Tulane scientist embarks on mission to Florida-sized glacier

November 20th, 2019

|

Barri Bronston bbronst@tulane.edu

View PDF

A Tulane University researcher is among nearly 100 scientists and support staff from the United States and the United Kingdom heading to Antarctica this week as part of a five-year quest to understand the Thwaites Glacier, the surrounding ocean system and their future contribution to global sea level.

Arnold Early Career Professor Brent Goehring, a geologist in the Tulane School of Science and Engineering, is heading to the Thwaites Glacier as part of the $50 million International Thwaites Glacier Collaboration (ITGC), considered one of the most detailed and extensive examinations of a massive Antarctic glacier ever undertaken.

Thwaites Glacier, covering 74,000 square miles, is an area the size of Florida or Great Britain and is particularly susceptible to climate and ocean changes. Over the past 30 years, the amount of ice flowing out of the region has nearly doubled, and computer models show that over the next several decades, the glacier may lose ice even more rapidly as ice retreat progresses.

Already, ice draining from Thwaites into the Amundsen Sea accounts for about 4 percent of global sea-level rise. A runaway collapse of the glacier would lead to a significant increase in sea levels of around 25 inches over the coming centuries.

“Our research directly bears on the unifying question of how much how fast, except instead of using modern observations of the glacier, we are looking to the past to inform the future and what Thwaites is capable of,” Goehring said.

He said his part of the mission will involve collecting subglacial bedrock cores to measure cosmogenic nuclides, specifically a form of radiocarbon that accumulates in rocks when at Earth’s surface but is otherwise absent. “Multiple cores from a range of depths underneath the ice will tell us how much thinner, if at all, Thwaites Glacier was during the past 10,000 years.

Goehring will do the measuring at his Tulane lab, one of only five globally that can make this type of measurement. The research aims to provide to modelers of Thwaites' future information on how much thinner glaciers Thwaites glacier was potentially, and under what conditions it might have been thinner and when and under what conditions it regrew.

Thwaites Glacier is extremely remote, and less than 100 people have ever set foot on it, according to David Vaughan, director of science at British Antarctic Survey and scientific coordinator for the ITGC in the U.K. It is located about 1,000 miles from both the U.K.’s British Antarctic Survey Rotherea Research Station and the U.S. Antarctic Program’s McMurdo Station. Getting scientists and support staff to field sites involves transferring people and equipment through multiple camps as staging bases using caravans pulled by giant tractors and several different types of aircraft fitted with skis for landing on the snow.

The ITGC research teams are departing for Antarctica this week with fieldwork taking place until March 2020. Most researchers will travel through the McMurdo research station, and then eastward to camps located near the Antarctic coast.

“This is going to challenge our logistics and science effort in every way,” said Ted Scambos, senior research scientist at the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado Boulder and lead scientific coordinator for the U.S. “It’s a long way out there, it’s a huge project, the weather is notoriously bad and we’re aiming for some real innovative work.”

The collaboration is being funded by the National Science Foundation the U.K. Natural Environment Research Council.

Goehring will share his experiences on Twitter using his personal Twitter account @brent_goehring. Those interested in following the mission as a whole can also search @glacierthwaites and #glacierthwaites on Twitter.