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FEATURES AND BENEFITS OF THE METHODOLOGY INVESTIGATION OF SOIL AND GROUNDWATER ECOLOGICAL STATE

The current state of the soils of Ukraine, and in particular, the Poltava region, for its agrochemical, and, so ecological status causeous the significant concerns [1]. Since the rural population of the Poltava region is using water from wells and boreholes (decentralized), and often without chemical analysis of quality, so there is a direct threat to life. In [2], the detailed analysis of the main soil degradation causes in the region, sources of soil and groundwater pollutions, the search of possible methods for improving of the main environment components state are presented. Degumification of Poltava chernozems, significant increase in density and erosion of soil cover are progressing rapidly [2].

The problem of soils chemical state investigation was studied by many scientists in the world. The authors studied the works of soil researchers. Percival [3] presented the basic methods of chemical analysis, based on the techniques initiated by Morgan, which makes it possible to determine the eight most important components of the soil. The analysis of the historical formation of the chemical analysis of soils was carried out by Anderson [4]. But research was mainly carried out to solve a narrowly specified problem. All the proposed research methods have some benefits and disadvantages [5 - 11].

The authors developed and presented the methodology of the study of the ecological state of the soil and groundwater provides an opportunity to determine the basic physical and chemical parameters, on the basis of which it is possible to determine the presence of mutual influence. This is especially important in identifying possible sources of pollution of the area or the entire aquatic horizon. The example of the analytical and calculation part demonstrates the possibility of calculation for the evaluation of the content of macrocomponents that cannot be determined experimentally at the moment. Thus, on the basis of the experimental data obtained, we can conclude that the formation of this aquifer is determined by the ground stream water. To preserve the soil, the positive experience of the scientific and production enterprises, where organic land use is introduced, i.e. chemical compounds and mineral fertilizers are not used, should find state support and institutional consolidation.

In the future, environmental researchers can apply the proposed methodology for soil research, soil extraction and water. As an example of our research, we have shown the degree of instability of the nature-human system. Even minor external influences make significant changes in the chemical composition of the environment, which in turn leads to changes in the human ecology, since a person cannot live in isolation from nature. The human body is an element of nature and develops in accordance with its laws. The laws of nature cannot be canceled. And changes in the chemical composition of the soil and water can be irreversible, as irreversible may be the change in the environmental balance of the environment. Therefore, it is important to study the chemistry of the environment with a further analysis of the impact of changing the main indicators of the state of the ecosystem on the life of mankind in general in the near future.

References

1. Baranovsky V.A. 2006. *Ecological-geographical atlas of Ukraine / Atlas-monograph.M: Varta, p. 61 (220 p).*
2. Senenko N. 2015. *Analysis of the state of soil, groundwater and possible improvement of their quality. In the book «Energy saving and rational nature use». Oradea University Press, pp. 116-148. ISBN 978-606-10-1452-1.*
3. Percival G.P. 1942. *Modern methods of soil testing. J. Chem. Educ., 19(12) p. 604*
Publication Date: December 1, 1942 <https://doi.org/10.1021/ed019p604>
4. Anderson M.S. 1960. *History and Development of Soil Testing. J. Agric. Food Chem. (82) 84-87. https://doi.org/10.1021/jf60108a001*
5. Skopp J., Jawson J.W., Doran M.D. 1990. *Steady-state aerobic microbial activity as a function of soil water content, Soil Science Society of America Journal, 54 No.6: 1619-1625 ref.28. DOI:10.2136/sssaj*
6. Mitchell A. Pavao-Zuckerman. 2009. *Scratching the surface and digging deeper: exploring ecological theories in urban soils. Urban Ecosystems, 12(1), 9–20*
<https://doi.org/10.1007/s11252-008-0078-3>
7. CAM van Gestel. 2012. *Soil ecotoxicology: state of the art and future directions. Zookeys, (176):275-96. doi: 10.3897/zookeys.176.2275.*
8. Alves PRL., Cardoso EJBN. 2016. *Overview of the Standard Methods for Soil Ecotoxicology Testing. DOI: 10.5772/62228. https://www.intechopen.com/books/invertebrates-experimental-models-in-toxicity-screening*
9. Hisyam J., Syed B., Syed O. 2017. *The Correlation between Resistivity and Soil Properties as an Alternative to Soil Investigation / Indian Journal of Science and Technology 10(6) DOI: 10.17485/ijst/2017/v10i6/111205*
10. Alqadad A., Shahrour I., Sukik A. 2017. *Smart system for safe and optimal soil investigation in urban areas, Underground Space Volume 2, Issue 4. 220-226*
<https://doi.org/10.1016/j.undsp.2017.10.003>
11. Hafeth I. Naji, 2018. *Analyzing the Factors Affecting the Soil Investigation Cost. Journal of Engineering and Applied Sciences, 13: 198-203. DOI: 10.3923/jeasci.2018.198.203 URL: http://medwelljournals.com/abstract/?doi=jeasci.2018.198.203*