



The Abdus Salam  
International Centre  
for Theoretical Physics



## 2018 Coastal Ocean Environment Summer School in Ghana (COESSING)

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### Evaluation of the Reg CM-ES (Earth System Regional Climate Model) in the Northern Gulf of Guinea Coastal Upwelling System

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- Main Objective
- The coastal upwelling in the northern Gulf of Guinea
- Reg CM-ES Coupled Ocean Atmosphere Model
- Observation data
- Temperature variability in the GGCUS

Evaluate the capability of the Model in representing the SST's condition in the GGCUS

Assessing the performance of the coupled regional model against observations in the Gulf of Guinea

- Climatology of sea temperature and the Seasonal Variability
- What mechanisms explain these performances or weakness of the model in this area

# Coastal upwelling in the Gulf of Guinea

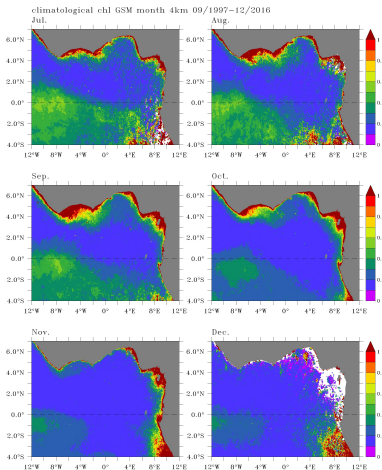


Figure 1 – *The Chlorophyll a Concentration*

# Earth System Regional Climate Model

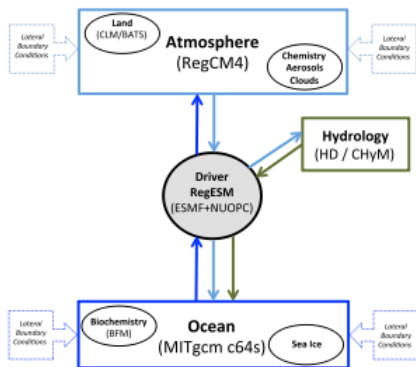


Figure 2 – The Reg CM-ES Components

- Satellite AVHRR
- Satellite SST TMI
- Reanalysis ORAP-5
- Absolute Topography Dynamics Topex-Jason
- NCEP/NCAR Reanalysis data
- Satellite surface wind data

# I. Variability of surface and subsurface Temperature in the Northern GGCUS

- Climatology
- Seasonal Variability

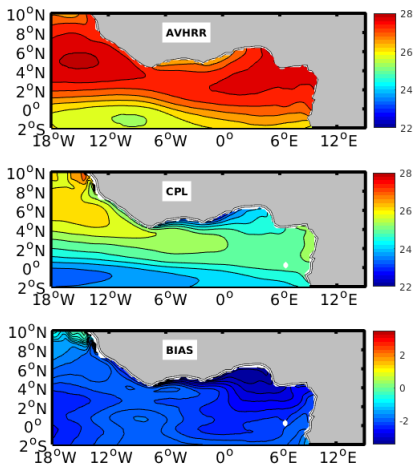


Figure 3 – Climatology of sst (panel above : Glorys, middle : Model, Below : Bias). Maximum biases in the Gulf of Guinea



# Seasonal Variability

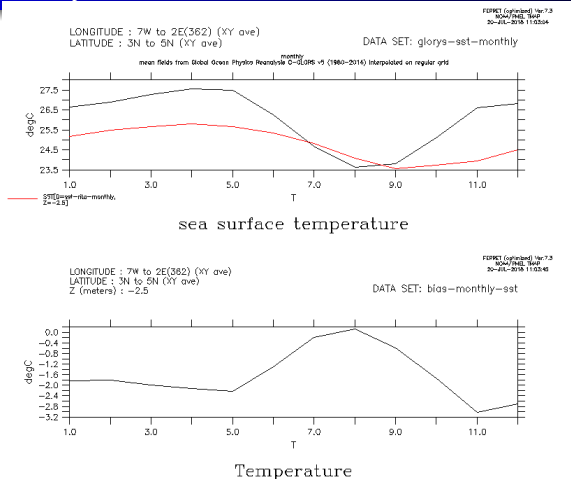


Figure 4 – Climatology of sst (Time series of SST (Red=Model, Black=Observation)). The model underestimates the values of SST during the whole year. We observe seasonal decreasing of SST associated with the coastal upwelling.

# Depth profile of the temperature

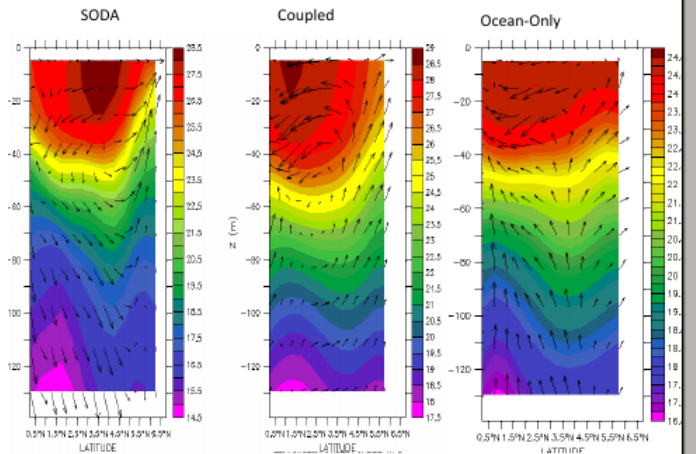


Figure 5 – *Depth versus latitude*

- negative biases the whole year
- model characterizes the coastal upwelling
- The SST during the upwelling season is well represented
- the biases are reduced during the upwelling season
- the minimum values of SST during upwelling is observed one month later
- The coupled model is improved than the Ocean Only

## NEXT : Try to understand the biases ?

- Atmospheric Processes
- Oceanic Processes

THANK FOR YOUR  
KIND ATTENTION