The Change of Hydrographic Environment and Special Publication No. 23

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Introduction

The general assembly of the IHO is supposed to be held in May, 2007. In this IHO general assembly, it seems that there will be discussions regarding the revised edition of special publication No.23. In 2002, the revision plan was presented for the purpose of publishing NO. 23 IHO, and the voting for this on the past of the membership countries was expected. However, this vote was suddenly cancelled two months later. Consequently, this revision has not been revised until today. We can see that the resolution of the IHO establishment and its general assembly held in London, England in 1919, says that the items decided at the first hydrographic conference were supposed to be revised in future new editions and revised editions.

Seventy-eight years have passed since special publication NO. 23 was published. During that time, the world's marine environment has changed drastically, so the publication of a revised edition including the mention of the East Sea has become an urgent matter.

During the past 78 years, scientific technology has greatly developed among which, IT and marine surveying technology has made great progress . Our technologies being superior to that of the early 20th has led to accurate surveying of geographic information through satellites. In particular, the geographic information system has made great progress, to the extent that it has been used not only in geographic information, but also in our day to day lives.

Even the marine environment has been changed since 1929 to such a degree that it is no longer recognizable. Even in the sea and on land, the environment has greatly changed and so surveying of new sea areas needs to be conducted, which is becoming a big impediment to marine development. Because of

subdivision trend occurring with maximization of utilization of world seas, in the Special Publication NO. 23(1937), in total 63 oceans, gulfs and straits have been recorded, but in Special Publication NO. 23(1953) this has been subdivided into 91. Also, in Special Publication NO. 23(1986) revision plan, totally 122 have been subdivided into seas. However the geographic information of revised 3th edition in 1953 is about the same as that of Special Publication NO. 23 in 1929. So it is hard to say that it has correct marine information in the 21st century. This study is going to clarify why we need a new Special Publication NO. 23 and we will also shed light on the motivation, and present the scope of new sea areas and the revision of their names at the time when Special Publication No. 23 comes out.

The Issue of Motivation of New Special Publication No. 23.

The occasion by which the East Sea was changed into "the Sea of Japan" occured in Special Publication NO. 23 which was published in 1929. In May 2007, the general assembly of the International Hydrography Organization will hold in Monaco. This general assembly is going to publish a revised edition of Special Publication NO. 23.

Therefore, it could be an opportunity to rename the East Sea. However, each country of the world will handle this matter in its national interest. Therefor, it is focus on that if it could be reasonably changed.

Since the first edition was published in 1929, "the Borderline of Big Oceans and Seas." which was published in 1937 and 1953 has lots of problems. Now, marine science technology has been developed compared with 1929, the borderline of the seas, oceans, gulfs, and the oceans of today are greatly different. With the measuring technology in 1929, accurate measuring couldn't be done.

However, marine measuring technology of the 21st century has become far more advanced. Now we can measure geographic information correctly by satellites and measure the borderline of the seas and oceans more precisely through the development of IT technology. In particular, the geographic information system has been developed phenomenally. Compared with 1929, today's marine environment has greatly changed. So new borderline has come to be needed and this is becoming to be a hurdle to the marine development in the world.

Development process of GIS

Entering the 21st century, the rapid development of IT technology has brought about innovate developments in marine chart and map making. In this study, the writer analyzes appearances and developments of GIS which repeat unlimited development throughout the Internet. Upon the basis of this development, we seek to applications for a device to graft with Special Publication NO. 23 based on the new concept.

1. GIS and GPS

(1) GIS

A geographic information system (GIS) is a system for capturing, storing, analyzing and managing data and associated attributes which are spatially referenced to the earth. In the strictest sense, it is a computer system capable of integrating, storing, editing, analyzing, sharing, and displaying geographically-referenced information. In a more generic sense, GIS is a tool that allows users to create interactive queries (user created searches), analyze the spatial information, edit data, maps, and present the results of all these operations. Geographic information science is the science underlying the applications and systems, taught as a degree program by several universities.

Geographic information system technology can be used for scientific investigations, resource management, asset management, Environmental Impact Assessment, Urban planning, cartography, criminology, history, sales, marketing, and route planning. For example, a GIS might allow emergency planners to easily calculate emergency response times in the event of a natural disaster, a GIS might be used to find wetlands that need protection from pollution, or a GIS can be used by a company to find new potential customers similar to the ones they already have and project sales due to expanding into that market.

(2) GPS

The Global Positioning System (GPS), is currently the only fully functional Global Navigation Satellite System (GNSS). More than two dozen GPS satellites are in medium Earth orbit, transmitting signals allowing GPS receivers to determine the receiver's location, speed and direction.

Since the first experimental satellite was launched in 1978, GPS has become an indispensable aid to navigation around the world, and an important tool for

map-making and land surveying. GPS also provides a precise time reference used in many applications including scientific study of earthquakes, and synchronization of telecommunications networks.

Developed by the United States Department of Defense, it is officially named NAVSTAR GPS (NAVigation Satellite Timing And Ranging Global Positioning System). The satellite constellation is managed by the United States Air Force 50th Space Wing. The cost of maintaining the system is approximately US$750 million per year,[1] including the replacement of aging satellites, and research and development. Despite this fact, GPS is free for civilian use as a public good.

2. Historical background of Marine Chart

In human history, from several thousand years ago, maps and marine charts have spoken for the enthusiasm for the seas. In the past, each country has made marine charts. However, marine charts made based on scientific systems, can only be said to have been be made once people entered the 20th century. In the 1930's, aviation photo technology was introduced. At the end of the 1960's, making maps by using computers began. Distance sounding has been used for making geographical images with satellites technology and computers. These are being used as important science technology. In other words, numerical information from image which had a computer decode it. This data continues to be corrected and complemented, shortening the time for making a map. It is also used to find errors. Recently, with the development of precise scanning sensors, it is possible to secure precise satellite photo data in a short time. This information science technology is the leading technology for today's map making field.

Making a map by computer began to be developed from the 1970's. It's been a useful utility to add or remove various information from maps. Now theme maps have been developed from this technology. Entering the 1980's, since the progress of computer technology, people have data, analyze them, made designs and have been able to perceive wide space systems and have come to be able to express image data as maps. Recently, by using GIS, various development plans, natural resources management and environmental plan are being used as a tool of space analysis. Also, it plays the role of providing information persistently by synthesizing an analyzing the new information from neighboring other science technology field. In addition, nowadays the attaining of necessary data for making map is more developed by the development of measuring science. The development of IT technology in the 21st century has made marine chart one step upgraded.

3. Appearance and History of New System.

A world map and marine chart are rapidly progressing. In particular, due to the development of the IT technology, in recent 20 years, the paradigm of map and marine chart are going through innovation. It is needed to search the change of making charts and maps by analyzing developmental process of GIS technology.

(1) 1950 ~ 1960

As for the initial GIS, we can cite the research of Washington University in America in 1950's. After that, the real beginning of GIS could be Canadian CGIS(Canadian GIS) in 1960's. CGIS has been developed as GIS for the natural resource management. At that time the use of GIS was limited to the government organizations and it started to be developed by public institutions but GIS had problems that it needed expensive computer device.

(2) 1970's

Computer industry has been greatly developed since the 1970's. This kind of computer technology and the graphic technology have made a great contribution to the expansion of GIS. In the 1970's, many organizations have performed demonstrative development plan and the recognition about necessity of GIS became expanded.

(3) The 1980's

In the 1980's, GIS was developed rapidly. Even in the technological aspect, there occurred a great change we can call it a representative matter that the establishment of satellite information has become to be possible.

(4) The 1990's

In the 1990's, because of rapid growth of computer hardware, the distribution of GIS by personal computer has become a possibility. And in accordance with the development of multimedia technology and various forms of providing information, the efficiency of GIS improved greatly, and because of this, GIS contribution to information and industrial field also increased.

(5) A New Paradigm in the 21st Century

After we entered the 21st century, the epoch-making progress of computer and the Internet made us a new paradigm of constructing geographic information

system. In particular, the internet enterprise such as Google Earth System brought about the innovation of map information. Through the new geographic information system, we can not only see all the regions of the world in detail, but also provide various information related to real living through this system. Now, a map does not simply provide geographic information, but provide the information which had not been provided in the political, social, cultural, and economic fields.

Now a map information become powerful by IT technology, and arrives to the extent of creating a new field. Now we have arrived at the age in which ships large or small cannot operate even a step without GPS.

4. Geographic System based on the Internet

A strong point of the new geographic information system, when it is based on the internet, can display a great influence. As seen in the Google Earth, its availability can be said to be infinite.

The Change of the Seas in "Limits of Oceans an Seas"

1. The number of the seas in the 3rd edition of "Limits of Oceans and Seas"

The number in the 3rd edition of "Limits if Oceans and Seas" published in 1953 suddenly increased to 102. And basin was added. As international of trading increased after World War Ⅱ, the navigation of vessels suddenly increased. And as the marine information of the each country of the world became known, the borders of seas were drawn in more detail and number of them went up. In particular, the number of sea suddenly increased to 49, while the number of oceans decreased by 1, so that the number of them decreased to 6. And it attracts our attention that the number of strait increased to 9.

1) Gulf - 16
2) Ocean - 6
3) Bay - 5
4) Sound(해협) - 1
5) Sea(바다) - 49
6) Channel(해협) - 4
7) Inner-Sea - 2

8) Archipelago - 1
9) Coastal Waters - 1
10) Passages - 1
11) 현지 지역명 - 2
12) Strait - 9
13) Bright - 1
14) Basin - 2

2. The Classification of the Seas in the 4th Edition Plan of "The Borders of Oceans and Seas" in 1986

The revised edition submitted in 1986 was not passed as a result of the voting of the member nations of the International Hydrographic Organization. Compared with 1953, We can see this revised edition utilized the outcome of scientific marine exploration and so "Limits of Oceans and Seas" was scientifically produced. Even if this revised edition plan failed to pass the voting, it showed well to what direction"Limits of Oceans and Seas"should be revised.

In the 1986 revised edition plan of "Limits of Oceans and Seas," the seas were subdivided into totally 186 seas. This proves that as a result of accurate marine exploration, not only scientific survey became possible, but also the marine environment changed a lot as several decades passed.

This revised edition plan indicates the border lines of seas precisely and the points linking these borderlines have been accurately marked.

It is a great characteristic that in this revised plan. the number of the seas greatly increased to 71. And the number of the Oceans has greatly been classified to 10 again, too. Even straits have been subdivided to 13, and it is peculiar that the number of inner seas increased to 4.

1) Gulf - 26
2) Ocean - 10
3) Bay - 5
4) Sound(해협) - 5
5) Sea(바다) - 71
6) Channel(해협) - 4
7) Inner-Sea - 4
8) Archipelagu - 1
9) Coastal Waters - 5
10) Passages - 1

11) 현지 지역명 - 3
12) Strait - 13
13) Bright - 1
14) Region - 1

3. The 2002 revised edition plan of "Limits of Oceans and Seas."

The 2002 revised edition plan of "Limits of Oceans and Seas" was circulated to the 72 member nations of the International Hydrographic Organization across the world in August,2002. It was expected that the revised edition plan of "Limits of Oceans and Seas would be examined, put to the vote, and passed and that the Limits of Oceans and Seas worthy of the 21st Century would be published.

However, this revised edition came to be revoked because of the opposition of some member nations after the absence of one month. This means that the revised edition to be published after the absence of 51years was withdrawn. This revised plan was the one whose dimension differed from the hitherto "Limits of Oceans and Seas." The borders of the Oceans were accurately measured upon the basis of the exploration by an artificial satellite, and the imperfect items that have been pointed out for the past 50 years have been complemented. And the borders of the oceans and seas have been divided by the means of a scientific method.

And regarding the names about which dissents were raised, the resolution item of the International Hydrographic Organization Conference for 1974 was reflected. In other words, recording together, or the on-the -spot names are actively reflected on the names of the seas about which dissents have been raised. This revised edition plan says that the 4th revised edition should be published without delay because 51years have passed since the 3rd revised edition was published.

During that time, among the 5 names of the seas about which dissents were dissents were raised, 4 names were recorded together with other names. And as for the East Sea, the revised edition was published by eliminating the name of the Sea because the agreement between Korea and Japan was not reached. They planed to list the name of the sea later if the two countries agree to the name of the sea.

The 2002 revised edition plan for "The borders between the oceans and the sea has subdivided the sea into 154 ones. It is a characteristic that the kinds of the seas have been further subdivided to 16, and it is a characteristic that the names of the seas which employed the spot regional names have greatly increased to 11. This is interpreted as complying with resolution of the

International Hydrographic Organization. And the concept of the oceans has been finally decided by reducing the oceans to 7.On the other hand, the number of gulfs decreased from 26 to 22. In particular, the 2002 revised edition of "The borders of the Oceans and Oceans"has divided the seas of the world into 10 on a large scale, and subdivided them into 154 seas. First of all, it has divided the sea into 10 as in the following.

1. NORTH ATLANTIC OCEAN
2. BALTIC SEA
3. MEDITERRANEAN REGION
4. SOUTH ATLANTIC
5. INDIAN OCEAN
6. SOUTH CHINA AND EASTERN ARCHIPELAGIC SEAS
7. NORTH PACIFIC
8. SOUTH PACIFIC OCEAN
9. ARTIC OCEAN
10. SOUTHERN OCEAN

And it has subdivided the entire world into 154 seas.

1) Gulf - 22
2) Ocean - 7
3) Bay - 7
4) Sound(해협) - 5
5) Sea(바다) - 71
6) Channel(해협) - 3
7) Inner-Sea - 2
8) Selat - 1
9) Coastal Waters - 1
10) Passages - 3
11) 현지 지역명 - 11
12) Strait - 15
13) Bright - 1
14) Basin - 1

Special Publication No. 23 of the GIS Ages

1. The Change and the East Sea

It has been known that the chance in which the East Sea inscription has

changed into "the Japan Sea" was given by Special Publication No. 23.

In the newly established international general assembly which was held for the first time in London, England, they decided to give the borderlines and names to the new seas, and so, respective countries were to make drafts, and circulate the drafts to the member nations of the International Hydrology Organization, which has been formalized. At that time, they surveyed borderline of the seas and the oceans, gulfs. straits, etc. by mobilizing the update technique of marine survey, and upon the basis of this data, they established the borderline of the seas the entire world. And names were given to these sea areas. However, at that time Korea was under Japan's colonial rule, and so Korea could not send its representative to thet general assembly of the International Hydrology Organization held in 1919. Of course, we could not participate in the making of Special Publication NO. 23 first edition published in 1929, and could not present our opinion.

As a result, in the Special Publication NO. 23, the name of the East Sea which had been used by ancient Korea came to disappear. In May, 2007, the general assembly of the International Hydrology Organization will be held in Monaco. At this general assembly, they are going to plan to publish the new Special Publication NO. 23 revised edition.

Because of the above developments, there will be an opportunity for revising the name of the East Sea. However, since the respective countries of the world are expected to deal with the fierce national interest and logic, following 1986 and 2002, an interest and concern are centering on whether or not rational result will be elicited.

Since the first edition was published in 1929, each of the editions S. P. 23 was republished in 1937 and 1953 still S. P. 23 has many problems. Compared with 1929, marine chart technology has made progress drastically, the environment of sea, oceans, gulfs differ greatly from that of today. In 1929, marine survey technology has not developed, and so precision survey could not be implemented.

However, the marine survey technology of the 21st century has greatly advanced. They are not only able to accurately survey goegraphic information, but also able to correctly survey the borderline of the seas and the oceans more correctly, because of the development of IT technology. In particular, the geographic information systems have been greatly developed. Therefore, it is being used at industrial development.

2. The Problems of S. P. No. 23 Revised Edition.

(1) The change of marine environment after 1929 first edition.

Because of first edition in 1929, the name of the East Sea was disappeared in "the borderlines of oceans and the seas," and the borderline of the Korean sea area came to be irrationally demarcated.

In May, 2007, the general assembly of the International Hydrology Organization will be held in Monaco. In this general assembly, it is supposed to publish a new "borderline of the oceans and the sea" as revised edition.

Since the first edition was published in 1929, S. P. 23 which was revised in 1937 and in 1953 has many problems. Compared with 1929, marine science technology has remarkably developed, so that the borderline of sea, and the oceans, and gulfs differ greatly from what they are today. In 1929, marine survey technology was not developed, and so they could not survey precisely.

(2) Countermeasure for new environment.

The resolution at the first conference in 1919 tells us that the items could be revised by new edition and revised edition. It has been 78 years since "the borderlines of the oceans and the seas" was made and during that time, marine environment has changed so much that the publication of new revised edition including the inscription of the East Sea is needed.

Hydrographic survey technology of the 21st century has greatly advanced. We can correctly survey geographics information by satellite and survey the borderlines of the seas and the oceans accurately by the development of IT technology. In particular, Geographic Information System is greatly advanced as much as it can be used in our life as well as in geology.

Also hydrographic environment has being changed drastically since 1929. The environment of the seas and lands has greatly changed, so that the survey of the new borderlines has been needed, which became a great hindrance to marine development.

Owing to subdivision trend classified by maximized use of world's seas, 63 oceans, seas, gulfs, and strait were inscribed in "Borderlines of the seas the and oceans" (1937), "the borderlines of the oceans and the seas" (1953) included 91 subdivided names and "The Borderlines of the Oceans and the Seas"(1986) included in total 122 seas. Therefore, it is necessary to subdivide the East Sea.

Conclusion

It is anticipated that in May, 2007 the borderlines and names will be reestablished for the first time since 1953. The coordinating work regarding the

borderlines and names of the world's oceans should be corrected along with the re-naming of the East Sea. This study aims to develope a model and analysis to obtain a new demarcation lines for the East Sea.

First, GIS, which began from the 1950's has operated brilliantly to the present time. Accordingly, S. R. 23, which was published in 1953 is inadequate in explain the hydrographic environment of the 21st century. Like GIS which has been change frequently, S. P. 23 should be updated as a new system.

Second, the world is experiencing rapid changes in the new area of information systems. From this stand point, new technology which utilizes computer based guidance information using IT technology is advanced and accurate method regarding much more through knowledge of than ever before

Accordingly, at the general assembly, considering the aforementioned viewpoint, it is necessary to gather general agreement and exert our influence to make changes to S. P. 23.

Third, the expansion of the Internet enriches our knowledge of other regions and the world. So far, the utilization of S. P. 23 has been restricted to several countries or to several international organization. However, it is utilized to a great degree by marine organizations. Therefore it is necessary to have accurate information on our oceans, sea and borderlines available for theses marine organizations and institutes.

Fourth, "The borderlines of the oceans and the seas" has greatly influenced issues regarding the seas. The revised edition of S. P. 23 which will be published in 2007, will further develop hydrographic science, hydrographic technology and the hydrographic environment. If we don't take immediate significant measures, changes to the hydrographic environment will be greatly restricted as it was in 2002. if all you have is a hammer, everything looks like a nail. In this way, if we consider S. P. 23 in simply terms, we will regard the seas as dots and lines and will be restricted by them. However, if we make efforts to reflect the views of coastal nations in updating S. P. 23, the development of the world seas will be maximized.

Fifth, hydrographic technology is changing rapidly, because of the technology emphasizing G(geographic) and the flow, grafting IT field with IT(information system). Owing to the influence, GIS market gets out of the traditional marine chart and new market field appears rapidly. We should apply the environment of the age.

Sixth, For years, people had been pursuing hydrographic charts to be based on the truth. The making of S. P. 23, 2007 should be done upon the scientific basis

without regard from mankind prejudice and nation's understanding.

Seventh, as a conclusion, I think the borderlines of sea areas should be renamed so that it might fit for hydrographic environment and naming of sea areas should be revised in order to reflect the opinion of coastal countries.

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