

# Changing climate, not tourism, seems to be driving decline in chinstrap-penguin populations

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This is a 2008 photo of a chinstrap penguin on the Antarctic Peninsula. Credit: Credit: Jon Brack, National Science Foundation

(Phys.org)—The breeding population of chinstrap penguins has declined significantly as temperatures have rapidly warmed on the Antarctic Peninsula, according to researchers funded in part by the National Science Foundation (NSF).

The study indicates that changing climatic conditions, rather than the impact of tourism, have had the greatest effect on the chinstrap population.

Ron Naveen, founder of a nonprofit science and conservation organization, Oceanites, Inc., of Chevy Chase, Md., documented the

decline in a paper published in the journal [Polar Biology](#). Naveen and coauthor Heather Lynch, of Stony Brook University, are researchers with the Antarctic Site Inventory (ASI).

The paper's findings are based on an analysis of data collected during fieldwork conducted in December 2011 at Deception Island, one of Antarctica's busiest tourist locations.

"We now know that two of the three predominant penguin species in the peninsula—chinstrap and Adélie—are declining significantly in a region where, in the last 60 years, it's warmed by 3 degrees Celsius (5 degrees Fahrenheit) annually and by 5 degrees Celsius (9 degrees Fahrenheit) in winter," said Naveen. "By contrast, Gentoo penguins are expanding both in numbers and in range. These divergent responses are an ongoing focus of our Inventory work effort."

The ASI has been collecting and analyzing Antarctic Peninsula-wide penguin population data since 1994, and these new findings have important implications both for the advancement of Antarctic science and the management of Antarctica by the Antarctic Treaty nations. The United States is a signatory to the Treaty.

The Inventory is supported in part by NSF's Office of Polar Programs and also by public contributions. The project's fieldwork at Deception Island was assisted by a grant from The Tinker Foundation.

Through Polar Programs, NSF carries out its presidential mandate to manage the U.S. Antarctic Program, which coordinates all U.S. research on the southernmost continent and in the Southern Ocean.

ASI is the only science project tracking penguin population changes throughout the entire [Antarctic Peninsula](#) region.

"Our Deception Island work, using the yacht Pelagic as our base, occurred over 12 days and in the harshest of conditions—persistent clouds, precipitation and high winds, the latter sometimes reaching gale force and requiring a lot of patience waiting out the blows. But, in the end, we achieved the first-ever, one-season survey of all chinstraps breeding on the island," Naveen said.

There has been speculation that tourism may have a negative impact on breeding chinstrap penguins—especially at Deception Island's largest chinstrap colony, known as Baily Head.

Naveen oversaw the Deception Island census effort. Lynch, the Inventory's chief scientist, undertook subsequent analyses.

The results and analyses, according to Lynch, shed new light on the massive changes occurring in this region.

"Our team found 79,849 breeding pairs of chinstrap penguins at Deception, including 50,408 breeding pairs at Baily Head. Combined with a simulation designed to capture uncertainty in an earlier population estimate, there is strong evidence to suggest a significant decline, greater than 50 percent, in the abundance of chinstraps breeding at Baily Head since 1986-87.

"The decline of chinstrap [penguins](#) at Baily Head is consistent with declines in this species throughout the region, including at sites that receive little or no tourism; further, as a consequence of regional environmental changes that currently represent the dominant influence on penguin dynamics, we cannot ascribe any direct link in this study between chinstrap declines and tourism."

The Baily Head analysis was abetted by Lynch's analyses of high-resolution satellite imagery. Images for the 2002-03 and the 2009-10

seasons suggest a 39-percent decline during that seven-year period, providing independent confirmation of this population decline.

Through support from NSF and a cooperative effort with the University of Minnesota's Polar Geospatial Center, the ASI continues to demonstrate the use of satellite imagery to analyze and describe environmental change in sensitive habitats.

Adds Lynch, "While there has been considerable focus in the policy and management community about the potential impact of tourism on these penguin populations, we cannot forget the overwhelming evidence that climate is responsible for the dramatic changes that we are seeing on the peninsula. If tourism is having a negative impact on these populations, it's too small an effect to be detected against the background of climate change."

Provided by National Science Foundation

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