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DOLPHIN VOCALIZATIONS

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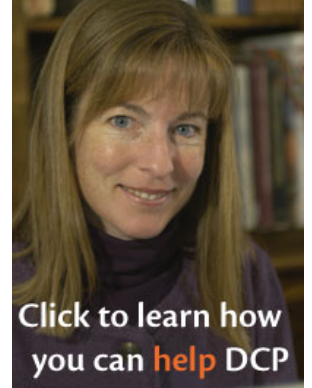
Learn all about dolphin vocalizations and dolphin sounds in this week's episode, featuring real audio recorded this summer from wild dolphins at our research field site at Mikura Island in Japan.

>Hello everyone! The Dolphin Pod is back on the air after a short break. I've just returned from a research trip to Mikura Island in Japan where the Dolphin Communication Project is involved in a long term study of a group of Indo-Pacific bottlenose dolphins that live around the island. I've been lucky enough to swim with these wild dolphins over the past few months, collecting video and audio data for our research. At the moment, I am looking at a fresh stack of DVDs filled with underwater dolphin video – 8 hours worth to be exact. It took me 26 boat trips and 53 hours out on the water in order to collect this video data.

This provides me the perfect opportunity to explain a little about dolphin vocalizations. Not only can I give you some facts about dolphin sounds, but I can play actual recordings from this summer's data in order to illustrate my point. So here goes:

The species that I was studying this summer, the Indo-Pacific bottlenose dolphin, produces vocalizations falling into roughly two categories: whistles and clicks. Interestingly, not all species of dolphins are able to make whistle

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Dolphin whistles are frequency modulated – meaning the pitch of the sound changes across time, going up and down. Here is an example of a typical whistle taken from this summer's audio data (play sound). You can hear the pitch of the whistle rising and falling. Whistles are thought to be used only for communication purposes. Dolphins produce whistles in a variety of situations: when excited, playful, or scared. Dolphins that are trapped in tuna nets are known to whistle intensely. Typically, dolphins produce more than just one type of whistle – scientists have tried to categorize the various whistles and click sounds produced by dolphins (primarily bottlenose dolphins since they are the easiest to study), and usually end up with a list of around 40 different sounds. It is likely, however, that whistles are not always distinct – they may be graded sounds, meaning that the different whistle categories might actually bleed into each other and sound only slightly different. It also appears that dolphins tend to change the structure of their whistles over the years. There is one hypothesis that suggests that dolphins produce a signature whistle – one stable whistle sound that is used to refer to themselves – a lot like a name. The hypothesis suggests that young dolphins will develop their own distinct whistle which they then emit in order to convey information about their identity to other dolphins. This hypothesis has a long and controversial history, and we will deal with it more fully in a future episode of The Dolphin Pod. For now, let's have a listen to some more dolphin sounds.

(play echolocation sound).

This is the sound of dolphin echolocation – it is a sound I hear quite a bit when swimming with the dolphins around Mikura. You may recall from previous episodes of The Dolphin Pod that dolphins produce rapid clicking sounds that they use as a kind of sonar. Dolphins produce clicks and listen to the click echoes as they bounce off objects in their environment, providing them with a variety of information about the object's size, composition, density, etc. The Mikura dolphins are always very interested in me and my strange underwater camera – presumably, the camera is an interesting object for dolphins as it will produce all sorts of click echoes thanks to its solid form. This explains why I seem to get a lot of dolphin echolocation attention when I am in the water. Listen to this next clip where you can hear a group of dolphins approaching me from the distance, all engaging their echolocation simultaneously. (play clip)

You might have noticed that the clicks tend to come more rapidly as the audio clip progresses. This is because the dolphins wait to produce their next click until the echo arrives from the previous click. As they get closer to me and the camera, it takes less time for the click to go out and back, so the click repetition rate gets faster and faster. Have a listen to the following clip where you can hear a dolphin approaching from the distance – note that the clicks get faster and faster as he gets closer. (play clip)

As a general rule, dolphins produce echolocation clicks that occur less than 250 clicks per second – when I am in the water with the Mikura dolphins I am usually hearing clicks that occur far less often than that. I can easily count the

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Dolphins are able to produce whistles and click sounds simultaneously. Here is an example of a dolphin that was swimming circles around me, whistling and clicking at the same time (play sound). This zany dolphin spent a few minutes making these whistle/click sounds while also emitting a bubble stream from his blowhole with every whistle.

One of my favorite sounds produced by the Mikura dolphins is something that I have nicknamed the pop-creak. It is usually produced when a large group of male dolphins is chasing an individual. I have the impression that this is an aggressive activity as it is usually accompanied by other behaviors that are typically seen during aggressive encounters: biting, chasing and charging. It is a bit hard to hear, but have a listen to the following clip – you can hear a pop sound followed by something that I can only describe as the sound of a ping-pong ball bouncing. (play sound)

Whenever I hear this sound I tend to get a bit nervous – it usually means that I will encounter a group of aggressive looking males off in the distance. Sometimes it is accompanied by a harsh dolphin whistle that sounds a lot like a scream. Listen to the clip again and see if you can pick out the scream whistle. (play clip). I am not sure if this is produced by the dolphin being chased, or by the chasers. Aggressive encounters like this are often accompanied by jaw clap sounds. Have a listen to a jaw-clap. (play sound) This sound is made by a dolphin vigorously clamping her jaws together – it is the sound of her teeth crashing together at high velocity. I can tell you from personal experience that it is extremely loud!

So there you have a small sampling of dolphin sounds that I experienced this summer. Different species of dolphins will of course produce a whole variety of different sounds. But these are the sounds I heard most often from the Indo-Pacific bottlenose dolphins that I encountered this summer. To learn more about my research trip to Japan, visit The Dolphin Pod website or [www.dolphincommunicationproject.org](http://dcp.cybersense.us/) (<http://dcp.cybersense.us/>)

Stay tuned for more episodes of The Dolphin Pod coming to you soon!

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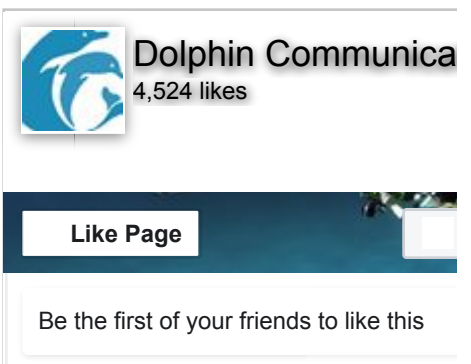
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