Robots monitor the environmental impact of the Nord Stream gas leak

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The underwater robots, called Gliders, register data from the sea bottom to the surface non stop. Credit: VOTO/Aleksandra Mazur

The University of Gothenburg has deployed three underwater robots in the Baltic waters around the leaks on the Nord Stream gas pipelines. This is done to be able to follow how chemistry and life in the sea changes over time due to the large release of methane gas. In addition, research vessel Skagerak is set to deploy on a new expedition to the Baltic Sea to

test run the large, unmanned vessel Ran.

The expedition with R/V Skagerak was not the only measure the university's researchers took when the Nord Stream pipelines began to leak methane gas. With the help of the Voice of the Ocean foundation, VOTO, three remote-controlled underwater robots were placed in the area. They will move around the sea and record water data continuously for the next 15 weeks.

"They are called gliders and are provided by VOTO, who also manages their operation. The robots can give us measurements over a series of time about how the chemistry and quality of the water is affected by the natural gas leak," says oceanographer Bastien Queste at the University of Gothenburg.

Plenty of data from the area

Since March 2021, VOTO has had two gliders in the area which functions as one of the foundation's ocean observatories and where the water quality is measured non-stop. The robots go down to the bottom and then turn up to the surface, something that is repeated over a preset distance. Every time the glider is at the surface, the latest measurement data is sent to the researchers via satellite. Thus, plenty of data from this area already exists from before. One of the three additional robots that was dropped into the sea last week has been equipped by the manufacturer Alseamar with a special sensor to be able to measure the change in the methane content over the next 15 weeks.

"Last week's expedition provided valuable data and a snapshot of the state of the ocean immediately after the leakage occurred. With the new robots in place, we receive continuous reports on the state of the water near the Nord stream pipeline leaks. They are deployed solely for this purpose," says Bastien Queste.

"The point is that we get measurements from the water over a long period of time and over a larger area. We can see how long it takes for the methane to disappear and how the aquatic environment reacts over time. The response in the sea is often delayed. It may take days or weeks before we see a change," says Bastien Queste.

The underwater robot will work in the area for 15 weeks. Credit: Anna Wåhlin

Even the underwater robots that are usually deployed there, can contribute important data as they measure salinity, temperature, oxygen content and the amount of chlorophyll. This completes the picture of how the water in the Baltic Sea is doing after the gas leak.

Solid scientific documentation

"Together with the new robots and the expedition's measurements, we researchers will have solid scientific documentation of the impact of the Nord Stream leak. When we add it all up, we have a good picture of both the immediate and the delayed effects. With gliders that continuously measure, we will be able to better understand the processes that were observed then," says Bastien Queste.

The expedition has barely had time to disembark before preparations for the next trip to the Baltic Sea with Skagerak have started. Polar researcher Anna Wåhlin had, for a long time, planned a trip with the ship precisely to the area east of Bornholm.

"I will test how the large underwater robot Ran behaves in seas with large layers of density and how well it can measure over sediment-rich bottoms. This place is perfect for that. Ran will also be able to contribute to research into gas emissions because it measures the carbon dioxide and nitrate levels in the water," says Anna Wåhlin. This is also the first time that Ran departs from Skagerak, which will be an important test of the ship's flexibility.

Provided by University of Gothenburg

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