Effects of elevated $pCO_2$ on living benthic foraminifera -

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Fig. 1. SEM images of benthic foraminifera from Flensburg Fjord.

Fig. 2. Sampling and experimental setup for culturing Ammonia aomoriensis.

Fig. 3. SEM images of Ammonia aomoriensis indicate different dissolution stages that increase at higher $pCO_2$ in the cultures (A through D).

Laboratory studies revealed that rising $pCO_2$ values affect the calcification of benthic foraminifera in the world oceans. In comparison to the open ocean, the acidification at strongest affects foraminifera in near-coastal areas and estuaries, like the Baltic Sea and the Gulf of Paria.

Goals:
(1) To obtain a better understanding about the influence of changed $CO_2$ concentrations on the shell formation of single individuals from boreal and tropical Ammonia species as well as living assemblages in short and long-term experiments.

(2) Monitoring the faunal composition and population density of benthic foraminifera in a natural, $CO_2$ rich near-coastal environment in Flensburg Fjord in the course of one year.

Results:
Test solution was observed in living benthic foraminifera from Flensburg Fjord. The same solution phenomena were created in a laboratory experiment with elevated $pCO_2$ values from 929 to 3130 µatm. These results demonstrate that it is necessary to understand the factors influencing benthic foraminiferal carbonate production in detail on species, community and ecosystem levels.