

STATEMENT

Regarding: Dissertation for obtaining the educational and scientific degree "Doctor" (PhD)

Author: Miroslava Damyanova Robinson

Topic: "Optimizing the Management of Marine Coastal Macro-Litter along the Bulgarian Black Sea Coast"

Professional Field: 5.5. "Transport, Shipping, and Aviation"

Doctoral Program: "Systems and Devices for Environmental Protection"

1. Relevance of the Problem Addressed in the Dissertation

The issue of marine litter pollution in the global ocean and coastal zones is a problem of global scale with recognized ecological, social, and economic significance. The relevance of this work is determined by several key factors:

- **Lack of Legal Framework:** In Bulgarian national legislation, the term "marine litter" is still not defined, which hinders effective management.
- **Critical State of the Black Sea:** Data shows that 92.5% of monitored zones in the Black Sea are classified as problematic.
- **Need for Innovation:** There is an objective need to optimize monitoring systems by introducing new technologies (UAVs) and refining assessment methodologies.

2. Identification and Assessment of the Most Significant Contributions

The dissertation demonstrates in-depth research and proposes solutions with clear scientific and applied character.

A) Scientific Novelty (New theories, hypotheses, methods):

- **Methodological Contribution:** For the first time, a method for monitoring marine litter using an Unmanned Aerial Vehicle (UAV/drone) has been applied and verified under the conditions of the Bulgarian coast.
- **Integrated Approach:** A methodology has been developed that combines conventional monitoring with the seasonal dynamics of the shoreline, increasing data accuracy.

B) Enrichment of Existing Knowledge:

- **Analysis of "Hotspots":** Channel 2 "Varna Lake – Black Sea" was identified as a critical accumulation point for the 2017-2022 period.
- **Detailed Classification:** A large-scale one-year (4-season) study was conducted at the "Orlovo Blato" polygon, proving the total dominance of artificial polymer materials (over 90% of the total count) and their transboundary origin.

C) Practical Application and Economic Effect:

- **Complex of Measures:** A specific set of measures for optimizing the national subsystem "Monitoring of Marine Coastal Macro-Litter" has been proposed.
- **Practical Applicability:** The results can serve to determine the currently missing "threshold values" for indicators in the Black Sea, which is critical for fulfilling commitments to the EC.

3. Critical Remarks

The following remarks can be made regarding the presented abstract:

- While the testing of UAVs is mentioned, it would be beneficial to present more detailed comparative tables between automated and visual object recognition within the abstract.
- A clearer distinction between locally generated waste (tourism) and waste from transboundary transport is recommended when formulating specific economic measures.

4. Motives and Conclusion

Miroslava Robinson's dissertation is a large-scale study that meets all the requirements of the Development of Academic Staff in the Republic of Bulgaria Act (ZRASRB). The author demonstrates skills in conducting complex field studies (*in situ*) and processing large datasets. The proposed assessment models (such as the CCI index) and technological innovations have direct application in environmental management.

In view of the above, I give a positive assessment of the dissertation and recommend to the Scientific Jury to award Miroslava Damyanova Robinson the educational and scientific degree "Doctor" (PhD).

11.03.2026
Varna

Assoc. Prof.

/P. Vankov/