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INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

CLIMATE CHANGE 2014

Synthesis Report



A REPORT OF THE
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



CLIMATE CHANGE 2014
Impacts, Adaptation, and Vulnerability

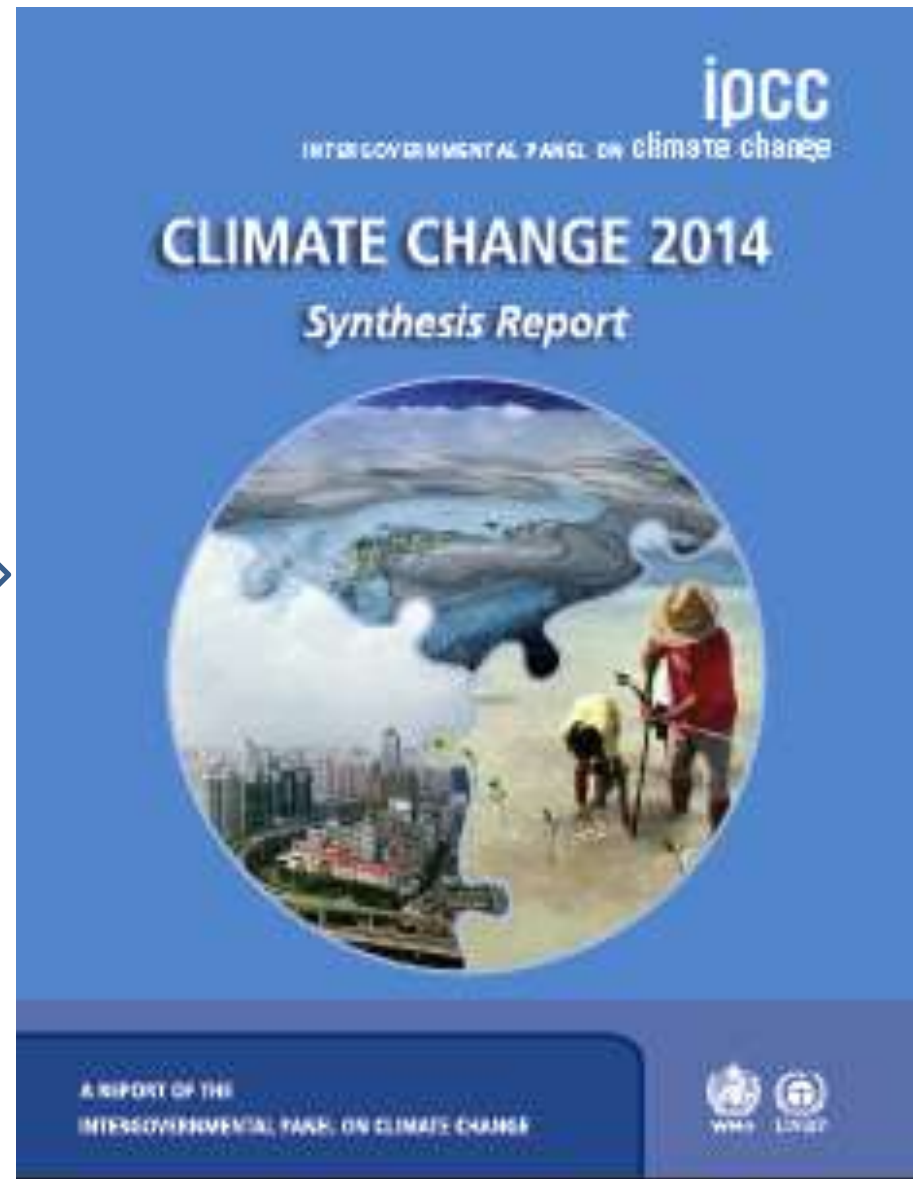
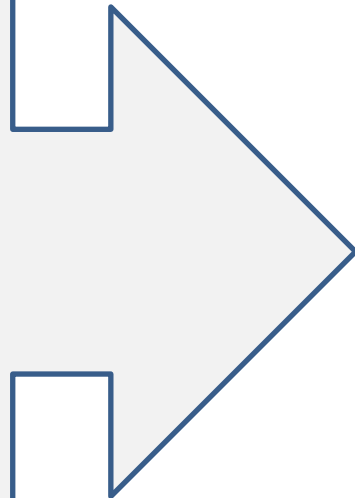
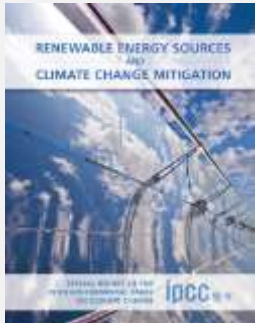
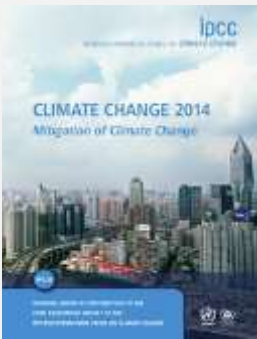
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INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

TOP-LEVEL FINDINGS
FROM THE WORKING GROUP II AR5 SUMMARY FOR POLICYMAKERS

Overview of the Fifth Assessment (AR5) Synthesis Report:

Key Messages on Adaptation

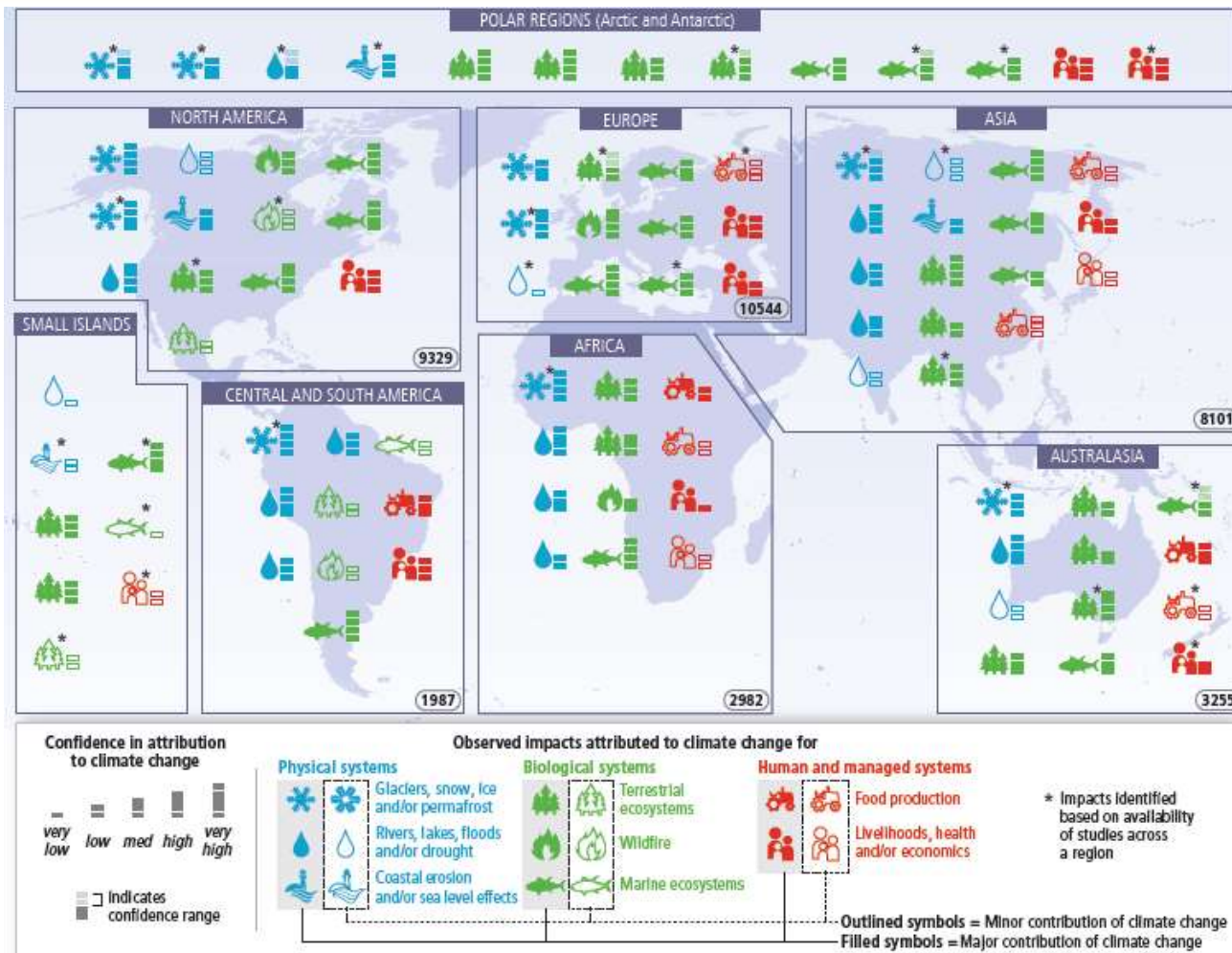
Joy Jacqueline Pereira
IPCC WGp. 2 Vice Chair



Products of the IPCC Fifth Assessment Cycle

SPM 1.3 Impacts of climate change

In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate. {1.3.2}



SPM 1.4 Extreme events

Changes in many extreme weather and climate events have been observed since about 1950. Some of these changes have been linked to human influences, including a decrease in cold temperature extremes, an increase in warm temperature extremes, an increase in extreme high sea levels and an increase in the number of heavy precipitation events in a number of regions. {1.4}

SPM 2.3 Future risks and impacts caused by a changing climate

Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development. {2.3}

SPM 2.4 Climate change beyond 2100, irreversibility and abrupt changes

Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases are stopped. The risks of abrupt or irreversible changes increase as the magnitude of the warming increases. {2.4}

Regional key risks and potential for risk reduction

Representative key risks for each region 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

Wildlife

Marine ecosystems

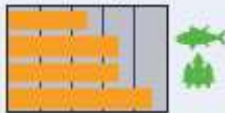
Human and managed systems

Food production

Livelihoods and/or economic

Polar Regions (Arctic and Antarctic)

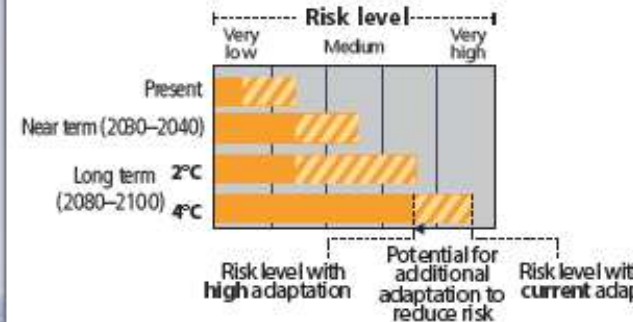
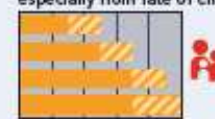
Risks for ecosystems



Risks for health and well-being

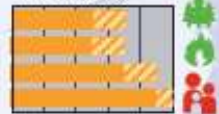


Unprecedented challenges, especially from rate of change

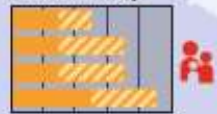


North America

Increased damages from wildfires



Heat-related human mortality



Increased damages from river and coastal urban floods



Europe

Increased damages from river and coastal floods



Increased water restrictions

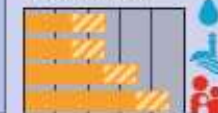


Increased damages from extreme heat events and wildfires



Asia

Increased flood damage to infrastructure, livelihoods and settlements



Heat-related human mortality

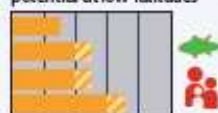


Increased drought related water and food shortage

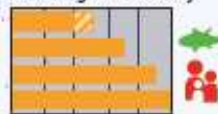


The Ocean

Distributional shift and reduced fisheries catch potential at low latitudes



Increased mass coral bleaching and mortality

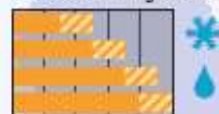


Coastal inundation and habitat loss

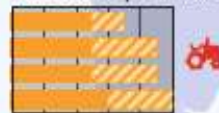


Central and South America

Reduced water availability and increased flooding and landslides



Reduced food production and quality

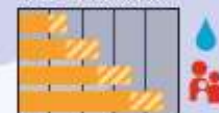


Spread of vector-borne disease



Africa

Compounded stress on water resources



Reduced crop productivity and livelihood and food security



Vector- and water-borne diseases

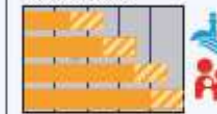


Small islands

Loss of livelihoods, settlements, infrastructure, ecosystem services and economic stability

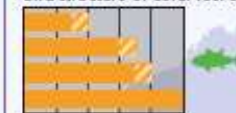


Risks for low-lying coastal areas



Australasia

Significant change in composition and structure of coral reef systems



Increased flood damage to infrastructure and settlements



Increased risks to coastal infrastructure and low-lying ecosystems



SPM 3.2 Climate change risks reduced by mitigation and adaptation

Without additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread and irreversible impacts globally (*high confidence*). Mitigation involves some level of co-benefits and of risks due to adverse side effects, but these risks do not involve the same possibility of severe, widespread and irreversible impacts as risks from climate change, increasing the benefits from near-term mitigation efforts. {3.2, 3.4}

SPM 3.3 Characteristics of adaptation pathways

Adaptation can reduce the risks of climate change impacts, but there are limits to its effectiveness, especially with greater magnitudes and rates of climate change. Taking a longer-term perspective, in the context of sustainable development, increases the likelihood that more immediate adaptation actions will also enhance future options and preparedness. {3.3}

SPM 4. Adaptation and Mitigation

Many adaptation and mitigation options can help address climate change, but no single option is sufficient by itself. Effective implementation depends on policies and cooperation at all scales and can be enhanced through integrated responses that link adaptation and mitigation with other societal objectives. {4}



TOP-LEVEL FINDINGS FROM THE WORKING GROUP II AR5 SUMMARY FOR POLICYMAKERS

Adaptation Experience

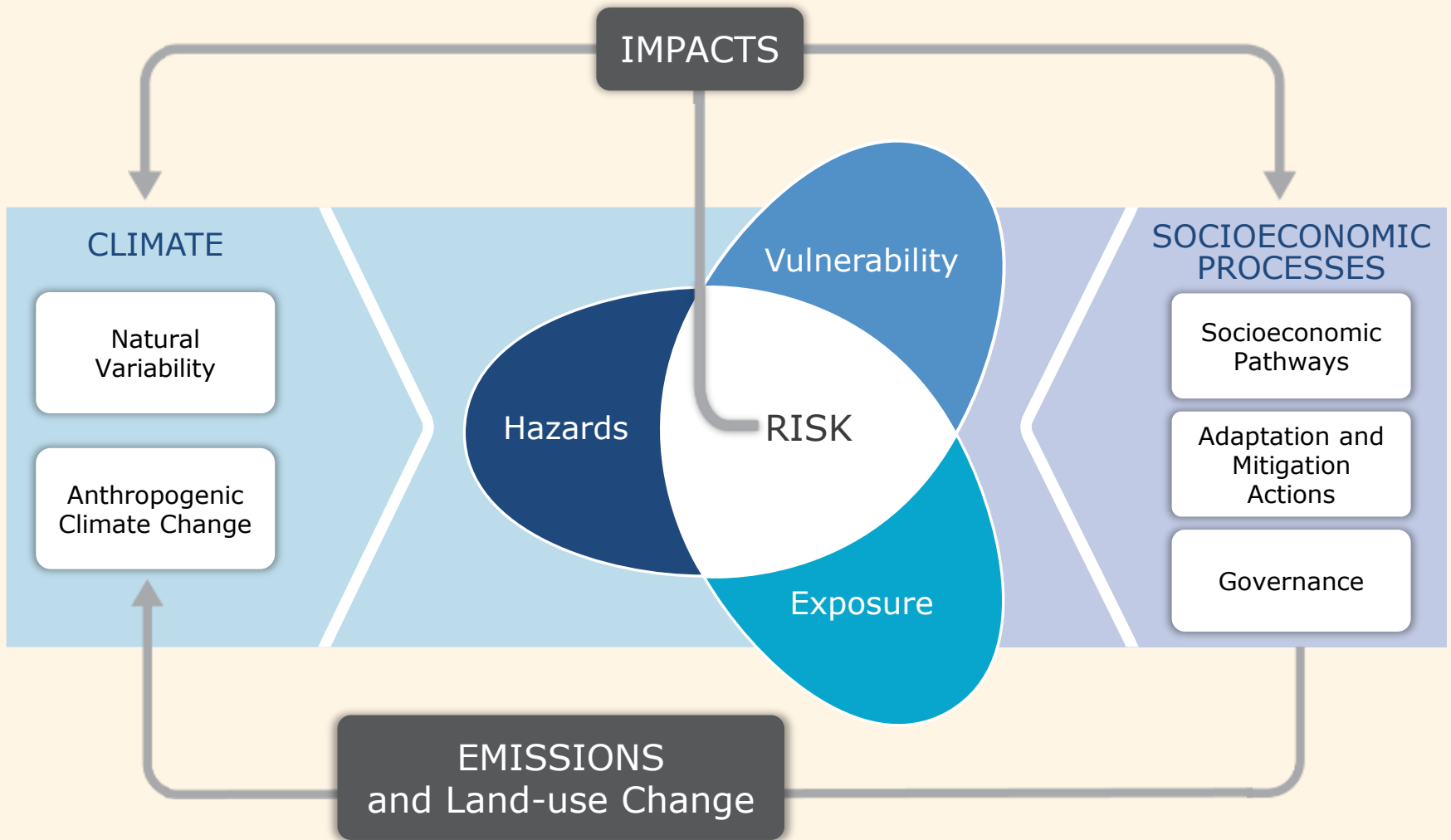
Adaptation is becoming embedded in some planning processes, with more limited implementation of responses (*high confidence*).

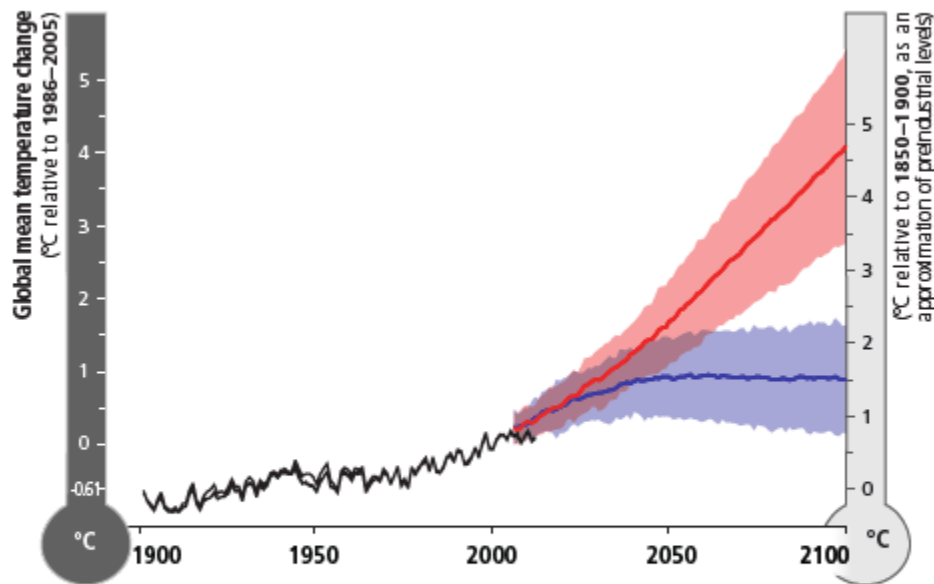
Adaptation experience is accumulating across regions in the public and private sector and within communities (*high confidence*). Governments at various levels are starting to develop adaptation plans and policies and to integrate climate-change considerations into broader development plans.

The Decision-making Context

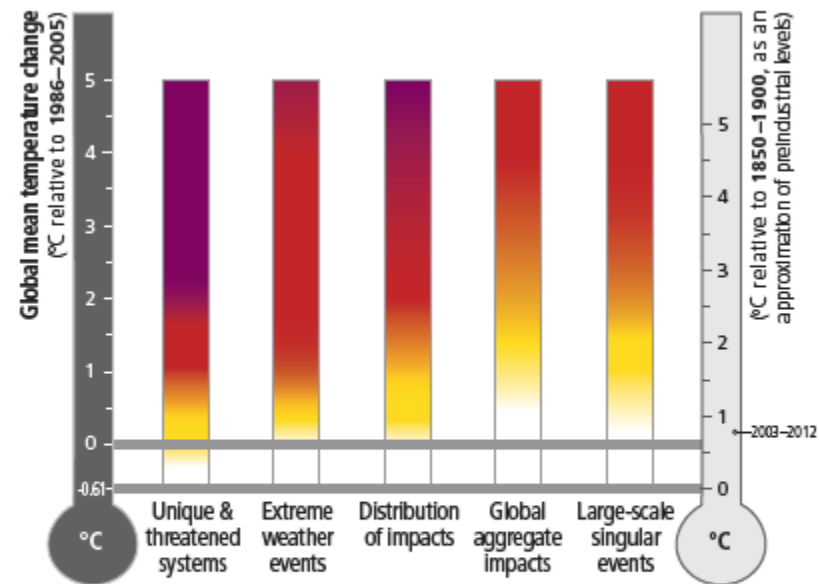
Responding to climate-related risks involves decision making in a changing world, with continuing uncertainty about the severity and timing of climate-change impacts and with limits to the effectiveness of adaptation (*high confidence*).

Adaptation and mitigation choices in the near term will affect the risks of climate change throughout the 21st century (*high confidence*).





— Observed
 RCP8.5 (a high-emission scenario)
 Overlap
 RCP2.6 (a low-emission mitigation scenario)



Level of additional risk due to climate change
 Undetectable Moderate High Very high

A global perspective on climate-related risks. Risks associated with reasons for concern are shown at right for increasing levels of climate change. The color shading indicates the additional risk due to climate change when a temperature level is reached and then sustained or exceeded. Undetectable risk (white) indicates no associated impacts are detectable and attributable to climate change. Moderate risk (yellow) indicates that associated impacts are both detectable and attributable to climate change with at least *medium confidence*, also accounting for the other specific criteria for key risks. High risk (red) indicates severe and widespread impacts, also accounting for the other specific criteria for key risks. Purple, introduced in this assessment, shows that very high risk is indicated by all specific criteria for key risks. For reference, past and projected global annual average surface temperature is shown at left.

Principles for Effective Adaptation

Adaptation is place- and context-specific, with no single approach for reducing risks appropriate across all settings (*high confidence*).

Adaptation planning and implementation can be enhanced through complementary actions across levels, from individuals to governments (*high confidence*).

A first step towards adaptation to future climate change is reducing vulnerability and exposure to present climate variability (*high confidence*). Strategies include actions with co-benefits for other objectives.

Adaptation planning and implementation at all levels of governance are contingent on societal values, objectives, and risk perceptions (*high confidence*). Recognition of diverse interests, circumstances, social-cultural contexts, and expectations can benefit decision-making processes.

Decision support is most effective when it is sensitive to context and the diversity of decision types, decision processes, and constituencies (*robust evidence, high agreement*).

Existing and emerging economic instruments can foster adaptation by providing incentives for anticipating and reducing impacts (*medium confidence*).

Constraints can interact to impede adaptation planning and implementation (*high confidence*).

Poor planning, overemphasizing short-term outcomes, or failing to sufficiently anticipate consequences can result in maladaptation (*medium evidence, high agreement*).

Limited evidence indicates a gap between global adaptation needs and the funds available for adaptation (*medium confidence*).

Significant co-benefits, synergies, and trade-offs exist between mitigation and adaptation and among different adaptation responses; interactions occur both within and across regions (*very high confidence*).