Antarctic Science 36(5), 379–397 (2024)
doi:10.1017/S0954102024000324

A bibliometric analysis of research on the variability of precipitation over the Antarctic Peninsula

SANJEEF KUMR SUBRAMANIAM [1,2], SHEEBA NETTUKANDY CHENOLI[3], WEE CHEAH[1,2], MOHD FADZIL FIRDAUS MOHD NOR[1,2], KARL JOHAN JOHARI CHAN[1], PETER CONVEY [4,5], GEOK YUAN ANNIE TAN[1,2,6], MOHAMMED RIZMAN-IDID[1,2] and SITI AISYAH ALIAS[1,2,]

[1]*National Antarctic Research Centre, Advanced Studies Complex, Universiti Malaya, Kuala Lumpur, Malaysia*
[2]*Institute of Ocean and Earth Sciences, Advanced Studies Complex, Universiti Malaya, Kuala Lumpur, Malaysia*
[3]*Department of Geography, Faculty of Arts and Social Science, Universiti Malaya, Kuala Lumpur, Malaysia*
[4]*British Antarctic Survey, Natural Environment Research Council, Cambridge, UK*
[5]*Department of Zoology, University of Johannesburg, Johannesburg, South Africa*
[6]*Institute of Biological Sciences, Faculty of Science, Universiti Malaya, Kuala Lumpur, Malaysia*
saa@um.edu.my

Abstract: Regional warming rates experienced in the Antarctic Peninsula since the mid-twentieth century, linked to global climate change, have been amongst the world's fastest. The majority of studies of change in this region have focused on temperature, and while precipitation is also predicted to change (both in form and quantity) in the models, fewer studies have set out to document and test this prediction. In this study, we examined trends in research publications on precipitation variability over the Antarctic Peninsula from 1990 to 2023 using the Web of Science Core Collection database. A total of 86 relevant papers were retained and used to identify patterns in scientific outputs. *VOSviewer* and *Bibliometrix* software packages were used to illustrate the subject content of and trends in publications retrieved by key word analysis. Our findings revealed a positive trend in the number of papers published by year. Within the analysed period, research on precipitation variability in the Antarctic Peninsula region was initiated by a study of Turner and colleagues from 1997. The UK and US research communities were the two largest contributors to this field of Antarctic research globally, with their researchers also holding strong positions within international collaborative networks.

Received 21 February 2024, accepted 16 August 2024

Key words: *Bibliometrix*, precipitation variability, rainfall, snowfall, *VOSviewer*

Introduction

The Antarctic Peninsula (AP) is one of the most intriguing and extreme regions on Earth. It is the northernmost part of Antarctica, and it stretches more than 1300 km into the Southern Ocean, in the direction of the southern tip of South America (Ducklow *et al.* 2013, Silva *et al.* 2020, Xu *et al.* 2021). This region is both scientifically valuable and unmatched in its beauty. With its massive ice shelves and high mountains, the AP provides an insight into the intricate dynamics of the polar regions of our planet.

The AP hosts crucial ecosystems, supporting a broad range of marine vertebrates such as penguins, whales, seals and seabirds, as well as Antarctic krill and complex and diverse benthic communities (Trathan *et al.* 2022, Kawaguchi *et al.* 2024). Its nutrient-rich waters maintain marine life and support global fisheries, contributing to the delicate balance of the Southern Ocean environment (Bestley *et al.* 2020). The region's glaciers and ice shelves are critical markers of climate change, with rapid ice melt and glacier retreat providing significant insights into the effects of global warming (Cook *et al.* 2016). Understanding the dynamics of the AP is therefore critical for understanding larger environmental processes and managing their consequences.

Apart from its environmental importance, the AP also provides exceptional opportunities for scientific research in various fields, including ecology, biodiversity, climatology, glaciology and terrestrial and marine biology. Its distinct environment provides researchers with significant insights into Earth's climatic history, contributing to the reconstruction of historical climates and forecasting of future trends (Cook *et al.* 2016, Tewari *et al.* 2022). Furthermore, the AP's remote location and extreme climatic conditions make it an ideal environment for researching adaptation mechanisms in diverse organisms such as animals, plants and microorganisms, with applications in fields such as medicine and biotechnology (Clarke *et al.* 2007, Fountain *et al.* 2014, Peck 2018).

The role that the AP plays in global climate and ocean systems is often underappreciated. The ice sheets and