

Health Examination of Enclosed Coastal Seas in Japan

Osamu Matsuda

Graduate School of Biosphere Sciences, Hiroshima University (Professor Emeritus), Japan
6-8-13 Hachihonmatsu-minami, Higashi-hiroshima City, 739-0144, Japan (home address)
Tel: 81-82- 428-3846, Fax: 81-82-428-3846
E-mail: matsuda036@go3.enjoy.ne.jp

Introduction

Environmental management of enclosed coastal seas in Japan has been so far made mainly from the viewpoint of water quality management with use of indicators such as COD (chemical oxygen demand), TN (total nitrogen) and TP (total phosphorus) in sea water. Although water quality management including “the area wide total pollution load control” was evaluated to be very successful by some many evidences, it is very clear that more holistic approach is necessary for coastal environmental assessment and management because deterioration of coastal environment evaluated by indicators other than water quality data is so obvious.

“Health Examination” of enclosed coastal seas is one of the possible promising approach essential for not only diagnosis of the present status of coastal environment but also for more holistic environmental assessment (Fig.1). Since the present status of the enclosed seas along the coast of Japan is more or less "damaged" or "deteriorated" mainly due to prolonged impact of human activities, “Health Examination” was conducted in the officially accepted 88 enclosed coastal seas in Japan.

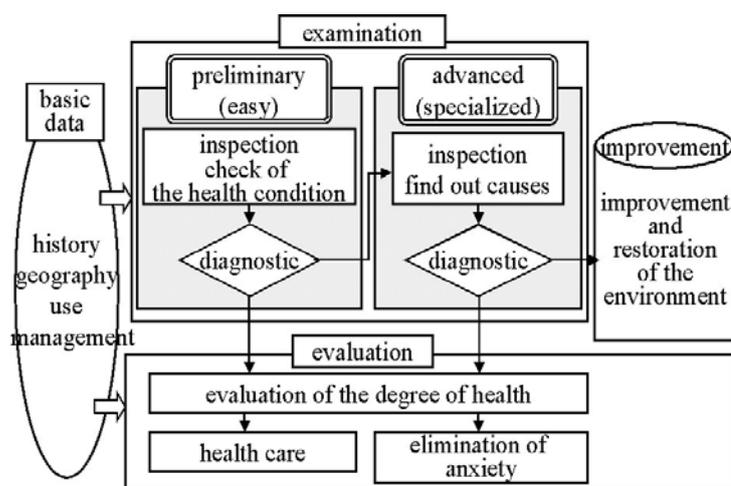


Fig.1. Organization of “Health Examination”.

Method

“Health Examination” was made by the special committee of Ship & Ocean Foundation (Ocean Policy Research Foundation: OPRF) following the proposed examination scheme based on the "Master Plan and Guideline" developed by OPRF. In this scheme, two major functions of marine ecosystem which are "ecosystem stability" and "smoothness of material cycling" are highlighted (Fig.2). Although health examination of coastal marine environment is widely accepted as a concept of analogy to the human health examination, definition of marine environmental health and practical methodology of examination has not been adequately developed. In the “Health Examination” activities initiated by OPRF, a health examination scheme as a new ecosystem approach to environmental monitoring and assessment which consist of “preliminary examination” and “advanced examination” have already been proposed. In the present study, “preliminary examination” was applied to particular 88 areas with use of varieties of published data on the individual item related to "ecosystem stability" and "material cycling".

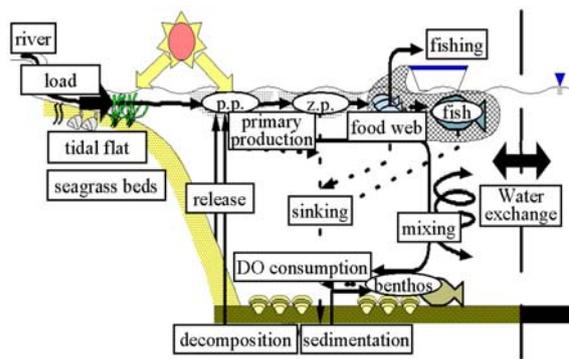


Fig.2. Structure of the ecosystem and material circulation.

Result and Discussion

As results, according to "ecosystem stability", conditions on species composition change indicated by fish catch data are most serious in almost all the areas examined. As to "smoothness of material cycling", conditions related to primary productivity indicated by transparency data, benthic environment indicated by sediment quality data, material cycling through benthic fish catch have been seriously damaged in more than half of the areas examined. Worsening of the benthic environment and ecosystem suggested by these results are the most critical items threatening the environmental health of the enclosed coastal seas in Japan.

Characterization of 88 enclosed coastal seas based on the result of the examination is also made in relation to the natural environment of the individual area. Some results on the trial of “advanced examination” and future perspective for the “Health Examination” is also discussed from the view point of environmental assessment and resource management of enclosed coastal seas.

