L'Oreal-UNESCO Women in Science Fellow - Christina Riesselman

Christina Riesselman (far right) discusses her research at the L'Oreal-UNESCO For Women in Science awards ceremony in Sydney. Seated are the Australia fellows Jodie Rummer, Muireann Irish, and Shari Breen.

Dr Christina Riesselman is a paleoceanographer from the University of Otago, and the winner of the inaugural $25,000 one-year L'Oreal-UNESCO for Women in Science New Zealand Fellowship.

These prestigious fellowships have been supporting early career women scientists around the world, and 2015 marks the first year that a dedicated fellowship has been available for New Zealand researchers.

Watch a 3 minute YouTube video of Christina on campus and at sea, talking about her research

Below are impressive "action" photos, and an explanation of Christina's exciting research:

Much of Christina's research takes place on Antarctica's ice shelves and at sea. She works with "cores" of sediment collected from the sea floor of the Southern Ocean, analysing the microscopic fossils that accumulate in an oozy belt that encircles the continent. This sediment, she says, "reveals the cycle of life and death in prehistoric Antarctica. The sediments are mostly made of the glass-like shells of diatoms, microscopic plants that form a large part of the plankton in the Southern Ocean. And these fossils can tell us much about the iciness, temperature, and chemistry of the oceans in which they grew."

The L'Oreal UNESCO fellowship will enable her to focus specifically on the end of the last Ice Age, which was approximately 11,000 years ago. She will study Antarctica's climate since the ice began to retreat – a period of rapid climate change, during which the sea rose to modern levels – by looking at sediment cores from that period.

Big questions like these are collaborative by nature: in addition to colleagues from New Zealand, Korea, and the U.S., Christina has a great team of current and former Otago students contributing to this work .

Rebecca Parker (BSc Geology & Geography 2014 (MSc Geology, 2016) joined Christina on a Korea Polar Research Institute expedition to the Ross Sea in January and February, when

many of the cores were collected from aboard the research ice breaker Araon; her MSc thesis focuses on the history of the McMurdo Sound region near Ross Island.

Greer Gilmer (PhD Geology, 2018) is developing a high-resolution reconstruction close to the front of a calving glacier further north in the Ross Sea, while Christine McLachlan (BSc Geology, 2012; MSc Marine Science, 2015) is employed as a research assistant to develop records from the East Antarctic margin and Southern Ocean.

While climate change due to natural factors is often a slow process, the planet warmed rapidly at the end of the last ice age. Today, the planet is again experiencing rapid climate change, this time at a rate that is unprecedented in the geologic record. By focusing on the most recent interval of warming, Christina's work not only helps us to understand past climate change, but in turn helps us to better understand our planet's changing climate now, and for the future.

While Christina gained her PhD in the USA at Stanford University, she is now a lecturer at the University of Otago, in a position shared between the Department of Geology and the Department of Marine Science. Alongside her research into the Southern Ocean and climate change, she is also the course co-ordinator for the first year paper, Introduction to Earth and Ocean Sciences, and for the third year paper Marine Geology and Geophysics, which anchors the geology thread of Otago's **new BSc in Oceanography**.

Christina and her student, Amanda McLenon, examine a sample collected from the boundary between the seafloor below and the ocean above. These soupy "sediment-water interface" samples capture particles that have just settled to the seafloor, and can help build links between modern environments and the sediment record. Image courtesy of Rachel Stevens.

Christina and her student, Rebecca Parker, sailing from Jang Bogo Station, Korea's new Antarctic base, located on Terra Nova Bay in the Ross Sea, to Lyttleton Harbour. Image courtesy of Diego Cotterle.

Christina and colleagues from the U.S. TRACERS expedition sample pancake ice, slush, and the water beneath. This is to learn whether the formation of sea ice stimulates diatoms to bloom. Image courtesy of Rob Dunbar.

You can read more about Christina, and the fellowship, at the **L'Oreal UNESCO for Women in Science website.**