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Toponymic data files and gazetteers

Management of Geographical Names Database and its Utilization

Submitted by Japan**

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1. Introduction

The Geospatial Information Authority of Japan (GSI) is promoting its effort of compiling and publishing geographical data on Japan's land area in accessible forms. Regarding geographical names, GSI has compiled and manages a database covering geographical names information composed of the annotations indicated on the existing 1:25,000-scale topographic maps. The geographical names information is used for GSI's various products such as annotations on the maps, search keys for the GSI's map system on the web, and the others. The management method for and some cases of utilization of the geographical names database are described below.

2. Compiling and updating the geographical names database

The geographical names database is a data set which comprehensively covers all over Japan and is composed of data on geographical names accompanied with geographic coordinates including about 346,000 residential geographical names and about 73,000 natural feature names. The representative points of geographical names and related information are managed by means of a geographic information system (GIS). Each geographical name not only has its own unique ID and its notation (usually in *kanji*, Chinese characters) on the map but also has its integrated set of data including category of geographical name, *kana* or *hiragana* notation, Romanized notation, English notation, and multiple appellations if any.

In general cases, geographical names in Japan are indicated in *kanji* characters. Since many names in *kanji* characters can be read variably by nature, geographical names in *kanji* should be accompanied with Japanese phonetic characters, *kana* or *hiragana* that represent their correct pronunciations. Some geographical names cannot be indicated correctly in *kanji* characters depending on the system used. Thus, in the map data of GSI, geographical names data contain specific IDs corresponding to the correct *kanji* characters as ancillary image but not as proper data.

The compiling and updating methods for residential geographical names are slightly different from those for natural feature names. Most residential geographical names are used as such for postal addresses. These names and information on change of area zoning are published in the local government's notices in accordance with the law. The geographical names database is compiled and updated using a collection of notices of local governments while polygons representing the areas are obtained.

On the other hand, natural feature names are generally not subject to any official naming system or any laws. Instead, they are based on the names conventionally called by local populations. For compiling and updating the database, GSI makes inquiries at local governments about the natural feature names in their administrative areas. As for collected natural feature names, a conference has been held since 1952 to adopt a unified geographical names notation for use on land maps created by GSI and nautical charts compiled by the Japan Coast Guard.

The database is usually updated every month. Updated information is taken into consideration in and added to GSI's products accordingly.

3. Products utilizing the geographical names information

GSI's major products based on the geographical names database are described below:

(1) "GSI Maps"

The "GSI Maps" is a charge-free map website provided by GSI. Annotations of geographical names on the GSI Maps are created after being selected from the geographical names database according to the scale (zoom level) and the density of annotations. The map page of the GSI Maps has a search window on its upper portion, enabling for users to search geographical names. Search keys for this function are updated whenever any data in the database has been renewed. Clicking on the bottom left corner of the map page will display the appropriate postal address referenced to the polygon data of the geographical names information around the center position of the page as well as the latitude, longitude, elevation, and the others. In 2020, a new function was added: switching between *kanji* and *hiragana* of the address notation according to the Japanese phonetic notation in *hiragana* contained in the geographical names information.

"Geographical Name" search: Enter a geographical name in the search window to move the current map display to the appropriate location on the map.
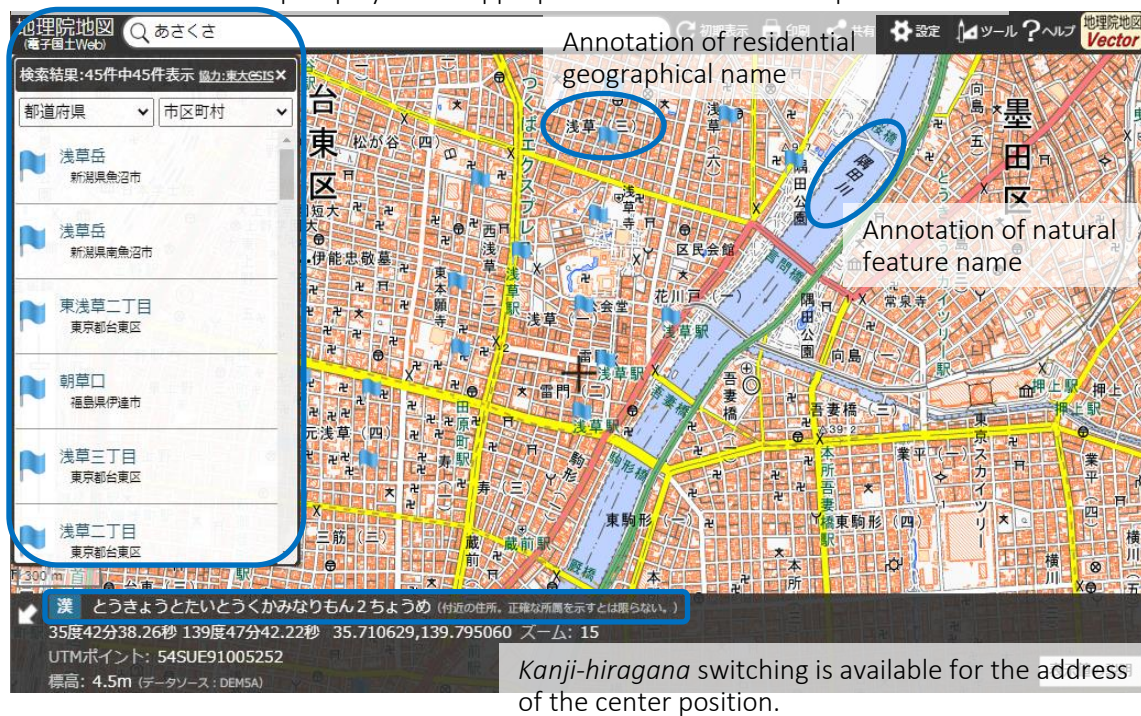

Figure 1: Utilization of the geographical names information on the map (area around the *Sensoji* temple) of the "GSI Maps"

(2) Topographic maps and indices

The annotations of geographical names on GSI's topographic maps are equivalent to those on the GSI Maps. Every larger-scale topographic map has its own index that represents its area coverage (about 4,400 areas for the 1:25,000-scale topographic maps). These indices are mainly determined after one of the residential geographical names or the natural feature names indicated on the map.

(3) Publication in vector data format

The data in GML and shapefile format converted from vector data of the geographical names information are provided for compensation together with map information and mesh elevation information as "Digital Map (Basic Geospatial Information)". Since July 2017, the vector tile data for geographical names are experimentally published on the GSI Maps website. Users have access to information such as names in *hiragana* and Romanized notations through the geographical names information in vector tile format in addition to the annotations of the geographical names on the map.

Figure 2: Display of vector tiles on the GSI Maps

(4) Maps with multilingual notations

Making further efforts for expanding globalization, GSI experimentally released "map in English notation" on the web in March 2019 as a first step for multilingual notations of geospatial information. In February 2020, GSI released on a trial basis an expanded version of the web map as "Japan map in multilingual notation" with notations in French, Korean, Simplified Chinese, Traditional Chinese and Romanized Japanese in addition to English. The vector data for residential geographical names and natural feature names contained in the maps in multilingual notations have been created and converted according to the notations in *kanji*, *hiragana*, Romanized Japanese and English of the geographical names database.

(5) "Gazetteer of Japan"

The Government of Japan will update in 2021 "Gazetteer of Japan" which has been published according to a resolution of the United Nations Conference on the Standardization of Geographical Names (UNCSGN). The land geographical names listed in the Gazetteer have been taken from the annotations on 1:1,000,000-scale maps and are managed manually, although they are compatible with the geographical names database. GSI is considering a technique for accomplishing its tasks more efficiently by using the geographical names database for continued updating of the Gazetteer.

4. Conclusion

This report has shown GSI's compiling and updating methods for the geographical names database and utilization of the geographical names information for its products in various forms. GSI will further be committed to compiling geographical names database in an efficient and adequate manner and providing users with useful and understandable geographical names information.

5. Points for discussion
The Group of Experts is invited to:

(a) Comment and provide input on similar work being carried out in other countries.

(b) Share good practices of the system linkage method between geographical names DB and various map data for efficient map updating.