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NATIONAL LABORATORY

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PNNL's Scientific

Vision

Our scientific vision is to understand, predict, and control the behavior of complex adaptive systems, with an emphasis on scientific earth, energy, and security systems that are central to the Department of Energy's strategic objectives.

In earth systems, we are developing new climate models that can represent the interactions of, and tradeoffs between, energy and water resources. In energy systems, we are advancing the science to achieve sustainable energy production, conversion, storage, and use. In security systems, we are developing and deploying new measurement and analytical systems to reduce threats.



U.S. DEPARTMENT OF
ENERGY

Director's Distinguished Lecture Series

Dr. Rodney C. Ewing

Department of Geological Sciences
Center for International Security & Cooperation
Stanford University

June 1, 2016 | 3:30 | Battelle Auditorium

Projecting Risk into the Future: Sinking of the Titanic and Failure of a Geologic Repository

Over one hundred years ago, the "unsinkable" RMS Titanic struck an iceberg in the North Atlantic and sank on its maiden voyage from Southampton, UK, to New York City. This "accident" and others, such as the tragedy at Fukushima Daiichi, can provide insight into the challenges that face the geologic disposal of radioactive waste. In this presentation, I reflect on the essential differences between analyzing the failure of engineered structures vs. a "failed" geologic repository. Perhaps, the most important difference is that for most countries there will only be a single repository, and we will never "see" that repository "in operation," as the operational phase of a geologic repository comes long after it has been filled with waste and sealed. The time-scales considered for the geologic disposal of radioactive waste place special demands on the analysis of how engineered and geologic systems might fail. As scientists and engineers, we should reflect on the sobering reality of how difficult it is to project the future behavior of a geologic repository over extended spatial and temporal scales that stretch over tens of kilometers and out to a hundreds of thousands of years.