Environmental Engineering and Management Journal

April 2026, Vol. 25, No. 4, 959-967
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu
http://doi.org/10.30638/eemj.2026.073

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DETERMINING ORGANISMS–ENVIRONMENT CRITICAL STATE UNDER MULTIPLE POLLUTION: GENERAL POLLUTION INDEX

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Abstract

The paper addresses the issue of the total effect of multiple pollution, regardless of the number of pollutants, whether of the same nature (e.g., chemical) or of different natures (chemical, radioactive, acoustic, particulate, electromagnetic, thermal, ultraviolet radiation, combustion gases, or byproducts resulting from energy recovery processes in waste) applied to living organisms or the environment, simultaneously and/or cumulatively over time.
The physical foundations (the principle of critical energy and the participation of specific energy) are presented, providing the basis for deriving a calculation method for *the general pollution index*, in the case of the nonlinear behavior of pollutants in relation to living organisms or the environment, while also considering their prior deterioration.
The limitations of current calculation methods for various air quality indices are presented, highlighting that they do not account for the prior deterioration of living organisms or the environment before pollution occurs.
Calculation examples illustrate the practical use of the general pollution index proposed in this paper, as well as its advantages in comparison to some existing methods in the literature. Furthermore, the general pollution index makes it possible to identify which pollutants contribute the most to pollution in a given case.

Key words: critical participation, deterioration, general pollution indices, multiple pollution, specific energy participation, the principle of critical energy

Received: March, 2026; Revised final: April, 2026; Accepted: June, 2026; Published in final edited form: April, 2026

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