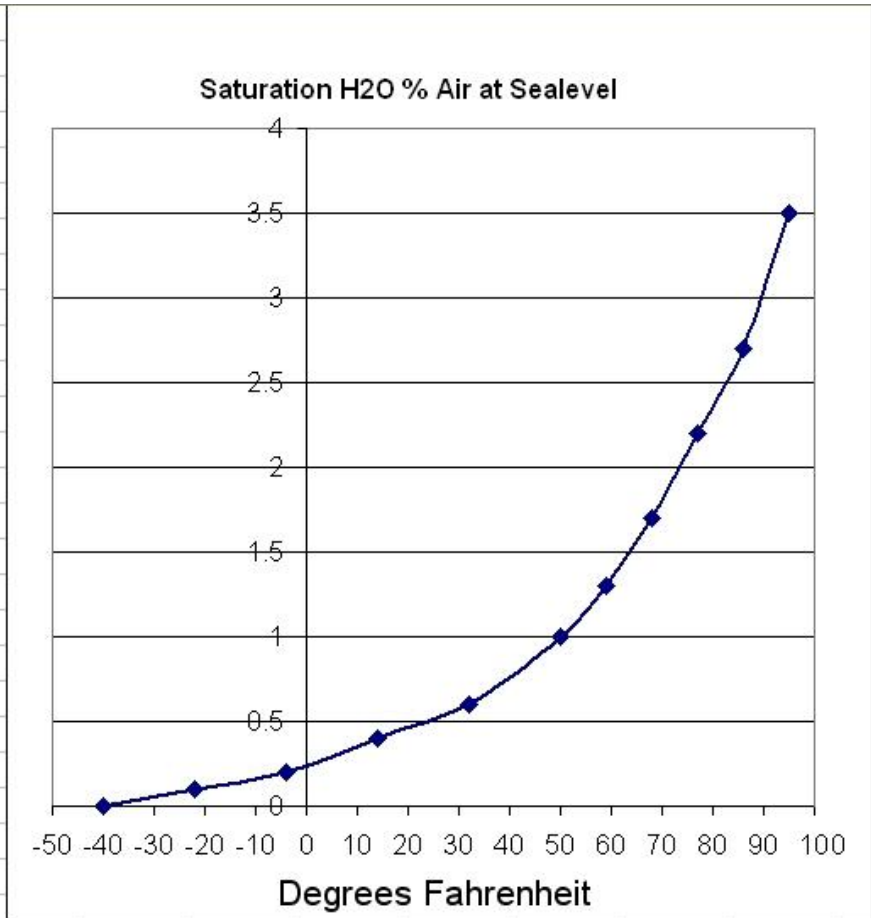


Water Saturation: What is “Dry air”?

Absolute Humidity = % of air consisting of water vapor.

But saturation level depends upon temperature:

Deg C	Deg F	H2O % Air
-40	-40	0
-30	-22	0.1
-20	-4	0.2
-10	14	0.4
0	32	0.6
10	50	1
15	59	1.3
20	68	1.7
25	77	2.2
30	86	2.7
35	95	3.5



Relative Humidity = Absolute water % / Saturation water % for given temperature

1. At 60°F, if water vapor in air is 1.0%, what is relative humidity?

2. If temperature falls from 60°F to 40°F, what happens?

3. If temperature now rises from 40°F to 80°F, what happens?

1. At 60°F, if water vapor in air is 1.0%, what is relative humidity?

Actual % water = 1.0%; Saturation % water at 60°F = 1.3%
Relative humidity = $1.0\% / 1.3\% = 77\%$ (approximately)

2. If temperature falls from 60°F to 40°F, what happens?

At 40°F, Saturation % water = 0.7%, which is less than 1.0%.
The extra water vapor condenses and falls as rain.
Water vapor decreases to 0.7% which is **100% relative humidity**.

3. If temperature now rises from 40°F to 80°F, what happens?

If water vapor is 0.7% at 60°F, when temperature rises to 80°F, saturation level will be 2.3%.
Relative humidity falls to: $0.7\% / 2.2\% = 32\%$. This feels dry; could be a desert.

Some common relative humidity levels:

Rain forest -- 90%

Nice spring day that "feels good" -- 40% to 50%

Sahara desert -- 25%

Inside your house in winter, without humidifier -- 5%

Inside a jet plane -- 1%