JCOMM Observing System Report Card 2016

The Global Ocean Observing System

IOC

WMO

GLOBAL OCEAN OBSERVATIONS

The ocean affects us all. It influences weather and climate, impacting many sectors such as agriculture, marine and coastal activities, marine ecosystems, tourism, living conditions, human health and disaster preparedness, both regional and globally.

In situ marine meteorological and oceanographic observations, together with satellite observations, are necessary for many applications and to address socio-economic needs. This first annual Report Card assesses the status and the value of the global ocean observing networks that are supported by many countries and coordinated through the Joint WMO-IOC (World Meteorological Organization-Intergovernmental Oceanographic Commission of UNESCO) Technical Commission for Oceanography and Marine Meteorology (JCOMM).

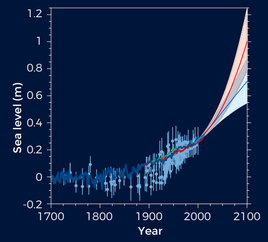
JCOMM

Ocean observing in the Pacific Ocean is vital for detection and prediction of the **El Niño Southern Oscillation** and its consequences for multiple sectors.

Monthly average of global burned area for August 2015. Credits: NASA.

El Niño-driven effects change the distribution and severity of wildfires worldwide. The change in ocean-atmospheric dynamics shifts the rainfall causing less rain to fall in many areas of the tropics and making forests more vulnerable to human-ignited fires. Fires in tropical forests also impact agriculture yield and accelerate carbon dioxide buildup in the atmosphere reducing air quality.

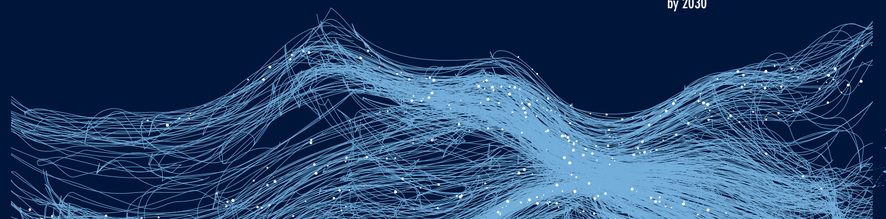
Sea level observations and projections help coastal communities planning for and adapting to the risk of rising sea levels to their economies, infrastructure and coastal habitats.



Adapted from Church, J.A. et al. 2013 (Fig 13.27): Sea level Change. In Climate Change 2013: The Physical Science Basis. Working Group I Contribution to the IPCC AR5, Figures 13.3, 13.8; 13.12, 13.20 and 13.27. [Stocker,T.F., et al(eds.)]. Cambridge University Press, UK and New York, USA.

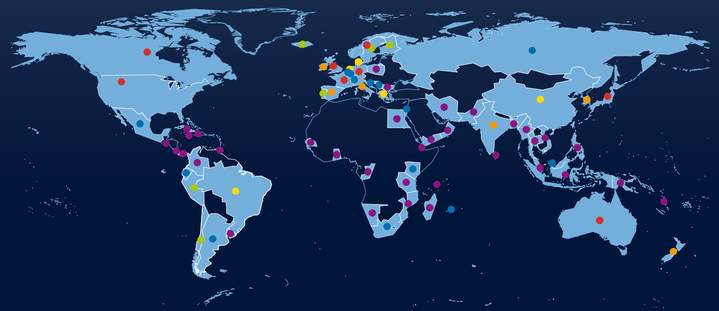
Sustained ocean observations are vital to support the **Blue Economy** which is predicted by the Organisation for Economic Co-operation and Development to more than double its contribution to global value-added, reaching over $3 trillion by 2030. The Blue Economy is marine-based economic development that leads to improved human well-being, while significantly reducing environmental risks and ecological scarcities.

40 million
full time jobs employed by ocean industries by 2030



NATIONAL PARTNERS

based on operational platforms registered at JCOMMOPS as of December 2016: 74 countries



Number of supported networks
1 2 3 4 5 6

Sustaining the oceanographic and marine meteorological observing networks remains a continuous challenge for the international community.

WMO Members and IOC of UNESCO Member States are investing in the observing system and rely on JCOMM expertise to guide them for addressing their needs.

CONTACTS

General information: **www.jcomm.info**
Networks status: **www.jcommops.org**
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Authors: JCOMM Observations Coordination Group (OCG) and the JCOMM in situ Observations Programme Support centre (JCOMMOPS).

JCOMMOPS monitors the status and improves the overall performance of the ocean observing system.

More information at:
www.jcommops.org/reportcard

OceanSITES
Argo
GLOSS
SOOP

OCEAN OBSERVING SYSTEM STATUS

WEATHER

The weather impacts a wide range of commercial operations and recreational activities, including shipping, fisheries, oil and gas, mining and sailing.

Real-time, open ocean and coastal observations are critical for generating marine weather forecasts and warnings which enable safe and efficient maritime operations and activities.

EXTREME EVENTS

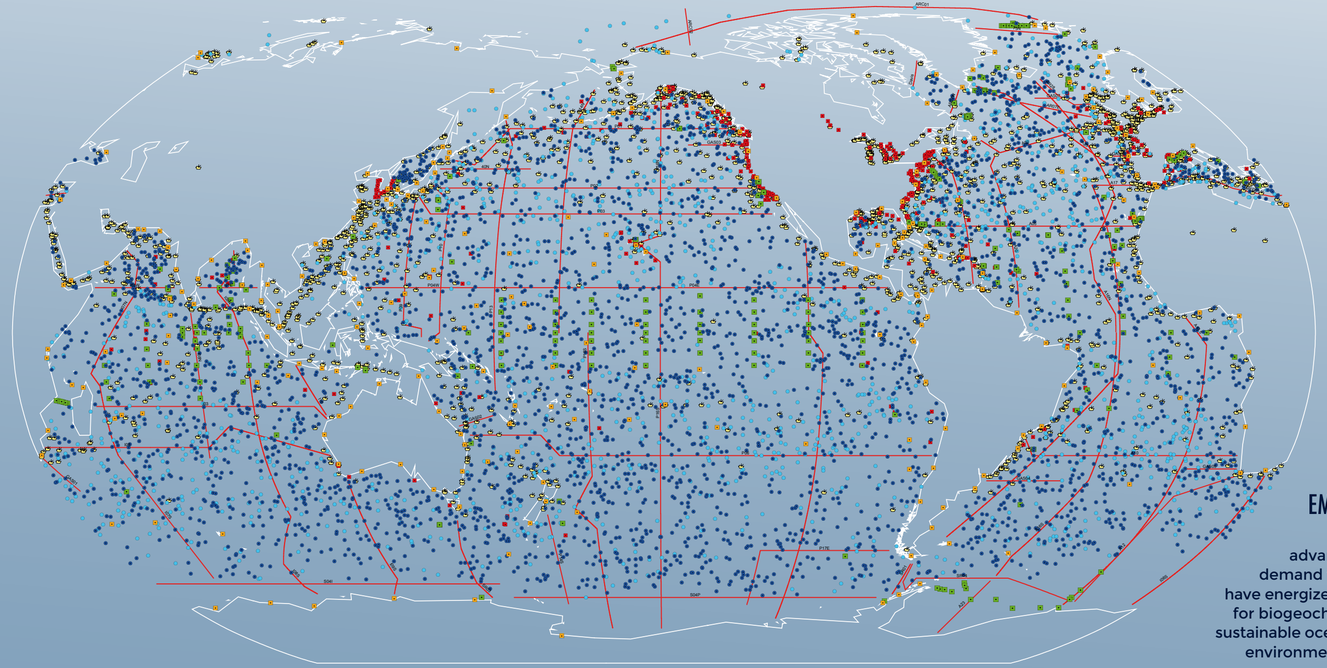
Extreme ocean events (tropical cyclones, ice storms, floods, droughts, tsunamis) cause loss of life and property, and place a financial burden on governments and industries.

Ocean observations, forecasts and early warning systems deliver real-time information to help manage risk and improve emergency response efficiency.

CLIMATE CHANGE & VARIABILITY

Large-scale ocean-atmosphere interactions like El Niño and changes in ocean circulation significantly impact seasonal weather patterns across extended regions. They influence phenomena such as storm frequency and severity, precipitation, drought and flooding, and impact activities ranging from fisheries and agriculture, to insurance and construction.

High quality and long duration (> 30 years) global observations of ocean temperature, salinity, circulation, sea level and chemistry, from sea surface to the deep ocean, are critical to detecting climate change and enabling environmental prediction and adaptation by communities and nations. Ocean data are increasingly required to improve short to long-term forecasts for governments and industries.



OCEAN HEALTH

Integrated physical, biogeochemical, and biological observations are required to monitor and understand the cumulative effects of key stressors, from climatic change, ocean acidification, to population pressure and industrial practices, on ocean health.

SUSTAINABLE OCEAN RESOURCES

Small-scale tourism and local fisheries are an important source of employment in many coastal communities. Integrated and timely ocean information lead to more effective protection of ecosystems, *e.g.* coral reefs, more viable small-scale fisheries and improved marine spatial planning.

EMERGING NETWORKS

Observational gaps, advanced technology, and demand for ocean information have energized emerging networks for biogeochemistry, ocean health, sustainable ocean resources, coastal environments, and remote parts of the global ocean.

Emerging networks	Themes
Biogeochemistry (floats, ships, moorings)	
Gliders	
HF Radars	
Animal borne sensors	

In situ networks	Contributing countries	Themes
Ship based measurements – SOT		
Sea level gauges – GLOSS		
Drifting buoys - DBCP		
Moored buoys – DBCP		
Moored buoys – OceanSITES		
Profiling floats – Argo		
Repeated transects – GO-SHIP		

Contributing countries: 10-19 20-29 >30

Satellite Essential Climate Variables	Years 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18 20 22	Themes
Sea ice		
Color		
Sea level		
Temperature		
Salinity		
Sea State		
Wind		

INADEQUATE MARGINAL ADEQUATE

The 3 categories are defined according to weather or not the missions are meeting the WMO/Global Climate Observing System requirements (accuracy of measurements, coverage, spatial resolution, temporal sampling, etc.).

More information at https://oceans.nasa.gov