



The Development of AERMOD-Ready Meteorological Data for the South Coast Air Basin and the Coachella Valley

Final Report

Volume II: Appendices

Prepared by

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For

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Project: EC-07-015
Report: 09-04-17 (II)

Appendix A: Wind Roses

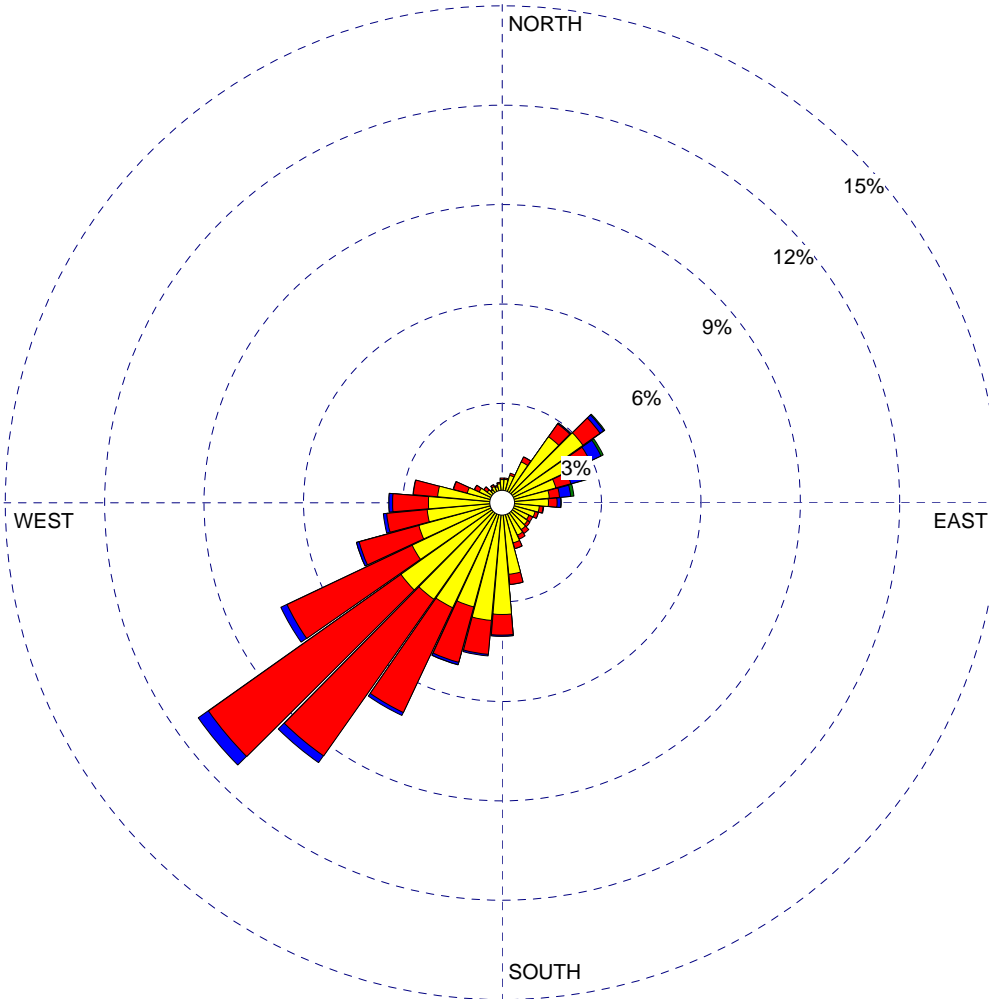
*The following wind roses depict the wind data used to create the AERMOD *.sfc and *.pfl input files for each sub-area. Electronic files of these wind roses are also provided on the accompanying CD in a directory called “Wind Roses” (see Appendix D).*

WIND ROSE PLOT:

anah

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.02%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.02%

TOTAL COUNT:

26139 hrs.

AVG. WIND SPEED:

1.90 m/s

DATE:

1/28/2009

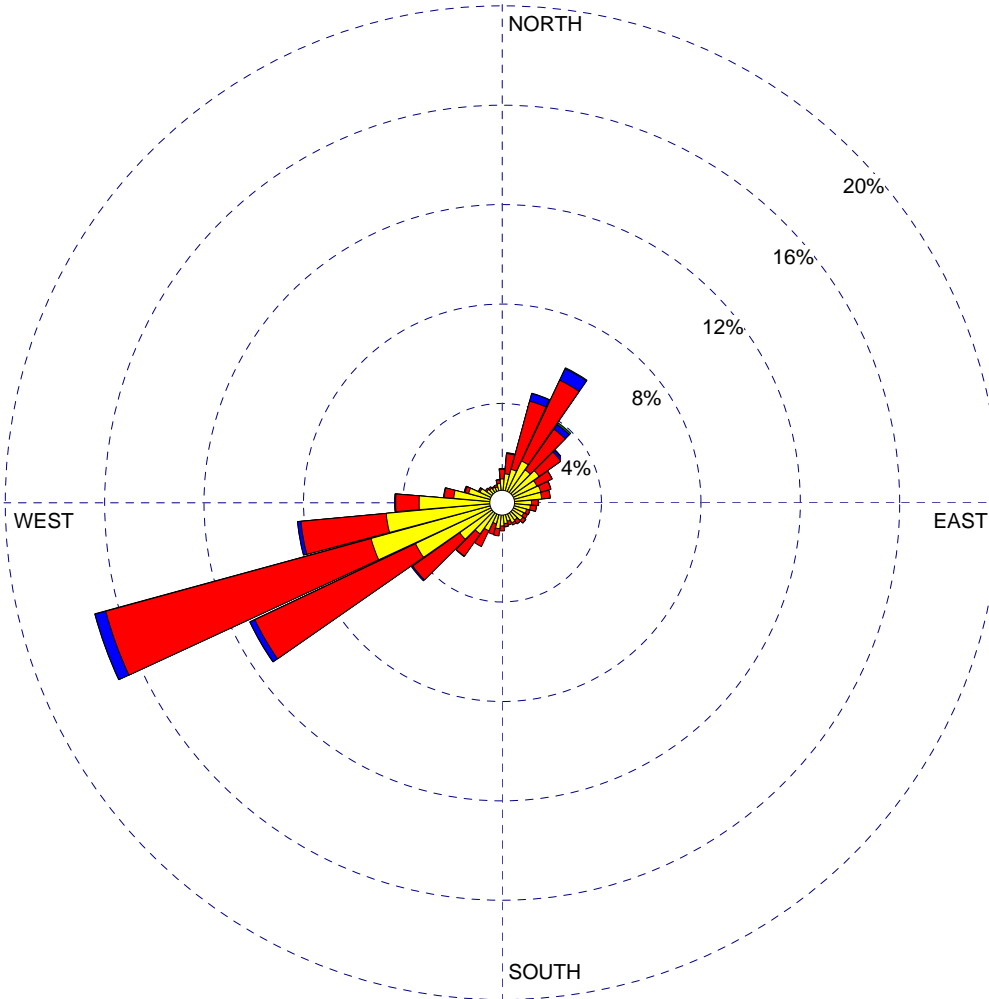
PROJECT NO.:

WIND ROSE PLOT:

azus

DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.00%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

25529 hrs.

AVG. WIND SPEED:

2.00 m/s

DATE:

1/28/2009

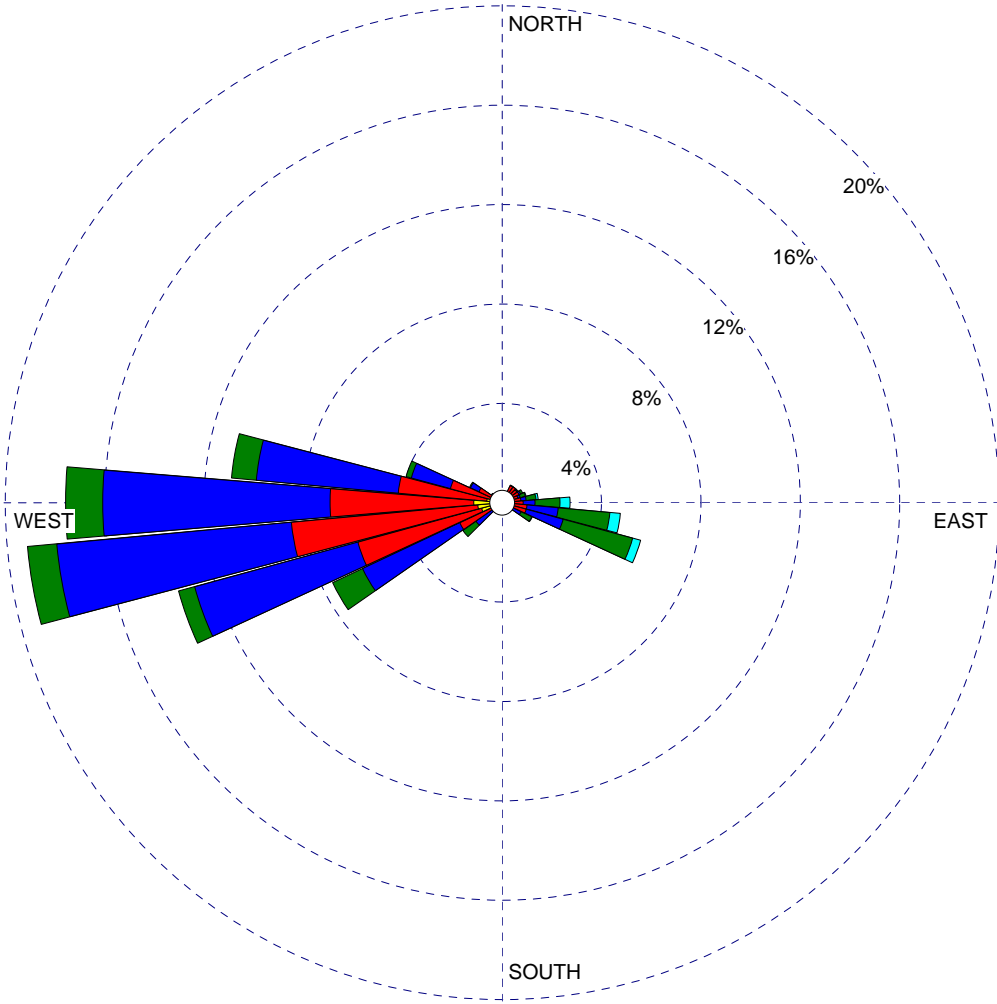
PROJECT NO.:

WIND ROSE PLOT:

bnap

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
 - 6.0 - 11.0
 - 4.0 - 6.0
 - 2.0 - 4.0
 - 0.5 - 2.0
 - 0.1 - 0.5
- Calms: 0.00%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

26234 hrs.

AVG. WIND SPEED:

4.40 m/s

DATE:

1/28/2009

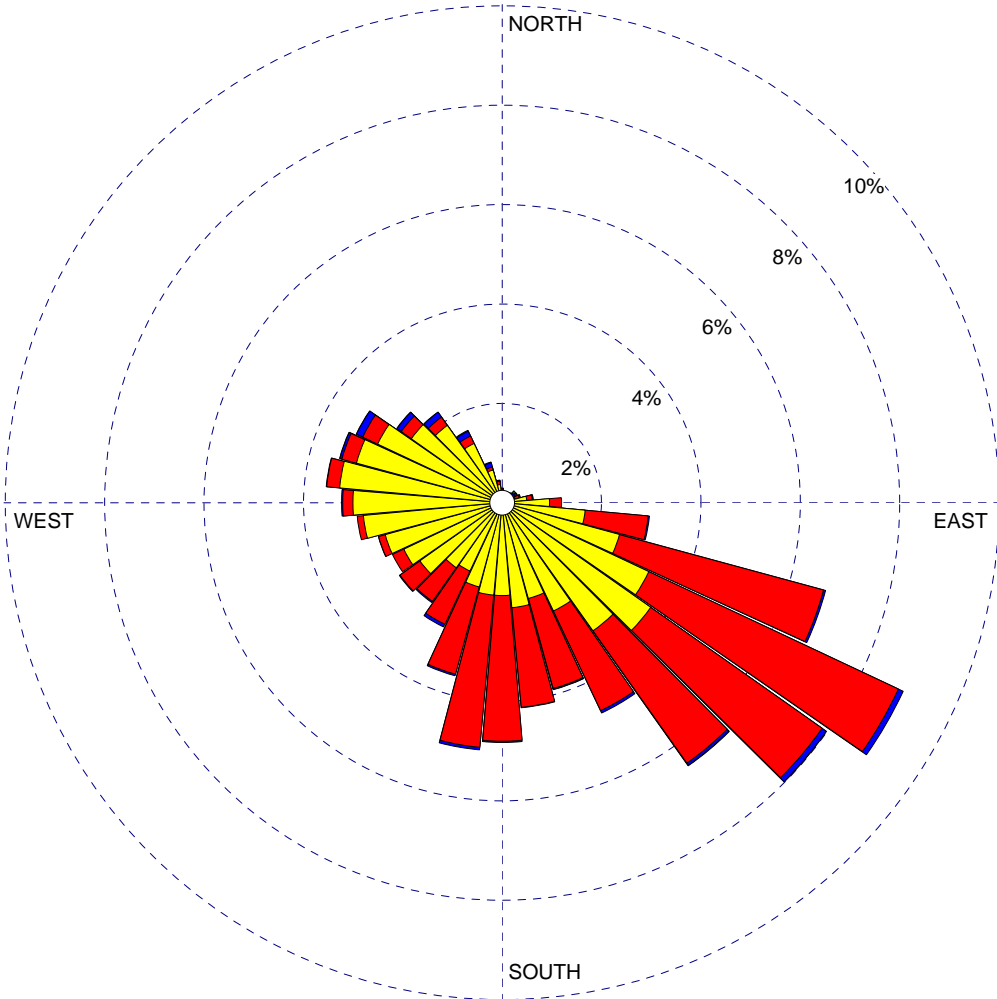
PROJECT NO.:

WIND ROSE PLOT:

burk

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.02%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.02%

TOTAL COUNT:

26170 hrs.

AVG. WIND SPEED:

1.82 m/s

DATE:

2/1/2009

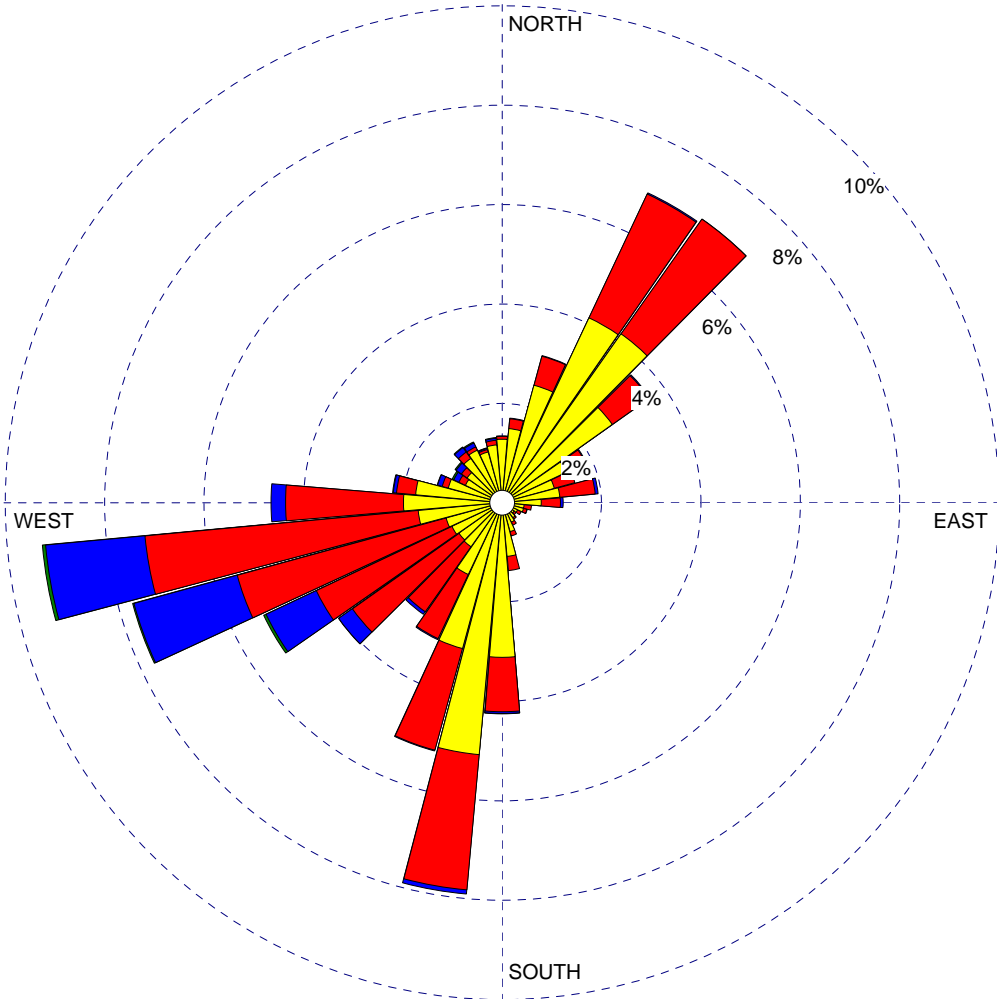
PROJECT NO.:

WIND ROSE PLOT:

cela

DISPLAY:

**Wind Speed
Direction (blowing from)**



**WIND SPEED
(m/s)**

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.00%

COMMENTS:

DATA PERIOD:

**2006-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

17417 hrs.

AVG. WIND SPEED:

2.11 m/s

DATE:

1/28/2009

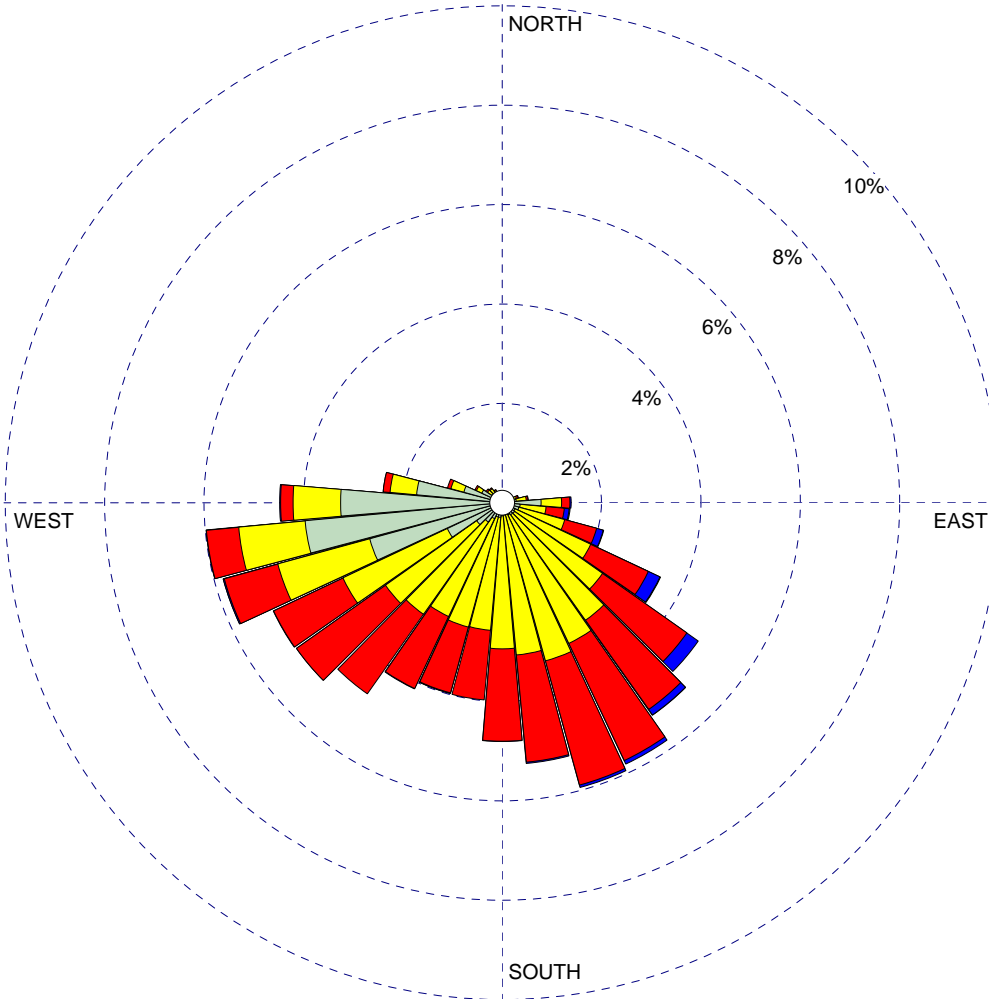
PROJECT NO.:

WIND ROSE PLOT:

cres

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 8.86%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

8.86%

TOTAL COUNT:

26032 hrs.

AVG. WIND SPEED:

1.36 m/s

DATE:

1/28/2009

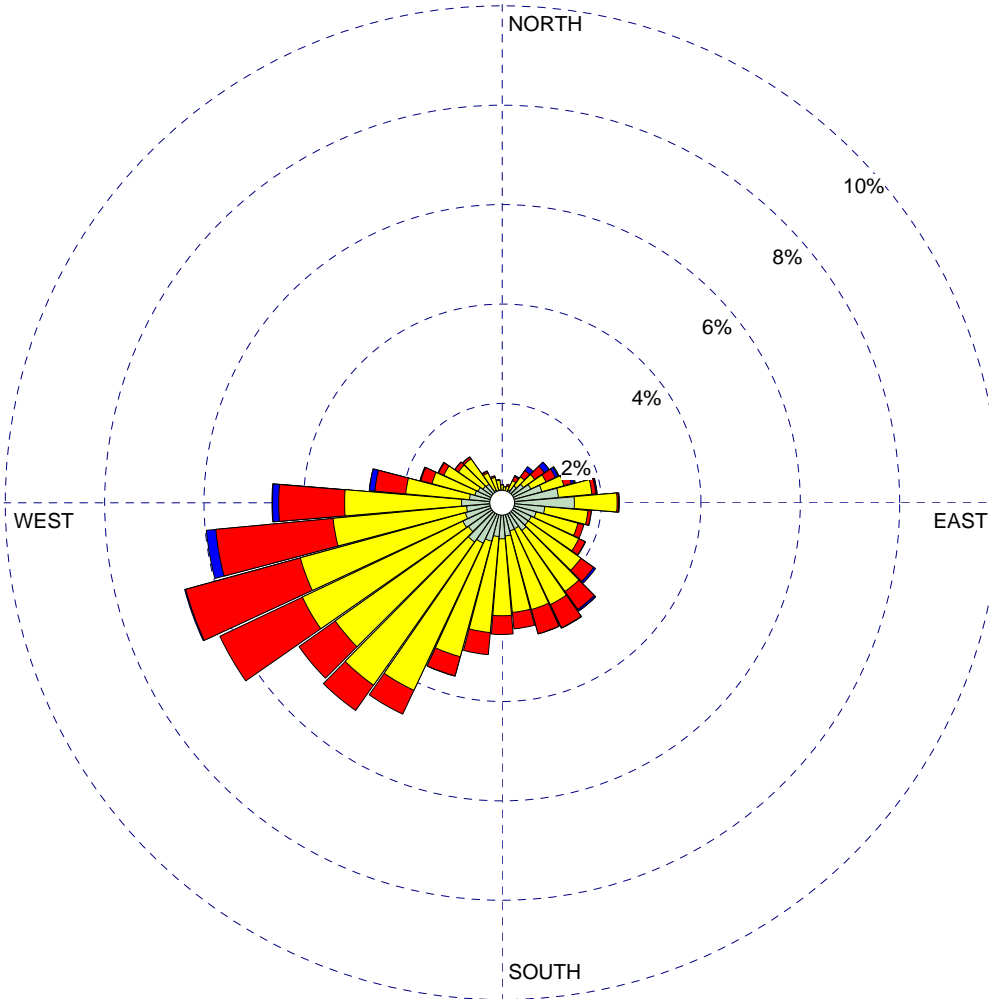
PROJECT NO.:

WIND ROSE PLOT:

csta

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 13.40%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

13.40%

TOTAL COUNT:

25385 hrs.

AVG. WIND SPEED:

1.06 m/s

DATE:

1/28/2009

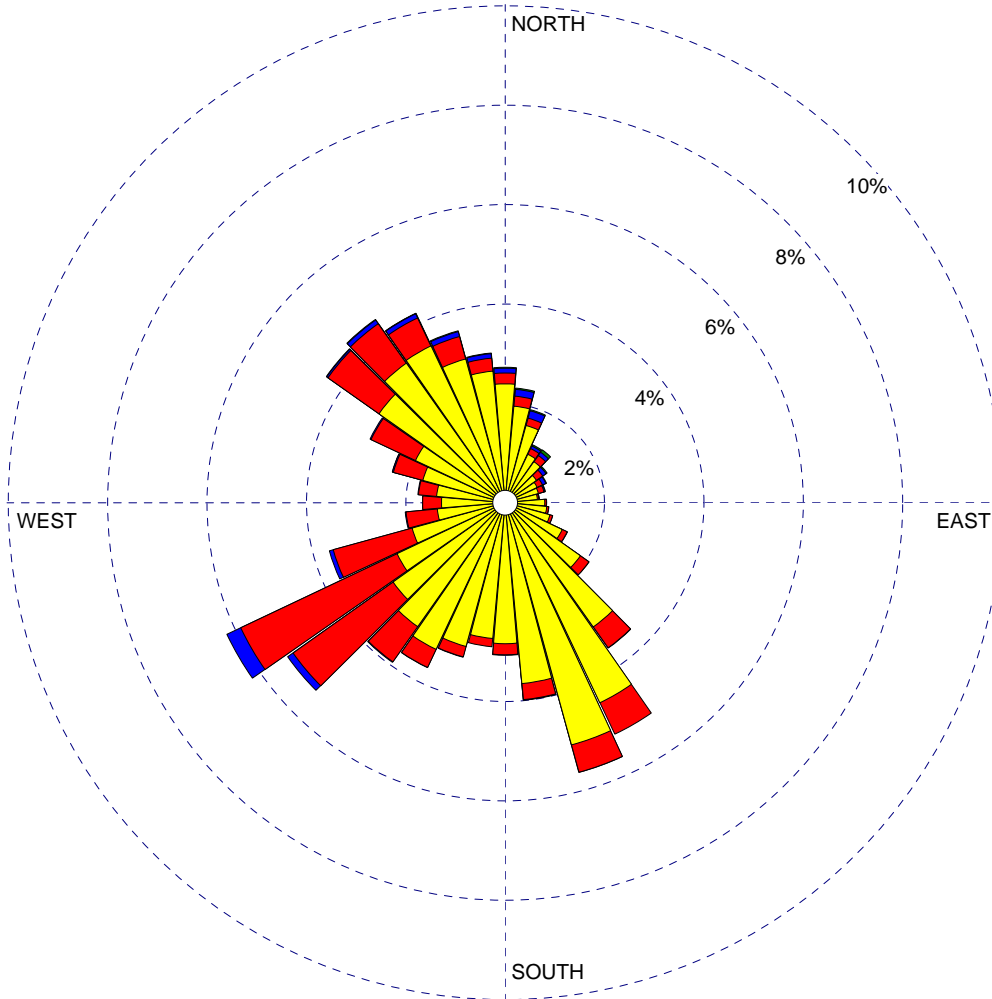
PROJECT NO.:

WIND ROSE PLOT:

elsi

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.03%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.03%

TOTAL COUNT:

24995 hrs.

AVG. WIND SPEED:

1.44 m/s

DATE:

1/28/2009

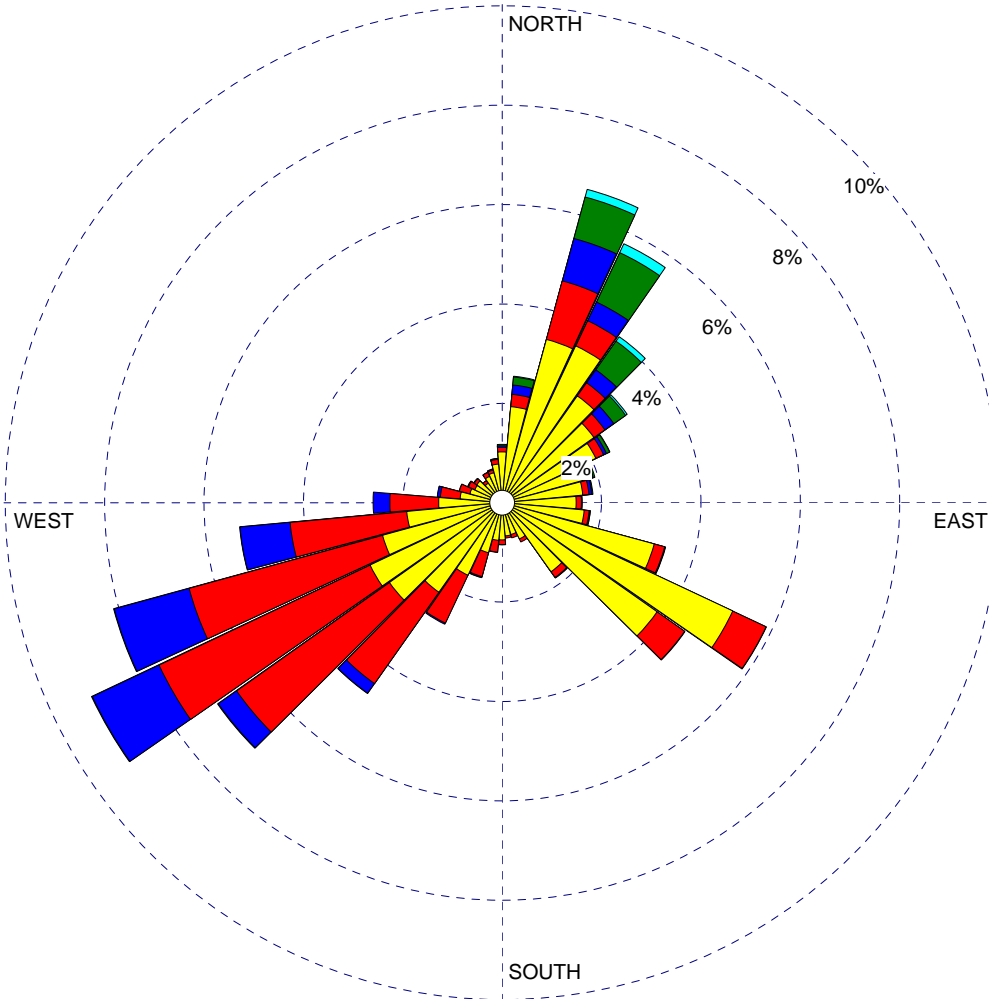
PROJECT NO.:

WIND ROSE PLOT:

font

DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.00%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

24069 hrs.

AVG. WIND SPEED:

2.15 m/s

DATE:

3/29/2009

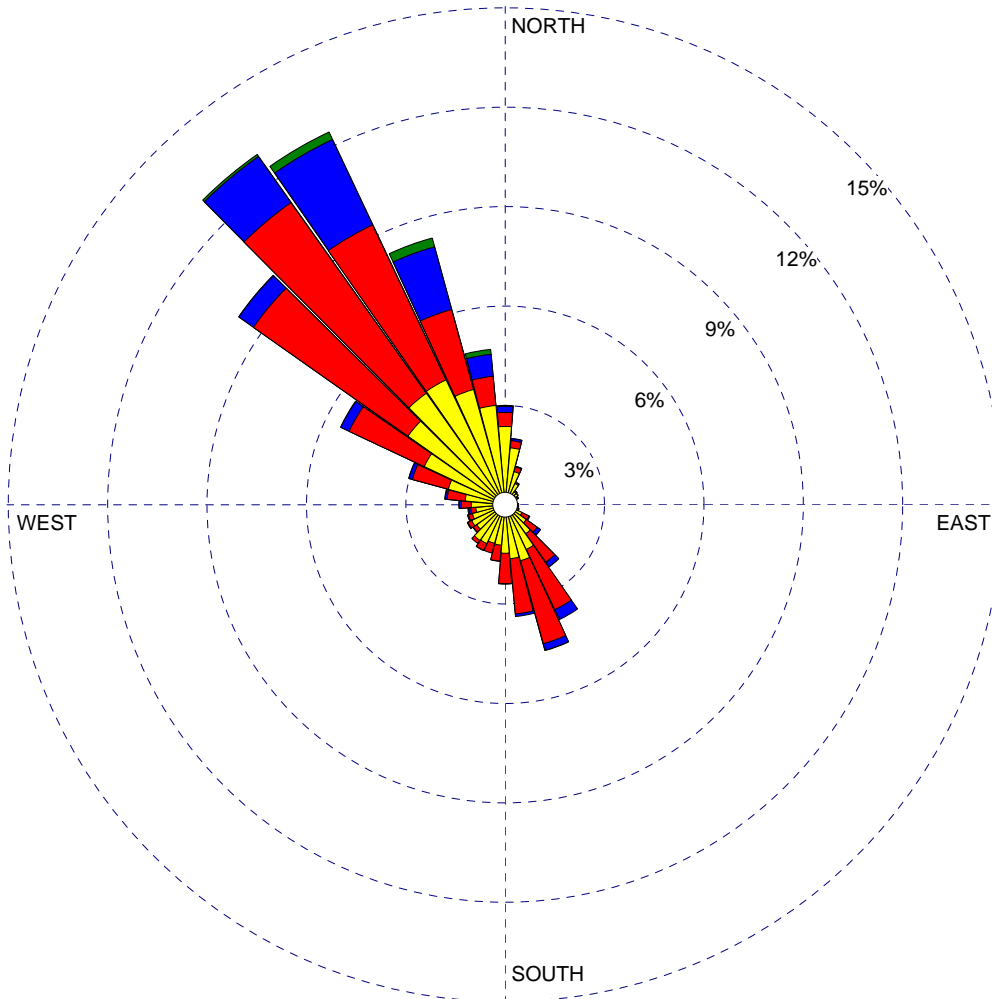
PROJECT NO.:

WIND ROSE PLOT:

ind

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.19%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.19%

TOTAL COUNT:

26033 hrs.

AVG. WIND SPEED:

2.14 m/s

DATE:

1/28/2009

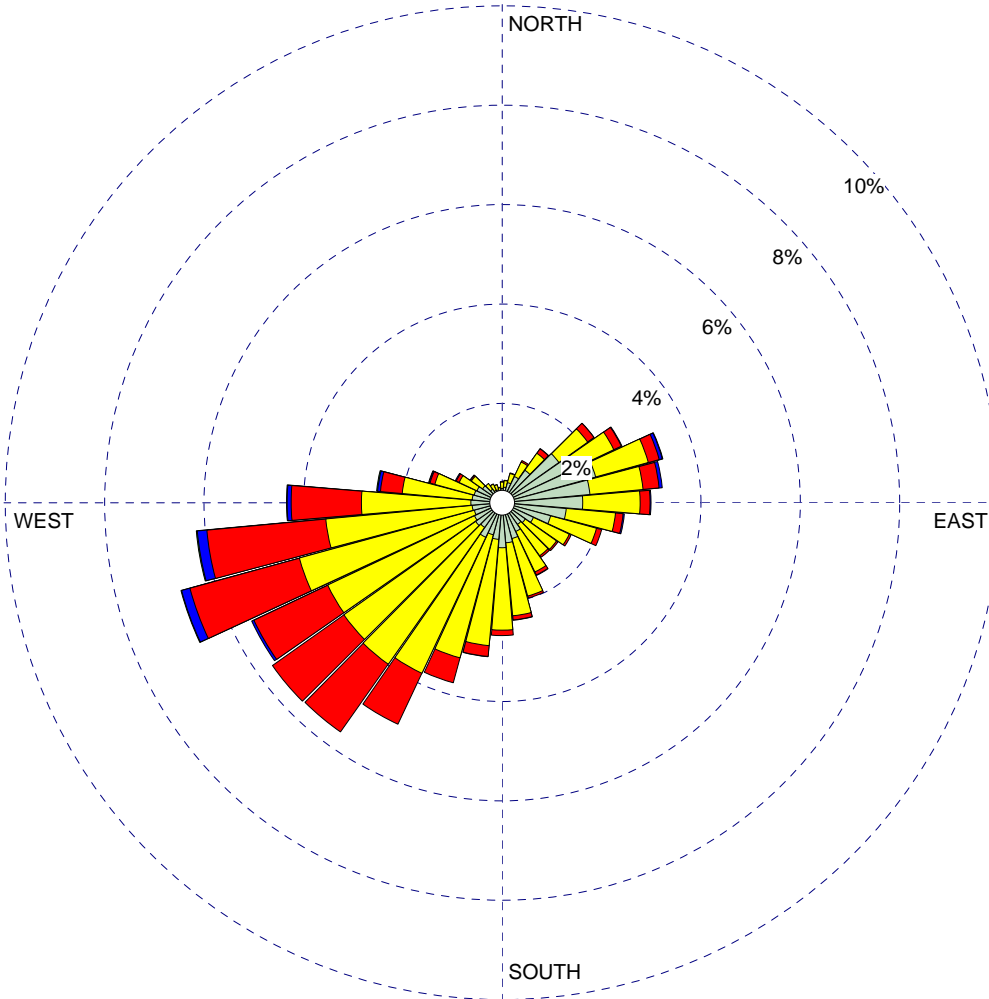
PROJECT NO.:

WIND ROSE PLOT:

lahb

DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 11.05%

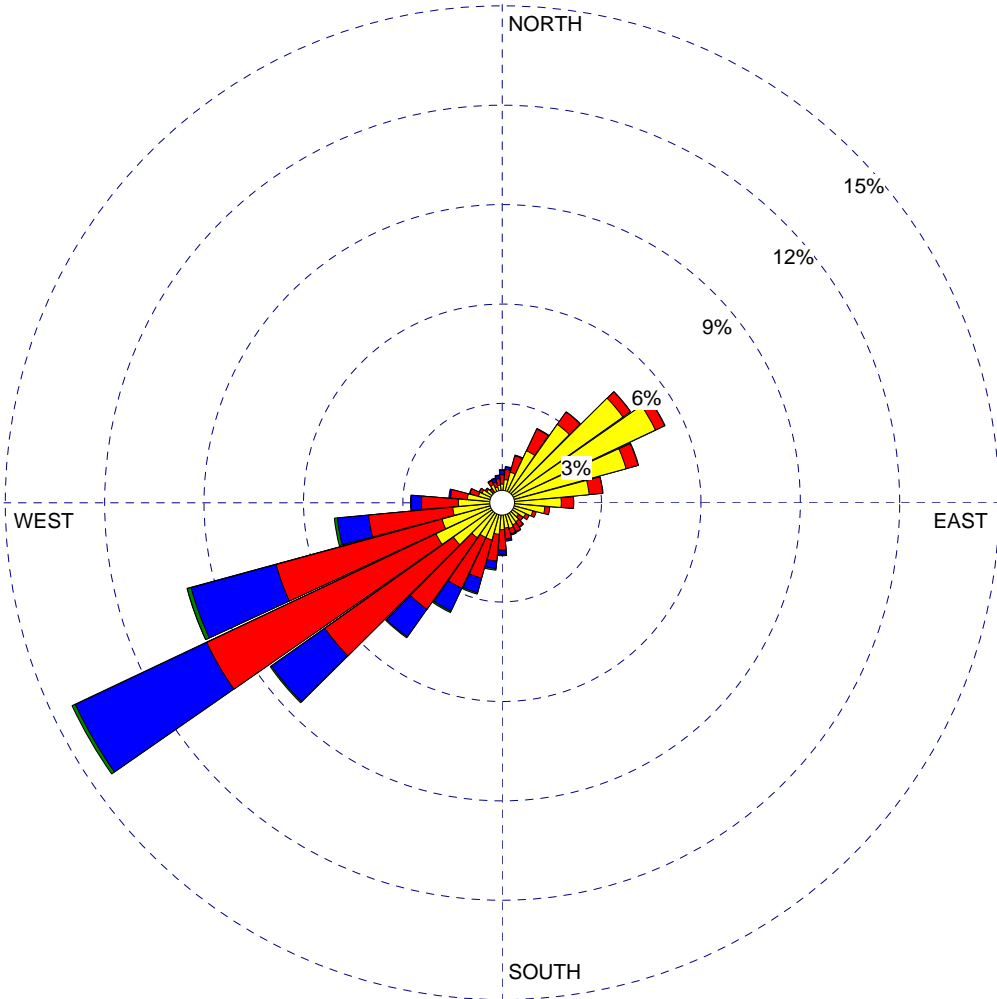
COMMENTS:	DATA PERIOD: 2005-2007 Jan 1 - Dec 31 00:00 - 23:00	COMPANY NAME:	
	CALM WINDS: 11.05%	MODELER:	
	AVG. WIND SPEED: 1.02 m/s	TOTAL COUNT: 25851 hrs.	
		DATE: 1/28/2009	PROJECT NO.:

WIND ROSE PLOT:

laxh

DISPLAY:

**Wind Speed
Direction (blowing from)**



**WIND SPEED
(m/s)**

- ≥ 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.06%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.06%

TOTAL COUNT:

26181 hrs.

AVG. WIND SPEED:

2.29 m/s

DATE:

2/1/2009

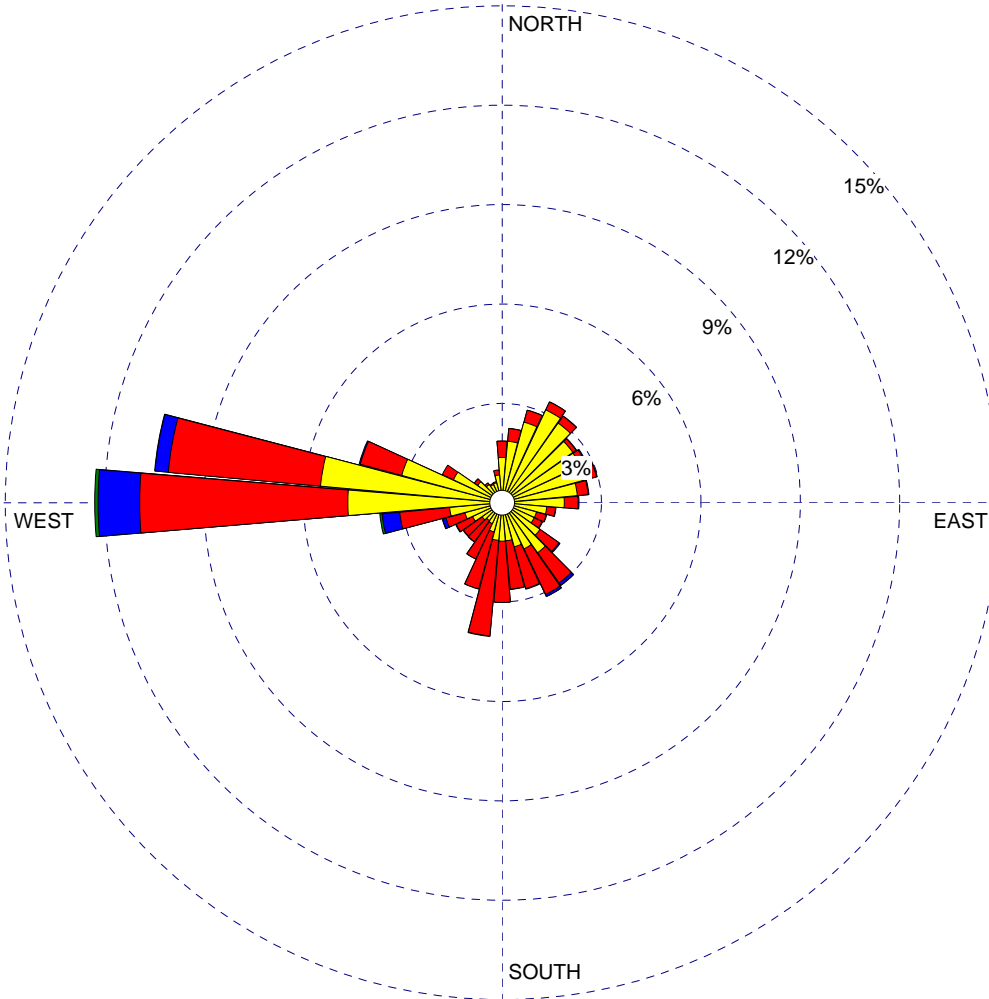
PROJECT NO.:

WIND ROSE PLOT:

Igbh

DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.00%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

26221 hrs.

AVG. WIND SPEED:

1.84 m/s

DATE:

1/28/2009

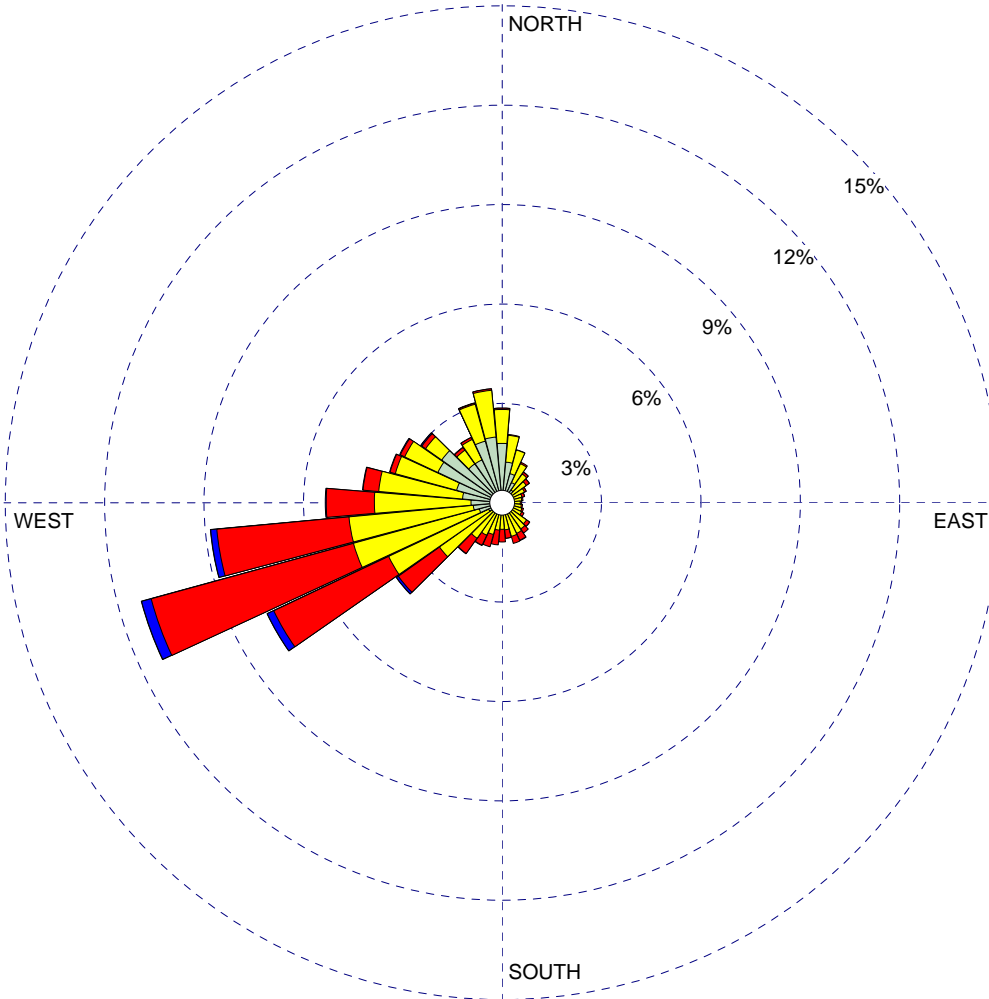
PROJECT NO.:

WIND ROSE PLOT:

lynn

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 10.14%

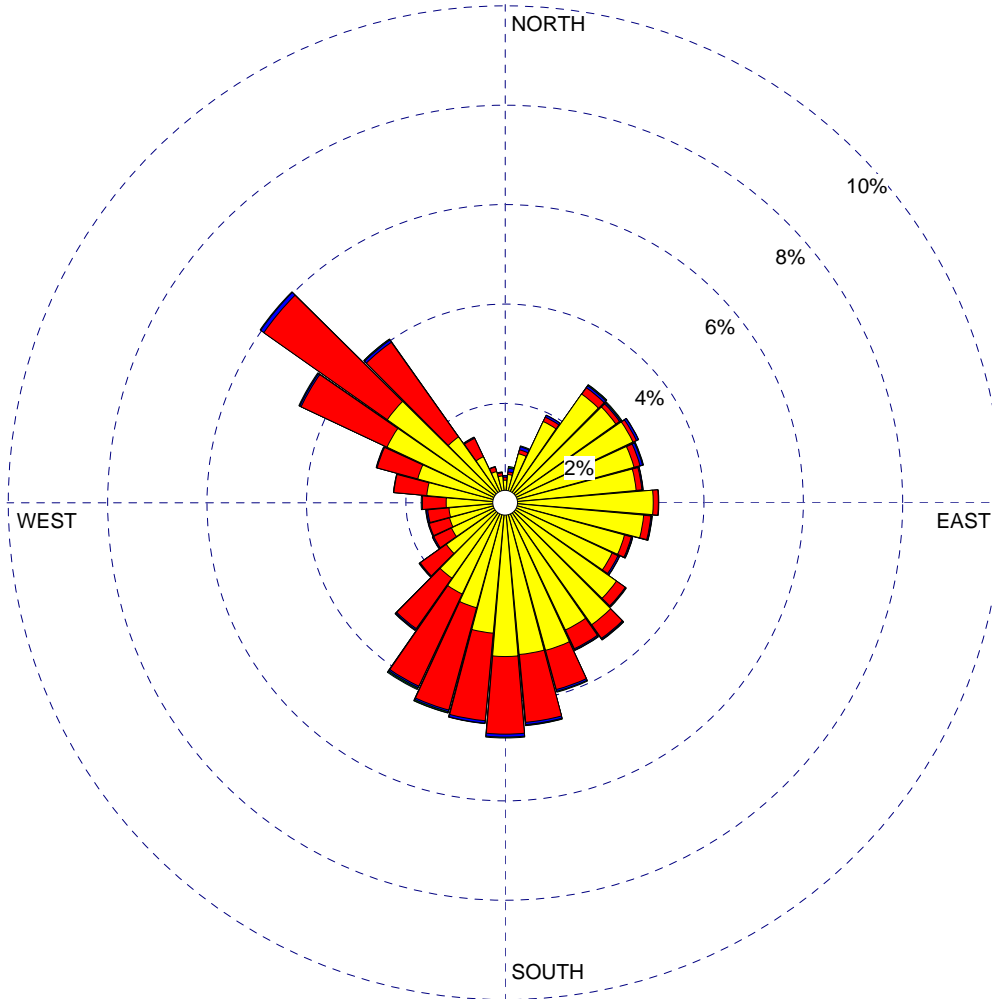
COMMENTS:	DATA PERIOD: 2005-2007 Jan 1 - Dec 31 00:00 - 23:00	COMPANY NAME:	
	CALM WINDS: 10.14%	MODELER:	
	AVG. WIND SPEED: 1.16 m/s	TOTAL COUNT: 25852 hrs.	
		DATE: 1/28/2009	PROJECT NO.:

WIND ROSE PLOT:

msvj

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.00%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

26146 hrs.

AVG. WIND SPEED:

1.61 m/s

DATE:

1/28/2009

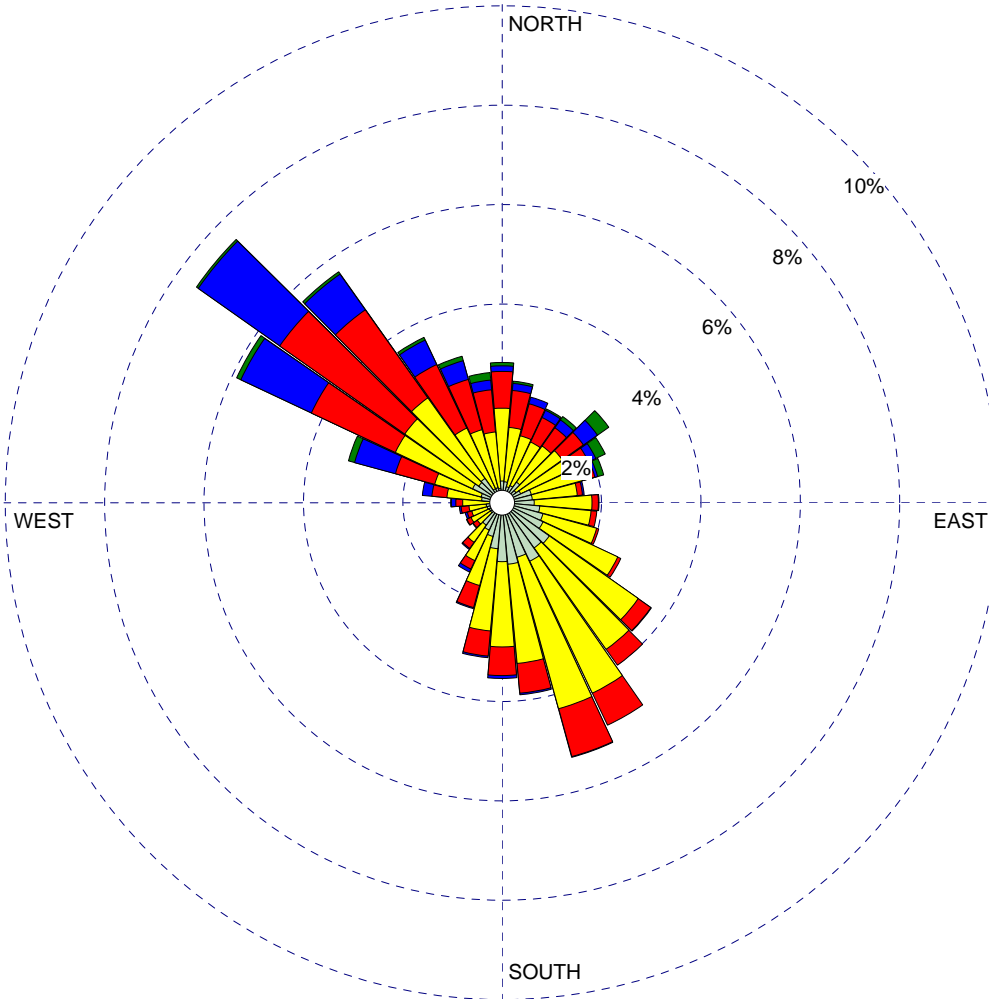
PROJECT NO.:

WIND ROSE PLOT:

peri

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.38%

COMMENTS:

DATA PERIOD:

**2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.38%

TOTAL COUNT:

8694 hrs.

AVG. WIND SPEED:

1.65 m/s

DATE:

1/28/2009

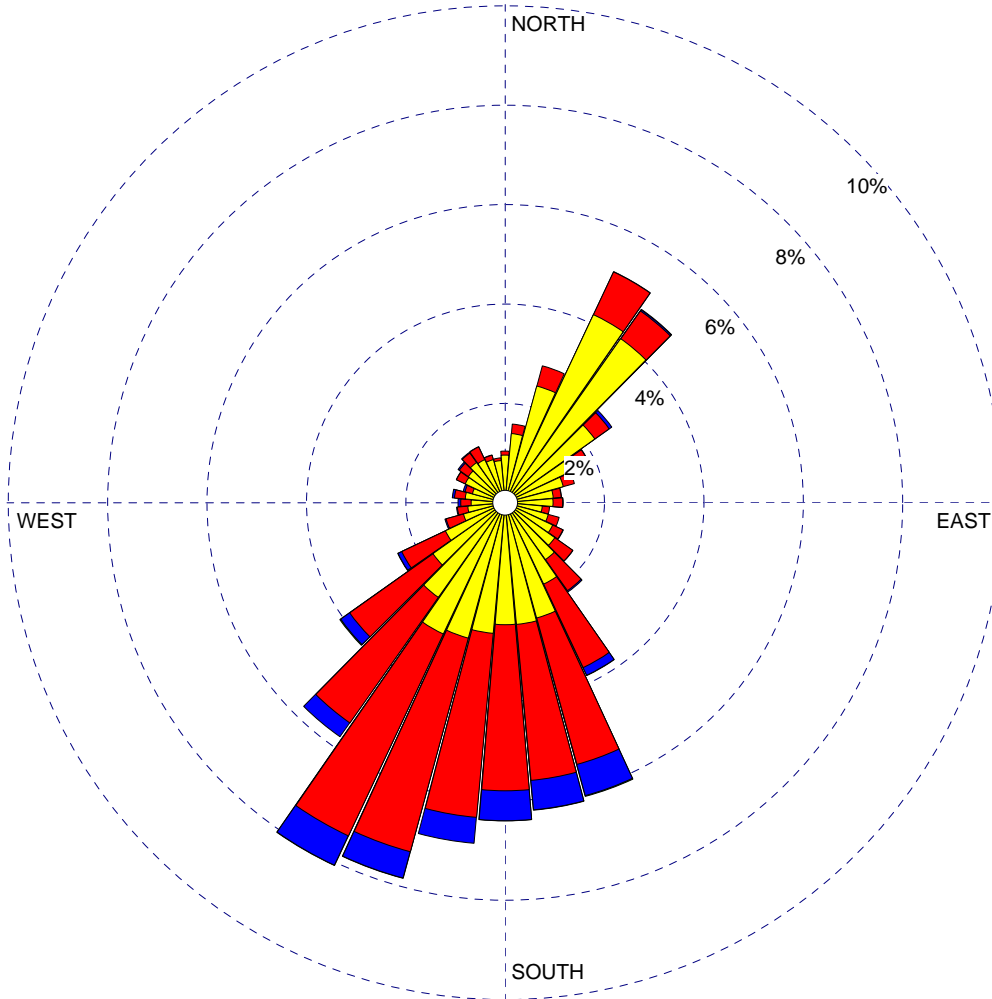
PROJECT NO.:

WIND ROSE PLOT:

pico

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.00%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

18694 hrs.

AVG. WIND SPEED:

1.96 m/s

DATE:

2/1/2009

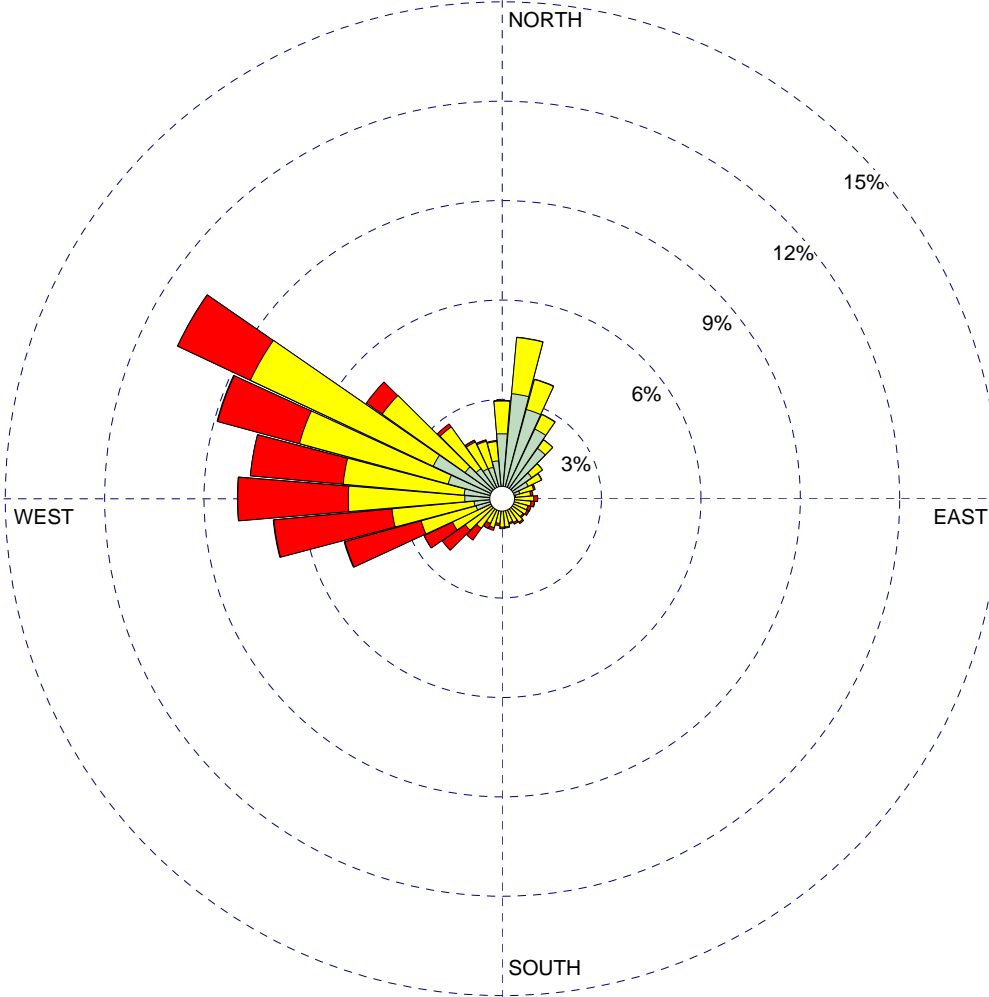
PROJECT NO.:

WIND ROSE PLOT:

poma

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.02%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.02%

TOTAL COUNT:

25892 hrs.

AVG. WIND SPEED:

1.18 m/s

DATE:

1/28/2009

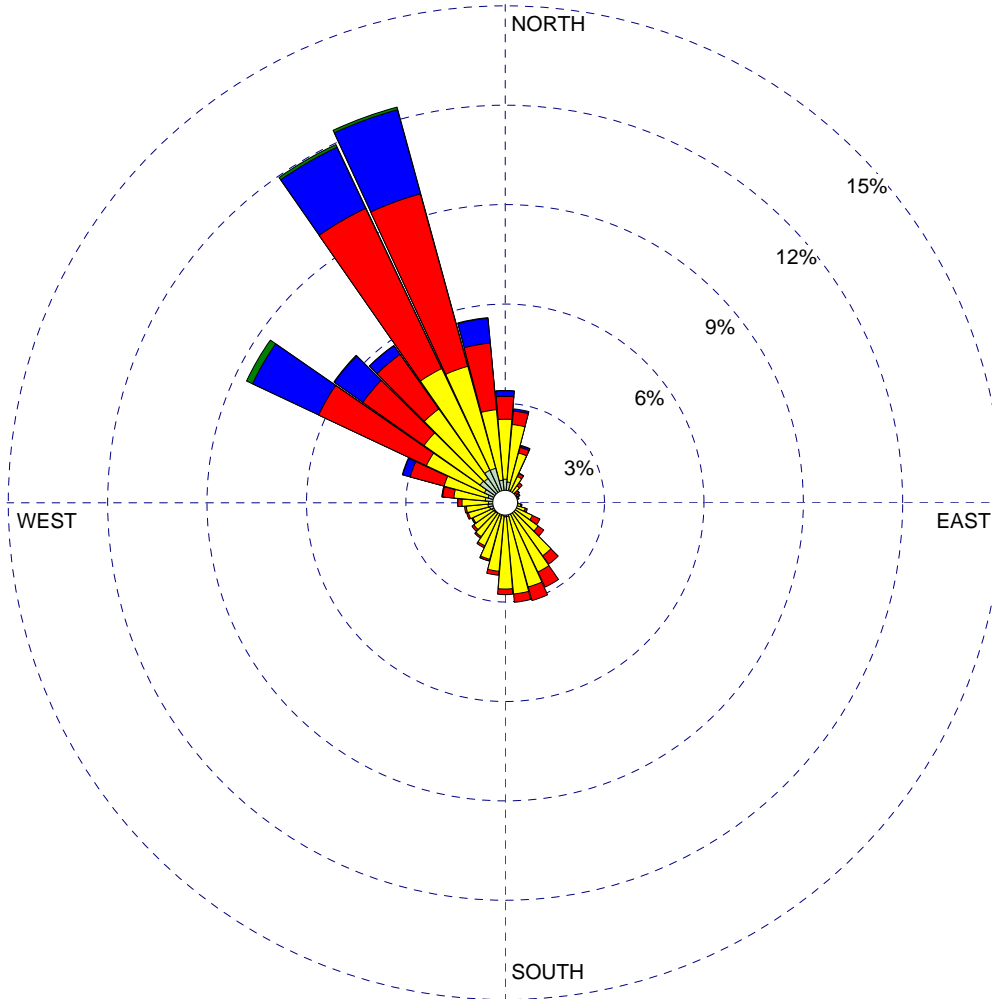
PROJECT NO.:

WIND ROSE PLOT:

pslp

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 1.58%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

1.58%

TOTAL COUNT:

24718 hrs.

AVG. WIND SPEED:

1.81 m/s

DATE:

1/28/2009

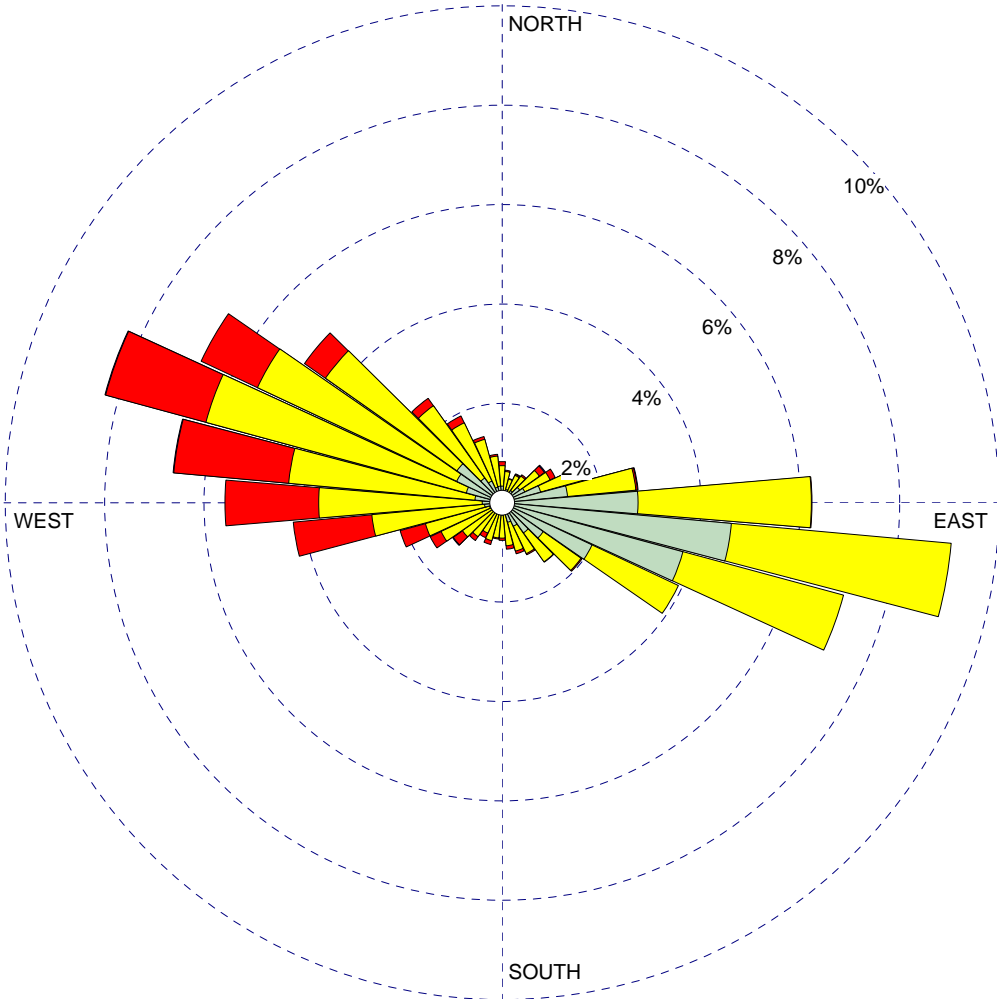
PROJECT NO.:

WIND ROSE PLOT:

rldd

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 4.97%

COMMENTS:

DATA PERIOD:

**2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

4.97%

TOTAL COUNT:

8715 hrs.

AVG. WIND SPEED:

0.94 m/s

DATE:

1/28/2009

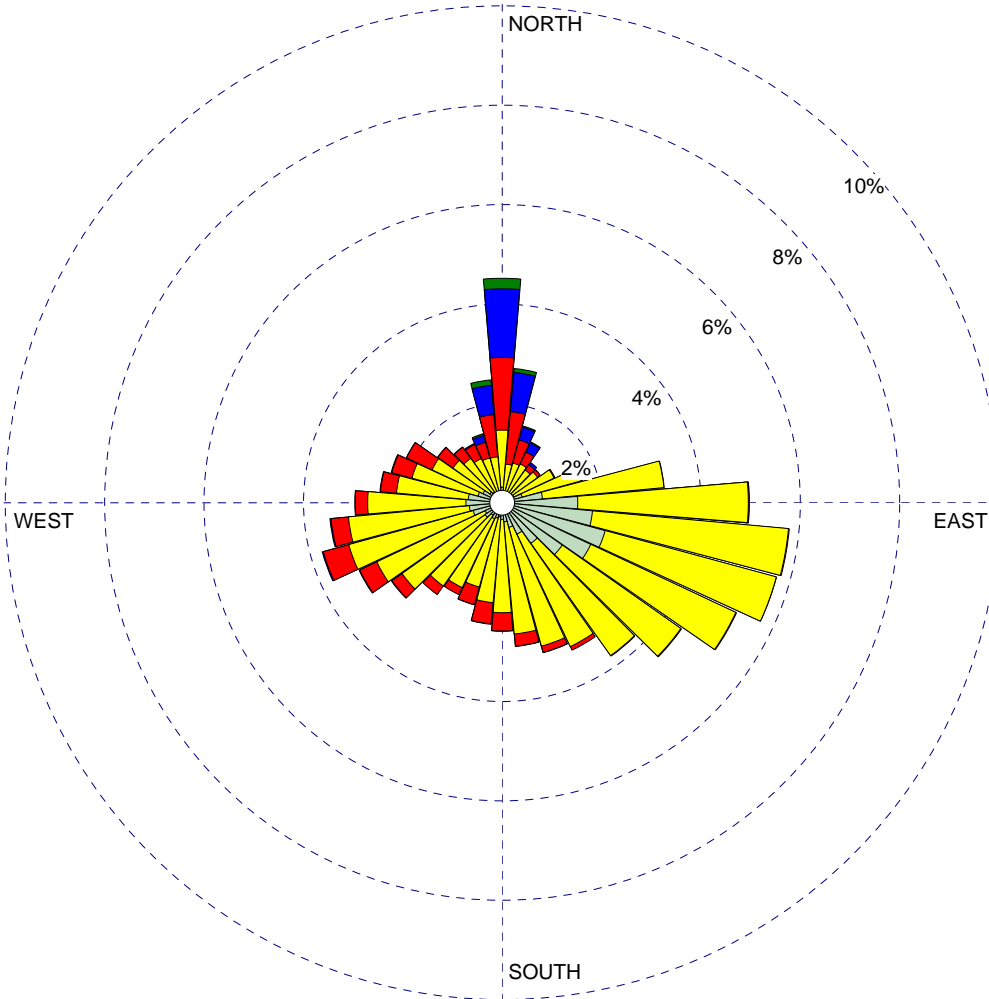
PROJECT NO.:

WIND ROSE PLOT:

rese

DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.03%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.03%

TOTAL COUNT:

26145 hrs.

AVG. WIND SPEED:

1.15 m/s

DATE:

2/1/2009

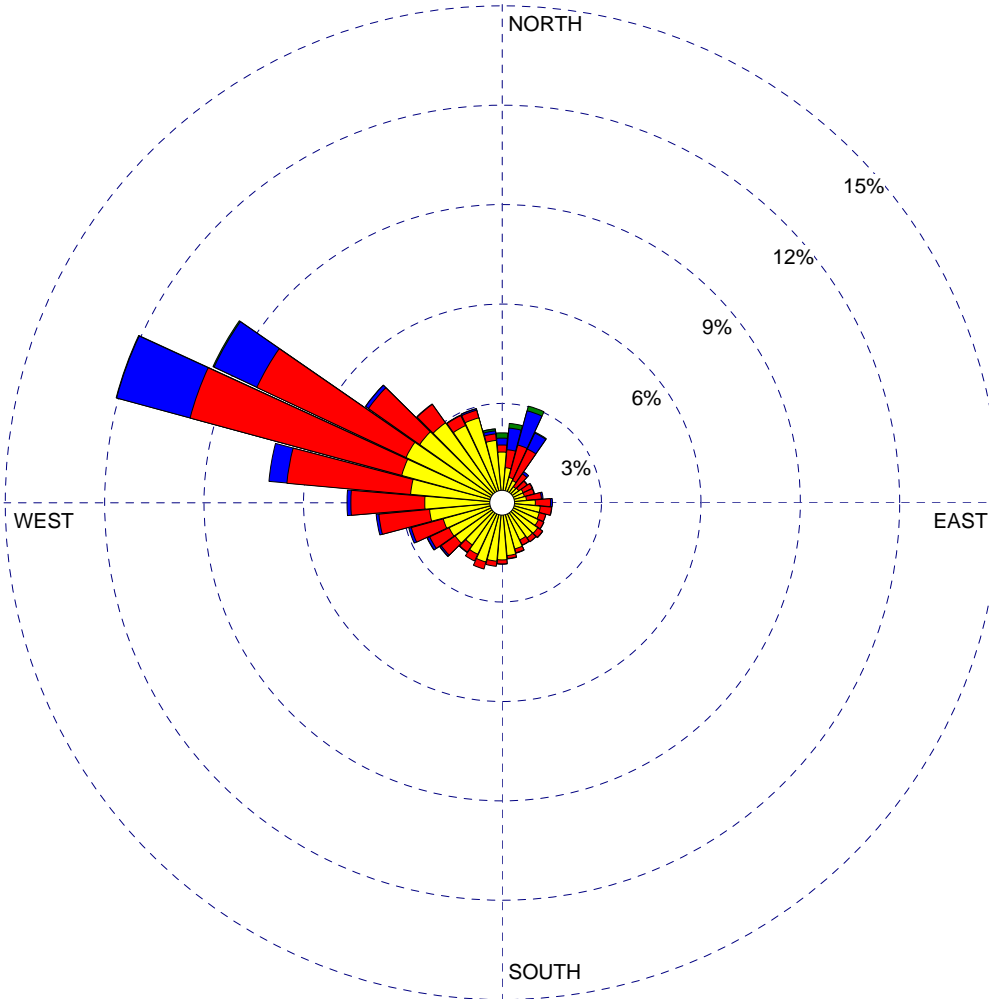
PROJECT NO.:

WIND ROSE PLOT:

rivr

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.00%

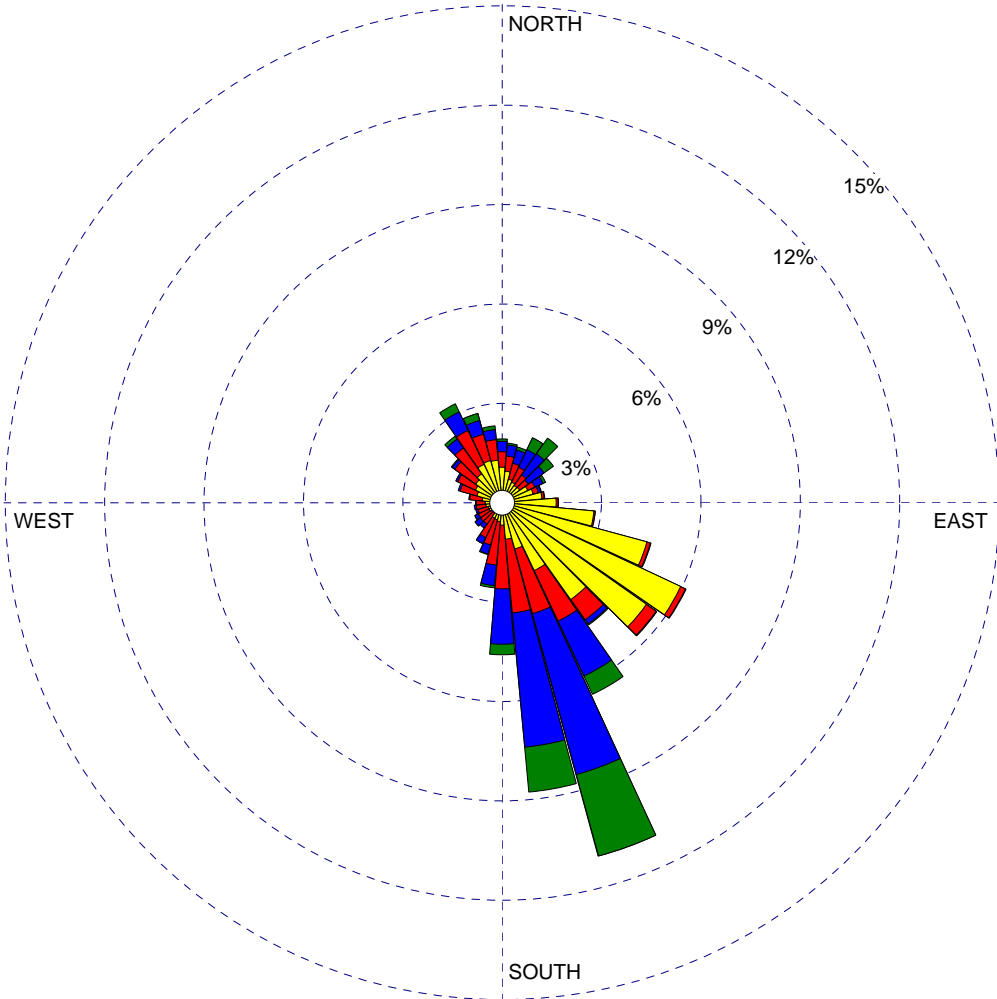
COMMENTS:	DATA PERIOD: 2005-2007 Jan 1 - Dec 31 00:00 - 23:00	COMPANY NAME:	
	CALM WINDS: 0.00%	MODELER:	
	AVG. WIND SPEED: 2.03 m/s	TOTAL COUNT: 26201 hrs.	
		DATE: 1/28/2009	PROJECT NO.:

WIND ROSE PLOT:

sclr

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.32%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.32%

TOTAL COUNT:

26197 hrs.

AVG. WIND SPEED:

2.76 m/s

DATE:

1/28/2009

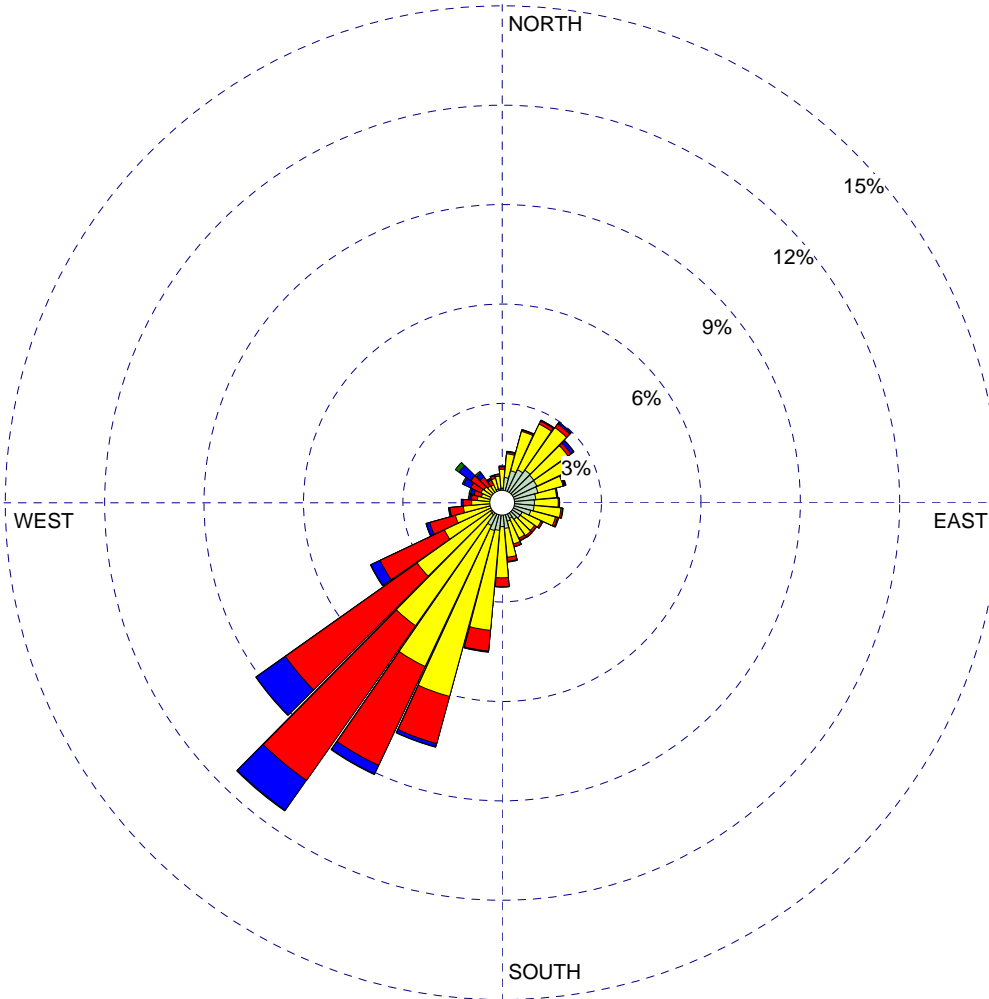
PROJECT NO.:

WIND ROSE PLOT:

snbo

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 4.21%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

4.21%

TOTAL COUNT:

26126 hrs.

AVG. WIND SPEED:

1.44 m/s

DATE:

1/28/2009

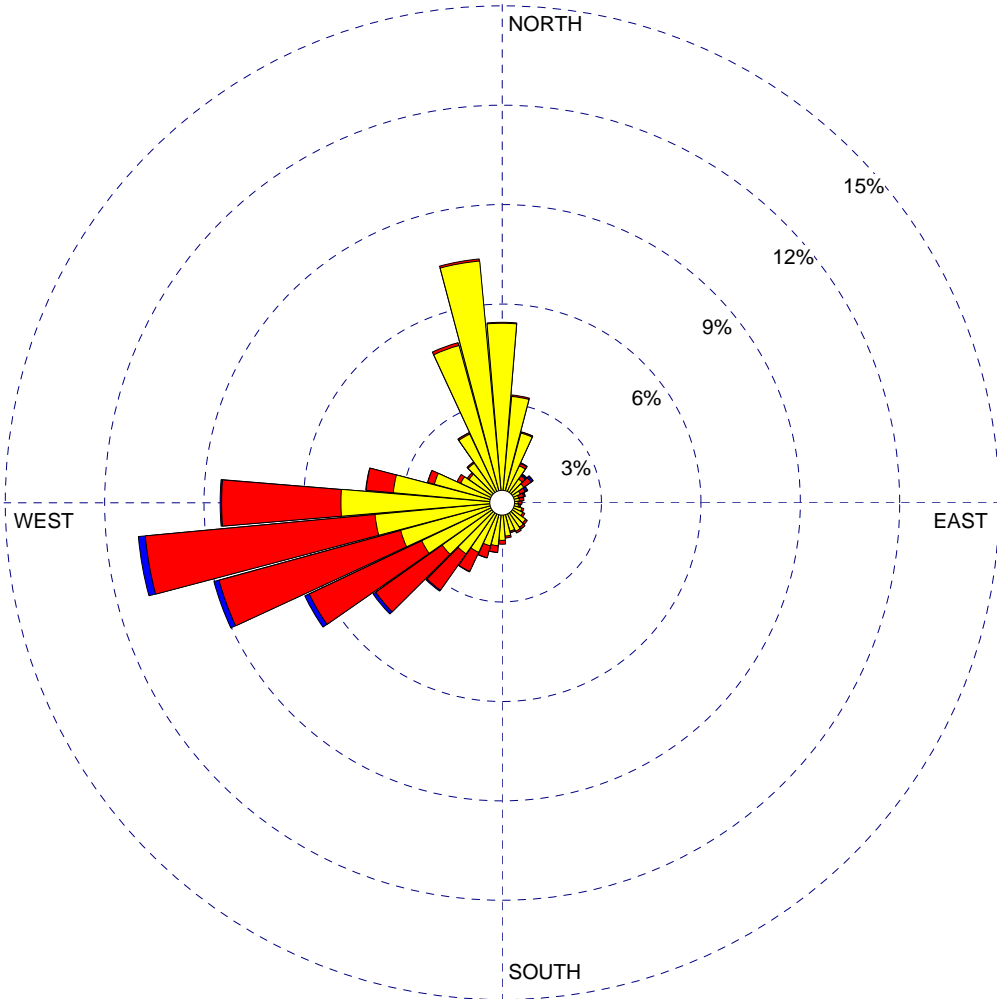
PROJECT NO.:

WIND ROSE PLOT:

upla

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 0.46%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

0.46%

TOTAL COUNT:

25894 hrs.

AVG. WIND SPEED:

1.64 m/s

DATE:

1/28/2009

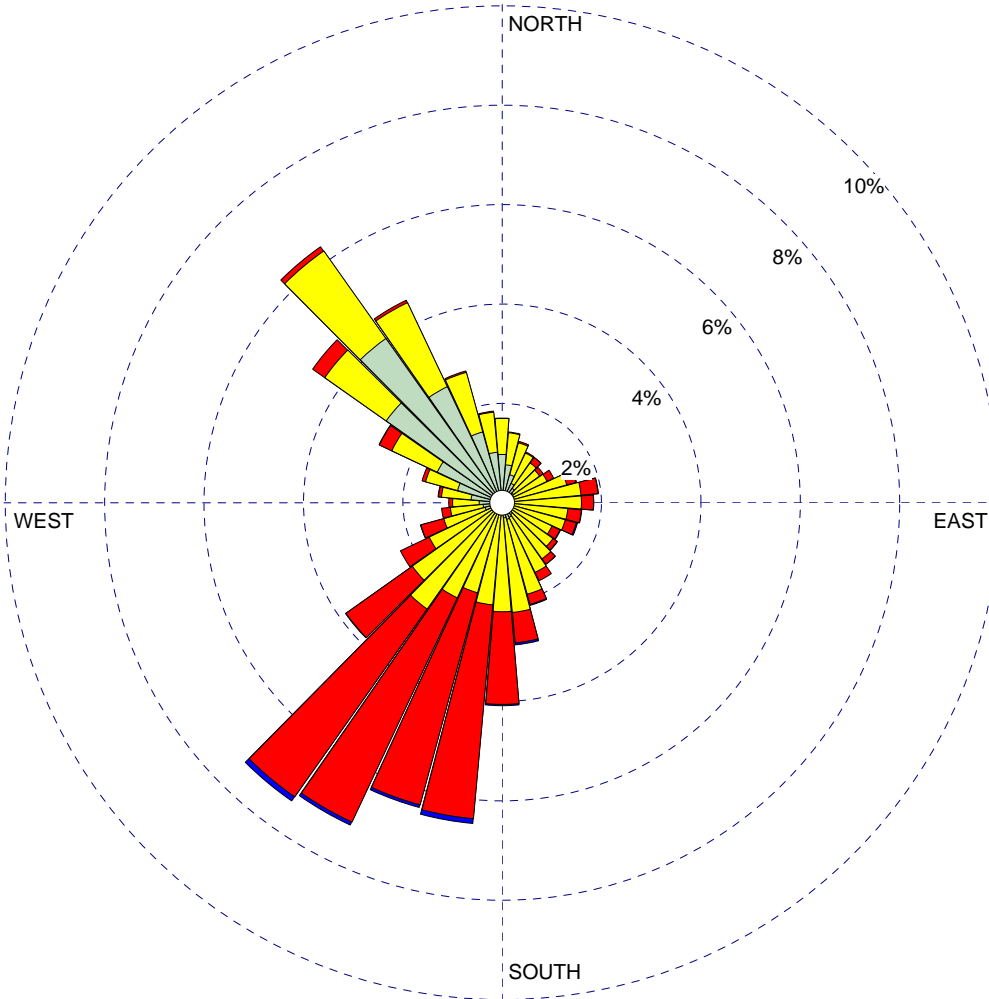
PROJECT NO.:

WIND ROSE PLOT:

wsla

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.0
- 6.0 - 11.0
- 4.0 - 6.0
- 2.0 - 4.0
- 0.5 - 2.0
- 0.1 - 0.5

Calms: 4.59%

COMMENTS:

DATA PERIOD:

**2005-2007
Jan 1 - Dec 31
00:00 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

4.59%

TOTAL COUNT:

25746 hrs.

AVG. WIND SPEED:

1.30 m/s

DATE:

1/28/2009

PROJECT NO.:

Appendix B: Readme Files

*The *.prn files described below are the “pre-processed” meteorological inputs to AERMET. See Figure 1.1 for reference. See also Figure 3.1 for locations of the various referenced meteorological stations.*

ANAHEIM

Data used to construct 'anah_inp.prn'

(a) Wind Speed and Direction

- AQMD 'anah' station
- Less than 1% missing/calm

(b) Solar Radiation

- CIMIS 75
- No missing data

(c) Temperature

- AQMD 'anah' station
- Replaced with NWS KFUL for periods of missing data

(d) Cloud coverage

- NWS KFUL site
- Time averaging to fill missing data (both short and long periods)
- No suitable nearby station available to replace long periods of missing data
- Note: KSLI is unusable (50% missing)

AZUSA**Data used to construct 'azus_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'asuz' station
- 2.9% calm/missing
- Time interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 159
- Replacement with CIMIS 133 for missing data

(c) Temperatures

- AQMD 'asuz' station
- Time averaging to fill short periods of missing data
- No long periods of missing data

(d) NWS cloud coverage

- 'KONT' station
- Time averaging to fill short and long periods of missing data
- Long periods of missing data also missing in KBUR and KVNY
- Note: 'KEMT & KPOC' stations are unusable

BANNING**Data used to construct 'bnap_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'bnap' station
- Less than 1% calm/missing
- Time Interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 44
- No missing data

(c) Temperature

- AQMD 'bnap' station
- Replacement with CIMIS 44 for long periods of missing data
- Time Interpolation applied to fill short places of missing data

(d) Cloud coverage

- KRAL station + KRIV from July 5, 2007 (hr10) to Dec 31, 2007
- Time interpolation applied to fill short periods of missing data
- Replacement with KRIV for long periods of missing data

BURBANK**Data used to construct 'burk_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'burk' station
- Less than 1% calm/missing data
- Filled short periods of missing winds through time interpolation
- Six hours of unreasonably high speeds 12/18/07 - 12/19/07 set to missing (-999.9)

(b) Solar Radiation

- Calculated by AERMET based on cloud coverage and hour of day & time of year

(c) Temperature

- AQMD 'burk' station
- Interpolation to fill short periods of missing data
- Replacement with K BUR for long periods of missing data

(d) Cloud coverage

- NWS 'KBUR' station
- Interpolation to fill short and long periods of missing data
- Long periods of missing data also missing in KVNY

CENTRAL LOS ANGELES**Data used to construct 'cela_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'cela' station
- Less than 1% calm/missing
- Time interpolation to fill short periods of missing data
- Periods of erroneously high wind speeds from 1/1/05 - 10/4/05
- Processed file only for years 2006 and 2007.

(b) Solar Radiation

- CIMIS 159
- Replacement with CIMIS 133 for missing data

(c) Temperature

- AQMD 'cela' station
- Time interpolation for short periods of missing data
- Replacement with CIMIS 159 for long periods of missing data

(d) Cloud coverage

- NWS 'KFUL' station
- Time interpolation to fill missing data

CRESTLINE**Data used to construct 'cres_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'cres' station
- 2.3% calm/missing
- Lots of hours of weak winds (a few hours of negative wind speeds)
- Time interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 192
- Replacement with CIMIS 199 and CIMIS 44 for long periods of missing data
- Time interpolation for short periods of missing data

(c) Temperature

- AQMD 'cres' station
- Replacement with CIMIS 192 for long periods of missing data
- Time averaging to fill short periods of missing data

(d) Cloud coverage

- Assigned a value of 0.5 for all hours
- No good NWS station in the area suitable for mountainous area

COSTA MESA**Data used to construct 'csta_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'csta' station
- 16% missing/calm (9.2% 0 ws, 0 wd; 6.8% 0 ws, non-zero wd)
- Lots of hours of weak winds

(b) Solar Radiation

- CIMIS 174
- Supplemented with AQMD 'lgbh' at beginning of 2005
- CIMIS 174 missing during beginning of 2005
- Time averaging to fill short periods of missing data

(c) Temperature

- AQMD 'lgbh'
- Time averaging to fill short periods of missing data
- Replacement with CIMIS 174 for long periods of missing data
- Note: No temperature data for AQMD 'csta' station

(d) Cloud coverage

- NWS 'KLGB' station
- Time averaging to fill short periods of missing data
- Note: KSLI is unusable (50% missing)

LAKE ELSINORE**Data used to construct 'elsi_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'elsi' station
- Bad data 1/10 - 1/14/05 (filled with missing value indicator -999.)
- 4.9% calm/missing data
- Time interpolation to fill short periods of missing data

(b) CIMIS solar radiation

- Calculated by AERMET based on cloud coverage and hour of day & time of year

(c) CIMIS temperature

- AQMD 'elsi' station
- Missing data (short period time-interpolation to fill)
- Missing data (long periods filled with CIMIS62 + CIMIS179)

(d) NWS cloud coverage

- KRIV station
- Time averaging applied to fill missing data

FONTANA**Data used to construct 'font_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'font' station
- Questionable wind data from 5/13 - 8/2/06 (flagged as missing)
- 8.4% missing
- Time interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 44
- No missing data
- Negative values at night (-1,-2,-3,-4) set to zero.

(c) Temperature

- AQMD 'font' station
- AQMD 'snbo' and CIMIS 44 to fill long periods of missing data
- Time averaging to fill short periods of missing data

(d) Cloud coverage

- 'KONT' station
- Time interpolated to fill missing data
- Note: 'KPOC' station is unusable

INDIO**Data used to construct 'ind_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'indi' station
- 1.1% calm/missing
- One hour of slightly negative wind speed on 1/24/05

(b) Solar radiation

- CIMIS 118
- Short period of missing data filled by time averaging on 7/6/06
- Long period of missing data from 6/4-7/9/07 filled with CIMIS 179 (Perris)
- Note: Indio CIMIS station data (200, 208,136) unusable

(c) CIMIS temperature

- AQMD 'indi' station
- Time averaging to fill short periods of missing data
- Replacement with AQMD 'plsp' + CIMIS 118 for long periods of missing data

(d) NWS cloud coverage

- KPSP station
- Time interpolation applied to fill missing data

LA HABRA**Data used to construct 'lahb_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'lahb' station
- 12.7% calm/missing
- Lots of hours of weak winds
- Time interpolation to fill short periods of missing data

(b) Solar Radiation

- CIMIS 75
- No missing data

(c) Temperature

- AQMD 'anah' station
- Replaced with NWS KFUL for periods of missing data

(d) Cloud coverage

- NWS KFUL site
- Time averaging to fill missing data

LOS ANGELES INTERNATIONAL AIRPORT**Data used to construct 'laxh_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'laxh' station
- Less than 1% calm
- Hours of questionably high speeds, filled with missing value -999.9)
(9/26/05, 4/20/06, 7/29/06, 11/18/06, 11/9/07, 11/11/07-11/12/07)

(b) Solar Radiation

- CIMIS 174
- AQMD 'lgbh' at start of 2005 (CIMIS 174 missing during this time)
- Time averaging to fill short periods of missing data

(c) Temperature

- AQMD 'laxh' station
- Time averaging to fill short periods of missing data
- Replacement with KLAX for long period of missing data from 6/1/06-7/5/06

(d) Cloud coverage

- NWS 'KLAX' station
- Time interpolation to fill short periods of missing data
- Replacement with 'KHHR' for long periods of missing data

LONG BEACH**Data used to construct 'lgbh_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'lgbh' station
- Less than 1% calms
- Filled short time periods of missing data (time interpolation)

(b) Solar Radiation

- CIMIS 174
- AQMD 'lgbh' at beginning of 2005 (CIMIS 174 missing during this time)
- Time averaging to fill short periods of missing data

(c) Temperature

- AQMD 'lgbh'
- Time averaging to fill short periods of missing data
- Replacement with CIMIS 174 for long periods of missing data

(d) Cloud coverage

- NWS 'KLGB' station
- Time averaging to fill short periods of missing data

LYNWOOD**Data used to construct 'lynn_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'lynn' station
- 11.5% calm/missing (4.4% 0 wd, 7.1% non-zero wd)
- Lots of weak winds (< 0.5 ms-1)
- Time interpolated to fill short periods of missing winds

(b) Solar Radiation

- CIMIS 174
- AQMD 'lgbh' at beginning of 2005 (CIMIS 174 missing during this time)
- Time averaging to fill short periods of missing data

(c) Temperature

- AQMD 'lgbh' station
- Note: no AQMD 'lynn' temperature data
- Time averaging to fill short periods of missing data
- Replacement with 'KHHR' to fill long periods of missing data

(d) Cloud coverage

- NWS 'KHHR' station
- Time averaging to fill short periods of missing data
- Replacement with 'KLGB' to fill long periods of missing data

MISSION VIEJO**Data used to construct 'msvj_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'msvj' station
- Less than 1% calm/missing (concentrated on certain days)
- Interpolation to fill short periods of missing data
- Hours of questionably high wind speeds often occur around sunrise and sunset hours

(b) Solar Radiation

- CIMIS 75
- No missing data

(c) Temperature

- AQMD 'msvj'
- Replaced with CIMIS 75 for hours of missing data

(d) Cloud coverage

- NWS KSNA site
- Time averaging to fill missing data
- Note: KNTK and KNZJ stations not usable

PERRIS**Data used to construct 'peri_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'peri' station
- Data only for 2007
- 1.1% missing/calm
- Time interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 179
- Time interpolation to fill one hour of missing data on 1/14/07

(c) Temperature

- AQMD 'peri' station
- Time interpolation to fill short periods of missing data
- Replacement with AQMD 'elsi' for long periods of missing data

(d) Cloud coverage

- KRIV station
- Time interpolation applied to fill missing data

PICO RIVERA**Data used to construct 'pico_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'pico' station
- Calm/missing winds 26% of data
- Calm/missing winds until 10/11/05 (accounts for ~ 90% of calm/missing winds)
- File only processed in AERMET from 10/12/05 - 2007

(b) Solar radiation

- CIMIS 159
- Replacement with CIMIS 133 for missing data

(c) Temperatures

- AQMD 'pico' station
- CIMIS 159 for long periods of missing data

(d) NWS cloud coverage

- 'KFUL' station
- Interpolated to fill missing data
- Note: 'KEMT & KPOC' station is unusable

PALM SPRINGS**Data used to construct 'pslp_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'pslp' station
- 7.4% calm/missing
- No data (1/1/05 - 2/11/05, 10/9-10/27/05, 12/30-12/31/05)
- Interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 118
- Short period of missing data filled by time averaging on 7/6/06
- Long period of missing data from 6/4-7/9/07 filled with CIMIS 179 (Perris)
- Note: Indio CIMIS station data (200,208,136) unusable

(c) CIMIS temperature

- AQMD 'plsp' station
- Time averaging to fill short periods of missing data
- Replacement with CIMIS 118 for long periods of missing data

(d) NWS cloud coverage

- KPSP station
- Time interpolation applied to fill missing data

POMONA**Data used to construct 'poma_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'poma' station
- 1.5% missing/calm
- Frequent hours of questionably low wind speeds from 1/29 – 7/10/07
- Long periods of 0.3 and 0.2 mph during 1/29 – 7/10/07

(b) Solar radiation

- CIMIS 78
- CIMIS 159 temperatures from 12/23/06 - 2/25/07

(c) Temperatures

- CIMIS 78
- Time interpolation to fill short periods of missing data
- CIMIS 159 temperatures from 12/23/06 - 2/25/07
- Note: no AQMD 'poma' temperature data

(d) Cloud coverage

- 'KONT' station
- Time interpolated to fill missing data
- Note: 'KPOC' station is unusable

REDLANDS**Data used to construct 'rdld_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'rdld' station
- Lots of zero and negative wind speed values during 2005 to August 2006.
- Used only 2007 data
- Time interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 44
- No missing data

(c) Temperature

- AQMD 'snbo' station
- Time averaging to fill short periods of missing data
- Replacement with CIMIS 44 for long periods of missing data
- Note: No AQMD 'rdld' data

(d) Cloud coverage

- KRAL station
- Replaced with KRIV from July 5, 2007 (hr10) to Dec 31, 2007
- Time interpolation applied to fill short periods of missing data
- Replacement with KRIV for long periods of missing data

RESEDA**Data used to construct 'rese_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'rese' station
- Less than 1% missing/calm
- Lots of hours of weak winds (< 1 m/s)
- Hours of unreasonably high wind speeds filled with -999.0
(12/26/05, 5/22/06, 10/13/07)

(b) Solar Radiation

- Calculated by AERMET based on cloud coverage and hour of day & time of year

(c) Temperature

- AQMD 'burk' station
- Time interpolation to fill short periods of missing data
- Replacement with KVNY for long periods of missing data
- Note: No AQMD temperature data at 'rese' station

(d) Cloud coverage

- NWS 'KVNY' station
- Time interpolation to fill short periods of missing data
- Replacement with KBUR for long period of missing data (12/7 - 12/8/07)

RUBIDOUX (RIVERSIDE)**Data used to construct 'rivr_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'rivr' station
- Less than 1% missing/calms
- Time interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 44
- No missing data
- Negative values at night (-1,-2,-3,-4) set to zero.

(c) Temperature

- AQMD 'rivr' station
- Interpolation applied to fill short periods of missing data
- Replacement with CIMIS 44 for long periods of missing data

(d) Cloud coverage

- KRAL station
- Replaced with KRIV from July 5, 2007 (hr10) to Dec 31, 2007
- Time interpolation applied to fill short periods of missing data
- Replacement with KRIV for long periods of missing data

SANTA CLARITA**Data used to construct 'sclr_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'sclr' station
- Less than 1% missing/calm
- Interpolation to fill short periods of missing data
- Filled remainder with 999 to flag as missing
- Questionably low wind speeds 3/29-4/4/06

(b) Solar Radiation

- Calculated by AERMET based on cloud coverage and hour of day & time of year

(c) Temperature

- AQMD 'sclr' station
- Time interpolation to fill short periods of missing data
- Teplacement with KVNY for long periods of missing data
- Note: CIMIS 204 has data only since 2007

(d) Cloud coverage

- NWS 'KVNY' station
- Time interpolation to fill short periods of missing data
- Replacement with KBUR for long period of missing data (12/7 - 12/8/07)

SAN BERNADINO**Data used to construct 'snbo_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'snbo' station
- 4.8% calm/missing
- Time interpolation to fill short periods of missing data

(b) Solar radiation

- CIMIS 44
- No missing data
- Negative values at night (-1,-2,-3,-4) set to zero.

(c) Temperature

- AQMD 'font' station
- AQMD 'snbo' and CIMIS 44 to fill long periods of missing data
- Time averaging to fill short periods of missing data

(d) Cloud coverage

- 'KONT' station
- Time interpolated to fill missing data
- Note: 'KPOC' station is unusable

UPLAND**Data used to construct 'upla_inp.prn'**

a) Wind Speed and Direction

- AQMD 'upla' station
- 1.9% calm/missing
- Questionable low wind speeds from 7/20/06 - 8/1/06
- Interpolation to fill short periods of missing data

b) Solar radiation

- CIMIS 78
- CIMIS 159 temperatures from 12/23/06 - 2/25/07

c) Temperatures

- AQMD 'upla' station
- Time interpolation to fill short periods of missing data
- Replacement for long periods of missing data with CIMIS 78
- Replacement with CIMIS 159 temperatures from 12/23/06 - 2/25/07

d) NWS cloud coverage

- 'KONT' station
- Time interpolated to fill missing data
- Note: 'KPOC' station is unusable

WEST LOS ANGELES**Data used to construct 'wsla_inp.prn'**

(a) Wind Speed and Direction

- AQMD 'wsla' station
- 6% calms/missing (2.7% 0 ws & 0 wd, 3.3% 0 ws, non-0 wd)
- Filled short periods of missing winds through time interpolation

(b) Solar Radiation

- CIMIS 174
- AQMD 'lgbh' at beginning of 2005 (CIMIS 174 missing during this time)
- Time averaging to fill short periods of missing data

(c) Temperature

- CIMIS 99 (no AQMD 'wsla' temperature data)
- Time averaging to fill short periods of missing data
- Replacement with KSMO to fill long periods of missing data

(d) Cloud coverage

- NWS 'KSMO' station
- Time averaging to fill short periods of missing data

Appendix C: User's Guide

The following describes the steps necessary to process raw data files, run AERMET, and (optionally) post-process the results to create AERMOD *.sfc and *.pfl input files for sub-areas within the SCAQMD air basin.

I. Pre-Processing (creating *.prn files)

This section is a step-by-step guide for producing the AERMET meteorological input files (*.prn) from the raw data.

Obtaining Raw Data

Variable	Data Source
Winds	AQMD supplied 'wnd_nnnn.txt' files
Temperature	AQMD supplied 'AQMD_Met_for_04_07.txt' file; CIMIS hourly data files (see below); NWS hourly data files (see below)
Solar Radiation	CIMIS hourly data files 'cimis_nnn.csv'; obtainable at http://wwwcimis.water.ca.gov/cimis/data.jsp (click on 'Hourly' link; user registration and login account required, no charge to obtain)
Cloud Coverage	NWS hourly data files 'Knnn.txt'; available at http://cdo.ncdc.noaa.gov/CDO/dataproduct (Choose "Surface Data, Hourly Global" from pull-down menu, then after accepting terms choose "Continue with Simplified Options")

Processing Raw Data

For a given sub-area, identify suitable AQMD, CIMIS and NWS stations within or close to the sub-area. Create an excel file with name “*nnnn_inp.xls*”, where ‘*nnnn*’ is the identifier string for the sub-area, for example ‘rivr’ for Riverside. This input file will contain the hourly input data (in LST) to be used by AERMET. Each record (row) will be an hour of data, and each column a certain field or meteorological variable. The rows are organized sequentially from top to bottom from beginning to end of the time period considered. For example, there will be 26,280 records (8760 hours per year × 3 years) for a three-year file covering the years 2005 – 2007.

The columns of the “*nnnn_inp.xls*” file are as follows:

- Column 1 - Year
 - Column 2 - Month
 - Column 3 - Day
 - Column 4 - Hour
 - Column 5 - Solar Radiation (W/m²)
 - Column 6 - Fractional Cloud Coverage (decimal)
 - Column 7 - Wind Speed (m/s)
 - Column 8 - Wind Direction (deg)
 - Column 9 - Temperature (deg C)
-

Fill in these columns from the raw data using the following procedure:

Variable	Processing Procedure
Winds	<ol style="list-style-type: none"> 1) Port AQMD 'wnd_nnnn.txt' file into Excel file 'wnd_nnnn_windgaps.xls' 2) Convert wind speeds from mph to m/s 3) Set 'zero, zero' wind speed/wind direction entries to either the missing value indicator (-999.0, -999.0) or leave as 'zero, zero' to indicate "calm", as judged appropriate. 4) Fill missing values by time averaging, as judged appropriate. 5) Cut-and-paste wind speed and wind direction into columns 7 and 8 of the 'nnnn_inp.xls' file 6) Note: Times in AQMD file are LST
Temperature	<ol style="list-style-type: none"> 1) Cut the temperature data for the station of interest from the AQMD supplied 'AQMD_Met_for_04_07.txt' file, and paste into a temporary called 'taqmd.txt'. 2) Execute the Fortran program 'maketmp.for' to convert the temperature data to column format (the compiled maketmp.exe file is supplied, which should run automatically by double-clicking if running Windows. Otherwise, recompile maketmp.for to re-create maketmp.exe, as necessary). 3) Port resulting 'taqmd2.txt' file into Excel, convert from °F to °C, identify missing data, and fill short periods of missing by time interpolation. 4) Replace long periods of missing data with data in appropriate CIMIS or NWS files. Note that NWS data are in GMT time. Convert data °F to °C, as necessary. 5) Cut temperature column from 'taqmd2.xls' into column 9 of the 'nnnn_inp.xls'.
Solar Radiation	<ol style="list-style-type: none"> 1) Cut solar radiation data from chosen CIMIS data file 'cimis_nnn.csv' into column 5 of the 'nnnn_inp.xls' file. 2) Identify and fill any short periods of missing data by time interpolation. 3) Fill long periods of missing data with data from another CIMIS station. 4) Note: Times in CIMIS data file are LST.

Variable	Processing Procedure
Cloud Coverage	<ol style="list-style-type: none"> 1) Port raw NWS data file ‘Knnn.txt’ into a temporary Excel file entitled ‘RAL-TMP.xls’. 2) Keep the ASOS cloud identifier, delete unnecessary columns, and break the time stamp into individual columns for year, month, day, hour, minute. 3) Assign fractional cloud coverage (in tenths) according to ASOS guidance (see next page). One can copy-and-paste the code contained in the provided sample excel file ‘convert-cld-asos.xls’ to do this. 4) Save ‘RAL-TMP.xls’ as a ‘formatted text (space delimited)’ file. This will create a file called ‘RAL-TMP.prn’. Be sure that the file is in the proper format (see provided files within sub-area directories on CD for format). 5) Run Fortran program ‘makenws.for’ to create the file ‘KRAL.inp’. This file will contain a full number of entries (26,280) for a three year period, and eliminate any NWS “special observation” entries from the records. 6) Read ‘KRAL.inp’ file into temporary Excel file “KRAL.xls”. 7) Interpolate to fill missing cloud coverage. First, fill any long periods of missing data with cloud coverage from another NWS station, if an appropriate one is available. Otherwise, time interpolate by copying-and-pasting columns G, H & I from the example file ‘KRAL-example.xls’ into “KRAL.xls” directly to the right of the column containing the fractional cloud coverage. Multiply this column by 10 so that the cloud coverage values are in tenths. The farthest right column will now be the ‘final’ fractional cloud coverage. 8) Copy-and-paste the ‘final’ cloud coverage (farthest right column in KRAL.xls) into ‘nnnn_inp.xls’, however see step #9 before doing this. 9) Note that since the times in the NWS data are GMT, you will start your copy at row 9 of “KRAL.xls” and paste into row 1 of ‘nnnn_inp.xls’. Because of this, there will be eight hours at the end of the ‘nnnn_inp.xls’ file that will need to be filled. Go to ‘weatherunderground.com’ to obtain cloud coverage for these last eight hours, which will be listed as the last eight hours of Dec. 31, 2007 if a file for years 2005 – 2007 is being created. Fill these last eight entries into ‘nnnn_inp.xls’ employing the ASOS coding to obtain fractional cloud coverage and using the above filling procedure if these last eight hours contain missing data.

Table 3. Cover ASOS Cloud Amount Report —Percent of Sky

ASOS Measured Amount in % of sky cover	Human Equivalent in oktas	ASOS Report
00 to \leq 05	0	CLR
> 05 to \leq 25	> 0 to 2/8	FEW
> 25 to \leq 50	> 2/8 to \leq 4/8	SCT
> 50 to \leq 87	> 4/8 to < 8/8	BKN
> 87 to 100	8/8	OVC

After the ‘*nnnn_inp.xls*’ file is completed, set the columns containing the meteorological variables to one decimal place, and save the file as a ‘formatted text (space delimited)’ file. This will create a file called ‘*nnnn_inp.prn*’, which will be input to AERMET to supply the hourly meteorological inputs.

II. Running AERMET

The input files required to run AERMET for each sub-area are as follows:

- IN1, IN2, IN3 ‘control’ files
- Pre-processed meteorological data input file (*.prn, described above)
- Miramar NAS upper air rawinsonde data (‘NKX.ua’)

Consult the appropriate AERMET model user’s guide (through EPA, Lakes Environmental, or other front-end software) for instructions on how to port these files and run AERMET. The *.prn file is to be ported as an “onsite” data file. Set the option within AERMET to run with only onsite surface data, since all needed surface data is contained in the “*.prn” file.

The needed output from our run of AERSURFACE is incorporated into the IN1, IN2 and IN3 files, however the output files from our AERSURFACE run are still included for completeness. Consult the appropriate AERSURFACE user's guide (EPA, Lakes Environmental, other front-end software) if you choose to re-run AERSURFACE to create values for land surface parameters other than those we used.

Output files from AERMET include

- *.sfc and *.pfl: These are the meteorological input files to AERMOD output by AERMET.
- Various other files (for example, *.RP1, *.RP2, *.RP3, *.MG1, *.MG2, *.MG3): These contain various run-time messages from the AERMET run.

III. Post-Processors (Optional)

We have developed three postprocessors that allow modification of the surface files (.sfc) produced by AERMET to account for processes not included in AERMET, and to examine the sensitivity of the outputs to surface parameters without rerunning AERMET:

- *Adjust_Mxht*
- *Adjust_SFC_File*
- *Convert_Rural_to_Urban*

The processor called '*Adjust_Mxht (SFC_File, max_mxht, remark)*' reads the .sfc file, replaces all the daytime mixed layer heights that exceed a user specified maximum value by this maximum value, recalculates w_* , and writes a new .sfc file. The inputs to the program are the name of the SFC file (*SFC_File*), the user-specified maximum mixed layer height (*max_mxht*), and a remark (*remark*). The output file is given the name of the input file plus the remark.

This processor can be used to account for the fact that the daytime boundary layer at a shoreline location corresponds to the convective internal boundary layer that develops when stable air

from the ocean flows on to warmer land. The height of this internal boundary grows as a function of distance from the source as the upward heat flux from the ground erodes the overlying stable layer. Within 10 km from the shoreline, the boundary layer height can be shallow relative to the height far inland where shoreline effects are absent. In Wilmington, for example, the internal boundary layer height rarely exceeded 200 m at a distance of 5 km from the shoreline in September (Yuan et al., 2006)¹. AERMET would instead typically estimate a maximum boundary layer height of around 1000 m because it does not account for two-dimensional shoreline effects. An overestimated boundary layer height will underestimate concentrations from both surface as well as elevated releases. It might therefore be necessary to use this processor to account for shoreline effects.

A processor called '*Adjust_SFC_File (SFC_File, z0_new, Bo_new,remark)*' is designed to examine the sensitivity of the .sfc information to changes in the Bowen ratio, Bo , and the surface roughness length, z_0 . The processor reads the .sfc file, recalculates the heat flux, Q_s , the convective mixed layer height, z_{ic} , the surface friction velocity, u_* , and the corresponding mechanical mixed layer height, z_{im} . The formulations used to recalculate these parameters differ slightly from those used in AERMET; so the adjusted file is not identical to what AERMET would produce with the new surface parameters. However, the output from this post-processor is adequate to examine the impact of changes in Bo and z_0 on AERMET output as well as on concentrations.

The inputs to the program are:

1. *SFC_File*: the original file that is adjusted;
2. *z0_new*: the new roughness length;
3. *Bo_new*: the new Bowen ratio;
4. *remark*: a string descriptor of the run.

The output file has the name of the input file plus the “remark”.

¹ Yuan, J., A. Venkatram, and V. Isakov, 2006: “Dispersion from ground-level sources in a shoreline urban area”, *Atmos. Environ.*, **40**, 1361-1372.

We have also developed a draft version of a postprocessor that allows examination of the sensitivity of AERMET output to changes in surface albedo in addition to changes in surface roughness and the Bowen ratio. The inputs to the processor called *Recompute_SFC_File*

1. The preprocessed (*.prn) used by AERMET;
2. *SFC_File*: the original file that is adjusted;
3. *z0_new*: the new roughness length;
4. *Bo_new*: the new Bowen ratio;
5. *alb_new*: the new albedo
6. *alb_old*: the old albedo
7. *remark*: a string descriptor of the run.

The output file has the name of the input file plus the “remark”.

As in *Adjust_SFC_File*, the formulations used to recalculate these parameters differ slightly from those used in AERMET; so the adjusted file is not identical to what AERMET would produce with the new surface parameters. *Recompute_SFC_File* also uses the incoming solar radiation to estimate the thermal radiation corresponding to the old value of the albedo. Then, the absorbed solar radiation is recalculated using the new value of the albedo, and the new absorbed solar radiation is added to the thermal radiation (which is not affected by the change in albedo) to estimate the net radiation. The new sensible heat flux is then estimated using the new value of net radiation.

A processor called ‘*Convert_Rural_to_Urban (Input_File, Output_File, zou, dh, Ru, wdf)*’ allows one to modify an .sfc file constructed using rural surface measurements to an .sfc file that accounts approximately for urban effects. The inputs to the program are:

1. *Input_File*: the name of the original .sfc file;
 2. *Output_File*: the name of the adjusted file;
 3. *zou*: the roughness length in m in the urban area;
 4. *dh*: the displacement height in m of the urban area;
 5. *Ru*: the distance in m between the rural and urban stations;
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6. *wdf*: a two element vector that specifies the wind directions in degrees between which the correction is applied.

This processor uses the method described in Luhar et al. (2006)² to account for urban effects. AERMOD has a method (see Cimorelli et al., 2005³) to partially account for urban effects during the night when the “URBAN” option is selected in AERMOD. This method, however, only accounts for the upward heat flux that occurs when stable air flows from a rural area over a warmer urban area during the night. It does not account, on the other hand, account for the corresponding increase in roughness when rural air flows over and urban area. Although the provided AQMD surface files that come directly from AERMET implicitly account for urban roughness effects because they are constructed using data from urban measurement sites, it might still be necessary to account for additional urban effects by (a) invoking the “URBAN” option when AERMOD is run and/or (b) running the ‘*Convert_Rural_to_Urban*’ post-processor to account for changes in surface characteristics that occur between the meteorological measurement site and the source/receptor location.

² Luhar, A. K., A. Venkatram, and S. Lee, 2006: “On relationships between urban and rural near-surface meteorology for diffusion applications”, *Atmos. Environ.*, **40**, 6541-6553

³ Cimorelli, A. J., S. G. Perry, A. Venkatram, J. C. Weil, R. J. Paine, R. B. Wilson, R. F. Lee, W. D. Peters, and R. W. Brode, (2005): “AERMOD: A dispersion model for industrial source applications. Part I: General model formulation and boundary layer characterization”, *J. App. Meteor.*, **44**, 682-693.

Appendix D: CD of Deliverables

The directory structure and contents of the provided CD are as follows:

Directory: Pre-Processing

Raw Data – Contains the raw meteorological data from the AQMD, NWS and CIMIS stations used for each sub-area.

Processing of Raw Data for Each Sub-Area – Contains codes and excel files used to process the raw data to produce AERMET meteorological input files (*.prn) for each sub-area.

AQMD Wind Processing (WindGaps) – Contains excel files in which the AQMD station wind data was processed.

Final Pre-Processing Files to AERMET – Contains the pre-processed *.prn meteorological input files for AERMET.

Directory: AERMET

Contains two directories:

- *Version 1: Runs for surface parameters calculated from AERSURFACE*
- *Version 2: Runs for uniform values of surface parameters.*

Within each directory are the following sub-directories:

- *AERMET Runs for Each Sub-Area* – Contains the AERMET run and accompanying I/O files for each sub-area. Two directories are provided:
 - *AERMET Output Files (sfc and pfl)* – Contains the *.sfc and .pfl files output by AERMET for each sub-area. Two directories are provided:
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- AERMOD Test for ANAH – Contains the I/O files for the test run conducted by us for the Anaheim sub-area using AERMOD (see Figures 2.4 and 2.5). This directory is only contained in the ‘Version 1’ directory.

Directory: Post-Processing

*Contains the MATLAB source code for the post-processors developed by us to check/modify AERMET *.sfc and *.pfl output files.*

Directory: Report

Contains the electronic pdf files for Volume I (Main Body) and Volume II (Appendices) of the final report.

Directory: Wind Roses

*Contains wind roses of the wind data used to create the AERMOD *.sfc and *.pfl input files for each sub-area.*
