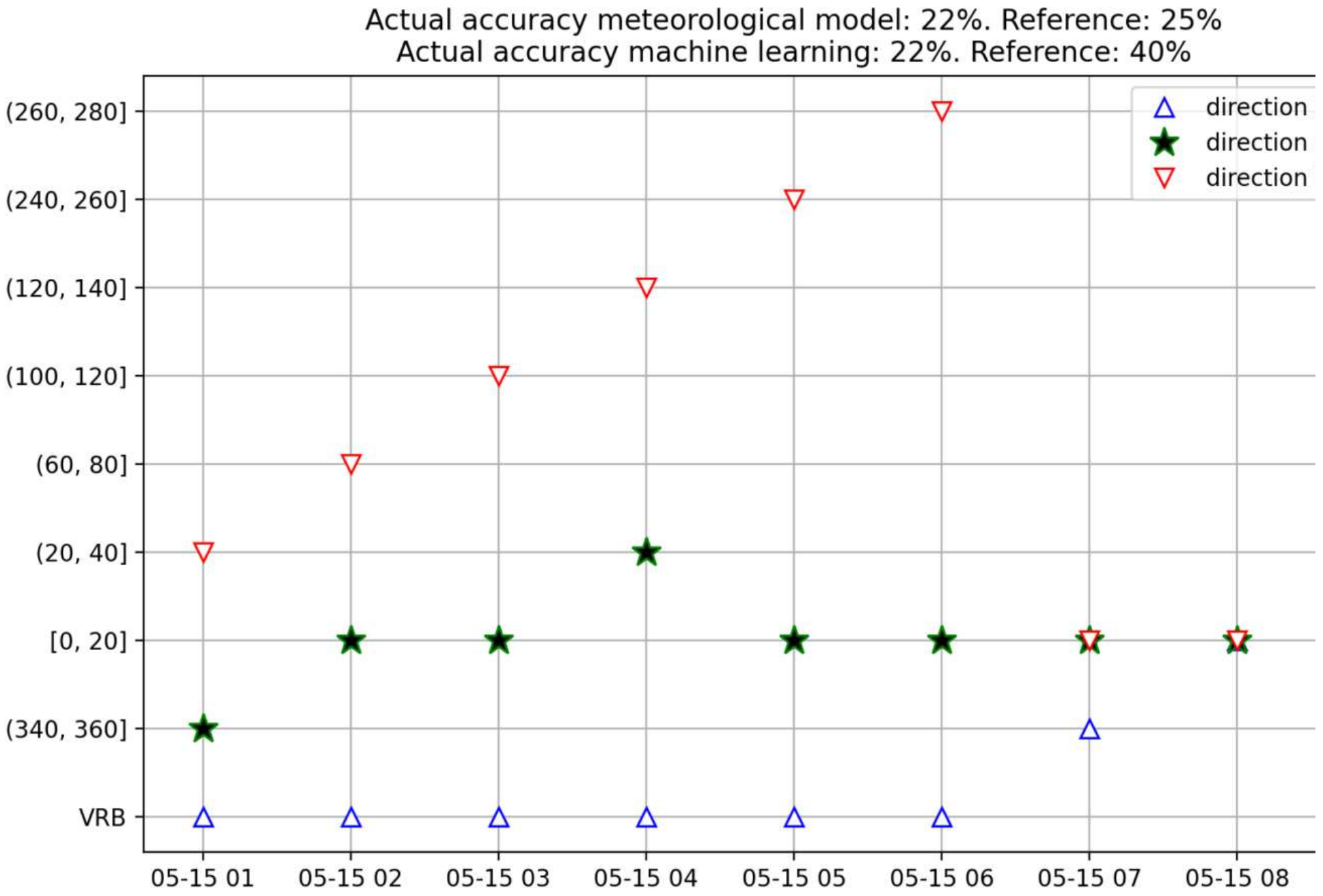
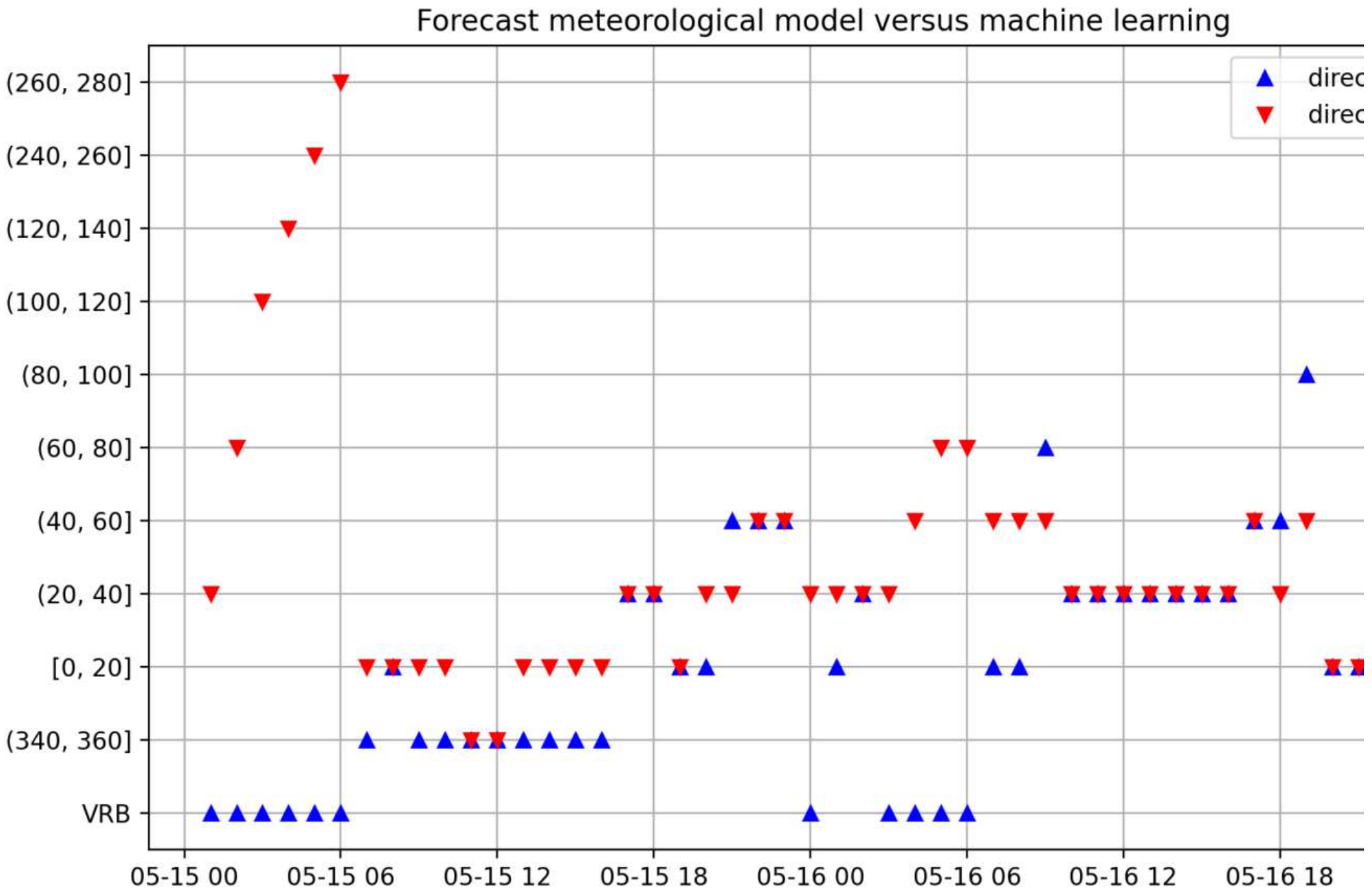
Metars

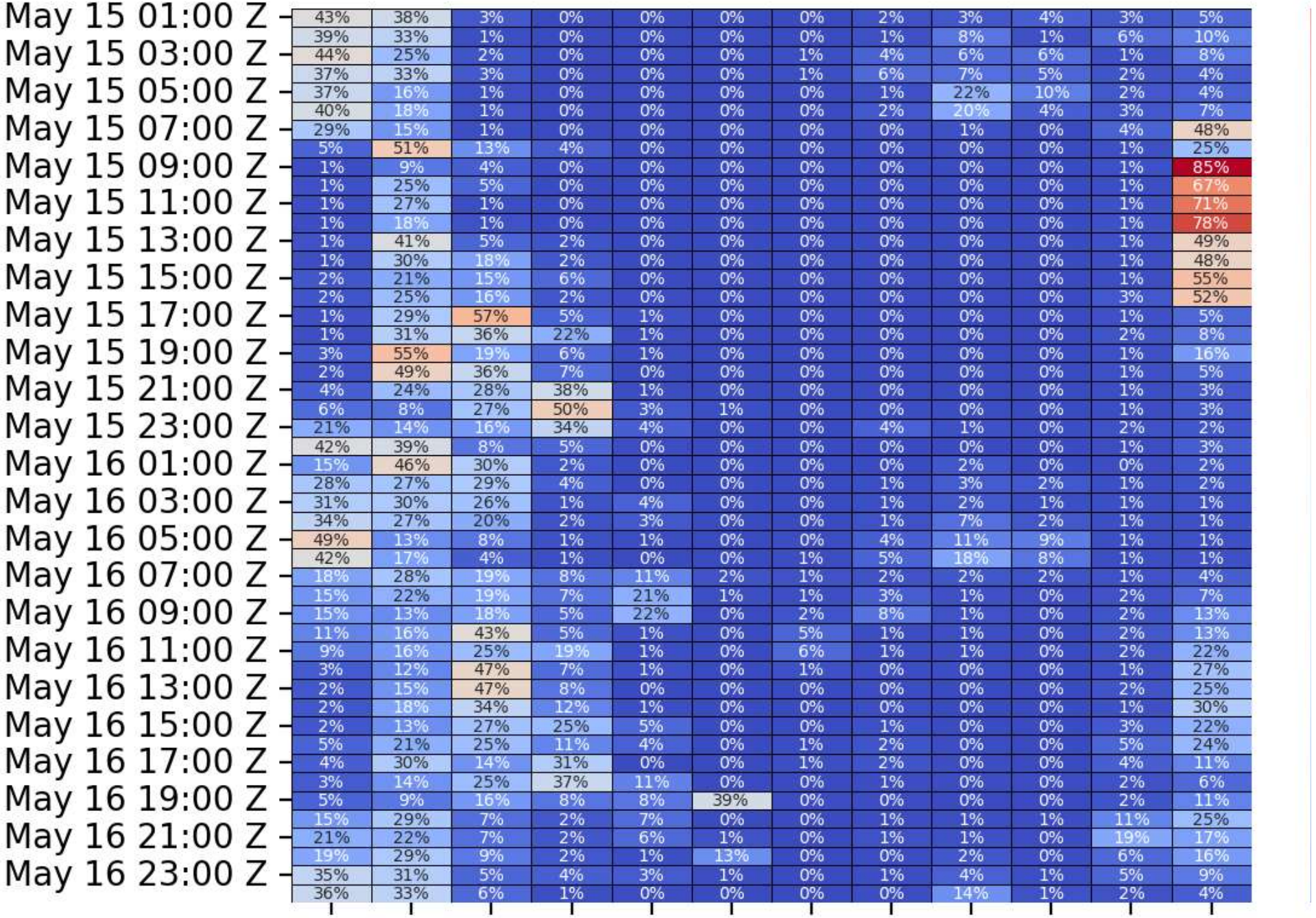
metar_o	dir_o	spd_o	gust_o	visibility_o	wxcodes_o
LECO 150000Z AUTO 02003KT 320V060 CAVOK 14/10 Q1024	20	3	M	9994	M
LECO 150030Z AUTO 02003KT 330V050 CAVOK 14/10 Q1024	20	3	M	9994	M
LECO 150100Z AUTO 36003KT 310V050 9999 BKN030 14/10 Q1024	360	3	M	9994	M
LECO 150130Z AUTO 01004KT 310V070 9999 OVC029 14/10 Q1024	10	4	M	9994	M
LECO 150200Z AUTO 02004KT 340V070 9999 OVC030 14/11 Q1024	20	4	M	9994	M
LECO 150230Z AUTO 04004KT 360V060 9999 OVC026 14/11 Q1024	40	4	M	9994	M
LECO 150300Z AUTO 02004KT 340V060 9999 BKN025 OVC032 14/11 Q1024	20	4	M	9994	M
LECO 150330Z 04005KT 010V070 9999 BKN027 14/11 Q1024 NOSIG	40	5	M	9994	M
LECO 150400Z 04004KT 9999 FEW018 SCT026 14/11 Q1023 NOSIG	40	4	M	9994	M
LECO 150430Z 02003KT 340V060 9999 SCT018 SCT027 13/11 Q1023 NOSIG	20	3	M	9994	M
LECO 150500Z 02005KT 330V060 9999 FEW012 BKN024 13/11 Q1023 NOSIG	20	5	M	9994	M
LECO 150530Z 03005KT 350V060 9999 FEW012 SCT020 BKN045 13/11 Q1023 NOSIG	30	5	M	9994	M

Wind direction


Actual accuracy meteorological model: 22%. Reference: 25%
Actual accuracy machine learning: 22%. Reference: 40%
direction
direction
direction
(260, 280]
(240, 260]
(120, 140]
(100, 120]
(60, 80]
(20, 40]
[0, 20]
(340, 360]
VRB
05-15 01
05-15 02
05-15 03
05-15 04
05-15 05
05-15 06
05-15 07
05-15 08


Forecast meteorological model versus machine learning
(260, 280]
(240, 260]
(120, 140]
(100, 120]
(80, 100]
(60, 80]
(40, 60]
(20, 40]
[0, 20]
(340, 360]
VRB
05-15 00
05-15 06
05-15 12
05-15 18
05-16 00
05-16 06
05-16 12
05-16 18
direc
direc

Probabilities wind direction more than 5%



Wind intensity knots

VRB

[0, 20]

(20, 40]

(40, 60]

(60, 80]

(80, 100]

(120, 140]

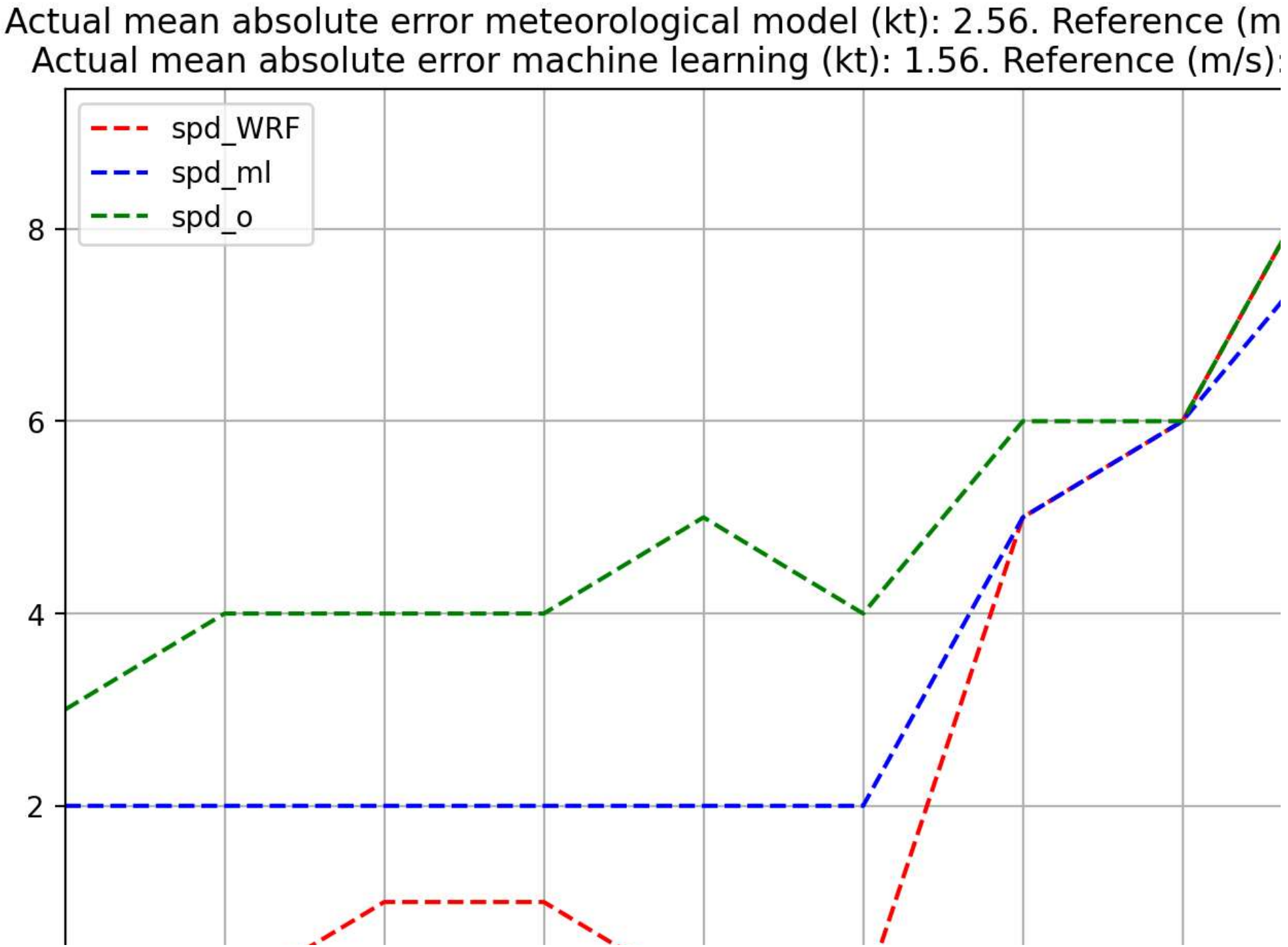
(140, 160]

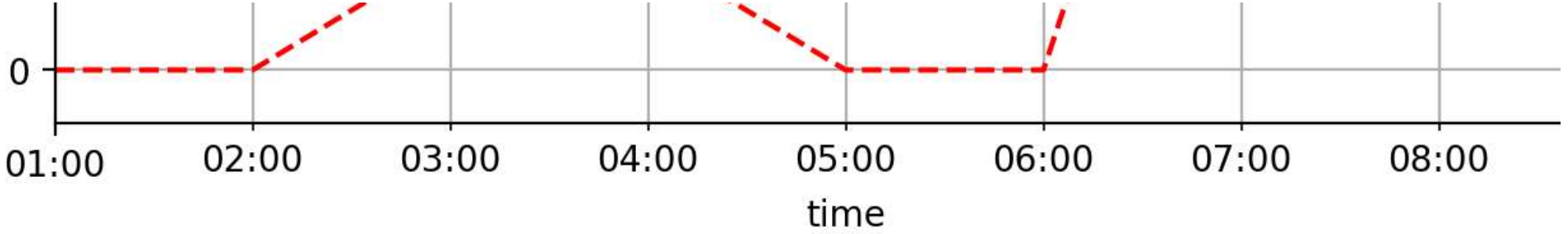
(160, 180]

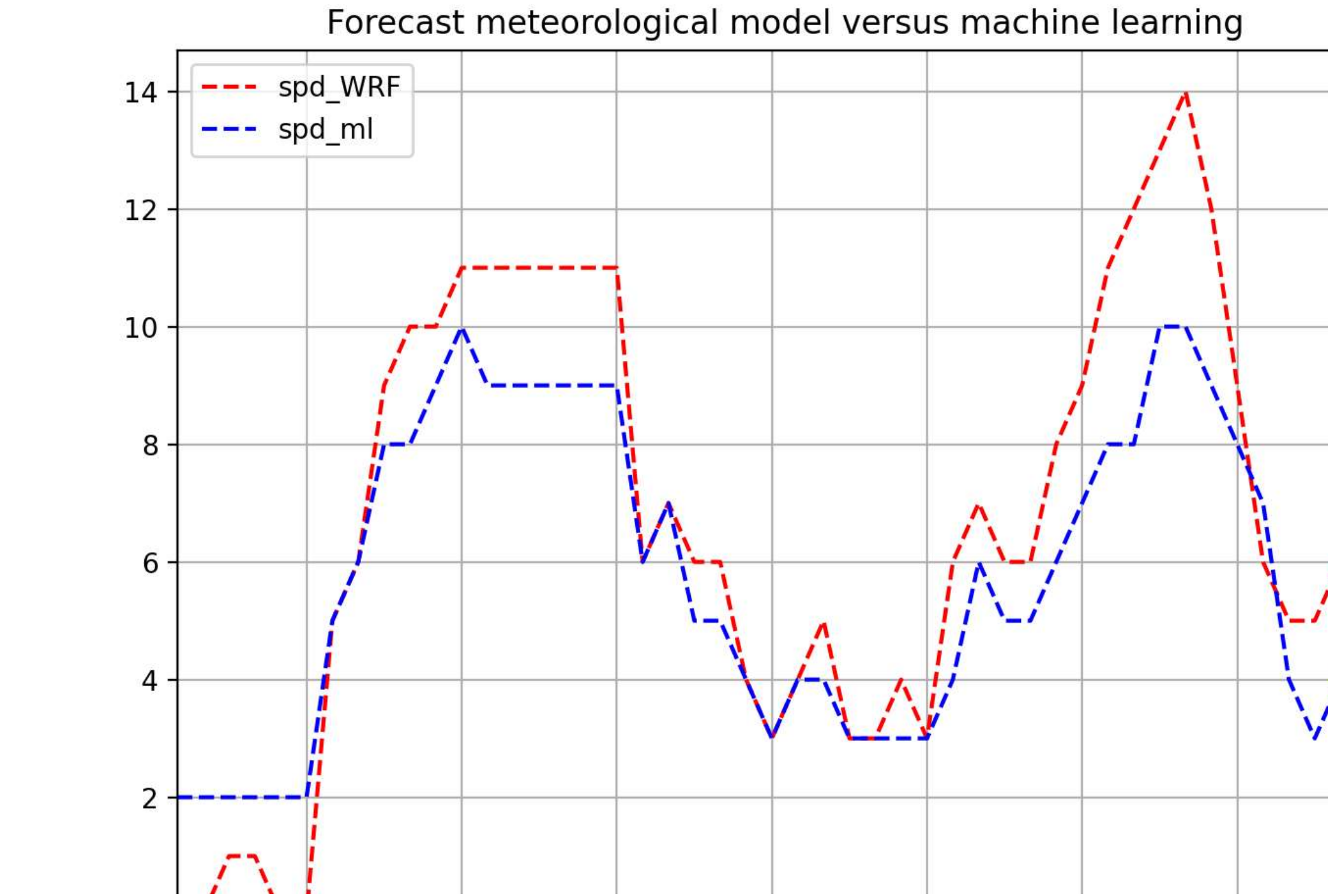
(180, 200]

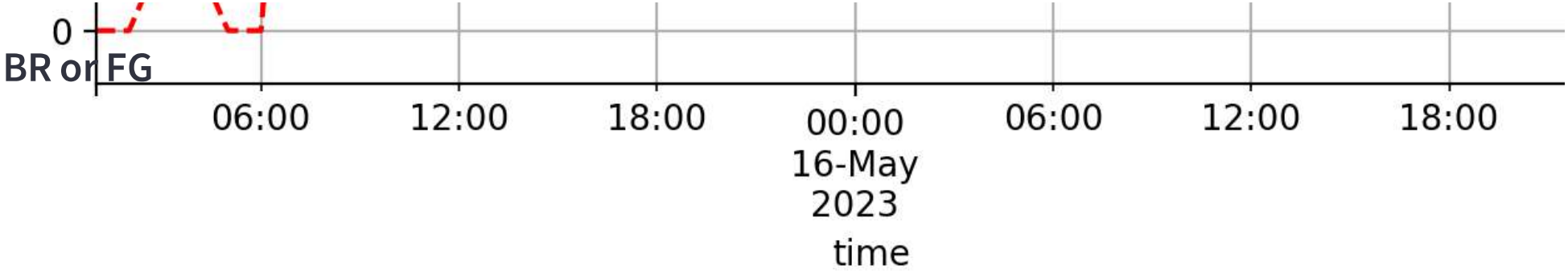
(320, 340]

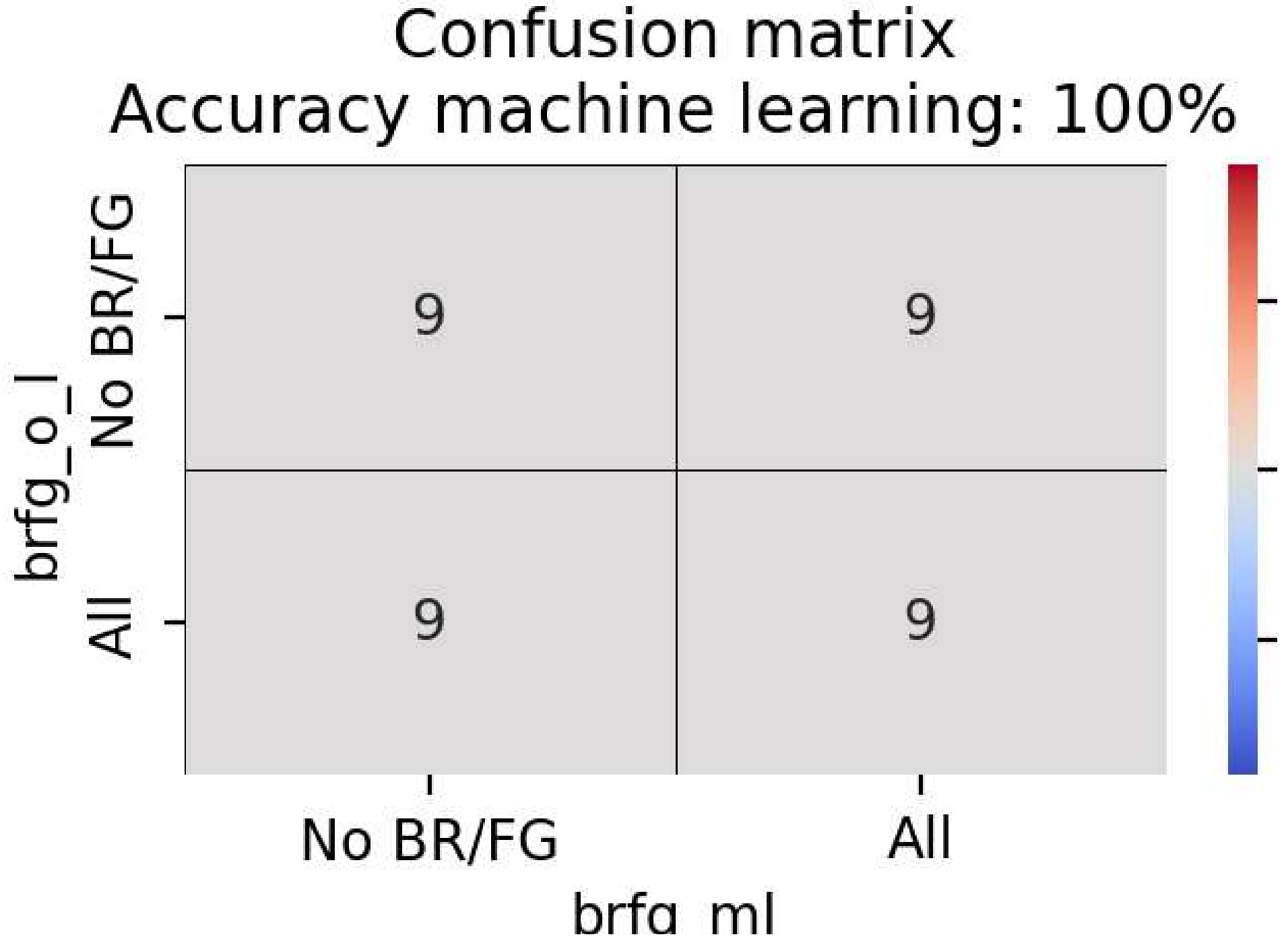
(340, 360]

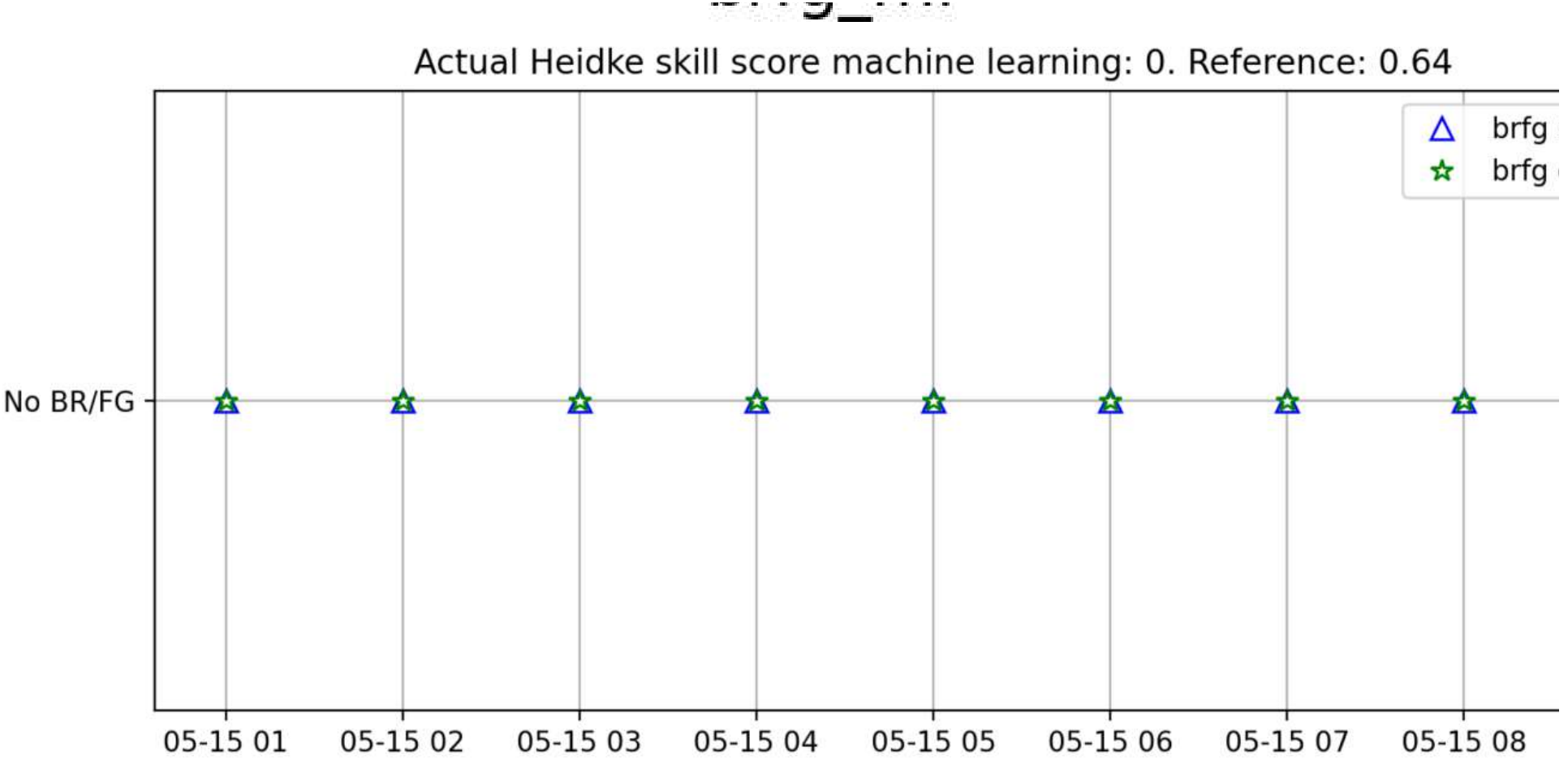

Actual mean absolute error meteorological model (kt): 2.56. Reference (m
Actual mean absolute error machine learning (kt): 1.56. Reference (m/s)
spd_WRF
spd_ml
spd_o
8
6
4
2

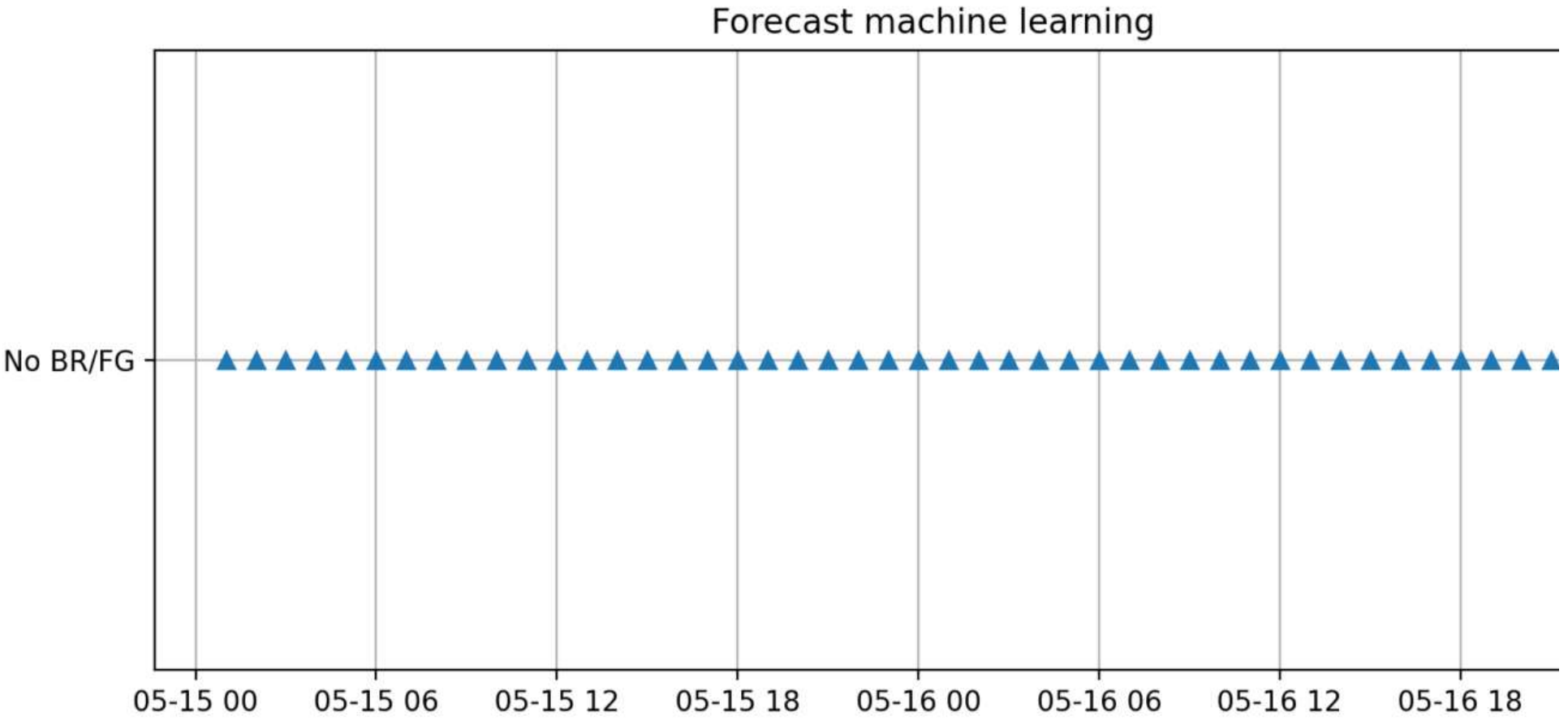

0
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
time

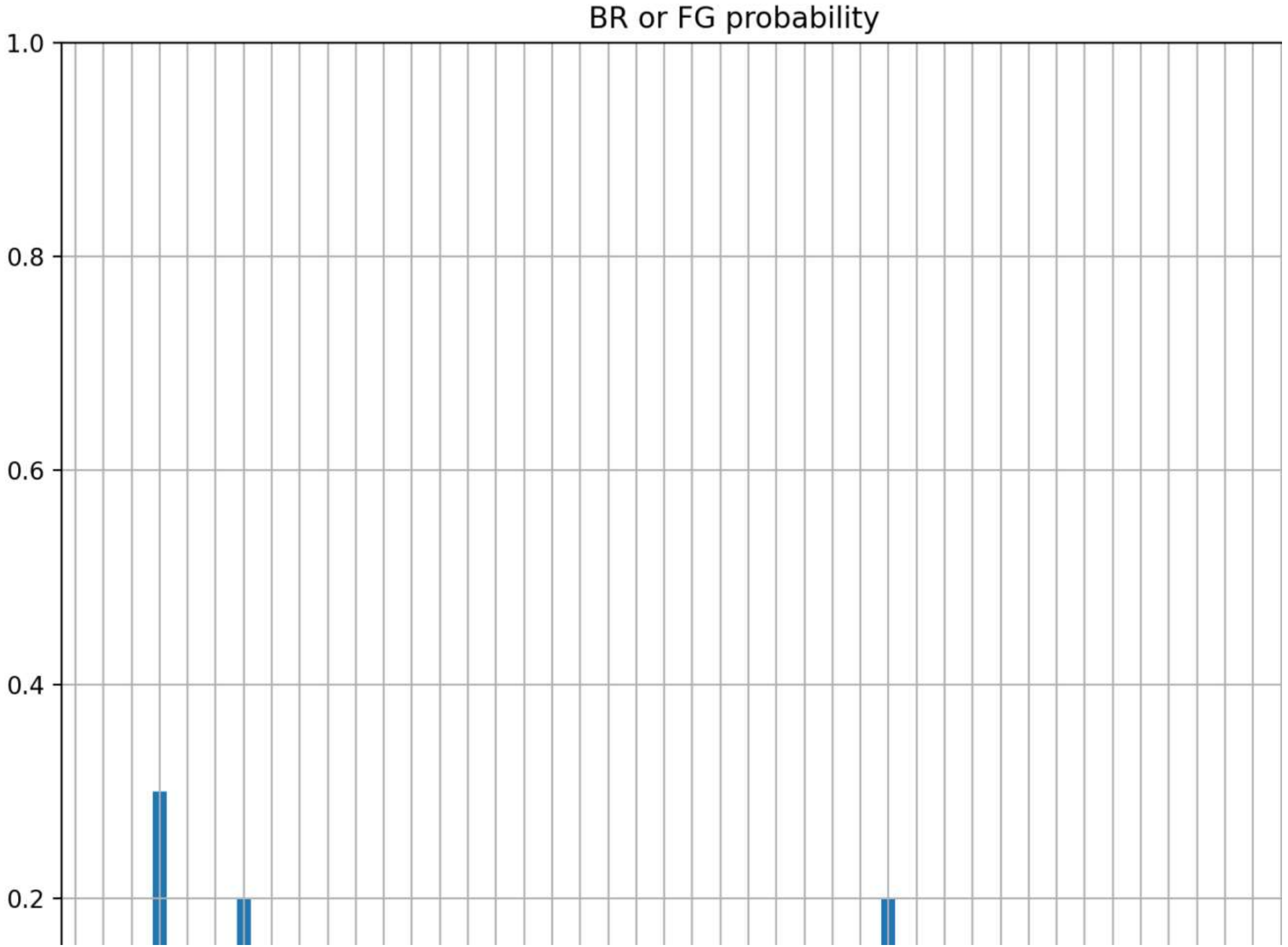

Forecast meteorological model versus machine learning
spd_WRF
spd_ml
14
12
10
8
6
4
2

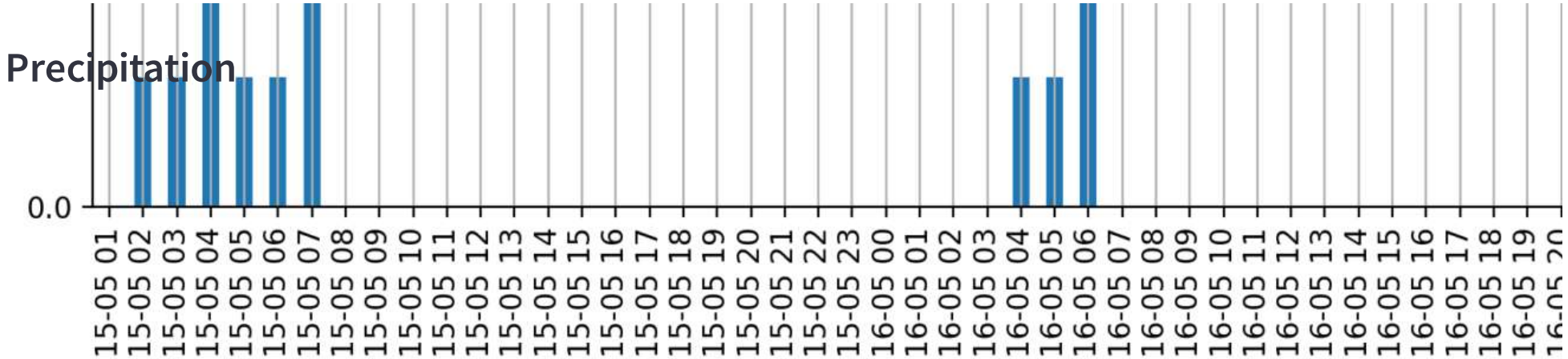

0
BR or FG
06:00
12:00
18:00
00:00
16-May
2023
06:00
12:00
18:00
time

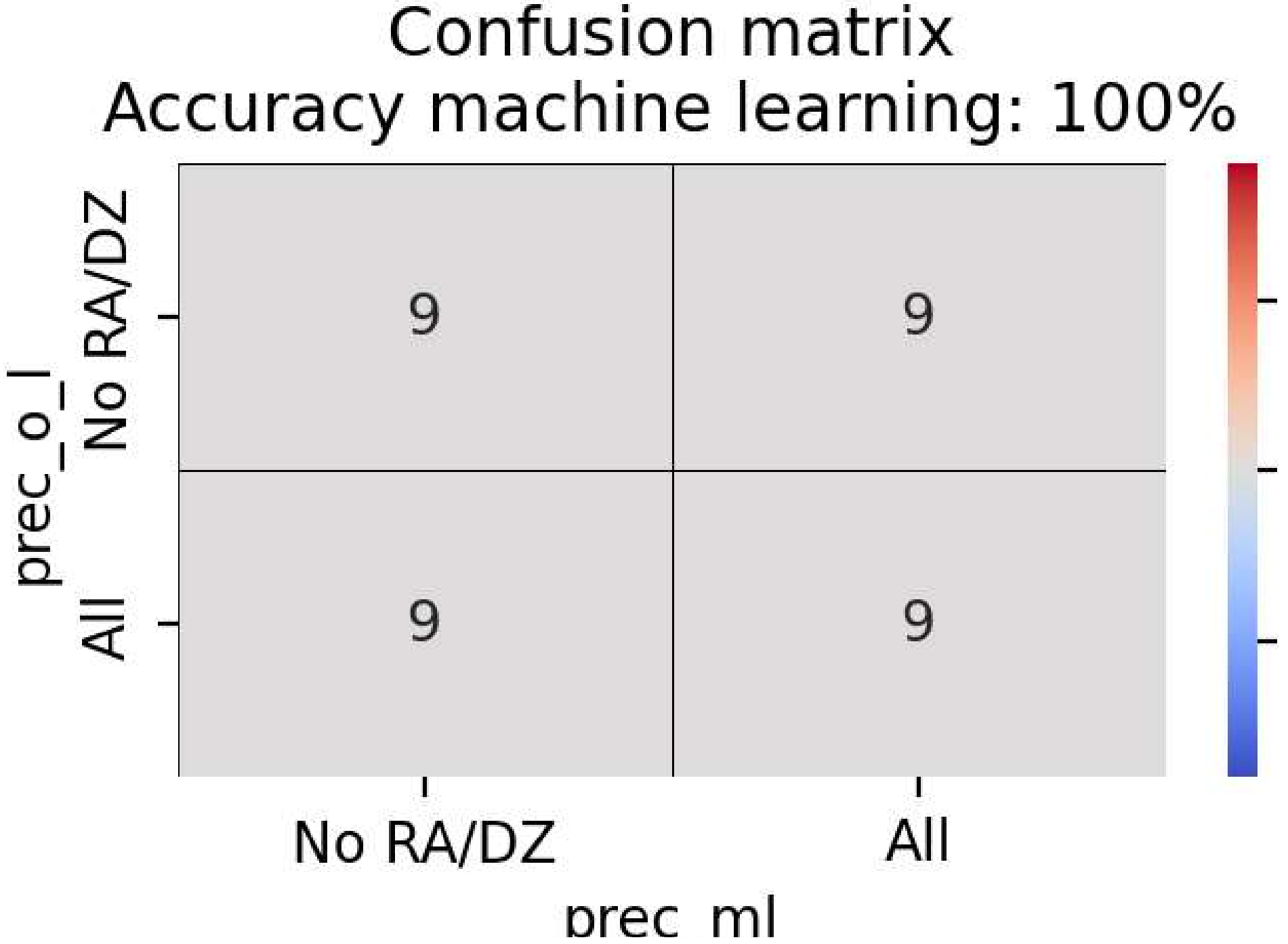

Confusion matrix
Accuracy machine learning: 100%
brfg_o_l
No BR/FG
All
9
9
9
9
No BR/FG
All
brfg_ml

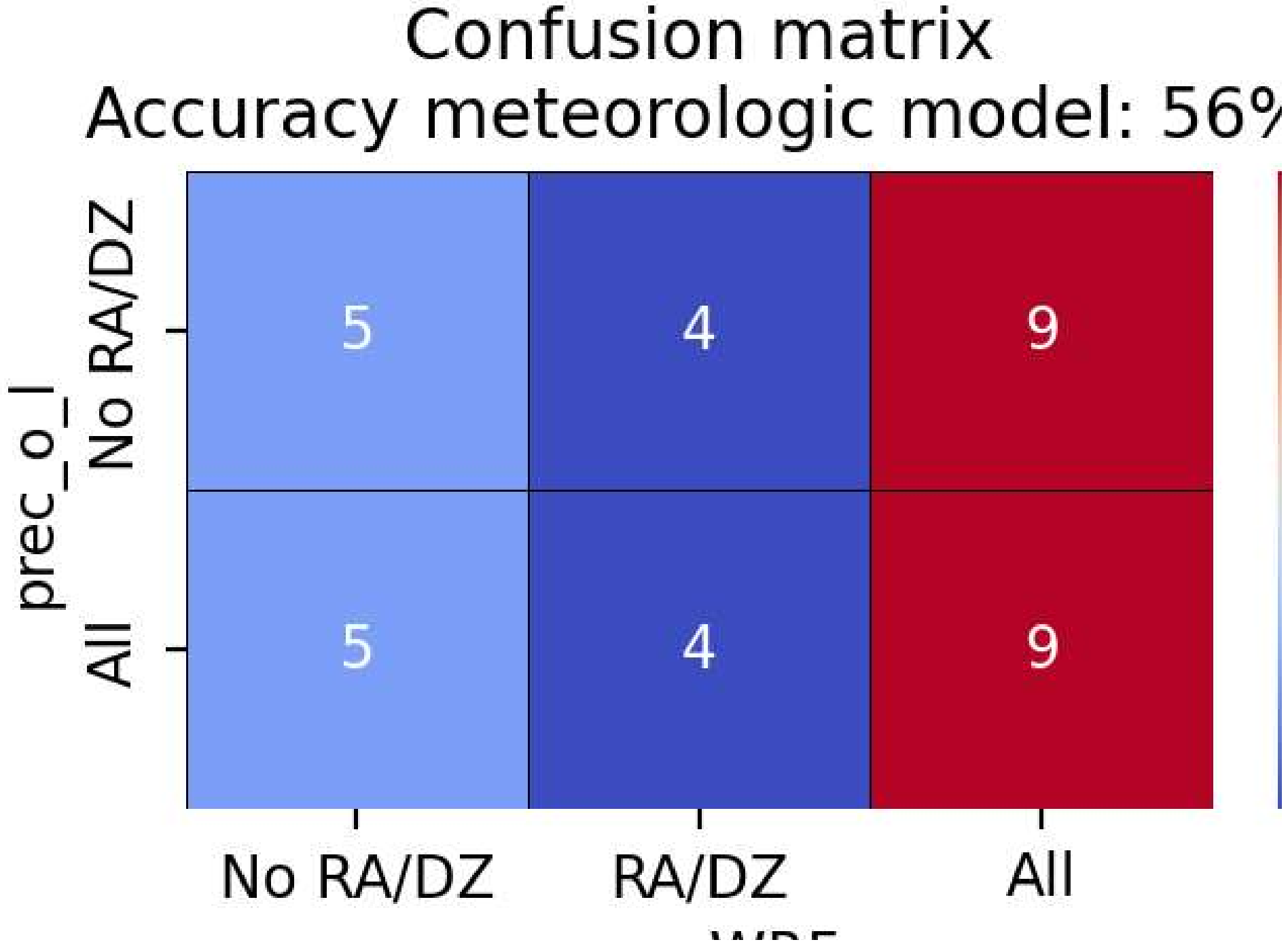

Actual Heidke skill score machine learning: 0. Reference: 0.64
brfg
brfg
No BR/FG
05-15 01
05-15 02
05-15 03
05-15 04
05-15 05
05-15 06
05-15 07
05-15 08

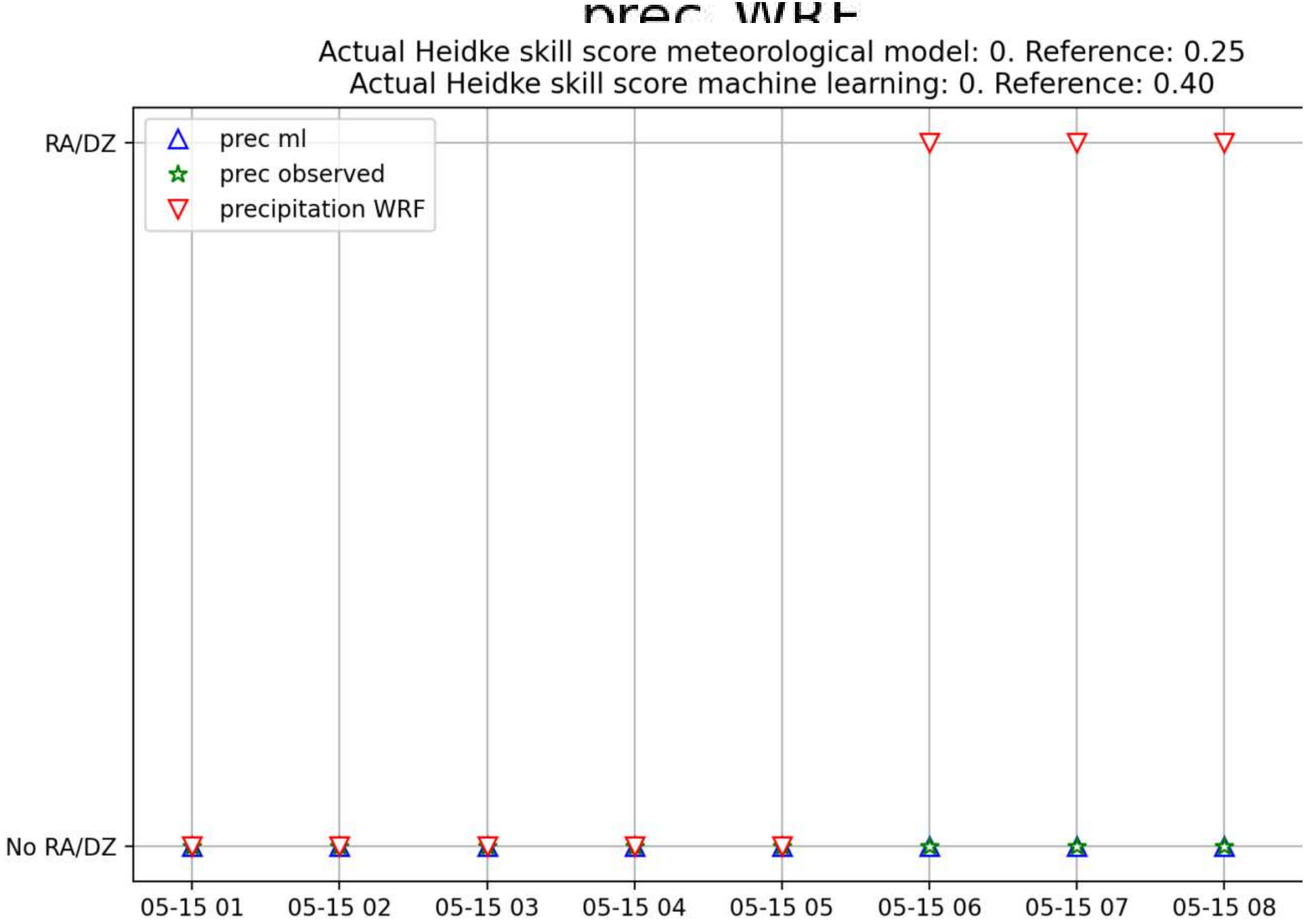

Forecast machine learning
No BR/FG
05-15 00
05-15 06
05-15 12
05-15 18
05-16 00
05-16 06
05-16 12
05-16 18

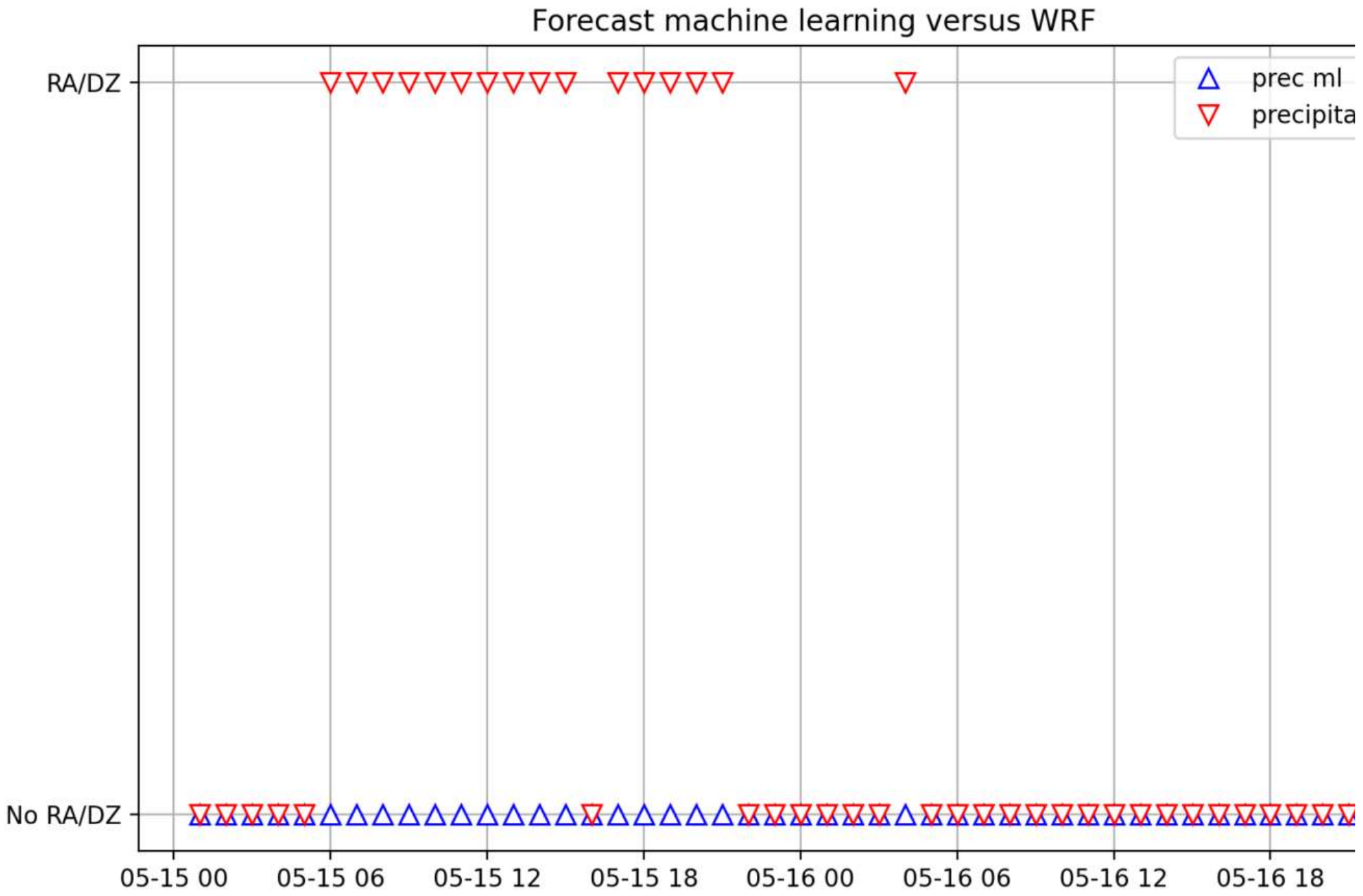

BR or FG probability
1.0
0.8
0.6
0.4
0.2

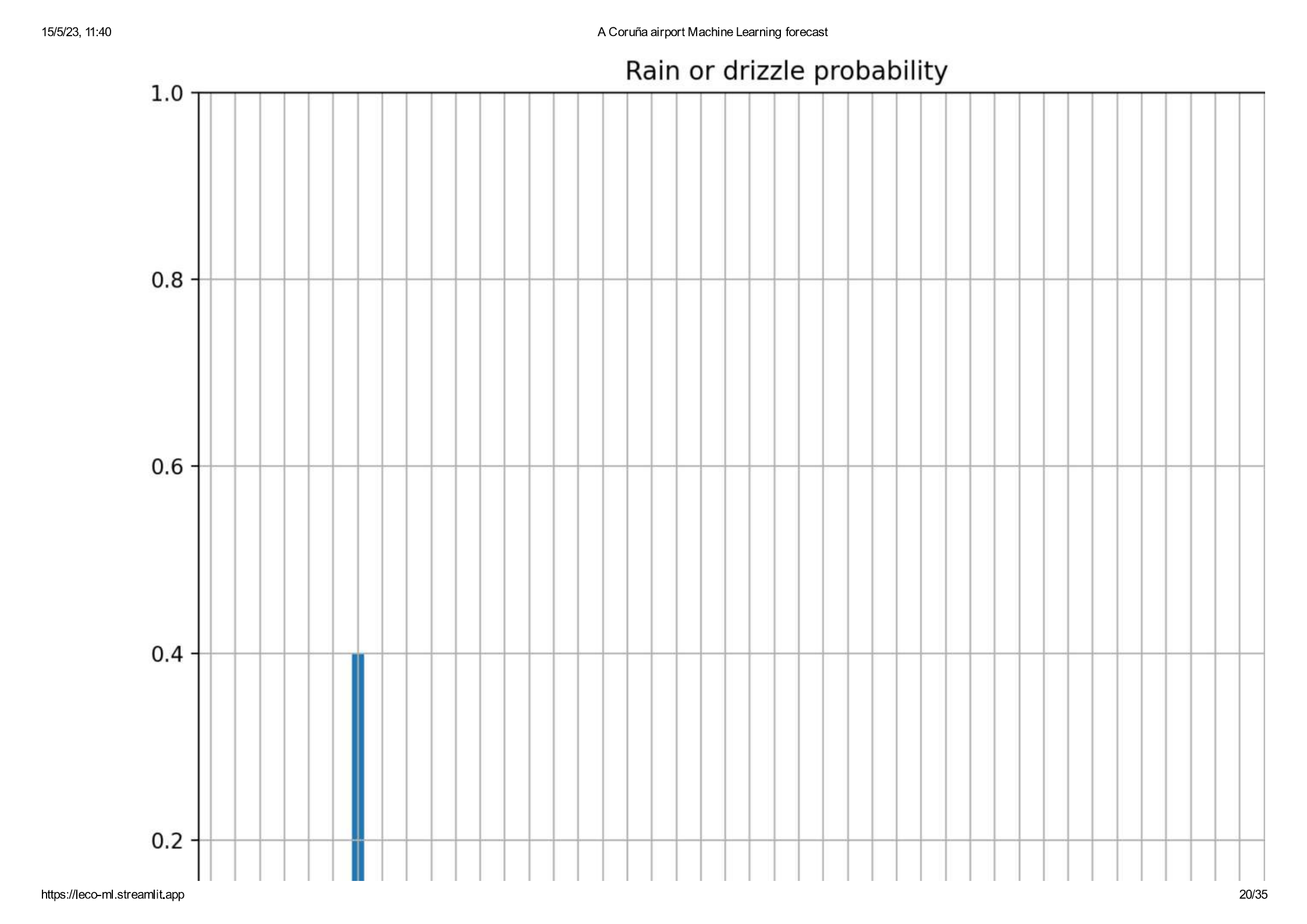

Precipitation
0.0
15-05 01
15-05 02
15-05 03
15-05 04
15-05 05
15-05 06
15-05 07
15-05 08
15-05 09
15-05 10
15-05 11
15-05 12
15-05 13
15-05 14
15-05 15
15-05 16
15-05 17
15-05 18
15-05 19
15-05 20
15-05 21
15-05 22
15-05 23
16-05 00
16-05 01
16-05 02
16-05 03
16-05 04
16-05 05
16-05 06
16-05 07
16-05 08
16-05 09
16-05 10
16-05 11
16-05 12
16-05 13
16-05 14
16-05 15
16-05 16
16-05 17
16-05 18
16-05 19

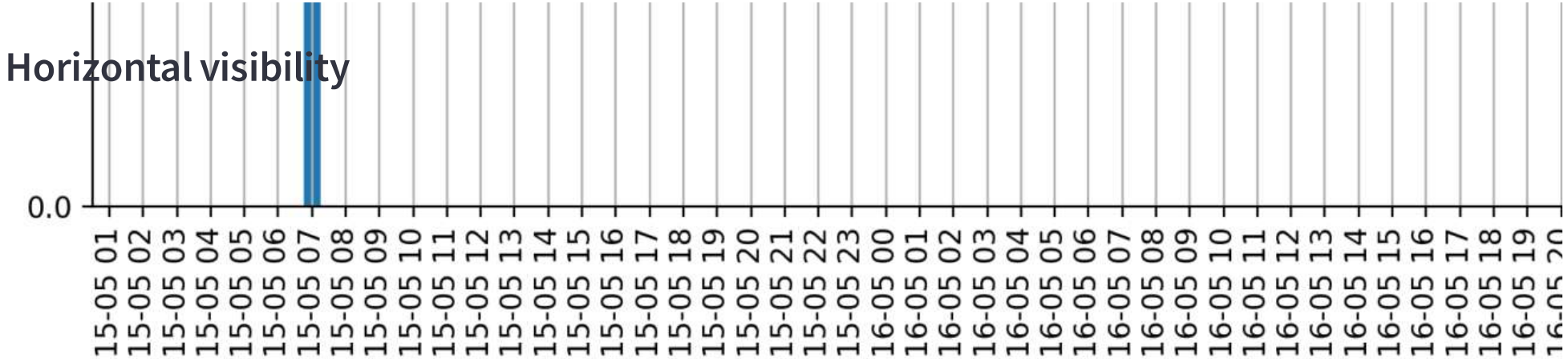

Confusion matrix
Accuracy machine learning: 100%
prec_o_l
No RA/DZ
All
9
9
9
9
No RA/DZ
All
prec_ml

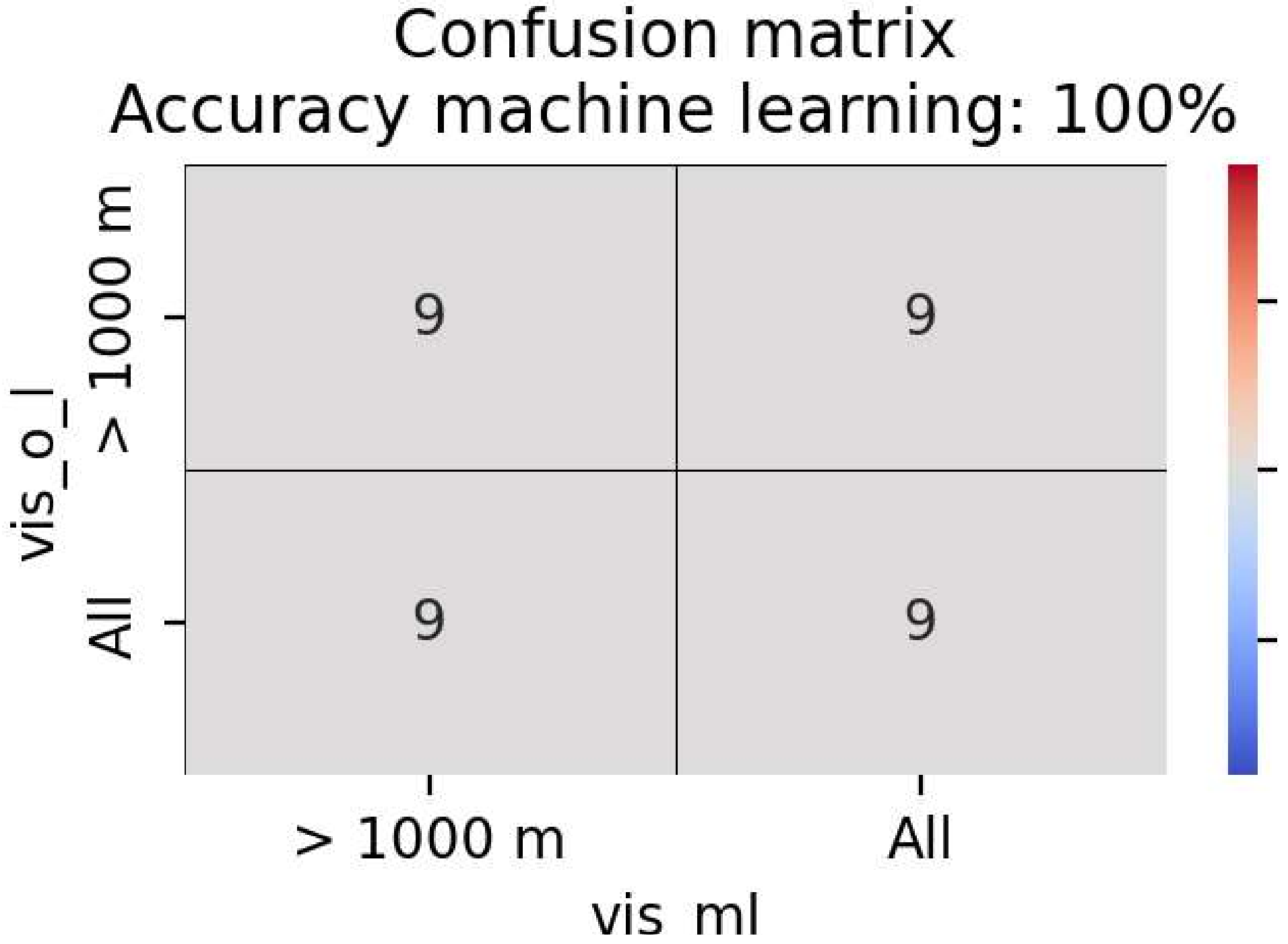

Confusion matrix
Accuracy meteorologic model: 56%
prec_o_l
No RA/DZ
All
5
4
9
5
4
9
No RA/DZ
RA/DZ
All

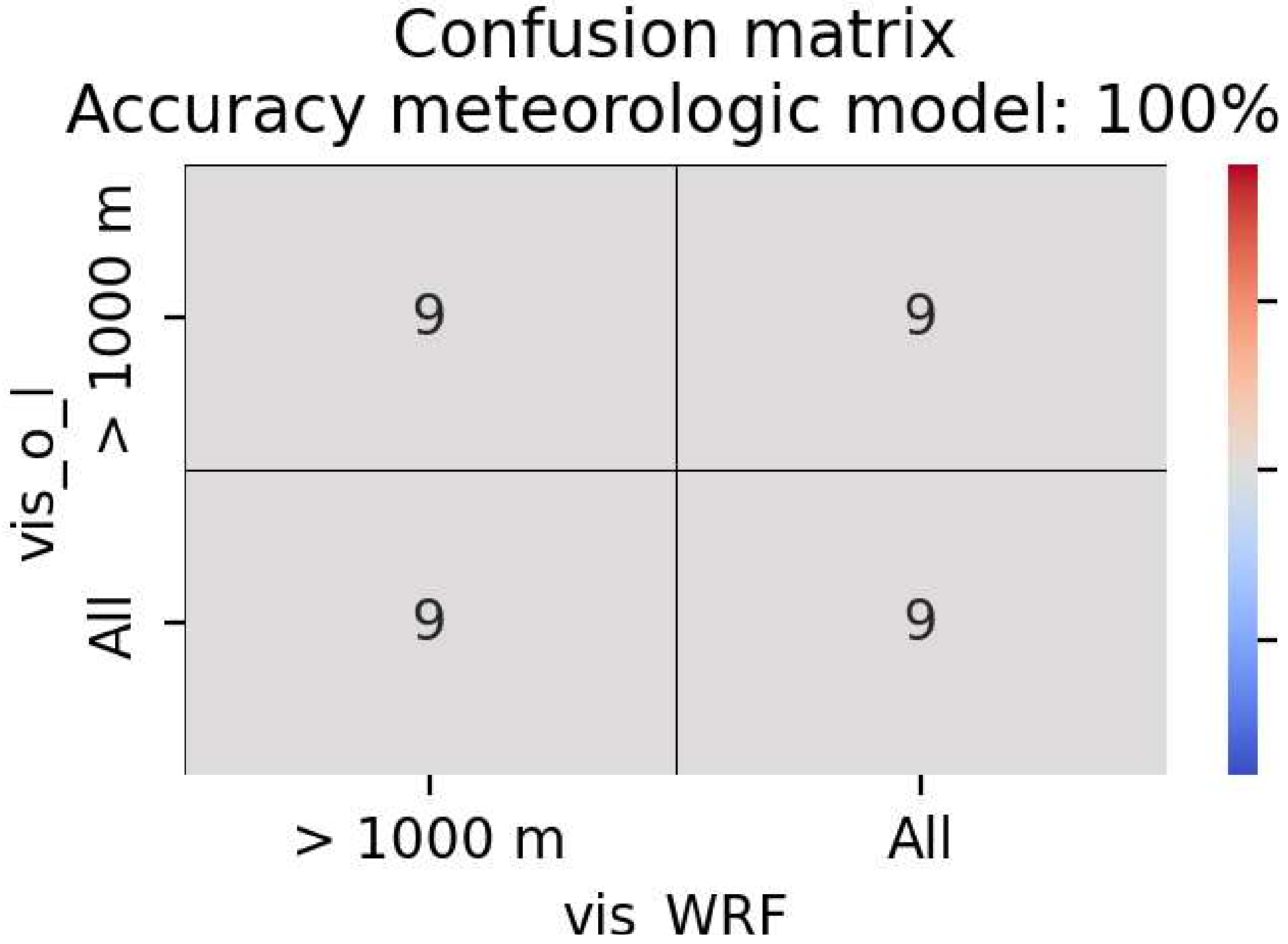

prec WRF
Actual Heidke skill score meteorological model: 0. Reference: 0.25
Actual Heidke skill score machine learning: 0. Reference: 0.40
prec ml
prec observed
precipitation WRF
RA/DZ
No RA/DZ
05-15 01
05-15 02
05-15 03
05-15 04
05-15 05
05-15 06
05-15 07
05-15 08

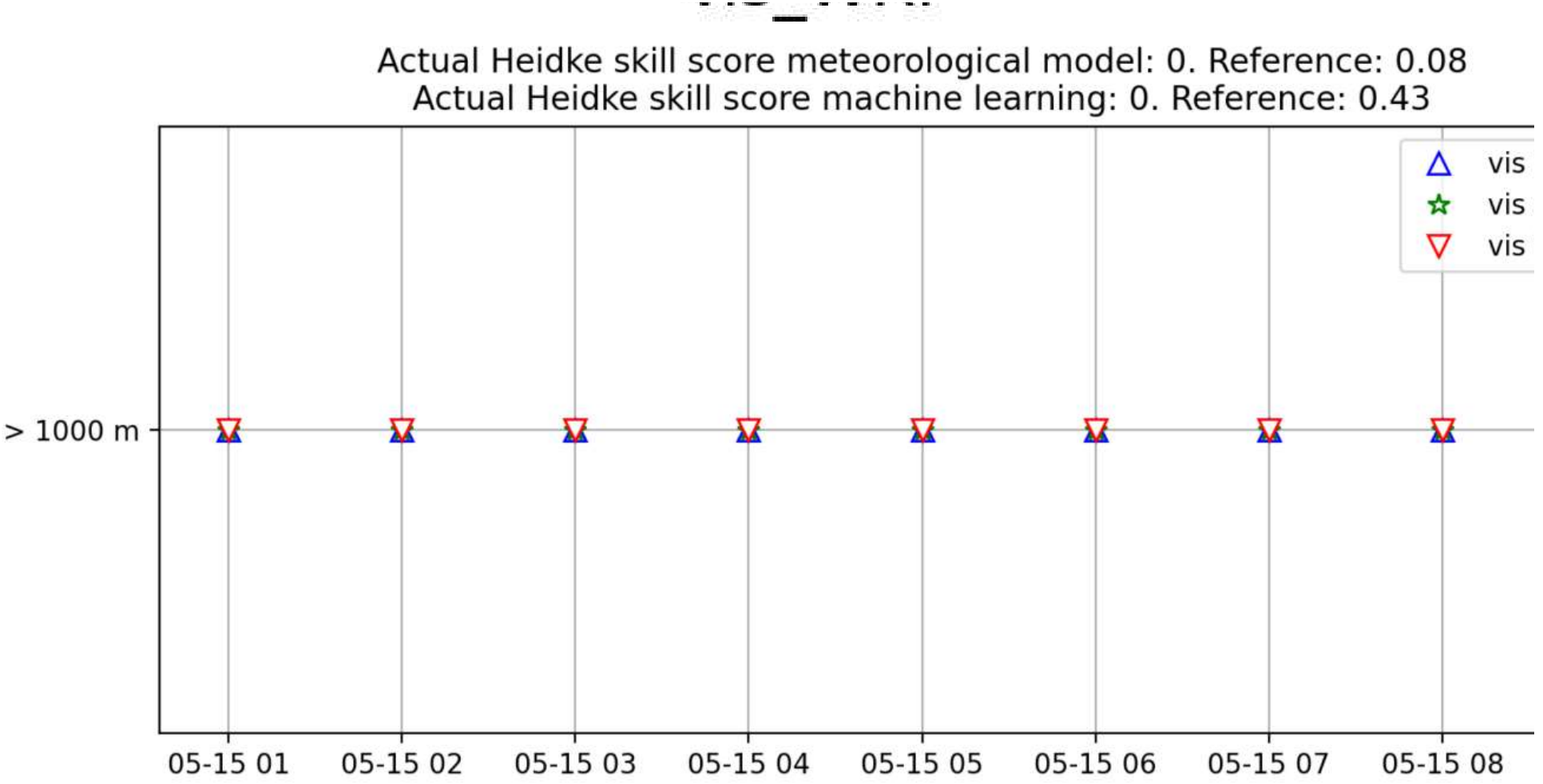

Forecast machine learning versus WRF
RA/DZ
No RA/DZ
prec ml
precipita
05-15 00
05-15 06
05-15 12
05-15 18
05-16 00
05-16 06
05-16 12
05-16 18

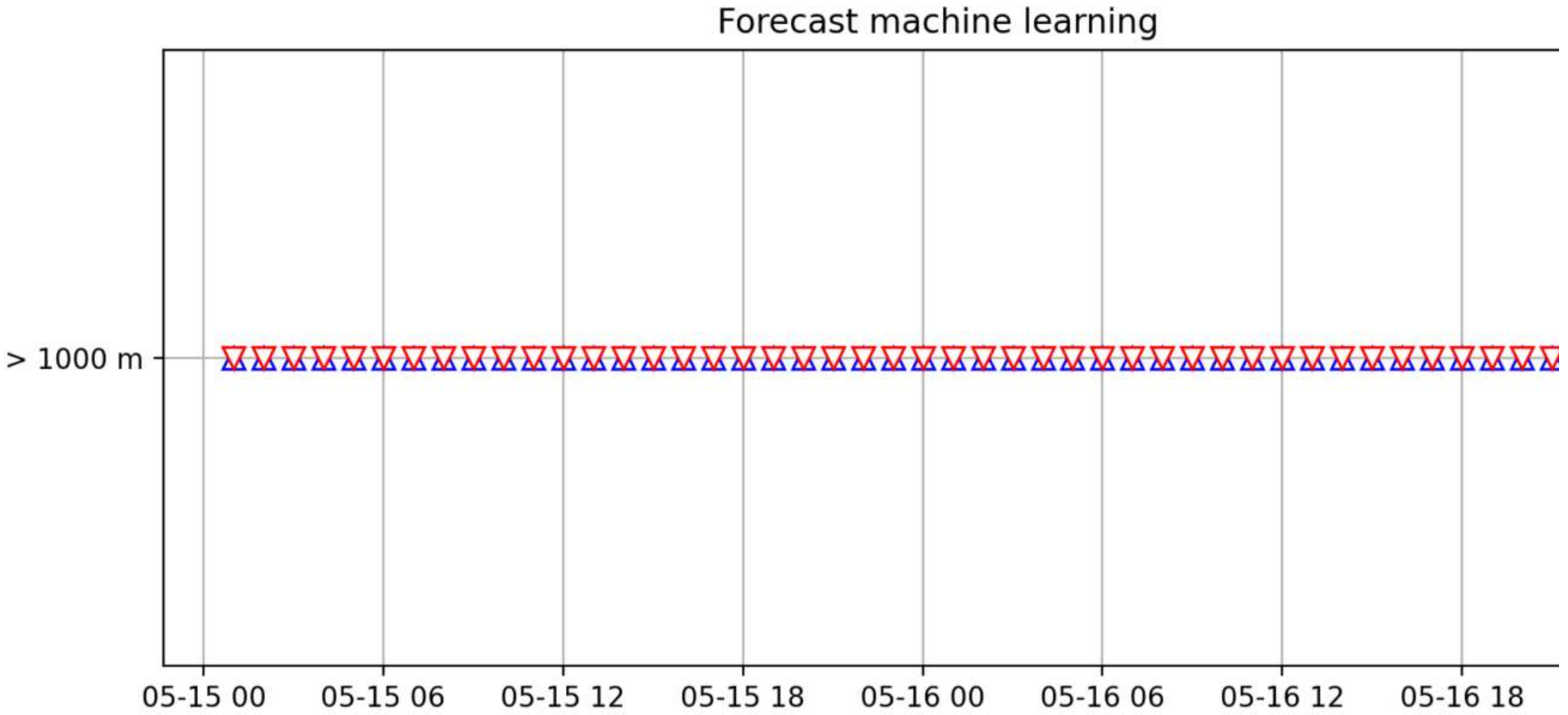

Rain or drizzle probability
1.0
0.8
0.6
0.4
0.2

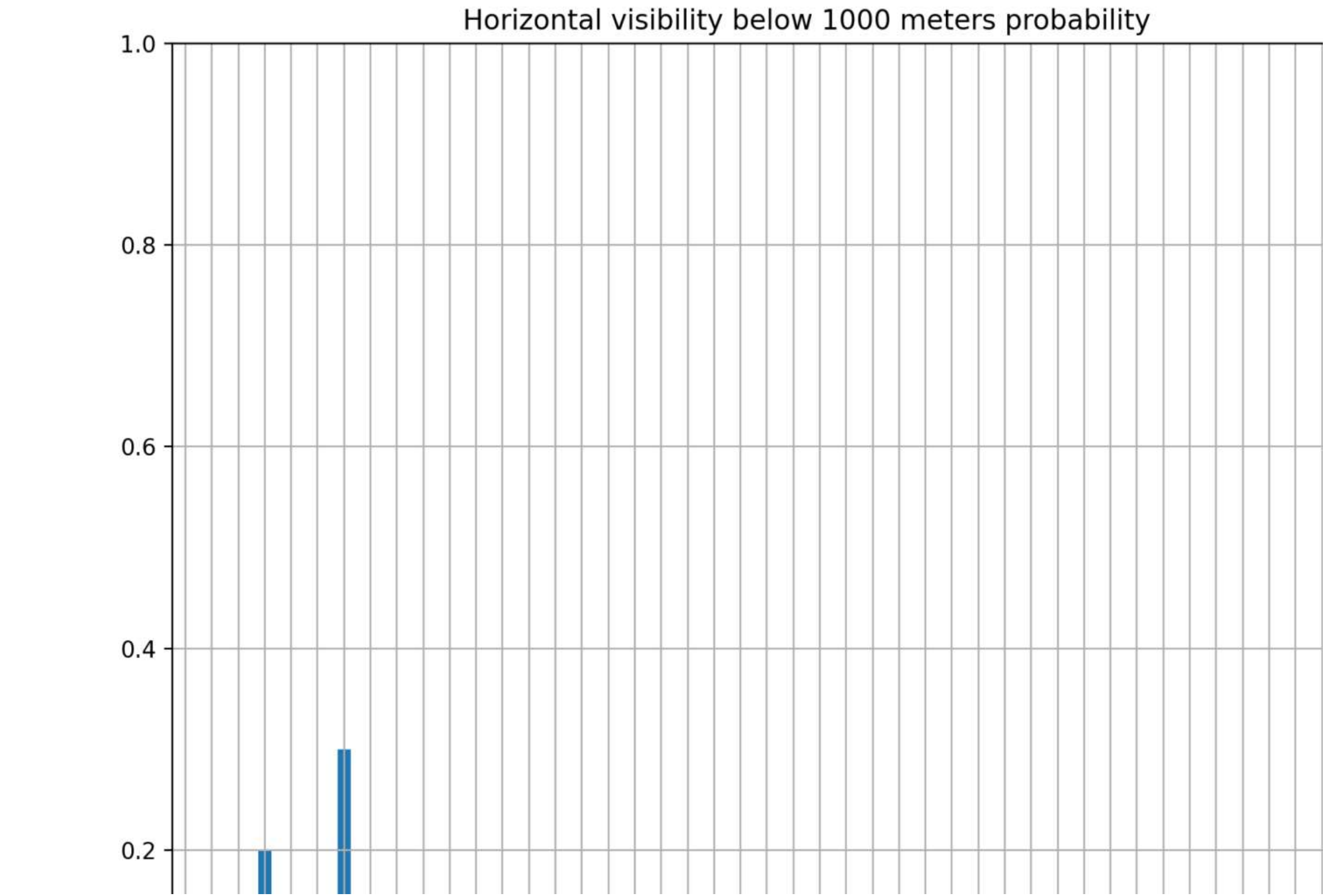

Horizontal visibility
0.0
15-05 01
15-05 02
15-05 03
15-05 04
15-05 05
15-05 06
15-05 07
15-05 08
15-05 09
15-05 10
15-05 11
15-05 12
15-05 13
15-05 14
15-05 15
15-05 16
15-05 17
15-05 18
15-05 19
15-05 20
15-05 21
15-05 22
15-05 23
16-05 00
16-05 01
16-05 02
16-05 03
16-05 04
16-05 05
16-05 06
16-05 07
16-05 08
16-05 09
16-05 10
16-05 11
16-05 12
16-05 13
16-05 14
16-05 15
16-05 16
16-05 17
16-05 18
16-05 19

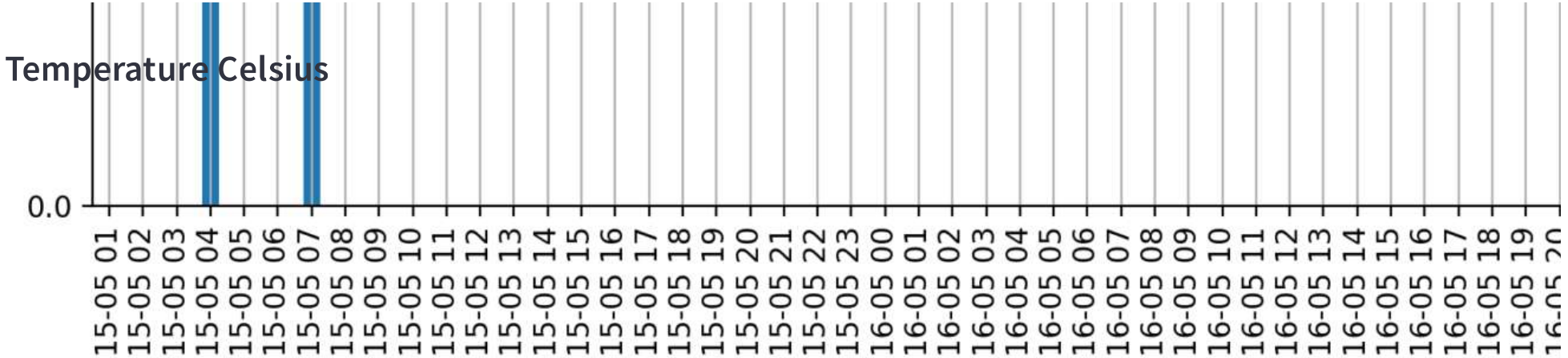

Confusion matrix
Accuracy machine learning: 100%
vis_o_l
> 1000 m
All
9
9
9
9
> 1000 m
All
vis_ml

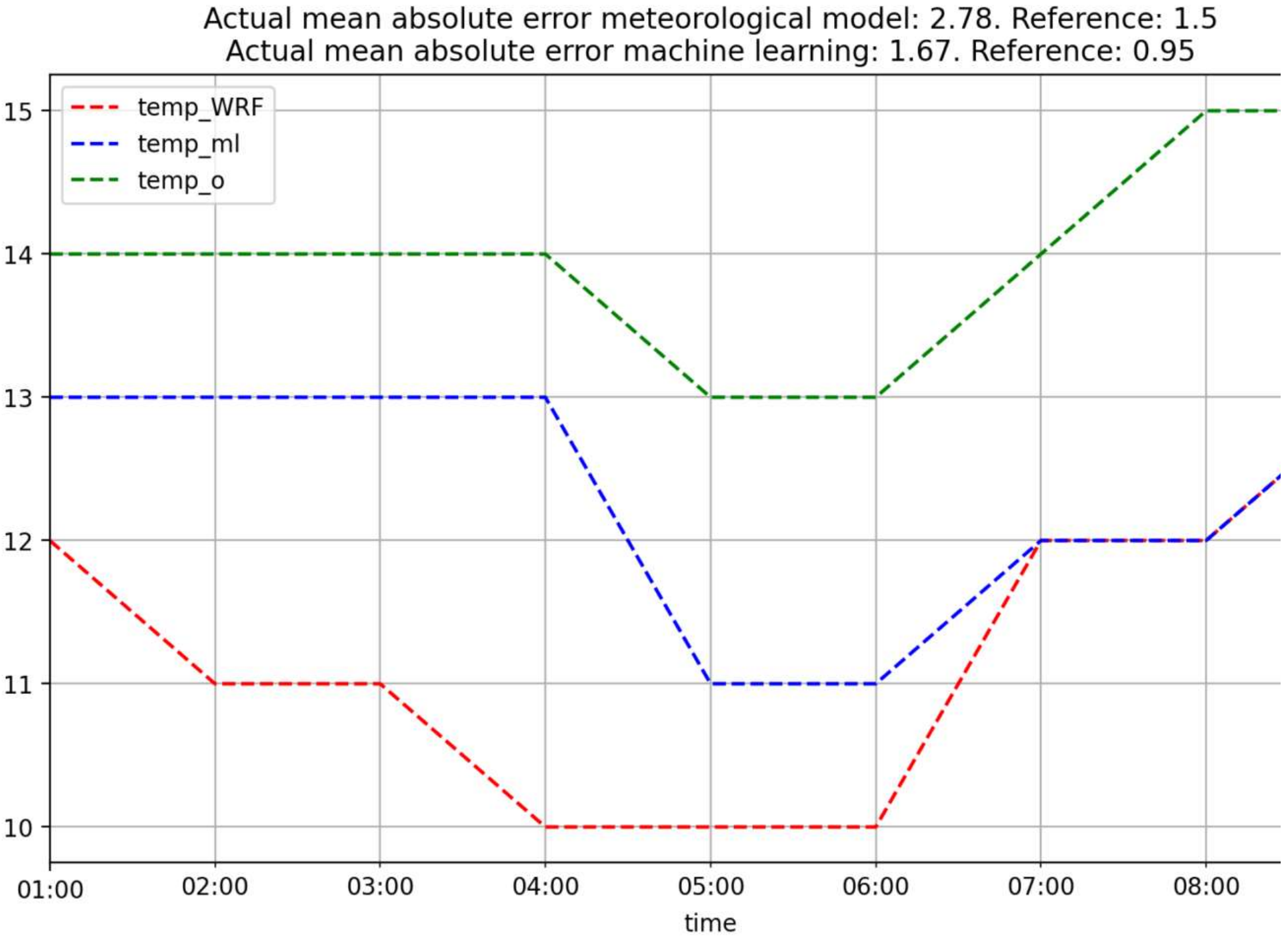

Confusion matrix
Accuracy meteorologic model: 100%
vis_o_l
> 1000 m
All
9
9
9
9
> 1000 m
All
vis WRF

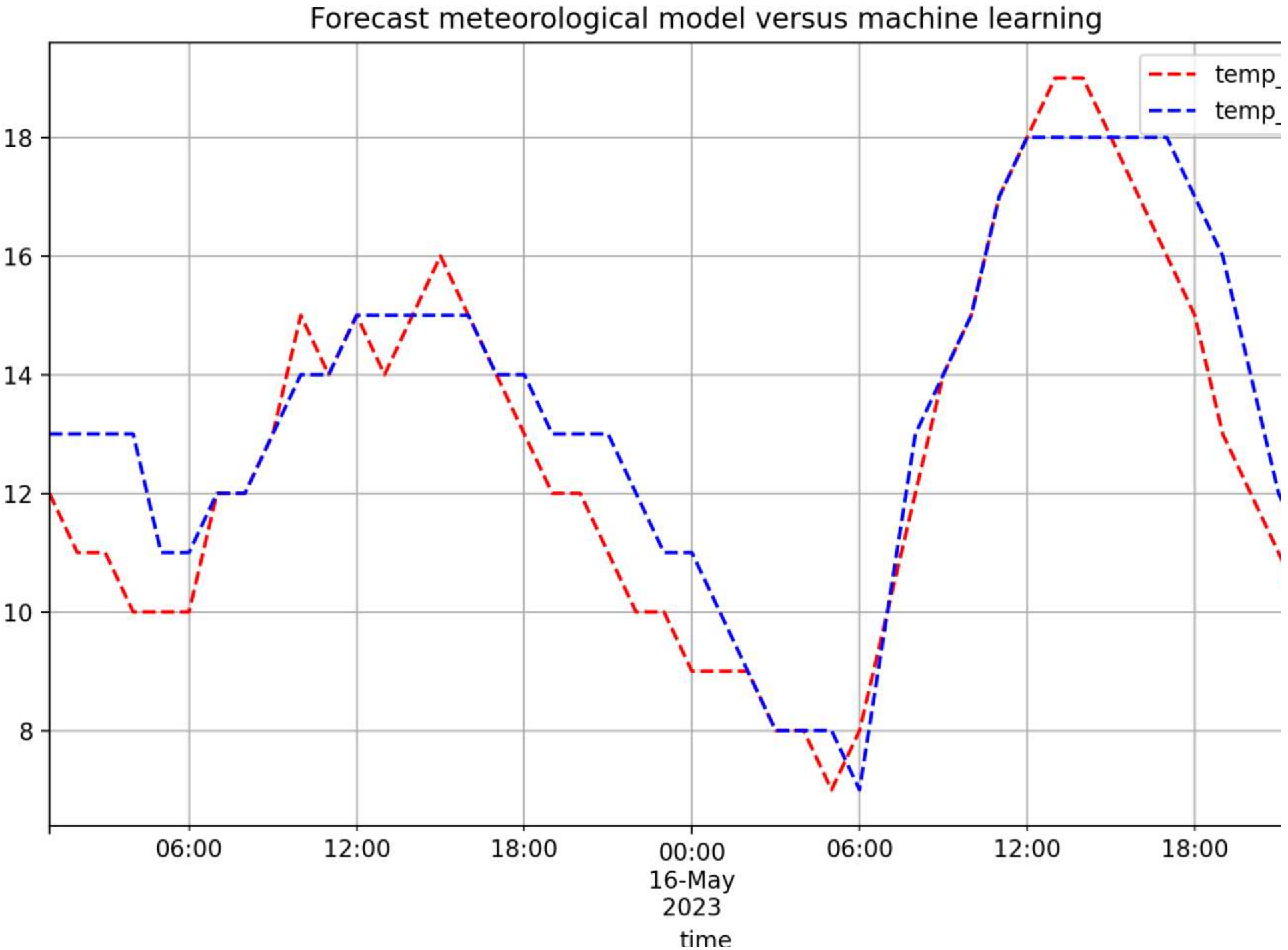

Actual Heidke skill score meteorological model: 0. Reference: 0.08
Actual Heidke skill score machine learning: 0. Reference: 0.43
vis
vis
vis
> 1000 m
05-15 01
05-15 02
05-15 03
05-15 04
05-15 05
05-15 06
05-15 07
05-15 08


Forecast machine learning
> 1000 m
05-15 00
05-15 06
05-15 12
05-15 18
05-16 00
05-16 06
05-16 12
05-16 18

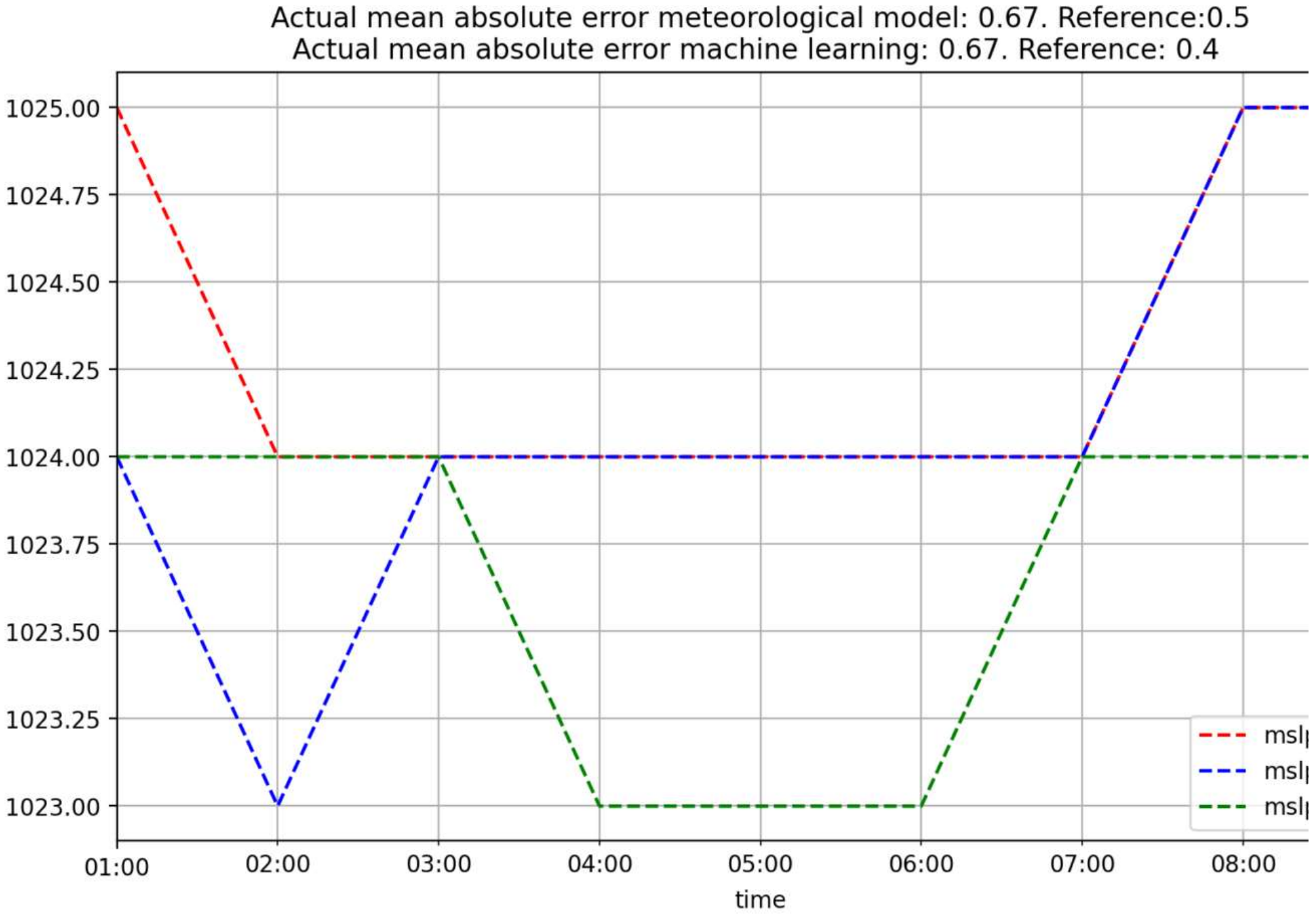

Horizontal visibility below 1000 meters probability
1.0
0.8
0.6
0.4
0.2

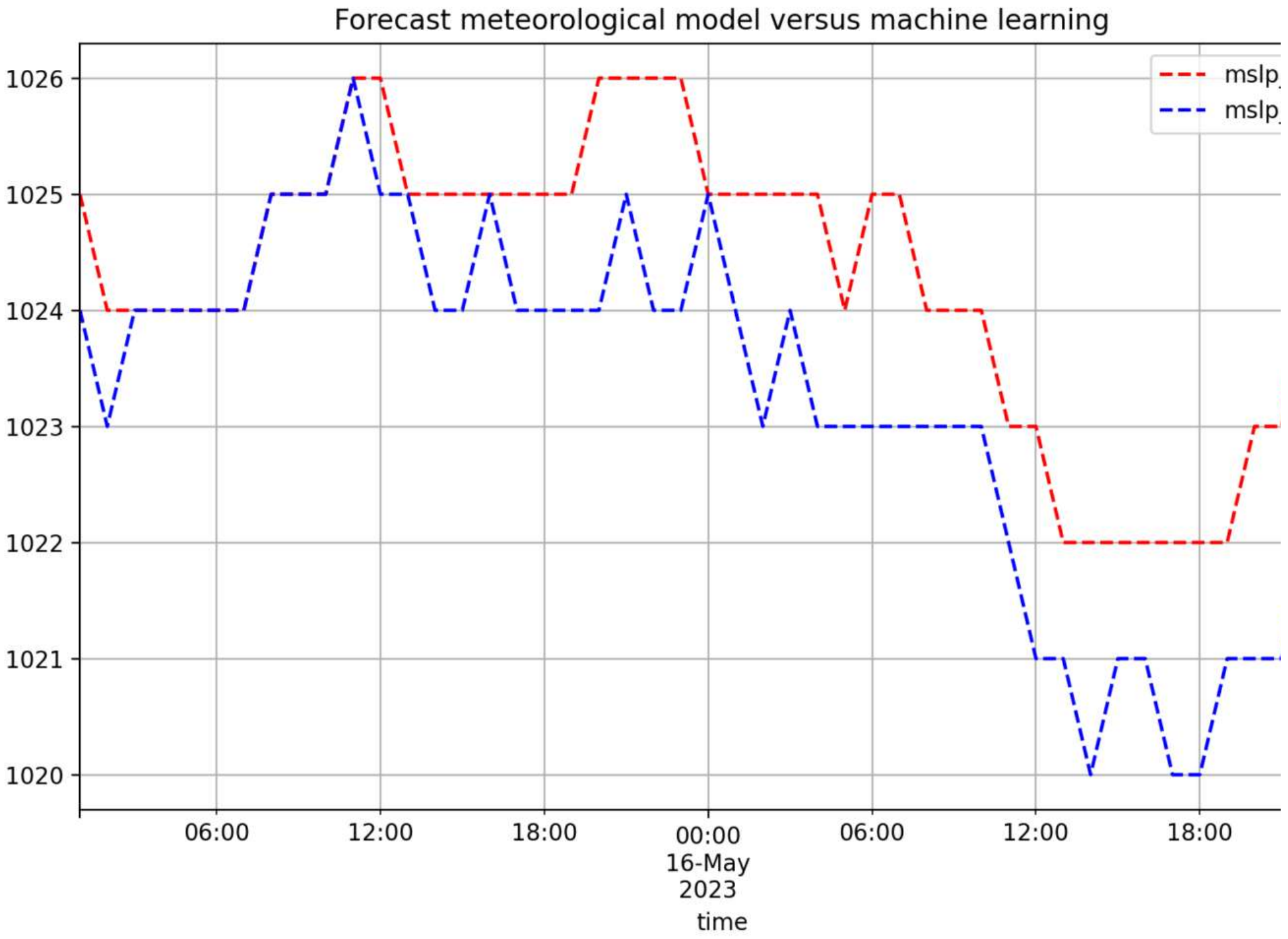

Temperature Celsius
0.0
15-05 01
15-05 02
15-05 03
15-05 04
15-05 05
15-05 06
15-05 07
15-05 08
15-05 09
15-05 10
15-05 11
15-05 12
15-05 13
15-05 14
15-05 15
15-05 16
15-05 17
15-05 18
15-05 19
15-05 20
15-05 21
15-05 22
15-05 23
16-05 00
16-05 01
16-05 02
16-05 03
16-05 04
16-05 05
16-05 06
16-05 07
16-05 08
16-05 09
16-05 10
16-05 11
16-05 12
16-05 13
16-05 14
16-05 15
16-05 16
16-05 17
16-05 18
16-05 19


Actual mean absolute error meteorological model: 2.78. Reference: 1.5
Actual mean absolute error machine learning: 1.67. Reference: 0.95
temp_WRF
temp_ml
temp_o
15
14
13
12
11
10
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
time


Forecast meteorological model versus machine learning
temp_
temp_
18
16
14
12
10
8
06:00
12:00
18:00
00:00
16-May
2023
06:00
12:00
18:00
time

Pressure hectopascals


Actual mean absolute error meteorological model: 0.67. Reference:0.5
Actual mean absolute error machine learning: 0.67. Reference: 0.4
1025.00
1024.75
1024.50
1024.25
1024.00
1023.75
1023.50
1023.25
1023.00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
time
msl
msl
msl


Forecast meteorological model versus machine learning
mslp
mslp
1026
1025
1024
1023
1022
1021
1020
06:00
12:00
18:00
00:00
16-May
2023
06:00
12:00
18:00
time

Global results

Better meteorological model outcome: 0

▸ []

Better machine learning outcome: 3

▾ [
  0 : "wind speed"
  1 : "precipitation"
  2 : "temperature"
]

Project link