

Authors' response to Reviewer #1

We sincerely appreciate the time and effort that Reviewer #1 has taken to evaluate our manuscript, "Solving Coastal Dynamics: Introduction to High Resolution Ocean Forecasting Services". The constructive comments provided have significantly contributed to improving the clarity, accuracy, and overall quality of our manuscript. Below, we provide a detailed point-by-point response to each of the reviewer's comments, along with explanations of the corresponding revisions made in the manuscript.

- RC1: 'Comment on sp-2024-44', Anonymous Referee #1, 13 Jan 2025 reply

The paper highlights the requirements that coastal models need to meet in order to properly represent complex phenomena encountered in the coastal ocean. The approach to coastal ocean modelling differs from open ocean in many aspects and the paper discusses modelling strategies for the coastal ocean. The presented work aims to support the development of more robust and adaptable tools for coastal forecasting.

Authors' response: We acknowledge and appreciate the reviewer's insightful feedback and have addressed each point carefully. Our primary focus in the revisions has been to enhance clarity, ensure scientific accuracy, and correct minor typographical errors.

This aim is achieved, in my opinion, and the paper reads very well and is well structured. There are some minor deficiencies that need to be addressed before the publication and I list them below.

Ln 15 introduceskey >> introduces key

Authors' response: This correction has been made in the revised manuscript.

Ln 17 forthe >> for the

Authors' response: The requested correction has been implemented in the manuscript.

Ln 39 I am not sure if the terms 'anthropogenic pressures' and 'natural drivers' are used here in the right context. I suggest these are replaced with direct and indirect anthropogenic impacts, respectively, which I think was the intended meaning by the authors. Some of the processes listed do have their own natural variability too, so the authors can, of course, can reflect it in the revised text

Authors' response: We have made the suggested revision in the text.

Ln 52 add 'the' before 'models'

Authors' response: have made the suggested revision in the text.

Ln 57 Again, the use of the term 'natural changes' in this paragraph should be revised in line with the comment above

Authors' response: We have made the suggested revision in the text.

Ln 63 use capital letters for MSFD

[Authors' response: We have made the suggested revision in the text.](#)

Ln 91 one of my main comments is related with the statement included in this paragraph. The authors say that the resolution of the coastal scale models typically range from a few to tens of km. This is way too coarse. In line 42 the authors state, rightly so, that coastal scale models need to resolve submesoscale processes, i.e. the processes of the scale <100 km, or perhaps even 1 to 10 km, as the authors state in line 100. In order to capture these, the resolution of the numerical models has to be at least 10 times greater, e.g. a 100 km scale requires the model of <10 km resolution, a 10 km the model of <1 km resolution, etc. Coastal models certainly cannot be of the tens of km resolution. Computing power increases all the time. Developing a coastal model of the resolution of tens of km is simply bad practice. To put it in the perspective, the Copernicus global model is <10 km and regional models are <5 km. Coastal models should typically be c. 1 km and less.

[Authors' response: We have made the suggested revision in the text.](#)

Ln 135 into $>>$ in the

[Authors' response: This correction has been applied as suggested.](#)

Ln 159-160 Here the authors correctly state the required horizontal resolutions in contradiction to the statements discussed above

[Authors' response: Thank you. Now this is consistent.](#)

Section 3.2 At least two important omissions in Table 1, NEMO and POM models

[Authors' response: This correction has been applied as suggested.](#)

Ln 231 which operational North Sea model?

Ln 240 references?

Ln 242 'developed ..' $>>$ 'designed to exchange'

[Authors' response: This correction has been applied as suggested.](#)

Ln 269 an explanation is needed on what OSSE and OSE are for the readers that are non-familiar. Especially that the paper is addressed to the readers less familiar with ocean modelling since most expert modellers would be well aware of the issues addressed in this paper. At the least, references should be added to the publications or online resources that introduce the concepts of OSSE and OSE.

[Authors' response: We appreciate this valuable suggestion and agree that providing a clear explanation of OSSE \(Observing System Simulation Experiments\) and OSE \(Observing System Experiments\) is essential for readers who are less familiar with ocean](#)

modelling. In the revised manuscript, we have added explanatory sentences to clarify these concepts, and additional references, supporting this.

Replace 'modeling' with 'modelling' across the manuscript

Authors' response: This correction has been applied as suggested.