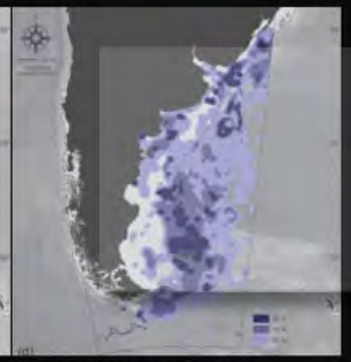


Seasonal Use (Spring)



Seasonal Use (Summer)

Seasonal Use (Autumn)



Seasonal Use (Winter)

All species

Principal feeding areas used by 16 Species of Top Predators:

Coastal areas: the waters adjacent to the Malvinas Islands, Staten Island, Diego Ramirez Islands, Peninsula Valdés and the waters stretching from the south of the peninsula to the north of the Gulf of San Jorge.

Pelagic areas: the slope of the Patagonian Shelf, the ocean environment adjacent to the Malvinas Islands, the shelf-slope area at the latitude of the Gulf of San Jorge, the areas influenced by the outflow of the Río de la Plata, and the area to the east of the Burdwood Bank. The coastal-pelagic corridor between the Valdés Peninsula and the slope is also relevant.

The areas most commonly used by seabirds and marine mammals reveal few seasonal variations, this suggests that the same extensive areas of the ocean are relevant during different periods of the annual cycle of the top predators.

None of the pelagic areas identified as important for top predators is under a regime of special management for the conservation of biodiversity.

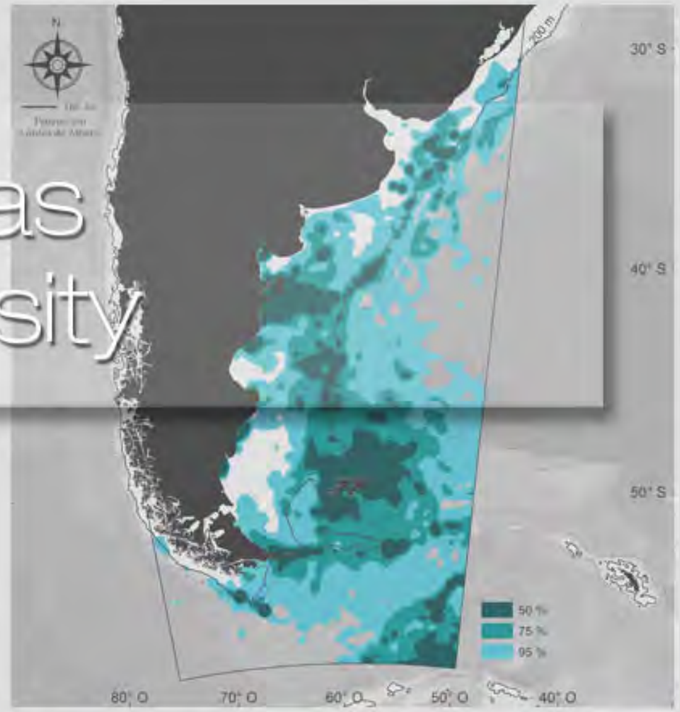
integrations

important marine areas for biodiversity

IMPORTANT MARINE AREAS FOR BIODIVERSITY

Seabirds and marine mammals of the Patagonian Sea, play key and varied roles in the marine ecosystem, and their conservation requires actions that extend beyond the protection of coastal breeding areas. Current conservation efforts are mostly restricted to coastal sites, such as breeding areas, but they are entirely insufficient to cover the annual and life cycles of marine top predator species.

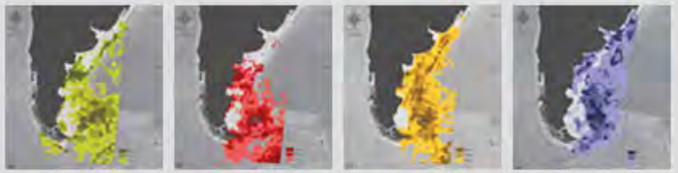
The ocean areas important for top predators identified in this *Atlas*, may help to define resource management strategies that will take into consideration the requirements of marine biodiversity in general. Identifying areas of the open ocean as important for biodiversity conservation is specially critical for those environments impacted by fishing and oil exploitation.



Use of the Patagonian Sea by 16 Species of Top Predators

Albatrosses, petrels, penguins, sea lions and elephant seals are top predators that require large spaces and abundant food supplies for their survival. Thus, some species are good indicators of important coastal and pelagic marine areas, also highly significant for other marine biodiversity. The greatest important areas for the Patagonian Sea are:

- Coastal areas: the waters adjacent to the Malvinas Islands, the Staten Island and the Diego Ramírez Islands. The Valdés Peninsula as far as the northern end of the Gulf of San Jorge. These areas have been recognised as being significant for the biological diversity of the Patagonian Sea.
- Pelagic environments: far from the coast, and therefore out of sight, are less well known and thus tend to be ignored. The data suggest as important areas for top predators the oceanographic front associated with the slope area of the Patagonian Shelf, the ocean environment adjacent to the Malvinas Islands, the shelf-slope area at the latitude of the Gulf of San Jorge and areas influenced by the outflow of the Río de la Plata.
- Also important are the waters to the east of the Burdwood Bank and those of the polar front in the far south-east of the Patagonian Sea. A coastal-pelagic corridor between the Valdés Peninsula and the slope appears to be particularly important for migratory movements from the coast to the deep sea.



Seasonal Use of the Patagonian Sea by Top Predators

The areas most commonly used by albatrosses, petrels, penguins, sea lions and elephant seals reveal few seasonal variations. This is a significant finding, suggesting that the same extensive areas of the ocean are relevant during different periods of the annual and life cycle of the top predators.

During the spring (distribution map with green areas) and summer (red areas), the breeding season for most species, the coastal areas most used by predators are those near the colonies: the north of the Gulf of San Jorge, Peninsula Valdés, Diego Ramirez Islands and Malvinas Islands. Autumn (yellow areas) and winter (blue) correspond to migratory and long distance foraging trips for most species. The slope front continues to be important, particularly the waters adjacent to the Malvinas Islands, at the latitudes of the San Jorge Gulf and the Río de la Plata, and to the east of the Burdwood Bank.

THREATS TO BIODIVERSITY

Incidental Catch

Every year thousands of seabirds, marine mammals and turtles die in commercial fishing operations in the Patagonian Sea. Longline fisheries (using baited hooks) are largely responsible for the reduction in many albatross populations. Most species of albatrosses and all marine turtles in the world are threatened with extinction. Incidental bycatch and ghost fishing (drifting nets) are major threats to these groups.

Photo: The La Plata dolphin, endemic to the Patagonian Sea, is one of the marine mammals most threatened by the small-scale fisheries that use gillnets or trawl nets. © Pablo Bordino

threats to biodiversity

updates
new species

© Ignacio Bruno
Green Turtle (*Chelonia mydas*).

Summer Autumn

Green Turtle
Chelonia mydas

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during all life-stages: intentional harvest of eggs, nesting habitat degradation (construction of buildings, artificial lights on nesting beaches, sand extraction), pollution and diseases. Bycatch and entanglement in marine fisheries are