

<b>Module Name</b>	<b>Climate-relevant trace gases in the ocean - Klimarelevante Spurengase im Ozean (500053)</b>	
<b>Module Number</b>	MNF-bioc-350	
<b>Person in Charge</b>	Prof. Dr. Hermann W. Bange Phone: +49-(0)431-600-4204, E-mail: hbange@geomar.de, Homepage: www.geomar.de/	
<b>Semester / Duration</b>	3. semester / one semester	<b>Status</b> optional
<b>Regular Cycle</b>	annual, in winter semester	
<b>Study Programme</b>	Master of Science in Biological Oceanography	
<b>Classes</b>	<b>Class Title (Teaching Form) Lecturers</b>	<b>Contact Time / Group Size</b>
	<i>Climate relevant trace gases in the ocean (Lecture)</i> Prof. Dr. Hermann W. Bange	2 hr per week / 20 students
<b>Credit Points / Workload</b>	2 ECTS / 60 hours	
<b>Prerequisites</b>	Basic knowledge in chemistry, physics, and biology	
<b>Completion Module</b>	None.	
<b>Following Module</b>	None.	
<b>Educational Objectives</b>	<i>The goal of this lecture is to gain a deeper understanding of the distribution and biogeochemical pathways of climate relevant trace gases in the ocean. Additionally the students will gain insights into the mechanisms of air-sea gas exchange as well as the role of the ocean as source or sink of atmospheric trace gases and the implications for the atmosphere (greenhouse effect, ozone hole).</i>	
<b>Content of Teaching</b>	<ul style="list-style-type: none"> <li>(i) significance of oceanic trace gases for greenhouse effect and ozone hole</li> <li>(ii) chemical and physical properties of dissolved gases</li> <li>(iii) models of air-sea gas exchange</li> <li>(iv) methods to measure dissolved trace gas (incl. guided lab tour)</li> <li>(v) marine biogeochemistry of selected trace gases (N<sub>2</sub>O, CH<sub>4</sub>, DMS, COS, CO, halocarbons, H<sub>2</sub>, NH<sub>3</sub>, OVOCs)</li> </ul>	
<b>Examination</b>	A graded oral exam.	
<b>Literature</b>	<ol style="list-style-type: none"> <li>1) "Earth System Science – From biogeochemical cycles to global change" ed. MC Jacobson et al., Academic Press, 2000.</li> <li>2) "Biogeochemistry – An analysis of global change", 2. Auflage, WH Schlesinger, Academic Press, 1997.</li> <li>3) „Chemie der Atmosphäre – Bedeutung für Klima und Umwelt“, TE Graedel and PJ Crutzen, Spektrum Akademischer Verlag, 1994.</li> </ol>	
<b>Additional Information</b>	<i>This lecture is interdisciplinary. Students interested in chemical oceanography, biological oceanography, marine microbiology and Earth system science are welcome. The lecture will be given regularly every week. Please check UnivIS for exact dates.</i>	