JOHNS HOPKINS
WHITING SCHOOL of ENGINEERING

Department of Civil and Systems Engineering

GRADUATE SEMINAR

Civil Engineering Resiliency in Response to Extreme Events East Coast Lessons

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Civil engineers often respond to the effects of extreme events, including earthquakes, hurricanes, floods and fires, many of which are "natural" and some alleged to be exacerbated by climate change. Looking into the future, the need for rapid and effective response will increase, as recent history suggests that "extremes" may now be the "new norm." Some of these (e.g., earthquakes) are thought to be "West Coast" problems, while some are attributed primarily to the East Coast (e.g., hurricanes). Rather than a reactive response, civil engineers should now consider a proactive position and develop designs for these new norms to minimize the devasting impacts on society. This presentation will include two parts. The first presents a brief summary of several of the author's primarily East Coast projects where extreme conditions drove the response and/or design. These include the impacts of recent hurricanes, construction over extremely soft sediments, and seismic response of dams and hazardous waste landfills. The second part will include a discussion regarding the evolution of design concepts from simple allowable stress and deterministic approaches to performance-based designs, risk-informed decision making, and resilient design considerations. Challenges may be the result of climate change and global warming, but also include the inevitability of strong seismic ground motions and construction over difficult ground conditions.

Dr. Robert Bachus is a civil engineer with more than 40 years of experience, with an expertise in geotechnical and geoenvironmental engineering. He started his professional career as a member of the faculty at the Georgia Institute of Technology where he taught for 11 years before joining Geosyntec Consultants in 1990, where he is now a Senior Principal. The firm specializes in geotechnical, environmental, and water resource engineering, with >1,200 employees in its 75 offices in the U.S., Canada, and Europe. His research and project activities cover a wide range of topics, including dams and levees, landslide assessment, landfill design and performance, soil/rock properties, and forensic engineering. He has worked extensively on the properties and beneficial use of coal combustion residuals (CCRs) and geotechnical data management and visualization. He is currently an Adjunct Professor at Georgia Tech and Chairman of the Transportation Research Board's Standing Committee on Soil and Rock Properties.

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