

Climate-related drivers of impacts



Global Risks

| Key risk | Adaptation issues & prospects | Climatic drivers | Timeframe | Risk & potential for adaptation | | | | | | | | | | | | | | | | | | | |
|--|---|------------------|--|---------------------------------|----------|--------|-----------|---------|--|--|--|-----------------------|--|--|--|-----------------------|--|--|--|--|-----|--|-----|
| <p>Reduction in terrestrial carbon sink: Carbon stored in terrestrial ecosystems is vulnerable to loss back into the atmosphere, resulting from increased fire frequency due to climate change and the sensitivity of ecosystem respiration to rising temperatures (<i>medium confidence</i>)</p> <p>[WGII 4.2, 4.3]</p> | <ul style="list-style-type: none"> Adaptation options include managing land use (including deforestation), fire and other disturbances, and non-climatic stressors. | | <table border="1"> <thead> <tr> <th></th> <th>Very low</th> <th>Medium</th> <th>Very high</th> </tr> </thead> <tbody> <tr> <td>Present</td> <td colspan="3"></td> </tr> <tr> <td>Near term (2030–2040)</td> <td colspan="3"></td> </tr> <tr> <td>Long term (2080–2100)</td> <td colspan="3"></td> </tr> <tr> <td></td> <td>2°C</td> <td></td> <td>4°C</td> </tr> </tbody> </table> | | Very low | Medium | Very high | Present | | | | Near term (2030–2040) | | | | Long term (2080–2100) | | | | | 2°C | | 4°C |
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| <p>Boreal tipping point: Arctic ecosystems are vulnerable to abrupt change related to the thawing of permafrost, spread of shrubs in tundra and increase in pests and fires in boreal forests (<i>medium confidence</i>)</p> <p>[WGII 4.3, Box 4-4]</p> | <ul style="list-style-type: none"> There are few adaptation options in the Arctic. | | <table border="1"> <thead> <tr> <th></th> <th>Very low</th> <th>Medium</th> <th>Very high</th> </tr> </thead> <tbody> <tr> <td>Present</td> <td colspan="3"></td> </tr> <tr> <td>Near term (2030–2040)</td> <td colspan="3"></td> </tr> <tr> <td>Long term (2080–2100)</td> <td colspan="3"></td> </tr> <tr> <td></td> <td>2°C</td> <td></td> <td>4°C</td> </tr> </tbody> </table> | | Very low | Medium | Very high | Present | | | | Near term (2030–2040) | | | | Long term (2080–2100) | | | | | 2°C | | 4°C |
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| <p>Amazon tipping point: Moist Amazon forests could change abruptly to less-carbon-dense, drought- and fire-adapted ecosystems (<i>low confidence</i>)</p> <p>[WGII 4.3, Box 4-3]</p> | <ul style="list-style-type: none"> Policy and market measures can reduce deforestation and fire. | | <table border="1"> <thead> <tr> <th></th> <th>Very low</th> <th>Medium</th> <th>Very high</th> </tr> </thead> <tbody> <tr> <td>Present</td> <td colspan="3"></td> </tr> <tr> <td>Near term (2030–2040)</td> <td colspan="3"></td> </tr> <tr> <td>Long term (2080–2100)</td> <td colspan="3"></td> </tr> <tr> <td></td> <td>2°C</td> <td></td> <td>4°C</td> </tr> </tbody> </table> | | Very low | Medium | Very high | Present | | | | Near term (2030–2040) | | | | Long term (2080–2100) | | | | | 2°C | | 4°C |
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| <p>Increased risk of species extinction: A large fraction of the species assessed is vulnerable to extinction due to climate change, often in interaction with other threats. Species with an intrinsically low dispersal rate, especially when occupying flat landscapes where the projected climate velocity is high, and species in isolated habitats such as mountaintops, islands or small protected areas are especially at risk. Cascading effects through organism interactions, especially those vulnerable to phenological changes, amplify risk (<i>high confidence</i>)</p> <p>[WGII 4.3, 4.4]</p> | <ul style="list-style-type: none"> Adaptation options include reduction of habitat modification and fragmentation, pollution, over-exploitation and invasive species; protected area expansion; assisted dispersal; and <i>ex situ</i> conservation. | | <table border="1"> <thead> <tr> <th></th> <th>Very low</th> <th>Medium</th> <th>Very high</th> </tr> </thead> <tbody> <tr> <td>Present</td> <td colspan="3"></td> </tr> <tr> <td>Near term (2030–2040)</td> <td colspan="3"></td> </tr> <tr> <td>Long term (2080–2100)</td> <td colspan="3"></td> </tr> <tr> <td></td> <td>2°C</td> <td></td> <td>4°C</td> </tr> </tbody> </table> | | Very low | Medium | Very high | Present | | | | Near term (2030–2040) | | | | Long term (2080–2100) | | | | | 2°C | | 4°C |
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| <p>Global redistribution and decrease of low-latitude fisheries yields, paralleled by a global trend to catches having smaller fishes (<i>medium confidence</i>)</p> <p>[WGII 6.3 to 6.5, 30.5, 30.6]</p> | <ul style="list-style-type: none"> Increasing coastal poverty at low latitudes as fisheries become smaller – partially compensated by the growth of aquaculture and marine spatial planning, as well as enhanced industrialized fishing efforts | | <table border="1"> <thead> <tr> <th></th> <th>Very low</th> <th>Medium</th> <th>Very high</th> </tr> </thead> <tbody> <tr> <td>Present</td> <td colspan="3"></td> </tr> <tr> <td>Near term (2030–2040)</td> <td colspan="3"></td> </tr> <tr> <td>Long term (2080–2100)</td> <td colspan="3"></td> </tr> <tr> <td></td> <td>2°C</td> <td></td> <td>4°C</td> </tr> </tbody> </table> | | Very low | Medium | Very high | Present | | | | Near term (2030–2040) | | | | Long term (2080–2100) | | | | | 2°C | | 4°C |
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| <p>Reduced growth and survival of commercially valuable shellfish and other calcifiers (e.g., reef building corals, calcareous red algae) due to ocean acidification (<i>high confidence</i>)</p> <p>[WGII 5.3, 6.1, 6.3, 6.4, 30.3, Box CC-OA]</p> | <ul style="list-style-type: none"> Evidence for differential resistance and evolutionary adaptation of some species exists, but they are <i>likely</i> to be limited at higher CO₂ concentrations and temperatures. Adaptation options include exploiting more resilient species or protecting habitats with low natural CO₂ levels, as well as reducing other stresses, mainly pollution, and limiting pressures from tourism and fishing. | | <table border="1"> <thead> <tr> <th></th> <th>Very low</th> <th>Medium</th> <th>Very high</th> </tr> </thead> <tbody> <tr> <td>Present</td> <td colspan="3"></td> </tr> <tr> <td>Near term (2030–2040)</td> <td colspan="3"></td> </tr> <tr> <td>Long term (2080–2100)</td> <td colspan="3"></td> </tr> <tr> <td></td> <td>2°C</td> <td></td> <td>4°C</td> </tr> </tbody> </table> | | Very low | Medium | Very high | Present | | | | Near term (2030–2040) | | | | Long term (2080–2100) | | | | | 2°C | | 4°C |
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| <p>Marine biodiversity loss with high rate of climate change (<i>medium confidence</i>)</p> <p>[WGII 6.3, 6.4, Table 30-4, Box CC-MB]</p> | <ul style="list-style-type: none"> Adaptation options are limited to reducing other stresses, mainly pollution, and limiting pressures from coastal human activities such as tourism and fishing. | | <table border="1"> <thead> <tr> <th></th> <th>Very low</th> <th>Medium</th> <th>Very high</th> </tr> </thead> <tbody> <tr> <td>Present</td> <td colspan="3"></td> </tr> <tr> <td>Near term (2030–2040)</td> <td colspan="3"></td> </tr> <tr> <td>Long term (2080–2100)</td> <td colspan="3"></td> </tr> <tr> <td></td> <td>2°C</td> <td></td> <td>4°C</td> </tr> </tbody> </table> | | Very low | Medium | Very high | Present | | | | Near term (2030–2040) | | | | Long term (2080–2100) | | | | | 2°C | | 4°C |
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