We thank the two anonymous reviewers for their useful comments to our manuscript. We found them valuable that helps to greatly improve the quality of the manuscript. Per your suggestion, we have carefully revised the manuscript (track-changed) following both reviewers' comments. Our point-by-point response (in blue) to the comments are as below:

Response to reviewer #2.

The study of freak waves is important because of their potential damages to ships, coastal and oceanic structures. However, they are very difficult to observe, which enables the wave model simulation a good choice besides experimental and theoretical approaches. A key study of freak waves is how to predict their occurrence. Usually, this question is studied using some wave parameters derived from wave spectrum. The authors of present study list these parameters, discuss their relationships with freak wave occurrence, find disadvantages of using single parameter and propose their new approach of multi-parameters. The study uses the well-developed third generation wave modelâˇAˇTWaveWacth III to simulate wave spectra. The figures show compellent details and the explanations are reasonable. Their result is interesting and meaningful, giving useful information on future study of freak wave occurrence. The whole paper is well organized with beautiful results and proper discussions. I think it can be published with some modifications.

We thank the reviewer for the encouragement. We have modified the manuscript according to your suggestions and hope you find the revision acceptable.

1. In page 4, lines 4-5: you mentioned that "Short-lived freak waves can last only for 1 to 10 wave periods". I am not quite clear about the expression "wave periods", does it have a value? or how to define this value?

Response: The "wave periods" is a description about the typical timescale of freak waves following Janssen (2003). It doesn't have a decisive value and is just a general description. The periods of ocean waves are always ranging from 1 to 20 seconds. To avoid confusion, we have reworded '1~10 wave periods' to 'a few wave periods'.

2. In page 4, lines 10-12: in Section 2 "Model configurations", I think it is not clear to readers on the following issues: 1) What is the outer/inner grid (or area) of the model, so you should explain how to define them. 2) You need to explain more about the model setup, i.e. how many source terms are considered in your calculations? 3) The data specification should be more detailed: the resolutions, the time span and your considerations on how to determine the time span (in other words, how do you determine the calculation period of the model).

Response: We thank the reviewer for bringing those to our attention.

1) The outer/inner grid information has now been added in Table 1. The simulated results are easily affected by the errors propagated from the outside boundary of model grid, so the inner grids that cover the freak wave incidents' positions are set in the middle of outer grids. (P4, line11 and Table 1, os-2015-93-discussions-typeset_manuscript_modified.pdf(hereafter, os..pdf))

[P4, line11]:

Hindcast simulations are conducted by WW3 multi-grid technique. The simulated results are easily affected by the errors propagated from the outside boundary of model grid, so the inner grids that cover the freak wave incidents' positions are set in the middle of outer grids. The coarse reso-

2) The implementations of WW3 in our simulations follows Tolman (2002, 2009) with few exceptions. As such, we feel it only necessary to a few explanations of the model setup. The wave directions are set to 36 (by 10 degree), and the number of frequencies ranges from 0.0412 to 0.4056 is set to 25 levels, with the increment factor of 1.1. The freak wave incidents do not occur in the shallow water, so only three source terms are considered in the model: wind-wave interaction term, nonlinear wave-wave interactions term and a dissipation (whitecapping) term (P4, line13, os..pdf).

3) We use the Cross-Calibrated, Multi-Platform Ocean Surface Wind Velocity (Atlas et al., 2011) to force the wave model, which is 0.25 degree resolution at 6 hours interval. A reanalysis ocean current from National Marine Data & Information Service (China) is also taken into account in the model for the diagnosis of the results. (P4,line14-16, os..pdf)

For WW3, it always needs 1 to 2 days to spin-up the model in cold start conditions. In our simulations, we allow more than 3 days for the model to spin-up before the freak wave incident time. (P4, line17, os..pdf)

Table 1. Time, position information and model set up of freak wave incidents.

Case	Time(UTC)	Position	Outer grid of model	Inner grid of model	Note
Case1	30 Dec 1980 05:30	156°11'E, 31° N	115°-180°E, 10°-65°N	140°-160°E, 25°-40°N	Northwest Pacific
Case2	23 Jun 2008 04:00	144°-145°E, 35°-36°N	115°-180°E, 10°-65°N	140°-160°E, 25°-40°N	Northwest Pacific
Case3	13 Dec 1978 00:00	44°N, 24°E	70°W-10°E,10°-75°N	30°W-20°W, 40°-50°N	Atlantic
Case4	1 Jan 1995 15:20	2°28'E, 58°11'N	70°W-10°E,10°-75°N	5°W-5°E, 55°-65°N	New Year Wave
Case5.1	18 Nov 1997 01:10	1°44'E, 60°45'N	70°W-10°E,10°-75°N	5°W-5°E, 55°-65°N	Alwyn oil platform
Case5.2	20 Nov 1997 01:51				
Case6	27 Jul 2002 12:00	22.17°E, 37.97 °S	0.5 °E-60°E, 70°S-0°N	17°E-27°E, 43°S-33°S	FA platform

case1, case2 and case3 are for ship sinkings which are thought to be caused by freak waves.

case4, case5 and case6 are freak waves that are recorded by in-situ measurements.

3. In page 7, lines 1-3: you mentioned that "A continuous sea state with large steepness (> 0.08) and small directional spreading (< 27°) lasting a long time means a "freakish" sea state. Do you have any idea about how long time is enough to generate freak waves?

Response: The conclusion is deduced from the seven freak wave incidents. It means that "the mentioned conditions" is easy to generate freak waves, although it's not a sufficient condition. We don't have a clear answer about how long time is enough to generate freak waves and will keep this in mind in the future study.

4. You mentioned three parameters to study freak wave occurrence: steepness, spectra bandwidth and directional spreading. However, you only discussed the joint distribution of steepness and directional spreading. Actually, there are several combinations of these parameters. Why do not you discuss other combinations?

Response: As the response to reviewer 1 in the 2nd question, the parameterization of frequency peakedness is not always performance well in the double peaked spectrum. So we used steepness instead of frequency peakedness. (P6,line17, os..pdf)

The following are some small suggestions:

1. In page 5: 1) You should explain every parameter in equations 1 and 2, and you missed θ, and the meaning of F is not exact. 2) Line 15: "spectra bandwidth" can be "spectral bandwidth" 3) Line 23: "BFI" should be "BFIs" 4) Line25: "freak waves occurs" is wrong

Response:

1) More explanations about σ, θ and F are added.

σ is the relative radian frequency, θ is the wave direction, F is the wave energy density spectrum,

(**The above sentence should be inserted in line4, Page5**, os..pdf)

2) "spectra bandwidth" is revised to "spectral bandwidth" (P4, line22; P5, line15,20, os..pdf)

3) "BFI" revised to "BFIs" (P5, line23; P15, line1, os..pdf)

2. Both "water waves" and "ocean waves" appear in this paper, I think it is better to use one of them for consistency.

Response: "water waves" is revised to "ocean waves" (P3, line1; P4, line9; P6, line1, os..pdf).

We thank reviewer #2 for your useful comments that improves the quality of the manuscript.