Development of database system for cruise information of JAMSTEC vessels and statistical analysis of observation downtime

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Japan Agency for Maine-Earth Science and Technology (JAMSTEC) has seven research vessels and controls the research cruise of these vessels. Each year, several tens of research cruises are carried out, and a large amount of marine observation data is acquired. JAMSTEC has not only the observation data but also a large amount of navigation data of past cruises. There were cruises in which many of the scheduled observations could not be implemented due to various causes. For example, in some research cruises carried out in the fall in the surrounding sea of the Japanese Islands, many of observations were canceled by typhoon. Scheduled observations cannot be performed and sufficient observation results cannot be obtained so that progress of the research will be prevented. However, even though there are navigation data, it has not been examined how many observations were canceled in past cruises and what caused the observation downtime. At present, JAMSTEC has to schedule all research cruises for the next fiscal year one year before, which may prevent efficient operation of the research cruise. In this study, we are developing database system for the cruise information operated in the past several tens years to clarify observation downtime for each cruise and what caused the downtime. We are also analyzing statistically the downtime data to describe the relationship between the downtime and various factors of the cruise such as season, sea area, observation equipment, vessel, etc. The analysis results will provide useful information to plan the cruise. Furthermore we will analyze all information of past cruises by machine learning, and we will predict the downtime of the planned cruise and propose better research cruise plan, which will help to obtain the sufficient observation results and to advance the research. Acknowledgments: we are grateful to Mr. Morisaki and Ms. Sada for their supports.