UNFCCC Research Dialogue Special Event

WASP Science and Adaptation Policy Briefs: Launch and Stakeholder Engagement

November 24, 16:00 – 17:00 pm CET

Introduction to the Science for Policy Briefs

Jean Palutikof

Griffith University, Gold Coast, Australia

With thanks to Ying Wang and Maarten Kappelle at UNEP for their hard work on the production of the Science for Policy Briefs

UNFCCC Research Dialogue Special Event, November 24 2020

WORLD ADAPTATION SCIENCE PROGRAMME

Why the Science for Adaptation Policy Briefs?

- The Science for Adaptation Policy Brief (SfPb) Series is an initiative of WASP, the World Adaptation Science Programme.
- WASP brings together leading thinkers and practitioners in global adaptation. This unique group of experts has the knowledge and experience to understand the emerging adaptation challenges
- The skills and expertise of WASP members ensures they are uniquely positioned to deliver the evidence base for effective decision making through the SfPBs
- The SfPBs target researchers, policy-makers and practitioners to support them to bridge the science-policy-action interface

WORLD ADAPTATION SCIENCE PROGRAMME

The first three SfPBs: SfPB1

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WORLD ADAPTATION SCIENCE PROGRAMME

making science work for climate adaptation

Science for Adaptation
Policy Brief

#1

Adaptation decision-support tools and platforms

About the WASP and the Policy Briefs

- The *Science for Adaptation Policy Brief Series* is an initiative of the World Adaptation Science Programme (WASP). The briefs target researchers, policymakers and practitioners to help them bridge the science-policy-action interface.
- The WASP is led by the United Nations Environment Programme (UNEP), the World Meteorological Organization (WMO), the United Nations Framework Convention on Climate Change (UNFCCC), the Intergovernmental Panel on Climate Change (IPCC) and the Green Climate Fund (GCF). Its Secretariat is hosted at UNEP, Nairobi. The current Chair of the WASP is Mr. Youssef Nassef at the UNFCCC, Bonn.
- WASP's mission is to ensure researchers, policymakers and practitioners have the knowledge and capacity necessary to underpin effective adaptation to climate change.

Key messages

- Decision support for adaptation should be useful (relevant, comprehensive and reliable) and usable (accessible, authoritative, attractive and engaging).
- Failure to deliver successful decision support can arise because of misalignment between the expectations of users and what developers can deliver, misunderstanding and misrepresentation of user needs and capabilities by developers, and inappropriate application by users.
- Success can only be achieved through intensive engagement between developers and intended users at all stages from planning to implementation, evaluation and updating. This engagement may take the form of consultation, co-design and co-production, with the adaptation community contributing their real-life experience.
- Success requires long-term monitoring and evaluation of the effectiveness of decision support resources and tools as a basis for continuous learning and improvement to retain policy and practice relevance. In turn this requires sustained human and financial resources beyond the initial development phase.

What are decision-support tools and platforms?

Effective adaptation to climate change requires support for sound decision making and good practice. Over the past two decades, a proliferation of decision-making resources and tools has emerged to address this need. Generally delivered online, these range in sophistication from simple climate data delivery platforms to complex risk management frameworks providing data, guidance, tools and adaptation enablers (such as case studies and virtual or live engagements) to support adaptation. Most commonly they will be in some way targeted – at a geographic environment such as coasts or mountains, at a sector such as agriculture or infrastructure, or at particular user groups such as local government. They may be designed to be used by the designer/developer, or by a client, or by a third party such as a consultant.

These decision support resources go by many different names, which can lead to confusion. In Box 1, we introduce and define the terms used in this document.

UN environment programme · WORLD METEOROLOGICAL ORGANIZATION · United Nations Climate Change · ipcc · GREEN CLIMATE FUND

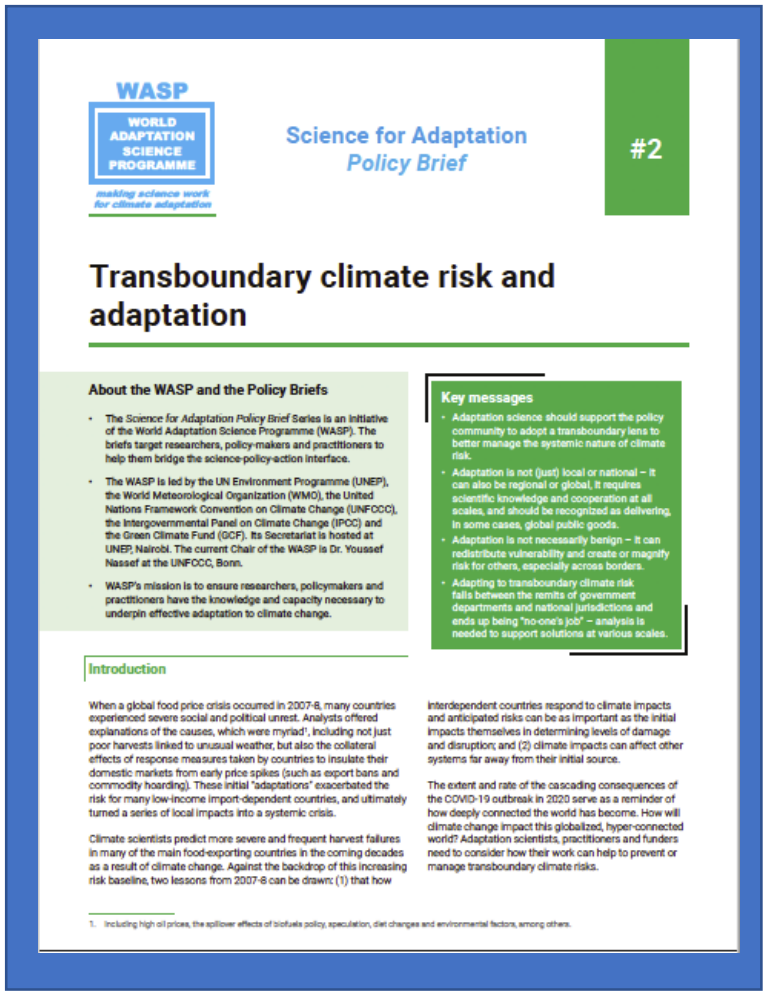
Adaptation decision support tools and platforms

Roger Street, University of Oxford

Jean Palutikof, Griffith University

Development of successful tools for adaptation requires long-term engagement between developers and practitioners, effective programmes of monitoring and evaluation, and long-term resourcing

The first three SfPBs: SfPB2



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Policy Brief

#2

Transboundary climate risk and adaptation

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- WASP's mission is to ensure researchers, policymakers and practitioners have the knowledge and capacity necessary to underpin effective adaptation to climate change.

Key messages

- Adaptation science should support the policy community to adopt a transboundary lens to better manage the systemic nature of climate risk.
- Adaptation is not (just) local or national – it can also be regional or global. It requires scientific knowledge and cooperation at all scales, and should be recognized as delivering, in some cases, global public goods.
- Adaptation is not necessarily benign – it can redistribute vulnerability and create or magnify risk for others, especially across borders.
- Adapting to transboundary climate risk falls between the remits of government departments and national jurisdictions and ends up being "no-one's job" – analysis is needed to support solutions at various scales.

Introduction

When a global food price crisis occurred in 2007-8, many countries experienced severe social and political unrest. Analysts offered explanations of the causes, which were myriad[1], including not just poor harvests linked to unusual weather, but also the collateral effects of response measures taken by countries to insulate their domestic markets from early price spikes (such as export bans and commodity hoarding). These initial "adaptations" exacerbated the risk for many low-income import-dependent countries, and ultimately turned a series of local impacts into a systemic crisis.

Climate scientists predict more severe and frequent harvest failures in many of the main food-exporting countries in the coming decades as a result of climate change. Against the backdrop of this increasing risk baseline, two lessons from 2007-8 can be drawn: (1) that how interdependent countries respond to climate impacts and anticipated risks can be as important as the initial impacts themselves in determining levels of damage and disruption; and (2) climate impacts can affect other systems far away from their initial source.

The extent and rate of the cascading consequences of the COVID-19 outbreak in 2020 serve as a reminder of how deeply connected the world has become. How will climate change impact this globalized, hyper-connected world? Adaptation scientists, practitioners and funders need to consider how their work can help to prevent or manage transboundary climate risks.

1. Including high oil prices, the spillover effects of biofuels policy, speculation, diet changes and environmental factors, among others.

Transboundary climate risk and adaptation

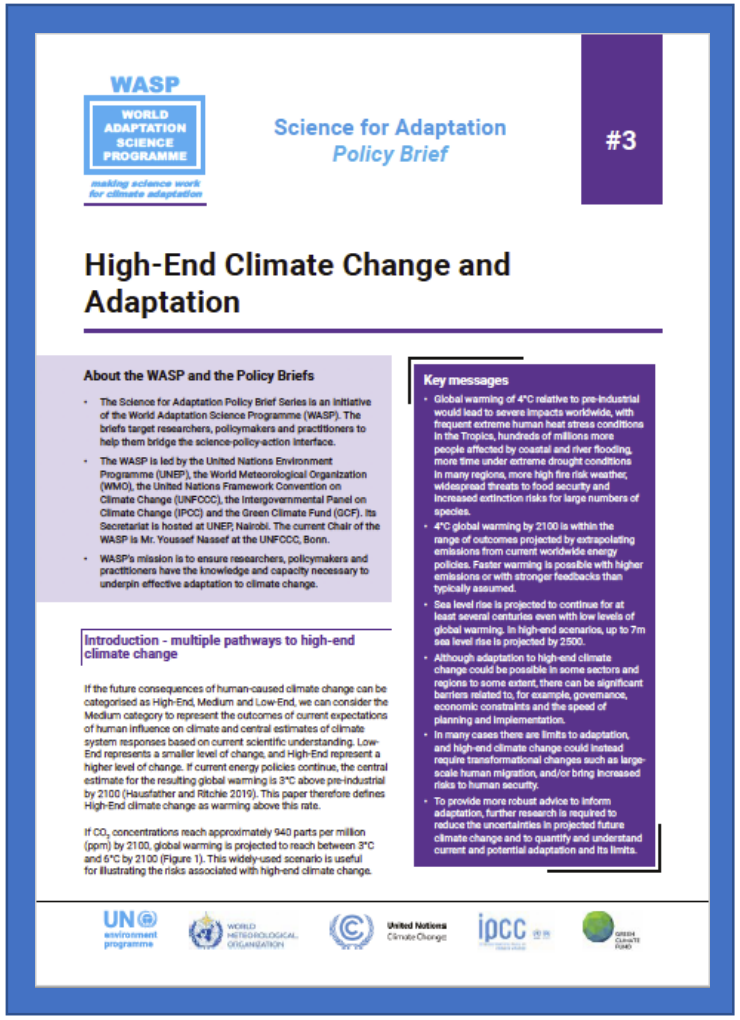
Magnus Benzie , Katy Harris

Stockholm Environment Institute, on behalf of the Adaptation Without Borders Initiative

Adaptation is not necessarily benign – it can redistribute vulnerability and create or magnify risk for others, especially across borders

Adaptation science should support the policy community to adopt a transboundary lens to better manage the systemic nature of climate risk

The first three SfPBs: SfPB3



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Policy Brief

#3

High-End Climate Change and Adaptation

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Introduction - multiple pathways to high-end climate change

If the future consequences of human-caused climate change can be categorised as High-End, Medium and Low-End, we can consider the Medium category to represent the outcomes of current expectations of human influence on climate and central estimates of climate system responses based on current scientific understanding. Low-End represents a smaller level of change, and High-End represent a higher level of change. If current energy policies continue, the central estimate for the resulting global warming is 3°C above pre-industrial by 2100 (Hausfather and Ritchie 2019). This paper therefore defines High-End climate change as warming above this rate.

If CO_2 concentrations reach approximately 940 parts per million (ppm) by 2100, global warming is projected to reach between 3°C and 6°C by 2100 (Figure 1). This widely-used scenario is useful for illustrating the risks associated with high-end climate change.

Key messages

- Global warming of 4°C relative to pre-industrial would lead to severe impacts worldwide, with frequent extreme human heat stress conditions in the Tropics, hundreds of millions more people affected by coastal and river flooding, more time under extreme drought conditions in many regions, more high fire risk weather, widespread threats to food security and increased extinction risks for large numbers of species.
- 4°C global warming by 2100 is within the range of outcomes projected by extrapolating emissions from current worldwide energy policies. Faster warming is possible with higher emissions or with stronger feedbacks than typically assumed.
- Sea level rise is projected to continue for at least several centuries even with low levels of global warming. In high-end scenarios, up to 7m sea level rise is projected by 2500.
- Although adaptation to high-end climate change could be possible in some sectors and regions to some extent, there can be significant barriers related to, for example, governance, economic constraints and the speed of planning and implementation.
- In many cases there are limits to adaptation, and high-end climate change could instead require transformational changes such as large-scale human migration, and/or bring increased risks to human security.
- To provide more robust advice to inform adaptation, further research is required to reduce the uncertainties in projected future climate change and to quantify and understand current and potential adaptation and its limits.

UN environment programme · World Meteorological Organization · United Nations Climate Change · ipcc · Green Climate Fund

High-end climate change and adaptation

Richard Betts, UK Met Office

There are barriers and limits to adaptation, especially at high levels of warming, which may require transformational changes such as large-scale human migration, with knock-on implications for human security

Thank you!

Adaptation decision-support tools and platforms

Science for Adaptation

Policy Brief #1

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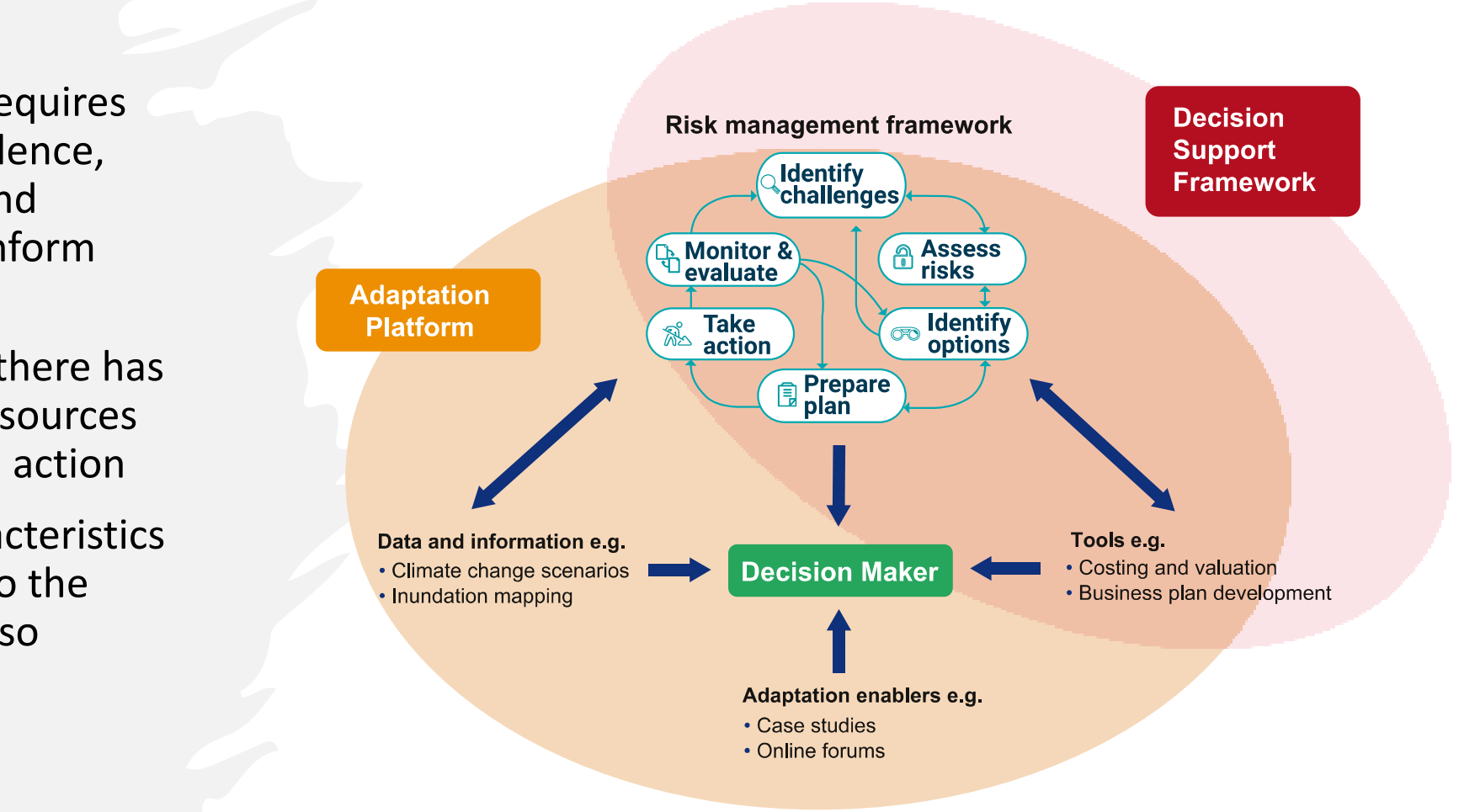
making science work for climate adaptation

Roger Street and Jean Palutikof

Adaptation platforms and decision-support frameworks

- Effective climate action requires support (knowledge, evidence, tools and advice) for sound decision making and to inform good practice.
- Over the past 3 decades there has been a proliferation of resources intended to support such action
- Each have different characteristics which can be beneficial to the intended audience but also challenging



Characteristics of ‘good’ adaptation decision support

Useful: relevant, comprehensive and reliable)

Usable (accessible, authoritative, attractive and engaging)

Implications:

- Require that developers have good knowledge and understanding of their targeted audience – decisions, framing, knowledge and capacity
- What is ‘useful’ and ‘usable’ will change depending on:
  - the nature and needs of the users – level of their understanding and capacity will define the level of support they require
- Co-design, co-production and co-evaluation working with representatives of the targeted audience are essential

Challenges to successful decision support

Intrinsic challenges

- *Potential for misalignment* between the expectations of users and what developers can deliver, including:
  - failure to deliver to user requirements; and
  - expectations that adaptation platforms will provide instant solutions
- *Limited understanding of their effectiveness* – the extent to which they are being used, by whom and for what purpose; and the extent to which they are useful.

Extrinsic challenges

- Lack of *sustained financial and human resources*
- Retaining policy and practice *relevance* – dynamic and evolving nature

Existing and emerging research and innovation gaps

Evaluation to understand the extent to which decision support resources effectively fulfil the needs of adaptation practitioners, and as a basis for updating and improvement.

- Development of evaluation mechanisms and metrics, including understanding and means of supporting co-evaluation

Objective comparative evaluation of the relative performance of decision-support resources

- To guide practitioners in making informed choices in the selection and application of decision support resources – utility and robustness of different approaches and point to areas needing further development

Exploration of **business models** to sustain decision support systems in the long-term.

Exploration of mechanisms (e.g., communities of practice) that would **support/enable cross-fertilisation of ideas** within and between the communities of developers and practitioners.

Thank you!

Transboundary climate risk and adaptation

World Adaptation Science Programme
Special Event

UNFCCC Research Dialogue,

24 November 2020

SEI Stockholm Environment Institute

Adaptation Without Borders

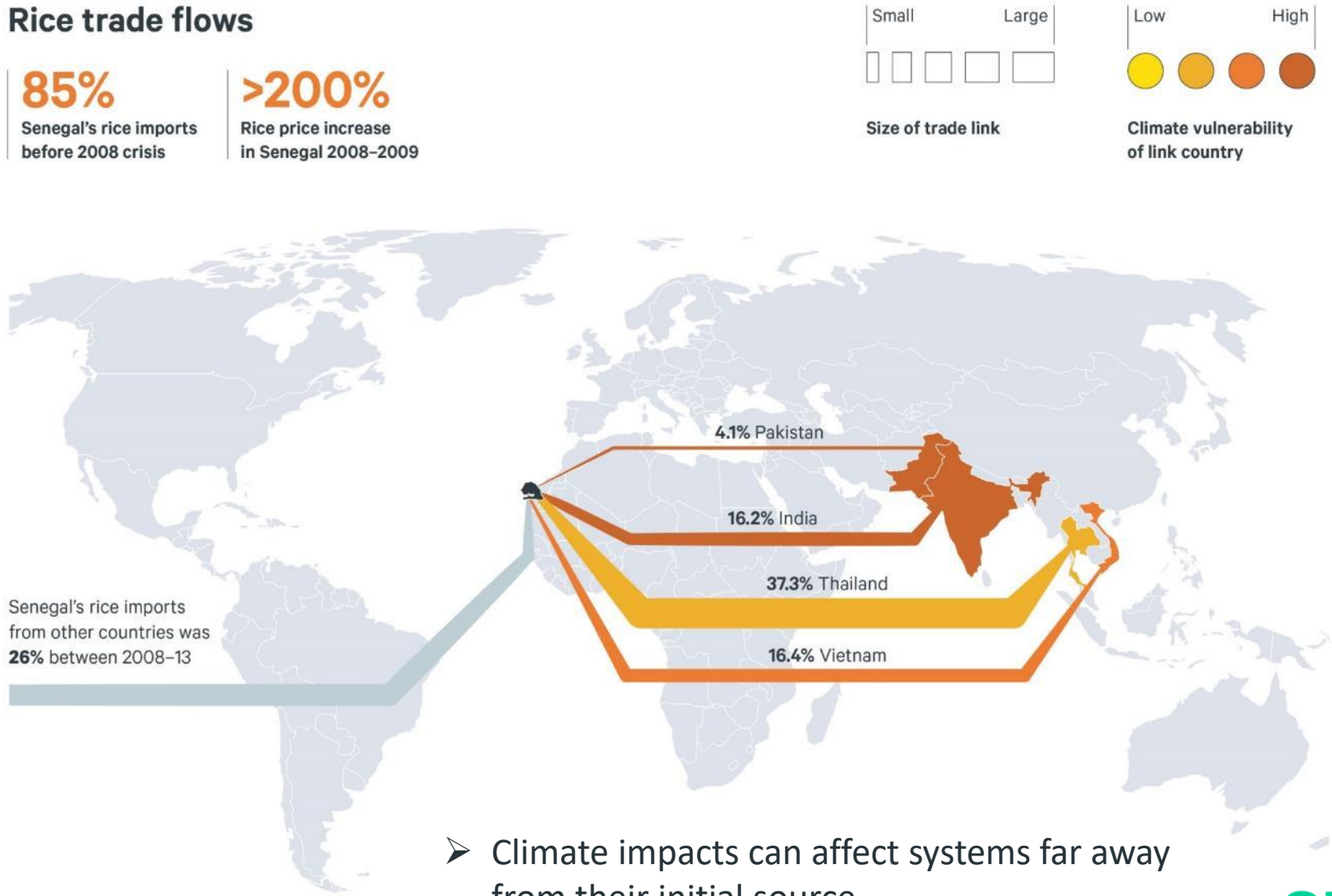
Magnus Benzie & Katy Harris

Senegal

Rice trade flows

85%
Senegal's rice imports before 2008 crisis

>200%
Rice price increase in Senegal 2008–2009



Source: UN comtrade & Schletz (2014).

- Climate impacts can affect systems far away from their initial source
- Adaptation responses determine levels of damage and disruption

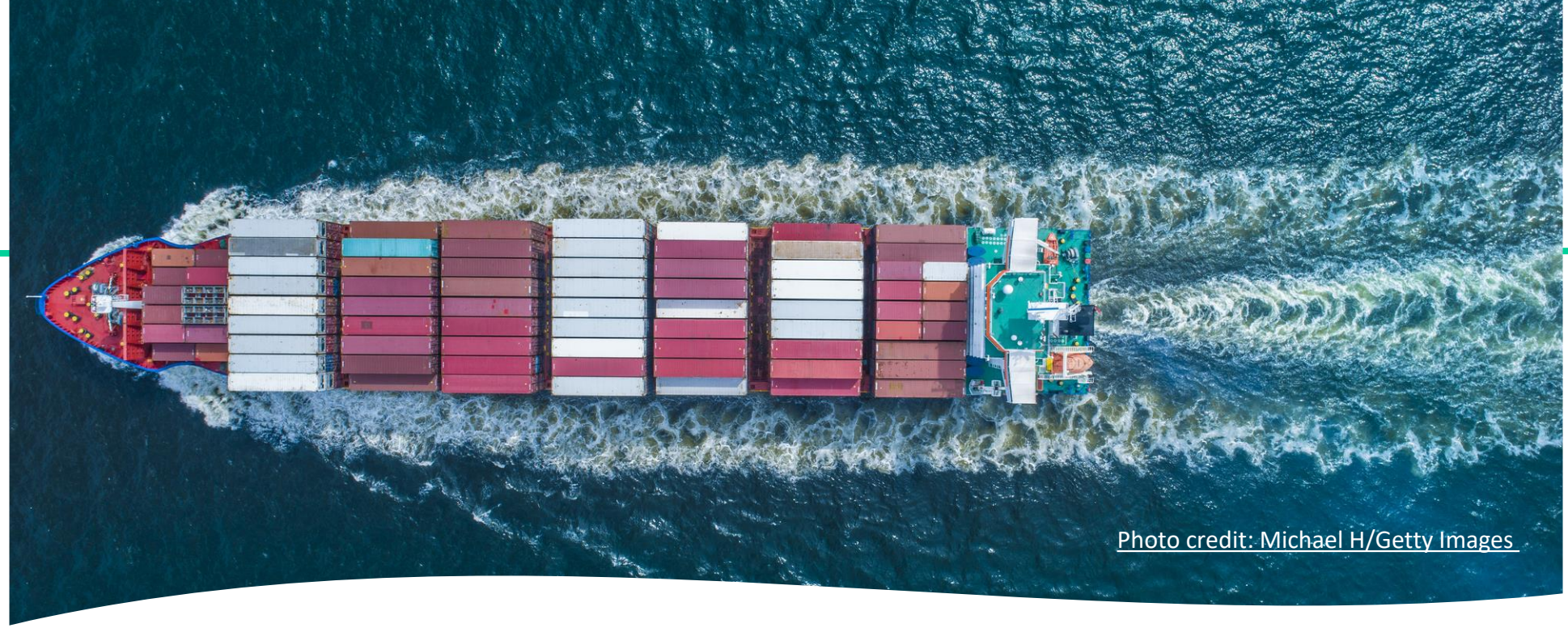


Photo credit: Michael H/Getty Images

Transboundary climate risks

- The impacts of climate change that cross national borders
- The effects of adaptation actions that cascade across nation states

We currently know very little about how countries, communities and companies will be exposed to transboundary climate risk.

Key messages

1. **Adaptation is not (just) local or national** – it can also be regional or global, it requires scientific knowledge and cooperation at all scales, and should be recognized as delivering, in some cases, global public goods.
2. **Adaptation is not necessarily benign** – it can redistribute vulnerability and create or magnify risk for others, especially across borders.
3. **Adapting to transboundary climate risk falls between the remits of government departments and national jurisdictions and ends up being "no-one's job"** – analysis is needed to support solutions at various scales.
4. **Adaptation science should support the policy community to adopt a transboundary lens** to better manage the systemic nature of climate risk.

The idea that countries, communities and companies can adapt in isolation is hard to accept in an interconnected world, but this is the implicit assumption behind much of mainstream adaptation research and practice. Responding to the global nature of the adaptation challenge will not be easy, but it could inject new momentum and spark new kinds of cooperation on adaptation – raising the bar to the benefit of all.

WASP Position Paper: Transboundary climate risk and adaptation

Adaptation Without Borders

THANK YOU

See the Virtual Poster Session **for examples of research outputs and more information about the Adaptation Without Borders global partnership.**

Title: *Managing transboundary climate risks to meet the global challenge of adaptation*

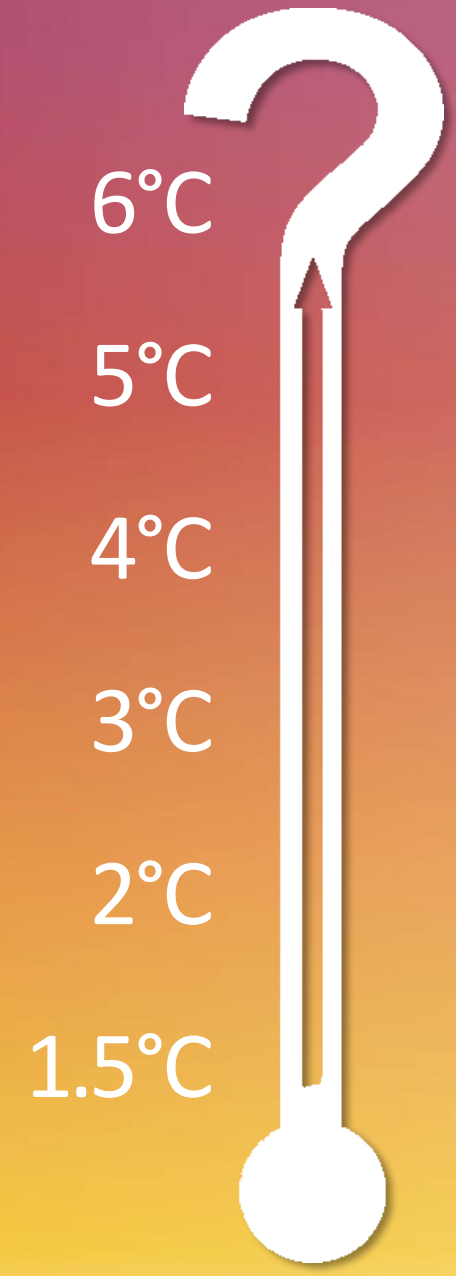
magnus.benzie@sei.org
katy.harris@sei.org

SEI Stockholm Environment Institute

Thank you!

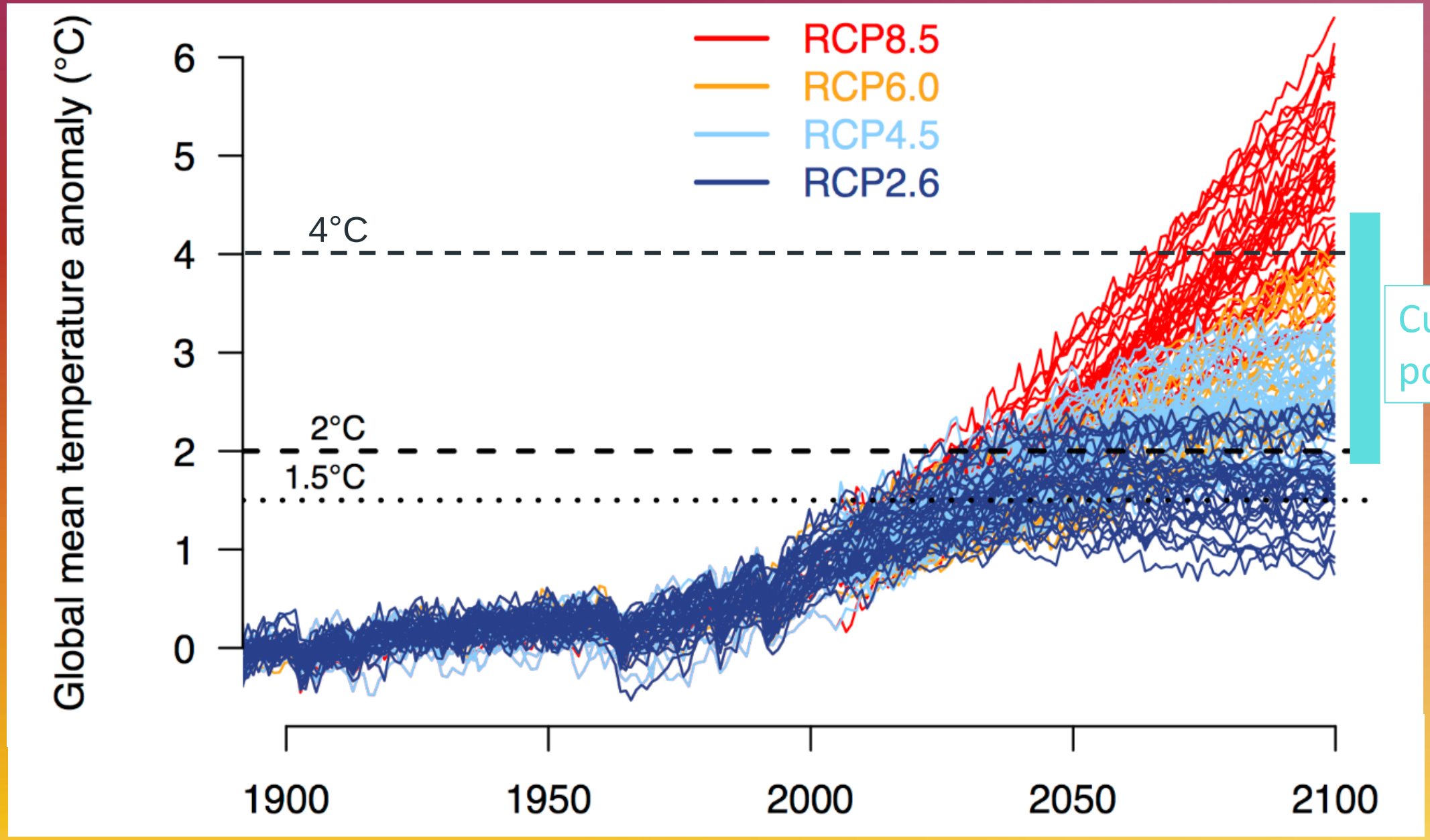
High-End Climate Change and Adaptation

Prof Richard Betts MBE



World Adaptation Science Programme Special Event,
Twelfth Meeting of the SBSTA Research Dialogue, 24th November 2020

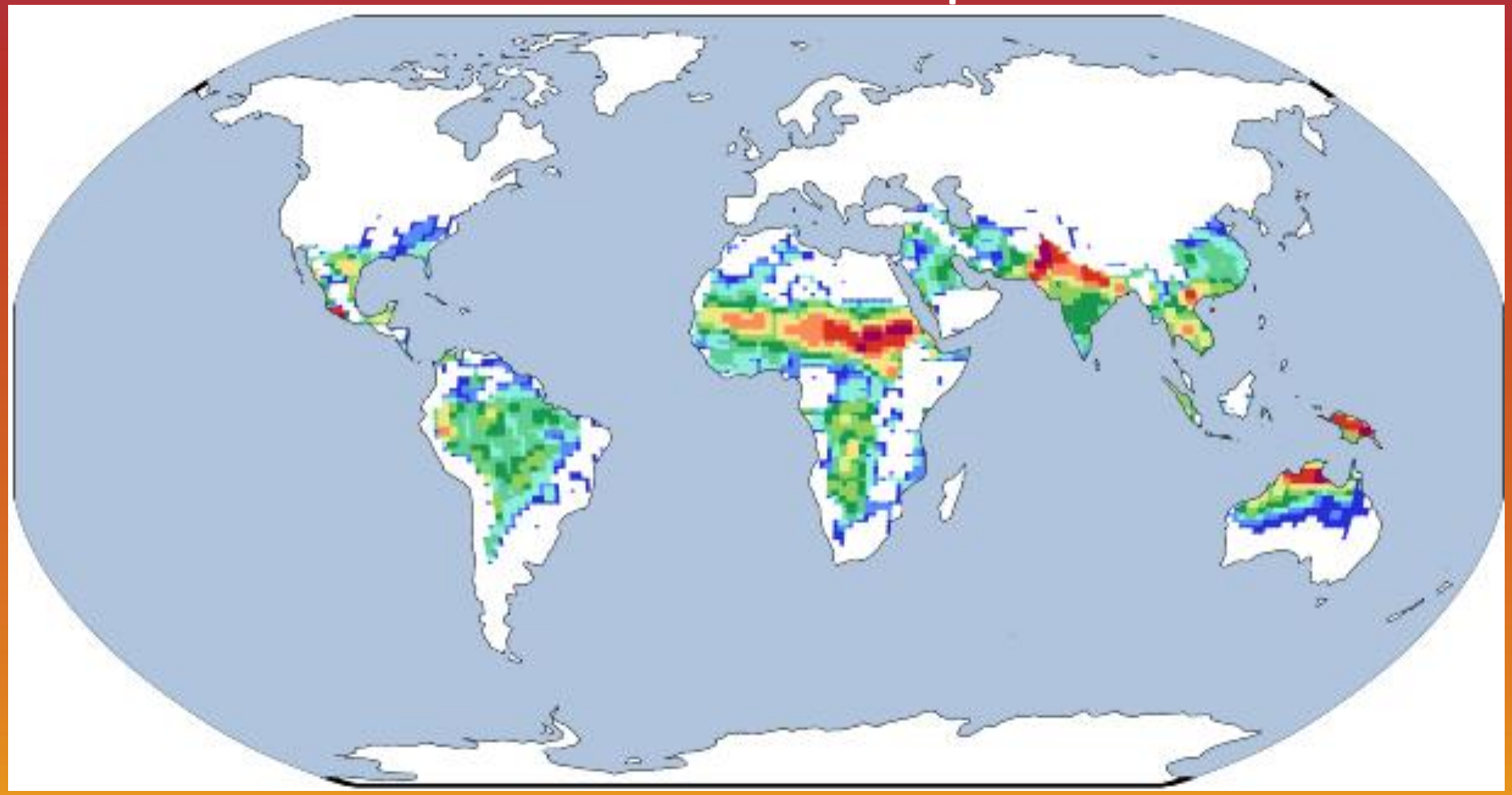
Projections from multiple climate models



HEAT STRESS: % of summer days with Extreme Risk (maximum Wet Bulb Globe Temperature above 32°C)

4°C global warming

Average from several climate models



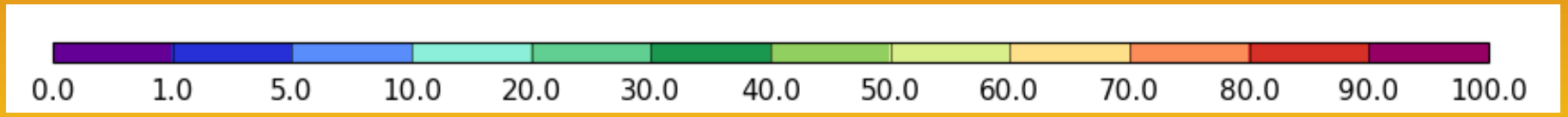
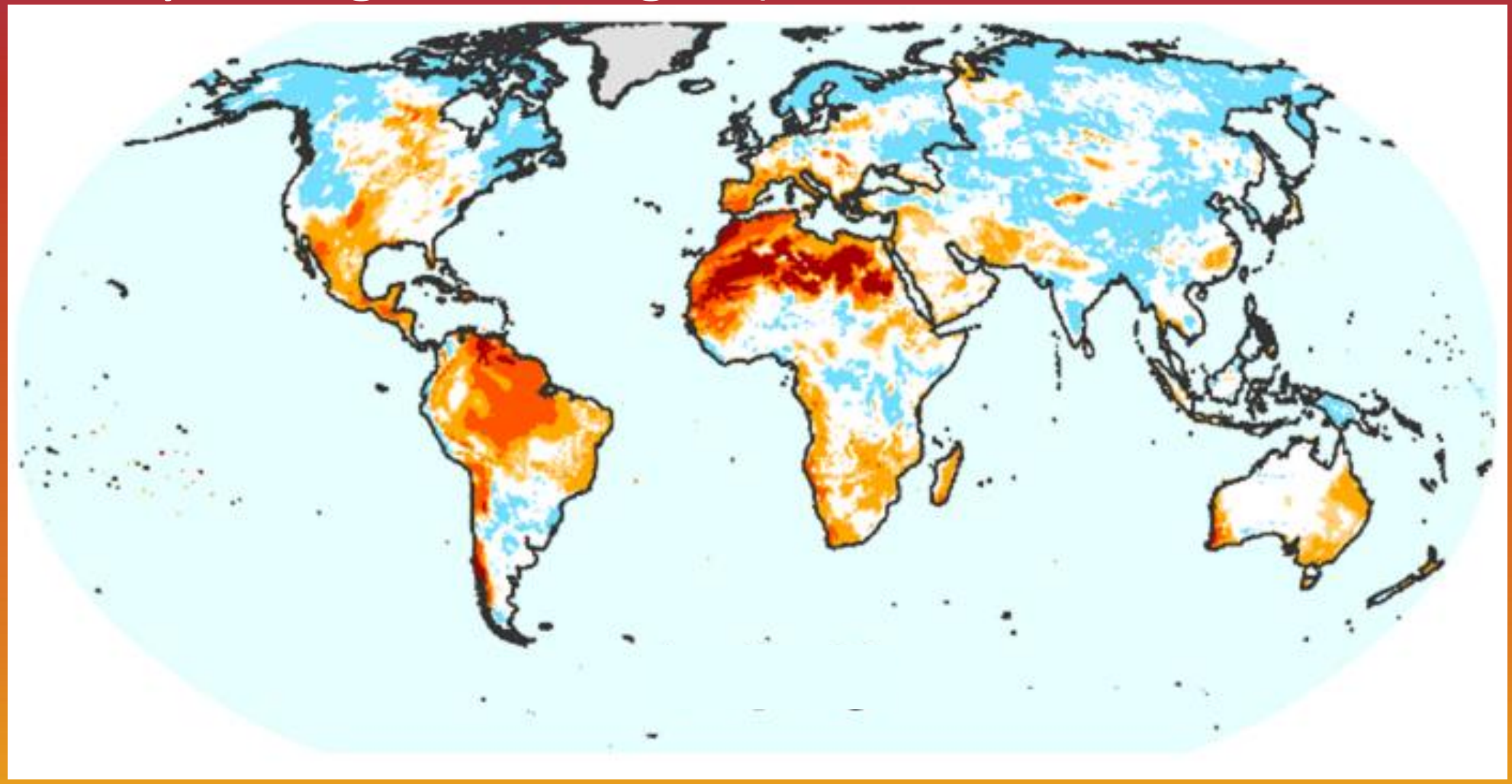


Figure by Laila Gohar

DROUGHT: Change in % of time under extreme hydrological drought (standardised runoff index)

4°C global warming

Average from several climate models

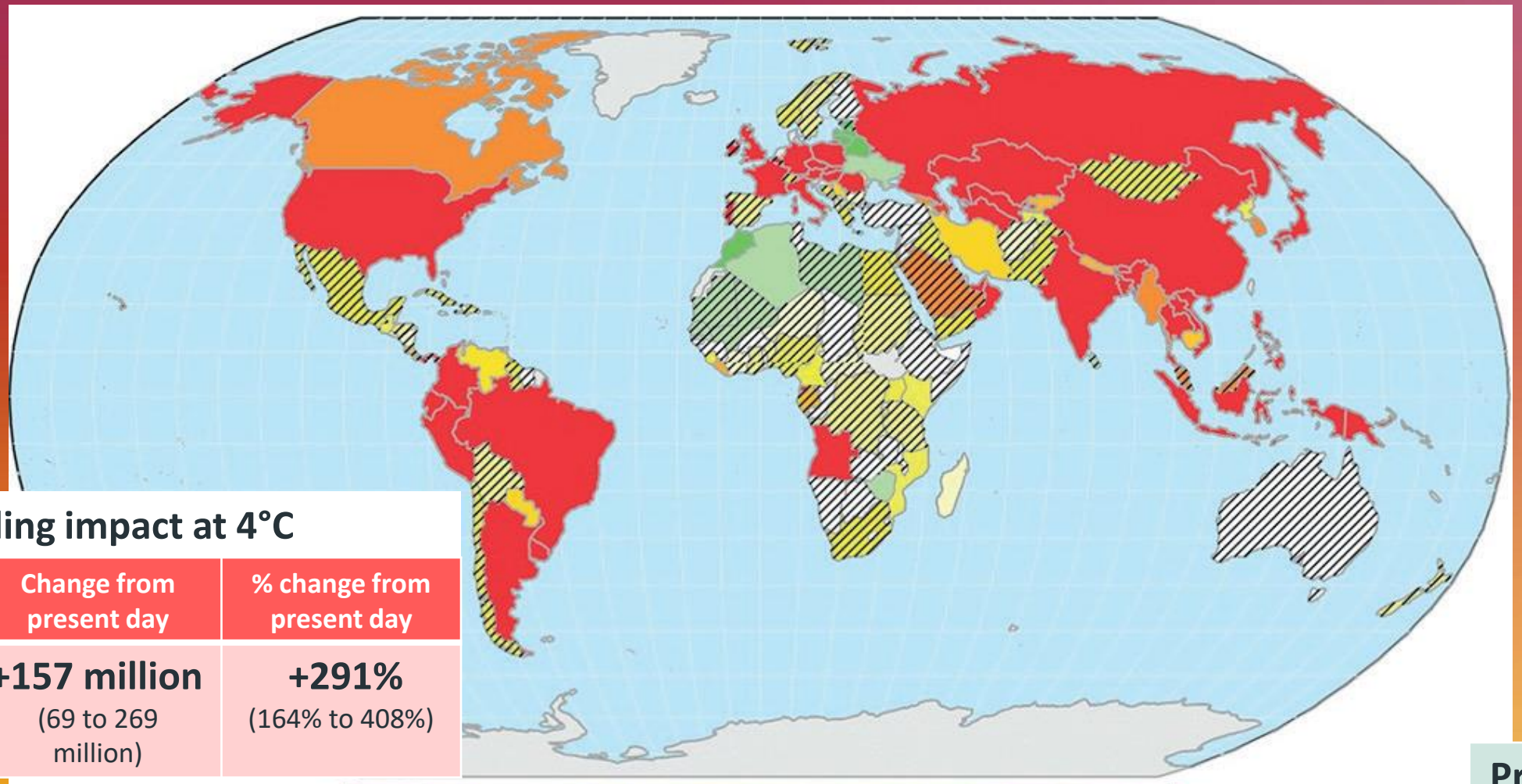


Koutroulis *et al*. (2019)

RIVER FLOODING: % change in people affected per year

4°C global warming

Average from several climate models



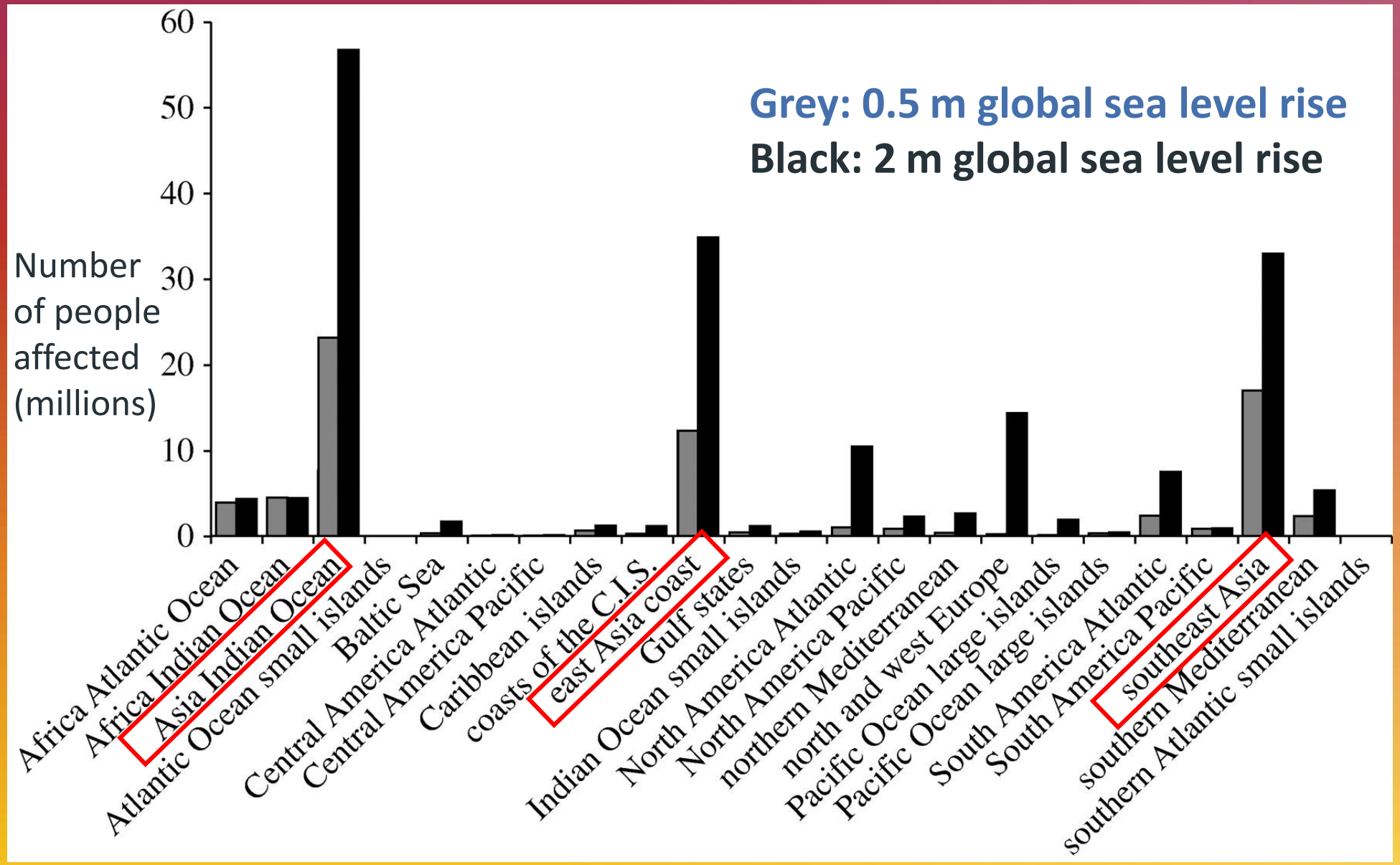
Flooding impact at 4°C

Number of people affected	Change from present day	% change from present day
211 million (111 to 335 million)	**+157 million** (69 to 269 million)	**+291%** (164% to 408%)

Present day: 54 million (42 to 66 million)

Alfieri *et al.* (2016)

COASTAL FLOODING: people affected by high-end sea level rise



Assumed population projection: SRES A1B for 2100

Nicholls *et al.* (2011)

• 4°C global warming by 2100 could occur with current worldwide energy policies

• This would lead to severe impacts and risks worldwide
- frequent extreme human heat stress conditions in the Tropics
- hundreds of millions more people affected by coastal and river flooding
- more time under extreme drought conditions in many regions

• Sea level rise is projected to continue for at least several centuries even with low levels of global warming

• Some adaptation could be possible, but there can be significant barriers

• Limits to adaptation mean transformational changes may be needed, large-scale migration

• Increased risks to human security

Research Dialogue Poster Q&A

November 24th
17:00 – 18:00

Questions for experts of the Integrated Assessment Modelling Community, the Joint Group of Experts on the Scientific Aspects of Marine Pollution, ICLEI – Local Governments for Sustainability,
and from Switzerland and Saudi Arabia