

GMT (Generic Mapping Tools)

操作・設定マニュアル

国土交通省関東地方整備局

—目次—

1、はじめに	- 1 -
2、導入手順	- 2 -
2-1 必要なファイルのダウンロード.....	- 2 -
2-1-1 GMT 本体と gawk (テキストデータ加工用ツール)	- 2 -
2-1-2 Ghostscript, GSview.....	- 5 -
2-2 インストール.....	- 7 -
2-2-1 GMT	- 7 -
2-2-2 GShhg.....	- 8 -
2-2-3 gawk	- 10 -
2-2-4 Ghostscript.....	- 10 -
2-2-5 GSview.....	- 12 -
3、操作方法	- 15 -
3-1 データの用意.....	- 15 -
3-2 テキストデータの配置とファイル名の変更.....	- 17 -
3-3 バッチのコピーと描画.....	- 18 -

1、はじめに

GMT (Generic Mapping Tools) は、ハワイ大学が開発した、地理的データを描画するためのフリーソフトです。

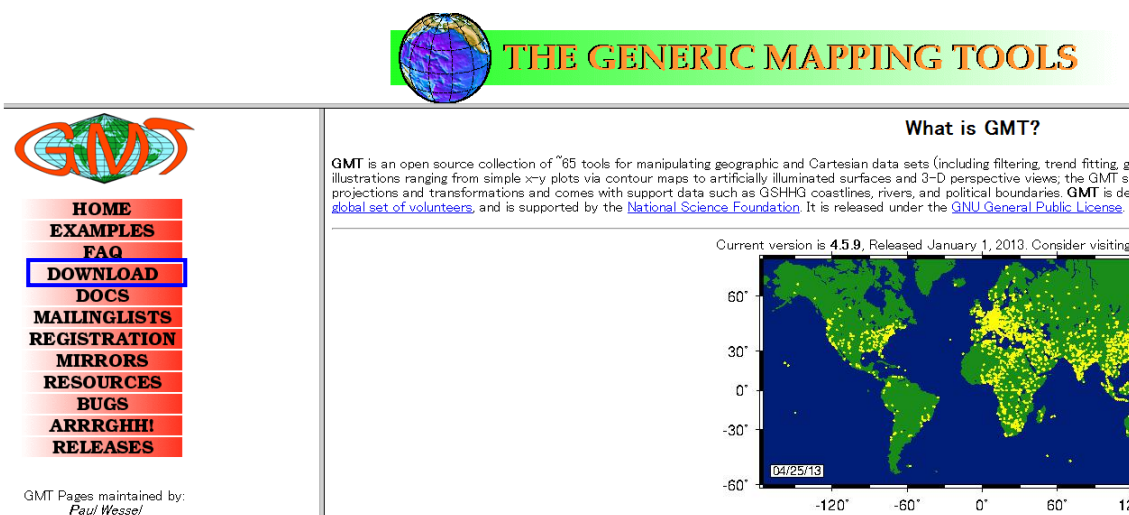
描画はコマンド（コンピュータ用の命令文）を使用して1つずつ行い、それらの描画を重ね合わせることで地図に様々なデータを描画することができます。

2、導入手順

2-1 必要なファイルのダウンロード

2-1-1 GMT 本体と gawk (テキストデータ加工用ツール)

- ① インターネットブラウザで、<http://gmt.soest.hawaii.edu/gmt4/>へアクセスします。
- ② ページ左側の **DOWNLOAD** をクリックします。



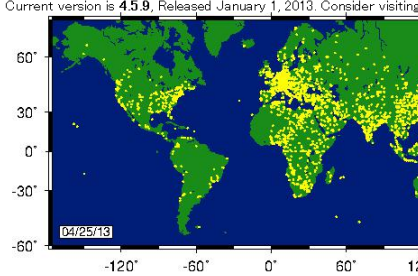
HOME
EXAMPLES
FAQ
DOWNLOAD
DOCS
MAILINGLISTS
REGISTRATION
MIRRORS
RESOURCES
BUGS
ARRRGHH!
RELEASES

GMT Pages maintained by:
Paul Wessel

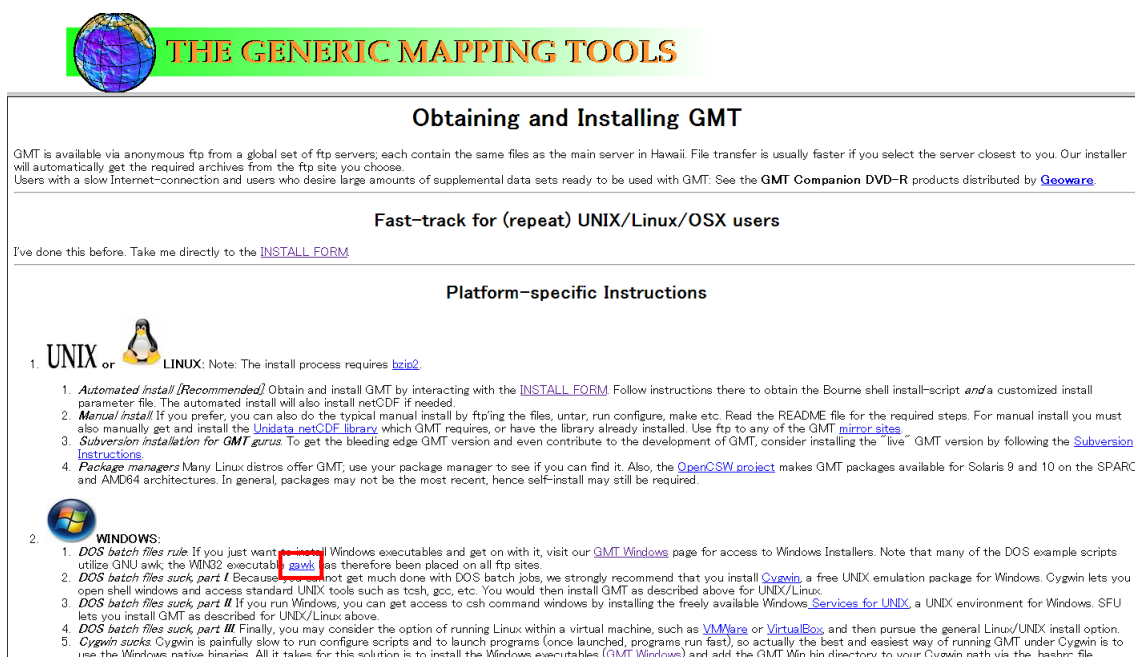
What is GMT?

GMT is an open source collection of ~65 tools for manipulating geographic and Cartesian data sets (including filtering, trend fitting, gr illustrations ranging from simple x-y plots via contour maps to artificially illuminated surfaces and 3-D perspective views; the GMT su projections and transformations and comes with support data such as GSHHG coastlines, rivers, and political boundaries. GMT is dev global set of volunteers, and is supported by the [National Science Foundation](#). It is released under the [GNU General Public License](#).

Current version is **4.5.9**, Released January 1, 2013. Consider visiting:



- ③ 画面右側中央部にある、**gawk** をクリックし、ダウンロードします。




Obtaining and Installing GMT

GMT is available via anonymous ftp from a global set of ftp servers, each contain the same files as the main server in Hawaii. File transfer is usually faster if you select the server closest to you. Our installer will automatically get the required archives from the ftp site you choose.
 Users with a slow Internet-connection and users who desire large amounts of supplemental data sets ready to be used with GMT: See the [GMT Companion DVD-R](#) products distributed by [Geoware](#).

Fast-track for (repeat) UNIX/Linux/OSX users

I've done this before. Take me directly to the [INSTALL FORM](#).

Platform-specific Instructions

1. **UNIX** or  **LINUX:** Note: The install process requires [bcn2](#).

1. *Automated install [Recommended]* Obtain and install GMT by interacting with the [INSTALL FORM](#). Follow instructions there to obtain the Bourne shell install-script *and* a customized install parameter file. The automated install will also install netCDF if needed.
2. *Manual install* If you prefer, you can also do the typical manual install by ftp'ing the files, untar, run configure, make etc. Read the README file for the required steps. For manual install you must also manually get and install the [Linux netCDF library](#) which GMT requires, or have the library already installed. Use ftp to any of the GMT [mirror sites](#).
3. *Subversion installation for GMT gurus.* To get the bleeding edge GMT version and even contribute to the development of GMT, consider installing the "live" GMT version by following the [Subversion Instructions](#).
4. *Package managers* Many Linux distros offer GMT, use your package manager to see if you can find it. Also, the [OpenCSW project](#) makes GMT packages available for Solaris 9 and 10 on the SPARC and AMD64 architectures. In general, packages may not be the most recent, hence self-install may still be required.

2. **WINDOWS:**

1. *DOS batch files rule.* If you just want Windows executables and get on with it, visit our [GMT Windows](#) page for access to Windows Installers. Note that many of the DOS example scripts utilize GNU awk; the WIN32 executables [gawk](#) as therefore been placed on all ftp sites.
2. *DOS batch files suck, part I.* Because [gawk](#) not get much done with DOS batch jobs, we strongly recommend that you install [Cygwin](#), a free UNIX emulation package for Windows. Cygwin lets you open shell windows and access standard UNIX tools such as `tcsh`, `gcc`, etc. You would then install GMT as described above for UNIX/Linux.
3. *DOS batch files suck, part II.* If you run Windows, you can get access to csh command windows by installing the freely available Windows [Services for UNIX](#), a UNIX environment for Windows. SFU lets you install GMT as described for UNIX/Linux above.
4. *DOS batch files suck, part III.* Finally, you may consider the option of running Linux within a virtual machine, such as [VMWare](#) or [VirtualBox](#), and then pursue the general Linux/UNIX install option.
5. *Cygwin sucks.* Cygwin is painfully slow to run configure scripts and to launch programs (once launched, programs run fast), so actually the best and easiest way of running GMT under Cygwin is to use the Windows native binaries. All it takes for this solution is to install the Windows executables ([GMT Windows](#)) and add the GMT Win bin directory to your Cygwin path via the `bashrc` file.

- ④ 画面右側中央部にある、GMT Windows をクリックします。



THE GENERIC MAPPING TOOLS

Obtaining and Installing GMT

GMT is available via anonymous ftp from a global set of ftp servers, each contain the same files as the main server in Hawaii. File transfer is usually faster if you select the server closest to you. Our installer will automatically get the required archives from the ftp site you choose. Users with a slow Internet-connection and users who desire large amounts of supplemental data sets ready to be used with GMT. See the [GMT Companion DVD-R](#) products distributed by [Geoware](#).

Fast-track for (repeat) UNIX/Linux/OSX users

I've done this before. Take me directly to the [INSTALL FORM](#)

Platform-specific Instructions



1. **UNIX or LINUX:** Note: The install process requires [bzio2](#).

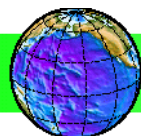
- Automated install [Recommended]** Obtain and install GMT by interacting with the [INSTALL FORM](#). Follow instructions there to obtain the Bourne shell install-script *and* a customized install parameter file. The automated install will also install netCDF if needed.
- Manual install** If you prefer, you can also do the typical manual install by ftp'ing the files, untar, run configure, make etc. Read the README file for the required steps. For manual install you must also manually get and install the [Unidata netCDF library](#), which GMT requires, or have the library already installed. Use ftp to any of the GMT [mirror sites](#).
- Subversion installation for GMT gurus:** To get the bleeding edge GMT version and even contribute to the development of GMT, consider installing the "live" GMT version by following the [Subversion Instructions](#).
- Package managers** Many Linux distros offer GMT, use your package manager to see if you can find it. Also, the [OpenCSW project](#) makes GMT packages available for Solaris 9 and 10 on the SPARC and AMD64 architectures. In general, packages may not be the most recent, hence self-install may still be required.



2. **WINDOWS:**

- DOS batch files rule** If you just want to install Windows executables and get on with it, visit our [GMT Windows](#) page for access to Windows Installers. Note that many of the DOS example scripts utilize GNU awk; the WIN32 executable [gawk](#), has therefore been placed on all ftp sites.
- DOS batch files suck, part I** Because you cannot get much done with DOS batch jobs, we strongly recommend that you install [Cygwin](#), a free UNIX emulation package for Windows. Cygwin lets you open shell windows and access standard UNIX tools such as `tcsh`, `gcc`, etc. You would then install GMT as described above for UNIX/Linux.
- DOS batch files suck, part II** If you run Windows, you can get access to `cmd` command windows by installing the freely available Windows [Services for UNIX](#), a UNIX environment for Windows. SFU lets you install GMT as described for UNIX/Linux above.
- DOS batch files suck, part III** Finally, you may consider the option of running Linux within a virtual machine, such as [VMWare](#) or [VirtualBox](#), and then pursue the general Linux/UNIX install option.
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- ⑤ 画面右側中央部にある、JAPAN を選択します。



THE GENERIC MAPPING TOOLS



GMT for Windows

We offer one required and one optional Windows Installers for those who do not wish to compile from source:

Required: Choose either the 32-bit or 64-bit GMT installer to install GMT version 4.5.9 with all executables (including supplement and the example batch scripts with test data [75 Mb]).

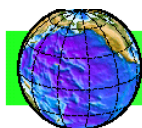
Required: Unless you have done so before, choose the complete GSHHG version 2.2.2 coastlines, rivers, and borders [45 Mb].

Optional: The PDF installer will install the complete documentation in PDF format [18 Mb].

Should you have additional needs for source code or tutorial data sets, etc., you may download the complete GMT distribution as suitable extractor (such as [7-zip](#)).

Click to change download site: [Hawaii](#) | [US East](#) | [US West](#) | [Norway](#) | [Austria](#) | [JAPAN](#) | [Australia](#) | [South America](#) | [South Africa](#)

- ⑥ 画面右側下部から、お使いの OS に対応するファイルおよび、gshhg-2.2.2_install.exe をダウンロードします。



THE GENERIC MAPPING TOOLS



GMT for Windows

We offer one required and one optional Windows Installers for those who do not wish to compile from source:

Required: Choose either the 32-bit or 64-bit GMT installer to install GMT version 4.5.9 with all executables (including supplements), the r and the example batch scripts with test data [75 Mb].

Required: Unless you have done so before, choose the complete GSHHG version 2.2.2 coastlines, rivers, and borders [45 Mb].

Optional: The PDF installer will install the complete documentation in PDF format [18 Mb].

Should you have additional needs for source code or tutorial data sets, etc., you may download the complete GMT distribution as a bzippe suitable extractor (such as [7-zip](#)).

Click to change download site: [Hawaii](#) | [US East](#) | [US West](#) | [Norway](#) | [Austria](#) | [JAPAN](#) | [Australia](#) | [South America](#) | [South Africa](#)

Direct download links for Windows Installers:

Selected ftp site: Tokai U, Shimizu, Japan

gmt-4.5.9_install32.exe	The 32-bit GMT distribution (programs, libraries, supplements, HTML docs, examples).
gmt-4.5.9_install64.exe	The 64-bit GMT distribution (programs, libraries, supplements, HTML docs, examples).
gmt-4.5.9_pdf_install.exe	The complete GMT PDF documentation.
gshhg-2.2.2_install.exe	The complete GSHHG coastlines, rivers, and borders data.

32bit 版 OS の場合…gmt-4.5.9_install32.exe + gshhg-2.2.2_install.exe

64bit 版 OS の場合…gmt-4.5.9_install64.exe + gshhg-2.2.2_install.exe

2-1-2 Ghostscript, GSview

GMT で描画された画像は ps(postscript)形式で保存されます。この ps 形式のファイルを表示するため、Ghostscript と GSview をダウンロードします。

- ① インターネットブラウザで、<http://pages.cs.wisc.edu/~ghost/gsview/index.htm> へアクセスします。
- ② 画面中央部にある、**GSview release v5.0** をクリックします。



GSview

GSview is a graphical interface for Ghostscript. Ghostscript is an interpreter for the PostScript. GSview requires Ghostscript. GSview is available for Windows, OS/2 and Linux.

GSview was written by [Russell Lang](#) at Ghostgum Software Pty Ltd. Ghostscript was originally written by Aladdin Enterprises and is now maintained by Artifex Software.

See [Obtaining GSview 5.0](#) and [Obtaining GPL Ghostscript](#).

GSview Software

- [GSview release v5.0](#) 2012-01-17, for [GPL Ghostscript 9.01](#) or later.
- [GSview release v4.9](#) 2007-11-18, for [GPL Ghostscript 8.64](#) or later.

Related Programs

- [RedMon](#) redirects a printer port to a program. Use as a virtual PostScript printer or a
- [gsprint](#) - A Ghostscript Win32 command line interface for printing to Windows printers,
- [epstool](#) - Add and remove EPS previews.
- [pstoedit](#) - convert to vector format from GSview
- [Ghostview](#) previewer for use under Unix/X11.

- ③ 画面上部から、お使いの OS に対応するファイルをダウンロードします。



GSview 5.0

Obtaining GSview

GSview 5.0 is available from

- [gsv50w32.exe](#) Win32 self extracting archive
- [gsv50w64.exe](#) Win64 (x86_64) self extracting archive
- [gsv50src.zip](#) Source archive

32bit 版 OS の場合…**gsv50w32.exe**

64bit 版 OS の場合…**gsv50w64.exe**

④ インターネットブラウザで、<http://pages.cs.wisc.edu/~ghost/gsview/index.htm> へアクセスします。

⑤ 画面中央部にある、**GPL Ghostscript 9.01** をクリックします。



GSview is a graphical interface for Ghostscript. Ghostscript is an interpreter for the PostScript. GSview requires Ghostscript. GSview is available for Windows, OS/2 and Linux.

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- [epstool](#) - Add and remove EPS previews.
- [pstoedit](#) - convert to vector format from GSview
- [Ghostview](#) previewer for use under Unix/X11.

⑥ 画面中央部から、お使いの OS に対応するファイルをダウンロードします。

For example, for personal use, use without redistribution, and use with no technical support the [GNU Affero Public License \(AGPL\)](#) download is your choice.

If you are unwilling/unable to abide by the terms of the [AGPL](#) (for instance, if you wish to redistribute these software packages or derivations thereof commercially), or if you wish to pay for technical support, you will need to acquire a [commercial license from Artifex](#).

If you are unsure of whether you can use the GPL release, or require a commercial license, you can contact: [Artifex Sales](#)

Platform \ License	GNU Affero General Public License	ARTIFEX® Software Inc. Artifex Commercial License
Ghostscript 9.07 for Windows (32 bit) ①	Ghostscript GPL Release	Ghostscript Commercial License
Ghostscript 9.07 for Windows (64 bit) ②	Ghostscript GPL Release	Ghostscript Commercial License
Ghostscript 9.07 for Linux x86 (32 bit)	Ghostscript GPL Release	Ghostscript Commercial License
Ghostscript 9.07 for Linux x86 (64 bit)	Ghostscript GPL Release	Ghostscript Commercial License
Ghostscript 9.07 Source for all platforms	Ghostscript GPL Release	Ghostscript Commercial License

come as installers or installable packages.

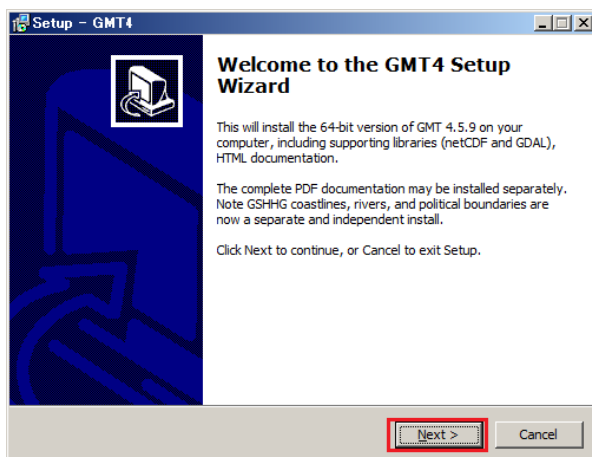
32bit 版 OS の場合…①の **Ghostscript GPL Release**

64bit 版 OS の場合…②の **Ghostscript GPL Release**

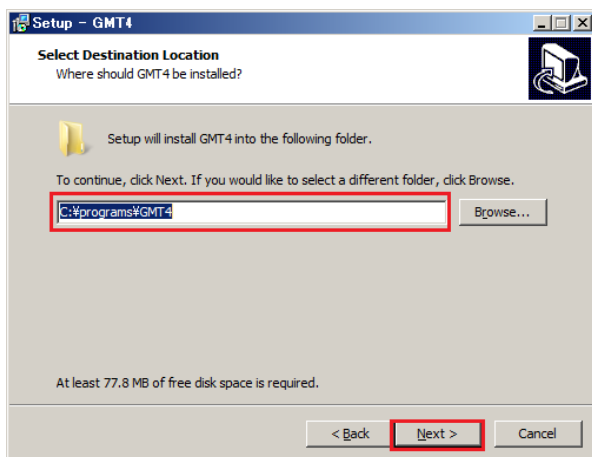
2-2 インストール

2-2-1 GMT

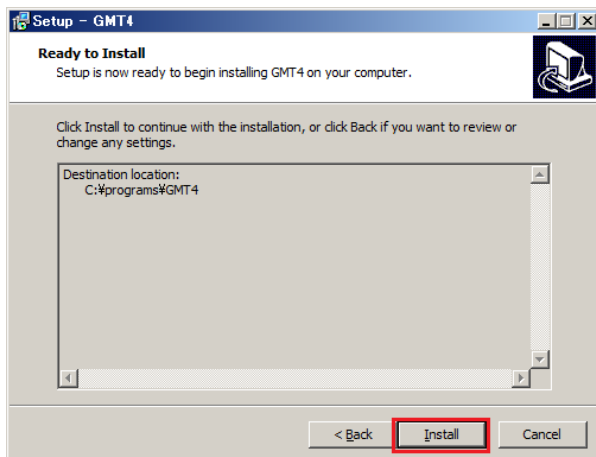
- ① ダウンロードした `gmt-4.5.9_install32.exe` または `gmt-4.5.9_install64.exe` をダブルクリックします。
- ② **Next** をクリックします。



- ③ To continue, click Next, If you would like to select a different folder, click Browse. にインストール先を指定し、**Next** をクリックします。

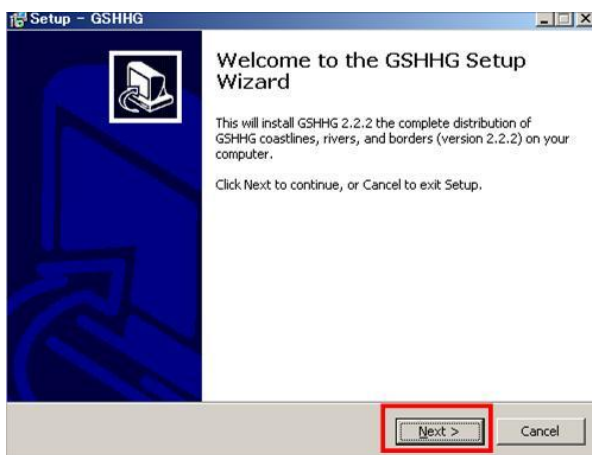


- ④ **Install** をクリックします。

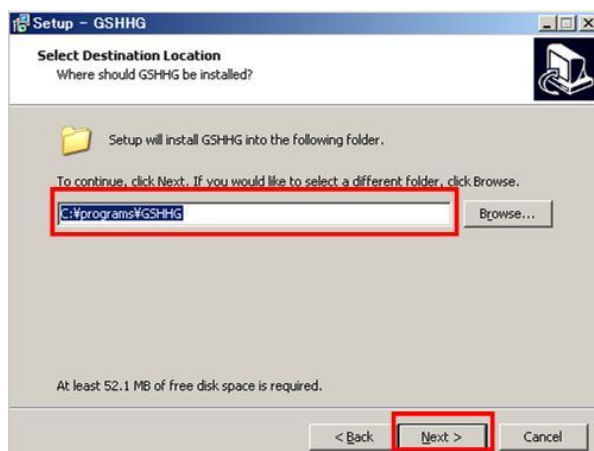


2-2-2 GShhg

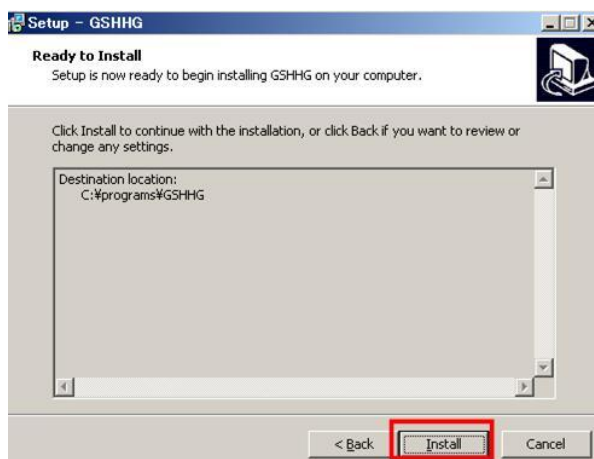
- ① ダウンロードした gshhg-2.2.2_install.exe をダブルクリックします。
- ② **Next** をクリックします。



- ③ To continue, click Next, If you would like to select a different folder, click Browse.
にインストール先を指定し、**Next** をクリックします。



- ④ **Install** をクリックします。

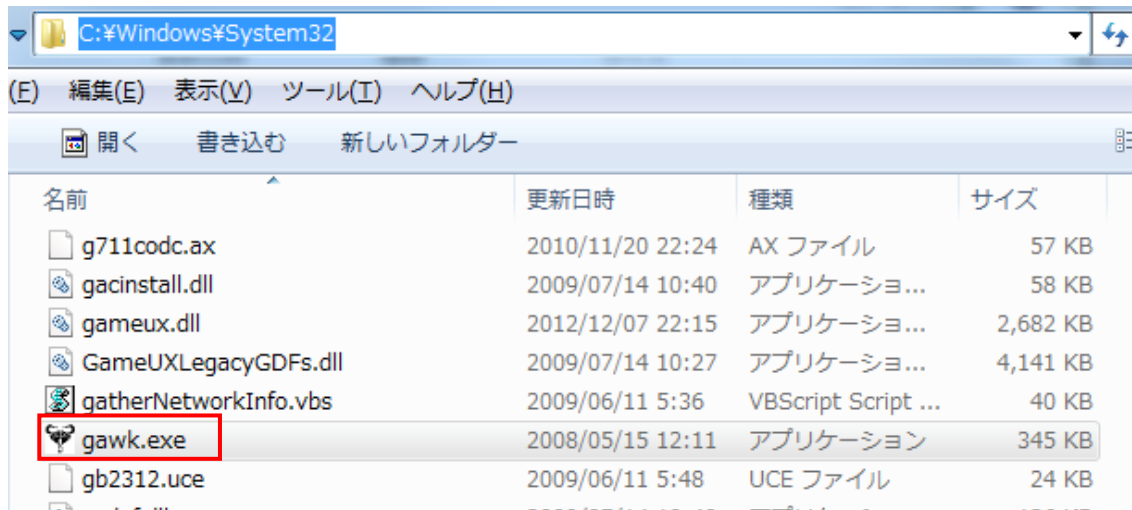


- ⑤ **Finish** をクリックします。



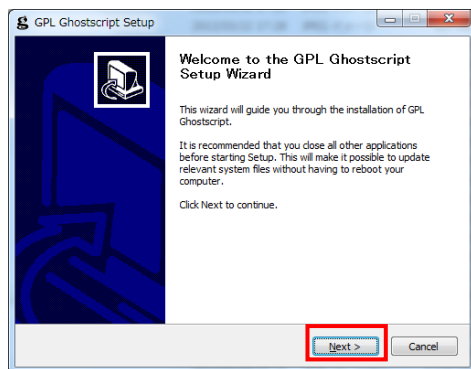
2-2-3 gawk

- ① ダウンロードした gawk.exe を、C:\¥Windows¥System32 にコピーします。

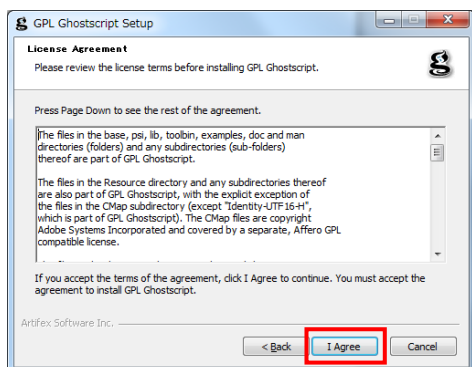


2-2-4 Ghostscript

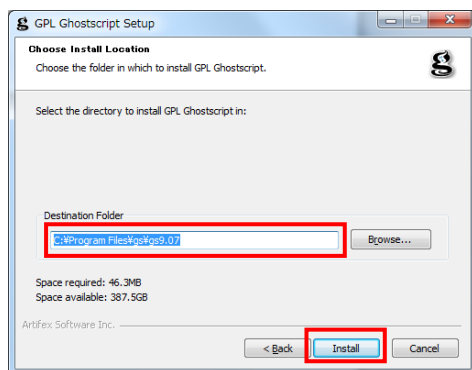
- ① ダウンロードした gs907w32.exe または gs907w64.exe をダブルクリックします。
- ② **Next** をクリックします。



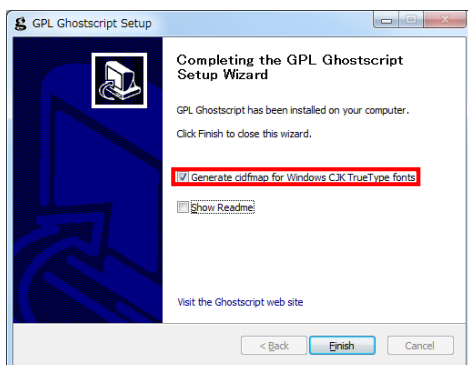
- ③ **I Agree** をクリックします。



- ④ **Destination Folder** にインストール先を指定し、**Install** をクリックします。

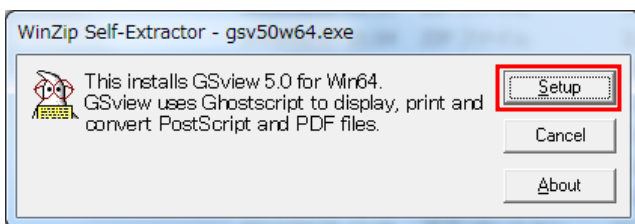


- ⑤ **Generate cidmap for Windows CJK TrueType fonts** にチェックを入れ、**Finish** をクリックします。

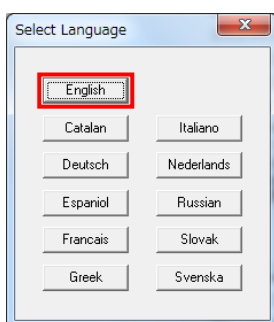


2-2-5 GSview

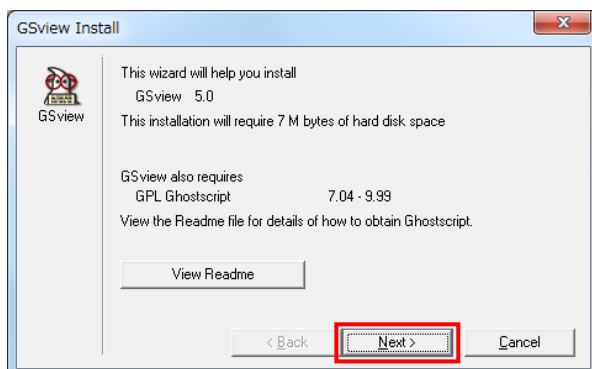
- ① ダウンロードした **gsv50w32.exe** または **gsv50w64.exe** をダブルクリックします。
- ② **Setup** をクリックします。



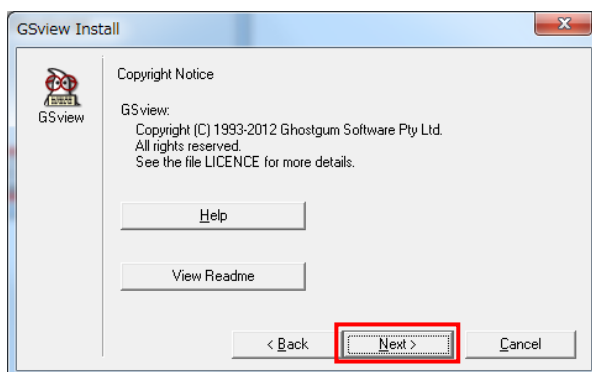
- ③ **English** をクリックします。



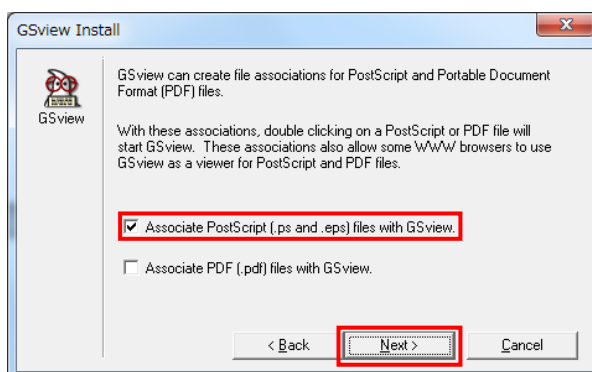
- ④ **Next** をクリックします。



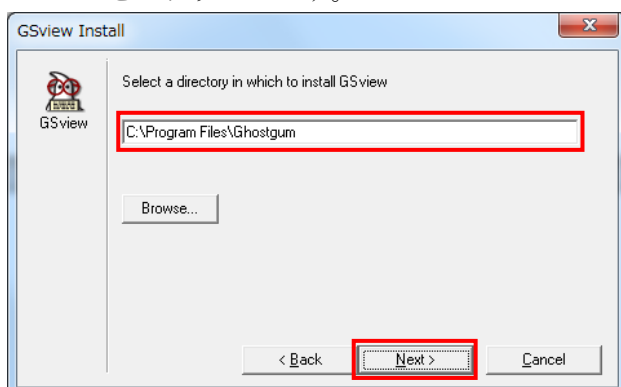
- ⑤ **Next** をクリックします。



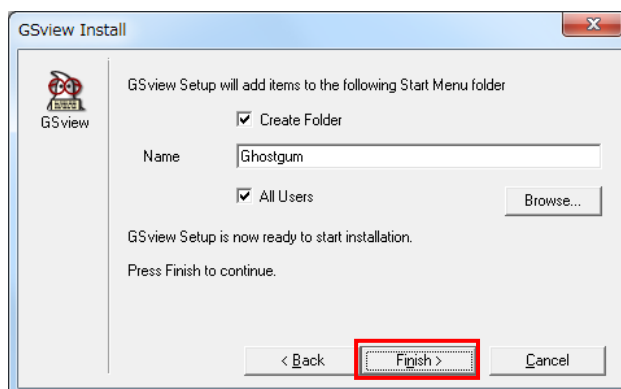
- ⑥ **Associate PostScript [.ps and .eps] files with GSview.** にチェックを入れ、**Next** をクリックします。



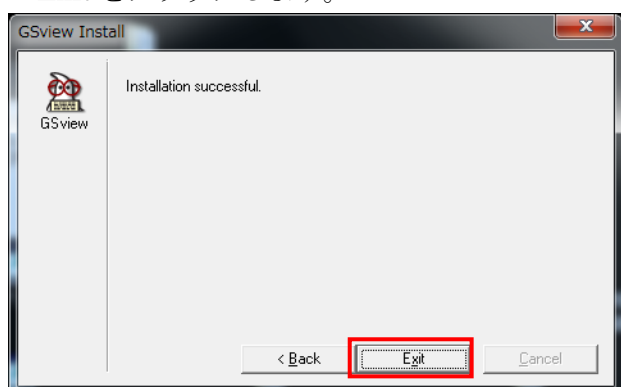
- ⑦ **Select a directory in which to install GSview** にインストール先を指定し、**Next** をクリックします。



- ⑧ **Finish** をクリックします。



- ⑧ インストールが開始し、完了すると下記の画面が表示されますので、**Exit** をクリックします。



3、操作方法

3-1 データの用意

GMT で使用するテキストデータは、以下のフォーマットとなります。

1)コンターデータ抽出データで抽出するフォーマットに準拠します。

項目番号	内容
1	観測開始日
2	観測開始時間
3	観測終了日
4	観測終了時間
5	団体名
6	地点名称
7	地点 ID
8	経度
9	緯度
10	全水深
11	観測深度
12	観測値

※データを自作する場合、**8 項目目、9 項目目、12 項目目のみ正常な値を入力**し、他項目はダミーデータ(0 等)で問題ありません。

2)1 行目は各項目の説明（データを自作する場合は空白でも可）

3)各項目の区切り文字はカンマ

4)各項目はダブルクォートで囲む

【水温のテキストデータ例】（項目を見やすくするため固定長に整形してあります。）

① 1～6項目

```

1 | 観測開始日 | 観測開始時間 | 観測終了日 | 観測終了時間 | 団体名 | 地点名称
2 | "2013/08/07" | "09:30" | "" | "" | "横浜港湾空港技術調査事務所" | "U1"
3 | "2013/08/07" | "09:30" | "" | "" | "横浜港湾空港技術調査事務所" | "U1"
4 | "2013/08/07" | "15:28" | "" | "" | "横浜港湾空港技術調査事務所" | "U2"
5 | "2013/08/07" | "15:28" | "" | "" | "横浜港湾空港技術調査事務所" | "U2"
6 | "2013/08/07" | "09:23" | "" | "" | "横浜港湾空港技術調査事務所" | "K1"

```

② 7～12項目

```

| 地点ID | 経度 | 緯度 | 全水深 | 観測深度 | 観測値 ↓
| "loc001" | "139.7763333333333" | "35.5045277777778" | "1.8" | "" | "27.552" ↓
| "loc001" | "139.7763333333333" | "35.5045277777778" | "1.8" | "" | "27.363" ↓
| "loc002" | "139.7416666666667" | "35.5039722222222" | "2.1" | "" | "29.069" ↓
| "loc002" | "139.7416666666667" | "35.5039722222222" | "2.1" | "" | "29.066" ↓
| "loc003" | "139.6808055555556" | "35.3983055555556" | "27.6" | "" | "27.155" ↓

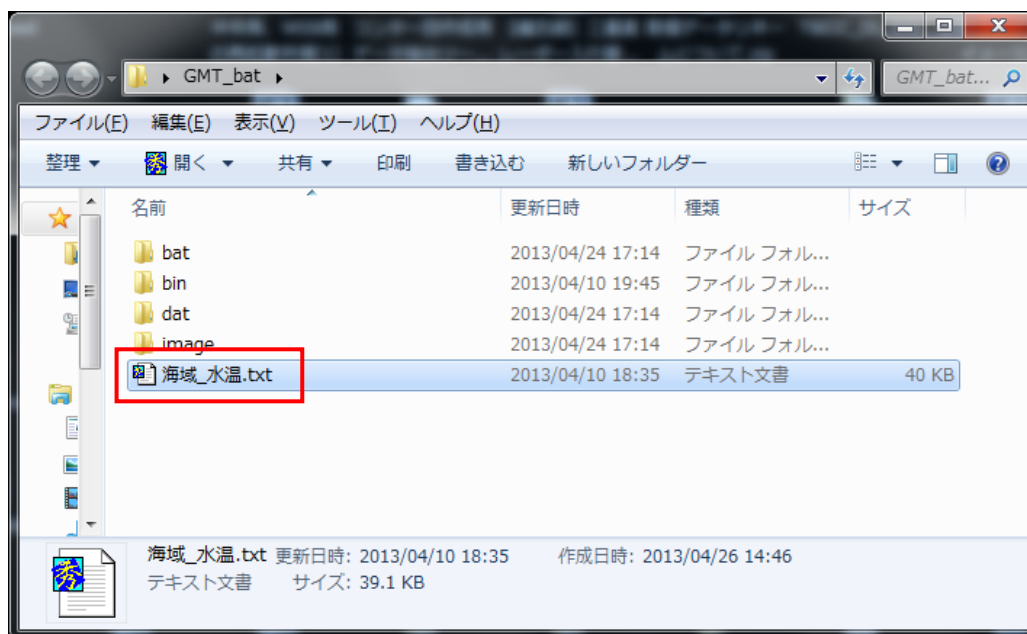
```

また、各項目の単位は下記となります。

エリア	値の種類	単位
陸域	水温	°C
	流量	m ³ /s
	COD	mg/l
海域	水温	°C
	塩分	-
	DO	mg/l
	透明度	m
	クロロフィル	μg/l

3-2 テキストデータの配置とファイル名の変更

- ① 用意したテキストデータファイルを、GMT バッチフォルダにコピーします。



- ② コピーしたテキストデータファイル名を、内容に従って下記に変更します。

エリア	値の種類	ファイル名
陸域	水温	tokyobay_landtmp.txt
	流量	tokyobay_landdis.txt
	COD	tokyobay_landcod.txt
海域	水温	tokyobay_seatmp.txt
	塩分	tokyobay_seasalt.txt
	DO	tokyobay_seado.txt
	透明度	tokyobay_seatp.txt
	クロロフィル	tokyobay_seachla.txt

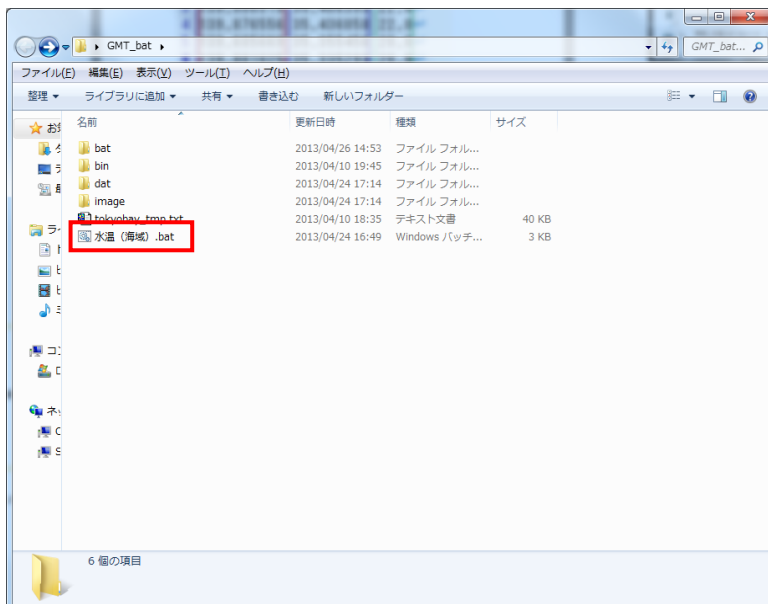
※陸域データと海域データの組み合わせで描画する場合、対応する**陸域データと海域データ両方**を GMT バッチフォルダに配置します。

例：陸域の流量と海域の塩分を描画する場合

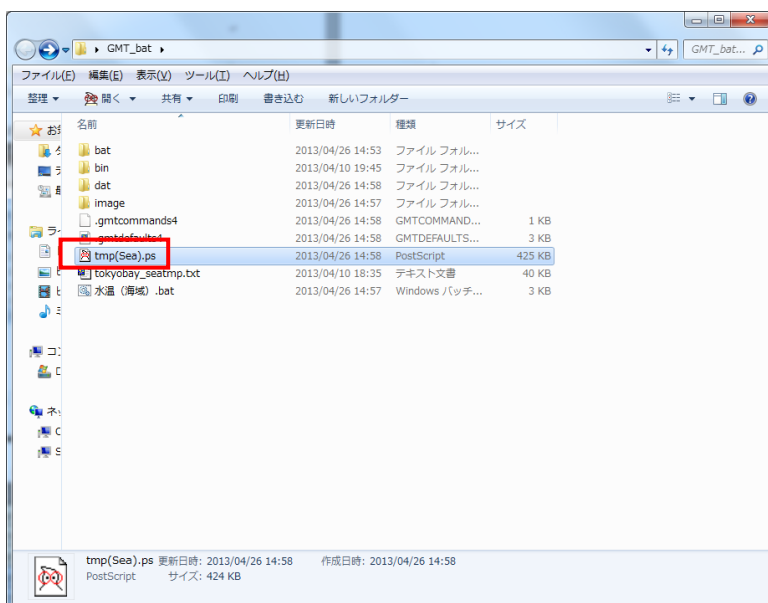
→tokyobay_landdis.txt と tokyobay_seasalt.txt を GMT バッチフォルダに配置

3-3 バッチのコピーと描画

- ① GMT バッチフォルダ内 bat フォルダから、3-2 で配置したテキストデータに対応したバッチファイルを、テキストデータと同じディレクトリにコピーします。



- ② コピーしたバッチファイルをダブルクリックします。
- ③ コマンドが流れた後、image フォルダ内に.ps ファイルが出力されます。



【描画された画像例】

