

Title of the doctorate theme	UNRAVELLING HIDDEN NITROGEN CYCLING PATHWAYS AND EMISSIONS IN COASTAL LAGOONS
Brief description of the topic	<p>Coastal lagoons deliver invaluable ecosystem services as they filter and recycle nutrients from land to ocean or exchange them with the atmosphere due to vital biogeochemical processes carried out by pelagic and benthic microorganisms. Although lagoon nitrogen (N) cycling is receiving considerable attention, few studies have quantified alternative ways to lose N via nitrogen oxide (NO, N₂O) production or gain through benthic dinitrogen (N₂) fixation. Thus, we have only partly depicted the complete N cycle.</p> <p>The proposed PhD project aims to increase the fundamental understanding of N-cycling through new alternative pathways in coastal lagoons. Such effort is needed to unveil the quantitative importance of pathways in regulating the so-called “lagoon filter” or “biogeochemical reactor” functions. Thus, the fate of N in the selected coastal lagoons will be quantified across seasonal and spatial gradients, combining analytical, biogeochemical and molecular techniques. The project will reveal previously neglected pathways (such as N oxides cycling, emissions, and benthic N₂ fixation) and help us understand feedback and ecosystem functioning along multiple gradients. This will also derive regional and global N oxide emission budgets from coastal systems.</p>
Requirements for a candidate	<p>Successful candidate must hold a master’s degree in a relevant field (marine chemistry, biogeochemistry, microbiology or geochemistry). Applicant should have the interest and ability to learn new research methods as these are needed for attaining the tasks; he/she should be able to work independently and in an interdisciplinary team; hence, communication skills and good English knowledge are necessary. Working experience and knowledge of gas chromatography and mass spectrometry is an advantage.</p>
Existing research infrastructure and support	<p>The Marine Research Institute at Klaipeda University (KU) operates cutting-edge analytical and experimental facilities that support applied research from the gene to the ecosystem level in aquatic and terrestrial environments. The existing collaboration between KU, Goteborg, and Stockholm Universities will provide access to the unique infrastructure needed to achieve specific tasks.</p>
How the topic advances the research capacity of the Klaipeda University	<p>The proposed project is part of the Coastal Environment and Biogeochemistry Laboratory's focus on understanding the ecosystem functioning and element cycling in shallow coastal ecosystems. Through field and lab studies, it will investigate crucial aspects of biogeochemical processes, support sustainable coastal management, and strengthen expertise in climate change impacts on aquatic pollution, reinforcing the LAB leadership in coastal sciences.</p>
Potential scientific supervisor	<p>Dr. Mindaugas Žilius, mindaugas.zilius@ku.lt , Lead Researcher, Head of Coastal Environment and Biogeochemistry Laboratory, Marine Research Institute, Klaipeda University https://scholar.google.lt/citations?user=E6jZxSEAAAAJ&hl=lt https://orcid.org/0000-0002-2390-6636 https://www.researchgate.net/profile/Mindaugas-Zilius</p>
Potential scientific advisor	<p>Dr. Stefano Bonaglia stefano.bonaglia@gu.se , Assistant Professor, Department of Marine Sciences, University of Gothenburg https://scholar.google.com/citations?user=Zgm_D40AAAAJ&hl=it https://orcid.org/0000-0003-4366-0677 https://www.researchgate.net/profile/Stefano-Bonaglia</p> <p>Dr. Tobia Politi, tobia.politi@gu.se Postdoctoral Researcher, Department of Marine Sciences, University of Gothenburg</p>