

Measure the intensity of global hurricane activity

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Abstract

This question uses the typhoon data of the "China Meteorological Administration" from 1971 to the present day to study the intensity of typhoon. Using the average strength of each year and the monthly typhoon number and maximum intensity as the standard for measuring typhoon activity, the monthly typhoon since 1971 Intensity of wavelet analysis, we conclude that the number of typhoons is obviously less than that of the past year. As the years increase, the typhoon activities extend backward. There are fewer typhoons in the first 6 months since 1990. The typhoon activity mainly distributes in October-December It can also be concluded that although the typhoon activity of this month was shed, the maximum strength of the typhoon did not decrease.

Keywords

Hurricane intensity , wavelet analysis, statistical description.

1. Introduction

This question mainly explores the intensity of global hurricane activities, but the activities of typhoons in different regions are different, and the intensity of global typhoon activities needs to be measured in time and space. Secondly, there are many factors that affect the intensity of hurricanes, making it more difficult to study the problems. In order to more accurately reflect the intensity changes of global hurricanes, we further simplify the problems and compare the total number of typhoons with typhoons of magnitude 5 each year Typhoon activities; the intensity, typhoon distribution and monthly maximum typhoon intensity are used to study the intensity changes of typhoon year by year.

2. The composition of this article

2.1 Typhoon, hurricane concept

Typhoon refers to tropical cyclones with maximum winds of 12-13 near the center in the western Pacific and South China Sea. Most formed in the latitude and longitude, latitude 5o-20o, especially in the north-south latitude 10o-20o occurred between the number of the total number of 65%. Typhoons in the western Pacific are mainly concentrated in three areas: the central South China Sea, the sea near Guam and the sea to the east of Luzon.

Hurricane refers to the tropical cyclones that occur in the Atlantic Ocean, the Gulf of Mexico and the eastern part of the North Pacific near the center with maximum winds of 12 or above. According to the hurricane center's hourly hurricane center, the U.S. National Hurricane Center divides hurricanes into five levels: a hurricane 119-153km / h, a hurricane 154-177km / h, a hurricane 178-209km / h, a hurricane IV 210-249km / h, five hurricanes 249km / h or more.

2.2 The impact of global hurricanes

In recent years, with the development of science and technology, CO2 emissions from heavy industry have brought about global warming; secondly, the people's crazy requests for natural resources have led to frequent natural disasters. The most serious of these is the emergence of typhoons. The hurricane brought a nearly devastating disaster to large-scale commercial, global economy, property and finance industries. This phenomenon has led many scholars to study the causes of hurricanes and

typhoons. Wang Jizhi[1]discussed the geographical distribution and seasonal variations of the typhoon in the western Pacific Ocean. Huang [2]analyzed the chronological change of typhoons, which is a change of time intensity of long-short periodic interactions. Although many researchers have done research in recent decades, no concrete conclusion has yet been reached and the status of the hurricane has not been answered yet.

This question uses the data of hurricanes and typhoons occurred in 1971-2014 provided by the China Tropical Meteorological Administration Tropical [3]Cyclone Data Center to study the changing trend and intensity of typhoons.

2.3 A Study on the Amount and Intensity of Typhoon and Hurricane since 1949

2.3.1 Discussion on Typhoon Number in Northwest Pacific:

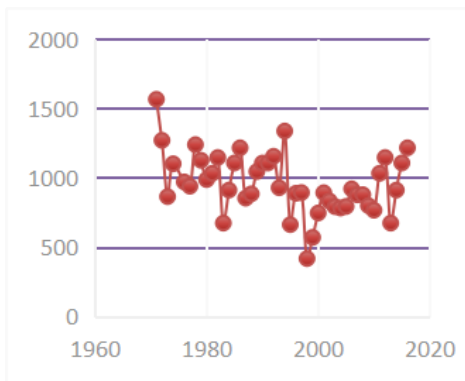


Figure 1 The total number of typhoon

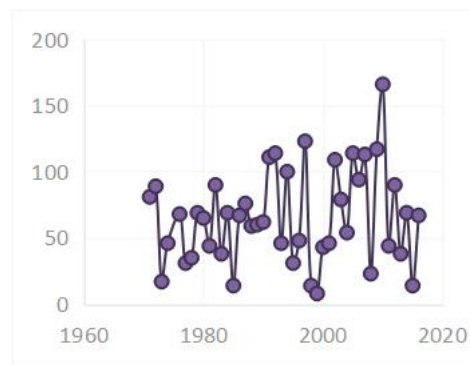


Figure 2 5 Typhoon number

As can be seen from Figure 1, the total amount of typhoon in the western North Pacific has shown a decreasing trend except for individual years (1996, 2002 and 2004). However, the total amount of typhoons did not decrease obviously. The typhoon and hurricane activities caused the changes of intensity of tropical convection.

2.3.2 Changes of Tropical Cyclones in the Southwest Pacific:

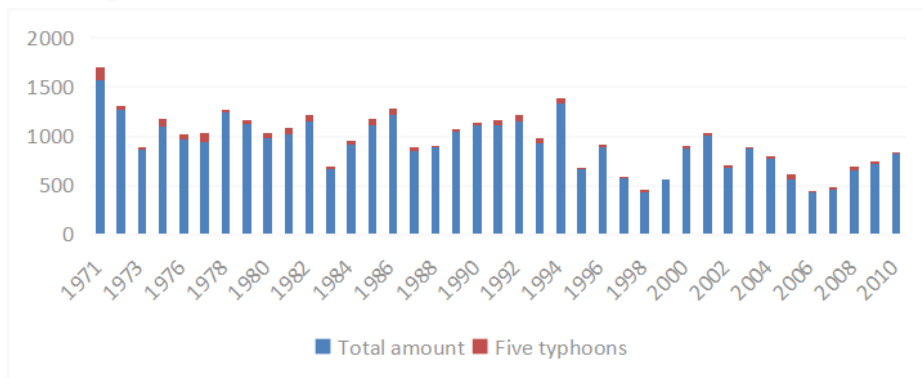


Figure 3 Shows the comparison between the number of typhoons.

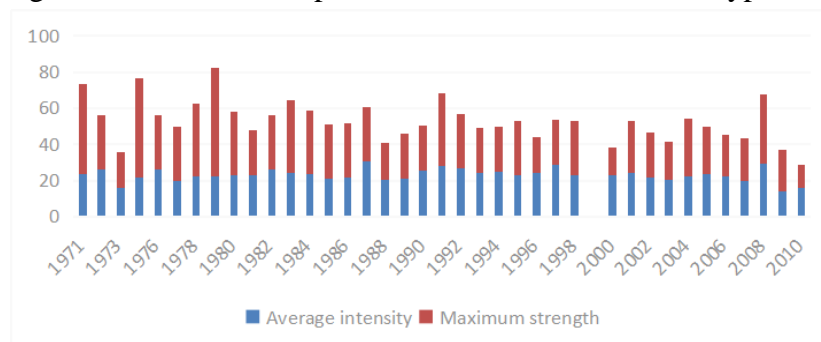


Figure 4 Shows the comparison between the average intensity.

Figure 3 shows the comparison between the number of typhoons at level 5 in the Southwest Pacific and the total number of typhoons in the whole year. Figure 4 shows the comparison between the average intensity and the maximum intensity per year.

Analysis of Figures 3 and 4 shows that the total number of typhoons and typhoons in the southwest Pacific Ocean has been declining year by year. In particular, the tendency of typhoon activity to drop significantly over the past decade has brought about a great The benefits of the earth, the global economy has regained its prosperity. The average intensity of typhoons is also relatively lower each year. However, the maximum intensity of typhoons has not changed much from that of other countries. This shows that with the improvement of science and technology, people's living standards have risen and people have indiscriminately exploited natural resources. As a result of the reduction in the number of forests, the intensity of the hurricanes did not diminish. When typhoon landed [4], typhoon intensity changed to some extent due to the difference of terrestrial and oceanic climate, but the lack of trees resulted in no obvious decrease of intensity, and even the typhoon intensity with a small part of coastal tendency increased.

2.3.3 Global Hurricane Strength Discussion:

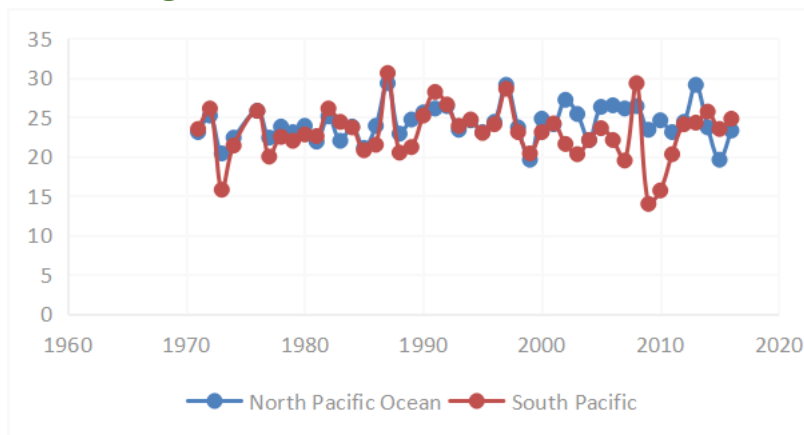


Figure 5 In the Southwest Pacific.

The intensity of typhoon is disturbed by many factors such as ocean temperature and air convection. Based on the calculation of the average typhoon intensity in the world, we can see from the figure that as the year increases, the average intensity of the typhoon does not show a large range fluctuation, but we can see since 2000, the strength of the typhoon in the North Pacific has shown subtle changes. The discussion so far cannot accurately summarize the specific changes in the typhoon. Next, we compare the number of typhoons per month in recent 40 years with the maximum typhoon intensity. Finally come to precise conclusions.

2.3.4 Study on typhoon changes in each month:

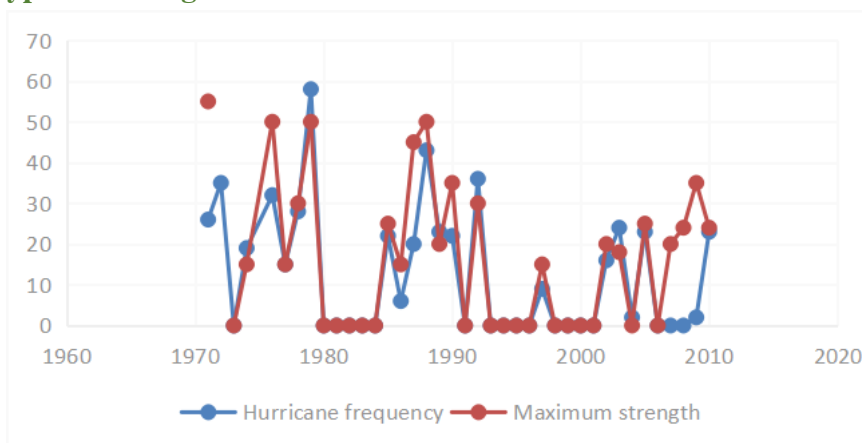


Figure 6 Typhoon intensity in the world.

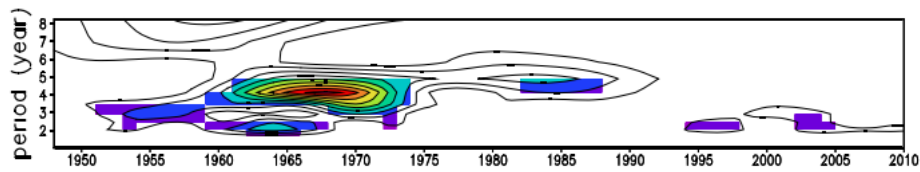


Figure7 Wavelet analysis

3. Conclusion

Since 1990, the number of hurricanes in the tropical Atlantic has decreased markedly compared with that in the previous two decades. The number of typhoons in the western North Pacific Ocean has gradually shifted back with the increase of years. Typhoon occurred mainly in autumn and winter, but in April and July each year, The number of typhoons decreased and the maximum intensity of the typhoon still remained unchanged. The number of typhoons in the Southwest Pacific Ocean increased from January to March every month. Statistics show that the annual occurrence of typhoons and hurricanes is delayed year by year. The number of typhoon hurricanes in July, August and September is reduced, the number of typhoons in October, December and December is increased, and the maximum intensity of typhoons It is also mainly concentrated in the months after the year.

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