Damage Assessment of Marine Pollution Disasters to Biological Resources Based on Numerical Models

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Abstract
The extent of Marine pollution damage to Marine organism resources has always been a scientific problem to be solved at home and abroad. In order to adequately protect these marine resources, we need to model and analyze the impact of Marine pollution disasters on Marine organisms. The modeling analysis of the impact of Marine pollution disasters on Marine organisms is very effective. It does not rely on modern remote sensing technology, and can analyze the impact of Marine pollution disasters on Marine organisms. In this article, the author establishes a model of the impact of Marine pollution disasters on Marine organisms using the ocean in Zhejiang as a research base. This model contains three dimensional factors. The three dimensional factors are social factors, economic factors and natural factors. The author can evaluate the geological condition of the place. Experiments show that this method has great advantages. It not only has a friendly customer interface and simple operation, also plays a very important role in the research on the impact of Marine pollution disasters on Marine organisms. This method is a great innovation and provides a new way for us to protect the Marine environment.

Key words: Marine Band, Modeling Analysis, Marine Pollution Disasters, Marine Organism

1. Introduction
The Marine band is formed by the interweaving and interaction of land, sea and atmosphere. The Marine band is a special place, which is the connection point between the ocean system and the land system. The combination of ocean system and land system promotes the emergence and development of Marine band. There are all kinds of areas on earth. Among them, the Marine bond is the most vital, it has a lot of natural phenomena. The rapid development of modern industry promotes the process of urbanization, which also has a great influence on the Marine ecological environment. It is not hard to imagine how much influence this will have. With the further improvement of urbanization, some unreasonable behaviors of people lead to global warming, which in turn leads to rising sea levels, Fresh water is not immune. People's health is endangered by the decrease in the quantity of fresh water and the deterioration of the water environment. The development of Marine ecological environment has attracted more and more attention. Therefore, the moderate development of Marine ecological environment is becoming more and more important. We need to develop a Marine ecological environment based on current technological standards. We need to develop a Marine ecological environment based on the principle that Marine organisms can remain unchanged. We should develop the Marine ecological environment at a fixed period and in a fixed area so that the Marine area can be fully sustainable. However, we cannot ignore this for the immediate benefit. We must fully consider the carrying capacity of the Marine ecological environment and develop it under reasonable capacity. We should implement a suitable industrial scale and analyze specific issues. We must do a good job of early warning and solve problems in time. The development of the Marine ecological environment requires us to start from the perspective of sustainable development of the ocean.

In these studies and explorations, we learned a lot of lessons, obtained many theories, and accumulated a lot of experience. It is not enough for us to rely on these alone. There, researchers need to constantly enrich their knowledge and continue to innovate. The researchers should innovate their own methods and strategies to solve some of the difficulties encountered during the development of the ocean. In this article, the author discusses how to make a better analyze the impact of Marine pollution disasters on Marine organisms. The author wants to...
use the theory of geography to solve the problem on the basis of research. The modeling analysis of the impact of Marine pollution disasters on Marine organisms is a very good method. We need to constantly improve on this basis to meet our need for Marine ecological environment and protect Marine organisms.

2. Overview of the Research Area

The Zhejiang Marine band is the intersection of China's northern and southern sea routes and the Yangtze river waterway, and it is also one of the main channels of China's north-south shipping and far east international routes. The Marine band of Zhejiang is in the coastal zone of China, and it is in the transition zone between the Yangtze river waterway and the north-south channel. The Zhejiang Marine band is a main thoroughfare that connects the north and south seas and the international routes of the far east, and it is very important. It's a vast ocean, the Marine lines in this area are continuous and more than 2,000 kilometers long. The sea area of Zhejiang province is 2.08 x 104 km² and the total length of Marine line is 2444 km. In 1972, the U.S. government promulgated the "Marine Belt Management Act". In 2001, the United Nations issued the "Marine Ecosystem Assessment". These two laws clearly define the boundaries of the Maritime band [1]. China discussed the planning of Marine ecological environment at the scientific meeting of the 147th Xiangshan mountain. In short, 10 meters away from land and 15 meters from the sea floor is the Marine band. Therefore, we can see that Zhejiang's Marine band is about 10 meters away from land and 15 meters from the sea floor. The ocean area discussed in this article is about the area have 10 meters away from the land of Zhejiang and 15 meters from the sea[2]. Our definition of the Marine bond in the relevant sea area was clearly defined in the previous Xiangshan science meeting. The specific range is shown in figure 1.

Figure 1. Research Area Map of Zhejiang Marine Band

3. The Construction of the Analytical Model for the Impact of Marine Pollution Disasters on Marine Organisms

The impact of Marine pollution disasters on Marine organisms is the supply of the whole system, which is not in balance with human consumption. In the study of geography, we can find an interrelated form, which is the balance between aggregate supply and aggregate demand. Aggregate supply and aggregate demand are unified. We can use our findings to explain the relationship between Marine pollution disasters and Marine organisms, and understand the factors that affect Marine pollution disasters and to maintain the balance between aggregate supply and aggregate demand. Referring to this form, we set up a model of aggregate demand and aggregate supply in geographical science, and put them in the same coordinate map for reference to Marine biological environment and price level [3]. The change of aggregate demand and aggregate supply and how the social economy realizes the equilibrium between aggregate demand and aggregate supply are shown in figure 2. Using this model, we analyze the impacts of Marine pollution disasters on Marine organisms by combining Marine resources with human consumption demand.
Figure 2. The Model of Aggregate Demand - Aggregate Supply (Modeling analysis of the Impact of Marine Pollution Disasters on Marine Organisms.)

AD: Aggregate Demand; AS: Aggregate Supply; Y: Year; P: The value of AD or AS; P0: P value at some point; YE: Some year; E: P value when AD=AS

The modeling analysis of the impact of Marine pollution disasters on the Marine organisms is formed by the aggregate demand and aggregate supply of functional relationships. Based on the function of supply and demand, we supplement and explain the impacts of Marine pollution disasters on Marine organisms by combining the yield and economic reasons. We use the following formula to further combine aggregate demand and aggregate supply to obtain economic phenomena related to Marine biological environment. The model of aggregate demand and aggregate supply model is expressed as follows.

\[ AD = f(p); AS = f(y); AD = AS \] (1)

In the formula (1), AD is aggregate demand; \( p \) is the factor in aggregate demand; AS is aggregate supply; \( y \) is the factor in aggregate supply; AD=AS means that the relationship between the two reaches a high point.

In the analysis model of the impact of Marine pollution disasters on Marine organisms, we assume that the system is at a certain point in time, usually a certain year. The abscissa represents the demand in the regional ecosystem [4]. It covers a wide range of areas, including resources, environmental requirements and damage, various factors, that is pressure factors, consumption factors and negative communication factors. These included ranges have a large loss of system. The vertical coordinate is the sum of various positive factors, including the output capacity, the driving force of economic development, and the positive communication factors [5]. The form represents the proportion between the two, the proportion is constantly changing in a particular region, we can figure out their ratio. Its formula is shown below. The model represents the proportional state of aggregate supply and aggregate demand of time points. This position falls in the area formed by the two coordinates. This position is shifted along with the change in the value of the abscissa and the vertical axis, which is the ratio of the SAS to the SAD [6]. The formula is as follows:

\[ T = \frac{SAS}{SAD} \] (2)

From the formula (2), we can see that \( T \) is the state value of the Marine biological protection at \( T \) certain point in time, which is the adaptive strength of its development. SAS is the aggregate supply of the system, which represents the aggregate supply in the pattern. SAD is the aggregate demand of the system, which is the total amount of demand in the form [7].

The analysis model of the impact of Marine pollution disasters on the organisms represents the state of the time in the time dimension. The x-coordinate is the time range, the y-coordinate is the value. The short term model will become a long-term model after a long development, which will play an important role in the study of Marine biological protection and enable us to understand it more deeply [8]. In general, in the coordinates that represent the state of a certain number of years, the x-coordinate represents the time dimension, and the ordinate represents the \( T \) value. The long-term model is the deepening of the short-term model, it is of practical significance for us to discuss the change of Marine biological protection on the time axis, it is convenient for us to grasp its dynamic trend, and it is the dynamic change of the impact of Marine pollution disasters on Marine organisms [9].
The mathematical representation of the analysis model of the impact of Marine pollution disaster on organism is as follows.

\[ S = P + J + K + Z + I \]  \hspace{1cm} (3)

From the formula (3), we can see that \( S \) is the aggregate supply index, which is the aggregate supply; \( P \) is the supply of Marine resources; \( J \) is the number of economic development in the sea area; \( K \) is the degree of technical support for the sea; \( Z \) is the social support index for the Marine bond; \( I \) is the degree of social support in the sea area, which is the positive ac factor index for the ocean. Each influencing factor is the dimensionless number, which is combined to be the integrated aggregate supply model of the system. The influence factor of each factor is the carrying capacity, which is the combination of dimensionless number and the combination of the total supply form. For these factors, it is affected by many aspects. We can use our findings to evaluate the ecological assets, and a formula is obtained as shown below, which is also known as the bearing factor. For the sub-index model mentioned above, the influencing factors are not single. We refer to the global ecological assets and use the total value of ecological assets in a certain region to calculate, the calculation of each sub-model is shown as follows [10].

\[ P = \sum_{i=1}^{n} P_i \times C_i \]  \hspace{1cm} (4)

\[ J = \sum_{i=1}^{n} J_i \times C_i \]  \hspace{1cm} (5)

\[ K = \sum_{i=1}^{n} K_i \times C_i \]  \hspace{1cm} (6)

\[ Z = \sum_{i=1}^{n} Z_i \times C_i \]  \hspace{1cm} (7)

\[ I = \sum_{i=1}^{n} I_i \times C_i \]  \hspace{1cm} (8)

From the formula above, we can see that \( i \) is the number of factors of each index, which is the sorting method of multiple factors; \( X_i \) is the indicator factor, which is the standard factor; \( C_i \) is the weight of each index. The total amount of components of the index contains many aspects, including the damage to the resource environment and various positive and negative factors [11].

The aggregate demand model consists of human consumption of resources and environment, as well as various pressure factors and negative communication factors that exert pressure on the whole system. The model for aggregate aggregate demand is as follows.

\[ D = Y + Q + H + I \]  \hspace{1cm} (9)

From the formula (9), we can see that \( D \) is aggregate demand, which is aggregate demand; \( Y \) is the social pressure index of the Marine bond, which is the extent of pollution in the sea area; \( H \) is the environmental pressure index of the Marine bond, which is the influence degree of the surrounding area; \( Q \) is the Marine Eco-environmental protection intensity index; \( I \) is the negative interaction factor for the system, which is the number of negative factors. Through the observation of the above factors, we can get the calculation formula of the impact of Marine pollution disaster on Marine organism. According to the establishment of each sub-index model in the above aggregate supply, the calculation formula of Marine pollution disasters for each sub-model in the aggregate demand model is as follows [12].

\[ Y = \sum_{i=1}^{n} Y_i \times C_i \]  \hspace{1cm} (10)

\[ H = \sum_{i=1}^{n} P_i \times C_i \times \sum_{i=1}^{n} H_j \times C_j \]  \hspace{1cm} (11)
For the final result of the impact of Marine pollution disaster on the organism, we observe the various factors of Marine development. According to people’s needs and the actual population size of the sea area, we can see that there are three results. The first result is overloading when the capacity is greater than one. The second result is equilibrium when capacity is equal to one [13]. The third result is short when the capacity is less than the moment. According to population and the demand of human activities on the resources and the environment and the difference of the actual supply capacity of the resource environment, we can divide the final result of the impact of Marine pollution disaster on the organism into three categories. The first case is that when RCC is more than 1, it can be loaded. The second case is when RCC is equal to 1, full load. The third case is when RCC is less than 1, overload.

\[
Q = \sum_{i=1}^{n} Q_i \times C_i \quad (12)
\]
\[
I = \sum_{i=1}^{n} I_i \times C_i \times I_i \times C_i \quad (13)
\]

![Figure 3. The Basis Figure of Evaluation of Marine Ecological Environment Protection](image)

Considering the particularity of Marine bond and small changes in the value of Marine organism protection, we divided the Marine organism protection results into five categories based on the three categories according to the ratio relationship between aggregate supply and aggregate demand. These 5 classes are no load, available load, full load, over load and load [14]. The ratio of supply to demand is called the Angle. We divide the angles into three dividing lines, they are 30 degrees, 45 degrees and 60 degrees. As shown in figure 3. The ratio of aggregate supply to aggregate demand is expressed in terms of the Angle $\theta$. $T$ is the magnitude of $\tan \theta$. We regard $\theta$ as 30, 45 and 60, and regard them as the dividing line of each result. According to the classification of $\tan \theta$ in figure 3, we divided the results of the impact of Marine pollution disasters on Marine organisms into five kinds. When $R(\sqrt{3})$, that is when $\theta > 60^\circ$, no load. When $\sqrt{3}/3$, that is when $60^\circ > \theta > 45^\circ$, available load. When $R = 1$, that is when $\theta = 45^\circ$, full load. When $\sqrt{3}/3$, that is when $45^\circ > \theta > 30^\circ$, overload. When $R(\sqrt{3}/3)$, that is when $\theta < 30^\circ$, load. Among them, $\sqrt{3} = 1.732$. For convenience, we set it to 1.8. The classification is shown below. When $R > \sqrt{3}$, it is full load; when $R > 1.8$, it is on load; when $R < 0.6$, it is load; when $1.8 > R > 1.1$, it is available load; when $R = 1$, it is full load; when $0.6 < R < 1$, it is over load; when $R < 0.6$, it is load. A point represents a full load. In order to effectively analyze, because the full load area in the system model is a certain point, we combine the actual situation with the full load standard to set a tolerance, and the tolerance value is 0.2. As shown in figure 4. Finally, we get the classification results. When it is greater than 1.8, its state is loadable, and when it is greater than 0.6 less than 0.9, the state is overloaded. When $R > 1.8$, on load; when $1.8 > R > 1.1$, available load; when $0.9 < R < 1.1$, full load; when $0.6 < R < 0.9$, overload; when $R < 0.6$, load.
4. Results and Analysis

Based on the statistical yearbook of Zhejiang province from 2006 to 2010, we have obtained the comprehensive formula 3-13, that is the analysis model of the impact of Marine pollution disasters on Marine organisms and the model of aggregate supply and aggregate demand in the construction system [15]. Through data processing and the analysis model of the impact of Marine pollution disasters on Marine organisms, we have calculated the Marine biological protection value [16]. According to the classification criteria, we have obtained the biological impact index of Marine pollution disaster, as shown in table 1, and got the analysis of the impact of the Marine pollution disaster on Marine organism, as shown in figure 5.

Table 1. Impact Indicators of Marine Pollution Disasters on Marine Organisms in Zhejiang Province from 2005 to 2009

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic aggregate supply</td>
<td>5.623</td>
<td>5.376</td>
<td>5.641</td>
<td>5.679</td>
<td>5.763</td>
</tr>
<tr>
<td>Synthetic aggregate demand</td>
<td>3.606</td>
<td>3.297</td>
<td>3.416</td>
<td>3.026</td>
<td>3.166</td>
</tr>
<tr>
<td>Synthetic carrying capacity of the impacts of Marine pollution disasters on Marine organisms</td>
<td>1.559</td>
<td>1.630</td>
<td>1.651</td>
<td>1.877</td>
<td>1.820</td>
</tr>
<tr>
<td>The impact levels of Marine pollution disasters on Marine organisms</td>
<td>Available load</td>
<td>Available load</td>
<td>Available load</td>
<td>No load</td>
<td>No load</td>
</tr>
</tbody>
</table>

Figure 4. Analysis Diagram of the Impact of Marine Pollution Disasters on Marine Organisms

Figure 5. Analysis of the Impact of Marine Pollution Disasters on Marine Organisms From 2005 to 2009.

From the perspective of comprehensive synthetic aggregate supply, we can see that the aggregate supply of
Marine ecological environment protection has not changed substantially from 2005 to 2009, the values are between 5.3 and 5.8. The aggregate supply value has slightly decreased in 2006, it began to decline in 2007, and the aggregate supply value has been in a slight increase in the following years [17]. The aggregate supply value reached 5.763 in 2009. From the perspective of comprehensive synthetic aggregate demand, we can find that the value of the aggregate demand index of Zhejiang's Marine bond system dropped downwards from 2005 to 2009, and the rise between the adjacent years was opposite. However, there was also a slight difference between the values, it was basically between 3.0 and 3.7. Although the value of aggregate demand rises and falls between years, the appreciation of value is always smaller than the value of the fall. Overall, aggregate demand is declining. From the results of the long and short-term SAD-ASA model, we can see that the impact values of Marine pollution disasters on Marine organisms in 2008 and 2009 are on the upper side of the loadline, which shows that the impact of Marine pollution disaster on Marine organisms is in no-load level. The impacts values of Marine pollution disasters on Marine organisms in 2008 and 2009 are in the available load area, which shows that the impact of Marine pollution disaster on Marine organisms of each year is dynamic. In the long term model, we can see the change in aggregate supply and aggregate demand. The aggregate supply is greater than the aggregate demand, which indicates that the development of Zhejiang Marine bond is always within the range of ecological environment, and the whole ecosystem is in a relatively healthy state. This article regards the sea area of Zhejiang as a key area, and establishes a model of Marine ecological environment protection, so as to construct a complete system. The author makes full use of the relevant technologies of contemporary geoscience to complete the collection of remote sensing information, which is a great progress of research and is of great benefit to the development of Marine industry. Although its advantages are obvious, we still need to carry out more in-depth exploration to continuously improve.

5. Conclusions

In this article, the author discussed how to make a better modeling analysis of the impacts of Marine pollution disasters on Marine organisms. The author needs to constantly improve on this basis to meet our need for Marine ecological environment and protect Marine organisms. The modeling analysis of the impact of Marine pollution disasters on Marine organisms is very effective. It does not rely on modern remote sensing technology, and can analyze the impact of Marine pollution disasters on Marine organisms. Human activities have had a great impact on the Marine environment, but our assessment of this loss is obviously very difficult. It is because of its difficulty that we should explore more. We should estimate the impact of human activities on the Marine ecological environment, and obtain accurate data to prepare for the measurement of ocean capacity. In the future, with the development of people's technology, we will gradually quantify these data to make it more accurate and more realistic.

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