Akvasafe

Analyse av strømdata ved Ospeneset oppdrettslokalitet
6. januar 2011 - 6. januar 2012

Referanse nr: C55471/R1
23. mai 2013

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Analyse av strømdata ved Ospeneset oppdrettslokalitet: C55471/R1				
Rev	**Dato**	**Forfatter**	**Godkjent**	**Formål**
R0	06.05.2013	Lasse Lønseth	Jan-Petter Mathisen	Presentasjon av resultater til kunden for kommentar.
R1	23.05.2013	Lasse Lønseth	Jan-Petter Mathisen	Endelig rapport.

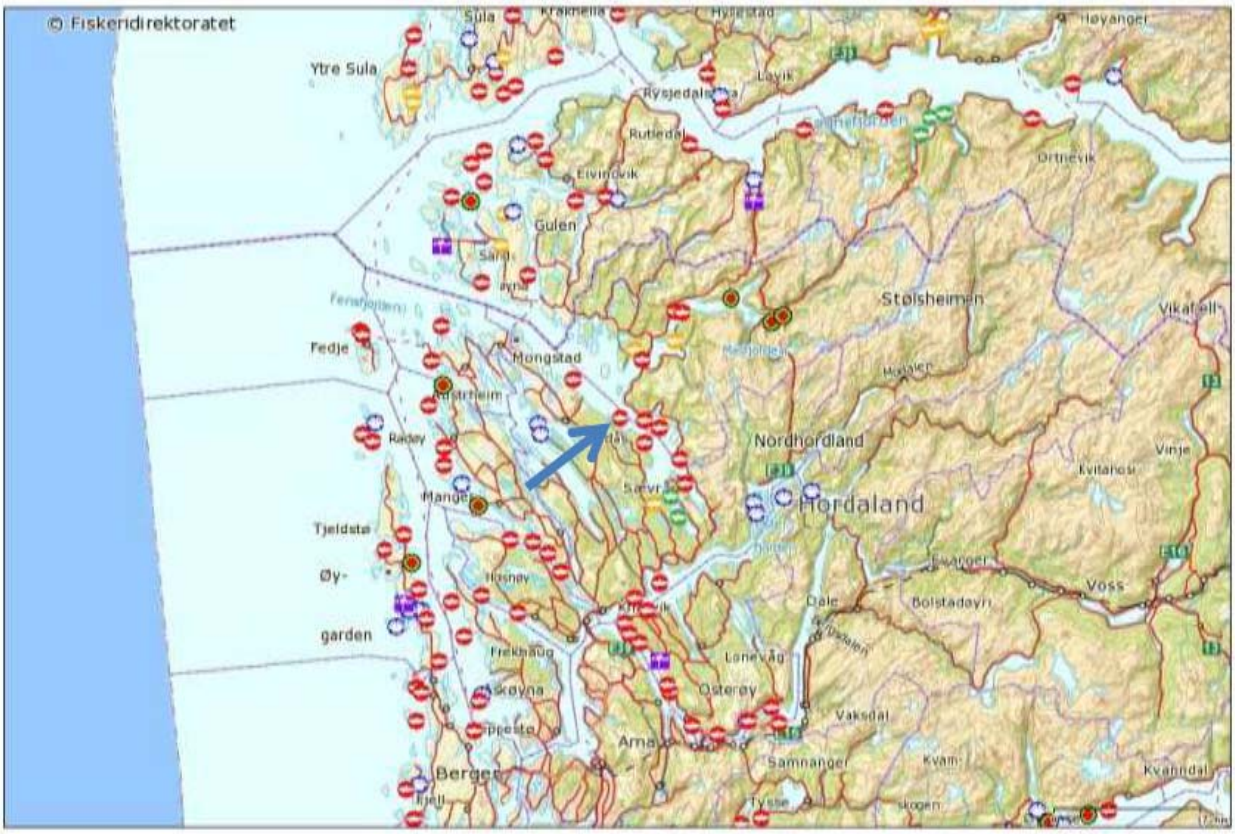
Rev 1 – 23. mai 2013	**Forfatter**	**Godkjent**
Signert:	*Lasse Lønseth*	*Jan-Petter Mathisen*

Denne rapporten må ikke brukes i kontraktuell hensikt eller til tekniske formål; med mindre dette er godtatt og signert for på angitt sted av både rapportens opphavsmann og av kontrollør/godkjenner, og at rapporten er angitt som "Endelig".

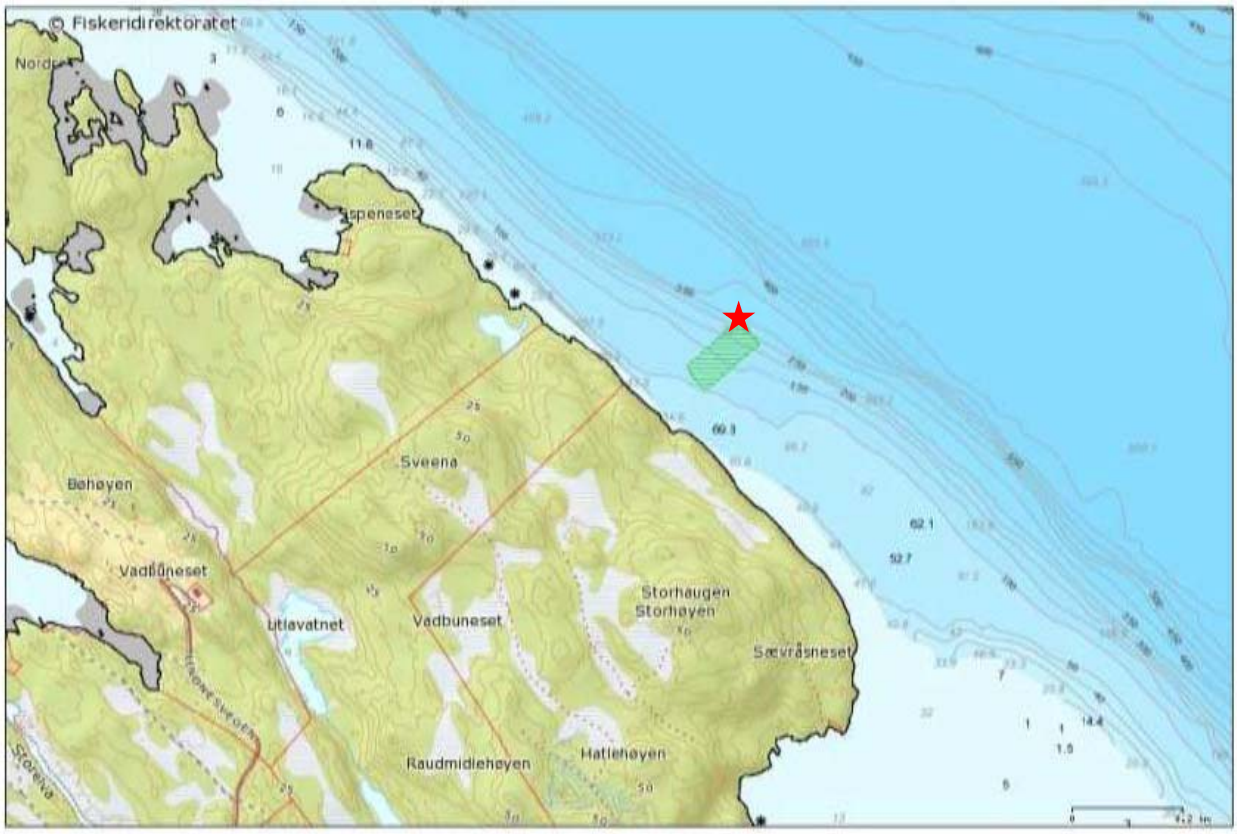
INNHOLDSFORTEGNELSE

1. INTRODUKSJON

Fugro OCEANOR har fått i oppdrag å analysere strømmålingsdata fra oppdrettslokaliteten Ospeneset i Lindås kommune. Lokaliteten ligger i Austefjorden, Figur 1. To strømmålere av type Sensordata SD-6000 har vært plassert på henholdsvis 5 og 15 m dyp ved det nordlige hjørnet av anlegget hvor dybden er ca 300 m som vist på Figur 2. Måleposisjon er ca. 60° 44.773' N, 5° 16.059' Ø (ref. WGS84). Målingene er utført i perioden 6. januar 2011 til 6. januar 2012.



Figur 1 Kart som viser beliggenheten av oppdrettslokaliteten Ospeneset (blå pil) i Austefjorden. (Fra tidligere rapport utarbeidet av Akvasafe AS, Dokumentnummer LR – 12001-0015.)



Figur 2 Kartutsnitt som viser plassering av strømmålere (rød stjerne) i forhold til anlegget. (Fra tidligere rapport utarbeidet av Akvasafe AS, Dokumentnummer LR – 12001-0015.)

2. Resultater

2.1 Datakvalitet

Dataene fra de to strømmålerne på 5 og 15 m dyp er presentert sammen i månedlige tidsserieplott i Vedlegg A. Data lagret i begynnelsen og slutten av serien mens instrumentene ikke var i måleposisjon er fjernet. Instrumentet på 5 m dyp har levert kontinuerlige data gjennom samtlige måleperioder. Instrumentet på 15 m dyp leverte ikke data i perioden 26. oktober – 7. desember 2011, men leverte kontinuerlige data gjennom de øvrige måleperiodene. Dataene synes overveiende å være av god kvalitet. Fra 21. april til 13. mai 2011 viste strømmåleren på 5 m dyp strømstille hele tiden, noe som er mistenkelig siden det er lite sannsynlig at det ikke er noen strøm over så lang periode. Samtidig er det noe strøm på 15 m dyp. Man ser at strømmen er tilbake på et mye høyere nivå og varierer som normalt etter at det er utført service på instrumentet den 13. mai 2011. Vi har ikke informasjon om begroing på instrumentet, men i denne perioden er det sannsynlig at rotorens bevegelse har vært hindret av begroing.

2.2 Statistikk

Fordeling av strømretning og -hastighet for hele perioden og for hver kalendermåned er presentert i Vedlegg B. Strømretning angir den retningen strømmen går mot, 0° er mot nord, 90° mot øst osv. Månedlige og totale middel- og maksimalverdier er oppsummert i Tabell 1 for 5 m dyp, og i Tabell 2 for 15 m dyp. Retningsfordelingen for hele perioden er vist i Tabell 3 for 5 m og Tabell 4 for 15 m dyp.

Tabell 1 Månedlige og totale middel- og maksimalverdier for strømhastighet i 5 m dyp ved Ospeneset, 6. januar 2011 – 6. januar 2012.

Måned	Middel strømfart	Maksimal strømhastighet		Vektormiddel av strømhastighet	
	(cm/s)	Fart (cm/s)	Retning (°)	Fart (cm/s)	Retning (°)
Januar	7,0	63	109	1,7	076
Februar	7,4	36	293	1,2	318
Mars	6,8	32	116	1,3	057
April	7,4	38	095	4,8	077
Mai	9,6	39	124	4,0	088
Juni	7,4	47	121	3,0	103
Juli	9,3	38	306	1,8	070
August	9,0	38	098	4,2	080
September	8,9	45	103	2,7	132
Oktober	10,8	55	129	2,0	030
November	9,3	40	123	3,2	063
Desember	14,5	53	117	3,5	356
Totalt	9,0	63	109	2,1	069

Tabell 2 Månedlige og totale middel- og maksimalverdier for strømhastighet i 15 m dyp ved Ospeneset, 6. januar 2011 – 6. januar 2012.

Måned	Middel strømfart	Maksimal strømhastighet		Vektormiddel av strømhastighet	
	(cm/s)	Fart (cm/s)	Retning (°)	Fart (cm/s)	Retning (°)
Januar	6,7	40	098	2,7	098
Februar	6,9	32	146	2,3	103
Mars	5,8	27	132	2,0	070
April	5,3	32	133	2,1	086
Mai	7,4	33	111	2,3	051
Juni	7,6	43	119	2,8	014
Juli	6,8	37	118	2,1	357
August	9,4	42	288	1,9	104
September	9,1	37	139	2,0	152
Oktober	8,4	39	105	0,6	029
November	-	-	-	-	-
Desember	10,7	47	094	2,4	043
Totalt	7,6	47	094	1,6	069

Tabell 3 Fordeling av strømfart mot retning i 8 retningssektorer for strømdata målt ved Ospeneset i 5 m dyp, 6. januar 2011 – 6. januar 2012.

Fordeling av Strømhastighet mot Strømretning	
Lokasjon	Ospeneset
Instrument:	Sensordata SD-6000
Måledyp:	5 m
Vanndyp:	300 m
Måleintervall	10 min.
Måleperiode	2011.01.06 - 2012.01.06

Strømfart (cm/s)	Retningssektor								Sum	% av total	Sum akkumulert	Kumulativ sannsynlighet
	Nord	Nordøst	Øst	Sørøst	Sør	Sørvest	Vest	Nordvest				
0. - 5.	5.478	7.120	14.722	4.378	1.197	0.895	2.920	6.651	21371	43.40	21371	0.43359
5. - 10.	0.442	0.477	7.962	2.873	0.028	0.012	1.538	5.600	9331	18.90	30702	0.62291
10. - 15.	0.106	0.154	5.563	3.329	0.008	0.000	1.128	5.407	7736	15.70	38438	0.77987
15. - 20.	0.059	0.079	3.100	2.767	0.004	0.000	0.534	4.017	5205	10.60	43643	0.88547
20. - 25.	0.012	0.014	1.702	1.570	0.000	0.000	0.377	2.102	2848	5.80	46491	0.94325
25. - 30.	0.008	0.006	0.945	0.704	0.000	0.000	0.254	1.225	1549	3.10	48040	0.97468
30. - 35.	0.000	0.000	0.432	0.438	0.000	0.000	0.138	0.501	744	1.50	48784	0.98977
35. - 40.	0.000	0.000	0.132	0.229	0.000	0.000	0.034	0.124	256	0.50	49040	0.99497
40. - 45.	0.000	0.000	0.101	0.148	0.000	0.000	0.018	0.067	165	0.30	49205	0.99832
45. - 50.	0.000	0.000	0.034	0.041	0.000	0.000	0.014	0.012	50	0.10	49255	0.99933
50. - 55.	0.000	0.000	0.024	0.018	0.000	0.000	0.000	0.002	22	0.00	49277	0.99978
55. - 60.	0.000	0.000	0.010	0.006	0.000	0.000	0.000	0.000	8	0.00	49285	0.99994
60. - 65.	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	2	0.00	49287	0.99998
>= 65.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.00	49287	0.99998
Sum	3009	3869	17119	8134	610	447	3428	12671	49287			
% av total	6.1	7.8	34.7	16.5	1.2	0.9	7	25.7	100			
Minimum fart	0.2	0.8	0.6	0.6	0.6	0.6	0.8	0.4	0.2			
Middelfart	2.4	2.2	8.6	12.4	1.6	1.4	9.0	11.5	9.0			
Maksimum fart	25.6	27	63.2	57.2	15.2	8	46.2	50	63.2			
Standardavvik	2.8	2.8	8	9.4	1.5	0.8	8.5	8.3	8.5			

Tabell 4 Fordeling av strømfart mot retning i 8 retningssektorer for strømdata målt ved Ospeneset i 15 m dyp, 6. januar 2011 – 6. januar 2012.

Fordeling av Strømhastighet mot Strømretning	
Lokasjon	Ospeneset
Instrument:	Sensordata SD-6000
Måledyp:	15 m
Vanndyp:	300 m
Måleintervall	10 min.
Måleperiode	2011.01.06 - 2012.01.06

Strømfart (cm/s)	Retningssektor								Sum	% av total	Sum akkumulert	Kumulativ sannsynlighet
	Nord	Nordøst	Øst	Sørøst	Sør	Sørvest	Vest	Nordvest				
0. - 5.	8.682	9.807	12.221	5.087	1.234	1.109	2.856	6.091	21862	47.10	21862	0.47087
5. - 10.	1.555	1.010	7.405	5.889	0.017	0.013	1.126	5.180	10305	22.20	32167	0.69282
10. - 15.	0.392	0.164	3.483	4.848	0.000	0.000	1.021	5.335	7077	15.20	39244	0.84525
15. - 20.	0.045	0.039	1.768	2.675	0.000	0.000	0.933	3.095	3972	8.60	43216	0.9308
20. - 25.	0.000	0.000	0.986	1.170	0.000	0.000	0.489	1.628	1984	4.30	45200	0.97353
25. - 30.	0.000	0.000	0.521	0.536	0.000	0.000	0.239	0.495	832	1.80	46032	0.99145
30. - 35.	0.000	0.000	0.181	0.162	0.000	0.000	0.090	0.157	274	0.60	46306	0.99735
35. - 40.	0.000	0.000	0.106	0.056	0.000	0.000	0.034	0.002	92	0.20	46398	0.99933
40. - 45.	0.000	0.000	0.032	0.019	0.000	0.000	0.002	0.000	25	0.10	46423	0.99987
45. - 50.	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	5	0.00	46428	0.99998
>= 50.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.00	46428	0.99998
Sum	4956	5116	12403	9491	581	521	3153	10207	46428	100.00	46428	0.99998
% av total	10.7	11	26.7	20.4	1.3	1.1	6.8	22	100			
Minimum fart	0.4	0.2	0.2	0.0	0.4	0.4	0.4	0.0	0.0			
Middelfart	3.0	2.3	7.5	10.2	1.3	1.2	9.4	10.2	7.6			
Maksimum fart	19.6	18.6	47.2	43.2	8.2	7.6	42	35.4	47.2			
Standardavvik	2.9	2.3	7	7	0.9	0.7	8.3	7.1	7			

Dominerende strømretninger er mot øst-sørøst og nordvest, altså langs fjordens hovedretning og langs dybdekotene i området ved anlegget. Hastigheter opp mot maksimum ser ut til å opptre langs begge disse hovedretningene. Dataene fra 5 m dyp viser ikke noen tydelig årstidsvariasjon. Desember måned hadde betydelig høyere middelhastighet enn de øvrige månedene, mens januar til april måned har noe lavere middelhastighet enn resten av året. De høyeste hastighetene ble observert i januar 2012 (63 cm/s, retning mot 109°) og desember 2011 (53 cm/s, retning mot 117°).

I 15 m dyp er bildet omtrent det samme, med noe lavere hastigheter. Også her ble høyeste middelhastighet, 10,7 cm/s, målt i desember, og månedene fra januar til og med april har noe lavere middelhastighet enn resten av året. De høyeste hastighetene ble observert i desember (47 cm/s, retning mot 094°) og juni (43 cm/s, retning mot 119°).

Tidevannsstrøm er beregnet med harmonisk analyse[1]. Komplett resultat er vist i Vedlegg C. Harmonisk analyse beregner den delen av strømhastigheten som skyldes tidevannskrefter, dvs. den delen av signalet som er i ressonans med gravitasjonskrefter fra måne og sol. Tidevannsstrømmen beskrives da som en sum av sinus-funksjoner, tidevannskomponenter, med gitte frekvenser. Den største av de hel- og halvdaglige tidevannskomponentene er M2 som er den primære komponenten drevet av månen. Her finner vi at for de halvdaglige komponentene er amplitudene 2,5 – 2,9 cm/s for M2, 1,3 cm/s for MKS2, og ca. 1 cm/s for S2, mens alle andre komponenter viser amplituder under 1 cm/s. Konklusjonen er at tidevannsstrømmen totalt ikke er mye over 5 cm/s og spiller en relativt liten rolle i det totale strømregimet på denne lokaliteten.

Ekstrem strømhastighet er beregnet ved å tilpasse den kumulative fordelingen av total strømhastighet til teoretiske ekstremverdifordelinger med en minste kvadraters metode. Vi har benyttet fordelingene Fischer-Tippet Type 3 og 3-parameter Weibull. Disse er tilpasset både til alle dataene, og til de høyeste 10% av dataene for å få en bedre tilpasning til halen av fordelingen. Førstnevnte fordeling ser ut til å gi best tilpasning til den øvre delen av dataene her, og tilpasningene til denne fordelingen er vist i Vedlegg D.

Resultatene er oppsummert i Tabell 5 som viser ekstremverdier for 1, 5, 10, 50 og 100 år. Ekstremverdien er den verdi som i det lange løp forventes å overskrides en gang i løpet av angitt intervall. Disse estimatene som er gitt på grunnlag av ett års målinger forutsetter at dette året er omtrent som normalt for dette området. Disse resultatene viser stor forskjell i ekstrem strøm på 5 m og 15 m dyp. (Vi ser også at på 15 m dyp er ekstremverdiene for 50 og 100 år den samme, når verdiene er avrundet til nærmeste hele cm/s.)

[1] Harmonisk analyse beregner den delen av strømhastigheten som skyldes tidevannskrefter, dvs. den delen av signalet som er i ressonans med gravitasjonskrefter fra måne og sol. Tidevannsstrømmen beskrives da som en sum av sinus-funksjoner, tidevannskomponenter, med gitte frekvenser. Se f.eks. http://en.wikipedia.org/wiki/Tide.

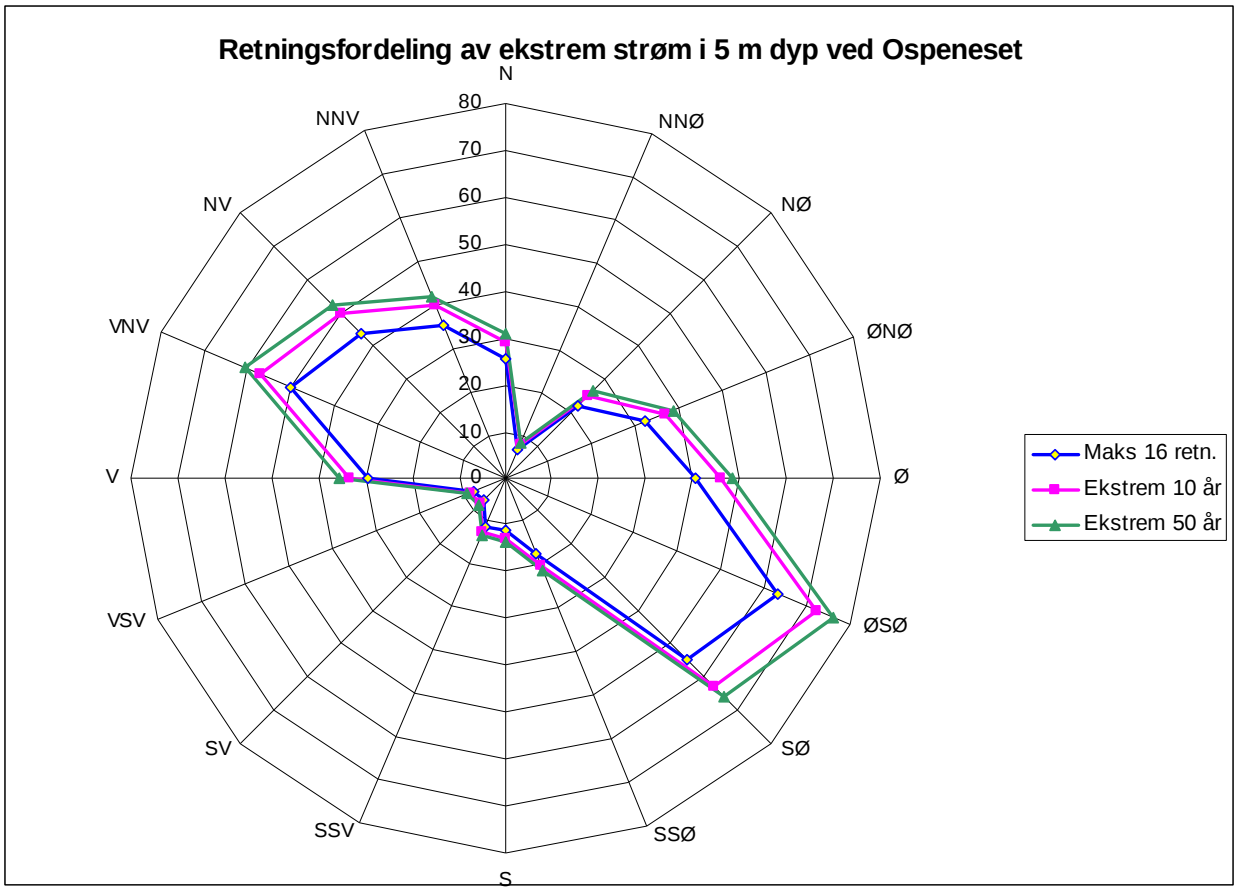
Tabell 5 Estimerte ekstremverdier for strømhastighet på 5 og 15 m dyp ved Ospeneset med gjentakelsesintervaller fra 1 år til 100 år

Gjentakelsesintervall (år)	1	5	10	50	100
Ekstremverdi (cm/s), 5 m dyp	64	70	72	76	78
Ekstremverdi (cm/s), 15 m dyp	49	53	54	56	57

Ved å skalere ekstremverdiene for 10 og 50 år mot maksimalverdiene i 8 retningssektorer får man ekstremverdier per retning som vist i Tabell 6 og Tabell 7. Et noe mer detaljert bilde, basert på fordelingen for 16 sektorer, er presentert i Figur 3 og Figur 4.

Tabell 6 Midlere, maksimal og estimert ekstrem strømfart i 5 m dyp for 10 og 50 år fordelt på 8 retningssektorer. Sektorbredden er 45° og sektorene er sentrert omkring nord, nordøst osv.

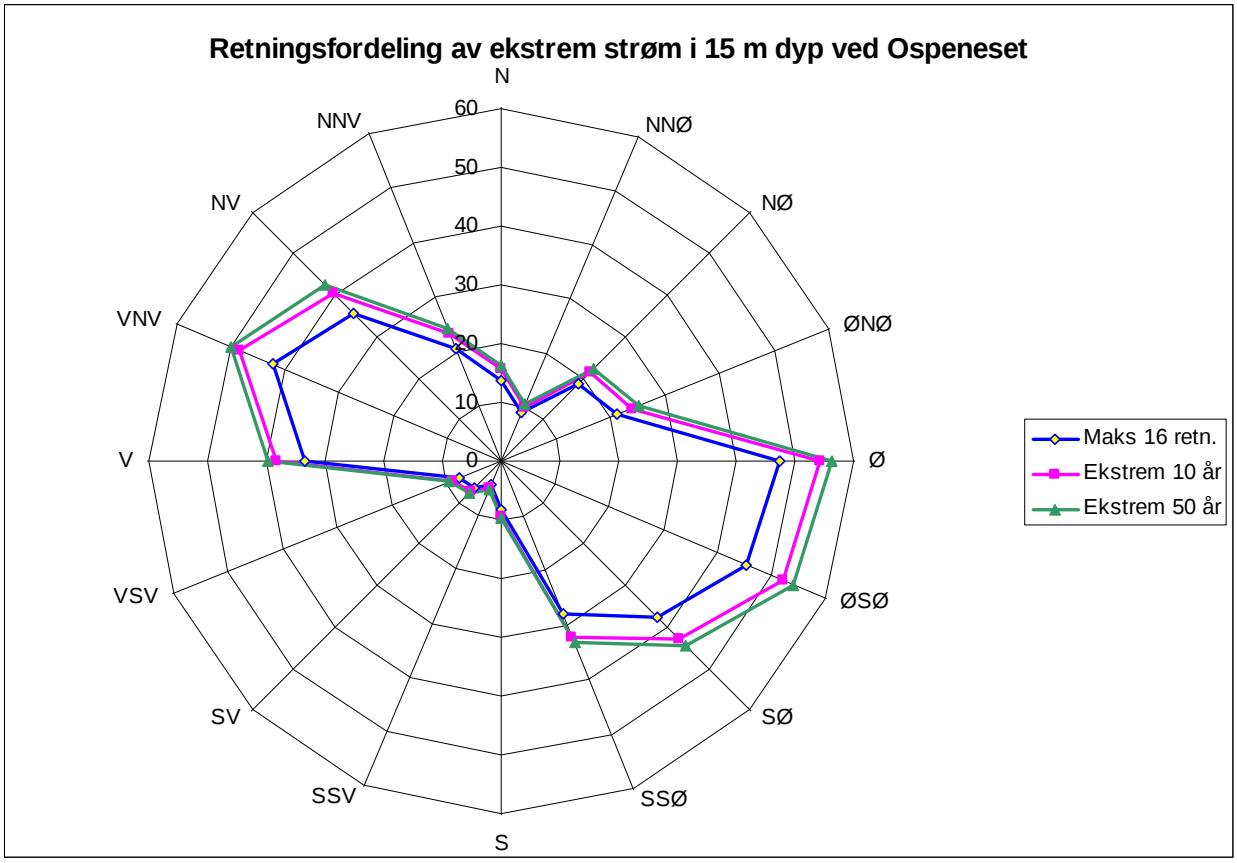
	Sektor								
	N	NØ	Ø	SØ	S	SV	V	NV	Totalt
Middel fart (cm/s)	2,4	2,2	8,6	12,4	1,6	1,4	9,0	11,5	9,0
Maksimum (cm/s)	26	27	63	57	15	8	46	50	63
Ekstrem 10 år (cm/s)	29	31	72	65	17	9	53	57	72
Ekstrem 50 år (cm/s)	31	32	76	69	18	10	56	60	76



Figur 3 Retningsfordeling av maksimal målt strømfart i 5 m dyp sammen med estimerte ekstremverdier for 10 og 50 år basert på målinger på 5 m dyp ved Ospeneset.

Tabell 7 Midlere, maksimal og estimert ekstrem strømfart i 15 m dyp for 10 og 50 år fordelt på 8 retningssektorer. Sektorbredden er 45° og sektorene er sentrert omkring nord, nordøst osv.

	Sektor								
	N	NØ	Ø	SØ	S	SV	V	NV	Totalt
Middel fart (cm/s)	3,0	2,3	7,5	10,2	1,3	1,2	9,4	10,2	7,6
Maksimum (cm/s)	20	19	47	43	8	8	42	35	47
Ekstrem 10 år (cm/s)	22	21	54	49	9	9	48	41	54
Ekstrem 50 år (cm/s)	23	22	56	51	10	9	50	42	56



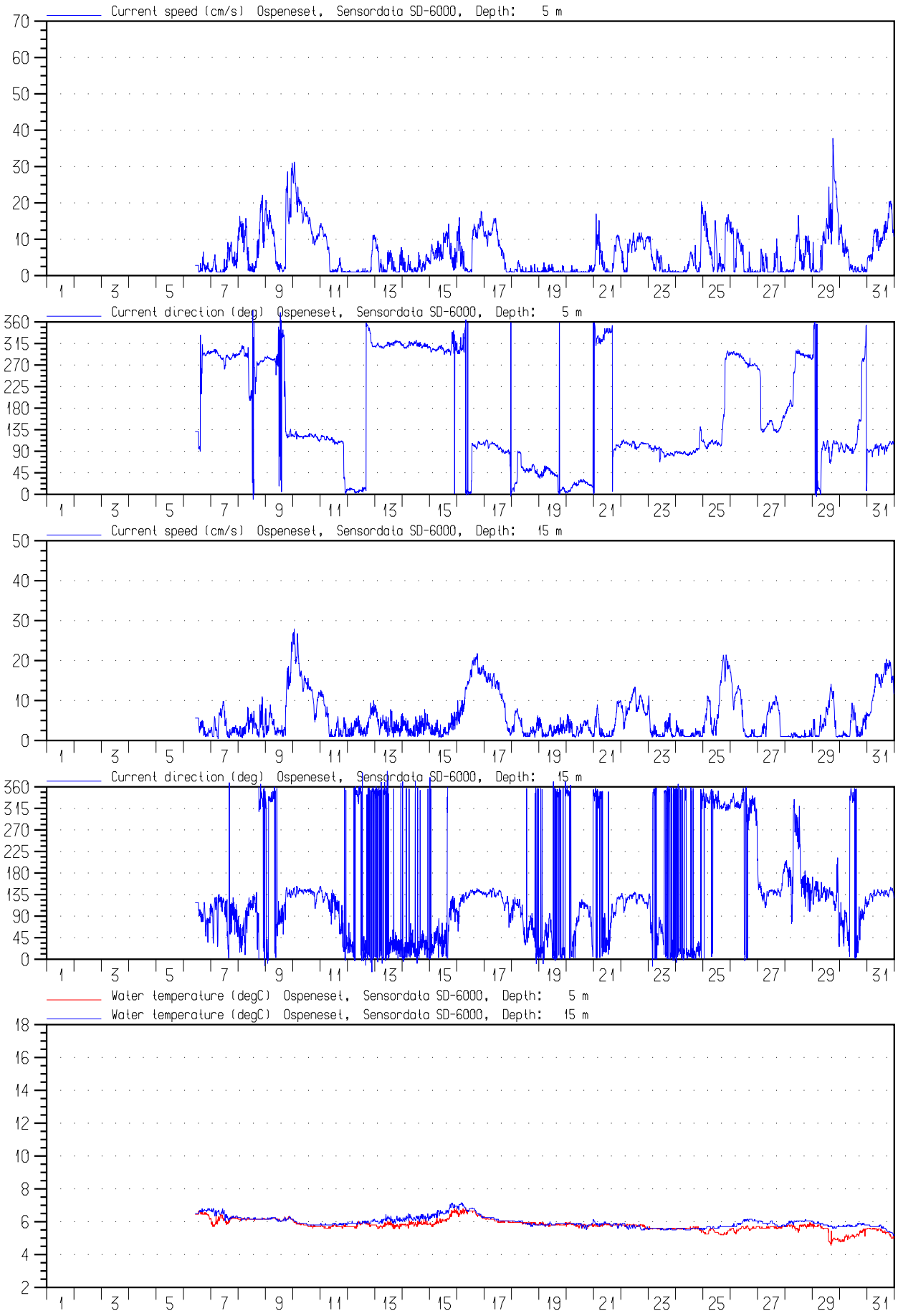
Figur 4 Retningsfordeling av maksimal målt strømfart sammen med estimerte ekstremverdier for 10 og 50 år basert på målinger på 15 m dyp ved Ospeneset.

Forskjellen i strøm mellom 5 m og 15 m dyp skyldes at det er lagdeling i tetthet pga. forskjeller i temperatur og saltholdighet mellom lagene, slik at det blir liten turbulent friksjon mellom lagene. Strømninger i overflaten som skyldes utstrømning av ferskvann, spesielt i flomperioder, og vinddrevet strøm i stormperioder merkes i mindre grad på 15 m dyp enn nær overflaten. Vi ser tydelig lagdelinger i forskjell på temperaturen mellom vannlagene, spesielt om våren og sommeren, mens det er mindre sjiktning i temperatur høst og vinter. Siden vi ikke har data for saltholdighet har vi ikke mulighet for å beregne forskjellen i tetthet, og har dermed ikke noe mål på stabiliteten i vannsøylen.

Vedlegg A

Tidsserieplott av strømhastighet ved Ospeneset

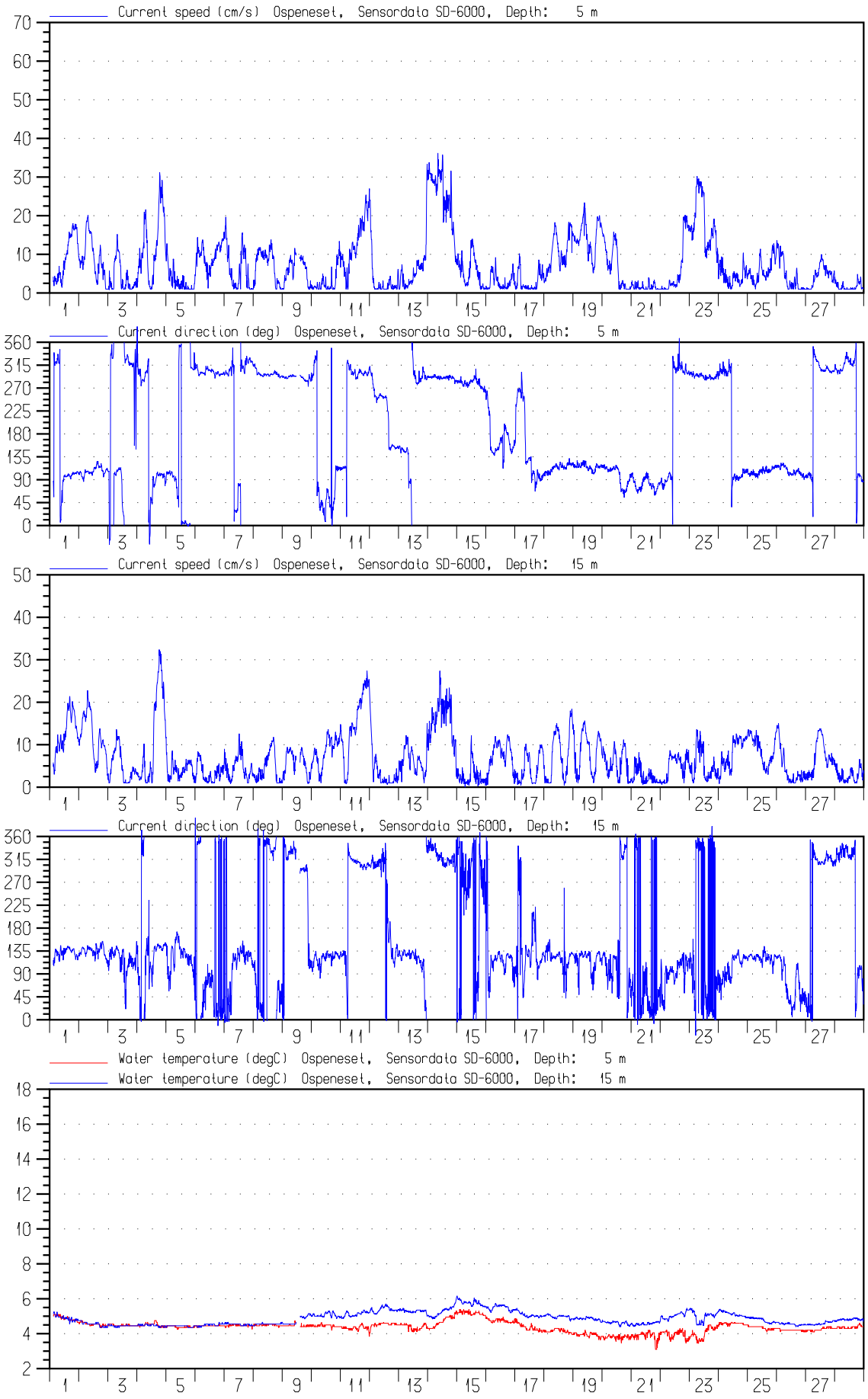
Måledyp: 5 m og 15m



Ospeneset				INSTRUMENT: Sensordata SD6000
LOCATION: Ospeneset	STATION: 01	WATER DEPTH: 300 m	INSTRUMENT DEPTH: 15 m	OBSERVATION PERIOD (gmt): 2011.01.01 00-2011.01.31 23
Fugro OCEANOR — *Oceanographic Company of Norway*			PROJECT: C55471	FIGURE: 1

Date: 2013-05-06

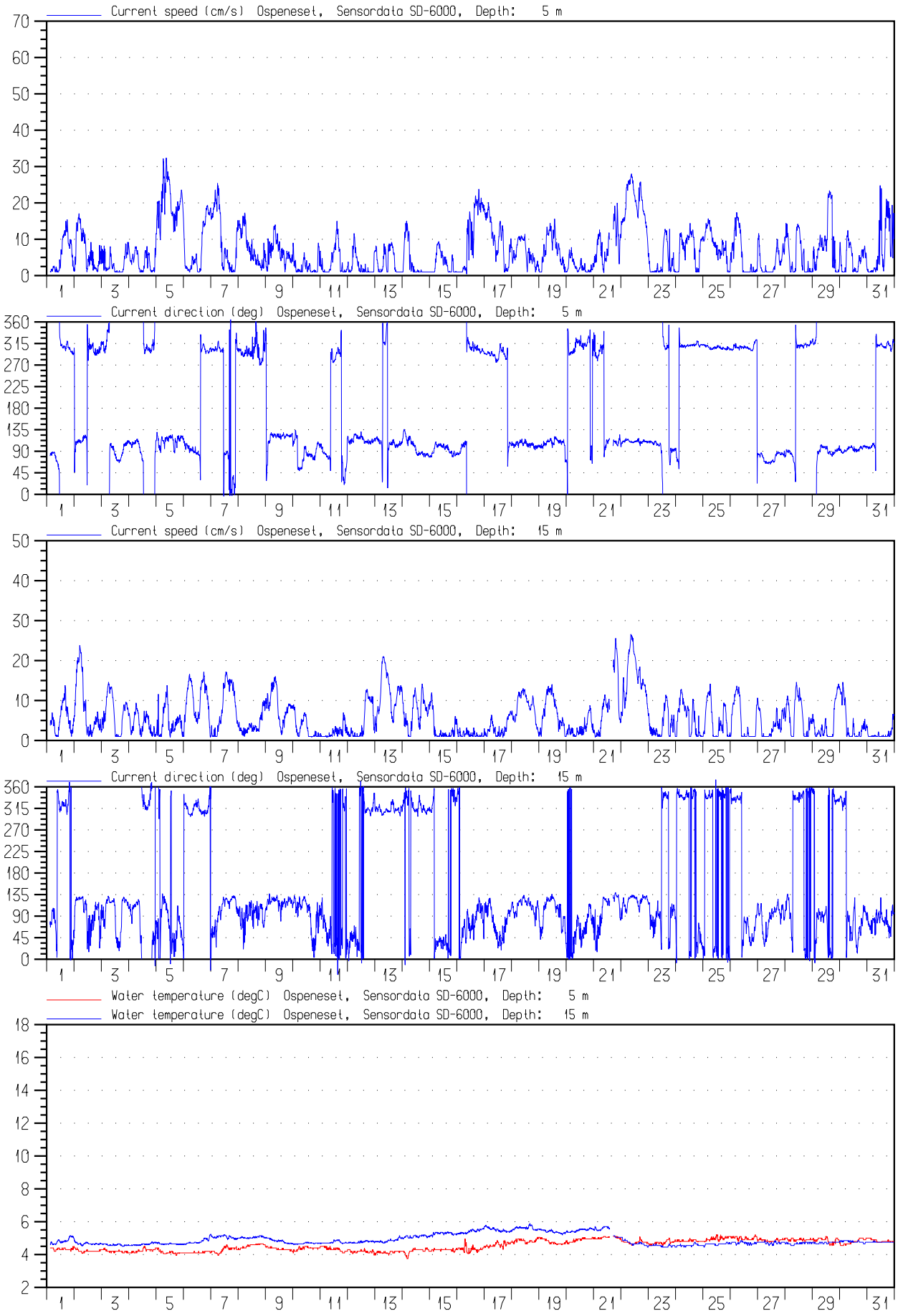
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT: Sensordata SD6000
LOCATION: Ospeneset	STATION: 01	WATER DEPTH: 300 m	INSTRUMENT DEPTH: 15 m	OBSERVATION PERIOD (gmt): 2011.02.01 00-2011.02.28 23
Fugro OCEANOR — *Oceanographic Company of Norway*			PROJECT: C55471	FIGURE: 2

Date: 2013-05-06

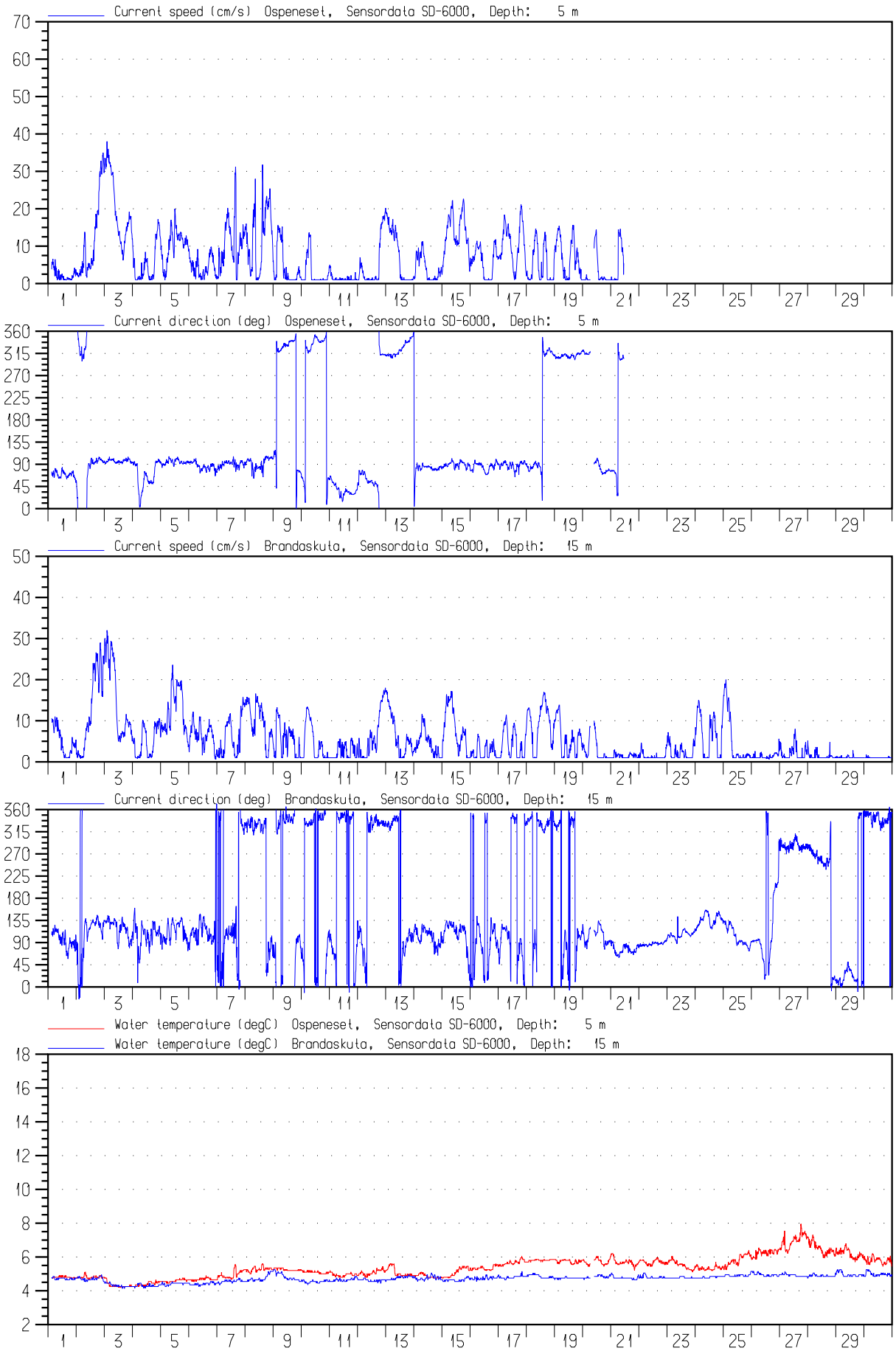
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT Sensordata SD6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD (gmt): 2011.03.01 00-2011.03.31 23
Fugro OCEANOR	*Oceanographic Company of Norway*		PROJECT C55471	FIGURE 3

Date: 2013-05-06

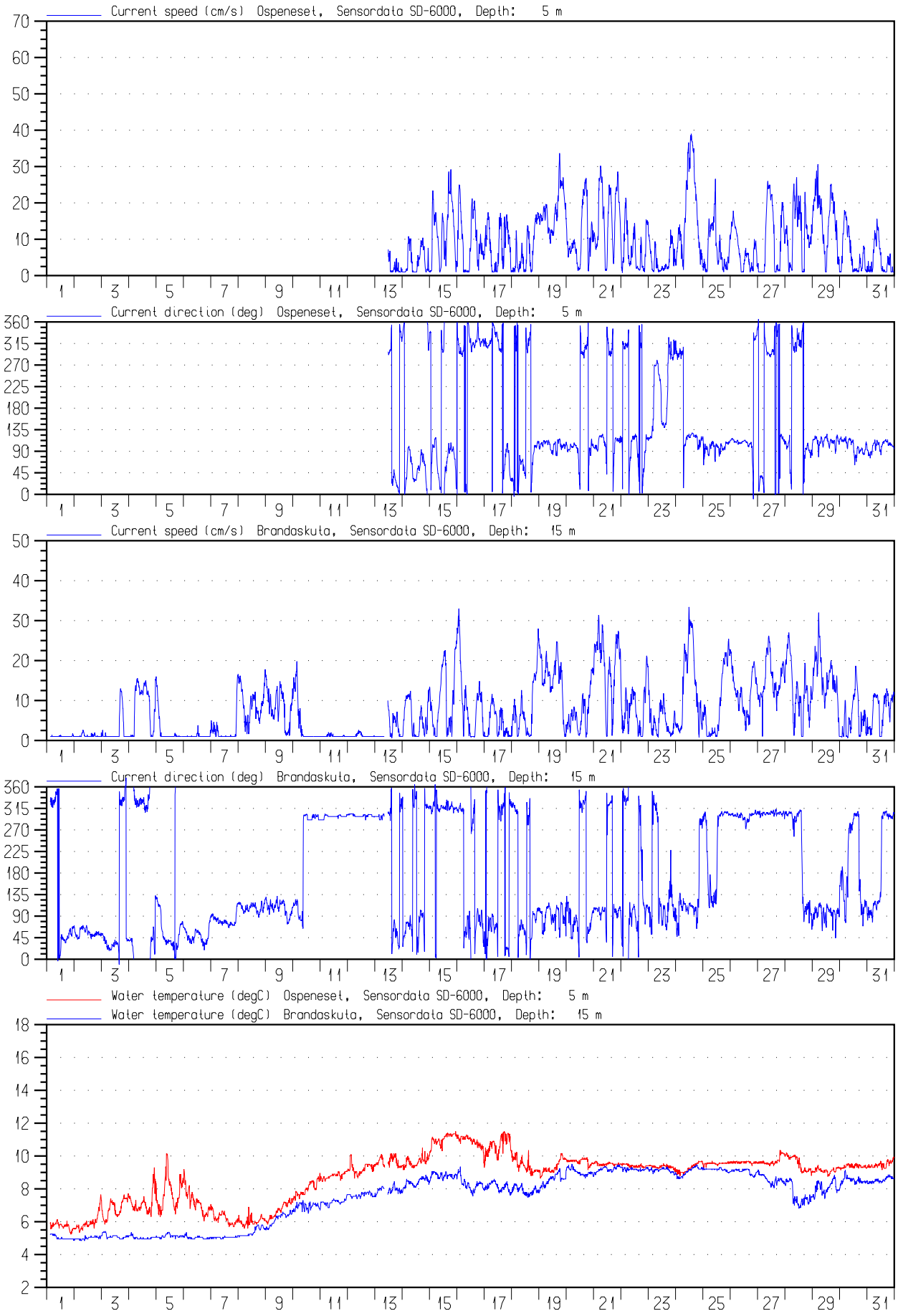
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT Sensordata SD6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD (gmt): 2011.04.01 00-2011.04.30 23
Fugro OCEANOR	*Oceanographic Company of Norway*		PROJECT C55471	FIGURE 4

Date: 2013-05-06

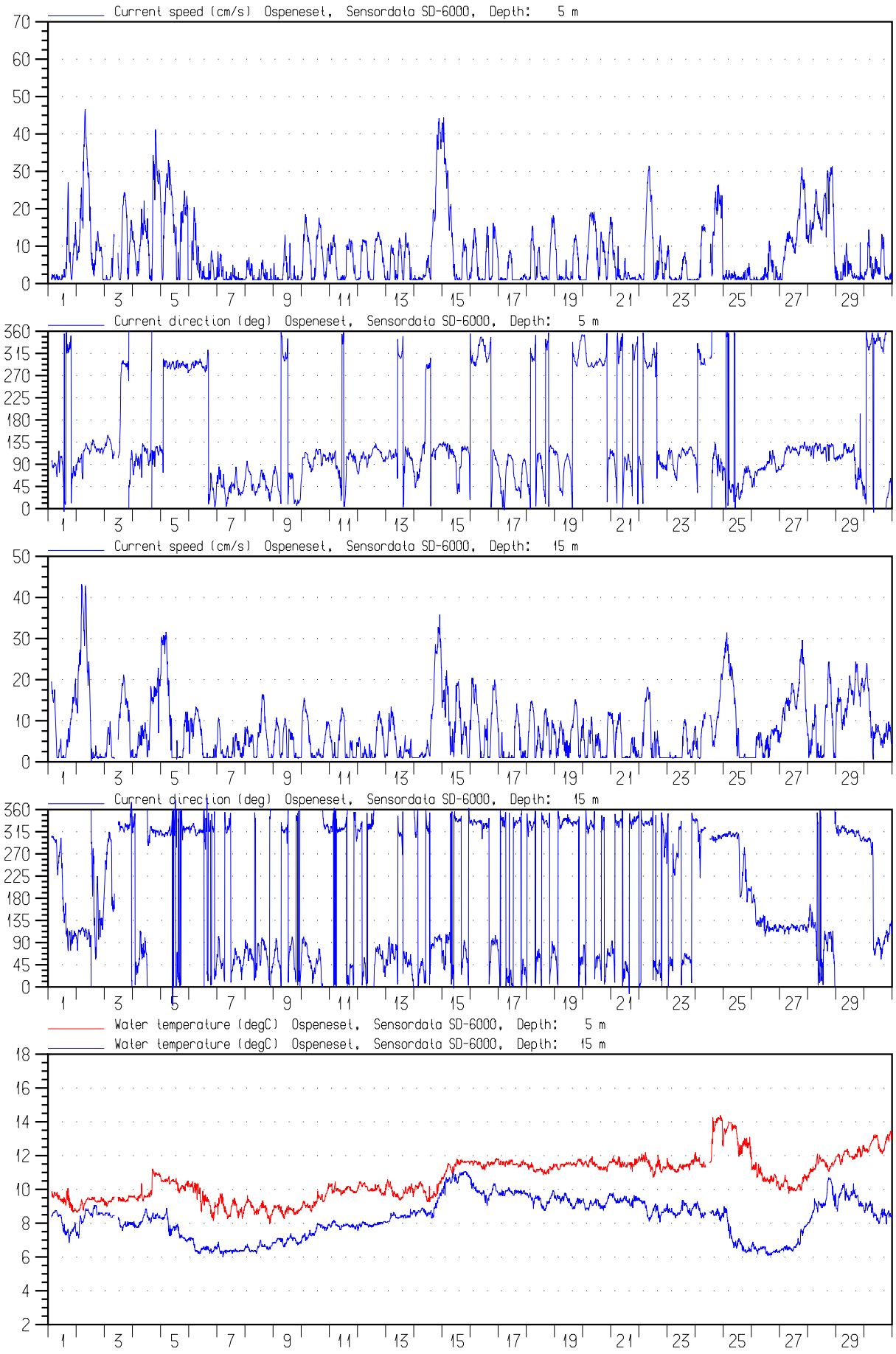
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT Sensordata SD6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD (gmt): 2011.05.01 00-2011.05.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE 5

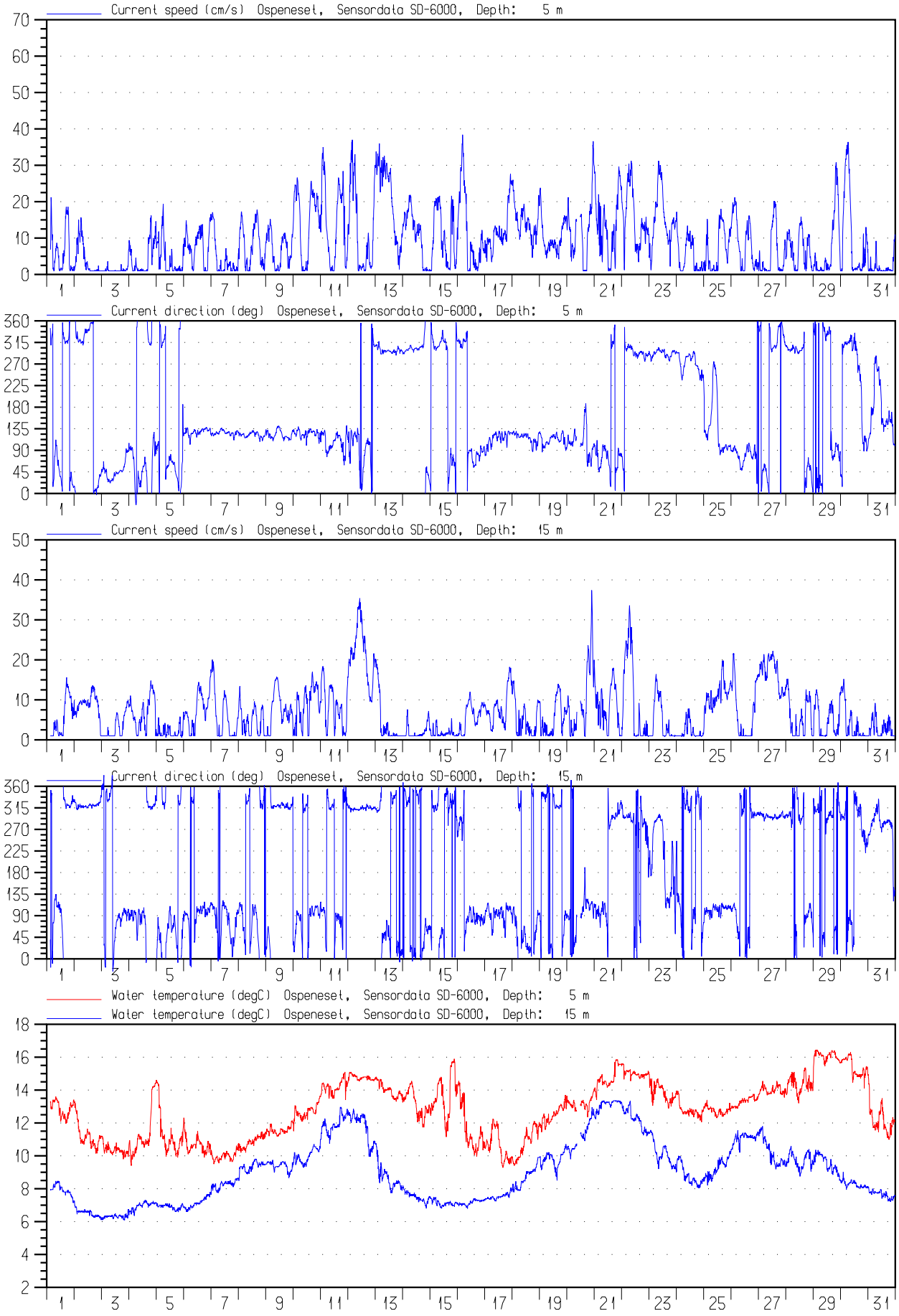
Date: 2013-05-06

Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT: Sensordata SD6000
LOCATION: Ospeneset	STATION: 01	WATER DEPTH: 300 m	INSTRUMENT DEPTH: 15 m	OBSERVATION PERIOD (gmt): 2011.06.01 00-2011.06.30 23
Fugro OCEANOR — *Oceanographic Company of Norway*			PROJECT: C55471	FIGURE: 6

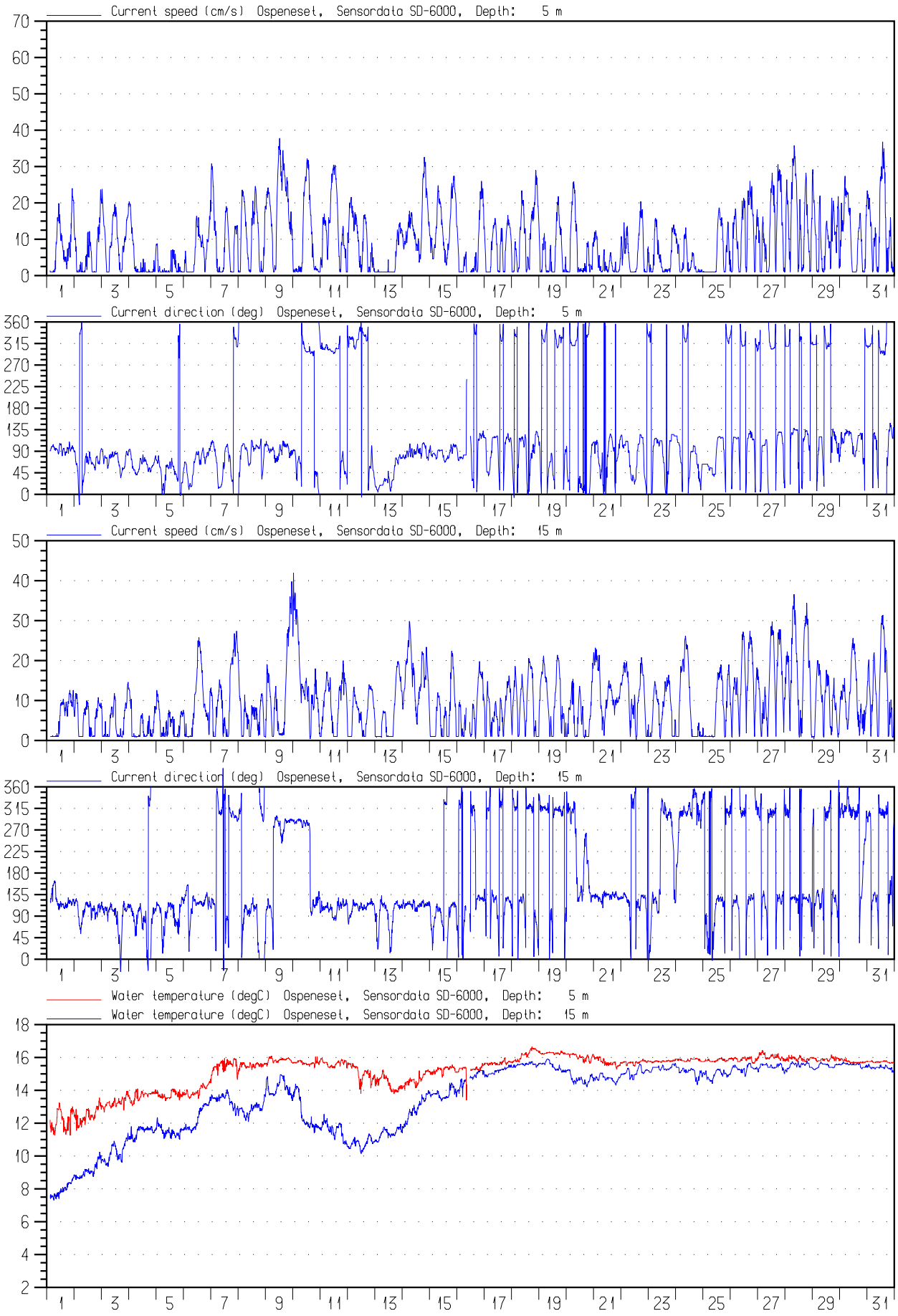
Date: 2013-05-06 *Orkan/orkapp/v4.1.5*



Ospeneset				INSTRUMENT: Sensordata SD6000
LOCATION: Ospeneset	STATION: 01	WATER DEPTH: 300 m	INSTRUMENT DEPTH: 15 m	OBSERVATION PERIOD (gmt): 2011.07.01 00-2011.07.31 23
Fugro OCEANOR — *Oceanographic Company of Norway*			PROJECT: C55471	FIGURE: 7

Date: 2013-05-06

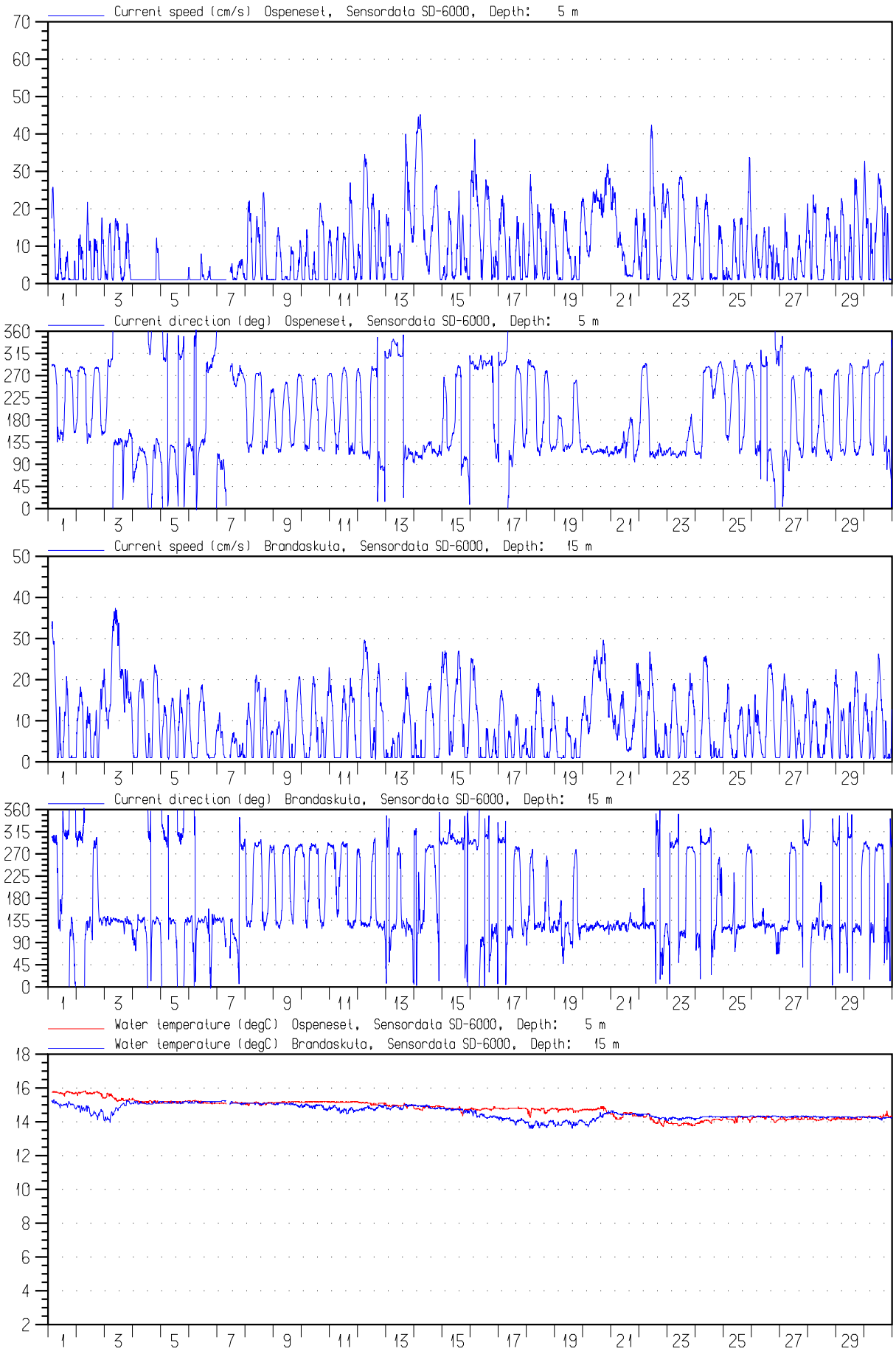
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT: Sensordata SD6000
LOCATION: Ospeneset	STATION: 01	WATER DEPTH: 300 m	INSTRUMENT DEPTH: 15 m	OBSERVATION PERIOD (gmt): 2011.08.01 00-2011.08.31 23
Fugro OCEANOR — *Oceanographic Company of Norway*			PROJECT: C55471	FIGURE: 8

Date: 2013-05-06

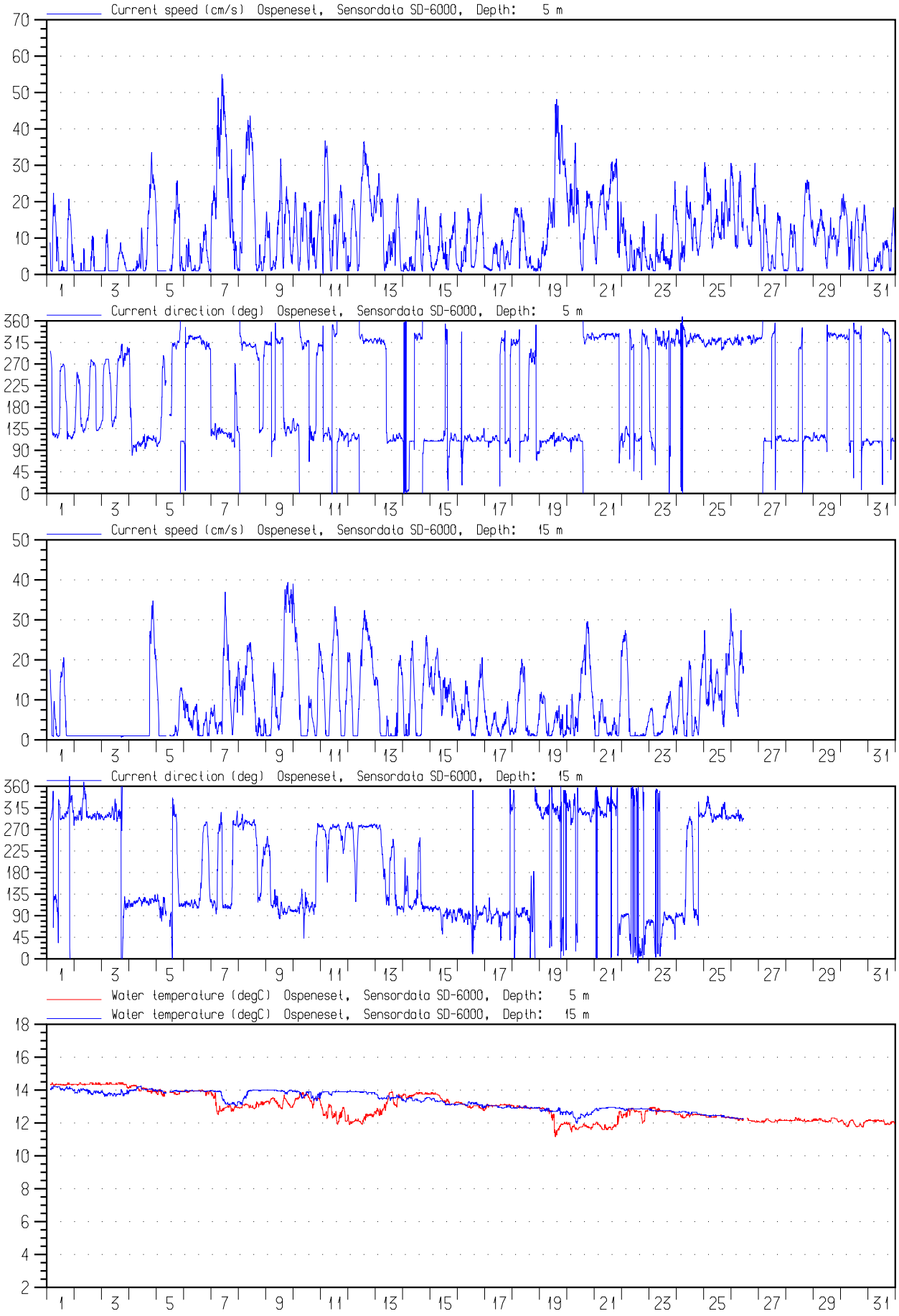
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT Sensordata SD6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD (gmt): 2011.09.01 00-2011.09.30 23
Fugro OCEANOR	*Oceanographic Company of Norway*		PROJECT C55471	FIGURE 9

Date: 2013-05-06

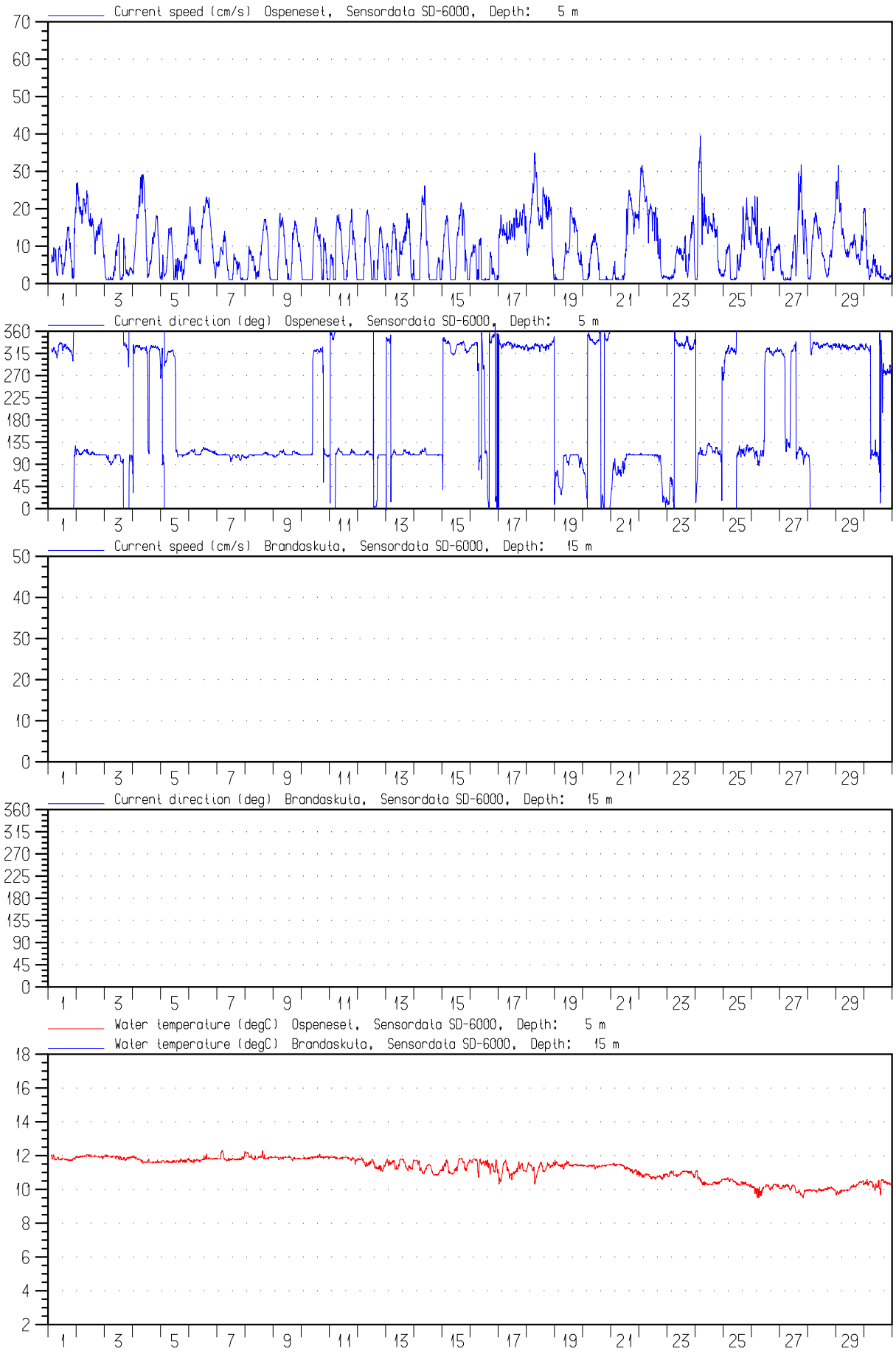
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT: Sensordata SD6000
LOCATION: Ospeneset	STATION: 01	WATER DEPTH: 300 m	INSTRUMENT DEPTH: 15 m	OBSERVATION PERIOD (gmt): 2011.10.01 00-2011.10.31 23
Fugro OCEANOR — *Oceanographic Company of Norway*			PROJECT: C55471	FIGURE: 10

Date: 2013-05-06

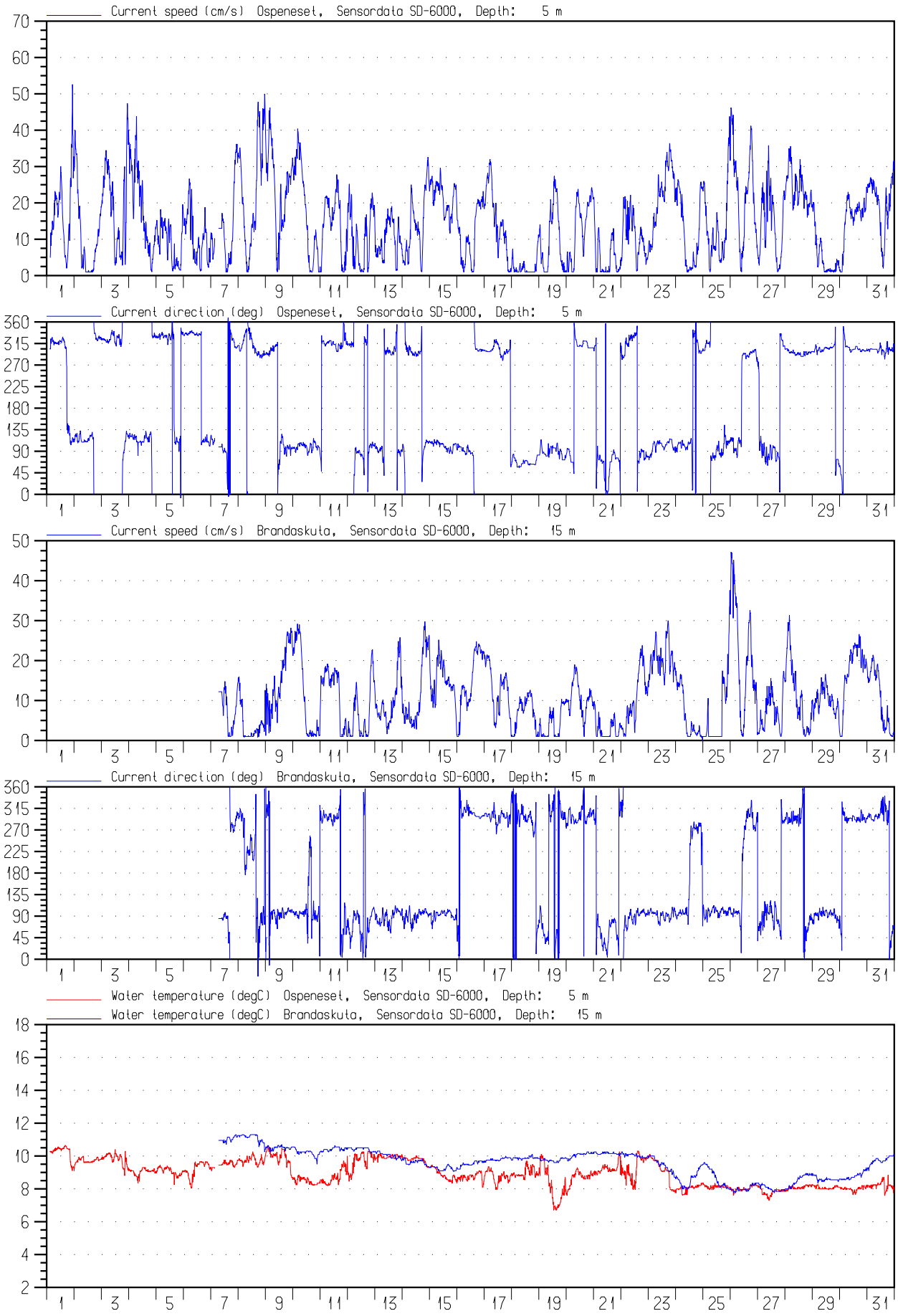
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT: Sensordata SD6000
LOCATION: Ospeneset	STATION: 01	WATER DEPTH: 300 m	INSTRUMENT DEPTH: 15 m	OBSERVATION PERIOD (gmt): 2011.11.01 00-2011.11.30 23
Fugro OCEANOR — *Oceanographic Company of Norway*			PROJECT: C55471	FIGURE: 11

Date: 2013-05-06

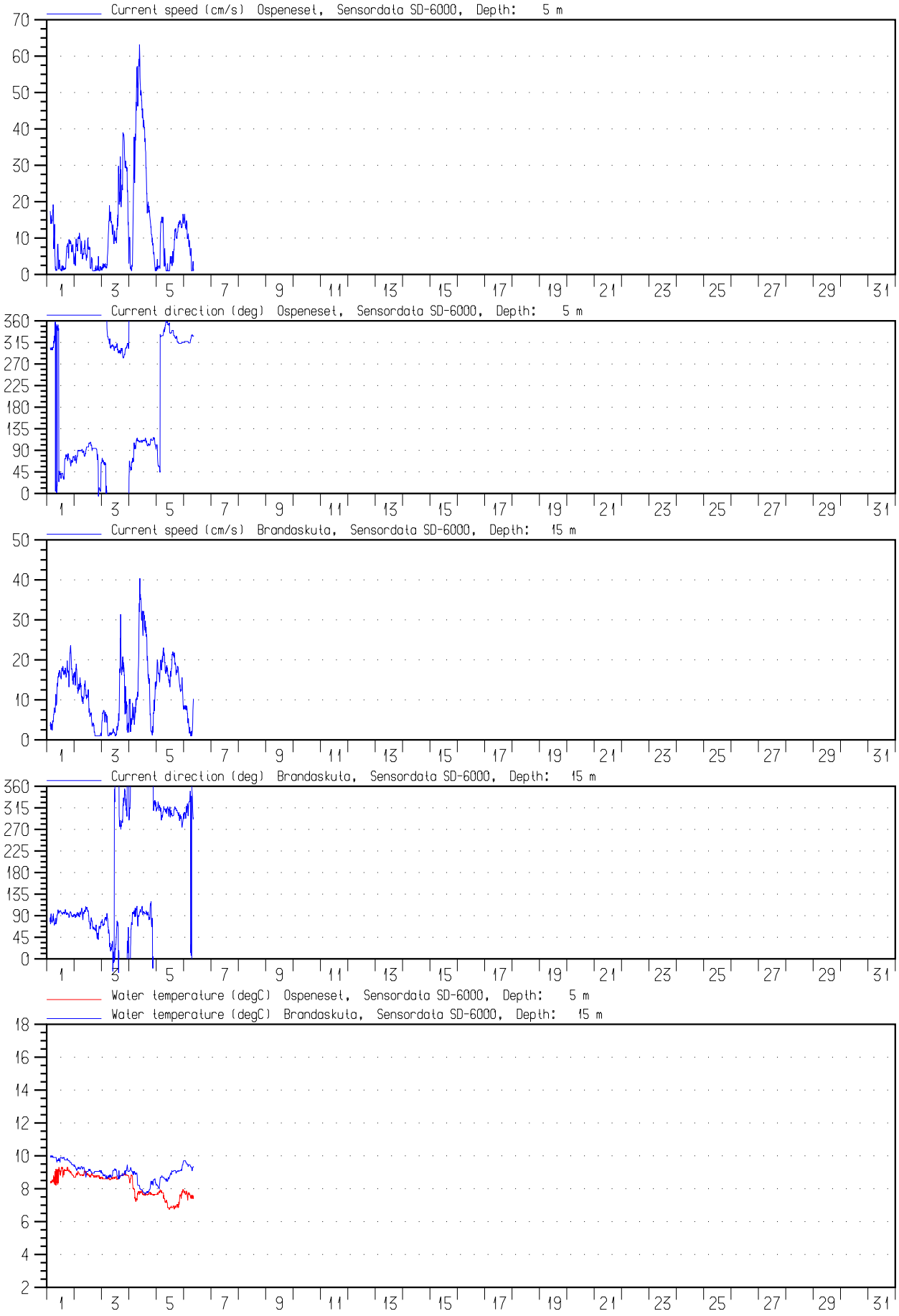
Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT Sensordata SD6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD (gmt): 2011.12.01 00-2011.12.31 23
Fugro OCEANOR	*Oceanographic Company of Norway*		PROJECT C55471	FIGURE 12

Date: 2013-05-06

Orkan/orkapp/v4.1.5



Ospeneset				INSTRUMENT: Sensordata SD6000
LOCATION: Ospeneset	STATION: 01	WATER DEPTH: 300 m	INSTRUMENT DEPTH: 15 m	OBSERVATION PERIOD (gmt): 2012.01.01 00-2012.01.31 23
Fugro OCEANOR — *Oceanographic Company of Norway*			PROJECT: C55471	FIGURE: 13

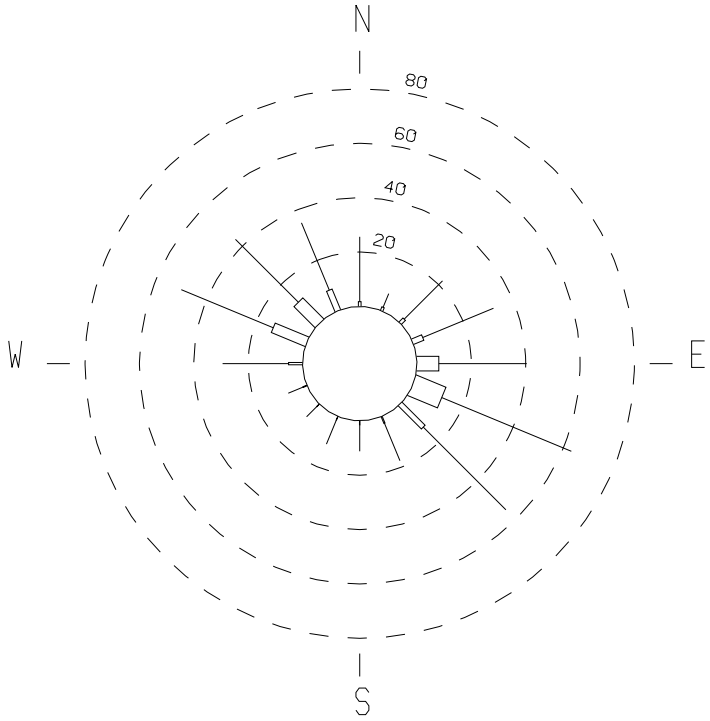
Date: 2013-05-06

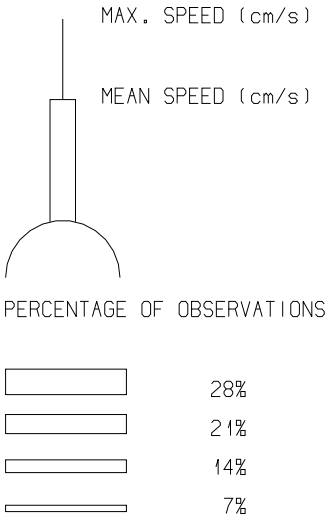
Orkan/orkapp/v4.1.5

Vedlegg B

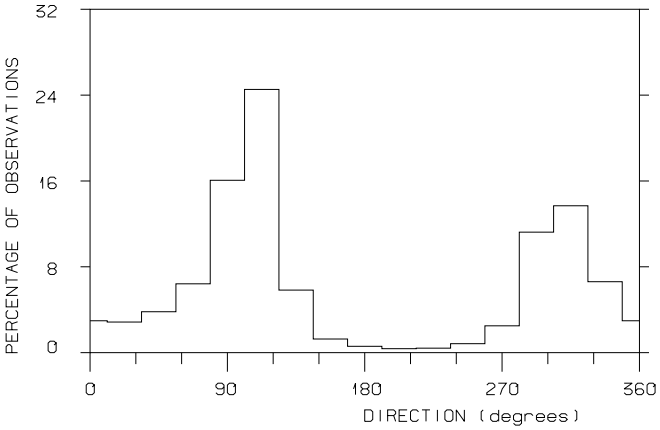
Retningsstatistikk av strømhastighet ved Ospeneset

Måledyp: 5 m og 15 m

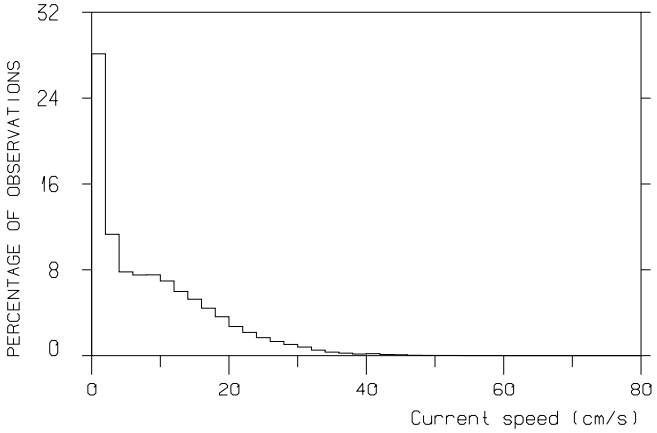




Current direction HISTOGRAM



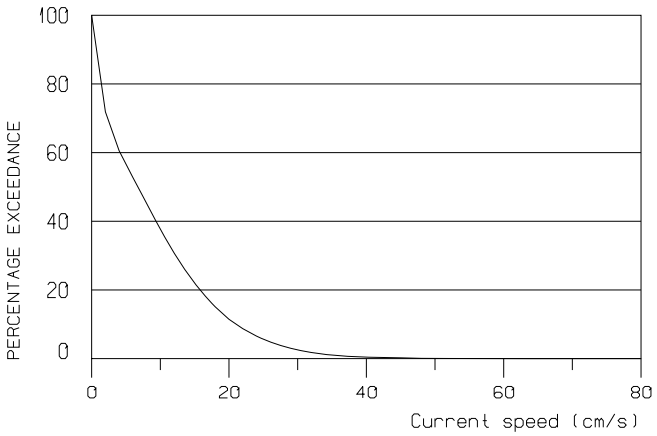
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 49287
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 63 cm/s DIRECTION: 109°
VECTOR MEAN MAGNITUDE: 2.1 cm/s DIRECTION: 69°
MEAN MAGNITUDE: 9.0 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 31 E: 60 S: 38 W: 46
DIRECTIONAL STABILITY: 23 %

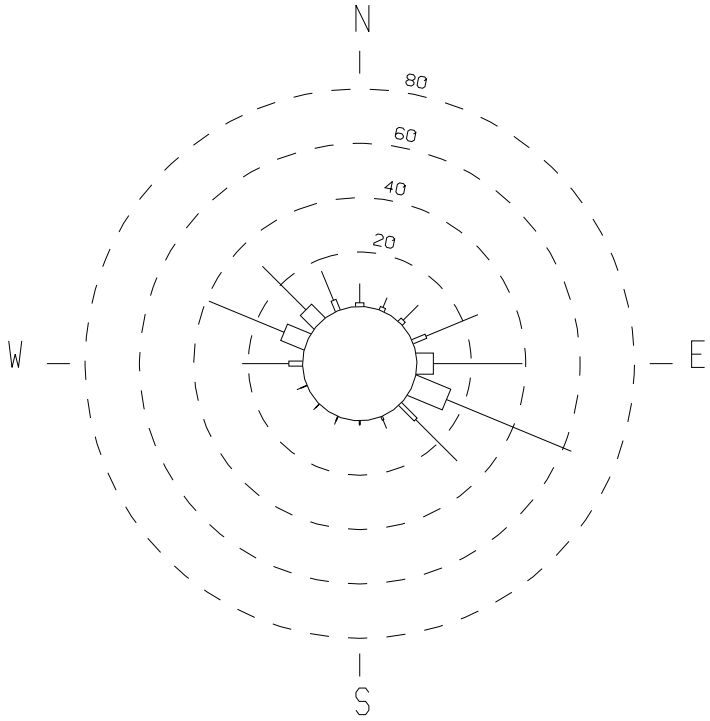
Current speed DISTRIBUTION

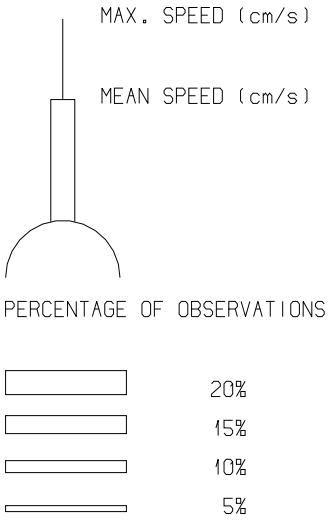


Summary statistics				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.01.06 00-2012.01.06 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

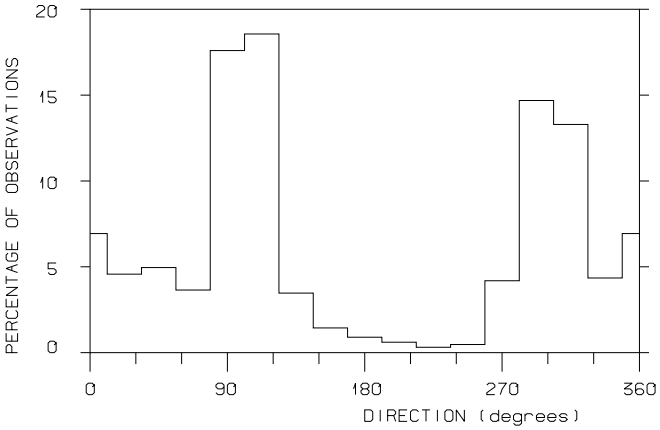
Date: 2013-05-06

Orkan/orkapp/v4.1.5

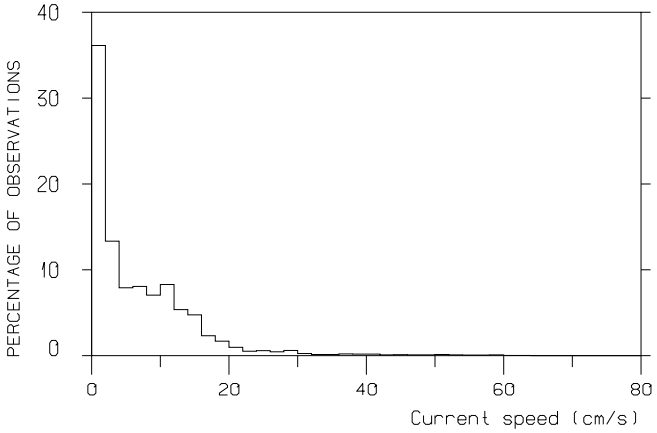




Current direction HISTOGRAM



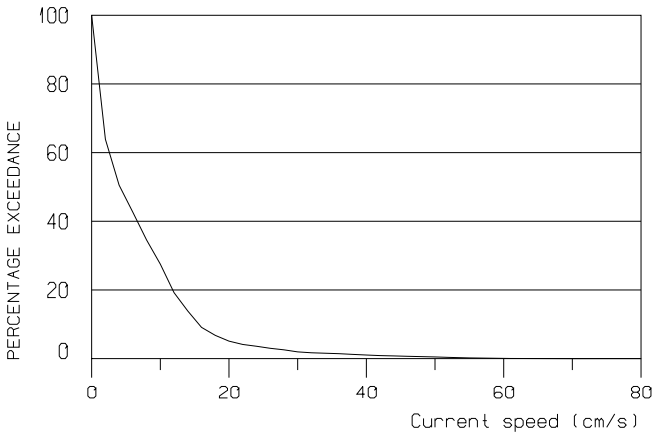
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4439
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 63 cm/s DIRECTION: 109°
VECTOR MEAN MAGNITUDE: 1.7 cm/s DIRECTION: 76°
MEAN MAGNITUDE: 7.0 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 18 E: 60 S: 25 W: 38
DIRECTIONAL STABILITY: 24 %

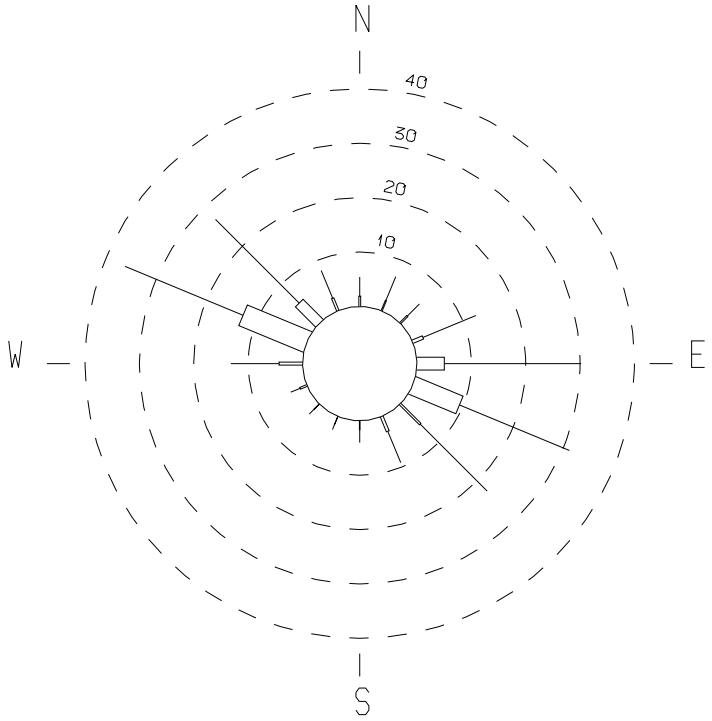
Current speed DISTRIBUTION

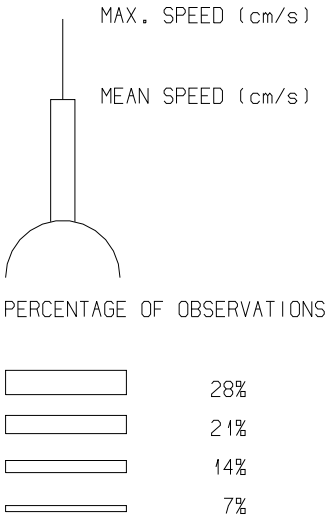


Monthly statistics for January from 2011 to 2012				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.01.01 00-2012.01.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

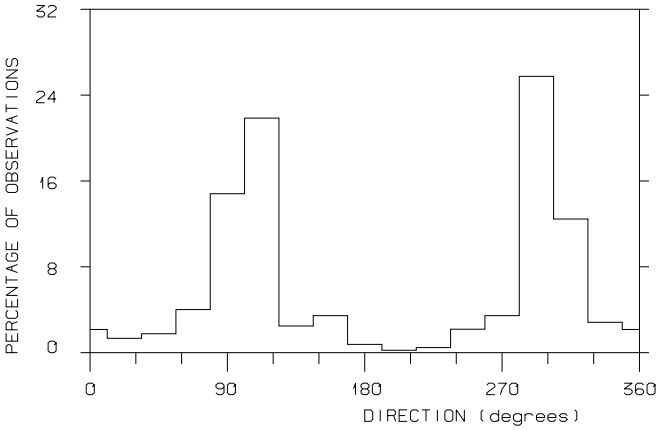
Date: 2013-05-06

Orkan/orkapp/v4.1.5

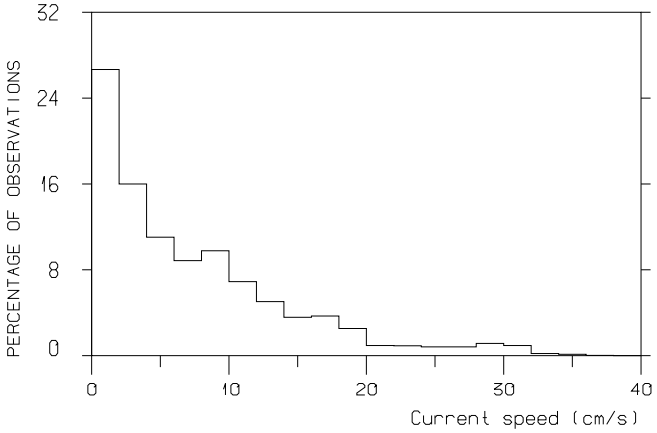




Current direction HISTOGRAM



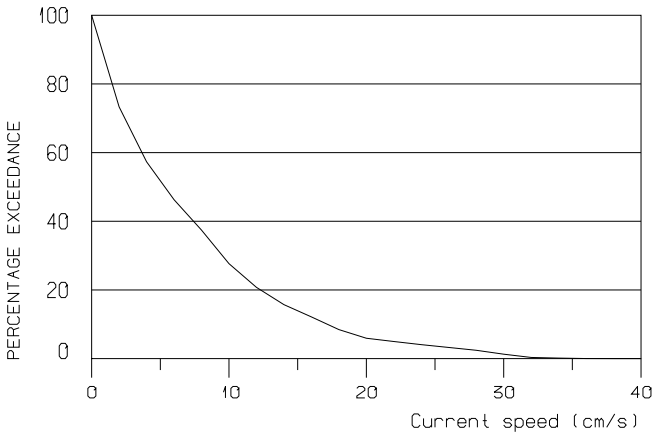
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4031
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 36 cm/s DIRECTION: 293°
VECTOR MEAN MAGNITUDE: 1.2 cm/s DIRECTION: 318°
MEAN MAGNITUDE: 7.4 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 17 E: 30 S: 13 W: 34
DIRECTIONAL STABILITY: 16 %

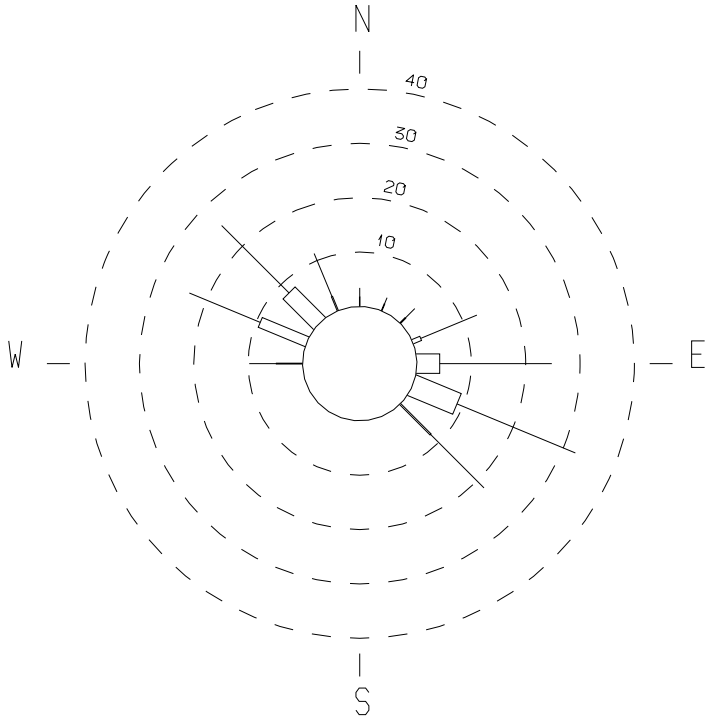
Current speed DISTRIBUTION

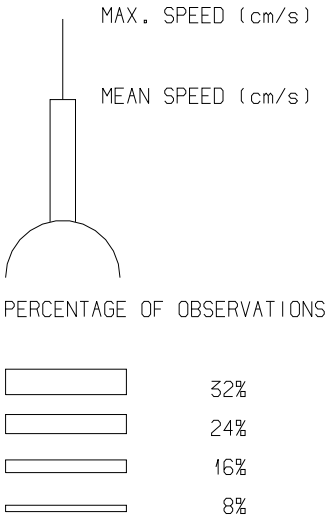


Monthly statistics for February 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.02.01 00-2011.02.28 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

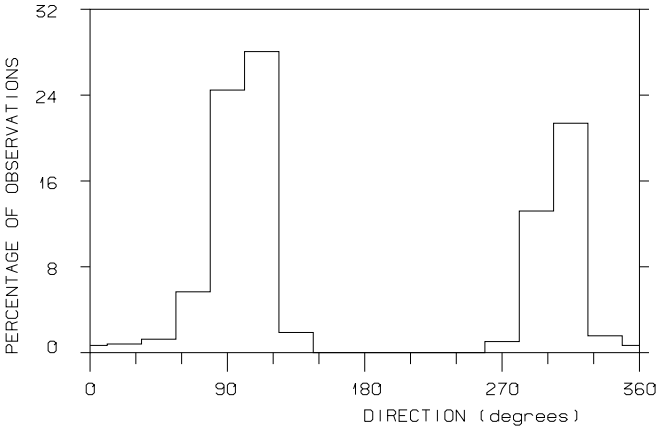
Date: 2013-05-06

Orkan/orkapp/v4.1.5

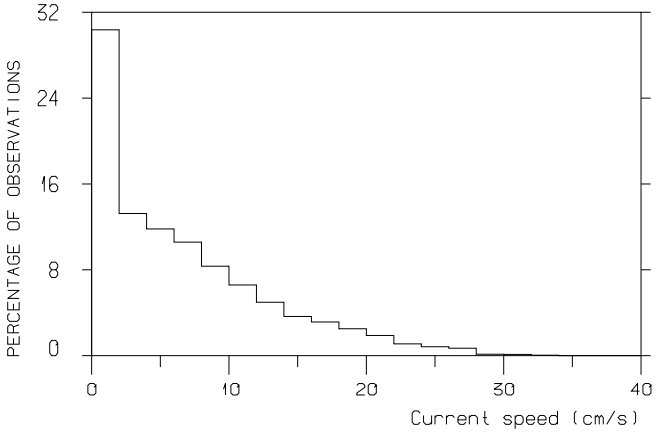




Current direction HISTOGRAM



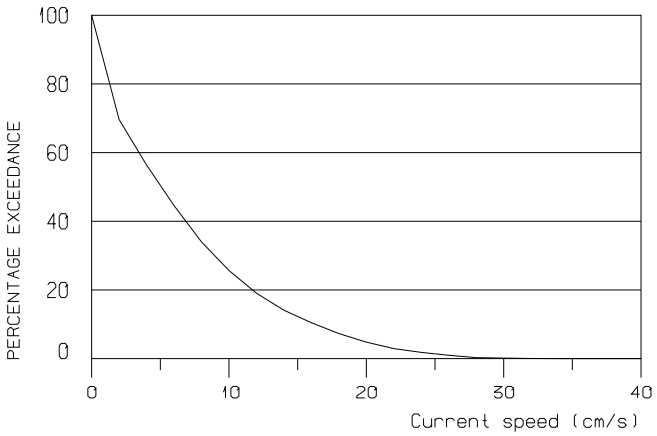
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4462
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 32 cm/s DIRECTION: 116°
VECTOR MEAN MAGNITUDE: 1.3 cm/s DIRECTION: 57°
MEAN MAGNITUDE: 6.8 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 18 E: 30 S: 15 W: 20
DIRECTIONAL STABILITY: 19 %

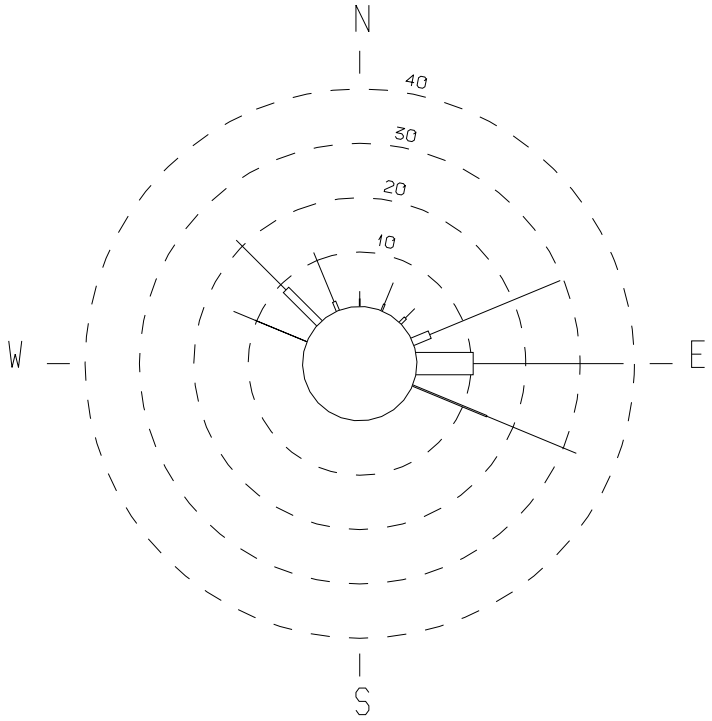
Current speed DISTRIBUTION

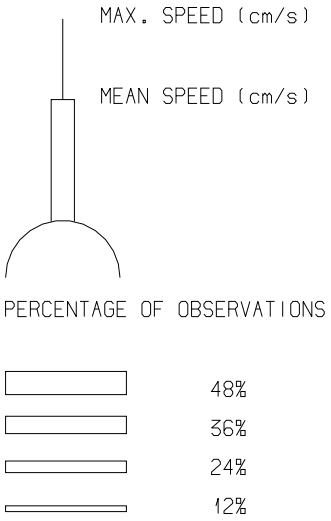


Monthly statistics for March 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.03.01 00-2011.03.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

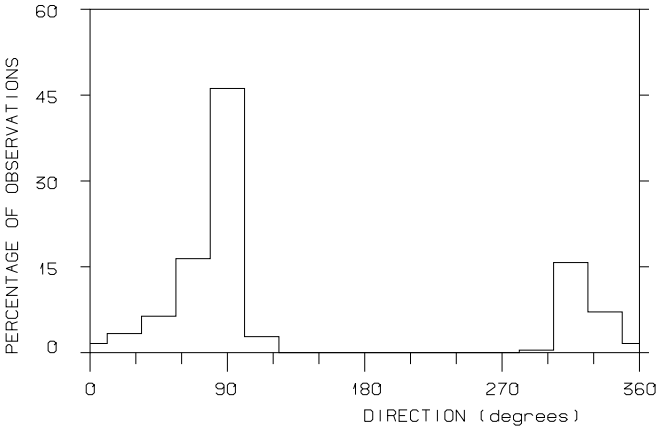
Date: 2013-05-06

Orkan/orkapp/v4.1.5

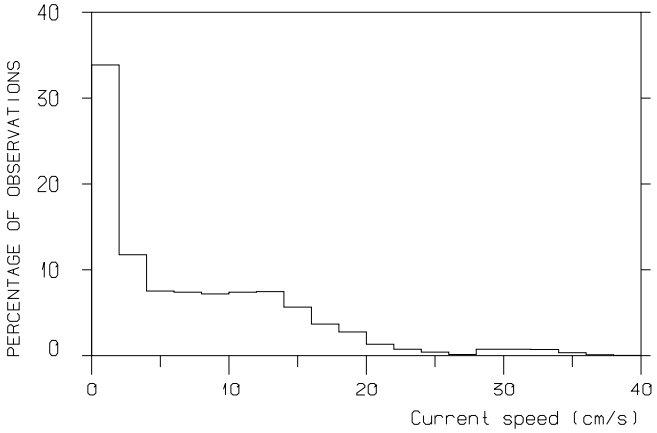




Current direction HISTOGRAM



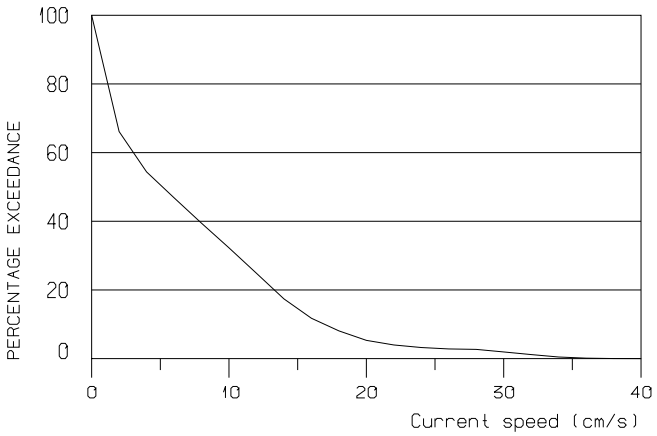
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 2935
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 38 cm/s DIRECTION: 95°
VECTOR MEAN MAGNITUDE: 4.8 cm/s DIRECTION: 77°
MEAN MAGNITUDE: 7.4 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 13 E: 38 S: 8 W: 17
DIRECTIONAL STABILITY: 64 %

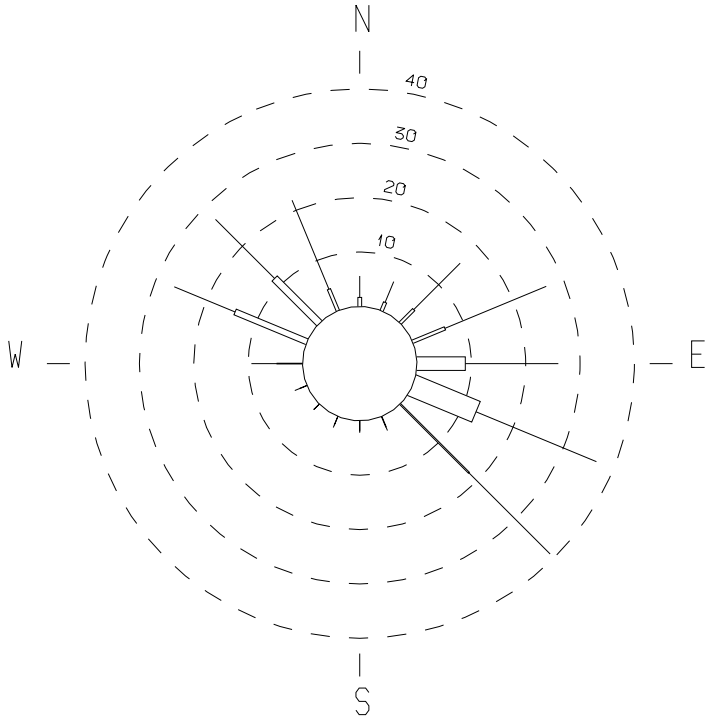
Current speed DISTRIBUTION

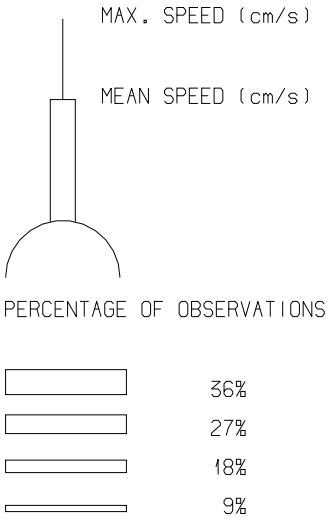


Monthly statistics for April 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.04.01 00-2011.04.30 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

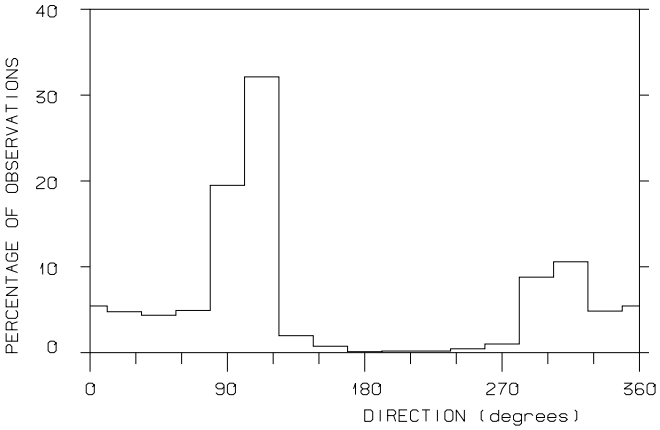
Date: 2013-05-06

Orkan/orkapp/v4.1.5

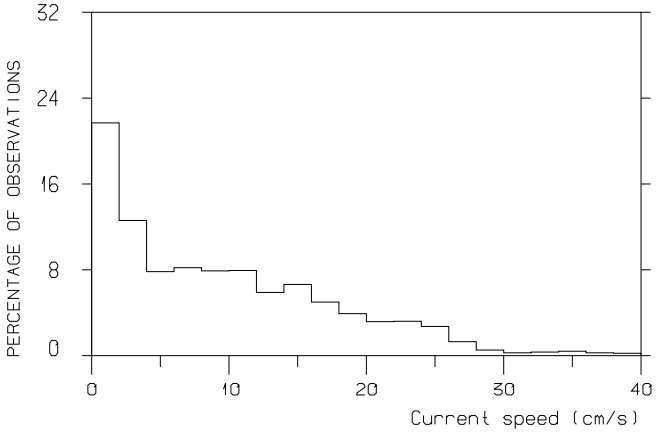




Current direction HISTOGRAM



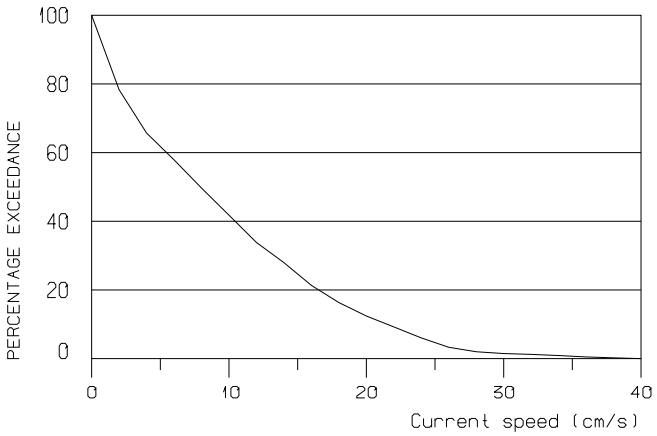
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 2683
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 39 cm/s DIRECTION: 124°
VECTOR MEAN MAGNITUDE: 4.0 cm/s DIRECTION: 88°
MEAN MAGNITUDE: 9.6 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 19 E: 32 S: 23 W: 24
DIRECTIONAL STABILITY: 42 %

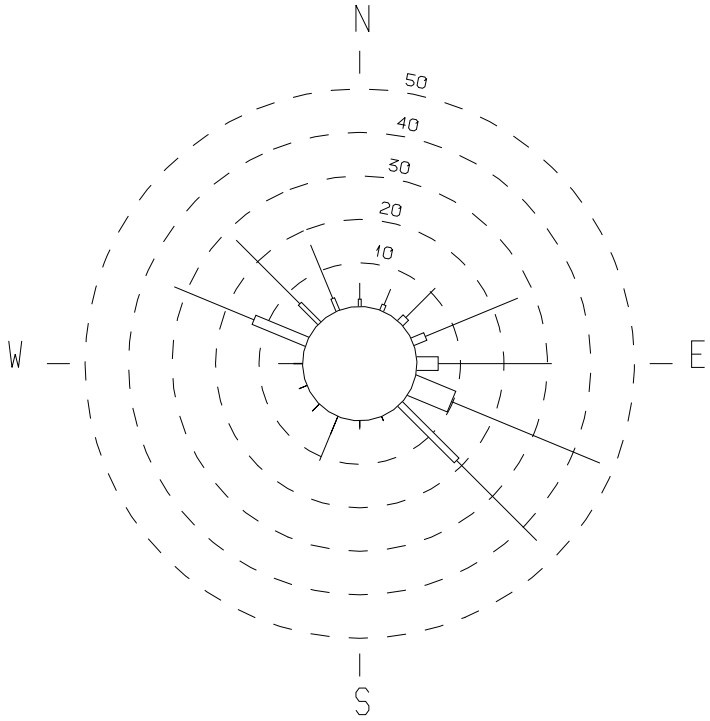
Current speed DISTRIBUTION

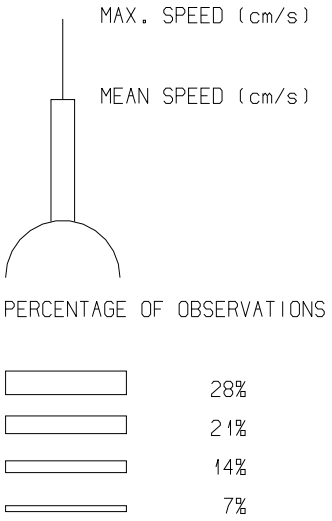


Monthly statistics for May 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.05.01 00-2011.05.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

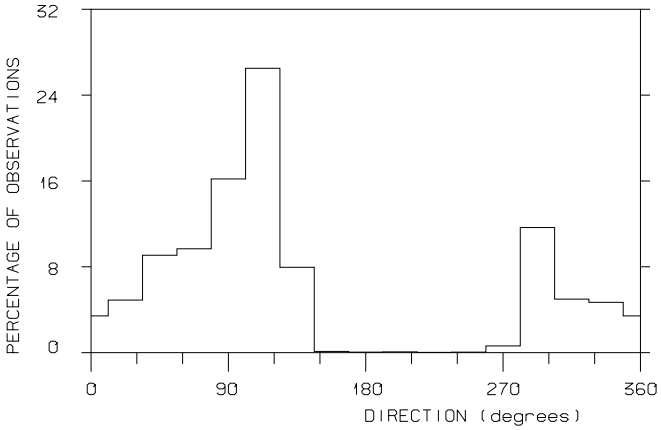
Date: 2013-05-06

Orkan/orkapp/v4.1.5

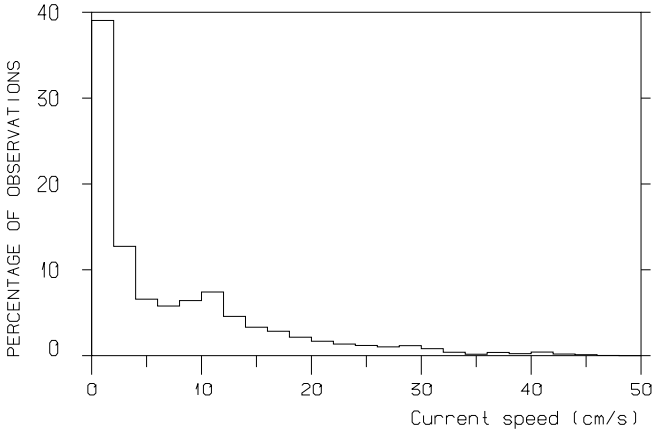




Current direction HISTOGRAM



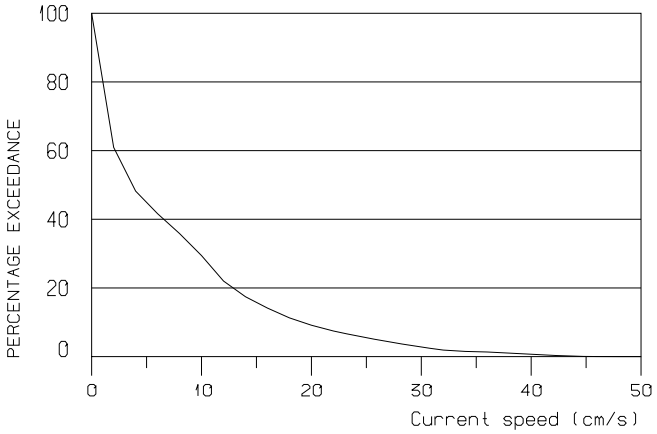
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4287
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 47 cm/s DIRECTION: 121°
VECTOR MEAN MAGNITUDE: 3.0 cm/s DIRECTION: 103°
MEAN MAGNITUDE: 7.4 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 20 E: 40 S: 31 W: 31
DIRECTIONAL STABILITY: 41 %

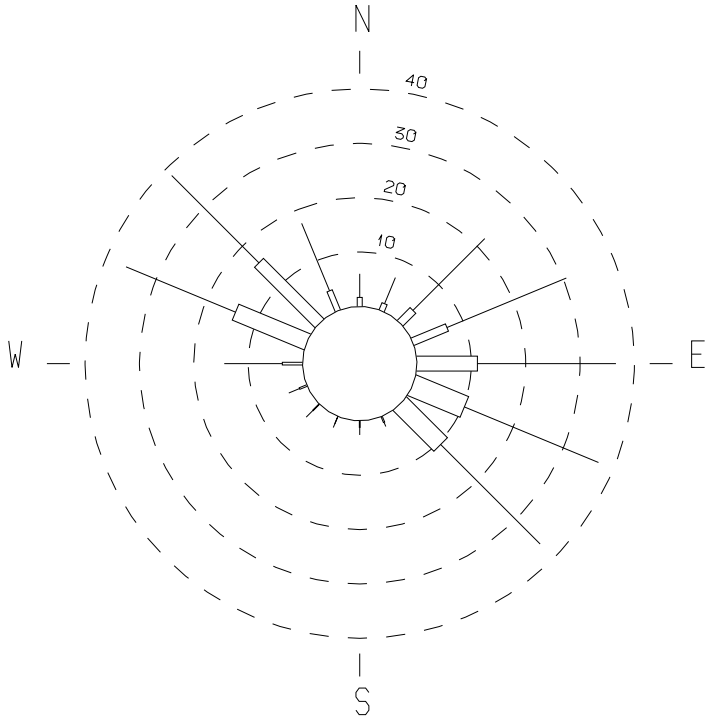
Current speed DISTRIBUTION

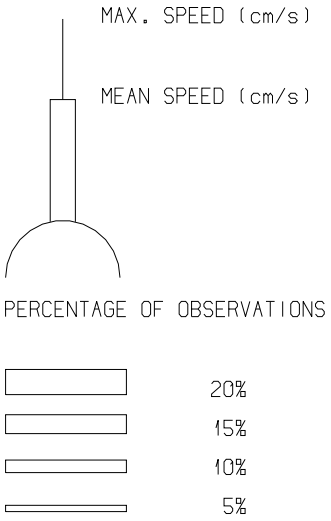


Monthly statistics for June 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.06.01 00-2011.06.30 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

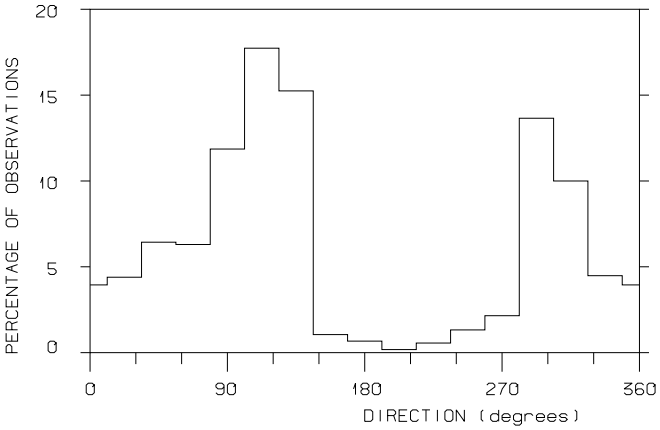
Date: 2013-05-06

Orkan/orkapp/v4.1.5

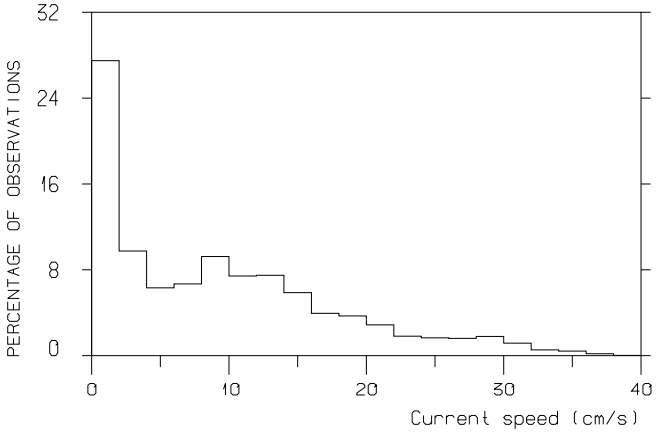




Current direction HISTOGRAM



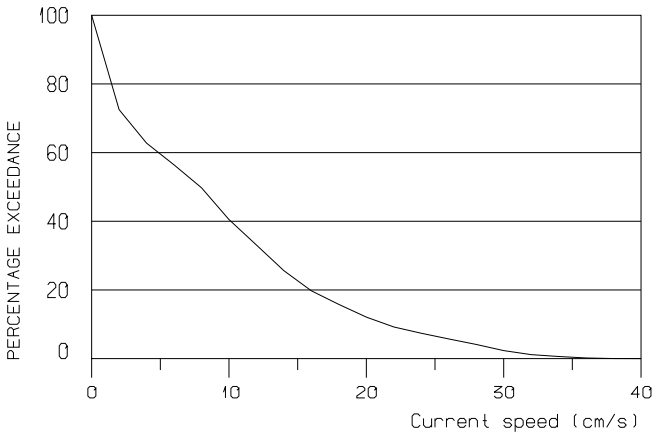
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4460
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 38 cm/s DIRECTION: 306°
VECTOR MEAN MAGNITUDE: 1.8 cm/s DIRECTION: 70°
MEAN MAGNITUDE: 9.3 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 27 E: 36 S: 23 W: 31
DIRECTIONAL STABILITY: 20 %

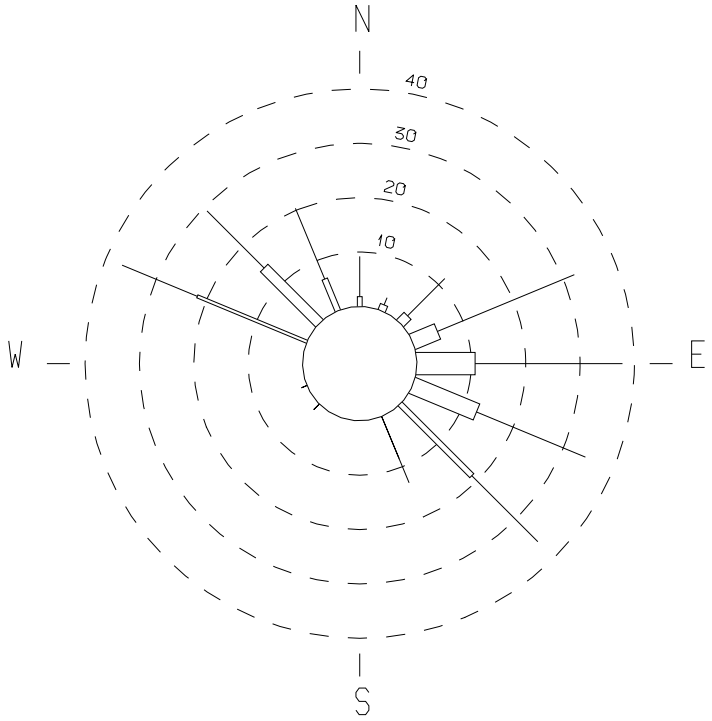
Current speed DISTRIBUTION

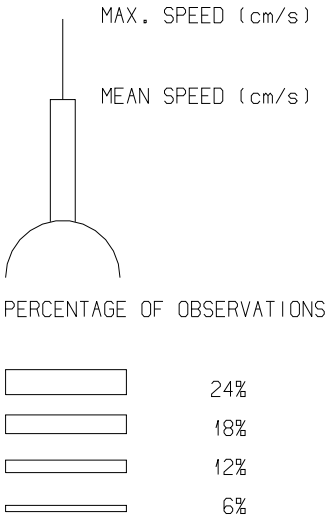


Monthly statistics for July 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.07.01 00-2011.07.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

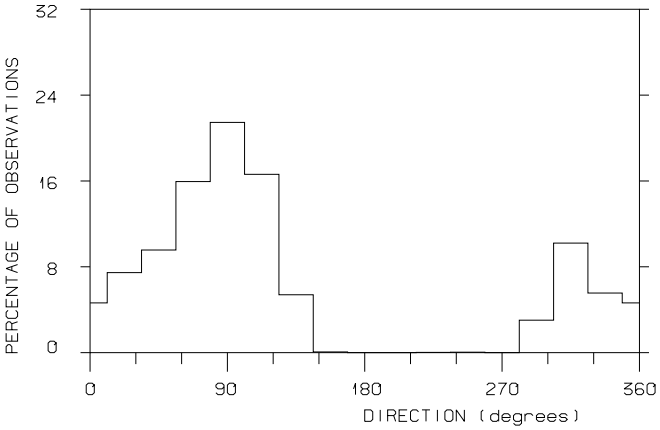
Date: 2013-05-06

Orkan/orkapp/v4.1.5

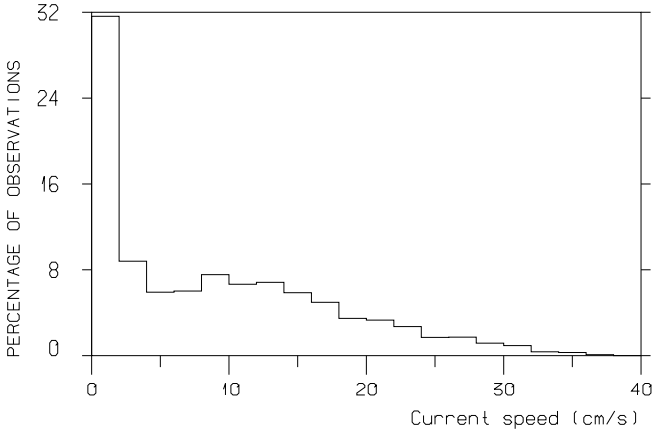




Current direction HISTOGRAM



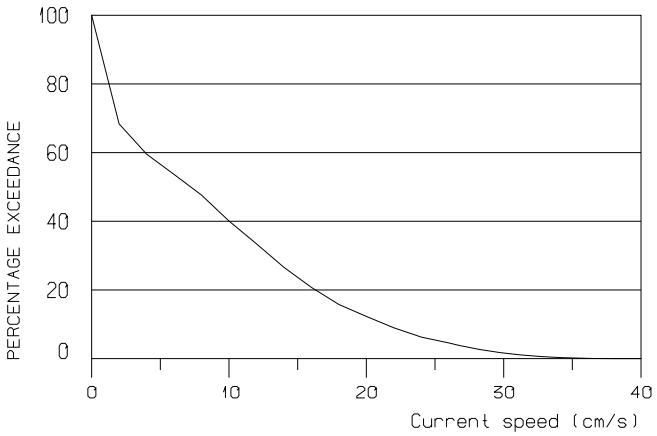
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4465
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 38 cm/s DIRECTION: 98°
VECTOR MEAN MAGNITUDE: 4.2 cm/s DIRECTION: 80°
MEAN MAGNITUDE: 9.0 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 21 E: 37 S: 27 W: 34
DIRECTIONAL STABILITY: 46 %

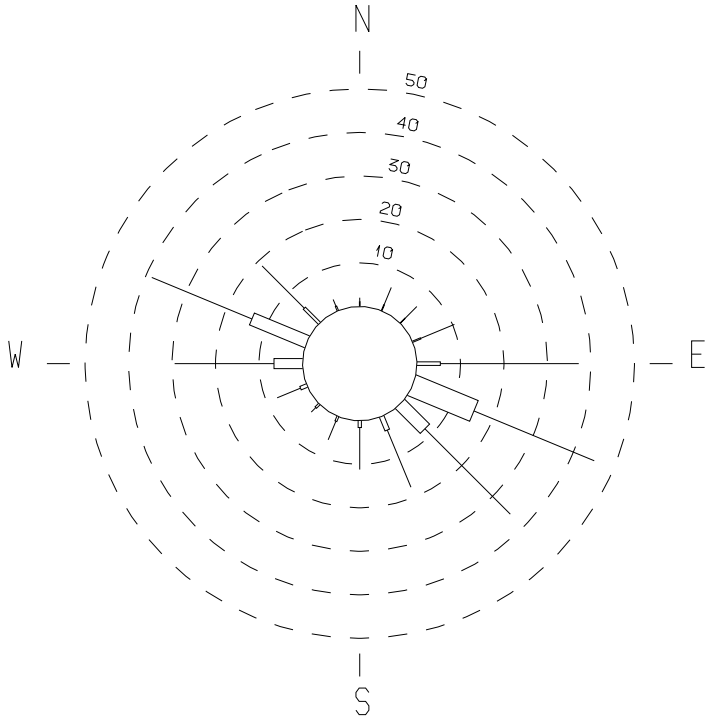
Current speed DISTRIBUTION

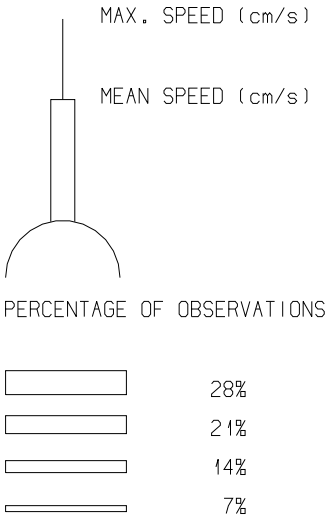


Monthly statistics for August 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.08.01 00-2011.08.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

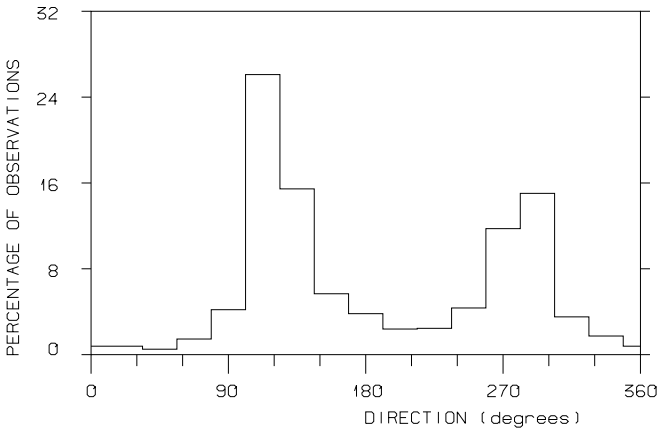
Date: 2013-05-06

Orkan/orkapp/v4.1.5

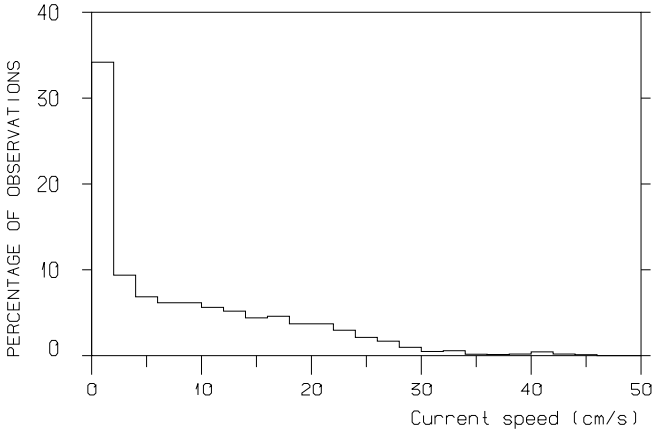




Current direction HISTOGRAM



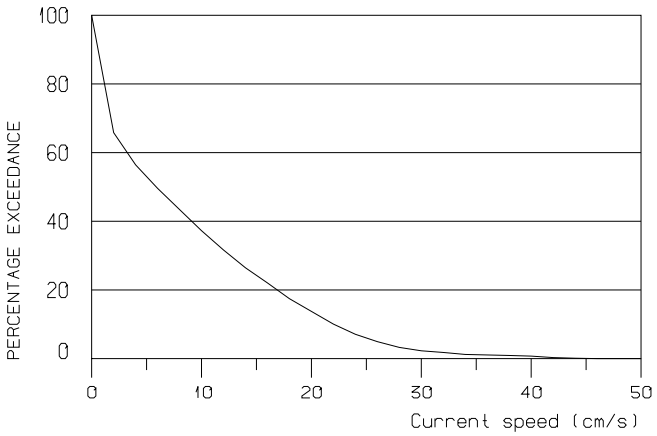
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4318
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 45 cm/s DIRECTION: 103°
VECTOR MEAN MAGNITUDE: 2.7 cm/s DIRECTION: 132°
MEAN MAGNITUDE: 8.9 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 15 E: 44 S: 21 W: 38
DIRECTIONAL STABILITY: 30 %

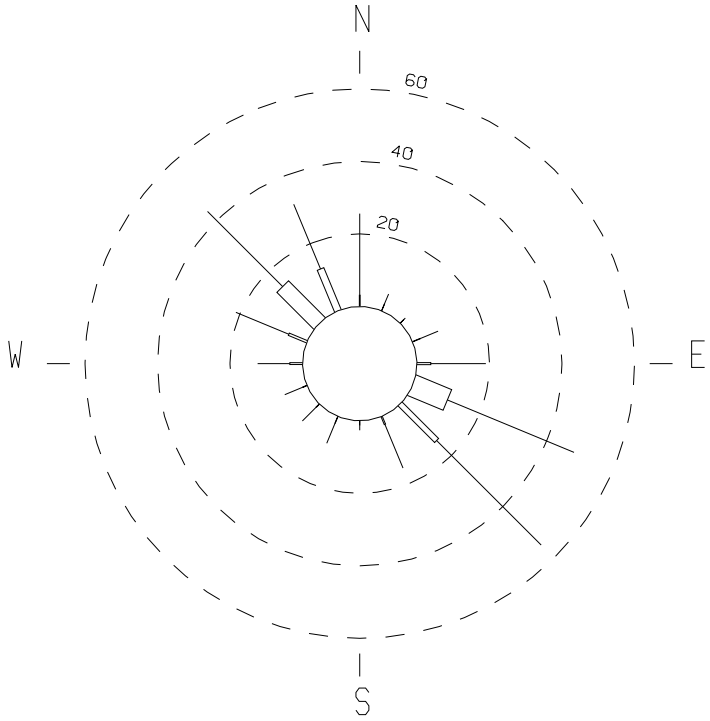
Current speed DISTRIBUTION

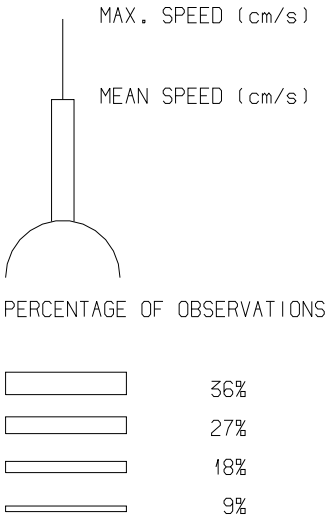


Monthly statistics for September 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.09.01 00-2011.09.30 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

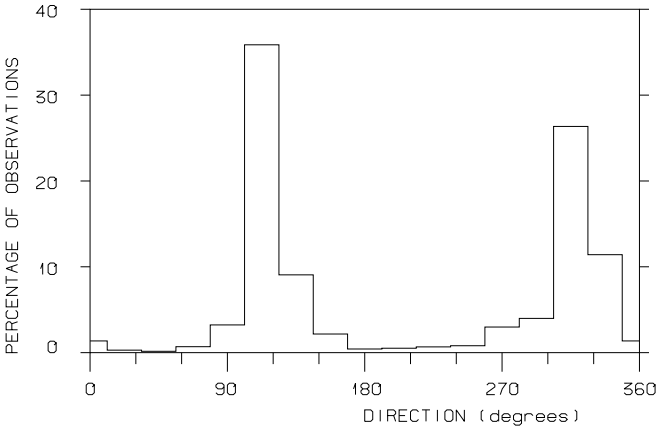
Date: 2013-05-06

Orkan/orkapp/v4.1.5

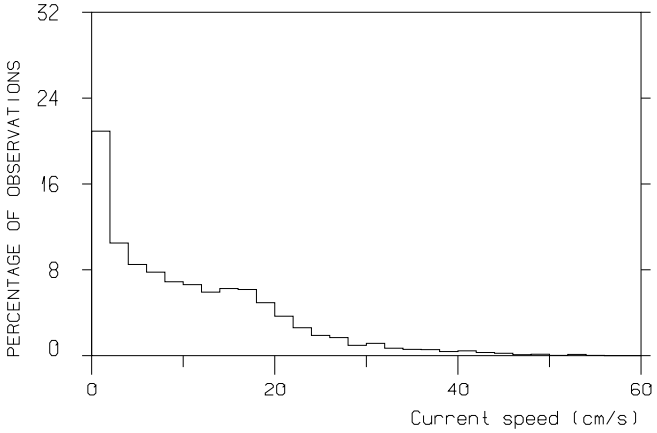




Current direction HISTOGRAM



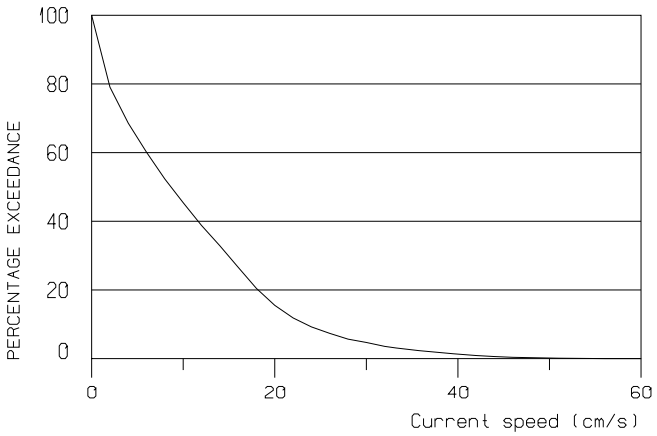
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4459
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 55 cm/s DIRECTION: 129°
VECTOR MEAN MAGNITUDE: 2.0 cm/s DIRECTION: 30°
MEAN MAGNITUDE: 10.8 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 28 E: 44 S: 38 W: 34
DIRECTIONAL STABILITY: 18 %

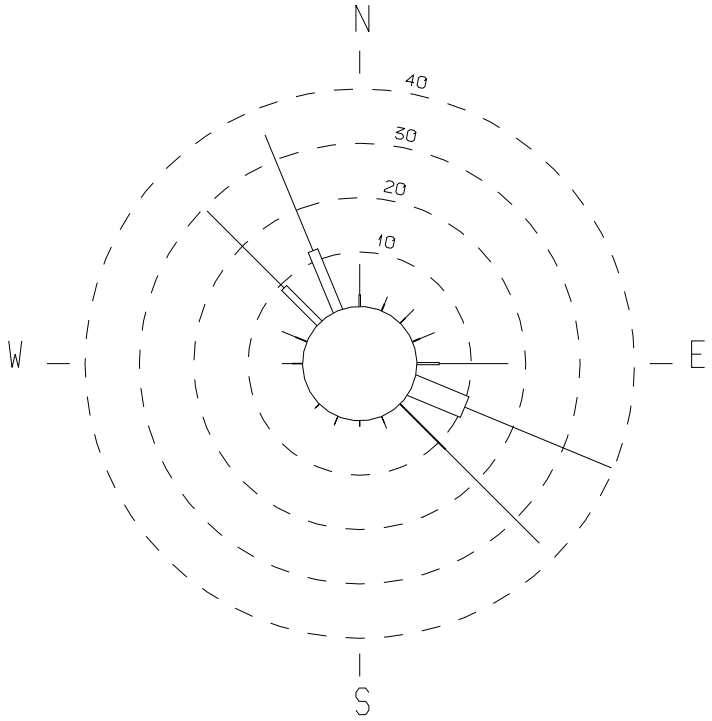
Current speed DISTRIBUTION

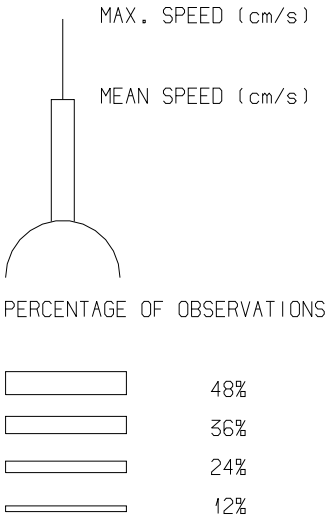


Monthly statistics for October 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.10.01 00-2011.10.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

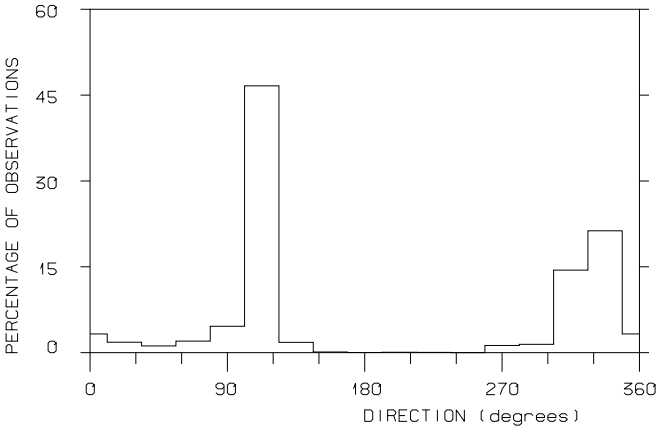
Date: 2013-05-06

Orkan/orkapp/v4.1.5

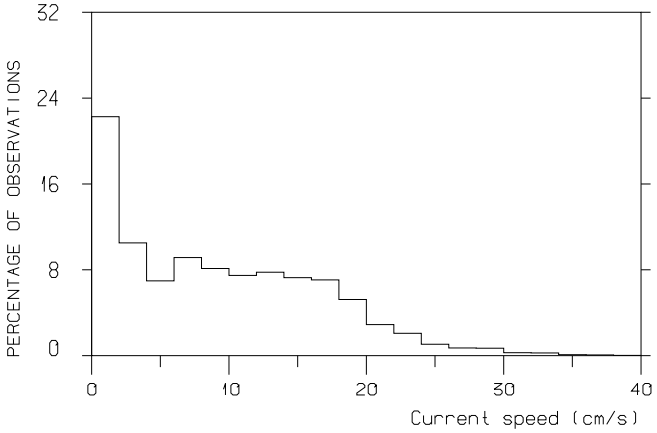




Current direction HISTOGRAM



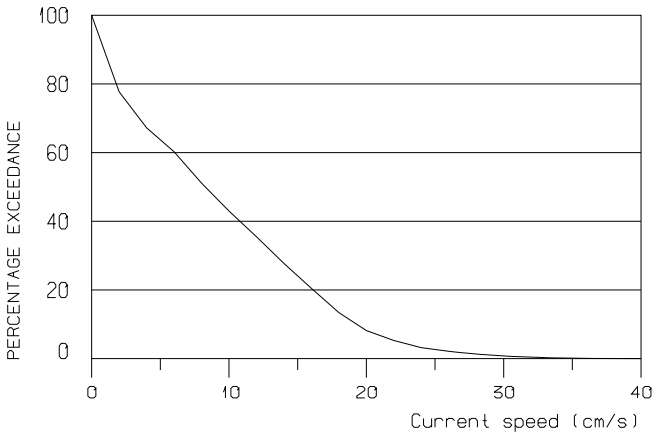
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4320
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 40 cm/s DIRECTION: 123°
VECTOR MEAN MAGNITUDE: 3.2 cm/s DIRECTION: 63°
MEAN MAGNITUDE: 9.3 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 31 E: 33 S: 22 W: 18
DIRECTIONAL STABILITY: 34 %

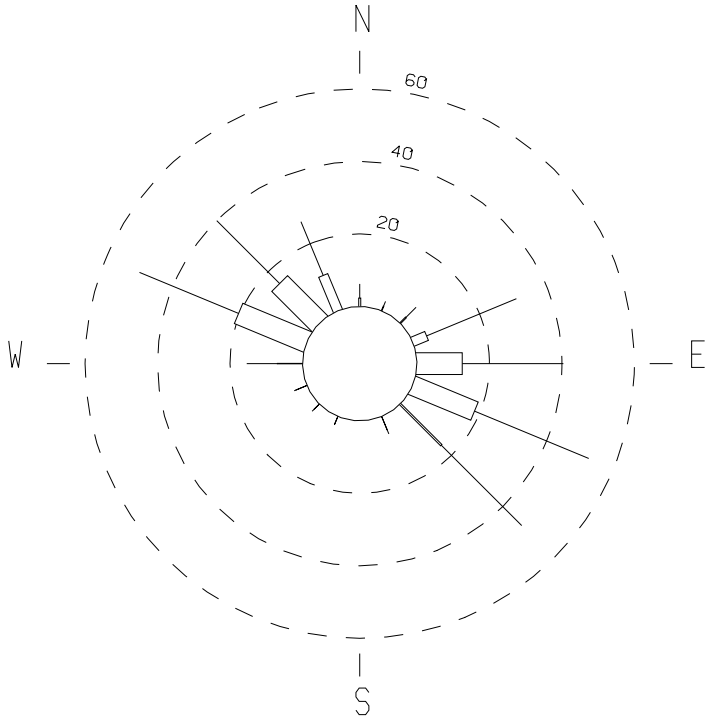
Current speed DISTRIBUTION

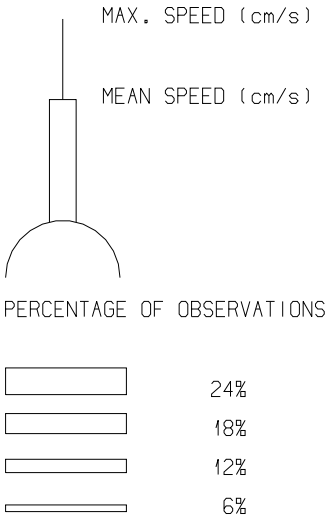


Monthly statistics for November 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.11.01 00-2011.11.30 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

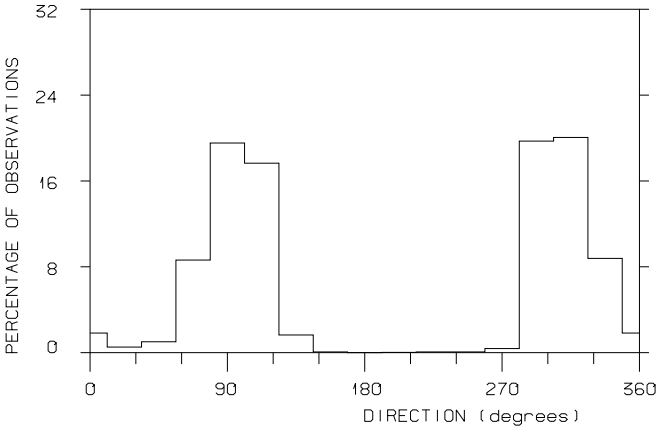
Date: 2013-05-06

Orkan/orkapp/v4.1.5

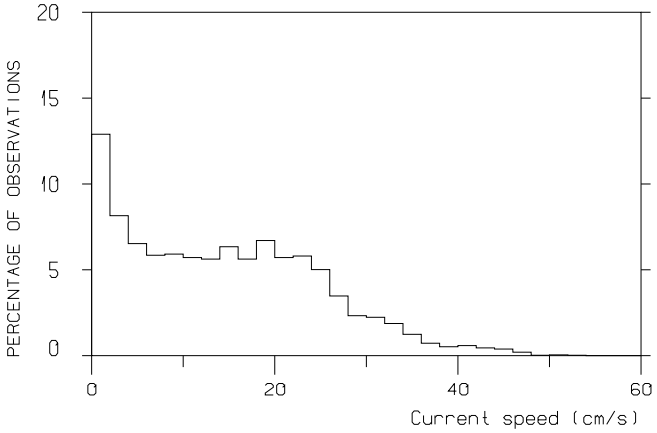




Current direction HISTOGRAM



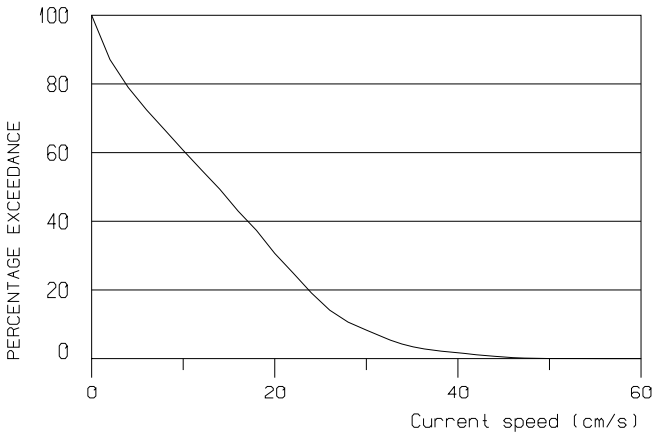
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4428
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 53 cm/s DIRECTION: 117°
VECTOR MEAN MAGNITUDE: 3.5 cm/s DIRECTION: 356°
MEAN MAGNITUDE: 14.5 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 26 E: 47 S: 28 W: 46
DIRECTIONAL STABILITY: 24 %

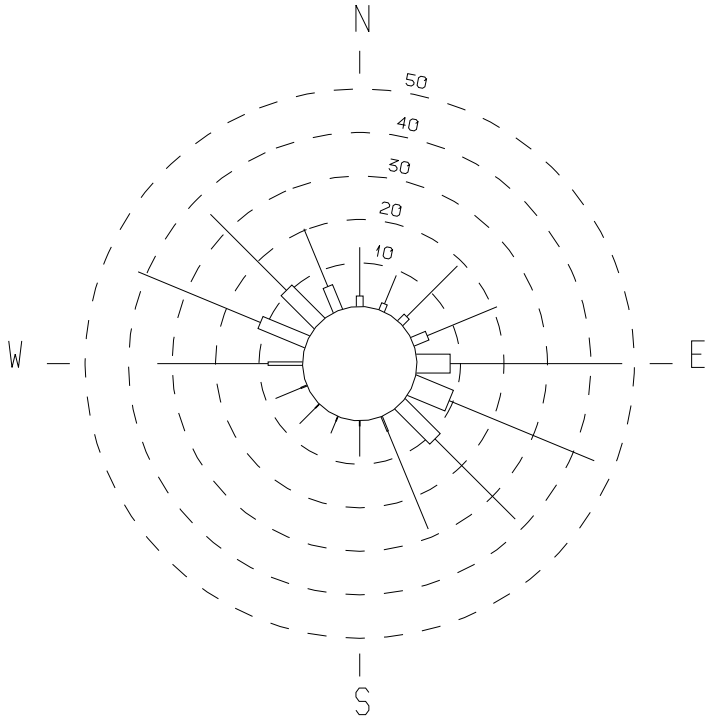
Current speed DISTRIBUTION

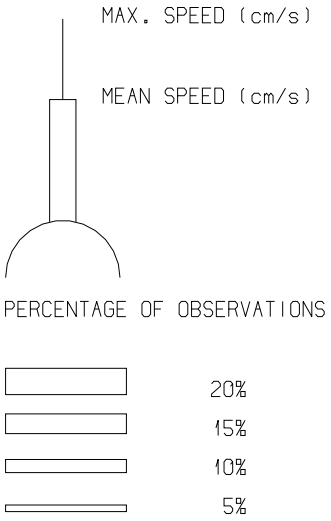


Monthly statistics for December 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 5 m	OBSERVATION PERIOD ( ): 2011.12.01 00-2011.12.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

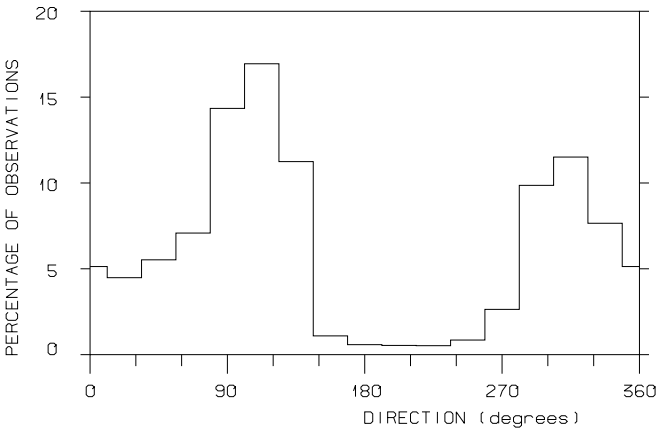
Date: 2013-05-06

Orkan/orkapp/v4.1.5

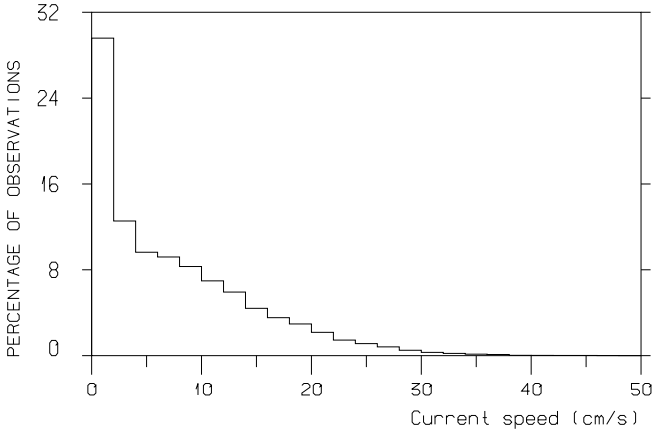




Current direction HISTOGRAM



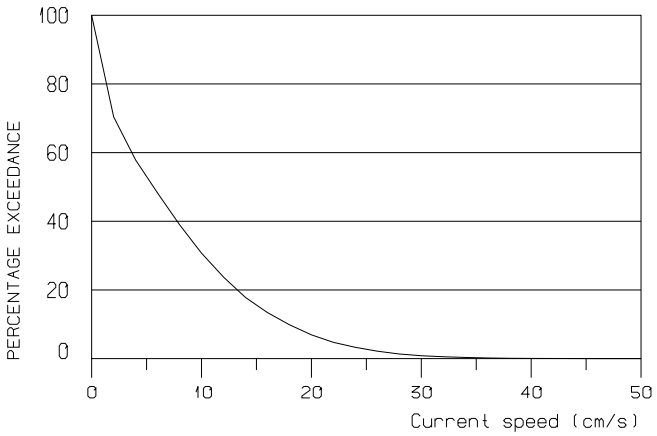
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 46428
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 47 cm/s DIRECTION: 94°
VECTOR MEAN MAGNITUDE: 1.6 cm/s DIRECTION: 69°
MEAN MAGNITUDE: 7.6 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 24 E: 47 S: 28 W: 40
DIRECTIONAL STABILITY: 21 %

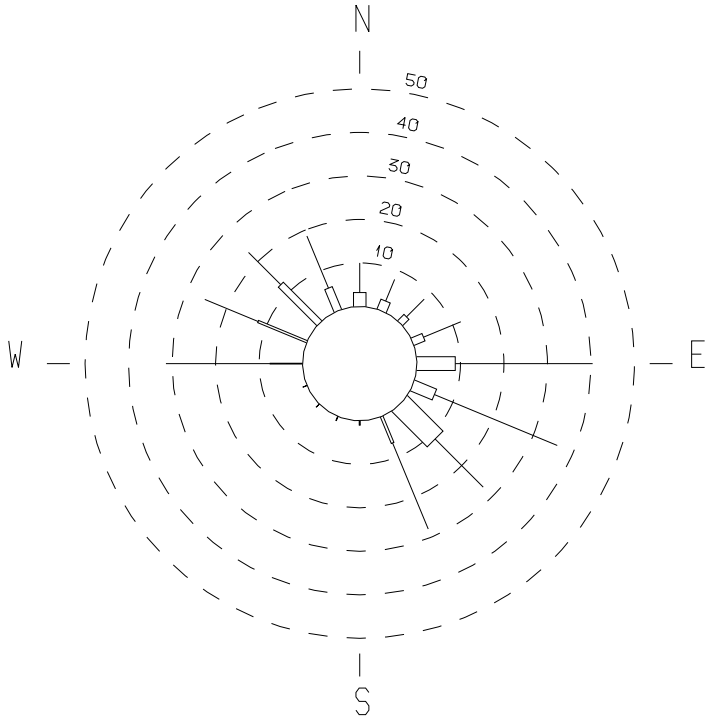
Current speed DISTRIBUTION

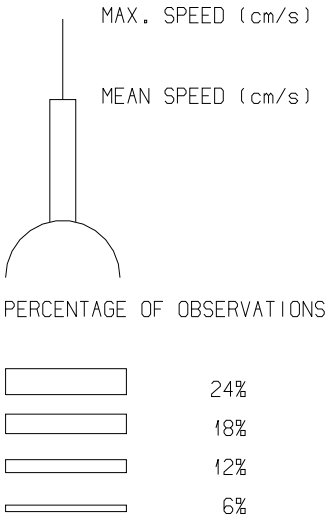


Summary statistics				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.01.06 00-2012.01.06 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

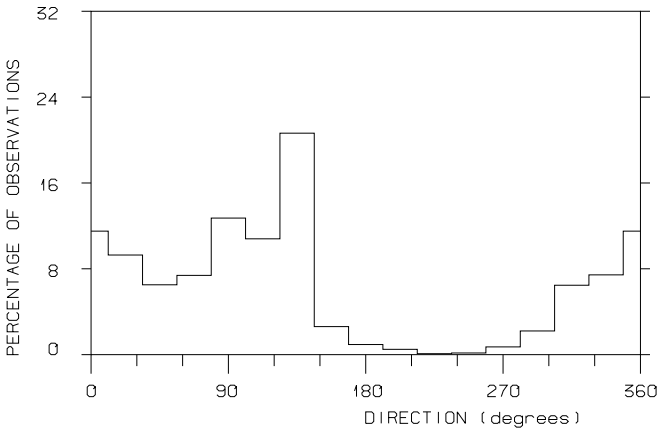
Date: 2013-05-06

Orkan/orkapp/v4.1.5

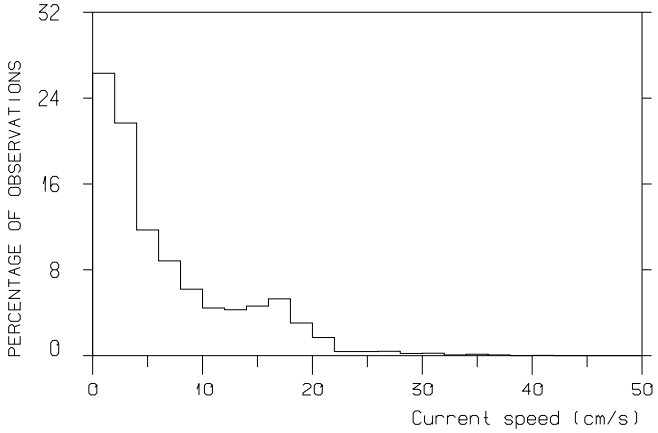




Current direction HISTOGRAM



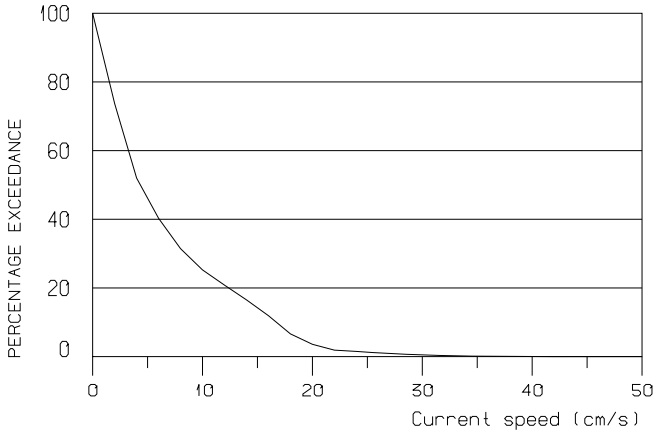
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4438
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 40 cm/s DIRECTION: 98°
VECTOR MEAN MAGNITUDE: 2.7 cm/s DIRECTION: 98°
MEAN MAGNITUDE: 6.7 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 17 E: 40 S: 24 W: 31
DIRECTIONAL STABILITY: 40 %

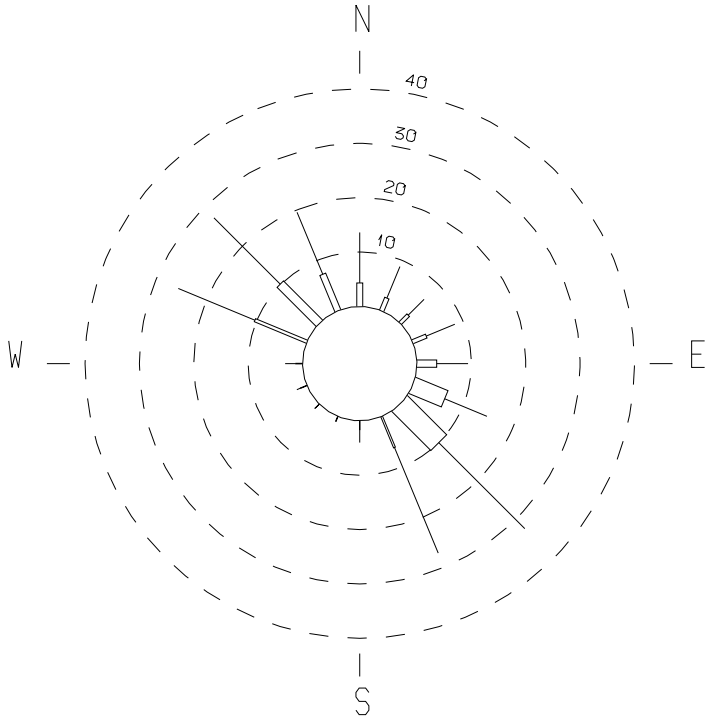
Current speed DISTRIBUTION

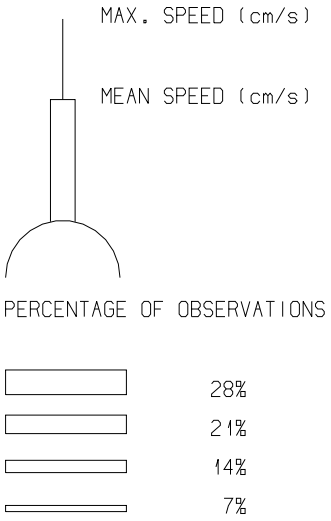


Monthly statistics for January from 2011 to 2012				INSTRUMENT Sensordata SD-6000
LOCATION Brandaskuta	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.01.01 00-2012.01.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

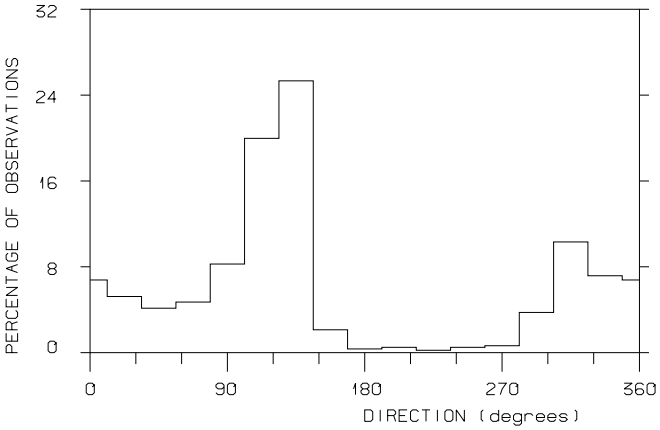
Date: 2013-05-06

Orkan/orkapp/v4.1.5

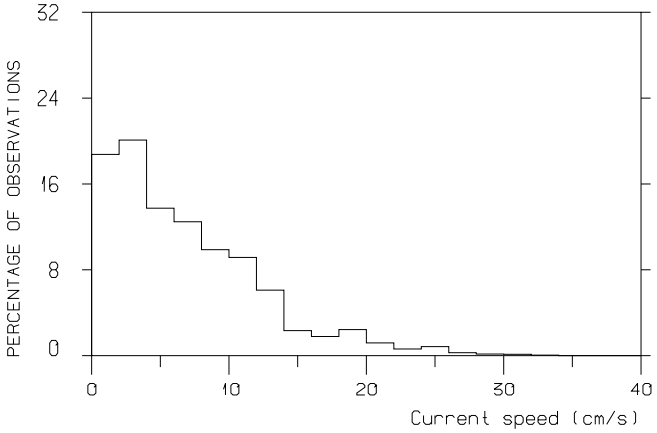




Current direction HISTOGRAM



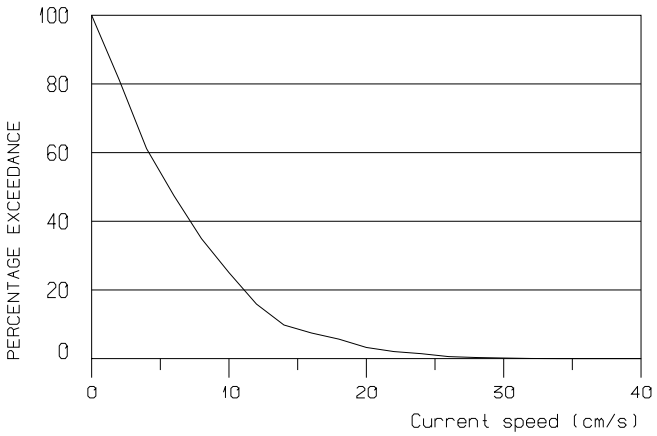
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4031
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 32 cm/s DIRECTION: 146°
VECTOR MEAN MAGNITUDE: 2.3 cm/s DIRECTION: 103°
MEAN MAGNITUDE: 6.9 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 20 E: 20 S: 27 W: 23
DIRECTIONAL STABILITY: 34 %

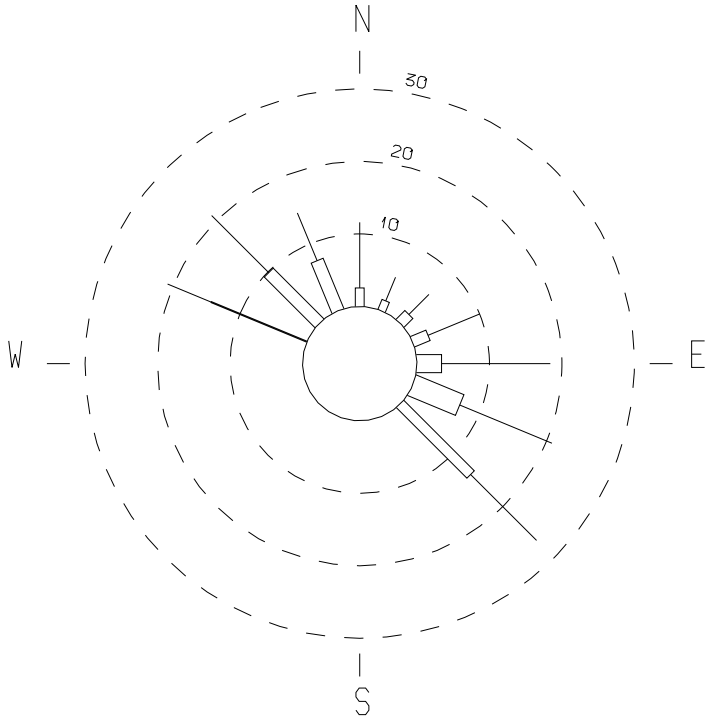
Current speed DISTRIBUTION

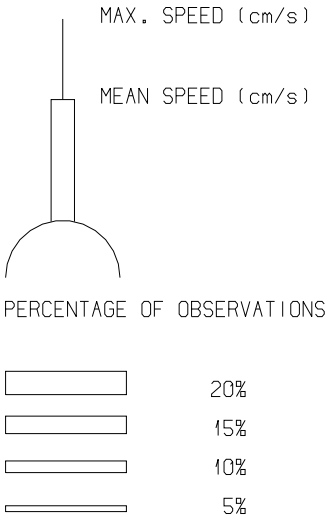


Monthly statistics for February 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.02.01 00-2011.02.28 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

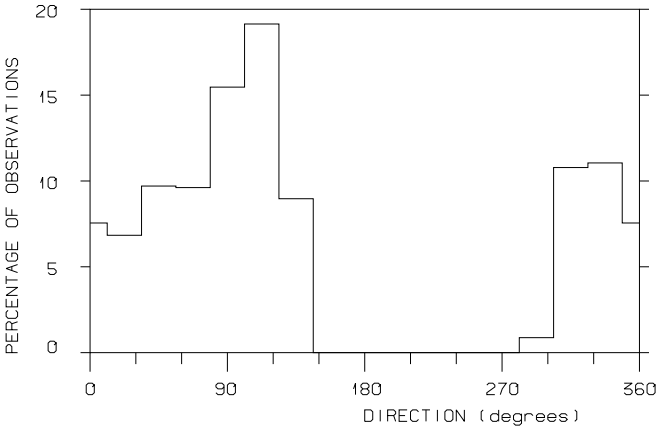
Date: 2013-05-06

Orkan/orkapp/v4.1.5

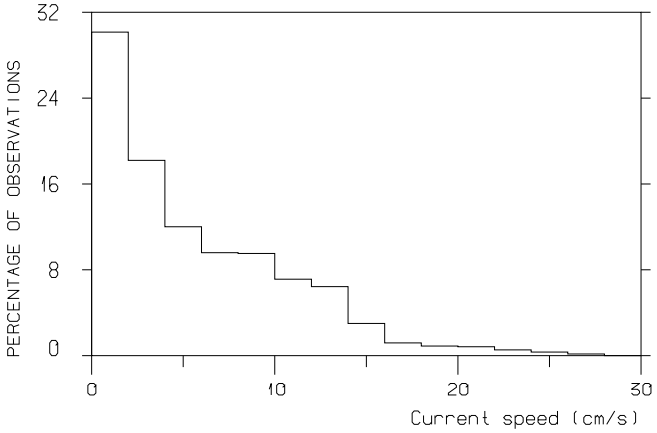




Current direction HISTOGRAM



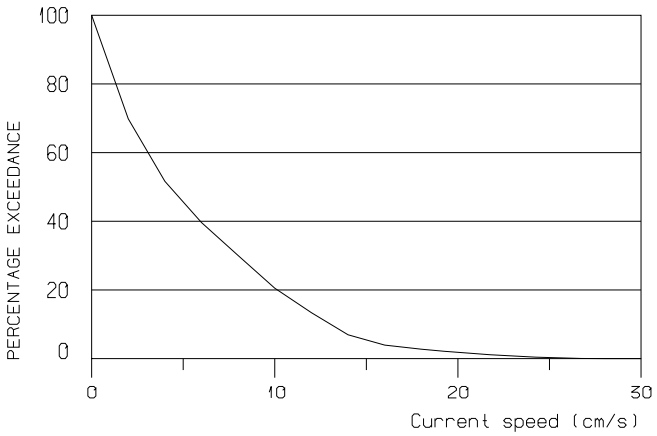
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4461
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 27 cm/s DIRECTION: 132°
VECTOR MEAN MAGNITUDE: 2.0 cm/s DIRECTION: 70°
MEAN MAGNITUDE: 5.8 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 13 E: 21 S: 19 W: 18
DIRECTIONAL STABILITY: 34 %

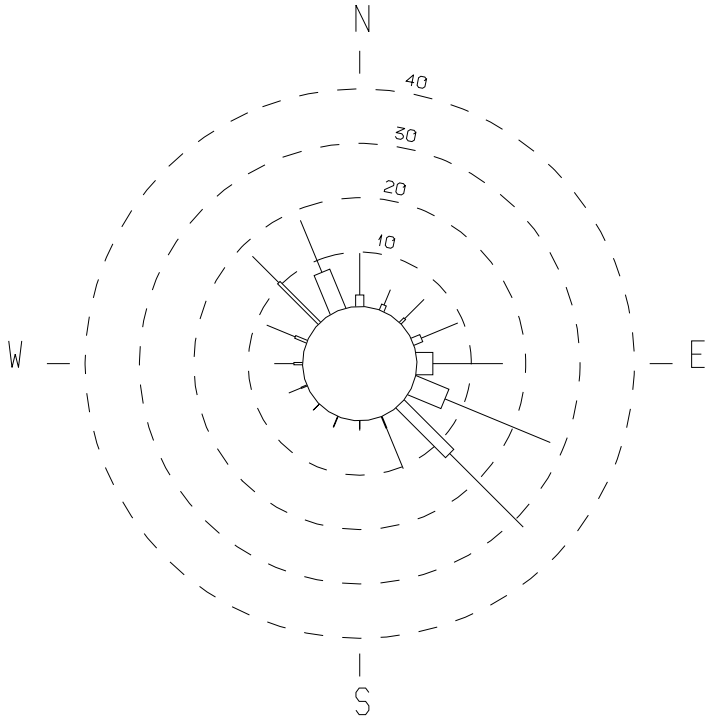
Current speed DISTRIBUTION

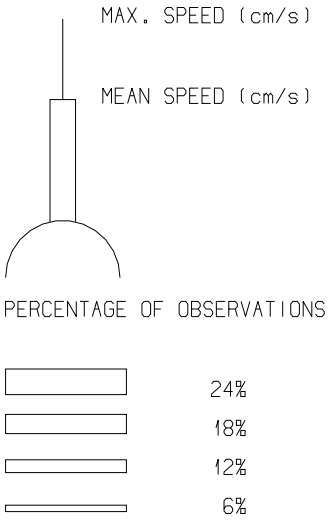


Monthly statistics for March 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.03.01 00-2011.03.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

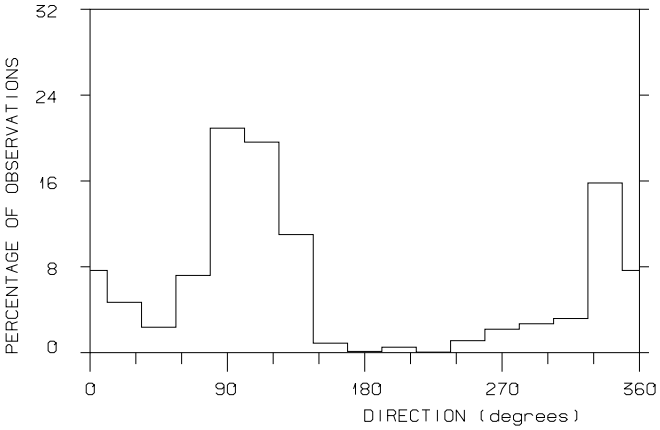
Date: 2013-05-06

Orkan/orkapp/v4.1.5

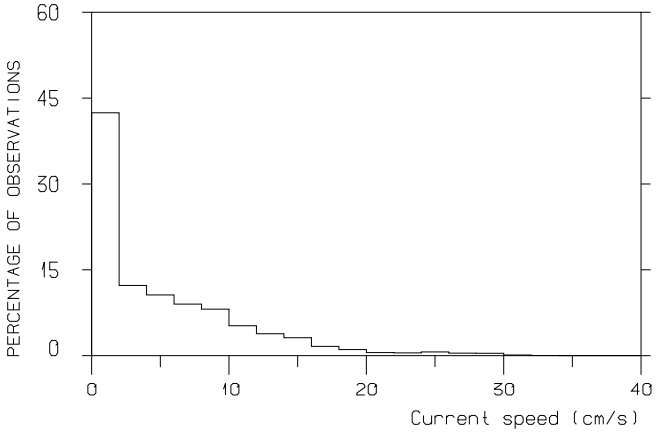




Current direction HISTOGRAM



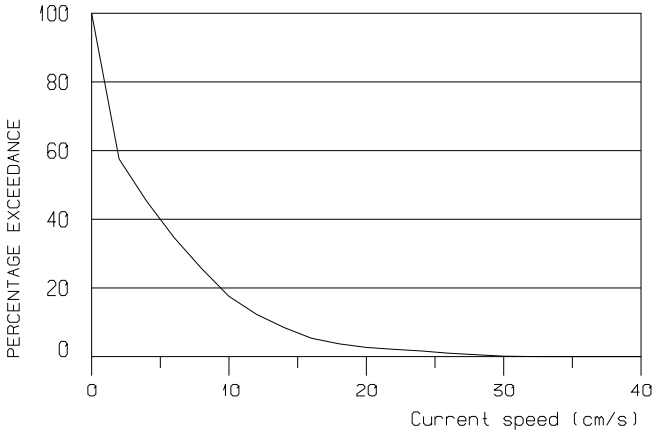
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4307
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 32 cm/s DIRECTION: 133°
VECTOR MEAN MAGNITUDE: 2.1 cm/s DIRECTION: 86°
MEAN MAGNITUDE: 5.3 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 17 E: 24 S: 25 W: 12
DIRECTIONAL STABILITY: 40 %

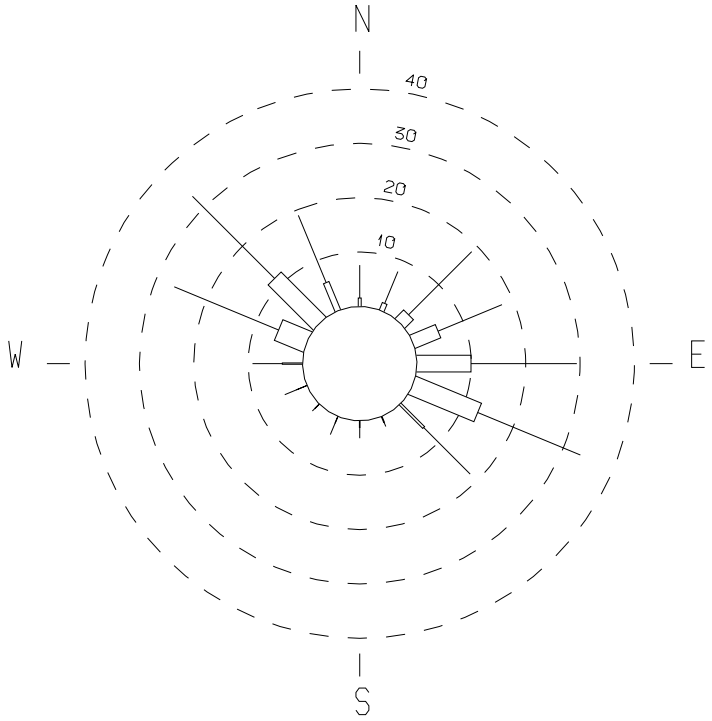
Current speed DISTRIBUTION

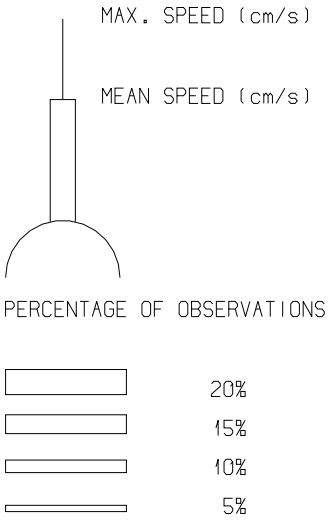


Monthly statistics for April 2011				INSTRUMENT Sensordata SD-6000
LOCATION Brandaskuta	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.04.01 00-2011.04.30 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

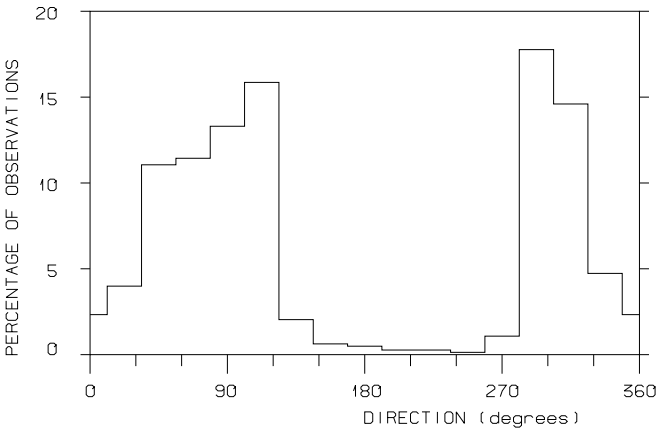
Date: 2013-05-06

Orkan/orkapp/v4.1.5

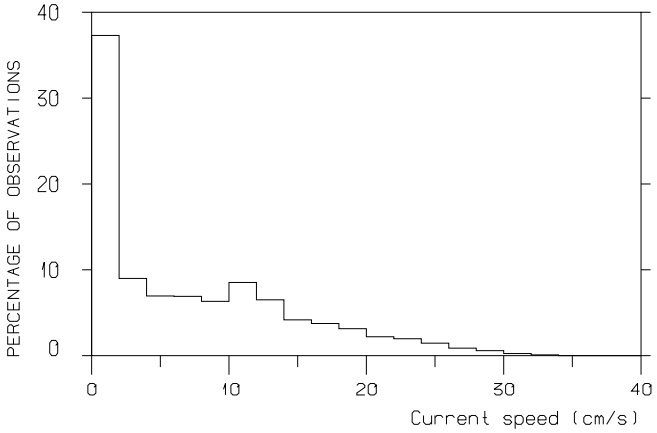




Current direction HISTOGRAM



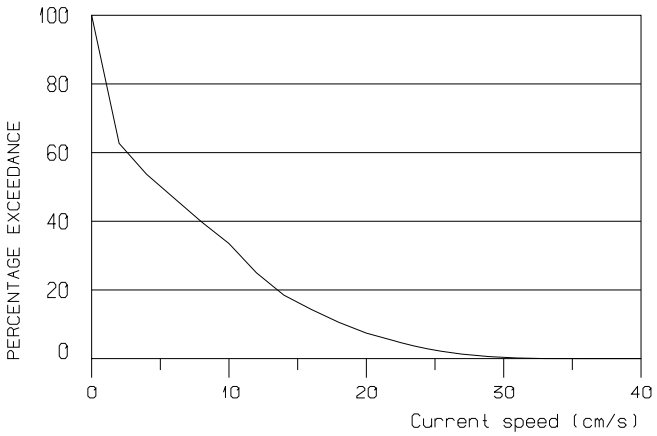
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4458
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 33 cm/s DIRECTION: 111°
VECTOR MEAN MAGNITUDE: 2.3 cm/s DIRECTION: 51°
MEAN MAGNITUDE: 7.4 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 23 E: 31 S: 14 W: 25
DIRECTIONAL STABILITY: 31 %

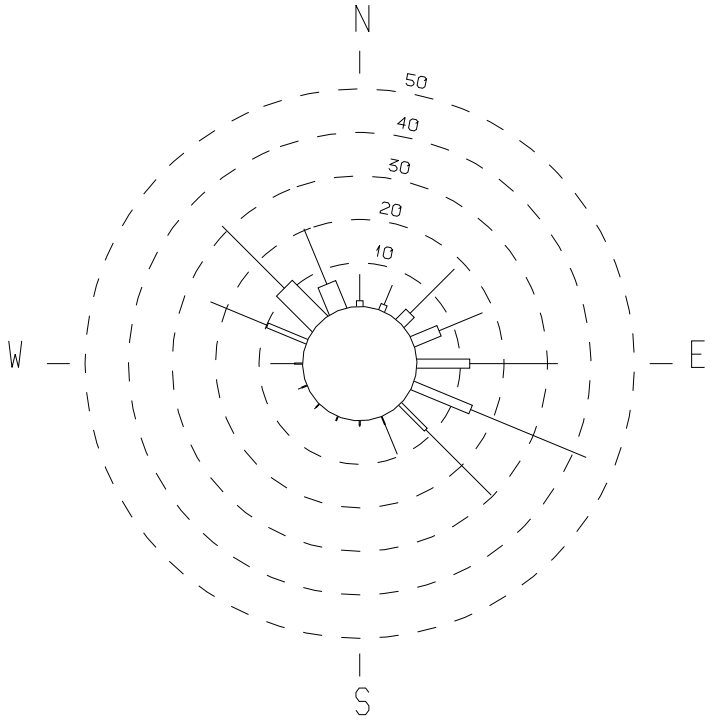
Current speed DISTRIBUTION

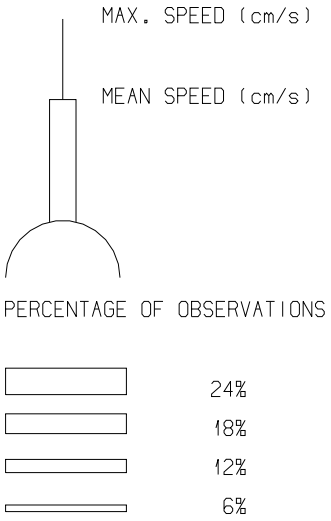


Monthly statistics for May 2011				INSTRUMENT Sensordata SD-6000
LOCATION Brandaskuta	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.05.01 00-2011.05.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

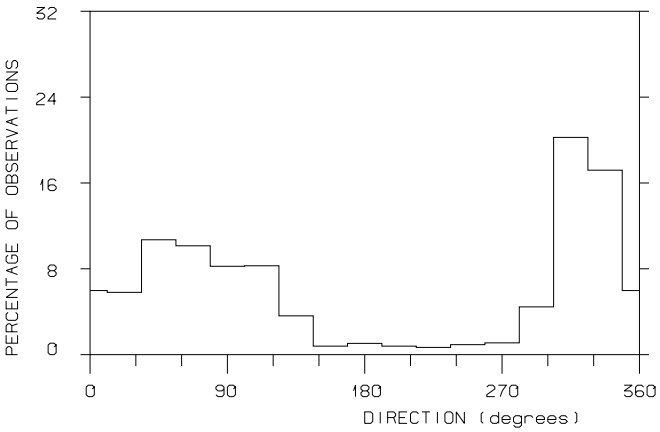
Date: 2013-05-06

Orkan/orkapp/v4.1.5

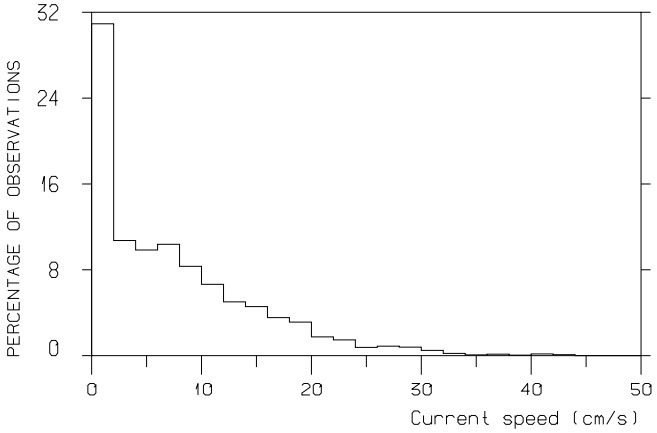




Current direction HISTOGRAM



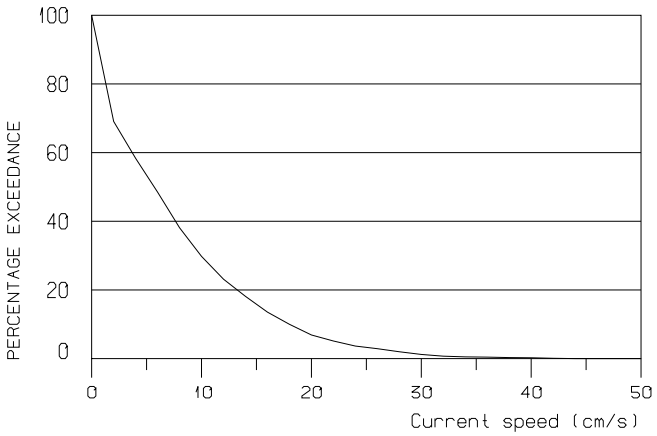
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4287
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 43 cm/s DIRECTION: 119°
VECTOR MEAN MAGNITUDE: 2.8 cm/s DIRECTION: 14°
MEAN MAGNITUDE: 7.6 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 22 E: 40 S: 21 W: 26
DIRECTIONAL STABILITY: 37 %

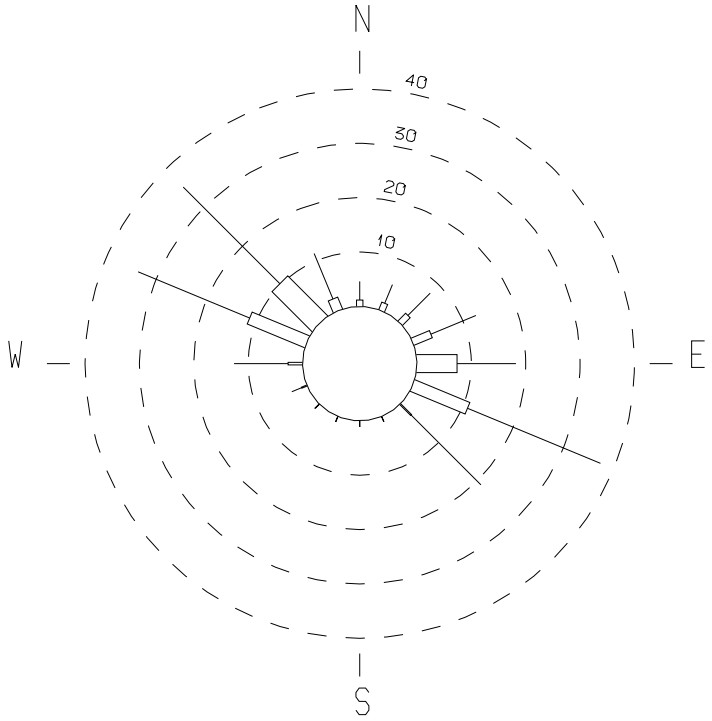
Current speed DISTRIBUTION

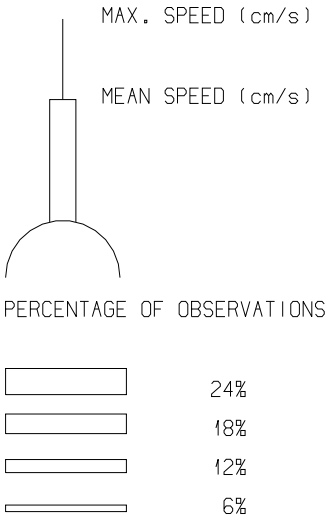


Monthly statistics for June 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.06.01 00-2011.06.30 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

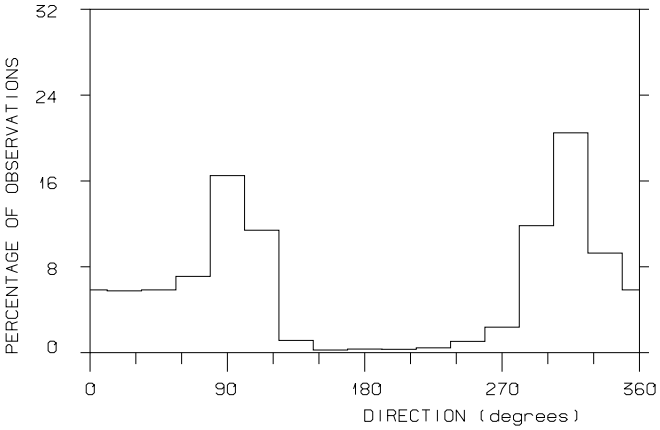
Date: 2013-05-06

Orkan/orkapp/v4.1.5

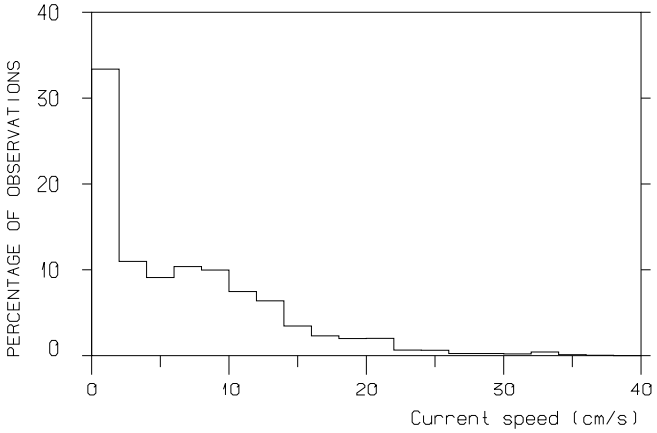




Current direction HISTOGRAM



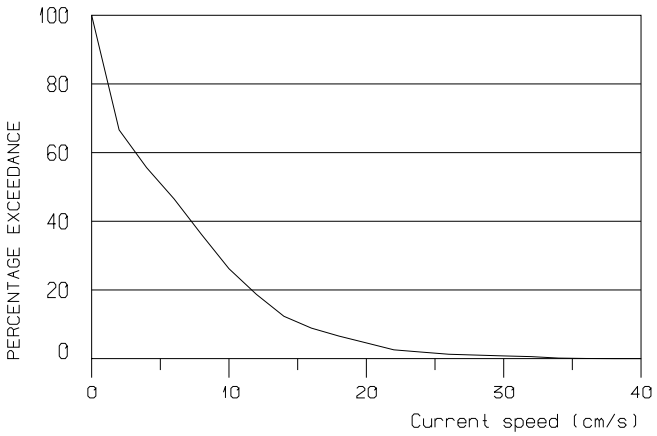
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4461
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 37 cm/s DIRECTION: 118°
VECTOR MEAN MAGNITUDE: 2.1 cm/s DIRECTION: 357°
MEAN MAGNITUDE: 6.8 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 24 E: 33 S: 18 W: 30
DIRECTIONAL STABILITY: 31 %

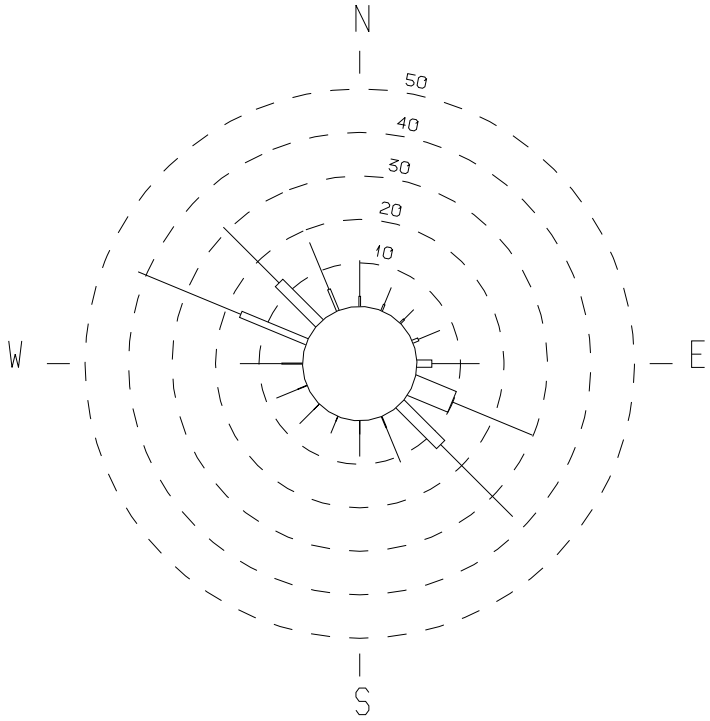
Current speed DISTRIBUTION

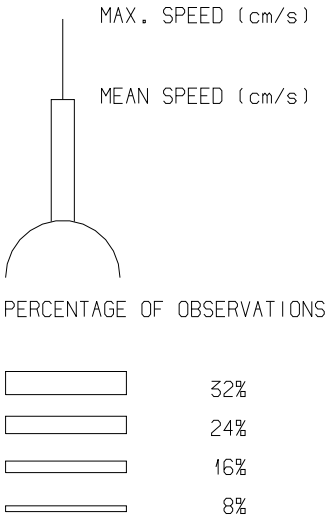


Monthly statistics for July 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.07.01 00-2011.07.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

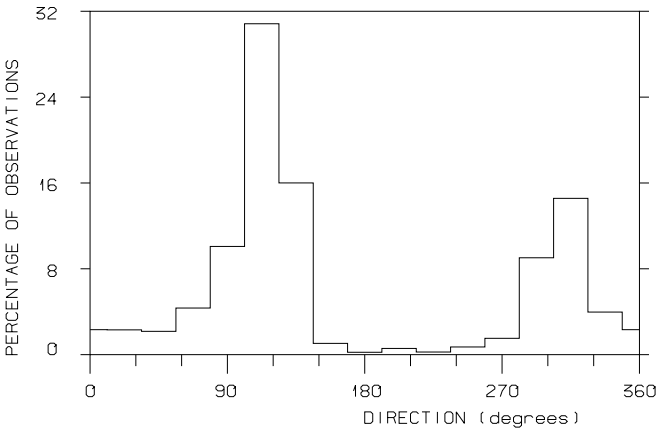
Date: 2013-05-06

Orkan/orkapp/v4.1.5

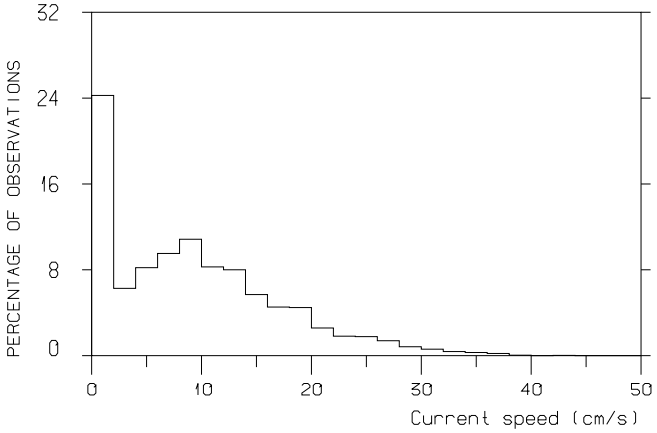




Current direction HISTOGRAM



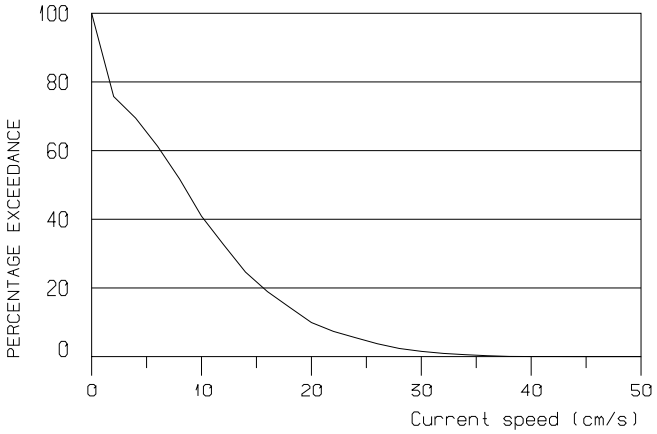
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4462
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 42 cm/s DIRECTION: 288°
VECTOR MEAN MAGNITUDE: 1.9 cm/s DIRECTION: 104°
MEAN MAGNITUDE: 9.4 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 22 E: 28 S: 23 W: 40
DIRECTIONAL STABILITY: 20 %

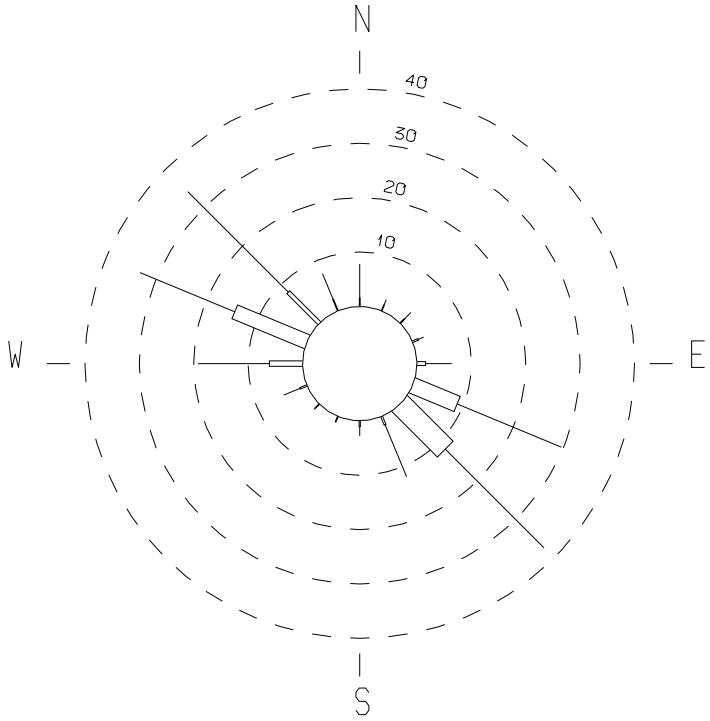
Current speed DISTRIBUTION

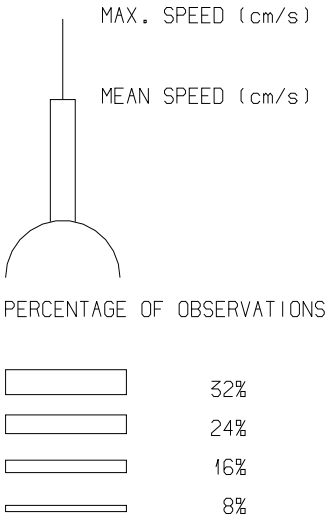


Monthly statistics for August 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.08.01 00-2011.08.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

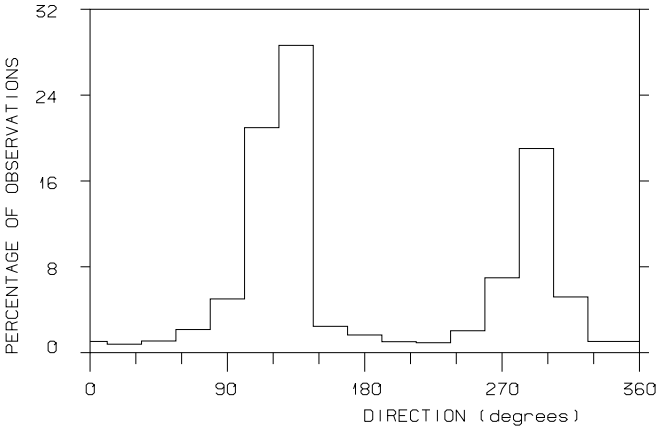
Date: 2013-05-06

Orkan/orkapp/v4.1.5

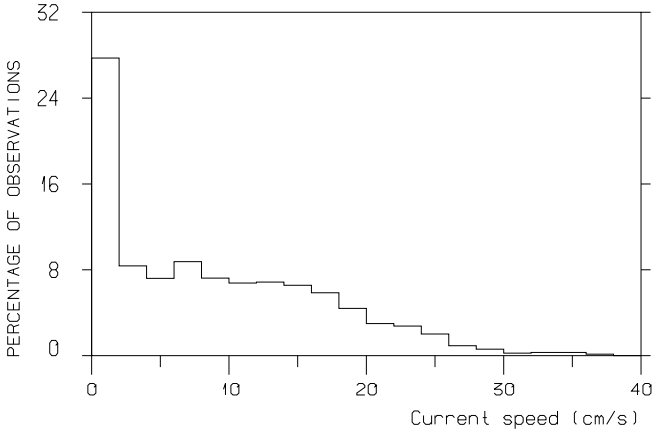




Current direction HISTOGRAM



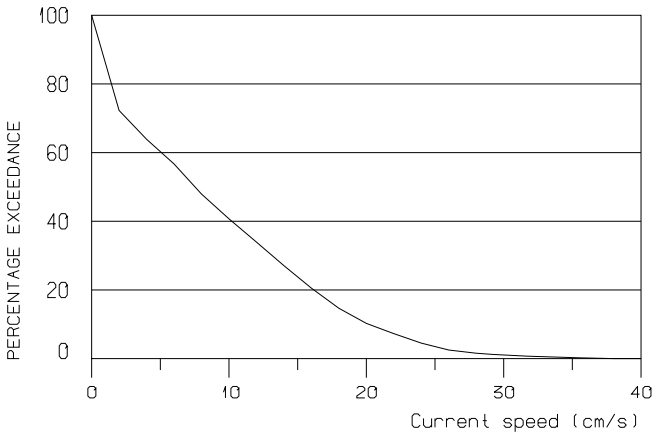
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 4316
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 37 cm/s DIRECTION: 139°
VECTOR MEAN MAGNITUDE: 2.0 cm/s DIRECTION: 152°
MEAN MAGNITUDE: 9.1 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 20 E: 26 S: 28 W: 30
DIRECTIONAL STABILITY: 23 %

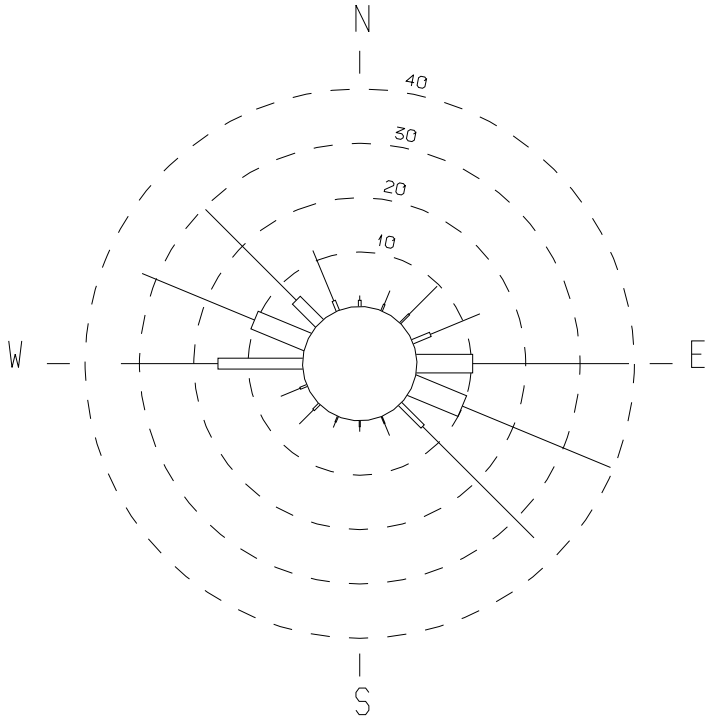
Current speed DISTRIBUTION

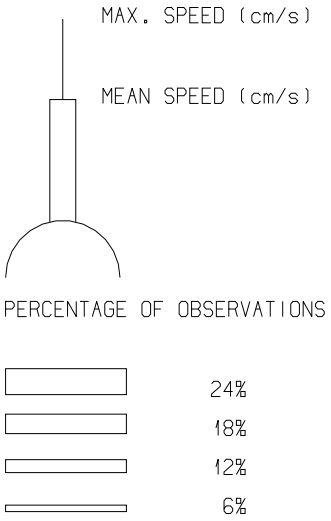


Monthly statistics for September 2011				INSTRUMENT Sensordata SD-6000
LOCATION Brandaskuta	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.09.01 00-2011.09.30 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

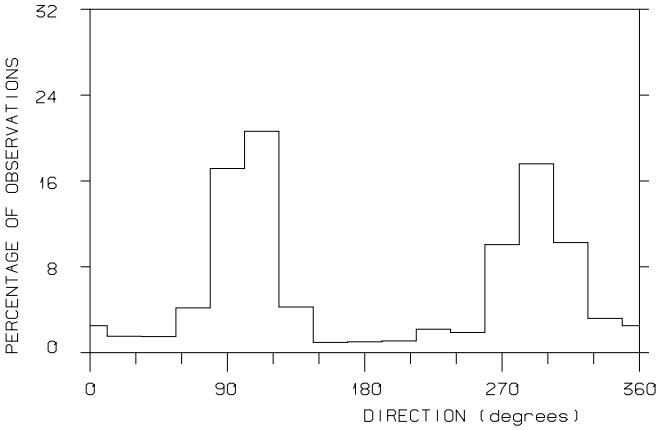
Date: 2013-05-06

Orkan/orkapp/v4.1.5

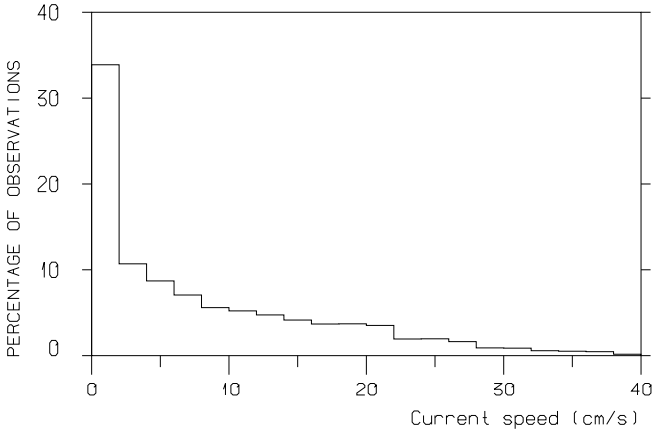




Current direction HISTOGRAM



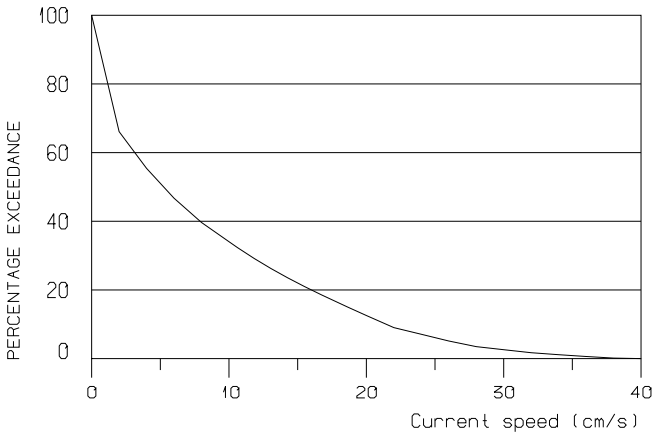
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 3665
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 39 cm/s DIRECTION: 105°
VECTOR MEAN MAGNITUDE: 0.6 cm/s DIRECTION: 29°
MEAN MAGNITUDE: 8.4 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 17 E: 39 S: 20 W: 33
DIRECTIONAL STABILITY: 7 %

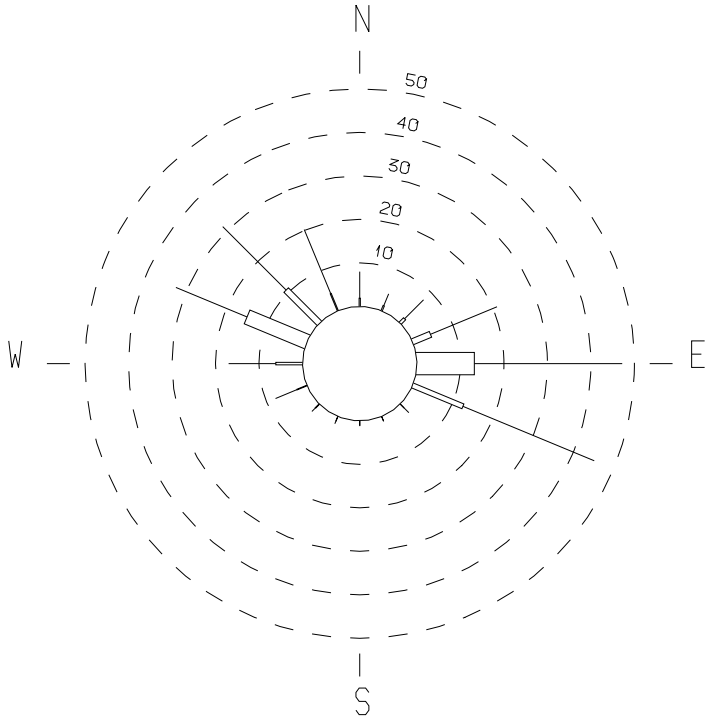
Current speed DISTRIBUTION

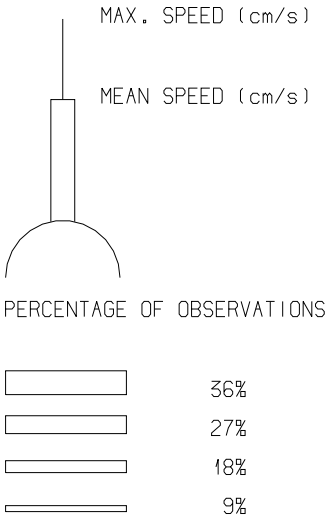


Monthly statistics for October 2011				INSTRUMENT Sensordata SD-6000
LOCATION Ospeneset	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.10.01 00-2011.10.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

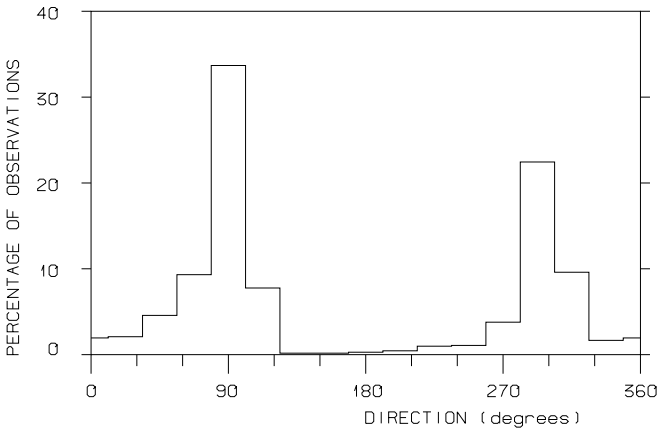
Date: 2013-05-06

Orkan/orkapp/v4.1.5

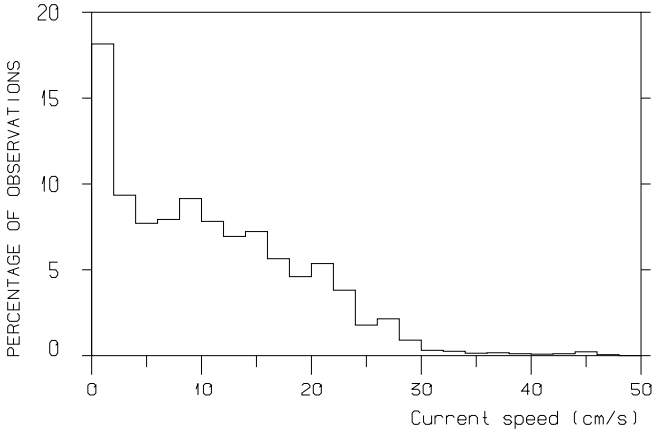




Current direction HISTOGRAM



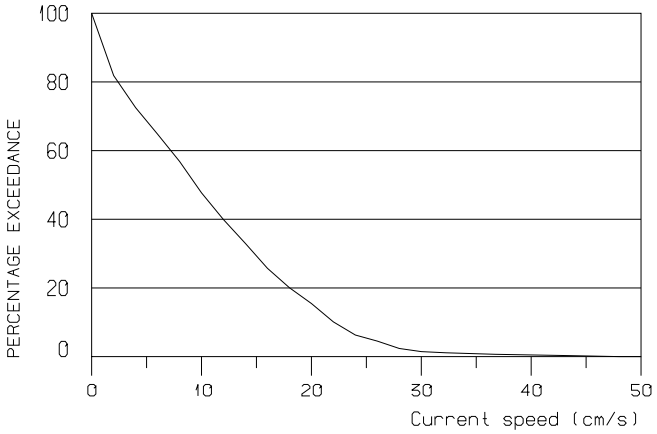
Current speed HISTOGRAM



STATISTICS

NUMBER OF OBSERVATIONS: 3542
SAMPLING INTERVAL: 10 min
INSTRUMENT TYPE: Sensordata SD-6000
MAXIMUM VALUE MAGNITUDE: 47 cm/s DIRECTION: 94°
VECTOR MEAN MAGNITUDE: 2.4 cm/s DIRECTION: 43°
MEAN MAGNITUDE: 10.7 cm/s
MAXIMUM VECTOR COMPONENTS (cm/s) N: 21 E: 47 S: 12 W: 30
DIRECTIONAL STABILITY: 23 %

Current speed DISTRIBUTION



Monthly statistics for December 2011				INSTRUMENT Sensordata SD-6000
LOCATION Brandaskuta	STATION 01	WATER DEPTH 300 m	INSTRUMENT DEPTH 15 m	OBSERVATION PERIOD ( ): 2011.12.01 00-2011.12.31 23
Fugro OCEANOR *Oceanographic Company of Norway*			PROJECT C55471	FIGURE

Date: 2013-05-06

Orkan/orkapp/v4.1.5

Vedlegg C

Resultat av harmonisk analyse av tidevannsstrøm ved Ospeneset

Måledyp: 5 m og 15 m

Harmonic analysis of current *OCEANOR - ORKAN V. 4.1.4/2000.10.06*

Station	Ospeneset	*Start time*	11.01.06 01:00
Position	60 d 44' N, 5 d 16' E	*End time*	12.01.06 01:00
Water depth	300 m	*Sensor depth*	5 m

Current file

Inclination: Direction of major axis, degrees clockwise from North
Phase G: Relative to Greenwich (UTC)
Direction of rotation: + indicates clockwise rotation of current vector

Tidal constituents		***Tidal current ellipse***					***Decomposed current***	
Name	*Period hrs*	*Major axis cm/s*	*Minor axis cm/s*	*Inclin. deg*	*G*	*Dir. of rotation*	*N/S Ampl cm/s*	*E/W Ampl cm/s*
Z0	---	2.16	0.00	70	0	-	---	---
SSA	4382.8892	0.81	0.38	33	123	-	0.71	0.55
MSM	763.4870	1.21	0.21	106	1	-	0.39	1.16
MM	661.3101	0.06	0.02	126	197	+	0.04	0.05
MSF	354.3674	0.98	0.08	103	168	+	0.23	0.96
MF	327.8592	0.65	0.12	125	261	+	0.38	0.54
ALP1	29.0727	0.21	0.09	102	80	+	0.10	0.21
2Q1	28.0062	0.52	0.09	120	22	-	0.27	0.46
SIG1	27.8484	0.18	0.07	121	196	+	0.11	0.15
Q1	26.8684	0.49	0.03	107	217	-	0.15	0.47
RHO1	26.7231	0.65	0.19	121	19	+	0.37	0.57
O1	25.8193	0.08	0.04	136	323	+	0.07	0.06
TAU1	25.6681	0.54	0.01	117	35	-	0.25	0.48
BET1	24.9748	0.22	0.02	75	151	-	0.06	0.21
NO1	24.8333	0.23	0.10	135	246	+	0.18	0.18
CHI1	24.7091	0.29	0.03	128	4	-	0.18	0.23
P1	24.0659	0.71	0.06	103	298	-	0.17	0.69
K1	23.9345	0.87	0.08	108	357	+	0.27	0.83
PHI1	23.8045	0.43	0.03	141	207	+	0.33	0.27
THE1	23.2070	0.37	0.04	105	299	-	0.11	0.36
J1	23.0985	0.34	0.12	128	187	+	0.23	0.28
SO1	22.4202	0.52	0.09	121	301	+	0.28	0.45
OO1	22.3061	0.48	0.09	120	115	+	0.25	0.42
UPS1	21.5782	0.25	0.02	99	270	-	0.05	0.25
OQ2	13.1622	0.19	0.04	170	258	-	0.19	0.05
EPS2	13.1273	0.38	0.01	126	111	-	0.22	0.30
2N2	12.9054	0.40	0.06	121	23	+	0.21	0.35
MU2	12.8718	0.27	0.09	133	187	+	0.19	0.20
N2	12.6583	0.23	0.01	101	5	+	0.04	0.22
NU2	12.6260	0.23	0.03	108	278	-	0.08	0.22
M2	12.4206	2.92	0.06	118	41	-	1.39	2.57
MKS2	12.3855	1.29	0.13	117	17	+	0.59	1.15
LDA2	12.2218	0.67	0.03	113	94	-	0.27	0.62
L2	12.1916	0.23	0.10	73	140	+	0.12	0.22
S2	12.0000	1.15	0.09	115	68	+	0.49	1.04

K2	11.9672	0.67	0.04	113	78	-	0.26	0.61
MSN2	11.7861	0.43	0.03	119	331	+	0.21	0.38
ETA2	11.7545	0.26	0.13	111	187	+	0.15	0.25
MO3	8.3863	0.16	0.05	104	159	-	0.06	0.16
M3	8.2804	0.19	0.05	126	285	+	0.12	0.16
SO3	8.1924	0.10	0.01	125	331	-	0.06	0.08
MK3	8.1771	0.09	0.07	142	265	-	0.08	0.08
SK3	7.9927	0.10	0.05	153	146	-	0.09	0.06
MN4	6.2692	0.11	0.02	121	140	+	0.06	0.09
M4	6.2103	0.06	0.01	95	72	+	0.01	0.06
SN4	6.1602	0.08	0.02	156	143	-	0.07	0.04
MS4	6.1033	0.13	0.03	107	123	-	0.05	0.12
MK4	6.0949	0.07	0.03	147	164	+	0.06	0.05
S4	6.0000	0.03	0.00	133	336	+	0.02	0.02
SK4	5.9918	0.15	0.01	147	145	-	0.13	0.08
2MK5	4.9309	0.09	0.03	150	165	+	0.08	0.05
2SK5	4.7974	0.08	0.03	111	169	+	0.04	0.07
2MN6	4.1663	0.04	0.00	144	154	-	0.04	0.03
M6	4.1402	0.12	0.06	145	32	-	0.11	0.08
2MS6	4.0924	0.09	0.01	115	241	-	0.04	0.08
2MK6	4.0886	0.06	0.01	168	326	-	0.05	0.01
2SM6	4.0457	0.05	0.02	90	288	-	0.02	0.05
MSK6	4.0419	0.08	0.03	117	276	-	0.04	0.07
3MK7	3.5296	0.10	0.02	132	205	+	0.07	0.08
M8	3.1052	0.05	0.02	170	286	+	0.05	0.02
2MN6	4.1663	0.35	0.06	43	193	-	0.26	0.24
M6	4.1402	0.56	0.06	38	247	-	0.44	0.35
2MS6	4.0924	0.47	0.03	33	319	+	0.39	0.26
2MK6	4.0886	0.24	0.01	27	300	-	0.21	0.11
2SM6	4.0457	0.15	0.03	31	71	+	0.13	0.08
MSK6	4.0419	0.09	0.02	5	276	-	0.09	0.02
3MK7	3.5296	0.06	0.01	57	349	+	0.04	0.05
M8	3.1052	0.11	0.00	68	327	-	0.04	0.10

Harmonic analysis of current *OCEANOR - ORKAN V. 4.1.4/2000.10.06*

Station	Ospeneset	*Start time*	06.01.2011 01:00
Position	60 d 44' N, 5 d 16' E	*End time*	06.01.2012 01:00
Water depth	300 m	*Sensor depth*	15 m

Current file

Inclination: Direction of major axis, degrees clockwise from North
Phase G: Relative to Greenwich (UTC)
Direction of rotation: + indicates clockwise rotation of current vector

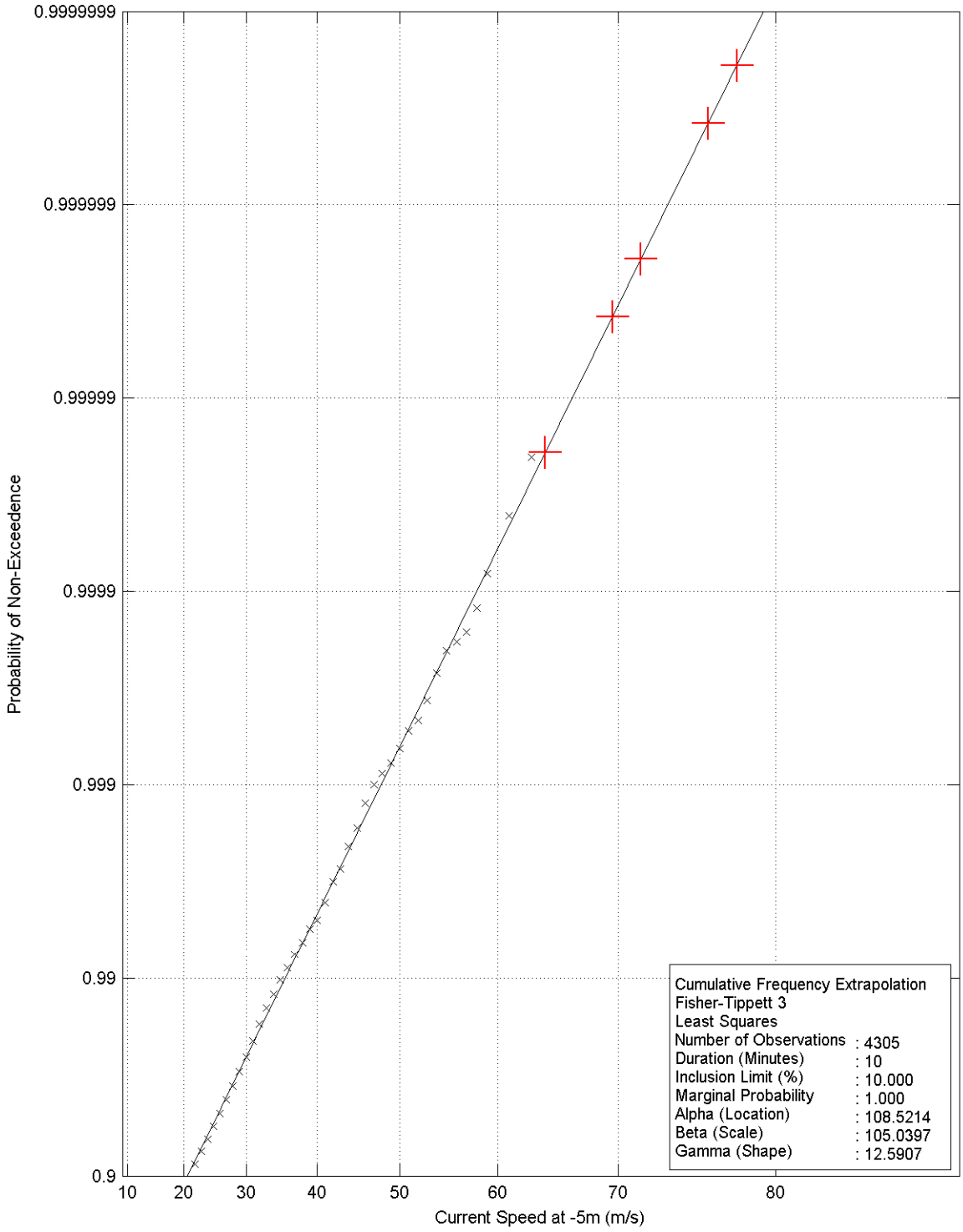
Tidal constituents		***Tidal current ellipse***					***Decomposed current***	
Name	*Period hrs*	*Major axis cm/s*	*Minor axis cm/s*	*Inclin. deg*	*G*	*Dir. of rotation*	*N/S Ampl cm/s*	*E/W Ampl cm/s*
Z0	---	1.61	0.00	65	360	-	---	---
SSA	4382.8892	1.53	0.07	175	147	+	1.52	0.16
MSM	763.4870	0.41	0.28	22	304	-	0.39	0.30
MM	661.3101	0.68	0.30	126	298	+	0.47	0.57
MSF	354.3674	1.45	0.22	111	224	-	0.56	1.36
MF	327.8592	0.86	0.26	95	21	+	0.27	0.86
ALP1	29.0727	0.22	0.01	89	264	+	0.01	0.22
2Q1	28.0062	0.48	0.02	111	35	+	0.17	0.45
SIG1	27.8484	0.22	0.02	113	190	-	0.09	0.20
Q1	26.8684	0.58	0.08	120	176	+	0.30	0.51
RHO1	26.7231	0.41	0.08	114	329	-	0.18	0.38
O1	25.8193	0.24	0.04	119	294	+	0.12	0.21
TAU1	25.6681	0.49	0.03	134	39	+	0.34	0.35
BET1	24.9748	0.04	0.02	7	122	-	0.04	0.02
NO1	24.8333	0.23	0.07	114	222	-	0.11	0.22
CHI1	24.7091	0.32	0.01	118	13	-	0.15	0.28
P1	24.0659	0.38	0.06	113	242	+	0.16	0.35
K1	23.9345	0.41	0.11	114	356	+	0.19	0.37
PHI1	23.8045	0.11	0.05	76	344	+	0.05	0.11
THE1	23.2070	0.20	0.03	119	277	-	0.10	0.18
J1	23.0985	0.20	0.05	94	84	-	0.05	0.20
SO1	22.4202	0.11	0.06	102	304	+	0.06	0.11
OO1	22.3061	0.37	0.08	104	83	-	0.12	0.36
UPS1	21.5782	0.19	0.01	154	66	-	0.17	0.08
OQ2	13.1622	0.14	0.07	15	196	+	0.14	0.07
EPS2	13.1273	0.28	0.11	124	107	-	0.18	0.24
2N2	12.9054	0.30	0.08	116	33	-	0.15	0.27
MU2	12.8718	0.31	0.03	109	136	+	0.10	0.29
N2	12.6583	0.33	0.04	130	354	-	0.21	0.25
NU2	12.6260	0.17	0.03	60	79	+	0.09	0.15
M2	12.4206	2.54	0.08	119	41	+	1.22	2.23
MKS2	12.3855	1.31	0.02	126	352	-	0.77	1.06
LDA2	12.2218	0.53	0.07	105	121	+	0.15	0.52
L2	12.1916	0.12	0.05	147	272	-	0.10	0.08
S2	12.0000	0.96	0.16	121	57	+	0.52	0.83

K2	11.9672	0.73	0.07	121	54	-	0.38	0.63
MSN2	11.7861	0.27	0.04	89	132	-	0.04	0.27
ETA2	11.7545	0.34	0.05	131	151	+	0.22	0.25
MO3	8.3863	0.03	0.01	161	45	-	0.03	0.01
M3	8.2804	0.06	0.03	55	140	-	0.04	0.05
SO3	8.1924	0.13	0.02	133	46	-	0.09	0.09
MK3	8.1771	0.13	0.02	140	353	-	0.10	0.09
SK3	7.9927	0.10	0.03	130	316	-	0.06	0.08
MN4	6.2692	0.05	0.03	167	113	-	0.05	0.03
M4	6.2103	0.05	0.00	61	124	-	0.02	0.04
SN4	6.1602	0.11	0.02	149	121	+	0.10	0.06
MS4	6.1033	0.10	0.02	136	121	+	0.07	0.07
MK4	6.0949	0.12	0.00	97	352	-	0.01	0.12
S4	6.0000	0.03	0.03	129	243	-	0.03	0.03
SK4	5.9918	0.03	0.02	103	107	-	0.02	0.02
2MK5	4.9309	0.03	0.01	108	191	+	0.02	0.03
2SK5	4.7974	0.08	0.01	121	39	+	0.04	0.07
2MN6	4.1663	0.06	0.00	123	244	-	0.03	0.05
M6	4.1402	0.02	0.02	147	15	+	0.02	0.02
2MS6	4.0924	0.03	0.01	112	161	-	0.01	0.03
2MK6	4.0886	0.06	0.01	137	336	-	0.04	0.04
2SM6	4.0457	0.03	0.02	100	330	+	0.02	0.03
MSK6	4.0419	0.07	0.01	107	334	+	0.02	0.07
3MK7	3.5296	0.04	0.01	128	79	+	0.02	0.03
M8	3.1052	0.05	0.01	126	170	+	0.03	0.04

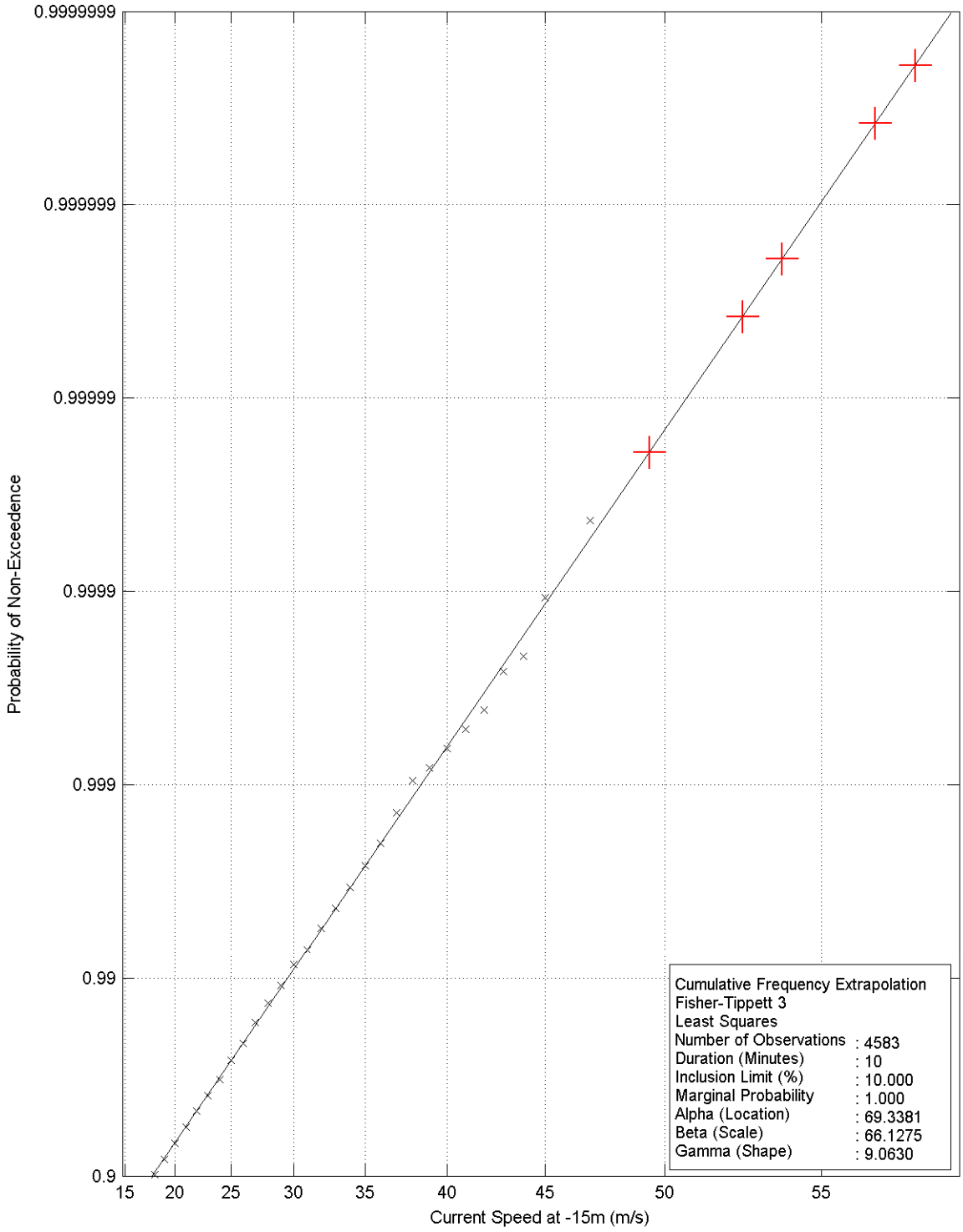
Vedlegg D

Ekstremverdistatistikk av strømhastighet ved Ospeneset

Måledyp: 5 m og 15 m



Return Period	Probability	Extreme Value
1 Year	0.9999809871	64.22
5 Years	0.9999961974	69.54
10 Years	0.9999980987	71.63
50 Years	0.9999996197	76.05
100 Years	0.9999998099	77.79



Return Period	Probability	Extreme Value
1 Year	0.9999809871	49.41
5 Years	0.9999961974	52.65
10 Years	0.9999980987	53.88
50 Years	0.9999996197	56.40
100 Years	0.9999998099	57.35