



## **What kind of disturbances did March 11, 2011 Tohoku Earthquake and Tsunamis leave continental margin ecosystems? : Lessons from five years monitoring research**

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On March 11, 2011, huge earthquake with M9.0 took place at Japan Trench area off Northeast Japan. Vigorous disturbances of marine environments and ecosystems have taken place at coastal areas where huge tsunamis swept sediments and organisms away from the coastal areas to deeper oceans. Distributional pattern of sediments and organisms in coves and bays have strongly changed after tsunamis. Marine ecosystems at Northeast Japan have totally disturbed and damaged. Scientists from Tohoku University, the University of Tokyo and JAMSTEC have started to monitor how much marine ecosystem disturbed and how it may recover. A research team, named Tohoku Ecosystem-Associated Marine Sciences, continually makes research on marine ecosystems as ten years monitoring project funded by MEXT, Japan since 2011.

On 2016, it takes five years from the Earthquake and Tsunami occurred. What happens marine ecosystems at Tohoku area during these years. Water column ecosystems are rather easy to recover from disturbances. Seaweed communities have strongly damaged, but, they gradually recover. Sediment communities have not recovered yet as sediment distribution is different from before earthquake and tsunamis. Most difficulties are scars in human minds. We, scientists, try to share scientific activities and results with local peoples including fishermen and local governments for better understanding of both oceanic conditions and fishery resources. Disaster risk reduction should accelerate with resilience of community structure. But, mental resilience is the most effective way to recover human activities at the damaged areas.