0.1 1986-01

1. Problems
   (a) Starting to have a few issues with Spirt. Some of my runs do not restart the next month and they are taking longer than they did previously.
2. Results
   (a) Level 1
      i. - Map
         A. - Max = 16.40-m, Mean = 5.87-m, U10 = 36.73-m/s
      ii. - Validation
         A. - Still missing a lot of the peaks through the month and at all of the buoys the mean period is still low from the model.
   (b) Level 2
      i. - Map
         A. - Max = 8.06-m, Mean = 3.75-m, U10 = 24.65-m/s
      ii. - Validation
         A. - Similar to level 1
   (c) Level 3N
      i. - Map
         A. - Max = 6.58-m, Mean = 3.10-m, U10 = 20.37-m/s
      ii. - Validation
         A. - 44005 - Model has negative bias in wave height for most of the month. The largest under-estimations occure during the peaks. Mean period is low all month too. peaks = offshore winds
         B. - 44007 - Good fit by model to the wave height. Mean period is a little low
         C. - 44011 - A little low in wave height from the model but much better than at 44005. Mean period is low
   (d) Level 3C

i. - Map
   A. - Max = 5.12-m, Mean = 2.54-m, U10 = 18.60-m/s
ii. - Validation
   A. - None

(e) Level 3S1
i. - Map
   A. - Max = 5.74-m, Mean = 2.54-m, U10 = 19.55-m/s
ii. - Validation
   A. - None

(f) Level 3S2
i. - Map
   A. - Max = 4.85-m, Mean = 2.33-m, U10 = 16.03-m/s
ii. - Validation
   A. - None

0.2 1986-02

1. Problems

   (a) No issues running

2. Results

   (a) Level 1
   i. - Map
      A. - Max = 13.97-m, Mean = 4.26-m, U10 = 11.27-m/s
   ii. - Validation
      A. - Negative bias in wave height and mean period for most of the buoys. The peaks at all buoys were missed by ¿ 1-m

   (b) Level 2
   i. - Map
      A. - Max = 7.49-m, Mean = 3.42-m, U10 = 23.65-m/s
   ii. - Validation

A. - Similar to level 1

(c) Level 3N

i. - Map

A. - Max = 4.33-m, Mean = 2.17-m, U10 = 16.99-m/s

ii. - Validation

A. - 44005 - Model has negative bias in wave height and mean period throughout month. Under-estimated largest peak by 2.5-m.

B. - 44007 - Low wave conditions for the most part, but model under-estimated the largest event on the 2nd by ¿ 1-m.

C. - 44011 - Under-estimated all peaks in wave height and mean period was ¿ 1-sec low all month.

(d) Level 3C

i. - Map

A. - Max = 4.73-m, Mean = 1.94-m, U10 = 17.34-m/s

ii. - Validation

A. - None

(e) Level 3S1

i. - Map

A. - Max = 4.73-m, Mean = 1.94-m, U10 = 18.06-m/s

ii. - Validation

A. - None

(f) Level 3S2

i. - Map

A. - Max = 3.58-m, Mean = 1.75-m, U10 = 14.28-m/s

ii. - Validation

A. - None

0.3 1986-03

1. Problems

(a) No issues running

2. Results

(a) Level 1

i. - Map

A. - Max = 13.15-m, Mean = 5.35-m, U10 = 26.67-m/s

ii. - Validation

A. - Less complete negative bias in wave height when compared to the previous two months. Still under-estimating the peak wave heights at most buoys.

(b) Level 2

i. - Map

A. - Max = 7.00-m, Mean = 3.15-m, U10 = 23.19-m/s

ii. - Validation

A. - Similar to level 1

(c) Level 3N

i. - Map

A. - Max = 5.48-m, Mean = 2.29-m, U10 = 19.57-m/s

ii. - Validation

A. - 44005 - Under-estimation by the model in wave height and mean period during all 5 peak events. The model was 2-m low in wave height during the largest event with measurements close to 6-m.

B. - 44007 - Model under-estimated the peak wave height event on the 20th by 1-m. Winds were turning from South to West during the event.

(d) Level 3C

i. - Map

A. - Max = 6.44-m, Mean = 2.35-m, U10 = 18.53-m/s

ii. - Validation

A. - None

(e) Level 3S1

i. - Map

A. - Max = 6.26-m, Mean = 2.34-m, U10 = 17.71-m/s

ii. - Validation

A. - 41002 - not enough data to evaluate

(f) Level 3S2

i. - Map

A. - Max = 4.62-m, Mean = 2.30-m, U10 = 15.97-m/s

ii. - Validation

A. - None

0.4 1986-04

1. Problems

   (a) No issues running

2. Results

   (a) Level 1

   i. - Map

   A. - Max = 10.06-m, Mean = 3.68-m, U10 = 25.13-m/s

   ii. - Validation

   A. - One large wave event during this month with wave heights near 7-m at places was captured well in the model. There were a few under-estimations closer to shore, but the off-shore buoy/model comparisons look good.

   (b) Level 2

   i. - Map

   A. - Max = 7.97-m, Mean = 2.56-m, U10 = 23.64-m/s

   ii. - Validation

   A. - Similar to level 1 except a few more buoys have under-estimations of wave height from the model.

   (c) Level 3N

   i. - Map

   A. - Max = 7.40-m, Mean = 2.17-m, U10 = 23.64-m/s

   ii. - Validation

A. - 44005 - Buoy was out during biggest event, but an wave height event on the 8th was under-estimated by the model by ¿ 1-m.

B. - 44007 - Both the wave height event on the 8th and the 20th were under-estimated. Almost appears to be a phase issue.

C. - 44011 - Good fit in wave height, but mean period is low during the largest event.

(d) Level 3C

i. - Map

A. - Max = 5.69-m, Mean = 1.99-m, U10 = 17.64-m/s

ii. - Validation

A. - None

(e) Level 3S1

i. - Map

A. - Max = 5.44-m, Mean = 1.97-m, U10 = 15.60-m/s

ii. - Validation

A. - 41002 - Under-estimated largest wave height event by ¿ 2-m. Mean perio dwas low by ¿ 3-sec too.

(f) Level 3S2

i. - Map

A. - Max = 4.28-m, Mean = 1.77-m, U10 = 12.86-m/s

ii. - Validation

A. - None

0.5 1986-05

1. Problems

(a) No issues running

2. Results

(a) Level 1

i. - Map

A. - Max = 8.37-m, Mean = 3.21-m, U10 = 21.23-m/s

ii. - Validation

A. - An event that lasted from the 8th to the 15th occured during this month. The wave heights were captured pretty well by the model with only a few misses and some slight phase issues.

(b) Level 2

i. - Map

A. - Max = 8.40-m, Mean = 2.21-m, U10 = 21.52-m/s

ii. - Validation

A. - Similar to level 1

(c) Level 3N

i. - Map

A. - Max = 7.42-m, Mean = 2.08-m, U10 = 21.48-m/s

ii. - Validation

A. - 44005 - Not enough data to compare too.

B. - 44007 - Peak wave height event under-estimated by 0.5-m but the rest of the month looks good. Mean period fits well.

C. - 44011 - Very good fit with wave height by the model.

(d) Level 3C

i. - Map

A. - Max = 5.62-m, Mean = 1.74-m, U10 = 16.29-m/s

ii. - Validation

A. - None

(e) Level 3S1

i. - Map

A. - Max = 5.00-m, Mean = 1.61-m, U10 = 13.40-m/s

ii. - Validation

A. - 41002 - Buoy went out during the rise in wave height on the front end of the event. The wave height was rising faster than the model.

(f) Level 3S2

i. - Map

A. - Max = 3.86-m, Mean = 1.64-m, U10 = 11.99-m/s

ii. - Validation

A. - None

0.6 1986-06

1. Problems

   (a) No issues running

2. Results

   (a) Level 1

   i. - Map

   A. - Max = 5.99-m, Mean = 2.60-m, U10 = 20.15-m/s

   B. - One storm track off coast of US.

   ii. - Validation

   A. - Winds were obviously tuned to storm on the 9th because wave heights were very close during the event, but the wave heights were underestimated during event on the 22nd.

   (b) Level 2

   i. - Map

   A. - Max = 5.41-m, Mean = 1.90-m, U10 = 21.56-m/s

   B. - One storm track that doesn't make landfall but turns just off shore of OBX.

   ii. - Validation

   A. - Similar to level 1

   (c) Level 3N

   i. - Map

   A. - Max = 5.27-m, Mean = 1.43-m, U10 = 18.53-m/s

   ii. - Validation

A. - 44005 - Lots of locally caused fluctuations in wave height that are not captured in the model. Wave heights are small, below 3-m.

B. - 44011 - Matched wave heights during peak event on the 9th, but under-estimated all other peaks for the month. Mean period is a little low, but still close.

(d) Level 3C

i. - Map

A. - Max = 5.51-m, Mean = 1.39-m, U10 = 22.53-m/s

B. - One storm track off coast of OBX.

ii. - Validation

A. - None

(e) Level 3S1

i. - Map

A. - Max = 4.55-m, Mean = 1.35-m, U10 = 20.12-m/s

B. - One storm track off coast.

ii. - Validation

A. - 41002 - Good fit overall but missed event on the 7th because of no data

(f) Level 3S2

i. - Map

A. - Max = 4.30-m, Mean = 1.57-m, U10 = 16.58-m/s

B. - Storm track starts off of Bahamas

ii. - Validation

A. - None

0.7 1986-07

1. Problems

   (a) No issues running

2. Results

   (a) Level 1

i. - Map
   A. - Max = 7.15-m, Mean = 3.04-m, U10 = 21.00-m/s
   B. - One storm track way offshore.
ii. - Validation
   A. - Overall, not a bad fit in wave height, but peaks are still under-estimated by wave model. No distinct trends in either wave height or mean period for all buoys.

(b) Level 2
i. - Map
   A. - Max = 4.73-m, Mean = 1.74-m, U10 = 19.94-m/s
   B. - One storm track offshore
ii. - Validation
   A. - Similar to level 1

(c) Level 3N
i. - Map
   A. - Max = 3.16-m, Mean = 1.09-m, U10 = 14.68-m/s
ii. - Validation
   A. - 44005 - Under-estimated both peaks wave height events. Wave heights below 3-m.
   B. - 44007 - Low wave heights all month (¡ 2-m), but good fit overall.
   C. - 44011 - Under-estimated peak wave height event on the 3rd by 2-m with max wave heights measured at 4-m. Mean period has a negative bias for the month
   D. - 44013 - Not a lot of movement in the wave height even when waves are apparent. Mean period is way off. Buoy located very close to shore.

(d) Level 3C
i. - Map
   A. - Max = 2.70-m, Mean = 1.25-m, U10 = 13.87-m/s
ii. - Validation
   A. - 44009 - Low wave heights but good fit.

(e) Level 3S1

i. - Map

A. - Max = 2.60-m, Mean = 1.25-m, U10 = 14.16-m/s

ii. - Validation

A. - 41002 - Under-estimated peak event on the 3rd by ¿ 1-m with the peak wave height measured at 4-m. Mean period stayed pretty constant all month.

(f) Level 3S2

i. - Map

A. - Max = 2.08-m, Mean = 1.39-m, U10 = 9.71-m/s

ii. - Validation

A. - None

0.8 1986-08

1. Problems

   (a) No issues running

2. Results

   (a) Level 1

   i. - Map

   A. - Max = 8.84-m, Mean = 2.60-m, U10 = 24.58-m/s

   B. - 2 storm tracks with one coming off the US coastline.

   ii. - Validation

   A. - One significant peak wave height event on the 19th with a general under-estimation by the model. Only at buoy 44009 does the wave model hit the peak wave height.

   (b) Level 2

   i. - Map

   A. - Max = 6.92-m, Mean = 1.80-m, U10 = 26.15-m/s

   B. - One storm track comes off coast of South Carolina and travels across OBX.

   ii. - Validation

   A. - Similar to level 1

(c) Level 3N

i. - Map

A. - Max = 5.73-m, Mean = 1.36-m, U10 = 19.18-m/s

B. - One storm track across Southeast corner of grid

ii. - Validation

A. - 44005 - Under-estimation of wave height between 19th and 26th, largest wave heights measured.

B. - 44007 - Under-estimation of largest peak measured on the 24th by 2-m. Mean period is weird during this time period

C. - 44011 - Storm went right across buoy and model under-estimated peak wave heights by 1.5-m. Mean period was low during this time period.

D. - 44013 - Model has low wave heights any time the measured wave heights increase.

(d) Level 3C

i. - Map

A. - Max = 6.78-m, Mean = 1.39-m, U10 = 26.70-m/s

B. - One track coming across OBX

ii. - Validation

A. - 44009 - Good fit for wave height. Mean period is low later in the month.

(e) Level 3S1

i. - Map

A. - Max = 3.95-m, Mean = 1.35-m, U10 = 19.32-m/s

B. - One strom track in North part of grid coming off land

ii. - Validation

A. - 41002 - Good fit for wave height. Model was low in mean period during small event later in month

(f) Level 3S2

i. - Map

A. - Max = 2.50-m, Mean = 1.61-m, U10 = 10.40-m/s

ii. - Validation

A. - None

0.9 1986-09

1. Problems
   (a) No issues running
2. Results
   (a) Level 1
      i. - Map
         A. - Max = 10.49-m, Mean = 2.83-m, U10 = 29.42-m/s
         B. - 3 storm tracks in grid
      ii. - Validation
         A. - Smaller wave heights this month, but a similar trend to most months with under-estimation of peak wave heights. The rest of the month looks good.
   (b) Level 2
      i. - Map
         A. - Max = 10.63-m, Mean = 2.02-m, U10 = 32.70-m/s
         B. - Storm tracks right on offshore boundary for grid
      ii. - Validation
         A. - Similar to level 1
   (c) Level 3N
      i. - Map
         A. - Max = 3.69-m, Mean = 1.25-m, U10 = 16.57-m/s
      ii. - Validation
         A. - 44005 - Model was low on all peaks during the month. Mean period has negative bias too.
         B. - 44007 - Largest wave heigth was 2-m, and model had less wave height fluctuations than what was measured.
         C. - 44011 - Good fit except for 1.5-m under-estimation of the peak wave height during the month.
         D. - 44013 - Similar to 44007 with very small wave heights and little fluctuation in model wave heights.
   (d) Level 3C

i. - Map

A. - Max = 2.34-m, Mean = 1.33-m, U10 = 12.75-m/s

ii. - Validation

A. - 44009 - Max wave height ¡ 2-m but overall a good fit by the model.

(e) Level 3S1

i. - Map

A. - Max = 2.62-m, Mean = 1.33-m, U10 = 11.23-m/s

ii. - Validation

A. - 41002 - Good fit for both wave heigth and mean period.

(f) Level 3S2

i. - Map

A. - Max = 2.62-m, Mean = 1.42-m, U10 = 10.14-m/s

ii. - Validation

A. - None

0.10 1986-10

1. Problems

   (a) No issues running

2. Results

   (a) Level 1

   i. - Map

   A. - Max = 12.80-m, Mean = 4.98-m, U10 = 28.74-m/s

   ii. - Validation

   A. - Good fit between model and buoy wave heights. The mean period has a tendancy to be negatively bias.

   (b) Level 2

   i. - Map

   A. - Max = 5.80-m, Mean = 2.34-m, U10 = 20.74-m/s

   ii. - Validation

A. - Similar to level 1

(c) Level 3N

i. - Map

A. - Max = 3.99-m, Mean = 1.73-m, U10 = 18.56-m/s

ii. - Validation

A. - 44005 - Model was negatively bias in both wave height and mean period all month

B. - 44007 - Negatively bias in wave height and mean period all month

C. - 44011 - Same as 44005 with a negative bias all month. Larger miss at the peaks

D. - 44013 - Wave heigths were ¿ 1-m low during the peaks.

(d) Level 3C

i. - Map

A. - Max = 5.47-m, Mean = 1.75-m, U10 = 15.99-m/s

ii. - Validation

A. - 44012 - Good fit except for the model is high during event on the 12th.

(e) Level 3S1

i. - Map

A. - Max = 3.98-m, Mean = 1.68-m, U10 = 15.34-m/s

ii. - Validation

A. - 41002 - Good fit in wave height. Mean period is a little low for the month.

(f) Level 3S2

i. - Map

A. - Max = 3.74-m, Mean = 1.74-m, U10 = 13.04-m/s

ii. - Validation

A. - None

0.11 1986-11

1. Problems

(a) No issues running

2. Results

(a) Level 1

i. - Map

A. - Max = 21.53-m, Mean = 5.63-m, U10 = 30.33-m/s

B. - One storm track in middle of ocean.

ii. - Validation

A. - Good fit for wave height overall, but under-estimated peaks between 19th and 23rd.

(b) Level 2

i. - Map

A. - Max = 8.33-m, Mean = 3.06-m, U10 = 29.35-m/s

B. - One track offshore

ii. - Validation

A. - Similar to level 1

(c) Level 3N

i. - Map

A. - Max = 5.71-m, Mean = 1.84-m, U10 = 23.03-m/s

ii. - Validation

A. - 44005 - Under-estimated all peaks in wave height, and low on mean period for the month

B. - 44007 - Under-estimated a couple peaks by 2-m and mean period was off most of the month

C. - 44011 - Under-estimated wave heights for peaks between 19th and 23rd by ¿ 3-m. Mean period was low all month

D. - 44013 - Model was low in wave heights during event between 19th and 23rd.

(d) Level 3C

i. - Map

A. - Max = 4.82-m, Mean = 1.88-m, U10 = 18.81-m/s

ii. - Validation

A. - 44009 - Good fit overall

B. - 44012 - Good fit overall

(e) Level 3S1

i. - Map

A. - Max = 4.83-m, Mean = 2.07-m, U10 = 17.49-m/s

ii. - Validation

A. - 41002 - Good fit except for slight over-estimation during peak event on the 15th.

(f) Level 3S2

i. - Map

A. - Max = 4.20-m, Mean = 2.50-m, U10 = 12.87-m/s

ii. - Validation

A. - None

0.12 1986-12

1. Problems

   (a) Ran out of time when running. Had to re-run and increase wall-time.

2. Results

   (a) Level 1

   i. - Map

   A. - Max = 20.92-m, Mean = 5.45-m, U10 = 34.60-m/s

   B. - Maximum wave height in Northeast corner with no winds.

   ii. - Validation

   A. - Overall model wave heights follow the trends measured by each buoy, but under-estimates the peak wave heights most of the time.

   (b) Level 2

   i. - Map

   A. - Max = 10.03-m, Mean = 3.27-m, U10 = 27.64-m/s

ii. - Validation

A. - Similar to level 1

(c) Level 3N

i. - Map

A. - Max = 6.58-m, Mean = 2.45-m, U10 = 23.02-m/s

ii. - Validation

A. - 44005 - negative bias in both wave height and mean period

B. - 44007 - model wave heights are low at all peaks by more than 2-m.

C. - 44011 - Good fit with wave height, negative bias in mean period

D. - 44013 - missed largest peak by 2-m and did not sustain wave heights as long as they were measured.

(d) Level 3C

i. - Map

A. - Max = 6.35-m, Mean = 2.30-m, U10 = 19.60-m/s

ii. - Validation

A. - 44009 - Good fit overall. Under-estimated peak on the 25th corresponds to a negative bias in mean period

B. - 44012 - similar results to 44009.

(e) Level 3S1

i. - Map

A. - Max = 5.46-m, Mean = 2.27-m, U10 = 16.66-m/s

ii. - Validation

A. - 41002 - model is bias low at the peaks for wave heights.

(f) Level 3S2

i. - Map

A. - Max = 3.84-m, Mean = 2.05-m, U10 = 13.38-m/s

ii. - Validation

A. - None

0.13 1986-stats

0.13.1 Level 1

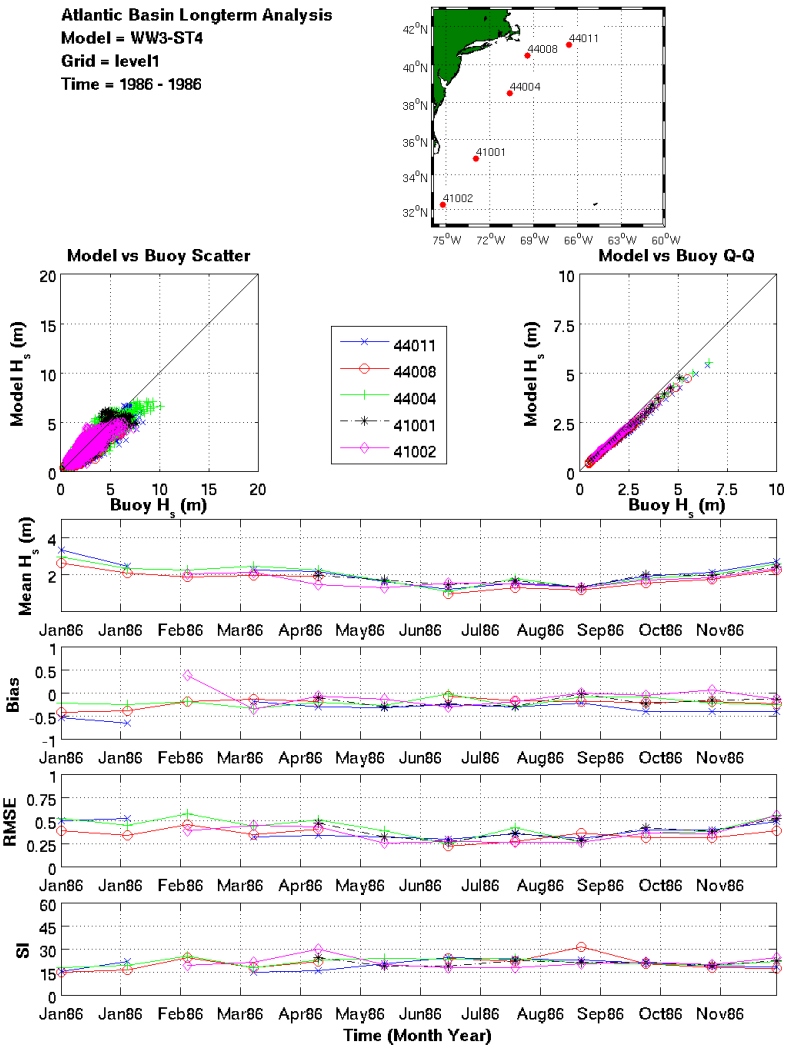

Figure 1: Comp 2 for Level 1

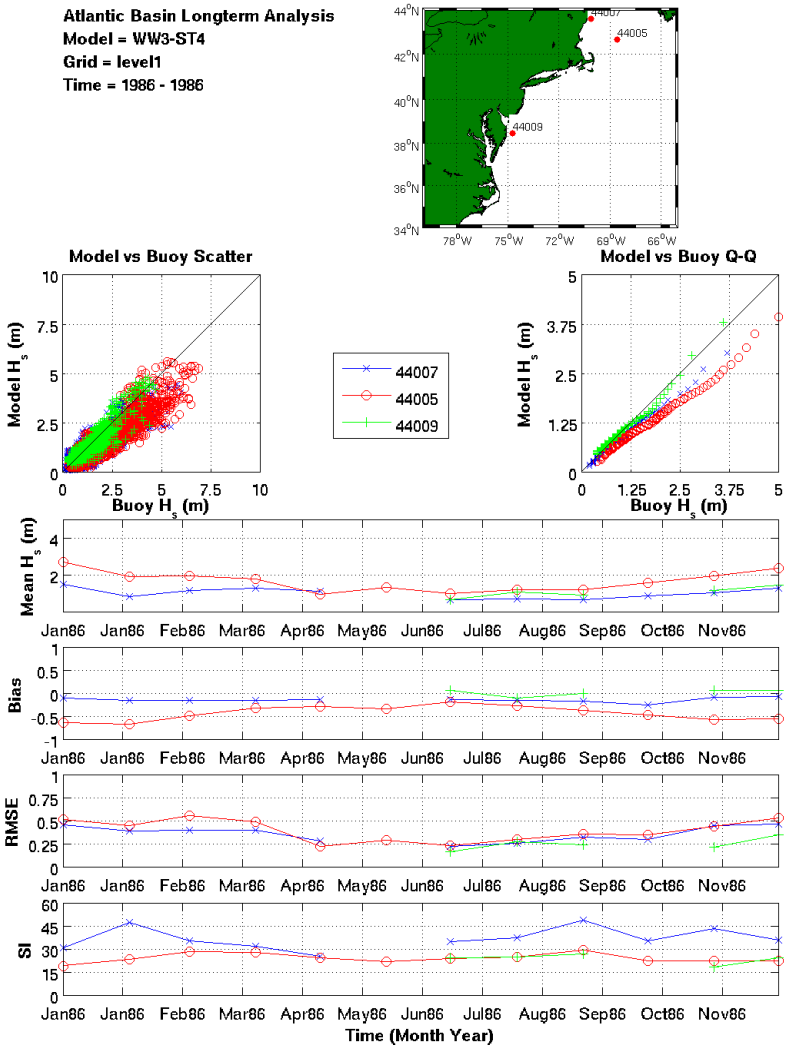

Figure 2: Comp 3 for Level 1

0.13.2 Level 2

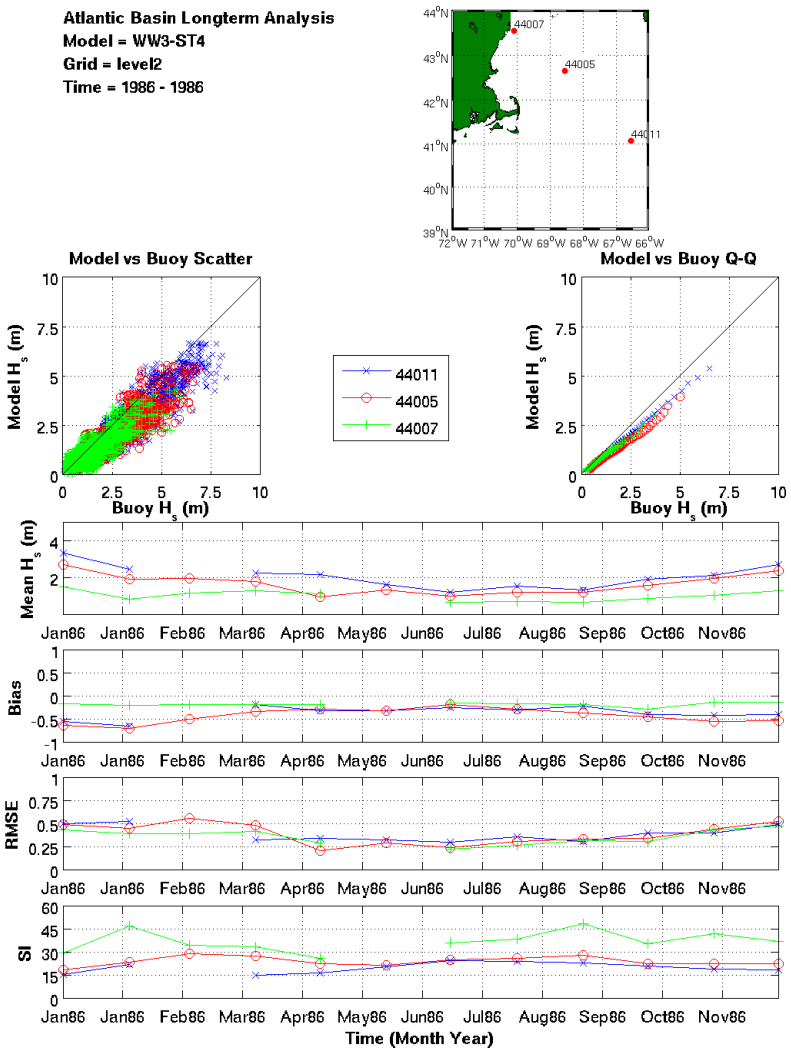

Figure 3: Comp 2 for Level 2

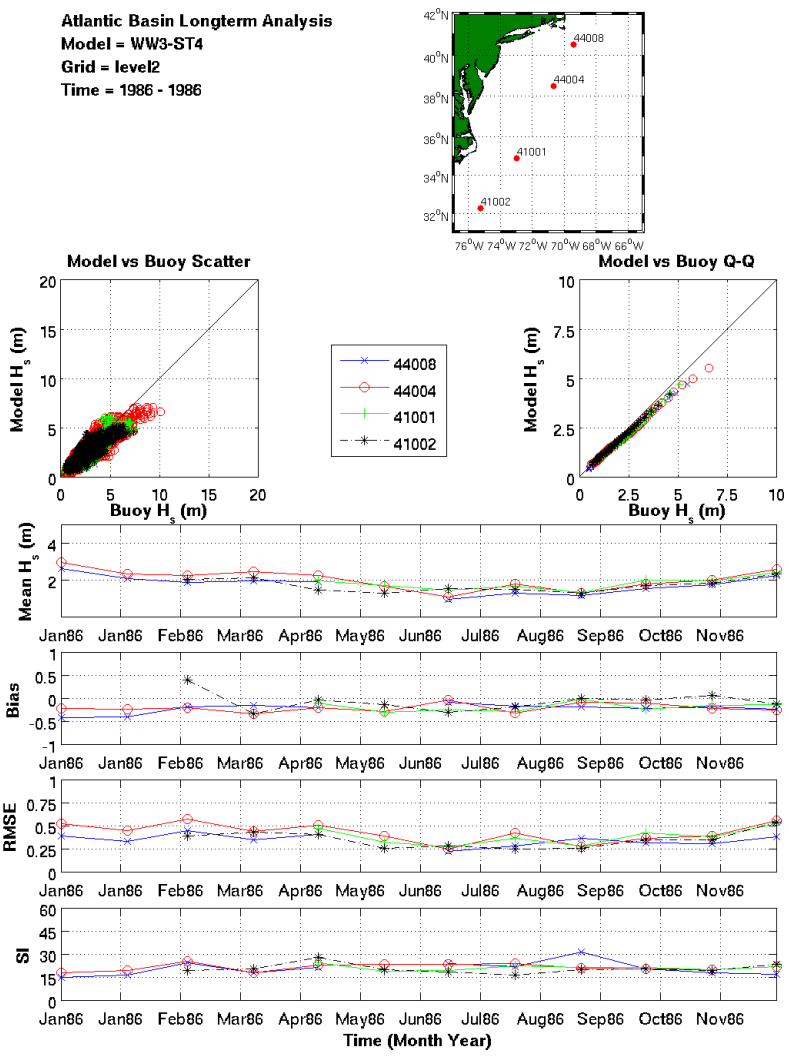

Figure 4: Comp 3 for Level 2

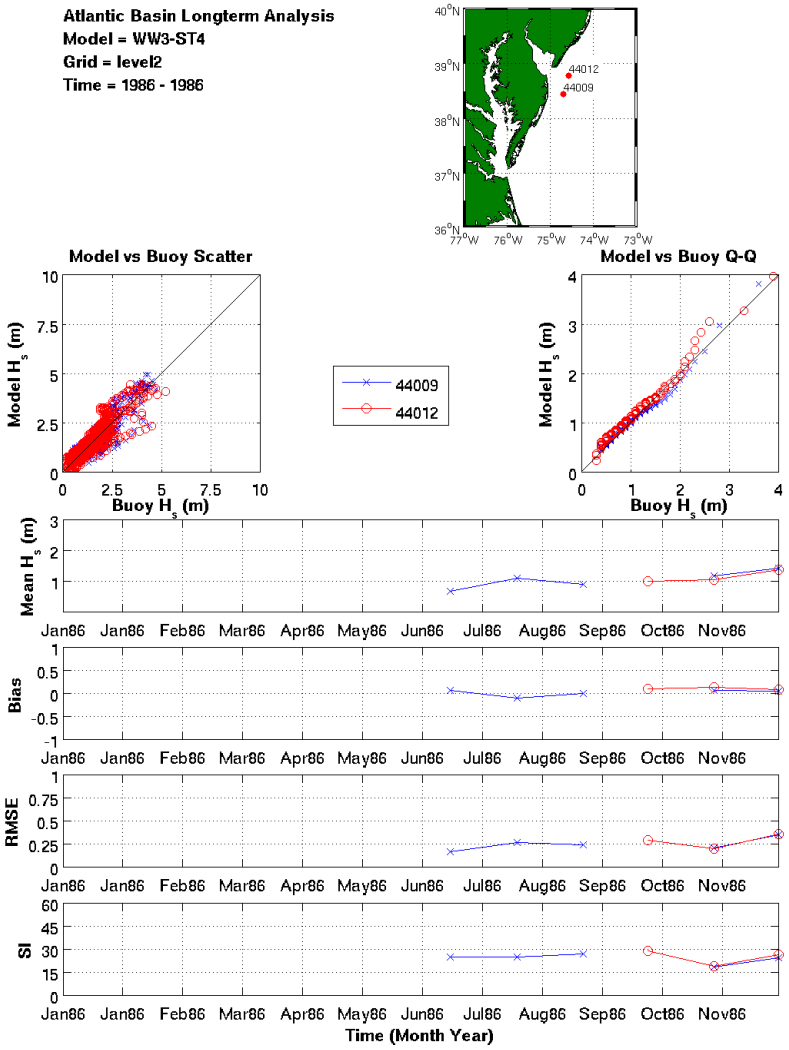

Figure 5: Comp 4 for Level 2

0.13.3 Level 3N

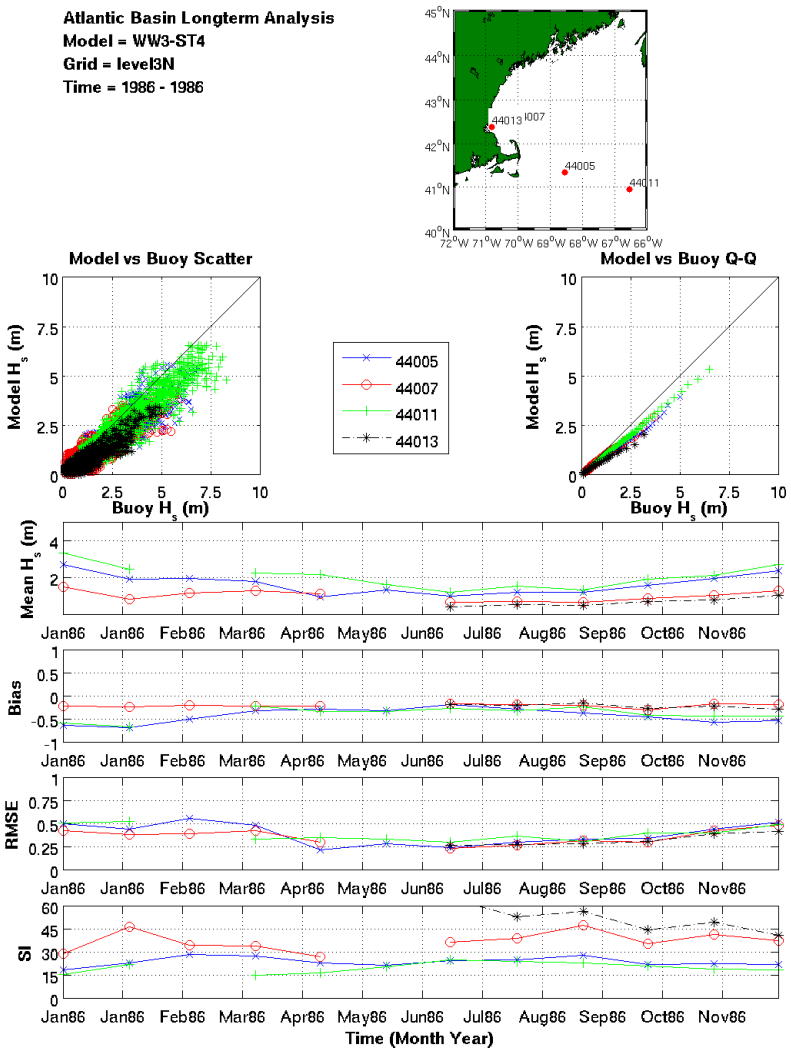

Figure 6: Comp 1 for Level 3N

0.13.4 Level 3C

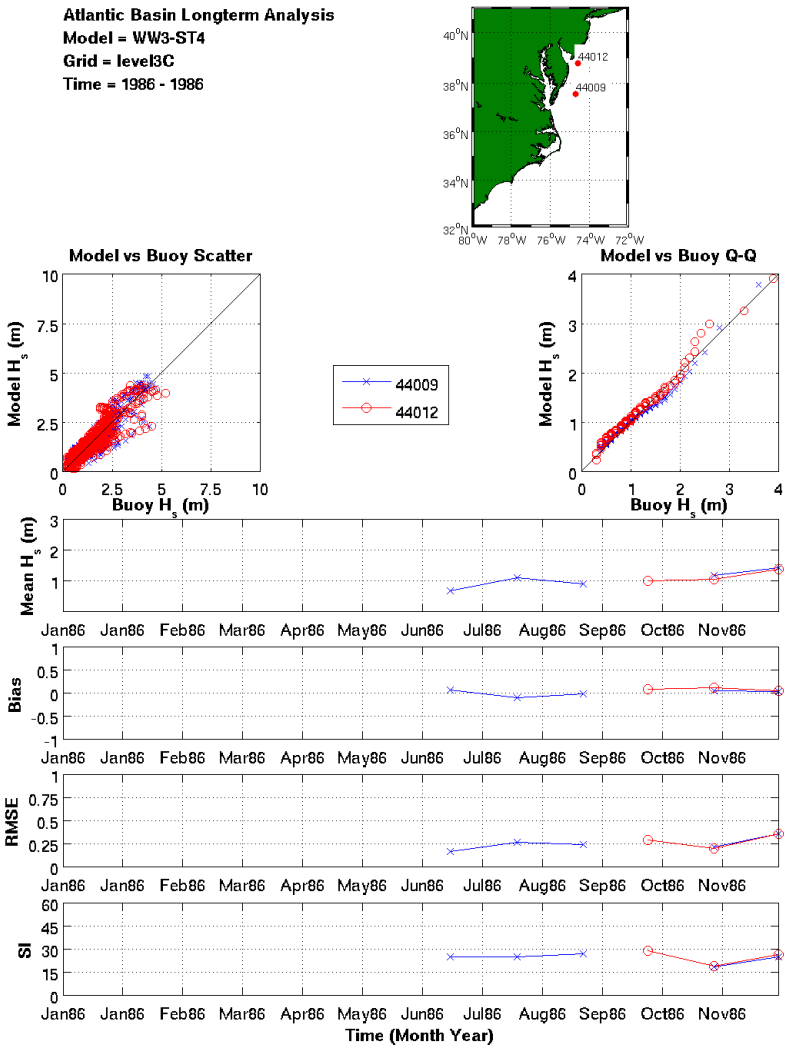

Figure 7: Comp 1 for Level 3C

0.13.5 Level 3S1

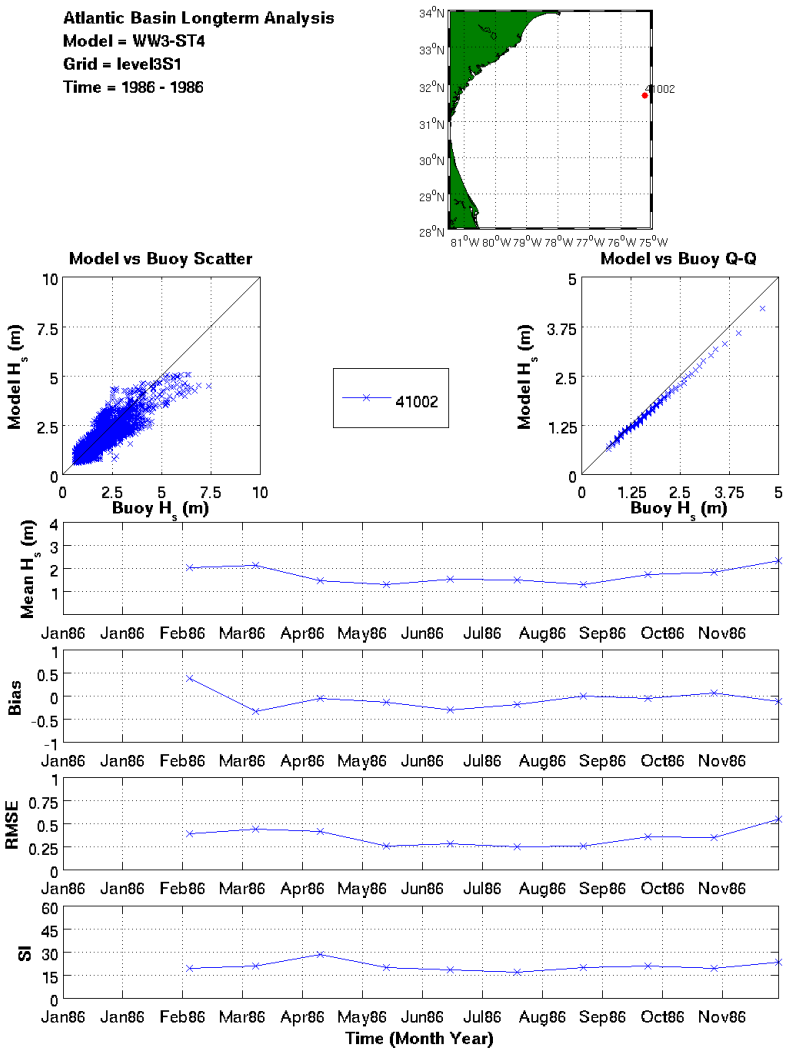

Figure 8: Comp 1 for Level 3S1