Natural Hazards
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Discussions

Interactive comment on "Storm-surge prediction at the Tanshui estuary: development model for maximum storm surges" *by* C.-P. Tsai et al.

Dr. Bajo (Referee)

marco.bajo@ve.ismar.cnr.it

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The manuscript describes a method, based on neural networks, to estimate storm surges in the Tanshui estuary, Taiwan. The authors tested different configurations, with different input data, in order to find the best one for the storm surge reproduction.

The manuscript's subject is interesting, but the work is still in a preliminary phase. The description of the methods is too short and inaccurate, as well as the part with the results. These should be exposed better and discussed more.

1   General Comments

1. The English needs to be improved and some sentences are not clear. I suggest a check by a natural English speaker after all the corrections;

2. In many parts of the manuscript citations are missing (see detailed comments). The references are few and rather old, especially those regarding the storm surge forecast;

3. A Figure showing the geographical zone of interest and the location of the stations would be useful to the reader;

4. The authors should give more details when they describe the methods. In particular:

   - they should give a standard definition of storm surge, with a citation (e.g., Pugh, D., 1987. Tides, Surges and Mean Sea Level. Wiley, New York);

   - Which neural network library are they using? Did they develop it? Give some informations and, if possible, some citations;

   - It's not clear what are the NN inputs and the desired output and some other NN settings. What is the temporal frequency of the records? How long are the database? How are computed the pressure differences?

   - From the manuscript it seems that the results are extracted from the training period. The performances of a neural network cannot be evaluated in this phase. This should be done in a testing period, where the data were not used for the training. If the database is too short I suggest to extend it with records from normal weather periods.

   - The choice of the number of neurons in the hidden layer is not clear. This should be explained better and possible overfitting problems should be discussed.

5. Conclusions should be extended.

2 Specific comments

1. p7334 l13 "levels" change in "level"

2. p7334 l13 storm surges occur not only with typhoons. Provide a definition of "storm surge" with a citation

3. p7334 l25 Please define the acronym "AR" before using it.

4. p7335 l26 "The predictions were ...". I don't understand this sentence. Please explain better.

5. p7336 l13 Give a citation for the MLP method and for the other methods cited below.

6. p7336 l20-21 "neural layer" or "neuron"?

7. p7337 l3 "trasformation function" or "activation function"?

8. p7337 l14 Give a citation for the RBF method.

9. p7339 formula (7) The notation of the x variable is not clear. Perhaps the use of subscript for max min and superscript for old (o) and new (n) would be better.

10. p7339 formula (9) Check the symbols over "y", some are wrong.

11. p7340 l5 "hidden layers": I suppose these are "neurons in the hidden layer" and there is 1 hidden layer. "output variables"=>"output neurons".

12. p7341 l12 "better than..". Even if the table is cited, this sentence should be more precise, with some numbers.

13. p7341 l25-26 "MLP predictions . . . not as precise as the MLP predictions." Check this sentence, it is contradictory.

14. p7342 l4 "The storm surges ...". I don't understand this classification. Explain better and/or provide a citation if possible.

15. p7343 l3 Empirical formula can be non-linear. The advantage of the neural network approach should be discussed more.

16. p7343 l7-8 The last sentence is not clear. Please explain better, with more details.