



# *U.S. Navy's Task Force Climate Change: Applying Science to Assess Climate Security Risk*



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Task Force Climate Change  
February 2011



# U.S. Navy Response

WHEN?

## Task Force Climate Change Establishment

Chief of Naval Operations Executive Board  
on May 15, 2009

## Charter

Global climate change impacts with near term Arctic focus

## Arctic exercises & port visits



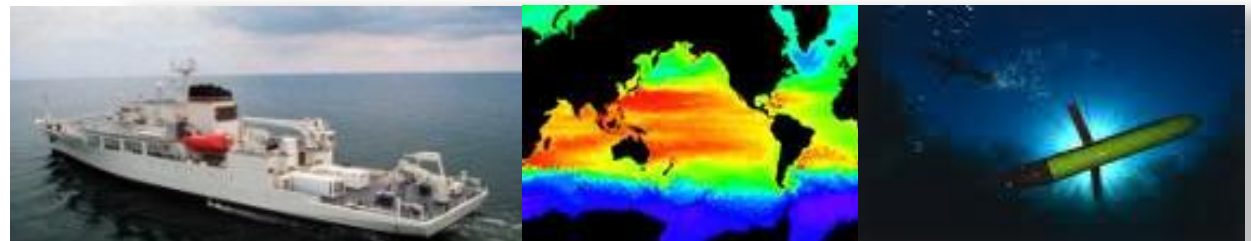
**Key Questions**  
Chief of Naval Operations Executive Board  
May 15, 2009



UNCLASSIFIED

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## Environmental observation & prediction





# Navy Initiatives

## Task Force Climate Change

### Observation & Prediction



Next Generation Air-ocean-ice numerical prediction



Cooperative Oceanographic Surveys



Remote sensing



Environmental Impact Assessments



### Adaptation

Arctic & Climate Change Roadmaps



Sea level rise impact modeling



Water resource management



Arctic civil relocation & erosion control



Arctic fleet training

## Task Force Energy

### Energy Efficiency

Smart Grid



Net Zero Installations



Metering & Auditing

Incentivized Conservation



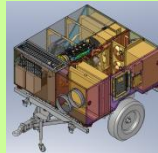
New Construction & Renovation

Training & Awareness



Smart Voyage Planning, & Efficient Aircraft & Ship Systems

### Alternative Energy



Portable Power



Biofuels



Renewable power



Alternative Fuel Vehicles

**Technology and Research to Understand, Predict and Adapt to Climate Change**

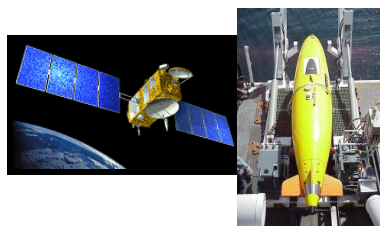
**Assure Mobility + Expand Tactical Reach + Lighten the Load = Combat Capability**

**Reduce the Navy Carbon Footprint**

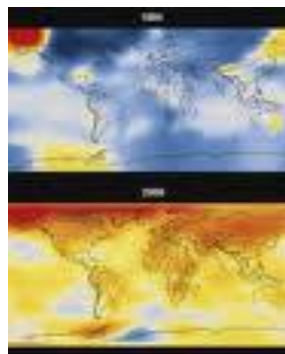


# How to Adapt?

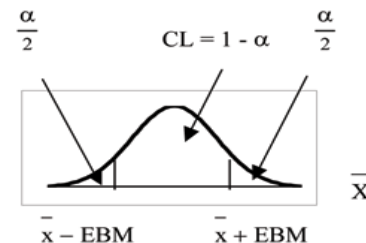
Climate Change Observations



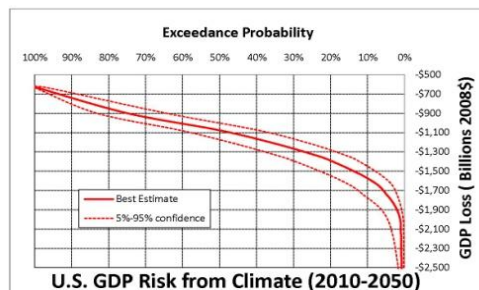
Climate Change Projections



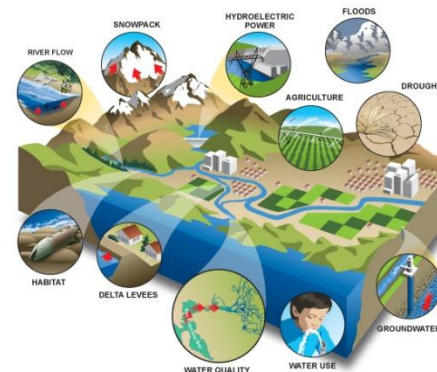
Uncertainty Quantification



Adaptive Management



Risk Assessment



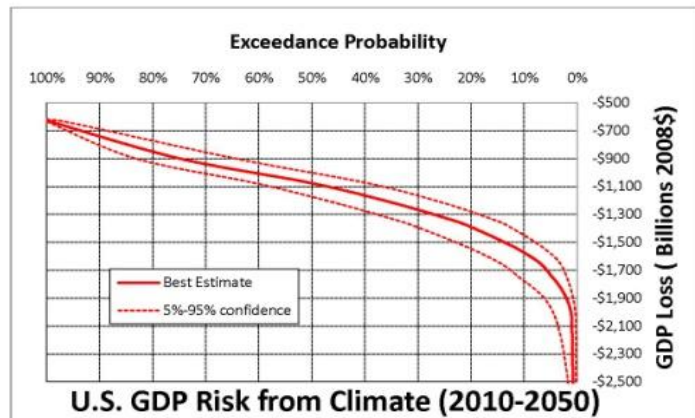
Impact Assessment

Assessing & Managing Climate Security Risk



# Impact & Risk Assessments

## U.S. Water Resource Example



*“Assessing the Risk of Near-term Risk of Climate Uncertainty: Interdependencies Among the U.S. States”*  
Sandia National Labs, 2010

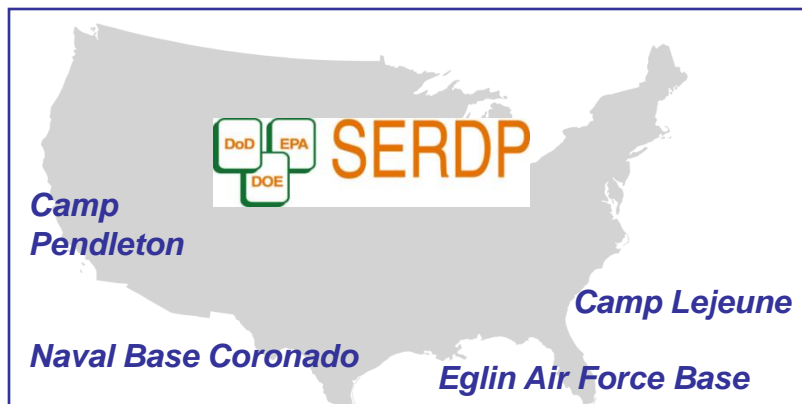
## Maritime Security Concerns



Extreme Weather, Floods, Droughts

Arctic

National Security



**Enabled & informed by sound science**



# Navy Adaptation Activity

## Education



Naval Post Graduate School Arctic & Climate Change Dissertations



Climate course established at US Naval Academy



Naval War College courses address Arctic & Climate Study Topics

## Studies & Assessments



Support to DoD sea level rise studies



Support to Defense Science Board Climate Change Task Force Study for AFRICOM



Naval Studies Board climate change study

## Outreach & Engagement



Support Interagency Climate Change Adaptation Task Force



Conferences, Symposia, Media events



Advocate for UNCLOS

## Policy, Strategy, & Plans



Support to 2010 QDR



Arctic & Climate Change Roadmaps



Navy Arctic Strategic Objectives



Exploring New Cooperative Partnerships

## Operations & Training



Northern Edge 2009



Wargames & Tabletop Exercises



Arctic glider UUV demonstration



Arctic Care 2010

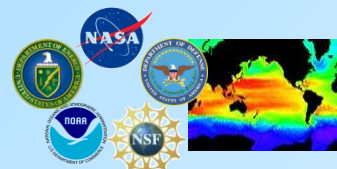


Operation NANOOK

## Science & Research



Smart Voyage Planning



Interagency partnership For air-ocean-ice numerical prediction



Science Ice Exercise Plan

Improve understanding

Ensure readiness (resilience)