KOWSAR

Annals of Military and Health Sciences Research

Prediction of Heavy Metals Concentration in the Groundwater Resources in Razan Plain: Extreme Learning Machine vs. Artificial Neural Network and Multivariate Adaptive Regression Spline

Author(s): Meysam Alizamir, Soheil Sobhanardakani, Amin Hasanalipour Shahrabadi

Review Timeline:

Submit Date:	1 Oct 2019
Accepted Date:	30 Nov 2019
Revised Date:	30 Nov 2019

Revision (0)

REFEREE: EIC — 7 Nov 2019

1. Please edit manuscript according to reviwer comments
2. The references are not in the journal format.
3. In a Research article, the Maximum Number of illustrations/Tables is 5.
4. there are some grammatical errors in the text.

Rohallah Mirjani: Associate Editor — 7 Nov 2019

Dear Editor-in-Chief
After addressing the reviewers' comments and a minor revision this manuscript should be considered to publish.
Best regard

Reviwer1:
Dear Editor-In-Chief
The work tries different machine learning methods including extreme learning machine, artificial neural network, and adaptive regression spline to model the concentration of three heavy metals (arsenic, zinc, and lead) in groundwater resources in Razan Plain. The work

has a fair novelty and written poorly. There are many typogrammatical errors in the text. The abstract does not well reflect the obtained results. The method section mainly describes the basic concept of each machine learning method and it did not clearly explain the parameters and workflow. Moreover, there is no information about the coordinates of the site-sampling area (Latitude and Longitude), the number of collected samples (20 wells versus 32 samples. is there a replication in the sampling? why?), the volume of each sample (how many milliliters?), any preprocessing procedure on the samples, the package used for the modeling (e.g. MATLAB, R2019b). The results section is written so short and data are represented in the discussion section! In tables, all values (calculated parameters) must be reported as the same decimal digit (e.g. in table 2, "r" in training or testing ELM). It is recommended the authors provide the codes in a supplementary data file.

Reviwer2:
1. There are some grammatical errors in the manuscript.
2. The novelty of the manuscript is low.
3. It is better to study other metals (In your other published paper you also used these metals.
4. In your discussion, you should compare your results with other people in the world that work with these algorithms.

REFEREE: Reviewer

2 Nov 2019

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Revision (1)

REFEREE: EIC

13 Nov 2019

the maximum number of Table+figure =5.

Associate Editor's Comments:

Associate Editor 1:
Dear Editor-in-Chief
After addressing the reviewers' comments and a minor revision this manuscript should be considered to publish.
Best regard

Reply: We tried to reply all the comments raised by the reviewers to the best of our capacity.

Thanks for your constructive and valuable comments.

EIC Decision:

1. Please edit manuscript according to reviewer comments

Reply: We applied all comments as suggested by the reviewers.

2. The references are not in the journal format.

Reply: The references have been modified based on the journal framework.

3. In a Research article, the Maximum Number of illustrations/Tables is 5.

Reply: There are only four tables in this study.

4. There are some grammatical errors in the text.

Reply: The manuscript has been revised as suggested.

Thanks for your constructive and valuable comments.

Reviewer 1:

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1. There are many typo grammatical errors in the text.

Reply: The manuscript has been revised as suggested.

2. The abstract does not well reflect the obtained results.

Reply: The related part in the abstract section has been revised as suggested.

3. The method section mainly describes the basic concept of each machine learning method and it did not clearly explain the parameters and workflow.

Reply: More information about the control parameters of the ELM, ANN models have been provided in the revised version as suggested.

4. Moreover, there is no information about the coordinates of the site-sampling area (Latitude and Longitude), the number of collected samples (20 wells versus 32 samples. is there a replication in the sampling? why?), the volume of each sample (how many milliliters?), any preprocessing procedure on the samples.

Reply: As suggested, we described more details about study area and process of collecting data to the study area section.

5. The package used for the modeling (e.g. MATLAB, R2019b).

Reply: This issue was reflected at end of the first paragraph of the result section.

6. The results section is written so short and data are represented in the discussion section!

Reply: The results section has been revised as suggested.

7. In tables, all values (calculated parameters) must be reported as the same decimal digit (e.g. in table 2, "r" in training or testing ELM).

Reply: The mentioned point in the tables has been revised as suggested.

8. It is recommended the authors provide the codes in a supplementary data file.

Reply: The ELM code that applied in this study is freely available at the following link.

https://www.ntu.edu.sg/home/egbhuang/elm_codes.html

Thanks for your constructive and valuable comments.

Reviewer 2:

1. There are some grammatical errors in the manuscript.

Reply: The manuscript has been revised as suggested.

2. The novelty of the manuscript is low.

Reply: We can mention again the originality of the study by giving some related literature. Applying existing methods to new area (in solving new problem) is enough originality for a research paper. All the following studies applied the ELM for different areas. Some of them are recently published.

References:

Deo, R. C. and Şahin, M., (2014). "Application of the extreme learning machine algorithm for the prediction of monthly Effective Drought Index in eastern Australia." Atmospheric Research **153**: 512-525.

Mohammadi, K., Shamshirband, S., Motamedi, S., Petkovic, D., Hashim, R., Gocic, M., (2015). "Extreme learning machine based prediction of daily dew point temperature." Computers and Electronics in Agriculture **117**: 214-225.

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Kisi O, Alizamir, M. Modelling reference evapotranspiration using a new wavelet conjunction heuristic method: Wavelet extreme learning machine vs wavelet neural networks. Agricultural and Forest Meteorology 2018; **263**: 41-48.

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Reply: We will try to model other metals in future works by applying novel models.

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Revision (2)

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30 Nov 2019

accept

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