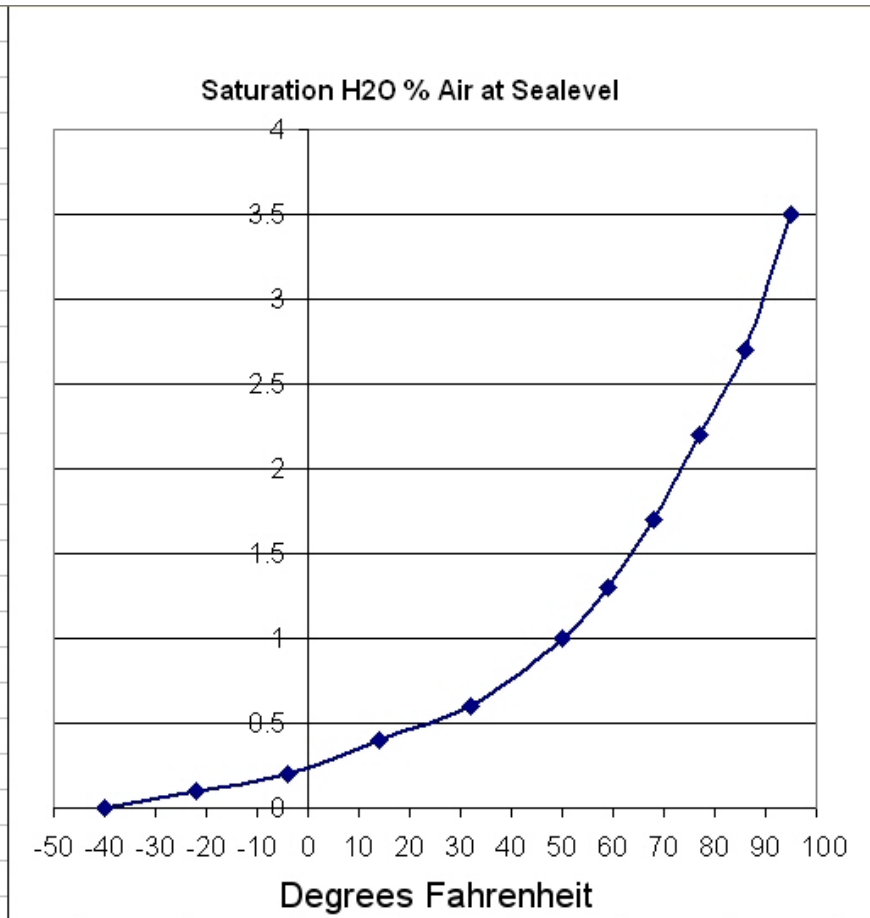


Water Saturation: What is “Dry air”?

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 = 1.6%

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%

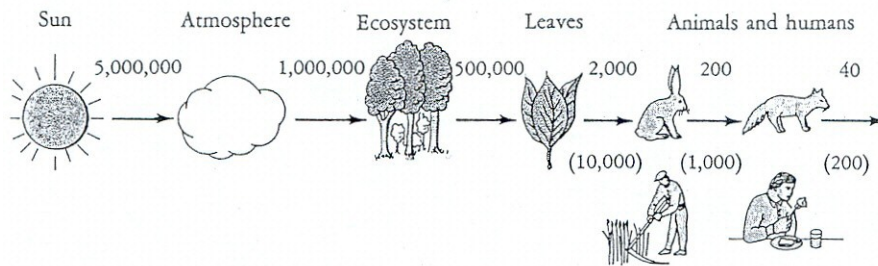
Inside your house in winter, without humidifier -- 5%

Inside a jet plane -- 1%

Energy Flow through the Biosphere

Figure 3 and Table 1 show what happens to solar radiation as it passes through the biosphere performing useful work every step of the way.

(A) Pictorial diagram



(B) Energy flow diagram

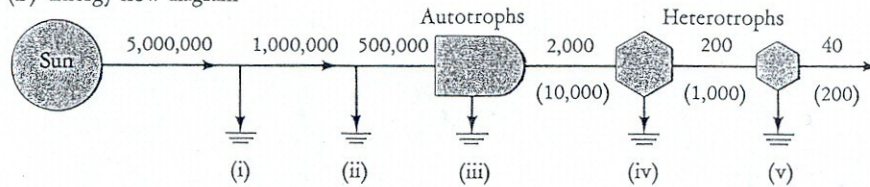


FIGURE 3. Solar energy flow through the biological food chain, in kcal per square meter per year. (A) is a pictorial diagram; (B) is a more formal energy flow model. Figures in parentheses show levels that may be reached in subsidized ecosystems when solar energy flow is enhanced by other types of energy such as fuels.

Ecosystems: Gambier versus Dune

