# Daily/Hourly 2m average air temperature

## MIN: -62.22 MAX: 46.11 UNITS: Degrees Celsius

## TIME PERIOD: hourly or daily TIME ZONE: UTC

Given that:

**at1m** : 1m average air temperature

**at1.5m** : 1m average air temperature

**at2m** : 2m average air temperature

**at3m** : 3m average air temperature

**max\_at**: 2m maximum air temperature

**min\_at**: 2m minimum air temperature

If **at1.5m**, then **at2m** is **at1.5m**.

If **at1m**, then

* If there is both **at1m** and **at3m**, then
  + **at2m** = (**at3m** – **at1m**)/2 + **at1m**
* If there is **at1m** and no **at3m**, then
  + **at2m** = **at1m**

If there is a **max\_at** and **min\_at**:

* **at2m** = (**max\_at** – **min\_at)**  / 2 + **min\_at**

# Daily 2m maximum air temperature

## MIN: -66.22 MAX: 46.11 UNITS: Degrees Celsius

## TIME PERIOD: daily TIME ZONE: UTC

Given that:

**max\_at1m** : 1m maximum air temperature

**max\_at1.5m** : 1m maximum air temperature

**max\_at2m** : 2m maximum air temperature

**max\_at3m** : 3m maximumair temperature

If **max\_at1.5m**, then **max\_at2m** is **max\_at1.5m**.

If **max\_at1m**, then

* If there is both **max\_at1m** and **max\_at3m**, then
  + **max\_at2m** = (**max\_at3m** – **max\_at1m**)/2 + **max\_at1m**
* If there is a **max\_at1m** and no **max\_at3m**, then
  + **max\_at2m** = **max\_at1m**

# Daily 2m minimum air temperature

## MIN: -66.22 MAX: 46.11 UNITS: Degrees Celsius

## TIME PERIOD: daily TIME ZONE: UTC

Given that:

**min\_at1m** : 1m minimum air temperature

**min\_at1.5m** : 1m minimum air temperature

**min\_at2m** : 2m minimum air temperature

**min\_at3m** : 3m minimumair temperature

If **min\_at1.5m**, then **min\_at2m** is **min\_at1.5m**.

If **min\_at1m**, then

* If there is both **min\_at1m** and **min\_at3m**, then
  + **min\_at2m** = (**min\_at3m** – **min\_at1m**)/2 + **min\_at1m**
* If there is a **min\_at1m** and no **min\_at3m**, then
  + **min\_at2m** = **min\_at1m**

# Daily/Hourly Average Relative Humidity (2m)

## MIN: 0 MAX: 100 UNITS: %

## TIME PERIOD: hourly or daily TIME ZONE: UTC

Given that:

**at1m** : 1m average air temperature

**at2m** : 2m average air temperature

**at3m** : 3m average air temperature

**rh1m**: 1m average relative humidity

**rh2m** : 2m average relative humidity

**rh3m** : 3m average relative humidity

**dew1m** : 1m average dew point temperature

**dew2m** : 2m average dew point temperature

**dew3m**: 3m average dew point temperature

If there is only **at1m** and **rh1m**, the r**h2m** is **rh1m**.

If **at1m**, **at3m**, **rh1m, rh3m** are *all* available, then

1. Calculate **dew1m** and **dew3m**:

LOG((0.611\*(EXP((17.3\***at1m**)/(**at1m**+237.3))))\***rh1m**/100)+0.4926)/(0.0708-0.00421\*LOG((0.611\*(EXP((17.3\***at1m**)/(**at1m**+237.3))))\***rh1m**/100)) as d**ew1m**

LOG((0.611\*(EXP((17.3\***at3m**)/(**at3m**+237.3))))\***rh3m**/100)+0.4926)/(0.0708-0.00421\*LOG((0.611\*(EXP((17.3\***at3m**)/(**at3m**+237.3))))\***rh3m**/100)) as **dew3m**

1. Calculate **dew3m**:

(**dew3m**-**dew1m**)/2+**dew1m** = **dew2m**

1. Calculate **at2m**:

(**at3m**-**at1m**)/2+**at1m = at2m**

If the 2m dew point temperature is not higher than the 2m air temperature, then calculate the **rh2m** using all values in given time period:

(0.611 \* EXP((17.3 \* AVG(**dew2m**))/(AVG(**dew2m)** + 237.3))) / (0.611 \* EXP((17.3 \* AVG(**at2m)**)/(AVG(**at2m)** + 237.3))) \* 100.0 as **rh2m**

# Daily/Hourly Wind Speed

## MIN: 0 MAX: 50 UNITS: m/s

## TIME PERIOD: hourly or daily TIME ZONE: UTC

Calculated average wind speed for all available data values that are measured at the maximum sensor height for each timestamp.

# Daily/Hourly Average Wind Direction

## MIN: 0 MAX:360 UNITS: Angular degrees

Calculated average wind direction for all available data values that are measured at the maximum sensor height for each timestamp.

1. Create vector components:

x = AVG(Wind Speed \* COS(Wind Direction \* PI/180))

y = AVG(Wind Speed \* SIN(Wind Direction \* PI/180))

2. Find offsets, used to go from vector back to radial:

if (x > 0 and y > 0) Offset=0

if (x < 0 ) Offset=180

if (x > 0) and y < 0) Offset=360

3. Calculate average wind direction:

if x <> 0, and x and y are not null

Wind Direction = ARCTAN(y/x)\*180/PI + Offset

else if x = 0

Wind Direction = 0

else

Wind Direction = null

# Daily/Hourly Average Snow Depth

## MIN: 0 MAX 6.096 UNITS: meters

## TIME PERIOD: hourly or daily TIME ZONE: UTC

Calculated average snow depth for all available data values.

# Daily/Hourly Average Snow Water Equivalent

## MIN: 0 MAX: 609.6 UNITS: mm

## TIME PERIOD: hourly or daily TIME ZONE: UTC

Calculated average snow water equivalent for all available data values.

# Daily Average Discharge

## MIN: 0 MAX: UNITS: cms

Calculated average discharge for all available data values.

# Hourly/Daily Total Precipitation

## MIN: 0 MAX: 635 UNITS: mm

## TIME PERIOD: daily TIME ZONE: UTC

Calculated total precipitation for all available data values.

# Daily Water Temperature

## MIN: MAX: UNITS: degrees Celsius

## TIME PERIOD: DAILY TIME ZONE: UTC

Calculated average water temperature for all available data values.