

Touristic Sector Case Study for Strategic Planning:

Climate change impacts on the tourism sector of the Spanish Mediterranean coast in the medium term

FUTURE CLIMATE CONDITIONS DERIVED FROM OUR TOOL RELEVANT FOR COASTAL TOURISM

The ECOAZUL-MED project (2021-2024) aims to develop, for the first time, a publicly accessible web tool that provides climate information derived from high-resolution, regional, air-sea coupled climate simulations. This tool will allow to anticipate the effects of climate change on aquaculture, fishing, and coastal tourism, considering different climate change scenarios for the next 40 years along the Spanish Mediterranean coast

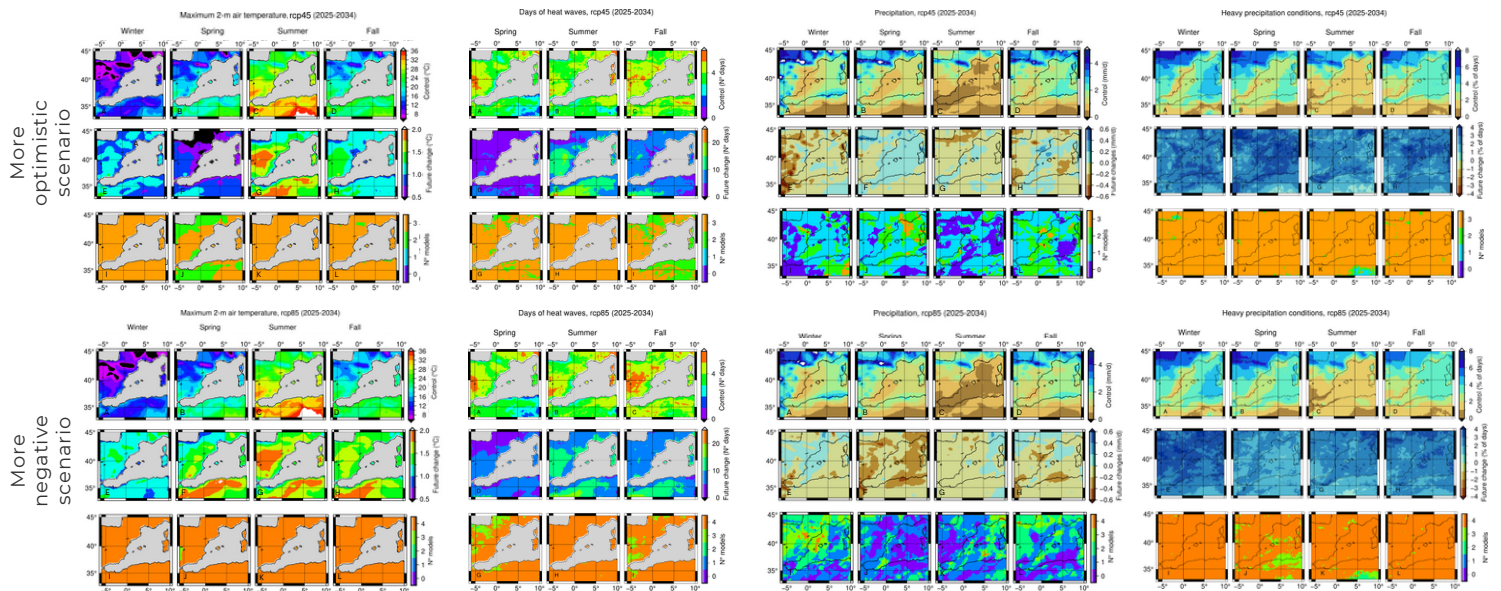
Our results indicate less favorable conditions for the coastal tourism sector in summer in the near- (2025-2034 decade) and medium-term (2055-2064) future scenarios. The latter reveals more extreme conditions in a few decades regarding temperature and precipitation. Even though changes for 2025-2034 are subtle, these highlight the need to implement adaptation measures

Summer maximum 2-m air temperature
 2025-2034: 1-2°C
 2055-2064: 3-4°C
 In the next decades thermal discomfort will enhance in summer

N° of days with heat wave conditions in summer
 2025-2034: 15-20
 2055-2064: 40
 Heat waves could become the new normal in the coming decades

Changes in precipitation
 Subtle, but the decrease will be greater in the next decades
 A proper management of water resources is key, especially in summer (greater n° of tourists)

N° of days with heavy precipitation
 2025-2034: 2-4% per season
 Total precipitation is similar, but heavy precipitation increases, aggravating the current situation



First row: Maximum air temperature (°C) in the control period (1976-2005). Second row: future change of the maximum air temperature (decade 2025-2034). Positive values indicate warming. Third row: n° of the ensemble models that project a future increase in the maximum air temperature.

First row: n° of days of heat waves per season in the control (1976-2005). Second row: future change in the n° of heat waves (decade 2025-2034). Positive values indicate more heat waves. Third row: n° of ensemble models that project an increase in the days with heat wave.

First row: daily precipitation (mm/day) in the control (1976-2005). Second row: future change in daily precipitation (mm/day)(decade 2025-2034). Positive values indicate more precipitation. Third row: n° of ensemble models that project a precipitation increase.

First row: % of days with heavy precipitation for the control (1976-2005). Second row: future change in the % of days with heavy precipitation (decade 2025-2034). Positive values indicate more intense precipitation. Third row: n° ensemble models that project an increase in the days with heavy precipitation.

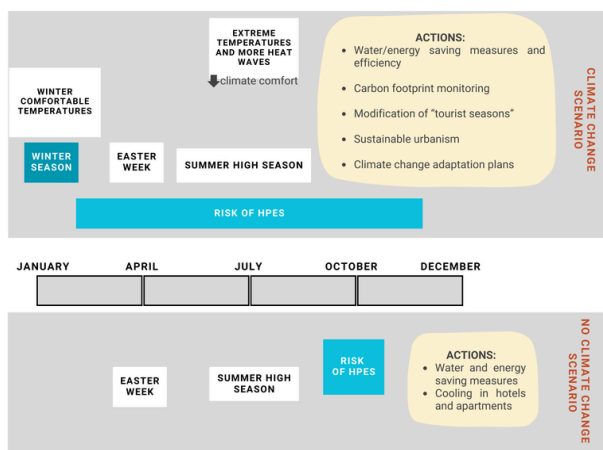
IS IT FEASIBLE TO EXTEND THE HIGH TOURIST SEASON TO LATE SPRING-EARLY FALL?

OUR RESULTS INDICATE...

- An increase of the n° of days with summer conditions (maximum air temperature greater or equal to 25°C) in the next decades in April-May and September-October
- A warming of the sea-surface temperature, favouring bath conditions between April-May and September-October
- Thermal conditions in September-October are more more favourable for the development of coastal tourism (air and sea temperature) than April-May. Notwithstanding, the % of days with heavy precipitation increases about 2-4 % days in April-May and September-October

Whilst the extension of the high tourist season towards late spring-early fall is doable, the possible interferences between thermal comfort and heavy precipitation should be carefully examined

ADAPTATION AND MITIGATION RECOMMENDATIONS FOR STAKEHOLDERS



Tourist calendar change in the Spanish Mediterranean coast as it was in the previous decades (no climate change scenario) and in the future (climate change scenario). HPES = heavy precipitation events. Source: own elaboration.

Coastal tourism in the region will face, in the coming years, transformations to adapt to climate change. Whilst traditional adaptation measures (i.e., no climate change scenario) basically included actions oriented to save water and energy and air conditioning in hotels and tourist apartments, recently, more adaptation actions have been developed in tourist destinations along the several strategic lines e.g., spatial planning in tourist destinations, buildings, normative, calendar changes and monitoring (see Table).

Based on our results, **we propose a tourist calendar change in the Spanish Mediterranean coast.** This would entail the **extension of the high summer season towards April-May, September-October, the maintenance of the Easter holiday and the potential establishment of a winter tourist season because of anticyclonic conditions.** However, care should be taken with heavy precipitation, which is projected to increase in frequency in all seasons. This, in turn, would make it necessary to implement adaptation actions in tourist destinations to minimise potential negative impacts.

Compilation of adaptation measures in the Spanish Mediterranean coast for the tourist sector, based on literature review. Source: own elaboration.

STRATEGIC LINES	ACTIONS
Spatial planning in tourist destinations	- Sustainable urbanism - Adaptation plans (spatial planning) - More urban green areas, fountains in parks and gardens etc.
Buildings	- Energy efficiency
Regulations	- Water saving measures - Approval of adaptation plans
Calendar changes	- Tourist promotion in seasons different to summer
Monitoring	- Carbon and water footprint, tourism indicators etc.

Infographic based on: de la Vara, A., Cabos, W., Gutiérrez, C., Olcina, J., Matamoros, A., Pastor, F., Khodayar, S., Ferrando, M. (2024). Climate change impacts on the tourism sector of the Spanish Mediterranean coast. Medium-term projections for a climate services tool. *Climate Services*, 34, 100466. <https://doi.org/10.1016/j.cliser.2024.100466>

ACCESS THE TOOL

