



WATER RESILIENCE STUDY

NATIONAL INFRASTRUCTURE ADVISORY COUNCIL (NIAC) QUARTERLY BUSINESS MEETING

MARCH 14, 2016

Jack Baylis, President and CEO, The Baylis Group, LLC, *Chair*

Albert J. Edmonds, Chairman and CEO, Edmonds Enterprises Services; CEO, Logistics Applications, Inc.

Margaret E. Grayson, President-Commercial Sector, Consulting Services Group, LLC

James J. Murren, Chairman and CEO, MGM Resorts International

Joan McDonald, Consultant, JMM Strategic Solutions

Beverly Scott, Ph. D., CEO, Beverly Scott Associates, LLC



AGENDA

- Study Update
- Study Group Findings
- Path Forward

STUDY CHARGE

Apply the NIAC-recommended framework for establishing resilience goals (developed in the 2010 study*) to the Water Sector in order to:

- Assess security and resilience in the Water Sector
- Uncover key water resilience issues
- Identify potential opportunities to address them.

**Framework for Establishing Critical Infrastructure Resilience Goals (NIAC 2010)*

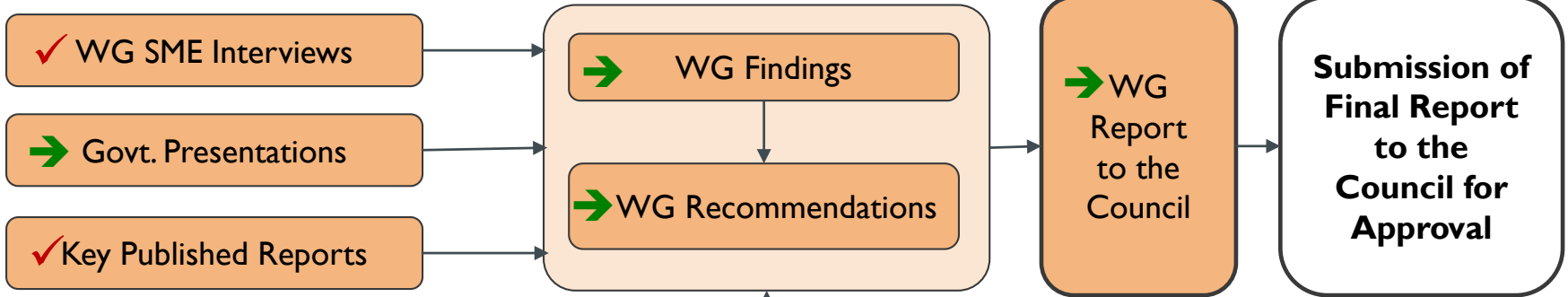
WORKING GROUP MEMBERS

- **Jack Baylis**, President and CEO, The Baylis Group, LLC, *Chair*
- **Albert J. Edmonds**, Chairman and CEO, Enterprise Services; CEO, Logistics Applications, Inc.
- **Margaret E. Grayson**, President-Commercial Sector, Consulting Services Group, LLC
- **James J. Murren**, Chairman and CEO, MGM Resorts International
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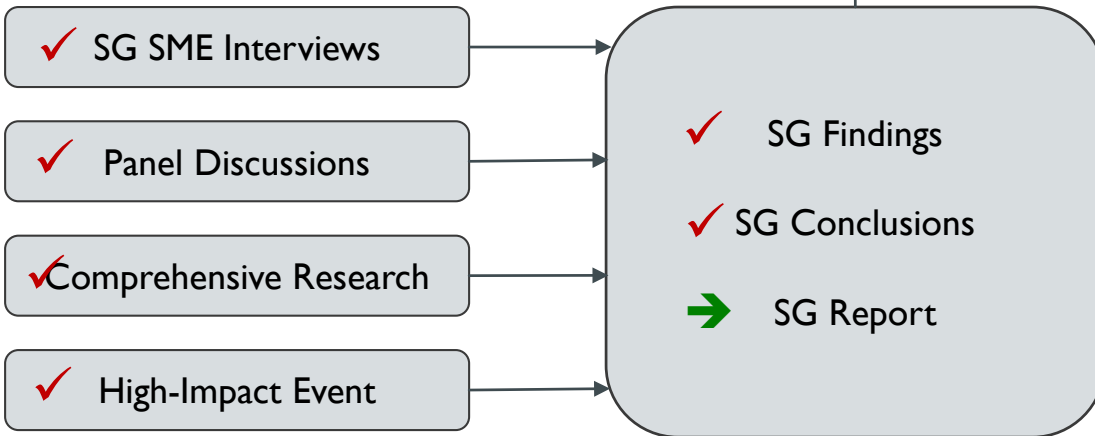
STUDY STATUS

Working Group

Data and Info Sources



Study Group



✓ Completed

➔ In Process

WORKING GROUP UPDATE

- 7 interviews completed since December 1:
 - **Stephen Flynn**, Professor of Political Science; Co-Director of Kostas Research Institute; Director of the Center for Resilience Studies, Northeastern University
 - **Paul Stockton**, Managing Director, Sonecon, LLC; former Assistant Secretary of Defense for Homeland Defense and America's Security Affairs
 - **Tony Cheesebrough**, Chief Economist, and **Steven Rushen**, Senior Economist, National Protection & Programs Directorate, U.S. Department of Homeland Security
 - **Peter Kraft**, Asset Management Coordinator, Denver Water
 - **Karen Durham-Aguilera**, Director of Contingency Operations and Office of Homeland Security, U.S. Army Corps of Engineers
 - **James Dalton**, Chief of Engineering and Construction, U.S. Army Corps of Engineers
 - **Ernesto Avila**, Partner and Co-Owner of Avila and Associates Consulting Engineers, Inc.
- In-person deliberative work session conducted March 14.
- Working Group is monitoring the Flint water crisis and lessons learned.

STUDY GROUP MEMBERS

- **Adel Hagekhalil (Chair)** – Assistant Director, City of Los Angeles Sanitation
- **Diane VanDe Hei (Vice Chair)** – CEO, Association of Metropolitan Water Agencies
- **Dave Aucoin** – Safety Compliance Coordinator, Narragansett Bay Commission
- **Steve Bieber** – Water Resources Technical Manager, Metropolitan Washington Council of Governments
- **Cherrie Black** – Infrastructure Strategist, Idaho National Labs
- **Patty Cleveland** – Assistant Regional Manager, Northern Region, Trinity River Authority of Texas
- **Dr. Glen Daigger** – Professor of Engineering Practice, University of Michigan
- **Kevin Donnelly** – Deputy Commissioner, NYC Department of Design and Construction
- **Scott Haskins** – Senior Vice President and Director of Strategic Consulting, CH2M Hill
- **Rick Houck** – Vice President, Hawaiian Electric Company
- **Adam Krantz** – CEO, National Association of Clean Water Agencies
- **Terry Leeds** – Director, Kansas City Water Services
- **Bianca Mallory** – Vice President, The Allen Group
- **Dr. Kevin Morley** – Security and Preparedness Program Manager, American Water Works Association
- **Jonathan Reeves** – Manager, DC Water and Sewer Authority
- **Dr. Sunil Sinha** – Director, Virginia Tech Sustainable Water Infrastructure Management Center

STUDY GROUP UPDATE

- **Conduct research and interviews to develop key findings and conclusions**
 - 56 subject matter experts interviewed in 8 panel discussions.
 - 150+ research documents and open-source information resources.
 - Final Findings and Conclusions delivered to the Working Group on February 26.
- **Assess sector resilience during a high-impact scenario or event**
 - Conducted case study webinar that examined 5 extreme water disruption scenarios to identify dependencies, gaps and challenges, and opportunities.
 - Disruptions included 2008 Midwest Floods, Superstorm Sandy, New Madrid Earthquake, 2003 Northeast Blackout, and Cyber Storm IV: Evergreen.
- **Prepare final report**
 - Final draft to be delivered to the Working Group by March 21.



STUDY GROUP FINDINGS THEMES

1. Priority as a Critical Sector
2. Undervaluation of Water Services
3. Underinvestment in Water Resilience
4. Changing Risk Environment
5. Regional Collaboration to Improve Resilience
6. Federal Support for Resilience

STUDY GROUP FINDING #1

Water is not given appropriately high priority as a critical sector.

- Majority of local, state, and federal stakeholders do not sufficiently recognize the criticality of water services.
- Cascading effects of water disruptions are not fully understood or valued among critical infrastructure sectors.
- Current federal authority for water emergencies is distributed across four Emergency Support Functions (ESFs), leading to uncertainty and leadership challenges.
- Planning for larger-scale (multi-community, multi-jurisdiction) supplies of emergency drinking water is inadequate.

STUDY GROUP FINDING #2

Water services are undervalued.

- Understanding, recognition, and support for the value of resilient water services is lacking by both the public-at-large and decision-makers.
- A lack of appreciation is an underlying contributor to the lack of support for infrastructure investment.
- Investments in resilience can produce order-of-magnitude savings compared to expenditures for emergency response and repair.
- The challenge of raising rates to meet actual short- and long-term needs—including resilience—is enormous.

STUDY GROUP FINDING #3

Greater investment is needed to improve Water Sector resilience.

- While resources are often available for short-term operational needs, investment in preventative measures is inadequate.
- Rate setting is often a political process, making it difficult to incorporate a full accounting of risks.
- Full-cost-of-service pricing is difficult for some communities due to the affordability challenge.
- Retaining qualified personnel, attracting new talent, and providing training to build staff capabilities are key challenges for the water sector.

STUDY GROUP FINDING #4

A dynamic risk environment requires sustained research and analysis to support risk management.

- Water systems may lack advanced capabilities to adapt to a range of potential threats.
- Sector dependencies, while generally well-understood, may not be adequately addressed in practice.
- Tools, analysis, and information is available, but not broadly used across the sector.
- Cybersecurity awareness is often limited, and the number of available Water Sector cyber experts is insufficient for current needs.

STUDY GROUP FINDING #5

Regional collaboration is highly valuable but not broadly applied.

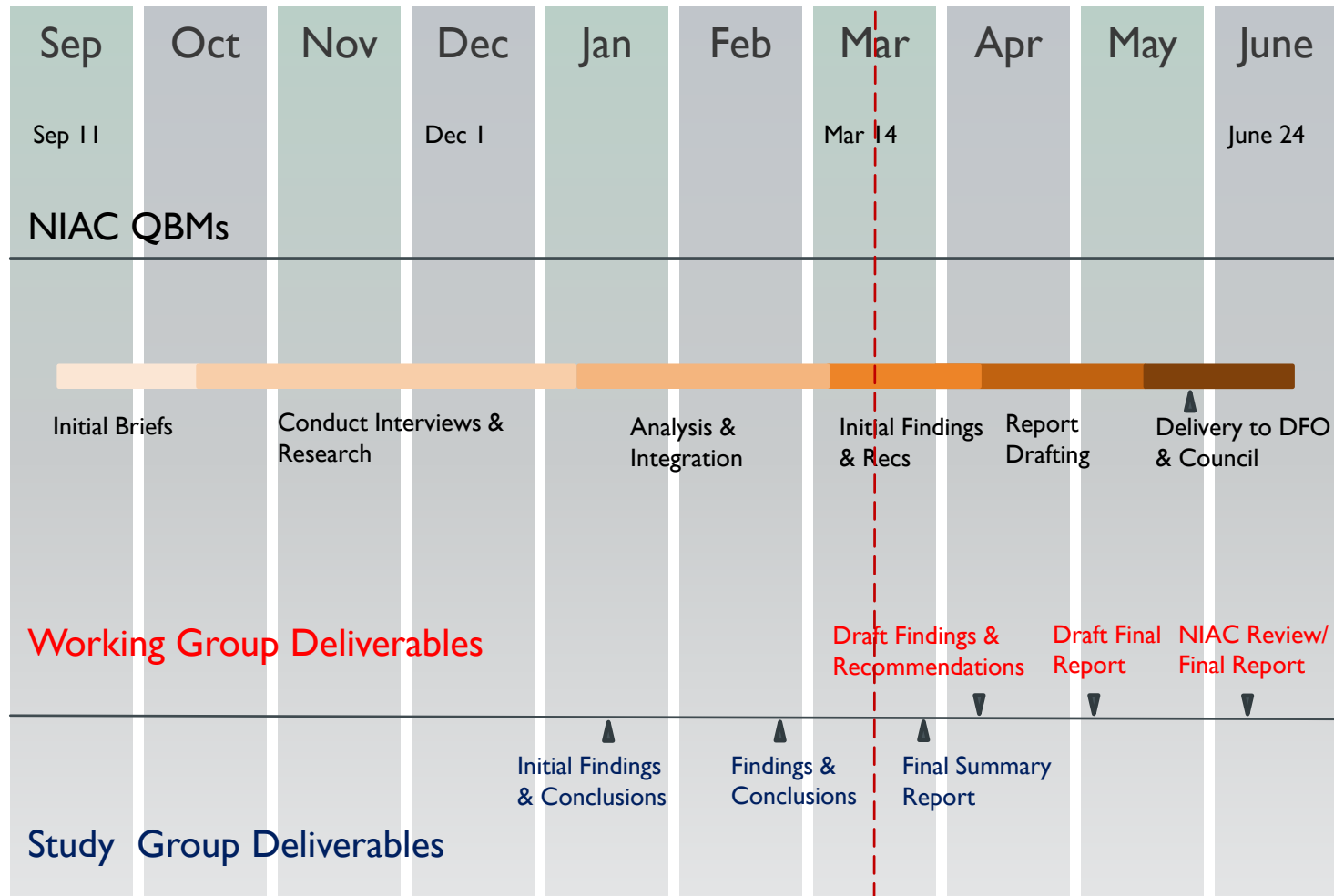
- Systems within a region containing multiple local and/or state jurisdictions tend to plan and operate independently.
- A shared approach to managing disruptions requires a framework of regional goals, resource-sharing criteria, and performance metrics.
- While the consequences of water disruptions are often local and regional, insufficient attention is given to the risk and impact of a large-scale, national disruptions.

STUDY GROUP FINDING #6

Federal program support for resilience is fragmented and weak.

- While resilience is well established in federal policy (e.g., PPD-8), it takes time to translate policy into programming and funding.
- Federal authorities, regulations, reporting requirements, and funding mechanisms currently do not promote a unified response to sector resilience.
- Flexibility to operate during emergencies (e.g., water quality, power-generation source) is constrained by regulatory requirements.

UPDATED STUDY TIMELINE



NEXT STEPS

- Finalize Working Group Findings
- Develop Study Recommendations
- Prepare Final Report
- Present the final findings and recommendations to the Council for deliberation at the June 24th Quarterly Business Meeting



QUESTIONS?





APPENDIX: BACKGROUND INFORMATION



FRAMING QUESTIONS

1. What **current strategies and practices promote resilience** in the sector?
What differences or common areas of understanding of resilience and plan coordination exist across regions and subsectors?
2. What are the implicit resilience goals that are aligned with **common practices for each region or sub-sector, and across the sector?**
3. What considerations and cascading effects result from **dependencies between sub-sectors and other infrastructure sectors**, including cyber systems and their disruptions, within a region and across the nation?
4. What **potential gaps and seams** exist that create obstacles for the sector and subsectors to achieve their resilience goals?

FRAMING QUESTIONS (CONTINUED)

5. What **unique factors within the sector influence risk mitigation**? What are the practical realities of risk priorities and risk mitigation, such as those related to investments and operations?
6. What **roles and responsibilities** should private sector and government at all levels play, operationally and at the senior executive level?
7. What **new policies and strategies** may be needed to improve resilience for the sector? What steps can the government take to implement them?

PREVIOUS WORKING GROUP UPDATE

- Five Working Group interviews completed as of 12/1/15:
 - **David Travers**, Director of the Water Security Division in the Office of Groundwater and Drinking Water, U.S. Environmental Protection Agency (EPA is the Water Sector-Specific Agency)
 - **Patricia Mulroy**, Senior Fellow at the Metropolitan Policy Program at Brookings; former general manager of the Southern Nevada Water Authority
 - **Marc Kodack**, Program Manager for the Office of the Deputy Assistant Secretary of the Army for Energy and Sustainability
 - **Christopher Dunn**, Director of the U.S. Army Corps of Engineers, Institute for Water Resources, Hydrologic Engineering Center
 - **Martha Daniel**, President and Chief Executive Officer; and **Brenda Taylor**, Chief Technology Officer and Executive Vice President; at Information Management Resources, Inc.
- Water and Wastewater Sector and Government Coordinating Councils facilitated discussion conducted 11/10/15.
- Working Group planning and analysis session conducted 12/1/15.