# Impact of Model Resolutions on Indian Ocean Simulations
# From Global NEMO Ocean Model

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A relatively newer version of Nucleus for European Modeling of the Ocean, NEMO, (v3.2) ocean model was configured recently on a high performance computing system at NCMRWF. These initial global model simulations were examined at two different resolutions –a coarser resolution (2x2 with 31 vertical layers) and another at a higher resolution (1x1 with 42 vertical layers) with climatalogical observed forcings. Sea surface Temperature (SST), Sea Surface Salinity (SSS), 20 degree isotherm depth (D20), heat content in upper 300 mts (HC) and surface currents from both coaser and higher resolution model versions were examined for different regions of the Indian Ocean for typical summer (July) and winter (December) periods including the annual cycle. For SST, D20, HC, SSS and summer surface currents, generally the higher resolution version is seen closer to observations and has lesser biases. Simulated annual cycle as seen through SST and SSS at three different typical regions of Indian Ocean are simulated well, with lesser bias in the higher resolution version. However, near head Bay of Bengal and Northern Arabian Sea regions the low SST is not simulated well in the model. Mini cold pool near southern tip of Indian peninsula is also not simulated well. In the equatorial Indian Ocean region, the model has difficulty in simulating the annual cycle even with the enhanced resolution. In the higher resolution version, the surface currents near equator during winter is seen to be very high compared to observations.

[Key Words: NEMO Ocean model, Indian Ocean Simulation, Coupled Modeling, Monsoon, Air-Sea Interaction]