

RV Maria S. Merian  
Cruise MSM103 (GPF 20-2-046)  
12.09. – 15.11.21, Emden – Emden

**PRINCE**  
**Groundwater resources offshore**  
**Prince Edward Island, Canada**

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[www.oceanblogs.org/msm103-prince](http://www.oceanblogs.org/msm103-prince)

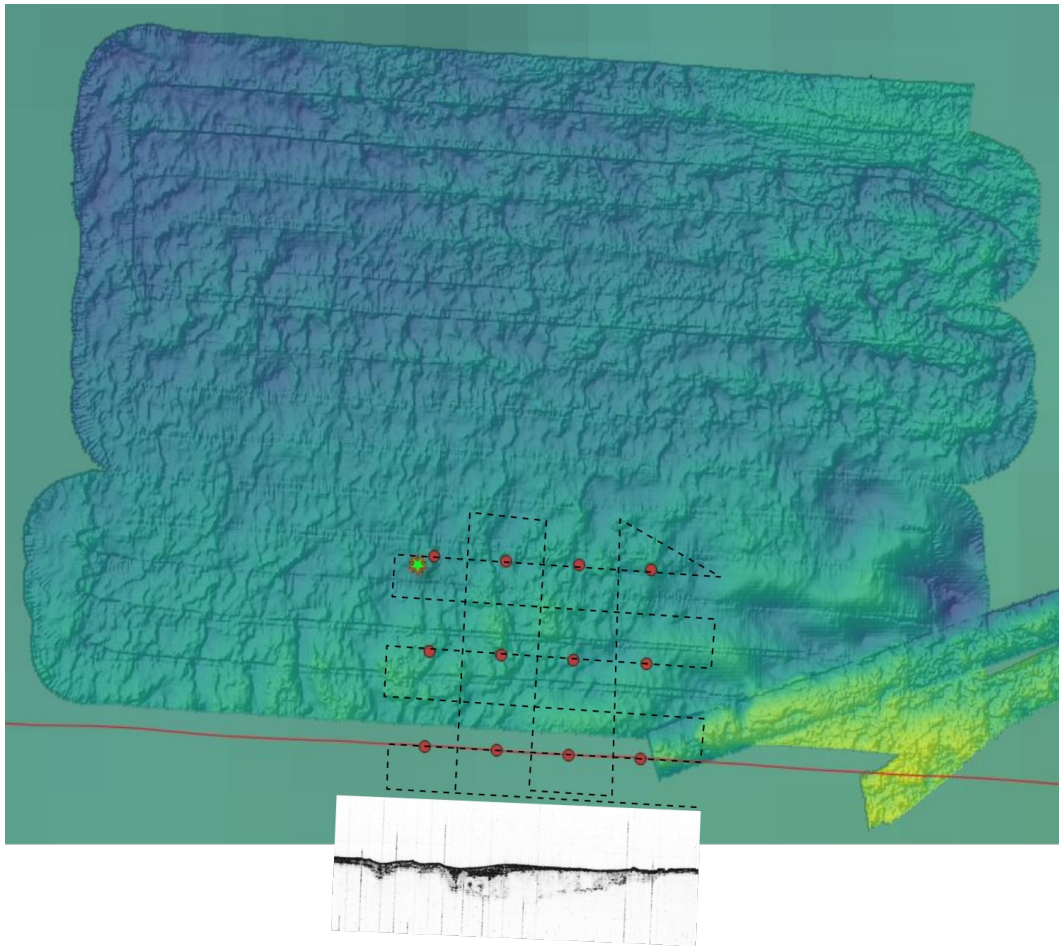


At the beginning of last week (October 18<sup>th</sup>) we were able to spend a day in Halifax in the most beautiful sunshine, unfortunately without going ashore. During our stay we said goodbye to the three marine mammal observers, who will no longer be on board, as we will not be doing any more seismic surveys in the second half of the cruise. At the same time, we were able to welcome a number of visitors on board. A film team from *Ocean School*<sup>1</sup>, a program of the *Ocean Frontier Institute* and the *National Film Board of Canada*, interviewed us about the objectives of the *Source* project, the methods used, work processes and life on board. The target group for the educational videos produced by the *Ocean School* are children aged 10-13 years, so we can hope to raise children's interest in marine research with our explanations. Furthermore, we were finally able to personally get to know our project partners from Dalhousie University (Vittorio Maselli, Mladen Nedimovic & Graeme Cairns). Due to the corona situation, contacts had previously only been possible via video conferences and the participation of the Canadian colleagues in the cruise had also been canceled. In Halifax we were able to view and discuss the first results for at least a few hours together with our Canadian colleagues and their two Mexican doctoral students José Miguel Castillo and Fernando Cordoba.

After our short stopover in Halifax and the subsequent transit back to the working area, we continued our work from October 20<sup>th</sup>. In the second half of the trip, we will focus on electromagnetic measurements that could provide a direct indication of the presence of fresh water, as this has a higher resistivity as compared to seawater. Generally, the evaluation of the hydroacoustic data collected during the past weeks as well as a video survey of the sea bed along the first profile line (see weekly report 3) have shown that we cannot safely use the bottom-towed system originally planned to be used during this cruise. Therefore, we will use our mobile CAGEM transmitter and the stationary OBEMs as receivers for the upcoming EM measurements.

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1 [oceanschool.nfb.ca](http://oceanschool.nfb.ca)



*Fig. 1: Study area northeast of PEI with a shaded relief derived from multibeam data, the position of the OBEM receivers (dots), the profile lines for the CAGEM transmitter (dashed line), the position of the hydroacoustic and seismic profile (red line) and a section from the sediment echosounder data along this profile (bottom).*

A first target for investigations was chosen based on seismics and hydroacoustic data, which identified an infilled channel structure northeast of Prince Edward Island (Fig. 1). This structure can be seen in the sediment echo sounder (Fig. 1, bottom) as well as in the seismic data (not shown). In the multibeam data it can be seen that the seabed is heavily structured and therefore not suitable for the bottom-towed CSEM system. Therefore, we decided to install a 4x3 grid of OBEM receivers over the structure (red dots in Fig. 1) and then covered it with evenly distributed profiles with the CAGEM transmitter system (dashed line). This setup should enable us to depict the channel structure, provided it has a resistivity that differs from the background.

On the basis of further hydroacoustic data, we believe that this channel structure continues approx. 50 km further in a north-easterly direction and connects with an approx. 140m deep, U-shaped depression, which indicates a formation in connection with glaciations in the working area. After upcoming investigations, we will hopefully be able to report whether or not this connection actually exists next week.

With best regards on behalf of the crew of cruise MSM103

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