WAMSI Biannual Progress Report to 31 May 2007 for *WAMSI Node 2 Project 2 (WAMSI Code 2.2):*

Dynamics and impact of the Leeuwin Current on the marine environment off Western Australia

Executive Summary

The "Dynamics and impact of the Leeuwin Current on the marine environment off Western Australia" project has successfully achieved its objectives for the first year. In January 2007, the research strategy of the project was discussed and refined at a joint research workshop among the project leaders of WAMSI Node 2 and the Commonwealth Marine and Tropical Science Research Facility (MTSRF) research team. A close collaboration between WAMSI, MTSRF and the CSIRO Wealth from Ocean Flagship BLUElink project has been formed. Highlights of the research include a preliminary study of the ocean heat budget within 9°S-6°N in the tropical Indian Ocean based on the French CNRM-CM3 coupled model, in order to understand the sea surface temperature warming trend in the tropical Indian Ocean observed over the last four decades. A long-term change in the temperature structure of the Indonesian Throughflow has been detected using historical data and the net volume transport of the Indonesian Throughflow is estimated to have decreased by more than 20% since mid-1970s. These changes are likely due to the reduction of the trade winds in the equatorial Pacific which has induced shallower thermocline depths in the southeast Indian Ocean. The long-term trends in the Leeuwin Current system and their potential drivers have been reviewed. A PhD project on "Cross-shelf transport induced by meso-scale eddies of the Leeuwin Current" has been set up with Murdoch University and the characteristics of a Leeuwin Current warm-core eddy and eddy-induced cross-shelf transport of finfish and invertebrate larvae are being determined using data collected from a 2006 *Southern Surveyor* cruise.

These are only preliminary findings in the first year of a five year program.