



Nationwide Probabilistic Flood Discharge Dataset

1. IDENTIFICATION INFORMATION

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|---------------------|---|
| Name | Nationwide Probabilistic Flood Discharge Dataset |
| Abbreviation | d4Flood |
| DOI | doi:10.20783/DIAS.672 [https://doi.org/10.20783/DIAS.672] |
| Metadata Identifier | d4Flood20250917224458-DIAS20221121113753-en |

2. CONTACT

2.1 CONTACT on DATASET

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2.2 CONTACT on PROJECT

2.2.1 Data Integration and Analysis System

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4. DATASET CREATOR

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5. DATE OF THIS DOCUMENT

2025-09-17

6. DATE OF DATASET

creation : 2025-07-01

7. DATASET OVERVIEW

7.1 Abstract

This dataset provides estimates of flood peak discharges corresponding to various return periods across all river channels in Japan, including small- and medium-sized rivers, under present and future climate conditions (assuming global temperature increases of +2° C and +4° C).

From the 5-km mesh ensemble climate projections (d4PDF_5kmDDS_JP), approximately 3,000 to 5,000 heavy rainfall events were extracted for each region. These were used as input to the nationwide Rainfall-Runoff-Inundation (RRI) model, which represents Japan's topography at a 150-meter resolution. Flood discharges were simulated for all river reaches across Japan, and the results are compiled in this dataset.

At each river location, the top 72 discharge events were analyzed using extreme value statistics based on a non-annual (Peak-over-Threshold) series to estimate probabilistic flood peak discharges corresponding to arbitrary return periods of 10 years or more. In addition, the dataset includes the hydrographs and basin-averaged rainfall time series (hyetographs) of these 72 events used in the estimation, as well as the corresponding spatial rainfall distributions.

7.2 Topic Category(ISO19139)

inlandWaters

7.3 Temporal Extent

| | |
|--------------------------|------------|
| Begin Date | 1951-09-01 |
| End Date | 2010-08-31 |
| Temporal Characteristics | Hourly |

7.4 Geographic Bounding Box

| | | |
|---------------------|-------|-----|
| North latitude | bound | 50 |
| West longitude | bound | 125 |
| Eastbound longitude | | 150 |
| South latitude | bound | 25 |

7.5 Grid

7.6 Geographic Description

7.7 Keywords

7.7.1 Keywords on Dataset

| Keyword Type | Keyword | Keyword thesaurus Name |
|--------------|--------------------|------------------------|
| theme | HYDROLOGY > Floods | AGU |

7.7.2 Keywords on Project

7.7.2.1 Data Integration and Analysis System

| Keyword Type | Keyword | Keyword thesaurus Name |
|--------------|--|------------------------|
| theme | DIAS > Data Integration and Analysis System | No_Dictionary |

7.8 Online Resource

file download : <https://data.diasjp.net/dl/storages/filelist/dataset:672>

7.9 Data Environmental Information

7.10 Distribution Information

| name | version | specification |
|-------|---------|---------------|
| ascii | 1.0 | |

8. DATA PROCESSING

8.1 Data Processing (1)

8.1.1 General Explanation of the data producer's knowledge about the lineage of a dataset

8.1.2 Data Source

| Data Source Citation Name | Description of derived parameters and processing techniques used |
|---------------------------|--|
|---------------------------|--|

9. DATA REMARKS

10. DATA POLICY

10.1 Data Policy by the Data Provider

The dataset can be freely used and modified for both commercial and non-commercial purposes, as long as proper citation is given.

10.2 Data Policy by the Project

10.2.1 Data Integration and Analysis System

If data provider does not have data policy, DIAS Terms of Service (<https://diasjp.net/en/terms/>) and DIAS Privacy Policy (<https://diasjp.net/en/privacy/>) apply.

If there is a conflict between DIAS Terms of Service and data provider's policy, the data provider's policy shall prevail.

11. LICENSE



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12. DATA SOURCE ACKNOWLEDGEMENT

12.1 Acknowledge the Data Provider

This study used a nationwide probabilistic flood discharge dataset (d4Flood), created using the RRI model covering all of Japan.

12.2 Acknowledge the Project

12.2.1 Data Integration and Analysis System

If you plan to use this dataset for a conference presentation, paper, journal article, or report etc., please include acknowledgments referred to following examples. If the data provider describes examples of acknowledgments, include them as well.

" In this study, [Name of Dataset] provided by [Name of Data Provider] was utilized. This dataset was also collected and provided under the Data Integration and Analysis System (DIAS), which was developed and operated by a project supported by the Ministry of Education, Culture, Sports, Science and Technology. "

13. REFERENCES

Chen, J., Sayama, T., Yamada, M., Tanaka, T., & Sugawara, Y. (2025). Projecting multiscale river flood changes across Japan at +2° C and +4° C climates. *Earth's Future*, 13, e2024EF005884. <https://doi.org/10.1029/2024EF005884>

Chen, J., Sayama, T., Yamada, M., & Sugawara, Y. (2025). Reducing the computational cost of process-based flood frequency estimation by extracting precipitation events from a large-ensemble climate dataset. *Journal of Hydrology*, 655, 132946. <https://doi.org/10.1016/j.jhydrol.2025.132946>

Sayama, T., Yamada, M., Yamakita, A. et al. Parameter regionalization of large-scale distributed rainfall runoff models using a conditional probability method. *Prog Earth Planet Sci* 12, 17 (2025). <https://doi.org/10.1186/s40645-025-00691-w>