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OCEANS AND THE LAW OF THE SEA:
REPORT OF THE SECRETARY-GENERAL (2020)

CONTRIBUTION BY THE WORLD METEOROLOGICAL ORGANIZATION (WMO)

TO THE IMPLEMENTATION OF GA RESOLUTION 74/19
'OCEANS AND LAW OF THE SEA'

Submitted June 2020

Pursuant to United Nations General Assembly Resolution 74/19 of 10 December 2019, entitled "Oceans and the law of the sea", the information below represents the contribution of the World Meteorological Organization (WMO) to the report of the UN Secretary-General, between September 2019 and June 2020.

1. INTRODUCTION

The World Meteorological Organization (WMO) is the authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the land and ocean, the weather and climate it produces and the resulting distribution of water resources. The ocean provides essential natural resources to humankind and regulate the global climate. WMO contributes to ocean-related issues through the observation and monitoring of the ocean and climate; research on the climate and connected Earth systems; development and delivery of services for disaster risk reduction (DRR), including marine hazards; capacity development

- Ocean acidification is increasing: Sea water is 26% more acidic than at the start of the industrial era
- Ocean acidification and marine heatwaves harmed marine life, ecosystems and coral reefs
- Sea level rise is accelerating due to the melting of ice sheets in Greenland and Antarctica
- Ocean heat content and the global mean sea level reached the highest values on record

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Together with ocean acidification and an accompanying deoxygenation, ocean warming is leading to dramatic changes in marine ecosystems and the wellbeing of people that depend on them.

In September 2019, the WMO released its final report on the *Global Climate 2015-2019*. The continuing and accelerated trends have predominated among other key climate indicators, including an acceleration of rising sea levels, a continued decline in the Arctic sea-ice extent, an abrupt decrease in Antarctic sea ice. More heat is being trapped in the ocean. Higher sea-surface temperatures endangered marine life and ecosystems. Among all weather-related hazards, tropical cyclones were associated with the largest economic losses, floods, landslides, and loss and damage. Seawater is becoming more acidic. Observations from open ocean sources over the last 20 to 30 years have shown a clear trend of decreasing average pH, caused by increased concentrations of CO_2

Related to both the observation needs, and coastal early warnings, WMO has been delivering in the Pacific Islands, communication material to improve public awareness of the impacts of coastal inundation and enhance the understanding of what marine meteorological warnings and forecasts mean. WMO has produced two public awareness videos in 2019 and 2020 to encourage public understanding of the dangers of coastal flooding, and of vandalism to ocean monitoring equipment. The animated videos are made freely available across the Pacific Islands, and are being translated, where possible, into local languages to enable wider use. They will be adapted to other regions in the future.

VIII Maritime safety and securit y and flag State implementation

WMO continues its collaboration with the International Maritime Organization (IMO) and the International Hydrographic Organization (IHO) for coordinated and standardized metocean[1] information, forecasts and warning services for safety of life and property at sea, improved marine environment and sustainable management of natural resources, with due focus on Polar Regions.

WMO continuously works with its partners relating to international shipping by its WorldWide Metocean Information and Warning Service (WWMIWS) as a contribution to the Global Maritime Distress and Safety (Sy)-4(plat4(mm

integrated across ocean, atmosphere and land. A relevant example is the Arctic where the air-sea-ice interaction determines a significant part of the variability of the Arctic environment. So, improving Arctic monitoring and prediction systems needs a careful design of joint modelling and observational campaigns. The WMO Polar Prediction Project (PPP) 2013-2022 is a World Weather Research Programme (WWRP)

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The Integrated Global Greenhouse Gas Information System (IG^3IS)[3]

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The WMO Global Data-Processing and Forecasting System (GDPFS) is composed of three types of centres distributed around globe providing information at global, regional and national level. These centres include World Meteorological Centres (WMCs), Regional Specialized Meteorological Centres (RSMCs) including Regional Climate Centres (RCCs) and National Meteorological Centres (NMCs). The standards for data-processing and forecasting are represented in the Manual on GDPFS (WMO-No. 485) which is considered as the single source of technical regulation for all operational data-processing and forecasting systems operated by WMO Members, including designation of specialized centres. In this context, there are 24 RSMCs for marine meteorological services covering METAREAs, four RSMCs for numerical ocean wave prediction and six RSMCs for tropical cyclone forecasting, including marine-related hazards. Since mid 2019, WMO is moving toward an Earth System Modelling and Prediction (ESMP) approach, which implies more integration of ocean parameters into ESMP. This responds to various ocean users' needs (coastal issues, shipping, fishing and etc.) and will improve the access to and use of marine products for protection of life and property at sea and along the coast.

XIII Regional Cooperation

The WMO has been engaged as an expert service provider by the Green Climate Fund (GCF) to enhance the use of scientific methodologies for adaptation planning and vulnerability assessment in climate sensitive sectors. In response to the Paris Agreement call for "Strengthening scientific knowledge on climate in a manner that informs climate services and supports decision-making (Article 7, paragraph 7 (c))", the GCF initiated an integrated approach to facilitate the generation and use of climate information in decision-making.

Under the service contract, WMO is developing the concept, scientific methodology, data, tools and

stronger focus on water resources and the ocean, more coordinated climate activities and a more concerted effort to translate science into services for society. It has paved the way for greater engagement with the rapidly growing private sector and more structured collaboration with development agencies. The Congress approved a new WMO strategic plan to achieve its overarching vision: “By 2030, a world where all nations, especially the most vulnerable, are more resilient to the socioeconomic impact of extreme weather, water,

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COP25 (December 2019, Madrid) was focused on the ocean and known as ‘Blue COP’. Discussion focussed on seeking solutions to combat the ocean issues outlined in the IPCC SROCC. The WMO provisional statement on the state of the global climate in 2019 was also issued on 3 December at the COP and received widespread international media attention along with announcements by the WMO and UN Secretary Generals. The Provisional Statement indicates that sea level rise has accelerated since the start of satellite measurements in 1993 partly because of the melting of ice sheets in Greenland and Antarctica. Oceans are warming and becoming more acidic. Deoxygenation is increasing. The UN Special Envoy for the Ocean, Ambassador Peter Thomson, said: "Let us remember this as Blue COP". Many events highlighted concern for climate change impacts on Polar regions and SIDS, which are being hit hard by sea level rise, marine heatwaves and impacts on coral reefs and fisheries. A UN Ocean Side Event ‘Raising the ocean ambition in climate’ included a presentation from Agnes Kijazi, WMO 3rd Vice President and Permanent Representative of Tanzania. A WMO-IPCC-Food and Agriculture Organization (FAO) side event focused on “State of climate services report: lessons learned and ways forward for “leaving no one behind” in SIDS”. WMO also organized a side event on “Ocean Regions and a Changing Climate: Polar and SIDS Perspectives” with a panel including the WMO SG, the UN Special Envoy Peter Thomson, and the Heads of the Meteorological Services (and ca9(I)-10.tDo79 T e10.ation v thcTanitvt1.1966 -3836.17 Tc.0103 Tw[(foc)-155(u)7.1(hig.1

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PART B: COVID19 IMPACT ON OCEAN ACTIVITIES

Maritime transportation is an essential sector to the global economy during the COVID-19 situation. All WMO marine partners have urged their Members or Member States to recognize all seafarers as 'key workers' and call for continuous accurate maritime weather services'. The WMO-IMO WWMIWS is operating without major impact during COVID-19, to help the global maritime community in combating this pandemic. At the meantime, COVID-19 complicates the management of weather, climate and water-related hazards and makes early warnings systems against multiple hazards even more important, especially in the tropical cyclone (TC) seasons. Examples like TC Harold across the Pacific Islands region (April 2020), and the TC Amphan in Bay of Bengal (May 2020) showed the benefit of the well-established WMO regional coordination mechanisms for tropical cyclone forecasting and warnings, that enabled Members to receive reliable and timely information based on impacts and in multi-hazard approach. As well, the newly operational coastal inundation forecasting system in Fiji was used for the first time in a cyclone and proved successful in anticipating storm surge and wave impacts. It provided early warnings for vulnerable coastal communities.

Limited immediate impact on ocean observation data flows, observations from commercial ships reduced by 20%, risk of degrading autonomous platforms, drifters show a 60% decline per year, profiling floats a 20% decline per year, which will degrade forecasts and create gaps in the climate record. The WMO-IOC JCOMMOPS office is maintaining a watch on the drops in data, deployments, cruises, etc. The tracker can be seen at:

GCOS	Global Climate Observing System
GCW	Global Cryosphere Watch

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NRT	(Near) Real-Time
NWP	Numerical Weather Prediction
OceanObs'19	Decadal Ocean Observations Conference 2019
OOPC	Ocean Observations Panel for Physics and Climate
OSEs	Observing System Experiments
PPP	Polar Prediction Project
RCC	Regional Climate Centres
RSMC	Regional Specialized Meteorological Centre
SBSTA	Subsidiary Body for Scientific and Technological Advice
SC-MMO	Standing Committee on
SERCOM	Commission for Weather, Climate, Water and Related Environmental Service Applications
SIDS	Small Island Developing States