A Marine Biological Index Applied to Vulnerability of Biological Resources for Coastal Oil-Spills

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ABSTRACT

It should be considerable and well planned for environmental protection in coastal area. The conservation function of eco-community as well as shielding function for oil spills impact are most concerned and assessed in coastal management. Deterioration of ecosystem by pollution is subjected to be a major consideration through the oil impact to coastal environment. Meanwhile, the damage to biota and its habitat is the most concerned. The NOAA built up an "environment sensitivity index (ESI)" map for oil-spills emergency response in 1976. The environmental indicators include shoreline classification, biological resources and human-use resources, or called socio-economic resources. They present alike sense within integrated communities in the same ecosystem of coastal area. They are induced reaction level under the impacts of adverse changes for safety, survival and reproduction. Furthermore, the index to biological resources is weighted by "vulnerability" to respond the pollution or the disaster which endanger security, survival and reproduction for biota. The evaluation of ecosystem by specified index usually can provide a healthy sign for environmental monitoring. The sensitivity is actually rather subjective, however it can represent a relative perception from pollution in biota. In this text, the concept of "ecological health" is introduced. Also, a marine biotic index (AMBI) is proposed to evaluate the impact by oil. The proper rank of quantified index for biotic health is needed to be built, too. Building a framework of suitable evaluation system for biological resources in Taiwan is expected in near future. There area two oil-spill cases in southern Taiwan are applied by this model. The simulated results show the coincidence with original report. It means that the application of AMBI is capable in Taiwan’s marine environment.

Keywords : oil-spills ; ecological indicators ; future ; taiwan ; environment sensitivity index (ESI) ; ecological health ; a marine biotic index (AMBI)

Table of Contents

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