

DAFTAR PUSTAKA

Alfiandy, S., & Permana, D. S. (2020). Tren Curah Hujan Berbasis Data Sinoptik BMKG dan Reanalisis MERRA-2 NASA di Provinsi Sulawesi Tengah. *Jurnal Sains & Teknologi Modifikasi Cuaca*, 21(2), 63-72. Badan Nasional Penanggulangan Bencana. (2012). "Pedoman Sistem Peringatan Dini Berbasis Masyarakat."

Badan Nasional Penanggulangan Bencana. (2012). "Pedoman Sistem Peringatan Dini Berbasis Masyarakat."

Chandra, H., & Suprpto, H. (2016). Sistem informasi intensitas curah hujan di daerah ciliwung hulu. *Jurnal Ilmiah Informatika Komputer*, 21(3).

ERA5 Hourly Data On Single Levels From 1940 To Present (<https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-single-levels?tab=overview>).

Gustari, I., Hadi, T. W., Hadi, S., & Renggono, F. (2012). Akurasi prediksi curah hujan harian operasional di Jabodetabek: Perbandingan dengan model WRF. *Jurnal Meteorologi dan Geofisika*, 13(2).

Halide, H. (2009). "Esensi Prediksi." Pustaka Pena Press



Halide H., & Ridd, P. (2008). A predictive model for dengue hemorrhagic fever epidemics. *International journal of environmental health research*, 18(4), 253-265.

Heng, J. (2015). Pusat Pengembangan Kebudayaan Tradisional Tionghoa Peranakan Di Batam. Yogyakarta: Universitas Atma Jaya.

Irmawan, D., dan Herusantoso, K., (2008), Penerapan Logika Fuzzy Sebagai Sistem Pendukung Keputusan Prakiraan Cuaca, Konferensi Teknologi Informasi dan Komunikasi untuk Indonesia, Bandung.

Laurensz, B., Lawalata, F., & Prasetyo, S. Y. J. (2019). Potensi Resiko Banjir dengan Menggunakan Citra Satelit (Studi Kasus: Kota Manado, Provinsi Sulawesi Utara). *Indonesian Journal of Computing and Modeling*, 2(1), 17-24.

Mahmud, Z., Nikentari, N., & Suswaini, E. (2016). Analisa Perbandingan Metode Sugeno Dan Mamdani Dalam Sistem Prediksi Cuaca (Studi Kasus BMKG Kelas III Tanjungpinang). *Tek. Inform*, 1-9.

Megalina, Y. (2010). Prediksi Cuaca Ekstrim Dengan Model Jaringan Syaraf Tiruan Menggunakan Program Matlab. *EINSTEIN (e-Journal)*, 2(1).

Mohr, S., Kunz, M., & Geyer, B. (2015). Hail potential in Europe based on a regional climate model hindcast. *Geophysical Research Letters*, 42(24), 10-904.

Mughozali, S., Firdianto, P. U., & Irawan, A. M. (2017). Analisis Hujan Lebat dan Angin Kencang di Wilayah Banjarnegara Study Kasus Rabu 8 ovember 2017. *Unnes Physics Journal*, 6(1), 65-69.



Mulyono, D. (2014). Analisis Karakteristik Curah Hujan di Wilayah Kabupaten Garut Selatan. *Jurnal Konstruksi Sekolah Tinggi Teknologi Garut*, 1(13), 1-9.

Murphy, A. H., & Brown, B. G. (1984). A comparative evaluation of objective and subjective weather forecasts in the United States. *Journal of Forecasting*, 3(4), 369-393.

Mursini, M. (2009). MIGRASI PEREMPUAN KE KOTA BATAM PROPINSI KEPULAUAN RIAU. *JIP (Jurnal Industri dan Perkotaan)*, 13(24), 155-178.

Nurasiah, (2019). “Generalized Pareto Untuk Pendugaan Curah Hujan Ekstrim di 4 Stasiun BMKG Provinsi Lampung”. Skripsi. Lampung : Universitas Islam Negeri Raden Intan Lampung.

OGIMET (<https://www.ogimet.com/home.phtml.en>).

Peraturan Kepala Badan Meteorologi, Klimatologi dan Geofisika. (2010). “Prosedur Standar Operasional Pelaksanaan Peringatan Dini, Pelaporan & Diseminasi Informasi Cuaca Ekstrem.”

Prakoso, A. and Kristianto, A., (2016). Kajian Gangguan Cuaca Pada Kejadian Hujan Lebat di Batam (Studi Kasus Tanggal 19 Desember 2014). *Jurnal Meteorologi Klimatologi Dan Geofisika*, 3(2), pp.1-8.



I. (2017). “Why precipitation is mostly concentrated over islands in the ritime Continent”. *Journal of the Atmospheric Sciences*. No.2, Vol.4, hh: 138-1441.

Rahayu, S., & Junior, J. J. (2021). Optimalisasi Kebijakan Dalam Pengelolaan Kawasan Perbatasan Studi Kasus Kota Batam, Provinsi Kepulauan Riau. *Jurnal Ilmu Administrasi Negara (JUAN)*, 9(2), 64-78.

Tjasyono, B., Juaeni, L., dan Harijono, S. W. B., (2007). “Proses Meteorologis Bencana Banjir di Indonesia”. *Jurnal Meteorologi dan Geofisika*. No.2, Vol.8, hh: 64-78.

Triangga, A., (2020). Analisis Curah Hujan Dengan Pemodelan Deret Waktu Pada DAS Walanae. Skripsi. Makassar: Universitas Bosowa.

Yushar. R. F., Ariastuti. N.L.P.S., (2017), Mengenal Cuaca Ekstrem, Fokus: Cuaca ekstrem, BMKG.

Waluwanja, A., Tanesib, J. L., Tarigan, J., & Wahid, A. (2019). Analisis pola distribusi unsur-unsur cuaca di lapisan atas atmosfer di wilayah kota kupang. *Jurnal Fisika: Fisika Sains dan Aplikasinya*, 4(2), 121-130.

World Meteorological Organization. (2014). Forecast Verification for the African Severe Weather Forecasting Demonstration Projects. Switzerland.

Zoom Earth (<https://zoom.earth/>).



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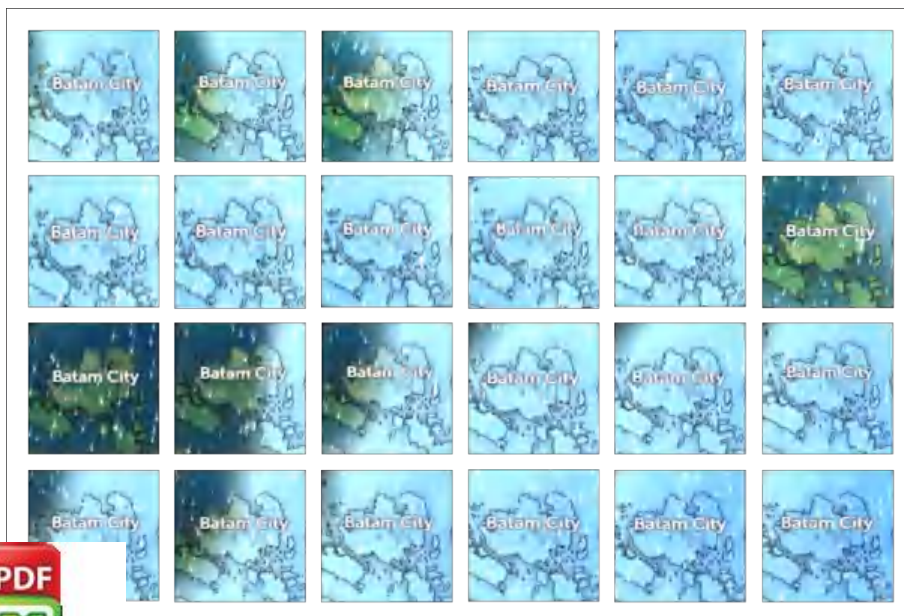


Lampiran 1. Data Zoom Earth

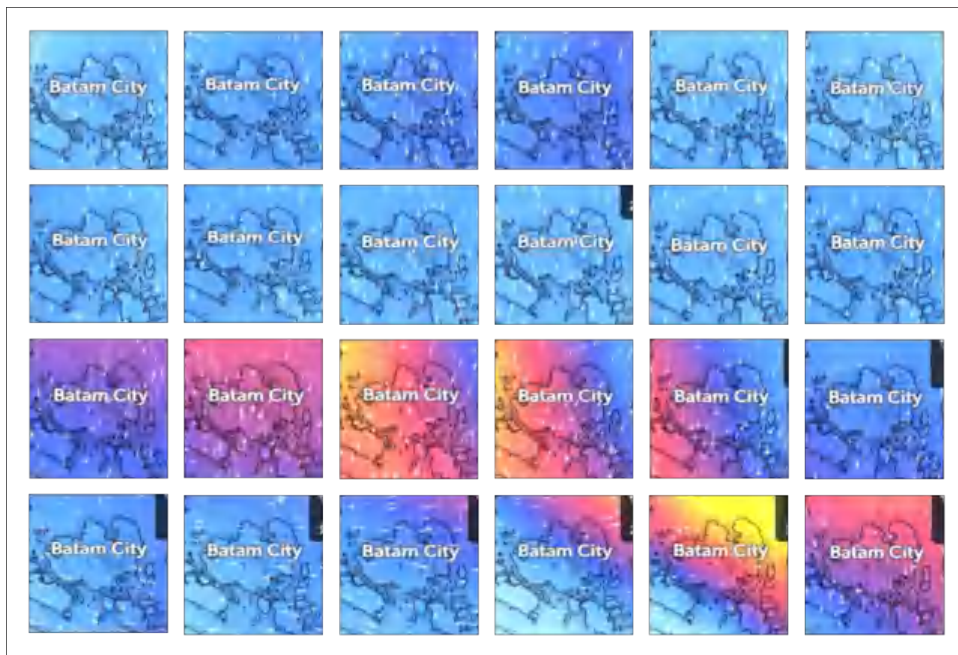
Tanggal 26 Februari 2023



Tanggal 27 Februari 2023



Tanggal 28 Februari 2023



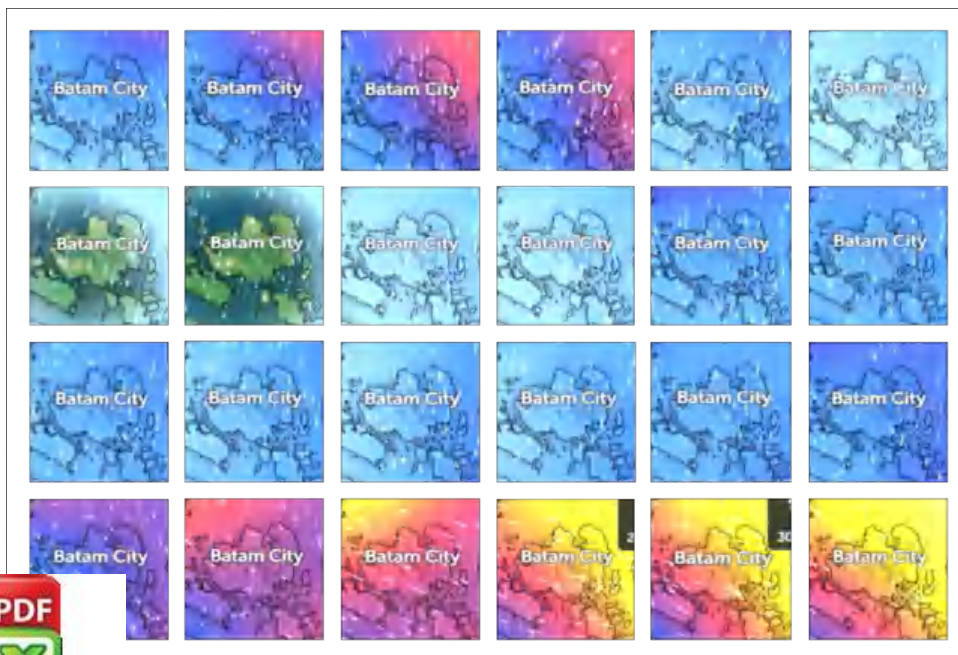
Tanggal 1 Maret 2023



Tanggal 2 Maret 2023



Tanggal 3 Maret 2023



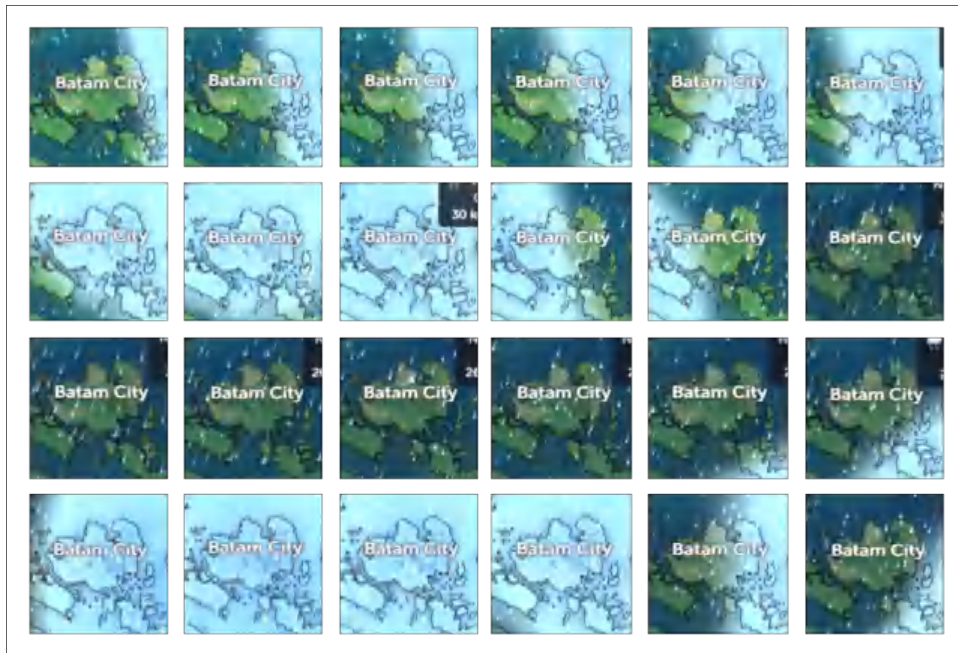
Tanggal 4 Maret 2023



Tanggal 5 Maret 2023



Tanggal 6 Maret 2023



Optimized using
trial version
www.balesio.com

Lampiran 2. Peringatan Dini BMKG



Lampiran 3. Data OGIMET

Decoded synop data. (10:56 mean solar time)
Time interval: 2 days before 2023/03/07 at 04:00 UTC.

Date		Prec (mm)
3/6/2023	21:00	0.0/3h
3/6/2023	18:00	90.0/6h
3/6/2023	15:00	Tr/3h
3/6/2023	12:00	0.0/6h
3/6/2023	9:00	0.0/3h
3/6/2023	6:00	3.0/6h
3/6/2023	3:00	0.2/3h
3/6/2023	0:00	6.0/24h
3/5/2023	21:00	0.0/3h
3/5/2023	18:00	0.0/6h
3/5/2023	15:00	0.0/3h
3/5/2023	12:00	2.0/6h
3/5/2023	9:00	2.0/3h
3/5/2023	6:00	4.0/6h
3/5/2023	3:00	0.1/3h
3/5/2023	0:00	29.0/24h
3/4/2023	21:00	1.0/3h
3/4/2023	18:00	Tr/3h
3/4/2023	15:00	0.2/6h
3/4/2023	12:00	0.2/3h
3/4/2023	9:00	3.0/6h
3/4/2023	6:00	3.0/3h
3/4/2023	3:00	24.0/6h
3/4/2023	0:00	3.0/3h
3/4/2023	0:00	99.0/24h
3/3/2023	21:00	0.3/3h
3/3/2023	18:00	0.1/3h
3/3/2023	15:00	11.0/6h
3/3/2023	12:00	10.0/3h
3/3/2023	9:00	12.0/6h
3/3/2023	6:00	11.0/3h
3/3/2023	3:00	77.0/6h
3/3/2023	0:00	22.0/3h
3/3/2023	0:00	41.0/24h



3/2/2023	21:00	7.0/3h
3/2/2023	18:00	5.0/3h
3/2/2023	15:00	13.0/6h
3/2/2023	12:00	11.0/3h
3/2/2023	9:00	16.0/6h
3/2/2023	6:00	14.0/3h
3/2/2023	3:00	0.5/6h
3/2/2023	0:00	0.5/3h
3/2/2023	0:00	5.0/24h
3/1/2023	21:00	Tr/3h
3/1/2023	18:00	0.0/3h
3/1/2023	15:00	0.4/6h
3/1/2023	12:00	0.0/3h
3/1/2023	9:00	Tr/6h
3/1/2023	6:00	Tr/3h
3/1/2023	3:00	5.0/6h
3/1/2023	0:00	5.0/3h
3/1/2023	0:00	5.0/3h
3/1/2023	0:00	298.0/24h
2/28/2023	21:00	9.0/3h
2/28/2023	18:00	71.0/3h
2/28/2023	15:00	215.0/6h
2/28/2023	12:00	111.0/3h
2/28/2023	9:00	46.0/6h
2/28/2023	6:00	12.0/3h
2/28/2023	3:00	14.0/6h
2/28/2023	0:00	13.0/3h
2/28/2023	0:00	3.0/24h
2/27/2023	21:00	0.5/3h
2/27/2023	18:00	0.0/3h
2/27/2023	15:00	0.1/6h
2/27/2023	12:00	0.0/3h
2/27/2023	9:00	Tr/6h
2/27/2023	6:00	Tr/3h
2/27/2023	3:00	3.0/6h
2/27/2023	0:00	2.0/3h
2/27/2023	0:00	0.4/24h
2/26/2023	21:00	Tr/3h
2/26/2023	18:00	0.0/3h
2/26/2023	15:00	0.4/6h



<u>2/26/2023</u>	<u>15:00</u>	0.0/3h
<u>2/26/2023</u>	<u>12:00</u>	0.0/6h
<u>2/26/2023</u>	<u>9:00</u>	0.0/3h
<u>2/26/2023</u>	<u>6:00</u>	0.0/6h
<u>2/26/2023</u>	<u>3:00</u>	0.0/3h
<u>2/26/2023</u>	<u>0:00</u>	0.0/24h



Lampiran 4. Data POWER *Data Access Viewer* NASA

-BEGIN HEADER-

NASA/POWER CERES/MERRA2 Native Resolution Hourly Data

Dates (month/day/year): 02/28/2023 through 03/06/2023

Location: Latitude 1.0545 Longitude 104.0041

Elevation from MERRA-2: Average for 0.5 x 0.625 degree lat/lon region = 6.34meters

The value for missing source data that cannot be computed or is outside of the sources availability range: -999

Parameter(s):

PRECTOTCORR MERRA-2 Precipitation Corrected (mm/hour)

-END HEADER-

YEAR	MO	DY	HR	PRECTOTCORR
2023	2	26	0	0.01
2023	2	26	1	0.01
2023	2	26	2	0.01
2023	2	26	3	0.01
2023	2	26	4	0.02
2023	2	26	5	0.02
2023	2	26	6	0.02
2023	2	26	7	0.04
2023	2	26	8	0.06
2023	2	26	9	0.08
2023	2	26	10	0.2
2023	2	26	11	0.32
2023	2	26	12	0.37
2023	2	26	13	0.36
2023	2	26	14	0.33
2023	2	26	15	0.26
2023	2	26	16	0.25
2023	2	26	17	0.26
2023	2	26	18	0.24
2023	2	26	19	0.27
2023	2	26	20	0.3
2023	2	26	21	0.36
2023	2	26	22	0.42



2023	2	26	23	0.47
2023	2	27	0	0.49
2023	2	27	1	0.48
2023	2	27	2	0.52
2023	2	27	3	0.55
2023	2	27	4	0.55
2023	2	27	5	0.59
2023	2	27	6	0.63
2023	2	27	7	0.59
2023	2	27	8	0.53
2023	2	27	9	0.69
2023	2	27	10	0.77
2023	2	27	11	0.73
2023	2	27	12	0.65
2023	2	27	13	0.56
2023	2	27	14	0.44
2023	2	27	15	0.38
2023	2	27	16	0.32
2023	2	27	17	0.3
2023	2	27	18	0.26
2023	2	27	19	0.29
2023	2	27	20	0.33
2023	2	27	21	0.36
2023	2	27	22	0.36
2023	2	27	23	0.33
2023	2	28	0	0.32
2023	2	28	1	0.33
2023	2	28	2	0.32
2023	2	28	3	0.43
2023	2	28	4	0.77
2023	2	28	5	1.11
2023	2	28	6	1.51
2023	2	28	7	3.6
2023	2	28	8	4.64
2023	2	28	9	5.26
2023	2	28	10	5.52
2023	2	28	11	5.87
	2	28	12	6.39
	2	28	13	7
	2	28	14	7.32
	2	28	15	6.99



2023	2	28	16	6.57
2023	2	28	17	6.12
2023	2	28	18	7.08
2023	2	28	19	9.24
2023	2	28	20	11.53
2023	2	28	21	11.93
2023	2	28	22	10.56
2023	2	28	23	9.04
2023	3	1	0	7.58
2023	3	1	1	6.06
2023	3	1	2	4.62
2023	3	1	3	3.92
2023	3	1	4	4.32
2023	3	1	5	5.38
2023	3	1	6	6.24
2023	3	1	7	2.55
2023	3	1	8	2.55
2023	3	1	9	2.66
2023	3	1	10	2.64
2023	3	1	11	2.65
2023	3	1	12	2.75
2023	3	1	13	2.68
2023	3	1	14	2.43
2023	3	1	15	2.21
2023	3	1	16	2.22
2023	3	1	17	2.8
2023	3	1	18	3.54
2023	3	1	19	4.51
2023	3	1	20	5.89
2023	3	1	21	6.5
2023	3	1	22	6.33
2023	3	1	23	5.39
2023	3	2	0	3.99
2023	3	2	1	2.48
2023	3	2	2	1.49
2023	3	2	3	0.92
2023	3	2	4	0.59
	3	2	5	0.44
	3	2	6	0.42
	3	2	7	0.57
	3	2	8	0.63



2023	3	2	9	0.59
2023	3	2	10	0.63
2023	3	2	11	0.67
2023	3	2	12	0.78
2023	3	2	13	0.94
2023	3	2	14	1.16
2023	3	2	15	1.28
2023	3	2	16	1.5
2023	3	2	17	1.86
2023	3	2	18	2.48
2023	3	2	19	3.16
2023	3	2	20	3.78
2023	3	2	21	3.87
2023	3	2	22	3.74
2023	3	2	23	3.65
2023	3	3	0	4.44
2023	3	3	1	4.85
2023	3	3	2	4.09
2023	3	3	3	3.61
2023	3	3	4	3.76
2023	3	3	5	4.08
2023	3	3	6	4.27
2023	3	3	7	3.77
2023	3	3	8	2.76
2023	3	3	9	1.89
2023	3	3	10	1.3
2023	3	3	11	0.91
2023	3	3	12	0.76
2023	3	3	13	0.94
2023	3	3	14	1.15
2023	3	3	15	1.31
2023	3	3	16	1.42
2023	3	3	17	1.48
2023	3	3	18	1.7
2023	3	3	19	1.84
2023	3	3	20	1.91
2023	3	3	21	1.85
	3	3	22	2
	3	3	23	2.19
	3	4	0	2.33
	3	4	1	2.27



2023	3	4	2	2.28
2023	3	4	3	2.2
2023	3	4	4	2.16
2023	3	4	5	2.17
2023	3	4	6	2.34
2023	3	4	7	5.8
2023	3	4	8	5.07
2023	3	4	9	4.02
2023	3	4	10	3.09
2023	3	4	11	3.07
2023	3	4	12	3.06
2023	3	4	13	2.64
2023	3	4	14	1.79
2023	3	4	15	1.12
2023	3	4	16	0.68
2023	3	4	17	0.45
2023	3	4	18	0.32
2023	3	4	19	0.23
2023	3	4	20	0.21
2023	3	4	21	0.15
2023	3	4	22	0.1
2023	3	4	23	0.04
2023	3	5	0	0.01
2023	3	5	1	0.03
2023	3	5	2	0.05
2023	3	5	3	0.05
2023	3	5	4	0.05
2023	3	5	5	0.07
2023	3	5	6	0.12
2023	3	5	7	0.08
2023	3	5	8	0.11
2023	3	5	9	0.13
2023	3	5	10	0.19
2023	3	5	11	0.31
2023	3	5	12	0.45
2023	3	5	13	0.52
2023	3	5	14	0.55
	3	5	15	0.55
	3	5	16	0.55
	3	5	17	0.49
	3	5	18	0.33



2023	3	5	19	0.18
2023	3	5	20	0.09
2023	3	5	21	0.05
2023	3	5	22	0.02
2023	3	5	23	0.02
2023	3	6	0	0.02
2023	3	6	1	0.03
2023	3	6	2	0.04
2023	3	6	3	0.03
2023	3	6	4	0.04
2023	3	6	5	0.05
2023	3	6	6	0.07
2023	3	6	7	0.07
2023	3	6	8	0.09
2023	3	6	9	0.12
2023	3	6	10	0.16
2023	3	6	11	0.16
2023	3	6	12	0.16
2023	3	6	13	0.16
2023	3	6	14	0.15
2023	3	6	15	0.16
2023	3	6	16	0.16
2023	3	6	17	0.16
2023	3	6	18	0.17
2023	3	6	19	0.12
2023	3	6	20	0.07
2023	3	6	21	0.04
2023	3	6	22	0.01
2023	3	6	23	0



Lampiran 5. Data ERA5

Data Perjam	Data Per 3 jam
0.113467	0.850405
0.155271	0.963274
0.319499	0.25619628
0.375635	0.04120644
0.315916	0.1266052
0.271723	0.3726495
0.243058	2.451478
0.0113467	0.3935513
0.00179158	0.734548
0.0131383	1.039715
0.00597194	0.573903
0.0220962	0.2806814
0.045984	0.60018
0.0274709	2.904748
0.0531503	2.726193
0.10212	0.478352
0.0752465	2.252015
0.195283	4.01553
0.364886	5.12453
1.16751	3.361604
0.919082	8.28428
0.300389	11.14843
0.0591222	9.1532
0.0340401	13.80057
0.108689	13.10597
0.244252	17.2431
0.381607	4.466852
0.271723	1.169097
0.335623	1.104387
0.432369	1.604812
0.366677	1.681233
0.105106	0.1978281
0.10212	0.2754806
0.0791	0.727219
0.1503	3.348909
0.07952	11.06605
0.03619	12.48782



0.357719	14.94742
0.118842	9.73611
0.394148	16.2743
0.98119	4.065654
1.52941	9.46125
2.13079	8.33528
0.215587	2.987141
0.379816	5.50961
0.244252	3.637332
0.11705	5.4258
0.11705	4.96665
0.317707	3.930058
0.785908	2.426935
1.1484	3.218874
1.12929	1.470462
1.404	0.07025675
1.48224	0.4443431
1.45895	0.918884
1.86205	1.895699
1.80353	2.007248
1.41535	2.526778
0.880264	1.0822
1.06599	0.1423624
1.74679	0.03512835
3.23381	0.0702568
3.30368	0.1602346
3.55928	0.1922816
3.94507	0.0868965
3.64408	0.1281878
2.78472	0.1663976
2.78531	0.08319871
3.58317	0.2582244
4.31712	0.1010711
4.55779	0.05916357
4.92566	0.00431401
5.22119	
4.26409	
069	
933	
102	
275	



3.8481	
0.263771	
0.354981	
0.374703	
0.470227	
0.324167	
0.287806	
0.268085	
0.548496	
0.775289	
0.559589	
0.269934	
0.236038	
1.06926	
0.375935	
0.0345121	
0.049303	
0.114013	
0.0887454	
0.0412912	
0.145444	
0.259457	
0.298283	
0.169479	
0.310609	
1.28003	
1.75827	
2.75973	
4.0638	
4.24252	
3.60466	
4.19383	
4.68933	
5.48372	
5.03075	
4.43295	
4.28135	
753	
723	
713	
248	



5.71052	
2.29814	
0.595334	
1.17218	
2.16317	
3.35384	
3.94424	
3.1141	
3.15169	
2.06949	
1.24428	
0.881291	
0.86157	
1.97335	
2.49966	
1.0366	
0.522612	
1.07789	
2.03683	
2.0923	
1.7669	
1.5666	
1.85009	
1.80695	
1.30961	
0.934908	
1.32933	
1.66582	
1.26585	
0.748173	
0.412912	
0.183654	
1.79956	
1.23566	
0.880058	
0.481937	
0.108467	
515	
1746	
3617	
1401	



0.15777	
0.243433	
0.192898	
0.332795	
0.393191	
0.555891	
0.689625	
0.650183	
0.552193	
0.550345	
0.90471	
0.761115	
0.886837	
0.878826	
0.64895	
0.253294	
0.179956	
0.0844314	
0.0283492	
0.0295818	
0.0049303	
0.00739545	
0.0228026	
0.0154072	
0.0160235	
0.0388261	
0.0610124	
0.0462215	
0.0530007	
0.070873	
0.062245	
0.0591636	
0.00616287	
0.00801173	
0.0727219	
0.0517681	
0.0456053	
3144	
3427	
3356	
3193	



0.00924431	
0.0277329	
0.0462215	
0.0591636	
0.0992223	
0.0998385	
0.0659427	
0.0301981	
0.0049303	
0.00123257	
0.0419075	
0.0160235	
0.00308144	
0.00123257	



Lampiran 6. Script Matlab

```
% Script 1
% Program ERA5 Untuk Data Temporal (28 Februari - 6 Maret 2023)
% Terkait Verifikasi Cuaca Ekstrem
% Lokasi: Batam, Kepulauan Riau
% Reika Aulia Nabilah
% Pembimbing: Prof. Dr. Halmar Halide, M.Sc.
% Lab Hidrometeorologi Dept. Geofisika FMIPA Unhas
% Makassar, Juli 2023

clc
clf

filename = 'era.8.nc'
ncdisp(filename)
latitude = ncread(filename,'lat');
longitude = ncread(filename,'lon');
[LN,LT]=meshgrid(longitude,latitude);
% waktu = ncread(filename,'time');
precip = ncread(filename, 'prep');
%precipave = mean(precip,3);
precip1=precip (:,:,1)*1000;
precip2=permute(precip1,[2 1 3]);
xlim([103.7 104.3])
ylim([0 1.5])
m_proj('miller','lon',[103.7 104.3],'lat',[0.6 1.3]);
mymap = m_pcolor(LN, LT, precip2);
mymap.EdgeAlpha=0;
shading interp
caxis([0 100])
colorbar
ylabel(colorbar,'daily total (mm)','FontSize',12)
```



```
s_i('color','k')
_f('color','k')
```

```

% m_grid('box','fancy','tickdir','in');
cmocean ('rain', 10)

% Script 2
% Program Metode PSS Untuk Data Temporal (28 Februari - 6 Maret
2023)
% Terkait Verifikasi Cuaca Ekstrem Zoom Earth Terhadap OGIMET
% Lokasi: Batam, Kepulauan Riau
% Reika Aulia Nabilah
% Pembimbing: Prof. Dr. Halmar Halide, M.Sc.
% Lab Hidrometeorologi Dept. Geofisika FMIPA Unhas
% Makassar, Juli 2023

clear
clf

% RAIN 26 Februari 2023 - 6 Maret 2023 peirce parameters
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=1;brn=0;crn=4;drn=3;% 0.2000 0.3582 0 0.3651
% arn=1;brn=0;crn=0;drn=7;% 1 0.4008 0 0.5345
% arn=0;brn=0;crn=2;drn=6;% 0 0.4082 0 0.4082
% arn=0;brn=1;crn=4;drn=3;% -0.2500 0.3423 0 0.3535
% arn=0;brn=1;crn=1;drn=6;% -0.1428 0.5321 0 0.5345
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=1;drn=7;% 0 0.5345 0 0.5345
% hr=peirceWR(arn,brn,crn,drn);%
% pri=hr(1,1);epri=hr(1,2);prir=hr(1,3);eprir=hr(1,4);
% exitt

load tesja.txt
rainskill=tesja;

```



```

rainskill(1,1);spacer=rainskill(1,2);racer=rainskill(1,3);sr
rainskill(1,4);

```

```

priar=rainskill(2,1);spriar=rainskill(2,2);rriar=rainskill(2,3);sr
riar=rainskill(2,4);
psbrr=rainskill(3,1);spsbrr=rainskill(3,2);rsbrr=rainskill(3,3);sr
sbrr=rainskill(3,4);
pjamr=rainskill(4,1);spjamr=rainskill(4,2);rjamr=rainskill(4,3);sr
jamr=rainskill(4,4);
plamr=rainskill(5,1);splamr=rainskill(5,2);rlamr=rainskill(5,3);sr
lamr=rainskill(5,4);
pdkir=rainskill(6,1);spdkir=rainskill(6,2);rdkir=rainskill(6,3);sr
dkir=rainskill(6,4);
pjabr=rainskill(7,1);spjabr=rainskill(7,2);rjabr=rainskill(7,3);sr
jabr=rainskill(7,4);
pjatr=rainskill(8,1);spjatr=rainskill(8,2);rjatr=rainskill(8,3);sr
jatr=rainskill(8,4);
pjogr=rainskill(9,1);spjogr=rainskill(9,2);rjogr=rainskill(9,3);sr
jogr=rainskill(9,4);

```

```

pri=[pacer priar psbrr pjamr plamr pdkir pjabr pjatr pjogr];
epri=[spacer spriar spsbrr spjamr splamr spdkir spjabr spjatr
spjogr];
prir=[racer rriar rsbrr rjamr rlamr rdkir rjabr rjatr rjogr];
eprir=[sracer srriar srsbrr srjamr srlamr srdkir srjabr srjatr
srjogr];

```

```

lead1=1:9;leads1=1*lead1;
% lead1=1:2;leads1=1*leads1;
% lead2=1:2;leads2=1*leads2;
% plot(leads1,pri,'-b',leads1,prir,'-r','linewidth',1.5),hold on
errorbar(leads1,pri,epri,'ob','linewidth',2),hold on
errorbar(leads1,prir,eprir,'*r','linewidth',1),hold off
set(gca,'xtick',1:9,...
'xticklabel',{'26','27','28','1','2','3','4','5','6'})
%legend BOXOFF
plot(1:9,leads1,prir,'r','linewidth',1.5)

```



lor

```

title('\it Peirce Skill Score}, Curah Hujan Zoom Earth & Ogimet
26 Februari - 6 Maret 2023')
legend('PSS+PSS', 'PSSr+PSSr', 'Location', 'Southeast')
xlabel('Hari ke- pada bulan April 2021')
ylabel('Nilai Peirce untuk Hujan')
%exit

% Script 3
% Program Metode PSS Untuk Data Temporal (28 Februari - 6 Maret
2023)
% Terkait Verifikasi Cuaca Ekstrem Zoom Earth Terhadap NASA
% Lokasi: Batam, Kepulauan Riau
% Reika Aulia Nabilah
% Pembimbing: Prof. Dr. Halmar Halide, M.Sc.
% Lab Hidrometeorologi Dept. Geofisika FMIPA Unhas
% Makassar, Juli 2023

clear
clf

% RAIN 26 Februari 2023 - 6 Maret 2023 peirce parameters
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=1;crn=2;drn=5;% -0.1666 0.4039 0 0.4082
% arn=1;brn=0;crn=2;drn=5;% 0.3333 0.3456 0 0.3651
% arn=0;brn=0;crn=2;drn=6;% 0 0.4082 0 0.4082
% arn=0;brn=1;crn=3;drn=4;% -0.2000 0.3582 0 0.3651
% arn=0;brn=1;crn=0;drn=7;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% hr=peirceWR(arn,brn,crn,drn);%
% pri=hr(1,1);epri=hr(1,2);prir=hr(1,3);eprir=hr(1,4);
% exit

```



```

>meearthnasa.txt
ll=zoomearthnasa;

```

```

pacer=rainskill(1,1);spacer=rainskill(1,2);racer=rainskill(1,3);sr
acer=rainskill(1,4);
priar=rainskill(2,1);spriar=rainskill(2,2);rriar=rainskill(2,3);sr
riar=rainskill(2,4);
psbrr=rainskill(3,1);spsbrr=rainskill(3,2);rsbrr=rainskill(3,3);sr
sbrr=rainskill(3,4);
pjamr=rainskill(4,1);spjamr=rainskill(4,2);rjamr=rainskill(4,3);sr
jamr=rainskill(4,4);
plamr=rainskill(5,1);splamr=rainskill(5,2);rlamr=rainskill(5,3);sr
lamr=rainskill(5,4);
pdkir=rainskill(6,1);spdkir=rainskill(6,2);rdkir=rainskill(6,3);sr
dkir=rainskill(6,4);
pjabr=rainskill(7,1);spjabr=rainskill(7,2);rjabr=rainskill(7,3);sr
jabr=rainskill(7,4);
pjatr=rainskill(8,1);spjatr=rainskill(8,2);rjatr=rainskill(8,3);sr
jatr=rainskill(8,4);
pjogr=rainskill(9,1);spjogr=rainskill(9,2);rjogr=rainskill(9,3);sr
jogr=rainskill(9,4);

```

```

pri=[pacer priar psbrr pjamr plamr pdkir pjabr pjatr pjogr];
epri=[spacer spriar spsbr r spjamr splamr spdkir spjabr spjatr
spjogr];
prir=[racer rriar rsbrr rjamr rlamr rdkir rjabr rjatr rjogr];
eprir=[sracer srriar srsbr r srjamr srlamr srdkir srjabr srjatr
srjogr];

```

```

lead1=1:9;leads1=1*lead1;
% lead1=1:2;leads1=1*leads1;
% lead2=1:2;leads2=1*leads2;
%plot(leads1,pri,'-b',leads1,prir,'-r','linewidth',1.5),hold on
errorbar(leads1,pri,epri,'ob','linewidth',2),hold on
errorbar(leads1,prir,eprir,'*r','linewidth',1),hold on
.'xtick',1:9,...
Label',{'26','27','28','1','2','3','4','5','6'})
BOXOFF
10 -1 1.5])

```



```

grid on
grid minor
title('{\it Peirce Skill Score}, Curah Hujan Zoom Earth & Nasa 26
Februari - 6 Maret 2023')
legend('PSS $\pm$ PSS', 'PSSr $\pm$ PSSr', 'Location', 'Southeast')
xlabel('Hari ke- pada bulan April 2021')
ylabel('Nilai Peirce untuk Hujan')
%exitt

% Script 4
% Program Metode PSS Untuk Data Temporal (28 Februari - 6 Maret
2023)
% Terkait Verifikasi Cuaca Ekstrem Zoom Earth Terhadap ERA5
% Lokasi: Batam, Kepulauan Riau
% Reika Aulia Nabilah
% Pembimbing: Prof. Dr. Halmar Halide, M.Sc. & Andika, S.Si.,
M.Sc.
% Lab Hidrometeorologi Dept. Geofisika FMIPA Unhas
% Makassar, Juli 2023

clear
clf

% RAIN 26 Februari 2023 - 6 Maret 2023 peirce parameters
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=1;brn=0;crn=3;drn=4;%
% arn=1;brn=0;crn=1;drn=6;%
% arn=0;brn=0;crn=5;drn=3;%
% arn=0;brn=1;crn=2;drn=5;%
% arn=0;brn=1;crn=0;drn=7;%
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000

prceWR(arn,brn,crn,drn);%
c(1,1);epri=hr(1,2);prir=hr(1,3);eprir=hr(1,4);

```




```

load ERA5ZE.txt
rainskill=ERA5ZE;

pacer=rainskill(1,1);spacer=rainskill(1,2);racer=rainskill(1,3);sr
acer=rainskill(1,4);
priar=rainskill(2,1);spriar=rainskill(2,2);rriar=rainskill(2,3);sr
riar=rainskill(2,4);
psbrr=rainskill(3,1);spsbrr=rainskill(3,2);rsbrr=rainskill(3,3);sr
sbrr=rainskill(3,4);
pjamr=rainskill(4,1);spjamr=rainskill(4,2);rjamr=rainskill(4,3);sr
jamr=rainskill(4,4);
plamr=rainskill(5,1);splamr=rainskill(5,2);rlamr=rainskill(5,3);sr
lamr=rainskill(5,4);
pdkir=rainskill(6,1);spdkir=rainskill(6,2);rdkir=rainskill(6,3);sr
dkir=rainskill(6,4);
pjabr=rainskill(7,1);spjabr=rainskill(7,2);rjabr=rainskill(7,3);sr
jabr=rainskill(7,4);
pjatr=rainskill(8,1);spjatr=rainskill(8,2);rjatr=rainskill(8,3);sr
jatr=rainskill(8,4);
pjogr=rainskill(9,1);spjogr=rainskill(9,2);rjogr=rainskill(9,3);sr
jogr=rainskill(9,4);

pri=[pacer priar psbrr pjamr plamr pdkir pjabr pjatr pjogr];
epri=[spacer spriar spsbrr spjamr splamr spdkir spjabr spjatr
spjogr];
prir=[racer rriar rsbrr rjamr rlamr rdkir rjabr rjatr rjogr];
eprir=[sracer srriar srsbrr srjamr srlamr srdkir srjabr srjatr
srjogr];

lead1=1:9;leads1=1*lead1;
% lead1=1:2;leads1=1*leads1;
% lead2=1:2;leads2=1*leads2;
%plot(leads1,pri,'-b',leads1,prir,'-r','linewidth',1.5),hold on
plot(leads1,pri,epri,'ob','linewidth',2),hold on
plot(leads1,prir,eprir,'*r','linewidth',1),hold on
set(gca,'xtick',1:9,...
'xlabel',{'26','27','28','1','2','3','4','5','6'})

```



```

%legend BOXOFF
axis([0 10 -1 1.5])
grid on
grid minor
title('{\it Peirce Skill Score}, Curah Hujan Zoom Earth & ERA5 26
Februari - 6 Maret 2023')
legend('PSS+ePSS', 'PSSr+ePSSr', 'Location', 'Southeast')
xlabel('Hari ke- pada bulan April 2021')
ylabel('Nilai Peirce untuk Hujan')
%exitt

```

```

% Script 5
% Program Metode PSS Untuk Data Temporal (28 Februari - 6 Maret
2023)
% Terkait Verifikasi Cuaca Ekstrem Peringatan Dini BMKG Terhadap
OGIMET
% Lokasi: Batam, Kepulauan Riau
% Reika Aulia Nabilah
% Pembimbing: Prof. Dr. Halmar Halide, M.Sc.
% Lab Hidrometeorologi Dept. Geofisika FMIPA Unhas
% Makassar, Juli 2023

```

```

clear
clf

```

```

% RAIN 26 Februari 2023 - 6 Maret 2023 peirce parameters
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=3;brn=0;crn=3;drn=2;% 0.5000 0.3679 0 0.4082
% arn=0;brn=0;crn=1;drn=7;% 0 0.5345 0 0.5345
% arn=0;brn=0;crn=2;drn=6;% 0 0.4082 0 0.4082
% arn=2;brn=0;crn=2;drn=4;% 0.5000 0.3061 0 0.3535
% arn=1;brn=0;crn=0;drn=7;% 1 0.4008 0 0.5345
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=1;drn=7;% 0 0.5345 0 0.5345
% PeirceWR(arn,brn,crn,drn);%

```



```

% pri=hr(1,1);epri=hr(1,2);prir=hr(1,3);eprir=hr(1,4);
% exitt

load bmkgogimet.txt
rainskill=bmkgogimet;

pacer=rainskill(1,1);spacer=rainskill(1,2);racer=rainskill(1,3);sr
acer=rainskill(1,4);
priar=rainskill(2,1);spriar=rainskill(2,2);rriar=rainskill(2,3);sr
riar=rainskill(2,4);
psbrr=rainskill(3,1);spsbrr=rainskill(3,2);rsbrr=rainskill(3,3);sr
sbrr=rainskill(3,4);
pjamr=rainskill(4,1);spjamr=rainskill(4,2);rjamr=rainskill(4,3);sr
jamr=rainskill(4,4);
plamr=rainskill(5,1);splamr=rainskill(5,2);rlamr=rainskill(5,3);sr
lamr=rainskill(5,4);
pdkir=rainskill(6,1);spdkir=rainskill(6,2);rdkir=rainskill(6,3);sr
dkir=rainskill(6,4);
pjabr=rainskill(7,1);spjabr=rainskill(7,2);rjabr=rainskill(7,3);sr
jabr=rainskill(7,4);
pjatr=rainskill(8,1);spjatr=rainskill(8,2);rjatr=rainskill(8,3);sr
jatr=rainskill(8,4);
pjogr=rainskill(9,1);spjogr=rainskill(9,2);rjogr=rainskill(9,3);sr
jogr=rainskill(9,4);

pri=[pacer priar psbrr pjamr plamr pdkir pjabr pjatr pjogr];
epri=[spacer spriar spsbrr spjamr splamr spdkir spjabr spjatr
spjogr];
prir=[racer rriar rsbrr rjamr rlamr rdkir rjabr rjatr rjogr];
eprir=[sracer srriar srsbrr srjamr srlamr srdkir srjabr srjatr
srjogr];

lead1=1:9;leads1=1*lead1;
=1:2;leads1=1*leads1;
=1:2;leads2=1*leads2;
>ads1,pri,'-b',leads1,prir,'-r','linewidth',1.5),hold on
:(leads1,pri,epri,'ob','linewidth',2),hold on

```



```

errorbar(leads1,prir,eprir,'*r','linewidth',1),hold on
set(gca,'xtick',1:9,...
    'xticklabel',{'26','27','28','1','2','3','4','5','6'})
%legend BOXOFF
axis([0 10 -1 1.5])
grid on
grid minor
title('\it Peirce Skill Score}, Curah Hujan Peringatan Dini BMKG
& Ogimet 26 Februari - 6 Maret 2023')
legend('PSS±ePSS','PSSr±ePSSr','Location','Southeast')
xlabel('Hari ke- pada bulan April 2021')
ylabel('Nilai Peirce untuk Hujan')
%exitt

% Script 6
% Program Metode PSS Untuk Data Temporal (28 Februari - 6 Maret
2023)
% Terkait Verifikasi Cuaca Ekstrem Peringatan Dini BMKG Terhadap
NASA
% Lokasi: Batam, Kepulauan Riau
% Reika Aulia Nabilah
% Pembimbing: Prof. Dr. Halmar Halide, M.Sc.
% Lab Hidrometeorologi Dept. Geofisika FMIPA Unhas
% Makassar, Juli 2023

clear
clf

% RAIN 26 Februari 2023 - 6 Maret 2023 peirce parameters
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=0;brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
% arn=2;brn=1;crn=1;drn=4;% 0.4666 0.3257 0 0.3651
% arn=0;brn=0;crn=3;drn=5;% 0 0.3651 0 0.3651
% arn=0;brn=0;crn=2;drn=6;% 0 0.4082 0 0.4082
% arn=0;brn=1;crn=2;drn=5;% 0.1666 0.3491 0 0.3535
% arn=0;brn=1;crn=0;drn=7;% 0 0.5000 0 0.5000

```



```

% arn=0;brn=0;crn=0;drn=8;% 0    0.5000    0    0.5000
% arn=0;brn=0;crn=0;drn=8;% 0    0.5000    0    0.5000
% hr=peirceWR(arn,brn,crn,drn);%
% pri=hr(1,1);epri=hr(1,2);prir=hr(1,3);eprir=hr(1,4);
% exitt

```

```

load peringatandini.txt
rainskill=peringatandini;

```

```

pacer=rainskill(1,1);spacer=rainskill(1,2);racer=rainskill(1,3);sr
acer=rainskill(1,4);
priar=rainskill(2,1);spriar=rainskill(2,2);rriar=rainskill(2,3);sr
riar=rainskill(2,4);
psbrr=rainskill(3,1);spsbrr=rainskill(3,2);rsbrr=rainskill(3,3);sr
sbrr=rainskill(3,4);
pjamr=rainskill(4,1);spjamr=rainskill(4,2);rjamr=rainskill(4,3);sr
jamr=rainskill(4,4);
plamr=rainskill(5,1);splamr=rainskill(5,2);rlamr=rainskill(5,3);sr
lamr=rainskill(5,4);
pdkir=rainskill(6,1);spdkir=rainskill(6,2);rdkir=rainskill(6,3);sr
dkir=rainskill(6,4);
pjabr=rainskill(7,1);spjabr=rainskill(7,2);rjabr=rainskill(7,3);sr
jabr=rainskill(7,4);
pjatr=rainskill(8,1);spjatr=rainskill(8,2);rjatr=rainskill(8,3);sr
jatr=rainskill(8,4);
pjogr=rainskill(9,1);spjogr=rainskill(9,2);rjogr=rainskill(9,3);sr
jogr=rainskill(9,4);

```

```

pri=[pacer priar psbrr pjamr plamr pdkir pjabr pjatr pjogr];
epri=[spacer spriar spsbrr spjamr splamr spdkir spjabr spjatr
spjogr];
prir=[racer rriar rsbrr rjamr rlamr rdkir rjabr rjatr rjogr];
eprir=[sracer srriar srsbrr srjamr srlamr srdkir srjabr srjatr

```



```

:9;leads1=1*lead1;
=1:2;leads1=1*leads1;

```

```

% lead2=1:2;leads2=1*leads2;
%plot(leads1,pri,'-b',leads1,prir,'-r','linewidth',1.5),hold on
errorbar(leads1,pri,epri,'ob','linewidth',2),hold on
errorbar(leads1,prir,eprir,'*r','linewidth',1),hold on
set(gca,'xtick',1:9,...
    'xticklabel',{'26','27','28','1','2','3','4','5','6'})
%legend BOXOFF
axis([0 10 -1 1.5])
grid on
grid minor
title('{\it Peirce Skill Score}, Curah Hujan Peringatan Dini BMKG
& Nasa 26 Februari - 6 Maret 2023')
legend('PSS+ePSS','PSSr+ePSSr','Location','Southeast')
xlabel('Hari ke- pada bulan April 2021')
ylabel('Nilai Peirce untuk Hujan')
%exitt

% Script 7
% Program Metode PSS Untuk Data Temporal (28 Februari - 6 Maret
2023)
% Terkait Verifikasi Cuaca Ekstrem Peringatan Dini BMKG Terhadap
ERA5
% Lokasi: Batam, Kepulauan Riau
% Reika Aulia Nabilah
% Pembimbing: Prof. Dr. Halmar Halide, M.Sc. & Andika, S.Si.,
M.Sc.
% Lab Hidrometeorologi Dept. Geofisika FMIPA Unhas
% Makassar, Juli 2023

clear
clf

```



```

26 Februari 2023 - 6 Maret 2023 peirce parameters
:brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
:brn=0;crn=0;drn=8;% 0 0.5000 0 0.5000
:brn=1;crn=2;drn=3;%

```

```

% arn=0;brn=0;crn=2;drn=6;%
% arn=0;brn=0;crn=5;drn=3;%
% arn=1;brn=1;crn=1;drn=5;%
% arn=0;brn=1;crn=0;drn=7;%
% arn=0;brn=0;crn=0;drn=8;% 0    0.5000    0    0.5000
% arn=0;brn=0;crn=0;drn=8;% 0    0.5000    0    0.5000
% hr=peirceWR(arn,brn,crn,drn);%
% pri=hr(1,1);epri=hr(1,2);prir=hr(1,3);eprir=hr(1,4);
% exitt

```

```
load bmkgERA5.txt
```

```
rainskill=bmkgERA5;
```

```

pacer=rainskill(1,1);spacer=rainskill(1,2);racer=rainskill(1,3);sr
acer=rainskill(1,4);
priar=rainskill(2,1);spriar=rainskill(2,2);rriar=rainskill(2,3);sr
riar=rainskill(2,4);
psbrr=rainskill(3,1);spsbrr=rainskill(3,2);rsbrr=rainskill(3,3);sr
sbrr=rainskill(3,4);
pjamr=rainskill(4,1);spjamr=rainskill(4,2);rjamr=rainskill(4,3);sr
jamr=rainskill(4,4);
plamr=rainskill(5,1);splamr=rainskill(5,2);rlamr=rainskill(5,3);sr
lamr=rainskill(5,4);
pdkir=rainskill(6,1);spdkir=rainskill(6,2);rdkir=rainskill(6,3);sr
dkir=rainskill(6,4);
pjabr=rainskill(7,1);spjabr=rainskill(7,2);rjabr=rainskill(7,3);sr
jabr=rainskill(7,4);
pjatr=rainskill(8,1);spjatr=rainskill(8,2);rjatr=rainskill(8,3);sr
jatr=rainskill(8,4);
pjogr=rainskill(9,1);spjogr=rainskill(9,2);rjogr=rainskill(9,3);sr
jogr=rainskill(9,4);

```

```

pri=[pacer priar psbrr pjamr plamr pdkir pjabr pjatr pjogr];
pacer spriar spsbrr spjamr splamr spdkir spjabr spjatr
:
acer rriar rsbrr rjamr rlamr rdkir rjabr rjatr rjogr];

```



```

eprir=[sracer srriar srsbrr srjamr srlamr srdkir srjabr srjatr
srjogr];

lead1=1:9;leads1=1*lead1;
% lead1=1:2;leads1=1*leads1;
% lead2=1:2;leads2=1*leads2;
%plot(leads1,pri,'-b',leads1,prir,'-r','linewidth',1.5),hold on
errorbar(leads1,pri,epri,'ob','linewidth',2),hold on
errorbar(leads1,prir,eprir,'*r','linewidth',1),hold on
set(gca,'xtick',1:9,...
'xticklabel',{'26','27','28','1','2','3','4','5','6'})
%legend BOXOFF
axis([0 10 -1 1.5])
grid on
grid minor
title('\it Peirce Skill Score}, Curah Hujan Peringatan Dini BMKG
& ERA5 26 Februari - 6 Maret 2023')
legend('PSS+ePSS','PSSr+ePSSr','Location','Southeast')
xlabel('Hari ke- pada bulan April 2021')
ylabel('Nilai Peirce untuk Hujan')
%exitt

```

Persamaan *Peirce Skill Score*

```

function hasil=peirceWR(sa,sb,sc,sd);
sa=sa;
sb=sb;
sc=sc;
sd=sd;
tot=sa+sb+sc+sd

at=(sa*sd)-(sb*sc);
sc)*(sb+sd);
:
+sd;
a+sc)*(sa+sb)/tot;

```




```

sbr=(sb+sd)*(sa+sb)/tot;
scr=(sa+sc)*(sc+sd)/tot;
sdr=(sb+sd)*(sc+sd)/tot;

atr=(sar*sdr)-(sbr*scr);
bwr=(sar+scr)*(sbr+sdr);
% atr=scr;
% bwr=sbr+sdr;

sensit=sa/(sa+sc);
specif=sd/(sd+sb);

pss=at/bw; %
spss=sqrt((tot^2-4*bw*pss^2)/(4*tot*bw)); %
pssr=atr/bwr; %
spssr=sqrt((tot^2-4*bwr*pssr^2)/(4*tot*bwr)); %

hasil=[pss spss pssr spssr];

```

