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Successful Adaptation to Climate Change

Geographic, Temporal & Process Dimensions

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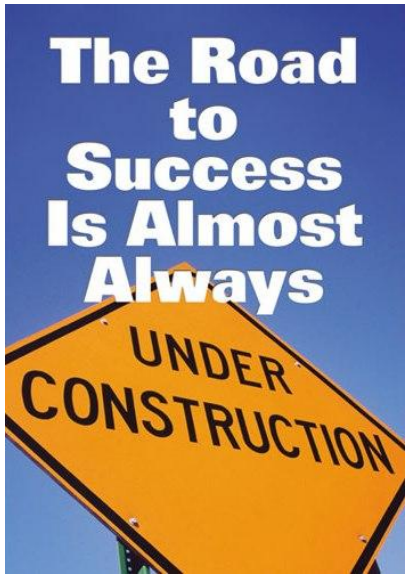
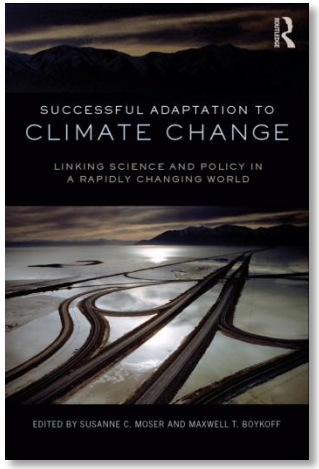
and
Stanford University

Outline



- Why Care about the Coasts in Tucson?
  Spoiler alert: Geography wins this one!
- Prompting the Imagination
  What does successful adaptation look like?
- Adaptation to Coastal Climate Change
  Success in the context of guaranteed loss
- Framework: Key Dimensions of Success
  Six necessary, but (by themselves) insufficient components
- What Role for Science?
  How science can assist decision-makers and publics

Thank you!



- For input and feedback from Max Boykoff (University of Colorado-Boulder)
- For book contributors
- For project partners, participants and funders of the "Successful Coastal Adaptation on the US West Coast" project

Sea Grant Washington Oregon California University of Southern California

STANFORD UNIVERSITY

CENTER FOR OCEAN SOLUTIONS

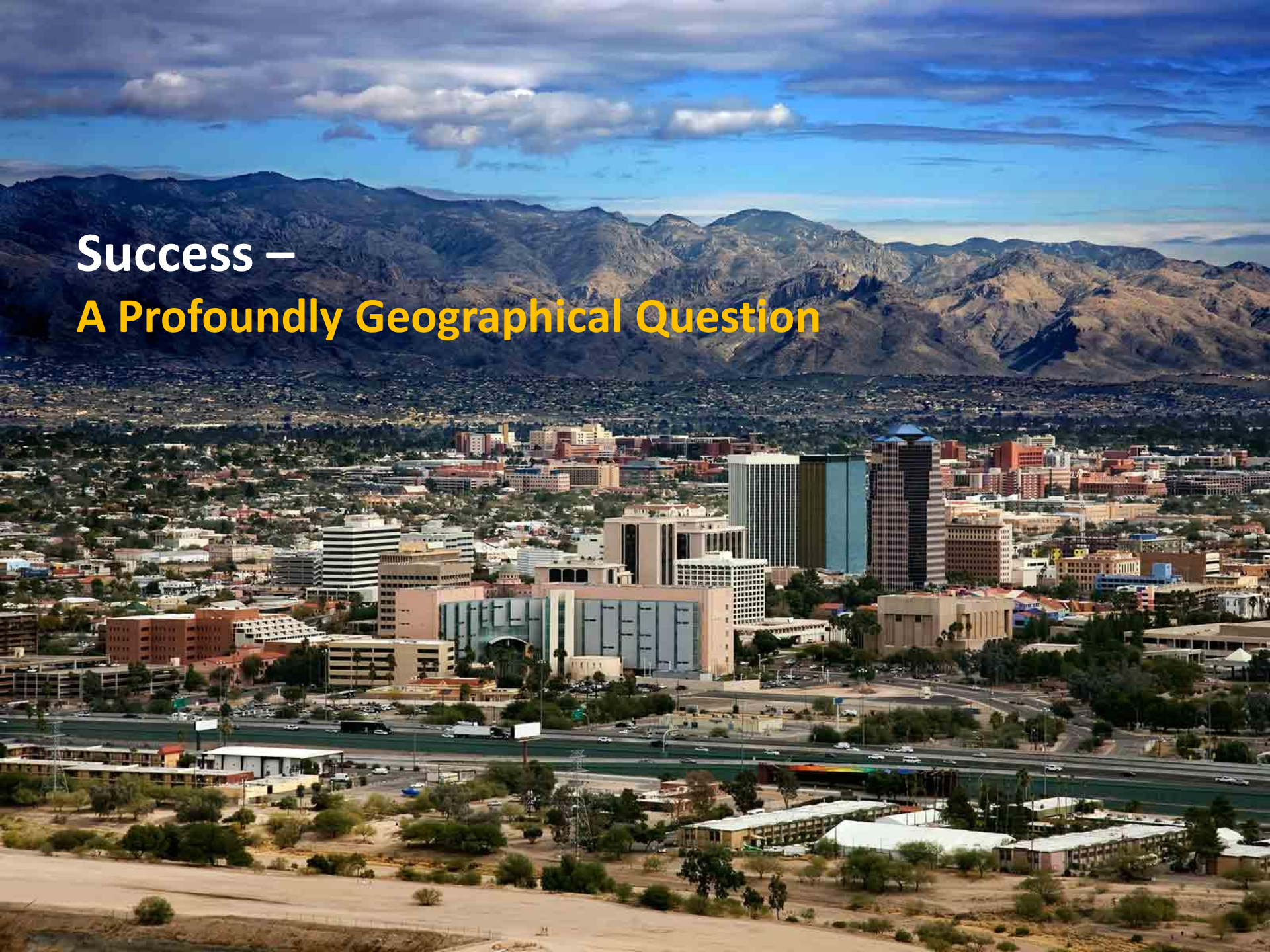
OSU Oregon State University

Institute for Sustainable Communities — what's possible

Gordon and Betty Moore Foundation — Creating positive outcomes for future generations

College of the Environment, University of Washington

Climate Impacts Group


Success –
A Profoundly Geographical Question

Adaptation Is NEVER Just Local

- Adaptation is nested within and linked to far away sources of risk, vulnerability, adaptive capacity and resilience
- Links are unavoidable in a federated system and a globalized world
- Links are sometime helpful and necessary, sometimes unfavorable
- Links across scale affect local chances at successful adaptation and sustainability

(Source: Moser and Finzi Hart, *Climatic Change* (2015)

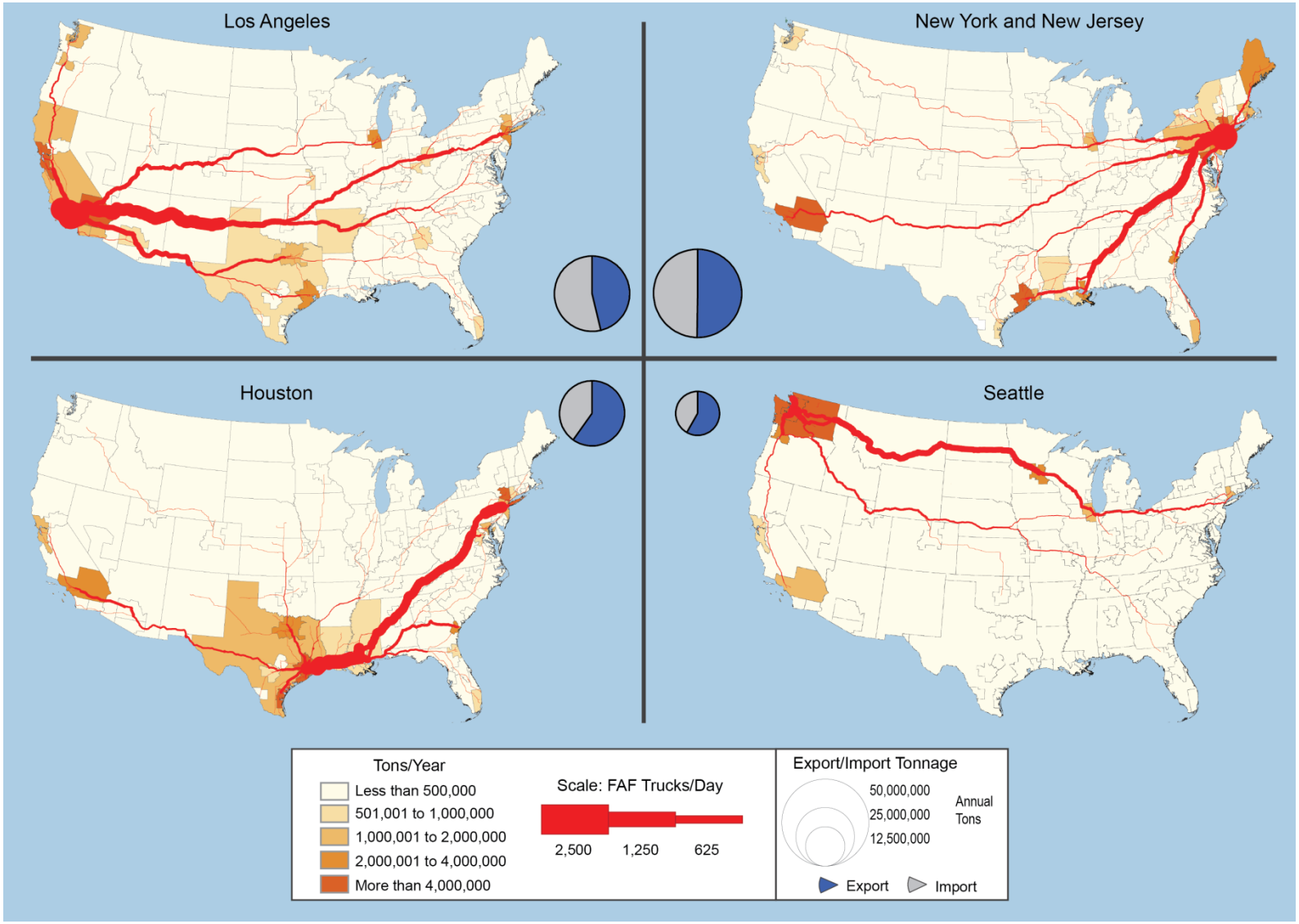
Third National Climate Assessment

Coastal Impacts Cause Far-Reaching Economic Disruptions



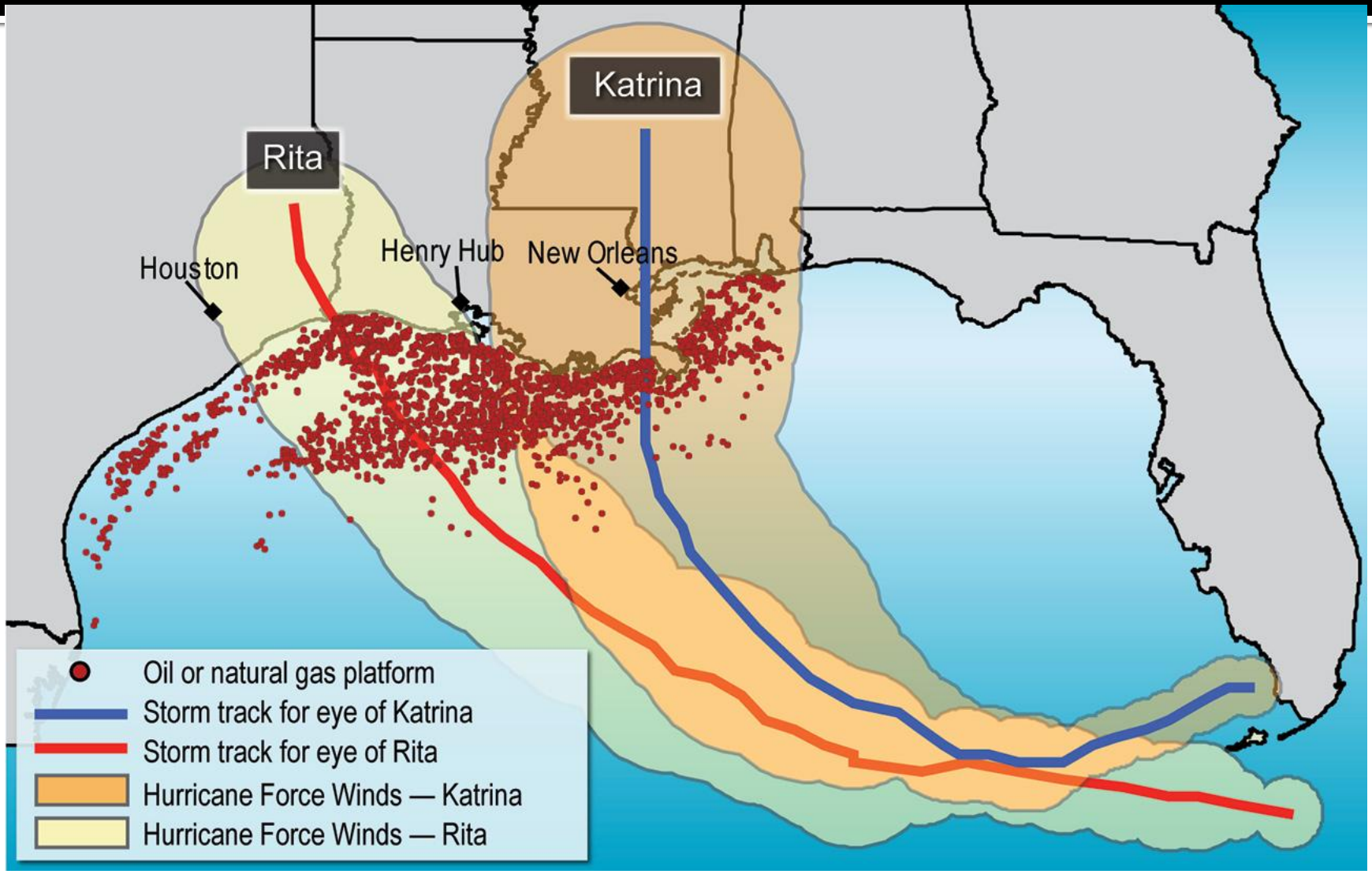

MADE IN CHINA
FABRIQUE EN CHINE

Coast-to-Inland Economic Connections



Graphic developed by FHWA; Source: Moser et al., 2014, NCA

Paths of Hurricanes Katrina and Rita Relative to Oil and Gas Production Facilities



Graphic source: Government Accountability Office 2006

Coastal lifelines at risk

Sea-Level Rise – Not Just in 100 Years from Now!

Impacts Are Already Widespread

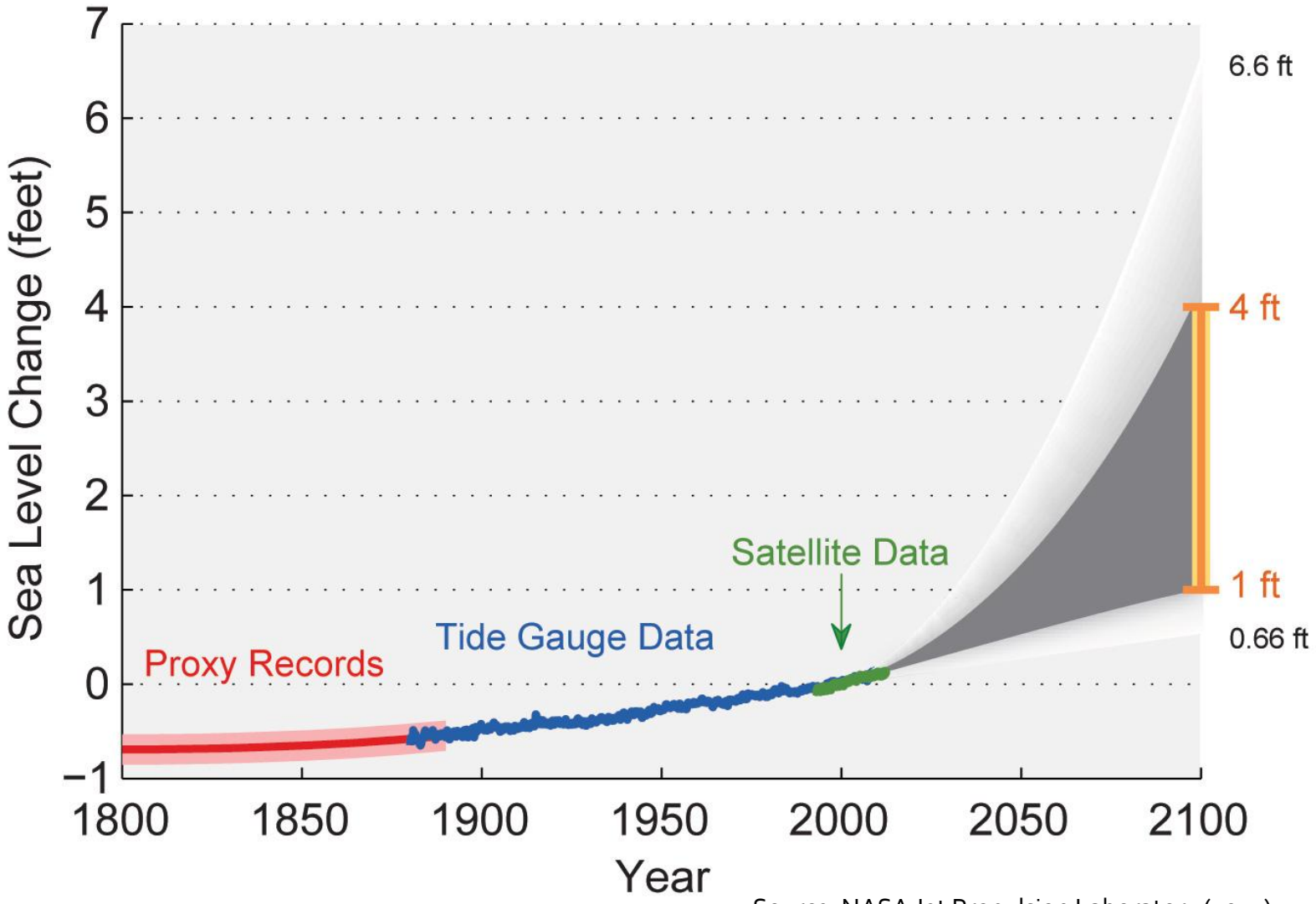
Charleston, SC

Olympia, WA

Annapolis, MD

(Photos: (left) NOAA Coastal Services Center; (center) Ray Garrido, January 6, 2010, reprinted with permission by the Washington Department of Ecology; (right) NOAA (2014))

Past and Projected Changes in Global Sea Level



Source: NASA Jet Propulsion Laboratory (2012)

Prompting the Imagination

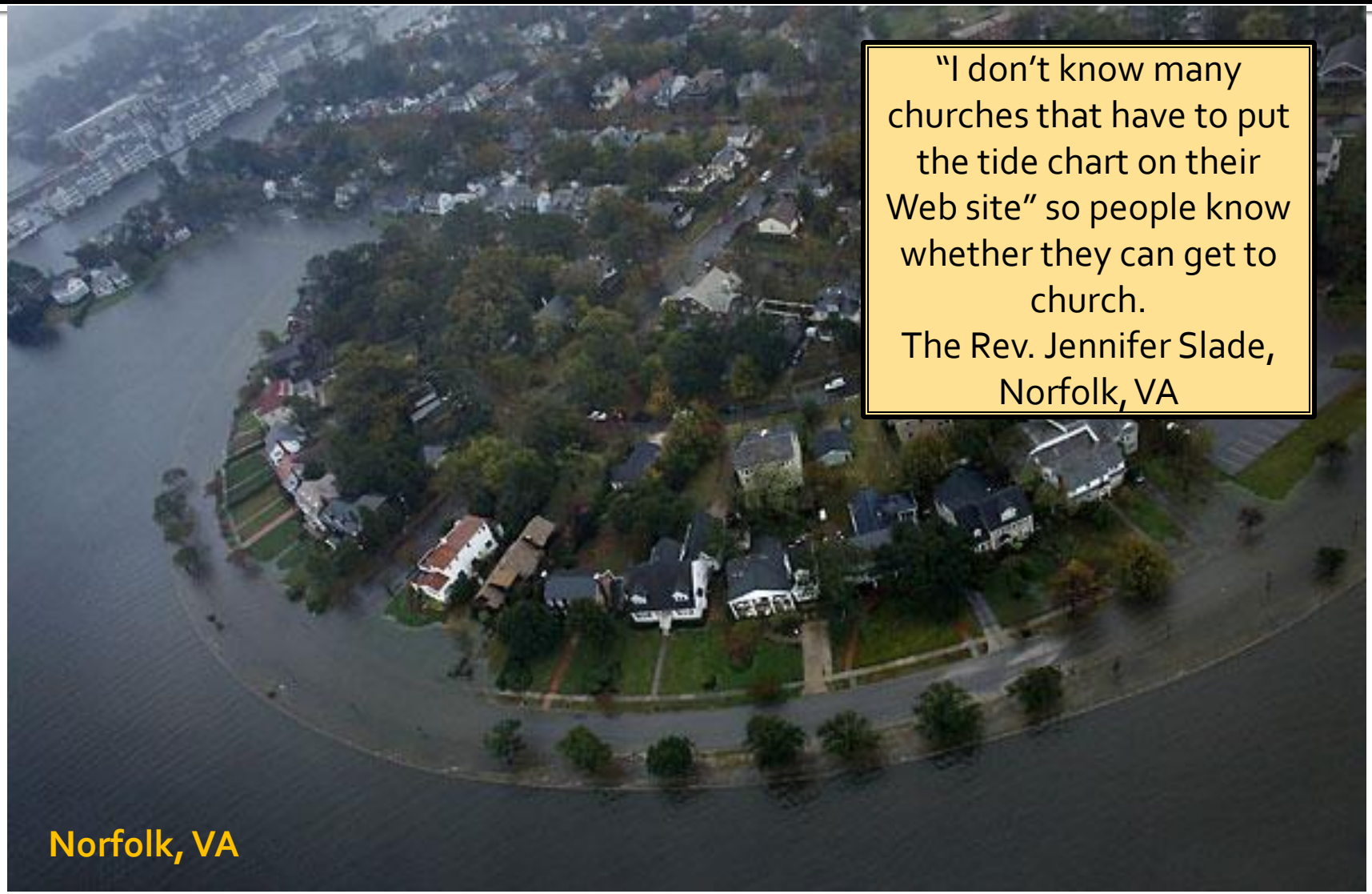
What Does Successful Adaptation Look like?

Photo: National Geographic

What Does Success Look Like?

Photos (L,R): leroyspinkfist.blogspot.com; nydailynews.com

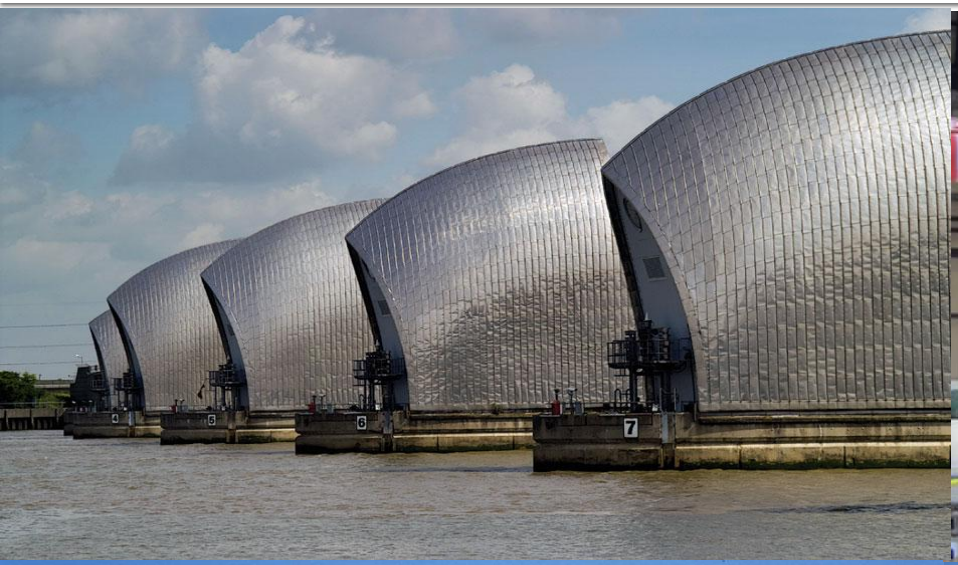
What Does Success Look Like?



What Does Success Look Like?

Photos (L,R): Andy Arms, Wikimedia Commons; CSUMB

What Does Success Look Like?



Photos (TL > BR: nature.com; nytimes.com; usbr.gov; inhabitat.com

What Does Success Look Like?

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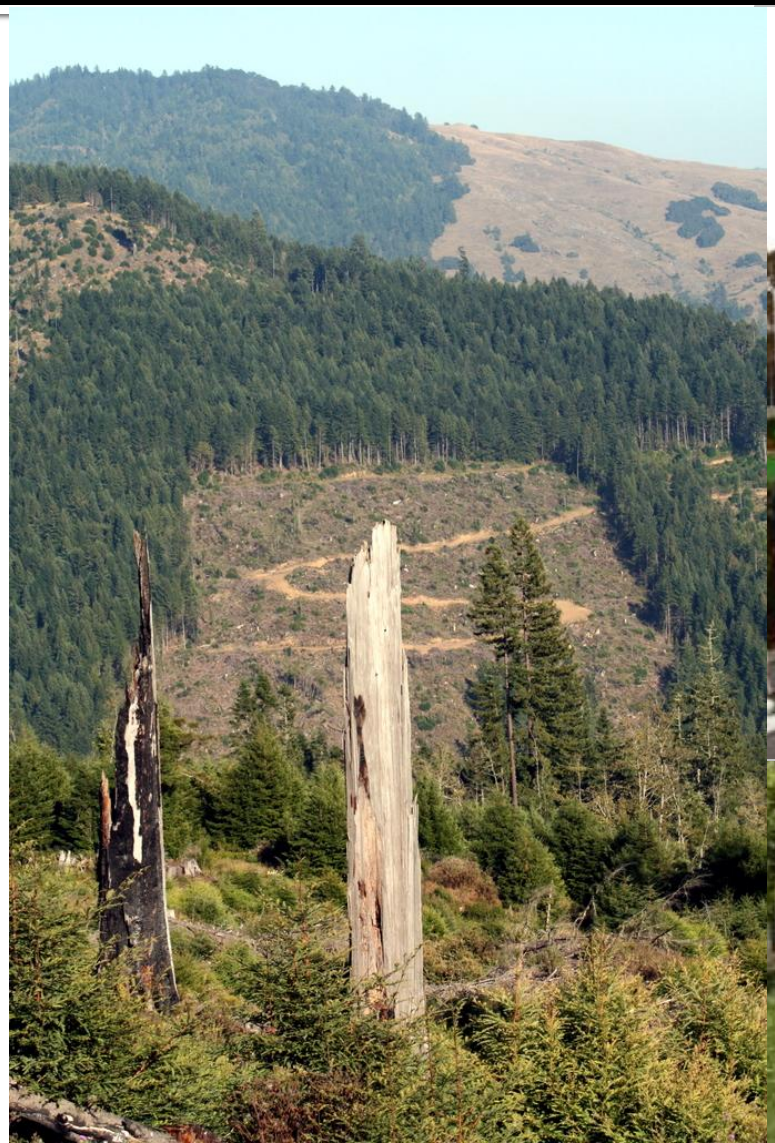

What Does Success Look Like?

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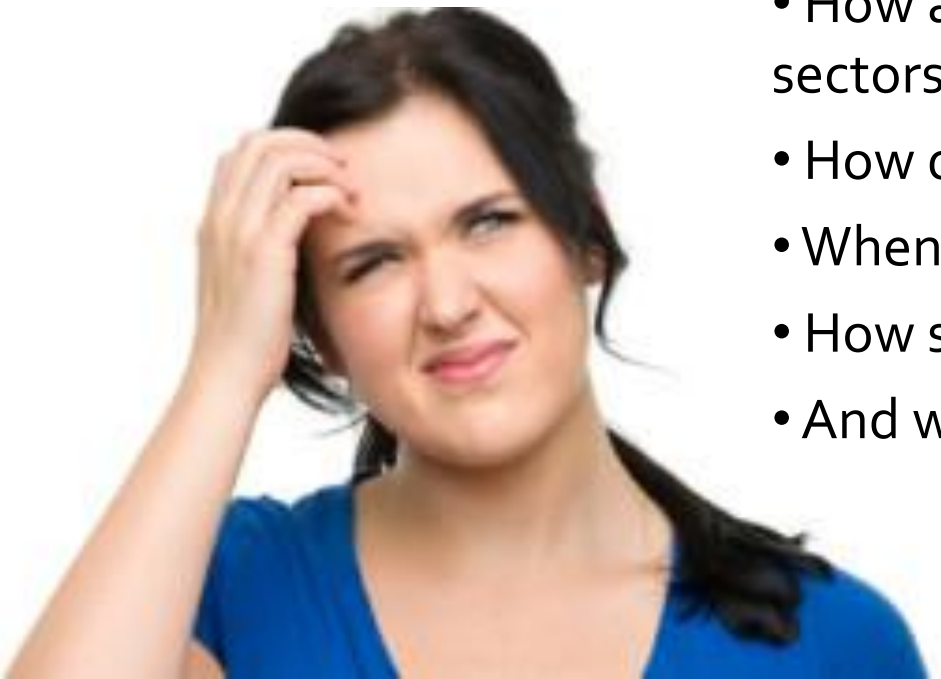
What Does Success Look Like?

Some of the Questions This Raises



- How much can science help here or is it all subjective and political?
- What is the right scale at which to consider success?
- How and how much do we integrate across sectors, policies and programs, and scales?
- How do we address trade-offs?
- When should we declare success (or not)?
- How should we measure success?
- And who gets to say?

5 Reasons to Think About Adaptation Success

1. **Communication and Public Engagement**
   - Communicating hope and desirable goal to work towards
   - Defining a common vision among diverse stakeholders

Why Think About Adaptation Success?

2. **Deliberate planning and decision-making**
   - Setting clear goals, aligning means and ends (internal consistency)
   - Best fit with other policy goals (external consistency)

Why Think About Adaptation Success?

3. Justification of adaptation expenditures

Why Think About Adaptation Success?

4. **Accountability and good governance**

Why Think About Adaptation Success?

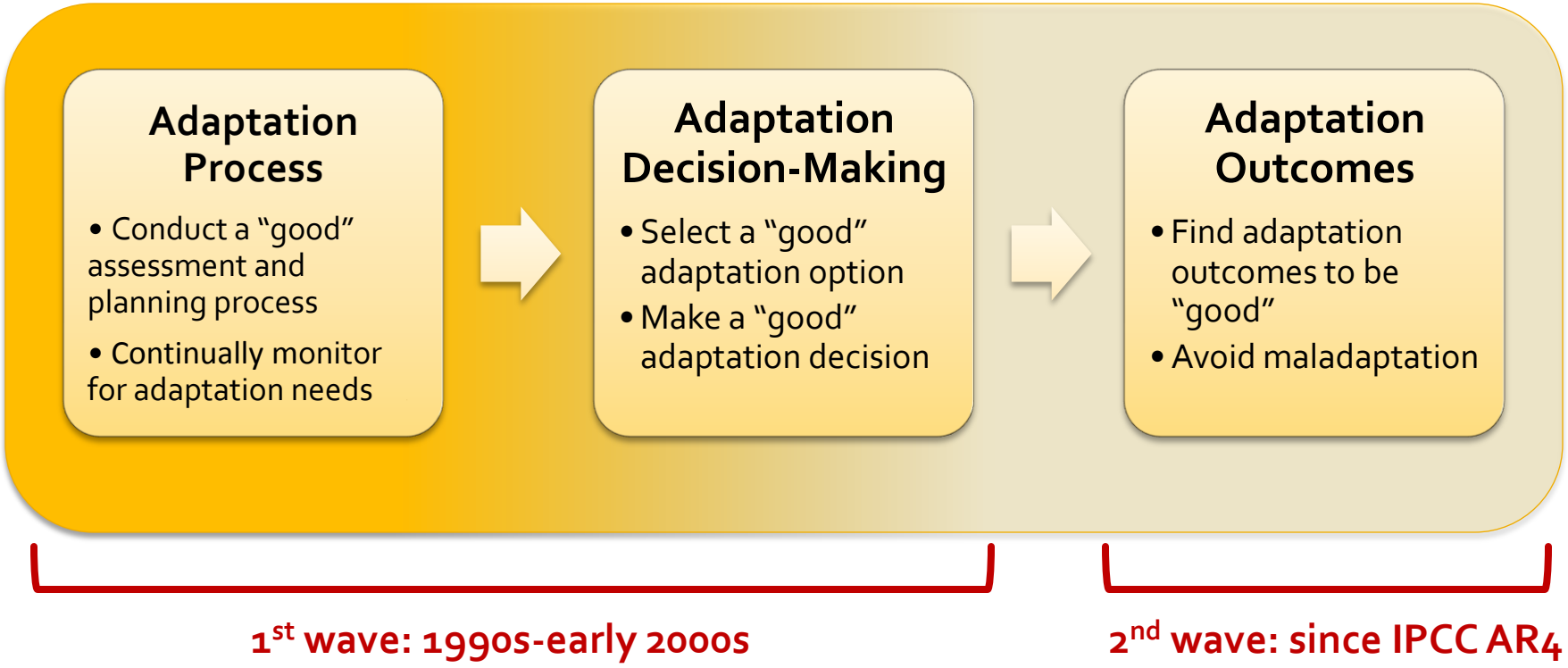
5. **Support for learning and adaptive management**

Source: SCIRO

Toward a General Framework of Success

Dimensions of Adaptation Success

Review of the scientific literature



Why Things Aren't So Simple

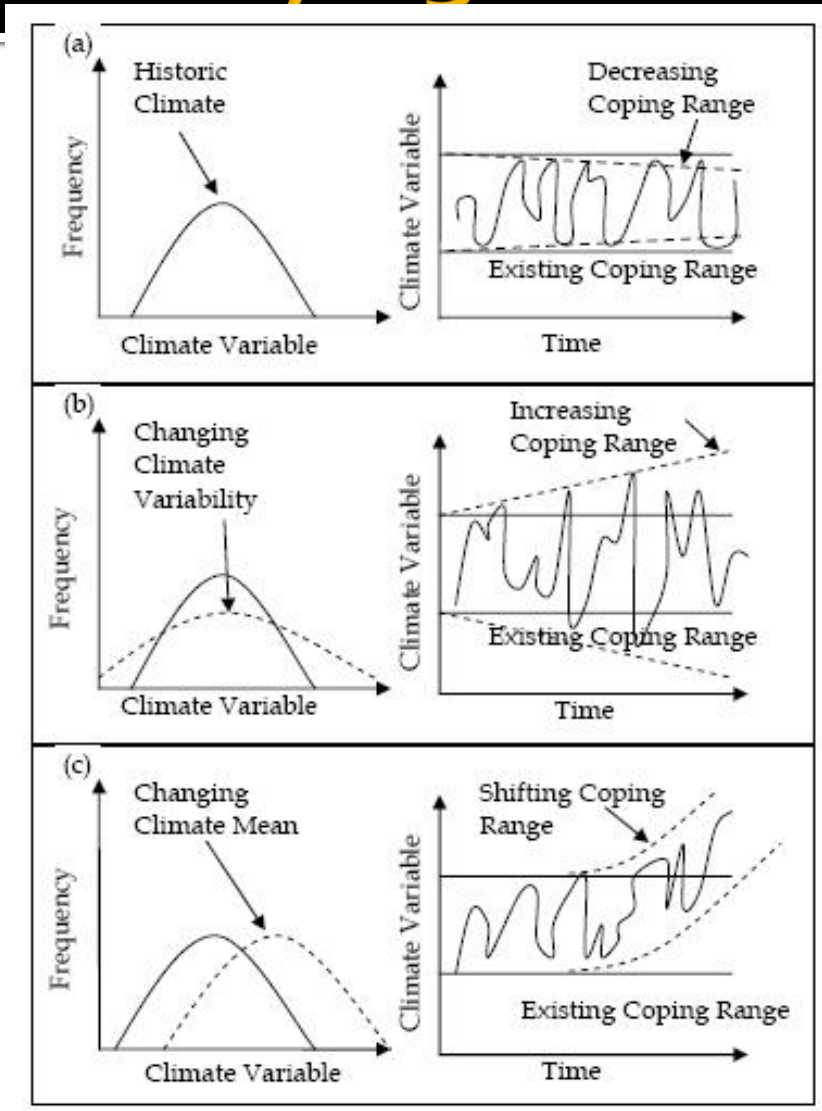
- **Meaning of adaptation – What to aim for, who to involve, which trade-offs**
  - **"Structural interpretation"** (keep what we've got)
  - **"Vulnerability interpretation"** (create a better world for all)
  - **"Resilience interpretation"** (social-ecological systems thrive the long-term)

(Based on Eakin et al., 2009; Pelling 2010)

Why Things Aren't So Simple (cont.)

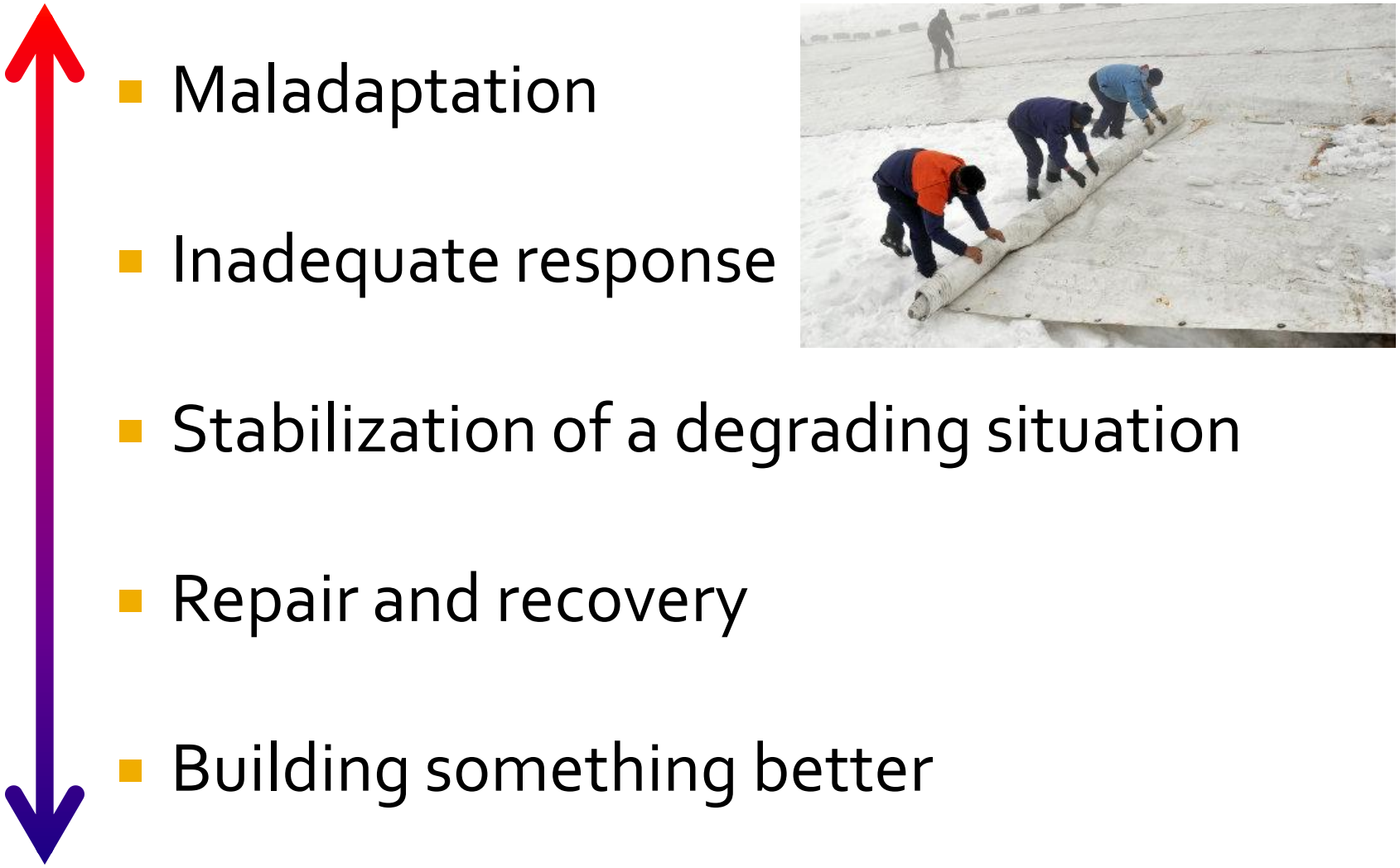
- **Adaptation effectiveness?**
  - Pragmatic challenges
    - Few projects set clear goals, establish baseline
    - Few projects are far enough along to be assessed
    - Few projects include monitoring and evaluation components
  - Common evaluation challenges
    - Timing of assessment of effectiveness
    - Establishing causality between actions > outcomes
    - Inevitable normative aspects of evaluation

Successful Adaptation: Staying within the Coping Range



Source: Moser & Luers (2008)

Failure-to-Success Continuum

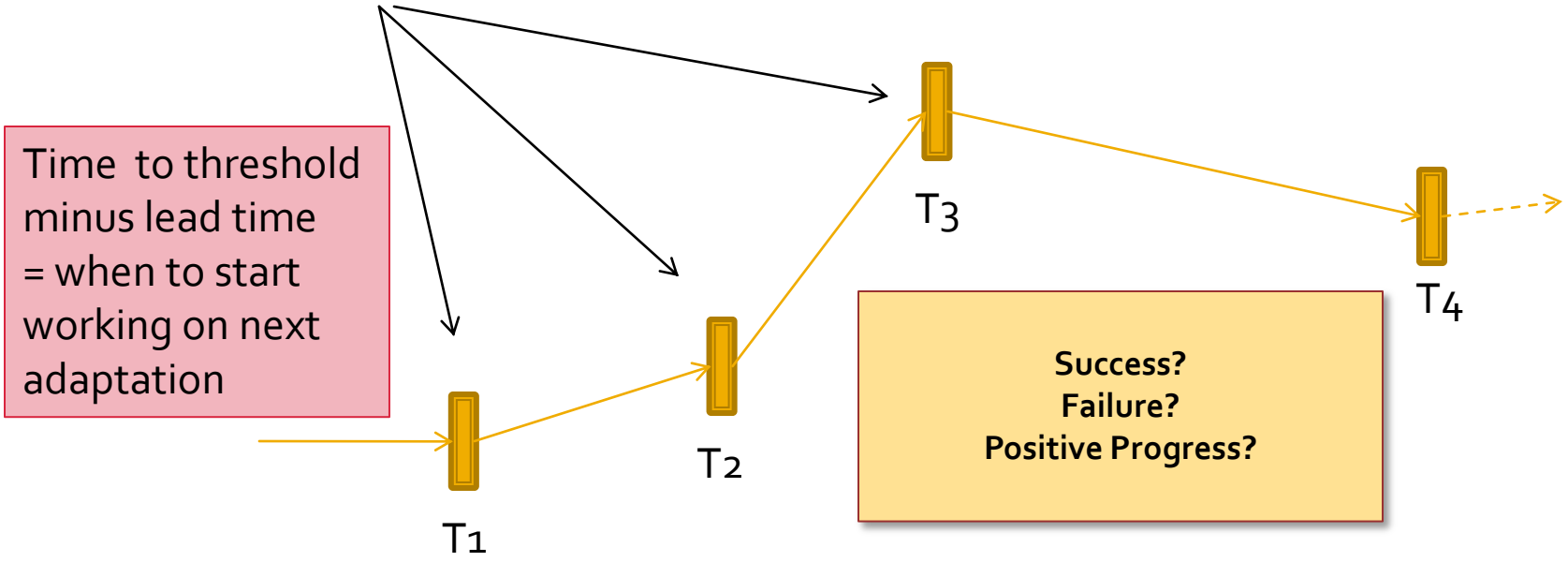


- Maladaptation
- Inadequate response
- Stabilization of a degrading situation
- Repair and recovery
- Building something better

Source: Expanding on Kasperson et al. (1995)

From Adaptation Actions to Adaptation Pathways

Threshold = indicator (or set of indicators) that suggests course correction

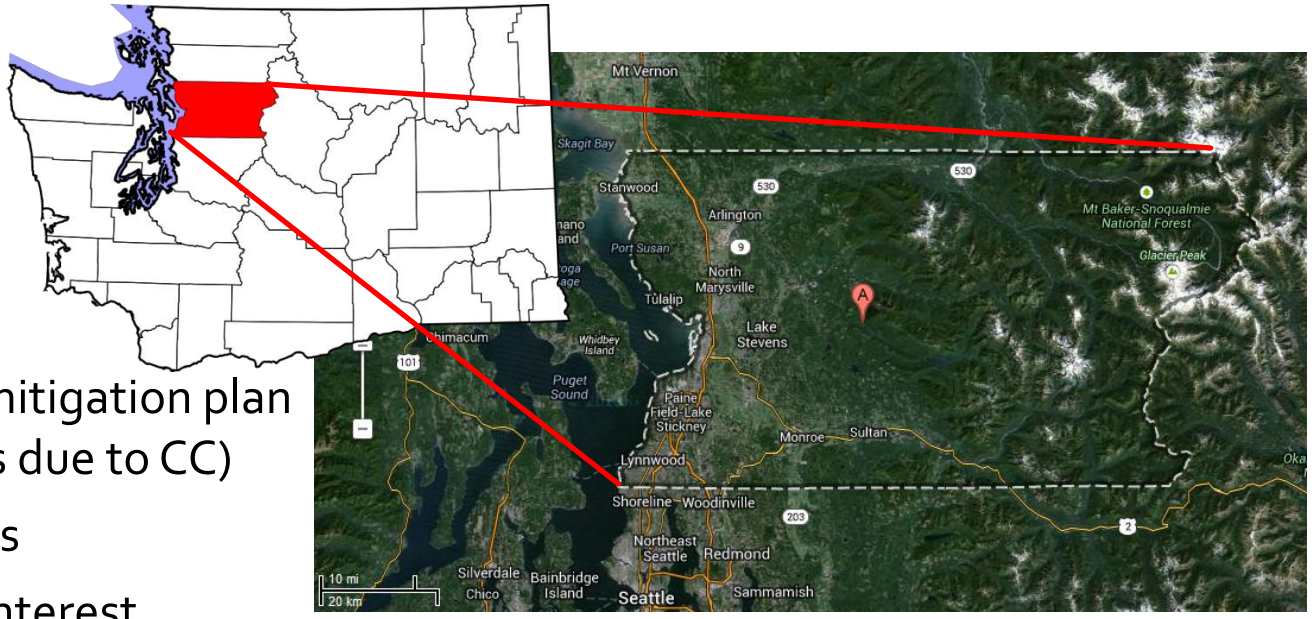


Example: Setback ----- Seawall -------- Higher seawall ---- (Un)managed retreat --- ?

Reality check:

Successful Adaptation on the West Coast

Snohomish County, WA

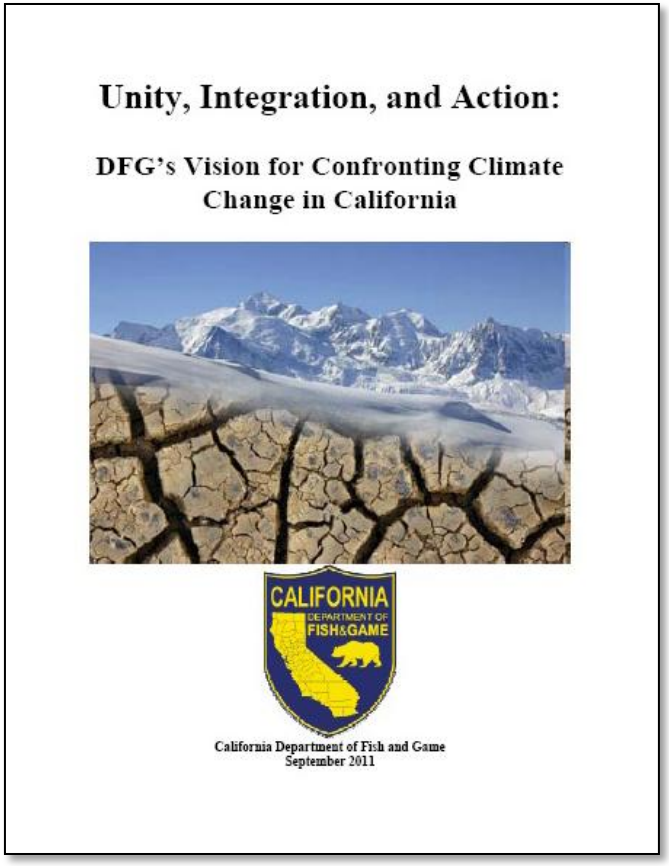


- Adaptation via hazard mitigation plan (changing hazard profiles due to CC)
- 2005 > 2010 > 2015 plans
- Raised awareness and interest, without stalling in debates, economically efficient, and politically expedient
- Success in reducing vulnerability will :
    - result in less media coverage
    - lower public awareness, complacency
    - lower political buy-in
    - lower success in obtaining further hazard mitigation funding from FEMA
- Ultimately: Greater vulnerability against backdrop of a continually changing climate

Oregon Shores Conservation Coalition

- Goal to catalyze long-term local adaptation planning (model process)
- Pilot Project in Newport, Lincoln Co.
- Launched Coastal Climate Change Adaptation Project
- "Paused" (failed?) due to funding barriers, lack of political support, lack of expertise, commitment

The California Climate College



CDFW
CLIMATE
COLLEGE
California Department of Fish and Wildlife

Learn more at:
http://www.dfg.ca.gov/Climate_and_Energy/Climate_Change/Climate_College/

Successful Adaptation to Climate Change on the California Coast

- Pre-workshop interviews with adaptation leaders ("practitioners")
- Workshop
  - "Fishbowl" of case studies
  - Group discussions
  - In-depth exploration of issues in small groups (process, outcomes, tradeoffs)
  - Evaluation
- Synthesis

Source: all pictures by Susi Moser

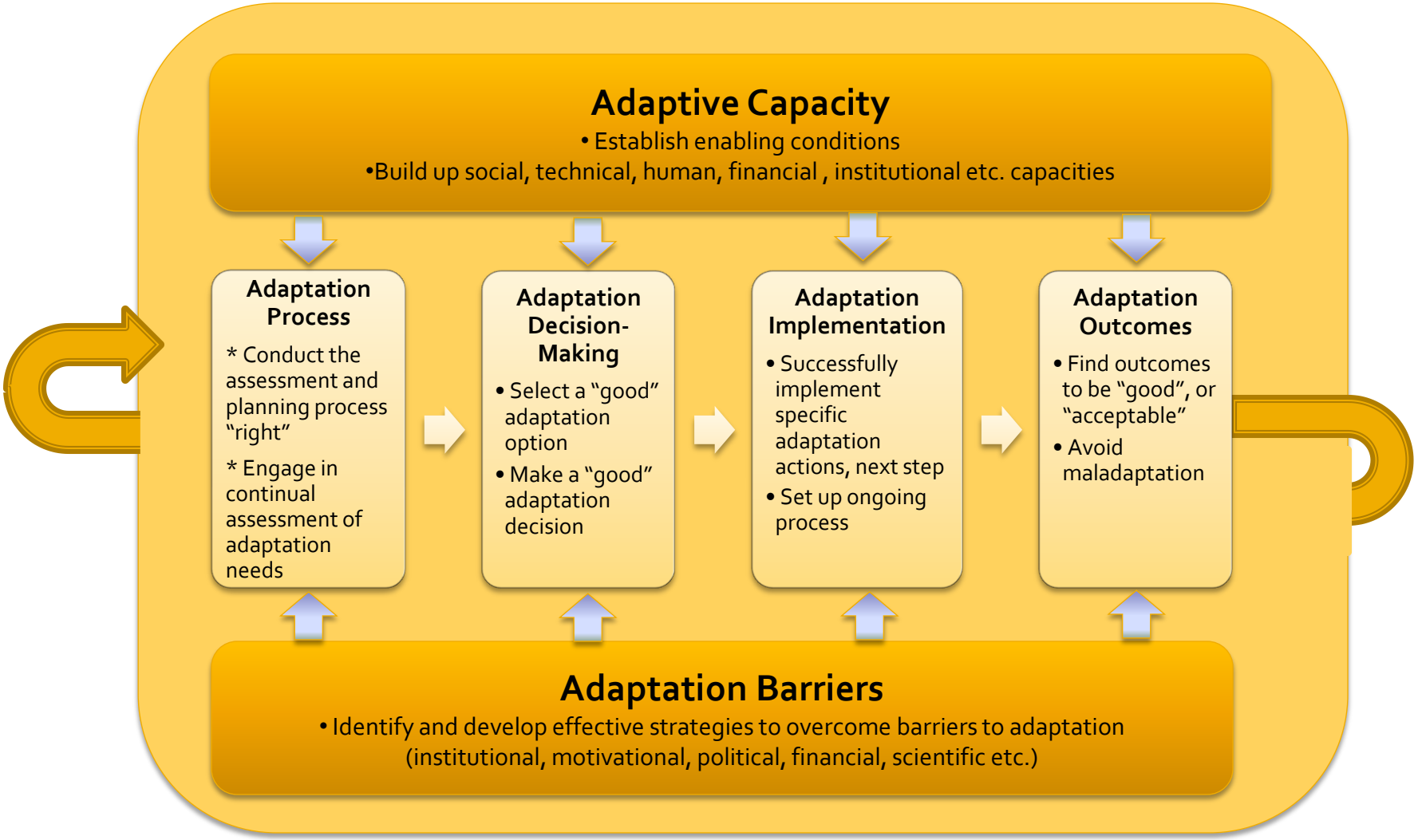
Success in Practitioners' Minds

- "Hahaha. I don't know…"
- **Capacity** – getting to a place to start
- **Actions** – that something gets done
- **Approaches** – how something gets done
- **People** – those who get it done
- **Process** – break it down & keep at it
- **Outcomes** – how it'll look, what we want

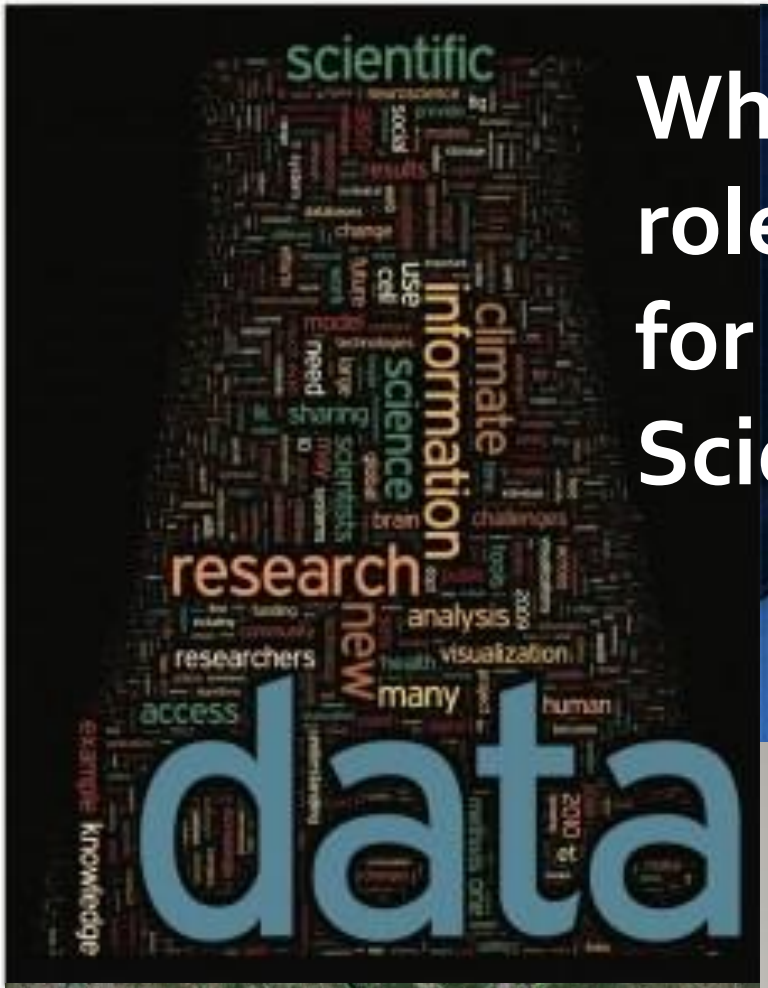
Three Categorical Successful Outcomes

- Something better
- If not that… something as good as what we have now
- If not that … at least a dignified way of life

Success in All Dimensions of Adaptation



What role for Science?



Science Informing Success

Habermas' Three Domains of Knowledge

Type of Human Interest	Kind of Knowledge	Research Methods
Technical (prediction)	Instrumental (causal explanation)	Positivist sciences (empirical, analytical methods)
Practical (understanding and interpretation)	Practical (descriptive)	Interpretive research (hermeneutics etc.)
Emancipatory (criticism and liberation)	Emancipatory (reflective)	Critical social science (critical theory)

Source: adapted from Tinning(1992)

Positivist Science to Support Measuring Success

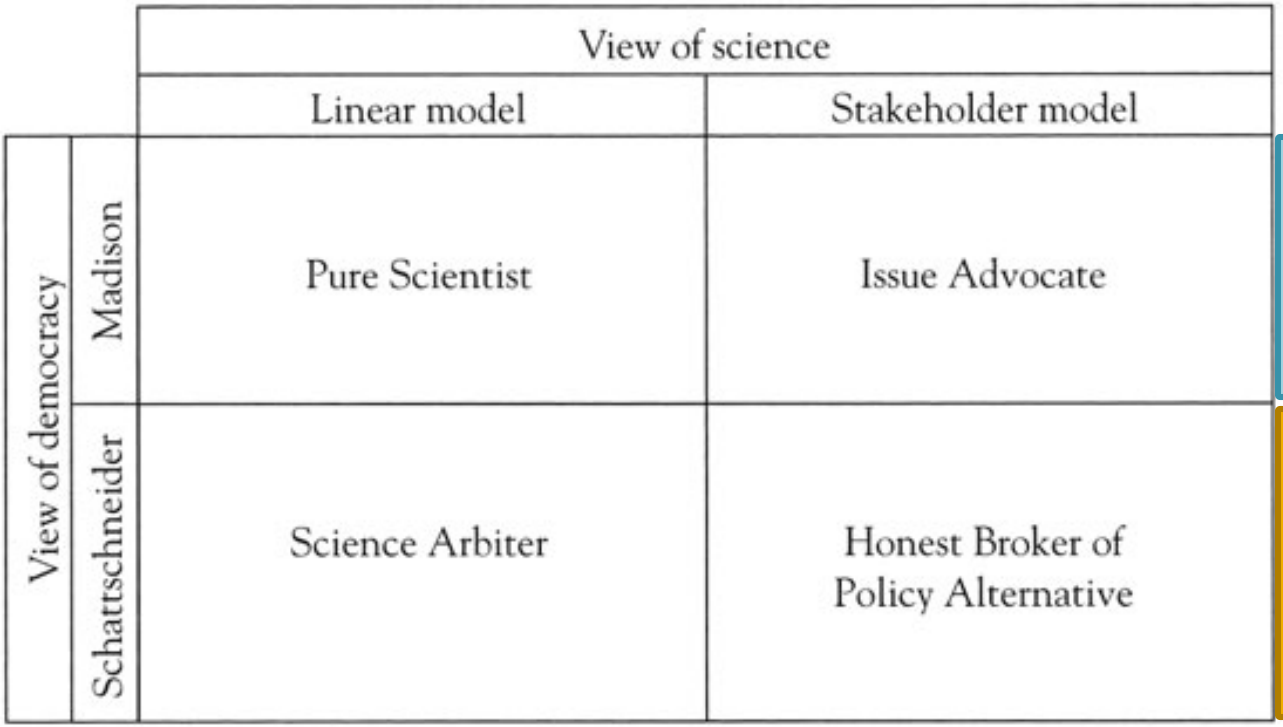
Purpose

- Communication and public engagement
- Deliberate planning and decision-making
  - Setting clear goals, aligning means and ends (internal consistency)
  - Best fit with other policy goals (external consistency)
- Justification of adaptation expenditures
- Accountability/good governance
- Support for learning and adaptive management

Relate Indicators & Metrics to Purpose

- Progress toward common vision, process achievements
- Standards of good planning, use of best/current science
  - Alignment of means and ends, setting of and adherence to criteria
  - Minimizing negative impacts on other policies, synergies
- Benefit-cost ratio, cost effectiveness, consideration of non-monetized issues
- Accomplishments, savings, benefits, inclusive decision-making, transparency
- Establishment and maintenance of monitoring systems, no-fear learning culture

Science Informing Success



Scientists promote a particular policy choice (like any other interest group)

Scientists clarify policy choices and to inform decision makers of the range of options open to them

Knowledge is always a prerequisite for action and sometimes compels policy/action

Policy-relevant science is not value-free and user and use considerations have a bearing on the production of knowledge

Source: Pielke, 2007, *The Honest Broker*

Scientist as Policy Advocate

'Tornado politics' (Pielke 2007)

- Crisis rhetoric ('we need to act now!') serves to suspend robust societal debate about future pathways.
- Researchers focus only on the 'best' means necessary to reach given environmental goals in light of existing arrangements, leaving these arrangements relatively immune to questioning

Scientist as Honest Broker+

Exploring a range of 'values–means–ends' packages (Castree et al. 2014)

- Make visible a number of actual and possible realities and pathways
- Foster mature deliberation rather than short-circuiting it in the rush to inform the key decisions humanity must take as it is confronted with crises and change

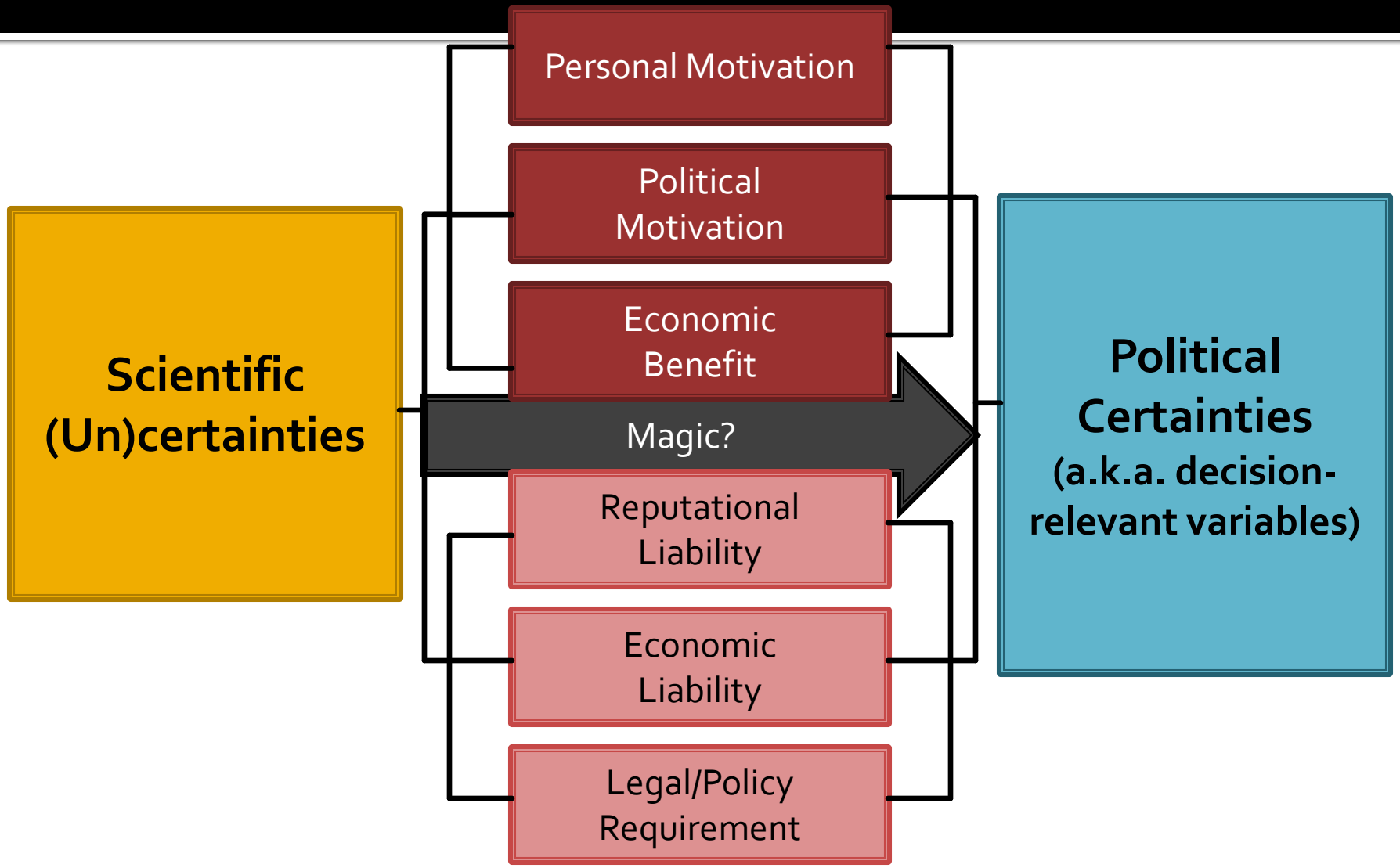
Castree et al., 2014, *Nature Climate Change*

Knowledge in the Political Context is always a Strategic Tool

- No knowledge is inherently valuable
- No knowledge is inherently "certain enough"
- No uncertainty is inherently decision-relevant

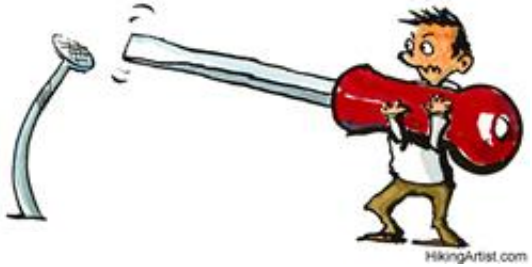
- But:
- All forms of knowledge can attain value in someone's eyes, in some contexts
- All knowledge can be "good enough" to act on
- Certainties and uncertainties can be made decision-relevant

How Science/Uncertainties Come to Matter



Science for Successful Adaptation: more than an Honest Broker?

- To be responsive
- To be supportive
- To be generative
- To be critical



Science Activities

- To collect data
- To undertake fundamental research (social, natural)
- To conduct use-inspired and applied research, incl. policy / legal analysis
- To develop, test models, tools
- To synthesize knowledge
- To monitoring & evaluate

Science-Practice Interface Activities

- To synthesize/translate information
- To explain & present information
- To convene stakeholders and enable mutual understanding
- To assess state of knowledge, knowledge needs
- To broker understanding
- To build capacity/deliver trainings

Policy-Making & Management Activities

- To plan and invest in future
- To mobilize constituencies / advocacy
- To build coalitions and align different agendas
- To formulate policy, write rules, create budgets, etc.
- To make decisions
- To provide oversight of and implement policy or management practices

Science & Assessment Services

- To generate scientific knowledge
- To assess soundness of existing knowledge
- To characterize and reduce uncertainties

Science-Practice Interface Services

- To be responsive
- To be supportive
- To be generative
- To be critical

Policy-Making & Management Services

- To enable the proper conduct of public affairs
- To safeguard the public trust
- To facilitate the achievement of societal goals

Scientific Action Space

Boundary Work Space

Political Action Space

In a Nutshell

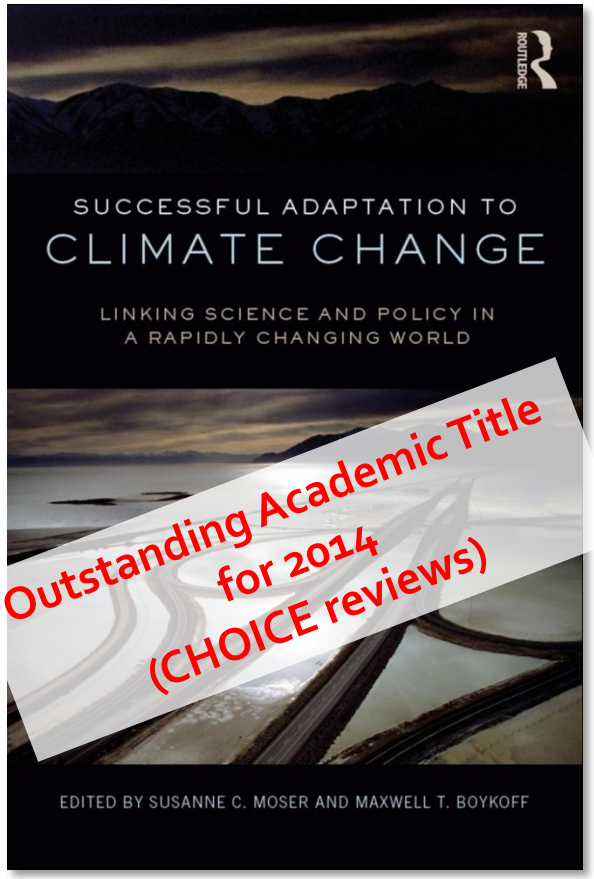
Adaptation success is

- Complex
- Context-sensitive
- Scalar & multi-dimensional
- A matter of degree and contestation
- Not only about outcomes but also about process
- Not determined by science or objective analysis
- Never final

Science

- Can become relevant
- Requires deliberate and skilled boundary work
- In the political process is either responsive, supportive, generative and/or critical
- Has a crucial, complex and also limited role to play in defining and delivering "success"

Thank you!



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