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Comment

Interactive comment on “Investigation of suitable sites for Wave Energy Converters around Sicily (Italy)” by C. Iuppa et al.

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The Authors wish to thank the Referee #1 for his useful suggestions that contribute to improve the overall quality of the manuscript. A detailed response to the queries is provided below:

1) Please explain why bottom friction term is not considered in the SWAN model.

The Authors add the following sentence at the end of line 19 (page 5): “Bottom friction was assumed negligible because the analyses are mainly focused for depths greater than or equal to 10 m.”

2) The number of observations in Capo Gallo buoy seems to be erroneous. With efficiency 73% and period of observations 2004–2008, the sample size is not analogous

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to the other buoys.

The buoy of Capo Gallo was activated in 2004 and deactivated in 2008, while the other two were activated in 1989. The Catania buoy was deactivated in 2006, while the Mazara del Vallo buoy was deactivated in 2008. This information will be reported clearly in the in the section 2.2 of the final revised paper.

3) Provide the recording period and the recording interval of the buoy measurements.

According to the Reviewer's query the previous sentence has been modified.

Previous sentence (page 6-line 20): "The wave data were validated using records from the buoys of the Italian National Wave Recording Network (NWRN) managed by the Agency for Environmental Protection and Technical Services. The wave data available are those of the three buoys placed near Catania, Capo Gallo (Palermo) and Mazara del Vallo (Trapani) (see Fig. 1 for the buoy locations). For these buoys the record reference periods are as follows: (i) Catania between July 1989 and October 2006, with a total efficiency of 84 %; (ii) Capo Gallo between January 2004 and March 2008, with a total efficiency of 73 %; and (iii) Mazara del Vallo between July 1989 and April 2008, with a total efficiency of 79 %."

New sentence: "Wave data were validated using records from the buoys of the Italian National Wave Recording Network (NWRN) managed by the Agency for Environmental Protection and Technical Services. The NWRN is composed by 15 buoys: eight of them were installed in 1989, while the remaining buoys were placed in the period 1999-2004. During the period 1989-2002, buoys acquired data for 30 minutes every three hours and the measure becomes continuous for storms characterized by a significant wave height over a threshold. Since 2002 buoy measurements are continuous and the data are produced every half an hour. In the present study available wave data to validate the ECMWF data are those of the three buoys placed near Catania, Capo Gallo (Palermo) and Mazara del Vallo (Trapani) (see Fig. 1 for the buoy locations). For such buoys the recording period periods are the following: (i) Catania July 1989–October

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2006, with a total efficiency of 84 %; (ii) Capo Gallo January 2004–March 2008, with a total efficiency of 73 %; and (iii) Mazara del Vallo July 1989–April 2008, with a total efficiency of 79 %.”

4) ECMWF data should be compared with buoy wave data with respect to the wave period as well.

The Authors have not reported a comparison of the wave periods because the Italian National Wave Recording Network (NWRN) provides the zero-upcrossing mean wave period and the peak period, while ECMWF provides the spectral mean period (also called energy period). The relationship between such wave periods depends on both the spectrum shape and spectral analyse. Therefore, a comparison through the coefficient of correlation seems reasonable. This information will be reported in the section 2.2 of the final revised paper.

5) The significant wave height and wave period from the SWAN model should be also compared with the buoy measurements.

This comparison was not performed because the buoys are located near the boundary of the computational domain (Capo Gallo and Mazara del Vallo) or in deep water (Catania). Hence, at the buoys locations, SWAN data present similar wave characteristics to those of ECMWF data.

6) page 7, line 12-13. The explanation is not rigorous and seems to have lack of meaning

According to the Reviewer's query the previous sentence has been modified.

Previous sentence (page 7, line 12-13):” The high value of s_i for the buoy at Catania (0.85) is due to the significant wave height at the site, which is predominantly less than 1 m.”

New sentence: ”It was observed that the higher value of the scatter index for the Catania buoys ($s_i = 0.85$) is more likely due to a poor ability of the ECMWF numerical model

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to reproduce wave generated by local winds coming from north-east”.

7)The authors should describe whether WAM wave model utilizes wave data assimilation; if yes, based on which satellites? If these are the same satellites used for the evaluation of ECMWF results, then the relevant comparison is biased.

Satellite data ENVISAT, ERS-2, Jason-1 and Jason-2 were used for the operational assimilation of wave height data in the ECMWF model. Satellite ERS-2 data were used over the period 1995-2003, ENVISAT since 2003, Jason-1 since 2006 and Jason-2 since 2009. These assimilation periods will be excluded for the validation of SWAN data. This information will be reported in the section 2.4 of the final revised paper.

8) In page 12, the authors present results on the ratio between the standard deviation and mean energy flux. This is the coefficient of variation (CV). First, the value of CV seems to be very low. Second, for wave energy assessment, the inter-annual variability (IAV) or the mean annual variability (MAV) should be better provided.

The Authors have provided a not appropriate definition of CV. Indeed, CV is defined as the ratio between the standard deviation and the average of the yearly mean wave power flux. This parameter corresponds to the inter-annual variability. CV value is consistent with those estimated by Liberti et al. (2014). This information will be reported in the section 3.2 of the final revised paper.

Technical corrections

1)page 3, line 8: Fig. 1 is not in correspondence with the relevant text. Fig. 1 depicts only a small part of the Med Sea.

The Authors modified the sentence “As shown in Fig. 1, waves in the Mediterranean Sea have a relatively low energy” with “As shown in Fig. 1, waves around Italy have a relatively low energy.”

2)page 3, line 27: the entire sentence makes no sense.

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The Authors modified the sentence “However, along the Italian coast wave data may be affected by the lack of sufficient records” with “However, the Italian buoys are characterized by periods of lack of records.”

3)page 12, line 6: correct "follows months" to "following months"

According to the Reviewer’s query the previous sentence has been modified.

4)Review carefully the syntax and grammar of the manuscript

The final manuscript will be reviewed by a native English speaking scientist.

Interactive comment on Ocean Sci. Discuss., 12, 315, 2015.

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