mar580 - Profile Module Microbial ecology of marine sediments

Module label
Profile Module Microbial ecology of marine sediments

Module code
mar580

Credit points
6.0 KP

Workload
180 h

Used in course of study
- Master's Programme Microbiology > Mastermodule

Contact person
Bert Engelen

Entry requirements
Lecture: Microbial ecology

Skills to be acquired in this module
- The students know how to
  - sample marine sediments
  - characterize the cores sedimentologically and biogeochemically
  - collect and analyze porewater
  - determine total cell counts
  - quantify groups of organisms molecular biologically
  - cultivate different physiological groups of bacteria
  - present and discuss scientific results
  - write a scientific protocol

Module contents
Microbial ecology of marine sediments: The physiological diversity of microorganisms and their spatial distribution within marine sediments are demonstrated according to chemical and physical parameters. Different physiological groups are analysed along the sediment column of intertidal sandflat or beach. Sediment sampling is performed at the back barrier area of the island 'Spiekeroog' at the beginning of the course. Oxygen penetration, porewater sulfate and methane concentrations are measured down to a depth of app. 5 meters. As microbiological parameters, total cell numbers are counted and the numbers of archaea and bacteria are calculated after quantitative PCR (qPCR). More specifically, the relative amounts of sulfate reducers and methanogens are also determined by qPCR targeting key-genes for sulfate reduction and methanogenesis. Furthermore, every single group of students will specifically enrich one physiological type of microorganisms from distinctive sediment layers. Microbial growth and activity are monitored over the whole period of the course.

Accompanying the course, all participants will give a talk to introduce 'their' physiological group concerning its ecology, physiology, and strategies for a specific enrichment. All the data and observations of the single groups will be combined at the end of the course to draw an overall picture of microbial diversity and the occurrence of the different physiological groups corresponding to relevant geochemical gradients.

Reader's advisory

Links

Language of instruction
English

Duration (semesters)
1 Semester

Module frequency
jährlich

Module capacity
unlimited

Reference text
6 CP | SE; PR | 2. FS | Engelen

Modullevel
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Modulart
je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program
Seminar (2 CP, 1SPPW ), practical course (4 CP, 4 SPPW)

Vorkenntnisse / Previous knowledge
Block course, 2 weeks, seminar and laboratory work

Examination
Time of examination
Type of examination
Final exam of module
Announced during the course.
One assessment of examination:
Portfolio (seminar presentation, written protocol)

Protocol (100 %), seminar presentation (no mark). Active participation (Active and documented participation in practical courses (labs, exercises, seminars, field trips) and
These include e.g. the delivery of exercises, writing a lab report or seminar presentations according to the advice of the course supervisor.

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>Seminar</td>
<td></td>
<td>1.00</td>
<td>14 h</td>
</tr>
<tr>
<td>Practical</td>
<td></td>
<td>4.00</td>
<td>56 h</td>
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</tbody>
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**Total time of attendance for the module**

70 h