Climate Resilience:

What to Expect, How to Prepare, and What You Can Learn from Others

Webcast sponsored by EPA's Watershed Academy

Wednesday, October 29, 2014

1:00pm – 3:00pm Eastern

Instructors:

- **Paul Fleming**, Manager, Climate Resiliency Group, Seattle Public Utilities
- **Dr. Michael Craghan**, Lead, Climate Ready Estuaries, Office of Wetlands, Oceans and Watersheds, U.S.
- **Kasey R. Jacobs**, Partnership and Outreach Coordinator for the Caribbean Landscape Conservation Cooperative and San Juan Bay National Estuary Program – Project Coordinator for Climate Ready Estuaries

1

Webcast Logistics

- **To Ask a Question** – Type your question in the "Questions" tool box on the right side of your screen and click "Send."
- **To report any technical issues** (such as audio problems) – Type your issue in the "Questions" tool box on the right side of your screen and click "Send" and we will respond by posting an answer in the "Questions" box.

2

Overview of Today's Webcast

- National Climate Assessment Report
- Workbook for Developing Risk-Based Adaptation Plans
- Pilot Project
  - San Juan Bay National Estuary Program

3

EPA Watershed Academy

Overview of the Process and Findings of 2014 NCA Water Resources Chapter

October 29, 2014

Paul Fleming
Seattle Public Utilities
Co-Convening Lead Author
Water Resources Chapter

Outline

- Primary messages
- NCA structure and process
- Water Resources chapter key messages and findings
- Discussion

5

NCA Topline Messages

- Human-induced climate change has moved into the present
- Americans are already feeling the effect of increases in some types of extreme weather and sea level rise
- Impacts are evident in every region and important sectors
- There are many actions we can take to reduce future climate change and its impacts and to prepare for impacts we can't avoid

6

Vision of the NCA

Advance an **inclusive, broad-based, and sustained process** for assessing and communicating scientific knowledge of the impacts, risks, and vulnerabilities associated with a changing global climate **in support of decision-making** across the United States.

Goal 3 from the US Global Change Research Program (USGCRP) Strategic Plan: **Conduct Sustained Assessments**

Build sustained assessment capacity that improves the Nation's ability to understand, anticipate, and respond to global change impacts and vulnerabilities

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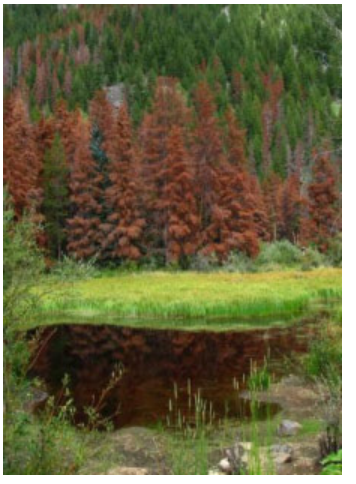
Sectors

- Water Resources
- Energy Supply and Use
- Transportation
- Agriculture
- Forests
- Ecosystems and Biodiversity
- Human Health



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Cross-Cuts

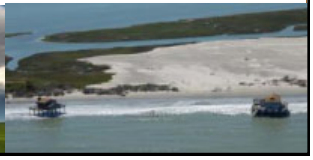
- Energy, Water and Land
- Urban Systems, Infrastructure, & Vulnerability
- Indigenous Peoples
- Land Use & Land Cover Change
- Rural Communities
- Biogeochemical Cycles
- Oceans
- Coasts

9

Sustained Assessment

- Special report of the NCADAC
- Goal: Enhance the ability of *decision-makers at multiple scales throughout* the United States to anticipate, mitigate and adapt to changes in the global environment
- Four elements:
  - Establish mechanisms to support enduring collaborative partnerships
  - Enhance scientific foundations for managing risks and opportunities of climate change
  - Provide infrastructure to support a sustained process
  - Diversify resource base and set priorities





Climate Change Impacts in the United States

CHAPTER 3
WATER RESOURCES

Convening Lead Authors
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Lead Authors
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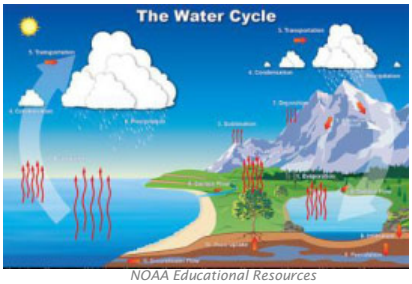
Water Resources Chapter Themes

- **Water Cycle Changes:** **Observed and projected.**

Fluxes: Precipitation (Averages, Extremes)
Evapotranspiration
Runoff, Streamflow,
GW Recharge

Storages: Snow Cover, SWE
Lakes/Reservoirs/Wetlands
Soil Moisture
Groundwater

Water Quality:
Water Temp, Sediment,
Nutrient Loads, DO, Pollutants



NOAA Educational Resources

- **Water Demand/Use Changes:** **Observed and projected.**
  - **Freshwater withdrawals from streams, rivers, lakes, and aquifers (off-stream water uses):** Municipal, industrial, and agricultural water supply; Cooling of re-circulating power plants
  - **In-stream, lake, and wetland water flows, levels, and quality:** Hydropower production; Cooling of once-through power plants, Navigation, Recreation, Waste assimilation, Ecosystem services.

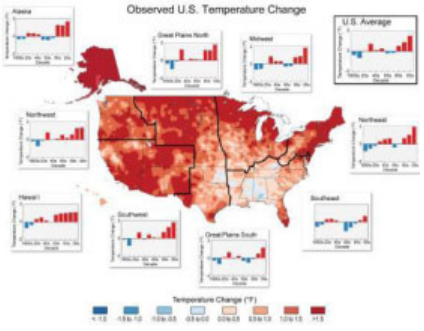
- **Key Water Resources Vulnerabilities.**

- **Management, Adaptation, and Institutional Responses.**

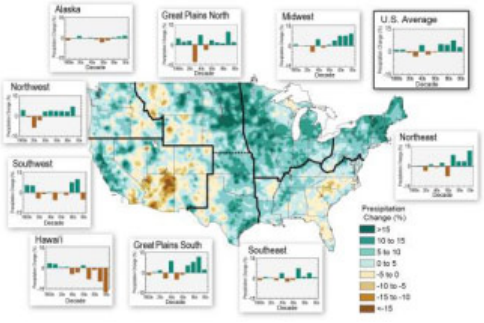
Observed U.S. Temperature and Precipitation Char

3rd NCA, Climate Chapter

Temperature Change
[1991-2012 Relative to 1901-1960]



Precipitation Change
[1991-2012 Relative to 1901-1960]



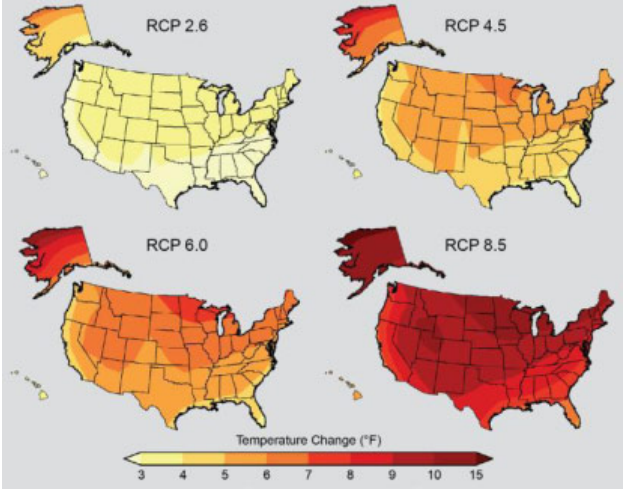
- Recent decades are warmer in every US region.
- 2001 to 2012 was warmer than any previous decade in every region.
- Most US regions experience wetter conditions (0.16 inches / decade).

13

Temperature Projections

3rd NCA, Climate Chapter

Georgakakos-Fleming

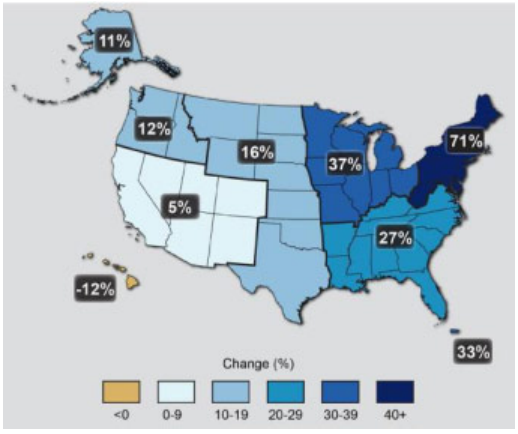


- US temperature projections indicate consistent warming in the coming decades across all models in the range 3 to 10 °F.
- Projected temperature increase is higher than model-to-model range.

14

Very Heavy Precipitation Change [1958-2012]

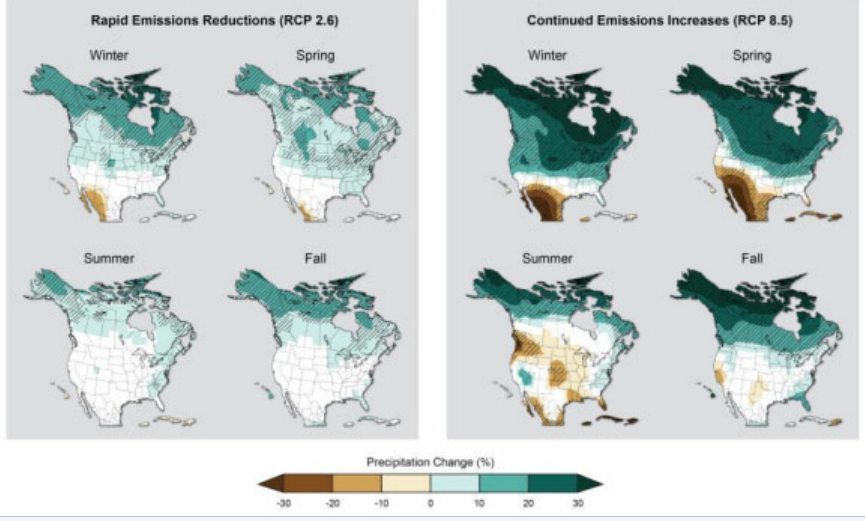
3rd NCA, Climate Chapter



- Very heavy precipitation [1% of all daily events] has increased and is expected to increase further in all US regions.
- Events with 1:20 year frequencies are expected to occur 1:15 to 1:5 by 2100.
- Trends are larger than natural variations for Northeast, Midwest, Southeast, Great Plains, Alaska, and Puerto Rico.

15

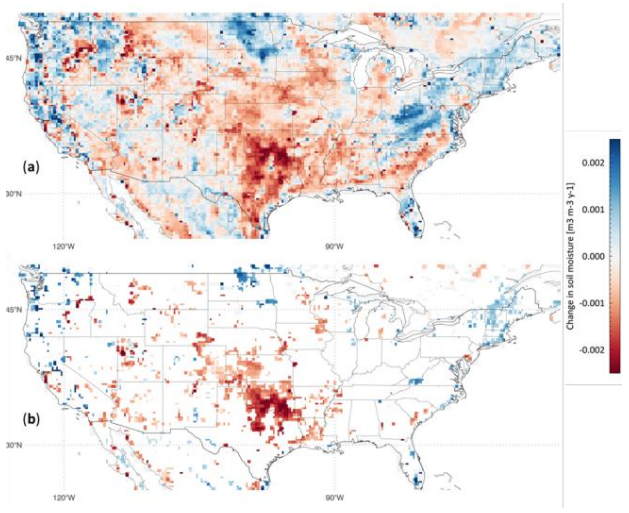
Precipitation Projections



- Con. US in the transition zone between drier subtropics and wetter north.
- Precipitation projections show consistent spring reductions in the Southwest and increases in the Northeast, Midwest, and Alaska.
- Dry spells are expected to increase in most regions.

16

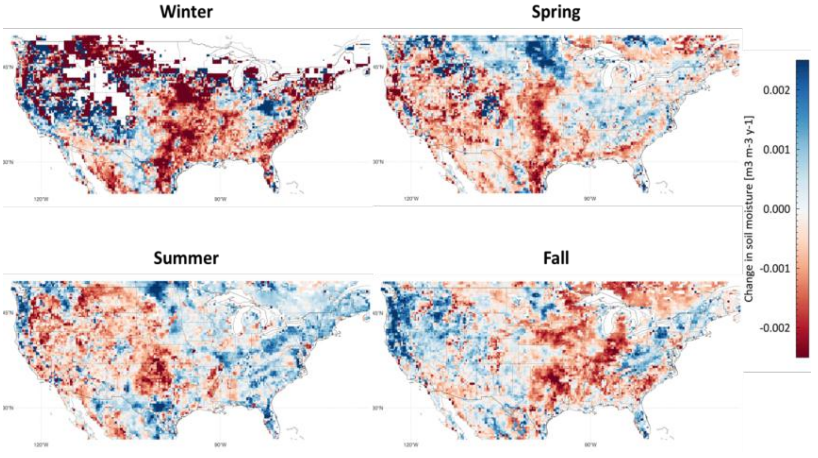
Observed Soil Moisture Changes [1988-2012]
3rd NCA Water Chapter



- **Annual surface soil moisture changes: Drying trends in many US regions.**
  [Dorigo et al., 2012, based on a multi-satellite data product]

17

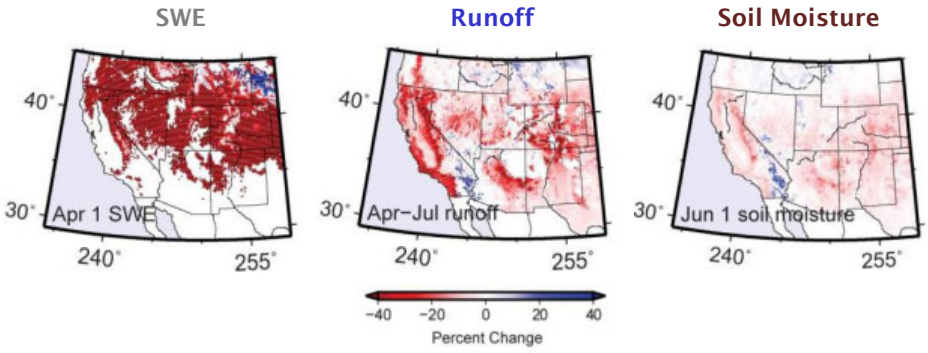
Observed Soil Moisture Changes [1988-2012]
3rd NCA Water Chapter



- **Seasonal surface soil moisture changes: Potential impacts on streamflow, recharge, and agriculture.**
  [Dorigo et al., 2012, based on a multi-satellite data product]

18

Projected Changes in SWE, Runoff, & Soil Moisture
3rd NCA Water Chapter

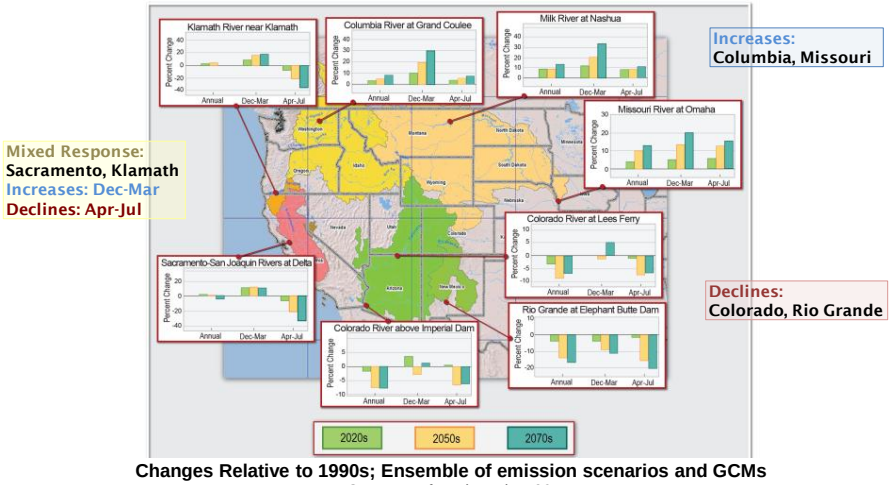


Projected [A2] Changes for 2041-2070 as Percent from 1971-2000 [Cayan et al. 2013]

- Projections indicate
  - **major losses in snowpack** water content (SWE);
  - **significant reductions in runoff** in California, Arizona, and the central Rockies;
  - **reductions in soil moisture** across the Southwest.

19

Projected Streamflow Changes [Western US]
3rd NCA Water Chapter

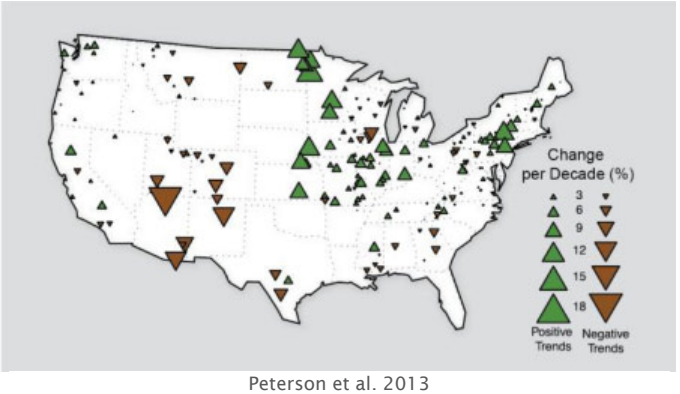


Changes Relative to 1990s; Ensemble of emission scenarios and GCMs
US Bureau of Reclamation, 2011

- **Streamflow increases are observed and projected in northern states.**
- **Streamflow decreases are observed and projected in southern states.**
- **Flow peaks occur earlier due to earlier snowmelt, declines of spring snowpack, and more rain than snow. Cool season increases, warm season decreases.**
- **By 2070, projected changes exceed historical variability.**

20

Flood Magnitude Trends [1920 – 2008]
3rd NCA Water Chapter



Peterson et al. 2013

- Significant increasing trends in Midwest and Northeast.
- Significant decreasing trends in Southwest.
- Local flooding trends and projections depend on many factors.

21

Flood Factors and Expected Trends
3rd NCA Water Chapter

- Flash and Urban Flooding: Expected to Increase
- Riverine Flooding: Uncertain, as it depends on several factors [basin extent, precipitation, soil moisture, time of year, snow cover, land use, terrain, etc.]
- Coastal Flooding: Expected to increase in many coastal areas.

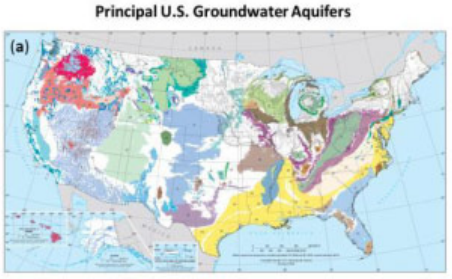


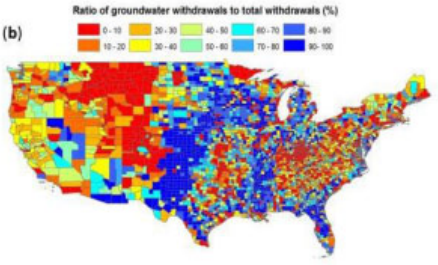

- Floods threaten lives and disrupt critical infrastructure.
- In the US, from 1959 to 2005, floods caused 4,585 deaths and property and crop damage averaging 8.22 billion dollars per year [Ashley and Ashley, 2008 , NOAA 2013].

22

Groundwater Availability
3rd NCA Water Chapter

National Climate Assessment
Georgakakos-Fleming





- Groundwater is the main water supply source for many US regions. [Great Plains, Mississippi Valley, east central US, Great Great Lakes region, Florida, etc.]
- GW provides buffer against droughts.
- GW is susceptible to the combined stresses of climate change (slow to manifest) and water use changes (more immediate impacts).
- Climate change impacts depend on several factors [geology, frequency and intensity of rainfall, seasonal timing of recharge events, GW-SW interactions, etc.]
- Coastal aquifers are vulnerable to inland droughts/floods, increased withdrawals, and SLR.
- GW is poorly monitored; Need for national groundwater monitoring framework.

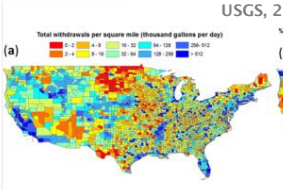
23

Water Use [Withdrawals]
3rd NCA Water Chapter

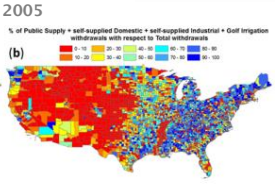
National Climate Assessment
Georgakakos-Fleming

USGS, 2005

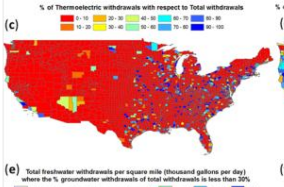
Total/sqmi
1000 g/d



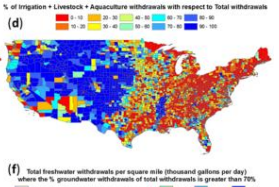
M&I/Total %



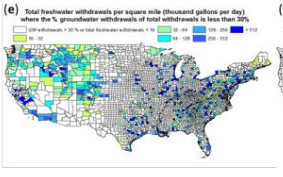
Thermo/Total %



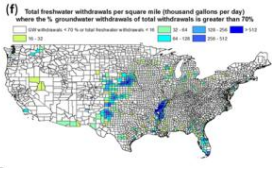
Irr-Liv-Aqu/Total %



Primarily SW



Primarily GW



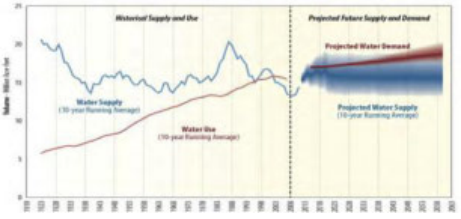
- Largest withdrawals occur in the drier western states for crop irrigation.
- In the east, water withdrawals mainly serve municipal, industrial, and thermoelectric uses.
- Groundwater withdrawals are intense in parts of the SE, SW, NW, GPs, Miss. Valley, FL, GA.

24

Climate Change Impacts on Water Management
3rd NCA Water Chapter

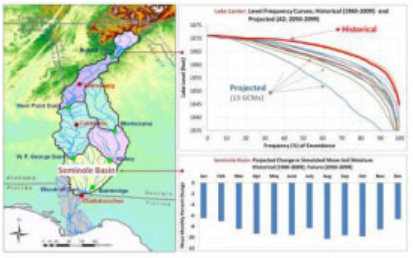
- **Water resources managers will encounter new risks that may not be managed with existing practices** [California, Southwest, Southeast, Northwest, Great Plains, Great Lakes, etc.].

Historical and Projected Water Supply and Demand for the Colorado River Basin



- **Median water demand exceeds supply by 3.2 MAF by 2060.**
  [Colorado River Basin WS&D Study, USBR 2012]

Projected Hydrologic and Water Resources Impacts for the ACF River Basin



- **Runoff has been and is projected to decrease** [Reservoir Mgt/WS/Env Impacts].
- **Soil moisture has been and is projected to decrease, esp. in summer** [Impacts for Ag.]
- **Droughts and floods projected to intensify.**
  [Georgakakos and Zhang, 2011]

- **Increasing resilience and enhancing adaptive capacity provide opportunities to strengthen water resource management and plan for climate impacts.**
- **Effective climate adaptation strategies may include: Conservation programs; more flexible, risk-based, and adaptive operating rules for reservoirs; integrated SW-GW mgt; better monitoring and assessment of statewide water use; better coordination among all relevant stakeholders.**

25

Summary

- Extensive assessment of water cycle and water resource impacts
- Traceable accounts
- Adaptation and Institutional Responses

26

Questions

Thank you

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Presentation developed in collaboration with Aris Georgakakos, Georgia Tech, and NCA/USGCRP staff

Climate Ready Estuaries

Climate Ready Estuaries works with the National Estuary Programs and the coastal management community to:

- assess climate change vulnerabilities;
- develop and implement adaptation strategies;
- engage and educate stakeholders.

CRE shares NEP examples to help other coastal managers, and provides technical guidance and assistance about climate change adaptation.

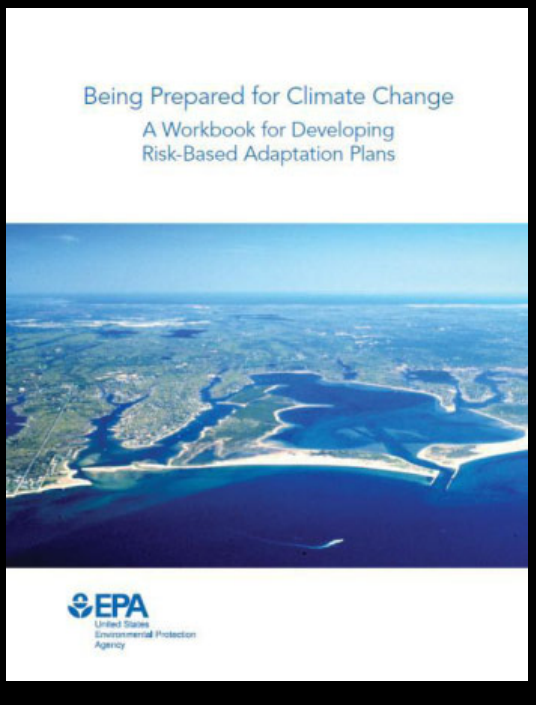
Vulnerability Assessment + Implementing an Action Plan

Climate Change Adaptation

A vulnerability assessment is an understanding of how climate change will affect an organization.

A VA is a ranked description of how climate changes would keep an organization from reaching its goals.

The VA tells you what your biggest risks are. An action plan tells what you will do about the risks.



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Why risk-based plans?

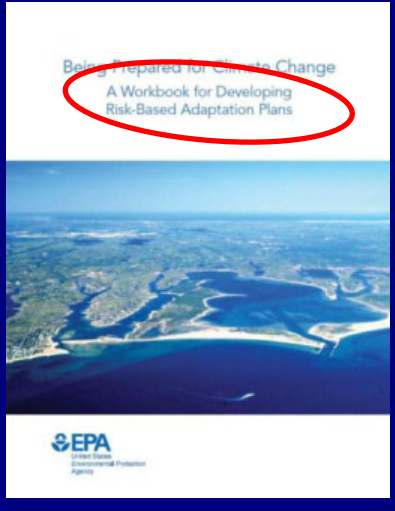
Risk management is about an organization.

Your organization's:

- Goals.
- Context.
- Decisions.

It clarifies your situation.

You get a better plan.



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How do you decide what to do?

100+ discrete risks from climate change.

(unfortunately, $5 \times 6 \times 4 > 100$)

How do you decide what to do if you don't have the resources to do everything you need to do?!

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Vulnerability Assessment

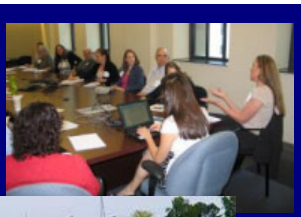
1—Communication and Consultation

2—Establishing the Context for the Vulnerability Assessment

3—Risk Identification

4—Risk Analysis

5—Risk Evaluation: Comparing Risks



Risk evaluation

An example consequence/probability matrix.

Likelihood (probability) of occurrence	Low	Medium	High
High	1. Warmer water may stress immobile biota 2. Warmer water may lead to changes in drinking water treatment processes n. _____	1. Warmer water may hold less dissolved oxygen 2. Sea level rise may cause bulkheads, sea walls and revetments to become more widely adopted n. _____	1. Shoreline erosion from sea level rise may lead to loss of beaches, wetlands and salt marshes 2. Combined sewer overflows may increase from more intense precipitation n. _____
Medium	1. Increased wildfires from warmer summers may lead to soil erosion 2. Warmer winters may lead species that once migrated through to stop and stay n. _____	1. Parasites and bacteria may have greater abundance, survival or transmission due to warmer water 2. Warmer summers may drive greater water demand n. _____	1. More frequent drought may diminish freshwater flow in streams 2. More intense precipitation may cause more flooding n. _____
Low	1. Warmer water may lead open seasons and fish to be misaligned 2. Warmer winters may lead to more freeze/thaw cycles that impact water infrastructure n. _____	1. Warmer water may lead jellyfish to be more common 2. Ocean acidification may cause the recreational shellfish harvest to be lost n. _____	1. Contaminated sites may flood from sea level rise 2. Warmer water may promote invasive species n. _____
	Consequence of impact		

Color key: Green | Yellow | Red

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Action Plan

Step 6—Establishing the Context for the Action Plan

Step 7—Risk Evaluation: Deciding on a Course

Step 8a—Finding Adaptation Actions

Step 8b—Selecting Ad. Actions

Step 9—Preparing and Implementing an Action Plan

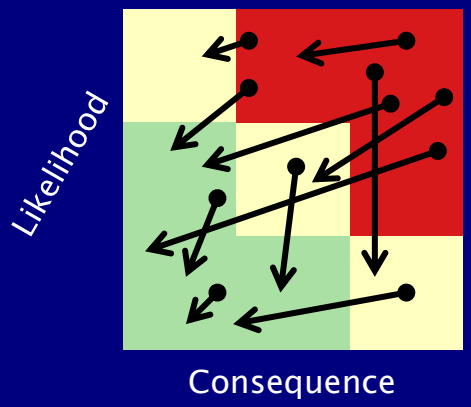
Step 10—Monitoring & Review

Mitigating actions

Risks are mitigated by actions that lower their likelihood or consequence.

When a risk is mitigated it would be re-plotted closer to the lower left.

Your aim is to have no red risks.



A risk-based climate change adaptation plan

Q: How do you decide what to do if you don't have the resources to do everything you need to do?

The vulnerability assessment points toward the biggest risks! The ones that are highly likely to occur and will have high consequences when they do.

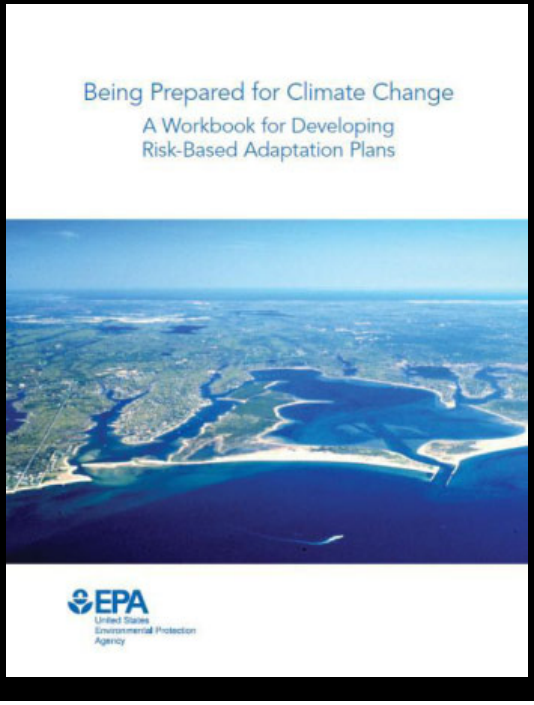
The action plan points to the actions that reduce the most risk and don't have bad side effects.

Is this workbook for you?

- Do you have environmental goals?
- Do you think climate change might affect what you are trying to accomplish?
- Do you have lots of risks in a variety of sectors?
- Do you have partners and stakeholders who should be involved?
- Do you have resource constraints?
- Could you use some decision support?

Then,

Yes!



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Questions?

Assessing the San Juan Bay Estuary Program's Vulnerabilities to Climate Change

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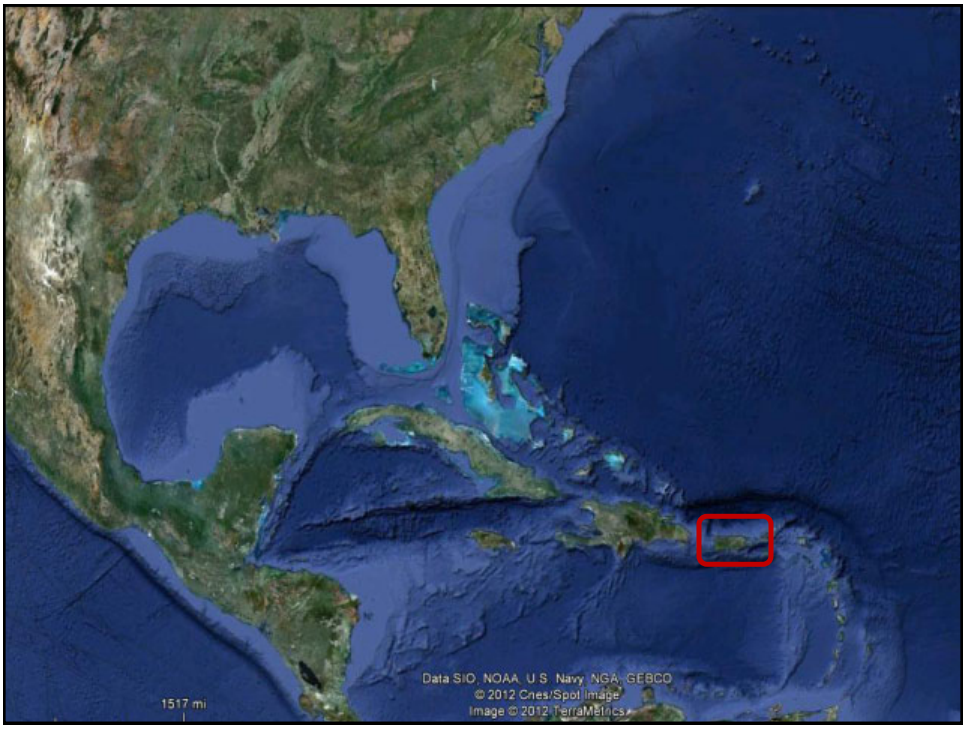
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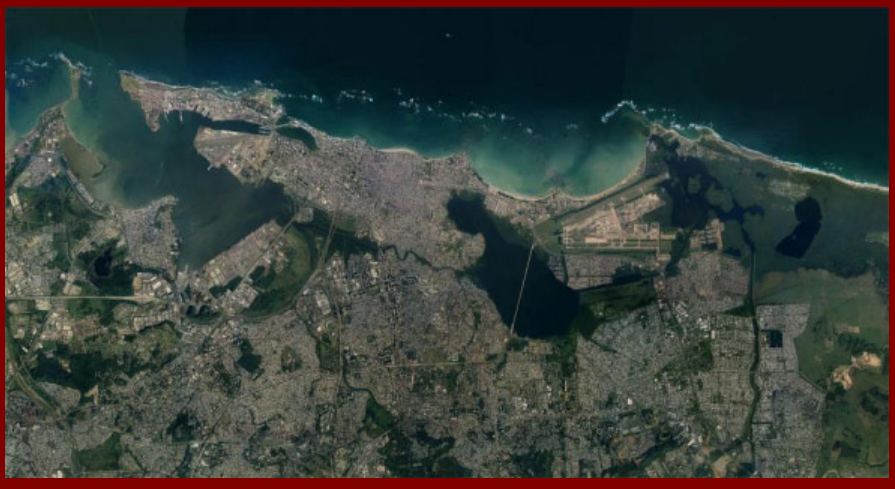

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CANAL SAN ANTONIO
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46

Methods

STEP ONE:

Communication and Consultation

Informing key people about the vulnerability assessment and asking for input

- o September 2012 Technical Stakeholder Workshop
- o Informal meetings about process with staff & stakeholders
- o Met with EPA Office of Water staff and conducted workshop with all programs of the National Estuary Program

47

Methods

STEP ONE:

Communication and Consultation

Stakeholder	Issue/Area of Focus	When should/did they become involved?
Angel Dieppa, Jobos Bay NERR		September workshop
Benito Pinto, La Regata	Recreational/Navigation/Fishing	September workshop
Craig Lilyestrom, DNER	Marine Resources/Fisheries	September workshop
David Cuevas, EPA	Water resources	September workshop
Ernesto Diaz, DNER-PRCZMP	Coastal hazards, development, nonpoint and point sources of pollution, public access	September workshop
Ernesto Olivares, SJBEP	Enforcement	September workshop
Evelyn Huertas, EPA		September workshop
Gustavo Garcia, SJBEP and DNER Assistant to Secretary	Public Policy	September workshop
Jorge Bauza, SJBEP	ALL	September workshop
Jose Rivera, NOAA		September workshop
Jose Seguinot Barbosa	Public health, water quality	September workshop
Julio Morell, CariCOOS	Monitoring, modeling and data management	September workshop
Katia Aviles, Proyecto ENLACE	Environmental justice communities, health, water quality, recreation, fisheries, marine resources	September workshop
Luis Jorge Herrera, IDS		September workshop
Luis Soler, USGS		September workshop
Pablo Mendez, UPR/SJBEP		September workshop
Pedro Diaz, USGS	Monitoring	September workshop
Pedro Gelabert, SJBEP	ALL	September workshop
Pedro Guevara, JCA	Water quality	September workshop
Ray David Rodriguez, Fideicomiso		September workshop
Raimundo Espinosa, TNC		September workshop
Vance Vicente		September workshop
Jorge Ortiz Zayas, UPR-ITES		September workshop
Ernesto Otero, RUM_CIMA		September workshop
Angel Melendez, JCA	Water quality	September workshop
Jose Juan Terrasa, Turismo	Recreation, coastal hazards, marine resources	September workshop

48

Methods

STEP TWO:

Establishing the context for the vulnerability assessment

Identifying organizational goals and objectives that are susceptible to climate change

Goals of the Program (SJBEP 2000):

Establish a comprehensive water quality policy. This policy will ensure the integrity of marine resources and terrestrial ecosystems while supporting human activities in the SJBE system.

Develop an effective administrative and regulatory framework for the SJBE system that will serve as a model for other estuary systems, especially for tropical systems.

Optimize the social, economic, and recreational benefits, which have been associated with the SJBEP system

Prevent further degradation and improve the system's water quality to help ensure healthy terrestrial and aquatic communities and social well-being

Minimize the health risks associated with direct human contact with the surface waters and the consumption of fish and shellfish

49

Methods

STEP TWO:

Establishing the context for the vulnerability assessment

Identifying organizational goals and objectives that are susceptible to climate change

Objectives of the Program:

Identify the major stressors impacting the system and establish their relative importance

Develop action plans to remediate the problems identified in the system

Conserve and enhance the integrity of the known, highly valuable natural resources in the SJBE system, and restore, to the extent possible, those areas which have been adversely impacted

Address the major concerns of the citizens and user groups have regarding the quality of the system

Promote the public's awareness regarding estuarine resources and involvement in the development of an effective management plan for the system

Develop a hydrological model of the system to determine effective alternatives to improve circulation and predict hydrological impacts of future development

50

Methods

STEP TWO:
Establishing the context for the vulnerability assessment

Organization's Goals & Objectives	Does it correspond with one of the clean water themes? (Y/N)
GOAL 1: Water and Sediment Quality/Aquatic Debris (new actions: solid waste management and green infrastructure) • Eliminate direct and indirect sewage discharges to the various canals and lagoons of the SJBE to reduce nutrient and pathogen loadings and increasing human uses of estuarine waters • Improve water circulation in the SJBE to enhance its flushing capacity resulting in an improvement of its waters and sediments • Reduce nutrient and toxics loadings from nonpoint sources which result in an impairment of the estuary's habitats and uses • Avoid the detrimental effects of oil and other contaminants on water and sediment quality, habitats, estuarine species and socioeconomic activities • Reduce levels of oil and grease, nutrients, sediments, toxics and other pollutants in municipal storm sewer point source discharges which result in the degradation of estuary habitats and uses • Significantly reduce the amount of aquatic debris that reaches all estuarine waters • Develop, promote, and implement voluntary compliance and pollution prevention initiatives • Strengthen the enforcement of littering laws and regulations • NEW: Establish pilot projects of contaminant prevention in freshwater tributaries of the San Juan Bay Estuary • NEW: Promote use of green infrastructure in San Juan Bay estuary watershed.	YES
GOAL 2: Habitat, Fish and Wildlife • Preserve and restore ecologically important habitat • Protect species relative abundance and diversity • Enhance economically viable fisheries resources and ensure their sustainability	YES
GOAL 3: Public Engagement and Involvement (new actions: education and community participation and social communication) • Increase the public's awareness of the estuary's functions and values	NO

51

Methods

STEP THREE:
Risk Identification

Example:

POLLUTION CONTROL: Water and Sediment Quality/Aquatic Debris (new actions: solid waste management and green infrastructure)

POLLUTION CONTROL:
Water and Sediment Quality/Aquatic Debris (new actions: solid waste management and green infrastructure)

	WARMER	WARMER "WINTERS"	WARMER "SUMMERS"	WARMER WATER	MORE FREQUENT DROUGHT	MORE INTENSE PRECIPITATION	SEA LEVEL RISE	INCREASED CARBON DIOXIDE/OCEAN ACIDIFICATION
NON-POINT SOURCES OF POLLUTION (NPS)				*Higher solubility may lead to higher concentration of pollutants already existing in lagoon or newly entering lagoon(EPA, PRCCC)*	*NPS pollution may rise from the buildup of pollutants on land, followed by high intensity flushes (EPA)*	*Streams may see greater erosion (EPA)*	*Tides may reach higher and flood new areas (EPA; PRCCC)*	*Decomposing organic matter release CO_2 which may exacerbate the ocean acidification problem in coastal waters with increasing NPS pollution from increasing precipitation (EPA). Coastal ocean acidification can occur when excess CO_2 is absorbed by, flushed into, or generated in coastal waters setting off a chain of chemical reactions that lowers the waters pH (Woods Hole Oceanographic Institute)*
				Increased toxicity of	*Decreased*	*Urban areas may*		

52

Methods

STEP THREE:
Risk Identification

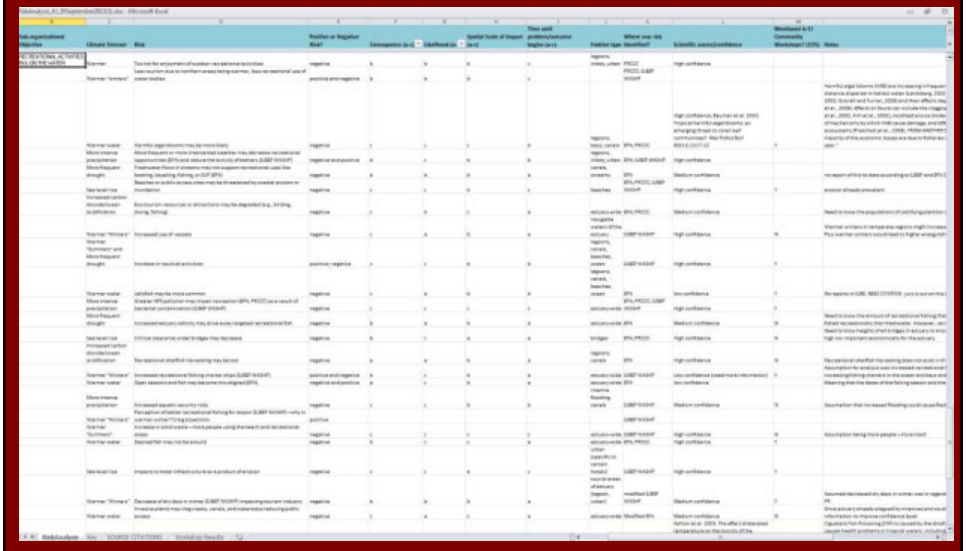
During risk identification process we also conducted community workshops.

53

54

Methods

STEP FOUR:
Risk Analysis
Developing an initial characterization of consequence and likelihood for each risk



55

Methods

STEP FOUR:
Risk Analysis

56

Methods

STEP FOUR:
Risk Analysis

Warmer water	Habitat type: Lagoons, bays, canals	EPA and PRCCC Identified Risk
Harmful algal blooms may be more likely	B: Will begin to occur within 15-30 years	Scientific source/confidence: High confidence; Bauman et al. 2010.
Negative	C: High Spatial Scale of Impact	Yes, it was mentioned in the workshops
C: High Consequence	C: High Likelihood	Notes

57

Water Quality of the San Juan Bay

Higher water temperaturas could result in increased algal blooms in the bay and lagoons

58

59

Methods

STEP FIVE:
Evaluation/Comparing Risks
Using a consequence/probability matrix to reach consensus about each risk

RECREATIONAL ACTIVITIES IN AND ON THE WATER

Likelihood (probability) of Occurrence	Low Consequence of Impact	Medium Consequence of Impact	High Consequence of Impact
High	1. Open seasons and fish may become misaligned (place ore region; decades)	2. Increased occurrence of Ciguatera fish poisoning (extensive; already occurring or soon to occur) 3. Desired fish may not be around (extensive; decades) 4. More frequent or more intense bad weather may decrease recreational opportunities and reduce the activity of bathers (place or region; within the next 15-30 years) 5. Increased recreational fishing charter ships (place or region; decades) 6. Critical clearance under bridges may decrease (site; decades)	1. Increase in solid waste – more people using the beach and recreational activities (extensive; already occurring) 2. Greater NPS pollution may impair recreation as a result of bacterial contamination (extensive; already occurring) 3. Beaches or public access sites may be threatened by coastal erosion or inundation (place or region; already occurring) 4. Impacts to hotel infrastructure as a product of erosion (site; already occurring) 5. Increased aquatic security risks (place or region; within the next 15-30 years) 6. Harmful algal blooms may be more likely (extensive; within the next 15-30 years) 7. Increase in nautical activities (place or region; within the next 15-30 years)
Medium		1. Decrease of dry days in winter impacting tourism industry (place or region; within the next 15-30 years) 2. Freshwater flows in streams may not support recreational uses like boating, kayaking, fishing or stand-up paddleboarding (SUP) (place or region; decades) 3. Less tourism due to northern areas being warmer, less recreational use of water bodies (place or region; already occurring or soon to occur) 4. Too hot for enjoyment of outdoor recreational activities (place or region; already occurring or soon to occur)	1. Eco-tourism resources or attractions may be degraded (e.g., birding, diving, fishing) (extensive; decades)
Low	1. Recreational shellfish harvesting may be lost (place or region; decades)	2. Increased estuary salinity may drive away targeted recreational fish (place or region; decades)	1. Invasive plants may clog creeks, canals and waterways reducing public access (extensive; decades) 2. Jellyfish may be more common (place or region; within the next 15-30 years) 3. Increased use of vessels (place or region; decades)

60

Modifications/Lessons

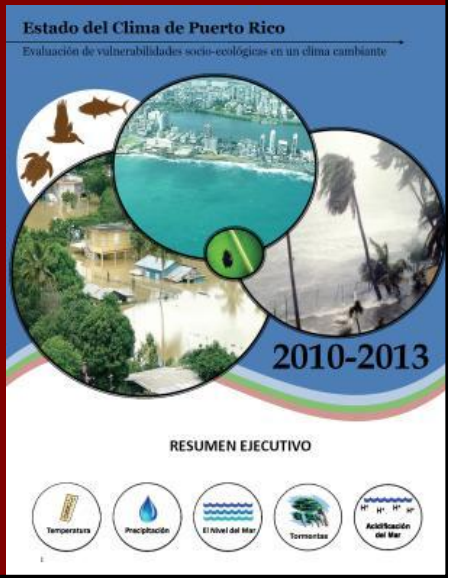
- **Strong emphasis on engaging the environmental justice communities that live and work around the estuary**

61

Modifications/Lessons

- Utilization of previously conducted state or regional vulnerability assessments

CONSEJO DE CAMBIOS CLIMÁTICOS
CLIMATE CHANGE COUNCIL
PUERTO RICO



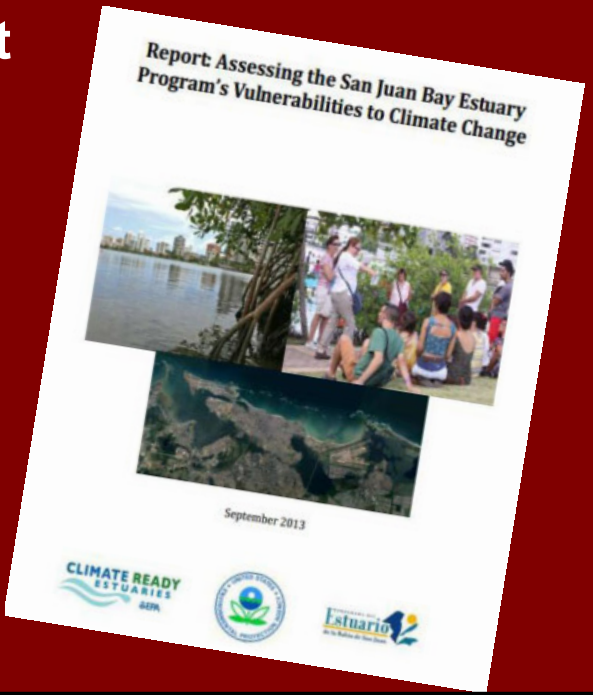
62

Modifications/Lessons

- **Additions to Risk Analysis Spreadsheet:**
  - Where was risk identified?
  - *Scientific* source/confidence
  - Mentioned in Workshops?
  - Notes

63

Final Report



64

¡Gracias!

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66

Next Watershed Academy Webcast: December 2014

More Details to Come!

www.epa.gov/watershedwebcasts

67

Participation Certificate

If you would like to obtain participation certificates **type the link below into your web browser:**

http://water.epa.gov/learn/training/wacademy/upload/2014-10-29-certificate.pdf

You can type each of the attendees names into the PDF and print the certificates.

68

Questions

69