The paper "Great Lakes Waves Forecast System on High-Resolution Unstructured Meshes" by Abdolali et al presents the Great Lakes Wave Forecast System, from the history of the first models in the area, to the present operational system and the future developments. The paper is well structured and written. However, sections are quite concise as the topics treated are often just mentioned. Also, the paper deals with a complex forecasting system in a complex geographical environment, which would require more detailed descriptions of the different elements involved (the forcings, the details of the modelling workflow, just to mention a couple) and of the figure and results presented. My recommendation is to revise the paper expanding the presentation, in particular of the topics of Section 2.

We are very grateful to the reviewer for his/her constructive critiques and comments. In the following, we state the referee's comments (in blue) followed by the response and actions taken (in black).

Specific comments:

line 77: the forecasting schedule is not clearly enough explained in my opinion, please make it more clear to the reader

We clarified it in the manuscript:

The Great Lakes wave forecast operates on an hourly basis, incorporating both short and long cycles, as depicted in Figure 3. There are twenty short cycles, each running for 48 forecast hours. Additionally, there are four long cycles, which extend for 150 forecast hours and are scheduled at 01z, 07z, 13z, and 19z.

line 94: it would be useful if authors repeat here the resolution of the Great Lakes grid

We added the following table and modified the text to address the comment:

Mesh resolution and corresponding histograms, highlighting the distribution of element size and significance of coastal elements in comparison to deep-water elements, are shown in Fig. 1. and the summary is provided in table 1.

Figure 2: acronyms should be added in the caption; also, details of the forcings are quite concise and might be better explained

The caption of Fig. 2 is modified:

Great Lake Wave Unstructured v2.0 atmospheric and ice forcing hierarchy. For wind, the National Digital Forecast Database (NDFD) and a combination of High-Resolution Rapid

Lake	# Node	# Element	Δx_{min} (m)	Δx_{max} (m)
Superior	51k	81k	246	3300
Michigan	58k	103k	250	2470
Huron	64k	101k	203	2840
Erie	45k	78k	203	1603
Ontario	35k	57k	224	2150
Champlain	30k	60k	60	400

Table 1: Mesh characteristics for Lakes Superior, Michigan, Huron, Erie, Ontario and Champlain in terms of number of nodes and elements, minimum and maximum resolutions.

Refresh (HRRR) and Global Forecast System (GFSv16) are used for the five lakes and Lake Champlain, respectively. The ice is taken from the National Ice Center (NIC) and WFO Burlington help-desk for the five lakes and Lake Champlain, respectively.

We added the following in the text to describe the missing info about NDFD, HRRR and GFS:

The National Digital Forecast Database (NDFD) is a combination of data from regional NWS Weather Forecast Offices (WFOs) and the National Centers for Environmental Prediction (NCEP) models (Glahn and Ruth, 2003). The Global Forecast System (GFSv16) (NOAA, 2021) from the National Centers for Environmental Prediction (NCEP) serves as a fundamental component in NCEP's operational numerical guidance suite for global climate modeling. It offers both deterministic and probabilistic global forecasts, extending up to 16 days, and plays a key role by supplying initial and boundary conditions for NCEP's regional, ocean, and wave prediction models.
The High-Resolution Rapid Refresh (HRRR) (Dowell et al 2022) is a NOAA real-time 3-km resolution, hourly updated, cloud-resolving, convection-allowing atmospheric model, initialized by 3km grids with 3km radar assimilation. Radar data is assimilated in the HRRR every 15 min over a 1-h period adding further detail to that provided by the hourly data assimilation from the 13km radar-enhanced Rapid Refresh.
The National Ice Center (NIC) Data for the Great Lakes are created from daily ice analysis. The files contain information on ice conditions that are separated into total ice concentration, ice types with their respective concentrations, and ice floe size.

References:

NOAA, 2021: Upgrade NCEP Global Forecast Systems (GFS) to v16: Effective March 17, 2021. Service Change Notice 21-20, Updated. National Weather Service Headquarters, Silver Spring MD.

Dowell, D. C., and Coauthors, 2022: The High-Resolution Rapid Refresh (HRRR): An hourly updating convection-allowing forecast model. Part I: Motivation and system description. Wea. Forecasting, https://doi.org/10.1175/WAF-D-21-0151.1.

Glahn, Harry R., and David P. Ruth. The new digital forecast database of the National Weather Service. Bulletin of the American Meteorological Society 84.2 (2003): 195-202.

Section 2.5: I do not see the reason for having a section without any result. This can be added in the conclusions or somewhere else

We moved it to the discussed section following reviewer's comment.

lines 205-215: the point the authors are raising here is quite important and they have already commented it well. However, I would stress a bit more the benefits of the high coastal resolution even in absence of a sea truth to prove them, by showing some examples.

In the manuscript, we discuss the example illustrated in Figure 8.

The second row in Figure 8 displays the differences between the $G0$ and $G1/G2$ grids. In the left-hand panel, the significant wave height is shown, which is extracted from simulations on the $G0$ grid. The middle panel illustrates the percentage changes between the $G0$-$G1$ grids, while the right panel shows the percentage changes between the $G1$-$G2$ grids. These changes indicate approximately a 5% variation in the domain extent. These variations primarily occur in regions characterized by sharp gradients in bathymetry, where the higher-resolution meshes can effectively resolve the terrain with a sufficient number of elements.

In the introduction a recent GLWU implementation which incorporates the implicit scheme and the current/water level forcing is mentioned. Then, the version 2.0 presently operational is presented, based on the explicit solver and no current/level forcing. And those two points are finally listed as future developments (the first is well elaborated, the second only mentioned). In my opinion, this generates confusion, so please, fix it.

We modified the text in the manuscript to clarify the research study, performed with the implicit solver and the operational implementation use of explicit.