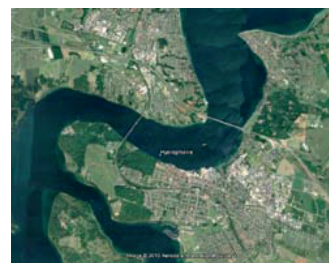
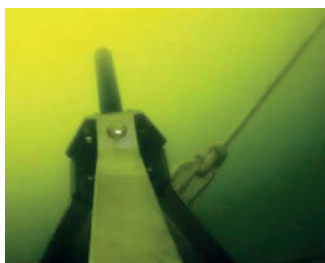


MIDDELFART LISTENING STATION



Middelfart is a marine protected area containing a high density of harbour porpoises. Seiche is working in partnership with Aarhus University and Naturpark Lillebaelt to provide real-time monitoring of porpoise activity and levels of ambient sound.

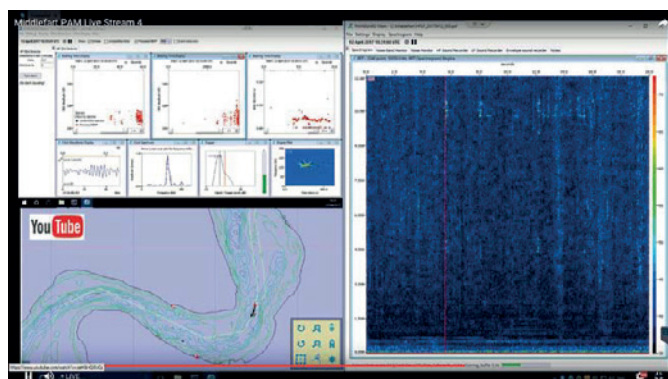


The aim of the Listening Station is to help gain an understanding of why this area is important for porpoises, why porpoise activity fluctuates over 24-hour periods as well as throughout the year, and how human activities affect porpoise behaviour.

Software is used to remotely access and control the system over the internet, and audio and visual displays are streamed to the Seiche YouTube channel.

Viewers may see a spectrogram of ambient sounds, a map with the tracks of larger vessels (AIS reports), or a click detector display, where porpoise clicks are automatically displayed as

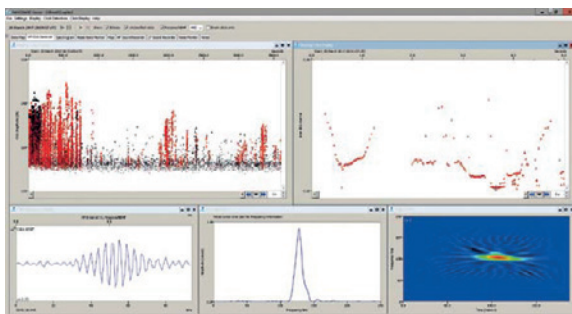
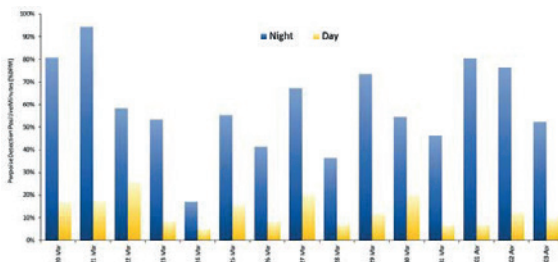
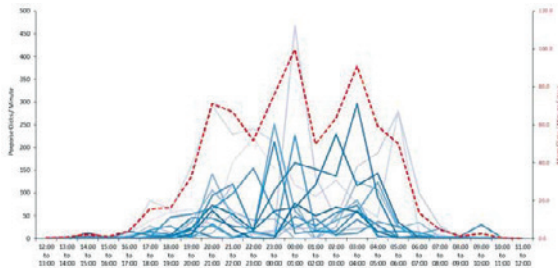
red triangles. The audio is a mix of low frequency background sounds and high frequency porpoise clicks that have been dropped down into human hearing range output via a PAMGuard envelope detector. An audio cable transmits these sounds to an adjacent public display.



MIDDELFART LISTENING STATION

Tailored Listening Stations:

If you would like more information, or are interested in discussing tailoring a system to suit your needs, contact Seiche on **+44 (0)1409 404050** or email **info@seiche.com**



Seabed Hydrophone Installation

The Middelfart Listening Station hydrophones and preamplifiers were mounted on a pyramidal frame, and placed on the seabed at the edge of an artificial reef, in about 15 m water depth. Two hydrophones are utilised: one sensitive to high frequencies to detect harbour porpoise echolocation clicks, and another sensitive to lower frequency response to record ambient sound levels including noise produced by vessels using the channel. A cable to shore runs along the underside of a jetty and into an old boat house where the shore-side electronics are located, from where electrical power (12 V DC) is supplied to the hydrophones.

First Results

We analysed continuous sound recordings from the first two weeks that the hydrophones were deployed at Middelfart. This initial data confirmed that porpoises occupy this area on a daily basis, but showed that their acoustic activity is far higher at night than during the day. Detection rates at night are very high, with porpoises present near the hydrophones for long periods. We suspect that porpoises move close inshore at night to feed around the artificial reef. At twilight during the installation, several porpoises were seen and heard blowing very close to the boat house jetty. One area of research will now focus on the automatic detection of feeding buzzes, to enable us to estimate the intensity and the success of night-time foraging.