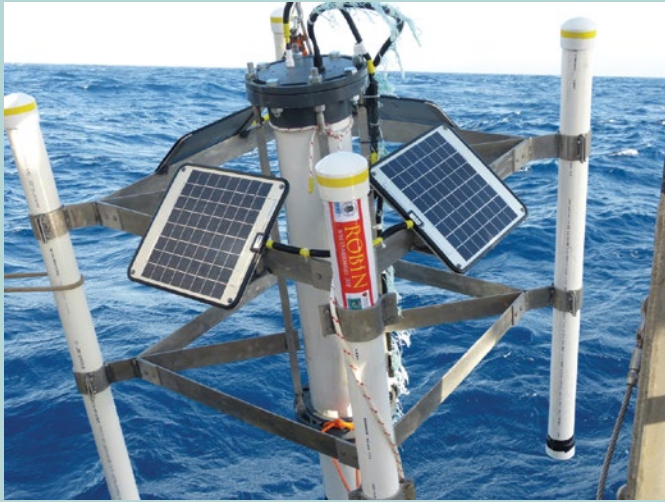


PHOTO BY FREDERIK SIMONS



Son-of-MERMAID

takes to the waters

SEISMIC WAVES CAUSED BY EARTHQUAKES can tell us a lot about the makeup of the Earth's crust and mantle. Yet we lack seismic readings from the regions under the world's oceans, which cover 70 percent of the planet's surface. To address this data gap, Associate Professor of Geosciences Frederik Simons and colleagues developed ocean-going autonomous buoys called MERMAIDs (Mobile Earthquake Recording in Marine Areas by Independent Divers) and, in a paper published on Aug. 20, 2015, in *Nature Communications*, reported that the divers can recognize earthquakes and transmit seismograms more or less in real time.

The divers are equipped with a hydrophone to detect acoustic signals generated by seismic waves. The MERMAID drifts as deep as 2,000 meters under the surface until it detects an earthquake. Then it ascends to transmit the recorded waveform and its GPS position.

Simons and colleagues at the University of Rhode Island are now working on the next-generation buoy, which they call Son-of-MERMAID. After its maiden voyage three years ago was disrupted by Hurricane Sandy, the float is once again being tested and will be ready for deployment in the next few months. Compared to its progenitor, the new float has better position awareness and real-time communication capabilities because part of the instrument is always above water, and, in addition to batteries, has solar panels that power a vertical array of hydrophones.

The research is supported by the A.H. Phillips Instrument Fund at Princeton University and by the National Science Foundation. **—By Catherine Zandonella**

Measles may weaken

immune system up to three years

THE MEASLES VIRUS can lead to serious disease in children by suppressing their immune systems for up to three years, according to a study published in the journal *Science* on May 8, 2015.

The study provides evidence that measles may throw the body into a much longer-term state of “immune amnesia,” where essential memory cells that protect the body against infectious diseases are partially wiped out. This vulnerability was previously thought to last a month or two.

“We already knew that measles attacks immune memory, and that it was immunosuppressive for a short amount of time. But this paper suggests that immune suppression lasts much longer than previously suspected,” said C. Jessica Metcalf, co-author and assistant professor of ecology and evolutionary biology and public affairs, who is affiliated with Princeton's Woodrow Wilson School of Public and International Affairs.

The research findings suggest that — apart from the major direct benefits — measles vaccination may also provide indirect immunological protection against other infectious diseases.

The work was funded by the Bill & Melinda Gates Foundation, the Science and Technology Directorate of the Department of Homeland Security, and the Research and Policy for Infectious Disease Dynamics (RAPIDD) Program of the National Institutes of Health's Fogarty International Center. **—By B. Rose Huber**



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