ICBM – Alumni News #16

Carl von Ossietzky Universität Oldenburg

Newsletter –

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Welcome to the sixteenth ICBM-Alumni-Newsletter

Dear ICBM Alumni,

we celebrated the 35th anniversary and the steady growth of the ICBM! It is always exciting to see what is happening around the ICBM. Look forward to reports on research from different working groups, learn more about our location in Wilhelmshaven and read about further growth and the new future lab.

Greetings and all the best,

Ferdinand Esser und Tabea Hildebrand

Topics of this issue

Science

- Glacial flour
- Asphalt as a source for S and C
- Plastic consuming bacteria
- Coral friendly UV protection
- Fin whales in Antarctica
- Upheavel in the ice age

Outside the box

- Documentary: „The North Drift“
- City of Science WHV
- Symposium SFB Roseobacter
- Uni by the sea

Congratulations

- Nature conservation award
- “Zukunftslabor Wasser”
- Illiana Baums
- 35 years of ICBM

The secret of glacial flour

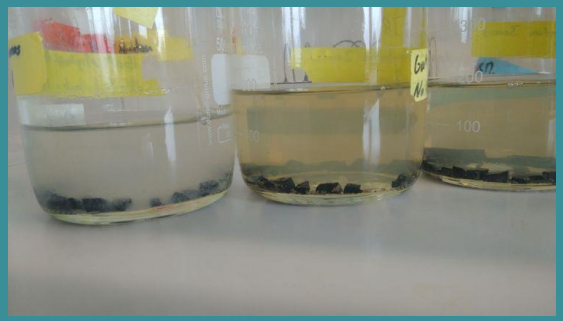
Dr. Jochen Wollschläger, from the Marine Sensor Systems research group, was on board the research vessel Meteor in the Beagle Channel in Tierra del Fuego in January and February of this year to investigate, together with colleagues from the ICBM as well as from Bremerhaven, Chile and Argentina, how glacier melt affects the ecosystems in the fjords. The tiny particles in the water play an important role here - especially the transparent splinters: "These mineral particles are called glacial flour. They are tiny rock particles that glaciers have eroded from the underlying rock during their migration" the researcher explains. When glaciers melt due to global warming, the particles previously trapped in the ice enter the water.

[...] The glacial debris has a strong effect on the growth of plant plankton - which in turn forms the basis of the food chain in the ocean. "Often it's already so dark 20 meters below the surface that hardly any photosynthesis can take place.", says Wollschläger. Now, the question is what quantities of glacial flour will enter the fjords in the future as the glaciers melt. [MW – 06.06.22]

Laboratory experiment identifies asphalt as source of poorly degradable sulfur compounds and carbon

If crude oil enters the sea, it is not always the result of an oil spill. There are natural seepage sites where microorganisms use the seeping oil as a source of energy and food. Researchers at the ICBM at the University of Oldenburg and MARUM - Center for Marine Environmental Sciences at the University of Bremen have for the first time found out what happens to the naturally seeping water-soluble part of the oil during a laboratory experiment: While some parts serve as a source of energy and food for microorganisms, non-biodegradable components are also released, persisting in the oceans for millennia. [...]

Until now, the only known source of these compounds, which remain stable in the ocean for tens of thousands of years, was soot, which is produced, for example, by forest fires. "With our study, we now show that natural asphalt deposits and potentially other petroleum spills can be sources for these very stable compounds in the deep sea. In further studies, we now want to determine whether these very stable carbon compounds are also released in other natural deep-sea habitats, such as hydrothermal systems. These stable organic compounds are so interesting because they sequester carbon for thousands of years and thus can no longer be released into the atmosphere as CO2," explains Dr. Michael Seidel, who played a key role in the study on the ICBM side. [...] [ICBM – 29.07.22]



Laboratory experiment [Photo: Jonas Brünjes]

Original publication: Jonas Brünjes, Michael Seidel, Thorsten Dittmar, Jutta Niggemann, and Florence Schubotz: Natural Asphalt Seeps Are Potential Sources for Recalcitrant Oceanic Dissolved Organic Sulfur and Dissolved Black Carbon. Environmental Science & Technology Article ASAP. DOI: 10.1021/acs.est.2c01123

Natural clean-up

Researchers from the Universities of Cambridge and Oldenburg have found [...] that some naturally occurring bacteria recycle the remains of plastic bags dissolved in water faster and more efficiently than natural materials such as leaves and twigs. The bacteria use plastic-derived carbon compounds as food [...]. Accordingly, enriching water bodies with certain types of bacteria could help to naturally get rid of plastic pollution.

According to the study, the effect is very pronounced; if the carbon content of the water increased by just four percent due to plastic particles, the growth rate of the bacteria doubled. The results suggest that the bacteria not only break down the plastic, but are subsequently better able to utilize other natural carbon compounds. [UWI - 07/26/22]

More information on the study, which included samples from 29 different Scandinavian lakes and work on the high-resolution mass spectrometer, can be found in this article and in the original publication.

Original publication: Sheridan, E.A., Fonvielle, J.A., Cottingham, S. et al. Plastic pollution fosters more microbial growth in lakes than natural organic matter. Nat Commun 13, 4175 (2022). https://doi.org/10.1038/s41467-022-31691-9

Coral damage from sunscreens and their ingredients?

Standardized tests are needed to better assess the hazard potential of the UV filters contained in sunscreen. The team led by Prof. Dr. Peter Schupp is now developing such tests for the marine environment, analogous to existing tests with freshwater organisms. [...] The tests are intended to help identify those UV filters that have a negative effect on coral larvae and adult corals and may therefore no longer be safe to use. For the time being, widely used UV filters such as oxybenzone or octinoxate, which are already in the public eye, will be tested, but also other substance groups. The investigations were carried out on different coral species [...]. The experiments showed differences in sensitivity between the species studied and the different age stages. In general, the larval stages were more sensitive than the adult corals. [...]

In addition to the standardized test, the goal of the project is to contribute to the introduction of a uniform label for environmentally friendly sunscreens. "Some manufacturers already advertise 'reef-safe' or 'coral-friendly' sunscreen, but these labels have little to say about how the ingredients actually affect coral reefs," Schupp points out. "On the other hand, we see that individual UV filters have been evaluated and already banned in some countries due to deficient studies." Standardized test procedures could provide more clarity here and could also be used to evaluate other

Coral reef [Photo: UOL, P. Schupp]

substances, such as those found in cosmetic products or pesticides, with regard to their potentially harmful effects on coral reefs, thus helping to protect them. [PR 154/22 – 13.07.22]

Fin whales back in Antarctica

Fin whales are the largest whales in the world after blue whales - and humans have nearly wiped out both species. After commercial whaling was banned in 1976, populations of the long-lived and slow-growing animals are recovering: researchers and filmmakers are now jointly publishing videos and photos in the journal Scientific Reports showing large groups of up to 150 southern fin whales in their historic feeding grounds - more than ever before documented using modern methods. The animals have an important role in nutrient recycling, so other species in the Antarctic ecosystem, such as krill, could also benefit from the population recovery.

"I have never seen so many whales in one place and was totally fascinated to watch these huge groups feeding," enthuses study co-author Prof. Dr. Bettina Meyer. [...] She led an expedition with the research vessel Polarstern from March to May 2018, during which groups of 50 and 70 southern fin whales (Balaenoptera physalus quoyi) were observed. [...] A recovery in fin whale stocks appears to be underway: The whale research team and the BBC returned to Elephant Island in a specially chartered ship the year after the Polarstern expedition and documented as many as 150 animals. "Even though we don't know the total number of fin whales in

Fin whale in Antarctica [Photo: Dan Beecham]

Antarctica due to a lack of synchronous observations, it could be a good sign that the fin whale population in Antarctica is recovering almost 50 years after commercial whaling was banned," Bettina Meyer is pleased to report. [...] [MW – 08.07.22]

Original publication: Herr, H., Viquerat, S., Devas, F. et al. Return of large fin whale feeding aggregations to historical whaling grounds in the Southern Ocean. Sci Rep 12, 9458 (2022). https://doi.org/10.1038/s41598-022-13798-7

Videos of the expedition: https://www.nature.com/articles/s41598-022-13798-7

Stronger upheavel in the Pacific during the icea age

The Tasman Sea between Australia and New Zealand is an important but previously neglected component in the global conveyor belt of ocean currents. A new study now provides evidence that the marginal sea in the South Pacific also played a significant role in the exchange of water masses between the major ocean basins during the last ice age. The results can help refine climate models and improve understanding of ocean circulation and carbon storage in the sea, an international team led by geoscientist Dr. Torben Struve of the University of Oldenburg now writes in the journal Nature Communications.

For the study, the team examined 62 fossil specimens of the stony coral Desmophyllum dianthus collected by the underwater robot JASON during a research

Fossils of stony corals [Photo: Eleni Anagnostou]

cruise south of Tasmania between 1,400 and 1,700 meters depth. Dating suggests that the animals had lived between 10,000 and 70,000 years ago, a period that spans the peak and end of the last ice age. "The corals grow in areas where there are strong currents and turbulence and no sediment settles," explains Struve, who conducts research in the Marine Isotope Geochemistry group at the ICBM. Because the skeletons of the sedentary animals record the chemical fingerprint of the surrounding seawater, the researchers can use elaborate analyses to find out how the ocean was chemically composed during the corals' lifetime at the corresponding water depth. This gives them clues as to which water masses flowed through the Tasman Sea at that time. [...] [PR 146/22 – 05.07.22]

Original publication: Torben Struve et al.: "A deep Tasman outflow of Pacific waters during the last glacial period", Nature Communications 13, 3763 (2022). doi.org/10.1038/s41467-022-31116-7

OUTSIDE THE BOX

Documentary „The North Drift" in the cinemas

Steffen Krones, documentary filmmaker from Dresden, was already at the ICBM in Wilhelmshaven in July 2020. At that time, he asked Rosanna Schöneich-Argent about the 'Macroplastics' project, which is dealing with the spread of plastic waste in the southern North Sea. Krones' curiosity was motivated by an experience in the

Scenery picture of documentary [Photo: Steffen Krones]

Lofoten Islands: On a remote and uninhabited rocky island, he had found a beer bottle with a German label, along with plastic waste washed ashore. From then on, he wondered whether plastic waste that ends up in the Elbe near Dresden could also end up near the Arctic Circle. [...]

Now the documentary film is finished and will be shown in numerous cinemas from October 27. The trailer and some dates in the presence of the filmmaker can be found here.

If you are interested in asking the filmmaker questions from home or want to learn more of the story behind the film, you will have the opportunity to do so on November 10th, 2022, starting at 5:30 pm. There, he will hold an online lecture as part of the series of events "No garbage in the river", which Dr. Rosanna Schöneich-Argent, now an employee of BUND, organizes together with the state association of adult education centers in Lower Saxony. (All details here). [SR – 04.10.22]

Minister President Stephan Weil visits the ICBM in Wilhelmshaven

Four German cities have already been awarded with the title "City of Science" - Wilhelmshaven wants to become the fifth. "Twelve research and science institutions in a city with a population of just under 78,000 impressively demonstrate that the Jade City is a cluster for education, research and development", says Mayor Carsten Feist with conviction. He is personally there to convince Minister President Stephan Weil to have the state approve the application. "This would make Wilhelmshaven

not only the first science city in Lower Saxony, but also the first in all of northern Germany. Wilhelmshaven is currently moving more than ever into the national consciousness as an Energy Hub 2.0 and is taking responsibility for Germany's security of supply." In order to win over the Minister President for the project, the two visited the ICBM together on Saturday, September 10th, in the presence of State Secretary Siemtje Möller, through which they were guided by Institute Director Prof. Dr. Heinz Wilkes and University President Prof. Dr. Ralph Bruder. [...]

For Institute Director Prof. Dr. Heinz Wilkes, it was a matter of course that the ICBM would support the city's application: "The title of City of Science puts the institutes much more in the public eye and gives them even more weight in the public perception. We all benefit from this together." Other supporters include the Jade University of Applied Sciences, the Institute for Bird Research, the Northwest German University Society, the Lower Saxony Institute for Historical Coastal Research, the Lower Saxony Wadden Sea National Park Administration and the Senckenberg Research Institute by the Sea. [ICBM – 10.09.22]

Collaborative Research Center: International symposium on small all-rounders of the oceans

They occur in all marine habitats - from the tropics to the polar seas, from the water surface to the deep sea: the bacteria of the Roseobacter group, which have been intensively and comprehensively studied over the past twelve years by more than

60 researchers under coordination of Oldenburg. At the end of the joint work in the Transregional Collaborative Research Center (SFB), supported by the German Research Foundation (DFG) with a total of more than 27 million euros, the participants from Oldenburg, Braunschweig, Göttingen and Bonn are now meeting for a symposium to discuss their results among themselves and with international experts. The scientific conference, hosted by the University of Oldenburg, took place on September 5 and 6 in the Old Parliament (Theodor-Tantzen-Platz). The SFB with its subprojects will run until the end of the year. [PR 180/22 – 02.09.22]

University by the sea

Part of the university is located directly at the Jade Bay in Wilhelmshaven: The Institute of Chemistry and Biology of the Sea (ICBM) has a site on the lock island near the southern beach, which has now been expanded with an extension. A branch office with a unique infrastructure.

More information about the branch office of the ICBM in Wilhelmshaven, its working groups, the various research platforms, its tropical aquariums, the "Sea Surface Facility" and the planktotrons, can be found here. [MW – 28.07.22]

ICBM-Wilhelmshaven [Photo: Markus Hibbeler]

CONGRATULATIONS!

Nature Conservation Award to Swaantje Fock

Swaantje Fock, managing director of the Wittbülten National Park House on Spiekeroog, has now received the 2022 Nature Conservation Award from the Haarmann Foundation in Osnabrück. [...]

The prize was awarded in recognition of Fock's efforts to convey the beauty of the Wadden Sea to visitors and, at the same time, her commitment to the protection of the habitat. The laudation was held by Prof. Gudrun Massmann, who conducts research at the Institute of Biology and Environmental Sciences (IBU) at the University of Oldenburg and is the spokesperson of a collaborative research project based on Spiekeroog. Prof. Helmut Hillebrand, head of the ICBM working group Planktology and also contact person of another collaborative project located on the island, gave a keynote speech on research on biodiversity in the Wadden Sea World Heritage Site under the title "Gray is the new colorful". [...] [SR – 19.09.22]

Swaantje Fock [Photo: Swaantje Hehmann]

“Zukunftslabor Wasser” starts its research

Water is the basis of life and must therefore be protected as a valuable resource. In order to guarantee the distribution of water in the face of increasingly severe droughts and to efficiently counter extreme situations such as flooding, coordinated measures are required from politics and industry - supported by further research based on modern methods of water management. Digitalization is essential for this. [...]

With the aim of making water management sustainable, resource-conserving and efficient, the new “Zukunftslabor Wasser” (Future Lab Water) has started its work at the Center for Digital Innovations (ZDIN). Science Minister Björn Thümler congratulated the five-year funding, for which a total of 3.7 million euros will be provided by the state of Lower Saxony and the Volkswagen Foundation. [...]

"Water economy, water management and the ecosystem water have an elementary supply function for our society. Climate change and the distributed structures of water management call for digitalization in water management in order to ensure the security of supply and quality of the resource water in the future and to significantly improve the handling of extreme situations. This is precisely where the “Future Lab Water” comes in with its intelligent systems and digital solutions." - Prof. Dr. Oliver Zielinski [...] [ICBM – 13.09.22]

Handing over the funding decision [Photo: Markus Hibbeler]

Iliana Baums is the new Professor for Marine Conservation at the Helmholtz-Institute

The evolutionary ecologist and coral expert Prof. Dr. Iliana Baums has been appointed to the joint professorship for "Marine Conservation" of the ICBM at the University of Oldenburg and the Bremerhaven Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI). As part of her cooperative professorship, Baums will conduct future research at the Helmholtz Institute for Functional Marine Biodiversity at the University of Oldenburg (HIFMB) - for example, questioning how the adaptive potential of marine ecosystems to changing environmental conditions can be increased. Previously, she was a professor of marine molecular ecology and evolution at Pennsylvania State University (USA). [...]

Her areas of focus include genetics and coral reef restoration. Baums' scientific work brings together insights and perspectives from genomics, ecology, evolutionary research and oceanography to understand the processes that shape marine life and to maintain the diversity as well as productivity of marine ecosystems. Their goal is to translate results from basic research into concrete measures for marine conservation. [PR 182/22 – 07.09.22]

Iliana Baums [Foto: UOL]

Celebrating 35 years of ICBM

About 130 people - institute members, partly accompanied by family members, as well as invited guests from the ICBM environment - celebrated the 35th anniversary of the institute in Wilhelmshaven in bright sunshine. In 1987, the ICBM, located in Oldenburg, was founded as an institute of the university on the recommendation of the Science Council. In 2008, the Terramare research center in Wilhelmshaven, which had already been closely linked to the Oldenburg university, was transferred to the university as part of the ICBM. In his welcoming speech, the deputy director of the institute, Prof. Dr. Thorsten Dittmar, was pleased about the steady growth of the ICBM and the successful integration of the Wilhelmshaven site into the institute. [...]

As usual for a summer party, there was a barbecue and a buffet to which many institute employees had made colorful culinary contributions. The band "John Bridges", whose musicians also include a member of the Institute, provided the musical entertainment. [SR – 02.09.22]

35 Jahre Feier [Foto: Sibet Riexinger]

If you have comments:

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