



## Basic Climatological Station Metadata

Current status

Metadata compiled: 27 JUL 2022

**Station:** INGHAM COMPOSITE

**Bureau of Meteorology station number:** 032078

**Bureau of Meteorology district name:** Herbert North Coast

**State:** QLD

**World Meteorological Organization number:** 95291

**Identification:** NO ID

**Network Classification:** National Benchmark Network for Agrometeorology

**Station purpose:** Synoptic

**Automatic Weather Station:**



Current Station Location				
<b>Latitude</b>	<b>Decimal</b>	-18.6494	<b>Hour Min Sec</b>	18°38'58"S
<b>Longitude</b>	<b>Decimal</b>	146.1769	<b>Hour Min Sec</b>	146°10'37"E
<b>Station Height</b>	11.8 m	<b>Barometer Height</b>	12.5 m	
<b>Method of station geographic positioning</b>			GPS	

**Year opened:** 1968

**Status:** Open

## Station summary

No summary for this site has been written as yet.

**Historical metadata for this site has not been quality controlled for accuracy and completeness. Data other than current station information, particularly earlier than 1998, should be considered accordingly. Information may not be complete, as backfilling of historical data is incomplete.**

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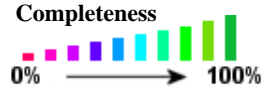
# Basic Climatological Station Metadata

Current status

<b>Station:</b> INGHAM COMPOSITE	<b>Location:</b> INGHAM COMPOSITE			<b>State:</b> QLD	
<b>Bureau No.:</b> 032078	<b>WMO No.:</b> 95291	<b>Aviation ID:</b> NO ID	<b>Opened:</b> 26 Feb 1968	<b>Current Status:</b> Still open	
<b>Latitude:</b> -18.6494	<b>Longitude:</b> 146.1769	<b>Elevation:</b> 11.8 m	<b>Barometer Elev:</b> 12.5 m	<b>Metadata compiled:</b> 27 JUL 2022	

## Observation summary

The table below indicates the approximate completeness of the record for individual element types within the Australian Data Archive for Meteorology. For elements not listed see the note below.



### DAILY DATA HOLDINGS

OBSERVATION TYPE	FIRST MONTH	LAST MONTH	COMPLETENESS (% estimate)	SINGLE DAYS MISSED	FULL MONTHS MISSED
EVAPORATION	JAN 1997	JUN 2019	91.7	643	1
MAXIMUM AIR TEMPERATURE	FEB 1968	JUN 2022	90.0	1366	20
RAINFALL	FEB 1968	JUL 2022	98	N/A	N/A

### HOURLY DATA HOLDINGS - from 1 to 24 observations per day

OBSERVATION TYPE	FIRST MONTH	LAST MONTH	COMPLETENESS (% estimate)	FREQUENCY average daily	SINGLE DAYS MISSED	FULL MONTHS MISSED
AIR TEMPERATURE	FEB 1968	JUN 2022	83.1	2.4	1178	39
DEW POINT	JAN 1973	JUN 2022	65.6	2.5	978	150
MEAN SEA LEVEL PRESSURE	JUN 1997	JUN 2022	86.2	2.6	707	0
TOTAL CLOUD AMOUNT	FEB 1968	JUN 2022	82.1	2.4	1195	44
WIND SPEED	FEB 1968	JUN 2022	82.9	2.4	1219	39

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### RAINFALL INTENSITY DATA HOLDINGS

OBSERVATION TYPE	FIRST MONTH	LAST MONTH	COMPLETENESS (% estimate)	SINGLE DAYS MISSED	FULL MONTHS MISSED
RAINFALL INTENSITY	JUL 1972	NOV 2015	79.0	921	79

**THERE ARE NO ONE-MINUTE DATA HOLDINGS**

**THERE ARE NO HALF-HOURLY DATA HOLDINGS**

**THERE ARE NO UPPER-AIR EDT DATA HOLDINGS**

#### Holdings calculated up to 01 Jul 2022

The % complete figure is the completeness of observations averaged over all months of record, for the given station and observation type, taking gaps into account. For hourly holdings, the completeness is relative to the maximum number of daily observations for the site each month, and is therefore an estimate. For daily holdings, the completeness figure shown is exact.

The single days missed figure is the total number of days for which no observation was received, not including full missed months. The full months missed figure is the total of full month gaps over the period of record. Where an element is not included assumptions can generally be made about availability, and the list to use has been suggested below.

#### Unlisted element

- Minimum air temperature
- Wet bulb temperature
- Soil temperature at 20, 50 & 100cm
- Relative humidity
- Minimum temp. of water in evaporimeter
- Visual observations eg. weather, visibility
- Sea related observations

#### Listed element to use

- Maximum air temperature
- Dew point
- 10cm soil temperature
- Dew point
- Evaporimeter - max water temp
- Total cloud amount
- Sea state

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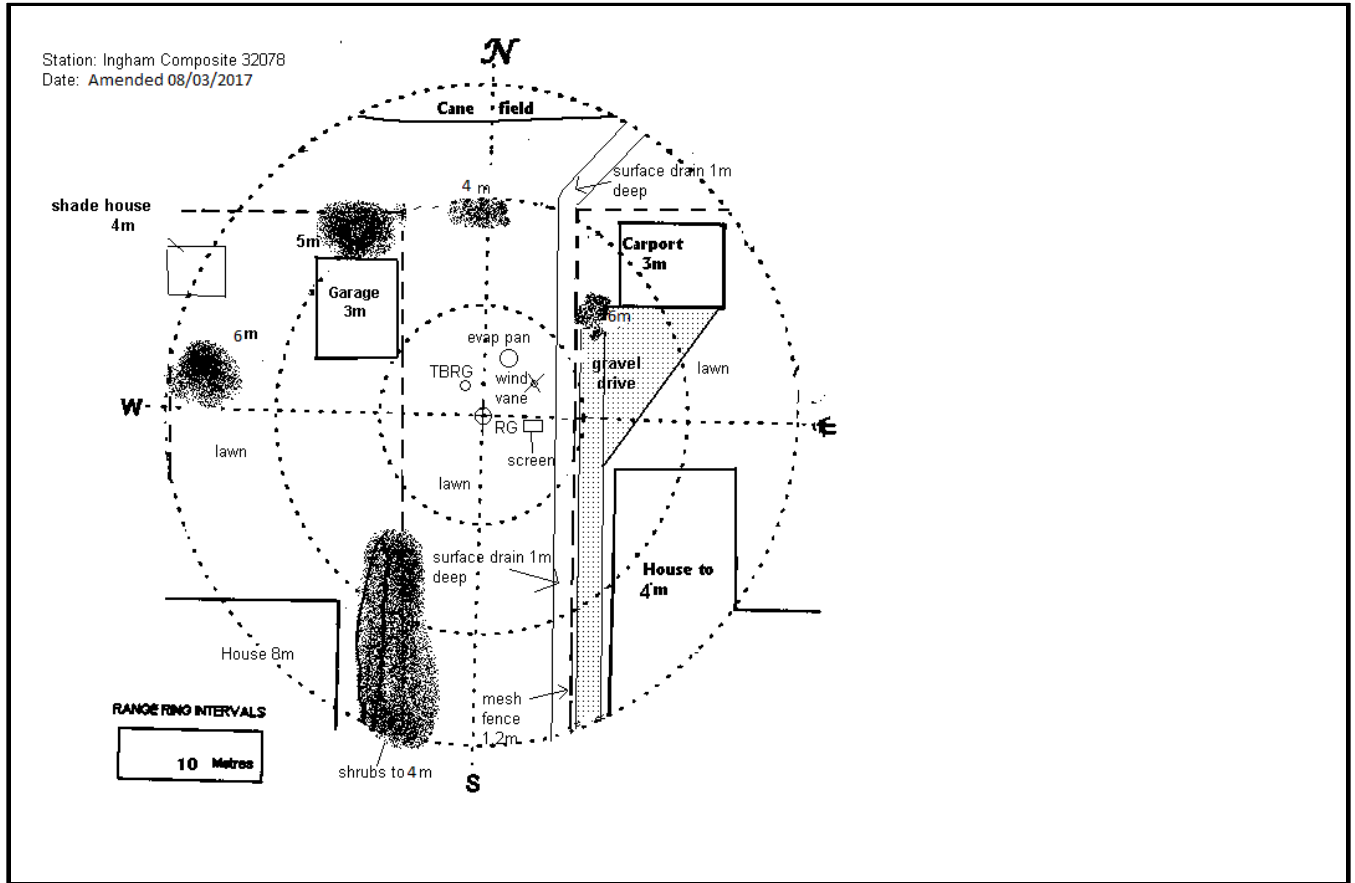
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### Instrument Location and Surrounding Features

08/03/2017(most recent)



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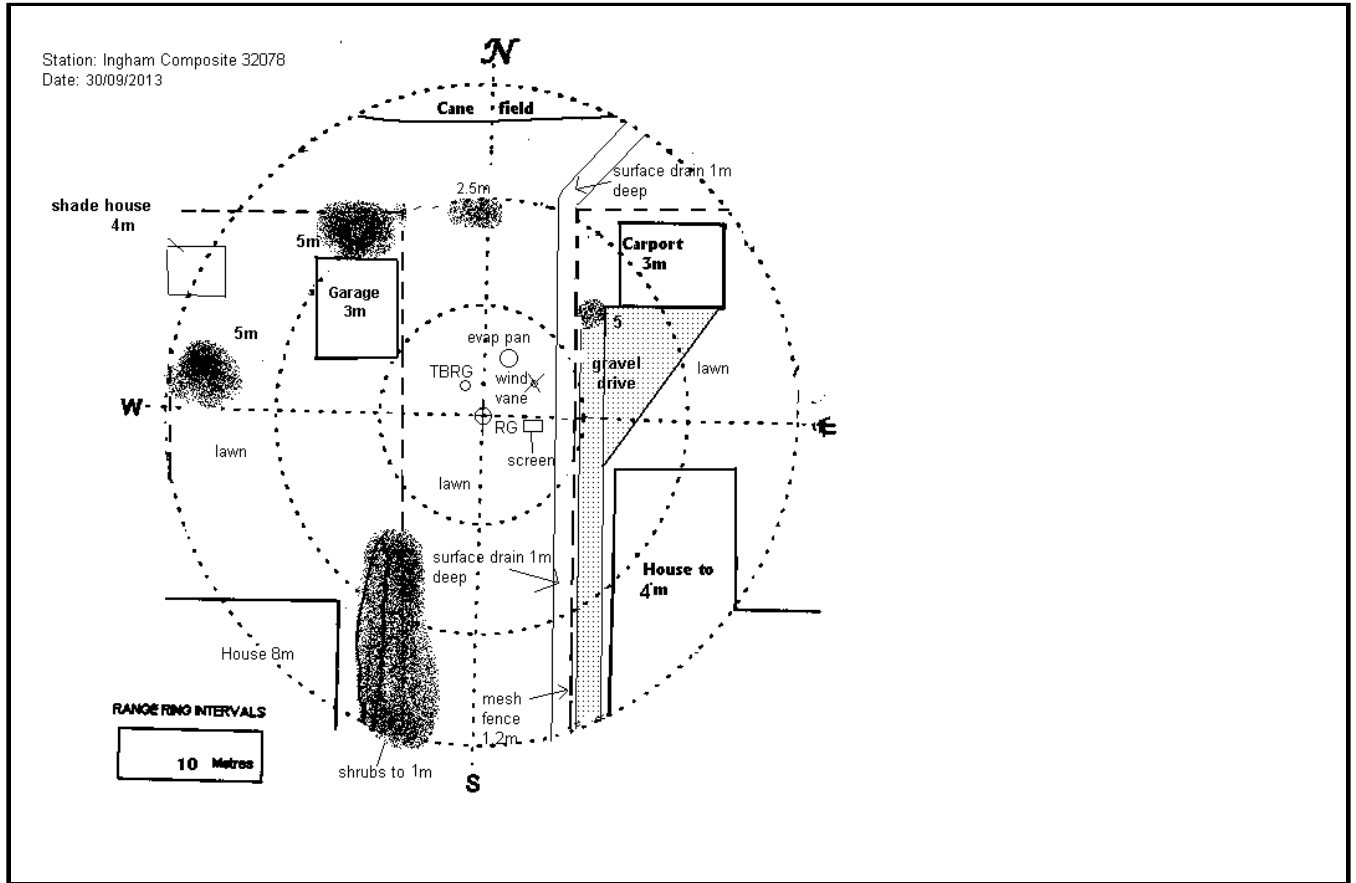
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### Instrument Location and Surrounding Features

30/09/2013



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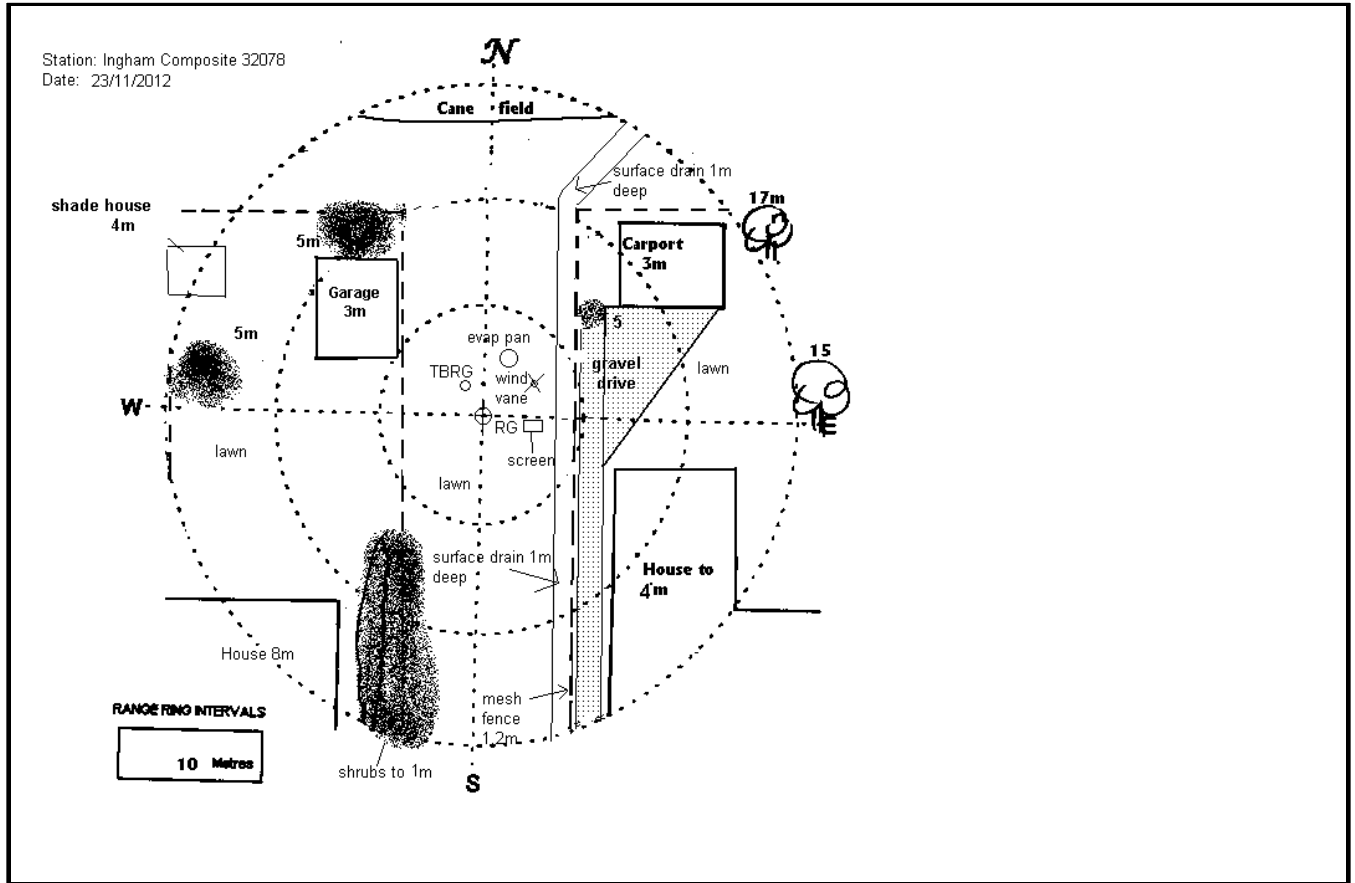
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### Instrument Location and Surrounding Features

23/11/2012



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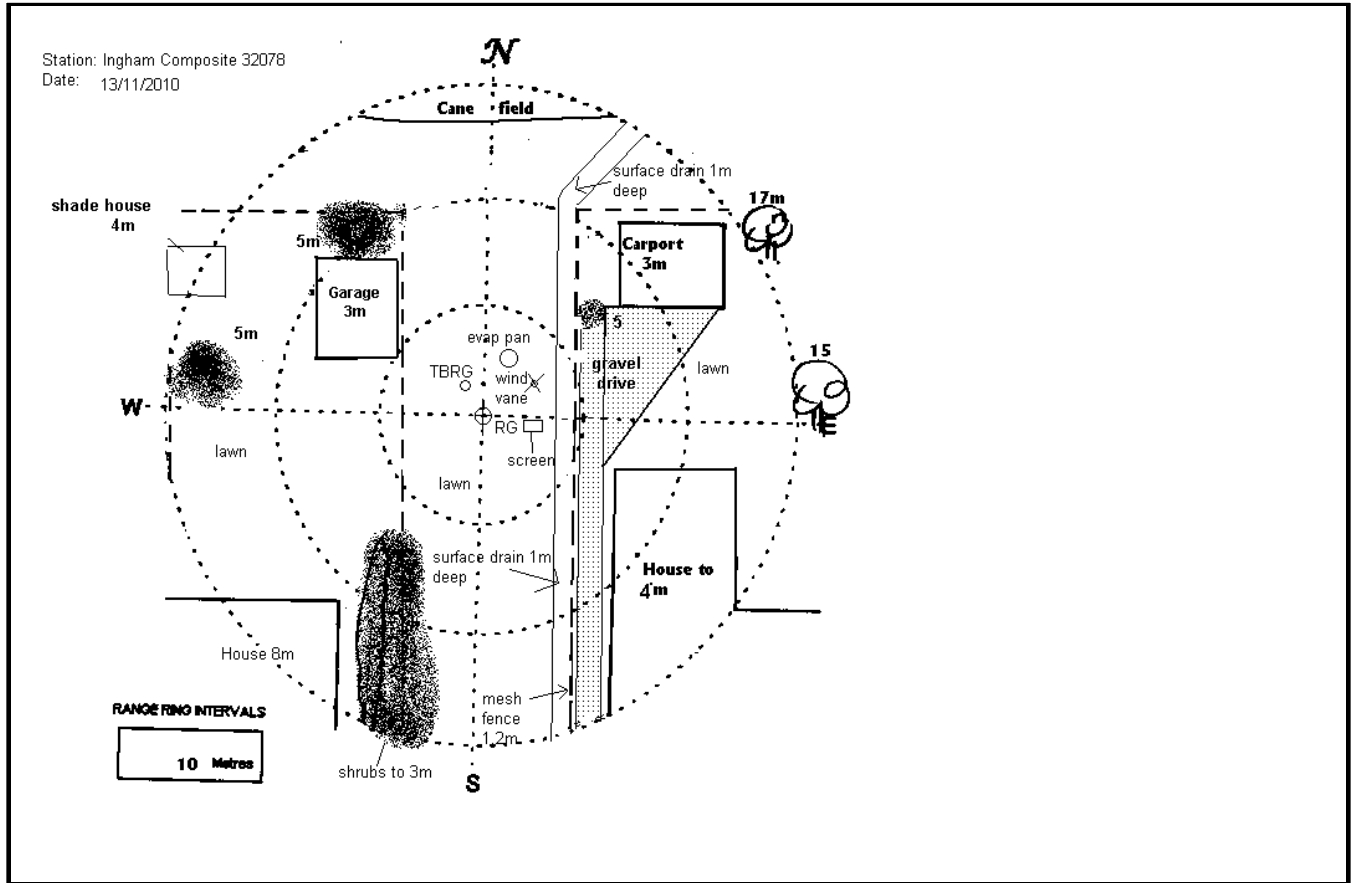
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### Instrument Location and Surrounding Features

13/11/2010



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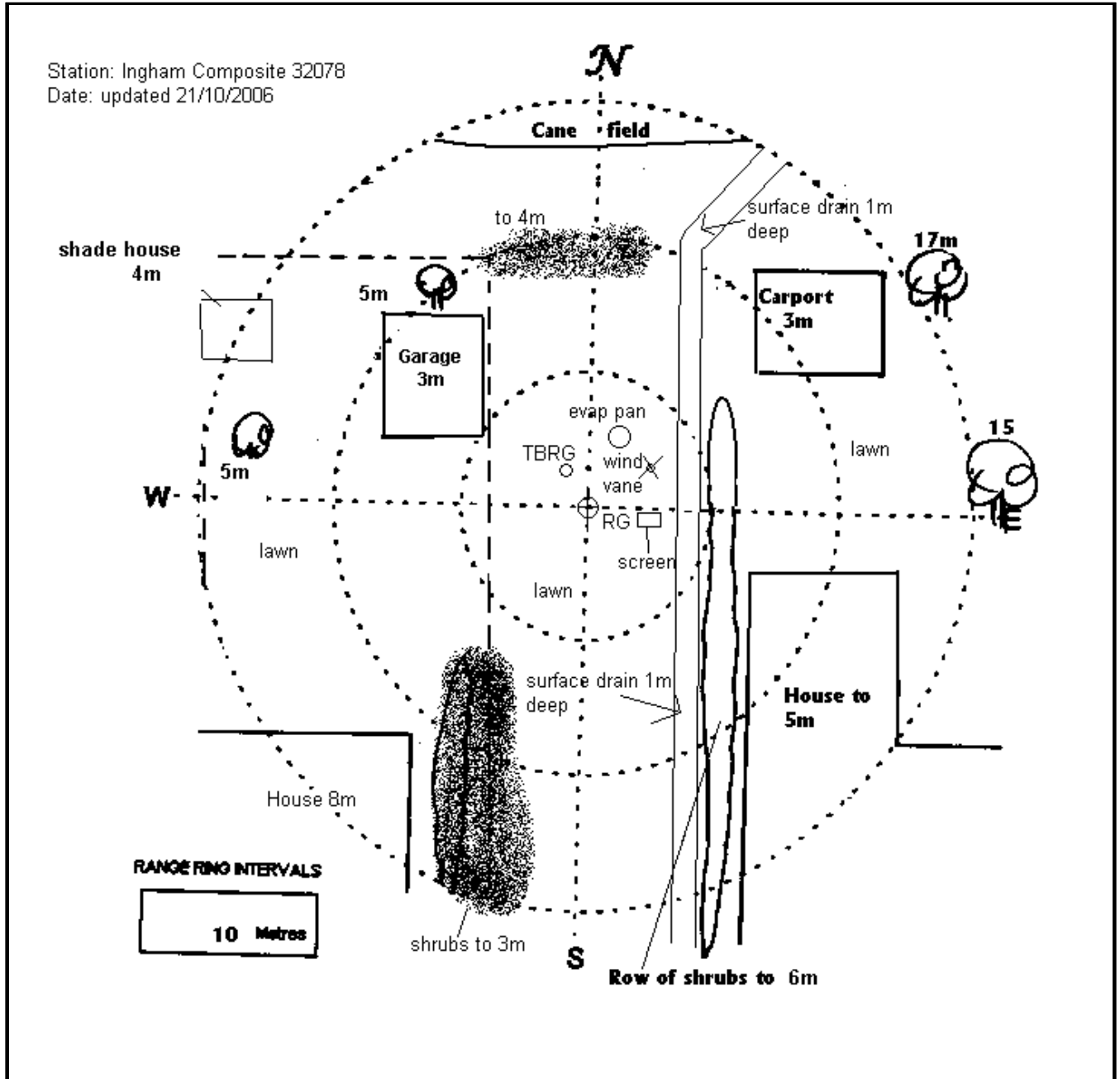
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### Instrument Location and Surrounding Features

04/12/2006



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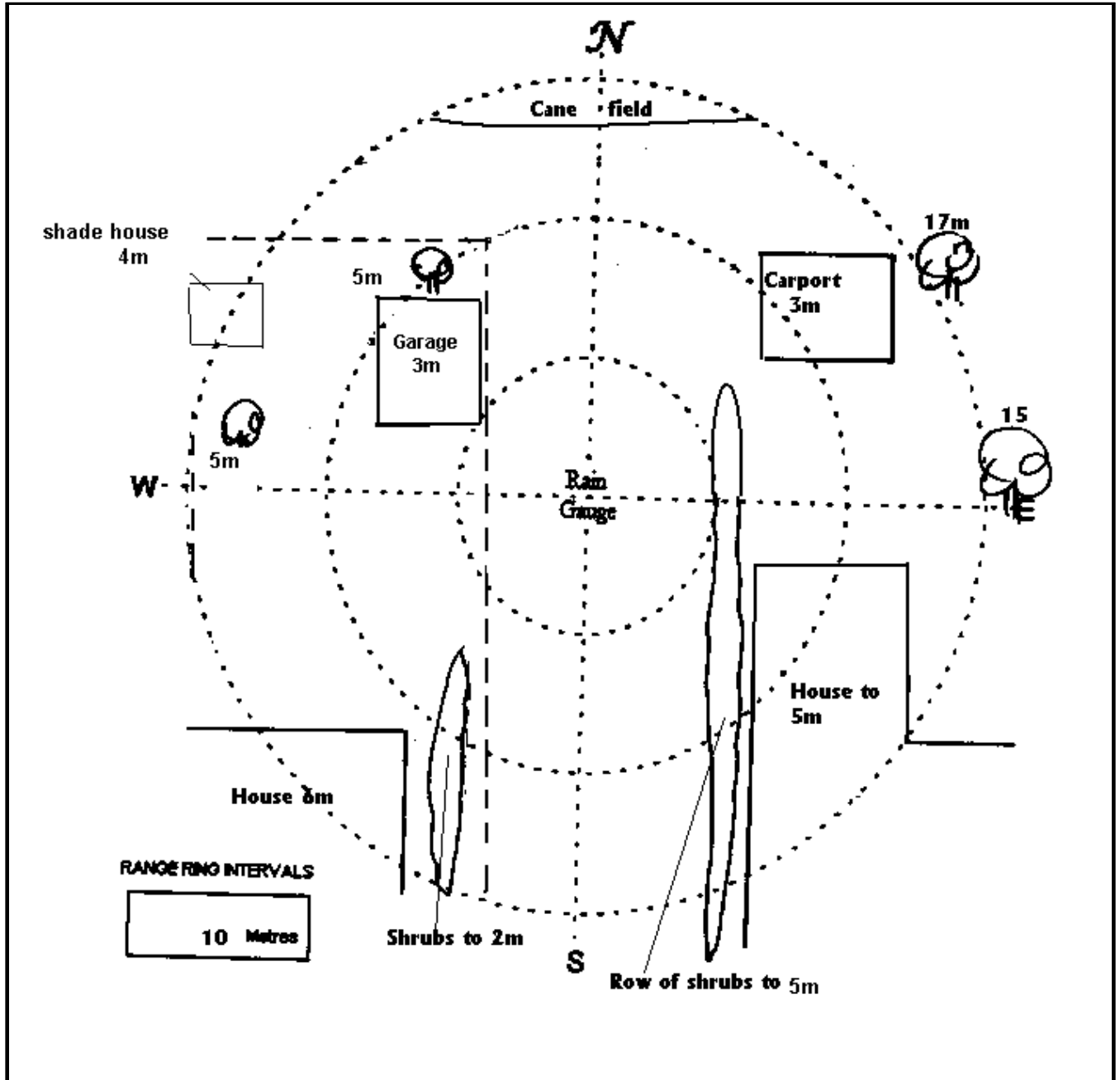
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### Instrument Location and Surrounding Features

28/09/2001



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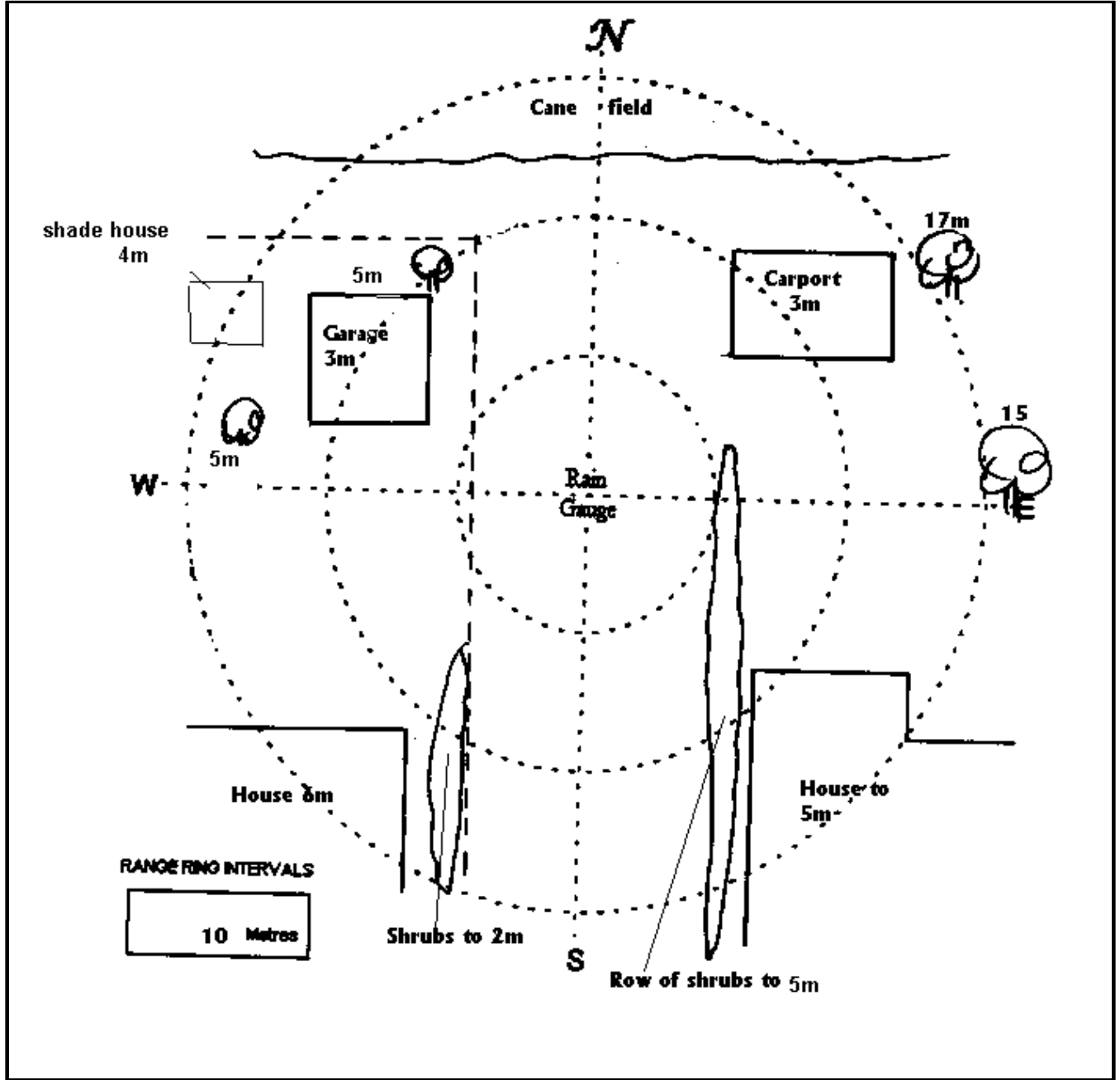
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### Instrument Location and Surrounding Features

30/09/2000



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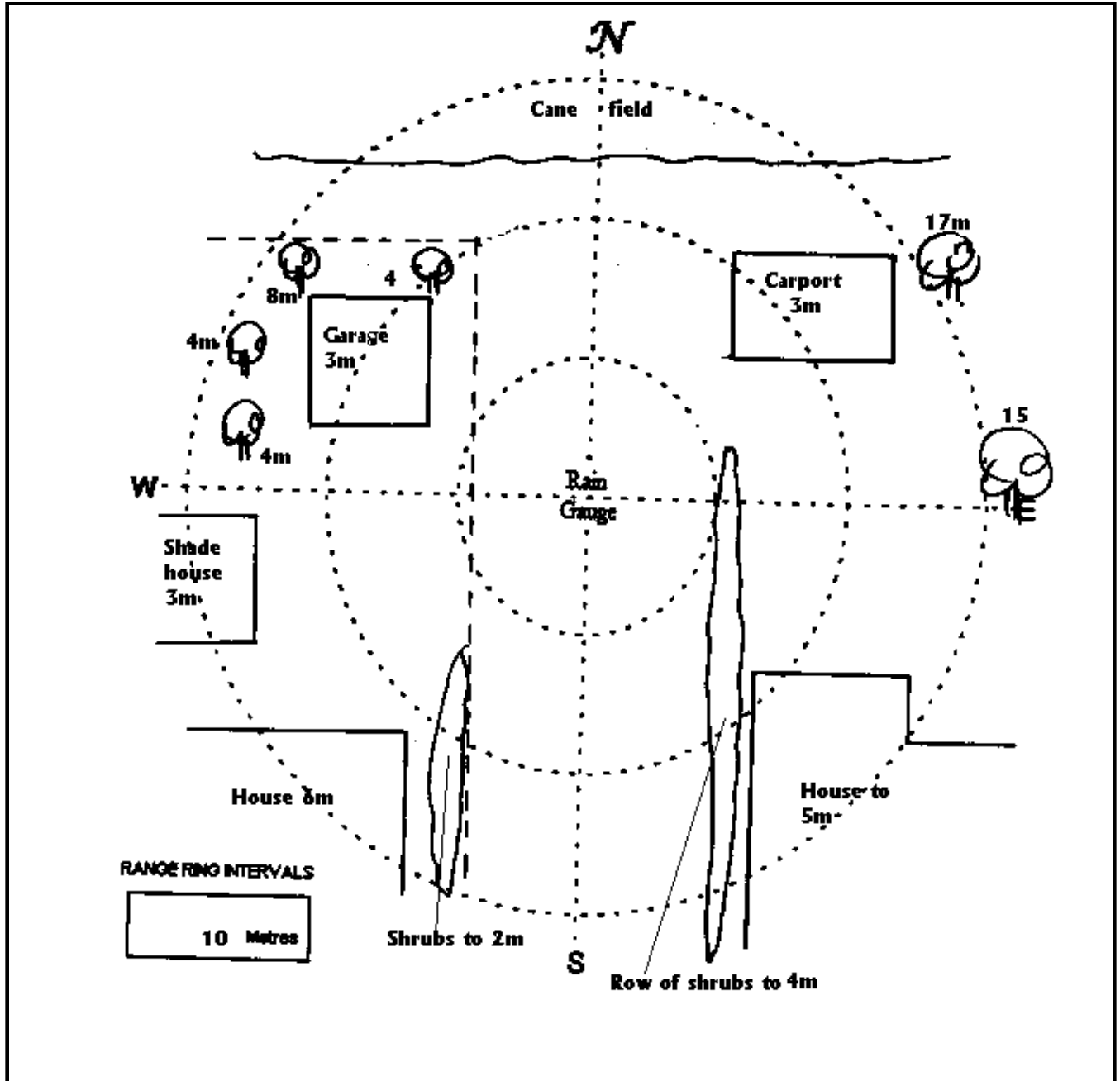
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### Instrument Location and Surrounding Features

25/09/1999



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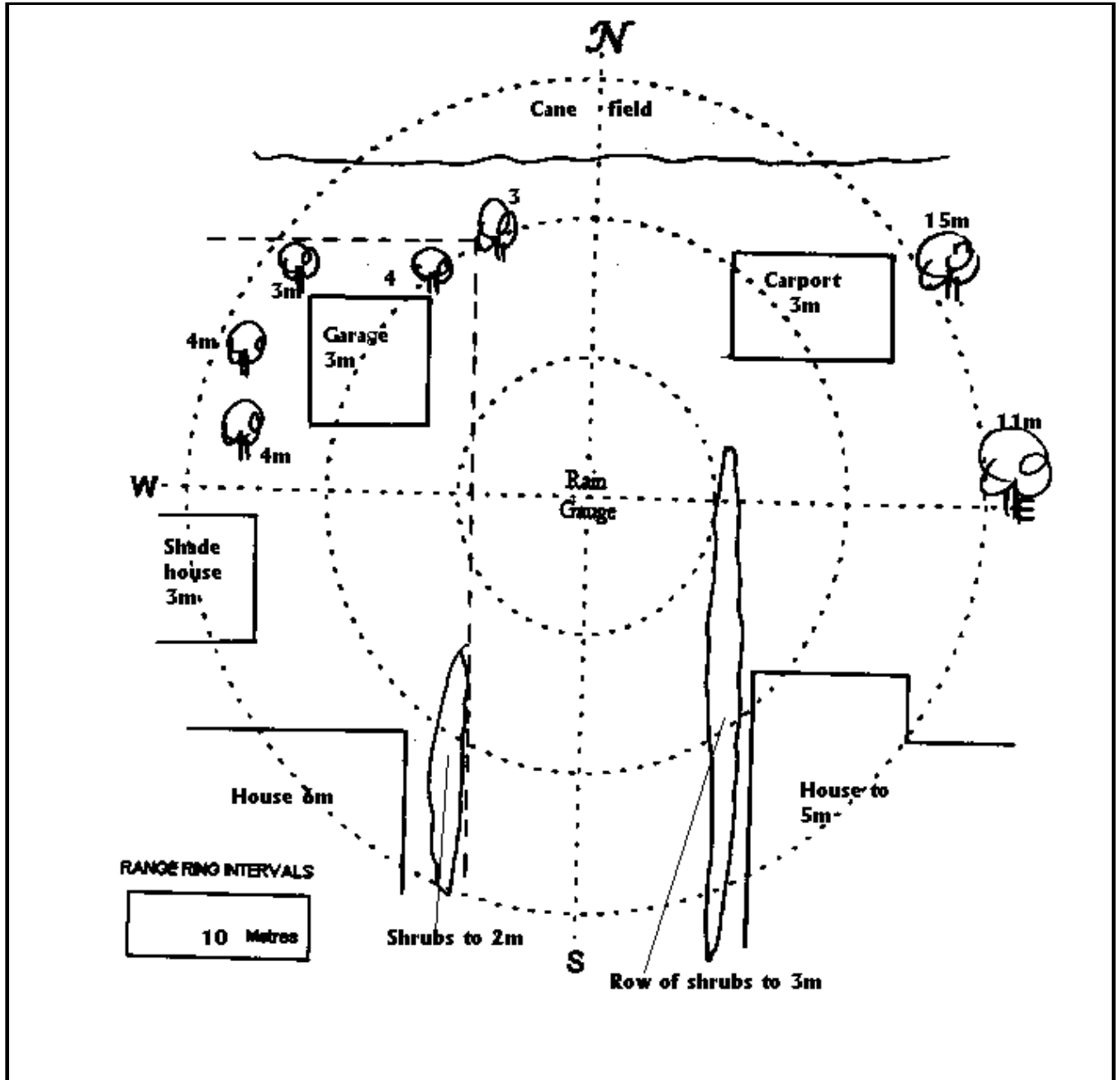
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### Instrument Location and Surrounding Features

04/10/1998



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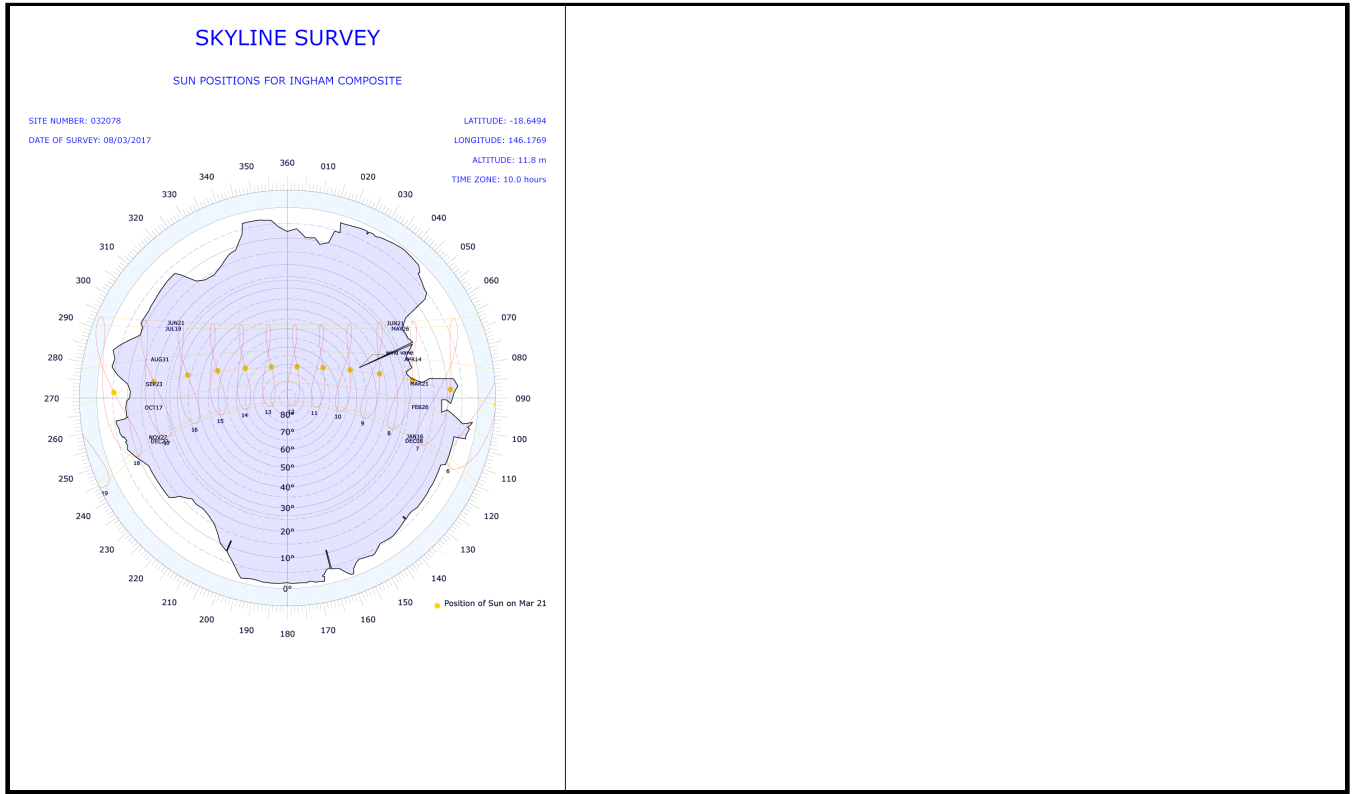
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### Skyline Diagram

08/03/2017(most recent)



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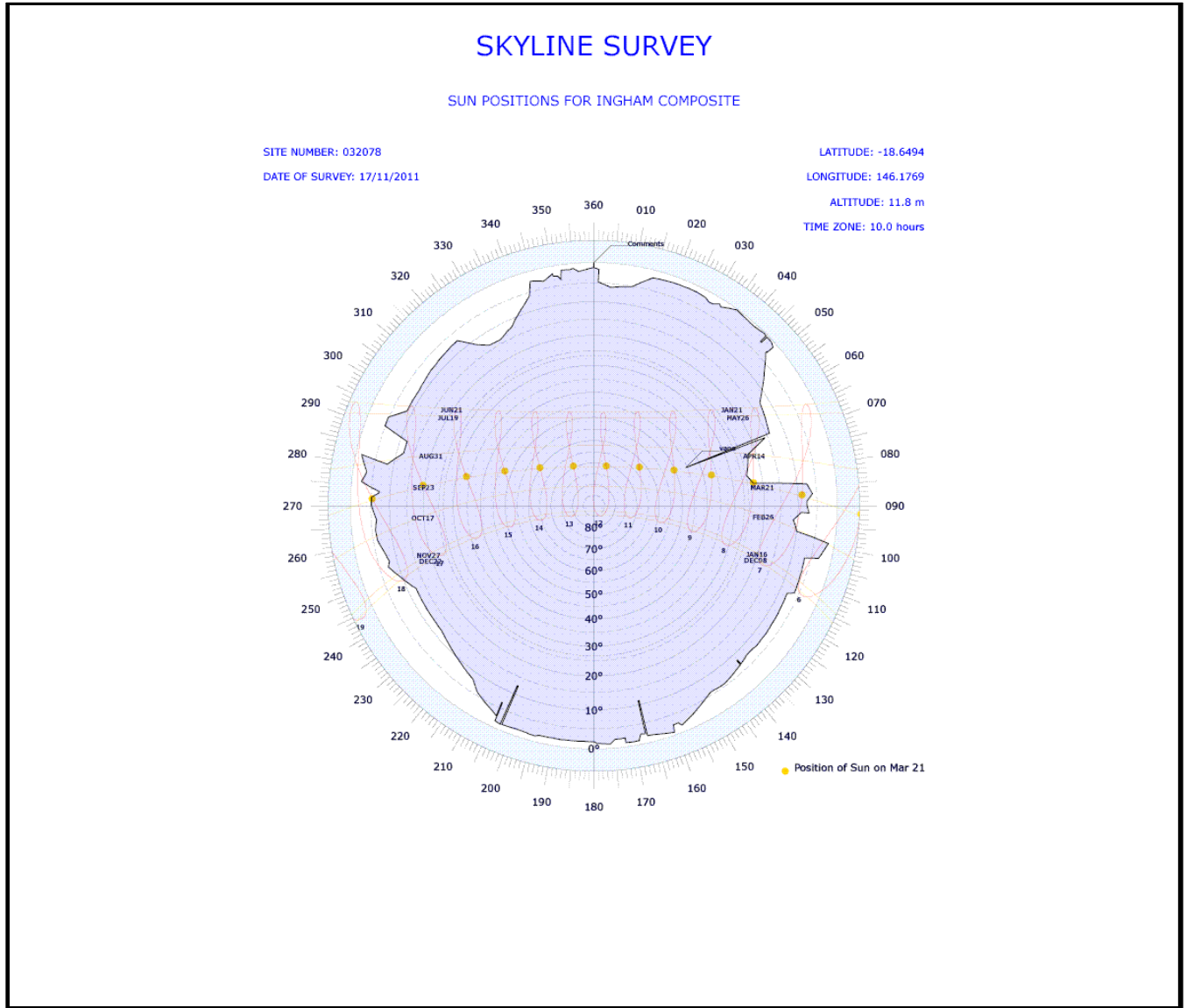


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### Skyline Diagram 18/11/2011



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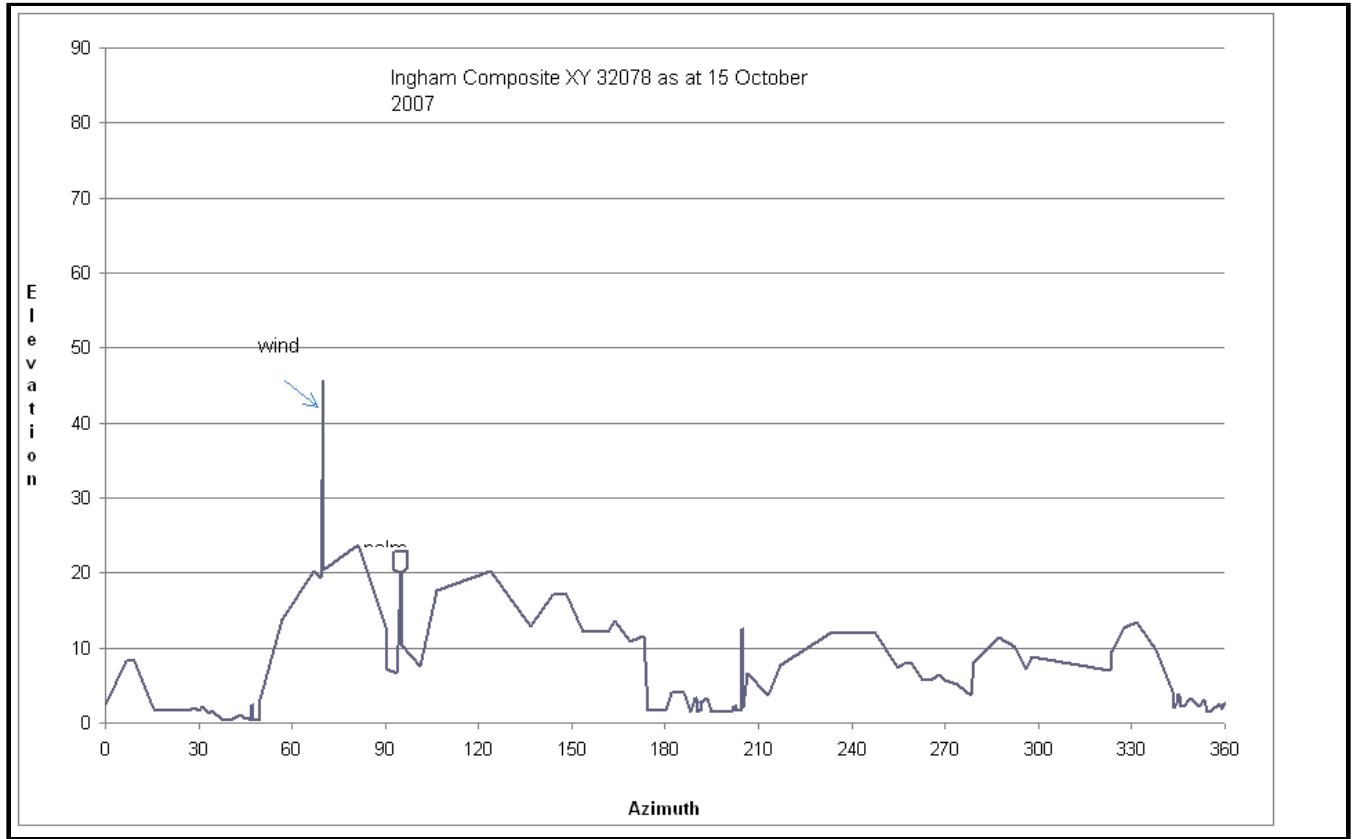
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### Skyline Diagram

15/10/2007



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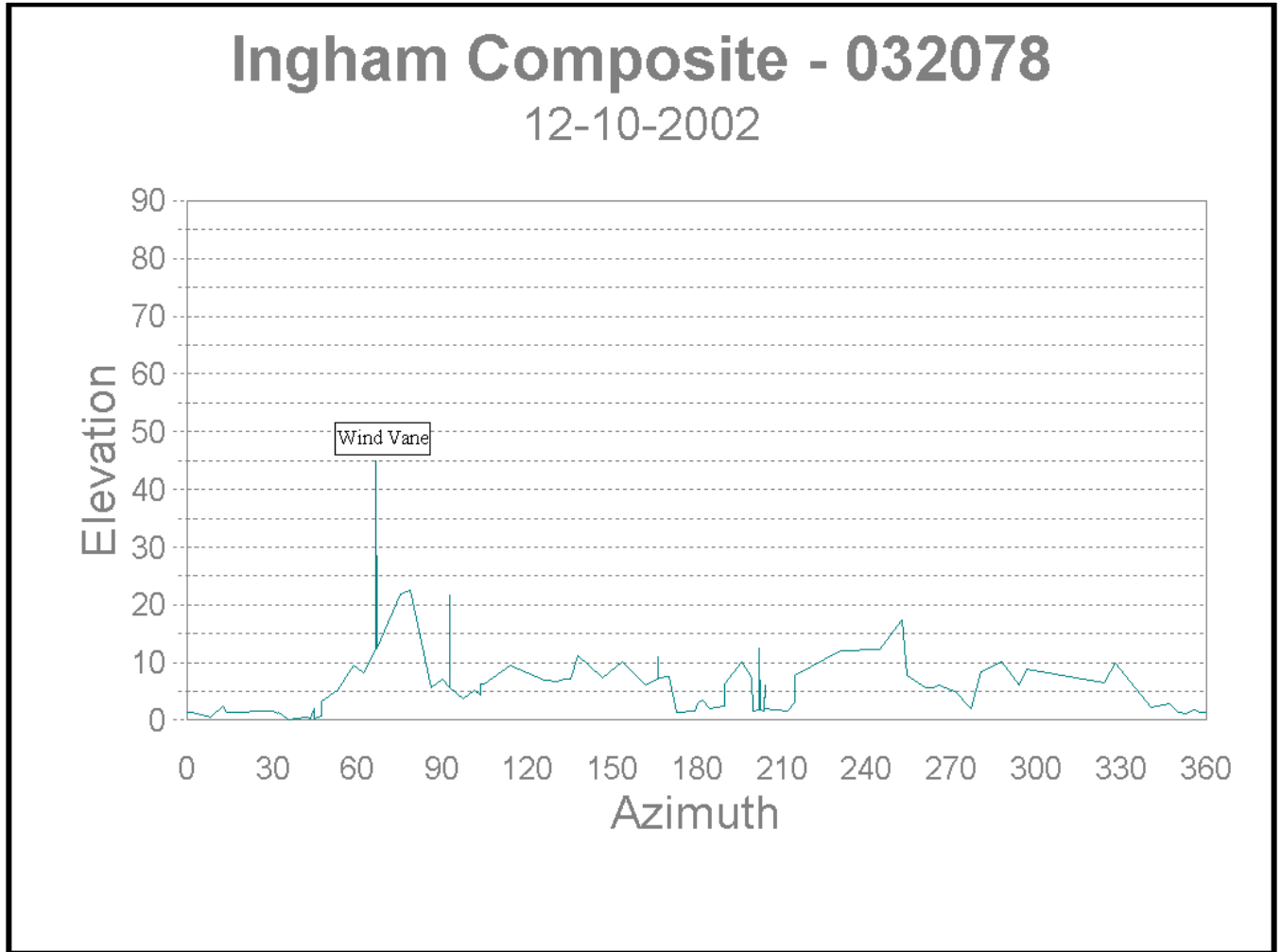
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### Skyline Diagram

12/10/2002



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<b>Latitude:</b> -18.6494	<b>Longitude:</b> 146.1769	<b>Elevation:</b> 11.8 m	<b>Barometer Elev:</b> 12.5 m	<b>Metadata compiled:</b> 27 JUL 2022	

### Station Observation Program Summary (Surface Observations) from 26/02/1968 to 12/12/1992

Current Observation	Continuous	Half Hourly	Hourly
Surface Observations	-	-	-

Current Observation	Program Type	12 AM	3 AM	6 AM	9 AM	12 PM	3 PM	6 AM	9 AM
Surface Observation	PERFORMED	-	-	-	Y	-	Y	-	-
Surface Observation	REPORTED	-	-	-	Y	-	-	-	-
Surface Observation	SEASONAL	-	-	-	-	-	-	-	-

### Station Observation Program Summary (Surface Observations) from 12/12/1992 to 01/04/1995

Current Observation	Continuous	Half Hourly	Hourly
Surface Observations	-	-	-

Current Observation	Program Type	12 AM	3 AM	6 AM	9 AM	12 PM	3 PM	6 AM	9 AM
Surface Observation	PERFORMED	-	-	-	Y	-	Y	-	-
Surface Observation	REPORTED	-	-	-	Y	-	Y	-	-
Surface Observation	SEASONAL	-	-	-	-	-	-	-	-

### Station Observation Program Summary (Surface Observations) from 01/04/1995 to 26/11/2001

Current Observation	Continuous	Half Hourly	Hourly
Surface Observations	-	-	-

Current Observation	Program Type	12 AM	3 AM	6 AM	9 AM	12 PM	3 PM	6 AM	9 AM
Surface Observation	PERFORMED	-	-	Y	Y	-	Y	-	Y
Surface Observation	REPORTED	-	-	Y	Y	-	Y	-	Y
Surface Observation	SEASONAL	-	-	-	-	-	-	-	-

### Station Observation Program Summary (Surface Observations) from 26/11/2001 to 01/12/2001

Current Observation	Continuous	Half Hourly	Hourly
Surface Observations	-	-	-

Current Observation	Program Type	12 AM	3 AM	6 AM	9 AM	12 PM	3 PM	6 AM	9 AM
Surface Observation	PERFORMED	-	-	-	Y	-	Y	-	Y
Surface Observation	REPORTED	-	-	-	Y	-	Y	-	Y
Surface Observation	SEASONAL	-	-	-	-	-	-	-	-

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## Extended Climatological Station Metadata

All History

<b>Station:</b> INGHAM COMPOSITE	<b>Location:</b> INGHAM COMPOSITE				<b>State:</b> QLD
<b>Bureau No.:</b> 032078	<b>WMO No.:</b> 95291	<b>Aviation ID:</b> NO ID	<b>Opened:</b> 26 Feb 1968	<b>Current Status:</b> Still open	
<b>Latitude:</b> -18.6494	<b>Longitude:</b> 146.1769	<b>Elevation:</b> 11.8 m	<b>Barometer Elev:</b> 12.5 m	<b>Metadata compiled:</b> 27 JUL 2022	

### Station Observation Program Summary (Surface Observations) from 01/12/2001 to 16/03/2005

Current Observation	Continuous	Half Hourly	Hourly
Surface Observations	-	-	-

Current Observation	Program Type	12 AM	3 AM	6 AM	9 AM	12 PM	3 PM	6 AM	9 AM
Surface Observation	PERFORMED	-	Y	-	Y	-	Y	-	Y
Surface Observation	REPORTED	-	Y	-	Y	-	Y	-	Y
Surface Observation	SEASONAL	-	-	-	-	-	-	-	-

### Station Observation Program Summary (Surface Observations) from 16/03/2005 to 01/09/2012

Current Observation	Continuous	Half Hourly	Hourly
Surface Observations	-	-	-

Current Observation	Program Type	12 AM	3 AM	6 AM	9 AM	12 PM	3 PM	6 AM	9 AM
Surface Observation	PERFORMED	-	Y	-	Y	-	Y	-	-
Surface Observation	REPORTED	-	Y	-	Y	-	Y	-	-
Surface Observation	SEASONAL	-	-	-	-	-	-	-	-

### Station Observation Program Summary (Surface Observations) from 01/09/2012 to 01/08/2015

Current Observation	Continuous	Half Hourly	Hourly
Surface Observations	-	-	-

Current Observation	Program Type	12 AM	3 AM	6 AM	9 AM	12 PM	3 PM	6 AM	9 AM
Surface Observation	PERFORMED	-	-	-	Y	-	Y	-	-
Surface Observation	REPORTED	-	-	-	Y	-	Y	-	-
Surface Observation	SEASONAL	-	-	-	-	-	-	-	-

### Station Observation Program Summary (Surface Observations) 27 JUL 2022 (most recent)

Current Observation	Continuous	Half Hourly	Hourly
Surface Observations	-	-	-

Current Observation	Program Type	12 AM	3 AM	6 AM	9 AM	12 PM	3 PM	6 AM	9 AM
Surface Observation	PERFORMED	-	-	-	Y	-	-	-	-
Surface Observation	REPORTED	-	-	-	Y	-	-	-	-
Surface Observation	SEASONAL	-	-	-	-	-	-	-	-

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## Extended Climatological Station Metadata

All History

<b>Station:</b> INGHAM COMPOSITE	<b>Location:</b> INGHAM COMPOSITE			<b>State:</b> QLD
<b>Bureau No.:</b> 032078	<b>WMO No.:</b> 95291	<b>Aviation ID:</b> NO ID	<b>Opened:</b> 26 Feb 1968	<b>Current Status:</b> Still open
<b>Latitude:</b> -18.6494	<b>Longitude:</b> 146.1769	<b>Elevation:</b> 11.8 m	<b>Barometer Elev:</b> 12.5 m	<b>Metadata compiled:</b> 27 JUL 2022

### Station Equipment History

#### Equipment Install/Remove

**Cloud Height (No Electronic History)**

**River Height (No Electronic History)**

**Wind Run (No Electronic History)**

**Spectral Radiation (No Electronic History)**

**Sea Surface Temperature (No Electronic History)**

**Sea Water Temperature (No Electronic History)**

#### Evaporation

01/JAN/1997 INSTALL Evaporation Pan (Type Class A S/N - NONE) Surface Observations

20/JAN/2011 REPLACE Evaporation Pan (Now Class A S/N - NONE) Surface Observations

#### Minimum Temperature

26/FEB/1968 INSTALL Thermometer, Alcohol, Min (Type Dobbie S/N - 20484) Surface Observations

26/FEB/1968 INSTALL Thermometer, Alcohol, Min (Type Dobbie S/N - 3783) Surface Observations

05/MAR/2001 REMOVE Thermometer, Alcohol, Min (Type Dobbie S/N - 3783) Surface Observations

05/JUN/2002 REPLACE Thermometer, Alcohol, Min (Now Amarol S/N - 20680) Surface Observations

11/APR/2015 REPLACE Thermometer, Alcohol, Min (Now Amarol S/N - 20680) Surface Observations

24/OCT/2016 REPLACE Thermometer, Alcohol, Min (Now Amarol S/N - 20680) Surface Observations

18/JUN/2013 REPLACE Thermometer, Alcohol, Min (Now WIKA S/N - 31162) Surface Observations

23/OCT/2016 REPLACE Thermometer, Alcohol, Min (Now WIKA S/N - 32976) Surface Observations

**Soil Temperature 50cm (No Electronic History)**

**Sub Surface Temperature (No Electronic History)**

**Electrical Conductivity (No Electronic History)**

#### Maximum Temperature

26/FEB/1968 INSTALL Thermometer, Mercury, Max (Type Dobbie S/N - M3993) Surface Observations

13/NOV/2014 REPLACE Thermometer, Mercury, Max (Now Amarol S/N - 21981) Surface Observations

26/OCT/2016 REPLACE Thermometer, Mercury, Max (Now Amarol S/N - 27709) Surface Observations

01/SEP/2009 REPLACE Thermometer, Mercury, Max (Now Amarol S/N - 30342) Surface Observations

01/NOV/2010 REPLACE Thermometer, Mercury, Max (Now Amarol S/N - 30342) Surface Observations

28/JAN/2004 REPLACE Thermometer, Mercury, Max (Now Dobbie S/N - 22050) Surface Observations

13/JAN/2004 REPLACE Thermometer, Mercury, Max (Now Dobbie S/N - 23421) Surface Observations

23/OCT/2006 REPLACE Thermometer, Mercury, Max (Now Dobbie S/N - 23421) Surface Observations

25/OCT/2009 REPLACE Thermometer, Mercury, Max (Now Dobbie S/N - 23421) Surface Observations

**Soil Temperature 20cm (No Electronic History)**

**Solar Radiation (No Electronic History)**

**Soil Temperature 5cm (No Electronic History)**

**Oxygen Content (No Electronic History)**

**Sea Water Level (No Electronic History)**

**Surface Inclination (No Electronic History)**

**Terrestrial Minimum Temperature (No Electronic History)**

**Visibility (No Electronic History)**

**Solar Radiation (Direct) (No Electronic History)**

**Magnetic Bearing (No Electronic History)**

#### Wind Direction

08/DEC/1988 INSTALL Anemometer (Type Dwyer on mast S/N - Unknown) Surface Observations

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## Extended Climatological Station Metadata

All History

<b>Station:</b>	INGHAM COMPOSITE		<b>Location:</b>	INGHAM COMPOSITE		<b>State:</b>	QLD	
<b>Bureau No.:</b>	032078	<b>WMO No.:</b>	95291	<b>Aviation ID:</b>	NO ID	<b>Opened:</b>	26 Feb 1968	
<b>Latitude:</b>	-18.6494	<b>Longitude:</b>	146.1769	<b>Elevation:</b>	11.8 m	<b>Barometer Elev:</b>	12.5 m	
							<b>Current Status:</b>	Still open
							<b>Metadata compiled:</b>	27 JUL 2022

### Station Equipment History (continued)

#### Equipment Install/Remove(Continued)

07/SEP/2006 INSTALL Anemometer (Type Kestrel 1000 S/N - 1664516) Surface Observations  
 26/FEB/1968 INSTALL Anemometer (Type Wind Vane S/N - NONE) Surface Observations  
 22/OCT/2008 REMOVE Anemometer (Type Dwyer on mast S/N - Unknown) Surface Observations

#### Air Temperature

26/FEB/1968 INSTALL Thermometer, Mercury, Dry Bulb (Type Dobbie S/N - 14579) Surface Observations

#### Wet Bulb Temperature

26/FEB/1968 INSTALL Thermometer, Mercury, Wet Bulb (Type Dobbie S/N - M1888) Surface Observations

#### Lightning (No Electronic History)

#### Turbidity (No Electronic History)

#### Total Column Ozone Amount (No Electronic History)

#### Pressure

20/JUN/1997 INSTALL Barometer (Type Vaisala PA11A S/N - S0610018) Surface Observations  
 11/DEC/2000 REPLACE Barometer (Now Vaisala PA11A S/N - S1110007) Surface Observations

#### Humidity (No Electronic History)

#### Sunshine Hours (No Electronic History)

#### Pressure Trend

01/NOV/1970 INSTALL Barograph (Type Weekly S/N - 035) Surface Observations  
 18/NOV/2011 REPLACE Barograph (Now Weekly S/N - 6286038) Surface Observations  
 07/JUL/2015 REPLACE Barograph (Now Weekly S/N - CBM0026) Surface Observations

#### Snow Height (No Electronic History)

#### Wind Speed

08/DEC/1988 INSTALL Anemometer (Type Dwyer on mast S/N - Unknown) Surface Observations  
 07/SEP/2006 INSTALL Anemometer (Type Kestrel 1000 S/N - 1664516) Surface Observations  
 26/FEB/1968 INSTALL Anemometer (Type Wind Vane S/N - NONE) Surface Observations  
 22/OCT/2008 REMOVE Anemometer (Type Dwyer on mast S/N - Unknown) Surface Observations

#### Rainfall

19/JUL/1972 INSTALL Pluviograph (Type Dines syphoning S/N - 201) Rainfall Intensity  
 30/JUN/1997 REMOVE Pluviograph (Type Dines syphoning S/N - 201) Rainfall Intensity  
 26/FEB/1968 INSTALL Raingauge (Type 203 mm (8in) - 200mm capacity S/N - NONE) Surface Observations  
 21/JUN/1997 INSTALL Raingauge (Type HS TB3A-0.2 S/N - 95-129) Rainfall Intensity  
 11/APR/2002 INSTALL Raingauge (Type Rimco 7499 TBRG S/N - 81106) Rainfall Intensity  
 15/OCT/2007 INSTALL Raingauge (Type Rimco 7499 TBRG S/N - 82514) Rainfall Intensity  
 15/OCT/2007 REMOVE Raingauge (Type Rimco 7499 TBRG S/N - 81106) Rainfall Intensity  
 21/MAR/2002 REMOVE Raingauge (Type Rimco 8020 TBRG S/N - 78880) Rainfall Intensity  
 02/JUL/2020 REMOVE Raingauge (Type Rimco TBRG (type unspecified) S/N - 560) Rainfall Intensity  
 30/SEP/2000 REPLACE Raingauge (Now Rimco 8020 TBRG S/N - 78880) Rainfall Intensity  
 13/NOV/2010 REPLACE Raingauge (Now Rimco TBRG (type unspecified) S/N - 560) Rainfall Intensity

#### Soil Temperature 100cm (No Electronic History)

#### Soil Temperature 10cm (No Electronic History)

#### Solar Radiation (Long Wave) (No Electronic History)

#### RF Reflectivity (No Electronic History)

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## Extended Climatological Station Metadata

All History

<b>Station:</b>	INGHAM COMPOSITE		<b>Location:</b>	INGHAM COMPOSITE		<b>State:</b>	QLD	
<b>Bureau No.:</b>	032078	<b>WMO No.:</b>	95291	<b>Aviation ID:</b>	NO ID	<b>Opened:</b>	26 Feb 1968	
<b>Latitude:</b>	-18.6494	<b>Longitude:</b>	146.1769	<b>Elevation:</b>	11.8 m	<b>Barometer Elev:</b>	12.5 m	
							<b>Current Status:</b>	Still open
							<b>Metadata compiled:</b>	27 JUL 2022

### Station Equipment History (continued)

The following table summarises information on field performance checks available electronically over the period indicated. The number of instances an instrument was found to fail field performance checks should only be used as a guide. A system of data quality flags is implemented by the Bureau of Meteorology to indicate the data quality of an observation as determined by a multi-stage quality control process.

Available Date Range	Element	Fail Field Performance Check
30/SEP/2000 - 29/JUL/2019	Evaporation	2
30/SEP/2000 - 29/JUL/2019	Minimum Temperature	0
30/SEP/2000 - 29/JUL/2019	Maximum Temperature	1
30/SEP/2000 - 29/JUL/2019	Wind Direction	2
30/SEP/2000 - 29/JUL/2019	Air Temperature	0
30/SEP/2000 - 29/JUL/2019	Wet Bulb Temperature	0
04/OCT/1998 - 29/JUL/2019	Pressure	1
30/SEP/2000 - 29/JUL/2019	Pressure Trend	3
30/SEP/2000 - 29/JUL/2019	Wind Speed	2
04/OCT/1998 - 29/JUL/2019	Rainfall	7

#### Station Detail Changes

30/AUG/2021 CLASSIFICATION Mastered in EAMS (EAMS)  
 01/MAY/1989 CLASSIFICATION National Benchmark Network for Agrometeorology (NBNA)  
 01/JUL/2017 CLASSIFICATION Observing Operations Hub - Cairns (OOH-C)  
 01/JUL/2017 CLASSIFICATION SLS Flood forecasting priority â€™ Low (FWP-L)  
 04/SEP/2012 OBJECT Document/032078 Ingham Composite Co-operative\_Observers\_Contract  
 16/JUL/2012 OBJECT Document/Coop review 2012 letter  
 12/OCT/2002 OBJECT Document/SKYLINE DATA  
 15/OCT/2007 OBJECT Document/SKYLINE DATA  
 18/NOV/2011 OBJECT Document/SKYLINE DATA  
 08/MAR/2017 OBJECT Document/SKYLINE DATA  
 26/FEB/1968 STATION - (nondb seeding) Opened  
 26/FEB/1968 STATION - (nondb seeding) bar\_ht Changed to 12.5  
 26/FEB/1968 STATION - (nondb seeding) bar\_ht\_deriv Changed to SURVEY  
 26/FEB/1968 STATION - (nondb seeding) latitude Changed to -18.6494  
 26/FEB/1968 STATION - (nondb seeding) longitude Changed to 146.1767  
 26/FEB/1968 STATION - (nondb seeding) stn\_ht Changed to 11.8  
 26/FEB/1968 STATION - (nondb seeding) stn\_ht\_deriv Changed to SURVEY  
 26/FEB/1968 STATION - (nondb seeding) wmo\_num Changed to 95291  
 12/OCT/2002 STATION latitude Changed to -18.6494  
 12/OCT/2002 STATION latlon\_deriv Changed to GPS  
 12/OCT/2002 STATION latlon\_error Changed to  
 12/OCT/2002 STATION longitude Changed to 146.1769  
 04/OCT/1998 STATION lu\_0\_100m Changed to Town 1000 to 10,000  
 04/OCT/1998 STATION lu\_100m\_1km Changed to Town 1000 to 10,000  
 04/OCT/1998 STATION lu\_1km\_10km Changed to Open farmland, grassland or tundra  
 26/FEB/1968 STATION name Changed to INGHAM COMPOSITE

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## Extended Climatological Station Metadata

All History

<b>Station:</b>	INGHAM COMPOSITE			<b>Location:</b>	INGHAM COMPOSITE		<b>State:</b>	QLD	
<b>Bureau No.:</b>	032078	<b>WMO No.:</b>	95291	<b>Aviation ID:</b>	NO ID	<b>Opened:</b>	26 Feb 1968	<b>Current Status:</b>	Still open
<b>Latitude:</b>	-18.6494	<b>Longitude:</b>	146.1769	<b>Elevation:</b>	11.8 m	<b>Barometer Elev:</b>	12.5 m	<b>Metadata compiled:</b>	27 JUL 2022

### Station Equipment History (continued)

#### Station Detail Changes(Continued)

04/OCT/1998 STATION soil\_type Changed to black soil  
 04/OCT/1998 STATION surface\_type Changed to fully covered by grass

#### System Changes

02/JUL/2020 SYSTEM Rainfall Intensity Ceased  
 19/JUL/1972 SYSTEM Rainfall Intensity Commenced  
 26/FEB/1968 SYSTEM Surface Observations Commenced

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## Notes on these metadata

The following notes have been compiled to assist with interpreting the metadata provided in this document. These notes are subject to change as the network evolves. Changes in station-specific metadata occur more frequently, both as recent changes are recorded and historical information is transferred from paper file to electronic database.

### Reliability of the metadata

The Commonwealth Bureau of Meteorology maintains information on more than 20,000 stations which have operated since observations began in the mid 1800s. The amount of information available for each of these sites and its associated uncertainty are influenced by a number of factors including the type and purpose of the station and the time over which it operated.

Early information about stations was held only on paper file. In 1998 a corporate electronic database was established to help maintain information about the network and its components. The number of parameters recorded about a station is now much greater than before this database was established. The national database has also helped improve consistency in the metadata through the implementation of predefined fields. As a result, and through the refinement of operating procedures, station metadata recorded since 1998 are of a higher overall standard than previously, although occasional omissions and errors are still possible.

The Bureau is part way through a task of entering historical information held on paper file into the corporate database. **Until this process is completed there will remain large gaps in the information contained in these metadata documents and considerable caution should be used when deriving conclusions from the metadata.** As an example, two consecutive entries about a rain gauge dated 50 years apart may appear in the equipment metadata. This may either mean that nothing happened to that instrument over the 50 years, or that information for the intervening period has yet to be entered into the database. Similarly, if no information was available about instruments at a site when it was first established, fields which were required to have a value present may have used the earliest information available as a best-guess estimate. Sometimes this was the metadata current when the database was established in 1998. In some instances there may be gaps in metadata relevant to the post 1998 period.

For the above reasons it is recommended that all metadata prior to 1998 be considered as indicative only, and used with caution, unless it has been quality controlled. The Bureau of Meteorology should be contacted if further information or confirmation of the data is required. Depending on the nature of the inquiry there may be a fee associated with this request. Contact details are provided in the telephone book for each capital city or the Bureau's web site at:  
<http://www.bom.gov.au>

The following pages contain explanatory notes for selected terms found in this document.

### Station Number

The Bureau of Meteorology station number uniquely specifies a station and is not intended to change over time, although on very rare occasions a station number may change or be deleted from the record (usually to correct an error). Generally a new station number is established if an existing station changes in a way that would affect the climate data record for that site (measured in terms of air temperature and precipitation). Significant station moves are an example of this.

Some stations also possess a World Meteorological Organization (WMO) station number. The WMO number is different to the Bureau of Meteorology number. It also uniquely specifies a station at any given time but can be reassigned to another station if the new station takes priority in the global reporting network. Only selected stations will have a WMO number. Significant stations may maintain their WMO number for many decades.

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## Notes on these metadata

### Network Classification

<b>SUPPORTING the BASIC CLIMATE SERVICE</b>
Global Climate Observing System (GCOS)
GCOS Upper Air Network (GUAN)
GCOS Surface Network (GSN)
National Climate Network {not yet assigned}
Reference Climate Stations (RCS)
Regional Basic Climatological Network (RBCN)
CLIMAT Stations (CLC)
CLIMAT TEMP Stations (CLT)
<b>SUPPORTING the NATIONAL WEATHER WATCH SYSTEM</b>
WMO Global Observing System (GOS)
GOS Upper Air Network
GOS Satellite Network
Global Atmospheric Watch
Background Atmospheric Pollution Monitoring Network (BAPMON)
Basic Ozone Network
Basic Solar and Terrestrial Radiation Network
Regional Basic Synoptic Network (RBSN)
WMO Global Oceanic Observing System (GOOS)
<b>SUPPORTING the BASIC WEATHER SERVICE (BWS)</b>
BWS Land Network
Significant Land Locations
Capital City Mesonets
National Benchmark Network for Agrometeorology (NBNA)
BWS Marine Network
Significant Coastal Locations
Open Ocean Network
BWS Upper Air Network
Major Significant Locations
BWS Remote Sensing Network
Weather Watch Radar Network
Fire Weather Wind Mesonets
High Resolution Satellite
<b>SUPPORTING the BASIC HYDROLOGICAL SERVICE</b>
Regional Flood Warning Network
Water Resources Assessment Network
Global Hydrological Network
Global Terrestrial Observing System (GTOS)
World Hydrological Cycle Observing System (WHYCOS)
National Hydrological Network

Networks of stations are defined for a variety of purposes (as defined in above table).

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## Notes on these metadata

### Network Classification Continued....

Stations may be included in several different networks, which may change over time. The table on the previous page lists current network classifications related to the scientific purpose of the network. Some of these networks - the GCOS network for instance - are components of a global network. Entries in the database for some networks may not be complete, thus not properly representing the status of the network. The composition of the network will usually change over time. While several of the networks have international significance, other network classifications have been developed to aid operational management.

### Station Purpose

The station purpose can be classified according to the observation program listed below. Parameters in brackets list some of the various different configurations which occur.

- Synoptic [Seasonal, River Height, Climatological, Telegraphic Rain, Aeronautical, Upper Air]
- Climatological [Seasonal, Telegraphic Rain]
- Aeronautical
- Rainfall [River Height]
- River Height
- Telegraphic Rain [Non-Telegraphic River Height, Telegraphic River Height]
- Non-Telegraphic Rain [Telegraphic River Height]
- Evaporation [Rainfall, River Height, Telegraphic River Height, Non-Telegraphic River Height, Telegraphic Rain, Non-Telegraphic Rain]
- Pluviograph [Rainfall, Telegraphic Rain, Non-Telegraphic Rain, River Height, Telegraphic River Height, Non-Telegraphic River Height]
- Radiation
- Lightning Flash Counter
- Public Information
- Local Conditions
- Radar Site
- Unclassified
- No Routine Observations

Note: Telegraphic observations are those which are sent by some electronic means be it a phone or telegram to the responsible Bureau office. It is a term which is historically linked to analogue non automatic data transmission.

### Station Observation Program Summary

#### Surface Observations

The following terms are used to describe the frequency of surface observations at a site. Historical observation programs will typically be missing for many sites until the database is backfilled with information.

Set a)

- Continuous Program
  - More than half hourly observations sent (eg an automatic weather station {AWS} which continuously transmits 10 minute observations). This will automatically include half hourly and hourly observations programs.
- Half hourly observations
  - Half hourly observations sent. This will automatically include hourly observations.
- Hourly observations
  - Hourly observations sent only. Stations report on non-synoptic hours (ie. 0100, 0200, 0400, 0500, etc)

**Historical metadata for this site has not been quality controlled for accuracy and completeness. Data other than current station information, particularly earlier than 1998, should be considered accordingly. Information may not be complete, as backfilling of historical data is incomplete.**

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## Notes on these metadata

### Surface observations continued....

#### Set b)

- Performed
  - Observations performed, instruments read and observations recorded
- Reported
  - Observations performed, instruments read and reported real time
- Seasonal
  - The program may only be performed during a defined season (such as Fire Weather observations) or the routine program may increase in reporting frequency and/or parameters. The program dates are currently modified at the start and end of each season for stations performing seasonal observations. Historically this was not always the case.

### Current Station Equipment Summary

Equipment listed in this metadata product is catalogued under one of systems listed below, appropriate to its application. The "Infrastructure" category has been included since it contains information about the mast height of an anemometer (if present).

- Flood Warning
- Infrastructure
- Radiation
- Rainfall Intensity
- Surface Observations
- Upper Air
- Weather Watch {RADAR}

### Station Equipment History

#### Equipment Install/Remove

One of four types of actions can be performed on an instrument in this listing:

**Install** - A new instrument is installed at the site. This can be either a completely new addition (eg the first barometer at the site), or the replacement of an existing instrument with a different type (eg replacing mercury barometer with electronic barometer)

**Remove** - An instrument can be removed either when it is no longer necessary to measure a particular element, or when the element is to be measured by an instrument of a different type ( see under "Install" above)

**Replace** - This occurs when one instrument is replaced with another of the same type (eg Kew pattern mercury barometer replacing another Kew pattern mercury barometer)

**Share** - The same instrument is used for observations under two (or more) systems (eg a rain gauge may be used within both Surface Observations and Rainfall Intensity systems)

**Unshare** - The instrument is no longer shared between systems

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## Notes on these metadata

### Calibration

During a site inspection an instrument will be calibrated as either being within or not within the specified tolerance in accuracy.

Where a quantitative calibration result can be achieved by comparison to a transfer standard (eg barometer comparisons and tipping bucket rain gauge calibrations), the instrument will be recorded as being within or outside the required tolerance. Instruments (such as 203mm rain gauges, screens and evaporation pans) where quantitative calibrations cannot be derived should be regarded as meeting specifications when the instrument is in 'good working order'.

This product provides a summary table of the number of times an instrument was found to be out of calibration

### Station Detail Changes

This set of metadata indicates when some aspect of the general information about a station has changed.

#### - STATION

Metadata which are categorised as pertaining to STATION are items of (textual) information describing a specific attribute of the station. A reference to (nondB seeding) indicates initial information of this field has been sourced from a previous database.

#### Station position

##### - Latitude and longitude

Derivation of station latitude and longitude, defined by the location of the rain gauge when it is present, has changed over time. Current practice is to locate or verify open and operational station latitude and longitude based on Global Positioning System equipment. Methods used to locate a station as described in this product (latlon\_deriv) are as follows: GPS, MAP 1:10000, MAP 1:12500, MAP 1:25000, MAP 1:50000, MAP 1:100000, MAP 1:250000, SURVEY, and Unknown (which is more commonly represented by a null value). The field latlon\_error should be used with caution as the method of determining this value has been interpreted in different ways over time.

##### - Height

Determination of heights for observing sites is by survey where possible. Otherwise height may be determined using a Digital Aneroid Barometer and a known surveyed point, or derived from map contours. The source of height is provided in the corresponding parameter with a suffix of "\_deriv".

Heights which may appear in these metadata are:

- aero\_ht
  - The official elevation of the aerodrome which normally corresponds to the altitude of the highest threshold of the runways at that airport;
- bar\_ht
  - this represents the height of the mercury barometer cistern or the digital aneroid barometer above mean sea level (MSL);
- stn\_ht
  - this normally represents the height of the rain gauge above MSL

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## Notes on these metadata

### - Land Use

To assist the long term understanding of climate change it is important to be able to determine the differences over time which are attributed to variations in the climate. Since land use has an effect on the micro climate around the site, and changes in land use will therefore affect the climate record, it is important that the characteristics of the site are monitored. Soil types are recorded as they affect the land use and also add to the knowledge of the site details.

#### Defined Land use Types.

- Non-vegetated (barren, desert)
- Coastal or Island
- Forest
- Open farmland, grassland or tundra
- Small town, less than 1000 population
- Town 1000 to 10,000 population
- City area with buildings less than 10 metres (3 stories)
- City area with buildings greater than 10 metres (3 stories)
- Airport

The land use code is entered on the station inspection form in the ranges 0 to 100 m, 100 to 1 km and 1km to 10 km; ie:

- lu\_0\_100m: Land Use 0 to 100 metres from the enclosure
- lu\_100m\_1km: Land Use 100 metres to 1 kilometre
- lu\_1km\_10km: Land Use 1 kilometre to 10 kilometres

#### Defined Soil Type (At Enclosure).

- unable to determine
- sand
- black soil
- clay
- rock
- red soil
- other

#### Surface Type (At Enclosure).

- unable to determine
- fully covered by grass
- mostly covered by grass
- partly covered by grass
- bare ground
- sand
- concrete
- asphalt
- rock
- other

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