

MULTI-LANGUAGE SUPPORT AND LOCALIZATION OF FREE AND OPEN SOURCE GRASS GIS

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ABSTRACT

In this paper we described the efforts towards Internationalization (i18n) of GRASS GIS and discuss present status. Development of GRASS-i18n has been carried out in the following four broadways.

- a) Teltkgrass-i18n and Nviz-i18n Graphical User Interface (GUI)
- b) i18n of GRASS command help system
- c) i18n of GRASS text drawing command such as *d.text* and *d.label*
- d) i18n of GRASS Postscript print command (*ps.map*)

As a result of the above developments, it is now easily possible to localize GRASS GUI to other languages by creating appropriate message files in other languages. Language localization of GRASS GUI for Japanese has been completed. Further, display and printing for other languages is supported using Unicode (UTF-8) encoding scheme.

1. INTRODUCTION

GRASS GIS is Free/Libre Open Source Software (FOSS) for Geoinformatics designed for accumulation, management, analysis and visualization of spatial information. GRASS is useful in the various fields such as resource management, hazard mapping, environmental monitoring, economic marketing and epidemics application (Neteler and Mitasova, 2002). GRASS can treat not only information on the surface of the earth but also underground three-dimensional geologic information (Masumoto *et al.*, 2004).

However, in general GIS, multi-languages is required for the purpose of enabling widespread use of GRASS in operational environment. Furthermore, English GUI and help function are hard to use for the more general end user who do not use English as a means of

communication. GRASS has Russian version as an example of language localization (Shevlakov A., 2002). Localization (L10n; "L" + 10 letters + "n"; upper case L is used to distinguish it from the numeral 1 (one)).) can be carried out for individual languages, however in order to support multi-language locales it is important that internationalization (i18n; "i" + 18 letters + "n"; lower case i is used to distinguish it from the numeral 1) of GRASS is carried out in a systematic and phased manner.

For these purposes, the i18n version of GRASS 5.0.3 is being developed. At present, Tcltkgrass GUI, Nviz, command help, text display on monitor, and Postscript print command have been developed as an i18n version. Efforts are also being made to incorporate the i18n features in GRASS 5.7 as it supports multi-language locales and UTF-8 encoding.

2 INTERNATIONALIZATION OF GRASS

Development of GRASS-i18n has been carried out in the four broadways. As a result of the developments, it is now easily possible to localize GRASS GUI to other languages by creating appropriate message catalogue files in other languages (eg. Nonogaki *et al.*, 2004).

2.1 Tcltkgrass-i18n and Nviz-i18n Graphical User Interface (GUI)

The menu of tcltkgrass which is the main GUI of GRASS has been internationalized. Tcltkgrass of the i18n version consists of "tcltkgrass-i18n" new command and modules include message catalogue file (en.msg). For desired languages, the Unicode-8 version of the new message catalog file XX.msg (XX is the locale code; eg. ja for Japanese, de for German, th for Thai etc.) needs to be created based on en.msg file. In case of Japanese multi-byte character-sets EUC-JP and Shift-JIS is also supported. Depending on the locale (LANG) environment, tcltkgrass-i18n can be displayed in locale language.

Example of message file;

```
Original >> ::msgcat::mcset en "File(F)" "File(F)"      (en.msg)
Changed << ::msgcat::mcset yy "File(F)" "zz(F)"        (XX.msg)
```

Where yy is the locale code and zz is the message in desired language. Only roman character (e.g. (F)) can be used for shortcuts.

2.2 GRASS command help system

The command help for the command included in tcltkgrass-i18n was internationalized. The command help dialog box can be displayed in tcltkgrass-i18n by clicking the right button of the mouse over a menu item or on a "RUN" (execute) button of a command dialog. And, the command help can be invoked also in a shell by typing the following:

```
GRASS:> grass_command help          (eg. d.rast help)
```

And also, for desired languages, the new message catalog file needs to be created as well as the above tcltkgrass-i18n menu.

2.3 GRASS text display command

The text display on the graphic monitor of GRASS was internationalized. It was changed to use TrueType fonts instead of the vector fonts of the original version of GRASS. By using TrueType fonts, Double Byte characters such as Japanese character set can be

display. To set up TrueType fonts, a new command "d.font.freetype" has been added to perform font and character encoding. Due to this internationalization, various languages can be used for the site label, legend and so on.

2.4 GRASS Postscript print command

To produce high quality hardcopy map products, PostScript print command (ps.map) was internationalized. PostScript output can be included the text in various language.

3 JAPANESE LOCALIZATION OF GRASS

Example of language localization of GRASS has been completed in Japanese. The original English menu and Japanese menu of tcltkgrass are shown in Fig. 1. The example of the module is shown in Fig. 2. The example of command help and the control main panel with surface panel of Nviz are shown in Fig. 3 and Fig. 4, respectively. In Fig. 5 and Fig. 6, site labels and legend are shown as the examples of Japanese font display on the graphics monitor. The example of PostScript print is shown in Fig. 7.



Figure 1. Tcltkgrass-i18n menu (upper; original English, lower; Japanese version).



Figure 2. Example of d.legend module (left; original English, right; Japanese version).

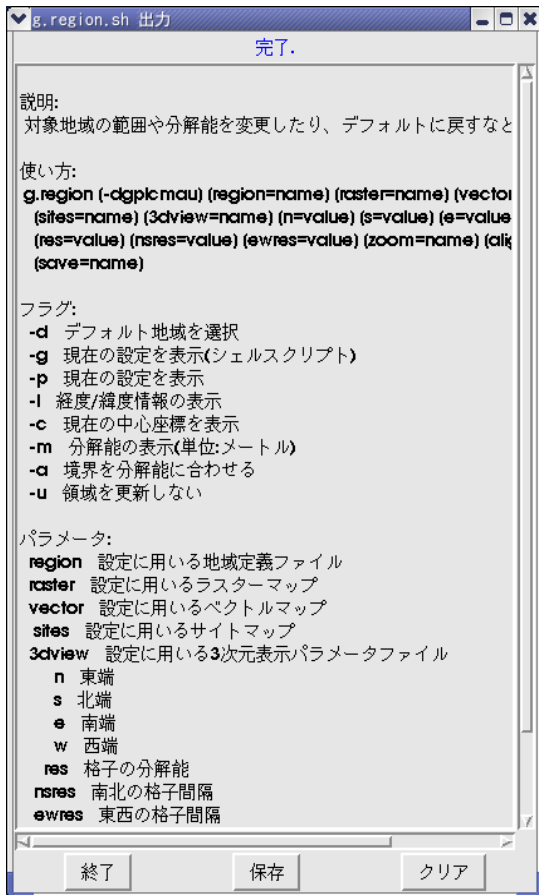


Figure 3. Example of Japanese command help (g.region.sh).

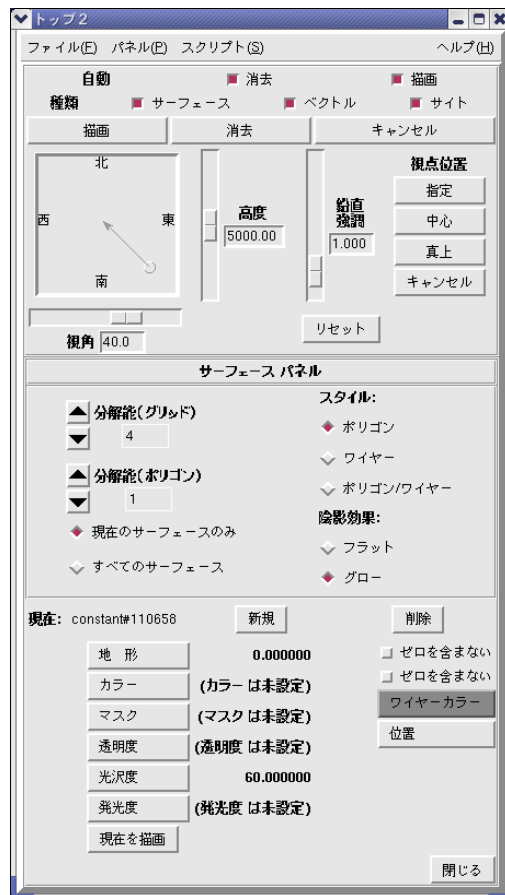


Figure 4. Example of Nviz-i18n Japanese version.

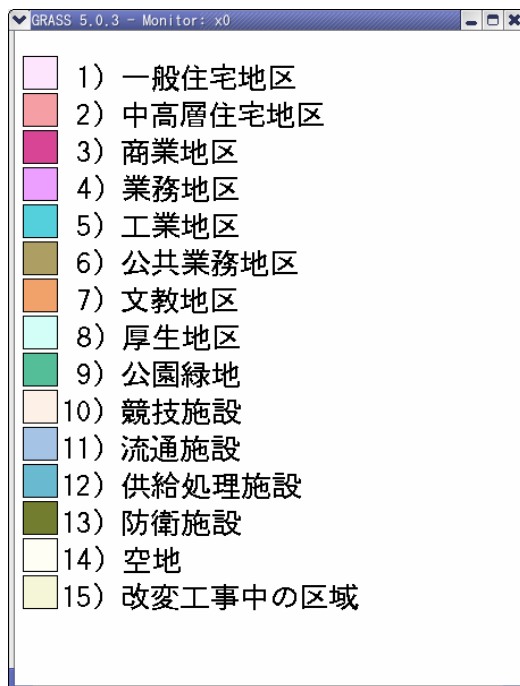


Figure 5. Example of Japanese legend using d.legend command.



Figure 6. Example of Japanese site labels using d.site.labels command.



Figure 7. Example of PostScript print using ps.map command.

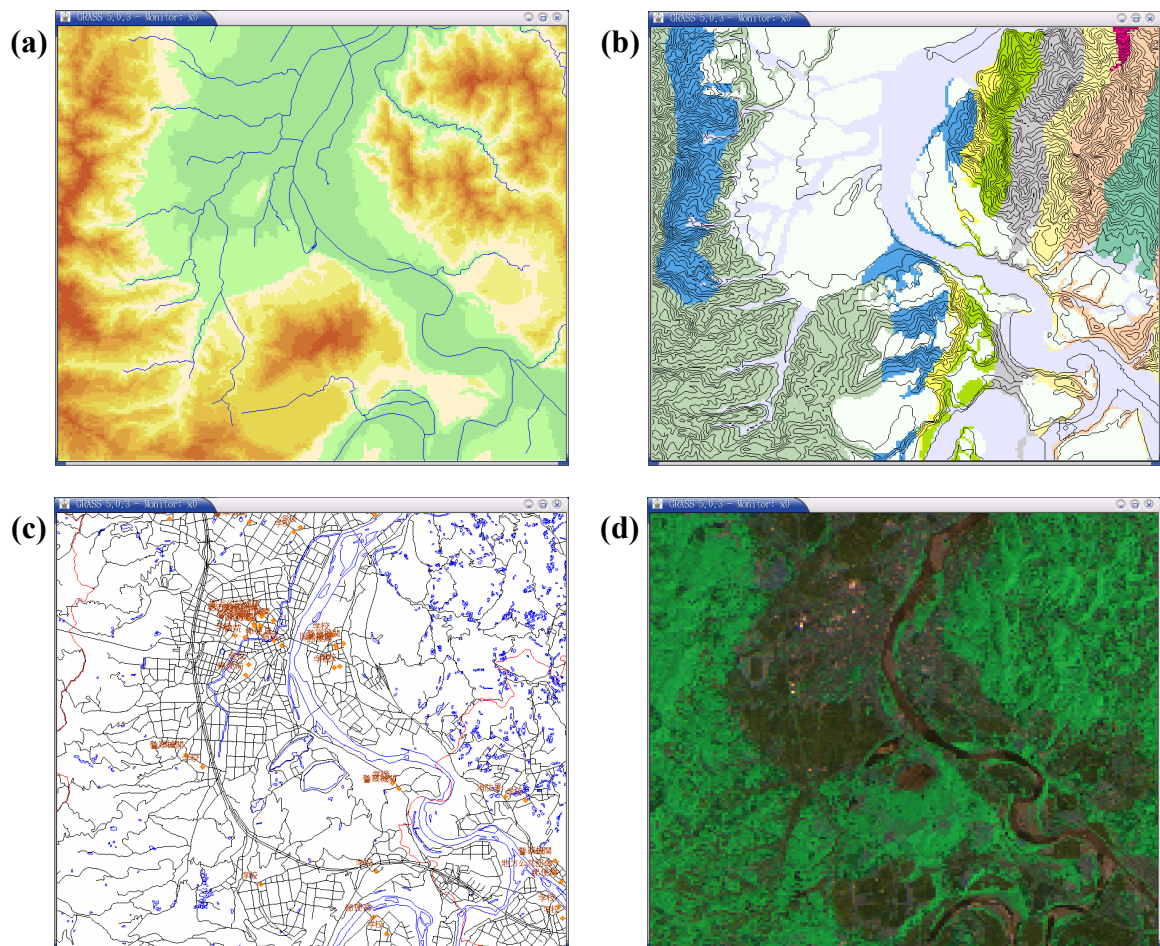


Figure 8. Examples of Japanese data set. (a) elevation with river line, (b) geology with contours, (c) road, river and public sites, (d) ASTER image.

To realize completely localization, Japanese GRASS sample datasets have been prepared. The sample data set of the Japanese version was developed for multi-purpose use similar to the Spearfish data set of GRASS. In this data set, natural science data (elevation, vegetation, geology, landslide, and ASTER images) and social science data (land use, population density, commerce establishment, road, railroad, and public facilities) were included. In Fig. 8, examples of this sample data set are shown. And, another four data sets which aimed at natural science, social science, and perspective view were prepared. These GRASS sample data sets are available freely, and can be downloaded from the Internet (<http://www.foss4g.org/FOSS4G/>). The sample datasets can help Japanese users to learn about GRASS functionality using datasets that they are familiar with.

4 CONCLUSIONS

The present status of the development of internationalization version of GRASS was summarized. And, The examples of Japanese version were expressed using Japanese sample data set. At present, internationalization of two main function of GRASS could not complete as following;

- (1) The message and notice of GRASS command,
- (2) GRASS online manual.

Further development and investigation are necessary to these functions.

The portal site to open these result and other information related GRASS and FOSS4G is <http://www.grass-japan.org/FOSS4G>. From this portal site, the binary code, source code of internationalized version of GRASS and Japanese sample data sets can be downloaded (Raghavan *et al.*, 2004).

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