Methane nibbling bacteria are more active during summer

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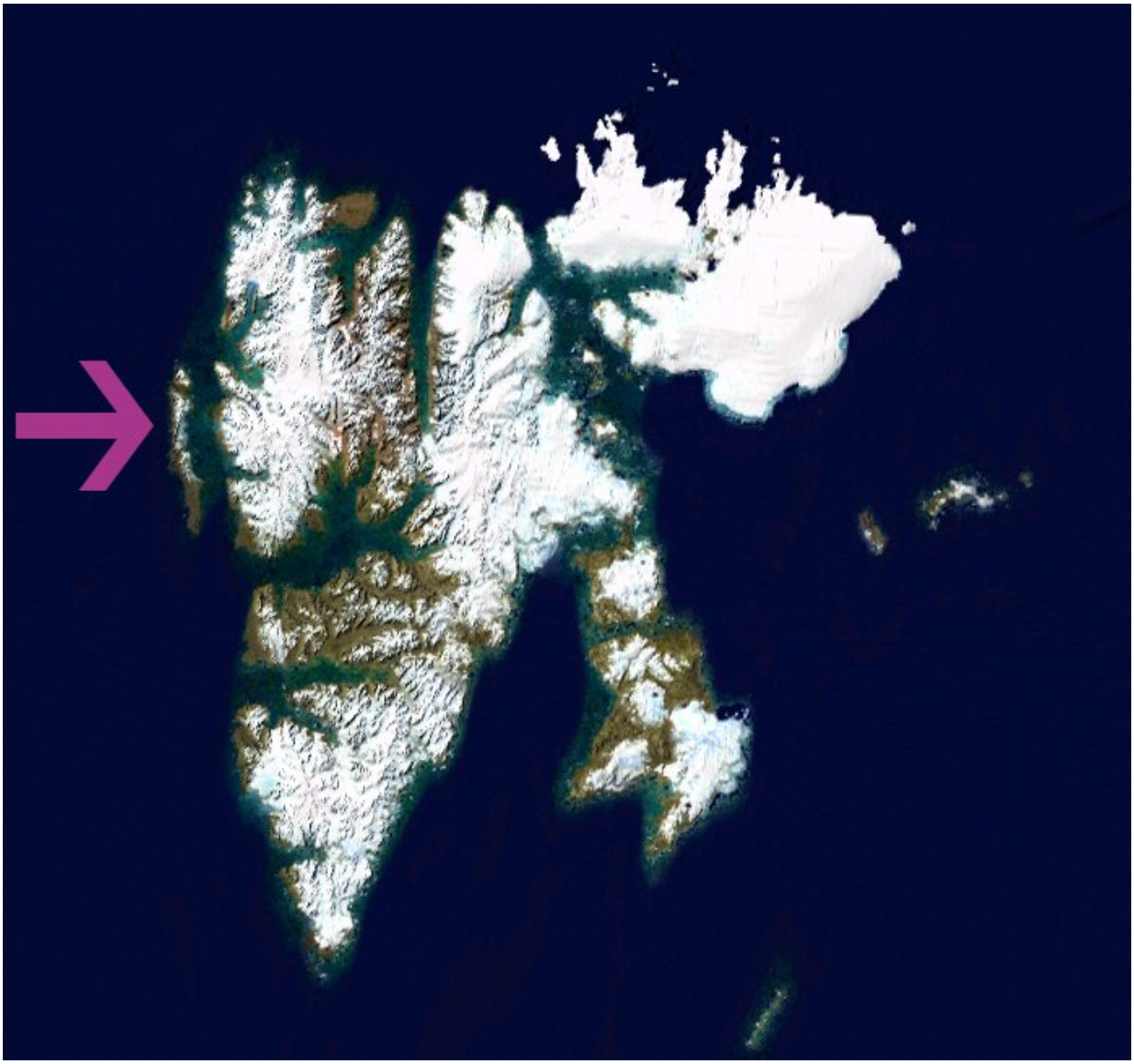

Outline of Svalbard. The arrow points to the study area offshore Prins Karls

Forland. Credit: UiT The Arctic University of Norway

Bacteria that thrive on methane released from the ocean floor are an important barrier preventing the greenhouse gas from reaching the atmosphere. A new study finds that these microbial communities flourish in seabed depressions and are more effective during the summer.

"The findings of our study tell us where and when greenhouse gas is being most absorbed in Arctic waters." Says Friederike Gründger, who conducted the study as part of her post-doctoral research at CAGE.

The study, which was conducted on the shallow shelf west of Svalbard, took a closer look at communities of bacteria that use methane as an energy source and carbon substrate for growth. The results from the study show that these methane-oxidizing bacteria are highly affected by the specific underwater landscape and seasonal conditions in the study area.

"Several large depressions, up to 40m deep, are observed along the shallow shelf off Western Svalbard, in an area which is also characterized by numerous methane flares. Our study shows that the bacteria are allowed to prosper in these sheltered depressions. We found 2-3 times higher methane consumption rates here than reported previously from other locations at the continental shelf around Svalbard ." Says Gründger

"Moreover, we found that in summer, these specific types of bacteria are much more active in utilizing methane, compared with other seasons. "

Microbial consumption is the final sink for the

methane gas

Microbial methane oxidation is the final sink for the greenhouse gas that is released from the seafloor before it is liberated into the atmosphere. This means that they are able to dimmish the amount of methane reaching the atmosphere.

"Our results have considerably improved our understanding of the influence of the landscape, and seasonality on the relationship between methane release and microbial communities that thrive in the methane-rich environment."

It is extremely important for scientist to gain a better understanding of the diversity, distribution, and activity of methane-oxidizing bacteria. This allows them to better estimate the balance between the amounts of methane released from the sediments, converted into biomass and potentially released into the atmosphere.

More information: Friederike Gründger et al, Seasonal shifts of microbial methane oxidation in Arctic shelf waters above gas seeps, *Limnology and Oceanography* (2021). DOI: 10.1002/lno.11731

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