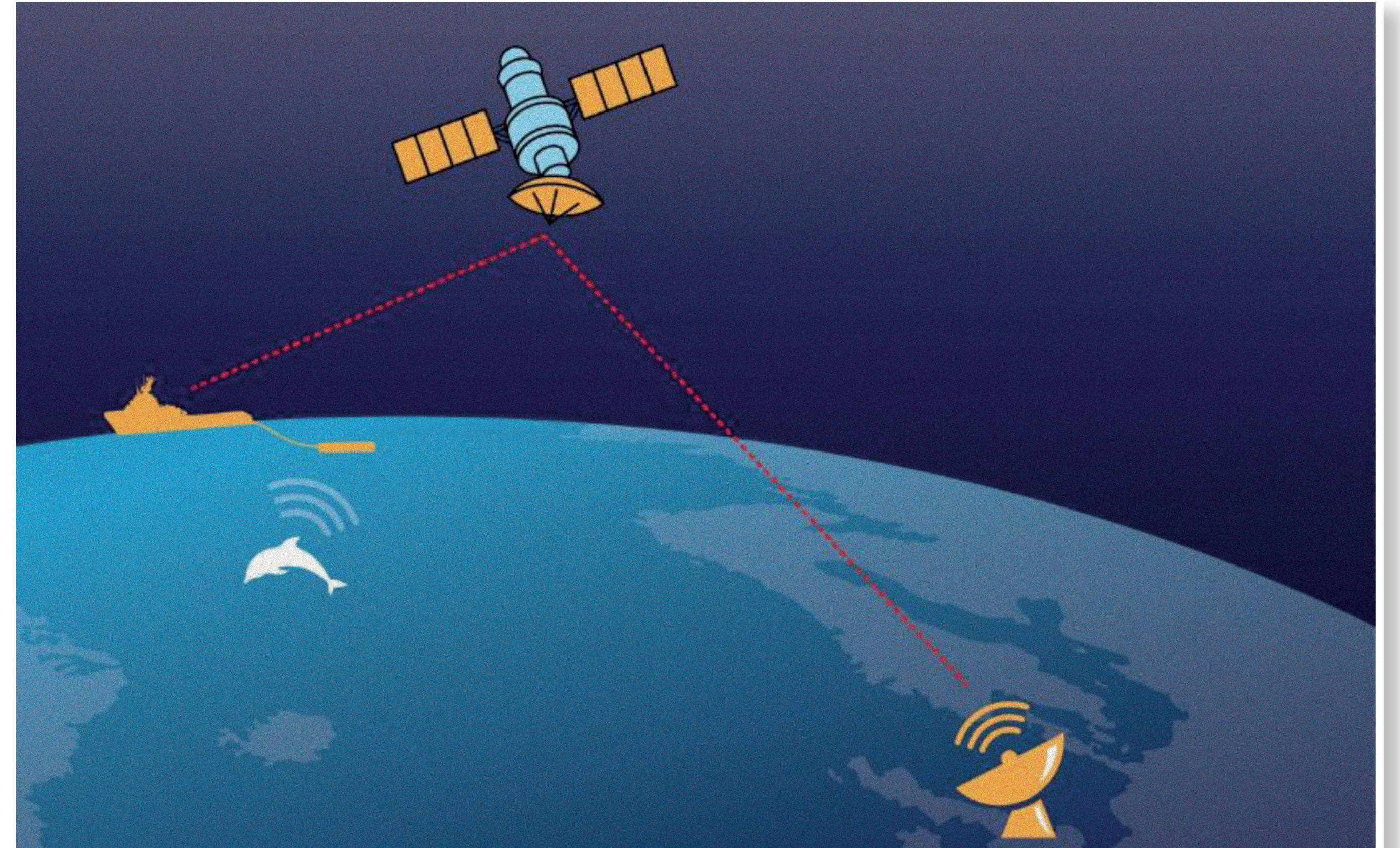


# Remote Passive Acoustic Monitoring for Mitigation

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## INTRODUCTION

Remote Passive Acoustic Monitoring (RPAM) technology enables live acoustic monitoring of marine mammals at an on-shore location. Acoustic data is transferred in real time via satellite link from an at-sea PAM system, such as a seismic vessel. From anywhere in the world, an RPAM operator can then detect vocalising whales and dolphins with reduced need for personnel offshore.



## METHODOLOGY

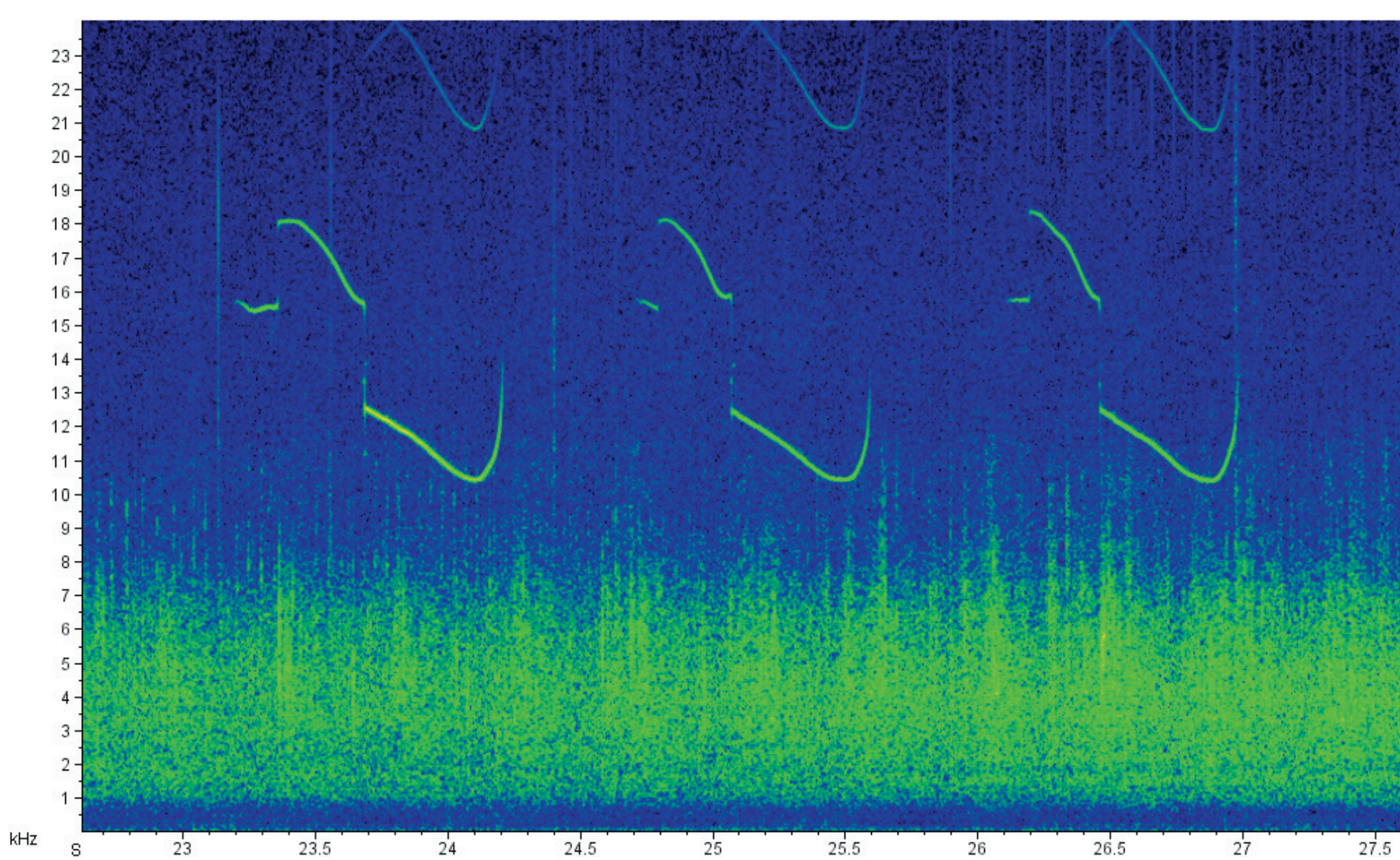
RPAM delivers a consistent stream of data at a quality comparable to the signal received on the vessel. The vessel's existing satellite communication is utilised with additional bandwidth. Full low frequency signal (<20 kHz) is transmitted. High frequency signal is monitored over remote desktop software.



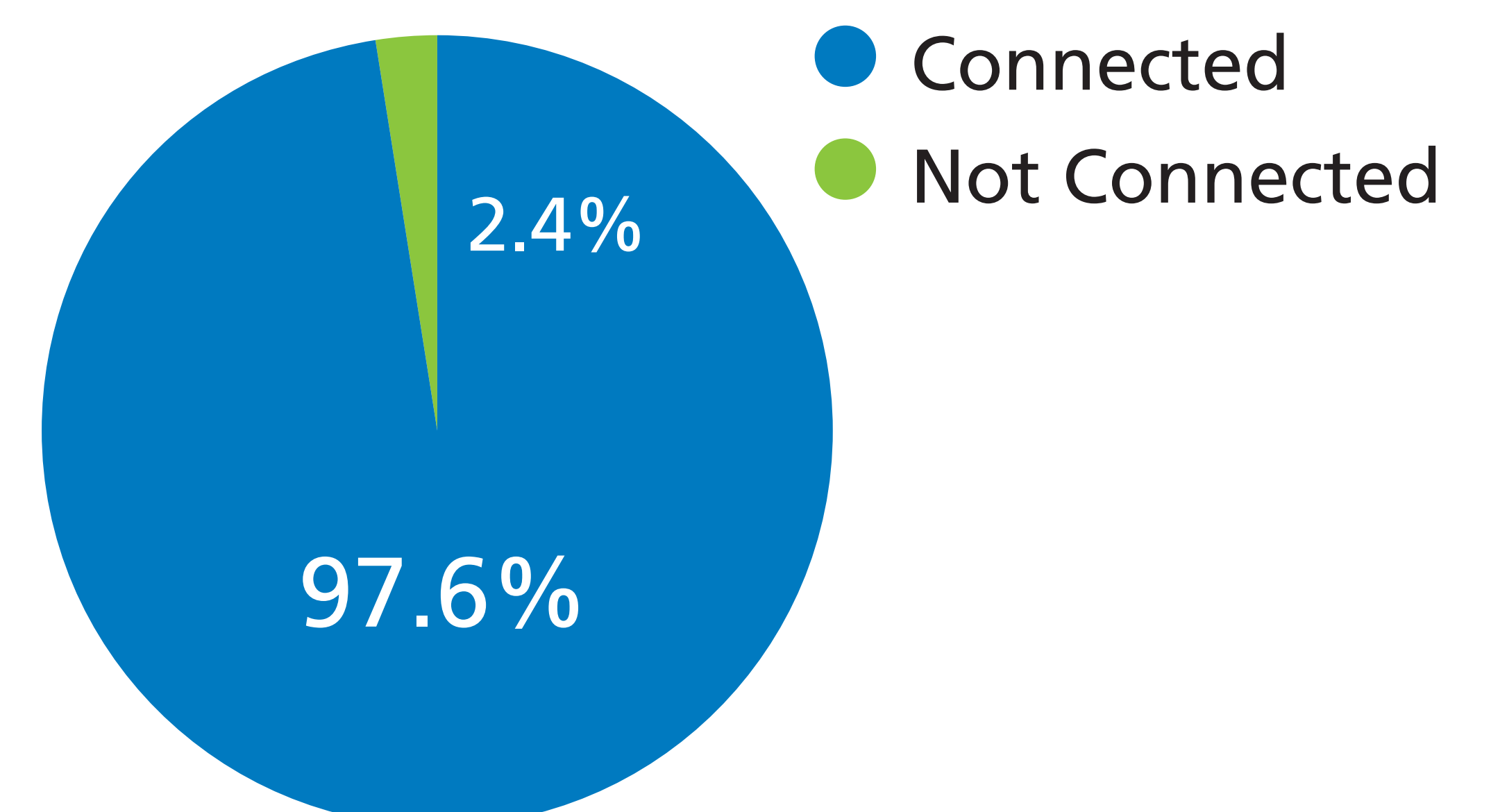
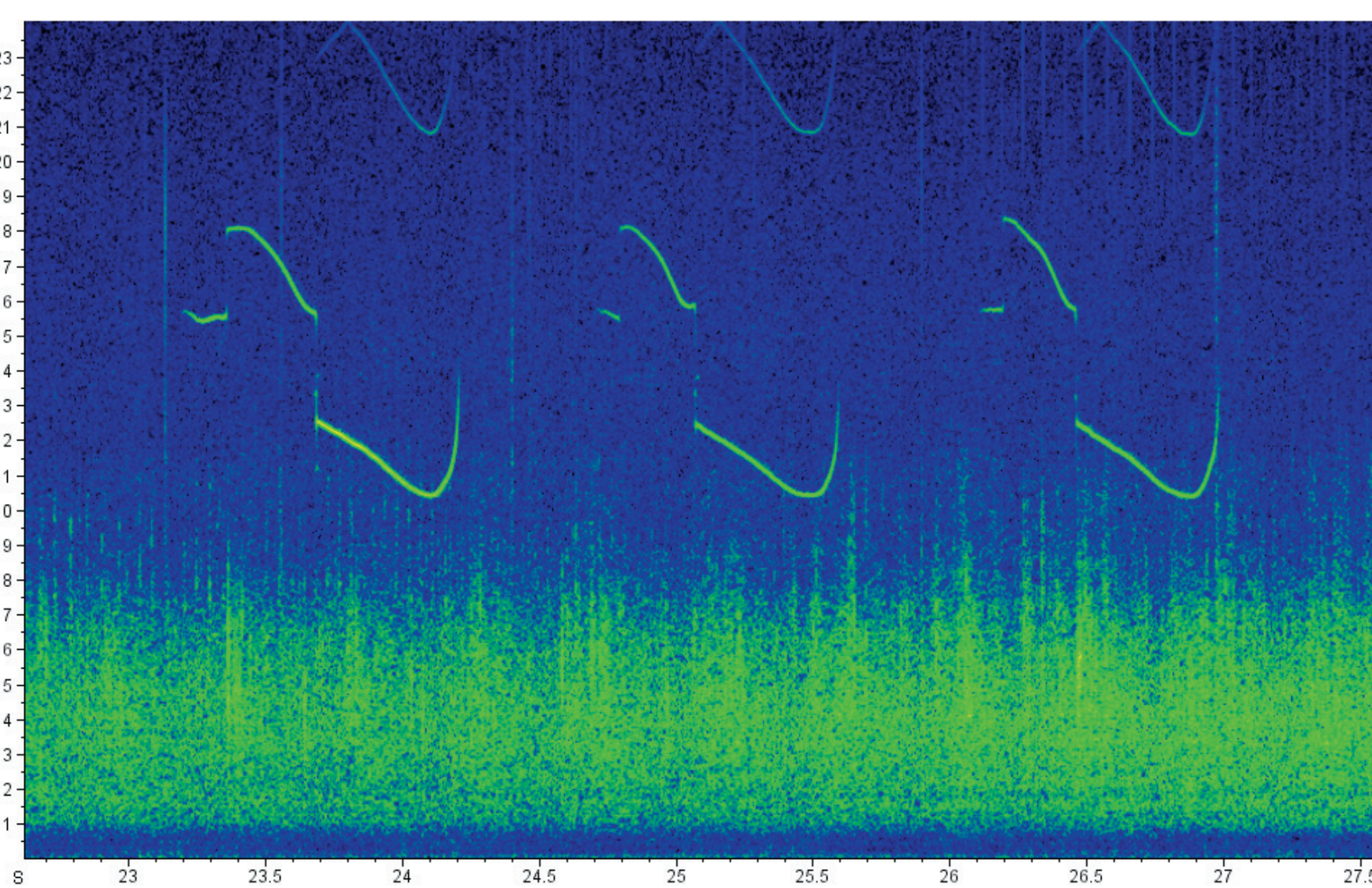
A well-trained Remote PAM Operator monitors from the safety of an onshore station. Constant communication with the onboard operator is maintained by instant chat-messaging, emails and telephone. Support can be provided to onboard operators on technical aspects and mitigation decisions from experts viewing the same signal.

## RESULTS

Four full-scale projects have now been completed from Seiche's RPAM base in Devon, UK. Over 12,000 hours of acoustic monitoring have been conducted from seismic vessels off Australia, Malaysia, Trinidad & Tobago, USA and Canada. Of this, sole mitigation monitoring has been provided for 600 hours. A total of 943 acoustic detections of several species of marine mammals have now been recorded remotely. Detection rates are near identical to those recorded onboard. Connection rates of >95% have been consistently attained.



*A dolphin whistle detected at sea in the USA (left) and simultaneously on land in the UK (right)*



*RPAM Connectivity: instances of RPAM "loss" subtracted from the available PAM signal*

## CONCLUSIONS

- Connection rates and quality levels very close to that on vessel, established from extensive trials
- Key role in supporting onboard operators to provide high quality mitigation monitoring