# Setting the Context

- Climate change intensifies pressures on World Heritage sites.
- Tourism contributes to emissions and faces climate risks, but it can also help drive solutions.
- Loss of heritage means loss of cultural diversity and community identity.
- Protecting heritage strengthens resilience, identity, and sustainable development.

# Climate Threats in the Mediterranean

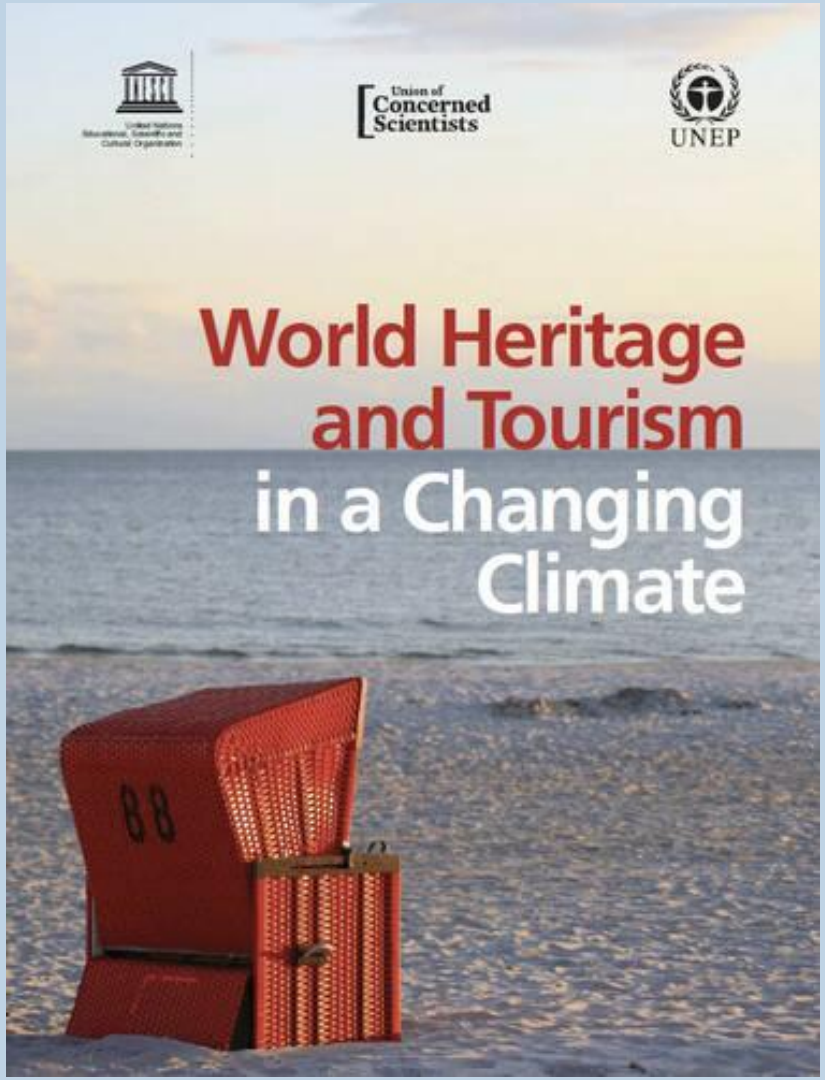
- Rising sea levels threaten coastal heritage and tourism infrastructure.
- Heatwaves, fires, droughts, and floods are increasingly affecting heritage sites and visitors.
- Invasive species

# Climate Change in Mediterranean World Heritage Cities 2025

- Mediterranean warming ~20% faster than global average; extremes intensifying.
- Sea-level rise of ~0.5–0.67 m by 2100 risks coastal heritage and infrastructure.
- 114 World Heritage cities assessed; 41 are coastal; over half face multiple hazards.
- Evidence from sites underscores practical adaptation needs.

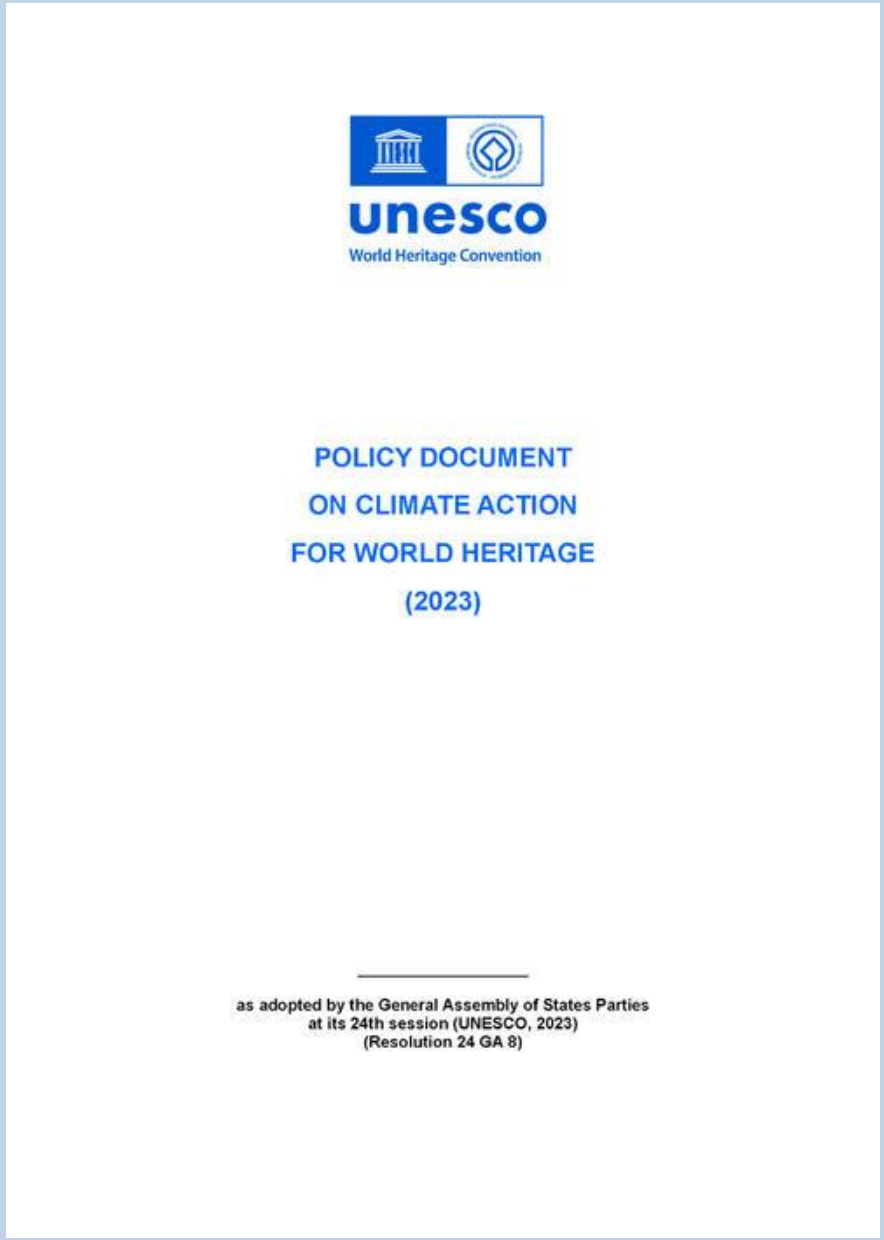
# World Heritage and Tourism in a Changing Climate (2016)

- Climate impacts already observable at many World Heritage properties.
- Tourism is both exposed to climate risk and contributes to pressure (esp. transport).
- Risk profiles vary by site type (coastal/islands, mountains/glaciers, arid, urban).
- Seasonality and visitor flows are shifting, complicating operations and staffing.
- Visitor safety and experience increasingly affected (closures, heat, floods, smoke).
- Marketing often ignores climate realities at sites.
- Tourism revenues can finance adaptation and conservation.



# UNESCO Policy Document Climate Change and World Heritage 2023

- Mainstream climate across World Heritage - nominations, management, monitoring.
- Safeguard OUV: assess risks, implement site-level adaptation, prioritize visitor safety.
- Mitigate: cut GHGs in site operations and tourism value chains (per Annex guidance).
- Enable action: monitor & report, build capacity (EO & Indigenous knowledge), mobilize finance/partnerships.



# Implications for Tourism & World Heritage Management

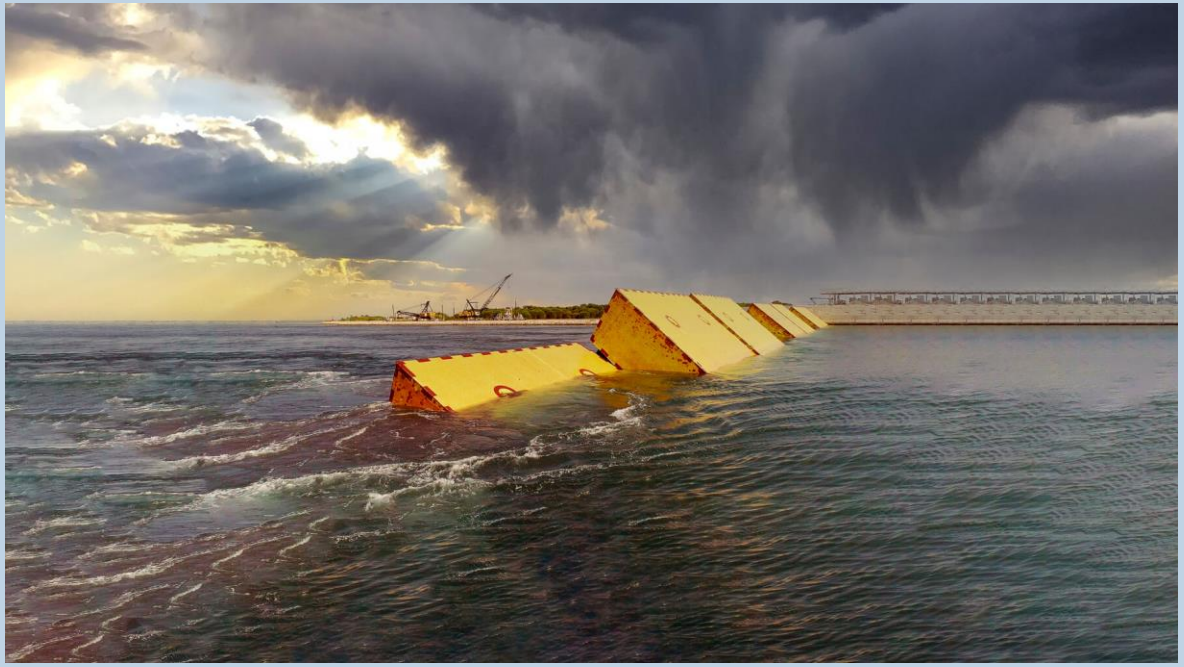
- Embed climate risk in site management, OUV conservation and capacity tools.
- Strengthen visitor safety protocols (heat/air quality/flood) and dynamic hours.
- Manage heat and water in facilities and public realms serving visitors.
- Redistribute demand (time/space) and diversify less climate-exposed offers.
- Channel tourism revenue to adaptation, protective works and community resilience.
- Use Earth Observation and digital tools for monitoring and clear risk communication.
- Align marketing & interpretation with on-site climate realities to build support.
- Educate visitors through awareness campaigns and interpretation.
- Establish clear codes of conduct and active monitoring.
- Create incentives for responsible tourism and local engagement.

# Adaptation in Practice
# Venice and its Lagoons

- Threats: Rising sea levels (+2.8 mm/year since 1993), recurrent flooding, and storm surges.

- Adaptation: Implementation of the MOSE barrier system, consisting of 78 mobile floodgates activated during extreme tides, reducing flooding events since 2021.

- Lesson: Large-scale infrastructure adaptation demonstrates how engineered systems can protect cultural heritage, though long-term maintenance challenges persist.



# Adaptation in Practice
# Acropolis

- Threats: Heatwaves exceeding 44° C forcing temporary closures of the Acropolis during peak hours in 2023 and 2025
- Adaptation: Implementation of a municipal Heat Action Plan with shaded visitor areas, free water stations, and adjusted opening hours.
- Lesson: Heat adaptation measures are becoming essential to sustain tourism and ensure visitor safety in heritage environments.

# Adaptation in Practice
# Medina Of Marrekesh

- Threats: Recurrent droughts with rainfall deficits up to 70% below seasonal averages and reservoirs at 25% capacity nationally (FAO, 2023; World Bank, 2023).

- Adaptation: Adoption of water-saving technologies, grey-water recycling, eco-certifications (Green Key), and desalination projects (Agadir: 275,000 $m^3$/day).

- Lesson: Marrakesh illustrates how water scarcity impacts both tourism operations and local communities, underscoring the need for sustainable resource management.