



STRAUMMÅLING

NS 9425-1 og -2

LOKALITET DJUPEVIK

Kvam herad





Resipientanalyse AS

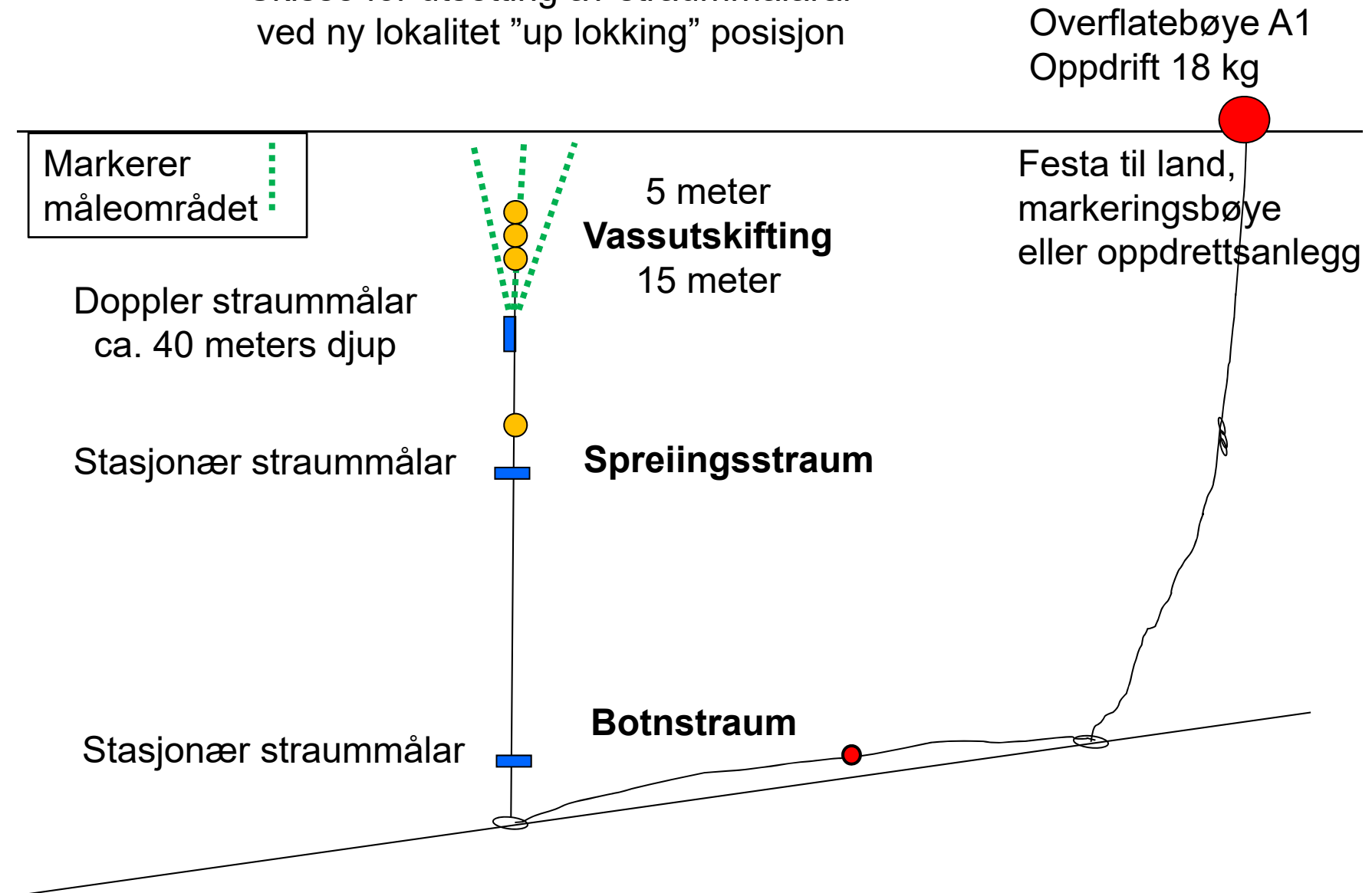
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<i>Lokalitetsnamn, lokalitetsnr.og biomasse tillatelse</i> Djupevik		<i>Dato, rapport</i> 17 / 09 – 2012
<i>Kommune</i> Kvam herad		<i>Dato, felt</i> Utsett: 13 / 08 – 2012 Opptak: 17 / 09 – 2012
<i>Oppdragsgjevar</i> Lingalaks AS		<i>Rapport nr.</i> 819 – 2012
<i>Oppdragsart</i> Straummåling		<i>Rapportsider</i> 59
<i>Personell feltundersøking</i> Frode Berge-Haveland, Resipientanalyse AS Normann Rong, Lingalaks AS		Høgste målte vasstraum: Ved 5 meters djup: 0,238 m/s MOT nordvest (315°). Ved 15 meters djup: 0,228 m/s MOT vest (270°).
Den gjennomsnittlege Vassutskiftingstraumen i måleperioden: 5 til 6 cm/s (dop) mellom 5 og 15 meters djup.	Den gjennomsnittlege Spreiingsstraumen i måleperioden: 4 til 6 cm/s (doppler) 20 til 24 meters djup. 1,3 cm/s (propell) 60 meters djup.	Den gjennomsnittlege Botnstraumen i måleperioden: 1,1 cm/s (prop) 170 meters djup.
<i>Samandrag</i> Ein Nortek 400kHz Aquadopp profilerande straummålar blei sett ut på ca. 27 meters djup. Ein SD6000 propell straummålar stod på 60 meters djup og målte spreingsstraum og ein SD6000 propell straummålar stod på 170 meters djup. Der var ca. 180 meter djupt ved målepunktet. Doppler straummålar målte oppover i vassøyla. Straumretninga i alle vasslaga går i hovudsak MOT Nordaust og MOT Sørvest. Den gjennomsnittlege spreing og botnstraumen var svært svak.		
<i>Fagansvarleg i Resipientanalyse</i> Frode Berge-Haveland <i>Cand. Scient. Marin mikrobiolog</i> Daglegleiar i Resipientanalyse		<i>Kvalitetsansvarleg i Resipientanalyse</i> Kjetil Aursland <i>Cand. Scient. Mikrobiolog</i> Kvalitetsleiar i Resipientanalyse

INNHALD

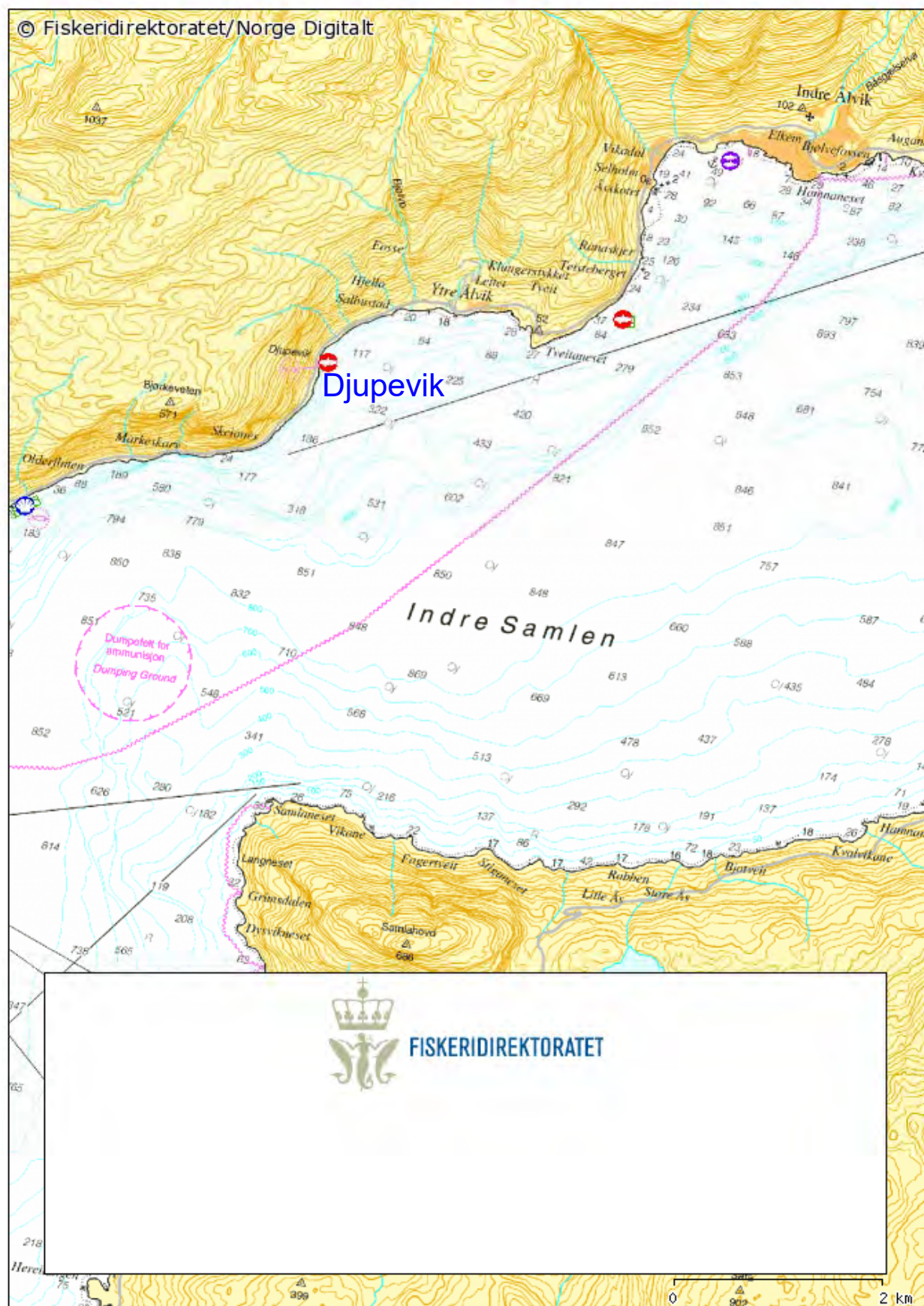
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Skisse for utsetting av straummålarar
ved ny lokalitet "up lokking" posisjon



26.07.2010

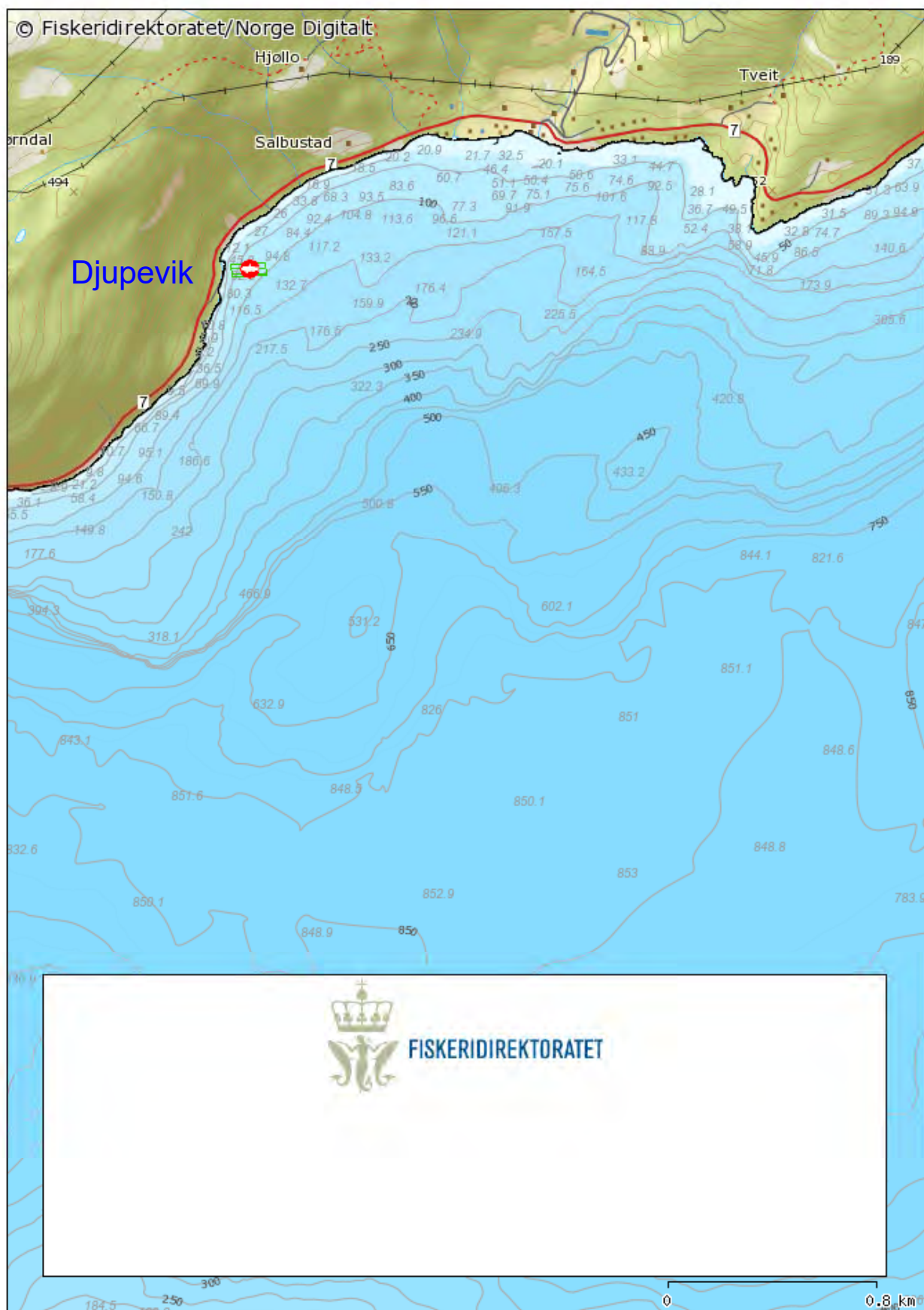
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FISKERIDIREKTORATET

Målestokk: 1:50 000

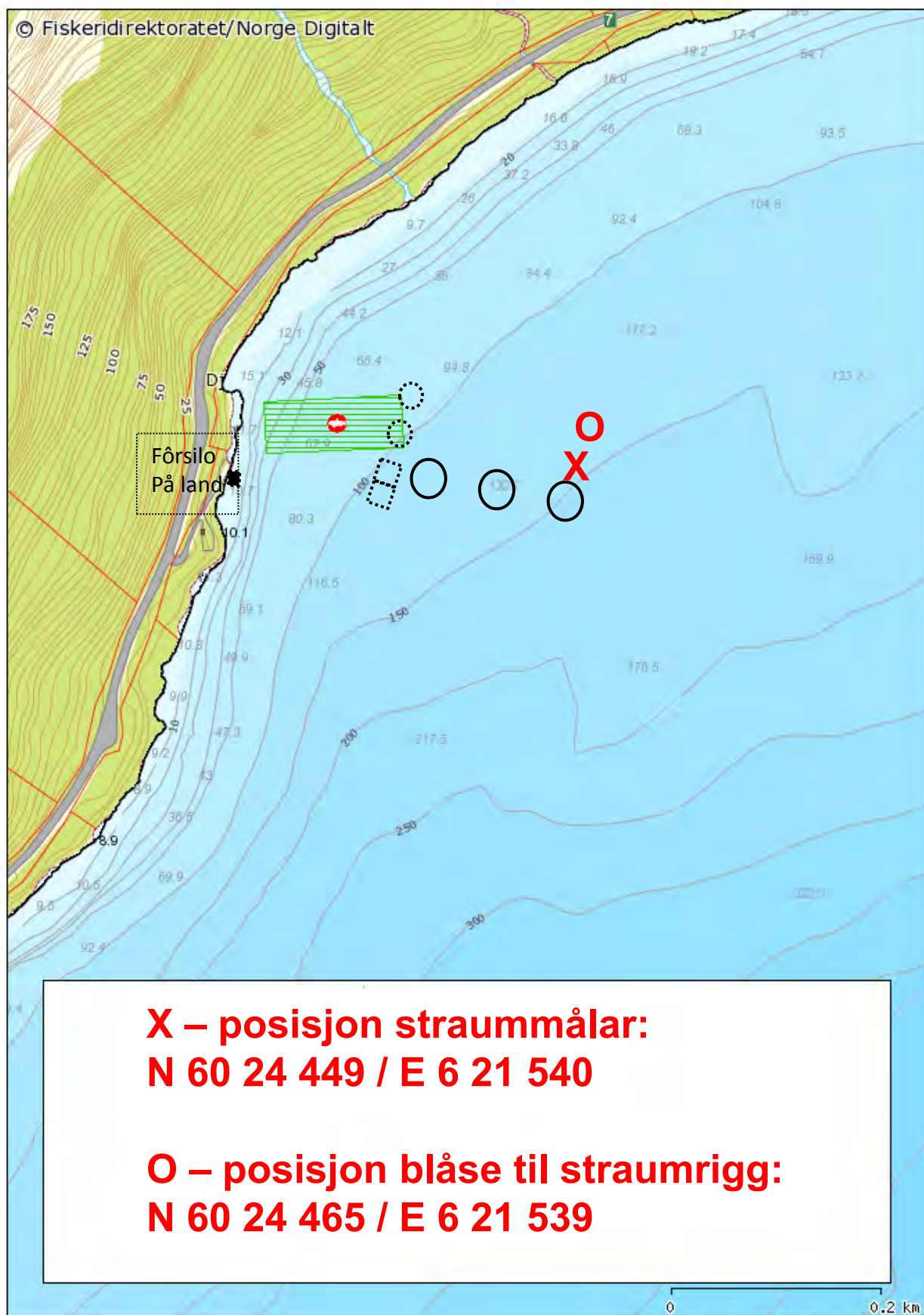
26.07.2010



Målestokk: 1:20 000

26.07.2010

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**X – posisjon strømmålar:
N 60 24 449 / E 6 21 540**

**O – posisjon blåse til straumrigg:
N 60 24 465 / E 6 21 539**

Målestokk: 1:5 000

Straummåling Djupevik

Vassutskifting

17.09.2012

Resipientanalyse AS

Frode Berge-Haveland

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Details

Instrument

Head Id	AQP 5209
Board Id	AQD 9592
Frequency	400000

Configuration

Start	13.08.2012 14:00
End	17.09.2012 10:50
Data records	5022
Longitude	6° 21,54'E
Latitude	60° 24,45'N
Orientation	DOWN
Cells	40
Cell size(m)	2
Blanking distance(m)	0,99
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	13.08.2012 14:00
Selected End	17.09.2012 10:30
Compass Offset	0
Pressure Offset	0
Selected Records	5020
Reference	Water Surface
Top Depth(m)	5
Top invalid data	0
Middle Depth(m)	10
Middle invalid data	0
Bottom Depth(m)	15
Bottom invalid data	1

Statistics

Top [5,0m]

Mean current [m/s]	0.06
Max current [m/s]	0.24
Min current [m/s]	0.00
Measurements [#]	5020
Std.dev [m/s]	0.03
Significant max velocity [m/s]	0.10
Significant min velocity [m/s]	0.03
10 year return current [m/s]	0.393
50 year return current [m/s]	0.441
Most significant directions [°]	225.00, 210.00, 180.00, 195.00
Most significant speeds [m/s]	0.10, 0.05, 0.15, 0.20
Most flow	12632.26m ³ by 210-225°.
Least flow	4039.00m ³ by 330-345°.

Middle [10,0m]

Mean current [m/s]	0.05
Max current [m/s]	0.40
Min current [m/s]	0.00
Measurements [#]	5020
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]	0.658
50 year return current [m/s]	0.738
Most significant directions [°]	210.00, 195.00, 180.00, 225.00
Most significant speeds [m/s]	0.05, 0.10, 0.15, 0.20
Most flow	14373.52m ³ by 195-210°.
Least flow	2874.06m ³ by 285-300°.

Bottom [15,0m]

Mean current [m/s]	0.05
Max current [m/s]	0.23
Min current [m/s]	0.00
Measurements [#]	5019
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]	0.377
50 year return current [m/s]	0.422
Most significant directions [°]	225.00, 75.00, 195.00, 210.00
Most significant speeds [m/s]	0.05, 0.10, 0.15, 0.20
Most flow	9802.16m ³ by 180-195°.
Least flow	3415.30m ³ by 285-300°.

Direction with return period

Top [5,0m]

Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,055	0,208	0,091	0,343	0,102	0,385
45	0,059	0,193	0,098	0,319	0,110	0,358
90	0,059	0,201	0,097	0,332	0,108	0,372
135	0,059	0,165	0,097	0,272	0,109	0,305
180	0,067	0,228	0,110	0,376	0,124	0,422
225	0,069	0,211	0,114	0,347	0,127	0,390
270	0,061	0,230	0,100	0,379	0,113	0,425
315	0,053	0,238	0,088	0,393	0,099	0,441

Middle [10,0m]

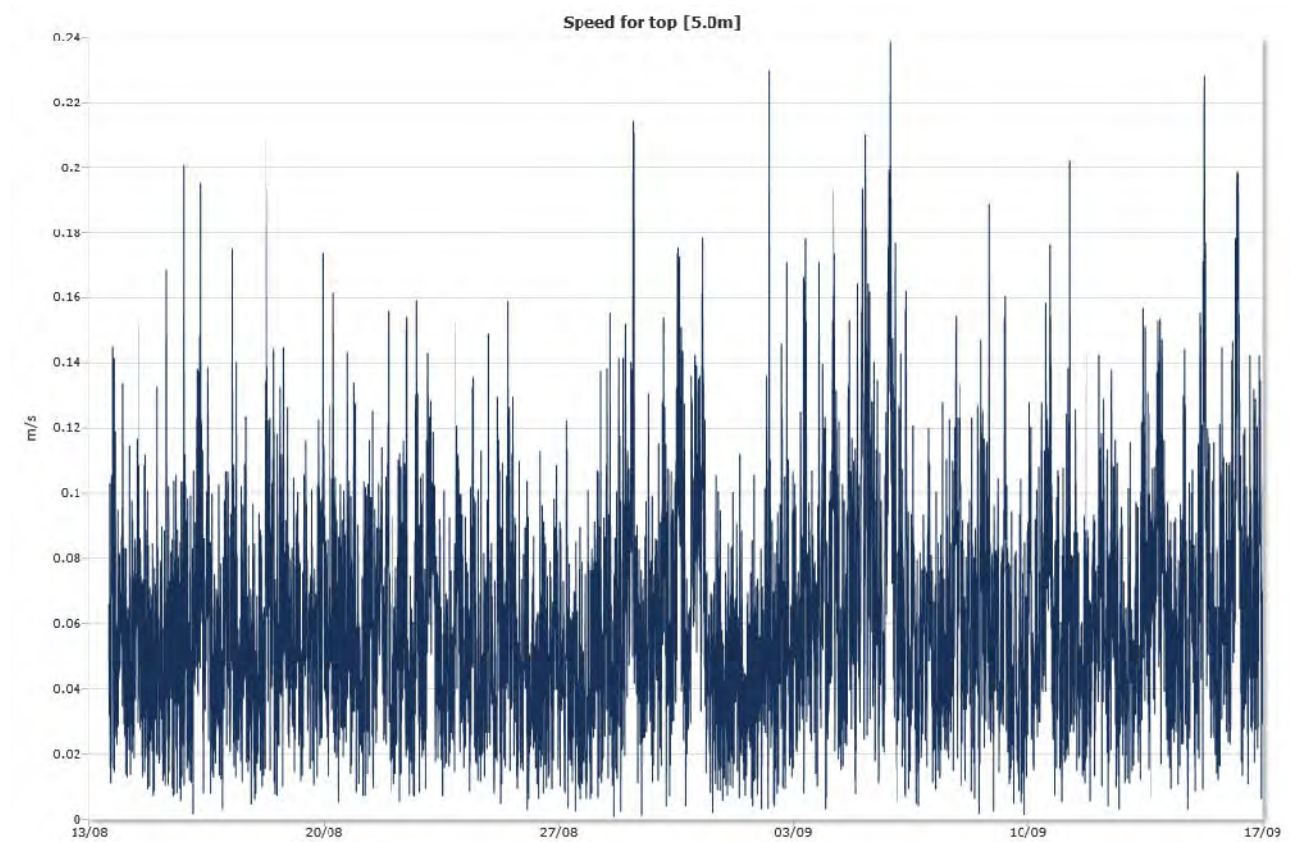
Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,049	0,399	0,080	0,658	0,090	0,738
45	0,051	0,334	0,085	0,552	0,095	0,619
90	0,051	0,191	0,084	0,315	0,094	0,353
135	0,053	0,214	0,087	0,354	0,097	0,397
180	0,064	0,226	0,106	0,373	0,119	0,418
225	0,064	0,370	0,106	0,610	0,119	0,684
270	0,050	0,273	0,082	0,450	0,092	0,504
315	0,043	0,146	0,071	0,241	0,080	0,270

Bottom [15,0m]

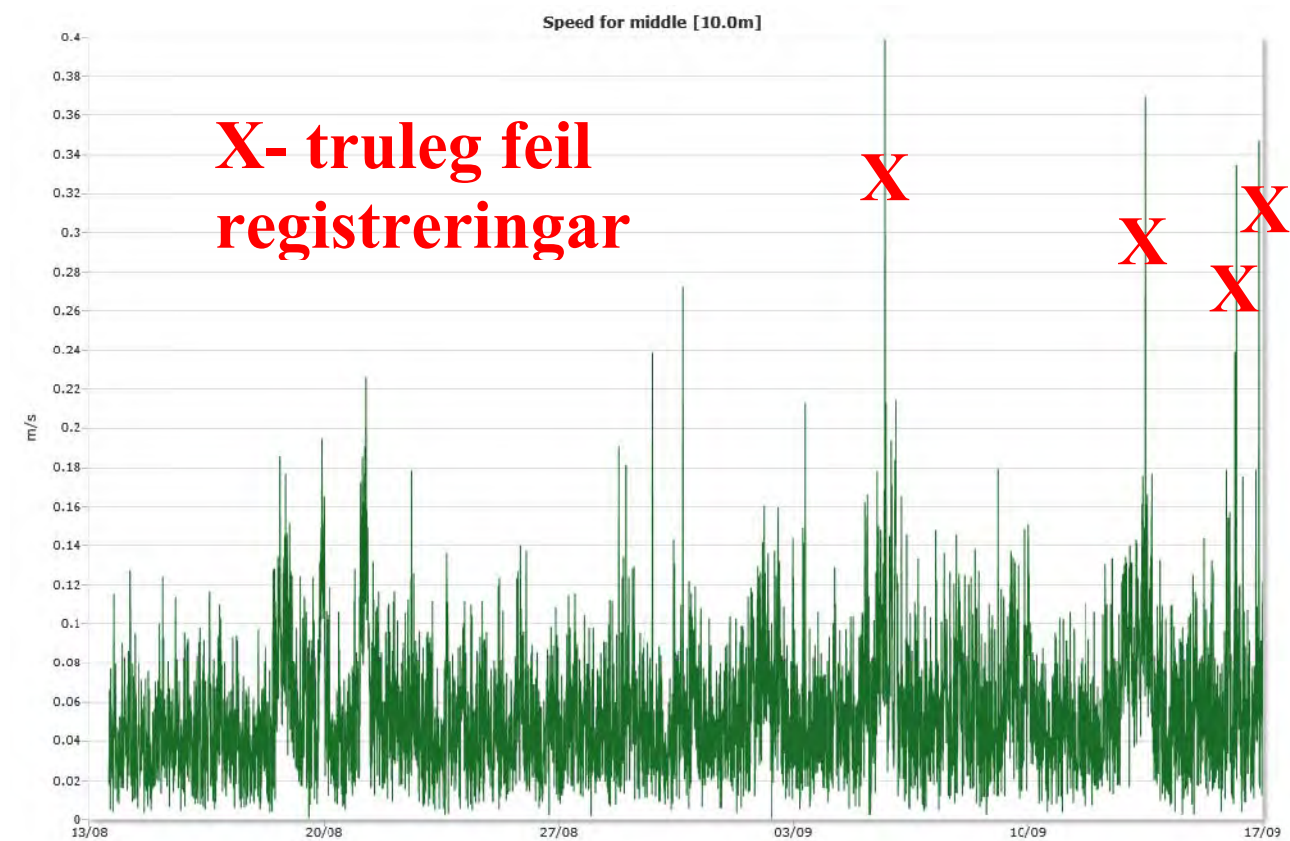
Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,047	0,145	0,077	0,239	0,086	0,268
45	0,055	0,166	0,090	0,273	0,101	0,306
90	0,051	0,182	0,083	0,301	0,093	0,338
135	0,043	0,139	0,071	0,230	0,080	0,258
180	0,055	0,189	0,090	0,312	0,101	0,350
225	0,055	0,201	0,091	0,331	0,103	0,371
270	0,046	0,228	0,075	0,377	0,085	0,422
315	0,041	0,127	0,068	0,209	0,077	0,235

Time series

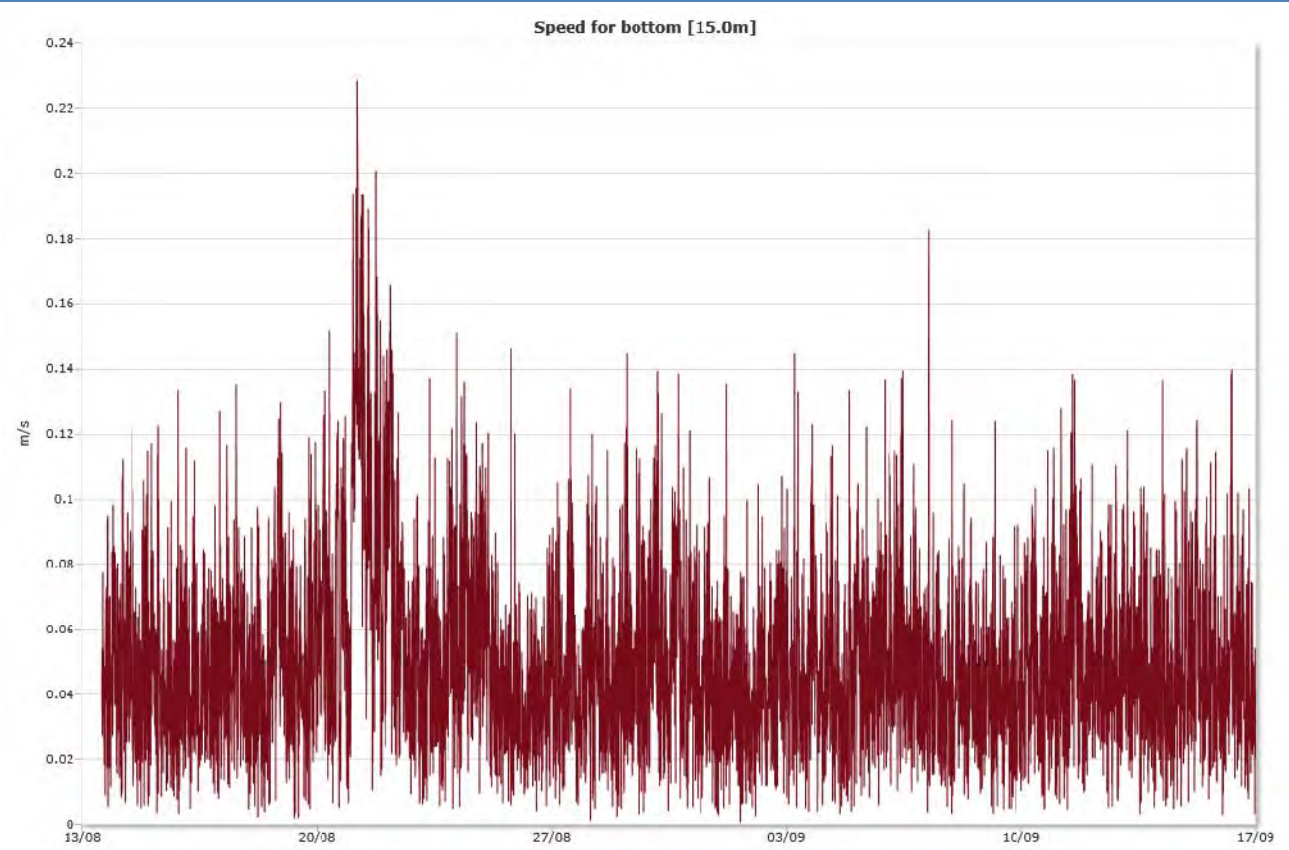
Top [5,0m]



Middle [10,0m]



Bottom [15,0m]

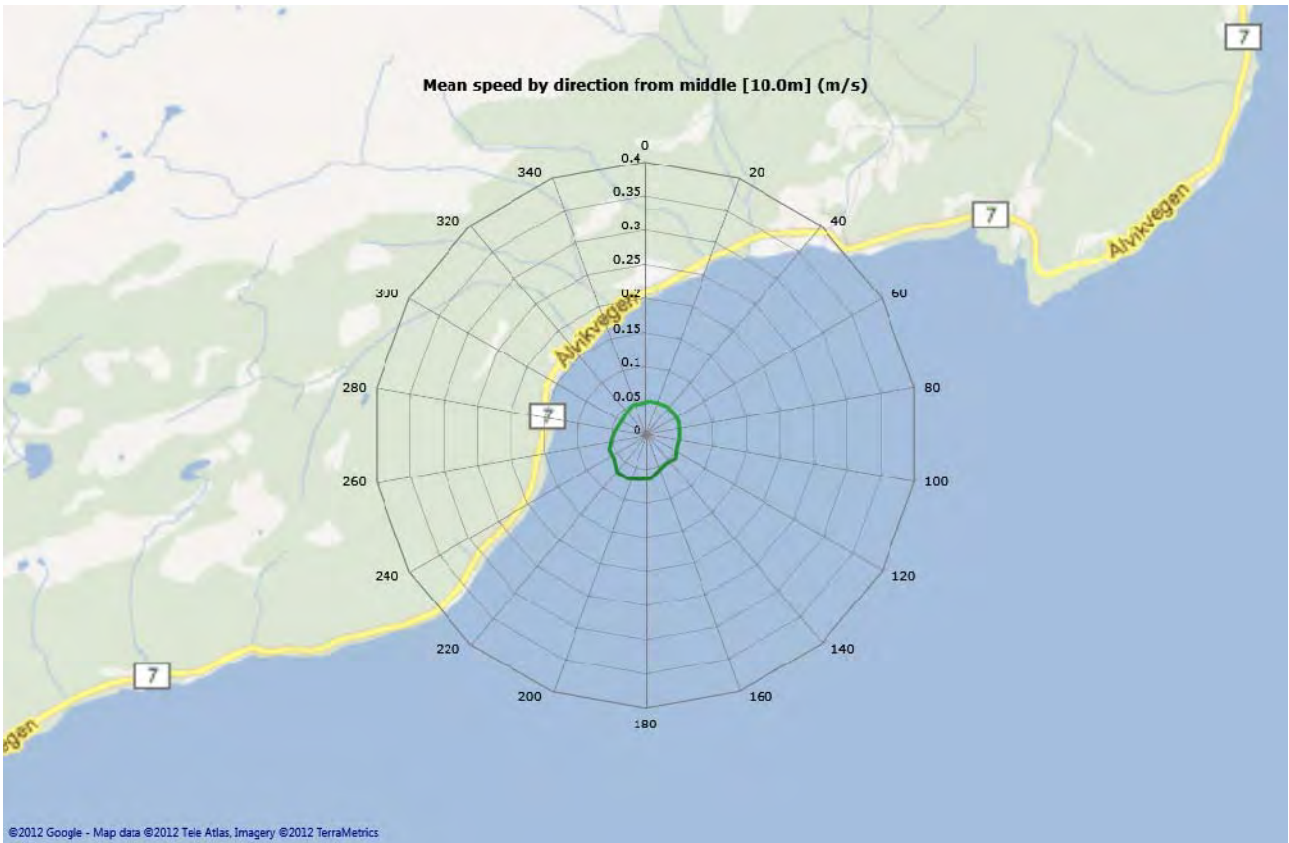


Mean speed - roseplot

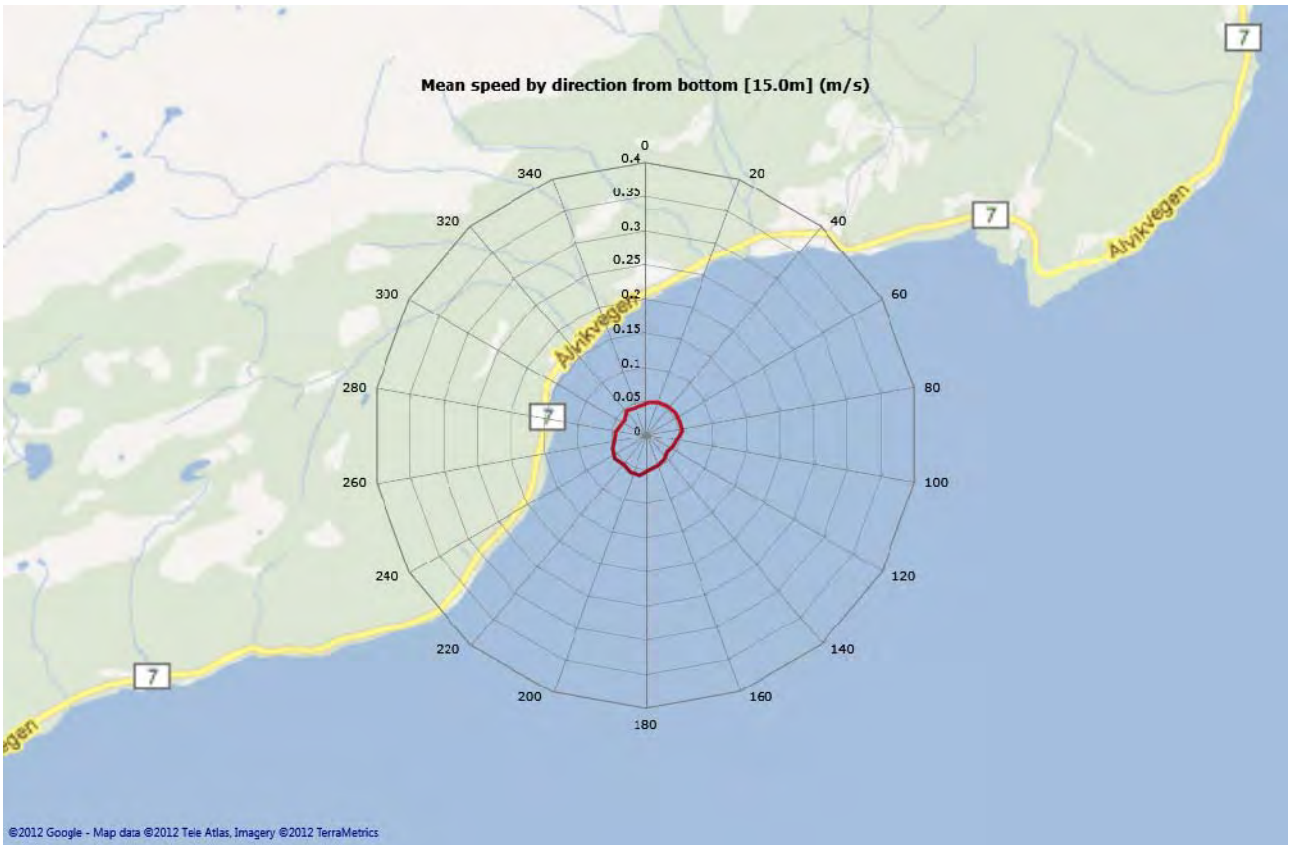
Top [5,0m]



Middle [10,0m]

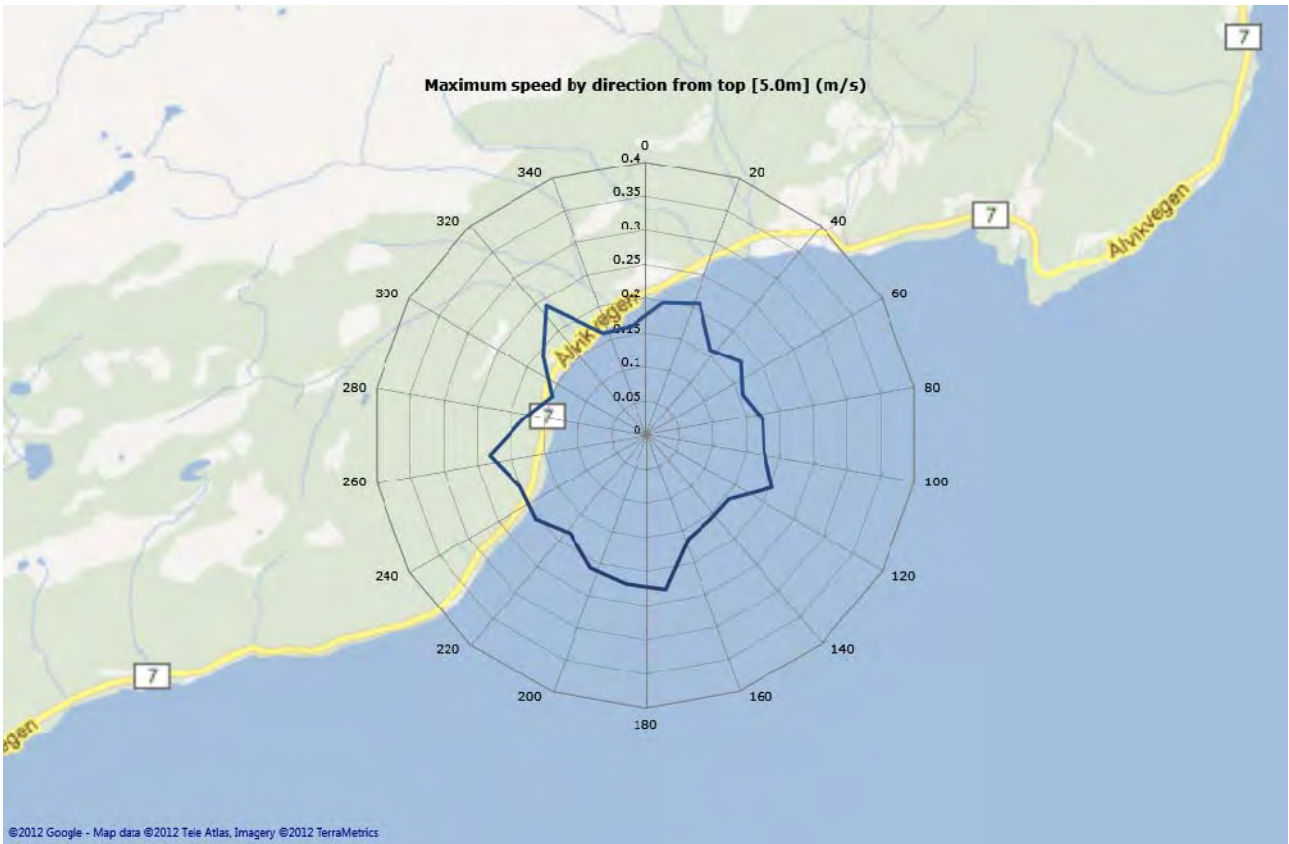


Bottom [15,0m]

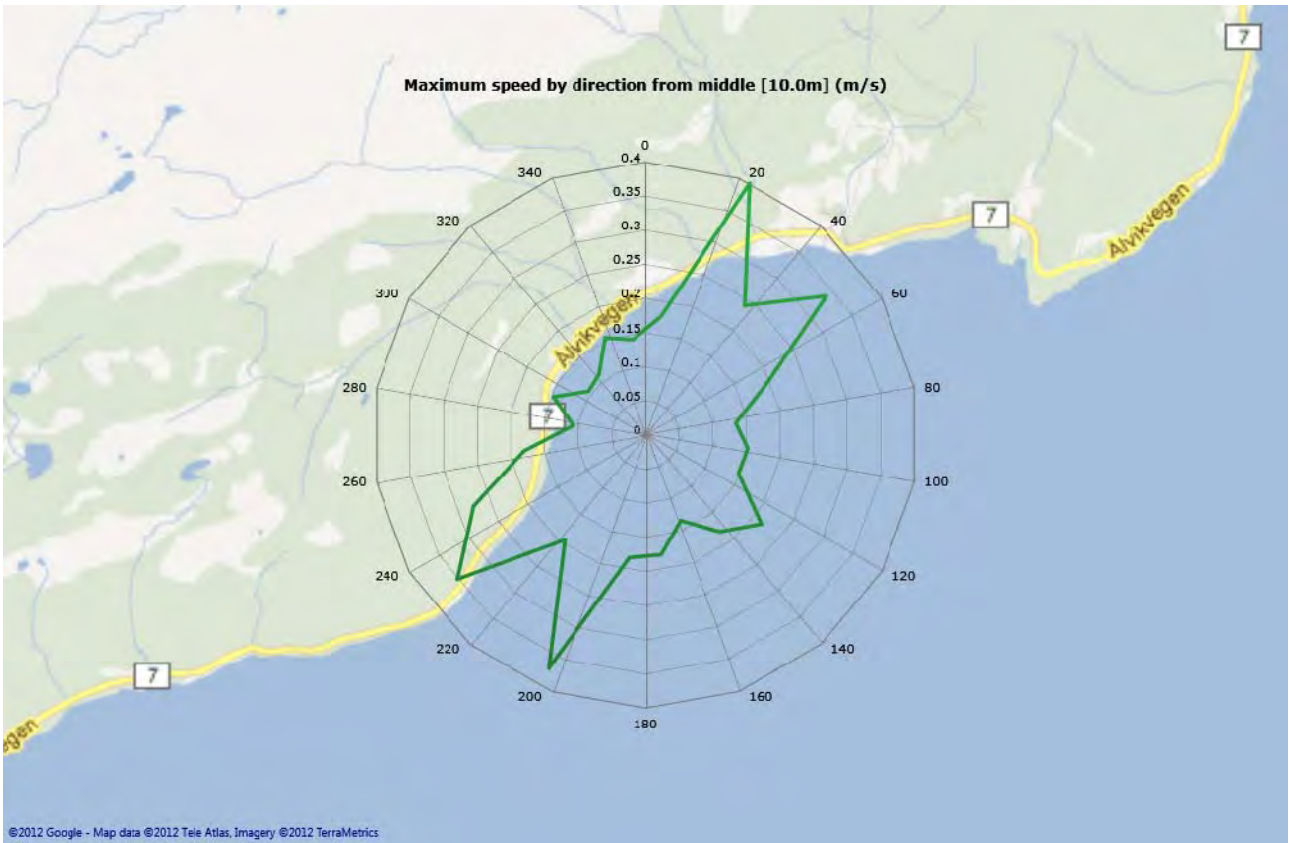


Max speed - roseplot

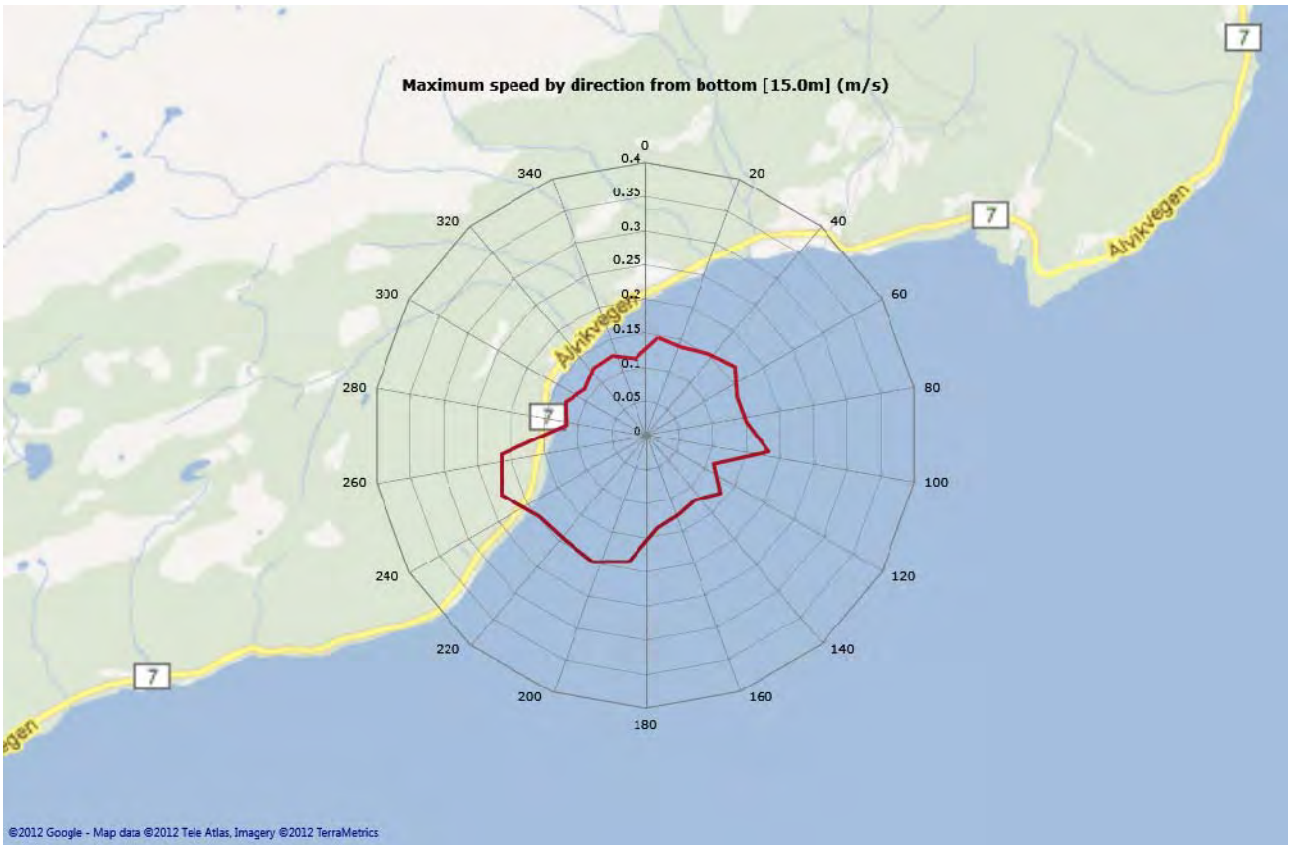
Top [5,0m]



Middle [10,0m]

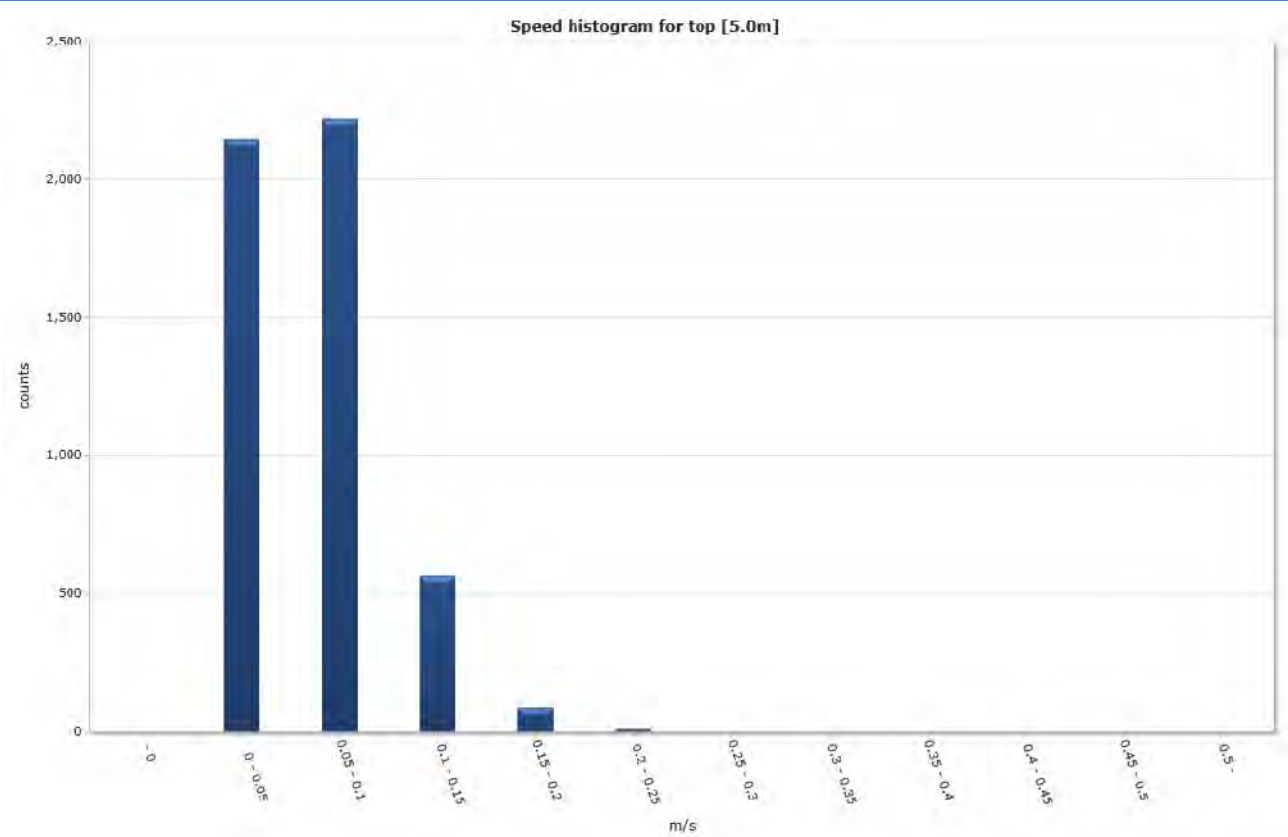


Bottom [15,0m]

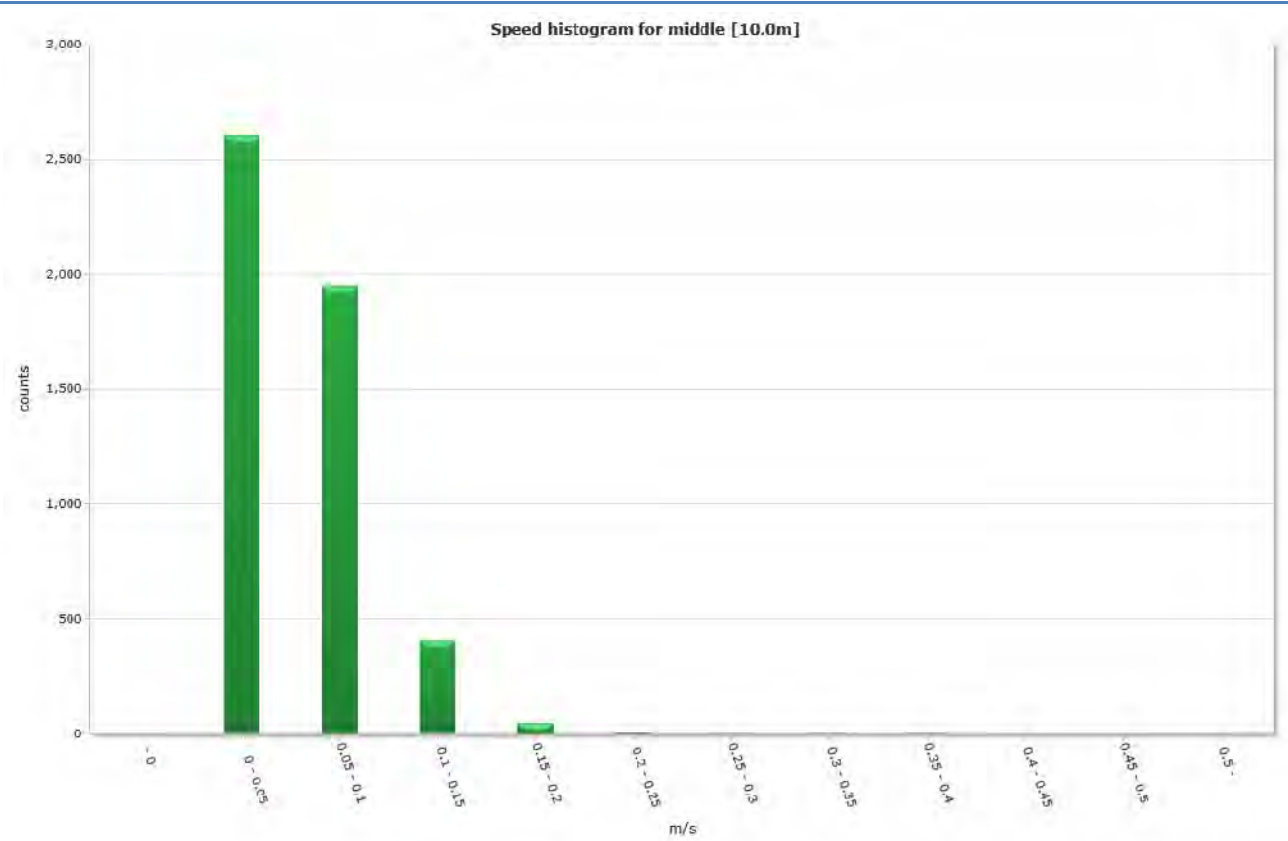


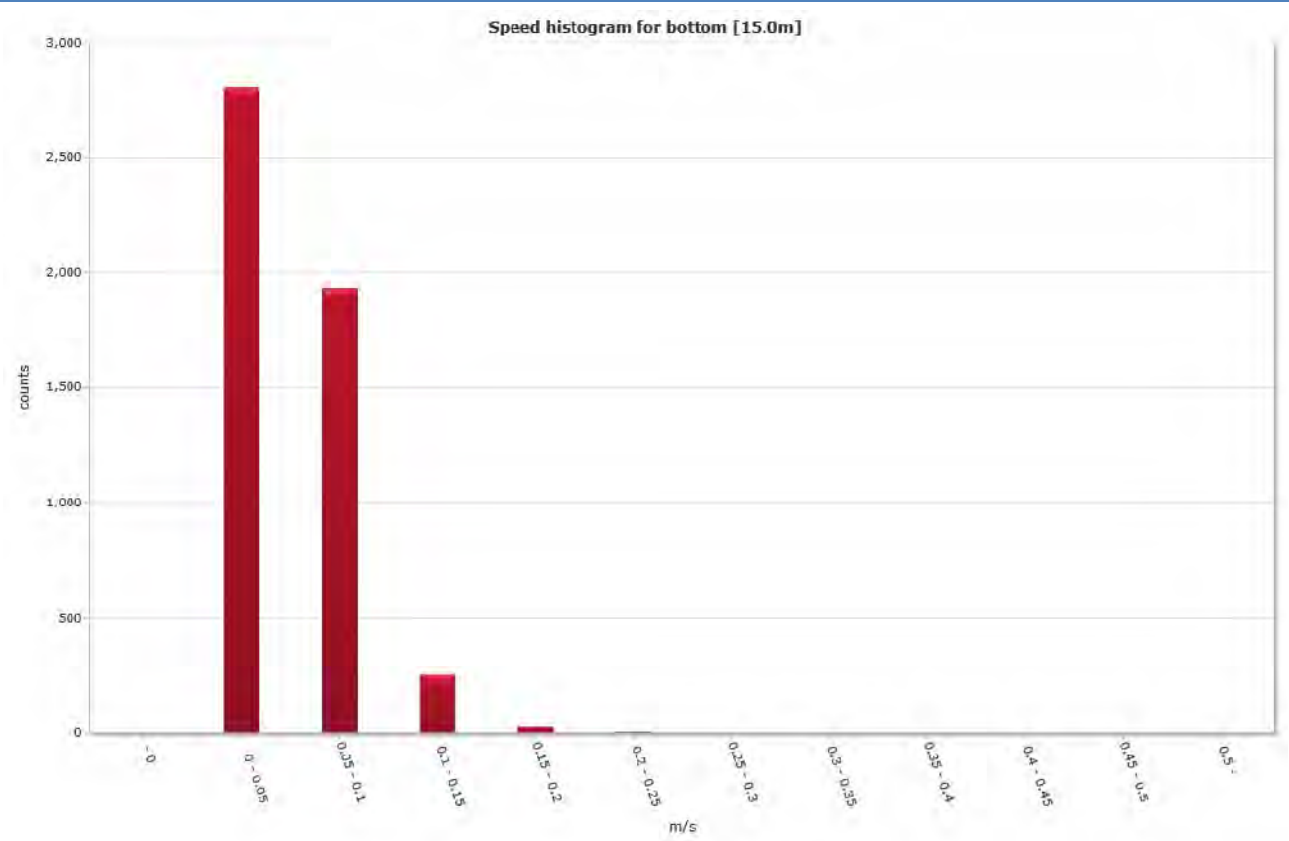
Speed histogram

Top [5,0m]



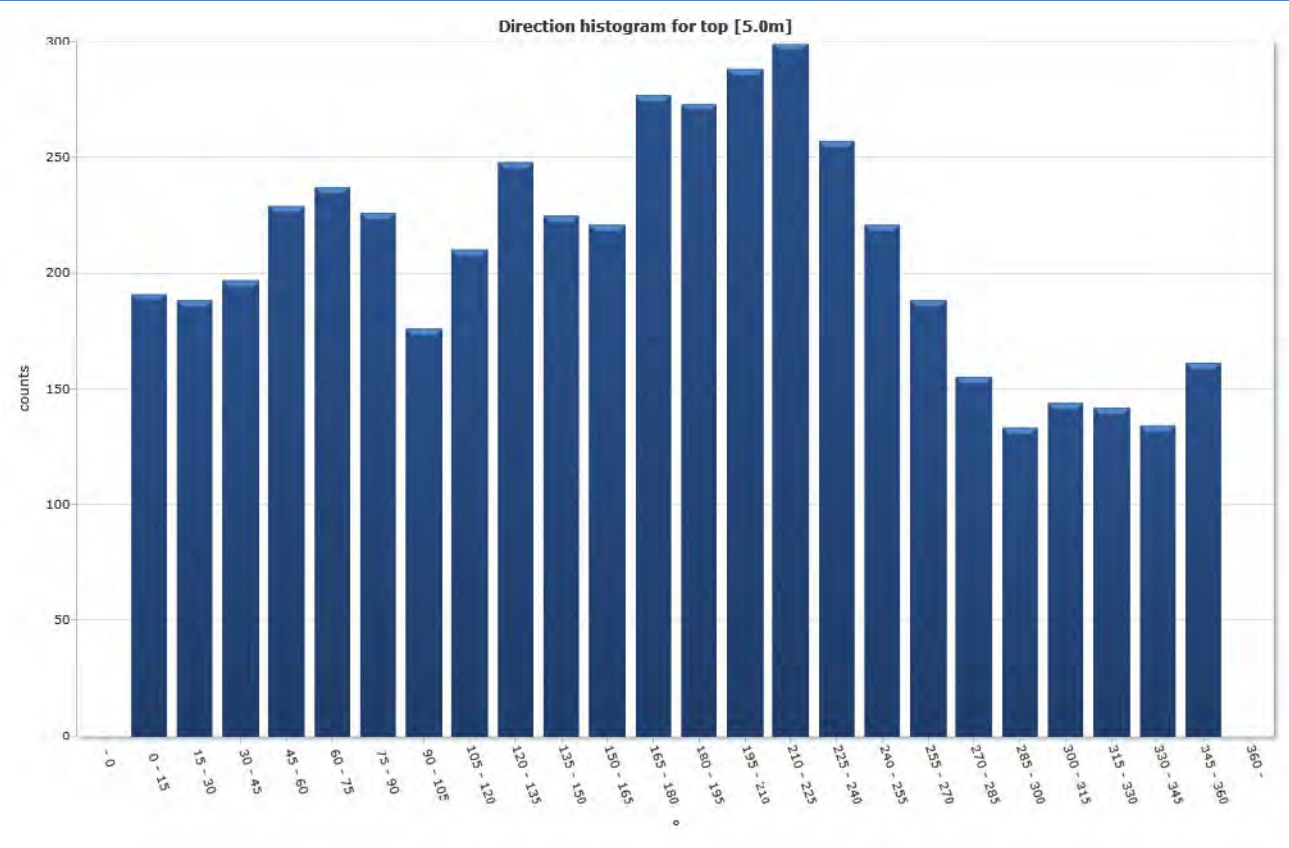
Middle [10,0m]



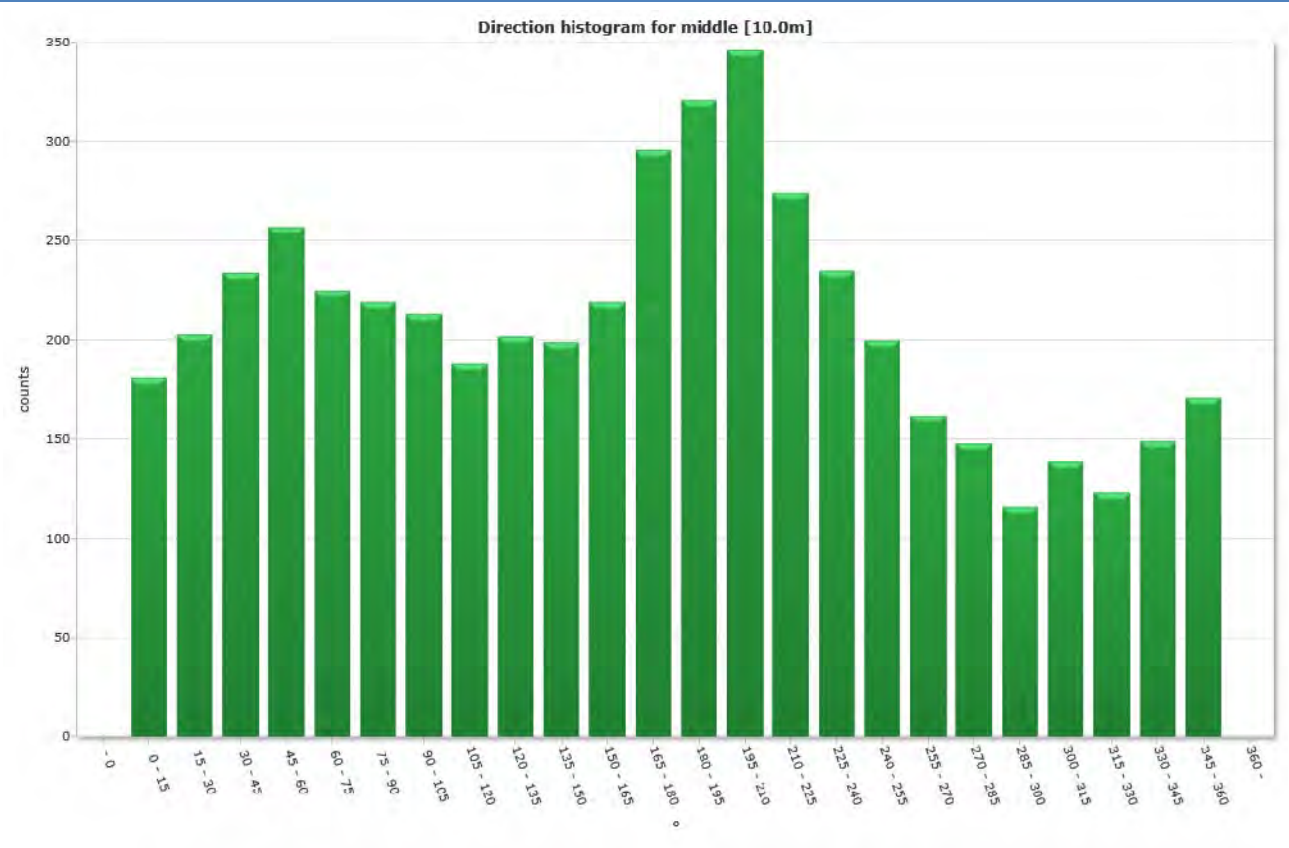


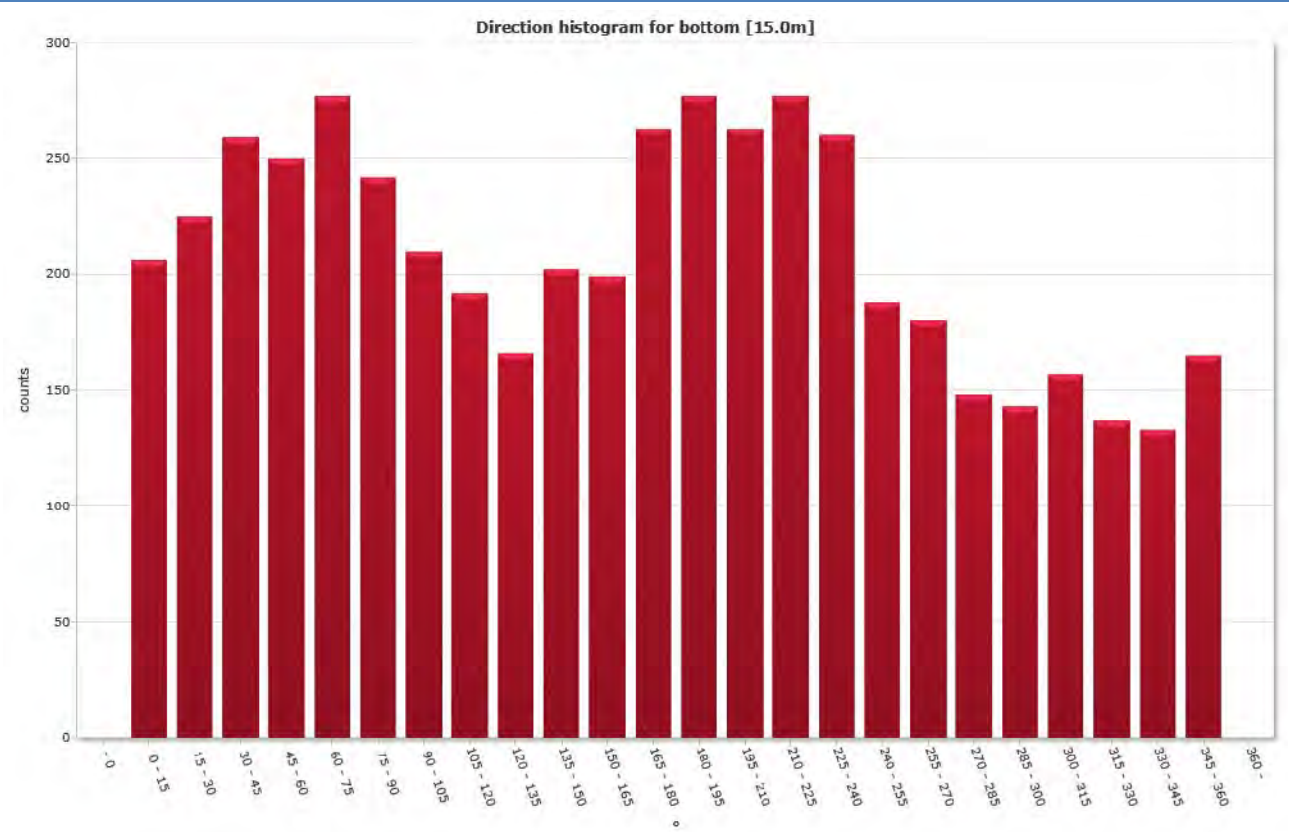
Direction histogram

Top [5,0m]



Middle [10,0m]





Direction/Speed histogram

Top [5,0m]

° m/s	Direction/speed matrix for top [5.0m]																										%	Sum
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	94	102	81	99	95	95	79	104	106	90	97	101	107	92	89	98	88	75	72	78	78	70	72	82	42.7	2145		
0.10	73	66	99	108	108	114	73	83	119	118	99	123	109	140	150	112	96	88	64	48	53	57	52	65	44.2	2217		
0.15	23	17	16	18	31	14	20	22	21	15	21	41	46	48	56	37	30	15	18	7	10	14	9	12	11.2	562		
0.20	1	2	1	4	2	3	4	0	2	2	4	10	9	7	4	9	7	8	1	0	3	0	1	2	1.7	85		
0.25	0	1	0	0	0	0	0	1	0	0	0	2	2	1	0	1	0	1	0	0	0	1	0	0	0.2	10		
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		
%	3.8	3.7	3.9	4.6	4.7	4.5	3.5	4.2	4.9	4.5	4.4	5.5	5.4	5.7	6.0	5.1	4.4	3.7	3.1	2.6	2.9	2.8	2.7	3.2	100.0	100.0		
Sum	191	188	197	229	237	226	176	210	248	225	221	277	273	288	299	257	221	188	155	133	144	142	134	161	100.0	5020		

Middle [10,0m]

° m/s	Direction/speed matrix for middle [10.0m]																												%	Sum
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						
0.05	103	124	129	147	116	120	124	109	97	109	107	125	126	127	97	108	91	91	97	88	95	80	88	106	51.9	2634				
0.10	67	69	93	95	94	90	74	65	89	74	88	122	139	154	121	96	90	61	50	24	43	42	55	56	38.9	1951				
0.15	10	7	8	14	14	9	14	14	11	14	24	45	50	53	46	29	15	8	1	4	1	1	5	9	8.1	406				
0.20	1	1	2	0	1	0	1	0	4	2	0	4	6	10	10	1	2	2	0	0	0	0	1	0	1.0	48				
0.25	0	1	2	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0.1	6				
0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.0	1				
0.35	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.0	2				
0.40	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.0	2				
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				
%	3.6	4.0	4.7	5.1	4.5	4.4	4.2	3.7	4.0	4.0	4.4	5.9	5.4	6.9	5.5	4.7	4.0	3.2	2.9	2.3	2.8	2.5	3.0	3.4	100.0	100.0				
Sum	181	203	234	257	225	219	213	188	202	199	219	296	321	346	274	235	200	162	148	116	139	123	149	171	100.0	5020				

Bottom [15,0m]

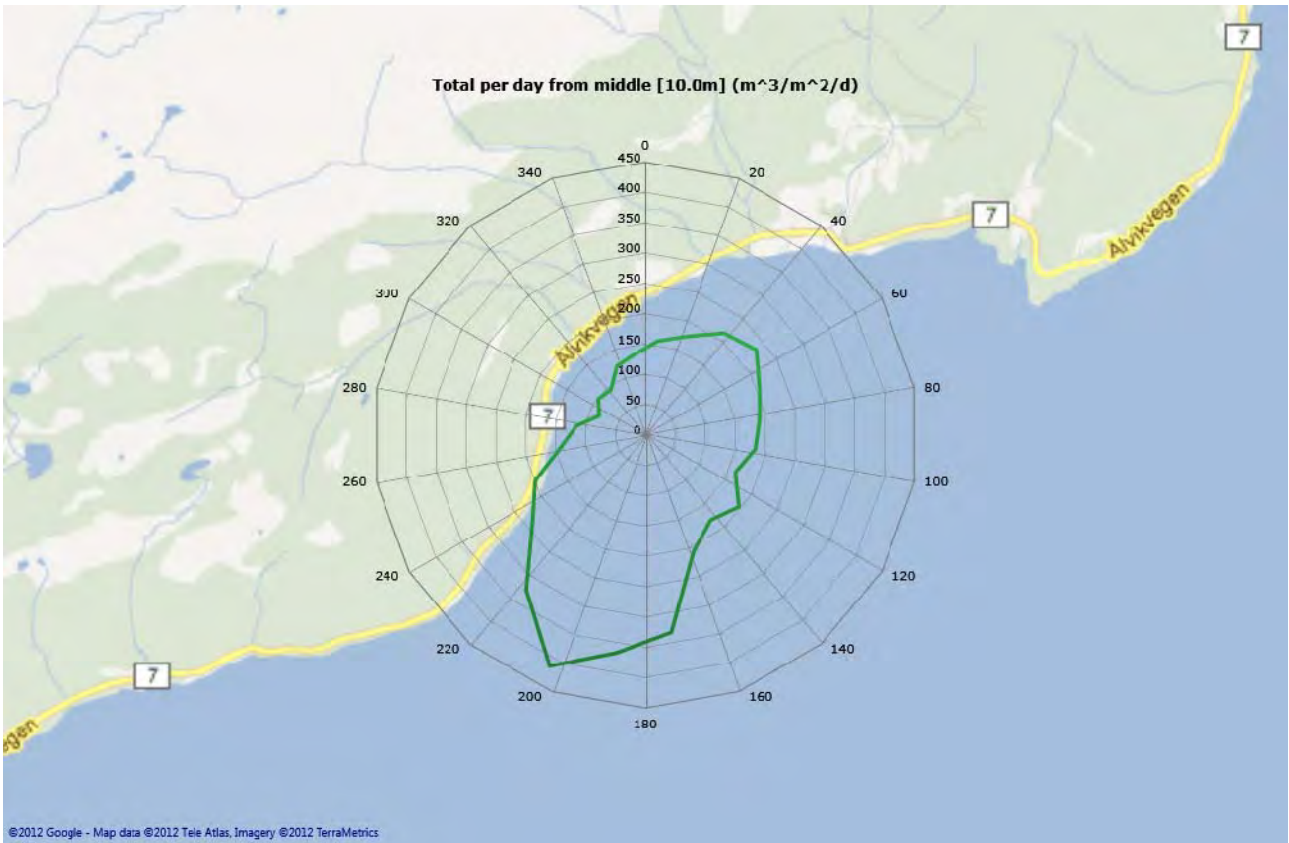
m/s	Direction/speed matrix for bottom [15.0m]																										
0.0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	%	Sum	
0.05	112	116	126	114	136	116	126	123	119	127	113	145	127	120	146	129	105	120	95	102	116	85	83	103	55.9	2834	
0.10	86	99	112	118	118	110	78	67	43	72	84	101	119	115	106	101	68	52	49	40	39	48	48	60	38.5	1933	
0.15	8	10	20	17	23	16	5	2	4	3	2	17	25	24	20	24	11	7	4	1	2	4	2	2	5.0	253	
0.20	0	0	1	1	0	0	1	0	0	0	0	0	6	3	5	6	2	0	0	0	0	0	0	0	0.5	25	
0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0	0	0	0	0	0	0.1	4	
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	
%	4.1	4.5	5.2	5.0	5.5	4.8	4.2	3.8	3.3	4.0	4.0	5.2	5.5	5.2	5.5	5.2	3.7	3.6	2.9	2.8	3.1	2.7	2.6	3.3	100.0	100.0	
Sum	206	225	259	250	277	242	210	192	156	202	199	263	277	263	277	260	188	180	148	143	157	137	133	165	100.0	5019	

Flow

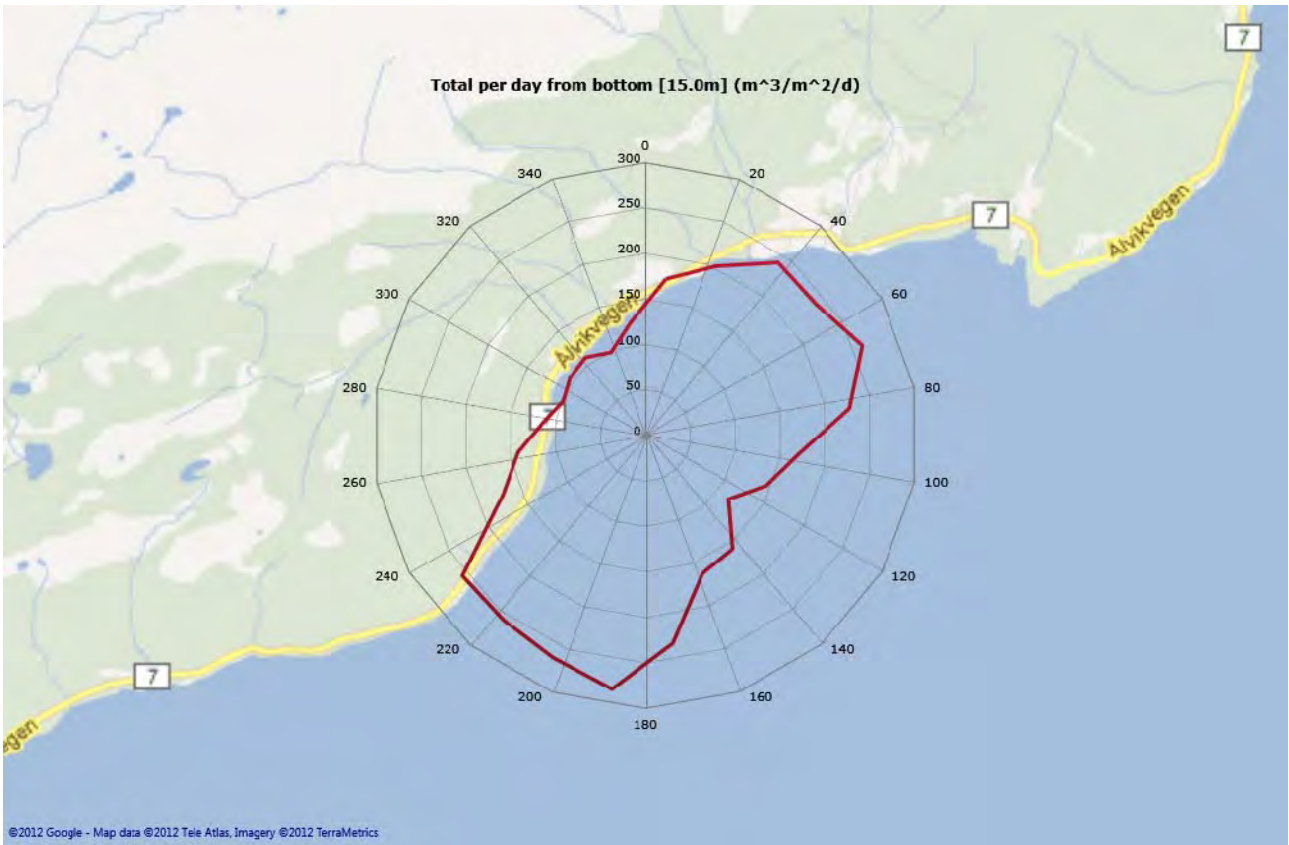
Top [5,0m]



Middle [10,0m]

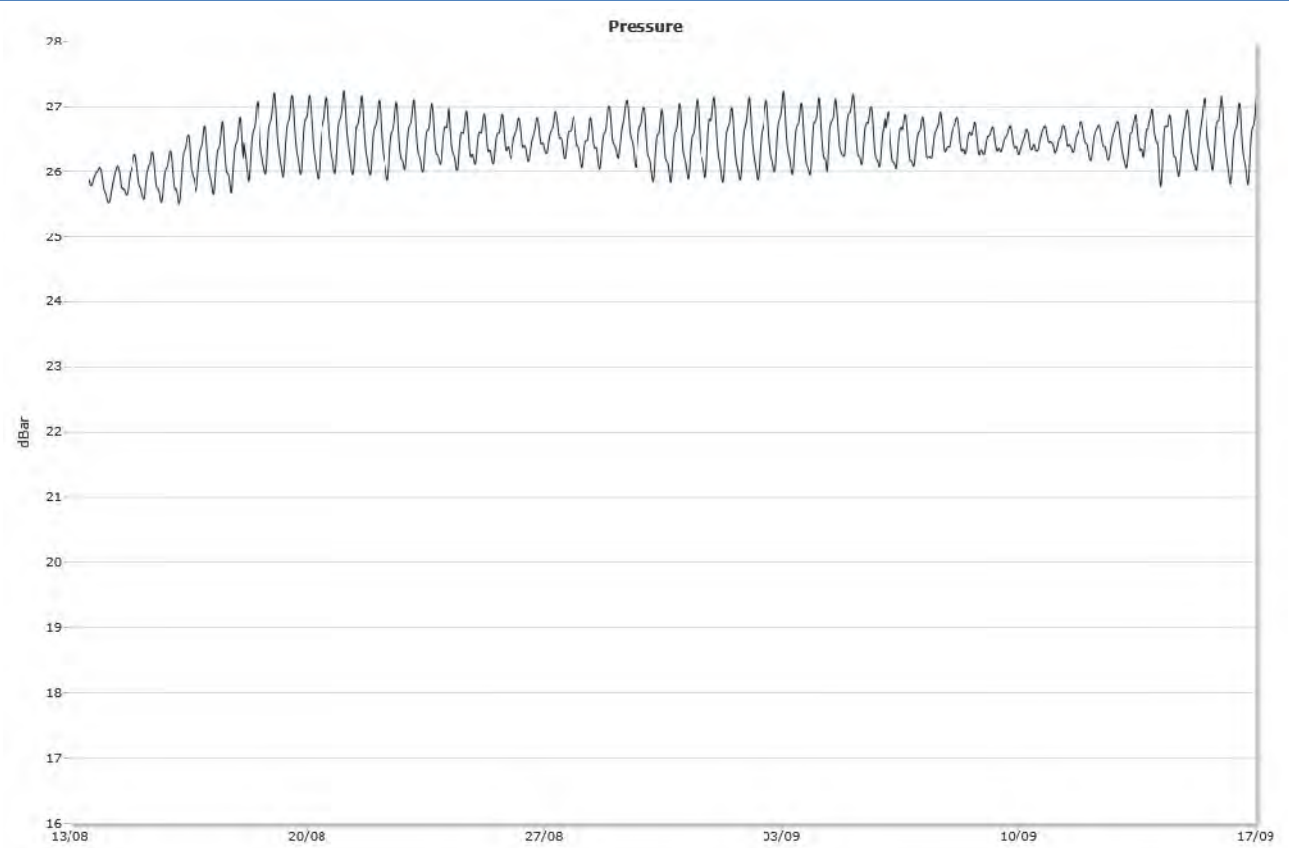


Bottom [15,0m]

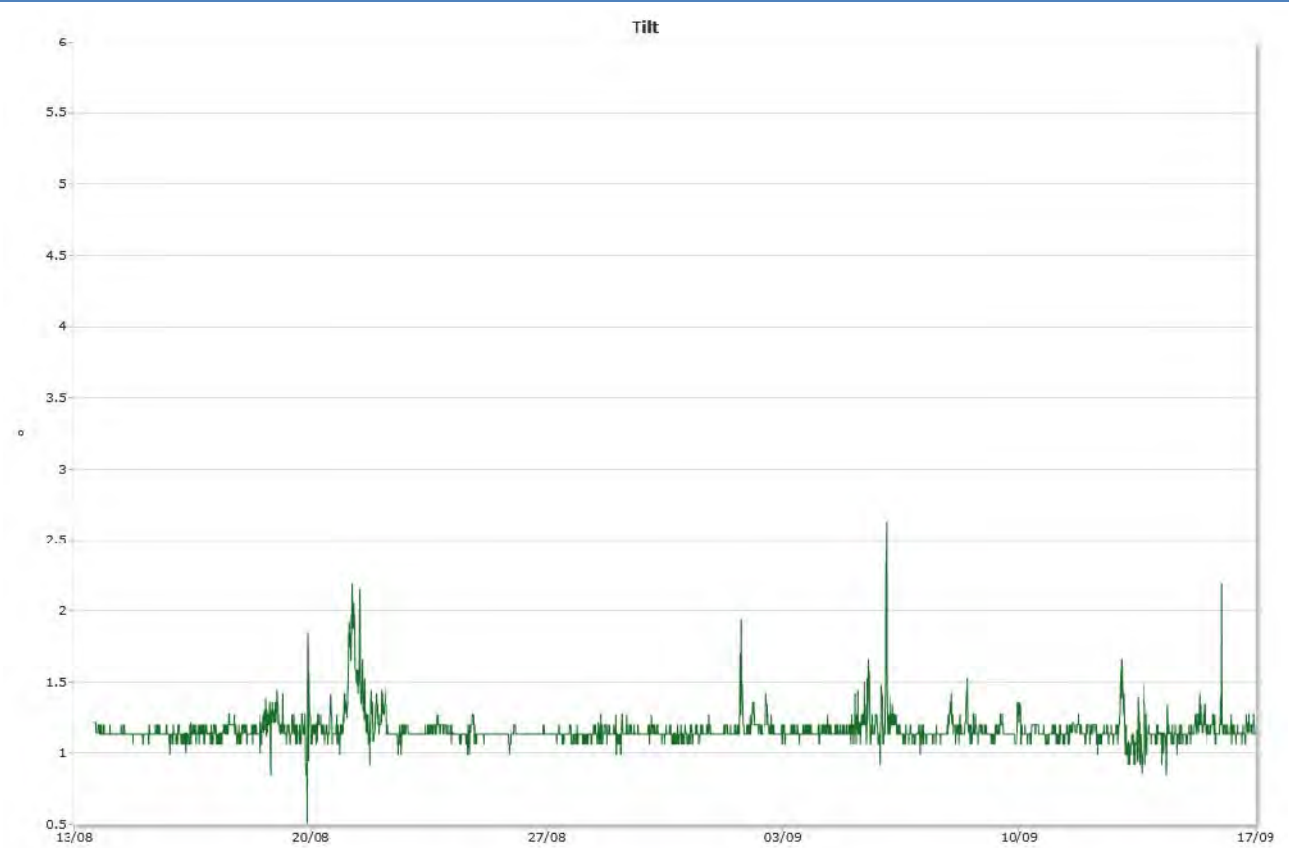


Sensors

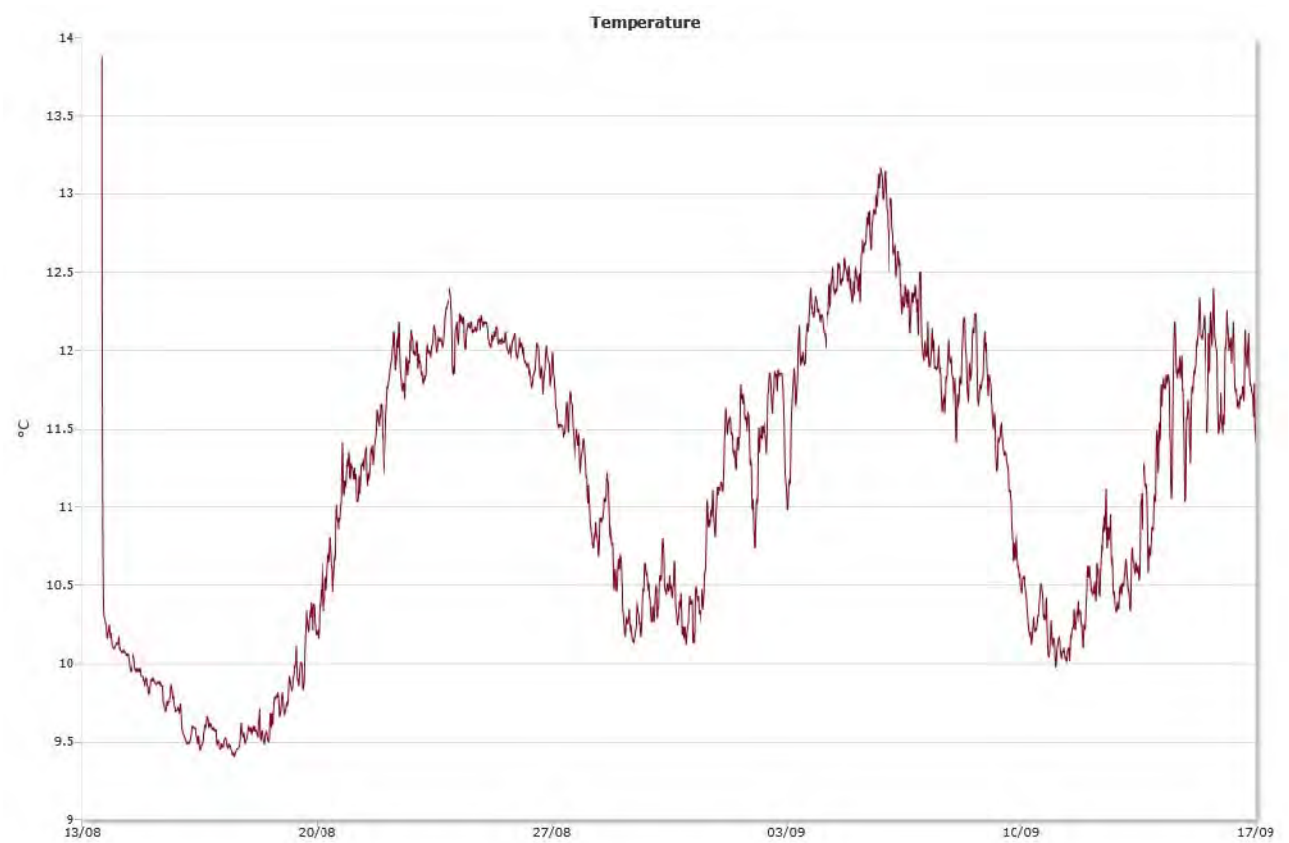
Pressure



Tilt



Temperature



Straummåling Djupevik

Spreiingsstraum

17.09.2012

Resipientanalyse AS

Frode Berge-Haveland

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Details

Instrument

Head Id	AQP 5209
Board Id	AQD 9592
Frequency	400000

Configuration

Start	13.08.2012 14:00
End	17.09.2012 10:50
Data records	5022
Longitude	6° 21,54'E
Latitude	60° 24,45'N
Orientation	DOWN
Cells	40
Cell size(m)	2
Blanking distance(m)	0,99
Average interval(sec)	60
Measurement interval(sec)	600

Quality

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

Post processing

Selected Start	13.08.2012 14:00
Selected End	17.09.2012 10:30
Compass Offset	0
Pressure Offset	0
Selected Records	5020
Reference	Water Surface
Top Depth(m)	20
Top invalid data	1
Middle Depth(m)	22
Middle invalid data	1
Bottom Depth(m)	24
Bottom invalid data	568

Statistics

Top [20,0m]

Mean current [m/s]	0.04
Max current [m/s]	0.29
Min current [m/s]	0.00
Measurements [#]	5019
Std.dev [m/s]	0.03
Significant max velocity [m/s]	0.07
Significant min velocity [m/s]	0.02
10 year return current [m/s]	0.482
50 year return current [m/s]	0.540
Most significant directions [°]	195.00, 45.00, 240.00, 225.00
Most significant speeds [m/s]	0.05, 0.10, 0.15, 0.20
Most flow	8728.83m ³ by 180-195°.
Least flow	4272.33m ³ by 300-315°.

Middle [22,0m]

Mean current [m/s]	0.04
Max current [m/s]	0.45
Min current [m/s]	0.00
Measurements [#]	5019
Std.dev [m/s]	0.03
Significant max velocity [m/s]	0.07
Significant min velocity [m/s]	0.02
10 year return current [m/s]	0.746
50 year return current [m/s]	0.836
Most significant directions [°]	210.00, 30.00, 15.00, 255.00
Most significant speeds [m/s]	0.05, 0.10, 0.15, 0.20
Most flow	7343.60m ³ by 195-210°.
Least flow	3890.91m ³ by 285-300°.

Bottom [24,0m]

Mean current [m/s]	0.05
Max current [m/s]	0.32
Min current [m/s]	0.00
Measurements [#]	4452
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]	0.536
50 year return current [m/s]	0.600
Most significant directions [°]	195.00, 240.00, 210.00, 15.00
Most significant speeds [m/s]	0.05, 0.10, 0.15, 0.20
Most flow	7854.42m ³ by 225-240°.
Least flow	4846.46m ³ by 285-300°.

Direction with return period

Top [20,0m]

Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,044	0,198	0,073	0,327	0,081	0,366
45	0,043	0,206	0,072	0,341	0,080	0,382
90	0,042	0,292	0,070	0,482	0,078	0,540
135	0,043	0,227	0,072	0,375	0,080	0,420
180	0,049	0,167	0,080	0,275	0,090	0,309
225	0,047	0,153	0,077	0,252	0,087	0,282
270	0,043	0,151	0,071	0,249	0,079	0,279
315	0,042	0,139	0,069	0,230	0,077	0,257

Middle [22,0m]

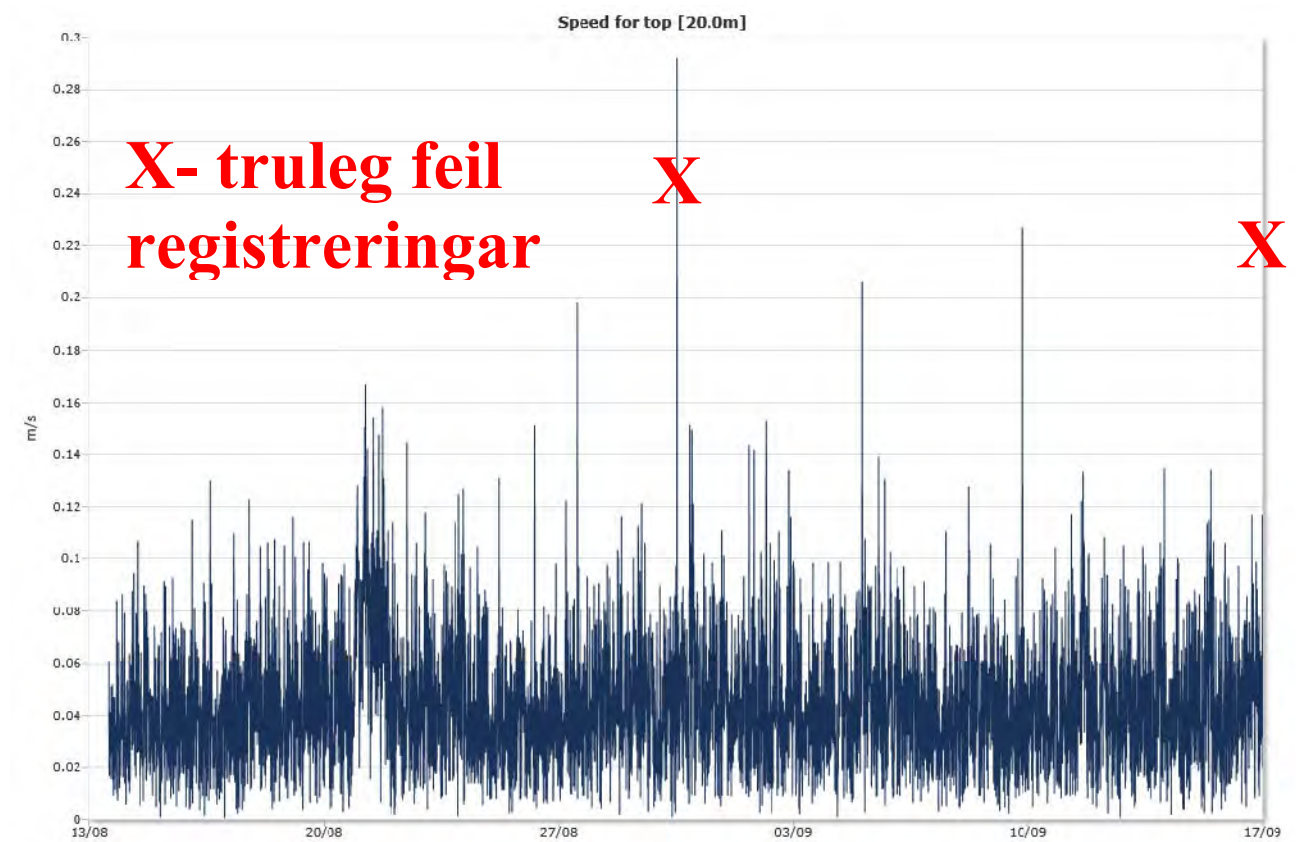
Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,044	0,177	0,072	0,292	0,081	0,328
45	0,044	0,186	0,073	0,308	0,082	0,345
90	0,044	0,452	0,073	0,746	0,081	0,836
135	0,041	0,171	0,068	0,283	0,076	0,317
180	0,047	0,277	0,078	0,457	0,088	0,513
225	0,049	0,172	0,080	0,285	0,090	0,319
270	0,043	0,133	0,070	0,219	0,079	0,245
315	0,042	0,220	0,069	0,362	0,077	0,406

Bottom [24,0m]

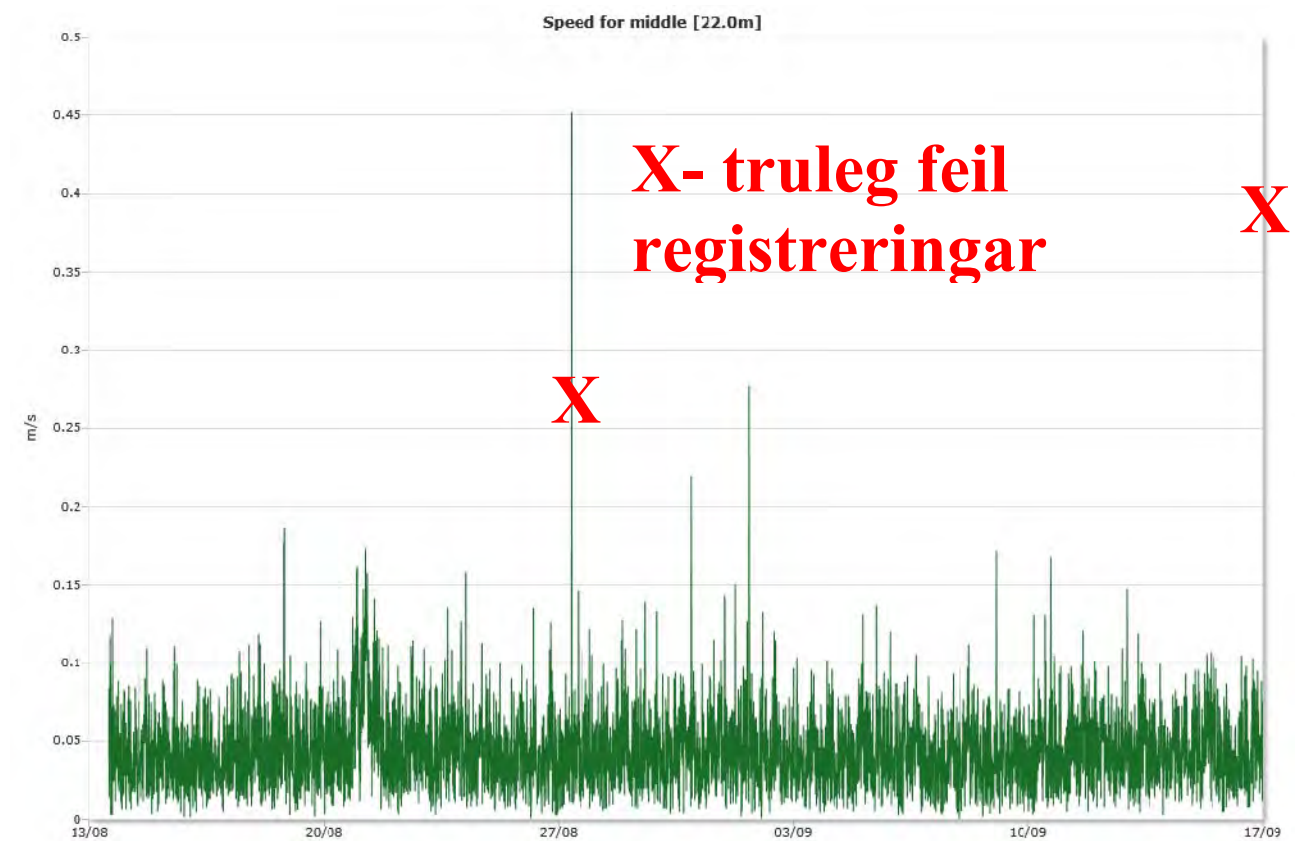
Direction	Mean	Max	Mean 10y	Max 10y	Mean 50y	Max 50y
0	0,055	0,325	0,091	0,536	0,101	0,600
45	0,055	0,199	0,091	0,328	0,101	0,368
90	0,052	0,219	0,085	0,361	0,096	0,405
135	0,053	0,197	0,087	0,325	0,098	0,364
180	0,053	0,243	0,087	0,401	0,098	0,449
225	0,057	0,199	0,094	0,328	0,105	0,368
270	0,053	0,190	0,088	0,314	0,099	0,352
315	0,052	0,230	0,085	0,379	0,096	0,425

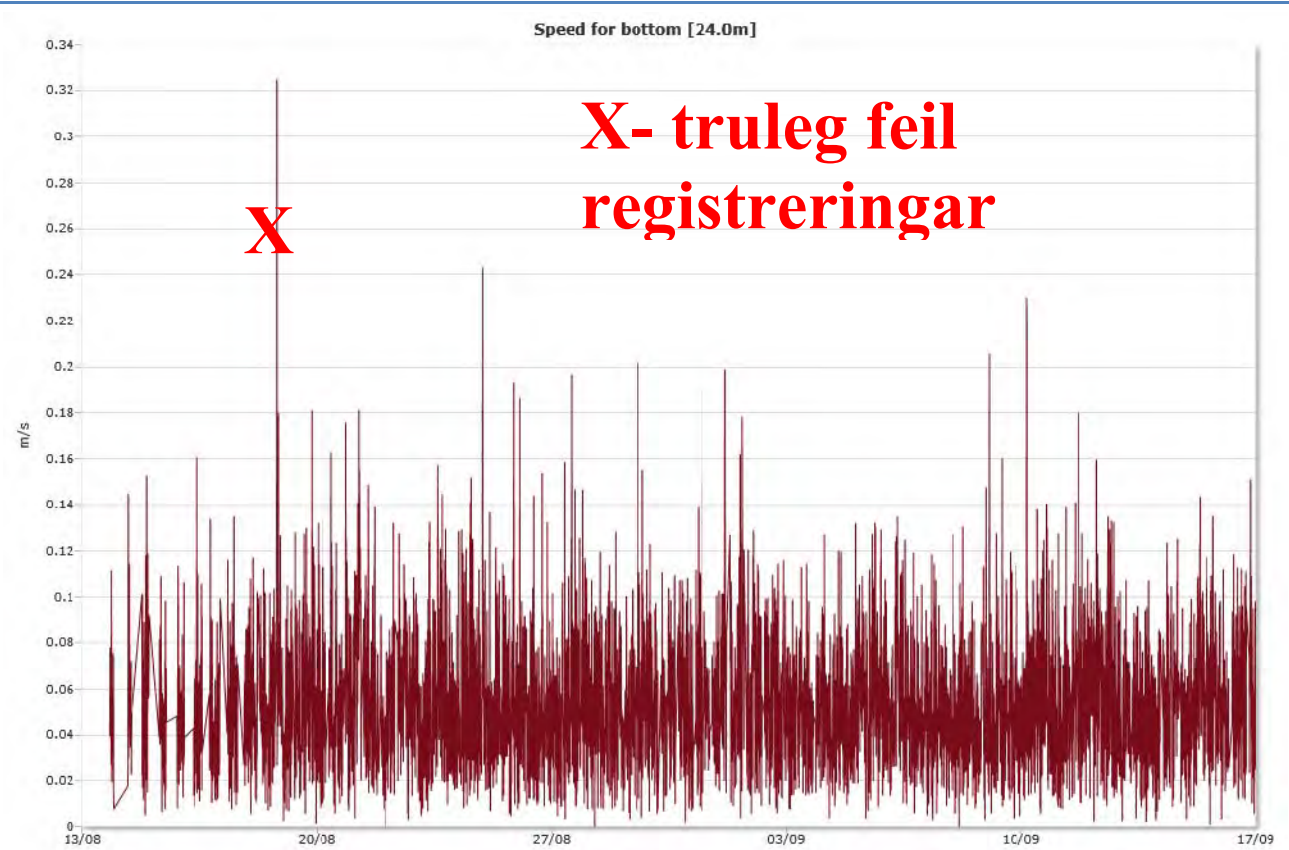
Time series

Top [20,0m]



Middle [22,0m]





Mean speed - roseplot

Top [20,0m]



Middle [22,0m]

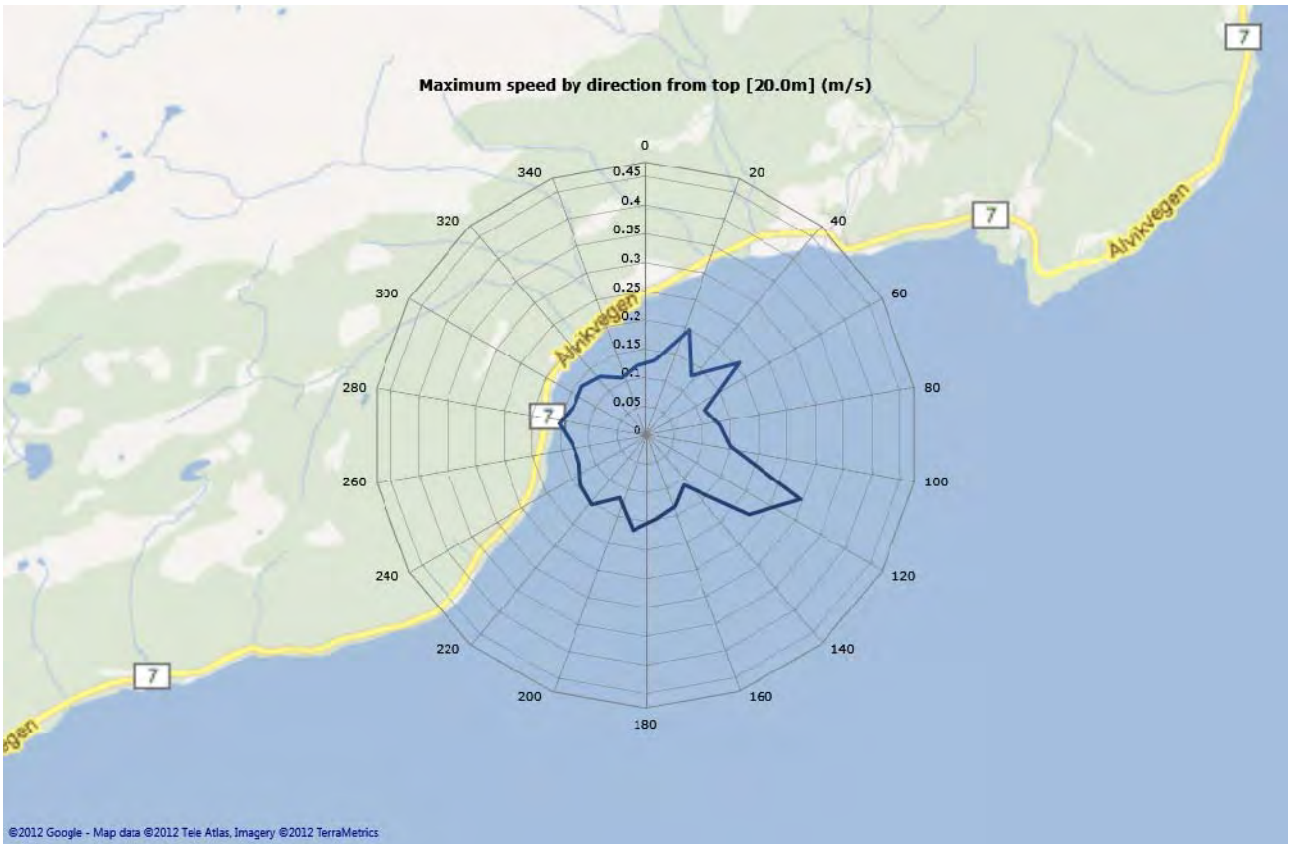


Bottom [24,0m]

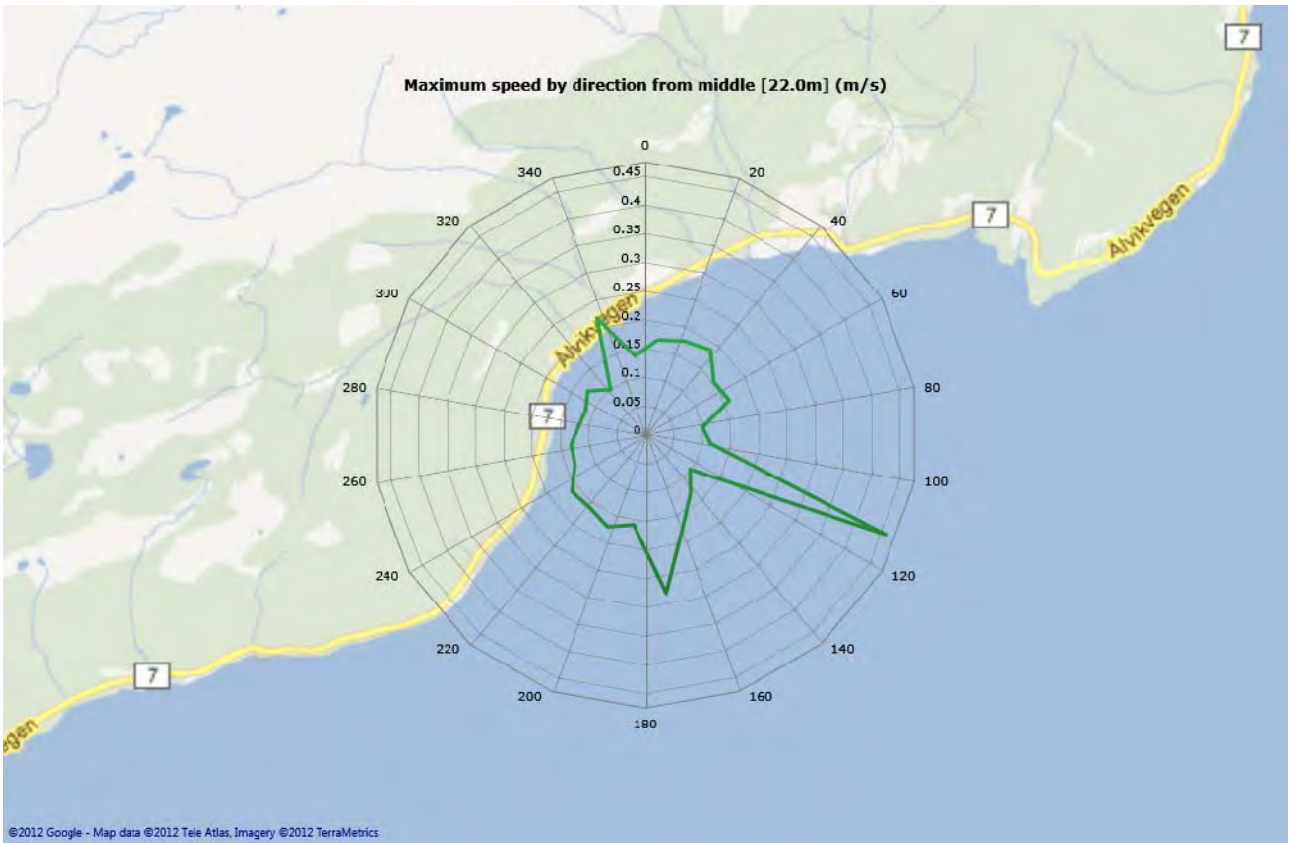


Max speed - roseplot

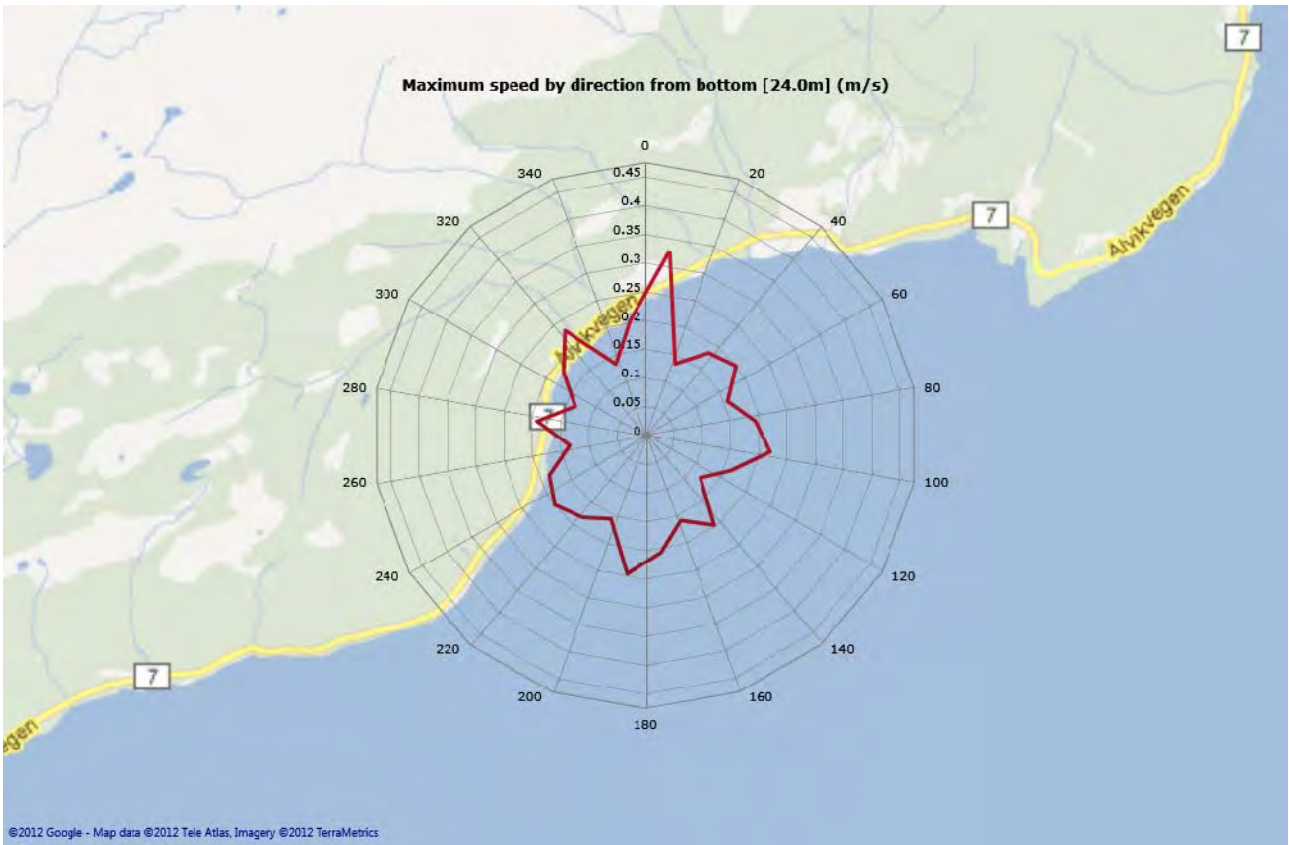
Top [20,0m]



Middle [22,0m]

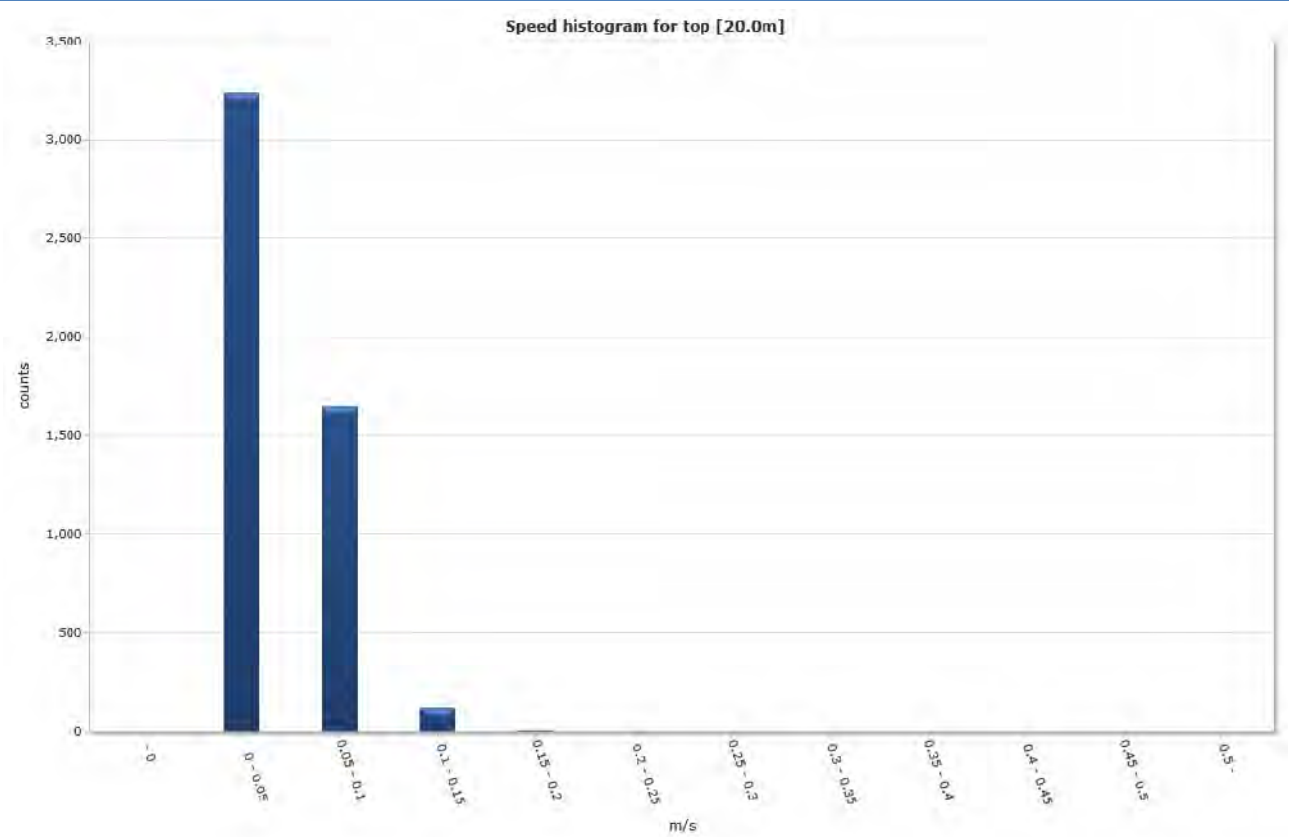


Bottom [24,0m]

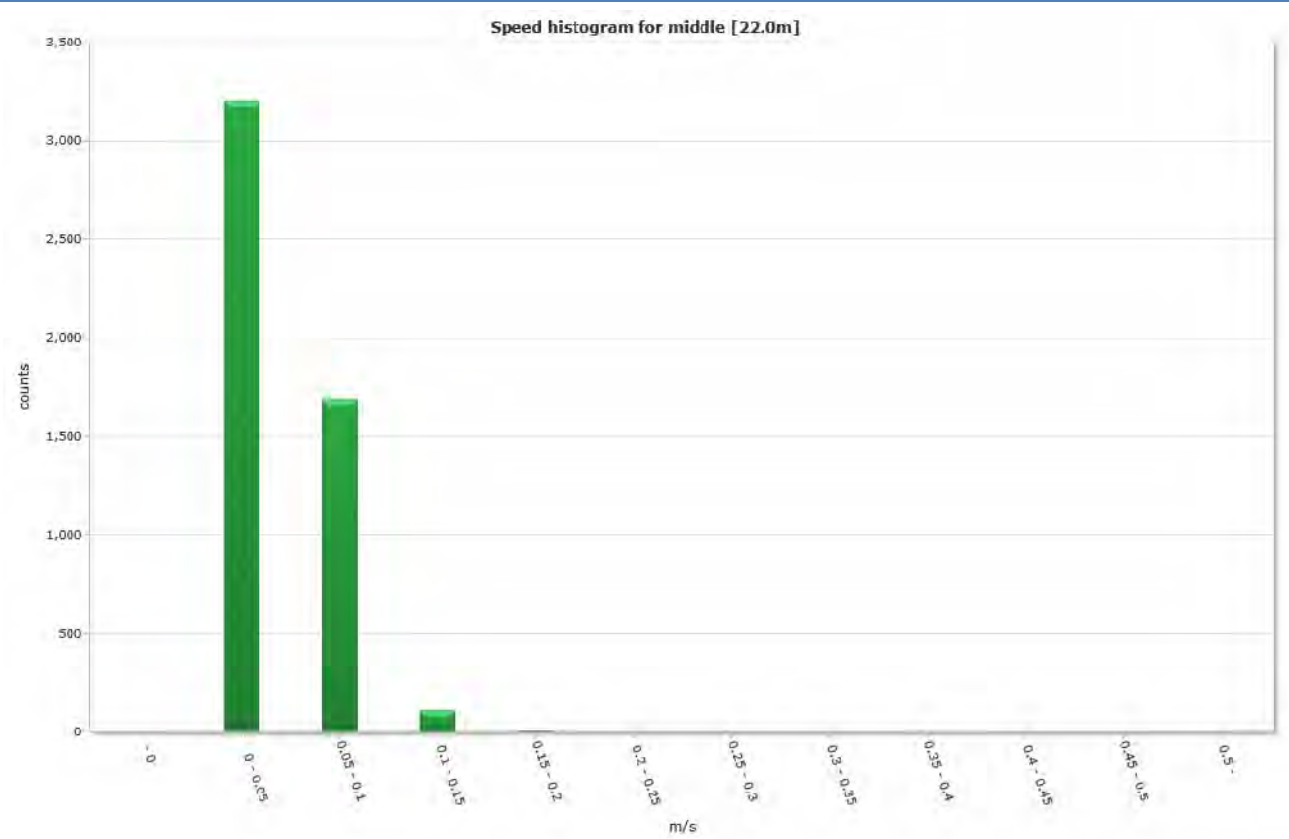


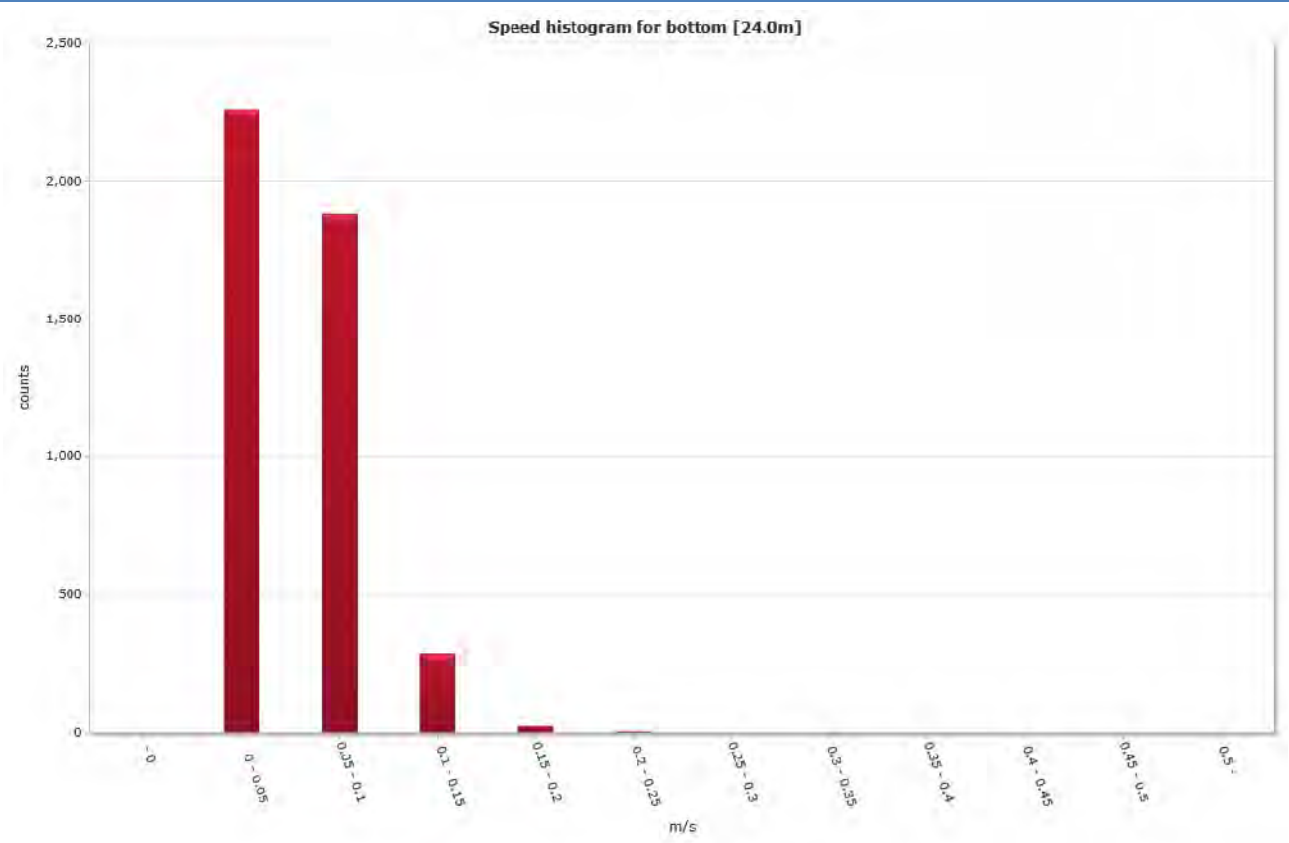
Speed histogram

Top [20,0m]



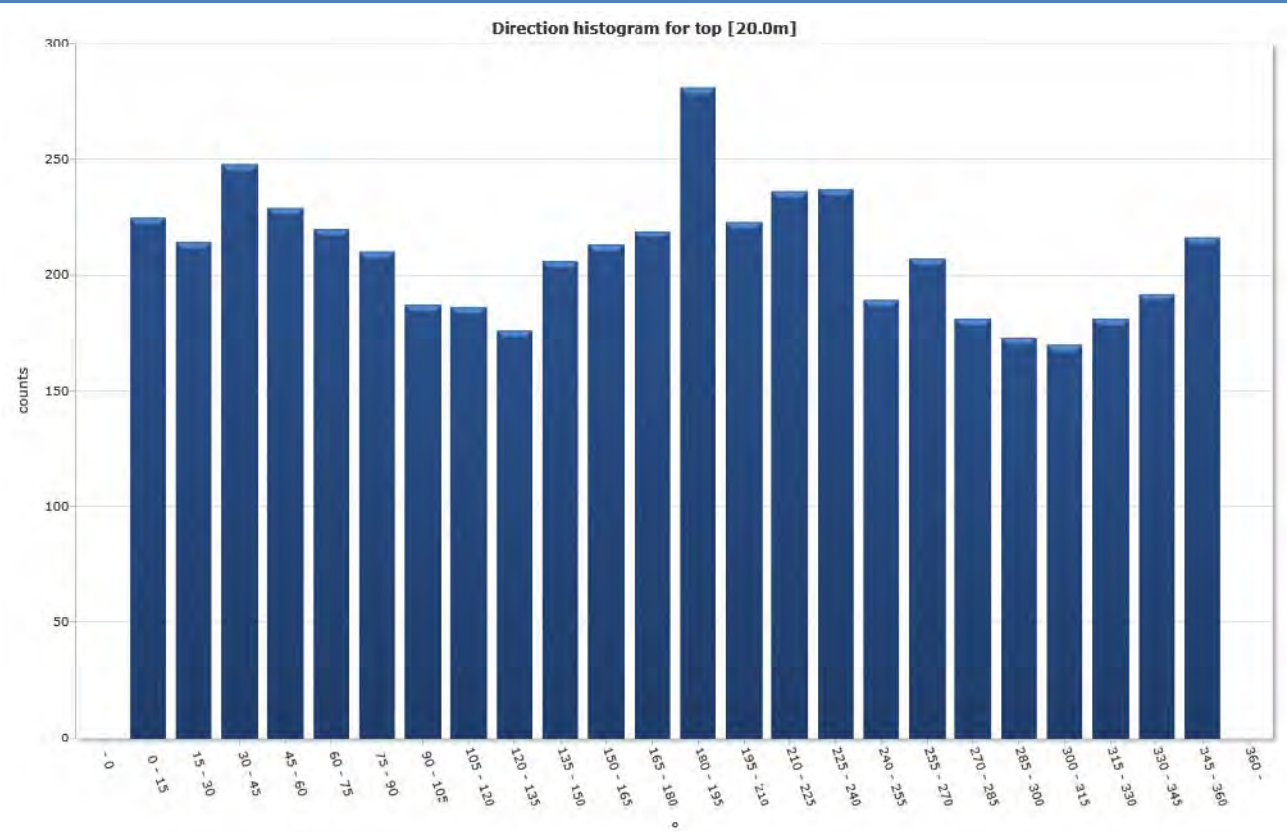
Middle [22,0m]



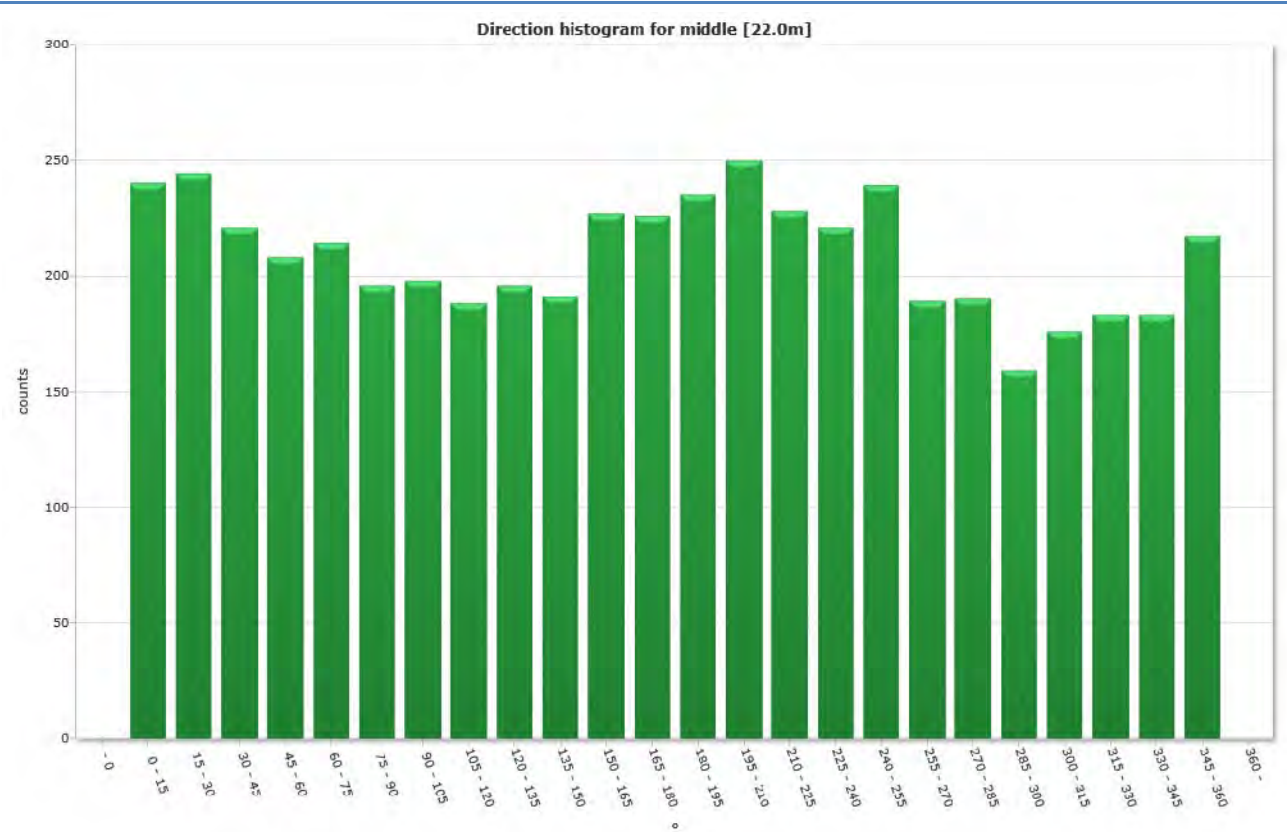


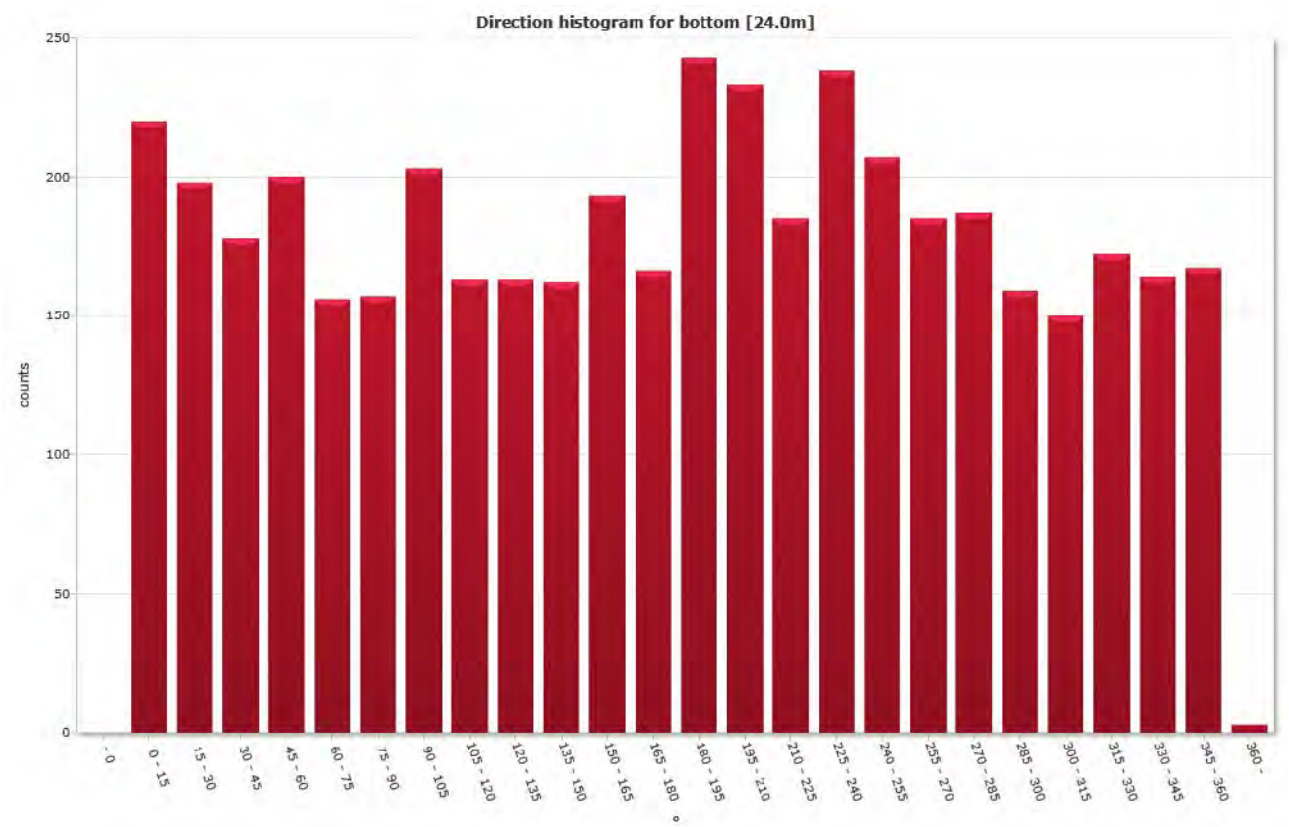
Direction histogram

Top [20,0m]



Middle [22,0m]





Direction/Speed histogram

Top [20,0m]

° m/s	Direction/speed matrix for top [20.0m]																										%	Sum
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	148	122	157	160	151	130	140	126	120	136	132	139	150	129	139	142	125	140	120	118	112	128	138	138	64.6	3240		
0.10	71	88	87	65	67	74	43	55	54	68	75	75	116	82	82	87	58	65	55	52	57	51	51	72	32.9	1650		
0.15	6	2	4	3	2	6	4	4	1	2	6	5	11	12	14	8	6	2	5	3	1	2	3	6	2.4	118		
0.20	0	2	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	1	0	0	0	0	0	0.2	8		
0.25	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	2		
0.30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1		
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		
%	4.5	4.3	4.9	4.6	4.4	4.2	3.7	3.7	3.5	4.1	4.2	4.4	5.6	4.4	4.7	4.7	3.8	4.1	3.6	3.4	3.4	3.6	3.8	4.3	100.0	100.0		
Sum	225	214	248	229	220	210	187	186	176	206	213	219	281	223	236	237	189	207	181	173	170	181	192	216	100.0	5019		

Middle [22,0m]

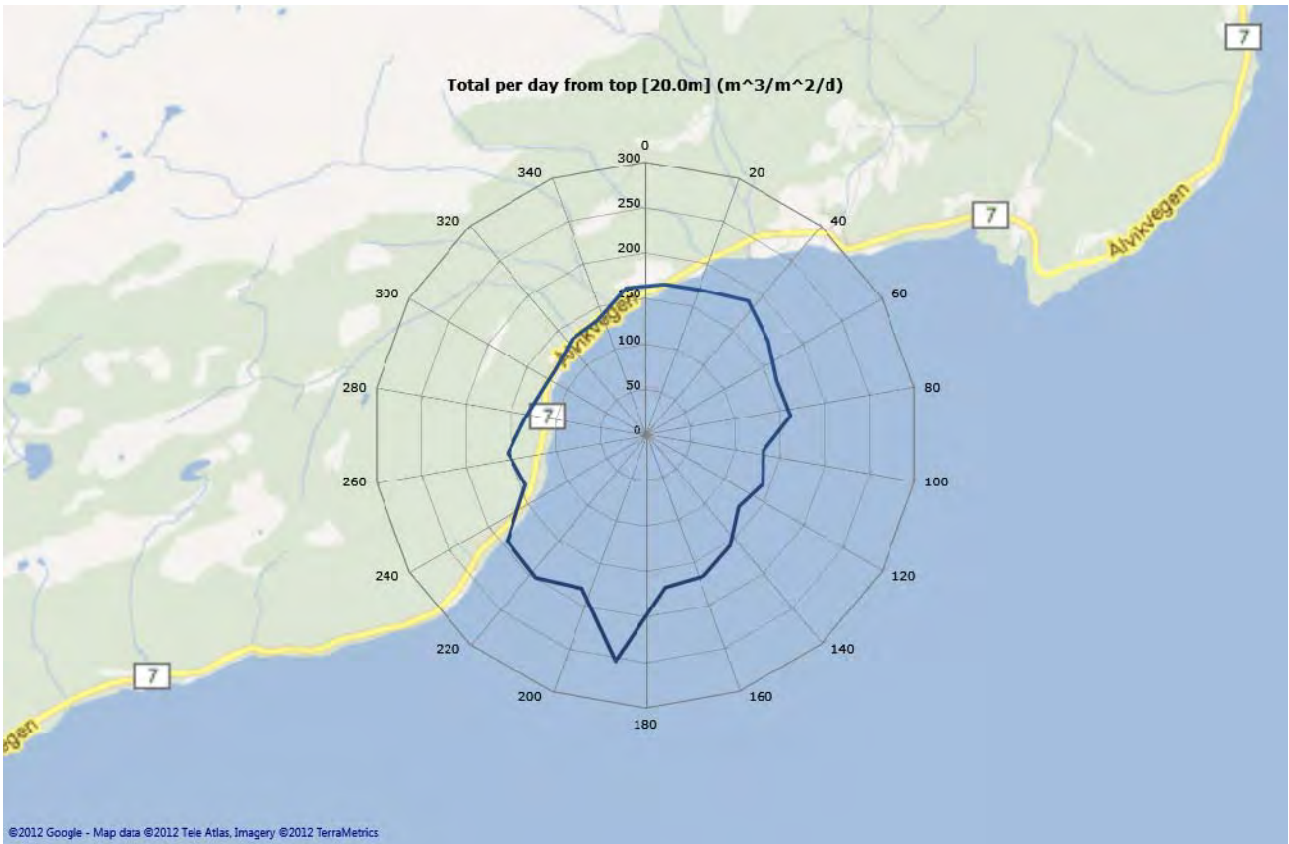
° m/s	Direction/speed matrix for middle [22.0m]																										%	Sum
0.0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	%	Sum		
0.05	160	161	128	132	145	123	130	126	139	116	158	141	126	147	140	124	144	122	132	111	119	125	122	134	63.9	3205		
0.10	73	76	92	72	65	72	64	61	57	74	63	80	94	86	79	83	90	62	54	42	55	58	56	82	33.7	1690		
0.15	6	6	0	3	3	1	4	0	0	1	5	4	14	16	8	13	5	5	4	6	2	0	4	1	2.2	111		
0.20	1	1	1	1	1	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0.2	10		
0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.0	1		
0.30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1		
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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1		
%	4.8	4.9	4.4	4.1	4.3	3.9	3.9	3.7	3.9	3.8	4.5	4.5	4.7	5.0	4.5	4.4	4.8	3.8	3.8	3.2	3.5	3.6	3.6	4.3	100.0	100.0		
Sum	240	244	221	208	214	196	198	188	196	191	227	226	235	250	228	221	239	189	190	159	176	183	183	217	100.0	5019		

Bottom [24,0m]

° m/s	Direction/speed matrix for bottom [24.0m]																									
	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
0.0																										
0.05	109	108	83	99	75	74	124	93	83	83	106	84	122	121	84	111	95	87	93	85	75	100	79	82	50.7	2255
0.10	89	78	86	86	66	68	68	61	70	69	77	70	103	96	80	105	93	81	87	67	67	62	78	71	42.2	1878
0.15	20	12	8	12	14	14	10	8	10	9	9	10	17	14	18	21	17	17	6	7	6	8	7	11	6.4	285
0.20	1	0	1	3	1	1	0	1	0	1	1	1	0	2	3	1	2	0	1	0	2	1	0	2	0.6	25
0.25	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0.1	5
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	1	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	1
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
%	4.9	4.5	4.0	4.5	3.5	3.5	4.6	3.7	3.7	3.6	4.3	3.7	5.5	5.2	4.2	5.3	4.7	4.2	4.2	3.6	3.4	3.9	3.7	3.8	100.0	100.0
Sum	220	198	178	200	156	157	203	163	153	162	193	166	243	233	185	238	207	185	187	159	150	172	164	167	100.0	4449

Flow

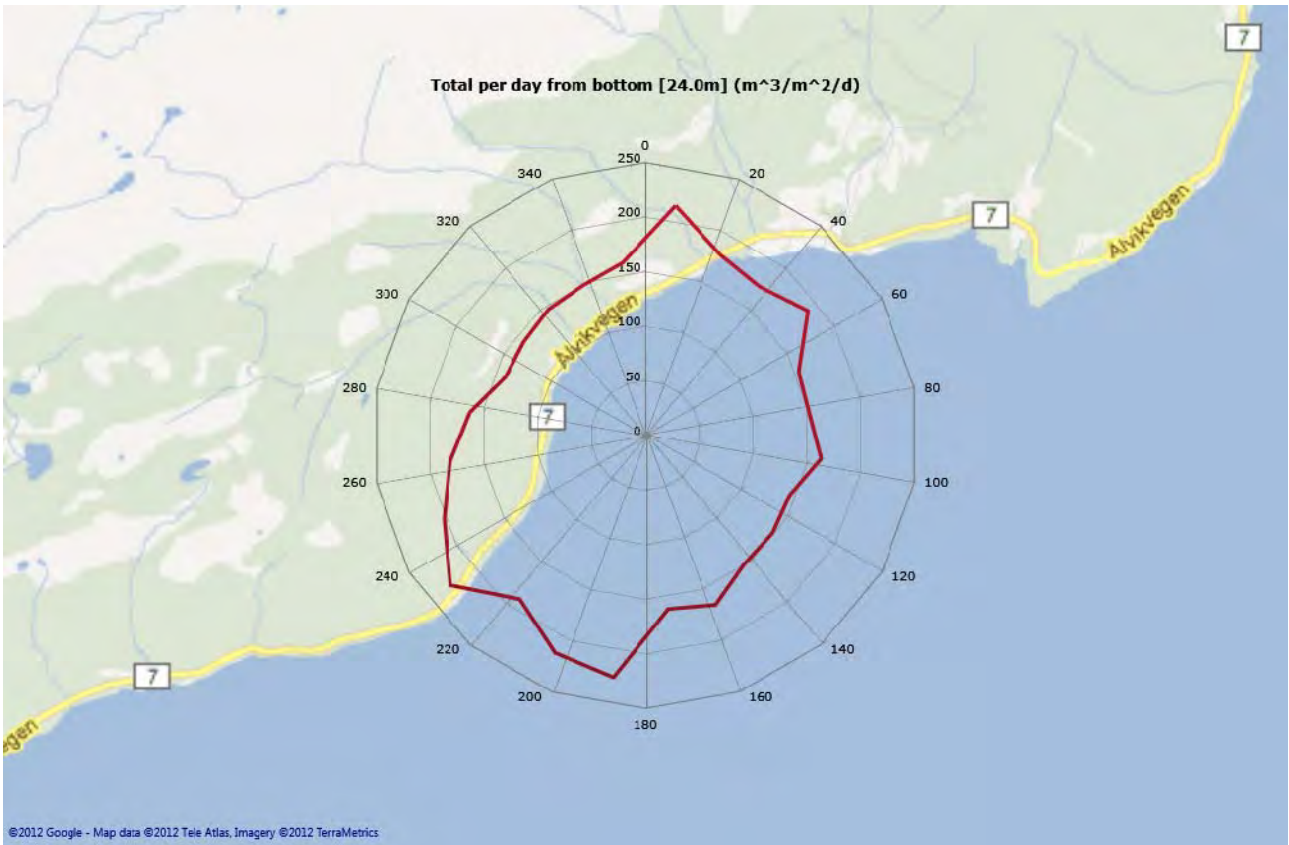
Top [20,0m]



Middle [22,0m]

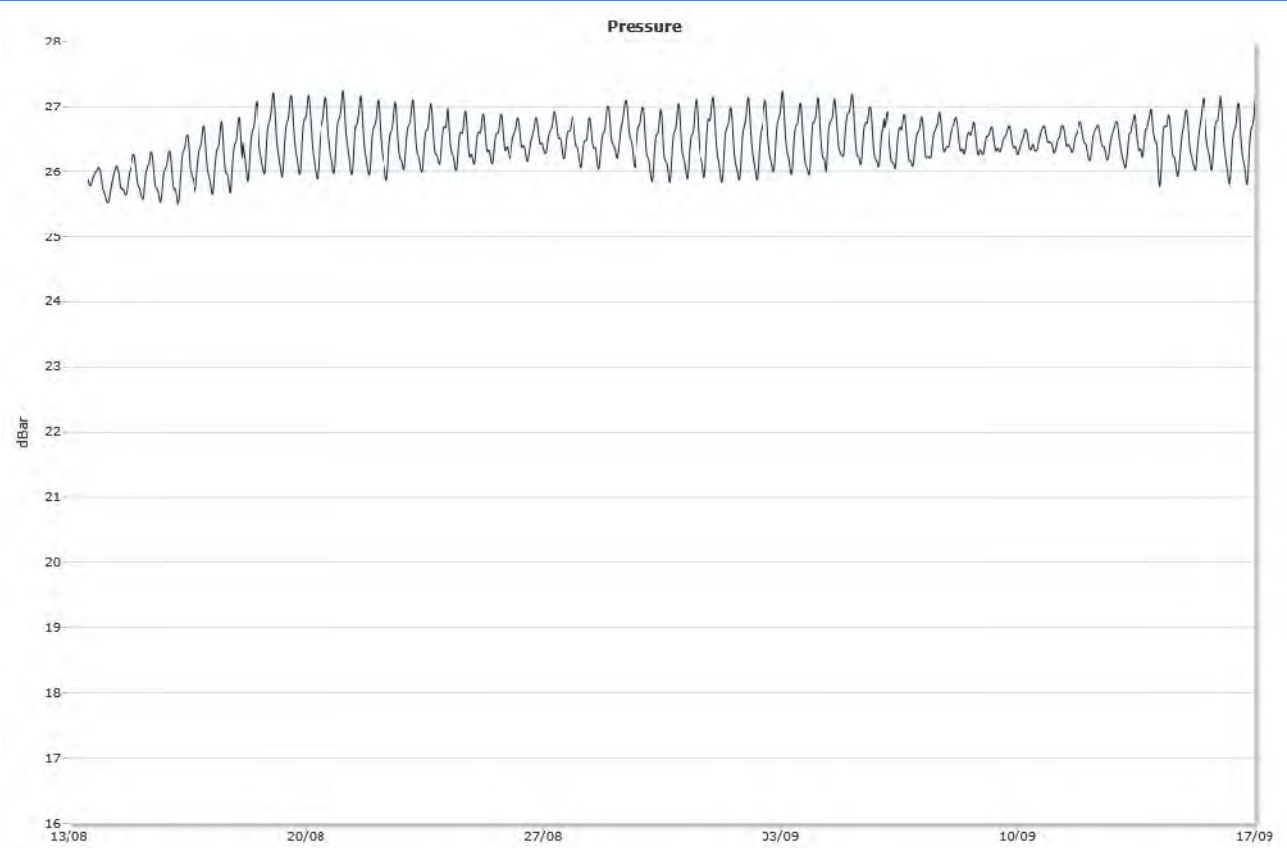


Bottom [24,0m]

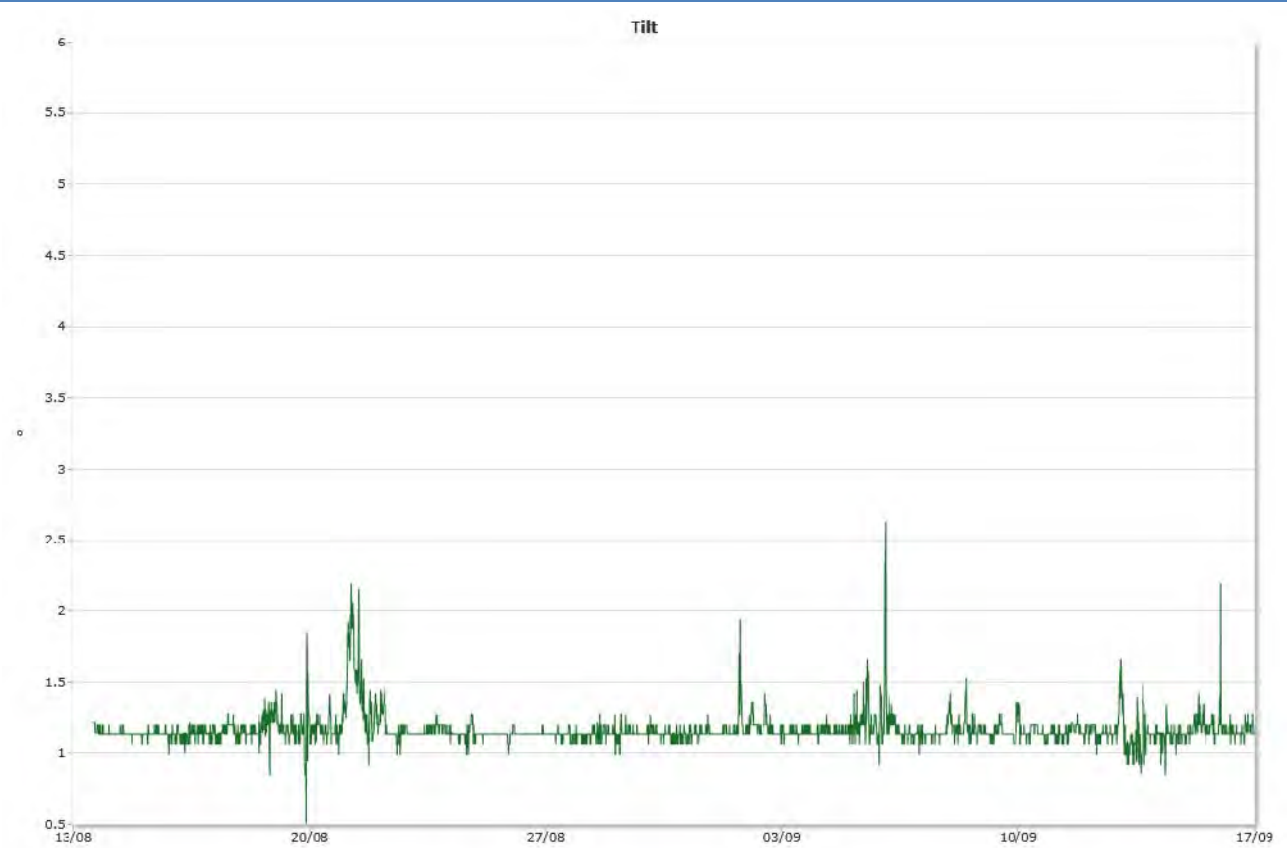


Sensors

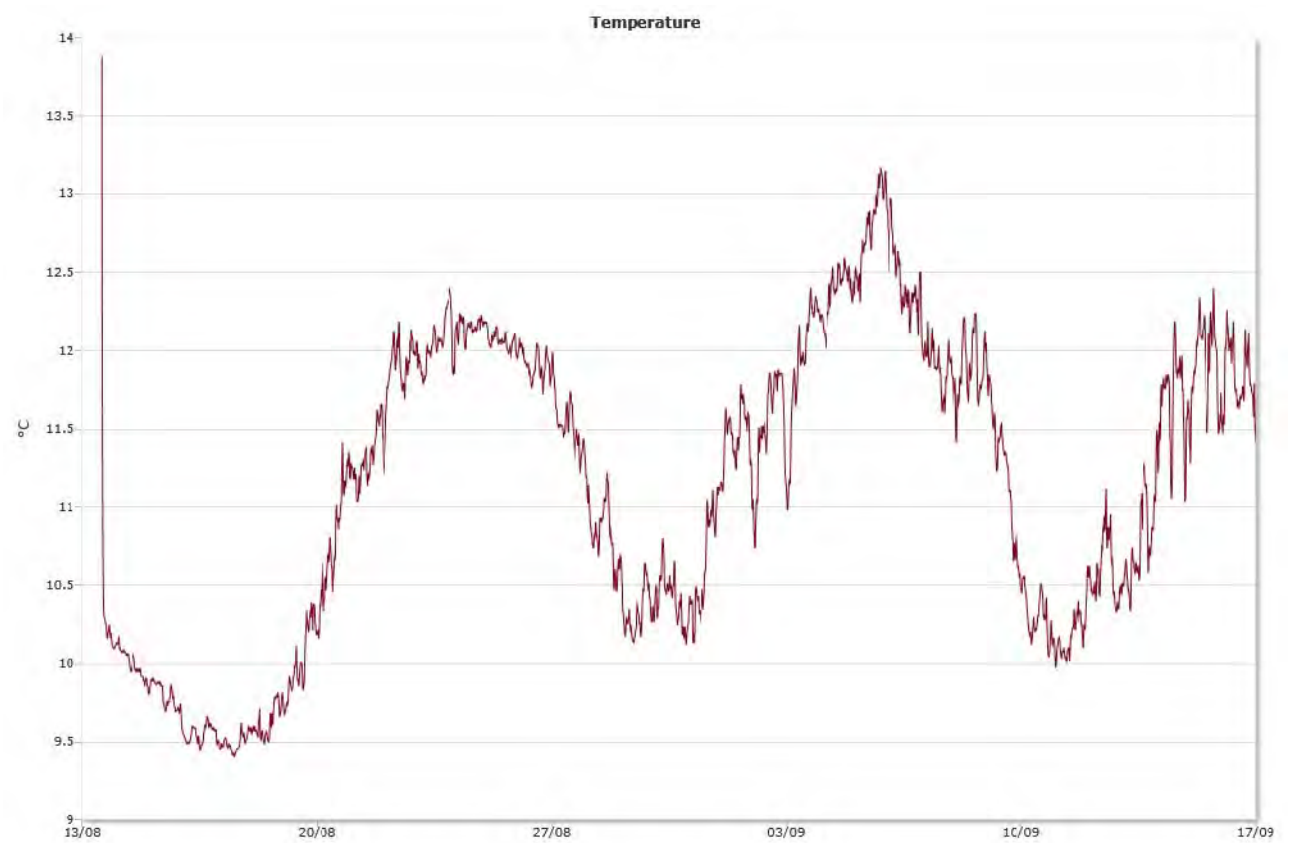
Pressure



Tilt



Temperature





Resipientanalyse AS

Foretaksnr.: NO 998 058 376 MVA
Adresse: Dortledhaugen 156
5239 Rådal

Kontaktperson: Frode Berge-Haveland
Telefon: 40231779

Epost: resipientanalyse@online.no

Internett: <http://www.resipientanalyse.no>

Dato: 17/09-2012

Lokaliteten: Djupevik, Kvam herad. Sprednings- og bunnstrøm.

Som avtalt oversender vi resultatene fra våre strømmålinger utført i området ved Djupevik i Kvam herad kommune. Vår vurdering av lokaliteten er i hovedsak basert på de viste måledata. Vi anbefaler sterkt at dere studerer de vedlagte data nøye selv. Rådataene finnes oppbevart i vårt arkiv.

Firmanavn / Lokalitet. Type oppdrett:

Firma	: Lingalaks AS	Adresse :	
Lokalitet	: Djupevik		
Kommune	: Kvam herad	Fylke	: Hordaland
UTM-koordinater	: N60 24 449 / E6 21 540		
Oppdrettstype	: Generelle strømforhold - matfiskanlegg		
Hva er vurdert	: Spredningsstrøm og bunnstrøm.		

Måleperioder / frekvenser.

Se vedlegg.

Oppsummering fra målingene.

Se ”Spesifikasjons og resultatoversikt”.

Vår vurdering:

Med hilsen:

Kvalitetssikret av:

Frode Berge-Haveland
Cand. Scient. Marin mikrobiolog
Daglegleiar i Resipientanalyse AS

Vedlegg og kopi:
Totalvurdering, resultatoversikt
Statistisk behandling av rådata.

SPESIFIKASJONS- OG RESULTATOVERSIKT.

Firma:

Lokalitet: Djupevik, Kvam herad kommune.

Generelle spesifikasjoner, periode, frekvens og resultater.

Tekst	Overflatestrøm	Spredningsstrøm	Bunnstrøm
Tidsrom for registreringer		13.08.2012-17.09.2012	13.08.2012-17.09.2012
Dybde på målestedet. Ca.	180	180	180
Dybde for registreringer (meter). Ca.		60	170
Måler type - nummer		SD6000 - nr1268	SD6000 - nr1320
Type måling	Kontinuerlig	Kontinuerlig	Kontinuerlig
Frekvens – varighet*4		2 min/10 min - 35 døgn	2 min/10 min - 35 døgn
Adresse for arkiv (data)	/N60 24 449 / E6 21 540o	/N60 24 449 / E6 21 540s	/N60 24 449 / E6 21 540b
% strøm mindre enn 1 cm/sek.(ca)		84.7 %	99.1 %
Gjennomsnittsstrøm		1.3	1.0
Rest strøm		0.4	0.4
Neumanns parameter		0.284	0.394
De 4 hyppigst forekommende retningene strømmen beveger seg mot (grader) *1		30, 15, 45, 60	15, 30, 0, 345
De 4 hyppigst forekommende strømhastighetene (cm /sek) *1		0-1, 1-3, 3-4, 4-5	0-1, 1-3, 3-4, 75-100
Mest vannutskiftning / retning / 15 graders sektor.*2		3835m ³ ved 30-45 grader. 110m ³ /m ² /døgn	4879m ³ ved 15-30 grader. 139m ³ /m ² /døgn
Minst vannutskiftning / retning / 15 graders sektor.*2		784m ³ ved 300-315 grader. 22m ³ /m ² /døgn	174m ³ ved 135-150 grader. 5m ³ /m ² /døgn
Gjennomsnittlig total vannutskiftning pr.døgn. Alle retninger		1103m ³ /døgn	864m ³ /døgn
Maksimum strøm – signifikant maksimum strøm (cm/sek) *3		7.8 - 1.9	3.4 - 1.0

*1: gruppert i synkende rekkefølge *2: vann som passerer gjennom hver loddrett plassert kvadratmeter.*3: gjennomsnittet av 1/3 målingene som viser høyest verdi. *4:måleren måler hvert x minutt, hvert y minutt gir måleren et gjennomsnitt av verdiene for 5 målinger."

Spredningsstrøm

TEMPERATURE

File name: Djupevik spreingsstraum.SD6

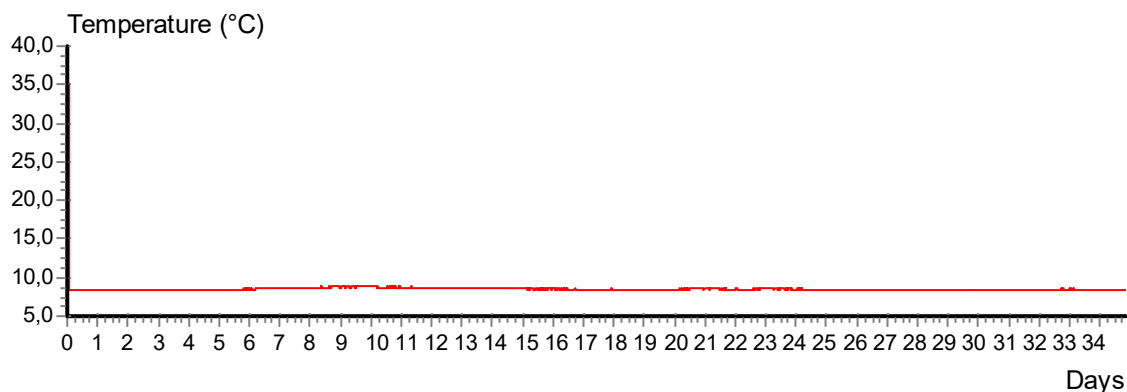
Ref. number: 1268

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12



CURRENT SPEED

File name: Djupevik spreingsstraum.SD6

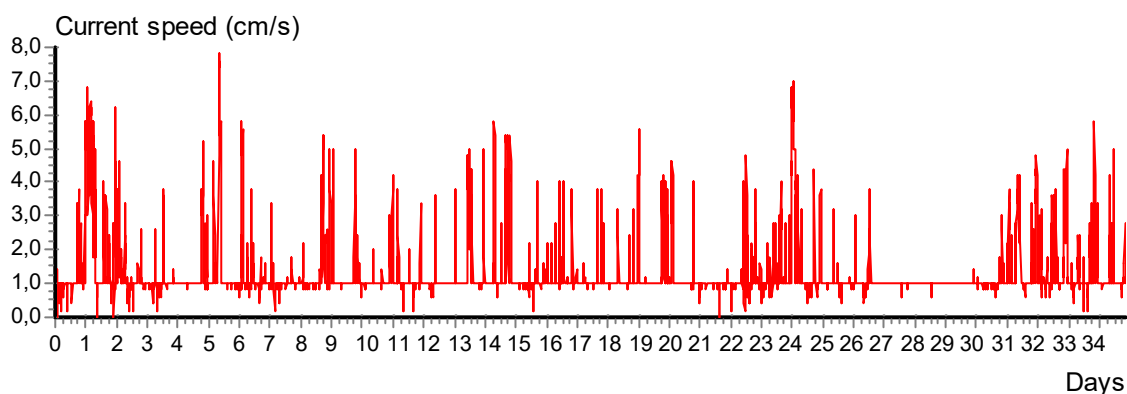
Ref. number: 1268

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12



CURRENT SPEED BAR CHART

File name: Djupevik spreingsstraum.SD6

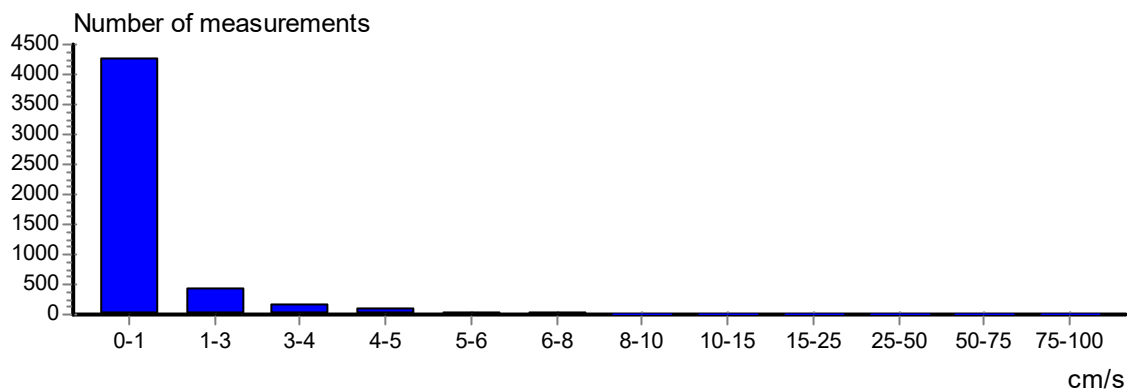
Ref. number: 1268

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12



CURRENT DIRECTION BAR CHART

File name: Djupevik spreingsstraum.SD6

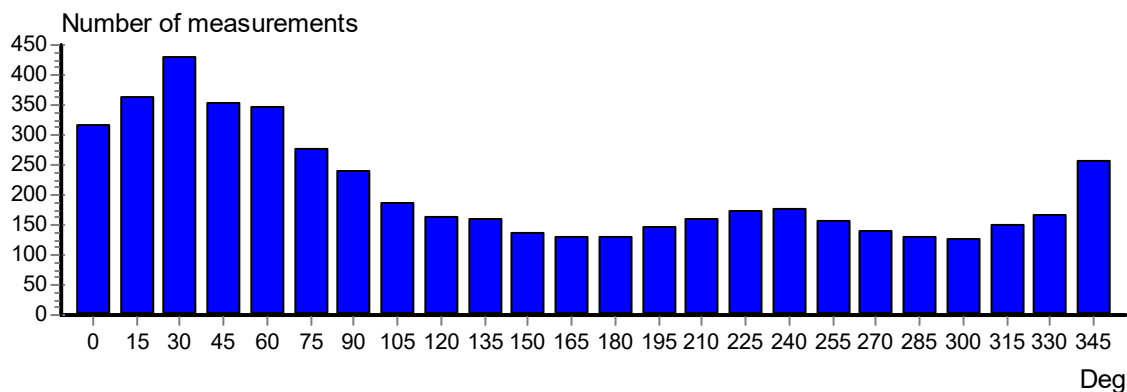
Ref. number: 1268

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12



PROGRESSIVE VECTOR

File name: Djupevik spreingsstraum.SD6

Ref. number: 1268

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

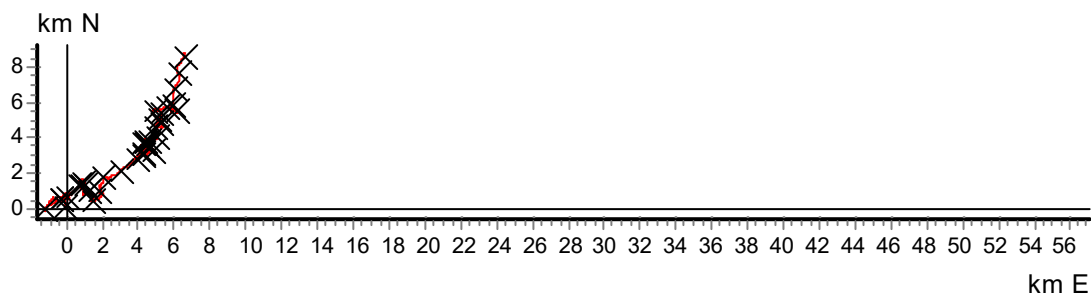
Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12

Neumann parameter: 0.284

Rest speed: 0.4 cm/s

Average speed: 1.3 cm/s

Rest direction: 37 deg.



CURRENT VELOCITY DISTRIBUTION DIAGRAM

File name: Djupevik spreingsstraum.SD6

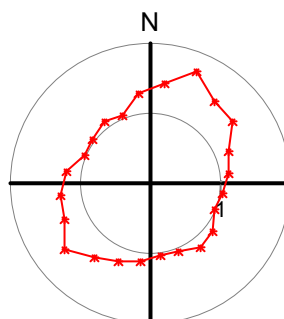
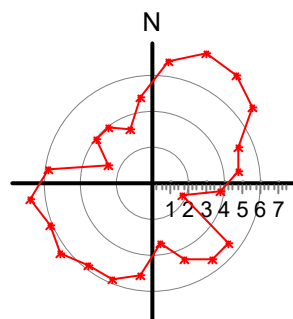
Ref. number: 1268

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12



CURRENT VELOCITY DISTRIBUTION DIAGRAM

File name: Djupevik spreingsstraum.SD6

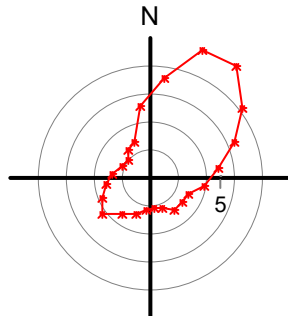
Series number: 1

Number of measurements in data set: 5020

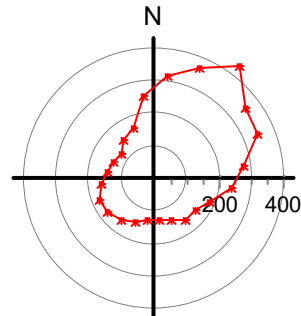
Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12

Ref. number: 1268

Interval time: 10 Minutes



Relative water flux (%)
per 15 deg sector



Number of measurements
per 15 deg sector

STICK DIAGRAM

File name: Djupevik spreingsstraum.SD6

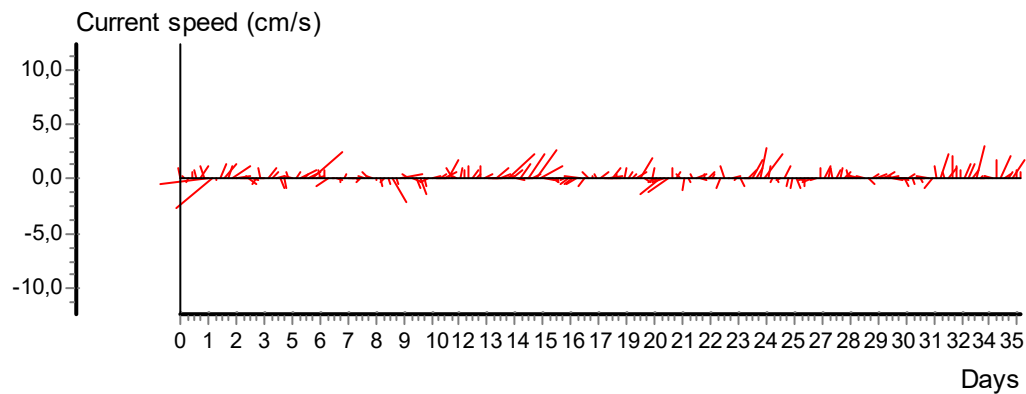
Series number: 1

Number of measurements in data set: 5020

Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12

Ref. number: 1268

Interval time: 10 Minutes



CURRENT SPEED / DIRECTION MATRIX

File name: Djupevik spreingsstraum.SD6

Ref. number: 1268

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:22 - 13.Aug-12 To: 08:52 - 17.Sep-12

	Current speed groups													Total flow		Max
	1	3	4	5	6	8	10	15	25	50	75	100	Sum%	m ³ /m ²	%	
0	245	44	14	10	1	3	0	0	0	0	0	0	6.3	2748	7.1	6.8
15	248	50	29	18	15	3	0	0	0	0	0	0	7.2	3768	9.8	7.8
30	334	44	29	14	5	3	0	0	0	0	0	0	8.5	3835	9.9	7.6
45	282	34	16	16	4	3	0	0	0	0	0	0	7.1	3164	8.2	7.0
60	295	37	9	4	1	0	0	0	0	0	0	0	6.9	2518	6.5	5.2
75	252	17	5	3	0	0	0	0	0	0	0	0	5.5	1890	4.9	4.8
90	224	13	2	0	0	0	0	0	0	0	0	0	4.8	1500	3.9	3.8
105	185	3	0	0	0	0	0	0	0	0	0	0	3.7	1121	2.9	1.8
120	148	11	2	1	1	0	0	0	0	0	0	0	3.2	1104	2.9	5.4
135	140	14	1	3	2	0	0	0	0	0	0	0	3.2	1118	2.9	5.4
150	129	7	1	1	0	0	0	0	0	0	0	0	2.7	876	2.3	4.6
165	122	5	2	0	0	0	0	0	0	0	0	0	2.6	805	2.1	3.4
180	114	12	2	1	1	0	0	0	0	0	0	0	2.6	878	2.3	5.2
195	127	15	2	1	3	0	0	0	0	0	0	0	2.9	1069	2.8	5.8
210	134	12	8	3	3	0	0	0	0	0	0	0	3.2	1273	3.3	5.8
225	134	19	5	12	3	2	0	0	0	0	0	0	3.5	1632	4.2	6.4
240	150	12	8	2	4	1	0	0	0	0	0	0	3.5	1411	3.7	6.2
255	136	12	2	2	4	2	0	0	0	0	0	0	3.1	1235	3.2	6.8
270	122	11	2	4	1	0	0	0	0	0	0	0	2.8	1024	2.7	5.8
285	124	7	0	0	0	0	0	0	0	0	0	0	2.6	802	2.1	2.6
300	119	5	1	0	0	0	0	0	0	0	0	0	2.5	784	2.0	4.0
315	137	8	4	0	0	0	0	0	0	0	0	0	3.0	989	2.6	4.0
330	151	15	1	0	0	0	0	0	0	0	0	0	3.3	1074	2.8	3.2
345	202	36	12	6	0	0	0	0	0	0	0	0	5.1	1987	5.1	4.8
Sum%	84.7	8.8	3.1	2.0	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0		38605		7.8

STATISTICAL SUMMARY

	Total	East / west	North / south
Mean current speed (cm/s)	1,3	0,8	0,8
Variance (cm/s) ²	0,822	0,471	0,647
Standard deviation (cm/s)	0,906	0,686	0,804
Mean standard deviation	0,707	0,861	0,953
Maximum current velocity	7,8		
Minimum current velocity	0,0		
Significant max velocity	1,9		
Significant min velocity	1,0		

Bunnstrøm

TEMPERATURE

File name: Djupevik botnstraum.SD6

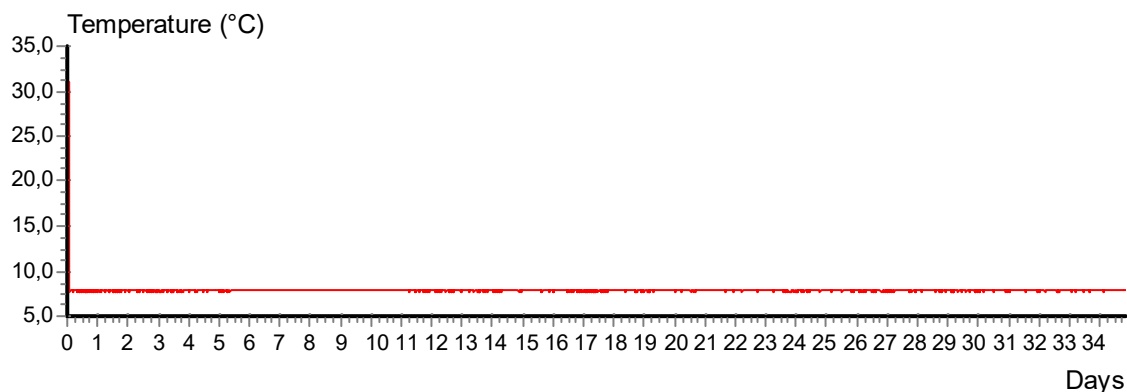
Ref. number: 1320

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12



CURRENT SPEED

File name: Djupevik botnstraum.SD6

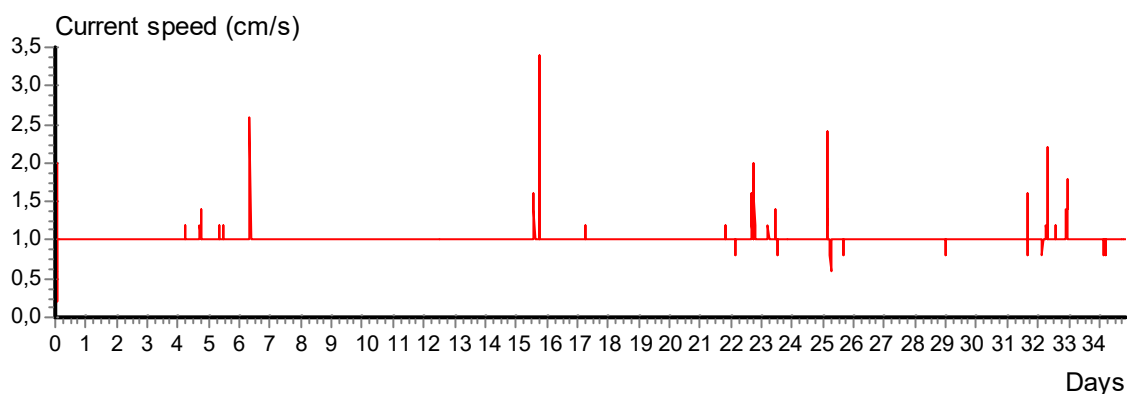
Ref. number: 1320

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12



CURRENT SPEED BAR CHART

File name: Djupevik botnstraum.SD6

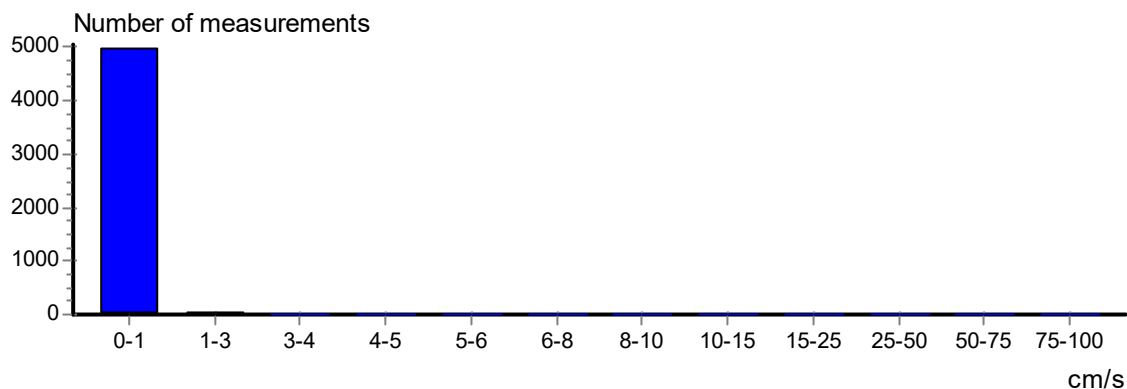
Ref. number: 1320

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12



CURRENT DIRECTION BAR CHART

File name: Djupevik botnstraum.SD6

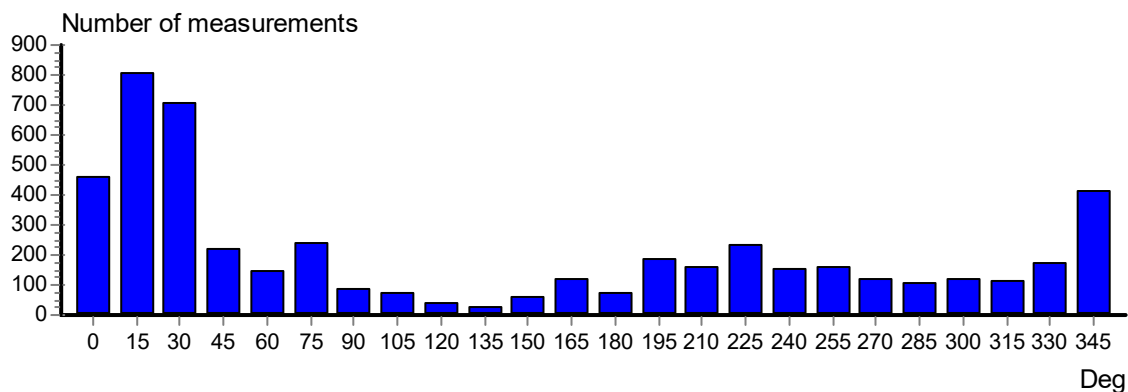
Ref. number: 1320

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12



PROGRESSIVE VECTOR

File name: Djupevik botnstraum.SD6

Ref. number: 1320

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

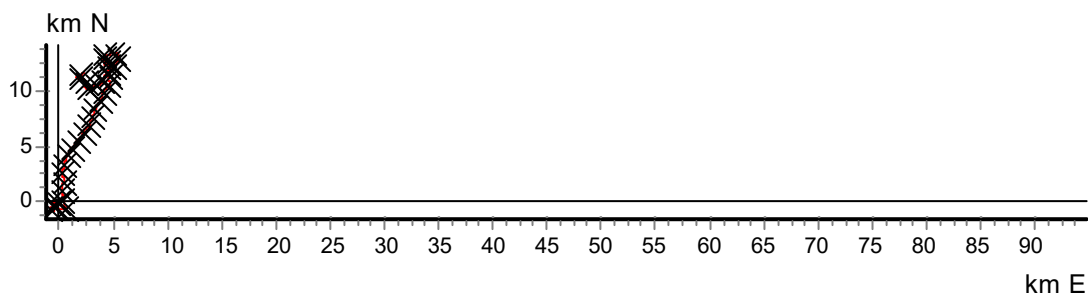
Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12

Neumann parameter: 0.394

Rest speed: 0.4 cm/s

Average speed: 1.0 cm/s

Rest direction: 11 deg.



CURRENT VELOCITY DISTRIBUTION DIAGRAM

File name: Djupevik botnstraum.SD6

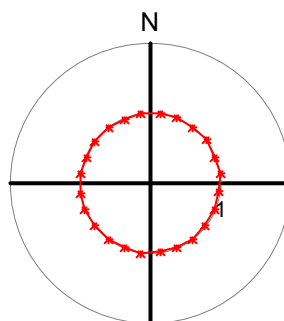
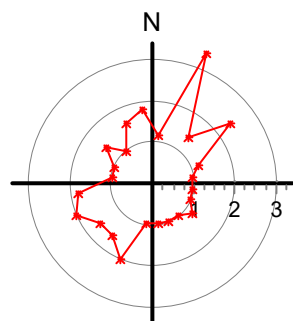
Ref. number: 1320

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12



CURRENT VELOCITY DISTRIBUTION DIAGRAM

File name: Djupevik botnstraum.SD6

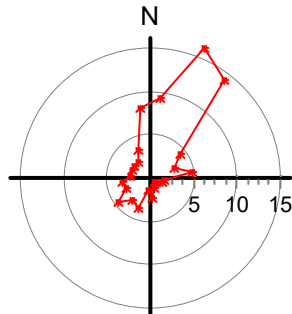
Series number: 1

Number of measurements in data set: 5020

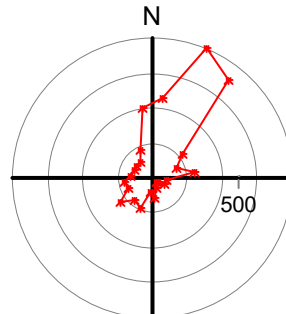
Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12

Ref. number: 1320

Interval time: 10 Minutes



Relative water flux (%)
per 15 deg sector



Number of measurements
per 15 deg sector

STICK DIAGRAM

File name: Djupevik botnstraum.SD6

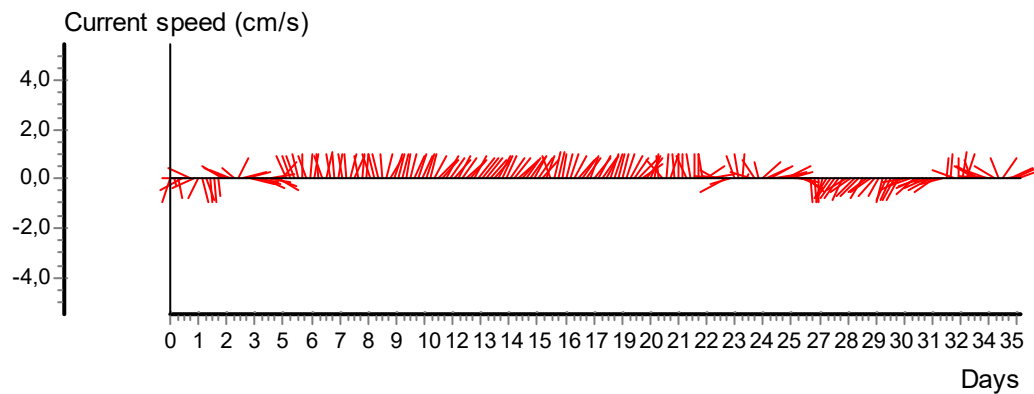
Series number: 1

Number of measurements in data set: 5020

Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12

Ref. number: 1320

Interval time: 10 Minutes



CURRENT SPEED / DIRECTION MATRIX

File name: Djupevik botnstraum.SD6

Ref. number: 1320

Series number: 1

Interval time: 10 Minutes

Number of measurements in data set: 5020

Data displayed from: 12:21 - 13.Aug-12 To: 08:51 - 17.Sep-12

	Current speed groups													Total flow		Max
	1	3	4	5	6	8	10	15	25	50	75	100	Sum%	m ³ /m ²	%	
0	462	1	0	0	0	0	0	0	0	0	0	0	9.2	2778	9.2	1.2
15	795	9	1	0	0	0	0	0	0	0	0	0	16.0	4879	16.1	3.4
30	706	4	0	0	0	0	0	0	0	0	0	0	14.1	4265	14.1	1.4
45	217	5	0	0	0	0	0	0	0	0	0	0	4.4	1351	4.5	2.4
60	148	1	0	0	0	0	0	0	0	0	0	0	3.0	895	3.0	1.2
75	241	0	0	0	0	0	0	0	0	0	0	0	4.8	1446	4.8	1.0
90	86	0	0	0	0	0	0	0	0	0	0	0	1.7	510	1.7	1.0
105	76	0	0	0	0	0	0	0	0	0	0	0	1.5	452	1.5	1.0
120	39	1	0	0	0	0	0	0	0	0	0	0	0.8	236	0.8	1.2
135	29	0	0	0	0	0	0	0	0	0	0	0	0.6	174	0.6	1.0
150	61	0	0	0	0	0	0	0	0	0	0	0	1.2	365	1.2	1.0
165	117	0	0	0	0	0	0	0	0	0	0	0	2.3	698	2.3	1.0
180	76	0	0	0	0	0	0	0	0	0	0	0	1.5	456	1.5	1.0
195	186	2	0	0	0	0	0	0	0	0	0	0	3.7	1135	3.8	2.0
210	160	2	0	0	0	0	0	0	0	0	0	0	3.2	979	3.2	1.6
225	234	1	0	0	0	0	0	0	0	0	0	0	4.7	1412	4.7	1.6
240	149	3	0	0	0	0	0	0	0	0	0	0	3.0	923	3.1	2.0
255	160	3	0	0	0	0	0	0	0	0	0	0	3.2	990	3.3	1.8
270	122	0	0	0	0	0	0	0	0	0	0	0	2.4	732	2.4	1.0
285	108	0	0	0	0	0	0	0	0	0	0	0	2.2	647	2.1	1.0
300	119	3	0	0	0	0	0	0	0	0	0	0	2.4	736	2.4	1.4
315	111	0	0	0	0	0	0	0	0	0	0	0	2.2	666	2.2	1.0
330	166	5	0	0	0	0	0	0	0	0	0	0	3.4	1036	3.4	1.6
345	408	3	0	0	0	0	0	0	0	0	0	0	8.2	2476	8.2	1.8
Sum%	99.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		30238		3.4

STATISTICAL SUMMARY

	Total	East / west	North / south
Mean current speed (cm/s)	1,0	0,5	0,7
Variance (cm/s) ²	0,005	0,097	0,084
Standard deviation (cm/s)	0,069	0,311	0,290
Mean standard deviation	0,069	0,576	0,395
Maximum current velocity	3,4		
Minimum current velocity	0,2		
Significant max velocity	1,0		
Significant min velocity	1,0		