SCHMIDT OCEAN INSTITUTE

Press Release

FOR RELEASE
Monday August 17, 2015

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Researchers return with latest El Niño data from the central equatorial Pacific

An international team of scientists led by researchers from the University of Hawai'i at Mānoa arrive into Honolulu after studying small scale ocean mixing under El Niño conditions aboard Schmidt Ocean Institute's research vessel Falkor.

The timing could not have been more perfect for this expedition, as Dr. Kelvin Richards, oceanographer at the University of Hawai'i at Mānoa, and his team return from a three-week research cruise in the central equatorial Pacific during strong El Niño conditions. The expedition aboard research vessel *Falkor* left Majuro, Marshall Islands in late July and completed an 11-day time-series at the equator, giving these researchers their first view of the water profile in this region.

The science team, led by Richards, has completed similar water profiling in the western equatorial Pacific region. However, this is Richards' first time moving to the central Pacific, and if the team sees similar mixing trends to that of data collected from previous western Pacific cruises, then they will continue to move further eastwards with future work.

Recent research suggests that small scale turbulence in the ocean plays a critical, and to a certain extent overlooked role in large ocean processes like El Niño. Accurately modeling how the ocean absorbs and moves heat is among the greatest challenges for climate change modeling, and forecasting of El Niño Southern Oscillations (ENSOs).

The ocean helps to regulate the earth's temperature with the movement of heat through vertical mixing in the ocean layers. However, ENSO alters regular ocean temperatures with anomalously warm or cold water bands that are developed off the western coast of South America, causing climatic changes across the tropics and subtropics. The movement of ocean heat is especially important in understanding ENSOs, which spawn weather shifts such as flooding in relatively dry regions of the western U.S., droughts in typically wetter regions in the western Pacific, and the lessening of trades and warmer temperatures in Hawai'i.

From the water profiles collected, the data indicates that there are indeed mixing patterns. Dr. Richards explains, "We are seeing small vertical scale features in the shear present here and perhaps even stronger than in the west, giving an indication that these features are important in turbulent mixing." The features that Dr. Richards alludes to are produced by a combination of factors including wind blowing across the surface of the ocean. "We are seeing that the equatorial region is a special place for the production of these small vertical scale velocity structures and mixing".

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This expedition comes after six successful collaborative research cruises with the Schmidt Ocean Institute and University of Hawai'i. Several projects completed in 2014 have already had meaningful impact including two extensive mapping cruises in the Papahānaumokuākea Marine National Monument, which led to the discovery of several new fish species. "Schmidt Ocean Institute is delighted to support this important research with significant implications for our understanding of how small scale mixing processes in the ocean are interconnected with the global climate change." says Victor Zykov, Director of Research for Schmidt Ocean Institute.

Research vessel *Falkor* will be in Honolulu through the summer and departs in early fall for another significant mapping cruise, sailing to Tamu Massif, the world's largest underwater volcano located about 1000 miles east of Japan. Tamu Massif is a unique undersea geographic formation, and the science team plans to explore the key interactions it has with the mid-ocean ridges using multibeam mapping systems and a marine magnetometer. For more information about this and future expeditions, visit http://www.schmidtocean.org.

Pictures and b-roll available here.

Schmidt Ocean Institute was created by Eric and Wendy Schmidt in 2009 to enable research that expands understanding of the world's ocean using advanced technology, intelligent observation, and the open sharing of information. Annually the organization invites select scientific teams from around the world to carry out collaborative oceanographic research and technology development aboard its 272-foot research vessel, Falkor, launched in 2012. For more information please visit www.schmidtocean.org.

The School of Ocean and Earth Science and Technology at the University of Hawai'i at Mānoa was established by the Board of Regents of the University of Hawai'i in 1988 in recognition of the need to realign and further strengthen the excellent education and research resources available within the University. SOEST brings together four academic departments, three research institutes, several federal cooperative programs, and support facilities of the highest quality in the nation to meet challenges in the ocean, earth and planetary sciences and technologies. www.soest.hawaii.edu

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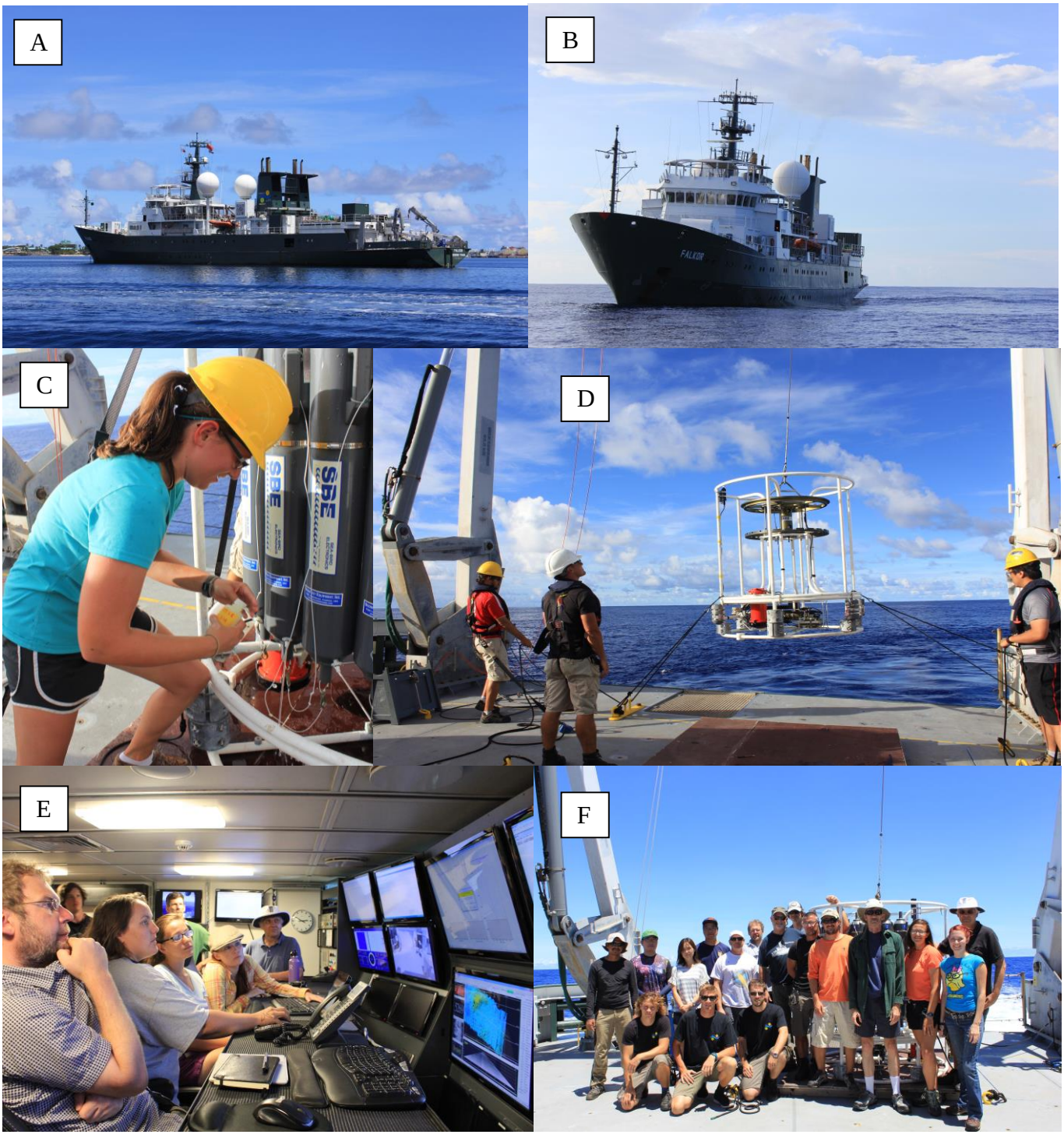

Clockwise: a/b) Research vessel *Falkor* sailed from Majuro, Marshall Islands to Honolulu over a three week period across the central Pacific equator; c) Student participant Julianna Diehl collects water samples from the central equatorial Pacific; d) *Falkor* crew and scientists deploy the CTD to collect water samples at the equator; e) The science team watches the CTD live from the control room on board *Falkor*; f) The science team and some of the *Falkor* crew. All photo credits: SOI/ Carlie Wiener.