

Le GIEC, 2°C et 1,5°C

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Institut Pierre-Simon Laplace

<http://www.ipsl.fr/>

GIEC : Trois Groupes



Groupe 1
Science du climat



Groupe 2
Impact, adaptation
et vulnérabilité



Groupe 3
Atténuation du
changement climatique

Le GIEC a été établi en 1988 par l'Organisation Météorologique Mondiale (WMO) et le Programme des Nations Unies pour l'Environnement (UNEP)

La méthode

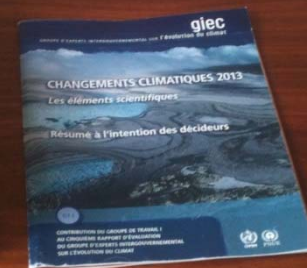
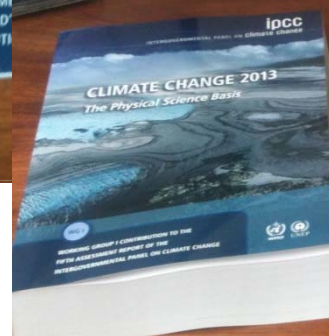
Revue de la littérature
scientifique
Conclusions sur le
changement climatique

Rapport
complet
(500-1000
pages)



"Résumé pour les décideurs"
(20-30 pages)

Et la communication grand
public qui va avec...



WGI-AR6

Summary for Policy Makers

Technical Summary

Chapter 1: Framing, context, methods

Chapter 2: Changing state of the climate

Chapter 3: Human influence on the climate

Chapter 4: Future global climate: scenario-based projections and near-term information

Chapter 5: Global carbon and other biogeochemical cycles and feedbacks

Chapter 6: Short-lived climate forcers

Chapter 7: The Earth's energy budget, climate feedbacks, and climate sensitivity

Chapter 8: Water cycle changes

Chapter 9: Ocean, cryosphere, and sea level change

Chapter 10: Linking global to regional climate change

Chapter 11: Weather and climate extreme events in a changing climate

Chapter 12: Climate change information for regional impact and for risk assessment

ANNEXES

Regional Atlas Cross Working Group

Glossary Technical Annexes

List of Acronyms

List of Contributors, List of Reviewers, INDEX

2018

IPCC AR6 WGI SCHEDULE (19 July 2018)

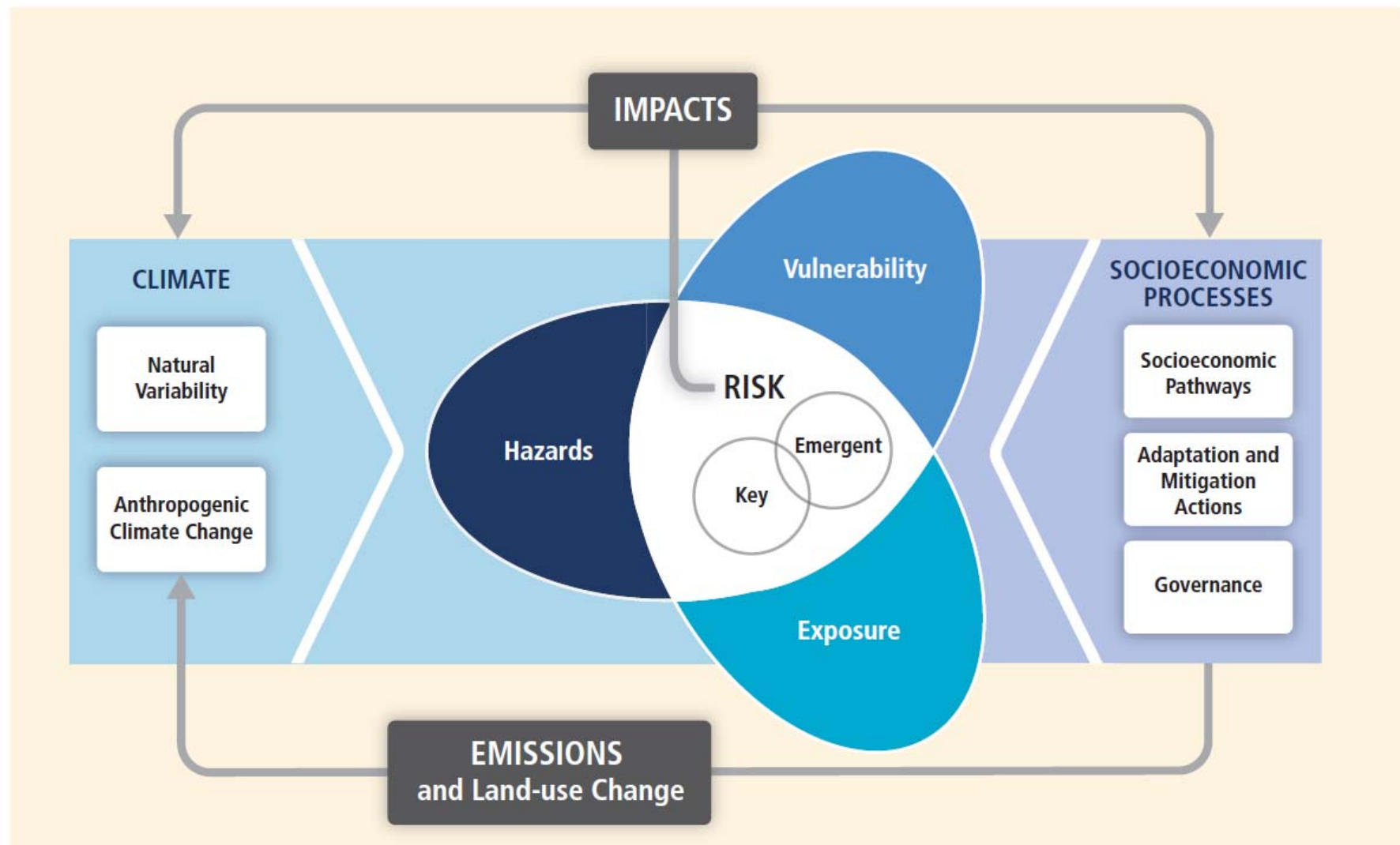
JUNE	25-29 June First Lead Author Meeting (LAM1)
OCT	14 October Submission of the Internal Draft to the TSU 15-28 October TSU compile Internal Draft 29 October - 25 November Internal Review of the Internal Draft
DEC	3 December TSU sends compiled Review Comments to CLAs
JAN	7-12 January Second Lead Author Meeting (LAM2)
APRIL	7 April Submission of the First Order Draft (FOD) to TSU 8-21 April TSU compiles FOD 29 April - 23 June Expert Review of FOD
JULY	1 July TSU sends compiled Review Comments to CLAs
AUG	26-31 August Third Lead Author Meeting (LAM3)
OCT	7 October Comment responses & RE First interim report due to TSU
DEC	31 December <i>Literature submission cut off</i>
JAN	12 January Submission of the Second Order Draft (SOD) to TSU 13-26 January TSU compile SOD
MAR	2 March - 26 April Expert and Government Review of the SOD and of the FOD of the Summary for Policy Makers (SPM)
MAY	4 May TSU send compiled Review Comments to CLAs
JUNE	1-6 June Fourth Lead Author Meeting (LAM4) 29 June RE second Interim report due to TSU
JULY	27 July SOD Review Comments response due to TSU
SEPT	30 September <i>Literature acceptance cut off</i>
OCT	18 October Submission of the Final Draft (FGD) to TSU 19 October - 1 November TSU compiles FGD
DEC	7 December - 31 January Final Government Distribution
FEB	8 February TSU send compiled Review Comments to SPM Drafting Team
APR	12-16 April IPCC 54 - Approval Session

2019

2020

2021

Le cadre des risques



Le « rapport à 1.5° »

This report responds to the invitation for IPCC ‘... to provide a Special Report in 2018 on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways’ contained in the Decision of the 21st Conference of Parties of the United Nations Framework Convention on Climate Change to adopt the Paris Agreement.¹

[REPORT HOME](#) [SUMMARY FOR POLICYMAKERS](#) [TABLE OF CONTENTS](#)

SPECIAL REPORT

Global Warming of 1.5 °C

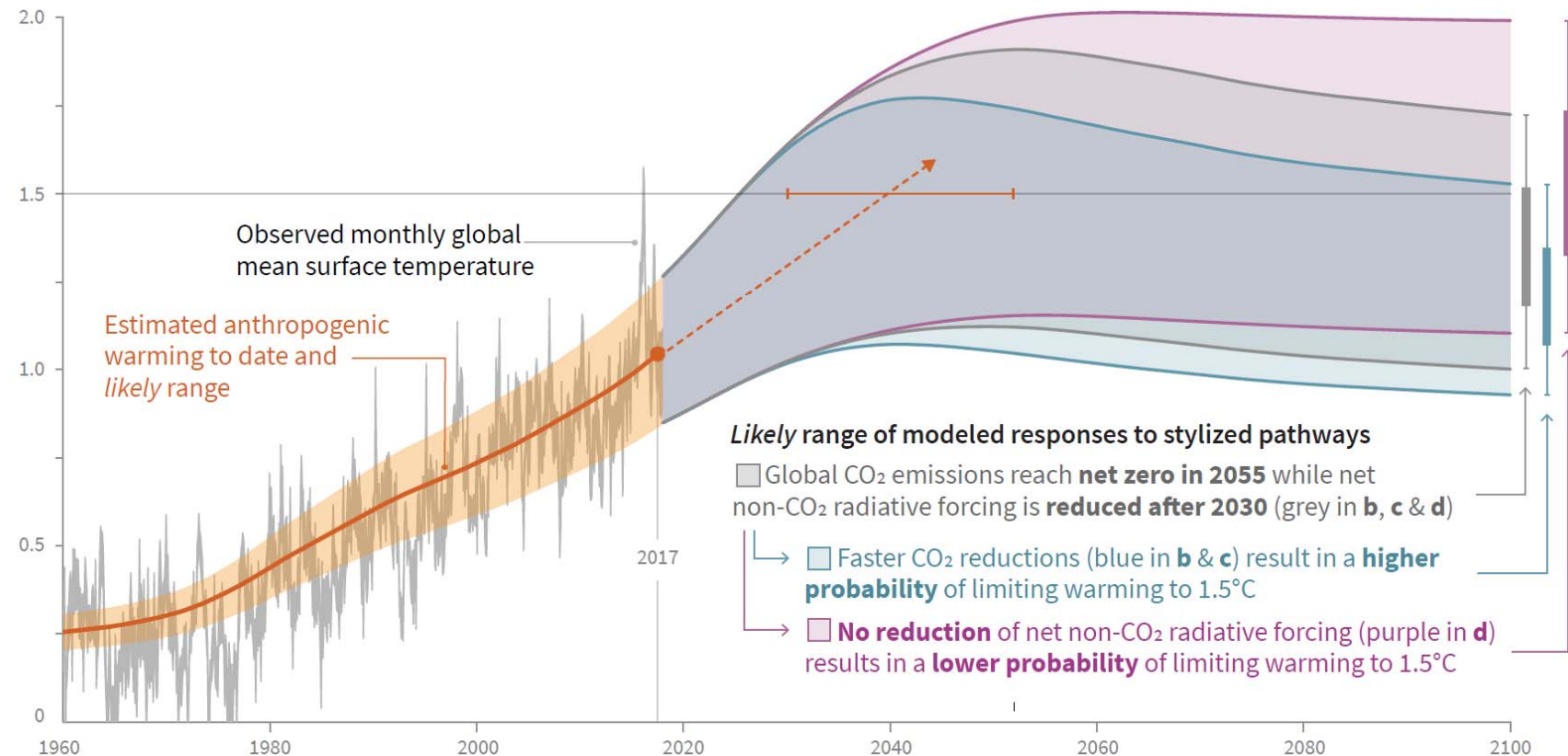
An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

S	Summary for Policymakers
1	Chapter 1 Framing and Context
2	Chapter 2 - Mitigation pathways compatible with 1.5°C in the context of sustainable development
3	Impacts of 1.5°C of Global Warming on Natural and Human systems
4	Strengthening and Implementing the Global Response
5	Sustainable Development, Poverty Eradication and Reducing Inequalities
G	Glossary

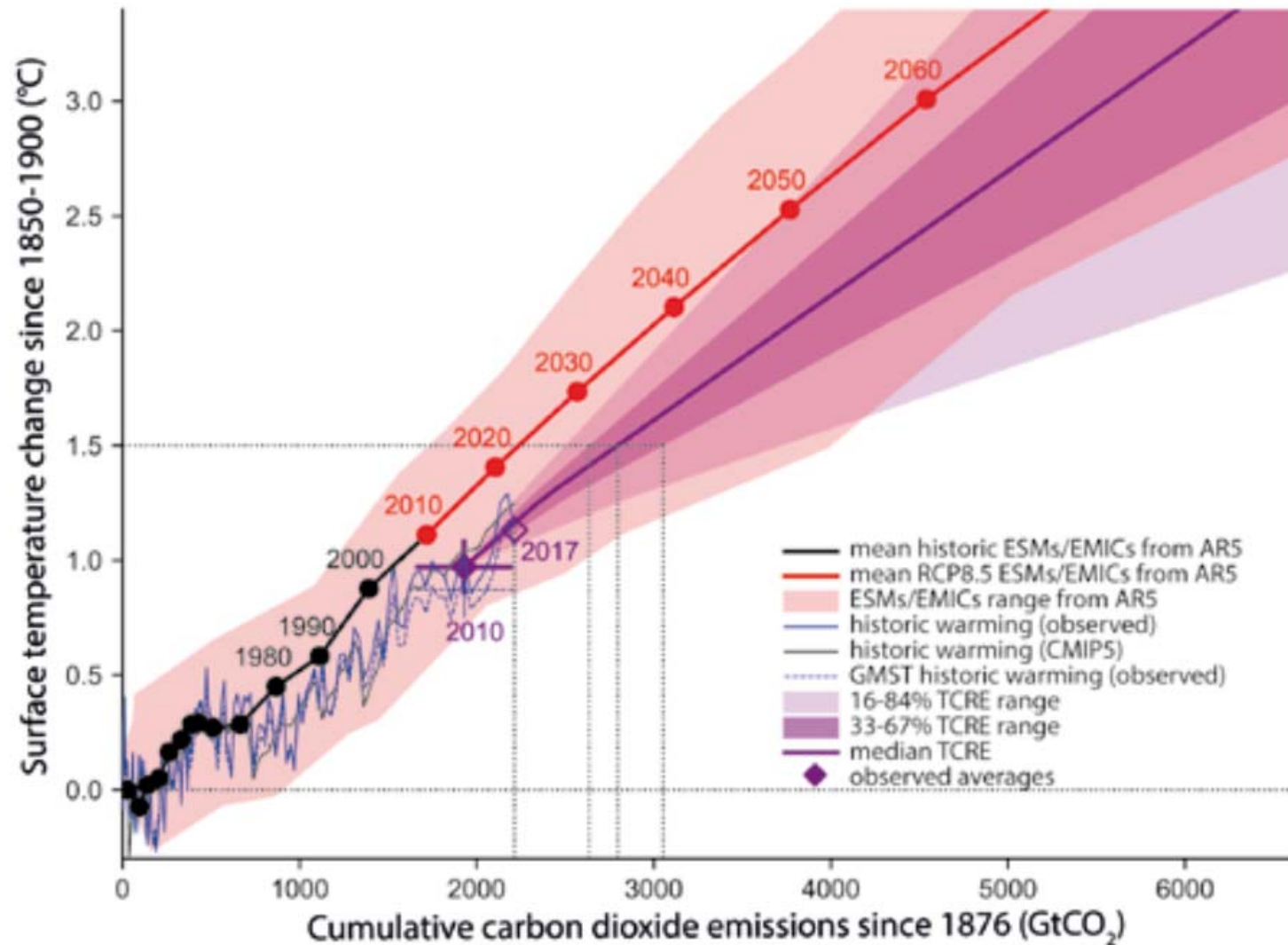
La question du « 1.5 »

a) Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways

Global warming relative to 1850-1900 (°C)



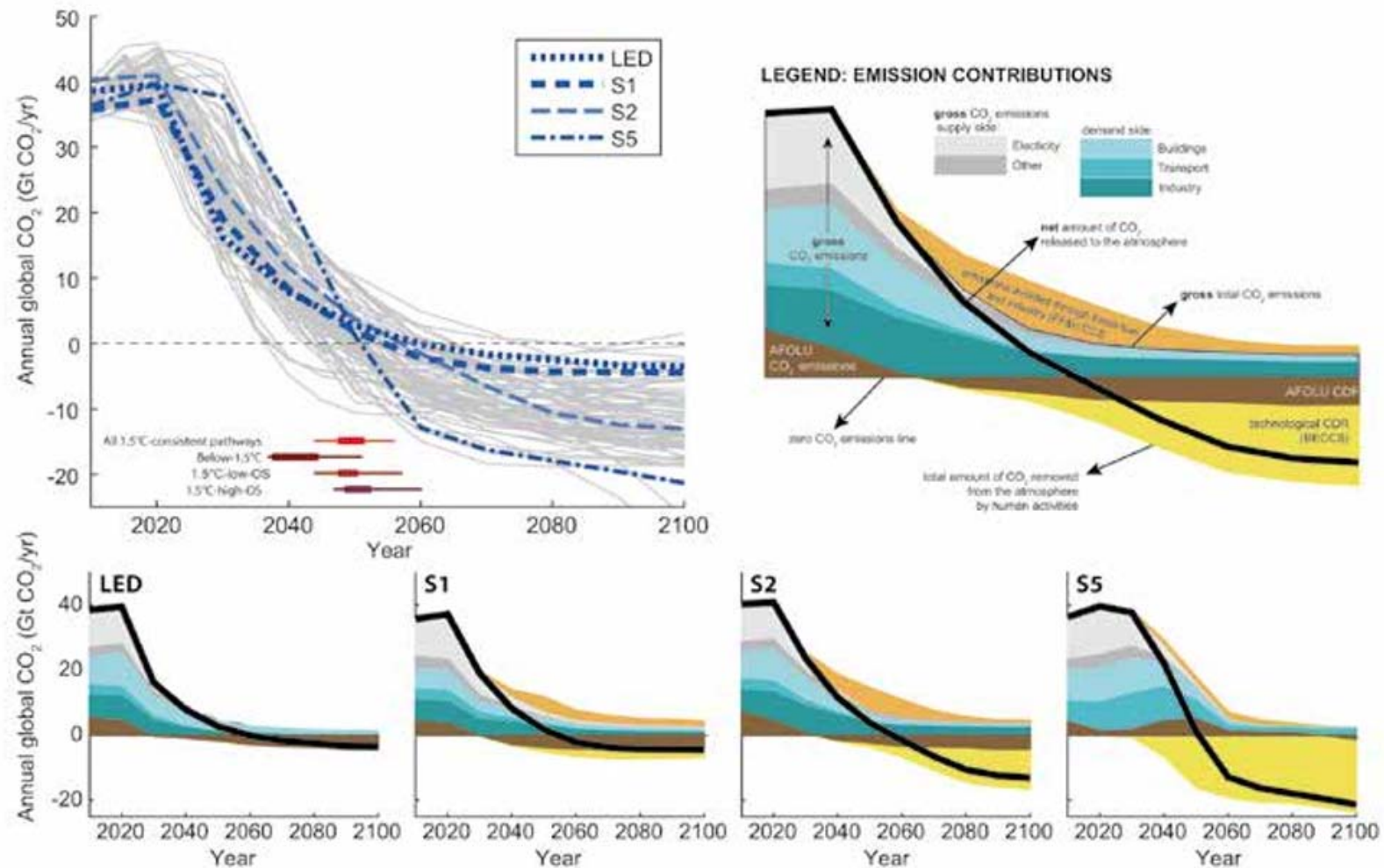
Le bilan carbone pour 1.5 degrés



Echelles de temps et scénarios

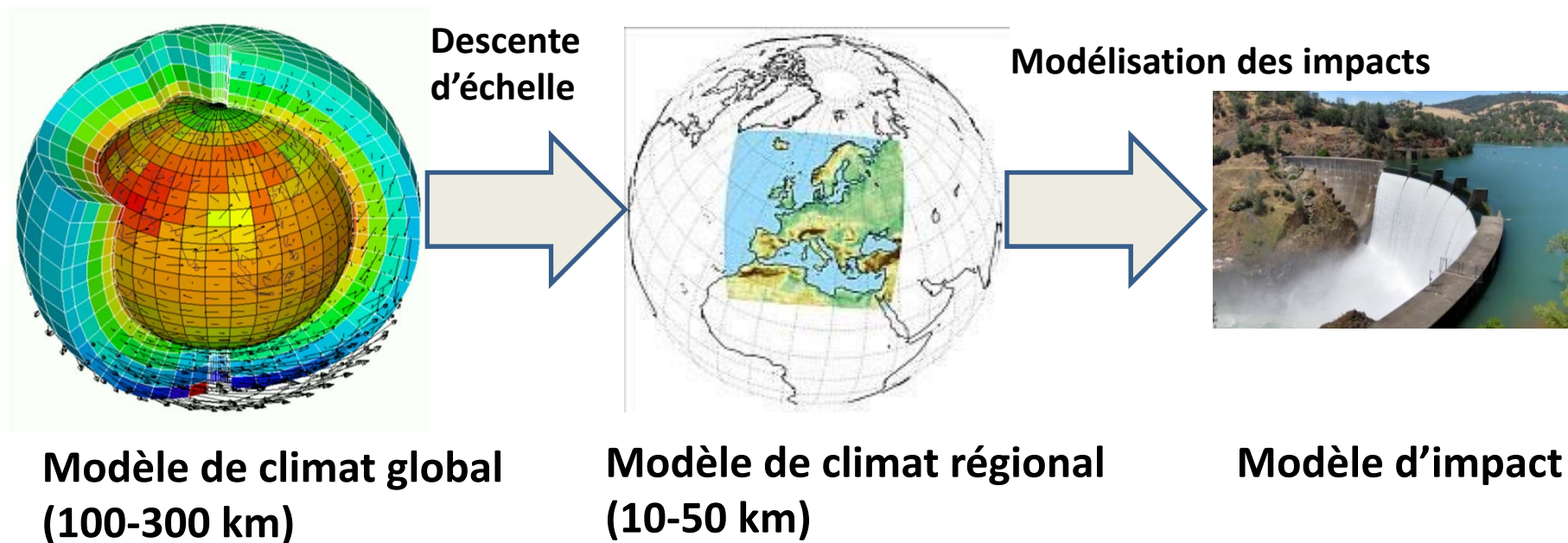
Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development

Chapter 2



Comment calcule-t-on le « climat
avec 2 degrés de réchauffement » et
ses impacts?

Utilisation d'observations, de modèles et méthodes statistiques



Utiliser toujours de multiples modèles pour statistiques fiables

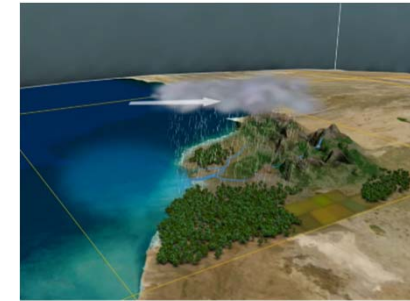
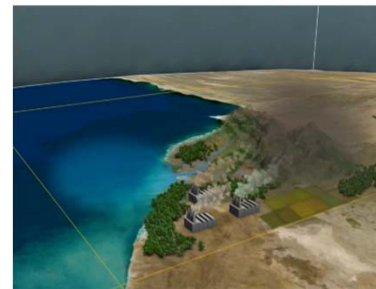
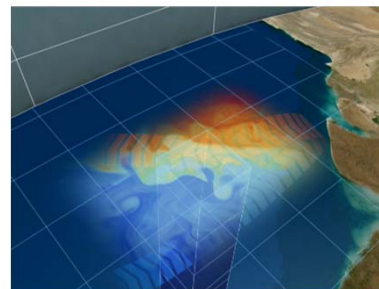
→ CMIP5: 30-40 modèles

→ EURO-CORDEX : ~35 modèles (résolution=12 km)



Institut
Pierre
Simon
Laplace

IPSL Climate Modelling Centre (IPSL-CMC)



INCA / REPROBUS
(chimie atmosphérique)
(aérosol)

ORCHIDEE
(surfaces continentales)
(végétation)

LMDZ
(atmosphère)

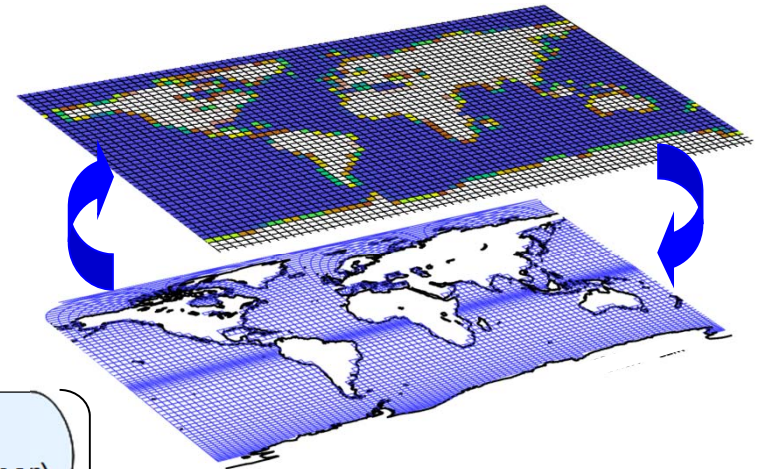
OASIS
(coupleur)

OPA
(océan)

LIM
(glace de mer)

PISCES
(biogéochimie marine)

NEMO

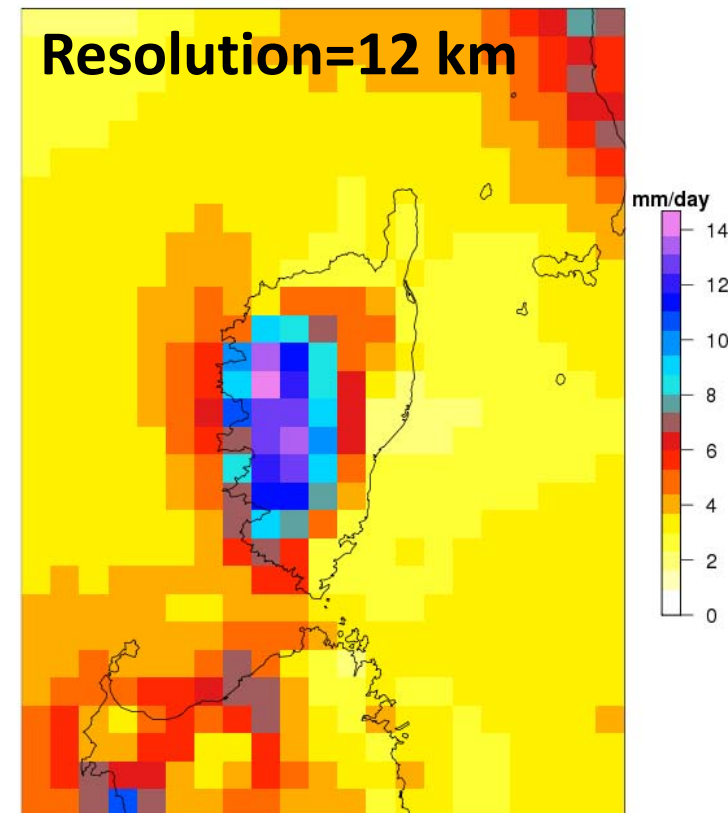
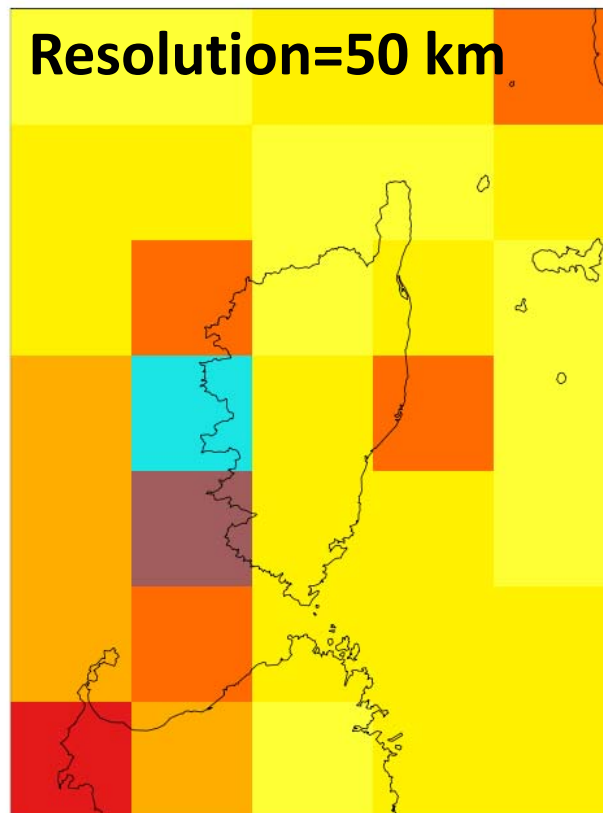


<https://cmc.ipsl.fr/>

Part of CLIMERI:

<http://climeri-france.fr>

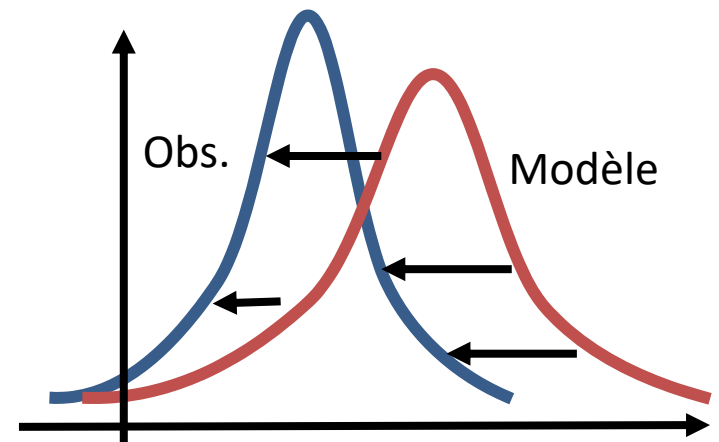
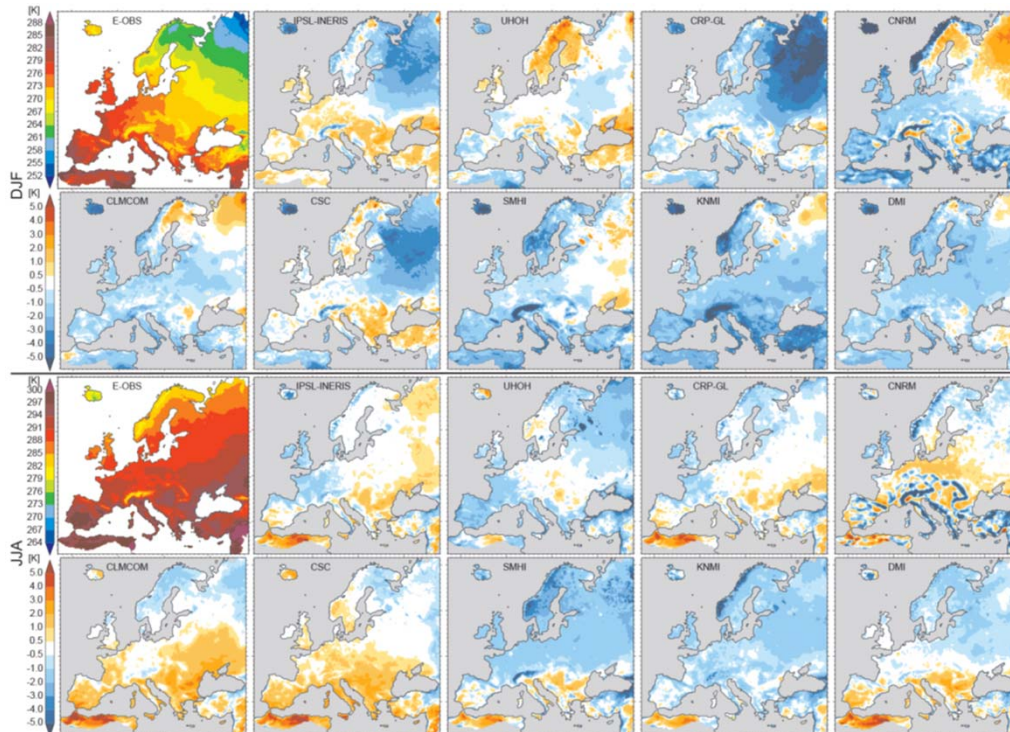
Orography effects better resolved at higher resolution!



Simulated daily precipitation amount

Méthodes statistiques

Evaluation des incertitudes, ajustement des biais:
méthodes statistiques en développement



Méthode des quantiles (exemple)

Biais de température des modèles euro-cordex

Le calcul et les données



ESGF: une infrastructure distribuée
Données entièrement publiques



Le calcul proche des données
bientôt indispensable



<https://esgf-node.ipsl.upmc.fr/>

(for expert users)

Combiner des informations de multiples sources

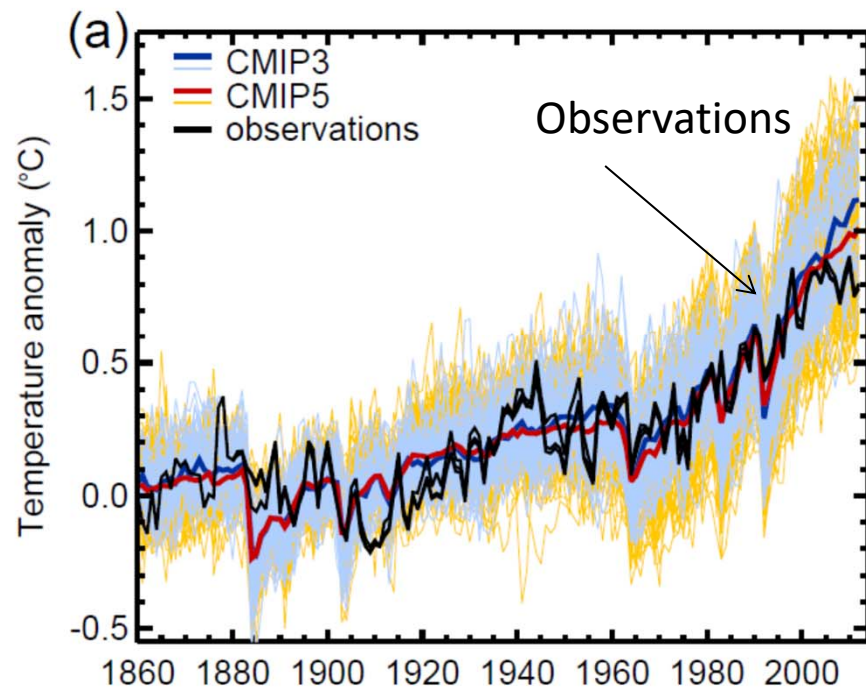
Changements passés

Projections existantes

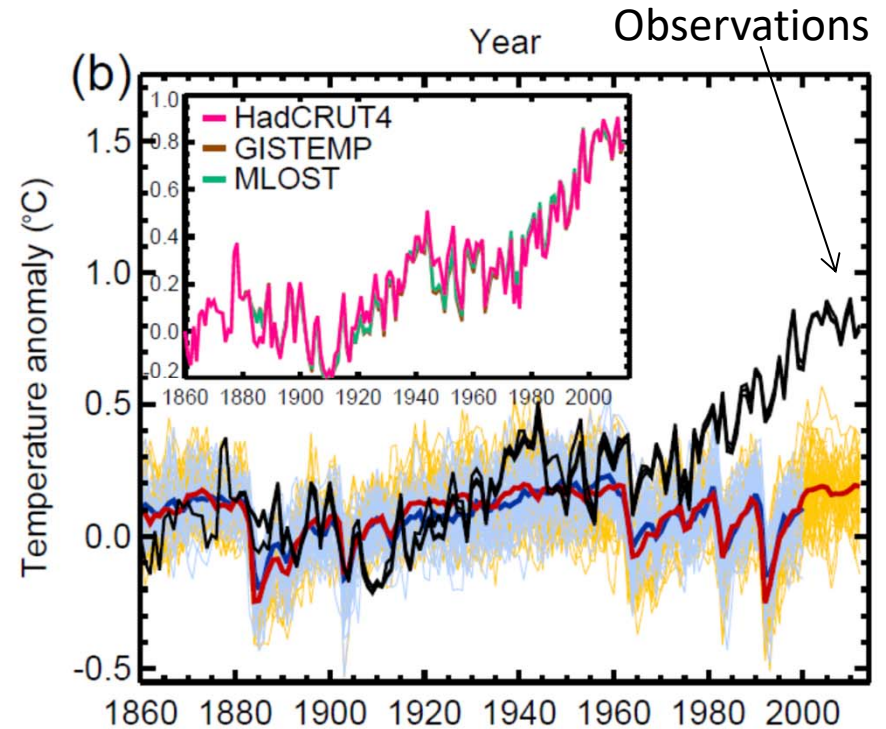
Nouveaux scénarios et storylines

La température a déjà augmenté d'un demi degré dans les 50 dernières années

Simulations avec influence humaine



Simulations sans influence humaine



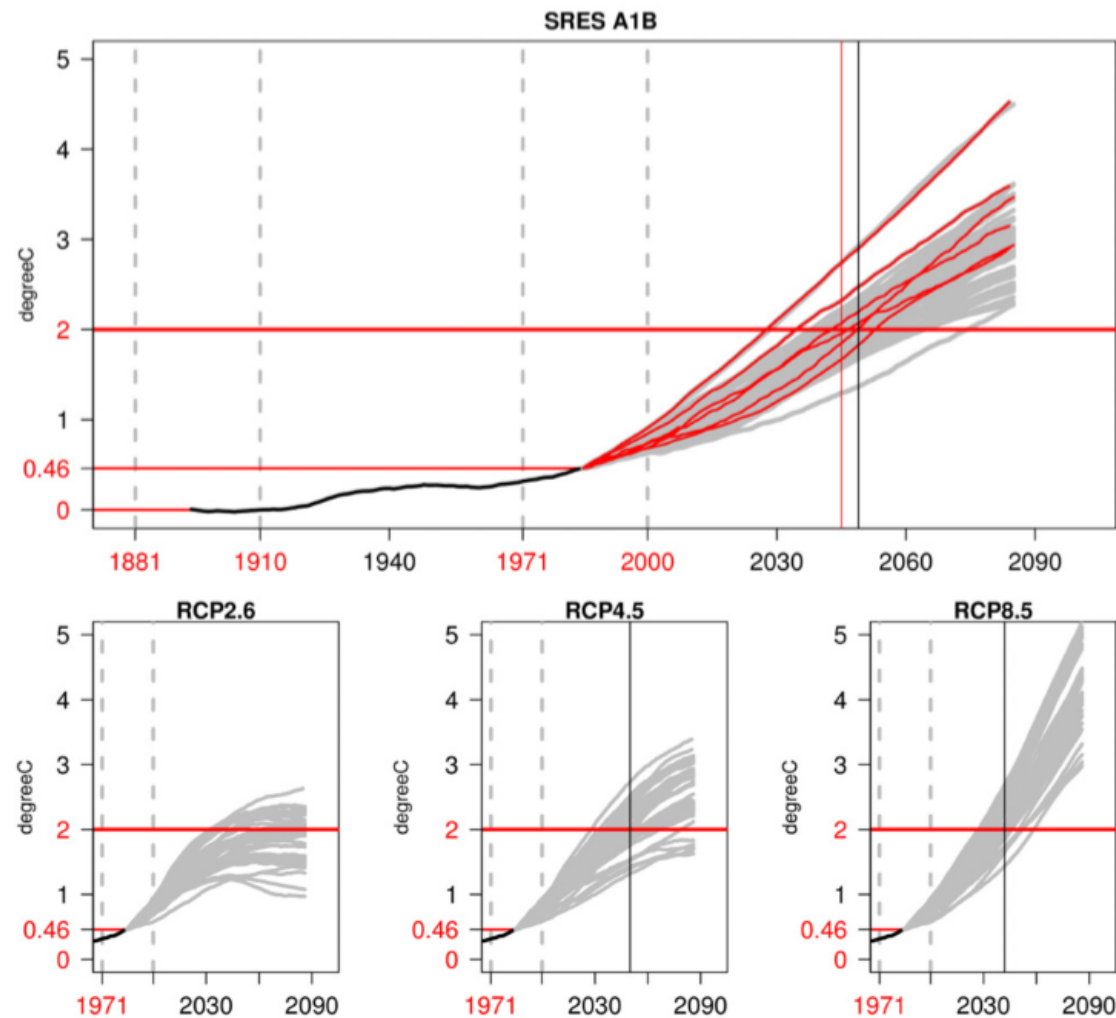
Attribution de la tendance au changement climatique

Comment utiliser les simulations
climatiques existantes alors
qu'elles ne mènent pas à 1.5°C?

Recherche de la période dans chaque simulation (transitoire)

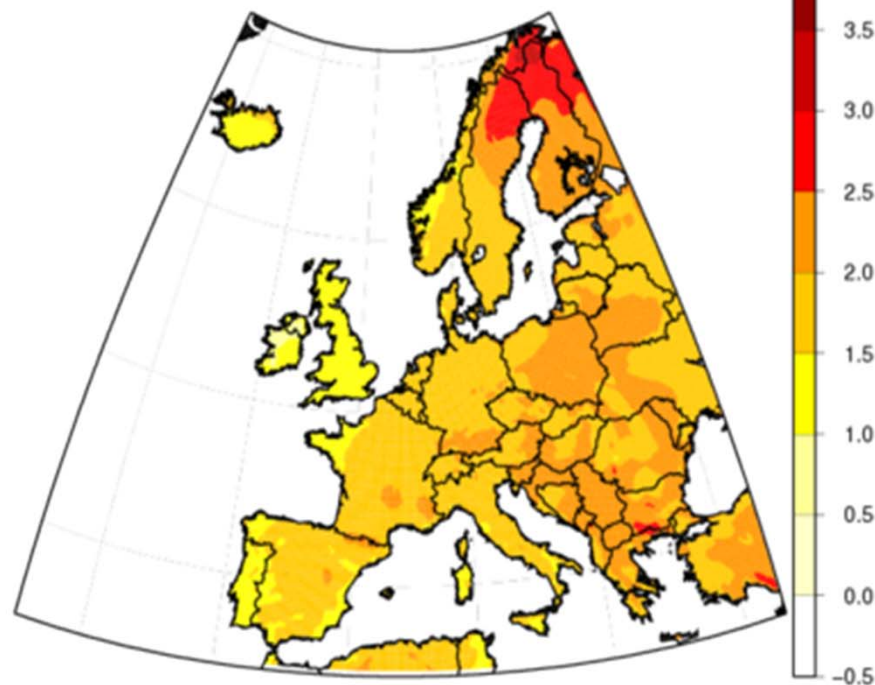
Environ. Res. Lett. 9 (2014) 034006

R Vautard *et al*

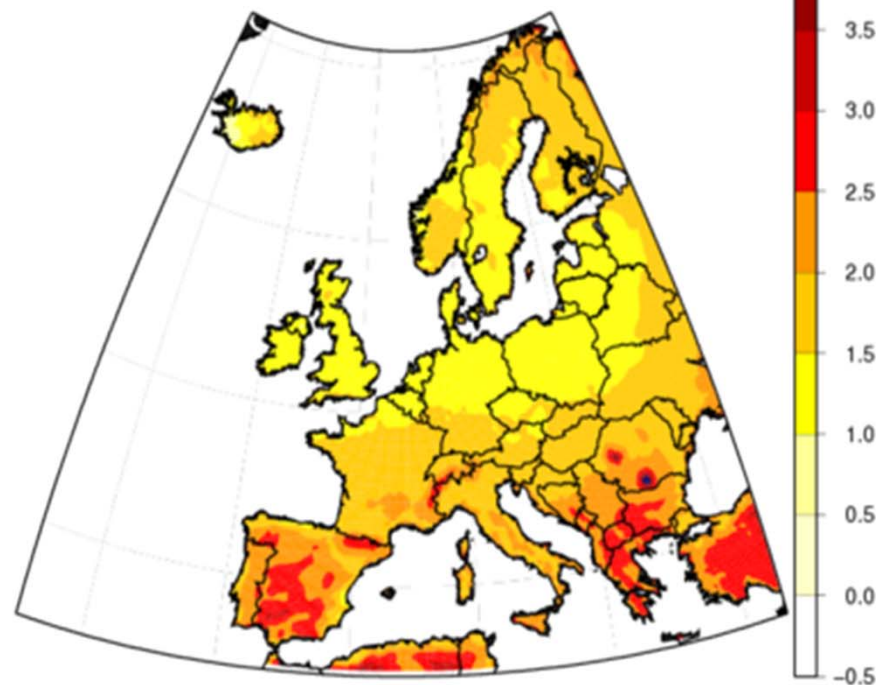


Changements de température en Europe pour +2°C de réchauffement global

HIVER

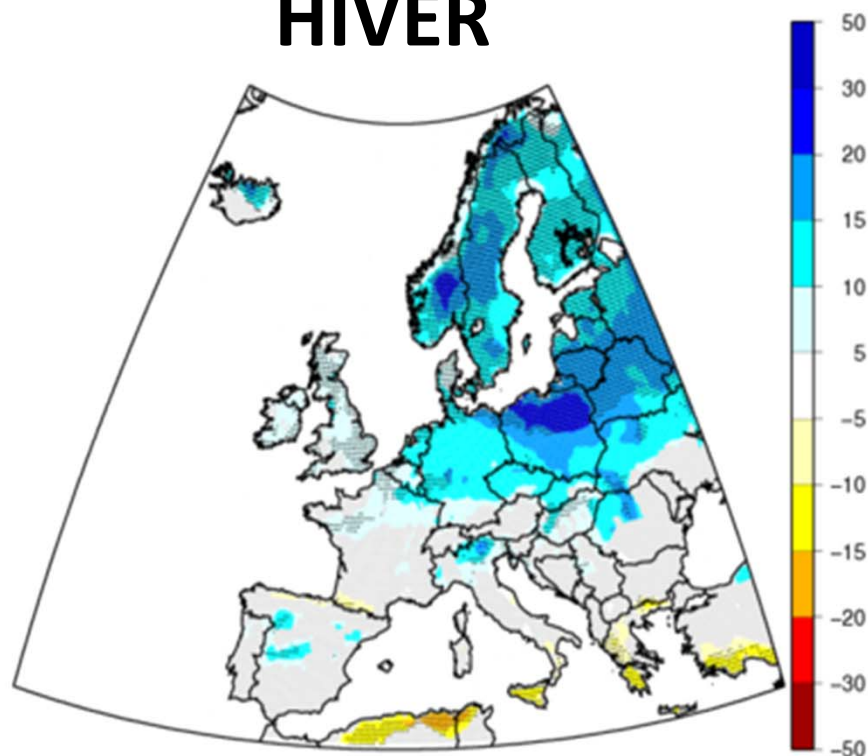


ETE

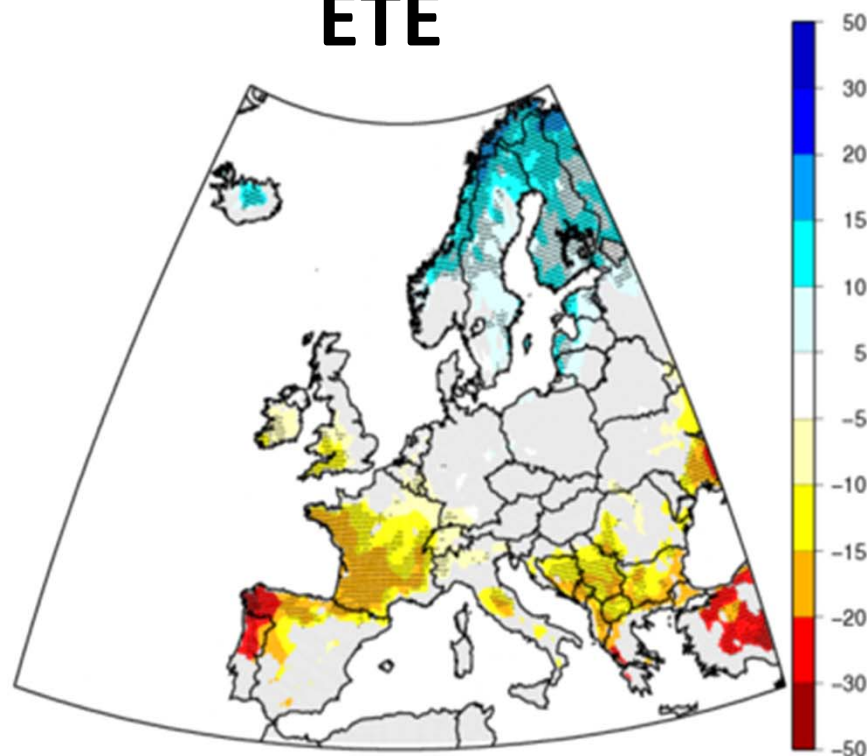


Changements de Précipitations en Europe pour +2°C de réchauffement global

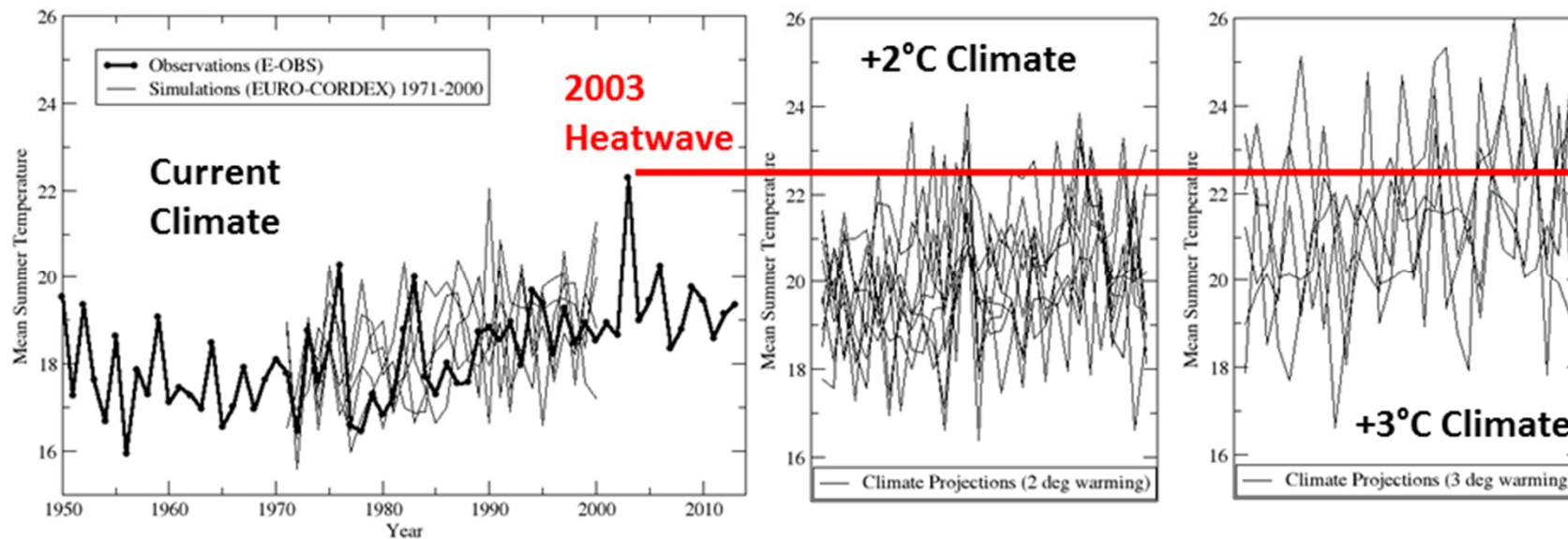
HIVER



ETE

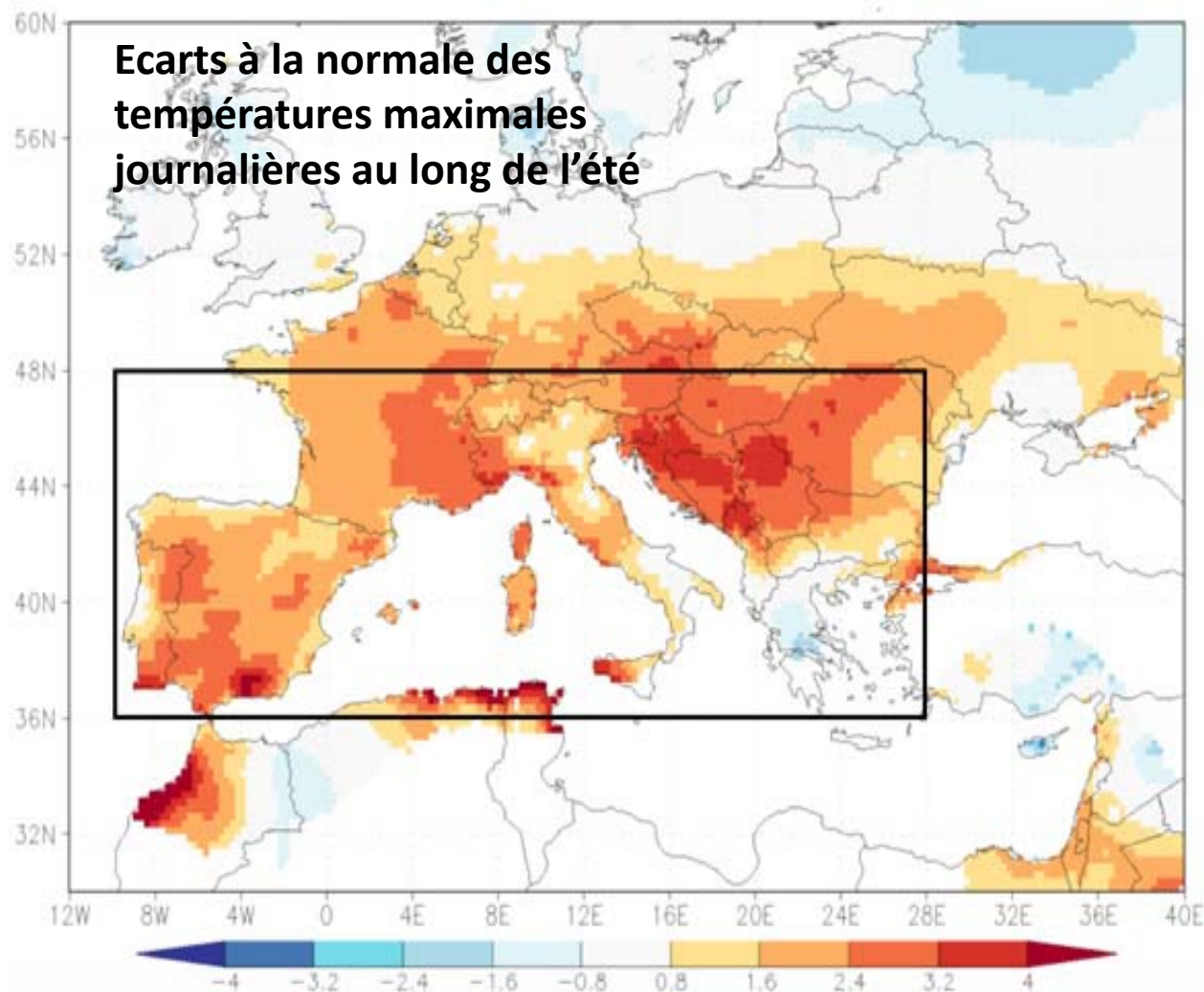


Etés comme 2003: 25% pour 3C, 6% pour 2C

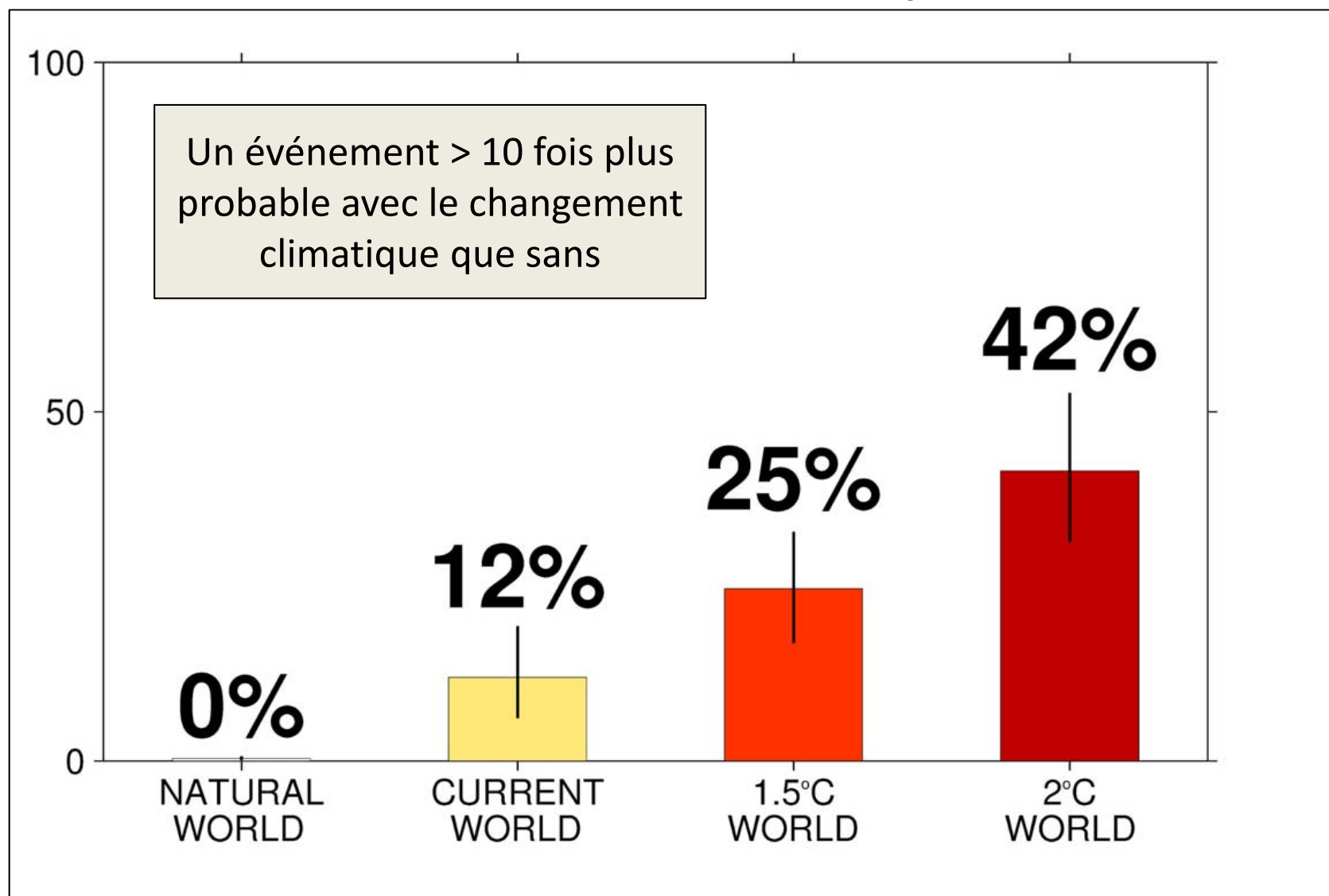


Températures moyennes d'été près de Paris pour +2C and +3C

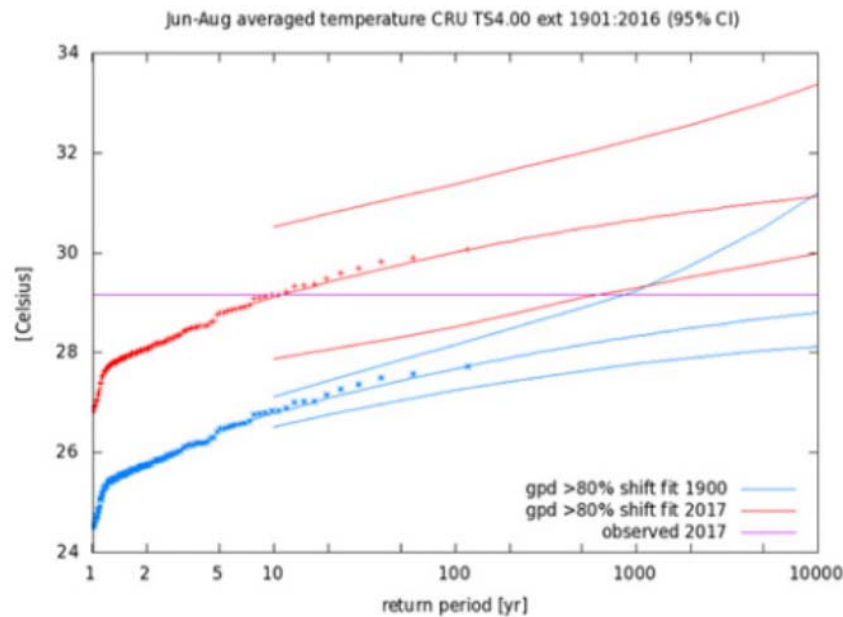
Exemple d'extrême: vague de chaleur de l'été 2017



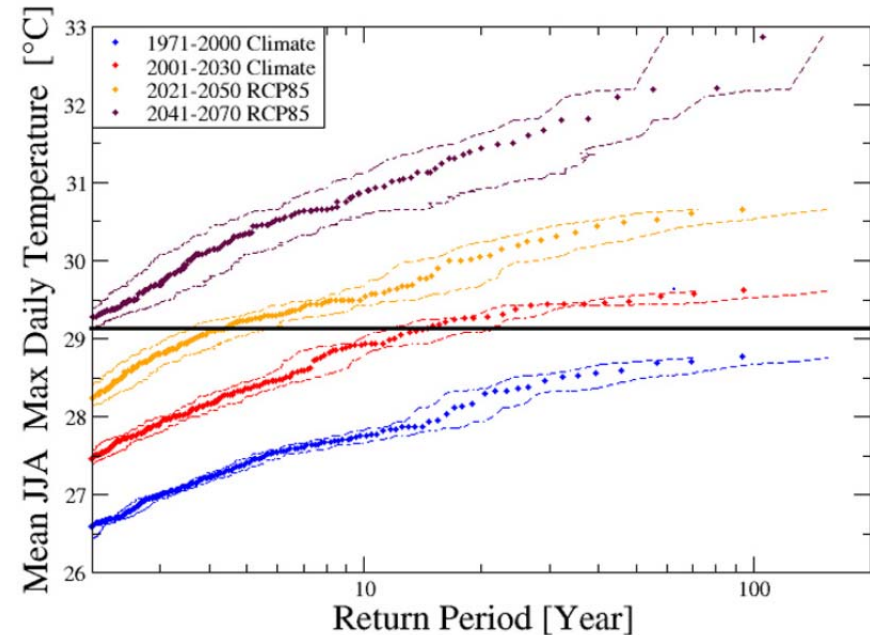
Probabilité d'avoir un été comme 2017 en Europe du Sud (en %)



Changement des distributions de température estivale



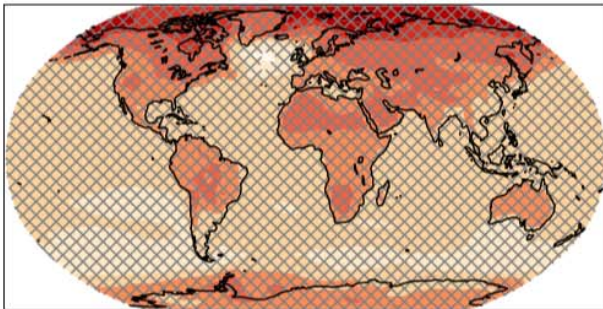
Observations
(avec loi d'extrêmes)



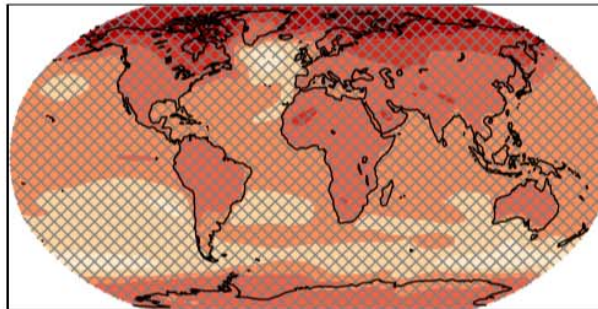
Modèles régionaux +
bootstrap

Echelle globale

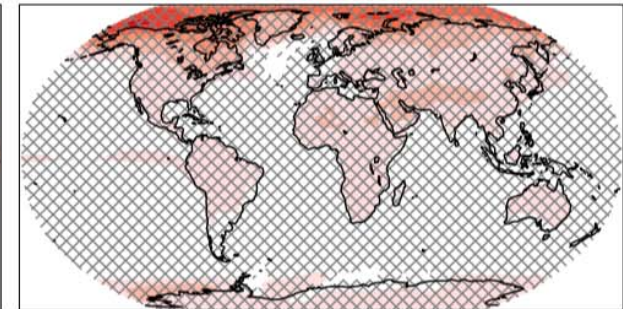
Mean temperature change
at 1.5°C GMST warming



Mean temperature change
at 2.0°C GMST warming



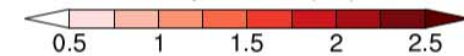
Difference in mean temperature
change (2.0°C - 1.5°C)



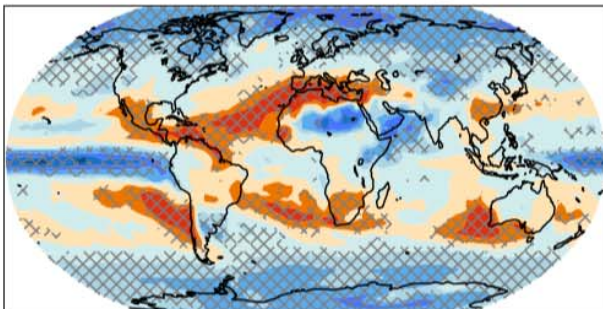
Temperature (°C)



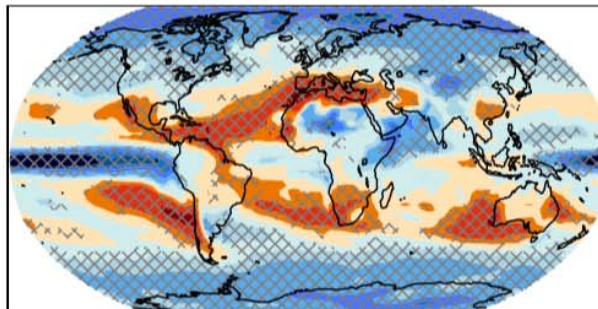
Temperature (°C)



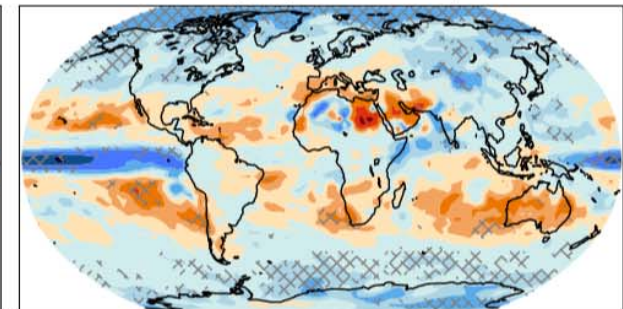
Mean precipitation change
at 1.5°C GMST warming



Mean precipitation change
at 2.0°C GMST warming



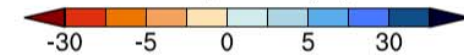
Difference in mean precipitation
change (2.0°C - 1.5°C)



Precipitation (%)

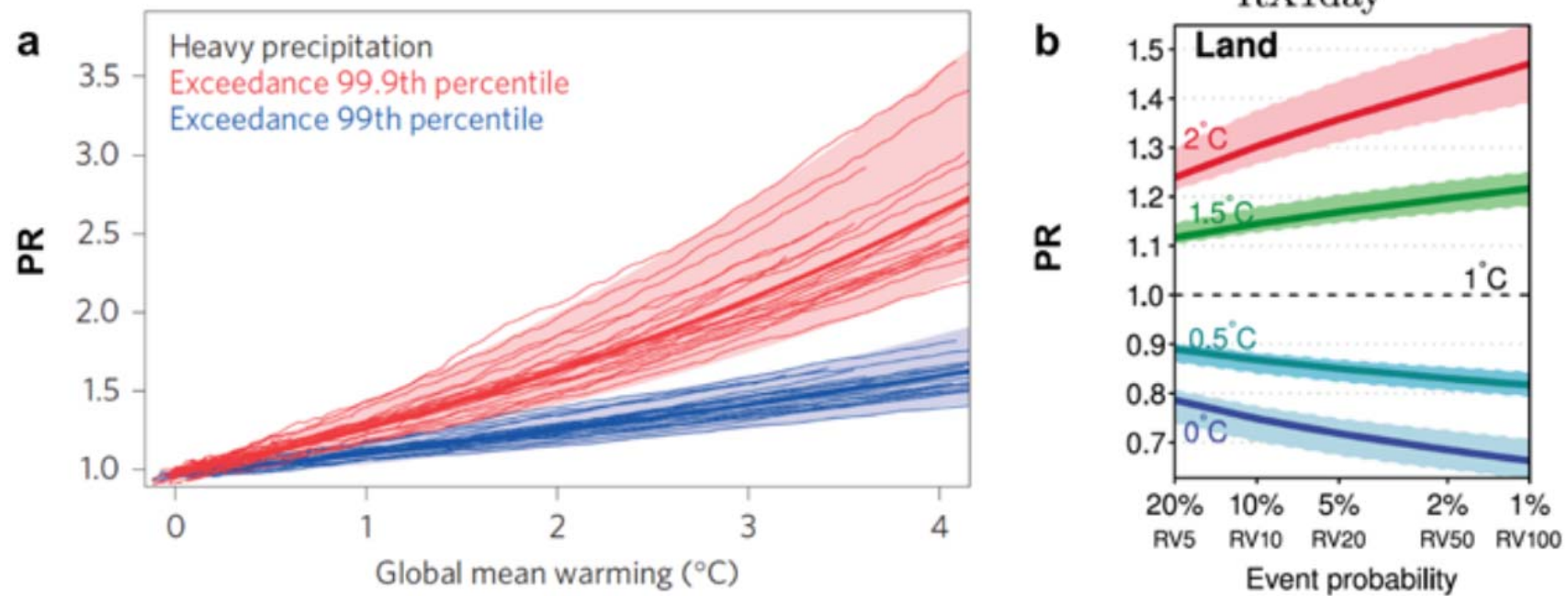


Precipitation (%)



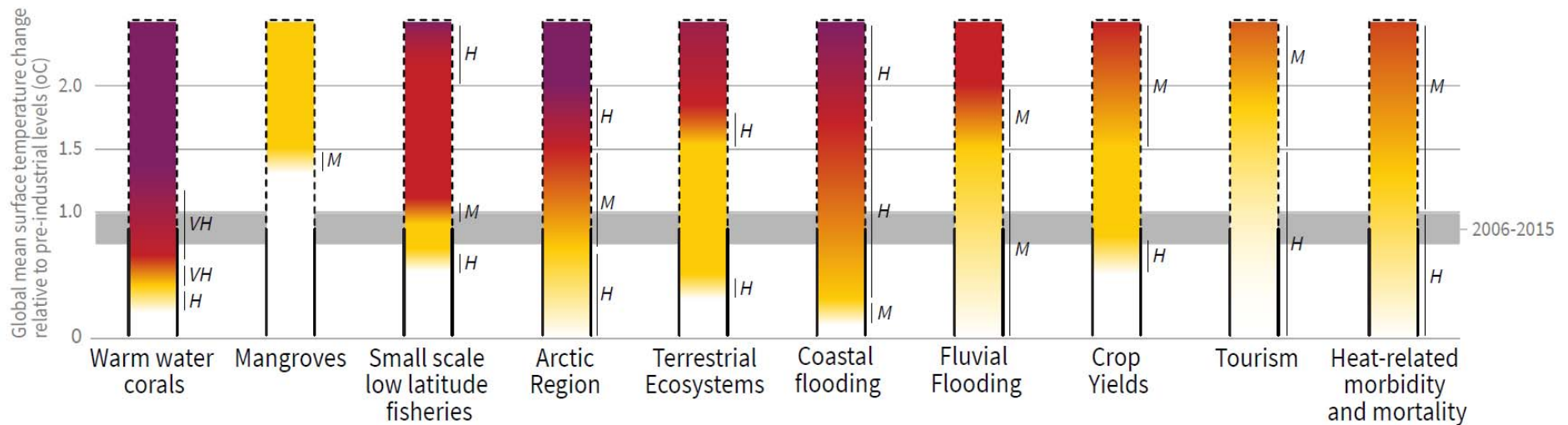
Précipitations extrêmes

Probability ratio of heavy precipitation as function of global warming and event probability



Une multitude d'impacts seraient moins forts ou évités

Impacts and risks for selected natural, managed and human systems

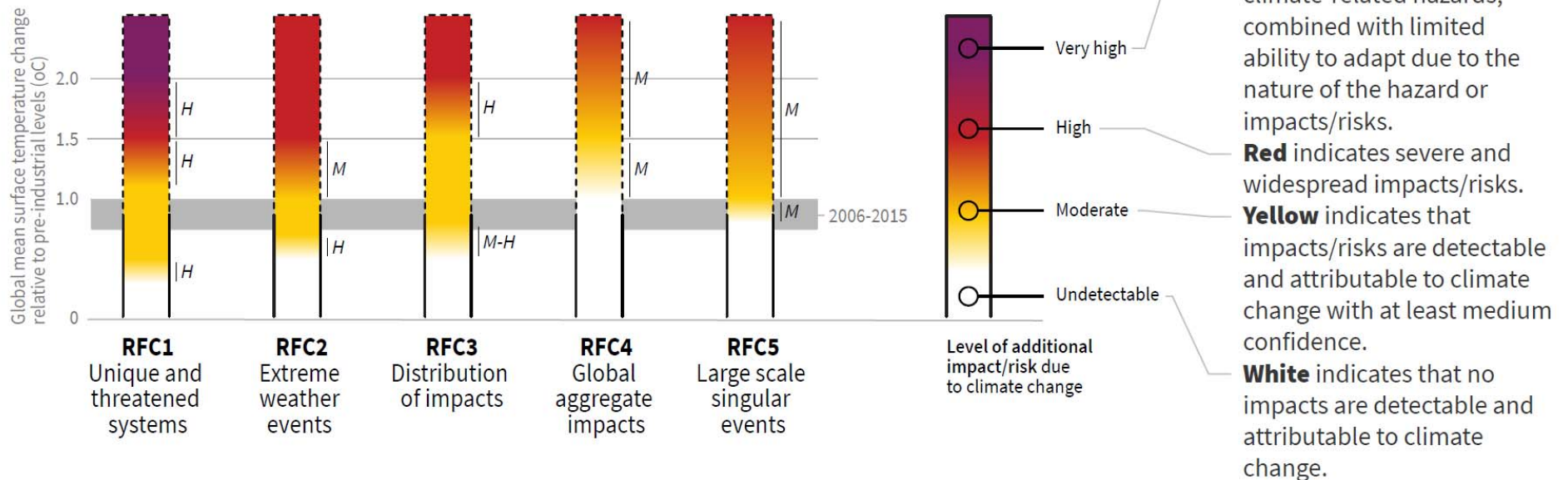


→ Travail très important et novateur sur les impacts et le détail entre 1.5 et 2 degrés

Les risques majeurs

Five Reasons For Concern (RFCs) illustrate the impacts and risks of different levels of global warming for people, economies and ecosystems across sectors and regions.

Impacts and risks associated with the Reasons for Concern (RFCs)



→ Adaptation beaucoup plus difficile à 2 degrés, dépendant des secteurs



**Merci de
votre écoute**

THE CHRISTIAN SCIENCE MONITOR *Bennett*