0.1 1984-01

1. Problems

   (a) No issues running

2. Results

   (a) Level 1

      i. - Map

         A. - Max = 23.57-m, Mean = 3.13-m, U10 = 25.77-m/s

         B. - Peak wave height associated with swell in the Northeast corner of grid.

      ii. - Validation

         A. - Wave results don't really look good, but neither do the wind speeds. The waves follow the wind speeds well.

   (b) Level 2

      i. - Map

         A. - Max = 6.61-m, Mean = 3.05-m, U10 = 23.89-m/s

      ii. - Validation

         A. - Resuls look much better than level 1. Missed a couple of peaks by 1-m but overall not too bad.

   (c) Level 3N

      i. - Map

         A. - Max = 6.08-m, Mean = 2.38-m, U10 = 23.63-m/s

      ii. - Validation

         A. - 44005- under-estimated peak by 1-m but overall trend is followed.

   (d) Level 3C

      i. - Map

         A. - Max = 5.92-m, Mean = 2.73-m, U10 = 19.53-m/s

      ii. - Validation

         A. - None

   (e) Level 3S1

i. - Map

　　　　A. - Max = 5.73-m, Mean = 2.73-m, U10 = 19.30-m/s

　　ii. - Validation

　　　　A. - 41002- strange happenings after the 19th. The measured wind speeds and wave heights are much more peaked than the model estimates. This leads to a lot of errors in the model.

(f) Level 3S2

　　i. - Map

　　　　A. - Max = 5.67-m, Mean = 2.62-m, U10 = 15.85-m/s

　　ii. - Validation

　　　　A. - None

0.2　1984-02

1. Problems

　(a) No issue running

2. Results

　(a) Level 1

　　i. - Map

　　　　A. - Max = 21.42-m, Mean = 5.05-m, U10 = 28.66-m/s

　　　　B. - Maximum wave height in Northeast corner again.

　　ii. - Validation

　　　　A. - Large under-estimation of wave height on the 29th event in 44007, 41001, and 41002.

　(b) Level 2

　　i. - Map

　　　　A. - Max = 8.26-m, Mean = 3.02-m, U10 = 24.49-m/s

　　ii. - Validation

　　　　A. - Similar to level 1

　(c) Level 3N

i. - Map

                A. - Max = 6.28-m, Mean = 2.52-m, U10 = 22.90-m/s

            ii. - Validation

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

                B. - 44007- good fit until 29th event when model is ¿ 3-m negatively bias in wave height.

    (d) Level 3C

            i. - Map

                A. - Max = 7.32-m, Mean = 2.45-m, U10 = 24.24-m/s

            ii. - Validation

                A. - None

    (e) Level 3S1

            i. - Map

                A. - Max = 5.81-m, Mean = 2.39-m, U10 = 21.65-m/s

            ii. - Validation

                A. - 41002- great fit in both wave height and mean period except for during the 3 events. Negative bias in wave heigth and mean period during extremes.

    (f) Level 3S2

            i. - Map

                A. - Max = 4.42-m, Mean = 2.31-m, U10 = 16.12-m/s

            ii. - Validation

                A. - None

0.3   1984-03

1. Problems

    (a) No issues running

2. Results

    (a) Level 1

      i. - Map

         A. - Max = 10.53-m, Mean = 3.78-m, U10 = 25.89-m/s

      ii. - Validation

         A. - Biggest misses occured on the 14th wave height event. There were some under-estimations of the larger event which occured on the 30th.

(b) Level 2

      i. - Map

         A. - Max = 9.82-m, Mean = 3.63-m, U10 = 26.60-m/s

      ii. - Validation

         A. - Similar to level 1

(c) Level 3N

      i. - Map

         A. - Max = 9.07-m, Mean = 3.20-m, U10 = 25.28-m/s

      ii. - Validation

         A. - 44006- negatie bias in wave height throughout.

         B. - 44007- missed peak on the 14th by ¿ 3-m.

(d) Level 3C

      i. - Map

         A. - Max = 7.15-m, Mean = 2.66-m, U10 = 26.60-m/s

      ii. - Validation

         A. - None

(e) Level 3S1

      i. - Map

         A. - Max = 6.80-m, Mean = 2.46-m, U10 = 22.93-m/s

      ii. - Validation

         A. - Good fit except for peak on the 30th. Both the wind-speed and wave height are low. The wind direction is turning during event.

(f) Level 3S2

      i. - Map

         A. - Max = 5.03-m, Mean = 2.02-m, U10 = 17.28-m/s

    ii. - Validation

        A. - None

0.4   1984-04

1. Problems

    (a) No issues running

2. Results

    (a) Level 1

    i. - Map

        A. - Max = 10.47-m, Mean = 3.30-m, U10 = 24.20-m/s

    ii. - Validation

        A. - Overall good fit with some under-estimation of wave heights at the peaks which usually occur during rotation in the wind field.

    (b) Level 2

    i. - Map

        A. - Max = 7.38-m, Mean = 3.18-m, U10 = 20.12-m/s

    ii. - Validation

        A. - Similar to level 1

    (c) Level 3N

    i. - Map

        A. - Max = 5.69-m, Mean = 2.71-m, U10 = 20.08-m/s

    ii. - Validation

        A. - 44005- negative bias throughout with under-estimated peak on the 22nd by 3-m.

        B. - 44007- good fit with slight under-estimation during events

    (d) Level 3C

    i. - Map

        A. - Max = 2.23-m, Mean = 19.52-m, U10 = 8.96-m/s

    ii. - Validation

A. - None

(e) Level 3S1

    i. - Map

      A. - Max = 4.92-m, Mean = 2.17-m, U10 = 18.90-m/s

    ii. - Validation

      A. - 41002- Not much data to compare too

(f) Level 3S2

    i. - Map

      A. - Max = 3.06-m, Mean = 1.78-m, U10 = 18.12-m/s

    ii. - Validation

      A. - None

0.5   1984-05

1. Problems

  (a) No issues running

2. Results

  (a) Level 1

    i. - Map

      A. - Max = 8.10-m, Mean = 2.57-m, U10 = 23.39-m/s

    ii. - Validation

      A. - Good fit but data is kind of sparse for the month.

  (b) Level 2

    i. - Map

      A. - Max = 6.65-m, Mean = 2.35-m, U10 = 22.24-m/s

    ii. - Validation

      A. - Similar to level 1

  (c) Level 3N

    i. - Map

      A. - Max = 5.59-m, Mean = 1.74-m, U10 = 21.62-m/s

    ii. - Validation

        A. - 44005- missing local effects but pretty good fit for wave heights and mean period

        B. - 44007- phase issues and missed largest event

        C. - 44011 - phase issues

(d) Level 3C

    i. - Map

        A. - Max = 5.27-m, Mean = 1.76-m, U10 = 20.39-m/s

    ii. - Validation

        A. - None

(e) Level 3S1

    i. - Map

        A. - Max = 4.38-m, Mean = 1.65-m, U10 = 20.39-m/s

    ii. - Validation

        A. - 41002- not much data to compare too

(f) Level 3S2

    i. - Map

        A. - Max = 3.41-m, Mean = 1.93-m, U10 = 17.18-m/s

    ii. - Validation

        A. - None

0.6   1984-06

1. Problems

(a) No issues running

2. Results

(a) Level 1

    i. - Map

        A. - Max = 7.29-m, Mean = 2.36-m, U10 = 20.37-m/s

    ii. - Validation

       A. - Under-estimation at 44011 early in the month but overall good fit for all other buoys.

(b) Level 2

    i. - Map

       A. - Max = 5.45-m, Mean = 1.80-m, U10 = 19.28-m/s

       B. - one storm track with landfall in Florida.

    ii. - Validation

       A. - Similar to level 1

(c) Level 3N

    i. - Map

       A. - Max = 3.90-m, Mean = 1.31-m, U10 = 16.16-m/s

    ii. - Validation

       A. - 44005,44011- negative bias at all peaks in both buoys.

(d) Level 3C

    i. - Map

       A. - Max = 3.10-m, Mean = 1.17-m, U10 = 15.28-m/s

    ii. - Validation

       A. - None

(e) Level 3S1

    i. - Map

       A. - Max = 3.08-m, Mean = 1.25-m, U10 = 14.02-m/s

       B. - One storm track through domain with landfall in Central Florida

    ii. - Validation

       A. - None

(f) Level 3S2

    i. - Map

       A. - Max = 2.67-m, Mean = 1.45-m, U10 = 11.29-m/s

    ii. - Validation

       A. - None

0.7   1984-07

1. Problems

   (a) No issues running

2. Results

   (a) Level 1
      i. - Map
         A. - Max = 4.42-m, Mean = 2.47-m, U10 = 17.81-m/s
         B. - One storm track entering Carribean.
      ii. - Validation
         A. - Good fit for 41001 (mean period is bias low for the entire month), but struggling with the peaks for all of the Northeast U.S buoys.

   (b) Level 2
      i. - Map
         A. - Max = 3.61-m, Mean = 2.06-m, U10 = 17.73-m/s
      ii. - Validation
         A. - Similar to level 1

   (c) Level 3N
      i. - Map
         A. - Max = 3.32-m, Mean = 1.27-m, U10 = 14.51-m/s
      ii. - Validation
         A. - 44005- good fit but missed little peaks. Max wave heights are less than 3-m
         B. - 44007- missed only little peak (2-m) by 1-m. Lots of local wind not caputured in our wind field.
         C. - 44011 - Under-estimated every peak by at least 1-m but maximum wave height was less than 4-m. Mean period was low for the entire month.

   (d) Level 3C
      i. - Map
         A. - Max = 3.16-m, Mean = 1.32-m, U10 = 17.75-m/s

    ii. - Validation

       A. - None

 (e) Level 3S1

    i. - Map

       A. - Max = 2.57-m, Mean = 1.41-m, U10 = 14.97-m/s

    ii. - Validation

       A. - None

 (f) Level 3S2

    i. - Map

       A. - Max = 2.88-m, Mean = 1.85-m, U10 = 10.72-m/s

    ii. - Validation

       A. - None

0.8   1984-08

1. Problems

 (a) No issues running

2. Results

 (a) Level 1

    i. - Map

       A. - Max = 8.17-m, Mean = 2.32-m, U10 = 22.04-m/s

       B. - 5 storm tracks but none making landfall

    ii. - Validation

       A. - Low wave energy for most of the month, so there is not a lot of issues in the wave height accuracy. Low on a few peaks but all waves are less than 3-m.

 (b) Level 2

    i. - Map

       A. - Max = 5.74-m, Mean = 1.55-m, U10 = 22.14-m/s

       B. - 4 storm tracks in domain

    ii. - Validation

A. - Similar to level 1

(c) Level 3N

    i. - Map

      A. - Max = 2.25-m, Mean = 1.01-m, U10 = 14.87-m/s

    ii. - Validation

      A. - 44005,44007 - both have low wave energy and very little issues

      B. - 44011- one event on the 13th was underestimated by 1-m but the rest of the month looks good.

(d) Level 3C

    i. - Map

      A. - Max = 2.42-m, Mean = 1.01-m, U10 = 16.87-m/s

    ii. - Validation

      A. - None

(e) Level 3S1

    i. - Map

      A. - Max = 1.96-m, Mean = 1.10-m, U10 = 14.99-m/s

    ii. - Validation

      A. - 41002- not enough data to evaluate

(f) Level 3S2

    i. - Map

      A. - Max = 3.10-m, Mean = 1.32-m, U10 = 14.73-m/s

    ii. - Validation

      A. - None

0.9   1984-09

1. Problems

(a) No issues running

2. Results

(a) Level 1

  i. - Map

   A. - Max = 8.84-m, Mean = 2.85-m, U10 = 28.54-m/s

   B. - Lots of storm tracks with a few hitting the US coastline

  ii. - Validation

   A. - Really good fit overall. Under-estimation of the largest peak at 44011 on the 16th. The measurement was 6-m and the model estimated 4-m, but there are very few data points.

(b) Level 2

  i. - Map

   A. - Max = 8.99-m, Mean = 2.08-m, U10 = 35.39-m/s

   B. - 2 storm tracks made landfall with others passing by

  ii. - Validation

   A. - Similar to level 1

(c) Level 3N

  i. - Map

   A. - Max = 4.11-m, Mean = 1.48-m, U10 = 24.51-m/s

  ii. - Validation

   A. - 44007- low waves with slight misses by the wave model.

   B. - 44011 - ONe peak with 2-m under-estimation by the model, but the rest of the month is spot on. The peak wave height corrisponds to a large mean period of 12-sec.

(d) Level 3C

  i. - Map

   A. - Max = 9.14-m, Mean = 2.08-m, U10 = 36.08-m/s

   B. - 2 storm tracks with one making landfall near Cape Lookout.

  ii. - Validation

   A. - None

(e) Level 3S1

  i. - Map

   A. - Max = 8.87-m, Mean = 2.08-m, U10 = 31.70-m/s

B. - 2 storm tracks, one offshore and one coming off the coast of Florida

    ii. - Validation

      A. - Great fit for wave height. Slight negative bias for the model with regards to mean period.

(f) Level 3S2

    i. - Map

      A. - Max = 6.57-m, Mean = 1.91-m, U10 = 26.03-m/s

      B. - one track through the Bahamas and making landfall on Florida

    ii. - Validation

      A. - None

0.10   1984-10

1. Problems

  (a) No issues running

2. Results

  (a) Level 1

    i. - Map

      A. - Max = 12.48-m, Mean = 3.96-m, U10 = 30.65-m/s

      B. - Lots of storm tracks with a few hitting the US coastline

    ii. - Validation

      A. - a phase issue with 44011 and a missed peak on 44007 but the rest looks good.

  (b) Level 2

    i. - Map

      A. - Max = 12.91-m, Mean = 2.82-m, U10 = 31.18-m/s

      B. - 4 storms in domain but 2 made landfall

    ii. - Validation

      A. - Similar to level 1

  (c) Level 3N

     i. - Map

        A. - Max = 6.95-m, Mean = 2.06-m, U10 = 17.52-m/s

     ii. - Validation

        A. - 44005- phase issue with peak on the 17th. Model had peak close to the 15th.

        B. - 44007 - under-estimated wave height peak on the 2nd by 2-m with peak measured at 5-m.

        C. - 44011 - phase issue at peak on 16th, but the phase issue also exists in the wind speeds.

(d) Level 3C

     i. - Map

        A. - Max = 9.57-m, Mean = 2.55-m, U10 = 24.22-m/s

        B. - one track in domain

     ii. - Validation

        A. - None

(e) Level 3S1

     i. - Map

        A. - Max = 9.63-m, Mean = 2.82-m, U10 = 24.60-m/s

        B. - one track coming off of Florida

     ii. - Validation

        A. - 41002- not enough data to compare too

(f) Level 3S2

     i. - Map

        A. - Max = 9.23-m, Mean = 2.82-m, U10 = 23.13-m/s

        B. - 2 tracks both making landfall in South Florida

     ii. - Validation

        A. - None

0.11   1984-11

1. Problems

   (a) No issues running

2. Results

   (a) Level 1

       i. - Map

          A. - Max = 12.22-m, Mean = 4.88-m, U10 = 27.81-m/s

          B. - 2 storm tracks in domain

       ii. - Validation

          A. - Under-estimation of most peak wave heights by at least
              1-m. Most of the peaks corrispond with offshore winds.

   (b) Level 2

       i. - Map

          A. - Max = 10.74-m, Mean = 3.31-m, U10 = 29.15-m/s

          B. - One storm track initializing off the Florida coast.

       ii. - Validation

          A. - Similar to level 1

   (c) Level 3N

       i. - Map

          A. - Max = 5.81-m, Mean = 2.20-m, U10 = 19.09-m/s

       ii. - Validation

          A. - 44005- negative bias in both wave height and mean pe-
              riod throughout the month.

          B. - 44007 - missed peak on the 10th by 1-m, mean period
              was low for same time frame

          C. - 44011 - Under-estimated peak on 15th by 2-m and had
              a small negative bias for rest of the month.

   (d) Level 3C

       i. - Map

          A. - Max = 5.35-m, Mean = 2.34-m, U10 = 21.35-m/s

       ii. - Validation

          A. - None

   (e) Level 3S1

       i. - Map

A. - Max = 5.89-m, Mean = 2.33-m, U10 = 18.59-m/s

    ii. - Validation

        A. - None

(f) Level 3S2

    i. - Map

        A. - Max = 5.17-m, Mean = 2.42-m, U10 = 14.14-m/s

        B. - one track starting off the coast of Miami

    ii. - Validation

        A. - None

0.12 1984-12

1. Problems

(a) No issues running

2. Results

(a) Level 1

    i. - Map

        A. - Max = 21.13-m, Mean = 5.71-m, U10 = 31.89-m/s

        B. - Maximum is in Northeast corner of grid

    ii. - Validation

        A. - Good fit but missed peaks at 44011, 44005, and 41001.

(b) Level 2

    i. - Map

        A. - Max = 11.81-m, Mean = 3.19-m, U10 = 32.13-m/s

        B. - One storm track way offshore

    ii. - Validation

        A. - Similar to level 1

(c) Level 3N

    i. - Map

        A. - Max = 4.80-m, Mean = 2.22-m, U10 = 19.36-m/s

    ii. - Validation

      A. - 44005 - lots of little peaks that are not captured in the wave model

      B. - 44007 - One peak that was not existant in the model on the 22nd.

      C. - 44011 - Good fit except for the peak wave heights are all low. One peak on the 7th was low by over 2-m. The mean periods are low in the model at these times too.

(d) Level 3C

    i. - Map

      A. - Max = 4.21-m, Mean = 1.75-m, U10 = 19.64-m/s

    ii. - Validation

      A. - None

(e) Level 3S1

    i. - Map

      A. - Max = 3.90-m, Mean = 1.91-m, U10 = 19.64-m/s

    ii. - Validation

      A. - None

(f) Level 3S2

    i. - Map

      A. - Max = 4.24-m, Mean = 2.51-m, U10 = 13.52-m/s

    ii. - Validation

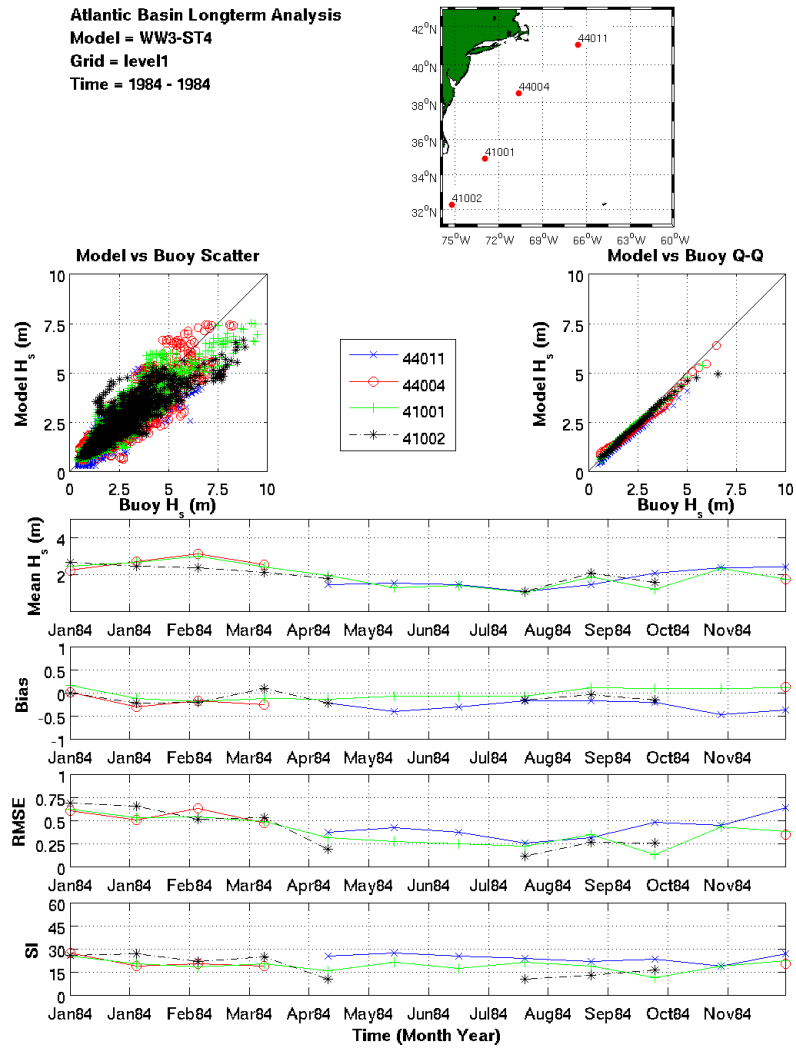   A. - None

0.13   1984-stats

0.13.1   Level 1
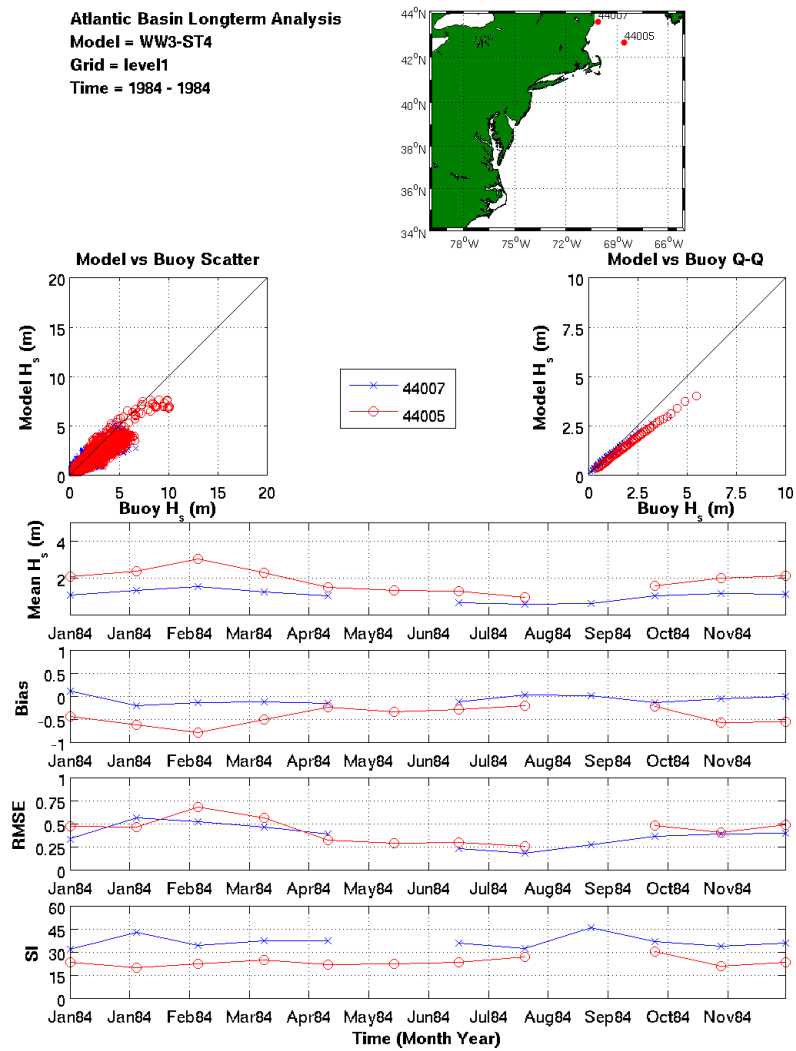

Figure 1: Comp 2 for Level 1

18

Atlantic Basin Longterm Analysis
Model = WW3-ST4
Grid = level1
Time = 1984 - 1984

Model vs Buoy Scatter

Model H_s (m)

Buoy H_s (m)

44007

44005

Model vs Buoy Q-Q

Model H_s (m)

Buoy H_s (m)

Mean H_s (m)

Jan84 Jan84 Feb84 Mar84 Apr84 May84 Jun84 Jul84 Aug84 Sep84 Oct84 Nov84

Bias

Jan84 Jan84 Feb84 Mar84 Apr84 May84 Jun84 Jul84 Aug84 Sep84 Oct84 Nov84

RMSE

Jan84 Jan84 Feb84 Mar84 Apr84 May84 Jun84 Jul84 Aug84 Sep84 Oct84 Nov84

SI

Jan84 Jan84 Feb84 Mar84 Apr84 May84 Jun84 Jul84 Aug84 Sep84 Oct84 Nov84

Time (Month Year)

Figure 2: Comp 3 for Level 1

0.13.2   Level 2
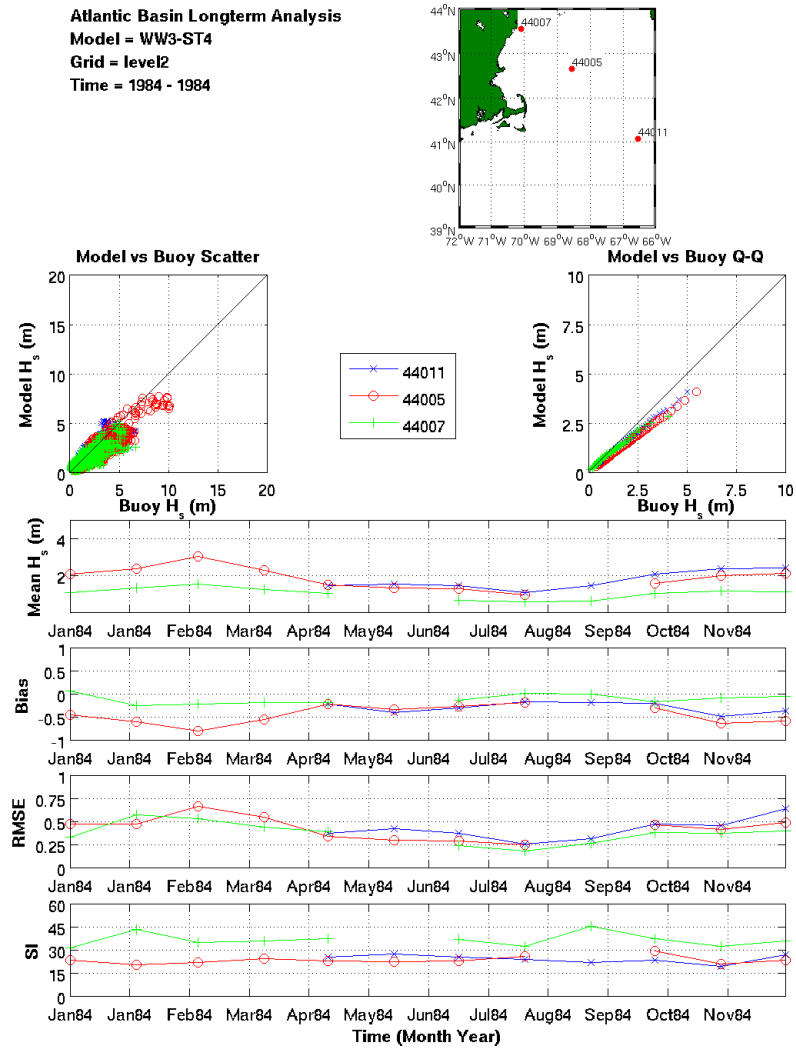
Figure 3: Comp 2 for Level 2

Figure 4: Comp 3 for Level 2

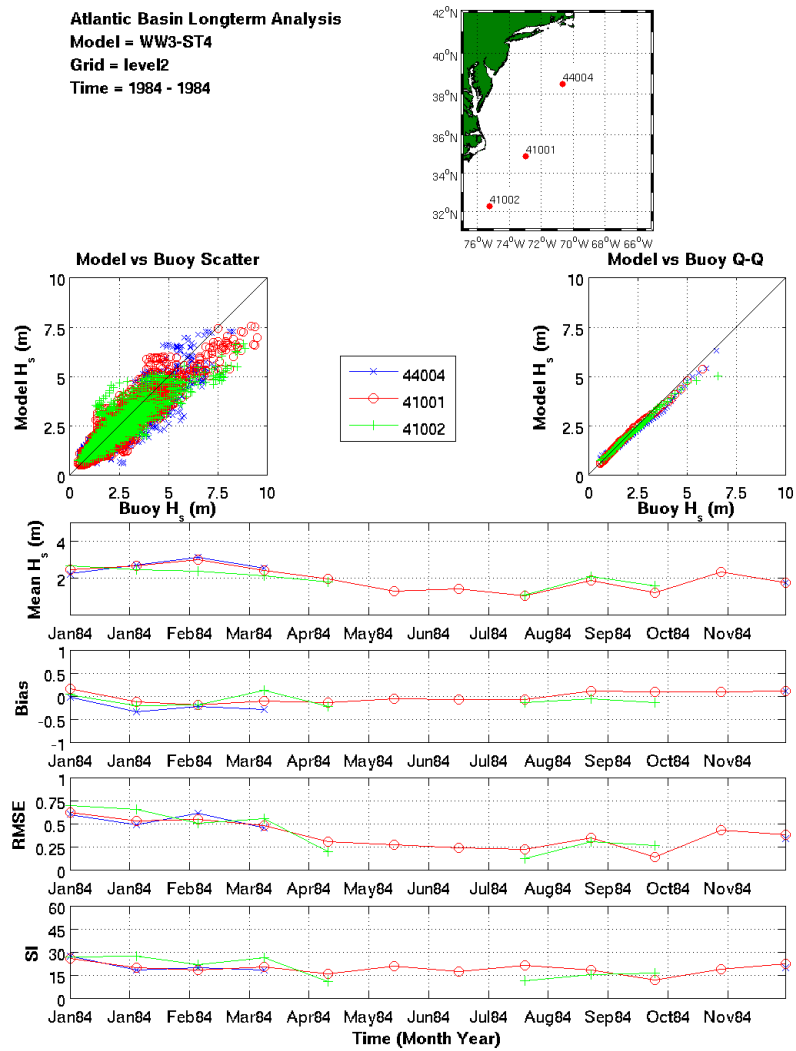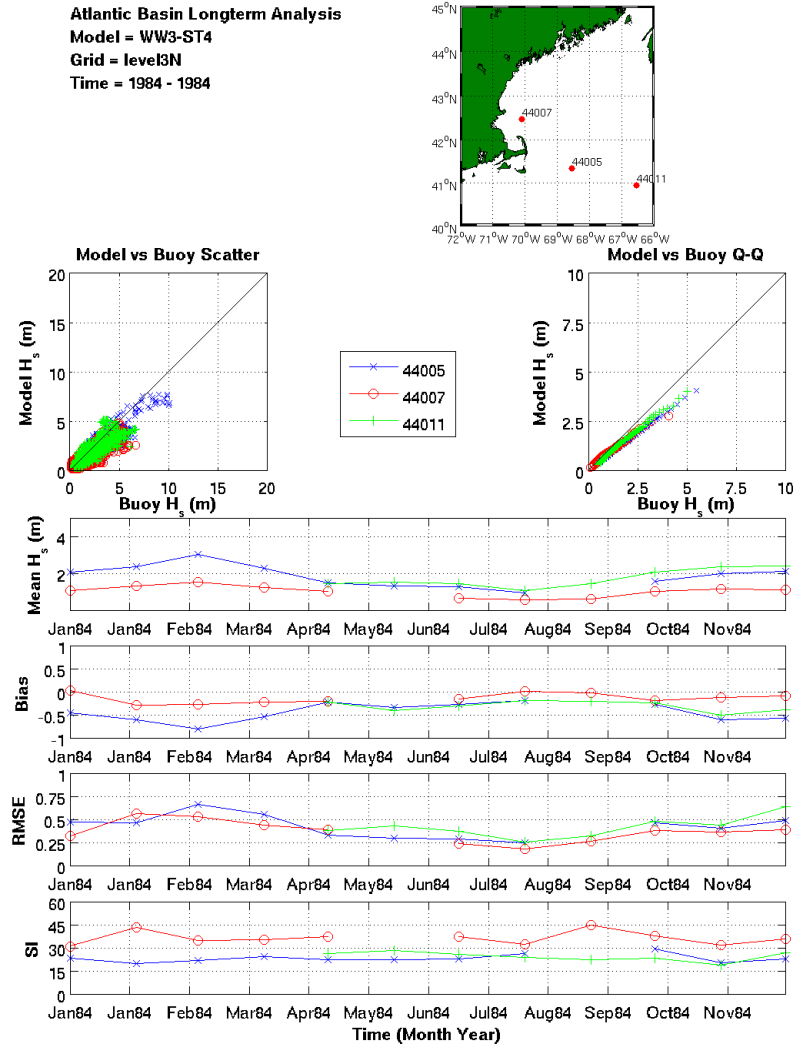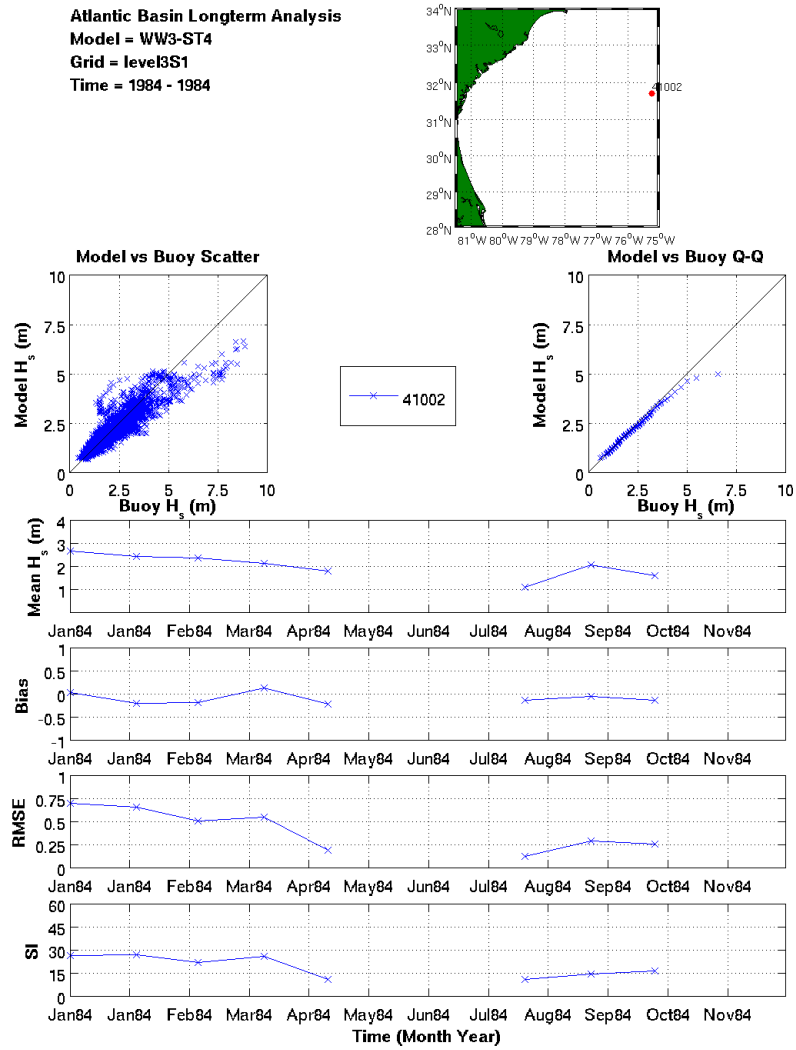### 0.13.3 Level 3N

Figure 5: Comp 1 for Level 3N

0.13.4 Level 3S1

Figure 6: Comp 1 for Level 3S1