Coastline climate and coastal library cultural information management based on geographic information system (GIS)

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Abstract
Typhoon is caused by the action of sea level and atmosphere. It is a kind of natural disaster with relatively strong destructive ability, which will seriously affect the development of coastal areas. Typhoon weather usually causes large-scale rainstorms and strong winds. Strong winds and heavy rains will form storm surges and large waves on the sea, and the damage to the coast is very huge and obvious. In order to reduce the damage caused to people by typhoon weather, researchers need to conduct specific analysis on the occurrence of typhoons. Only by grasping the trajectory and law of typhoon activities can they provide a basis for people to prevent typhoon disasters in advance. In the data analysis, this study built a functional analysis model in the geographic information system, used the pixel scale to measure the specific situation of typhoon landing, and combined the population distribution and total economic growth in my country’s coastal areas. A further analysis was made on the spatial distribution of typhoons, and the results of the analysis can provide certain help to the economic development of coastal areas in my country. This article also studies the development of tourism in coastal areas, puts forward effective suggestions for the establishment and development of library culture, and advocates that people make full use of the advantages of library culture to improve the level of tourism development in coastal areas.

Keywords Geographic information system · Coastline climate · Library culture · Information management

Introduction
In the context of globalization, different countries and regions are looking for new development opportunities, and economic development is also facing more challenges and opportunities. In the development of the new era, many countries have seen the importance of establishing city brands. With the improvement of people’s living standards, people began to seek spiritual enjoyment, and the development of tourism gradually prospered. In accordance with the characteristics of their own development, many regions have created leisure and cultural experience places with characteristics of tourist areas for tourists, so that when they relax, they can feel the influence of local culture and enhance their travel experience (Jaafari et al. 2014). The topography of coastal areas is quite unique. Some coastal areas have long coastlines, and the construction and use of ports are very good. In the construction of tourist attractions in coastal cities, such areas should be regarded as the central area of tourism construction and development. Let the development of this part of the region drive the progress of the rest. Many coastal areas are distributed with ports, which are the main places for foreign trade and product circulation. Coastal cities should use their own geographical advantages to develop other industries. The economic benefits brought by the port have also promoted the economic development of coastal areas to a certain extent and improved the living standards of many people. In coastal areas, the area of salt fields is relatively broad. Coastal cities can effectively develop and use salt fields as a unique tourism resource to increase the income of local residents.

With the continuous development of tourism, people’s understanding of the scope of tourism no longer stays in scenic spots, and people begin to explore entertainment venues other than specific scenic spots. In the process of urban construction, some resources will be wasted, and the development of tourism can promote the reuse of these resources (Al-Rawas 2000). The development of the new era provides more possibilities for the development of tourism, new entertainment methods and new
cultural forms are constantly being formed, and people’s entertainment and relaxation projects are also increasing. When designing tourism projects, cities can use various resources brought about by the development of the new era to create more entertainment projects and attract tourists to participate in entertainment activities in the scenic area. In a tourist city, almost all urban facilities can provide services for the development of tourism. Combining the construction characteristics of the city with the development of tourism can break the traditional tourist model and bring people a brand new tourist experience (Johari and Nejad 2015). Due to the rapid development and change of the times, tourism projects also need to be adjusted according to the changes of the times to meet the different needs of people. When constructing, we must fully consider the characteristics of different groups of people, provide people with interesting tourism activities, let people actively participate in the activities, and let people feel the fun of playing.

In the development of the tourism industry, more people are pursuing tourism projects with rich cultural connotations. The construction of library culture in coastal areas has gradually become an important project to attract tourists. This cultural construction can collect the economic development and information of coastal areas in a unified manner. Visitors can understand the specific development of coastal cities by browsing the books in the library. This article studies the typhoons that have landed in coastal areas of my country over the years, analyzes the activities of all typhoons from 1951 to 2017, and introduces the detailed landing time and specific landing locations of these typhoons. By analyzing the specific conditions of the typhoon, it can help people take preventive measures in advance and reduce the losses caused by the typhoon (Juang and Elton 1997). In the process of development, coastal cities should analyze their own economic and cultural advantages, link the development of tourism projects with the development of local humanities, and build a tourism development model with its own characteristics. In addition, the construction of library culture in coastal areas mainly depends on the development and construction of the libraries of various universities in coastal cities. Each university must make full use of the human resources of universities and contribute to the construction of library culture in coastal areas.

Principles of information collection in university library

Academic principles

Because there are many professional talents in colleges and universities, the work of information collection is more professional than that of ordinary tourism organizations. The quality of the faculty of colleges and universities is relatively high. Many researchers and students in the school can also participate in the work of information collection (Anderson 1968). Tourism information can be classified in the process of information collection, so that people can quickly find the information they want. By analyzing the characteristics of the information structure of university libraries and the information structure collected by ordinary institutions, it can be seen that the information in university libraries has obvious academic characteristics. In the process of traveling, tourists can find the tourist information they want in the library of the university. In the library, they can find the route of the tour, the traffic of the city, the accommodation conditions around the scenic spot, and the specific information of the scenic spot they want to visit. In university libraries, in order to facilitate researchers to analyze the economic development of coastal areas, people have set up a database of special cultural tourism resources (Khalili et al. 2004). The resources in this database mainly serve the education undertakings of universities and the research of scientific researchers. The special database of universities is to provide help for education and scientific research, so it must follow the academic principle. In the process of building the database, relevant personnel need to analyze the structure of the data first to determine that the structure of the database can meet the needs of academic work. When collecting database information, it is necessary to collect tourism data in the academic field. The main sources of information include tourism education conclusions summarized by relevant scholars and research reports on tourism development. In addition to the aforementioned information, researchers also need to analyze the specific situation of the development of the cultural tourism industry, statistics on the specific direction of the development of the cultural tourism industry, relevant government policies and regulations, and the annual development report of the tourism department (Ayadat and Hanna 2007). University library data must have a strong academic nature, so that the university’s humanistic tourism resource database can be constructed more perfect, and university database can become an important content of the construction of tourism culture system in coastal areas.

Systematic principles

When improving the data and information in university libraries, it is necessary to consider all the development situations of coastal areas, systematically classify all aspects of information, classify the temporal and spatial characteristics of coastal city development, and build a highly systematic database (Li et al. 2016). When collecting information on the development of coastal cities, it is necessary to understand the religious beliefs of coastal areas, the development of culture and art, the development and changes of cultural customs, the details of urban characteristic buildings, the historical buildings and cultural relics of scenic spots, and the biological characteristics of coastal areas. The characteristics of meteorological changes and other situations are analyzed in detail, and the
collected relevant information is stored in the database to enrich the information types of the database.

**The principle of regional and national priority**

In the development of colleges and universities, the construction of college libraries can not only provide assistance for the development of their own education but also promote the development of tourism in the area where the college is located. In order to better promote the development of tourism in the area where the university is located, the university should collect local tourism development data when constructing the library database (Benchouk et al. 2013). In the process of development, university libraries can incorporate local characteristic ethnic customs and unique tourism culture into the database as a unique data resource, providing a certain reference for the development of local tourism.

**The principle of market orientation**

In the process of tourism development, the effective development and utilization of tourism resources are directly related to the quality of tourism development in a region. When planning and developing tourism projects, it is necessary to classify tourism resources purposefully and develop tourism projects suitable for the development of the region (Lim and Miller 2004). When constructing a library, colleges and universities should investigate the allocation of tourism resources in the corresponding area, improve the information in the database according to the characteristics of market development, and link the development theme of the database with the development of local cultural tourism.

**Ways of information collection in university library**

**Book stack**

By analyzing the structure of book resources in the libraries of various universities, it can be known that almost all universities have equipped their libraries with tourist reference books and maps (Nazari 2012). In the process of people traveling, many people do not know much about the topography and the distribution of scenic spots in the tourist area. Therefore, the books in the library can help people find relevant information quickly, so that people have a good travel experience.

**Periodical reading room**

University libraries should set up special periodical reading rooms, so that visitors can view some cultural and tourism periodicals or newspapers. In most cases, people have no way to understand all the conditions of tourist areas by consulting online materials (Bui et al. 2012). The ethnic customs and unique cultural resources of some tourist areas need to be experienced locally. The periodical reading room of the library can provide people with a good information search place. People can find a lot of real-time travel information and have a deeper understanding of the tourist area.

**Reference book reading room**

In the process of people traveling, many people are not clear about the route and traffic conditions of tourist attractions. The books in the library reference book reading room can provide good help for tourists. In the reference book reading room, people can look up maps of tourist areas, traffic routes, the distribution of scenic spots, etc. This can help people grasp the specific conditions of tourist areas and make better travel plans.

**Internet**

With the development of information technology and network technology, the way people obtain information begins to change. In the era of information explosion, people can find the information they want in a short time by entering keywords in some websites, which brings a lot of convenience to people’s lives (Rabbi et al. 2014). When searching for cultural tourism information, people can open the browsing pages of Baidu, Sohu, Sina, or NetEase, and the web pages will quickly search for the information people want.

**The feasibility of coastal university libraries providing information services for local economic and cultural construction**

Although the rapid development of information technology provides people with a quick way to search for information, the construction of university libraries is still the main way of information collection and retrieval. In the process of library development and utilization, colleges and universities should consciously assume certain social responsibilities and improve their awareness of serving the society (Bui et al. 2016). Therefore, the construction of university libraries must not only provide data support for the development of its own teaching career but also actively collect relevant information about social development and provide scientific data support for the formulation of social development strategies.

**Advantages of rich information resources**

In the development of coastal cities, the construction of university libraries can rely on the unique development conditions of coastal areas to improve the content of library databases. The coastal area has formed a unique marine development culture in the long-term development process, which is...
also the main resource for the database construction of university libraries (Sandemir 2011). In addition, the large number of books and materials in the library can also provide theoretical reference for the development of coastal areas, so that the development of coastal areas has a more reliable scientific basis.

Advantages of advanced technology, equipment, and retrieval methods

With the prosperity of the social economy and the rise and development of various science and technology, information technology has become one of the important technologies that promote the development of the current era. In the education and teaching activities of the new era, many schools in our country pay special attention to the use of information technology to help teachers and students establish corresponding teaching relationships. In the field of education and teaching, many teaching activities and teaching models in our country have begun to provide help and support for daily teaching work and teaching activities by introducing computer technology. Various colleges and universities also use information technology to adjust the construction of libraries and introduce some advanced technology and equipment in the process of library construction, which improves the information level of college libraries (Choudhury and Bharat 2015). In addition, universities have also built a special book retrieval network. Many book resources can be viewed on the university’s library website. The university also connects the construction of the library network with the library networks of various universities across the country to provide people with a broader information retrieval platform.

Advantages of high-quality professionals information service is a collection of knowledge, technology, and intelligence

In the process of building libraries in colleges and universities, whether the construction work of colleges and universities can provide effective assistance to the economic development of relevant areas mainly depends on the talent allocation of colleges and universities. In the process of construction, universities in the coastal areas attach great importance to the cultivation of outstanding talents. In the long-term development, they have cultivated a team with strong professionalism, strong information retrieval awareness, and deep professional knowledge reserves (Sandemir 2014). The number of young people in the talent team of colleges and universities is the largest, which is also the hope and main driving force for my country’s future development. By analyzing the composition of the talent team of a certain university, it can be seen that the talent team of the university is mainly composed of a full professor in charge of the work of the team. The other members are 1 associate professor, 2 undergraduates majoring in information management, and 2 graduate students studying other majors and an expert proficient in computer technology. In the process of development, the school has also established deep connections with experts and scholars from other schools. The school’s talent structure can fully serve the local economic development. In the process of local social development, the school’s talent team applied for more than 100 patents, which indirectly helped the local economic growth.

Materials and methods

Data source and preprocessing

To analyze the development of coastal areas in detail, a variety of data needs to be analyzed. The types of data are the following:

1. Typhoon path data: Typhoon is the main factor affecting the development of coastal areas. This study downloaded typhoon data from 1951 to 2017 in a certain area from intelligence websites of other countries. The typhoon data analyzed in this article includes the name of the typhoon, the study number of the typhoon, the formation time of the typhoon, the disappearance time of the typhoon, the central area of the typhoon, the air pressure in the central area, and the wind speed in the central area.

2. Other data: During data processing and analysis, the statistical data is divided into two parts. First, a part of county-level data is randomly selected to analyze the development of coastal areas, and the remaining data is used to finally build the data source of the model. In the operation of data analysis, now the computer software draws out the data scatter plots of the three selected areas, first analyzes the trend of the data collected in the census and other data, and will compare it with the data in the further analysis (Conforti et al. 2014). Data irrelevant to the census statistics or data with a small degree of relevance are deleted. Using geographic information technology to analyze the typhoon’s activities, people can predict the trajectory of the typhoon and provide certain help for future development.

Analysis method of coastline climate

When analyzing the climate change of the coastline, the researchers used the R/S analysis method. Using this method, the number and frequency of typhoon landings can be calculated. The calculation principles and steps are as follows:

\[ \xi_\tau = \frac{1}{\tau} \sum_{i=1}^{\tau} \xi(i), \tau = 1, 2, \ldots, n \] (1)
X(t) represents the cumulative deviation of the data set:

\[ X(t, \tau) = \sum_{u=1}^{t} (\xi(u) - \xi_u), \quad 0 \leq t \leq \tau \]  

(2)

The range can be calculated with the following formula:

\[ R(\tau) = \max_{0 \leq t \leq \tau} X(t, \tau) - \min_{0 \leq t \leq \tau} X(t, \tau), \quad \tau = 1, 2, \cdots, n \]  

(3)

The standard deviation can be calculated using the following formula:

\[ S(\tau) = \left[ \frac{1}{\tau} \sum_{i=1}^{\tau} (\xi(i) - \xi_{\tau})^2 \right]^{1/2}, \quad \tau = 1, 2, \cdots, n \]  

(4)

The following results can be obtained by calculation:

\[ \frac{R(\tau)}{S(\tau)} = \left( \frac{\pi \tau}{2} \right)^M \]  

(5)

\[ \frac{R(\tau)}{S(\tau)} = (c_T)^M \]  

(6)

Find the logarithm of both sides of the equal sign at the same time, you can get:

\[ \log \left( \frac{R(\tau)}{S(\tau)} \right) = H \log c + H \log \tau \]  

(7)

In this paper, the maximum entropy spectrum estimation method is used to analyze the changes of various indicators of the typhoon. The calculation principle is as follows:

\[ H = - \int_{-\infty}^{+\infty} p(x) \ln p(x) dx \]  

(8)

Through processing, the calculation formula of entropy can be obtained; the formula is as follows:

\[ p_x(\omega) = p_{ME}(\omega) \frac{e^{2}}{1 + \sum_{m=1}^{M} a_m e^{-j\omega_m}} \]  

(9)

The calculated results are shown in Table 1:

**Results**

**Analysis of characteristics of coastline landing typhoons**

The typhoon registration data collected in this study is shown in Table 2:

The study also conducted a specific analysis of the intensity of typhoon registration. The specific data is shown in Table 3:

Spatial variation analysis of typhoon landing on coastline

By analyzing the number and frequency of typhoon registrations, the degree of harm caused by typhoon activities to coastal areas can be predicted. Through specific analysis, the main conclusions are the following:

(1) My country has been affected by typhoons many times in recent years, and the degree of impact varies greatly in each region (Sandemir and Severcan 2016). The southern and coastal areas of my country have been affected the most and most frequently, covering a wide range, while the regional and northern regions are less affected and the scope is smaller. In addition to our country, neighboring countries in the south of our country will also be affected by typhoons, which will be more serious (Fig. 1).

(2) Due to the large topographical differences between regions in my country and the relatively large area, when a typhoon makes landfall, the scope and extent of the impact decreases from the southeast to the northwest. The southeast coastal areas of my country are most affected and the central region. Secondly, the northeast and northwest regions are the least affected every time a typhoon makes landfall, and the typhoon is the least affected (Figs. 2 and 3).

By observing the data in Table 4, it can be seen that the more typhoons make landfall, the degree of damage and the scope of impact of typhoons on coastal areas gradually decreases (Fig. 4).

The study also analyzed the impact of typhoon activities on land. The collected data are shown in Table 5:

In order to understand the impact of the typhoon when it makes landfall, we have to analyze it from the perspective of distance and space (Fig. 5). The impact of a typhoon becomes smaller as the distance from the typhoon center is farther. It mainly radiates and weakens from the typhoon center (Constantin et al. 2011). When a typhoon comes, the professional department will calculate the extent of the typhoon’s impact on each place based on the distance from the typhoon center, and use this to judge whether the disaster is serious. According to the impact of the typhoon in recent years, our southeast coastal areas are affected. It has the greatest influence, and the specific influence rule can be seen from the image below (Figs. 6 and 7):
Analyzing the information contained in the picture, it can be seen that there are large differences in the spatial distribution of the impact of typhoon landing on coastal areas (Schanz and Karim 2018). Typhoon activities have a wide range of impacts on some coastal areas and a small range of impacts on some areas. In the analysis, it is necessary to judge the impact of the typhoon on the place according to the topography and topography characteristics of different areas.

Table 1 Typhoon classification basis (pressure: hpa)

| Grade                  | Tropical depression (TD) | Tropical storm (TS) | Severe tropical storm (STS) | Typhoon (TY) | Strong typhoon (STY) | Super typhoon (Super TY) |
|------------------------|--------------------------|---------------------|-----------------------------|--------------|----------------------|--------------------------|
| Minimum air pressure at center | $P \geq 998$            | $998 > P \geq 988$  | $988 > P \geq 977$          | $977 > P \geq 961$ | $961 > P \geq 941$ | $P < 941$               |

(1) Analyzing the information contained in the picture, it can be seen that there are large differences in the spatial distribution of the impact of typhoon landing on coastal areas (Schanz and Karim 2018). Typhoon activities have a wide range of impacts on some coastal areas and a small range of impacts on some areas. In the analysis, it is necessary to judge the impact of the typhoon on the place according to the topography and topography characteristics of different areas.

Climate can be used to uniformly explain a variety of different weather changes in the natural world, and climate changes will have a direct impact on the social and natural environment of people’s lives. In the process of climate change, people can analyze the impact of climate change by observing changes in some meteorological elements such as precipitation changes in nature, temperature fluctuations, and wind changes (Cui et al. 2017). Climate changes will also trigger changes in coastal locations. The changes in coastal locations can be judged by observing the silt deposits in coastal areas. Changes in climate and changes in weather affect each other, but their influence and role in shaping the coast are different. Typhoon weather and cold wave weather usually cause large-scale rainstorms and strong winds, and strong winds and heavy rains will form storm surges and large waves on the sea, and the damage to the coast is very huge and obvious. In the process of heavy rain and strong winds affecting the coast, the strong impact will take away the sediment deposited on the coast, causing rapid changes in the shape of the coast. In severe cases, a storm profile may be formed (Taskiran 2010). The appearance of the coast will be larger than before. There are different. After the storm, if the dynamic environment of the coast has not changed much, the coast can be restored to its original appearance in a short time. Although strong changes in weather will have a certain impact on the shaping of the coast, such effects are usually sudden and temporary.

Analyzing changes in weather cannot form an accurate conclusion on the shaping of the coast. By analyzing the effect of climate change on the coast, it can be seen that climate change contains more factors and the situation of climate change is more complicated. In many cases, there is no way to draw certain conclusions in a short period of time.

(2) Because of my country’s vast territory, the impact intensity of typhoons when they landed in recent years differs greatly in different regions, mainly in a strip shape, decreasing from the coastal areas of southeast my country to the inland areas of the northwest (Dehnavi et al. 2015). The intensity of typhoon impacts. The largest is the southern coastal area of our country, followed by the eastern coastal area, and the least affected are the northwest, central, and northeast regions. When the typhoon makes landfall, the area affected is relatively large, but the area with the greatest impact only occupies a small part, and the area with less impact has the largest proportion (Fig. 8).

Analysis of the data in the table can know the specific situation of typhoon landing (Table 6). With the development of time, the impact of typhoon activities on land development gradually weakened, mainly because many areas have taken certain preventive measures against typhoon, and these measures have achieved good results.

Figure 9 a, b, c, and d are 1978–1987, 1988–1997, 1998–2007, and 2008–2017, respectively.

Discussion

By observing the changes in the data in the table, we can know that the greater the impact of typhoon activity on coastal areas, the smaller the area affected by it (Table 7).

Table 2 Statistics of landings in different decades

| Years | 1950s | 1960s | 1970s | 1980s | 1990s | 2000s | 2010s |
|-------|-------|-------|-------|-------|-------|-------|-------|
| Number/piece | 59    | 77    | 79    | 71    | 78    | 72    | 54    |
| (Percentage/%) | (2.04) | (15.71)| (16.2) | (4.49) | (15.92)| (14.69)| (11.02) |
Comprehensive risk analysis of coastline typhoon disaster based on GIS

As can be seen from the above content, there are many factors that cause natural disasters, and the degree of influence of each factor is different (Dempster 2008). The risk and number of influences of each factor are analyzed, and it can be seen that the disaster situation under the influence of each different factor happening. However, in order to more clearly and clearly see the extent of the disaster in the area affected by the typhoon when the typhoon makes landfall, using relevant theoretical foundations, the spatial and regional layout of the impact of the disaster in different years can be calculated, which can be compared with the disaster caused by the typhoon today. The product of the impact frequency and the comprehensive vulnerability knowledge can be used to derive the comprehensive disaster risk index, which is used to reflect the situation of regional disasters when the typhoon makes landfall (Fig. 10).

| Grade | TD | TS | STS | TY | STY | Super TY | Total |
|-------|----|----|-----|----|-----|----------|-------|
| Number/piece | 52 | 136 | 122 | 112 | 55 | 13 | 490 |
| (Percentage/%) | (10.61) | (27.76) | (24.90) | (22.85) | (11.22) | (2.65) | (100) |

From the perspective of the areas affected by typhoons in the past few years in my country, the areas where people are concentrated and the economy is more developed are the most affected, but these areas are mainly concentrated in the eastern coastal zone, and the central region of my country is less affected. The western inland areas and the northeastern areas are the least affected, which has a certain relationship with the characteristics of my country’s topographical distribution (Esmaeili-choobar et al. 2013). In recent years, the spatial and regional distribution characteristics of the impact caused by typhoons have not changed much. The overall distribution is still in strips. The intensity of the impact decreases from the southeast coast of my country to the northwest inland areas. The eastern coastal areas of my country are affected by the disaster. The impact is large, followed by the central region, and the northeast and northwest inland are the smallest. Moreover, my country’s economically developed and densely populated areas are mainly concentrated in the eastern coastal areas of my country, so the risk index is higher in the face of disasters. On the contrary, the risk index of the western development area is the smallest.

Fig. 1 Spatial distribution of frequency of influence from 1978 to 2017
Positioning of the cultural information management mode of coastal libraries

Knowledge norm type

In the process of library construction in colleges and universities, it is necessary to adopt standardized management methods to realize the management of library book resources. In the process of management, many colleges and universities will use the knowledge model management mode to manage the normal business of the library. This management mode has high requirements on the library staff and can improve the standard of library management to a certain extent.

Expert management mode

With the development of information technology, people began to use network platforms to collect certain information (Ferreira 2001). In the development of library information management, it is necessary to train professional operators to
ensure the normal operation of the library management system.

**Build an intelligence organization and focus on talent development**

In the process of social life and development, information is an indispensable element. Information and the development of social life are mutually complementary. The development of information is conducive to promoting the development of social life, and the development of social life will also bring about the progress of information (Tenpe and Patel 2018). In today’s network age, knowledge has become the main driving force of social development, so the competition for talents in society is becoming increasingly fierce. In order to meet the requirements of the times, pay attention to the cultivation of talents, and actively cultivate talents in all fields, so that the information collection personnel of the library can participate in it and improve the quality of the staff to better complete their work (Houston et al. 2002). At the same time, the innovation and technology of library and information organization should be changed and optimized, and the management mode of library and information organization should be changed and optimized to build a more complete and effective library and information organization. Only in this way can we provide students with more high-quality and complete knowledge to improve from the most basic perspective. Staff quality, expand the talent team, and enhance talent competitiveness.

**Table 4** Land area (10,000 km²) and proportion (%) of different frequency of impact from 1978 to 2017

| Frequency (Area 10,000 km²) | 1–25 | 25–50 | 50–80 | 80–110 | 110–141 | The total area |
|-----------------------------|------|-------|-------|--------|---------|---------------|
| Area                        | 290.98 | 37.30 | 31.85 | 24.71  | 13.80   | 398.64        |
| (Proportion)                | (72.99) | (9.36) | (7.99) | (6.20) | (3.46)  | (100)         |
businesses in social development can be fully combined with various management tasks of the library, so that the information collectors of the library can collect more extensive social development information, which can better perfect the system structure of the library database.

**Problems in the cultural information management of coastal libraries**

**The flood of pirated books**

Under the current development background, the development of the Internet era provides more development opportunities and development space for the construction and management of university libraries, but the speed of Internet information is very fast, which has led to many pirated books becoming popular on the Internet, causing trouble to the management of the library. In the information age, many people enjoy the convenience of the development of science and technology, and most people choose to read e-books. Network administrators have negligence in their work when revising books, causing many people to read e-books with certain conceptual errors, which will mislead students and reduce the quality of student learning.

**Bad information misguided**

Many people are always harassed from all kinds of harmful information on the Internet when searching for information in their own school library, which will mislead the information they obtain. Nowadays, students are curious and want to be recognized by the public, so when they have been unable to achieve this idea, they will be tempted by the Internet. In this case, because of their strong curiosity, students will encounter many temptations on the Internet, open bad websites, and obtain a lot of harmful information, which adversely affects the physical and mental health of the students. In order for students not to be disturbed by harmful information, library

| Frequency of impact | 1978–1987 | 1988–1997 | 1998–2007 | 2008–2017 |
|---------------------|------------|------------|------------|------------|
|                     | Area       | Proportion | Area       | Proportion | Area       | Proportion | Area       | Proportion |
| 1–10                | 140.04     | 69.58      | 216.02     | 67.66      | 123.39     | 61.48      | 237.32     | 73.93      |
| 10–20               | 32.40      | 16.10      | 54.92      | 17.20      | 48.27      | 24.05      | 41.40      | 12.90      |
| 20–30               | 27.44      | 13.63      | 31.58      | 9.89       | 22.74      | 11.33      | 32.65      | 10.17      |
| >30                 | 1.38       | 0.69       | 16.74      | 5.24       | 6.30       | 3.14       | 9.64       | 3.00       |
| The total area      | 201.26     | 100        | 319.26     | 100        | 200.70     | 100        | 321.01     | 100        |

![Fig. 4](image-url) The spatial distribution of the frequency of my country's terrestrial influence from 1978 to 2017
managers must perform their own functions to fundamentally eliminate harmful information (Houston et al. 2001). In the school’s library information management system to publish information suitable for students, it is necessary to strictly review the sources and content of information to reduce the adverse impact on students.

The quality of management personnel is relatively low

By analyzing the management of universities, it can be seen that many universities do not pay special attention to the selection of library managers. Many colleges and universities believe that library management personnel will not affect the normal
operation of the library, but in real life, the quality of library management personnel is related to the environmental construction of the library. Many university library managers have low levels of education and lack a strong awareness of the library’s information collection work, which will hinder the implementation of the library’s database system construction work (Houston et al. 1993). Therefore, when selecting library managers, colleges and universities should investigate the applicant’s educational background and the development of some basic qualities, so as to ensure the normal development of library management.

Specific strategies for improving the cultural information management of coastal libraries

Insist on buying genuine

The importance of library and information management in colleges and universities is self-evident. Managers must ensure that the sources of college books are genuine books. This puts higher requirements on managers. Piracy of books is becoming more and more rampant in today’s society.
Therefore, library managers must choose genuine channels when buying books and choose regular publishing houses. In addition, the management personnel must strengthen their self-cultivation, and they will not buy pirated books for personal gain or cost saving. Once someone is found to be seeking personal gain, they must be severely punished. In addition, careful inspection should be carried out when the purchased books are delivered to avoid problems such as insufficient books and unclear printing to ensure the validity and accuracy of the information.

**Avoid bad information from harming the intelligence system**

Bad information can cause great harm to a person’s development, especially for some young students, the students themselves are relatively young, and their own judgment ability is relatively weak, and there is no accurate judgment ability on some things. In the era of information development, the continuous dissemination of bad information on the Internet will cause harm to the healthy growth of young people (Huang et al. 2018). Therefore, the library management of colleges and universities should build a complete database system, resolutely resist the spread of bad information, and create a healthy growth environment for students. When collecting information, library managers must first screen the information to prevent some unhealthy information from appearing in students’ study and life. When managing the information collection work of the library, it is necessary to block some unhealthy websites, pay attention to the latest information released by these unhealthy websites in time, and take measures to prevent students from browsing these unhealthy websites. In the daily teaching process, it is necessary to teach students the hazards and risks of bad websites, actively guide students to actively block bad websites, and report bad information published by bad websites. In order to increase the enthusiasm of students to report bad websites, certain rewards can be

| Distance                  | 1–4500     | 4500–9200 | 9200–15,000 | 15,000–22,000 | 22,000–29,000 | >29,000 | The total area |
|---------------------------|------------|-----------|-------------|---------------|---------------|---------|---------------|
| Area (proportion)         | 293.27 (73.57) | 33.62 (8.43) | 28.44 (7.13) | 26.74 (6.72)  | 12.6 (3.18)   | 3.90 (0.98) | 398.64 (100)  |

Fig. 8 The spatial distribution of my country’s terrestrial influence intensity from 1978 to 2017.
given to students who report behaviors, and the surrounding students can be stimulated to supervise the healthy operation of the network environment.

**Optimize the quality of management personnel**

The quality of library management personnel is very important to the management of the library, and the good quality of management personnel is conducive to the development of the library. First of all, library administrators must have certain professional knowledge. In the process of selecting books, they must choose genuine books. They must be carefully screened when the books are delivered to ensure the accuracy of the books and have certain access value. Nowadays, every university library has its own network system. Library managers must be able to master the application network proficiently, and library managers must have a certain degree of cultural accomplishment and be able to select networks that are beneficial to the physical and mental development of students. Information, bad websites, and harmful information are strictly prohibited from entering the library network system so as to fundamentally promote the development of library management information management.

**Conclusion**

Because coastal areas have abundant resources, the development of coastal tourism can not only promote the economic development of coastal cities but also can well inherit national culture. In the current development, the development of tourism in coastal areas has not formed its own unique brand advantage, many tourism resources have not been effectively used, and tourism in coastal areas does not have a great competitive advantage. In the development of tourism in coastal areas, there are still problems such as small-scale development of tourism, weak competitiveness, low brand awareness, and lack of brand building plans. Typhoon is the main factor affecting the normal development of coastal areas. This study uses geographic information technology to analyze the

**Table 7** Land area (10,000 km²) and proportion (%) of different intensities of influence from 1978 to 2017

| Distance  | Area   | Proportion | Area   | Proportion | Area   | Proportion | Area   | Proportion |
|----------|--------|------------|--------|------------|--------|------------|--------|------------|
| 1–2700   | 164.24 | 81.60      | 228.00 | 71.42      | 146.47 | 72.98      | 257.94 | 80.35      |
| 2700–5000| 26.10  | 12.97      | 40.72  | 12.76      | 35.46  | 17.67      | 41.33  | 12.88      |
| 5000–7500| 9.43   | 4.68       | 34.26  | 10.73      | 14.53  | 7.24       | 18.06  | 5.63       |
| >7500    | 1.50   | 0.74       | 4.27   | 5.10       | 2.11   | 1.15       | 3.68   | 1.15       |
| The total area | 201.26 | 100        | 319.26 | 100        | 200.70 | 100        | 321.01 | 100        |
situation of typhoon activities and provides a certain reference for the development of coastal areas. Although after a long period of development, the use of geographic information technology has had obvious effects, but there are still great limitations in the specific practice process. In the future development process, we can further optimize the use of geographic information technology in terms of research methods, monitoring methods, data processing, and information extraction. In addition, the construction of university libraries can provide good help for the construction of library culture in coastal cities. This is also the main way to play the important role of humanistic tourist resources in coastal areas. Universities should build valuable humanistic tourism resources in accordance with certain principles. The database contributes to the development of coastal cities.

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Declarations

Conflict of interest The authors declare that they have no competing interests.

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Dehnavi A, Aghdam IN, Pradhan B, Varzandeh MHM (2015) A new hybrid model using step-wise weight assessment ratio analysis (SWARA) technique and adaptive neuro-fuzzy inference system Fig. 10 Spatial distribution of comprehensive disaster risk in different decades

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