

# Abstract

## Impacts of the 2011 mega-earthquake and tsunami on Ezo abalone *Haliotis discus hannai* at Iwaisaki, Miyagi, Japan

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On 11 March 2011, a massive tsunami generated by a mega-earthquake hit a wide area of Pacific coast of northeast Japan. We have analysed effects of the tsunami on Ezo abalone *Haliotis discus hannai* population at Iwaisaki in Miyagi. Ezo abalone is among the most economically valuable and important commercial fisheries resources in Japan, so rapid assessments are needed to evaluate effects of the disaster on the abalone population. Before the tsunami, algal forests dominated by the brown macroalga *Eisenia bicyclis* had developed in the survey area shallower than 8 m in depth, where large juvenile and adult abalone > 30 mm in shell length (SL) inhabited. Juvenile abalone < 30 mm SL inhabited the deeper area dominated by crustose coralline alga (CCA). After the tsunami, no apparent decrease was observed in the density of large juvenile and adult abalone inhabited in the algal forests. The impact of the tsunami was more profound in the CCA area than in the algal forests. Zero and one-year-old juveniles largely decreased to less than 5 % of the densities just before the tsunami. The distribution pattern of juveniles could be a cause of the marked decrease, because most of them inhabited the CCA area where the disturbance by the massive water movement was not reduced by the effects of the macroalgal forest. Since the age at first capture of abalone is at 4-5 years old, the future commercial catch may considerably decrease for at least 4-5 years after the tsunami.