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THEME 2 - MAPPING OF NATURE AND NATURAL RESOURCES
FOR ENVIRONMENTAL PROTECTION

[THE ENVIRONMENT AND THEMATIC MAPS PUBLISHED
BY THE GEOGRAPHICAL SURVEY INSTITUTE OF JAPAN]

by

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Introduction - The Geographical Survey Institute (GSI) of Japan is the national organization for publishing the basic maps of Japan. GSI prepares various geographic thematic maps and compiles the national atlas of Japan, as well as conducts geodetic surveys and produces topographic maps and other general maps. The principal geographic thematic maps prepared by the GSI on a continual basis are Land Use Maps, Land Condition Maps, Lake Bathymetric Maps, Water Use Maps, and Land Condition Maps of the Coastal Areas (including the sea bottom). Besides these maps, GSI has compiled several thematic maps related to the environment, such as land subsidence, disasters by floods, earthquakes, landslides, land falls, snow avalanches, etc. and landform classification, in co-operation with other governmental organizations, Ministry of Construction, National Land Agency, Science & Technology Agency, Environment Agency, and so on. A brief explanation of four of these maps are presented below concerning the environment protection.

Land Use Maps - Japan has a large population on its small and mountainous territory, which may lead to too high a utilization of its lowlands and deterioration of the environment. Especially, rapid growth of Japanese economy of these two decades brought about considerable distortion of national land use patterns. Many industries and population have centered on big cities and towns rapidly. In the areas thus become over-populated, such serious problems arose as deterioration of environment conditions, housing problems and dreadful hiking up of the price of land. In the rural district, on the other hand, due to the out-flow of the young generation, the average age of inhabitants became older, and the base of living and agriculture became weaker. To solve these problems, National Land Use Planning Act was enacted in June, 1974. The act declares that with the limited natural resources, public welfare should be given the highest priority, the preservation of the natural environment should be taken into consideration; the healthy and cultural living environment should be secured; and the well-balanced development of the land should be promoted. With the enactment

of National Land Use Planning Act, a new agency, National Land Agency was set up to enforce the act, and to make plans and adjustments of the land use.

GSI, which had compiled many land use maps at various scales, started the preparation of a new land use map series at a scale of 1 : 25,000 for covering main areas of the nation, about 90,000 Km² during four years beginning in 1975, in co-operation with the National Land Agency, as one of its National Land Information Services activities to supply necessary data for the national and regional land use plannings which are made by the government and prefectures under the provisions of the National Land Use Planning Act.

The contents of the map series are as follows besides those of the regular topographic map:

Urban Area

Residential (common)	not exceeding 3 stories
Residential (middle and high)	more than 4 stories
Commercial	shops, amusement, hotels, etc.
Business	offices of private companies
Industrial	
Public business	
Education & culture	
Welfare & hospitals	
Park & green area	
Playground	
Transportation & distribution	
Supply & disposal	
Defense installations	
Vacant land	
Under construction	

Agricultural Area

Paddy field
Upland field
Orchard
Mulberry garden
Tea garden
Other tree crops
Pasture & meadow
Cattle shed
Green house

Forest

- Conifer (afforested)
- Conifer (natural)
- Broad leaf
- Mixed of conifer & broad leaf
- Bamboo
- Palm trees
- Dwarf pines
- Scrub
- Waste land

Boundary of special area

The contents of the map are set to fit in urban and regional plannings, that is, each land use categories of the map are comparable with those of the National Land Use Planning Act and the Urban Planning Act which aim national, regional, and urban land use plannings for good environment as one of the objects.

This map is a topographic land use map, in a sense, that is, a land use map including wholly the contents of the regular topographic quadrangle and additionally indicating necessary land use categories with colors.

Land Condition Maps - The land condition is one of important factors for an environmental land use planning. The Land Condition Maps depict the landform classification, indicating terrain forms and characteristics, the ground elevation lines, showing detailed terrain heights, especially in the lowlands, and the organizations and installations concerned with disaster prevention, and land conservation and development, and so on. They are a kind of applied geomorphological map which would serve to determine optimum location of various land use categories from the viewpoint of the physical environment of the land. GSI has prepared the maps for the main densely populated and developed areas of Japan at a scale of 1 : 25,000 or in special areas at a scale of 1 : 10,000 or 1 : 15,000.

The contents of the maps are in general as follows:

1. Landform classification is the major category of the map. Each of the following numerous categories is shown with a colored areal symbol or a symbol.

Slopes: classified into several categories according to the shape of the horizontal section; Ridge type, Valley type and Linear type, and according to the gradient; Gentle, Steep and Very steep.

Main watersheds:

Unstable slopes: Knife ridge, Cliff, precipice rock, Rockfall slope, Bare rock, and Landslide.

Terraces: High, Upper, Middle, Lower and Low terraces.

Piedmont slopes: Colluvium, Talus, and Debris flow shape.

Lowlands: Alluvial fan, Gentle frontage of fan, Natural levee, Sand dune, Sand bar, Heightened bank along upheaved river bed, Hollow, Valley plain and flood plain, Coastal plain and delta, Back marsh, Former stream channel, High water river bed, Low water river bed, Marsh, Tidal flat, and Shoreline.

Artificial landforms: Cut and rolled surface, Banked up surface, Filled up surface, Reclaimed land, Excavation, and Area under construction.

2. Ground elevation Detailed ground elevation is represented by contours with one meter intervals in lowlands including those below sea level. Many bench marks and spot heights are also plotted. In the sea area, depth contours with one meter intervals are drawn to the depth of 15 meters.

3. Organizations, public facilities, and miscellaneous. The following are indicated with different symbols: Administrative boundaries, land conservation service offices, observatories, traffic facilities, facilities which may produce dangerous situations when floods or earthquakes occur, pumping equipment, relief and security facilities, facilities along rivers and coasts, bridges, etc.

Lake Bathymetric Maps - Lakes are important elements of the environment. From ancient times, Japanese love lakes, and they have been themes or stages of various literature, legends or history. Many lakes are included in the national parks, quasi-national parks or prefectural parks. Recent years, with economic and industrial development and increase of tourists, eutrophication and deterioration of some lakes have been progressing rapidly. For example, the transparency in Mashu Lake in eastern Hokkaido was observed to be 41.6 meters, the most transparent in the world, in 1931, while in August, 1974, it was observed to be 24.6 meters on a very fine windless day.

GSI has prepared a Lake Bathymetric Map series at a scale of 1 : 10,000 by echo-sounding for about thirty major lakes in Japan since 1955, including Lake Biwa, the largest, and Lake Tazawa, the deepest in Japan, and the project is still going on. The maps show bathymetric lines and

topographic features, water weeds, bottom materials, public facilities, control points, and peripheral topography and land use, and they include a Bottom Materials Map at a scale of 1 : 50,000 as an inset. In Japan, many lake bathymetric maps had been prepared by various organizations before GSI's maps, but generally in smaller scales, less detailed and of diverse legends. GSI's maps are one of the most fundamental materials for the environmental research and protection, as well as the academic research and practical utilization, of the lakes, though many lakes remain uncovered by them as yet.

Land Condition Maps (and Topographic Maps) of Coastal Areas - Japan has a long coastline in comparison to its land surface. As Japan is a mountainous country, the coastal areas are very important for various activities such as industry, transportation, fisheries, construction materials, recreation, etc. and for the environment. GSI has prepared the Land Condition Maps and Topographic Maps of Coastal Areas at a scale of 1 : 25,000 for Ise Bay, Yatsushiro-Kai, a part of Seto Inland Sea, and Kujukuri-Hama since 1972, and is continuing this project.

The Land Condition Maps of Coastal Areas have the same contents as the ordinary Land Condition Maps for the land areas, while for the sea areas, the former indicate the submarine landform classification, the bottom materials by dredging samples, the submarine geology by sonic prospecting etc., the thickness of the alluvium, the iso-depth contour lines of the sea bottom and the base rock, and so on. The Topographic Maps of Coastal Areas have about the same contents as the regular topographic maps for the land areas, however, some buildings and public facilities concerned with the sea areas are added. For the sea areas, the maps include three items--natural conditions (iso-depth lines, bottom materials, transparency, etc.), public facilities (facilities along seacoasts, ports and harbors, observatories, relief and security facilities, facilities for fisheries, facilities for supply, etc.) and administration boundaries (limits of harbor areas, boundaries of national parks, etc.).

Conclusion - The thematic maps explained above are all on sale to the public and for general use, e.g. for education, scientific or applied researches, urban or regional plannings, disaster prevention, recreation, and so on. They are not prepared exclusively for environment protection, but they are closely related to it as a basic data through various representations of the conditions of the land surface.

Résumé

L'ENVIRONNEMENT ET LES CARTES THEMATIQUES PUBLIEES PAR LE GEOGRAPHICAL SURVEY INSTITUTE DU JAPON

Le Geographical Survey Institute (GSI) du Japon est l'organisation nationale pour produire et publier des cartes fondamentales du Japon. Le GSI fait la production de diverses cartes thématiques géographiques et de l'atlas national, en outre du levé géodétique et de la production des cartes topographiques à diverses échelles.

On explique ici en bref sur la carte de l'utilisation du sol, la carte de la condition du sol, la carte bathymétrique du lac, et la carte de la condition du sol (et la carte topographique) de la zone côtière, qui sont continuellement produites, publiées en vente, et en relation avec la protection de la nature et de l'environnement comme des données fondamentales à travers des représentations diverses des conditions de la surface de la terre, bien qu'elles sont pour l'utilisation générale, enseignement, recherches scientifiques et appliquées, desseins urbains et régionaux, prévention de désastres, récréation, etc.