



**METER**

# 7 WEATHER STATION INSTALLATION MISTAKES TO AVOID

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# DON'T MESS UP YOUR WEATHER STATION INSTALLATION NO ROOKIE MISTAKES!

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# 7 STEPS

1. Pre-field testing
2. Choosing the right site
3. High-quality installation
4. Field check
5. Troubleshooting
6. Metadata recording
7. Post-installation

## Step 0. Choose your weather station

<https://www.metergroup.com/environment/events/weather-monitoring-101-which-weather-station-is-right-for-you/>





# PRE-FIELD TESTING

Set up instrumentation and test it BEFORE you go to the field

- mounting hardware
- sensor function
- power supply & charging
- data acquisition
- logger program
- data delivery

Test everything to make sure install will be successful

Ensure you have all necessary equipment for the install

Make a list



# CHOOSE THE RIGHT SITE

## Minimal slope

## Far from obstructions

- WMO calls for minimum 10X height of obstruction
- ASABE calls for 10X to 50X height of obstruction
- homogenous fetch of 100X height preferable





# CHOOSE THE RIGHT SITE

No overhead obstructions for pyranometer and rain gauge

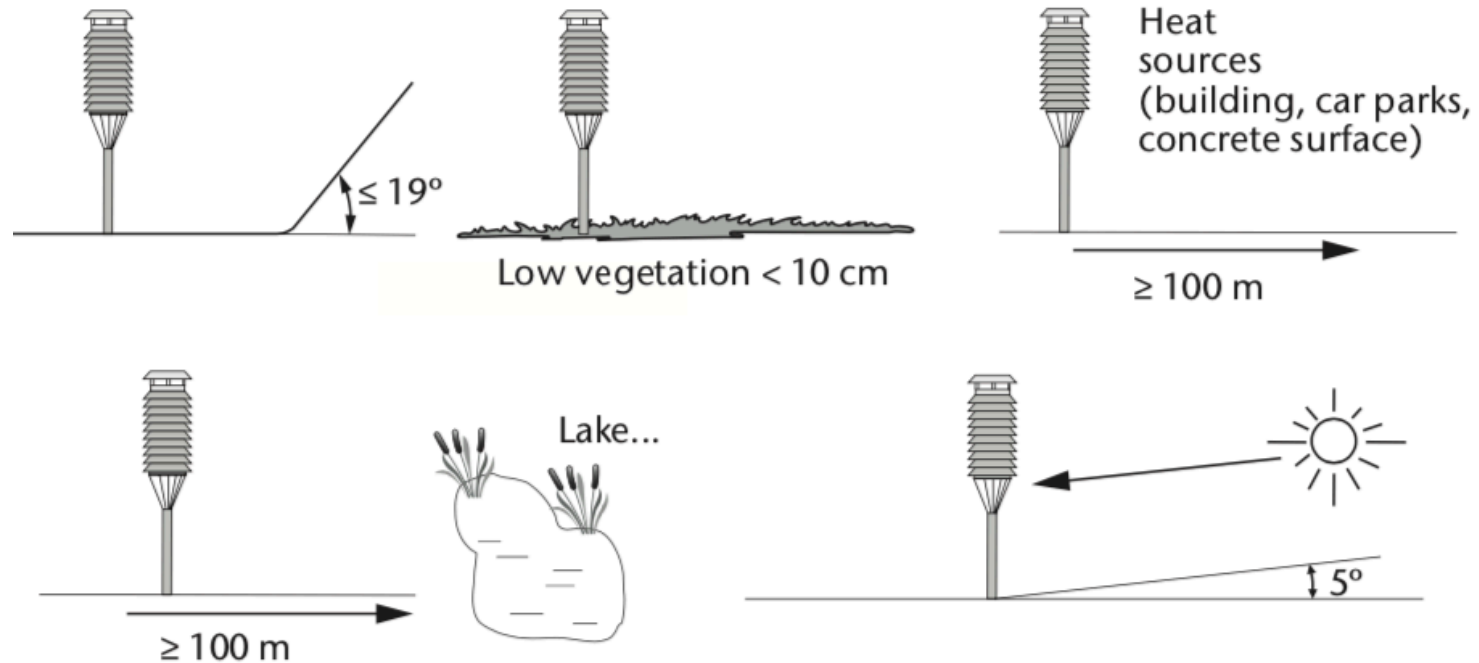
Consider “view factor” of pyranometer

Far from any object that might heat up in the sun and increase air temperature (buildings, pavement)

Far from water bodies



# CHOOSE THE RIGHT SITE



Guide to Meteorological Instruments and Methods of Observation 2017. WMO-No. 8





# MICROCLIMATE

Not in local depression

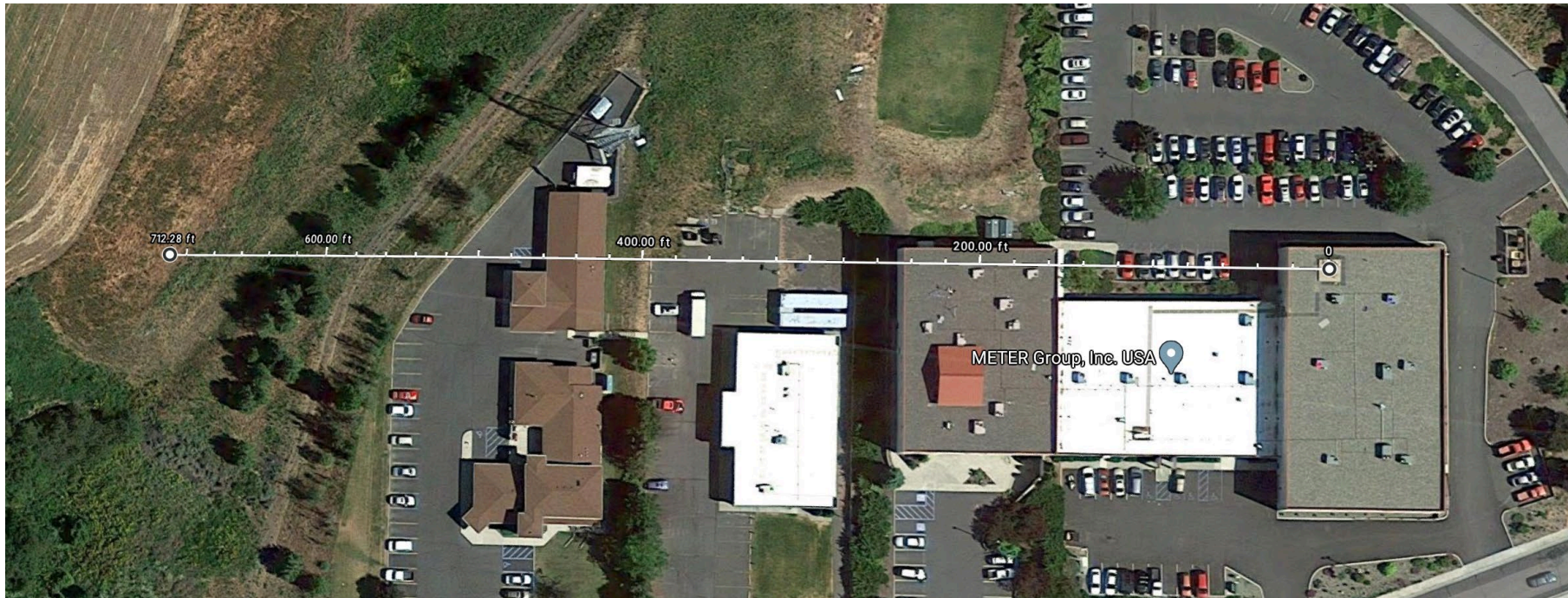
Not on ridge top

Vegetation is important

Rooftop is generally poor

Might need to characterize microclimate

- pest management
- disease modeling
- animal enclosures
- human comfort in urban areas



220 m, 6°C temperature difference



# INSTALLATION

Exclosure – keep out animals & people

Take more tools than you think you need

Tighten the mounting hardware

Guy wire if necessary

Orient your wind direction sensor

- true N vs. magnetic N

Shield temperature sensor from radiation

<https://www.metergroup.com/environment/events/stop-hiding-behind-shield/>





# INSTALLATION

Keep the birds off

Cable management & protection

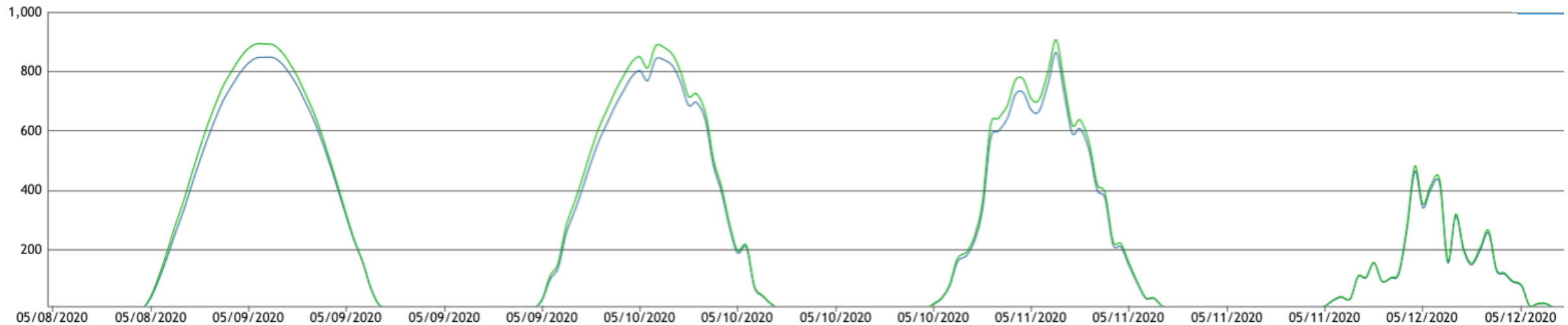
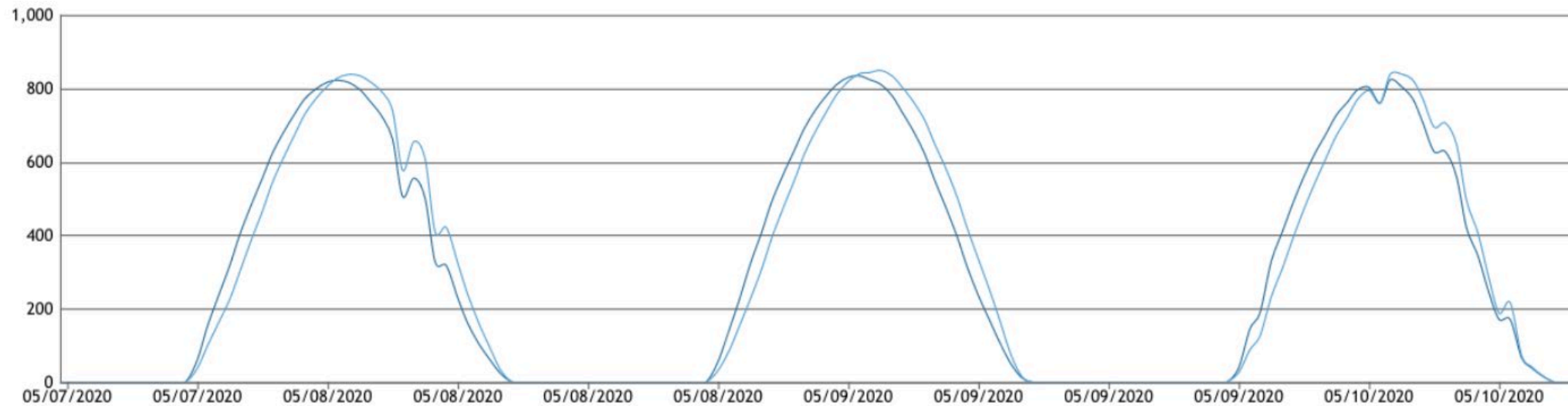
Level your sensors

- rain gauge
- anemometer



# INSTALLATION

Level your sensors – solar radiation





# FIELD CHECK

Check every measurement. Are they plausible?

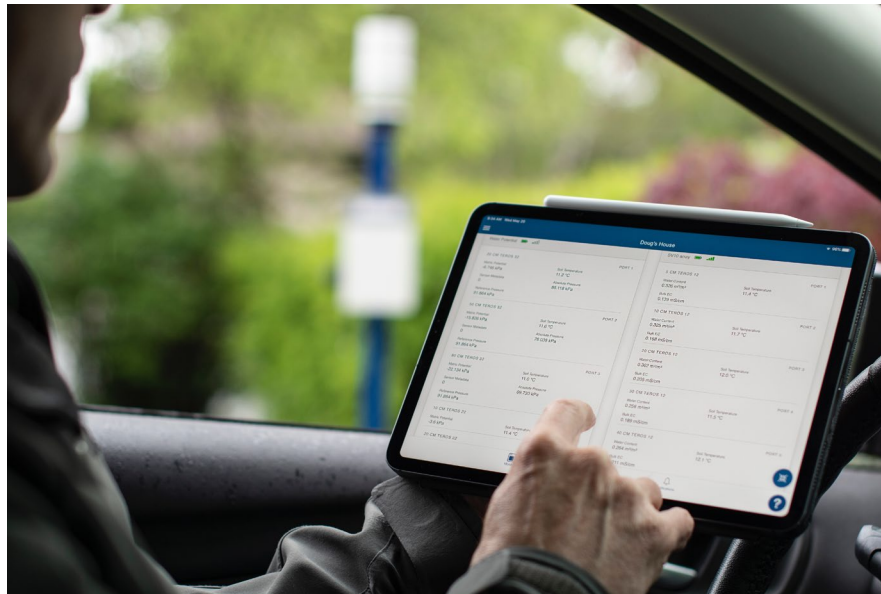
Confirm proper data acquisition

Confirm successful data transfer

Confirm system power supply & charging



ZENTRA Utility Mobile



ZENTRA Cloud Field



# TROUBLESHOOTING

## Have documentation available

- user manuals
- integrator's guides
- technical sheets

## Have contact information for instrument support departments



ATMOS 41



ATMOS 14



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### ATMOS 41 INTEGRATOR GUIDE

#### SENSOR DESCRIPTION

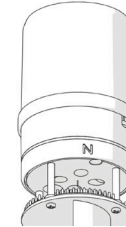
The ATMOS 41 All-in-One Weather Station is designed for continuous monitoring of environmental variables, including all standard weather measurements (see Measurement Specifications). All sensors are integrated into a single unit, requiring minimal installation effort. Ultra-low power consumption and a robust, no moving parts design that prevents errors because of wear or fouling make the ATMOS 41 ideal for long-term, remote installations.

#### APPLICATIONS

- Weather monitoring
- Microenvironment monitoring
- Spatially distributed environmental monitoring
- Crop weather monitoring
- Fire danger monitoring/mapping
- Weather networks

#### ADVANTAGES

- Robust, no moving parts design
- Small form factor
- Integrated design for easy installation
- Low-input voltage requirements
- Low-power design supports battery-operated data loggers
- Supports the SDI-12 three-wire interface
- Tilt sensor informs user of out-of-level conditions
- No configuration necessary
- Measures all standard weather variables (plus



# METADATA

“The shortest pencil is longer than the longest memory.”

GPS location

Site elevation

Measurement heights & depths

Site slope & aspect

Vegetation

Any obstructions or shading issues

Any exposure to nearby buildings or pavements

Station		Update	
Elevation	Latitude	Longitude	
<div><div>0 200 m</div><div><div>Enclosure</div><div>Building</div><div>Road</div><div>Trees, bushes</div><div>Height (m) of obstacle</div><div>Elevation contour</div></div></div>			
<div><div>Radiation horizon</div><div><div>1: 6</div><div>1: 10</div><div>1: 20</div></div><div><div>N</div><div>E</div><div>S</div><div>W</div><div>N</div></div></div>			
<div><div>Temperature and humidity:</div><div>Surface cover under screen</div><div>Soil under screen</div></div>			
<div><div>Precipitation:</div><div>Gauge rim height</div></div>			
<div><div>Wind:</div><div>Anemometer height</div><div>Free-standing?</div><div>yes/no</div></div>			
<div><div>(if "no" above: building height</div><div>, width</div><div>, length</div></div>			
<div><div>Terrain roughness class: to N</div><div>, to E</div><div>, to S,</div><div>to W</div></div>			
<div>Remarks:</div>			

General template for station exposure metadata

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Methods of Observation 2017. WMO-No. 8





# METADATA

Panoramic photos of site

Photos of instrumentation setup





# METADATA

## Instrumentation metadata

- sensor & logger types
- sensor & logger serial numbers
- sensor & logger firmware versions
- date of purchase or last calibration



	A	B	C	D
1	Configuration	Device Name	Soil and Weather	
2		Site Name	Doug's House	
3		Serial Number	8	
4		Device Type	190	
5		Firmware Version	204	
6		Hardware Version	unknown	
7		Measurement Interval	600	
8				
9	Software	Software Version	1.0	
10				
11	Location	Latitude	46.7586097	
12		Longitude	-117.150382	
13		Logger Time	2020-05-17 02:30:19.016160-05:00	
14		Current Time Zone	UTC-7	
15		Satellite Vehicles	11	
16		GPS Fix Status	5	
17		Horizontal Accuracy	905	
18		Altitude	782478	
19				
20	Cellular Hardware	SIM Number	89302720396933926912	
21		Modem Firmware Version	2341	
22		Modem Type	3	
23				
24	Cellular Configuration	Queue Data	1	
25		Allow All Upload Hours	1	
26		Unrestricted Measurements	0	
27		Four Reports per Hour	0	
28		Four Reports per Night	0	
29				
30	Radio	Power		
31		Channel		
32		Firmware Version		
33				
34	Sensors	Port #	1	
35		Name	ATMOS 41 All-in-one Weather Station	
36		Serial Number	ATM-410003090	
37		Meta	1755	
38		Value	0	
39		Status	1	
40		Version	528	
41				
42				
43		Port #	2	

ZENTRA system metadata

# POST-INSTALLATION

Check your data early and often

- remote data access is a big help

Pay attention to system alerts

Monitor change level of battery powered systems





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**QUESTIONS?**