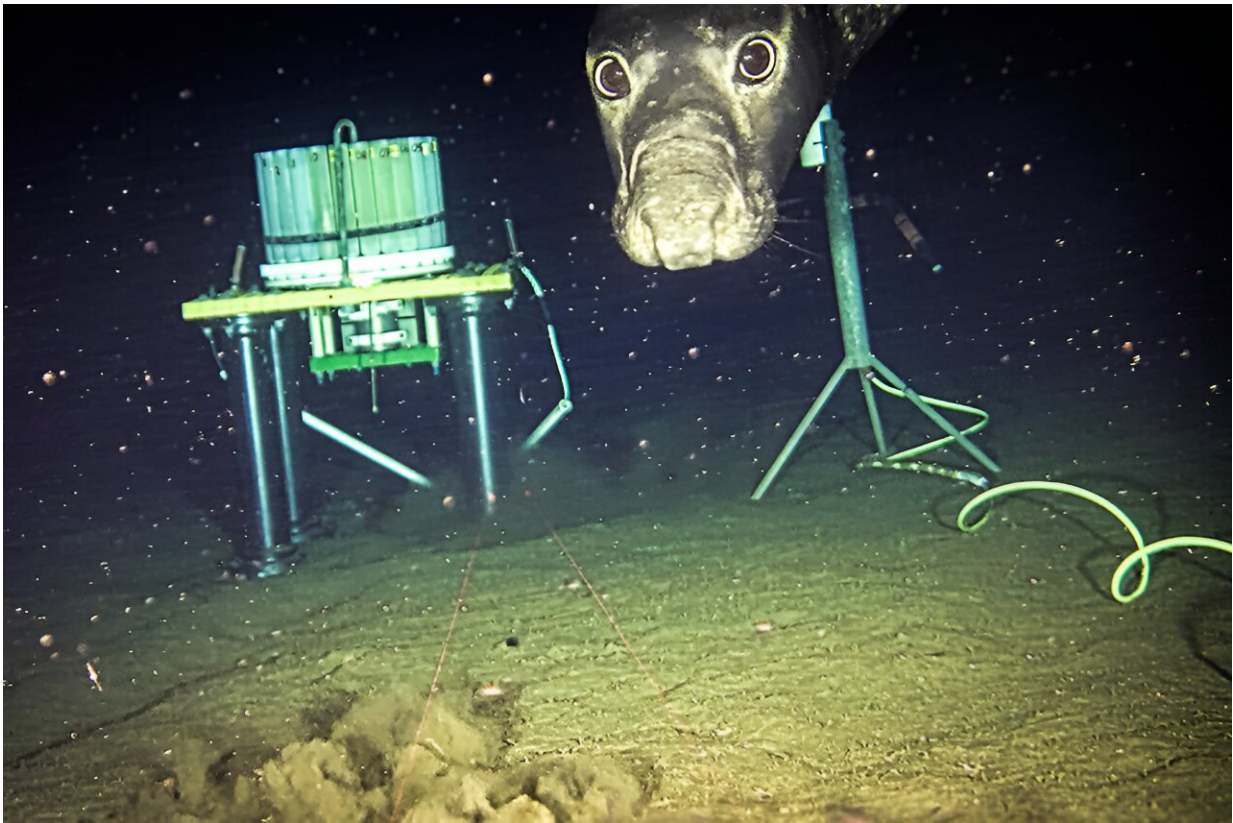


Northern elephant seals use deep-sea research sonar as dinner bell

September 5 2024



A young, male northern elephant seal (*Mirounga angustirostris*) chases an offscreen sablefish (*Anoplopoma fimbria*) at Ocean Networks Canada's NEPTUNE's Barkley Canyon observatory site off the west coast of Vancouver Island, Canada. Credit: Ocean Networks Canada

Northern elephant seals were repeatedly captured on camera in the deep

Pacific Ocean using sonar from an Ocean Networks Canada (ONC) observatory as a dinner bell to forage for their next fish feast, according to a new study led by University of Victoria researchers.

The [study](#), published in *PLOS ONE*, provides a unique, first-ever visual glimpse into the elusive mammal's deep-sea behaviors, with a focus on their sophisticated feeding strategies, prey preferences as well as resting habits.

Altogether, at least eight male elephant seals, ages 4 to 7, were observed on [camera](#) and detected by hydrophones during multiple visits to the 645-meter-deep research site at Barkley Canyon along ONC's subsea cabled observatory NEPTUNE off the British Columbia west coast between 2022 and 2023.

The findings came almost by chance; UVic, Instituto de Ciencias del Mar (ICM-CSIC), a Barcelona-based research institute, and ONC researchers were studying the effects of light and bait on fish and invertebrate behavior at Barkley Canyon, using a high-definition camera, acoustic imaging sonar, hydrophone, pair of LED lights, and automatic bait release.

But a review of the camera, acoustic images and sound data revealed the surprise visitors.

"We suspect the seals have learned to associate sonar noise from the research instrument with the presence of food—a phenomenon known as the 'dinner bell' effect.

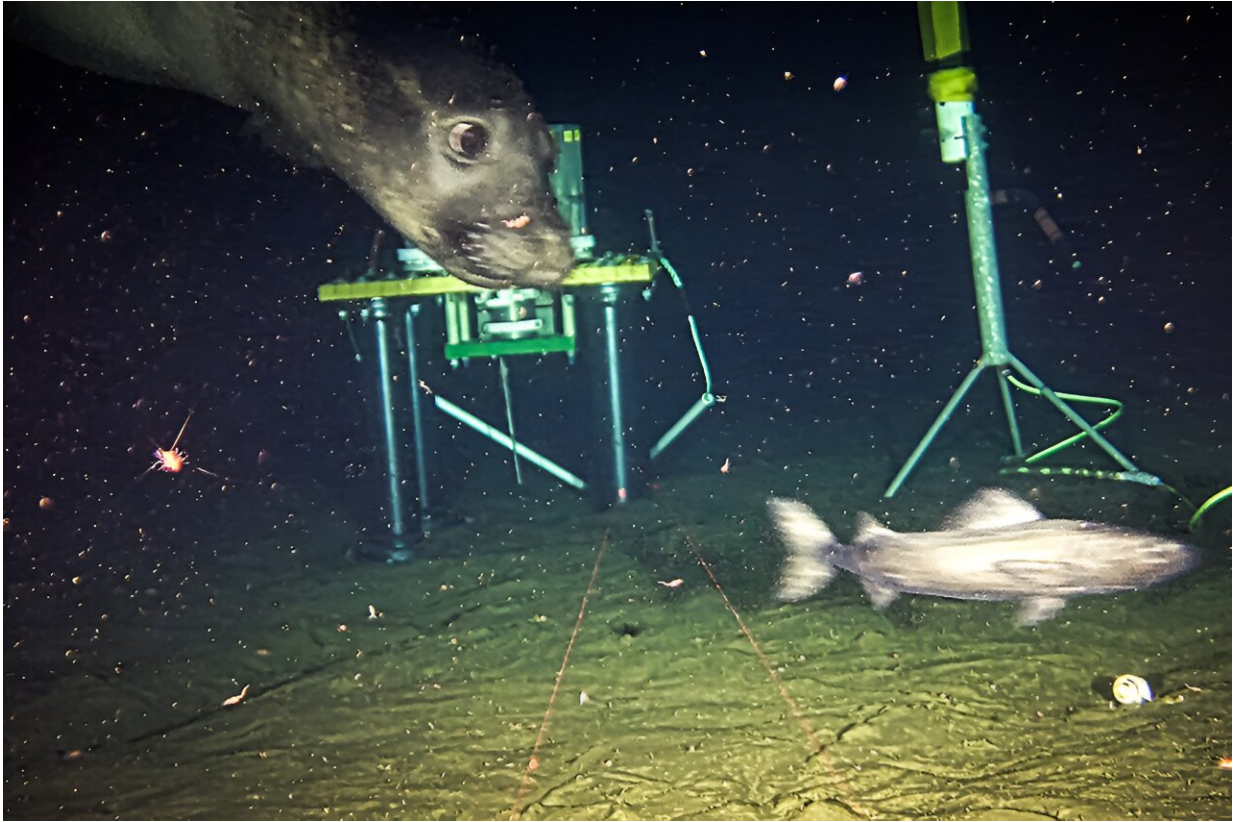
"The seals appeared to use this sound to locate an area with prey and may take advantage of fish disturbed by the camera lights, particularly targeting sablefish, their preferred meal, as seen in the [video footage](#)," says Héloïse Frouin-Mouy, lead author of the publication.

Frouin-Mouy, a visiting scientist at UVic in the department of biology and assistant scientist at the University of Miami, collaborated on this research with Francis Juanes, UVic biology professor and Liber Ero Chair for Fisheries Research, and adjunct professor Rodney Rountree. ICM-CSIC's Jacopo Aguzzi and ONC's Fabio De Leo Cabrera are also co-authors on the paper.

In one instance, the repeated visits over 10 days by four of the identified seals to the research site also demonstrate that they quickly learned to use the infrastructure to forage for food more efficiently, adds Frouin-Mouy.

"We became familiar with the mammals and ended up naming them in the paper after members of The Beach Boys to differentiate between the frequency of [visits](#) and observed habits," she says.

The adolescent males visiting the site predominantly targeted actively swimming sablefish, ignoring the over dozen other stationary or drifting prey options. Several individuals were interestingly recorded on camera and hydrophone bobbing their heads and producing low-frequency sounds while chasing prey.



A northern elephant seal (*Mirounga angustirostris*) attempts to catch a sablefish (*Anoplopoma fimbria*), captured by Ocean Networks Canada's high-definition camera at the Barkley Canyon NEPTUNE observatory site, off the west coast of Vancouver Island, Canada. Credit: Ocean Networks Canada

Sonar videos also revealed seals power-napping on the seafloor at Barkley Canyon, another new and never-seen behavior from the adolescent male northern elephant seal.

NEPTUNE's [real-time monitoring capacity](#) allowed the researchers to adapt the use of ONC's subsea instruments deployed at the research site for the fish study to pick up on the presence of the seals and observe them for nearly a year.

Although northern elephant seal colonies are found as far north as Alaska and southern towards the Baja Peninsula, they are typically studied using biotags to track movement, or found primarily on land.

Results from the also-completed fish acoustics experiment study will be published in the near future.

More information: Héloïse Frouin-Mouy et al, Deep-sea cabled video-observatory provides insights into the behavior at depth of sub-adult male northern elephant seals, *Mirounga angustirostris*, *PLOS ONE* (2024). [DOI: 10.1371/journal.pone.0308461](https://doi.org/10.1371/journal.pone.0308461)

Provided by University of Victoria

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