Sedimentary fish abundance records over the last 1500 yrs from western North Pacific: Basin-scale link of fish abundance

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It is well known that basin-scale link of abundance of sardine and anchovy over the Pacific exists in the 20th century. Fluctuations in these populations off the coast of Japan, California, South America and those in the Pacific salmon varied at multidecadal timescales, and they showed coherent or anti-phase patterns. Many scientists suspect that this basin scale link of fish abundance may be caused by multidecadal-scale variability of ocean-atmosphere circulation in the Pacific. However, the mechanisms behind population and physical changes remain poorly understood. Meanwhile, it is still unknown whether the basin scale link of fish abundance exists also in the past, i.e., before the 20th century (Baumgartner et al., 1992). This is due to a lack of sedimentary fish abundance records in the west Pacific, while the records in the east Pacific exist. Comparison between the records in the west and east Pacific and between fish abundance and climate in the Pacific would unravel the mechanisms behind both the population and physical changes on long timescales.

Our research group, supported by COE program, first discovered fish scales in the sediments in Beppu Bay southwest of Japan. Such fish scales are very rare in the western North Pacific and valuable for elucidating the long-term dynamics of fish abundance in this area. In this study, we have examined the fish scale abundance using 4-m piston core and gravity core samples which were collected from Beppu Bay.

In the presentation, we will deliver the 1500-yr fish abundance records from Beppu Bay and discuss the basin-scale link of fish abundances among sardine and anchovy in the western and eastern North Pacific and Pacific salmon (Finney et al., 2002). Furthermore, we will discuss relationship between the climate changes and the long-term variations of fish abundance over the North Pacific.