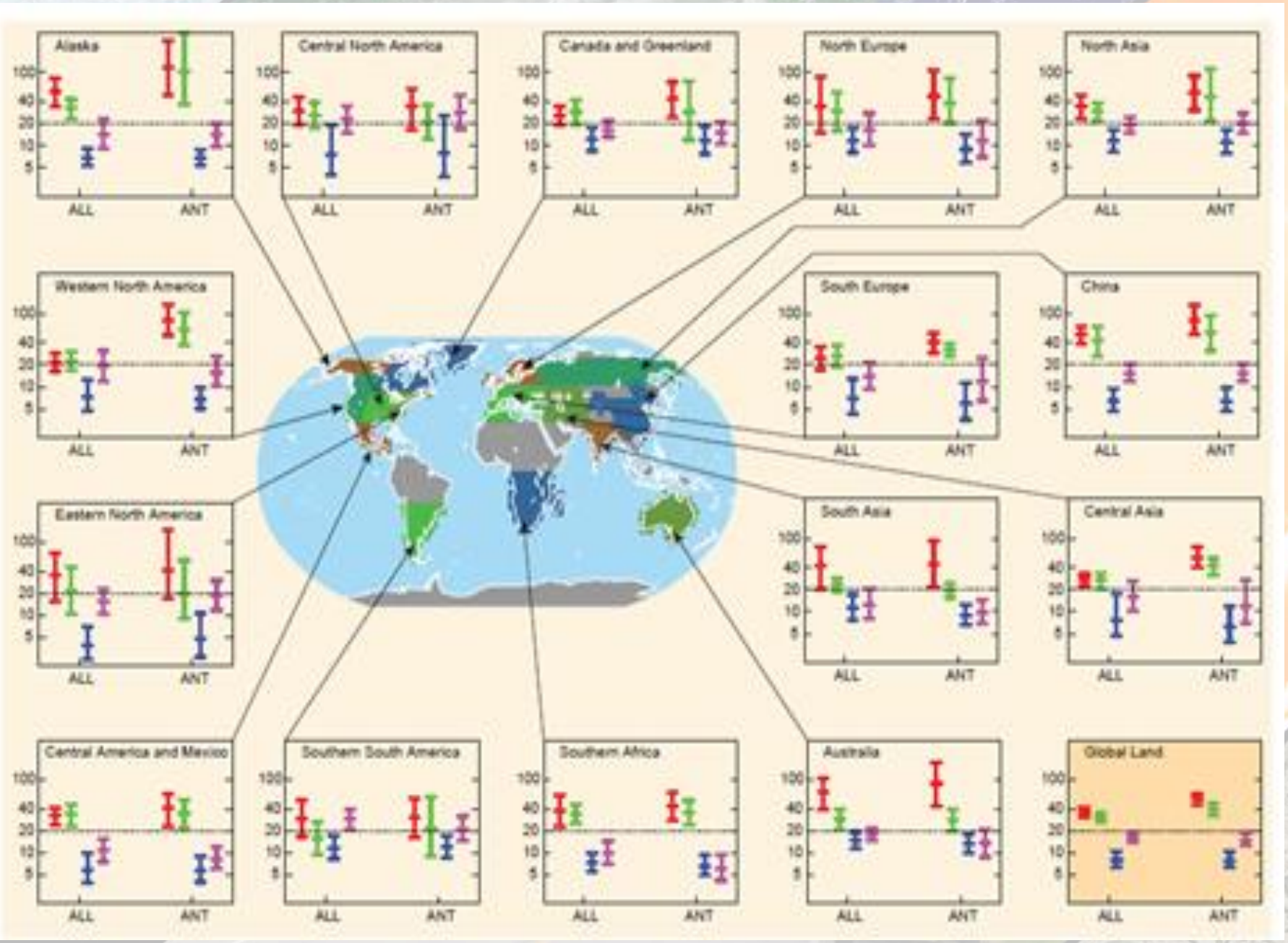
Observed and projected changes in weather and climate extremes

Observed and Projected Changes in Weather and Climate Extremes

1. Temperature

Temperature is associated with several types of extremes, for example, heat waves and cold spells, and related impacts, for example, on human health, the physical environment, ecosystems, and energy consumption


Alaska
Central North America
Canada and Greenland
North Europe
North Asia
Western North America
South Europe
China
Eastern North America
South Asia
Central Asia
Central America and Mexico
Southern South America
Southern Africa
Australia
Global Land
100
40
20
10
5
ALL
ANT

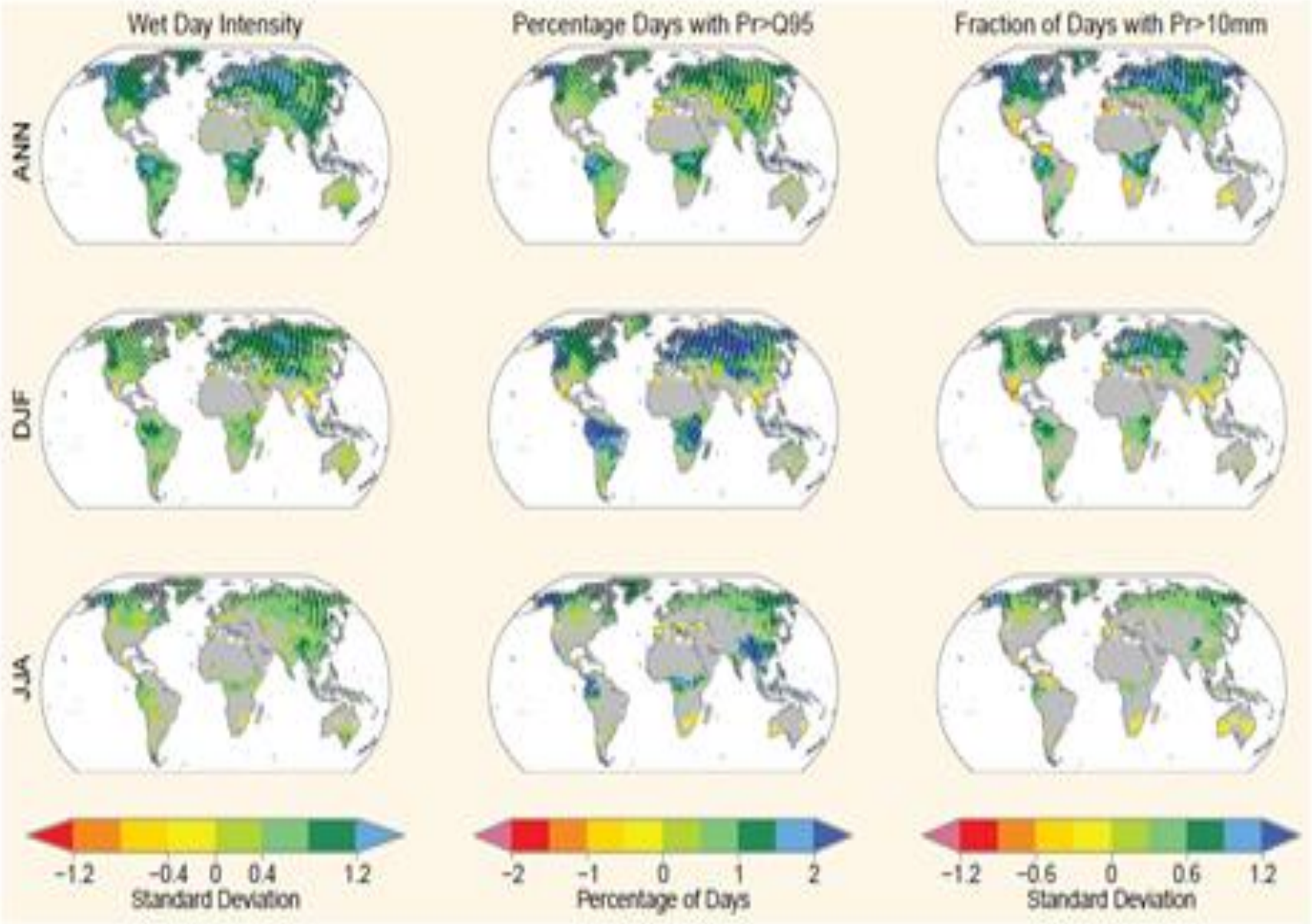
Precipitation

This section addresses changes in daily extreme or heavy precipitation events. Reductions in mean (or total) precipitation that can lead to drought

In general, two different approaches have been used:

(1) relative thresholds such as percentiles (typically the 95th percentile) and return values;

(2) absolute thresholds [e.g., 50.8 mm (2 inches) day-1 of rain in the United States, and 100 mm day-1 of rain in China].


Wet Day Intensity
Percentage Days with Pr>Q95
Fraction of Days with Pr>10mm
ANN
DJF
JJA
-1.2 -0.4 0 0.4 1.2
Standard Deviation
-2 -1 0 1 2
Percentage of Days
-1.2 -0.6 0 0.6 1.2
Standard Deviation

Wind

Extreme wind speeds pose a threat to human safety, maritime and aviation activities, and the integrity of infrastructure. As well as extreme wind speeds, other attributes of wind can cause extreme impacts. Trends in average wind speed can influence potential evaporation and in turn water availability and droughts Aeolian processes exert significant influence on the formation and evolution of arid and semi-arid environments, being strongly linked to soil and vegetation. A rapid shift in wind direction may reposition the leading edge of a forest fire

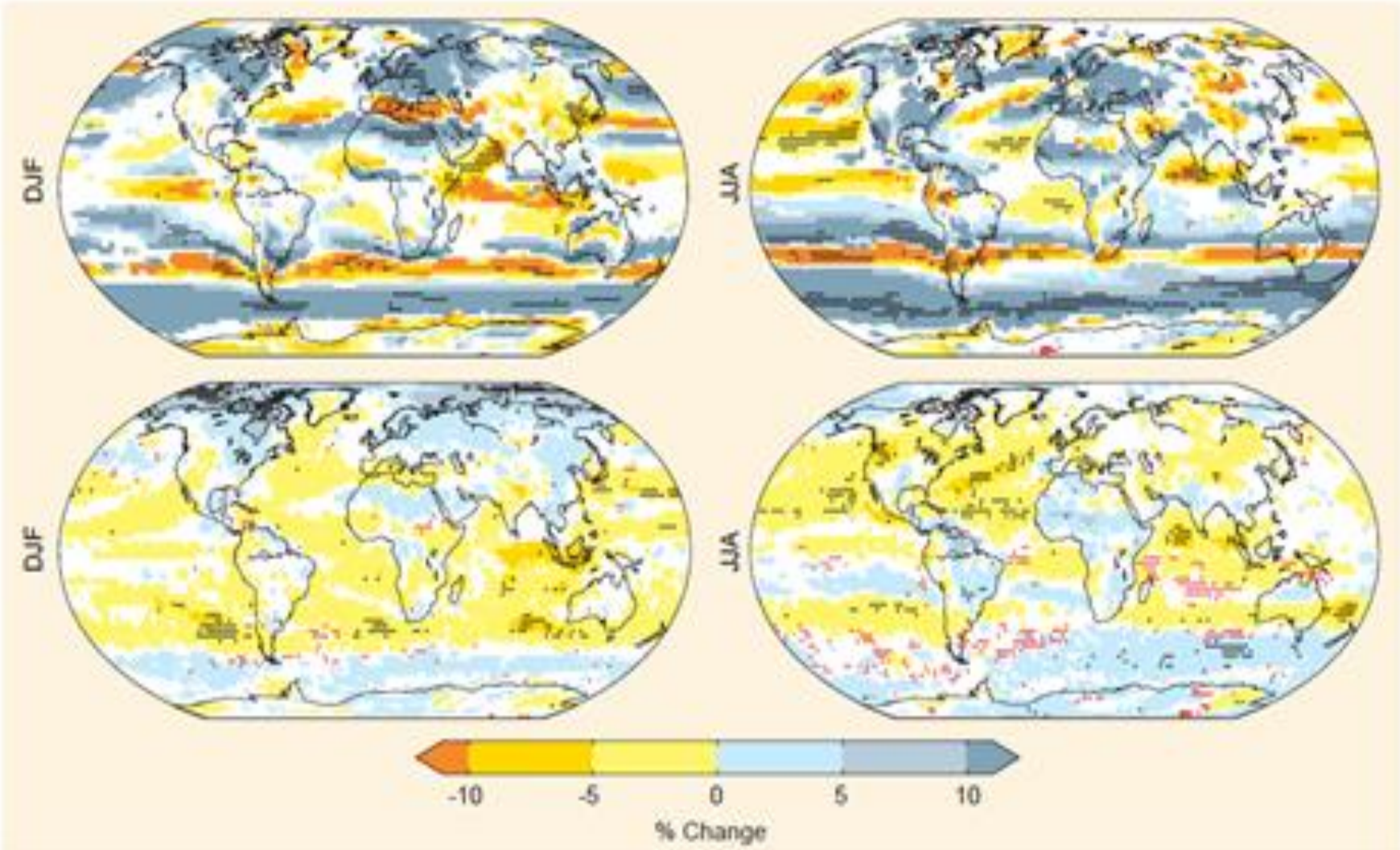


Figure 3-8 | Averaged changes from a 19-member ensemble of CMIP3 GCMs in the mean of the daily averaged 10-m wind speeds (top) and 99th percentile of the daily averaged 10-m wind speeds (bottom) for the period 2081-2100 relative to 1981-2000 (% change) for December to February (left) and June to August (right) plotted only where more than 66% of the models agree on the sign of the change. Black stippling indicates areas where more than 90% of the models agree on the sign of the change. Red stippling indicates areas where more than 66% of models agree on a small change between ±2%. Adapted from McInnes et al. (2011); for more details see Appendix 3.A.