

**UNIVERSITY OF TEXAS AT DALLAS**  
**DEPARTMENT of PHYSICS and SIGMA XI SOCIETY**  
**COLLOQUIUM**

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Wednesday, October 31, 2007; 4:00-5:00 PM  
Kusch Auditorium, FN 2.102

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**The New Orleans Levee Failures: What Went Wrong and Why?**

**Dr. David E. Daniel**

*The University of Texas at Dallas*

Hurricane Katrina produced enormous surges of water that overwhelmed New Orleans' levees, severely damaging or destroying 170 miles of the 350-mile levee system. More than 1,000 people lost their lives, one-quarter of all homes were destroyed, educational and health-care systems have been decimated, and 400,000 residents have not returned. It was one of the worst catastrophes in our nation's history.

Overtopping caused massive erosion and destruction of many miles of levee. In addition, four critical sections of "I Wall" levee collapsed, even though the water levels never reached the top of the walls. There were several other contributing factors. The massive pumping system was not designed to survive levee breaches. The design hurricane did not consider the risk of future hurricanes. Levees were 1 to 3 feet too low because of failure to account for regional subsidence and because the survey datum for elevation control was not updated. The levees were constructed piecemeal with no overall system design. There was no consideration of land use or integration with emergency response plans with the hurricane protection system. Finally, the management structure is fundamentally flawed because no one is in charge.

Nearly everything went wrong, at essentially all levels. Complacency, a lack of priority on protection of public safety, and some very poor "management" choices were the root causes. The catastrophe is a sobering reminder of the devastating potential of extreme, infrequent natural occurrences, and of the need to be vigilant even as many years pass without the inevitable extreme event occurring. Avoiding a future catastrophe will not be easy and will require improving everything from the engineering design criteria for levees to the overall management approach. As an example how we might apply the lessons learned from Katrina, drought and water shortage issues in North Texas are briefly examined because of certain similarities to the situation in New Orleans.

**About the speaker:** Dr. Daniel is the President of UT Dallas and a member of the National Academy of Engineering. In 2005-06, he served as Chair of the External Review Panel of the American Society of Civil Engineers charged to advise on the causes of levee failure and the future adequacy of the levees. Dr. Daniel received his Ph.D. degree in engineering from UT Austin, and served on its faculty from 1980 to 1996. In 1996, he moved to the University of Illinois, finishing his service there as Dean of Engineering before joining UTD as its president in 2005. Dr. Daniel's professional work has focused on environmental controls for contaminated land and groundwater. He has published over 100 technical articles and five books. His work has been recognized by the highest awards of the American Society of Civil Engineers.