

Long-term data on deep-sea environment obtained with JAMSTEC's cabled observatories

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Since the deployment of a cabled observatory on deep seafloor off Hatsushima Island in Sagami Bay in September 1993, more than 18 year deep-sea environmental data, such as CTD, water current on seafloor and so on, are stored in JAMSTEC. After the Southern Hyogo prefecture earthquake in 1995, cabled observatories capable of deep-sea environmental observation were also deployed off Muroto Cape in Kochi and off Kushiro-Tokachi in Hokkaido. However, aims are mainly focused on seismological observation not only in budgetary aspect but also in other aspect, and accordingly those environmental data, some of which are open on web, have some problems in qualities and are not easy for public users to utilize, compared to those data obtained with seismometers. In addition, the cabled observatories have some problems of electrical interference among sensors and calibration that are not the problems with self-recording type mooring systems which are electrically isolated.

For example, the data of the electro-magnetic current meter of off Kushiro-Tokachi observatory have large offset that is obviously different from its calibration sheet and contain electronic noises caused by rush currents of ADCP. However, having tried removing those noises and offset by comparing data of the current meter and the ADCP, current velocity changes that indicate more than one slope collapses associated with off Tokachi Earthquake in 2003 and those associated with tsunamis of off the Pacific Coast of Tohoku Earthquake in 2011 were detected, which had not been recognized with raw data.

At off Hatsushima Island observatory, the click sounds of sperm whales were observed with a hydrophone when ADCP echo intensity in middle layers increased, which suggests the relation between the increase of the biomass and the biological activity.

Those kinds of long-term observation at fixed points on deep seafloor have rarely been achieved in the past and undoubtedly valuable. The situations coping with those problems including the trial of quality control will be reported.

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