



Prof. Dr. Lisa Beal

Professor of Ocean Sciences, Rosenstiel
School of Marine and Atmospheric Science,
University of Miami, U.S.A.



Following the
lecture, the WEB in-
vites anyone interested
in talking to Prof. Beal
to stay for some discus-
sion with coffee and
biscuits!

“IT WAS VERY EXCITING IN THOSE DAYS.
WE WERE EXPLORERS.”

Marie-Tharp [1920-2006], Oceanographer

Tuesday, 3rd September, 2019, 11:00 a.m. [11:00h]

GEOMAR Lecture Hall West (R.54) | Düsternbrooker Weg 20, 24105 Kiel

Western Boundary Currents in a Changing Climate: A Case Study of the Agulhas Current

Western boundary currents, like the Agulhas Current in the Indian Ocean, carry heat poleward, moderating Earth’s climate and fuelling the mid-latitude storm tracks. They could exacerbate or mitigate warming and extreme weather events in the future, depending on their response to anthropogenic climate change.

Climate models show an ongoing poleward expansion and intensification of the global wind systems, most robustly in the Southern Hemisphere, and linear dynamical theory suggests that western boundary currents will intensify and shift poleward as a result. Observational evidence of such changes comes from accelerated warming and air–sea heat flux rates within all western boundary currents, which are two or three times faster than global mean rates. Despite these expectations, a proxy of Agulhas Current transport, built from an array of moorings combined with satellite altimeter data, shows that the Agulhas Current has not intensified since the early 1990s. Instead, we find that it has broadened as a result of more eddy activity. Recent analyses of other western boundary currents—the Kuroshio and East Australia currents—hint at similar trends. These results indicate that intensifying winds may be increasing the eddy kinetic energy of boundary currents, rather than their mean flow. This could act to decrease poleward heat transport, in contrast to the climate model predictions. Sustained in situ measurements are needed to properly understand the role of these current systems in a changing climate.