GMOS Update 2018

Statistical Modeling Branch, MDL

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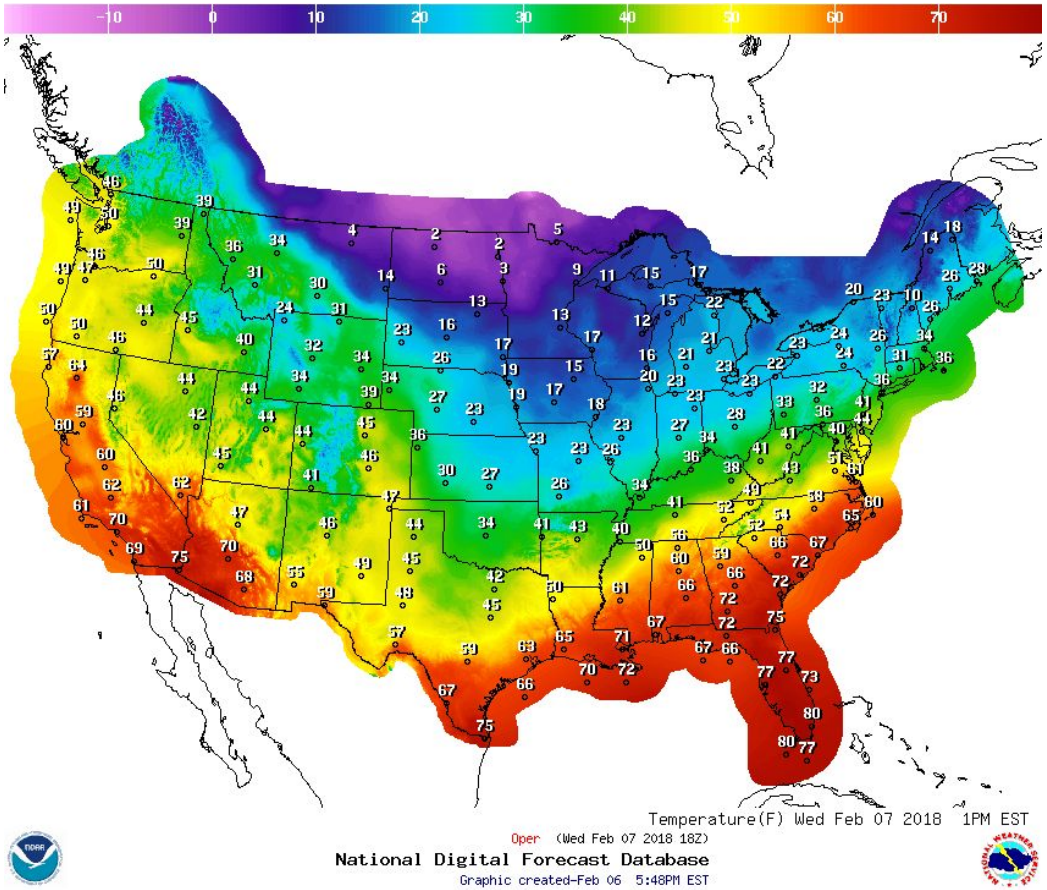
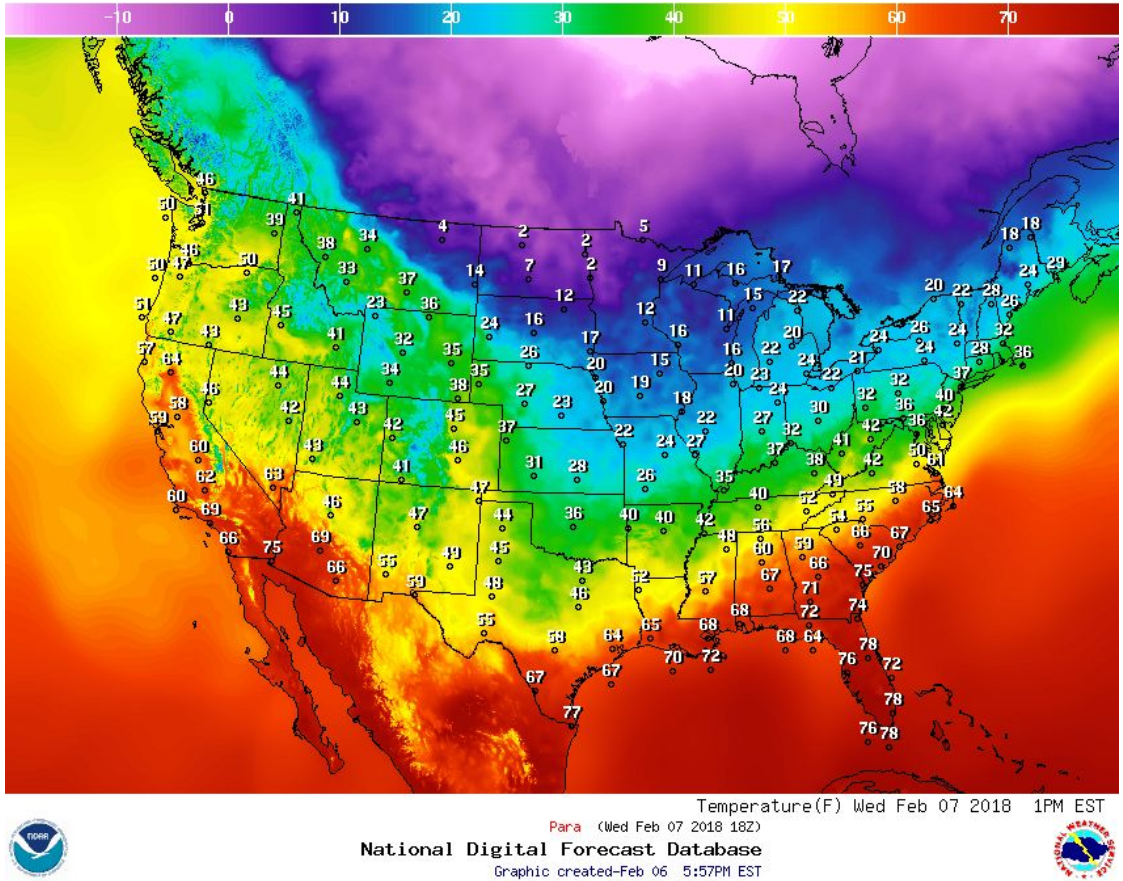
GMOS - What's Changing?

1. New MOS stations added to analysis
    a. 12,000+ MADIS stations added to CONUS analyses
    b. 1200+ MADIS and Canadian stations added to Alaska analyses
2. CONUS and Alaska grids expanded to cover the full domain
    a. These grids will be made available to the National Blend of Models
    b. Grids will be clipped before dissemination
3. Updates to unified terrain and land/water masks
    a. Updated for CONUS, Alaska, and Hawaii
    b. Updates were made in conjunction with EMC (URMA/RTMA) and AWIPS
4. Updates to background grids used to make analyses
    a. Updated Alaska grids to use .25 degree GFS DMO and GOE data instead of 47 KM
    b. Added a GFS DMO grid as a background grid for CONUS sky cover analyses

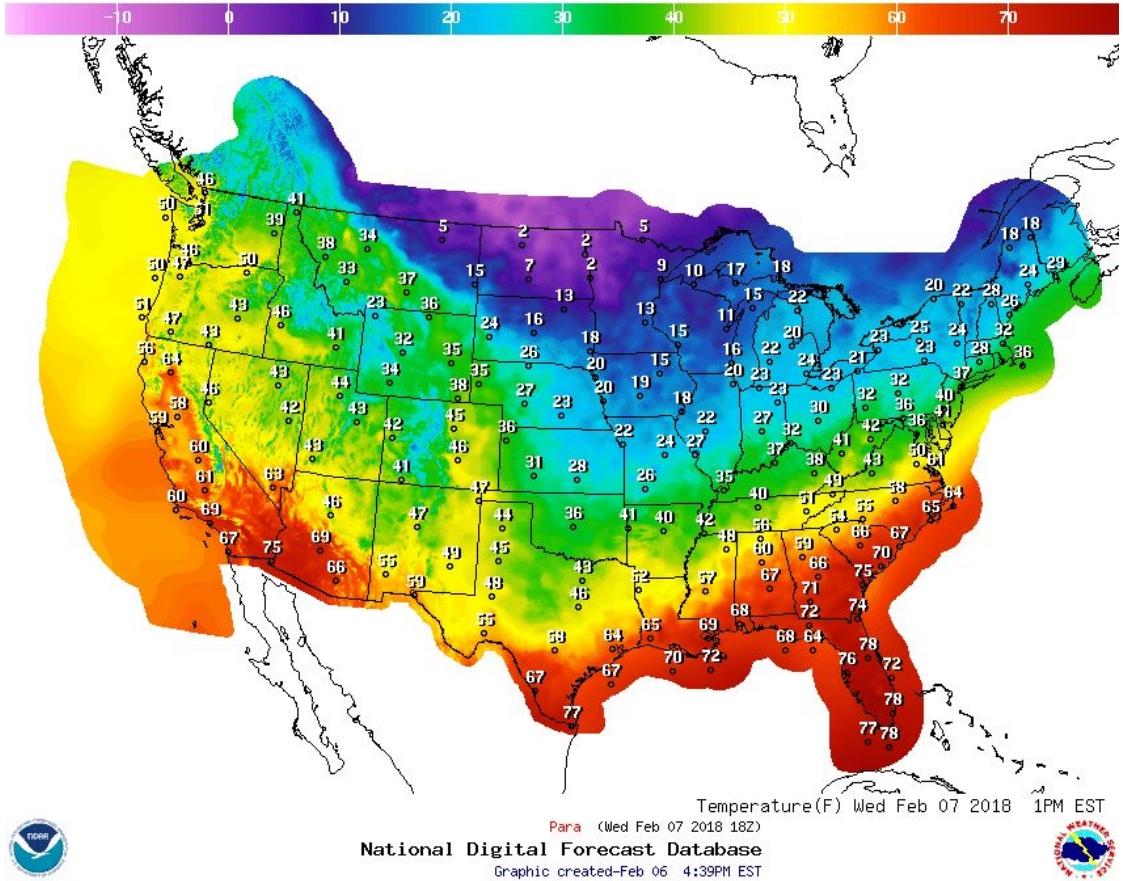
CONUS GMOS - Current Operational Extent



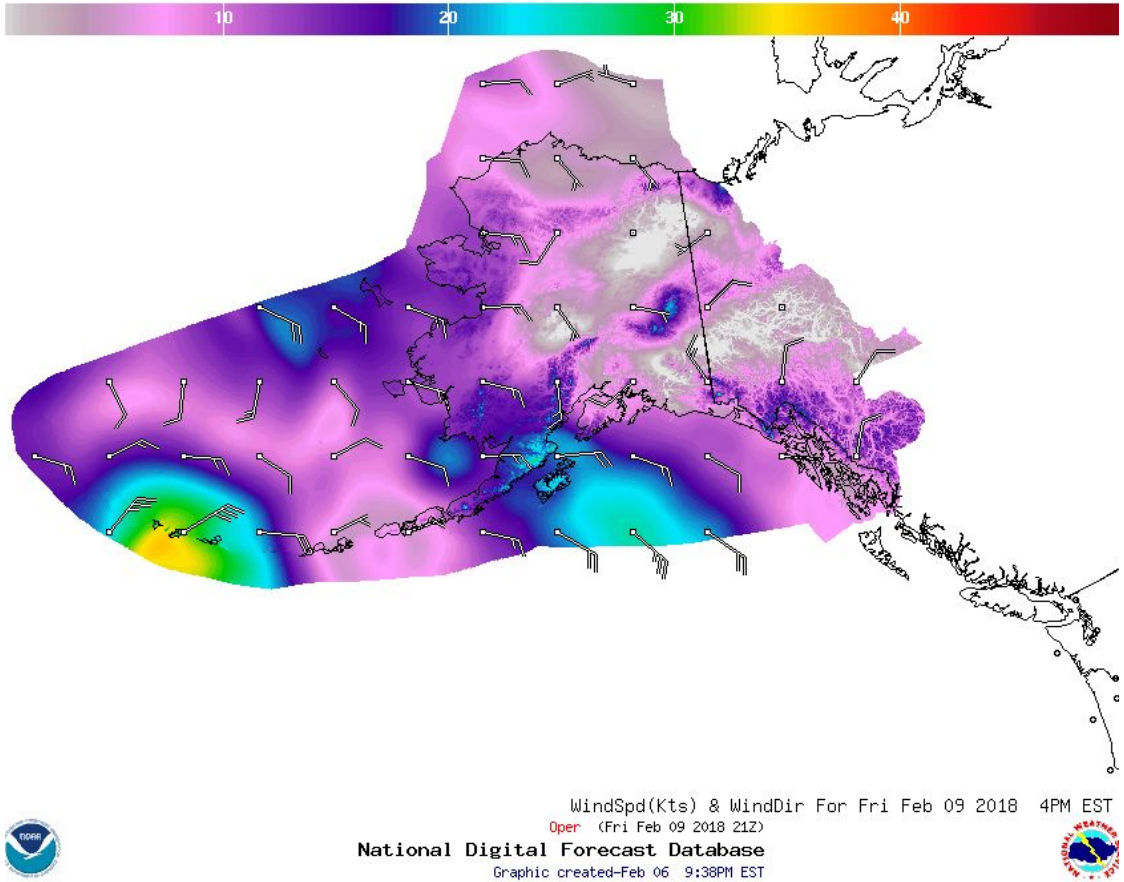
CONUS GMOS - New Extent (TDLpack for NBM)



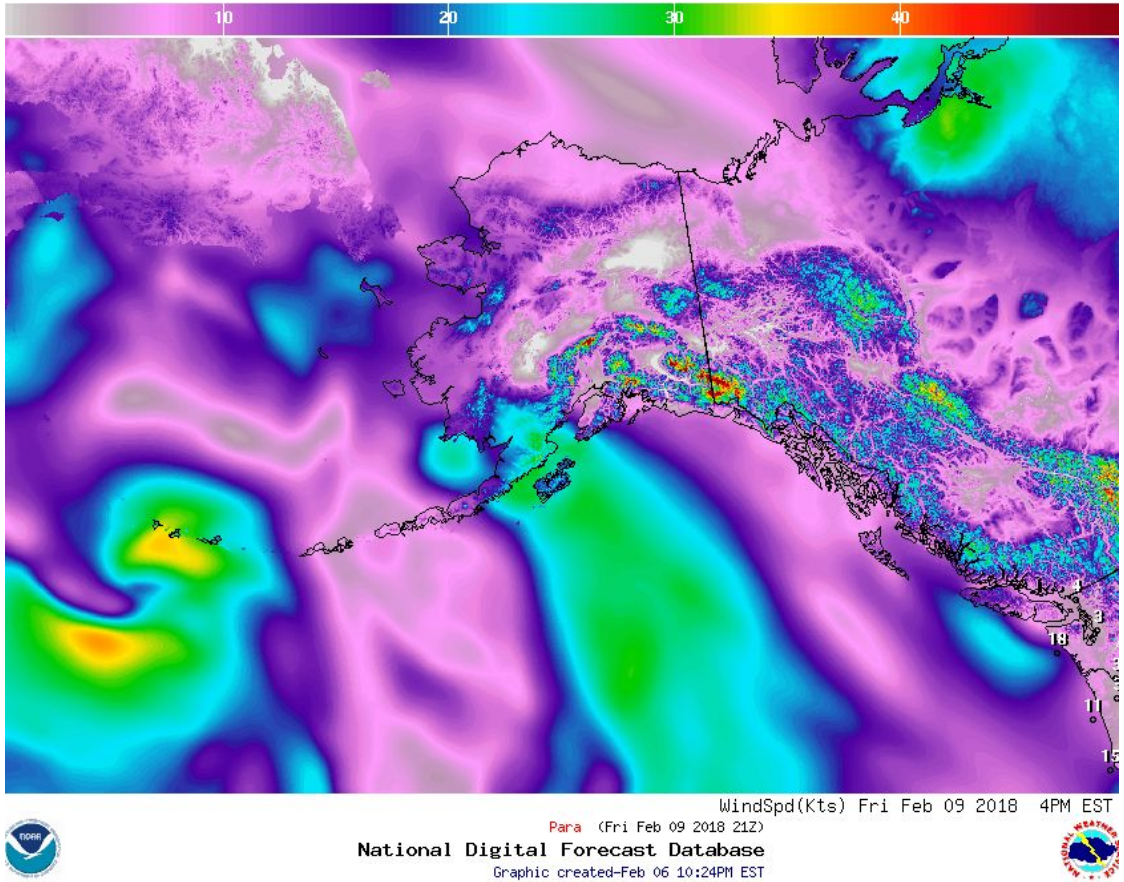
CONUS GMOS - New Extent (GRIB2 Files)



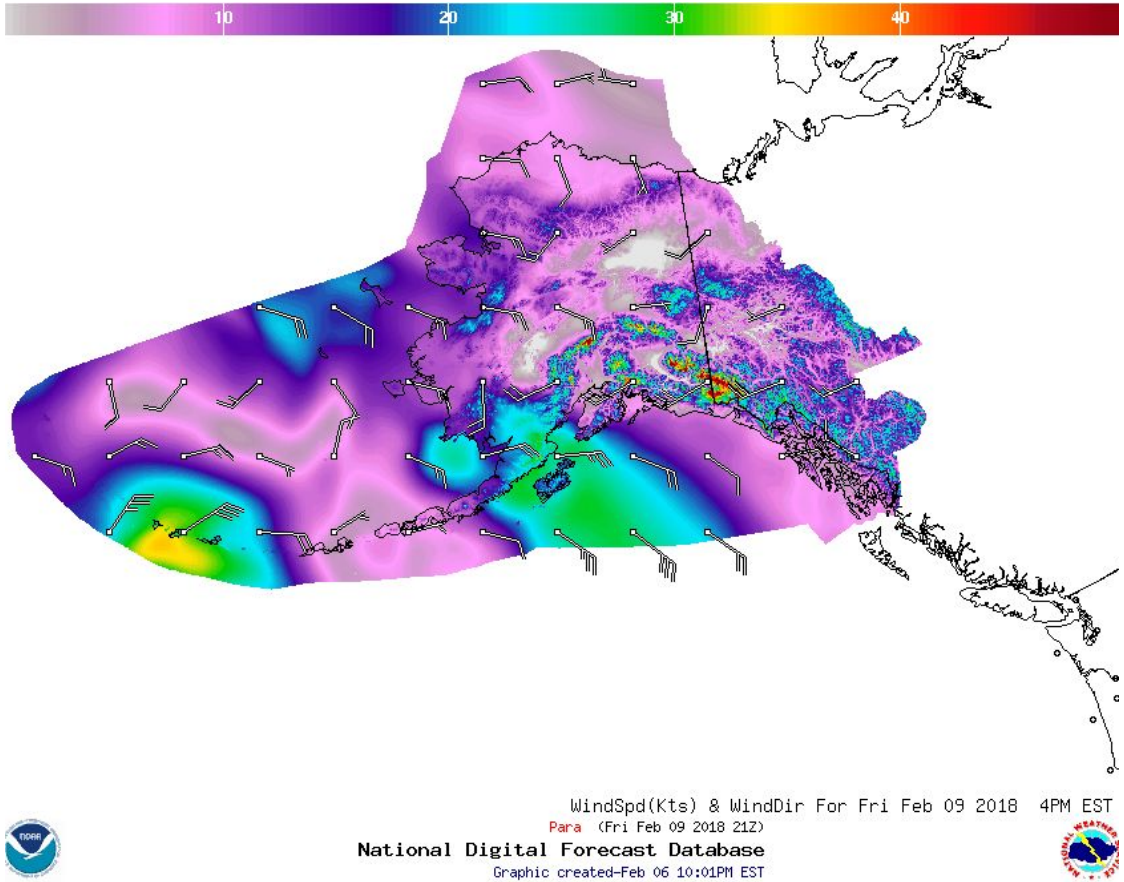
Alaska GMOS - Current Operational Extent



Alaska GMOS - New Extent (TDLpack for NBM)



Alaska GMOS - New Extent (GRIB2 Files)

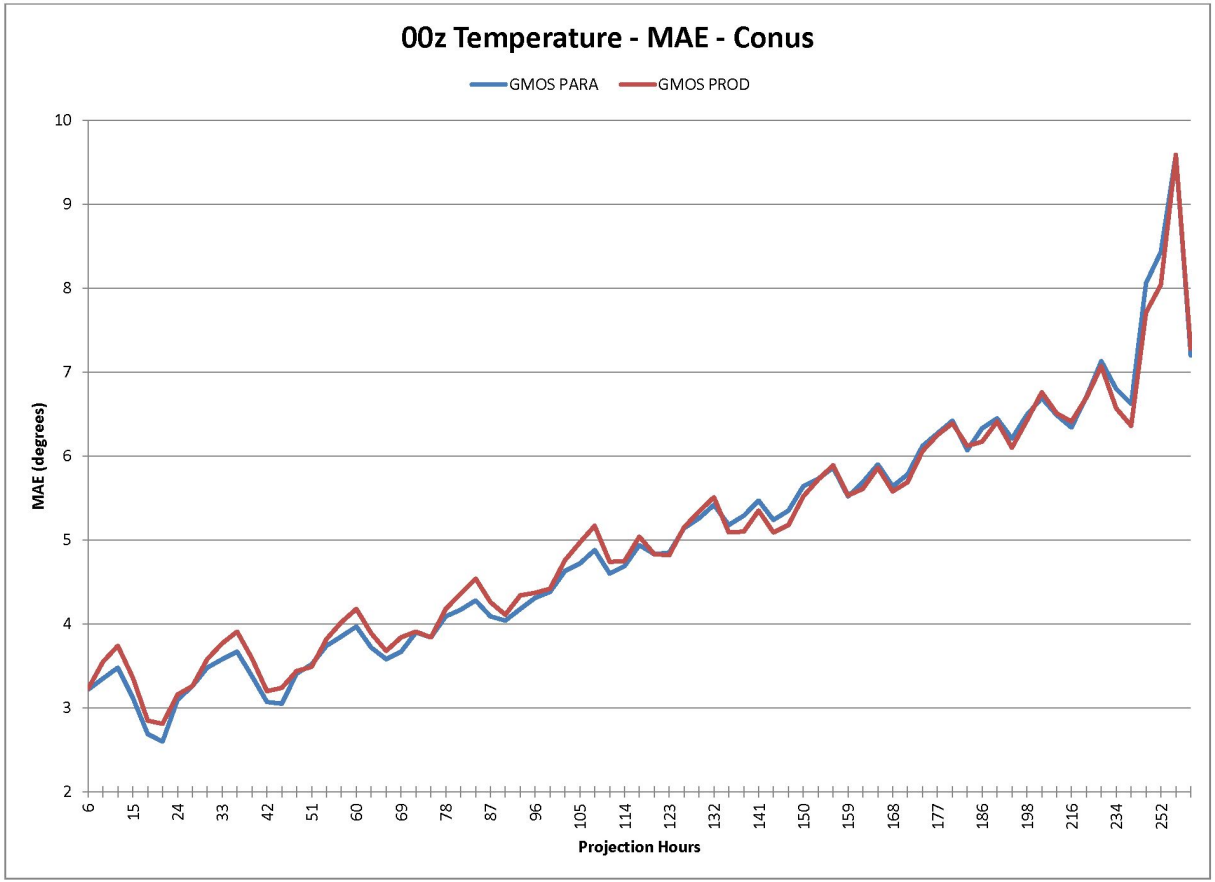


Gridded MOS Verification

1. Verification Dates: 20171201-20171231
2. Domains: CONUS and Alaska
3. Elements:
   a. Temperature
   b. Dewpoint
   c. Daytime Maximum Temperature
   d. Nighttime Minimum Temperature
   e. Sky Cover
   f. Wind Speed
   g. 6-HR QPF
   h. 12-HR PoP
4. Scores: Mean Absolute Error (MAE), Bias, Brier Score

2-M Temperature Verification

1. Verification Dates: 20171201-20171231
2. Domains: CONUS and Alaska
3. Scores: Mean Absolute Error (MAE), verified against URMA
   a. CONUS grids were clipped to match the URMA grid
4. Models verified
   a. GMOS Para - Parallel run of GMOS, which includes the latest updates
   b. GMOS Prod - Operational version of GMOS currently running in production


00z Temperature - MAE - Conus
GMOS PARA
GMOS PROD
MAE (degrees)
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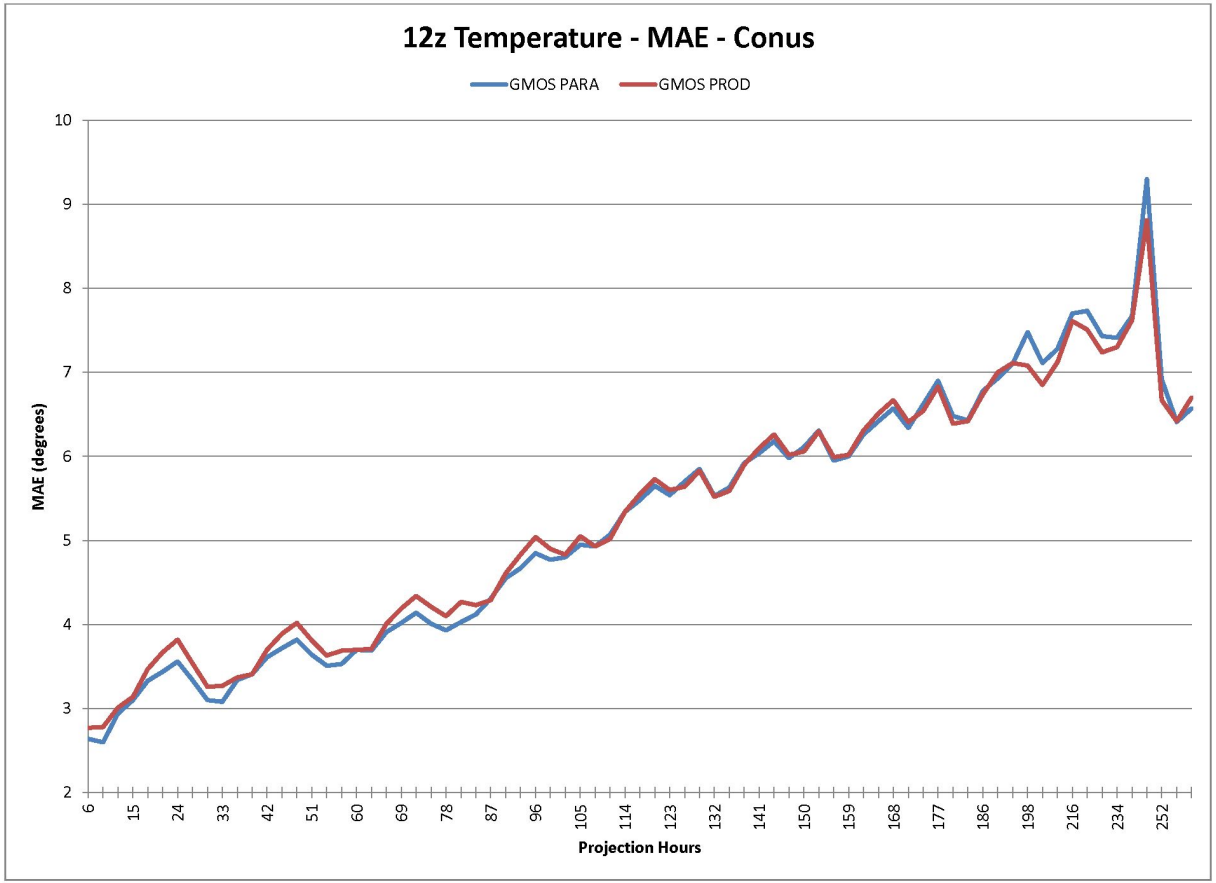
Projection Hours


12z Temperature - MAE - Conus
GMOS PARA
GMOS PROD
MAE (degrees)
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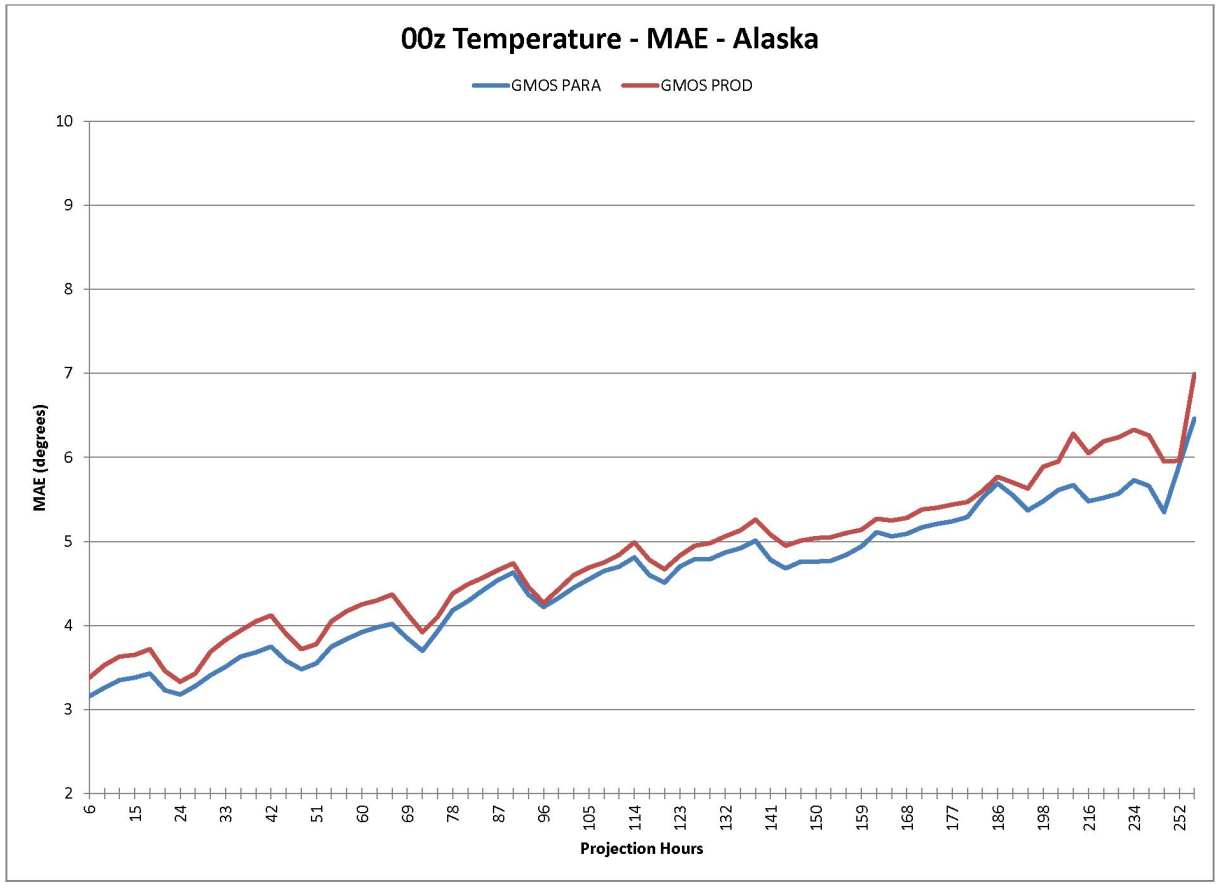
Projection Hours


00z Temperature - MAE - Alaska
GMOS PARA
GMOS PROD
MAE (degrees)
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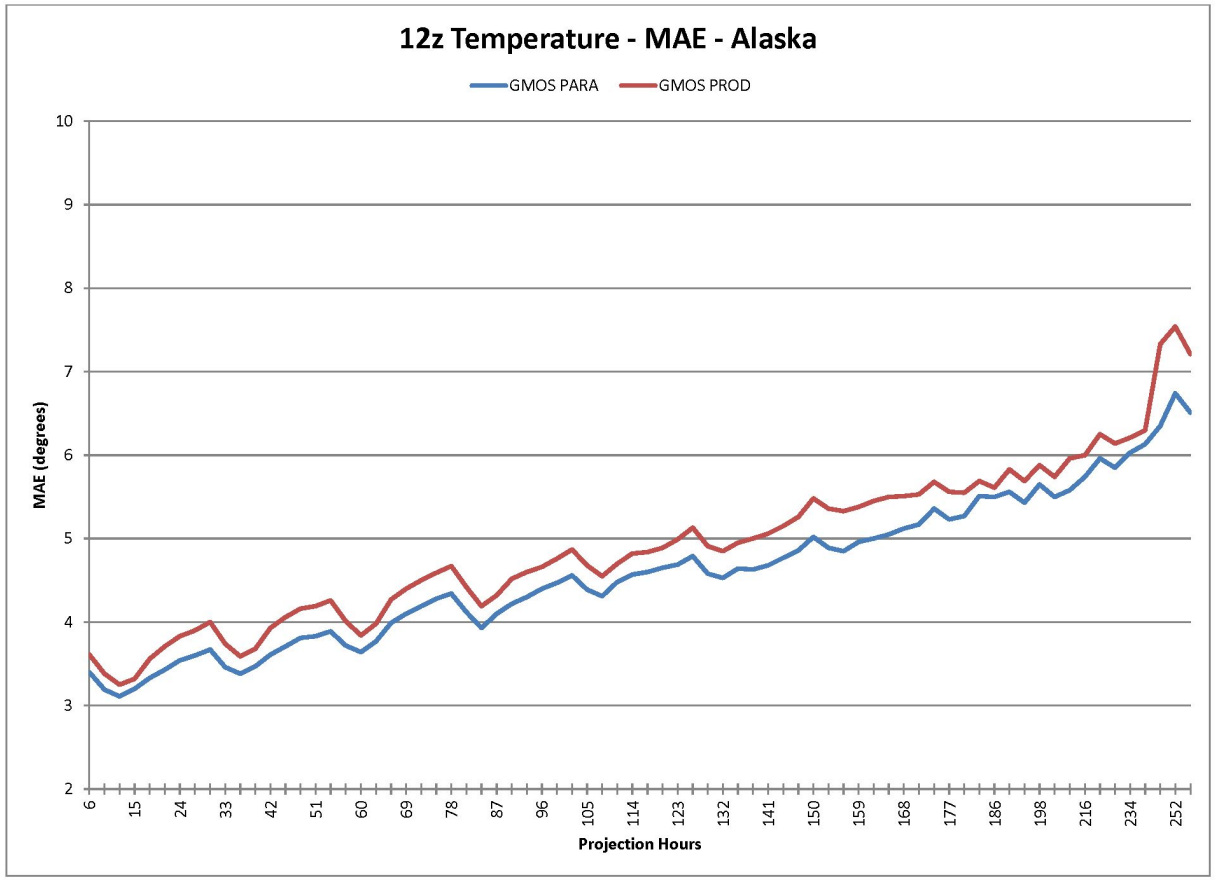
12z Temperature - MAE - Alaska
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GMOS PROD
MAE (degrees)
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Projection Hours

2-M Dewpoint Verification

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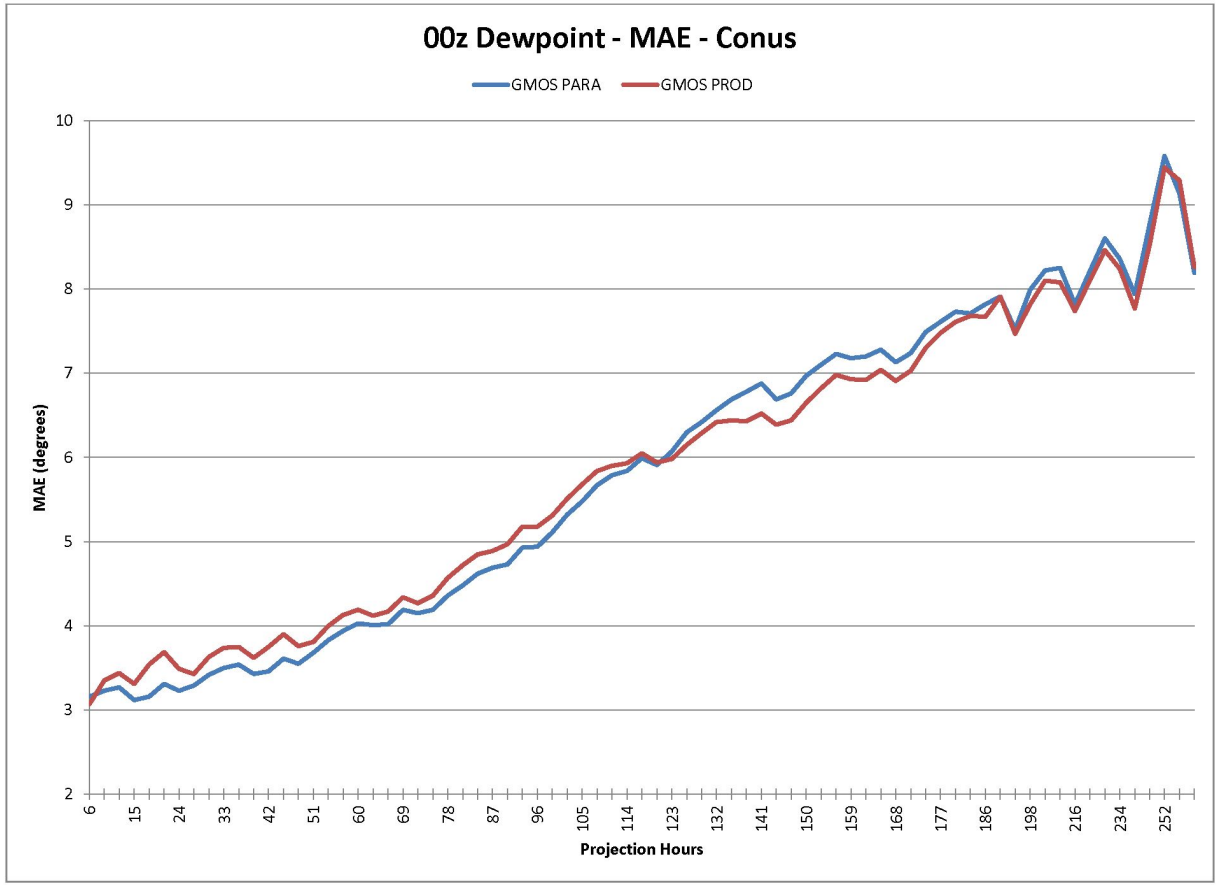
00z Dewpoint - MAE - Conus
GMOS PARA
GMOS PROD
MAE (degrees)
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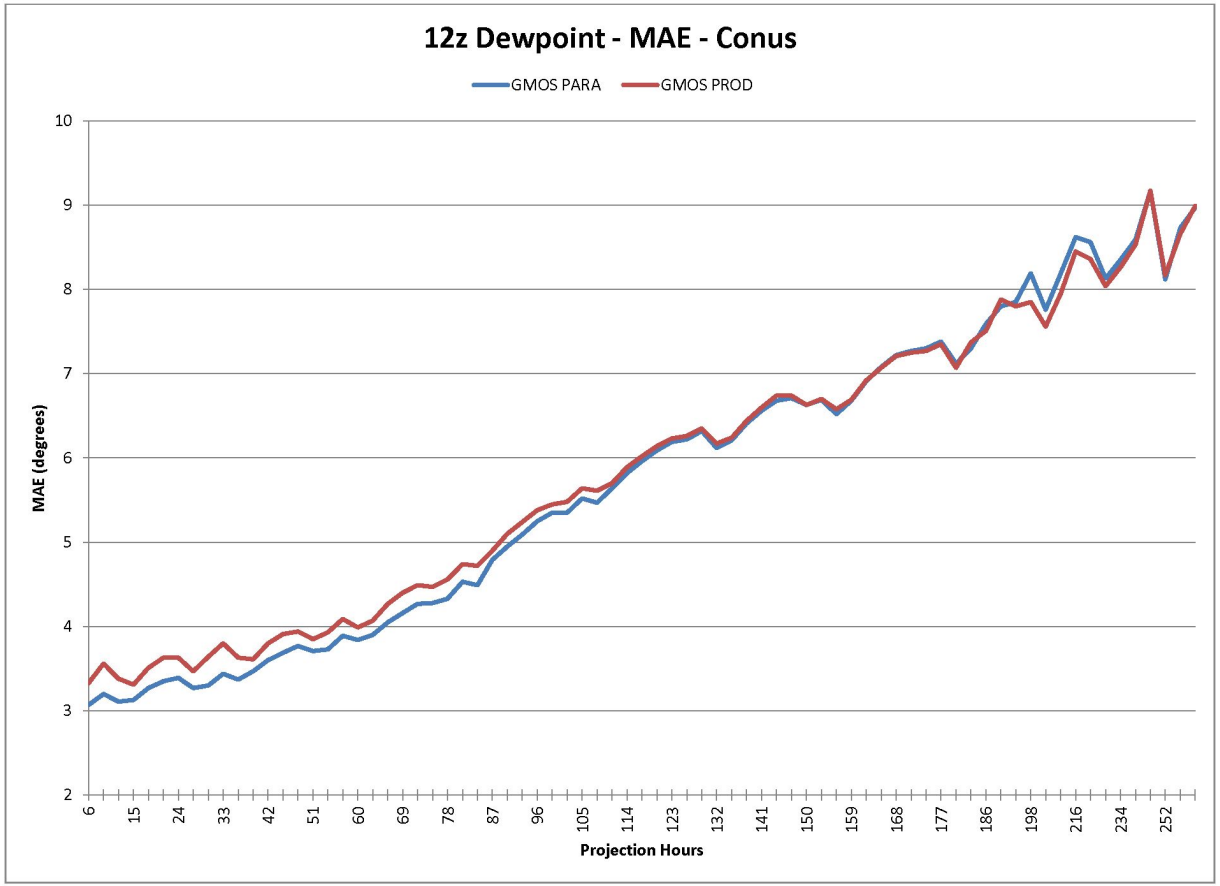
Projection Hours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MAE (degrees)
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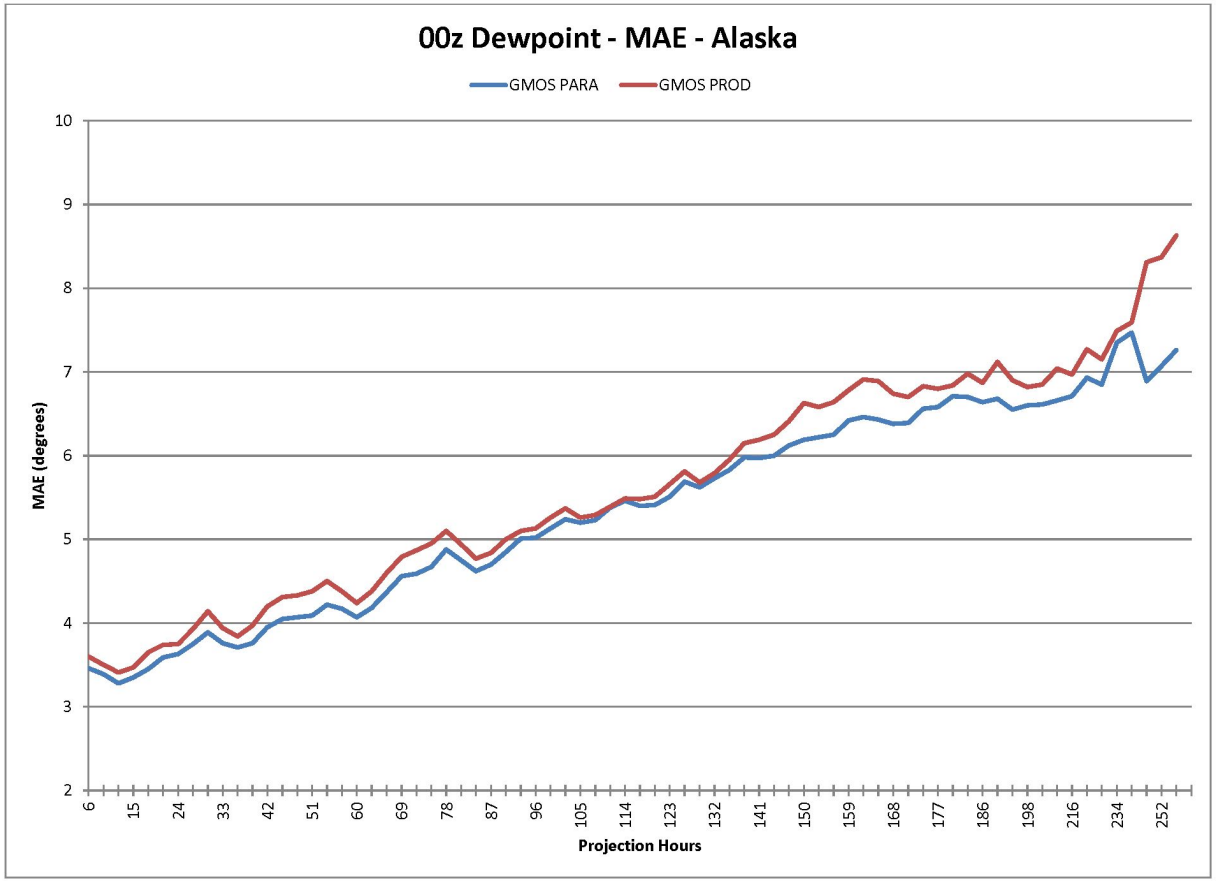
Projection Hours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GMOS PROD
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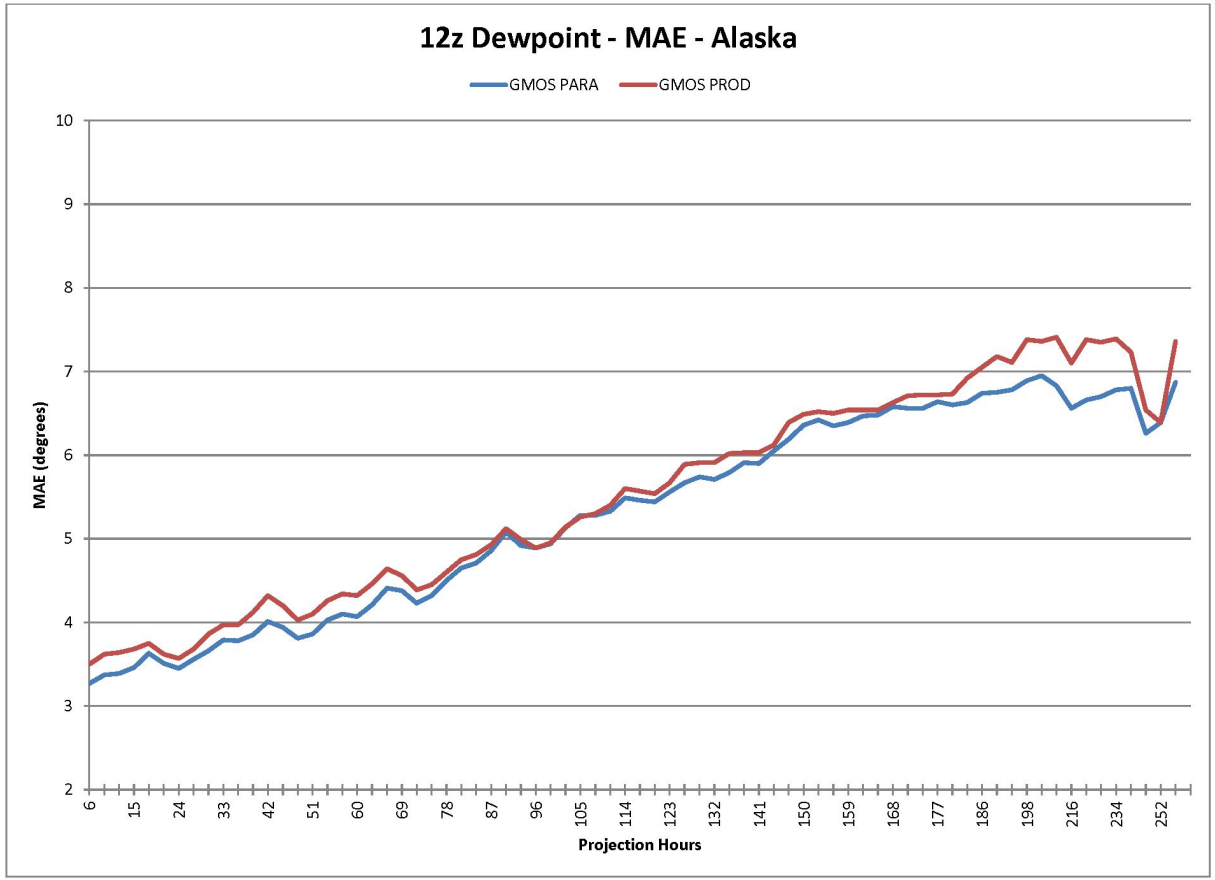
Projection Hours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Daytime Maximum Temperature Verification

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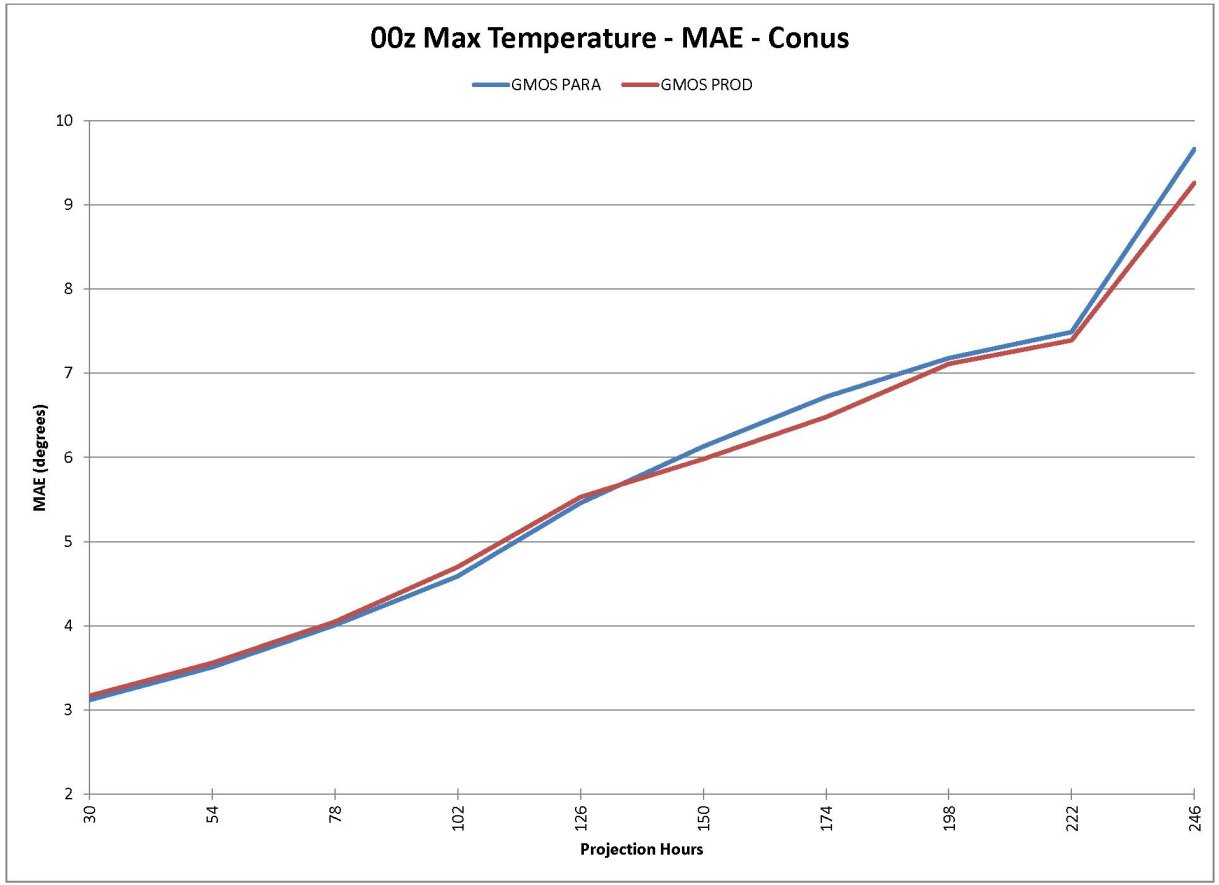
00z Max Temperature - MAE - Conus
GMOS PARA
GMOS PROD
MAE (degrees)
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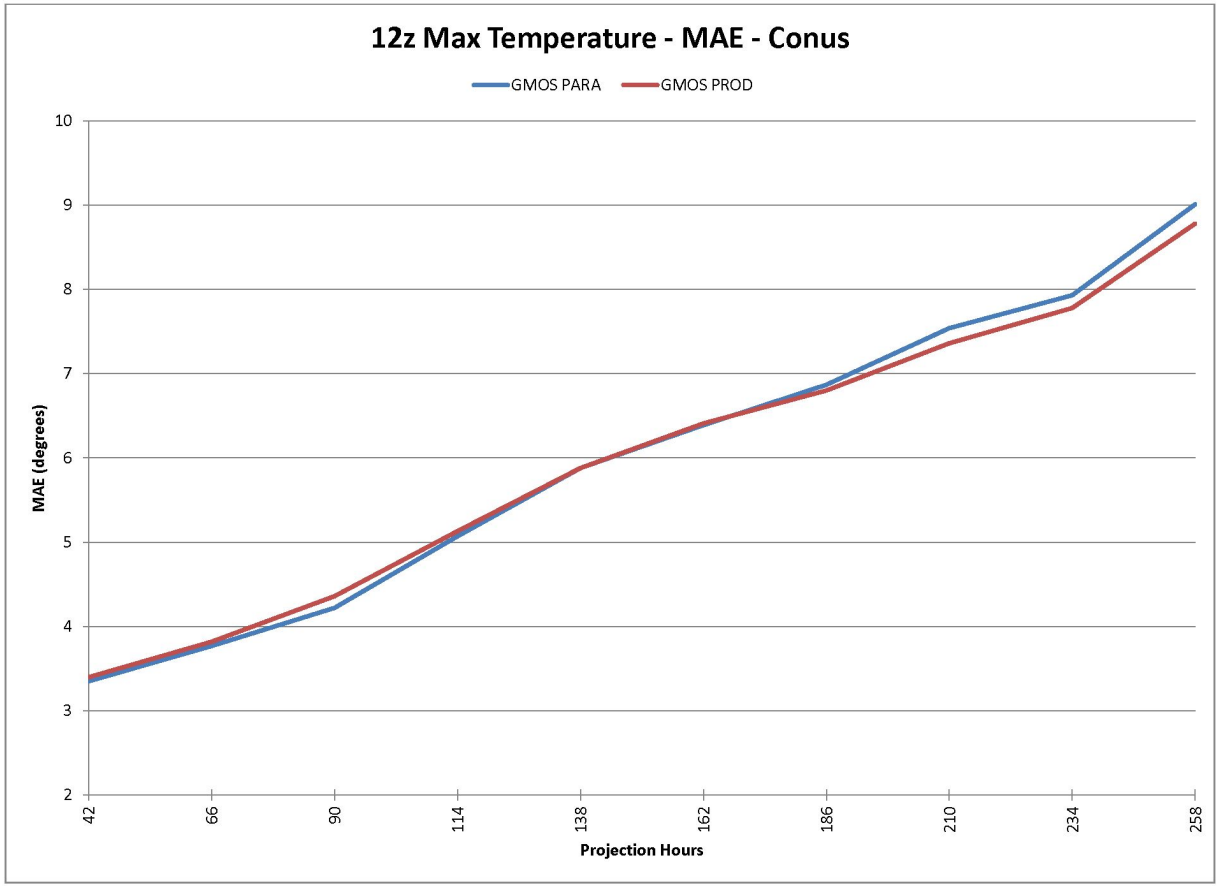
Projection Hours


12z Max Temperature - MAE - Conus
GMOS PARA
GMOS PROD
MAE (degrees)
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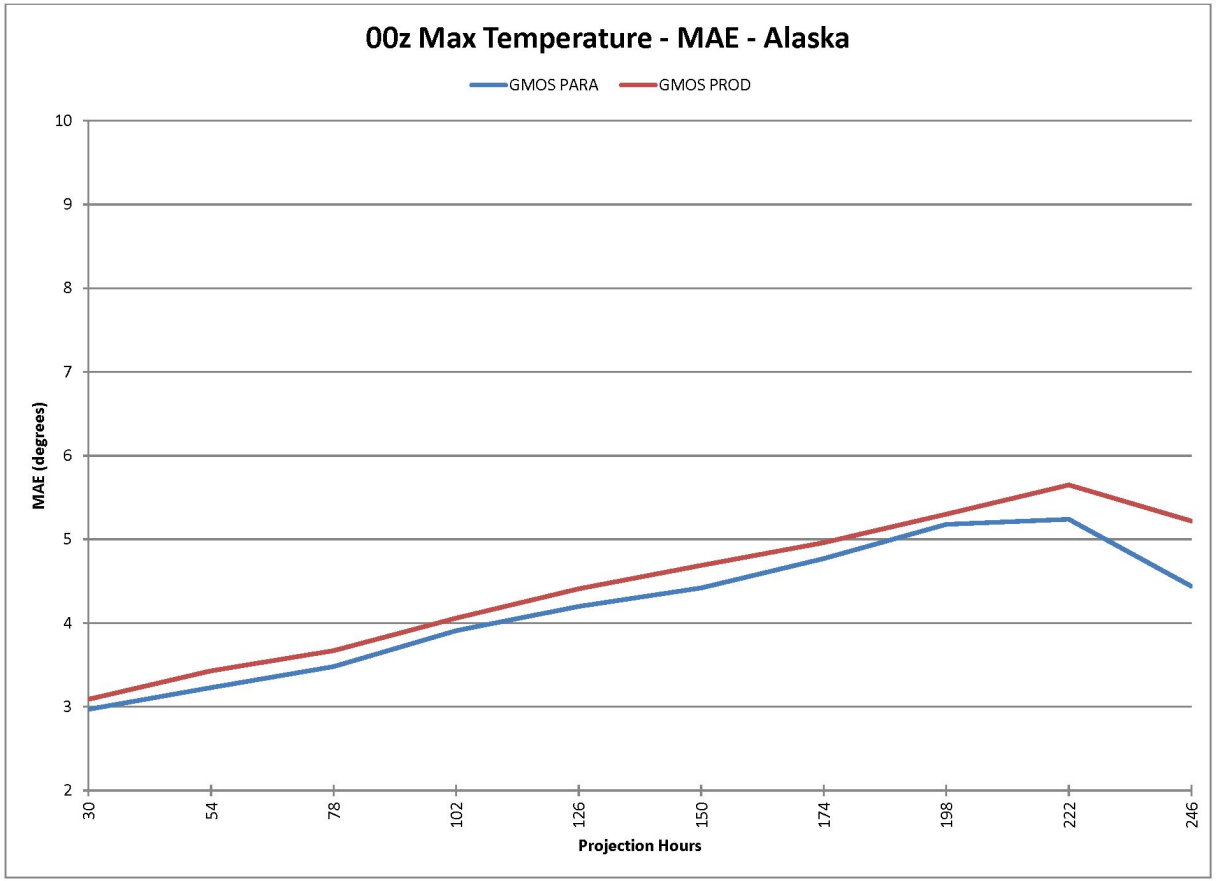
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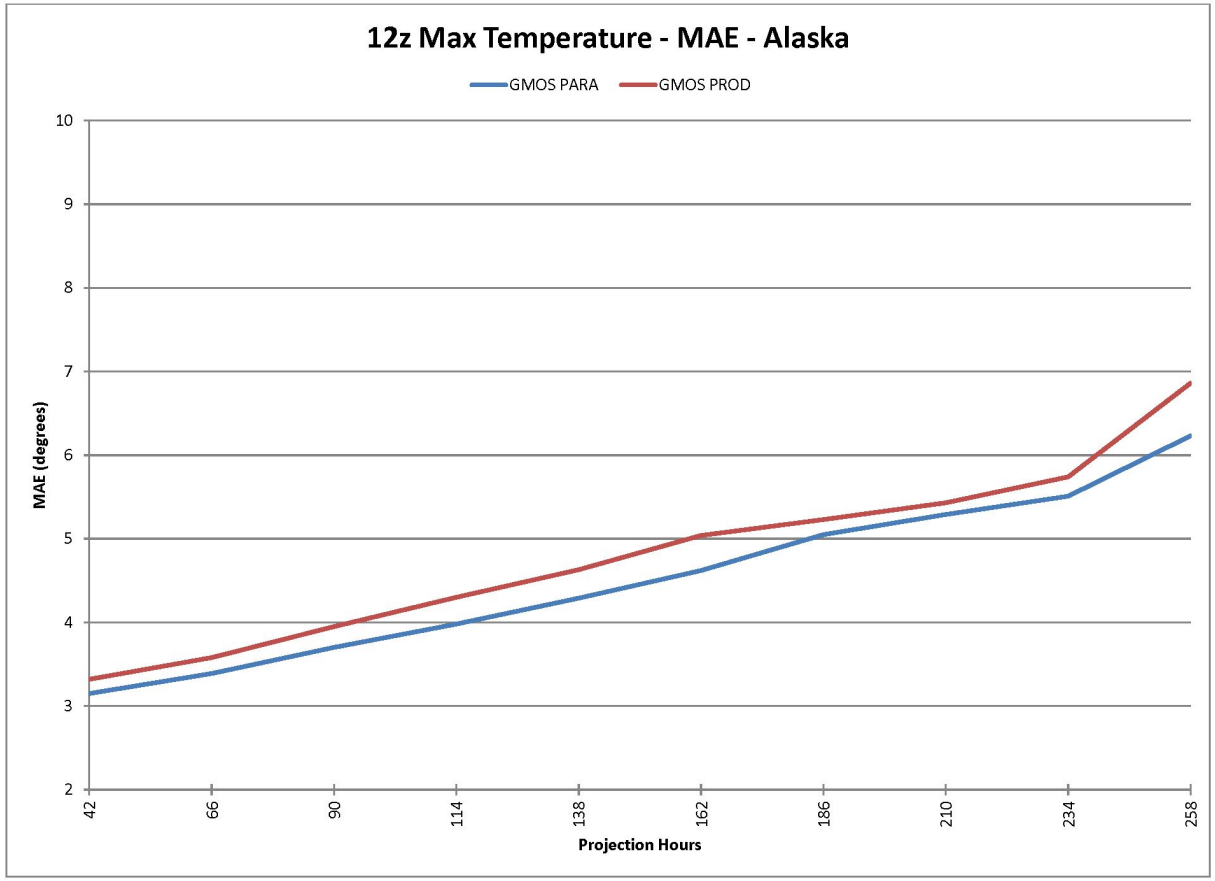
12z Max Temperature - MAE - Alaska
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MAE (degrees)
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Projection Hours

Nighttime Minimum Temperature Verification

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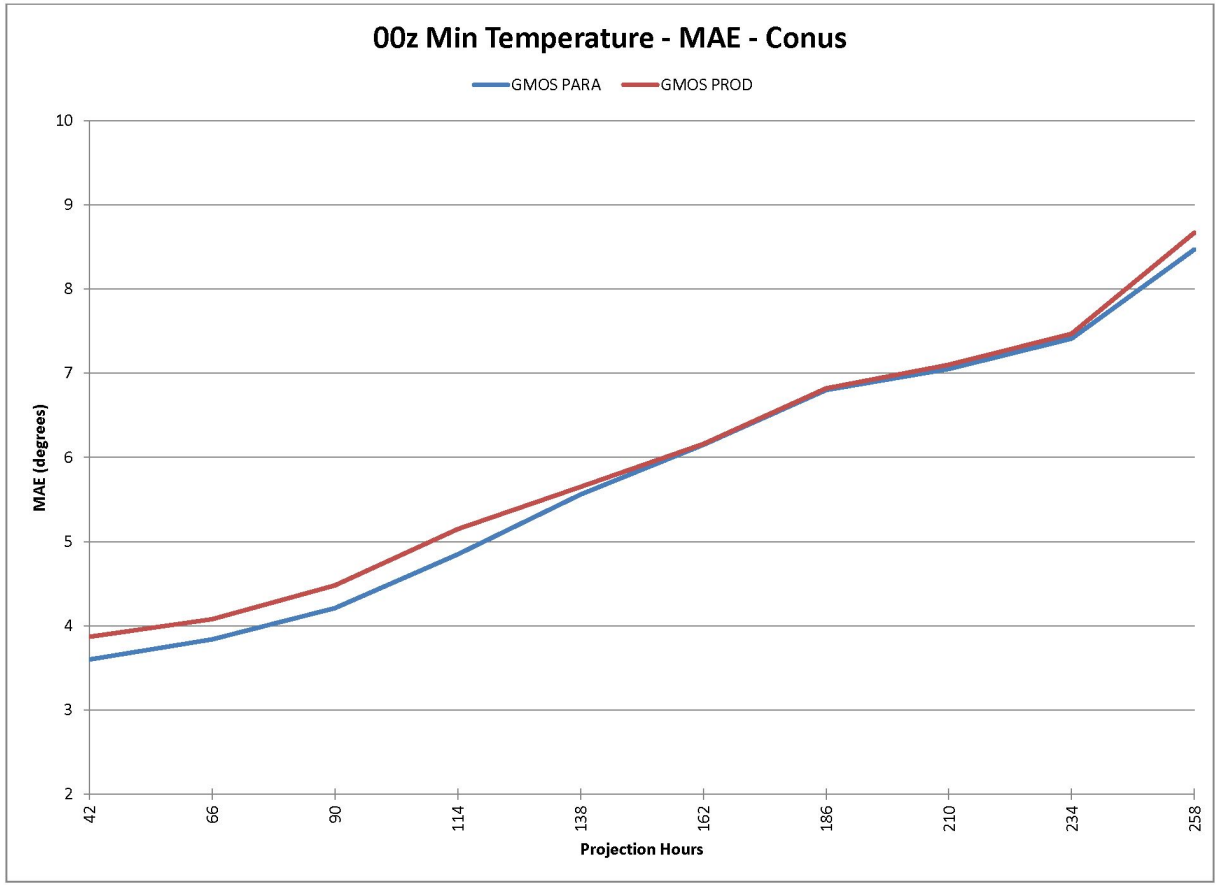
00z Min Temperature - MAE - Conus
GMOS PARA
GMOS PROD
MAE (degrees)
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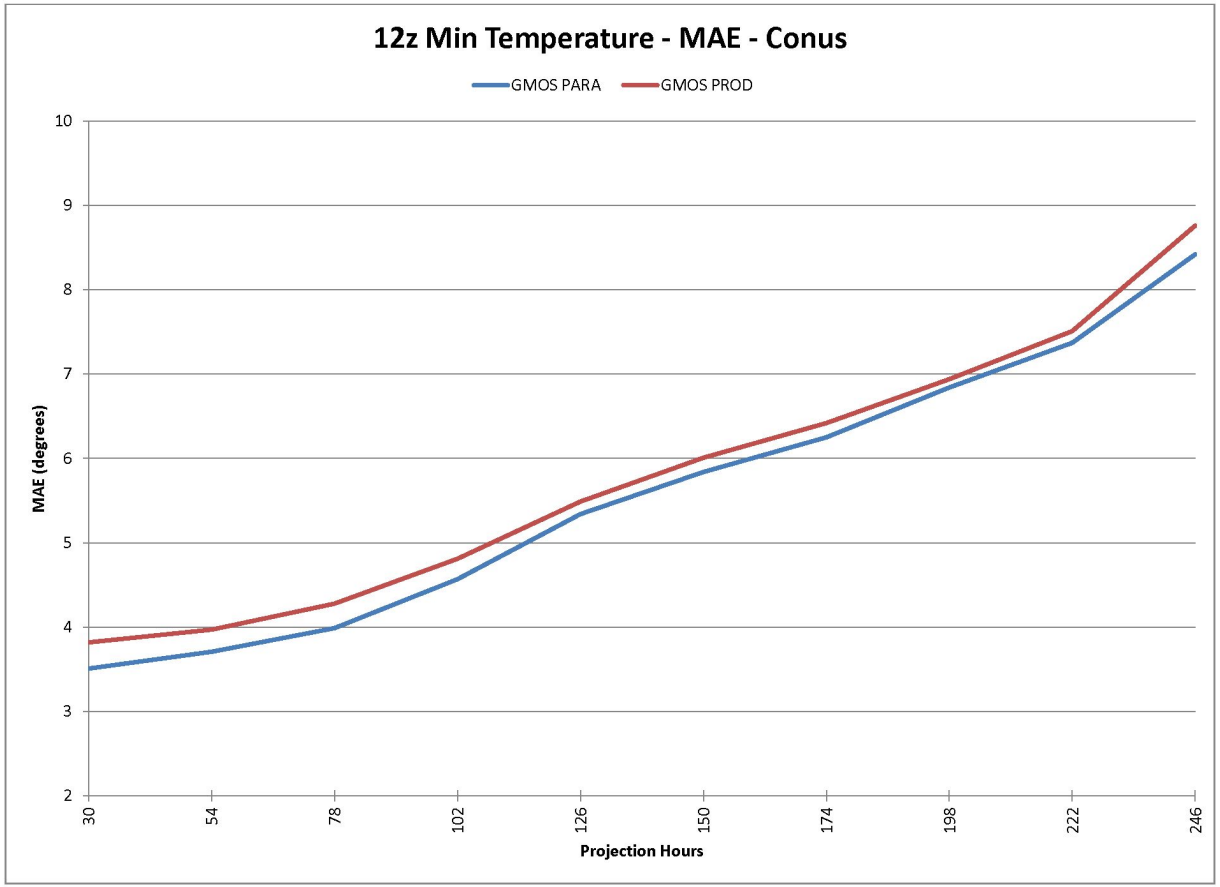
Projection Hours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GMOS PARA
GMOS PROD
MAE (degrees)
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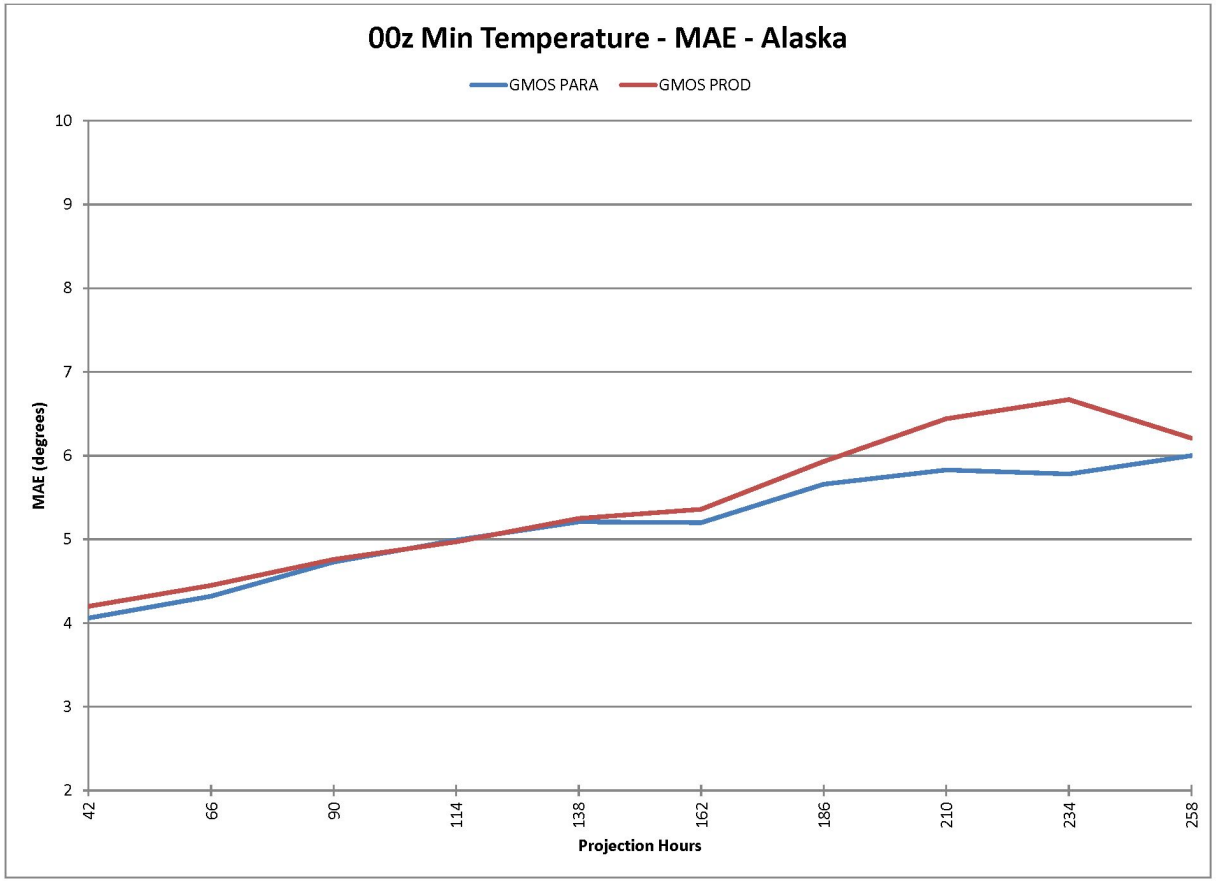
Projection Hours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GMOS PARA
GMOS PROD
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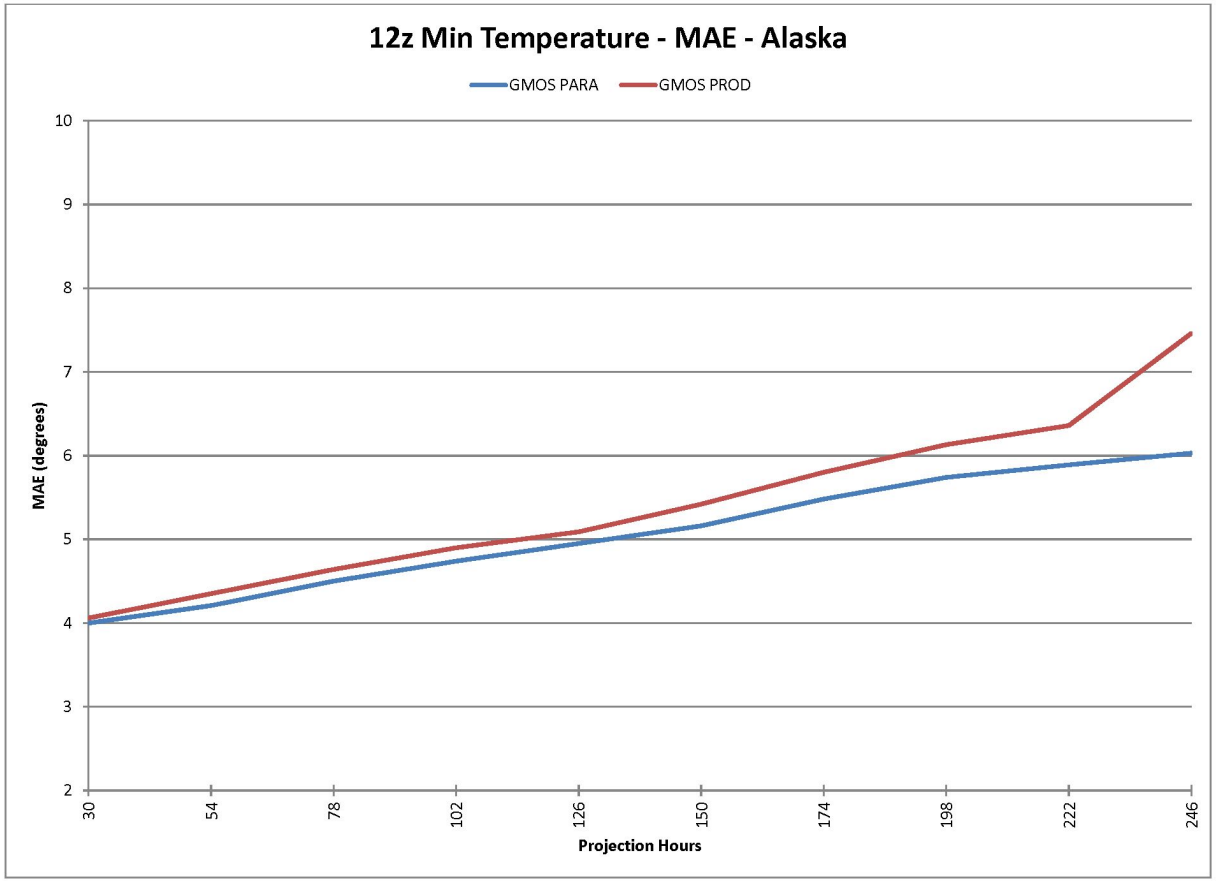
12z Min Temperature - MAE - Alaska
GMOS PARA
GMOS PROD
MAE (degrees)
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Projection Hours

Sky Cover Verification

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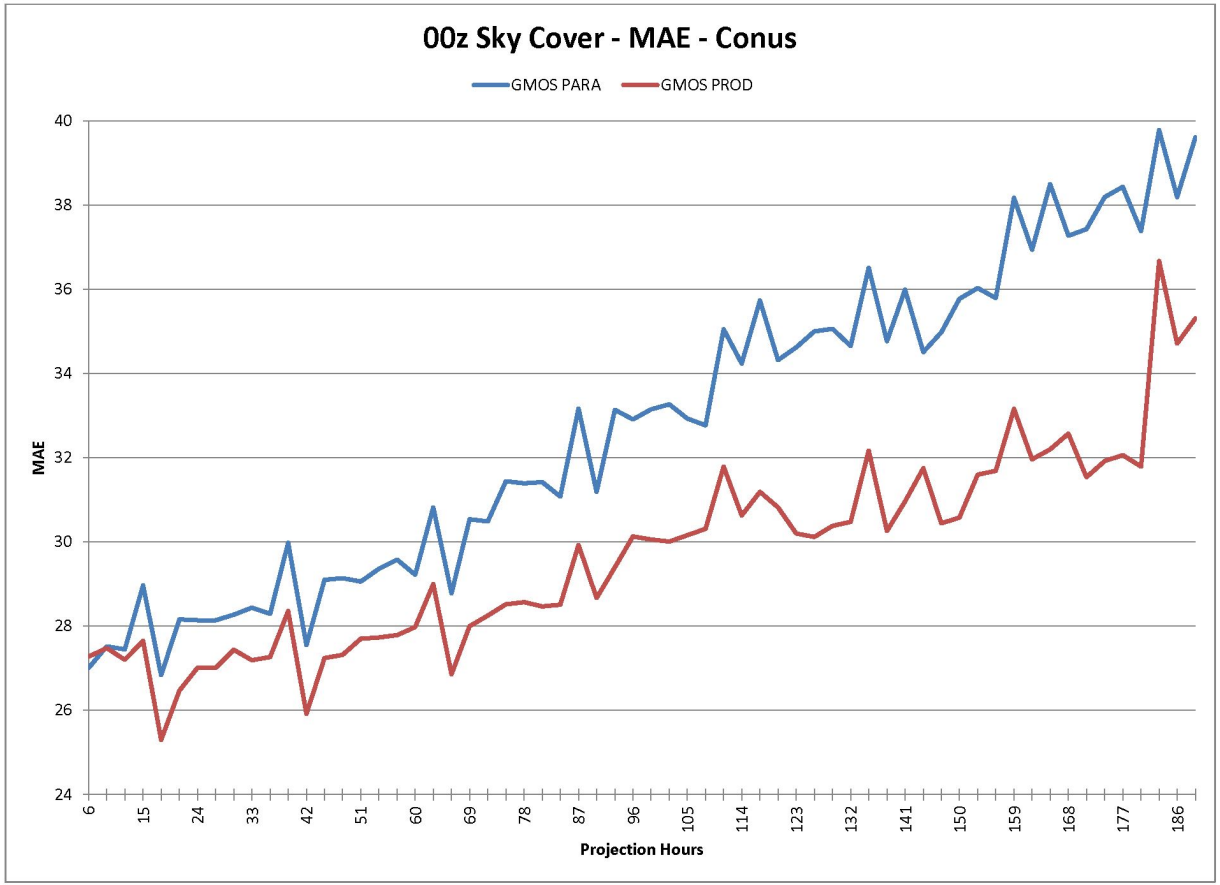
00z Sky Cover - MAE - Conus
GMOS PARA
GMOS PROD
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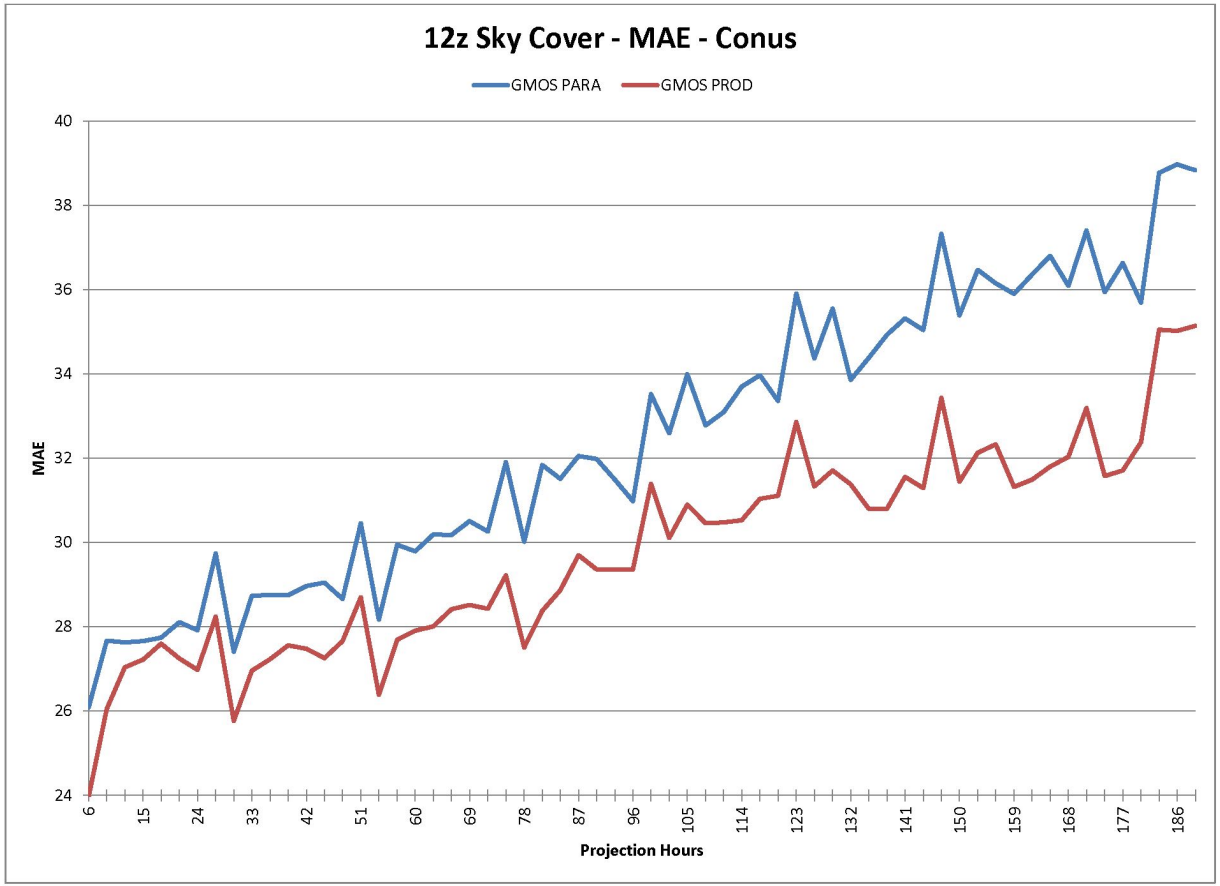
Projection Hours


12z Sky Cover - MAE - Conus
GMOS PARA
GMOS PROD
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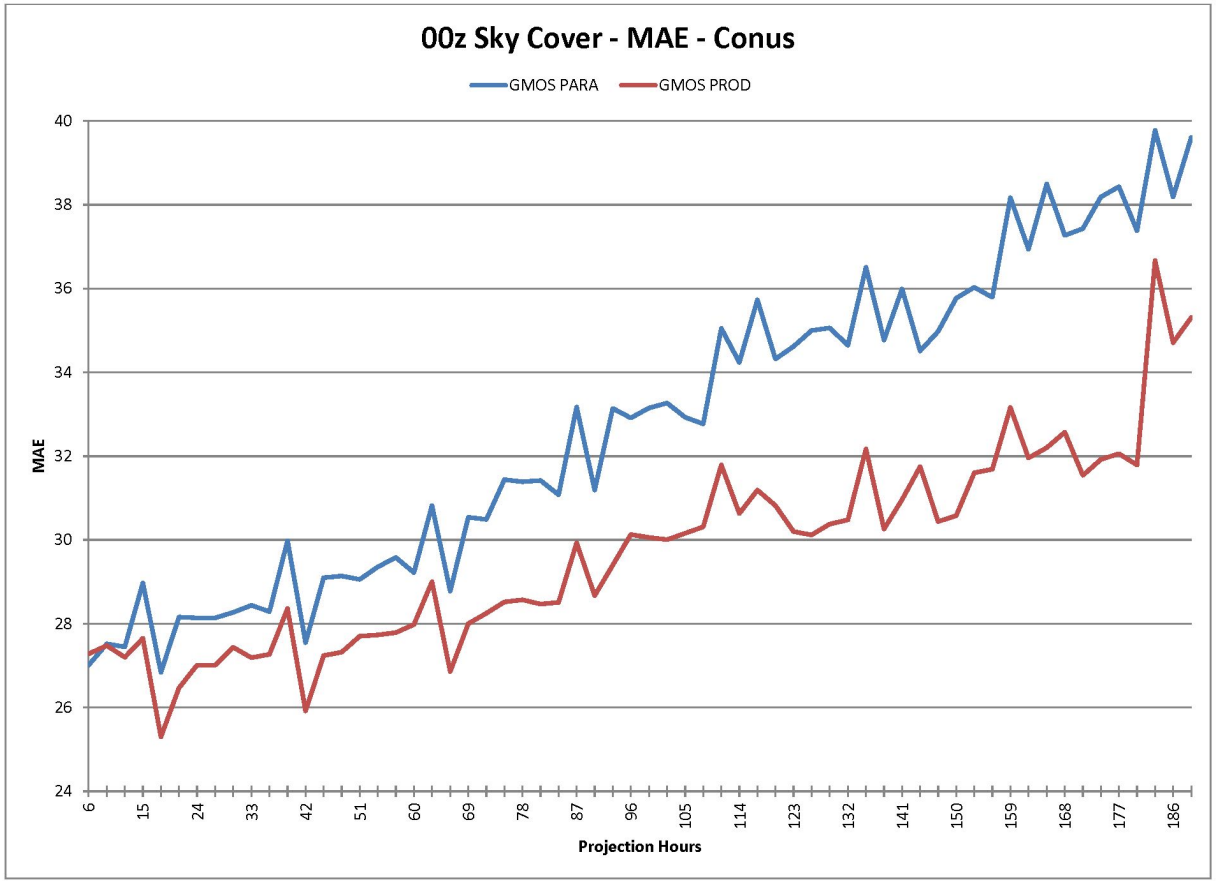
Projection Hours


00z Sky Cover - MAE - Conus
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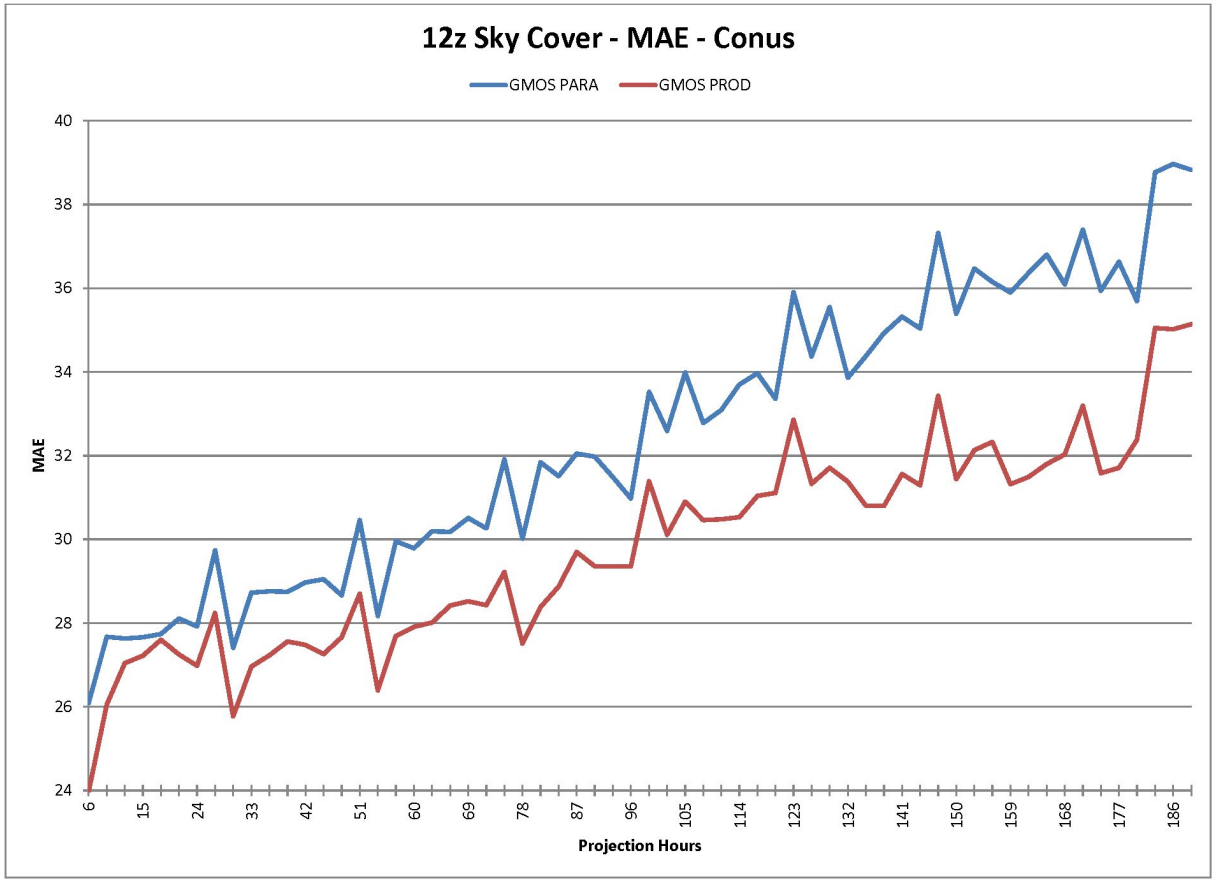
Projection Hours


12z Sky Cover - MAE - Conus
GMOS PARA
GMOS PROD
MAE
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Projection Hours

Wind Speed Verification

1. Verification Dates: 20171201-20171231
2. Domains: CONUS and Alaska
3. Scores: Mean Absolute Error (MAE) and Bias, verified against URMA
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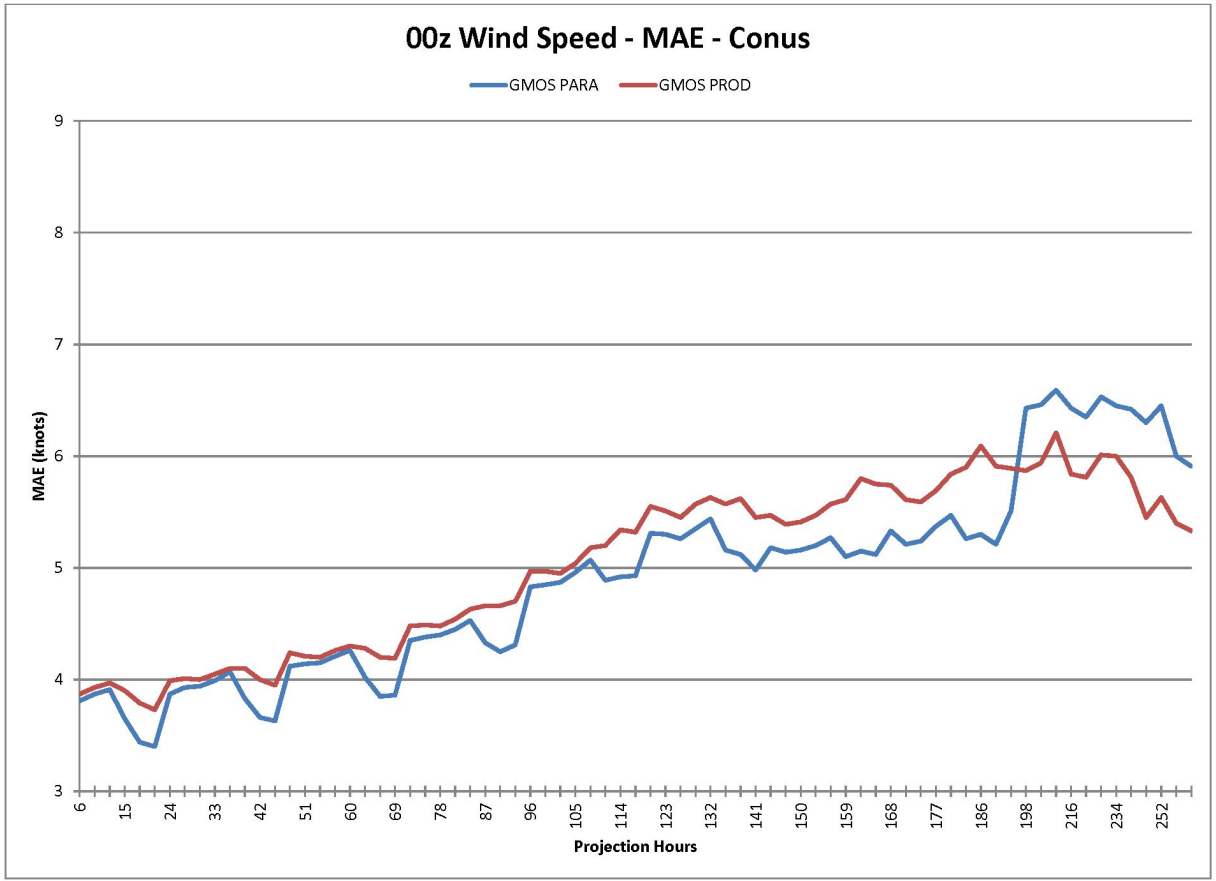
00z Wind Speed - MAE - Conus
GMOS PARA
GMOS PROD
MAE (knots)
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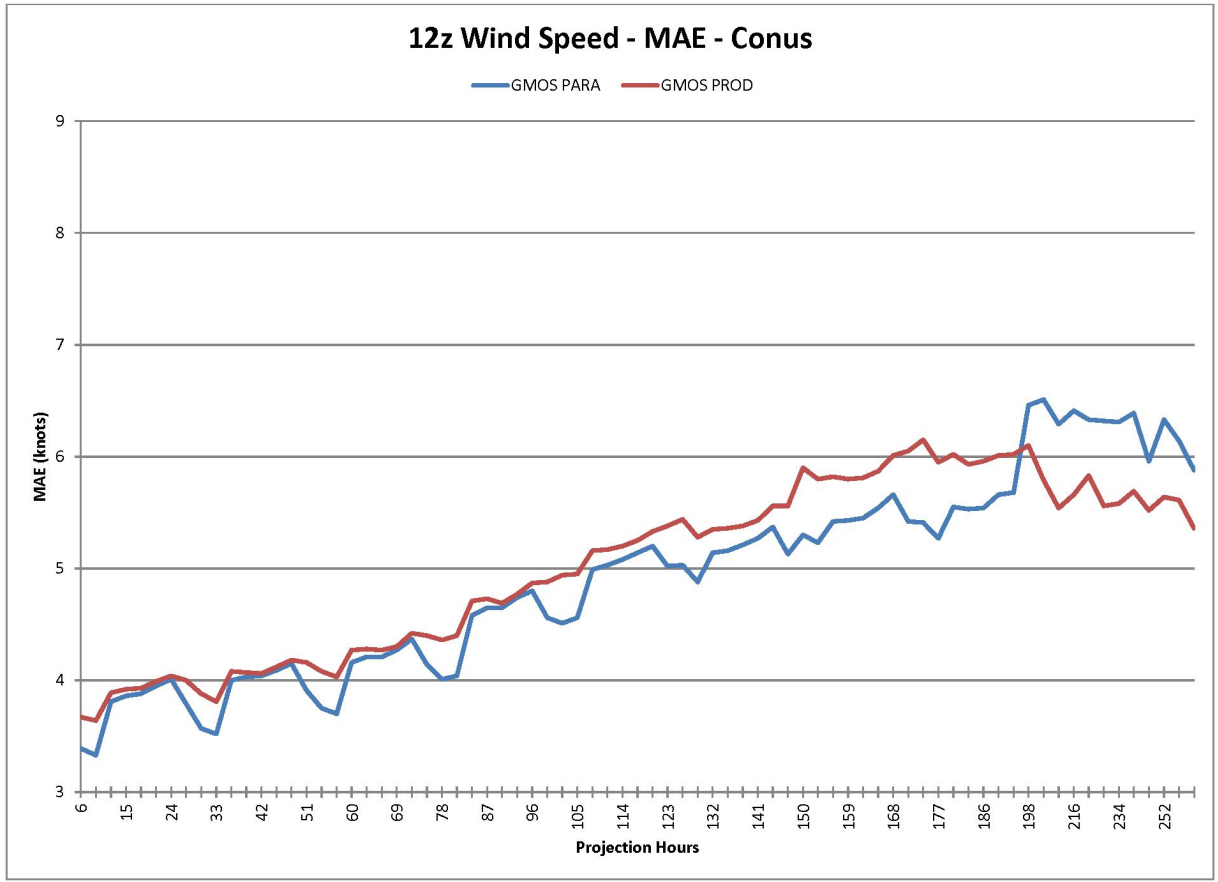
Projection Hours


12z Wind Speed - MAE - Conus
GMOS PARA
GMOS PROD
MAE (knots)
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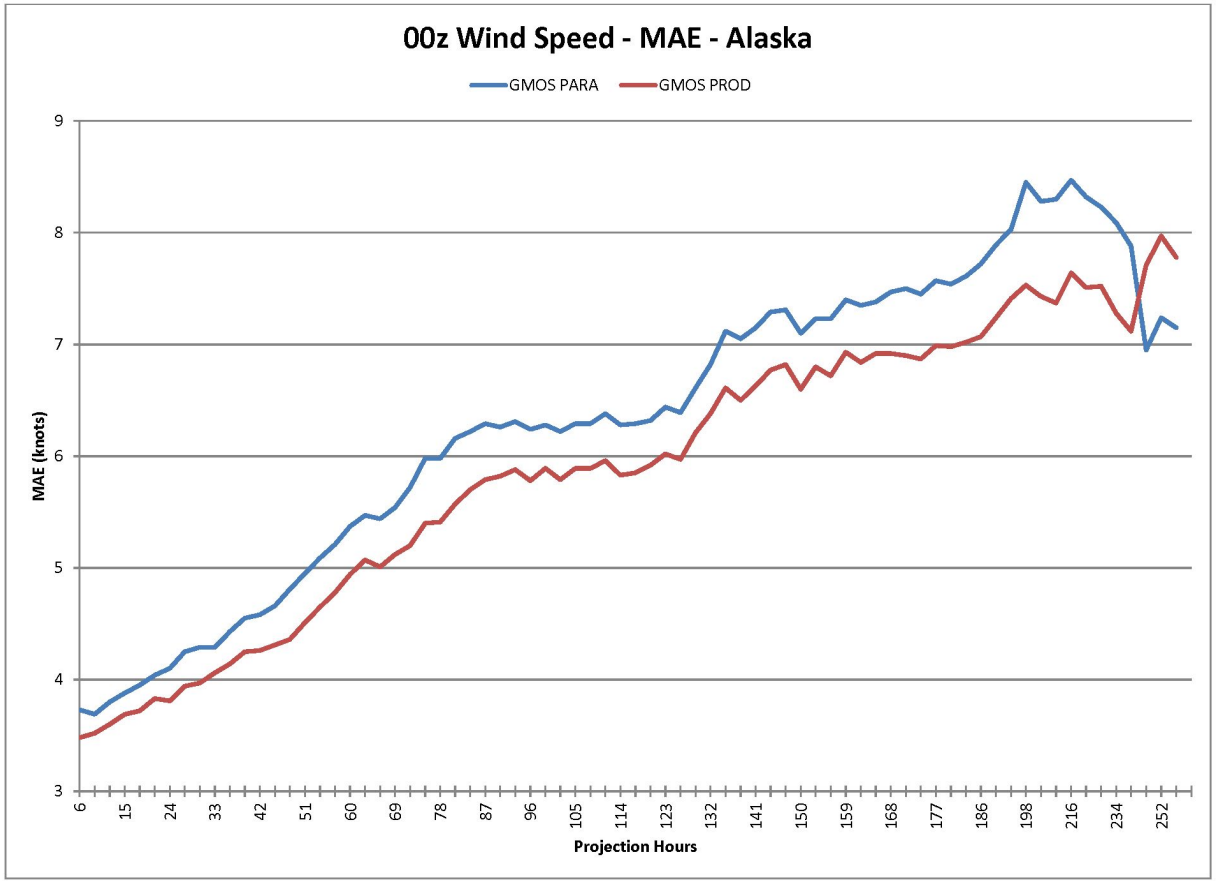
Projection Hours


00z Wind Speed - MAE - Alaska
GMOS PARA
GMOS PROD
MAE (knots)
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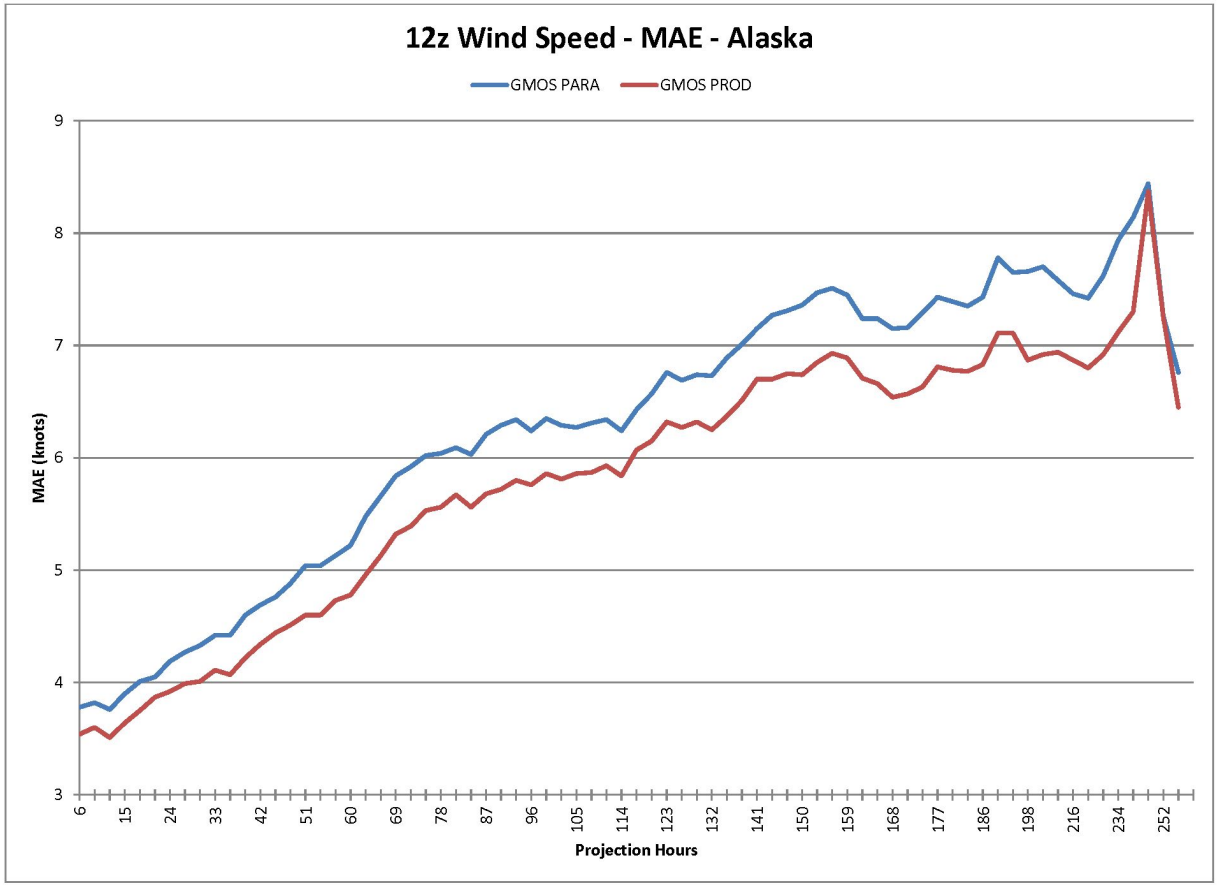
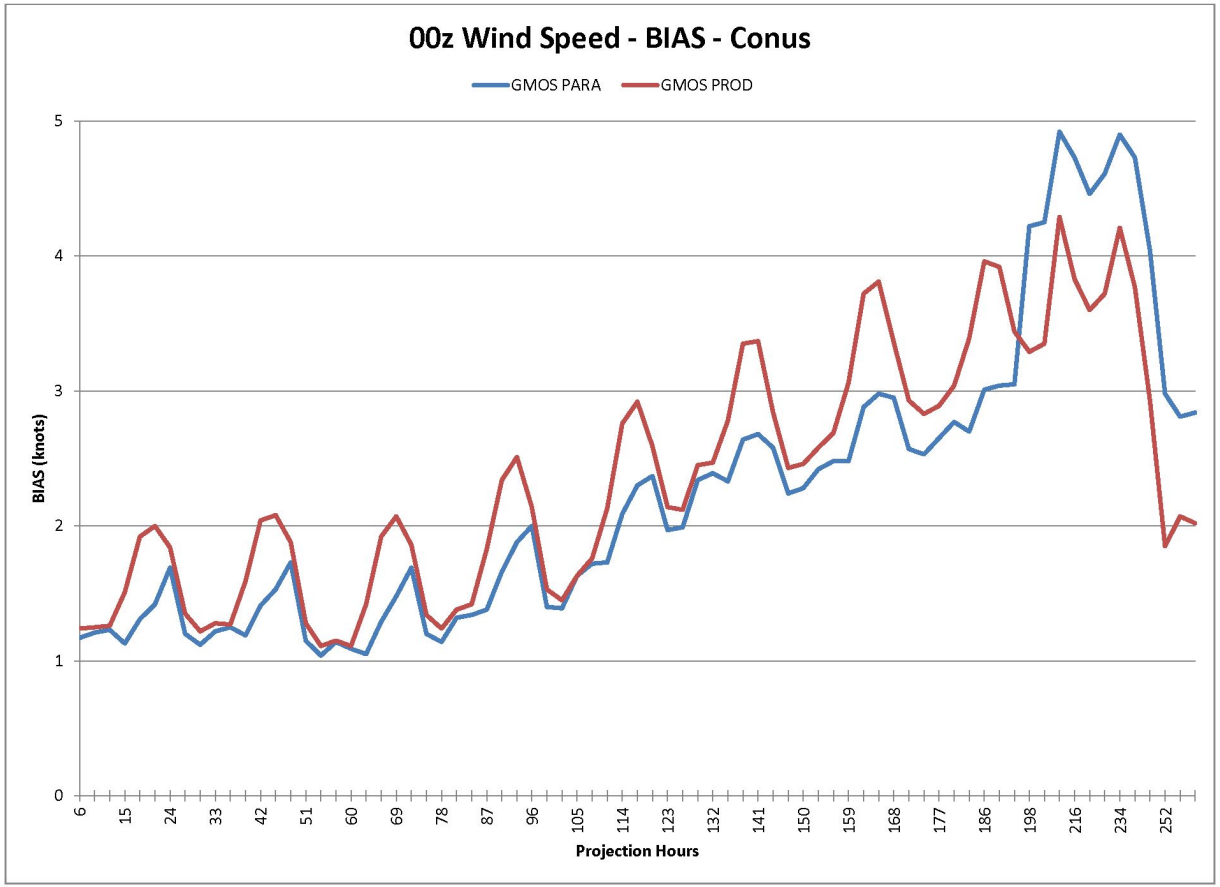
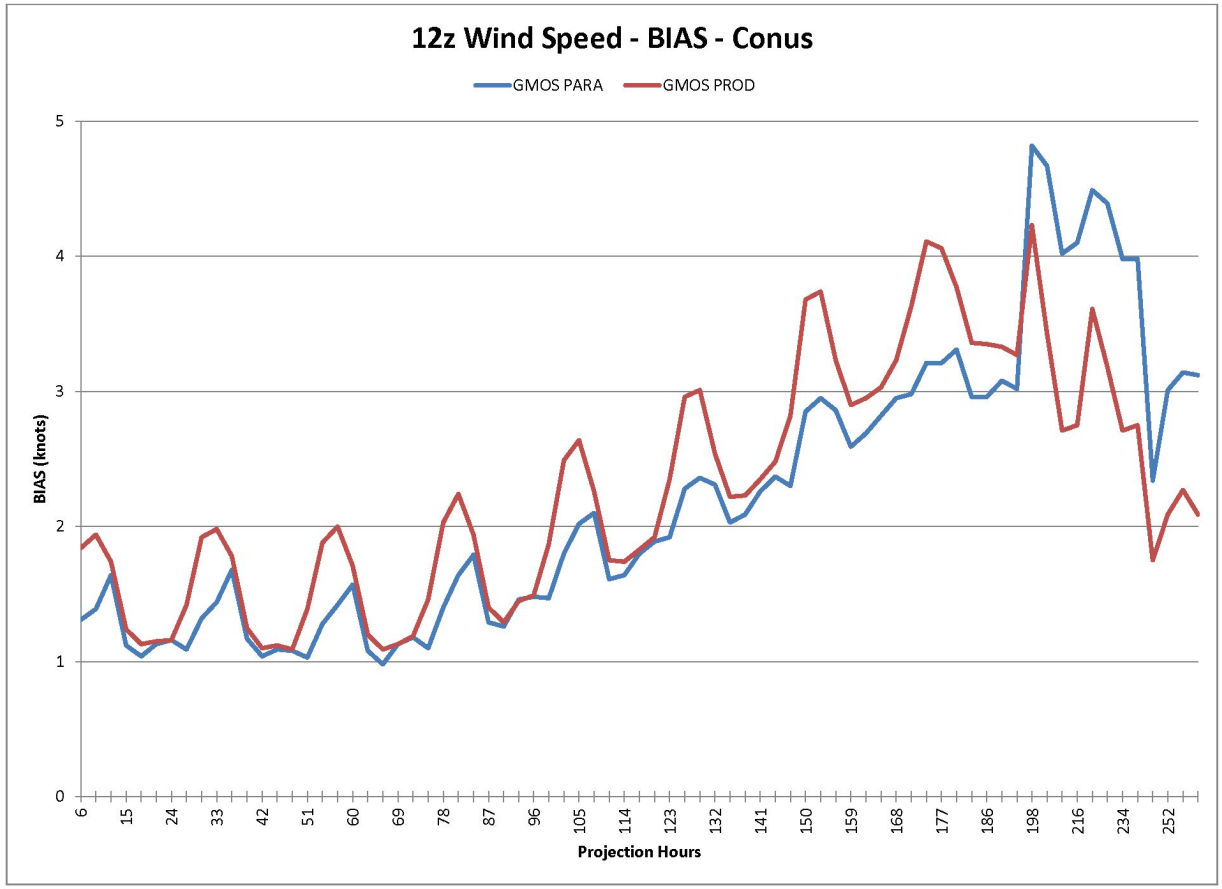
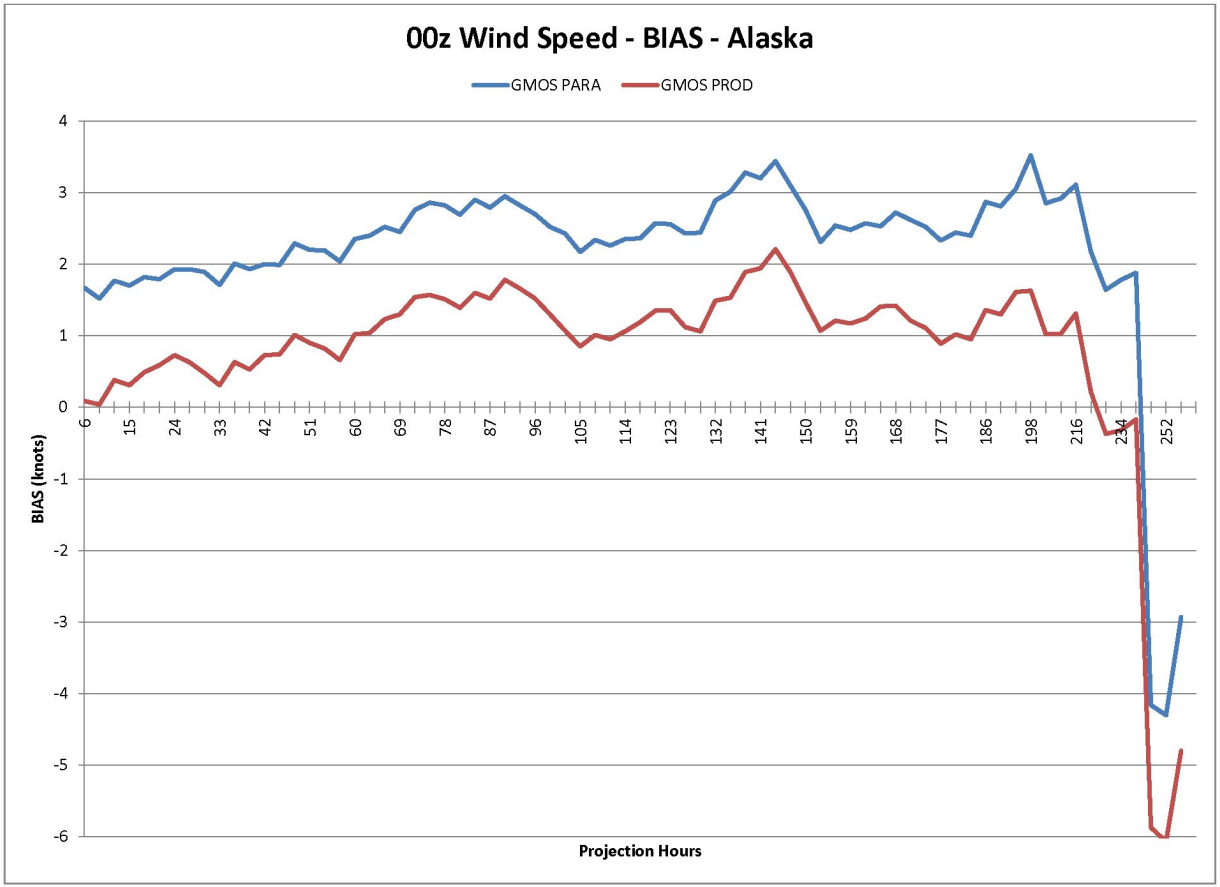
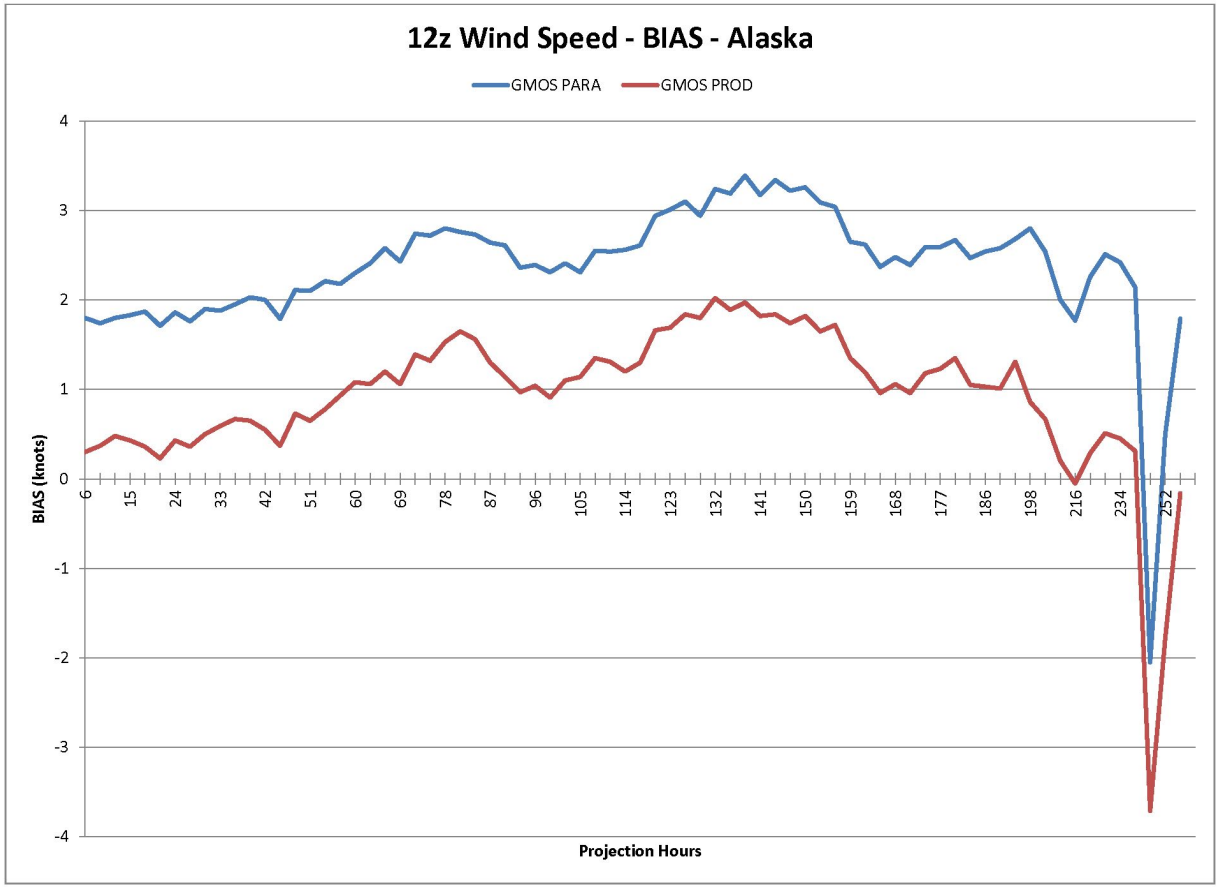
Projection Hours


12z Wind Speed - MAE - Alaska
GMOS PARA
GMOS PROD
MAE (knots)
9
8
7
6
5
4
3
6
15
24
33
42
51
60
69
78
87
96
105
114
123
132
141
150
159
168
177
186
198
216
234
252
Projection Hours


00z Wind Speed - BIAS - Conus
GMOS PARA
GMOS PROD
BIAS (knots)
0
1
2
3
4
5
6
15
24
33
42
51
60
69
78
87
96
105
114
123
132
141
150
159
168
177
186
198
216
234
252
Projection Hours

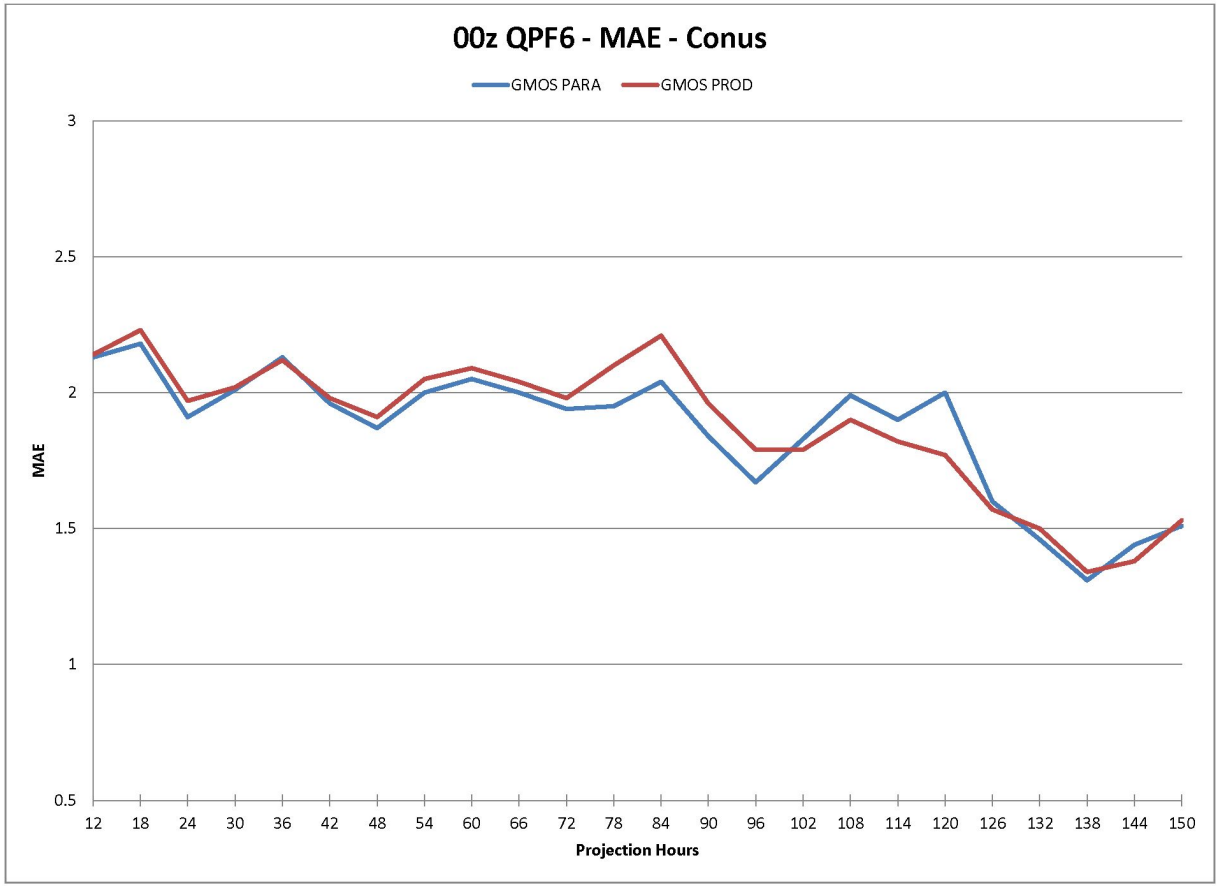

12z Wind Speed - BIAS - Conus
GMOS PARA
GMOS PROD
BIAS (knots)
0
1
2
3
4
5
6
15
24
33
42
51
60
69
78
87
96
105
114
123
132
141
150
159
168
177
186
198
216
234
252
Projection Hours

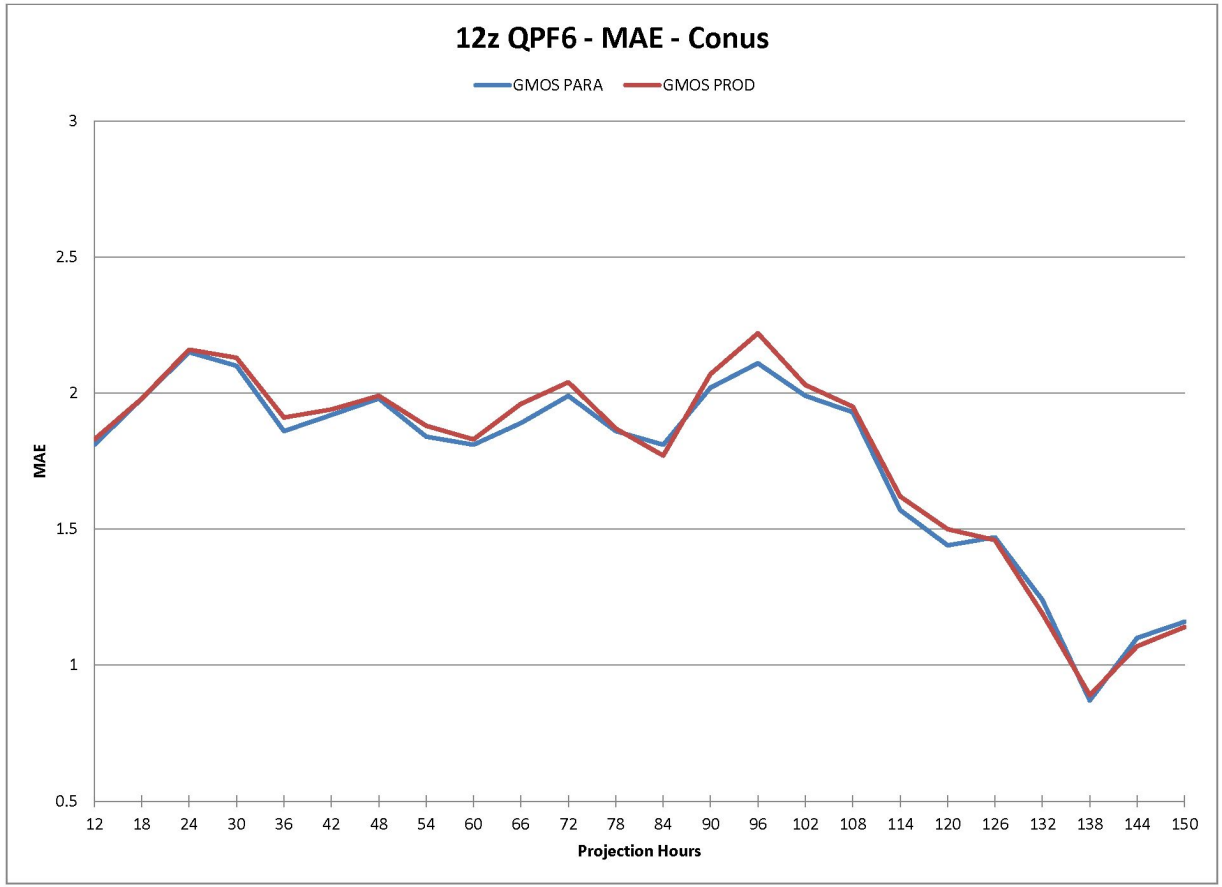

00z Wind Speed - BIAS - Alaska
GMOS PARA
GMOS PROD
BIAS (knots)
4
3
2
1
0
-1
-2
-3
-4
-5
-6
6
15
24
33
42
51
60
69
78
87
96
105
114
123
132
141
150
159
168
177
186
198
216
234
252
Projection Hours

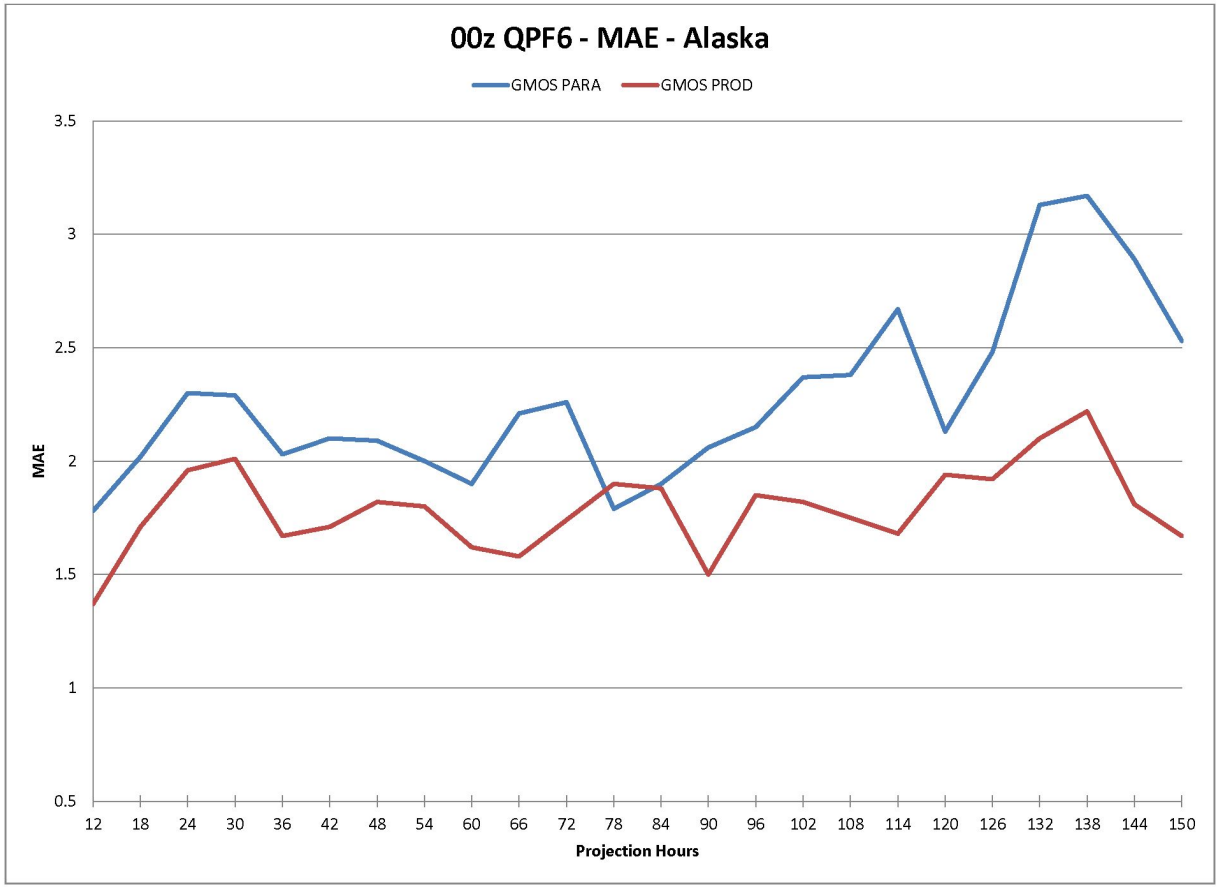

12z Wind Speed - BIAS - Alaska
GMOS PARA
GMOS PROD
BIAS (knots)
4
3
2
1
0
-1
-2
-3
-4
6
15
24
33
42
51
60
69
78
87
96
105
114
123
132
141
150
159
168
177
186
198
216
234
252
Projection Hours

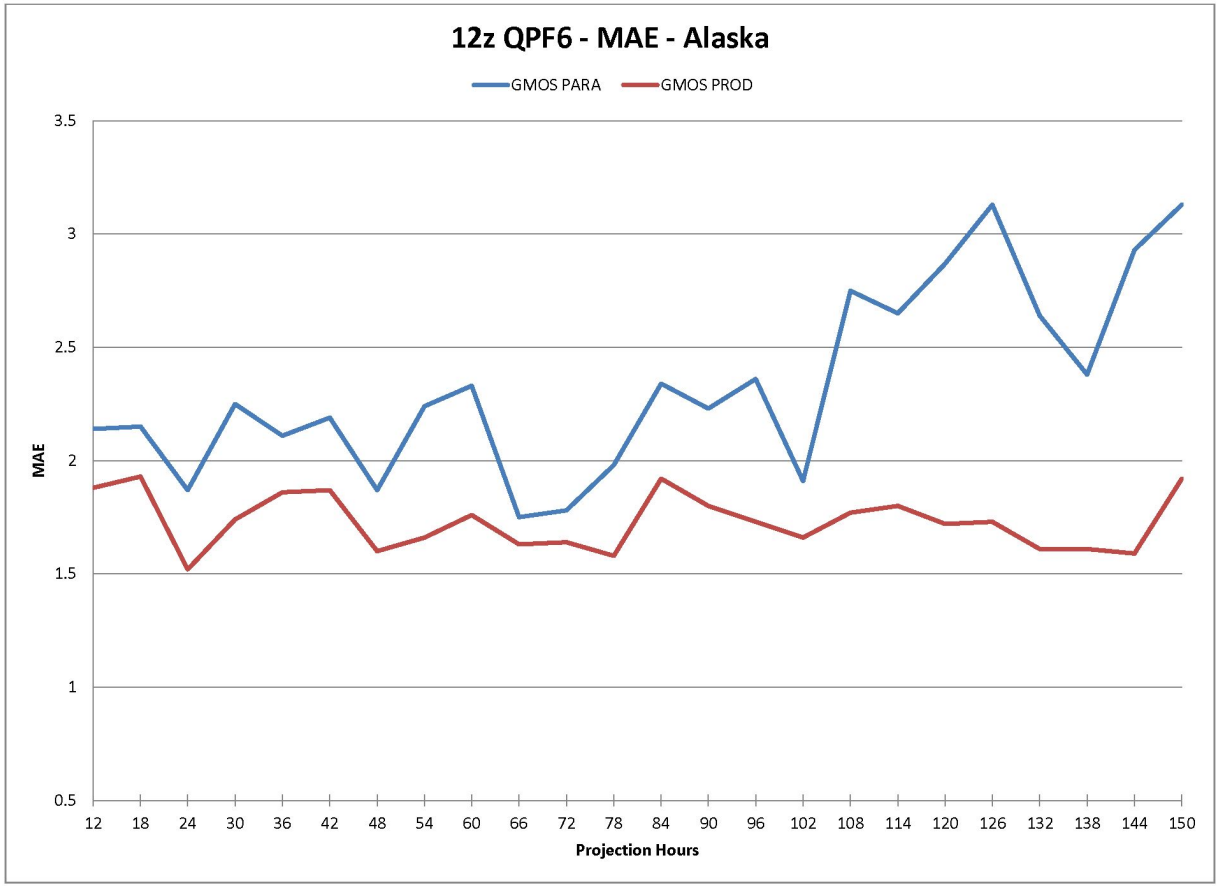
6-HR QPF Verification

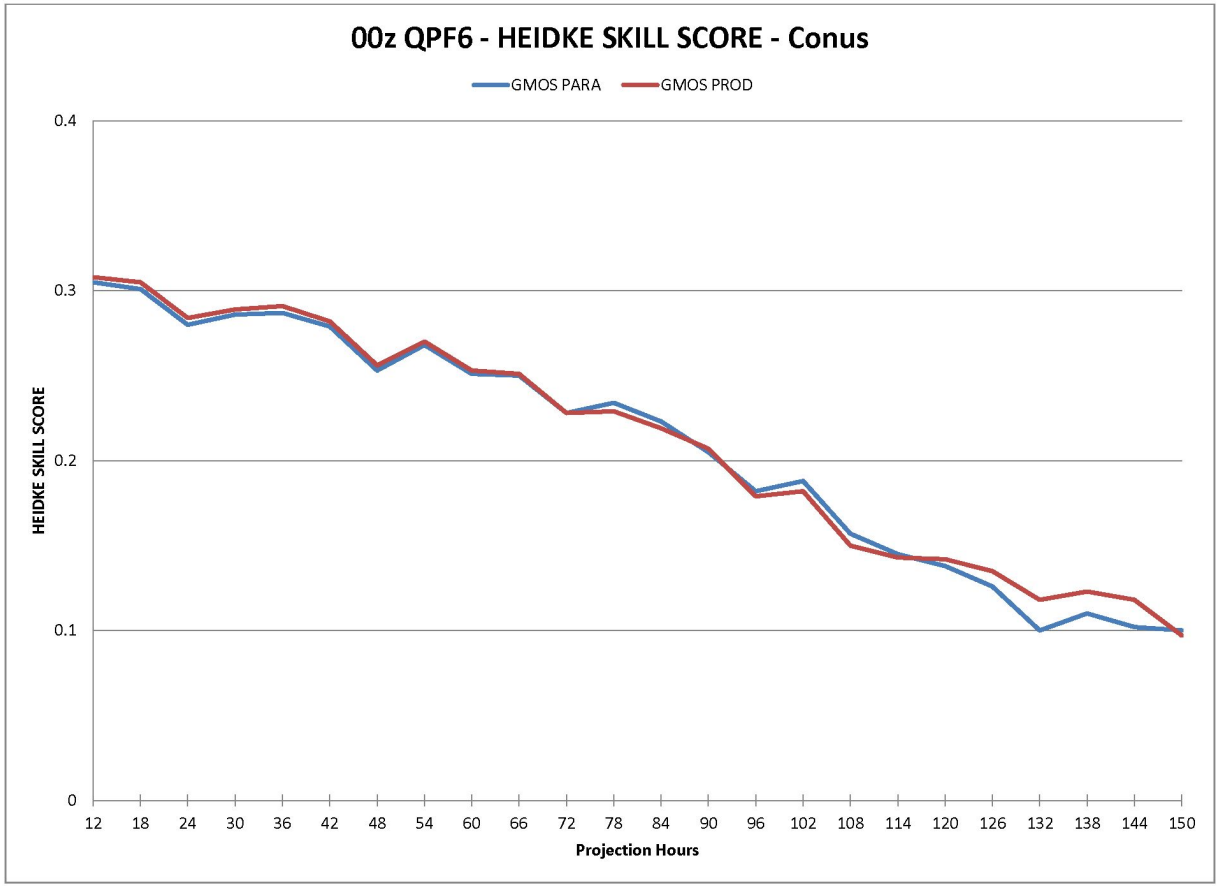
1. Verification Dates: 20171201-20171231
2. Domains: CONUS and Alaska
3. Scores: Mean Absolute Error (MAE), HEIDKE Skill Score, verified against URMA
    a. CONUS grids were clipped to match the URMA grid
4. Models verified
    a. GMOS Para - Parallel run of GMOS, which includes the latest updates
    b. GMOS Prod - Operational version of GMOS currently running in production

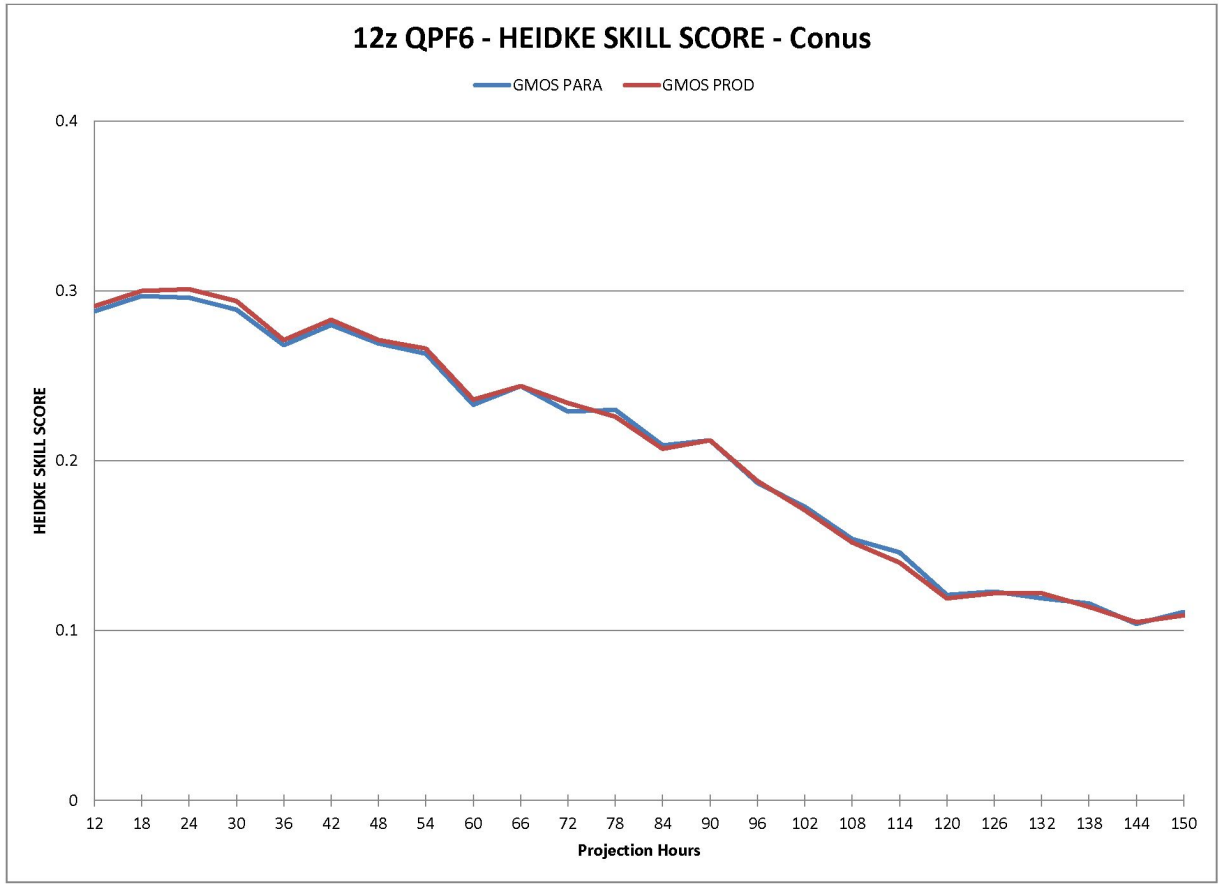

00z QPF6 - MAE - Conus
GMOS PARA
GMOS PROD
MAE
3
2.5
2
1.5
1
0.5
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
102
108
114
120
126
132
138
144
150
Projection Hours

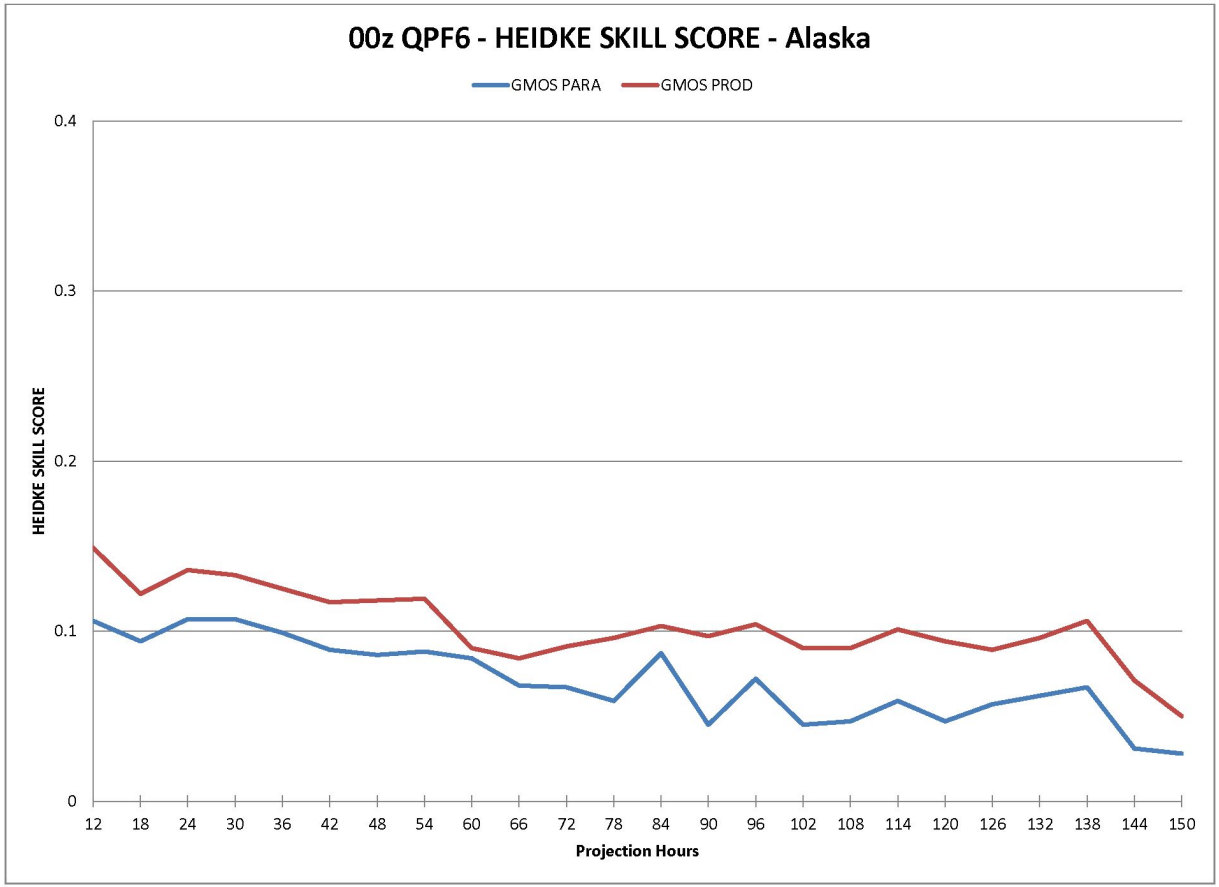

12z QPF6 - MAE - Conus
GMOS PARA
GMOS PROD
MAE
3
2.5
2
1.5
1
0.5
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
102
108
114
120
126
132
138
144
150
Projection Hours

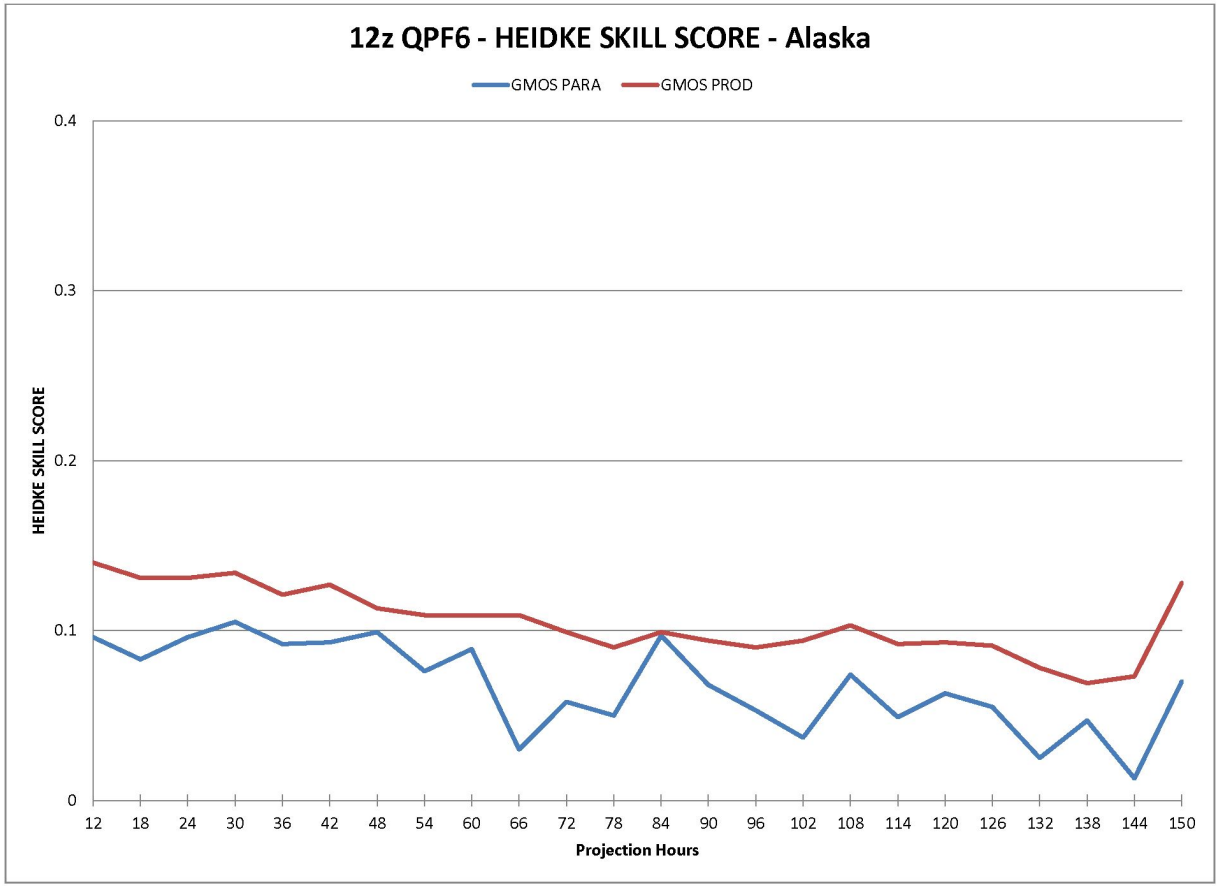

00z QPF6 - MAE - Alaska
GMOS PARA
GMOS PROD
MAE
3.5
3
2.5
2
1.5
1
0.5
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
102
108
114
120
126
132
138
144
150
Projection Hours


12z QPF6 - MAE - Alaska
GMOS PARA
GMOS PROD
MAE
3.5
3
2.5
2
1.5
1
0.5
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
102
108
114
120
126
132
138
144
150
Projection Hours


00z QPF6 - HEIDKE SKILL SCORE - Conus
GMOS PARA
GMOS PROD
HEIDKE SKILL SCORE
0.4
0.3
0.2
0.1
0
12 18 24 30 36 42 48 54 60 66 72 78 84 90 96 102 108 114 120 126 132 138 144 150
Projection Hours

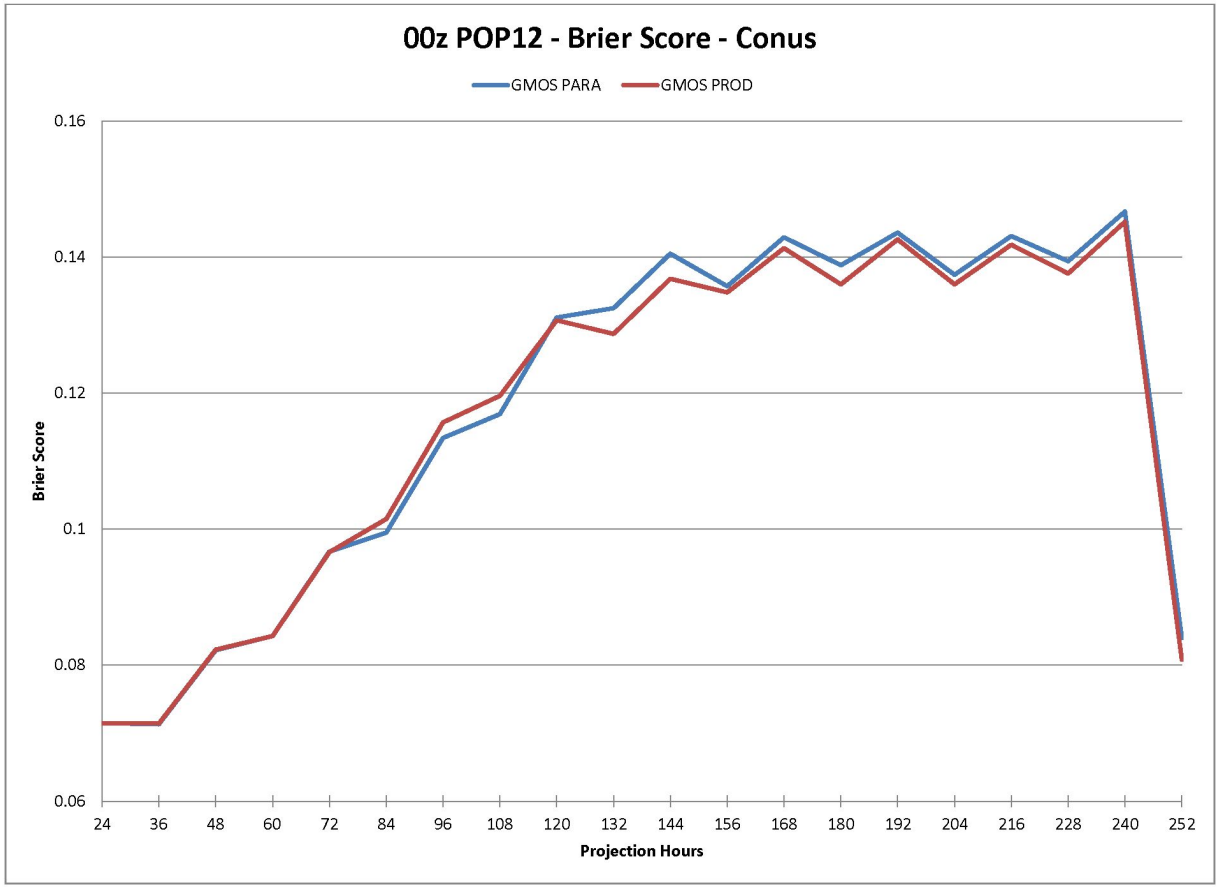

12z QPF6 - HEIDKE SKILL SCORE - Conus
GMOS PARA
GMOS PROD
HEIDKE SKILL SCORE
0.4
0.3
0.2
0.1
0
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
102
108
114
120
126
132
138
144
150
Projection Hours

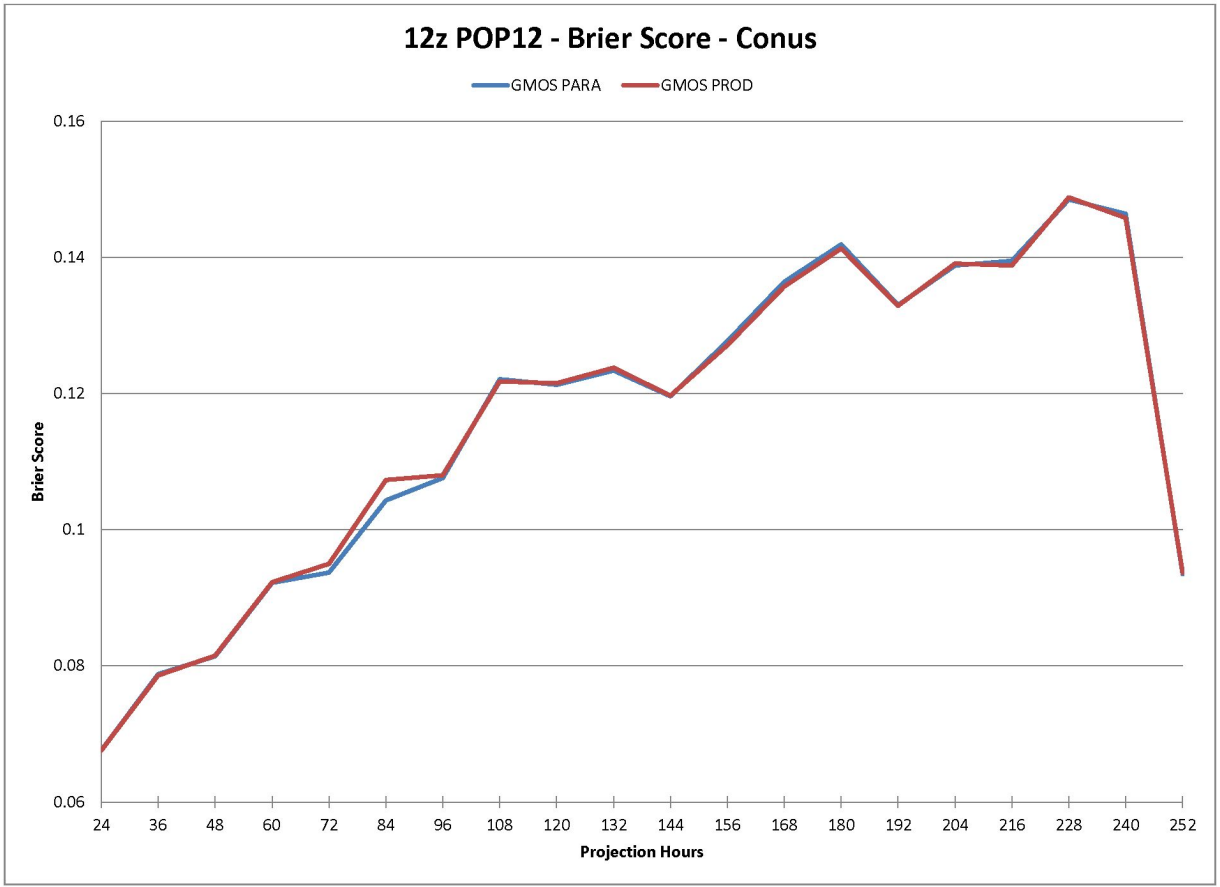

00z QPF6 - HEIDKE SKILL SCORE - Alaska
GMOS PARA
GMOS PROD
HEIDKE SKILL SCORE
0.4
0.3
0.2
0.1
0
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
102
108
114
120
126
132
138
144
150
Projection Hours

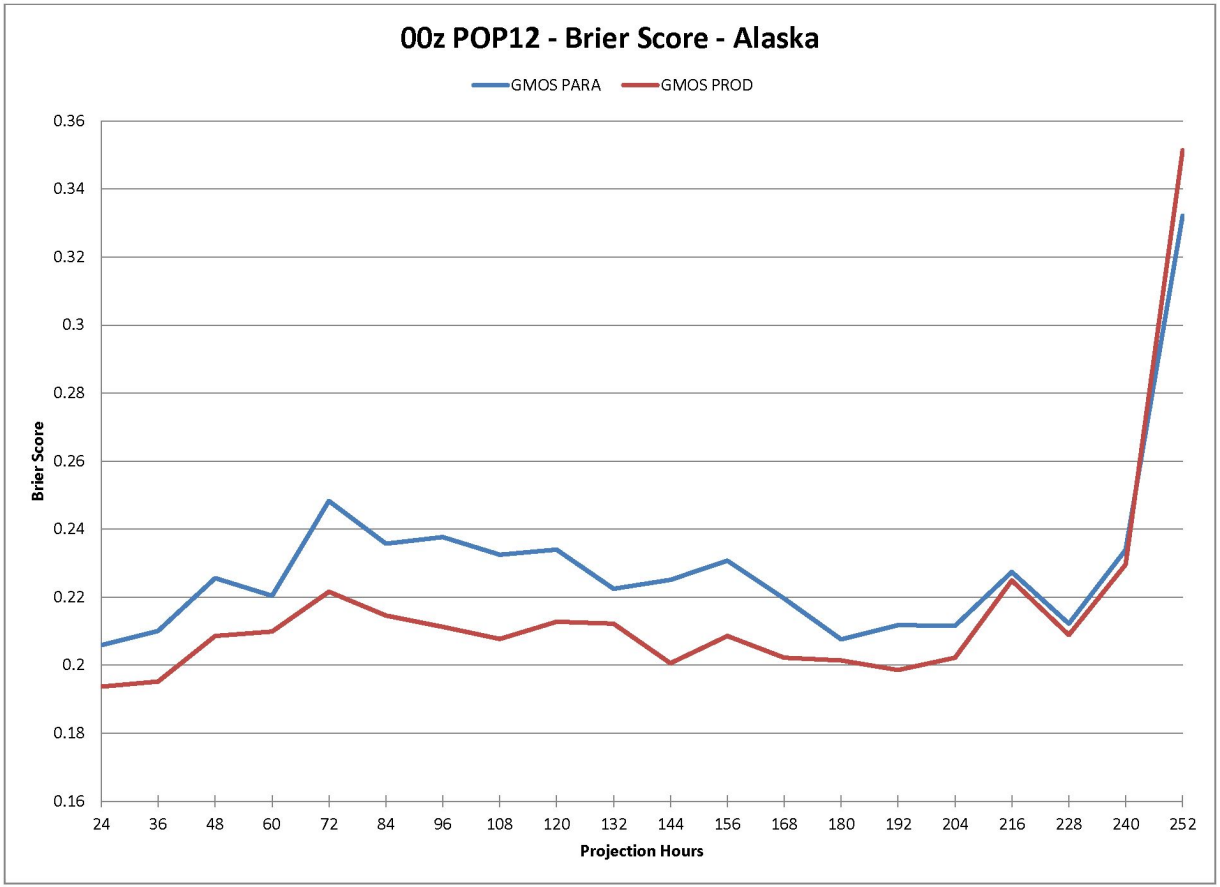

12z QPF6 - HEIDKE SKILL SCORE - Alaska
GMOS PARA
GMOS PROD
HEIDKE SKILL SCORE
0.4
0.3
0.2
0.1
0
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
102
108
114
120
126
132
138
144
150
Projection Hours

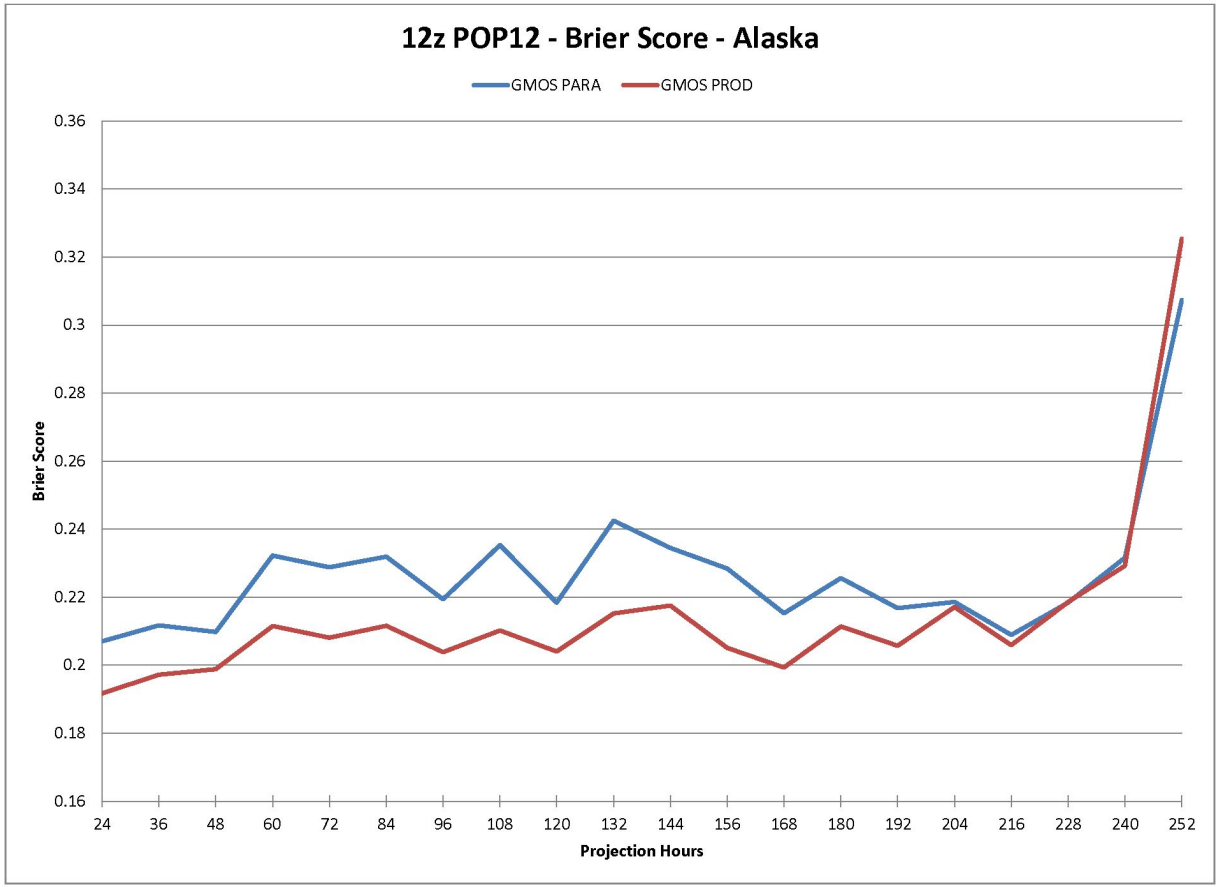
12-HR POP Verification

1. Verification Dates: 20171201-20171231
2. Domains: CONUS and Alaska
3. Scores: Brier Score, verified against URMA
   a. CONUS grids were clipped to match the URMA grid
4. Models verified
   a. GMOS Para - Parallel run of GMOS, which includes the latest updates
   b. GMOS Prod - Operational version of GMOS currently running in production


00z POP12 - Brier Score - Conus
GMOS PARA
GMOS PROD
0.16
0.14
0.12
0.1
0.08
0.06
Brier Score
24
36
48
60
72
84
96
108
120
132
144
156
168
180
192
204
216
228
240
252
Projection Hours


12z POP12 - Brier Score - Conus
GMOS PARA
GMOS PROD
0.16
0.14
0.12
0.1
0.08
0.06
Brier Score
24
36
48
60
72
84
96
108
120
132
144
156
168
180
192
204
216
228
240
252
Projection Hours


00z POP12 - Brier Score - Alaska
GMOS PARA
GMOS PROD
Brier Score
0.36
0.34
0.32
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
24
36
48
60
72
84
96
108
120
132
144
156
168
180
192
204
216
228
240
252
Projection Hours


12z POP12 - Brier Score - Alaska
GMOS PARA
GMOS PROD
Brier Score
0.36
0.34
0.32
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
24
36
48
60
72
84
96
108
120
132
144
156
168
180
192
204
216
228
240
252
Projection Hours

Your feedback is appreciated!

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