instrumentation

URI OCEANOGRAPHERS MEASURE WINDS FROM OCEAN BOTTOM

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University of Rhode Island oceanographers are going to the bottom of the ocean to measure wind speeds.

Dr. David L. Evans and Dr. D. Randolph Watts, URI physical oceanographers, have developed an instrument which, placed on the sea bottom, measures ocean background noises caused by the wind.

"It has been known for years that both wind and rain produce high frequency background noises in the ocean. Our experiments show that anywhere in the ocean we can measure this background noise and determine wind speed at the ocean surface," Dr. Evans told scientists at an American Geophysical Union meeting in Washington D.C.

The oceanographer explained that the instrument they deelped, called WOTAN (Weather Observations Through Ambient Noise), is basically a hydrophone which "listens" to noise at three frequencis, 4.3 kHz, 8kHz, and 14.5 kHz. "To distinguish wind from rain, we compare noise at two frequencies since noise caused by rain will be the same at each frequency while wind-caused noise levels will differ," Dr. Evans explained.

WOTAN was developed by the two URI oceanographers after initial tests conducted by URI graduate student P. T. Shaw in 1977 indicated that wind speed and background noise levels in the ocean were related. The instrument was tested last summer off Scotland during a joint U.S.-European study on air-sea interactions. "Our results show that records from the instrument, placed on the sea floor a mile and a half below a surface wind speed indicator, match the surface wind speed record," Dr. Evans stated. Currently the instrument is being used in a similar experiment in the equatorial Pacific.

Dr. Evans foresees WOTAN becoming a useful tool for oceanographers who study how winds transfer energy into the ocean and thus drive ocean currents. "Historically wind speed has been measured from a ship or by a moored instrument, neither of which is an inexpensive, reliable or accurate method. In contrast, WOTAN can stay on the bottom where conditions are not as harsh so it lasts longer, it is simple in concept, and inexpensive to build," he explained.

Investigations into improving the technique of matching wind speed and background ocean noise are continuing by Dr. Evans and Dr. Watts who are now trying to find a way to determine wind direction from the same instrument. "In equatorial areas, we can combine satellite photographs of low level clouds with the WOTAN measurements, but we need to discover another way to tell wind directions further north," Dr. Evans concluded.

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