Method of Determining the Overload Threshold of Marine Resources and Environmental Carrying Capacity from the Perspective of Marine Resources Segmentation and Protection

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Abstract: With the reform and opening up and the continuous improvement of the economy, the marine environment has been seriously polluted, and the health of the ocean has been destroyed. In order to comprehensively promote the construction of an ecological civilization system, ensure the health of the ocean, and follow the concept of sustainable improvement, it is necessary to strengthen research on theories related to marine resources and methods for determining the overload threshold. The purpose of this paper is to analyze the environmental carrying capacity of marine resources from the perspective of marine resource segmentation and protection, so as to determine the overload threshold method. In the experiment, through the Gaussian model method, the threshold value of plankton was determined, and the ecological threshold value of phytoplankton and copepod zooplankton was analyzed. In any ecosystem dynamic, the threshold value is inevitable.

1. Introduction

The 21st century is the century of utilization and improvement of marine resources. As an important resource, marine resources are related to the future improvement of our country. At this stage, the protection system of marine resources law is not perfect. Civil law, administrative law and local regulations all have relatively comprehensive provisions on the protection of marine resources. However, there are only a handful of marine resources protection clauses in my country's criminal law. In addition, the consequences of damaging marine resources It is particularly urgent to improve the criminal law protection of marine resources [1]. This also makes the study of marine

resources criminal legislation of great significance.

The ocean is my country's second territory. In today's world with an increasing population, a gradual scarcity of terrestrial resources, and deteriorating environmental problems, people have begun to turn their improvement goals to the ocean. Minh-Thu P studied that different residence times was carried out by means of radioactivity, numerical dynamics simulations, and coastal land-sea interaction methods.The results of the radioactive and numerical dynamic simulations show a complete picture of water exchange in the study area, while the coastal land-sea interaction method shows the water exchange that occurs throughout the water body. Therefore, it is improved by integrating radiological methods into numerical simulations [2]. Ito S I has carried out various studies to elucidate the impact of climate change on marine living resources. However, the limitations of observational methods that directly investigate the environment experienced by larvae and larvae have hindered understanding. reviewed previous studies on living marine resources and discussed that reconstructing the environmental history of juvenile and juvenile fish is important for understanding the impact of climate change on living marine resources [3]. The division and protection of marine resources is also a hot and key issue that has attracted the attention of the international community.

Based on the research background, this paper summarizes the existing problems of marine resources, studies the concept and connotation of marine resources and environmental carrying capacity, and finally clarifies the research on marine resources and environmental carrying capacity. In the experiment, through the Gaussian model method, the threshold value of plankton was determined, and the ecological threshold value of phytoplankton and copepod zooplankton was analyzed. In any ecosystem dynamic, the threshold value is inevitable.

2. Research and Concept

2.1. Research Background

At present, the research on carrying capacity of resources and environment has involved the integrated innovation of multiple disciplines, and a issue related to the future improvement of human beings [4-5]. At present, Chinese researchers have carried out a lot of research work. my country is a big ocean country, and the ocean is an important research field for economic and social improvement and ecological civilization construction. A large number of studies have provided a guarantee for the improvement of human social civilization. However, with the progress of the times, the pollution of the ocean has become more and more serious, and human beings are drawing energy from the ocean endlessly. The economic improvement around the ocean has also brought damage to the marine ecological civilization, resulting in the destruction of the marine ecological environment and habitat degradation. And a series of problems, contrary to the concept of harmonious and sustainable improvement of the ocean. Therefore, studying the carrying capacity of marine resources and environment has become an important topic to ensure marine health and maintain marine ecological civilization [6-7].

2.2. Existing Problems of Marine Resources

Marine resources mainly include biological resources and non-biological resources. Among these biological resources, about 3 billion tons of aquatic products can be provided to human beings every year under the condition that their ecosystems are not destroyed. Non-biological resources such as energy resources, mineral resources, tourism resources, and environmental resources can provide convenience for our lives and create a lot of wealth for us at the same time [8-9]. Just as people use terrestrial resources to improve marine resources unreasonably, marine resources also

have a series of problems. As a big resource-consuming country, my country faces more serious problems in these areas, which are mainly reflected in the following aspects:

1. Excessive exploitation and unreasonable utilization of marine resources Our country's marine resources are over-exploited and the exploitation and utilization of marine resources is unreasonable. At the same time, due to the lack of protection of marine resources by various systems, our living environment and marine ecology have suffered serious damage.

2. The aggravation of marine pollution and the unreasonable improvement and utilization of marine resources are related to the increasingly serious problem of marine pollution. Due to the needs of my country's economic improvement, the number of industrialized areas has continued to increase, and the discharge of a large amount of industrial waste water and waste residues has seriously polluted the offshore sea area [10].

3. The security situation of marine resources is severe. my country's sea area is 3 million square kilometers, but the actual control does not exceed 2 million square kilometers, and a large number of territorial waters are occupied by foreign countries [11]. Fishermen engaged in fishing operations in these disputed waters are often searched or detained by foreign countries, resulting in the inability of Chinese fishermen to fish normally and seriously affecting the interests of the Chinese people.

2.3. Concept and Connotation of Marine Resources and Environmental Carrying Capacity

(1) Ocean Health

Ocean health means that the marine ecosystem does not have any adverse reactions to external influences and can maintain a stable state. Therefore, ocean health can be considered as the marine ecosystem showing its own vitality and maintaining its self-determination over time [12-13]. A healthy marine ecosystem is resilient and able to maintain productivity while providing services to humans. Ocean health is a way to evaluate the best state of the marine ecosystem. The capacity is directly related to the level of ocean health. The strategic position of the ocean in modern science and technology and economic and social improvement is becoming more and more important, but at the same time, it is also faced with major problems such as insufficient resource supply, serious environmental pollution, and ecosystem degradation.

(2) The theory of carrying capacity

It has been more than two centuries for the concept of basic carrying capacity to improve from thought to language expression, from theoretical research to management practice. The concept of carrying capacity originally referred to engineering properties or mechanical properties, and the concept proposed at the time seemed to have nothing to do with living organisms and natural systems [14-15]. Humans have discovered that the natural resources they need to survive in society are limited, so they apply the concept of carrying capacity to ecology. Carrying capacity is a scientific point of view, and is an important basis for the management of sustainable human improvement.

(3) Concept and connotation of resource and environmental carrying capacity

The carrying capacity of resources and environment is a field in the scientific research of resources and environment. It measures the quality and capacity of the resources and environment, and is an important parameter for evaluating and analyzing the impact of human economic activities and daily life on the ecosystem. Currently, environmental resource issues The continuous deterioration exceeds the limit of natural tolerance, and gradually affects human life and economic society. The main purpose of evaluating the carrying capacity of resources and environment is to adjust the economic activities of human beings, in order to achieve a balance between the natural environment and economic and social improvement, and ultimately achieve sustainable

improvement. Marine resources and environmental carrying capacity is a research based on marine resource supply and marine ecological environment, and it is also an important part of the evaluation of sustainable improvement of marine resources and environment.

2.4. Research on the Carrying Capacity of Resources and Environment Based on Ocean Health

Factors affecting the carrying capacity of marine resources and environment
The environmental carrying capacity of marine resources is related to regional natural resources and environmental conditions, regional social economy and culture, and human marine improvement activities, as well as some factors [16]. Mainly include:
(1) Natural factors
Geographical location, resources, environment, etc. are all natural factors. In terms of marine resources, it is expressed as the quantity, quality and utilization of resources. In terms of the marine environment, it is mainly reflected in the capacity and quality of the marine environment.
(2) Human factors
The pressure of human activities on the ecosystem and the regulation of carrying capacity are the two main aspects of human factors. The magnitude of the pressure is related to the population base, structure and economic improvement (level of economic improvement, spatial characteristics of improvement, investment patterns, import and export characteristics, economic diversity) [17-18]. It is also closely related to the pollution of the marine environment and the destruction of the marine ecosystem in the long history of rapid human improvement. The rest also include the size of the ocean carrying capacity, which is affected by regional marine culture, living standards, consumption patterns, and government decisions.
(3) Subjective factors
Today, there is no consensus on how to explore carrying capacity, and different evaluation methods and indicators, as well as different operation methods, will produce different research results.

3. Test Method and Content

3.1. Research Content

To analyze the related research on ecological thresholds of phytoplankton and copepod zooplankton, thresholds are inevitable in any ecosystem dynamics. The threshold for plankton was determined by the Gaussian model method.

3.2. Data Processing Methods

SPSS 22.0 software was used to analyze the correlation of phytoplankton biological indicators, and the Gaussian model method was adopted. The correlation coefficient was determined by fitting the curve and the obtained equation, so as to determine the salinity environment of Daphnia chinensis. The ecological threshold under the factor gradient, the relevant equation is as follows:

$$R^2 = 0.70$$

(1)

$$y = 31.09 \exp\left[-\frac{1}{2}(x-21.36)^2 / 1.186^2\right]$$

(2)

4. Analysis and Research on the Method of Determining the Overload Threshold of Marine Resources and Environmental Carrying Capacity

4.1. The Ecological Threshold of Phytoplankton

Through the correlation analysis of phytoplankton growth of four environmental factors, the ecological threshold of phytoplankton was determined. Phytoplankton related data are shown in Table 1 and Figure 1:

Table 1. Correlation between phytotons growing water quality

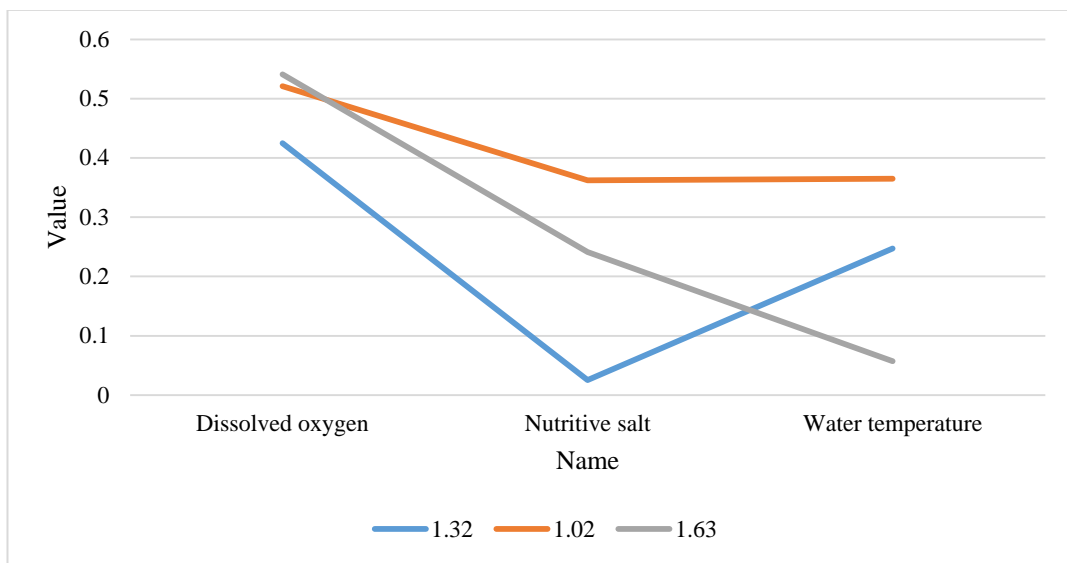| Salinity	1.32	1.02	1.63
Dissolved oxygen	0.425	0.521	0.541
Nutritive salt	0.025	0.362	0.241
Water temperature	0.247	0.365	0.057

Figure 1. Water quality and environment data map of phytoplankton growth

4.2. Ecological Thresholds of Copepod Zooplankton

(1) Analysis of copepod zooplankton

The dominance of copepod zooplankton was calculated, and the results are shown in Table 2 and Figure 2:

Table 2. Advantage and detection frequency of copepod zooplankton

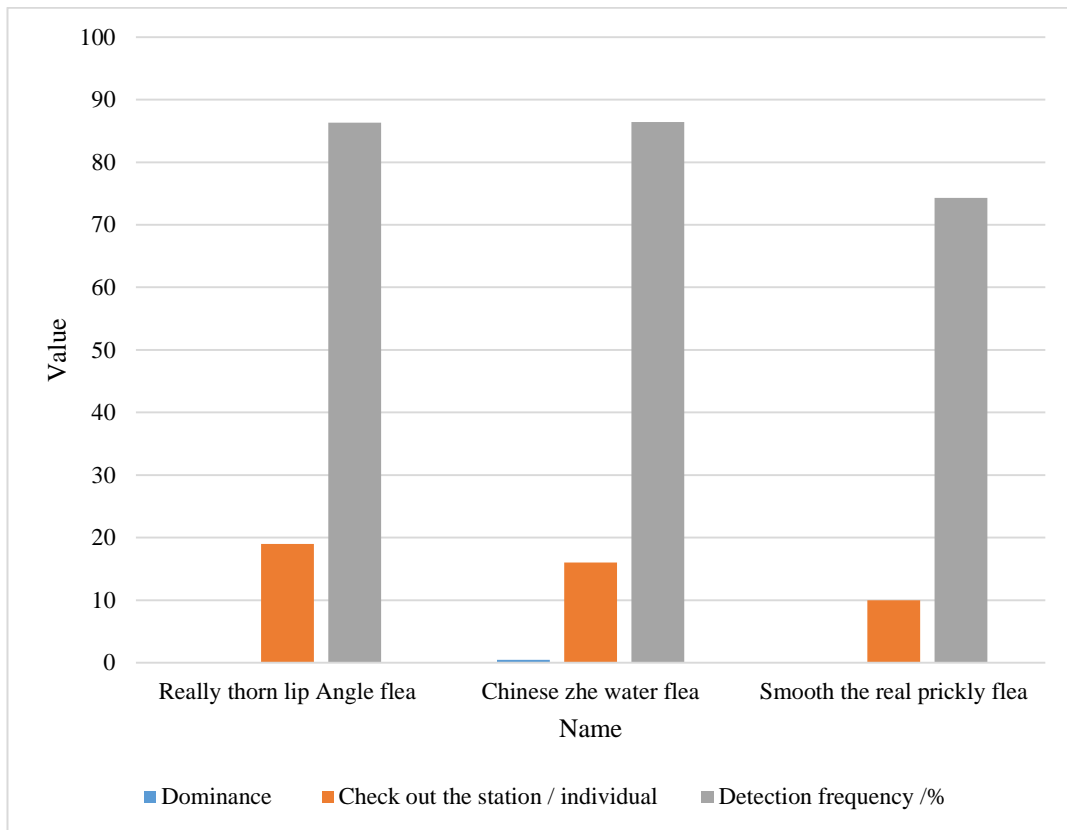| Specific name	Dominance	Check out the station / individual	Detection frequency /%
Really thorn lip Angle flea	0.084	19	86.3
Chinese zhe water flea	0.452	16	86.4
Smooth the real prickly flea	0.015	10	74.3

Figure 2. Ccopepod zooplankton data Fig

The results showed that when the value of dominance degree was greater than 0.02, it was the dominant species, so Daphnia smoothis was not the dominant species this time.

(2) Correlation of Copepod Zooplankton

Correlation analysis was carried out with water quality environmental factors such as salinity, water temperature, dissolved oxygen (DO) and pH value, and the experimental results showed that the abundance of Daphnia similis was correlated with the four environmental factors. The specific data results are shown in Table 3 and Figure 3:

Table 3. Correlation analysis between abundance of zooplankton and water environment factors

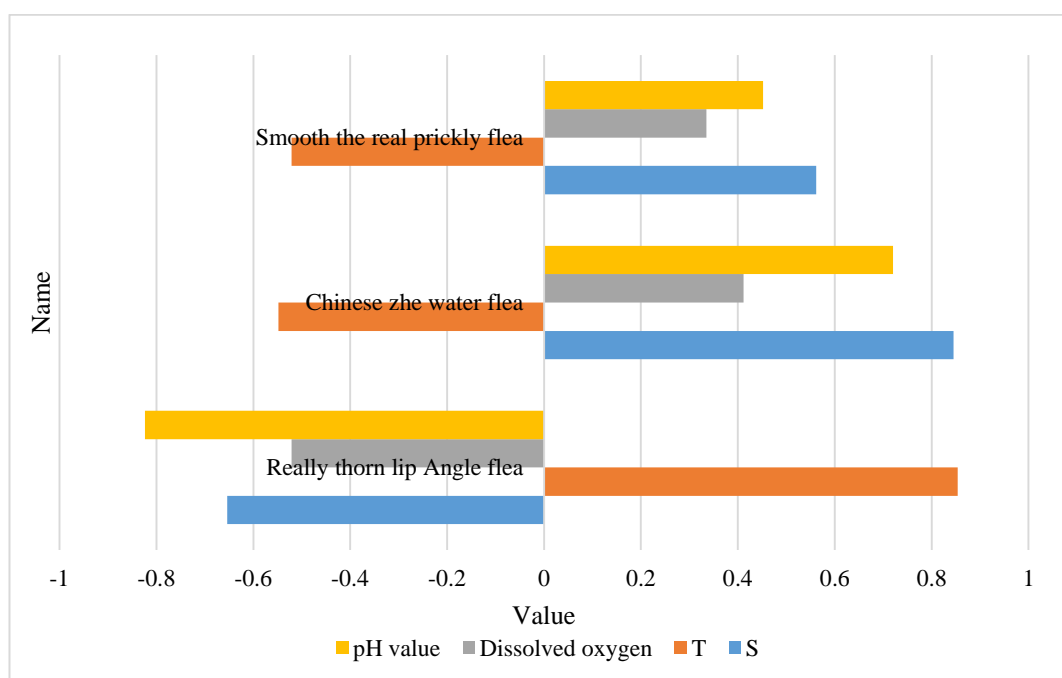| Specific name	S	T	Dissolved oxygen	pH value
Really thorn lip Angle flea	-0.654	0.854	-0.521	-0.824
Chinese zhe water flea	0.845	-0.548	0.412	0.720
Smooth the real prickly flea	0.562	-0.521	0.335	0.452

Figure 3. Data related to main foot zooplankton

5. Conclusion

In recent years, with the expansion of the scale of marine improvement and utilization, and the lack of awareness and measures for marine ecological environmental protection in the early days, my country's marine environment is facing a huge threat, and people have gradually begun to pay attention to how to improve the ocean rationally and sustainably. cause. The proposal and improvement of capacity provides a new entry point for evaluating the health of marine ecosystems. The environmental of marine resources is a reflection of the health of the marine ecosystem, and the capacity is directly related to the health of the ocean.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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