

Could humans communicate with whales?

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The Geochemical and Environmental Research Group (GERG), a center within the College of Geosciences at Texas A&M University, will conduct a research program with [Project CETI](#), the Cetacean Translation Initiative, to understand vocalizations of sperm whales off the west coast of Dominica in the Caribbean.

The research is funded by CETI, a non-profit organization. Texas A&M GERG's role in the project is to build three massive buoys and moorings, which GERG will deploy in about 6,000 to 7,500 feet of water. The Aggie scientists will also work with the University of Haifa, Israel, to develop acoustic monitoring systems within the buoys. The large buoys are almost eight-foot-wide surface floats, with acoustic monitoring systems throughout the top 3,600 feet.

New technologies, such as [artificial intelligence](#) and machine learning, will translate the clicks and other vocalizations into a language to understand what sperm whales are talking about, said Anthony Knap, director of GERG and the principal investigator at Texas A&M for the project. John Walpert, technical team lead for GERG, will lead a team of engineers, technicians and software engineers to design and construct the arrays.

"GERG and Texas A&M are excited to be part of this project and we were pleased to be approached to build these systems," Knap said.

The project lead principal investigator is David Gruber, presidential professor of biology and environmental science at City University of New York (CUNY). Gruber is also an explorer for National Geographic, discovered the first biofluorescent sea turtle, and developed a "shark-eye" camera to gain a shark's perspective of the underwater world.

Recent advances in engineering, artificial intelligence (AI), biology, and linguistics have brought scientists closer than ever to understanding the communication of other animals, Knap said. The sperm whale is the animal with the largest brain, and like humans, it has a complex communication system and lives in tightly knit family groups, he said.

The researchers believe they now have the tools to identify and translate the deep structure of their communicative patterns and kick-start the

path toward meaningful dialog with another species. The team said that they also aim to illustrate whales' intelligence and the value of conservation actions.

[Project CETI is bringing together](#) a unique team of accomplished scientists and technologists to study the [communication of sperm whales](#). This includes collaborators such as Harvard University, Massachusetts Institute of Technology, Imperial College London, Haifa University, University of California at Berkeley and ISI Italy. Recent breakthroughs in AI and unsupervised machine translation have, for the first time, allowed researchers to interpret and translate between two unknown human languages without needing a "Rosetta Stone" or parallel structure, the researchers said. Project CETI will build on these discoveries to provide the first-ever blueprint of another animal's language.

GERG has decades of experience designing, building and operating a wide array of remote and autonomous ocean observing systems throughout the world. GERG operates the Texas Automated Buoy Network for the Texas General Land Office, and also operates a High Frequency Radar Network on the Texas coast. GERG also operates a number of underwater autonomous systems such as buoyancy gliders and autonomous wave powered vehicles. The buoyancy gliders have been recently used for measuring upper ocean heat content to get a better prediction of hurricane intensity.

"Our work with the University of Haifa, Israel in the development of THEMO, the Texas A&M Haifa Eastern Mediterranean Observatory, has led to this opportunity with CETI," Knap said. "Along with all of the CETI team, I look forward to translating what the whales are saying."

Provided by Texas A&M University

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