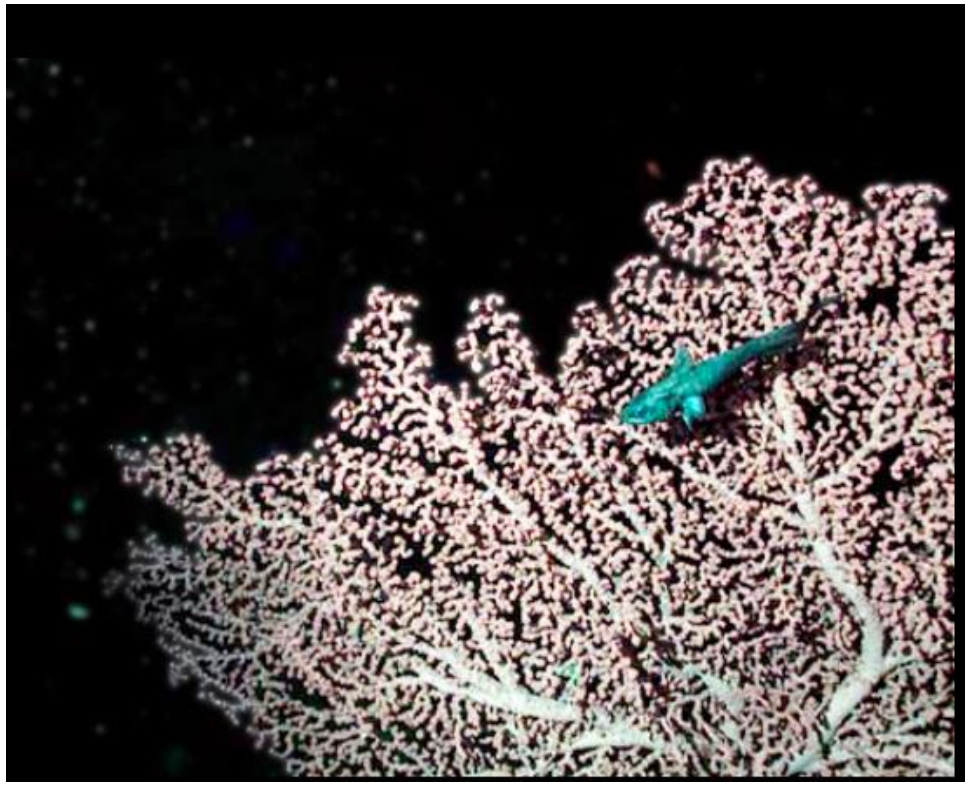
Gamma-ray spectra from natural archives

Radionuclide tracers to understand climate change

Mikael Hult, Dana Ransby

Team-leader, Radionucliude Metrology

Cold water corals



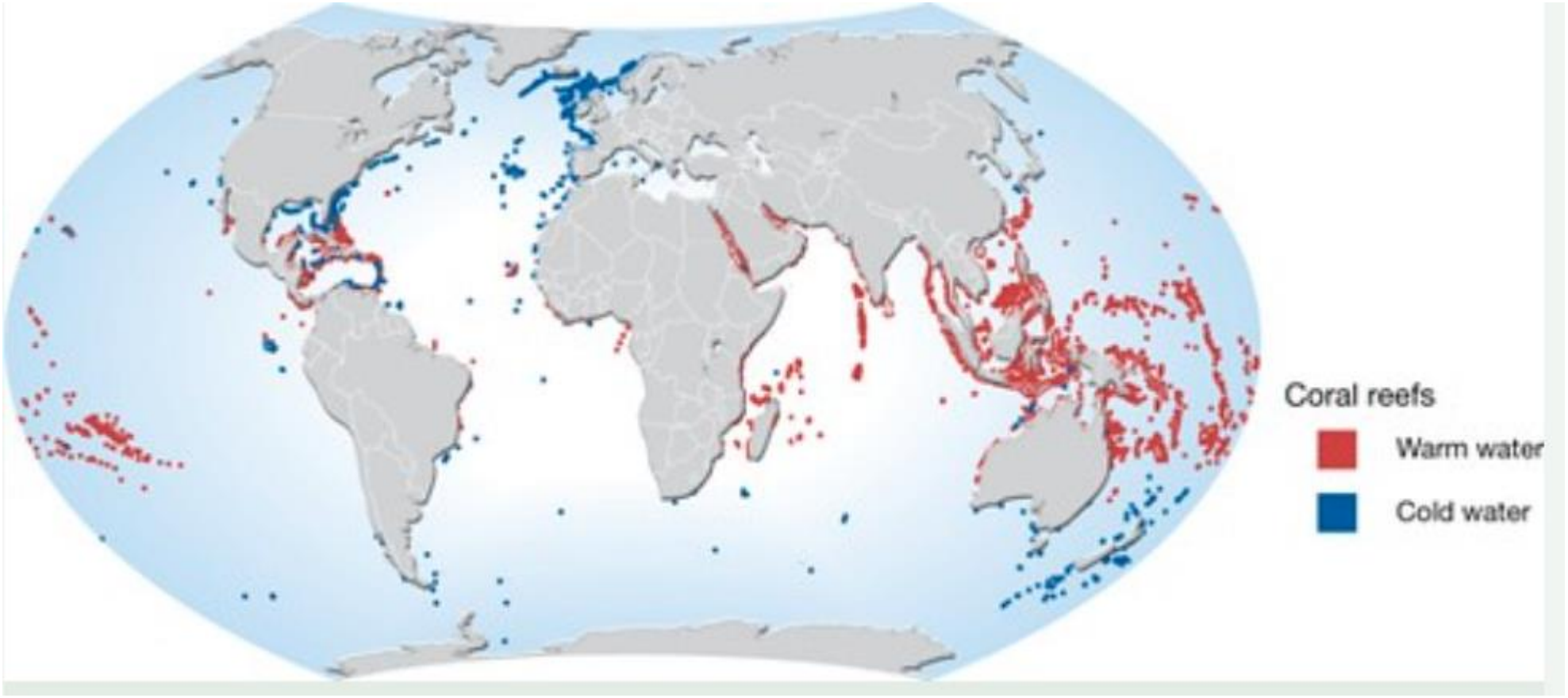
Extract from Wikipedia:

- D**eep-water corals**, also known as **cold-water corals**, extends to deeper, darker parts of the oceans than tropical corals,

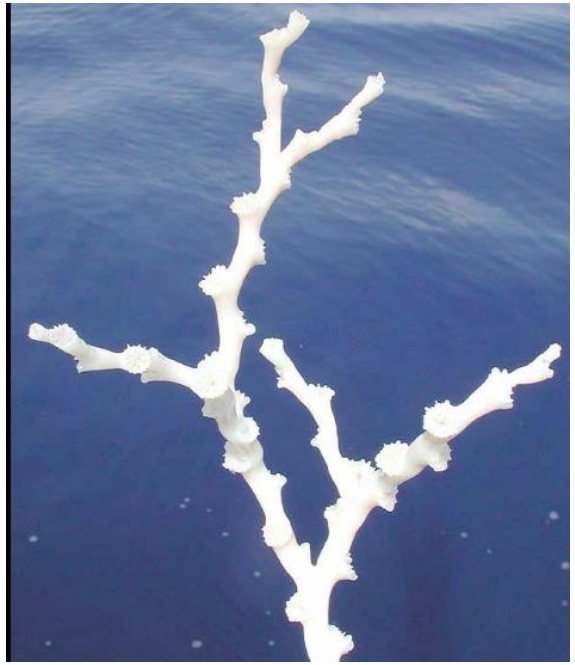
- Habitat ranging from near the surface to beyond 2,000 metres where water temperatures may be as cold as 4 °C.

- Deep-water corals belong to the Phylum Cnidaria and are most often stony corals, but also include black and thorny corals and soft corals including the Gorgonians (sea fans).

The world’s oldest living organism?



Lophelia pertusa



Extract from Wikipedia:

- Lophelia pertusa, the only species in the genus ***Lophelia***,

- It is a cold-water coral that grows in the deep waters throughout the North Atlantic ocean
- Although *L. pertusa* reefs are home to a diverse community, the species is extremely slow growing and may be harmed by destructive fishing practices, or oil exploration and extraction.

European Commission

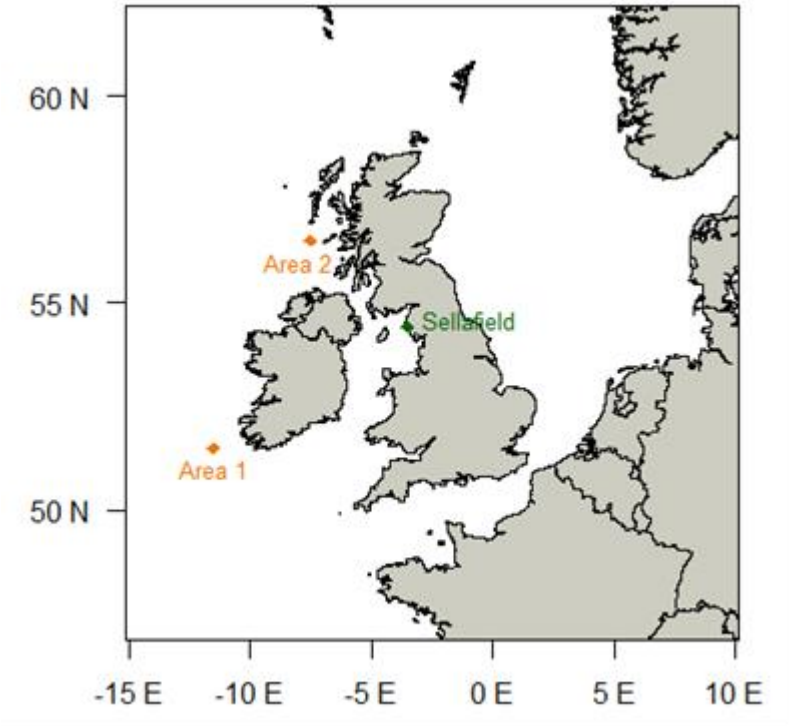
Lophelia pertusa

- Radiocarbon dating indicates that some *Lophelia* reefs in the waters off North Carolina may be 40,000 years old, with individual living coral bushes as much as 1,000 years old.

Sampling sites

Sampling by:

Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany



Map of the North Atlantic Ocean indicating the two sampling and research locations.

Area 1 - Pollux Mound

Area 2 - Mingulay Reef

Alfred Wegener Institute,
Helmholtz Centre for Polar and Marine Research,
Bremerhaven, Germany

European Commission

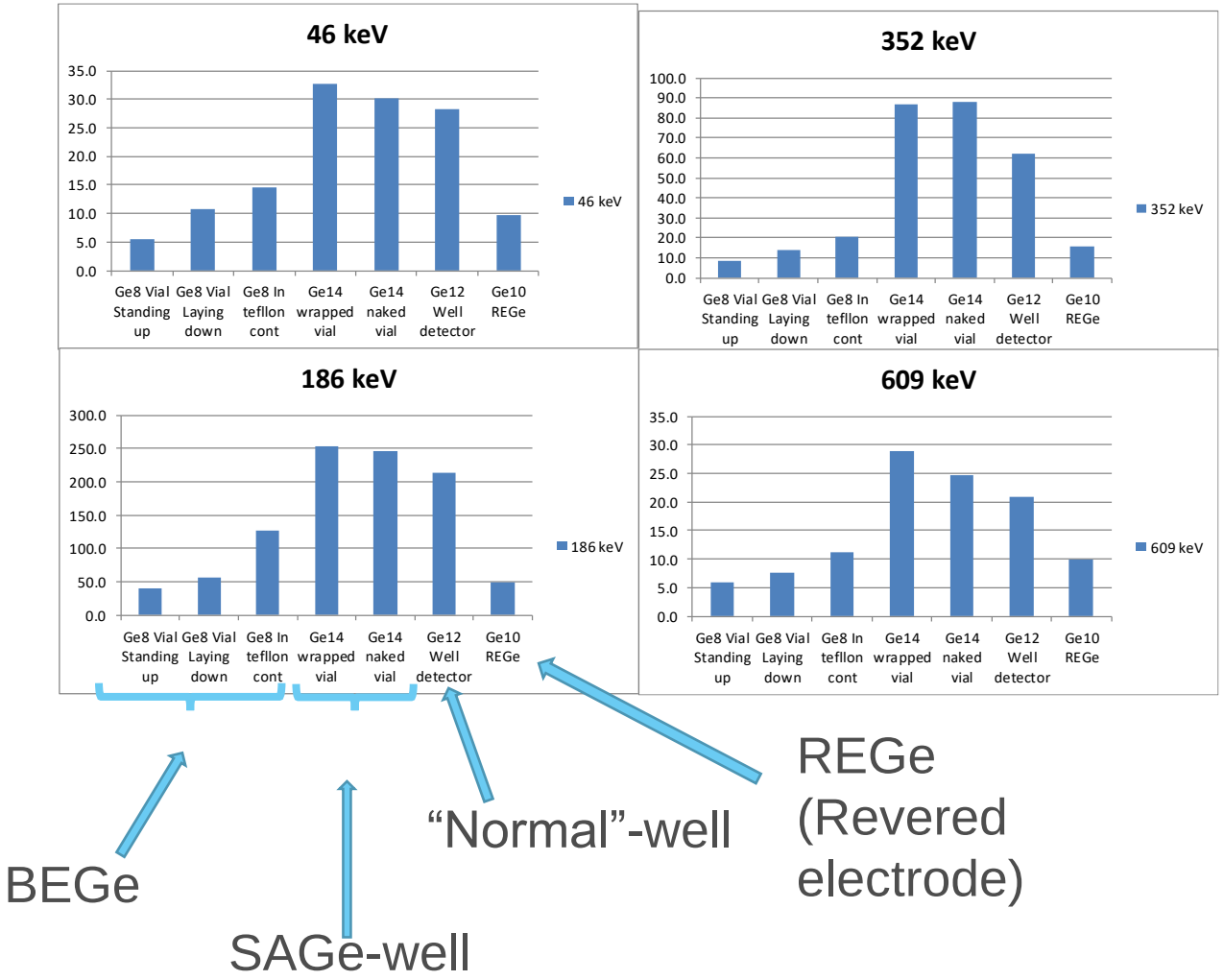
Lophelia pertusa

Lophelia coral branch from Pollux Mound with several generations of polyps

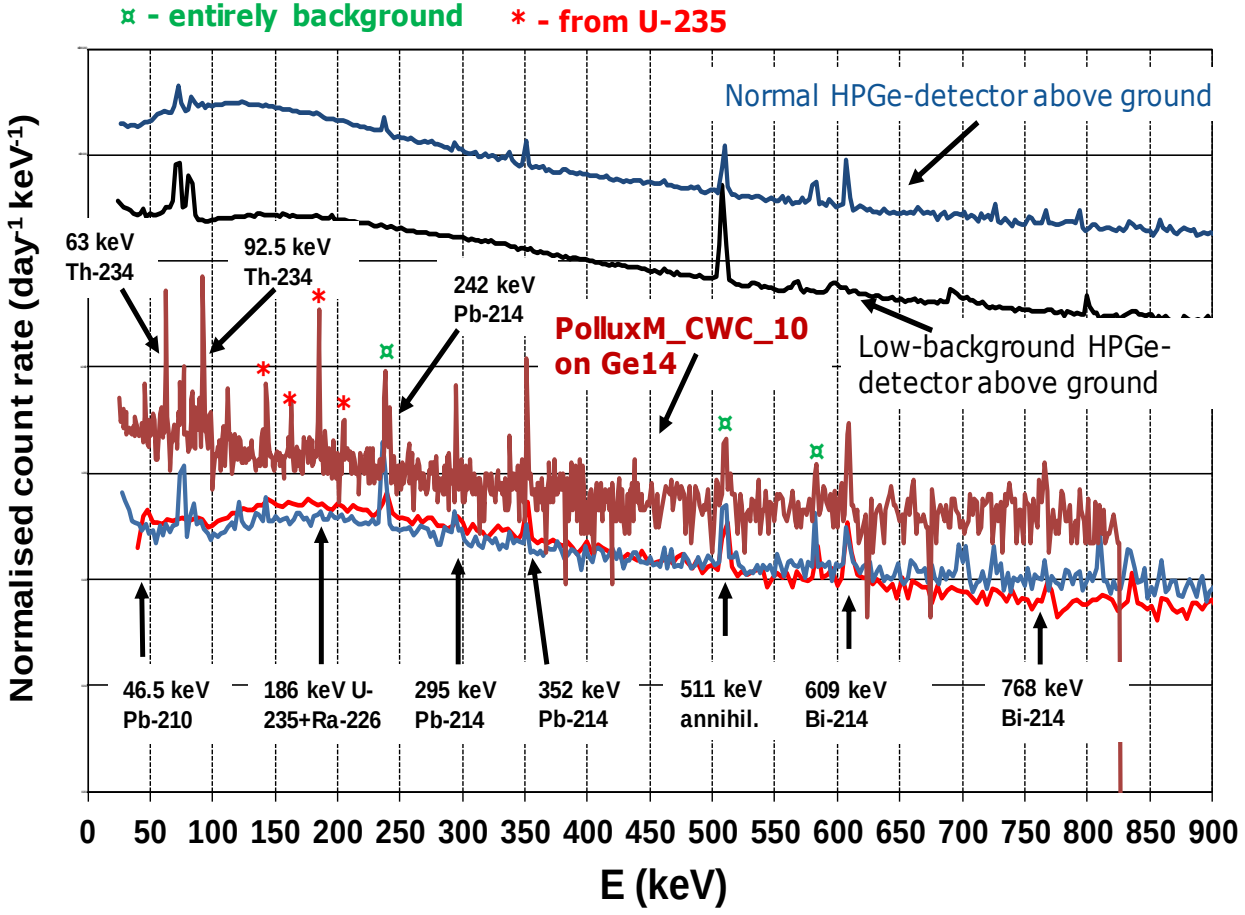
Lophelia pertusa

A photo of sample “PolloxM CWC 08”, when placed in the measurement vial which is wrapped in Teflon tape at the top.

FEP efficiencies in different configuration



SAGe-well spectrum of 0.53 g *Lophelia*



The spectrum from sample **PolluxM-CWC_10** measured for 14 days on SAGe-well detector Ge-14 in HADES.

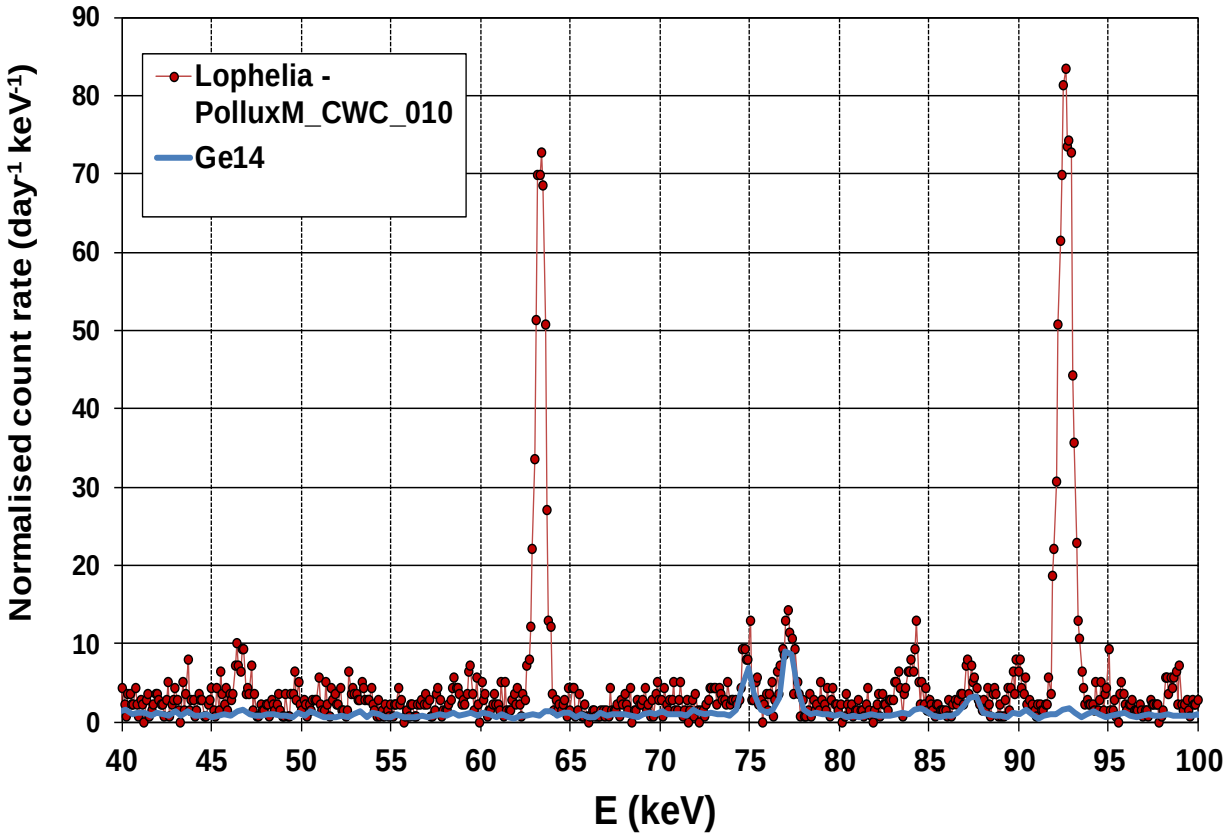
Comparison is made with background spectra from different detectors.

The Ge-14 background is the solid blue line at the bottom.

The solid red line is the background of the sandwich detector (which was not used in this study).

European Commission

SAGe-well spectrum of 0.53 g *Lophelia*



The low-energy part of previous slide, including only two spectra:

The background of Ge-14 (in blue), measured for 48 days,

and a Lophelia sample (in red) measured for 14 days.

Thank you

European Commission