



Resiliency Panel:

William Anderson

(National Academy of Science)

Bernie Deneke

(NAVFAC)

Joe Manous

(USACE)

JANUARY 2019

NoVA Post Updates

Upcoming Events



- An intensive two-day series of sessions addressing topics such as asset management, life cycle sustainability, energy efficiency and strategic sourcing.
- <http://www.fmworkshop.org/>

NoVA Post Events - www.same.org/NOVA

- February 7th - CAPT Patrick Dugan, PE, Commandant, Chief, Office of Civil Engineering, USCG
- March 14th - Melanie Gilbert, Chief, Facilities and Security Office, Administrative Offices of the US Courts

K-12 Outreach

Science Fairs start this weekend 1/12 – Full List available

JANUARY 2019 NoVA Post INFRASTRUCTURE RESILIENCY PANEL



JANUARY 2019 INFRASTRUCTURE RESILIENCY PANEL

Recognize our Panel Committee :

- **Renee Parker**, AFG Group, Post Program Director
- **Christine Tsai**, IBTS, Post Program Chair
- **Julie Smiley**, Woods • Peacock Engineering Consultants, Post Secretary
- **Rob Snow**, Dewberry, Post Membership Chair

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Markon Solutions



JANUARY 2019 INFRASTRUCTURE RESILIENCY PANEL

Welcome to our Panelists

- **William “Bill” Anderson**, Transportation Research Board of National Academies of Sciences, Engineering, and Medicine
- **Bernie Deneke**, NAVFAC, Director, Engineering Criteria & Programs
- **Joe Manous**, Chair, SAME Resilience Committee and Director, Institute for Water Resources, USACE
- **Ryan Colker**, Alliance for National & Community Resilience (*Could not make it*)

JANUARY 2019

INFRASTRUCTURE RESILIENCY PANEL

Goal : To think beyond the “noise” and understand how we can implement new ideas to centuries old challenges

Agenda:

- Introduction to our topic and Panelists
Chris Gorman P.E. (CE-WR) - Markon Solutions
- Panelist Discussion
- General Q/A
- Wrap-up and message from Markon

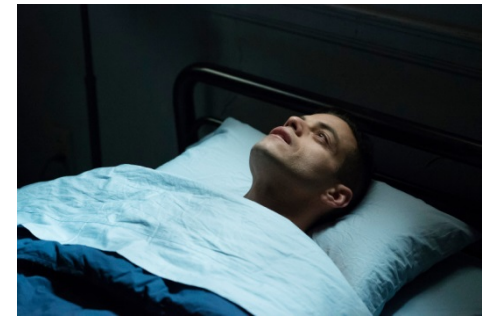


How to define for today?

What is Resiliency?

‘The ability to plan and prepare for, absorb, recover from, and more successfully adapt to disruptive events’ (National Research Council, 2012)

- Latest trend in our Industry
- A buzz word that can mean many things to many different people
- It can ruffle feathers, especially when you use the “C” word
- Can get into political discussions quickly
- Something that keeps planners up at night



For us in - a new way to look at our built environment - how we plan and live, more than just “being prepared” in an organized manner.

JANUARY 2019 INFRASTRUCTURE RESILIENCY PANEL

For today's discussion we will focus on **Site Infrastructure Resiliency**

Consulting our two biggest clients/partners:

- USACE
- NAVFAC



Definite need for future sessions
on other “resilience” areas

JANUARY 2019 INFRASTRUCTURE RESILIENCY PANEL

Breaking Down this as a Designer/Planner :

- Geotechnical (including Seismic)
- Hydrologic – Watershed/ Stormwater Runoff
- Utilities – (including indirect disruptions or failures)
- Proximity to nearby Waterway (River, Lake, Ocean) –Storm Surge and Sea Level
- Existing Infrastructure and Community developments, Sustainability
- Historical indexes
- Workforce



More than meets the Eye...

The screenshot displays the Georeferencer | Compare web application interface. The top navigation bar includes a menu icon, the title "Georeferencer | Compare", and several tool options: "Overlay", "Grid", "Swipe", and "Spy glass". A "Sign in" link is located in the top right corner. The main map area shows a modern satellite-style map of Annapolis, Maryland, with a semi-transparent historical map overlay. The historical map features a grid and various geographical features, including the Potomac River and the city's layout. A search bar on the left side of the map contains the text "Annapolis".

On the right side of the interface, there is a "My private maps" section. It includes a sub-section for "Anne Arundel." with a map thumbnail and a "Add maps here" button. Below this, a message states "This list is empty." with an "Add own map" button. Further down, there is a prompt: "Upload a scanned map from your computer." At the bottom right, a blue bar displays the name "David Rumsey" and an "All maps" button.

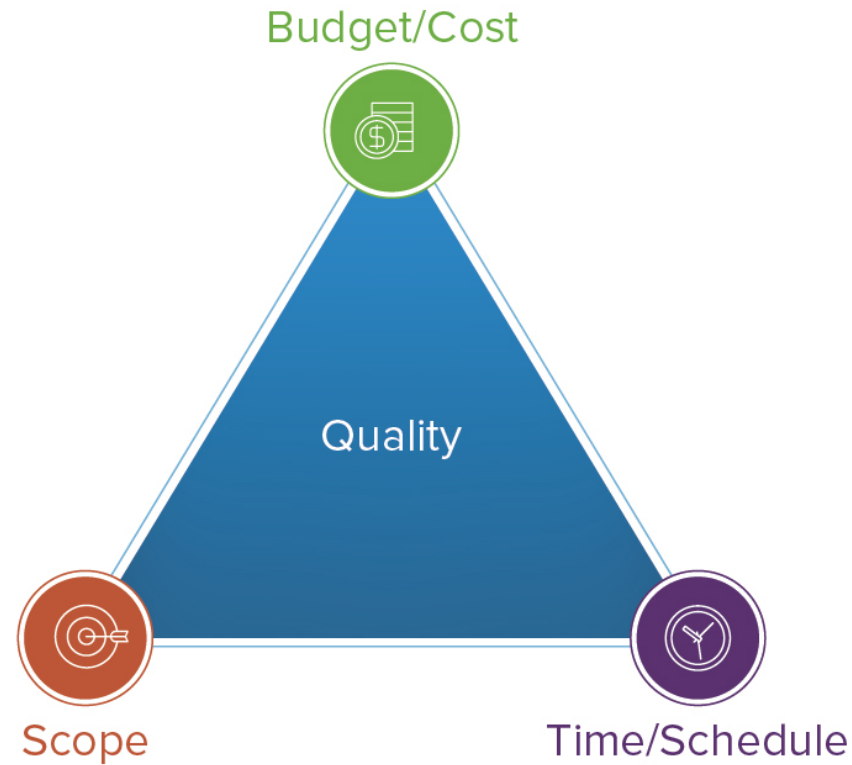
At the bottom left of the map, the copyright information reads: "© MapTiler © OpenStreetMap contributors © David Rumsey".

What about sustainability?

The screenshot displays the Georeferencer | Compare web application. The main map area shows a topographic map of Washington, D.C., with a grid overlay. The map includes labels for various locations such as Rosslyn, Radnor Heights, Virginia Highlands, Addison Heights, National Landing, and the Potomac River. The interface features a navigation bar at the top with options like 'Overlay', 'Grid', 'Swipe', and 'Spy glass'. A sidebar on the right contains 'My private maps' and 'Add own map' buttons. The bottom of the page shows the user's name 'David Rumsey' and a link to 'All maps'.

© MapTiler © OpenStreetMap contributors © David Rumsey

Why is this important?



We only have finite time and resources to focus on solving defined **Scope** challenges

Do we have a bias?



Heisenberg

The Observer Effect

Physics

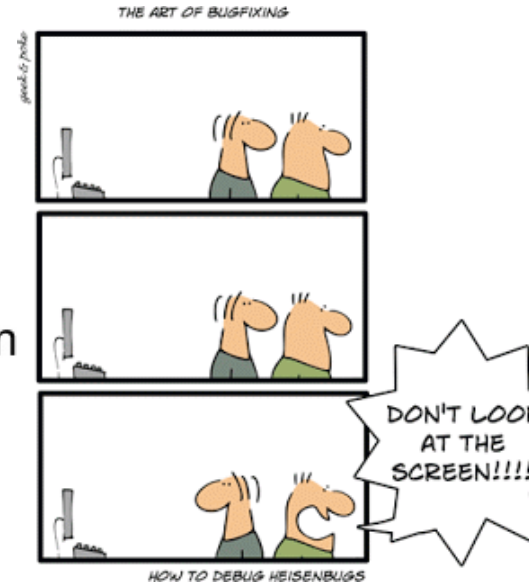
– Changes that the act of observation will make on the phenomenon being observed

- Information Technology

– The potential impact of the act of observing a process output while the process is running

- Psychology

– A form of reactivity, in which a researcher's cognitive *bias* causes them to subconsciously influence the participants of an experiment



We need to understand BIAS that can cause an unintended result



Tversky and Kahneman

Example : Coastal Flooding

What factors pose the largest risks and should be considered ?

Factors Affecting Coastal Flooding

From Sweet et al., 2017

Physical Process	Spatial Scale			Temporal Scale	Potential Magnitude (yearly)
	Global	Regional	Local		
Wind Waves (e.g., dynamical effects, runup)	TWL		x	seconds to minutes	< 10 m
Tsunami		x	x	minutes to hours	< 10's of m
Storm Surge (e.g., tropical storms or nor'easters)	SWL	x	x	minutes to days	< 15 m
Tides			x	hours	< 15 m
Seasonal Cycles		x	x	months	< 0.5 m
Ocean/Atmospheric Variability (e.g., ENSO response)		x	x	months to years	< 0.5 m
Ocean Eddies, Planetary Waves		x	x	months to years	< 0.5 m
Ocean Gyre and Over-turning Variability (e.g., PDO response)		x	x	years to decades	< 0.5 m
Land Ice Melt/Discharge	x	x	x	years to centuries	mm's to cm's
Thermal Expansion	x	Trend	x	years to centuries	mm's to cm's
Vertical Land Motion		x	x	minutes to centuries	mm's to m's

*The total water level (TWL) is the sum of SWL, wave setup, and wave runup.

EXAMPLE: UPDATING STATISTICAL DESIGN MODELS - RAINFALL

NEWS & FEATURES

NOAA updates Texas rainfall frequency values

Data is used in infrastructure design and flood risk management

Weather | flooding rain

SHARE |    

Audio from the media teleconference is posted to the "resources" section below.

September 27, 2018 —

100-yr Houston rainfall increased from 13 to 18 in. and previously 100-yr event values now classified as 25-yr.



A NOAA analysis released today finds significantly higher rainfall frequency values in parts of Texas, redefining the amount of rainfall it takes to qualify as a 100-year or 1000-year event.

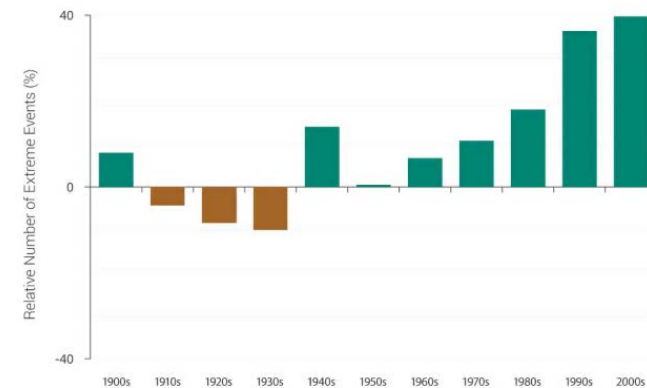
NFIP established 1968

FEMA Flood Maps constantly under Revision (CLOMR) due to development

Current precip. tables

- Some data 1940s to present
- spotty in areas
- Many use 1980 to present

Observed U.S. Trends in Heavy Precipitation

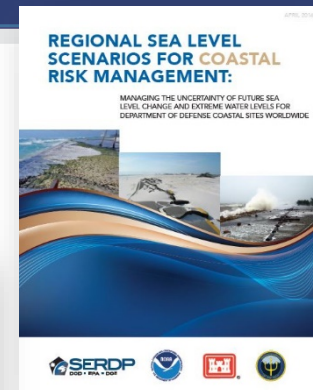
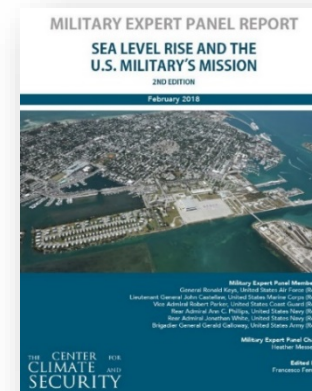


Source: NOAA News Center : <https://www.noaa.gov/media-release/noaa-updates-texas-rainfall-frequency-values>

DoD-Focused Reports & Research - available for a time in transition

Examples:

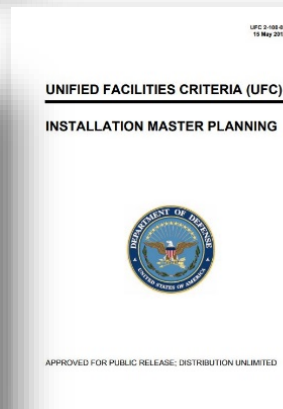
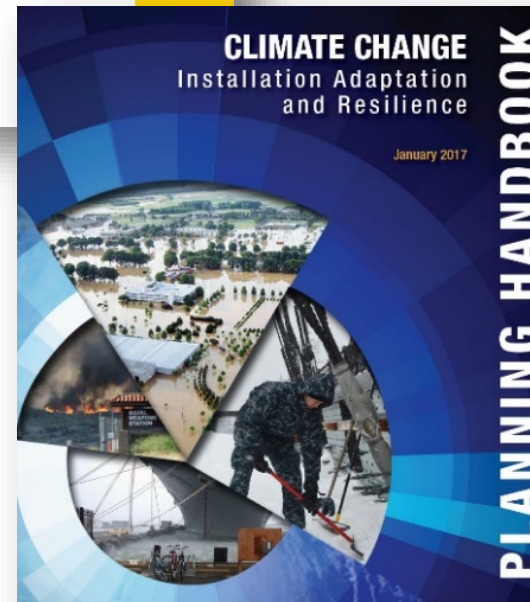
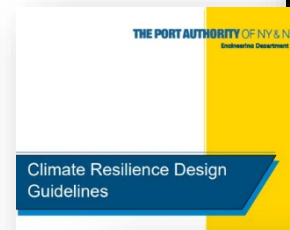
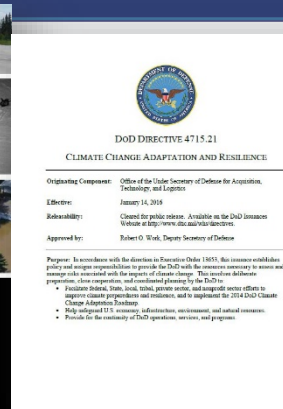
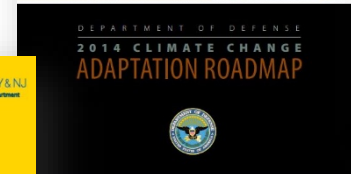
- SERDP Studies – “Managing DoD Coastal Sites Worldwide”
- The Center for Climate and Security - “Sea Level Rise and the U.S. Military’s Mission”
- Union for Concerned Scientists – “The US Military on the Front Lines of Rising Seas”
- NCHRP Report Freight 50: Supply Chain Resilience
- National Climate Assessment conducted/submitted by 13 federal agencies
- National Academy of Sciences Report
- Transportation Research Database (<https://trid.trb.org/>) - TRB
- American Security Project – “Resilience in the Face of Rising Seas”



Directives, Guidelines, Policy

Examples:

- Executive Orders
- DoD Directive 4715.21
- DoD 2014 Climate Change Adaption Roadmap
- Unified Facilities Criteria– Installation Master Planning (Whole Building Design Guide)
- *NAVFAC - Climate Change Planning Handbook*
- PATH NYNJ– Climate Resilience Design Guide
- GSA PBS P100 – July 2018 Update Section 1.10.7 RESILIENCE
- ASCE 2414 – Flood Resilient Design & Construction

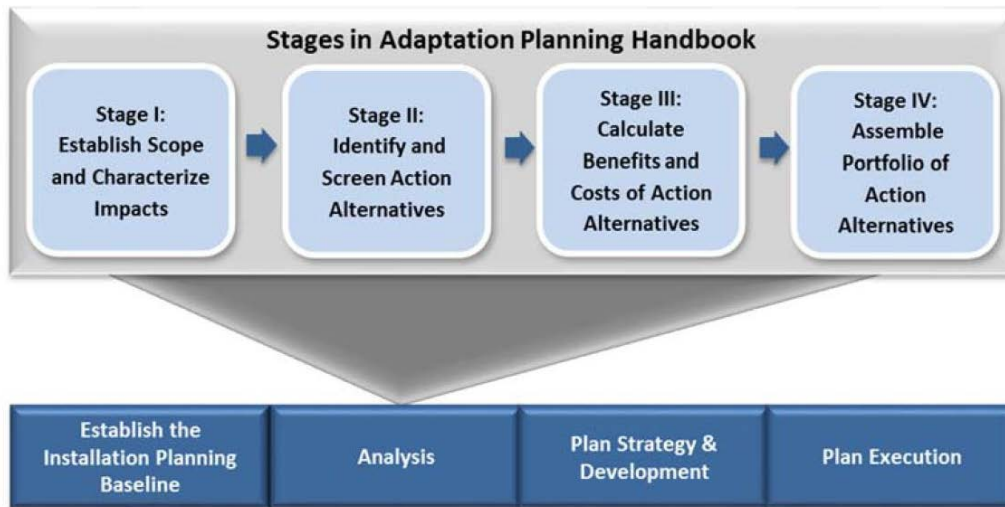


NAVFAC Climate Change Planning Handbook – Jan 2017

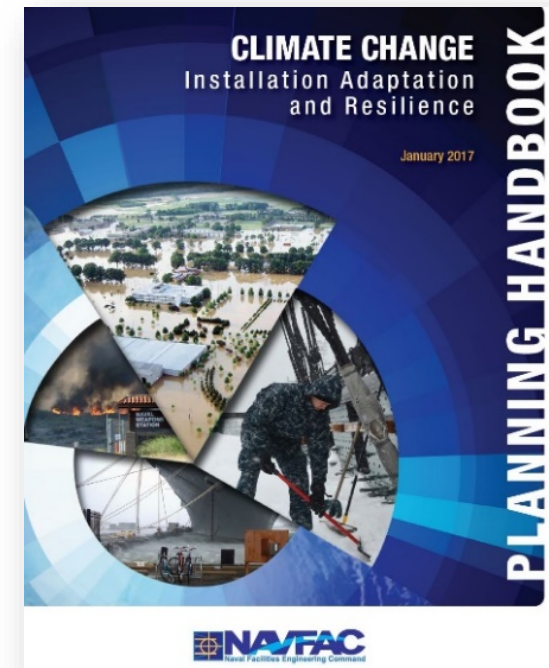
The DoD 2014 Climate Change Assessment Roadmap listed four primary challenges /criteria likely to affect the Department's activities:

- Fluctuating global temperature patterns
- Inconsistent precipitation patterns
- Increasing frequency or intensity of extreme weather events (wet or dry)
- Observed Sea level change and magnified impacts of storm surge

4 Stage Process to implement **Adaption** and **Resilience**



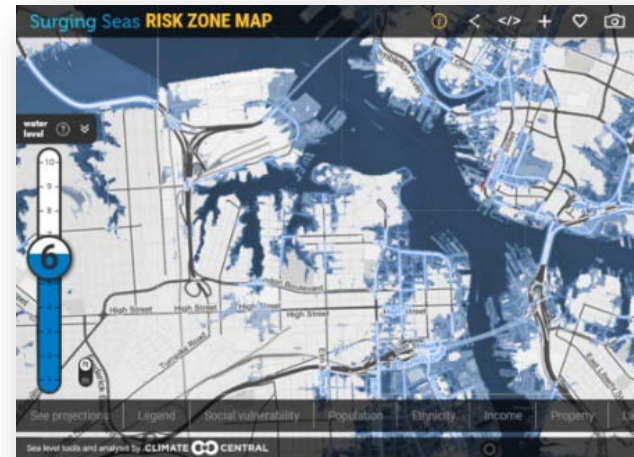
(Does consider costs)



Data Resources

Examples:

- NOAA Resource Guide (Precipitation Data Server (NPFDS) , Federal Flood Data tools, Hurricane resources)
- Climate Central: Surging Seas Risk Finder
- FEMA – Current Flood Maps
- NOAA’s Digital Coast Tools
- Digital Elevation Model (DEM) Discovery Portal
- USACE – Sea-Level Change Curve Calculator, Nonstationarity Detection Tool, Climate Hydrology Assessment Tool
- USGS – Inundation Mapper, Flood history, etc.
- Pew Chartable Trust



To our distinguished panel...



Bill Anderson

Senior Program Officer

Transportation Research Board (TRB) of the National Academies of Sciences, Engineering, and Medicine.

At TRB he focuses on policy, economic, and social issues in transportation, which includes subjects in the areas of community sustainability, regional and infrastructure resilience, and transportation system operations and management. Most recently, his committees supported the development of a Resilience Primer for Executives of State Departments of Transportation, a resilience self-assessment tool for state transportation agencies, and a five-year transportation resilience research roadmap, all to be released in 2019.

Between 2008-2015, Bill was the Director and Chief Operations Officer for The Infrastructure Security Partnership (TISP), which SAME was the lead benefactor.

TISP, a public private partnership founded by USACE, lead our nation in developing the national policy for regional and infrastructure resilience policy.

Bill holds degrees from Roger William University and the University of Maryland in College Park.

He is an active member of the International Association of Emergency Management, ITS America, and SAME NoVA and DC Posts .

To our distinguished panel...



Bernie Deneke

Director, Engineering Criteria and Programs
Naval Facilities Engineering Command (NAVFAC)

He is responsible for overall program management of Navy and Marine Corps worldwide facility planning, design, construction, operations and maintenance criteria. His office directly supports the NAVFAC Headquarters' Chief Engineer on all facility criteria and related engineering programs providing technical support, guidance, policy, and procedures across NAVFAC Echelon II, III, and IV Commands. Support is also provided to the Tri-Service Department of Defense Unified Facility Criteria Program through participation on the Tri-Service Coordinating Panel and support to the Engineering Senior Executive Panel.

Over the past 31 years, Bernie has served in various capacities with NAVFAC. Prior to his current position, he served as NAVFAC EURAFSWA Capital Improvements Business Line Coordinator and Chief Engineer, NAVFAC Atlantic Capital Improvements Engineering and Design Product Line Manager, senior criteria program manager for Antiterrorism and Force Protection (ATFP), the Navy's antenna and tall tower consultant, and as a structural engineer and supervisor. He has designed and/or reviewed designs for the Navy, Marine Corps and other DoD agency facilities in North America, South America, Central America, Europe, Caribbean, North Africa, Middle East and Australia.

He is a Registered Professional Engineer in the Commonwealth of Virginia. .

To our distinguished panel...



Dr. Joe Manous, PE, F.SAME

Director for the Institute for Water Resources
US Army Corps of Engineers (USACE)

Resilience Committee Chair
SAME

Dr Manous is a civil engineer specializing in the areas of water resources and environmental security issues associated with water.

He served as Professor at the United States Military Academy at West Point from 2000 through 2008, where he taught courses in environmental engineering, water resources, and environmental security.

A US Army Corps of Engineers officer, Joe retired from active duty in the grade of Colonel in 2008. Dr. Manous has been actively involved with the "professional" aspects of the engineering profession for over 20 years particularly through his involvement with the American Society of Civil Engineers where he chaired the ASCE Committee on Professional Practice, the Post-Hurricane Katrina Critical Infrastructure Guidance Task Force, and the Paraprofessional Task Committee.

He is also a member of the Executive Board of the National Institute for Engineering Ethics (NIEE).

He is active in several professional engineering organizations to include ASCE, National Society of Professional Engineers, Order of the Engineer, and the Army Engineer Association.

Joe is a current board member of the SAME NoVA Post, and the Chair for SAME's Resilience Committee. He is a registered Professional Engineer in the Commonwealth of Virginia

Dr. Manous is a graduate of the Georgia Institute of Technology (BS, Civil Engineering), North Georgia College (Physics), University of Illinois (MS, Civil Engineering), US Army War College (Masters of Strategic Studies), and Univ. of Minnesota (PhD, Env. Engineering).



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