



NVAO • THE NETHERLANDS

INITIAL ACCREDITATION

WO-BACHELOR

MARINE SCIENCES

Wageningen University

FULL REPORT

13 MARCH 2023

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1 Peer review

The Accreditation Organisation of the Netherlands and Flanders (NVAO) determines the quality of a new programme on the basis of a peer review. This initial accreditation procedure is required when an institution wishes to award a recognised degree after the successful completion of a study programme.

The procedure for new programmes differs slightly from the approach to existing programmes that have already been accredited. Initial accreditation is in fact an ex ante assessment of a programme. Once accredited the new programme becomes subject to the regular review process.

The quality of a new programme is assessed by means of peer review. A panel of independent peers including a student reviews the plans during a site visit to the institution. A discussion amongst peer experts forms the basis for the panel's final judgement and the advisory report. The agenda for the panel visit and the documents reviewed are available from the NVAO office upon request.

The outcome of this peer review is based on the standards described and published in the limited NVAO Assessment framework for the higher education accreditation system of the Netherlands (Stcrt. 2019, nr. 3198). Each standard is judged on a three-point scale: meets, does not meet or partially meets the standard. The panel will reach a conclusion about the quality of the programme, also on a three-point scale: positive, conditionally positive or negative.

NVAO takes an accreditation decision on the basis of the full report. Following a positive NVAO decision with or without conditions the institution can proceed to offer the new programme.

This report contains the findings, analysis and judgements of the panel resulting from the peer review. It also details the commendations as well as recommendations for follow-up actions. A summary report with the main outcomes of the peer review is also available.

Both the full and summary reports of each peer review are published on NVAO's website www.nvao.net. There you can also find more information on NVAO and peer reviews of new programmes.

2 New programme

2.1 General data

Institution	Wageningen University
Programme	wo-bachelor Marine Sciences
Variants	Fulltime
Degree	Bachelor of Science (BSc)
Tracks	none
Location	Wageningen
Study load	180 ECTS ¹
Field of study	Agriculture and natural environment [Landbouw en Natuurlijke Omgeving]

2.2 Profile

Graduates of the English taught three-year BSc Marine Sciences are equipped with the knowledge and skills to positively contribute to sustainable socio-ecological marine systems. They will investigate and analyse social, economic and biological processes and evaluate and design innovative and integrated solutions for challenges faced in marine systems nowadays and in the future. Graduates of this BSc could opt for a subsequent MSc study or starting their professional career in the field of Marine Sciences as policy advisor or consultant. The programme consists of four learning trajectories. In the *conceptual learning trajectory* students acquire the conceptual knowledge of the core focus areas nature, food and society. The *research learning trajectory* is focussed on deepening knowledge in the field of mathematics and statistics and on conducting scientific research. In the *learning trajectory personal development* students reflect on using an interdisciplinary perspective. They develop reflective and collaborative skills that enable them to cross boundaries and work in multidisciplinary and intercultural teams on interdisciplinary perspectives. It also provides support in developing a personal professional career path. Each academic year of the BSc consists of a mix of disciplinary and interdisciplinary courses and will be completed with *the integration trajectory*. In an integrated project students apply the knowledge and skills they acquired in the other three learning trajectories.

2.3 Panel

Peer experts

- **Prof. dr. Michel Kaiser** (chair), Professor of Fisheries Conservation at The Lyell Centre, Heriot-Watt University in Edinburgh (Scotland);
- **dr. Marion Jegen**, Research Group leader – Marine EM, IfM Geomar/ Helmholtz Centre for Ocean Research Kiel (Germany);
- **dr. Ton Peeters**, was previously a lecturer/researcher, education manager and Programme Director bachelor in Biology at Utrecht University (the Netherlands);
- **Arwen Barendregt** (student-member), Student bachelor Applied Biology at HAS Green Academy (the Netherlands).

Assisting staff

drs. Riekje de Jong (secretary);
Tinka Thede, MSc (NVAO policy advisor and process coordinator).

Site visit

Wageningen, 31 January 2023

¹ European Credits

3 Outcome

The NVAO approved panel reaches a positive conclusion regarding the quality of the initial accreditation bachelor in Marine Sciences offered by Wageningen University. The programme complies with all standards of the limited NVAO framework.

Graduates of the English taught three-year fulltime BSc Marine Sciences will be able to positively contribute to sustainable socio-ecological marine systems. They will investigate and analyse social, economic and biological processes in marine systems. They will also evaluate and design innovative and integrated solutions for challenges faced in marine systems nowadays and in the future.

The programme provides a balanced mix of disciplinary and interdisciplinary courses. The courses are focused on the conceptual domain, on research and on personal development and working in an international/intercultural environment. Every academic year ends up in an integrated project in which students use the knowledge and skills they have acquired in the courses of that year. In these projects students also learn to translate their research findings into responsible and practical recommendations. In the final semester students work on an individual research project that leads to a bachelor thesis. Graduates can choose for a subsequent MSc study, or they can start a professional career as a policy advisor or consultant in the field of Marine Sciences.

The overall quality of the examinations and the evaluation of the quality of the assessments are safeguarded in Wageningen University's assessment policy. The panel concludes that students will realize the interdisciplinary profile of the BSc Marine Sciences with the variety of assessment methods offered and with their final individual research project and thesis report. The panel concludes that evaluation procedures are in place to monitor the quality of the programme and students' performance.

The panel is of the opinion that the institution has developed a relevant programme. The programme is appropriate for the bachelor level and enables students to contribute to sustainable socio-ecological marine systems from an interdisciplinary perspective.

Standard	Judgement
1. Intended learning outcomes	meets the standard
2. Teaching-learning environment	meets the standard
3. Student assessment	meets the standard
<i>Conclusion</i>	<i>Positive</i>

4 Commendations

The programme is commended for the following features of good practice.

1. Unique mix of disciplinary and interdisciplinary courses – Using blended disciplinary and interdisciplinary courses, the BSc Marine Sciences enables students to develop social, economic and biological knowledge and skills to work on sustainable socio-ecological marine systems.
2. Project-based learning – Every year of the programme ends up in integrated projects in which students apply the knowledge and skills they have acquired in the courses of that year. Students will come up with innovative and integrated solutions and learn to translate their research findings into responsible and practical recommendations.
3. Boundary Crossing – Throughout the programme students learn to reflect on different perspectives outside one's own scientific domain, culture or context. Students develop skills to collaborate with specialists and stakeholders in multidisciplinary and intercultural teams. They also develop their attitude and skills to choose their personal learning paths to work on their professional identity.
4. Professional field requirements – The BSc programme meets the strong need for graduates with an interdisciplinary focus in the professional field. Therefore the programme has a unique position in the international field.
5. Staff – The core staff have an excellent track record of multidisciplinary teaching and research.

5 Recommendations

For further improvement to the programme, the panel recommends a number of follow-up actions.

1. Communication – Provide an unambiguous description of the content of the BSc programme. Unambiguously communicate prior knowledge required for admission to subsequent masters' programmes with students at the start and in the second year of the programme. Specify agreements with subsequent MSc programmes also outside Wageningen University and update the agreements if the MSc programmes change.
2. Admission levels – Do not constrain the admission levels of graduates of secondary education because of the aim for a balanced intake of students with a science and humanities background. Use flexible entry requirements through an either/or option.
3. Study advisor – Evaluate if the study advisory is rightly aligned to prepare students for the choices they make in the second year. Also monitor the study advisory with regard to study delay of specific groups of students or to specific courses.
4. Proactivity – Decide in advance of the start of the programme which courses are the most challenging due to their cross disciplinary nature (e.g. biologists taking social science courses may struggle initially). Evaluate during the course to adapt the course if needed.
5. Subject specificity – integrate subject-specific statistics and economic concepts in already existing (disciplinary) courses in the first year. At least make students aware by showing the basics so that they understand what they are doing.

6 Assessment

6.1 Standard 1: Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Judgement

Meets the standard.

Findings, analysis and considerations

Level and orientation of the programme

Graduates of the BSc Marine Sciences are equipped with the knowledge and skills to positively contribute to sustainable socio-ecological marine systems. They are able to use a marine systems approach that emphasizes both the fundamental linkage between terrestrial, coastal, open and deep ocean that underpin ecosystem integrity as well as the social and economic benefits from and the impacts to the marine environments today and into the future. Students will investigate and analyse social, economic, environmental and biological processes and evaluate and design innovative and integrated solutions for challenges faced in marine systems. In using an interdisciplinary perspective students develop reflective and collaborative skills that enable them to cross boundaries and develop their own professional career path.

Students will be both confronted with disciplinary and interdisciplinary perspectives and faced with the differences between them. Boundary crossing activities that function as a red ribbon in the programme will help students to develop their skills to integrate the different perspectives and develop their interdisciplinary attitude. Graduates of the BSc Marine Sciences will be able to opt for a MSc or for a career in the professional field of Marine Sciences for example as policy advisor or consultant.

The panel discussed the overall intended learning outcomes (ILO's) and the academic nature of the programme with all participants. The programme management and involved lecturers explained convincingly the academic level and orientation of the programme. The ILO's describe the conceptual knowledge base as well as systems analysis to study the field in an integrative way. The research skills describe the analysis, evaluation, design and the conduct of a conceptual sound research project within the domain of marine sciences. The personal development skills describe the skills to collaborate with specialists and stakeholders in multidisciplinary and intercultural teams and the skills to translate research findings into responsible and practical recommendations. Also reflective skills and the attitude to develop individual learning paths and a professional identity are involved. The panel values the unique focus of the BSc Marine Sciences on systems thinking and interdisciplinarity that culminate in sustainable, innovative and inclusive solutions of important challenges of the socio-ecological marine systems.

International positioning and professional field

The management explained the unique position of this BSc programme in the international area, whereas only Australia provide a comparable programme. This unique position was also endorsed by the professional field, especially by the representatives with a broad international network. They emphasize that the profile of the programme meets the needs of the professional field and therefore endorse the ILO's.

For some positions the representatives prefer to recruit MSc graduates. However they would hire BSc graduates of this programme as their interdisciplinary focus is much needed in the professional field.

The panel met a broad representation of the professional field. Some of the representatives have also been consulted throughout the development of the programme. The professional field is committed to contribute in the future for example with guest lectures or project proposals. The panel appreciates the role of the representatives of the professional field and noticed that some of them consider taking part in an advisory board if they were asked.

Considerations and conclusion

The panel values the focus on systems thinking and interdisciplinarity that culminate in sustainable, innovative and inclusive solutions of challenges of the marine ecosystems. The panel concludes that the overall profile of ILO's is appropriate. This profile is also endorsed by the representatives of the professional field the panel met.

The panel recommends the management to establish an advisory board of representatives of the professional field. The panel decides to evaluate Standard 1 as positive.

6.2 Standard 2: Teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Judgement

Meets the standard.

Findings, analysis and considerations

Description of the programme

The curriculum Marine Sciences consists of six semesters, each with a nominal study load of 30 ECTS credits. Students follow courses during the first four semesters. The courses are part of one of the four learning trajectories of the programme. In the first learning trajectory students acquire the conceptual knowledge of the core disciplines nature, food and society. The second learning trajectory is focussed on research. Students become acquainted with design models and methods of data analysis and are deepening their knowledge in the field of mathematics and statistics. The third learning trajectory is focused on personal development. Students develop their ability to make individual choices in their learning process and develop their skills to cross disciplinary and cultural boundaries. The course *Boundary Crossing* and the integrated boundary crossing activities in other courses will facilitate students to reflect on differences in perspectives and cultures throughout the programme.

At the end of each academic year, the three learning trajectories lead to the *integration learning trajectory*. In the integration projects students apply the knowledge and skills acquired in the other three learning trajectories. Whereas the integrated project in the first year is focused on analysing problems and challenges in the North Sea and Wadden Sea, the second year project is focused on evaluation, design and application of nature-based solutions in an international context for example: coastal defence, reef-restoration or marine sources of sustainable energy. Both integrated projects converge in the third year project: Assessment of Marine Nature Based Solutions.

In the third academic year one semester is available for a minor. Students can use the minor to specialize for a MSc programme, for an international exchange or to broaden their knowledge with electives. In the final semester students work on an individual research project that leads to a bachelor thesis report. The programme also incorporates nine core skills of Wageningen University such as presenting, writing, collaboration, philosophy of science and research design.

Name of the programme

The panel discussed with the management and programme committee the name of the programme. Marine sciences is a very broad area and although the panel is of the opinion that the name is very clever and subtle, they considered the name Marine systems more appropriate. The management recognized this discussion and also have considered Marine systems as one of the options. However they have chosen Marine Sciences because this better reflects the broad approach that characterizes the educational philosophy and the profile of all Wageningen University's educational programmes. Overall the panel agrees with the name of the programme. The panel also agrees with the representatives that the title of this programme expresses the importance of explicitly explaining the interdisciplinary nature of the programme to students. The panel therefore recommends to provide an unambiguous description of the content of the programme.

Coherence of the programme

The panel discussed with the management and lecturers the coherence of the programme. They explain that in every period of the first two academic years disciplinary and interdisciplinary courses are aligned. In the first course of the programme: *Introduction to Marine Sciences* coherence in the programme is introduced to the students. This integrative course focuses on the theoretical basis of the interdisciplinary study of socio-ecological systems. The course clarifies main marine problems and challenges which are introduced with real life cases that illustrate the complexity and co-dependency of socio-ecological systems.

The quartermaster of the programme explained that coherence also was key in the design process of the new master. In different phases of the design process all lecturers were involved. To realize coherence lecturers needed to align their course to the new set of ILO's. Lecturers were also asked to tie in interdisciplinary aspects in disciplinary courses for example by using marine based examples. Lecturers explained that they used the additional framework of the programme to decide what was needed to add to the content of their already existing disciplinary courses or what has to be adapted in already existing interdisciplinary courses and which courses have to be newly developed. The course *Boundary Crossing* and the integrated boundary crossing activities in courses are newly developed as well as the integrated projects. The panel strongly supports the importance and the innovative character of the integration of boundary crossing activities in the programme. In sum, the panel is positive about the coherence of the programme.

Knowledge building

The panel discussed with lecturers knowledge building over the years and more specific, the integration of subject-specific statistics and economic concepts in already existing (disciplinary) courses in the first year. Lecturers agreed on the importance of statistical knowledge building over the years and provided some examples. Economic aspects are integrated in the real-world cases and in group projects of several courses. Especially in the interdisciplinary courses students are invited to take the position of stakeholders to develop different perspectives.

Lecturers emphasized their discussions about feeding in disciplinary knowledge in the integrated project of the first year. They will also assure disciplinary and interdisciplinary knowledge building by guiding students in this project. In this context the panel also emphasized the importance of collaboration with the Texel community and the development of students 'awareness of 'giving back' their research findings as appreciation of the cooperation of the community.

Relation with subsequent MSc programmes

The panel was looking for more clarity about the alignment of the broad BSc Marine Sciences with subsequent MSc programmes and the role of the minor. Management and lecturers agreed that students have to make an important choice in the second year with regard to choosing a MSc. In the second year the study advisor explains to students how they could organize their MSc orientation to become well prepared for such an important choice. The panel wondered how much flexibility students have left to fill in the minor if MSc programmes required specific prior knowledge of students. The programme management was aware of the importance of clear information about an unconditionally entrance to MSc programmes. They therefore realized agreements of entry for BSc graduates of Marine sciences to (some) Wageningen University master programmes such as Aquaculture and Marine Resource Management and some masters of other Dutch universities. The examining board emphasizes the need to specify these agreements before students start the 2nd year and update them if these MSc Admission levels programmes change. The panel supports the agreements of entry to subsequent MSc programmes and emphasized the importance of clear and unambiguous information about previous knowledge required for admission to master programmes. The panel strongly advises the programme to consider signed agreements of entry to subsequent MSc programmes.

Admission levels

The panel discussed the admission level of graduates of secondary education related to the previous knowledge that is needed to successfully achieve the bachelor level. Programme management clarified that with the profiles, Nature & Health, Nature & Technology and Economy & Society² they could create a diverse and balanced group of students. The profile Nature & Technology³ is not necessarily required. Lecturers emphasize that necessary (previous) knowledge of physics will be provided in several courses in the programme. The panel advises the programme management to choose for flexible entry requirements and not to constrain the admission levels of graduates of secondary education. This is more in line with the aim for a balanced intake of students with a science and social background.

² Natuur & Gezondheid, Natuur & Techniek, Economie & Maatschappij

³ Natuur & Techniek

Staff

The panel has met a staff that is well prepared for the programme. The academic staff has a track record in multi-disciplinary teaching and research and they have acquired a university teaching qualification (UTQ). Because this BSc programme is the first one that has integrated boundary crossing throughout the programme the management facilitates the request of the lecturers of the first year to develop their coaching skills in a professional development programme Boundary Crossing.

The study advisor is a linking pin in the communication and information to students. In plenary sessions across the first and the second academic year important topics such as study skills, study progress and the planning of the third year will be discussed. The study advisor also monitors students' performance and supports students to solving their problems and being back on track. Lecturers, programme committee and examining board all emphasize the important role of study advisory in early identification of study delay. The panel therefore advises the programme committee to evaluate if study advisory is rightly aligned to prepare the students for the choices made in the second year. The panel also advises to monitor the role of study advisory with regard to study delay of specific groups of students or to specific courses.

Some of the Chair Groups involved in the new BSc have decided to look for new staff with experience in the field of Marine Sciences. Wageningen University has also developed a human resource policy regarding a career in education that is combined with a continuous development programme.

Language

Wageningen University is well known of its international oriented programmes. It is attracting students from all over the world and has an inclusive learning environment where English is the common language of the teaching and learning environment. Wageningen University considers the international classroom as an effective way to prepare students to an international and intercultural working environment. Both the research field and the labour market of Marine Sciences are strongly internationally oriented. Seas and oceans are connected which means that graduates are dealing with issues of an international nature. Because of this international character the panel affirms English as language of the teaching and learning environment.

Considerations and conclusion

The panel has met a committed management and an enthusiastic, well equipped team of lecturers. The panel concludes that the programme is coherent. It is well thought through balancing disciplinary and interdisciplinary courses that culminate in yearly integrated projects. The course objectives are well aligned with the ILOs of the programme. The panel appreciates the choice of integrating *Boundary Crossing* in the programme. The panel concludes that the set-up of the programme is in line with the educational philosophy and profile of Wageningen University. The panel emphasized the importance of a good description of the innovative and interdisciplinary nature of the BSc Marine sciences for students. The panel also highlights the important role of clear and unambiguous information to students especially for preparing their minor and choosing a subsequent MSc programme. The panel supports the agreements to guarantee entry to certain MSc programmes. The panel affirms English as language of the teaching and learning environment. The panel decides that the requirements of Standard 2 has been met.

6.3 Standard 3: Student assessment

The programme has an adequate system of student assessment in place.

Judgement

Meets the standard.

Findings, analysis and considerations

Assessment policy

Wageningen University has an institution-wide assessment policy in place to assure the quality of examinations. The institution has a clear vision on assessment, has described education and examination regulations in the

Student Charter. Wageningen University Teaching and Learning Centre provides support regarding construction and execution of examinations. The BSc Marine Sciences will be placed under the Examining board Life Sciences.

Quality assurance

The programme committee of the new BSc will consist of an equal number of students and staff members who are appointed by the Wageningen University board of education. The programme committee will discuss student evaluations and suggest improvements.

The programme director emphasized that the student evaluations of the courses are very important in monitoring the quality of the new programme. The examining board also emphasizes the importance of student evaluation especially for the newly developed courses during the implementation of this programme. They both agree what does not work has to be changed.

The panel adds that imbalances in student performance also have to be monitored especially because of differences in students' previous knowledge. In addition, the panel discussed the implications of procrastination and study delay. If students miss knowledge they could also miss context knowledge for the next courses and their performance in the integrated project becomes at risk. If necessary lecturers and the examining board have to consider additional actions. The panel concludes that a system of student evaluation is in place. The panel advises the programme committee to discuss in advance which courses are the most challenging and have to be evaluated during the course to adapt the course if needed.

Course assessment

The panel discussed assessment and examination of the courses and projects with lecturers and the examining board. Lecturers clarified the alignment of the assessment with the ILO's. They also relate the variety of course products with different assessment methods. Information about the assessments is included in the course manuals.

Many courses have at least two assessments: an individual exam and an assessment of the group product. Individual exams are mainly multiple choice question exams or open-ended question exams. The assessment of group product usually consists of a combined peer assessment and lecturer assessment. The process of peer assessment (usually peer feedback) is graded with pass/fail. In assessing the group product a rubric is used. The rubric for the group projects is based on the thesis rubric. The categories of the group projects rubrics are the same as the thesis rubric except the wording. The wording has been adapted to the specific project. The examining board emphasizes that using a well-defined rubric in peer assessments will prevent students to use their evaluations as a popularity poll or to use their peer assessments to collectively upgrade their group assessment. In the process of grading students have to compare and justify their assessment with the assessment of the lecturer who has also used the rubric. In adapting the same rubric to specific projects it will also be possible to monitor the student's development.

Thesis and assessment of the final level

The panel discussed the very detailed rubric of the thesis with the examining board. The board clarifies the use of this rubric. They describe the detailed rubric as an excellent instrument to start a dialogue with students about the required quality or level of the final product. They also emphasize the possibility for lecturers to relate their assessment to the student's performance by using words from the rubric to justify the grade. The panel also asked how the interdisciplinary approach will be realised in the final level. The examining board explained that the final level is safeguarded in the final integrated project: *Assessment of Marine Nature Based Solutions* together with the BSc thesis. They clarified that students could work on an individual research project that leads to an interdisciplinary BSc thesis report. If their individual research project has a disciplinary focus students have to write in their thesis report a paragraph about the interdisciplinary context of their results. The panel concludes that interdisciplinarity is well realized in the final integrated project and the BSc thesis report.

The thesis coordinator has an important role in the assessment of students project proposal and in the assessment of the final thesis. The thesis coordinator also provides feedback to thesis supervisors. Panel and examining board agreed on the important role of the thesis coordinator. Because of the amount of work and the expected number of students, it could be better to decide on a group of thesis coordinators instead of one person.

Considerations and conclusion

The panel concludes that the assessment rules and regulations of the BSc Marine Sciences are well embedded in the Wageningen University's assessment policy. The overall quality of the examination and the evaluation of the

quality of the assessments are safeguarded. The panel concludes that evaluation procedures are in place to monitor the quality of the programme and students performance. The panel concludes that the examining board is aware of the important role of students' evaluation of newly developed courses and advises to decide in advance of the evaluation procedure. The panel also advises to monitor study advisory in monitoring students' delay.

The panel concludes that students will realize the interdisciplinary profile of the BSc Marine Sciences with the variety of assessment methods and their final individual research project and thesis report.

The panel supports the idea of working with a small group of thesis coordinators instead of one person.

The panel decides to evaluate Standard 3 as positive.

6.4 Degree and field of study

The panel advises awarding the following degree to the new programme: Bachelor of Science

The panel supports the programme's preference for the following field of study: Agriculture and natural environment (*Landbouw en Natuurlijke Omgeving*)

Abbreviations

BSc	Bachelor of Science
BC	Boundary Crossing
ECTS	European Credits
ILO's	Intended learning outcomes
MSc	Master of Science
NVAO	Nederlands-Vlaamse Accreditatie Organisatie
UTQ	University Teaching Qualification

