Review Report

This manuscript presents an updated version of the Regional Coupled Suite for the northwest European shelf (RCS-UKC4), including developments in coupled weather and climate capability, ensemble forecasting, river routing, and high-frequency coupling for meteotsunami representation. The topic is relevant, and the manuscript reflects a substantial amount of technical work. However, the current version still has important issues regarding language, internal consistency, attribution of results, and figure–text correspondence that should be addressed before publication. I therefore recommend some moderate revision before the manuscript can be considered for publication.

Major issues

1. The manuscript attributes the lower wave RMSE in UKC4 to "the combination of increased resolution and the wind and wave modulation by tidal currents." While this explanation is physically plausible, the comparison is not sufficiently controlled to support such attribution unambiguously, because the two forecasting systems differ in coupling, resolution and scientific configuration. The manuscript itself later notes that the wind-speed improvement may partly reflect the higher resolution and different configuration of MOGREPS-UK relative to MOGREPS-G. I therefore suggest that the wording be made more cautious, with a clearer distinction between results that are directly demonstrated by the experiments and interpretations that remain plausible but not fully isolated.
2. The meteotsunami section is interesting, but some mechanism-based conclusions should be softened. The manuscript argues that the event was driven by Proudman resonance because the atmospheric disturbance speed is close to the estimated oceanic long-wave phase speed, and because repeated application of the pressure signal can approximately account for the modeled sea-level amplitude. This is a reasonable interpretation, but the evidence shown remains partly diagnostic and inferential. The wording should distinguish between a strongly supported interpretation and a fully demonstrated mechanism.
3. Table 1 states that the ocean time step is 90 s or 60 s (with 10 min coupling). However, Section 4.1.2 (Line 454) states that the time step had to be reduced from 100 s to 60 s when switching to 10-minute coupling.
4. The manuscript states that NSE is "the ratio of RMSE to observation variance", which is not correct. It is defined as one minus the ratio of the error variance of the modeled time-series divided by the variance of the observed time-series. You may derive NSE based on RMSE, but the definition should remain unchanged.

Minor issues:

1. Language, typographical and grammatical issues, for example:

   Two "for" in the title sounds awkward;

   "ensemble forescasts" in the abstract;

"biogeochemisty" Line 98;

"This suggest that UKC4…" Line 442;

"10mn" Line 76, "min" is more standard;

"which current operational systems can't currently forecast" sounds awkward.

Overall, this reviewer would suggest the authors to carefully read and edit the language to avoid such problems. The manuscript would benefit from a final consistency check in terminology and style.

2. Figure1: the right panel has no labeled longitudes. The tick mark label font is too small (also for other figures).
3. The main text states that the buoy locations are shown in Figure 10, which is correct. However, the caption of Figures 11,12 refers buoys to Fig. 9.
4. Figure 5, MAM, DJF, JJA and SON, acronyms without explanation.
5. Figure 6 panel references in the text do not match the caption ordering. This panel mapping should be corrected to avoid confusion. Meanwhile, please add longitude-latitude ranges for the map figures.
6. The manuscript notes a strong concentration of HS and SST observations near coasts and North Sea oil rigs, and wind-speed observations are also spatially uneven. This sampling limitation should be emphasized more consistently when drawing broader conclusions about domain-wide model performance.
7. The statement that SST is "a good proxy" for the heat budget during marine heatwave conditions is plausible but should be framed more carefully.
8. Figure 22b, please explain color and dash pattern, either in the figure caption or using legend.
9. Code availability: "Model code was provided to editor and reviewers at review time". Please clarify what exactly was made available to the editor and reviewers, and whether the material provided is sufficient for independent assessment of the configuration used in this study.
10. Line 225 "*Thanks to these results, the coupled system contributed, for the first time, in the decision for one more iteration in the development cycle next standard regional atmosphere and land configuration, from RAL3.2 to RAL3.3*"
    This reviewer does not quite understand the point of this sentence, which seems to be related to some in-house management workflow. Please clarify.