An overview of the information

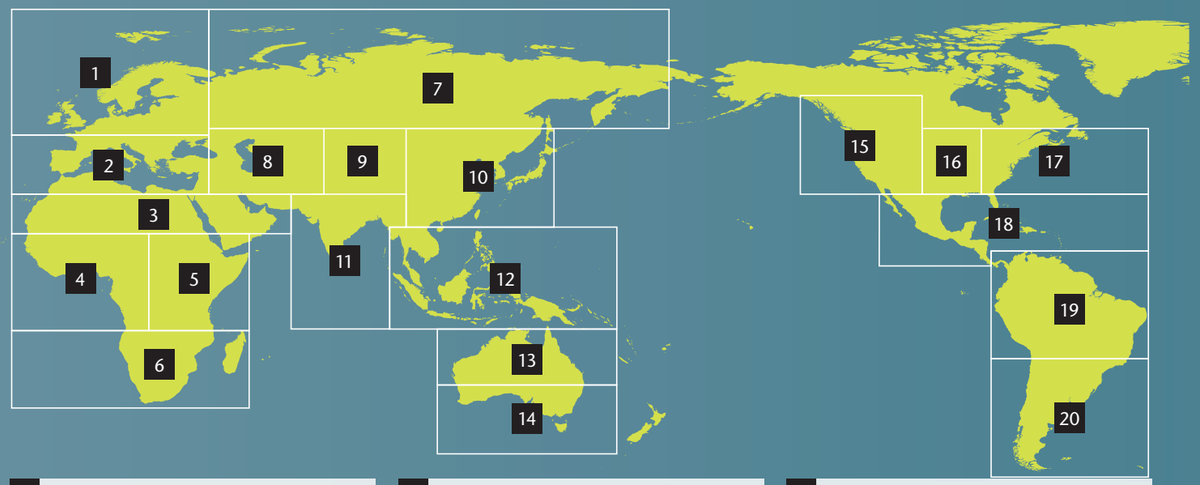
The future impacts of climate change will be felt both locally and globally, with major importing regions being linked through trade to the local impacts of climate change in major exporting regions. For example the Middle East, North Africa, and parts of Asia are major importers of wheat, maize, soybean and rice; this links them to the impacts of climate change in South and Southeast Asia (major rice exporting region), South America (major maize and soybean exporting region) and North America (major exporter of wheat, maize, soybean and rice).

The crop yield projections shown here include the effects of CO_2 fertilisation (which varies between climate impact models and crop species), over both rainfed and irrigated land, and have been weighted according to the present-day yield values. These projections show some signal for global increases in average wheat, rice and soybean yield, particularly in North America, southern South America and Asia, but on average, decreases in maize yield globally. However, projections of average annual crop yield changes are highly uncertain, with models often disagreeing on the direction of change. These changes in yield also assume the supply of sufficient water for irrigation. However, the amount of water required for irrigation is projected to increase in most regions, as a result of the warmer climate, and surface and sub-surface water run-off in the future is projected to increase in some areas, but decrease in others. The crop projections shown are for average yields, and do not reflect how the variability of crop yield will change. The variability of yields from year-to-year will be affected by drought, flood and high temperatures. The number of days in drought and the temperature of the warmest days is projected to increase, and the frequency of flood events is projected to increase in some regions, for example much of Asia, and decrease in others, for example around the Mediterranean.

Changes in water run-off, agricultural irrigation demand, drought and high temperature, not only have the potential to reduce average crop yields and increase the inter-annual variability of yields, but also affect water availability for human consumption and industry. Large parts of the world, particularly those with high population densities today, already face severe water stress, for example Sub-Saharan Africa and South and Southeast Asia; increases in population density in many of these regions will only increase demand (in the absence of adaptation). For some regions melting glaciers may also compound water security challenges.

Increasing temperatures and increased pressures on water availability and quality can exacerbate many health and sanitation issues, such as heat stress, diarrheal and vector-borne diseases. Non-climate factors will also significantly impact human health, but geographic changes are quite uncertain and are therefore not shown on the poster.

Climate change also has the potential to negatively impact marine ecosystems, through ocean acidification and increasing temperatures, which threaten fish populations and the dependent fishing industries and livelihoods. Marine areas off the coast of East and Southeast Asia, the west coast of South America and the North Atlantic are all major fishing regions where the impact may be most strongly felt. Coastal populations will be affected by flooding due to sea level rise. Adaptation measures can significantly reduce the number of people flooded each year from the projections shown on this poster; although these may not be affordable or desirable in all nations and situations. People and assets in tropical cyclones regions are particularly exposed.



Data look-up tables

The tables below show the data values and ranges of the climate projections on the poster overleaf. Open up the poster first, and refer back to these tables for more detail. The climate model data has been averaged over climatologically similar regions (marked on the maps as white boxes), and represented as scaled icons. The tables show the median and inter-quartile ranges of the ensemble of climate impacts models used between the baseline period (1981—2010) and the end of the century (2071—2100), under a 'business as usual' greenhouse gas concentration scenario (RCP 8.5) and a 'middle of the road' socio-economic scenario (SSP2). The numbers of people flooded along the coast due to sea level rise are calculated per country and the values listed below correspond to a medium ice melting scenario, with the range showing values from low and high ice melting scenarios.

Icons depict change in:

- warm day temperature
- area of increased/decreased flood hazard
- number of days in drought
- water run-off
- water demand for irrigation
- wheat yield
- maize yield
- rice yield
- soybean yield

1 Northern Europe

6.0˚C (5.9 – 6.3) | 30% (8 – 64)
65% (61 – 76) | 9% (1 – 30)
13% (5 – 18) | 5% (-1 – 24)
-7% (-23 – -3)

2 Mediterranean Basin

6.4˚C (5.5 – 7.6) | 5% (-8 – 17)
54% (45 – 67) | -3% (-14 – 5)
33% (28 – 44) | 27% (13 – 53)
-32% (-37– -23) | 12% (-1 – 24)
27% (13 – 44)

3 Sahara

5.7˚C (4.7 – 6.5) | 16% (-13 – 35)
47% (41 – 57) | 15% (9 – 26)
14% (11 – 18) | -6% (-21 – 20)

4 Western Africa

4.7˚C (3.5 – 5.2) | 18% (2 – 27)
61% (48 – 70) | -19% (-37 – -1)
18% (9 – 30) | -1% (-5 – 16)
-12% (-19– 3)

5 Eastern Africa

4.6˚C (3.7 – 5.3) | 0% (-6 – 14)
56% (48 – 71) | 9% (0 – 20)
13% (6 – 18) | -3% (-10 – 8)

6 Southern Africa

5.7˚C (4.7 – 5.8) | -20% (-25 – -11)
45% (28 – 62) | 25% (17 – 38)
29% (22 – 36) | -5% (-19 – 5)

7 Northern Asia

6.7˚C (6.2 – 7.1) | 29% (21 – 33)
61% (50 – 68) | 41% (19 – 66)
5% (0 – 5) | 14% (2 – 30)

8 Central Asia

7.0˚C (5.7 – 7.5) | 19% (-1 – 32)
51% (39 – 62) | 3% (-11 – 18)
16% (15 – 27) | -2% (-39 – 20)
22% (9 – 29)

9 Tibet

6.2˚C (5.3 – 6.4) | 15% (8 – 22)
48% (40 – 62) | -9% (-22 – 3)
6% (1 – 16) | 13% (-20 – 40)
14% (7 – 28)

10 Eastern Asia

5.6˚C (4.8 – 6.6) | 5% (-2 – 15)
70% (59 – 78) | -4% (-11 – 11)
12% (10 – 22) | 18% (3 – 22)
11% (7 – 25) | 25% (8 – 40)
24% (12 – 33)

11 Southern Asia

4.9˚C (3.6 – 4.9) | -15% (-47 – -2)
78% (73 – 80) | -19% (-28 – 2)
7% (5 – 11) | 5% (-16 – 19)
38% (36 – 41) | 8% (-28 – 32)
10% (2 – 15)

12 Southeast Asia

4.3˚C (3.1 – 4.4) | 10% (-2 – 21)
77% (56 – 84) | -15% (-25 – -2)
5% (1 – 17) | 4% (-4 – 15)
-8% (-15 – -5)

13 Northern Australia

4.9˚C (4.0 – 5.0) | -12% (-18 – -10)
45% (37 – 65) | 15% (6 – 30)
16% (12 – 26)

14 Southern Australia

3.9˚C (3.5 – 5.0) | -29% (-32 – -25)
40% (22 – 53) | 19% (9 – 31)
20% (13 – 35) | 4% (-10 – 26)

15 Western North America

6.5˚C (5.9 – 7.5) | 21% (8 – 30)
52% (40 – 65) | 15% (6 – 34)
12% (5 – 17)
-2% (-7 – 3)

16 Central North America

6.9˚C (6.2 – 7.6) | 4% (-13 – 17)
40% (24 – 57) | -3% (-20 – 5)
13% (10 – 20) | 5% (-15 – 15)
8% (2 – 16) | 16% (-27 – 47)
38% (18 – 52)

17 Eastern North America

5.6˚C (5.4 – 7.6) | -1% (-19 – 3)
46% (34 – 59) | -3% (-8 – 4)
16% (13 – 21) | 12% (-6 – 32)
1% (-5 – 10)
44% (10 – 61)

18 Central America

4.9˚C (4.2 – 5.3) | 26% (13 – 39)
53% (39 – 68) | -12% (-29 – 10)
30% (18 – 43)
-28% (-33 – -20)

19 Amazon Basin

5.2˚C (4.9 – 7.2) | -8% (-17 – 2)
49% (42 – 63) | 5% (-2 – 19)
25% (20 – 38) | -3% (-14 – 4)
-29% (-37 – -16)
35% (19 – 47)

20 Southern South America

5.1˚C (3.7 – 5.5) | 9% (1 – 19)
45% (38 – 54) | 0% (-10 – 7)
20% (10 – 23) | 13% (6 – 19)
-1% (-4 – 10) | 12% (5 – 25)
22% (16 – 35)

Average number of people flooded per year due to sea level rise without additional adaptation, for a selection of the worst affected countries
(tens of thousand, ordered by percentage of population)

Benin	508 (495 – 548)
Myanmar	1808 (1788 – 1865)
Maldives	3.2 (3.0 – 3.5)
Guinea - Bissau	79 (76 – 85)
Mauritania	148 (140 – 175)
Western Sahara	3.1 (3.0 – 3.6)
Kuwait	58 (52 – 87)
Iraq	515 (510 – 526)
Vietnam	1276 (1050 – 1890)
Marshall Islands	0.4 (0.4 – 0.5)
Mozambique	265 (248 – 299)
Bangladesh	723 (558 – 1287)
Thailand	245 (167 –446)
China	2320 (1886 – 3446)
Indonesia	422 (308 – 790)
India	1826 (1429 – 2658)