EIMR2014-9101

Advances in studying vocalising cetaceans in energetic coastal sites using moored and drifting passive acoustic detectors

Jim Elliott, Steven Benjamins, Ben Wilson

Scottish Association for Marine Science, Scottish Marine Institute, Oban, Argyll, PA37 1QA, UK

Dynamic coastal waters present considerable difficulties for the study of cetacean distribution, abundance and habitat use, due to diverse bathymetry, exposed coastlines and the variable impact of tides and waves. With these areas showing increased interest for wave and tidal developments, detailed information on cetacean activity and their use of these areas is important information for consenting.

Vessel-mounted surveys of these sites are often negatively impacted by unsettled weather patterns and localised tidal conditions, and can offer only snapshots of cetacean distribution. Conversely, moored passive acoustic monitoring (e.g. C-PODs) allows for continuous data acquisition, although moorings can be costly to deploy and run the risk of equipment loss from trawlers or strong tidal flows. For the last three years, our research group has specialised in developing and testing low-cost, lightweight mooring designs for tidal and wave energy sites off Scotland. Autonomous porpoise click detectors (C-PODs) and sub-surface acoustic releases were included within linear moorings of rope, chain and ballast, and deployed from commercial vessels with modest winch specifications.

Our methods have evolved following positive and negative experiences, resulting in recent successes in tidal (click detectors deployed in 100m with 5m/s current for 5 days) and wave energy test sites (click detectors deployed over 250m in 60m of water over 2 months). Previous losses were due to: a) delayed retrieval, b) unknown fishing activity or c) poor buoyancy design. New techniques have utilised moored and drifting click detectors to assess variability in temporal-spatial distribution of harbour porpoise (*Phocoena phocoena*). Recent trials have shown that 1) basic mooring designs can be efficiently deployed from low-cost platforms, 2) lack of surface expression greatly reduces consenting requirements and risks, 3) moored passive acoustic methods can, as a result, be successfully used to study odontocete cetaceans in tidal streams, and 4) drifting detectors are easy and cost-effective to deploy; 5) they provide wider spatial coverage albeit without standardised effort coverage, 6) the combination of moored and drifting devices can provide more detailed information about how porpoises use the site.