



## **The impact of ocean acidification and warming on the elemental and stable isotope composition of *Fucus vesiculosus* in Wadden Sea mesocosm studies**

Vera Winde (1), Andreas Pansch (2), Anna-Kathrina Fenner (1), Maren Voss (1), Iris Schmiedinger (1), Bernd Schneider (1), Ragnhild Asmus (2), Harald Asmus (2), and Michael E. Böttcher (1)

(1) IOW, Geochemistry & Isotope Geochemistry, Warnemünde, Germany (michael.boettcher@io-warnemuende.de), (2) AWI Wadden Sea Station List, Sylt Island, Germany

In the frame of the German BIOACID II project the separate and combined effects of different stress factors (acidification, warming, eutrophication) on the elemental and stable isotope composition of *Fucus vesiculosus* are investigated by means of benthic mesocosm experiments in coastal waters of the the North Sea. We aim for a calibration of the biogeochemical and stable isotope composition of *Fucus* in response to single and combined temperature, pCO<sub>2</sub> (pH), and nutrient changes.

Benthocosm experiments are carried out at the AWI Wadden Sea station in List (Sylt Island, North Sea) with application of different stressors: an increase in temperature and an increase in atmospheric CO<sub>2</sub> partial pressure. The experiments run for almost several months per season. The aquatic biogeochemistry (e.g. TA, pH, [U+F064] 13C(DIC)) as well as the elemental and stable isotope composition of the grown *Fucus vesiculosus* organic tissue were followed.

It was found, that the changes in daily biological activity caused by alternating phases of net respiration and photosynthesis created strong variations in the dissolved carbonate system and changes in the carbon isotope composition of DIC. The atmosphere of some experimental set-ups was enriched with gaseous carbon dioxide. This caused fast corresponding changes in the isotopic composition of DIC, thereby acting as a tracer for newly formed organic tissue. The chemical and isotopic parameters of the dissolved carbonate system showed differences between the set ups.

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