

Assessment of costal environment of eastern Hokkaido using Ocean Health Index

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Recent climate change impacts have prevented us from enjoying ecosystem services as ever. Although countermeasures have been taken to alleviate the current situation, the effects have not been properly assessed because the quantification of ecosystem services has not been completed. One of the reasons is that there is a gap between evaluation specialized for ecosystem function and socio-economic evaluation, so that comprehensive assessment has not been applied yet. Halpern *et al.* (2012) invented the ocean health index, which can comprehensively evaluate the benefits related to the ocean by the goal set from the functional, socio-economic approach. In this index, by calculating scores of each goal with 100 full marks, it is possible to compare each goal and target area. In this research, by applying the index to the coastal municipalities of the Okhotsk Subprefecture (Okhotsk), Nemuro Subprefecture (Nemuro) and the Kushiro Subprefecture (Kushiro) located in the eastern Hokkaido, we aimed to assess the current situations of the coastal environment and the use of ecosystem services, and provide recommendations for the improvements. The ocean health index is composed of ten goals such as food provision, livelihoods and economies. However, in this research, we used eight indicators and excluded two indicators of the artisanal fishing opportunities and marine products, which were difficult to define in the target area, difficult to acquire data, or difficult to evaluate the five years from 2010 to 2014 as the target year of this research. In each target area, status and pressure and resilience were determined for each indicator. Evaluation values for each index were calculated using these indices, and the scores of the eight goals were weighted and added together to calculate the total scores of each target area.

The total score was highest for Okhotsk (85.4 points), and 51.5 points for Nemuro and 71.7 points for Kushiro. One of the reasons for the high total score of Okhotsk is because of the high evaluation values for food provision, tourism and recreation. The high score of food provision is presumed to be mainly due to the high catches of scallops and salmon in Okhotsk. The high score of tourism and recreation is thought to be due to the number of tourists visiting Abashiri and Shari. On the other hand, although the score was relatively high in tourism and recreation at Kushiro, the low score of food provision led to the difference in total score from Okhotsk. In addition, from the comparison with a previous study that applied the ocean health index to Xiamen in China (Ma *et al.*, 2016), which has low scores in goals related to environment, we found that the scores of both goals related to economy and environment for the three subprefectures were relatively high. The results suggest that further further environmental monitoring and survey are necessary to assess continuously the current situations and develop measures and policies to improve the situations in the target area.

Keywords: Ocean Health Index, Coastal environment, ecosystem service, Eastern Hokkaido