

CYMS

Cyclone
Monitoring Service
with Sentinel-1



Cutting edge space observations
for metocean applications
& climate studies



SENTINEL-1: Copernicus-on-Demand for Tropical Cyclone Observations

NEW USE OF COPERNICUS

Sentinel-1 is the only mission able to provide near real-time and high-resolution observations of tropical cyclone.

STORM SURGE WARNINGS

Sentinel-1: A Copernicus mission can now offer operational Tropical Cyclone monitoring services

> Satellite on demand

A unique acquisition strategy developed for Tropical Cyclone observations successfully tested with ESA using Sentinel-1.

> A potential new Copernicus service

This innovative TC acquisition strategy can be developed and operated on a daily basis within the Copernicus Program.

> A service in line with european goals

This new service concurs to Sentinel-1 mission to “help manage our environment, understand and tackle the effects of climate change, and safeguard everyday lives.”

Sentinel-1: A full picture of Tropical Cyclones

> Unprecedented observations of TC

- Ocean surface wind estimates day and night at high spatial resolution and over wide images for hurricane-force winds.
- Additional key information on Tropical Cyclone structure: maximum wind speed, eye diameter, wind radii, eyewall replacement cycle...

> Complementary observations for a full TC picture

Enhance synergies with existing observations (geostationary imagery, radiometry, scatterometry, and hurricane hunting).

RESILIENCE/ RISK MITIGATION

CLIMATE CHANGE STUDIES

MARITIME SAFETY

CYMS

Unleash the Power of SAR Imagery



OCEAN SURFACE WIND FIELD PRODUCTS

Sentinel-1-derived ocean surface wind field products acquired along hurricane forecast tracks:

Near real-time delivery for demonstrating operational use for the upcoming hurricane season

Reprocessing archive center delivering a complete, state-of-the-art and homogeneous dataset since the Sentinel-1 launch.

Foster developments for future Tropical Cyclone seasons and answer fundamental questions on Tropical Cyclone physical processes.



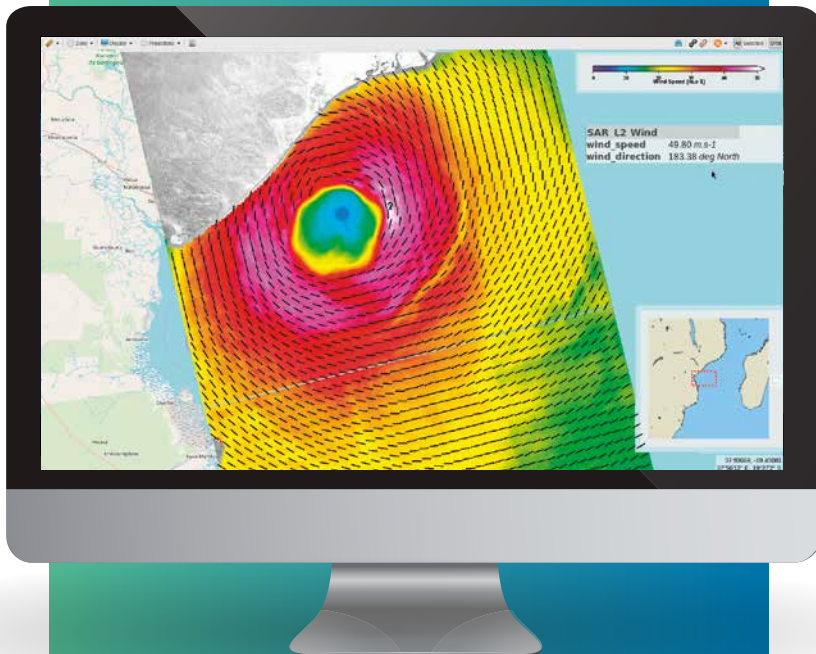
END-USER UPTAKE

Customized, validated and fully acknowledged Tropical Cyclone products
Standardized, interoperable and harmonized service



A SINGLE INTEGRATED PORTAL

WebGIS platform and archive center
High-level service presentation for the general public & decision-makers
Near real-time information
Documentation & selected publications



Ocean surface wind estimated from Sentinel-1 acquisition over Tropical Cyclone IDAI before landfall

IPCC:

Modeling studies project a likely increase in peak wind intensity and near-storm precipitation in future tropical cyclones [...] and an increase in the frequency of the most intense storms.

Up to 50 %
of Sentinel-1
planned
acquisitions
catch TC eyes

80
Tropical Cyclones
have been
monitored by
Sentinel-1 between
2016 - 2019

20 %
of the damage
and casualties
caused by natural
disasters result
from Tropical
Cyclones

Up to
category 5
hurricanes

Ocean Tropical Cyclone observations are key for extreme event monitoring & warning services. The main objective of the **CYclone Monitoring Service (CYMS)** is to first scale up an operational solution based on SAR images recorded through Sentinel-1 and second, prepare its integration into a Copernicus Service. This cutting-edge solution will enhance global meteorological services, providing a more accurate estimate of the tropical cyclones intensity. It will help decision-makers manage natural risks and protect people, goods & infrastructure.

CYMS will manage the first operational campaign maximizing ocean surface observations at very high resolution over extreme events, thereby building a unique database to trace air-sea interactions for advanced research on ocean-atmosphere coupling, a major cause of climate variability.

CYMS is an ESA project led by CLS (Collecte Localisation Satellites) and IFREMER (French Research Institute on the Ocean).

Supporting partners:

