



To:
The Scientific Jury
appointed by Order
No. ND-05-33/01.12.2025
of the Director General
National Institute of Meteorology and Hydrology (NIMH)

Enclosed hereby: REVIEW

On the competition for the academic position of "PROFESSOR" in the field of higher education 5. Technical Sciences, professional field 5.7. Architecture, Construction and Geodesy, scientific specialty "Engineering Hydrology, Hydraulics and Water Management" (Quantitative assessment of water resources and runoff regimes under drought conditions and climate variability), announced in the State Gazette, issue No. 81 / 03.10.2025.

with candidate:

Assoc. Prof. Eng. Elena Kirilova Bozhilova, PhD

Reviewer:

Prof. Nelly Stefanova Hristova, PhD

Professor at Climate, Atmosphere and Water Research Institute, Department "Water"
Bulgarian Academy of Science

Address and contacts
Climate, Atmosphere and Water Research Institute
Bulgarian Academy of Science
Sofia, 66 Tsarigradsko shose Blvd
Email address: nhristova@cawri.bas.bg

This review has been prepared in accordance with the requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB) (amended, State Gazette No. 102 of 23 December 2022), the Regulations for the Implementation of the Act for the Development of the Academic Staff (Section IV – Conditions and Procedure for Holding the Academic Position of "Professor"), and the Regulations on the Conditions and Procedure for the Acquisition of Academic Degrees and Holding Academic Positions at the National Institute of Meteorology and Hydrology (NIMH).

I hereby declare that my participation as a reviewer is not in conflict with the requirement for absence of conflict of interest within the meaning of Art. 4, §5, item 1 of the ADASRB and §2a of the Additional Provisions of the ADASRB, and that no restrictions under Art. 33 of the ADASRB apply between myself and the candidates in the competition, either from or towards me.

To
Chairmen of a scientific jury,
Determined by Order
No. ND-05-33 / 01.12.2025 of the Director General
National Institute of Meteorology and Hydrology (NIMH)
an academic position "professor"

REVIEW

by Prof. Nelly Stefanova Hristova, PhD
About: Procedure for taking
THE ACADEMIC POSITION "PROFESSOR"

in the field of higher education 5. Technical Sciences, professional field 5.7 Architecture, Construction, and Geodesy, scientific specialty "Engineering Hydrology, Hydraulics, and Water Management" (Quantitative assessment of water resources and runoff regimes under drought conditions and climate variability), with a single candidate admitted to participate by the Admission Commission National Institute of Meteorology and Hydrology

1. DATA ON THE CANDIDATE IN THE COMPETITION (Career Profile)

under Art. 29(1) and Art. 29b of ZRASRB, art.60 of PPZRASRB and Art. 56 (1), (2) and Art. 57 (1) of the Regulations of NIMH under ZRASRB

Assoc. Prof. Eng. Elena Kirilova Bojilova, PhD, obtained a Master's degree in Hydromelioration Construction from the Higher Institute of Architecture and Construction (HIAC) in 1990. In 2003, she defended her Doctoral degree in the scientific specialty "Engineering Hydrology, Hydraulics and Water Management" (Certificate No. 28574/01.08.2003). She subsequently held the academic positions of Research Associate III degree (1992–1995), II degree (1995–2000), and I degree (2000–2007) at the National Institute of Meteorology and Hydrology, Bulgarian Academy of Sciences. Since 2007, she has held the position of Senior Researcher II degree. In 2012, she was elected Associate Professor at the same institute, where she continues to work to the present day. Assoc. Prof. Bojilova has undertaken research specializations at the International Institute for Infrastructure, Hydraulics and Environmental Engineering, the Netherlands (1995–1997), and the International Institute for Applied Systems Analysis, Austria (2001).

International recognition: Assoc. Prof. Bojilova is a member of several national and international scientific and professional organizations, including the International Association of Hydrological Sciences (IAHS), the Japanese scientific foundation Matsumae International Foundation (MIF), and has served as a visiting researcher under the program of the Japan Society for the Promotion of Science (JSPS). This attests to her active participation in the scientific community and her international visibility. Since 2001, she has been a member of the International Hydrological Programme (currently the Intergovernmental Hydrological Programme – Danube), subsequently serving as its secretary, and since 2023 as its Chair. In the period 2013–2015, she held a secondment position at the European Research Council (ERC).

Administrative position: Deputy Director General for International Activities and Projects."

Scientific visibility

- Scopus h-index: 2
- Reviewer and thematic editor for a number of journals and proceedings, including the Bulgarian Journal of Meteorology and Hydrology, the 1st and 2nd National Scientific Conference on Environment (2023 and 2024), and others.

Assoc. Prof. Bojilova has a command of the English language (written B2, spoken C1) and a good command of Russian (B1), which enables full participation in international scientific forums, publication activities, and project work.

The candidate demonstrates a high level of computer literacy, including proficiency in office applications as well as specialized software for data processing and analysis (Statistics, HydroBEAM, HEC-HMS, etc.).

Conclusion: The professional development of Assoc. Prof. Bojilova is closely aligned with the research profile of the announced competition. Her career development meets the mandatory requirements of the ADASRB and the Regulations for its Implementation concerning the conditions and procedures for acquiring scientific degrees and holding the academic position of "Professor" pursuant to Art. 2, para. 2, as she has held the academic position of Associate Professor for more than five years.

2. SCIENTIFIC RESEARCH AND APPLIED SCIENTIFIC ACTIVITY

In accordance with Art. 29 (1), item 1, item 3, item 4, item 5, item 6, (2) and (3), Art. 29b (1) of ZRASRB, Art. 60 (1), item 3, item 4, item 5, item 6, (2) and (4) of PPZRASRB, art. 56 (1), item 1, item 4, item 5, item 6, item 7, (2), (3) of the Regulations of NIMH under ZRASRB is presented:

2.1. Scientometric Indicators

Assoc. Prof. Bojilova submits for participation in the competition for the academic position of "Professor" a list of 17 scientific works, including one monograph, 15 scientific articles in peer-reviewed journals, one book chapter, 48 citations, 19 participations in national and international projects, and one utility model. All submitted publications were published after the acquisition of the academic position of Associate Professor, in journals indexed and abstracted in internationally recognized scientific databases, as well as in journals included in the National Reference List of NACID, in compliance with the requirement of Art. 29, para. 5(3), according to which candidates must provide evidence of fulfillment of the minimum national requirements under Art. 2b, paras. 2 and 3. Following a detailed review of the submitted documentation, the following are not accepted:

- Scientific publication 9.1 (according to the numbering in the list), as it does not meet the requirement of a minimum length of 10 pages. After this reduction, the total number of points under indicator "G" amounts to 297 (Table 1).
- Citations of reviews of the monographic work, reported by the candidate with a total of 20 points.

Additional verification indicates that four citations (with a total of 8 points) should be added under indicator "D14", which were not included in the candidate's list. Following this

correction, the total number of citations is 52, and the total number of points is 351, which is approximately three times higher than the requirements (100 points) and more than twice the requirement under the Regulations of NIMH pursuant (150 points) (Tables 1 and 2).

- Scientific publication 9.1 (according to the numbering in the list) is not accepted, as it does not meet the requirement of a minimum length of 10 pages¹. Following this reduction, the total number of points under indicator "G" amounts to 297.
- Citations of reviews of the monographic work, reported by the candidate with a total of 20 points, are not accepted.

After this correction, the total number of citations is 52, and the total number of points is 351 (Tables 1 and 2).

Table 1. Scientometric Indicators

Indicators		№	Брой точки
Group	Indicators		
A	Dissertation paper for awarding educational and scientific title "Doctor"	1	50
	Total	1	50
B	3. Habilitation work – Monography	1	100
	Total	1	100
Г	7. Science publication in editions referenced and indexed in world-renowned databases with scientific information	13	279
	8. Science publication in not referenced journals with scientific reviewing or in edited collective volumes	1	20
	Total	10	297.0
Д	12. Citations or reviews in science editions, referenced and indexed in world-renowned databases with scientific information or in monographs and collective volumes	29	290
	13. Citations in monographs and collective volumes with scientific reviewing	15	45
	14. Citations or reviews in not referenced journals with scientific reviewing	8	16
	Total	52	351
E	18. Participation in a national science or educational project	12	120
	19. Participation in an international science or educational project	2	40
	20. Leadership of an international scientific or educational project	3	60
	21. Leadership of a national scientific or educational project	1	40
	26. Utility model	1	40
	Total	19	300
TOTAL			1098

¹ Water Guidelines for assessing compliance with the minimum national requirements under Article 2b, paragraphs 2 and 3 in the Republic of Bulgaria (ADASRB) and the Regulations for its implementation. National Center for Information and Documentation (NACID), Ref. No. 20-00-413, 04 July 2025.

Table 2. Scientometric Indicators according Regulations for its implementation (PPZRASRB) and the Regulations of NIMH under ZRASRB

Group Indicators	For the professor		
	Required number of points		Number points of the candidate
	PPZRASRB)	Regulations of NIMH	
A	50	50	50
Б	—	—	
B	100	100	100
Г	200	200	297
Д	100	150	351
Е	150	150	300
Общо	600	650	1098

Conclusion for Section 2.1: The scientific publications of Assoc. Prof. Elena Bojilova meet the national minimum requirements for holding the academic position of “Professor”. The total number of points (1098) significantly exceeds the thresholds set by the Regulations for the Implementation of the ADASRB (600 points) and by the Regulations of NIMH under the ADASRB (650 points).

2.2. Assessment of Scientific Publications and Project Activities

The scientific publications and participation in research projects of Assoc. Prof. Dr. Bojilova are focused on the field of hydrology and engineering hydrology and reflect a consistently developed research trajectory.

2.2.1 Monograph

The monograph “The Yantra River – Hydrological Analyses and River Runoff Modelling” (ISBN 978-619-7739-10-7, Neofeedback Publishing House, 234 pp.) meets all the requirements for a monographic work. It is based on long-term hydrological data (1936–2019) from the National Institute of Meteorology and Hydrology (NIMH) and, through an analysis of the Yantra River catchment, presents the typical runoff-forming factors and conditions characteristic of Northern Bulgaria.

In this scholarly work, the author demonstrates an in-depth and systematic approach to the study of river runoff by applying and integrating a wide range of methods—from classical statistical and probabilistic techniques to empirical and theoretical models for analysis and forecasting. Annual and seasonal runoff, extreme values (minimum and maximum discharge), as well as trends in their dynamics, are examined in detail. The proposed river runoff forecasting models have the potential to be applied to other river basins as well.

Conclusion to 2.2.1. The monograph “The Yantra River – Hydrological Analyses and River Runoff Modelling” is distinguished by originality, methodological rigor, and high practical relevance, and convincingly demonstrates Assoc. Prof. Bojilova’s profound scientific expertise in the field of hydrological processes and their modelling.

2.2.2. Scientific Publications

Assoc. Prof. Bojilova submitted 15 scientific publications for participation in the competition, distributed by authorship and publication type as follows:

- The candidate is the sole author of five publications, first author in three, second author in four, and third author in three publications;
- Ten publications were published in journals indexed and peer-reviewed in Scopus, two publications in journals indexed and peer-reviewed in Web of Science, two publications in non-indexed peer-reviewed journals, and one chapter in a collective monograph;
- Thirteen publications are in English and two publications are in Bulgarian.

The scientific publications of Assoc. Prof. Elena Bojilova demonstrate a high level of professional expertise in hydrology and engineering hydrology. They are distinguished by:

- a) clear focus, consistency, and continuity of the research topics;
- b) strong competencies in the analysis and interpretation of hydrometric and hydrological data;
- c) collaboration in research teams, as a significant portion of the publications result from joint studies.

Conclusion to 2.2.2. Assoc. Prof. Elena Bojilova's research activity is characterized by originality and methodological depth. It demonstrates significant scientific achievements, and the presented publications reflect an established and coherent scientific profile.

2.2.3. Research Projects

Water Assoc. Prof. Bojilova submitted for the competition evidence of leadership and participation in 19 research projects, including three international projects—a portfolio covering a wide spectrum of applied research and constituting an important criterion for appointment to the position of “Professor.”

Her leadership in international research projects (e.g., UNESCO projects) highlights her recognition abroad and her ability to coordinate research on transboundary water resources (Danube River basin). Leadership of projects at NIMH and the National Science Fund demonstrates her capacity to formulate and address fundamental issues in Bulgarian hydrology.

Participation in national and international projects (Indicators E.18 and E.19) provides evidence of Assoc. Prof. Bojilova's expert contribution to natural disaster prevention (projects under the Operational Programme “Environment”), assessment of minimum ecological flow, and determination of water resources by “water bodies”—developments forming the basis for water management planning in the country.

Particular attention should be given to the registered utility model (the adapted HEC-HMS model for the Yantra River basin), which demonstrates the link between Assoc. Prof. Bojilova's scientific work and real engineering practice.

Conclusion to 2.2.3. Assoc. Prof. Dr. Eng. Elena Bojilova's project activity is characterized by continuity and progressive development, high societal relevance, proven ability to lead research teams, and successful completion of complex hydrological projects—guaranteeing the continued successful development of applied research in the field. The submitted summary under Indicator Group “E” (total 300 points) clearly exceeds the minimum national requirements and demonstrates a sustained commitment to the practical application of hydrological science.

2.3. Assessment of Scientific Contributions

I. Theoretical Contributions

(general analyses, identification of trends in hydrological processes)

A conceptual framework has been developed for the analysis of regional hydrological specificity, contributing to a systematic understanding of hydrological processes within river basins;

The applicability of stochastic models in river basins with mixed rainfall–snowmelt runoff has been demonstrated, expanding theoretical capabilities for interpreting hydrological processes in similar river systems.

II. Methodological Contributions

(development and refinement of methods and approaches)

A methodology has been developed for the regionalization and determination of ecological river flow (minimum allowable flow in river channels);

An advanced approach for parameterizing hydrological models HEC-HMS and HEC-GeoHMS has been created, improving the reliability of river flow simulations and forecasts;

The applicability of stochastic models (ARMA) has been demonstrated for forecasting reservoir inflows and for analyzing river flow time series across the country.

III. Applied Contributions

(practical solutions relevant for water resources management)

A technological scheme for determining water resources by water bodies has been developed, addressing the practical problem of missing hydrometric information. This scheme has been applied in practice by the Ministry of Environment and Water (MOEW) and basin directorates as part of the national water management system.

Conclusion to 2.3. Assoc. Prof. Dr. Elena Bojilova's scientific contributions encompass theory, methodology, and practice in regional hydrology, hydrological modeling, and water resources assessment, with a particularly strong methodological component.

NOTES AND RECOMMENDATIONS

I would like to make one recommendation: that Assoc. Prof. Bojilova continue and expand her research activity through the development of academic monographs focused on potential scenarios for the evolution of hydrological processes under increasing air temperatures and the growing frequency and intensity of climatic extremes.

CONCLUSION

Upon reviewing the materials submitted for the competition, no violations of the procedure were identified. The requirements of Art. 29 (1), (2), (3) of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), Art. 60 (1), (2), and (4) and Art. 61 (1), (3) of the Regulations for the Implementation of the Act (PP ZRASRB), as well as Art. 56 (1), items 1, 4, 5, 6, 7, (2), (3) of the Rules of NIMH under ZRASRB, have been fully complied with.

The scientific works and contributions of Assoc. Prof. Bojilova not only meet but exceed the national minimum requirements for holding the academic position of "Professor," demonstrating methodological innovation and practical applicability in the field of engineering hydrology.

Based on the above, I recommend that the members of the scientific jury vote positively for the appointment of Assoc. Prof. Dr. Elena Kirilova Bojilova to the academic position of "Professor" in the field of higher education 5. Technical Sciences, professional field 5.7 Architecture, Construction, and Geodesy, scientific specialty "Engineering Hydrology, Hydraulics, and Water Management."

01.02.2026 r.

Reviewer: :.....

*Prof. Nelly Hristova
Climate, Atmosphere and Water Research
Institute, Bulgarian Academy of Science*