

A new opportunity for extreme
hydrologic prediction research
using the **d**atabase for **P**olicy **D**ecision
making for **F**uture climate change
(d4PDF)



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database for Policy Decision making for Future climate change (d4PDF)

MRI-AGCM 3.2H, 60km spatial resolution

■ Present Climate Experiments:

100 sets of 60 years climate simulation under different boundary conditions, which provides **6,000 years** hydrologic time series data

■ The End of 21st Century Climate Experiments:

90 sets of 60 years climate simulation under different initial and boundary conditions, which provides **5,400 years** hydrologic time series data

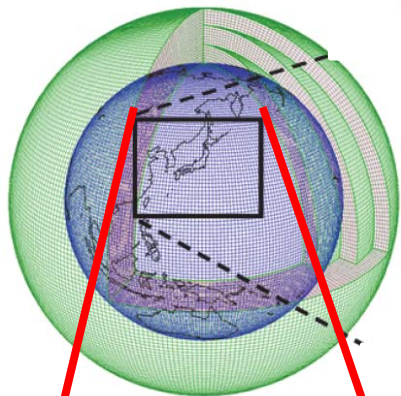
MRI-NHRCM, 20km spatial resolution

■ Present Climate Experiments:

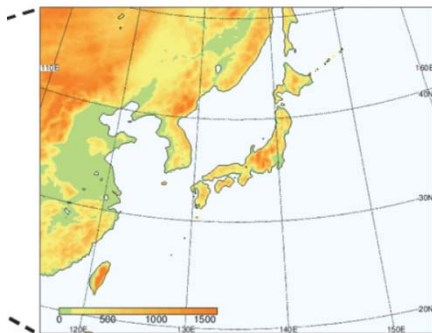
50 sets of 60 years climate simulation under different boundary conditions, which provides **3,000 years** hydrologic time series data

■ The End of 21st Century Climate Experiments:

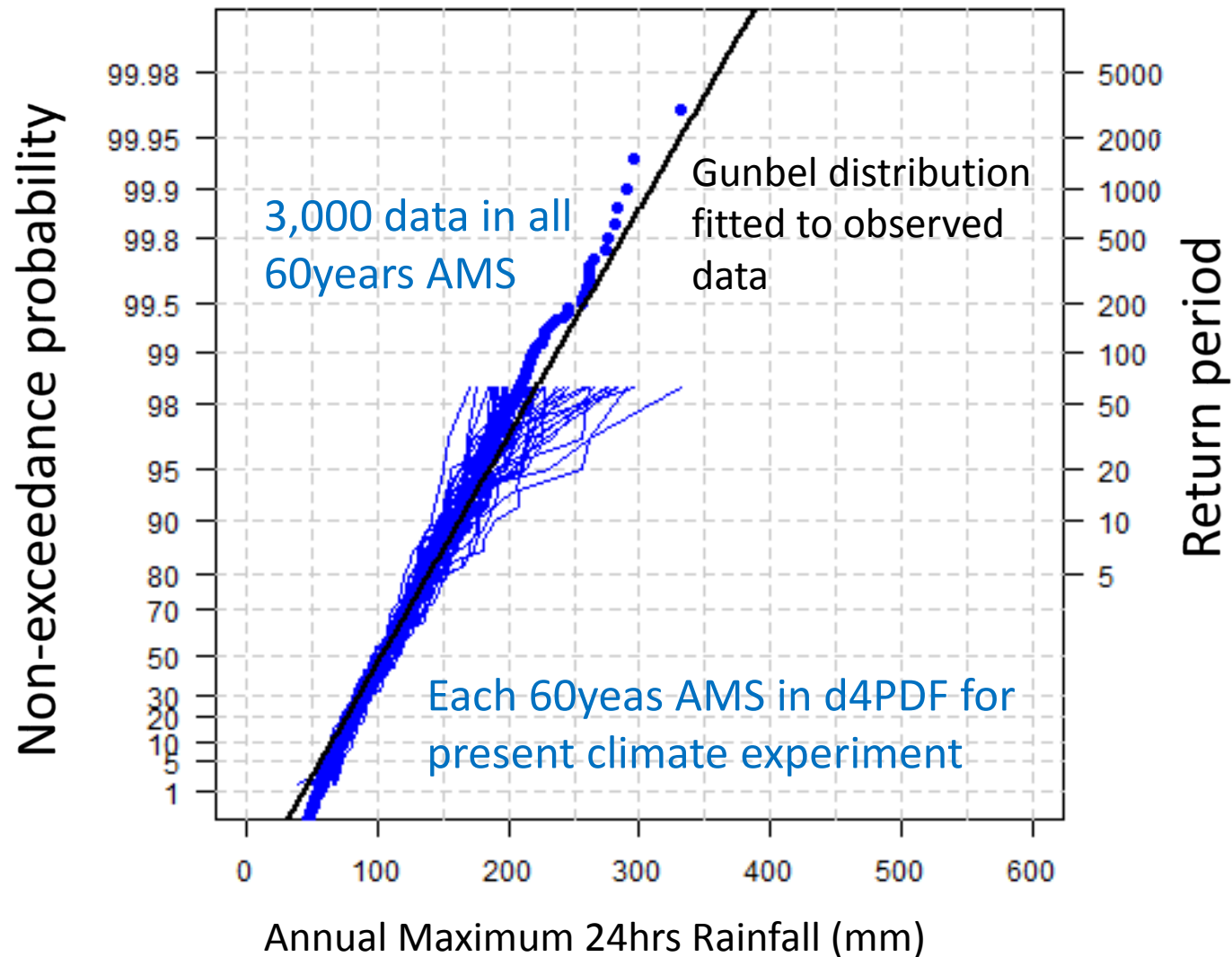
90 sets of 60 years climate simulation under different initial and boundary conditions, which provides **5,400 years** hydrologic time series data



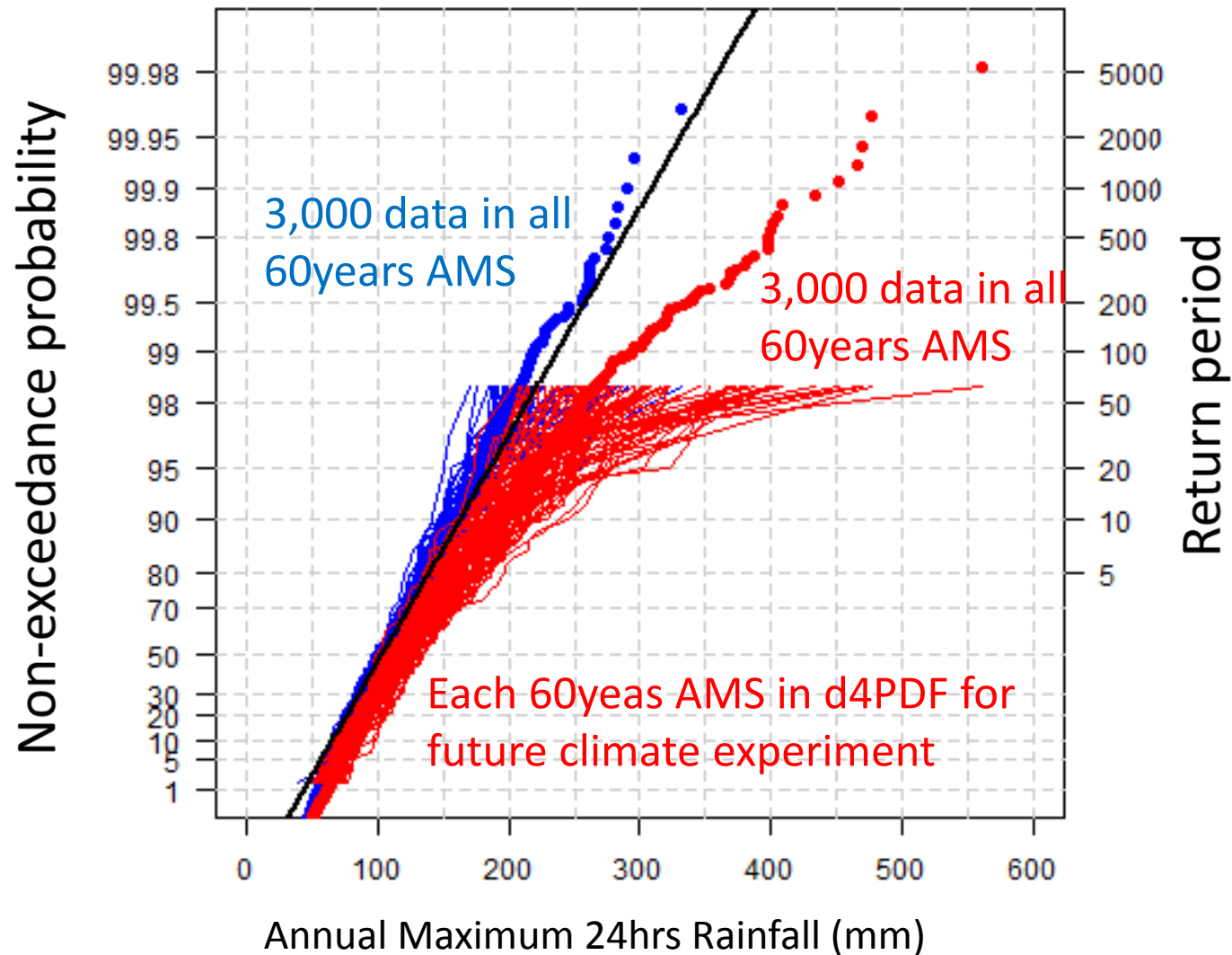
(画像: 気象庁提供)



Probability Plot for Annual Maximum 24hrs Catchment Mean Rainfall at Yodo River Basin

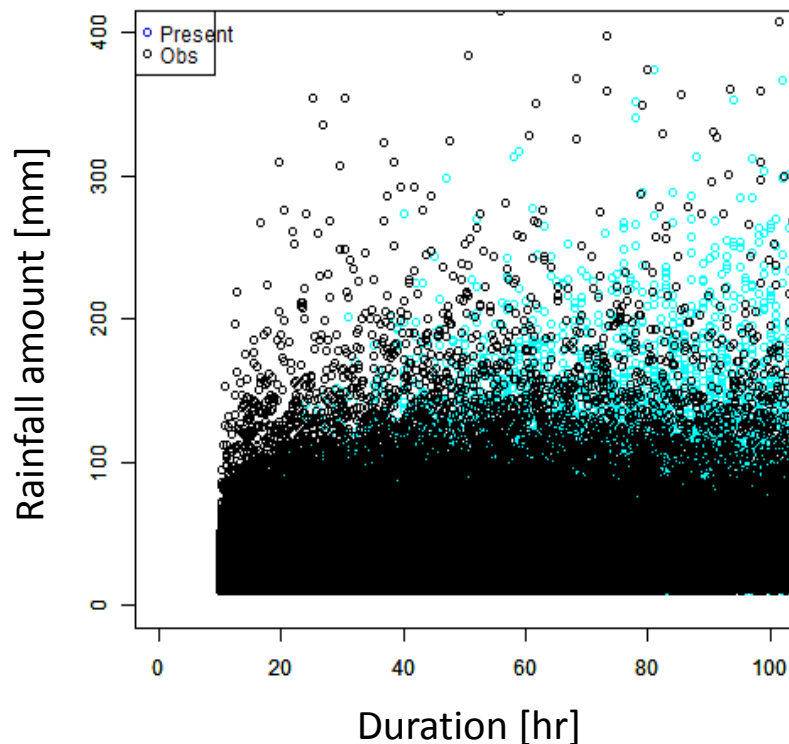


Probability Plot for Annual Maximum 24hrs Catchment Mean Rainfall at Yodo River Basin



Comparison of catchment mean rainfall in terms of duration and total amount

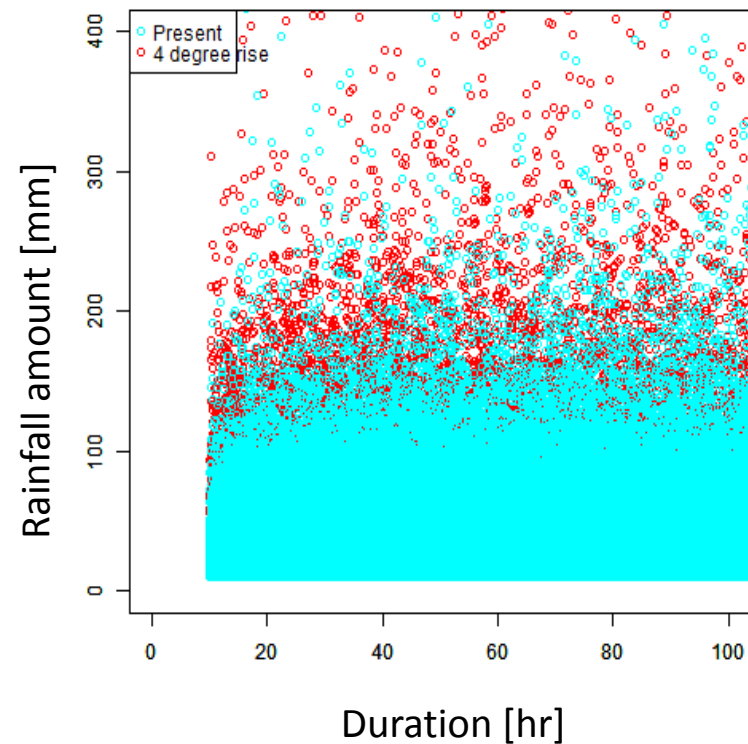
Black: Observed, Blue d4PDF(present)



Rate of occurrence of rainfall events more than 150mm

Observed: 0.51%, d4PDF(present): 0.61%

Red: d4PDF(future), Blue d4PDF(present)



Rate of occurrence of rainfall events more than 150mm

d4PDF: 0.61%, d4PDF(present): 1.1%

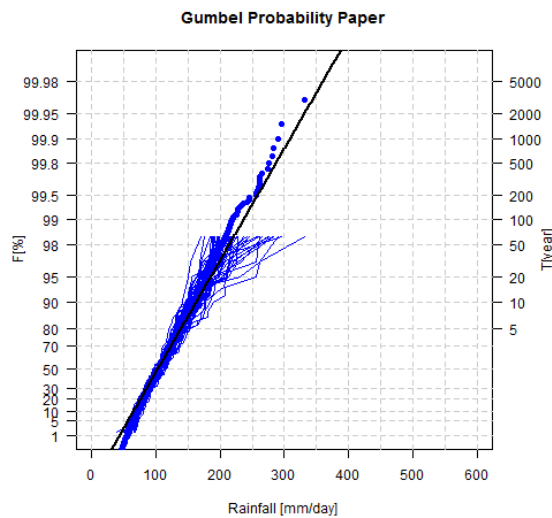
Summary

- An extreme frequency distribution estimated by d4PDF was well matched to observed one.
- d4PDF provides very long hydrologic time series data (future projections: 5,400 years).
- d4PDF offers a new opportunity for extreme hydrologic prediction research.

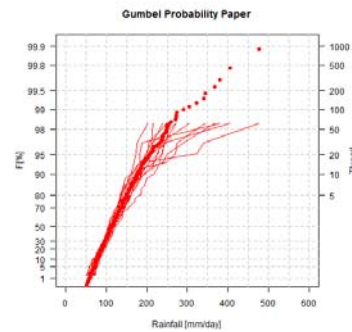
Difference of future annual maximum 24hrs catchment mean rainfall at Yodo River basin due to different SST settings

Present climate
RCM 50members

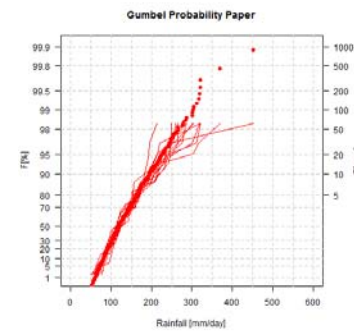
Future climate experiment
15 members for each SST setting



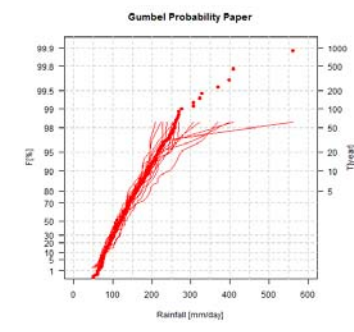
CCSM4 (CC)



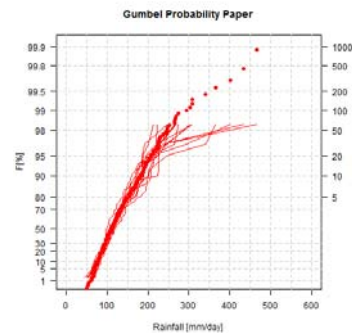
GFDL-CM3 (GF)



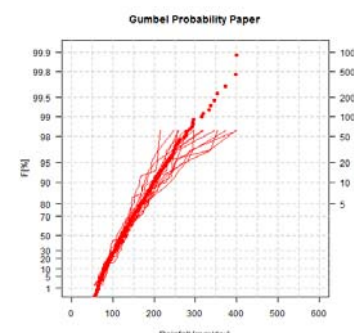
HadGEM2-AO (HA)



MIROC5 (MI)



MPI-ESM-MR (MP)



MRI-CGCM3 (MR)

