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Methane dynamics in the Belgian coastal zone, a contribution to the BELSPO project "4 decades of Belgian marine monitoring" (4Demon)

Methane is the second most important greenhouse gas after CO₂. Yet, there remains an important uncertainty on estimates of the sources and sinks of CH₄, and how their variations can affect the atmospheric CH₄ growth rate and burden. The open ocean is a very modest source of CH₄ to the atmosphere compared to other natural and anthropogenic CH₄ emissions. Coastal regions are more intense sources of CH₄ to the atmosphere than open oceanic waters. The high CH₄ concentrations in surface waters of continental shelves are due to direct CH₄ inputs from estuaries and from sediments where methanogenesis is sustained by high organic matter sedimentation. Biogenic or thermogenic CH₄ can accumulate in large quantities in sub-surface seabed (gassy sediments) in deep and shallow areas, and can be released as bubbles (gas flares) or by pore water diffusion. We report a data-set of CH₄ concentrations in surface waters of the Belgian coastal zone (BCZ) in spring, summer and fall 2010 and 2011. This is a coastal area with multiple possible sources of CH₄ such as from rivers and gassy sediments. This is a contribution to BELSPO projects BELCOLOUR-II and 4Demon.