

**Oceanic Mixing over the Northern Arabian Sea in a Warming Scenario:  
Tug of War between Wind and Buoyancy Forces**

Scientists at the Indian Institute of Tropical Meteorology (IITM) and York University, Abu Dhabi conducted a new collaborative study using a set of high-resolution regional ocean model downscaling experiments for the present and future climate and report on oceanic mixing between the Tug of War between the wind and the buoyancy forces over the northern Arabian Sea in a warming scenario. Scientists found that the air intensity caused by the change in low-level jet (LLJ) tends to counteract the stratification achieved by surface oceanic warming and maintains the mixing process in a warming scenario. The mixing energetics sheds light on how this is achieved. Intensified winds promote shear production and surface ocean warming demotes buoyancy production of turbulent kinetic energy (TKE), with a net effect of an increase in TKE.

Despite the increase in oceanographic stratification, turbulent mixing continues in northern Arabian Sea due to the contribution of changes in wind intensity, which also increases upward along the Arabian coasts.

Combined with enhanced mixing, Northern Arabian Sea will compensate for some warming effects in the future. This study also reiterates the importance of incorporating atmospheric responses and spatial inhomogeneity while anticipating future changes in the ocean. Because northern Arabian Sea is a hot spot for productivity sensitivity, the supplementation of nutrients by a mixture prevalent in the twenty-first century adds another approach to the region's projection of climate change.