Figures from WIPAFF project

The following figures are the same as Figure 7 in the main text but for other available UAS flights. The caption given for the first figure applies to all, but the corresponding date is reported at the top of the figure and in the caption.

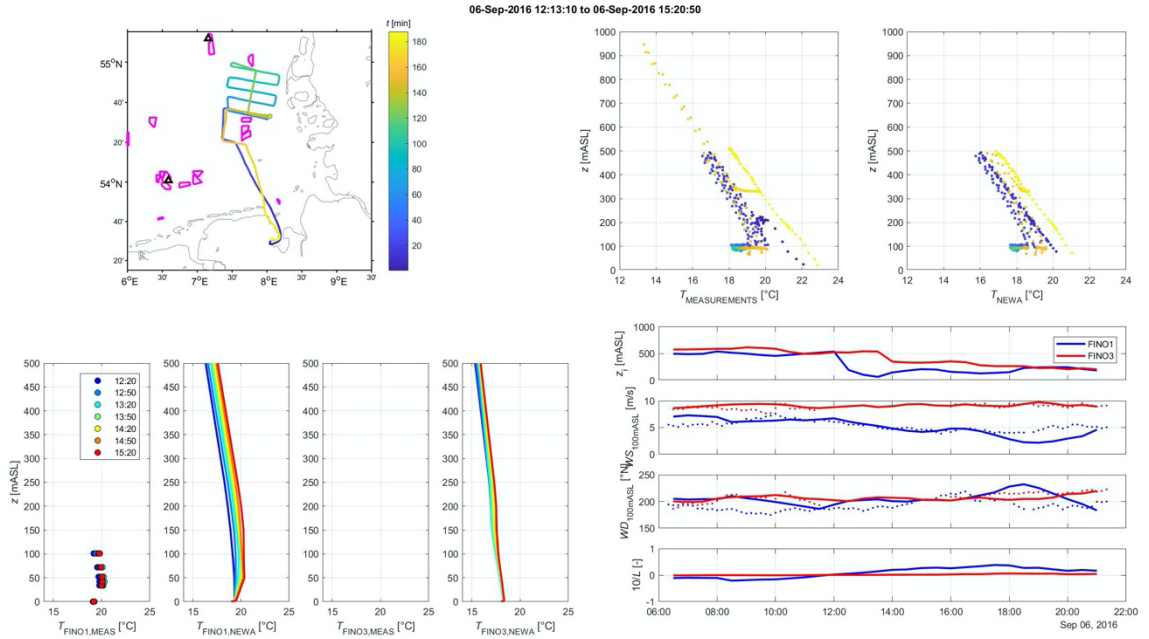
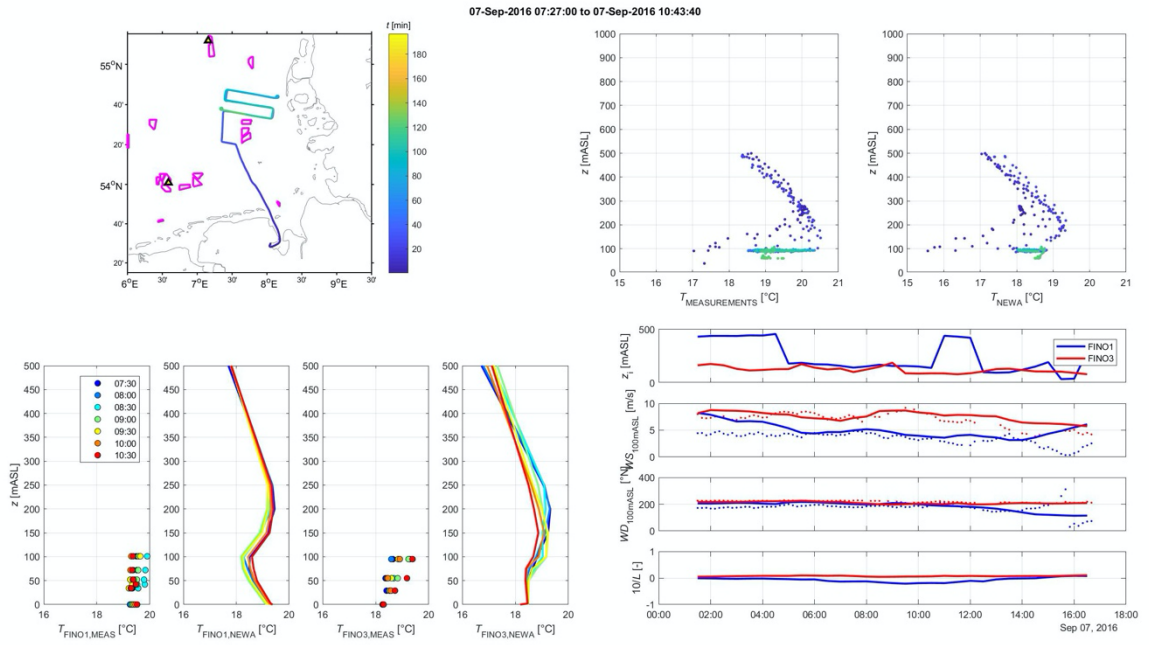
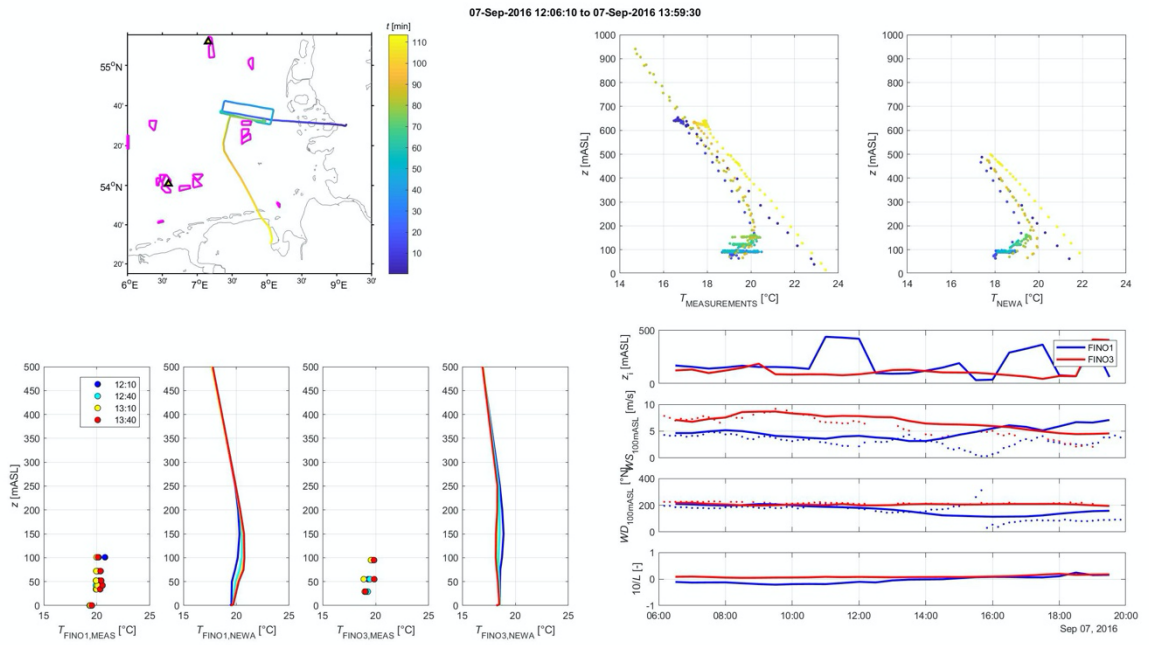
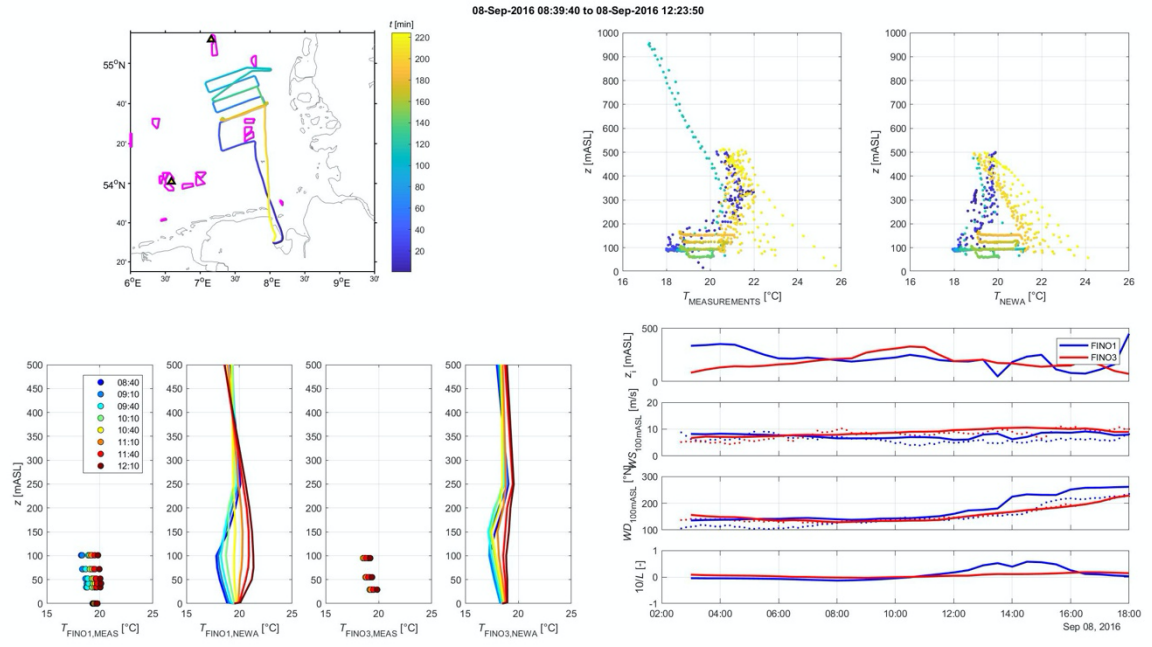
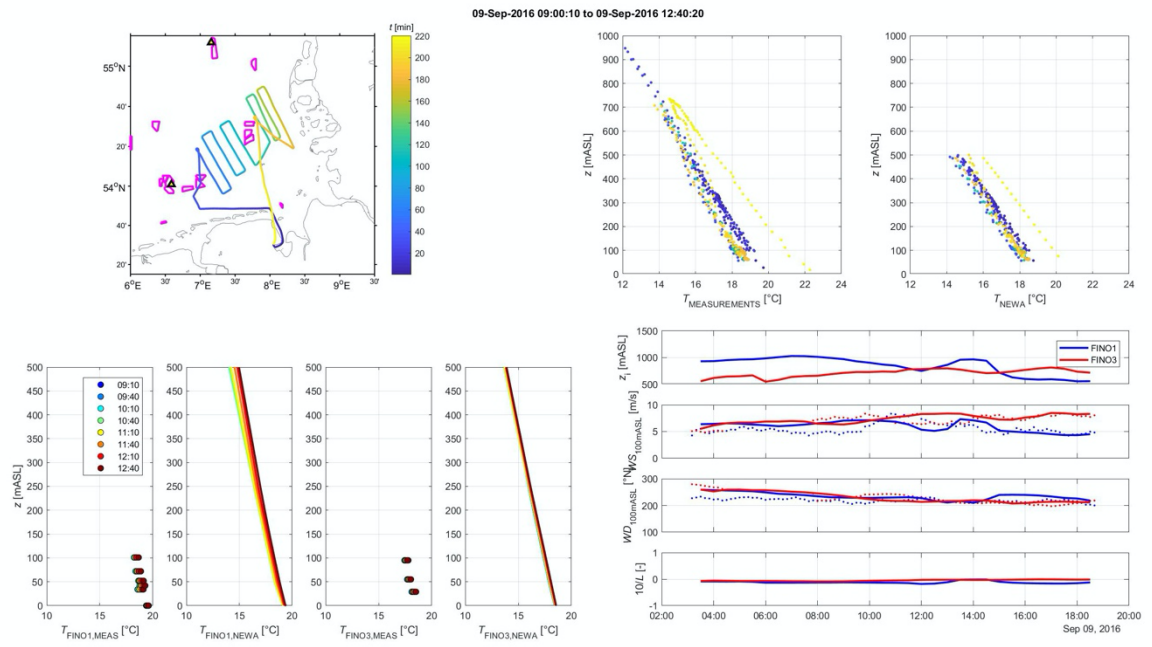
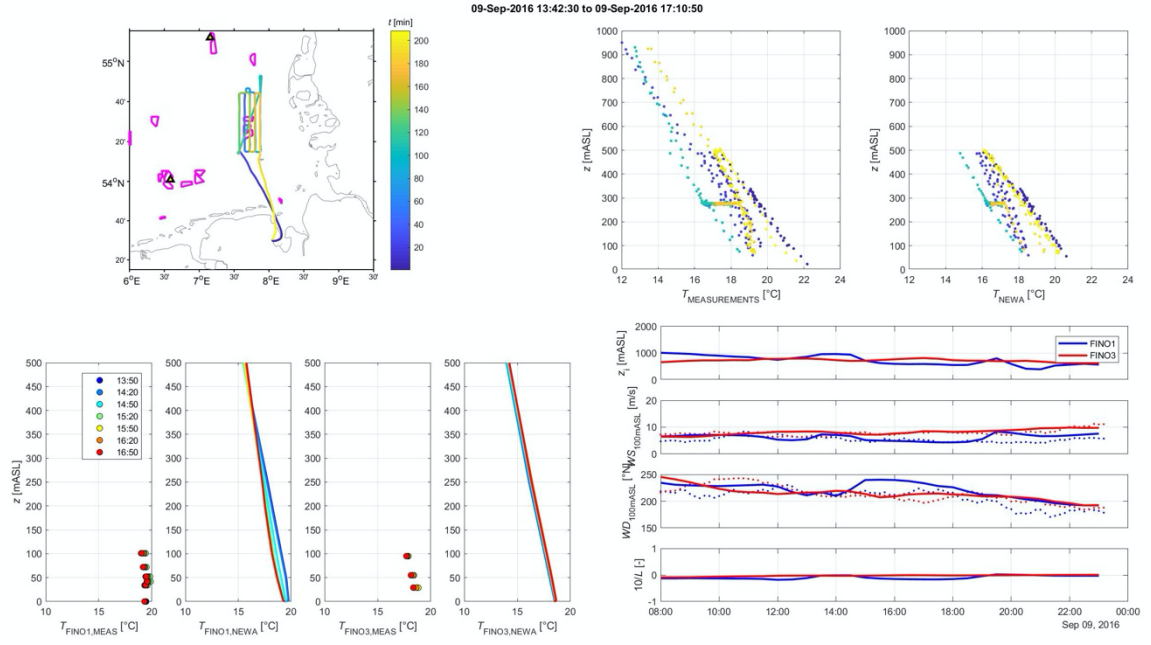



Figure S1: Comparison of temperature from in-situ measurements and NEWA model data over the German Bight from the WIPAFF campaign on September 06, 2016 from 12:13 to 15:20 UTC. Clockwise from top-left: (a) Flight path with the location of existing wind farms (indicated by magenta shapes) and the two met masts at FINO1 and FINO3 locations (black triangles in the southern and northern part of the map, respectively). Line colour indicates time from flight start. (b) Comparison of temperature profiles from in-situ measurements (flights) and NEWA model datasets (color-coded according to the corresponding flight time in panel (a)). (c) Time series of ABL height, wind speed and direction at 100 m, and Obukhov length at surface provided by ERA5 during the flight time period (blue line: FINO1; red line: FINO2). Wind speed and direction measured at 100 m from met masts are also shown (dotted lines). (d) Comparison between temperature profiles from in-site measurements (met masts) and NEWA model data during the flight time period (color-coded according to the corresponding flight time in panel (a)).

19   **Figure S2**: Same as Fig.S1 but for September 07, 2016 from 07:27 to 10:43 UTC.

22   **Figure S3**: Same as Fig.S1 but for September 07, 2016 from 12:06 to 13:59 UTC.

23
24   **Figure S4**: Same as Fig.S1 but for September 08, 2016 from 08:39 to 12:23 UTC.
25

26
27   **Figure S5**: Same as Fig.S1 but for September 07, 2016 from 09:00 to 12:40 UTC.
28

29
30 **Figure S6**: Same as Fig.S1 but for September 09, 2016 from 13:42 to 17:10 UTC.
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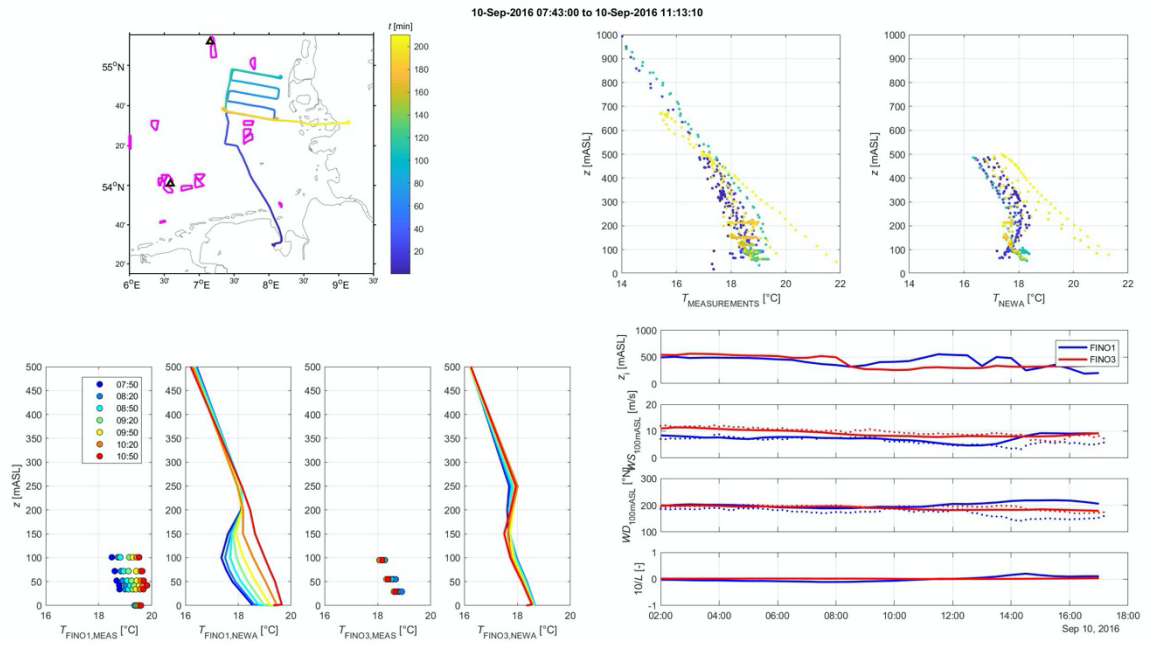
32

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34 **Figure S7**: Same as Fig.S1 but for September 10, 2016 from 07:43 to 11:13 UTC.
35

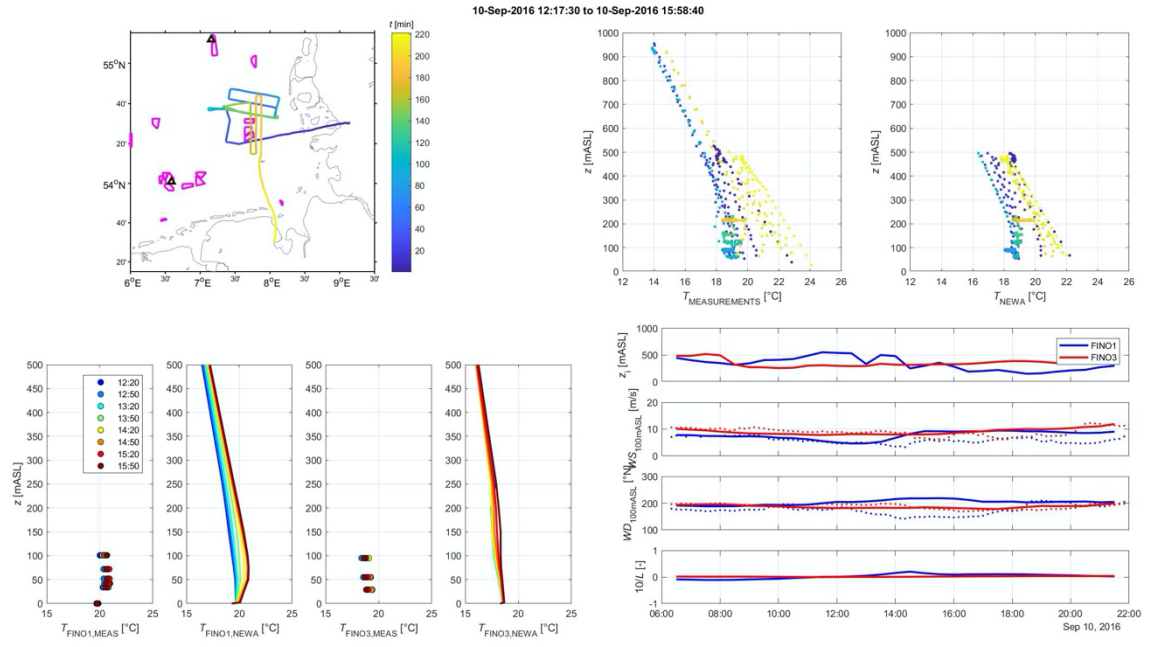



Figure S8: Same as Fig.S1 but for September 10, 2016 from 12:17 to 15:58 UTC.

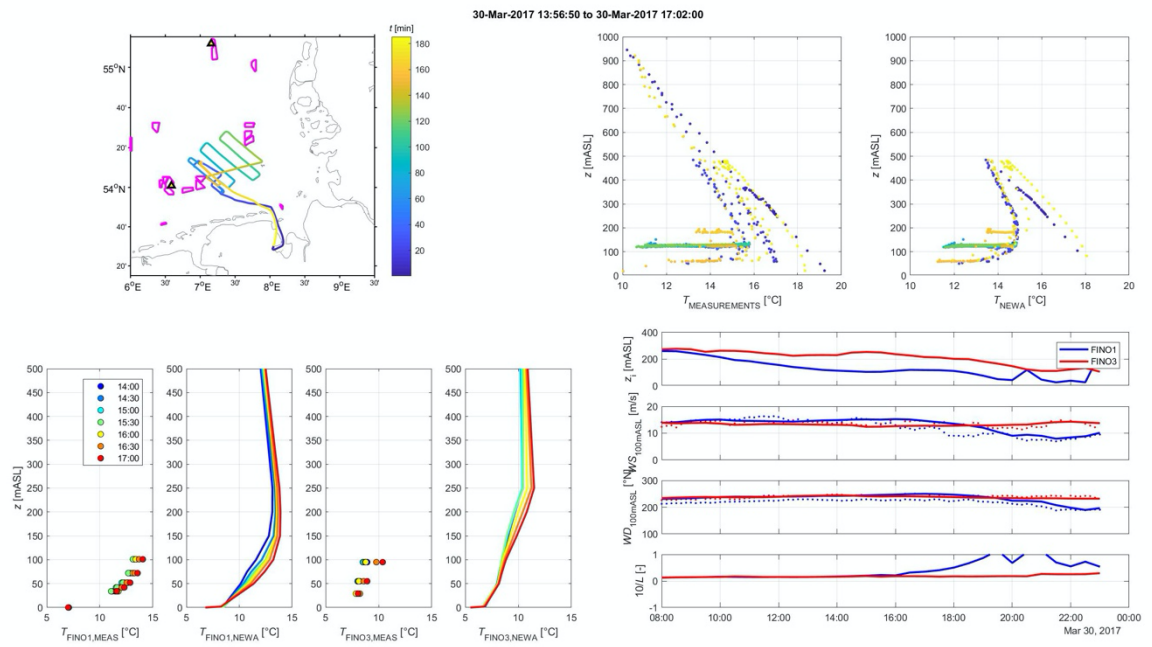
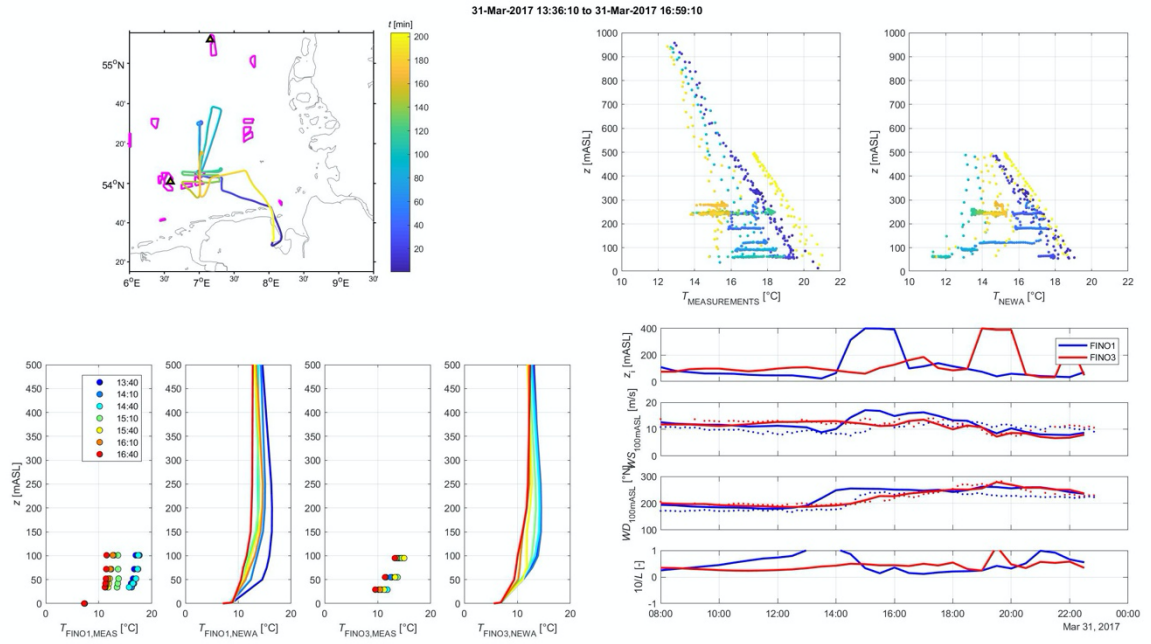



Figure S9: Same as Fig.S1 but for March 30, 2017 from 13:56 to 17:02 UTC.

43
44   **Figure S10**: Same as Fig.S1 but for March 31, 2017 from 13:36 to 16:59 UTC.
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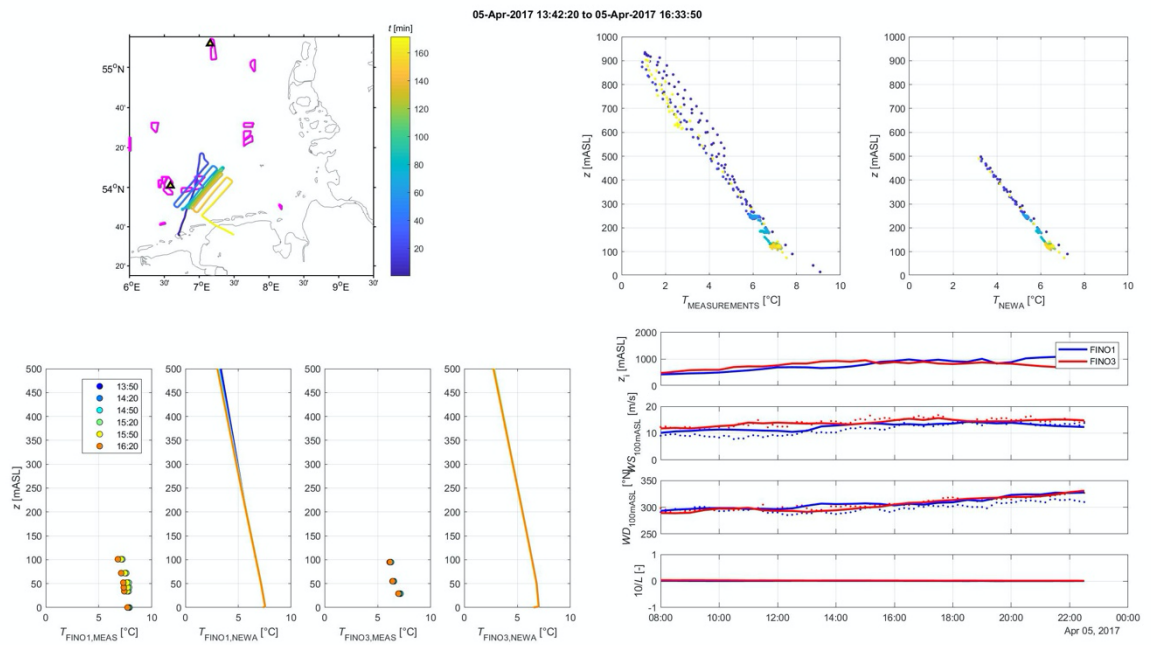
46

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48   **Figure S11**: Same as Fig.S1 but for April 5, 2017 from 13:42 to 16:33 UTC.
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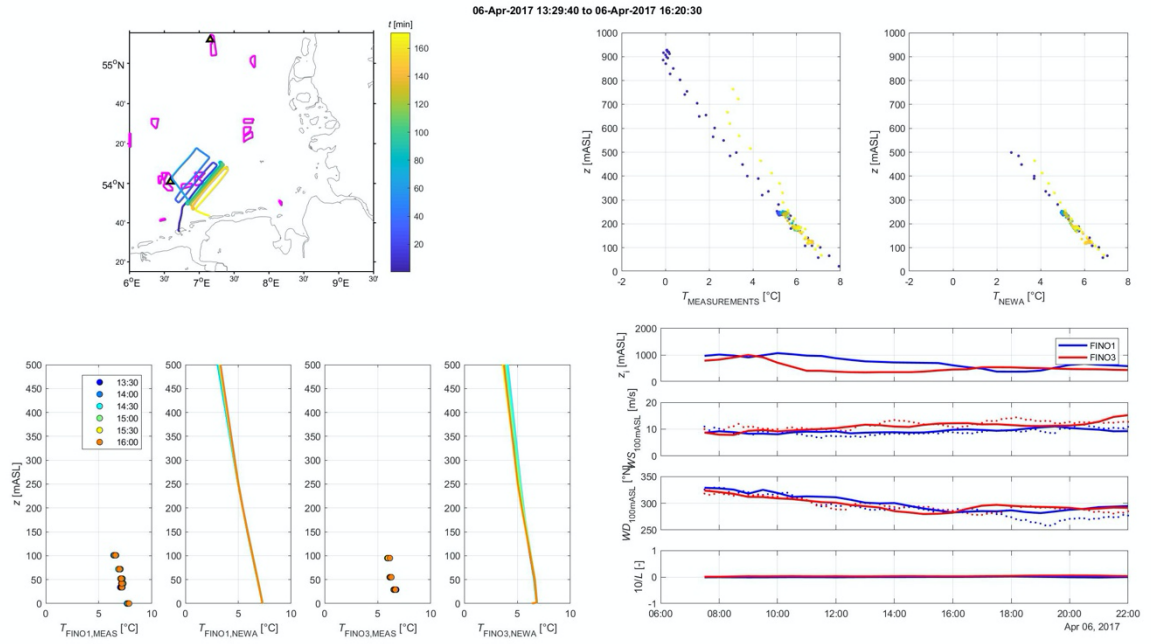
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51 **Figure S12**: Same as Fig.S1 but for April 6, 2017 from 13:29 to 16:20 UTC.
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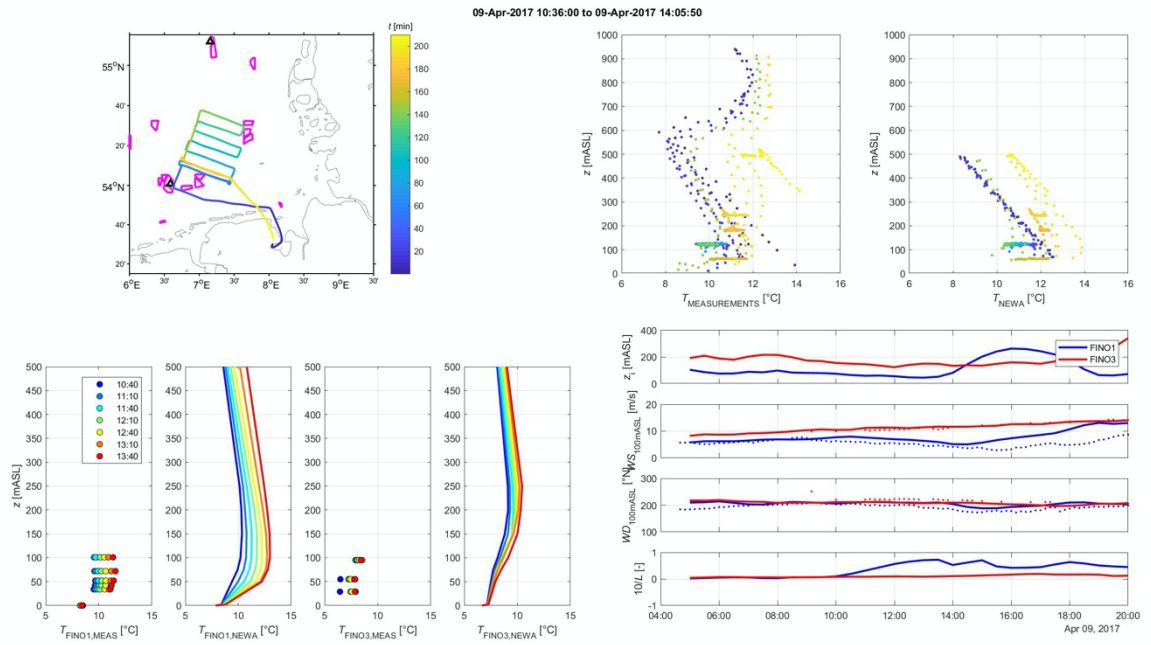
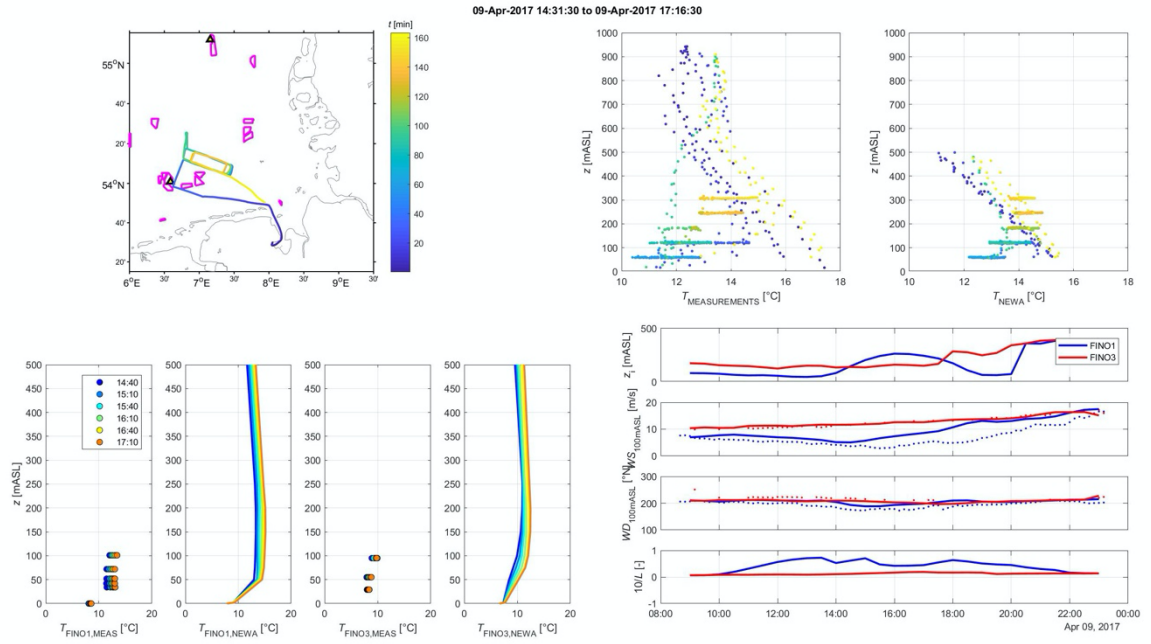
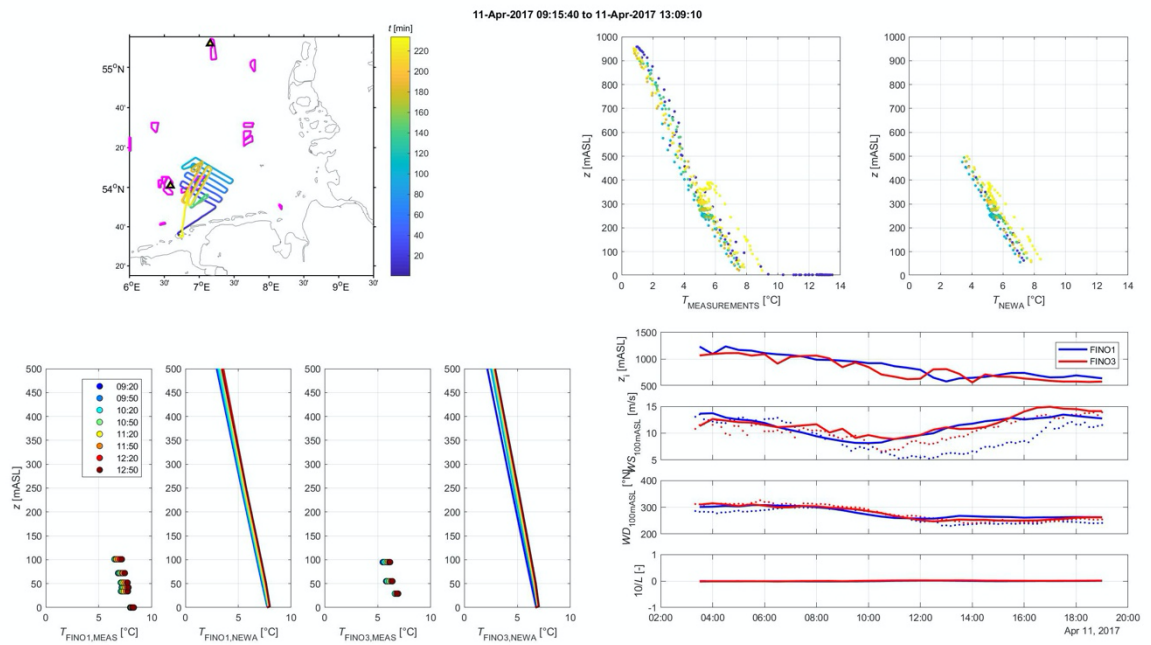
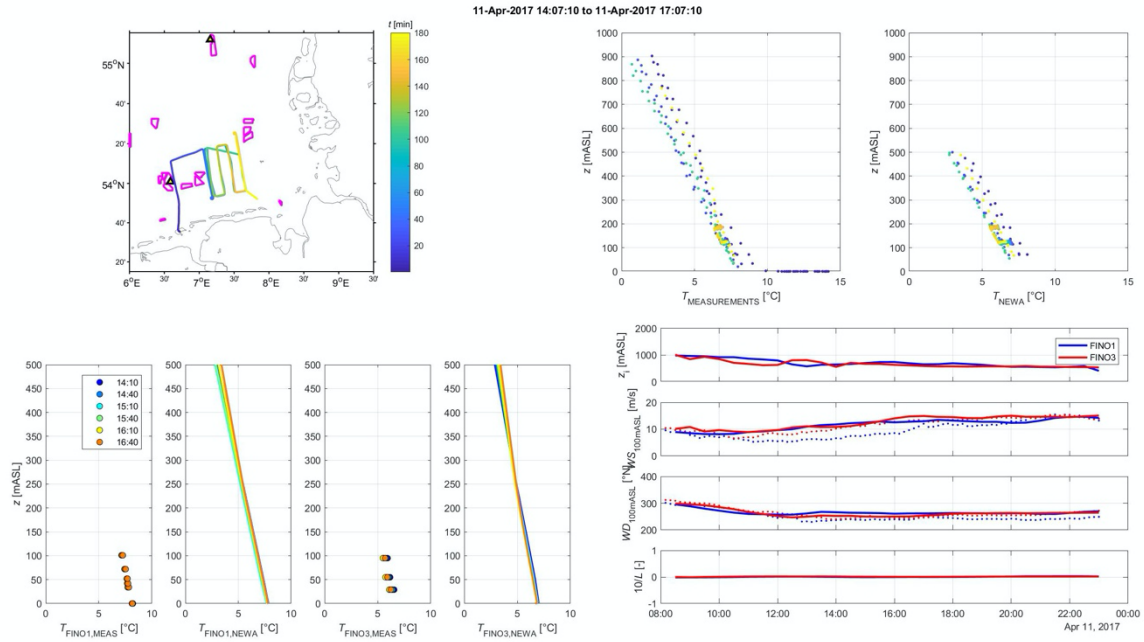

54
55 **Figure S13**: Same as Fig.S1 but for April 9, 2017 from 10:36 to 14:05 UTC.
56

 Figure S14: Same as Fig.S1 but for April 9, 2017 from 14:31 to 17:16 UTC.

 Figure S15: Same as Fig.S1 but for April 11, 2017 from 09:15 to 13:09 UTC.

64
65 **Figure S16**: Same as Fig.S1 but for April 11, 2017 from 14:07 to 17:07 UTC.
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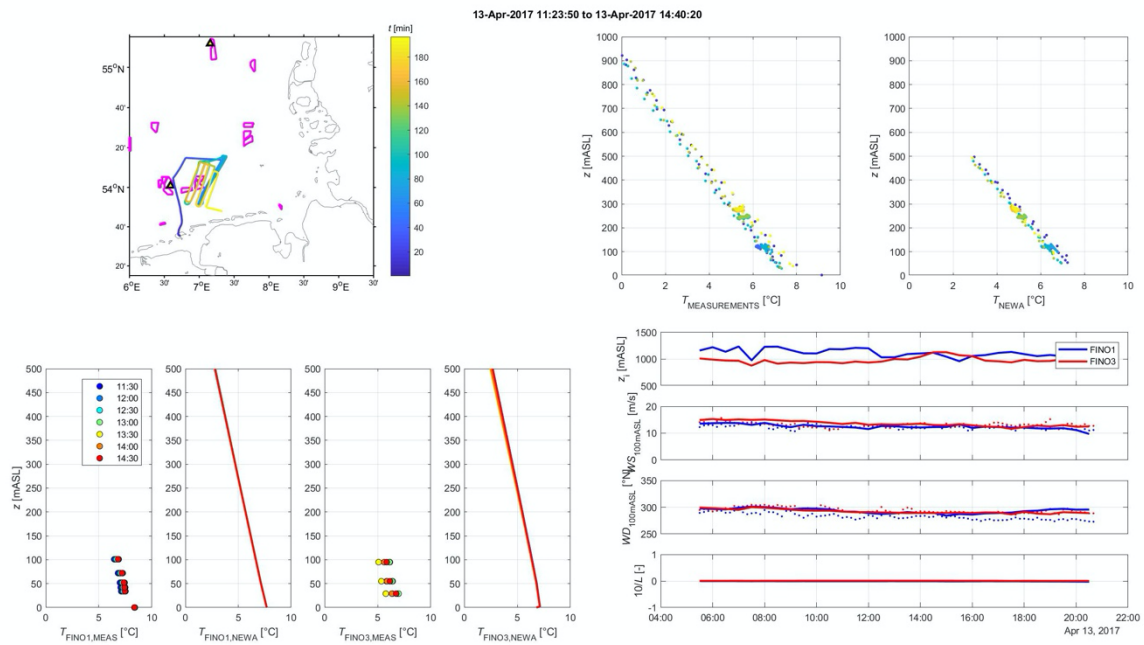
67

68
69 **Figure S17**: Same as Fig.S1 but for April 13, 2017 from 11:23 to 14:40 UTC.
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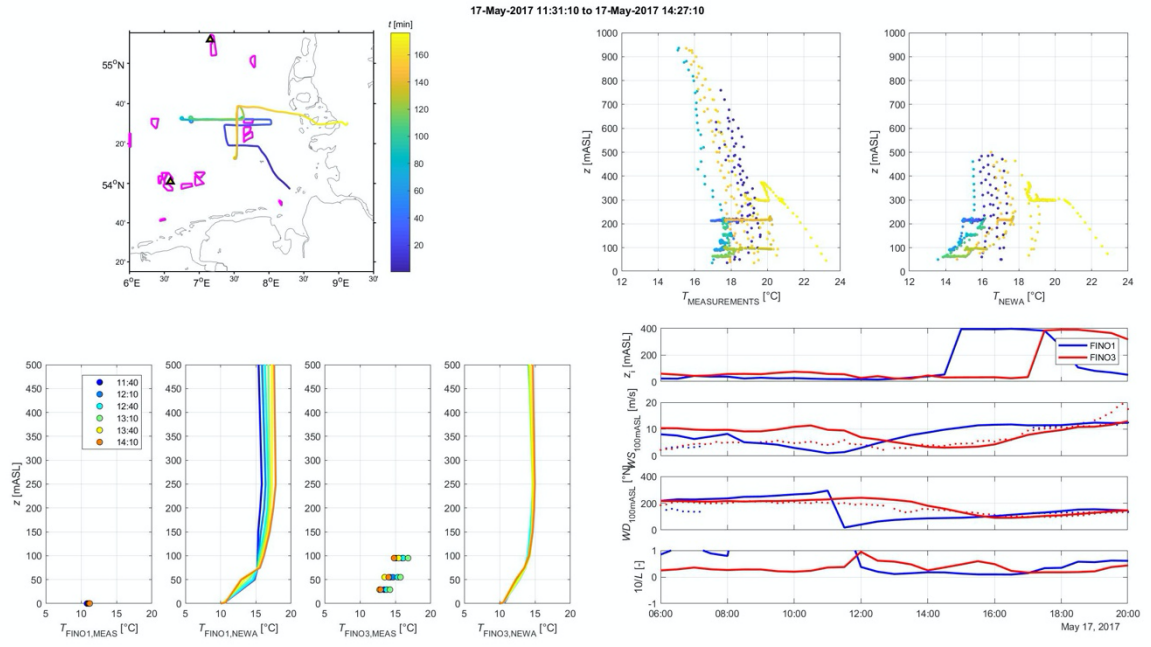
71

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73   **Figure S18**: Same as Fig.S1 but for April 17, 2017 from 11:31 to 14:27 UTC.

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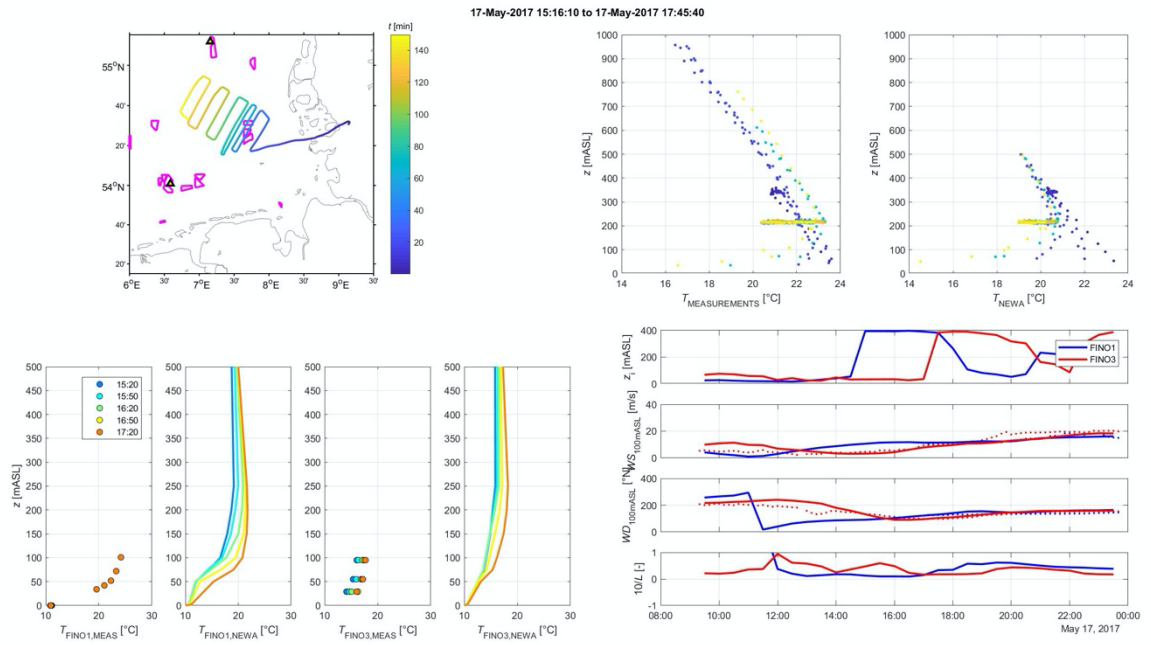
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77   **Figure S19**: Same as Fig.S1 but for April 17, 2017 from 15:16 to 17:45 UTC.

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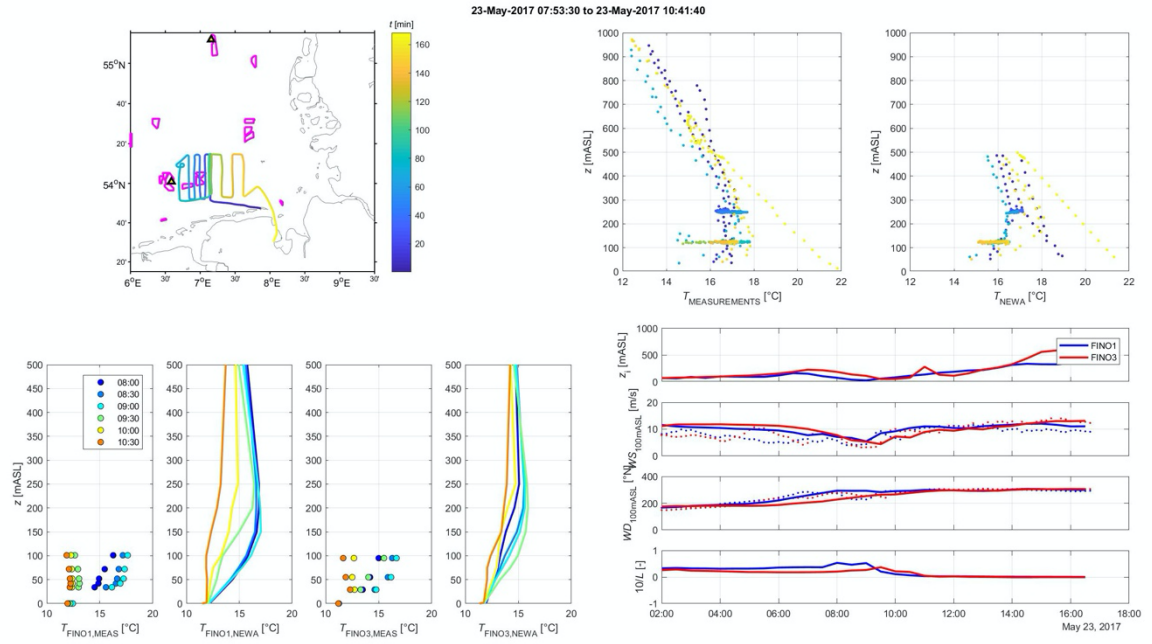
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81 **Figure S20**: Same as Fig.S1 but for May 23, 2017 from 07:53 to 10:41 UTC.
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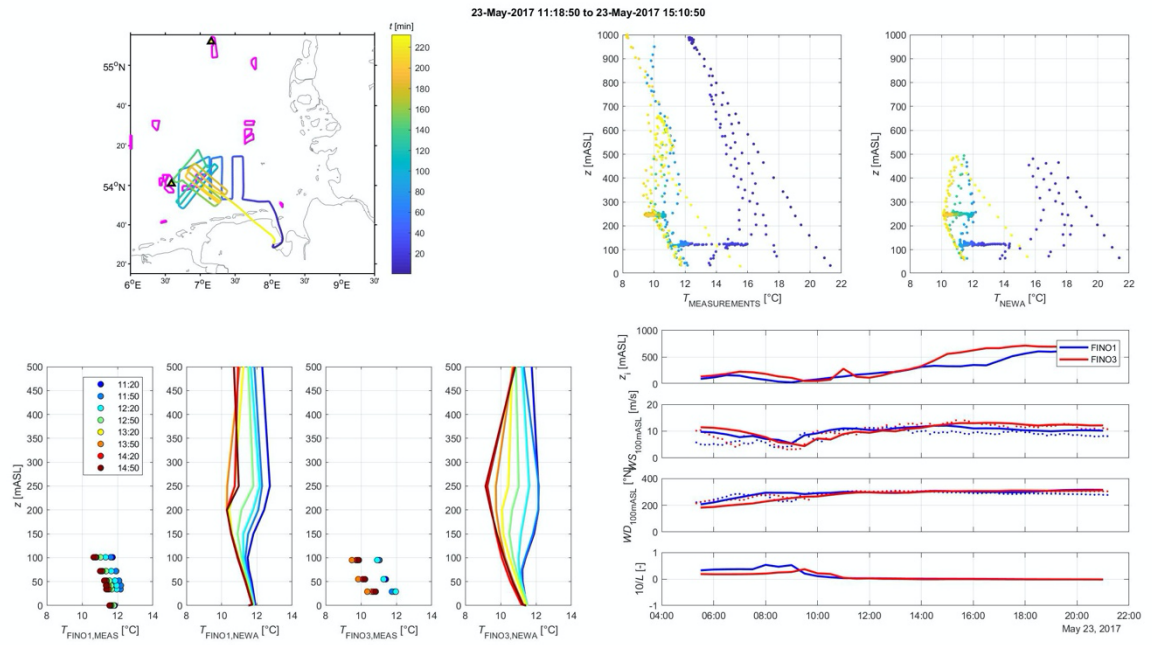
84
85 **Figure S21**: Same as Fig.S1 but for May 23, 2017 from 11:18 to 15:10 UTC.
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89 **Figure S22**: Same as Fig.S1 but for May 24, 2017 from 05:40 to 09:33 UTC.
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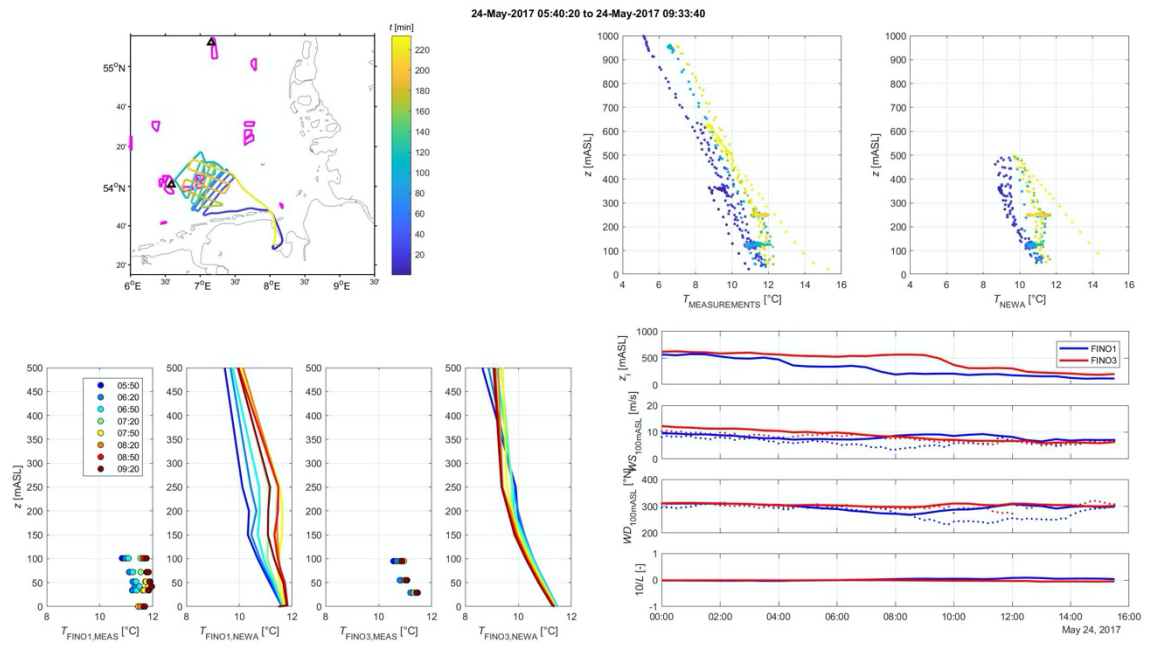
92
93 **Figure S23**: Same as Fig.S1 but for May 24, 2017 from 10:13 to 14:10 UTC.
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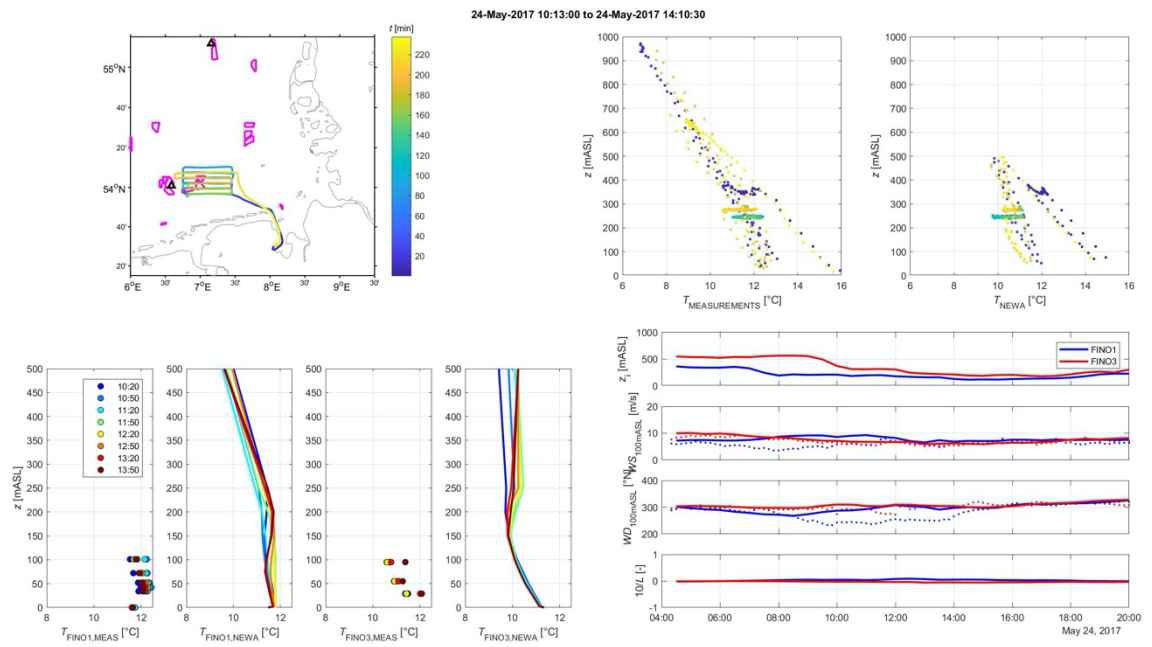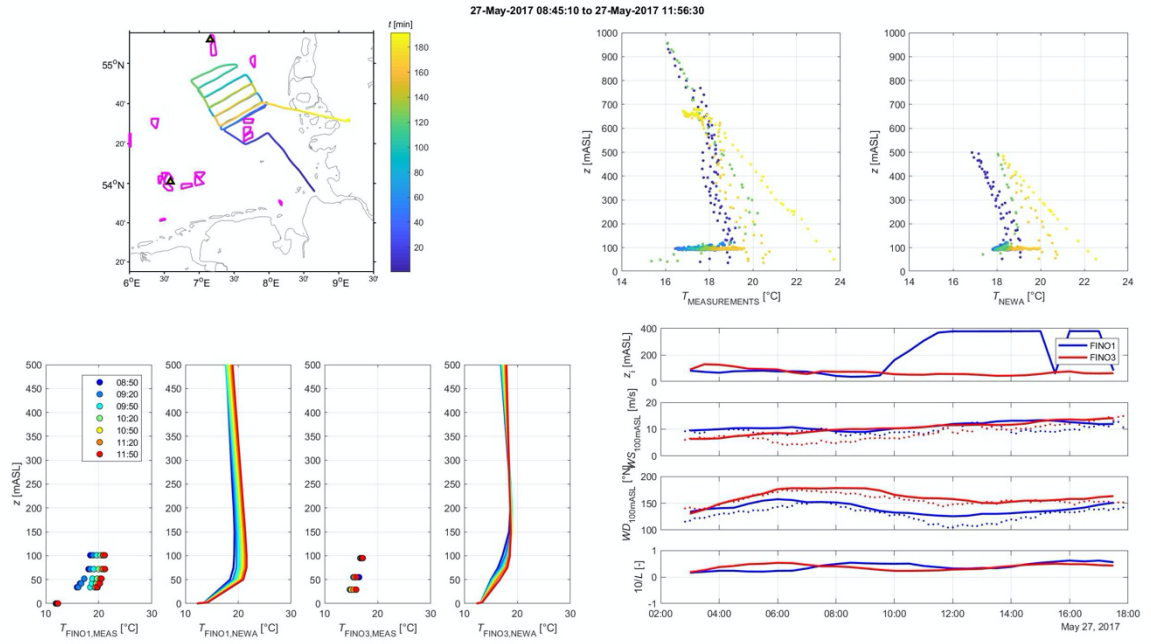
Figure S24: Same as Fig.S1 but for May 27, 2017 from 08:45 to 11:56 UTC.

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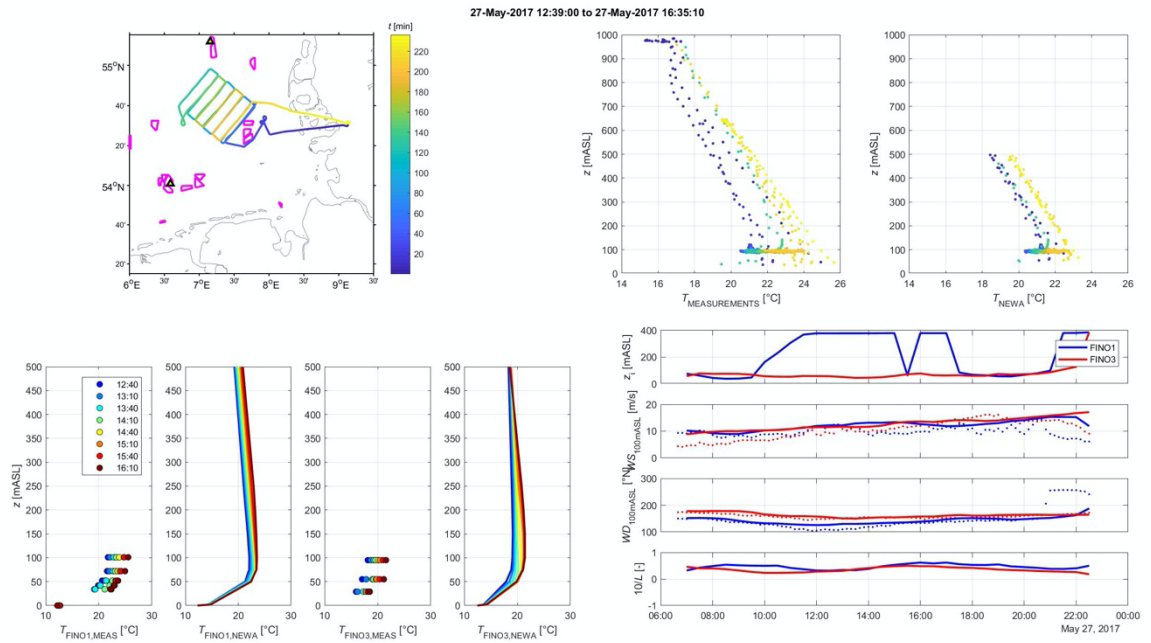
100
101 **Figure S25**: Same as Fig.S1 but for May 73, 2017 from 12:39 to 16:35 UTC.

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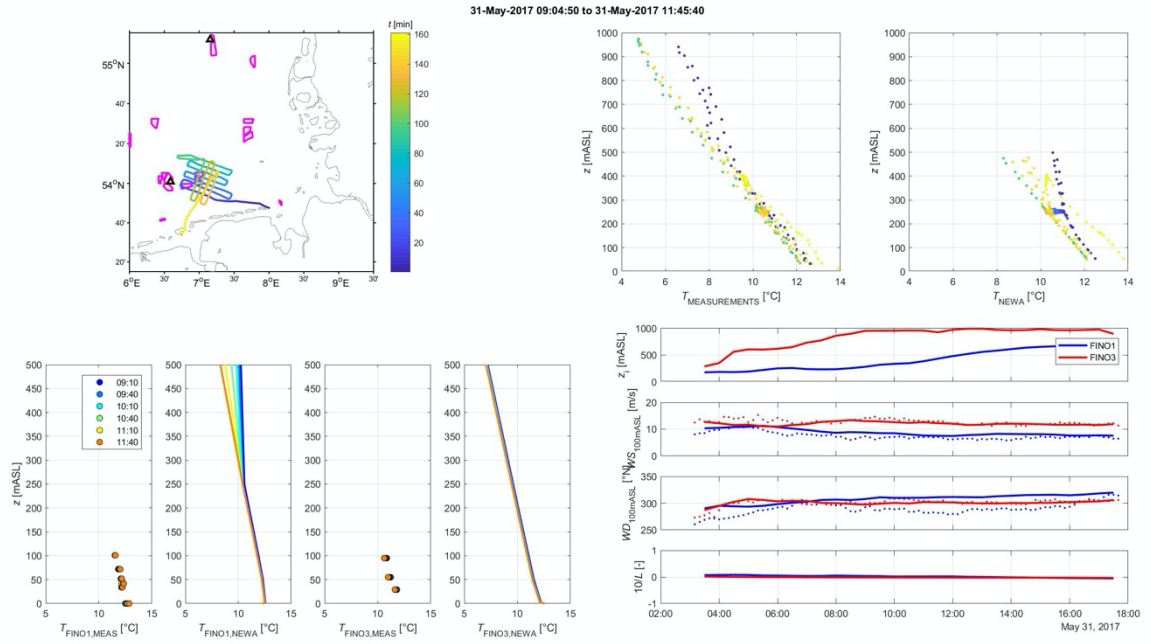
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105   **Figure S26**: Same as Fig.S1 but for May 31, 2017 from 09:04 to 11:45 UTC.
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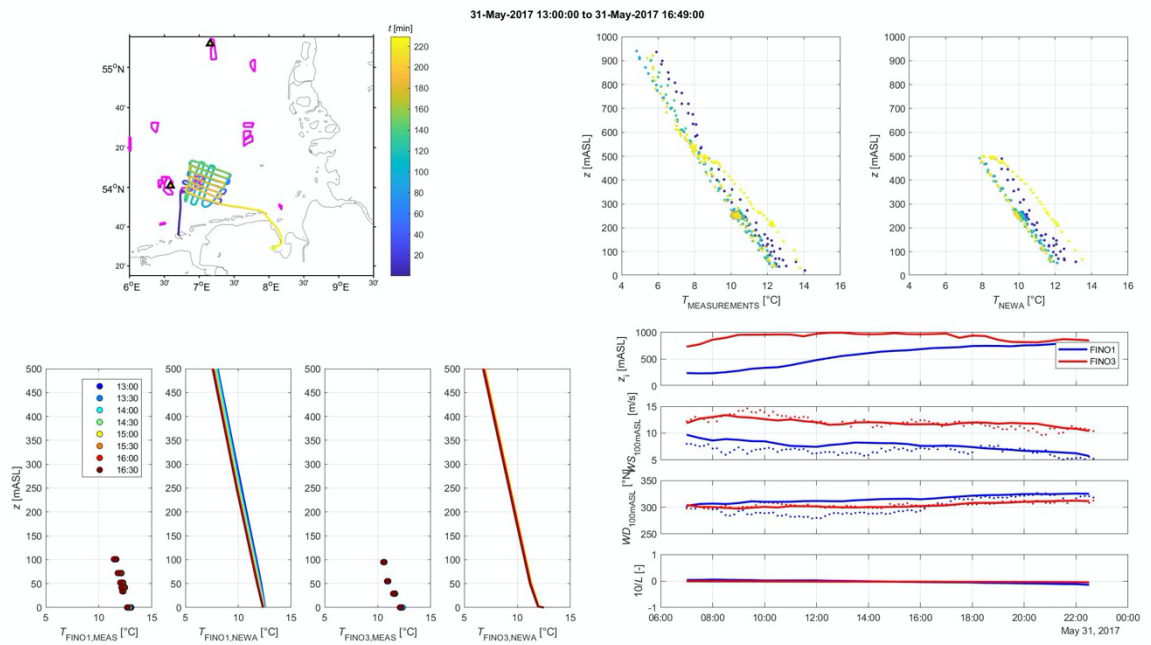
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109   **Figure S27**: Same as Fig.S1 but for May 31, 2017 from 13:00 to 16:49 UTC.
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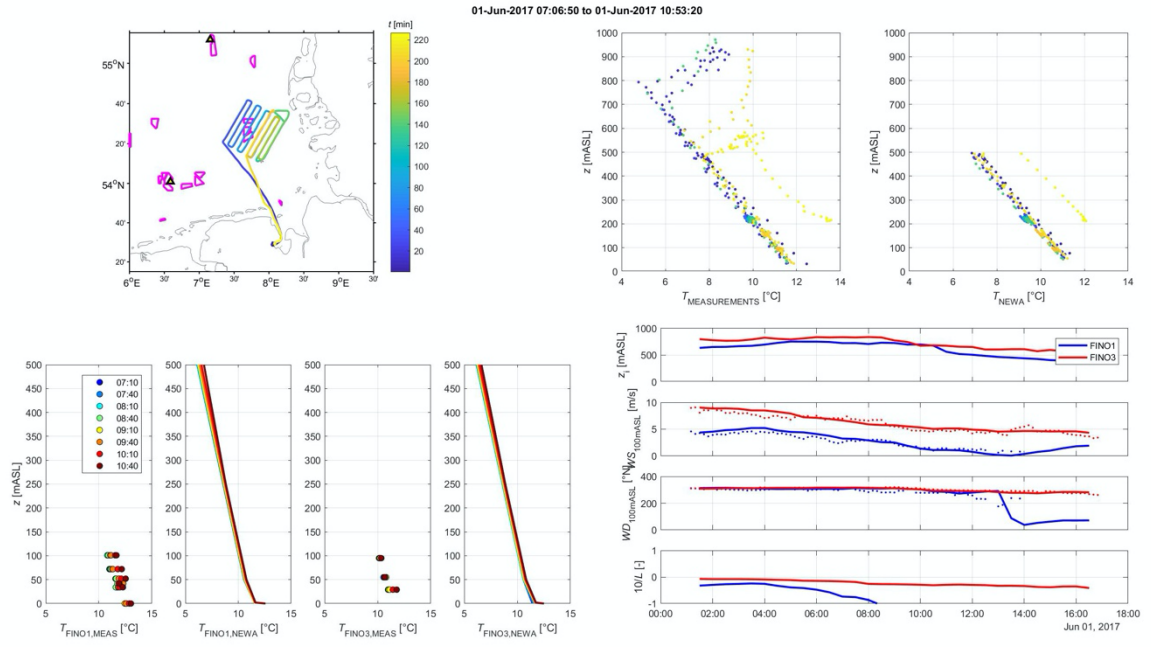
111

112
113 **Figure S28**: Same as Fig.S1 but for Jun 1, 2017 from 07:06 to 10:53 UTC.
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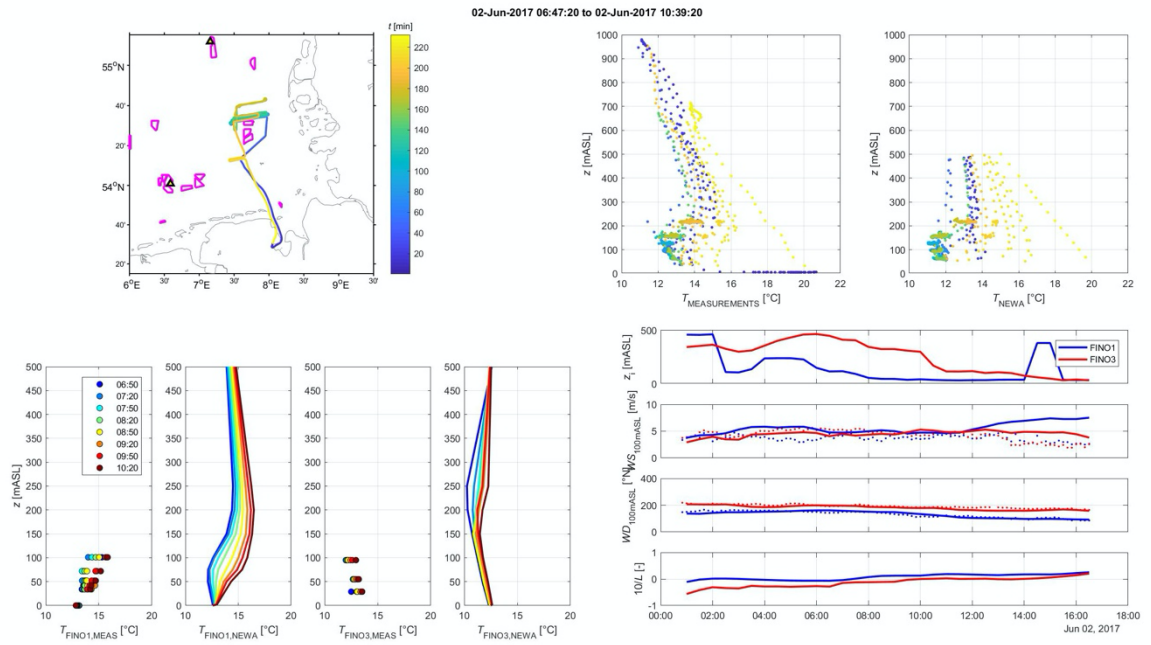
116
117 **Figure S29**: Same as Fig.S1 but for Jun 2, 2017 from 06:47 to 10:39 UTC.
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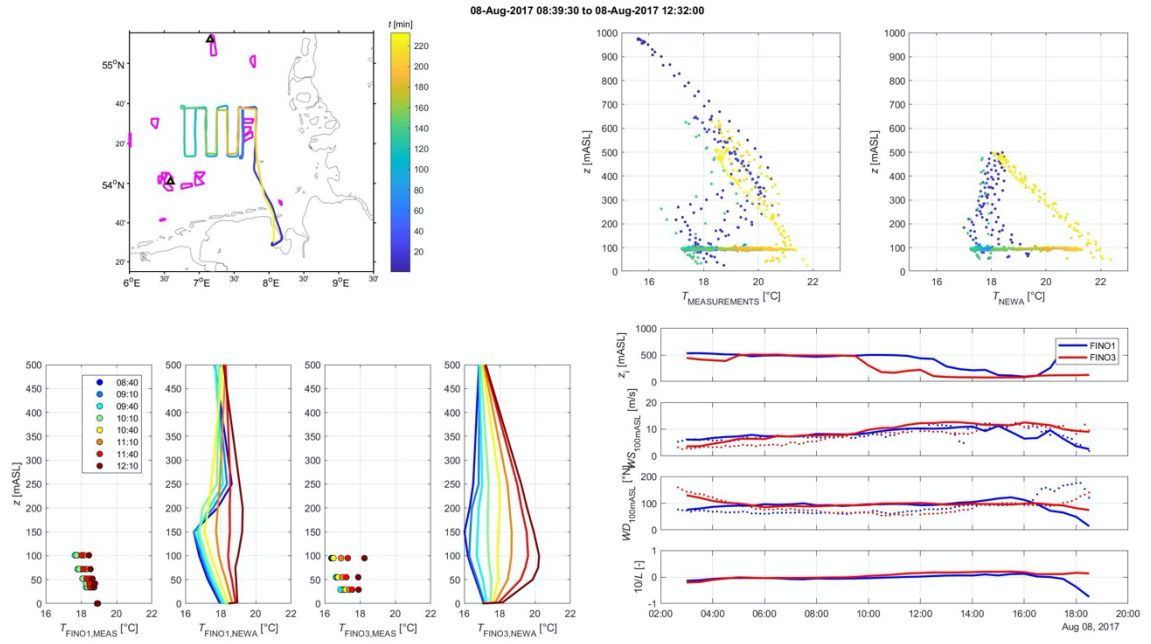
119

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121 **Figure S30**: Same as Fig.S1 but for Aug 8, 2017 from 08:39 to 12:32 UTC.
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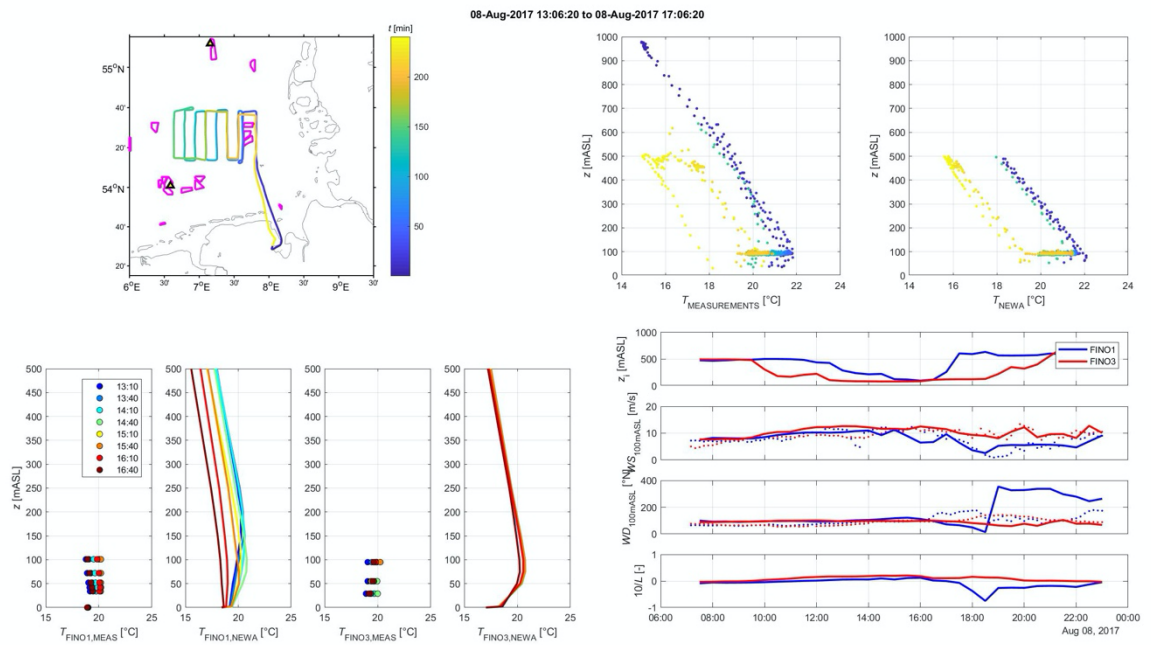
124
125 **Figure S31**: Same as Fig.S1 but for Aug 8, 2017 from 13:06 to 17:06 UTC.
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129   **Figure S32**: Same as Fig.S1 but for Aug 9, 2017 from 08:34 to 12:36 UTC.
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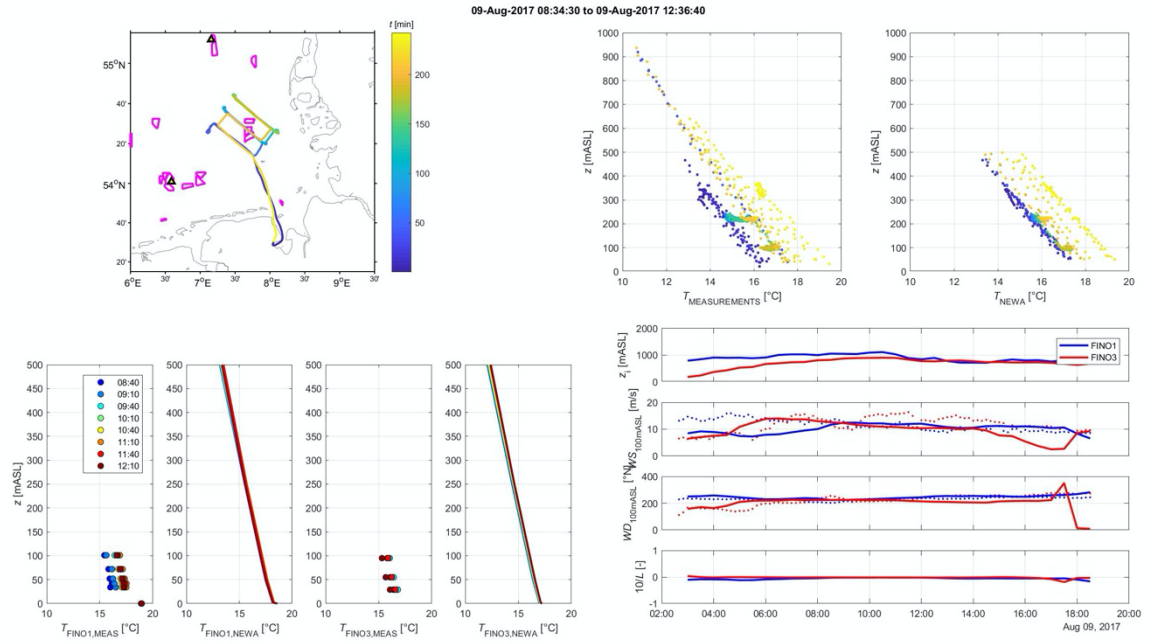
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133   **Figure S33**: Same as Fig.S1 but for Aug 9, 2017 from 13:09 to 17:04 UTC.
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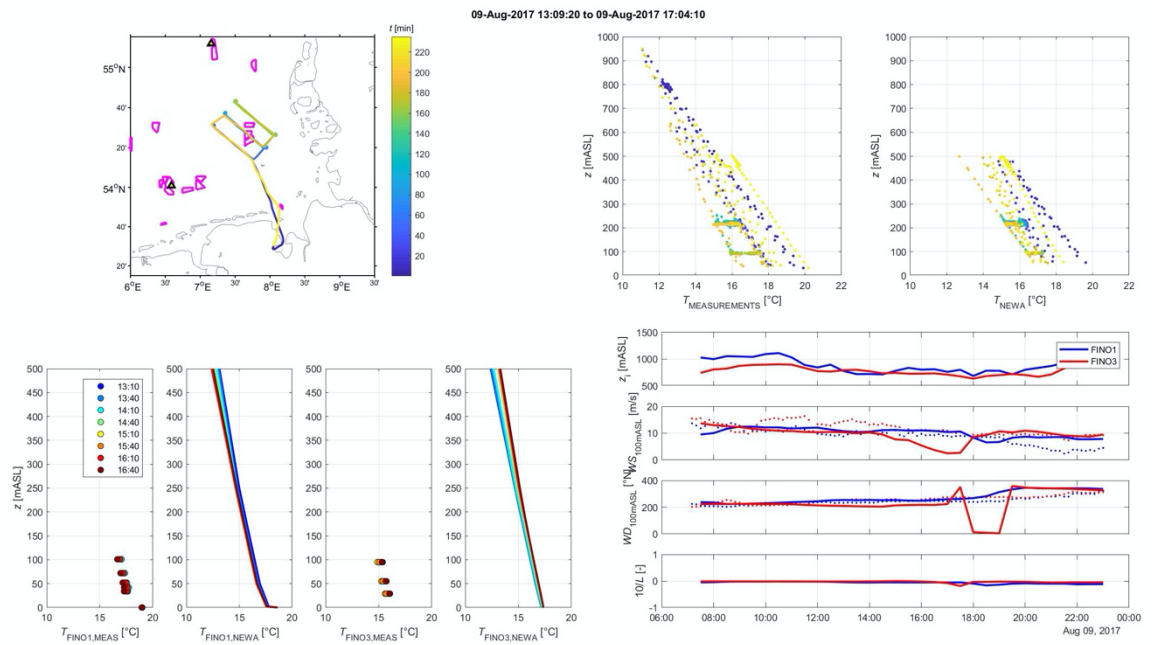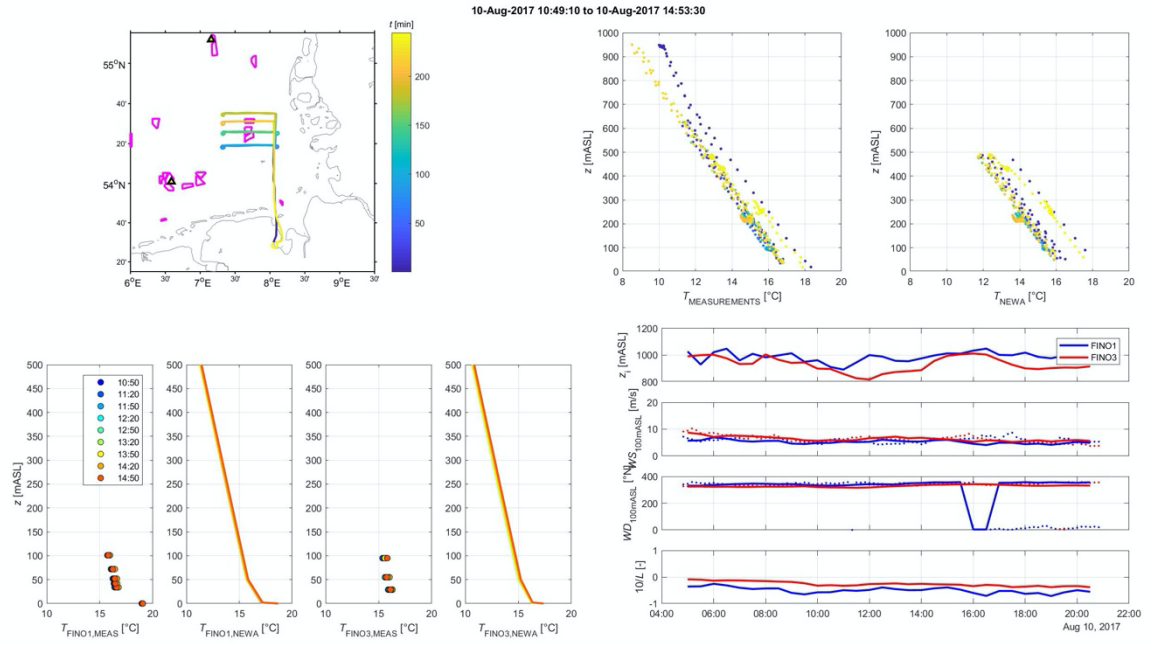
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137   **Figure S34**: Same as Fig.S1 but for Aug 10, 2017 from 10:49 to 14:53 UTC.
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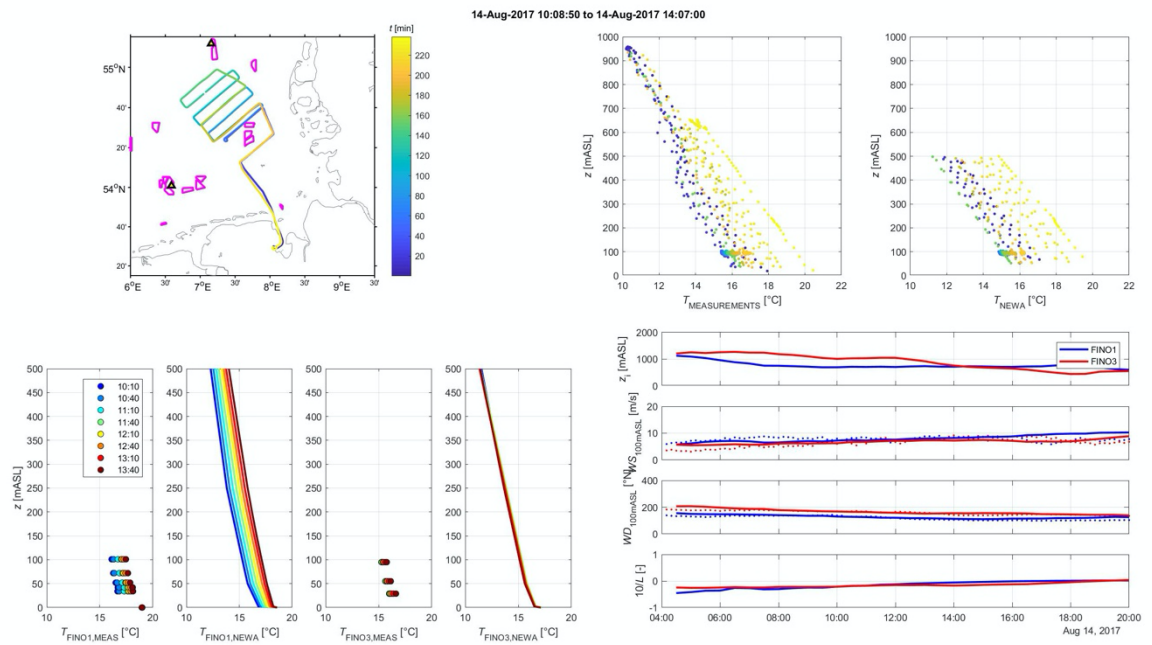
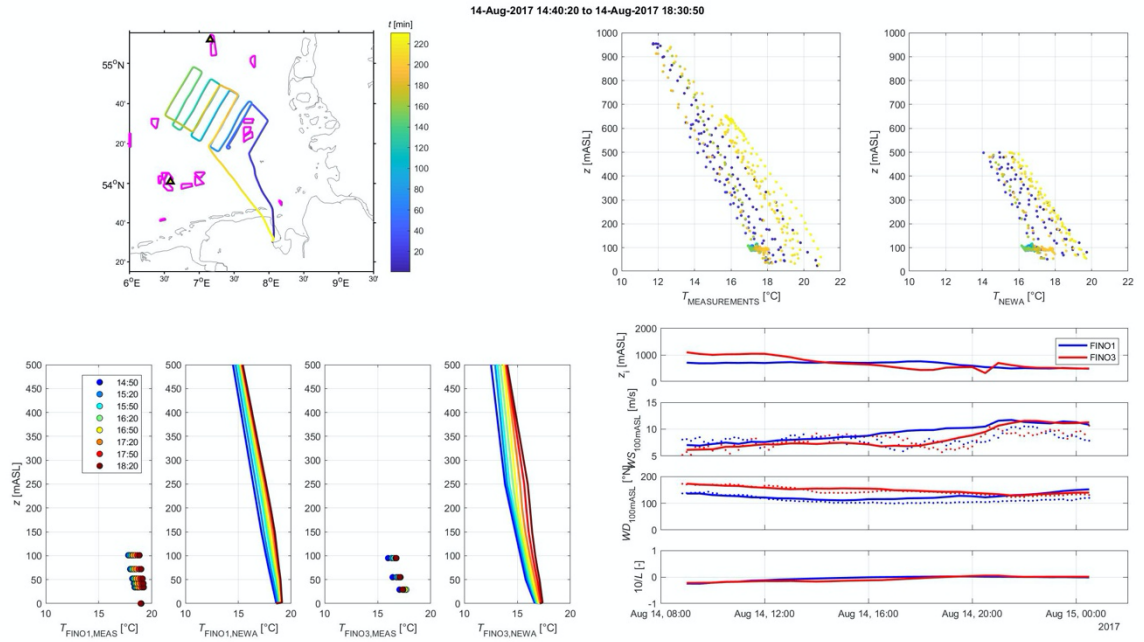
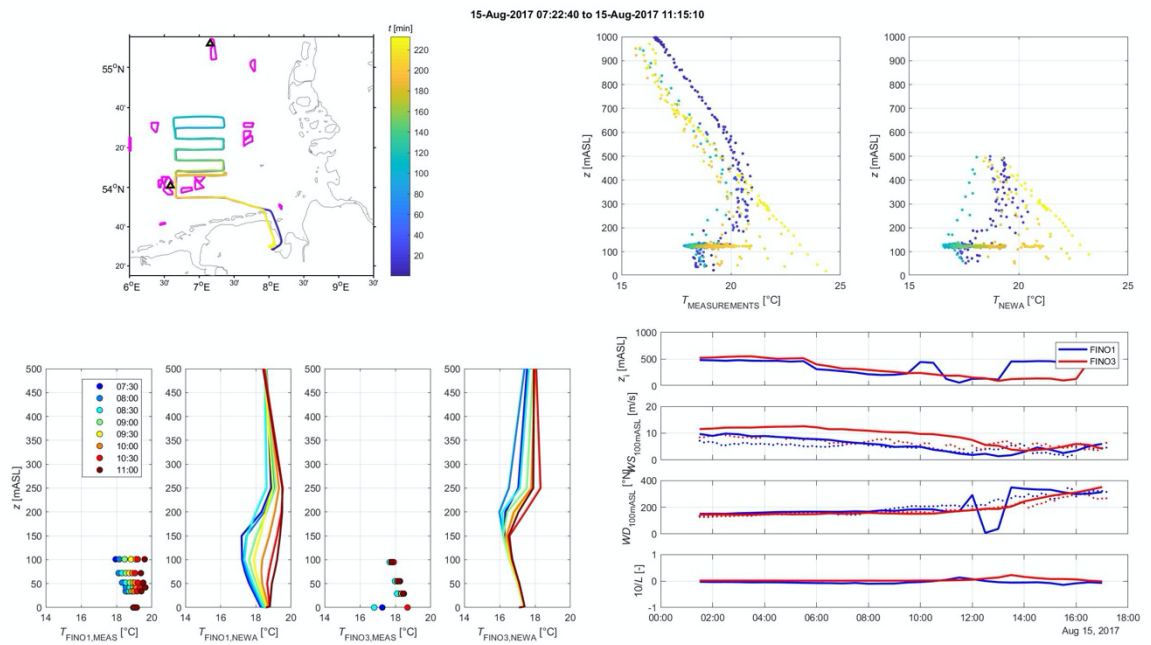

140
141   **Figure S35**: Same as Fig.S1 but for Aug 14, 2017 from 10:08 to 14:07 UTC.
142
143

144
145 **Figure S36**: Same as Fig.S1 but for Aug 14, 2017 from 14:20 to 18:30 UTC.
146
147

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149 **Figure S37**: Same as Fig.S1 but for Aug 15, 2017 from 07:22 to 11:15 UTC.
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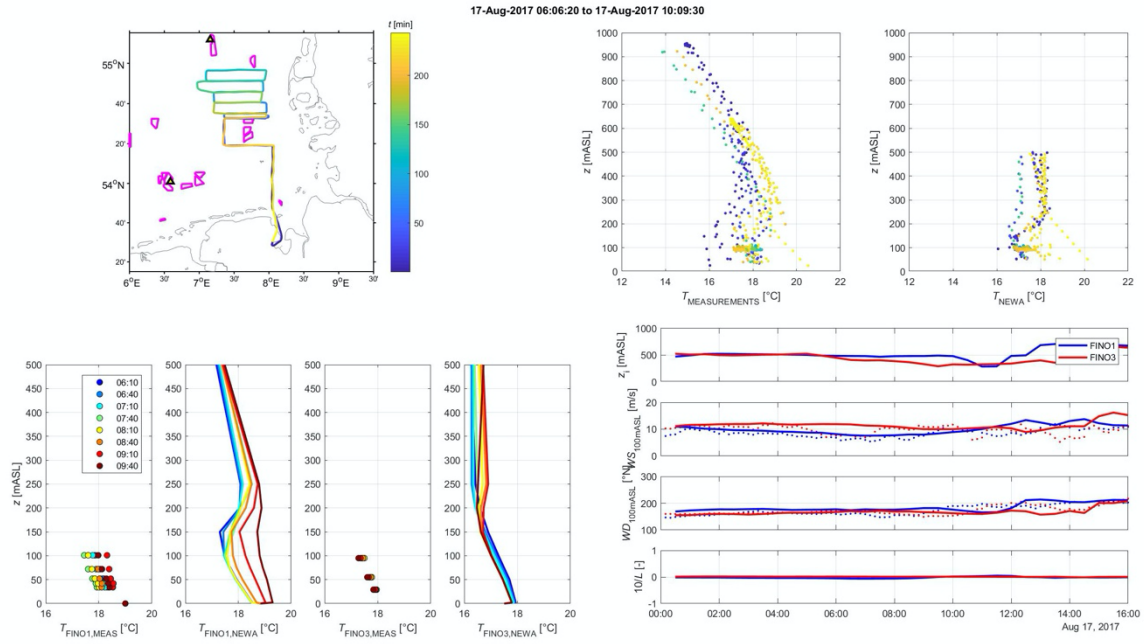
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153 **Figure S38**: Same as Fig.S1 but for Aug 17, 2017 from 06:06 to 10:09 UTC.
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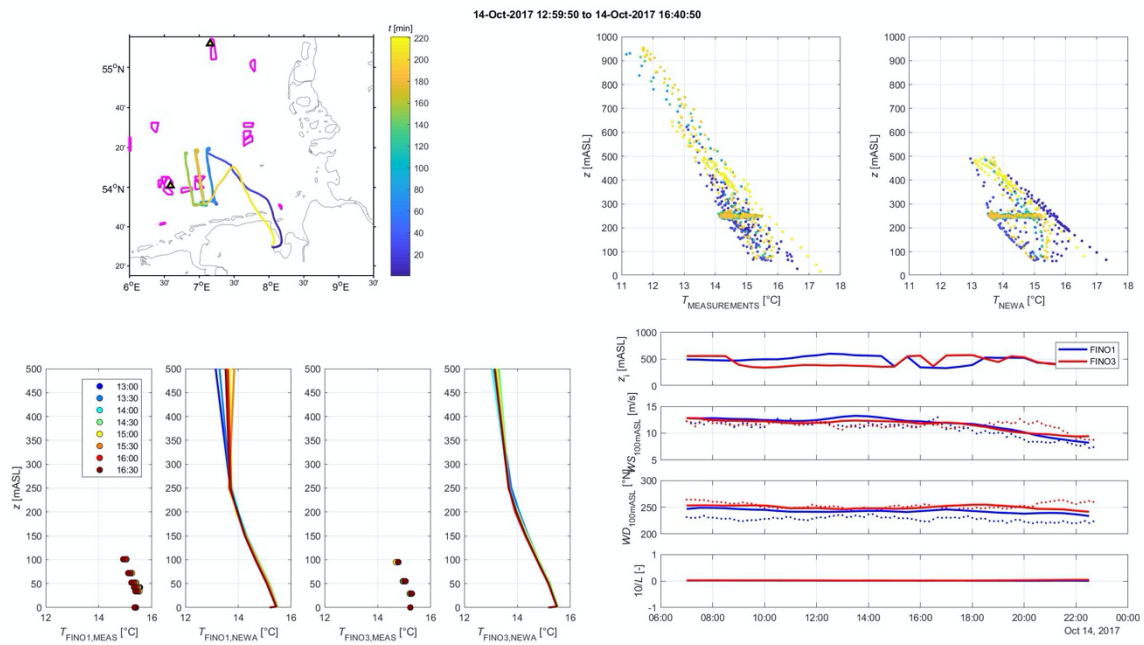
155

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157 **Figure S39**: Same as Fig.S1 but for Oct 14, 2017 from 12:59 to 16:40 UTC.
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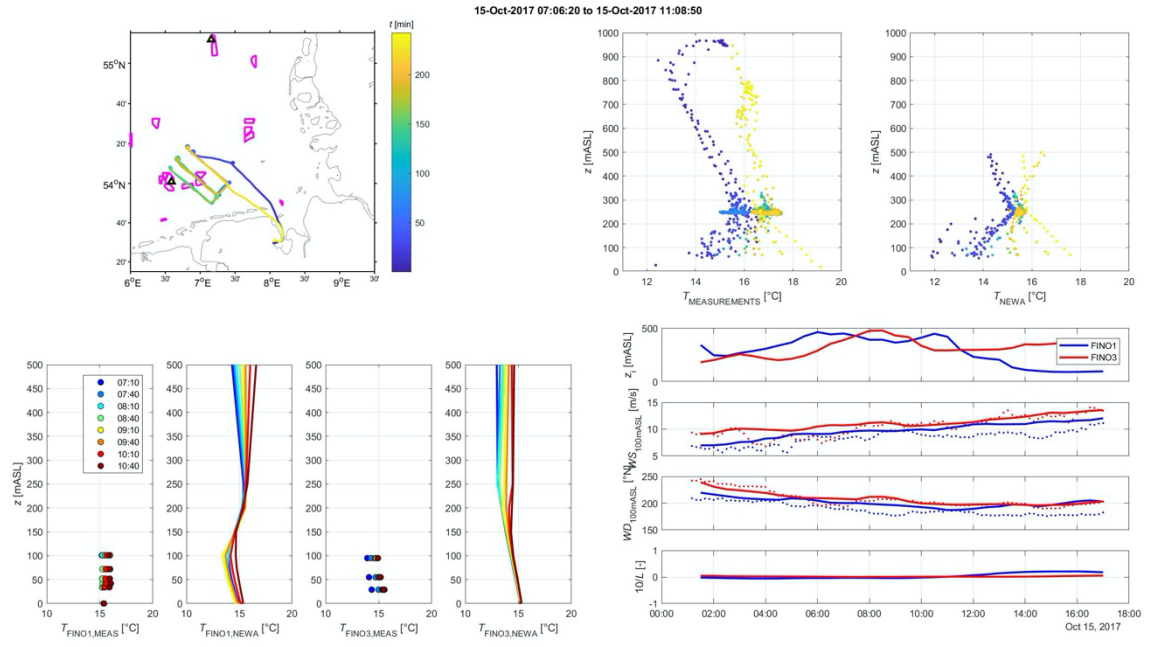
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161   **Figure S40**: Same as Fig.S1 but for Oct 15, 2017 from 07:06 to 11:08 UTC.
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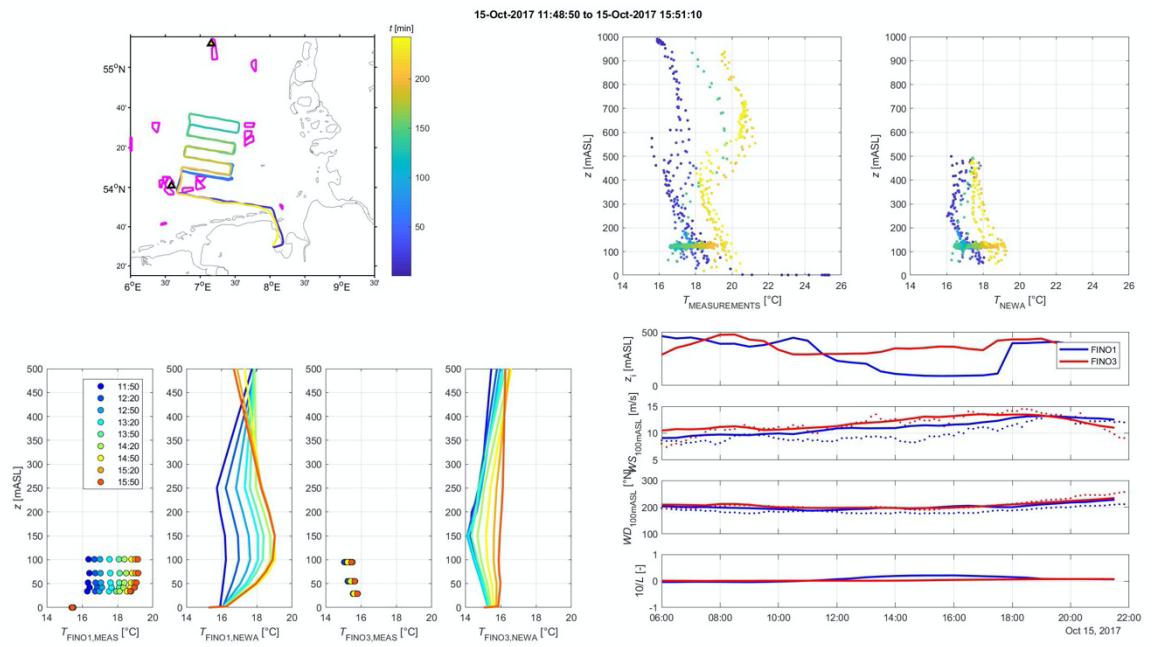
164
165   **Figure S41**: Same as Fig.S1 but for Oct 15, 2017 from 11:48 to 15:51 UTC.
166
167