How do subsurface sea temperatures vary inter-annually in the tropical Western Indian Ocean off the East African Region?

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Much studies on subsurface temperature have been conducted in the southwestern Indian Ocean where such subsurface temperature influences on sea surface temperature (SST); consequently, impact living resources, weather and climate variability over the region. However, no clear study of the subsurface variability in the ocean off East Africa has been conducted. This study applies a regional ocean model to study inter-annual variability of the subsurface temperature between the East African shelf and offshore. Over the region with the strongest SST variability in the offshore region lies over high subsurface temperature variations located between 30 and 130 m being related to strong variations in the thermocline depth. Such thermocline variations are associated with strong interannual variability associated with El Niño-Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD) events. However, the lowest SST variations in the East African shelf waters lie over the subsurface waters with the smallest temperature variations in the upper 200 m. Such SST variations match with weak variations in the thermocline depth being mainly related to local forcing. This knowledge is very important for climate and marine living resources particularly for planning and management of climate sensitive activities in the East African marine ecosystem region.