COSPPac
Climate and Oceans Support Program in the Pacific

Pacific Community
Communauté du Pacifique

Climate Change in the Pacific 2022:

Historical and Recent Variability, Extremes and Change

Australian Government
Bureau of Meteorology

SPREP
Secretariat of the Pacific Regional Environment Programme

Australian Aid

NEW ZEALAND
FOREIGN AFFAIRS & TRADE
Manatū Aorere

Climate Change in the Pacific 2022:

Historical and Recent Variability, Extremes and Change

Simon McGree, Grant Smith, Elise Chandler, Nicholas Herold, Zulfikar Begg, Yuriy Kuleshov, Philip Malsale and Mathilde Ritman

Suva, Fiji, 2022

Original text: English

Pacific Community Cataloguing-in-publication data

Climate Change in the Pacific 2022: historical and recent variability, extremes and change / Simon McGree, Grant Smith, Elise Chandler, Nicholas Herold, Zulfikar Begg, Yuriy Kuleshov, Philip Malsale and Mathilde Rittman

1. Climatic changes — Oceania.

2. Climatic changes — Management — Oceania.

3. Climate change mitigation — Oceania.

4. Rain and rainfall — Oceania.

5. Temperature — Oceania.

6. Sea level — Oceania.

7. Cyclones — Oceania.

8. Environment — Management — Oceania.

I. McGree, Simon II. Smith, Grant III. Chandler, Elise IV. Herold, Nicholas V. Begg, Zulfikar VI. Malsale, Philip VII. Rittman, Mathilde VIII. Title IX. Pacific Community

577.220995 AACR2

ISBN: 978-982-00-1479-4

Printed with corrections, September 2023

Prepared for publication and printed at SPC Suva Regional Office
Private Mail Bag, Suva, Fiji
www.spc.int

Contents

Abbreviations

ARI	average return interval (or annual recurrence interval)
CliDE	Climate Data for the Environment
COSPPac	Climate and Oceans Support Program in the Pacific
CSIRO	(Australian) Commonwealth Scientific and Industrial Research Organisation
ECMWF	European Centre for Medium-Range Weather Forecasts
EEZ	exclusive economic zone
ENSO	El Niño–Southern Oscillation
ERA5	European Centre for Medium-Range Weather Forecasts reanalysis version 5
FSM	Federated States of Micronesia
GA	Geoscience Australia
GPD	generalized Pareto distribution
IPCC	Intergovernmental Panel on Climate Change Research
IPO	Interdecadal Pacific Oscillation
ITCZ	Intertropical Convergence Zone
MJO	Madden–Julian Oscillation
NIWA	(New Zealand) National Institute of Water and Atmospheric Research
NOAA	(United States) National Oceanic and Atmospheric Administration
PACCSAP	Pacific–Australia Climate Change Science and Adaptation Planning
PCCM	Pacific Climate Change Monitor
PCCSP	Pacific Climate Change Science Program
PDO	Pacific Decadal Oscillation
PNG	Papua New Guinea
PSLGM	Pacific Sea Level and Geodetic Monitoring
RCC	Regional Climate Centre
RMI	Republic of the Marshall Islands
SHTC	Southern Hemisphere Tropical Cyclone
SPC	Pacific Community (formerly South Pacific Commission)
SPCZ	South Pacific Convergence Zone
SPEI	Standardised Rainfall Evapotranspiration Index
SPREP	(Secretariat of the) Pacific Regional Environment Programme
SST	sea surface temperature
The Bureau	(Australian) Bureau of Meteorology
WMO	World Meteorological Organization
WPM	West Pacific Monsoon

Acknowledgments

This report is an outcome of the high degree of cooperation and collaboration that exists between the implementing partners of the Australian Aid-funded Climate and Oceans Support Program in the Pacific (COSPPac), specifically the Bureau of Meteorology (The Bureau), the Pacific Community (SPC) and Pacific Regional Environmental Programme (SPREP), together with the valuable ongoing support from the national meteorological services in the 15 partner countries and territories.

Coordinating lead authors
Simon McGree, Grant Smith and Elise Chandler

Lead authors
Nicholas Herold, Zulfikar Begg, Yuriy Kuleshov, Philip Malsale and Mathilde Ritman

Peer review
Andy Taylor, The Bureau
David Jones, The Bureau
Chalapan Kaluwin, The University of Papua New Guinea
Awnesh Singh, The University of the South Pacific

Other reviewers
Andrew Jones, The Bureau
COSPPac partner country and territory national meteorological services

Editorial committee and support
Celine Becker, Merana Kitione and Azarel Mariner (COSPPac), Neil Conning & Associates, New Zealand Aid Programme, SPC Publications team

How to cite this report
McGree, S., G. Smith, E. Chandler, N. Herold, Z. Begg, Y. Kuleshov, P. Malsale and M. Ritman. 2022. *Climate Change in the Pacific 2022: Historical and Recent Variability, Extremes and Change*. Climate and Oceans Support Program in the Pacific. Pacific Community, Suva, Fiji. 220pp