

# 第2部 – DIASに触れてみよう！

## 分科会セッション

### 1) 地球温暖化モデルデータの利用法

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第5期結合モデル相互比較計画(CMIP5)  
気候変動予測モデルの選択と、降水データ  
のバイアス補正と解析ツールについて

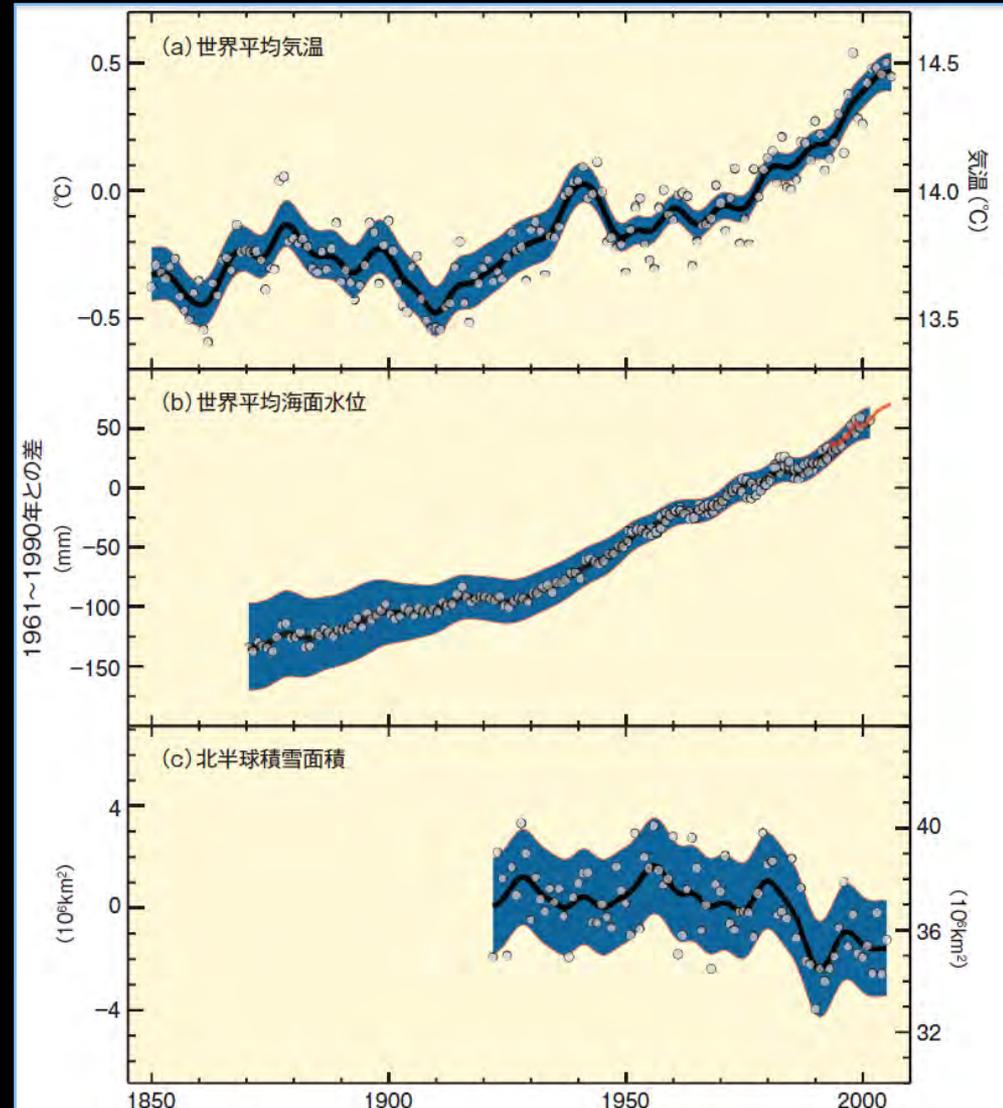
東京大学 河川／流域環境研究室

気候が変化すると  
異常気象が起こる？

# 気候は変化しているのか？ 何が原因か？

気候システムの温暖化には  
疑う余地がない。

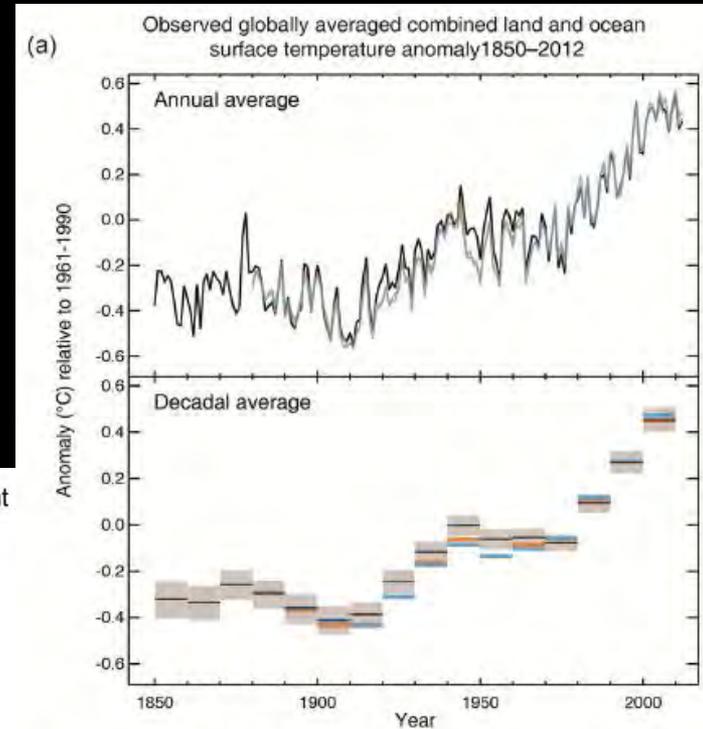
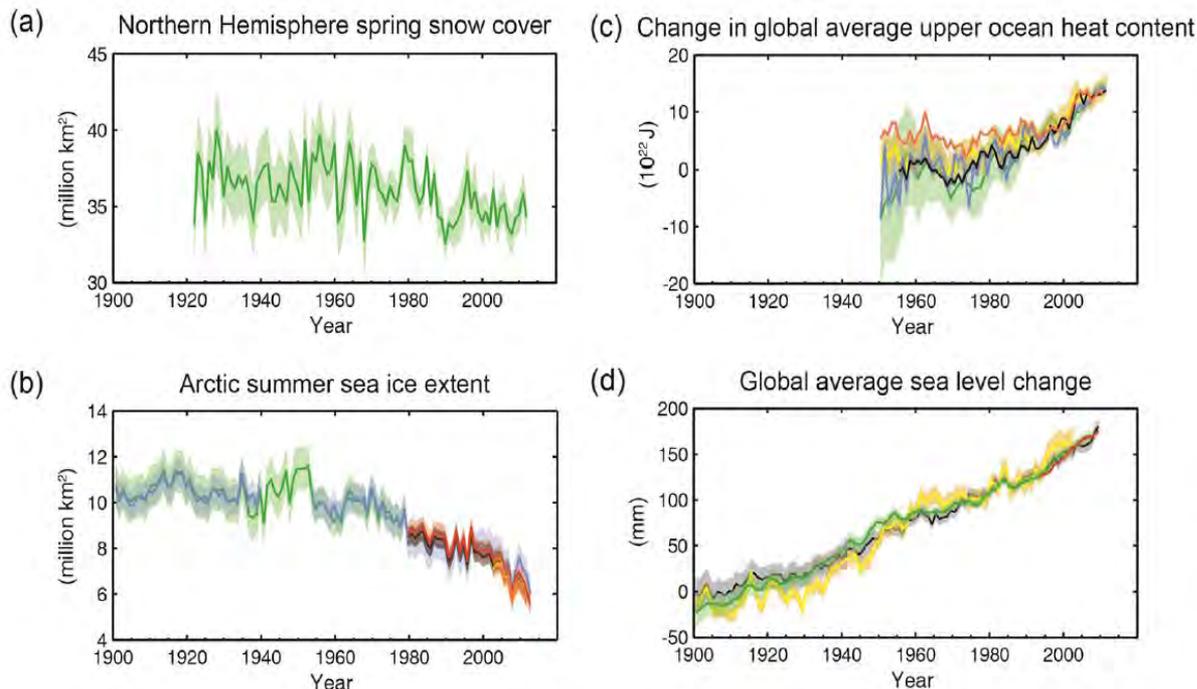
気候変動に関する政府間パネル(IPCC)  
第4次評価報告書統合報告書,2007



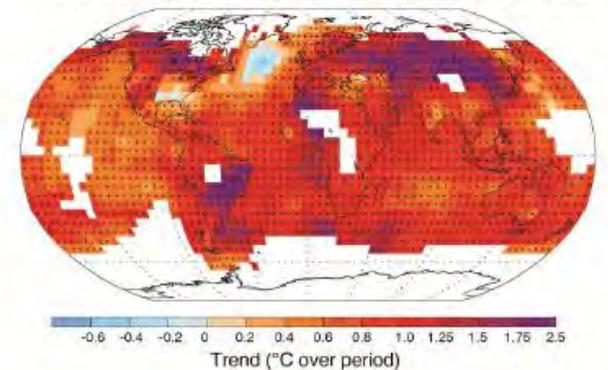
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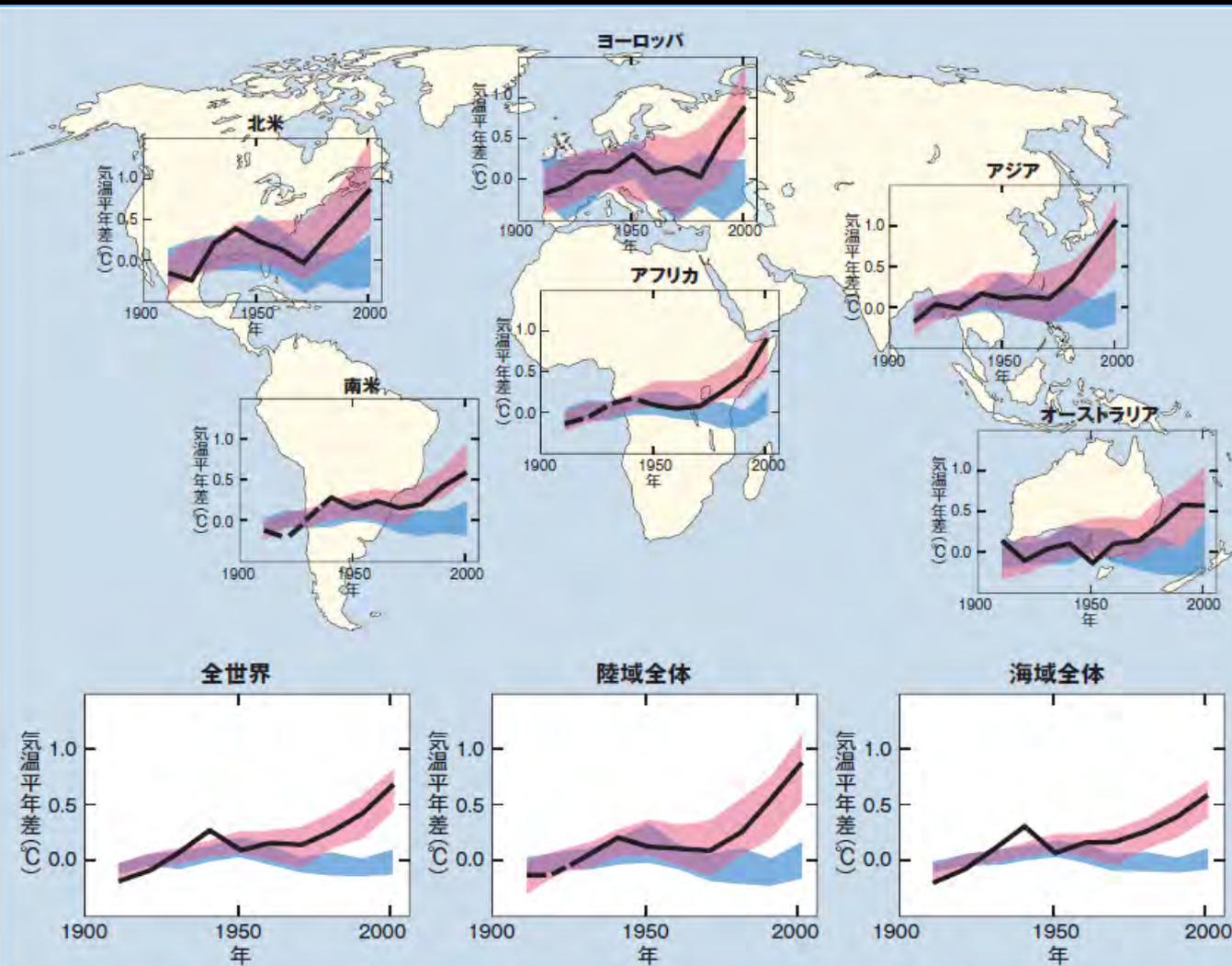
気候変動に関する政府間パネル(IPCC)  
第5次評価報告書統合報告書, 2013



(b) Observed change in average surface temperature 1901–2012



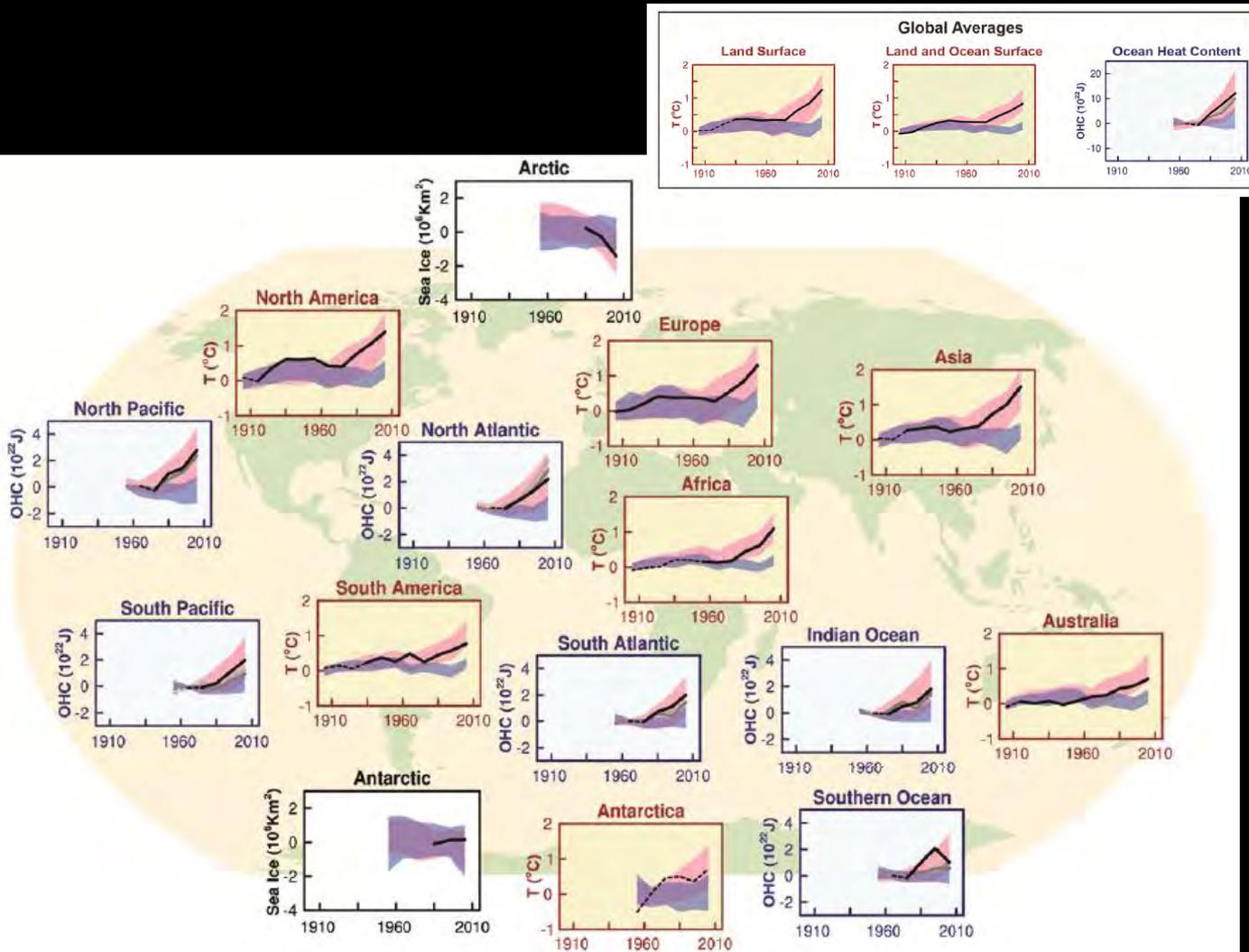
# 気候は変化しているのか？ 何が原因か？



20世紀半ば以降に観測された世界平均気温の上昇のほとんどは、人為起源の温室効果ガス濃度の観測された増加によってもたらされた可能性が非常に高い。  
(IPCC、2007)

# 気候は変化しているのか？ 何が原因か？

1951~2000年に観測された世界の地表温度の上昇の半分以上は、人為起源の温室効果ガス濃度の上昇と他の人為起源の外力が組み合わさって引き起こされたという可能性が極めて高い。  
(IPCC、2013)



models using only natural forcings
  models using both natural and anthropogenic forcings
  observations

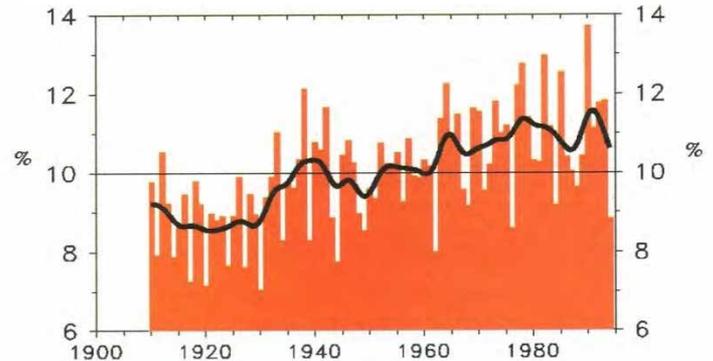
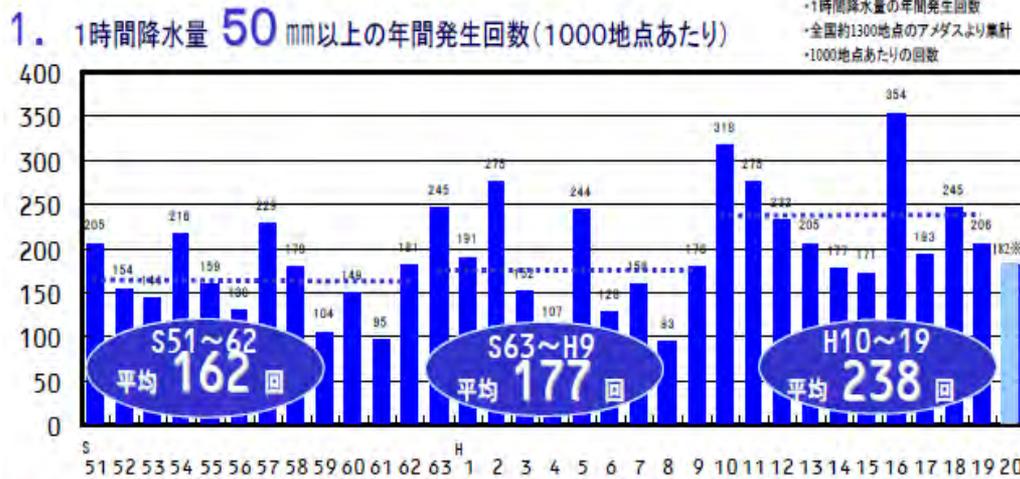
気候が変化すると

異常気象が起こる？

# 気候と水循環の変動(豪雨の頻度)

最近10年(H10-19)と30年前(S53-62)を比較すると  
 時間50mmの豪雨の発生頻度は約1.5倍  
 時間100mmの豪雨の発生頻度は約2.0倍に増加

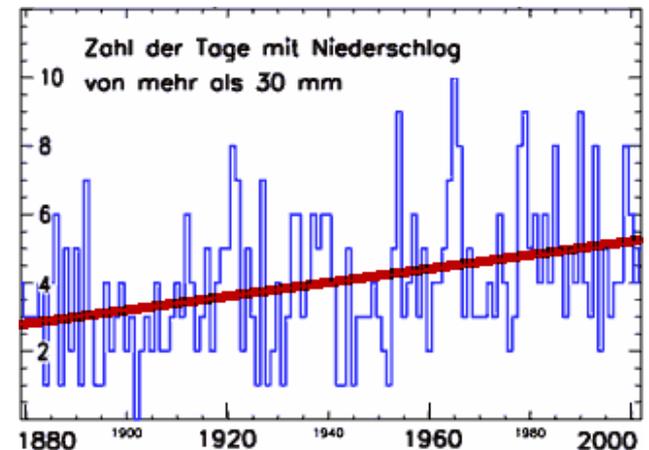
米国での極端事象(豪雨)の変化  
 1910年~2000年



Source: <http://www.ncdc.noaa.gov/ol/climate/research/gcps/papers/amsbull/amsbull.html>



ドイツでの極端事象(豪雨)の変化  
 1880年~2000年

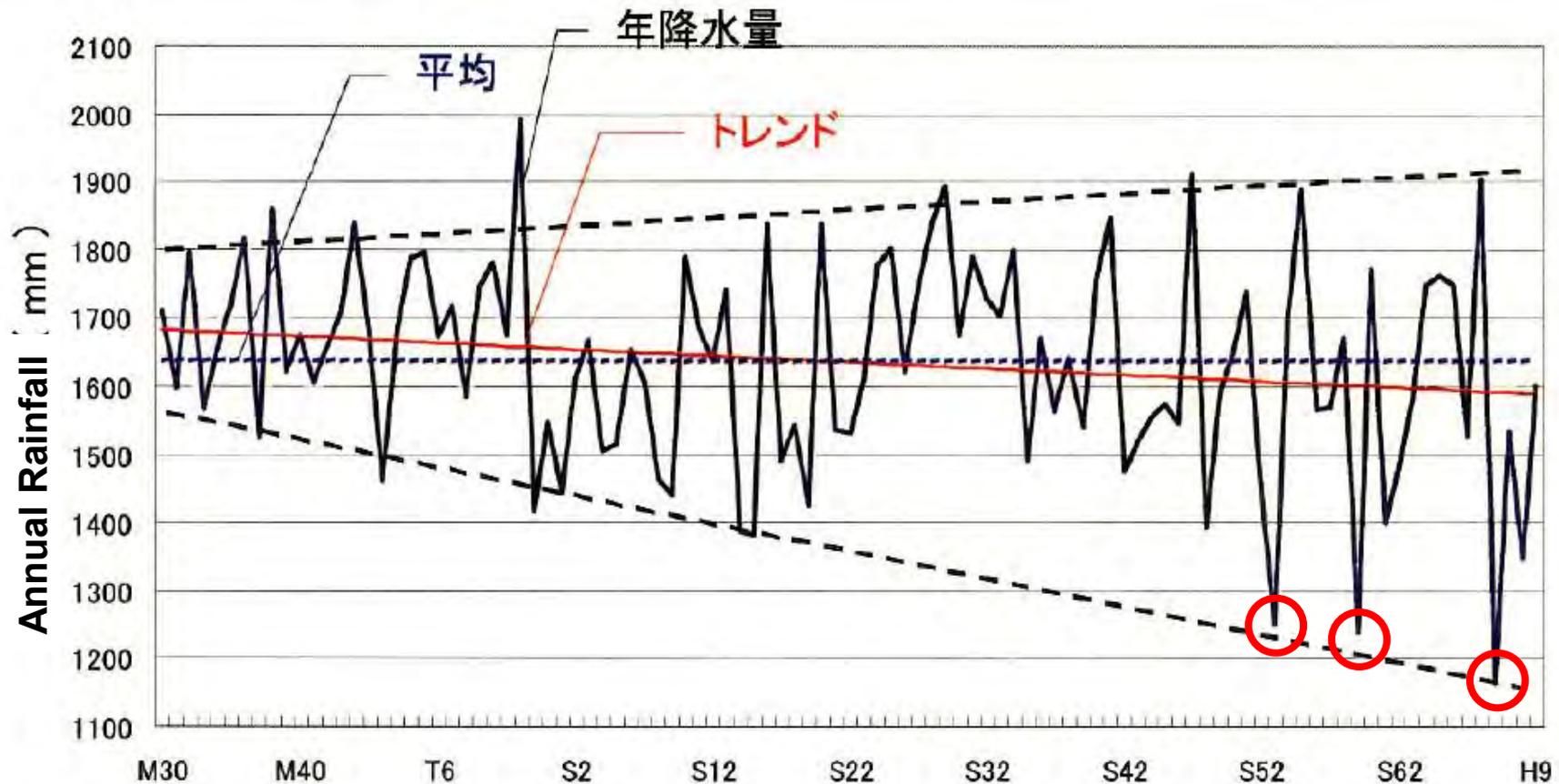


Source: Wetterstation Hohenpeißenberg

# 気候と水循環の変動(渇水)

## わが国の年降水量変動

(極端に降水量の少ない年が頻発)



# 気候と水循環の変動（IPCC第5次評価報告書総括）

現象及び変化傾向	変化発生の評価 (特に断らない限り 1950 年以降)		将来変化の可能性	
			21 世紀末	
ほとんどの陸域で 寒い日や寒い夜の 頻度の減少や昇温	可能性が非常に高い 可能性が非常に高い 可能性が非常に高い	{2.6}	ほぼ確実 ほぼ確実 ほぼ確実	{12.4}
ほとんどの陸域で 暑い日や暑い夜の 頻度の増加や昇温	可能性が非常に高い 可能性が非常に高い 可能性が非常に高い	{2.6}	ほぼ確実 ほぼ確実 ほぼ確実	{12.4}
ほとんどの陸域で 継続的な高温/熱波の 頻度や持続期間の増加	世界規模で確信度が中程度 ヨーロッパ、アジア、オーストラリアの大部分で可 能性が高い 多くの(すべてではない)地域で確信度が中程度 可能性が高い	{2.6}	可能性が非常に高い  可能性が非常に高い 可能性が非常に高い	{12.4}
大雨の頻度、強度、 大雨の降水量の増加	減少している陸域より増加している陸域のほうが 多い可能性が高い <sup>(c)</sup> 減少している陸域より増加している陸域のほうが 多い可能性が高い ほとんどの陸域で可能性が高い	{2.6}	中緯度の大陸のほとんどと湿潤な熱帯 域で可能性が非常に高い 多くの地域で可能性が高い  ほとんどの陸域で可能性が非常に高い	{12.4}
干ばつの強度や 持続期間の増加	世界規模で確信度が低い いくつかの地域で変化した可能性が高い <sup>(d)</sup> いくつかの地域で確信度が中程度 1970 年以降多くの地域で可能性が高い <sup>(e)</sup>	{2.6}	地域規模から世界規模で可能性が高 い(確信度は中程度) <sup>(h)</sup> いくつかの地域で確信度が中程度 可能性が高い <sup>(e)</sup>	{12.4}
強い熱帯低気圧の 活動度の増加	長期(百年規模)変化の確信度が低い 1970 年以降北大西洋でほぼ確実 確信度が低い 1970 年以降いくつかの地域で可能性が高い	{2.6}	北西太平洋と北大西洋でどちらかと言 えば <sup>(i)</sup> いくつかの海域でどちらかと言え ば可能性が高い	{14.6}
極端に高い潮位の 発生や高さの増加	可能性が高い(1970 年以降) 可能性が高い(20 世紀後半) 可能性が高い	{3.7}	可能性が非常に高い <sup>(l)</sup> 可能性が非常に高い <sup>(m)</sup> 可能性が高い	{13.7}

**気候が変化すると  
異常気象が起こる？**

**YES**

**どのように対応したらいいか？**

# 気候の変化の予測の不確実性は大きい

## ○計算量が膨大で計算機能力が追いつかない

理由:

- ・長期間の計算が必要(100年程度 $\Leftrightarrow$ 1週間(天気予報))
- ・大気だけでなく、海洋の動きの同時計算も必要  
→粗い格子で計算するしかない

影響:

- ・地形の効果が表現できない
- ・雲が物理的に表現できない

問題と対応:

- モデルによって結果が異なる(モデル選択と相互比較)
- 強い雨が表現できない(観測データを用いた補正)
- 毎日のように弱い雨が降る(観測データを用いた補正)

# Bias Correction Scheme

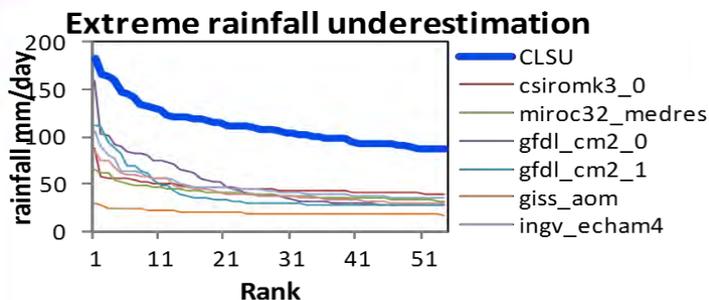
Rain Type

Threshold

Correction

豪雨

- 解析期間における 90 - 99% の日雨量を対象
- 観測値と同じ頻度でGCM出力も発生するとする。



一般化パレート分布(英:generalized Pareto distributions, GPD) を適用

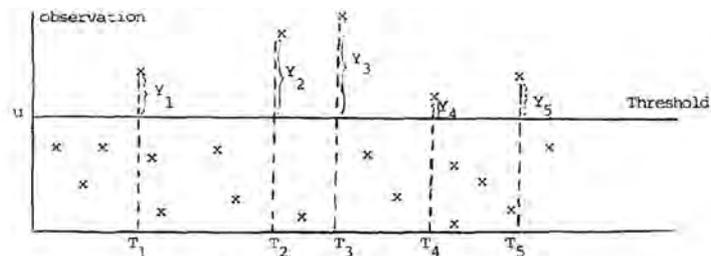
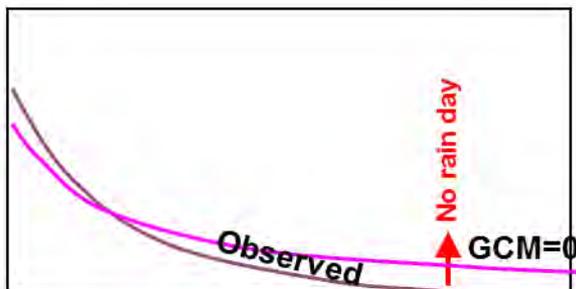


Fig. 2. Illustration of threshold model.

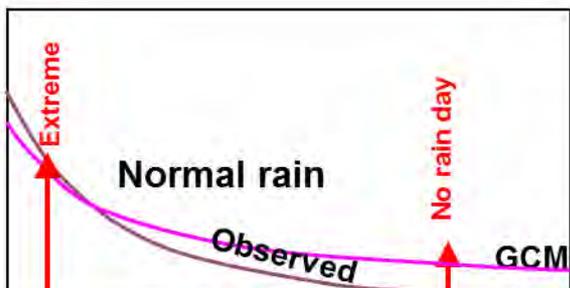
無降雨日



Ranking order statistics

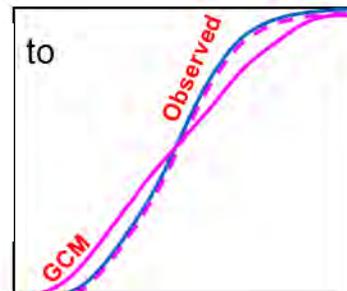
観測値、モデル出力を降雨強度順に並び替え、観測値の降雨が0になる順位を求め、その順位を下回る降雨を無降雨とする。

通常の雨

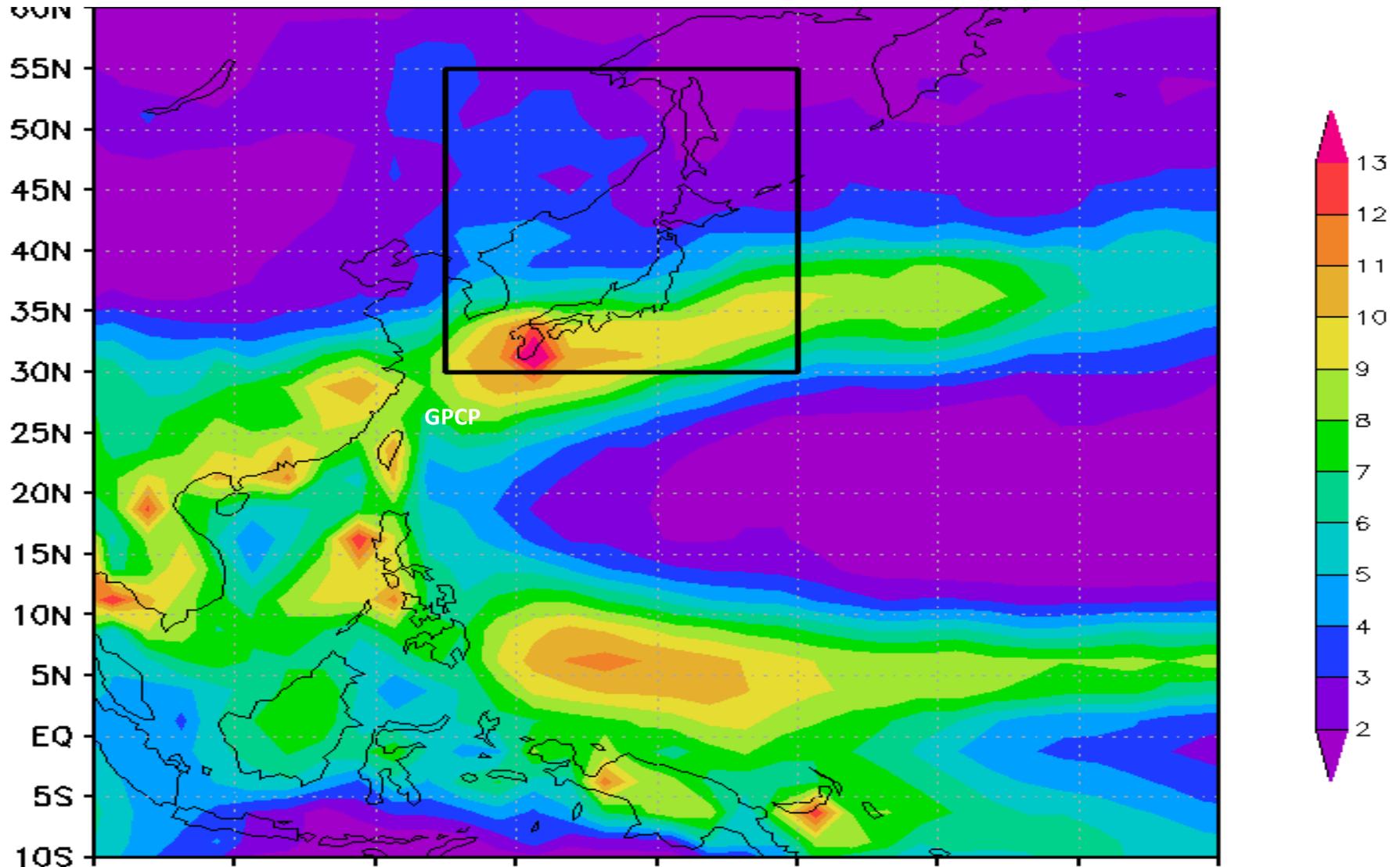


Gamma Distribution

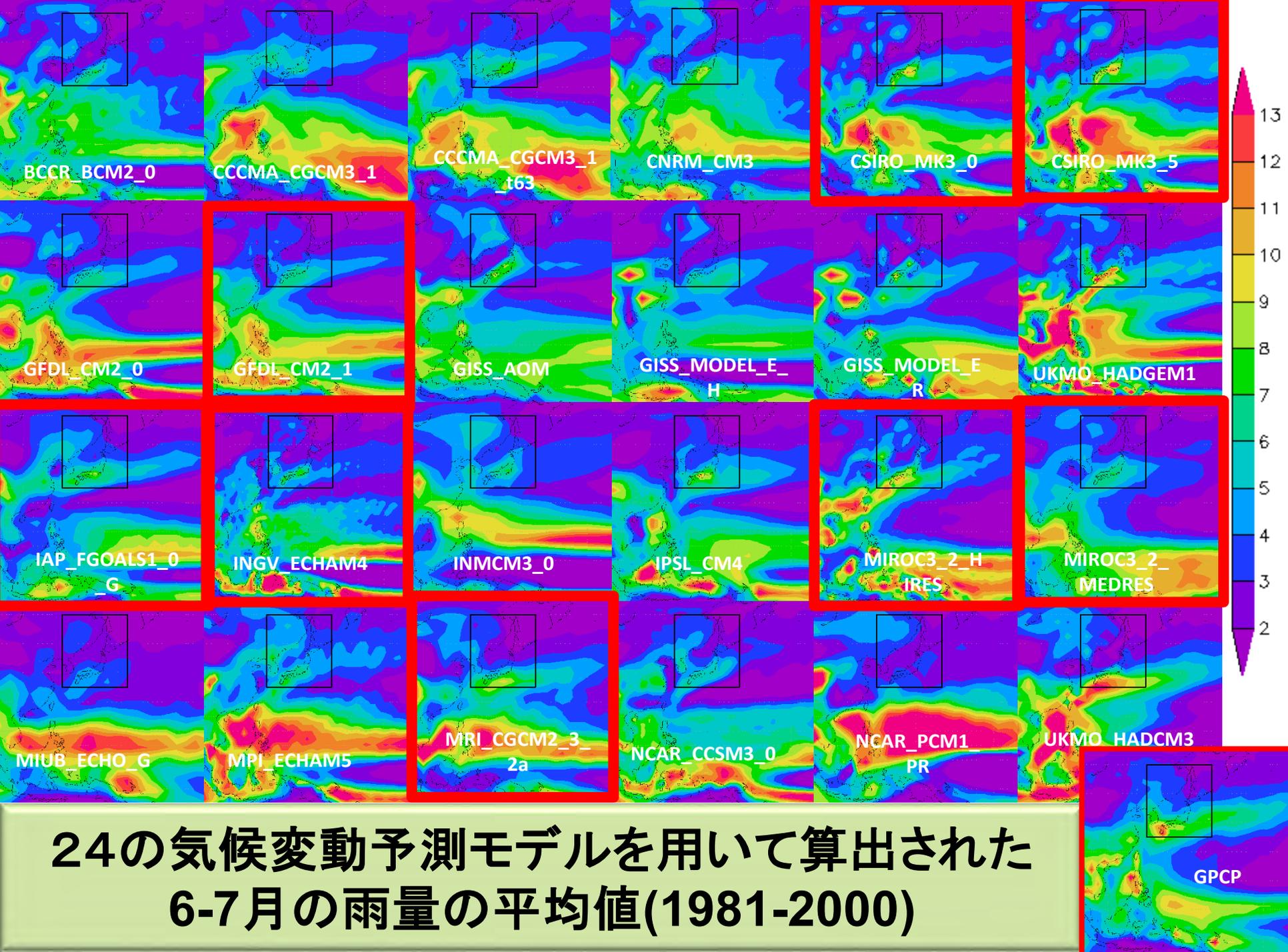
観測雨量の積算値の確率分布にガンマ関数を適用して、GCMの出力を補正



# 衛星によって観測された6-7月の雨量の平均値 (1981-2000)



*Basis of Spatial comparison*

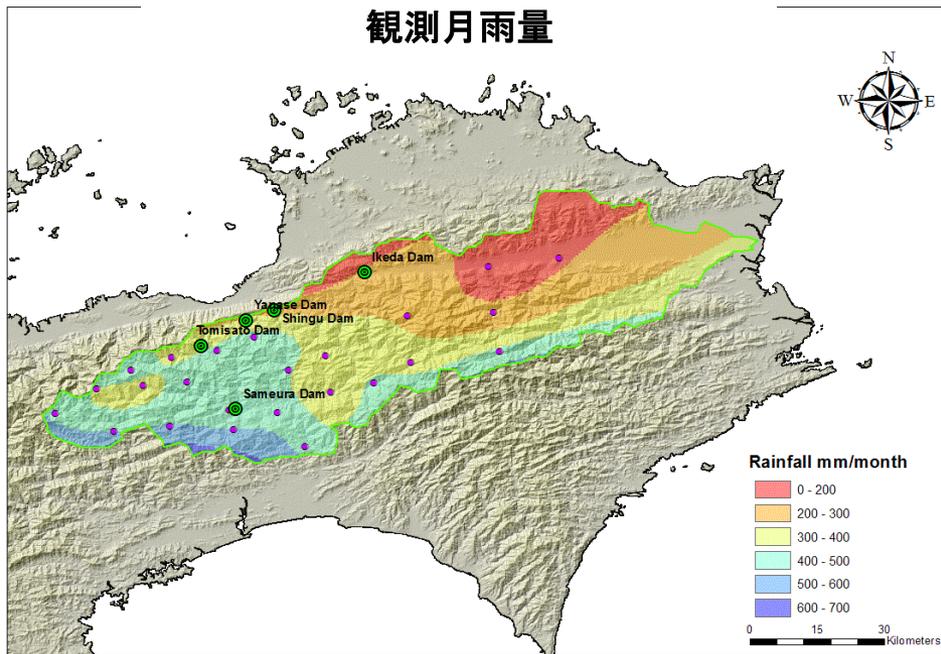


24の気候変動予測モデルを用いて算出された  
6-7月の雨量の平均値(1981-2000)

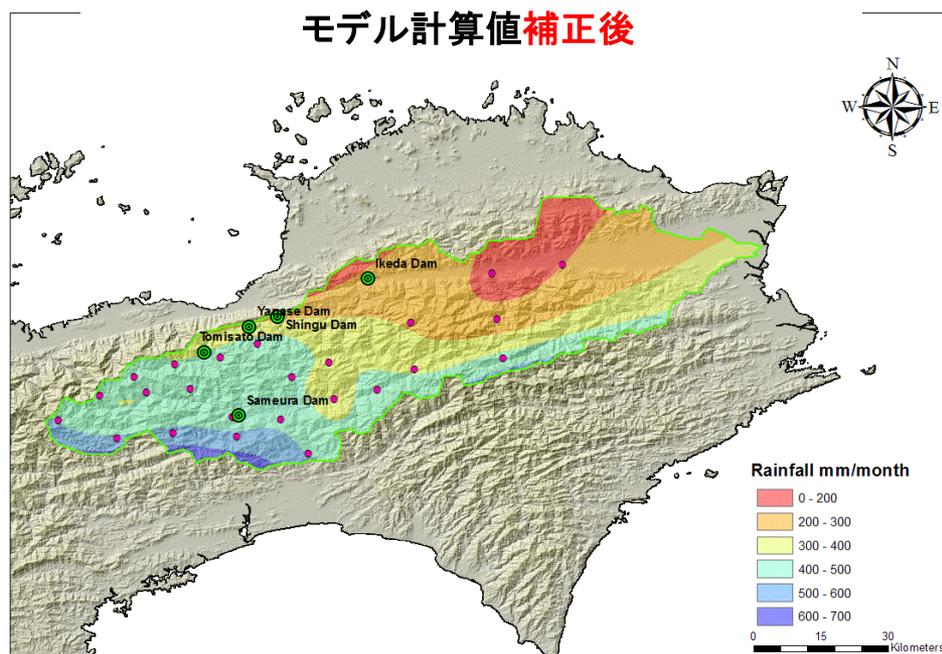
# 気候変動予測モデル出力の誤差補正(地域分布)

(1981-2000年の9月の20年間平均月降雨量)

観測月雨量



モデル計算値補正後



# 気候変動の予測結果は？

## 将来の四国の気候はとなると予測されたか？

(見ていただく資料)

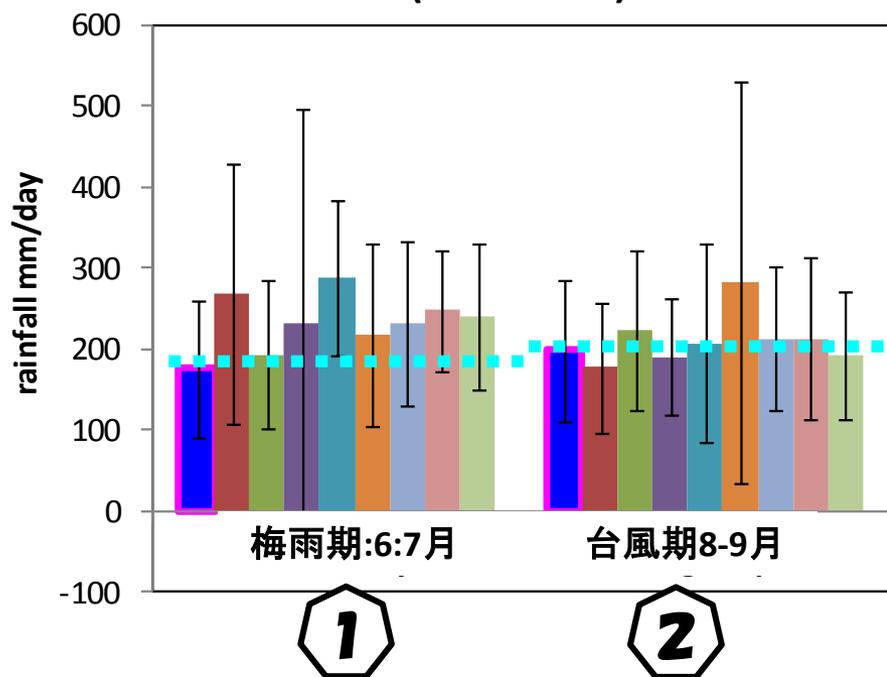
(資料の解説)

### 早明浦の季節降雨量の変化

(梅雨期:6-7月、台風期:8-9月)

豪雨(一時間に50ミリ以上の強い雨)

Extreme Rainfall (2046-2065) & standard deviation



青■:1981-2000年の20年間の平均月観測雨量  
その他:2046-2065年の気候変動モデルの  
計算結果の平均月降雨量

気候変動の予測結果を、梅雨期および台風期に絞って、ももう少し詳しく見ていきます。まず、豪雨についてです。

青■のグラフ(左端)は、1981年~2000年の20年間の平均月観測雨量です。その他の色■のグラフは、2046年~2065年の20年間の平均月観測雨量の予測結果です。

① 梅雨期は、8つ全てのモデルで豪雨の雨量が増加すると予測しており、ほぼ確実に激しい雨の雨量は増加すると考えられます。

② 台風期は、5つのモデルで豪雨の雨量が増加すると予測しており、どちらかと言えば激しい雨の雨量は増加の可能性があると考えられます。

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# CMIP5モデル選択、 バイアス補正の考え方

# CMIP5とは？

<http://cmip-pcmdi.llnl.gov/cmip5/>

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- 第5 期結合モデル相互比較計画(CMIP5)に提出された気候変動予測シミュレーション結果：
  - 過去(2005年まで)の現象をシミュレーション結果がどの程度表現しているか
  - 将来における気候変動のシナリオベースでの予測を2つのタイムスケールで予測(近未来:~2035、長期:~2100)
  - モデル間におけるシナリオベースで予測。

# GCM降水量の気候変動評価のための 3つのプロセス

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1. 対象としている地域において、GCM降水量の出力と観測結果を比較し、再現性の高いモデルの選択を行う。
2. 過去のGCM降水出力値と降水観測値を比較し、そのバイアスを補正する。将来においても過去のデータで補正したバイアスを将来にも適用する。
3. GCMのダウンスケーリング(解像度を高くする)  
例: 水文モデルへのインプット

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# 再現性の高いGCMの 選択方法

# GCMモデル選択の方法

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対象地域、また、対象気候要素に着目し、それが観測値と合っている（整合性が高い）**GCM**モデルを選択する。

過去のモデル出力結果と、それと同じ期間における参照データ（観測データ）との比較

-> **空間相関係数** (Scorr) と **平均二乗誤差**(RMSE) の算定

対象地域における鍵となるパラメータ、期間(時期・季節)において、DIASで開発した、CMIP5データ解析ツールを用いて、20年間の月ごとの平均をモデル出力結果と観測データ両方で計算し**Scorr** と **RMSE** を計算する。

簡単な点数化法(Scoring method)を用いて、それぞれのモデルのパフォーマンスを比較・評価する。

# DIAS Toolで使用している、各要素における参照データ(観測データ)のリスト

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- Specific Humidity(比湿): **JRA55**
- Precipitation(降水量): **GPCP**
- Sea Level Pressure(海面水温): **JRA55**
- Outgoing Longwave Radiation(上向き長波放射): **NOAA**
- Air Temperature(気温): **JRA55**
- Sea Surface Temperature(海面水温): **HADLEY**
- Ground Temperature(地上温度): **JRA55**
- Zonal Wind(東西風): **JRA55**
- Meridional wind(南北風): **JRA55**
- Geopotential Height(ジオポテンシャル高度): **JRA55**

# 検討に使用している要素

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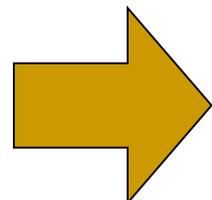
□ モデルのパフォーマンスは通常次の気象要素で評価している。

- |                                      |        |          |
|--------------------------------------|--------|----------|
| ■ Precipitation (降水量)                | (狭い領域) | (地表面)    |
| ■ Air Temperature (気温)               | (広い領域) | (850hPa) |
| ■ Geopotential Height (ジオポテンシャル高度)   | (広い領域) | (850hPa) |
| ■ Sea Surface Temperature (海面水温)     | (広い領域) | (地表面)    |
| ■ Outgoing Longwave Radiation (外向長波) | (広い領域) | (地表面)    |
| ■ Sea Level Pressure (海面気圧)          | (広い領域) | (海水面)    |
| ■ Zonal Wind (東西風)                   | (広い領域) | (850hPa) |
| ■ Meridional Wind (南北風)              | (広い領域) | (850hPa) |

# Scoring Method(点数化法)

- Scorr と RMSE の平均:
1. 解析月
  2. 全モデルの平均

Meteorological Element: Precipitation						
model	June		July		August	
	S_corr	RMSE	S_corr	RMSE	S_corr	RMSE
1 bccr_bcm2_0	0.61257	2.9636	0.64191	3.14939	0.654535	3.04457
2 cccma_cgcm3_1	0.67609	2.80544	0.702107	2.9001	0.705961	2.95936
3 cccma_cgcm3_1_t63	0.668077	2.82739	0.699067	2.92443	0.679764	3.07007
4 cnrm_cm3	0.525991	3.40764	0.616057	3.33114	0.658663	3.10189
5 csiro_mk3_0	0.634887	3.01851	0.701048	2.99784	0.804089	2.35907
6 csiro_mk3_5	0.604204	3.39617	0.637255	3.36531	0.765534	2.62358
7 gfdl_cm2_0	0.699975	2.881	0.764176	2.69764	0.722448	2.97213
8 gfdl_cm2_1	0.745677	2.67032	0.77535	2.70179	0.763758	2.77364
9 giss_aom	0.508475	3.4729	0.606315	3.34358	0.68674	2.94604
10 giss_model_e_h	0.522648	4.00037	0.475727	4.49904	0.450178	4.32617
11 giss_model_e_r	0.479788	3.83325	0.595113	3.79972	0.627638	3.51206
12 iap_fgoals1_0_g	0.2221	3.99231	0.45438	3.68498	0.606514	3.1221
13 ingv_echam4	0.712693	2.73918	0.644567	3.17053	0.718778	2.78949
14 inmcm3_0	0.493076	3.41301	0.555526	3.56882	0.655465	3.0002
15 ipsl_cm4	0.468554	3.56933	0.516445	3.75673	0.626658	3.24568
16 miroc3_2_hires	0.759938	2.6016	0.573135	3.74899	0.566137	3.67448
17 miroc3_2_medres	0.778193	2.40629	0.591421	3.54172	0.53499	3.64249
18 miub_echo_g	0.501836	3.57485	0.621491	3.41304	0.7526	2.53125
19 mpi_echam5	0.700632	3.27375	0.667879	3.54028	0.726193	3.01962
20 mri_cgcm2_3_2a	0.624962	3.32155	0.592236	3.59373	0.64089	3.25602
21 ncar_ccsm3_0	0.586914	3.15148	0.607632	3.33779	0.621849	3.3873
22 ncar_pcm1	0.592746	3.73951	0.510997	4.16259	0.593308	3.61601
23 ukmo_hadcm3	0.602475	3.87233	0.656899	3.7304	0.69017	3.61585
24 ukmo_hadgem1	0.63235	3.66643	0.713683	3.61798	0.747354	3.45026



	Analysis Period	
	S_corr	RMSE
	0.63634233	3.0525867
	0.69539267	2.8876333
	0.68230267	2.94063
	0.600237	3.2802233
	0.71334133	2.7918067
	0.66899767	3.1283533
	0.72886633	2.8502567
	0.761595	2.71525
	0.60051	3.2541733
	0.482851	4.2751933
	0.567513	3.71501
	0.42766467	3.5997967
	0.69201267	2.8997333
	0.56802233	3.3273433
	0.537219	3.5239133
	0.63307	3.34169
	0.634868	3.1968333
	0.625309	3.1730467
	0.69823467	3.2778833
	0.61936267	3.3904333
	0.605465	3.29219
	0.56568367	3.83937
	0.649848	3.7395267
	0.69779567	3.5782233
<b>Total Average</b>	<b>0.62885435</b>	<b>3.2946292</b>

Scorr と RMSE の値は DIAS CMIP5 tool で計算・取得できます。

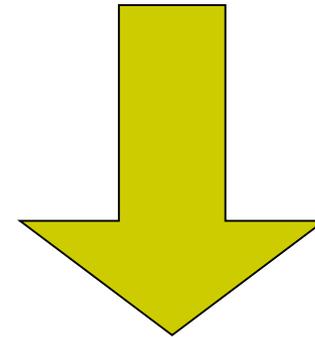
# 点数化の考え方

$$\text{Scorr}_{\text{model}} \geq \text{Scorr}_{\text{total average}} \Rightarrow \text{Index}_{\text{Scorr}} = 1$$

$$\text{Scorr}_{\text{model}} < \text{Scorr}_{\text{total average}} \Rightarrow \text{Index}_{\text{Scorr}} = 0$$

$$\text{RMSE}_{\text{model}} \leq \text{RMSE}_{\text{total average}} \Rightarrow \text{Index}_{\text{RMSE}} = 1$$

$$\text{RMSE}_{\text{model}} > \text{RMSE}_{\text{total average}} \Rightarrow \text{Index}_{\text{RMSE}} = 0$$



$$\text{Index}_{\text{Scorr}} = 1 \text{ and } \text{Index}_{\text{RMSE}} = 1 \Rightarrow \text{Index}_{\text{total}} = 1$$

$$\text{Index}_{\text{Scorr}} = 1 \text{ and } \text{Index}_{\text{RMSE}} = 0 \Rightarrow \text{Index}_{\text{total}} = 0$$

$$\text{Index}_{\text{Scorr}} = 0 \text{ and } \text{Index}_{\text{RMSE}} = 1 \Rightarrow \text{Index}_{\text{total}} = 0$$

$$\text{Index}_{\text{Scorr}} = 0 \text{ and } \text{Index}_{\text{RMSE}} = 0 \Rightarrow \text{Index}_{\text{total}} = -1$$

Analysis Period	
S_corr	RMSE
0.63634233	3.0525867
0.69539267	2.8876333
0.68230267	2.94063
0.600237	3.2802233
0.71334133	2.7918067
0.66899767	3.1283533
0.72886633	2.8502567
0.761595	2.71525
0.60051	3.2541733
0.482851	4.2751933
0.567513	3.71501
0.42766467	3.5997967
0.69201267	2.8997333
0.56802233	3.3273433
0.537219	3.5239133
0.63307	3.34169
0.634868	3.1968333
0.625309	3.1730467
0.69823467	3.2778833
0.61936267	3.3904333
0.605465	3.29219
0.56568367	3.83937
0.649848	3.7395267
0.69779567	3.5782233
<b>Total Average</b>	<b>0.62885435</b>
	<b>3.2946292</b>

# Scoring Method(点数化法)

## –Grand Total Score (総合計点)

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最終的に、それぞれのモデル出力において、全ての要素における指標を合計し、次の式により総合計点が計算される。

Grand Total Score(総合計点) =

$$= \text{Index}_{\text{total}}(\text{precip}) + \text{Index}_{\text{total}}(\text{air temp.}) + \text{Index}_{\text{total}}(\text{geopot. heigh}) + \dots$$

総合計点の高いモデルを、気候変動影響評価のモデルとして利用する。





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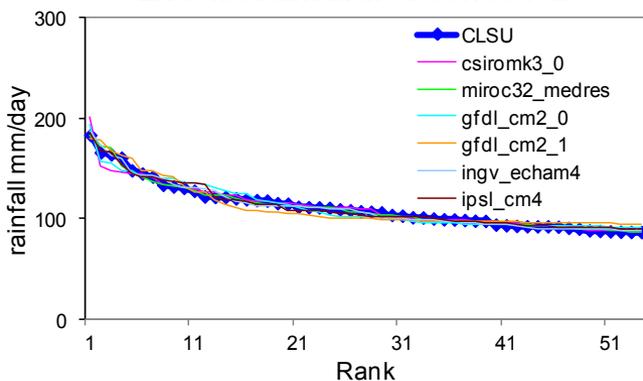
# バイアス補正の方法

# なぜ、GCM降水量のバイアス補正が必要か？

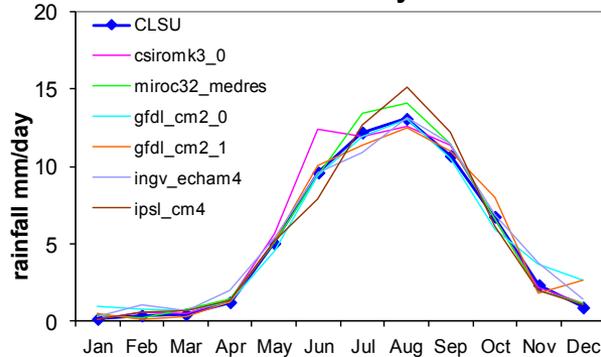
## GCM降水量の主な問題点

- 豪雨の値が小さい（ほとんどのGCMで豪雨が過小評価）
- 通常の雨も合っていない(季節変動が小さい、値の差が大きい)
- 無降雨日が少ない（非現実的な多くの小雨日が出力される）

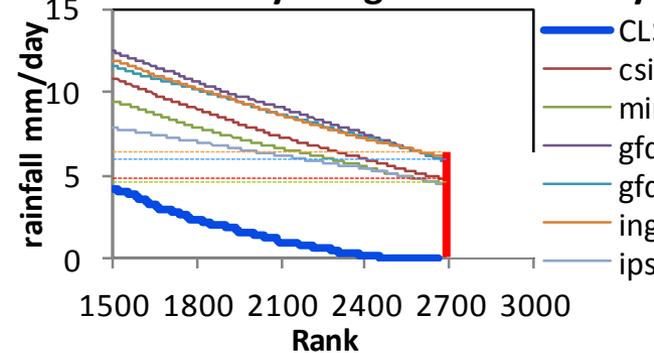
Extreme rainfall after correction



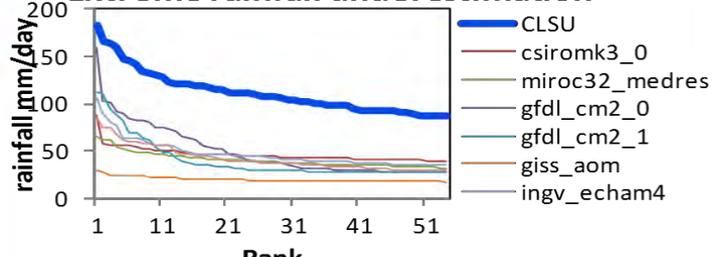
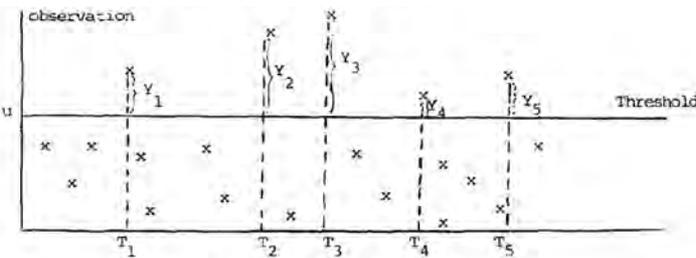
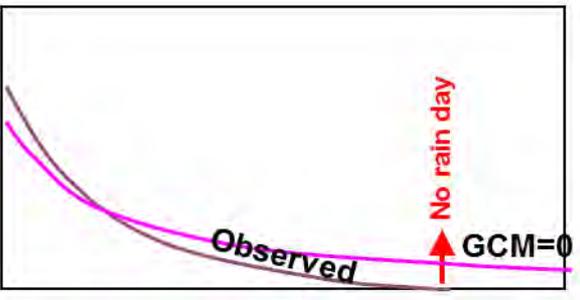
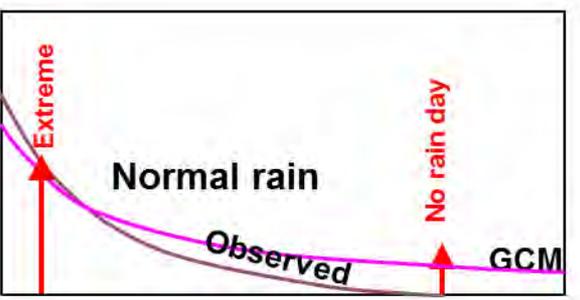
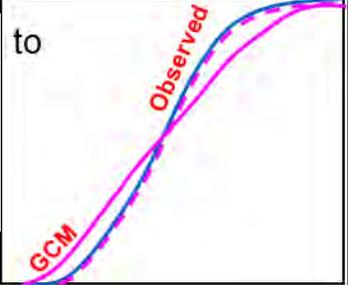
Biascorrected monthly distribution



Low intensity long drizzel rain day



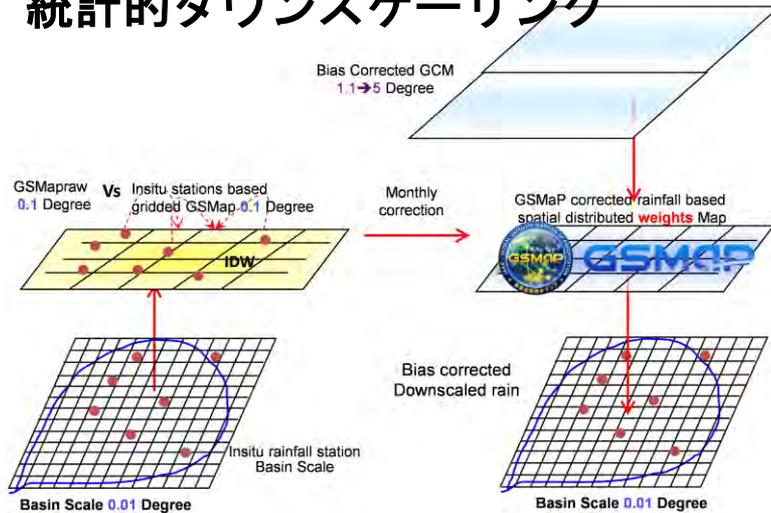
# Bias Correction Scheme

Rain Type	Threshold	Correction
<p><b>豪雨</b></p> 	<ul style="list-style-type: none"> <li>解析期間における <b>90 - 99%</b> の日雨量を対象</li> <li>観測値と同じ頻度でGCM出力も発生するとする。</li> </ul> <p><b>Extreme rainfall underestimation</b></p> 	<p>一般化パレート分布(英:generalized Pareto distributions, GPD) を適用</p>  <p>Fig. 2. Illustration of threshold model.</p>
<p><b>無降雨日</b></p> 		<p><b>Ranking order statistics</b></p> <p>観測値、モデル出力を降雨強度順に並び替え、観測値の降雨が0になる順位を求め、その順位を下回る降雨を無降雨とする。</p>
<p><b>通常の雨</b></p> 		<p><b>Gamma Distribution</b></p> <p>観測雨量の積算値の確率分布にガンマ関数を適用して、GCMの出力を補正</p> 

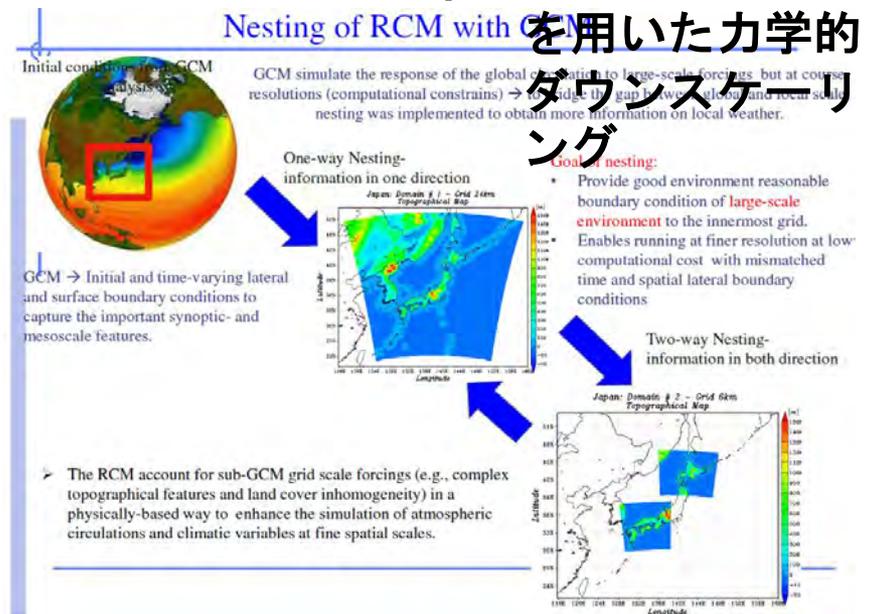
# GCM出力の空間分解能の問題

- 空間分解能が粗い

## 統計的ダウンスケーリング



ダウンスケーリング(より詳細な空間分解能へ) 領域気候モデルを用いた力学的



を用いた力学的ダウンスケーリング

- Goal of nesting:
  - Provide good environment reasonable boundary condition of large-scale environment to the innermost grid.
  - Enables running at finer resolution at low computational cost with mismatched time and spatial lateral boundary conditions

- モデル間によるばらつき



複数のモデルの解析

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# 実習： 利根川流域を対象に

*by Petra Koudelova*

# Step 1: Model Selection(モデル選択)

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- DIAS で開発した CMIP5 解析ツールを利用
- 対象地域における、GCMの過去の降水量出力(1979 - 2005)と参照データ(観測データ)を比較、評価
- 今回は、地上降水量、地上気温、ジオポテンシャル高度(850hPa)の値で評価。
- 今回は、夏期(6~8月)の3ヶ月を対象とする。

# Folder organization(ディレクトリ構成)

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## □ **ModelSelection**

- MODEL\_LIST.xlsx
- MODEL\_SELECTION\_TEMPLATE.xlsx
- MODEL\_SELECTION\_Petra.xlsx
- DIASToolURL.docx

# 対象とするGCMのリスト : **MODEL\_LIST.xlsx**

## ディレクトリ名: **ModelSelection**

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ACCESS1.0@ens\_mean  
BCC-CSM1.1@ens\_mean  
CESM1(BGC)@ens\_mean  
CNRM-CM5@ens\_mean  
CanESM2@ens\_mean  
FGOALS-g2@ens\_mean  
GISS-E2-R-CC@ens\_mean  
HadGEM2-ES@ens\_mean  
GFDL-CM3@ens\_mean  
IPSL-CM5A-MR@ens\_mean  
MIROC-ESM@ens\_mean  
MIROC5@ens\_mean  
MPI-ESM-MR@ens\_mean  
MRI-CGCM3@ens\_mean  
NorESM1-M@ens\_mean

# 評価シート名: MODEL\_SELECTION\_TEMPLATE.xlsx

## ディレクトリ: ModelSelection

Coordinates of the inspection areas for model selection														
Country	Small Scale Area (precip)			Large Scale (other elements)			Level (Tair, Geopot. Height)							
Japan	32-42N, 135-145E			5-60N, 80-160E			850hPa							
Model selection analysis														
PRECIPITATION (small area)		JUNE		JULY		AUGUST								
Model	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE	S_corr	RMSE	S_corr Index	RMSE Index	Total Index Precip	Grand Total	Models	descending
ACCESS1.0@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	ACCESS1.0@ens_mean	0
BCC-CSM1.1@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	BCC-CSM1.1@ens_mean	0
CESM1(BGC)@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	CESM1(BGC)@ens_mean	0
CNRM-CM5@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	CNRM-CM5@ens_mean	0
CanESM2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	CanESM2@ens_mean	0
FGOALS-g2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	FGOALS-g2@ens_mean	0
GFDL-CM3@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	GFDL-CM3@ens_mean	0
GISS-E2-R-CC@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	GISS-E2-R-CC@ens_mear	0
HadGEM2-ES@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	HadGEM2-ES@ens_mear	0
IPSL-CM5A-MR@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	IPSL-CM5A-MR@ens_me	0
MIROC-ESM@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	MIROC-ESM@ens_mean	0
MIROC5@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	MIROC5@ens_mean	0
MPI-ESM-MR@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	MPI-ESM-MR@ens_mear	0
MRI-CGCM3@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	MRI-CGCM3@ens_mean	0
NorESM1-M@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	NorESM1-M@ens_mean	0
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	total average		0.00	0.00		
AIR TEMPERATURE (large area, 850hPa)														
		JUNE		JULY		AUGUST								
Model	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE	S_corr	RMSE	S_corr Index	RMSE Index	Total Index Air Temp			
ACCESS1.0@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
BCC-CSM1.1@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CESM1(BGC)@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CNRM-CM5@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CanESM2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
FGOALS-g2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
GFDL-CM3@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
GISS-E2-R-CC@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			

## Scoring (点数化)

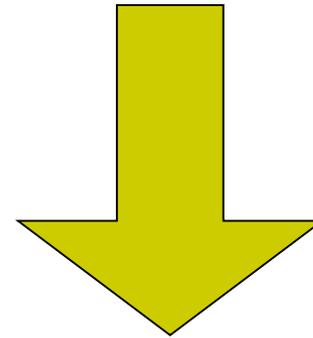
	S_corr Index	RMSE Index	Total Index	Gr To
	1	1	1	
	1	1	1	
	1	1	1	
	0	1	0	
	1	1	1	
	1	1	1	
	1	1	1	
	1	1	1	
	0	1	0	
	0	0	-1	
	0	0	-1	
	0	0	-1	
	1	1	1	
	0	0	-1	
	0	0	-1	
	1	0	0	
	1	1	1	
	0	1	0	
	1	1	1	
	0	0	-1	
	0	1	0	
	0	0	-1	
	1	0	0	
	1	0	0	

$$\text{Scorr}_{\text{model}} \geq \text{Scorr}_{\text{total average}} \Rightarrow \text{Index}_{\text{Scorr}} = 1$$

$$\text{Scorr}_{\text{model}} < \text{Scorr}_{\text{total average}} \Rightarrow \text{Index}_{\text{Scorr}} = 0$$

$$\text{RMSE}_{\text{model}} \leq \text{RMSE}_{\text{total average}} \Rightarrow \text{Index}_{\text{RMSE}} = 1$$

$$\text{RMSE}_{\text{model}} > \text{RMSE}_{\text{total average}} \Rightarrow \text{Index}_{\text{RMSE}} = 0$$



$$\text{Index}_{\text{Scorr}} = 1 \text{ and } \text{Index}_{\text{RMSE}} = 1 \Rightarrow \text{Index}_{\text{total}} = 1$$

$$\text{Index}_{\text{Scorr}} = 1 \text{ and } \text{Index}_{\text{RMSE}} = 0 \Rightarrow \text{Index}_{\text{total}} = 0$$

$$\text{Index}_{\text{Scorr}} = 0 \text{ and } \text{Index}_{\text{RMSE}} = 1 \Rightarrow \text{Index}_{\text{total}} = 0$$

$$\text{Index}_{\text{Scorr}} = 0 \text{ and } \text{Index}_{\text{RMSE}} = 0 \Rightarrow \text{Index}_{\text{total}} = -1$$

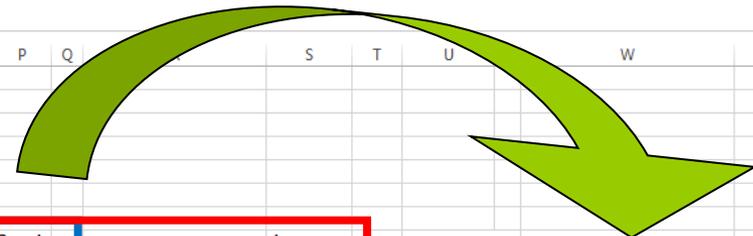
# 評価シート名: MODEL\_SELECTION\_TEMPLATE.xlsx

## ディレクトリ: ModelSelection

Coordinates of the inspection areas for model selection														
Country	Small Scale Area (precip)				Large Scale (other elements)				Level (Tair, Geopot. Height)					
Japan	32-42N, 135-145E				5-60N, 80-160E				850hPa					
Model selection analysis														
PRECIPITATION (small area)														
Model	JUNE		JULY		AUGUST		S_corr	RMSE	S_corr Index	RMSE Index	Total Index Precip	Grand Total	Models	descending
	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE								
ACCESS1.0@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	ACCESS1.0@ens_mean	0
BCC-CSM1.1@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	BCC-CSM1.1@ens_mean	0
CESM1(BGC)@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	CESM1(BGC)@ens_mean	0
CNRM-CM5@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	CNRM-CM5@ens_mean	0
CanESM2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	CanESM2@ens_mean	0
FGOALS-g2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	FGOALS-g2@ens_mean	0
GFDL-CM3@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	GFDL-CM3@ens_mean	0
GISS-E2-R-CC@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	GISS-E2-R-CC@ens_mear	0
HadGEM2-ES@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	HadGEM2-ES@ens_mear	0
IPSL-CM5A-MR@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	IPSL-CM5A-MR@ens_me	0
MIROC-ESM@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	MIROC-ESM@ens_mean	0
MIROC5@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	MIROC5@ens_mean	0
MPI-ESM-MR@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	MPI-ESM-MR@ens_mear	0
MRI-CGCM3@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	MRI-CGCM3@ens_mean	0
NorESM1-M@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-3	NorESM1-M@ens_mean	0
Total average							0.00	0.00						
AIR TEMPERATURE (large area, 850hPa)														
Model	JUNE		JULY		AUGUST		S_corr	RMSE	S_corr Index	RMSE Index	Total Index Air Temp			
	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE								
ACCESS1.0@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
BCC-CSM1.1@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CESM1(BGC)@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CNRM-CM5@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CanESM2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
FGOALS-g2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
GFDL-CM3@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
GISS-E2-R-CC@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			

# 評価シート名: MODEL\_SELECTION\_Petra.xlsx

## ディレクトリ: ModelSelection



Coordinates of the inspection areas for model selection												
Country	Small Scale Area (precip)				Large Scale (other elements)				Level (Tair, Geopot. Height)			
Japan	32-42N, 135-145E				5-60N, 80-160E				850hPa			
Model selection analysis												
PRECIPITATION												
	JUNE		JULY		AUGUST							
Model	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE	S_corr	RMSE	S_corr	RMSE	Total Index	
ACCESS1.0@ens_mean	0.948	1.164	0.737	1.377	-0.07	2.332	0.32	0.97	0	0	-1	1
BCC-CSM1.1@ens_mean	0.647	2.042	0.723	2.173	0.518	1.157	0.38	1.07	1	0	0	-2
CESM1(BGC)@ens_mean	0.539	2.155	0.77	1.175	0.467	1.155	0.36	0.90	1	1	1	1
CNRM-CM5@ens_mean	0.714	1.78	0.747	1.273	0.388	1.27	0.37	0.86	1	1	1	3
CanESM2@ens_mean	0.323	2.473	0.862	0.742	-0.1	1.478	0.22	0.94	0	1	0	0
FGOALS-g2@ens_mean	0.921	2.547	0.733	1.015	0.273	1.248	0.39	0.96	1	0	0	0
GFDL-CM3@ens_mean	0.936	1.519	0.355	1.174	0.773	0.753	0.41	0.69	1	1	1	3
GISS-E2-R-CC@ens_mean	0.787	1.784	0.785	2.224	0.318	2.421	0.38	1.29	1	0	0	1
HadGEM2-ES@ens_mean	0.93	1.481	0.722	1.022	0.189	2.585	0.37	1.02	1	0	0	0
IPSL-CM5A-MR@ens_mean	0.65	2.119	0.756	1.207	0.584	1.353	0.40	0.94	1	1	1	1
MIROC-ESM@ens_mean	0.357	2.3	0.567	0.951	-0.15	1.218	0.16	0.89	0	1	0	-1
MIROC5@ens_mean	0.629	2.069	0.542	1.495	0.428	1.317	0.32	0.98	0	0	-1	-1
MPI-ESM-MR@ens_mean	0.325	2.349	0.618	1.358	0.275	1.321	0.24	1.01	0	0	-1	0
MRI-CGCM3@ens_mean	0.934	1.799	0.833	1.015	0.49	1.517	0.45	0.87	1	1	1	3
NorESM1-M@ens_mean	0.879	1.298	0.755	1.184	0.011	1.578	0.33	0.81	0	1	0	-1
	<b>0.70</b>	<b>1.93</b>	<b>0.70</b>	<b>1.29</b>	<b>0.29</b>	<b>1.51</b>	Total average	<b>0.34</b>	<b>0.95</b>			
AIR TEMPERATURE												
	JUNE		JULY		AUGUST							
Model	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE	S_corr	RMSE	S_corr	RMSE	Total Index	
ACCESS1.0@ens_mean	0.962	1.255	0.902	1.37	0.952	1.096	0.56	0.74	1	1	1	1
BCC-CSM1.1@ens_mean	0.779	3.446	0.591	3.172	0.712	3.259	0.42	1.98	0	0	-1	-1
CESM1(BGC)@ens_mean	0.933	1.701	0.808	1.945	0.885	1.812	0.53	1.09	0	1	0	0
CNRM-CM5@ens_mean	0.962	1.356	0.876	1.645	0.925	1.406	0.55	0.88	1	1	1	1
CanESM2@ens_mean	0.923	2.053	0.806	2.679	0.856	2.316	0.52	1.41	0	0	-1	-1
FGOALS-g2@ens_mean	0.979	2.19	0.938	2.028	0.961	2.081	0.58	1.26	1	0	0	0
GFDL-CM3@ens_mean	0.986	2.107	0.974	1.611	0.981	1.507	0.59	1.05	1	1	1	1
GISS-E2-R-CC@ens_mean	0.954	2.053	0.909	2.08	0.919	2.065	0.56	1.24	1	1	1	1
HadGEM2-ES@ens_mean	0.968	1.127	0.939	1.091	0.968	0.903	0.58	0.62	1	1	1	1
IPSL-CM5A-MR@ens_mean	0.947	4.116	0.911	4.353	0.941	4.581	0.56	2.61	1	0	0	0
MIROC-ESM@ens_mean	0.905	2.587	0.622	3.084	0.859	2.546	0.48	1.64	0	0	-1	-1
MIROC5@ens_mean	0.87	2.174	0.633	2.629	0.773	2.306	0.46	1.42	0	0	-1	-1
MPI-ESM-MR@ens_mean	0.974	1.336	0.952	1.166	0.969	1.177	0.58	0.74	1	1	1	1
MRI-CGCM3@ens_mean	0.961	1.671	0.931	1.534	0.974	1.511	0.57	0.94	1	1	1	1

Grand Total	Models	descending
1	ACCESS1.0@ens_mean	0
-2	BCC-CSM1.1@ens_mean	0
1	CESM1(BGC)@ens_mean	0
3	CNRM-CM5@ens_mean	0
0	CanESM2@ens_mean	0
0	FGOALS-g2@ens_mean	0
3	GFDL-CM3@ens_mean	0
1	GISS-E2-R-CC@ens_mean	0
0	HadGEM2-ES@ens_mean	0
1	IPSL-CM5A-MR@ens_mean	0
-1	MIROC-ESM@ens_mean	0
-1	MIROC5@ens_mean	0
0	MPI-ESM-MR@ens_mean	0
3	MRI-CGCM3@ens_mean	0
-1	NorESM1-M@ens_mean	0



## Login

Authentication for DIAS Systems

日本語

Enter your Email address and Password

Email Address:

fa@hydrat.u-tokyo.ac.jp

ユーザ名

Password:

パスワード

Warn me before logging me into other sites.

LOGIN clear

ログインボタン

- Forgot your password ? [Please reset your password](#)
- [Please register](#) if you don't have a account.

Out and Exit your web browser when you are done accessing services that require

[1] Intercomparison with Re-analysis Data

[2] Comparison of Global Warming Projection

[3] Tools for CMIP5 Analysis

2-D Statistical Analysis ▾ Execute

Climate Models ▾ Execute

Bias Correction (in-situ) ▾ Execute

CMIP5 Data Viewer

Hide Insu

Help

Institute Model Experiment Time

e Length Path

クリックすると、新規にウィンドウが開く  
(インタラクティブ ウィンドウ)

*Firstly, please select data files using CMIP5 Data Viewer!*

**注意！！：**

この新しく開くウィンドウは、データと連動しているため、解析をしている間(ツールを使用している間)は、閉じないでください。

## Description

## Filter

<b>Institute</b>	<input checked="" type="checkbox"/> BCC <input checked="" type="checkbox"/> BNU <input checked="" type="checkbox"/> CCCMA <input checked="" type="checkbox"/> CMCC <input checked="" type="checkbox"/> CNRM-CERFACS <input checked="" type="checkbox"/> COLA-CFS <input checked="" type="checkbox"/> CSIRO-BOM <input checked="" type="checkbox"/> CSIRO-QCCCE <input checked="" type="checkbox"/> FIO <input checked="" type="checkbox"/> ICHEC <input checked="" type="checkbox"/> INM <input checked="" type="checkbox"/> INPE <input checked="" type="checkbox"/> IPSL <input checked="" type="checkbox"/> LASG-CESSE <input checked="" type="checkbox"/> LASG-IAP <input checked="" type="checkbox"/> MIROC <input checked="" type="checkbox"/> MOHC <input checked="" type="checkbox"/> MPI-M <input checked="" type="checkbox"/> MRI <input checked="" type="checkbox"/> NASA-GISS <input checked="" type="checkbox"/> NASA-GMAO <input checked="" type="checkbox"/> NCAR <input checked="" type="checkbox"/> NCC <input checked="" type="checkbox"/> NCEP <input checked="" type="checkbox"/> NICAM <input checked="" type="checkbox"/> NIMR-KMA <input checked="" type="checkbox"/> NOAA-GFDL <input checked="" type="checkbox"/> NSF-DOE-NCAR <input checked="" type="checkbox"/> SMHI <input checked="" type="checkbox"/> UNSW
Select All	
Clear All	
<b>Model</b>	<input checked="" type="checkbox"/> ACCESS1.0 <input checked="" type="checkbox"/> ACCESS1.3 <input checked="" type="checkbox"/> BCC-CSM1.1 <input checked="" type="checkbox"/> BCC-CSM1.1(m) <input checked="" type="checkbox"/> BNU-ESM <input checked="" type="checkbox"/> CanAM4 <input checked="" type="checkbox"/> CanCM4 <input checked="" type="checkbox"/> CanESM2 <input checked="" type="checkbox"/> CCSM4 <input checked="" type="checkbox"/> CESM1(BGC) <input checked="" type="checkbox"/> CESM1(CAM5) <input checked="" type="checkbox"/> CESM1(CAM5.1.FV2) <input checked="" type="checkbox"/> CESM1(FASTCHEM) <input checked="" type="checkbox"/> CESM1(WACCM) <input checked="" type="checkbox"/> CFSv2-2011 <input checked="" type="checkbox"/> CMCC-CESM <input checked="" type="checkbox"/> CMCC-CM <input checked="" type="checkbox"/> CMCC-CMS <input checked="" type="checkbox"/> CNRM-CM5 <input checked="" type="checkbox"/> CNRM-CM5-2 <input checked="" type="checkbox"/> CSIRO-Mk3.6.0 <input checked="" type="checkbox"/> CSIRO-Mk3L-1-2 <input checked="" type="checkbox"/> EC-EARTH <input checked="" type="checkbox"/> FGOALS-g2 <input checked="" type="checkbox"/> FGOALS-g1 <input checked="" type="checkbox"/> FGOALS-s2 <input checked="" type="checkbox"/> FIO-ESM <input checked="" type="checkbox"/> GEOS-5 <input checked="" type="checkbox"/> GFDL-CM2.1 <input checked="" type="checkbox"/> GFDL-CM3 <input checked="" type="checkbox"/> GFDL-ESM2G <input checked="" type="checkbox"/> GFDL-ESM2M <input checked="" type="checkbox"/> GFDL-HIRAM-C180 <input checked="" type="checkbox"/> GFDL-HIRAM-C360 <input checked="" type="checkbox"/> GISS-E2-H <input checked="" type="checkbox"/> GISS-E2-H-CC <input checked="" type="checkbox"/> GISS-E2-R <input checked="" type="checkbox"/> GISS-E2-R-CC <input checked="" type="checkbox"/> HadCM3 <input checked="" type="checkbox"/> HadGEM2-A <input checked="" type="checkbox"/> HadGEM2-AO <input checked="" type="checkbox"/> HadGEM2-CC <input checked="" type="checkbox"/> HadGEM2-ES <input checked="" type="checkbox"/> INM-CM4 <input checked="" type="checkbox"/> IPSL-CM5A-LR <input checked="" type="checkbox"/> IPSL-CM5A-MR <input checked="" type="checkbox"/> IPSL-CM5B-LR <input checked="" type="checkbox"/> MIROC-ESM <input checked="" type="checkbox"/> MIROC-ESM-CHEM <input checked="" type="checkbox"/> MIROC4h <input checked="" type="checkbox"/> MIROC5 <input checked="" type="checkbox"/> MPI-ESM-LR <input checked="" type="checkbox"/> MPI-ESM-MR <input checked="" type="checkbox"/> MPI-ESM-P <input checked="" type="checkbox"/> MRI-AGCM3.2H <input checked="" type="checkbox"/> MRI-AGCM3.2S <input checked="" type="checkbox"/> MRI-CGCM3 <input checked="" type="checkbox"/> MRI-ESM1 <input checked="" type="checkbox"/> NICAM-09 <input checked="" type="checkbox"/> NorESM1-M <input checked="" type="checkbox"/> NorESM1-ME
Select All	
Clear All	
<b>Experiment</b>	<input checked="" type="checkbox"/> 1pctCO2 <input checked="" type="checkbox"/> abrupt4xCO2 <input checked="" type="checkbox"/> amip <input checked="" type="checkbox"/> amip4K <input checked="" type="checkbox"/> amip4xCO2 <input checked="" type="checkbox"/> amipFuture <input checked="" type="checkbox"/> aqua4K <input checked="" type="checkbox"/> aqua4xCO2 <input checked="" type="checkbox"/> aquaControl <input checked="" type="checkbox"/> decadal1959 <input checked="" type="checkbox"/> decadal1960 <input checked="" type="checkbox"/> decadal1961 <input checked="" type="checkbox"/> decadal1962 <input checked="" type="checkbox"/> decadal1963 <input checked="" type="checkbox"/> decadal1964 <input checked="" type="checkbox"/> decadal1965 <input checked="" type="checkbox"/> decadal1966 <input checked="" type="checkbox"/> decadal1967 <input checked="" type="checkbox"/> decadal1968 <input checked="" type="checkbox"/> decadal1969 <input checked="" type="checkbox"/> decadal1970 <input checked="" type="checkbox"/> decadal1971 <input checked="" type="checkbox"/> decadal1972 <input checked="" type="checkbox"/> decadal1973 <input checked="" type="checkbox"/> decadal1974 <input checked="" type="checkbox"/> decadal1975 <input checked="" type="checkbox"/> decadal1976 <input checked="" type="checkbox"/> decadal1977 <input checked="" type="checkbox"/> decadal1978 <input checked="" type="checkbox"/> decadal1979 <input checked="" type="checkbox"/> decadal1980 <input checked="" type="checkbox"/> decadal1981 <input checked="" type="checkbox"/> decadal1982 <input checked="" type="checkbox"/> decadal1983 <input checked="" type="checkbox"/> decadal1984 <input checked="" type="checkbox"/> decadal1985 <input checked="" type="checkbox"/> decadal1986 <input checked="" type="checkbox"/> decadal1987 <input checked="" type="checkbox"/> decadal1988 <input checked="" type="checkbox"/> decadal1989 <input checked="" type="checkbox"/> decadal1990 <input checked="" type="checkbox"/> decadal1991 <input checked="" type="checkbox"/> decadal1992 <input checked="" type="checkbox"/> decadal1993 <input checked="" type="checkbox"/> decadal1994 <input checked="" type="checkbox"/> decadal1995 <input checked="" type="checkbox"/> decadal1996 <input checked="" type="checkbox"/> decadal1997 <input checked="" type="checkbox"/> decadal1998 <input checked="" type="checkbox"/> decadal1999 <input checked="" type="checkbox"/> decadal2000 <input checked="" type="checkbox"/> decadal2001 <input checked="" type="checkbox"/> decadal2002 <input checked="" type="checkbox"/> decadal2003 <input checked="" type="checkbox"/> decadal2004 <input checked="" type="checkbox"/> decadal2005 <input checked="" type="checkbox"/> decadal2006 <input checked="" type="checkbox"/> decadal2007 <input checked="" type="checkbox"/> decadal2008 <input checked="" type="checkbox"/> decadal2009 <input checked="" type="checkbox"/> decadal2010 <input checked="" type="checkbox"/> decadal2011 <input checked="" type="checkbox"/> decadal2012 <input checked="" type="checkbox"/> esmControl <input checked="" type="checkbox"/> esmFdbk1 <input checked="" type="checkbox"/> esmFdbk2 <input checked="" type="checkbox"/> esmFixClim1 <input checked="" type="checkbox"/> esmFixClim2 <input checked="" type="checkbox"/> esmHistorical <input checked="" type="checkbox"/> esmrcp85 <input checked="" type="checkbox"/> historical <input checked="" type="checkbox"/> historicalExt <input checked="" type="checkbox"/> historicalGHG <input checked="" type="checkbox"/> historicalMisc <input checked="" type="checkbox"/> historicalNat <input checked="" type="checkbox"/> lgm <input checked="" type="checkbox"/> midHolocene <input checked="" type="checkbox"/> noVolc1960 <input checked="" type="checkbox"/> noVolc1965 <input checked="" type="checkbox"/> noVolc1970 <input checked="" type="checkbox"/> noVolc1975 <input checked="" type="checkbox"/> noVolc1980 <input checked="" type="checkbox"/> noVolc1985 <input checked="" type="checkbox"/> noVolc1990 <input checked="" type="checkbox"/> noVolc1995 <input checked="" type="checkbox"/> noVolc2000 <input checked="" type="checkbox"/> noVolc2005 <input checked="" type="checkbox"/> past1000 <input checked="" type="checkbox"/> piControl <input checked="" type="checkbox"/> rcp26 <input checked="" type="checkbox"/> rcp45 <input checked="" type="checkbox"/> rcp60 <input checked="" type="checkbox"/> rcp85 <input checked="" type="checkbox"/> sst2030 <input checked="" type="checkbox"/> sst2090 <input checked="" type="checkbox"/> sst2090rcp45 <input checked="" type="checkbox"/> sstClim <input checked="" type="checkbox"/> sstClim4xCO2 <input checked="" type="checkbox"/> sstClimAerosol <input checked="" type="checkbox"/> sstClimSulfate <input checked="" type="checkbox"/> volcIn2010
Select All	
Clear All	
<b>Frequency</b>	<input checked="" type="checkbox"/> 3hr <input checked="" type="checkbox"/> 6hr <input checked="" type="checkbox"/> day <input checked="" type="checkbox"/> fx <input checked="" type="checkbox"/> mon <input checked="" type="checkbox"/> monClim <input checked="" type="checkbox"/> subhr <input checked="" type="checkbox"/> yr
Select All	
Clear All	
<b>Product</b>	<input checked="" type="checkbox"/> output <input checked="" type="checkbox"/> output1 <input checked="" type="checkbox"/> output2 <input checked="" type="checkbox"/> restricted <input checked="" type="checkbox"/> unsolicited
Select All	
Clear All	
<b>aerosol</b>	<input checked="" type="checkbox"/> abs550aer <input checked="" type="checkbox"/> cdnc <input checked="" type="checkbox"/> cldnci <input checked="" type="checkbox"/> cldncl <input checked="" type="checkbox"/> cldnvi <input checked="" type="checkbox"/> concaerh2o <input checked="" type="checkbox"/> concbb <input checked="" type="checkbox"/> concbc <input checked="" type="checkbox"/> concen <input checked="" type="checkbox"/> concdms <input checked="" type="checkbox"/> concdust <input checked="" type="checkbox"/> concnh4 <input checked="" type="checkbox"/> concno3 <input checked="" type="checkbox"/> concoa <input checked="" type="checkbox"/> concpoa <input checked="" type="checkbox"/> concso2 <input checked="" type="checkbox"/> concso4 <input checked="" type="checkbox"/> concsoa <input checked="" type="checkbox"/> concss <input checked="" type="checkbox"/> drybc <input checked="" type="checkbox"/> drydms <input checked="" type="checkbox"/> drydust <input checked="" type="checkbox"/> drynh3 <input checked="" type="checkbox"/> drynh4 <input checked="" type="checkbox"/> dryoa <input checked="" type="checkbox"/> drypoa <input checked="" type="checkbox"/> dryso2 <input checked="" type="checkbox"/> dryso4 <input checked="" type="checkbox"/> drysoa <input checked="" type="checkbox"/> dryss <input checked="" type="checkbox"/> ec550aer <input checked="" type="checkbox"/> emibb <input checked="" type="checkbox"/> emibc <input checked="" type="checkbox"/> emidms <input checked="" type="checkbox"/> emidust <input checked="" type="checkbox"/> eminh3 <input checked="" type="checkbox"/> emioa <input checked="" type="checkbox"/> emipoa <input checked="" type="checkbox"/> emiso2 <input checked="" type="checkbox"/> emiso4 <input checked="" type="checkbox"/> emiss <input checked="" type="checkbox"/> inc <input checked="" type="checkbox"/> loadbc <input checked="" type="checkbox"/> loaddust <input checked="" type="checkbox"/> loadnh4 <input checked="" type="checkbox"/> loadno3 <input checked="" type="checkbox"/> loadoa <input checked="" type="checkbox"/> loadpoa <input checked="" type="checkbox"/> loadso4 <input checked="" type="checkbox"/> loadsoa <input checked="" type="checkbox"/> loadss <input checked="" type="checkbox"/> od550aer <input checked="" type="checkbox"/> od550It1aer <input checked="" type="checkbox"/> od870aer <input checked="" type="checkbox"/> reffclwc <input checked="" type="checkbox"/> reffclws <input checked="" type="checkbox"/> reffclwtop <input checked="" type="checkbox"/> rdsdcsdiff <input checked="" type="checkbox"/> rdsdiff <input checked="" type="checkbox"/> sconcbc <input checked="" type="checkbox"/> sconcdust <input checked="" type="checkbox"/> sconcnh4 <input checked="" type="checkbox"/> sconcnco3 <input checked="" type="checkbox"/> sconcoa <input checked="" type="checkbox"/> sconcpoa <input checked="" type="checkbox"/> sconcsco4 <input checked="" type="checkbox"/> sconcscoa <input checked="" type="checkbox"/> sconcss <input checked="" type="checkbox"/> wetbc <input checked="" type="checkbox"/> wetdms <input checked="" type="checkbox"/> wetdust <input checked="" type="checkbox"/> wetnh4 <input checked="" type="checkbox"/> wetoa <input checked="" type="checkbox"/> wetpoa <input checked="" type="checkbox"/> wetso2 <input checked="" type="checkbox"/> wetso4 <input checked="" type="checkbox"/> wetsoa <input checked="" type="checkbox"/> wetss
Select All	
Clear All	
	<input checked="" type="checkbox"/> albiscpp <input checked="" type="checkbox"/> areacella <input checked="" type="checkbox"/> atb532 <input checked="" type="checkbox"/> boxptopiscpp <input checked="" type="checkbox"/> boxtauisccpp <input checked="" type="checkbox"/> ccb <input checked="" type="checkbox"/> ccbClim <input checked="" type="checkbox"/> cct <input checked="" type="checkbox"/> cctClim <input checked="" type="checkbox"/> cfadDbze94 <input checked="" type="checkbox"/> cfadLidarsr532 <input checked="" type="checkbox"/> cfc113global <input checked="" type="checkbox"/> cfc11global <input checked="" type="checkbox"/> cfc12global <input checked="" type="checkbox"/> ch4 <input checked="" type="checkbox"/> ch4global <input checked="" type="checkbox"/> ch4mmr <input checked="" type="checkbox"/> ci <input checked="" type="checkbox"/> ciClim <input checked="" type="checkbox"/> cl <input checked="" type="checkbox"/> clc <input checked="" type="checkbox"/> clcalipso <input checked="" type="checkbox"/> clcalipso2 <input checked="" type="checkbox"/> clClim <input checked="" type="checkbox"/> clhcalipso <input checked="" type="checkbox"/> clhmodis <input checked="" type="checkbox"/> cli <input checked="" type="checkbox"/> clic <input checked="" type="checkbox"/> cliClim

[1] Intercomparison with Re-analysis Data

[2] Comparison of Global Warming Projection

[3] Tools for CMIP5 Analysis

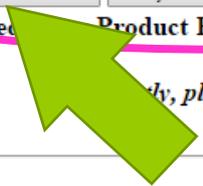
2-D Statistical Analysis ▾ Execute

Climate Models ▾ Execute

Bias Correction (in-situ) ▾ Execute

CMIP5 Data Viewer | Hide Unsupported Items | Gray Out Unsupported Items | Show All Items || Show Description | Hide Description || Help

Institute Model Experiment Time Frequency Product Realm Variable CMOR Table Ensemble Version Start End Calendar Size Time Length Path



*By the way, please select data files using CMIP5 Data Viewer!*

[Description](#)

### Filter

**Institute**  
  
  
 BCC  BNU  CCCMA  CMCC  CNRM-CERFACS  COLA-CFS  CSIRO-BOM  CSIRO-QCCCE  FIO  ICHEC  INM  INPE  IPSL  LASG-CESSE  
 LASG-IAP  MIROC  MOHC  MPI-M  MRI  NASA-GISS  NASA-GMAO  NCAR  NCC  NCEP  NICAM  NIMR-KMA  NOAA-GFDL  
 NSF-DOE-NCAR  SMHI  UNSW

**Model**  
  
  
 ACCESS1.0  ACCESS1.3  BCC-CSM1.1  BCC-CSM1.1(m)  BNU-ESM  CanAM4  CanCM4  CanESM2  CCSM4  CESM1(BGC)  CESM1(CAM5)  
 CESM1(CAM5.1.FV2)  CESM1(FASTCHEM)  CESM1(WACCM)  CFSv2-2011  CMCC-CESM  CMCC-CM  CMCC-CMS  CNRM-CM5  CNRM-CM5-2  
 CSIRO-Mk3.6.0  CSIRO-Mk3L-1-2  EC-EARTH  FGOALS-g2  FGOALS-g1  FGOALS-s2  FIO-ESM  GEOS-5  GFDL-CM2.1  GFDL-CM3  
 GFDL-ESM2G  GFDL-ESM2M  GFDL-HIRAM-C180  GFDL-HIRAM-C360  GISS-E2-H  GISS-E2-H-CC  GISS-E2-R  GISS-E2-R-CC  HadCM3  
 HadGEM2-A  HadGEM2-AO  HadGEM2-CC  HadGEM2-ES  INM-CM4  IPSL-CM5A-LR  IPSL-CM5A-MR  IPSL-CM5B-LR  MIROC-ESM  
 MIROC-ESM-CHEM  MIROC4h  MIROC5  MPI-ESM-LR  MPI-ESM-MR  MPI-ESM-P  MRI-AGCM3.2H  MRI-AGCM3.2S  MRI-CGCM3  MRI-ESM1  
 MRI-CGCM3.2A1  MRI-CGCM3.2A2  MRI-CGCM3.2A3  MRI-CGCM3.2A3.1  MRI-CGCM3.2A3.2  MRI-CGCM3.2A3.3  MRI-CGCM3.2A3.3.1  MRI-CGCM3.2A3.3.2  MRI-CGCM3.2A3.3.3  MRI-CGCM3.2A3.3.4  MRI-CGCM3.2A3.3.5  MRI-CGCM3.2A3.3.6  MRI-CGCM3.2A3.3.7  MRI-CGCM3.2A3.3.8  MRI-CGCM3.2A3.3.9  MRI-CGCM3.2A3.3.10  MRI-CGCM3.2A3.3.11  MRI-CGCM3.2A3.3.12  MRI-CGCM3.2A3.3.13  MRI-CGCM3.2A3.3.14  MRI-CGCM3.2A3.3.15  MRI-CGCM3.2A3.3.16  MRI-CGCM3.2A3.3.17  MRI-CGCM3.2A3.3.18  MRI-CGCM3.2A3.3.19  MRI-CGCM3.2A3.3.20  MRI-CGCM3.2A3.3.21  MRI-CGCM3.2A3.3.22  MRI-CGCM3.2A3.3.23  MRI-CGCM3.2A3.3.24  MRI-CGCM3.2A3.3.25  MRI-CGCM3.2A3.3.26  MRI-CGCM3.2A3.3.27  MRI-CGCM3.2A3.3.28  MRI-CGCM3.2A3.3.29  MRI-CGCM3.2A3.3.30  MRI-CGCM3.2A3.3.31  MRI-CGCM3.2A3.3.32  MRI-CGCM3.2A3.3.33  MRI-CGCM3.2A3.3.34  MRI-CGCM3.2A3.3.35  MRI-CGCM3.2A3.3.36  MRI-CGCM3.2A3.3.37  MRI-CGCM3.2A3.3.38  MRI-CGCM3.2A3.3.39  MRI-CGCM3.2A3.3.40  MRI-CGCM3.2A3.3.41  MRI-CGCM3.2A3.3.42  MRI-CGCM3.2A3.3.43  MRI-CGCM3.2A3.3.44  MRI-CGCM3.2A3.3.45  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MRI-CGCM3.2A3.3.472  MRI-CGCM3.2A3.3.473  MRI-CGCM3.2A3.3.474  MRI-CGCM3.2A3.3.475

[Description](#)

## Filter

<b>Institute</b>	<input checked="" type="checkbox"/> BCC <input checked="" type="checkbox"/> BNU <input checked="" type="checkbox"/> CCCMA <input checked="" type="checkbox"/> CMCC <input checked="" type="checkbox"/> CNRM-CERFACS <input checked="" type="checkbox"/> COLA-CFS <input checked="" type="checkbox"/> CSIRO-BOM <input checked="" type="checkbox"/> CSIRO-QCCCE <input checked="" type="checkbox"/> FIO <input checked="" type="checkbox"/> ICHEC <input checked="" type="checkbox"/> INM <input checked="" type="checkbox"/> INPE <input checked="" type="checkbox"/> IPSL <input checked="" type="checkbox"/> LASG-CESS <input type="button" value="Select All"/> <input type="button" value="Clear All"/>
<b>Model</b>	<input checked="" type="checkbox"/> LASG-IAP <input checked="" type="checkbox"/> MIROC <input checked="" type="checkbox"/> MOHC <input checked="" type="checkbox"/> MPI-M <input checked="" type="checkbox"/> MRI <input checked="" type="checkbox"/> NASA-GISS <input checked="" type="checkbox"/> NASA-GMAO <input checked="" type="checkbox"/> NCAR <input checked="" type="checkbox"/> NCC <input checked="" type="checkbox"/> NCEP <input checked="" type="checkbox"/> NICAM <input checked="" type="checkbox"/> NIMR-KMA <input checked="" type="checkbox"/> NOAA-GFDL <input checked="" type="checkbox"/> NSF-DOE-NCAR <input checked="" type="checkbox"/> SMHI <input checked="" type="checkbox"/> UNSW <input type="checkbox"/> ACCESS1.0 <input type="checkbox"/> ACCESS1.3 <input type="checkbox"/> BCC-CSM1.1 <input type="checkbox"/> BCC-CSM1.1(m) <input type="checkbox"/> BNU-ESM <input type="checkbox"/> CanAM4 <input type="checkbox"/> CanCM4 <input type="checkbox"/> CanESM2 <input type="checkbox"/> CCSM4 <input type="checkbox"/> CESM1(BGC) <input type="checkbox"/> CESM1(CAM5) <input type="checkbox"/> CESM1(CAM5.1.FV2) <input type="checkbox"/> CESM1(FASTCHEM) <input type="checkbox"/> CESM1(WACCM) <input type="checkbox"/> CFSv2-2011 <input type="checkbox"/> CMCC-CESM <input type="checkbox"/> CMCC-CM <input type="checkbox"/> CMCC-CMS <input type="checkbox"/> CNRM-CM5 <input type="checkbox"/> CNRM-CM5-2 <input type="checkbox"/> CSIRO-Mk3.6.0 <input type="checkbox"/> CSIRO-Mk3L-1-2 <input type="checkbox"/> EC-EARTH <input type="checkbox"/> FGOALS-g2 <input type="checkbox"/> FGOALS-g1 <input type="checkbox"/> FGOALS-s2 <input type="checkbox"/> FIO-ESM <input type="checkbox"/> GEOS-5 <input type="checkbox"/> GFDL-CM2.1 <input type="checkbox"/> GFDL-CM3 <input type="checkbox"/> GFDL-ESM2G <input type="checkbox"/> GFDL-ESM2M <input type="checkbox"/> GFDL-HIRAM-C180 <input type="checkbox"/> GFDL-HIRAM-C360 <input type="checkbox"/> GISS-E2-H <input type="checkbox"/> GISS-E2-H-CC <input type="checkbox"/> GISS-E2-R <input type="checkbox"/> GISS-E2-R-CC <input type="checkbox"/> HadCM3 <input type="checkbox"/> HadGEM2-A <input type="checkbox"/> HadGEM2-AO <input type="checkbox"/> HadGEM2-CC <input type="checkbox"/> HadGEM2-ES <input type="checkbox"/> INM-CM4 <input type="checkbox"/> IPSL-CM5A-LR <input type="checkbox"/> IPSL-CM5A-MR <input type="checkbox"/> IPSL-CM5B-LR <input type="checkbox"/> MIROC-ESM <input type="checkbox"/> MIROC-ESM-CHEM <input type="checkbox"/> MIROC4h <input type="checkbox"/> MIROC5 <input type="checkbox"/> MPI-ESM-LR <input type="checkbox"/> MPI-ESM-MR <input type="checkbox"/> MPI-ESM-P <input type="checkbox"/> MRI-AGCM3.2H <input type="checkbox"/> MRI-AGCM3.2S <input type="checkbox"/> MRI-CGCM3 <input type="checkbox"/> MRI-ESM1 <input type="checkbox"/> NICAM-09 <input type="checkbox"/> NorESM1-M <input type="checkbox"/> NorESM1-ME
<b>Experiment</b>	<input type="button" value="Select All"/> <input type="button" value="Clear All"/> <input checked="" type="checkbox"/> historical <input checked="" type="checkbox"/> historicalExt <input checked="" type="checkbox"/> rcp26 <input checked="" type="checkbox"/> rcp45 <input checked="" type="checkbox"/> rcp60 <input checked="" type="checkbox"/> rcp85
<b>Frequency</b>	<input type="button" value="Select All"/> <input type="button" value="Clear All"/> <input checked="" type="checkbox"/> day <input checked="" type="checkbox"/> mon <input checked="" type="checkbox"/> yr
<b>Product</b>	<input type="button" value="Select All"/> <input type="button" value="Clear All"/> <input checked="" type="checkbox"/> output1 <input checked="" type="checkbox"/> output2
<b>Variable</b>	<div style="background-color: #d9ead3; padding: 2px;"><b>atmos</b></div> <input type="button" value="Select All"/> <input checked="" type="checkbox"/> hurs <input checked="" type="checkbox"/> huss <input checked="" type="checkbox"/> pr <input checked="" type="checkbox"/> prc <input checked="" type="checkbox"/> prsn <input checked="" type="checkbox"/> psl <input checked="" type="checkbox"/> rlds <input checked="" type="checkbox"/> rlus <input checked="" type="checkbox"/> rsds <input checked="" type="checkbox"/> rsus <input checked="" type="checkbox"/> sbl <input checked="" type="checkbox"/> ta <input checked="" type="checkbox"/> tas <input checked="" type="checkbox"/> tasmax <input checked="" type="checkbox"/> tasmin <input checked="" type="checkbox"/> ts <input checked="" type="checkbox"/> ua <input checked="" type="checkbox"/> uas <input checked="" type="checkbox"/> va <input checked="" type="checkbox"/> vas <input checked="" type="checkbox"/> zg <input type="button" value="Clear All"/> <div style="background-color: #d9ead3; padding: 2px;"><b>ocean</b></div> <input type="button" value="Select All"/> <input checked="" type="checkbox"/> tos <input type="button" value="Clear All"/>
<b>Ensemble</b>	<input type="button" value="Select All"/> <input type="button" value="Clear All"/> <input checked="" type="checkbox"/> r10i1p1 <input checked="" type="checkbox"/> r11i1p1 <input checked="" type="checkbox"/> r12i1p1 <input checked="" type="checkbox"/> r13i1p1 <input checked="" type="checkbox"/> r14i1p1 <input checked="" type="checkbox"/> r1i1p1 <input checked="" type="checkbox"/> r1i1p2 <input checked="" type="checkbox"/> r1i1p3 <input checked="" type="checkbox"/> r1i2p1 <input checked="" type="checkbox"/> r1i2p2 <input checked="" type="checkbox"/> r2i1p1 <input checked="" type="checkbox"/> r2i1p2 <input checked="" type="checkbox"/> r2i1p3 <input checked="" type="checkbox"/> r2i2p1 <input checked="" type="checkbox"/> r3i1p1 <input checked="" type="checkbox"/> r3i1p2 <input checked="" type="checkbox"/> r3i1p3 <input checked="" type="checkbox"/> r3i2p1 <input checked="" type="checkbox"/> r4i1p1 <input checked="" type="checkbox"/> r4i1p2 <input checked="" type="checkbox"/> r4i1p3 <input checked="" type="checkbox"/> r5i1p1 <input checked="" type="checkbox"/> r5i1p2 <input checked="" type="checkbox"/> r5i1p3 <input checked="" type="checkbox"/> r6i1p1 <input checked="" type="checkbox"/> r6i1p3 <input checked="" type="checkbox"/> r7i1p1 <input checked="" type="checkbox"/> r8i1p1 <input checked="" type="checkbox"/> r9i1p1

## Data Summary

Row  Column

	<input type="button" value="Total"/>
--	--------------------------------------

**Institute**  
 BCC  BNU  CCCMA  CMCC  CNRM-CERFACS  COLA-CFS  CSIRO-BOM  CSIRO-QCCCE  FIO  ICHEC  INM  INPE  IPSL  LASG-CESS  LASG-IAP  MIROC  MOHC  MPI-M  MRI  NASA-GISS  NASA-GMAO  NCAR  NCC  NCEP  NICAM  NIMR-KMA  NOAA-GFDL  NSF-DOE-NCAR  SMHI  UNSW

**Model**  
 ACCESS1.0  ACCESS1.3  BCC-CSM1.1  BCC-CSM1.1(m)  BNU-ESM  CanAM4  CanCM4  CanESM2  CCSM4  CESM1(BGC)  CESM1(CAM5)  CESM1(CAM5.1.FV2)  CESM1(FASTCHEM)  CESM1(WACCM)  CFSv2-2011  CMCC-CESM  CMCC-CM  CMCC-CMS  CNRM-CM5  CNRM-CM5-2  CSIRO-Mk3.6.0  CSIRO-Mk3L-1-2  EC-EARTH  FGOALS-g2  FGOALS-g1  FGOALS-s2  FIO-ESM  GEOS-5  GFDL-CM2.1  GFDL-CM3  GFDL-ESM2G  GFDL-ESM2M  GFDL-HIRAM-C180  GFDL-HIRAM-C360  GISS-E2-H  GISS-E2-H-CC  GISS-E2-R  GISS-E2-R-CC  HadCM3  HadGEM2-A  HadGEM2-AO  HadGEM2-CC  HadGEM2-ES  INM-CM4  IPSL-CM5A-LR  IPSL-CM5A-MR  IPSL-CM5B-LR  MIROC-ESM  MIROC-ESM-CHEM  MIROC4h  MIROC5  MPI-ESM-LR  MPI-ESM-MR  MPI-ESM-P  MRI-AGCM3.2H  MRI-AGCM3.2S  MRI-CGCM3  MRI-ESM1  NICAM-09  NorESM1-M  NorESM1-ME

**Experiment**  
 historical  historicalExt  rcp26  rcp45  rcp60  rcp85

**Frequency**  
 day  mon  yr

**Product**  
 output1  output2

**Variable**  
**atmos**  
 hus  pr  ps1  rlut  ta  tas  ts  ua  va  zg  
**ocean**  
 tos

**Ensemble**  
 r10i1p1  r11i1p1  r12i1p1  r13i1p1  r14i1p1  r1i1p1  r1i1p121  r1i1p124  r1i1p125  r1i1p126  r1i1p127  r1i1p128  r1i1p2  r1i1p3  r1i2p1  r1i2p2  r2i1p1  r2i1p2  r2i1p3  r2i2p1  r3i1p2  r3i1p3  r3i2p1  r4i1p1  r4i1p2  r4i1p3  r5i1p1  r5i1p2  r5i1p3  r6i1p1  r6i1p2  r6i1p3  r7i1p1  r8i1p1  r9i1p1

## Data Summary

Row	Institute	Column	Model																			
		Total	ACCESS1.0	BCC-CSM1.1	CanESM2	CESM1(BGC)	CNRM-CM5	FGOALS-g2	GFDL-CM3	GISS-E2-R-CC	HadGEM2-ES	IPSL-CM5A-MR	MIROC-ESM	MIROC5	MPI-ESM-MR	MRI-CGCM3				NorESM1-M		
<b>Total</b>		183DSs 6215files 1.4TB	8DSs 60files 28.8GB	8DSs 60files 28.8GB	20DSs 110files 55.6GB	4DSs 37files 57.2GB	30DSs 670files 306.1GB	9DSs 958files 29.9GB	12DSs 1859files 60.9GB	4DSs 121files 13.7GB	18DSs 601files 150.3GB	12DSs 86files 87.9GB	11DSs 65files 43.7GB	20DSs 690files 155.9GB	8DSs 320files 68.6GB	12DSs 486files 245.5GB	<b>Total</b>				5 34	
<b>BCC</b>		8DSs 60files 28.8GB																			<b>BCC</b>	
<b>BNU</b>																					<b>BNU</b>	
<b>CCCMA</b>		20DSs 110files 55.6GB			20DSs 110files 55.6GB																<b>CCCMA</b>	
<b>CMCC</b>																					<b>CMCC</b>	
<b>CNRM-CERFACS</b>		30DSs 670files 306.1GB					30DSs 670files 306.1GB														<b>CNRM-CERFACS</b>	
<b>COLA-CFS</b>																					<b>COLA-CFS</b>	
<b>CSIRO-BOM</b>		7DSs 93files 64.6GB	7DSs 93files 64.6GB																		<b>CSIRO-BOM</b>	

**Model**  
 ACCESS1.0  BCC-CSM1.1  BCC-CSM1.1(m)  BNU-ESM  CanAM4  CanAM4  CanESM2  CCSM4  CESM1(BGC)  CESM1(CAM5)  CESM1(CAM5.1.FV2)  CESM1(FASTCHEM)  CESM1(WACCM)  CFSv2-2011  CMCC-CESM  CMCC-CM  CMCC-CMS  CNRM-CM5  CNRM-CM5-2  CSIRO-Mk3.6.0  CSIRO-Mk3L-1-2  ECHAM5  FGOALS-g2  FGOALS-gl  FGOALS-s2  FIO-ESM  GEOS-5  GFDL-CM2.1  GFDL-CM3  GFDL-ESM2G  GFDL-ESM2M  GFDL-HIRAM-C180  GFDL-HIRAM-C360  GISS-E2-H-CC  GISS-E2-R  GISS-E2-R-CC  HadCM3  HadGEM2-A  HadGEM2-AO  HadGEM2-CC  HadGEM2-ES  INM-CM4  IPSL-CM5A-LR  IPSL-CM5A-MR  IPSL-CM5A-MR3  MIROC-ESM  MIROC-ESM-CHEM  MIROC4h  MIROC5  MPI-ESM-LR  MPI-ESM-MR  MPI-ESM-P  MRI-AGCM3.2H  MRI-AGCM3.2S  MRI-CGCM3  MRI-ESM1.0  NorESM1-M  NorESM1-ME

**Experiment**  
 historical  historicalExt  rcp26  rcp45  rcp60  rcp85

**Frequency**  
 day  mon  yr

**Product**  
 output1  output2

**Variable**

**atmos**  
 hus  pr  ps1  rlut  ta  tas  ts  ua  va  zg

**ocean**  
 tos

**Ensemble**  
 r10i1p1  r11i1p1  r12i1p1  r13i1p1  r14i1p1  r1i1p1  r1i1p121  r1i1p124  r1i1p125  r1i1p126  r1i1p127  r1i1p128  r1i1p2  r1i1p3  r1i2p1  r1i2p2  r2i1p1  r2i1p2  r2i1p3  r3i1p2  r3i1p3  r3i2p1  r4i1p1  r4i1p2  r4i1p3  r5i1p1  r5i1p2  r5i1p3  r6i1p1  r6i1p2  r6i1p3  r7i1p1  r8i1p1  r9i1p1

## Data Summary

Row  Column

	Total	historical	rcp85
<b>Total</b>	183DSs 6215files 1.4TB	122DSs 4767files 1.0TB	61DSs 1448files 353.7GB
<b>ACCESS1.0</b>	7DSs 93files 64.6GB	5DSs 77files 53.6GB	2DSs 16files 11.0GB
<b>BCC-CSM1.1</b>	8DSs 60files 28.8GB	6DSs 33files 17.9GB	2DSs 27files 10.8GB
<b>CanESM2</b>	20DSs 110files 55.6GB	10DSs 55files 34.6GB	10DSs 55files 21.1GB
<b>CESM1(BGC)</b>	4DSs 37files 57.2GB	2DSs 21files 35.6GB	2DSs 16files 21.7GB
<b>CNRM-CM5</b>	30DSs 670files 306.1GB	20DSs 460files 213.7GB	10DSs 210files 92.5GB
<b>FGOALS-g2</b>	9DSs 958files	7DSs 758files	2DSs 200files



# Data Summary

Row	Model	Column	Experiment
		<b>Total</b>	<b>historical</b> <b>rcp85</b>
<b>Total</b>		183DSs 6215files 1.4TB	122DSs 4767files 1.0TB
ACCESS1.0		7DSs 93files 64.6GB	5DSs 77files 53.6GB
BCC-CSM1.1		8DSs 60files 28.8GB	6DSs 33files 17.9GB
CanESM2		20DSs 110files 55.6GB	10DSs 55files 34.6GB
CESM1(BGC)		4DSs 37files 57.2GB	2DSs 21files 35.6GB
CNRM-CM5		30DSs 670files 306.1GB	20DSs 460files 213.7GB
FGOALS-g2		9DSs 958files 29.9GB	7DSs 758files 24.0GB
GFDL-CM3		12DSs 1859files 60.9GB	10DSs 1650files 53.9GB
GISS-E2-R-CC		4DSs 121files 13.7GB	2DSs 77files 8.4GB
HadGEM2-ES		18DSs 601files 150.3GB	10DSs 314files 83.8GB
IPSL-CM5A-MR		12DSs 86files 87.9GB	9DSs 71files 72.9GB
MIROC-ESM		11DSs 65files 43.7GB	9DSs 54files 37.2GB
MIROC5		20DSs 690files 155.9GB	10DSs 455files 109.6GB
MPI-ESM-MR		8DSs 320files 68.6GB	6DSs 264files 57.0GB
MRI-CGCM3		12DSs 486files 245.5GB	10DSs 430files 218.9GB
		<b>Total</b>	<b>historical</b> <b>rcp85</b>
NorESM1-M		8DSs 59files 24.4GB	6DSs 48files 28.6GB

ここをクリックすることで、選択されたデータセット一覧が、CMIP5 Tool のメインウィンドウにリストされる。

### [1] Intercomparison with Re-analysis Data

### [2] Comparison of Global Warming Projection

### [3] Tools for CMIP5 Analysis

2-D Statistical Analysis

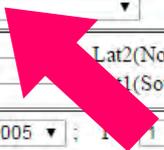
Climate Models

Bias Correction (in-situ)

CMIP5 Data Viewer | Hide Unsupported | Gray Out Unsupported Items | Show All Items | Show Description | Hide Description | Help

Institute	Model	Experiment	Time Frequency	Variable	Beam	Variable	CMOR Table	Ensemble	Version	Start	End	Calendar	Size	Time Length	Path
BCC	BCC-CSM1.1	historical	mon	output1	atmos	hurs	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153944	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/hurs/hurs_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	huss	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153816	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/huss/huss_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	pr	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153636	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/pr/pr_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	prc	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153596	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/prc/prc_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	prsn	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153600	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/prsn/prsn_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	psl	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153568	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/psl/psl_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	rlds	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153544	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/rlds/rlds_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	rhus	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153540	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/rhus/rhus_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	rsds	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153544	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/rsds/rsds_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	rsus	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153544	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/rsus/rsus_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	ta	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	1089661152	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/ta/ta_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	tas	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153812	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/tas/tas_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	tasmax	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153952	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/tasmax/tasmax_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	tasmin	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153952	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/tasmin/tasmin_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	ts	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153560	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/ts/ts_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	ua	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	1089661056	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/ua/ua_Amon_bcc-csm1-1_historical
BCC	BCC-CSM1.1	historical	mon	output1	atmos	uas	Amon	riilp1	1	1850-01-16	2012-12-16	noleap	64153708	1956	output1/BCC/bcc-csm1-1/historical/mon/atmos/Amon/riilp1/v1/uas/uas_Amon_bcc-csm1-1_historical

<b>Meteorologic Element</b>	Specific Humidity ▾	Level: 1000hPa ▾	
<b>Analysis Area</b> ASIA ▾	Lon1(West): 40	Lat2(North): 40 Lat1(South): -10	Lon2(East): 140
<b>Time Range</b>	From 1979 ▾	To 2005 ▾	; 1 ▾ month(s) starting from January ▾
<b>Display Option</b>	<input type="checkbox"/> Maskout the altitude above 150 meters		
	Colorbar for diffs	<input type="radio"/> Max range	<input type="radio"/> Manual: <input type="text"/> (absolute value of range)
		<input checked="" type="radio"/> Separate setting	<input type="button" value="Recalculation"/>
<input checked="" type="checkbox"/> Display area	Lon1(West): -5	Lat2(North): 50 Lat1(South): -25	Lon2(East): 155



### Reference Data

ReqID:    (3 per row)

## Model Output: CMIP5

# 本演習で評価する要素

## Evaluated elements during the course

---

- 次に示す3つの気象要素でモデルを評価する。
- Model performance is evaluated for the following three meteorological elements:
  - **Precipitation** (降水量) (狭い領域, 地表面)
  - Air Temperature (気温) (広い領域, 850hPa)
  - Geopotential Height (ジオポテンシャル高度) (広い領域, 850hPa)

<b>Meteorologic Element</b>	Specific Humidity	Level: 1000hPa
<b>Analysis Area</b> ASIA	Lon1(West): 40 Lat2(North): 40 Lat1(South): Lat2(South):	Lon2(East): 140
<b>Time Range</b>	From 1979 To 2005 ; For 1 month(s) starting from January	
<b>Display Option</b>	<input type="checkbox"/> Maskout the altitude above 150 meters	
	Colorbar for diffs <input type="radio"/> Max range <input type="radio"/> Manual: (absolute value of range) <input checked="" type="radio"/> Separate setting <input type="button" value="Recalculation"/>	
	<input checked="" type="checkbox"/> Display area Lon1(West): -5 Lat2(North): 50 Lat1(South): -25 Lon2(East): 155	

### Reference Data

ReqID:    (3 per row)

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### Model Output: CMIP5

<b>Meteorologic Element</b>	Specific Humidity	Level: 1000hPa
<b>Analysis Area</b> ASIA	Specific Humidity	North: 40
	Precipitation	South: -10
<b>Time Range</b>	Sea Level Pressure	Lon2(East): 140
	Outgoing Longwave Radiation (OLR)	month(s) starting from January
<b>Display Option</b>	Air Temperature	meters
	Near-Surface Air Temperature	<input type="radio"/> Manual: (absolute value of ra
	Sea Surface Temperature	<input type="button" value="Recalculation"/>
	Ground Temperature	
	Zonal Wind	
	Meridional Wind	
<input checked="" type="checkbox"/> Display area	Lon1(West): -5	Lat2(North): 50 Lat1(South): -25
		Lon2(East): 155

ReqID: cmip5-6966

(3 per row)

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## Model Output: CMIP5

<b>Meteorologic Element</b>	Precipitation	Level: Ground/water surface
<b>Analysis Area</b>	ASIA	Lon1(West): 135    Lat2(North): 42    Lon2(East): 145 Lat1(South): 32
<b>Time Range</b>	From 1979	To 2005 ; For 1 month(s) starting from June
<b>Display Option</b>	<input type="checkbox"/> Maskout the altitude above _____ meters	
	Colorbar for diffs	<input type="radio"/> Max range <input type="radio"/> Manual: _____ (absolute value of range) <input checked="" type="radio"/> Separate setting <input type="button" value="Recalculation"/>
	<input checked="" type="checkbox"/> Display area	Lon1(West): 70    Lat2(North): 70    Lon2(East): 170 Lat1(South): -5

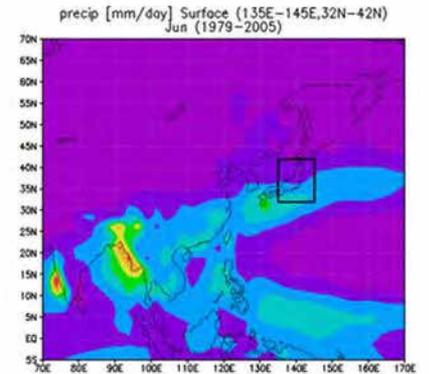
ReqID: cmp5-6966

[View Reference Data](#)

[View Model Output](#) (3 per row)

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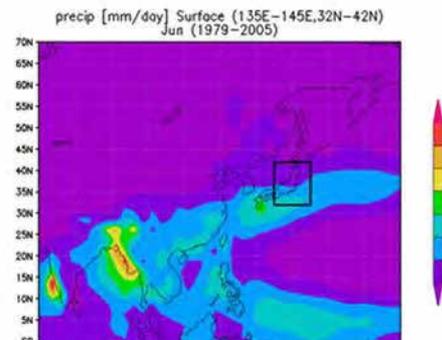
## Reference Data



Model Output: CMIP5

<b>Meteorologic Element</b>	Precipitation	Level: Ground/water surface
<b>Analysis Area</b>	Lon1(West): 135 Lat2(North): 42 Lon2(East): 145 ASIA Lat1(South): 32	
<b>Time Range</b>	From 1979 To 2005 ; For 1 month(s) starting from June	
<b>Display Option</b>	<input type="checkbox"/> Maskout the altitude above meters	
	Colorbar for diffs	<input type="radio"/> Max range <input type="radio"/> Manual: (absolute value of range) <input checked="" type="radio"/> Separate setting <input type="button" value="Recalculation"/>
	<input checked="" type="checkbox"/> Display area	Lon1(West): 70 Lat2(North): 70 Lon2(East): 170 Lat1(South): -5

## Reference Data



CMIP5 (15 models / 60 ensemble members):

[Open in New Tab](#)

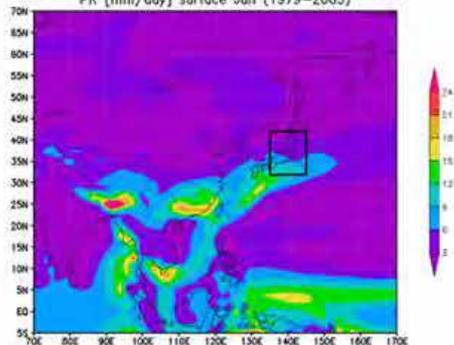
[View All Difference image](#)

[Summary of Analysis Results](#)

Sort: Model Name

ACCESS1.0

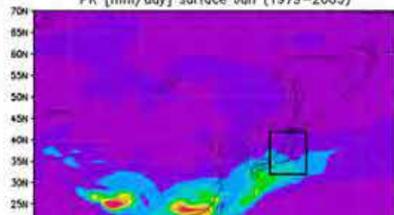
ACCESS1.0 (ens\_mean) : Scorr=0.948054, RMSE=1.16436  
PR [mm/day] surface Jun (1979-2005)



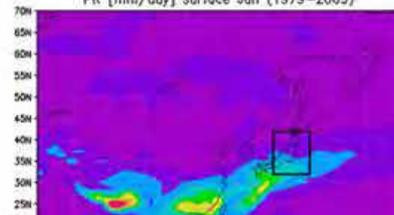
[Difference Image](#)

ensemble member ( 3 )

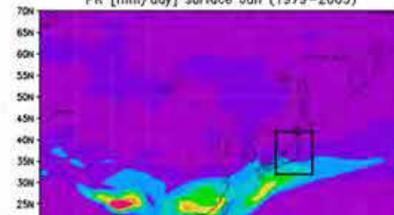
ACCESS1.0 (r1i1p1) : Scorr=0.9333, RMSE=1.21456  
PR [mm/day] surface Jun (1979-2005)



ACCESS1.0 (r2i1p1) : Scorr=0.94147, RMSE=1.23743  
PR [mm/day] surface Jun (1979-2005)

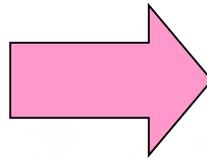


ACCESS1.0 (r3i1p1) : Scorr=0.942807, RMSE=1.3918  
PR [mm/day] surface Jun (1979-2005)



結果が、新しいウィンドウに表示される。

Summary of Analysis Results Download: [CSV file](#)



Model	Scorr	RMSE
<a href="#">ACCESS1.0(ens_mean)</a>	0.731768	3.29818
<a href="#">ACCESS1.0(r1i1p1)</a>	0.721709	3.315
<a href="#">ACCESS1.0(r2i1p1)</a>	0.729007	3.29535
<a href="#">ACCESS1.0(r3i1p1)</a>	0.733411	3.37353
<a href="#">BCC-CSM1.1(ens_mean)</a>	0.613724	2.12771
<a href="#">BCC-CSM1.1(r1i1p1)</a>	0.610785	2.14547
<a href="#">BCC-CSM1.1(r2i1p1)</a>	0.567942	2.29681
<a href="#">BCC-CSM1.1(r3i1p1)</a>	0.641535	2.03847
<a href="#">CanESM2(ens_mean)</a>	0.874198	2.00561
<a href="#">CanESM2(r1i1p1)</a>	0.854276	2.19753
<a href="#">CanESM2(r2i1p1)</a>	0.871277	1.92533
<a href="#">CanESM2(r3i1p1)</a>	0.874925	1.8706
<a href="#">CanESM2(r4i1p1)</a>	0.878183	2.09959
<a href="#">CanESM2(r5i1p1)</a>	0.875295	2.0553
<a href="#">CSIRO-Mk3.6.0(ens_mean)</a>	0.809291	2.52705
<a href="#">CSIRO-Mk3.6.0(r10i1p1)</a>	0.77837	2.8038
<a href="#">CSIRO-Mk3.6.0(r1i1p1)</a>	0.816622	2.50522
<a href="#">CSIRO-Mk3.6.0(r2i1p1)</a>	0.835138	2.565
<a href="#">CSIRO-Mk3.6.0(r3i1p1)</a>	0.782103	2.71349
<a href="#">CSIRO-Mk3.6.0(r4i1p1)</a>	0.793812	2.58305
<a href="#">CSIRO-Mk3.6.0(r5i1p1)</a>	0.812508	2.50253
<a href="#">CSIRO-Mk3.6.0(r6i1p1)</a>	0.773597	2.60921
<a href="#">CSIRO-Mk3.6.0(r7i1p1)</a>	0.816588	2.35206
<a href="#">CSIRO-Mk3.6.0(r8i1p1)</a>	0.800288	2.54702
<a href="#">CSIRO-Mk3.6.0(r9i1p1)</a>	0.80498	2.6785
<a href="#">GFDL-CM3(ens_mean)</a>	0.821169	2.46287
<a href="#">GFDL-CM3(r1i1p1)</a>	0.826502	2.69807

	A	B	C	D	E
1	ACCESS1.0	-0.07097	2.33229		
2	BCC-CSM1.1	0.517698	1.15675		
3	CESM1(BG)	0.467255	1.15462		
4	CNRM-CM3	0.387627	1.26953		
5	CanESM2	-0.10394	1.47793		
6	FGOALS-g1.0	0.2734	1.24837		
7	GFDL-CM3	0.773491	0.752622		
8	GISS-E2-R	0.318397	2.42101		
9	HadGEM2	0.189114	2.58458		
10	IPSL-CM5	0.58422	1.35329		
11	MIROC-ES	-0.14753	1.21802		
12	MIROC5	0.42825	1.3167		
13	MPI-ESM	0.275436	1.32122		
14	MRI-CGCM	0.490395	1.51673		
15	NorESM1	0.010876	1.57789		
16					
17	ACCESS1.0	-0.07097	2.33229		
18	ACCESS1.0	-0.17241	2.77663		
19	ACCESS1.0	-0.04518	2.19524		
20	ACCESS1.0	0.032276	2.21253		
21	BCC-CSM1	0.517698	1.15675		
22	BCC-CSM1	0.188096	1.11295		
23	BCC-CSM1	0.600179	1.40395		
24	BCC-CSM1	0.496017	1.09811		
25	CESM1(BG)	0.467255	1.15462		
26	CESM1(BG)	0.467255	1.15462		
27	CNRM-CM3	0.387627	1.26953		
28	CNRM-CM3	0.298332	1.583		
29	CNRM-CM3	0.407846	1.56392		
30	CNRM-CM3	0.358624	1.42289		

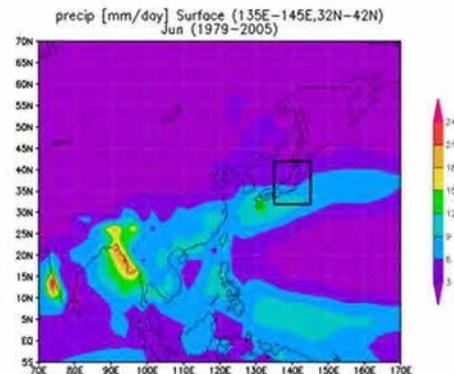
# 評価シート名: MODEL\_SELECTION\_TEMPLATE.xlsx

## ディレクトリ: ModelSelection

Coordinates of the inspection areas for model selection														
Country	Small Scale Area (precip)			Large Scale (other elements)			Level (Tair, Geopot. Height)							
Japan	32-42N, 135-145E			5-60N, 80-160E			850hPa							
<b>Model selection analysis</b>														
PRECIPITATION (small area)														
	JUNE		JULY		AUGUST									
Model	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE	S_corr	RMSE	S_corr	RMSE	Total Index	Grand	Models	descen-
											Precip	Total		ding
ACCESS1.0@ens_mean	0.948	1.164	0	0	0	0	0.00	0.00	0	0	-1	-3	ACCESS1.0@ens_mean	0
BCC-CSM1.1@ens_mean	0.647	2.042	0	0	0	0	0.00	0.00	0	0	-1	-3	BCC-CSM1.1@ens_mean	0
CESM1(BGC)@ens_mean	0.539	2.155	0	0	0	0	0.00	0.00	0	0	-1	-3	CESM1(BGC)@ens_mean	0
CNRM-CM5@ens_mean	0.714	1.78	0	0	0	0	0.00	0.00	0	0	-1	-3	CNRM-CM5@ens_mean	0
CanESM2@ens_mean	0.323	2.473	0	0	0	0	0.00	0.00	0	0	-1	-3	CanESM2@ens_mean	0
FGOALS-g2@ens_mean	0.921	2.547	0	0	0	0	0.00	0.00	0	0	-1	-3	FGOALS-g2@ens_mean	0
GFDL-CM3@ens_mean	0.936	1.519	0	0	0	0	0.00	0.00	0	0	-1	-3	GFDL-CM3@ens_mean	0
GISS-E2-R-CC@ens_mean	0.787	1.784	0	0	0	0	0.00	0.00	0	0	-1	-3	GISS-E2-R-CC@ens_mear	0
HadGEM2-ES@ens_mean	0.93	1.481	0	0	0	0	0.00	0.00	0	0	-1	-3	HadGEM2-ES@ens_mear	0
IPSL-CM5A-MR@ens_mea	0.65	2.119	0	0	0	0	0.00	0.00	0	0	-1	-3	IPSL-CM5A-MR@ens_me	0
MIROC-ESM@ens_mean	0.357	2.3	0	0	0	0	0.00	0.00	0	0	-1	-3	MIROC-ESM@ens_mean	0
MIROC5@ens_mean	0.629	2.069	0	0	0	0	0.00	0.00	0	0	-1	-3	MIROC5@ens_mean	0
MPI-ESM-MR@ens_mean	0.325	2.349	0	0	0	0	0.00	0.00	0	0	-1	-3	MPI-ESM-MR@ens_mear	0
MRI-CGCM3@ens_mean	0.934	1.799	0	0	0	0	0.00	0.00	0	0	-1	-3	MRI-CGCM3@ens_mean	0
NorESM1-M@ens_mean	0.879	1.298	0	0	0	0	0.00	0.00	0	0	-1	-3	NorESM1-M@ens_mean	0
	0.70	1.93	0.00	0.00	0.00	0.00	Total average	0.00	0.00					
AIR TEMPERATURE (large area, 850hPa)														
	JUNE		JULY		AUGUST									
Model	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE	S_corr	RMSE	S_corr	RMSE	Total Index			
											Air Temp			
ACCESS1.0@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
BCC-CSM1.1@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CESM1(BGC)@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CNRM-CM5@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
CanESM2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
FGOALS-g2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
GFDL-CM3@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			
GISS-E2-R-CC@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1			

<b>Meteorologic Element</b>	Precipitation	Level: Ground/water surface
<b>Analysis Area</b>	Lon1(West): 135 Lat2(North): 42 Lon2(East): 145 ASIA Lat1(South): 32	
<b>Time Range</b>	From 1979 To 2005; For 1 month(s) starting from <b>July (7月)</b>	
<b>Display Option</b>	<input type="checkbox"/> Maskout the altitude above _____ meters	
	Colorbar for diffs	<input type="radio"/> Max range <input type="radio"/> Manual: _____ (absolute value of range) <input checked="" type="radio"/> Separate setting <input type="button" value="Recalculation"/>
	<input checked="" type="checkbox"/> Display area	Lon1(West): 70 Lat2(North): 70 Lon2(East): 170 Lat1(South): -5

## Reference Data

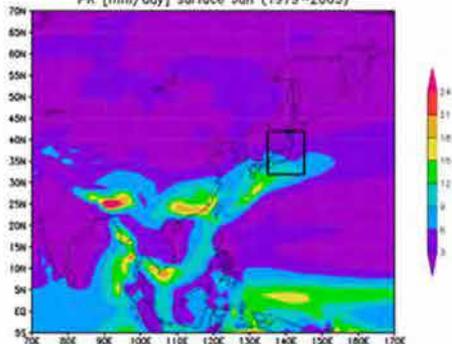


CMIP5 (15 models / 60 ensemble members):   [Summary of Analysis Results](#)

ort:

ACCESS1.0

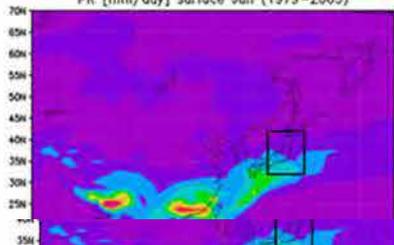
ACCESS1.0 (ens\_mean) : Scorr=0.948054, RMSE=1.16436  
PR [mm/day] surface Jun (1979-2005)



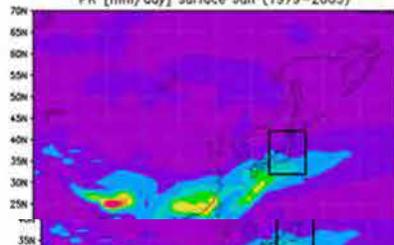
[Difference Image](#)

ensemble member ( 3 )

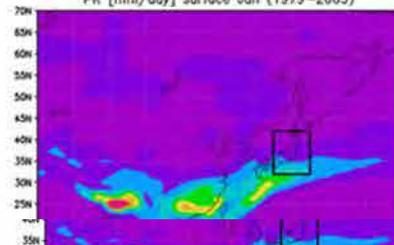
ACCESS1.0 (r1i1p1) : Scorr=0.9333, RMSE=1.21456  
PR [mm/day] surface Jun (1979-2005)



ACCESS1.0 (r2i1p1) : Scorr=0.94147, RMSE=1.23743  
PR [mm/day] surface Jun (1979-2005)

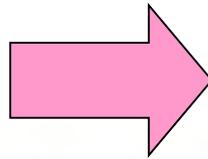


ACCESS1.0 (r3i1p1) : Scorr=0.942807, RMSE=1.3918  
PR [mm/day] surface Jun (1979-2005)



結果が、新しいウィンドウに表示される。

Summary of Analysis Results Download: [CSV file](#)



Model	Scorr	RMSE
<a href="#">ACCESS1.0(ens_mean)</a>	0.731768	3.29818
<a href="#">ACCESS1.0(r1i1p1)</a>	0.721709	3.315
<a href="#">ACCESS1.0(r2i1p1)</a>	0.729007	3.29535
<a href="#">ACCESS1.0(r3i1p1)</a>	0.733411	3.37353
<a href="#">BCC-CSM1.1(ens_mean)</a>	0.613724	2.12771
<a href="#">BCC-CSM1.1(r1i1p1)</a>	0.610785	2.14547
<a href="#">BCC-CSM1.1(r2i1p1)</a>	0.567942	2.29681
<a href="#">BCC-CSM1.1(r3i1p1)</a>	0.641535	2.03847
<a href="#">CanESM2(ens_mean)</a>	0.874198	2.00561
<a href="#">CanESM2(r1i1p1)</a>	0.854276	2.19753
<a href="#">CanESM2(r2i1p1)</a>	0.871277	1.92533
<a href="#">CanESM2(r3i1p1)</a>	0.874925	1.8706
<a href="#">CanESM2(r4i1p1)</a>	0.878183	2.09959
<a href="#">CanESM2(r5i1p1)</a>	0.875295	2.0553
<a href="#">CSIRO-Mk3.6.0(ens_mean)</a>	0.809291	2.52705
<a href="#">CSIRO-Mk3.6.0(r10i1p1)</a>	0.77837	2.8038
<a href="#">CSIRO-Mk3.6.0(r1i1p1)</a>	0.816622	2.50522
<a href="#">CSIRO-Mk3.6.0(r2i1p1)</a>	0.835138	2.565
<a href="#">CSIRO-Mk3.6.0(r3i1p1)</a>	0.782103	2.71349
<a href="#">CSIRO-Mk3.6.0(r4i1p1)</a>	0.793812	2.58305
<a href="#">CSIRO-Mk3.6.0(r5i1p1)</a>	0.812508	2.50253
<a href="#">CSIRO-Mk3.6.0(r6i1p1)</a>	0.773597	2.60921
<a href="#">CSIRO-Mk3.6.0(r7i1p1)</a>	0.816588	2.35206
<a href="#">CSIRO-Mk3.6.0(r8i1p1)</a>	0.800288	2.54702
<a href="#">CSIRO-Mk3.6.0(r9i1p1)</a>	0.80498	2.6785
<a href="#">GFDL-CM3(ens_mean)</a>	0.821169	2.46287
<a href="#">GFDL-CM3(r1i1p1)</a>	0.826502	2.69807

	A	B	C	D	E
1	ACCESS1.0	-0.07097	2.33229		
2	BCC-CSM1.1	0.517698	1.15675		
3	CESM1(BG)	0.467255	1.15462		
4	CNRM-CM3.0	0.387627	1.26953		
5	CanESM2.3	-0.10394	1.47793		
6	FGOALS-g2.3	0.2734	1.24837		
7	GFDL-CM3.0	0.773491	0.752622		
8	GISS-E2-R	0.318397	2.42101		
9	HadGEM2.ES	0.189114	2.58458		
10	IPSL-CM5.0	0.58422	1.35329		
11	MIROC-ES2.3	-0.14753	1.21802		
12	MIROC5.2	0.42825	1.3167		
13	MPI-ESM1.2	0.275436	1.32122		
14	MRI-CGCM3.2a	0.490395	1.51673		
15	NorESM1.0	0.010876	1.57789		
16					
17	ACCESS1.0	-0.07097	2.33229		
18	ACCESS1.0	-0.17241	2.77663		
19	ACCESS1.0	-0.04518	2.19524		
20	ACCESS1.0	0.032276	2.21253		
21	BCC-CSM1.1	0.517698	1.15675		
22	BCC-CSM1.1	0.188096	1.11295		
23	BCC-CSM1.1	0.600179	1.40395		
24	BCC-CSM1.1	0.496017	1.09811		
25	CESM1(BG)	0.467255	1.15462		
26	CESM1(BG)	0.467255	1.15462		
27	CNRM-CM3.0	0.387627	1.26953		
28	CNRM-CM3.0	0.298332	1.583		
29	CNRM-CM3.0	0.407846	1.56392		
30	CNRM-CM3.0	0.358624	1.42289		

# 評価シート名: MODEL\_SELECTION\_TEMPLATE.xlsx

## ディレクトリ: ModelSelection

Coordinates of the inspection areas for model selection														
Country	Small Scale Area (precip)			Large Scale (other elements)			Level (Tair, Geopot. Height)							
Japan	32-42N, 135-145E			5-60N, 80-160E			850hPa							
<b>Model selection analysis</b>														
PRECIPITATION (small area)														
	JUNE		JULY		AUGUST									
Model	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE	S_corr	RMSE	S_corr	RMSE	Total Index	Grand	Models	descen-
											Precip	Total		ding
ACCESS1.0@ens_mean	0.948	1.164	0.737	1.377	-0.071	2.332	0.32	0.97	0	0	-1	-3	ACCESS1.0@ens_mean	0
BCC-CSM1.1@ens_mean	0.647	2.042	0.723	2.173	0.518	1.157	0.38	1.07	1	0	0	-2	BCC-CSM1.1@ens_mean	0
CESM1(BGC)@ens_mean	0.539	2.155	0.77	1.175	0.467	1.155	0.36	0.90	1	1	1	-1	CESM1(BGC)@ens_mean	0
CNRM-CM5@ens_mean	0.714	1.78	0.747	1.273	0.388	1.27	0.37	0.86	1	1	1	-1	CNRM-CM5@ens_mean	0
CanESM2@ens_mean	0.323	2.473	0.862	0.742	-0.104	1.478	0.22	0.94	0	1	0	-2	CanESM2@ens_mean	0
FGOALS-g2@ens_mean	0.921	2.547	0.733	1.015	0.273	1.248	0.39	0.96	1	0	0	-2	FGOALS-g2@ens_mean	0
GFDL-CM3@ens_mean	0.936	1.519	0.355	1.174	0.773	0.753	0.41	0.69	1	1	1	-1	GFDL-CM3@ens_mean	0
GISS-E2-R-CC@ens_mean	0.787	1.784	0.785	2.224	0.318	2.421	0.38	1.29	1	0	0	-2	GISS-E2-R-CC@ens_mear	0
HadGEM2-ES@ens_mean	0.93	1.481	0.722	1.022	0.189	2.585	0.37	1.02	1	0	0	-2	HadGEM2-ES@ens_mear	0
IPSL-CM5A-MR@ens_mear	0.65	2.119	0.756	1.207	0.584	1.353	0.40	0.94	1	1	1	-1	IPSL-CM5A-MR@ens_mear	0
MIROC-ESM@ens_mean	0.357	2.3	0.567	0.951	-0.148	1.218	0.16	0.89	0	1	0	-2	MIROC-ESM@ens_mean	0
MIROC5@ens_mean	0.629	2.069	0.542	1.495	0.428	1.317	0.32	0.98	0	0	-1	-3	MIROC5@ens_mean	0
MPI-ESM-MR@ens_mean	0.325	2.349	0.618	1.358	0.275	1.321	0.24	1.01	0	0	-1	-3	MPI-ESM-MR@ens_mear	0
MRI-CGCM3@ens_mean	0.934	1.799	0.833	1.015	0.49	1.517	0.45	0.87	1	1	1	-1	MRI-CGCM3@ens_mean	0
NorESM1-M@ens_mean	0.879	1.298	0.755	1.184	0.011	1.578	0.33	0.81	0	1	0	-2	NorESM1-M@ens_mean	0
	0.70	1.93	0.70	1.29	0.29	1.51	Total average		0.34	0.95				
AIR TEMPERATURE (large area, 850hPa)														
	JUNE		JULY		AUGUST									
Model	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE	S_corr	RMSE	S_corr	RMSE	Total Index	Grand	Models	descen-
											Air Temp	Total		ding
ACCESS1.0@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-1	ACCESS1.0@ens_mean	0
BCC-CSM1.1@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-1	BCC-CSM1.1@ens_mean	0
CESM1(BGC)@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-1	CESM1(BGC)@ens_mean	0
CNRM-CM5@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-1	CNRM-CM5@ens_mean	0
CanESM2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-1	CanESM2@ens_mean	0
FGOALS-g2@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-1	FGOALS-g2@ens_mean	0
GFDL-CM3@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-1	GFDL-CM3@ens_mean	0
GISS-E2-R-CC@ens_mean	0	0	0	0	0	0	0.00	0.00	0	0	-1	-1	GISS-E2-R-CC@ens_mean	0

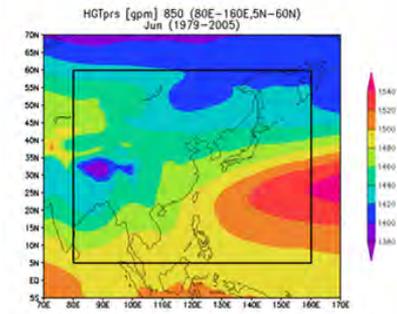
# Evaluated elements during the course

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- 次に示す3つの気象要素でモデルを評価する。
- Model performance is evaluated for the following three meteorological elements:
  - Precipitation(降水量) (狭い領域, 地表面)
  - **Air Temperature (気温)** (**広い領域, 850hPa**)
  - **Geopotential Height (ジオポテンシャル高度)**(**広い領域, 850hPa**)

Meteorologic Element	Geopotential Height	Level: 850hPa
Analysis Area	ASIA	Lon1(West): 80 Lat2(North): 60 Lon2(East): 160 Lat1(South): 5
Time Range	From 1979 To 2005; For 1 month(s) starting from June	
Display Option	<input type="checkbox"/> Maskout the altitude above 1500 meters	
	Colorbar for diffs	<input type="radio"/> Max range <input type="radio"/> Manual: (absolute value of range) <input checked="" type="radio"/> Separate setting <input type="button" value="Recalculation"/>
	<input checked="" type="checkbox"/> Display area	Lon1(West): 70 Lat2(North): 70 Lon2(East): 170 Lat1(South): -5

Reference Data: JRA55



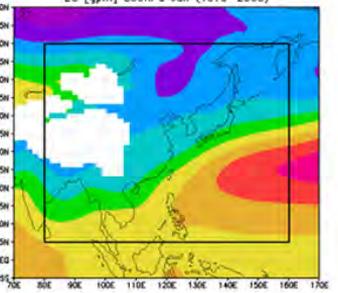
ReqID: cmip5-13662      
Copyright © 2010-2015 EDITORIA, The University of Tokyo

5 (15 models / 60 ensemble members):   [Summary of Analysis Results](#)

Model Name

1.0

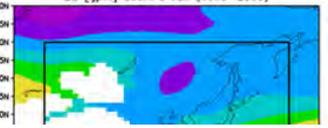
ACCESS1.0 (ens\_mean) : Scorr=0.974554, RMSE=7.54179  
ZG [gpm] 850hPa Jun (1979-2005)



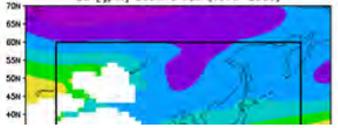
[Difference Image](#)

member (3)

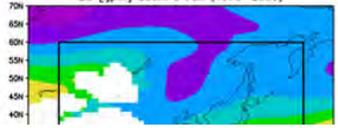
ACCESS1.0 (r1i1p1) : Scorr=0.970833, RMSE=8.06392  
ZG [gpm] 850hPa Jun (1979-2005)



ACCESS1.0 (r2i1p1) : Scorr=0.976111, RMSE=7.23897  
ZG [gpm] 850hPa Jun (1979-2005)



ACCESS1.0 (r3i1p1) : Scorr=0.973788, RMSE=7.8137  
ZG [gpm] 850hPa Jun (1979-2005)



# 評価シート名: MODEL\_SELECTION\_Petra.xlsx

## ディレクトリ: ModelSelection

「形式を選択して貼付け」  
→ 「値」  
として貼り付ける

Coordinates of the inspection areas for model selection														
Country	Small Scale Area (precip)				Large Scale (other elements)				Level (Tair, Geopot. Height)					
Japan	32-42N, 135-145E				5-60N, 80-160E				850hPa					
Model selection analysis														
PRECIPITATION														
Model	JUNE		JULY		AUGUST		S_corr	RMSE	S_corr Index	RMSE Index	Total Index Precip	Grand Total	Models	descen-ding
	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE								
ACCESS1.0@ens_mean	0.948	1.164	0.737	1.377	-0.07	2.332	0.32	0.97	0	0	-1	1	ACCESS1.0@ens_mean	0
BCC-CSM1.1@ens_mean	0.647	2.042	0.723	2.173	0.518	1.157	0.38	1.07	1	0	0	-2	BCC-CSM1.1@ens_mean	0
CESM1(BGC)@ens_mean	0.539	2.155	0.77	1.175	0.467	1.155	0.36	0.90	1	1	1	1	CESM1(BGC)@ens_mean	0
CNRM-CM5@ens_mean	0.714	1.78	0.747	1.273	0.388	1.27	0.37	0.86	1	1	1	3	CNRM-CM5@ens_mean	0
CanESM2@ens_mean	0.323	2.473	0.862	0.742	-0.1	1.478	0.22	0.94	0	1	0	0	CanESM2@ens_mean	0
FGOALS-g2@ens_mean	0.921	2.547	0.733	1.015	0.273	1.248	0.39	0.96	1	0	0	0	FGOALS-g2@ens_mean	0
GFDL-CM3@ens_mean	0.936	1.519	0.355	1.174	0.773	0.753	0.41	0.69	1	1	1	3	GFDL-CM3@ens_mean	0
GISS-E2-R-CC@ens_mean	0.787	1.784	0.785	2.224	0.318	2.421	0.38	1.29	1	0	0	1	GISS-E2-R-CC@ens_mean	0
HadGEM2-ES@ens_mean	0.93	1.481	0.722	1.022	0.189	2.585	0.37	1.02	1	0	0	0	HadGEM2-ES@ens_mean	0
IPSL-CM5A-MR@ens_mean	0.65	2.119	0.756	1.207	0.584	1.353	0.40	0.94	1	1	1	1	IPSL-CM5A-MR@ens_mean	0
MIROC-ESM@ens_mean	0.357	2.3	0.567	0.951	-0.15	1.218	0.16	0.89	0	1	0	-1	MIROC-ESM@ens_mean	0
MIROC5@ens_mean	0.629	2.069	0.542	1.495	0.428	1.317	0.32	0.98	0	0	-1	-1	MIROC5@ens_mean	0
MPI-ESM-MR@ens_mean	0.325	2.349	0.618	1.358	0.275	1.321	0.24	1.01	0	0	-1	0	MPI-ESM-MR@ens_mean	0
MRI-CGCM3@ens_mean	0.934	1.799	0.833	1.015	0.49	1.517	0.45	0.87	1	1	1	3	MRI-CGCM3@ens_mean	0
NorESM1-M@ens_mean	0.879	1.298	0.755	1.184	0.011	1.578	0.33	0.81	0	1	0	-1	NorESM1-M@ens_mean	0
	0.70	1.93	0.70	1.29	0.29	1.51	Total average	0.34	0.95					
AIR TEMPERATURE														
Model	JUNE		JULY		AUGUST		S_corr	RMSE	S_corr Index	RMSE Index	Total Index Air Temp	Grand Total	Models	descen-ding
	Scorr	RMSE	Scorr	RMSE	Scorr	RMSE								
ACCESS1.0@ens_mean	0.962	1.255	0.902	1.37	0.952	1.096	0.56	0.74	1	1	1	1	ACCESS1.0@ens_mean	1
BCC-CSM1.1@ens_mean	0.779	3.446	0.591	3.172	0.712	3.259	0.42	1.98	0	0	-1	-1	BCC-CSM1.1@ens_mean	-1
CESM1(BGC)@ens_mean	0.933	1.701	0.808	1.945	0.885	1.812	0.53	1.09	0	1	0	0	CESM1(BGC)@ens_mean	0
CNRM-CM5@ens_mean	0.962	1.356	0.876	1.645	0.925	1.406	0.55	0.88	1	1	1	1	CNRM-CM5@ens_mean	0
CanESM2@ens_mean	0.923	2.053	0.806	2.679	0.856	2.316	0.52	1.41	0	0	-1	-1	CanESM2@ens_mean	-1
FGOALS-g2@ens_mean	0.979	2.19	0.938	2.028	0.961	2.081	0.58	1.26	1	0	0	0	FGOALS-g2@ens_mean	0
GFDL-CM3@ens_mean	0.986	2.107	0.974	1.611	0.981	1.507	0.59	1.05	1	1	1	1	GFDL-CM3@ens_mean	0
GISS-E2-R-CC@ens_mean	0.954	2.053	0.909	2.08	0.919	2.065	0.56	1.24	1	1	1	1	GISS-E2-R-CC@ens_mean	0

# 演習 : Your task:

---

「Model Selection」ディレクトリ あるいは各シートを、DIAS CMIP5 ツールから値を計算し、貼り付けし、完成させる。

## ■対象:

- 3ヶ月間
- 3つの気象要素
- 結果の(モデルの)ソート
- 適切なモデルを4~7程度選ぶ。

---

End of Model Selection  
(モデル選択の演習終了)

## Part 2: Bias Correction (バイアス補正)

---

Part1で選択したモデルに対して、それらの降水量のバイアス補正を実施する。

- シナリオ：RCP8.5 (最もシビアなシナリオ)
- 日データ
- バイアス補正には、日本の地上観測降水量(in-situ)を使用する。



**CMIP5 data viewer window** にて、**Part1**で選択した、モデル名をクリック (チェックボックスをオン) にする。

**Institute**  
 BCC  BNU  CCCMA  CMCC  CNRM-CERFACS  COLA-CFS  CSIRO-BOM  CSIRO-QCCCE  FIO  ICHEC  INM  INPE  IPSL  LASG-CESS  LASG-IAP  MIROC  MOHC  MPI-M  MRI  NASA-GISS  NASA-GMAO  NCAR  NCC  NCEP  NICAM  NIMR-KMA  NOAA-GFDL  NSF-DOE-NCAR  SMHI  UNSW

**Model**  
 ACCESS1.0  ACCESS1.3  BCC-CSM1.1  BCC-CSM1.1(m)  BNU-ESM  CanAM4  CanCM4  CanESM2  CCSM4  CESM1(BGC)  CESM1(CAM5)  CESM1(CAM5.1.FV2)  CESM1(FASTCHEM)  CESM1(WACCM)  CFSv2-2011  CMCC-CESM  CMCC-CM  CMCC-CMS  CNRM-CM5  CNRM-CM5-2  CSIRO-Mk3.6.0  CSIRO-Mk3L-1-2  EC-EARTH  FGOALS-g2  FGOALS-g1  FGOALS-s2  FIO-ESM  GEOS-5  GFDL-CM2.1  GFDL-CM3  GFDL-ESM2G  GFDL-ESM2M  GFDL-HIRAM-C180  GFDL-HIRAM-C360  GISS-E2-H  GISS-E2-H-CC  GISS-E2-R  GISS-E2-R-CC  HadCM3  HadGEM2-A  HadGEM2-AO  HadGEM2-CC  HadGEM2-ES  INM-CM4  IPSL-CM5A-LR  IPSL-CM5A-MR  IPSL-CM5B-LR  MIROC-ESM  MIROC-ESM-CHEM  MIROC4h  MIROC5  MPI-ESM-LR  MPI-ESM-MR  MPI-ESM-P  MRI-AGCM3.2H  MRI-AGCM3.2S  MRI-CGCM3  MRI-ESM1  NICAM-09  NorESM1-M  NorESM1-ME

**Experiment**  
 historical  historicalExt  rcp26  rcp45  rcp60  rcp85

**Frequency**  
 day  mon  yr

**Product**  
 output1  output2

**Variable**  
**atmos**  
 hus  pr  ps1  rlut  ta  tas  ts  ua  va  zg  
**ocean**  
 tos

**Ensemble**  
 r10i1p1  r11i1p1  r12i1p1  r13i1p1  r14i1p1  r1i1p1  r1ilp121  r1ilp124  r1ilp125  r1ilp126  r1ilp127  r1ilp128  r1ilp2  r1ilp3  r1i2p1  r1i2p2  r2i1p1  r2i1p2  r2i1p3  r2i2p1  r3i1p1  r3i1p2  r3i1p3  r3i2p1  r4i1p1  r4i1p2  r4i1p3  r5i1p1  r5i1p2  r5i1p3  r6i1p1  r6i1p2  r6i1p3  r7i1p1  r8i1p1  r9i1p1

## Data Summary

Row  Column

	Total	historical	rcp85
<b>Total</b>	37DSs 659files 221.1GB	30DSs 600files 192.5GB	7DSs 59files 28.6GB
<b>ACCESS1.0</b>	4DSs 25files 21.3GB	3DSs 21files 17.7GB	1DSs 4files 3.6GB
<b>CESM1(BGC)</b>	2DSs 8files 18.9GB	1DSs 5files 11.7GB	1DSs 3files 7.1GB
<b>CNRM-CM5</b>	11DSs 339files 73.8GB	10DSs 320files 69.6GB	1DSs 19files 4.2GB
<b>GFDL-CM3</b>	6DSs 169files 14.6GB	5DSs 150files 12.9GB	1DSs 19files 1.7GB
<b>GISS-E2-R-CC</b>			
<b>IPSL-CM5A-MR</b>	8DSs 28files 31.5GB	6DSs 24files 26.2GB	2DSs 4files 5.3GB
<b>MRI-CGCM3</b>	6DSs 90files 61.0GB	5DSs 80files 54.3GB	1DSs 10files 6.6GB

## [1] Intercomparison with Re-analysis Data

## [2] Visualization of Interannual Change

## [3] Comparison of Global Warming Projection

## [4] Tools for CMIP5 Analysis

2-D Statistical Analysis Time-series Change Climate Models Bias Correction (in-situ) 
 | 
 

 || 
 

バイアス補正(in-situ:地上観測)

Institute	Model	Experiment	Time Frequency	Product	Realm	Variable	CMOR Table	Ensemble	Version	Start	End	Calendar	Size	Time Length	Path
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1850-01-01 12:00:00	1854-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18500101-18541231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1855-01-01 12:00:00	1859-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18550101-18591231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1860-01-01 12:00:00	1864-12-31 12:00:00	gregorian	239529856	1827	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18600101-18641231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1865-01-01 12:00:00	1869-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18650101-18691231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1870-01-01 12:00:00	1874-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18700101-18741231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1875-01-01 12:00:00	1879-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18750101-18791231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1880-01-01 12:00:00	1884-12-31 12:00:00	gregorian	239529856	1827	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18800101-18841231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1885-01-01 12:00:00	1889-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18850101-18891231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1890-01-01 12:00:00	1894-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18900101-18941231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1895-01-01 12:00:00	1899-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_18950101-18991231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1900-01-01 12:00:00	1904-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_19000101-19041231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1905-01-01 12:00:00	1909-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_19050101-19091231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1910-01-01 12:00:00	1914-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_19100101-19141231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1915-01-01 12:00:00	1919-12-31 12:00:00	gregorian	239398760	1826	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_19150101-19191231.nc
CNRM-CERFACS	CNRM-CM5	historical	day	output1	atmos	pr	day	r10i1p1	20120703	1920-01-01 12:00:00	1924-12-31 12:00:00	gregorian	239529856	1827	output1/CNRM-CERFACS/CNRM-CM5_historical_r10i1p1_19200101-19241231.nc

Meteorologic Element	Precipitation ▾	Level / Layer:	Ground/water surface ▾
Emission Scenario	rcp85 ▾		
Area/Country	JAPAN ▾		
Processing Region	West: 139	North: 37	East: 140.5
		South: 36	
Grid Interval	0.05	deg	(fixed)
Options	nEx: 10 ▾	nloop: 30 ▾	

**Climate Model**  
ACCESS1.0  
CESM1 (BGC)  
CNRM-CM5  
GFDL-CM3  
IPSL-CM5A-MR  
MRI-CGCM3

Time Range				
Past	From:	1 ▾	JAN ▾	1981 ▾
	To:	31 ▾	DEC ▾	2000 ▾
Future	From:	1 ▾	JAN ▾	2046 ▾
	To:	31 ▾	DEC ▾	2065 ▾

豪雨を決めるための閾値

繰り返し回数の定義

Request ID: cmip5-30311   Exec Bias Correction   Clear All   Help  
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### CMIP5 Daily Data



# バイアス補正の完了

Meteorologic Element	Precipitation	Level / Layer:	Ground/water surface
Emission Scenario	rcp85		
Area/Country	JAPAN		
Processing Region	West:	North:	East:
	139	37	140.5
Processing Region	South:		
	36		
Grid Interval	0.05 deg (fixed)		
Options	nEx:	10	nloop:
	<input checked="" type="checkbox"/> Enable interpolation		

Climate Model	ACCESS1.0
	CESM1(BGC)
Time Range	From: 1 JAN 1981
	To: 31 DEC 2000
Future	From: 1 JAN 2046
	To: 31 DEC 2065

User ID: petra@hydrat.t.u-tokyo.ac.jp

Request ID: cmp5-30311

Exec Bias Correction

Clear All

Help

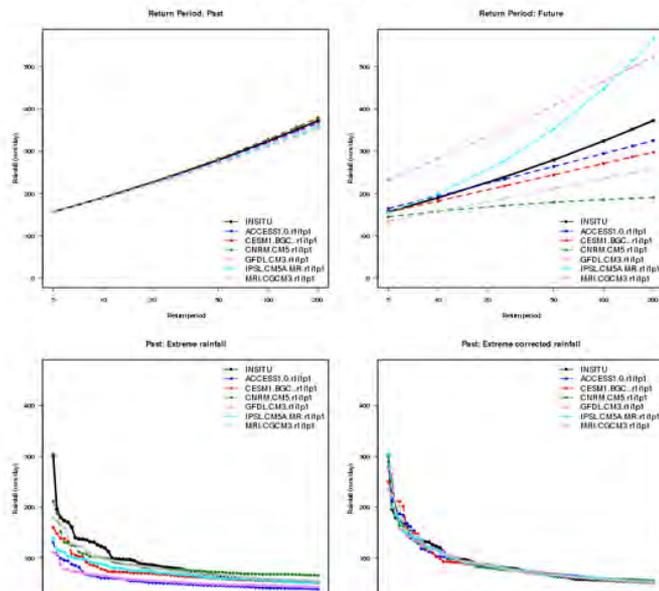
## Bias Correction Results

[Open in New Window/Tab](#)

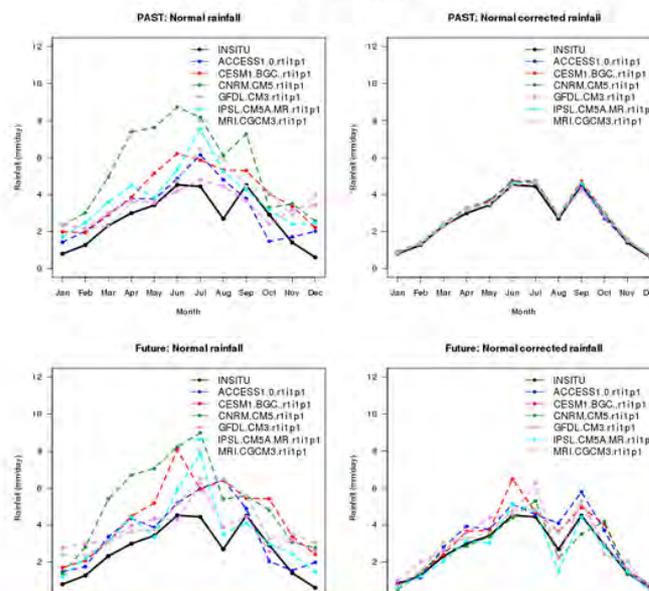
Download : ZIP archive of [POINT files](#) | [PLOT files](#)

Point 1: ( 139.3800 , 36.1500 )

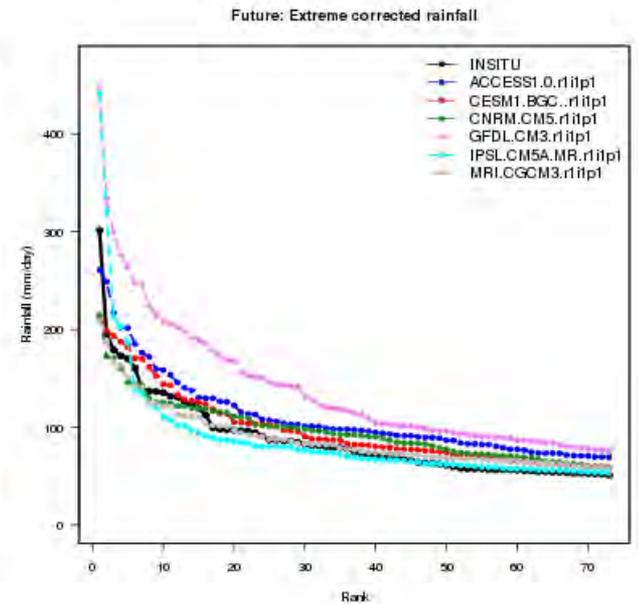
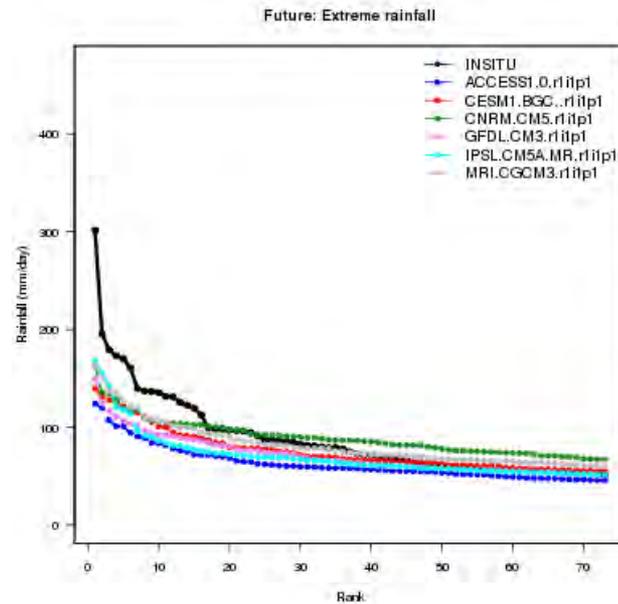
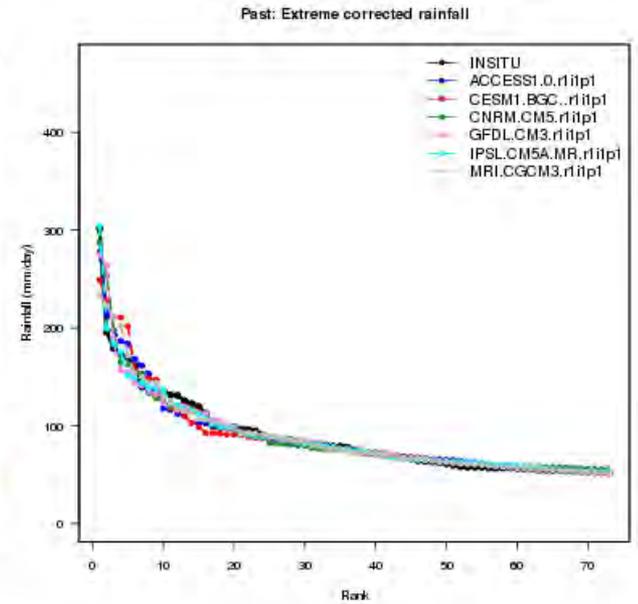
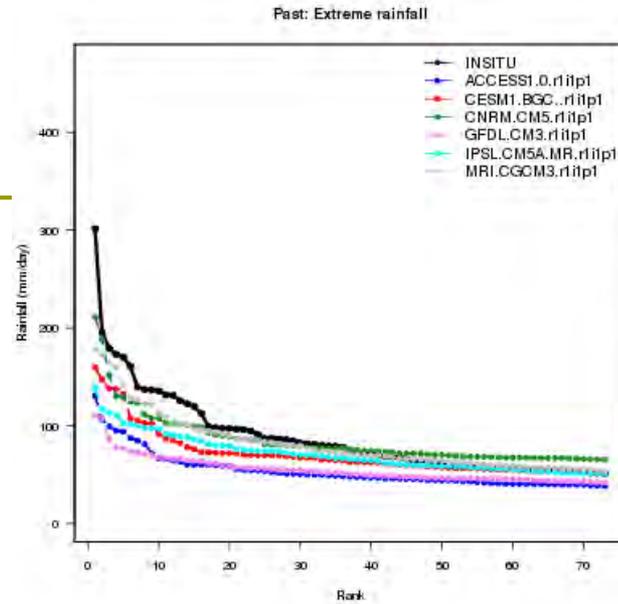
[1] Extreme Rainfall



[2] Normal Rainfall

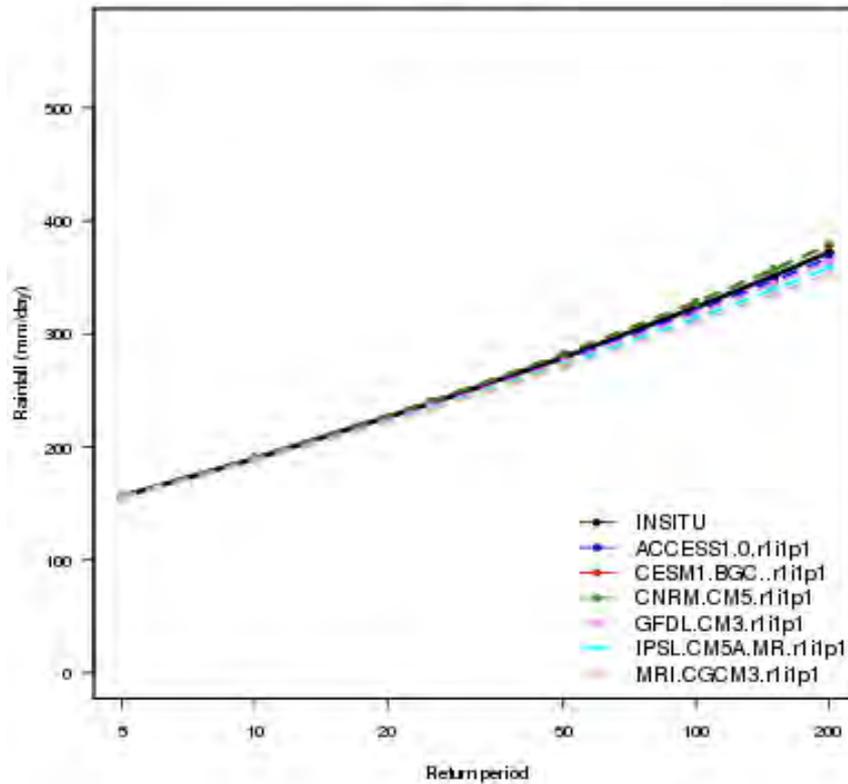


# Extreme Rainfall (豪雨)

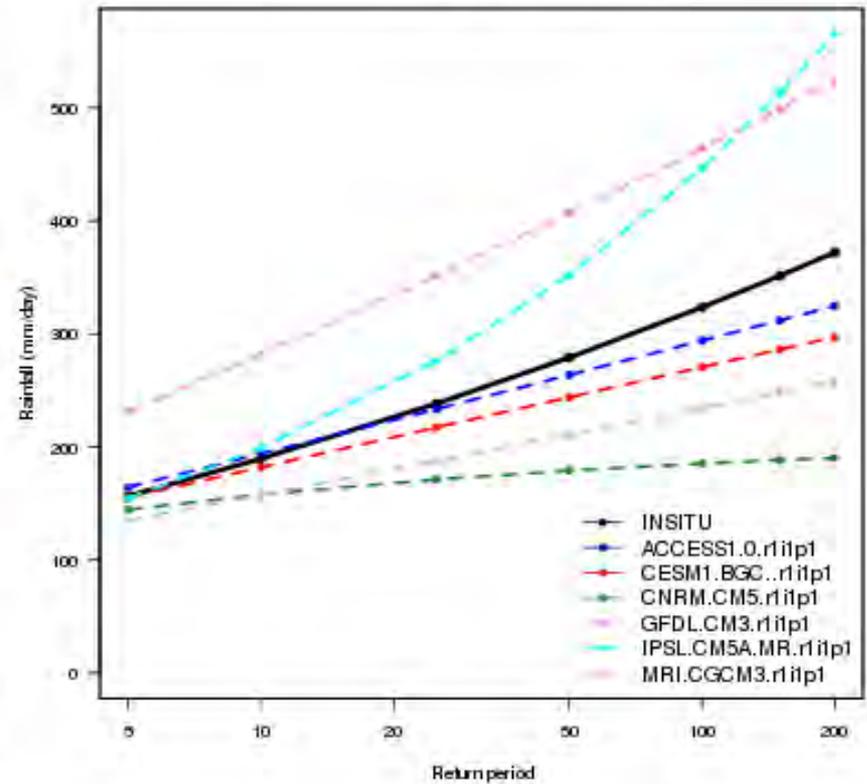


# Extreme Rainfall (豪雨)

Return Period: Past



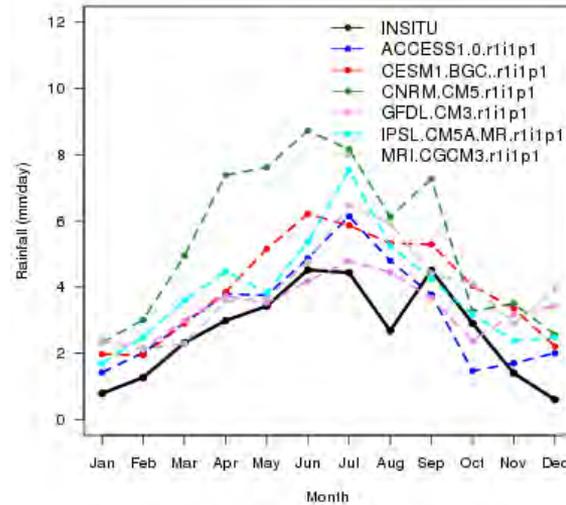
Return Period: Future



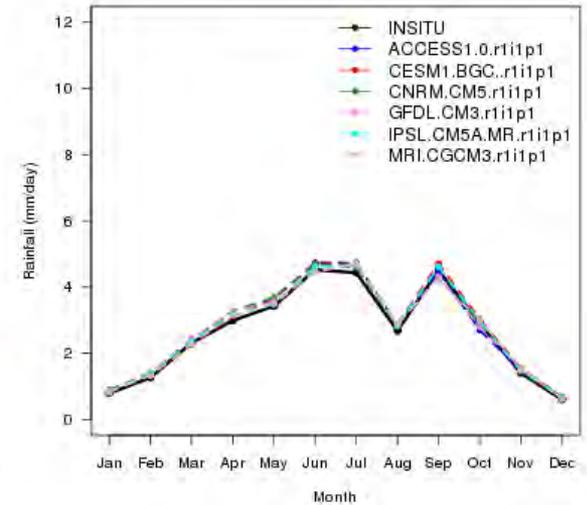
# Monthly rainfall (通常の雨)

## Normal Rainfall

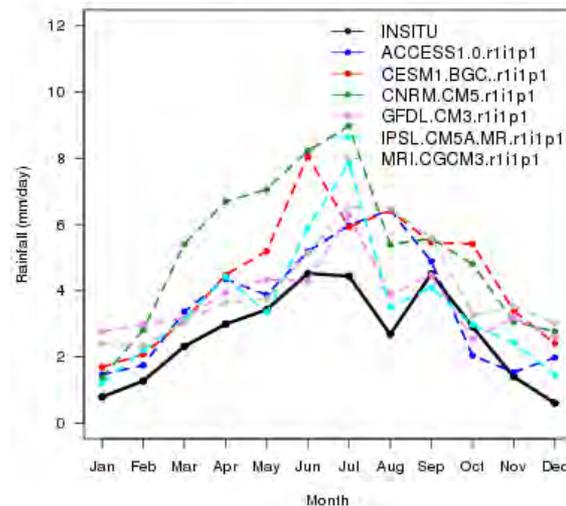
PAST: Normal rainfall



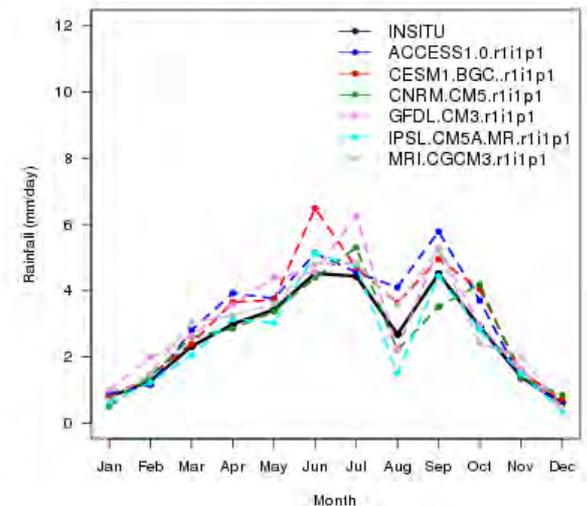
PAST: Normal corrected rainfall



Future: Normal rainfall



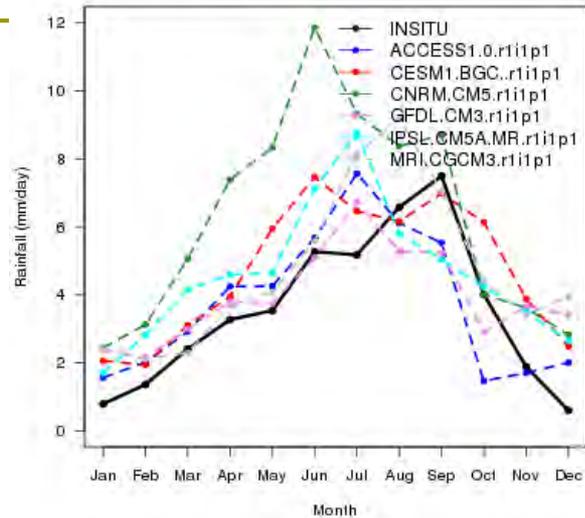
Future: Normal corrected rainfall



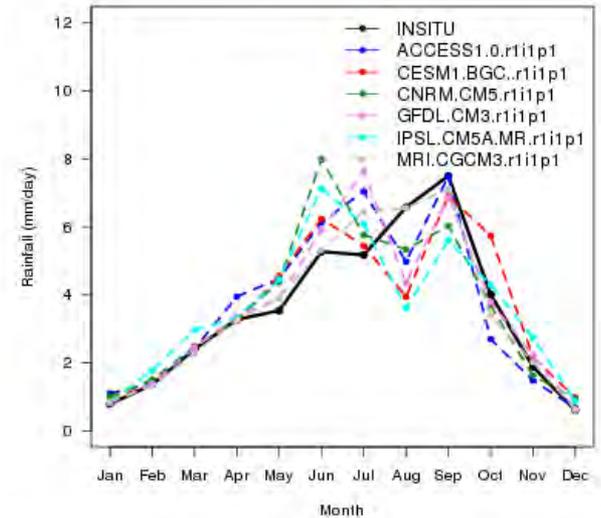
# Monthly rainfall (通常の雨)

Final Result

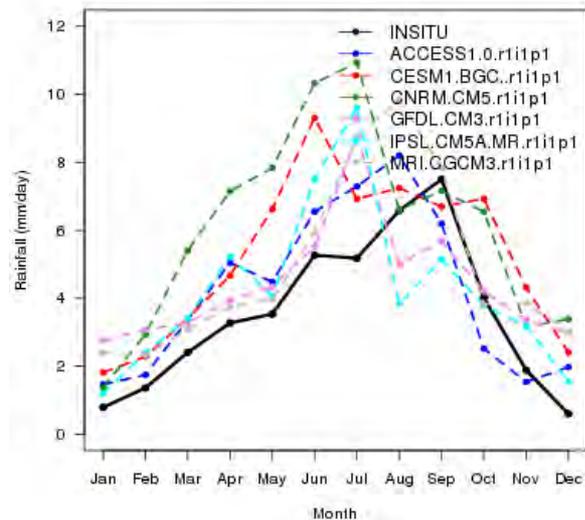
PAST: Monthly rainfall



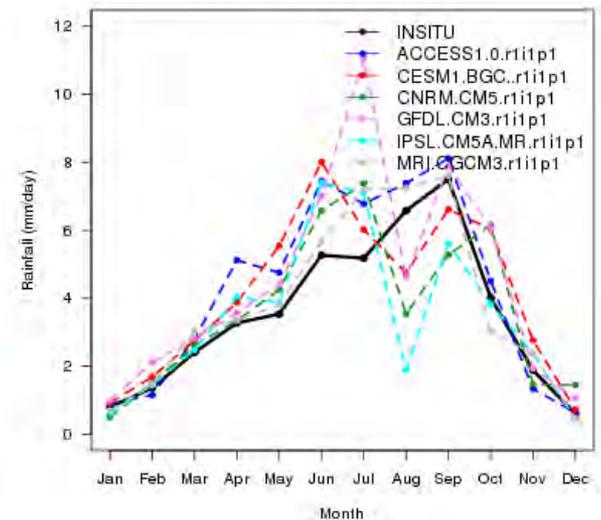
PAST: Monthly corrected rainfall



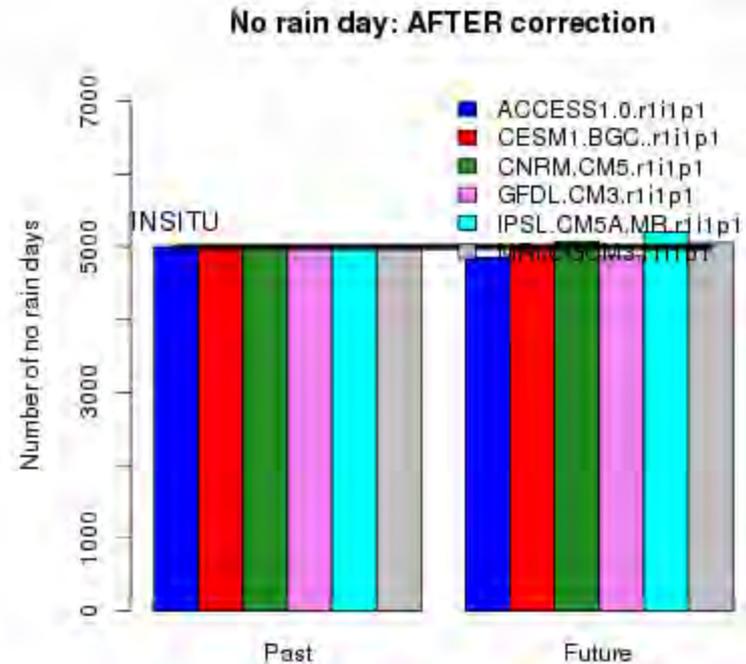
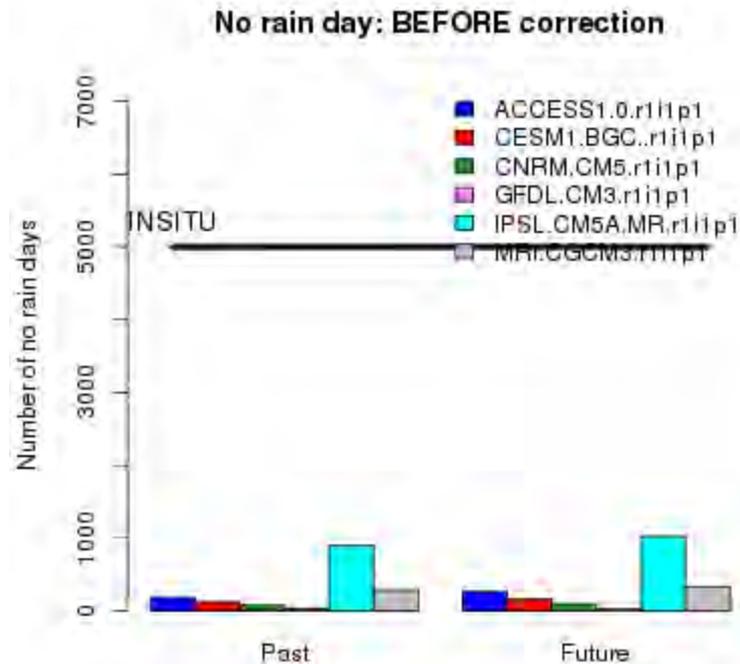
Future: Monthly rainfall



Future: Monthly corrected rainfall



# Number of no rain days (無降雨日)



# Bias correction done(バイアス補正の完了)

Meteorologic Element	Precipitation	Level / Layer:	Ground/water surface
Emission Scenario	rcp85		
Area/Country	JAPAN		
Processing Region	West: 139	North: 37	East: 140.5
		South: 36	
Grid Interval	0.05 deg (fixed)		
Options	nEx: 10	nloop: 30	
	<input type="checkbox"/> Enable interpolation		

Climate Model			
ACCESS1.0			
CESM1(BGC)			
CNRM-CM5			
GFDL-CM3			
IPSL-CM5A-MR			
MRI-CGCM3			

Time Range				
Past	From:	1	JAN	1981
	To:	31	DEC	2000
Future	From:	1	JAN	2046
	To:	31	DEC	2065

User ID: petra@hydrat.t.u-tokyo.ac.jp

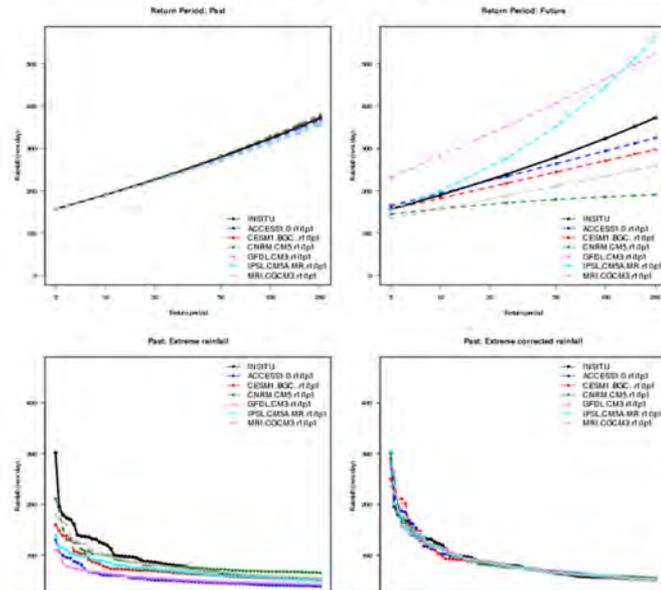
Request ID: cmi05-20311    Exec Bias Correction    Clear All    Help

Bias Correction Results    Open in New Window/Tab    Download : ZIP archive of [POINT files](#) | [PLOT files](#)

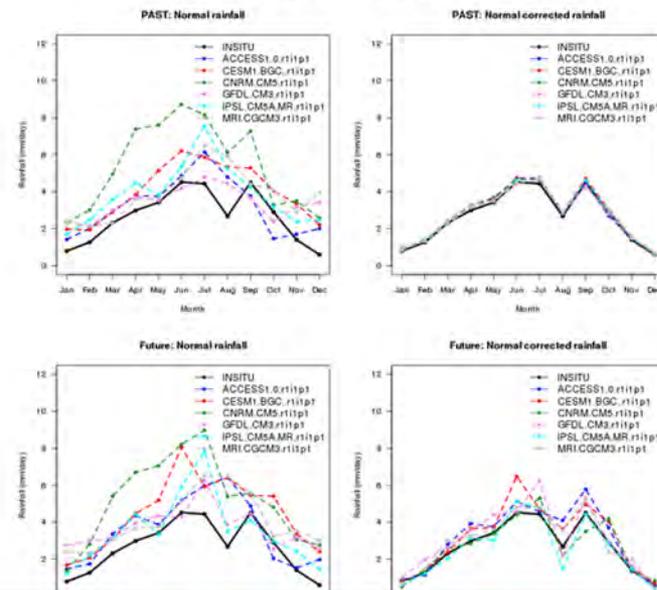
JAPAN\_plot.zip  
JAPAN\_point.zip

Point 1: ( 139.3800 , 36.1500 )

[1] Extreme Rainfall



[2] Normal Rainfall



# Folder organization (ディレクトリ構成)

---

## □ **DataAnalysis**

- DATA\_ANALYSIS\_TEMPLATE.xlsx

## □ **Results**

- DATA\_ANALYSIS\_Petra.xlsx
- JAPAN\_plot
- JAPAN\_point

# “DataAnalysis” ディレクトリ

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JAPAN\_plot.zip と JAPAN\_point.zip を **DataAnalysis** ディレクトリにコピーし、同じ場所に解凍する。



DataAnalysis/JAPAN\_plot/PLOT/JAPAN



統計データ、表示用データ

DataAnalysis/JAPAN\_point/OUT/JAPAN



選択したモデルにおける過去と将来の時系列データ。無降雨日のデータも含む。

# ディレクトリ名:

“DataAnalysis/JAPAN\_plot/PLOT/JAPAN”

## Folders:

txt

統計データ、表示用データ

png

画像データ (png format) DIAS tool上で表示された画像データ。)

▶ DataAnalysis ▶ JAPAN\_plot ▶ PLOT ▶ JAPAN ▶ txt

- 139.0600\_36.4050\_future.txt
- 139.0600\_36.4050\_past.txt
- 139.0600\_36.4050\_past.txt\_fr\_fut.txt
- 139.0600\_36.4050\_past.txt\_fr\_past.txt
- 139.0600\_36.4050\_past.txt\_monthly.txt
- 139.0600\_36.4050\_past.txt\_monthly\_co.txt
- 139.0600\_36.4050\_past.txt\_monthly\_fut.txt
- 139.0600\_36.4050\_past.txt\_monthly\_fut\_co.txt
- 139.0600\_36.4050\_past.txt\_normal.txt
- 139.0600\_36.4050\_past.txt\_normal\_co.txt
- 139.0600\_36.4050\_past.txt\_normal\_fut.txt
- 139.0600\_36.4050\_past.txt\_normal\_fut\_co.txt
- 139.0600\_36.4050\_past.txt\_sort\_fut.txt
- 139.0600\_36.4050\_past.txt\_sort\_fut\_co.txt
- 139.0600\_36.4050\_past.txt\_sort\_past.txt
- 139.0600\_36.4050\_past.txt\_sort\_past\_cor.txt

time	INSITU	ACCESS1.0@r11p1	CESM1(BGC)@r11p1	CNRM-CM5@r11p1	GFDL-CM3@r11p1	IPSL-CM5A-MR@r11p1	MRI-CGCM3@r11p1
1	0.683	0.969	0.754	0.873	0.678	0.744	0.728
2	1.252	1.290	1.260	1.389	1.269	1.618	1.204
3	2.108	2.144	2.265	2.199	2.165	2.643	2.046
4	2.651	3.406	2.981	2.809	2.891	2.852	2.802
5	3.115	3.833	3.807	3.774	3.381	3.855	3.406
6	5.048	5.960	6.367	7.574	5.768	6.714	5.309
7	5.876	6.997	5.796	5.889	7.431	6.219	6.438
8	6.669	5.781	4.590	5.893	5.118	4.589	6.977
9	7.957	7.511	7.219	6.418	6.993	6.016	7.121
10	3.094	2.340	4.546				
11	1.366	1.086	1.535				
12	0.408	0.457	0.698				

20年月平均降水量 (気候値)

time	INSITU	ACCESS1.0@r11p1	CESM1(BGC)@r11p1	CNRM-CM5@r11p1	GFDL-CM3@r11p1
5	121.8423	122.0400	122.3310	122.3074	121.7087
10	143.6327	144.2553	145.5877	146.2775	143.2855
25	174.5593	176.0431	179.5605	181.8288	173.7892
50	199.6715	202.0642	207.9462	211.9837	198.4615
100	226.3661	229.9193	238.8758	245.2720	224.6004
150	242.7546	247.1148	258.2381	266.3256	240.6051
200	254.7429	259.7375	272.5774	282.0192	252.2930

X年確率降雨

time	INSITU	ACCESS1.0@r11p1	CESM1(BGC)@r11p1	CNRM-CM5@r11p1	GFDL-CM3@r11p1
1	201.0002	196.3815	193.4813	202.4377	197.3323
2	175.0000	160.2571	162.2162	184.0399	190.4311
3	157.5000	149.0996	155.2892	151.7320	140.4845
4	135.5000	142.4132	150.2486	130.6688	121.9845
5	134.0000	140.7021	147.7196	129.5676	120.7177
6	115.5000	130.5859	118.8355	124.7540	113.1718
7	111.5000	126.1612	116.5327	123.4400	111.4617
8	107.0000	120.6978	114.3822	109.9303	107.6340
9	102.5000	105.0718	112.4811	105.9592	105.6248
10	95.0000	96.6056	107.0353	105.3169	100.0927
11	90.5000	95.6506	106.5931	99.6367	99.3006
12	89.0000	92.9741	99.0480	99.6319	97.1695
13	89.0000	91.2549	96.6939	98.4481	97.0440
14	88.5000	86.2944	93.5228	97.4623	94.3294

20年における上位"n"個の豪雨値 (大きい順)

# データ解析 (What to do with all these data)

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- 過去と将来における降水量の比較。  
(% 増加/減少)
  - 頻度分析(Frequency analysis) (確率年における降雨強度の比較):
    - at a point for 100-year and 200-year return period  
139.0600\_36.4050\_past.txt\_fr\_past.txt (past)  
139.0600\_36.4050\_past.txt\_fr\_fut.txt (future)
  - 月平均 (Monthly averages) : 月毎、選択したモデル毎 ->  
possible seasonal shifts  
139.0600\_36.4050\_past.txt\_monthly\_co.txt (past)  
139.0600\_36.4050\_past.txt\_monthly\_fut\_co.txt (future)

# How to do it

## DataAnalysis/**DATA\_ANALYSIS\_TEMPLATE.xlsx**

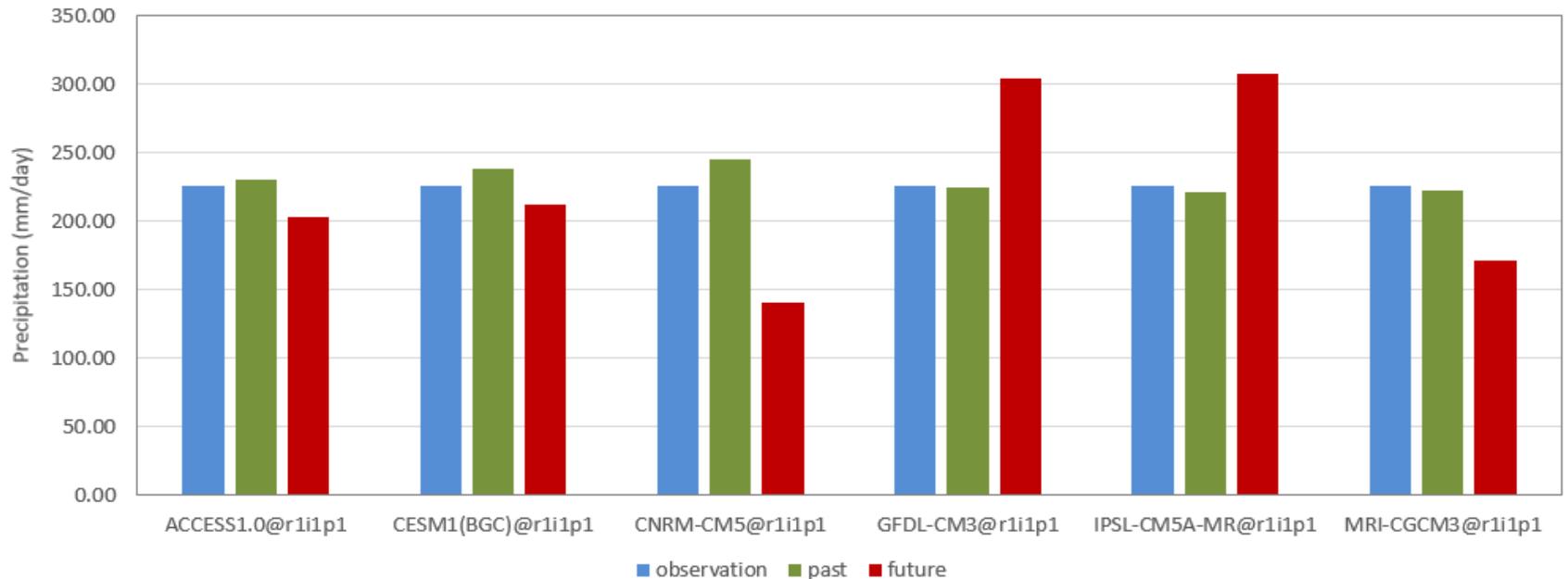
ワークシート名:  
Extremes

139.0600\_36.4050\_past.txt\_fr\_past.txt  
139.0600\_36.4050\_past.txt\_fr\_fut.txt

### 100-year probability rainfall

	ACCESS1.0@r1i1p1	CESM1(BGC)@r1i1p1	CNRM-CM5@r1i1p1	GFDL-CM3@r1i1p1	IPSL-CM5A-MR@r1i1p1	MRI-CGCM3@r1i1p1
observation	226.37	226.37	226.37	226.37	226.37	226.37
past	229.92	238.88	245.27	224.60	221.66	222.10
future	203.07	212.55	140.02	304.51	307.56	171.14
%change	-11.68	-11.02	-42.91	35.58	38.76	-22.95

100-year probability rainfall: past and future



# How to do it

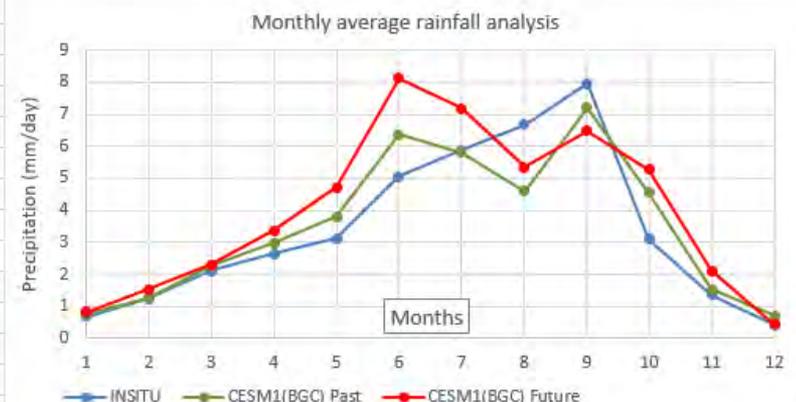
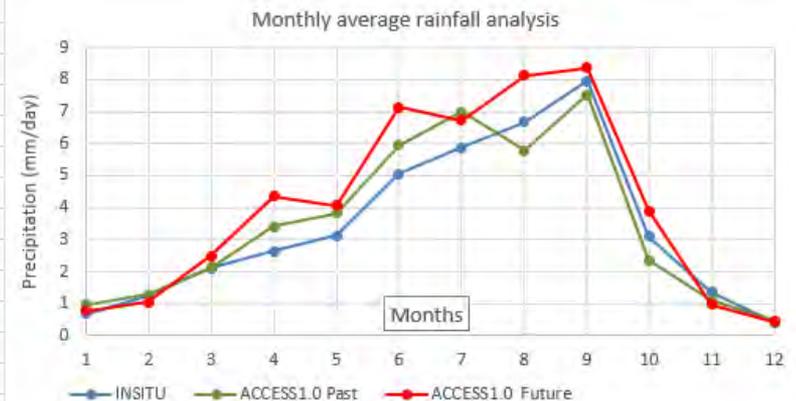
## DataAnalysis/**DATA\_ANALYSIS\_TEMPLATE.xlsx**

ワークシート名:  
Monthly

139.0600\_36.4050\_past.txt\_monthly\_co.txt  
139.0600\_36.4050\_past.txt\_monthly\_fut\_co.txt

Month	INSITU	ACCESS1.0 Past	ACCESS1.0 Future	%change
1	0.683	0.969	0.784	-19.09
2	1.252	1.29	1.051	-18.53
3	2.108	2.144	2.486	15.95
4	2.651	3.406	4.358	27.95
5	3.115	3.833	4.077	6.37
6	5.048	5.96	7.144	19.87
7	5.876	6.997	6.725	-3.89
8	6.669	5.781	8.115	40.37
9	7.957	7.511	8.377	11.53
10	3.094	2.34	3.9	66.67
11	1.366	1.086	0.973	-10.41
12	0.408	0.457	0.434	-5.03

Month	INSITU	CESM1(BGC) Past	CESM1(BGC) Future	%change
1	0.683	0.754	0.818	8.49
2	1.252	1.26	1.528	21.27
3	2.108	2.265	2.306	1.81
4	2.651	2.981	3.371	13.08
5	3.115	3.807	4.711	23.75
6	5.048	6.367	8.119	27.52
7	5.876	5.796	7.173	23.76
8	6.669	4.59	5.355	16.67
9	7.957	7.219	6.488	-10.13
10	3.094	4.546	5.282	16.19
11	1.366	1.535	2.111	37.52
12	0.408	0.698	0.444	-36.39



*Thank you for your attention*

