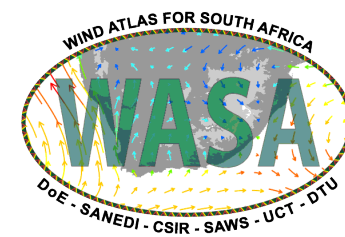


WASA Work Package 2

Wind Measurements

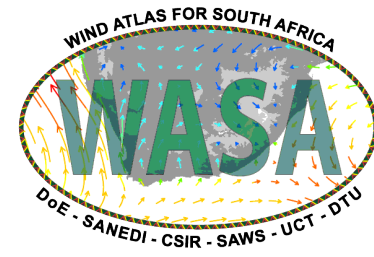


- Site selection criteria developed.
- 10 sites were identified; representative terrain types, suitable for meso-scale modelling, and geographically spread over the project area.
- Site visits, land owner interaction and agreements.
- EIA - Basic assessment procedure completed (was applicable at the time), and Environmental approvals obtained.



WASA Work Package 2

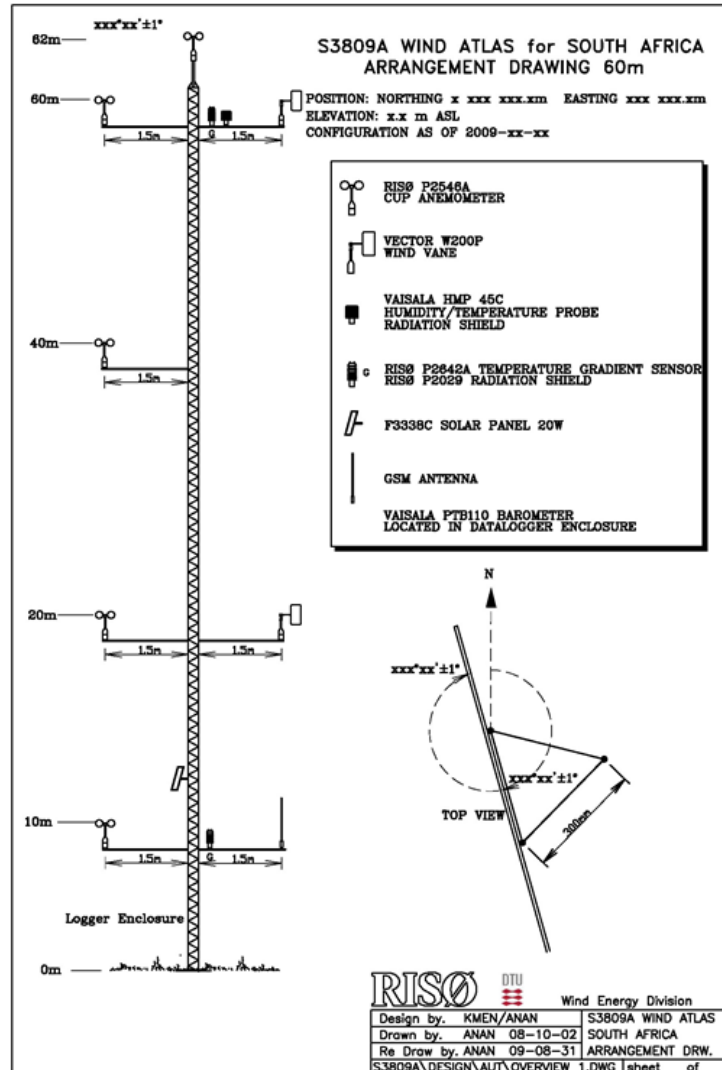
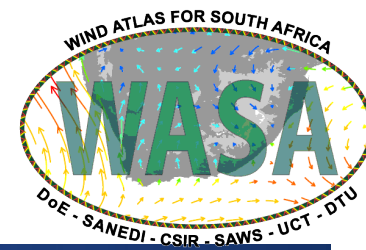
Wind Measurements continued...



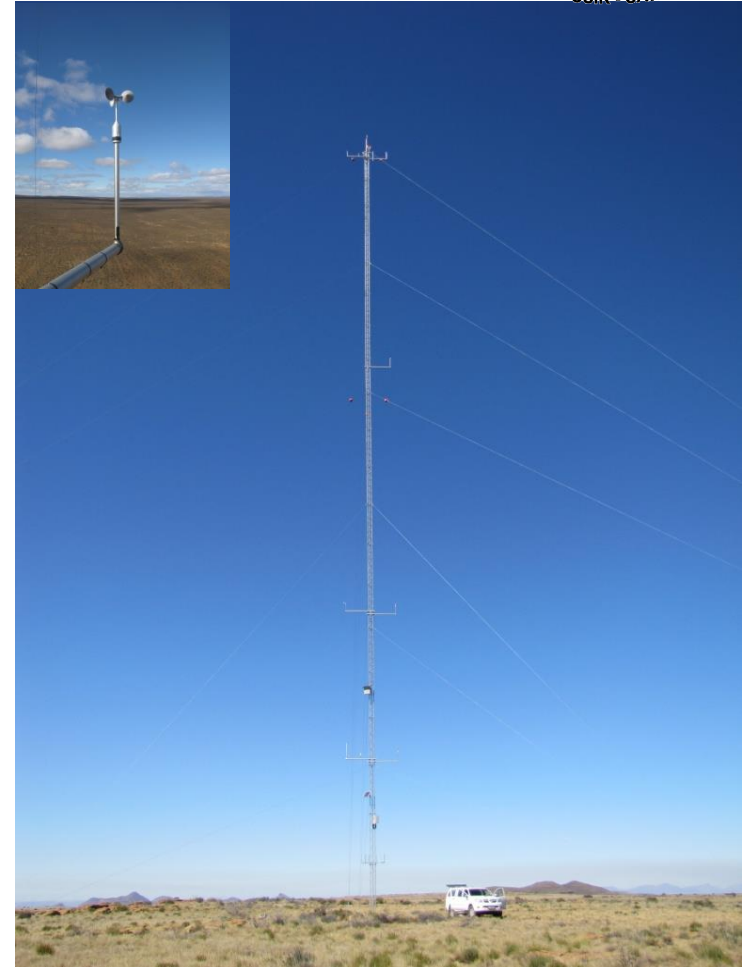
- 10 x 60m masts locally designed, manufactured, procured and installed.
- The wind measurement stations were designed with a view to meeting IEC standards and MEASNET guidelines.
- Instrumentation arranged to minimise errors and uncertainties due to flow distortion.
- First mast, WM04 was commissioned on 18 May 2010.
- Last mast, WM06 was commissioned on 17 September 2010.
- Station and Site Description Report also available.

WASA Work Package 2

Masts installed - layout



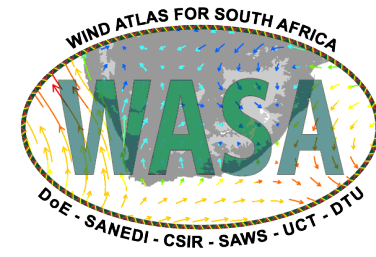
Standardised layout for WASA project



WM09 Noupoot
60-m lattice mast

WASA Work Package 2

WASA Website



- 3 years of QC data available free to public.
- Registration necessary to download data.
- Hourly data transfer from stations via GSM.
- Acquisition, QC, calibration and database organisation and web publishing by RODEO at CSIR.

Project information

Duration: 2010-06-24 15:40 onwards

Historical data from: 2010-06-24

Position: 31° 43' 49.40" S
18° 25' 10.11" E
240 m A.S.L.
[Show in the map](#)

Contact: [Eric Prinsloo](#)

Description: Vredendal

Comment: Please note: The data is given in SAST (UTC+2)

[Link to a larger image](#)

Project documents

[Arrangement Drawing](#)
[Instrument Summary](#)
[Mast Site Information](#)
[Station and Site Description \(Feb 2012\)](#)

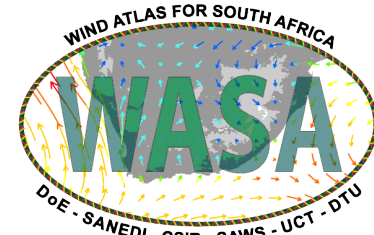
Measurements

Name	Height [m]	Duration	Latest (2012-12-07 15:10)
Station_ID	0.00	2010-06-24 15:40 onwards	490.00
WS_62	62.00	2010-06-24 15:40 onwards	8.97 m/s
WS_60	60.00	2010-06-24 15:40 onwards	9.03 m/s
WS_40	40.00	2010-06-24 15:40 onwards	9.05 m/s
WS_30	20.00	2010-06-24 15:40 onwards	8.81 m/s
WS_10	10.00	2010-06-24 15:40 onwards	8.19 m/s
WD_60	60.00	2010-06-24 15:40 onwards	236.50 °
WD_30	20.00	2010-06-24 15:40 onwards	239.40 °
Tair	60.00	2010-06-24 15:40 onwards	17.00 °C
Tgrad	60.00	2010-06-24 15:40 onwards	-1.29 °C
Pbaro	6.00	2010-06-24 15:40 onwards	986.80 hPa
RH	60.00	2010-06-24 15:40 onwards	80.20 %
Vbat	6.00	2010-06-24 15:40 onwards	13.92 V
Tpanel	6.00	2010-06-24 15:40 onwards	23.88 °C

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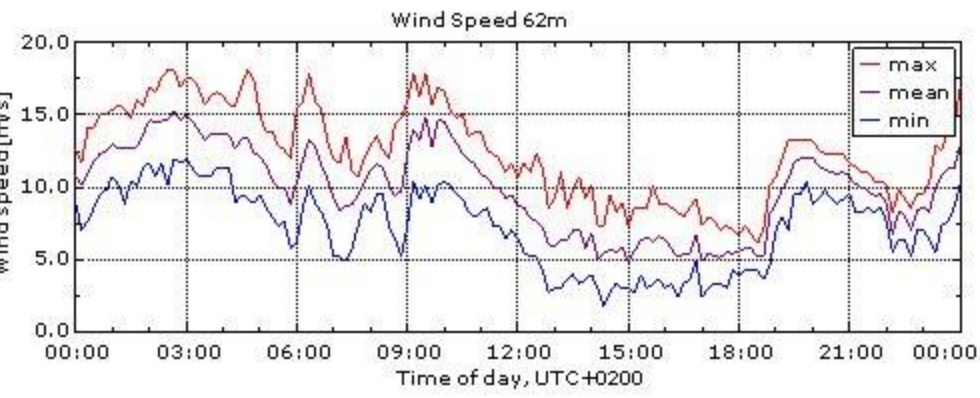
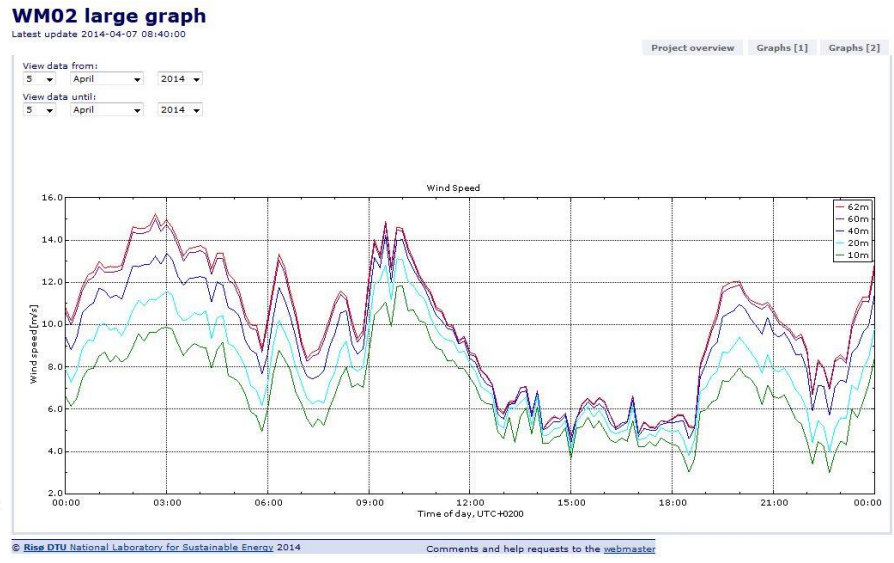
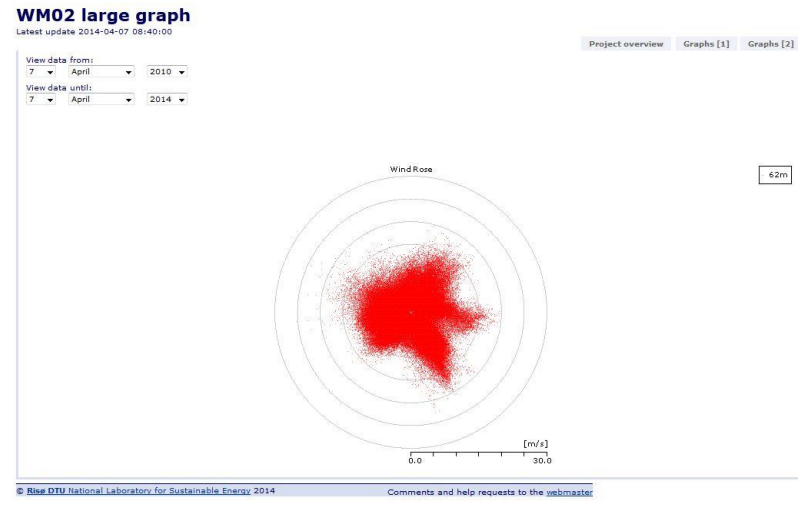
WASA Work Package 2

WASA Website continued...



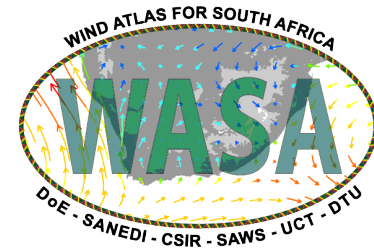
- Web site: www.wasa.csiir.co.za
- Graphs daily updated hourly
- QC data files monthly

Note: Data is used at own risk

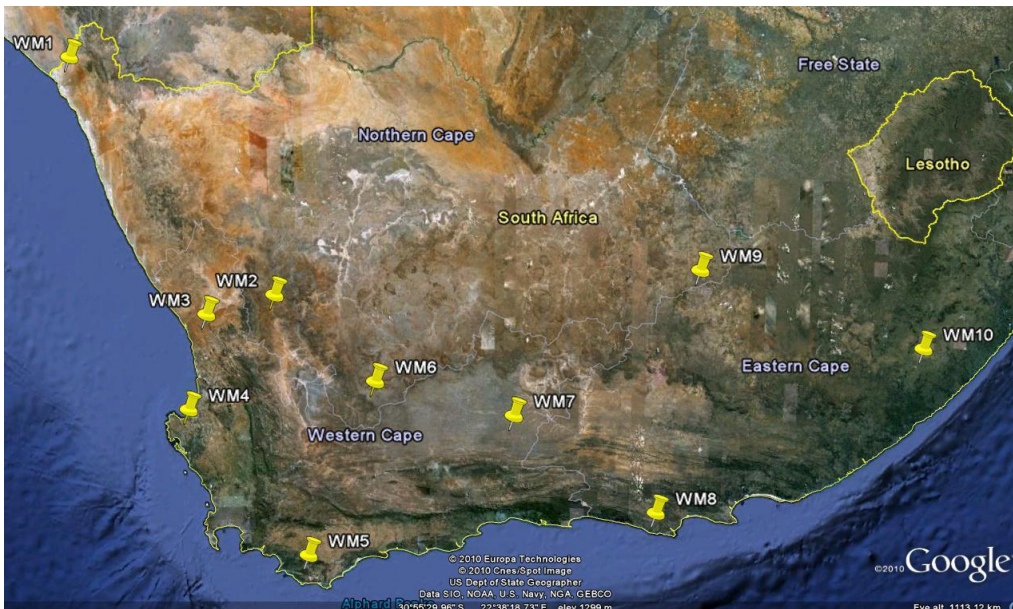


WASA Work Package 2

WASA Data



- Updated report Apr 2014: “Observational Wind Atlas for 10 Met. Masts in Northern, Western and Eastern Cape Provinces”.
- Three-year period 2010-10-01 to 2013-09-30; except WM08, WM09 and WM10 for which only 2 years are available. Data recovery above 90% for all masts as indicated in the table.

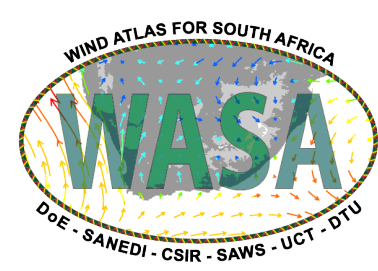


WASA	U_{mean} @ 61.9 m - 1 YEAR	U_{mean} @ 61.9 m - 3 YEARS*	ΔU	Data recovery
	[m/s]	[m/s]	[%]	[%]
WM01	5.86	6.06	2.7	100
WM02	6.21	6.14	-1.8	93.4
WM03	7.09	7.14	0.0	100
WM04	6.59	6.71	0.9	100
WM05	8.64	8.56	-0.8	98.6
WM06	7.02	7.36	1.6	99.9
WM07	6.85	6.93	0.3	97.0
WM08*	7.36	7.34	0.3	100
WM09*	7.58	8.22	3.0	99.7
WM10*	6.55	6.55	0.0	98.8

- 2-year periods for WM08, WM09 and WM10:
 WM08 2010-10 to 2012-10
 WM09: 2010-10 to 2013-09 minus the year 2011.
 WM10: 2011-03 to 2012-02 plus 2012-10 to 2013-09.

WASA Work Package 2

WASA Data

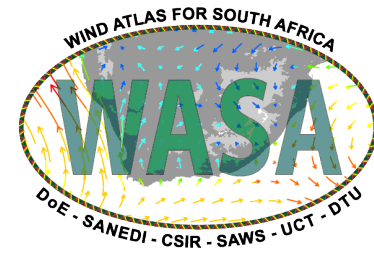


Reasons for data losses from previous table

- WM02 – Hail damage, one cup of 62m anemometer broken off
- WM05 – Possible lightning surge, 62m anemometer bearings damaged
- WM06 – Ice build up around anemometers after heavy snowfalls
- WM07 – Hail damage , one cup of 62m anemometer broken off
- WM09 – Ice build up around anemometers after heavy snow falls
- WM10 – Data loss due to theft and vandalism (solar panels, batteries, cables)

WASA Work Package 2

WASA Data User Statistics



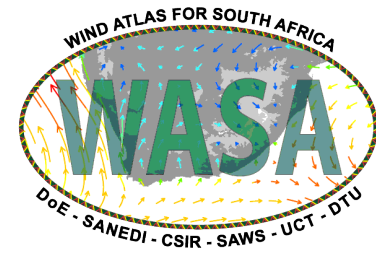
Affiliation

All Registered Users

➤ SA Governmental/Provincial/Municipal Agencies	114
➤ SA Non-Profit	65
➤ SA Private Companies	557
➤ SA Universities and Schools	185
➤ SA Other	40
➤ Non-SA Governmental/Provincial/Municipal Agencies	20
➤ Non-SA Non-Profit	21
➤ Non-SA Private Companies	198
➤ Non-SA Universities and Schools	79
➤ Non-SA Other	12
➤ Other	225
➤ 1496 registered users from 60 countries	
➤ 44951 downloads from 1032 users	
➤ 49.8% private companies (All)	
➤ 78.23% South African with 225 "Other" above	

WASA Work Package 2

Lessons learnt



- Security issues – theft of solar panels, batteries, cables, even sabotaging of mast by cutting guy ropes.
- Weather damage – snow, hail, lightning surges and strikes.
- Basic Impact Assessments required during initial mast installation took up a lot of time.
- Maintain good relationships with site owners – they can often assist with mast and instrument observations and checks.



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