Planning for Growth and Open Space Conservation

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Organized by
Rick Pringle, Susan Stein, Sara Comas, Susan Guynn (Clemson University)
and the
Forest Service National Open Space Conservation Group

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Session #13: City and County Open Space Programs

This program presents growth and open space conservation planning for cities and counties. Speakers will present the Trust for Public Land's Conservation Almanac and LandVote resources that are available online for researching conservation activities, and public funding for land conservation. We will also learn about open space conservation planning processes, ordinances, funding mechanisms, and partnerships employed in Missoula, Montana, and Baltimore County, Maryland.

- **Mary Bruce Alford** Trust for Public Land
- **Jackie Corday** City of Missoula, Montana
- **Don Outen** Baltimore County, Maryland

Link to video presentation
Link to PDF Presentation
Link to resources from this webinar

Session #12: Greening Grey Infrastructure: Federal Highway Administration's Eco-Logical Approach and Case Studies from National Forests in Ohio and Washington

Session #11: An All Lands Approach to Ecosystem Services for Water

Session #10: Tools for Conservation Planning

Webinar Resources and Tools

Find relevant resources for each webinar session here!
If you have relevant resources to share please send them to us!

Session #19 – Collaborative Forest Landscape Restoration Program

Tuesday, October 15th at 2:00 pm Eastern

Lauren Marshall

USFS Collaborative Forest Landscape Restoration Program Coordinator

Reese Lolley

The Nature Conservancy's Eastern Washington Program

Dick Fleishman

US Forest Service's Four Forests Restoration Initiative

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Session #18:
Planning for Climate Change Adaptation: forests, wildlife, and land use

Dave Peterson
US Forest Service
Pacific Northwest
Research Station

Bruce Stein
National Wildlife Federation
Washington D.C.

Phil Berke
Dept. of City and Regional Planning
University of North Carolina

Logistics – Q&A

- **Continuing Education Credits**
  - Attend entire presentation
- **Questions for speakers – chat pod**
- **Technical difficulties – chat pod or**

  email Susan Guynn: SGUYNN@clemson.edu

Getting to Know You!

Bruce Stein

National Wildlife Federation

Climate-Smart Conservation

Acting with Intentionality

Dr. Bruce Stein
Director, Climate Change Adaptation
National Wildlife Federation

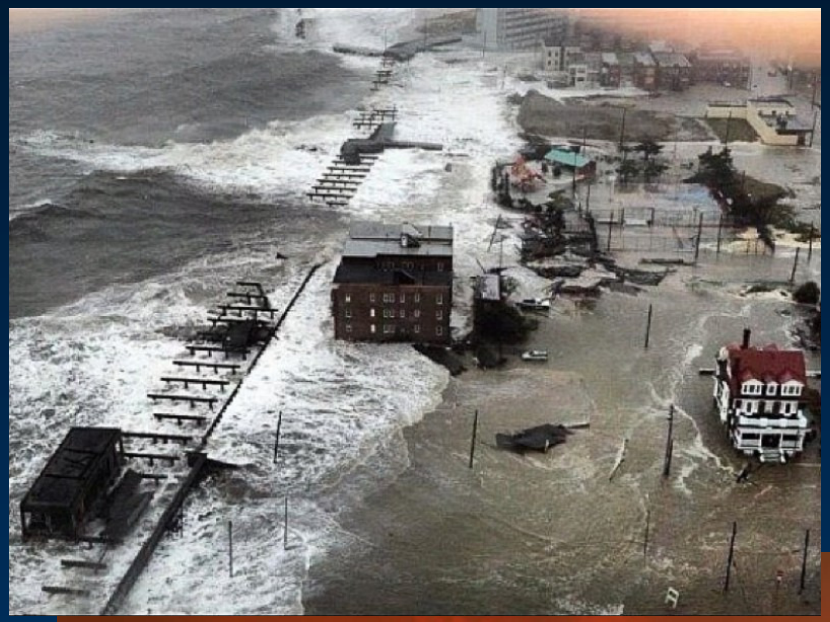
USFS Planning for Growth and Open Space Conservation Webinar

September 4, 2013

The future ain’t what it used to be.

-- Yogi Berra

Unfortunately, the Future is Now!



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Responses to Climate Change

- Mitigation
  - Addresses causes of global warming
  - Focus on reducing greenhouse gas emissions

- Adaptation
  - Addresses impacts of climate change on people and ecosystems
  - Focus on preparing for and managing climate change impacts

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"I skate to where the puck is going to be, not where it has been."

--- Wayne Gretsky

What Constitutes Good Adaptation?

- Adaptation an emerging field
  - Still poor understanding of what climate adaptation means
- Most guidance still at very high level; little operational advice
- Danger of existing work simply re-labeled as adaptation

Climate-Smart Conservation

- NWF-led expert workgroup developing guidance for "climate-smart conservation"
- Follows on successful guidance and training on vulnerability assessment
- Not a recipe book, rather focus is on "the way to cook"


Quick Guide to
Climate-Smart Conservation

Act with intentionality
We must explicitly consider and address climate impacts—both direct and indirect—in our conservation actions, and be able to "show our work." Most adaptation actions will draw from existing conservation techniques, but may differ in when, where, and why they are applied.

Manage for change, not just persistence
Conservation efforts usually strive to maintain existing conditions or restore back to some historical state. Increasingly, we will be faced with managing system transformations, and may need to focus on sustaining ecological functions, rather than historical assemblages of plants and animals.

Reconsider goals, not just strategies
As conditions change, many of our current conservation goals and management objectives may no longer be feasible. Successful climate adaptation will depend not only on adjusting strategies, but also on reevaluating—and revising as appropriate—our underlying conservation goals and objectives.

Integrate adaptation into existing work
Getting climate-smart strategies implemented can benefit from incorporating them in ongoing work and existing decision processes. Helping managers address near-term challenges in ways consistent with longer-term adaptation needs is especially important for putting adaptation into practice.

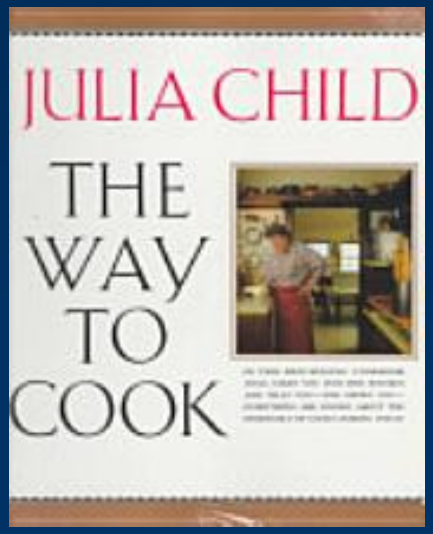
Climate change already is having significant impacts on the nation's species and ecosystems, and these effects are projected to increase considerably over time. As a result, climate change is now a primary lens through which conservation and natural resource management must be viewed. How should we prepare for and respond to the impacts of climate change on wildlife and their habitats? What should we be doing differently in light of these climatic shifts, and what actions continue to make sense? This *Quick Guide to Climate-Smart Conservation* offers an introduction to designing and carrying out conservation in the face of a rapidly changing climate.

Making Conservation Climate Smart

The fate of our wildlife and wild places depends on steps we take now to prepare for and cope with the growing impacts of a changing climate, a process known as *climate adaptation*. While managers traditionally have looked to the past for inspiration, increasingly we will be faced with future conditions that may have no historical analogs. Making a transition to forward-looking and climate-smart conservation will require that we pay particular attention to the following overarching themes:

What is Climate-Smart Conservation?
Climate-Smart Conservation is the intentional and deliberative consideration of climate change in natural resource management, realized through forward-looking goals and linking actions to key climate impacts and vulnerabilities.

Quick Guide to Climate-Smart Conservation | 1



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Iron Chef
Adaptation Edition

What's in Your Basket?

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Adaptation in a Nutshell

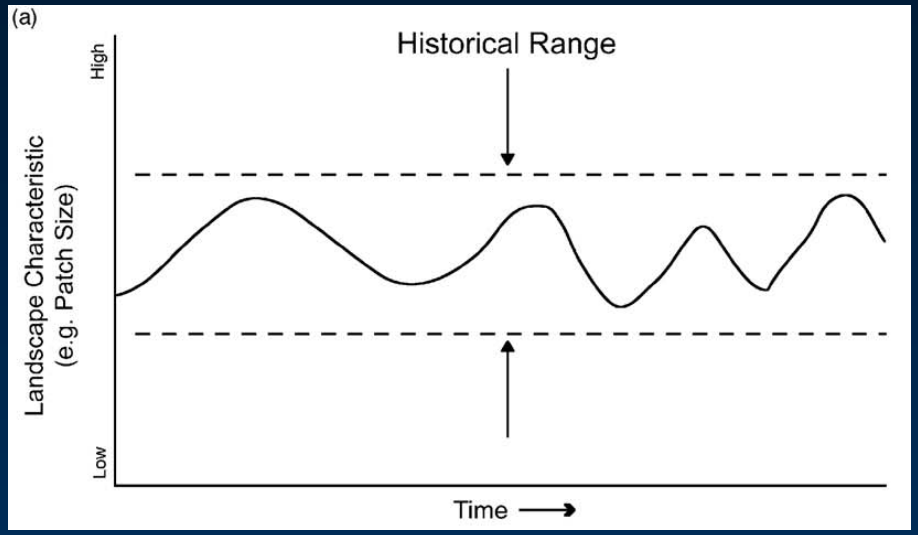
- Act with intentionality — show your work!
- Manage for change, not just persistence
- Reconsider goals, not just strategies
- Integrate adaptation into existing work

Acting with Intentionality

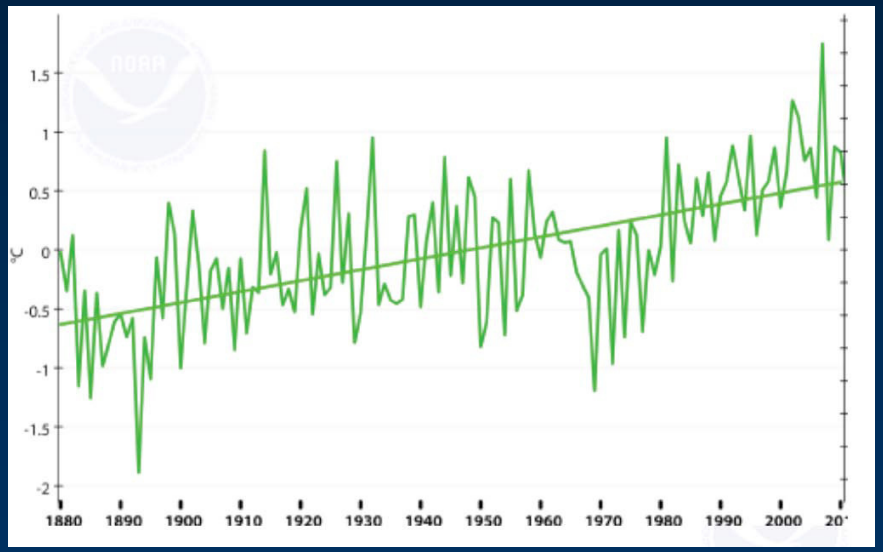
Link Actions to Climate Impacts

- What's your theory of change?
  - How will actions address key vulnerabilities?
  - Vague reference to "enhance resilience" not sufficient
- Show your work!
  - Whether novel approaches indicated
  - Or existing approaches and actions validated

Manage for Change
Not Just Persistence



Historical Range of Variability



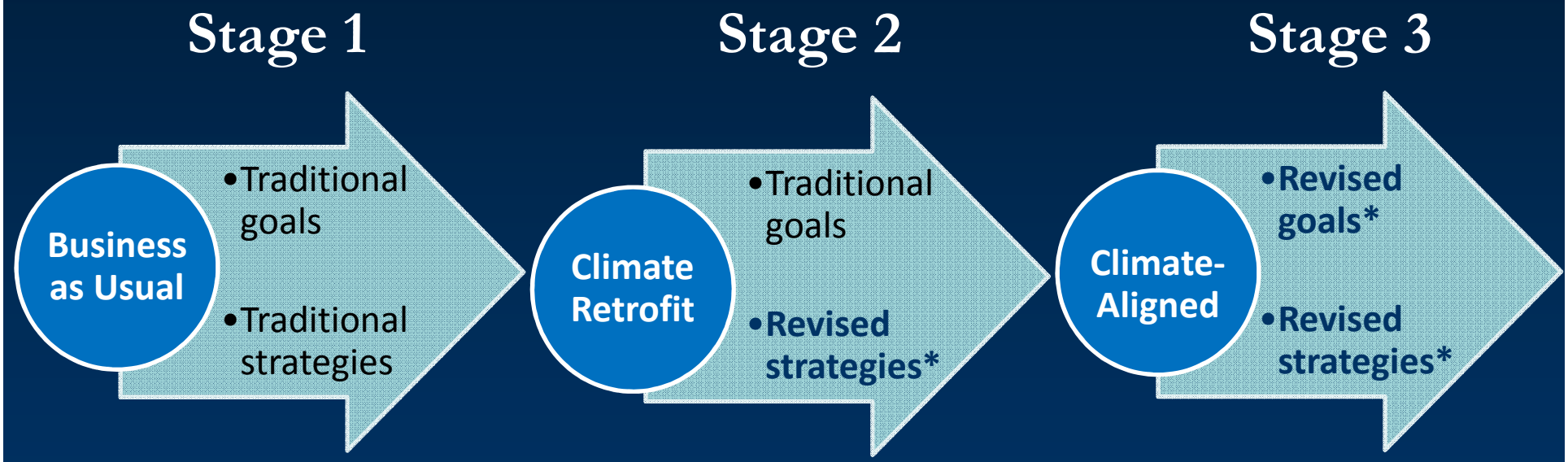
Global Average January Temperatures.
Source: NOAA 2009

Stationarity is Dead!

Reconsider Conservation Goals
Not Just Strategies

- Goals are the *why*; strategies the *how*
- Need for forward-looking rather than retrospective goals
- Need for "climate-informed conservation goals"
  - Don't just change strategies to meet current goals

Aligning Goals and Strategies for Climate Adaptation



*** Review and revised as needed, based on climate change assessments.**

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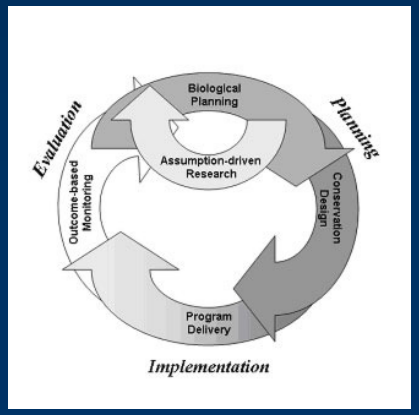
Integrate with Existing Work

Not Just Stand-Alone Adaptation Plans



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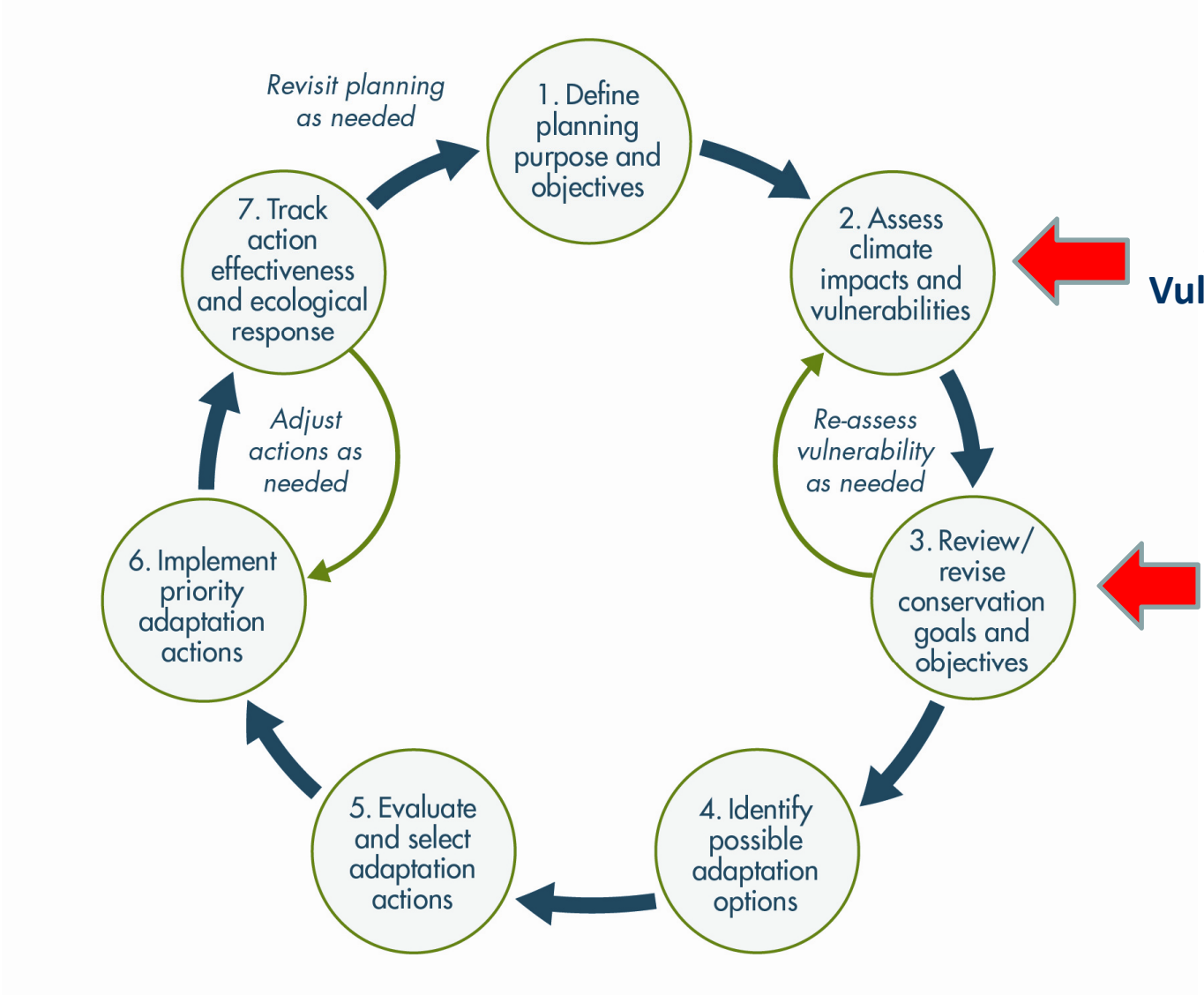
Climate-Smart Conservation Cycle



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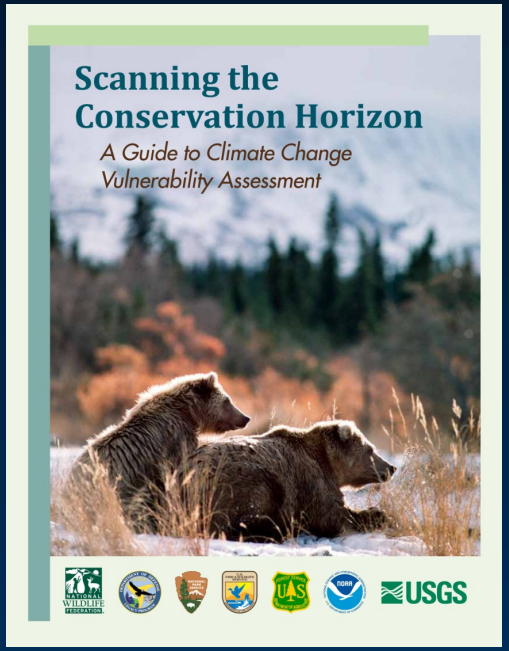
Understanding Vulnerability

- Vulnerability provides essential context for adaptation
  - What's at risk?
  - Why is it at risk?
- Components of vulnerability
  - Sensitivity
  - Exposure
  - Adaptive Capacity



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Anticipating Change in Delaware Coastal Impoundments

- Freshwater impoundments at risk from sea-level rise
  - Breached levees allow salt water to inundate important wildlife habitat
- Delaware Fish and Wildlife is implementing various adaptation options
  - Accepting conversion for some ("strategic retreat")
  - Creating new impoundments inland and upland to provide continued ecological function ("system relocation")

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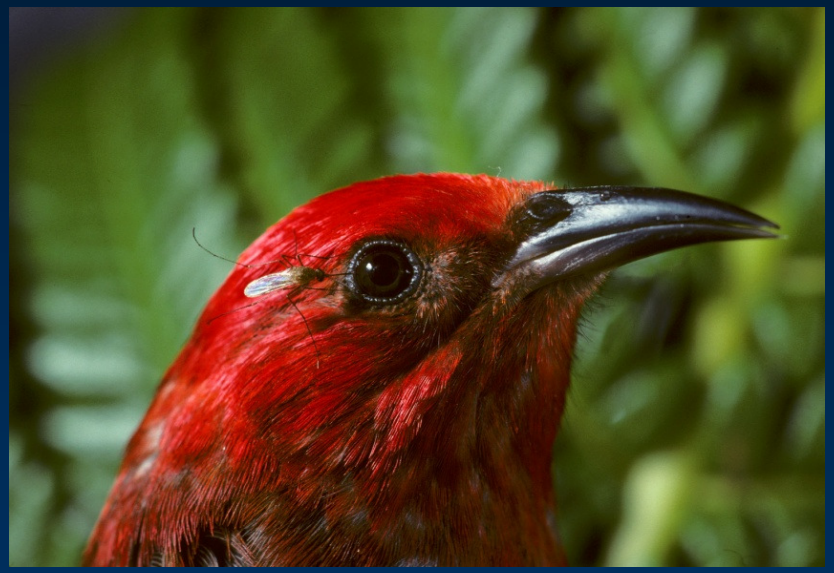
Enabling Upslope Shifts in Hawaiian Forest Birds

- Warming temperatures leading to
  - Mosquito shifts upslope
  - Increased avian malaria in mid-elevation forest birds
- Upslope forest restoration on Mauna Kea designed to
  - Reconnect mid-elevation with higher- elevation forests
  - Enable upslope shifts of forest birds
  - Provide continued malaria-free refuges



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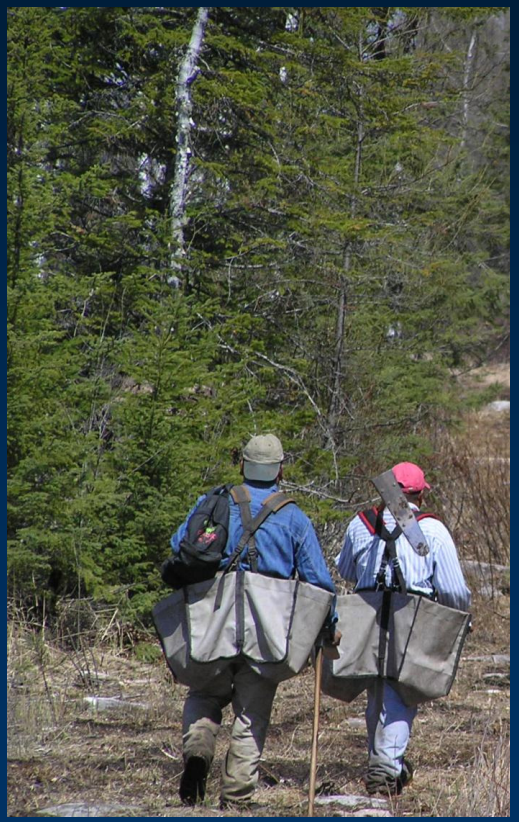
Forward-Looking Forest "Restoration" in Minnesota's North Woods

- Traditional restoration focused on boreal conifers and re-creating historical snap-shot
- Climate-projections identify "winners" and "losers" among tree species
- Shift in restoration goals to facilitate—rather than resist—system transition
  - More southerly species being incorporated
  - Focus on ecological processes
  - Still includes boreal species, but doesn't emphasize



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Summing Up

- Act with intentionality
- Manage for change, not just persistence
- Reconsider goals, not just strategies
- Integrate adaptation into existing work

Dave Peterson

US Forest Service
Pacific Northwest Research Station

Climate Change Adaptation: A Risk Management Approach

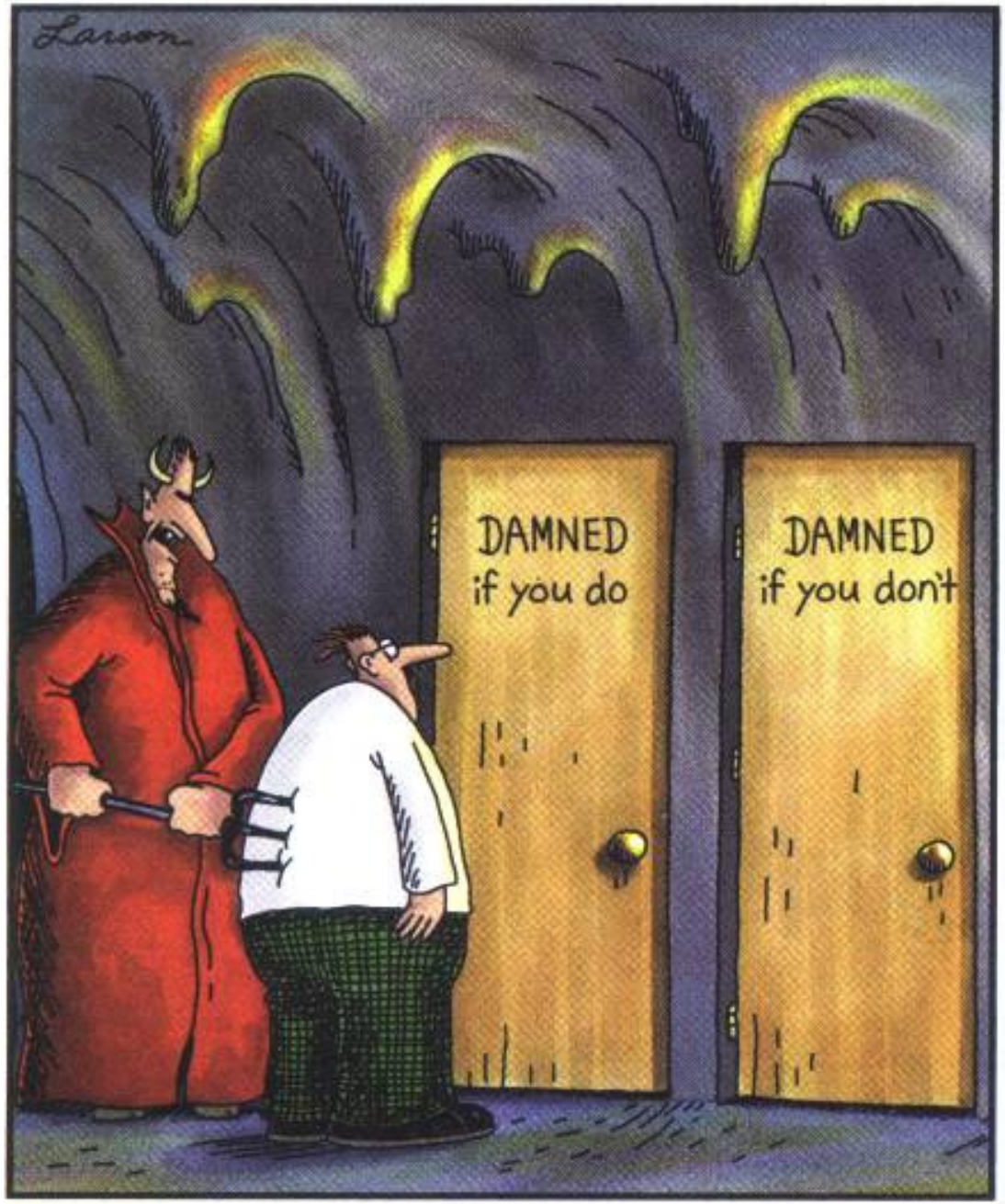
Dave Peterson

U.S. Forest Service

Pacific Northwest Research Station

Planning for Growth and Open Space Conservation
September 4, 2013

Options for adapting to climate change?



"C'mon, c'mon—it's either one or the other."

Sources of uncertainty

- Emissions scenarios
- Global Climate Models (GCMs)
- Downscaling methods
- Effects models
- Interactions among multiple stressors
- Scale of effects assessment vs. management actions

Uncertainty ≠ ignorance

- High confidence in broader scale projections
- Higher confidence in mid-century projections than late-century
- Higher confidence in projections of some climate variables than others (i.e., temperature vs. precipitation)
- Evaluate the evidence and judge projected impacts for specific areas – look for convergence among impact models

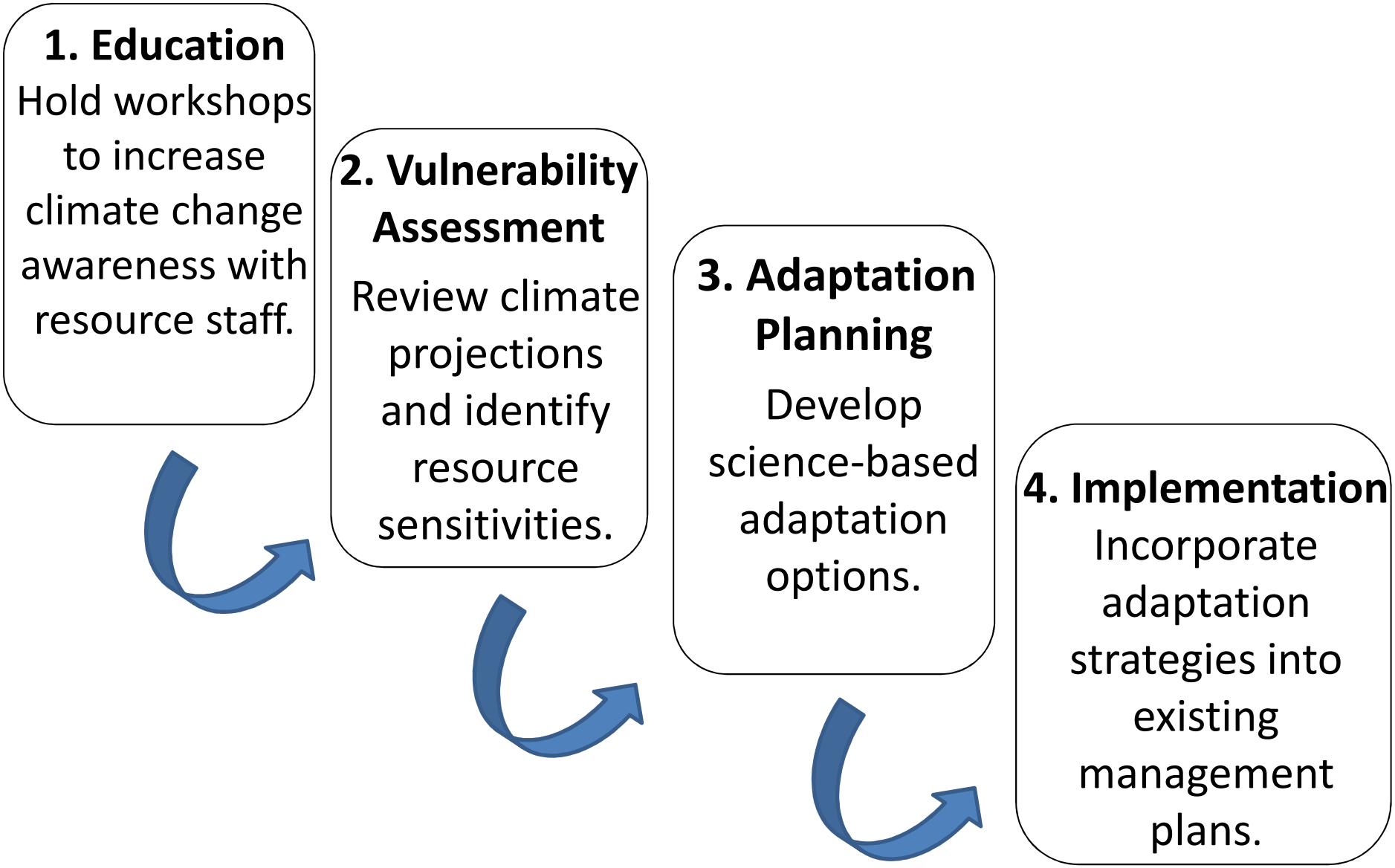
Address climate change effects as ***risk***

Address adaptation as ***risk management***

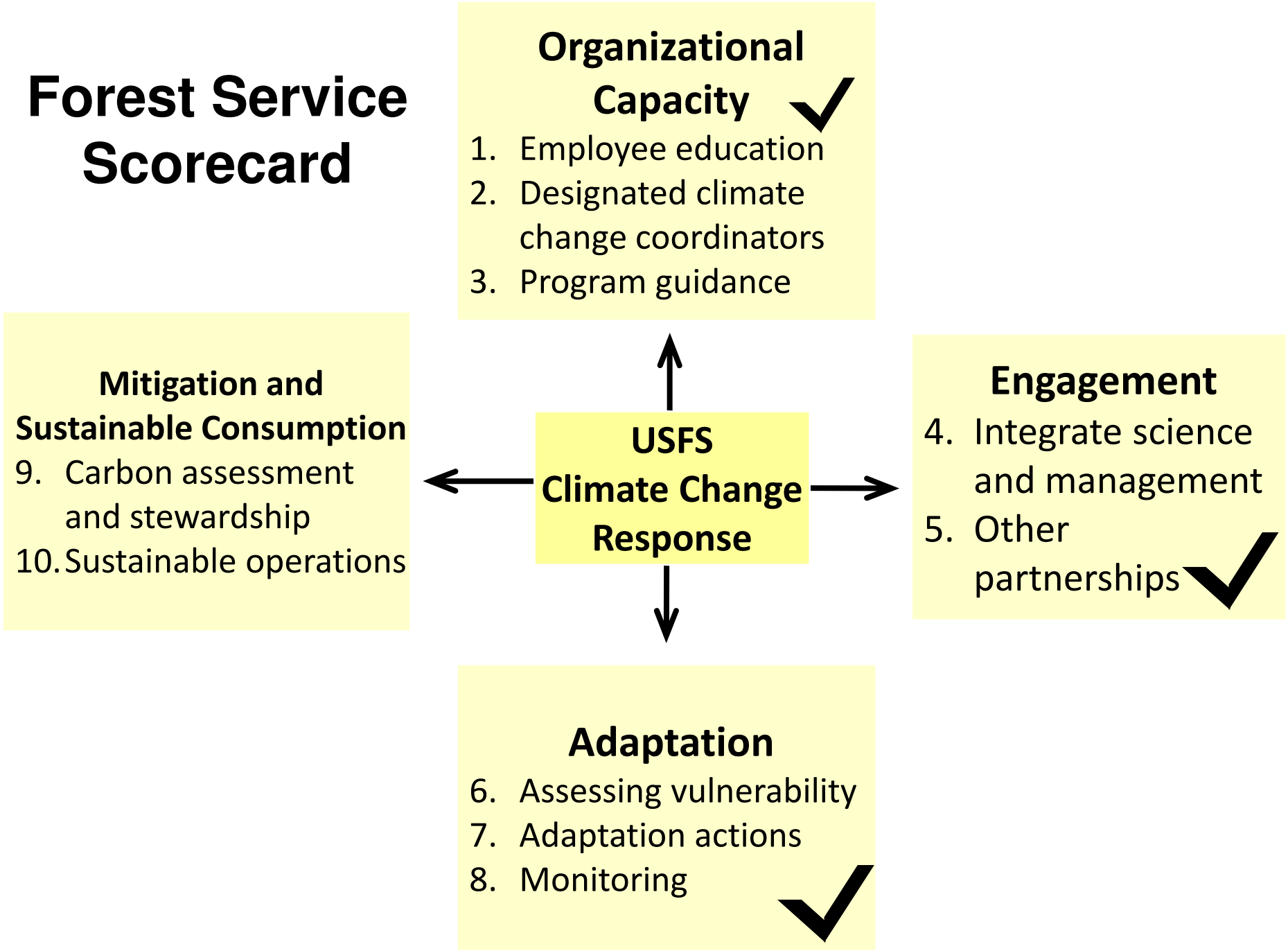
- Uncertainty and risk management are common in resource management
- Climate change poses new challenges
  - ✓ Non-analog conditions
  - ✓ Rapid change
  - ✓ Evolving science
  - ✓ Interactions

Establish a science-management partnership

- Develop a cadre of scientists and managers with multiple areas of expertise
- Focus on a consensus range of issues and resource disciplines
- Work together towards final products and outcomes

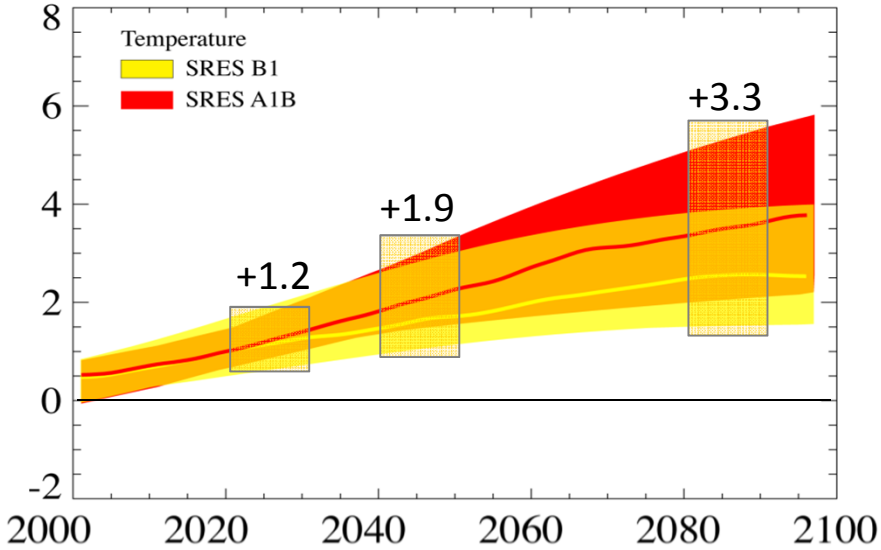

1. Education
Hold workshops to increase climate change awareness with resource staff.
2. Vulnerability Assessment
Review climate projections and identify resource sensitivities.
3. Adaptation Planning
Develop science-based adaptation options.
4. Implementation
Incorporate adaptation strategies into existing management plans.

Forest Service Scorecard



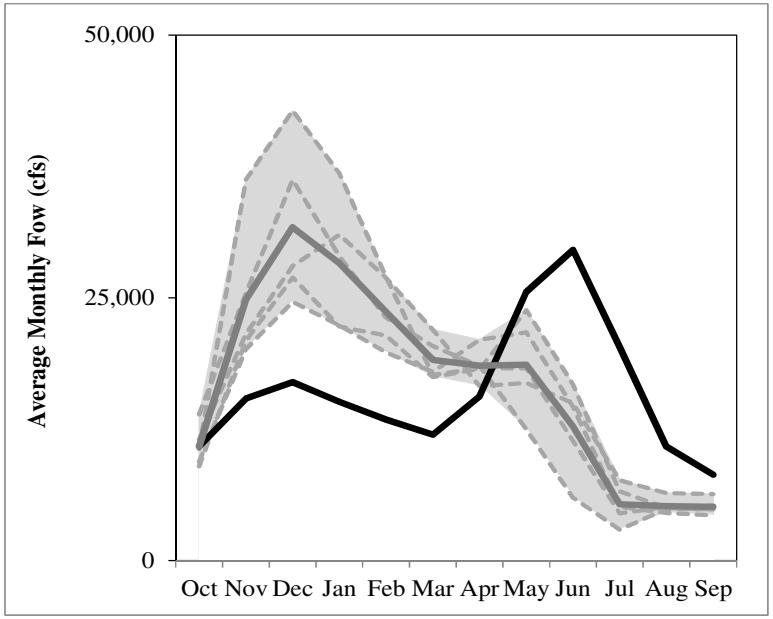
Identify scenarios for future climate and potential effects

- Identify a range of climate and effects projections for your area (from multiple models)
- Focus on a time horizon relevant for decision making, but also consider longer term



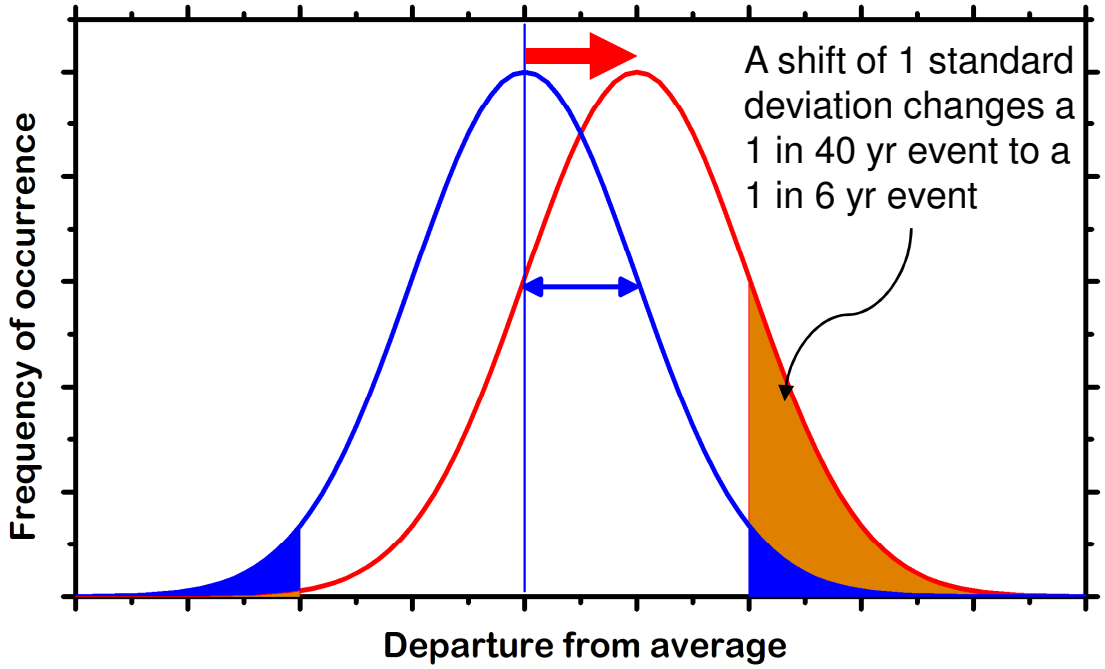
Quantify vulnerability and risks

- Start with existing conditions and stressors (sensitivity)
- Consider observed variability and trends along with projected trends (exposure)
- Estimate potential for different resources to respond favorably to an altered climate (adaptive capacity)



Extremes matter

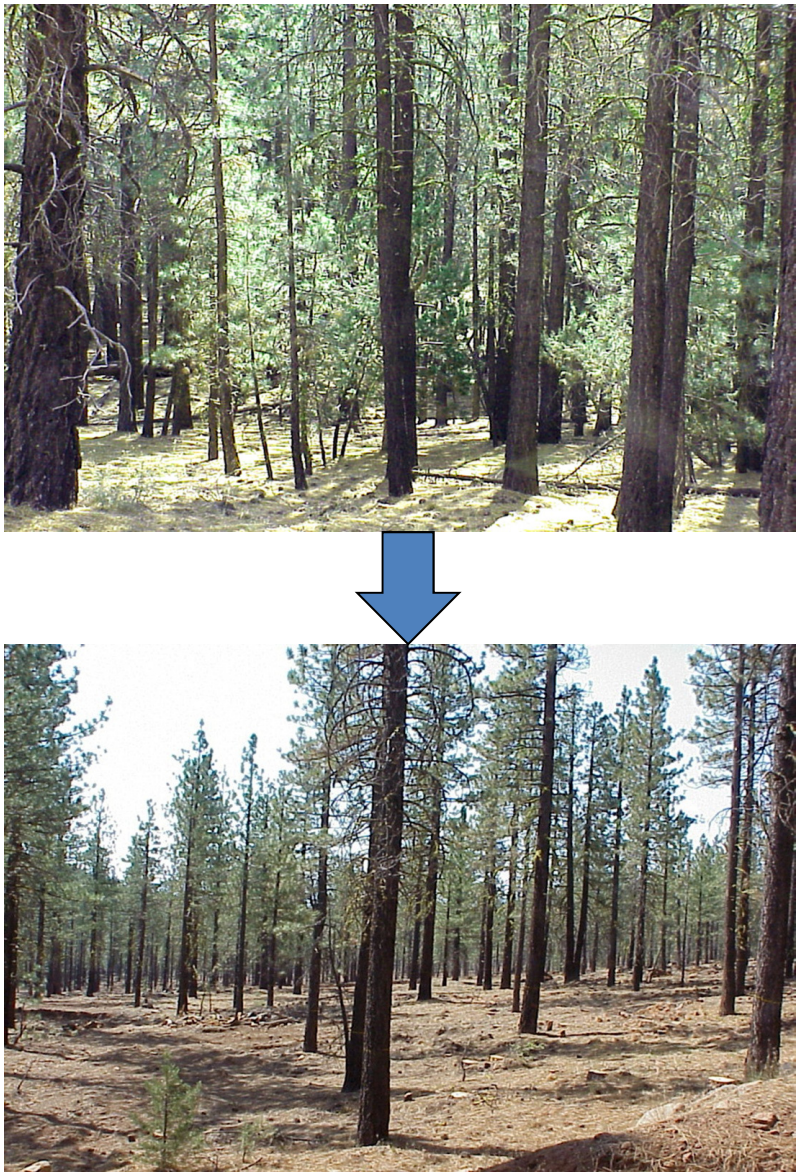
Frequency, extent, and severity of disturbances may be affected by climate change, altering the mean and *variability* of disturbance properties.



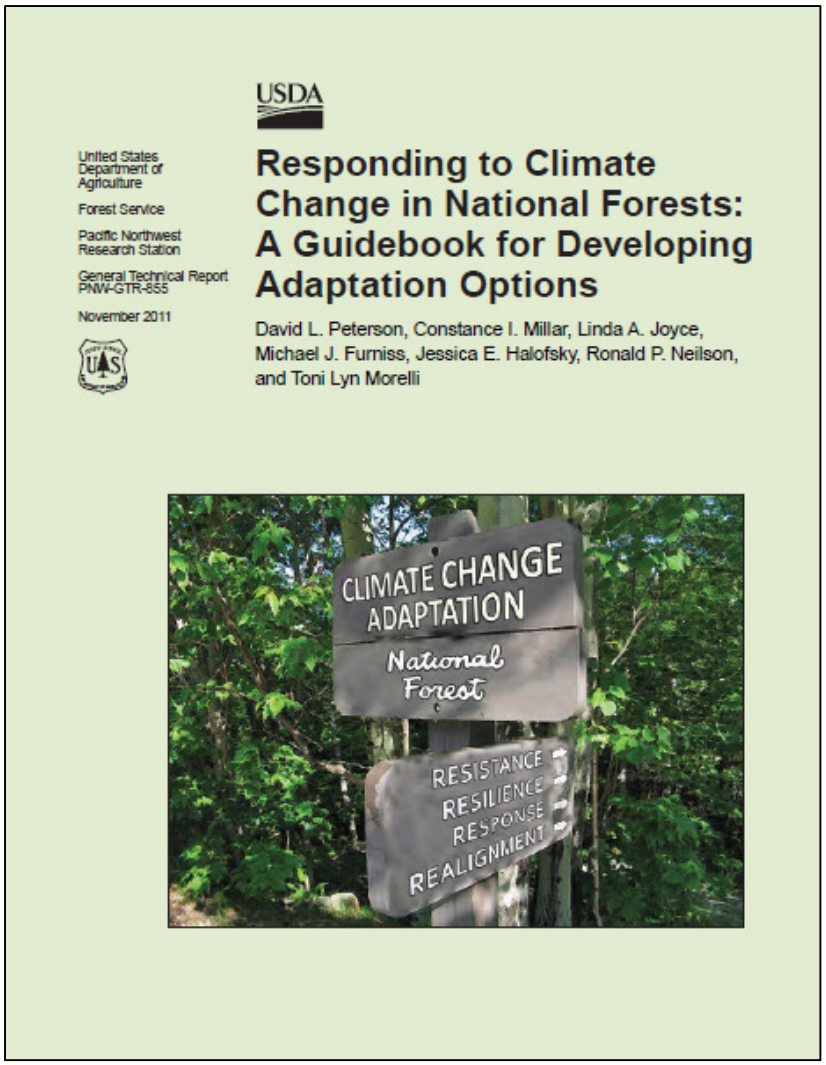
A shift in *distribution* of fire properties has a larger relative effect at the *extremes* than near the mean.

Use “climate smart” decision making

- Strive for decisions that accomplish objectives across a range of projections
- Prioritize “no regrets” actions with high probability of success/impact
- Use climate change as a context to identify options and evaluate tradeoffs



Adapting to climate change – Information & tools



Adapting to climate change – Information & tools

Climate Change Resource Center
U.S. Forest Service

http://www.fs.fed.us/ccrc

Adapting to climate change – Information and tools

north cascadia adaptation partnership

Preparing for climate change through science-management collaboration

North Cascadia Adaptation Partnership (NCAP)




NCAP is a Forest Service - National Park Service collaboration that is using an "all lands" approach to:

1. Increase awareness of climate change;
2. Assess the vulnerability of cultural and natural resources; and
3. Incorporate climate change adaptation into current management of federal lands in the North Cascades region.

Contents

What's new to the NCAP website:

May 2013: A draft of the North Cascadia Adaptation Partnership in GTR format is now available. The final GTR is in press and will be published by the USFS PNW Research Station in a couple months. Click citation to view or right-click link to save the PDF file (10.6 MB).

Raymond, C.L.; Peterson, D.L.; Rochefort, R.M. 20xx. Climate change vulnerability and adaptation in the North Cascades

Adapting to climate change – Information and tools

Adaptation: Hydrology and Access

Climate change sensitivity:

Higher peak flows leading to increased road damage and affects on aquatic habitat at stream crossings.

Adaptation strategies:

- Increase resilience of culverts and bridges to higher peak flows.
- Increase resistance of road surfaces to higher peak flows at stream crossings.
- Allow watersheds to respond to higher peak flows by reducing road system.

Adaptation: Hydrology and Access

Strategy: Allow watersheds to respond to higher peak flows by reducing road system.

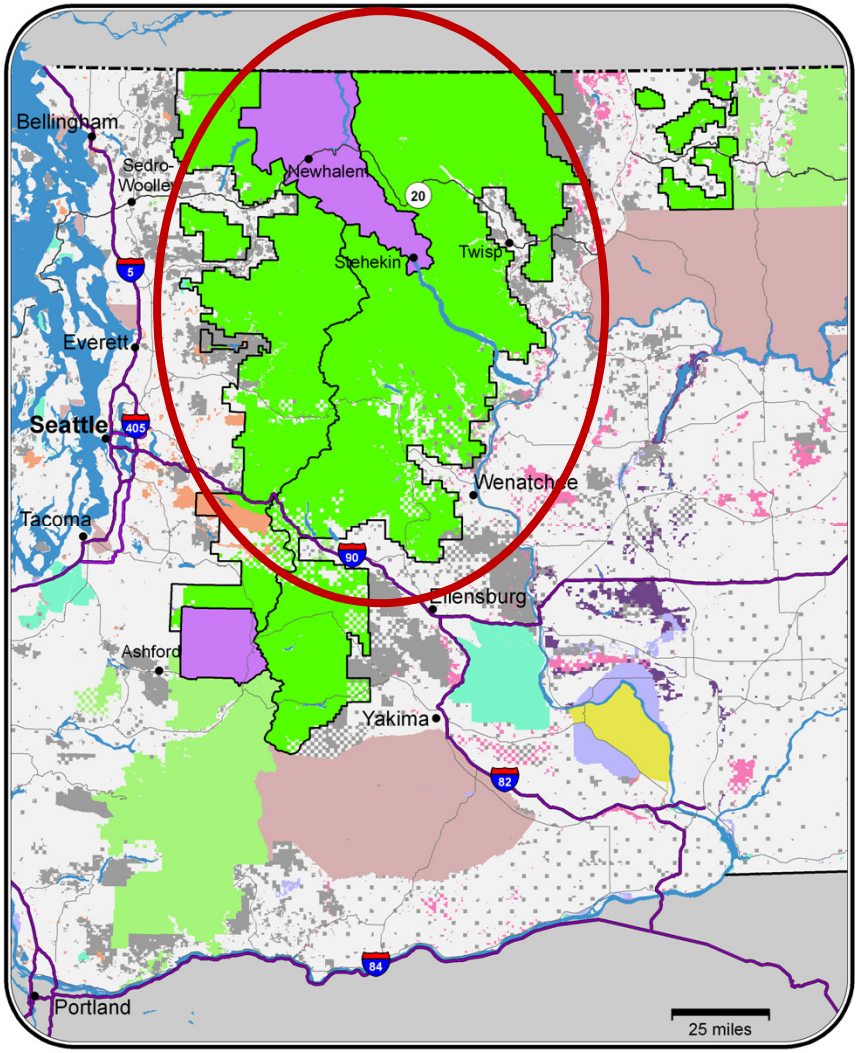
Tactics

- Decommission roads with high risk and low access.
- Convert use to other transportation modes.
- Change user expectations of access.

portlandhikers.org

This adaptation framework…

- Has been used in 20 National Forests and 5 National Parks
- Has been documented in the peer-reviewed literature
- Is incorporated in the national process used by the U.S. Forest Service



Adaptation – progress?

- Adaptation activities have increased greatly over the past 5 years, often led by federal agencies.
- Most adaptation is strategic, focused on resistance and resilience to stressors.
- Implementation in formal planning and policy is limited.
- Implementation on the ground is limited.

No, we don’t need more research!

We can do this!

- We have successfully addressed more difficult challenges in the past
- Climate smart = managing for resilience to disturbance
- Choose your battles wisely
- Work with your neighbors – share your experiences

CLIMATE CHANGE
IT'S IN YOUR BACK YARD

Phil Berke

Dept. of City and Regional Planning
University of North Carolina

UNC
INSTITUTE FOR
THE ENVIRONMENT

PUBLIC RISKS AND THE CHALLENGES TO CLIMATE ADAPTATION: PLANNING IN THE AGE OF UNCERTAINTY

Philip Berke
Department of City & Regional Planning
Institute for the Environment
University of North Carolina at Chapel Hill, U.S.A.

Topics

- Challenges and obstacles to action
- New models of governance in the age of uncertainty
- Case studies
  - Coastal Louisiana; London, UK; and Punta Gorda, FL
- Next Steps

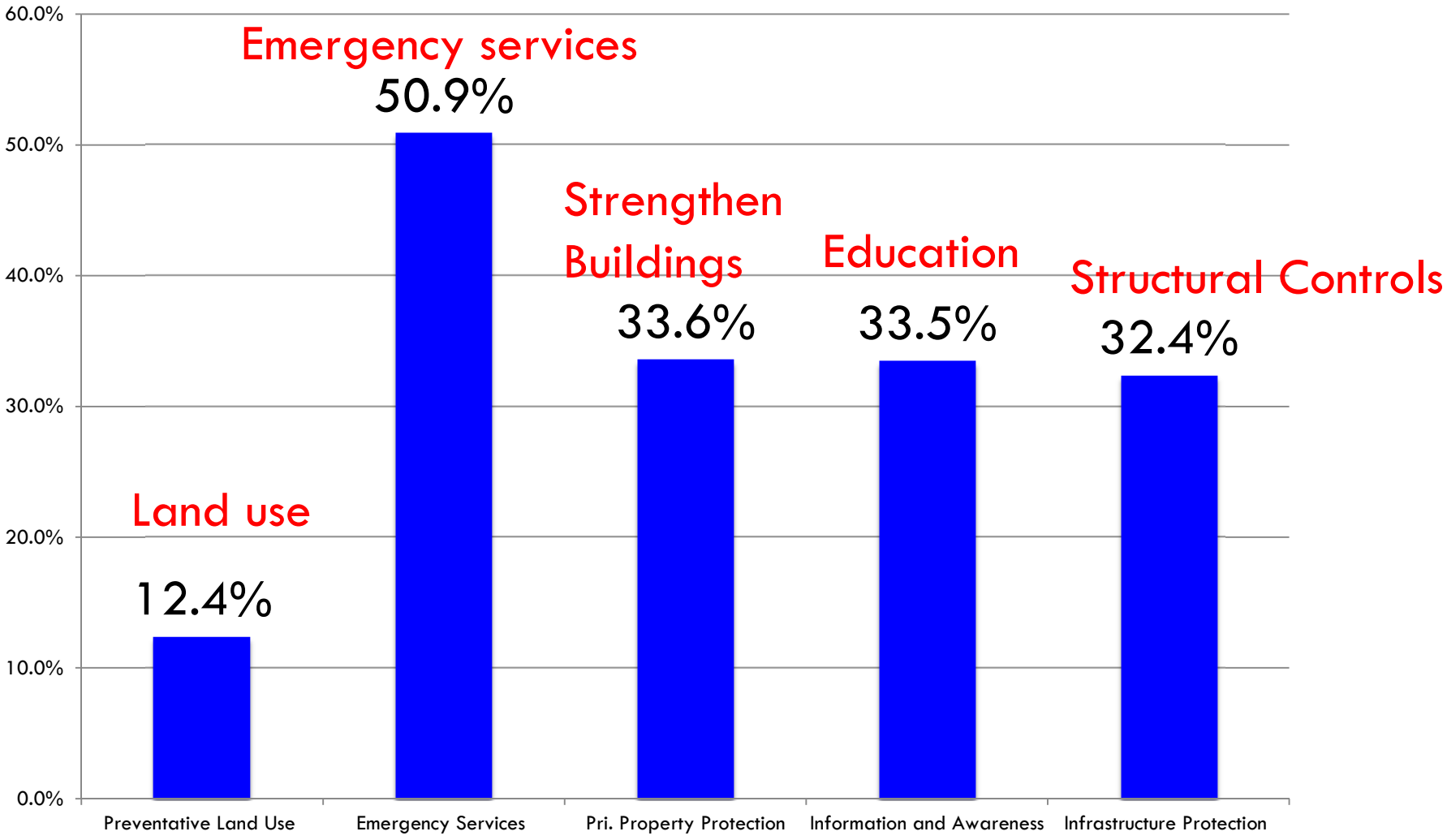
What risk is easier to fix? Melting ice cap or broken bike?

Climate Change as a Case of Public Risks

- **Public risks:** mass-produced, widely spatially distributed, temporally remote, and largely beyond control of individuals.
  - sea level rise, floods, ozone depletion, and earthquakes
- **Private risks:** more immediate, focused upon by the individual, and generally understandable.
  - automobile brake failures, steep stairs, and tainted food

Source: May, P. 1995, J of Federalism

Means of % of all Possible Policy Actions in Local Mitigation Plans: Disaster Mitigation Act (n=175 local plans)



Source: Berke, Lyles and Smith 2012

Smart Growth in Dumb Locations

Seaside, Florida: The first New Urban development in US.

"A wave of Smart Growth is engulfing the Texas coast…"
http://www.texasgulfcoastonline.com/,
1/12/12

A New Approach to Planning in the Age of Climate Change: Replace "Predict & Plan"

- **Plan for multiple futures rather than a single fixed future**
- **Employ flexible strategies (e.g. robust and worst case policies) rather than rigid strategies**
- Ongoing program to monitor implementation and changes to social, economic and environmental resilience

Case Studies

- Rising to the Challenge: London Climate Change Adaptation Strategy 2010
- Louisiana's Comprehensive Master Plan for a Sustainable Coast 2012
- Punta Gorda, FL: Hazard Mitigation, Sea Level Rise and Transportation Planning 2010

City of London: Policies focus on the "likely" scenario of events

Scenarios

- **Climate risk factors**: temp, precipitation, sea level rise, air quality
- **Two scenarios**
  - Likely case: 33% chance above and below mean
  - Extreme case: upper and lower 10% chance (NOT USED)

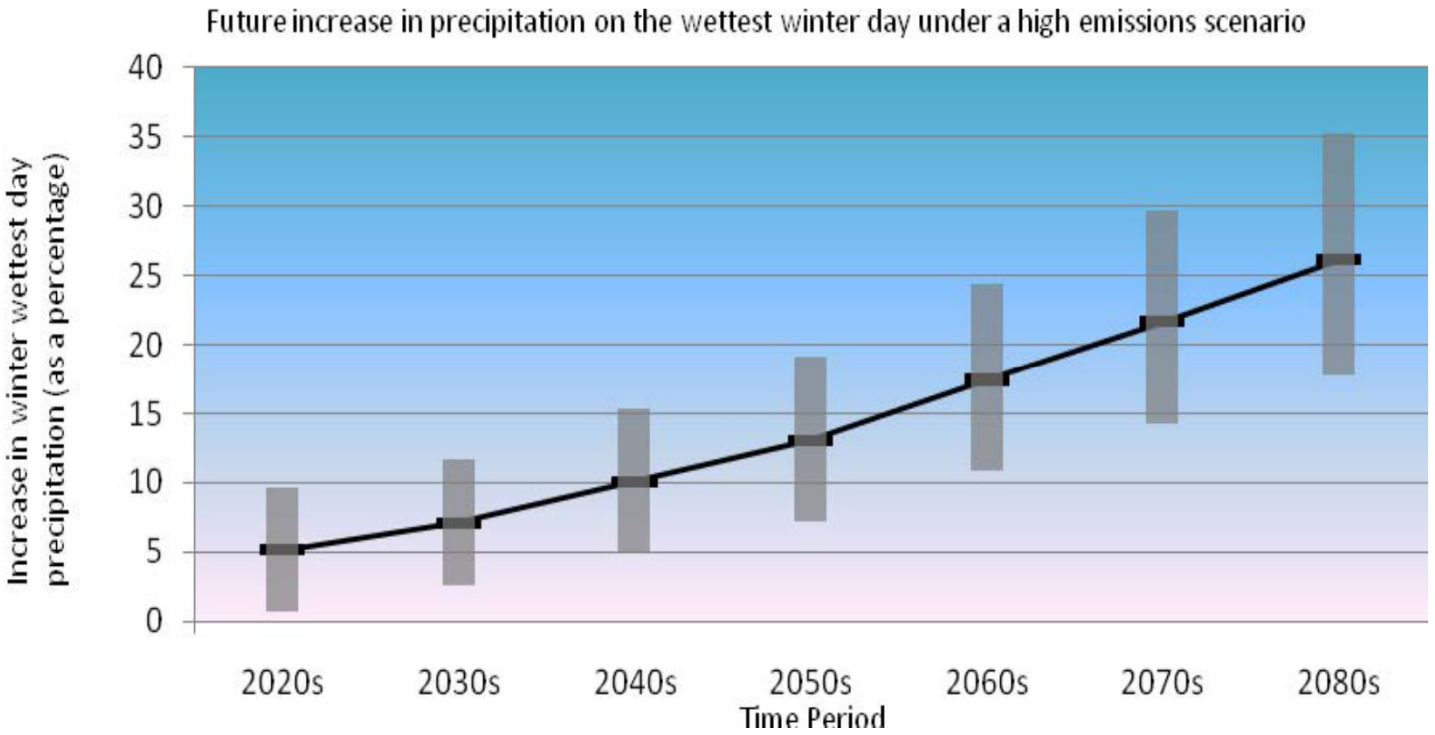
Policies: "gain acceptance, build capacity"

No-regrets. Benefits that exceed their costs, whatever extent of climate change

Low-regrets. Low cost, and have potentially large benefits

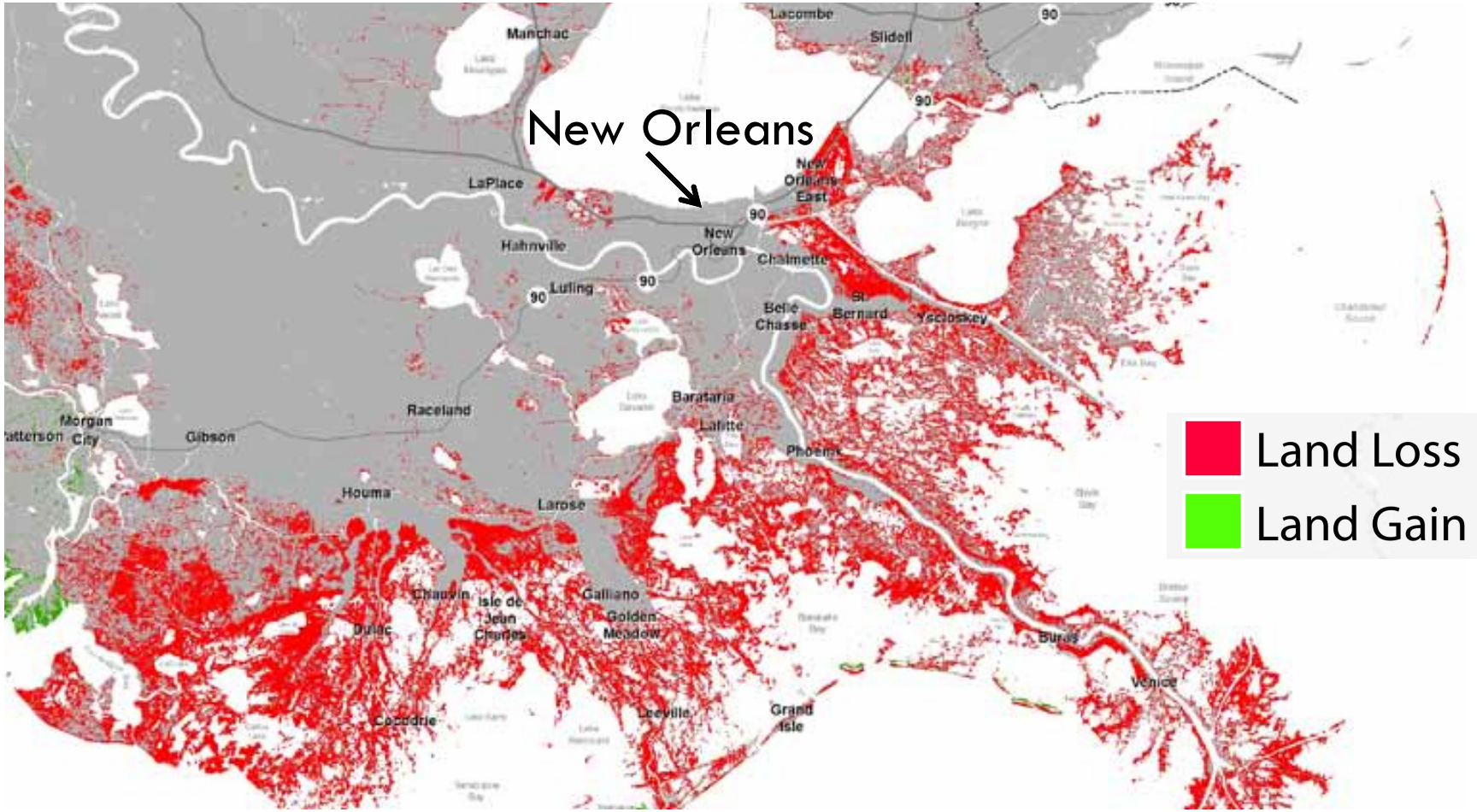
Win-win. Co-benefits

London: Rise of Winter Precipitation due to Climate Change (likely event scenario of +,-33% around mean)



Source: City of London (2010)

Louisiana Coast in Crisis: Predicated land loss of 2,900 miles^2 over next 50-years



Source: Louisiana's Comprehensive Master Plan for a Sustainable Coast (2012)

Louisiana Coast: Policies focus on "less optimistic scenario" of events

Major environmental risk factors:

- sea level rise; subsidence, river sediment, hurricane intensity

Two Scenarios

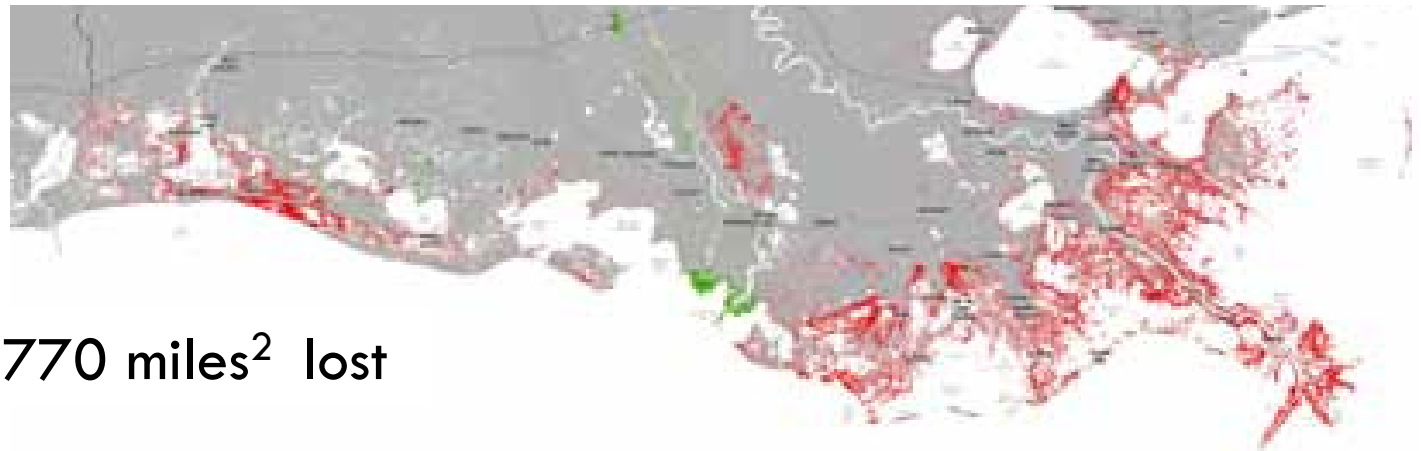
- **Moderate** Scenario
  - historic rates of change for each factor (NOT USED)
- **Less Optimistic** Scenario
  - higher rates of change for each factor

Policy Drivers: maximize flood risk reduction and marsh land creation

- **Robust:** "Hope for the best but plan for the worst;" cover moderate and less optimistic scenarios
- **No regrets:** Benefits exceed the costs under all scenarios for all policies
- **Win-win:** Reduce flood risk and create multi-ecosystem services

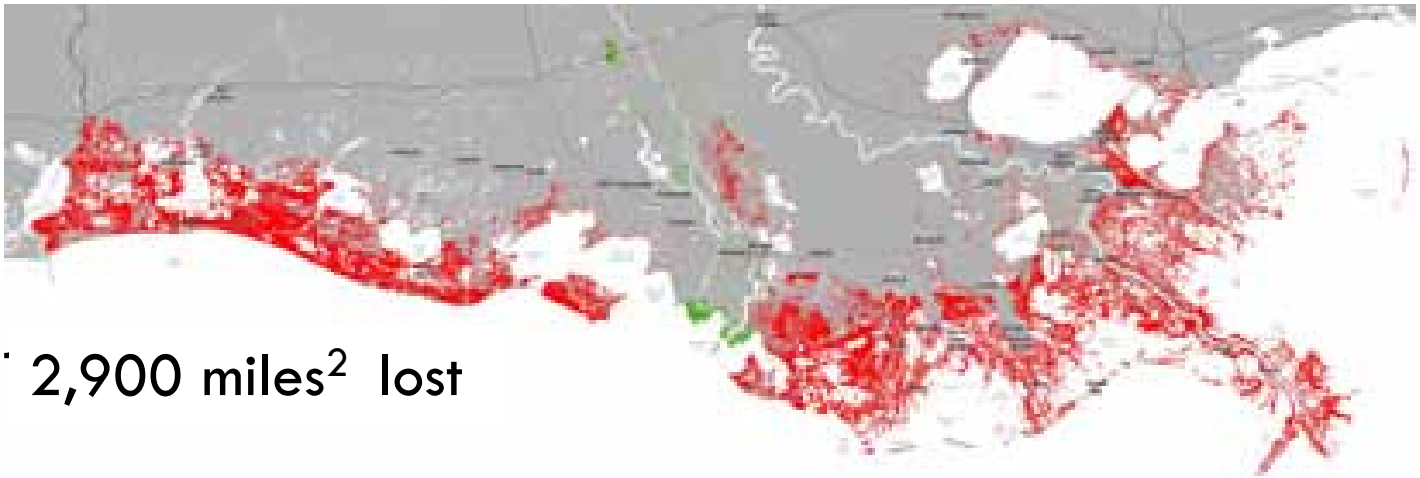
Louisiana Coast: Alternative Future Scenarios of Predicted Land Loss

Moderate Scenario



770 miles^2 lost

Less Optimistic Scenario



2,900 miles^2 lost

Land Loss

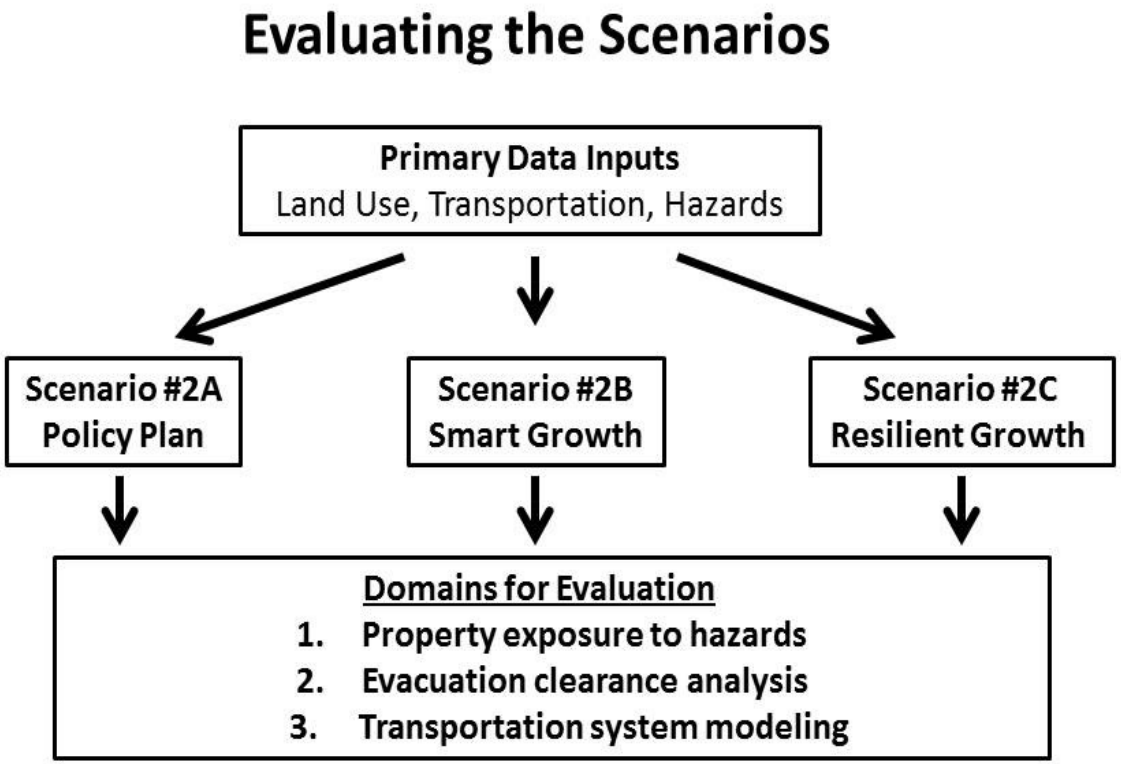
Land Gain

Old ways may no longer work

- Resiliency Planning: A New Generation of Plans?
- Resiliency to climate change:
  - anticipate uncertain change
  - adapt
  - reorganize and rapidly recover
  - transformative: new normal to safer, better, and more equitable place
- Compared to current practice, Resiliency Plans place more emphasis on:
  - greater range of alternative futures
  - emphasize monitoring
  - greater flexibility given more robust set of policy solutions
  - longer time horizon (50+ years)

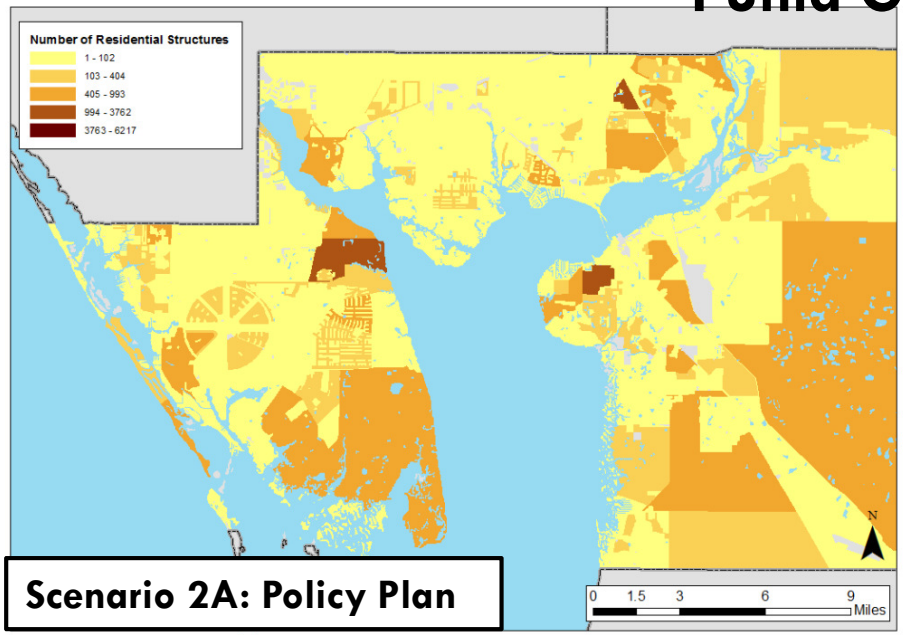
Thank you

Evaluating the Impacts of Future Scenarios, Punta Gorda, FL

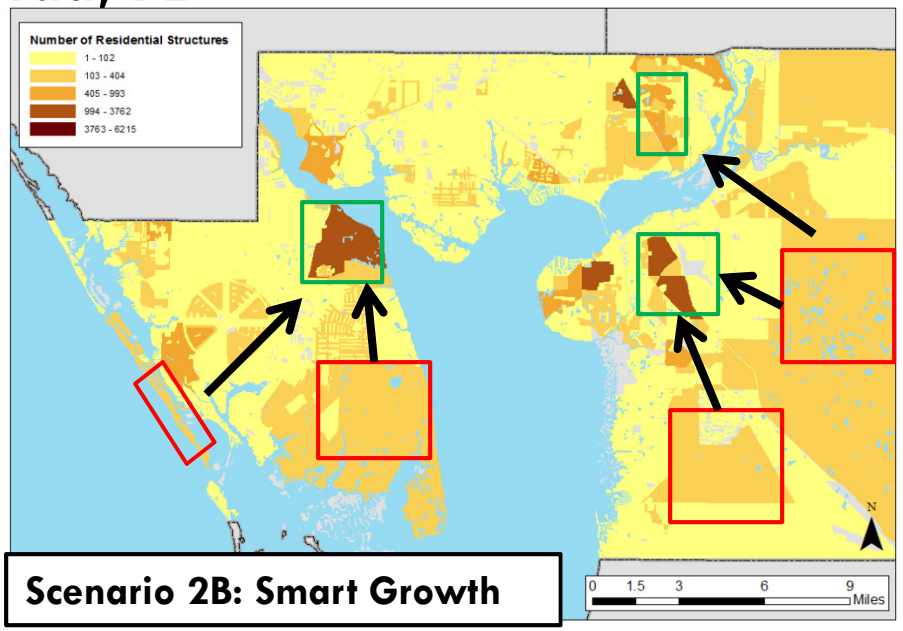


Source: Chapin, Deyle and Higgins (2010)

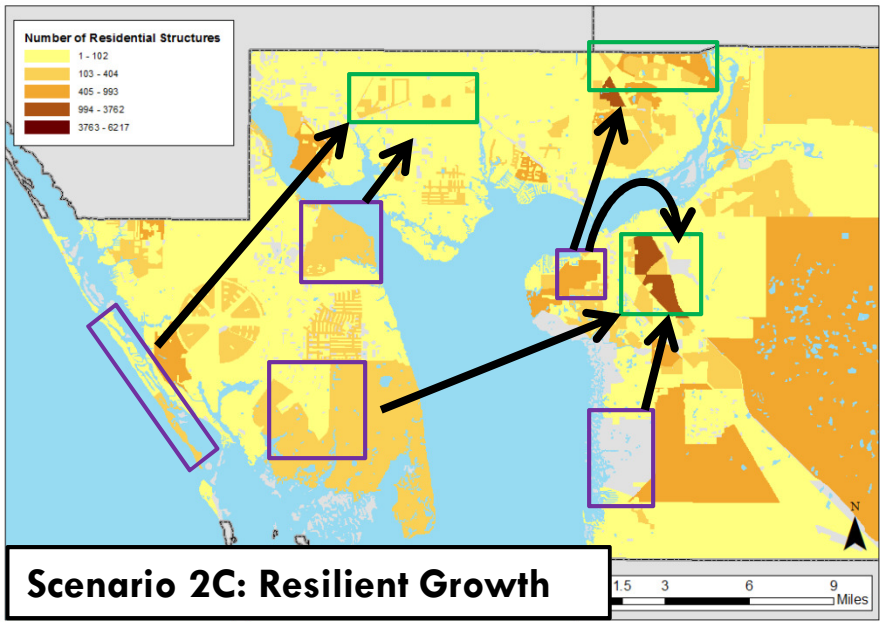
Scenario Comparison: Residential Structures by Block
Punta Gorda, FL



Scenario 2A: Policy Plan



Scenario 2B: Smart Growth



Scenario 2C: Resilient Growth

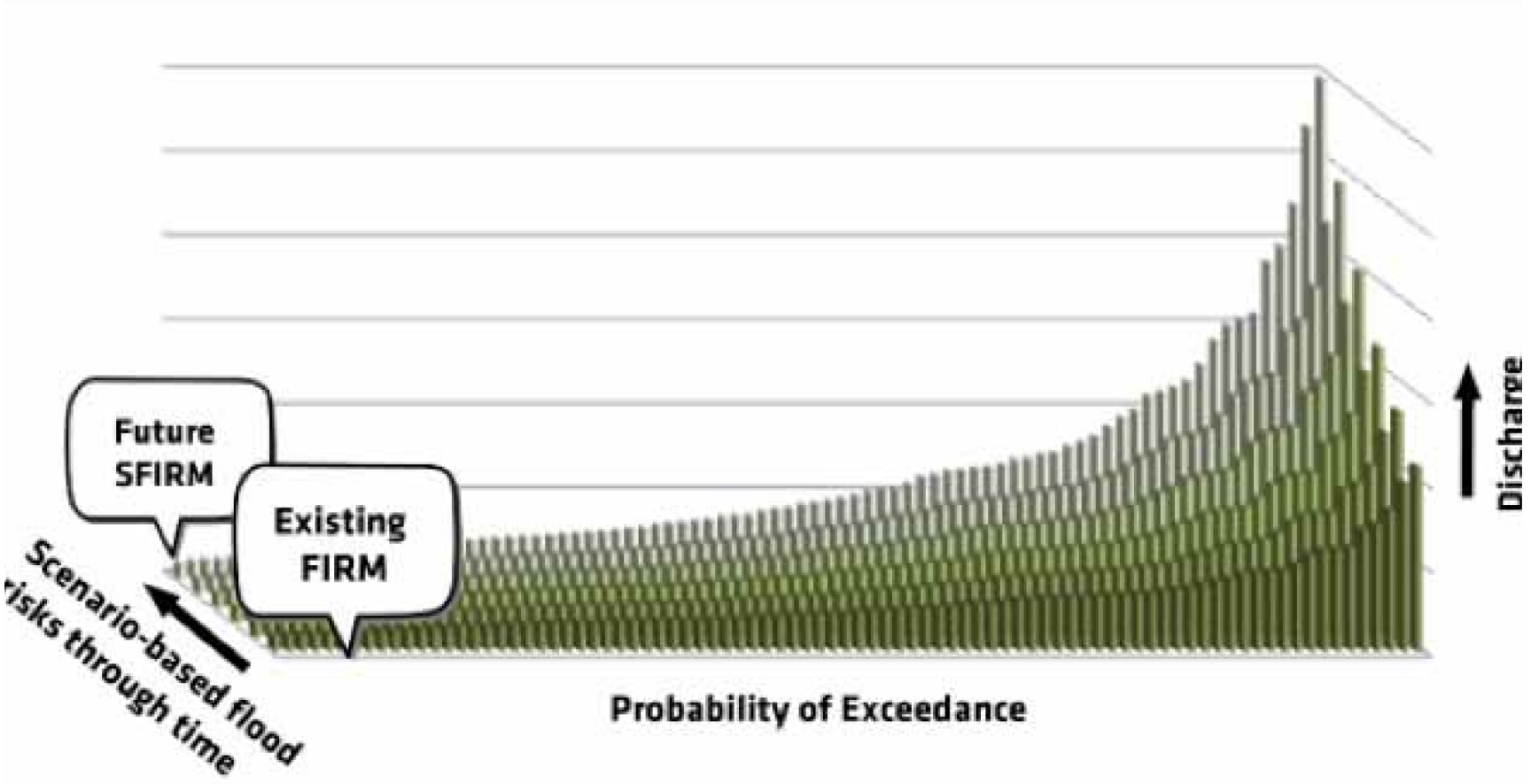
Denotes an Increase Over Policy Plan Scenario

Denotes a Decrease Over Policy Plan Scenario

Denotes a Decrease Over the Policy Plan and Smart Growth Scenarios

Source: Chapin, Deyle, and Higgins 2010

Risk-based Scenario Planning: A Proposed New Approach for Floodplain Mapping under the Nat'l Flood Insurance Program



Source: Frietag et al. 2012, *Natural Hazards Observer*

Questions and Answers

Ask questions through the chat pod

Session #19 – Collaborative Forest Landscape Restoration Program

Tuesday, October 15th at 2:00 pm Eastern

Lauren Marshall

USFS Collaborative Forest Landscape Restoration Program Coordinator

Reese Lolley

The Nature Conservancy's Eastern Washington Program

Dick Fleishman

US Forest Service's Four Forests Restoration Initiative

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Future Webinar Topics

- **November –** Community Wildfire Protection Planning
- **December –** Planning for Urban Forests

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