

# Agenda

- 1:00pm Welcome (Jeff Flood, SC Staff)
- 1:05pm Roll Call (Jeff)
- 1:10pm FOIA Preamble (Tom Crabbs, SC Chair)
- 1:15pm Chair Updates (Tom)
- 1:25pm NASA Langley Resilience Planning Efforts (Laura Rogers)
- 1:55pm Lines of Effort Update (Tom)
- 2:00pm JLUS/REPI/Sentinel Landscapes Crosswalk (Kevin Du Bois)
- 2:25pm Public Comments & Next Meeting July 21, 2021 (Jeff)
- 2:30pm Motion to Adjourn (Tom)



“ under the current state of emergency [COVID19 Pandemic], it is it impracticable or unsafe for the subcommittee to assemble in a single location; and that the purpose of the meeting is to discuss or transact the business necessary to continue operations of the Subcommittee, and the discharge of its lawful purposes, duties, and responsibilities under Executive Order 71.

# UPDATE

- DEWBERRY

- The Commonwealth is gearing up for a flood resilience project data call to solicit localities and tribes to input projects in the Virginia Coastal Resilience Master Plan. Virginia's federal installation partners will have the opportunity to add their projects to the database via an online form. The objective of the federal project data call is for the state to understand the location/status of federal projects and to promote regional coordination on project needs that span federal/local property lines.
- We are also working on the federal partnership outreach meeting to occur this summer on a parallel track.






Laura Rogers  
Patrick Taylor

# Lines of Effort

## Action

- Recommend state governance role
- Deliver a prioritized list of existing shared projects
- Target a recommended project
- Develop a model that delivers collective local, tribal, state, private, and federal strategy and investment to execute a recommended project
- Work cooperatively with DoD installations and their surrounding communities to secure OLDCC grants to conduct Compatibility Use Plans or addendums that address climate resiliency.
- Pursue appropriations for CRSM studies for the area of Virginia included in the Coastal Resiliency Master Plan.
- Support legislative language that enables USACE to include federal property in non-DoD funded feasibility studies

# JLUS/REPI/Sentinel Landscape Crosswalk

Installation	Jurisdiction	REPI Program	2020 REPI Challenge	Sentinel Landscape	JLUS/CUP Partnership	JLUS/CUP Compatibility Issues
Regional Assessment: Including Fort Lee, Naval Support Facility Dahlgren, Marine Corp Base Quantico, Naval Air Station Oceana, Joint Base Langley Eustis, and Fort AP Hill	VA			Virginia Security Corridor (VSC) Sentinel Landscape designation being sought	 <p>2017 Virginia Regional JLUS Implementation Strategy (Covers Fort Lee, NSP Dahlgren, MCB Quantico, NAS Oceana, JBLE, and Fort AP Hill only):  <a href="https://www.vade.virginia.gov/media/governorviriniagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vade.virginia.gov/media/governorviriniagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a></p>	<p>Enhance Ongoing Communication and Coordination between the Commonwealth of Virginia and the Military, Establish and Maintain an Interactive Mapping and Public Domain Data Repository between the Commonwealth and Military, Adopt Statewide Military Compatible Land Use Planning Guidelines for Local Governments to Integrate into Regional and Local Planning and Zoning Documents, Establish Procedures for Permitting Renewable Energy Development in Consideration of Military Compatibility, Establish Permanent Funding Sources for Military Compatibility Planning and Assistance for Local Governments and Other Agencies, Leverage Federal Investment through Education and Awareness of Available Programs and Grant Federal Funding Opportunities, Enhance Real Estate Disclosure Laws in the Commonwealth of Virginia, <u>Protect the Commonwealth of Virginia's Public Resources (public lands and airspace) utilized by both Virginia's Military installations and Local Communities (see more detail in Goal 6, pg. 16), protection of Potomac River Tidal Range and public land, airspace, waterway assets, promotion of veteran-owned businesses.</u></p> <p><u>Recommendation from the VA Regional JLUS:</u></p> <ul style="list-style-type: none"> <li>- Consider Establishing a Virginia-Maryland Military Compatibility Working Group: Virginia Leadership should consider working with the military and Maryland Leadership to formally establish a Virginia-Maryland Military Compatibility Working Group. If established, this group should consider being responsible for communication, coordination, and monitoring the implementation of actions needed to address compatibility issues that occur within the identified public resources used for military training. The primary focus for this group is broad military capabilities that can affect state installations that have operational or influence areas that span both states (such as Military Training Routes and the Potomac River). Other Partner: State of Maryland</li> <li>- Virginia Leadership should consider working with the military and North Carolina Leadership to formally establish a Virginia-North Carolina Military Compatibility Working Group. It would be helpful if this group would consider being responsible for communication, coordination, and monitoring the implementation of actions needed to address compatibility issues that occur within the identified public resources used for military training. The primary focus for this group is broad military capabilities that can affect state installations that have operational or influence areas that span both states (such as Military Training Routes). Other Partner: State of North Carolina</li> </ul>
NAS Oceana	VA	 <p>Military focus on managing lands for compatibility with flight operations, noise, night operations. Public benefits - working lands, supports the development of a JLUS</p>			 <p>1. 2005 Hampton Roads JLUS:  <a href="https://www.hrpdva.gov/departments/index/printpage/id/115/">https://www.hrpdva.gov/departments/index/printpage/id/115/</a></p> <p>2. 2017 Virginia Regional JLUS Implementation Strategy:  <a href="https://www.vade.virginia.gov/media/governorviriniagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vade.virginia.gov/media/governorviriniagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a></p> <p>3. 2019 Norfolk and Virginia Beach Joint Land Use Study (JLUS), NAS Oceana and Dam Neck Annex, NSN, and NSR HR Main Site:  <a href="https://www.hrpdva.gov/uploads/docs/FINA_LNoVBLUSReport.pdf">https://www.hrpdva.gov/uploads/docs/FINA_LNoVBLUSReport.pdf</a></p>	<p>1. Preservation of airfield operations. Development encroachment. Reduce noise impacts on communities surrounding NAS Oceana, MALT Fortress, and Chambers Field while accommodating growth and maintaining regional economic sustainability. Factors: Coordination, Communication, Sound Attenuation, Real Estate Disclosure, Planning and Public Policy, Land Use Regulation, Acquisition, Military Operations.</p> <p>2. Noise pollution specifically (see other notes in Call G4 above)</p> <p>3. Total flooding that will worsen over time with SLR and threats on infrastructure (roadway corridors and community assets that military personnel rely on on a daily basis). Challenges: Getting to work (infrastructure flooding - reliability and access), accessing community facilities, managing stormwater, maintaining utility services, coordinating between neighboring jurisdictions. The JLUS sets forth 22 Actions and related coordination strategies that Norfolk and Virginia Beach can implement in response to threats from flooding and SLR that aim to strengthen and enhance the Navy's ability to carry out its mission, improve the quality of life for sailors and their families, and allow the Navy to remain a major and robust part of the region's economy.</p>

# Public Comment





June 16, 2021

# EXPLORE EARTH

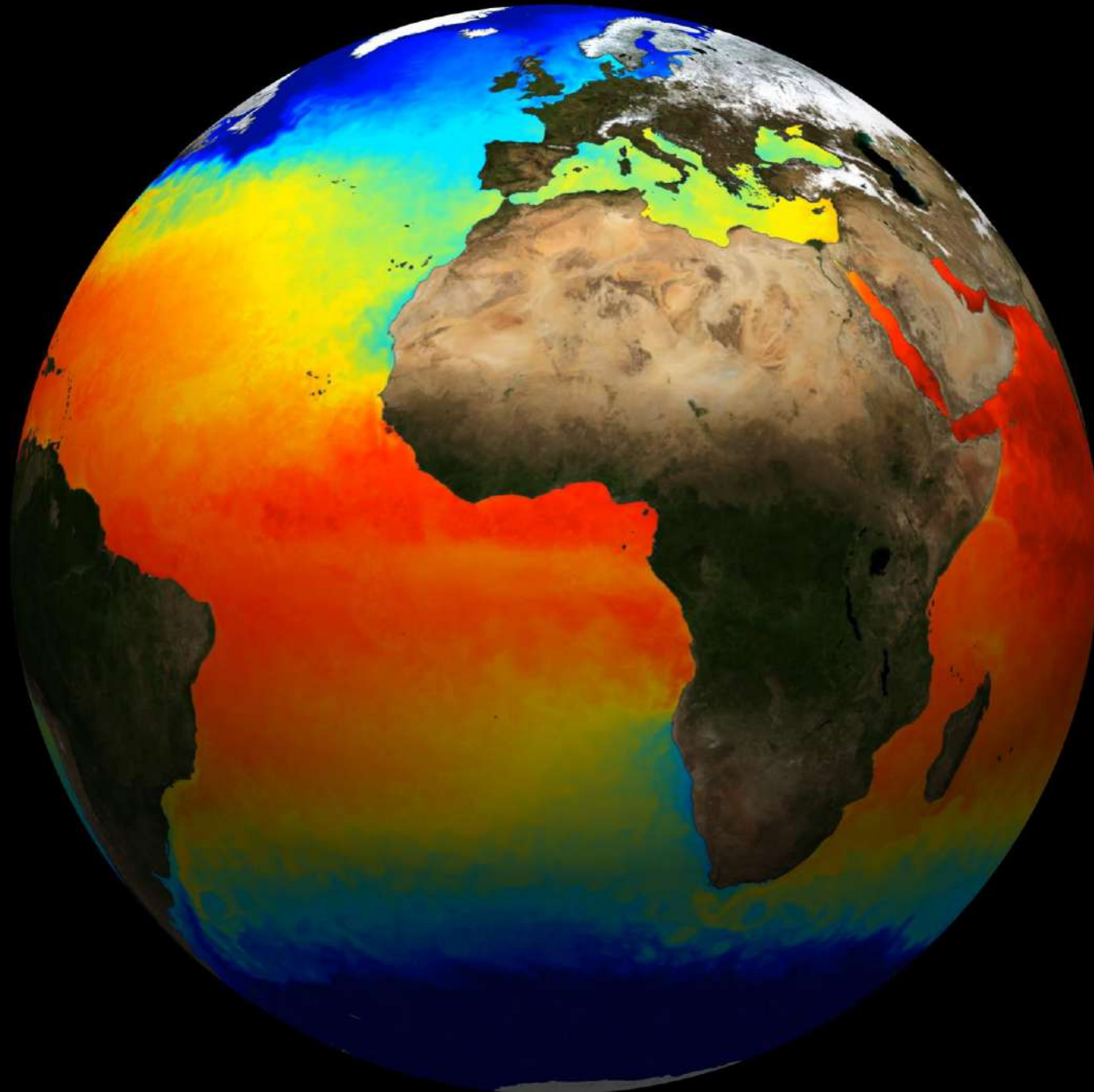
Laura Rogers  
NASA Langley Research Center

Slides collected from numerous colleagues across NASA



# Sea Surface Temperature SST-MUR (JPL)

02 Jun 2014 00:00





# NASA EARTH FLEET

OPERATING & FUTURE THROUGH 2023

SWOT (CNES)

LANDSAT-9 (USGS)

SENTINEL-6 B (ESA, EUMETSAT, NOAA)

TROPICS (6)

GEOCARB

NISAR (ISRO)

MAIA

TSIS-2

TEMPO

PREFIRE (2)

PACE (NSO)

GLIMR

SENTINEL-6 Michael Freilich (ESA, EUMETSAT, NOAA)

## INVEST/CUBESATS

ICESAT-2

CSIM-FD

HARP

GRACE-FO (2) (GFZ)

TEMPEST-D

CYGNSS (8)

CIRiS

NISTAR, EPIC (DISCOVER/NOAA)

CTIM

HyTI

## ISS INSTRUMENTS

EMIT

CLARREO-PF

GEDl

OCO-3

TSIS-1

ECOSTRESS

LIS

SAGE III

SNoPl

NACHOS

CLOUDSAT (CSA)

TERRA (METI, CSA)

AQUA (JAXA, AEB)

AURA (NSO, FMI, UKSA)

CALIPSO (CNES)

GPM (JAXA)

LANDSAT 7 (USGS)

LANDSAT 8 (USGS)

OCO-2

SMAP

SUOMI NPP (NOAA)

## JPSS-2, 3 & 4 INSTRUMENTS

OMPS-Limb

LIBERA

(PRE) FORMULATION ●

IMPLEMENTATION ●

PRIMARY OPS ●

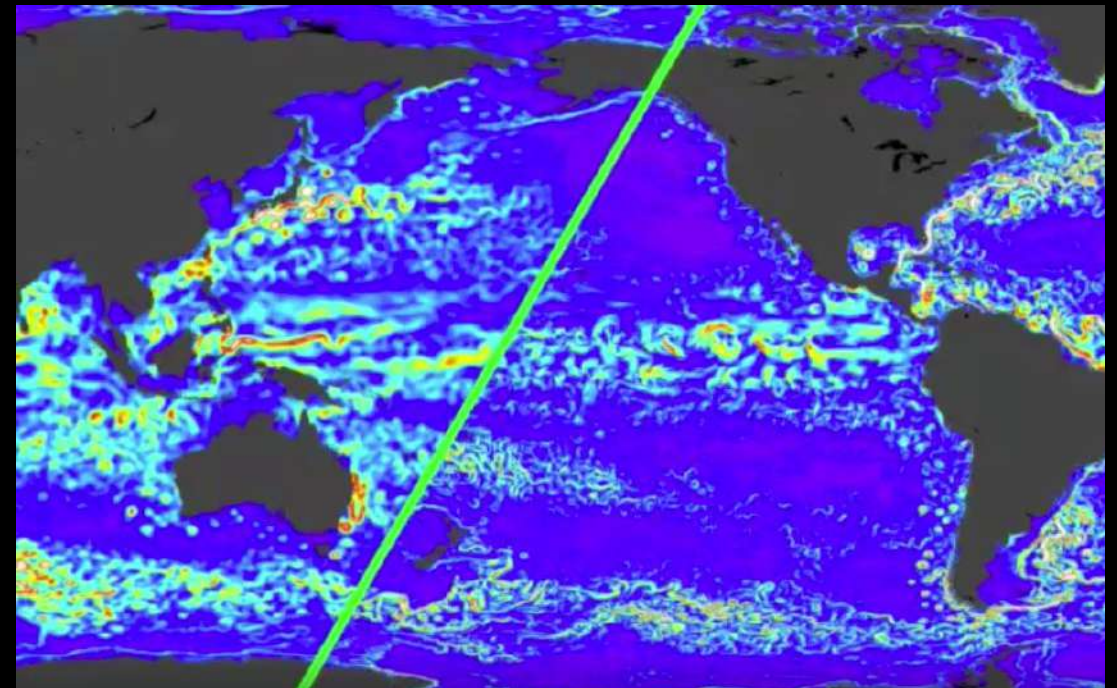
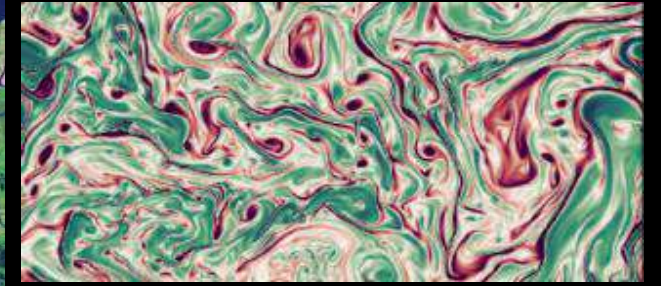
EXTENDED OPS ●

03.26.2021



# Sentinel-6 Michael Freilich

Extending sea level climate records into 4<sup>th</sup> decade



**SWOT** SURFACE WATER AND OCEAN TOPOGRAPHY

New ways to track water cycle and sea level



# Upcoming Satellite Missions



## SWOT: Surface Water and Ocean Topography

Launches in 2022

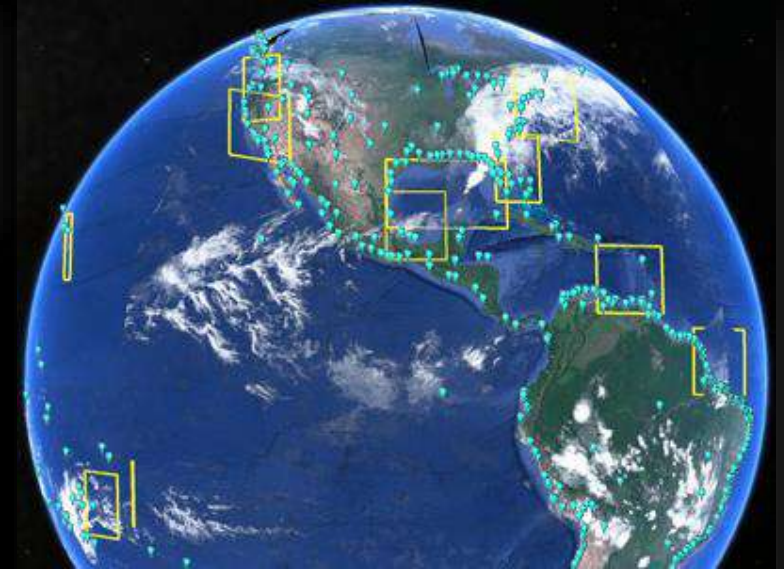
NASA's first global survey of Earth's surface water, observing major lakes, rivers and wetlands while detecting ocean features with unprecedented resolution



## PACE: The Plankton, Aerosol, Cloud, ocean Ecosystem

Launches in late 2023

Will advance the assessment of ocean health by measuring the distribution of phytoplankton, and will continue systematic records of key variables associated with air quality and climate



## GLIMR: Geosynchronous Littoral Imaging and Monitoring Radiometer

Launches in the 2026-2027 timeframe

Will provide unique observations of ocean biology, chemistry, and ecology in the Gulf of Mexico, portions of the southeastern U.S. coastline, and the Amazon River plume



# Field Campaigns



## **EXPORTS: EXport Processes in the Ocean from RemoTe Sensing**

Field campaign will start its N. Atlantic deployment out of Southampton, UK, on May 1, 2021!

Develop a predictive understanding of the export and fate of global ocean net primary production (NPP) and its implications for present and future climates

<https://oceanexports.org/index.html>



## **Delta-X: Field Campaign in the Mississippi River Delta**

Delta-X is studying why land is lost and why it is gained, so we can help make deltas grow.

Evaluate hydrological and ecological processes responsible for the resilience and vulnerability of river deltas to Relative Sea Level Rise (RSLR), and their relative contributions to soil elevation

<https://deltax.jpl.nasa.gov/about/>



# Data Integration, Modeling, and Prediction

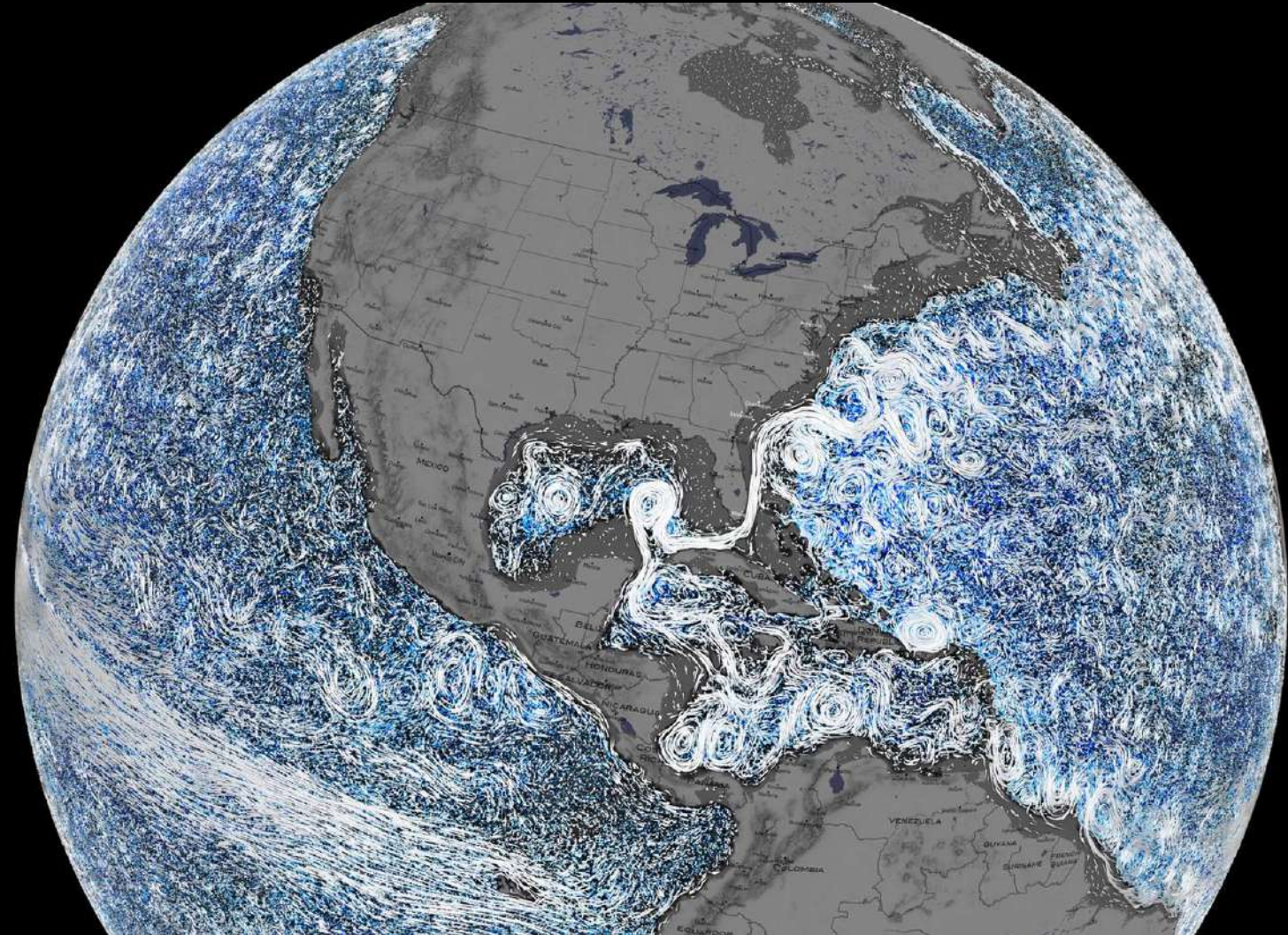
ECCO

GMAO

GOES-5

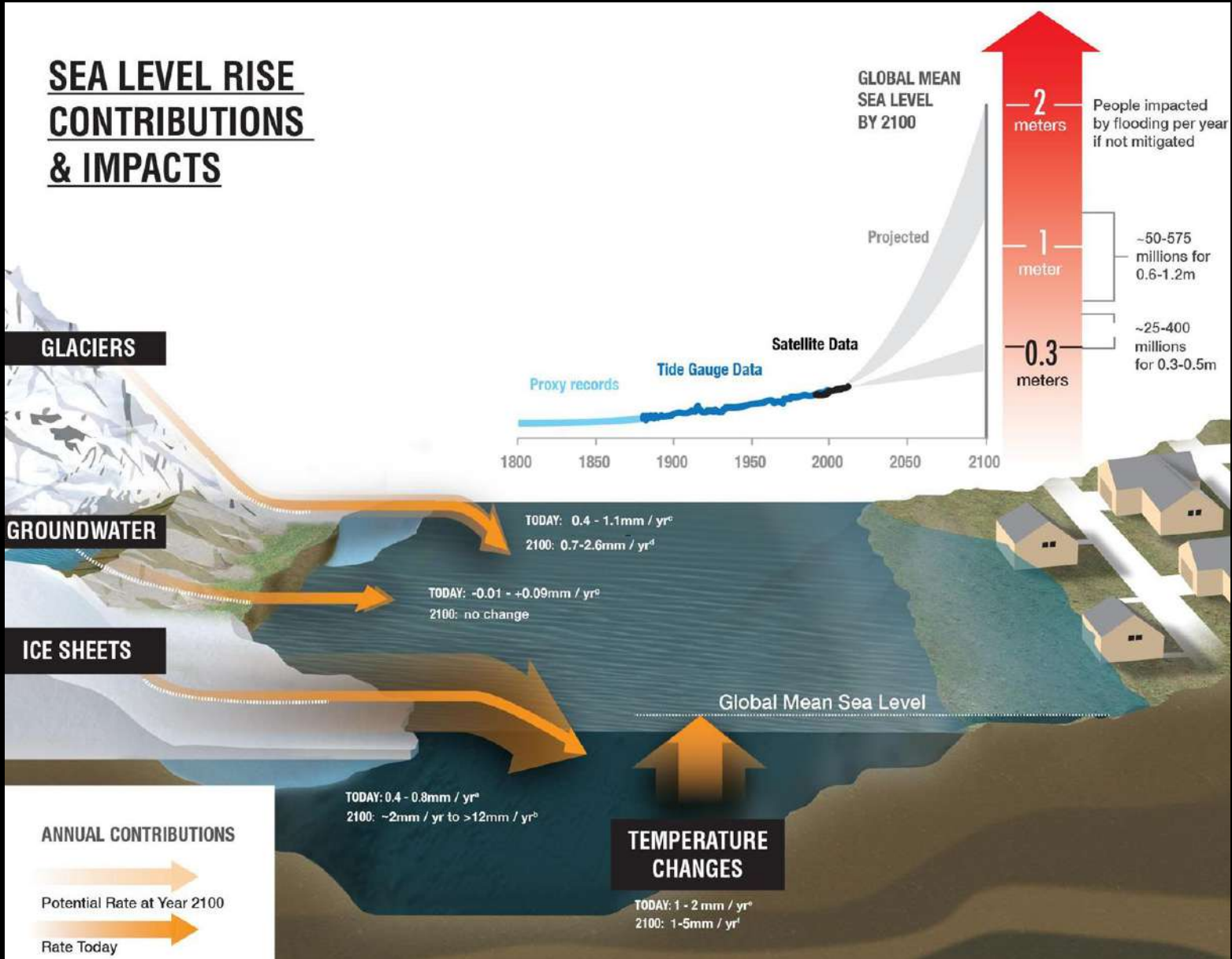
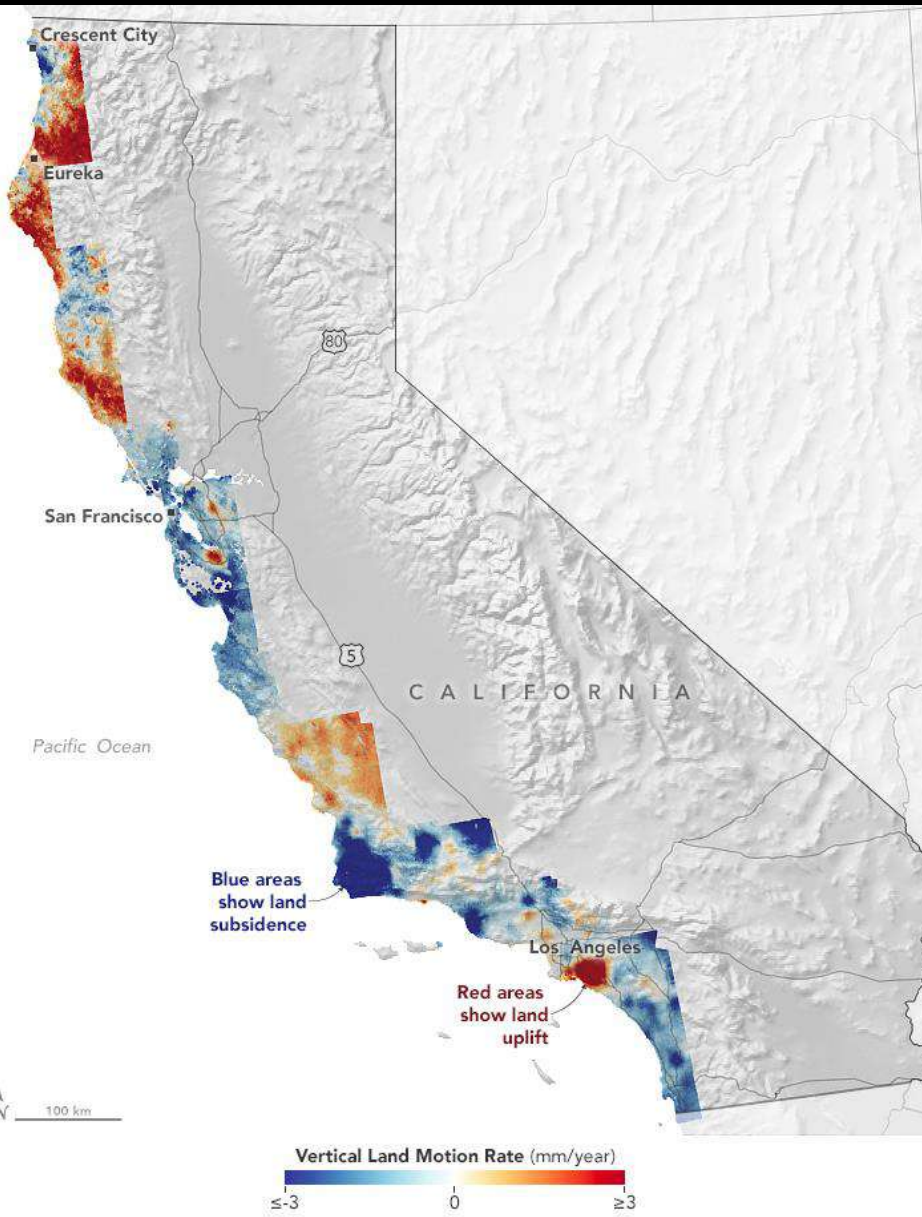
GISS

Machine  
Learning





# NASA Sea Level Change Team

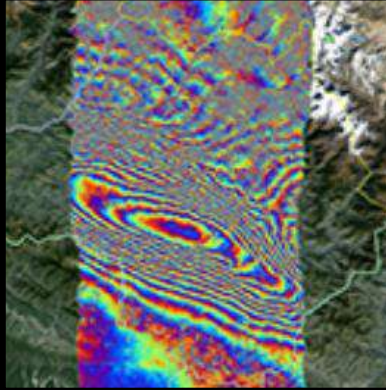




# NASA Disasters Program



Hurricanes & Cyclones



Earthquakes



Floods



Wildfires



Volcanoes



Industrial Incidents



Landslides



Severe & Winter Weather



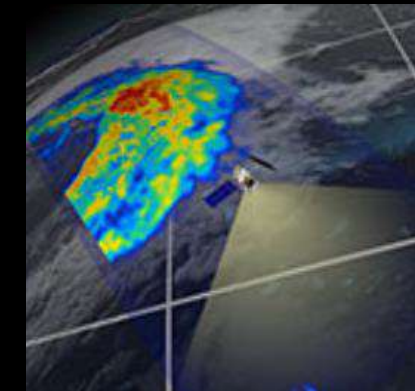
ISS Imagery



Risk Reduction



External Resources



Near Real-time Products



# Should NASA be concerned?



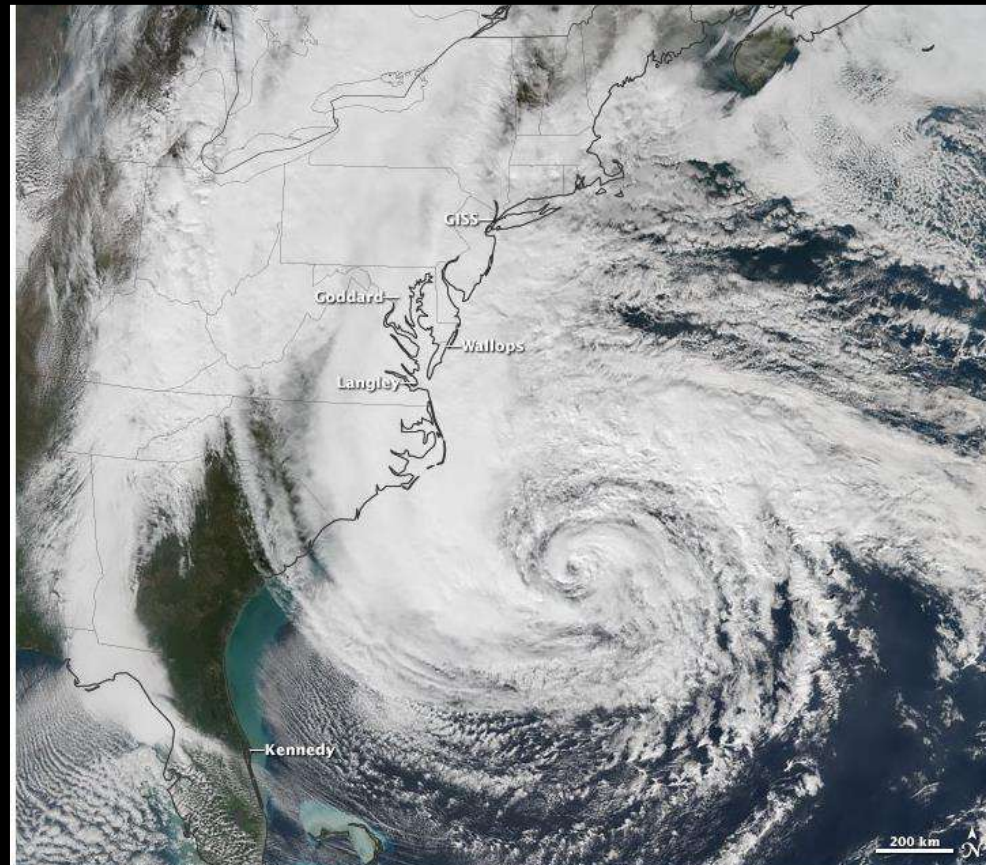
The Sun rises at Kennedy Space Center. The sea is steadily doing the same. (Photo by NASA/Andres Adorno)



Barrier beaches near the spaceport on Wallops Island, Virginia, have been receding by as much as 12 feet per year. (Photo by NASA/Bill Ingalls)



Launch Pad 39B at Kennedy Space Center has been the site of dozens of Apollo era and space shuttle launches. Future SLS and Orion spacecraft will lift off from this site. (NASA)



Hurricane Sandy had wind, wave, or water impacts on five NASA centers along the U.S. East Coast. (NASA Earth Observatory image by Jesse Allen, using Suomi NPP VIIRS data provided by NOAA Class)



# Agency Resilience Planning

## ENHANCING CLIMATE RESILIENCE AT NASA CENTERS

A Collaboration between Science and Stewardship

BY CYNTHIA ROSENZWEIG, RADLEY M. HORTON, DANIEL A. BADER, MOLLY E. BROWN, RUSSELL DEYOUNG, OLGA DOMINGUEZ, MERRILEE FELLOWS, LAWRENCE FRIEDL, WILLIAM GRAHAM, CARLTON HALL, SAM HIGUCHI, LAURA IRACI, GARY JEDLOVEC, JACK KAYE, MAX LOEWENSTEIN, THOMAS MACE, CRISTINA MILESI, WILLIAM PATZERT, PAUL W. STACKHOUSE JR., AND KIM TOUFECTIS

NASA has developed a partnership between its Earth scientists and its institutional stewards to prepare for a changing climate and growing climate-related vulnerabilities.

National Aeronautics and Space Administration (NASA) scientists have been instrumental in discovering the nature of weather and climate hazards, yet their agency also has direct experience with their impacts. Power outages and electrical system damage from the tornado outbreak of 27–28 April 2011 closed Marshall Space Flight Center in Huntsville, Alabama, for 10 days. The Station Fire of August–October 2009, which burned a modern-record 250 sq. miles in Los Angeles County, reached within a mile of the Jet Propulsion Laboratory's (California) main campus adjacent to Pasadena (Fig. 1). Air quality concerns closed the Center, and employees, their families, and neighbors experienced evacuations and stress.

Coastal storms are another threat: Hurricane Isabel flooded portions of Langley Research Center (Virginia) in September 2003. Hurricane Frances in 2004 damaged Kennedy Space Center's (Florida)



FIG. 1. Recent climate extremes that have impacted NASA Centers. (a) Hurricane Frances, Sep 2004; (b) Damage to the Vehicle Assembly Building at the Kennedy Space Center from Hurricane Frances in Sep 2004; (c) Station Fire, Sep 2009; (d) Wildfires outside of the Jet Propulsion Laboratory in Sep 2009.

nature

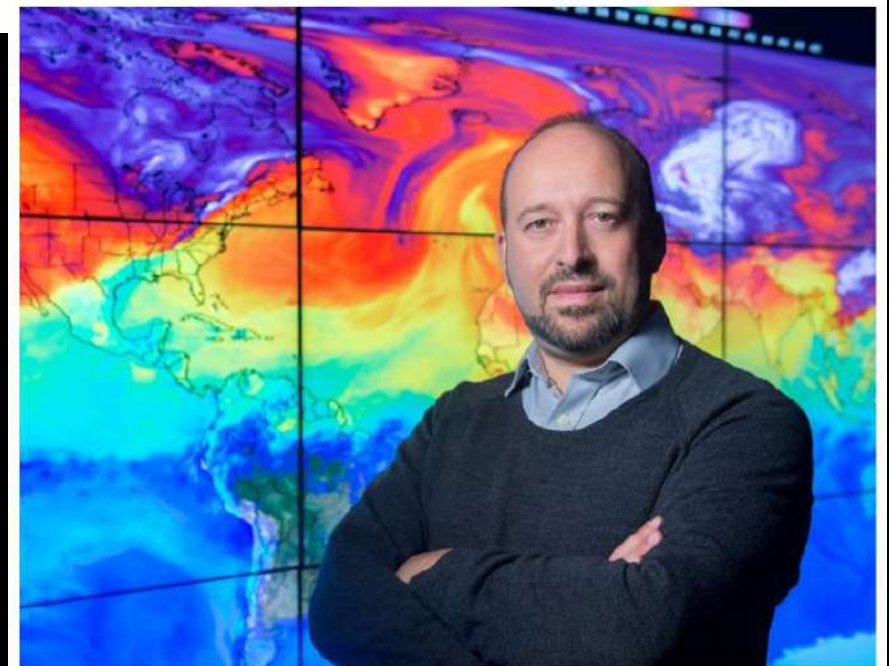
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nature > news > article

NEWS | 07 May 2021

## NASA reboots its role in fighting climate change

Space agency aims to breathe new life into its Earth-science programme as US President Joe Biden pushes an ambitious climate agenda.



Gavin Schmidt is NASA's first climate adviser. Credit: NASA



# Earth System Observatory

## SURFACE BIOLOGY AND GEOLOGY

Earth Surface & Ecosystems

## SURFACE DEFORMATION AND CHANGE

Earth Surface Dynamics

CCP

## CLOUDS, CONVECTION AND PRECIPITATION

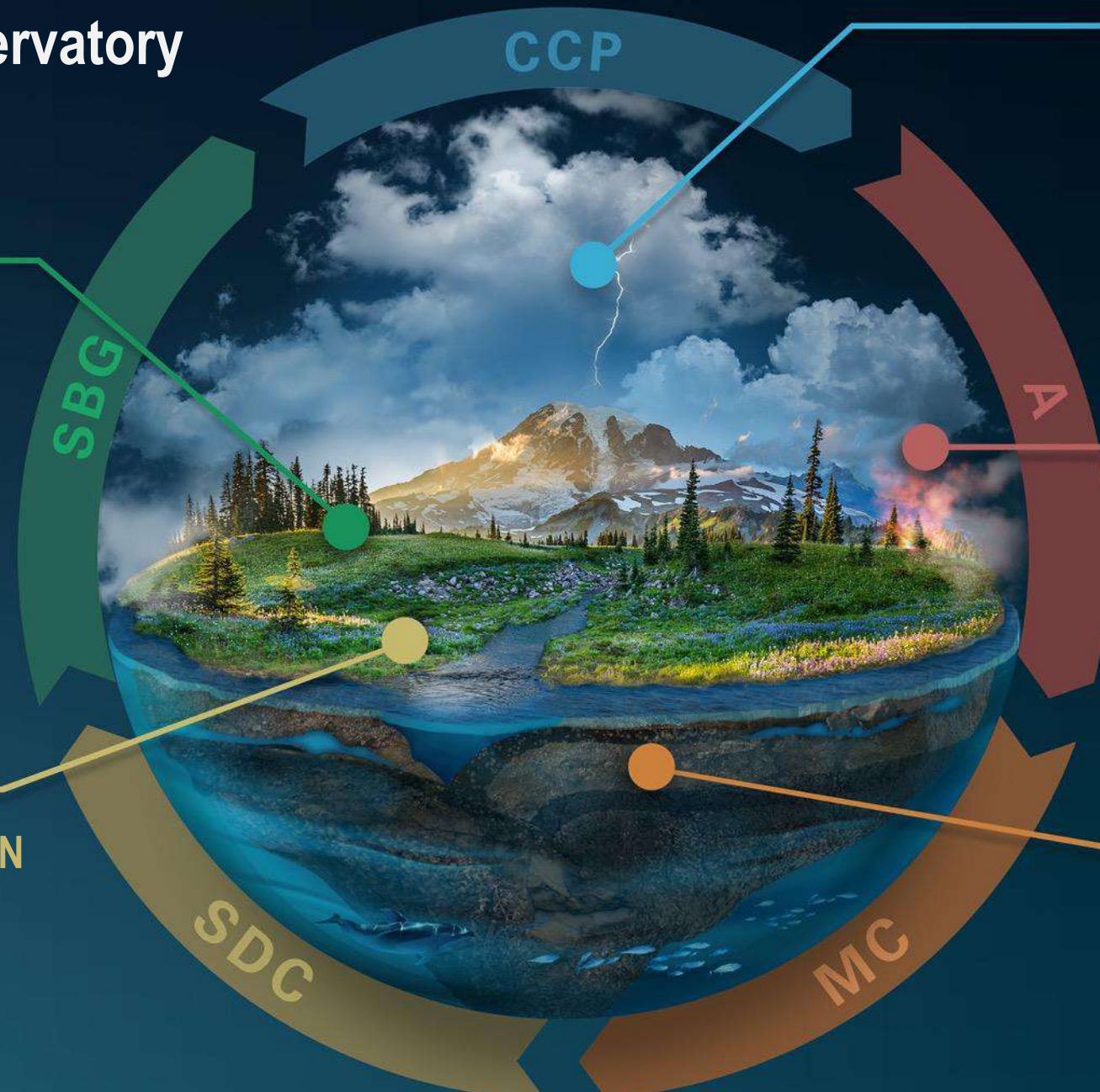
Water and Energy in the Atmosphere

## AEROSOLS

Particles in the Atmosphere

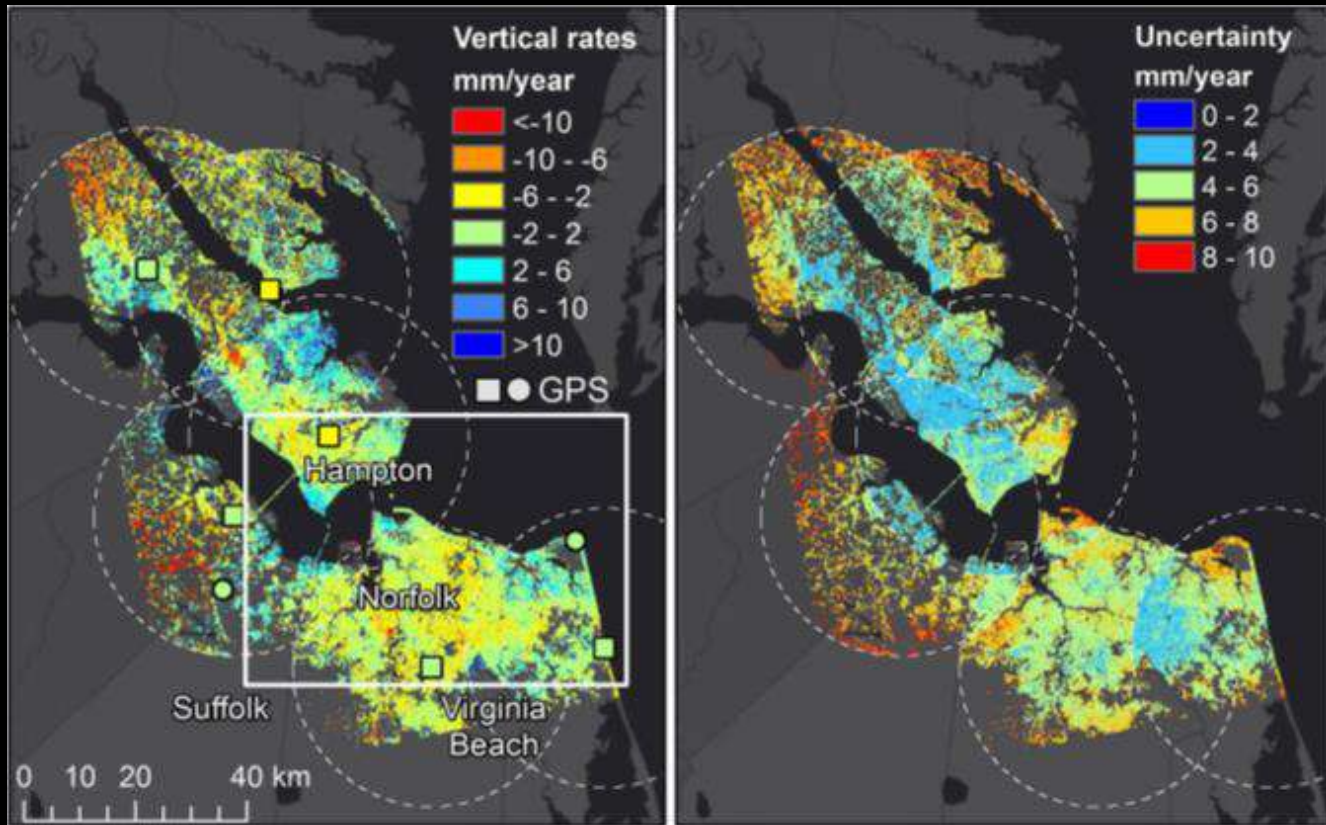
## MASS CHANGE

Large-scale Mass Redistribution





# Subsidence Mapping



Bekaert et al., Scientific Reports 2017





# Mid-Atlantic Communities and Areas at Intensive Risk: Translating compounding hazards to societal risk

## Demonstration Intent:

- Integrate satellite derived earth observations and physical models into *actionable, trusted* knowledge
- Create comprehensive understanding of *compounding risk* to enable *risk-informed decisions*

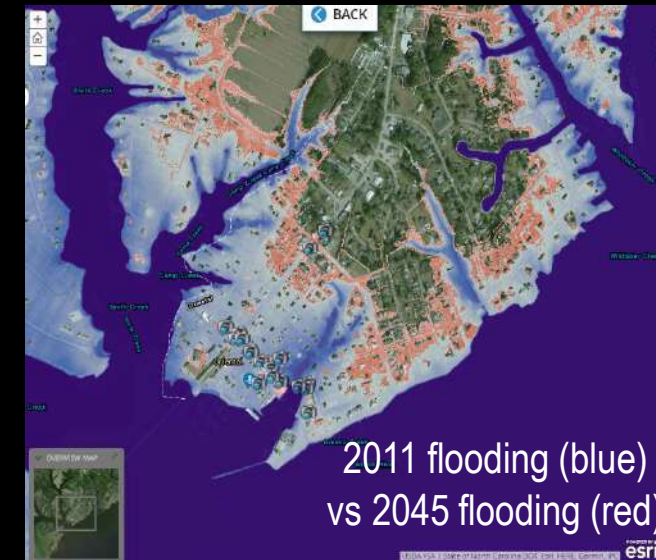
Working with the City of Norfolk and the Virginia Department of Emergency Management, the mid-Atlantic Communities at Intensive Risk (CAIR) project used a representative storm surge case (Hurricane Irene) to predict building level flood impacts at current day and for sea level rise (SLR) and subsidence scenarios in a changing climate.

## Risk Visualization: Interactive Storymap

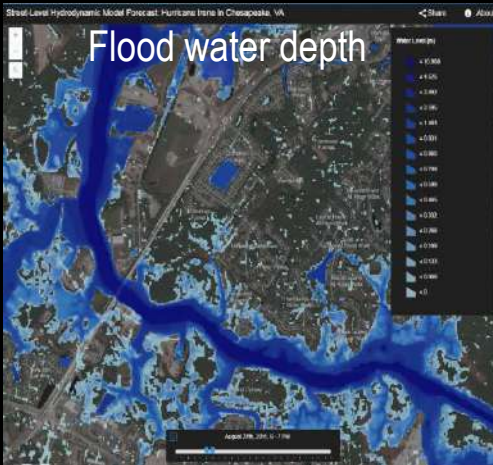
- Geospatially enabled – zoom, flood point depth, embedded photos
- Time-aware flood layers
- Buildings turn from green to red when first floor elevation flood level is exceeded
- Direct flood comparison today vs 2045 – extent and depth

Having that regional water depth map really helps us get a handle on what our future day to day looks like in Norfolk with sea level rise.

--Kyle Spencer, Norfolk Deputy Resilience Officer



Analysis of the town of Oriental, NC determined an additional 28% of the community will experience flooding above the first floor elevations by the year 2045



# Virginia Specific Activities and Needs

**Army Corps awards business \$23M beach renourishment contract at Wallops Island, helping protect space-flight facilities**



A wide-angle view of an inert Minotaur V launch vehicle is erected on the Mid-Atlantic Regional Spaceport's pad 0B at NASA's Wallops Flight Facility in Virginia during a pathfinder exercise for NASA's Lunar Atmosphere and Dust Environment Explorer (LADEE) Mission.







# EXPLORE EARTH **Thank You!**



## Introduction

This spreadsheet provides publicly available information on Department of Defense DoD (DoD) installations within the Chesapeake Bay Watershed in Virginia (VA). It includes information on the following authorized federal programs: Readiness and Environmental Protection Integration (REPI), Joint Land Use Study/Compatible Use Plan (JLUS/CUP) and Sentinel Landscapes.

Disclaimer: The entries on the spreadsheet provide summary information that is otherwise publicly available, compiled in an organized format. The summary entries do not contain classified information, nor do they contain any pre-decisional information, and the spreadsheet was not created with an intent for publication.

### Legend:

**Text in red:** Indicates information with a potential or actual climate resilience applicability.

**Text in blue:** Highlights military focus or military benefit

✓ Indicates, as a quick visual reference, that the installation has the identified program. Columns without checks represent new opportunities.




1, 2 etc: Numbers in columns G & H tie the informational text to the specific source JLUS/CUP.






**CLEARED**  
**For Open Publication**

2  
Jun 16, 2021

Department of Defense  
OFFICE OF PREPUBLICATION AND SECURITY REVIEW








Installation	Jurisdiction	REPI Program	2020 REPI Challenge	Sentinel Landscape	JLUS/CUP Partnership	JLUS/CUP Compatibility Issues
Regional Assessment: Including Fort Lee, Naval Support Facility Dahlgren, Marine Corp Base Quantico, Naval Air Station Oceana, Joint Base Langley Eustis, and Fort AP Hill	VA			Virginia Security Corridor (VSC) Sentinel Landscape designation being sought	 2017 Virginia Regional JLUS Implementation Strategy (Covers Fort Lee, NSF Dahlgren, MCB Quantico, NAS Oceana, JBLE, and Fort AP Hill only): <a href="https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a>	<p>Enhance Ongoing Communication and Coordination between the Commonwealth of Virginia and the Military, Establish and Maintain an Interactive Mapping and Public Domain Data Repository between the Commonwealth and Military, Adopt Statewide Military Compatible Land Use Planning Guidelines for Local Governments to Integrate into Regional and Local Planning and Zoning Documents, Establish Procedures for Permitting Renewable Energy Development in Consideration of Military Compatibility, Establish Permanent Funding Sources for Military Compatibility Planning and Assistance for Local Governments and Other Agencies, Leverage Federal Investment through Education and Awareness of Available Programs and Grant Federal Funding Opportunities, Enhance Real Estate Disclosure Laws in the Commonwealth of Virginia, <b>Protect the Commonwealth of Virginia's Public Resources (public lands and airspaces) utilized by both Virginia's Military Installations and Local Communities (see more detail in Goal 6, pg. 18), protection of Potomac River Test Range and public land, airspace, waterway assets, promotion of veteran-owned businesses.</b></p> <p><b>Recommendation from the VA Regional JLUS:</b></p> <ul style="list-style-type: none"> <li>- Consider Establishing a Virginia-Maryland Military Compatibility Working Group Virginia Leadership should consider working with the military and Maryland Leadership to formally establish a Virginia-Maryland Military Compatibility Working Group. If established, this group should consider being responsible for communication, coordination, and monitoring the implementation of actions needed to address compatibility issues that occur within the identified public resources used for military training. The primary focus for this group is broad military capabilities that can affect state installations that have operational or influence areas that span both states (such as Military Training Routes and the Potomac River). Other Partner: State of Maryland</li> <li>- Virginia Leadership should consider working with the military and North Carolina Leadership to formally establish a Virginia-North Carolina Military Compatibility Working Group. It would be helpful if this group would consider being responsible for communication, coordination, and monitoring the implementation of actions needed to address compatibility issues that occur within the identified public resources used for military training. The primary focus for this group is broad military capabilities that can affect state installations that have operational or influence areas that span both states (such as Military Training Routes). Other Partner: State of North Carolina</li> </ul>
NAS Oceana	VA	 Military focus on managing lands for compatibility with flight operations, noise, night operations. Public benefits - working lands, supports the development of a JLUS			 1. 2005 Hampton Roads JLUS: <a href="https://www.hrpdcva.gov/departments/index/printpage/id/115/">https://www.hrpdcva.gov/departments/index/printpage/id/115/</a> 2. 2017 Virginia Regional JLUS Implementation Strategy: <a href="https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a> 3. 2019 Norfolk and Virginia Beach Joint Land Use Study (JEB LC/FS, NAS Oceana and Dam Neck Annex, NSN, and NSA HR Main Site): <a href="https://www.hrpdcva.gov/uploads/docs/FINALNoVBJLUSReport.pdf">https://www.hrpdcva.gov/uploads/docs/FINALNoVBJLUSReport.pdf</a>	1. Preservation of airfield operations. Development encroachment. Reduce noise impacts on communities surrounding NAS Oceana, NALF Fentress, and Chambers Field while accommodating growth and maintaining regional economic sustainability. Factors: Coordination, Communication, Sound Attenuation, Real Estate Disclosure, Planning and Public Policy, Land Use Regulation, Acquisition, Military Operations. 2. Noise pollution specifically (see other notes in Cell G4 above) 3. Tidal flooding that will worsen over time with SLR and threats on infrastructure (roadway corridors and community assets that military personnel rely on on a daily basis). Challenges: Getting to work (infrastructure flooding - reliability and access), accessing community facilities, managing stormwater, maintaining utility services, coordinating between neighboring jurisdictions The JLUS sets forth 22 Actions and related coordination strategies that Norfolk and Virginia Beach can implement in response to threats from flooding and SLR that aim to strengthen and enhance the Navy's ability to carry out its mission, improve the quality of life for sailors and their families, and allow the Navy to remain a major and robust part of the region's economy.

Joint Base Langley Eustis-Eustis	VA	 Military focus on tree height/flight approach (runway compatability), live-fire training. Public benefits - protects sensitive ecosystems, supports the implementation of a JLUS.		VSC - proposed: focus on coastal resilience	 1. 2018 Joint Base Langley Eustis (Fort Eustis) Joint Land Use Study 2. 2018 Hampton-Langley JLUS Resilience Addendum 3. 2017 Virginia Regional JLUS Implementation Strategy: <a href="https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a>	1. Main Gate, SLR and Coastal Flooding, Third Port Mission, Traffic, Waterway Access, Alternative Energy Development, Airspace Management, Dredge Disposal, Installation Access, Unmanned Aircraft Systems, Vertical Obstructions, Wildlife Habitat Preservation, Cultural Resources, Light and Glare, Noise. Climate Adaptation was an issue of high interest and priority ranking. 8 different studies/evaluations were listed as high priority areas of interest to be implemented 1-3 years following JLUS completion (pg. 96, 143). Flooding of access roads to essential locations. Cultural resources at risk for being flooded or destroyed. 2. This report supplements the 2010 JLUS by addressing resilience and adaptation, with a focus on how a changing climate has and will continue to impact the base, how the base can become more resilient, and how the City of Hampton can collaborate with JBLELangley to support the implementation of strategies that will create multiple and longterm benefits. This JLUS Addendum also builds upon the Resilient Hampton initiative, an ongoing effort that assesses the multiple forces of water, incorporates community principles and values, and recommends solutions driven by unique neighborhood characteristics. The city is uniquely poised to tackle these issues, and lead the way to a resilient future. 3. Waterway use specifically (see other notes in Cell G4 above)
Joint Base Langley-Eustis-Langley	VA				 1. 2010 Hampton-Langley JLUS: <a href="https://hampton.gov/DocumentCenter/View/1222/Hampton-Langley-Joint-Land-Use-Study">https://hampton.gov/DocumentCenter/View/1222/Hampton-Langley-Joint-Land-Use-Study</a> 2. 2018 Hampton-Langley JLUS Resilience Addendum: <a href="https://hampton.gov/DocumentCenter/View/23346/Hampton-Langley-JLUS-Addendum">https://hampton.gov/DocumentCenter/View/23346/Hampton-Langley-JLUS-Addendum</a>	1. Compatibility Issues: Land Use, Safety Zones, Vertical Obstructions, ATFP, Noise, Light and Glare, T&E Species, Land, Air, and Sea Spaces, Ground Transportation. Land Acquisition to preserve military readiness for existing and future missions (: Leverage DoD Readiness and Environmental Protection Integration (REPI) funds by submitting applications for REPI funding to acquire those environmentally important lands that, if developed, would not only remove important habitat, but also impact the military mission at Langley AFB.), conservation easements (Develop a conservation easement program that protects Langley AFB while also protecting special status species and the habitats that support them.), capital improvement planning, sound attenuation, BASH/Natural Hazards, Legislative issues, Flight Operations, Vertical Obstructions, Land Use, Light and Glare (There were no issues identified for marine environments within the study area that would cause incompatible use with operations at Langley AFB.) 2. This report supplements the 2010 JLUS by addressing resilience and adaptation, with a focus on how a changing climate has and will continue to impact the base, how the base can become more resilient, and how the City of Hampton can collaborate with JBLELangley to support the implementation of strategies that will create multiple and longterm benefits. This JLUS Addendum also builds upon the Resilient Hampton initiative, an ongoing effort that assesses the multiple forces of water, incorporates community principles and values, and recommends solutions driven by unique neighborhood characteristics. The city is uniquely poised to tackle these issues, and lead the way to a resilient future.
MCB Quantico	VA	 Military focus: live fire training, helicopter training (noise). Public Benefit - protects working lands, provides recreational opportunities.		VSC - proposed: Focus on incompatible development and Dark skies	 1. 2017 Virginia Regional JLUS Implementation Strategy: <a href="https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a> 2. 2014 Marine Corps Base Quantico Joint Land Use Study: <a href="http://eservice.pwcgov.org/planning/documents/JLUS/JLUS_FinalExecutiveSummary2014_0701.pdf">http://eservice.pwcgov.org/planning/documents/JLUS/JLUS_FinalExecutiveSummary2014_0701.pdf</a> 3. A new regional CUP with Quantico, Fort Belvoir, and Joint Base Meyer-Henderson Hall?	1. Minimize the noise impacts, vibration impacts, and potential safety hazards generated by the use of live fire ranges and aircraft overflight and aviation impacts in general. MCB Quantico portion of the Potomac River provides airspace and areas for important military aviation training. Currently, this portion of the Potomac River assists with aviation activities that originate with the airfield at MCB Quantico including the imaginary surfaces. See Goal 8, page 43: Further assessment is needed to evaluate other military service operations for changes in locations of training activities including increased aviation training operations over the MCB Quantico portion of the Potomac River. 2. Key Themes: Coordination, Communication, Military Operations, Transportation Systems, Utility/Municipal Services, Virginia Legislative Initiatives, Community Development/Planning, and Environmental/Conservation/Open Space. Recommendations (CO.6) Develop a regional dialogue towards mitigation of environmental impacts and resource conservation (on and off base). This could be accomplished as an agenda item(s) through the QRESC/QRPT structure (see 1.1 in the document), involving regional and local agencies and organizations as appropriate. (EC.1) Pursue conservation partnering opportunities through the Readiness and Environmental Protection Integration (REPI) under DoD and through state, local and private conservation efforts (in collaboration with conservation partners) to pursue suitable properties for conservation in JLUS Military Influence Area Zones 1.2, 1.3, 2.1, 2.4, 3.1 and 5.1. (EC.2) Pursue Transfer of Development Rights (TDR) and Purchase of Development Rights (PDR) programs for future land conservation purposes in the three JLUS counties and utilize the programs to transfer development potential out of JLUS Military Influence Area Zones 1.2, 1.3, 2.1, 2.4 and 3.1 once established. (EC.3) Using the QRESC/QRPT structure, cooperatively work together on stormwater management and other water quality initiatives for shared watersheds (see Recommendation CO.6) (EC.4) Through coordination between Prince William County and MCB Quantico, pursue restoration projects along Little Creek to address erosion and flooding issues in this water body and the adjacent properties from Route 1 to the Potomac River. SEE ONGOING, MID-TERM, and LONG-TERM strategies.



NWS Yorktown	VA	✓ Military focus on 24-hr a day special warfare training (dark/noise), ROTHER transmitter. Public Benefit - preserves working lands and local character, protects cultural resources, supports green corridor for wildlife travel.	✓ Military benefit: Protect shoreline, wetlands, and piers from degradation and improving installation resilience, fortifying federal superfund sites. Public benefit: marine habitat and oyster restoration.	✓	✓ 1. 2017 Virginia Regional JLUS Implementation Strategy: <a href="https://www.vada.virginia.gov/media/governorviriniagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vada.virginia.gov/media/governorviriniagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a> 2. 2013 Encroachment Action Plan	1. (see Goal 8, page 43) There are several public waterways including the Appomattox, Potomac, James, and York Rivers that provide invaluable training assets and realistic training environments for the military; however, these public waterways are also utilized by the general public and commercial business. These waterways should be protected to support ongoing multiple uses.  (From the Pemminman Spit FY22 REPI Challenge proposal) An Encroachment Action Plan (EAP) for NWSY was developed in 2013 to identify encroachment challenges facing NWSY and management strategies to/ prevent or mitigate encroachment impacts. Eighteen issues with potential to impact the mission at NWSY were identified in the EAP, including water use surrounding waterfront operations and shoreline erosion from sea-level rise.
Fort Pickett	VA	✓ Military focus: Generation of noise, dust, and smoke during live fire maneuvering, requires dark skies for night flights. Public Benefits - protects working lands and local character, recreation.		VSC - proposed: focus on dark skies and working farm and forestlands	✓ Fort Pickett Joint Land Use Study (currently under development) : <a href="http://www.pickettlanduse.com/">http://www.pickettlanduse.com/</a>	In the early stages of development (11/24/2020 Fact sheet)? Includes the full suite of potential issues of concerns including Hazard Mitigation and REPI
Fort AP Hill	VA	✓ Military focus on training, maneuvering, and live fire operations. Public benefits - green corridor, recreation, wetlands preservation, protected water supply		VSC - proposed: Focus on resiliency, dark skies, farm and forest retention	✓ 2017 Virginia Regional JLUS Implementation Strategy: <a href="https://www.vada.virginia.gov/media/governorviriniagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vada.virginia.gov/media/governorviriniagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a>	1. See notes in cell G4 above
Naval Support Activity Hampton Roads - Northwest Annex	VA	✓ Military focus: ROTHER transmission, electromagnetic interference. Public benefit - protects working lands, protects habitat for notable species.				
Naval Support Activity Hampton Roads - Portsmouth Annex	VA				✓ Portsmouth-Chesapeake JLUS: <a href="https://www.hrpdcva.gov/departments/joint-land-use-studies/portsmouth-chesapeake-joint-land-use-study">https://www.hrpdcva.gov/departments/joint-land-use-studies/portsmouth-chesapeake-joint-land-use-study</a>	1. Flooding, damage to transportation infrastructure and access to medical services used by military personnel
Naval Support Activity Hampton Roads - Main Site	VA				✓ 2019 Norfolk and Virginia Beach Joint Land Use Study: <a href="https://www.hrpdcva.gov/uploads/docs/FINALNoVBJLUSReport.pdf">https://www.hrpdcva.gov/uploads/docs/FINALNoVBJLUSReport.pdf</a>	1. Tidal flooding that will worsen over time with SLR and threats on infrastructure (roadway corridors and community assets that military personnel rely on on a daily basis). Challenges: Getting to work (infrastructure flooding - reliability and access), accessing community facilities, managing stormwater, maintaining utility services, coordinating between neighboring jurisdictions The JLUS sets forth 22 Actions and related coordination strategies that Norfolk and Virginia Beach can implement in response to threats from flooding and SLR that aim to strengthen and enhance the Navy's ability to carry out its mission, improve the quality of life for sailors and their families, and allow the Navy to remain a major and robust part of the region's economy.

Naval Station Norfolk - Main Site	VA				 1. 2019 Norfolk and Virginia Beach Joint Land Use Study: <a href="https://www.hrpdcva.gov/uploads/docs/FINALNoVBJLUSReport.pdf">https://www.hrpdcva.gov/uploads/docs/FINALNoVBJLUSReport.pdf</a> 2. 2005 Hampton Roads JLUS: <a href="https://www.hrpdcva.gov/departments/index/printpage/id/115/">https://www.hrpdcva.gov/departments/index/printpage/id/115/</a>	1. Tidal flooding that will worsen over time with SLR and threats on infrastructure (roadway corridors and community assets that military personnel rely on on a daily basis). Challenges: Getting to work (infrastructure flooding - reliability and access), accessing community facilities, managing stormwater, maintaining utility services, coordinating between neighboring jurisdictions The JLUS sets forth 22 Actions and related coordination strategies that Norfolk and Virginia Beach can implement in response to threats from flooding and SLR that aim to strengthen and enhance the Navy's ability to carry out its mission, improve the quality of life for sailors and their families, and allow the Navy to remain a major and robust part of the region's economy. 2. Preservation of Airfield Operations. Development encroachment. Reduce noise impacts on communities surrounding Chambers Field (and NAS Oceana and NALF Fentress) while accommodating growth and maintaining regional economic sustainability.
Naval Station Norfolk - Navy Supply Systems Command Fleet Logistics Center Norfolk, Craney Island Fuel Depot	VA				 Portsmouth Chesapeake JLUS - In Development: <a href="https://www.hrpdcva.gov/departments/joint-land-use-studies/portsmouth-chesapeake-joint-land-use-study">https://www.hrpdcva.gov/departments/joint-land-use-studies/portsmouth-chesapeake-joint-land-use-study</a>	1. Craney Island: Potential flooding, impacts to infrastructure, access, rail and port operations and stormwater management
Joint Base Little Creek/Fort Story	VA				 2019 Norfolk and Virginia Beach Joint Land Use Study: <a href="https://www.hrpdcva.gov/uploads/docs/FINALNoVBJLUSReport.pdf">https://www.hrpdcva.gov/uploads/docs/FINALNoVBJLUSReport.pdf</a>	1. Tidal flooding that will worsen over time with SLR and threats on infrastructure (roadway corridors and community assets that military personnel rely on on a daily basis). Challenges: Getting to work (infrastructure flooding - reliability and access), accessing community facilities, managing stormwater, maintaining utility services, coordinating between neighboring jurisdictions The JLUS sets forth 22 Actions and related coordination strategies that Norfolk and Virginia Beach can implement in response to threats from flooding and SLR that aim to strengthen and enhance the Navy's ability to carry out its mission, improve the quality of life for sailors and their families, and allow the Navy to remain a major and robust part of the region's economy.
Norfolk Naval Shipyard	VA				 Portsmouth Chesapeake JLUS - In Development: <a href="https://www.hrpdcva.gov/departments/joint-land-use-studies/portsmouth-chesapeake-joint-land-use-study">https://www.hrpdcva.gov/departments/joint-land-use-studies/portsmouth-chesapeake-joint-land-use-study</a>	1. Flooding, damage to transportation infrastructure and impacts to gate access, stormwater infrastructure and effectiveness.
Fort Lee	VA				 2017 Virginia Regional JLUS Implementation Strategy: <a href="https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf">https://www.vada.virginia.gov/media/governorvirginiagov/secretary-of-veterans-and-defense-affairs/pdf/Virginia-Regional-JLUS-Implementation-Strategy-June-2017.pdf</a>	1. Fort Lee maintains 33 training areas including an Appomattox River Training Center that provide various capabilities for Fort Lee and its tenants to train soldiers. (See info in Cell G4 above)