



World Meteorological Organization

Weather • Climate • Water

CIMO / WIGOS EXPLORATORY WORKSHOP

Special Needs of Developing Countries

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OUT LINE

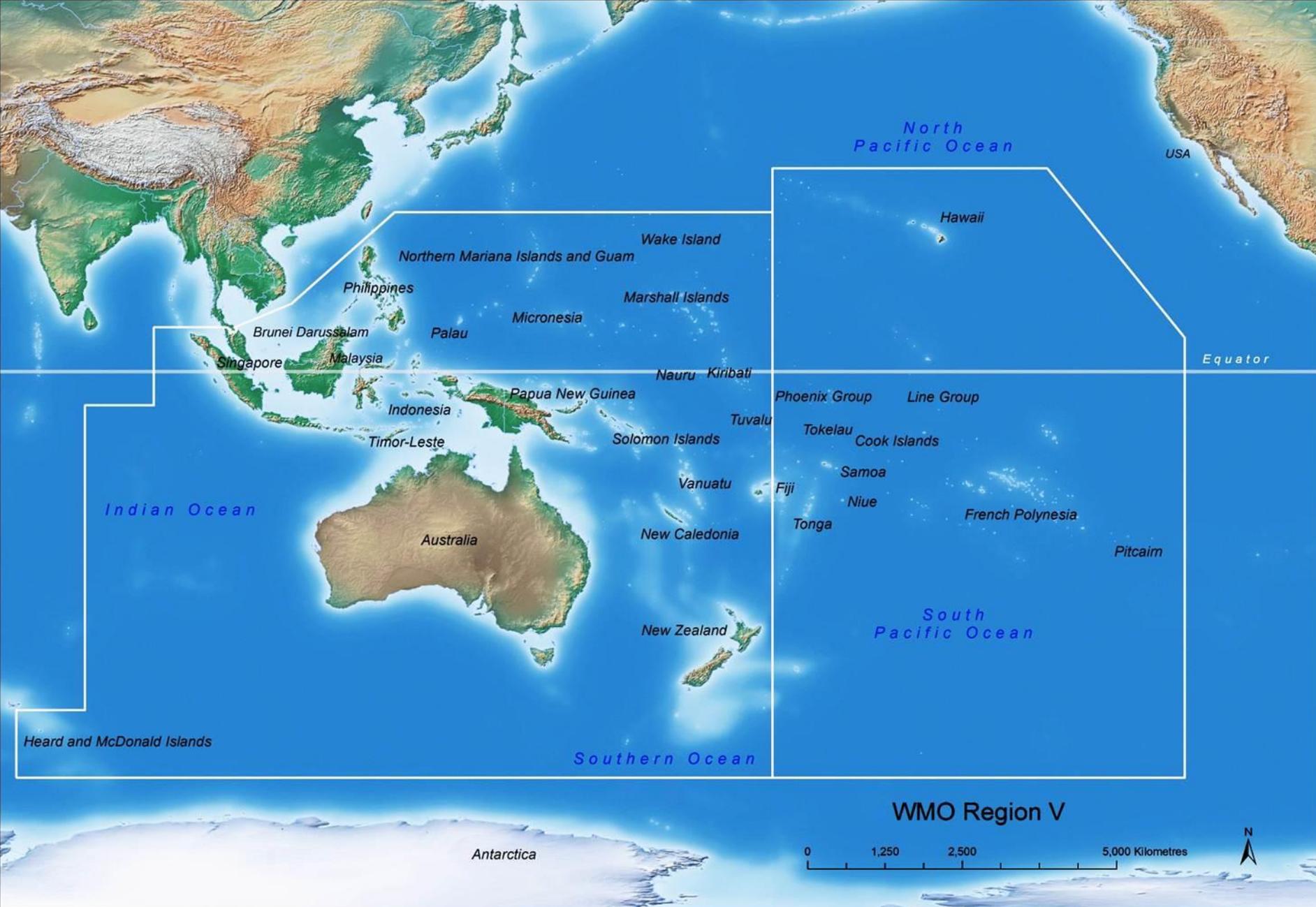
- Introduction
- Telecommunication
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- Observation Equipment
- Standardization of Observation Equipment
- Observation network



Introduction

- Number of RA V Member countries: 22
- The majority of the RA V member countries are Small Island Developing States (SIDS).
- RA V region is characterized by its vast ocean areas





North Pacific Ocean

USA

Hawaii

Northern Mariana Islands and Guam

Wake Island

Philippines

Marshall Islands

Micronesia

Palau

Brunei Darussalam

Singapore

Malaysia

Nauru Kiribati

Papua New Guinea

Indonesia

Timor-Leste

Solomon Islands

Tuvalu

Phoenix Group

Line Group

Tokelau

Cook Islands

Samoa

Niue

French Polynesia

Fiji

Tonga

Pitcairn

Indian Ocean

Australia

New Caledonia

New Zealand

South Pacific Ocean

Heard and McDonald Islands

Southern Ocean

WMO Region V

Antarctica

0 1,250 2,500 5,000 Kilometres



Telecommunication and Electricity

- Fact:
 - Not all of observation stations has been integrated.
 - High cost connectivity
 - Lack of electricity

- Needs:
 - Integration of all observation station.
 - Reliable and affordable telecommunication line.
 - Capacity development in data communication techniques related to observations collection and reporting.
 - Sufficient power supply



Isolated Site Example



- Long Bawan, Indonesia
 - No road access to another town, even to the district capital
 - No broadband internet access
 - No 24 hours power supply (6 hours per day on average)



Human Resources

- Facts:
 - Limited qualified personnel (quality and quantity).
- Needs:
 - The number of technician should be increased.
 - Competency assessments standard.
 - Need to provide capacity building in Information and Communication Technology (ICT) skills and knowledge.



Observation Equipment

- Facts
 - Most of the observation equipment is analog-mechanical (conventional) instruments.
- Needs:
 - Budget allocation for instrument transition from analog to digital-automatic equipment.



Standardization of Observation Equipment

- Standardized operational procedures
 - Maintenance
 - Calibration
- Training to improve human resources quality (Capacity building).
- Transfer of technology.
- Budgeting for standardization



Observation Instruments Calibration

- Standardization of calibration laboratory through ISO 17025:2005 accreditation
- Regular intercomparison of laboratory standard equipment, both regional and inter-regional.
- Regular workshop on the instruments calibration methods.
- Implementation of WMO guide on Meteorological Instruments and Observation Methods with supervision of related WMO Technical Commissions



Observation station network

- Facts:
 - Number of stations vs Area – insufficient density of observing sites (i.e. in Indonesia)
 - Diverse geographical and topographical conditions
- Needs:
 - Increase observation network density representing all geographical and topographical features
 - Requires special attention to Marine Observation Station.



AWS Ship/Voluntary Observing Ships





Thank you
for your attention

