IPCC Fifth Assessment Report
WGI, WGII, WGIII, Synthesis Report
2013/2014

Chris Field
Co-chair, WGII

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INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

CLIMATE CHANGE

UNDERSTANDING, REDUCING, AND MANAGING RISKS

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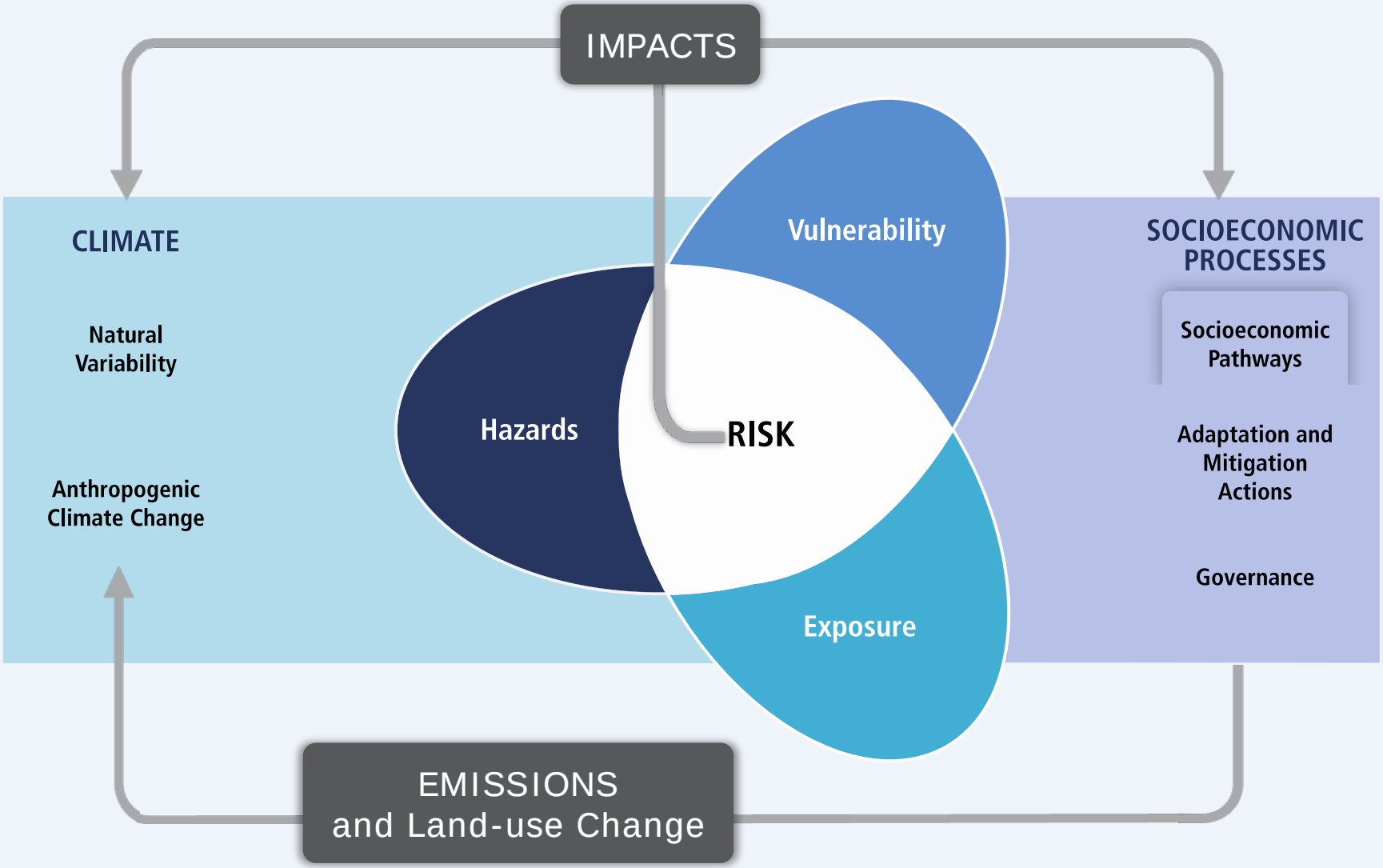
INTERGOVERNMENTAL PANEL ON Climate change



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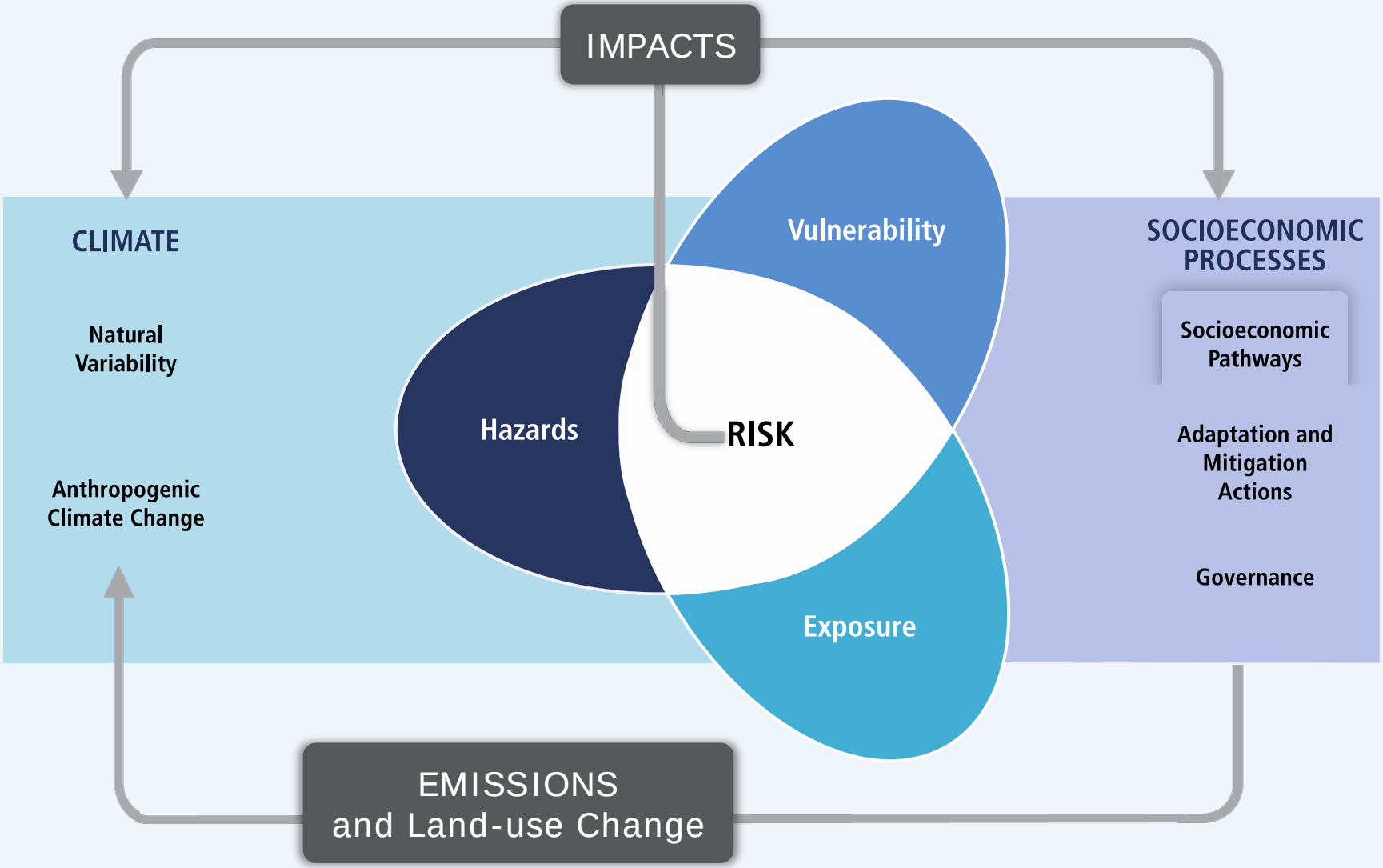
INTERGOVERNMENTAL PANEL ON climate change



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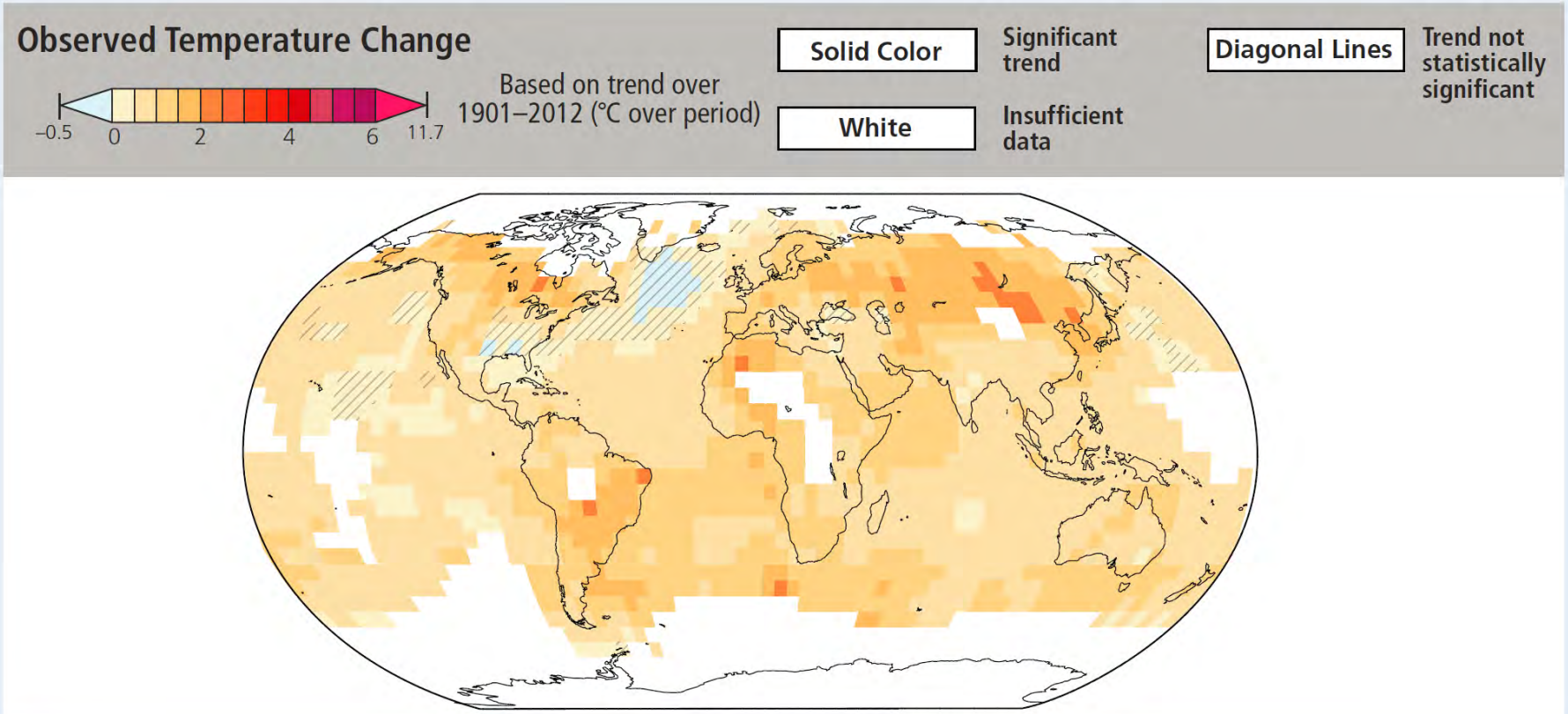
Warming over the past century



Based on WGII Figure SPM 4

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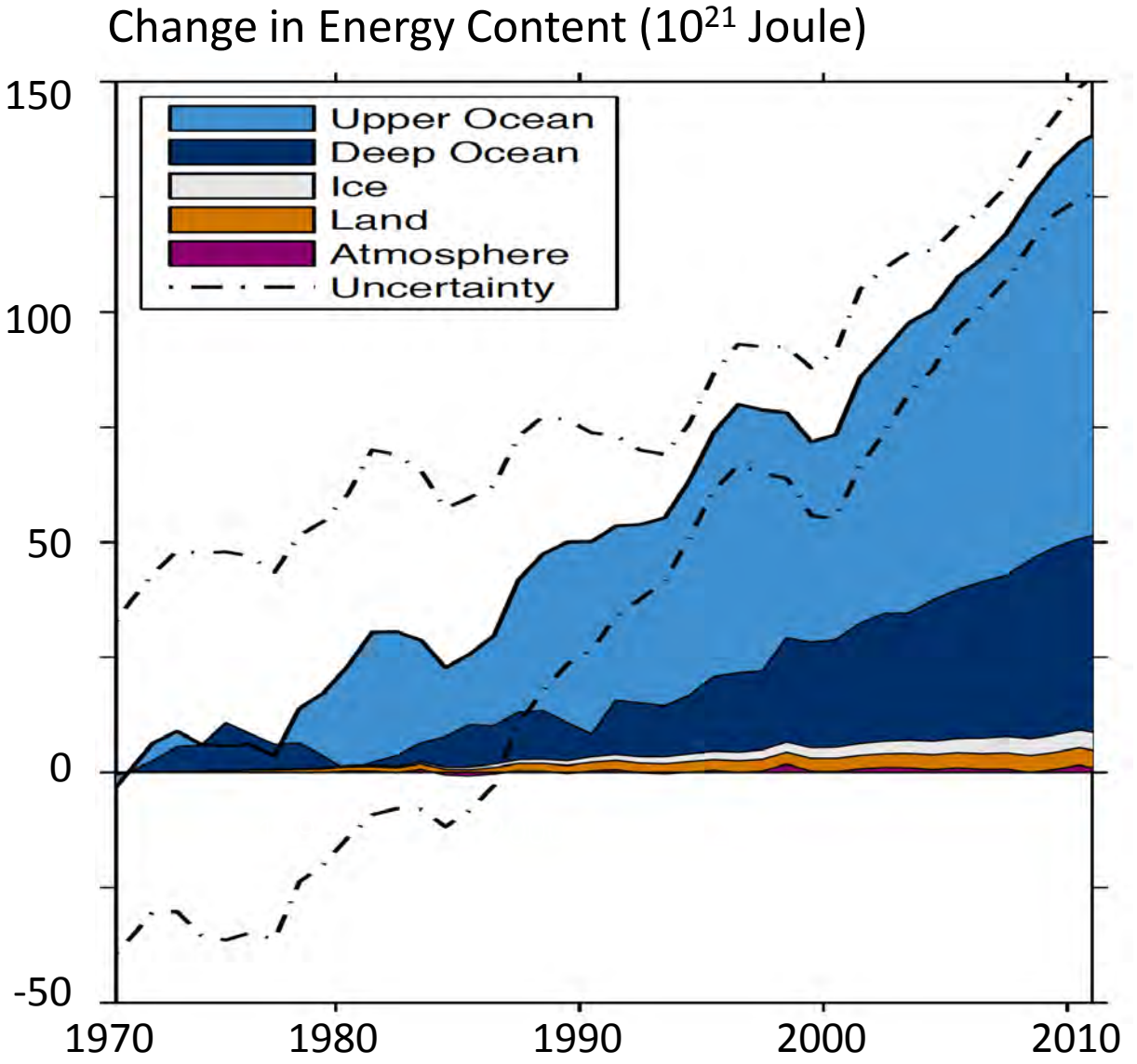
Warming since 1970



(IPCC 2013, Box 3.1, Fig. 1, modified)

Based on WGI Box 3.1 Figure 1

Worldwide Effects

- atmosphere, land, ocean
- extreme events
- water cycle
- sea ice, glaciers, ice sheets
- global mean sea level

Human influence on the climate system is clear


GHG EMISSIONS GROWTH
HAS ACCELERATED
DESPITE REDUCTION EFFORTS
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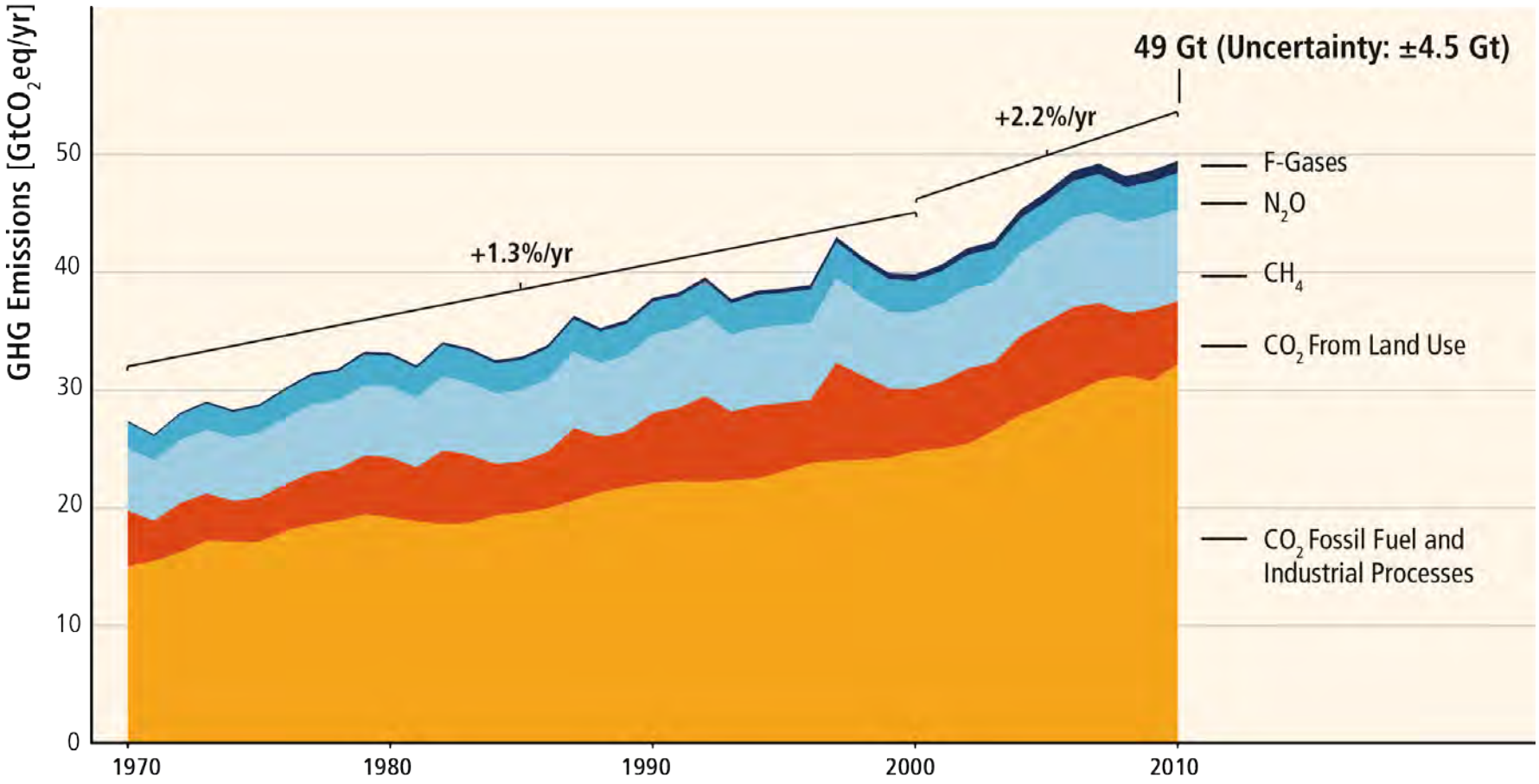
GHG emissions growth between 2000 and 2010 has been larger than in the previous three decades.



Based on WGIII Figure SPM 1

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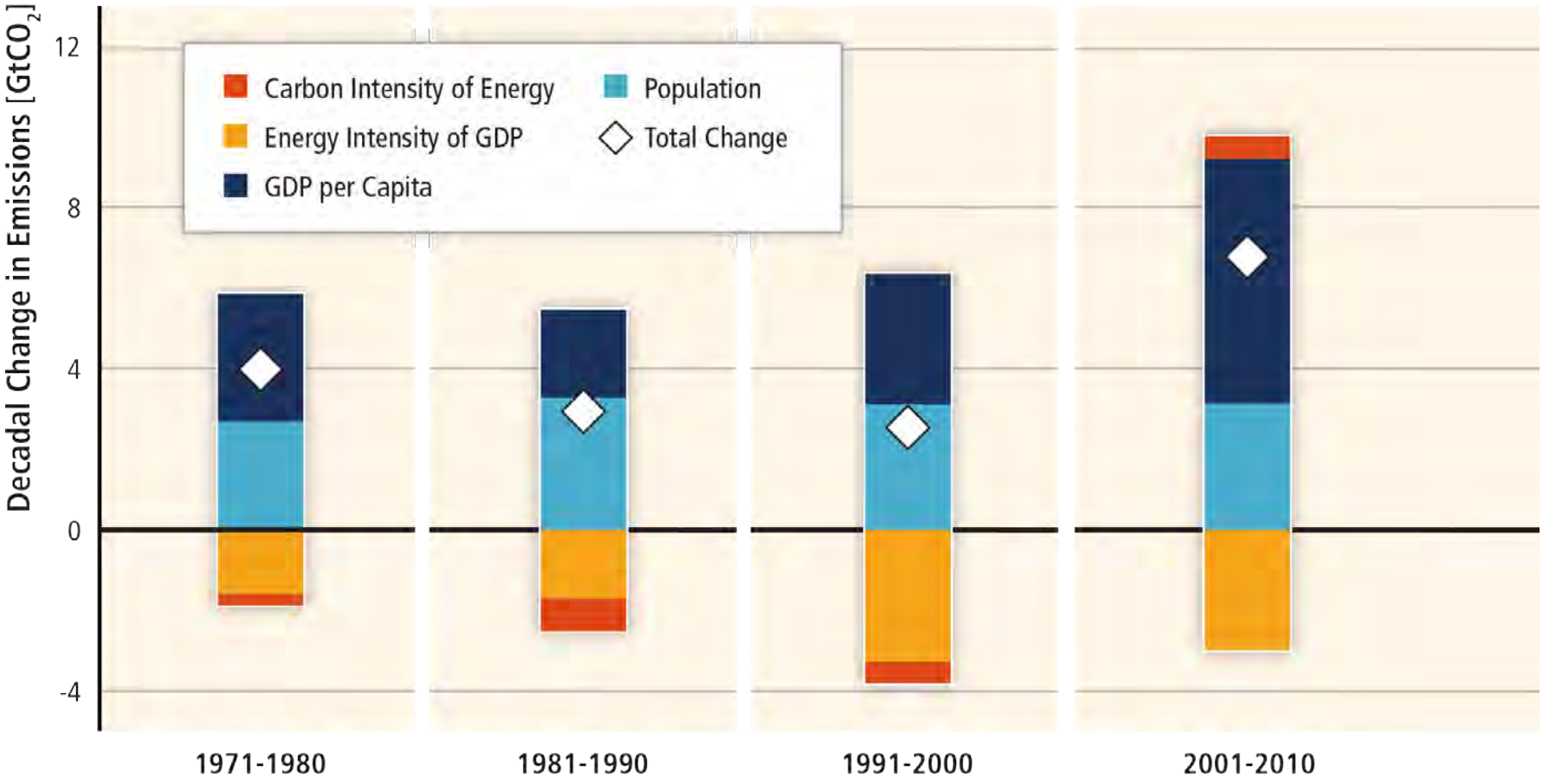
GHG emissions rising with growth in GDP and population



Based on WGIII Figure SPM 3


OBSERVED IMPACTS
OF CLIMATE CHANGE
ARE WIDESPREAD
AND CONSEQUENTIAL
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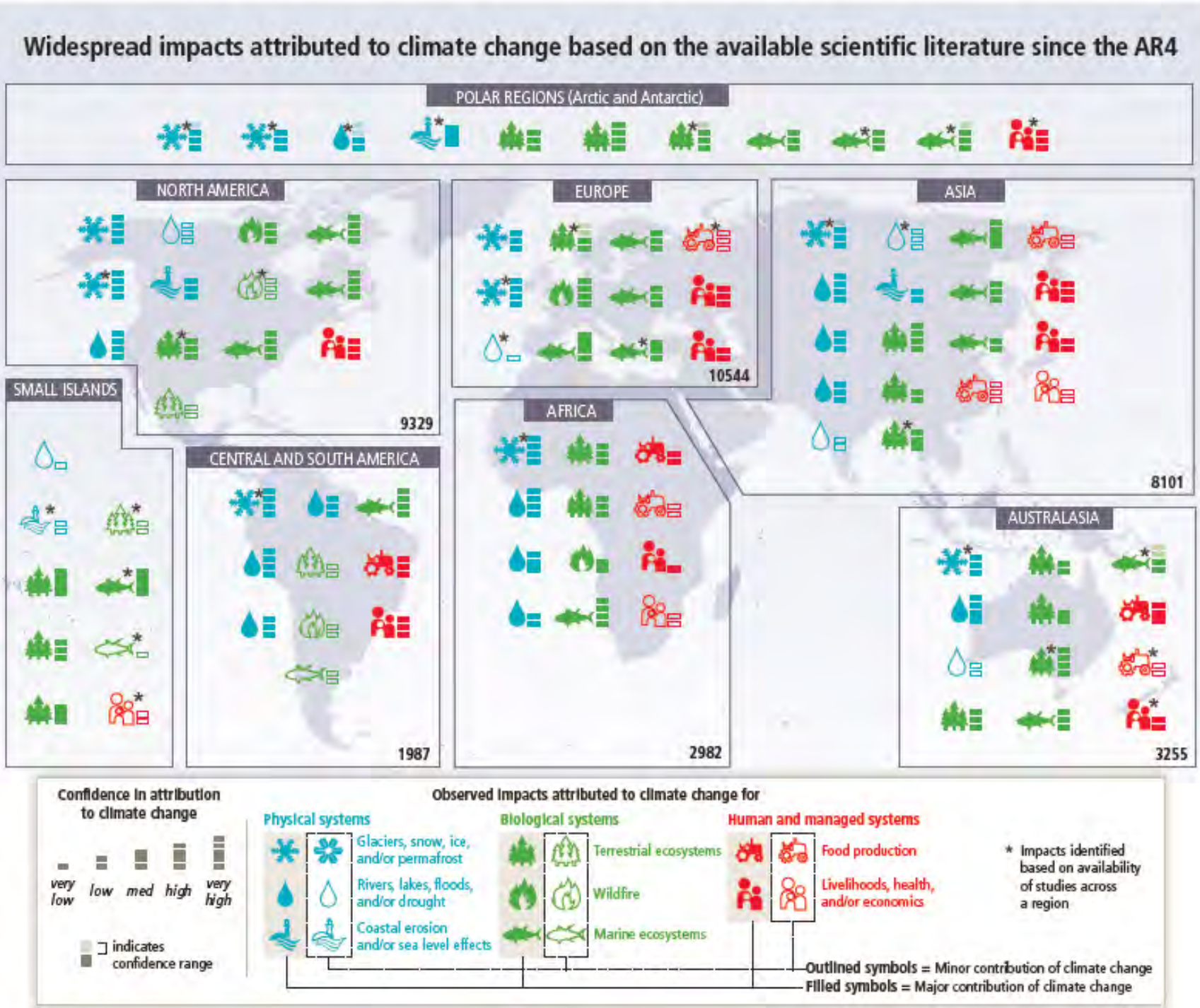
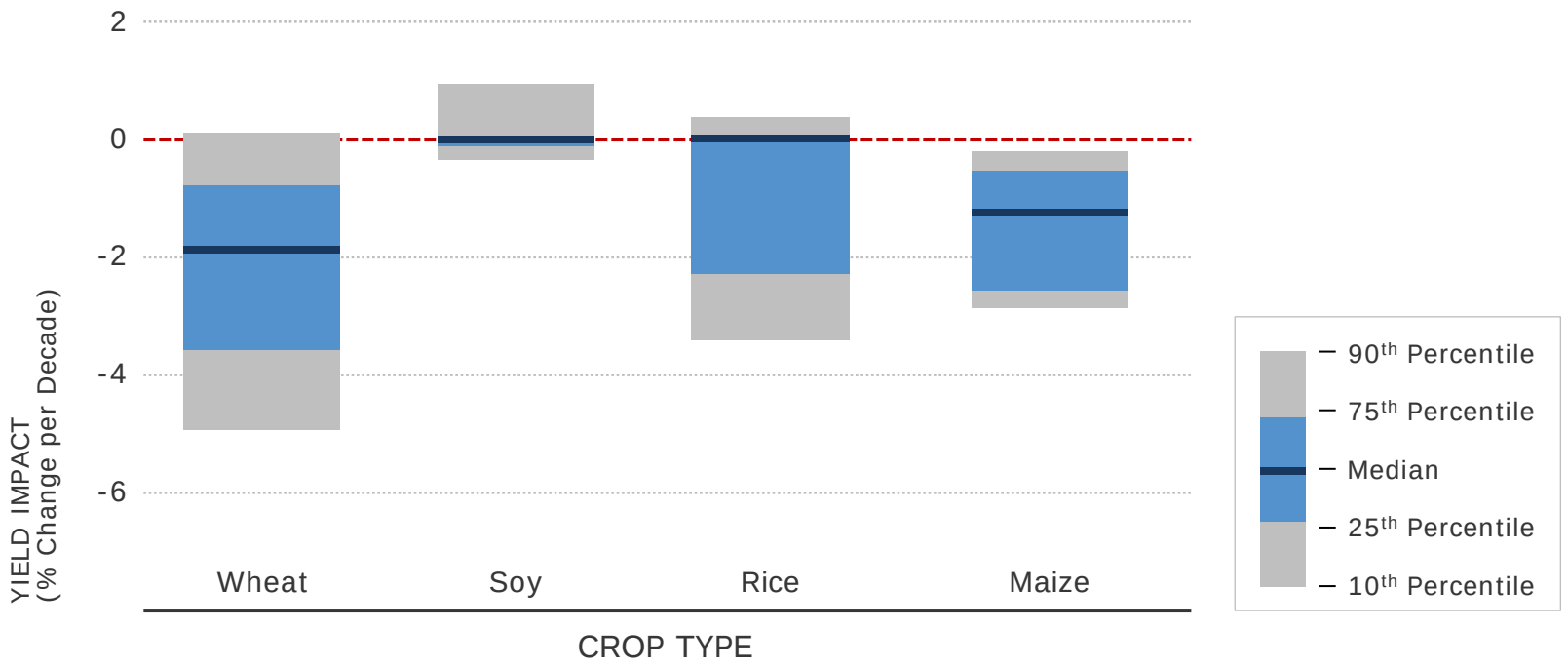

Widespread impacts attributed to climate change based on the available scientific literature since the AR4
POLAR REGIONS (Arctic and Antarctic)
NORTH AMERICA
9329
EUROPE
10544
ASIA
8101
SMALL ISLANDS
CENTRAL AND SOUTH AMERICA
1987
AFRICA
2982
AUSTRALASIA
3255
Confidence in attribution to climate change
very low
low
med
high
very high
indicates confidence range
Observed impacts attributed to climate change for
Physical systems
Glaciers, snow, ice, and/or permafrost
Rivers, lakes, floods, and/or drought
Coastal erosion and/or sea level effects
Biological systems
Terrestrial ecosystems
Wildfire
Marine ecosystems
Human and managed systems
Food production
Livelihoods, health, and/or economics
* Impacts identified based on availability of studies across a region
Outlined symbols = Minor contribution of climate change
Filled symbols = Major contribution of climate change



WGII Figure SPM 2

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VULNERABILITY AND EXPOSURE

AROUND THE WORLD

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PEOPLE, SOCIETIES,
AND ECOSYSTEMS
AROUND THE WORLD
VULNERABLE
AND EXPOSED
IN DIFFERENT WAYS
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ADAPTATION IS
ALREADY OCCURRING
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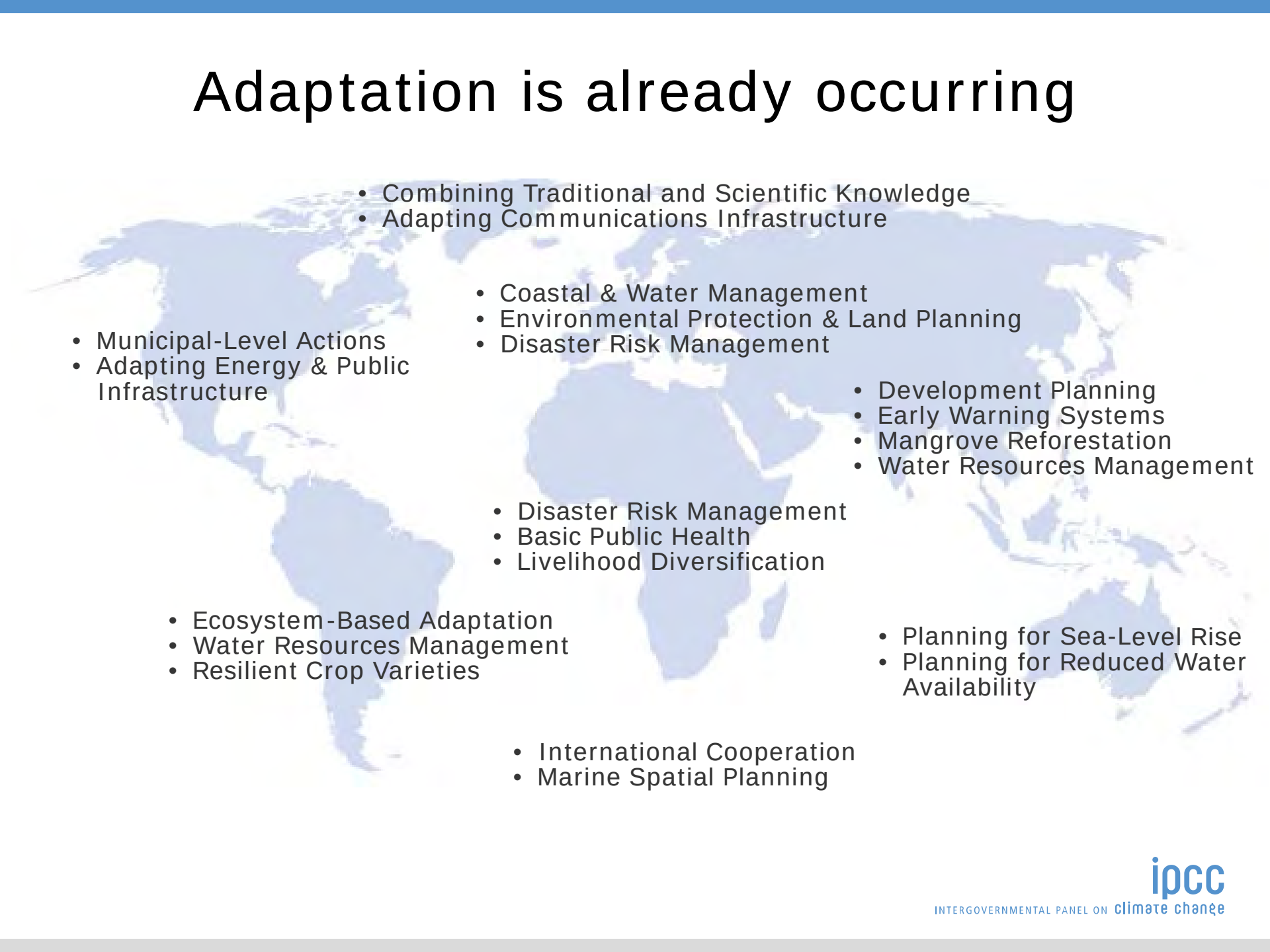
Adaptation is already occurring



- Combining Traditional and Scientific Knowledge
- Adapting Communications Infrastructure

- Coastal & Water Management
- Environmental Protection & Land Planning
- Disaster Risk Management

- Municipal-Level Actions
- Adapting Energy & Public Infrastructure

- Development Planning
- Early Warning Systems
- Mangrove Reforestation
- Water Resources Management

- Disaster Risk Management
- Basic Public Health
- Livelihood Diversification

- Ecosystem-Based Adaptation
- Water Resources Management
- Resilient Crop Varieties

- Planning for Sea-Level Rise
- Planning for Reduced Water Availability

- International Cooperation
- Marine Spatial Planning

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INCREASING MAGNITUDES
OF WARMING INCREASE
THE LIKELIHOOD OF
SEVERE AND
PERVASIVE IMPACTS
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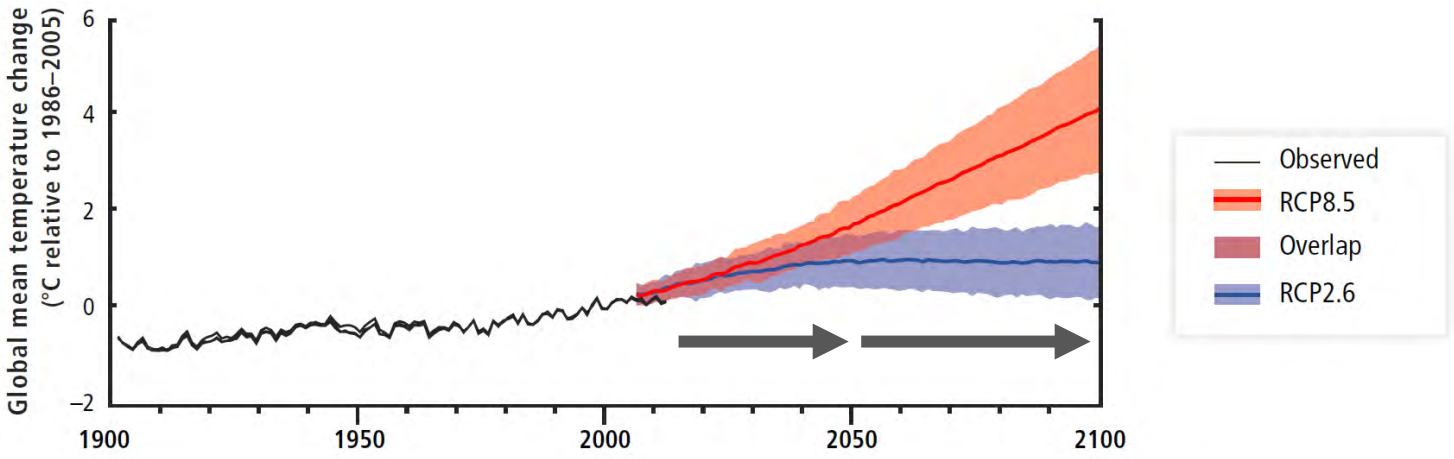
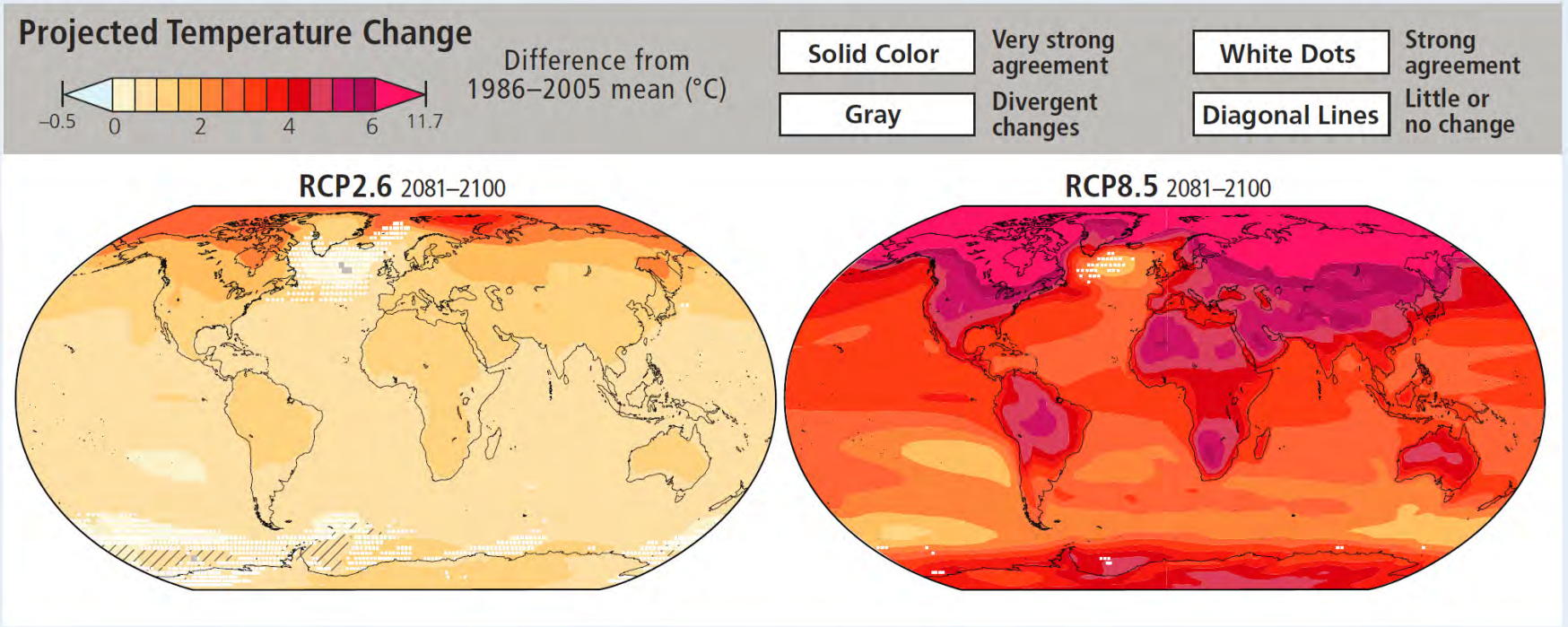
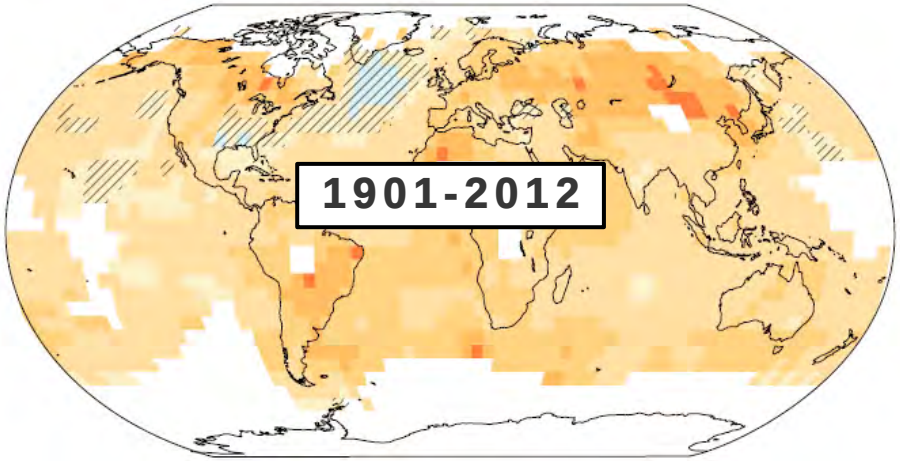
Warming over the 21st century

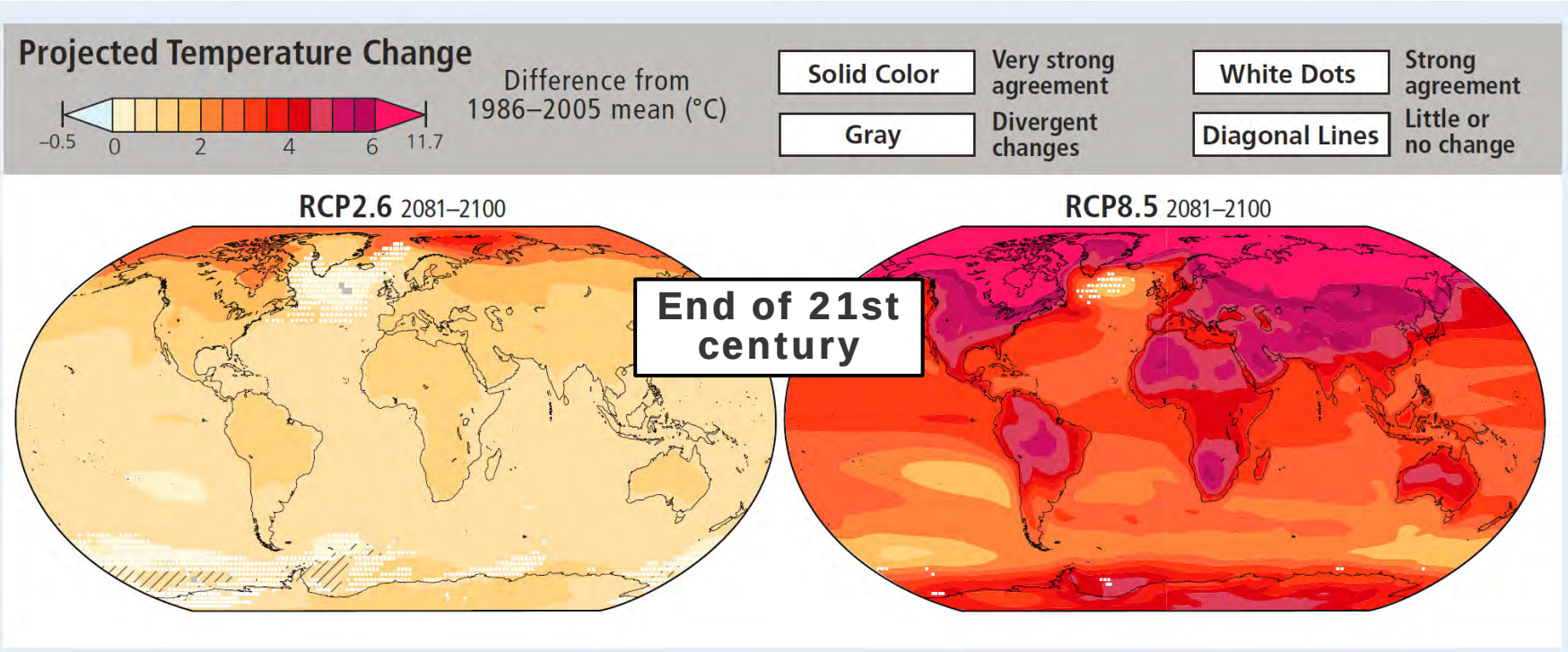




Based on WGII Figure SPM 4

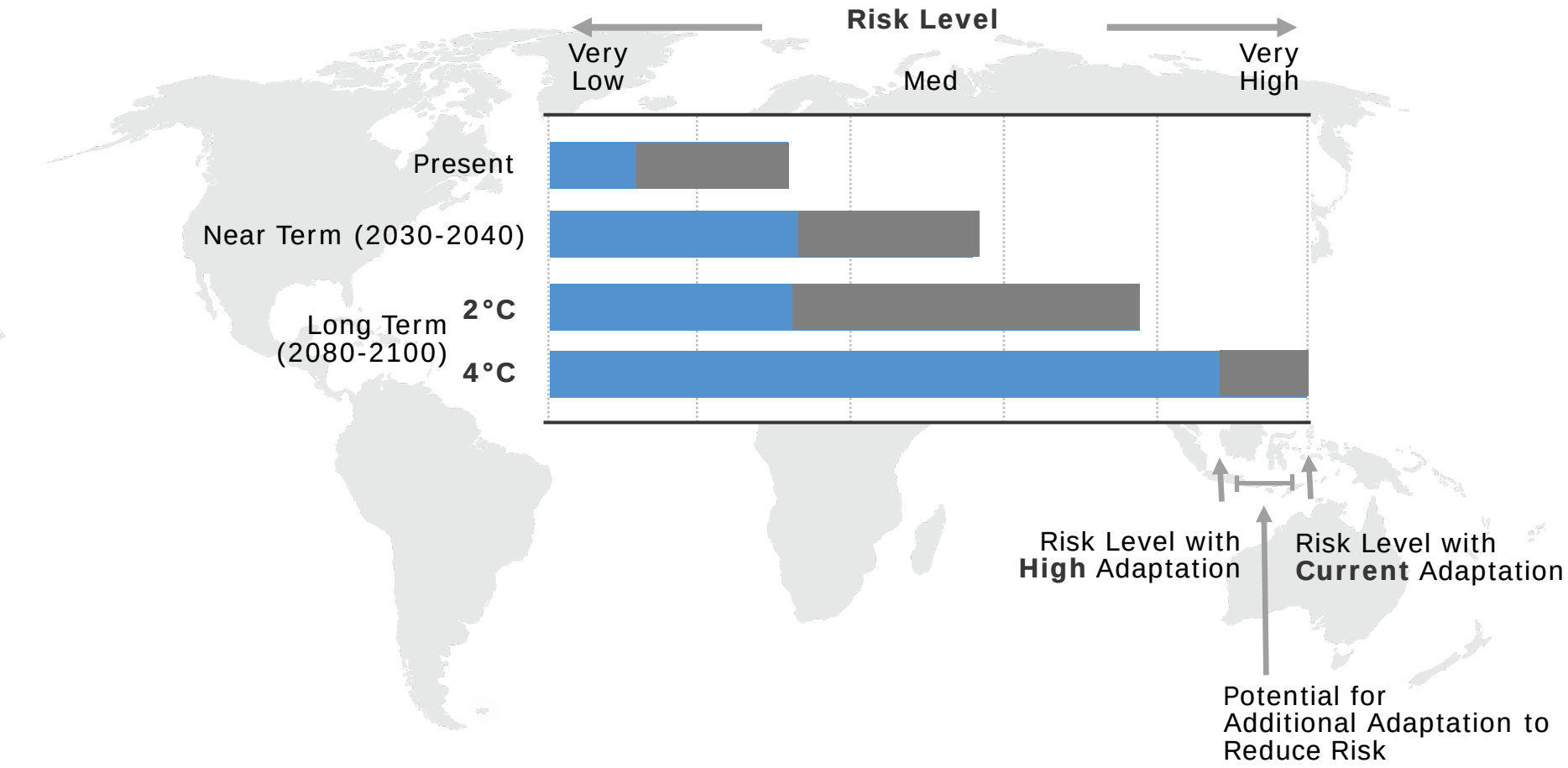
Warming over the 21st century

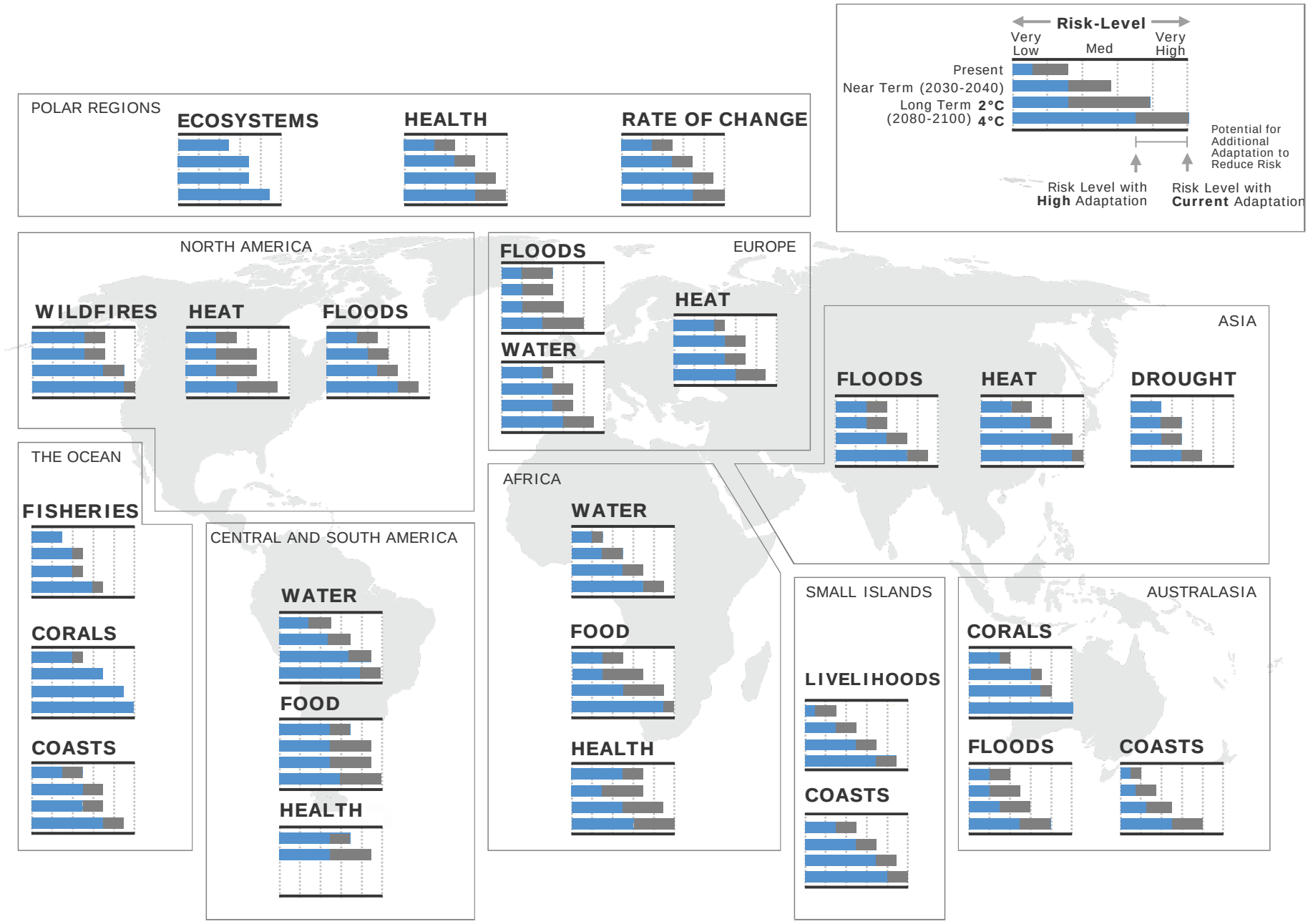




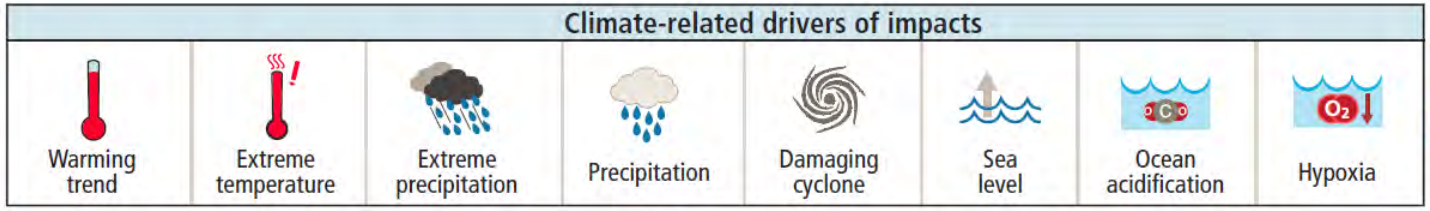
Based on WGII Figure SPM 4

Assessing risk



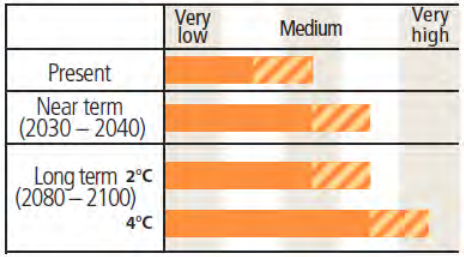
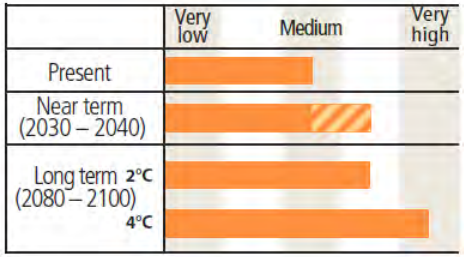
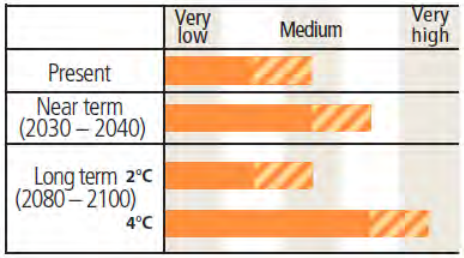


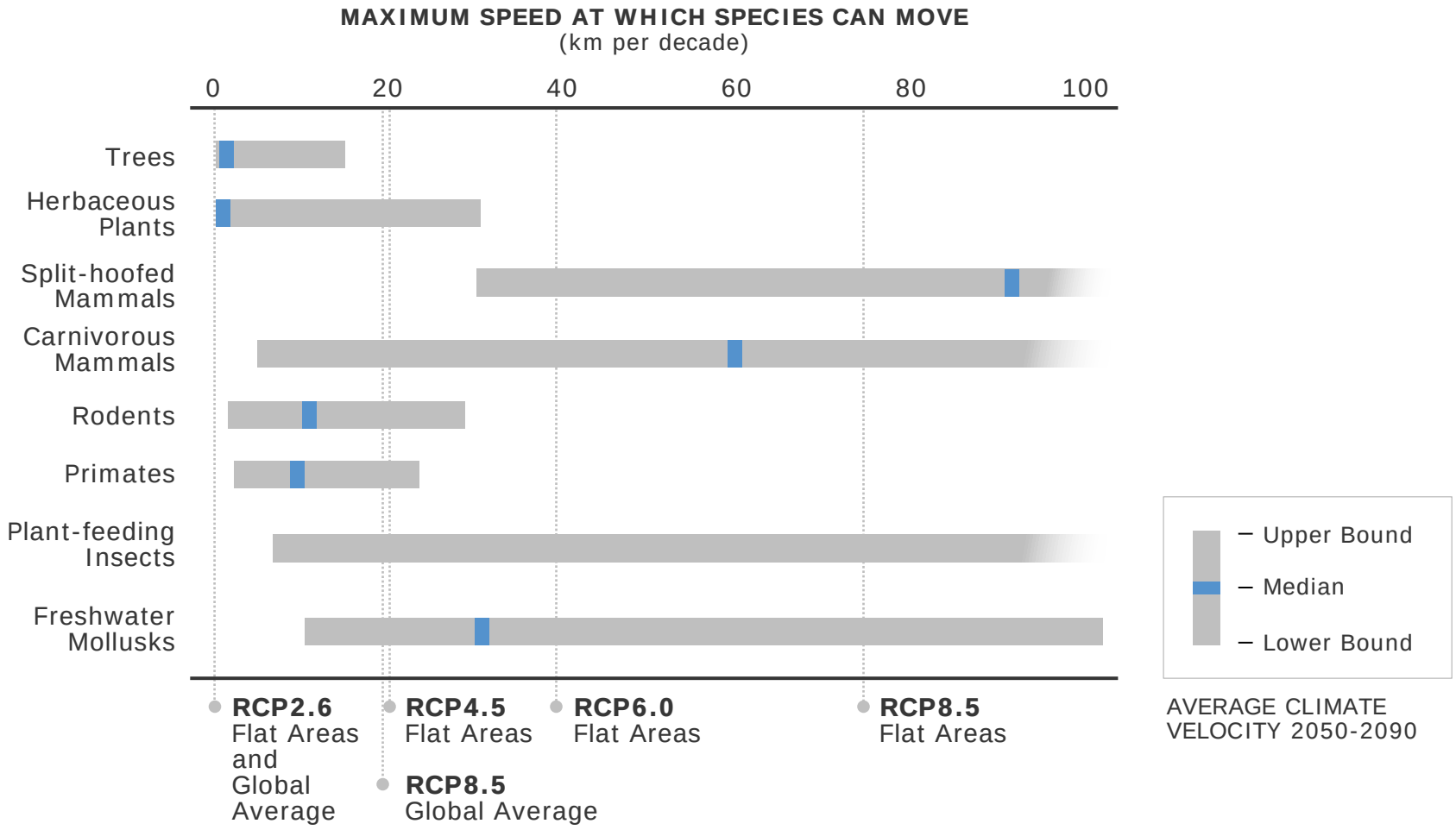
Based on WGII Box SPM 2 Table 1



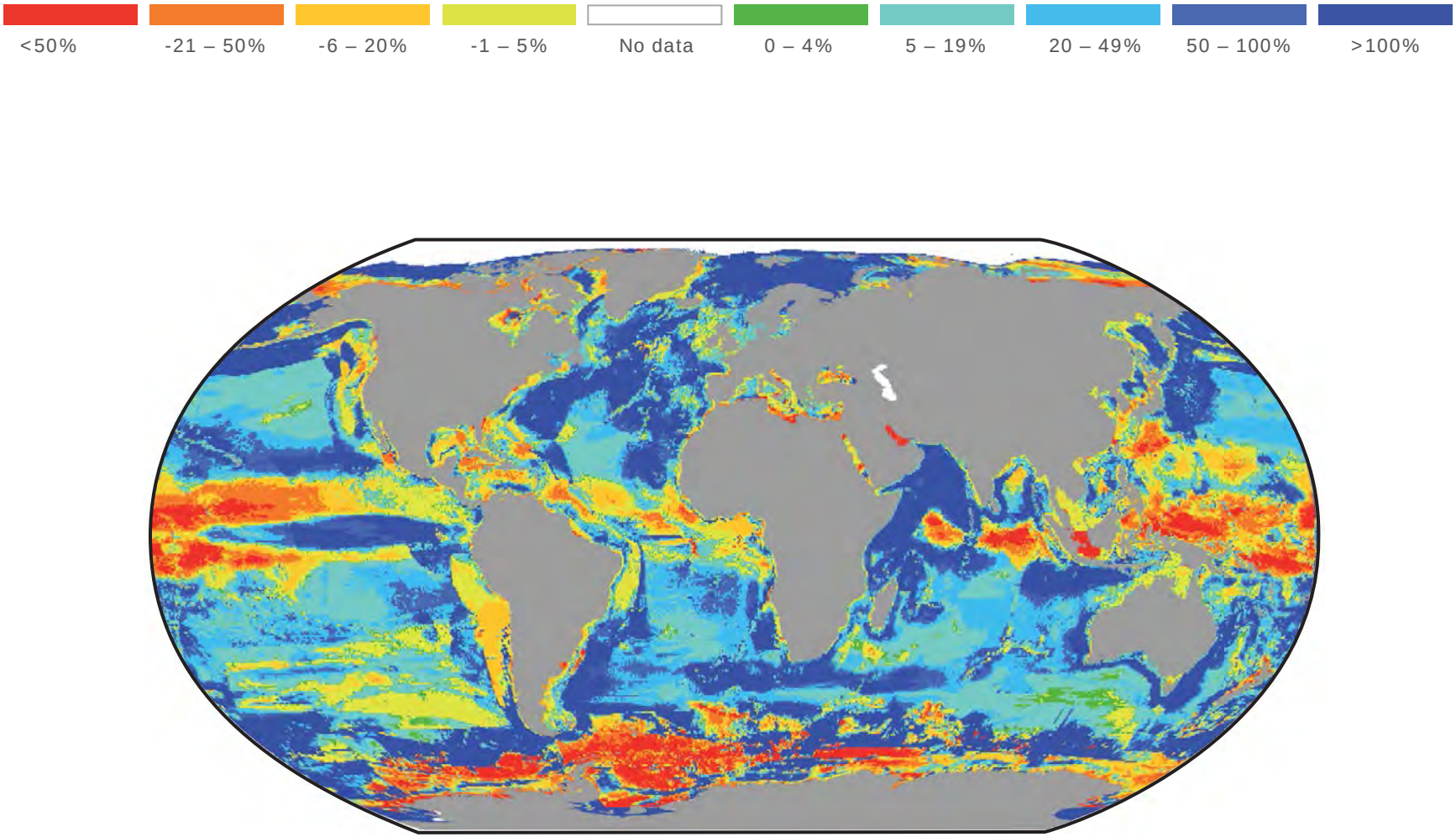
Risks to ecosystems and adaptation options

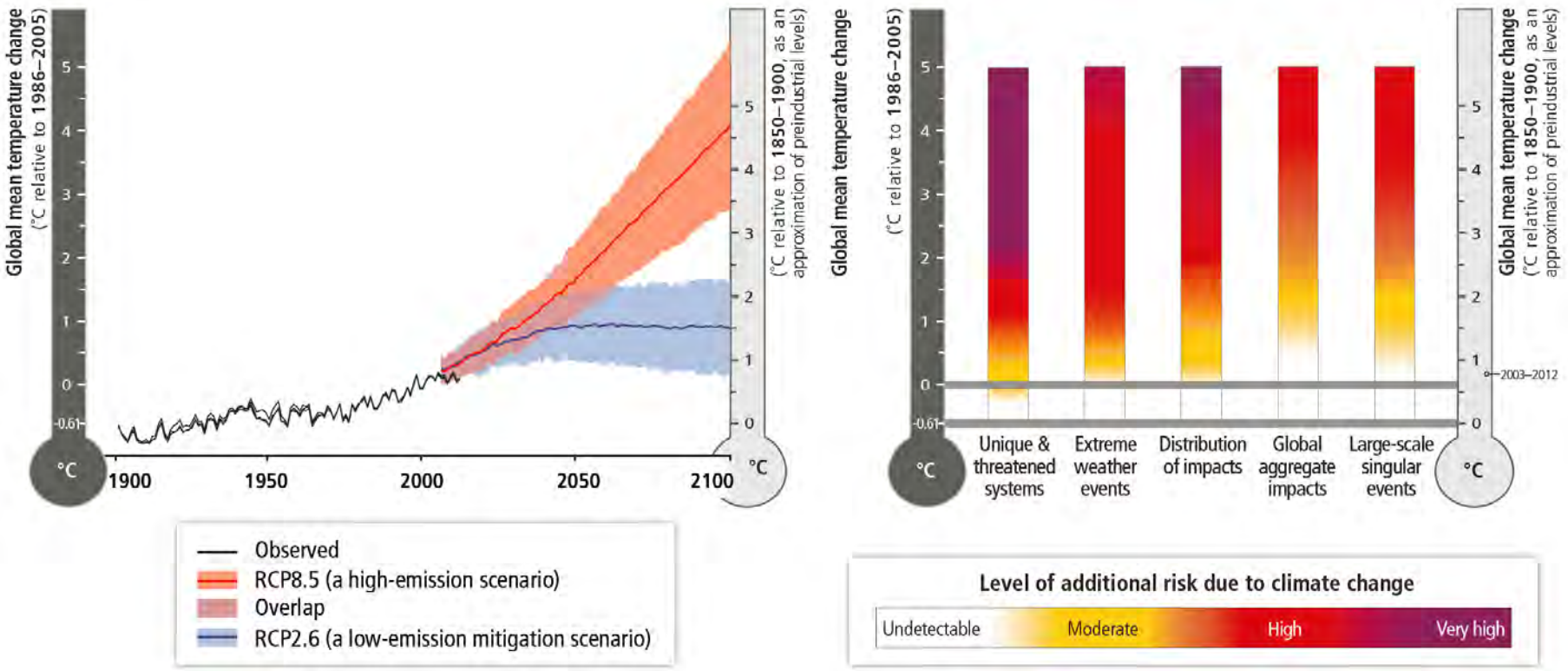
Key risk	Adaptation issues & prospects	Climatic drivers	Timeframe	Risk & potential for adaptation
Changes in ecosystem productivity	Options limited, include translocation of industrial fishing & expansion of aquaculture		Present Near term (2030 – 2040) Long term (2080 – 2100) 2°C / 4°C	Very low – Medium – Very high
Shifts in fish & invertebrate Populations	Evolutionary adaptation limited; translocation, flexible management & expansion of aquaculture		Present Near term (2030 – 2040) Long term (2080 – 2100) 2°C / 4°C	Very low – Medium – Very high
Hypoxia expansion & effects	Large-scale translocation of fisheries, a few fisheries may benefit, limiting pollutant runoff		Present Near term (2030 – 2040) Long term (2080 – 2100) 2°C / 4°C	Very low – Medium – Very high

Climate-related drivers of impacts								Level of risk & potential for adaptation		
Warming trend	Extreme temperature	Extreme precipitation	Precipitation	Damaging cyclone	Sea level	Ocean acidification	Hypoxia			
Variability in pelagic fishes in E. boundary upwelling systems	New & specific management tools & models, reduced fishing intensity									
Decreased catch & diversity in tropical coral reefs	Restoration of overexploited fisheries, alternate livelihoods, aquaculture									
Risks to current spatial management units, especially MPAs	Continuous revision and shifts of MPA borders and goals									


MAXIMUM SPEED AT WHICH SPECIES CAN MOVE
(km per decade)
0
20
40
60
80
100
Trees
Herbaceous Plants
Split-hoofed Mammals
Carnivorous Mammals
Rodents
Primates
Plant-feeding Insects
Freshwater Mollusks
RCP2.6 Flat Areas and Global Average
RCP4.5 Flat Areas
RCP8.5 Global Average
RCP6.0 Flat Areas
RCP8.5 Flat Areas
Upper Bound
Median
Lower Bound
AVERAGE CLIMATE VELOCITY 2050-2090

CHANGE IN MAXIMUM CATCH POTENTIAL (2051-2060 COMPARED TO 2001-2010, SRES A1B)





Based on WGII Box SPM 1 Figure 1

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LIMITING WARMING TO 2°C INVOLVES SUBSTANTIAL TECHNOLOGICAL, ECONOMIC AND INSTITUTIONAL **CHALLENGES**

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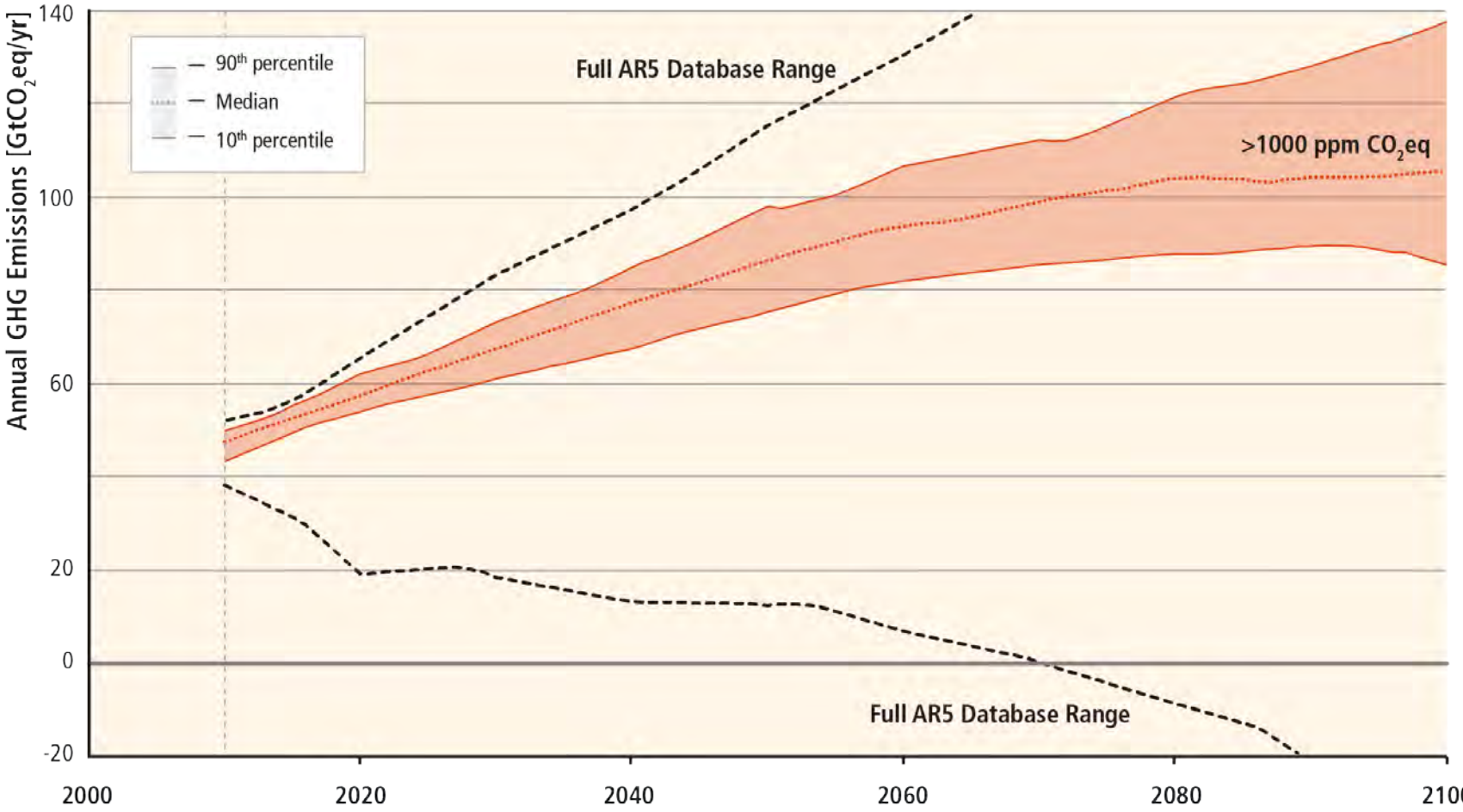
Stabilization of atmospheric concentrations requires moving away from the baseline – regardless of the mitigation goal



Based on WGIII Figure SPM 4

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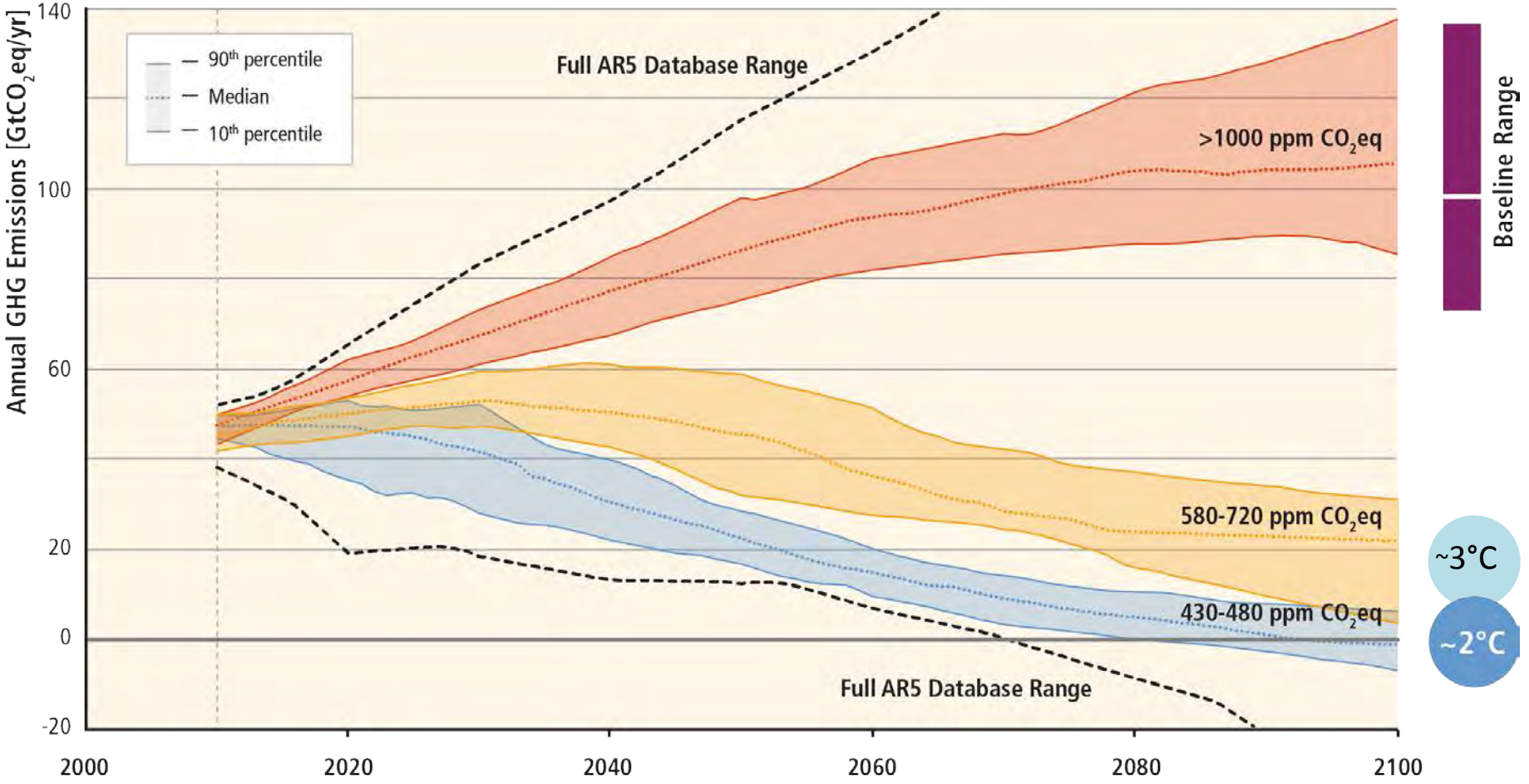
INTERGOVERNMENTAL PANEL ON climate change

Stabilization of atmospheric concentrations requires moving away from the baseline – regardless of the mitigation goal



Based on WGIII Figure SPM 4

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INCREASING FRACTION OF
EMISSIONS COVERED BY
MITIGATION PLANS
AND STRATEGIES
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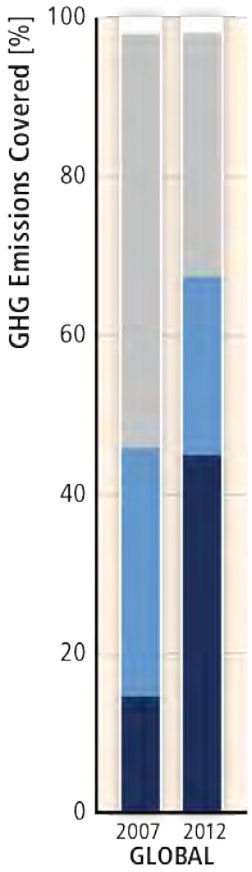
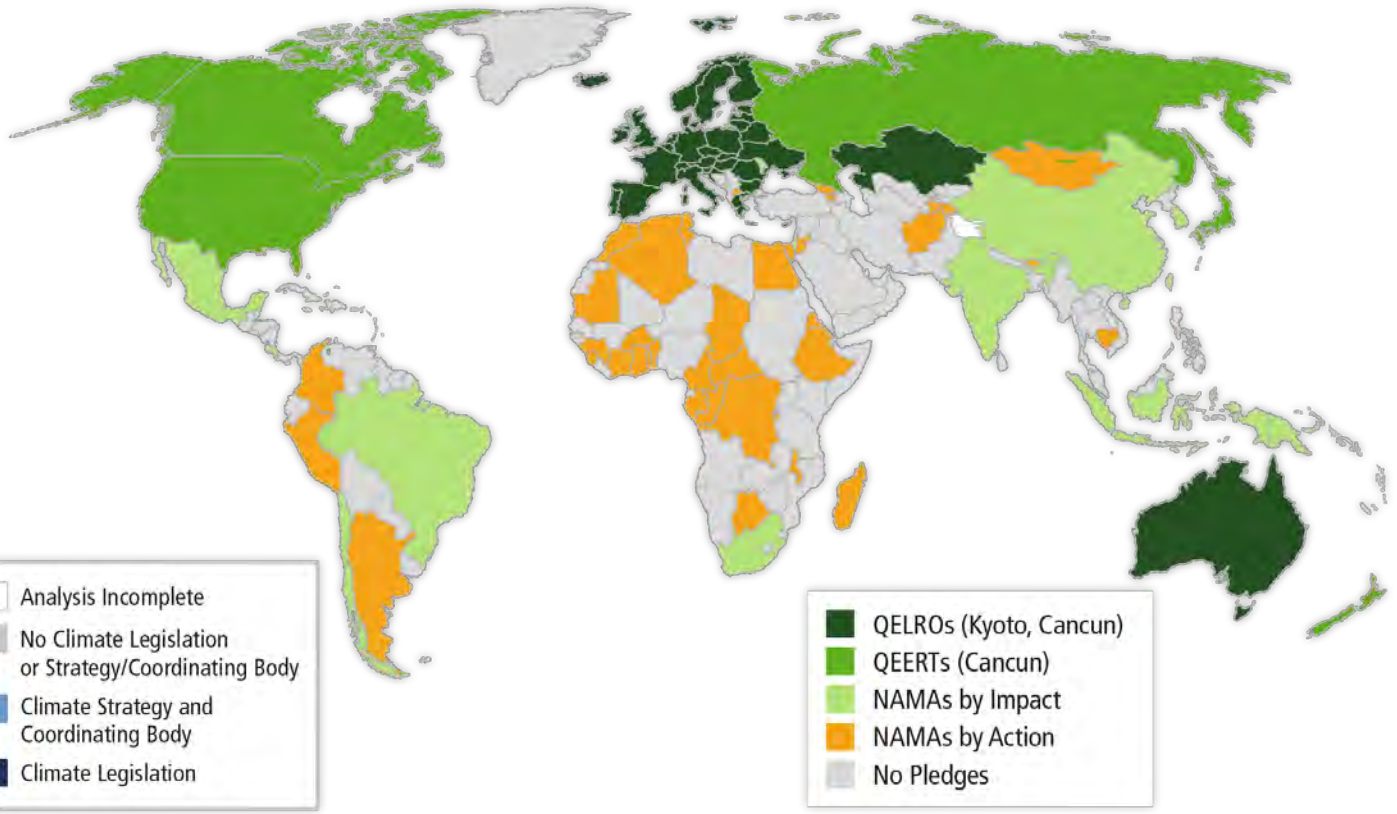
Increase in national and sub-national mitigation policies





Based on WGIII Figures 15.1 and 13.3

EFFECTIVE CLIMATE CHANGE RESPONSES

A MORE VIBRANT WORLD

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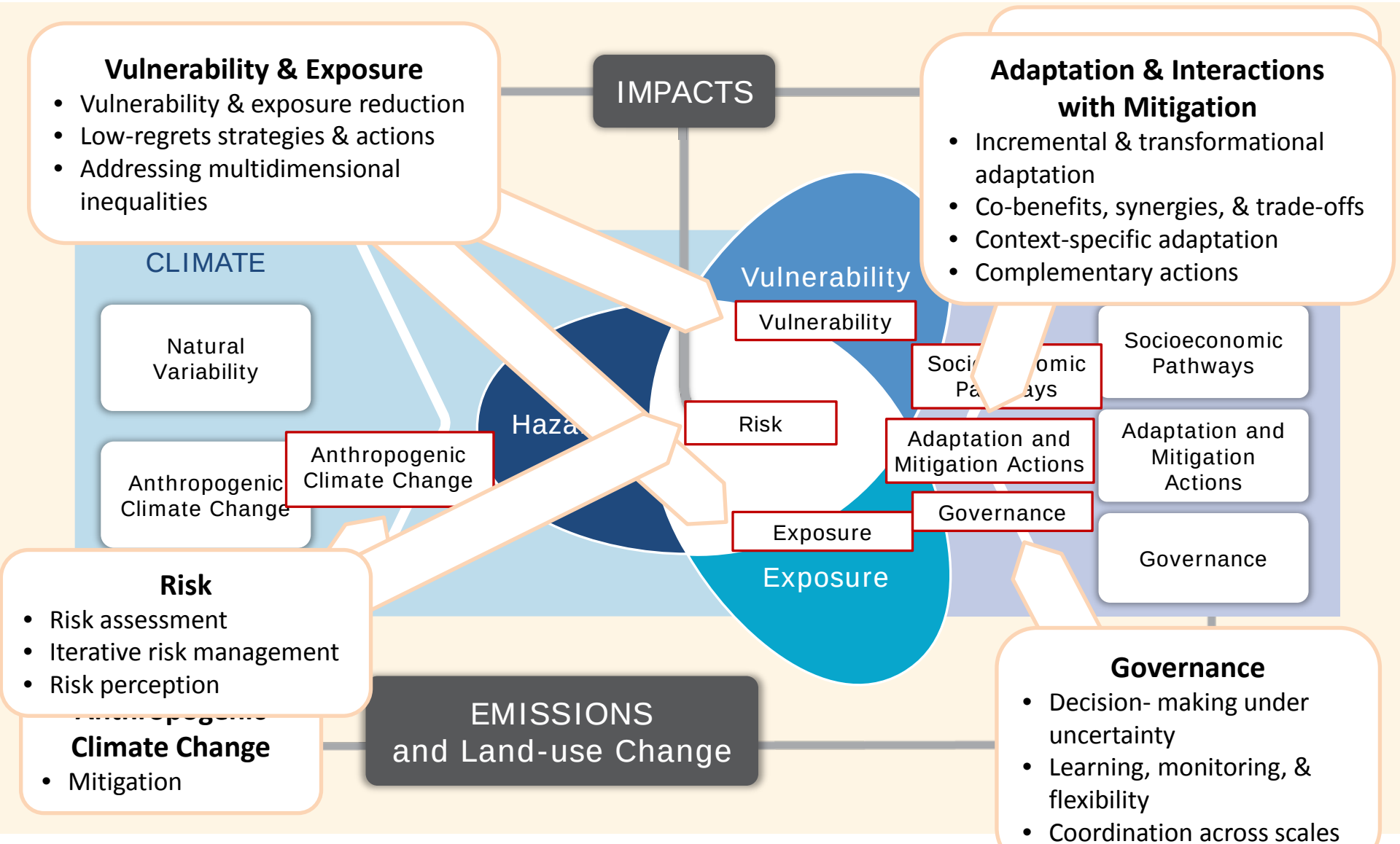
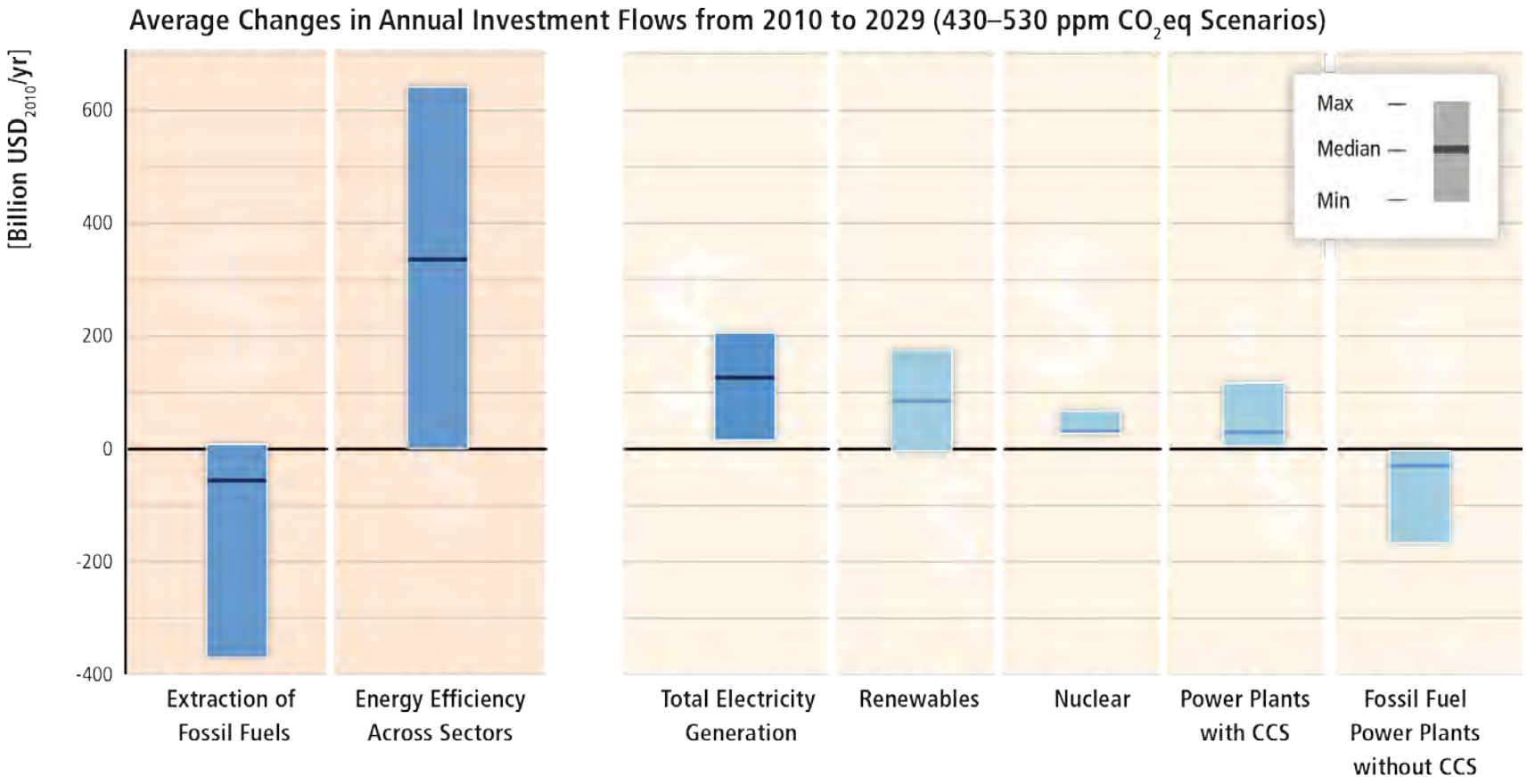

Vulnerability & Exposure
• Vulnerability & exposure reduction
• Low-regrets strategies & actions
• Addressing multidimensional inequalities
IMPACTS
Adaptation & Interactions with Mitigation
• Incremental & transformational adaptation
• Co-benefits, synergies, & trade-offs
• Context-specific adaptation
• Complementary actions
CLIMATE
Natural Variability
Anthropogenic Climate Change
Anthropogenic Climate Change
Haza
Risk
Vulnerability
Vulnerability
Socioeconomic Pathways
Adaptation and Mitigation Actions
Governance
Exposure
Exposure
Socioeconomic Pathways
Adaptation and Mitigation Actions
Governance
Risk
• Risk assessment
• Iterative risk management
• Risk perception
Climate Change
• Mitigation
EMISSIONS and Land-use Change
Governance
• Decision- making under uncertainty
• Learning, monitoring, & flexibility
• Coordination across scales

Substantial emissions reductions linked to new investments



Based on WGIII Figure SPM 9

CLIMATE CHANGE

REDUCING AND MANAGING RISKS

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