

## Oxygen concentrations in/around deployed whale bones during decay of a whale-fall

\*Akiko Tsuruta<sup>1</sup>, Robert Jenkins<sup>1</sup>, Shozo Ogiso<sup>2</sup>

1. Division of Environmental Science and Engineering, Graduate School of Natural Science and Technology, Kanazawa University, 2. Engineering and Technology Department, Kanazawa university

A whale-fall community is one of the unique biological community formed on decaying a whale carcass, the biggest organic mass (Smith et al., 2015). This community has habitat segregation around-to-in deployed whale bones. This segregation is thought to be due to the amount of oxygen or other factors accompanying the decomposition of organic matter inside and outside the bone. However, there are very few actual measurements of oxygen concentration distributed around/in whale carcasses. In this study, we measured dissolved oxygen concentration of seawater in/around deployed whale carcass during its decay. Oxygen concentration was measured mainly by following two methods. (1) Undisturbed sampling at seafloor: deployed whale-carcass fixed in hand-made frame with several suction tubes on natural seabed, then water samples were obtained through the suction tubes time to time during decay of the carcass, and analyzed. (2) 2D O<sub>2</sub>-Sensor film method: 2 months deployed carcass, recovered from seafloor, was cut and glued to a glass tank with an oxygen sensor chip. As results of measurements, decomposition of whale-bone with soft tissue forms less than 1 cm thick dysoxic environment on the bone surface. After removal of the soft tissue around the bones, the dysoxic environment area shrinks to 2 mm thick on the bone surface, the inside of the bone is anoxic. At this stage, sulfur-oxidized bacteria and Zoothamnium inhabit rich oxygen-dysoxic environment on the bone, and Dorvilleidae, Nereididae and Capitellidae (all three are annelids) basically inhabit anoxic environment in bone.

Keywords: Whale-fall, Chemosynthesis