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## A journey to a cold seep: a paired teaching video lesson on how scientists study methane in the Arctic Ocean

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The knowledge generated through scientific research in the Arctic Ocean is often done with little input or communication with the public. In particular, school communities have few opportunities to engage in and contribute to knowledge generation and sharing related to the Arctic Ocean.

To address this issue, the 2022 AKMA OceanSenses expedition (11-23 May) brought together scientists and teachers to co-create educational materials that are scientifically accurate and pedagogically engaging. Here, we present an educational video about methane activity in the Arctic Ocean. The video follows a pedagogical model known as paired teaching. This approach enables scientists and teachers to create and instruct virtual lessons and activities that are carried out under the guidance of in-class teachers in school classrooms. The video is designed to be viewed in short segments. In each segment, the video scientist asks questions that will be explored through hands-on activities and group discussions under the guidance of the classroom teacher in between segments.

The video introduces students to methane and gas hydrates, their geographical distribution, and global significance. These topics are taught through lively discussions and observation-based exercises where students work together to relate scientific datasets to discover processes that produce methane and gas hydrates. The video and supporting materials are freely available on the YouTube channel of the European Geoscience Union (<https://youtu.be/k0awmdQQITA>).