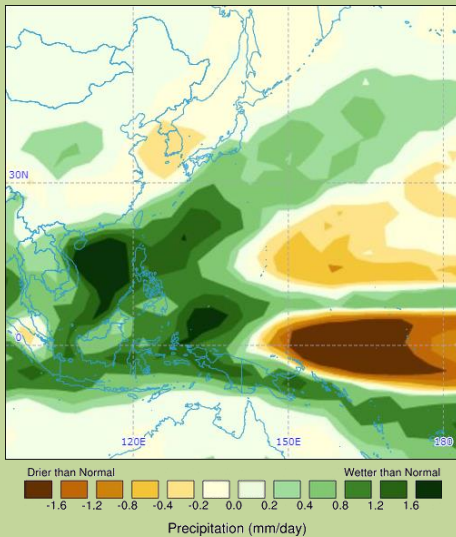


Multi-Model Ensemble Prediction using CLIK

MME

MME

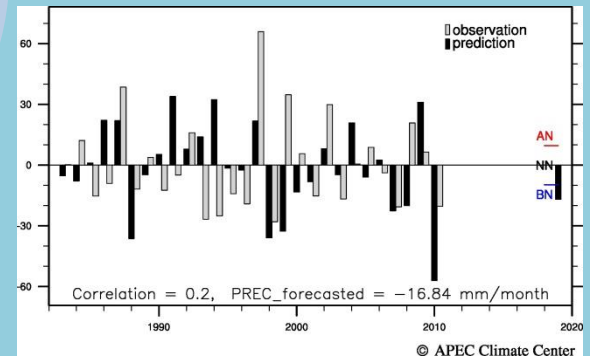
Individual models and MME forecast manipulated by users



CLIK

Downscale

Statistical downscaled forecast using individual models & MME forecast





MME

MME

DMME

PMME

SCM Simple Composite Method

Average of individual forecast
with equal weighting

GAUS Gaussian fitting method

Tercile based categorical probabilities



Precipitation for Daegu for OND 2020?

1. Deterministic MME

1-1. Customize your own prediction

The screenshot shows the Clik Climate Information Toolkit interface. The top navigation bar includes the Clik logo and tabs for 'MME', 'Downscale', and 'My Page'. The 'MME' tab is highlighted with a red circle. Below the navigation bar is a 'Predict' section with several configuration panels:

- Lead Month:** 3Month (selected)
- Year/Season:** Year: 2020, Season: OND
- Methods:** Deterministic (selected), Probabilistic
- Variables:** PREC (selected), T2M, T850, SLP, SST, Z500
- Models:** ALL, APCC, BOM, CMCC, CWB, HMC, KMA, MGO, MSC, NASA, NCEP, PNU, UKMO (all selected)

A 'Predict & Verify' button is located at the bottom right of the configuration area.

① When

: 3-month lead prediction data is updated every month.

② Methods

: 1 deterministic (SCM) and 1 probabilistic (GAUS) MME methods

③ Variables

: the target variable

④ Models

: GCM models for a MME prediction

1. Deterministic MME

1-1. Customize your own prediction

The screenshot shows the 'Predict' section of the Clik Climate Information Toolkit. The interface includes a top navigation bar with 'MME', 'Downscale', and 'My Page' tabs, and a 'Logout Edit HelpDesk' link. The 'Predict' section is divided into four main areas:

- Lead Month:** A radio button selection for '3Month' (annotated with a red circle 1).
- Year/Season:** Dropdown menus for 'Year' (set to '2020') and 'Season' (set to 'OND') (annotated with a red circle 2).
- Methods:** Radio button selection for 'Deterministic' (selected) and 'Probabilistic' (annotated with a red circle 2).
- Variables:** Radio button selection for 'PREC' (selected) and other options like 'T2M', '1850', 'SLP', 'Z500' (annotated with a red circle 3).
- Models:** A grid of checkboxes for various models: ALL, APCC, BOM, CMCC, CWB, HMC, KMA, MGO, MSC, NASA, NCEP, PNU, and UKMO. The 'MGO' checkbox is unchecked, while all others are checked (annotated with a red circle 4).

A 'Predict & Verify' button is located at the bottom right of the form.

① When (**2020/OND**)

: 3-month lead prediction data is updated every month.

② Methods (**Deterministic**)

: 1 deterministic (SCM) and 1 probabilistic (GAUS) MME methods

③ Variables (**PREC**)

: the target variable

④ Models (**ALL w/o MGO**)

: GCM models for a MME prediction



1. Deterministic MME

1-2. Read the map

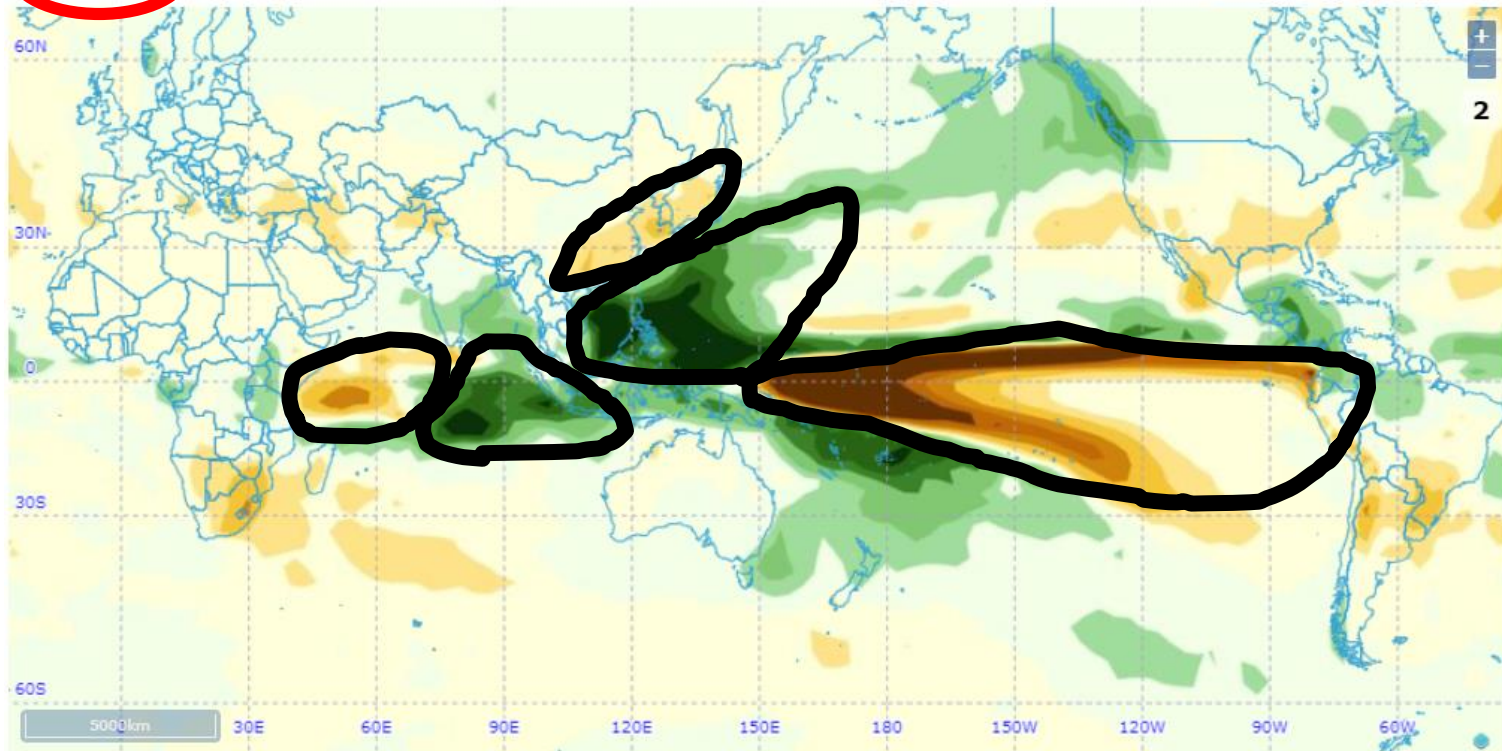
View
modes

Result

☒ Prediction only ☐ Prediction & Verification

Move Center

Download



Zoom
buttons

Label bar for
probabilities



1. Deterministic MME

1-2. Read the map

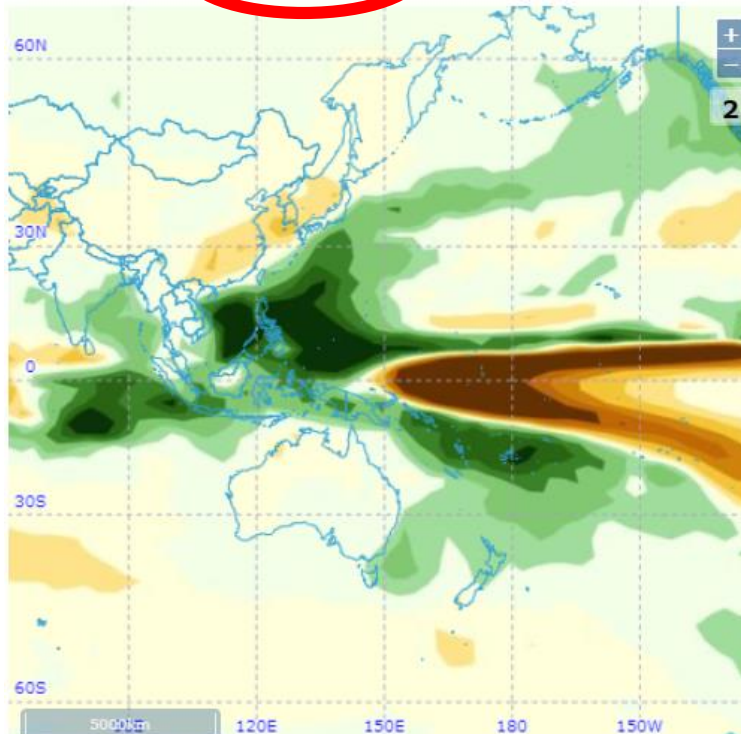
View
modes

Result

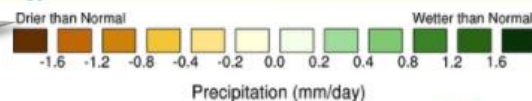
☐ Prediction only ☒ Prediction & Verification

Move Center

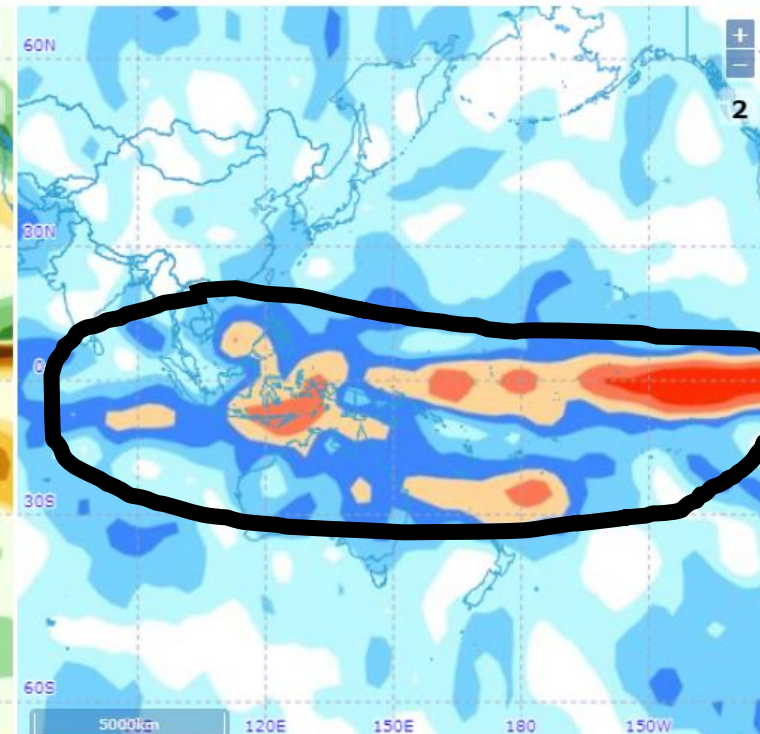
Download



Label bar for
probabilities



☒ Lat/Lon Grid



Zoom
buttons

1. Deterministic MME

1-2. Read the map

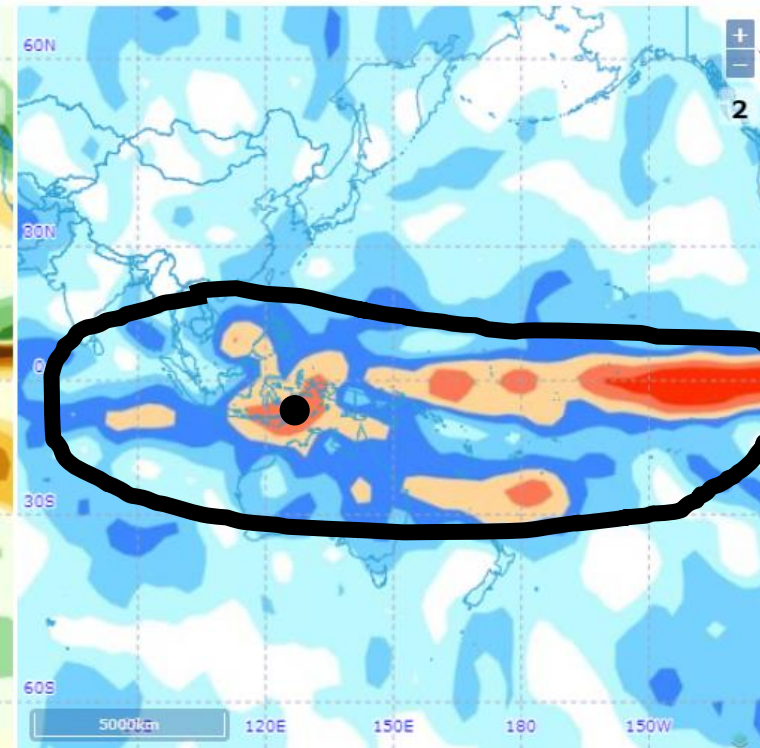
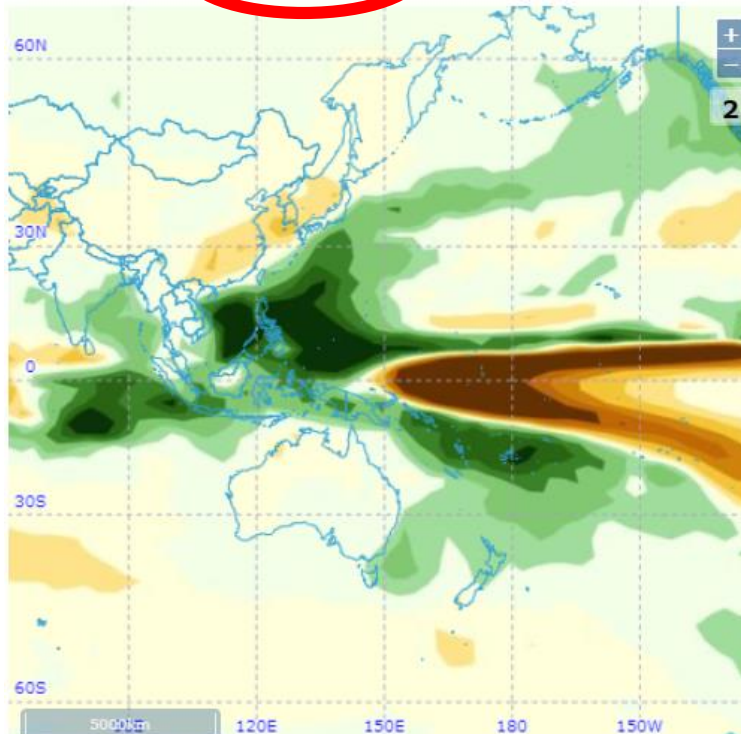
View
modes

Result

☐ Prediction only ☒ Prediction & Verification

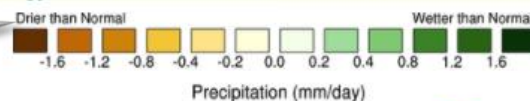
Move Center

Download



Zoom
buttons

Label bar for
probabilities



☒ Lat/Lon Grid

1. Deterministic MME

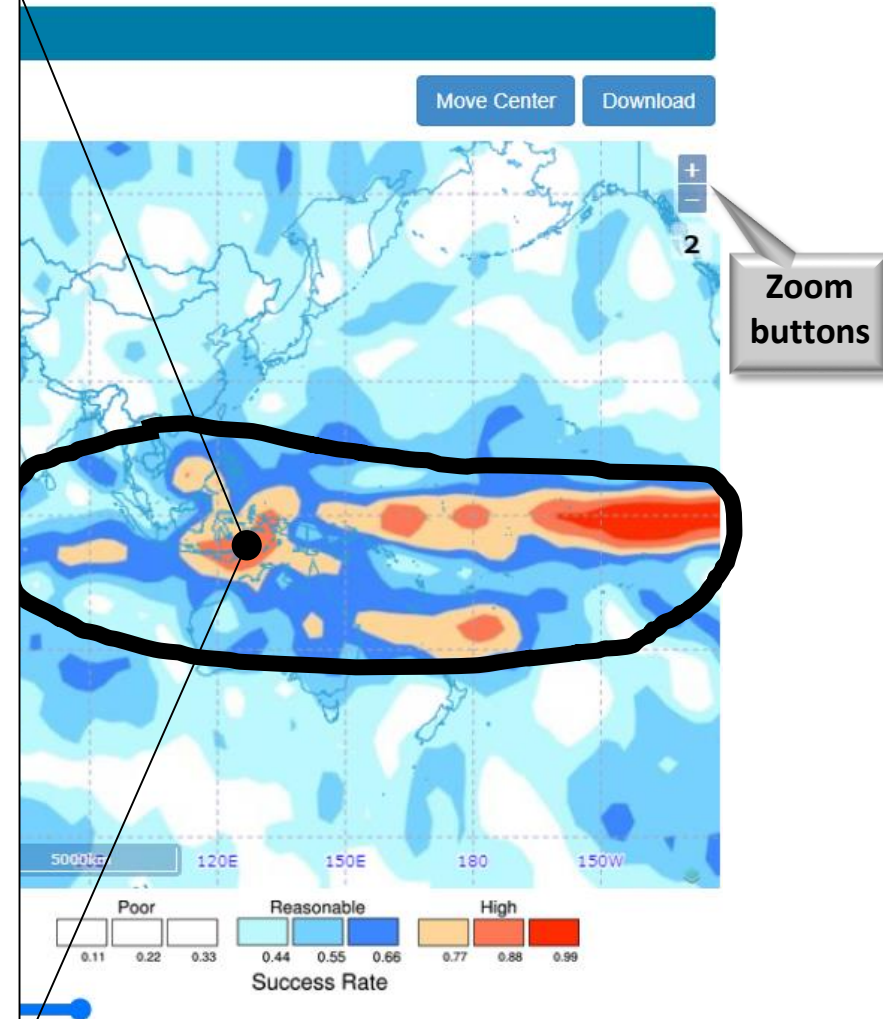
1-2. Read the map

Success Rate

% of success among a number of attempts

$\begin{array}{c c} & O \\ \hline F & \end{array}$	AN	NN	BN
AN	8	1	1
NN	0	3	0
BN	2	0	3

$$SR = 14/18 \sim 0.78$$



2. Probabilistic MME

2-1. Customize your own prediction

The screenshot shows the Clik Climate Information Toolkit interface. The 'MME' tab is highlighted with a red circle. The 'Predict' section contains several form fields:

- Lead Month:** 3Month (selected)
- Year/Season:** Year: 2020, Season: OND
- Methods:** Probabilistic (selected)
- Variables:** PREC (selected)
- Models:** ALL, APCC, BOM, CMCC, CWB, HMC, KMA, MGO, MSC, NASA, NCEP, PNU, UKMO (all selected)

A 'Predict & Verify' button is located at the bottom right of the form.

① When

: 3-month lead prediction data is updated every month.

② Methods

: 1 deterministic (SCM) and 1 probabilistic (GAUS) MME methods

③ Variables

: the target variable

④ Models

: GCM models for a MME prediction

2. Probabilistic MME

2-1. Customize your own prediction

The screenshot shows the 'Predict' interface of the Clik Climate Information Toolkit. The interface is divided into several sections:

- Lead Month:** A radio button for '3Month' is selected, indicated by a red circle with the number 1.
- Year/Season:** Two dropdown menus are shown: 'Year' set to '2020' and 'Season' set to 'OND', both highlighted by a red box and a red circle with the number 1.
- Methods:** Two radio buttons are shown: 'Deterministic' and 'Probabilistic'. 'Probabilistic' is selected, indicated by a red circle with the number 2.
- Variables:** A list of variables is shown: 'PREC', 'T2M', 'SLP', and 'Z500'. 'PREC' is selected, indicated by a red circle with the number 3.
- Models:** A grid of checkboxes is shown for various models: 'ALL', 'APCC', 'BOM', 'CMCC', 'CWB', 'HMC', 'KMA', 'MGO', 'MSC', 'NASA', 'NCEP', 'PNU', and 'UKMO'. 'ALL' is selected, indicated by a red circle with the number 4.
- Predict & Verify:** A blue button is located at the bottom right, highlighted by a red box.

① When (**2020/OND**)

: 3-month lead prediction data is updated every month.

② Methods (**Probabilistic**)

: 1 deterministic (SCM) and 1 probabilistic (GAUS) MME methods

③ Variables (**PREC**)

: the target variable

④ Models (**ALL w/o MGO**)

: GCM models for a MME prediction



2. Probabilistic MME

2-2. Read the map

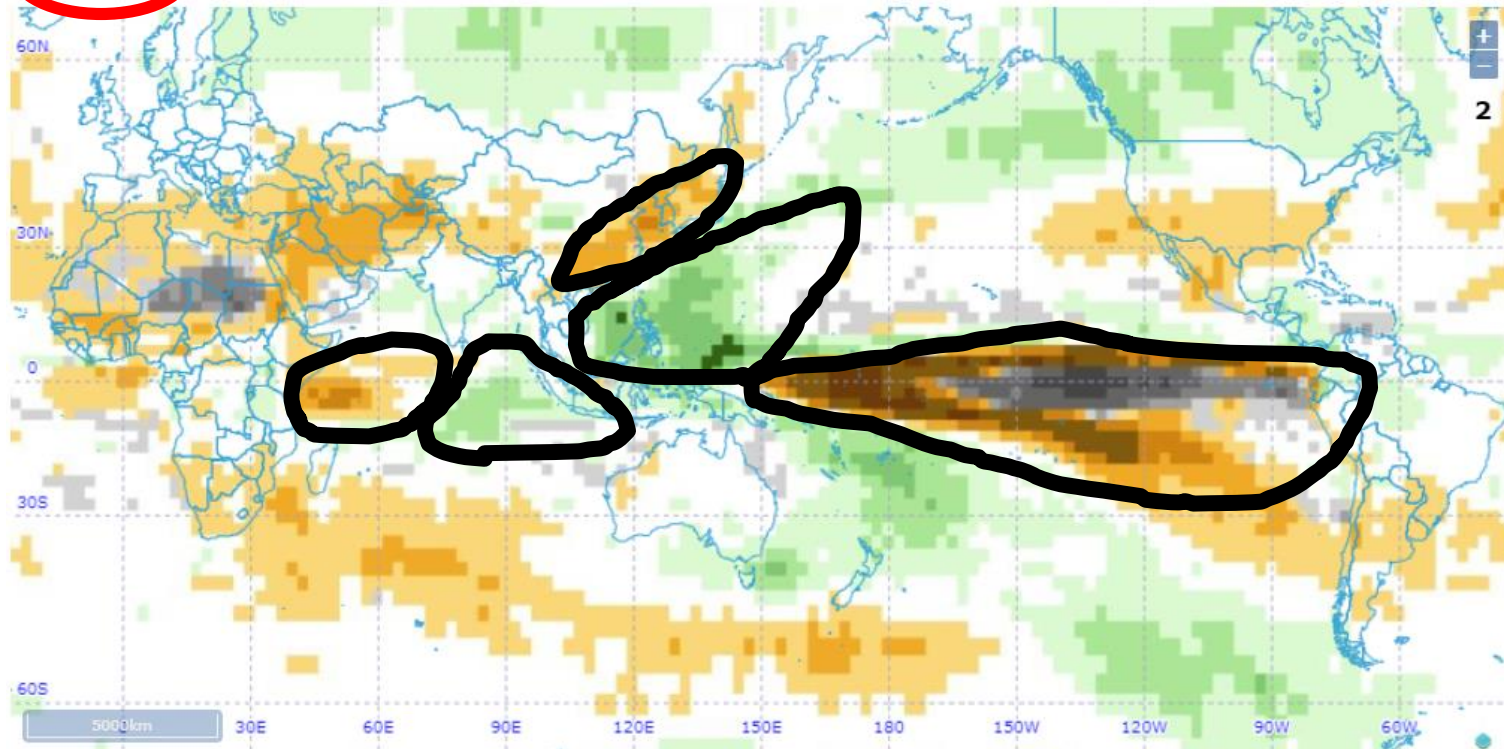
View
modes

Result

☒ Prediction only ☐ Prediction & Verification

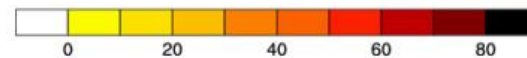
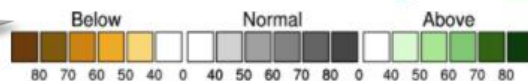
Move Center

Download



Zoom
buttons

Label bar for
probabilities



☒ Opacity

☒ Lat/Lon Grid

☒ Opacity

Heidke Skill Score

2. Probabilistic MME

2-2. Read the map

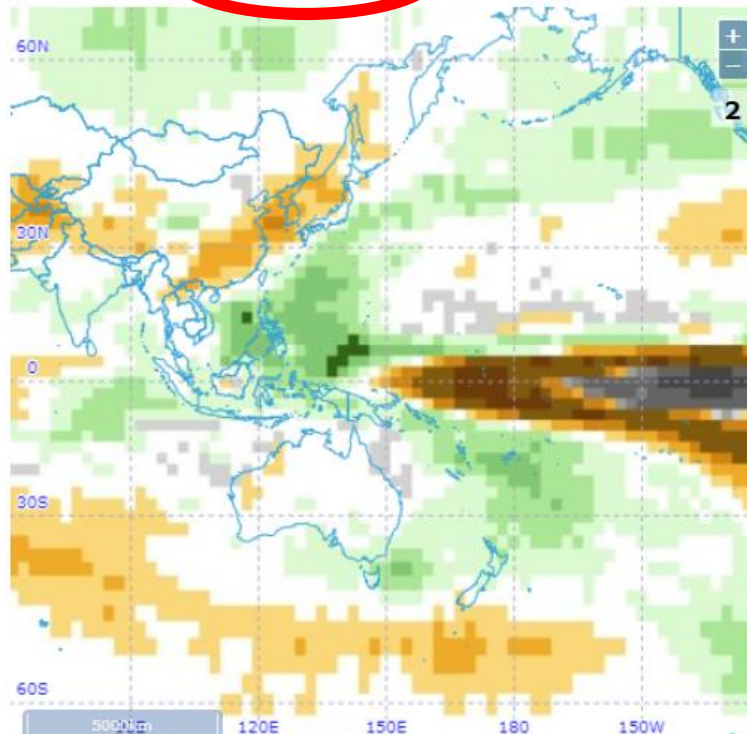
View
modes

Result

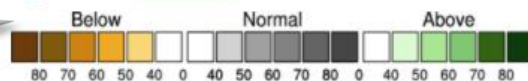
☐ Prediction only ☒ Prediction & Verification

Move Center

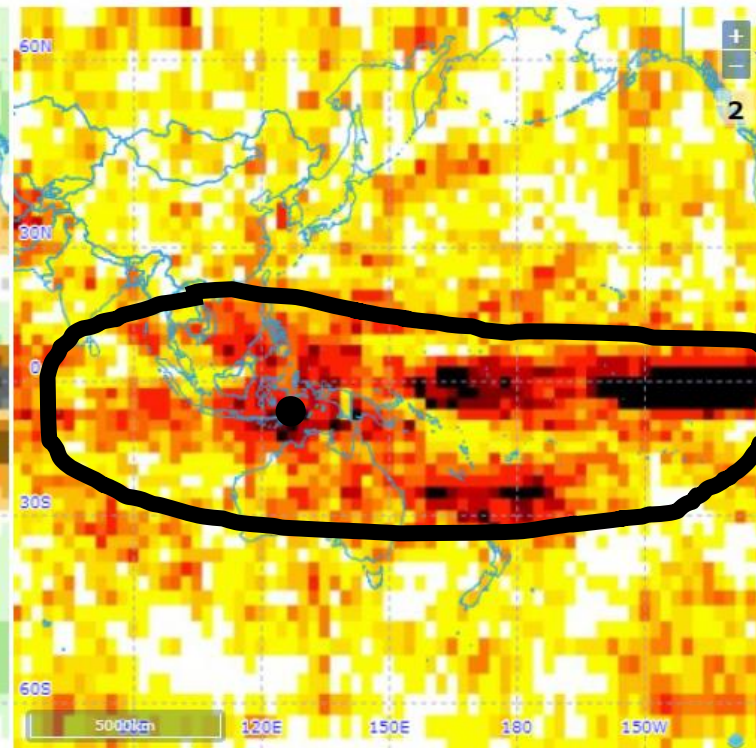
Download



Label bar for
probabilities



☒ Lat/Lon Grid



Zoom
buttons

Label bar for
skill scores



Heidke Skill Score

2. Probabilistic MME

2-2. Read the map

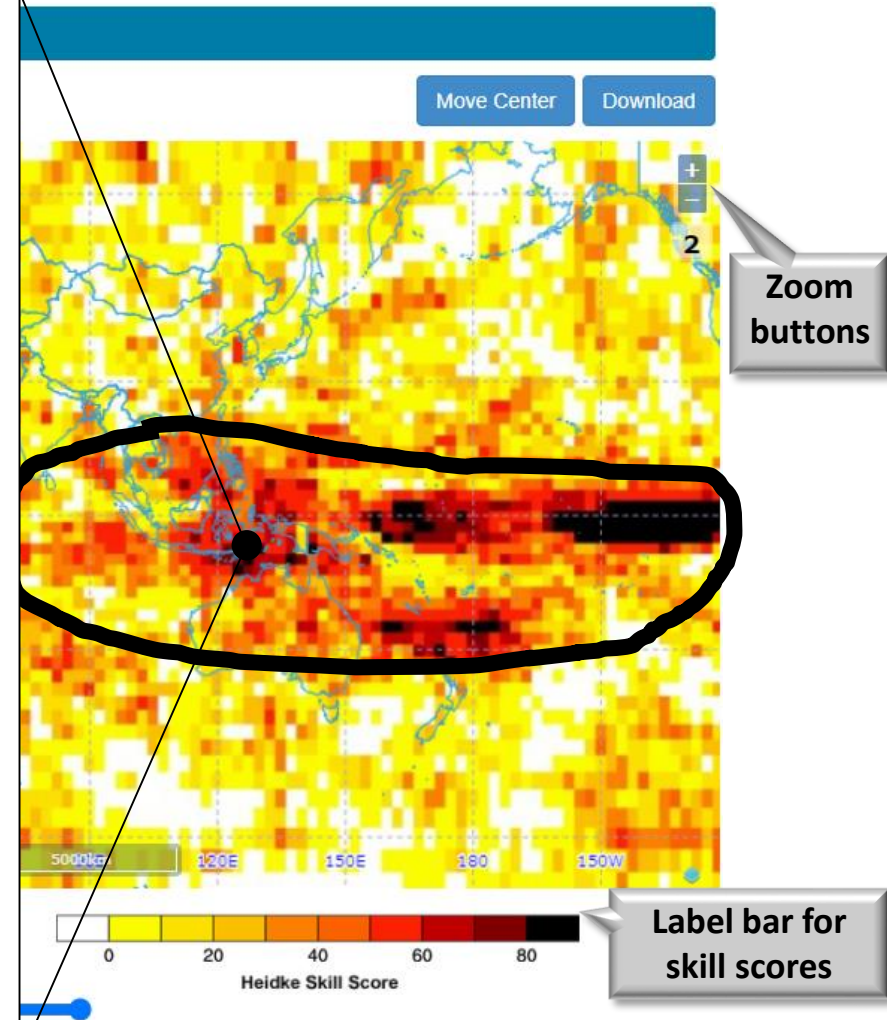
Heidke Skill Score

A scaled measure of the % improvement in skill relative to a set of random forecasts

	AN	NN	BN	Hit
1993	45	35	20	0
1994	33	33	33	0.333
1995	40	33	27	1
...				...
2009	15	30	55	1
2010	20	40	40	0.5

$$\text{HSS} = 100 \times \frac{\text{Hit} - \text{by Chance}}{\text{Total} - \text{by Chance}}$$

$\frac{13.666 - 18/3}{18 - 18/3}$



2. Probabilistic MME

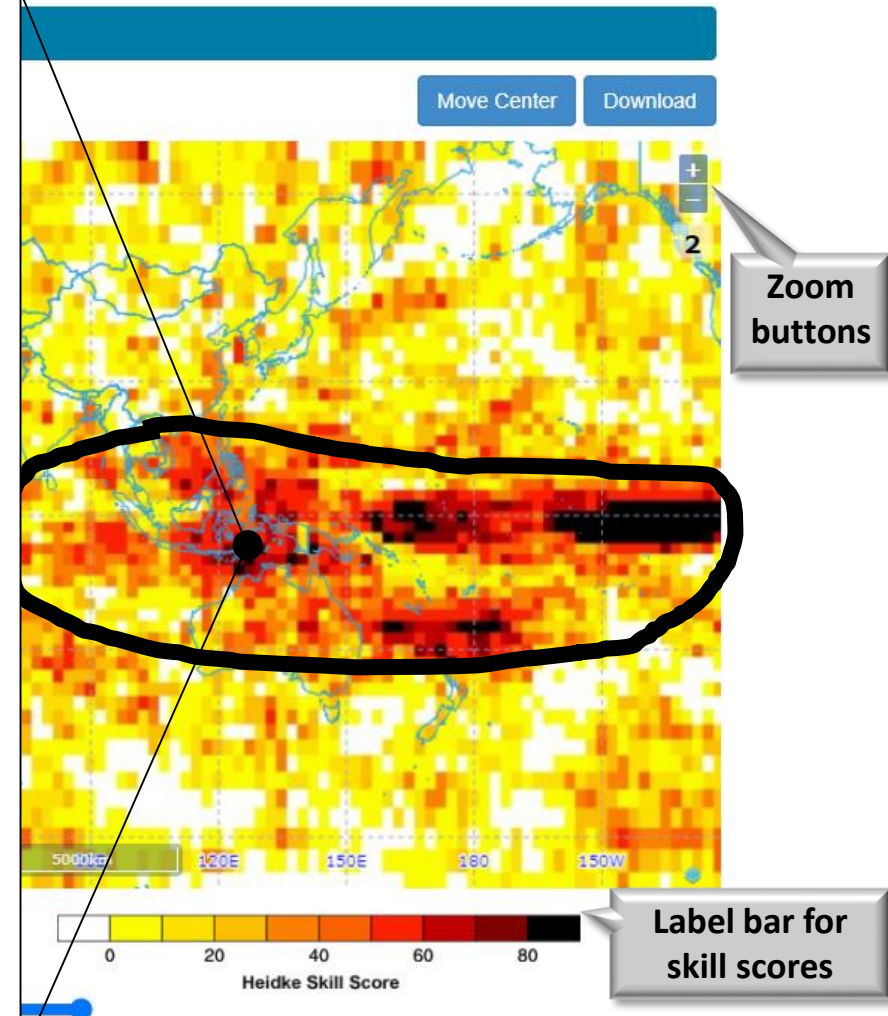
2-2. Read the map

Heidke Skill Score

A scaled measure of the % improvement in skill relative to a set of random forecasts

	AN	NN	BN	Hit
1993	45	35	20	0
1994	33	33	33	0.333
1995	40	33	27	1
...				...
2009	15	30	55	1
2010	20	40	40	0.5

$$\text{HSS} = 100 \times \frac{13.666 - 18/3}{18 - 18/3} \sim 64$$



2. Probabilistic MME

2-2. Read the map

View
modes

Result

☐ Prediction only ☒ Prediction & Verification

Move Center

Download

Prediction - PNG
Verification - PNG

NC - FILE

APCC - FILE

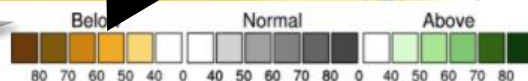
ZIP

〈3개월 전망 요약〉



[그림 1] 월별 (a)평균기온 및 (b)강수량 확률 예보(2020년 9월~11월)

Label bar for
probabilities



☒ Lat/Lon Grid

Heidke Skill Score



Label bar for
skill scores

2. Probabilistic MME

2-3. Get quantities

« FORECAST » GAUS » OCT » OND » 2020

이름

유형

prec.asc

ASC 파일

```
[Variable=prec][MME method=GAUS][Models=APCC BOM_ACCESS-S1 CMCC_SPS3 CWB_GFS119 GLOSEA5 HMC MSC_CANSIPSV2 NASA_NCEP_PNU_CGCMV2.0 UKMO][Training Period=1993-2010]
1 [Longitude], 0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5, 25, 27.5, 30, 32.5, 35, 37.5, 40, 42.5, 45, 47.5, 50, 52.5, 55, 57.5, 60, 62.5, 65, 67.5, 70, 72.5, 75,
2 [time=2020OND][lev=1][lat=90], 32.760, 32.538, 32.411, 32.618, 32.654, 32.525, 32.374, 32.527, 32.848, 33.010, 32.977, 33.057, 33.041, 33.283, 33.2
3 [time=2020OND][lev=1][lat=87.5], 31.371, 32.294, 32.697, 32.899, 33.387, 33.448, 33.564, 32.766, 32.511, 32.910, 33.245, 33.470, 33.435, 34.075, 34
4 [time=2020OND][lev=1][lat=85], 30.344, 30.742, 30.881, 30.477, 30.092, 30.759, 31.252, 30.363, 30.176, 30.012, 29.276, 29.599, 29.372, 29.738, 29.5
5 [time=2020OND][lev=1][lat=82.5], 28.225, 29.350, 29.889, 29.216, 29.403, 30.587, 30.210, 31.695, 31.098, 31.764, 31.814, 30.931, 30.669, 30.460, 30
6 [time=2020OND][lev=1][lat=80], 31.326, 30.235, 28.328, 26.990, 26.866, 26.216, 26.793, 28.513, 28.741, 27.796, 27.351, 27.564, 29.025, 31.233, 33.4
7 [time=2020OND][lev=1][lat=77.5], 34.684, 33.364, 32.576, 32.010, 30.606, 29.973, 30.795, 30.350, 30.024, 30.664, 30.725, 31.693, 33.065, 34.139, 34
8 [time=2020OND][lev=1][lat=75], 36.919, 36.291, 35.126, 33.062, 33.304, 34.269, 35.609, 35.024, 35.191, 32.298, 34.824, 34.504, 35.033, 34.951, 35.4
9 [time=2020OND][lev=1][lat=72.5], 37.740, 35.732, 37.920, 37.154, 36.460, 37.633, 38.409, 38.065, 35.872, 35.971, 33.837, 36.032, 3
10 [time=2020OND][lev=1][lat=70], 37.716, 36.497, 35.113, 35.074, 35.089, 36.426, 34
11 [time=2020OND][lev=1][lat=67.5], 39.147, 38.047, 37.287, 37.958, 39.577, 38.459, 3
12 [time=2020OND][lev=1][lat=65], 35.163, 34.999, 35.289, 35.603, 35.244, 35.499, 35
13 [time=2020OND][lev=1][lat=62.5], 33.523, 32.185, 32.814, 34.939, 35.264, 35.678, 3
14 [time=2020OND][lev=1][lat=60], 36.073, 37.594, 38.646, 37.693, 36.955, 38.709, 38
15 [time=2020OND][lev=1][lat=57.5], 40.141, 38.908, 37.900, 36.792, 36.104, 35.909, 3
16 [time=2020OND][lev=1][lat=55], 36.937, 37.458, 38.073, 36.413, 35.748, 34.033, 34
17 [time=2020OND][lev=1][lat=52.5], 38.409, 38.065, 35.872, 35.971, 33.837, 36.032, 3
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19 [time=2020OND][lev=1][lat=47.5], 39.882, 38.675, 40.482, 37.106, 35.005, 34.967, 3
20 [time=2020OND][lev=1][lat=45], 33.950, 33.365, 33.699, 29.225, 30.043, 31.009, 30
21 [time=2020OND][lev=1][lat=42.5], 30.947, 30.431, 30.418, 31.058, 30.679, 31.458, 2
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23 [time=2020OND][lev=1][lat=37.5], 33.742, 36.289, 36.363, 36.331, 39.168, 35.969, 3
24 [time=2020OND][lev=1][lat=35], 32.982, 33.099, 33.261, 31.674, 34.611, 33.480, 33
25 [time=2020OND][lev=1][lat=32.5], 35.026, 35.288, 31.800, 33.142, 31.530, 34.059, 3
26 [time=2020OND][lev=1][lat=30], 30.586, 27.431, 28.175, 29.759, 30.774, 27.208, 22
27 [time=2020OND][lev=1][lat=27.5], 30.518, 27.678, 27.897, 31.160, 29.870, 26.958, 17
28 [time=2020OND][lev=1][lat=25], 27.746, 29.962, 28.611, 31.415, 31.212, 22.031, 17
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30 [time=2020OND][lev=1][lat=20], 31.396, 32.313, 28.313, 31.674, 20.957, 17.845, 25
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35 [time=2020OND][lev=1][lat=7.5], 28.404, 25.143, 23.602, 21.070, 33.830, 40.910, 3
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37 [time=2020OND][lev=1][lat=2.5], 21.259, 24.596, 25.798, 30.101, 37.931, 47.770, 4
38 [time=2020OND][lev=1][lat=0], 18.486, 18.324, 22.192, 29.703, 41.797, 40.021, 35.06
39 [time=2020OND][lev=1][lat=-2.5], 16.468, 16.540, 20.566, 25.871, 36.811, 41.316, 29
40 [time=2020OND][lev=1][lat=-5], 28.934, 25.051, 29.544, 32.699, 34.188, 30.199, 28.26
41 [time=2020OND][lev=1][lat=-7.5], 21.669, 23.186, 22.604, 22.707, 22.910, 17.395, 17
42 [time=2020OND][lev=1][lat=-10], 24.851, 25.993, 27.066, 26.098, 25.107, 24.460, 20.8
43 [time=2020OND][lev=1][lat=-12.5], 9.729, 15.026, 17.176, 18.098, 33.416, 12.515, 17
44 [time=2020OND][lev=1][lat=-15], 17.210, 16.783, 14.796, 12.925, 10.563, 9.343, 8.4
45 [time=2020OND][lev=1][lat=-17.5], 17.210, 16.783, 14.796, 12.925, 10.563, 9.343, 8.4
```

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	[Variable=prec][MME method=GAUS][Models=APCC BOM_ACCESS-S1 CMCC_SPS3 CWB_GFS119 GLOSEAS HMC MSC_CANSIPSV2 NASA_NCEP_PNU_CGCMV2.0 UKMO][Training Period=1993-2010]																			
2	[Longitude]	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	
3	[time=202	32.76	32.538	32.411	32.618	32.654	32.525	32.374	32.527	32.848	33.01	32.977	33.057	33.041	33.283	33.278	33.435	33.505	33.626	33.659
4	[time=202	31.371	32.294	32.697	32.899	33.387	33.448	33.564	32.766	32.511	32.91	33.245	33.347	33.473	34.075	34.076	34.206	34.975	34.998	34.703
5	[time=202	30.344	30.742	30.881	30.477	30.092	30.759	31.252	30.363	30.176	30.012	29.276	29.599	29.372	29.738	29.565	30.071	31.754	31.545	32.524
6	[time=202	28.225	29.35	29.889	29.216	29.403	30.587	30.21	30.695	31.098	31.764	31.814	30.931	30.669	30.406	30.803	30.793	30.35	30.929	32.646
7	[time=202	31.326	30.235	28.328	26.99	26.866	26.216	26.793	28.513	28.741	27.796	27.351	27.564	29.025	31.233	33.457	35.144	35.943	37.349	39.397
8	[time=202	34.684	33.364	32.576	32.01	30.606	29.973	30.795	30.350	30.024	30.664	30.725	31.693	33.065	34.139	34.282	36.307	39.937	41.752	43.373
9	[time=202	36.919	36.291	35.126	33.062	33.304	34.269	35.609	35.024	35.191	32.298	34.824	34.504	35.033	34.951	35.472	37.109	39.112	39.946	41.156
10	[time=202	37.74	35.732	37.92	37.154	36.46	37.633	38.842	37.707	37.468	38.992	37.742	31.087	31.923	30.546	29.934	32.605	34.772	34.996	34.496
11	[time=202	37.716	36.497	35.113	35.074	35.889	36.426	34.129	32.085	30.369	27.371	26.04	26.767	27.653	27.692	30.653	32.229	32.543	31.716	33.614
12	[time=202	39.147	38.047	37.287	37.958	39.577	38.459	37.029	37.243	35.848	33.404	30.383	28.749	28.117	27.987	30.783	31.288	32.236	34.143	35.313
13	[time=202	35.163	34.999	35.289	35.603	35.244	35.499	35.287	35.198	34.771	33.915	34.244	32.6	30.254	30.421	30.078	31.161	30.929	30.044	31.777
14	[time=202	33.523	32.185	32.814	34.938	35.264	35.678	33.742	33.101	33.355	32.062	30.375	31.141	32.39	32.038	30.655	30.509	31.944	33.396	33.203
15	[time=202	36.073	37.594	38.646	37.693	36.985	38.709	38.403	38.984	36.317	35.085	35.438	35.568	33.667	32.869	33.664	32.872	32.624	33.276	32.093
16	[time=202	40.141	38.908	37.900	37.692	36.104	35.909	36.592	36.281	35.895	35.486	35.746	31.15	30.235	28.956	29.921	29.942	32.6	31.714	30.777
17	[time=202	36.937	37.458	38.073	36.413	35.748	34.033	34.197	35.704	34.966	30.6	29.998	29.316	29.105	29.109	28.627	25.327	24.68	24.04	25.928
18	[time=202	38.409	38.065	35.872	35.971	33.837	36.032	37.31	36.409	36.933	35.353	35.604	34.407	30.598	27.104	26.02	24.838	24.235	25.447	26.447
19	[time=202	36.836	36.116	36.868	37.677	35.347	33.613	32.853	31.307	32.364	32.572	29.375	27.83	26.402	26.328	25.696	26.055	28.271	29.668	29.747
20	[time=202	38.882	38.675	40.482	37.106	35.005	34.967	34.741	33.464	29.281	26.237	23.693	22.817	22.498	27.321	27.921	27.111	24.344	22.281	24.366
21	[time=202	33.95	33.365	33.699	29.225	30.043	31.009	30.401	30.951	31.193	29.545	29.39	29.587	30.28	26.398	24.102	24.129	22.026	25.57	22.866
22	[time=202	30.947	30.431	30.418	31.058	30.679	31.458	29.992	29.907	29.985	26.128	27.074	31.237	28.198	31.092	25.067	24.204	18.467	18.719	19.583
23	[time=202	34.296	33.365	35.614	35.578	33.884	37.334	40.038	41.609	35.202	34.698	27.801	28.475	27.656	27.169	21.813	22.205	16.855	20.403	22.597
24	[time=202	33.742	36.289	36.363	36.331	39.168	35.969	36.203	37.883	40.649	36.504	27.254	23.643	25.134	23.382	20.94	23.349	23.974	22.704	23.297
25	[time=202	32.982	33.099	33.261	31.674	34.611	33.48	33.366	30.996	32.52	28.267	27.023	31.102	26.946	23.58	24.102	23.279	22.625	20.262	23.374
26	[time=202	35.026	35.288	31.842	31.142	31.53	34.059	30.835	25.119	23.406	26.194	20.643	27.444	22.301	23.964	22.834	19.294	19.273	17.152	19.237
27	[time=202	30.586	27.431	28.175	29.759	30.874	27.208	22.996	20.896	26.864	27.003	27.885	27.608	26.943	24.973	21.917	17.129	15.959	14.67	17.247
28	[time=202	30.518	27.678	27.897	31.16	29.707	26.958	16.143	22.531	27.858	28.869	27.593	26.641	28.831	24.546	15.024	13.715	15.522	17.178	25.227
29	[time=202	27.746	29.962	28.611	31.415	31.212	22.031	17.898	23.799	27.244	26.54	26.993	29.97	22.364	18.944	18.757	14.568	16.125	21.224	27.166
30	[time=202	30.232	29.912	31.499	33.379	27.713	27.157	18.639	25.887	28.612	23.541	23.987	25.727	22.108	21.114	21.034	18.159	22.803	23.637	27.254
31	[time=202	31.396	32.313	28.313	31.674	20.957	17.845	25.985	27.313	25.542	22.272	25.68	30.9	28.924	22.733	25.254	29.567	29.888	33.562	30.388
32	[time=202	33.086	33.861	30.573	29.671	28.387	26.949	26.809	28.083	25.283	28.875	34	36.934	32.845	27.751	27.893	30.377	37.456	37.081	37.798
33	[time=202	35.974	29.951	24.233	26.051	30.565	29.474	32.119	27.4	26.941	31.169	35.572	38.895	35.748	28.238	23.019	28.357	36.197	39.835	35.106
34	[time=202	36.369	34.784	25.220	26.802	27.436	37.17	34.579	33.906	31.375	29.349	32.07	34.988	36.895	34.113	31.45	36.047	37.292	45.411	47.964
35	[time=202	23.338	25.413	23.288	18.152	25.896	32.372	30.711	28.322	30.781	30.355	35.636	40.341	40.394	40.148	36.205	39.668	35.605	36.829	35.258
36	[time=202	28.404	25.143	23.602	21.070	33.830	40.910	37.8	26.685	28.459	33.759	37.176	42.534	43.187	48.82	47.625	36.645	26.493	21.105	21.852

2. Probabilistic MME

2-3. Get quantities

	A	B	C	D	E	F	G	H	I	J
1	[Variable=prec][MME method=GAUS][Models=APCC BOM_ACCESS-S1 CMCC_SPS3 CWB_GFST119 GLOSEA5 HMC MSC_CANSIPSV2									
2	[Longitude=]	0	2.5	5	7.5	10	12.5	15	17.5	20
197	[time=2020OND][lev=3][lat=30]	40.574	42.603	44.425	43.363	44.733	47.224	44.162	38.438	37.738
198	[time=2020OND][lev=3][lat=32.5]	42.45	46.421	41.803	45.021	43.295	39.436	37.836	39.129	40.953
199	[time=2020OND][lev=3][lat=35]	48.28	49.186	48.769	47.616	45.302	42.542	42.333	44.594	41.311
200	[time=2020OND][lev=3][lat=37.5]	41.16	46.386	43.723	42.123	43.953	44.627	47.228	45.177	41.568
201	[time=2020OND][lev=3][lat=40]	32.7	32.583	35.762	36.676	40.245	42.648	42.903	41.783	36.555
202	[time=2020OND][lev=3][lat=42.5]	32.7	33.501	36.569	36.047	35.937	33.786	35.616	35.196	30.541
203	[time=2020OND][lev=3][lat=45]	32.597	31.171	32.337	33.286	33.218	32.808	28.201	31.167	33.657
204	[time=2020OND][lev=3][lat=47.5]	32.991	33.986	32.255	31.305	30.909	30.584	30.948	31.158	30.726
205	[time=2020OND][lev=3][lat=50]	29.382	29.31	29.749	30.622	32.647	33.3	29.528	27.408	27.644
206	[time=2020OND][lev=3][lat=52.5]	27.006	29.917	28.544	29.461	32.187	33.683	33.156	32.069	31.834
207	[time=2020OND][lev=3][lat=55]	37.399	32.408	28.847	25.17	26.5	27.203	26.295	29.02	28.653
208	[time=2020OND][lev=3][lat=57.5]	34.492	31.814	27.884	24.578	25.237	24.895	28.032	29.576	25.731
209	[time=2020OND][lev=3][lat=60]	33.138	33.899	26.207	24.31	27.28	26.463	26.302	29.543	27.002
210	[time=2020OND][lev=3][lat=62.5]	32.734	32.74	29.579	28.14	27.006	27.42	30.252	29.479	30.036
211	[time=2020OND][lev=3][lat=65]	33.246	33.913	31.905	26.708	27.612	28.273	26.325	27.239	26.915
212	[time=2020OND][lev=3][lat=67.5]	28.63	27.012	25.977	27.543	29.617	29.772	32.144	29.267	28.099
213	[time=2020OND][lev=3][lat=70]	32.079	34.018	33.68	32.012	33.187	30.298	27.651	28.157	29.22
214	[time=2020OND][lev=3][lat=72.5]	30.783	29.274	32.999	33.784	35.292	33.597	28.869	28.697	28.089
215	[time=2020OND][lev=3][lat=75]	34.147	34.652	35.317	36.788	38.984	38.879	38.307	42.075	41.84
216	[time=2020OND][lev=3][lat=77.5]	24.83	22.714	31.644	32.092	34.517	35.141	35.39	29.776	31.617
217	[time=2020OND][lev=3][lat=80]	33.243	32.429	29.612	32.769	34.221	28.612	23.408	20.641	19.418
218	[time=2020OND][lev=3][lat=82.5]	29.494	29.141	28.859	27.486	27.319	26.166	25.534	24.789	24.475
219	[time=2020OND][lev=3][lat=85]	24.243	24.349	24.845	24.228	24.197	23.625	23.93	24.07	23.341
220	[time=2020OND][lev=3][lat=87.5]	24.114	24.366	24.459	24.54	24.488	23.672	24.23	24.291	24.053
221	[time=2020OND][lev=3][lat=90]	29.609	29.678	29.777	29.806	29.767	29.795	29.872	29.836	29.911
222	[time=2020OND][lev=4][lat=-90]	1E+20	1E+20	1E+20	1E+20	1E+20	1E+20	1E+20	1E+20	1E+20

Get annoyed with scrolling up and down?

1. Delimit data from text to columns.

Data

Text to Columns

Separate the contents of one Excel cell into separate columns.

For example, you can separate a column of full names into separate first and last name columns.

In Word, use this feature to convert the selected text into a table, splitting the text into columns at each comma, period, or other character you specify.

Press F1 for more help.

Variable=prec	MME method=SCM	Models=APCC CMCC COLA CWB HMC IRIF IRI CA MGO MSC NASA NCEP PNU POAMA	Training Period
[Longitude=]	0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5, 25, 27.5, 30, 32.5, 35, 37.5, 40,		
[time=2017JFM][lat=-90],	-0.012, -0.011, -0.011, -0.011, -0.011, -0.011, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010, -0.010,		
[time=2017JFM][lat=-87.5],	0.010, 0.011, 0.011, 0.012, 0.012, 0.013, 0.013, 0.014, 0.014, 0.014, 0.014, 0.014, 0.014, 0.014, 0.014, 0.014, 0.014, 0.014, 0.014, 0.014,		
[time=2017JFM][lat=-85],	0.010, 0.011, 0.011, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013, 0.013,		
[time=2017JFM][lat=-82.5],	0.010, 0.011, 0.011, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012, 0.012,		
[time=2017JFM][lat=-80],	0.013, 0.012, 0.010, 0.009, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008, 0.008,		
[time=2017JFM][lat=-77.5],	0.015, 0.014, 0.015, 0.012, 0.008, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005, 0.005,		
[time=2017JFM][lat=-75],	0.012, 0.008, 0.007, 0.006, 0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002, -0.002,		
[time=2017JFM][lat=-72.5],	0.046, 0.041, 0.039, 0.038, 0.031, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026, 0.026,		
[time=2017JFM][lat=-70],	0.038, 0.043, 0.052, 0.062, 0.064, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062, 0.062,		
[time=2017JFM][lat=-67.5],	0.006, -0.012, -0.035, -0.031, -0.037, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054, -0.054,		
[time=2017JFM][lat=-65],	0.048, 0.048, 0.041, 0.042, 0.024, 0.011, -0.006, -0.019, -0.027, -0.024, -0.025, -0.018, -0.021, -0.017, -0.015, -0.015, -0.015, -0.015, -0.015,		
[time=2017JFM][lat=-62.5],	0.035, 0.036, 0.034, 0.026, 0.017, 0.012, 0.011, 0.010, 0.012, 0.021, 0.028, 0.020, 0.014, 0.016, 0.021, 0.021, 0.021, 0.021, 0.021,		

Get annoyed with scrolling up and down?

The image shows three overlapping screenshots of Microsoft Excel, illustrating the process of importing data and the resulting data table.

Top Screenshot: Shows the '데이터' (Data) tab in the ribbon. The '데이터 분석' (Data Analysis) group is visible, including options like '데이터 필터링' (Data Filter), '데이터 정렬' (Data Sort), '데이터 그룹화' (Data Grouping), and '데이터 분석' (Data Analysis).

Middle Screenshot: Shows the '데이터' (Data) tab in the ribbon. The '데이터 분석' (Data Analysis) group is visible, including options like '데이터 필터링' (Data Filter), '데이터 정렬' (Data Sort), '데이터 그룹화' (Data Grouping), and '데이터 분석' (Data Analysis).

Bottom Screenshot: Shows the '데이터' (Data) tab in the ribbon. The '데이터 분석' (Data Analysis) group is visible, including options like '데이터 필터링' (Data Filter), '데이터 정렬' (Data Sort), '데이터 그룹화' (Data Grouping), and '데이터 분석' (Data Analysis).

Data Table: The bottom screenshot displays a large data table with the following structure:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	[Variable=prec][MME method=SCM][Models=APCC CMCC COLA CWB HMC IRIF												
2	[Longitude=]	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5
3	[time=2017JFM]	-0.012	-0.011	-0.011	-0.011	-0.011	-0.011	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
4	[time=2017JFM]	0.01	0.011	0.011	0.012	0.012	0.013	0.013	0.014	0.014	0.014	0.014	0.014
5	[time=2017JFM]	0.01	0.011	0.011	0.013	0.013	0.013	0.014	0.014	0.014	0.013	0.013	0.012
6	[time=2017JFM]	0.01	0.011	0.011	0.012	0.012	0.012	0.011	0.009	0.008	0.006	0.005	0.005
7	[time=2017JFM]	0.013	0.012	0.01	0.009	0.008	0.008	0.007	0.005	0.003	0.001	0.001	0
8	[time=2017JFM]	0.015	0.014	0.015	0.012	0.008	0.005	0.002	0	-0.001	-0.001	-0.001	-0.001
9	[time=2017JFM]	0.012	0.008	0.007	0.006	0.002	-0.002	-0.005	-0.006	-0.006	-0.005	-0.003	-0.001
10	[time=2017JFM]	0.046	0.041	0.039	0.038	0.031	0.026	0.023	0.022	0.022	0.028	0.037	0.044
11	[time=2017JFM]	0.038	0.043	0.052	0.062	0.064	0.062	0.059	0.045	0.034	0.037	0.047	0.037
12	[time=2017JFM]	0.006	-0.012	-0.035	-0.031	-0.037	-0.054	-0.061	-0.068	-0.066	-0.034	-0.019	-0.022
13	[time=2017JFM]	0.048	0.048	0.041	0.042	0.024	0.011	-0.006	-0.019	-0.027	-0.024	-0.025	-0.018
14	[time=2017JFM]	0.035	0.036	0.034	0.026	0.017	0.012	0.011	0.01	0.012	0.021	0.028	0.02
15	[time=2017JFM]	0.036	0.022	0.012	0	-0.007	0.004	0.015	0.011	0.005	0.003	0.008	-0.006
16	[time=2017JFM]	0.04	0.037	0.03	0.024	0.017	0.023	0.039	0.052	0.043	0.027	0.009	-0.006
17	[time=2017JFM]	0.018	0.017	0.026	0.028	0.024	0.024	0.021	0.015	0.01	0.005	0.004	0
18	[time=2017JFM]	-0.025	-0.03	-0.024	-0.023	-0.024	-0.027	-0.03	-0.026	-0.014	0.002	-0.004	-0.025
19	[time=2017JFM]	0	-0.011	-0.017	-0.022	-0.02	-0.003	0.018	0.023	0.025	0.014	0.018	0.044
20	[time=2017JFM]	0.028	0.023	0.035	0.018	0.014	0.007	0.002	0.001	-0.01	-0.023	-0.013	-0.004

Get annoyed with scrolling up and down?

2. Select the cell whose longitude is 0 and latitude is -90 and freeze panes.

The image shows three overlapping screenshots of Microsoft Excel, illustrating the steps to freeze panes. The top screenshot shows the 'View' tab with the 'Freeze Panes' button highlighted. The middle screenshot shows the 'Freeze Panes' dialog box with 'Freeze the active cell' selected. The bottom screenshot shows the Excel spreadsheet with the cell containing longitude 0 and latitude -90 selected, and the 'Freeze Panes' button highlighted again.

View

Freeze Panes

Freeze Panes

	A	B	C	D	E	F	G	H	I	J	K
1	[Variable=prec][MME method=SCM][Models=APCC CMCC COLA CWB HMC IRIF IRI CA MGO MSC NASA NCEP PNU POAMA][Training Period										
2	[Longitude=]	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5
3	[time=2017JFM][lat=-90]	-0.012	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011
4	[time=2017JFM][lat=-87.5]	0.01	0.011	0.011	0.012	0.012	0.013	0.013	0.014	0.014	0.014
5	[time=2017JFM][lat=-85]	0.01	0.011	0.011	0.013	0.013	0.013	0.014	0.014	0.014	0.013
6	[time=2017JFM][lat=-82.5]	0.01	0.011	0.011	0.012	0.012	0.012	0.012	0.011	0.009	0.008
7	[time=2017JFM][lat=-80]	0.013	0.012	0.01	0.009	0.008	0.008	0.008	0.007	0.005	0.003
8	[time=2017JFM][lat=-77.5]	0.015	0.014	0.015	0.012	0.008	0.005	0.002	0	-0.001	-0.001
9	[time=2017JFM][lat=-75]	0.012	0.008	0.007	0.006	0.002	-0.002	-0.005	-0.006	-0.006	-0.005
10	[time=2017JFM][lat=-72.5]	0.046	0.041	0.039	0.038	0.031	0.026	0.023	0.022	0.022	0.028
11	[time=2017JFM][lat=-70]	0.038	0.043	0.052	0.062	0.064	0.062	0.059	0.045	0.034	0.037
12	[time=2017JFM][lat=-67.5]	0.006	-0.012	-0.035	-0.031	-0.037	-0.054	-0.061	-0.068	-0.066	-0.034
13	[time=2017JFM][lat=-65]	0.048	0.048	0.041	0.042	0.024	0.011	-0.006	-0.019	-0.027	-0.024
14	[time=2017JFM][lat=-62.5]	0.035	0.036	0.034	0.026	0.017	0.012	0.011	0.01	0.012	0.021
15	[time=2017JFM][lat=-60]	0.036	0.022	0.012	0	-0.007	0.004	0.015	0.011	0.005	0.003
16	[time=2017JFM][lat=-57.5]	0.04	0.037	0.03	0.024	0.017	0.023	0.039	0.052	0.043	0.027
17	[time=2017JFM][lat=-55]	0.018	0.017	0.026	0.028	0.024	0.024	0.021	0.015	0.01	0.005
18	[time=2017JFM][lat=-52.5]	-0.025	-0.03	-0.024	-0.023	-0.024	-0.027	-0.03	-0.026	-0.014	0.002
19	[time=2017JFM][lat=-50]	0	-0.011	-0.017	-0.022	-0.02	-0.003	0.018	0.023	0.025	0.014
20	[time=2017JFM][lat=-47.5]	0.028	0.023	0.035	0.018	0.014	0.007	0.002	0.001	-0.01	-0.023

2. Probabilistic MME

2-3. Get quantities

<< FORECAST ▶ GAUS ▶ AUG ▶ ASO ▶ 2019			
이름	수정한 날짜	유형	크기
t850	2019-08-22 오전...	ASC 파일	418KB

Daegu

Longitude = $128.653^{\circ}\text{E} \approx 127.5^{\circ}\text{E}$

Latitude = $35.878^{\circ}\text{N} \approx 35^{\circ}\text{N}$

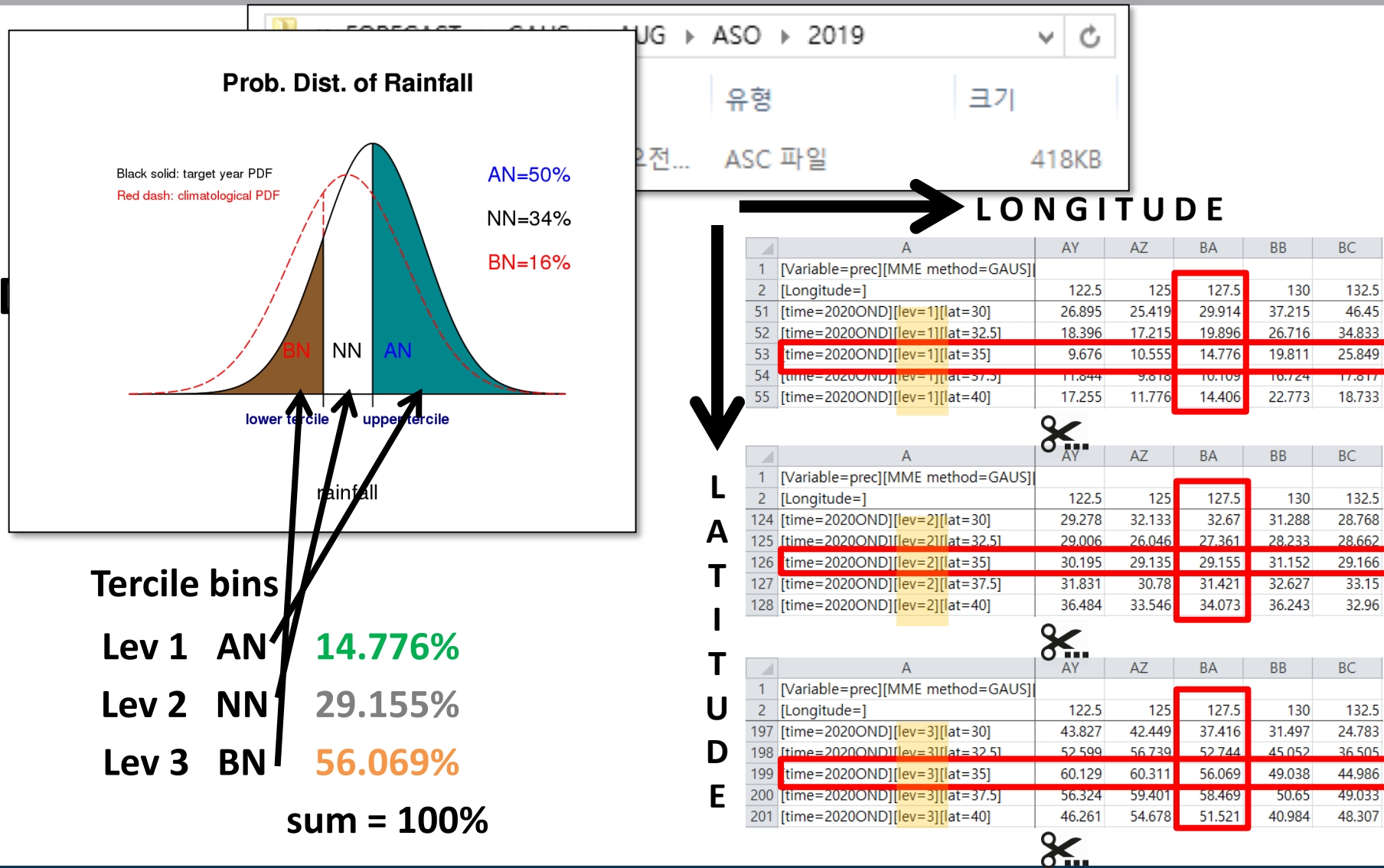
	A	AY	AZ	BA	BB	BC
1	[Variable=prec][MME method=GAUS]					
2	[Longitude=]	122.5	125	127.5	130	132.5
51	[time=2020OND][lev=1][lat=30]	26.895	25.419	29.914	37.215	46.45
52	[time=2020OND][lev=1][lat=32.5]	18.396	17.215	19.896	26.716	34.833
53	[time=2020OND][lev=1][lat=35]	9.676	10.555	14.776	19.811	25.849
54	[time=2020OND][lev=1][lat=37.5]	11.844	9.818	10.109	16.724	17.817
55	[time=2020OND][lev=1][lat=40]	17.255	11.776	14.406	22.773	18.733

	A	AY	AZ	BA	BB	BC
1	[Variable=prec][MME method=GAUS]					
2	[Longitude=]	122.5	125	127.5	130	132.5
124	[time=2020OND][lev=2][lat=30]	29.278	32.133	32.67	31.288	28.768
125	[time=2020OND][lev=2][lat=32.5]	29.006	26.046	27.361	28.233	28.662
126	[time=2020OND][lev=2][lat=35]	30.195	29.135	29.155	31.152	29.166
127	[time=2020OND][lev=2][lat=37.5]	31.831	30.78	31.421	32.627	33.15
128	[time=2020OND][lev=2][lat=40]	36.484	33.546	34.073	36.243	32.96

	A	AY	AZ	BA	BB	BC
1	[Variable=prec][MME method=GAUS]					
2	[Longitude=]	122.5	125	127.5	130	132.5
197	[time=2020OND][lev=3][lat=30]	43.827	42.449	37.416	31.497	24.783
198	[time=2020OND][lev=3][lat=32.5]	52.599	56.739	52.744	45.052	36.505
199	[time=2020OND][lev=3][lat=35]	60.129	60.311	56.069	49.038	44.986
200	[time=2020OND][lev=3][lat=37.5]	56.324	59.401	58.469	50.65	49.033
201	[time=2020OND][lev=3][lat=40]	46.261	54.678	51.521	40.984	48.307

2. Probabilistic MME

2-3. Get quantities



2. Probabilistic MME

2-3. Get quantities

<< FORECAST >> GAUS > AUG > ASO > 2019			
이름	수정한 날짜	유형	크기
t850	2019-08-22 오전...	ASC 파일	418KB

Daegu

Longitude = $128.653^{\circ}\text{E} \approx 127.5^{\circ}\text{E}$

Latitude = $35.878^{\circ}\text{N} \approx 35^{\circ}\text{N}$

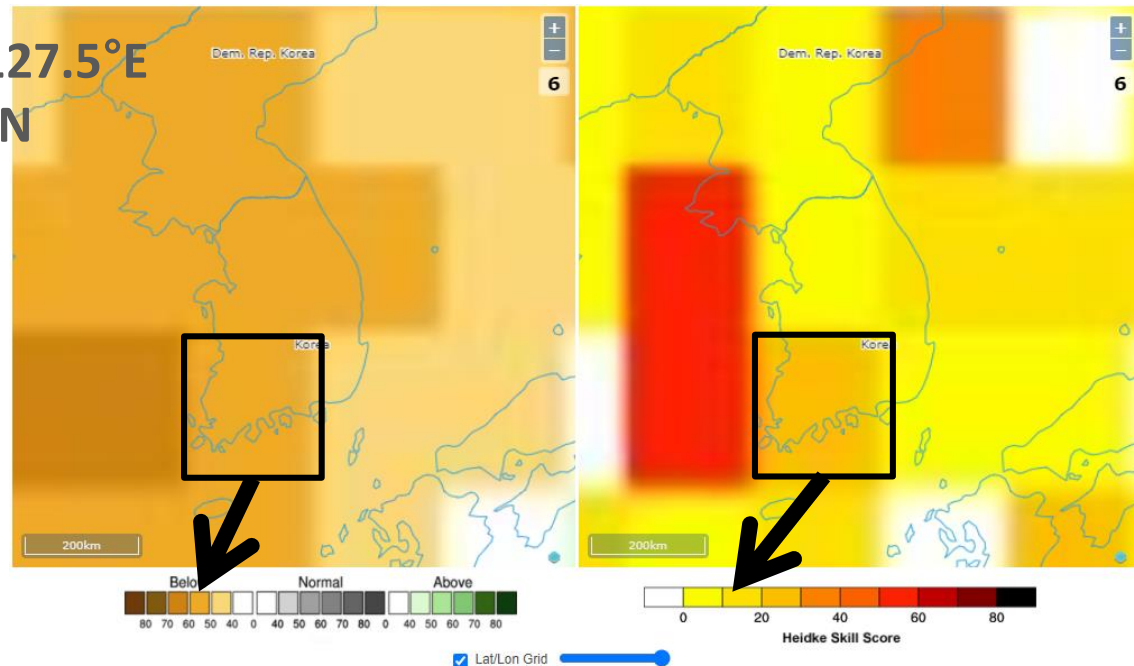
Tercile bins

Lev 1 AN 14.776%

Lev 2 NN 29.155%

Lev 3 BN 56.069%

sum = 100%



2. Probabilistic MME

2-3. Get quantities

<< FORECAST >> GAUS > AUG > ASO > 2019			
이름	수정한 날짜	유형	크기
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Daegu

Longitude = $128.653^{\circ}\text{E} \approx 127.5^{\circ}\text{E}$

Latitude = $35.878^{\circ}\text{N} \approx 35^{\circ}\text{N}$

Tercile bins

Lev 1 AN **14.776%**

Lev 2 NN 29.155%

Lev 3 BN **56.069%**

sum = 100%

AN

NN

BN

HSS

Probability for precipitation over Daegu



10~20

2. Probabilistic MME Practice!


[MME](#)
[Downscale](#)
[My Page](#)
[Logout](#) [Edit](#) [HelpDesk](#)

Predict

Lead Month

☒ 3Month

Year/Season

Year

Season

Methods

☐ Deterministic ☒ Probabilistic

Variables

☐ PREC ☒ T2M
☐ T850 ☐ SLP
☐ SST ☐ Z500

Models

☒ ALL
☒ APCC ☒ BOM ☒ CMCC ☒ CWB
☐ HMC ☒ KMA ☐ MGO ☒ MSC
☒ NASA ☒ NCEP ☒ PNU ☒ UKMO

When (2020/OND)

Methods (Probabilistic)

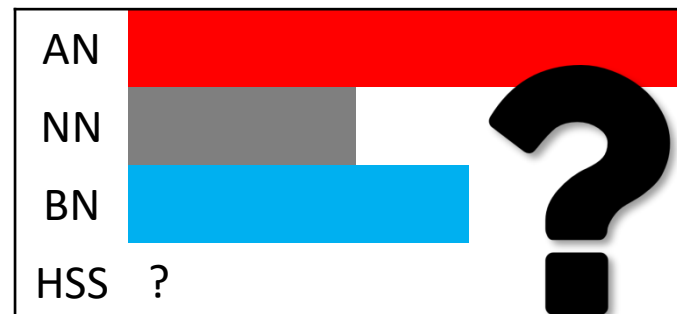
Variables (T2M)

Models (ALL w/o HMC & MGO)

Predict & Verify



Lat ?
Lon ?





Thank you!