

The authors have made a substantial revision of the manuscript “*The 2025 Mediterranean marine heatwave in the context of climate change through sea surface temperature analogues*”, which is now clearer and better structured. The revisions have substantially improved the presentation of the results as well as the added value and limitations of the analogue approach. Therefore, I recommend publication after some minor comments (below) are addressed:

Minor Comments:

Title: The current title is good but could also be shortened to : “The 2025 Mediterranean Marine heatwaves throughout sea surface temperature analogues”.

The abstract is clearer and more straightforward than before, which makes it easier for the reader to grasp the key messages of the paper. Perhaps a few adjustments in the writing style could be: “...that differs from the ~~more~~-common, **atmospheric (?)** circulation-based analogue attribution approach”

“...the associated atmospheric and surface conditions in a past ~~period~~ (1950 to 1986) and a present ~~one~~ (1987 to 2024) period, ~~based on~~ using ERA5 daily fields over the Mediterranean ~~during~~ between June to September..”

When you say “*atmospheric and surface conditions*” do you mean atmospheric and ocean surface conditions of surface atmospheric conditions?

Also:

~~They do not constitute a complete formal attribution on their own, sSince the analogue framework cannot fully separate externally forced trends from internal variability and it does not explicitly resolve ocean dynamical processes such as advection, mixing, and stratification changes, these results do not constitute a complete formal attribution on their own. Nevertheless..”~~

1) Introduction

The Introduction is more focused than before, more pertinent to the topic of the paper and better structured. A few suggestions for improving the readability of some sentences are provided below:

“...with major impacts on **local** marine ecosystems and coastal environments (Coll et al. 2010..”

“..conditions, whose frequency is ~~itself~~increasing **in recent years**”

“..complementary approach in extreme event attribution **field** (Vautard et al., 2016; ...”

>>and magnitude of the 2025 event ~~with~~ **from** an independent observational perspective.”

2) Data &Methods:

The Data and Methods are also more clearly described and better presented than before.

No comments.

3) The June 2025 Mediterranean marine heatwave

This section reads as Results. Maybe it could be moved in that section??

Figure 1a). It would be better to increase the fontsize of both the x axis and y axis ticklabels and the legends to improve readability

Figure 1b) What is the white area over the Aegean Sea? Do this correspond to an area not touched by the MHW? If so, this has to be mentioned in the caption of the figure.

Also, the colorbar of this figure looks odd. Could you perhaps plot a discrete colorbar with coherent colours? Otherwise, explain in the caption of the figures, what do the squares illustrate exactly.

Line 178: The first sentence of the Abstract states that the event occurred between 20 and 30 June, whereas this section indicates that it persisted until mid-July. For consistency, the corresponding sentence in the Abstract could perhaps be revised?

Lines 184-187: These two sentence I sense they express a similar concept or are well connected, so maybe they could be merged?

4) Results:

Lines 249-253: The information on the source of the large scale climate indices may be better moved in the relevant Methods section, where it would fit naturally alongside the description of the data (e.g., daily data) used to derive the indices. Currently, it is a bit disruptive for the Results description.

5) Discussion:

Lines 289-290: Replace the lines with commas instead. “...*lie in the thermodynamic fields — SST itself, near-surface air temperature over surrounding land, and incoming shortwave radiation — rather than in the dynamic fields...*”

Lines 292-294: “...*This is consistent with the expectation that long-term warming primarily elevates...while atmospheric circulation remains more constrained by internal variability..*”. Is there previous work that supports this statements and specifically the part about atmospheric circulation remaining constrained by internal variability? If so, it should be cited here. I am also wondering whether the patchy present-past differences of SLP, windspeed, latent and sensible heat fluxes, can only reflect that “..the atmospheric circulation remains constrained by internal variability..”, based on the evidence provided here. This, could be indeed a plausible interpretation of the result. However, I am wondering, could these heterogeneous patterns also mean that the atmospheric response is spatially complex or that atmospheric circulation changes could be weaker than internal variability, or that regional processes could also dominate?

Line 335: “..*of the order of a few..*”

Lines 350-352: I feel this sentence is a bit too strong for its purpose. The issue is not that CMIP models **cannot** produce these diagnostics. They certainly can provide variable-by-variable, grid-point-resolved diagnostics. The distinctive feature of the analogue method, from the way that is described here, is that the diagnostics are conditioned on observed analogues of a specific event, rather than derived from model simulations or attribution ensembles. That is the real methodological distinction. Maybe this sentence could be revised?

Line 374: “*differing primarily in the background state*”?

Line 376: “..*making this assumption plausible*”

6. Conclusions:

Line 393: Maybe revise it to: “*This distinguishes the study from the more commonly used circulation-based analogue approach.*”