Rapport nr. 523-2011

STRAUMMÅLING

NS 9425-1

LOKALITET VIKANE

Masfjorden kommune

Resipientanalyse
Foretaksnr.: NO 984 238 630 mva
Adresse: Dortledhaugen 156
5239 Rådal
Kontaktperson: Frode Berge-Haveland
Telefon: 40231779 / 55135242
Epost: resipientanalyse@online.no
Internett: http://www.resipientanalyse.no

Lokalitet **Vikane**	*Dato, rapport* 28 / 01 – 2011
Kommune Masfjorden kommune	*Dato, felt* 15 / 12 – 2010 28 / 01 – 2011
Oppdragsgjevar Blom Fiskeoppdrett AS	*Rapport nr.* 523 – 2011
Oppdragsart Straummåling	*Rapportsider* 14
Personell feltundersøking Frode Berge-Haveland, Resipientanalyse Arne Marøy, Blom Fiskeoppdrett AS Kjell Harald Blomvågnes,Blom Fiskeoppdrett AS	Gjennomsnittleg og høgste målte vasstraum:
Samandrag 4 stk SD6000 straummålar frå Sensordata AS blei sett ut på 5, 15, 50 og 100 meters djup. Straummålaren blei programmert til å måle straum kvart 10 minutt. Den gjennomsnittlige vassutskifting straumen var svak til middels sterk. Den gjennomsnittlige spreiing og botn straumen var middels sterk. Den sterkaste straumen blei målt ved 5 meters djup og var 22,0 cm/s. Hovudstraumen er dominert av ein sørgåande overflatestraum og nordvestgåande botnstraum. Straumen i overflatelaget er påverka av både tidevatnet og vindgenerert overflate straum. Straumen nedover i vassøyla er dominert av tidevatnet.	Vassutskifting – 5 meters djup: **3,1 cm/s og 22,0 cm/s** Vassutskifting – 15 meters djup: **2,5 cm/s og 16,4 cm/s** Spreiingsstraum – 50 meters djup: **2,4 cm/s og 14,4 cm/s** Botnstraum – 100 meters djup: **2,5 cm/s og 13,2 cm/s**

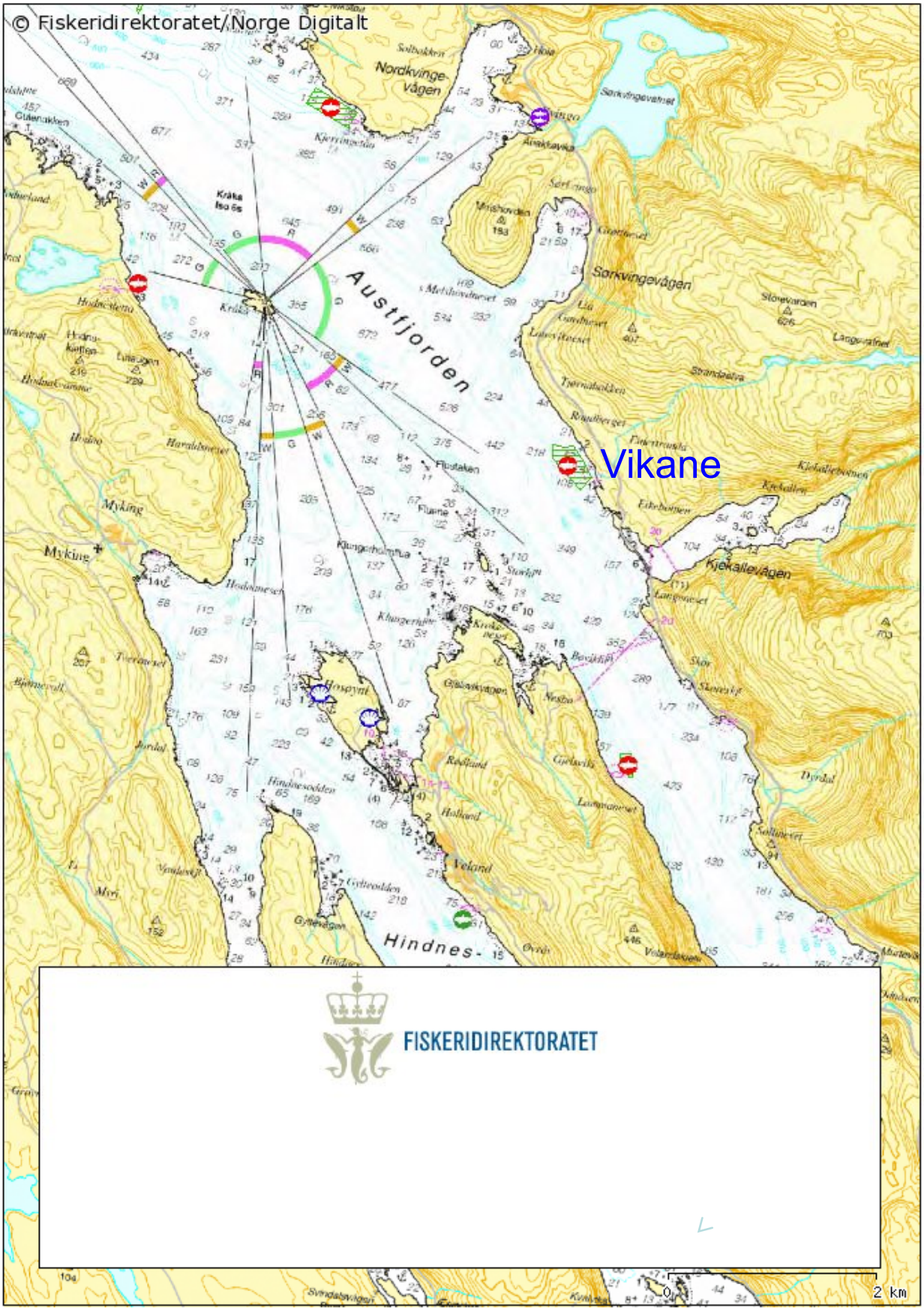
Underskrift forfattar
Frode Haveland
Digitalt signert av Frode Haveland
DN: cn=Frode Haveland, o=Resipientanalyse, ou, email=resipientanalyse@online.no, c=NO
Dato: 2011.02.02 12:00:47 +01'00'
Frode Berge-Haveland
Cand. Scient. Marin mikrobiolog

Ansvarlig underskrift for Resipientanalyse

Frode Berge-Haveland
Cand. Scient. Marin mikrobiolog

INNHALD

15.12.2010



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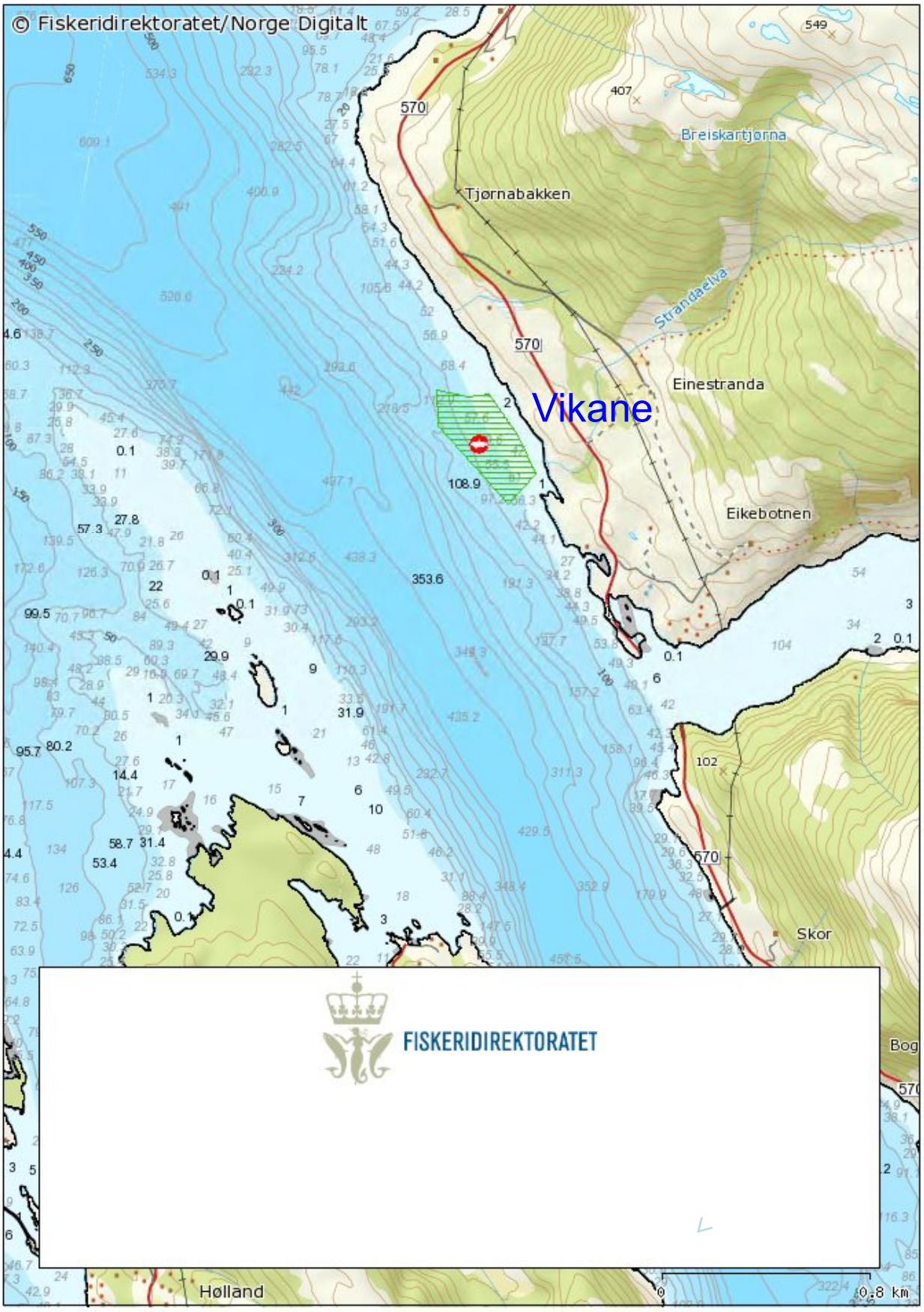
15.12.2010



FISKERIDIREKTORATET

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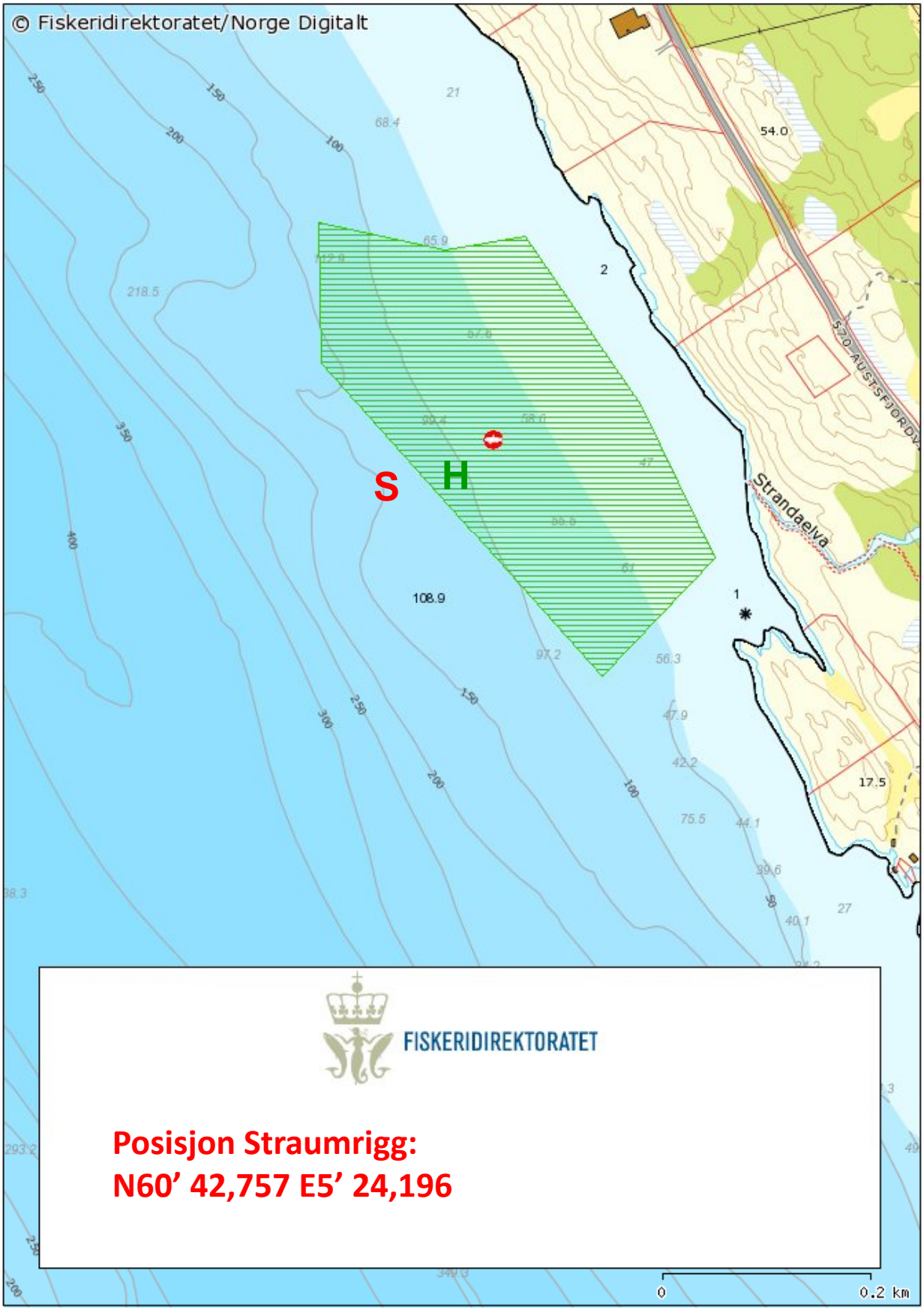
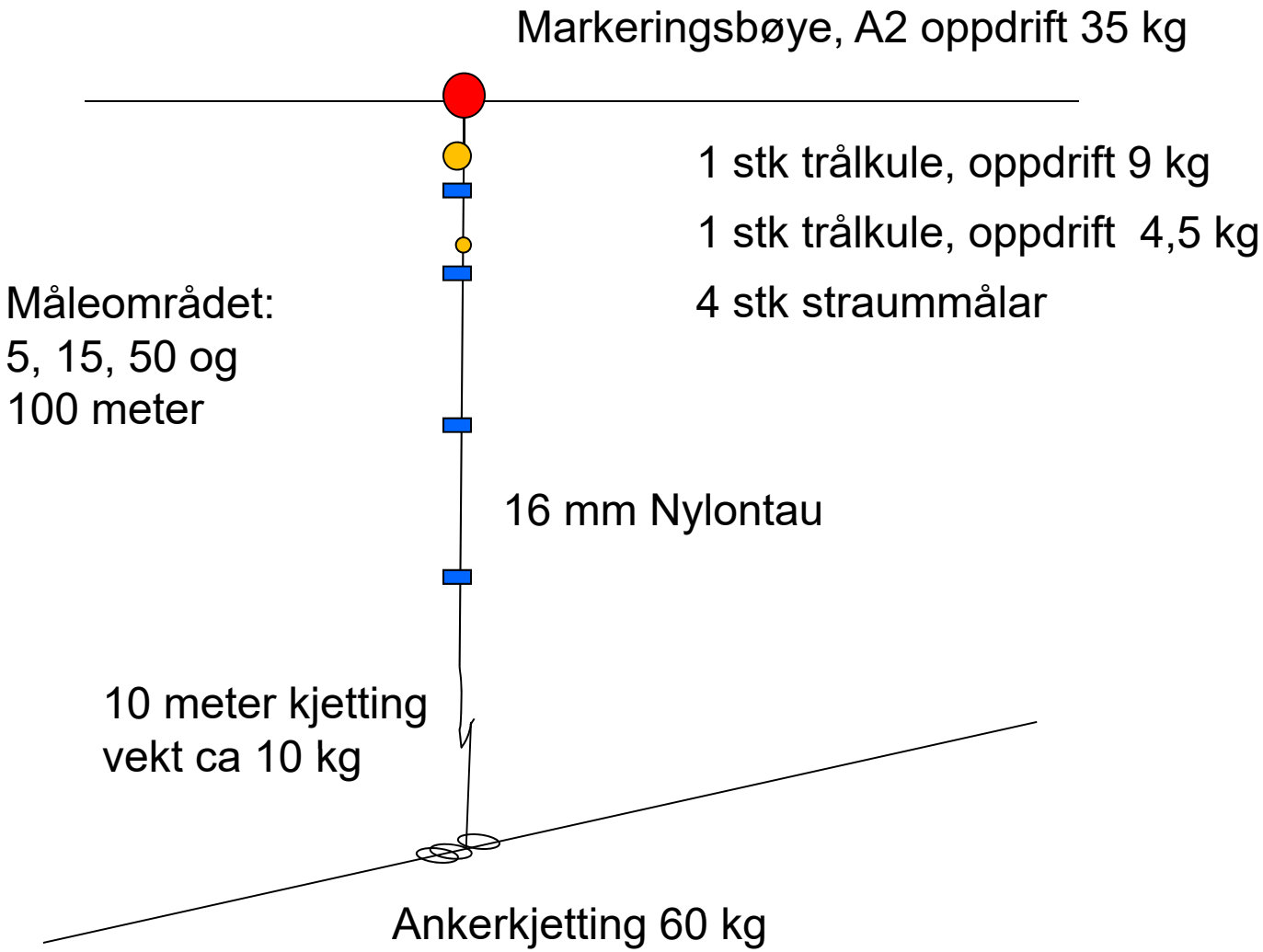


Målestokk: 1:5 000

Skisse for utsetting av SD6000 straummålarar ved ny lokalitet



3.1 Statistisk oppsummering av straummålingsdata

STATISTICAL SUMMARY
File name: Vikane 5 meter.SD6 — Ref. number: 1265
Series number: 1 — Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:25 - 15.Dec-10 To: 04:35 - 26.Jan-11

	Total	East / west	North / south
Mean current speed (cm/s)	3,1	1,5	2,4
Variance (cm/s)²	5,140	1,378	4,856
Standard deviation (cm/s)	2,267	1,174	2,204
Mean standard deviation	0,742	0,759	0,911
Maximum current velocity	22,0		
Minimum current velocity	0,0		
Significant max velocity	5,4		
Significant min velocity	1,2		

5 meter

STATISTICAL SUMMARY
File name: Vikane 15 meter.SD6 — Ref. number: 1245
Series number: 1 — Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

	Total	East / west	North / south
Mean current speed (cm/s)	2,5	1,6	1,7
Variance (cm/s)²	2,837	1,597	1,950
Standard deviation (cm/s)	1,684	1,264	1,397
Mean standard deviation	0,682	0,789	0,832
Maximum current velocity	16,4		
Minimum current velocity	0,2		
Significant max velocity	4,2		
Significant min velocity	1,1		

15 meter

STATISTICAL SUMMARY
File name: Vikane 50 meter.SD6 — Ref. number: 1268
Series number: 1 — Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

	Total	East / west	North / south
Mean current speed (cm/s)	2,4	1,3	1,8
Variance (cm/s)²	3,045	0,888	2,891
Standard deviation (cm/s)	1,745	0,942	1,700
Mean standard deviation	0,723	0,715	0,928
Maximum current velocity	14,4		
Minimum current velocity	0,2		
Significant max velocity	4,2		
Significant min velocity	1,0		

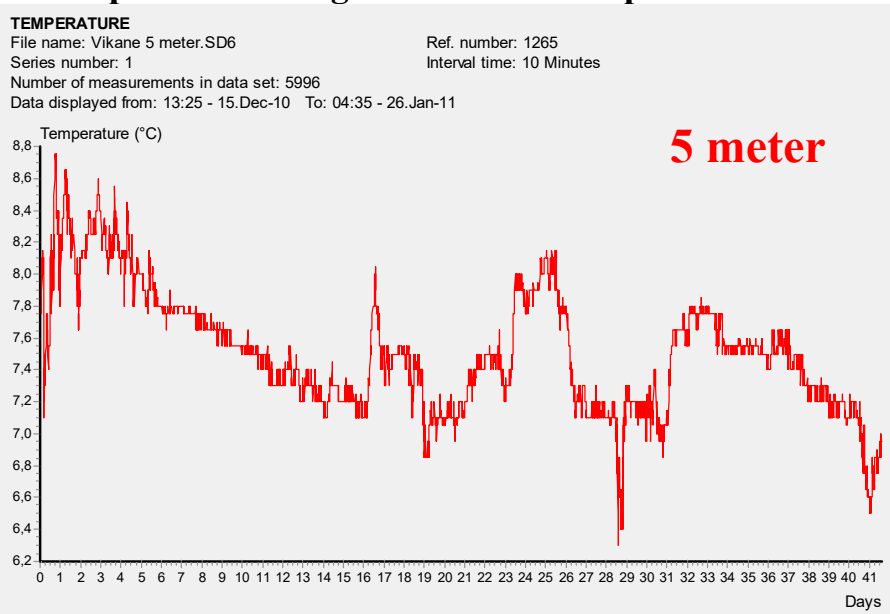
50 meter

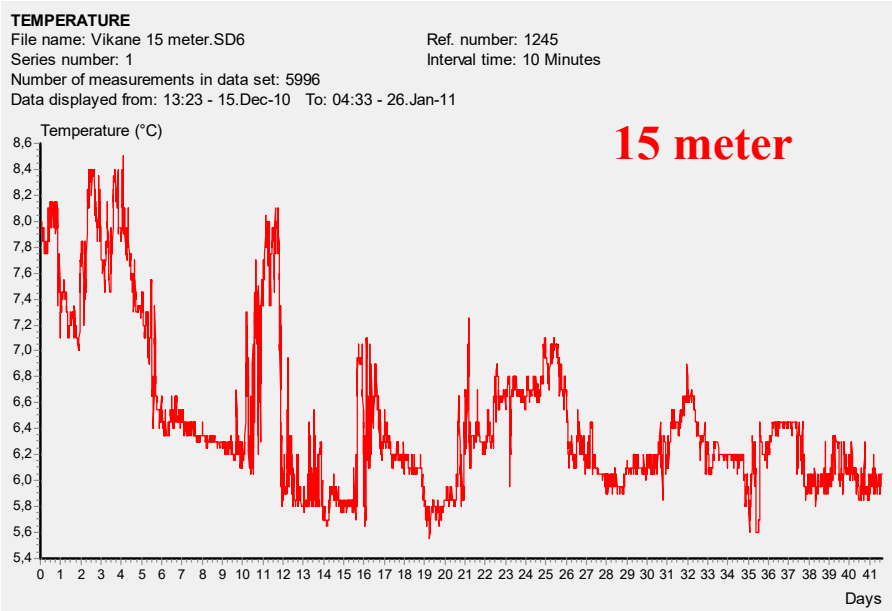
STATISTICAL SUMMARY
File name: Vikane 100 meter.SD6 — Ref. number: 1320
Series number: 1 — Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

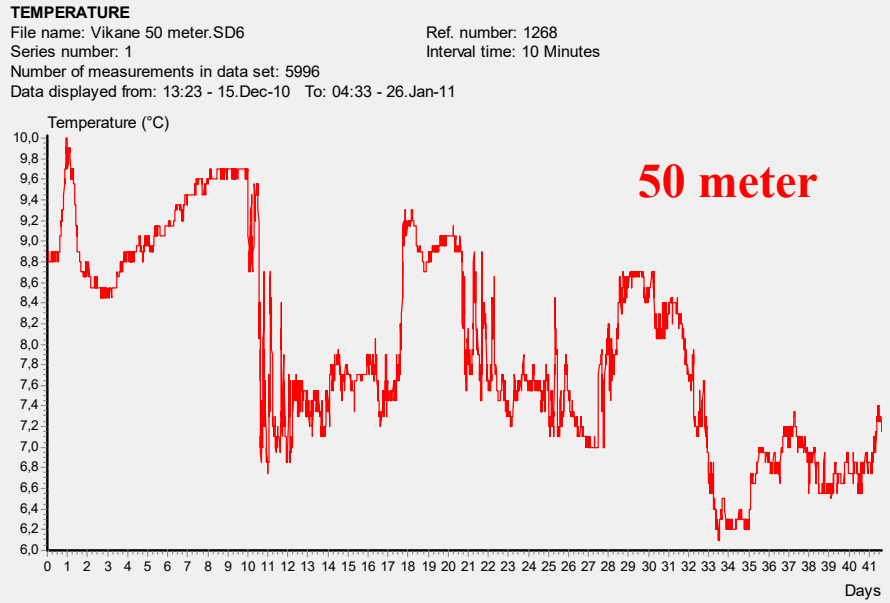
	Total	East / west	North / south
Mean current speed (cm/s)	2,5	1,4	1,8
Variance (cm/s)²	3,278	1,093	2,742
Standard deviation (cm/s)	1,811	1,045	1,656
Mean standard deviation	0,738	0,727	0,899
Maximum current velocity	13,2		
Minimum current velocity	0,0		
Significant max velocity	4,4		
Significant min velocity	1,0		

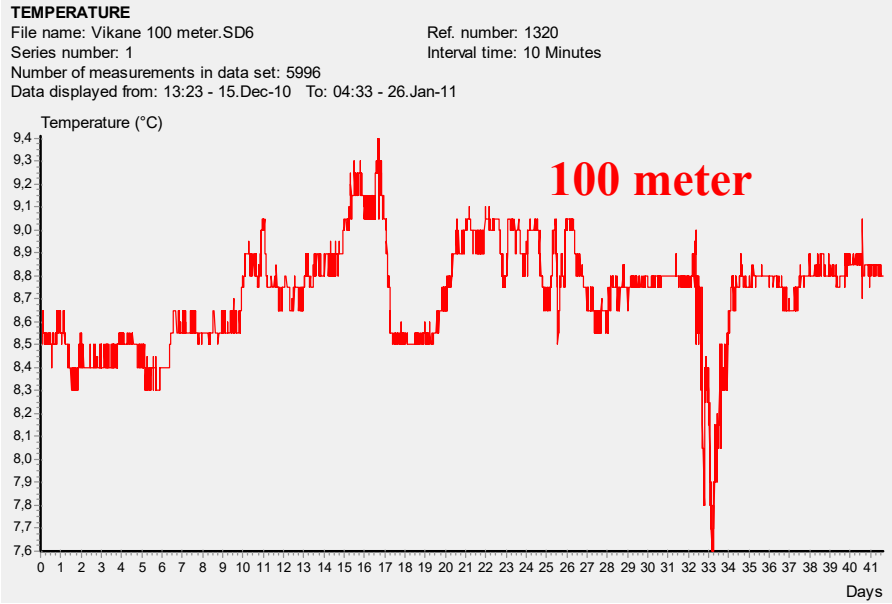
100 meter

3.2 Temperaturdata i graf for heile måleperioden



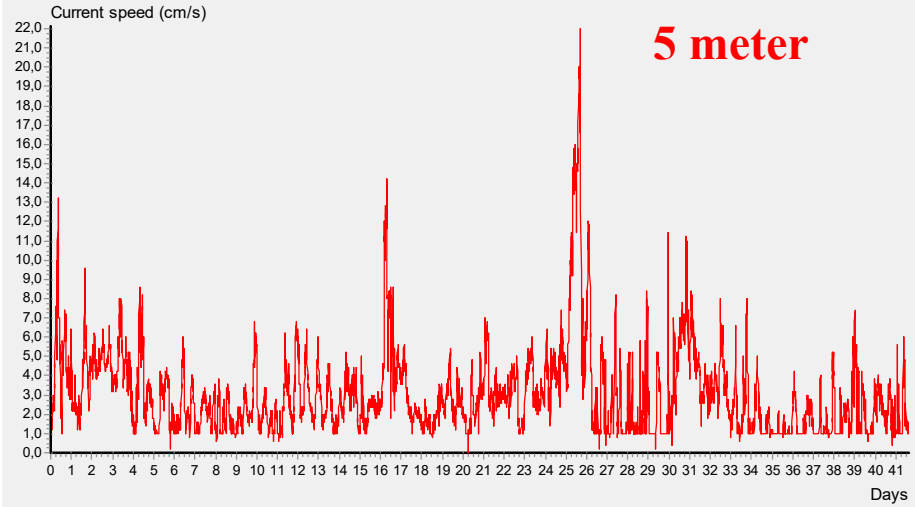




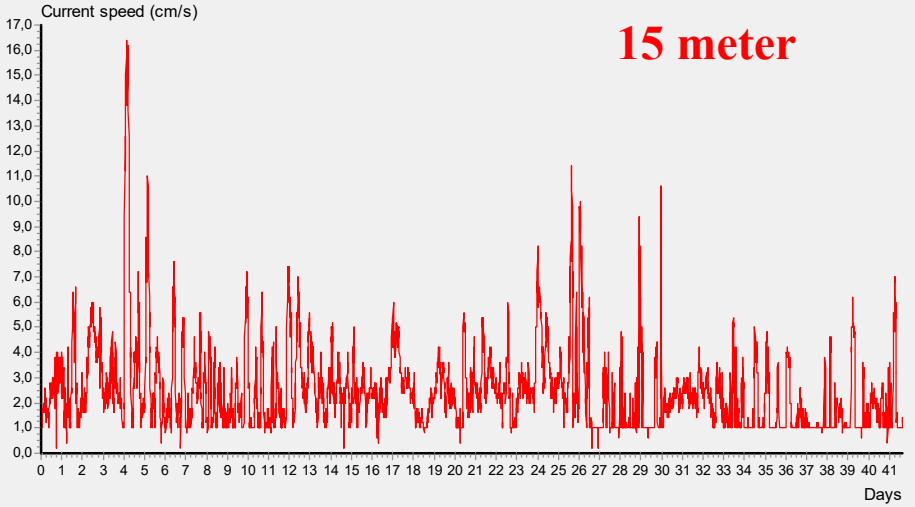


3.3 Straummålingsdata i graf for heile måleperioden

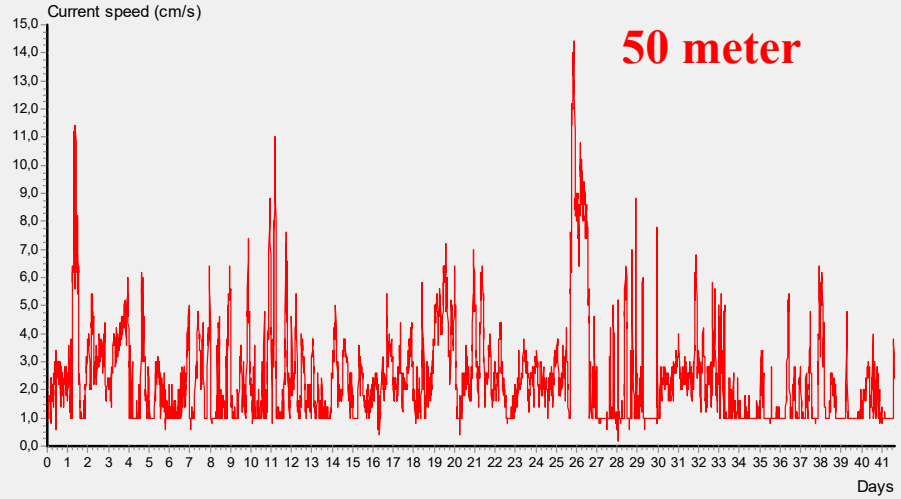
CURRENT SPEED
File name: Vikane 5 meter.SD6 Ref. number: 1265
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:25 - 15.Dec-10 To: 04:35 - 26.Jan-11



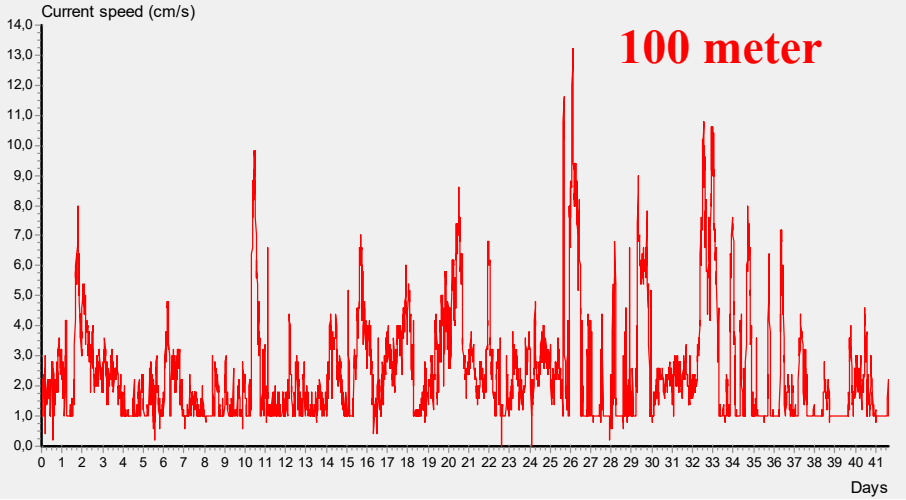
CURRENT SPEED
File name: Vikane 15 meter.SD6 Ref. number: 1245
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11



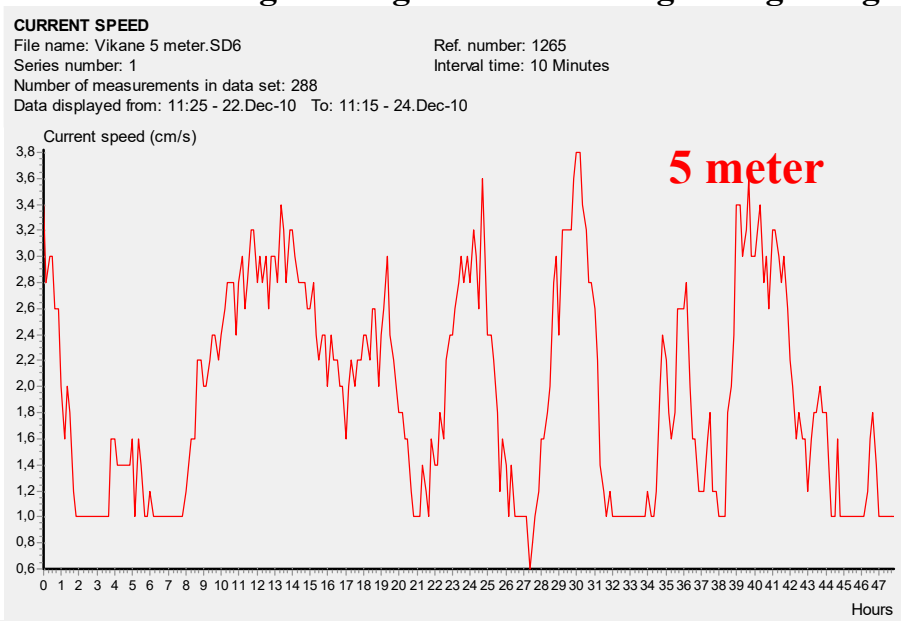
CURRENT SPEED
File name: Vikane 50 meter.SD6 Ref. number: 1268
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

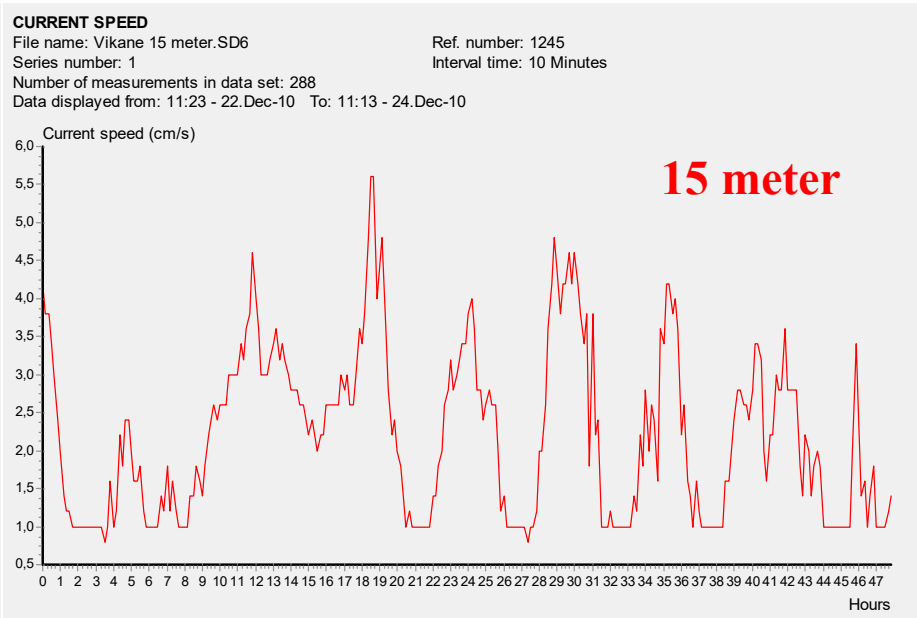


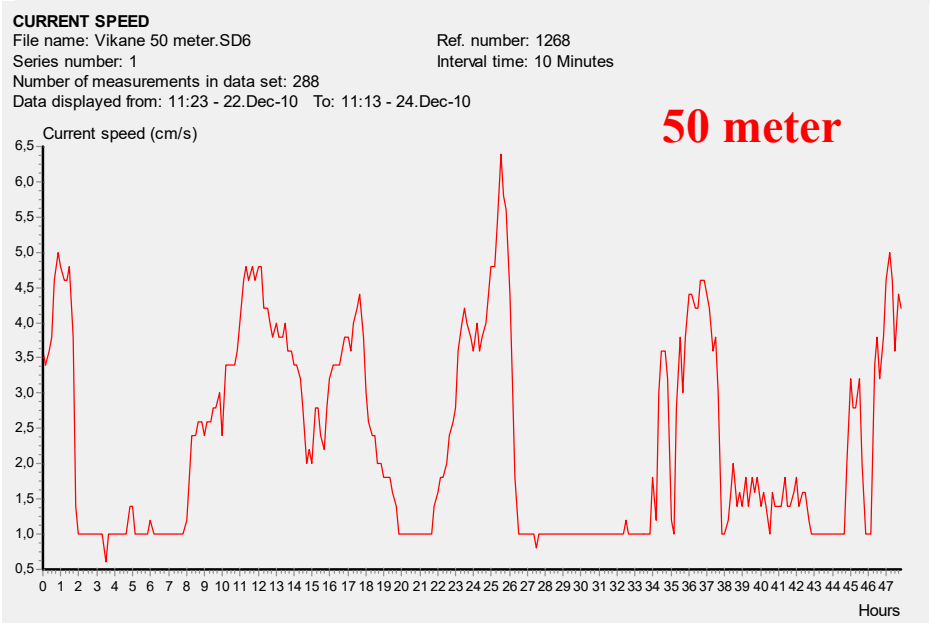
CURRENT SPEED
File name: Vikane 100 meter.SD6 Ref. number: 1320
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

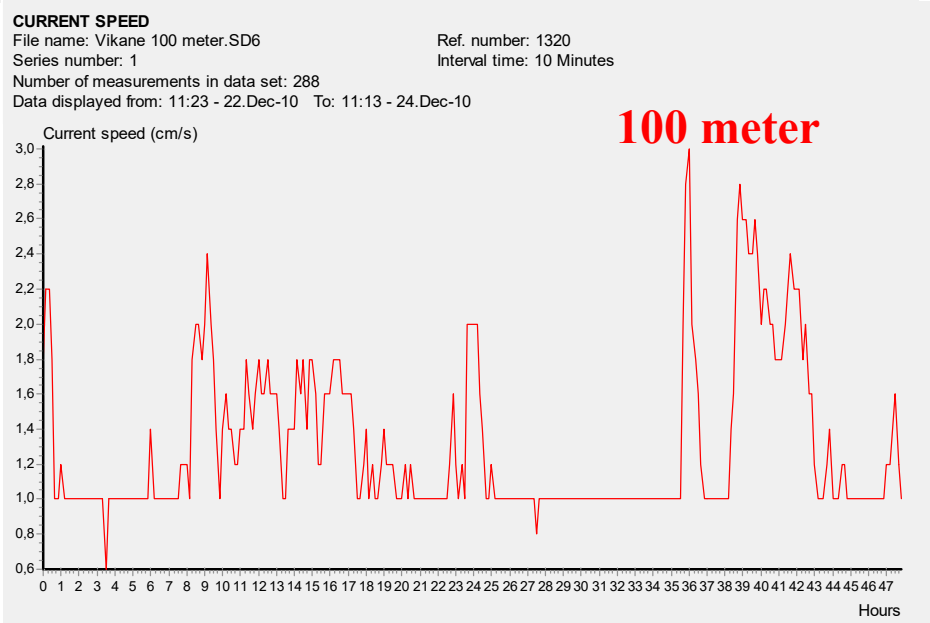


3.4 Straummålingsdata i graf for 2 tilfeldig utvalgte døgn





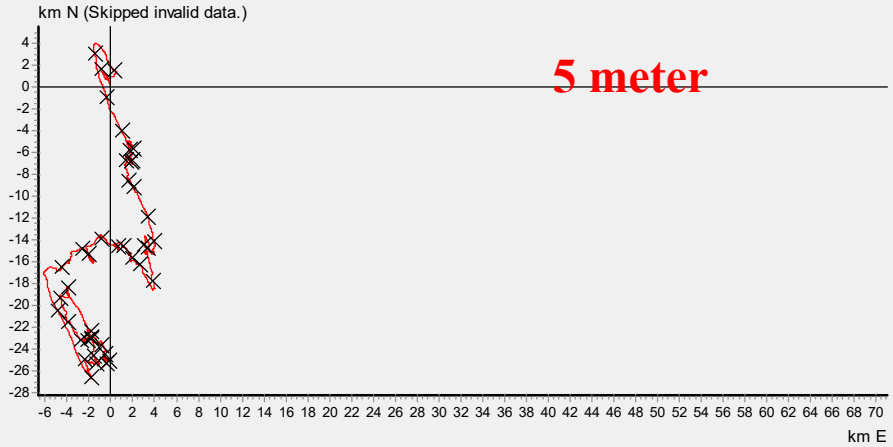




3.5 Progressiv vektor

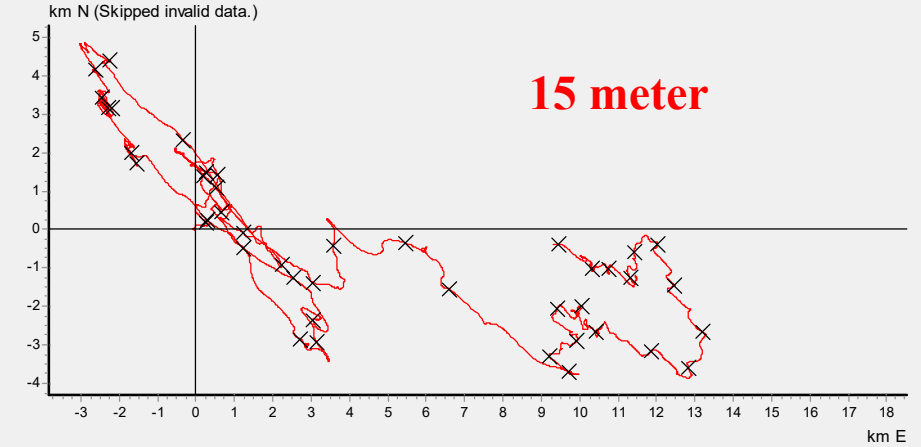
PROGRESSIVE VECTOR
File name: Vikane 5 meter.SD6 Ref. number: 1265
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:25 - 15.Dec-10 To: 04:35 - 26.Jan-11

Neumann parameter: 0.232 Rest speed: 0.7 cm/s
Average speed: 3.1 cm/s Rest direction: 181 deg.



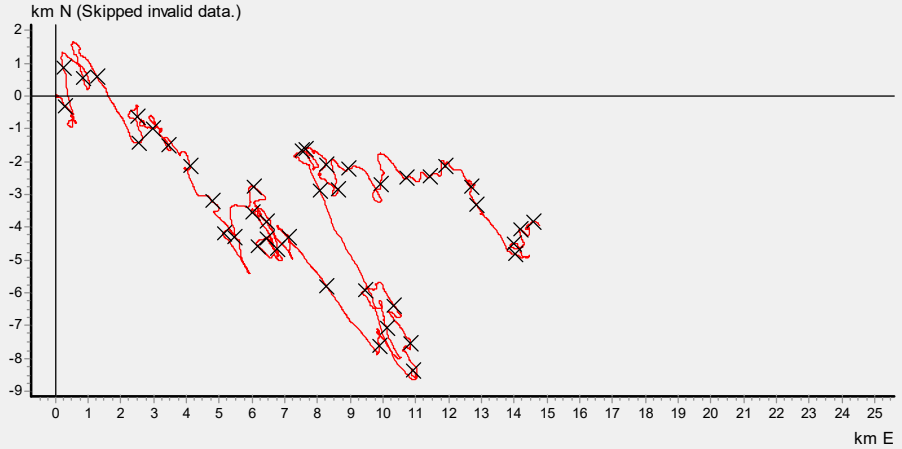
PROGRESSIVE VECTOR
File name: Vikane 15 meter.SD6 Ref. number: 1245
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

Neumann parameter: 0.105 Rest speed: 0.3 cm/s
Average speed: 2.5 cm/s Rest direction: 92 deg.



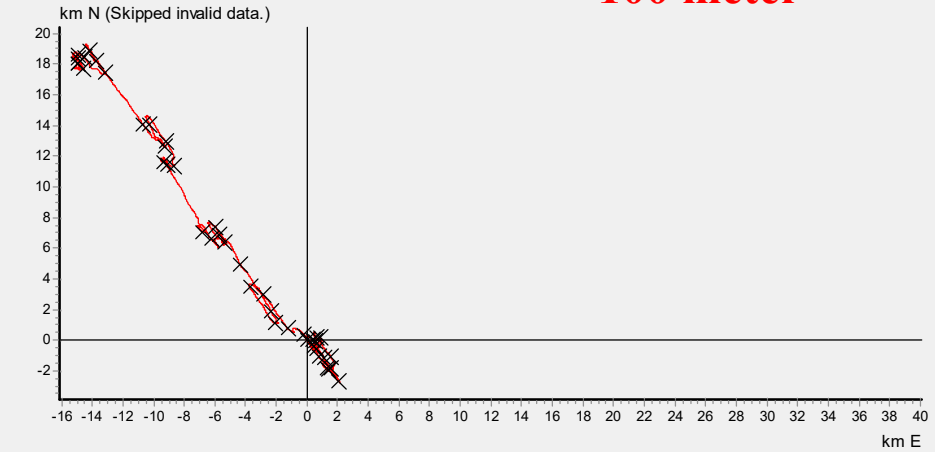
PROGRESSIVE VECTOR
File name: Vikane 50 meter.SD6 Ref. number: 1268
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

Neumann parameter: 0.176 Rest speed: 0.4 cm/s
Average speed: 2.4 cm/s Rest direction: 105 deg.



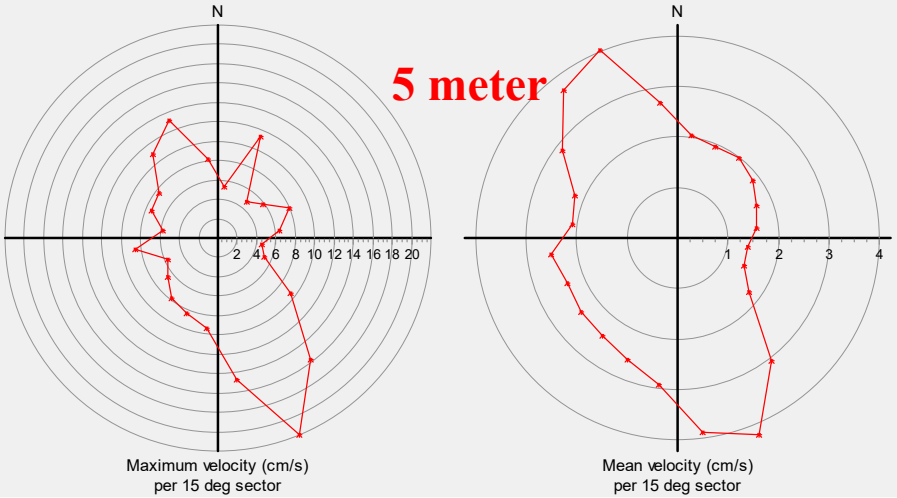
PROGRESSIVE VECTOR
File name: Vikane 100 meter.SD6 Ref. number: 1320
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

Neumann parameter: 0.269 Rest speed: 0.7 cm/s
Average speed: 2.5 cm/s Rest direction: 321 deg.

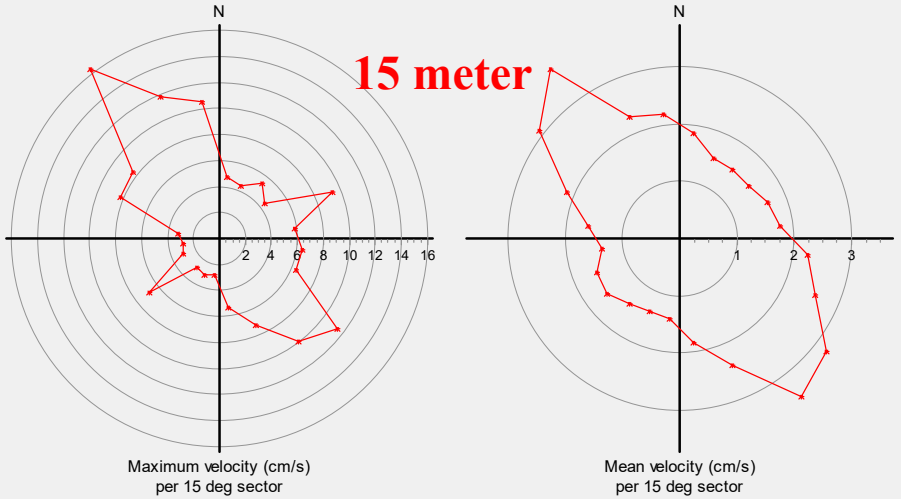


3.6 Maksimum og gjennomsnittlig straumfordelings diagram

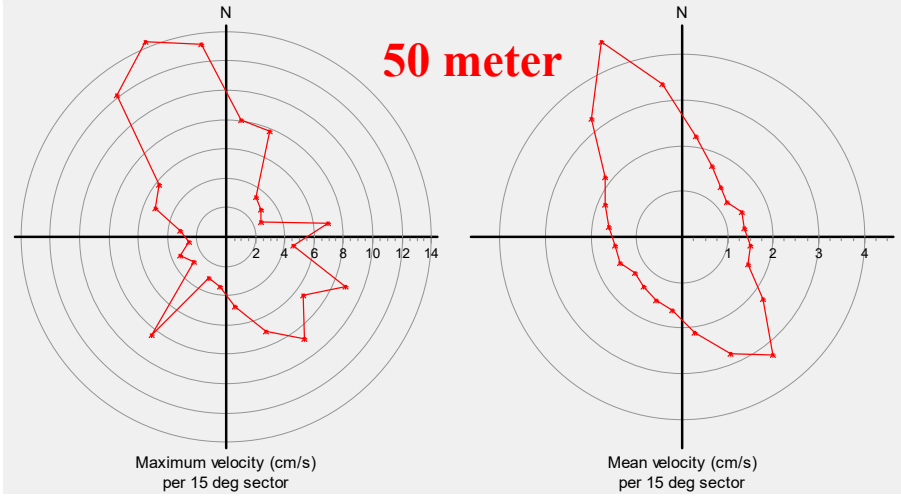
CURRENT VELOCITY DISTRIBUTION DIAGRAM
File name: Vikane 5 meter.SD6 Ref. number: 1265
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:25 - 15.Dec-10 To: 04:35 - 26.Jan-11



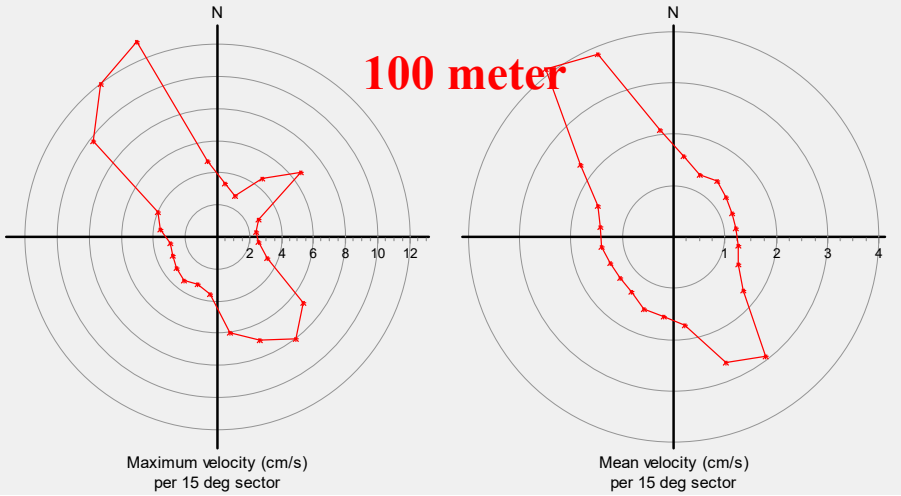
CURRENT VELOCITY DISTRIBUTION DIAGRAM
File name: Vikane 15 meter.SD6 Ref. number: 1245
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11



CURRENT VELOCITY DISTRIBUTION DIAGRAM
File name: Vikane 50 meter.SD6 Ref. number: 1268
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

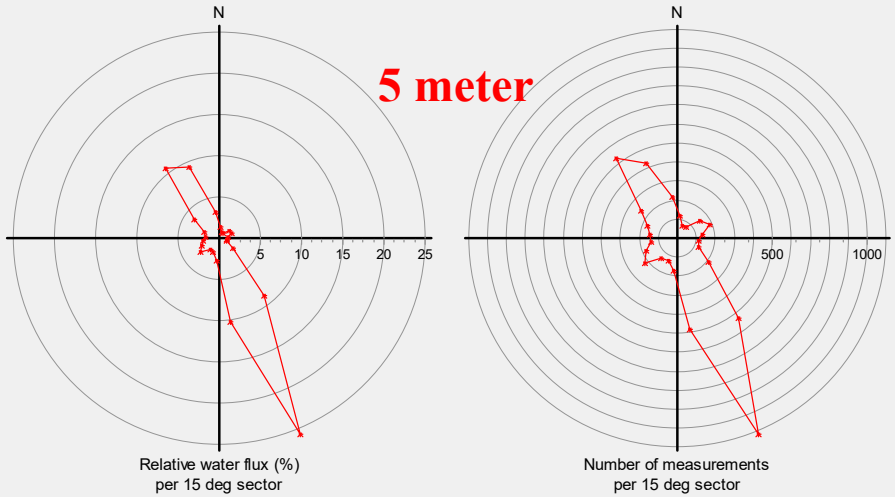


CURRENT VELOCITY DISTRIBUTION DIAGRAM
File name: Vikane 100 meter.SD6 Ref. number: 1320
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

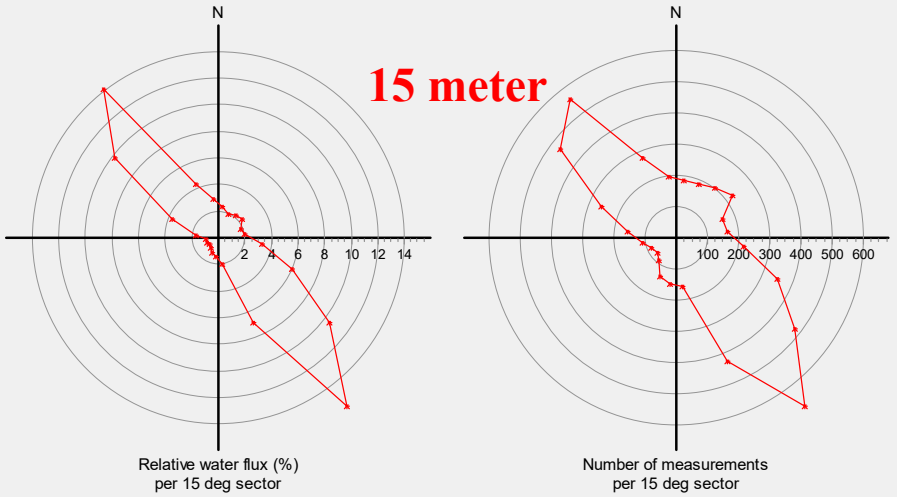


3.7 Vassflux

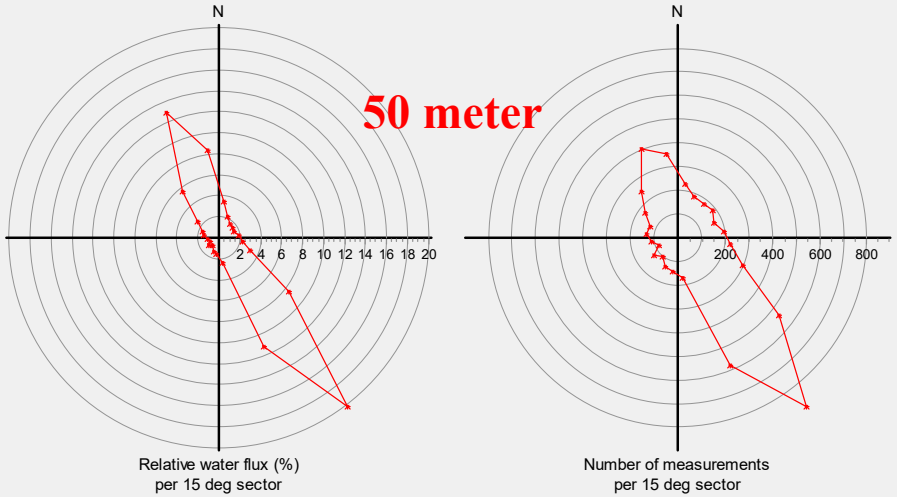
CURRENT VELOCITY DISTRIBUTION DIAGRAM
File name: Vikane 5 meter.SD6 Ref. number: 1265
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:25 - 15.Dec-10 To: 04:35 - 26.Jan-11



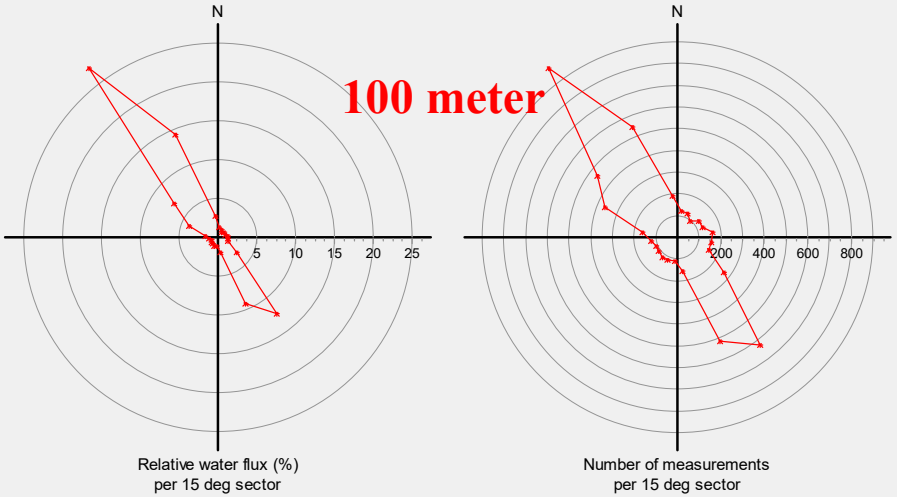
CURRENT VELOCITY DISTRIBUTION DIAGRAM
File name: Vikane 15 meter.SD6 Ref. number: 1245
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11



CURRENT VELOCITY DISTRIBUTION DIAGRAM
File name: Vikane 50 meter.SD6 Ref. number: 1268
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11



CURRENT VELOCITY DISTRIBUTION DIAGRAM
File name: Vikane 100 meter.SD6 Ref. number: 1320
Series number: 1 Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11



3.8 Straum matrise

CURRENT SPEED / DIRECTION MATRIX
File name: Vikane 5 meter.SD6
Series number: 1
Number of measurements in data set: 5996
Data displayed from: 13:25 - 15.Dec-10 To: 04:35 - 26.Jan-11

Ref. number: 1265
Interval time: 10 Minutes

5 meter

Neumann parameter:
Average speed:
Rest speed:
Rest direction:

	Current speed groups													Total flow		Max
	1	3	4	5	6	8	10	15	25	50	75	100	Sum%	m³/m²	%	curr
0	45	49	12	7	3	0	0	0	0	0	0	0	1.9	1435	1.3	5.4
15	35	30	4	1	2	0	0	1	0	0	0	0	1.2	857	0.8	11.4
30	26	42	6	4	0	0	0	0	0	0	0	0	1.3	931	0.8	4.8
45	65	63	15	6	1	0	0	0	0	0	0	0	2.5	1676	1.5	5.8
60	105	56	11	11	1	1	0	0	0	0	0	0	3.1	1870	1.7	8.0
75	72	48	6	3	0	1	0	0	0	0	0	0	2.2	1240	1.1	6.4
90	67	42	2	3	0	0	0	0	0	0	0	0	1.9	962	0.9	4.6
105	68	46	3	2	1	0	0	0	0	0	0	0	2.0	1031	0.9	5.2
120	79	107	17	1	2	0	2	0	0	0	0	0	3.5	2213	2.0	9.4
135	78	265	73	57	16	16	2	18	2	0	0	0	8.8	9726	8.8	15.8
150	56	419	232	156	99	83	11	37	24	0	0	0	18.6	28272	25.7	22.0
165	24	198	95	66	40	25	12	21	0	0	0	0	8.0	11208	10.2	14.8
180	17	91	27	19	6	12	1	0	0	0	0	0	2.9	3031	2.8	9.4
195	11	83	16	11	1	3	1	0	0	0	0	0	2.1	1964	1.8	8.4
210	24	76	18	14	2	1	0	0	0	0	0	0	2.3	1984	1.8	7.8
225	39	122	23	24	3	1	0	0	0	0	0	0	3.5	3046	2.8	6.6
240	26	109	27	11	3	0	0	0	0	0	0	0	2.9	2492	2.3	5.6
255	23	78	26	9	2	2	1	0	0	0	0	0	2.4	2134	1.9	8.6
270	41	74	26	3	3	0	0	0	0	0	0	0	2.5	1856	1.7	5.8
285	35	100	24	7	3	2	0	0	0	0	0	0	2.9	2249	2.0	7.4
300	25	132	29	28	21	6	0	0	0	0	0	0	4.0	4152	3.8	7.6
315	26	197	103	100	53	39	9	3	0	0	0	0	8.8	11750	10.7	11.0
330	33	113	96	77	42	48	12	8	0	0	0	0	7.2	10350	9.4	13.2
345	63	67	42	26	3	14	1	0	0	0	0	0	3.6	3511	3.2	8.2
Sum%	18.1	43.5	15.6	10.8	5.1	4.2	0.9	1.5	0.4	0.0	0.0	0.0		109940		22.0

CURRENT SPEED / DIRECTION MATRIX
File name: Vikane 15 meter.SD6
Series number: 1
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

Ref. number: 1245
Interval time: 10 Minutes

15 meter

Neumann parameter:
Average speed:
Rest speed:
Rest direction:

	Current speed groups													Total flow		Max
	1	3	4	5	6	8	10	15	25	50	75	100	Sum%	m³/m²	%	curr
0	66	103	16	1	0	0	0	0	0	0	0	0	3.1	2065	2.3	4.8
15	100	76	10	1	0	0	0	0	0	0	0	0	3.1	1716	1.9	4.4
30	116	74	11	0	2	0	0	0	0	0	0	0	3.4	1865	2.1	5.4
45	123	88	11	3	0	0	0	0	0	0	0	0	3.8	2036	2.3	4.4
60	75	74	7	3	0	0	1	0	0	0	0	0	2.7	1602	1.8	9.4
75	65	86	5	4	5	0	0	0	0	0	0	0	2.8	1747	2.0	5.8
90	42	137	15	11	11	1	0	0	0	0	0	0	3.6	2942	3.3	6.4
105	44	205	55	27	13	4	0	0	0	0	0	0	5.8	5358	6.0	6.4
120	28	253	91	42	26	28	8	4	0	0	0	0	8.0	9349	10.5	11.4
135	36	330	100	82	63	58	9	0	0	0	0	0	11.3	14171	16.0	10.0
150	72	269	52	28	5	2	0	0	0	0	0	0	7.1	6132	6.9	7.2
165	40	114	2	0	1	0	0	0	0	0	0	0	2.6	1735	2.0	5.4
180	85	65	0	0	0	0	0	0	0	0	0	0	2.5	1282	1.4	2.8
195	89	44	0	0	0	0	0	0	0	0	0	0	2.2	1097	1.2	3.0
210	47	45	0	0	0	0	0	0	0	0	0	0	1.5	800	0.9	2.8
225	32	43	0	0	0	1	0	0	0	0	0	0	1.3	731	0.8	6.8
240	35	51	0	0	0	0	0	0	0	0	0	0	1.4	814	0.9	3.0
255	62	45	0	0	0	0	0	0	0	0	0	0	1.8	877	1.0	2.8
270	61	96	1	0	0	0	0	0	0	0	0	0	2.6	1532	1.7	3.2
285	53	167	30	5	2	0	1	0	0	0	0	0	4.3	3298	3.7	8.2
300	31	234	94	61	31	16	1	0	0	0	0	0	7.8	8718	9.8	8.4
315	47	264	119	51	18	17	12	22	10	0	0	0	9.3	12534	14.1	16.4
330	60	173	28	10	4	0	1	1	0	0	0	0	4.6	3838	4.3	11.8
345	57	103	22	13	1	0	0	1	0	0	0	0	3.3	2593	2.9	10.6
Sum%	24.4	52.4	11.2	5.7	3.0	2.1	0.6	0.5	0.2	0.0	0.0	0.0		88832		16.4

CURRENT SPEED / DIRECTION MATRIX

File name: Vikane 50 meter.SD6
Ref. number: 1268
Series number: 1
Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

50 meter

Neumann parameter:
Average speed:
Rest speed:
Rest direction:

	Current speed groups													Total flow		Max
	1	3	4	5	6	8	10	15	25	50	75	100	Sum%	m³/m²	%	curr
0	47	148	16	4	6	6	0	0	0	0	0	0	3.8	3048	3.5	8.0
15	70	109	6	0	0	1	0	0	0	0	0	0	3.1	1890	2.2	7.8
30	105	71	3	0	0	0	0	0	0	0	0	0	3.0	1478	1.7	3.4
45	126	62	0	0	0	0	0	0	0	0	0	0	3.1	1412	1.6	3.0
60	81	83	0	0	0	0	0	0	0	0	0	0	2.7	1387	1.6	2.6
75	110	87	0	0	0	2	0	0	0	0	0	0	3.3	1633	1.9	7.0
90	110	105	4	3	0	0	0	0	0	0	0	0	3.7	2011	2.3	4.6
105	143	145	8	1	0	0	1	0	0	0	0	0	5.0	2772	3.2	8.8
120	147	281	76	27	8	1	0	0	0	0	0	0	9.0	7295	8.4	6.6
135	93	332	227	155	50	36	5	0	0	0	0	0	15.0	17588	20.3	8.8
150	94	277	122	55	25	11	0	0	0	0	0	0	9.7	9692	11.2	7.0
165	44	100	10	14	0	0	0	0	0	0	0	0	2.8	2122	2.4	4.8
180	60	81	1	0	0	0	0	0	0	0	0	0	2.4	1380	1.6	3.4
195	70	64	0	0	0	0	0	0	0	0	0	0	2.2	1204	1.4	3.0
210	63	36	0	0	0	0	1	0	0	0	0	0	1.7	830	1.0	8.4
225	74	51	0	0	0	0	0	0	0	0	0	0	2.1	979	1.1	2.8
240	35	52	1	0	0	0	0	0	0	0	0	0	1.5	782	0.9	3.4
255	43	67	0	0	0	0	0	0	0	0	0	0	1.8	974	1.1	2.6
270	49	82	1	0	0	0	0	0	0	0	0	0	2.2	1294	1.5	3.2
285	36	87	4	0	1	0	0	0	0	0	0	0	2.1	1414	1.6	5.2
300	42	114	14	0	3	0	0	0	0	0	0	0	2.9	2214	2.6	5.8
315	33	129	30	13	13	12	10	8	0	0	0	0	4.1	4885	5.6	12.2
330	23	140	81	26	21	38	54	21	0	0	0	0	6.7	11240	12.9	14.4
345	40	167	71	26	15	14	15	11	0	0	0	0	6.0	7295	8.4	13.2
Sum%	29.0	47.9	11.3	5.4	2.4	2.0	1.4	0.7	0.0	0.0	0.0	0.0		86821		14.4

CURRENT SPEED / DIRECTION MATRIX

100 meter

File name: Vikane 100 meter.SD6
Ref. number: 1320
Series number: 1
Interval time: 10 Minutes
Number of measurements in data set: 5996
Data displayed from: 13:23 - 15.Dec-10 To: 04:33 - 26.Jan-11

Neumann parameter:
Average speed:
Rest speed:
Rest direction:

	Current speed groups													Total flow		Max
	1	3	4	5	6	8	10	15	25	50	75	100	Sum%	m³/m²	%	curr
0	52	67	2	0	0	0	0	0	0	0	0	0	2.0	1145	1.3	3.4
15	71	50	0	0	0	0	0	0	0	0	0	0	2.0	961	1.1	2.8
30	57	33	1	1	0	0	0	0	0	0	0	0	1.5	763	0.9	4.6
45	66	57	0	0	0	1	0	0	0	0	0	0	2.1	955	1.1	6.6
60	71	52	0	0	0	0	0	0	0	0	0	0	2.1	904	1.0	2.8
75	97	64	0	0	0	0	0	0	0	0	0	0	2.7	1190	1.3	2.4
90	96	62	0	0	0	0	0	0	0	0	0	0	2.6	1194	1.4	2.6
105	76	75	2	0	0	0	0	0	0	0	0	0	2.6	1256	1.4	3.4
120	119	127	12	4	4	1	0	0	0	0	0	0	4.5	2730	3.1	6.8
135	97	291	119	58	21	40	0	0	0	0	0	0	10.4	11024	12.5	8.0
150	49	316	93	31	15	11	0	0	0	0	0	0	8.6	8220	9.3	7.0
165	61	83	9	4	1	0	0	0	0	0	0	0	2.6	1654	1.9	6.0
180	37	69	3	0	0	0	0	0	0	0	0	0	1.8	1022	1.2	3.6
195	39	73	2	0	0	0	0	0	0	0	0	0	1.9	1049	1.2	3.2
210	56	56	1	0	0	0	0	0	0	0	0	0	1.9	916	1.0	3.4
225	58	48	1	0	0	0	0	0	0	0	0	0	1.8	852	1.0	3.2
240	59	45	0	0	0	0	0	0	0	0	0	0	1.7	828	0.9	3.0
255	62	62	0	0	0	0	0	0	0	0	0	0	2.1	1055	1.2	3.0
270	72	89	2	0	0	0	0	0	0	0	0	0	2.7	1414	1.6	3.6
285	152	203	7	0	0	0	0	0	0	0	0	0	6.0	3473	3.9	4.0
300	83	312	46	8	4	7	2	0	0	0	0	0	7.7	6358	7.2	9.8
315	70	352	179	95	73	123	70	18	0	0	0	0	16.3	24227	27.4	12.0
330	63	206	104	23	50	70	22	11	0	0	0	0	9.2	12688	14.4	13.2
345	52	110	23	5	0	0	0	0	0	0	0	0	3.2	2401	2.7	4.8
Sum%	28.6	48.4	10.1	3.8	2.8	4.2	1.6	0.5	0.0	0.0	0.0	0.0		88278		13.2

4 Hydrografiprofil