



Climate Adaptation for DoD Natural Resource Managers

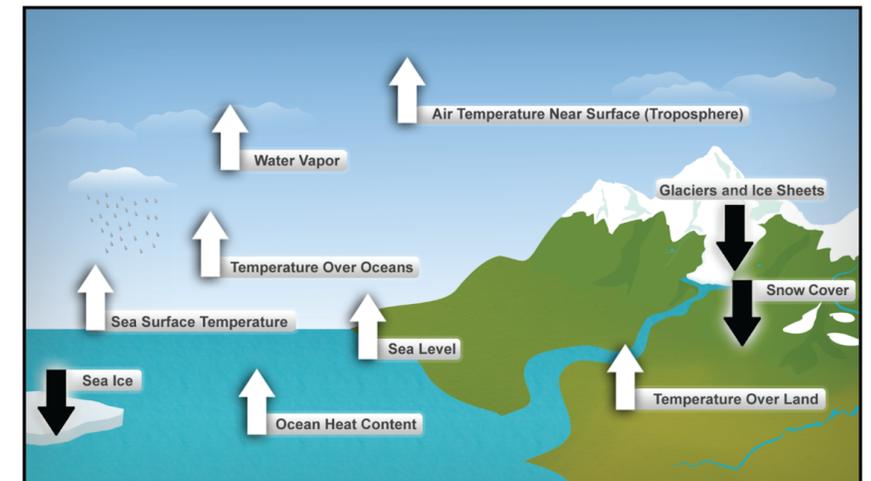
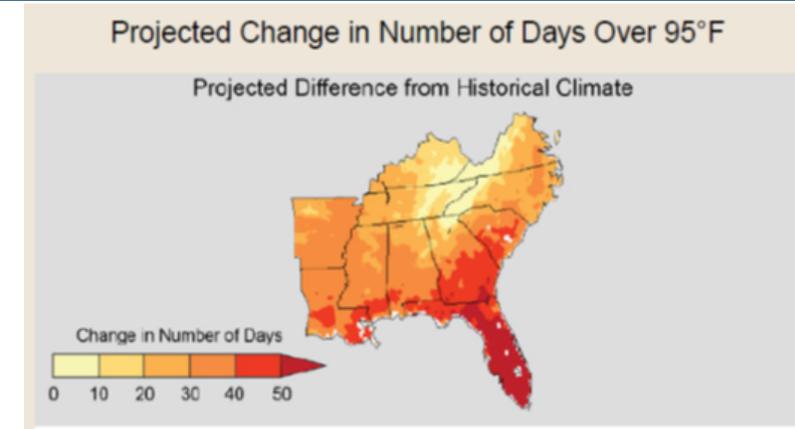
Dr. Bruce A. Stein
Chief Scientist, National Wildlife Federation

December 4, 2019



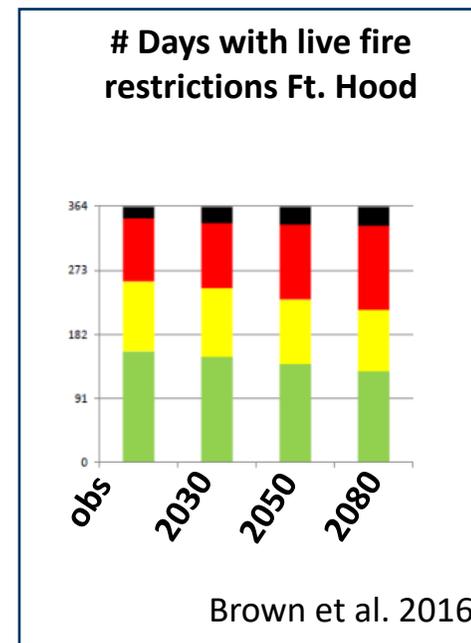
Climate Change Concerns Affecting DoD Installations

- Rising temperatures
- Changing precipitation patterns
- Increasing frequency or intensity of extreme weather events
- Rising sea levels and associated storm surge
- Melting permafrost and sea ice



Climate Risks to Installations

- Effects on the suitability of training and testing sites
- Limitations on the timing of training and other activities
- Increased damage to facilities and operational assets
- Higher regulatory compliance costs and restrictions



DoD Guidance on Climate Change and INRMPs

- DoDM 4715.03 (2013) INRMP implementation manual (Encl 8)
 - Calls for installations to address potential climate impacts when revising or updating INRMPs
- Service-specific guidance
 - Air Force, Army, Navy, and Marine Corps all have specific guidance for assessing climate risks and adaptation planning (see p. 31 of guide)



Department of Defense
INSTRUCTION

NUMBER 4715.03

USD(AT&L)

SUBJECT: Natural Resources Conservation Program

References: See Enclosure 1

1. PURPOSE. This Instruction:

- a. Reissues and ren... 4715.3 (Reference (a))
in accordance with the... 5134.01
(Reference (b)) and... (c) and (d)) to
establish policy... al, State, and
local statutory... ment of
memorandum... or controlled
natural resour... by DoD.
- b. Deve... al controlled
resources (i... by DoD.
- c. Imple...
- d. Provide... implementing.

2. APPLICABILITY

a. Applies to:

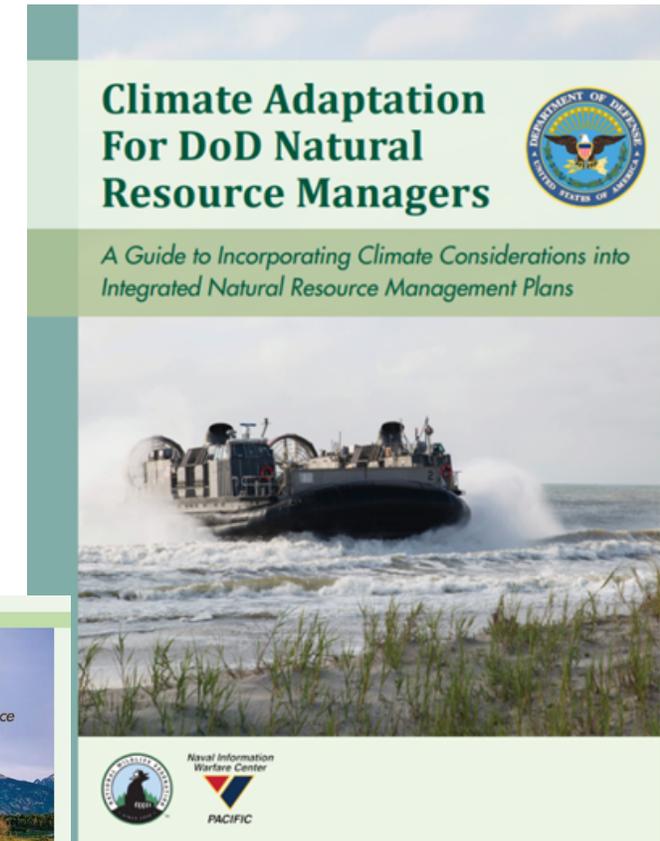
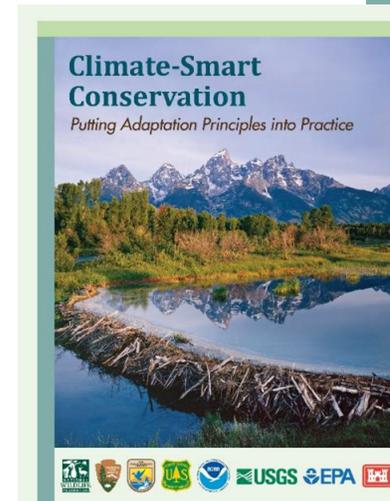
(1) The Office of the Secretary of Defense, the Military Departments (including their Reserve Components), the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff, the Combatant Commands, the Office of Inspector General of DoD, the Defense Agencies, the DoD Field Activities, and all other organizational entities in DoD (hereafter referred to



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DoD Climate Adaptation Guide

- **Funded by DoD Resources Legacy Program to:**
 - Support INRMP Implementation Manual guidance on climate change
 - Develop a user-friendly climate adaptation guide for DoD natural resource managers
 - Develop and deliver associated outreach and training based on the guide
- **Builds on Existing NWF/Interagency Adaptation Guide**
 - Climate-Smart Conservation



Guide Contents

Part I

- Introduction
- Climate Risks to DoD Natural Resources and Mission
- Adaptation Principles and Practices
- Understanding Climate Science Basics
- Incorporating Climate Considerations in INRMPs
- Exploring INRMP Program Elements

Part II

- Step-by-Step Process for INRMP Adaptation Planning

Appendices

- Key Resources for Information and Expertise
- Supporting Worksheets



Guide Released for DoD Use by Assistant Secretary McMahon on June 3, 2019



SUSTAINMENT

ASSISTANT SECRETARY OF DEFENSE
3500 DEFENSE PENTAGON
WASHINGTON, DC 20301-3500

JUN - 3 2019

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS, ENERGY AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY (ENERGY, INSTALLATIONS AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (INSTALLATIONS, ENVIRONMENT AND ENERGY)

SUBJECT: Climate Adaptation for Department of Defense Natural Resources Managers

This memorandum releases the guide on, "Climate Adaptation for Department of Defense (DoD) Natural Resources Managers." DoD installations will experience significant impacts from a changing climate which could compromise their capacity to support readiness and undermine DoD's ability to protect and restore the native ecosystems needed to conduct realistic training and testing activities. Although DoD Instruction 4715.03 requires DoD natural resources managers to incorporate climate adaptation strategies into installation Integrated Natural Resources Management Plans (INRMPs), there are few tools available to help them do this.

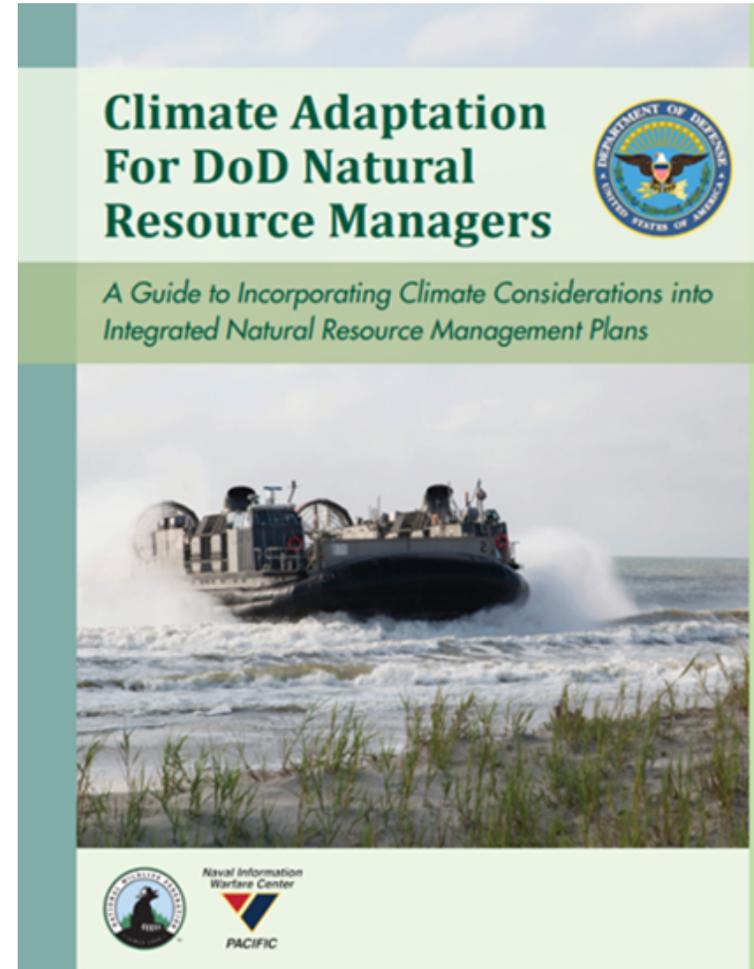
This guide provides an overview of how a changing climate may affect military lands and other resources, and offers a six-step process for incorporating adaptation strategies into INRMPs. It introduces installation managers to overarching concepts and principles, and is structured around a generalized, yet flexible, INRMP adaptation planning process.

We developed this guide in collaboration with headquarters and installation DoD Component staff. Please accept my thanks for your staff's efforts to review and edit this guide.

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Robert H. McMahon

Attachment:
As stated



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Design Considerations

- **Cross-Service**
 - Air Force, Army, Marine Corps, National Guard, Navy
- **Diversity of geographies and ecosystems**
 - Coastal, desert, mountain, arctic, etc.
- **Varying sectors/program elements**
 - T&E species, wetlands, BASH, fire management, invasives, forestry, etc.
- **Varying levels of technical capacity**
 - Large and small installations



What is Climate Adaptation?

The process of adjustment to actual or expected climate and its effects

--- IPCC AR5 (2014)

The process of adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects

--- DoDD 4715.21 (2016)



A form of iterative risk management



Principles for Effective Adaptation

- Act with intentionality; link actions to climate risks
- Manage for change, not just persistence
- Reconsider goals, not just strategies
- Integrate adaptation into existing work



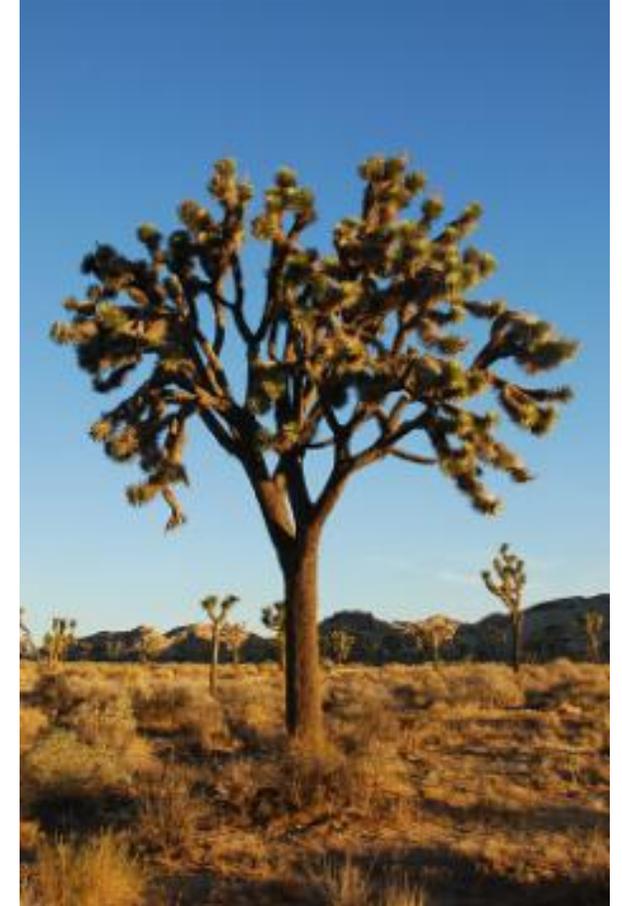
Assessing Vulnerability and Risk

- Reducing vulnerability and risk is the essence of climate adaptation
 - Understanding vulnerability is key to designing effective adaptation strategies and actions
- **Vulnerability – 3 Components**
 - Sensitivity to a change
 - Exposure to the change
 - Adaptive Capacity – ability to cope with or adjust to the change



Reconsider Management Goals Not Just Strategies

- Goals are the *ends*; strategies the *means*
- Some goals and objectives may no longer be achievable with rapid climatic changes
- Need for forward-looking rather than retrospective goals



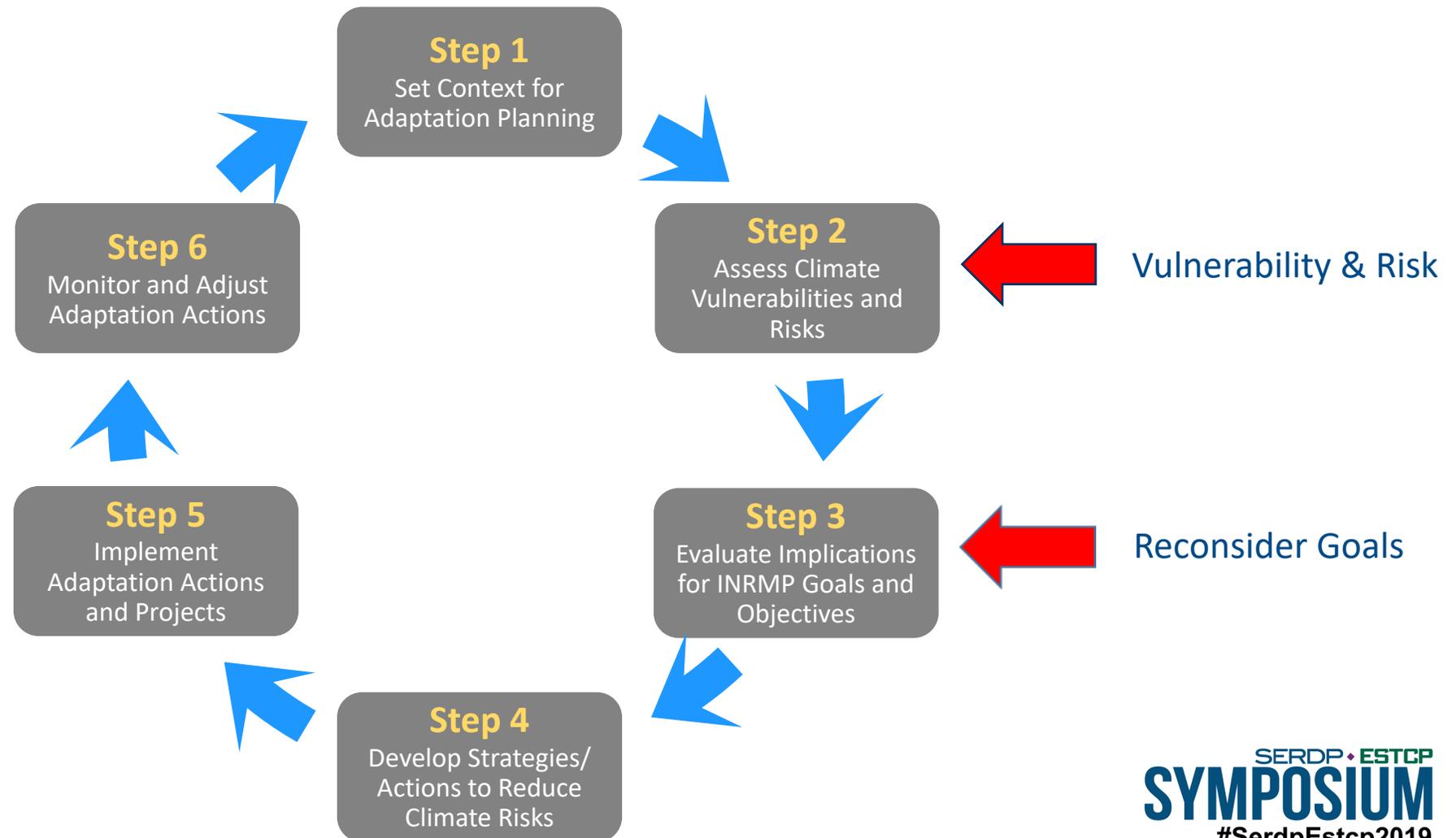
Example of Climate-Altered Goals: Marine Corps Recruit Depot, Parris Island

Slash pine forests on the installation are vulnerable to projected climate impacts

- Existing forest management goals
 - Provide shade and realistic terrain for recruit training
 - Provide revenue from timber harvest
 - Provide habitat for wildlife habitat
- In the future
 - May need to prioritize shade for training over revenue from timber production
 - May need to refocus forest management from climate-vulnerable slash pine to more climate-resilient hardwoods
 - May need to look at alternative areas for meeting wildlife objectives (and possibly training needs)



INRMP Adaptation Planning Process



Detailed Outline of INRMP Adaptation Planning Process

Step 1. Set Context for Adaptation Planning

- Conduct project scoping
- Assemble planning team/engage stakeholders
- Compile background information

Step 2. Assess Climate Vulnerabilities & Risks

- Project future conditions
- Assess vulnerability of target natural resources
- Assess resulting risk to military mission

Step 3. Evaluate Implications for Goals

- Evaluate continued achievability
- Update climate-compromised goals & objectives

Step 4. Develop Strategies to Reduce Risks

- Identify potential adaptation strategies and actions
- Evaluate for effectiveness/feasibility
- Select priority risk-reduction measures

Step 5. Implement Actions and Projects

- Identify project requirements and dependencies
- Incorporate actions into INRMP implementation table

Step 6. Monitor and Adjust

- Define expected results of adaptation strategies
- Monitor project effectiveness and ecological responses
- Adjust strategies and plans as needed



Supporting Worksheets for Each Step in the Adaptation Planning Process

Worksheet 2.1. Climate Concerns and Projections

| Key Climate Concerns | Climatic Factors | Historical/Current Conditions | Trend | Projections | Confidence/Uncertainty |
|---|---|--|---|--|--|
| <i>What are the key climate change-related impacts or threats to the installation, and more specifically for the target natural resource?</i> | <i>What are the climatic factors or variables related to those concerns, and which are ecologically</i> | <i>What are the historical/current values for this climate factor?</i> | <i>What is the trend or directionality for this factor, if known?</i> | <i>What are available projections for this variable?</i> | <i>What is the level of confidence or certainty in the trend or magnitude of change for this variable?</i> |

Worksheet 2.2. Climate Vulnerabilities of Target Natural Resources

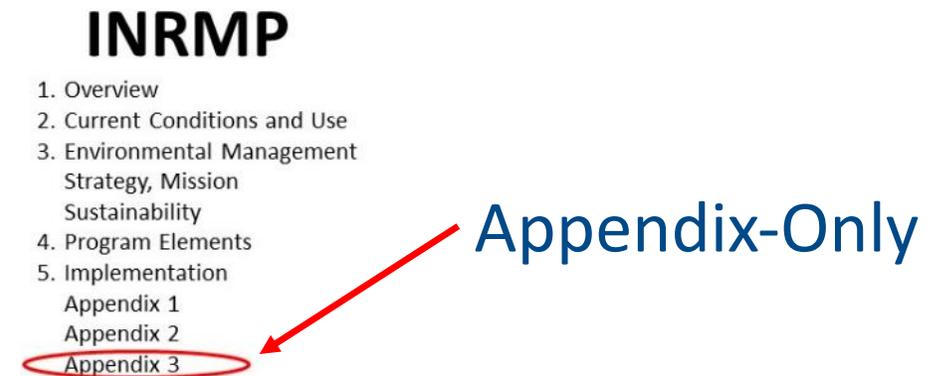
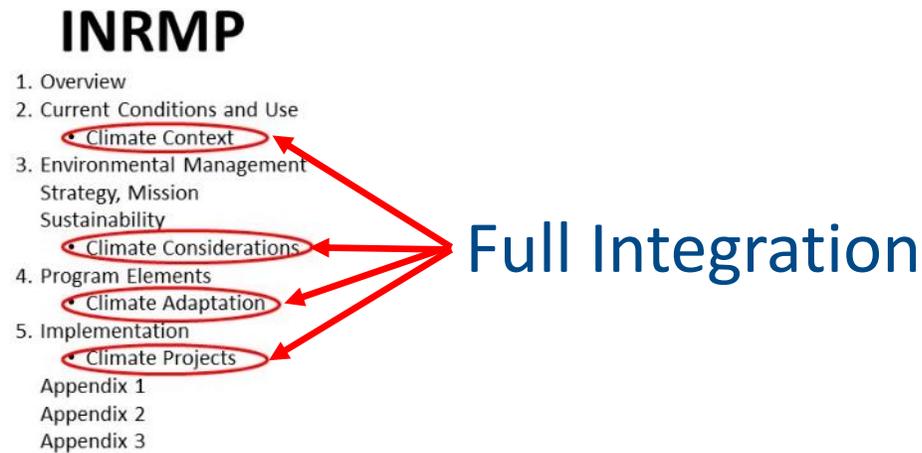
| Target Natural Resource(s) | Climate-Related Threats | | | Other Threats | Degree/Reason for Vulnerability |
|--|---|--|--|---|--|
| <i>What are the target natural resources to be evaluated (from Worksheet 1.2)?</i> | Sensitivity <i>How and to what degree might this resource respond (negatively or positively) to expected climate-related changes?</i> | Exposure <i>To what degree is the resource likely to overlap with and be exposed to conditions to which it is sensitive?</i> | Adaptive Capacity <i>Does the target resource have the ability to accommodate, cope with, or adjust to projected changes in climate conditions? If so,</i> | <i>What existing or “non-climate” threats to the resource may be exacerbated by or amplified due to projected changes in in climatic factors?</i> | <i>Rate the relative vulnerability (e.g., Very High, High, Medium, Low) and describe the reason for that rating.</i> |

Worksheet 2.3. Military Mission Risks from Natural Resource Vulnerabilities

| Vulnerabilities of Target Natural Resources | Risks to Installation Mission Requirements | Degree of Risk |
|---|--|--|
| <i>List the most consequential natural resource vulnerabilities identified in the last column of Worksheet 2.2.</i> | <i>How might this natural resource vulnerability affect the ability of the installation to deliver its military mission (e.g., training, testing, etc.) and long-term sustainment?</i> | <i>Rate the relative risk this vulnerability poses to the installation’s ability to meet its military mission requirements (e.g., Very High, High, Medium, Low).</i> |
| | | |



Options for Incorporating Climate Adaptation into INRMP



- Choice depends on multiple factors
- Can transition from Appendix-Only to Full-Integration in future



Considering Climate Implications for Program Elements

19 program elements, 3 general types:

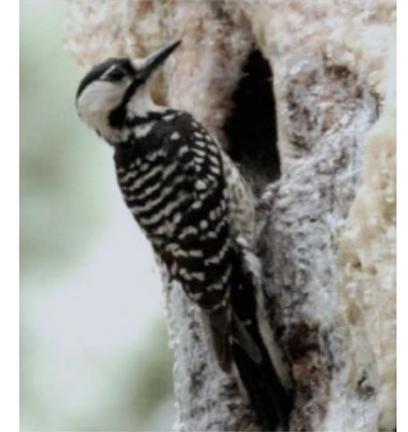
- Threats-based (e.g., Invasive Species, Pest Management)
- Target Resources (e.g., T&E Species, Migratory Birds, Wetlands)
- Practices-based (e.g., Agricultural Outleasing, Recreation)

Consider:

- Will projected climate exacerbate existing stressors?
- Will changes in management strategies be needed?
- Are climate-vulnerable ecosystems at-risk of type conversion?

Chapter 6 of adaptation guide...

- Discusses climate and adaptation issues for each program element
- Provides pointers to program element-specific adaptation resources



Implementing Adaptation Strategies in INRMP Projects and Actions

- Existing INRMP projects may have climate adaptation benefits
 - Little to no change may be necessary
 - Prioritization or timing may need adjusting
 - However, important to validate adaptation benefit through INRMP adaptation planning process
- Existing projects may need modification or refinement
- New or novel projects may be necessary
 - Project timeline and phasing can help keep manageable



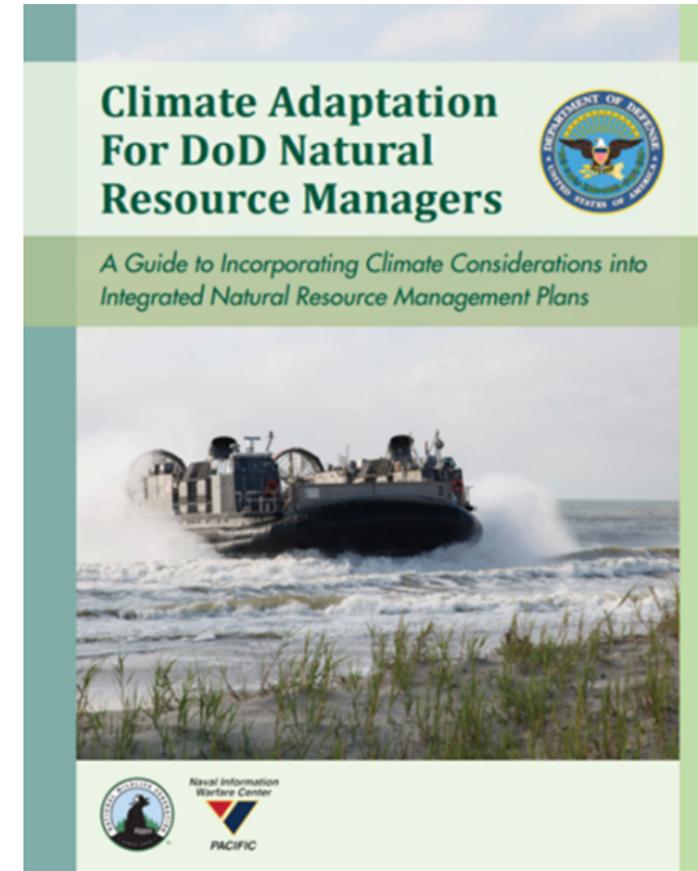
Adaptation Training

- Training based on the guide now being offered
 - Workshops previously held at Sustaining Military Readiness (SMR) and NMFWA conferences
 - Course is based on adaptation curriculum NWF developed with other federal partners (USFWS, NPS, NOAA)
- Next training to be held March 9, 2020 at NMFWA annual workshop (Omaha, NE)



Obtaining the Guide and Worksheets

- **Available online:**
 - On DoD Denix website: www.denix.osd.mil/nr/DoDAdaptationGuide
 - On NWF website: www.nwf.org/DoDAdaptationGuide
 - On NMFWA website: www.nmfwf.org/climate-change.html
- **Print copies available:**
 - Through individual Service liaisons
 - Through Legacy Resource Management Program
- **“Commanders Guide” in preparation**
 - Brief summary version of guide to be available in 2020





Questions?