



Climate Change and the U.S. Navy Installation Vulnerability



Courtney St. John
Climate Change Affairs Officer
Task Force Climate Change

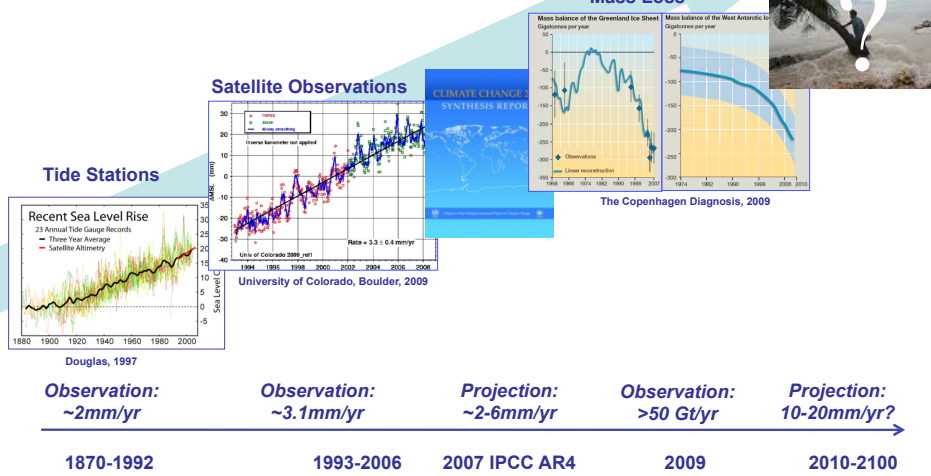
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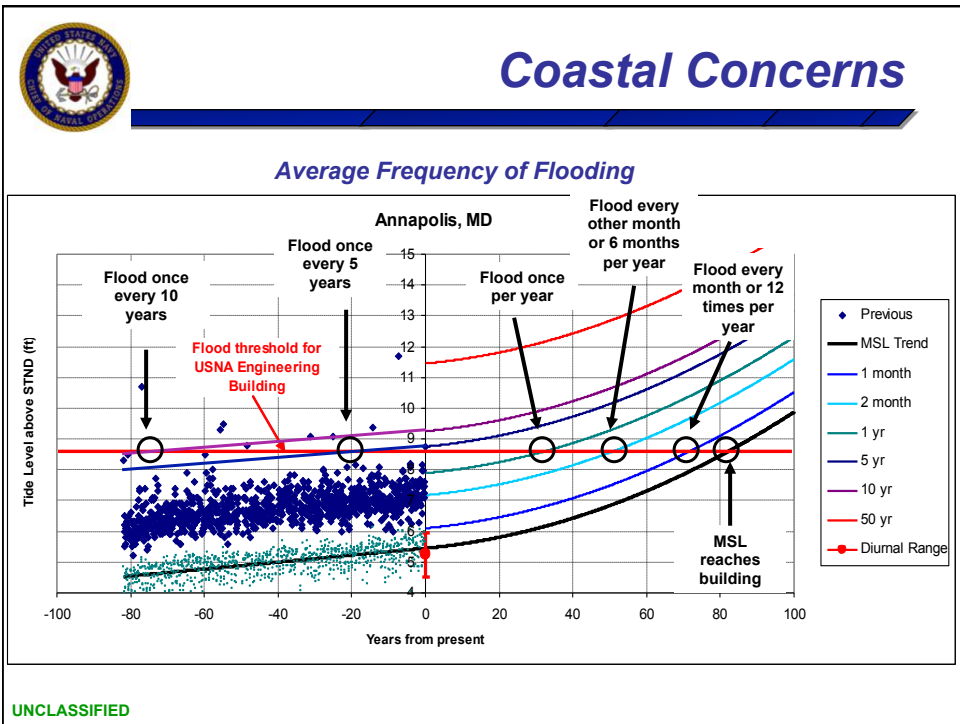
Sea Level Rise Update

21st Century
Sea Level Rise

Accelerating Ice Sheet
Mass Loss

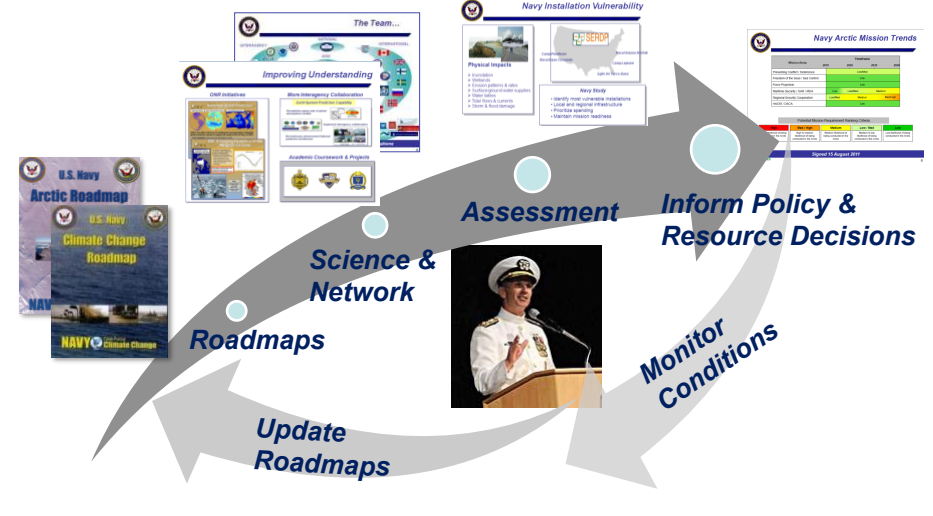


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U.S. Navy Task Force Climate Change

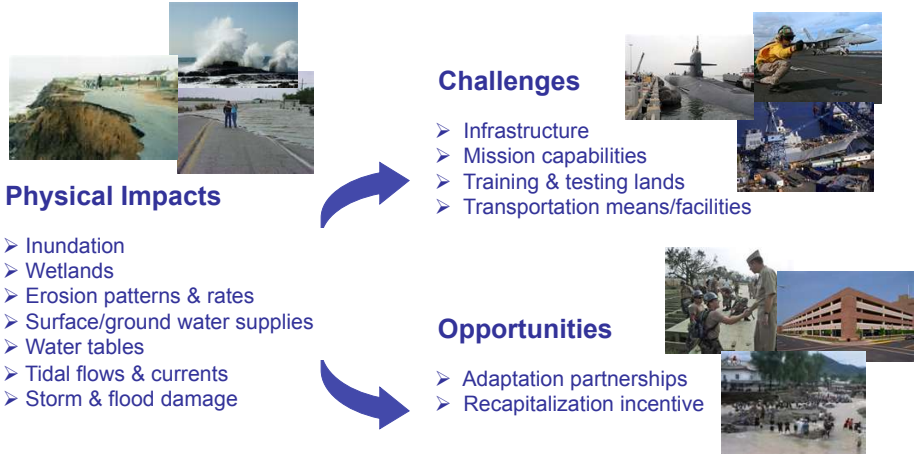


Science-based approach, cooperative partnerships, risk assessments

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Navy Sea Level Rise Concerns

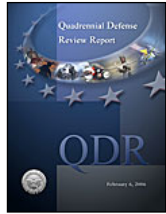


Directly impacts readiness, strategic access, & influence

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Guidance & Other Efforts



2010 QDR

"Climate change, energy security, and economic security are inextricably linked"

"...the Department must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required."



US Army Corps of Engineers

EC 1165-2-211 "Incorporating Sea-Level Change Considerations in Civil Works Programs"

Engineering Technical Letter on Procedures to Evaluate Sea Level Change Impacts, Responses, and Adaptation

Enabled & informed by sound science

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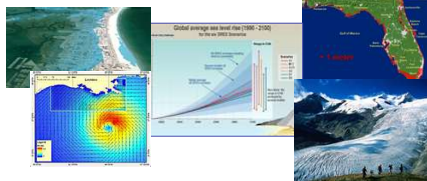
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Science Needs

Sea Level Rise

- Thermal expansion
- Ice sheet mass loss
- Glacier melt
- River runoff
- Subsidence/uplift
- Local currents
- Atmospheric pressure
- Elevation data



Local to global spatial scales, hourly to millennial temporal scales

Adaptation

- In-water structures
- Infrastructure protection
- Water supply protection
- Erosion control
- Environmental protection



Environmental planning & civil/ocean engineering

Quantify & reduce uncertainties to optimize investment decisions

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