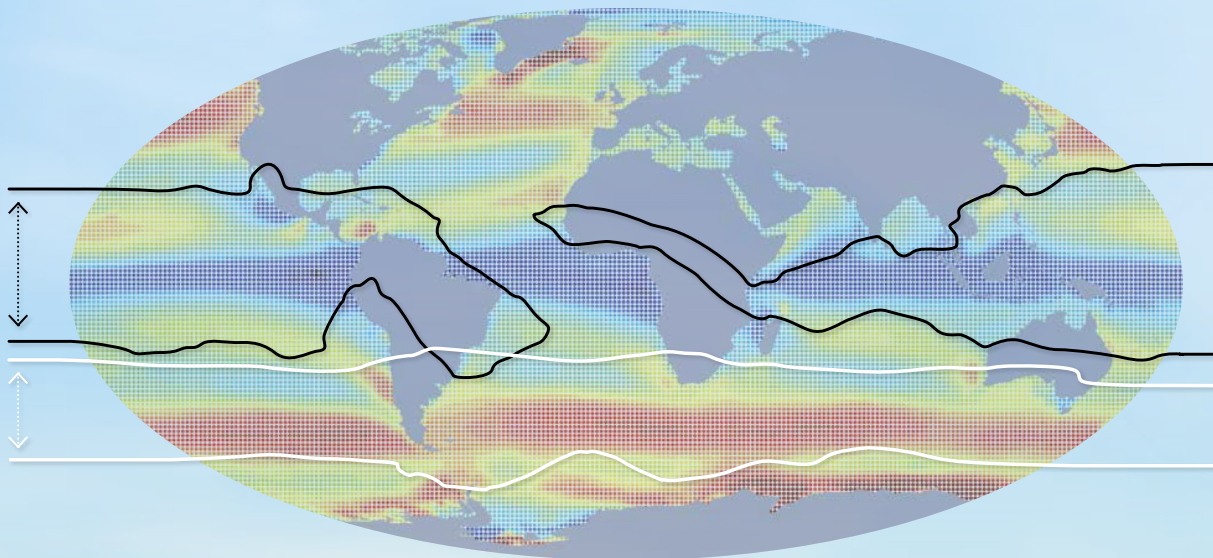


BIRDS IN STRONG WIND

Strong winds and storms are a defining factor in the lives of seabirds across many ocean regions. Flying under these conditions is particularly energy-intensive. GPS data on the flight paths of various different bird species show that the ratio of body weight to wing area decisively determines the maximum

wind speed at which a species can still fly. Heavy species with comparatively small wing areas can cope even with strong winds. At the same time, birds are adapted not to the maximum, but rather to the average wind speeds in their habitats.



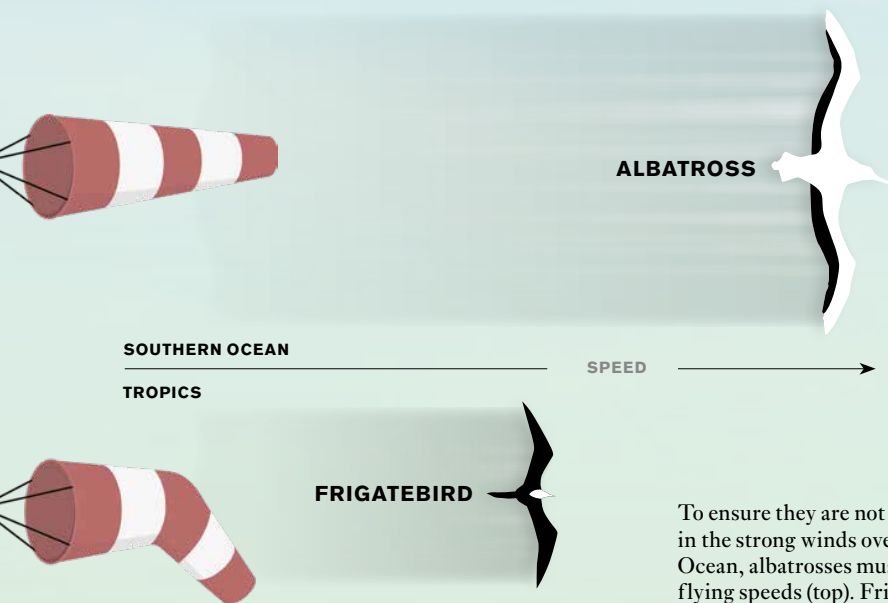
22 — Geographic range of the frigatebird
 — Geographic range of the albatross

Wind speeds
■ over 35 km/h ■ under 7 km/h

LIFE IN THE WIND

Wandering albatrosses live over the Southern Ocean, where they often have to cope with strong winds (red). Frigatebirds are found in the low-wind (blue) tropical regions (shown here are the average wind speeds over the course of a year at an altitude of 100 meters).

FASTER THAN THE WIND



To ensure they are not blown off course in the strong winds over the Southern Ocean, albatrosses must reach high flying speeds (top). Frigatebirds, in contrast, fly more slowly, given the low average wind temperatures in the Tropics (bottom).

WINGSPAN

3.5 m

WEIGHT

8.0 kg

WING SURFACE

0.6 m²



FRIGATEBIRD

Frigatebirds live in the Tropics. The ratio of bodyweight to wing surface is lower than for the albatross, so they need to avoid strong winds and tropical cyclones.



WINGSPAN

2.0 m

WEIGHT

1.5 kg

WING SURFACE

0.4 m²

WING LOADING
(weight to area ratio)

Wandering albatross
HIGH

Frigatebird
LOW



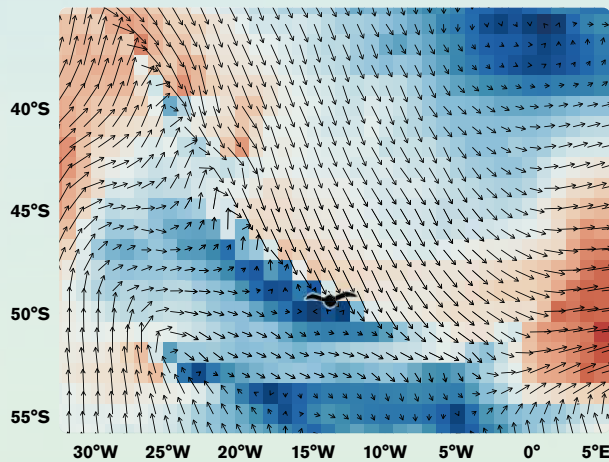
WANDERING ALBATROSS

Wandering albatrosses spend the majority of their lives over the Southern Ocean. They are heavy, and despite their huge wingspan of three-and-a-half meters, they have a relatively low wing area. This makes them particularly well adapted to strong winds.



ON THE EDGE OF THE STORM

Even albatrosses, who are used to strong winds, will avoid storms wherever possible. Here a bird flies in the virtually windless areas (blue) along a storm front in the South Atlantic.



Arrows: wind direction
■ Wind speeds over 70 km/h ■ 0 km/h

