

# Data pool documentation

## Status 08.2011

C. Heret / DWD



# Data set documentation

## Parameter names

unified parameter names  
and units for all sites

standard time resolution  
10 m

quality flags for all parameters

Q\_  
if provided with the data

g good quality  
i interpolated or simulated  
value or replaced by other  
systems

d dubious value  
u unchecked value  
b bad

m missing  
9 quality flag not available

	parameter	unit
<i>profiles between 10 m and 200 m &lt;height in m&gt;</i>	TAIR<hhh>	temperature
	TD<hhh>	dew point
	additionally: humidity (relative humidity RH [%], specific humidity Q [gkg <sup>-1</sup> ])	
	WSPEED<hhh>	wind speed
	WDIR<hhh>	wind direction
<i>(near-)surface</i>	TAIR002	temperature 2 m
	TD002	relative humidity 2 m
	additionally: humidity in 2 m (relative humidity RH [%], specific humidity Q [gkg <sup>-1</sup> ])	
	WSPEED010	wind speed 10 m
	WDIR010	wind direction 10 m
	P0	surface pressure
	RR	hourly precipitation sum
	SNOW	accumulated snow height
	SNOWN	new snow height
	CLC	total cloud cover
	<i>radiation and energy</i>	RSWD
RSWU		reflected solar radiation
RLWD		incoming thermal radiation
RLWU		outgoing thermal radiation
RN		or - if components are not available - net radiation
HS		sensible heat flux
LE		latent heat flux
MOM		momentum flux
USTAR		friction velocity
T0		radiative surface temperature
<i>soil quantities &lt;depth in cm&gt;</i>	TSOIL<hhh>	soil temperature
	MSOIL<hhh>	soil moisture content
	G0<hhh>	soil heat flux





## Site documentation

	site		description of instruments	mNN	soil type	local land use	land use (10 km)
LIN	Lindenberg Meteorological Observatory - Richard Aßmann Observatory (MOL-RAO)	<a href="http://www.dwd.de/mol">http://www.dwd.de/mol</a>	v	73	loamy sand Eutric Podzoluvisol	grass	60 % grassland/cropland, 30 % pine forest, 5% settlement, 5 % water
CAB	Cabauw Experimental Site for Atmospheric Research (CESAR)	<a href="http://www.cesar-observatory.nl/">http://www.cesar-observatory.nl/</a>	v	-0.7	clay	open pasture for at least 400 m	
PAY	MeteoSwiss aerological station Payerne	<a href="http://www.meteoswiss.admin.ch/">http://www.meteoswiss.admin.ch/</a>		490			82 % grassland/cropland, 10 % forest, 5 % settlement, 3 % water
CFM	Office National d'Etudes et des Recherches Aérospatiales (ONERA)	<a href="http://www.onera.fr/fauga-mauzac/index.php">http://www.onera.fr/fauga-mauzac/index.php</a>		186	loamy sand	grassland	grassland
SPC	Meteorological Site of San Pietro Capofiume		v	11	loamy sand CalcariFluvicCambisols	grassland, surrounded by crop	
SOD	Finnish Meteorological Institute Arctic Research Centre (FMI-ARC)	<a href="http://fmiarc.fmi.fi/">http://fmiarc.fmi.fi/</a>		179			28.2 % coniferous, 23.6 % transitional woodland/shrub, 17.2 % mixed forest, 12.9 % bog, 8.1 % broadleaved forest, 4.8 % water, 5.2 % other
CAR	UK Met Office Cardington	<a href="http://badc.nerc.ac.uk/data/cardington/instr_v7/index.html">http://badc.nerc.ac.uk/data/cardington/instr_v7/index.html</a>	available at BADC web site	29		grassland	



# Status data set Availability [%]

= 100
>= 90 && < 100
>= 60 && < 90
>= 30 && < 60
>= 10 && < 30
>= 0 && < 10
= 0

LIN

quality flags for all parameters Q\_

	2006	2007	2008	2009	2010
P0	99.9	99.9	100.0	100.0	100.0
RAIN	100.0	99.6	99.6	98.5	100.0
TAIR002	99.9	99.9	100.0	100.0	100.0
RH002	99.9	99.9	100.0	100.0	100.0
TD002	99.9	99.9	100.0	100.0	100.0
TAIR010	99.9	99.9	100.0	100.0	100.0
RH010	99.9	99.9	100.0	100.0	100.0
TD010	99.9	99.9	100.0	100.0	100.0
WSPEED010	98.4	99.8	99.9	99.1	97.6
WDIR010	99.2	99.9	100.0	100.0	100.0
TAIR020	99.9	99.7	100.0	99.9	100.0
RH020	99.4	99.7	100.0	97.5	100.0
TD020	99.4	99.7	100.0	97.5	100.0
TAIR040	99.9	99.9	100.0	100.0	100.0
RH040	99.9	99.9	100.0	100.0	100.0
TD040	99.9	99.9	100.0	100.0	100.0
WSPEED040	99.9	99.9	100.0	100.0	100.0
WDIR040	99.9	99.9	100.0	100.0	100.0
TAIR060	99.9	99.9	100.0	100.0	100.0
RH060	95.4	99.9	100.0	99.9	100.0
TD060	95.4	99.9	100.0	99.9	100.0
TAIR080	99.9	99.9	100.0	100.0	100.0
RH080	99.9	99.9	99.9	100.0	100.0
TD080	99.9	99.9	99.9	100.0	100.0
TAIR098	99.9	99.2	97.9	100.0	99.9
RH098	99.9	99.2	97.9	100.0	99.9
TD098	99.9	99.2	97.9	100.0	99.9
WSPEED098	99.9	99.9	99.8	100.0	99.9
WDIR098	99.9	99.9	100.0	100.0	100.0
RSWD	99.9	99.9	100.0	100.0	100.0
RSWU	99.9	99.9	100.0	100.0	100.0
RLWD	99.9	99.9	100.0	100.0	100.0
RLWU	99.9	99.9	100.0	100.0	100.0
CLC*2	100.0	100.0	100.0	100.0	100.0
USTAR*1	90.5	93.1	89.5	92.6	89.6
MOM*1	90.5	93.1	89.5	92.6	89.5
HS*1	96.9	98.5	94.9	98.4	95.3
LE*1	75.8	80.6	71.7	78.8	74.7
TSOIL005	99.9	99.9	100.0	100.0	99.8
TSOIL010	99.9	99.9	100.0	100.0	99.8
TSOIL015	99.9	99.9	100.0	100.0	99.8
TSOIL020	99.9	99.9	100.0	100.0	99.8
TSOIL030	99.9	99.9	100.0	100.0	99.8
TSOIL045	99.9	99.9	100.0	100.0	99.6
TSOIL050	99.9	99.9	100.0	100.0	99.8
TSOIL060	99.9	99.9	100.0	100.0	99.8
TSOIL090	99.9	99.9	100.0	100.0	99.8
TSOIL100	99.9	99.9	100.0	100.0	99.8
TSOIL120	99.9	99.9	100.0	100.0	99.8
TSOIL150	99.9	99.9	100.0	100.0	99.8
MSOIL008	99.9	99.9	100.0	100.0	100.0
MSOIL015	99.9	99.9	100.0	100.0	99.5
MSOIL030	99.9	99.9	100.0	100.0	71.1
MSOIL045	99.9	99.9	100.0	100.0	97.2
MSOIL060	99.9	99.9	100.0	100.0	98.1
MSOIL090	99.9	99.9	100.0	100.0	68.7
G005	99.9	99.9	100.0	100.0	99.2
G010	99.9	99.9	100.0	100.0	99.2
SNOW*4	21.5	4.6	3.5	14.3	25.8
SNOWN*4	6.2	3.9	0.0	0.0	0.0

different time resolution  
\*1 30 min  
\*2 60 min  
\*4 24 h if snow exists

Monthly availability see <http://www.cosmo-model.org/srnwp/>



# Status data set Availability [%]

= 100
>= 90 && < 100
>= 60 && < 90
>= 30 && < 60
>= 10 && < 30
>= 0 && < 10
= 0

CAB

	2006	2007	2008	2009	2010
P0	99.9	99.4	99.9	100.0	98.6
RAIN	99.9	99.3	99.4	100.0	98.8
TAIR002	100.0	99.4	99.9	99.9	96.7
TD002	100.0	99.4	99.9	99.9	94.6
TAIR010	100.0	99.4	99.9	99.9	95.4
TD010	100.0	99.4	99.9	99.9	93.8
WSPEED010	99.3	99.4	99.4	99.9	97.9
WDIR010	99.3	99.4	99.5	100.0	98.0
TAIR020	100.0	99.4	99.9	99.9	97.0
TD020	100.0	99.4	99.9	99.9	95.1
WSPEED020	99.5	99.4	99.8	99.9	98.7
WDIR020	99.5	99.4	99.8	99.9	98.8
TAIR040	100.0	98.0	99.9	97.4	96.9
TD040	100.0	98.0	99.9	93.0	95.2
WSPEED040	99.8	99.4	99.9	99.8	98.3
WDIR040	100.0	99.4	99.9	100.0	98.6
TAIR080	100.0	99.4	99.2	99.9	97.6
TD080	100.0	99.4	97.3	99.9	97.6
WSPEED080	100.0	99.4	99.7	99.9	98.7
WDIR080	100.0	99.4	99.7	100.0	98.7
TAIR140	99.8	99.4	98.6	99.9	94.8
TD140	100.0	99.4	99.8	99.9	94.1
WSPEED140	100.0	99.4	99.8	99.8	98.6
WDIR140	100.0	99.4	99.9	100.0	98.6
TAIR200	99.4	97.8	95.4	99.1	95.9
TD200	99.8	98.6	95.7	99.1	96.9
WSPEED200	99.8	99.4	99.8	100.0	98.1
WDIR200	100.0	99.4	99.8	100.0	98.6
RSWD	100.0	94.4	99.9	99.9	98.5
RSWU	99.5	98.2	99.8	100.0	98.5
RLWD	100.0	96.3	97.5	99.2	98.5
RLWU	100.0	96.3	97.5	99.2	98.5
CLC*2	99.0	98.8	98.3	77.5	98.5
USTAR	83.3	88.7	88.9	89.8	90.9
MOM	83.2	88.7	88.8	89.7	87.8
HS	90.6	65.1	93.1	95.0	96.1
LE	73.7	64.8	59.3	64.7	67.6
TSOIL000	100.0	90.3	99.5	100.0	96.4
TSOIL002	100.0	98.1	99.5	100.0	96.4
TSOIL004	100.0	98.1	99.5	100.0	96.4
TSOIL006	0.0	7.8	0.0	0.0	2.8
TSOIL008	100.0	90.3	99.5	100.0	96.4
TSOIL012	100.0	98.1	99.5	100.0	96.4
TSOIL020	100.0	98.1	99.5	100.0	96.4
TSOIL030	100.0	98.1	99.5	100.0	96.4
TSOIL050	100.0	98.1	99.5	100.0	96.4
MSOIL008	100.0	98.1	99.5	100.0	95.4
G00	100.0	95.0	97.8	97.0	96.0
G005	100.0	97.9	99.5	100.0	96.4
G010	100.0	42.8	0.0	0.0	96.4

different time resolution  
\*2 60 min

Monthly availability see <http://www.cosmo-model.org/srnwp/>



# Status data set Availability [%]

= 100
>= 90 && < 100
>= 60 && < 90
>= 30 && < 60
>= 10 && < 30
>= 0 && < 10
= 0

differing time resolution  
 \*2 30 min  
 \*3 60 min till 200612051200  
 \*4 24 h if snow exists  
 \*5 ca 180 min

	2006	2007	2008	2009	2010
P0	100.0	100.0	100.0	100.0	100.0
RAIN	100.0	100.0	100.0	100.0	100.0
TAIR002	100.0	100.0	100.0	100.0	100.0
RH002	100.0	100.0	100.0	100.0	100.0
TD002	100.0	100.0	100.0	100.0	100.0
WSPEED010	100.0	100.0	100.0	100.0	100.0
WDIR010	100.0	100.0	100.0	100.0	100.0
RSWD	100.0	100.0	100.0	100.0	100.0
RSWU	100.0	100.0	100.0	100.0	100.0
RLWD	100.0	100.0	100.0	100.0	100.0
RLWU	100.0	100.0	100.0	100.0	100.0
CLC*5	31.7	32.4	32.7	32.3	31.4
USTAR	0.0	0.0	0.0	0.0	0.0
MOM	0.0	0.0	0.0	0.0	0.0
HS	0.0	0.0	0.0	0.0	0.0
LE	0.0	0.0	0.0	0.0	0.0
TSOIL005*3	100.0	100.0	100.0	100.0	100.0
TSOIL010*3	100.0	100.0	100.0	100.0	100.0
TSOIL020*3	100.0	100.0	100.0	100.0	100.0
SNOW*4	99.2	99.2	99.2	99.2	99.2
SNOWN*4	99.2	99.2	99.2	99.2	99.2

PAY



# Status data set Availability [%]

= 100
>= 90 && < 100
>= 60 && < 90
>= 30 && < 60
>= 10 && < 30
>= 0 && < 10
= 0

energy fluxes 2006 and 2007 with questionable data, therefore omitted

time resolution of measured data:  
30 min

CFM

	2006	2007	2008	2009	2010
P0	100.0	100.0	100.0	100.0	100.0
RAIN	100.0	100.0	100.0	100.0	100.0
TAIR002	100.0	100.0	100.0	100.0	100.0
Q002	100.0	100.0	100.0	100.0	100.0
TD002	100.0	100.0	100.0	100.0	100.0
WSPEED010	100.0	100.0	100.0	100.0	100.0
WDIR010	0.0	0.0	100.0	100.0	100.0
RSWD	100.0	100.0	100.0	100.0	100.0
RSWU	0.0	0.0	99.4	99.8	0.0
RLWD	100.0	100.0	100.0	100.0	100.0
RLWU	0.0	0.0	86.8	99.6	0.0
RN	97.1	99.1	86.9	90.2	99.7
CLC	0.0	0.0	0.0	0.0	0.0
USTAR	81.1	96.5	95.0	96.9	94.1
MOM	81.0	95.7	95.0	96.7	94.0
HS	0.0	0.0	92.8	93.8	90.2
LE	0.0	0.0	92.8	93.6	90.5
TOGRASS	95.5	39.4	0.0	0.0	0.0
TOSOIL	95.5	93.9	0.0	0.0	0.0
TSOIL001	93.6	92.8	88.3	97.5	97.5
TSOIL005	93.6	92.8	88.3	97.5	97.8
TSOIL020	93.6	92.8	88.1	97.5	97.8
TSOIL050	93.6	92.8	88.3	97.5	97.8
TSOIL090	93.6	92.8	89.0	97.5	97.8
MSOIL003	94.3	94.2	96.5	99.2	99.7
MSOIL008	94.5	94.2	96.5	99.2	99.7
MSOIL015	94.5	94.2	96.5	99.2	99.7
MSOIL025	94.5	94.2	96.5	99.2	99.7
MSOIL035	94.5	94.1	96.5	99.2	99.7
MSOIL045	94.5	94.2	96.5	99.2	99.7
MSOIL055	94.5	94.2	96.5	99.2	99.7
MSOIL065	94.5	94.2	96.5	99.2	99.7
MSOIL075	94.5	94.0	96.5	99.2	99.7
MSOIL085	94.5	94.1	96.5	99.2	99.7
G003	96.8	99.1	98.9	100.0	99.2

Monthly availability see <http://www.cosmo-model.org/srnwp/>



# Status data set Availability [%]

= 100
>= 90 && < 100
>= 60 && < 90
>= 30 && < 60
>= 10 && < 30
>= 0 && < 10
= 0

SPC

	2006	2007	2008	2009	2010
P0	38.6	60.8	99.1	99.8	99.9
RAIN	38.6	39.2	83.5	99.8	98.5
TAIR002	38.6	56.8	99.1	99.8	99.9
RH002	38.6	56.8	99.1	99.8	99.9
TD002	38.6	56.8	99.1	99.8	99.9
WSPEED010	38.6	56.4	99.1	99.8	98.8
WDIR010	38.6	56.4	99.1	99.8	99.9
RSWD	0.0	56.4	99.1	84.5	99.9
RSWU	0.0	56.4	99.1	99.8	99.8
RLWD	0.0	56.4	66.7	99.8	99.9
RLWU	0.0	56.4	99.1	99.8	99.9
CLC	0.0	0.0	0.0	0.0	0.0
USTAR	0.0	0.0	0.0	0.0	0.0
MOM	0.0	0.0	0.0	0.0	0.0
HS	0.0	0.0	0.0	0.0	0.0
LE	0.0	0.0	0.0	0.0	0.0
TSOIL010	50.2	48.1	88.5	61.3	100.0
TSOIL025	50.3	48.3	88.5	61.3	100.0
TSOIL045	50.3	48.3	88.5	61.3	100.0
TSOIL070	50.2	48.3	88.5	61.3	100.0
TSOIL100	50.2	48.3	88.5	61.3	100.0
TSOIL135	50.3	48.3	88.5	9.9	0.0
TSOIL180	50.3	48.3	88.5	61.3	100.0
MSOIL010	0.0	23.1	44.0	49.0	95.8
MSOIL025	0.0	23.2	44.0	50.0	94.8
MSOIL045	0.0	23.2	46.3	50.0	96.7
MSOIL070	0.0	23.2	39.4	49.8	94.7
MSOIL100	0.0	0.0	0.0	31.2	48.0
MSOIL135	0.0	0.0	0.0	36.9	66.6
MSOIL180	0.0	0.0	0.0	41.8	79.1

Monthly availability see <http://www.cosmo-model.org/srnwp/>





# Status data set Availability [%]

= 100
>= 90 && < 100
>= 60 && < 90
>= 30 && < 60
>= 10 && < 30
>= 0 && < 10
= 0

soil moisture could not be used caused by dubious conversion factors

different time resolution  
\*1 30 min

	2007 (11/12)	2008	2009	2010
P0	59.2	98.8	98.7	96.7
RAIN	23.3	65.4	43.8	42.1
TAIR002	59.2	98.8	98.7	96.7
RH002	59.2	98.8	98.7	96.7
TD002	59.2	98.8	98.7	96.7
TAIR003	68.4	100.0	90.2	97.7
RH003	68.4	100.0	90.2	97.7
TD003	68.4	100.0	90.2	97.7
TAIR008	68.4	100.0	90.2	97.7
RH008	68.4	100.0	90.2	97.7
TD008	68.4	100.0	90.2	97.7
WSPEED010	59.2	98.8	98.7	96.7
WDIR010	59.2	98.8	98.7	96.7
TAIR018	68.4	100.0	90.2	97.7
RH018	68.4	100.0	90.2	97.7
TD018	68.4	100.0	90.2	97.7
WSPEED018	68.4	100.0	90.2	97.7
WSPEED030	68.4	100.0	90.2	97.7
TAIR032	68.4	100.0	90.2	97.7
RH032	68.4	100.0	90.2	97.7
TD032	68.4	100.0	90.2	97.7
WSPEED038	68.4	100.0	90.2	97.7
WSPEED047	68.4	100.0	90.2	97.7
TAIR048	68.4	100.0	90.2	97.7
RH048	68.4	100.0	90.2	97.7
TD048	68.4	100.0	90.2	97.7
RSWD	0.0	99.3	99.4	97.7
RSWU	0.0	97.8	98.1	96.6
RLWD	0.0	95.2	96.2	92.5
RLWU	0.0	94.6	95.8	91.9
CLCL	57.8	95.4	96.3	95.4
CLCM	59.2	98.8	98.7	96.7
CLCH	59.2	98.8	98.7	96.7
USTAR*1	67.6	99.3	89.9	85.1
MOM*1	67.6	99.3	89.9	85.1
HS*1	67.6	99.3	89.9	85.1
LE*1	67.6	99.3	89.9	85.1
SNOW	50.5	90.2	95.0	86.8

SOD

Monthly availability see <http://www.cosmo-model.org/srnwp/>

# Status data set Availability [%]



data are available till 11/2009  
months with obviously wrong data are omitted completely  
and will be completed after correction by data providers

CAR

	2006	2007	2008	2009	2010
P0	65.8	91.3	58.0	49.8	0.0
RAIN	65.9	90.9	57.7	49.8	0.0
TAIR001	65.6	91.0	50.7	49.8	0.0
Q001	64.1	90.9	50.7	49.8	0.0
RH001	64.1	90.9	50.7	49.8	0.0
TD001	64.3	91.3	55.3	49.8	0.0
TAIR010	65.6	89.3	55.9	49.7	0.0
Q010	59.8	72.3	49.1	44.9	0.0
TD010	59.8	72.3	49.1	44.8	0.0
WSPEED010	65.6	89.3	55.8	49.7	0.0
WDIR010	65.6	89.3	55.8	49.7	0.0
TAIR025	64.9	88.3	53.9	49.7	0.0
RH025	50.2	0.0	5.2	25.8	0.0
TD025	50.2	0.0	5.2	25.8	0.0
WSPEED025	64.9	88.3	53.8	49.8	0.0
WDIR025	64.9	88.3	53.8	49.8	0.0
TAIR050	64.3	87.3	48.9	49.5	0.0
RH050	64.3	87.3	47.2	0.0	0.0
TD050	64.3	87.3	47.2	0.0	0.0
WSPEED050	64.3	87.4	48.9	49.7	0.0
WDIR050	64.3	87.4	48.9	49.7	0.0
RSWD	65.5	91.2	58.0	49.9	0.0
RSWU	65.5	91.4	58.0	49.9	0.0
RLWD	65.5	91.2	58.0	49.9	0.0
RLWU	65.5	91.4	58.0	49.9	0.0
T0GRASS	65.8	91.3	58.0	49.9	0.0
TSOIL001	64.0	89.5	57.8	41.0	0.0
TSOIL004	64.0	89.5	57.8	41.0	0.0
TSOIL007	0.0	0.0	0.0	0.0	0.0
TSOIL010	64.0	89.5	57.8	41.0	0.0
TSOIL017	64.0	89.5	57.8	41.0	0.0
TSOIL035	64.0	89.5	57.8	41.0	0.0
TSOIL065	64.0	89.5	57.8	41.0	0.0
MSOILW010	0.0	0.0	0.0	0.0	0.0
MSOILW022	65.8	91.3	58.0	49.0	0.0
MSOILW057	65.8	91.3	58.0	49.0	0.0
MSOILW160	65.8	91.3	58.0	49.0	0.0

# Data set documentation

## Dew point calculation

### Water vapour saturation pressure [hPa]

Sonntag, D., Advancements in the field of hygrometry, Meteorol. Z., N. F., 3, 51-66, 1994.

$$sdd = \exp((a_1 * tk^{**(-1)} + a_2 + a_3 * tk + a_4 * tk^{**2} + a_5 * \log(tk)))$$

tk temperature [K]

rh relative humidity [%]

# ice

$$a_1 = -6024.5282$$

$$a_2 = 24.721994$$

$$a_3 = 1.0613868E-2$$

$$a_4 = -1.3198825E-5$$

$$a_5 = -0.49382577$$

$$c_1 = 6.1078$$

$$c_2 = 17.84362$$

$$c_3 = 245.425$$

# water

$$a_1 = -6096.9385$$

$$a_2 = 16.635794;$$

$$a_3 = -2.711193E-2$$

$$a_4 = 1.673952E-5$$

$$a_5 = 2.433502$$

$$c_1 = 6.1078$$

$$c_2 = 17.08085$$

$$c_3 = 234.175$$

### Water vapour pressure [hPa]

$$dd = rh/100. * sdd$$

### Dew point [°C]

$$td = (c_3 * \log(dd/c_1)) / (c_2 - \log(dd/c_1))$$

