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WINDFREC, STABFREC and METFREC Meteorological Programs Users Guide

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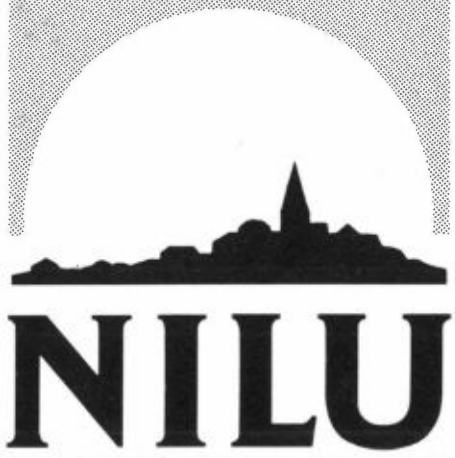

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SUMMARY

This report consists of user's guides for a set of three programs for statistical evaluation of meteorological and air quality data. All the programs are interactive and the input are synoptic monthly data-files.

- WINDFREC
  This program presents standard statistics for wind speed and direction for four wind speed classes and up to 36 wind sectors (wind rose).

- STABFREC
  This program presents diurnal distribution in four classes of stability for a stability parameter.

- METFREC
  This program presents joint frequency distribution of wind speed, wind direction, stability and air quality for four wind classes, twelve wind sectors and four stability classes for a given period.

Based on information of wind, stability and air quality METFREC can perform an impact matrix, which relates air quality to meteorological conditions.

WINDFREC, STABFREC AND METFREC METEOROLOGICAL PROGRAMS - USERS GUIDE

1 INTRODUCTION

NILU has developed several programs for statistical evaluation of meteorological and air quality data. This report consists of user guides for the following programs:

- WINDFREC
  This program presents standard statistics for wind speed and direction for four wind speed classes and up to 36 wind sectors (wind rose).

- STABFREC
  This program presents diurnal distribution in four classes of stability for a stability parameter.

- METFREC
  This program presents joint frequency distribution of wind speed, wind direction, stability and air quality for four wind classes, twelve wind sectors and four stability classes for a given period.

The user guides consists of a general description of the program and an example of a typical dialogue. In addition, a test-example for the program with the results are included in the user guide. All the programs are interactive with a dialogue to the user's terminal. The program input is based on synoptic monthly data-files.

The programs are written in FORTRAN for a 386 MS-DOS PC and are stored under the user PROGRAM.

1.1 SYNOPTIC MONTHLY DATA-FILES

The three programs reads data from the same synoptic data file prepared to METFREC. In METFREC synoptic data (one line for each hour) for 5 variables are read:

1. T upper, Delta T or another stability parameter
2. T lower
3. Wind direction DD, the wind is blowing from DD
4. Wind speed in m/s
5. Extra variable concentration or other.

Data for all 5 variables should be present at the file. If they are not used, insert dummy data or put the value 0.0.

A synoptic file shall be of the type .SYN. When identifying a .SYN-file, only 8 characters are available for the file name. It is recommended to use a combination of the month name and the place: 'HUNSEP91.SYN', JAN-MUK.SYN'.

The file can start with an information label which contains information about the data, the stations etc. The information label ends with a line which begins with START.

The programs reads:

```
ISA     1 all the data from the same station
        2 data from different stations

If ISA=1, read:
        STATION Name of the station (with apostrophes)

If ISA=2, read:
        STDELTA, STUPPER, STLOWER, STWIND, STEXTRA
        Names of the different stations (with apostrophes)
```

Then the programs reads 2 dummy lines, which may contain additional information about the data (see example)

Then follows the data
YY,MM,DD,HH, (Y(I),I=1,5)
Format (4I3, 5F8.2)

One line for each hour, NDAY*24 lines. If there are too many or too few lines, the programs gives error messages and stops.

Missing data are given the code value -9900.0.

```
File HUNSEP91.SYN contains meteorological data from
NILU's automatic weather station Hunndalen, Norway

PERIOD:    1/ 9 1991 - 30/ 9 1991

Par.  1: DT    oC,   Station 853, HUNNDALEN        from file: (AWS)853SEP91
Par.  2: TEMP  oC,   Station 853, HUNNDALEN        from file: (AWS)853SEP91
Par.  3: DD    deg., Station 853, HUNNDALEN        from file: (AWS)853SEP91
Par.  4: FF    m/s,  Station 853, HUNNDALEN        from file: (AWS)853SEP91
Par.  5: GUST  m/s,  Station 853, HUNNDALEN        from file: (AWS)853SEP91

START
1
'HUNNDALEN'
IIIiiiIIIiiiFFFFF.FFffffff.fffffff.fffffff.fffffff.FF   ┐ 2 data information
 YY  MM  DD  HH      DT      TEMP      DD        FF      GUST   ┘ lines
 91   9   1   1    2.85      14.4    133.0       .4       1.2
 91   9   1   2    2.47      13.2    143.0       .2       1.2
 91   9   1   3    2.39      13.0    182.0       .5       1.5
 91   9   1   4    2.30      12.3  -9900.0       .0   -9900.0
 91   9   1   5    2.46      11.9    149.0       .4       1.5
 91   9   1   6    1.56      11.2    124.0       .3       1.2
 91   9   1   7    -.95      13.2    126.0       .2       1.2
 91   9   1   8   -1.58      14.0     55.0       .0       2.1
 91   9   1   9   -1.28      15.1     68.0      1.2       2.7
 91   9   1  10   -1.03      15.8     71.0      2.0       4.2
 91   9   1  11    -.92      16.5     59.0      2.4       4.8
 91   9   1  12    -.97      17.5     76.0      2.7       5.7
 91   9   1  13    -.91      19.4     73.0      2.3       4.8
 91   9   1  14   -1.06      22.9    186.0      2.2       5.7
 91   9   1  15   -1.04      23.7    206.0      2.8       6.9
 91   9   1  16    -.87      23.5    197.0      3.0       6.9
 91   9   1  17    -.60      22.8    220.0      3.1       6.6
 91   9   1  18    -.04      21.7    198.0      2.4       6.9
 91   9   1  19     .65      19.6    184.0      2.3       5.4
 91   9   1  20     .57      18.0    187.0      2.7       6.0
 91   9   1  21     .64      17.1    195.0      2.8       5.4
 91   9   1  22    1.08      16.0    192.0      2.0       5.4
 91   9   1  23     .80      15.3    191.0      2.2       5.4
 91   9   1  24    1.12      14.6    206.0      1.7       5.4
 91   9   2   1     .72      14.4    224.0      2.3       7.2
 91   9   2   2     .72      13.7    226.0      1.8       5.1
 91   9   2   3     .86      12.9    236.0      1.6       3.6
 91   9   2   4     .66      12.6    226.0      2.4       5.4
  .   .   .   .       .         .        .        .         .
  .   .   .   .       .         .        .        .         .
  .   .   .   .       .         .        .        .         .
  .   .   .   .       .         .        .        .         .
 91   9  30  19    -.08       4.7     51.0      1.8       5.1
 91   9  30  20    -.11       4.5     57.0      1.5       3.9
 91   9  30  21    -.10       4.6     47.0      1.8       5.1
 91   9  30  22    -.07       4.6     40.0      1.8       4.8
 91   9  30  23    -.11       4.3     39.0      1.4       3.0
 91   9  30  24    -.09       4.1     12.0       .0       3.0      NDAY *24 lines
```

Figure 1: Synoptic monthly data-file.

2 PROGRAM WINDFREC

2.1 GENERAL DESCRIPTION OF THE PROGRAM

The following data are input for the program:

- Wind speed
- Wind direction

The program WINDFREC gives the following results:

- Diurnal variation of wind directions
- Distribution of wind speed with wind directions
- Average wind speed for each wind sector
- Average wind speed for selected wind speed classes

2.2 THE PROGRAM DIALOGUE

The program WINDFREC is an interactive program with a dialogue to the users terminal. The results are written on an user specified resultfile. The example below is a typical input sequence for the progam. The numbers of parameters will vary dependent of the work to be carried out. The program uses all data, but the print-out may be restricted to f.ex. every 3. hour.

```
PROGRAM WINDFREC

Name of input file or TERM ..................... : 'TERM'
Name of the result file ........................ : 'WIND.PRN'
Number of months ............................... : 1
Wind distribution for each I hour, enter I ..... : 3
Time of the day for the first distribution ..... : 1
```

If the number of months are more than 1, the following question is given:

```
Output for each month? (Y/N) ..................... : N

Maximum windspeed defined as calm ................ : 0.2
Number of bounds for windspeed distribution (Max 6): 3
Enter 3 upper bounds for windspeed distribution .. : 2.0,4.0,6.0
Number of sectors (12,16,32) ..................... : 12

Wind direction equal zero might be interpreted in three ways:

1: Data not available
2: Calm conditions
3: Wind direction equal 360 degrees
Enter 1,2 or 3 ................................... : 3

Number of days in the month ...................... : 30
Name of the input file ........................... : 'HUNSEP91.SYN'
```

The data at the .SYN files shall be according to chapter 1.1.

2.3 TEST-EXAMPLE FOR THE PROGRAM

```
>PROGRAM\WINDFREC
'WIND.PRN'                  ,output file
1                           ,number of months
3                           ,wind distributon every 3. hour
1                           ,first windrose kl.01
0.2                         ,calm
3                           ,wind clasees
1,2,3                       ,bounds
12                          ,sectors
3                           ,wind direction 0=360
30                          ,days
'HUNSEP91.SYN'              ,file name
```

2.4 THE RESULTS FROM THE TEST-EXAMPLE

Wind direction 0 = 360 deg

Station : 'HUNNDALEN'
Period : 91. 9. 1 - 91. 9.30

DIURNAL VARIATION OF WIND DIRECTIONS (%)

*) Wind-				Hours					Wind-
direction	01	04	07	10	13	16	19	22	rose
30	.0	.0	.0	13.3	6.7	6.7	.0	3.4	2.8
60	3.3	6.7	6.7	10.0	13.3	3.3	3.3	3.4	7.5
90	3.3	3.3	.0	26.7	20.0	33.3	13.3	6.9	12.3
120	10.0	.0	6.7	3.3	.0	10.0	.0	.0	5.4
150	.0	6.7	3.3	6.7	10.0	.0	.0	.0	2.8
180	6.7	3.3	.0	.0	.0	.0	6.7	6.9	2.5
210	26.7	36.7	43.3	.0	.0	6.7	36.7	34.5	18.0
240	40.0	23.3	26.7	20.0	23.3	6.7	16.7	17.2	23.4
270	.0	.0	3.3	6.7	3.3	13.3	6.7	6.9	6.5
300	3.3	3.3	6.7	10.0	10.0	.0	6.7	10.3	6.0
330	6.7	.0	.0	3.3	6.7	13.3	10.0	.0	3.9
360	.0	.0	.0	.0	3.3	3.3	.0	6.9	2.5
Calm	.0	16.7	3.3	.0	3.3	3.3	.0	3.4	6.4
Wind speed < .20 m/s = calm									
Nobs	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(29)	(718)
Average wind m/s	1.63	1.42	1.56	2.03	2.28	2.04	1.65	1.47	1.69

DISTRIBUTION OF WINDSPEED WITH WIND DIRECTIONS (%)

Class I: Windspeed .3 - 1.0 m/s
Class II: Windspeed 1.1 - 2.0 m/s
Class III: Windspeed 2.1 - 3.0 m/s
Class IV: Windspeed > 3.0 m/s

*) Wind-	Classes						Average
direction	I	II	III	IV	Total	Nobs	wind m/s
30	1.3	1.4	.1	.0	2.8	(20)	1.03
60	1.0	4.6	1.9	.0	7.5	(54)	1.62
90	4.3	7.7	.3	.0	12.3	(88)	1.23
120	3.1	1.9	.4	.0	5.4	(39)	1.09
150	1.3	.1	1.4	.0	2.8	(20)	1.58
180	.6	1.1	.8	.0	2.5	(18)	1.69
210	5.4	7.4	4.5	.7	18.0	(129)	1.59
240	3.8	7.5	7.0	5.2	23.4	(168)	2.29
270	1.4	1.8	1.3	2.1	6.5	(47)	2.36
300	1.3	2.1	1.8	.8	6.0	(43)	1.98
330	.8	1.1	.7	1.3	3.9	(28)	2.15
360	.4	.7	.0	1.4	2.5	(18)	2.56
Calm					6.4	(46)	
Total	24.5	37.5	20.2	11.4	100.0	(718)	
Average wind m/s	.72	1.53	2.48	3.86			1.69

*) This number indicates central direction of sector

3 PROGRAM STABFREC

3.1 GENERAL DESCRIPTION OF THE PROGRAM

The program STABFREC needs the following input-data:

- Temperature difference ΔT or
- Temperature data at two levels.

Program STABFREC gives the following results:

- Diurnal distribution of four selected stability classes

3.2 THE PROGRAM DIALOGUE

The program STABFREC is an interactive program with a dialogue to the users terminal. The results are written on an user specified resultfile. The following example presents a typical sequence for the program. The number of parameters will vary with the work to be carried out. Instead of using the temperature difference as a stability parameter you may use another variable, with other bounds for the stability classes.

```
Name of input file or TERM ..................... : 'TERM'
Name of the result-file ........................ : 'STAB.PRN'
Number of months ............................... : 1
```

If the number of months are more than 1, the following question is given:

```
    Output for each month (Y/N) .................. : N
```

Stability can be represented in three ways:

1) Temperature difference directly from file
2) Temperature difference:100*(Tupper-Tlower)/Height difference
3) Temperature difference:(Tupper-Tlower)

Enter 1,2 or 3 ..... : 1

For option 2 the program will ask:

Height difference (m) between the upper and
lower level for the temperature measurements . :

Enter 3 upper bounds for the stability classes : -0.5,-0.0,0.5

Number of days in the month ..... : 30
Name of input file ..... : 'HUNSEP91.SYN'

The data at the .SYN files shall be according to chapter 1.1.

The selection of stability will thus be:

Unstable : ΔT <-0,5
Neutral : -0,5 < ΔT <0,0
Light stable: 0,0 < ΔT <0,5
Stable : 0,5 < ΔT

3.3 TEST-EXAMPLE FOR THE PROGRAM

```
>PROGRAM\STABFREC
'TERM'                    ,Input from terminal
'STAB.PRN'                ,Output file
1                         ,1 month
1                         ,Stability from ΔT, variable no. 1
-0.5,0.0,0.5              ,Stability classes
30                        ,Days
'HUNSEP91.SYN'            ,Station
```

3.4 THE RESULTS FROM THE TEST-EXAMPLE

Delta T : HUNNDALEN H
Parameter : Temperature difference (DT)
Unit : Degrees C
Period : 01.11.91 - 30.11.91

DIURNAL VARIATION OF STABILITY (%)

Class I: Unstable DT < -.5 Degrees C
Class II: Neutral -.5 < DT < .0 Degrees C
Class III: Light stable .0 < DT < .5 Degrees C
Class IV: Stable .5 < DT Degrees C

	Classes			
Hour	I	II	III	IV
1	.0	18.8	31.9	49.3
2	.0	20.3	33.3	46.4
3	.0	23.2	30.4	46.4
4	.0	25.8	27.3	47.0
5	.0	25.8	27.3	47.0
6	.0	28.8	27.3	43.9
7	1.5	28.4	34.3	35.8
8	4.5	44.8	32.8	17.9
9	18.5	58.5	15.4	7.7
10	24.2	66.7	6.1	3.0
11	37.3	53.7	9.0	.0
12	47.8	49.3	3.0	.0
13	41.8	56.7	1.5	.0
14	41.8	53.7	3.0	1.5
15	33.8	56.9	7.7	1.5
16	22.2	63.5	7.9	6.3
17	9.5	49.2	27.0	14.3
18	.0	34.9	28.6	36.5
19	.0	25.0	31.3	43.8
20	.0	21.5	33.8	44.6
21	.0	23.1	29.2	47.7
22	.0	26.6	26.6	46.9
23	.0	24.6	24.6	50.8
24	.0	22.7	27.3	50.0
Total	11.8	37.5	21.9	28.7

Number of obs.: 1581
Missing obs. : 603

4 PROGRAM METFREC

4.1 GENERAL DESCRIPTION OF THE PROGRAM

The program METFREC needs the following input-data:

- Stability parameter (1 or 2)
- Wind speed
- Wind direction
- Air quality data (option)

Program METFREC is classifying observations into classes of wind speed, wind direction and stability. The results are given in two parts.

The first part represents a joint frequency distribution of four classes of wind speed and stability and 12 wind direction sectors. The values in the line "Total" gives the occurrence in percent of each stability class in each wind class for all wind directions. The values in the column "Rose" gives the occurrence in percent of winds blowing from this sector for all classes of wind speed and stability.

The second part of the program is sorting values of concentrations or other variables into boxes of different meteorological conditions related to the wind/stability classification given in the first part. This fifth variable may be a SO_2-concentration, but might also be mixing height or gust. The values in this table represents arithmetic average values for all observations that occur in each class (box). The line "Average" gives the average values of concentrations for the observations in one stability and wind speed class for all wind directions. The column "Rose" gives the average concentrations for all observations that occur during each wind sector.

4.2 THE PROGRAM DIALOGUE

Program METFREC is an interactive program with a dialogue to the users terminal. The results are written to a user specified result-file. The example below is a typical input sequence of the program. The numbers of parameters will vary with the work to be carried out.

```
PROGRAM METFREC
Name of input file or 'TERM' ..................... : 'TERM'
Name of the result-file (with apostrophes
and .PRN) ....................................... : 'DHUSEP91.PRN'

A separate file for multiple source modelling  :
Separate output-file for frequency distri-
bution to KILDER (Y/N) ......................... : N

If the answer is 'Y', read the name of the
MET-file, with apostrophes and .MET ............ : 'DHUSEP91.MET'

Number of months ................................ : 1
```

If the number of months are more than 1, the following question is given:

```
    Output for each month (Y/N) ..................... : N
```

Stability may be represented in three ways:

1) Temperature difference directly from file
2) Temperature difference:100*(Tupper-Tlower)/Height difference
3) Temperature difference:(Tupper-Tlower)

```
    Enter 1,2 or 3 ............................... : 1
```

For option 2:

Height difference (m) between the upper and
lower level for the temperature measurements:

Wind direction equal zero might be interpreted in three ways:

1: Data not avialable
2: Calm conditions
3: Wind directions equal 360 degrees

Enter 1, 2 or 3 ..... : 3

Number of wind sectors (12 or 36) ..... : 12
Enter 3 upper bounds for the wind speed classes: 1.0,2.0,3.0
Enter 3 upper bounds for the stability classes : -0.5,-0.0,0.5
Max.wind speed defined as calm ..... : 0.2

Enter number of hours per day ..... : 12

If the number is different from 24, the following question is given:

Enter hours to be included: 7,8,9,10,11,12,13,14,15,16,17,18

Reading of extra variable 5 Y/N?
If the answer is Y, then:

Enter variable name and unit (both with apostrophes),
and the number of decimals in the data: 'GUST','m/s',2

Number of days in the month ..... : 30
Name of input file ..... : 'HUNSEP91.SYN'

If there are big diurnal differences in the meteorological data and the emissions, then it is recommended to make separate dispersion calculations for day time and night time.

The data at the .SYN files shall be according to chapter 1.1.

4.3 TEST-EXAMPLE FOR THE PROGRAM

```
>PROGRAM\METFREC
'TERM'                                  ,Input from terminal
'DHUSEP91.PRN'                          ,Output file
Y                                       ,Wants a .MET-file
'DHUSEP91.MET'                          ,MET-file name
1                                       ,1 month
1                                       ,Stability from ΔT
1                                       ,Wind direction 0=not available
12                                      ,Sectors
1,2,3                                   ,Wind speed classes
-0.5,0,0.5                              ,Stability classes
0.2                                     ,Calm
12                                      ,Wants a day-matrix
7,8,9,10,11,12,13,14,15,16,17,18        ,hours to be included
Y                                       ,extra variable
'GUST','m/s',2                          ,variable name, unit,
                                         decimals
30                                      ,days
'HUNSEP91.SYN'                          ,syn-file
```

4.4 THE RESULTS FROM THE TEST-EXAMPLE

Delta T : HUNNDALEN
Wind : HUNNDALEN
Period : 91.09.01. - 91.09.30.
Unit : Percent
Data from the following hours are used: 7 8 9 10 11 12 13 14 15 16 17 18

JOINT FREQUENCY DISTRIBUTION OF STABILITY, WIND SPEED AND WIND DIRECTION

Class I: Unstable DT < -.5 Degrees C
Class II: Neutral -.5 < DT < .0 Degrees C
Class III: Light stable .0 < DT < .5 Degrees C
Class IV: Stable .5 < DT Degrees C

Calm: U less or equal .20 m/s

	.0- 1.0 m/s				1.0- 2.0 m/s				2.0- 3.0 m/s				over 3.0 m/s				
Wind-direction	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	Rose
30	.6	1.1	.3	.0	1.4	.8	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	4.5
60	.8	.6	.3	.0	3.9	1.7	.0	.0	1.1	2.8	.0	.0	.0	.0	.0	.0	11.1
90	2.8	1.7	.0	.6	7.8	3.3	.8	.0	.3	.0	.3	.0	.0	.0	.0	.0	17.5
120	.6	1.4	.3	1.7	.0	2.2	1.1	.0	.0	.0	.8	.0	.0	.0	.0	.0	8.1
150	.0	.0	.3	.8	.0	.0	.3	.0	.6	1.7	.6	.0	.0	.0	.0	.0	4.2
180	.0	.0	.0	.0	.0	.6	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0	.8
210	.0	.3	.0	.8	.0	.0	2.5	.6	.6	1.1	1.1	.3	.3	.0	.3	.0	7.8
240	.6	.3	.0	.8	.6	2.8	.0	1.1	1.4	2.2	1.4	.3	2.8	4.2	.6	.0	18.9
270	.8	.3	.3	.0	.6	.6	.6	.3	.6	.8	.0	.0	1.7	1.7	.0	.0	8.1
300	.0	1.1	.3	.0	1.9	.6	.0	.0	.6	1.1	.6	.0	.6	.8	.0	.0	7.5
330	.0	.6	.3	.3	.0	.3	.0	.0	1.1	.3	.0	.0	1.1	1.4	.0	.0	5.3
360	.8	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0	2.5	.3	.0	.0	3.9
Calm	1.4	.6	.0	.3													2.2
Total	8.4	7.8	1.9	5.3	16.4	12.8	5.3	1.9	6.4	10.3	4.7	.6	8.9	8.4	.8	.0	100.0

Occurrence	23.4 %	36.5 %	22.0 %	18.1 %	100.0 %
Wind speed	.72 m/s*	1.5 m/s	2.5 m/s	3.9 m/s	2.01 m/s*

*: Calm not included

Frequency of occurrence of the stability classes

Class I	Class II	Class III	Class IV	
Occurrence	40.1 %	39.3 %	12.8 %	7.8 %	100.0 %

Period : 91.09.01. - 91.09.30.

MEAN VALUE OF GUST AS A FUNCTION OF STABILITY, WIND SPEED AND WIND DIRECTION

Unit : m/s

Wind-direction	.0- 1.0 m/s				1.0- 2.0 m/s				2.0- 3.0 m/s				over 3.0 m/s				Rose
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
30	2.40	1.72	2.10	-	4.14	3.20	-	-	-	4.20	-	-	-	-	-	-	10.84
60	3.50	2.85	3.90	-	4.07	4.00	-	-	4.65	5.46	-	-	-	-	-	-	15.64
90	2.91	2.95	-	2.10	3.40	3.63	2.90	-	5.70	-	6.60	-	-	-	-	-	12.00
120	1.80	4.08	1.50	1.85	-	4.88	4.65	-	-	-	7.40	-	-	-	-	-	14.41
150	-	-	1.20	2.30	-	-	4.50	-	6.30	6.20	6.75	-	-	-	-	-	18.17
180	-	-	-	-	-	4.80	-	-	5.70	-	-	-	-	-	-	-	18.31
210	-	5.70	-	2.30	-	-	3.63	3.75	6.90	5.78	4.50	3.60	6.60	-	7.20	-	16.04
240	4.80	2.10	-	3.30	5.70	4.44	-	3.52	7.02	6.66	5.64	4.50	10.11	9.83	8.40	-	25.23
270	1.90	2.40	2.40	-	4.50	4.65	6.00	3.30	7.50	6.50	-	-	10.52	10.67	-	-	25.46
300	-	3.45	5.10	-	5.96	4.65	-	-	6.60	7.88	9.00	-	9.00	10.20	-	-	24.09
330	-	2.70	1.80	2.10	-	7.80	-	-	8.88	8.10	-	-	10.05	9.64	-	-	28.17
360	2.40	-	-	-	4.50	-	-	-	-	-	-	-	11.24	9.30	-	-	31.34
Calm	2.04	2.70	-	.90													7.40
Average	2.69	3.05	2.57	2.21	4.06	4.27	4.03	3.56	6.75	6.26	6.26	4.05	10.32	9.98	8.00	-	5.34

Value	2.69	4.10	6.35	10.06

Average values in selected stability classes

	Class I	Class II	Class III	Class IV
Value	5.59	5.77	4.89	2.68

Number of obs.: 359
Missing obs. : 1

The file DHUSEP91.MET will be:

Period : 91.09.01. - 91.09.30.
HUNNDALEN Station
Mean temp.
.7, 1.5, 2.5, 3.9, Wind speed
Height for wind measurements
Start vel. for wind sensor
Standard wind profile exp.? Y/N
Standard mix. heights? Y/N
New mix. heights

30	.6	1.1	.3	.0	1.4	.8	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0
60	.8	.6	.3	.0	3.9	1.7	.0	.0	1.1	2.8	.0	.0	.0	.0	.0	.0
90	2.8	1.7	.0	.6	7.8	3.3	.8	.0	.3	.0	.3	.0	.0	.0	.0	.0
120	.6	1.4	.3	1.7	.0	2.2	1.1	.0	.0	.0	.8	.0	.0	.0	.0	.0
150	.0	.0	.3	.8	.0	.0	.3	.0	.6	1.7	.6	.0	.0	.0	.0	.0
180	.0	.0	.0	.0	.0	.6	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0
210	.0	.3	.0	.8	.0	.0	2.5	.6	.6	1.1	1.1	.3	.3	.0	.3	.0
240	.6	.3	.0	.8	.6	2.8	.0	1.1	1.4	2.2	1.4	.3	2.8	4.2	.6	.0
270	.8	.3	.3	.0	.6	.6	.6	.3	.6	.8	.0	.0	1.7	1.7	.0	.0
300	.0	1.1	.3	.0	1.9	.6	.0	.0	.6	1.1	.6	.0	.6	.8	.0	.0
330	.0	.6	.3	.3	.0	.3	.0	.0	1.1	.3	.0	.0	1.1	1.4	.0	.0
360	.8	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0	2.5	.3	.0	.0
	1.4	.6	.0	.3					Calm							

For the use of this MET-file in the KILDER programs, some additional data should be included, see the KILDER manual for POI-KILD and ARE-KILD.

NORSK INSTITUTT FOR LUFTFORSKNING (NILU)
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TITTEL	PROSJEKTLEDER
WINDFREC, STABFREC and METFREC. Meteorological Programs - Users Guide.	T. Bøhler
	NILU PROSJEKT NR. O-92014
FORFATTER(E) F. Gram	TILGJENGELIGHET * A
	OPPDRAGSGIVERS REF.

OPPDRAGSGIVER (NAVN OG ADRESSE)
Norwegian Institute for Air Research (NILU)
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STIKKORD
Programmer | Statistikk | Brukerbeskrivelser

REFERAT
NILU har utarbeidet brukerbeskrivelser for PC-versjonen av tre statistikk-programmer utviklet på NILU. De tre programmene er: WINDFREC, STABFREC og METFREC. Brukerbeskrivelsene inneholder en generell beskrivelse og eksempler på dialog og kjøring av programmet.

TITLE

ABSTRACT
NILU has performed user guides for the PC-version of three statistical programs developed at NILU: WINDFREC, STABFREC and METFREC. The user guides consist of a general description and examples of how to run the programs.

* Kategorier: Åpen - kan bestilles fra NILU A
Må bestilles gjennom oppdragsgiver B
Kan ikke utleveres C