

# Creep into the DEEPEND

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# SEAMAIL™

FROM: DEEPEND Science Team  
TO: DEEPEND Virtual Team Leaders  
SUBJECT: Vertical Migration and SONAR

Dear Virtual Science Team,

I am part of DEEPEND's Acoustic Research Team. What is that? In our DEEPEND project, we use sound to measure the number of animals in the ocean and how deep they live.

One of the most amazing aspect of the deep sea is that many of the animals move up and down every day. At night, they move up from the deep ocean toward the surface. When the sun rises, they move back to the deep again. We call this **vertical migration**. Vertical migration is the largest migration on Earth. It happens every day throughout the World's ocean.

In order to study vertical migration, we use \*SONAR. Basically, that means using sound to see. Think of bats or dolphins. They use echolocation. That's nature's version of SONAR.

Our SONAR sends out pulses of sound into the ocean. When the sound bounces back, we measure what animals the sound bounced off of -- the echo. It is kind of like turning on a flashlight in a dark room. The first two images (PHOTOS 1 AND 2) shows the SONARs we use when we are at sea to illuminate the deep sea. The first shows the SONAR attached to the ship. It gives a full picture of where the sound was reflected and means those are animals.

One of the challenges with this research is that we can only get broad patterns of where animals are located. It is difficult to inspect the behavior of a single fish, shrimp, or plankton. You can see in the third image that these animals move up and down in the ocean and that changes when the sun comes up or goes down. During this research trip we tried something new. We put a SONAR on our [CTD](#). Then sent it down to 984 feet (300 meters) to watch the migrating animals (PHOTO 3). This gave us a tiny view of what lives in these layers. With this information we can count and measure the animals and even see how fast they move through the water.

If you were part of our Team, Team Acoustics, how would you use sound to study the ocean? Can you think of some challenges to using sound to study the deep?

*Kevin*

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Creep into the DEEPEND Mission

\*SONAR stands for **S**ound **N**avigation and **R**anging.

PS: Here's a [NOAA video](#) about how scientists use SONAR to map the seafloor



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