

## REVIEW

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Member of the scientific jury for the competition for the academic position of Associate Professor,  
in the field of **higher education**: 4. Natural Sciences, Mathematics and Informatics,  
**professional field**: 4.4. Earth Sciences,  
**scientific specialty**: Geology of the Oceans and Seas,  
**scientific area**: Geological and geomorphological mapping and monitoring of the coastal zone,  
**scientific section**: Coastal zone dynamics,  
**announced in the State Gazette**, issue No. 63 of August 1, 2025.

### Competition Information

The present opinion has been prepared pursuant to Order No. 299 of 26 September 2025 issued by the Director of the Institute of Oceanology at the Bulgarian Academy of Sciences – Varna, and in accordance with the decision of the meeting of the scientific jury held on 10 October 2025. This opinion complies with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Implementation, and the Regulations on the Conditions and Procedures for the Acquisition of Educational and Scientific Degrees and for Holding Academic Positions at the Institute of Oceanology – Bulgarian Academy of Sciences.

For the announced competition for the academic position of "Associate Professor" in the Section of Coastal zone dynamics at the Institute of Oceanology – Varna, the sole candidate is Chief Assistant Bogdan Kirilov Prodanov, PhD.

The review of the documents submitted by the candidate for participation in the competition shows that they fully comply with Article 24, Paragraph 1 of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Article 53 of the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, and Article 52, Paragraph 1 of the Regulations on the Conditions and Procedures for the Acquisition of Educational and Scientific Degrees and for Holding Academic Positions at the Institute of Oceanology.

The candidate fully meets the minimum national requirements for holding the academic position of Associate Professor, as specified in Article 2b, Paragraphs 2 and 3 of the Law on the Development of the Academic Staff in the Republic of Bulgaria.

### **Brief Biographical Data of the Candidate**

Chief Assistant Bogdan Prodanov, PhD was born in Varna in 1987. He completed his secondary education at the "Vasil Levski" Vocational High School of Architecture, Construction and Geodesy, Varna, with the qualification "Specialist-Geodesist". He continued his higher education at the University of Mining and Geology "St. Ivan Rilski", Sofia, where in 2010 he received the Educational and Qualification Degree "Bachelor", with the qualification "Engineer - Geophysicist", and in 2012 - a Master's degree, with the qualification "Engineer in Exploration Geophysics". In 2023, he graduated from the Master's program "Geomorphology" at the Faculty of Geology and Geography of Sofia University "St. Kliment Ohridski" and received a second master's degree - "Geomorphologist".

In the period 2013–2016, he was a doctoral student at the Institute of Oceanology "Prof. Fridtjof Nansen" of the Bulgarian Academy of Sciences, Varna, in the section "Coastal Zone Dynamics". In 2017, she defended her doctoral dissertation entitled "Geological Basis for Mapping Benthic Habitats on the Bulgarian Continental Shelf off the Avren Coast" and was awarded the educational and scientific degree "Doctor" in the professional field 4.4. Earth Sciences.

The candidate's total professional experience in the specialty is 13 years. It began in 2012, when he started working as a geophysicist in the "Coastal Zone Dynamics" section at the Institute of Oceanology – BAS, Varna. In 2016, he assumed the academic position of "Assistant", and since June 2017 he has held the position of "Chief Assistant". During this period, he has gained qualifications in the fields of geophysics, ocean and marine geology, geomorphology, cartography, and others.

Dr. Bogdan Prodanov acquires various knowledge and skills related to his professional experience:

- Mapping relief in the coastal zone and shelf through the application of geomorphological, geological, geophysical, and remote sensing methods;
  - Mapping the coastal zone using remotely operated unmanned aerial systems;
  - Operating specialized equipment for marine research, underwater surveys, and seabed sediment sampling during geological studies;
  - Working with Geographic Information Systems (GIS);
  - Holding a captain's license;
  - Holding a diving certification and participating in underwater research, among others.
- He is proficient in English and Russian at B2 level, and German at B1 level.

### **Scientometric Data**

Chief Assistant Bogdan Prodanov, PhD is participating in the competition for the academic position of "Associate Professor" with 40 scientific publications. In 9 of these, Dr. Prodanov is the first author, while in the remaining 31 publications, he is the second or subsequent author.

Dr. Prodanov's research has been published primarily in peer-reviewed scientific journals indexed in internationally recognized databases such as Web of Science and Scopus – 21 items.



Some of the works have been printed in refereed editions or in proceedings of scientific conferences outside these databases – 19 items.

The works subject to review include 7 scientific publications submitted in place of a habilitation thesis – a monograph (B.4.1 – B.4.7), 13 scientific publications in editions that are referenced and indexed in world-renowned scientific information databases (Scopus and Web of Science) outside the habilitation thesis, 1 publication (G.8) – a published study or a chapter from a collective monograph, and 19 scientific publications in peer-reviewed editions. Of the submitted publications, 35 – or 87.5% – are in English.

The citation report shows that the candidate meets the requirements and demonstrates sufficient activity under Indicator D. In the citation report submitted for participation in the competition for "Associate Professor", Chief Assistant Bogdan Prodanov, PhD has included 4 cited scientific works and a total of 16 citations. All 16 citations are in scientific publications referenced and indexed in world-renowned scientific information databases (Scopus and Web of Science).

According to the amendments to the Regulations on the Conditions and Procedures for the Acquisition of Educational and Scientific Degrees and for Holding Academic Positions at the Institute of Oceanology – BAS, effective as of 10 June 2025, points under Indicator E are not required for holding the academic position of "Associate Professor".

Nevertheless, Chief Assistant Bogdan Prodanov, PhD has submitted a report on his participation in 35 scientific and scientific-educational projects – 18 of which are national and 17 international. He has served as the leader of 10 national and 2 international scientific or educational projects.

The documentation submitted by the candidate, including publication activity in refereed and indexed journals, citations, participation in national and international projects, and involvement in scientific forums, convincingly demonstrates that Chief Assistant Bogdan Prodanov, PhD meets the necessary criteria for holding the academic position of "Associate Professor", in accordance with Art. 1a of the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, and fulfills the requirements set by the Regulations on the Conditions and Procedures for the Acquisition of Educational and Scientific Degrees and for Holding Academic Positions at the Institute of Oceanology of the Bulgarian Academy of Sciences.

The report on meeting the minimum national requirements for holding the academic position of "Associate Professor" shows that Bogdan Prodanov, PhD meets the criteria and demonstrates sufficient activity under Indicators A, B, G, and D, with a total of 514 points out of the required minimum of 430 points. By category, the points are distributed as follows: A – 50 points; B – 120 points; G – 264 points; D – 80 points.

### **Research and Applied Scientific Activity**

The research activity of Chief Assistant Dr. Eng. Bogdan Kirilov Prodanov is clearly focused in the field of marine geology, marine geomorphology, and applied geophysical methods for studying dynamic coastal systems. His work is characterized by strong interdisciplinarity,

encompassing geophysical, geological, geomorphological, and cartographic approaches to analyzing processes in the Bulgarian sector of the Black Sea.

The candidate's research is focused on comprehensive geological and geomorphological mapping of the continental shelf and coastal zone, with an emphasis on structural and lithological characteristics, contemporary geodynamic processes, sedimentary environment, and the development of underwater relief forms. In his studies, he successfully applies modern instrumental methods – multibeam bathymetric systems, side-scan sonar, seismic-acoustic profiles, sampling, and laboratory analyses – which ensure high reliability and detail of the obtained results.

His work is closely connected with international and national research projects, within which Dr. Prodanov participates in marine expeditions, monitoring programs, and thematic working groups for the assessment of the geoecological status of the shelf. His scientific output is distinguished by high publication activity, including in internationally peer-reviewed journals, demonstrating steady development and recognition within the scientific community.

His contribution to the development of marine habitat maps and to the scientific foundation for the implementation of European environmental directives in the Bulgarian coastal zone is particularly valuable. His research has a clearly defined applied focus, providing reliable information used in the assessment of geo-risks, coastal resource management, and the planning of sustainable conservation activities.

### **Scientific Contributions**

I support the contribution elements of the publications that are the result of the author's research work. The scientific contributions of Chief Assistant Eng. Bogdan Prodanov, PhD can be divided into three groups:

#### ***1. Contributions to the geological and geomorphological mapping of the coastal zone***

- Comprehensive multidisciplinary studies have been conducted on the seabed, the bottom substrate, and the processes shaping the current form of the underwater coastal slope of the Bulgarian shelf and coastal zone [B.4-1], [B.4-2], [B.4.6], [B.4.7], [G.7-13].
- A geomorphological map of the underwater coastal slope in the Avren coastal area between Galata Cape and Ilandzhik Cape, at a scale of 1:10,000, has been produced [B.4-1].
- A detailed geomorphological map of the Varna Bay waters, based on morphological forms and hydrodynamic processes of the seabed, has been created [B.4-2].
- A comprehensive morphostructural map of the above-water and underwater coastal slope of the Strandzha Black Sea sector has been constructed [B.4-6].
- An initial spatial-temporal assessment of the loss of natural seabed along the entire Bulgarian Black Sea coast as a result of coastal infrastructure construction during the period 1970/83–2017 has been carried out, based on a high-precision cartographic foundation (scale 1:5,000) [B.4-7].
- Mapping of coastal dunes along the Bulgarian Black Sea coast [B.4-5], [G.7-9], [G.7-11].



## ***2. Contributions to the monitoring and assessment of the geoecological status of the coastal zone***

- Initial assessment of pollution by macro-waste on the beach-dune systems along the Bulgarian Black Sea coast [B.4-4], [G.7-1].
- Study of the loss of benthic habitats [B.4-7].
- Mapping of dune habitats along the Bulgarian Black Sea coast [B.4-5], [G.7-11].
- Assessment of the physical loss of dune habitats [B.4-5].

The scientific contributions presented in the first two groups claim to be the first scientifically based, quantitative, and spatially detailed study of dune habitats along the entire Bulgarian coastline (both within and outside protected areas), providing a basis for updating specialized maps according to Ordinance No. 1/2008 and formulating proposals for new protected areas under the Protected Territories Act.

### ***3. Applied Scientific Contributions:***

- For the first time in the Bulgarian coastal area, the candidate has developed and applied an integrated methodology for aerial photogrammetry using unmanned aerial systems (UAS, drones) for mapping the coastal strip and marine waters. This methodology allows the creation of a comprehensive digital elevation model, with drones used as a substitute for echo sounders in shallow waters where marine vessels cannot operate. The entire coastline was comprehensively surveyed during 2018–2020 and 2023. The data have been used for various geomorphological, ecological, and hydrological studies [B.4-3], [B.4-4], [B.4-5], [B.4-6], [B.4-7], [G.7-1], [G.7-5], [G.7-6], [G.7-7], [G.7-9], [G.7-11], [G.7-27], [G.7-28], [G.7-29], [G.8-1].
- The candidate has made a significant applied scientific contribution within multidisciplinary studies of key coastal lakes along the Bulgarian Black Sea coast by conducting geological and geomorphological investigations as a basis for the overall assessment of the ecological status and ichthyofauna in the coastal waters and lakes such as Durankulak Lake, Varna and Beloslav Lakes, and Mandrensko Lake [G.7-2], [G.7-7], [G.7-8], [G.7-15], [G.7-22], [G.7-25].
- Combination of remote sensing and geophysical methods in geoarchaeological research along the Bulgarian Black Sea coast and shelf. The candidate has contributed to conducting geoarchaeological studies (both marine and terrestrial) by combining remote sensing (aerial photogrammetry, etc.) and geophysical methods (echo sounding and side-scan sonar surveys) to detect, locate, and interpret archaeological sites in the coastal zone and shelf [G.7-5], [G.7-28], [G.7-30], [G.7-31], [G.8-1].
- Defining type-specific reference hydromorphological conditions in Bulgarian coastal waters in support of marine environmental management [G.7-10], [G.7-17].
- For the first time in Bulgarian Black Sea coastal waters, various Type-Specific Reference Hydromorphological Conditions (TSRHC) have been identified and systematized in accordance with the requirements of the Water Framework Directive (WFD 2000/60/EC). These reference conditions were derived through a comprehensive geospatial analysis combining current geological, geomorphological data with long-term wave exposure data [G.7-10], [G.7-17].

- Applied scientific contributions to the study of hydrodynamic conditions and risk management of marine flooding [G.7-18], [G.7-21], [G.7-23], [G.7-26], [G.7-32].
- Original applied scientific contribution to the development of strategic documents for the Republic of Bulgaria in the field of nature protection [B.4-5].

The structure and methodology for conducting geological and geomorphological mapping developed by the author have been adopted as mandatory in all future procedures under the Law on the Black Sea Coastal Zone by Order No. RD-57/17.01.2024 of the Minister of Environment, giving the contribution a long-term impact on policy regarding the conservation, registration, and sustainable management of sand dunes and related habitats along the Bulgarian Black Sea coast.

Based on the analysis of the presented publications, project participations, and obtained results, the scientific contributions of Chief Assistant Dr. Eng. Bogdan Prodanov can be systematized as follows:

1. A comprehensive contribution has been made to the geological and geomorphological mapping of the Bulgarian continental shelf through the integration of high-resolution bathymetric and seismic-acoustic data, significantly improving knowledge of the seabed relief.
2. Identification and analysis of key underwater geomorphological features (accumulative bodies, paleodolines, fault structures, underwater slopes), with proposed interpretations of their genesis and evolution.
3. Contribution to the development of the geological basis for marine habitat mapping by detailed characterization of the lithological and sedimentological features of benthic habitats in the Avren area and other sections of the Bulgarian coast.
4. Development and application of methodologies for coastal zone monitoring, including analysis of coastal processes, processing of bathymetric data, and assessment of contemporary geodynamic trends.
5. Establishing connections between geological structure, dynamic processes, and the condition of coastal ecosystems, creating a scientific foundation for the sustainable management of the marine environment.
6. Contribution to the reconstruction of the paleoenvironments of the western Black Sea shelf, including interpretations of sea-level changes and sedimentation conditions during the Late Quaternary.
7. Building a database of marine geophysical surveys used for scientific, expert, and management purposes at the national level.

### **Critical Remarks and Recommendations**

1. I have no critical remarks. The documentation is complete, properly formatted, and complies with the requirements of the regulatory framework.
2. I accept and positively evaluate the candidate's contributions.
3. I recommend that in the future the candidate directs their scientific publications to specialized international journals with a high impact factor, which will enhance the international visibility of the scientific results and increase their citation rates.



4. It would be useful in the future to comprehensively summarize the results of the conducted geophysical and geomorphological studies in a standalone monograph presenting an integrated concept of the geological and geomorphological development of the Bulgarian coastal zone. Such a publication would have significant value for the national scientific community.

### **Conclusion**

From the review and analysis of the materials submitted for participation in the competition, it can be concluded that Chief Assistant Dr. Eng. Bogdan Prodanov has worked from the beginning of his scientific career until now in the professional field 4.4. Earth Sciences, scientific specialty "Geology of Oceans and Seas", scientific field "Geological and Geomorphological Mapping and Monitoring of the Coastal Zone".

The scientific output presented by Dr. Prodanov for the competition is of sufficient volume and very good quality, containing scientific and applied scientific contributions. It meets and exceeds the minimum requirements of the Institute of Oceanology – BAS for the academic position of "Associate Professor." The candidate's total score is 514 points, exceeding the mandatory minimum of 430 points for indicator groups B, G, and D. There is no proven plagiarism in the scientific works according to the legally established procedure – Article 4 (11).

The materials submitted for the competition provide grounds to consider that Dr. Bogdan Prodanov is a very good researcher in the implemented developments within the professional field. His scientific work reinforces the conviction that he is a well-prepared, proactive, and productive specialist, possessing knowledge and skills, with extensive research experience in the fields of geophysics, geology, and geomorphology of the coastal zone.

I have no joint publications with the candidate and I am not related to him within the meaning of § 1, item 5 of the Additional Provisions of the Act on the Development of the Academic Staff in the Republic of Bulgaria.

**Based on these conclusions and on the compliance of the competition documents with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, I give a positive evaluation of the scientific works submitted for participation in the competition and recommend that the Academic Jury take a positive decision regarding the selection and propose to the Scientific Council of IO–BAS to vote for Chief Assistant Eng. Bogdan Kirilov Prodanov, [PhD to occupy the academic position of "Associate Professor" in Higher Education Area 4. Natural Sciences, Mathematics, and Informatics, Professional Field 4.4. Earth Sciences, Scientific Specialty "Geology of Oceans and Seas", Scientific Field "Geological–Geomorphological Mapping and Monitoring of the Coastal Zone", for the needs of the "Coastal Zone Dynamics" Department at the Institute of Oceanology of the Bulgarian Academy of Sciences – Varna.**

19.11.2025

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