BP 14

ENG

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State of Antarctic Penguins 2022 Report

State of Antarctic Penguins 2022 Report

Background Paper submitted by SCAR

Summary

Oceanites's State of Antarctic Penguins 2022 report summarizes the present status – population size and population trends – of Antarctica's five penguin species, continent-wide and in key regions.

Introduction

Oceanites, Inc. is a nonprofit scientific and educational organization that was founded in 1987 (https://oceanites.org). Its mission is to advance science-based conservation and to increase the awareness of climate change, its potential impacts, and climate change adaptation through the lens of Antarctic penguins.

Since 1994, for 28 consecutive field seasons, its Antarctic Site Inventory has been monitoring and analyzing penguin and seabird population changes across the entirety of the vastly-warmed Antarctic Peninsula, and is focused on distinguishing the direct and interactive effects of climate change, fishing, tourism, and other human activities on the Antarctic Peninsula ecosystem.

In 2016, the Mapping Application for Penguin Populations and Projected Dynamics (MAPPPD) launched (https://www.penguinmap.com). MAPPPD is an open access, decision-support tool developed for Oceanites that assembles Antarctic penguin population data and makes such data easily and publicly available. MAPPPD integrates expert biological field surveys, satellite imagery analyses, and citizen science and, over the past five years, has quickly become a key research tool used throughout the Antarctic community and a primary resource for scientific and other information about Antarctic penguins.

This continent-wide penguin population database is continually being updated and is utilized by Oceanites to generate its *State of Antarctic Penguins* reports. As in previous reports, we encourage those who have not yet contributed data to do so.

State of Antarctic Penguins Report 2022

Oceanites's *State of Antarctic Penguins ("SOAP")* reports comprehensively summarize the present status – population size and population trends – of Antarctica's five penguin species, outlining the population size and trends for the continent and in key regions that have been the focus of conservation management efforts by CCAMLR – the Antarctic Peninsula (CCAMLR Areas 48.1 and 48.2), the Ross Sea (CCAMLR Areas 88.1, 88.2 and 88.3), and Eastern Antarctica (CCAMLR Areas 58.4.1 and 58.4.2).

Despites complications caused by the COVID-19 pandemic, the MAPPPD database, on which Oceanites's *State of Antarctic Penguins ("SOAP")* reports are based, continues to grow – as of 1 April 2022 containing counts from 740 sites across the entirety of the Antarctic continent, encompassing 4,489 records from 145 data sources of on-the-ground colony counts and satellite photo analyses.

Since the SOAP 2020 report, the number of records in MAPPPD and the number of data sources have both increased by 12%. The numbers reported here are expected to grow as soon as recent drone imagery from a number of locations is analysed.

These reports and the underlying MAPPPD database provide evidence to assist all Antarctic stakeholders in their deliberations and activities: decision-makers and governments, scientists,

NGOs, the private sector including fishing and tourism operators, and concerned citizens throughout the world. The goal is to make available the latest, most accurate population data about Antarctic penguins; both continent-wide and regionally, and of the latest trends in such numbers.

Key Report Findings

SOAP 2022 highlights that the five Antarctic penguin species total 6.12 million breeding pairs nesting at 740 sites across the entire Antarctic continent. As with previous reports, per the Antarctic Treaty, Antarctica is defined as all of the land and ice shelves south of 60°S latitude, which excludes penguins nesting in the south Atlantic Ocean and the South Sandwich Islands. Also, note that in the table below, "N" refers to the number of nesting pairs.

Table A: Penguin N totals, new sites included

	N 2022	N 2020	N CHANGE	% CHANGE
EMPE (Emperor)	(no new data)	238,340	(no new data)	(no new data)
ADPE (Adélie)	4,321,919	4,172,180	149,739	3.59%
CHPE (Chinstrap)	1,423,333	1,395,774	27,559	1.97%
GEPE (Gentoo)	126,538	122,549	3,989	3.26%
MCPE (Macaroni)	(no new data)	13,249	(no new data)	(no new data)
	6,123,379	5,942,092	181,287	3.05%

In part, the continent-wide increase in Adélie (*Pygoscelis adeliae*), chinstrap (*Pygoscelis antarctica*), and gentoo (*Pygoscelis papua*) penguin nests reflects counts from new breeding sites that have been added in the last two years to the MAPPPD database.

Removing these new counts from Table A, thus focusing solely on sites known in 2020, reveals that chinstrap and Adélie penguins continue to decline and gentoo penguins continue to increase in the Antarctic Peninsula (CCAMLR Areas 48.1 and 48.2), while Adélie penguins are increasing in the Ross Sea (CCAMLR Areas 88.1, 88.2 and 88.3), and Eastern Antarctica (CCAMLR Areas 58.4.1 and 58.4.2).

Table B: Penguin N totals, new sites removed

		N 2022	N 2020	N CHANGE	% CHANGE
ADPE (Adélie)	48.1	1,313,840	1,314,933		
	48.2	146,761	146,761		
	subtotal	1,460,601	1,461,694	-1,093	-0.07%
	58.4.1	508,366	503,474		
	58.4.2	589,839	575,250		
	subtotal	1,098,205	1,078,724	19,481	1.81%
	88.1	1,538,287	1,408,390		
	88.2	52,823	52,823		
	88.3	170,549	170,549		
	subtotal	1,761,659	1,631,762	129,897	7.96%
CHPE (Chinstrap)	48.1	732,912	748,477		
	48.2	637,273	647,273		

	88.1	24	24		
	subtotal	1,370,209	1,395,774	-25,565	-1.83%
GEPE (Gentoo)	48.1	119,631	117,051		
	48.2	5,498	5,498		
	subtotal	125,129	122,549	2,580	2.11%

Oceanites's collaborators, as well as many other researchers, are focused on distinguishing the interactive effects of climate change vis-à-vis human activities and other causes that might definitively explain penguin population changes being detected.

These analyses continue and are examining a suite of potential causal factors, including: a potentially shifting or shrinking krill stock; the amount of krill fishing and higher exposure to fishing interference during the penguin breeding season; competition for krill with whales and seals; penguins' winter foraging ranges and other nonbreeding season impacts; and rising temperatures, increased precipitation, and retreating sea ice due to global warming.

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