Job posting (PHY 09/2025)

The Leibniz Institute for Baltic Sea Research Warnemünde (IOW) has a temporary vacancy for

a PhD candidate in High Resolution Ecosystem Modeling and application of artificial intelligence

starting in the department Physical Oceanography for a period of 36 months and a percentage of 75% (30h/week), subject to the funding of the project(s) by **January 1, 2026**.

Remuneration is paid in accordance with the Tarifvertrag für den öffentlichen Dienst der Länder (TV-L, Public Sector Collective Agreement on Länder) salary scale at level 13.

About the SEAGUARD and ISOLUME projects

This position is embedded within two concurrent, complementary projects, **SEAGUARD** and **ISOLUME and is co-financed by the WWF Germany**.

The **SEAGUARD** project (Seagrass Growth and Adaptation Using AI Research & Development), focuses on assessing the **CO_2 storage potential of seagrass meadows** and identifying **climate-resilient restoration sites** in the **Baltic Sea**. The project integrates regional climate modeling, AI-driven simulations, optical remote sensing and biogeochemical modeling to predict seagrass distribution under various climate and nutrient scenarios. SEAGUARD aims to provide science-based recommendations for nature-based climate mitigation and marine biodiversity conservation. SEAGUARD is a joint effort of the IOW, the informatics department of the University of Kiel, and the remote sensing company EOMAP GmbH & Co. KG.

The **ISOLUME** project (Indicators of Changing Lightscapes in Underwater Marine Ecosystems) focuses on assessing **how marine lightscapes have changed** across European sea basins over decadal timescales, due to coastal darkening (COD) and artificial light at night (ALAN), and will determine **drivers, sources and impacts of these changes** at both large and small scales. The scientific evidence-based knowledge developed in ISOLUME will be used to develop a **roadmap** for **implementing changing marine lightscapes** as an **indicator** in management policies, monitoring programmes and essential ocean (biodiversity) variables. ISOLUME is a collaborative effort between IOW and 10 European partners and is supported by the JPI

Oceans Changing Marine Lightscapes initiative. ISOLUME has been endorsed by the Intergovernmental Oceanographic Commission (IOC) as part of the **UN Ocean Decade of Ocean Science for Sustainable Development 2021-2030**.

Who are we?

The IOW is an independent research institute of the Leibniz Association for which equal opportunities, family friendliness and work-life balance are very important. Our research focus is on the coastal and marginal seas, especially the Baltic Sea. The staff of the five departments Physical Oceanography, Marine Chemistry, Biological Oceanography, Marine Geology and Marine Observations work interdisciplinary within a joint research program.

What will be your tasks?

As part of the SEAGUARD and ISOLUME projects , the PhD project will focus on evaluating the spatial potential and CO_2 storage capacity of seagrass habitats in the Greifswalder Bodden, a shallow lagoon of the southern Baltic Sea. The research will utilize an ultra-high-resolution version of the coupled General Estuarine Transport Model (GETM) - Ecological Regional Ocean Model (ERGOM), adapted specifically for the Greifswalder Bodden, to investigate the complex interactions between turbulence, bottom friction, light availability, and nutrient inputs. The primary aim is to improve our understanding of the environmental conditions that support long-term seagrass establishment including the impacts of changing marine lightscapes on seagrass habitats.

A central task will be the assessment of seagrass carbon storage potential under different climate and nutrient input scenarios. Within IOW, the PhD candidate will collaborate with IOW's Department of Marine Observations Integrated Optical Remote Sensing Research Group. The candidate will also collaborate with the Department of Computer Science at Kiel University and the remote sensing company EOMAP GmbH, employing state-of-the-art machine learning techniques to improve the predictive accuracy of the model outputs. These outputs will be validated against observational datasets, including those collected by ongoing WWF monitoring programs.

While the Greifswalder Bodden domain is a mandatory core focus, the PhD position allows room for the individual research interests of the applicant to shape specific aspects—whether in modeling strategy, applied machine learning methods, or biogeochemical scenario development—provided they align with the overarching goals of the SEAGUARD and ISOLUME projects. The PhD candidate will be a part of these larger interdisciplinary projects, with a strong support system of senior scientists, supporting their work.

Your primary responsibilities will include:

- Apply and adapt a high-resolution coupled hydrodynamic (GETM) - biogeochemical (ERGOM) model to assess seagrass habitat suitability in the Greifswalder Bodden.
- Evaluate CO_2 storage potential of seagrass meadows under future climate and nutrient scenarios.
- Collaborate with ISOLUME scientists on the impacts of changing marine lightscapes on seagrass habitats.
- Collaborate with SEAGUARD partners on machine learning approaches to enhance model outputs and map seagrass distributions.
- Validate simulation results using field data (e.g., from WWF initiatives).
- Present research results at conferences and publish in peer-reviewed journals. Contribute to broader SEAGUARD and ISOLUME project goals and knowledge exchange with IOW's shallow-water research focus.

What do we expect from you?

A very good university degree in meteorology, oceanography, physics, mathematics, or a related natural science discipline with a strong focus on physical and mathematical aspects is required. In addition, scientific programming skills (preferably in Python) and experience with numerical models are essential. Desirable qualifications include experience with high-performance computing (HPC), initial experience with ecosystem models, willingness and ability to actively contribute to interdisciplinary teams, knowledge of climate-relevant processes in the Baltic Sea region, experience in the visualization and scientific analysis of large climate datasets, and confident communication in English.

What does the IOW offer?

The IOW offers you a varied workplace in the immediate vicinity of the Baltic Sea (Work at sea) with flexible working arrangements, e.g. the possibility of working from home or remotely, a company health management system and qualification opportunities for the English/German language. A very good infrastructure with modern laboratory and office equipment, including on our own research vessel, form the framework for the best working conditions.

How do we promote equal opportunities?

Our job offers are aimed at all people regardless of their gender. Research benefits from a diverse working environment, which is why we have signed the Diversity Charter. IOW aims to specifically promote women in areas where they are underrepresented. For this purpose, the institute has given itself a plan to promote equality (plan for the equal opportunities committee at the IOW) and has repeatedly been awarded the Total E-Quality award for its

commitment (website TOTAL E-QUALITY e. V.) Female applicants are given preference in the case of equal qualifications and suitability, as the position belongs to a working group in which women are underrepresented. You can find an overview of our measures for equal opportunities and for improving the compatibility of work and family on our website.

We give preference to applications from disabled persons with equal professional and personal suitability. Please mention the disability or equality in your letter of application and enclose a copy of the relevant certificate.

How to apply?

Please send us your application documents including a cover letter, CV, copies of your certificates, description of relevant activities and experiences. Combine all application documents into **a single PDF file.**

We look forward to receiving your application, quoting the keyword:

PHY 09/2025 by 31.10.2025

to:

bewerbung.physik@io-warnemuende.de

or:

Leibniz Institute for Baltic Sea Research Warnemünde
Human Resources Department
Seestraße 15
18119 Rostock
Germany

The interviews are expected to take place on **14.11.2025**

Unfortunately, we cannot cover your application and travel costs.

Online participation in the job interview is possible.

For further information please contact:

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