

## **Annex no. 1 – Award application\***

### **1. Candidate**

Name: Costache

Previous name (if applicable):

First Name: Romulus-Dumitru

PhD graduate since (year) (a copy of the doctor's degree or equivalent is presented): 2017

Position occupied: Project Director (Scientific Researcher)

Institution: Universitatea Transilvania din Braşov, Bulevardul Eroilor 29, Braşov 500036

Mobile phone. .

Email address:

2. Edition “Gala Cercetării Româneşti”: 2024

3. Award and category for which you apply (individual or research team): Award: *Earth, environment and climate change sciences – Award “Grigore Cobălcescu”*; Categoria: *individual*

4. Team leader, if applicable: -

5. Research team structure, if applicable (names of team members, position held, year of last degree awarded):-

6. A description of the most important scientific achievements of the last 5 years (max. 4 pages, A4 format, Times New Roman characters, 12 points, 1.5 line spacing and 2 cm margins)\*\*.

In recent years, studies in which advanced artificial intelligence techniques are used in various scientific fields have increased significantly in number. In this context, Dr. Romulus-Dumitru Costache (candidate) is one of the leading researchers worldwide who applies these techniques in order to study susceptibility to natural hazards, mainly flash-floods and floods. This is also certified in a Review Article published by [Duan et al. \(2022\)](#) in which it is mentioned that Romulus Costache (candidate) is, at international literature level, the author who has published the most significant number of articles (in Web of Science Core Collection) focused on the assessment of flash-flood susceptibility. This information can be verified at page 7 of the above-mentioned article. It should be mentioned that candidate applied for the first time in the literature new approaches by which the susceptibility to flash floods can be determined as accurately as possible. Thus, in the article [Costache \(2019\)](#), P.L. proceed for the first time in the literature to the inventory of areas with torrential phenomena, in polygon format, to define the dependent variable in the case of calculating the flash-flood susceptibility, compared to previous studies that used as the dependent variable locations that were affected by flash floods in GIS vector point format. This article, published in **Science of The**

**Total Environment** journal (mentioned 1st in the list from **section B2**), received a relatively high attention from international researchers being cited by 52 times (excluding self-citations). During several months, in the last years, this article was included in Highly Cited Papers category (Top 1%) in Web of Science Core Collection. Next, another new approach proposed by the candidate in the case of the study flash-flood susceptibility study, it is the application, in addition to the machine learning techniques, of the Flow Accumulation method to calculate the degree of torrentiality of the areas that were in the immediate vicinity of the slopes with a high susceptibility to flash floods. This new approach was highlighted in two articles published by candidate ([Costache et al., 2019, 2022a](#)) in journals from Q1 (**CATENA**) or Q2 (**Geocarto International**) according to AIS. The article published in **CATENA** journal (mentioned in the 9th position in the list from section B2) received 32 citations (excluding self-citations). At the same time, in the 2 articles previously mentioned and published in 2019, models resulting from the combination of the following algorithms were used for the first time in the literature in order to determine the susceptibility to flash floods: i) Support Vector Machine and Logistic Regression on the one hand with Frequency Ratio and Weights of Evidence on the other hand; ii) Artificial Neural Network and Naive Bayes on the one hand with Certainty Factor and Evidential Belief Function on the other hand. Moreover, among the multiple articles where the P.L. proposed new combined algorithms for flash-flood susceptibility assessment can be remarked the paper published in *Journal of Hydrology* in 2022 ([Costache et al., 2022b](#)) mentioned at position 8th in the list from B2 section. In this scientific article the **candidate** used for the first time the H2O R package to apply the Deep Learning Neural Network in combination with multicriteria decision making models. This article received very fast the attention of researchers, currently having 23 citations (without self-citations) and being in this moment a *Highly Cited paper – Included in the Top 1% of the academic field of Engineering according to Web of Science (Clarivate Analytics)*. It must be said that at the present time (18.07.2023) a number of 8 articles in which P.L. is first author or co-author are included in the *Top 1% most cited papers*. The applied models in P.L. articles proved to be able to estimate the flash-flood susceptibility with high accuracy, becoming benchmark techniques for susceptibility modelling to flash-floods or other natural hazards in other parts of the world. His concerns regarding the way in which the changes produced in the environment influence the characteristics of flash floods were materialized by the publication of an article in which the correlation between land use change and flash-flood susceptibility was analysed ([Costache et al., 2020](#)). It was for the first time in the literature when remote sensing techniques, GIS and artificial intelligence were used in an integrated manner to develop such an approach.

Additionally, it should be noted that according to his scientific record, **candidate** manage to coordinate in his papers published in Q1 or Q2 of WOS (according to AIS), research teams from various

countries like: Romania, Norway, Slovakia, Australia, Austria, USA, South Korea, Egypt, Iran, Vietnam, Saudi Arabia, Bangladesh, India, China or Taiwan. Moreover, it can be admitted that in the Romanian literature the applicant is the first researcher that carried out scientific articles using machine learning/AI techniques and also who successfully managed a Research Project (as Director) in which these algorithms were applied for natural hazards estimation (the Project is mentioned at **section 7 - CV section**).

Being employed also in the Flash-Flood Forecast and Warning compartment from the National Institute of Hydrology and Water Management, P. L. made the results obtained in his researches available to the institution in order to improve the procedures for developing forecasts and warnings for flash floods

### References

- Duan, L., Liu, C., Xu, H., Pan, H., Liu, H., Yan, X., Liu, T., Yang, Z., Liu, G., Dai, X., 2022. *Susceptibility Assessment of Flash Floods: A Bibliometrics Analysis and Review*. Remote Sensing 14, 5432.
- Costache, R., 2019. *Flash-Flood Potential assessment in the upper and middle sector of Prahova river catchment (Romania). A comparative approach between four hybrid models*. Science of The Total Environment 659, 1115–1134.
- Costache, R., Bao Pham, Q., Corodescu-Roșca, E., Cîmpianu, C., Hong, H., Thi Thuy Linh, N., Ming Fai, C., Najah Ahmed, A., Vojtek, M., Muhammed Pandhiani, S., 2020. *Using GIS, Remote Sensing, and Machine Learning to Highlight the Correlation between the Land-Use/Land-Cover Changes and Flash-Flood Potential*. Remote Sensing 12, 1422.
- Costache, R., Hong, H., Wang, Y., 2019. *Identification of torrential valleys using GIS and a novel hybrid integration of artificial intelligence, machine learning and bivariate statistics*. Catena 183, 104179.
- Costache, R., Pham, Q.B., Arabameri, A., Diaconu, D.C., Costache, I., Crăciun, A., Ciobotaru, N., Pandey, M., Arora, A., Ali, S.A., 2022a. *Flash-flood propagation susceptibility estimation using weights of evidence and their novel ensembles with multicriteria decision making and machine learning*. Geocarto International 37, 8361–8393.
- Costache, R., Tin, T.T., Arabameri, A., Crăciun, A., Ajin, R., Costache, I., Islam, A.R.M.T., Abba, S., Sahana, M., Avand, M., 2022b. *Flash-flood hazard using deep learning based on H2O R package and fuzzy-multicriteria decision-making analysis*. Journal of Hydrology 609, 127747.

7. Narrative Curriculum Vitae of the "individual" candidate or of each member of the research team, in the case of the "research team" candidate, showing the results of the research activity of the last 5 years, according to the quantitative indicators in Annex no. 2 to the regulation and qualitative assessment criteria provided in Annex no. 3 to the regulation.

Costache Romulus-Dumitru graduated in 2011 the Faculty of Geography, from the University of Bucharest, specializing in Meteorology-Hydrology. In September 2013, he graduated a Master program in Climatology-Hydrology, from the same faculty. His doctoral thesis completed between 2013 and 2016, at the "Simion Mehedinți" Doctoral School at the University of Bucharest, was entitled: *The assessment of structural vulnerability to floods and flooding in the upper and middle sector of Buzău River Basin*. The applicant has a PhD in Geography since 20.04.2017. It is worth to note that during the doctoral studies the candidate also obtained a doctoral scholarship granted by the Institute of National Economy which is part of the Romanian Academy. Within this scholarship, Costache Romulus-Dumitru elaborated another research work entitled "*Assessment of economic damages caused by floods and flooding in the upper and middle sector of Buzău River Basin*", which was finally integrated as a chapter in the final doctoral thesis.

The candidate has the degree of Scientific Researcher at the National Institute of Hydrology and Water Management of Romania where is employed from 2015.

After he completed the doctoral studies, the candidate managed to obtain, through project competitions, a number of 3 postdoctoral fellowships awarded by the Research Institute of the University of Bucharest. The first fellowship took place between 15.06.2018 - 14.06.2019, the second one between 01.01.2020 – 31.12.2020, while the 3<sup>rd</sup> one started on 01.09.2023 and is to be completed on 31.08.2024.

Between 08.04.2021 and 31.12.2022 the candidate was Director of a Postdoctoral Project obtained through a competition organized by UEFISCDI. He received the EXCELENT degree for the results achieved during this Project.

Additionally, he was implied as member in teams of 2 international research projects ("*IS-ENES2* – Infrastructure for the European Network of Earth System Modelling – Period: 01/02/2017 – 31/03/2017" and "*MOSES* - Managing Crop Water Saving with Enterprise Services – Period 01/09/2016 – 01/11/2018") and in a national project related to the risk evaluation ("*Ro-Risk Project* – advisory and expertise services for flood risk assessment under the Project „Assessing Disaster Risks at National Level” – Period: 21/07.2016 – 31/12/2016”).

It should be mentioned that, in the present, the candidate is the Project Responsible on behalf of Transilvania University of Braşov (Romania) within a HORIZON EUROPE project during the period

between 01.10.2023-30.09.2027. The Grant Agreement refers to the project *MULTICARE (Multi-hazard low-carbon resilient technologies and multi-scale digital services for a future-proof, sustainable & user-centred built environment)* – Project Number 10123467 that received funding HORIZON-CL5-2022-D4-02 call, having as topic HORIZON-CL5-2022-D4-02-01 - *Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People)*.

The candidate started his didactic career (between 22/02/2023 – 02/06/2023) as Associate Professor of Transilvania University of Brasov, Romania. He taught GIS classes on the Faculty of Civil Engineering, Master Programme (English): *Project management in urban regeneration*.

Regarding the Scientific Awards, the candidate obtained **1<sup>st</sup> place** (winner from Romania country side) at “*Danubius Young Scientist Award 2020*” – organized by Austrian Federal Ministry for Education, Science and Research (BMBFW) and the Institute for the Danube Region and Central Europe (IDM). It should be mentioned that young researchers from all fields of research participated in this competition. Also, he obtained a **Special Mention** at “*Rada Mihalcea Awards - Young Researchers in science and engineering* – 6th edition - 2020” - organized by Cluj-Napoca (Romania) city hall.

Due to his rich scientific activity the candidate was included in the **World's Top 2% Scientists by Stanford University (2022 and 2023 Release)**. In 2022, Costache Romulus-Dumitru occupied the place of 29716 among all the scientists included in this Ranking (200196 persons). According to this Ranking, the P.L. is on the **17<sup>th</sup>** position among the Romanian researchers. In 2023, Costache Romulus-Dumitru occupied the place of 11794 among all the scientists included in this Ranking. According to this Ranking, the candidate is on the **4<sup>th</sup> position** (excluding self-citations) among the Romanian researchers from all scientific domains. Moreover, according to this ranking, he occupied the **1<sup>st</sup> place** in Romania and **84<sup>th</sup>** at the global level in the field of **Geological & Geomatics Engineering**.

Overall, the candidate has a total of 71 scientific papers published as first, corresponding or co-author published in journals located in Q1 or Q2 according to AIS. The updated Curriculum Vitae along with the publication list of the candidate can be found and downloaded from the next link:

<https://www.brainmap.ro/romulus-dumitru-costache>.

Currently the candidate is Academic Editor at the next 3 journals:

- **Advances in Civil Engineering** journal (Impact Factor = 1.8) included in Science Citation Index Expanded (SCIE) of Web of Science (<https://www.hindawi.com/journals/ace/editors/>).
- **International Journal of RF and Microwave Computer-Aided Engineering** journal (Impact Factor = 1.7) included in Science Citation Index Expanded (SCIE) of Web of Science (<https://www.hindawi.com/journals/ijmce/editors/>).

- **Land** journal (Impact Factor = 3.9) included in Science Citation Index Expanded (SCIE) of Web of Science ([https://www.mdpi.com/journal/land/editors?page\\_no=2](https://www.mdpi.com/journal/land/editors?page_no=2)).

The visibility and the impact of the scientific contribution of the candidate can be estimated through several elements listed below. First of all, the share (percentage) of articles published in Q1 (red zone)/Q2 (yellow zone) journals according to AIS from the total number of published articles is equal to 62.28%. The total numbers of articles published by candidate in Q1 and Q2 is 71, while the total numbers of articles of the candidate (including also the databases – WOS-ESCI; Scopus and other international databases) is 114. The minimum value of 7 (of the articles in Q1 according to AIS) is exceeded. If is taken into account only the scientific papers published in SCIE (Science Citation Index Expanded) or SSCI (Social Science Citation Index) of Web of Science, the share will be equal to 74.73%. The number of the total publication in SCIE (Science Citation Index Expanded) or SSCI (Social Science Citation Index) of Web of Science is equal to 101 (at 09.02.2024). According to Web of Science, the total number of citations (without self-citations) of the candidate is 2966 (accessed online at 09.02.2024). According to Scopus the total number of citations (without self-citations) of the candidate is 3749 (accessed online at 09.02.2024). In case of candidate, the average of citations per publication (without self-citations), according to the Web of Science Core Collection is 24.38 (accessed online at 09.02.2024), while the average of citations per publication (without self-citations), according to the Scopus is 26.7 (accessed online at 09.02.2024). The Hirsch Index according to Web of Science is 36, while the Hirsch Index according to SCOPUS is 37.

The cumulative Article Influence Score (calculated according to ANNEX 2 of regulation) exceeds value of 5 (minimum value).

8. The list of publications of the "individual" candidate or of each member of the research team, in the case of the "research team" candidate, highlighting the relevant publications of the candidate in the last 5 years and the joint publications of the members of a research team in the case of the candidate "research team". A link to the web page where the candidate's publications can be found is also mentioned.

For almost all the publications below the DOI or the entire web page were indicated. Also, using only the DOI the web-page of the publication will be displayed.

1. **Costache R.**, Fontanine I., Corodescu E., (2014), *Assessment of surface runoff depth changes in Sărățel River Basin, Romania, using GIS techniques*, Central European Journal of Geosciences, **6(3)**: 363-372. **ISI I.F. = 0.432**
2. **Costache R.**, Prăvălie R., Mitof I., Popescu C., (2015), *Flood vulnerability assessment in the low sector of Sărățel catchment: Joseni village*, Carpathian Journal of Earth and Environmental Science, 10(1): 161 – 169. **ISI I.F. = 0.67**
3. Zaharia L., **Costache R\***., Prăvălie R. & Minea, G. (2015), *Assessment and mapping of flood potential in the Slanic catchment in Romania*, Journal of Earth System Science. 124(6),1311-1324. **ISI I.F. = 0.858**

(\*corresponding author)

4. Zaharia L., **Costache R\***, Prăvălie R., & Ioana-Toroimac G. (2017). *Mapping flood and flooding potential indices: a methodological approach to identifying areas susceptible to flood and flooding risk. Case study: the Prahova catchment (Romania)*. *Frontiers of Earth Science*, 11(2), 229-247. **ISI I.F. = 1.051** (\*corresponding author)
5. **Costache R.**, & Zaharia L. (2017). *Flash-flood potential assessment and mapping by integrating the weights-of-evidence and frequency ratio statistical methods in GIS environment—case study: Bâsca Chiojdului River catchment (Romania)*. *Journal of Earth System Science*, 126(4), 1 – 19. **ISI I.F. = 0.955**
6. **Costache R. (2019)**. *Flash-Flood Potential assessment in the upper and middle sector of Prahova river catchment (Romania). A comparative approach between four hybrid models*. *Science of The Total Environment*, 659, 1115 – 1134. <https://www.sciencedirect.com/science/article/abs/pii/S0048969718352902>. **ISI I.F. = 5.589 (Q1)**. - relevant publication
7. **Costache R. (2019)**. *Flash-flood Potential Index mapping using weights of evidence, decision Trees models and their novel hybrid integration*, *Stochastic Environmental Research and Risk Assessment*, 33(7), 1375 – 1402. DOI : 10.1007/s00477-019-01689-9. <https://link.springer.com/article/10.1007/s00477-019-01689-9> **ISI I.F. = 2.667 (Q1)**. - relevant publication
8. **Costache R. (2019)**. *Flood Susceptibility Assessment by Using Bivariate Statistics and Machine Learning Models - A Useful Tool for Flood Risk Management*, *Water Resources Management*, 33(9), 3239 – 3256. DOI: 10.1007/s11269-019-02301-z. <https://link.springer.com/article/10.1007/s11269-019-02301-z> **ISI I.F. = 2.987 (Q1)**. - relevant publication
9. Wang Y., Hong H., Chen W., Li S., Panahi M., Khosravi K., Shirzadi A., Shahabi H., Panahi S., **Costache R. (2019)**. *Flood susceptibility mapping in Dingnan County (China) using adaptive neuro-fuzzy inference system with biogeography based optimization and imperialistic competitive algorithm*. *Journal of Environmental Management*, 247, 712-729. <https://www.sciencedirect.com/science/article/abs/pii/S0301479719309041> **ISI I.F. = 4.865 (Q1)**. - Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023). - relevant publication
10. **Costache, R., & Bui, D. T. (2019)**. *Spatial prediction of flood potential using new ensembles of bivariate statistics and artificial intelligence: A case study at the Putna river catchment of Romania*. *Science of The Total Environment*, 691, 1098-1118. <https://www.sciencedirect.com/science/article/abs/pii/S004896971933311X> **ISI I.F. = 5.589 (Q1)**. - relevant publication
11. **Costache, R., Hong, H., & Wang, Y. (2019)**. *Identification of torrential valleys using GIS and a novel hybrid integration of artificial intelligence, machine learning and bivariate statistics*. *Catena*, 183, 104179. **ISI I.F. = 3.851 (Q1)**. <https://www.sciencedirect.com/science/article/abs/pii/S0341816219303212> - relevant publication
12. Pham B. Q., Abba S.I., Usman A. G., Linh N.T.T., Guta V., Malik A., **Costache R.**, Vo N. D. (2019) *Potential of hybrid data-intelligence algorithms for multi-station modelling of rainfall*, *Water Resources Management*, 33(15):5067–5087. DOI: 10.1007/s11269-019-02408-3 **ISI I.F. = 2.987 (Q1)**.
13. Tien Bui D., Hoang N.-D., Matinez-Alvarez F., Thi Ngo P.-T., Hao P. V., Pham T. D., Samui P., **Costache R.**, (2020). *A novel deep learning neural network approach for predicting flash flood susceptibility: A case study at a high frequency tropical storm area*, *Science of the Total Environment*, 701, 134413 (1 – 12). DOI:10.1016/j.scitotenv.2019.134413. **ISI I.F. = 6.551 (Q1)**. - Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023). - relevant publication
14. **Costache R.**, Pham Q.P., Sharifi E., Linh N.T.T., Abba S.I., Vojtek M., Vojtekova J., Nhi P.T.T., Khoi D.N. (2020) *Flash-flood susceptibility assessment using multicriteria decision-making and machine learning supported by remote sensing and GIS techniques*, *Remote Sensing*, 12, 106. DOI: 10.3390/rs12010106. **ISI I.F. = 4.502 (Q2)**. - Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023). - relevant publication
15. **Costache R.**, Pham B.P., Corodescu-Roșca E., Cîmpianu C., Hong H., Linh N.T.T., Fai C.M., Ahmed A.N., Vojtek M., Pandhiani S.M., Minea G., Ciubotaru N., Popa M.C., Diaconu D.C., and Pham B.T. (2020), *Using GIS, Remote Sensing, and Machine Learning to Highlight the Correlation between the Land-*

*Use/Land-Cover Changes and Flash-Flood Potential*, Remote Sensing, 12(9), 1422. **ISI I.F. = 4.502 (Q2).** - relevant publication

16. **Costache R.**, Hong, H., & Pham, Q. B. (2020). *Comparative assessment of the flash-flood potential within small mountain catchments using bivariate statistics and their novel hybrid integration with machine learning models*. Science of the Total Environment, 711, 134514. DOI:10.1016/j.scitotenv.2019.134514. **ISI I.F. = 6.551 (Q1).** – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). - relevant publication
17. **Costache R.**, & Bui, D. T. (2020), *Identification of areas prone to flash-flood phenomena using multiple-criteria decision-making, bivariate statistics, machine learning and their ensembles*, Science of The Total Environment, 712, 13692. DOI: 10.1016/j.scitotenv.2019.136492. **ISI I.F. = 6.551 (Q1).** – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). - relevant publication
18. Chițu Z., Tomei F., Villani G., Di Felice A., Zampelli G., Păltineanu I. C., Vișinescu I., Dumitrescu A., Bularda M., Neagu D., **Costache R.**, Luca E. (2020) *Improving Irrigation Scheduling Using MOSES Short-Term Irrigation Forecasts and In Situ Water Resources Measurements on Alluvial Soils of Lower Danube Floodplain, Romania*, Water, 12(2), 520. **ISI I.F. = 2.544 (Q2).**
19. **Costache R.**, Ngo P.T.T., Tien Bui D. (2020) *Novel Ensembles of Deep Learning Neural Network and Statistical Learning for Flash-Flood Susceptibility Mapping*, Water, 12(6), 1549. DOI: 10.3390/w12061549. **ISI I.F. = 2.544 (Q2).** - relevant publication
20. **Costache R.**, Popa M.C., Tien Bui D., Diaconu D.C., Ciubotaru N., Minea G., Pham Q.B. (2020) *Spatial predicting of flood potential areas using novel hybridizations of fuzzy decision-making, bivariate statistics, and machine learning*, Journal of Hydrology, 585, 124808, DOI: 10.1016/j.jhydrol.2020.124808. **ISI I.F. = 4.5 (Q1).** – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). - relevant publication
21. **Costache R.**, Pham Q.B., Avand M., Linh N.T.T., Vojtek M., Vojtekova J., Lee S., Khoi D.N., Nhi P.T.T., Dung T.D. (2020) *Novel hybrid models between bivariate statistics, artificial neural networks and boosting algorithms for flood susceptibility assessment*, Journal of Environmental Management, 265, 110485. DOI: 10.1016/j.jenvman.2020.110485. **ISI I.F. = 5.647 (Q1).** - relevant publication
22. Ali S.A., Parvin F., Pham Q.B., Vojtek M., Vojtekova J., **Costache R.**, Linh N.T.T., Nguyen H.Q., Ahmad A., Ghorbani M.A. (2020) *GIS-based comparative assessment of flood susceptibility mapping using hybrid multi-criteria decision-making approach, naïve Bayes tree, bivariate statistics and logistic regression: A case of Topľa basin, Slovakia*, Ecological Indicators, 117, 106620. DOI:10.1016/j.ecolind.2020.106620. **ISI I.F. = 4.229 (Q1).** – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023). - relevant publication
23. Yariyan P., Janizadeh S., Phong T.V., Nguyen H.D., **Costache R.**, Le H.V., Pham B.T., Pradhan B., Tiefenbacher J. (2020) *Improvement of Best First Decision Trees Using Bagging and Dagging Ensembles for Flood-risk Mapping*, Water Resources Management, 34(9), 3037-3053. DOI: 10.1007/s11269-020-02603-7. **ISI I.F. = 2.924 (Q1).** – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). - relevant publication
24. **Costache R.**, Tincu R., Elkhachy I., Pham Q.B., Popa M.C., Diaconu D.C., Avand M., Costache I., Arabameri A., Tien Bui D. (2020) *New neural fuzzy based machine learning ensemble for enhancing the prediction accuracy of flood susceptibility mapping*, Hydrological Sciences Journal. 65(16): 2816-2837. DOI: 10.1080/02626667.2020.1842412. **ISI I.F. = 2.186 (Q2).** - relevant publication
25. Lei X., Chen W., Avand M., Janizadeh S., Kariminejad N., Shahabi H., **Costache R.**, Shahabi H., Shirzadi A., Mosavi A. (2020) *GIS-based machine learning algorithms to gully erosion susceptibility mapping in a semi-arid region of Iran*, Remote Sensing, 2478, 12(15). DOI: 10.3390/rs12152478. **ISI I.F. = 4.502 (Q2).**
26. Abba S.I., Linh N.T.T., Abdullahi J., Ali S.I.A., Pham Q.B., Abdulkadir R.A., **Costache R.**, Thai V.N., Anh D.T. (2020) *Hybrid Machine Learning Ensemble Techniques for Modeling Dissolved Oxygen Concentration*, IEEE Access, DOI: 10.1109/ACCESS.2020.3017743. **ISI I.F. = 3.745 (Q1).**
27. Nhu V.-H., Ngo P.T.T., Pham T.D., Dou J., Song X., Hoang N.D., Tran D.A., Cao D.P., Aydilek I.B., Amiri M., **Costache R.**, Hoa P.V., Tien Bui D. (2020) *A new hybrid Firefly-PSO optimized random subspace tree intelligence for torrential rainfall-induced flash flood susceptibility mapping*, Remote Sensing, 12(17). DOI: 10.3390/rs12172688. **ISI I.F. = 4.502 (Q2).** - relevant publication
28. Talukdar S., Ghose B., Shahfahad, Salam R., Mahato S., Pham Q.B., Linh N.T.T., **Costache R.**, Avand M.



(2020) *Flood susceptibility modeling in Teesta river basin, Bangladesh using novel ensembles of bagging algorithms*, Stochastic Environmental Research and Risk Assessment. DOI: 10.1007/s00477-020-01862-5.

**ISI I.F. = 2.351 (Q1).** - relevant publication

29. Sahana M., Pham B.T., **Costache R.\***, Chakraborty R., Stayam N., Nguyen H.D., Phong T.V., Le H.V., Pal S.C., Shukla M., Areendran G., Imdad K., Prakash I. (2020) *Novel Hybrid Soft Computing Methods Based on Multi-layer Perceptron Neural Network Classifier*, Geocarto International. DOI: 10.1080/10106049.2020.1837262. **ISI I.F. = 3.789 (Q1)** (\*corresponding author)
30. Yariyan P., Avand M., Abbaspour R.A., Haghghi A.T., **Costache R.**, Ghorbanzadeh O., Janizadeh S., Blaschke T. (2020). *Flood Susceptibility Mapping Using an Improved Analytic Network Process with Statistical Models*, Geomatics, Natural Hazards and Risk. 11(1): 2282-2314. DOI: 10.1080/19475705.2020.1836036. **ISI I.F. = 3.333 (Q1)** - relevant publication
31. Ali S.A., Parvin F., Vojteková J., **Costache R.**, Linh N.T.T., Pham Q.B., Vojtek M., Gigović L., Ahmad A., Ghorbani M.A. (2021) *GIS-Based Landslide Susceptibility Modeling: A Comparison between Fuzzy Multi Criteria and Machine Learning Algorithms*, Geoscience Frontiers. 12(2): 857-876. DOI: 10.1016/j.gsf.2020.09.004. **ISI I.F. = 6.853 (Q1).** - Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023).
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91. Bien T.X., Iqbal M., Jamal A., Nguyen D. D., Phong T.V., **Costache R.\***, Ho S.L., Le H.V., Nguyen H.B.T., Prakash I., Pham B.T. (2023) *Integration of Rotation Forest with MultiBoost Ensemble Methods with Forest by Penalizing Attributes for Spatial Prediction of Landslide Susceptible Areas*, Stochastic Environmental Research and Risk Assessment, 37(12), 4641–4660. DOI: 10.1007/s00477-023-02521-1. **ISI I.F. = 4.2 (Q1).** (\*corresponding author). - relevant publication
92. Varol M., Habib M.A., Islam A.R.M.T., Phoungthong K., Khan R., Islam M.S., Hasanuzzaman M., Mia M.Y., **Costache R.**, Pal S.C. (2023) *Receptor model-based source-specific health risks of toxic metal(loid)s in coal basin-induced agricultural soil in northwest Bangladesh*, Environmental Geochemistry and Health, DOI: <https://doi.org/10.1007/s10653-023-01740-3>. **ISI I.F. = 4.2 (Q2).**
93. Shelar R.S., Nandgude S.B., Pande C.B., **Costache R.**, El-Hiti G.A., Tolche A.B., Son C.T., Yadav K.K. (2023) *Unlocking the hidden potential: Groundwater zone mapping using AHP, remote sensing and GIS techniques*, Geomatics, Natural Hazards and Risk, 14(1), 2264458, DOI: 10.1080/19475705.2023.2264458. **ISI I.F. = 4.2 (Q1).**
94. Haider S., Masood M.U., Rashid M., Alshehri F., Pande C.B., Katipoğlu O.M., **Costache R.** (2023) *Simulation of the Potential Impacts of Projected Climate and Land Use Change on Runoff under CMIP6 Scenarios*, Water, 15(19), 3421, DOI: 10.3390/w15193421. **ISI I.F. = 3.4 (Q2).**
95. Pal S.C., Chakraborty R., Islam A.R.M.T., Roy P., Chowdhuri I., Saha A., Islam A., **Costache R.**, Alam E. (2023) *Land use and climate change-induced soil erosion mapping in a sub-tropical environment*, Geomatics, Natural Hazards and Risk, 14(1), 2270129, DOI: 10.1080/19475705.2023.2270129. **ISI I.F. = 4.2 (Q1).**

96. Costache R., Abdo H.G., Mishra A.P., Pal S.C., Islam A.R.M.T., Pande C.B., Almohamad H., Dughairi A.A.A., Albanai J.A. (2023) *Using fuzzy and machine learning iterative optimized models to generate the flood susceptibility maps: Case study of Prahova River basin, Romania*, *Geomatics, Natural Hazards and Risk*, 14(1), 2281241, DOI: 10.1080/19475705.2023.2281241. **ISI I.F. = 4.2 (Q1) - relevant publication**
97. Pal S.C., Biswas T., Ruidas D., Saha A., Shit M., Islam A.R.T.M., Islam A., Costache R. (2023). *Evaluation of groundwater contamination and associated human health risk in a water scarce hard rock-dominated region of India: issues, management measures and policy recommendation*, *Groundwater for Sustainable Development*, 23, 101039, DOI: 10.1016/j.gsd.2023.101039 **ISI I.F. = 5.9 (Q1 - ESCI)**.
98. Rashid M., Haider S., Masood M.U., Pande C.P., Tolche A.D., Alshehri F., Costache R., Elkhachy I. (2023). *Sustainable Water Management for Small Farmers with Center Pivot Irrigation: A Hydraulic and Structural Design Perspective*, *Sustainability*, 15(23), 16390, DOI: 10.3390/su152316390. **ISI I.F. = 3.9 (Q2)**.
99. Pham B.T., Thanh B.N., Phong T., Costache R., Amiri M., Nguyen D., Le H., Prakash I. (2023) *Prediction of Coastal Erosion Susceptible Areas of Quang Nam Province, Vietnam Using Machine Learning Models*, *Earth Science Informatics*, 17, 401–419. DOI: 10.1007/s12145-023-01182-6. **ISI I.F. = 2.8 (Q2)**.
100. Tuyen T.T., Al-Ansari N., Nguyen D.D., Le H.M., Phan T.N.Q, Prakash I., Costache R.\*, Pham B.T. (2024) *Prediction of White Spot Disease Susceptibility in Shrimps Using Decision Trees based Machine Learning Models*, *Applied Water Science*, 14, 2. DOI: 10.1007/s13201-023-02049-3. **ISI I.F. = 5.5 (Q1). (\*corresponding author)**.
101. Alam M.M., Akter M.Y., Islam A.R.M.T., Mallick J., Kabir Z., Chu R., Arabameri A., Pal S.C., Al Masudi M.A., Costache R., Senapathi V. (2024) *A review of recent advances and future prospects in calculation of reference evapotranspiration in Bangladesh perspective using soft computing models*, *Journal of Environmental Management*, 351, 119714 DOI: 10.1016/j.jenvman.2023.119714. **ISI I.F. = 8.7 (Q1)**.

9. List of research projects won by the candidate and their value.

a. *The integrated analysis of flash-floods and floods susceptibility in Romania using machine learning algorithms and bivariate statistics (PN-III-P1-1.1-PD-2019-0424)*, contract No. PD 226 from 08/04/2021. Period: 01/01/2021 – 31/12/2022 (Acronym: RO-FLOOD-SUSCEP) – the candidate (Costache Romulus-Dumitru) was **Project Director; the Project Value was 246800 RON** (around 50000 EUR). The Host Institution was Transilvania University of Braşov.

b. *Multi-hazard low-carbon resilient technologies and multi-scale digital services for a future-proof, sustainable & user-centred built environment – Project Number 10123467*. (Acronym: MULTICARE). **Horizon Europe Programme**. Period: 01/10/2023 – 30/09/2027. – the candidate (Costache Romulus-Dumitru) is **Project Responsible** from the partner Transilvania University of Braşov. The allocated budget for Transilvania University of Braşov is 327128 EUR (around 1635640 RON). The total budget of the Project is 7497153 EUR. The Project Coordinator is Delft University of Technology.

c. *Multi-hazard low-carbon resilient technologies and multi-scale digital services for a future-proof, sustainable & user-centred built environment (PN-IV-P8-8.1-PRE-HE-ORG-2023-0135)*, contract No. 50PHE from 03/01/2024. Period: 03/01/2024 – 31/12/2025 – the candidate (Costache Romulus-Dumitru) is **Project Director; the Project Value is 163560 RON** (around 32700 EUR). The

Host Institution is Transilvania University of Braşov. This project was obtained from UEFICDI within the *Horizon Europe Award Competition - Research Teams 2023* (<https://uefiscdi.gov.ro/premiere-orient-europa-echipe-de-cercetare>).

**10. List of patents filed and accepted, if applicable..**

Not applicable

\* Se redactează în limba engleză. Prin excepție, redactarea cererii de premiere se face în limba română pentru cererile din domenii cu specific românesc: limba și literatura română și dreptul românesc.

\*\* Rezultatele activității de cercetare sunt evaluate conform Anexei nr. 3 la Regulamentul de organizare și funcționare a programului Gala Cercetării Românești.

## PERSONAL INFORMATION

## Dr. Romulus-Dumitru Costache



Sex Male | Date of birth 05/06/1989 | Nationality Romanian

## WORK EXPERIENCE

03/01/2024 – to date

**Project Director**
**Transilvania University of Brasov, Romania** (<https://www.unitbv.ro/>)

*Multi-hazard low-carbon resilient technologies and multi-scale digital services for a future-proof, sustainable & user-centred built environment (PN-IV-P8-8.1-PRE-HE-ORG-2023-0135), contract No. 50PHE from 03/01/2024. Period: 03/01/2024 – 31/12/2025*

Business or sector research

01/10/2023 – to date

**Project Responsible**
**Transilvania University of Brasov, Romania** (<https://www.unitbv.ro/>)

Leading the Transilvania University of Braşov research team in MULTICARE (*Multi-hazard low-carbon resilient technologies and multi-scale digital services for a future-proof, sustainable & user-centred built environment*) Project. The Project is part of HORIZON EUROPE programme. A number of 2 Work Packages are led by the undersigned. Project number 101123467

Business or sector research

09/03/2023 – to date

**Flood hazard assessment expert**
**Danube Delta National Institute for Research and Development, Romania**

 (<http://ddni.ro/wps/ro/acasa/>)

- Involved as key expert in the activities regarding the Nucleu Project PN 23 13 02 01 – „*Research on the contribution of ecological restoration activities in the management of environmental risks caused by global climate change in the Danube Delta Biosphere Reserve*”

Business or sector research

22/02/2023 – 02/06/2023

**Associate Professor**
**Transilvania University of Brasov, Romania** (<https://www.unitbv.ro/>)

- Teaching GIS classes on the Faculty of Civil Engineering, Master Programme (English): Project management in urban regeneration

Business or sector research

01/03/2022 – to date

**Socio-economic expert**
**Danube Delta National Institute for Research and Development, Romania**

 (<http://ddni.ro/wps/ro/acasa/>)

- Involved in the activities regarding the project *Development of the monitoring station for migratory fish: sturgeon and mackerel - Isaccea (acronym ANADROM)*

Business or sector research

01/12/2019 – to date

**Hydrologist Expert**

 National Administration “Romanian Waters” (<https://rowater.ro/>)

- Involved in the activities regarding the project - ROFLOODS (*Strengthening the capacity of the central public authority in the field of water for the purpose of implementing the 2nd and 3rd stages of Cycle II of the Flood Directive*) – Cod. SIPOCA 734 Cod MySmis2014 130033.

Domeniu de activitate: research

03/03/2015 – to date

**Scientific researcher**
**National Institute of Hydrology and Water Management, Romania** ([www.inhga.ro](http://www.inhga.ro))

- Involved in the activity of Flash-Flood Forecast and Warning Department. The main activity is



represented by flash-flood forecast and warning issue. I have also an important contribution in realization of GIS workflows used in the operational activity of the Department.

Business or sector research

26/04/2021 – 31/12/2022

### Project Manager

**Transilvania University of Brasov, Romania** (<https://www.unitbv.ro/>)

- Leading the RO-FLOOD-SUSCEP Project (Ctr. No. D / 226/2021) on the assessment of susceptibility to floods and floods through artificial intelligence combined with GIS techniques.

Business or sector research

26/04/2021 – 31/12/2022

### Socio-economic expert

**Danube Delta National Institute for Research and Development, Romania** (<http://ddni.ro/wps/ro/acasa/>)

- Involved in the activities regarding the *Project of the Danube Delta Biosphere Reservation Management Plan*.

Business or sector research

12/10/2021 – 31/08/2022

### GIS expert

**Danube Delta National Institute for Research and Development, Romania** (<http://ddni.ro/wps/ro/acasa/>)

- Involved in the activity of contract number 644/2021/INCDDD – "The assessment of environmental impact for the project "Construction works for the heavy water detritification plant" proposed to be located on the Nuclear Power Plant Platform, Cernavoda City, Constanța County.

Business or sector research

01/07/2015 – 01/12/2015

### Geographer

**ESRI Romania**, 8, Roma, District 1, Bucharest, Romania, website: <http://www.esri.ro/>

- Digitization and updating the Geodatabase with roads and buildings from different localities of Romania from Orthophotomaps

Business or sector IT

15/04/2014 – 01/10/2014

### Geographer

**ESRI Romania**, 8, Roma, District 1, Bucharest, Romania, website: <http://www.esri.ro/>

- Development of a tool in ArcGIS 10.2 with Model Builder for assessment the roads vulnerability to blizzard;
- Digitization and updating the Geodatabase with railways from 10 counties of Romania and Bucharest from Orthophotomaps

Business or sector IT

## EDUCATION AND TRAINING

2013 –2016

### Ph.D. (doctorate)

Faculty of Geography, University of Bucharest, Romania

- Applying GIS and Remote Sensing techniques in hydrology in order to assess the vulnerability of settlements to floods and flash-floods.

2011 - 2013

### Master Degree in Hydrology and Meteorology

Faculty of Geography, University of Bucharest, Romania

- GIS in meteorology and hydrology, Remote Sensing, Geostatic, Hydrology modelling, hydraulic modelling.

2008 – 2011

### Bachelor Degree in Hydrology and Meteorology

Faculty of Geography, University of Bucharest, Romania

- GIS, Remote Sensing, Cartography, Meteorology, Hydrology, Climatology

## PERSONAL SKILLS

Mother tongue(s) Romanian

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
Replace with name of language certificate. Enter level if known.					
French	B1	B1	B1	B1	B1
Replace with name of language certificate. Enter level if known.					

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user  
Common European Framework of Reference for Languages

- Communication skills ▪ Good communication skills gained through my experience with my work colleagues at ESRI Romania.
- Job-related skills ▪ Very good skills in GIS, Remote Sensing, Cartography, Database processing.
- Computer skills ▪ Very good command of ArcGIS 10.x software tools, especially Editor and Spatial Analyst extensions, good command of QGIS, SAGA GIS and Global Mapper software, good command of ENVI 5.1 software, good command of Microsoft Office Softwares. Good skills in Python programming language.
- Driving licence ▪ B

## RESEARCH ACTIVITY

### Project Director

**RO-FLOOD-SUSCEP** - The integrated analysis of flash-floods and floods susceptibility in Romania using machine learning algorithms and bivariate statistics (PN-III-P1-1.1-PD-2019-0424) – **Period: 01/01/2021 – 31/12/2022**

### Member in project teams

1. **Ro-Risk Project** – advisory and expertise services for flood risk assessment under the Project „Assessing Disaster Risks at National Level” – **Period: 21/07.2016 – 31/12/2016** (Project headed by General Inspectorate of Emergency Situation)
2. **MOSES Project** - Managing Crop Water Saving with Enterprise Services – **Period 01/09/2016 – 01/11/2018** (Project headed by ESRI Italy)
3. **IS-ENES2 Project** – Infrastructure for the European Network of Earth System Modelling – **Period: 01/02/2017 – 31/03/2017**

### Fellowships

1. **Scientific performance fellowship** – University of Bucharest
  - a. **Project title:** Manifestation potential of hydrological risk phenomena, floods and flooding, across the Subcarpathian sector of Buzău River Basin
  - b. **Period:** 01/11/2012 – 30/06/2013
2. **Doctoral POSDRU fellowship within SOCERT Project**
  - a. **Project title:** Assessment of economic damages caused by floods and flooding in the upper and middle sector of Buzău River Basin
  - b. **Period:** 01/07/2014 – 30/09/2015
3. **Postdoctoral Fellowship – Research Institute of University of Bucharest**
  - a. **Project title:** GIS tool for flash-flood vulnerability assessment and technical support for hidrological forecast and warning

b. Period: 15/06/2018 – 14/06/2019

4. **Postdoctoral Fellowship – Research Institute of University of Bucharest**

a. **Project title:** The use of artificial intelligence combined with hydrological and hydraulic modelling for a detailed identification of torrential valleys and river sectors prone to flash-floods

b. Period: 01/01/2020 – 31/12/2020

### Editorial Board Member

1. **Academic Editor – *Advances in Civil Engineering* – Hindawi (Web of Science Impact Factor = 1.924)**
2. **Academic Editor – *International Journal of RF and Microwave Computer-Aided Engineering* – Wiley Online Library (Web of Science Impact Factor = 1.987)**
3. **Topic Editor - *Geosciences* – MDPI (included in Emerging Sources Citation Index, SCOPUS CiteFactor: 1.82)**
4. **Associate Editor – *Frontiers in Remote Sensing* - (Indexed in: 1Science, CLOCKSS, CrossRef, DeepGreen, Dimensions, DOAJ, Figshare, Jisc, MyScienceWork, OpenAIRE, Semantic Scholar, Sherpa/Romeo)**
5. **Guest Editor for Special Issue in *Water* (MDPI) (I.F.: 2.544, Q2 – Web of Science): *Flash-Flood Susceptibility, Forecast and Warning***
6. **Guest Editor for Special Issue in *Geosciences* (MDPI): *Assessment of Natural Risk Phenomena Susceptibility Using Novel Analysis Algorithms Combined with GIS Techniques***
7. **Guest Editor for Special Issue in *Land* (MDPI) (I.F.: 3.905, Q2 – Web of Science): *Application of Geographic Information System for Monitoring and Predicting Flash Flood Susceptibility***
8. **Editor of *Journal of Mining and Earth Sciences* (Indexed in Crossref, Citation Gateway and Google Scholar).**
9. **Editor of *Hydrology* – Science Publishing Group (Indexed in WorldCat, Crossref, Zeitschriften Datenbank, etc.)**

### Scientific Awards

1. **1<sup>st</sup> place (winner from Romania country side) at “Danubius Young Scientist Award “2020”** – organized by Austrian Federal Ministry for Education, Science and Research (BMBFW) and the Institute for the Danube Region and Central Europe (IDM).
2. **Special Mention at “Rada Mihalcea Awards - Young Researchers in science and engineering – 6<sup>th</sup> edition - 2020”** - organized by Cluj-Napoca (Romania) city hall

### Scientometric indicators

1. **Citations number:**
  - **Web of Science** - 3142 citations
  - **Scopus** - 3497 citations
  - **Google Scholar** - 4726 citations
2. **Hirsch Index (h-index)**
  - **Web of Science** - 34
  - **Scopus** - 36
  - **Google Scholar** - 41

### LIST OF PUBLICATIONS

#### Papers published in ISI Journals (Clarivate)

1. **Costache R., Fontanine I., Corodescu E., (2014), *Assessment of surface runoff depth changes in Sărățel River Basin, Romania, using GIS techniques*, Central European Journal of Geosciences, 6(3): 363-372. ISI I.F. = 0.432**

### Analytics - Web of Science)

2. **Costache R.**, Prăvălie R., Mitof I., Popescu C., (2015), *Flood vulnerability assessment in the low sector of Sărățel catchment: Joseni village*, Carpathian Journal of Earth and Environmental Science, 10(1): 161 – 169. **ISI I.F. = 0.67**
3. Zaharia L., **Costache R\***, Prăvălie R. & Minea, G. (2015), *Assessment and mapping of flood potential in the Slanic catchment in Romania*, Journal of Earth System Science. 124(6),1311-1324. **ISI I.F. = 0.858** (\*corresponding author)
4. Zaharia L., **Costache R\***, Prăvălie R., & Ioana-Toroimac G. (2017). *Mapping flood and flooding potential indices: a methodological approach to identifying areas susceptible to flood and flooding risk. Case study: the Prahova catchment (Romania)*. Frontiers of Earth Science, 11(2), 229-247. **ISI I.F. = 1.051** (\*corresponding author)
5. **Costache R.**, & Zaharia L. (2017). *Flash-flood potential assessment and mapping by integrating the weights-of-evidence and frequency ratio statistical methods in GIS environment—case study: Bâsca Chiojdului River catchment (Romania)*. Journal of Earth System Science, 126(4), 1 – 19. **ISI I.F. = 0.955**
6. **Costache R.** (2019). *Flash-Flood Potential assessment in the upper and middle sector of Prahova river catchment (Romania). A comparative approach between four hybrid models*. Science of The Total Environment, 659, 1115 – 1134. **ISI I.F. = 5.589 (Q1)**.
7. **Costache R.** (2019). *Flash-flood Potential Index mapping using weights of evidence, decision Trees models and their novel hybrid integration*, Stochastic Environmental Research and Risk Assessment, 33(7), 1375 – 1402. DOI : 10.1007/s00477-019-01689-9. **ISI I.F. = 2.667 (Q1)**.
8. **Costache R.** (2019). *Flood Susceptibility Assessment by Using Bivariate Statistics and Machine Learning Models - A Useful Tool for Flood Risk Management*, Water Resources Management, 33(9), 3239 – 3256. DOI: 10.1007/s11269-019-02301-z. **ISI I.F. = 2.987 (Q1)**.
9. Wang Y., Hong H., Chen W., Li S., Panahi M., Khosravi K., Shirzadi A., Shahabi H., Panahi S., **Costache R.** (2019). *Flood susceptibility mapping in Dingnan County (China) using adaptive neuro-fuzzy inference system with biogeography based optimization and imperialistic competitive algorithm*. Journal of Environmental Management, 247, 712-729. **ISI I.F. = 4.865 (Q1)**. — Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023).
10. **Costache R.**, & Bui, D. T. (2019). *Spatial prediction of flood potential using new ensembles of bivariate statistics and artificial intelligence: A case study at the Putna river catchment of Romania*. Science of The Total Environment, 691, 1098-1118. **ISI I.F. = 5.589 (Q1)**.
11. **Costache R.**, Hong, H., & Wang, Y. (2019). *Identification of torrential valleys using GIS and a novel hybrid integration of artificial intelligence, machine learning and bivariate statistics*. Catena, 183, 104179. **ISI I.F. = 3.851 (Q1)**.
12. Pham B. Q., Abba S.I., Usman A. G., Linh N.T.T., Guta V., Malik A., **Costache R.**, Vo N. D. (2019) *Potential of hybrid data-intelligence algorithms for multi-station modelling of rainfall*, Water Resources Management, 33(15):5067–5087. DOI: 10.1007/s11269-019-02408-3. **ISI I.F. = 2.987 (Q1)**.
13. Tien Bui D., Hoang N.-D., Matinez-Alvarez F., Thi Ngo P.-T., Hao P. V., Pham T. D., Samui P., **Costache R.**, (2020). *A novel deep learning neural network approach for predicting flash flood susceptibility: A case study at a high frequency tropical storm area*, Science of the Total Environment, 701, 134413 (1 – 12). DOI:10.1016/j.scitotenv.2019.134413. **ISI I.F. = 6.551 (Q1)**. — Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023).
14. **Costache R.**, Pham Q.P., Sharifi E., Linh N.T.T., Abba S.I., Vojtek M., Vojtekova J., Nhi P.T.T., Khoi D.N. (2020) *Flash-flood susceptibility assessment using multicriteria decision-making and machine learning supported by remote sensing and GIS techniques*, Remote Sensing, 12, 106. DOI: 10.3390/rs12010106. **ISI I.F. = 4.502 (Q2)**. — Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023).
15. **Costache R.**, Pham B.P., Corodescu-Roșca E., Cîmpianu C., Hong H., Linh N.T.T., Fai C.M., Ahmed A.N., Vojtek M., Pandhiani S.M., Minea G., Ciubotaru N., Popa M.C., Diaconu D.C., and Pham B.T. (2020), *Using GIS, Remote Sensing, and Machine Learning to Highlight the Correlation between the Land-Use/Land-Cover Changes and Flash-Flood Potential*, Remote Sensing, 12(9), 1422. **ISI I.F. = 4.502 (Q2)**.
16. **Costache R.**, Hong, H., & Pham, Q. B. (2020). *Comparative assessment of the flash-flood potential within small mountain catchments using bivariate statistics and their novel hybrid integration with machine learning models*. Science of the Total Environment, 711, 134514. DOI:10.1016/j.scitotenv.2019.134514. **ISI I.F. = 6.551 (Q1)**. — Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics).
17. **Costache R.**, & Bui, D. T. (2020), *Identification of areas prone to flash-flood phenomena using multiple-criteria decision-making, bivariate statistics, machine learning and their ensembles*,

- Science of The Total Environment, 712, 13692. DOI: 10.1016/j.scitotenv.2019.136492. **ISI I.F. = 6.551 (Q1)**. – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics).
18. Chițu Z., Tomei F., Villani G., Di Felice A., Zampelli G., Păltineanu I. C., Vișinescu I., Dumitrescu A., Bularda M., Neagu D., **Costache R.**, Luca E. (2020) *Improving Irrigation Scheduling Using MOSES Short - Term Irrigation Forecasts and In Situ Water Resources Measurements on Alluvial Soils of Lower Danube Floodplain, Romania*, Water, 12(2), 520. **ISI I.F. = 2.544 (Q2)**.
  19. **Costache R.**, Ngo P.T.T., Tien Bui D. (2020) *Novel Ensembles of Deep Learning Neural Network and Statistical Learning for Flash-Flood Susceptibility Mapping*, Water, 12(6), 1549. DOI: 10.3390/w12061549. **ISI I.F. = 2.544 (Q2)**.
  20. **Costache R.**, Popa M.C., Tien Bui D., Diaconu D.C., Ciubotaru N., Minea G., Pham Q.B. (2020) *Spatial predicting of flood potential areas using novel hybridizations of fuzzy decision-making, bivariate statistics, and machine learning*, Journal of Hydrology, 585, 124808, DOI: 10.1016/j.jhydrol.2020.124808. **ISI I.F. = 4.5 (Q1)**. – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics).
  21. **Costache R.**, Pham Q.B., Avand M., Linh N.T.T., Vojtek M., Vojtekova J., Lee S., Khoi D.N., Nhi P.T.T., Dung T.D. (2020) *Novel hybrid models between bivariate statistics, artificial neural networks and boosting algorithms for flood susceptibility assessment*, Journal of Environmental Management, 265, 110485. DOI: 10.1016/j.jenvman.2020.110485. **ISI I.F. = 5.647 (Q1)**.
  22. Ali S.A., Parvin F., Pham Q.B., Vojtek M., Vojtekova J., **Costache R.**, Linh N.T.T., Nguyen H.Q., Ahmad A., Ghorbani M.A. (2020) *GIS-based comparative assessment of flood susceptibility mapping using hybrid multi-criteria decision-making approach, naïve Bayes tree, bivariate statistics and logistic regression: A case of Topfa basin, Slovakia*, Ecological Indicators, 117, 106620. DOI:10.1016/j.ecolind.2020.106620. **ISI I.F. = 4.229 (Q1)**. – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics). (January/February 2023).
  23. Yariyan P., Janizadeh S., Phong T.V., Nguyen H.D., **Costache R.**, Le H.V., Pham B.T., Pradhan B., Tiefenbacher J. (2020) *Improvement of Best First Decision Trees Using Bagging and Dagging Ensembles for Flood-risk Mapping*, Water Resources Management, 34(9), 3037-3053. DOI: 10.1007/s11269-020-02603-7. **ISI I.F. = 2.924 (Q1)**. – Highly Cited paper – Included in the Top 1% of the academic field of Environment/Ecology according to Web of Science (Clarivate Analytics).
  24. **Costache R.**, Tincu R., Elkhachy I., Pham Q.B., Popa M.C., Diaconu D.C., Avand M., Costache I., Arabameri A., Tien Bui D. (2020) *New neural fuzzy based machine learning ensemble for enhancing the prediction accuracy of flood susceptibility mapping*, Hydrological Sciences Journal. 65(16): 2816-2837. DOI: 10.1080/02626667.2020.1842412. **ISI I.F. = 2.186 (Q2)**.
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