



Surface Oceanographic Parameters Forecast for the next 10 days 11th-21st September, 2020

Introduction

The satellite remote sensing operational service focuses on the forecasting of surface oceanographic parameters at different time scale. The forecast oceanographic data parameters were retrieved from the Copernicus Marine Environment Monitoring service (CMEMS). The spatial resolution of the forecasted data is 1/12 degree daily frequency. The forecasting parameters that have been developed are:

- Sea Surface Temperature
- Sea Surface Chlorophyll Concentration
- Sea Surface Height

These oceanographic parameters are extremely significant for a wide spectrum of users ranging from fishermen to offshore industries. The forecast of sea state conditions will enable the fishermen for both deep sea and nearshore to take appropriate decisions regarding fishing area, thus an inherent economic benefit to the users of the ocean state forecast information.

KMFRI's Research Mandate

KMFRI's mandate is to undertake research in "marine and freshwater fisheries, aquaculture, environmental and ecological studies, and marine research including chemical and physical oceanography", in order to provide scientific data and information for sustainable development of the Blue Economy

Vision

A Centre of Excellence in innovative research in marine, fisheries for Blue Economy Development

Mission

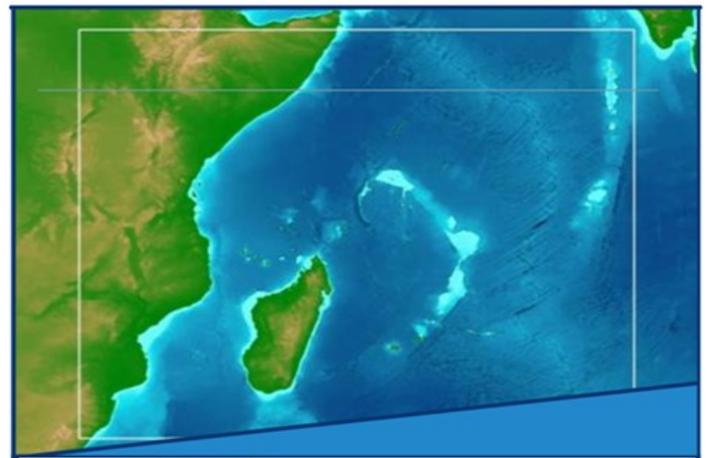
To generate and disseminate scientific information for sustainable development of the Blue Economy.

Acknowledgements

This bulletin was compiled by the Kenya Marine and Fisheries Research Institute (KMFRI). Data used for the forecast was retrieved from the Copernicus Marine Environment Monitoring Service (CMEMS). Special thanks to KMFRI management for their support in drafting this document. We also acknowledge the immense contribution received from CMEMS and Mercator Ocean.

Abbreviations

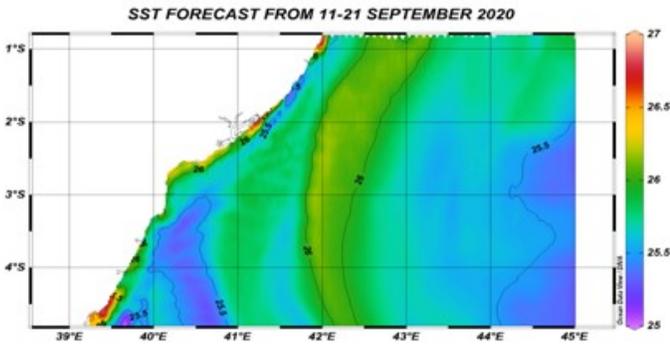
- Chl-a:** Chlorophyll a
EEZ: Exclusive Economic Zone
Geode: A reference surface corresponding to the equilibrium water level of the stationary ocean
Hs: Significant wave height
SSH: Sea Surface Height above the geode
SST: Sea Surface Temperature



Disclaimer

The Kenya Marine and Fisheries Research Institute assumes no legal liability or responsibility for the accuracy, completeness or usefulness of the information provided regardless of the cause of such or for any decision made, action taken, or action not taken by the user in reliance upon any maps or information provided herein.

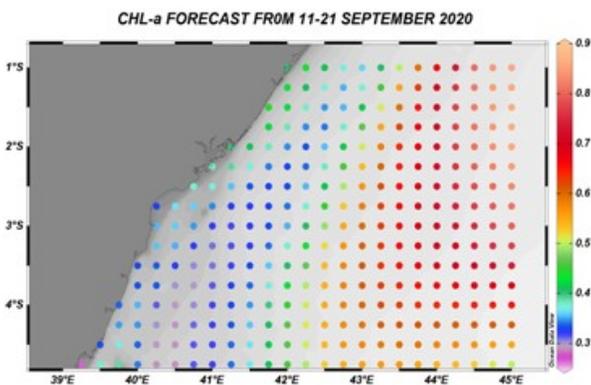
Sea Surface Temperature



Description of Environmental Indicators

1. *Sea Surface Temperature (SST)* reflects the storage of thermal energy in the upper mixed layer of the oceans. Sea surface temperature anomalies have practical applications to fisheries and coastal waters management, including coral reef monitoring and prediction of red tides or other harmful algal blooms. Phytoplankton populations are influenced by climatic factors such as sea surface temperatures and winds. The lower the sea surface temperature the higher the Chlorophyll-a concentration and the higher the fish productivity.
2. *Sea Surface Temperature Anomaly (SST Anomaly)* means a departure from a reference value or long-term average. A positive anomaly indicates that the observed temperature was warmer than the reference value, while a negative anomaly indicates that the observed temperature was cooler than the reference value.

Chlorophyll Concentration



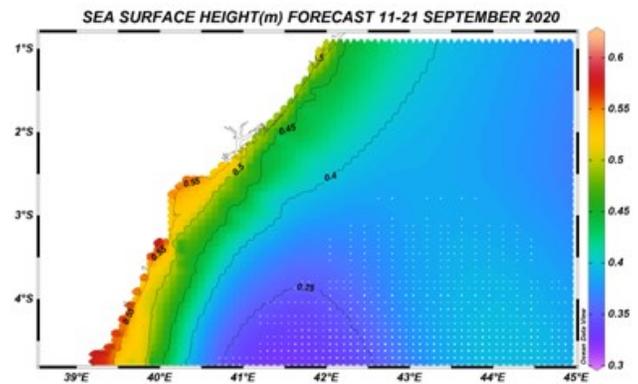
Description of Environmental Indicators

1. *Sea Surface Chlorophyll-a*: Chlorophyll a is the light-harvesting pigment found in marine microscopic

photosynthetic plants, known as phytoplankton. Its concentration is widely used as an index of phytoplankton biomass and is also used as a proxy for primary production. Chlorophyll absorbs most visible light but reflects some green and near-infrared light. By measuring what kind of light is absorbed and reflected, satellite can measure chlorophyll concentrations in the ocean, thus providing valuable insights on the health of the ocean.

2. *Sea Surface Chlorophyll-a* sometimes can be higher due to rainfall, particularly when the rain has flushed nutrients into the water, also this can occur due to upwelling systems that bring cooler water from the bottom to the sea surface.
3. From the forecast, the region from (4.8°S - 1°S, 39°E - 42.5°E) predicts sea surface chlorophyll-a that ranges between 0.1-0.5mg/l, which is a good signature for fish for the nearshore fishermen, while the region from (4.8°S - 1°S, 42.5°E - 45°E) predicts sea surface chlorophyll-a that ranges between 0.4-0.9 mg/l, which is a good signature for fish for the deep-sea fishermen.

Sea Surface Height



Description of Environmental Indicators

1. *Sea Surface Height (SSH)* is defined as the distance of the sea surface above a known reference surface, such as the earth's ellipsoid or the marine geoid.
2. *Sea Surface Height Anomaly* is the difference between the best estimate of the satellite-observed sea surface height and a mean sea surface.
3. *Significant wave height (Hs)* is defined as the average height of the highest one-third waves in a wave spectrum