

Acceptance speech

20 June 2023

James C. Zachos, awardee in the Climate Change category (15th edition)

I am honored and very grateful for the BBVA Foundation's recognition of my scientific achievements along with those of my longtime colleague, Dr. Ellen Thomas.

My research on climate change was originally inspired by the desire to understand the causes of major environmental perturbations of the past, including mass extinctions.

While still a graduate student in the early 1980's studying one of the largest extinction events, evidence emerged proving this event was the result of a meteorite impact. However, the lack of evidence for impacts during other periods of environmental stress and extinction raised the possibility that Earth might have experienced episodes of rapid and extreme changes in climate.

Not long after, the first evidence of an abrupt and extreme warming event 55 million years ago was discovered in deep sea cores recovered off the coast of Antarctica by Dr. Thomas and her colleagues, and shortly thereafter in continental sediments of North America by my colleagues. This set of timely discoveries set in motion a major community effort to understand the nature of this unusual global warming event, one that eventually would become one of key case studies for validating climate theory on greenhouse warming.

Moving forward, our research would eventually involve collaborations with a large and diverse community of Earth scientists. This includes colleagues involved with the International Ocean Drilling Program which recovered the dozens of sedimentary archives upon which much of our research was based. The effort to collect and study these archives, which spanned over three decades, enabled the paleoclimate community to reconcile the finer details of this extreme warming event, eventually demonstrating that the warming was driven by a rapid rise in atmospheric greenhouse gases. As such, this and other

warming events, taken as natural greenhouse climate experiments, began to serve as case studies for testing the rigor of advanced climate models to hindcast past changes in climate, and thus their ability to forecast future change in climate.

Among other achievements, the success of this work demonstrated the benefits of combining the resources and talents of the global scientific community to solve one of the most challenging problems facing society.

I thank the BBVA Foundation and the selection committee for their efforts to recognize those working to advance knowledge for the benefit of society. I also thank former mentors, students and postdocs for their valuable contributions, and those many colleagues, such as Dr. Thomas, who have provided the expertise, insight and inspiration for advancing this important work.