***Understanding and Combating the Security Risks of Climate Change***

**Written Statement by Ann C. Phillips, Rear Admiral, U.S. Navy (Retired)**
**Special Assistant to the Governor of Virginia for Coastal Adaptation and Protection**

**Office of the Governor**
**1111 E. Broad Street**
**Richmond, VA 23219**

**Statement for the Senate Special Committee on the Climate Crisis**
**February 13th, 2020**

**Senator Duckworth, Chairman Schatz,** and distinguished Members of the Select Committee, thank you for the opportunity to testify to you today. It is a privilege to be before you at this hearing to discuss this very important topic.

My name is Ann Phillips, and I am the Special Assistant to the Governor of Virginia for Coastal Adaptation and Protection. I am a retired Surface Warfare Officer - I drove and commanded ships for the United States Navy for 31 years, served abroad in Guam and Lisbon, Portugal, and operated extensively with NATO and Partnership for Peace nations. I retired in 2014 as a Rear Admiral and Commander, Expeditionary Strike Group TWO. My experience in coastal adaptation and protection, along with climate and national security, stems from my work as Chair of the Surface Force Working Group for the Navy's Task Force Climate Change while still on active duty, and from my work since retiring, chairing the Infrastructure Working Group for the Hampton Roads Intergovernmental Sea Level Rise Pilot Planning Project from 2014 to 2016, as a member of the Advisory Board of the Center for Climate and Security, and on the Board of Directors for the Council on Strategic Risks.

Today, I've been asked to address the security risks of Climate Change from the perspective of the Commonwealth of Virginia, as we prepare to adapt and protect our coastal region, including substantial national security infrastructure, from the impact of sea level rise and recurrent flooding. **Virginia's priorities are to identify critical infrastructure that is vulnerable to rising waters and recurrent flooding; to determine the best and most practical, innovative**

**and cost effective solutions to adapt and protect that infrastructure; to partner with Federal, State and Local stakeholders in determining those solutions, to use creative and less costly green or green-gray infrastructure approaches to protect more dispersed assets, to ensure environmental equity for underserved communities; and to leverage federal, state and local funds to help make Coastal Virginia more resilient to climate change.**

## SETTING THE STAGE

**Climate change has a significant and intensifying impact on our coastal communities in Virginia today.** Rising sea levels lead to recurrent nuisance flooding, caused by high tides, accompanied by wind, and /or increased intensity and frequency of rainfall, or any combination of the three. These circumstances intensify the impact of coastal storms and hurricanes and the accompanying flooding and storm surges. **Coastal Virginia deals with water where we did not plan for it to be, and that impedes the expected pattern of life, in some form, nearly every day.** This is our "new normal" - it affects every aspect of our lives in ways that we do not yet understand, or even realize. My current position works at the local, regional, state and national level to foster action across the whole of government, community and society to address and build resilience to this existential threat and to protect and adapt Coastal Virginia.

## VIRGINIA'S UNIQUE RISK

We have a water-based economy in Coastal Virginia. The cornerstones of that economy are:

- **Our Federal presence**, **arguably the largest concentration in the nation** - in particular Department of Defense with Navy as the largest service represented, and including the substantial commercial industry surrounding military and commercial shipbuilding, maintenance and repair
- **The Port of Virginia** – large and expanding capacity with multi-modal access reaching from the East Coast to west of the Mississippi River
- **Beach and Water-related Tourism**
- **Water- adjacent and dependent agriculture, aquaculture, fisheries, commercial property, and housing stock**

All of this is supported by critical public and private utility and transportation infrastructure, as well as a substantial medical / hospital presence, and the universities, schools, and public infrastructure sustaining cities, counties and towns, along our coast.

**Virginia's high concentration of critical national security infrastructure is bound to the water by the very nature of its mission, and at risk from the threat of sea level rise and climate change impacts**. In their 2016 report, "The Military on the Front Lines of Rising Seas," the Union of Concerned Scientists found that a 3-foot increase in sea level rise would threaten 128 coastal DOD installations in the United States, 43% of which are Navy facilities valued at roughly $100 billion.[1] In its own 2019 "Report on Effects of a Changing Climate to the Department of Defense," the Department found that 53 of its mission-critical facilities are currently vulnerable to recurrent flooding, with 60 such facilities vulnerable within the next 20 years. When other hazards from climate change are considered (wildfire, drought, desertification), 79 total DoD facilities are vulnerable at present. **In Virginia, five Hampton Roads area facilities are on the US Navy and US Air Force list of most vulnerable infrastructure released in June 2019, including Naval Air Station Norfolk, Naval Air Station Oceana, Naval Support Activity Hampton Roads, Naval Support Activity Hampton Roads - Northwest Annex, and Joint Base Langley-Eustis**.[2] A 2008 study by the Organization for Co-operation and Economic Development, ranked the Hampton Roads metropolitan area as the 10th most vulnerable in the world related to the value of assets at risk from sea level rise.[3]

The Department of Defense and our federal partners are the largest employers in the state[4] and Virginia's percentage of gross domestic product derived from the federal presence in the

[1] "The US Military on the Front Lines of Rising Seas," Executive Summary (Union of Concerned Scientists, 2016), https://www.ucsusa.org/sites/default/files/attach/2016/07/front-lines-of-rising-seas-key-executive-summary.pdf.
[2] United States Department of Defense, "Report on Effects of a Changing Climate to the Department of Defense," January 2019, https://media.defense.gov/2019/Jan/29/2002084200/-1/-1/1/CLIMATE-CHANGE-REPORT-2019.PDF. March 2019 update, June 2019 Update.
[3] RJ Nicholls et al., "Ranking Port Cities with High Exposure to Climate Extremes - Exposure Estimates," Environment Working Papers (Organization for Economic Co-operation and Development. 2008.), http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/WKP(2007)1&doclanguage=en.
[4] "Virginia Statewide Community Profile" (Virginia Employment Commission, 2019). https://virginiawlmi.com/Portals/200/Local%20Area%20Profiles/5101000000.pdf

state is 8.9% (the highest percentage of any state).[5] Virginia also has the highest rate of defense personnel spending of any state, and is second only to California in defense contract spending and defense-related contract spending. **The Hampton Roads region hosts federal facilities that are unique and not easily replicable in other locations, including our largest Naval Base, Naval Station Norfolk, as well as the only shipyard where we build aircraft carriers and one of only two places where we build nuclear- powered submarines - Newport News Shipbuilding, owned by Huntington Ingalls Industries**. **The City of Portsmouth is home to Norfolk Naval Shipyard, one of only four Navy - owned and operated nuclear repair shipyards in the United States, at extreme risk of flooding. Joint Base Langley-Eustis**, **with Fort Eustis in the City of Newport News and Langley Air Force Base in the City of Hampton**, **is also vulnerable**. Langley AFB, which deals with rising water as a matter of routine and has done considerable work to make its facilities resilient, has taken up much of the overflow from the impact to aviation training for the F-22 Strike Fighter from Tyndall Air Force Base after Hurricane Michael's impact on that facility last year.[6]

**The Eastern Shore of Virginia hosts NASA's Flight Facility at Wallops Island, which includes Virginia Space's MidAtlantic Regional Spaceport, NASA flight test facility, National Oceanic and Atmospheric Administration and Federal Aviation Administration facilities, and the Navy's Surface Combat Systems Center Range**. These facilities are unique and incredibly important. For example, the Navy Surface Combat Systems Center Range, the only such test range on the East Coast of the United States, supports the majority of new construction combat systems training for the Fleet.

**We also are home to the Port of Virginia, the third largest container port on the East Coast and sixth busiest port by container traffic volume in the United States.** A multi-modal port with facilities located in Hampton Roads in the cities of Norfolk, Portsmouth and Newport

[5] "Defense Spending by State, FY 2017" (US Department of Defense, Office of Economic Adjustment, March 2019).
[6] "Tyndall AFB Personnel, F-22s Temporarily Relocate to Hawaii and Alaska," U.S. Indo-Pacific Command, accessed July 17, 2019, https://www.pacom.mil/Media/News/News-Article-View/Article/1682655/tyndall-afb-personnel-f-22s-temporarily-relocate-to-hawaii-and-alaska-bases/.

News, and with barge service to the Port of Richmond and an Inland Port intermodal transfer facility in Front Royal, Virginia, [7] the Port of Virginia is the only East Coast port with federal authorization to dredge to a 55 foot channel depth, and generates a total of $60 billion in economic activity for the Commonwealth.[8] It is also one of 17 Maritime Administration (MARAD) designated Commercial Strategic Seaports.[9] With a focus on sustainability, the Port of Virginia works to build resilience, aligned with the surrounding communities. Much like the regions' federal facilities, however, its future resilience, security and sustainability are inextricably linked to that of the surrounding cities and other localities that support and provide its critical utilities, transportation, logistics, and supply chain infrastructure.

**Coastal Virginia's substantial tourism industry generates direct travel-related expenditures exceeding $5.2 billion in our Coastal region**[10]. Virginia boasts wide beaches, access to a myriad of water sports and recreational activities, as well as natural tidal marshlands, unique barrier island structures, and we are a critical stopover on the North Atlantic migratory bird flyway. All incredible facilities and natural amenities, and all at extreme risk.

**Our substantial aquaculture and wild fishing industries generate over $1.4 billion in annual sales,[11] including oysters, crabs, and the largest clam industry on the East Coast of the United States**.[12] These industries are vulnerable to both sea level rise and ocean acidification and warming. The infrastructure necessary for their success ties them to low-lying areas near the water - vulnerable to flooding - and accessibility to workplaces and docks is becoming a challenge during the more frequent high tide flooding that impacts road access, as well as

[7] "NAFTA Region Container Traffic - 2017 Port Rankings by TEU's" (American Association of Port Authorities, 2017).
[8] "About the Port of Virginia," accessed July 18, 2019, http://www.portofvirginia.com/about/.
[9] "National Port Readiness Network (NPRN) | MARAD," December 13, 2019, https://www.maritime.dot.gov/ports/strong-ports/national-port-readiness-network-nprn.
[10] "The Economic Impact of Domestic Travel on Virginia Counties 2017: A Study Prepared for Virginia Tourism Authority" (U.S. Travel Association, August 2018), https://www.vatc.org/wp-content/uploads/2018/08/2017-Economic-Impact-of-Domestic-Travel-on-Virginia-and-Localities.pdf.
[11] "Fisheries Economics of the United States 2016" (U.S. Department of Commerce, NOAA National Marine Fisheries Service, 2018), https://www.fisheries.noaa.gov/content/fisheries-economics-united-states-2016.
[12] Thomas J. Murray and Karen Hudson, "Economic Activity Associated with Shellfish Aquaculture in Virginia 2012," , https://www.vims.edu/research/units/centerspartners/map/aquaculture/docs_aqua/MRR2013_4.pdf.

activities on the waterfront. Ocean acidification and warming will affect the ability of some species to survive and reproduce in Coastal Virginia waters - in particular shellfish, endangering the wild-caught and grown seafood industry treasured by the Chesapeake Bay region.[13] For Virginia, this may be only a matter of time as such impacts have already been observed in the Pacific Northwest region of the United States, costing that region over $110 million dollars and putting 3,200 jobs at risk.[14]

**Finally, our waterfront property and housing stock is a challenge we share with many other coastal states – and for Virginia, this is where those who operate, maintain, and support our critical national security infrastructure live.** Within the next 30 years - the lifespan of a typical mortgage - as many as 311,000 coastal homes in the lower 48 states with a collective market value of about $117.5 billion in today's dollars will be at risk of chronic flooding (more than 26 times a year or about every other week). By the end of the century, 2.4 million homes and 107,000 commercial properties currently worth more than $1 trillion altogether could be at risk, with Virginia's coastal real estate significantly exposed. In 2045, the homes expected to be at risk currently contribute about $23 million in annual property tax revenue in Virginia. The homes at risk by 2100 currently contribute roughly $342 million collectively in annual property tax revenue. [15] In a recent Comprehensive Sea Level Rise and Recurrent Flooding Study conducted by the City of Virginia Beach and Dewberry, the annualized losses today in that City alone result in residential damages of $26 million annually due to coastal flooding events. If no action is taken, with 1.5 feet of additional sea level rise, expected within 20-30 years, that number increases to $77 million annually, and with 3 feet of additional sea level rise, forecast within 60-70 years, to $329 million annually, a 12 – fold + increase.[16]

---

[13] "Virginia Is Highly Vulnerable to Ocean Acidification" (Natural Resources Defense Council adopted from Ekstrom et al., 2015, February 2015), https://www.nrdc.org/sites/default/files/state-vulnerability-VA.pdf.
[14] "New Study: Rapid Ocean Acidification Threatens Coastal Economies in 15 States," 2015. NRDC Press Release https://www.nrdc.org/media/2015/150223.
[15] "Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate" (Union of Concerned Scientists, June 2018), https://www.ucsusa.org/global-warming/global-warming-impacts/sea-level-rise-chronic-floods-and-us-coastal-real-estate-implications.
[16] CJ Bodnar, "Virginia Beach Sea Level Wise Adaptation Strategy Draft" (City of Virginia Beach: Dewberry, January 2020), https://www.vbgov.com/government/departments/public-works/comp-sea-level-rise/Documents/20200102%20VBSLWAS_DRAFTREPORT_2020101_ELECTRONIC.pdf.

## COLLABORATIVE OPPORTUNITIES: THE HAMPTON ROADS SEA LEVEL RISE AND RESILIENCE INTERGOVERNMENTAL PILOT PROJECT

Virginia has a longstanding and vital relationship with our Federal partners, in particular the Department of Defense and Coast Guard. In 2014, the Hampton Roads region became part of a strategic effort to address and create practices by which Federal, State and Local partners could come together to identify and address climate impacts, and develop a codified process for achieving collaborative solutions. This project, initiated through the National Security Council, was the Hampton Roads Sea Level Rise and Resilience Intergovernmental Planning Pilot Project (Intergovernmental Pilot Project or IPP). Convened by Old Dominion University, the IPP was one of four federal and three Department of Defense climate preparedness and resilience planning pilots.[17] In correspondence as the then Acting Deputy Undersecretary of Defense for Installations and the Environment, Mr. John C. Conger designated the Navy as lead service supporting the Hampton Roads Pilot Project. The stated intent leveraged the Department of Defense's existing relationships and resources to develop additional partnerships and processes by which mutual regional resilience, supporting Department of Defense mission assurance and surrounding communities sustainability, could be developed.[18]

The Intergovernmental Pilot Project (IPP) in Hampton Roads ran for two years from June 2014 to June 2016, and brought together more than 200 federal, state and regional professionals. Focused on holistic understanding of shared challenges and on developing solutions to prepare for sea level rise and recurrent flooding impacts in the Hampton Roads Region, the IPP developed a series of final reports, and included five key priorities for action.[19]

[17] "June 27, 2016 IPP SC Consensus Resolution" (The Steering Committee of the Hampton Roads Sea Level Rise Preparedness and Resilience Intergovernmental Planning Pilot Project, June 27, 2016), https://www.floodingresiliency.org/wp-content/uploads/2016/11/IPP-Consensus-Resolution-All-Signatures.pdf.
[18] John Conger, Acting Under Secretary of Defense, "Memoradum for Assistant Secretaries of the Army, Navy and Air Force: DoD Climate Preparedness and Resilience Planning Pilots," October 29, 2014.
[19] Emily E. Steinhilber et al., "Hampton Roads Sea Level Rise Preparedness and Resilience Intergovernmental Pilot Project. Phase 2 Report: Recommendations, Accomplishments and Lessons Learned" (Old Dominion University, October 2016), https://digitalcommons.odu.edu/hripp_reports/2/.

- First: Set and implement common planning standards
- Second: Ensure the support of a consortium of universities, to guarantee that the best possible science and engineering technology is available to decision-makers.
- Third: Collect, analyze, process and share data to enable common regional understanding and analysis of outcomes.
- Fourth: define and identify critical and vulnerable infrastructure from the context of shared infrastructure dependencies and interdependencies.
- Fifth and finally, develop a strategic planning process to achieve desired outcomes and determine funding priorities and necessary to achieve those outcomes. [20]

At the conclusion of the IPP, the steering committee and advisory and working group committee chairs signed a resolution recommending paths forward that the region might consider.[21] While the resolution was not ultimately adopted at a regional level, many of the recommendations have been taken up and implemented by cities, localities, and the Hampton Roads Planning District Commission, and many more are under consideration today. Those adopted include: setting standards, establishing a consortium of universities, and collecting and sharing data at a regional level. At the state level, Virginia intends to develop an analysis of critical and vulnerable infrastructure. Our challenge, like that of our Federal partners and fellow coastal and riverine states remains: how will we pay for this?[22]

The Intergovernmental Pilot Project was also one of two regional collaborative efforts analyzed in a recently completed doctoral dissertation by Dr. Hannah M. Teicher for her PhD in Architecture for the Massachusetts Institute of Technology, Department of Urban Studies and Planning, in June 2019, ***"Climate Allies: How Urban/Military Interdependence Enables Adaptation"***.[23]

[20] Steinhilber et al.
[21] "June 27, 2016 IPP SC Consensus Resolution."
[22] Steinhilber et al., "Hampton Roads Sea Level Rise Preparedness and Resilience Intergovernmental Pilot Project. Phase 2 Report: Recommendations, Accomplishments and Lessons Learned."
[23] Hannah M Teicher, "Climate Allies: How Urban/Military Interdependence Enables Adaptation" (Doctoral Dissertation, Massachusetts Institute of Technology; Department of Urban Studies and Planning, 2019), https://dspace.mit.edu/handle/1721.1/122193.

Dr. Teicher identifies key points and outcomes highlighting the value of partnerships and alignments between communities and regional entities, and their Department of Defense and other Federal partners.[24]

In particular, she states *"the shared risks between installations and the communities that surround them bring great potential for joint adaptation planning and in fact drive a need for it*". Her research found that, by using the circumstances and processes already in existence in these two unique communities of practice, "*Hampton Roads, Virginia and San Diego, California employed the most readily available joint planning mechanisms*" to elevate their broader adaptation agenda. In Hampton Roads, the IPP led to Joint Land Use Studies to further expand resilience planning, and in San Diego, the Integrated Natural Resource Management Plan (INRMP) process became the foundation for a Memorandum of Understanding between the Navy and the Port of San Diego to expand joint adaptation planning.[25]

Finally, Dr. Teicher points out two main enabling mechanisms in her dissertation: those of "**recognizing independence and constructing credibility,"** as key to not only initiating such alliances, but to reinforcing and expanding them.[26]

The IPP process in and of itself brought hundreds of stakeholders together, built lasting and ongoing relationships, and produced many workable recommendations for the region, accomplished by a variety of partnerships. The key deliverables - a whole of government mitigation and adaptation planning process, and a recommended integrated regional strategy to move forward, can both serve as a template for other regions[27] . Some of this work may be specific only to a unique circumstance or area, but when taken as a whole, it brings substantive change in the context of local, regional and federal collaboration. Finally, the IPP built on

[24] Hannah M Teicher.
[25] Hannah M Teicher.
[26] Hannah M Teicher.
[27] Steinhilber et al., "Hampton Roads Sea Level Rise Preparedness and Resilience Intergovernmental Pilot Project. Phase 2 Report: Recommendations, Accomplishments and Lessons Learned."

previous efforts accomplished by other leaders in the Hampton Roads region, and continues to leverage those outcomes to accelerate regional adaptation.[28]

## TAKING ADVANTAGE OF EXISTING FEDERAL PROGRAMS

**DOD Office of Economic Adjustment, Joint Land Use Studies:** As a direct outcome from the IPP, and as recommended by Commander Navy Region Mid-Atlantic, the Navy's Executive Agent for the IPP, the Department of Defense, Office of Economic Adjustment (OEA) undertook a series of Joint Land Use Studies (JLUS) within the Hampton Roads Region. The context of these studies, understanding compatible use of infrastructure by federal and local partners, focused on how infrastructure external to federal DOD facilities would be impacted by the encroachment of recurrent flooding, storm surge, sea level rise, and other coastal hazards, and how those impacts and outcomes would affect the environmental resilience of the federal facilities in the region. The first of the studies, completed in June 2018, built upon an existing JLUS with the City of Hampton in 2010, expanded to include compatible use aspects, and included the city of Newport News, James City and York Counties, and Joint Base Langley-Eustis, with a focus on the FT Eustis facility.[29]

Key recommendations from the Newport News /Hampton JLUS study also support IPP outcomes. In particular, establishing a formal communications process and developing a series of memoranda of understanding to ensure standardized processes for future collaboration between the localities and the federal facilities on a host of topics, including GIS, land use compatibility, communication, sea level rise and recurrent flooding, traffic, waterway access, energy and natural resources.[30]

The IPP led directly to two additional new JLUS study efforts. The Norfolk/Virginia Beach JLUS, including Naval Station Norfolk, Joint Expeditionary Base Little Creek/ Fort Story and Naval Air Station Oceana, and the Portsmouth/Chesapeake JLUS, including Norfolk Naval Shipyard in

[28] Commonwealth of Virginia, "EO 24; Increasing Virginia's Resilience to Sea Level Rise and Natural Hazards.," November 2, 2018, https://www.governor.virginia.gov/executive-actions/.
[29] "Joint Base Langley Eustis (Fort Eustis) Joint Land Use Study" (City of Newport News, March 2018), https://docs.wixstatic.com/ugd/3a99a7_58423e7847ce4078af32aceafeb6489f.pdf.
[30] "Joint Base Langley Eustis (Fort Eustis) Joint Land Use Study."

Portsmouth, outlying Fentress Field in Chesapeake, and the Portsmouth Naval Medical Center. The Norfolk/Virginia Beach Study has just finished its final public comment – with the Portsmouth/ Chesapeake study currently underway.[31]

**These studies are a great value to the region and to the Commonwealth of Virginia. Not only do they give us a better understanding of how shared infrastructure interdependencies will be negatively impacted by climate change effects over time, but they inform our adaptation work with federal partners across the region.**

**Through the assistance of the Department of Defense Office of Economic Adjustment, the City of Hampton has applied for and received additional planning grants to allow them to take steps collaboratively with their federal partners to begin to plan for selected IPP/JLUS recommended outcomes, and other Hampton Roads cities are considering applications. This program provides critical planning funding to communities adjacent to DOD/Federal facilities that offers direct assistance to those facilities for resilience work, and should be fully funded and expanded.**

**US Army Corps of Engineers:** The Commonwealth of Virginia also works closely with the US Army Corps of Engineers across a number of programs, most specifically the Feasibility Study 3x3x3 process and Continuing Authorities programs.[32] Both processes allow Army Corps districts to work with local governments to study the needs of communities dealing with rising waters and storm surge. Related to recommendations from the 2015 North Atlantic Coast Comprehensive Survey, completed by USACE North Atlantic Division, the City of Norfolk and USACE Norfolk District completed a 3x3x3 in February of 2019 and have proceeded to the preliminary engineering design phase.[33] The second recommended study area, Potomac River shoreline in Northern Virginia, has just started a Coastal Storm Risk Management Study (July 15,

[31] "Joint Land Use Studies | Hampton Roads Planning District Commission," accessed September 16, 2019, https://www.hrpdcva.gov/departments/joint-land-use-studies/.
[32] "The Corps Feasibility Study – Finding a Balanced Solution," Headquarters, accessed September 16, 2019, https://www.usace.army.mil/Media/News-Archive/Story-Article-View/Article/643197/the-corps-feasibility-study-finding-a-balanced-solution/.
[33] "North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk," Study (United States Army Corps of Engineers, 2015), https://www.nad.usace.army.mil/CompStudy/.

2019) under the auspices of the Baltimore District, USACE, with the Metropolitan Washington Council of Governments as the non-federal sponsor, and the Commonwealth of Virginia as one of several cost share partners.[34] The 2018 Water Resources Development Act authorized a full coastal study for Coastal Virginia, to include flood risk management, ecosystem restoration and navigation, which gives the Commonwealth the flexibility to include more than one city or municipality in the study area, critical to a region such as Hampton Roads, where multiple cities, localities, and federal facilities exist in close proximity. [35]

The challenge, though, is that such studies do not include Federal property, as dictated by restrictions to funding appropriations sources, and so require additional coordination between USACE, DOD, State and local participants to align appropriated funding. As an example, the Norfolk CSRM study only includes the City of Norfolk, and did not include a similar level of effort or the impacts to or outcomes of storm surge and flooding for Naval Station Norfolk or Naval Support Activity Hampton Roads. While USACE can work for DOD, they must be funded with DOD appropriations for such work, which does not often happen because of a lack of coordination.

**Virginia values its relationship with the US Army Corps of Engineers and their ongoing work with State agencies and localities. There is, however, an urgent need to align Corps planning standards, Principles and Guidelines, Feasibility Study, and benefit-cost analysis processes to better serve Coastal States and their communities dealing with rising waters and recurrent flooding, which includes the co-benefits of ensuring resilient and mission-ready national security infrastructure.**

[34] "Northern Virginia Coastal Study," accessed September 16, 2019, https://www.nab.usace.army.mil/DC_Coastal_Study/.
[35] "Water Resources Development Act of 2018," Pub. L. No. H.R. 8, § 201 (9) (2018), https://www.congress.gov/bill/115th-congress/house-bill/8/text.

**VIRGINIA IS TAKING ACTION**

**Under Governor Ralph Northam, Virginia is taking bold and substantive action to identify risk and develop a strategic vision and actionable steps to prepare our coast.** He intends to build capacity for Virginia as we set standards and define how we as a coastal state will approach this existential threat, **and has taken a series of executive actions;**

- **Executive Order 24, *Increasing Virginia's Resilience to Sea Level Rise and Natural Hazards*, signed November 2nd, 2018,**
- **Executive Order 29, which establishes the *Virginia Council on Environmental Justice*, signed January 22nd, 2019,**
- **Executive Order 45, *Floodplain Management Requirements and Planning Standards for State Agencies, Institutions and Property*, signed November 14th 2019**

**Executive Order 24 directs development of a Virginia Coastal Protection Master Plan** to adapt and protect our coastal region. This plan will build on and align those actions that our localities and regions have already taken to prepare themselves for their future, and will lay out a series of recommended actions and strategies for our state to develop and prioritize how it will adapt and protect our **valuable and vulnerable** coastline. In this context, it is essential to work with our federal partners, in particular the Corps, as we move forward to better prepare our state, regions, localities, and communities, to build trust, and demonstrate value. Executive Order 24 will serve to coordinate, collaborate, and communicate across state entities, across and with federal entities, and across our Coastal regions, communities, and localities to ensure coordinated objectives, and the best use of scarce funding dollars.[36] **Executive Order 29** directs Virginia's commitment **to ensure environmental justice. Underserved communities often bear the most substantial brunt of flooding challenges,** and yet have the least capacity to plan, apply for grant dollars, determine or meet federal and state match requirements, and to sort out solutions to fund and implement actions to keep their communities and their histories viable into the future. **Executive Order 45 directs Virginia to determine the vulnerability of**

[36] "Commonwealth of Virginia Executive Order 29" (Office of the Governor, January 22, 2019), https://www.governor.virginia.gov/media/governorvirginiagov/executive-actions/EO-29-Establishment-Of-The-Virginia-Council-On-Environmental-Justice.pdf.

**and set standards for future built infrastructure throughout the Commonwealth, to make Commonwealth holdings more resilient.** We have established and implemented a series of sea level rise scenario planning curves, to ensure the resilience of state-owned infrastructure and as recommendations for local governments and regions to use in planning and preparations for the future. We have also established a series of recommendations for first finished floor elevation for future constructed state-owned buildings that may be located in floodplains, and, we have incorporated substantive changes to our National Flood Plain Program oversight and implementation structure.

Further, Governor Northam has re-introduced legislation to allow Virginia to join the Regional Greenhouse Gas Initiative (RGGI) and to use funds generated through the sale of carbon pollution credits on the RGGI market to improve energy efficiency and resilience to climate change across the state, with a focus on our most vulnerable communities. This would direct an estimated $100 million annually to improving energy efficiency and lowering energy bills for low income Virginians, preparing coastal and inland communities for increased flood hazards associated with climate change, and program administration to support clean energy and pollution reduction. In addition, Governor Northam has proposed legislation to allow Commonwealth localities to regulate the activity, use and development of flood plains consistent with state or federal flood plain management programs and requirements, giving them the authority to build resilience through regulating their floodplains.

**HOW THIS COMMITTEE CAN HELP**

**First, I would like to thank both the House and the Senate for the addition of climate- related amendments in the 2018, 2019, and 2020 National Defense Authorization Act language. Of particular note in the 2020 language:**

- **Incorporation of Military Installation Resilience into Installation Master Plans**,
- **Creation of a Dedicated Budget Line Item for Adaptation to Extreme Weather,**
- **Requirement for Improved Building Codes under the Unified Facilities Criteria,**
- **Requirement for use of the Navy's Climate Change Installation Adaptation and Resilience planning handbook by the entire DoD**,

- **Extension of Restrictions on Construction in Floodplains** to cover projected sea level rise over the projected life of a building,
- **Direction to Create a Climate Vulnerability and Risk Assessment Tool by DoD,** to inform mitigation planning and infrastructure development.[37][38]

These efforts help coastal communities in Virginia with substantial federal presence improve coordination at the federal, state, and local level and improve resilience for our federal and defense facilities along with that of the surrounding communities, without which they would not be able to ensure our forces are prepared to deploy. I would also like to thank the House and the Senate for their work on the 2018 Disaster Recovery Reform Act and its many innovative solutions to focus on pre-disaster hazard mitigation, which will also give options and opportunities for coastal communities to better prepare themselves in advance of increased hazardous weather and storm activity.

**In addition, this Committee can help by supporting action on several key topics:**

**Institutionalize interoperability and resilience planning and preparedness at the Federal Level - Implement an Interagency Task Force to coordinate across agencies, and develop and implement a national policy, standards and processes to address and prepare for climate impacts.**

A similar construct was directed by President Obama's Presidential Memorandum on Climate Change and National Security, of September 21st, 2016. The Memorandum specifically focused on "establishing a framework to direct Federal Departments and Agencies to ensure climate-related impacts were fully considered in national security doctrine, policies and plans."[39] It built on existing Presidential directives and policies, including the Climate Action Plan of June

[37] Caitlin Werrell and Francesco Femia, "U.S. Congress Continues to Address Climate Change in Defense and Intelligence Legislation," *The Center for Climate & Security* (blog), December 12, 2019, https://climateandsecurity.org/2019/12/12/congress-continues-to-address-climate-change-in-defense-and-intelligence-legislation/.
[38] James M. Inhofe, "S.1790 - 116th Congress (2019-2020): National Defense Authorization Act for Fiscal Year 2020," webpage, December 20, 2019, https://www.congress.gov/bill/116th-congress/senate-bill/1790.
[39] Barack Obama, "Presidential Memorandum -- Climate Change and National Security" (The White House Office of the Press Secretary, September 21, 2016), https://obamawhitehouse.archives.gov/the-press-office/2016/09/21/presidential-memorandum-climate-change-and-national-security.

2013, and Executive Orders 13653 (Preparing the United States for the Impacts of Climate Change) of November 1, 2013 (revoked in 2017), 13677 (Climate-Resilient International Development) of September 23, 2014, and 13693 (Planning for Federal Sustainability for the Next Decade) of March 19, 2015..[40] [41] [42] [43] **It further directed the establishment of a Climate and Security Working Group**, chaired by members of the National Security Council, and including representation from stakeholder Federal departments and agencies. Unfortunately, this group never convened, but the need for an institutionalized national-level focus, process and strategy, one that could be replicated at the State and regional level to coordinate on Pre-disaster preparedness, planning and adaptation development was shown by the Hampton Roads IPP to be of value, and it remains a critical need.

**In addition, the 2016 Water Resources Development Act directed the US Army Corps of Engineers to establish an Interagency Coordination process**, to participate in any State level activities related to Federal property that would be impacted by local, regional, or State adaptation and protection efforts to prepare for coastal resilience. The 2016 WRDA/WIN Act §1183(b)[44] language, could also be a template for an interagency coordination effort, though it is not clear how USACE has implemented this legislation.

**<u>Ensure Federal Agency Funding Alignment</u>**

While USACE can work for DoD and other Federal agencies, they must be funded with DOD or other agencies' appropriations for such work, which does not often happen because of a lack of

[40] Executive Office of the President, "The President's Climate Action Plan" (The White House, June 2013), https://obamawhitehouse.archives.gov/sites/default/files/image/president27sclimateactionplan.pdf.
[41] Barack Obama, "Executive Order 13653: Preparing the United States for the Impacts of Climate Change" (The White House Office of the Press Secretary, November 6, 2013), https://www.federalregister.gov/documents/2013/11/06/2013-26785/preparing-the-united-states-for-the-impacts-of-climate-change.
[42] Barack Obama, "Executive Order 13677: Climate-Resilient International Development" (The White House Office of the Press Secretary, September 26, 2014), https://www.federalregister.gov/documents/2014/09/26/2014-23228/climate-resilient-international-development.
[43] Barack Obama, "Executive Order 13693: Planning for Federal Sustainability in the Next Decade" (The White House Office of the Press Secretary, March 25, 2015), https://www.federalregister.gov/documents/2015/03/25/2015-07016/planning-for-federal-sustainability-in-the-next-decade.
[44] "Water Infrastructure Improvements For The Nation Act," Pub. L. No. 114–322, § 1183(b) (2016), https://www.congress.gov/114/plaws/publ322/PLAW-114publ322.pdf.

coordination. In a region like Hampton Roads, or on the Eastern Shore at NASA's Wallops Island Flight Test Facility – both with billions of dollars if critical national infrastructure at risk, the failure to include Federal facilities in Coastal Storm and Environmental planning by the Corps is a grave oversight.

**Recognize climate resilience and disaster preparedness as one of the country's greatest and most immediate needs**.

Without significant funding for and coordination across the federal agencies that provide resilience and pre-disaster mitigation, Congress will fail to meet its charge of protecting the communities of the United States. In addition, Congress should encourage greater alignment of these programs to eliminate redundancies and ensure the most expedient and effective use of funds to protect people and property and reduce repetitive disaster spending.

In addition to resilience, pre-disaster mitigation, and infrastructure and flood plain actions, the U.S. Army Corps of Engineers (USACE) has a $96 billion backlog of authorized but unconstructed projects, while annual appropriations for the USACE Construction account under Energy and Water Development appropriations bills have averaged $2 billion in recent years. Congress has also limited the number of new studies and construction projects initiated with annual discretionary appropriations, with a limit of five new construction starts using FY2019 appropriations.[45] Since only a few construction projects are typically started each fiscal year, numerous projects that have been authorized by previous Congresses remain unfunded and backlogged. This problem has worsened in recent decades as Congress has authorized construction of new projects at a rate that exceeds USACE's annual construction appropriations. This drives competition for funds among authorized activities during the budget development and appropriations process, and only a few projects make it into the President's budget each year. Non-federal entities involved in USACE projects are frustrated with the extreme effort it takes to fund the projects their localities need.

[45] "Army Corps of Engineers Annual and Supplemental Appropriations: Issues for Congress" (Congressional Research Service, October 2018), https://crsreports.congress.gov/product/pdf/R/R45326.

Finally, additional topic areas of need include:

- **Strong Environmental Review Processes**
- **Substantive and timely, publically-available scientific data**
- **Aligned and Expanded Federal Block Grant Programs**
- **State resilience incentivized with Federal Matching Funds**

**CONCLUSION**

**In summary, as viewed from the State level, the need to understand and combat the security risks of climate change reveals an urgent need for a coordinated federal effort, and for codified Federal /State/Local aligned planning processes to deal with the impacts of climate change and rising waters on Critical National Infrastructure.** Rising waters and recurrent flooding know no political boundaries; they know no boundaries of wealth or race; they know no boundaries of society. Critical infrastructure across Virginia and around the country is impacted today.

**This Committee can help by recognizing climate resilience and disaster preparedness as one of the country's greatest and most immediate needs**.

**Virginia is committed to building capacity for our coastal region in alignment with our federal partners to prepare for and ensure resilience to this threat**, and as one of many impacted coastal and riverine states, **we need the support of a coordinated nationwide federal response to make this happen.**

We have no time to waste because **"Time and Tide wait for no man."**
(The words of Geoffrey Chaucer)

Thank you again for the opportunity to offer this testimony, and I look forward to your questions.