

National Award for Ocean Science & Technology

Dr. Doraiswamy Shankar



Dr. D. Shankar has made significant contributions to the physical oceanography of the Indian Ocean. He has addressed problems in ocean dynamics using simple models, providing elegant, yet quantitative, explanations for the observed circulation. In all his studies, one can see a blend of observation and theory. This blend of observations, physics, and simple models makes his work unique in India.

The 1990s saw a marked improvement in the understanding of the circulation in the north Indian Ocean (NIO) and Dr. Shankar played a significant role in the evolution of the theoretical framework. He elucidated the processes that force the boundary currents in the Indian EEZ and the monsoon currents, which are the most conspicuous feature of the large-scale circulation in the NIO.

Dr. Shankar played a key role in setting up a project, which he currently leads, under which moorings equipped with acoustic Doppler current profilers (ADCPs) were deployed on the shelf and slope off the Indian east and west coasts. Data from the ADCP moorings on the shelf off the west coast led to first quantitative analysis of the shelf current off the Indian west coast. The results of these papers demonstrate remote forcing of currents in near-coastal waters even at short periods and have implications for the environmental impact assessments in the coastal zone.

Dr. Shankar has applied his insight into tropical ocean dynamics to sea-level variability, ocean-atmosphere interaction, and the ecosystem response to the monsoonal forcing. In his PhD thesis and related papers, Shankar postulated a new hypothesis on the factors that control the long-term sea level along the coast of India, showing that the interannual to interdecadal changes in coastal sea level are influenced by monsoon rainfall. This interannual to interdecadal variability of sea level is also important in estimating the long-term sea-level trends from tide gauges. Using altimeter data, he showed that variability at a period of 18 months or more almost vanishes in certain regions of the Indian Ocean owing to simple linear dynamics.

Shankar played a significant role in formulating the ocean component of the Arabian Sea Monsoon Experiment (ARMEX) and led two of the of the four ARMEX cruises. The results of ARMEX emphasise that the ocean plays an active role in the air-sea interaction in the region. He also coordinated the ocean-atmosphere component of the Continental Tropical Convergence Zone (CTCZ) programme and led the 2012 cruise in the southern Bay of Bengal. Data from this cruise have been used to prove the existence of Persian Gulf Water and Red Sea Water throughout the bay, resolving an issue that dates back to the IIOE in the 1960s.

Ocean dynamics also has a major role to play in the biogeochemistry and ecosystem dynamics of the NIO. The nature of the fisheries changes along the west coast of India. Dr. Shankar has shown that the physical forcing and its seasonal cycle can explain some key observations: the dominance of planktivorous fish like sardines off Kerala and of carnivorous fish like Bombay Duck of Gujarat, the lower productivity of the central west coast of India compared to Kerala, and the change from sardine dominance off Kerala to

mackerel dominance off Karnataka and Goa. Shankar continues to apply his insights into ocean dynamics and is currently part of a major trans-disciplinary project linking oceanic processes and fisheries.

In recognition to his outstanding research contributions in the field of Ocean Science and Technology the Ministry of Earth Sciences honours Dr. D. Shankar with the “National Award in the field of Ocean Science and Technology” for the year 2019.