We would like to thank Referee #2 for reviewing our manuscript and giving constructive comments and suggestions, which substantially helped us improve the quality of the paper. Appropriated changes have been introduced to the revised manuscript according to the referee's comments and suggestions. In the following, responses to the referee's comment are described in a point-to-point manner. The referee's comments are displayed in the grey background and the responses are displayed in blue.

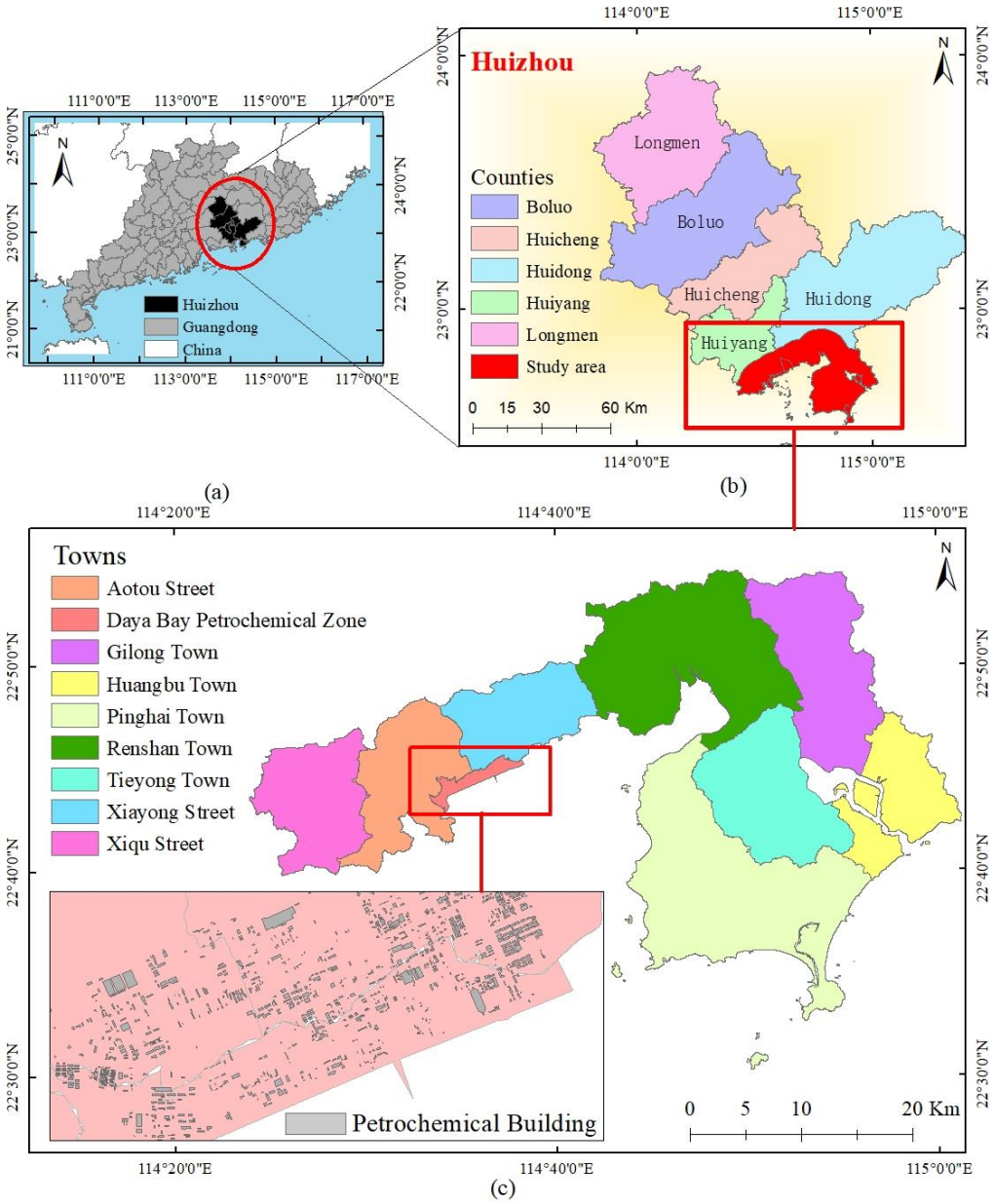
Major comments:

(1) Line 84: The 'Standard Technical Guideline' is made on Year 2019, how does it use for Year 2016? If such rules have been tested or used before the publication of Guideline, please reconstruct this sentence for proper statement.

Response: The trial version of the *technical directives for risk assessment and zoning of marine disaster-Part 1: storm surge* was published in 2012. In this paper, the risk assessment of storm surge was conducted with the latest version (2019). This sentence has been reconstructed in the revised manuscript.

(2) In Figure 1, to add a mark for 'Daya Bay'.

Response: Figure 1 in the original manuscript has been removed, and the remade Figure 1 in which the 'Daya Bay Petrochemical Zone' and the 'petrochemical building distribution in the Zone' were added is as follows. Moreover, according to the comments about the figure presentation by the two referees, many figures have been remade at high resolution, as can be seen in the revised manuscript.



(3) Line 130-145 presents the status of Huizhou City, please provide reference or source link.

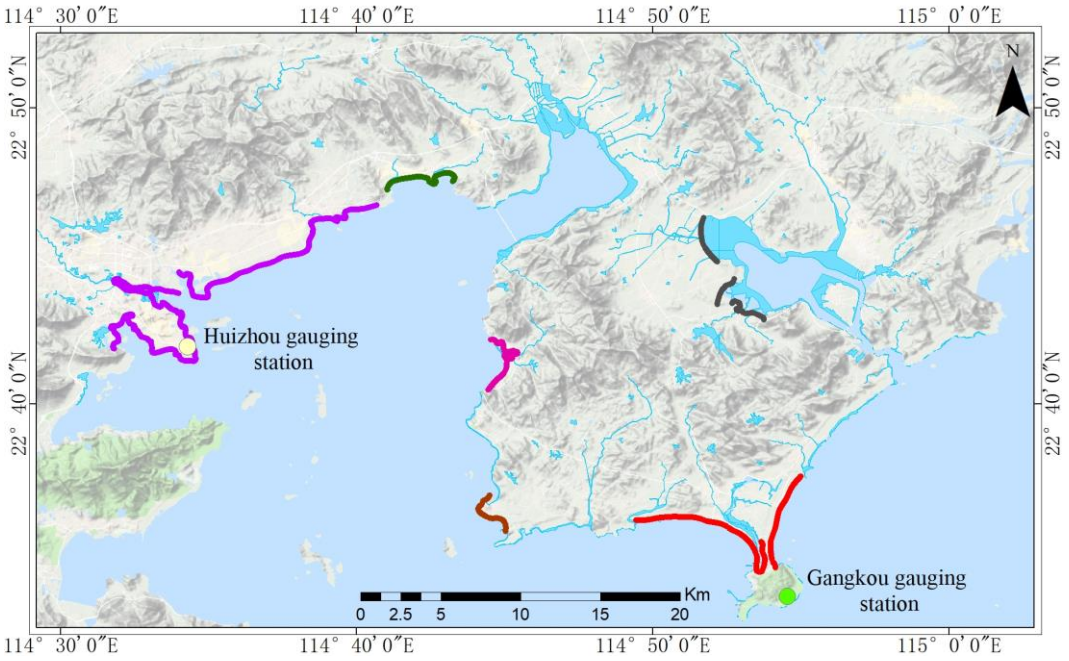
Response: The source links (Huizhou Guangdong province, 2019; Huizhou, 2018) which provide a detailed introduction of Huizhou City and study area in Line 130-145 have been added in the revised manuscript.

(4) In 2.2 Dataset requirement, please provide reference for each dataset.

Response: The reference for the dataset in section 2.2 has been added in the revised manuscript and the datasets can be downloaded from the link (nhess-datasets-2020-130, 2020).

(5) Would it be possible to merge Figure 2 and 3 to one figure?

Response: Figure 2 and Figure 3 in the original manuscript were merged into the Figure as follows. The different sections of storm surge barriers along the coastline of the study area and two gauging stations including Huizhou gauging station and Gangkou gauging station were marked in the Figure as shown below. The lines and dots represent the storm surge barriers and gauging stations, respectively in the Figure. The remade Figure has been added in the revised manuscript as Figure 3.



(6) Line 195, please provide references for these existing studies.

Response: The references (Kerr et al., 2013; Orlić et al., 2010; Li et al., 2020) about the hydrology model applied in the regions have been added in the revised manuscript.

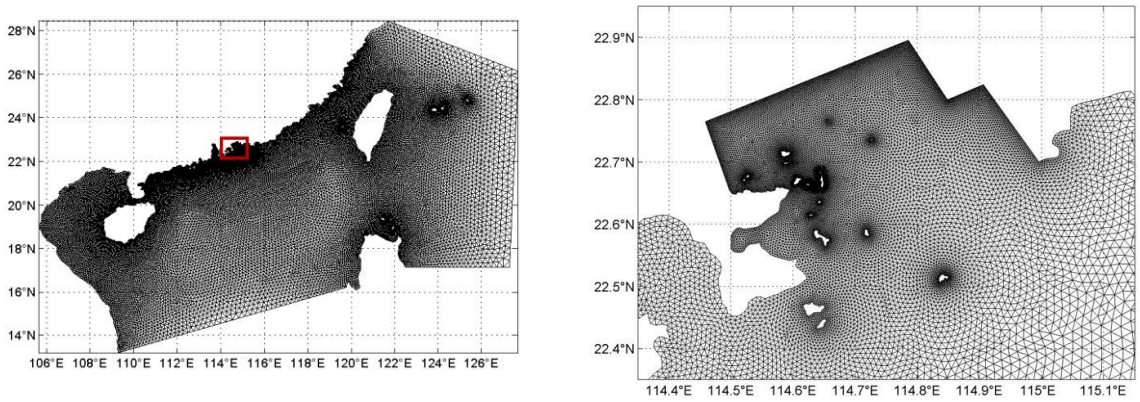
(7) Line 204-205, could you provide further details about the 11 astronomical tidal components? And only tidal components?

Response: The open boundary of the model water level is controlled by the total water level, which is obtained by the superposition of 11 astronomical tidal components. These 11 astronomical tidal components are M2, N2, S2, K2, K1, O1, P1, Q1, MS_4, M_4, M_6.

(8) Figure 4, the red rectangular in Panel a is different from the region of Panel b and c.

Response: The red rectangular spanning from 113˚W to 116˚W longitude in the original Figure 4 was replaced with the rectangular spanning from 114˚W to 116˚W longitude in the

revised manuscript, which is exactly corresponded to the region in the Panel b and c. The remade Figure is as follows.



(9) In Lines 238-240: 'The Absolute Error (AE) is computed when the highest measured water level is above 100 cm. The Relative Error (RE) is calculated as the measured observed water level is below 100 cm.' Is it consistent with that in Table 2?

Response: Thanks for your correction. The sentence was written wrong in Lines 238-240. The rewritten text was added in the revised manuscript that the Absolute Error (AE) is computed when the highest measured water level is **below** 100 cm and the Relative Error (RE) is calculated as the measured observed water level is above 100 cm, which is consistent with statistics in Table 2

(10) Please provide references to Equations in 3.2.2

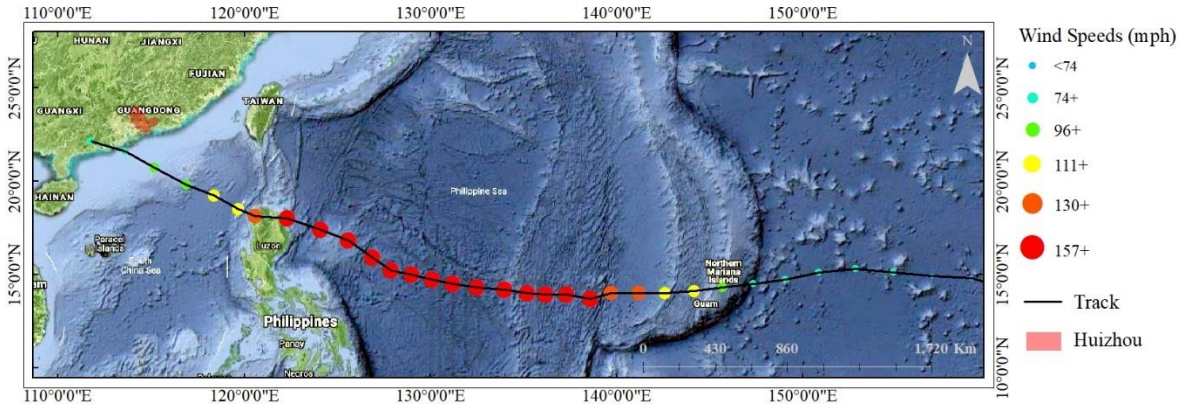
Response: The references (Vickery et al., 2000; Cheung et al., 2007) on the Equations in 3.2.2 have been added in the revised manuscript.

(11) What meaning are the colors of the curves in Figure 9?

Response: Abbreviations that Tropical Depression (TD), Tropical Storm (TS), Severe Tropical Storm (STS), Typhoon (TY), Severe Typhoon Super (STY), and Super Typhoon (Super TY) are explained in detail in the Figure 9 caption. The rewritten Figure 9 caption has been added in the revised manuscript.

(12) What the meaning of the green and red dots in Figure 10?

Response: The remade Figure containing figure legend in which the different colors represent wind speeds has been added in the revised manuscript. The remade Figure is as follows.



(13) The 'Value' in Table 6 is a try of set up via this work, or refers to some references?

Response: The vulnerability values of land types to storm surge are provided by the guideline, which can be downloaded from the link (Ministry of Natural Resources of the People's Republic of China, 2019).

Minor comments:

(1) Line 6: to use 'concentrations'.

Response: Thanks for your correction.

(2) Line 39: should it be the word 'severe'?

Response: Thanks for your correction. The 'Server' has been rewritten with 'severe'.

(3) Line 44: Please use 'RMB' instead of 'Yuan' throughout the manuscript.

Response: Thanks for your correction. The 'Yuan' has been replaced with 'RMB'.

(4) Line 48: Please use a proper reference for IPCC report.

Response: Thanks for your suggestion.

(5) Line 63: impact 'on', not 'to'.

Response: Thanks for your correction. The 'to' has been replaced with 'on'.

(6) Line 79: Is there a reference for the 'Standard Technical Guideline'? or webpage?

Response: Thanks for your correction. The reference was added in the revised manuscript.

(7) Line 101: Use ‘depicts’ instead of ‘details’.

Response: Thanks for your correction. The ‘details’ has been replaced with ‘depicts’.

(8) Line 237: Use ‘are’ instead of ‘were’.

Response: Thanks for your correction. The ‘were’ has been replaced with ‘are’.

(9) In Table 5 column 1st, the bracket is not paired in format.

Response: Thanks for your correction.

(10) Line 527: replace ‘increasing’ by ‘lowering’.

Response: Thanks for your correction. The ‘increasing’ has been replaced with ‘lowering’

(11) Line 577: Use increased instead of heightened.

Response: Thanks for your correction. The ‘heightened’ has been replaced with ‘increased’

References

(1) Huizhou Guangdong province, 2019, available online at: http://govt.chinadaily.com.cn/s/201907/08/WS5d145d96498e5314096b63f5/huizhou-guangdong-province.html.

(2) Huizhou, 2018, available online at: https://www.bayarea.gov.hk/en/about/huizhou.html.

(3) nhess-datasets-2020-130, 2020, available online at: https://doi.org/10.6084/m9.figshare.12459794.v1.

(4) Kerr, P. C., Donahue, A. S., Westerink, J. J., Luettich Jr, R. A., Zheng, L. Y., Weisberg, R. H., ... & Roland, A. (2013). US IOOS coastal and ocean modeling testbed: Inter-model evaluation of tides, waves, and hurricane surge in the Gulf of Mexico. Journal of Geophysical Research: Oceans, 118(10), 5129-5172.

(5) Orlić, M., Belušić, D., Janeković, I., & Pasarić, M. (2010). Fresh evidence relating the great Adriatic surge of 21 June 1978 to mesoscale atmospheric forcing. Journal of Geophysical Research: Oceans, 115(C6).

(6) Li, A., Guan, S., Mo, D., Hou, Y., Hong, X., & Liu, Z. (2020). Modeling wave effects on storm surge from different typhoon intensities and sizes in the South China Sea. Estuarine, Coastal and Shelf Science, 235, 106551.

(7) Vickery, P. J., Skerlj, P. F., & Twisdale, L. A. (2000). Simulation of hurricane risk in the US using empirical track model. Journal of structural engineering, 126(10), 1222-1237.

(8) Cheung, K. F., Tang, L., Donnelly, J. P., Scileppi, E. M., Liu, K. B., Mao, X. Z., ... & Murnane, R. J. (2007). Numerical modeling and field evidence of coastal overwash in southern New England from Hurricane Bob and implications for paleotempestology. Journal of Geophysical Research: Earth Surface, 112(F3).

(9) Ministry of Natural Resources of the People's Republic of China, Technical guidance for risk assessment and zonation of storm surge disaster, 2019, available online at: https://www.renrendoc.com/p-82139795.html (in Chinese).