Biodiversity and Climate Change

United Nation Convention on Biological Diversity

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Achieving the 2010 Biodiversity Target

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Section 1: Consequences of climate change on biodiversity
Section 2: Role of biodiversity in mitigation and adaptation
Section 3: Approach of the Convention on Biological Diversity (CBD)
Section 4: Proposed orientations
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Conclusion

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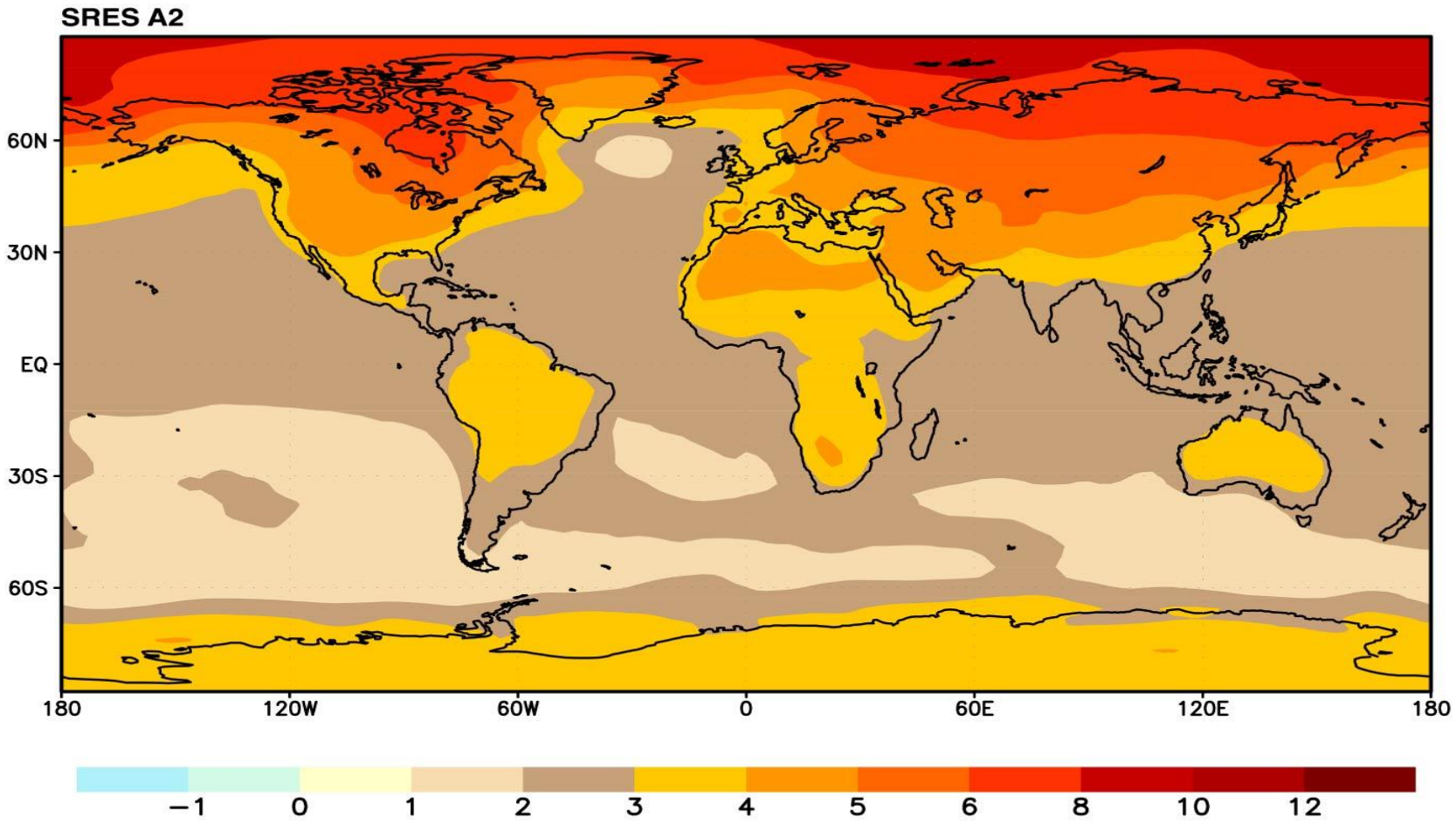
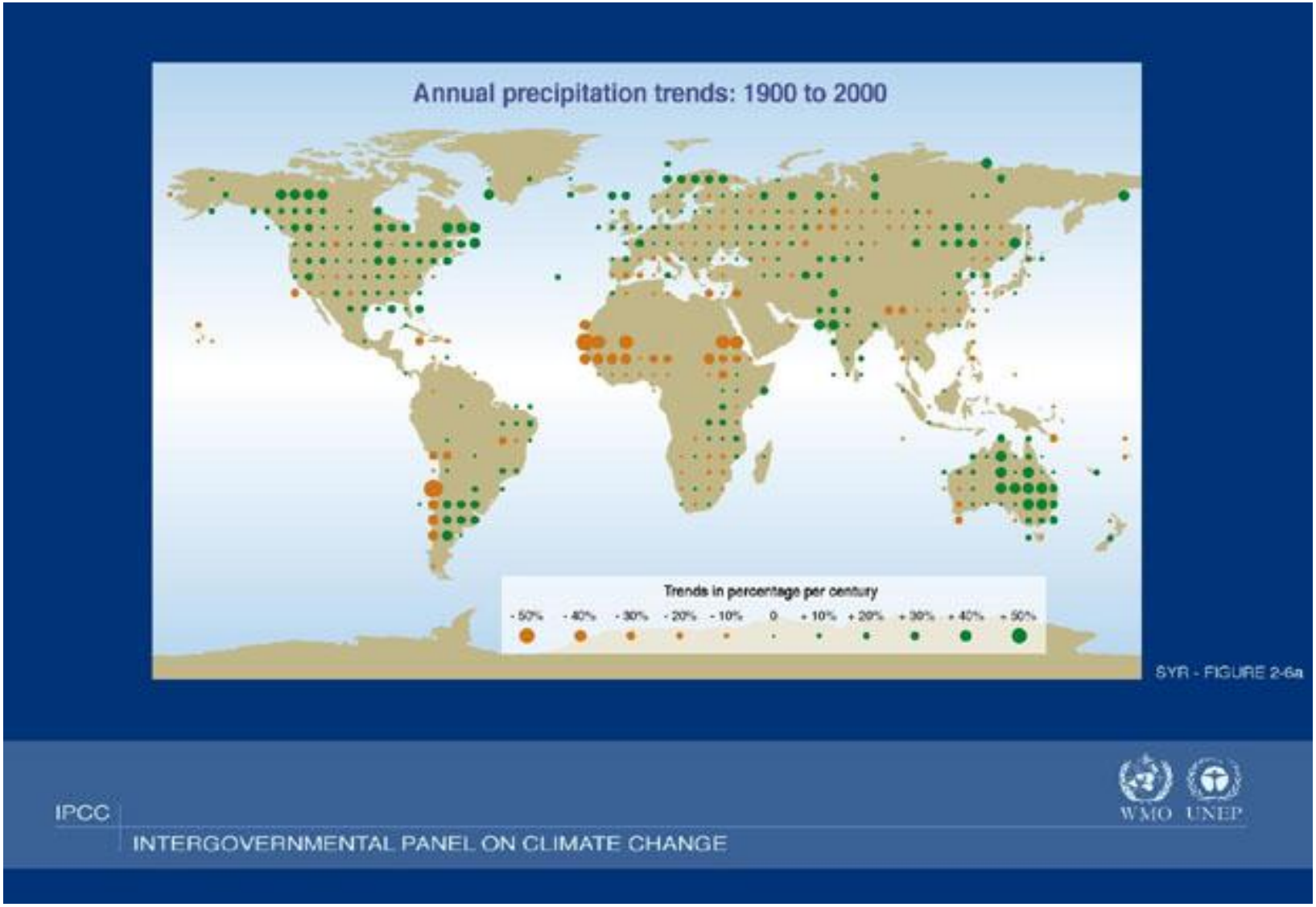
Predicted changes in mean temperature



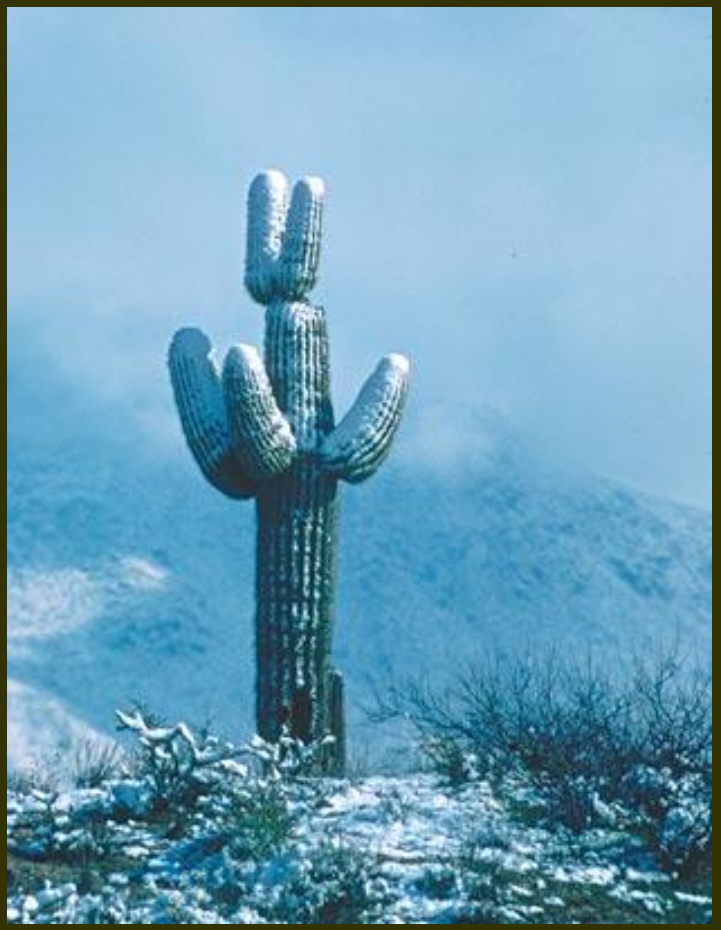
Annual mean temperature change, 2071 to 2100 relative to 1990: Global Average in 2085 = 3.1°C

Changes in the distribution of rain and snow



Vegetation and reflection of radiation

Biodiversity and Climate Change



- **Biodiversity** – the web of life

- **Threats**:
  - Habitat modification
  - Invasive species
  - Overexploitation
  - Pollution
  - And….Climate change

- **New challenges**
  - According to the **Millennium Ecosystem Assessment** – Climate change is the second biggest threat to biodiversity.

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- According to the **Intergovernmental Panel on Climate Change** (IPCC):
  - (high confidence)
    - Ground instability in permafrost and mountains regions
    - Poleward and upward shifts in ranges in plant and animal species
    - Increase in algal abundance in high-altitude and high-latitude lakes
  - Knowledge about future impacts are alarming!
    - Resilience of many ecosystems likely to be exceeded this century (high confidence)

(medium confidence)

20-30% of plant and animal species likely to be at increased risk of extinction if increases in global average temperature exceed 1.5-2.5°C

(high confidence)

- Some adaptation strategies in place but a **more intensive application of these adaptations** will be necessary to decrease ecosystems vulnerability

  Technological, behavioural, managerial and regulatory adaptation

- **Sustainable development** can reduce vulnerability (very high confidence) and **emissions reduction** can mitigate or delay the impact (high confidence)

(very high confidence)

- If no adaptation or mitigation strategies are put in place, **costs** associated with climate change impact **will increase with time**

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Report for the British government released in 2006 by economist Nicholas Stern:

If no action is taken, the overall costs and risks of climate change will be equivalent to losing at least **5% of global GDP** each year.

If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more.

Impacts of climate change mitigation activities

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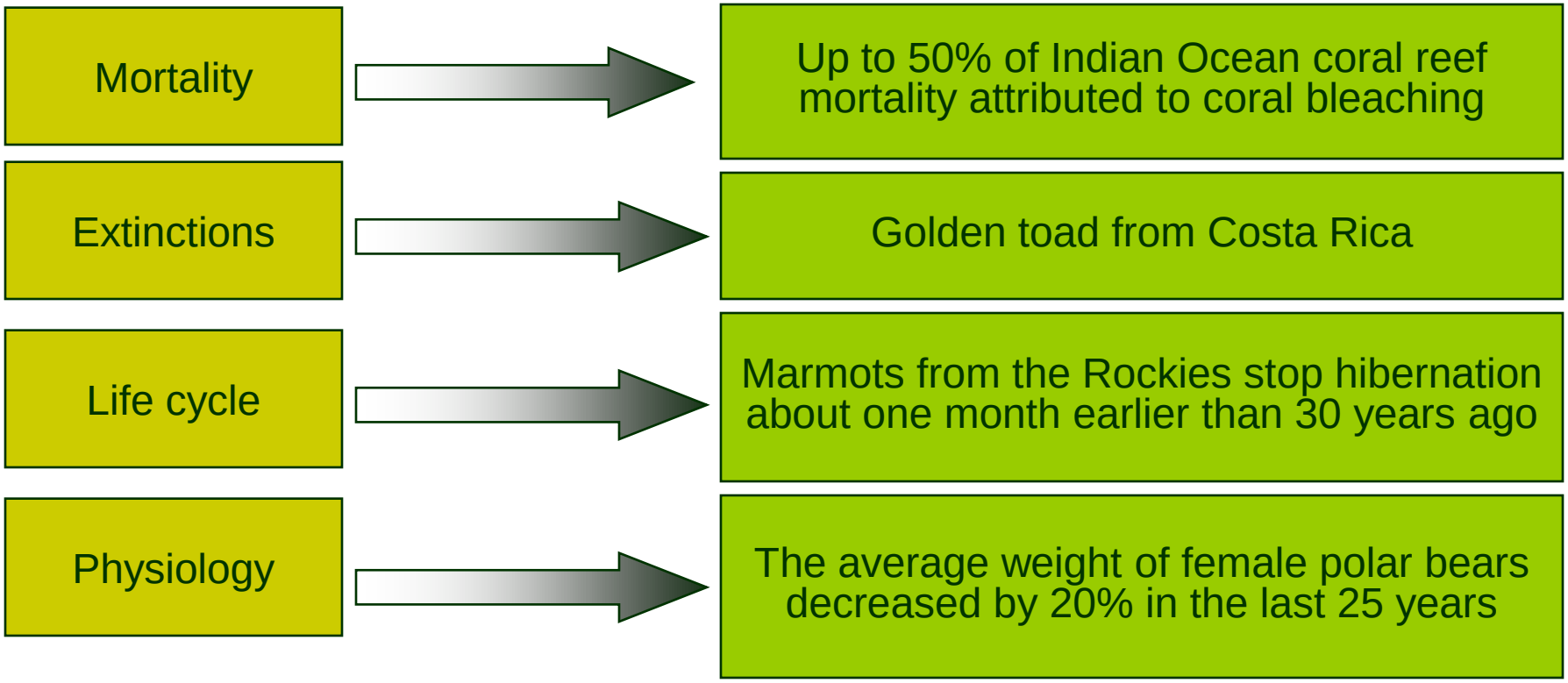
Climate change **affects species** in various ways:

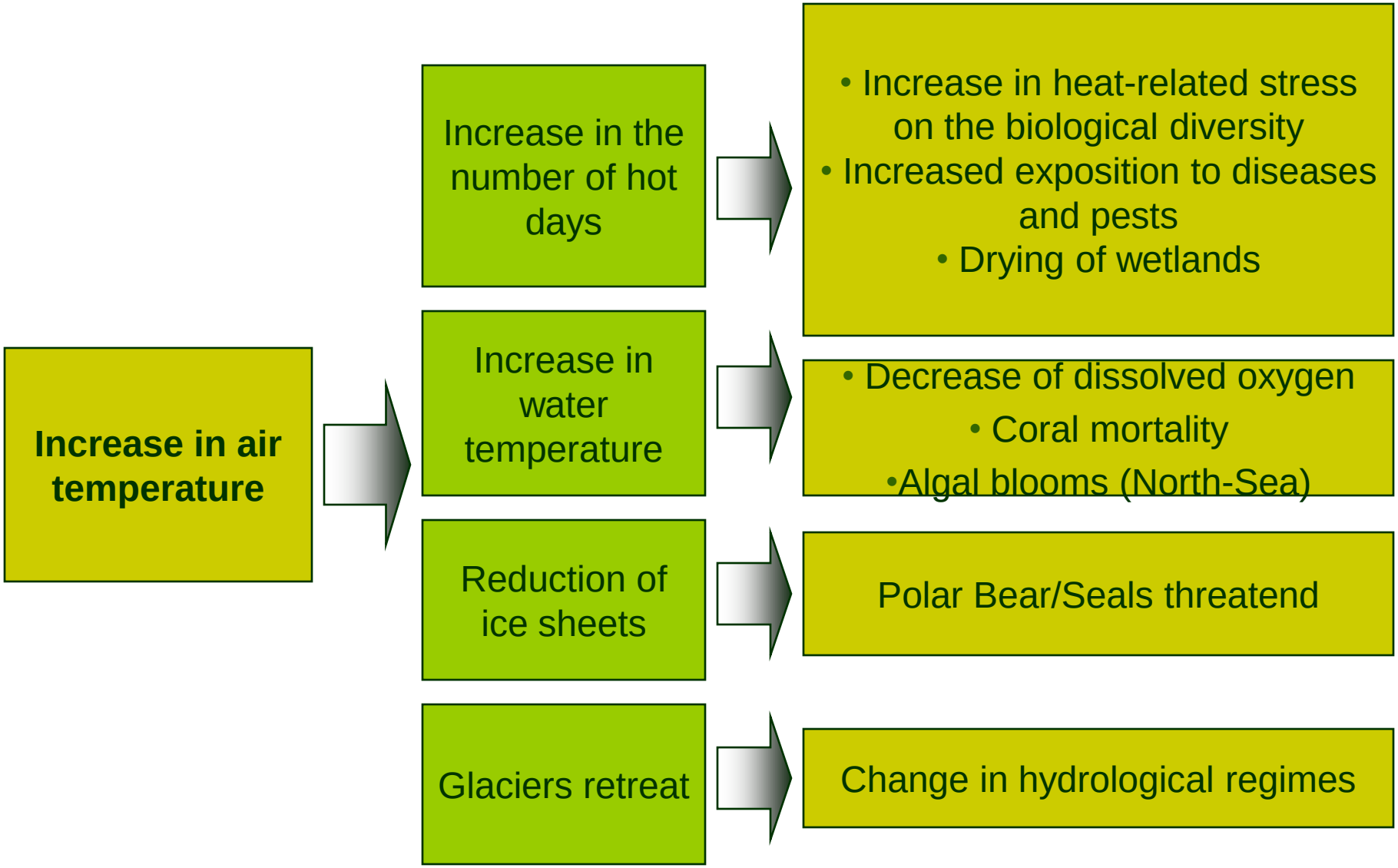


Impacts of climate on biodiversity (Examples)

- Lengthening of the growing season in Europe by more than 10 days between 1969 and 1998
- Spreading of new animal and plant species in Germany

Impacts of climate on biodiversity

Severe coral bleaching events (e.g. in 1998)


Increase in air temperature
Increase in the number of hot days
Increase in water temperature
Reduction of ice sheets
Glaciers retreat
• Increase in heat-related stress on the biological diversity
• Increased exposition to diseases and pests
• Drying of wetlands
• Decrease of dissolved oxygen
• Coral mortality
•Algal blooms (North-Sea)
Polar Bear/Seals threatend
Change in hydrological regimes

Glaciers are shrinking in many parts of the world:

Eastern Himalaya: 2000 glaciers have disappeared since 1900

Kilimanjaro: about 80 % of the snow and ice fields were lost since 1912

European Alps: glaciers have shrunk by about half of their volume over the last 150 years

Patagonia: almost all glaciers are melting at an alarming rate

Change in rainfall patterns

Increase of droughts in the dry seasons

- Desertification
- Loss of soils biodiversity
- Increase in fire risks
- Drying of wetlands

Increase of floods in the wet seasons

- Soils erosion
- Risks linked to waterborne diseases
- Change of rivers natural flow

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Increase in sea level

Salt water intrusion in costal wetlands → Habitats modification

Coastal floods → Coastal erosion

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Increase in frequency and intensity of extreme climatic events

→ Decrease of ecosystems resistance and resilience → • Reduction of productivity • Increased mortality of certain organisms

→ Increased height of storms waves → Perturbation and loss of habitat

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Emissions reduction	Forests sequester more than half of the total carbon stored in terrestrial vegetation and soils.
'safety net'	Cultivation of the traditional varieties provide genetic material necessary for the development of new varieties resistant to drought.
Bio-shield	Coastal protection provided by mangroves has an estimated value of $25-$50 per hectare.

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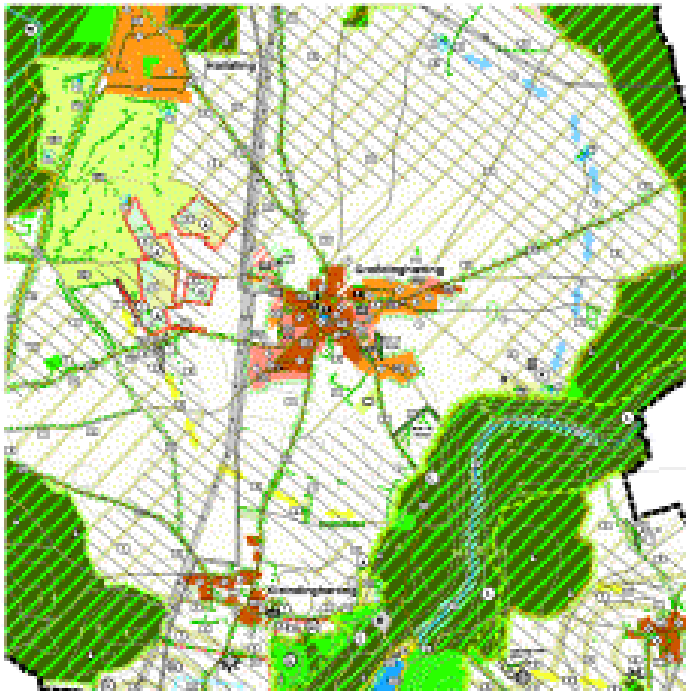
- Examples of **activities** facilitating climate change **mitigation** and **adaptation**:

  - **Maintenance and restoration** of indigenous ecosystems
  - **Protection** of ecosystems services
  - **Management and habitats protection** for species at risk of exctinction
  - Creation of **refuges** and **buffer zones**
  - Creation of a **network of protected areas** taking into account future climate change

Create good conditions for species migration

Networks of protected areas and corridors



- Climate change and biodiversity are addressed by the CBD through:
  - **Cross-cutting issues** on biodiversity and climate change and the ecosystem approach
  - The **Technical Expert Group on climate change and biodiversity**. Resulting products: Technical Series N°10 et N° 25 of the CBD
  - Climate change consideration in the **thematic programmes** of the Convention
  - The **joint work** by the UNFCCC on technology transfer, vulnerability and adaptation, and on emissions reduction from deforestation

Using the carbon storage potential of ecosystems

In paragraphe 8 of **decision VIII/30**, the COP to the Convention on Biological Diversity requests the SBSTTA, while respecting the mandate of the United Nations Convention on Climate Change, to **develop draft guidance** on **how to integrate relevant climate change impacts and response activities, into the programmes of work of the Convention**

1. **Identify** vulnerable regions, subregions and ecosystem types, including **vulnerable biodiversity** within these areas
   - Island
   - Mountains (especially near ridges and mountaintops)
   - Tropical and boreal forests
   - Marine and coastal zone (especially mangroves, coral reefs and coastal wetlands)
   - Wetlands (especially prairie wetlands)
   - Polar regions
   - rangelands/savannahs (especially remnant native grasslands) and fynbos
   - Ecosystems overlying permafrost

2. Assess the threats and likely impacts of climate change on biodiversity in the identified vulnerable areas

3. Identify and evaluate climate change mitigation and adaptation options (**Technical Series No. 25**)

Adaptation activity	Type of adaptation	Likely impact on biodiversity	Potential risk to biodiversity	Possible action for adaptative management
Marine and coastal biodiversity				
Introduction of salt tolerant varieties of native plants and animals for coastal protection/revegetation	Scientific and economic	Positive to neutral	Low	Monitor for likely effect on biodiversity and include adaptative management
Forest biodiversity				
Establishment of corridors	Scientific, regulatory and institutional	Positive	Low to medium if allowing migration of invasive species	Monitor the migration of plant and animal species in the corridors and the connected cells of the landscapes and manage invasive species when detected

4. Implement and monitor selected mitigation and adaptation plans

Lessons learned:

- Ensure stakeholder participation
- Develop adequate technical and informational capacity
- Consider the long-term sustainability of activities
- Develop and appropriate policy framework

- Role of **biofuels**
  - Greenhouse gas emissions?
  - Deforestation – resulting in emissions and loss of biodiversity

- Reducing emissions from **déforestation**
  - Deforestation = responsible for 25% of anthropogenic CO_2 emissions
  - Financial incentives to reduce the loss of forests?
  - Afforestation and reforestation: avantages and disavantages

- Needs in **research**
  - Consequence on **species** and enhanced **monitoring**
  - others

Conclusions

1. Climate Change is an important issue for biodiversity conservation and sustainable use!
2. Biodiversity is affected by climate change (directly and indirectly)
3. Good management can increase resilience of ecosystems
4. Climate change mitigation and adaptation activities in other sectors can affect biodiversity (negative and positive)
5. There are possible win-win solutions
6. Biodiversity can help human society to adapt better to climate change and natural desasters caused by climate change
7. Biodiversity can help to mitigate climate change
8. Strong cooperation between CBD, UNFCCC and other partners is needed!
9. We have to act now, before things become worse!

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Thank you for your attention!