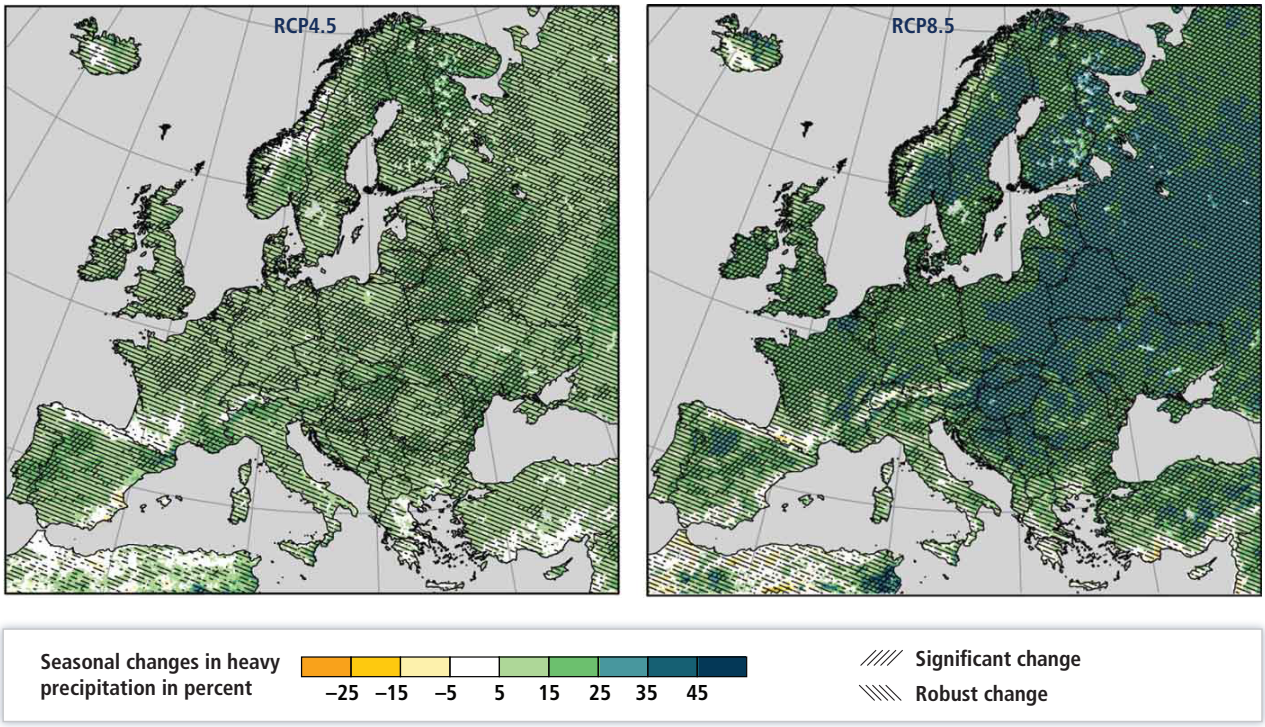
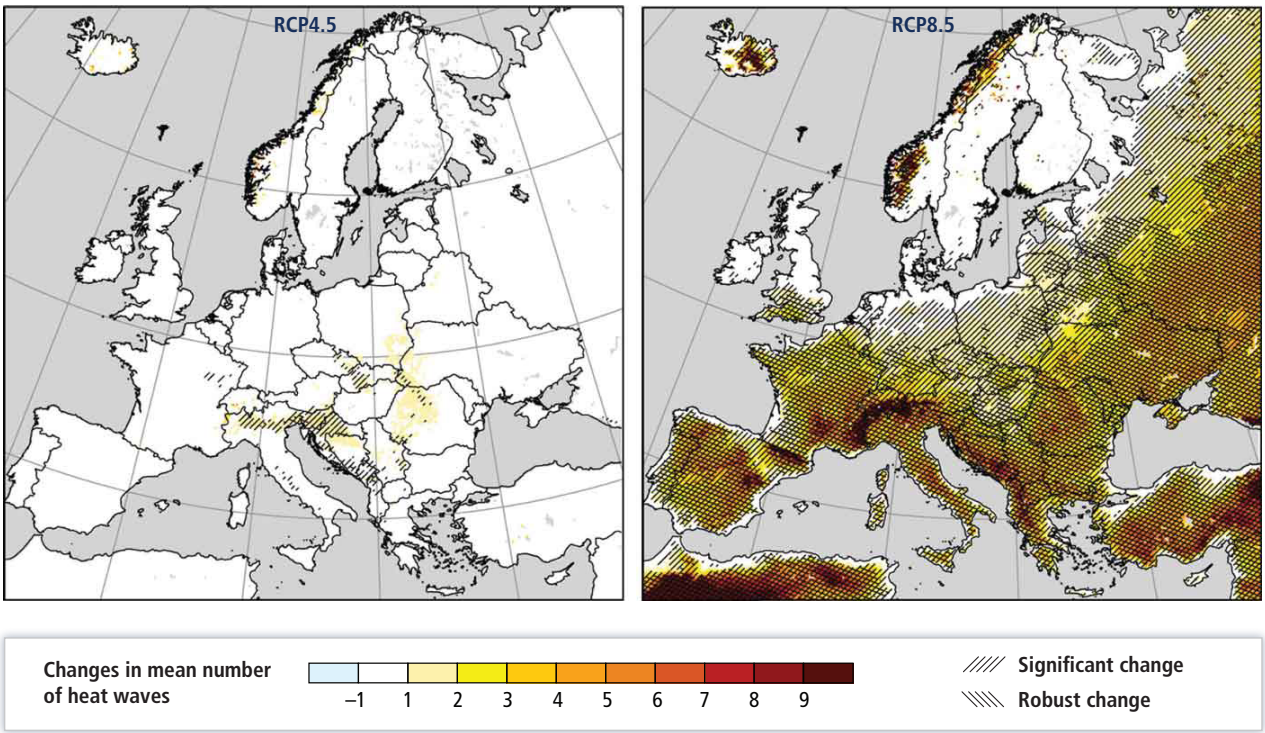
**(a) Seasonal changes (December to February) in heavy precipitation (%), 2071–2100 compared to 1971–2000**




**(b) Changes in mean number of heat waves for the May to September season, 2071–2100 compared to 1971–2000**




(a) Projected seasonal changes in heavy precipitation defined as the 95th percentile of daily precipitation for the period 2071–2100 compared to 1971–2000 (in %) in the months December to February. (b) Projected changes in the mean number of heat waves occurring in the months May to September for the period 2071–2100 compared to 1971–2000 (number per 30 years). Heat waves are defined as periods of more than 5 consecutive days with daily maximum temperature exceeding the mean maximum temperature of the May to September season of the control period (1971–2000) by at least 5°C. Changes represent the mean over 8 (RCP4.5, left side) and 9 (RCP8.5, right side) regional model simulations. [WGII AR5 Figure 23-2]

Key regional risks from climate change in Europe and the potential for reducing risk through mitigation and adaptation. Key risks result from high hazard, high vulnerability, and/or high exposure. They are identified based on assessment of the literature and expert judgments. Risk levels are estimated through the 21st century for the current state of adaptation and for a hypothetical highly adapted state. [WGII AR5 Table 23-5]

**Climate-related drivers of impacts**

Warming trend | Extreme temperature | Extreme precipitation | Drying trend | Sea level

**Level of risk & potential for adaptation**

Potential for additional adaptation to reduce risk

Risk level with **high** adaptation | Risk level with **current** adaptation

| Key risk | Adaptation issues & prospects | Climatic drivers | Timeframe | Risk & potential for adaptation (Very low – Medium – Very high) |
|---|---|---|---|---|
| Increased economic losses and people affected by flooding in river basins and coasts, driven by increasing urbanization, increasing sea levels, coastal erosion, and peak river discharges (*high confidence*)<br><br>[23.2-3, 23.7] | Adaptation can prevent most of the projected damages (*high confidence*).<br>• Significant experience in hard flood-protection technologies and increasing experience with restoring wetlands<br>• High costs for increasing flood protection<br>• Potential barriers to implementation: demand for land in Europe and environmental and landscape concerns | | Present<br>Near term (2030–2040)<br>Long term (2080-2100) 2°C<br>4°C | |
| Increased water restrictions. Significant reduction in water availability from river abstraction and from groundwater resources, combined with increased water demand (e.g., for irrigation, energy and industry, domestic use) and with reduced water drainage and runoff as a result of increased evaporative demand, particularly in southern Europe (*high confidence*)<br><br>[23.4, 23.7] | • Proven adaptation potential from adoption of more water-efficient technologies and of water-saving strategies (e.g., for irrigation, crop species, land cover, industries, domestic use)<br>• Implementation of best practices and governance instruments in river basin management plans and integrated water management | | Present<br>Near term (2030–2040)<br>Long-term (2080–2100) 2°C<br>4°C | |
| Increased economic losses and people affected by extreme heat events: impacts on health and well-being, labor productivity, crop production, air quality, and increasing risk of wildfires in southern Europe and in Russian boreal region (*medium confidence*)<br><br>[23.3-7, Table 23-1] | • Implementation of warning systems<br>• Adaptation of dwellings and workplaces and of transport and energy infrastructure<br>• Reductions in emissions to improve air quality<br>• Improved wildfire management<br>• Development of insurance products against weather-related yield variations | | Present<br>Near term (2030-2040)<br>Long term (2080–2100) 2°C<br>4°C | |



photo: Maeslant storm surge barrier in Rotterdam, Netherlands. © Asahi Shimbun / Getty Images