

# **C r u i s e r e p o r t o f A M B E R s u b - p r o j e c t s B 4 - 6**

**Cruise-No. 07PE/09/19 from 23.06.2009 to 30.06.2009 with R/V “Prof. A. Penck”**

- 1. Geographical area:**  
Gdansk Bay, southern Baltic Sea (see Figures 1 and 2)
- 2. Purpose of the cruise:**  
Impact of groundwater on geochemical cycles of coastal ecosystems in the southern Baltic Sea.
- 3. Co-operating institutions:**  
Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany  
  
Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland
- 4. Scientific equipment:**  
CTD with bottle rosette, Pump-CTD, Scan-Fish with pump, multicorer, single beam Echosounding, mass-spectrometer for CH<sub>4</sub>, Rad 7 for Rn-isotopes
- 5. Preliminary results:**

The major goal of this cruise was to identify possible sites of groundwater discharge in the coastal environment of the southern Baltic Sea. For this purpose transects with undulating pump-scan fish and single beam echosounding were carried out at certain parts of along the german and polish coast (see track chart in Figure 1).

Although, a first examination of CTD data revealed some anomalies direct influences of groundwater seepage were not observed. In contrast, CTD-profiles from the main study area at Puck Bay (sites A – L in Figure 2) partly show slightly decreasing salinities in the bottom waters (Figures 3 and 4) which may be due to an influence of groundwater in the western part of the bay. This assumption was supported by online methane and Rn-isotope measurements onboard ship, which showed increasing values in such levels. At these sites water samples for determination of nutrients and trace metals were taken as groundwater seepage is generally enriched in such parameters. Furthermore, surface sediments were recovered by using a multicorer (sites 1-6, Figure 2). These cores will be analysed for their geochemical composition of the sediments and pore waters (e.g. alkalinity, nutrients, methane, major and trace elements, S species, C and S isotopes). Echosoundings in the Gdansk Bay revealed sedimentary anomalies at certain sites which are probably due to the occurrence of methane in the subsurface layers, thus also pointing towards possible influences of groundwater.

## 6. Track chart of cruise

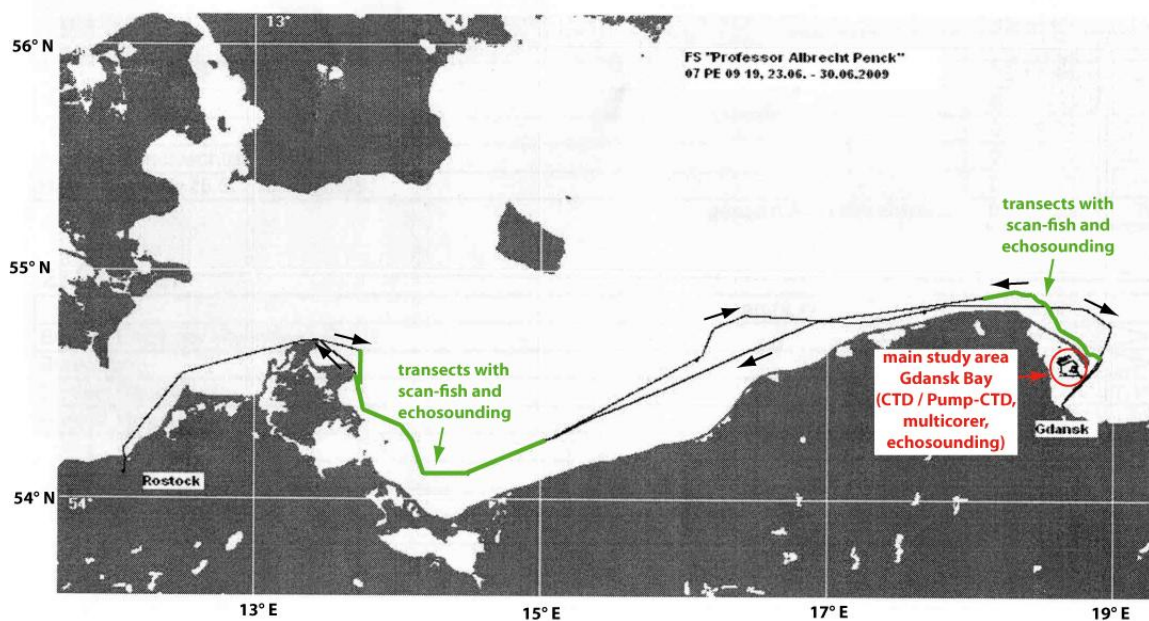


Figure 1: Map showing the track chart of cruise 07PE/09/19. Green lines mark transects with towed scan-fish and single beam echosounding. The red circle indicates the main study area in the Bay of Puck (part of Gdansk Bay) where vertical CTD and Pump-CTD profiles, echosounding and multicorers were carried out.

Table 1: List of stations in Puck Bay:

Date	Time UTC	Device	°N	°E	name
25.06.2009	13:28	CTD	54° 33,0710	18° 47,0140	A
25.06.2009	15:00	CTD	54° 33,1770	18° 39,7880	B
25.06.2009	15:48	CTD	54° 34,1690	18° 41,9940	C
25.06.2009	16:31	CTD	54° 35,1560	18° 43,8060	D
25.06.2009	17:22	CTD	54° 35,8900	18° 45,3380	E
25.06.2009	18:09	CTD	54° 37,2270	18° 43,4350	F
25.06.2009	18:44	CTD	54° 36,7570	18° 41,3050	G
25.06.2009	19:22	CTD	54° 36,0780	18° 39,2860	H
25.06.2009	20:07	CTD	54° 37,3910	18° 37,0280	I = 3
25.06.2009	20:44	CTD	54° 37,7760	18° 39,6390	J = 1
26.06.2009	02:50	CTD	54° 38,5770	18° 41,2810	K = 6
26.06.2009	05:30	MUC	54° 37,8180	18° 39,6180	1
26.06.2009	06:20	MUC	54° 38,6100	18° 41,3440	2
26.06.2009	07:30	MUC	54° 38,073	18° 42,1680	3
26.06.2009	10:00	PCTD - MUC	54° 37,3540	18° 36,9390	4
27.06.2009	08:10	CTD-PCTD-MUC	54° 36,6800	18° 36,9680	L = 5
27.06.2009	15:00	CTD-MUC-PCTD	54° 35,1820	18° 43,8630	6

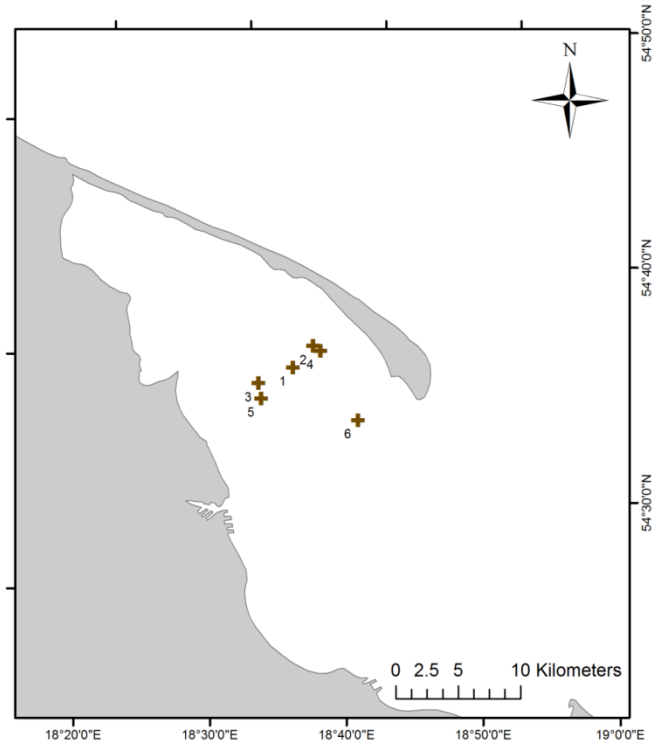
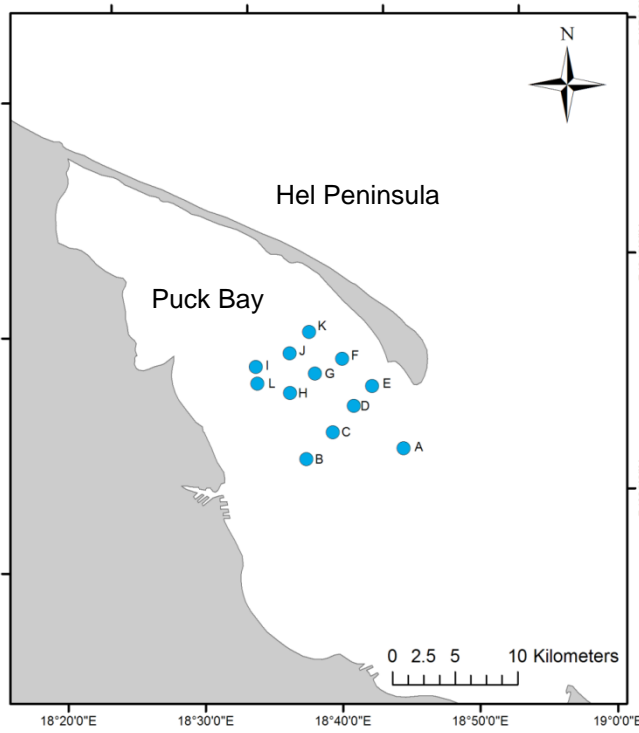


Figure 2: Map showing CTD (left) and multicorer (right) sites in the Bay of Puck.

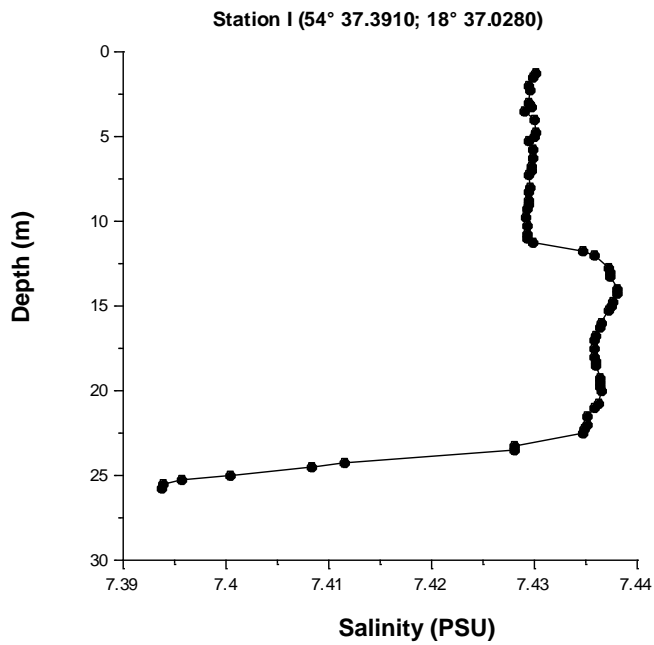


Figure 3: Salinity profile at site I.

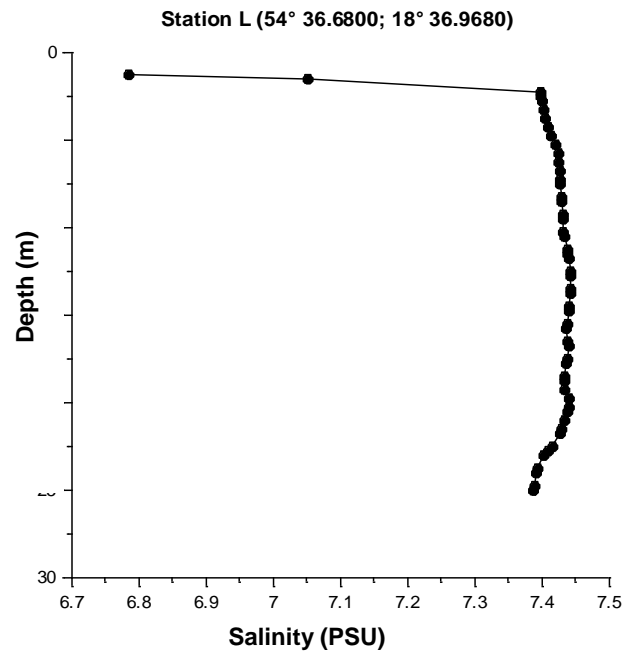


Figure 4: Salinity profile at site L.