

A GIS-based decision support system for coastal environmental impact assessment

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A better understanding of coastal environment requires an integration of studies on the hydrodynamics, geographical processes, as well as process of the eco-system and even social-economic system. Nowadays, to make any effective environmental impact assessment (EIA), besides carefully monitoring, various analysis methods/tools, and especially mathematical models have usually to been considered. In addition, to analyze the characteristics of physical/ecological aspects and get optimal use on the large storage of environmental information, we need new approaches for their statistical design, analysis, and graphical display. Therefore, integrated computer systems(i.e. decision support systems) become a useful tools, to handle those diverse environmental aspects (usually spatially heterogeneous) , for regional planning and policy/decision making processes.

In this study, based on the research work conducted by Osaka University, the authors set up the Osaka bay Environmental Information System (OBEIS). The system is designed to integrate a range of distributed information resources, simulation models, environmental rules and analysis tools in an easy-to-use framework that support environmental planning and decision-making processes. With control system, model base and database, the system offers a frame that integrates environmental analysis schemes can help the evaluation of policy alternatives. Here, the system architecture is targeted to provide knowledge-based assistance for the tasks of coupled-modeling, and linking of simulation models with datasets in Geographic Information System (GIS). In the present study, a case study is provide on EIA of hypothetic coastal development projects. The objective is to analyze the alternative development projects or activities, and calculate their potentially significant adverse impacts with consideration of foreseeable cumulative effects