



# Braving the Forces of Nature

Max Planck scientists cooperate with partners in more than 110 countries worldwide. Here they relate their personal experiences and impressions. Marine biologist Greta Giljan is a doctoral student at the Max Planck Institute for Marine Microbiology in Bremen. She reports on a research expedition to the Irish Sea, on heavy storms, problems with equipment weighing several tons, and crew unity.

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When I look out at the clear Irish Sea from aboard the British research vessel *Cefas Endeavour*, it's difficult to believe that there are millions of microscopic creatures living in it. These guarantee that fundamental processes and cycles on our planet function properly, and that's why I find them so interesting.

With my deep-sea incubator, I collect and incubate them in their natural environment – the Irish Sea – at depths of up to 100 meters. But this requires painstaking dexterity: when we lower the device, which weighs just under a ton, it is connected to the research vessel only by a steel rope, a cable and a cable winch. There were powerful storms for the first eleven days after departure, so there was a substantial risk that these connections would snap and that we could lose the incubator, or that it would smash against the ship's hull.

All we could do was wait – and anyone who knows how valuable ship time is understands how frustrating this can be. Ultimately, I'm on my own, one of many marine researchers on board. And I'm glad I was able to come along, but irretrievable time was lost due to the storm. And even



**Greta Giljan**, 25, studied biotechnology in Darmstadt, Germany before coming to the Max Planck Institute for Marine Microbiology to complete her bachelor's thesis, which was followed by her master's thesis. Since September 2016, Giljan has been working on her doctoral thesis with Bernhard Fuchs in the Department of Molecular Ecology, where she researches the metabolic activity of a variety of marine populations with small genomes. It is thought that these populations can express only a few metabolic enzymes themselves and are therefore dependent on absorbing nutrients from the water column. In 2018, Greta Giljan is also serving as the Max Planck PhDnet treasurer.

an attempt to plot the route of the ship so that we would avoid the storm wasn't fruitful. Despite this setback and my dwindling motivation, I wasn't ready to give up yet. Heartened by the encouraging words of the crew, who initially doubted that deployment would be possible, I hadn't lost the hope of calm seas. At sea, you stick together.

And then the weather suddenly took a turn for the better. Now everything needs to run smoothly, every plan needs to work in order for the colossus to finally be lowered into the depths. But only now, in the hands-on situation, do we realize that, despite all our planning, communications with the device don't work! Fortunately, I'm in constant e-mail contact with our technicians at the Max Planck Institute, who can give me important tips thanks to their many years of experience. What on earth did researchers do in the past, without the internet?

I enjoy optimal conditions for my work as a marine researcher at the Institute in Bremen. I am fulfilling a childhood dream. As a child, I watched numerous documentaries about fish and the oceans, and I found the work on the research ships, in particular, so fascinating that I wanted to go along one day, too. All in all, it's even more diverse than I had imagined. After all, we environmental researchers aren't constantly outdoors in the wild, but spend a large part of our time at the computer. Data needs to be analyzed, visualized and evaluated – and this is where the real core of our work begins: delving deeper into the data and discovering what information it contains about our global material cycles.

Despite my fascination for marine research, it's difficult to make plans for the future. Of course it's all incredibly interesting, but the experience gained as a Max Planck doctoral student can also be put to good use in other professional fields. For example, the ability to organize oneself in everyday research, to convey newly gained insights, and sometimes to take a different perspective on things. At the moment, though, I'm focusing on analyzing my hard-won samples. Then I'll explore which waters I can lower my incubator into next – let's hope for a calm sea.