

39918

INTERNATIONAL CARTOGRAPHIC ASSOCIATION

Fifth General Assembly

MOSCOW, USSR

August 3 - 10, 1976

NATIONAL CARTOGRAPHIC REPORT OF JAPAN

DURING THE PERIOD 1972 THROUGH 1976

Presented by

The Japanese National Committee for Cartography

c/o Geographical Survey Institute
24-13, Higashiyama 3-chome, Meguro-ku
Tokyo, 153 JAPAN

Japan Cartographers Association

c/o Japan Map Center
Kudan Pompian Bldg.
8-8, Kudan-Minami 4-chome, Chiyoda-ku
Tokyo, 102 JAPAN

NATIONAL CARTOGRAPHIC REPORT OF JAPAN
DURING THE PERIOD 1972 THROUGH 1976

- C O N T E N T S -

- I. Japanese National Committee for Cartography
- II. Present Status of Map Production at the Geographical
Survey Institute
- III. Existing Status of Chart Production at the Hydrographic
Department
- IV. Present Status of Map Production at Other Agencies
- V. Present Status of Mapping Activities and Cartographic
Publications by Private Enterprises
- VI. Report on the Education of Cartographers in Japan
- VII. Treatment of Maps in School Education
- VIII. The Japan Cartographers Association and Its Activities

Výukový ústav geodetický, topografický
a kartografický v Praze
Knihovna

1314/46

39918

I. JAPANESE NATIONAL COMMITTEE FOR CARTOGRAPHY

The Japanese National Committee for Cartography has conducted international and national studies and researches in cartography. The Committee has also represented Japanese membership in ICA from 1968. The present membership of the Committee is as follows:

Chairman:

Mr. Masayoshi TAKASAKI, Geographical Survey Institute

Secretary:

Mr. Toshitomo KANAKUBO, Geographical Survey Institute

Prof. Dr. Yasuo MASAI, Tsukuba University

Members:

Mr. Bunkichi IMAYOSHI, Hydrographic Department

Prof. Dr. Noriyoshi UKITA, The University of KYOTO

Mr. Kei KANAZAWA, Tokyo Cartographic Co., Ltd.

Dr. Norihiro SATO, Hydrographic Department

Prof. Dr. Osamu NISHIKAWA, The University of TOKYO

Prof. Dr. Shoshichi NOMURA, Yokohama National University

Prof. Dr. Akira WATANABE, Hosei University

II. PRESENT STATUS OF MAP PRODUCTION AT THE GEOGRAPHICAL SURVEY INSTITUTE

The Geographical Survey Institute is producing and publishing various kinds of general maps, thematic maps and the national atlas to provide fundamental data on the national land. The principal maps are described as follows:

1. General Maps

(1) National Base Maps

Preparation of the national base map series is in progress to cover an area of 190,000 km² (1/2 of the entire national territory) mainly of plains areas. There are large-scale topographic maps prepared according to standardized

specifications. Aerial photographs necessary for preparation of the maps are taken mostly at the scale of 1:20,000 repeated at a cycle of every 5 years on the average. As for the scale of the topographic maps, 1:2,500 is used for important areas such as city planning areas, and 1:5,000 for other areas.

(2) Medium-Scale Topographic Maps

Since 1964, the project of preparing the 1:25,000 scale topographic map series to cover the whole country has been undertaken by using aerial photogrammetry, and more than 90% of the national land has already been covered by this series.

The 1:50,000 scale topographic maps were completed approximately 50 years ago covering the entire national land by planetable surveying. Nevertheless, for those areas where new 1:25,000 maps have been prepared, compilations of new 1:50,000 scale editions are being made by reducing the 1:25,000 scale maps which are used as base maps. The 1:50,000 scale map series covers the whole country with 1,257 sheets. Among them, the number of sheets compiled from 1:25,000 scale maps amounts to 1,032.

(3) Small-Scale Compiled Maps

The 1:200,000 scale regional map series, compiled from the 1:50,000 scale topographic maps as base maps, covers the whole territory with 130 sheets.

The 1:500,000 scale district map series covers the whole territory with 8 sheets. The map has a specific wide coverage feature, each sheet covering one district.

The 1:1,000,000 scale International Map of the World series is compiled in accordance with internationally standardized specifications. The 1:200,000 and 1:500,000 scale maps are used as base maps, and covers the whole land with 3 sheets.

The 1:3,000,000 scale map titled "Japan and Surroundings" is a map showing the geographical location of Japan.

2. Thematic Maps

In addition to the above-described general maps, various kinds of thematic maps, mainly at medium scales, are prepared

to serve as basic materials for development, utilization and preservation planning of the national land. The principal maps are the Land Use Map series (1:25,000 and 1:50,000 scale), Land Condition Map series (1:25,000 scale), and Lake Charts (1:10,000 scale), etc.

3. National Atlas of Japan

Compilation of the national atlas, "Atlas Japan", was started from 1971, and will be close to completion in 1976. In early 1977, the maps will be published as a one volume atlas containing about 180 sheets.

III. EXISTING STATUS OF CHART PRODUCTION AT THE HYDROGRAPHIC DEPARTMENT

The Hydrographic Department is publishing nautical charts, basic maps of the sea, aeronautical charts and other miscellaneous charts.

Preparation of nautical charts, which is the main function of the Hydrographic Department, has been continued principally for navigational purposes, though their characteristic as a general map of the sea has been taken into consideration. In recent years, however, classification of marine charts has become well-defined in connection with rationalization of maritime shipping, preparation of fundamental data for ocean development and legislative movements concerning the law of the sea. Consequently, in marine charting, such efforts as to provide versatile general maps on the one hand and thematic maps on the other have been reflected on chart publication policy.

1. Nautical Charts

Main functions of nautical charts have so far been to chart all natural information necessary for navigation, fisheries, etc. and navigational information including aids to navigation, landmarks and other descriptions. Due to the recent remarkable increase in the size of vessels and in the volume of traffic at sea, new techniques of chart representation as well as new types of information have been introduced, such as, in the former case, showing the water depths alongside

wharfs, on shipping routes and in anchorages by a representative sounding figure for better legibility, and in the latter case, such information concerning regulated and controlled navigation.

In addition, preparation of charts for electronic navigational aids such as Loran and Decca has been in progress, and also preparation of Omega charts is planned as a result of the opening of an Omega station in Japan in 1975.

At present, the total number of nautical charts for issue in Japan amounts to 978.

2. Basic Map of the Sea

Recently, various countries of the world have initiated full-scale ocean development activities from the viewpoint of securing resources over a long period and preservation of marine environments as well as of utilization of the ocean. In Japan, it has also become necessary to perform detailed charting around the country for preparation of a versatile general map required for execution of the ocean development projects. Thus, since 1967, the Basic Map of the Sea Project has been started. The Project is now in progress with an objective to cover the areas of the ocean, continental shelf and coastal waters around Japan. The outline of the Project is shown in Table 1.

3. Aeronautical Charts

The Aeronautical Route Chart series (1:1,000,000 scale), compiled according to ICAO specifications to cover all Japan in 3 sheets from north to south, has been revised to incorporate the latest data and information.

4. Miscellaneous Charts

Of the miscellaneous charts, 16 sheets of the Chart Showing the Positions of Set Net Fisheries series (1:200,000 scale) have been revised on the basis of the latest data and information.

Table 1. The present condition of the "Basic Map of the Sea" Project up to 1976.

Project zone	Area covered	Scale	Purpose	Schedule	Method	Sort and No. of sheets issued			
						Bathymetric Chart	Submarine Structural Chart	Total Intensity Chart	Gravity Anomaly Chart
Ocean	Western Pacific	1/8 million	Education, research, planning	1971	Compilation	1	X		X
	GEBCO (5.02, 5.06)	1/3 million	Research, planning	1966, 1968	Compilation	4	X	X	X
	GEBCO (5.02, 5.06)	1/1 million	Research, planning, survey	1973	Compilation	29	X	X	X
	Western Pacific	1/500,000	Planning, survey	1976	Survey	-	-	-	-
Continental margin	Continental shelf & slope	1/200,000	Planning, survey	1969	Survey	39	38	38	27
Coast	Within 12 miles off coast	1/50,000	Planning, survey	1971	Compilation survey	55	3	X	X
	Coastal sea	1/10,000	Survey, field operation	1971	Survey	12	5	X	X

- : under planning
X : none

IV. PRESENT STATUS OF MAP PRODUCTION AT OTHER AGENCIES

Maps and atlases have been prepared by governmental agencies other than the Geographical Survey Institute and the Hydrographic Department.

Population maps, land classification maps, geological maps and others were issued by several agencies. The principal maps are as follows:

1. Land Classification Maps by prefecture, 1:200,000 scale, by the Land Bureau, National Land Agency. The purpose of these maps is to grasp the general situation of natural conditions of the whole territory. The preparation of this map series was started in 1967 and the completion of the work is scheduled for 1977. The work has been carried out by the National Land Agency in cooperation with each prefecture for comprehensive coverage of the prefectural area.
2. Population Distribution by Landforms, 1:1,000,000 scale, by the Bureau of Statistics, Office of the Prime Minister, 1973. This map series, consisting of 3 sheets, shows the distribution of the population in Japan by landforms. This series was prepared based on population data from the October 1970 Population Census. The type of landform is based on the landform divisions defined by the Geographical Survey Institute.
3. Percentage of Population that Moved After 1965, 1:1,500,000 scale, by the Bureau of Statistics, Office of the Prime Minister, 1973. This map shows the percentage of the total population that moved into their present residences after January 1965 for each Shi, Ku, Machi and Mura. The data on this map are based on the 1970 Population Census.
4. Vegetation Map of Each Prefecture, 1:200,000 scale, by the Agency for Cultural Affairs, Ministry of Education, 1971. The purpose of this map is to present fundamental map source data to grasp the actual conditions of vegetation preserved by nature. The preparation of this map series was started in 1968 and all prefectures are scheduled to be completed by 1977. The work is being done by the Agency in cooperation with each prefecture covering its area of jurisdiction.
5. Geological maps have been produced by the Geological Survey of Japan. There are geological sheets at scales of 1:50,000; 1:75,000; 1:200,000 and 1:500,000. The 1:50,000 scale geological sheets have been produced since 1949; the

1:75,000 scale sheets since 1921; the 1:200,000 scale sheets since 1952 and the 1:500,000 scale sheets since 1951. Besides these geological base maps, since the late 1950's, Geological Maps of Coal Fields or Oil and Gas Fields, and Geological Tectonic Maps have appeared. One of the principal maps is the Geological Maps of the Oil and Gas Fields of Japan, which have been produced since 1961, and another is the Geological Tectonic Map Series published since 1968. In the Geological Tectonic Map Series, the geological structure is shown, i.e. faulting and volcanos active in the Neogene - early Late Quaternary period and the geology. From this map, the state of upheaval and depressions can be determined.

V. PRESENT STATUS OF MAPPING ACTIVITIES AND CARTOGRAPHIC PUBLICATIONS BY PRIVATE ENTERPRISES

1. General Trend of Utilization of Maps in Recent Years

In Japan, demand for maps has rapidly increased during the last ten years. According to the purpose of the user, the kinds of maps purchased can be classified as follows:

- (1) For leisure and sports such as traveling, driving and mountaineering.
- (2) As tools for business and daily life.
- (3) For research and investigation.
- (4) As education materials such as textbooks.
- (5) As interior decorations.
- (6) As references for cultural studies at home.
- (7) Others.

Increase in the demand for maps is particularly remarkable for (1) above, and except for (2), (3) and (4) for which demands are fixed, the demand for (5) has become quite popular recently.

2. Present Status and Problems in Map Publications by Private Enterprises

As for contents, representation and updating, maps published by private enterprises are by no means inferior to

those of foreign countries. The problem is that the maps for (6) are inadequate.

As for (1), the number of kinds of already published maps are numerous. For road maps, which are the representative maps, updated information is required since the road conditions vary rapidly, so that it is no longer unusual for revisions to be made several times a year. The representative map of (2) is the prefectural map, and its usage is considerably wide. The representative maps of (3) are the topographic maps prepared by the Geographical Survey Institute of the Ministry of Construction, a governmental organization. The national atlas recently prepared by the same Institute also plays an active role in this category. The most representative maps of (4) are those compiled as a type of textbook for social studies. An almost fixed demand is expected every year. They cover a variety of subjects so that they serve as substitutes for home atlases in many cases after the user finishes school education.

Those in (5) are old maps and pictorial maps modified so that they may be pasted on the walls of rooms. The characteristic of a map as an art object has been utilized in making the map as a commercial article in accordance with a rise in the living standard. As for (6), in many cases maps are published as part of encyclopedias and several other publications. As for the maps and atlases in (6), they are on such a level that their contents are substantially the same as school atlases, or cover only Japan, or are merely translations of foreign atlases showing regions which are not adequate for Japanese. Accordingly, they do not always satisfy the majority. It is regrettable that a full-scale home atlas which can be proudly shown to the world has not yet been published.

3. Problems on Map Production by Private Enterprises

The common problem confronted by private enterprises is the shortage of specialized staff members. Cartographers presently educated at universities and colleges are limited in number, and in almost all private companies the only way is to train and educate, in their own way, those new employees who are recognized as having cartographic aptitude. Also, there is considerable work in collecting information for updating the contents of maps. It is especially difficult to collect source data on foreign countries. Most private

enterprises are on a small scale. Therefore, it would be desirable for a single agency or organization to collect information so that various companies may use the collected information, rather than the companies individually collecting the data. Quite recently an organization whose main activities are to collect and distribute updated information mainly concerning Japan has been established, and also another agency conducting activities for dissemination of maps has been organized. This tendency is quite welcome for private mapping companies.

As described above, although mapping activities by private enterprises are gradually flourishing, the fact that full-scale atlases are not yet sufficiently utilized at home is a problem to be solved in the future. For Japan, where resources are insufficient and the population is increasing, it is indispensable to correctly analyze the world situation to survive in the world society, and it is necessary to make known to the people the role maps play for that purpose. To provide a basis for that, it is desirable to enrich map education at school, especially at elementary schools.

VI. REPORT ON THE EDUCATION OF CARTOGRAPHERS IN JAPAN

The education of cartographers can be classified into four categories in Japan. The first is the cartographic training in the course of geography in universities and colleges. The second is the training in the twelve professional surveyors schools. The third consists of short evening courses held by the professional surveyors schools and by the Japan Surveyors Association. The fourth is education and on-the-job training at each cartographic enterprise.

In order to encourage and foster fully qualified engineering cartographers, a standard for the certification of their qualification is fundamentally needed. As for the certification of cartographers, the certification test accompanied by a short course intended for cartographers of private organizations has been conducted by the Japan Surveyors Association since 1960. This certification is required as the qualification of cartographers in the employ of private organizations which are going to accept orders from governmental cartographic organizations.

The system of certification was generally revised on the 1st of December 1975 and is as follows:

The certification consists of two grades: first class eligible and second class eligible. The former certifies persons who passed the tests of all subjects for Category A. The latter is for Category B. And the headings are composed of Cartographic Compilation and Map Drawings. Each heading is divided into two categories: A and B.

The subjects of each category are described as follows:

1. Cartographic Compilation

Category A: Compilation planning, design of specifications and map projects, art of compilation, compilation of basic map and its application, quality of map compilation practice.

Category B: Map projection, map specifications, selection and evaluation of map data, generalization techniques, map representation and layout.

2. Map Drawing

Category A: Theory of drawing, process management, theory and practice on plane feature symbols, contours and lettering.

Category B: Art of drawing, practice on plane feature symbols, contours and lettering.

Qualifications of applicants are as follows:

1. Cartographic Compilation

Category A: Eligible for legal surveyor, having at least eight years practical experience in surveying and at least three years practical experience in map compilation, or certified for the second class certification of map compilation.

Category B: Eligible for legal surveyor or assistant surveyor, having at least two years practical experience in surveying.

2. Map Drawing

Category A: Eligible for legal surveyor or assistant surveyor, having at least two years practical experience in map drawing or certified for the second class certification of map drawings.

Category B: At least one year practical experience in map drawing.

The number of registered persons having certification as of the 1st of December 1975 is as follows:

Category B of Map Compilation	57
Category B of Map Drawing	305

No registrations have been made for Category A in both Cartographic Compilation and Map Drawing.

VII. TREATMENT OF MAPS IN SCHOOL EDUCATION

More than 100 years have passed since public education started in Japan, and during the long span of time geographical education has been carried on almost without interruption until today. Up to the time immediately after World War II, geography was treated as an independent subject. As a phase of compulsory education, geographical education has been positioned as an indispensable element of social studies since 1947.

In discussing geographical education, maps have always been considered as important education materials and their effective utilization has been desired. World maps including globes, continent maps, maps of Japan and district maps (prefectural maps) have been not only used as education materials, but also compiled into atlases since early times and used for the daily studies of pupils and students.

However, it can be said that the treatment of maps in learning was such that the maps were used as a means to memorize mechanically so-called geographical knowledge, such as locations and names of cities, mountains, rivers, etc.

Study activities in such a system in which reading of maps is performed when required and knowledge is found subjectively from maps have not been efficiently practiced until today, although it has been advocated frequently. Study activities based on map making are extremely insufficient, presenting problems to be solved in the future.

It is considered that one of the reasons why map study could not become the nucleus of geographical education for the entrance examinations to schools of higher grades was because such examinations are apt to question the amount of geographical knowledge of candidates. Also, on the other hand, it should be pointed out that, in the syllabus of lectures in prewar days and in the course of study since social studies started in the postwar period, the treatment of maps in geographical education was only an item for consideration.

It was only during the last ten years that a stipulation has been made that map study should be mainly organized by map reading and map making, and thus has become an important goal for promoting geographical education. It is also a recent phenomenon that the necessity for study by observation and research using large-scale maps is being stressed. The system in which large-scale maps as publications were compiled on the basis of 1:50,000 scale topographic maps and produced primarily for military use, is one of the reasons for making poor utilization of maps in the educational field.

The 1:50,000 scale topographic map in which omissions and generalizations are made to a considerable degree is inadequate for making beginners comprehend how to make use of large-scale maps. Despite the fact that topographic maps at a scale of about 1:10,000 in urban areas and of about 1:25,000 scale in rural and mountainous districts are required, at present little consideration is given to the former. Nevertheless, publication of 1:25,000 scale topographical maps will be completed covering the whole territory in the near future, and this is a welcome phenomenon for development of geographical and map education as compared with the situation so far experienced.

VIII. THE JAPAN CARTOGRAPHERS ASSOCIATION AND ITS ACTIVITIES

1. Foundation and Purpose

In Japan, there is only one institution specializing in cartography--the Japan Cartographers Association (JCA). JCA was established in November 1962 for the purpose of making studies, conducting discussions, providing information service, etc. on a wide scope of general geographical cartography covering not only technical aspects of the map production system including map projection, compilation and reproduction, but also the substantial side of various thematic maps and atlases such as land use maps, land classification maps, city maps, economic statistical maps, etc.

2. Organization and Members

The executives of JCA in 1976 are as follows:

President: Prof. Dr. Akira WATANABE

Secretary General: Mr. Keiji NISHIMURA, Director
Geographic Research Division,
Geographical Survey Institute

JCA is comprised of about 1,900 members engaging in all fields of official and private cartographic activities, including map users.

3. Activities

Activities of JCA are: annual technical conference, lectures, map exhibitions, excursions, regular meetings (in one years, several times in Tokyo and once or twice in local cities). Local meetings were held at Niigata, Kyoto, Osaka, Mito and Shizuoka in 1973 to 1976.

Within JCA, seven commissions are organized at present, i.e. map education, history of cartography, map specifications, cartographic terms, map reproduction, atlases, and marine charts. Each and every commission has meetings several times a year, and is very active.

4. JCA Publication

A cartographic periodical entitled "MAP", Journal of JCA, in Japanese with English abstracts, is issued quarterly. This journal is well received especially because of sample copies of latest multicolored thematic maps that are included with each issue.