Data integration system for marine biodiversity constructed in JAMSTEC

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Background
Occurrence records of organisms, including observational records and collection records, are essential to understand the distributional pattern of each biological species as well as to elucidate regional or global biodiversity. Such information is becoming more and more important for the conservation of biological resources under changing natural environments in various geographical scales. The Japan Agency for Marine Science and Technology (JAMSTEC) has several databases to provide observational records (e.g. video and still images taken by manned or unmanned submersibles) and related documents such as cruise reports. Recently we newly constructed the Marine Biological Sample Database to provide the information of biological specimens collected during JAMSTEC's research cruises. A data-system, the Biological Information System for Marine Life (BISMaL), was also developed to integrate the biological information in JAMSTEC and to further exchange data with external databases or data-systems.

Marine Biological Sample Database
The JAMSTEC's Marine Biological Sample Database <http://www.godac.jp/BioSam1/> launched in June 2009 publishes the data of the biological sample collections of JAMSTEC to facilitate sample-sharing, among marine scientists. Users can search the collections online by biological names, geographical areas, dates, collection methods, name of ship/submersibles and others. The core data elements follow DarwinCore, an international standardized schema to exchange biological occurrence data. Currently, approximately 2,000 records taken after April 2009 are published, and all new collections by JAMSTEC's cruises as well as over 10,000 specimens collected before April 2009 will be published in future.

Biological Information System for Marine Life (BISMaL)
JAMSTEC publishes biological information through several databases, and the integration of related biological information is needed to increase usability. BISMaL <http://www.godac.jp/bismal> was designed to serve a broad spectrum of data, including taxonomical information, observational and collection records, brief description for each taxon including ecological and physiological properties, related literature as well as images and footage taken by JAMSTEC's submersibles. Occurrence record of each taxon came from the Deep-sea Video Database and biological sample collections are visualized on a distributional map, and users are also able to see deep-sea videos stored in the Deep-sea Video Database on each taxon page of BISMaL.

Data exchange with external databases
Ocean Biogeographic Information System (OBIS) has been operated for the integration and data-sharing of distributional records of marine organisms under the international research project, Census of Marine Life, and grown up to the world largest database for marine biodiversity-related data. However, the information of Japanese species, particularly deep-sea taxa is quite limited in OBIS. Thus, JAMSTEC plans to provide occurrence records taken during JAMSTEC's researches

to OBIS via BISMaL. Furthermore, JAMSTEC aims to accumulate the information of Japanese marine species from external datasources, to develop BISMaL as a Japanese portal of marine biodiversity information.