## Interannual Changes in Sediment Environment in Hirota Bay

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The 2011 off the Pacific coast of Tohoku Earthquake triggered a massive tsunami that damaged the coastal areas of the Tohoku region. In this study, I clarified the particle size distribution from the results of the bottom sediments sampling survey in the Hirota Bay, Rikuzentakata City, Iwate Prefecture, and examined the temporal and spatial changes in the sediment environment from before the earthquake until today.

In the spring and autumn of 2019, sandy sediments were dominant in the inner part of the bay and on the Hirota Peninsula side, while muddy sediments were dominant from the central part of the bay to the mouth of the bay, showing the same tendency as in previous years. However, sandy sediments in the inner bay spread to the south over the central bay than in previous years, suggesting that they are still changing due to seasonal changes and reconstruction work.

However, there were almost no surveys of the bottom sediments in the Hirota Bay before the earthquake and the surface sediments before the earthquake were not available, comparisons of the surface sediments before and after the earthquake have not been made. Therefore, the columnar core samples collected in the bay from 2012 to 2015 were used for comparison with the surface sediments. The columnar core samples were divided into the sediments originating from the tsunami (U1), and the sediments in the bay before the earthquake (U2). In this study, the upper U2 layer was considered to have the closest environment to the surface sediments before the earthquake.

The results showed that the particle size of the surface sediments before the earthquake tended to be smaller from the inner bay to the central bay. The changes in grain size after the earthquake were different in the inner bay, between the inner bay and the central bay, and in the central bay.

In the inner bay, which is easily affected by the inflow from the Kesen River and reconstruction work, it is difficult to return to the grain size characteristics before the earthquake. In addition, it was considered that the particle characteristics after the earthquake tend to return to those before the earthquake as going from the inner bay to the central bay. It was predicted that the grain size change in the vicinity of Odomoura would be similar to that in the middle point between the inner bay and the central bay, but the time most similar to the particle size distribution before the earthquake was earlier in the sites, which was specific. Therefore, it is necessary to increase the number of observation points in the vicinity of Odomoura in order to observe the changes in grain size.

As described above, Hirota Bay before the earthquake has been affected by seasonal changes and reconstruction work, and is still changing, but the changes differ from place to place. In the inner bay, which is easily affected by the inflow from the Kesen River and reconstruction work, it is difficult to return to the grain size characteristics before the earthquake. In addition, it was considered that the particle characteristics after the earthquake tend to return to those before the earthquake as going from the inner bay to the central bay. The large-scale reconstruction work is scheduled to be completed in 2020, and it is considered that the characteristics of the bay will appear in the bottom sediment environmental change of Hirota Bay in the future. Therefore, it is important to continue to observe the changes in Hirota Bay caused by natural forces.

Keywords: The 2011 off the Pacific coast of Tohoku Earthquake, The Hirota Bay, the sediment environment, the columnar core samples

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