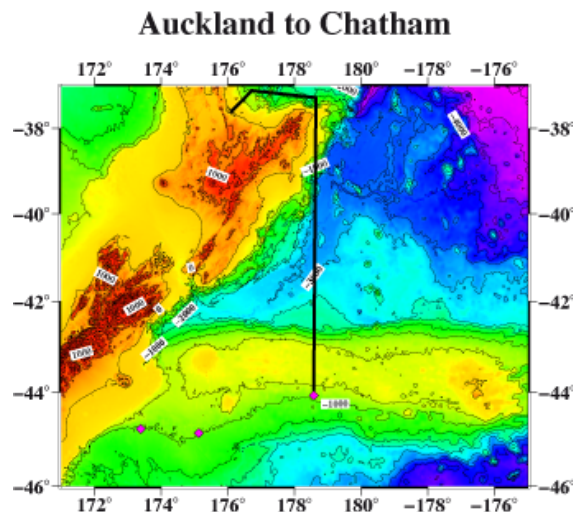


## 1. Weekly Report S0226 CHRIMP

In order to prepare for the first leg of cruise SO-226 17 scientists joined in the port of Auckland on 07<sup>th</sup> Jan. 2013 on board R/V SONNE. The expedition, headed by GEOMAR, Kiel, is undertaken in co-operation with scientists from University of Southampton, GNS Lower Hutt, the University of Otago and the University of Auckland.

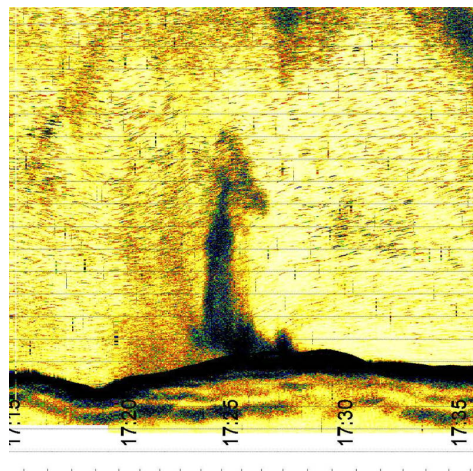
The aim of the project CHRIMP is to investigate gas expulsion sites along the Chatham Rise where in previous times or even today methane gas may be expelled from the seafloor. Methane is one of the most aggressive greenhouse gases driving climate change. Unfortunately the amount and the dynamics of natural methane reservoirs and sources are (e.g. as gas hydrate layers along the continental margins) are not completely understood. Improving our understanding and modelling of climate dynamics requires detailed quantitative knowledge of natural reservoirs and sources of methane, such as the widespread gas hydrate deposits of the continental margins. Increasing numbers of active and passive locations of fluid and gas expulsion (cold seeps) are known from these areas. At present only seeps from shallow water contribute methane directly to the atmosphere, but much higher flow rates have been inferred for the past. Many locations of focused fluid flow appear as funnel-shaped depressions at the seafloor, so called "pockmarks". Typical dimensions are within a few hundreds of meters. However, five to twelve kilometre wide "giant pockmarks" (GP) are known as well. Although full understanding of the mechanism of formation of such pockmarks is lacking GPs are thought to be responsible for massive gas release causing the Palaeocene/Eocene Thermal Maximum (PETM) at about 55 million years ago. Offshore New Zealand GPs have been identified at the Chatham Rise and allow studying these systems in the context of exceptionally stable water temperature during glacial sea level variations.



The port call on 07. and 08. Jan. was used to complete repairs of the vessel and to prepare the scientific equipment. Until 07. Feb. it is the task of the first leg to map pockmark structures by sub-bottom profiler and seismic data. 2D seismic is used to identify suitable locations that will be imaged in 3D later on by the GEOMAR P-Cable system.

On the 09. Jan. bunkering was completed and the 600 nm long voyage towards the working area at 178° E and 44° S began. Thanks to continuously favourable weather the scientific crew have easily become used to sea conditions.

On 12. Jan mapping of a 10 km wide depression was started. Due to the morphologic expression the structure it was interpreted as a giant pockmark. If further structures of the subsurface support this interpretation we will start our first 3D investigation along this structure. Within the last hours indications for a similar structure right next to the currently investigated one were recorded. A 200 m high gas flare mapped by the Parasound echosounder demonstrates the current seep activity of this structure. Despite a large number of known pockmark structures it is the first confirmation of gas expulsion along the Chatham Rise.



All are doing well on board. With regards on behalf of all participants

*Jörg Riden*