“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

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”

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.

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[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.

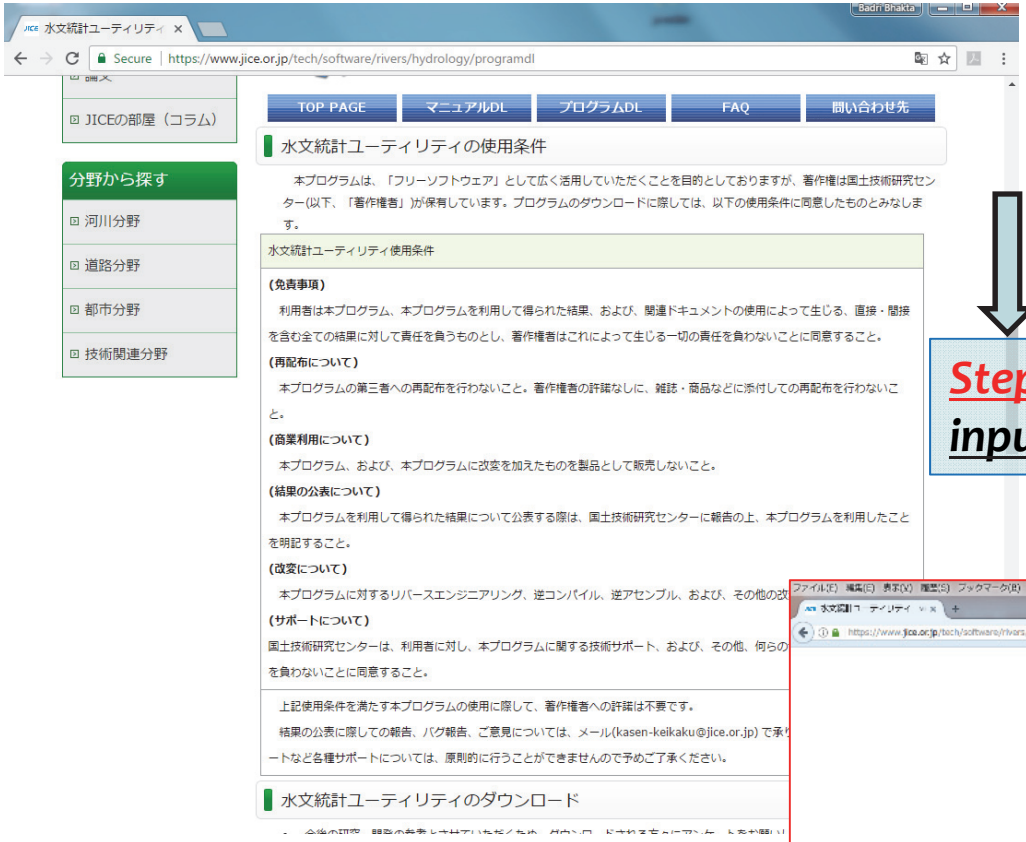
[Modification of the Program]
The user shall not modify the Program in any way including but not limited to reverse engineering, reverse compiling, or reverse assembling.

[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”

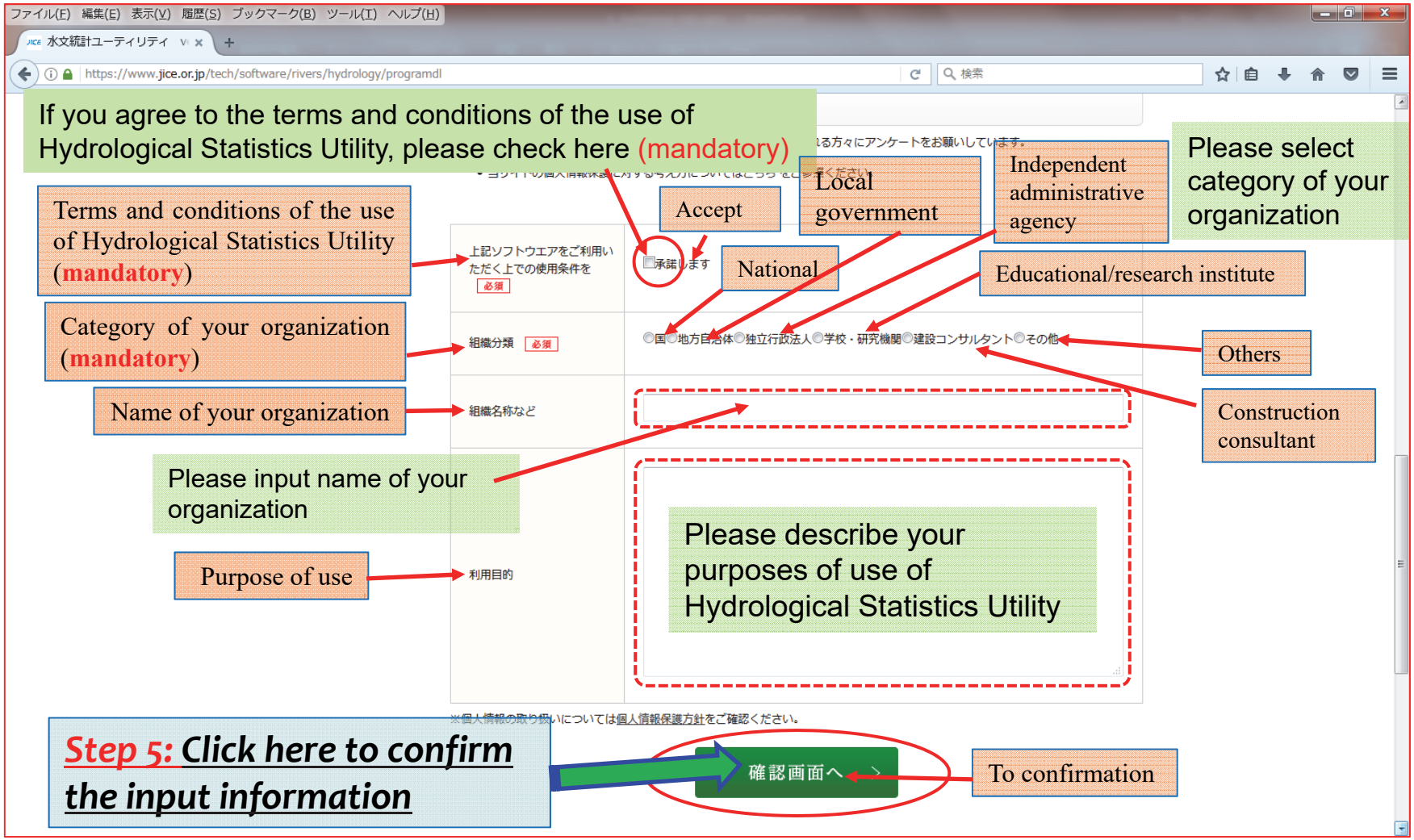


Step 3: Scroll down and find the input field for your information

Input field (See next slide)

3. How to use “Hydrological Statistics Utility”

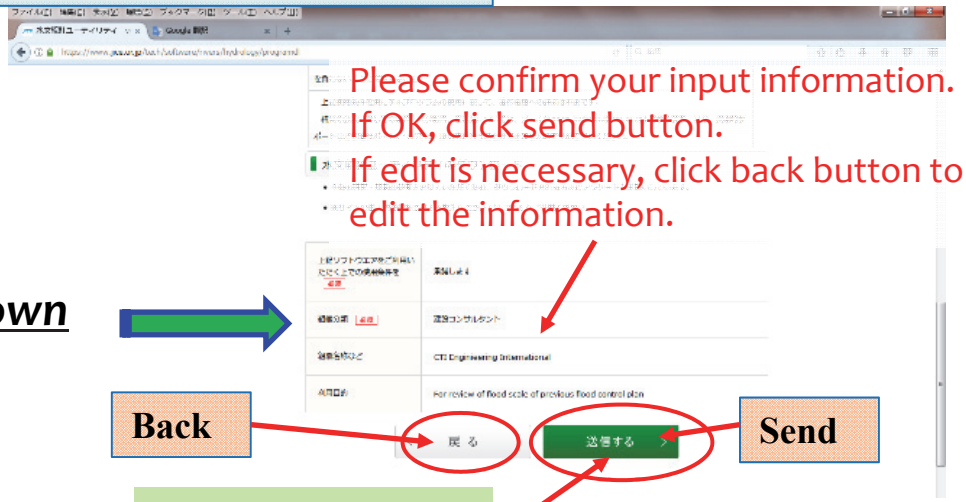
Step 4: Input your information



3. How to use “Hydrological Statistics Utility”

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

Scroll down



Please confirm your input information.
If OK, click send button.
If edit is necessary, click back button to edit the information.

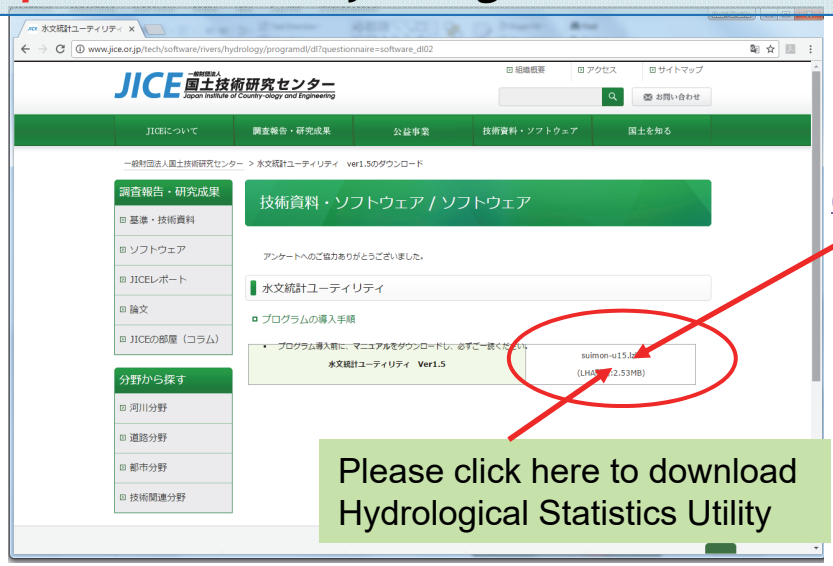
Back

Send

Please click here to send information

After sending the information, download page will appear

Step 7: Download Hydrological Statistics Utility



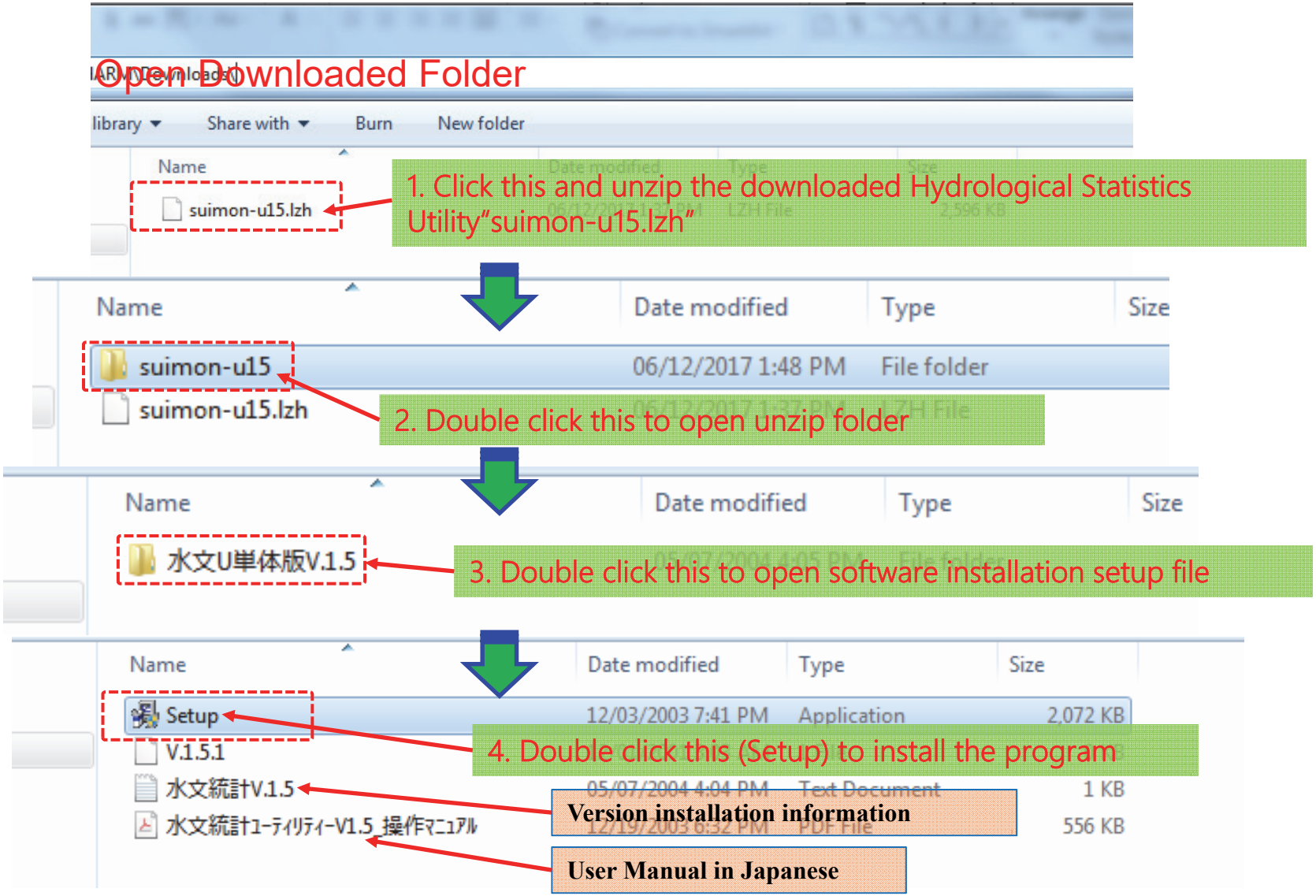
suimon-u15.lzh
(LHA形式:2.53MB)

Please click here to download Hydrological Statistics Utility

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

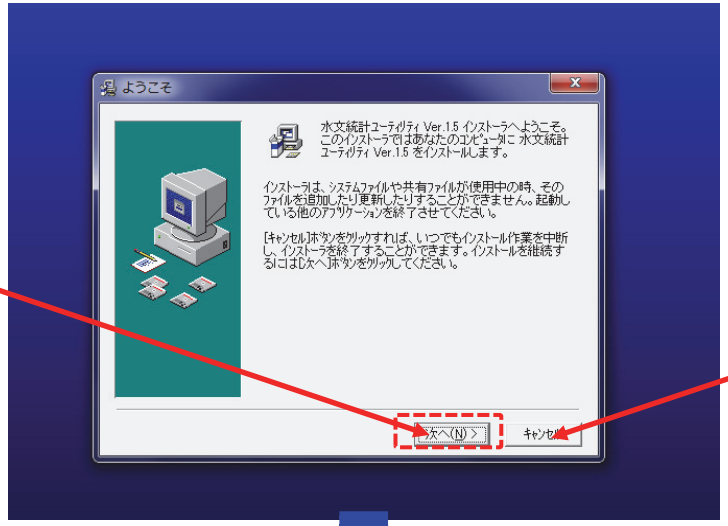
3. How to use “Hydrological Statistics Utility”

❖ ***Steps for installing Hydrological Statistics Utility:***



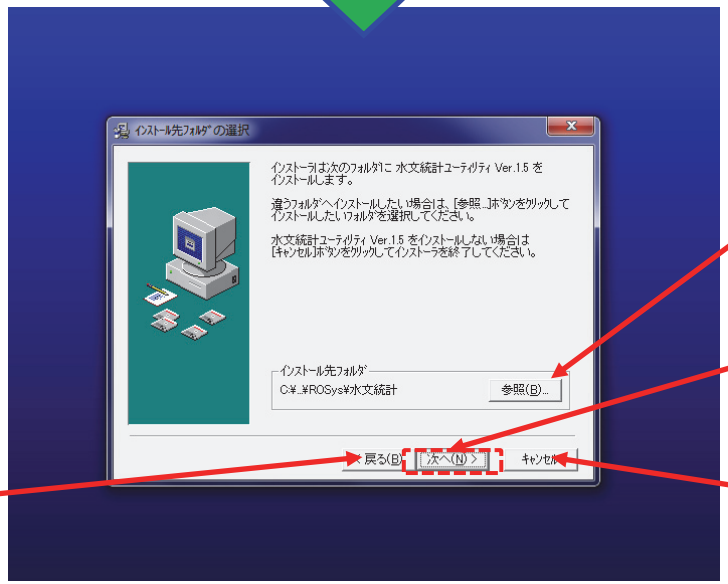
3. How to use “Hydrological Statistics Utility”

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

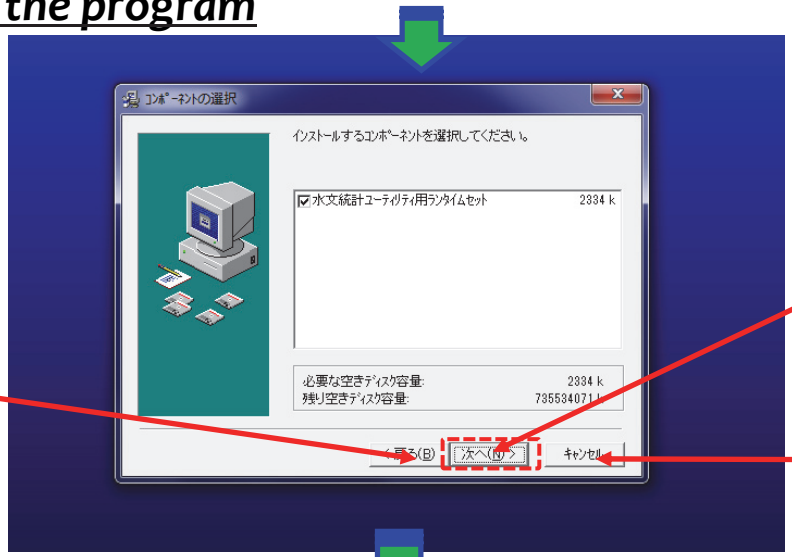
Click here at “Next” button for installation process

Back Button

Cancel Button

3. How to use “Hydrological Statistics Utility”

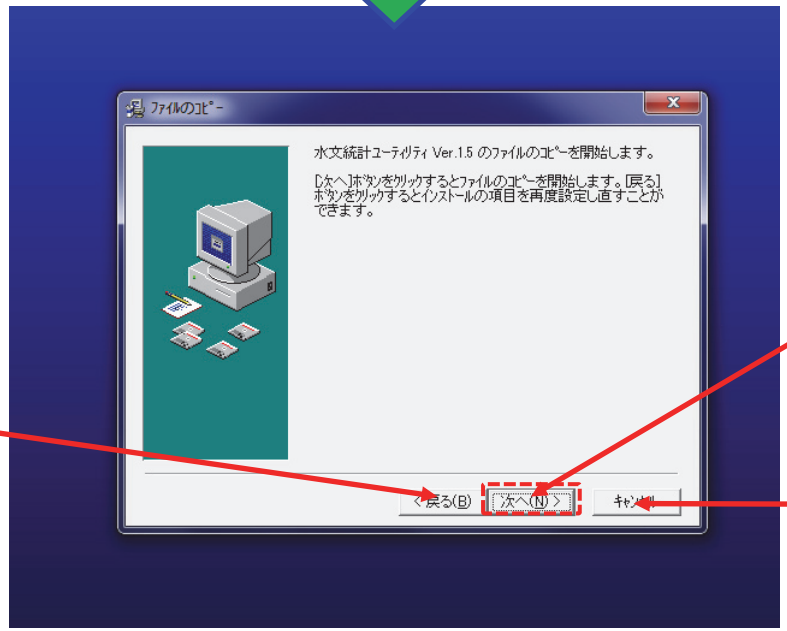
Steps for installation of the program



Click here at “Next” button for installation process

Back Button

Cancel Button



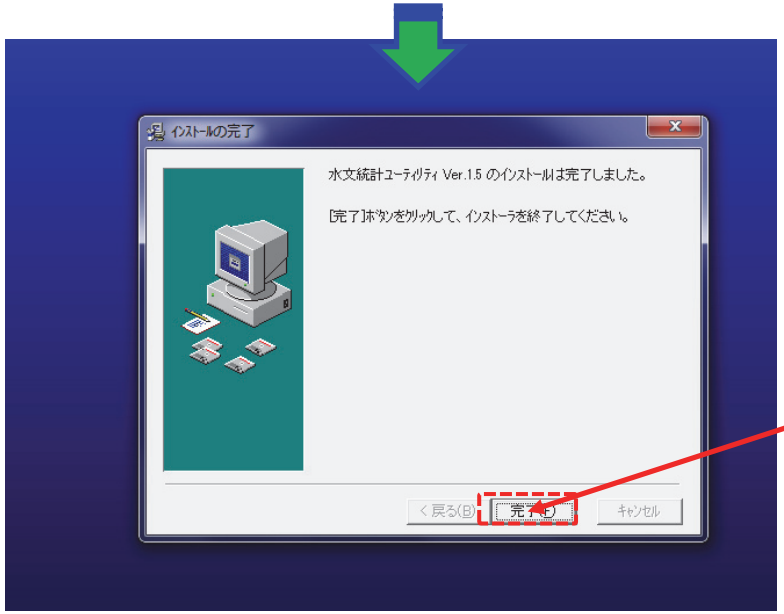
Click here at “Next” button to install software

Back Button

Cancel Button

3. How to use “Hydrological Statistics Utility”

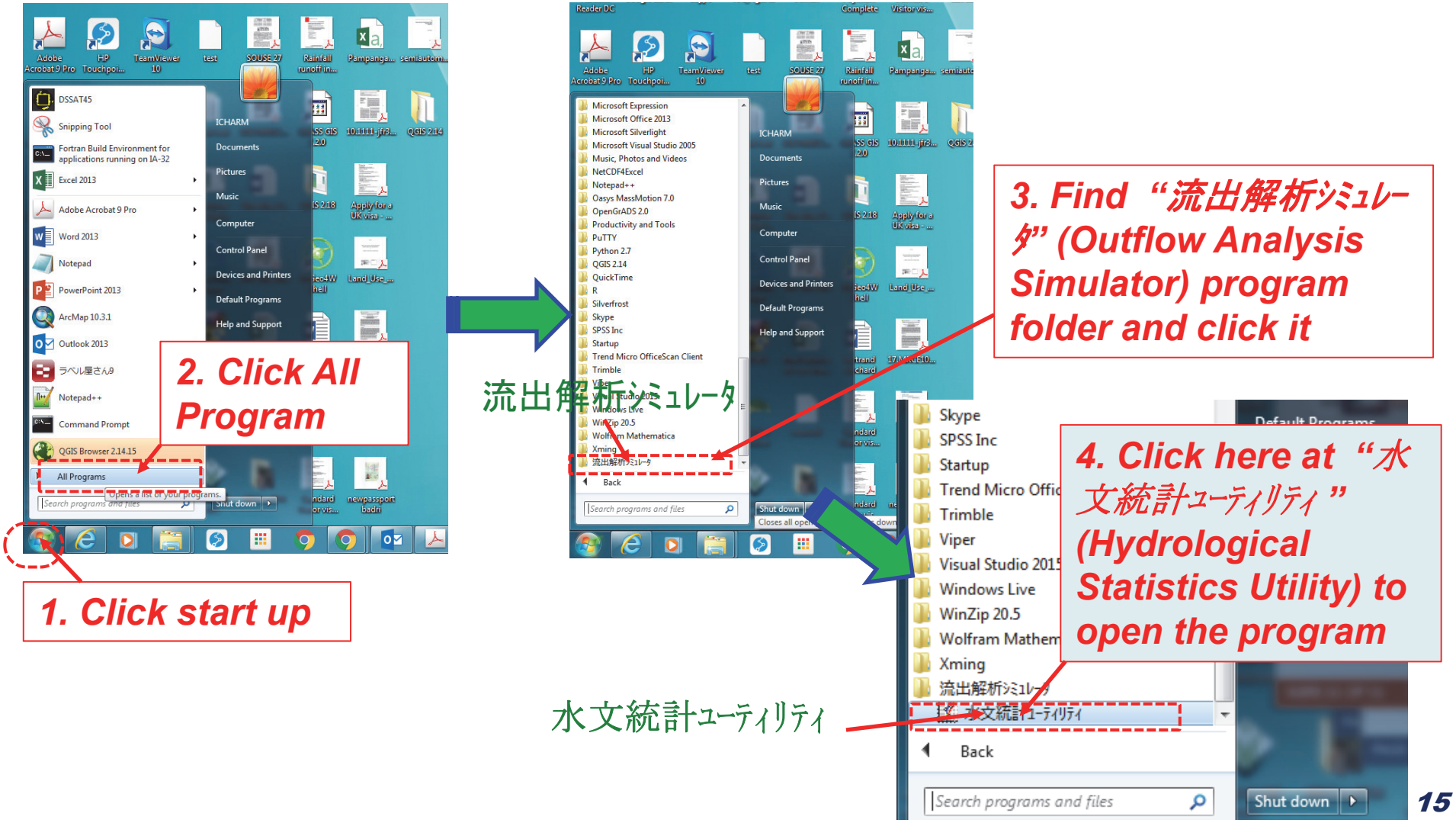
Steps for installation of the program



Click here at “Finish” button for completion of installation

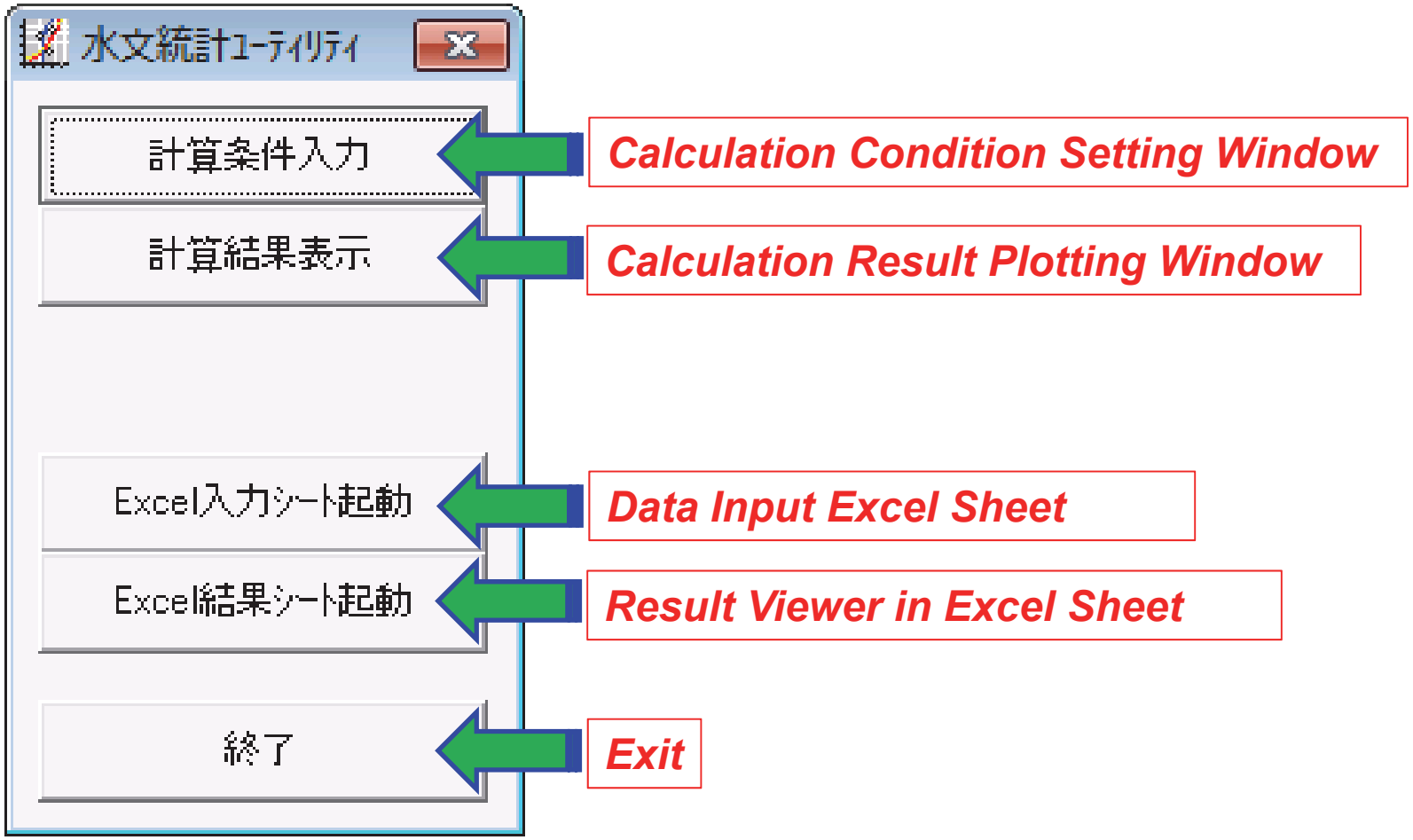
3. How to use “Hydrological Statistics Utility”

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



3. How to use “Hydrological Statistics Utility”

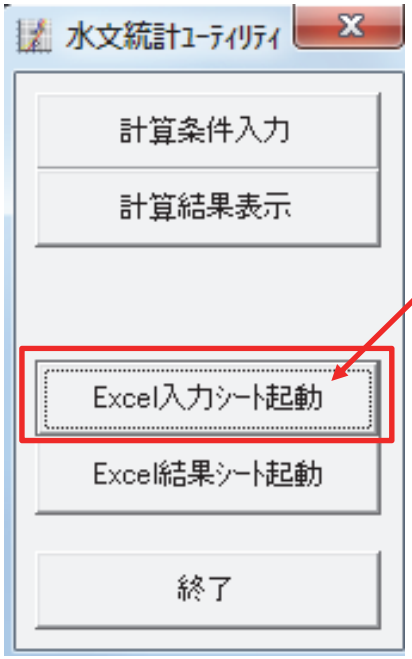
Explanation of Hydrological Statistics Utility Buttons



3. How to use “Hydrological Statistics Utility”

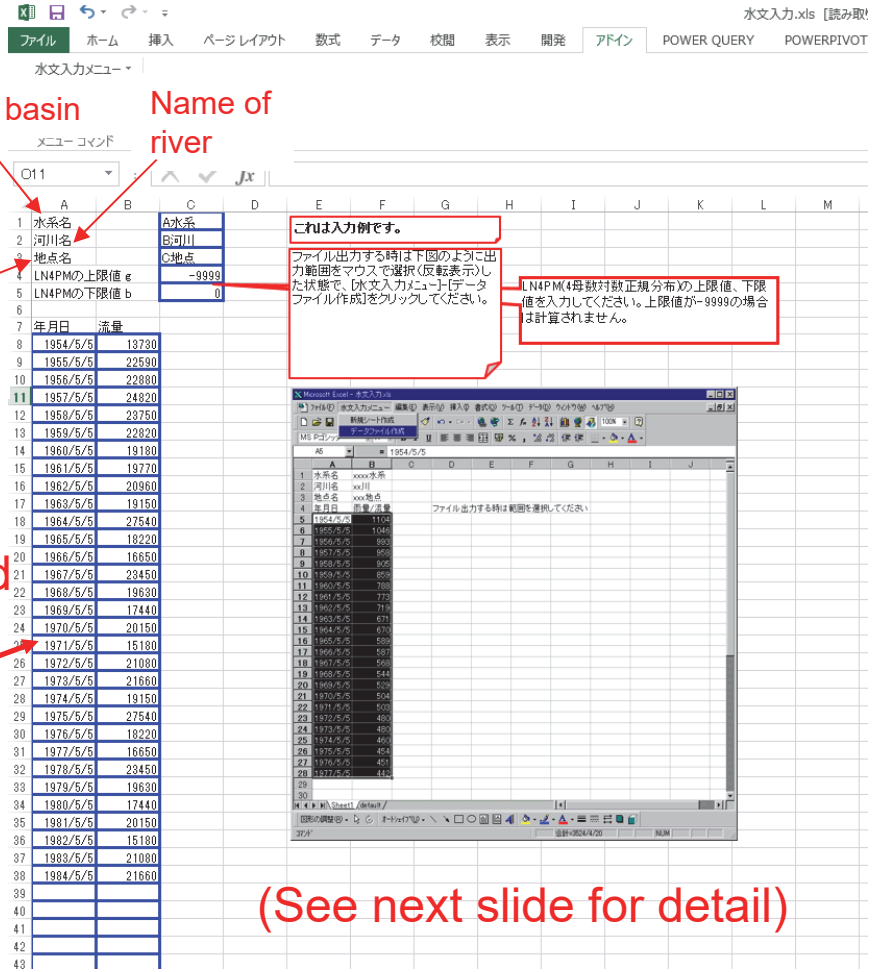
❖ Steps for statistical analysis using “Hydrological Statistics Utility”

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.

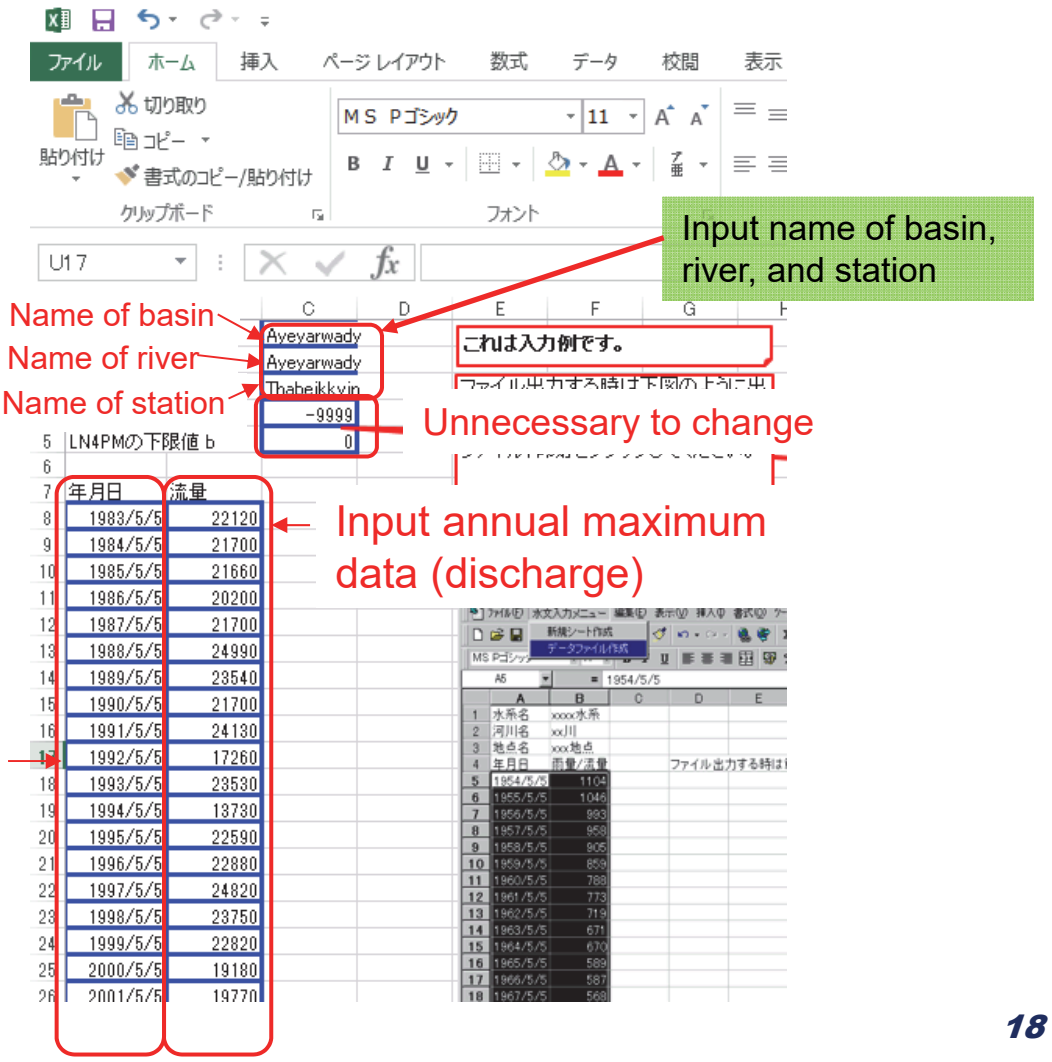
3. How to use “Hydrological Statistics Utility”

◆ 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.



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

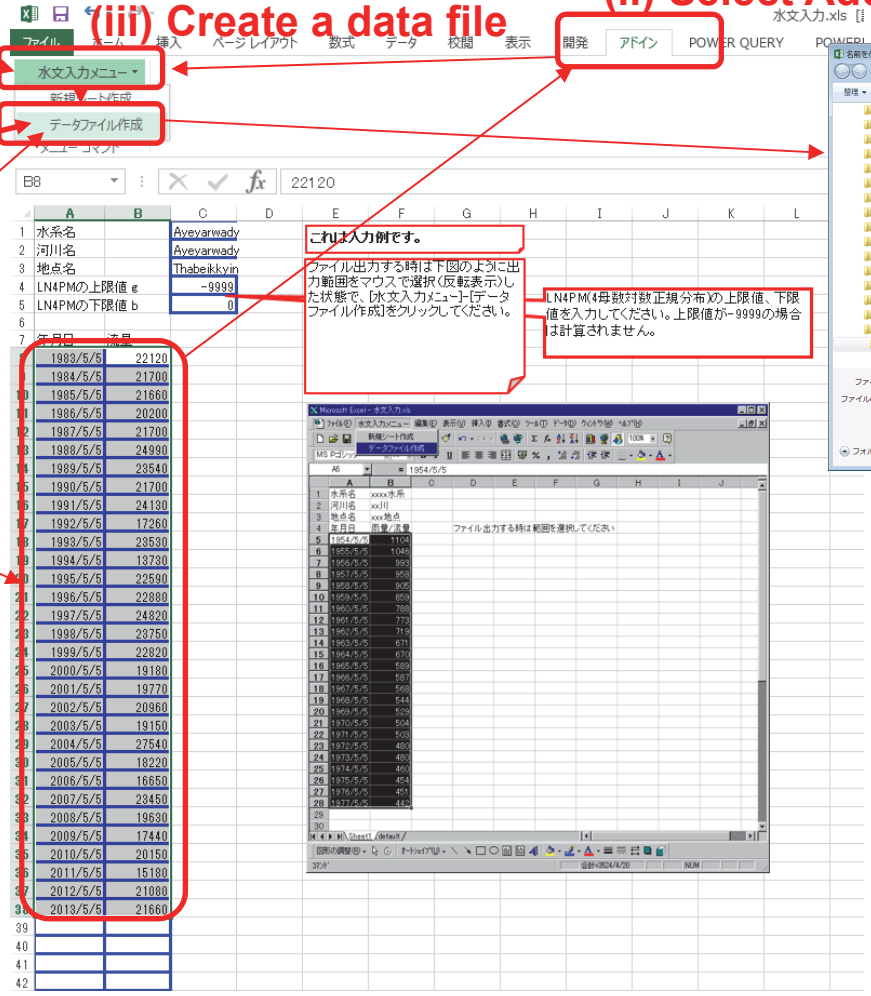
Data File Creation

Click here to create data file

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

(ii) Select Add-in

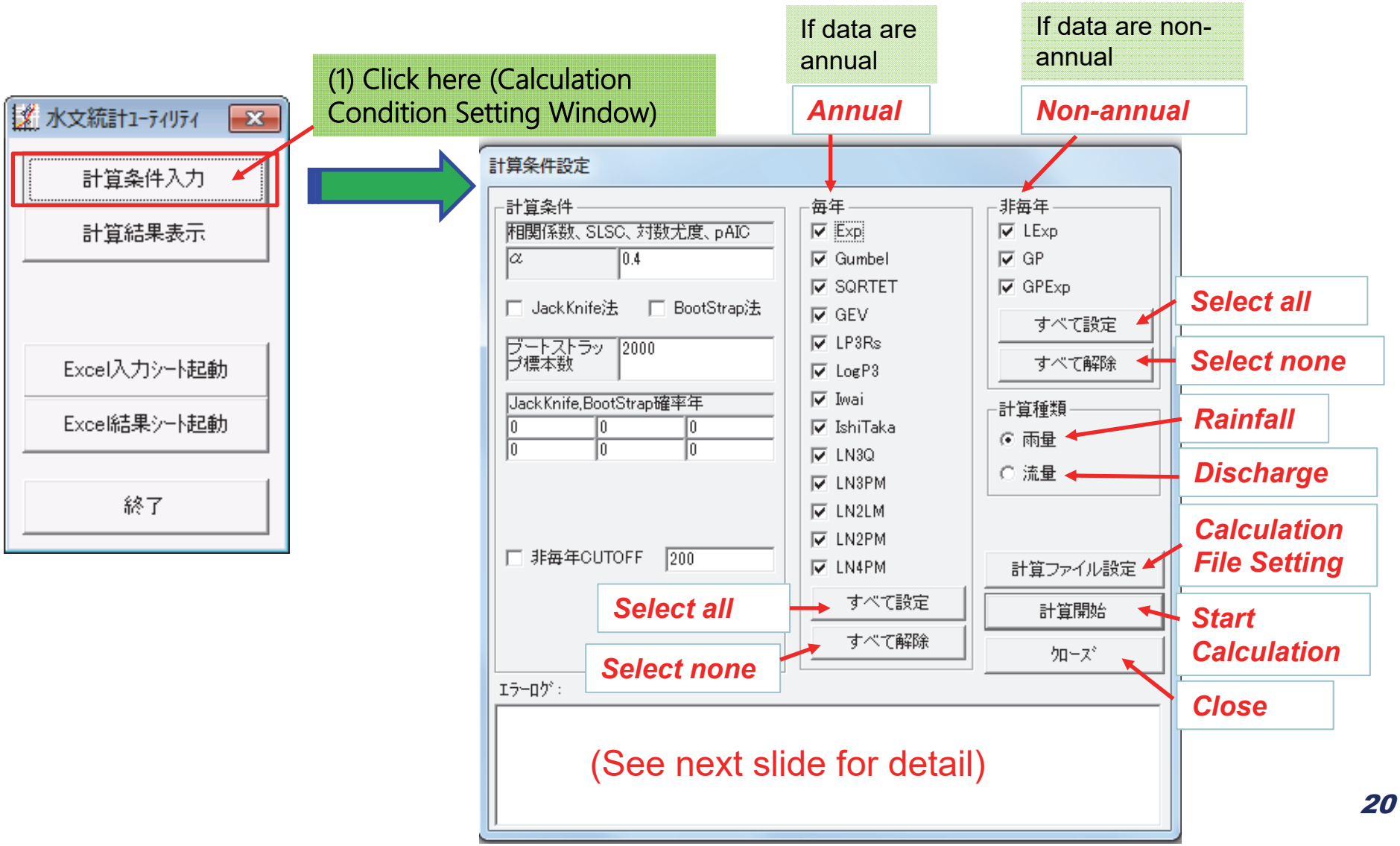
(iii) Create a data file



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

3. How to use “Hydrological Statistics Utility”

2. Calculation Condition Setting

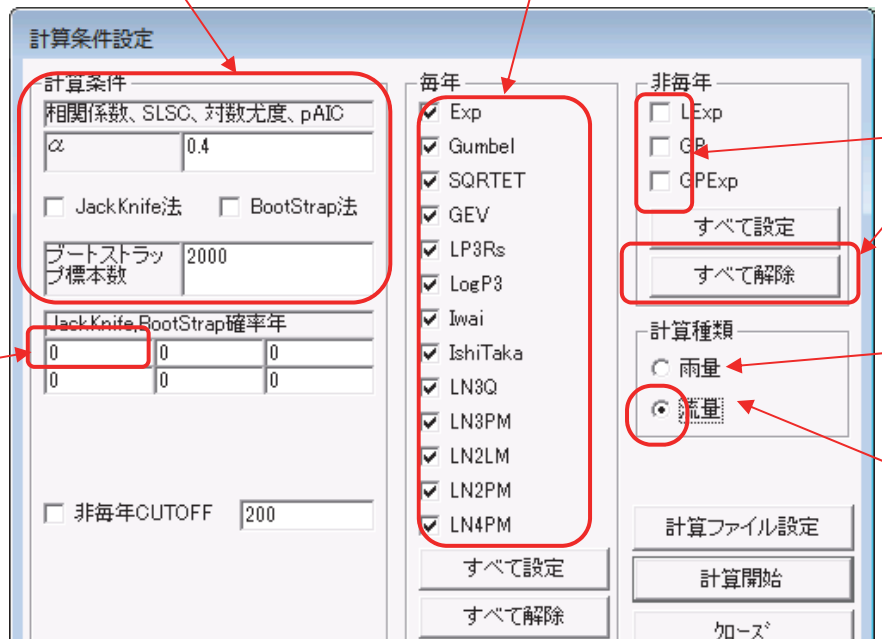


3. How to use “Hydrological Statistics Utility”

(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

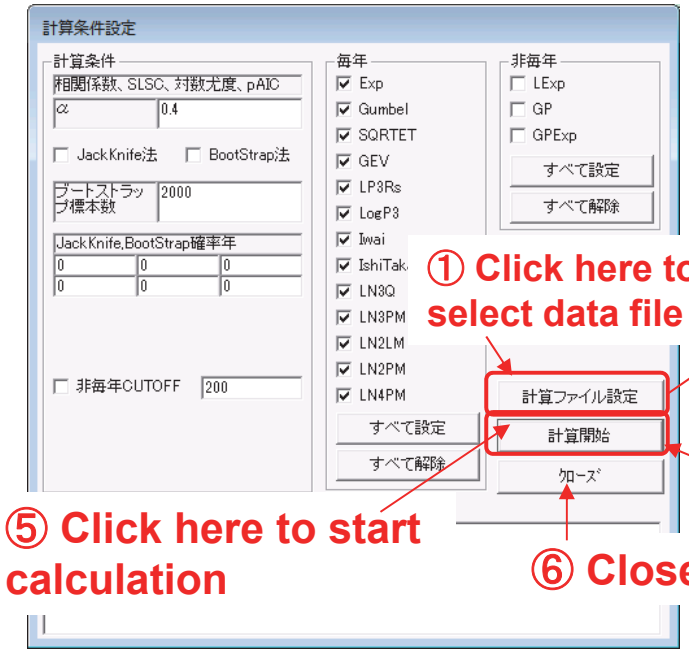
Select in the case of precipitation

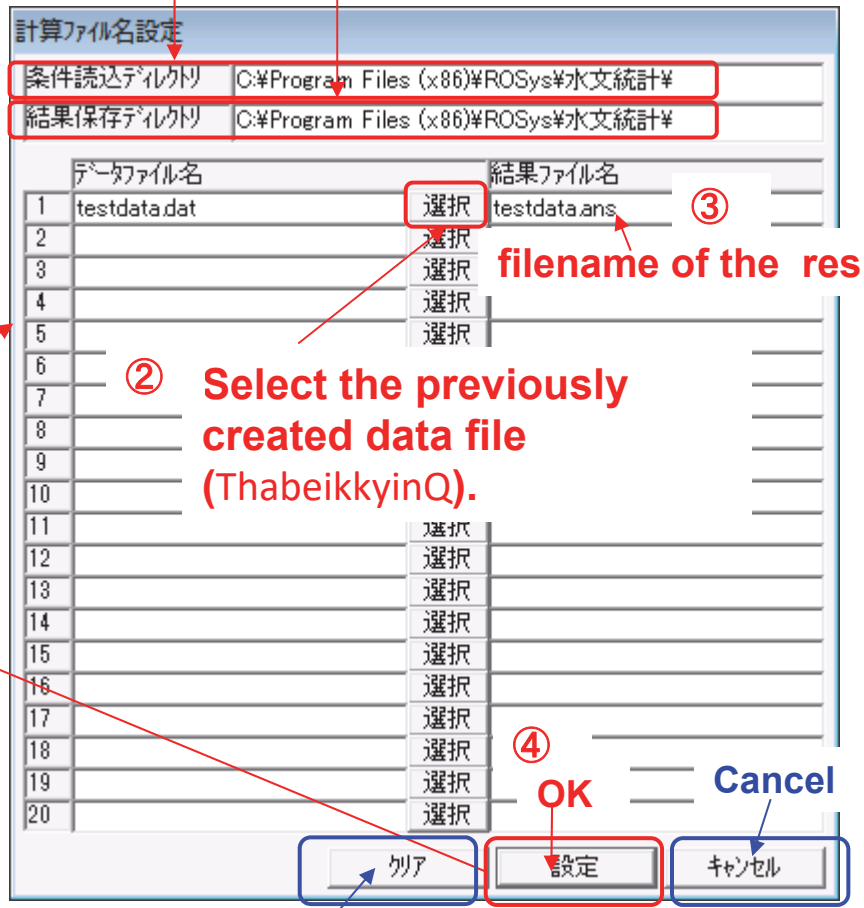
Select in the case of discharge

Exp : Exponential distribution
Gumbel : Gumbel distribution
SQRTET : 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





Directory to load condition data

Directory to save results

① Click here to select data file

② Select the previously created data file (ThabeikkyinQ).

③ filename of the result

④ OK

Cancel

⑤ Click here to start calculation

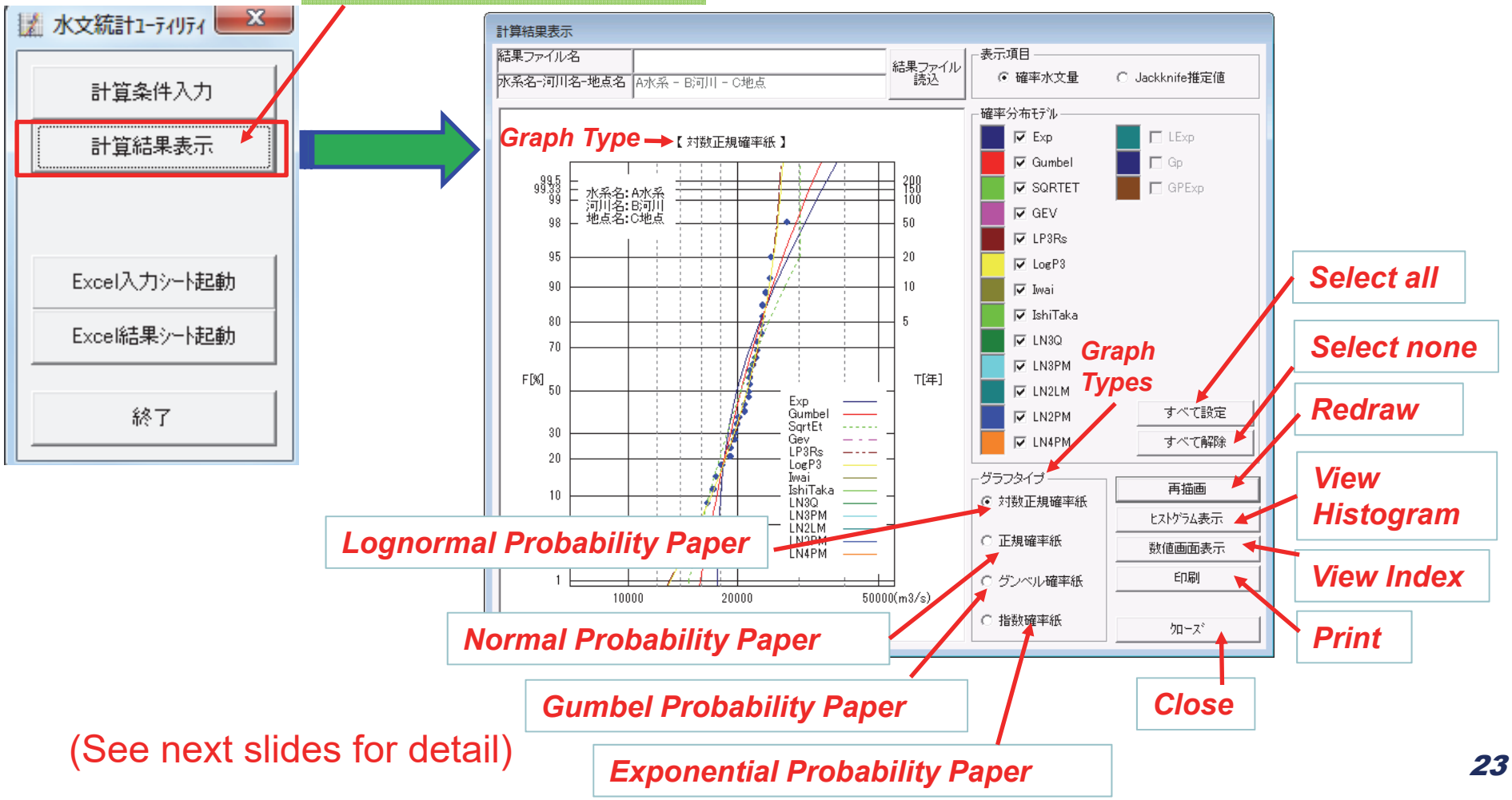
⑥ Close

Clear

3. How to use “Hydrological Statistics Utility”

3. Calculation Results Plotting

(1) Click here (Calculation Result Plotting Window)

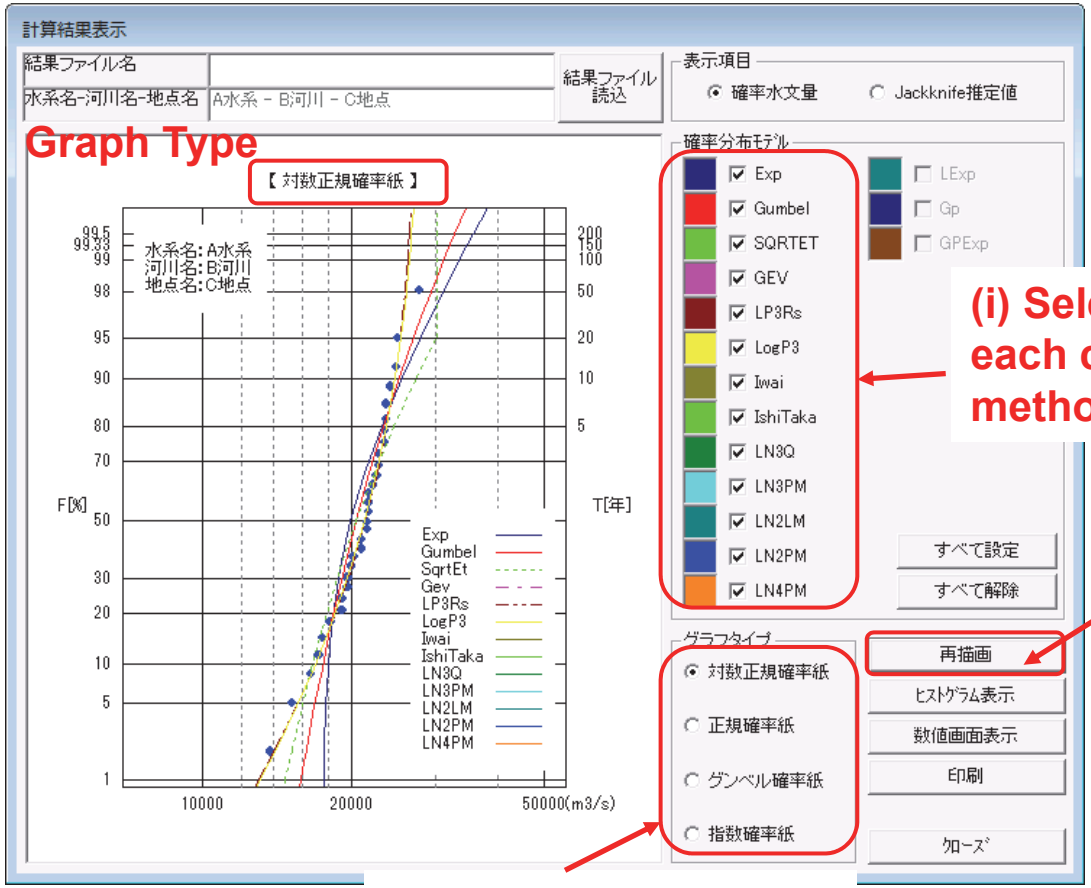


(See next slides for detail)

3. How to use “Hydrological Statistics Utility”

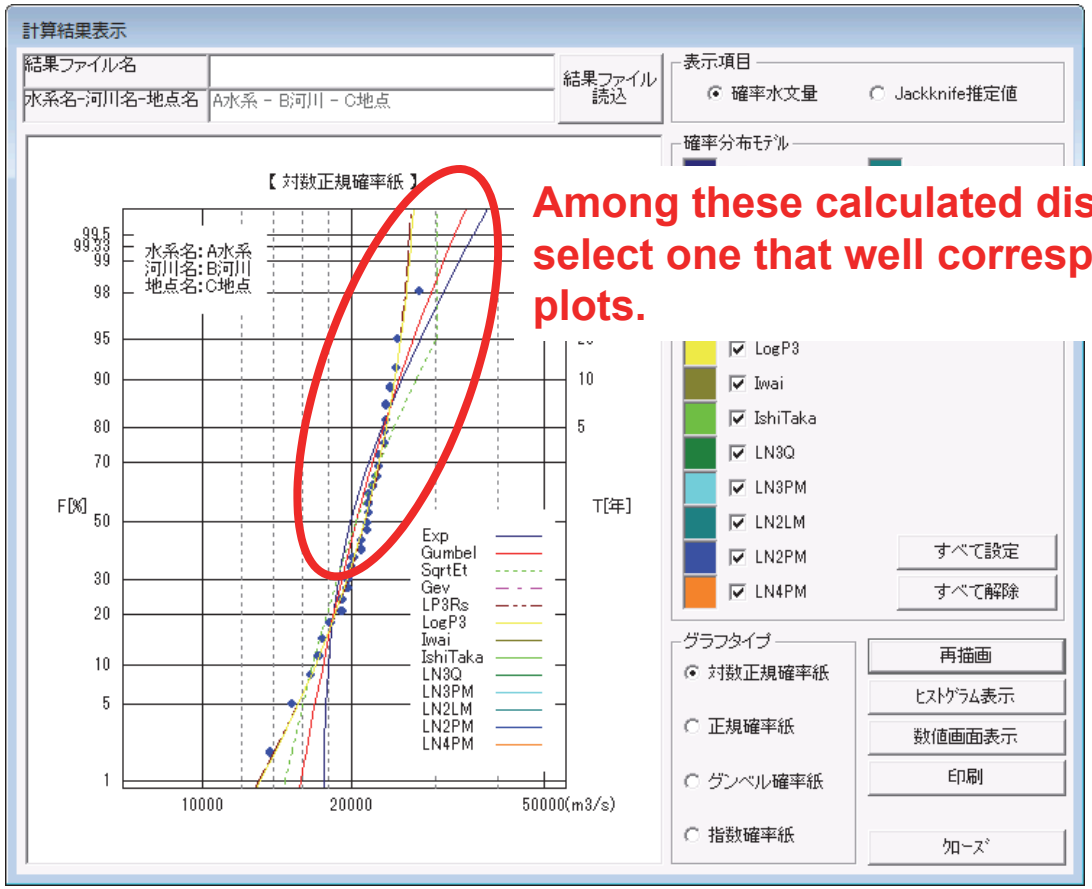
(2) Plotting Graphs

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



3. How to use “Hydrological Statistics Utility”

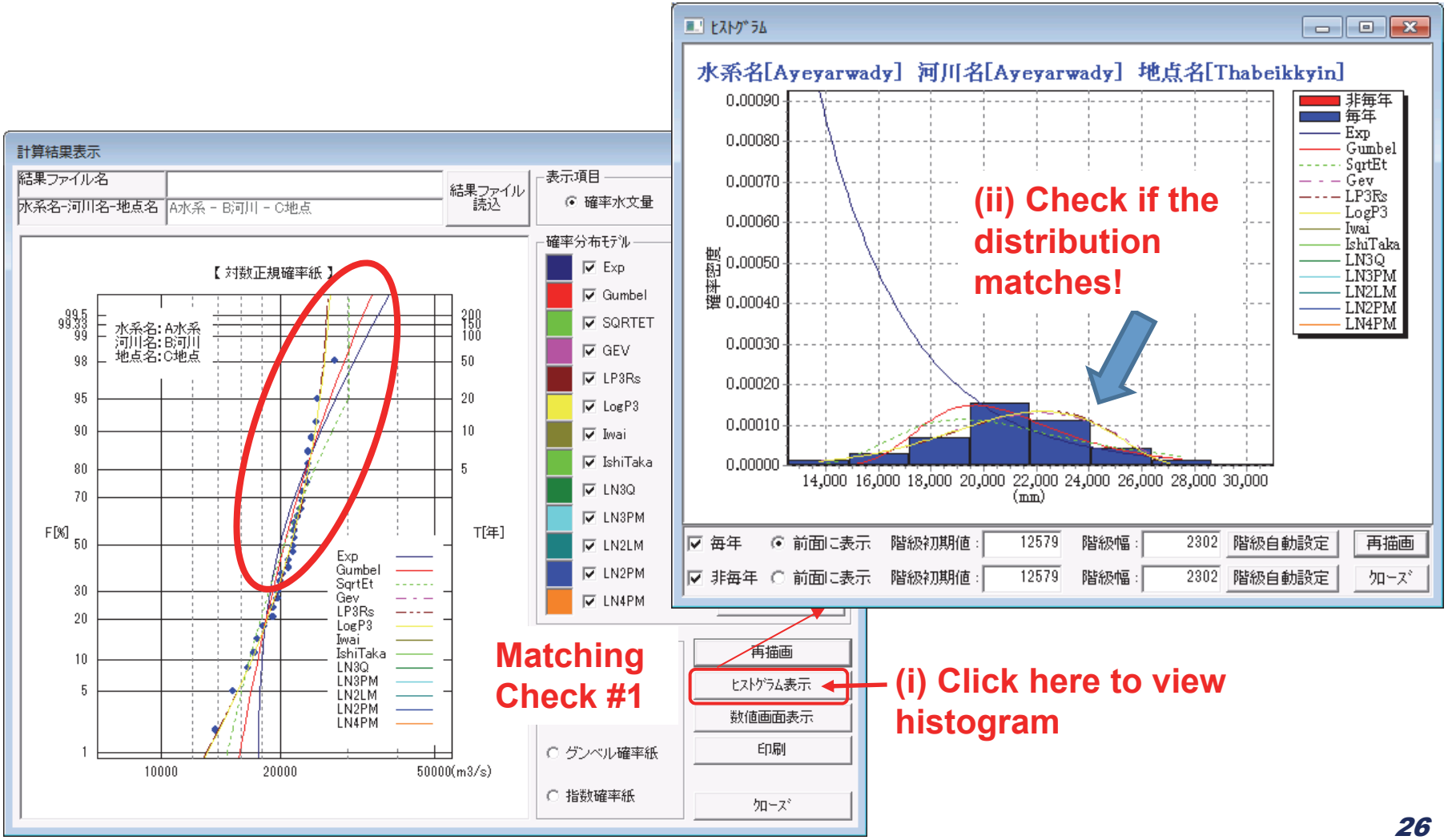
(3) Check the Graph



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

3. How to use “Hydrological Statistics Utility”

(3) Check the Graph (Contd.)



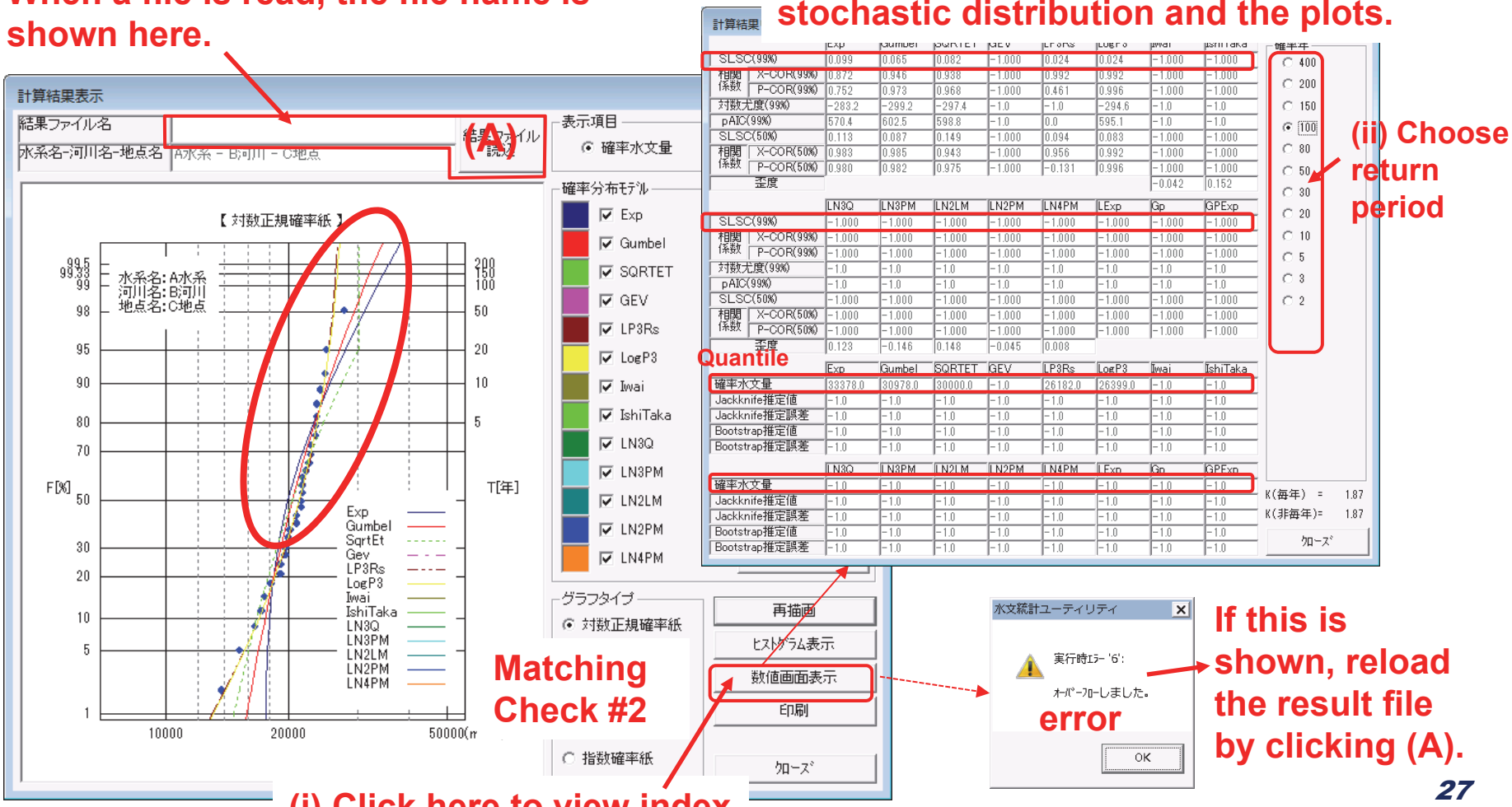
3. How to use “Hydrological Statistics Utility”

(3) Check the Graph (Contd.)

SLSC (standard least-square criterion)

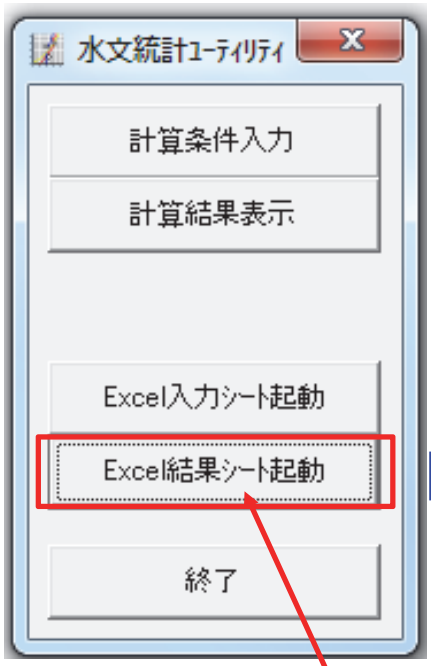
SLSC: fit index-> smaller value means better matching of the stochastic distribution and the plots.

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



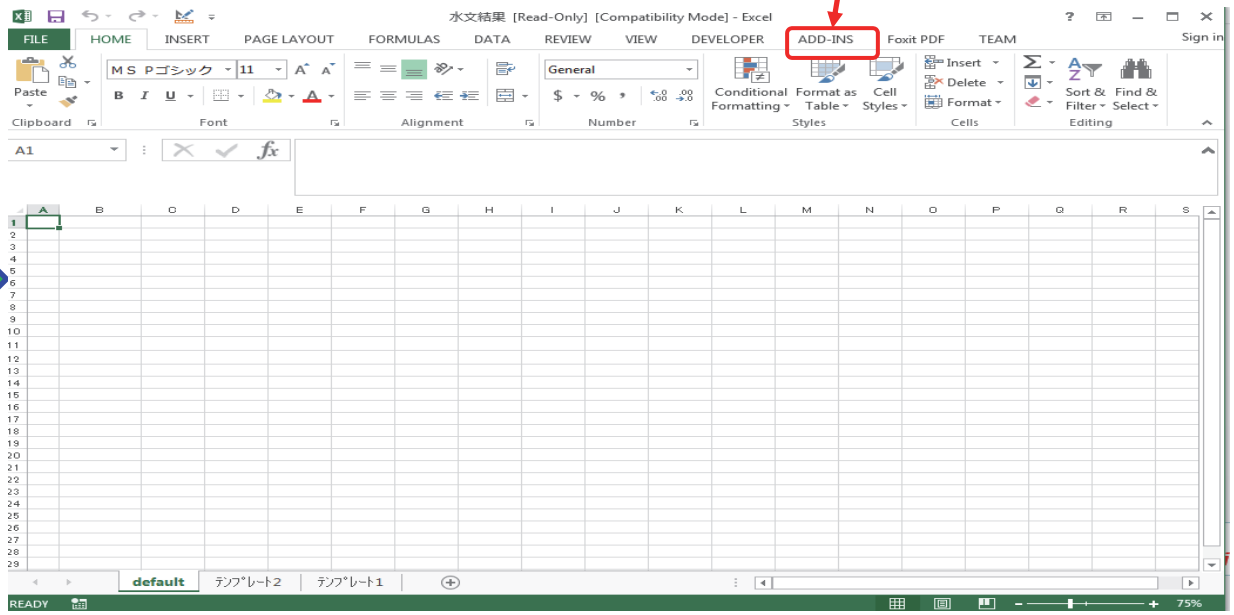
3. How to use “Hydrological Statistics Utility”

4. View Results in Excel Sheet



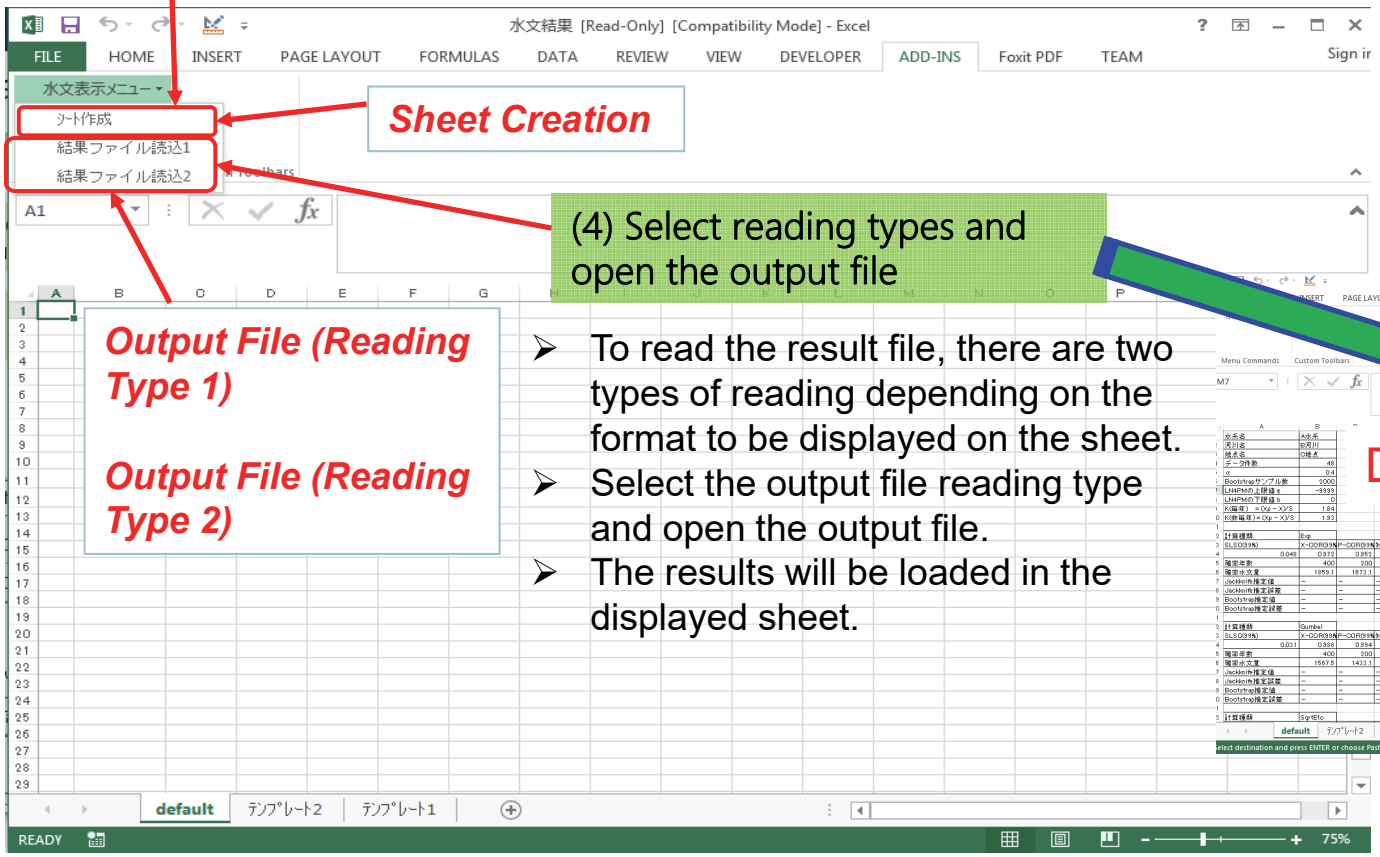
(1) Click here (Result Viewer in Excel Sheet)

(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



- 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.