

Researcher dodges typhoons, studies monsoons in the Japan Sea

October 29 2013, by Evelyn Perez



William Anderson (right) poses with Takuya Sagawa, a sedimentologist from Kyushu University, aboard the JOIDES Resolution.

William Anderson, associate professor in the Department of Earth and Environment and the Marine Sciences Program, recently spent two months aboard the research vessel JOIDES Resolution in the Pacific Ocean.

Surrounded by crashing waves reaching almost 15 feet tall, Anderson and 30 other scientists dodged five major storms on their way to the Japan Sea.

"Going out to the Pacific was rough, we barely missed every major storm. It's typhoon season, so we were lucky these major storms went south or east of us," Anderson said. "We'd huddle around the monitors to see where the storms were going, just how we do here in South Florida. On top of that, we worked 12-hour shifts and didn't have a single day off. So it was a very intense time at sea."

As part of the Integrated Ocean Drilling Program's (IODP) Expedition 346: Asian Monsoon, the research team set out to test the hypothesis that the creation of the Himalaya mountains, which occurred 50 million years ago when the Indian and Eurasian subcontinents collided, caused the great variations between the summer monsoon and winter monsoon seasons in East Asia.

The East Asian monsoon is a large-scale sea breeze that carries air inland from the Indian and Pacific oceans. It is characterized by warm, wet summers and cold, dry winters. It influences the climate of nearly eight nations and one-third of the world's population. According to Anderson, scientists theorize the Himalayas, home to the planet's highest peaks, alter weather patterns and are responsible for the varying summer and winter seasons.

"It is important to answer the question of whether the uplift caused the great variability in monsoon seasons because monsoonal circulation affects global winds and even changes oceanic currents," Anderson said. "Large scale tectonic processes have affected our global climate system, so we are studying the most recent major event, the building of the Himalayas. Most of the world's population lives in this global region, it's important to the global community."

The scientists gathered data from numerous sites across the Japan Sea and East China Sea, including 6,135 meters of sediment from under the ocean floor. Ocean sediments preserve organic matter, but some are processed by microbes resulting in the formation of methane and carbon dioxide. How and where these processes happen are important for adding to scientific knowledge about how specific regional, global processes, including the East Asian monsoon, affect global weather and atmospheric conditions.

They also used new approaches to quantify the rate of carbon cycling by analyzing the sediments physical properties water chemistry. Changes in rainfall, over hundreds and thousands of years, can be detected in the sedimentary record. Anderson's research focuses on the oxygen, carbon and nitrogen isotopic signature in organic material.

"This research is two-fold. It is specific for this region of the world, but it's also helping us establish a longer record of climate change in the planet's history," Anderson said. "Because of its unique setting, this area, the Japan Sea, doesn't have any paleoclimatological records from beyond 2-10 million years ago. In order to understand future [climate change](#), it's important to understand the past.

The core samples of sediments are currently being housed at a core repository in Japan. Scientists aboard the vessel, including Anderson, will travel to the Asian nation to perform further analyses on those materials recovered next year.

Expedition 346 included scientists and staff from the University of Miami, Texas A&M University, Brown University, Rice University, Massachusetts Institute of Technology, and other institutions in France, Brazil, UK, Germany, Japan, Korea, Portugal, India and China.

More information: joidesresolution.org/node/2737

Provided by Florida International University

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