# Data delivery and visualization service for climate forecast data in the Arctic Ocean during R/V Mirai cruise MR18-05

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Understanding of the weather situation is the most important issue for observation cruse in the sea ice area. In particular, overviewed information of 1000 km scale is a good indication to determine a safe route and plan, and the weather forecast and observation data is required. However, limited satellite telecommunication line on the ship makes on-demand data delivery difficult. And more, if the compressed data would be sent via this line, a professional staff for decoding and visualizing the data must always be needed on the ship. In order to reduce these anxiety and burden, automatically system integrating these processes (delivery, decoding, and visualizing data) is needed. ADS (Arctic Data archive System) has been developed the new integrated system for the ship to delivery and visualize data, which is called VENUS (VEssele Navigator by Unitized Systems). This system has been implemented to R/V Mirai cruise in the Arctic Ocean since MR16-06. MR18-05 cruse was a winter observation in the Arctic Ocean, and we delivered 10 days weather forecast data produced byECMWF, and high resolution sea ice forecast model output from IcePOM developed in the University of Tokyo. Total size of delivered data via e-mail was reached to about 100 MB/day, and more than 100 e-mails were delivered to Mirai every day. Our system was always in a high load condition due to visualization processing. We need to In this research, we want to introduce technical performances and advantages of this system. For safe cruse, we must complete the transmission and visualization of such massive data by the scheduled time. Therefore, we devised a lot of solutions to solve the technical difficulties. In this research, we introduce what we did to solve these problems and discuss various issues of data distribution and processing in ship.

Keywords: Arctic Ocean, Ship Observation, IoT, Forecast Data, Visualization, Satellite communication