Towards development of software to predict observation downtime of the future cruise of the research vessels belonging to JAMSTEC

*山岸 保子[1]、阪口 秀[1]、山室 悠太[2]
*Yasuko Yamagishi[1], Hide Sakaguchi[1], Yuta Yamamuro[2]

1. 国立研究開発法人海洋研究開発機構 数理科学・先端技術研究分野、2. 国立研究開発法人海洋研究開発機構 海洋工学センター
1. Department of Mathematical Science and Advanced Technology, Japan Agency for Marine-Earth Science and Technology, 2. Marine Technology and Engineering Center, Japan Agency for Marine-Earth Science and Technology

Japan Agency for Marine-Earth Science and Technology (JAMSTEC) carries out various oceanographic observations every year using owned research vessels. Recently the importance of oceanographic observation is rapidly increasing due to the occurrence of great earthquake, the investigation of global warming, exploration of the seabed resources and so on. Therefore, it is indispensable to efficiently perform the observation, that is, to organize an optimal research cruise schedule. At present, JAMSTEC has to plan all research cruises for next fiscal year one year before. Our project aims to provide useful information for planning future research cruises. For this purpose, we have constructed a database system for past cruise information of research vessels belonging to JAMSTEC and clarified observation downtime for each cruise. Downtime of research cruise is the period when observation or cruise stops due to rough weather, machine trouble, etc. The downtime is one of the indicators to judge quantitatively as to whether the observation of the research cruise was successful or not. Now we started developing application to predict the downtime of future research cruise using the data provided by the database system we developed. Before developing software to predict the downtime of future cruise, we need to find important factors that affect the downtime. To find them we firstly statistically analyzed the relationship between the factors, which are season, sea area, vessel, observation equipment, captain, and so on, and the downtime. Next we started to analyze the downtime of past research cruise using the factors we selected based on the results of the statistical analysis by machine learning. Using machine learning and the results of the statistical analyses, we will develop an application to predict the downtime of the planed cruise and help to make the better research cruise schedule. Acknowledgments: we are grateful to Mr. Morisaki and Ms. Sada for their supports to make data stored into the database system.

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