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First identification of shallow gas in the Rías Altas (NW Iberian Peninsula)

S. Garcia-Gil, J. Iglesias, N. Martinez and M. Perez
Dpt. of Geociencias Marinas, University of Vigo, Spain

The Galician rias are located in the NW region (Galicia) of the Iberian Peninsula. Based on their geographical position they are divided into two main groups called Rias Altas and Rias Baixas. The boundary between both groups corresponds to Finisterre Cape being the Rias Altas to the north and the Rias Baixas to the south. The study area corresponds to the Corcubión (87 km^2), Coruña (16 km^2), Ares-Betanzos (73 km^2) and Ferrol (25 km^2) rias which are the most important related to their surface. The maximum water depth in these rias ranges from 30m to 43m except from Corcubion rias that is 90m. In general, the Rias Altas have smaller extension and lower depth at their entrances than the Rias Baixas. Another physiographical difference consists in the lack of islands at the entrances of the Rias Altas while these are present in the Rias Baixas diminishing open sea influences.

In 2004, a geophysical cruise was carried out to explore a possible gas occurrence in the study region. Very high resolution seismic survey was run in order to get a good definition of acoustic characteristics and features of gassy sediment. Approximately 350 km tracking lines were recorded. Data were acquired using a “modified Boomer” (boomer type source together with both an ORE 3.5 kHz and boomer receivers) which allows very high resolution records (10-20 cm of resolution and ca. 30 m of penetration). HYPACK navigation software (Hydrographic Survey Software) and DGPS (Trimble) were also employed.

Interpretation of the seismic records allows identifying shallow gas fields in the Corcubión, Coruña and Ferrol rias for a first time. Inside Corcubión ria the five identified fields show a total area of 1.6 km^2 where the gas fronts range from 1 to 16.5 ms (twt) depth from present sea bed. Within the Coruña Ria two small shallow gas fields have been recognized showing a total extension of 0.8 km^2 where upper gas fronts appear

between 1 and 19.5 ms (twt) depth. Finally, the fields from the Ferrol Ria occupy 0.9 $km^2$and the gas occurs at 1.5 to 10 ms (twt) depth.

In general, the gas fields coincide with areas where muddy sediment appears at the present seabed in a similar way to the Rias Baixas. The shallow gas occurrence in the Rias Altas is less important quantitatively than those from the Rias Baixas. The gassy sediments of Rias Altas accumulate deeper than in the Rias Baixas. Several main reasons can explain these main facts, 1- the individual areas of the Rias Altas are smaller, 2- the extension of the present seabed covered by mud is also smaller, 3- in this rias more open sea influence and stronger hydrodynamic conditions occurs, 4- upwelling penetrates here less than in the Rias Baixas and the potential of accumulation and preservation of the organic matter can be different. Ongoing research, specially the seismic stratigraphy analysis, is necessary in order to get more specific conclusions.