Preparing for Climate Change with a Risk-Based Approach: Lessons Learned

RAE-TCS Summit
New Orleans
December 13, 2016
10:30–12:00

Michael Craghan, US EPA
Lexie Bell, Morro Bay National Estuary Program (Calif.)
Curtis Bohlen, Casco Bay Estuary Partnership (Maine)
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A Risk-Based Approach to Preparing for Climate Change

Michael Craghan

CLIMATE READY ESTUARIES

EPA

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100+ discrete risks
from climate change.

(unfortunately, **5 × 6 × 4 > 100**)

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

What is a risk based approach? *or* What is risk management?

Risk = the possibility that a given [climate change] stressor will affect your ability to meet your goals

Risk management

- looking at stressors for consequences, likelihoods, and effects on goals
- figuring out which are the biggest potential problems
- deciding the best way to deal with those risks so you can still be successful

Why risk-based plans?

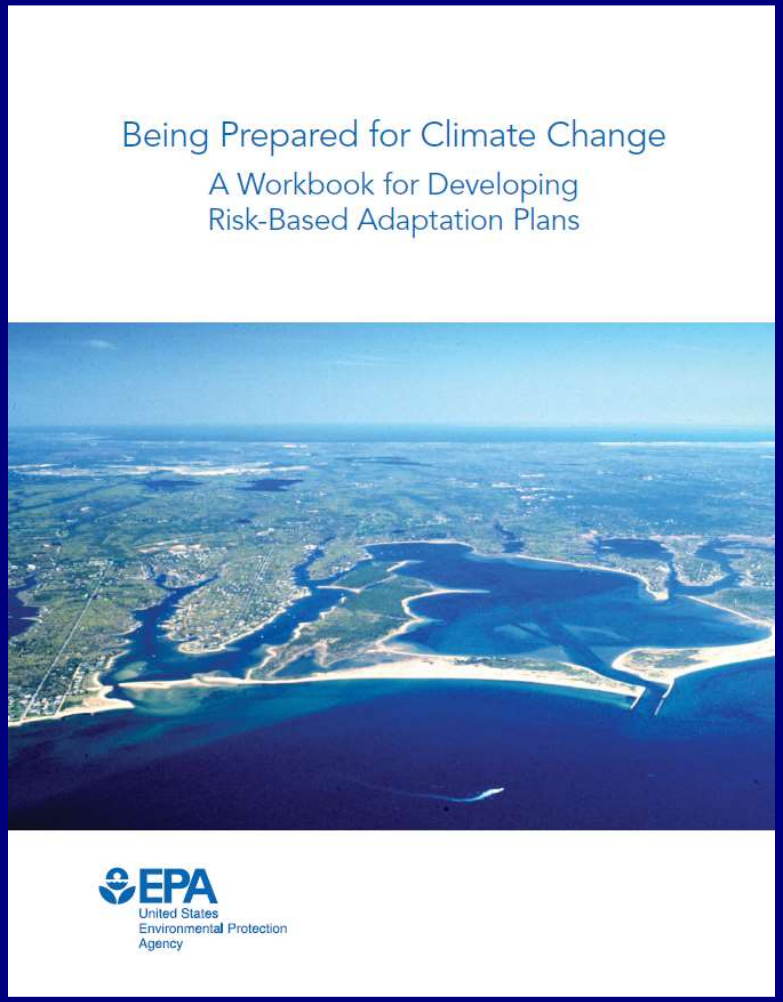
Risk management is about an organization.

Your organization's:

- Goals.
- Context.
- Decisions.

It clarifies your situation.

You get a better plan.



Vulnerability Assessment

1—Communication and Consultation

2—Establishing the Context for the Vulnerability Assessment

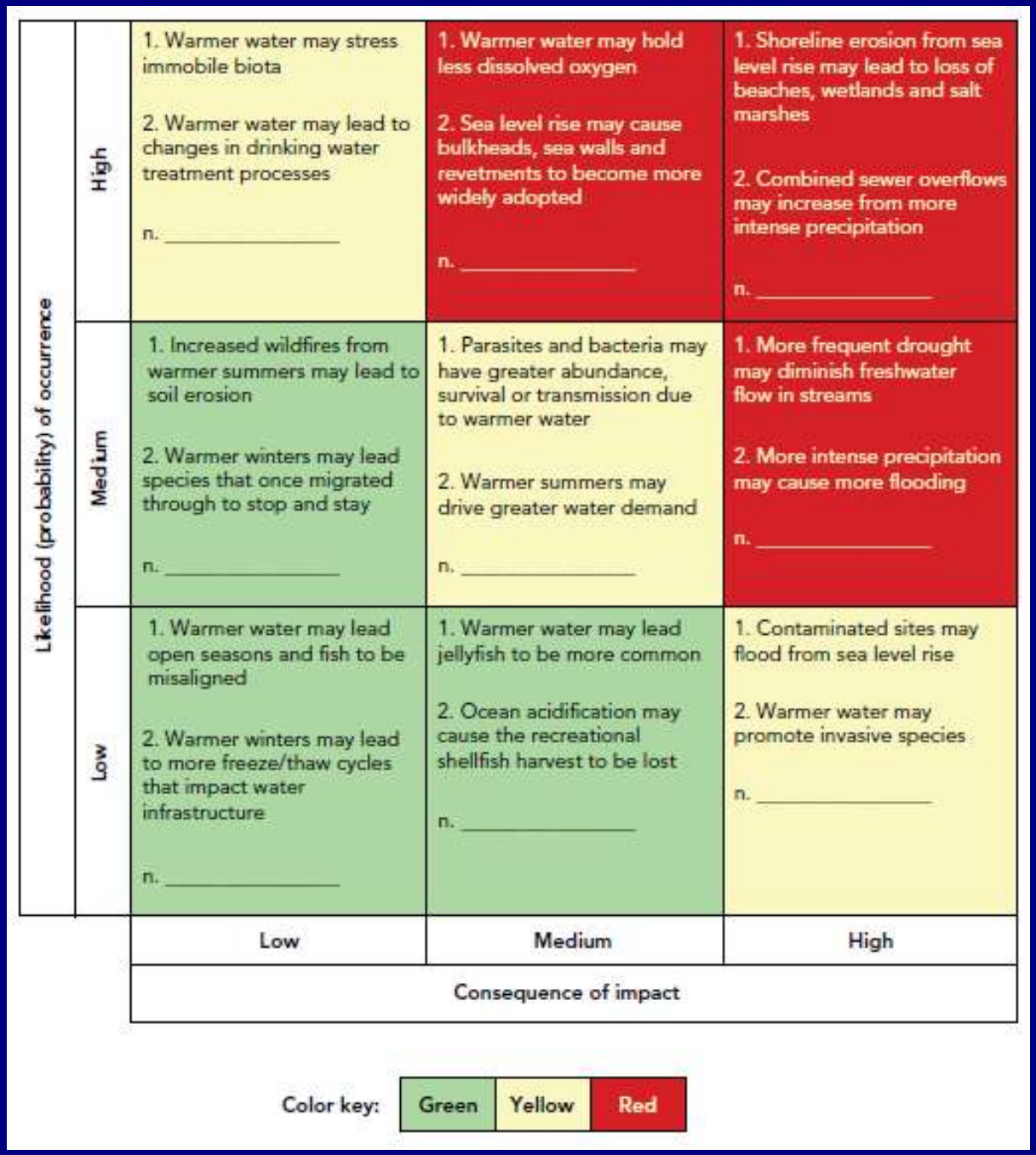
3—Risk Identification

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

Prioritizing in an adaptation plan

Using a risk-based vulnerability assessment actually gives you a basis for prioritizing.

Before this workbook, climate change planners never had good guidance on how to prioritize!

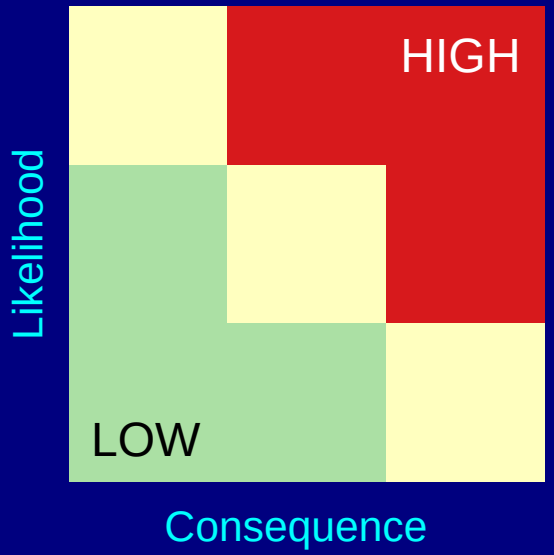
The leading guides to climate change adaptation said to just get started on something, or just decide what you want to do, or go after low hanging fruit, or choose robust projects, or look for projects with co-benefits, etc.

Work on the biggest risks

The CRE Workbook advises that you should not choose to work on *any* good thing.

In your VA you identified a set of risks which are highly likely to occur and will derail you if they do.

You can't ignore high risks.
You must adapt to them.



Do not prioritize interesting low-impact risks.

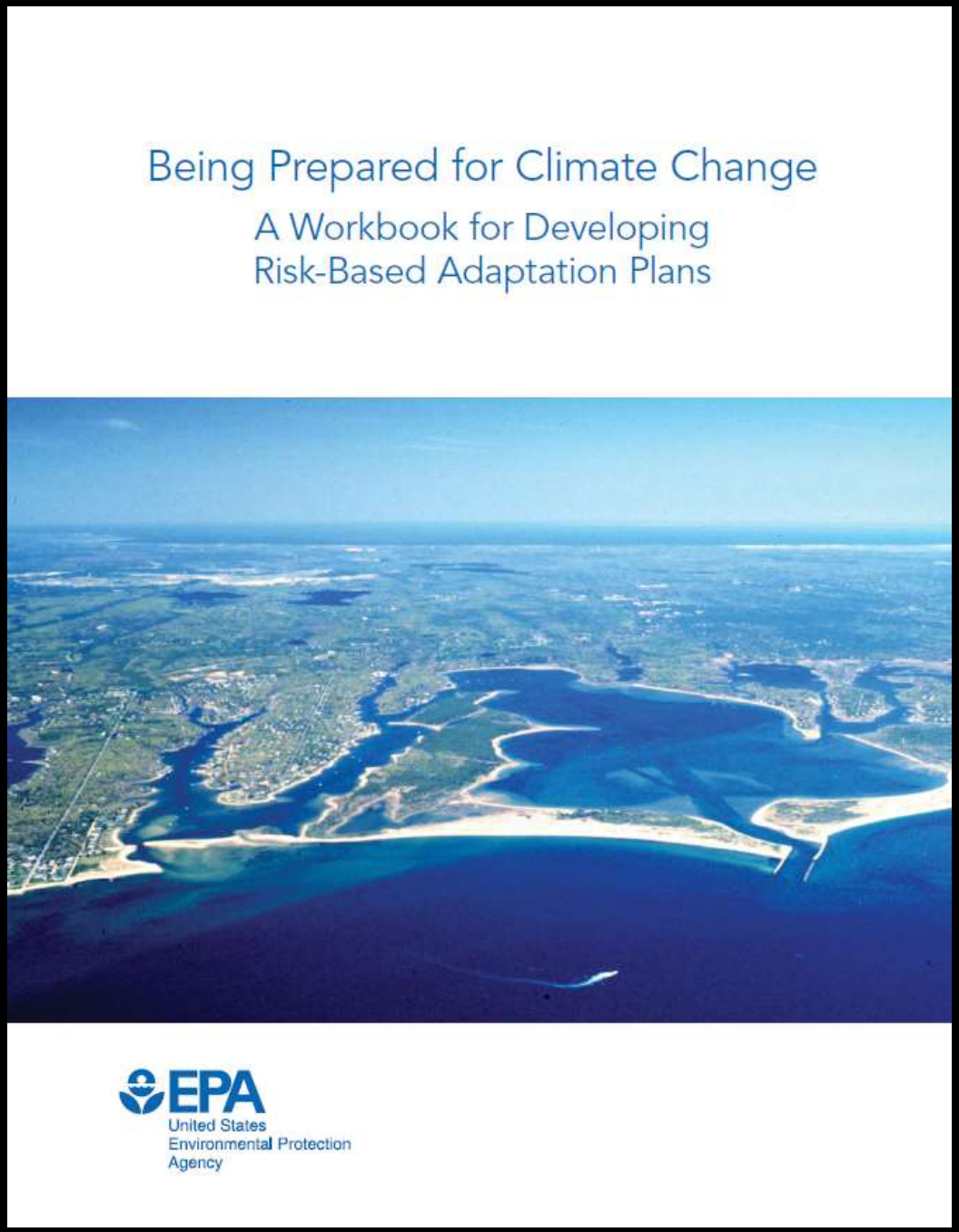
Pay attention to the risks that matter *!!!*

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.



CRE risk page:

https://www.epa.gov/cre/risk-based-adaptation

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