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DYNAMIC VISUALIZATION OF SPATIO-TEMPORAL PROCESS MODEL BASED ON NETCDF AND OPTIMAL INTERPOLATION FOR MARINE ENVIRONMENT

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Abstract

The ocean is an indispensable source of materials and energy for the survival of human beings and social development. It is also an essential factor affecting climate change and ecological balance. In view of the dynamic, three-dimensional (3D), and complex marine environment, this study proposes the construction and dynamic visualization of a marine spatio-temporal process model based on Network Common Data Form (NetCDF) and optimal interpolation. The proposed model combines the advantages of NetCDF data models, which store and share high-performance multidimensional data, visualize marine spatio-temporal processes based on optimal interpolation, eliminate the "time crack" of large time resolution data, and ensure continuous, smooth, dynamic visualization. Weekly-averaged survival data of Chinese seas and optimal global interpolation daily-averaged sea surface temperature data of centralized advanced very high-resolution radiometer-only products are selected, and 3D visual expression and analysis of multidimensional, dynamic marine environmental data are realized. Experimental results indicate that the proposed method efficiently and intuitively expresses marine environmental data, thus providing a powerful visualization tool for the expression, change regularity analysis, and trend prediction of complex phenomena.

Key words: marine environement, multidimensional dynamic visualization, optimal interpolation, process model, spatio-temporal data model

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