Ocean Bottom Seismometer-System (OBS)

K.U.M. Umwelt- und Meerestechnik Kiel GmbH designs, manufactures and sells OBS-Systems and works closely together with IFM-GEOMAR (Leibniz-Institute for Marine Sciences, Kiel).

Two versions are available:
first the OBH-System (Ocean Bottom Hydrophone-System) and second the OBS-System (Ocean Bottom Seismometer-System). They differ from each other that latter is additionally equipped with a seismometer.

Since 1992 the IFM-GEOMAR successfully uses both systems and has deployed them over 4000 times.

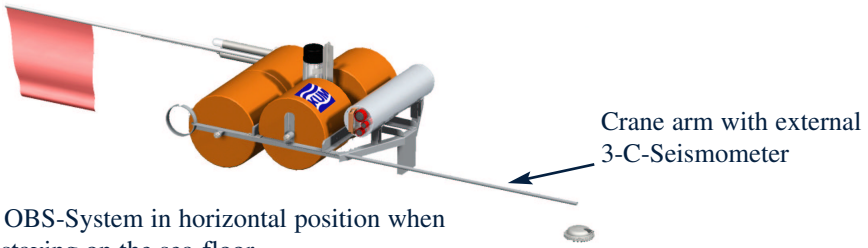

Fig.. 2: OBS-System in horizontal position when staying on the sea-floor.

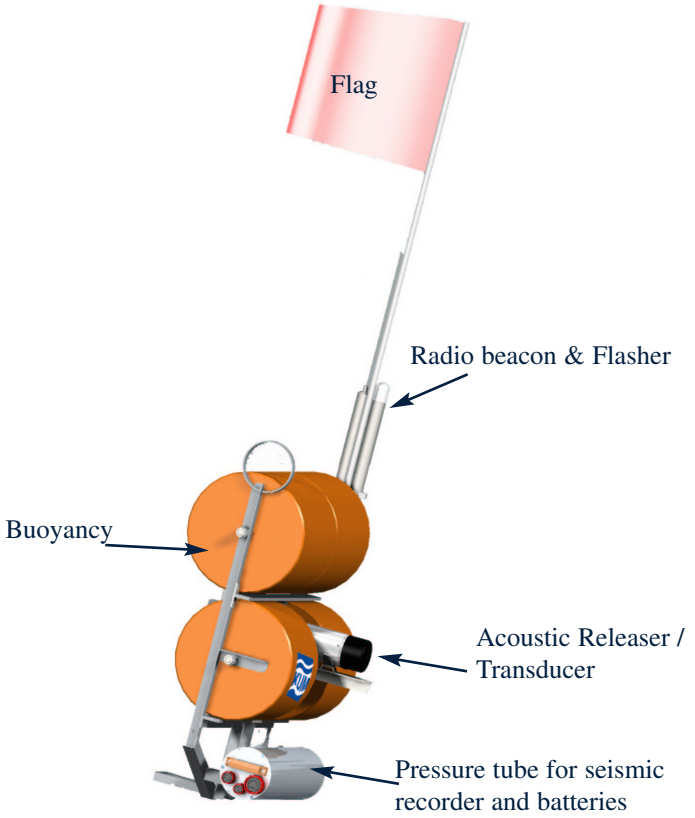

Fig. 1: OBS-System in upright position when ascending.

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General

The OBH/OBS-System serves to investigate the sea bottom.
There are two methods.

a.) Airgun-technique (generation of pressure waves = active seismics)

Artifically generated pressure waves and their echo are measured, recorded and evaluated.
By that layer thicknesses (bottom layers) up to some kilometers can be classed with a material.

(b.) Passive Seismic, Seismology

Tectonic movements or sea quakes generate seismic signals which are measured and evaluated on the basis of their amplitudes and lengths.

Commercial use / Offshore Exploration

With the help OBS-systems sub-sea oil and gas deposits (hydrocarbon) can be detected. Oil industries use them for offshore exploration.
The search for oil and gas deposits is effected with seismic methods: the airgun shoots sounds to the seafloor and the echoes reflected from the different ground layers are recorded. Each material generates a different, specific echo. In this way oil and gas deposits can be detected. Data recording with the OBS-system is done directly on the seafloor. By that recorded data is much more useful and exact than data recorded from “streamers”, that are towed from ships near below the water surface.

Since the eighties the know-how of such systems is developed from Research Institutes in the US and in Europe. Already in early times it was forwarded to exploration industries in Germany.

OBS - what`s it?
An OBS is an autonomous system. Due to its anchor weight it sinks down to the sea floor. There the hydrophone records the water echo and the geophone smallest ground movements. After the resarch period an acoustic signal coming from the vessels effects that the anchor drops and the OBS-system ascends again to the water surfac where it is recovered from the research vessel.

Our OBS-systems work (= descend, data recording on the sea floor, ascend) completely autonoumously, i.e. without any (cable) connection to the vessel. That`s why they are “Self-Landing and Ascending Ocean Bottom Seismic Systems” or SLA-OBS.

The OBS is designed for 4C Seismic-Measurement on the sea floor up to 6000m depth (4C = 4 components:
1x hydrophone: measures pressure waves in water, 3x geophone: measure pressure and shear waves on the ocean bottom).

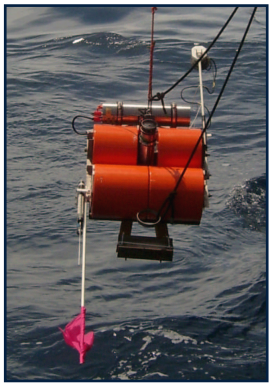
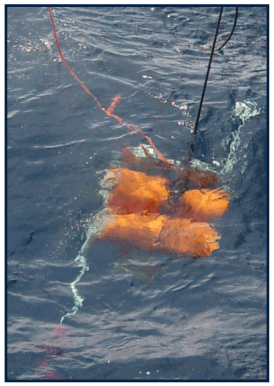


Fig. 3+4: OBS deployment



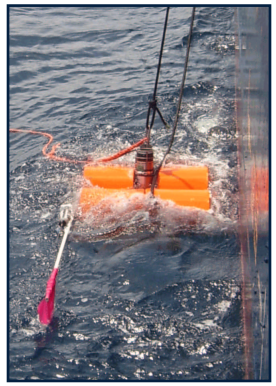


Fig. 5+6: OBS recovery