Southern Europe: people at risk of water scarcity - high adaptation

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| Summary of the assessed risk:Risk of water scarcity in Southern Europe with high adaptation, including cascading impacts beyond the water sector (such as agriculture, energy and shipping). [13.10.2.3] Database id: 141 ([link](https://climrisk.org/cree/ember/141)). Scenario: High adaptation.This ember is found in the following figure(s):Figure 13.31 (a) of AR6-WGII-Chapter13; (as a rule, summaries are not listed here)The ember diagram included in this document is based on the assessment provided in the IPCC report and supplementary material listed below, but it does not come from the IPCC; all additional information is provided in view of helping to understand this diagram and is also based on, or reproduced from, the same IPCC sources. Please read the disclaimer notice at the end of this document. |  |

# Transition: undetectable to moderate

|  |  |  |
| --- | --- | --- |
| min | 0.9 | *medium confidence* |
| max | 1.3 |

At the time of writing (around 1°C GWL), there was already an adaptation deficit that could potentially be addressed. Improvements in water efficiency and behavioural changes can be effective in some SSP scenarios [Table SM13.29].

# Transition: moderate to high

|  |  |  |
| --- | --- | --- |
| min | 1.8 | *medium confidence* |
| max | 2.2 |

Investment in large water infrastructure and advanced technologies (including storage), water transfer, water recycling and reuse, and desalination is needed. By adding such adaptation measures to those related to water demand, the transition is shifted upwards by 0.5°C GWL as compared to low adaptation [Table SM13.29, figure 13.31].

# Transition: high to very high

|  |  |  |
| --- | --- | --- |
| min | 2.8 | *low confidence* |
| max | 3.8 |

Transformational adaptation is needed; ultimately planned relocation of industry and development of alternative livelihoods may be needed. There are trade-offs with other adaptation options which require water (in particular irrigation). High adaptation shifts the transition to very high risk by about 0.2 - 0.3°C. [Table SM13.29, Figure 13.30]

Adaptation becomes increasingly difficult at 3°C GWL and above, due to geophysical and technological limits; hard limits are likely first reached in parts of Southern Europe. [ES]

# Supplementary information

The description of the transitions provided in the report is limited; some of the text provided here reflects our understanding, beyond the wording in the report. According to the reference paper, it is mainly SSP1 that is considered for high adaptation in the statement on water efficiency and behavioural change [Papadimitriou, et al. 2019, <https://doi.org/10.1016/j.scitotenv.2019.134027>].

# Reference for the source data:

Bednar-Friedl., B., R. Biesbroek, D.N. Schmidt, P. Alexander, K Yngve Børsheim, J. Carnicer, E. Georgopoulou, M. Haasnoot, G Le Cozannet, P. Lionello, O. Lipka, C. Möllmann, V. Muccione, T. Mustonen, D Piepenburg, L Whitmarsh, 2022: Europe. In: *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* [Pörtner, H.-O., D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1817-1927. <https://doi.org/10.1017/9781009325844.015>
Alternative direct download: [www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC\_AR6\_WGII\_Chapter13.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter13.pdf)

Bednar-Friedl., B., R. Biesbroek, D.N. Schmidt, P. Alexander, K Yngve Børsheim, J. Carnicer, E. Georgopoulou, M. Haasnoot, G Le Cozannet, P. Lionello, O. Lipka, C. Möllmann, V. Muccione, T. Mustonen, D Piepenburg, L Whitmarsh, 2022: Europe Supplementary Material. In: *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* [Pörtner, H.-O., D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)], url: [www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC\_AR6\_WGII\_Chapter13\_SM.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter13_SM.pdf)

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