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for Sustainable Development



**MERCATOR
OCEAN**
INTERNATIONAL

Ghana Meteorological Agency

Department: **Synoptic Meteorology & Forecasting**

Ministry in charge: **Communication, Digital Technology and Innovations**

Website: *meteo.gov.gh*

Country: **Ghana**



OPERA

OCEAN PREDICTION
ENHANCEMENT IN
REGIONS OF AFRICA





METAREAS



WORLD
METEOROLOGICAL
ORGANIZATION

Worldwide Met-Ocean Information and Warning Service (WMIWS)





OVERVIEW OF GHANA'S GEOGRAPHICAL FEATURES AND WATER BODIES

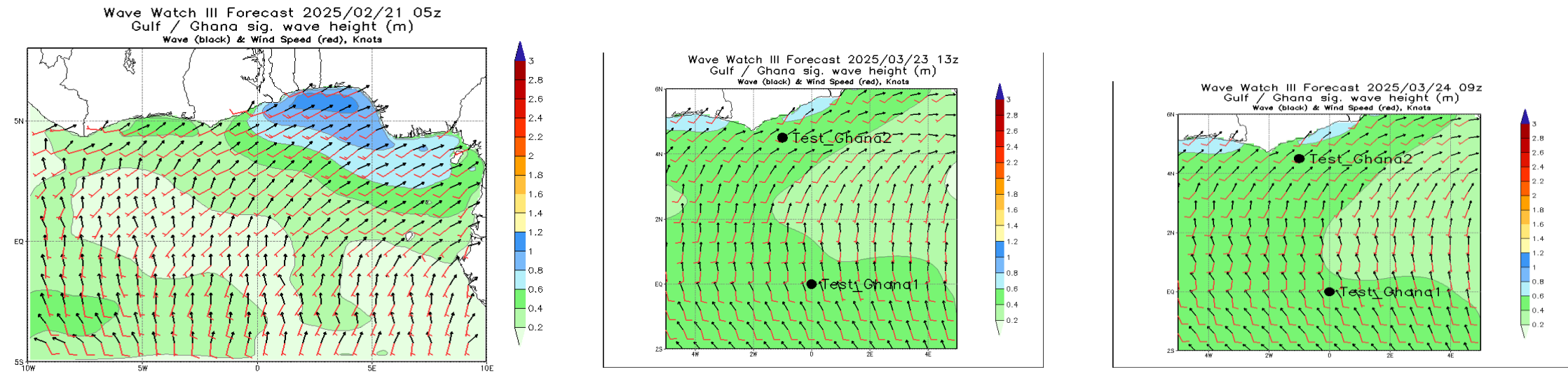


- Ghana has several significant lakes, with Lake Volta and Lake Bosomtwe being the largest among them.

Description of ocean forecasting system



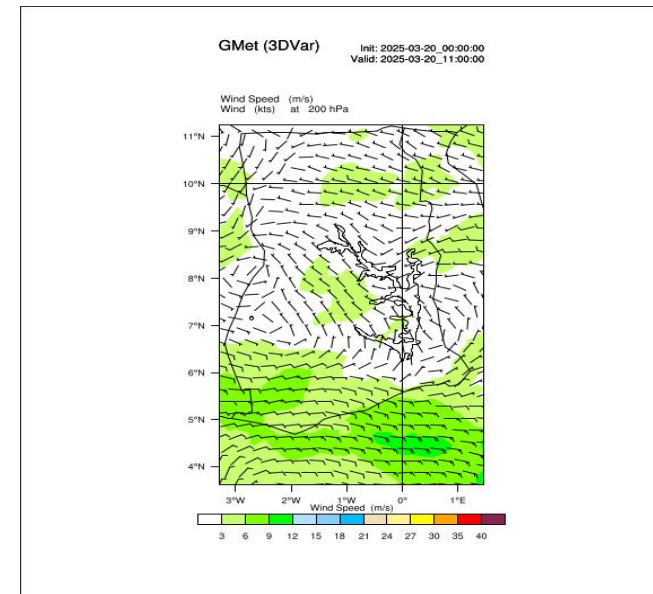
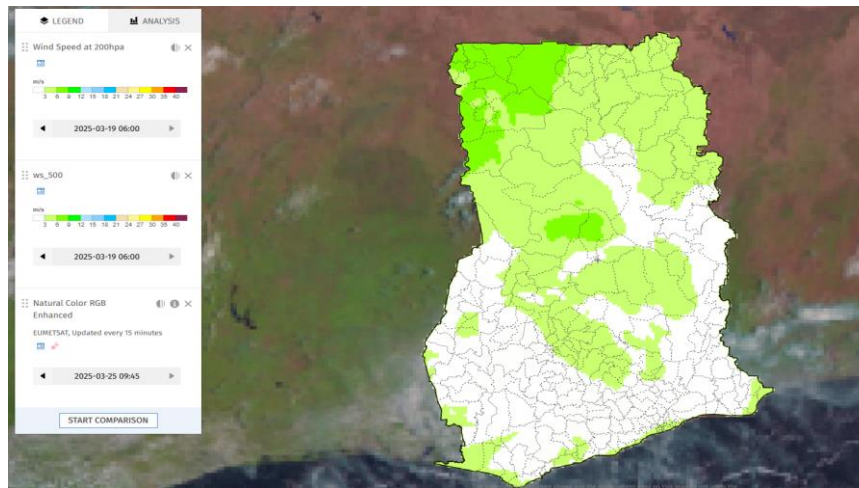
- Name of the system: *Oceanic model wavewatch3*
- Type of system: *wave & swell height and wave direction*
- Start of operation of the system: **2024**
- Describe your data sharing policy: **The forecast is generated at the NWP and sent to forecasters**



Description of marine forecasting system



- Name of the system: *Weather Research and Forecasting*
- Type of system: *Atmospheric weather*
- Start of operation of the system: **2024**
- System website (if available):
- Describe your data sharing policy: **The forecast is generated at the NWP and sent to forecasters**



Technical description



- Model employed: *Oceanic model wavewatch3*
- Resolution: *12km*
- Forcing Data: **GFS**
- Forecast horizon: **5 days forecast**



Technical description



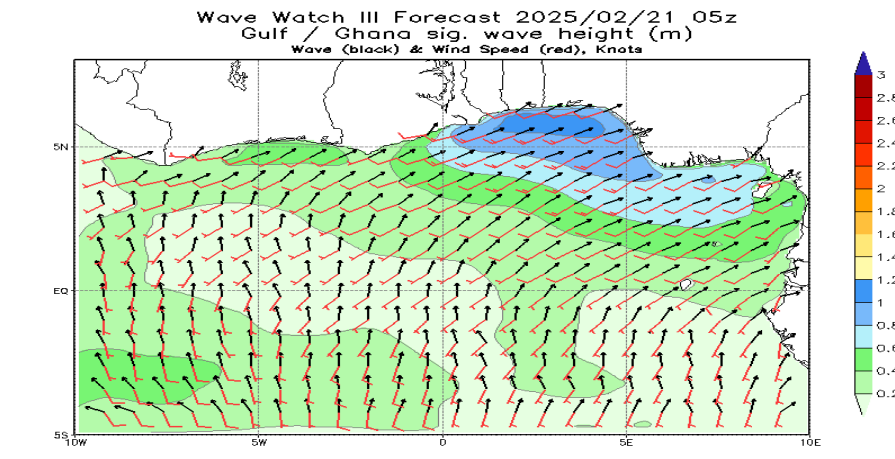
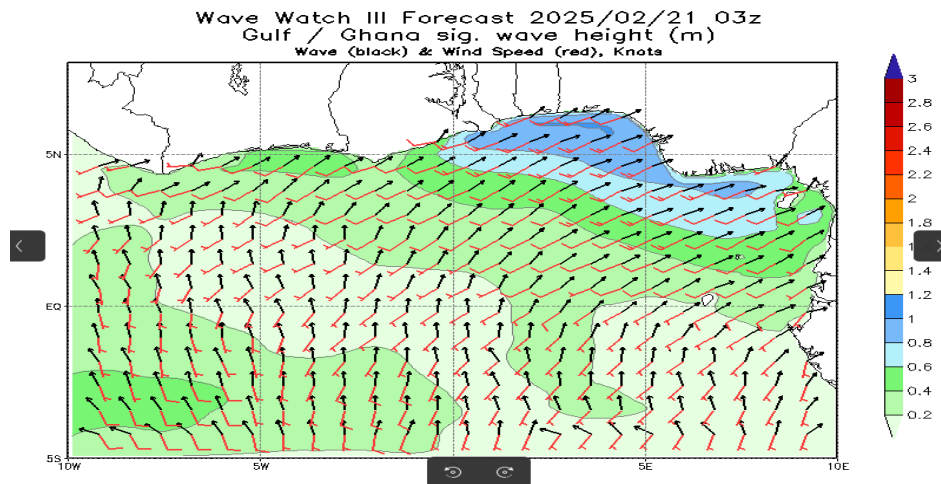
- Model employed: *WRF model*
- Resolution: *12km Outer Domain, 4km inner domain*
- Forcing Data: **GFS**
- Forecast horizon: **5 days forecast**



Description of system results



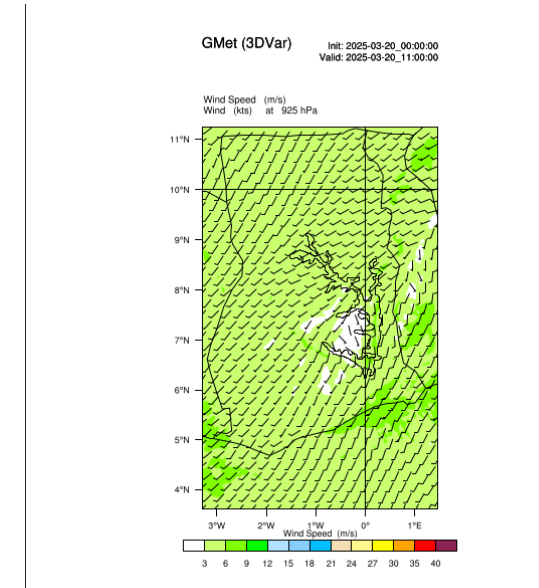
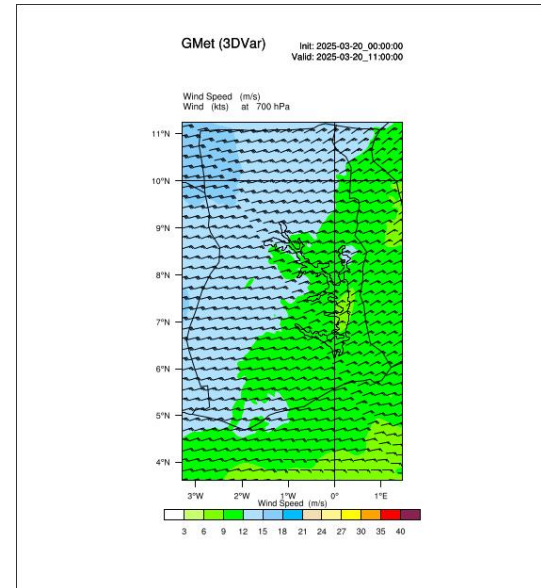
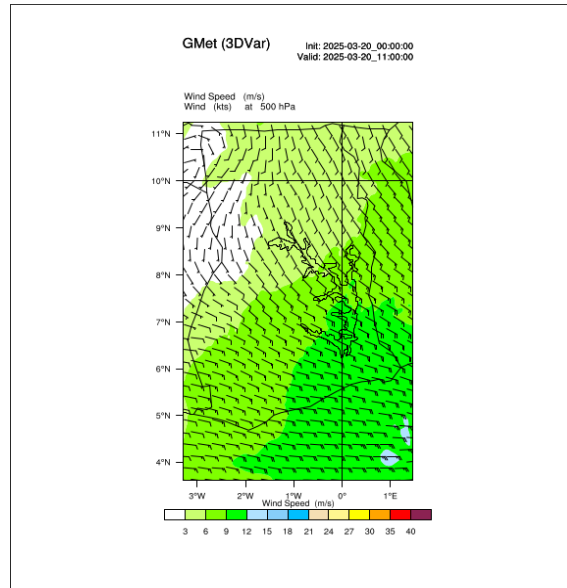
According to forecasters, the model's predicted wave heights correlate with actual measurements over the forecast period, though it tends to slightly underestimate the real wave height.



Description of system results



Model forecast wind speed and direction at various pressure levels



Validation: The model is yet to be validation due to the unavailability of grided ground data.



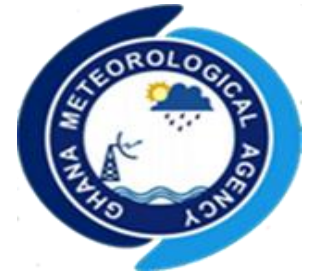
Applications



- Application areas: navigation, disaster response.
- the model forecast the wind intensity which guides Navigation and also disaster response at sea .
- Main users: Marine forecasters

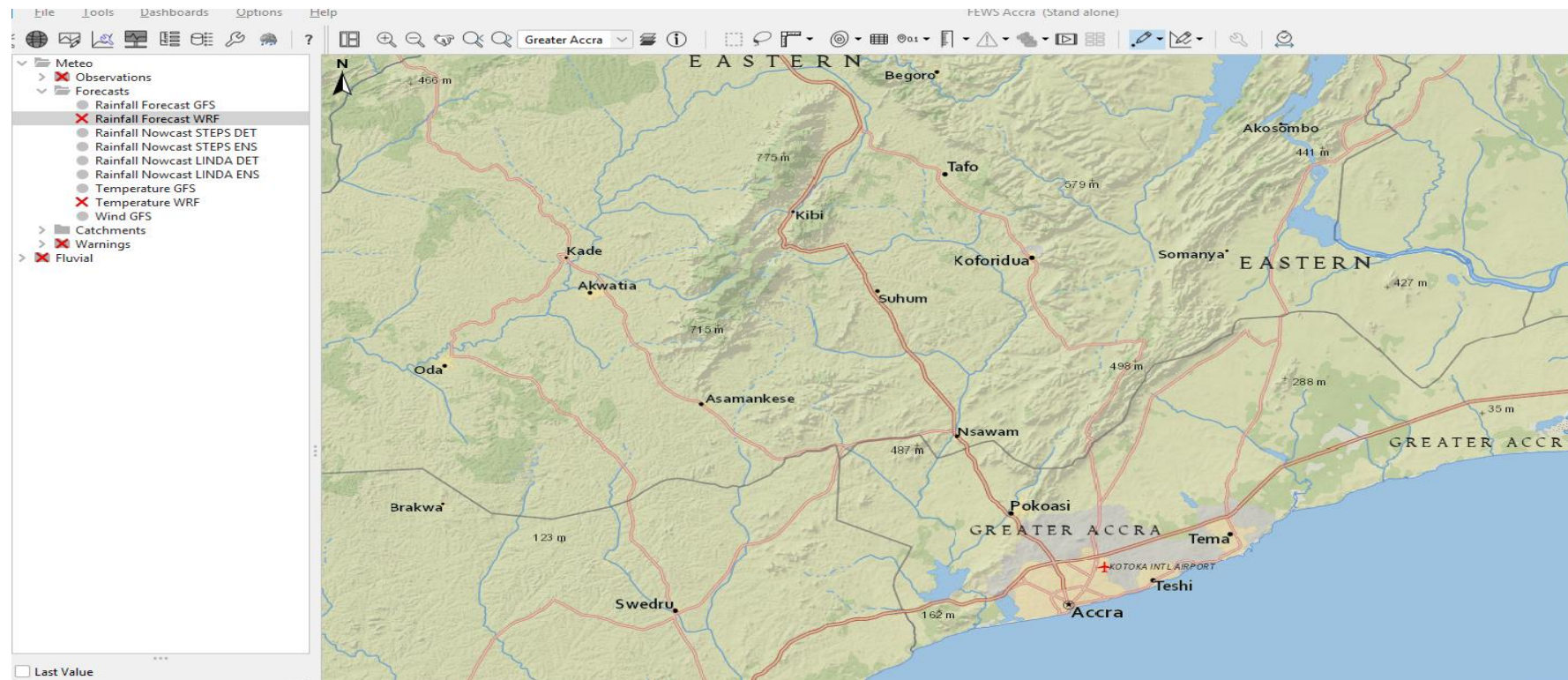


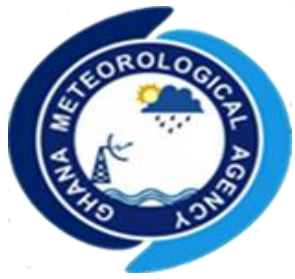
Specific examples of application



Our product is being used in myDewtra project for forecasting flood within the Volta Basin.

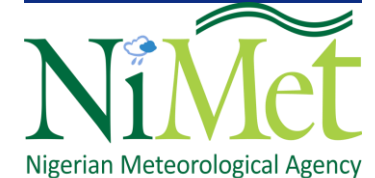
Our product is also used FEWS project for forecasting the risk of flood within the Greater Accra Region.





National and international links

- **Relevant national partners:** *World Meteorological Organization: they regulate meteorological activities to meet international standard.*
- **GMES AND AFRICA:** *they provide marine training.*
- **Regional/continental partnerships:** Togo and Nigeria meteorological offices for collaboration and co-ordination.



Future plans



- **Plans for evolution of your system:** *running the model at a finer resolution for a longer forecasting period: weekly, monthly and seasonally.*
- **Limitations/challenges:** Limited observational data, particularly from buoys, over West Africa especially Ghana coastline, makes data assimilation for improved forecasting challenging. *improving computational power to run the models at a finer resolution, experts training needed for running other oceanic models like SWAN.*