

Changes in the demersal fish communities of the sandy beach in Sendai Bay after the disturbance by the tsunami

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Introduction

The tsunami caused by the Great East Japan Earthquake (11 March 2011) damaged marine environments along the coastal area in northeast Japan.

Recently, it has been reported that coastal habitats such as eelgrass beds and rocky shores have been damaged after the tsunami disaster.

Sendai Bay has a long sandy beach, which provides a favorable nursery ground for fish such as flatfish. Since **the tsunami reached up to 6m in height in Sendai Bay**, it was supposed that the shore habitat in Sendai Bay was also damaged.

Thus, to describe the effects of the tsunami on the fish community and its sandy beach environment, we compared demersal fish in Sendai Bay before and after the tsunami.



The tsunami hit coastal area in Sendai Bay



Somewhere in Sendai Bay

Conclusion

Fish community and abundance did not drastically change after the tsunami. But the abundance of dragonet (*E. mirabilis*) markedly decreased in 2011.

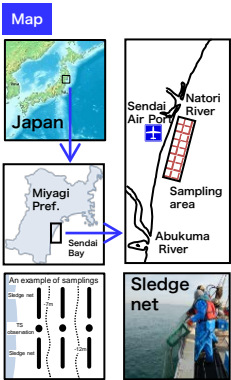
Although effects of the tsunami were not negligible, decreasing in dragonet abundance may be influenced by high salinity in the survey area.

Negative impacts of the tsunami disaster on the summer-autumn fish community in sandy beach were little.

But...

Since the abundance of demersal fish had annually changed in Sendai Bay before the tsunami, we should be careful in interpreting changes in the fish community and abundance. Long-term monitoring is needed.

Material & Methods



Summary of sampling year and month

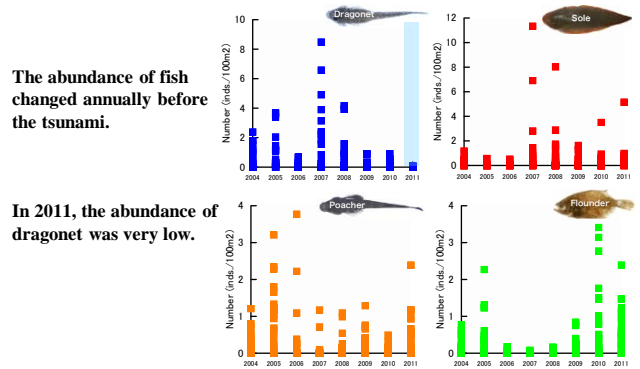
	July	Aug.	Sep.	Oct.	Nov.	Dec.
2004			○	○		
2005			○		○	
2006	○	○		○	○	
2007	○	○	○	○		
2008	○	○	○	○		
2009	○	○	○		○	○
2010	○	○	○			
2011	○	○				○

We sampled fish from summer to autumn in Sendai Bay from 2004 to 2010 (before the tsunami) and 2011 (after the tsunami) using a sledge net (net width: 2m, net height: 0.2m, mesh size: 6mm, time of towing: 10min).

The sledge net was towed at three or four depth ranges between 5m and 15m depth along the shore.

Results

Annual changes of abundance of dominant species

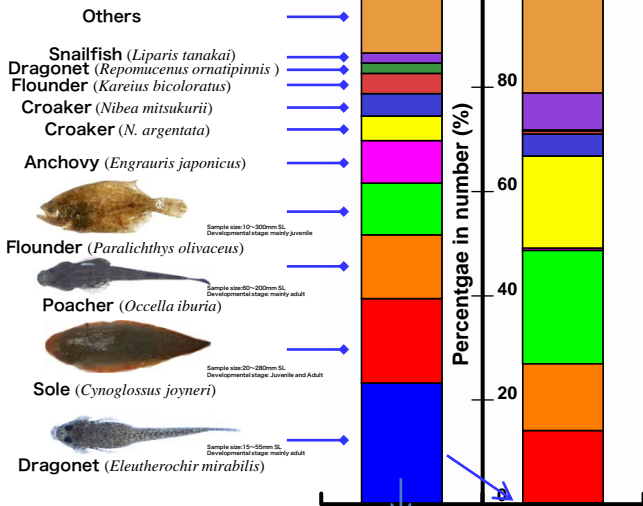


The abundance of fish changed annually before the tsunami.

In 2011, the abundance of dragonet was very low.

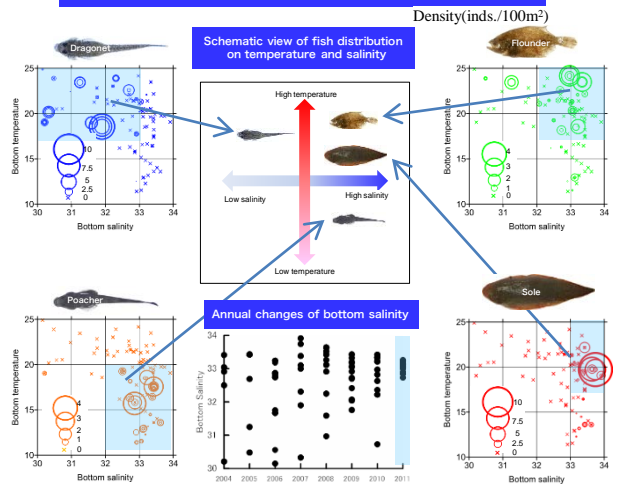
Results

Composition of fish



The occurrence of dragonet was lower in 2011 than that of 2004-2010.

Relationship between abundance and bottom temperature/salinity



Dragonet mainly distributed in low salinity water. Bottom salinity was higher in 2011 than that of 2004-2010.