Portuguese air quality forecast evaluation with Delta Tool (2021 year)

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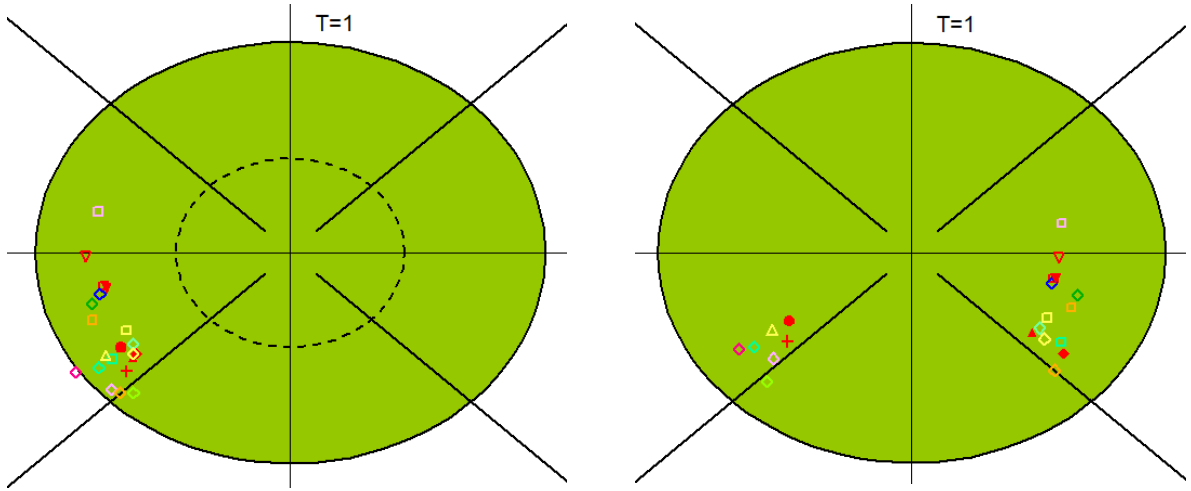
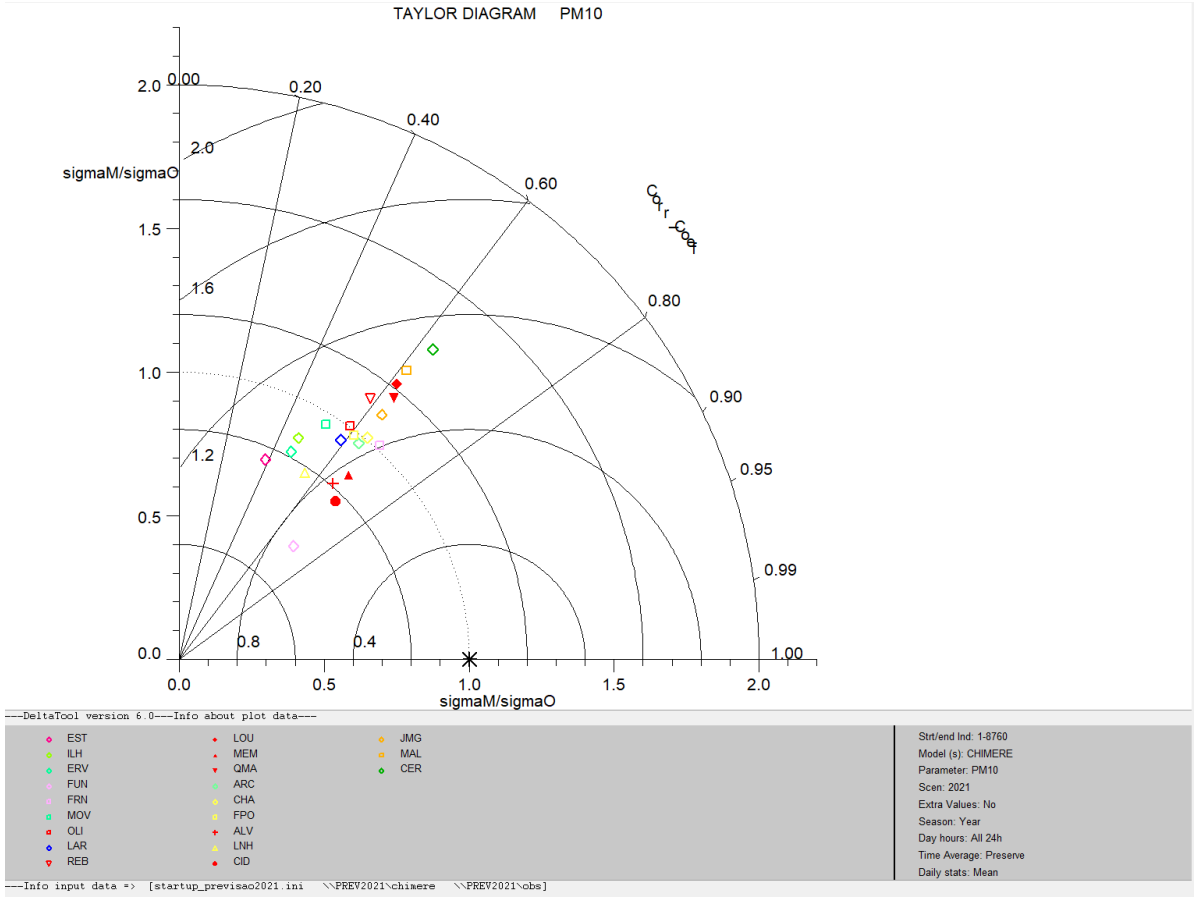
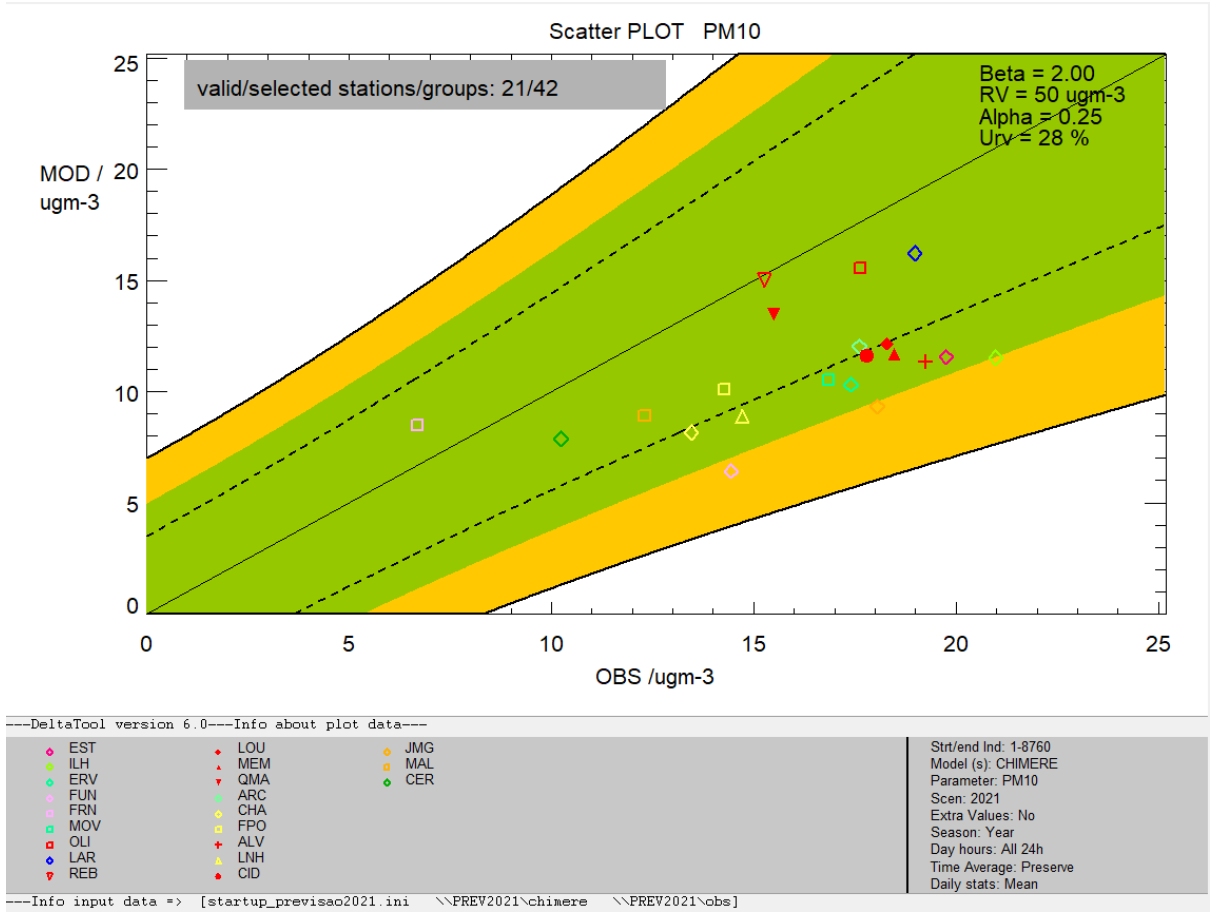


Forecast (CT3)

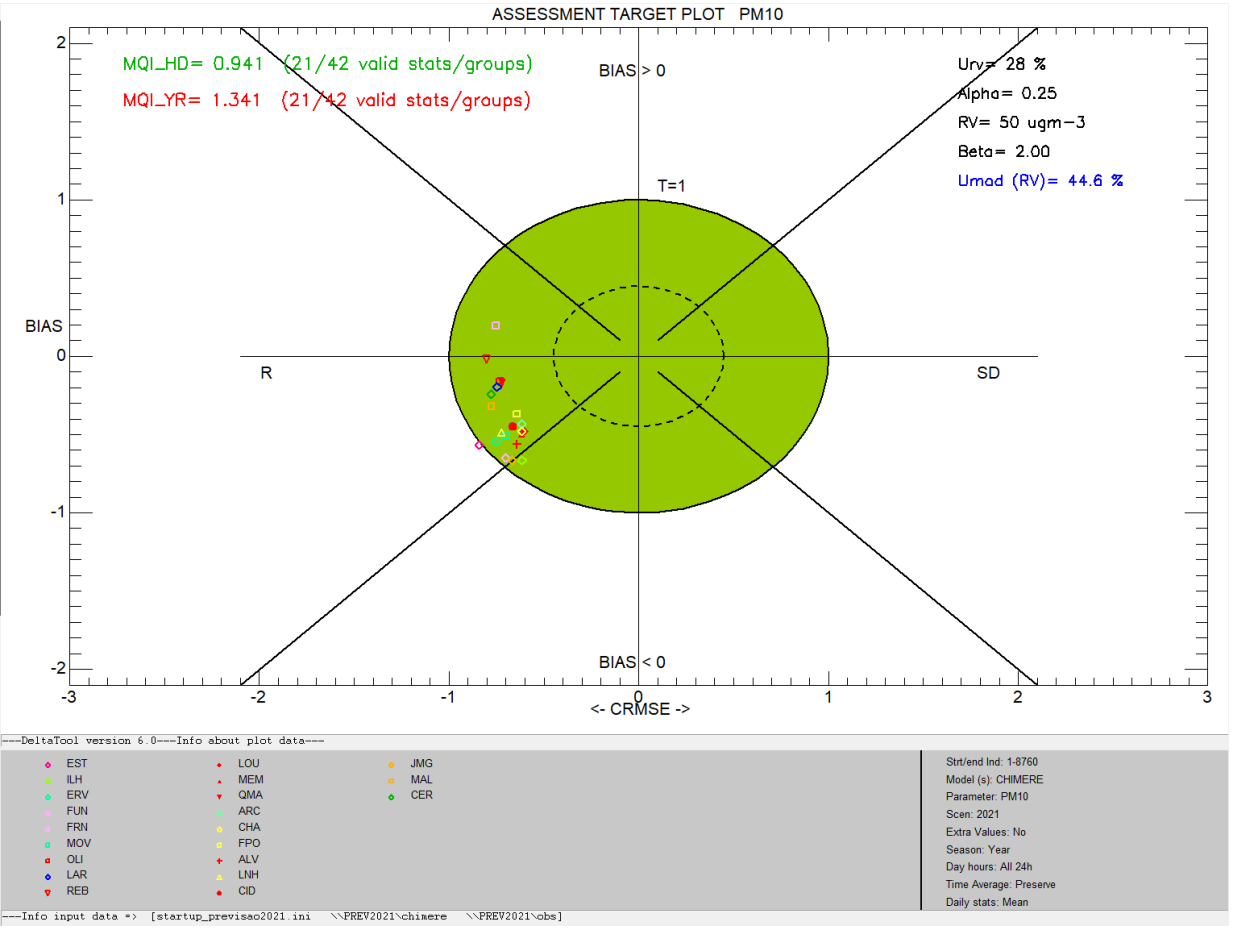
FAIRMODE technical meeting, Oslo NO, 18-20 October 2022

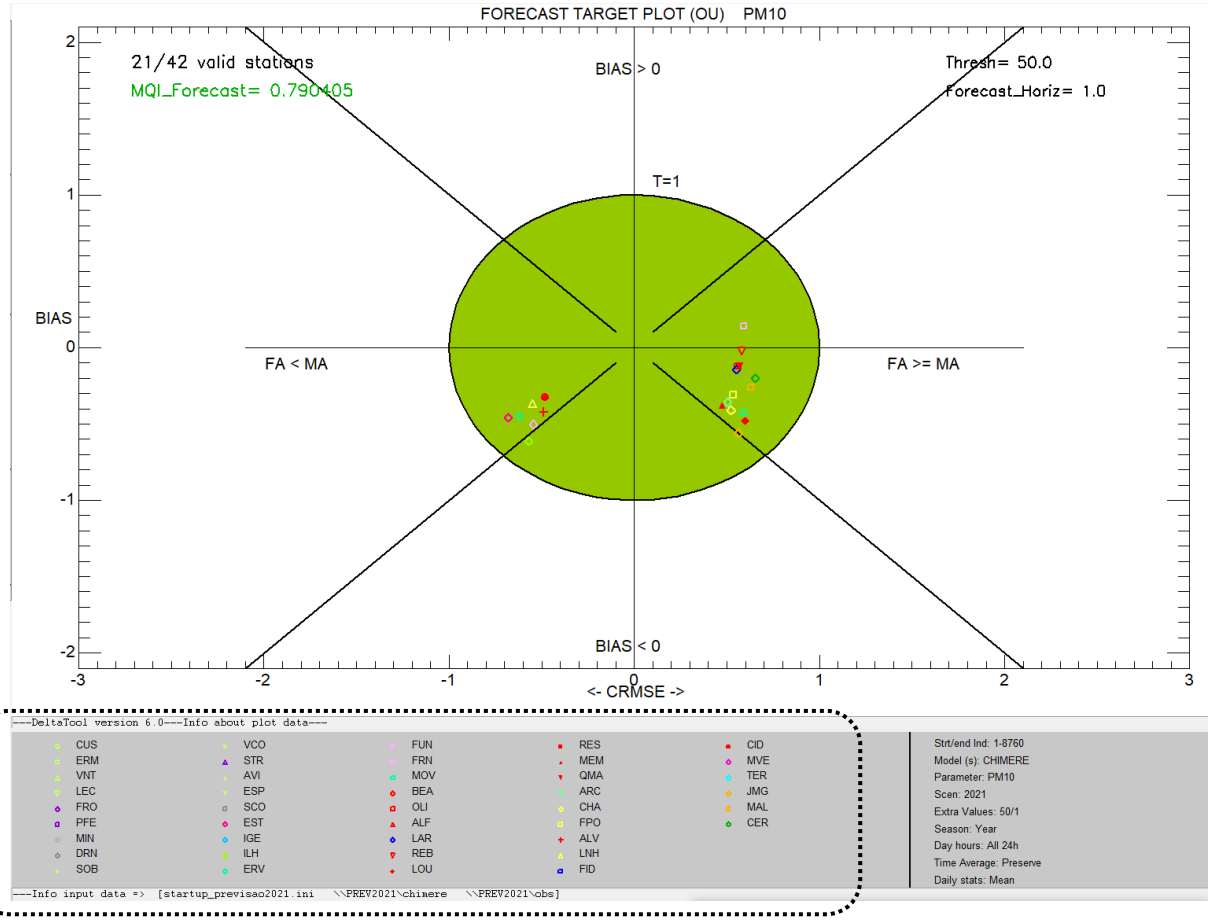
PM10


TAYLOR DIAGRAM PM10
sigmaM/sigmaO
Corr Coef
0.00
0.20
0.40
0.60
0.80
0.90
0.95
0.99
1.00
2.0
1.5
1.6
1.0
1.2
0.5
0.8
0.4
0.0
0.5
1.0
1.5
2.0
---DeltaTool version 6.0---Info about plot data---
EST
ILH
ERV
FUN
FRN
MOV
OLI
LAR
REB
LOU
MEM
QMA
ARC
CHA
FPO
ALV
LNH
CID
JMG
MAL
CER
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: PM10
Scen: 2021
Extra Values: No
Season: Year
Day hours: All 24h
Time Average: Preserve
Daily stats: Mean
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]


Scatter PLOT PM10
valid/selected stations/groups: 21/42
Beta = 2.00
RV = 50 ugm-3
Alpha = 0.25
Urv = 28 %
MOD / ugm-3
OBS /ugm-3
0
5
10
15
20
25
---DeltaTool version 6.0---Info about plot data---
EST
ILH
ERV
FUN
FRN
MOV
OLI
LAR
REB
LOU
MEM
QMA
ARC
CHA
FPO
ALV
LNH
CID
JMG
MAL
CER
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: PM10
Scen: 2021
Extra Values: No
Season: Year
Day hours: All 24h
Time Average: Preserve
Daily stats: Mean
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]

PM10

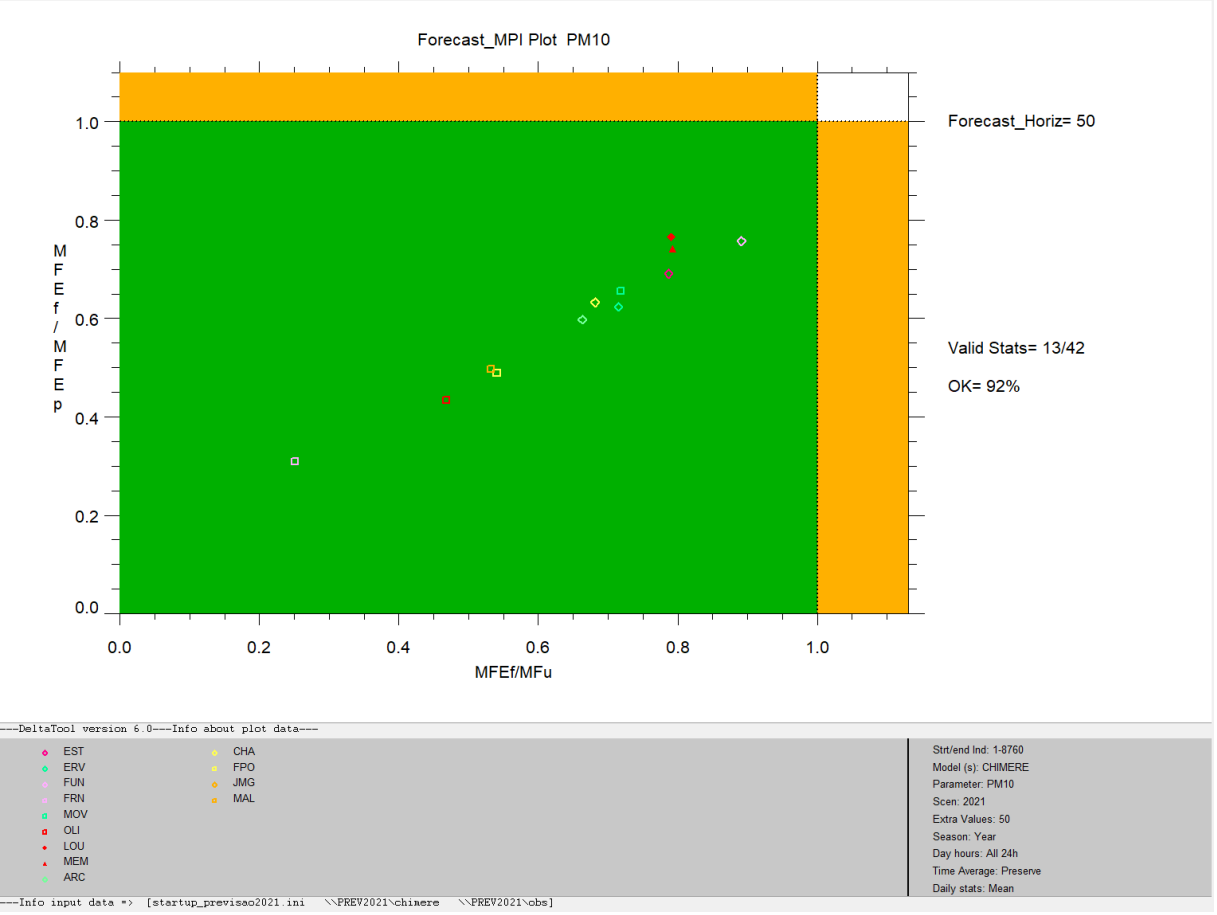


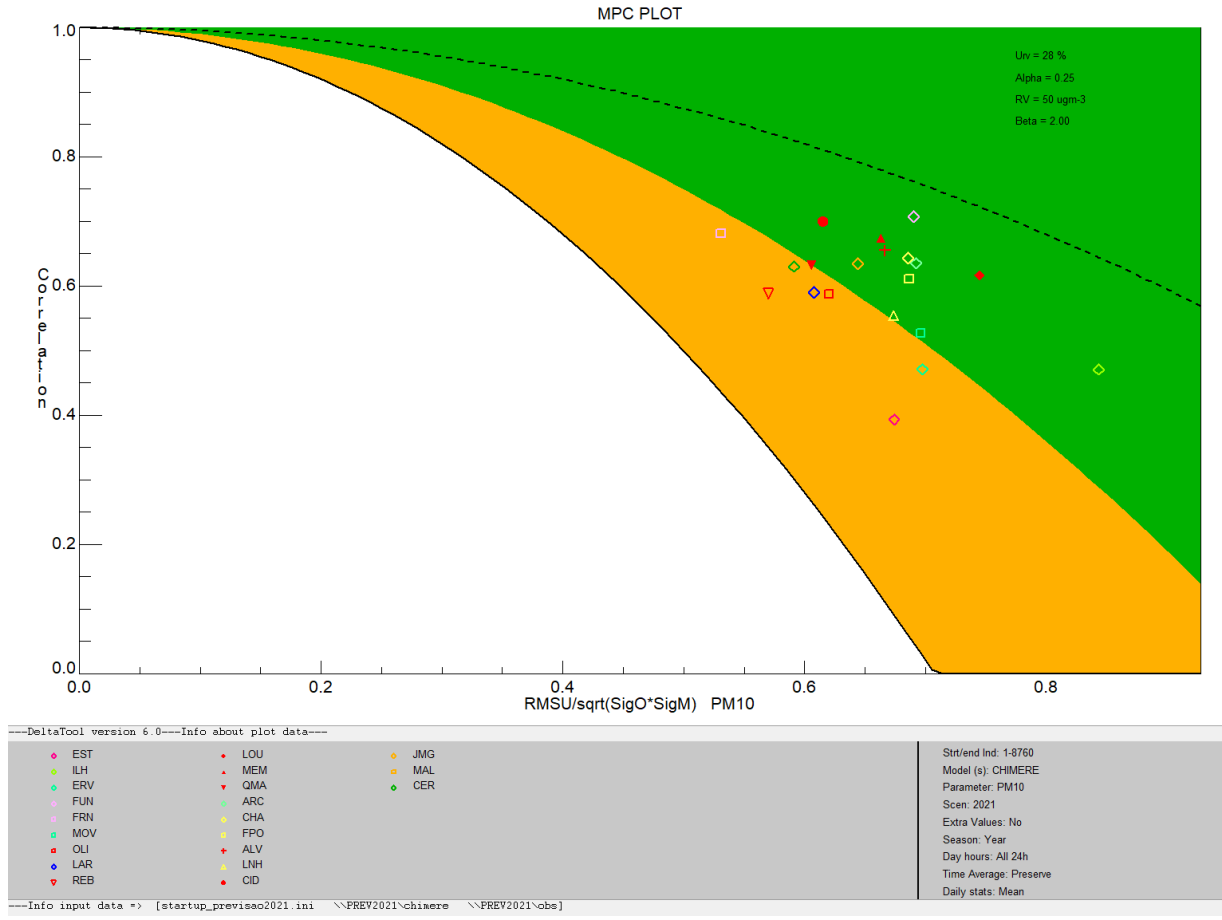


The 42 stations are shown here.

Suggestion: include only valid stations.

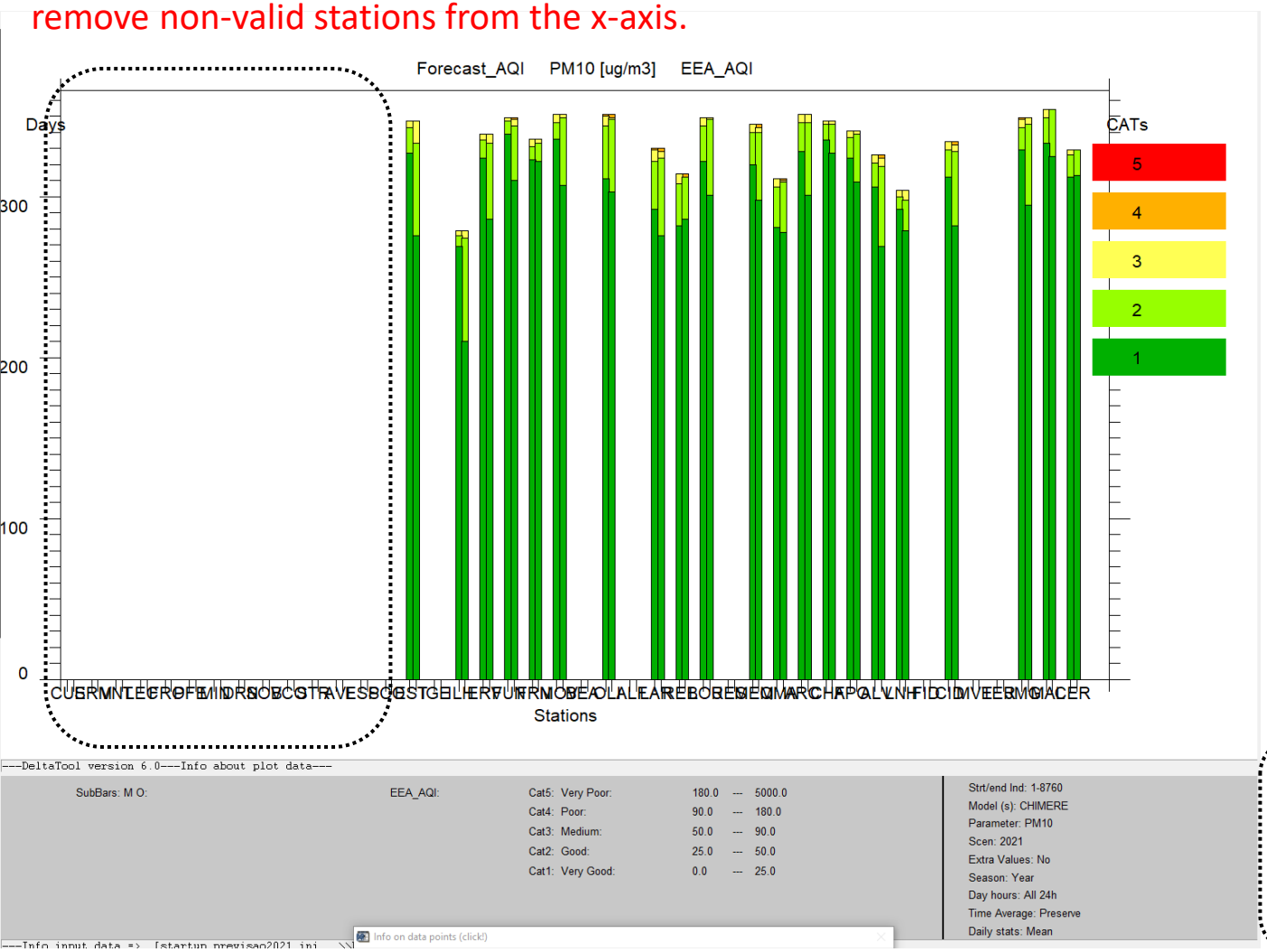
PM10

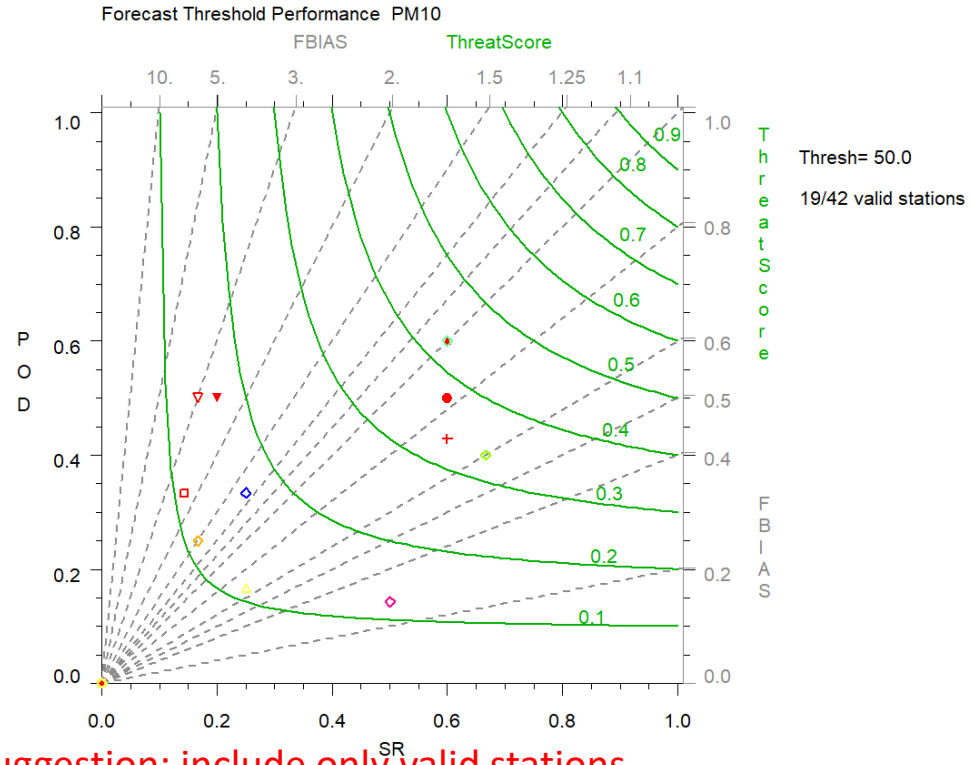

Forecast_MPI Plot PM10
MFEf/MFEp
MFEf/MFu
0.0
0.2
0.4
0.6
0.8
1.0
Forecast_Horiz= 50
Valid Stats= 13/42
OK= 92%
---DeltaTool version 6.0---Info about plot data---
EST
ERV
FUN
FRN
MOV
OLI
LOU
MEM
ARC
CHA
FPO
JMG
MAL
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: PM10
Scen: 2021
Extra Values: 50
Season: Year
Day hours: All 24h
Time Average: Preserve
Daily stats: Mean
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]


MPC PLOT
Correlation
RMSU/sqrt(SigO*SigM) PM10
0.0
0.2
0.4
0.6
0.8
1.0
Urv = 28 %
Alpha = 0.25
RV = 50 ugm-3
Beta = 2.00
---DeltaTool version 6.0---Info about plot data---
EST
ILH
ERV
FUN
FRN
MOV
OLI
LAR
REB
LOU
MEM
QMA
ARC
CHA
FPO
ALV
LNH
CID
JMG
MAL
CER
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: PM10
Scen: 2021
Extra Values: No
Season: Year
Day hours: All 24h
Time Average: Preserve
Daily stats: Mean
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]

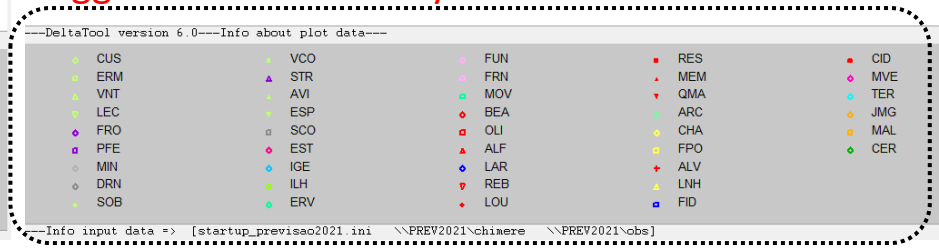
PM10

Suggestion:
remove non-valid stations from the x-axis.

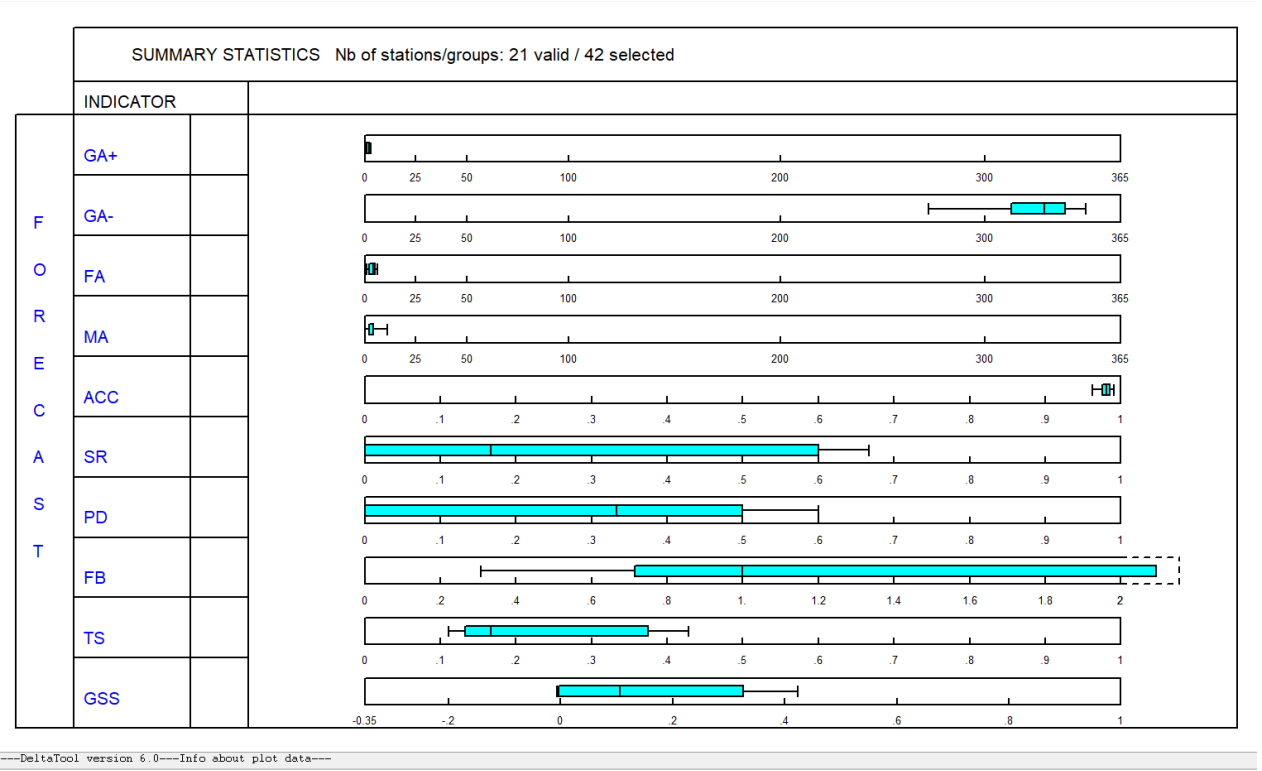


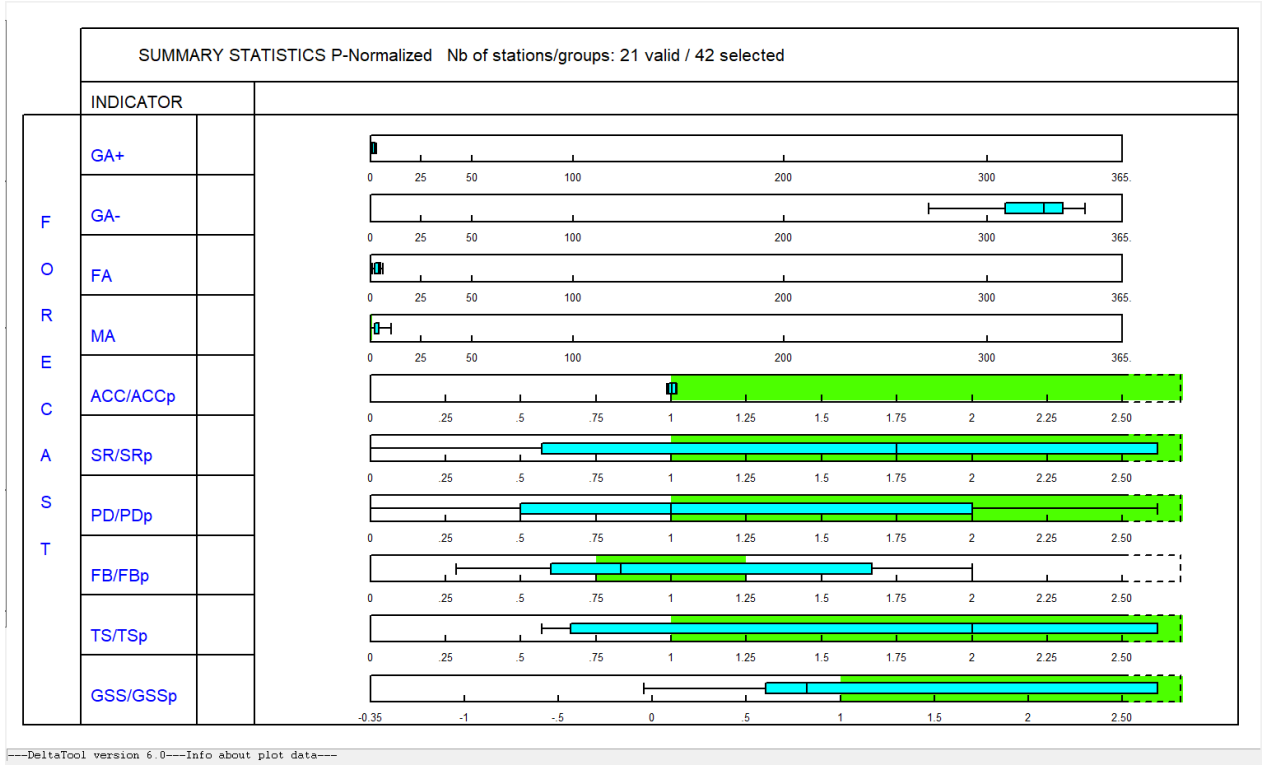


Suggestion: include only valid stations.

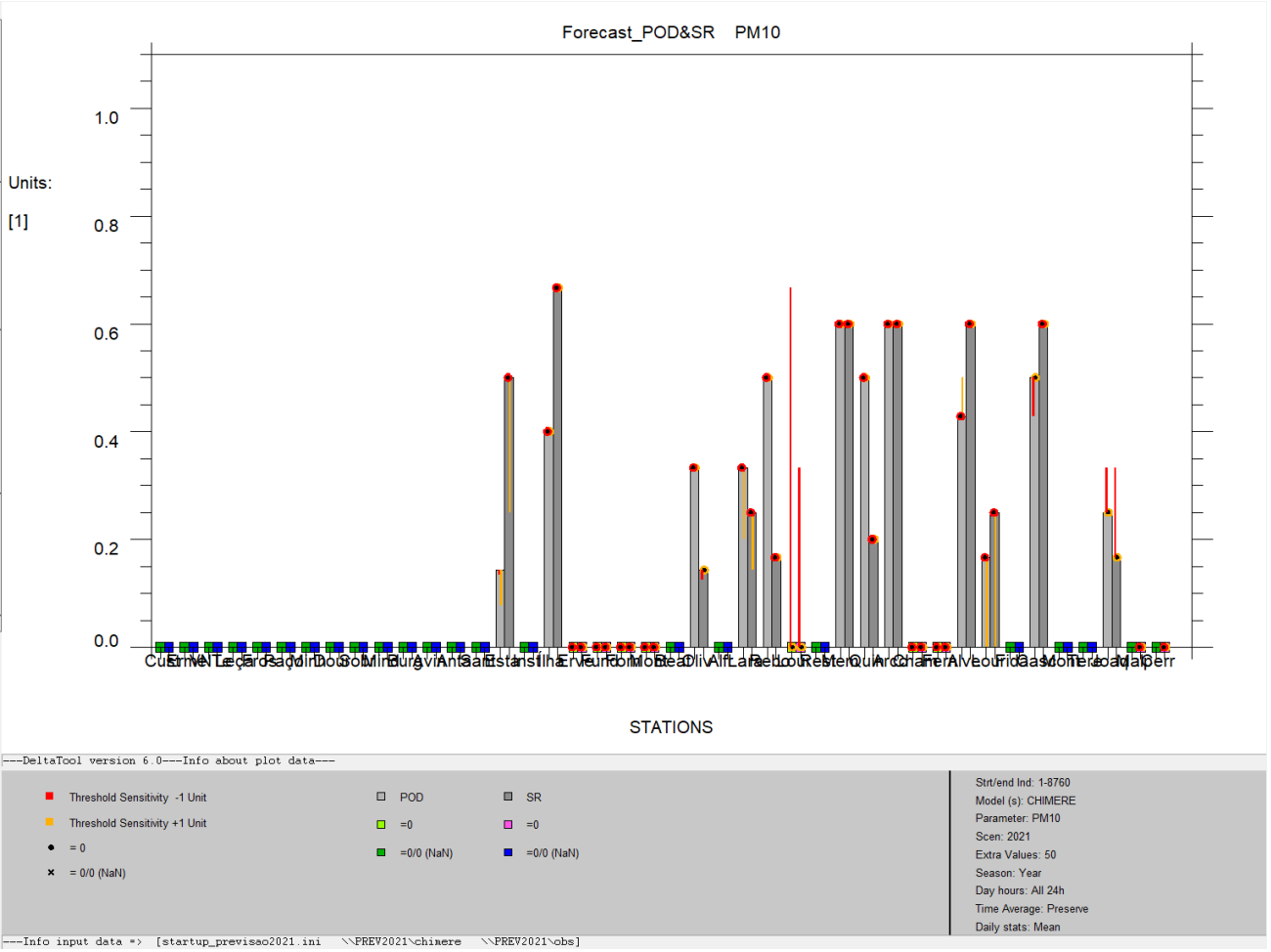


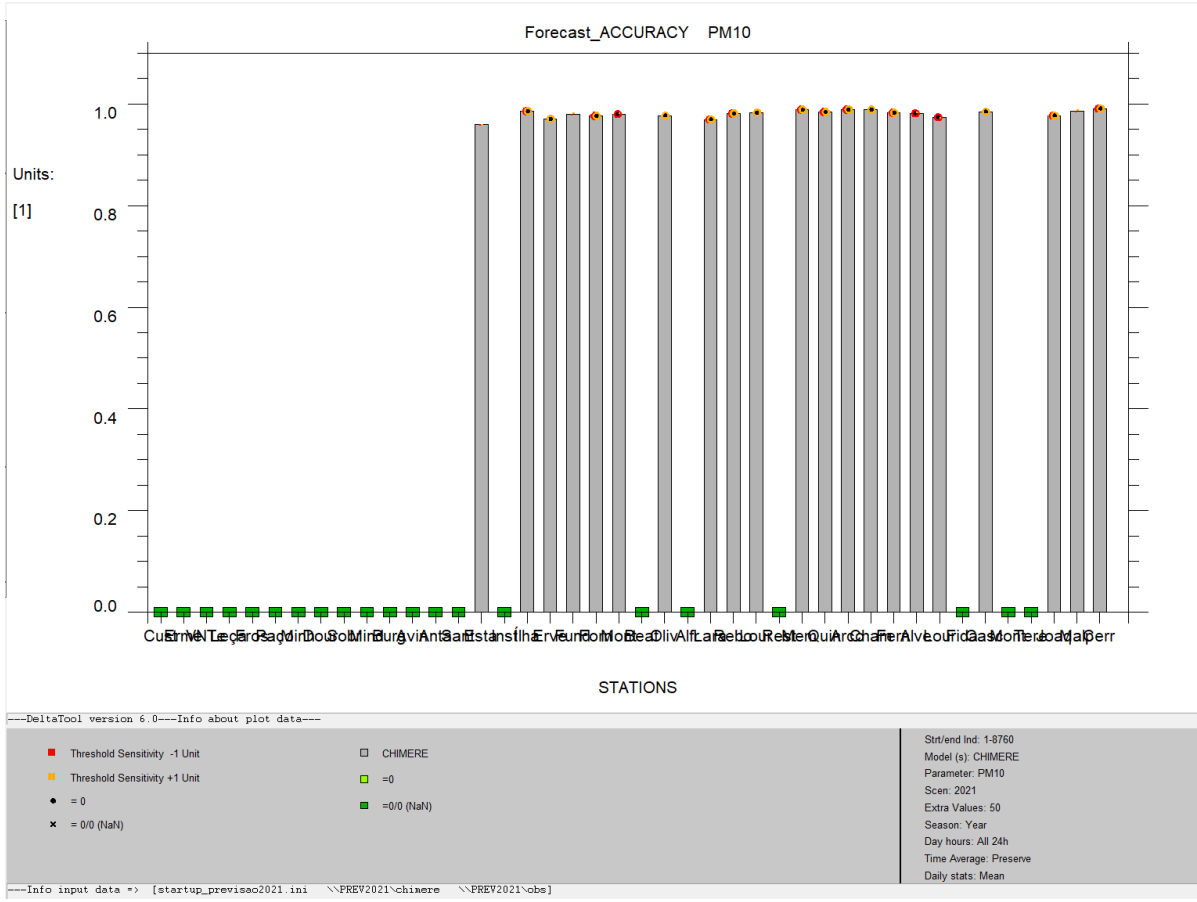
PM10


SUMMARY STATISTICS Nb of stations/groups: 21 valid / 42 selected
INDICATOR
FORECAST
GA+
GA-
FA
MA
ACC
SR
PD
FB
TS
GSS
---DeltaTool version 6.0---Info about plot data---


SUMMARY STATISTICS P-Normalized Nb of stations/groups: 21 valid / 42 selected
INDICATOR
FORECAST
GA+
GA-
FA
MA
ACC/ACCp
SR/SRp
PD/PDp
FB/FBp
TS/TSp
GSS/GSSp
---DeltaTool version 6.0---Info about plot data---

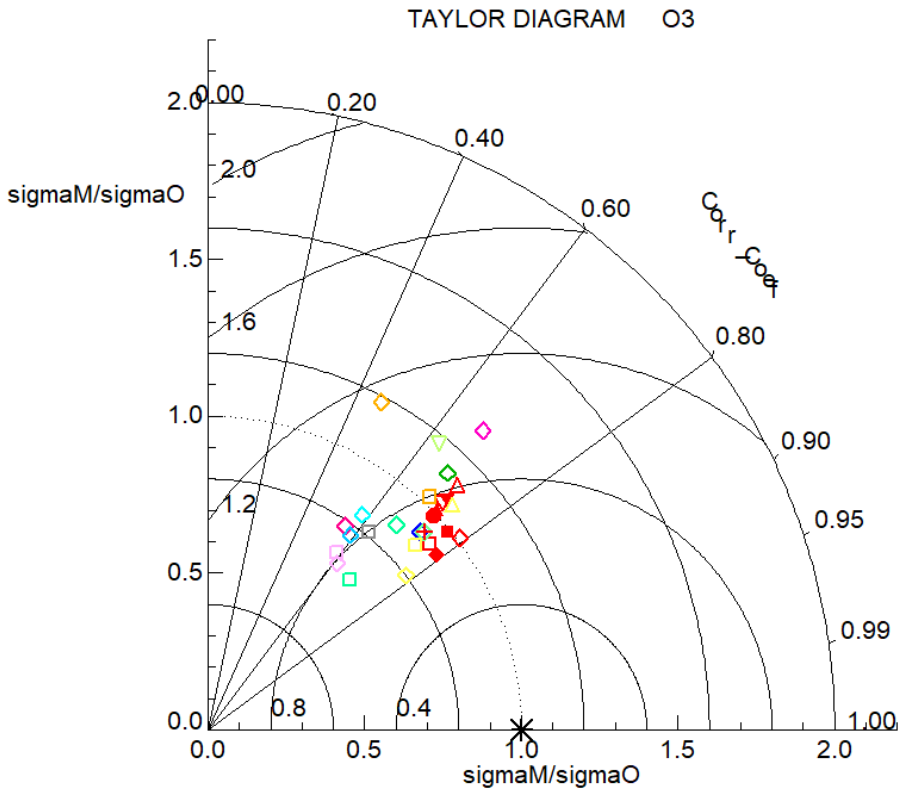
PM10

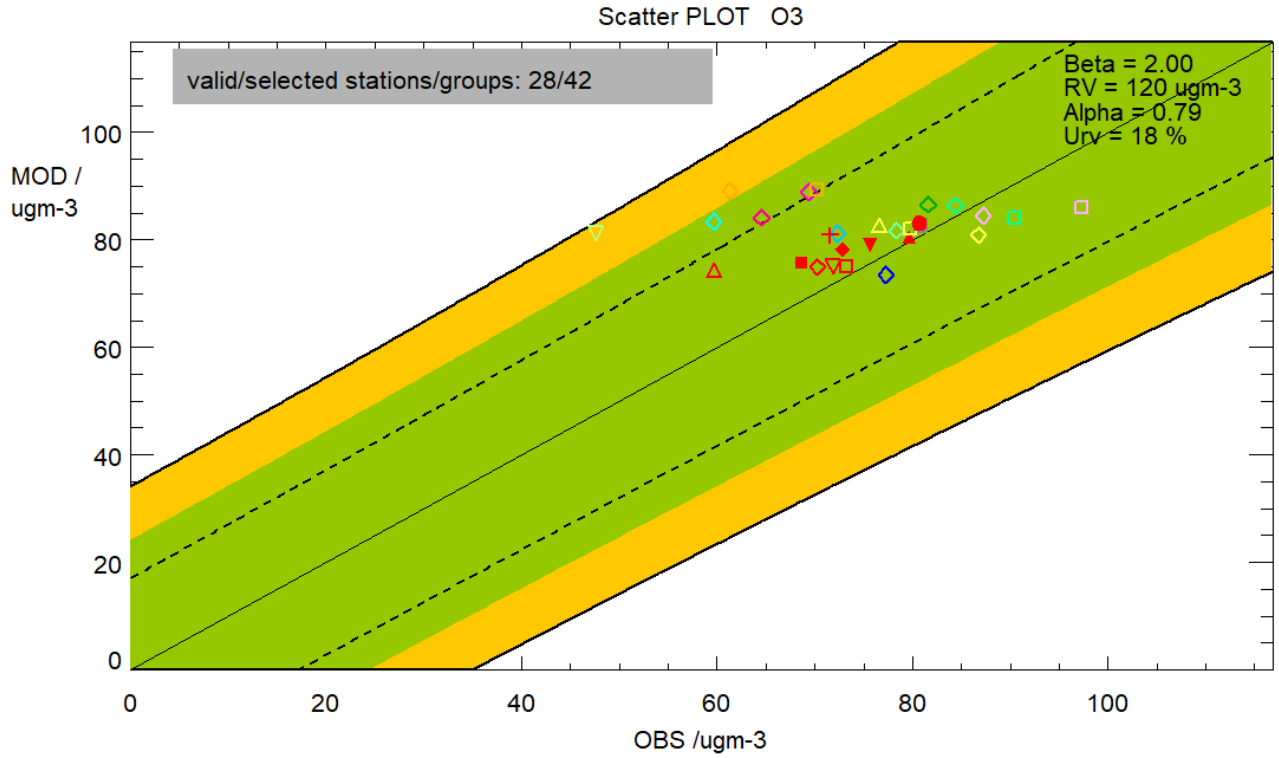




POD: Probability Of Detection
SR: Success Ratio

O_3





---DeltaTool version 6.0---Info about plot data---

LEC	OLI	CHA	CER
SCO	ALF	FPO	
EST	LAR	ALV	
IGE	REB	LNH	
ERV	LOU	CID	
FUN	RES	MVE	
FRN	MEM	TER	
MOV	QMA	JMG	
BEA	ARC	MAL	

Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: No
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max

---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]

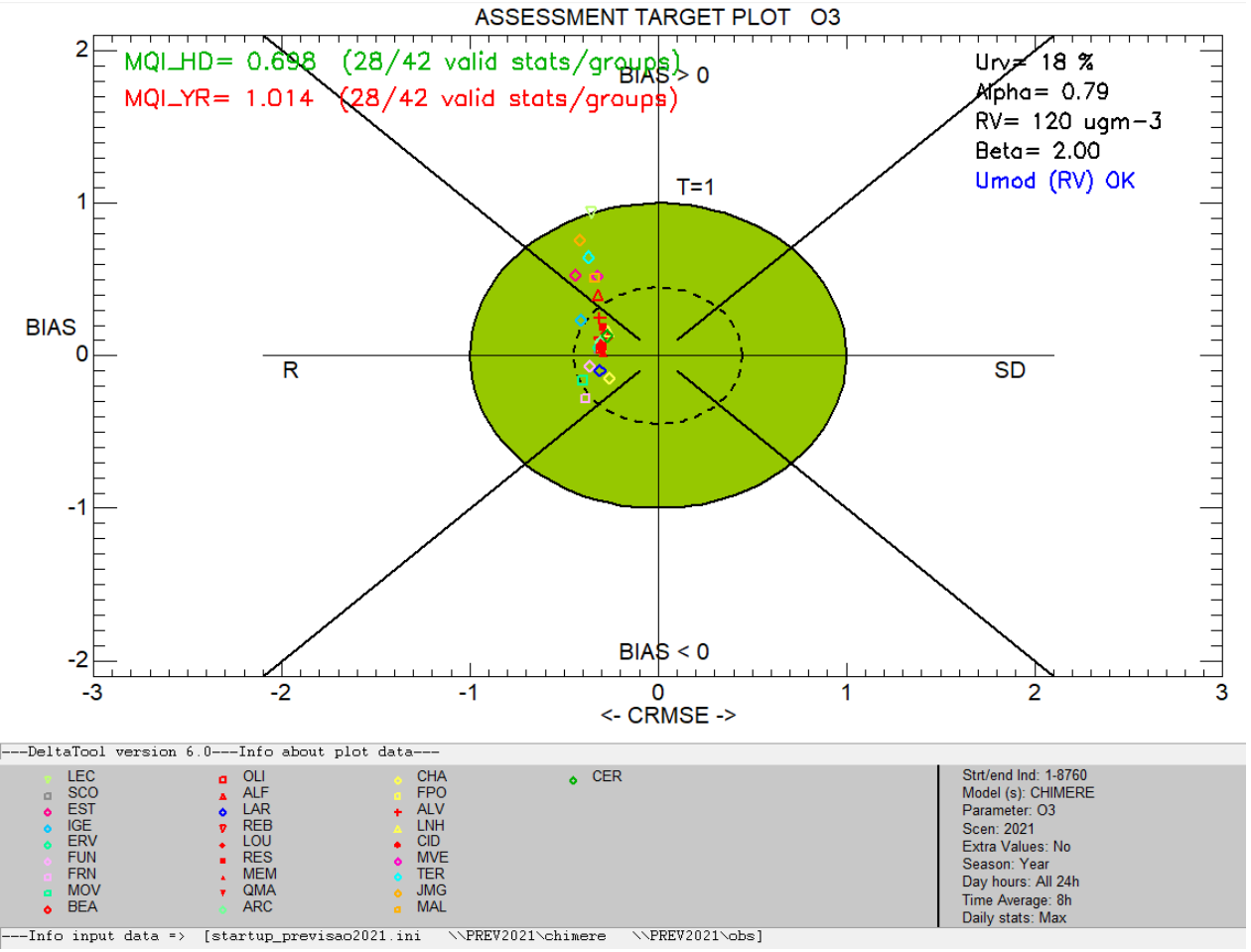
---DeltaTool version 6.0---Info about plot data---

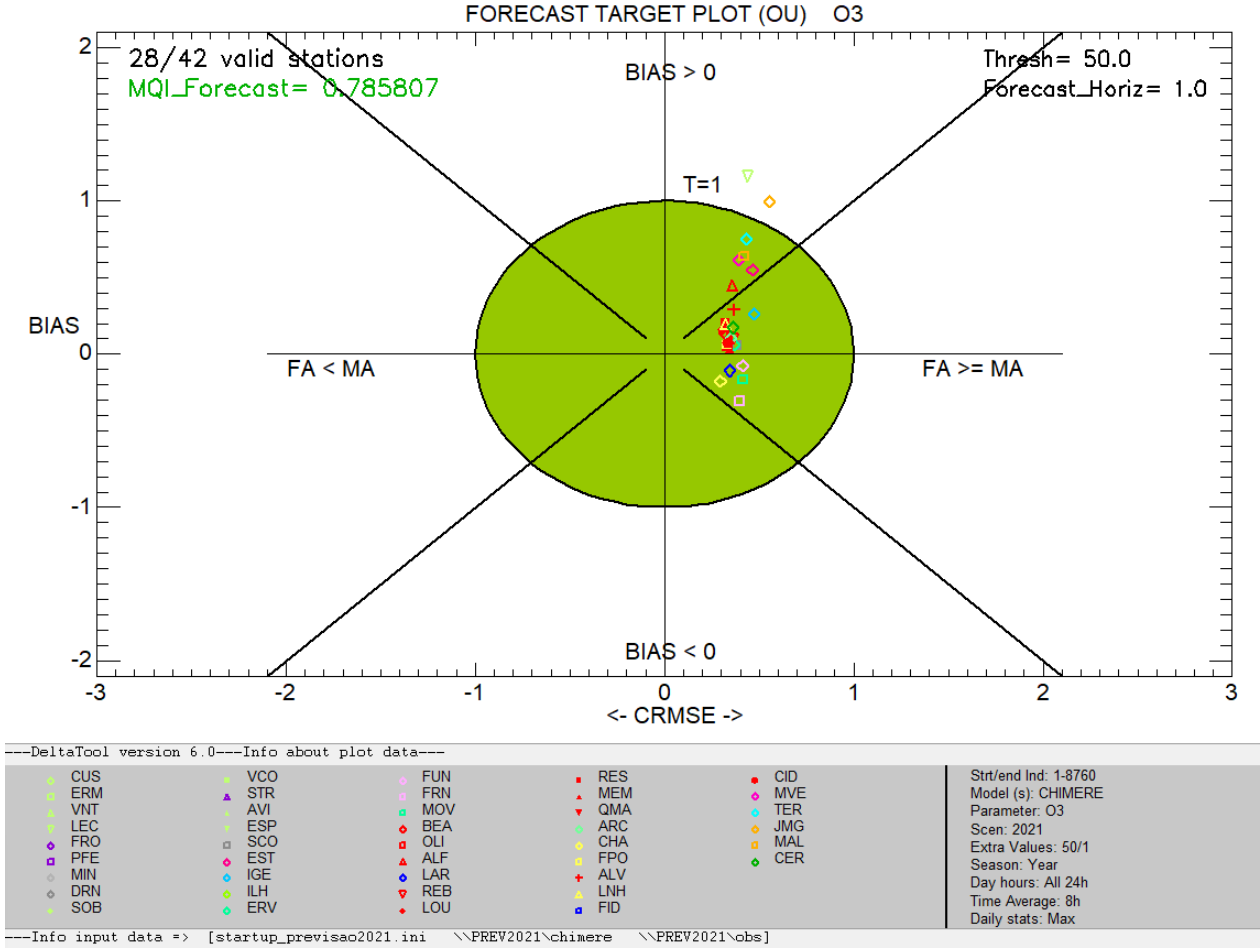
LEC	OLI	CHA	CER
SCO	ALF	FPO	
EST	LAR	ALV	
IGE	REB	LNH	
ERV	LOU	CID	
FUN	RES	MVE	
FRN	MEM	TER	
MOV	QMA	JMG	
BEA	ARC	MAL	

Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: No
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max

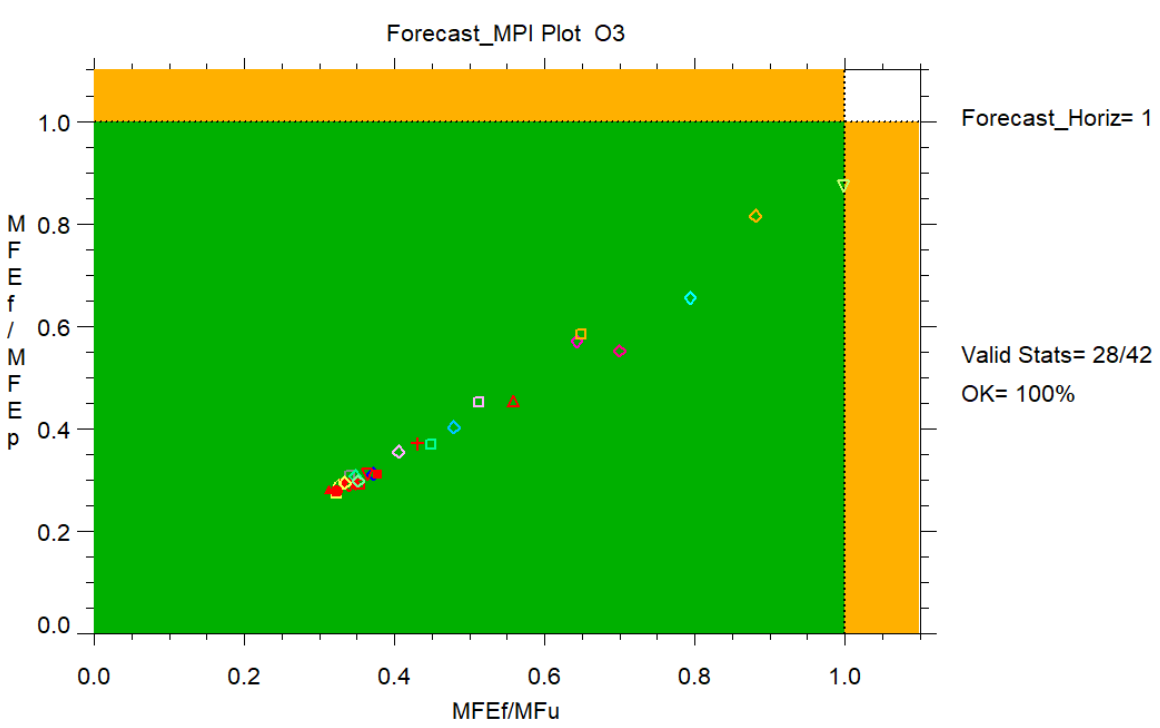
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]

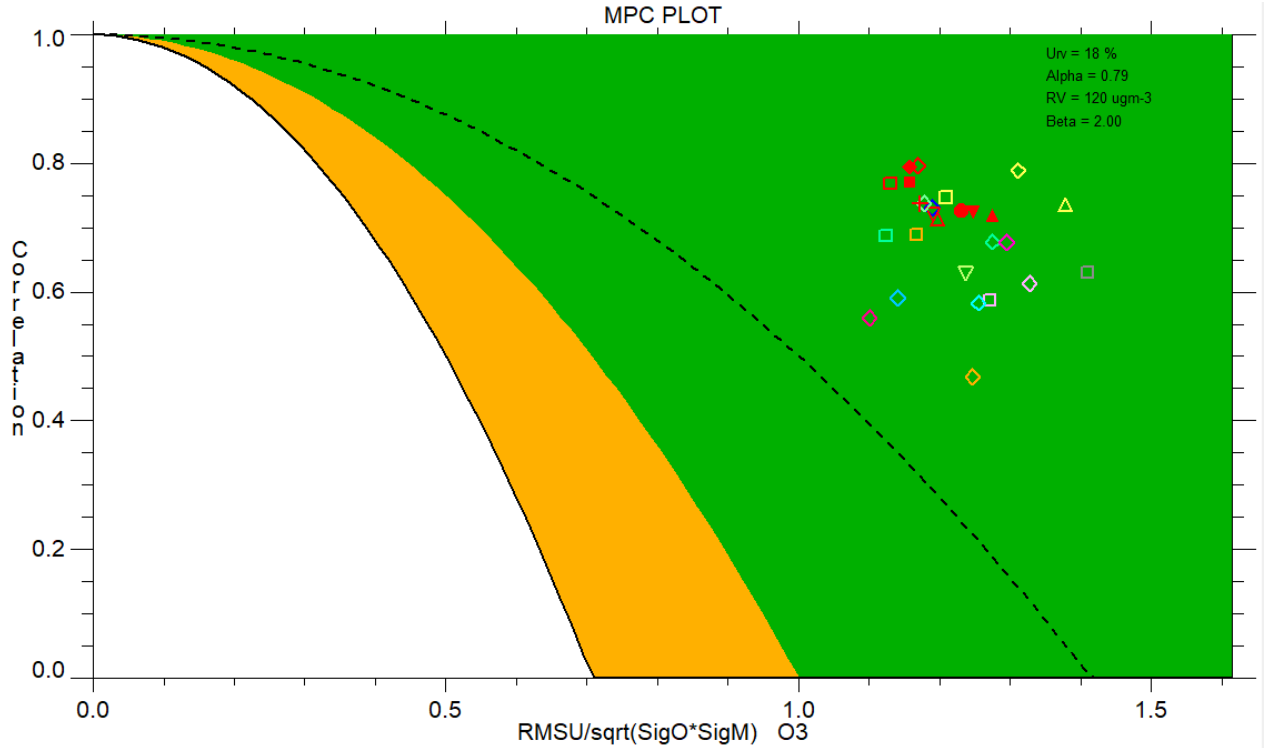
O_3


ASSESSMENT TARGET PLOT O3
MQI_HD= 0.698 (28/42 valid stats/groups)
MQI_YR= 1.014 (28/42 valid stats/groups)
Urv= 18 %
Alpha= 0.79
RV= 120 ugm-3
Beta= 2.00
Umod (RV) OK
BIAS > 0
T=1
R
SD
BIAS < 0
BIAS
<- CRMSE ->
---DeltaTool version 6.0---Info about plot data---
LEC SCO EST IGE ERV FUN FRN MOV BEA
OLI ALF LAR REB LOU RES MEM QMA ARC
CHA FPO ALV LNH CID MVE TER JMG MAL
CER
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: No
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]


FORECAST TARGET PLOT (OU) O3
28/42 valid stations
MQI_Forecast= 0.785807
Thresh= 50.0
Forecast_Horiz= 1.0
BIAS > 0
T=1
FA < MA
FA >= MA
BIAS < 0
BIAS
<- CRMSE ->
---DeltaTool version 6.0---Info about plot data---
CUS ERM VNT LEC FRO PFE MIN DRN SOB
VCO STR AVI ESP SCO EST IGE ILH ERV
FUN FRN MOV BEA OLI ALF LAR REB LOU
RES MEM QMA ARC CHA FPO ALV LNH FID
CID MVE TER JMG MAL CER
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: 50/1
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]

O_3





---DeltaTool version 6.0---Info about plot data---

LEC SCO EST IGE ERV FUN FRN MOV BEA
OLI ALF LAR REB LOU RES MEM QMA ARC
CHA FPO ALV LNH CID MVE TER JMG MAL
CER

Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: 1
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max

---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]

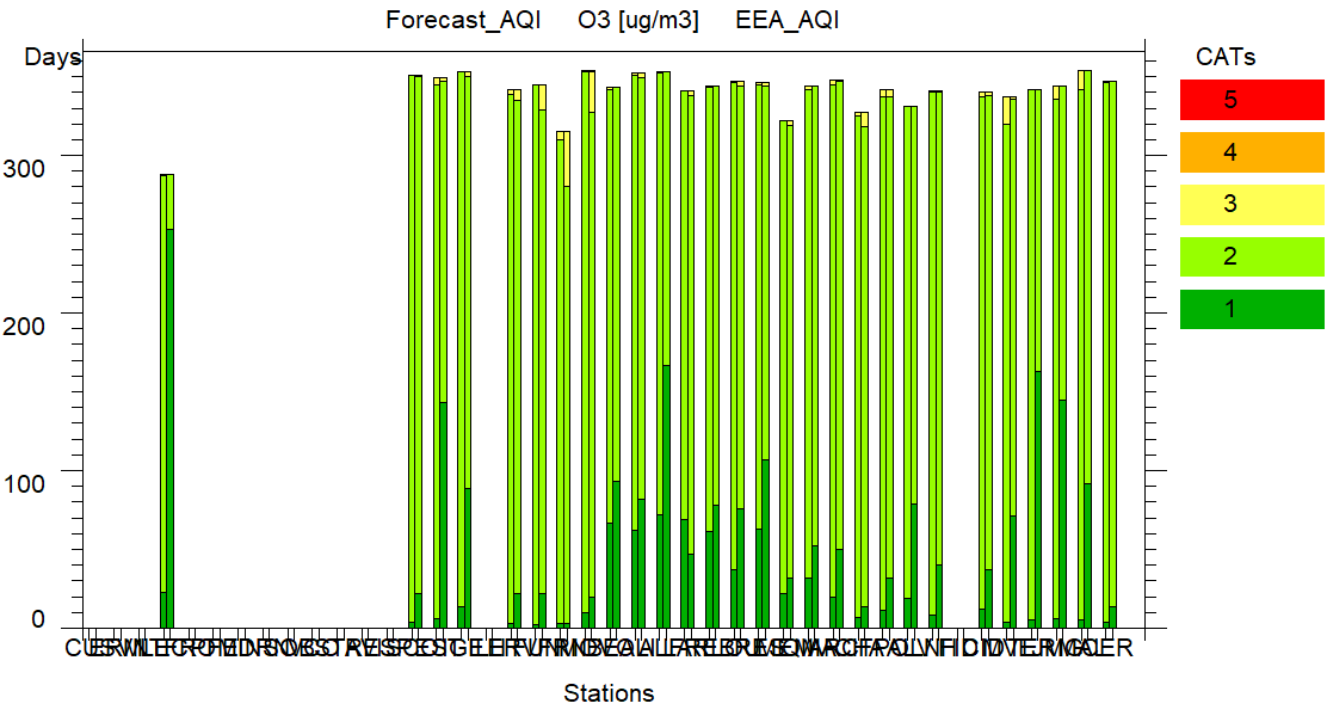
---DeltaTool version 6.0---Info about plot data---

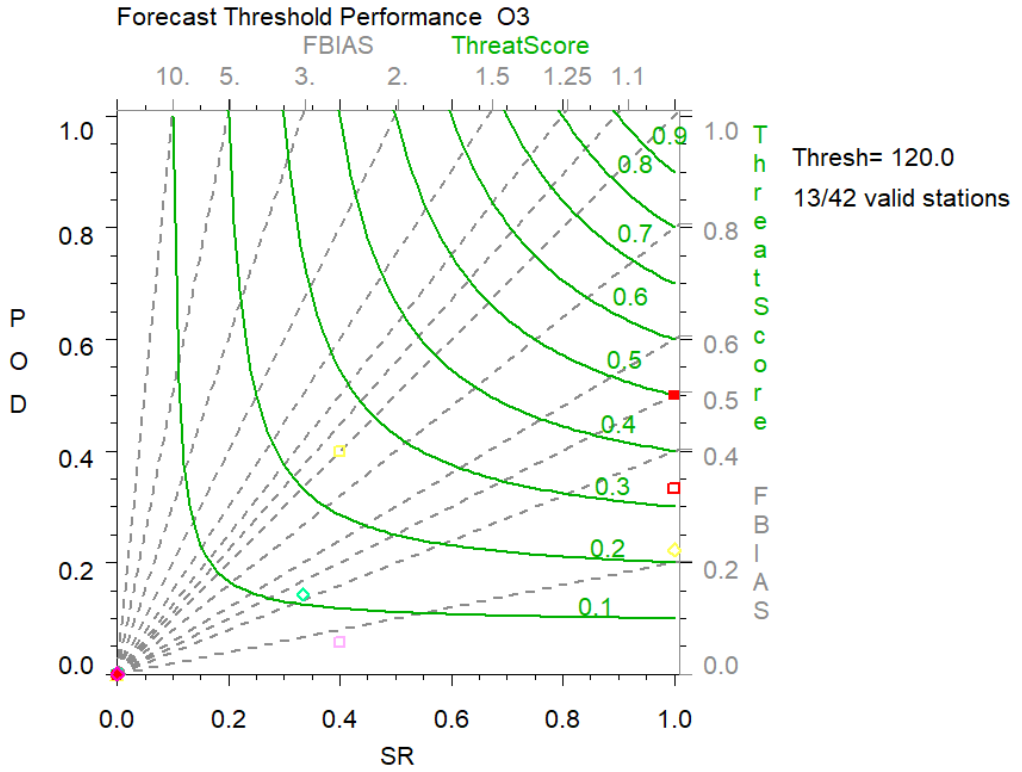
LEC SCO EST IGE ERV FUN FRN MOV BEA
OLI ALF LAR REB LOU RES MEM QMA ARC
CHA FPO ALV LNH CID MVE TER JMG MAL
CER

Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: No
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max

---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]

O_3

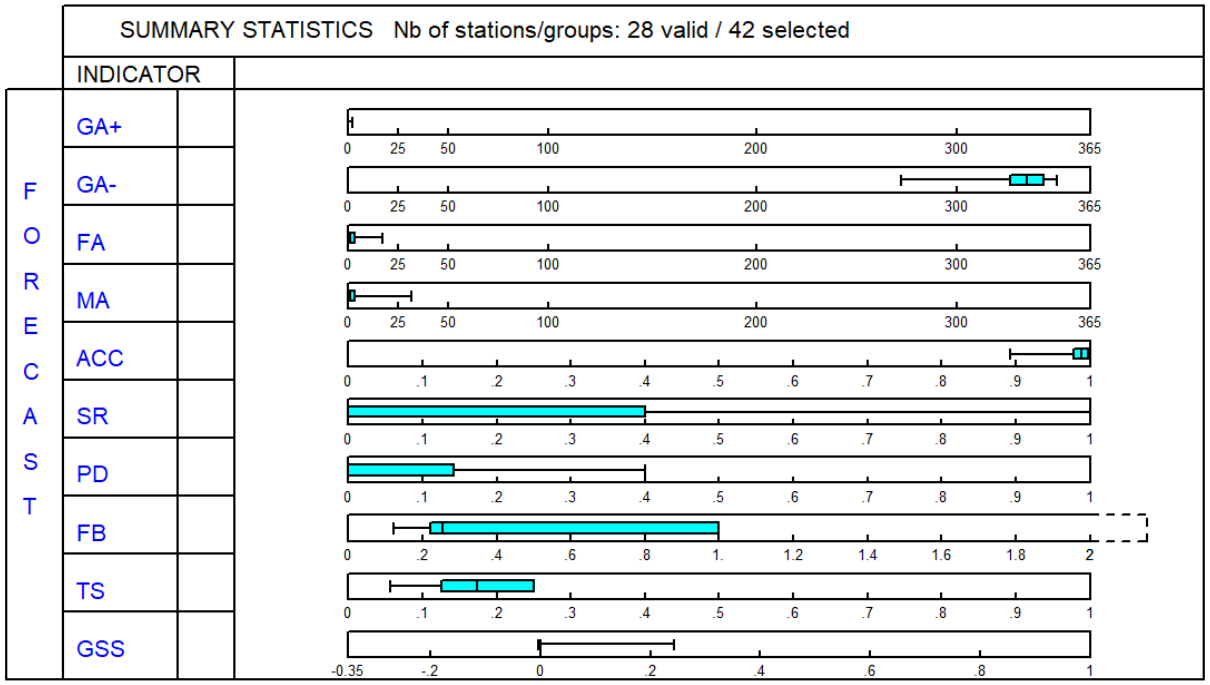




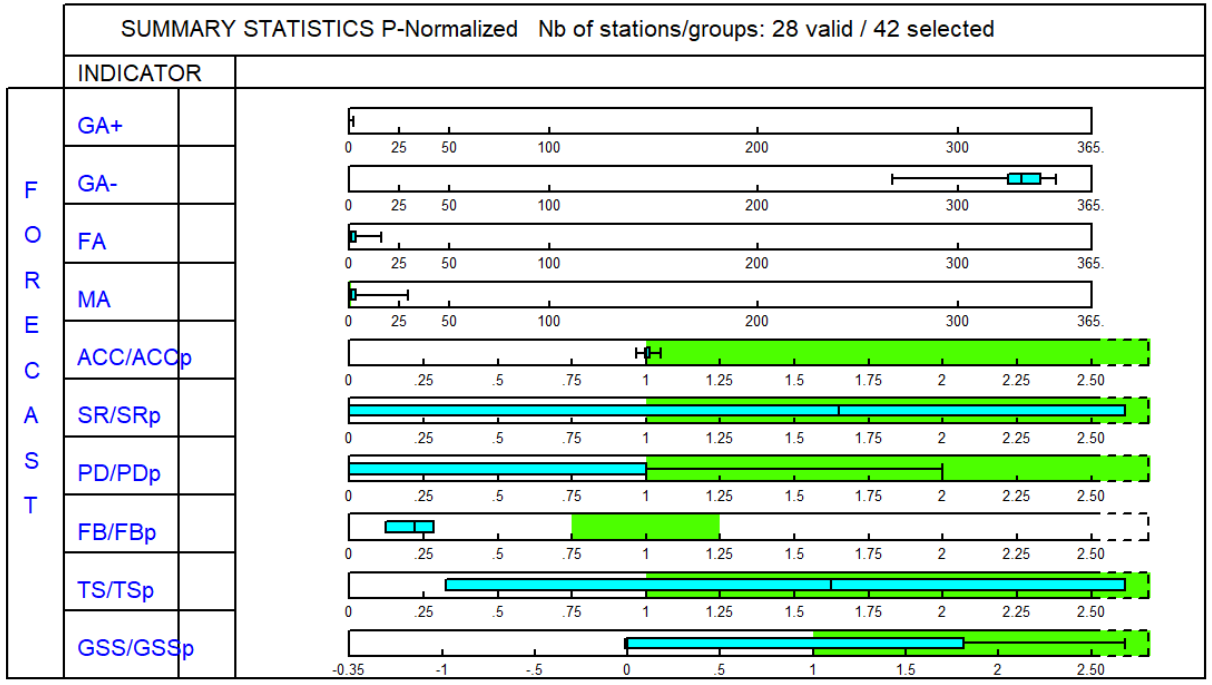

```
---DeltaTool version 6.0---Info about plot data---
SubBars: M O:
EEA_AQI:
Cat5: Very Poor: 240.0 --- 5000.0
Cat4: Poor: 180.0 --- 240.0
Cat3: Medium: 120.0 --- 180.0
Cat2: Good: 60.0 --- 120.0
Cat1: Very Good: 0.0 --- 60.0
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: No
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]
```

```
---DeltaTool version 6.0---Info about plot data---
CUS VCO FUN RES CID
ERM STR FRN MEM MVE
VNT AVI MOV QMA TER
LEC ESP BEA ARC JMG
FRO SCO OLI CHA MAL
PFE EST ALF FPO CER
MIN IGE LAR ALV
DRN ILH REB LNH
SOB ERV LOU FID
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: 120
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]
```

O_3

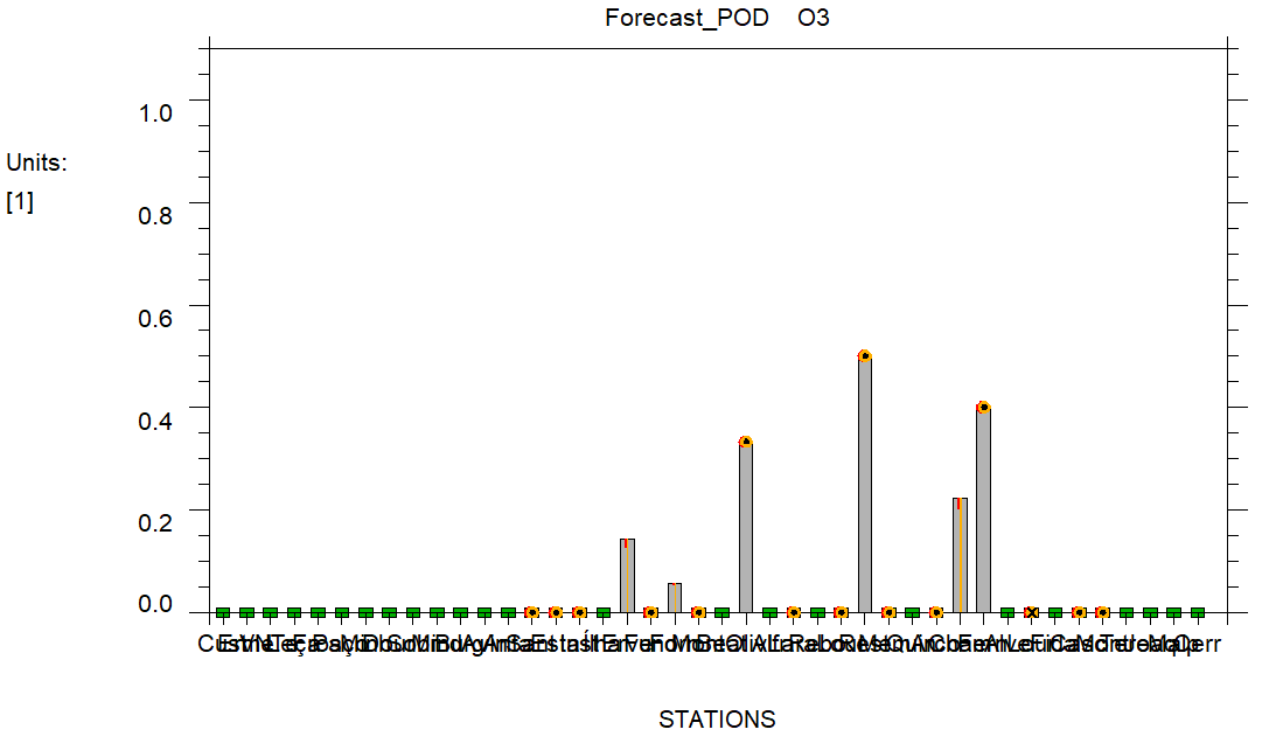


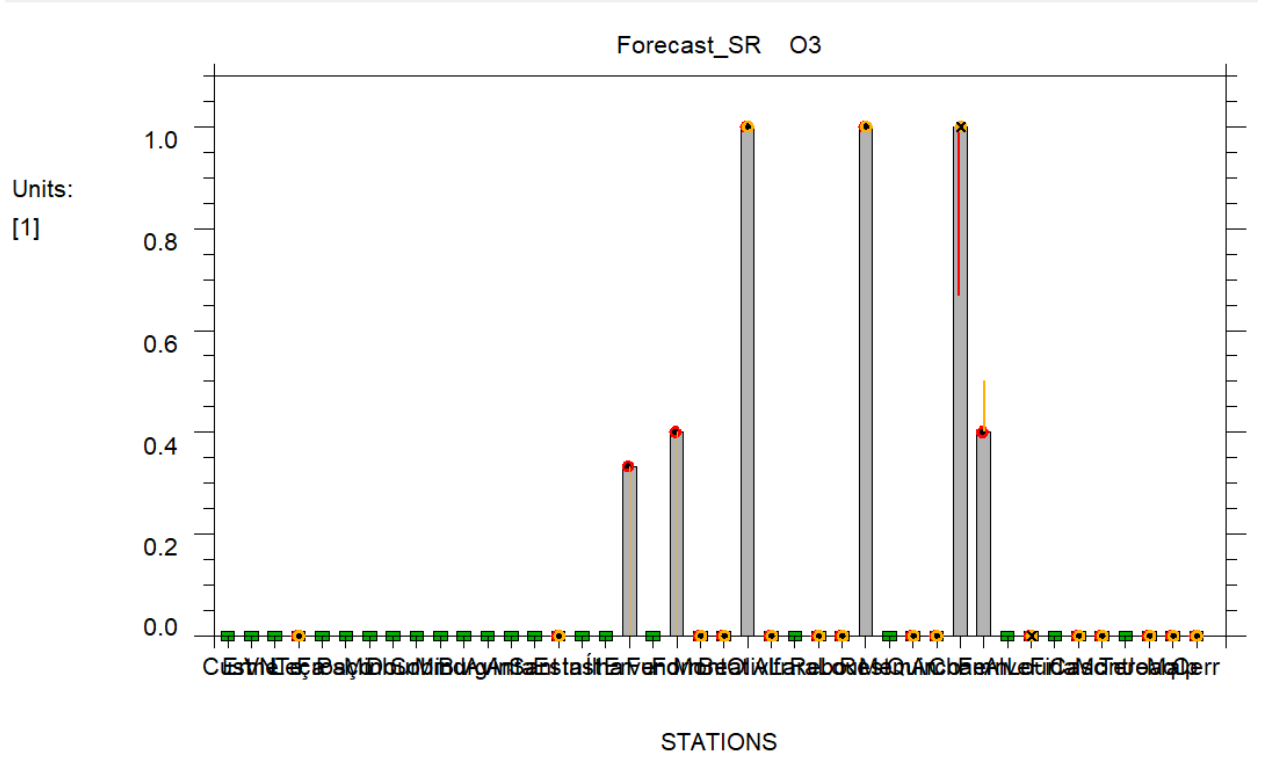
---DeltaTool version 6.0---Info about plot data---



---DeltaTool version 6.0---Info about plot data---

O_3


Forecast_POD O3
Units:
[1]
1.0
0.8
0.6
0.4
0.2
0.0
STATIONS
---DeltaTool version 6.0---Info about plot data---
Threshold Sensitivity -1 Unit
Threshold Sensitivity +1 Unit
= 0
= 0/0 (NaN)
CHIMERE
=0
=0/0 (NaN)
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: 120
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]


Forecast_SR O3
Units:
[1]
1.0
0.8
0.6
0.4
0.2
0.0
STATIONS
---DeltaTool version 6.0---Info about plot data---
Threshold Sensitivity -1 Unit
Threshold Sensitivity +1 Unit
= 0
= 0/0 (NaN)
CHIMERE
=0
=0/0 (NaN)
Strt/end Ind: 1-8760
Model (s): CHIMERE
Parameter: O3
Scen: 2021
Extra Values: 120
Season: Year
Day hours: All 24h
Time Average: 8h
Daily stats: Max
---Info input data => [startup_previsao2021.ini \\PREV2021\chimere \\PREV2021\obs]

discussion

- Are the side outcomes (MPI diagram, POD & SR diagram on stations, summary report, Air Quality Index diagram) adequate to support the model evaluation, especially for experts?

  Yes, but only with guidance support

- Does the current methodology look sufficiently complete?

  What (if any) important features are missing?

  We think so...

- Should the Air Quality index diagram be improved (with Multi-category Contingency Tables)?

  We think it will be good idea to have feedback from stakeholders

- Can/should we plan an application of the methodology on European scale (e.g. on CAMS data)?

  Why not?