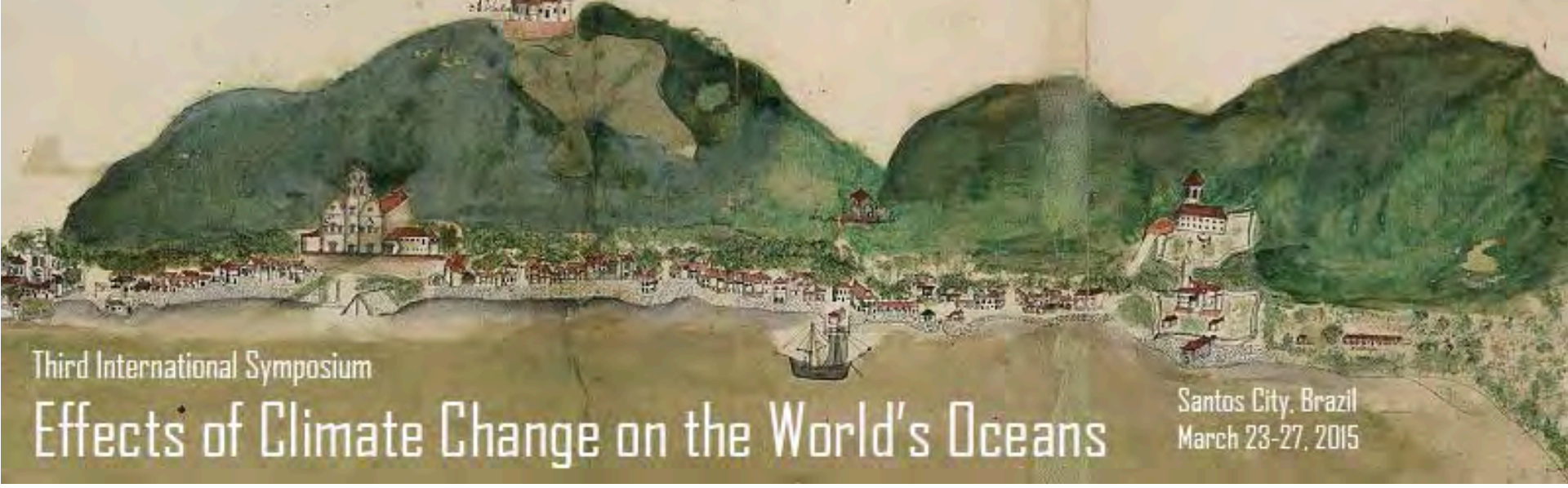

Climate change and coastal people:

what we know and how social science could help us learn more

Edward H Allison

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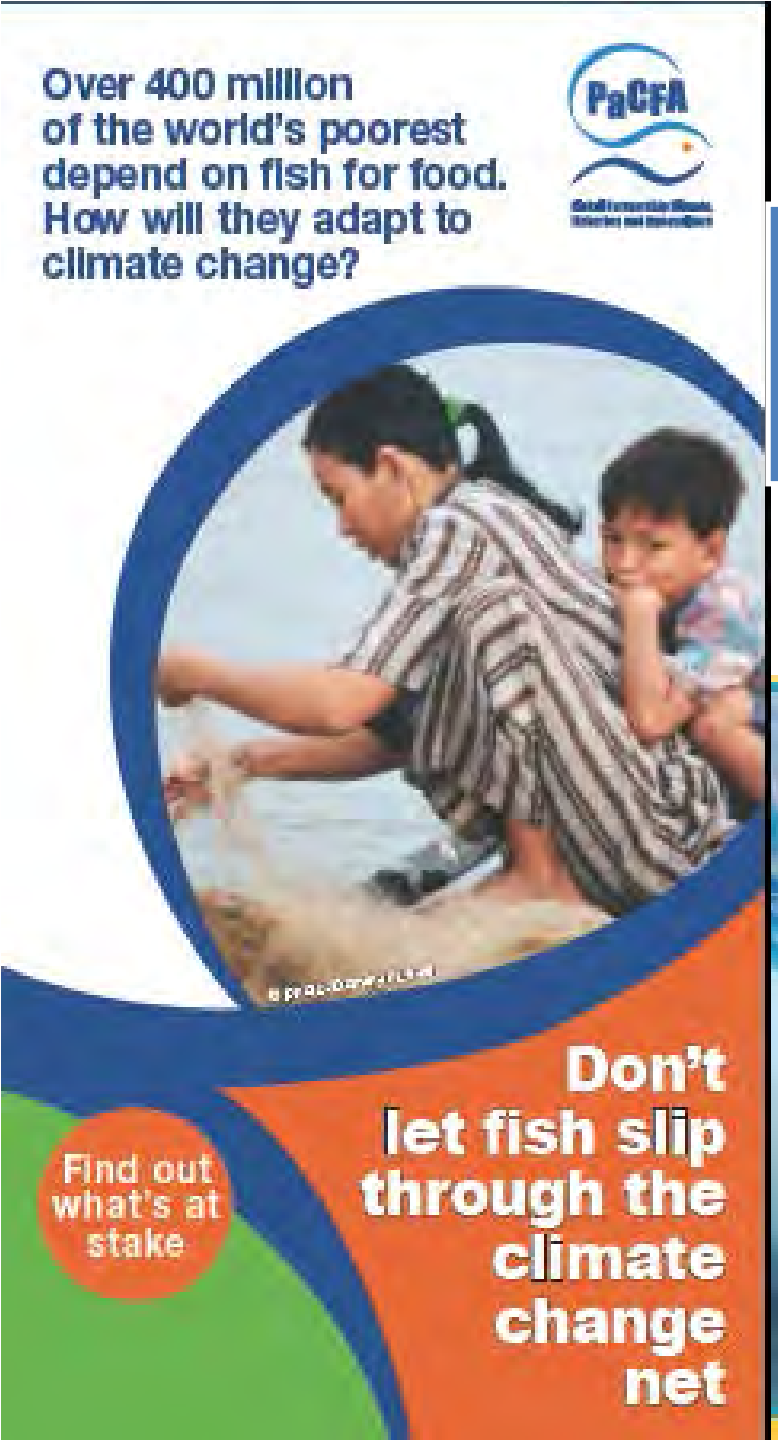


Fisheries and aquaculture policy

Climate adaptation and mitigation policy

Oceans Day at Copenhagen

The Importance of Oceans, Coasts, and Small Island Developing States in the Climate Regime

December 14, 2009

8:00 to 22:00

Venue: European Environment Agency, Copenhagen

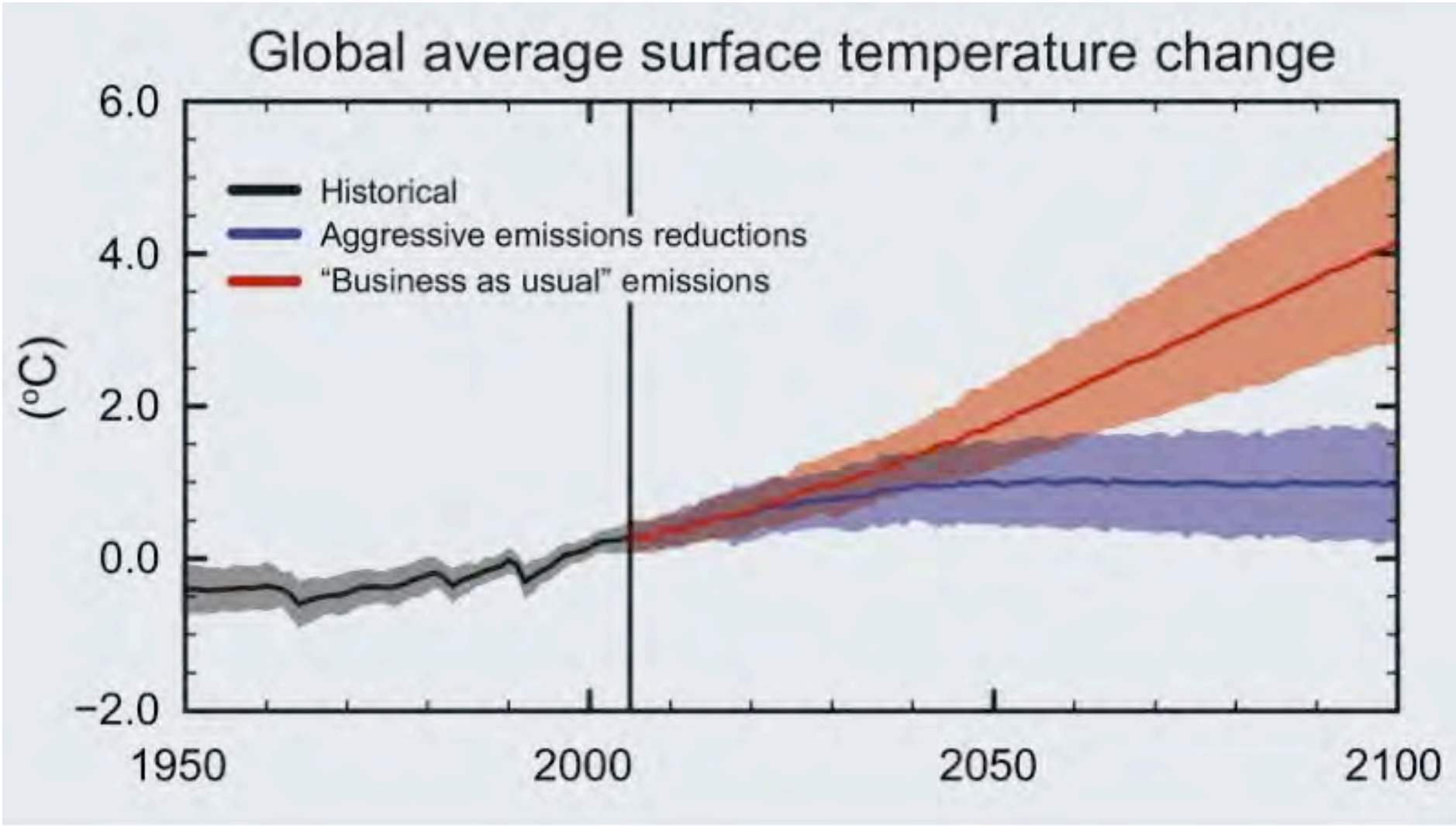
Featuring H.S.H. Prince Albert II of Monaco
Indonesian Minister Dr. Fadel Muhammad
Grenada's UN Ambassador Dr. Dessima Williams
US NOAA Administrator Dr. Jane Lubchenco
and other World Leaders

Outline

- What do we know about ocean-related climate change and its impacts on coastal people?
- What can the social sciences offer to further our understanding and support effective societal responses?
- How can ‘human dimensions’ be incorporated in ICES/PICES research and policy advisory work?

The consequences of policy (in)action: future climate change relative to 1986 to 2005 average

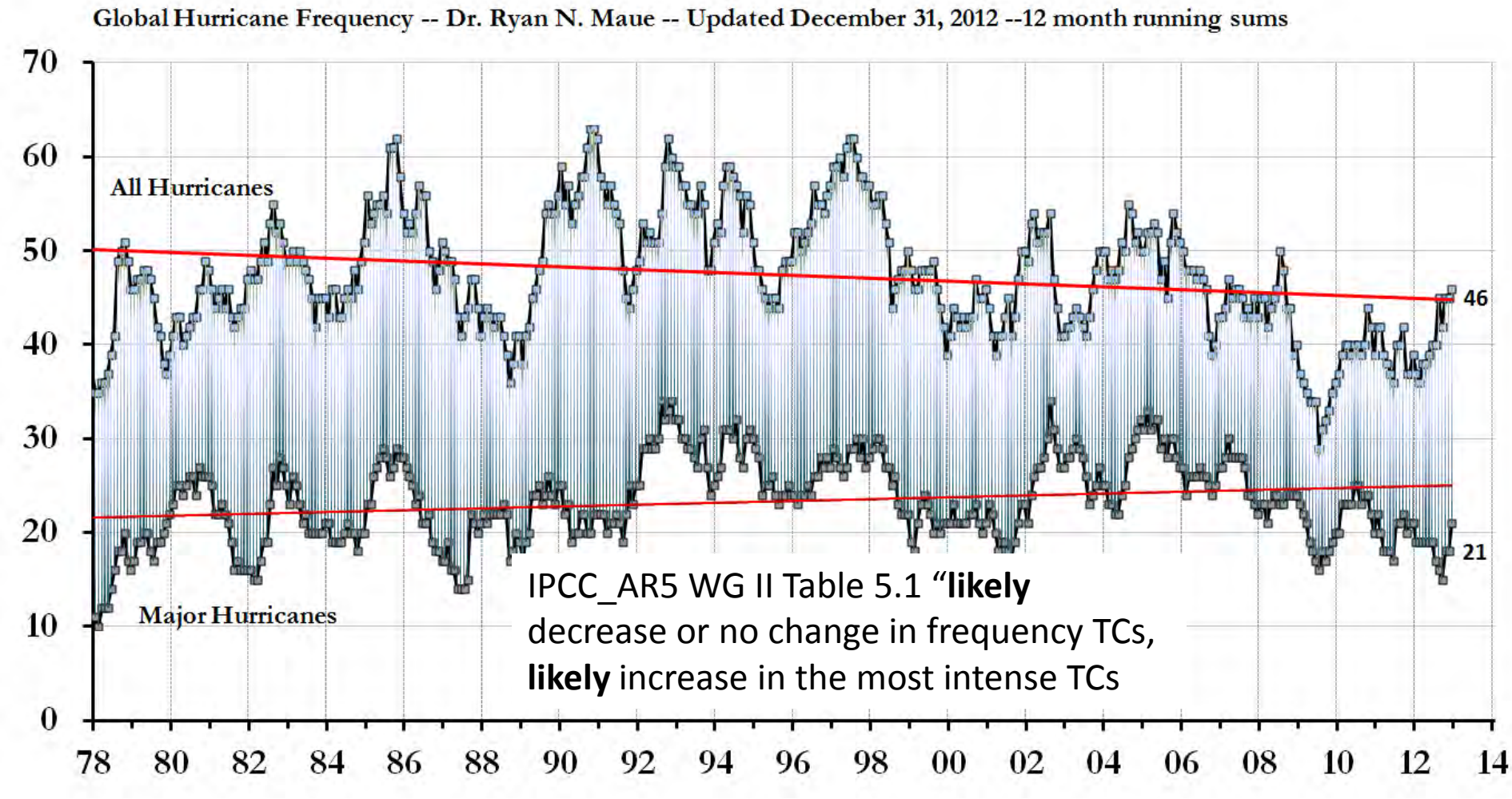
(US National Academy of Sciences, citing IPCC_AR5)



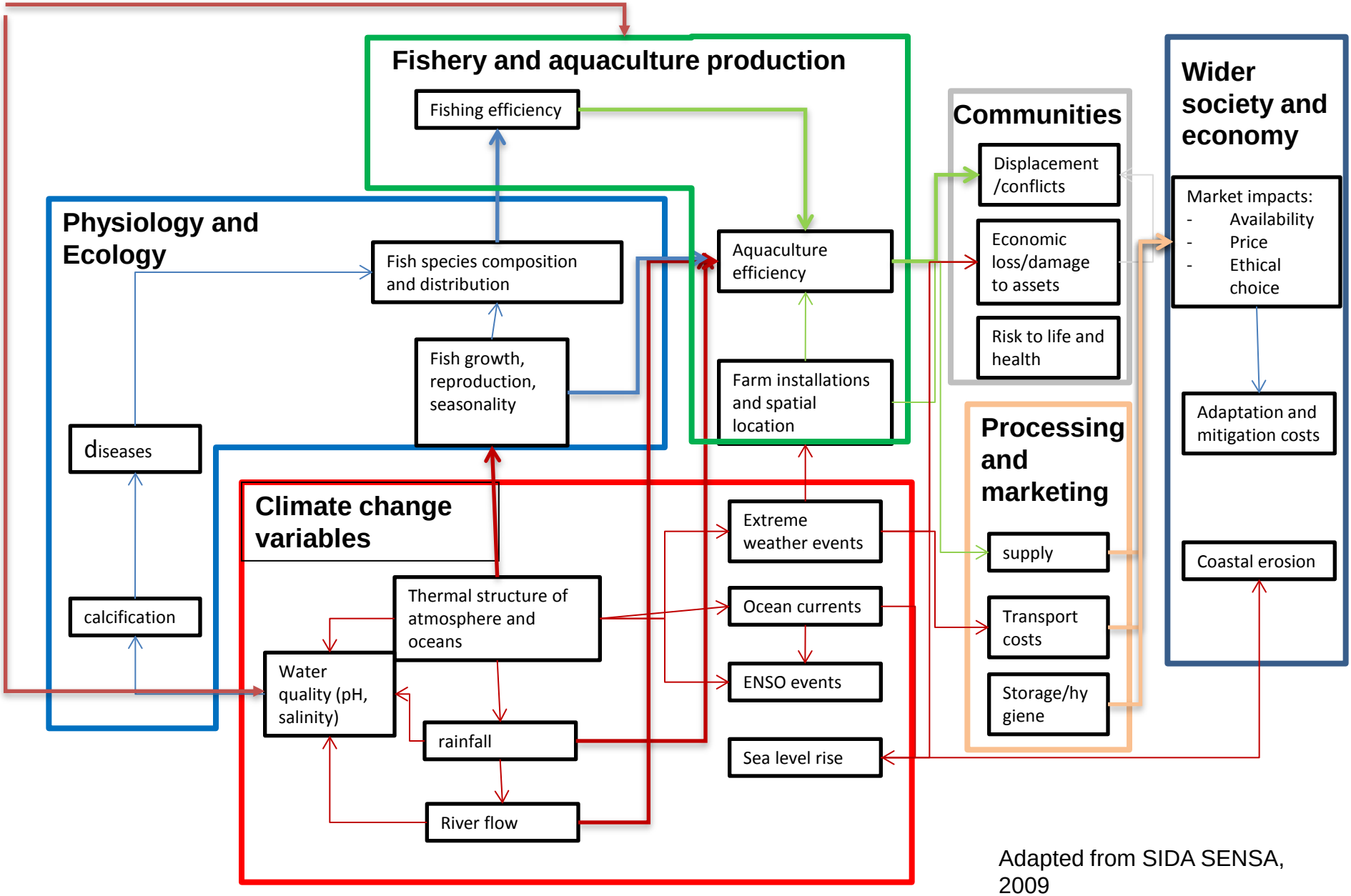
Extreme events:

Globally, hurricanes are getting stronger but not more frequent – but regional patterns differ. Same for droughts and floods

Maue (2011) *Geophys. Res. Lett.* (data updated *31/12/12)*



Climate change and aquaculture: potential impact pathways



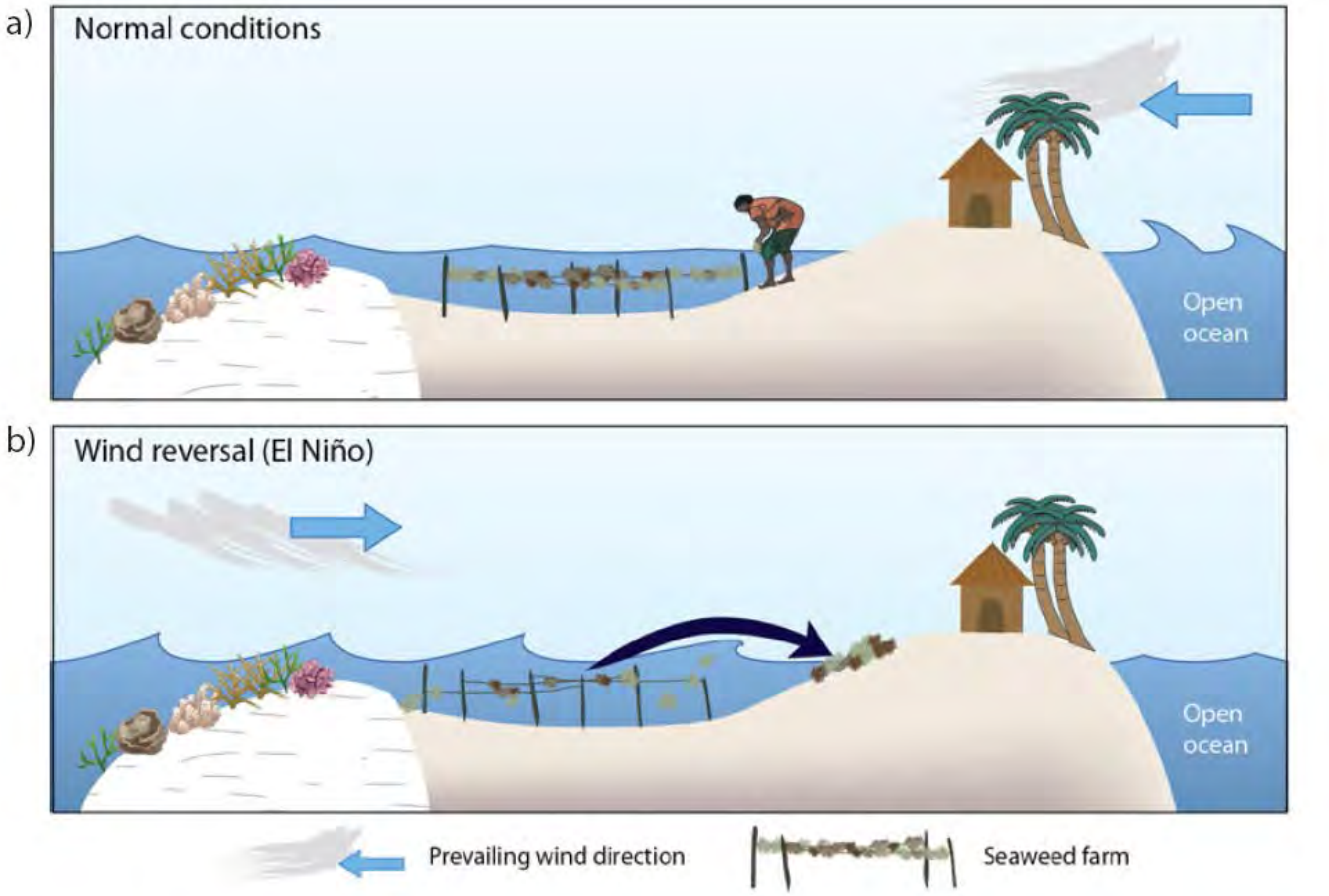
Adapted from SIDA SENSA, 2009

101 Idiosyncratic pathways, #37 – a change in the prevailing wind and its impact on seaweed farms

Photo: Georges Steinmetz

Seaweed farm, Tabiteuea Atoll, Kiribati

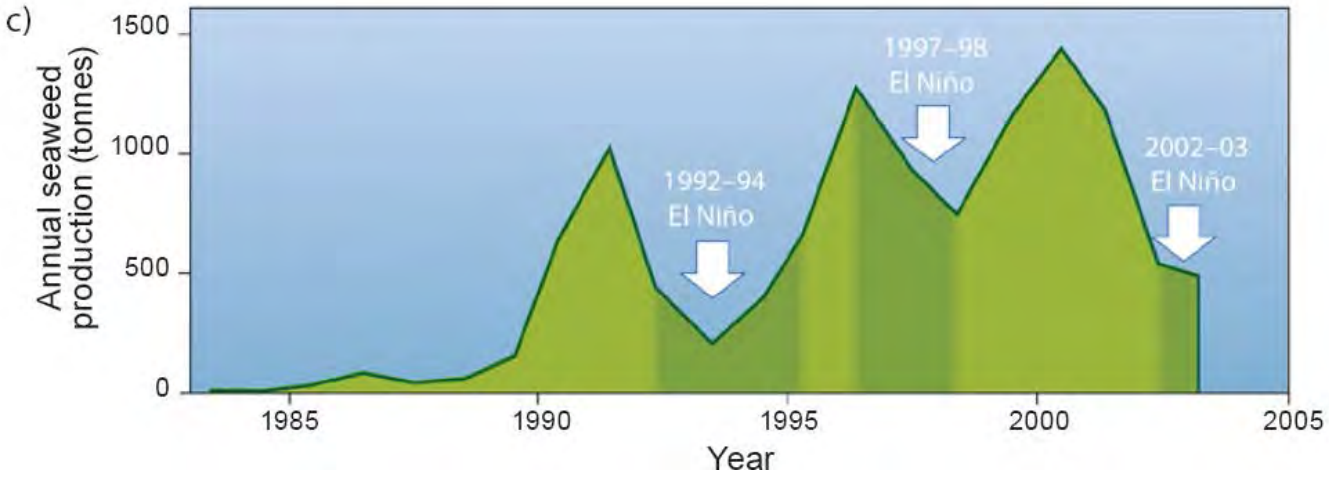
Source: Pickering et al 2011



More frequent and severe ENSO events

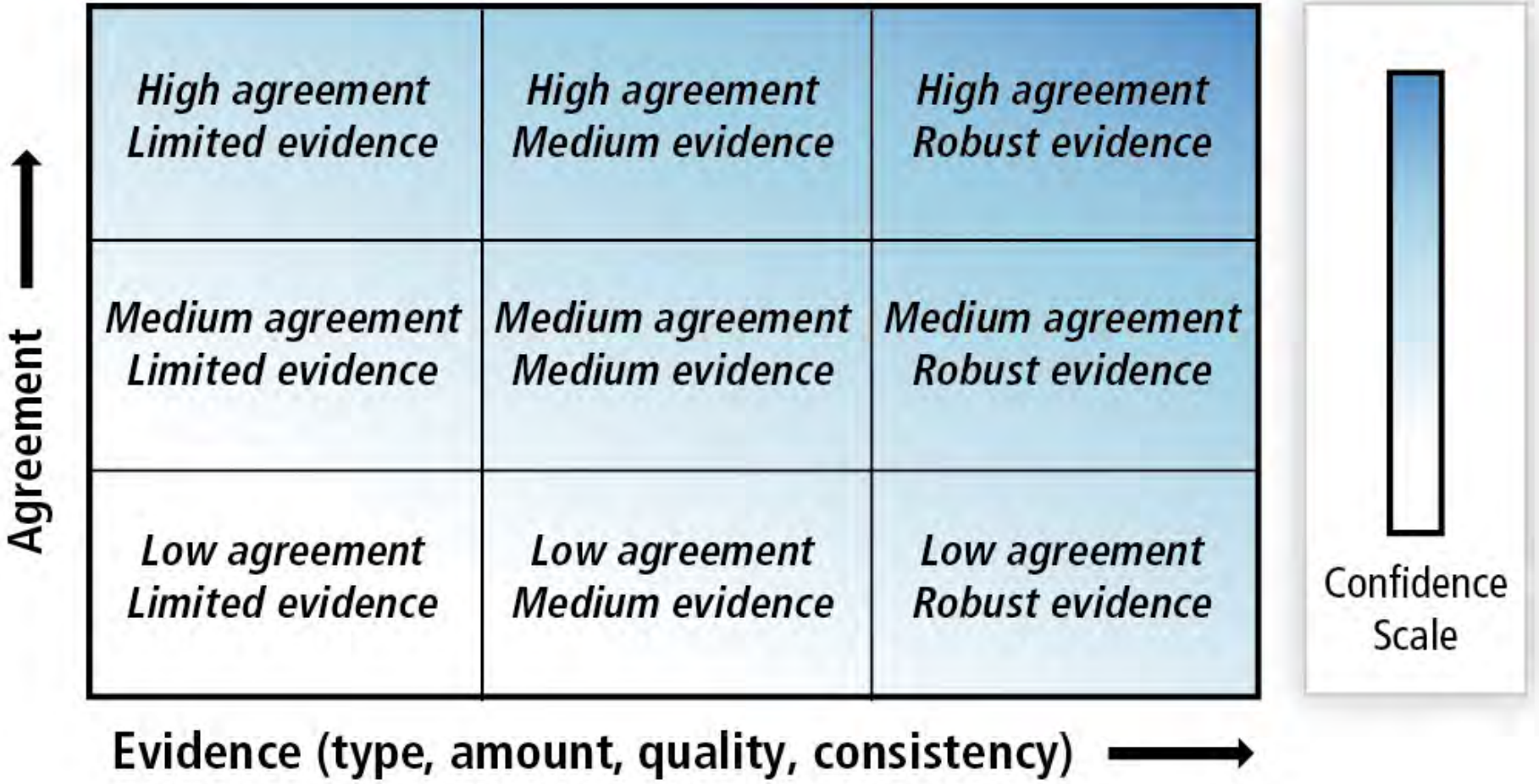
ENSO-associated shifts in prevailing wind in S Pacific

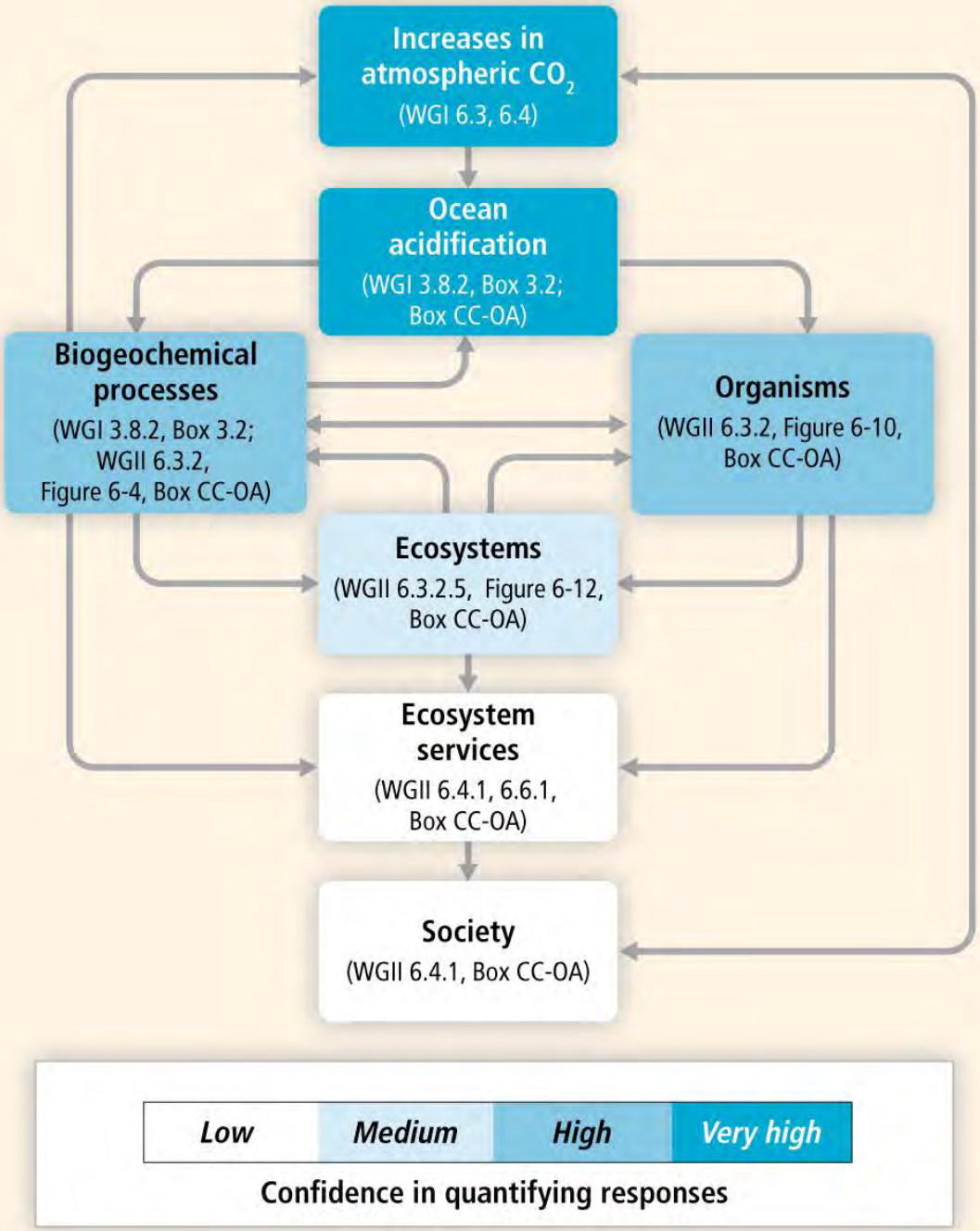
Coastal aquaculture more exposed to storm damage



Pickering *et al* (2011) Vulnerability of aquaculture in the tropical Pacific to climate change, In Bell *et al*. SPC.

How IPCC decides what we know about climate change



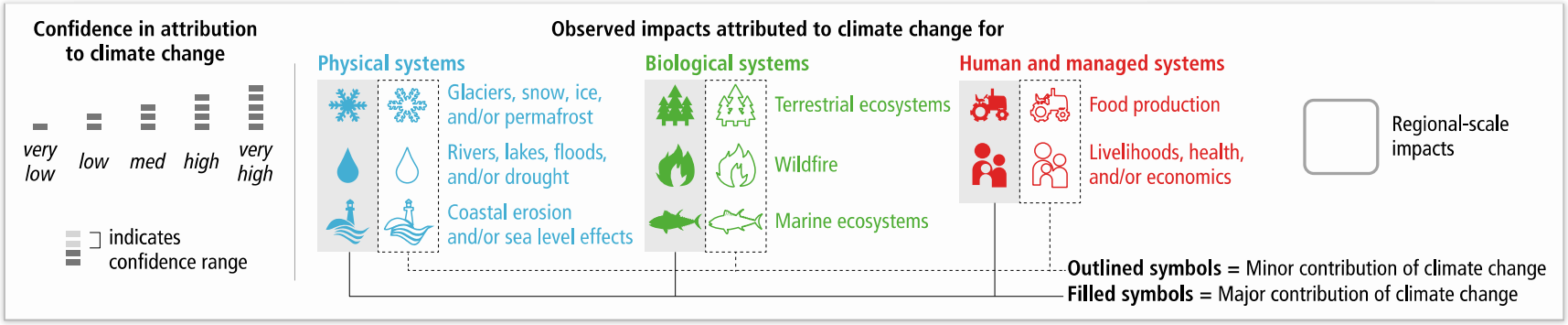


Increased atmospheric CO_2 and the oceans:

The further we get from the distal driver of change, the less confident we become in quantifying impacts

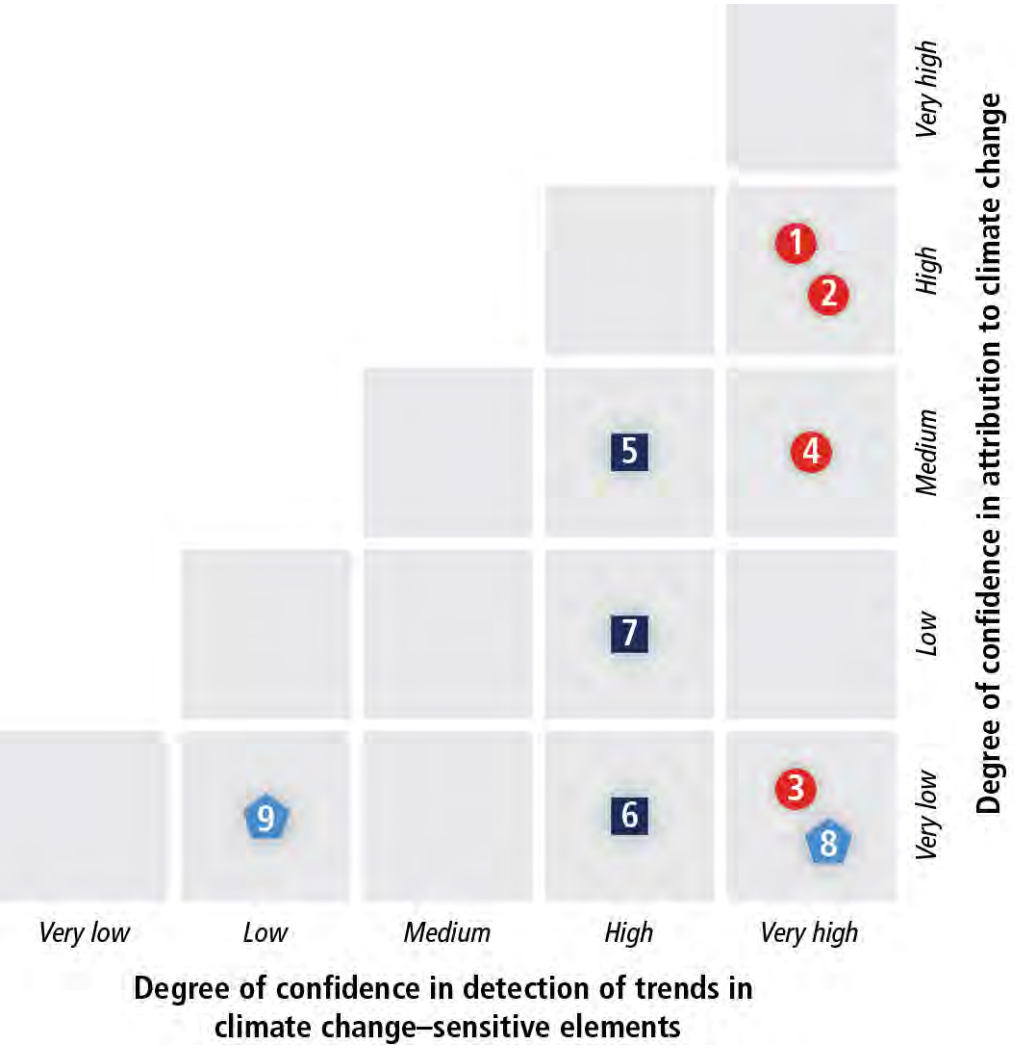
Source:
IPCC_AR5 WGII, Fig 19-3

Observed impacts of climate change on human and managed systems are based of a small number of case-studies



Hansen & Cramer, 2015. *Nature Clim. Change* 5(3): 182-185.

What we know about climate change and marine & coastal systems



Evidence of changes in species and ecosystems

1. Increase in coral bleaching
2. Shift in range limits of species distribution
3. Decline in the extent of salt marshes and mangroves
4. Decline in the extent of seagrasses

Impacts on coastal processes

5. Decreased calcification
6. Increased beach erosion
7. Increased saltwater intrusion

Impacts on human systems

8. Increased flood damage
9. Decreased harbor operations

Source: IPCC_AR5 WG II Fig 5.5 (2014)

How can social science help increase what we know?

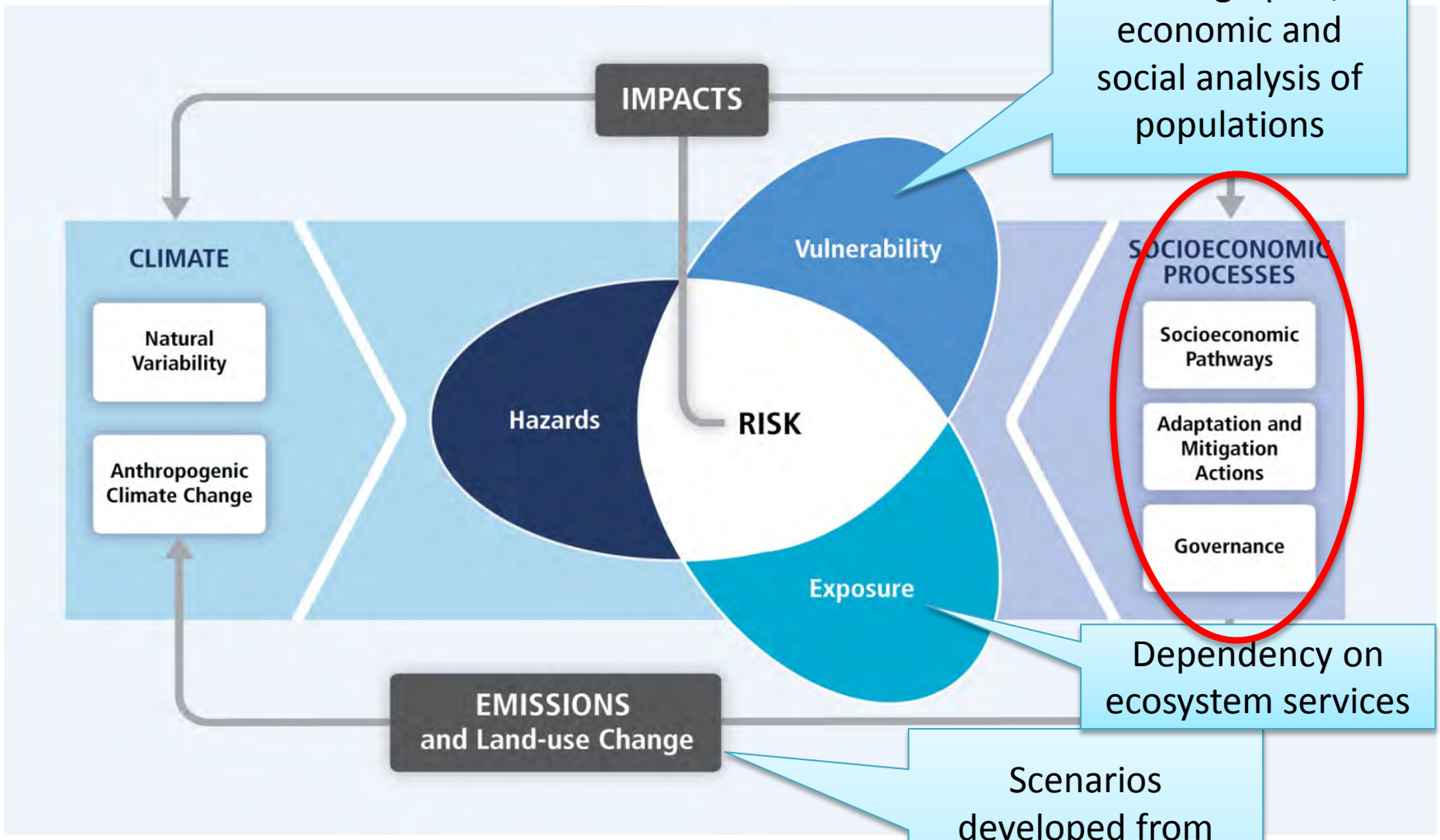
Five fundamental questions for societally relevant trans-disciplinary research
(modified from Flyvberg, 2001 *Making Social Science Matter*)

1. Where are we going?
2. Is this desirable?
3. Who benefits and who is losing out?
4. Which mechanisms of power make us stay on course?

5. What should be done if we are on the wrong track?

Social science in climate change analysis and prediction

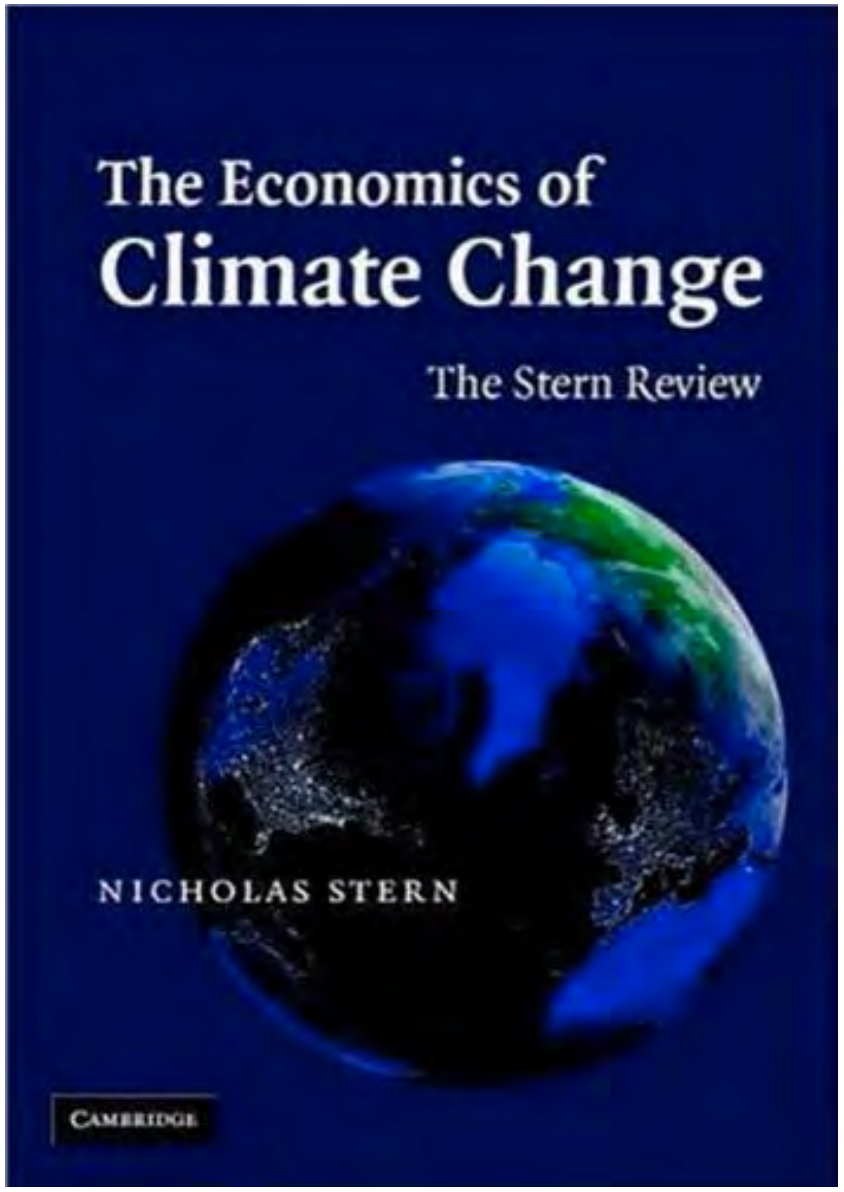
(IPCC 5th Assessment WGII, 2014)



Demographic, economic and social analysis of populations

Dependency on ecosystem services

Scenarios developed from social, political and economic analysis

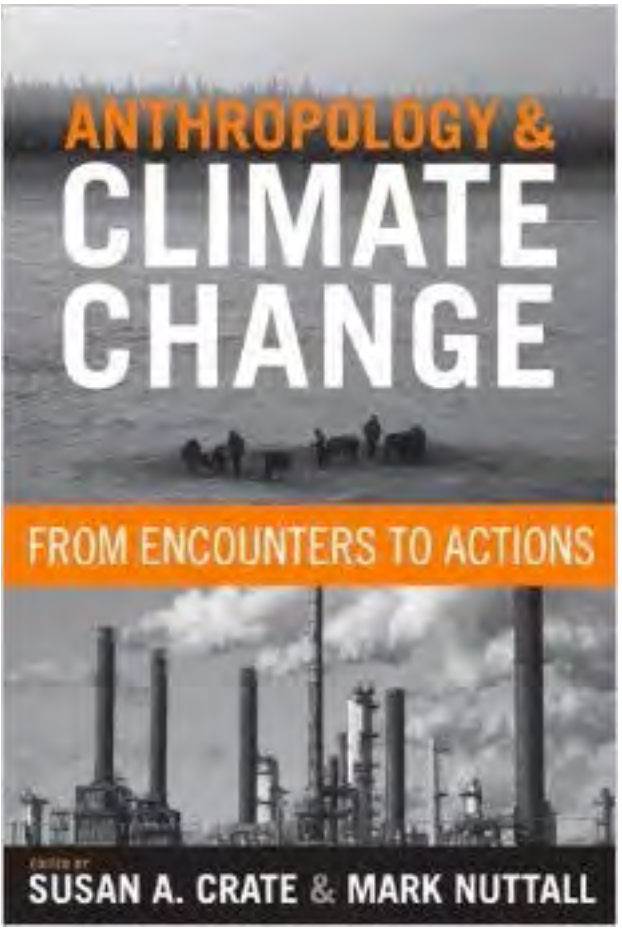


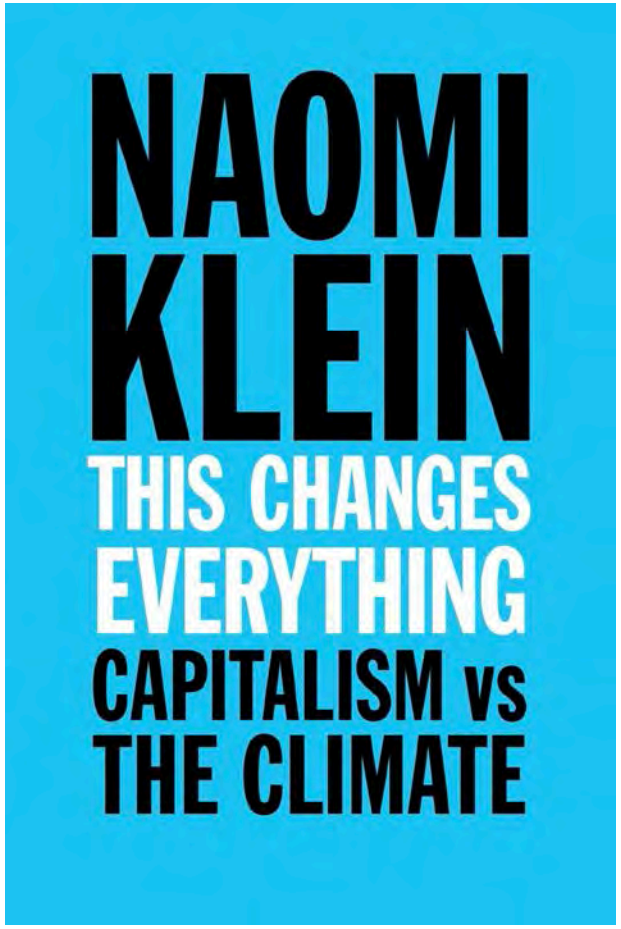
Climate change could cost the world 5% to 20% of GDP a year

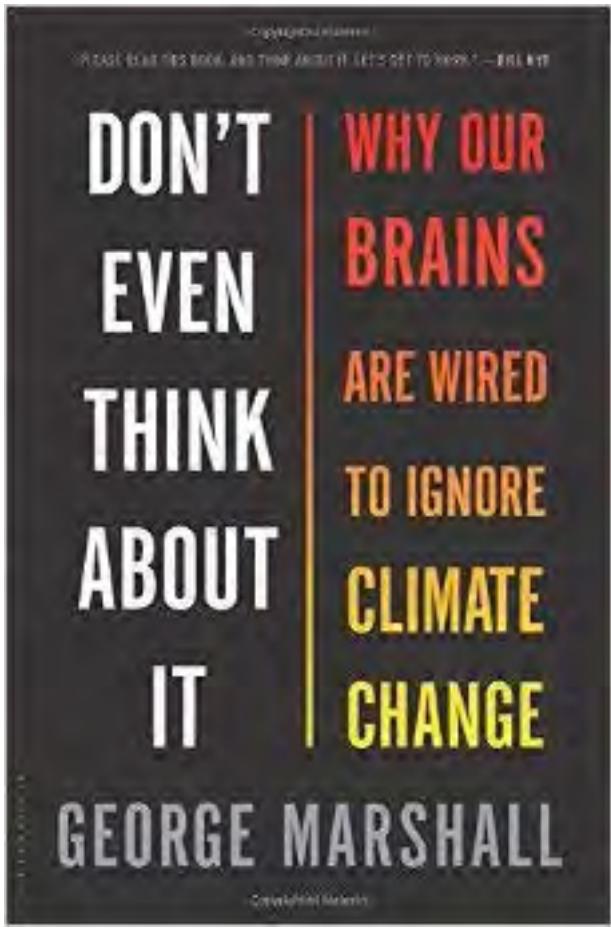
Shifting the world onto a low-carbon path could benefit the economy by $2.5 trillion a year

By 2050, markets for low-carbon technologies could be worth at least $500 bn

Economics is not the only social science





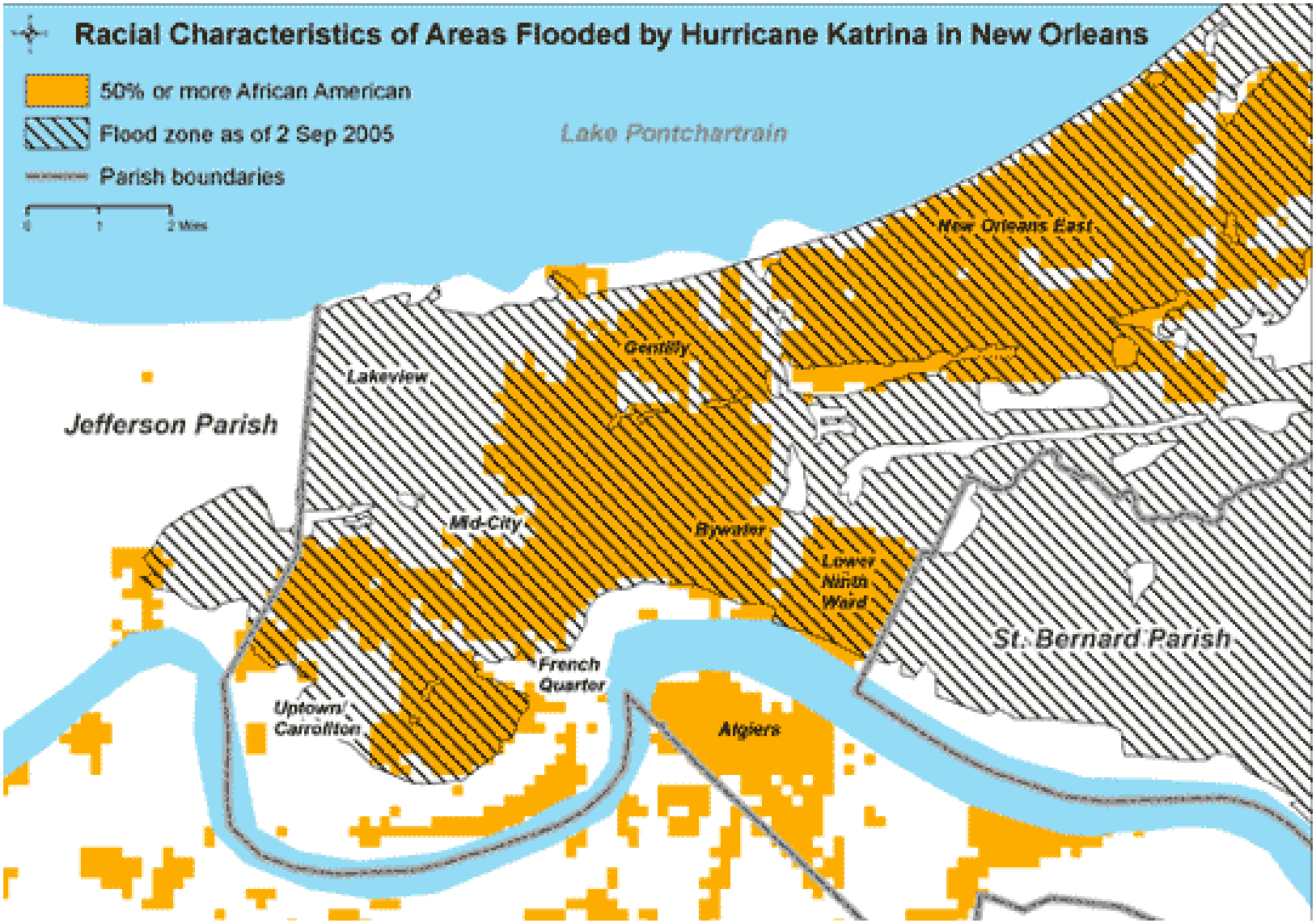


What is a coastal community?

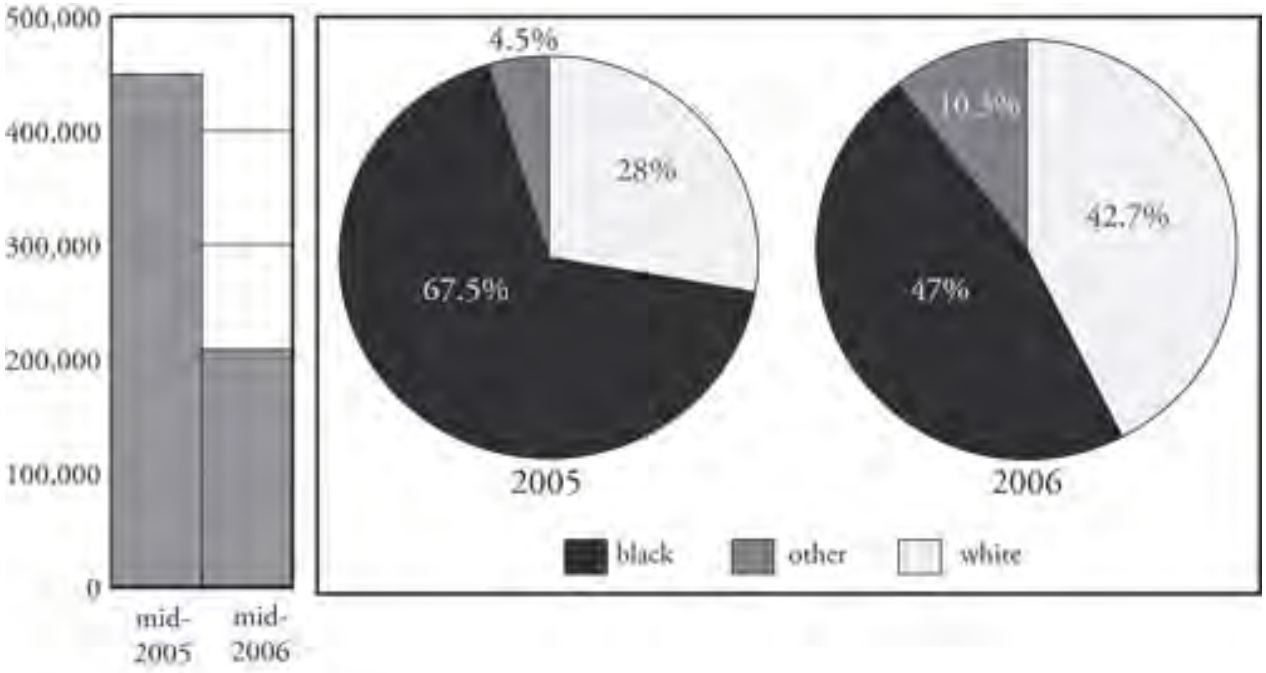
Community of place, occupation or interest

Social divisions lead to vulnerability differentials

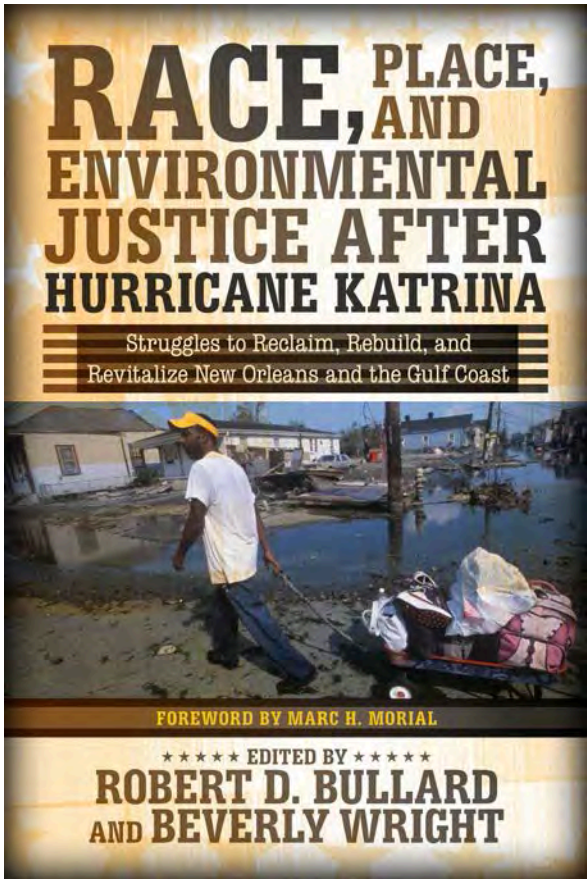
The Hurricane Katrina experience, New Orleans, August 2005



Longer-term consequences of differential vulnerability on coastal communities – the legacy of Hurricane Katrina in New Orleans



Population of New Orleans in mid-2005 and mid-2006, (in numbers) and by race
Fussell, 2007 *J. American History* 94: 846-55



2014 update: 380,000 people in 2013
100,000 fewer AA in 2013 than 2000, increase in Latino and Asian populations

Gender and climate change

Some stereotypes and then some social analysis

- Women as environmentally vulnerable…

Women as environmentally virtuous…

Women have lower carbon footprints than men, and are more interested in nurturing natural resources while men prefer to plunder them..etc

Gender and climate change

- Climate change and disasters expose and exacerbate existing gender inequities
- Adaptation and mitigation policies that are 'gender-blind' are likely to be less effective
- Labeling women as either victims or virtuous is simplistic and damaging - as is blaming men for climate change

References:

Terry, G. (2009) No climate justice without gender justice: *Gender and Development* **17**(1): 5-18

Arora-Jonsson, S (2011) Virtue and vulnerability: discourses on women, gender and climate change *Global Env. Change* **21** 744-751.

How can coastal communities adapt to climate change?

Adaptation and mitigation decisions under uncertainty

e.g. Shrimp or rice in low-lying coastal Asia?

Photos: Mike Lusmore, WorldFish

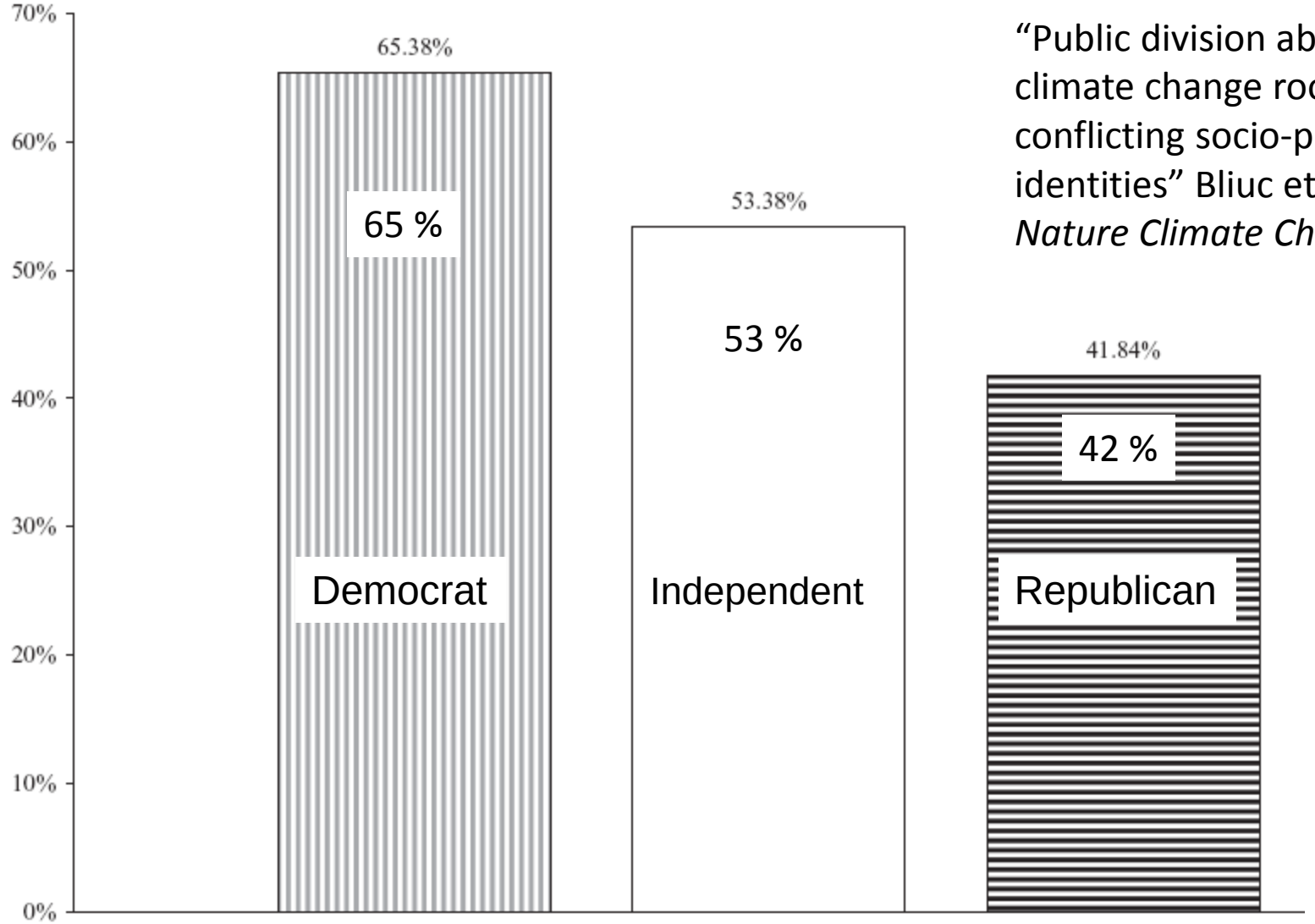
Global climate trends and projections **?** → Local climate trends and projections **??** → Impacts on biophysical systems **???** → Responses of social-ecological systems **????**

Daw et al (2008) for FAO

What do people think about climate change? What actions are they taking to address their concerns?

Percent of US citizens who believe global warming has already begun

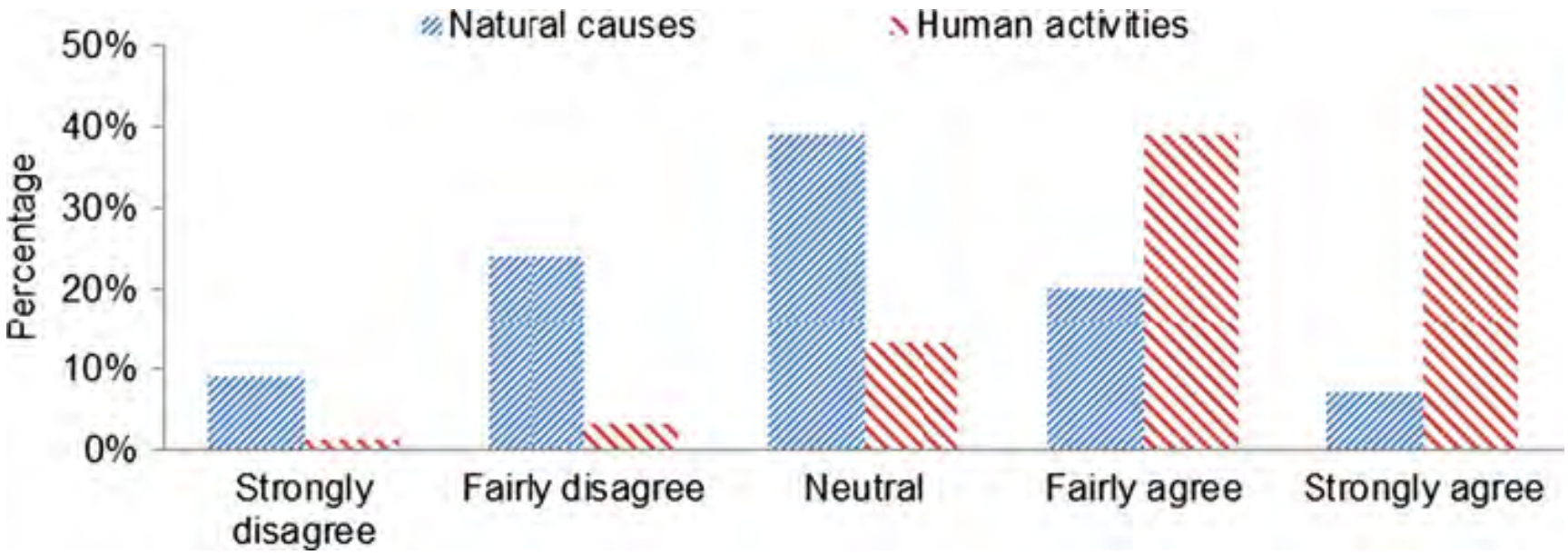
McCright & Dunlap (2011) *The Sociological Quarterly* **52**



"Public division about climate change rooted in conflicting socio-political identities" Bliuc et al (2015) *Nature Climate Change* 5

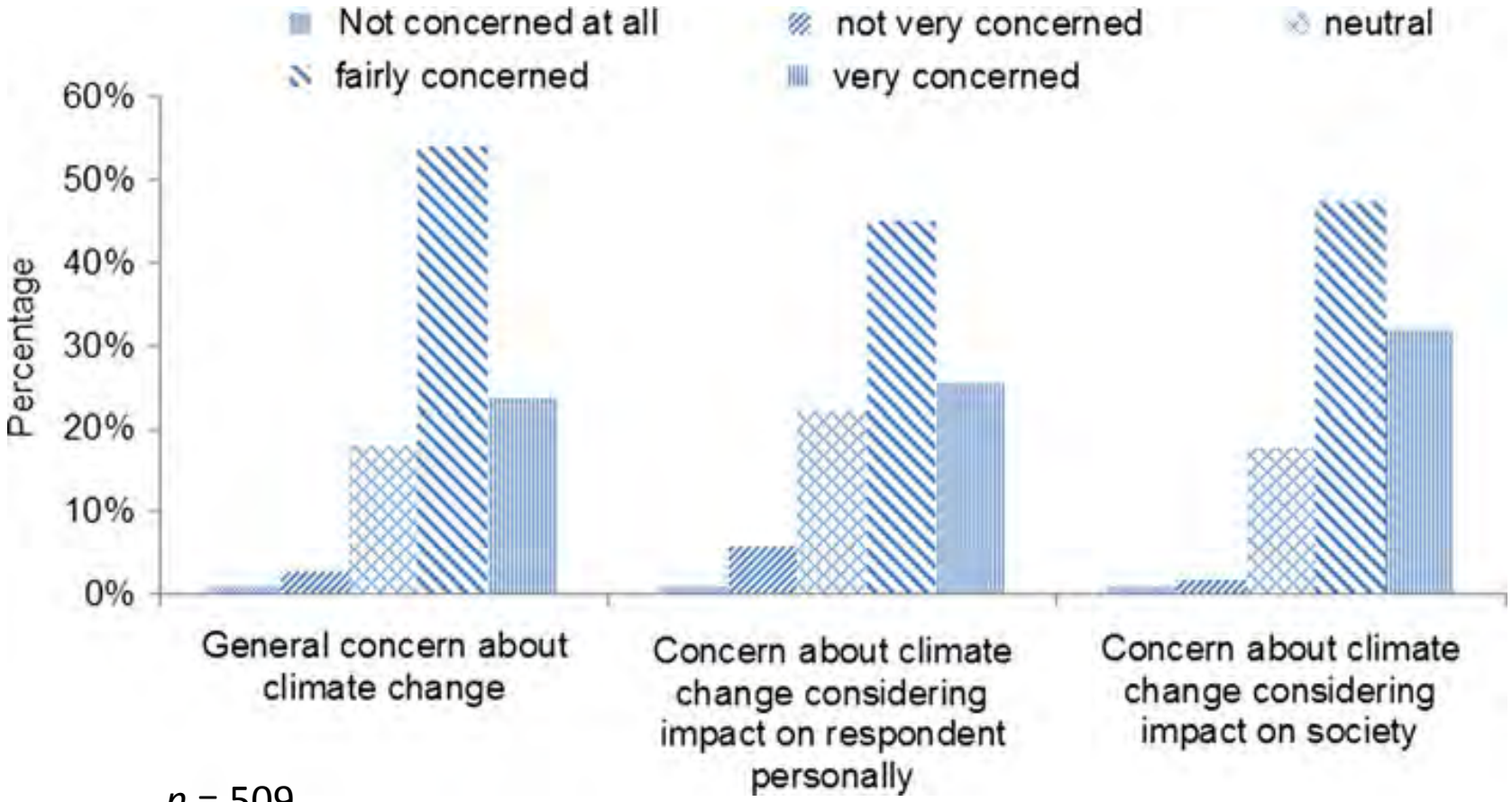
Chinese public's perception of the causes of climate change

n = 509



Yu et al (2013) *Natural Hazards* 69: 459-472

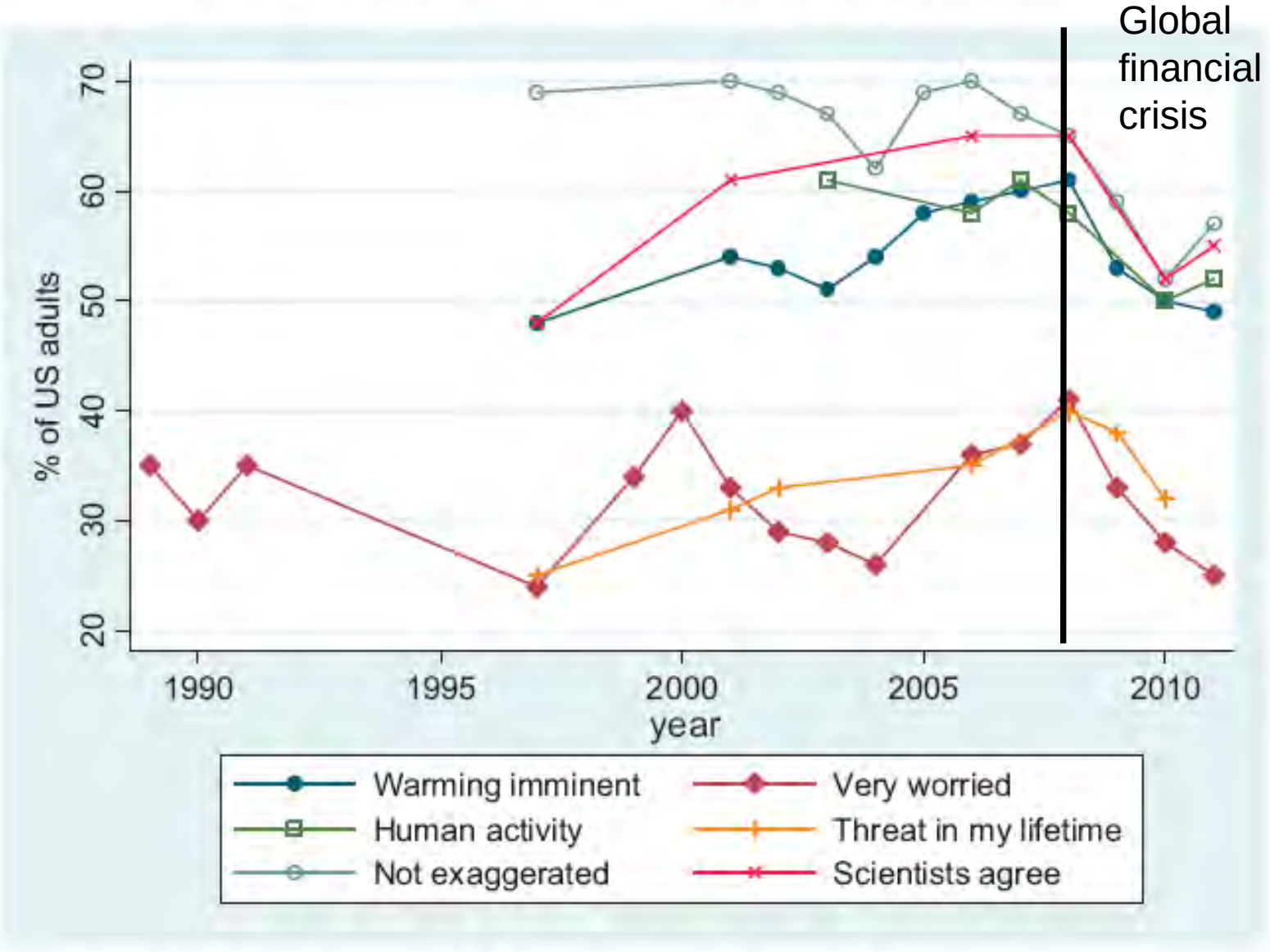
Chinese public's concern for climate change impacts



n = 509

Yu et al (2013) *Natural Hazards* 69: 459-472

L. Scruggs, S. Benegal / Global Environmental Change 22 (2012) 505–515



What do the public know about climate change?
Gallup poll trends on % of US public support for questions about global warming

Coastal climate change concerns in context

European study of public awareness, concerns and priorities about anthropogenic change (*n* = 10, 106)

Gelcich *et al*. 2014 www.pnas.org/cgi/doi/10.1073/pnas.1417344111

Climate change in broader risk context: Solomon Islands

A.-M. Schwarz et al./Global Environmental Change 21 (2011) 1128–1140

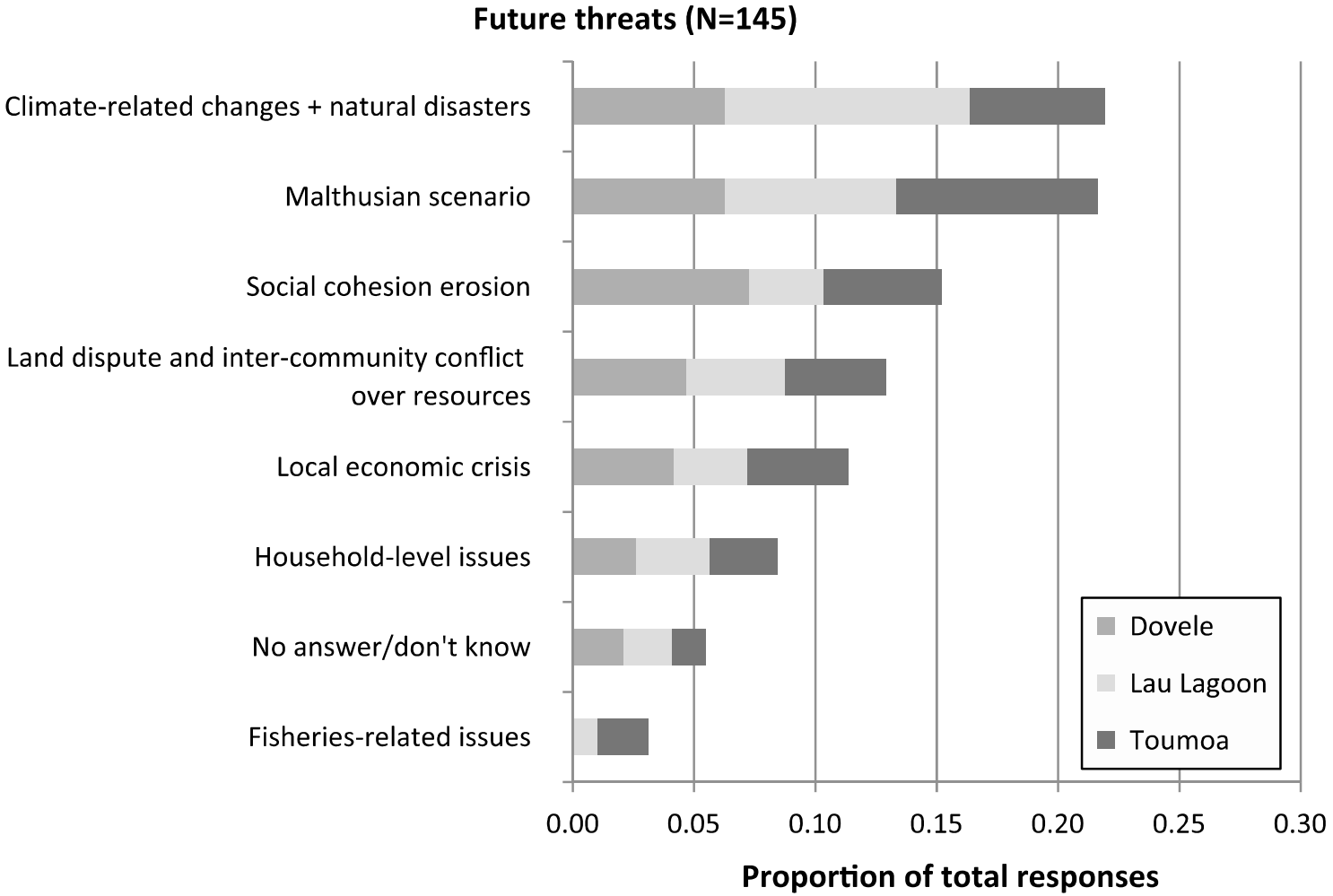
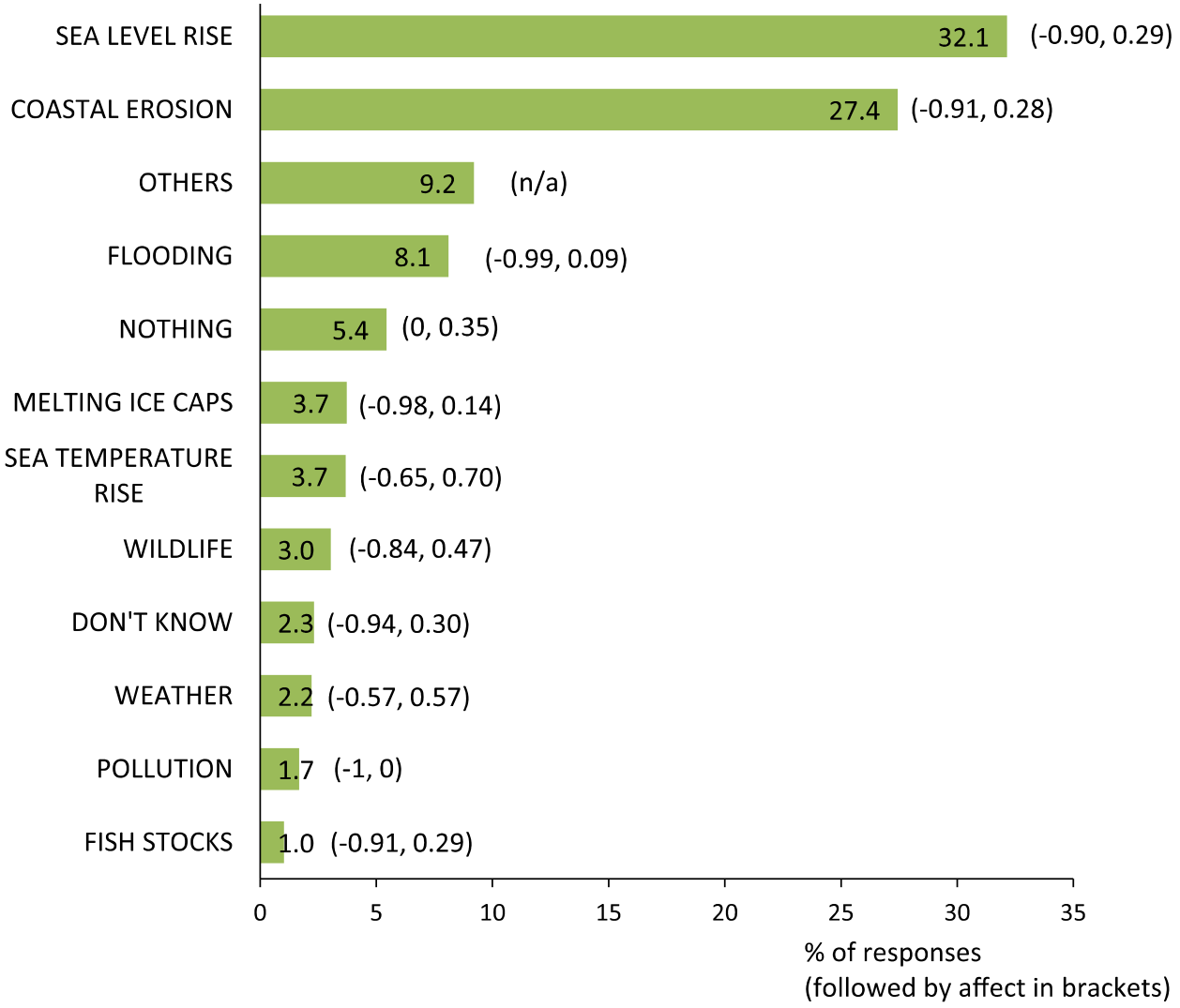


Fig. 4. Future threats, identified by the respondents during the vulnerability analysis.

What impacts do people associate with climate change on the coasts and seas in the UK?

(UK sample, *n*=1001; Chilvers *et al* 2014 *GEC* 29)



Engaging citizens in climate action: "Fear won't do it"

(O'Neill & Nicholsen-Cole, 2009. *Sci. Comm.* 30(3)

“non-threatening images that relate to every-day emotions and concerns tend to be the most engaging”

Opportunities: New technologies and new social movements

New technologies

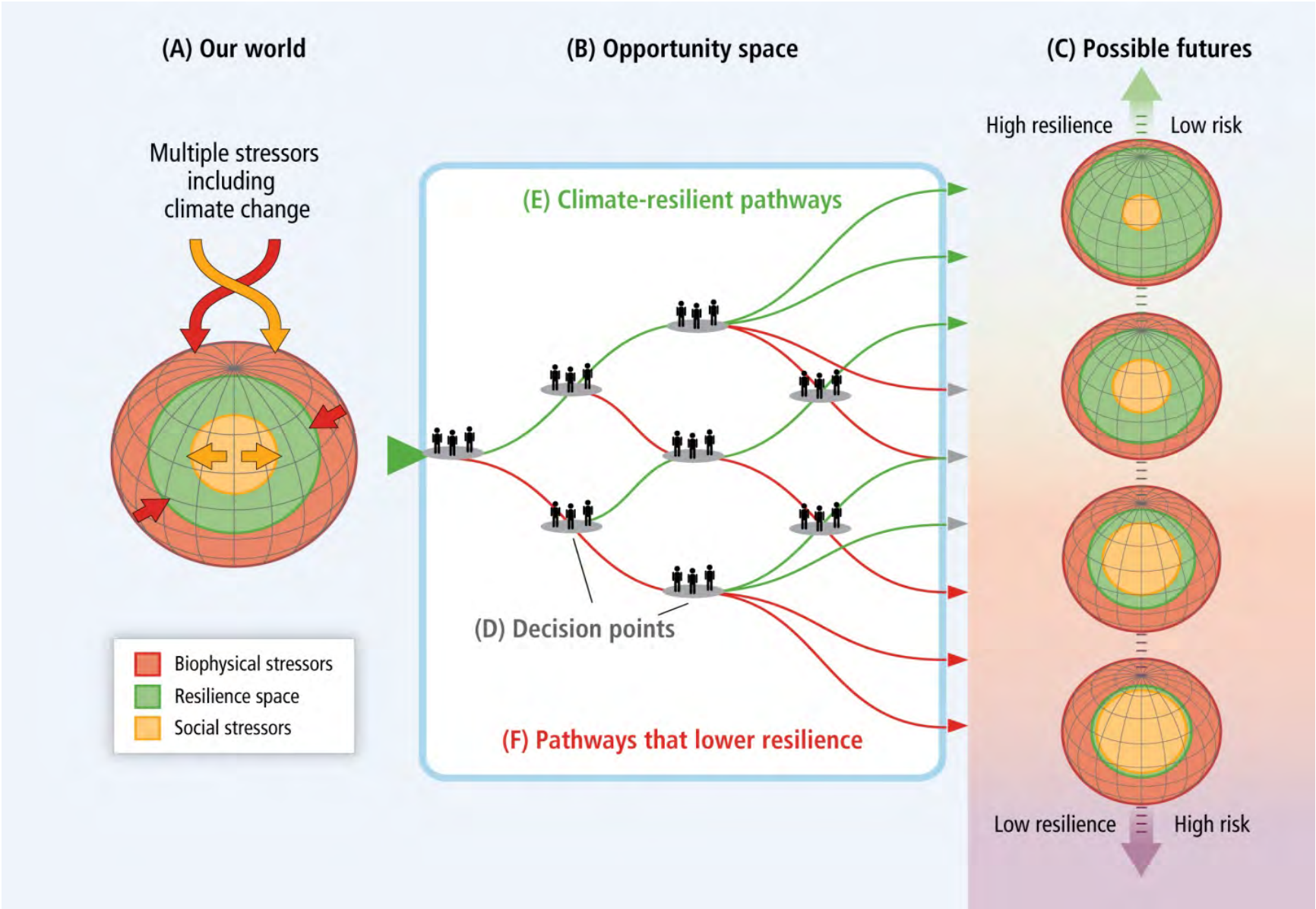
New social movements

Synthesis: Some potential social science contributions

Social enquiry in order to:	Which can help to:
Understand people's perceptions about climate change	Develop strategies to influence support for policies addressing emissions; design effective adaptation measures
Understand people's emotional responses to climate variability and chang	Influence behaviour; communicate climate science more effectively
Identify technological, political, economic, and social trends and forces influencing the climate system	Identify the best opportunities and processes for transformational change
Understand how adaptation plans and action decisions are made	Improve governance, planning and resource allocation
Social difference and its links to climate vulnerability	Target adaptation support; helping to give a voice to marginalized people
Reveal vested interests, networks of influence and the exercise of power	Challenge power, support climate justice and get to agreement on emissions controls?

Pathways to a future on a resilient planet

(IPCC_AR5 WGII)



PEOPLE'S CLIMATE MOBILISATION

QUEST-Fish

Manuel Barange
Gorka Merino

Cassandra de Young
Doris Soto

Hannah Bassett