

“Hydrological Statistics Utility”

<http://www.jice.or.jp/tech/software/rivers/hydrology/programdl>

User's Manual

September, 2017

Development of the system and manual (in Japanese):

Japan Institute of country-ology and Engineering (JICE)

English translation:

*International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO,
Public Works Research Institute (PWRI)*

and

CTI Engineering Co., Ltd

JICE 一般財団法人
国土技術研究センター
Japan Institute of Country-ology and Engineering


United Nations
Educational, Scientific and
Cultural Organization


International Centre for
Water Hazard and Risk Management
under the auspices of UNESCO


Public Works Research Institute,
National Research and Development
Agency, Japan


CTI Engineering Co., Ltd.

“Hydrological Statistics Utility”

User’ s Manual

- 1. What is “Hydrological Statistics Utility”?**
- 2. Characteristics of “Hydrological Statistics Utility”**
- 3. How to use “Hydrological Statistics Utility”**

1. What is “Hydrological Statistics Utility”?

What is “Hydrological Statistics Utility”?

- “Hydrological Statistics Utility” is software for statistical analysis of hydrological data.
- In this analysis, hydrological data such as rainfall and discharge are statistically processed to obtain the probabilities of occurrence of hydrological events. This statistical analysis is essential for the development of a flood management plan, an important part of river management conducted by river administrators of national and local governments. For example, calculating the probability of occurrence of rainfall provides the most important data as the first step in the development of a flood management plan.
- This software was developed by the Japan Institute of Country-ology and Engineering (JICE).
- The software can be downloaded from the JICE homepage for free of charge. User registration is required before the use of this product.

2. Characteristics of “Hydrological Statistics Utility”

Characteristics of “Hydrological Statistics Utility”

1. Probability distribution models

16 types of probability distribution models

13 annual distributions & 3 non-annual distributions

2. Calculations

Different types of statistical values are calculated to help select proper probability distribution models.

e.g. outlier criteria

fitness functions (estimated values and errors by resampling,
standard least-squares criterion, etc.)

3. Probability papers (graphs)

4 types of probability paper can be used to show calculated results on a graph.

4. Print out of calculated results

Calculated results can be output onto Microsoft Excel sheets in a pre-set format.

3. How to use “Hydrological Statistics Utility”

❖ Steps for downloading Hydrological Statistics Utility:

Please access website below and download “Hydrological Statistics Utility”

<http://www.jice.or.jp/tech/software/rivers/hydrology/programdl>

Water Hydrology Statistics Utility ver1.5

調査報告・研究成果

- 基準・技術資料
- ソフトウェア
- JICELレポート
- 論文
- JICEの部屋 (コラム)

分野から探す

- 河川分野
- 道路分野
- 都市分野
- 技術関連分野

技術資料・ソフトウェア / ソフトウェア

河川計画シミュレータ
水文統計ユーティリティ

TOP PAGE | マニュアルDL | プログラムDL | FAQ | 問い合わせ先

水文統計ユーティリティの使用条件

本プログラムは、「フリーソフトウェア」として広く活用していただくことを目的としておりますが、著作権は国土技術研究センター（以下、「著作権者」）が保有しています。プログラムのダウンロードに際しては、以下の使用条件に同意したものとみなします。

水文統計ユーティリティ使用条件

(免責事項)

利用者は本プログラム、本プログラムを利用して得られた結果、および、関連ドキュメントの使用によって生じる、直接・間接を含む全ての結果に対して責任を負うものとし、著作権者はこれによって生じる一切の責任を負わないことに同意すること。

(再配布について)

Step 1: Scroll down and find terms and conditions of the use of Hydrological Statistics Utility

Terms and conditions of the use of Hydrological Statistics Utility

3. How to use “Hydrological Statistics Utility”

The screenshot shows a web browser window with the URL <https://www.jice.or.jp/tech/software/rivers/hydrology/programdl>. The page has a navigation bar with buttons for TOP PAGE, マニュアルDL, プログラムDL, FAQ, and 問い合わせ先. A sidebar on the left contains a menu for 分野から探す (Search by field) with options for 河川分野, 道路分野, 都市分野, and 技術関連分野. The main content area is titled 水文統計ユーティリティの使用条件 (Terms and conditions of the use of Hydrological Statistics Utility). The text explains that the program is free software and its use is subject to the following conditions:

- (免責事項)** 利用者は本プログラム、本プログラムを利用して得られた結果、および、関連ドキュメントの使用によって生じる、直接・間接を含む全ての結果に対して責任を負うものとし、著作権者はこれによって生じる一切の責任を負わないことに同意すること。
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- (商業利用について)** 本プログラム、および、本プログラムに改変を加えたものを製品として販売しないこと。
- (結果の公表について)** 本プログラムを利用して得られた結果について公表する際は、国土技術研究センターに報告の上、本プログラムを利用したことを明記すること。
- (改変について)** 本プログラムに対するリバースエンジニアリング、逆コンパイル、逆アセンブル、および、その他の改変は一切行わないこと。
- (サポートについて)** 国土技術研究センターは、利用者に対し、本プログラムに関する技術サポート、および、その他、何らのサポートも提供する義務を負わないことに同意すること。

At the bottom of the terms section, it states: 上記使用条件を満たす本プログラムの使用に際して、著作権者への許諾は不要です。結果の公表に際しての報告、バグ報告、ご意見については、メール(kasen-keikaku@jice.or.jp)で承ります。なお、技術的サポートなど各種サポートについては、原則的に行うことができませんので予めご了承ください。

Below the terms section is a section titled 水文統計ユーティリティのダウンロード (Download of Hydrological Statistics Utility).

Terms and conditions of the use of Hydrological Statistics Utility

Step 2: Please confirm these terms and conditions of the use of Hydrological Statistics Utility (see the English translation in next slide)

3. How to use “Hydrological Statistics Utility”

Terms and conditions of the use of Hydrological Statistics Utility (English Translation)

This Hydrological Statistics Utility (hereinafter the “Program”) is “Free Software” intended for wide public use. The copyright of the Program belongs to Japan Institute of Country-ology and Engineering (hereinafter the “Copyright Holder”). By downloading the Program, the user is deemed to agree to the following terms and conditions.

Terms and conditions of the use of Hydrological Statistics Utility:

[Disclaimers]

The user shall be responsible for the Program, the results obtained from the use of the Program, and all other direct or indirect results from the use of the documents relevant to the Program, and the Copyright Holder shall not bear any responsibility for the consequences from the action of the user associated with the use of the Program.

[Redistribution of the Program]

The user shall not redistribute the Program to any third party, including but not limited to the redistribution of the Program as a supplement to a publication or product, without a prior written consent of the Copyright Holder.

[Commercial use of the Program]

The user shall not sell the Program or a modified version of the Program.

[Disclosure of Results]

The user wishing to publicize the results obtained from the use of the Program shall inform the Copyright Holder to that effect and clearly state the use of the Program in the publication of the user.

[Modification of the Program]

The user shall not modify the Program in any way including but not limited to reverse engineering, reverse compiling, or reverse assembling.

[Support for the user]

The Copyright Holder is not liable to provide the user with any support including but not limited to technical support.

The user agreeing to this terms and conditions of the use of the Program may use the Program without requesting a permission of the use of the Program from the Copyright Holder.

Please email (kasen-keikaku@jice.or.jp) a notification of the publication of the results obtained from the use of the Program, reports on programming bugs, or other comments regarding the Program. Again, please note that any support including technical support will not be provided in principle.

3. How to use “Hydrological Statistics Utility”



Step 3: Scroll down and find the input field for your information



Input field (See next slide)

3. How to use “Hydrological Statistics Utility”

Step 4: Input your information

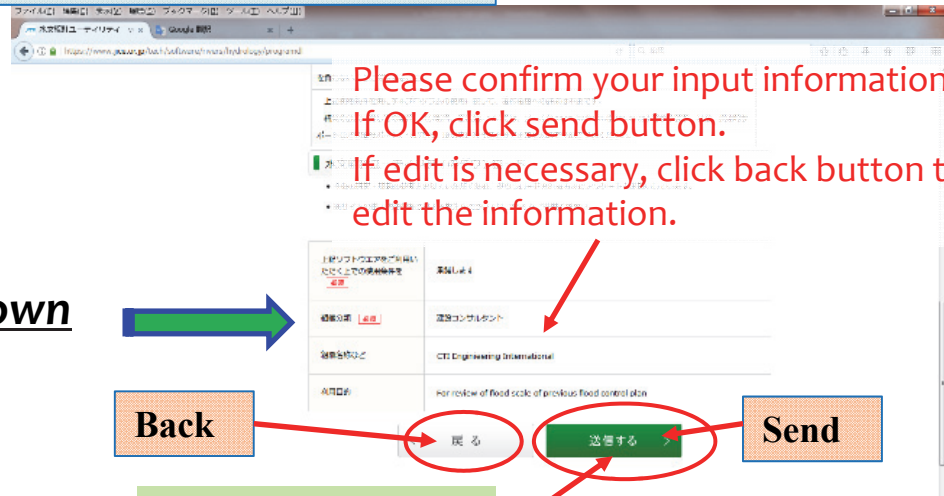
The screenshot shows a web browser window with the URL <https://www.jice.or.jp/tech/software/rivers/hydrology/programdl>. The form contains several fields and options:

- Terms and conditions of the use of Hydrological Statistics Utility (mandatory):** A checkbox labeled "承諾します" (I agree) is circled in red. A green box above it says "If you agree to the terms and conditions of the use of Hydrological Statistics Utility, please check here (mandatory)".
- Category of your organization (mandatory):** Radio buttons for "国" (National), "地方自治体" (Local government), "独立行政法人" (Independent administrative agency), "学校" (Educational/research institute), "研究機関" (Research institute), "建設コンサルタント" (Construction consultant), and "その他" (Others). A green box on the right says "Please select category of your organization".
- Name of your organization:** A text input field with a red dashed border. A green box above it says "Please input name of your organization".
- Purpose of use:** A text input field with a red dashed border. A green box above it says "Please describe your purposes of use of Hydrological Statistics Utility".
- Confirmation:** A green button labeled "確認画面へ" (To confirmation) is circled in red. A blue box below it says "Step 5: Click here to confirm the input information".

Other annotations include orange boxes pointing to "Accept", "Local government", "Independent administrative agency", "Educational/research institute", "Others", and "Construction consultant".

3. How to use “Hydrological Statistics Utility”

Step 6: Please confirm your information and click “Send” button



Please confirm your input information. If OK, click send button.

If edit is necessary, click back button to edit the information.

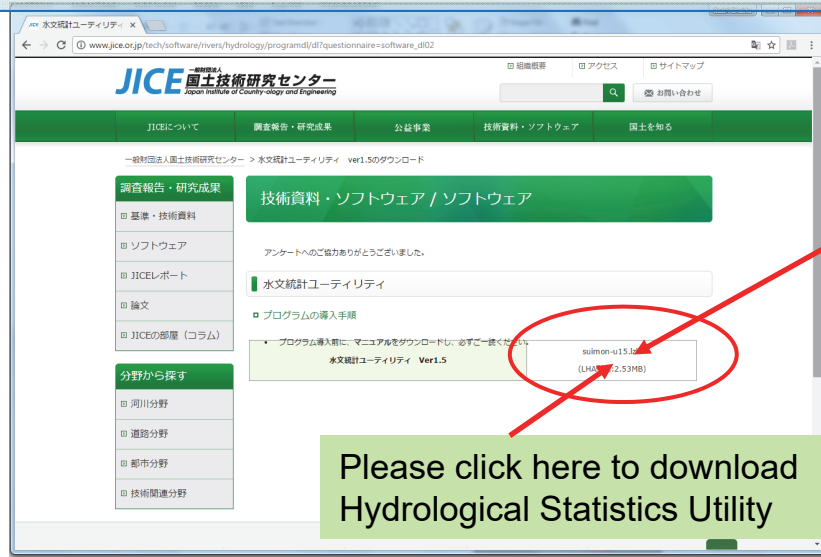
Back

Send

Please click here to send information

After sending the information, download page will appear

Step 7: Download Hydrological Statistics Utility



[suimon-u15.lzh](#)
(LHA形式:2.53MB)

Please click here to download Hydrological Statistics Utility

After download, please open the folder where suimon-u15.lzh is saved.

3. How to use “Hydrological Statistics Utility”

❖ Steps for installing Hydrological Statistics Utility:

Open Downloaded Folder

1. Click this and unzip the downloaded Hydrological Statistics Utility “suimon-u15.lzh”

2. Double click this to open unzip folder

3. Double click this to open software installation setup file

4. Double click this (Setup) to install the program

Version installation information

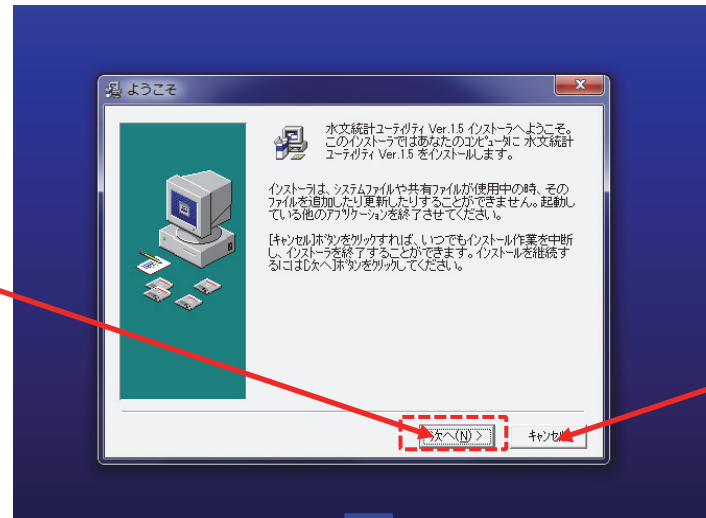
User Manual in Japanese

Name	Date modified	Type	Size
suimon-u15	06/12/2017 1:48 PM	File folder	
水文U単体版V.1.5			
Setup	12/03/2003 7:41 PM	Application	2,072 KB
V.1.5.1			
水文統計V.1.5	05/07/2004 4:04 PM	Text Document	1 KB
水文統計1-ライクティ-V1.5 操作マニュアル	12/19/2003 6:32 PM	PDF File	556 KB

3. How to use “Hydrological Statistics Utility”

Steps for installation of the program

Click here at “Next” button for installation process



Cancel Button

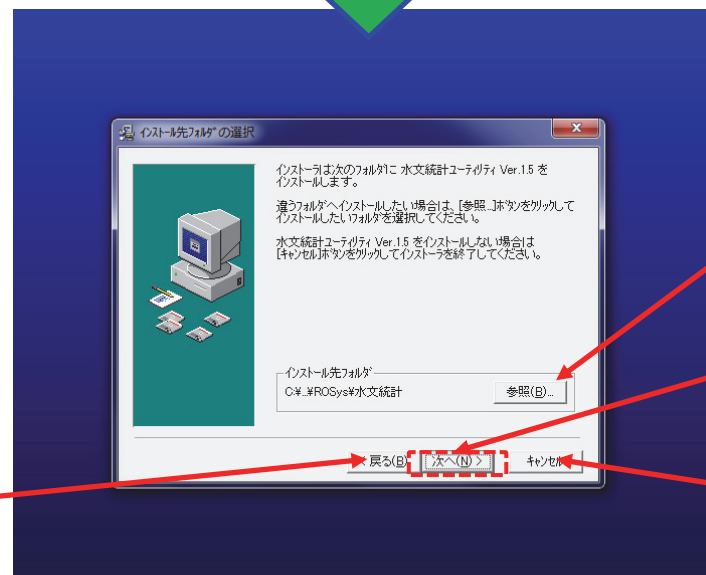


If you want to define folder location for the installation

Please click here to browse the folder

Click here at “Next” button for installation process

Back Button



Cancel Button

3. How to use “Hydrological Statistics Utility”

Steps for installation of the program

The image shows two sequential steps of the installation process for the Hydrological Statistics Utility. Each step is a dialog box with a 'Back Button', a 'Next Button', and a 'Cancel Button'. Red arrows point from text boxes to these buttons.

Step 1: Component Selection

Dialog Title: コンポーネントの選択 (Component Selection)

Text: インストールするコンポーネントを選択してください。 (Please select the components to install.)

Component List:

<input checked="" type="checkbox"/>	水文統計ユーティリティ用ランタイムセット	2334 k
-------------------------------------	----------------------	--------

Required free disk space: 2334 k
Remaining free disk space: 735534071 k

Buttons: <戻る(B) (Back), 次へ(N) > (Next), キャンセル (Cancel)

Callouts:

- Back Button (points to <戻る(B))
- Click here at “Next” button for installation process (points to 次へ(N) >)
- Cancel Button (points to キャンセル)

Step 2: File Copy

Dialog Title: ファイルのコピー (File Copy)

Text: 水文統計ユーティリティ Ver.1.5 のファイルのコピーを開始します。 [次へ] ボタンをクリックするとファイルのコピーを開始します。 [戻る] ボタンをクリックするとインストールの項目を再度設定し直すことができます。 (We will start copying files for Hydrological Statistics Utility Ver.1.5. Clicking the [Next] button starts file copying. Clicking the [Back] button allows you to reconfigure the installation items.)

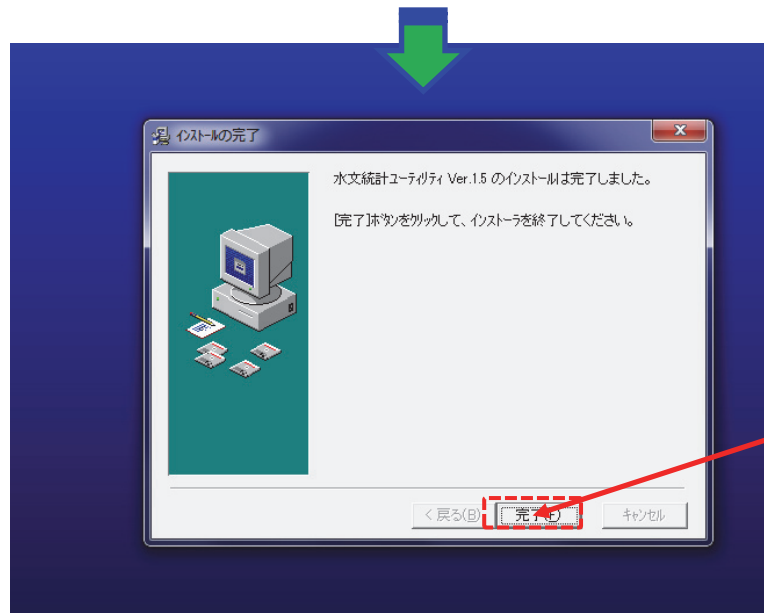
Buttons: <戻る(B) (Back), 次へ(N) > (Next), キャンセル (Cancel)

Callouts:

- Back Button (points to <戻る(B))
- Click here at “Next” button to install software (points to 次へ(N) >)
- Cancel Button (points to キャンセル)

3. How to use “Hydrological Statistics Utility”

Steps for installation of the program



**Click here at “Finish”
button for completion
of installation**

3. How to use “Hydrological Statistics Utility”

❖ Steps for Starting Hydrological Statistics Utility (水文統計ユーティリティ)

1. Click start up

2. Click All Program

3. Find “流出解析シミュレータ” (Outflow Analysis Simulator) program folder and click it

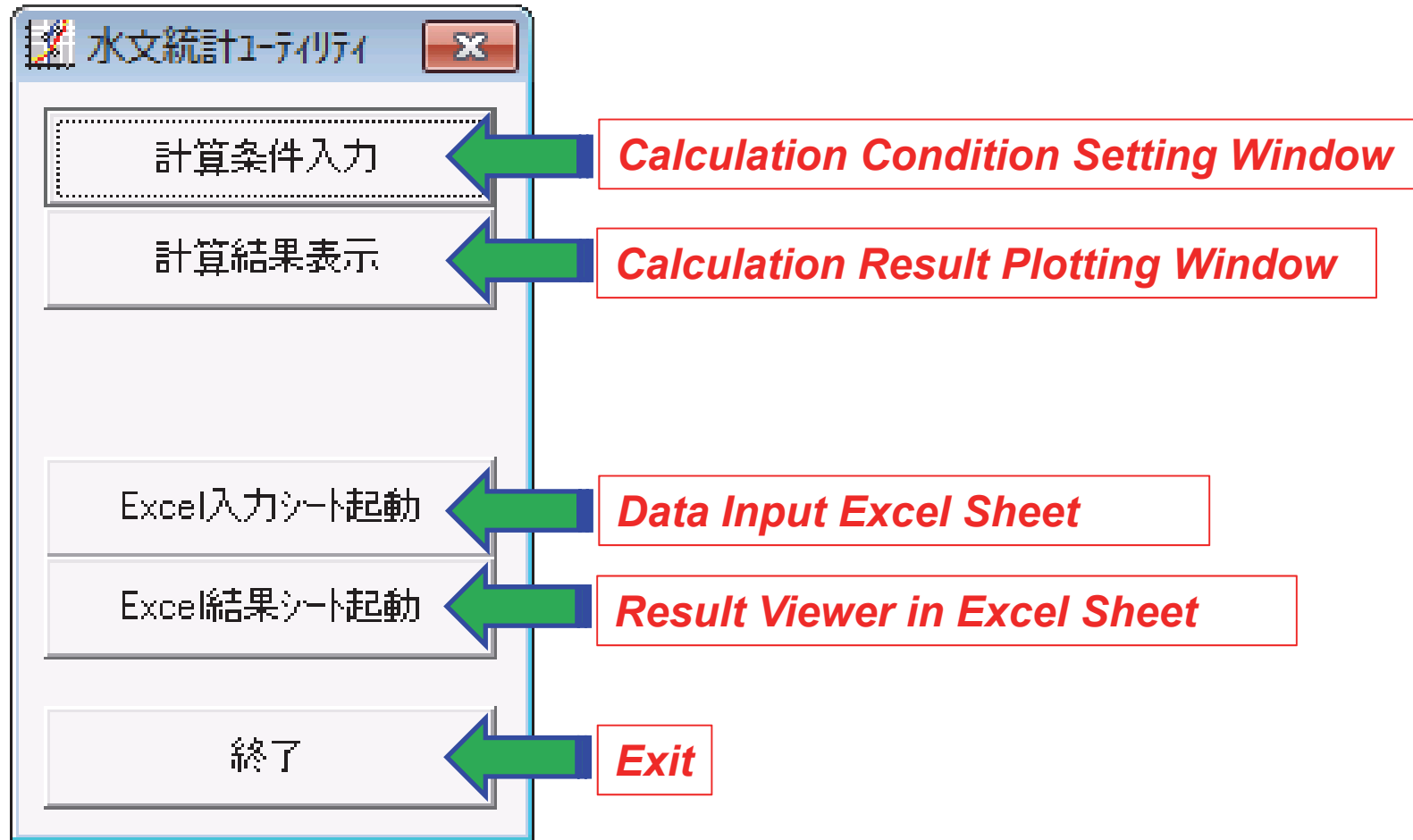
4. Click here at “水文統計ユーティリティ” (Hydrological Statistics Utility) to open the program

流出解析シミュレータ

水文統計ユーティリティ

3. How to use “Hydrological Statistics Utility”

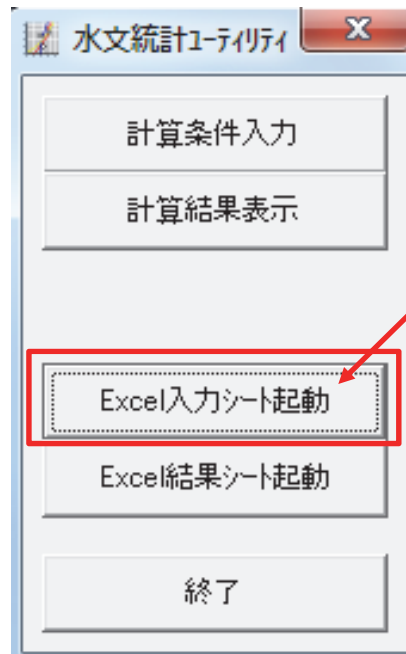
Explanation of Hydrological Statistics Utility Buttons



3. How to use “Hydrological Statistics Utility”

❖ Steps for statistical analysis using “Hydrological Statistics Utility”

1. Open Data Input Excel Sheet and Create Data File



(1) Click here
(Data Input
Excel Sheet)

After click, the excel
sheet will be opened
automatically.

In this sheet, input discharge (or precipitation) to be used in the hydrological statistics utility. Output file will be created in the format that can be used in the hydrological statistics utility program.

Name of basin

Name of river

Name of station

これは入力欄です。

ファイル出力する時は下図のように出力範囲をマウスで選択(反転表示)した状態で、[水文入力メニュー] [データファイル作成]をクリックしてください。

LN4PMK(4母数対数正規分布)の上限値、下限値を入力してください。上限値が-9999の場合は計算されません。

年	月	日	流量
1954	5	5	13730
1955	5	5	22590
1956	5	5	22880
1957	5	5	24820
1958	5	5	23750
1959	5	5	22820
1960	5	5	19180
1961	5	5	19370
1962	5	5	20960
1963	5	5	19150
1964	5	5	27540
1965	5	5	18220
1966	5	5	16850
1967	5	5	23450
1968	5	5	19630
1969	5	5	17440
1970	5	5	20150
1971	5	5	15180
1972	5	5	21080
1973	5	5	21660
1974	5	5	19150
1975	5	5	27540
1976	5	5	18220
1977	5	5	16850
1978	5	5	23450
1979	5	5	19630
1980	5	5	17440
1981	5	5	20150
1982	5	5	15180
1983	5	5	21080
1984	5	5	21660

(See next slide for detail)

3. How to use “Hydrological Statistics Utility”

◆ Calculate probabilistic discharge using “Hydrological Statistics Utility”

(2) Input Data in Excel Sheet

Year	Discharge (m ³ /s)	
	Thabeikkyin	
1983	22,120	
1984	21,700	
1985	21,660	
1986	20,200	
1987	21,700	
1988	24,990	
1989	23,540	
1990	21,700	
1991	24,130	
1992	17,260	
1993	23,530	
1994	13,730	
1995	22,590	
1996	22,880	
1997	24,820	
1998	23,750	
1999	22,820	
2000	19,180	
2001	19,770	
2002	20,960	
2003	19,150	
2004	27,540	
2005	18,220	
2006	16,650	
2007	23,450	
2008	19,630	
2009	17,440	
2010	20,150	
2011	15,180	
2012	21,080	
2013	21,660	

Data in years must correspond to observed actual years, while month and day does not affect the results.

Input name of basin, river, and station

Name of basin: Aveyarwady

Name of river: Aveyarwady

Name of station: Thabeikkyin

Unnecessary to change: -9999

Input annual maximum data (discharge)

年月日	流量
1983/5/5	22120
1984/5/5	21700
1985/5/5	21660
1986/5/5	20200
1987/5/5	21700
1988/5/5	24990
1989/5/5	23540
1990/5/5	21700
1991/5/5	24130
1992/5/5	17260
1993/5/5	23530
1994/5/5	13730
1995/5/5	22590
1996/5/5	22880
1997/5/5	24820
1998/5/5	23750
1999/5/5	22820
2000/5/5	19180
2001/5/5	19770

3. How to use “Hydrological Statistics Utility”

◆ Calculate probabilistic discharge using “Hydrological Statistics Utility”

(3) Create Output Data to be used in the Program

Hydrometric Input Menu

Data File Creation

Click here to create data file

(i) Select all cells of input data as shown in the right

(ii) Select Add-in

(iii) Create a data file

(iv) Save file (with filename such as “ThabeikkyinQ”)

これは入力欄です。
ファイル出力する時は下図のように出力範囲をマウスで選択(反転表示)した状態で、「水文入力メニュー」データファイル作成をクリックしてください。
LN4PM(4母数対数正規分布)の上限値、下限値を入力してください。上限値が-9999の場合は計算されません。

年	月	日	流量
1983	5	5	22120
1984	5	5	21700
1985	5	5	21660
1986	5	5	20200
1987	5	5	21700
1988	5	5	24990
1989	5	5	23540
1990	5	5	21700
1991	5	5	24130
1992	5	5	17260
1993	5	5	23530
1994	5	5	13730
1995	5	5	22590
1996	5	5	22880
1997	5	5	24820
1998	5	5	23750
1999	5	5	22820
2000	5	5	19180
2001	5	5	19770
2002	5	5	20960
2003	5	5	19150
2004	5	5	27540
2005	5	5	18220
2006	5	5	16650
2007	5	5	23450
2008	5	5	19630
2009	5	5	17440
2010	5	5	20150
2011	5	5	15180
2012	5	5	21080
2013	5	5	21660

3. How to use “Hydrological Statistics Utility”

2. Calculation Condition Setting

(1) Click here (Calculation Condition Setting Window)

Annual (If data are annual)

Non-annual (If data are non-annual)

Select all

Select none

Rainfall

Discharge

Calculation File Setting

Start Calculation

Close

(See next slide for detail)

3. How to use “Hydrological Statistics Utility”

(2) Setting Calculation Conditions

Unnecessary to change

Probability distribution method to be calculated. Normally, all boxes should be checked.

When calculating 1000-year flood, 1000 should be entered here.

Unchecked

Select in the case of precipitation

Select in the case of discharge

- Exp : Exponential distribution
- Gumbel : Gumbel distribution
- SQRTE : Square-root exponential type maximum distribution
- GEV : Generalized extreme value distribution
- LP3Rs : Log-Pearson Type III Distribution (Real coordinate space)
- LogP3 : Log-Pearson Type III Distribution (Log coordinate space)
- Iwai : Iwai method
- IshiTaka : Ishihara Takase method
- LN3Q~ LN4PM : Log-normal distribution

3. How to use “Hydrological Statistics Utility”

(3) Select Calculation Data Files and Start Calculation

The image shows two windows from the 'Hydrological Statistics Utility' software. The left window is titled '計算条件設定' (Calculation Condition Setting) and the right window is '計算ファイル名設定' (Calculation File Name Setting).

Calculation Condition Setting Window:

- 計算条件 (Calculation Conditions):** Includes parameters like 相関係数 (Correlation coefficient), SLSO, 対数尤度 (Log-likelihood), pAIC, and α (set to 0.4). It also has checkboxes for Jack Knife法 and BootStrap法.
- ブートストラップ (Bootstrap):** Includes ブートストラップ標準数 (Bootstrap standard number) set to 2000 and Jack Knife, BootStrap 確率年 (Probability year) set to 0.
- 非毎年 (Not Annual):** Includes checkboxes for LExp, GP, and GPExp, and buttons for 'すべて設定' (Set all) and 'すべて解除' (Reset all).
- Buttons:** '計算ファイル設定' (Set calculation file), '計算開始' (Start calculation), and 'クローズ' (Close).

Calculation File Name Setting Window:

- Directories:** '条件読込ディレクトリ' (Condition loading directory) and '結果保存ディレクトリ' (Result saving directory) are both set to 'C:\Program Files (x86)\ROSys\水文統計\'. Red arrows point to these fields with labels: 'Directory to load condition data' and 'Directory to save results'.
- Table:** A table with columns 'データファイル名' (Data file name) and '結果ファイル名' (Result file name).

データファイル名	結果ファイル名
1 testdata.dat	testdata.ans
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
- Buttons:** 'クリア' (Clear), '設定' (Set), and 'キャンセル' (Cancel).

Annotations and Steps:

- ① Click here to select data file (points to '計算ファイル設定' button).
- ② Select the previously created data file (ThabeikkyinQ). (points to 'testdata.dat' in the table).
- ③ filename of the result (points to 'testdata.ans' in the table).
- ④ OK (points to '設定' button).
- ⑤ Click here to start calculation (points to '計算開始' button).
- ⑥ Close (points to 'クローズ' button).

3. How to use "Hydrological Statistics Utility"

3. Calculation Results Plotting

(1) Click here (Calculation Result Plotting Window)

Calculation Results Plotting Window

結果ファイル名: 水系名-河川名-地点名 A水系 - B河川 - C地点

表示項目: 確率水文学量 Jackknife推定値

確率分布モデル:

- Exp
- Gumbel
- SQRTET
- GEV
- LP3Rs
- LogP3
- Iwai
- IshiTaka
- LN3Q
- LN3PM
- LN2LM
- LN2PM
- LN4PM
- LExp
- Gp
- GPExp

グラフタイプ:

- 対数正規確率紙
- 正規確率紙
- グンベル確率紙
- 指数確率紙

操作ボタン:

- すべて設定
- すべて解除
- 再描画
- ヒストグラム表示
- 数値画面表示
- 印刷
- コース

Graph Types

Lognormal Probability Paper

Normal Probability Paper

Gumbel Probability Paper

Exponential Probability Paper

Select all

Select none

Redraw

View Histogram

View Index

Print

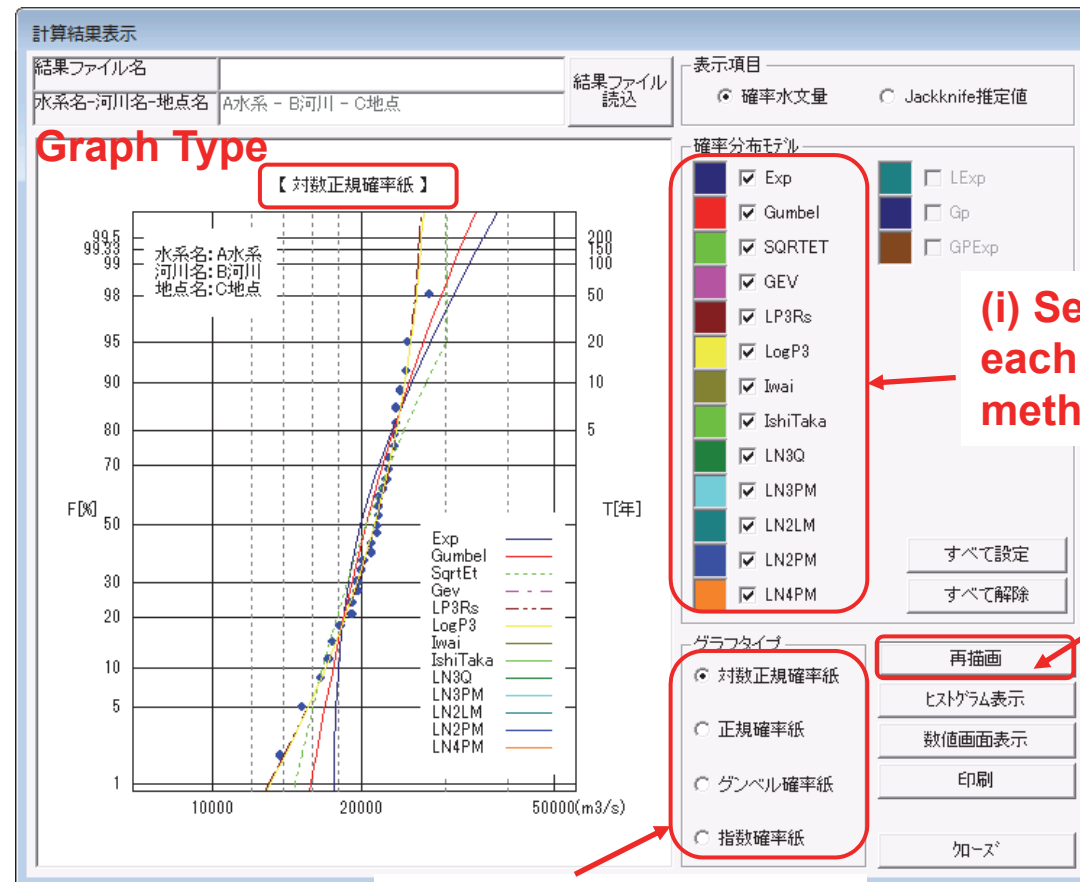
Close

(See next slides for detail)

3. How to use “Hydrological Statistics Utility”

(2) Plotting Graphs

Select from calculated stochastic distributions (graph type) to be plotted, then click at redraw button.



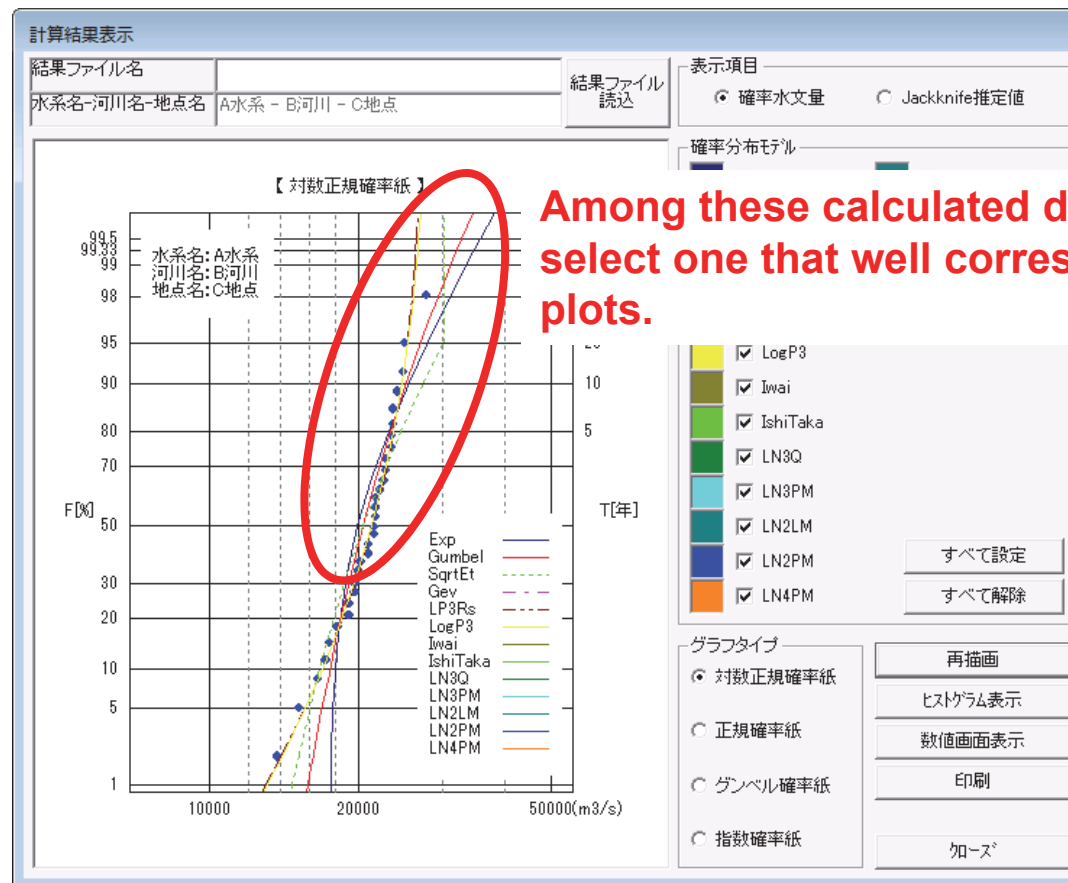
(i) Select to show each calculated methods

(iii) Click here (redraw) to plot the graphs

(ii) Select Graph Type

3. How to use “Hydrological Statistics Utility”

(3) Check the Graph



Among these calculated distributions, select one that well corresponds to the plots.

3. How to use “Hydrological Statistics Utility”

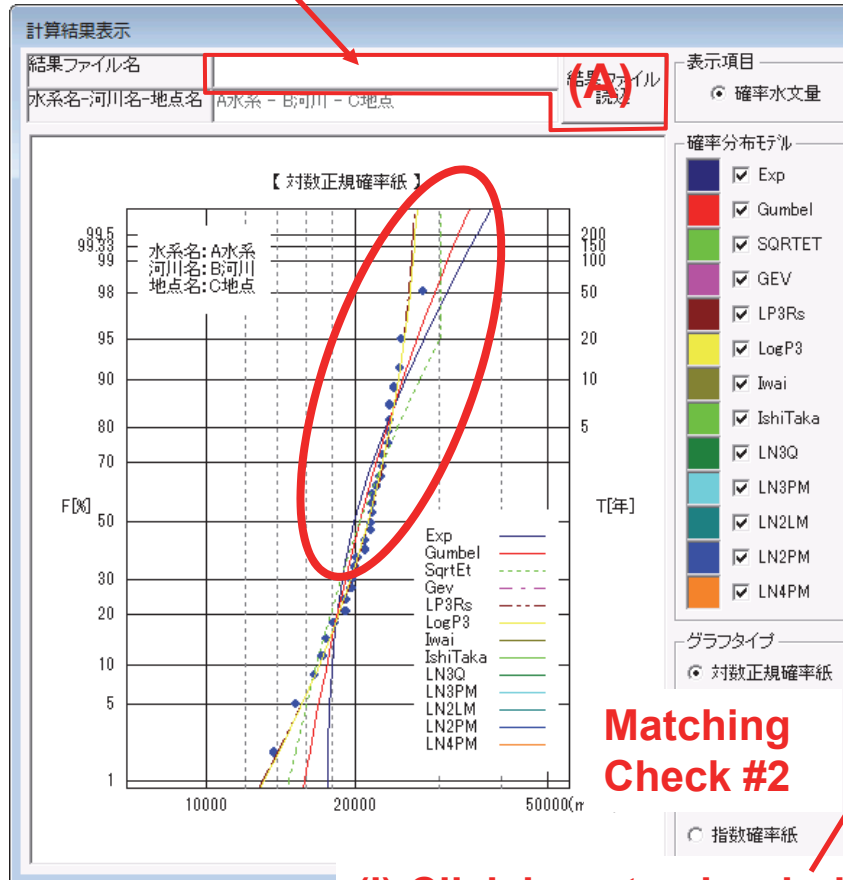
(3) Check the Graph (Contd.)

The image shows two windows from the 'Hydrological Statistics Utility' software. The left window, titled '計算結果表示' (Calculation Results Display), shows a probability plot for '対数正規確率紙' (Log-normal probability paper). The plot displays observed data points (blue dots) and several theoretical distribution curves (Exp, Gumbel, SQRTET, GEV, LP3Rs, LogP3, Iwai, IshiTaka, LN3Q, LN3PM, LN2LM, LN2PM, LN4PM). A red oval highlights the data points and the fitted curves, with the text 'Matching Check #1' below it. The right window, titled 'ヒストグラム' (Histogram), shows a histogram of the data with a blue arrow pointing to the distribution. A red text box says '(ii) Check if the distribution matches!'. Below the histogram, there are controls for '毎年' (Annual) and '非毎年' (Non-annual) data, and a 'ヒストグラム表示' (Histogram Display) button. A red arrow points to this button with the text '(i) Click here to view histogram'. The histogram shows a distribution of values between 14,000 and 30,000 mm, with a peak around 20,000 mm.

3. How to use "Hydrological Statistics Utility"

(3) Check the Graph (Contd.)

When a file is read, the file name is shown here.



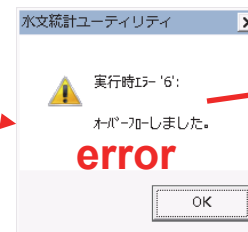
(i) Click here to view index

Matching Check #2

SLSC (standard least-square criterion)

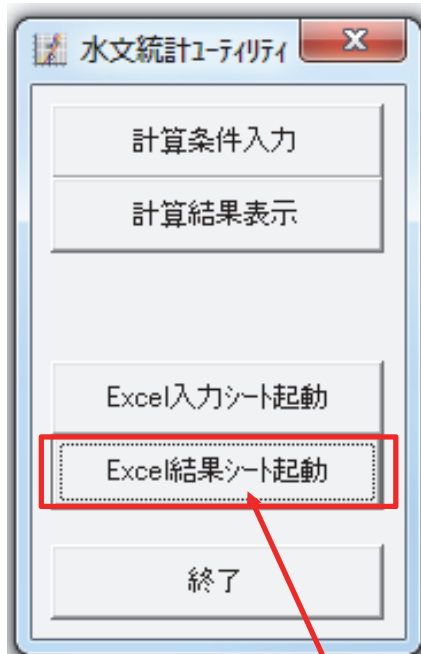
SLSC: fit index-> smaller value means better matching of the stochastic distribution and the plots.

If this is shown, reload the result file by clicking (A).



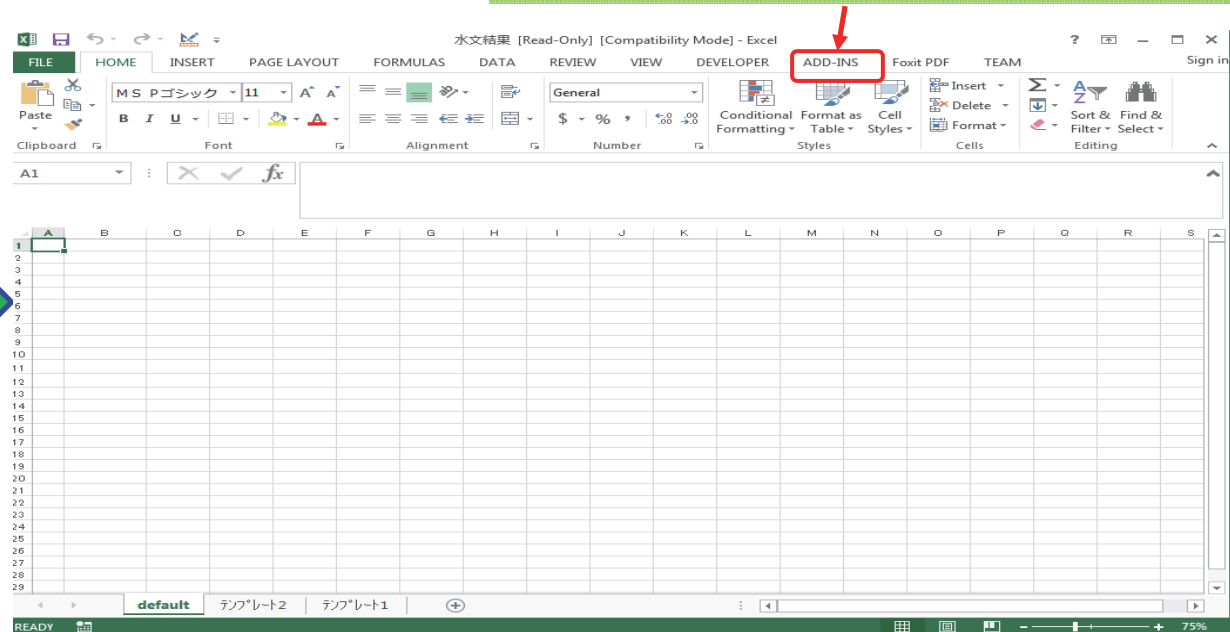
3. How to use “Hydrological Statistics Utility”

4. View Results in Excel Sheet



(1) Click here (Result Viewer in Excel Sheet)

(2) Click here (at ADD-INS) for selecting the calculation result file in excel



3. How to use “Hydrological Statistics Utility”

(3) Create new sheet

Sheet Creation

Output File (Reading Type 1)

Output File (Reading Type 2)

(4) Select reading types and open the output file

- To read the result file, there are two types of reading depending on the format to be displayed on the sheet.
- Select the output file reading type and open the output file.
- The results will be loaded in the displayed sheet.

Display the results

水名	川名	流域	流域面積	平均流量	最大流量	最小流量	平均流量	最大流量	最小流量	平均流量	最大流量	最小流量	平均流量	最大流量	最小流量
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
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16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
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20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
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26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29