



## **2018 LUDWICK LECTURE**

DEPARTMENT OF OCEAN, EARTH AND ATMOSPHERIC SCIENCES

3:00 PM – ECSB ROOM 1202 “The Auditorium” (Cave)

Tuesday, May 1st, 2018

### ***DR. KEVIN TRENBERTH, UNIVERSITY CORPORATION FOR ATMOSPHERIC RESEARCH***

This year’s Ludwick Lecturer is Dr. Kevin E. Trenberth, a distinguished senior scientist in the Climate Analysis Section at the National Center for Atmospheric Research. From New Zealand, he obtained his doctorate from the Massachusetts Institute of Technology. He has been prominent in most of the Intergovernmental Panel on Climate Change (IPCC) scientific assessments of Climate Change and has also extensively served the World Climate Research Programme (WCRP) in numerous ways, most recently as chair of the WCRP Global Energy and Water Exchanges (GEWEX) project. He has also served on many U.S. national committees. He is a Fellow of the American Meteorological Society, the American Association for Advancement of Science, the American Geophysical Union, and an Honorary Fellow of the Royal Society of New Zealand. He has published over 544 articles or books and is one of the most cited scientists in his field. He has given many invited scientific talks as well as appearing in a number of television, radio programs, and newspaper articles.

Dr. John Ludwick (“Jack”) loved seminars and as legend has it, never missed one if he was in town, no matter the topic or discipline. Thus, it seemed a fitting retirement gift to him, beginning in 1988, to initiate a distinguished lecture series bearing his name. Each year the Department brings in a leader or innovator in oceanography or earth sciences to meet with faculty, students, and alumni, and deliver a public lecture to a general audience. Responsibility for selecting the lecturer is rotated among the department’s academic sub-disciplines.

## **CHANGES IN EXTREMES WITH CLIMATE CHANGE, INCLUDING ATLANTIC HURRICANES IN 2017**

The climate is changing because of human activities, and the main changes are from the increases in carbon dioxide and other greenhouse gases in the atmosphere, which affect the natural flows of energy through the climate system. As a result there is an energy imbalance at the top-of-atmosphere, and the main changes result from the accumulated effects of the heat, most of which end up in the ocean. Hence, the air is warmer and moister over the oceans and this affects all storms, which produce heavier rains, or snows, and more intense storms. In drought areas, droughts become more intense and the risk of wild fire increases. 2017 is by far the warmest year on record for the global ocean heat content down to 2000 m depth. The ocean was also at record heat levels in the Gulf of Mexico prior to the summer of 2017, and it set the stage for a very active hurricane season. While hurricanes are natural phenomena, they play a role of pumping heat out of the ocean, into the atmosphere, but this results in heavy rains and more intense storms. For the first time for any storm, we can match the heat loss by Harvey with the record rainfall in Harvey. Hence Harvey, Irma and Maria were supersized, and the damage was in the hundreds of billions of dollars. However, the lack of preparedness in Texas, Florida, the Caribbean Islands and Puerto Rico, given the known threats, greatly exacerbated the damage. We can mitigate climate change by cutting emissions. We also need to adapt to climate change, which will occur to some degree anyway. Or we can suffer the consequences.

**AFTER THE SEMINAR, PLEASE JOIN US IN ROOM 404, THE ZANEVELD  
CONFERENCE ROOM, FOR COFFEE AND COOKIES, AND TO MEET WITH  
THE SEMINAR SPEAKER.**