Strømmåling

Gjennomført i perioden 13.07 – 14.08.16
Lokalitet Hausvik

24.08.2016

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Content

Summary

Strømmålingen ved Hausvik ble gjennomført i perioden 13.07 – 14.08.16.

Målerens ble montert på bunnen på 57 meters dyp I posisjon 58. 3. 158 N, 6. 58. 5340 Ø

Det ser ut som om måleren har flyttet seg ca 1,5 meter dypere 20.7.

Rapporten angir strømmålinger på overflaten (5 meters dyp), midt i vannsøylen (30 m dyp)

og 3 meter over bunnen 54 meters dyp.

Max strømhastighet på hhv 5, 30 og 54 meter var 45, 20 og 20 cm/sek

Gjennomsnitt for de samme dyp var 9, 5 og 5 cm/sek

Prosent strømstille for samme dyp var 1,69, 4,98 og 3,31 %

Progressiv vector viser hvor en tenkt partikkel ved strømmåleren hadde befunnet seg ved slutten av målingen, viss den hadde fulgt vannbevegelsen i måleperioden. Dette gir et bilde av den totale vannbevegelsen i måleperioden, på et gitt dyp.

I overflaten hadde dette punktet beveget seg ca 90 km N og 80 km V. På 30 meter hadde punket beveget seg lite, ca 1 km S og 2,5 km Ø, mens det på bunnen hadde beveget seg, ca 14 km N og 14 km V.

Det ble registrert store temperatursvingninger i perioden (fra 8,3 til 13,7 grader). Dette indikerer bevegelse/utskiftning av vannmassene over bunnen.

NB. Det er en sensor i måleren som skal registrere om den måler mot bunnen eller mot overflaten. Denne måleren viste seg å ha hengt seg opp slik at den hele tiden tror den måler mot bunnen. For flere figurer er det derfor ikke samsvar mellom figurtittel og det som står som overskrift i selve grafen. Det er overskriften som er rett.

Har diskutert dette med produsenten av måleren (Nortek) og de bekrefter at det ikke har innvirkning på registrering av data

Details

Instrument

Head Id	AQP 2445
Board Id	AQD 2826
Frequency	400000

Configuration

File	Lyngda01.prf
Start	11.07.2016 16:00
End	16.08.2016 01:00
Data Records	5095
Longitude	6° 58,534'E
Latitude	58° 3,158'N
Orientation	UP
Cells	21
Cell Size [m]	2,5
Blanking Distance [m]	1
Average Interval [sec]	60
Measurement Interval [sec]	600

Quality

Low Pressure Treshold	0
HighTilt Threshold	30
Expected Orientation	UP
Amplitude Spike Treshold	70
Velocity Spike Treshold	5
SNR Treshold	3

Post processing

Selected Start	13.07.2016 18:12
Selected End	14.08.2016 06:04
Compass Offset	0
Pressure Offset	0
Selected Records	4535
Reference	Instrument
Bottom Depth [m]	57
Bottom Invalid Data	0
Middle Depth [m]	30
Middle Invalid Data	15
Top Depth [m]	5
Top Invalid Data	329

Manually removed data

Statistics

Bottom [54m]

Mean current [m/s]	0.05
Max current [m/s]	0.20
Min current [m/s]	0.00
Measurements used/total [#]	4535 / 4535
Std.dev [m/s]	0.03
Significant max velocity [m/s]	0.09
Significant min velocity [m/s]	0.02
10 year return current [m/s]	0.333
50 year return current [m/s]	0.374
Most significant directions [°]	330°, 345°, 315°, 150°
Most significant speeds [m/s]	0.05, 0.10, 0.15, 0.20
Most flow	456.23m³ / day at 315-330°
Least flow	77.73m³ / day at 30-45°
Neumann parameter	0.14
Residue current	0.01 m/s at 313°
Zero current [%] - [HH:mm]	3.31% - 00:20

Middle [30m]

Mean current [m/s]	0.05
Max current [m/s]	0.20
Min current [m/s]	0.00
Measurements used/total [#]	4520 / 4535
Std.dev [m/s]	0.03
Significant max velocity [m/s]	0.08
Significant min velocity [m/s]	0.02
10 year return current [m/s]	0.334
50 year return current [m/s]	0.375
Most significant directions [°]	315°, 150°, 135°, 330°
Most significant speeds [m/s]	0.05, 0.10, 0.15, 0.20
Most flow	336.36m³ / day at 300-315°
Least flow	64.95m³ / day at 15-30°
Neumann parameter	0.02
Residue current	0.00 m/s at 113°
Zero current [%] - [HH:mm]	4.98% - 00:30

Top[5m]

Mean current [m/s]	0.09
Max current [m/s]	0.45
Min current [m/s]	0.00
Measurements used/total [#]	4206 / 4535
Std.dev [m/s]	0.07
Significant max velocity [m/s]	0.17
Significant min velocity [m/s]	0.03

10 year return current [m/s]	0.739
50 year return current [m/s]	0.828
Most significant directions [°]	330°, 345°, 315°, 300°
Most significant speeds [m/s]	0.10, 0.05, 0.15, 0.20
Most flow	1471.69m³ / day at 315-330°
Least flow	59.94m³ / day at 210-225°
Neumann parameter	0.50
Residue current	0.05 m/s at 317°
Zero current [%] - [HH:mm]	1.69% - 00:20

Direction with return period

Bottom [54m]

Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,051	0,197	0,085	0,324	0,095	0,364
45	0,040	0,144	0,067	0,238	0,075	0,267
90	0,044	0,156	0,073	0,258	0,081	0,289
135	0,052	0,173	0,086	0,286	0,097	0,321
180	0,046	0,138	0,075	0,227	0,085	0,255
225	0,038	0,154	0,063	0,253	0,071	0,284
270	0,046	0,151	0,077	0,249	0,086	0,279
315	0,066	0,202	0,109	0,333	0,123	0,374

Middle [30]

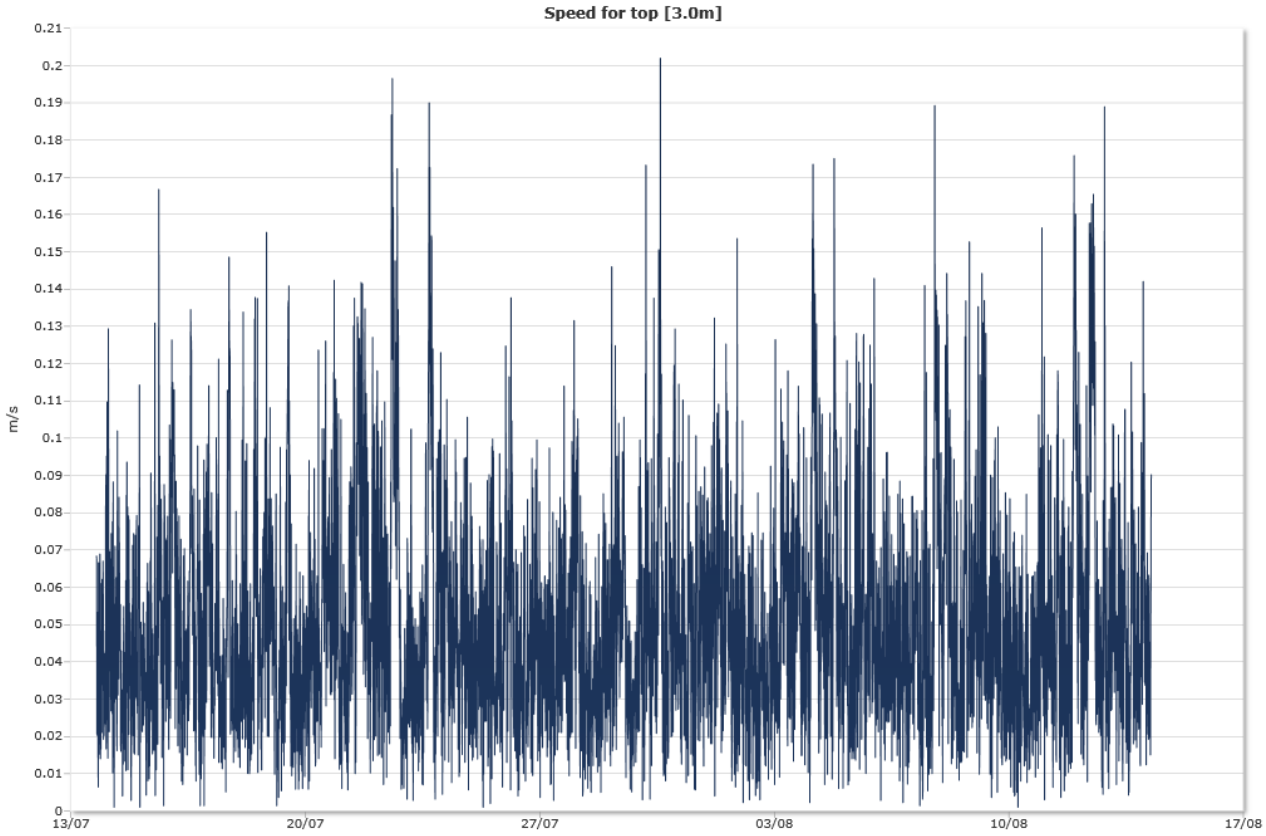
Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,040	0,200	0,066	0,330	0,074	0,370
45	0,037	0,121	0,060	0,199	0,068	0,224
90	0,048	0,175	0,079	0,289	0,088	0,324
135	0,051	0,201	0,084	0,331	0,094	0,371
180	0,039	0,120	0,064	0,198	0,072	0,222
225	0,037	0,183	0,062	0,302	0,069	0,339
270	0,043	0,137	0,072	0,225	0,080	0,253
315	0,053	0,203	0,087	0,334	0,098	0,375

Top[5m]

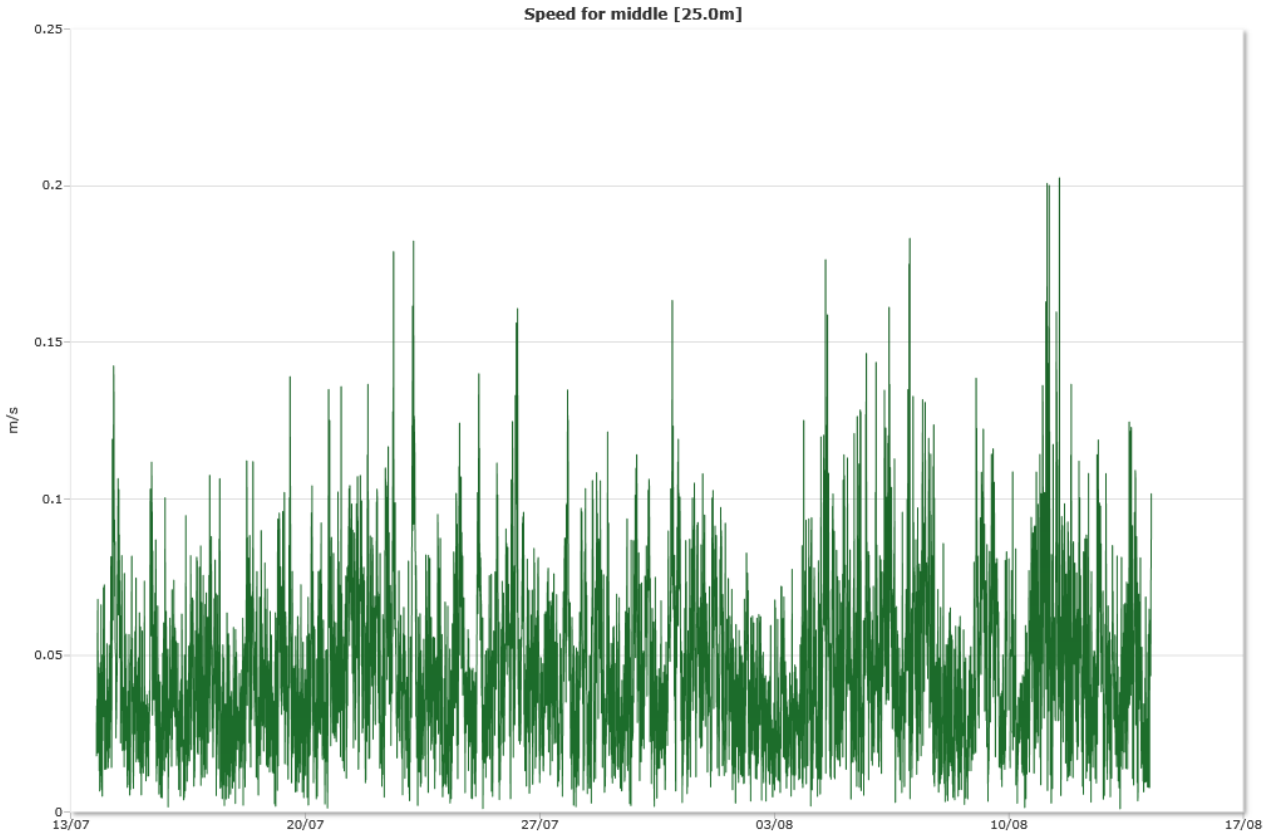
Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,089	0,328	0,147	0,541	0,165	0,606
45	0,055	0,216	0,091	0,356	0,103	0,400
90	0,065	0,212	0,107	0,350	0,120	0,393
135	0,070	0,195	0,115	0,322	0,129	0,361
180	0,052	0,156	0,086	0,258	0,097	0,289
225	0,056	0,186	0,093	0,307	0,104	0,344
270	0,108	0,376	0,179	0,621	0,201	0,696
315	0,129	0,448	0,214	0,739	0,239	0,828

Time series

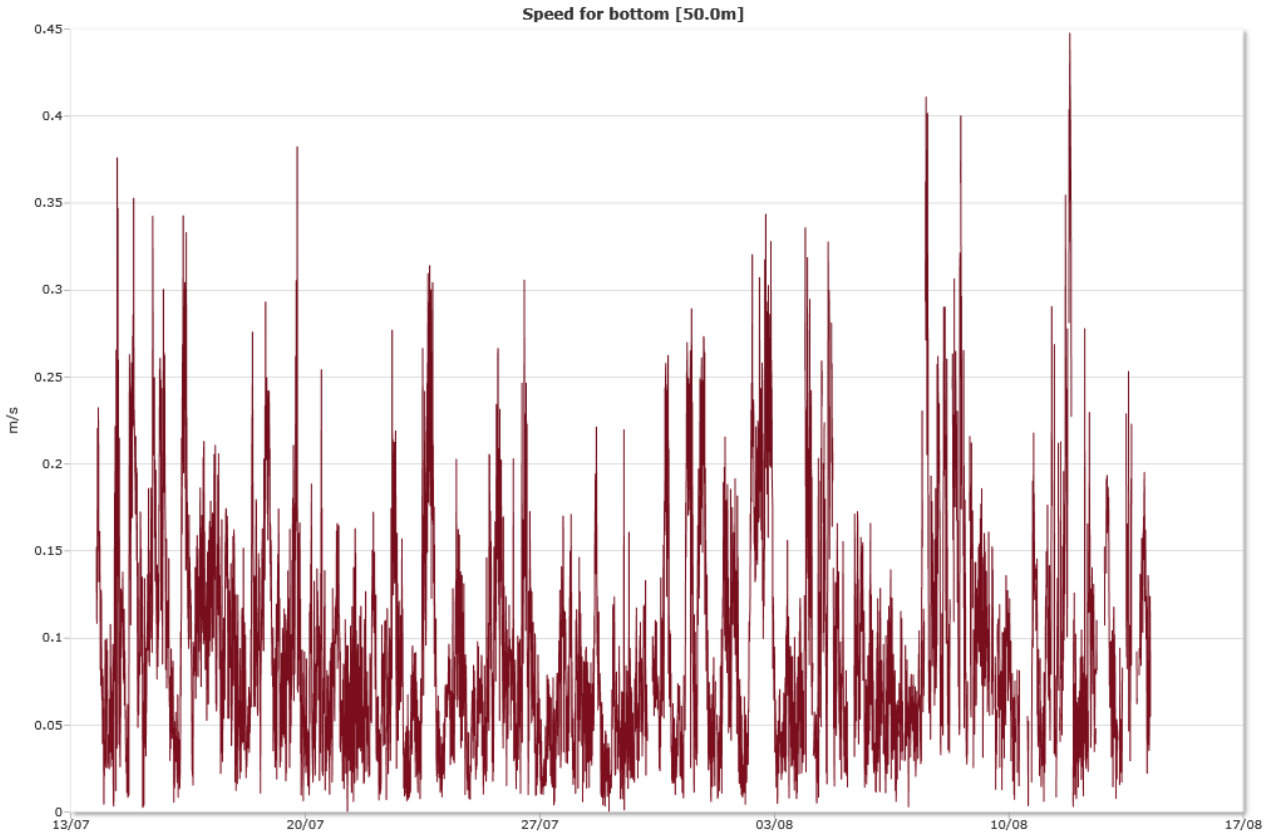
Bottom[54m]



Middle [30 m]

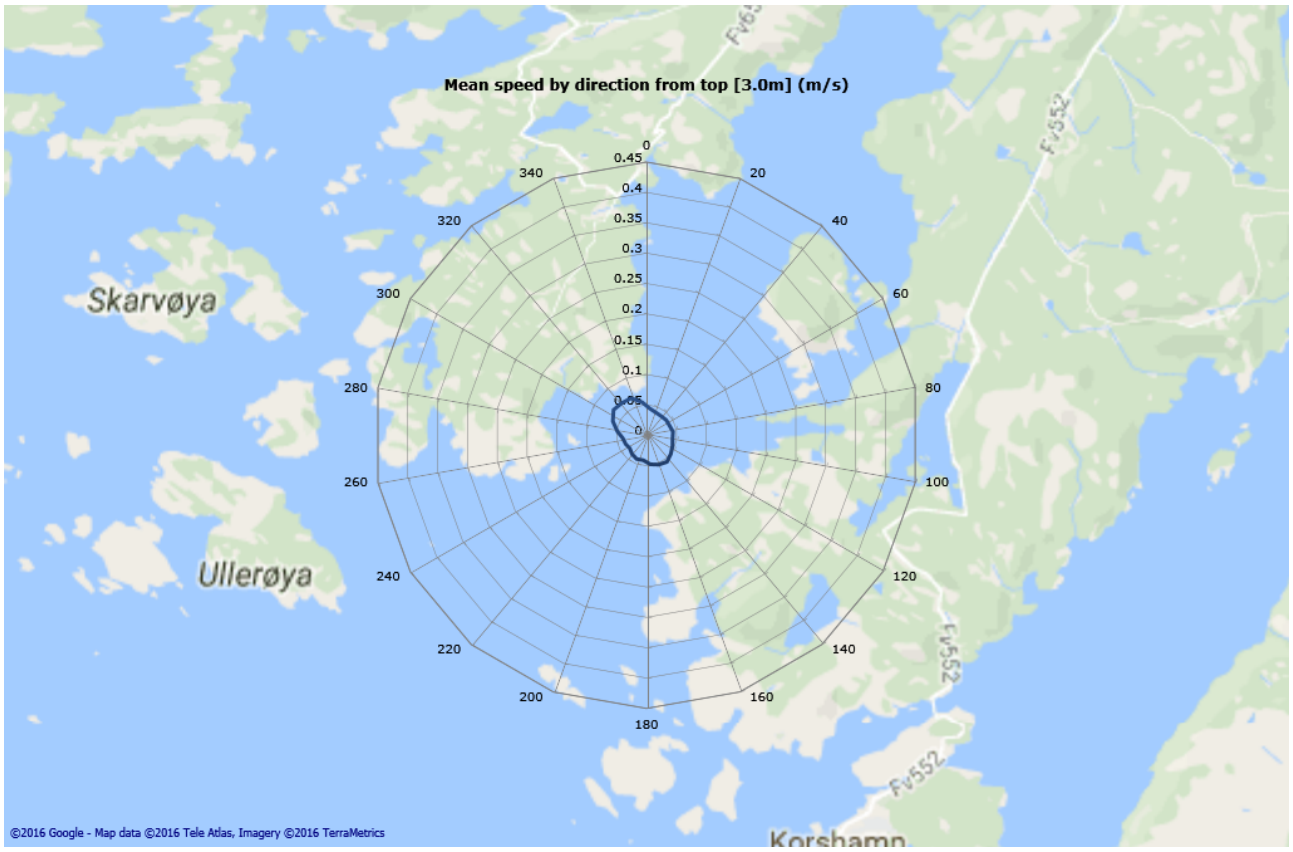


Top [5m]

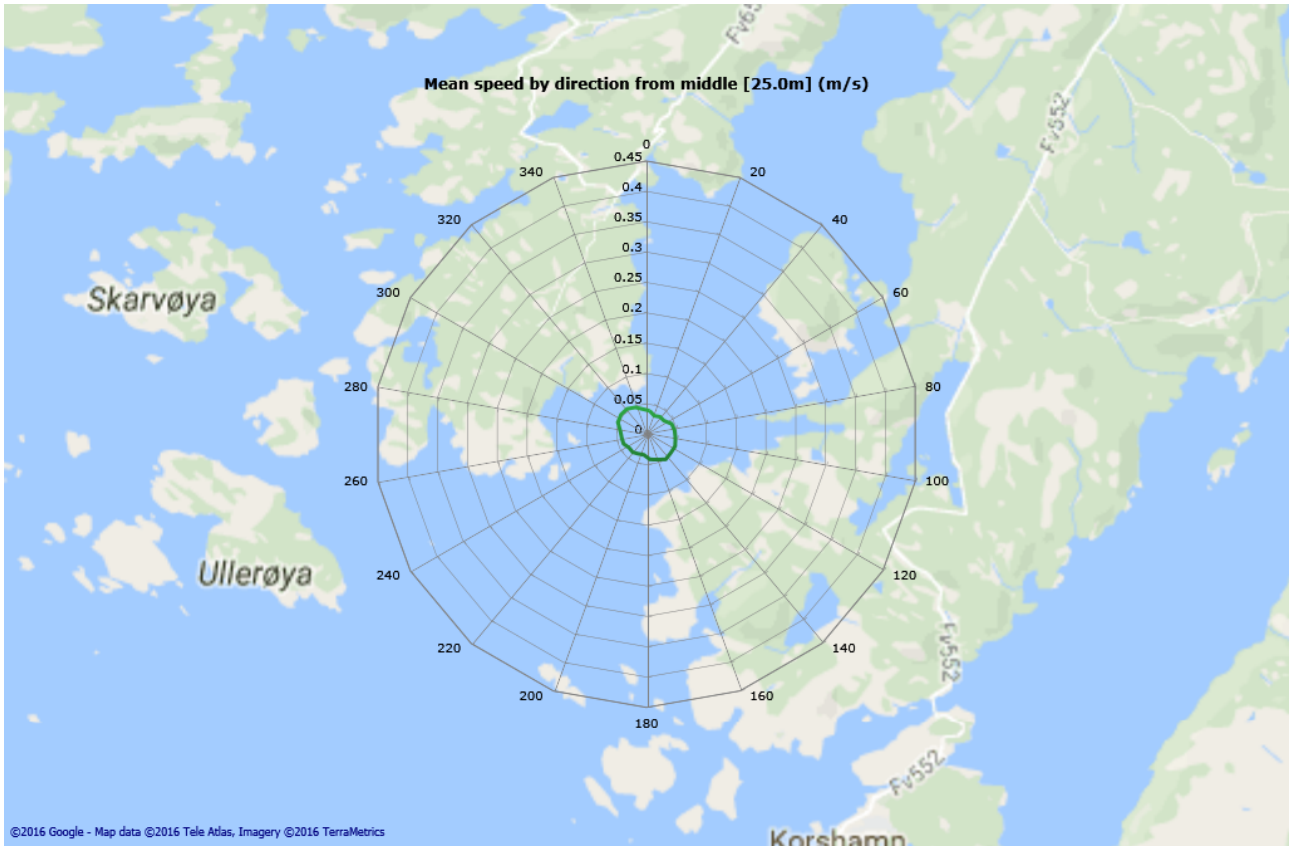

Speed for bottom [50.0m]
m/s
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
13/07
20/07
27/07
03/08
10/08
17/08

Mean speed - roseplot

Bottom [54m]



Middle [30]



Top [5m]


Mean speed by direction from bottom [50.0m] (m/s)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Skarvøya
Ullerøya
Fv552
Korshamn
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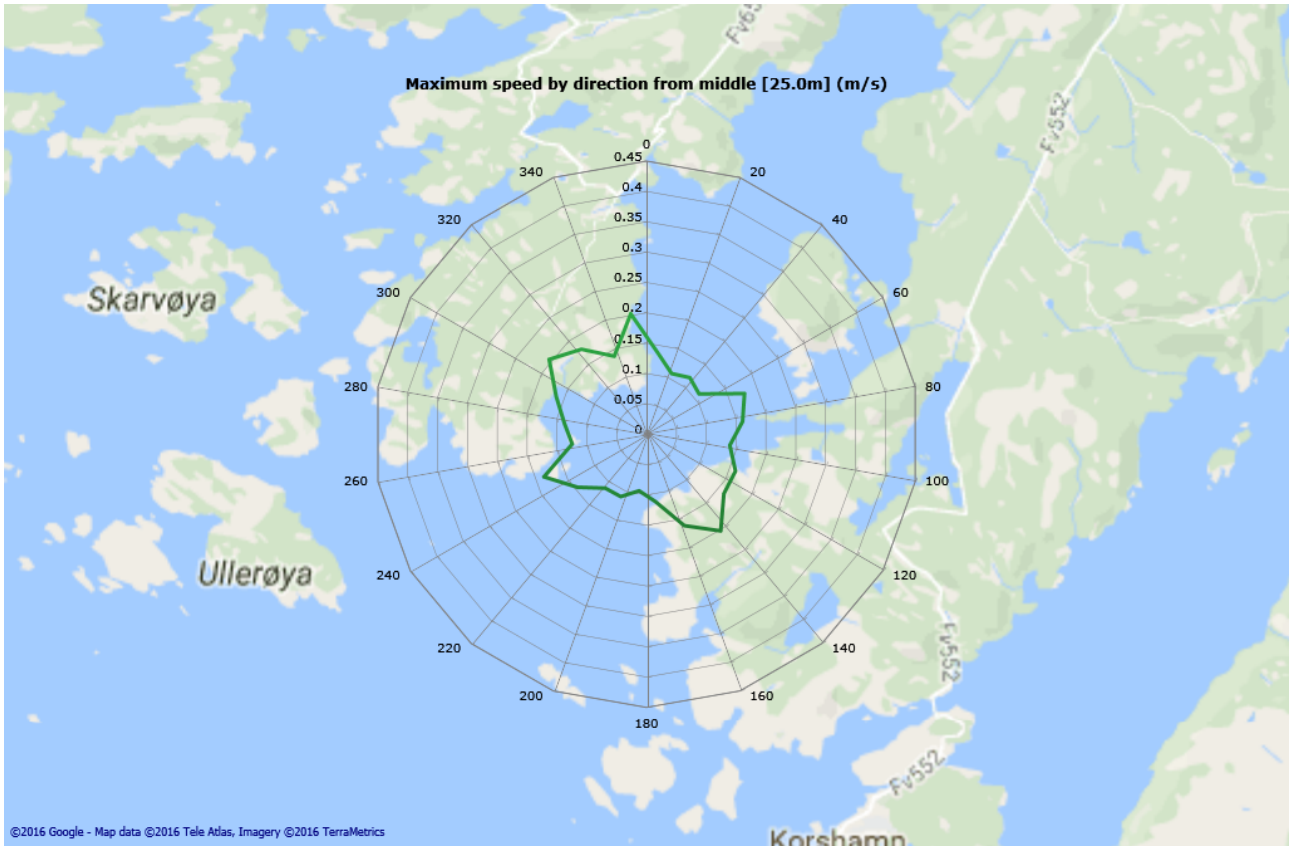
Max speed - roseplot

Bottom [54m]

Middle [30 m]



Top [5m]


Maximum speed by direction from bottom [50.0m] (m/s)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Skarvøya
Ullerøya
Fv552
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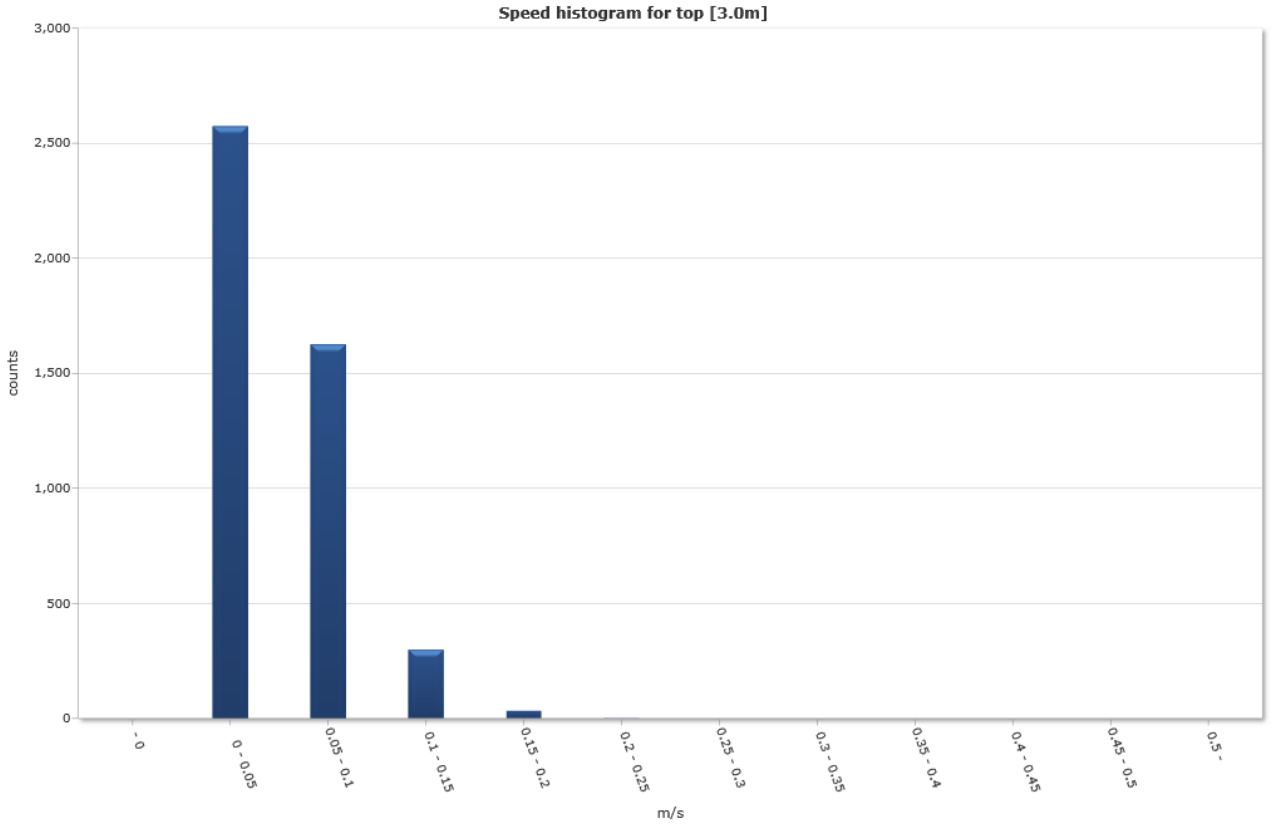
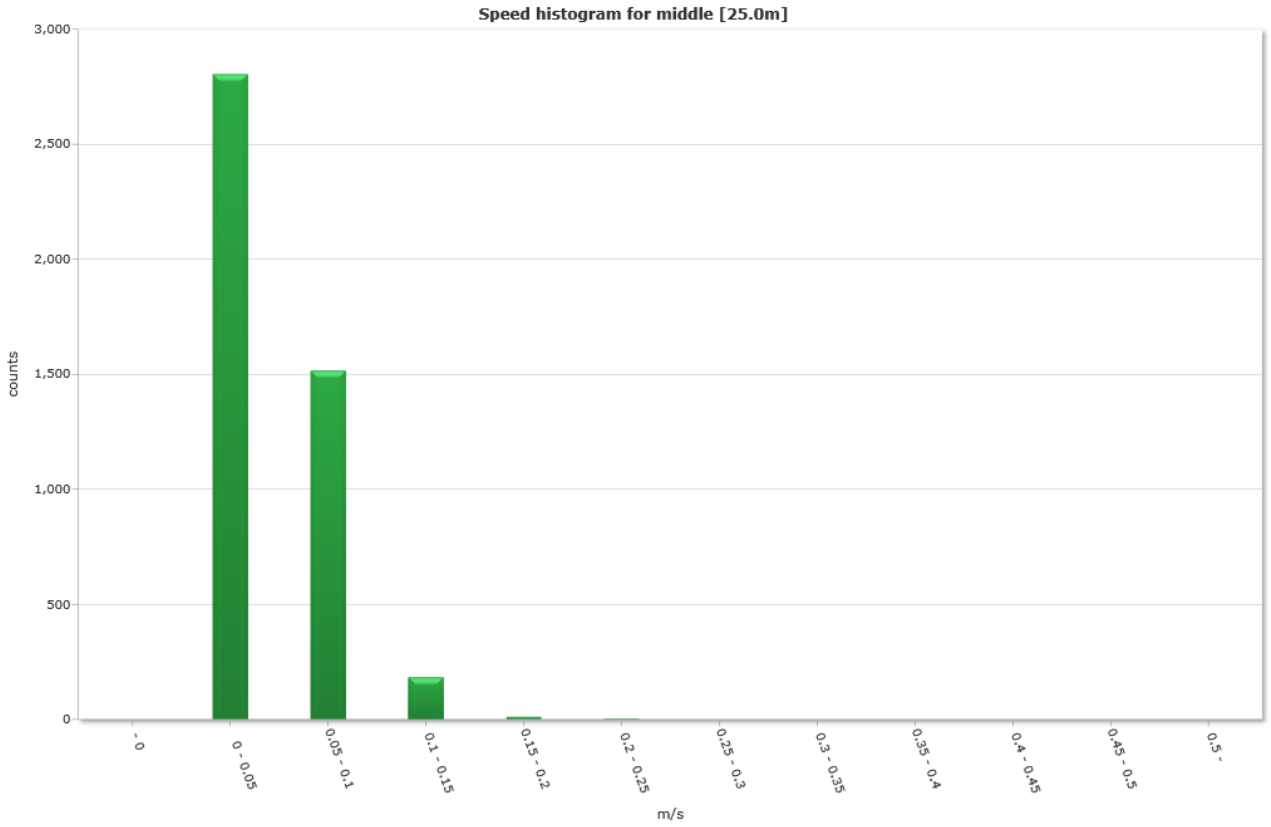
Speed histogram

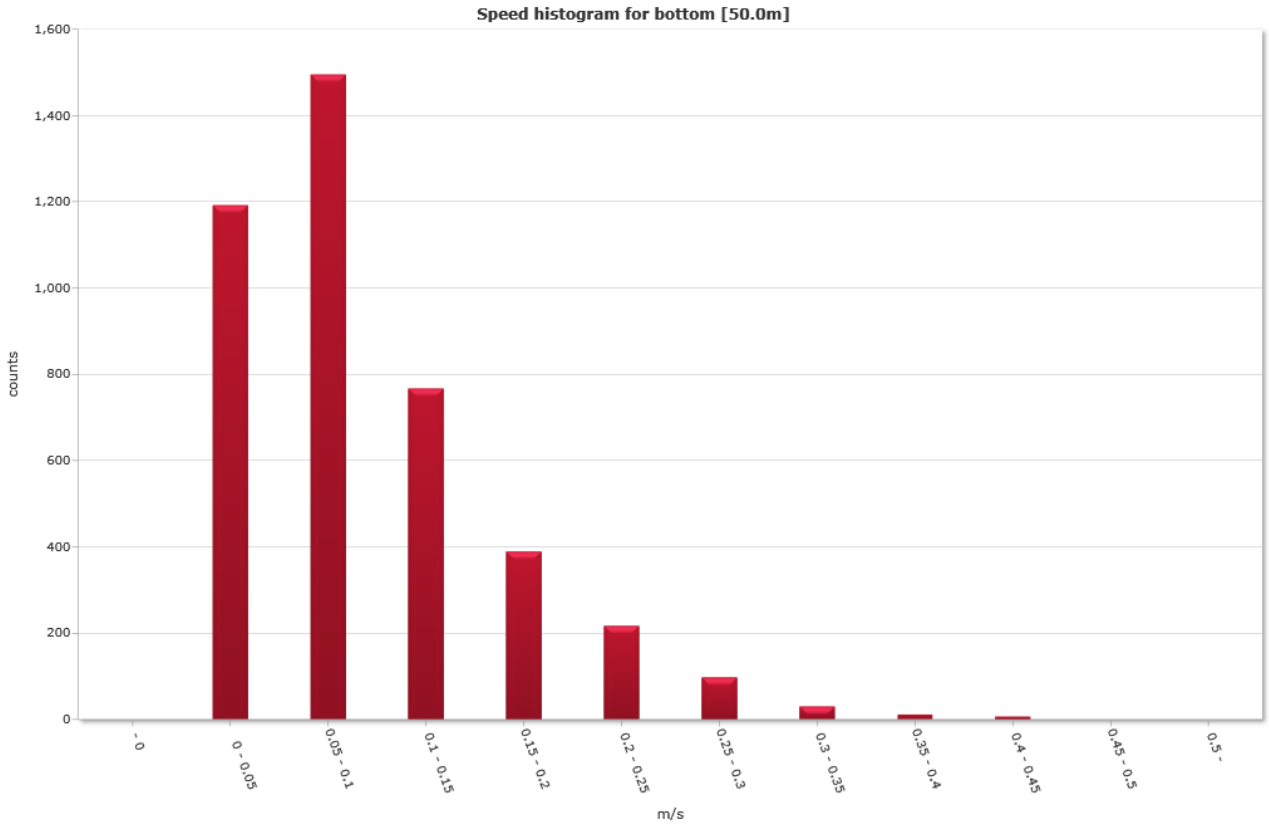
Bottom [54m]



Middle [30]

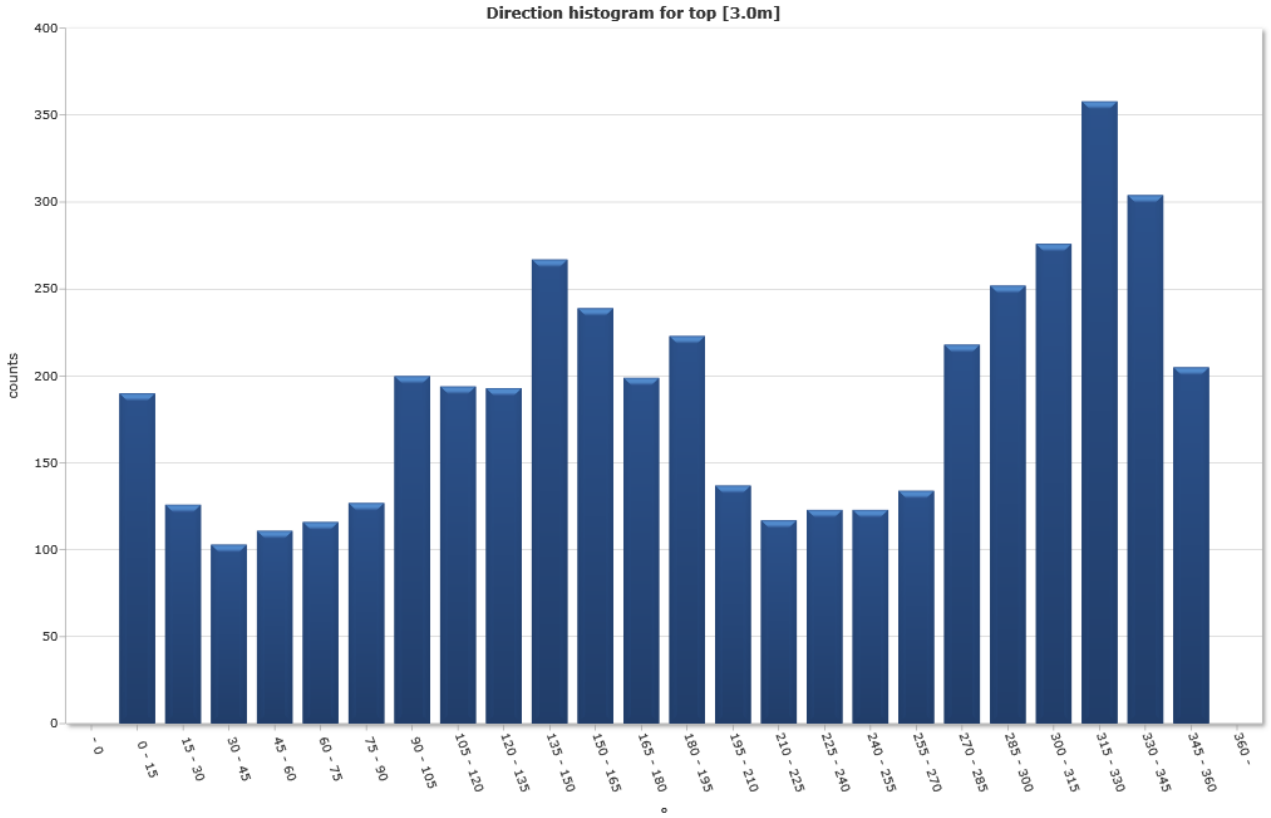


Top [5 m]

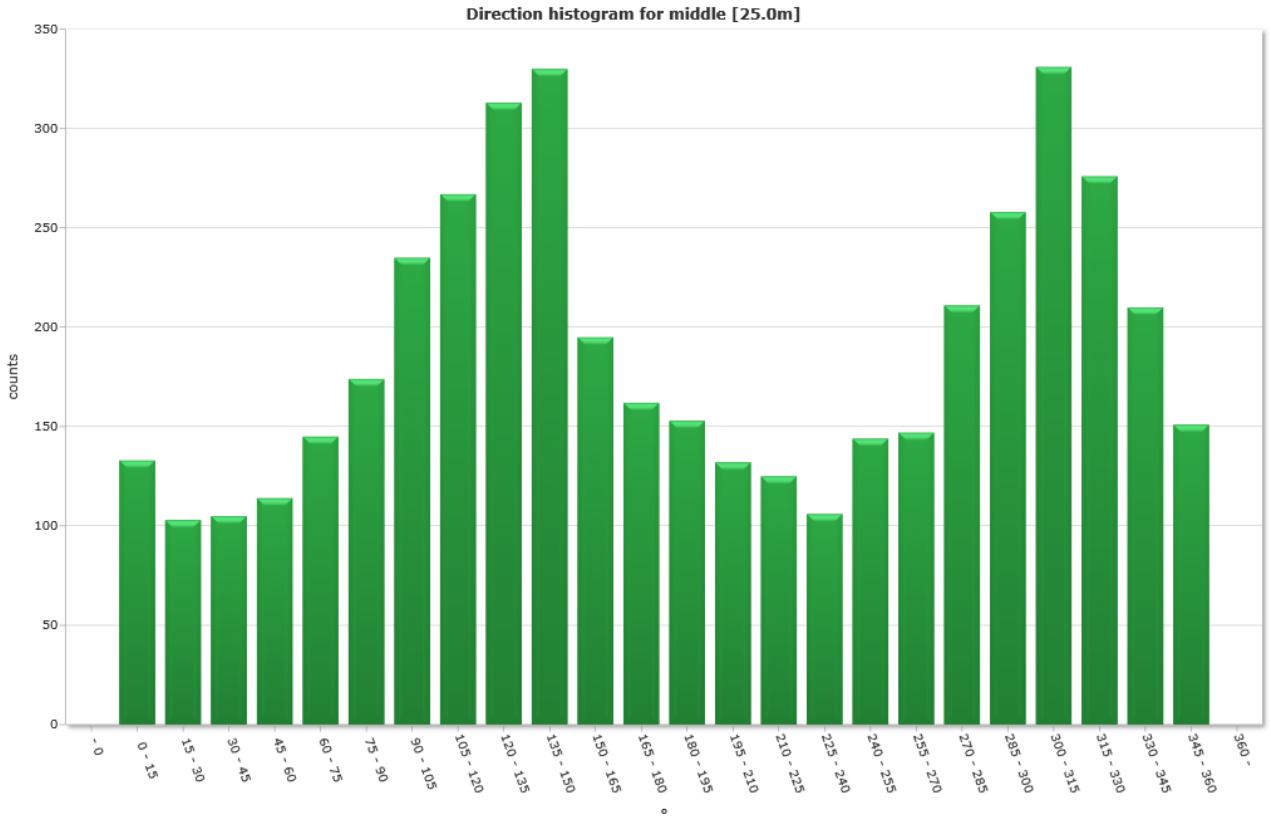

Speed histogram for bottom [50.0m]
counts
1,600
1,400
1,200
1,000
800
600
400
200
0
- 0
0 - 0.05
0.05 - 0.1
0.1 - 0.15
0.15 - 0.2
0.2 - 0.25
0.25 - 0.3
0.3 - 0.35
0.35 - 0.4
0.4 - 0.45
0.45 - 0.5
0.5 -
m/s

Direction histogram

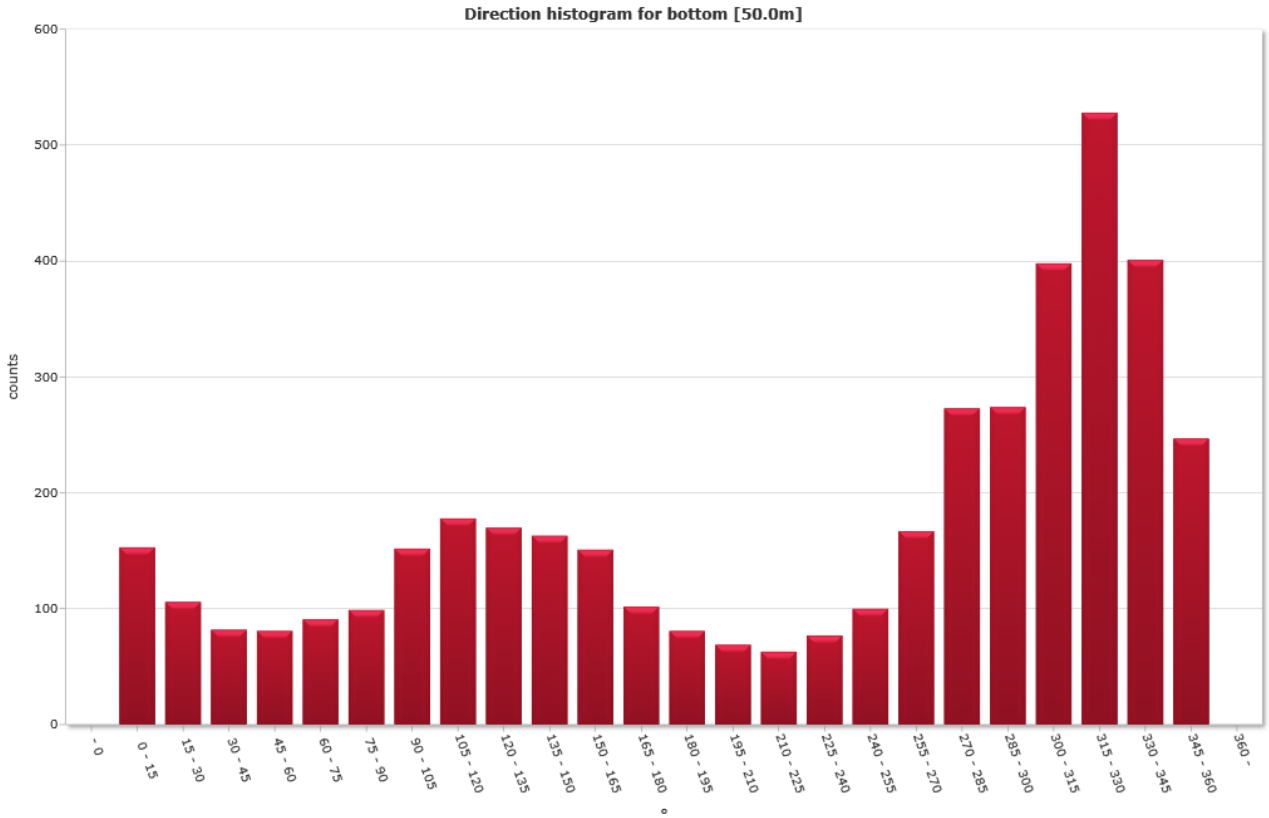
Bottom [54m]



Middle [30 m]



Top [5 m]


Direction histogram for bottom [50.0m]
counts
600
500
400
300
200
100
0
- 0
0 - 15
15 - 30
30 - 45
45 - 60
60 - 75
75 - 90
90 - 105
105 - 120
120 - 135
135 - 150
150 - 165
165 - 180
180 - 195
195 - 210
210 - 225
225 - 240
240 - 255
255 - 270
270 - 285
285 - 300
300 - 315
315 - 330
330 - 345
345 - 360
360 -
°

Direction/Speed histogram

Bottom[54 m]

° m/s	Direction/speed matrix for top [3.0m]																									
0.0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	%	Sum
0.05	115	90	76	75	85	81	134	119	114	132	126	115	151	91	87	98	96	98	127	107	98	142	116	101	56.8	2574
0.10	69	32	24	35	28	45	60	69	67	116	97	77	67	44	29	24	26	36	77	114	127	138	139	86	35.9	1626
0.15	5	4	3	1	3	1	5	6	12	19	15	7	5	2	0	1	1	0	13	27	41	72	42	14	6.6	299
0.20	1	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	4	9	6	7	4	0.8	35
0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.0	1
0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
%	4.2	2.8	2.3	2.4	2.6	2.8	4.4	4.3	4.3	5.9	5.3	4.4	4.9	3.0	2.6	2.7	2.7	3.0	4.8	5.6	6.1	7.9	6.7	4.5	100.0	100.0
Sum	190	126	103	111	116	127	200	194	193	267	239	199	223	137	117	123	123	134	218	252	276	358	304	205	100.0	4535

Middle [30 m]

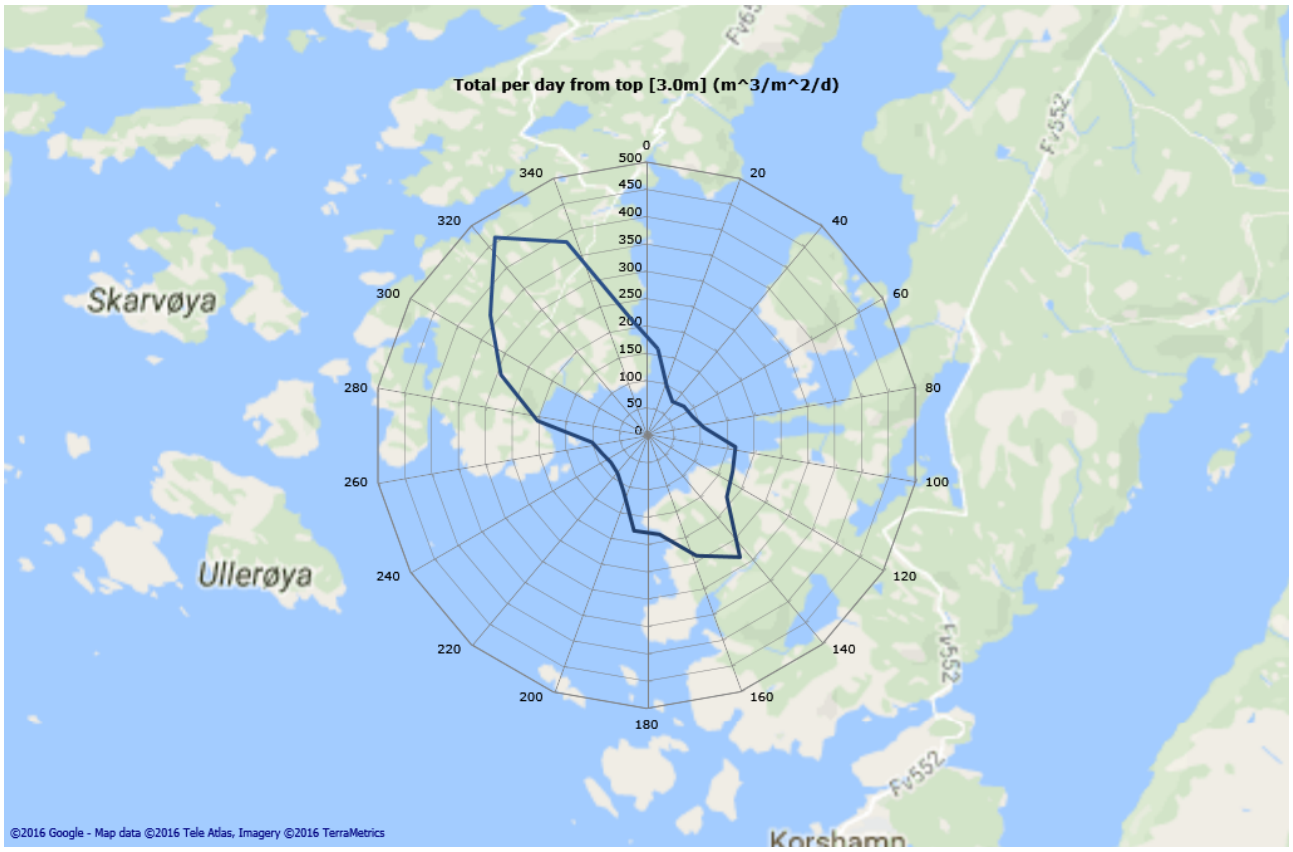
° m/s	Direction/speed matrix for middle [25.0m]																									
0.0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	%	Sum
0.05	97	87	81	86	97	108	138	144	171	168	124	109	118	108	90	84	103	98	139	129	164	141	123	98	62.1	2805
0.10	34	14	20	25	39	55	84	111	126	142	66	51	35	21	33	17	36	44	64	119	142	115	72	51	33.5	1516
0.15	2	2	4	3	8	10	13	11	14	19	4	2	0	3	2	5	4	5	8	9	21	18	15	1	4.0	183
0.20	0	0	0	0	1	1	0	1	2	0	1	0	0	0	0	0	1	0	0	1	3	2	0	0	0.3	13
0.25	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.1	3
0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
%	2.9	2.3	2.3	2.5	3.2	3.8	5.2	5.9	6.9	7.3	4.3	3.6	3.4	2.9	2.8	2.3	3.2	3.3	4.7	5.7	7.3	6.1	4.6	3.3	100.0	100.0
Sum	133	103	105	114	145	174	235	267	313	330	195	162	153	132	125	106	144	147	211	258	331	276	210	151	100.0	4520

Top [5 m]

° m/s	Direction/speed matrix for bottom [50.0m]																									
0.0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	%	Sum
0.05	46	55	36	46	50	50	58	46	54	60	47	44	45	47	35	36	40	38	47	51	64	80	67	50	28.3	1192
0.10	69	41	33	25	32	30	59	91	85	77	84	49	35	19	25	29	36	55	69	73	116	136	131	96	35.5	1495
0.15	31	8	12	5	7	14	29	30	20	21	19	9	1	3	3	8	21	44	72	70	93	103	88	56	18.2	767
0.20	3	1	1	4	2	4	6	11	11	5	1	0	0	0	0	4	3	16	40	47	51	89	59	31	9.2	389
0.25	3	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	10	33	21	32	72	34	9	5.2	217
0.30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	8	25	32	15	4	2.3	97
0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	15	5	4	1	0.7	30
0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	6	2	0	0.3	12
0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	0	0.2	7
0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
%	3.6	2.5	1.9	1.9	2.2	2.4	3.6	4.2	4.0	3.9	3.6	2.4	1.9	1.6	1.5	1.8	2.4	4.0	6.5	6.5	9.5	12.6	9.5	5.9	100.0	100.0
Sum	153	106	82	81	91	99	152	178	170	163	151	102	81	69	63	77	100	167	273	274	398	528	401	247	100.0	4206

Flow

Bottom [54m]



Middle [30m]

Top [5 m]


Total per day from bottom [50.0m] (m^3/m^2/d)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
1,400
1,200
1,000
800
600
400
200
0
Skarvøya
Ullerøya
Fv552
Korshamn
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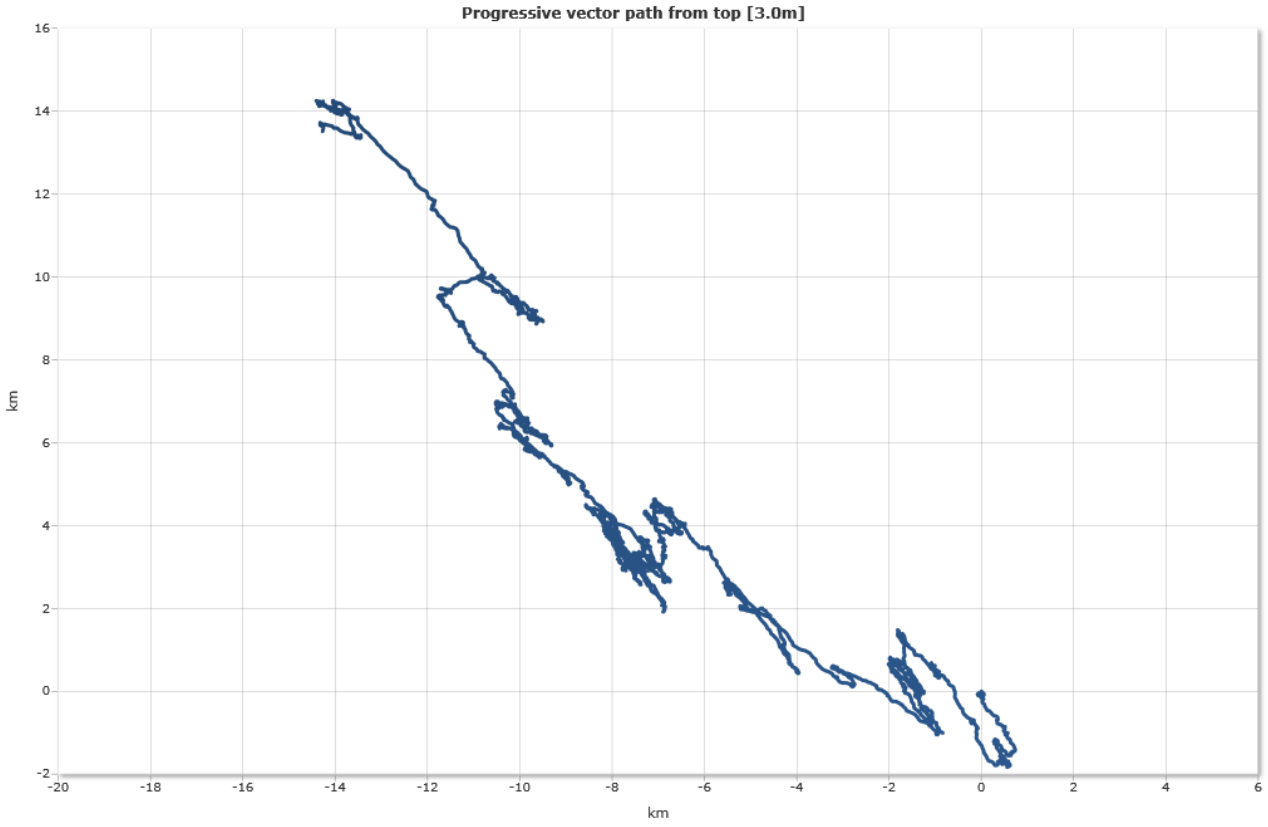
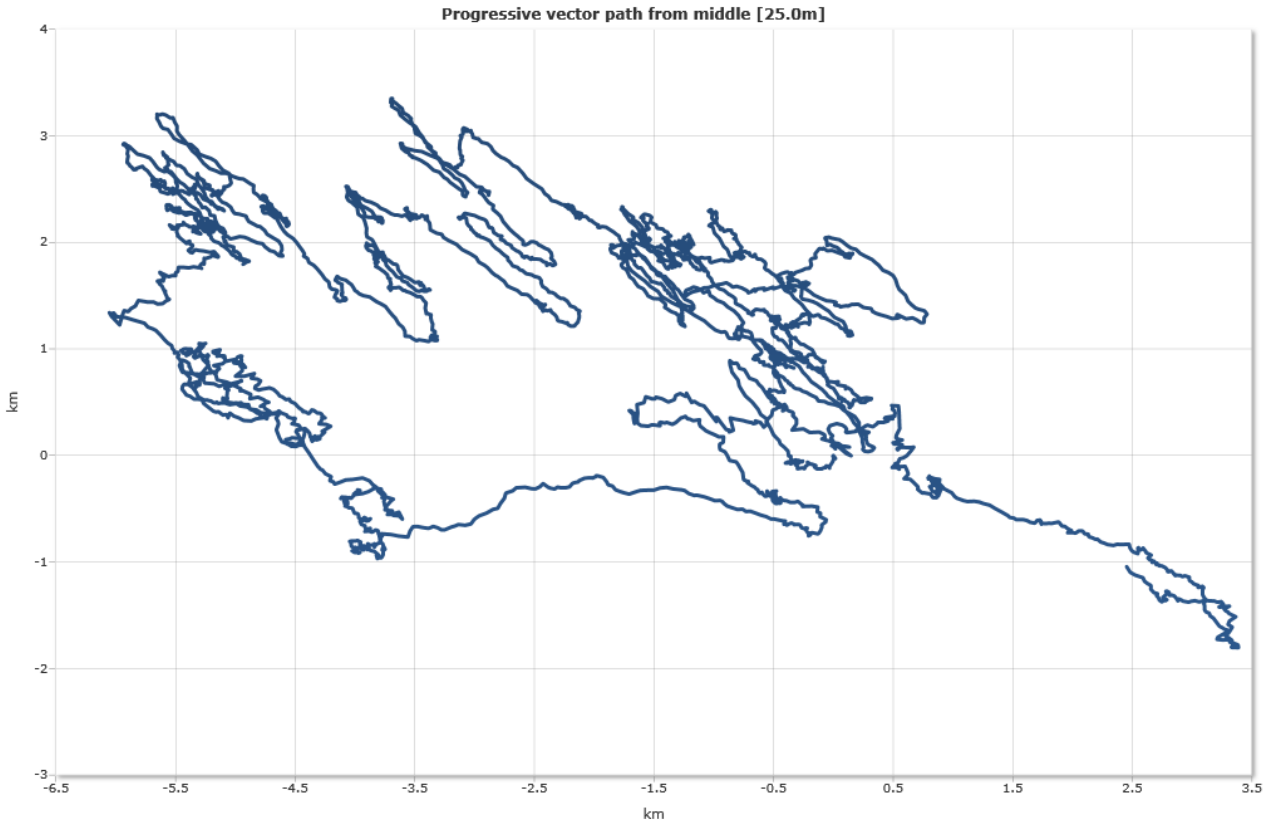
Progressive vector

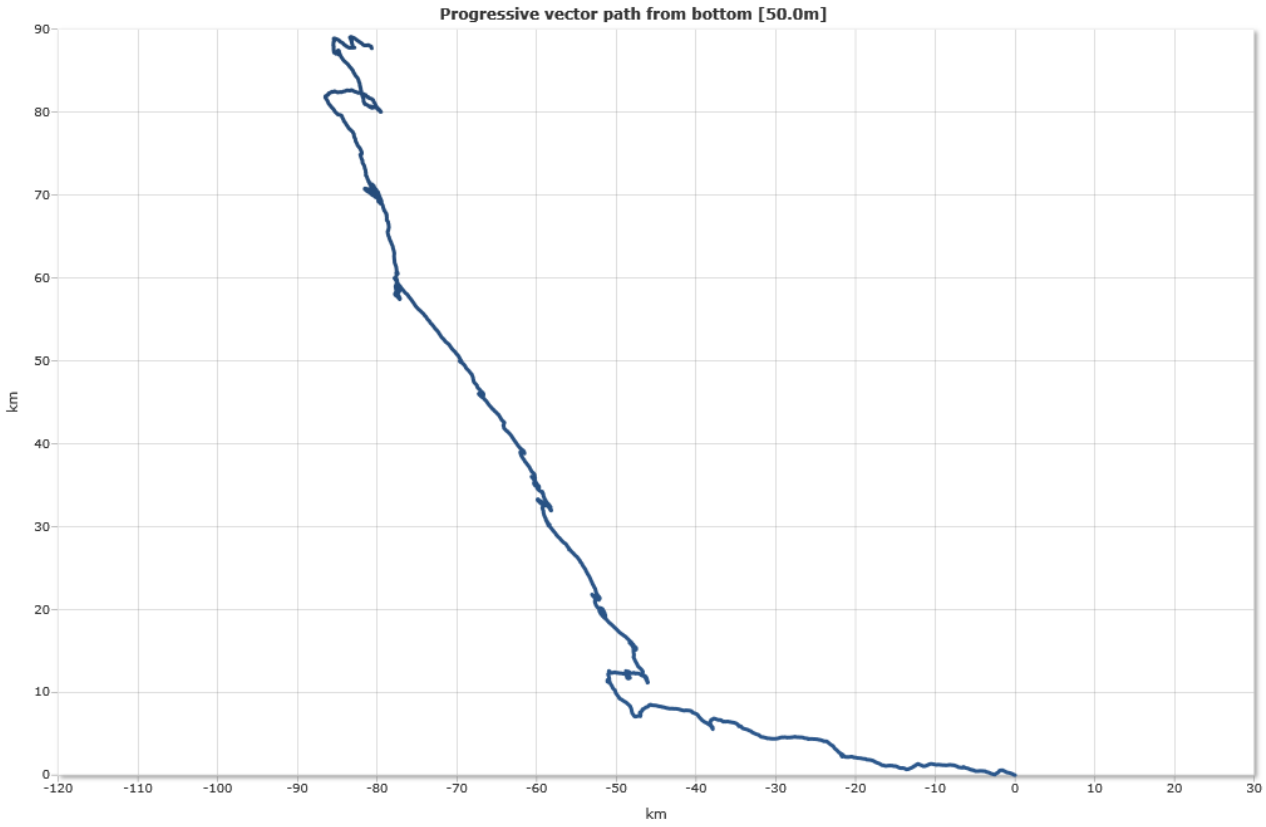
Bottom [54 m]



Middle [30m]

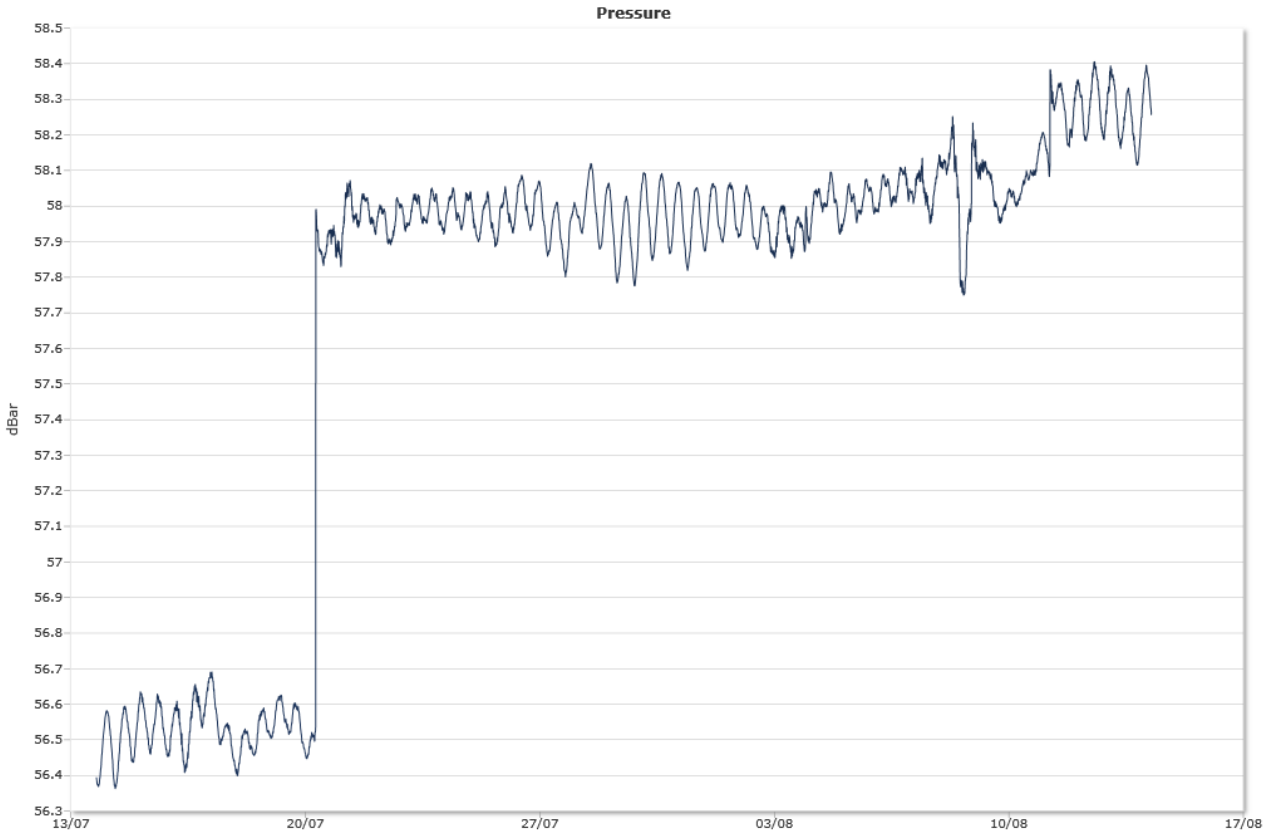


Top [5 m]

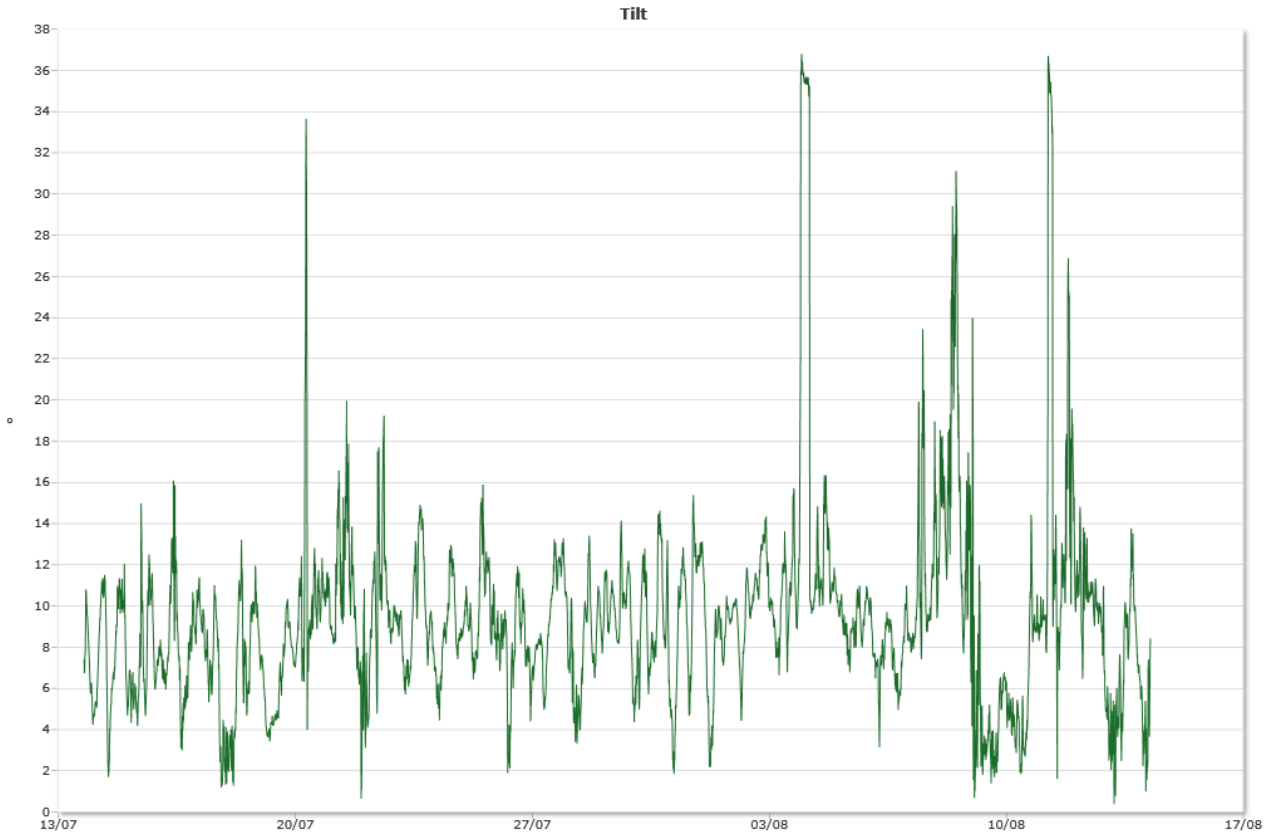

Progressive vector path from bottom [50.0m]
km
km
90
80
70
60
50
40
30
20
10
0
-120
-110
-100
-90
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30

Sensors

Pressure



Tilt



Temperature