



The longest animal migration in the world revealed

Astonishing new information on the wonders of animal migration has been revealed in a recent paper in the U.S. journal *Proceedings of the National Academy of Sciences*. An international research team found that the Arctic tern flies an incredible 70,000+ km on its annual migration trip from pole to pole - the equivalent of three trips to the moon and back over its lifetime.

The researcher team, from Greenland, Denmark, the United States, Great Britain, and Iceland, have successfully mapped the impressive migratory movements of the Arctic tern. The results of the study verify what has been supposed for decades: that the Arctic tern does indeed conduct the longest annual migration in the world. Every year this small seabird travels an average of around 71,000 km roundtrip from Greenland to the Weddell Sea, on the shores of Antarctica, and back to the breeding grounds in Greenland.

The research results not only confirm the Arctic tern as the champion of long-distance migration, but also held a few surprises in store for the research team. It turns out that the birds do not immediately travel south, but spent almost a month at-sea in the middle of the North Atlantic Ocean, approximately 1,000 km north of the Azores. After this lengthy stop over, the birds continued their long journey south down the coast of northwest Africa, but around the Cape Verde Islands the birds behaviour surprised the researcher team again. Approximately half of the birds continued down the coast of Africa, while the other half crossed the Atlantic Ocean to follow a parallel route south down the east coast of South America.

All of the birds spent the northern winter months in Antarctic waters. Interestingly, on their long return journey the birds did not choose the shortest route back to their breeding grounds in Greenland. Instead, the Arctic terns traced out a gigantic 'S' pattern northward through the Atlantic Ocean - a detour of several thousand kilometres over a straight line north to their breeding colonies.

"This study on seabird migration has given us an incredibly detailed insight into how long-distance migrants behave at times of the year when it's normally impossible for us to follow them" said Carsten Egevang of the Greenland Institute of Natural Resources, the papers primary author.

This study on Arctic terns used a tiny instrument (1.4g) for tracking animal migration, known as a geolocator. These regularly record light intensity, which can be used to generate two geographical positions per day. "The use of these devices on seabirds is not only revolutionising our understanding of migration patterns, but the resulting data on distribution also help address the requirement to identify important biological hotspots" said Richard Phillips from British Antarctic Survey, who is a co-author on the paper.

"Our analysis shows that the birds behaviour is closely correlated with both biological and physical parameters along the migration route. They paused in their southward migration to spend time in highly productive waters in the middle of the Atlantic Ocean. Compared to this stop-over site, the marine area immediately to the south is lower in productivity. Clearly, Arctic terns have learned to "fuel up" before crossing areas of ocean with limited foraging options" Carsten Egevang continued.

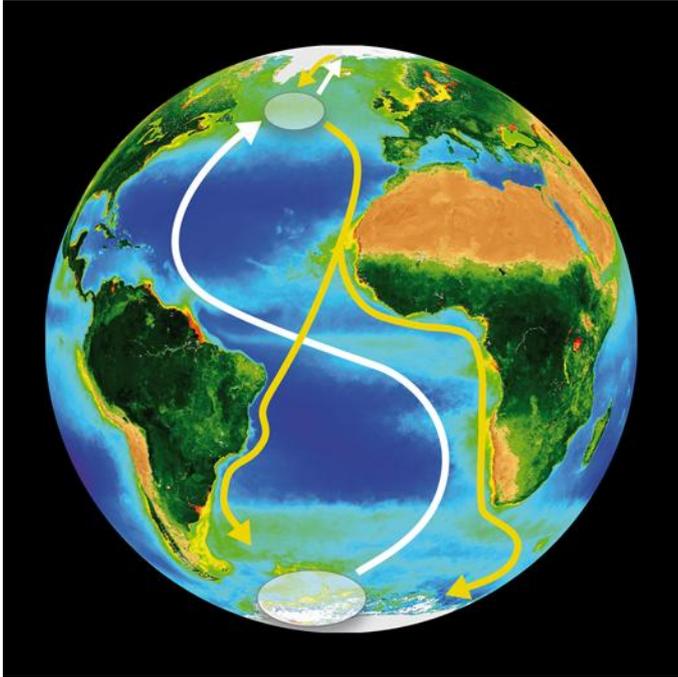
"The indirect 'S-shaped' return journey in spring indicates that Arctic terns take full advantage of the prevailing global wind systems to reduce energetic costs on their long flight north" said Iain Stenhouse, a co-author on the paper.

Arctic terns can live up to 34 years of age, and they make the annual journey between the Arctic and Antarctic throughout their adult life. When added up, the total distance an Arctic tern flies over its lifetime is the equivalent of three journeys to the moon and back. "This is a mind-boggling achievement for a bird of just over 100 grams" concluded Carsten Egevang.



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Simplified figure showing migration patterns of the Arctic tern, from the breeding sites in Greenland and Iceland to the winter grounds at Antarctica. After initiating the southbound migration (yellow line) the birds paused their migration in the central part of the North Atlantic (small circle) for almost a month before they continue towards the wintering sites at Antarctica (large circle). In spring, the northbound migration (white line) is conducted more than twice as fast in a gigantic "S" shaped pattern through the Atlantic Ocean. Areas particular rich in biological productivity are indicated by yellow and green colours.

Further information, a version of the PNAS paper, high-resolution maps and images for press purposes can be found at: www.arctictern.info

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