Well associated gas seeps from exploration wells on the Norwegian Continental Shelf

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The Norwegian Continental Shelf (NCS) hosts around 2000 drilled exploration wells (wildcat and appraisal wells). Here we present a compilation of data based on multibeam echosounder (MBES) water column data (WCD) from 8 different scientific research expeditions and 14 different governmental surveys covering large parts of the Barents Sea, the Norwegian Sea and the northern parts of the Norwegian North Sea (between 60.25°N - 62°N). MBES WCD from ~650 exploration wells in these areas of the NCS have been investigated, representing more than 50% of all exploration wells drilled in the investigated areas. ~35-42% of these exploration wells, depending on area, have well associated gas seeps (WAGS). WAGS are in this study defined as water column anomalies (gas flares) in MBES WCD with close proximity (<~25 m) to well locations. Large regional differences in the number of WAGS are observed in the different areas, some areas having zero WAGS, others more than 50%. These differences seem to largely be due to different geological settings. A strong correlation between areas with natural gas seeps and areas with WAGS is observed. Many dry wells have WAGS, indicating gas from somewhere else than inside the well. E.g. from (very) shallow gas or natural preexisting seep/migration systems in the shallow overburden which, when exploration wells are drilled, can find new paths to the seafloor through the borehole, most likely outside the surface casing.