

Sandra K. Knight, PhD, PE, D. WRE, D. NE
Director, Center for Disaster Resilience
Senior Research Engineer
Department of Civil and Environmental Engineering
University of Maryland, College Park

Areas of Expertise

- **National policy expert** on water resources, science and technology, and disaster reduction
- **National/International technical expert** in water resources management, hydraulic and coastal engineering, flood risk management, navigation engineering and marine transportation systems, and environmental sustainability
- **Research and technology advisor** specializing in transitioning research and innovations into operations and applications
- **Career and organizational leadership specialist** capitalizing on years of leading and managing organizations and training and mentoring staff

Education

- Ph.D., Civil Engineering (1996) University of Memphis, Memphis, TN
- M.S., Civil Engineering (1988) Mississippi State University, Starkville, MS
- B.S., Civil Engineering (1980), Cum Laude Memphis State University, Memphis, TN

Current Positions

- **Senior Research Engineer, Director, Center for Disaster Resilience, Department of Civil and Environmental Engineering, University of Maryland, May 2013 to present**
- **President, WaterWonks LLC, Washington, DC, January 2013 to present**
- **Senior Advisor to Dawson and Associates, April 2013 to present**

Previous Professional Experience

- Deputy Associate Administrator, Mitigation, Federal Insurance and Mitigation Administration, Federal Emergency Management Agency (FEMA), Arlington, VA, January 2010 – September 2012
- Director, Policy, Planning, and Evaluation, Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration (NOAA), Silver Spring, MD, February 2007 – December 2009
- US Army Corps of Engineers (USACE), various locations, June 1980 – February 2007
 - Technical Director for Navigation Research, US Army Engineer Research and Development Center (ERDC), September 2003- January 2007
 - Team Lead, Asset Management, Headquarters, Washington, DC, February 2006 – December 2006
 - Chief Business Technical Division, Mississippi Valley Division, October 2005 – February 2006
 - Acting Deputy Director Research and Development, Headquarters, October 2003- February 2004
 - Hydraulic Engineer : Vicksburg District, Memphis District, ERDC, 1980-2003

Recent Career Highlights:

University of Maryland, Center for Disaster Resilience

- Director of the Center for Disaster Resilience, University of Maryland. In collaboration with colleagues and the university established a new center to assist individuals, communities and governments in understanding and reducing the catastrophic effects of natural hazards, especially coastal and riverine flood hazards. (2013-present)
- Principal Investigator on DHS S&T education grant to develop a disaster and project management curriculum (underway)
- Co-principal investigator for the District Department of the Environment in developing a business plan for DC government regarding flood risk reduction under FEMA's Cooperating Technical Partners Program (2015)
- Appointed to the National Research Council, Committee on Community-based Approaches to Flood Insurance Options (2014-2015)
- Co-principal investigator for a DHS S&T grant on evaluating resilience metrics (2014-2015)

WaterWonks LLC

- Subject Matter Expert for Science and Engineering Board, Coastal Protection and Restoration Authority, State of Louisiana (underway)
- Chair, Research Review Board, RAPID Apex Program, DHS S&T Coastal Hazards Center of Excellence, UNC
- Senior advisor to large A/E firm providing strategic support (2013-2015)
- Co-principal on development and preparation of USACE Flood Risk Management R&D Strategic Plan (2014-2016)
- Facilitator and SME for TRB/USACE/NOAA sponsored workshop on Coastal Resilience Metrics Expert Meeting (May 2015)
- Research review team lead for USACE Red Team R&D reviews, 2013, 2014 and 2015
- Policy advisor and co-author on the "Institutional and Other Barriers" chapter of the North Atlantic Coast Comprehensive Study. Funded by USACE through CDM Smith (2013-2014)
- Member of the Technical Team evaluating the Changing Course Competition. The competition is a privately funded competition to rethink the future of the lower Mississippi River Delta. (2013-2015)
- Technical and strategy advisor to technology company for patented waste-to-energy process (2013)

Prior Career Highlights

- Senior executive over the National Flood Insurance Program's (NFIP) flood risk mapping program
- Senior executive responsible for establishing policies and assuring compliance to floodplain management requirements for over 21,000 communities in the NFIP
- Senior executive responsible for establishing policies and assuring compliance in execution of 5 major national hazard mitigation grant programs to states. Outlay of approximately \$500 million/yr
- Senior executive responsible for compliance of FEMA programs to over 30 laws related to environmental and historic preservation
- Senior leader in FEMA responsible for development of the National Mitigation Framework and Federal Interagency Operating Plan for Presidential Policy Directive-8, National Preparedness
- Senior leader in FEMA responsible for execution of the National Dam Safety Program
- Senior emergency manager responsible for organizational oversight and preparedness of over 1200 disaster reservists in the field of mitigation and environmental and historic preservation
- Senior executive responsible for the development of FEMA's Mitigation Strategic Plan to Advance Disaster-Resilient, Sustainable Communities

- Co-principal with USACE for the Federal Interagency Floodplain Management Task Force
- Senior Lead for FEMA and Advisor to Systems Approach to Geomorphic Engineering (SAGE)
- Co-lead for NOAA's Buoy and Observing System Recapitalization Plan
- Co-lead of Research and Development Integrated Action Team for the Committee on the Marine Transportation System, developing a MTS National Strategic Plan for R&D
- Team lead for Asset Management, moving USACE into compliance with the executive order for federal real property (2006)
- Executive committee member of the oldest international organization dedicated to waterborne transportation infrastructure (PIANC), shaping strategic direction to modernize the organization
- Technical Director for Navigation Research helping to bridge transformational research and technology to improve planning and operational success of USACE projects.
- Research engineer conducting applied research and providing technical expertise to support numerous Corps projects related to flood control, navigation, water supply and environmental impacts.
- Author, co-author or team lead responsible for delivery of numerous technical reports and strategic planning documents
- Keynote and/or invited speaker or panelist at dozens of national and international conferences, symposia and workshops
- Mentor/role model for many students/professionals in Science, Technology, Engineering and Math (STEM) careers.

Professional Societies and Affiliations

- American Meteorological Society, May 2013 to present
- American Society of Civil Engineers (ASCE), 1985 to present
- Coasts, Oceans, Rivers and Ports Institute, Waterways Committee member, 2002 to 2009
- World Association for Waterborne Transport Infrastructure (PIANC), 1989 to present
- Society of Women Engineers, 1979-1980, 2004 to present
- Women's Aquatic Network, 2009 to present
- Sigma Xi, 1993 to present
- Society of American Military Engineers (SAME), 1984- 2002, Publicity Chairman, 1987-1988
- Vicksburg Rotary Club, 1998-2001
- Vicksburg Toastmasters, 1981-1983, Secretary, 1983

Certifications and Honors

- Registered Professional Engineer, Tennessee, License No. 17,646 (1985 to present)
- Diplomate, Water Resource Engineer, 2007 to present
- Diplomate, Navigation Engineer, 2010 to present
- US Commissioner PIANC, 2009 to 2010
- Fellow, US Section PIANC, 2008
- Special Recognition, Inland Navigation Commission, PIANC, 2007 for contributions as Chair
- Selected to Senior Executive Service, February 2007 through September 2012.
- Department of the Army, Superior Civilian Service Award for excellence in leadership, 2007
- Award of Excellence, Director of Civil Works for leadership in Asset Management, April 2006
- Commanders Coin, Director of Military Programs for leadership in Federal Real Property, 2006
- Woman of Distinction, River City Business and Professional Women, 1998
- Gamma Beta Phi, 1979

- Tau Beta Pi, 1978

Key Publications and Deliverables

(Publications prior to 2004 can be provided upon request)

National Research Council. A Community-Based Flood Insurance Option. Washington, DC: The National Academies Press, 2015. Print (served on the committee for community-based flood insurance that prepared the report.)

Knight, S., Link, L., Rohner, J. and Miller, L. "Building Blocks for a National Resilience Assessment," Research report funded through the DHS Science and Technology, Coastal Hazards Center of Excellence, June 2015.

Gilbert, R., Wells, T., Espey, W., Knight, S., Kirby, J., Willson, C. "Expert Review Panel on Greater New Orleans Hurricane and Storm Damage Risk Reduction System Design Guidelines," May 21, 2014, funded by Coastal Protection and Restoration Authority of Louisiana, Published by The Water Institute of the Gulf.

Department of Homeland Security, "Mitigation Federal Interagency Operational Plan," July 2014 (Senior leader responsible for development of report and co-author while at FEMA in 2012)

"Strategic Plan for the National Dam Safety Program, Fiscal Years 2012-2016," (Senior executive at FEMA leading the National Dam Safety Program, responsible for development of plan in coordination with the Dam Safety Review Board and the Interagency Committee on Dam Safety.)

"Dam and Levee Safety and Community Resilience," 2012, Committee on Integrating Dam and Levee Safety and Community Resilience, National Research Council of the National Academies. (provided direction to statement of task for study and as Deputy Associate Administrator for Mitigation, commissioned the study with the NAS.)

"Urban Meteorology: Forecasting, Monitoring, and Meeting Users' Needs," 2012, Committee on Urban Meteorology, Board on Atmospheric Sciences and Climate of the National Academies. (participated in the BASC Summer Workshop as speaker and subject matter expert on behalf of FEMA.)

"FEMA Mitigation and Insurance Strategic Plan, 2012-2014," FEMA P-857/September 2011. (Led the development of this plan on behalf of the Administrator FEMA.)

"Understanding Floods: Questions and Answers," Queensland Government, June 2011. (Served on the International Review Group in posing questions to working group and reviewing document.)

"Strategic Action Plan for Research and Development in the Marine Transportation System, Committee on the Marine Transportation System." January 2011. (Co-lead the CMTS R&D Integrated Action Team that developed report.)

"NOAA's Next-Generation Strategic Plan, December 2010. (Served on Planning Steering Committee on behalf of NOAA OAR.)

Oceanic and Atmospheric Research Directive (January 2009), "Graduate Studies Program." (led team development)

NOAA Buoy and Related Systems Strategic Recapitalization Plan: Phase I (November 2008). National Oceanic and Atmospheric Administration. (Co-led study and principal author to report.)

Sohnngen, B., Koop, J., Knight, S., Rythonen, J, Beckwith, P., Ferrari, N., Iribarren, J, Keevin, T, Wolter, C, Maynard, S. (2008) "Considerations to Reduce Environmental Impacts of Vessels," Report No. 99, Inland Navigation Commission, Navigation, Ports, Waterways (PIANC).

Spinrad, Richard and Knight, Sandra (April 2008). "Risk-Informed Investments in Oceanic and Atmospheric Research", The 2008 Lloyd's Register Education Trust Lecture, The Royal Academy of Engineering, London, England.

Oceanic and Atmospheric Research Directive (July 2007), "Laboratory Review Policy." (led team development)

USACE Asset Management Plan: Three-year Timeline Plan (December 2006). (Principal author and team lead.) Prepared by USACE Headquarters, Washington, DC. Accepted by Office of Management and Budget for Federal Real Property Report Card.

Knight, S.K. and Parchure, T.M. (Sept 2004). "Hydraulic Effects of Recreational Boat Traffic on the Upper Mississippi River System," ENV Report 43, Upper Mississippi River – Illinois Waterway System Navigation Study, prepared for the US Army Corps of Engineers, Rock Island, St. Louis, St. Paul.