Ocean study explores link with Australian rainfall

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A five-nation oceanographic team is taking the first steps in a $3.6 million project studying the major flow of ocean currents between Asia and Australia and how they influence rainfall across Southern Australia and Indonesia.

Scientists are investigating fluctuations in the flow of warm waters from the western Pacific Ocean draining through the Indonesian Archipelago into the Indian Ocean north of Australia.

"Our climate, and particularly the amount of rainfall across the country, is regulated by the oceans around Australia," says CSIRO's Dr Susan Wijffels.

"Through new satellite and sub-surface technologies we are gradually building a picture of these key influences on rain-bearing cloud band systems in the eastern Indian Ocean. Over the next three years we hope to understand the variations that occur to the flow of currents including any effects of El Nino and La Nina events," Dr Wijffels says.

Dr Wijffels is co-leader of the project, called INSTANT. Sub-surface ocean monitoring equipment valued at more than $2 million has been moored at strategic 'choke' points across the entry of the currents into Indonesia waters, and their exit to the Indian Ocean through Lombok and Ombai Straits and Timor Passage.

Partially funded by the Australian Greenhouse Office and CSIRO, the

array of tidal gauges and ocean moorings will sample pressures, currents, temperature and salinity and provide a record of changing conditions.

Dr Wijffels says the INSTANT science team, comprising US, French, Dutch and Indonesian scientists, has successfully deployed highly sophisticated measuring instruments in the straits from the Indonesian research vessels, Baruna Jaya I and VIII.

She says the data collected will be compared with simple models and computer simulations of the tropical oceans, and the way the oceans then interact with the atmosphere.

"The atmosphere is very sensitive to the distribution of warm waters near the equator. In our region two large warm water pools exist - in the Western Pacific and Eastern Indian Ocean.

"We believe the exchange of warm low salinity water between the Pacific and Indian Oceans through the Indonesian passages will yield critical information on how these two 'pools' of warm water in our region interact."

Dr Wijffels says it will be at least 18 months before scientists can retrieve the information obtained from the ocean instruments, which are sub-surface and will be serviced and redeployed by the INSTANT team using Indonesian ships in 2005.

Indonesian participation in the project will also have broad benefits, according to joint project Director, Dr Ir. Indroyono Soesilo, of the Indonesian Agency for Marine and Fisheries Research.

"Improved climate predictions will benefit many people living in areas affected by El Nino/La Nina and the Asian-Australian Monsoon," Dr Soesilo says.

"The Republic of Indonesia is strongly affected by these phenomena, and will be able to use the model projections to make informed management decisions regarding agricultural, water and fisheries resource issues and prepare for climate-related forest fires.

"Measurements of the way these waters mix in regions such as the Flores and Banda Seas will provide an important understanding of the processes that sustain fisheries stocks in these seas."

Dr Tony Haymet, Chief of CSIRO Marine Research, emphasises that the INSTANT team research is both an important international research project in its own right, and also a key step in the steady expansion of CSIRO's research with partners in the oceans north and west of Australia.

Australia has an extensive oceans and climate research program, particularly in the Indian and Southern Oceans, and participates in many international monitoring projects such as the global float array Argo.

Source: CSIRO

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