Development of archiving knowledge in the database for Gfdnavi:analysis and visualization tool for geophysical fluid data.

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Recently, observational numerical data on geophysical fluids such as the atmosphere and ocean have been increasing explosively, and numerical simulation have been generating massive amount of data. These data are multidimensional, and they can have meaning only after visualizing and/or analyzing them. Therefore, it is wanted that a data providing server has the function of analyzing and visualizing data, searching data as database, and using data seamlessly across servers. To satisfy the need, our group has been developing Gfdnavi (Geophysical fluid data navigator), an analysis and visualization tool for geophysical fluid data.

In this study, we extended Gfdnavi to support documentation and archival of knowledge and images obtained through data analysis. A Gfdnavi knowledge document consists of figures along with the parameters used to create them, and it is saved in the database holding the metadata of the numerical data. The database is build automatically, and there are relations between numerical data and knowledge documents. As a result, various functions as follows are enabled.

One can find figures and knowledge documents made from specific numerical data. Thus, for example it is able to see results of analysis and knowledge documents of other co-researchers. Also, it is possible to search numerical data and analysis procedures used to create knowledge documents. By using the data and process, he or she can reproduce the figures in the documents, and can further extend the analysis. Furthermore, one can search indefinite numerical data and knowledge documents using a keyword (now developing). Even if the data to search doesn't have the keyword, one can find it through keywords in knowledge documents as metadata. For example, there are no keywords as 'typhoon' in rainfall data. If there are metadata with the data in the result of case analysis of typhoons, one knows that it is possible to analyze typhoons through the data. Therefore, in this system, knowledge documents can be regarded as metadata of the numerical data. In this regard, metadata increase automatically through knowledge documents produced by scientists who use Gfdnavi.