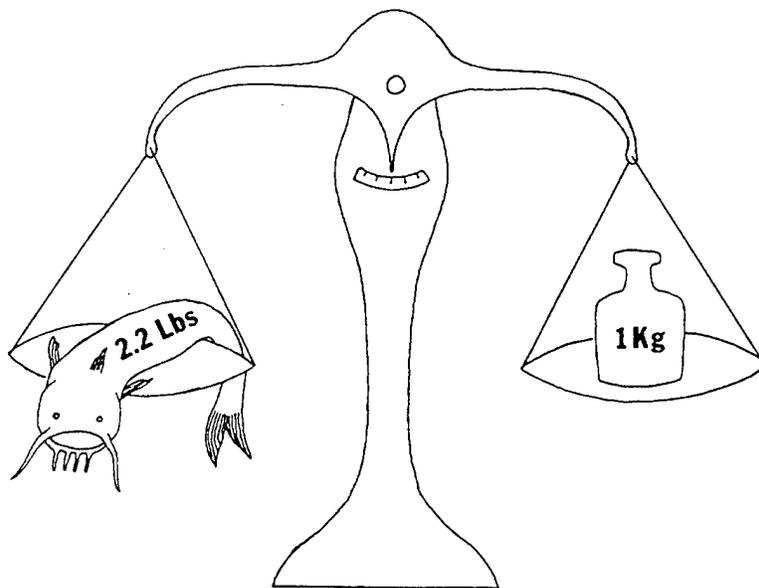


# Conversions Useful in Fish Culture and Fishery Research and Management



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# Conversions Useful in Fish Culture and Fishery Research and Management

Compiled by

Brenda Rodgers Moore  
Andrew J. Mitchell

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UNITED STATES DEPARTMENT  
OF THE INTERIOR  
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Abbreviations not defined in the lists of conversions.

atmosphere (atm)	mercury (Hg)
avoirdupois (avdp)	minute (min)
British Imperial (B.I.)	per (/)
Celsius (C)	percent (‰)
day (d)	per mille (‰)
Fahrenheit (F)	Rankine (R)
hour (h)	second (s)
international nautical mile (INM)	United States (U.S.; only with measurement)
Kelvin (K)	water (H <sub>2</sub> O)

# Conversions Useful in Fish Culture and Fishery Research and Management

compiled by

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*Stuttgart, Arkansas 72160-0860*

These tables of conversions from metric to English and English to metric measurements, as well as to metric and English from other systems such as British Imperial and troy, are primarily designed for use by fish farmers, fish culturists, and fishery technicians and scientists. The lists are compiled in the form we have found to be most useful. Also included are tables for conversion of Fahrenheit to Celsius temperatures, gallons to liters, and miles to kilometers.

---

<sup>1</sup>Present address: 3008 Covewood Dr., Highpoint, N.C. 27260.

---

## Conversions

**acre (A) =**

4046.9 m<sup>2</sup>  
40.469 a  
0.405 ha  
43,560 ft<sup>2</sup>  
4840 yd<sup>2</sup>  
160 rod<sup>2</sup>  
0.00156 mi<sup>2</sup>  
circle 235.4 ft diameter  
square 208.71 ft/side

**acre-foot (A-ft) =**

1,233,500 L  
1233.5 m<sup>3</sup>  
1.233 dam<sup>3</sup>  
1,233,500 kg H<sub>2</sub>O  
2,718,000 lb H<sub>2</sub>O  
325,850 gal  
43,560 ft<sup>3</sup>  
1 A of surface covered with 1 ft H<sub>2</sub>O

**ångström (Å) =**

0.1 nm  
0.0000000001 m  
10<sup>-10</sup> m

**are (a) =**

119.6 yd<sup>2</sup>  
3.954 rod<sup>2</sup>  
0.0247 A  
100 m<sup>2</sup>  
1.00 dam<sup>2</sup>  
100 ca  
0.01 ha

**barrel, U.S. fruits and vegetables =**

115.62 L  
13.12 pk  
3.28 bu  
30.55 gal  
7056 in.<sup>3</sup>  
4.083 ft<sup>3</sup>

**barrel, U.S. liquid (bbl) =**

119.24 L  
262.8 lb H<sub>2</sub>O

---

26.23 gal<sub>BI</sub>

31.5 gal

4.21 ft<sup>3</sup>

**barrel, U.S. petroleum =**

158.98 L

34.97 gal<sub>BI</sub>

42 gal

**bushel, B.I. (bu<sub>BI</sub>) =**

36.368 L

0.036 m<sup>3</sup>

9.607 gal

1.032 bu

2219.36 in.<sup>3</sup>

1.284 ft<sup>3</sup>

8 gal<sub>BI</sub>

4 pk<sub>BI</sub>

**bushel, U.S. (bu) =**

35.238 L

35.238 cm<sup>3</sup>

64 pt. dry

32 qt. dry

4 pk

2150.42 in.<sup>3</sup>

1.244 ft<sup>3</sup>

**centare *or* centiare (ca) =**

1549.9 in.<sup>2</sup>

10.764 ft<sup>2</sup>

1.196 yd<sup>2</sup>

1.0 m<sup>2</sup>

0.01 a

**centigram (cg) =**

0.154 grain

0.000353 oz

$3.53 \times 10^{-4}$  oz

10 mg

0.01 g

**centiliter (cL) =**

0.338 fl oz

10 mL

0.01 L

**centimeter (cm) =**

0.394 in.

0.0328 ft

---

0.0109 yd

10 mm

0.01 m

**centimeter of mercury (cm Hg) =**

0.444 ft H<sub>2</sub>O

0.193 lb/in.<sup>2</sup>

27.74 lb/ft<sup>2</sup>

135.462 kg/m<sup>2</sup>

0.0132 atm

**centimeter per second (cm/s) =**

0.0328 ft/s

1.969 ft/min

0.000373 mi/min

$3.73 \times 10^{-4}$  mi/min

0.0224 mph

0.6 m/min

0.036 km/h

**centner (zentner) =**

50 kg

**cubic centimeter (cm<sup>3</sup>) =**

0.0338 fl oz

0.00211 pt

0.00106 qt

0.000264 gal

$2.64 \times 10^{-4}$  gal

0.061 in.<sup>3</sup>

0.0000353 ft<sup>3</sup>

$3.53 \times 10^{-5}$  ft<sup>3</sup>

0.00000131 yd<sup>3</sup>

$1.31 \times 10^{-6}$  yd<sup>3</sup>

0.0353 oz H<sub>2</sub>O

1.0 g H<sub>2</sub>O

1.0 mL

0.001 L

1000 mm<sup>3</sup>

0.000001 m<sup>3</sup>

$10^{-6}$  m<sup>3</sup>

**cubic decimeter (dm<sup>3</sup>) =**

61.023 in.<sup>3</sup>

0.0353 ft<sup>3</sup>

1000 cm<sup>3</sup>

0.001 m<sup>3</sup>

1.0 L

---

**cubic foot (ft<sup>3</sup>) =**

28.317 mL  
28.317 cm<sup>3</sup>  
28.317 L  
28.317 dm<sup>3</sup>  
0.0283 m<sup>3</sup>  
28.317 g H<sub>2</sub>O  
28.317 kg H<sub>2</sub>O  
957.5 fl oz  
59.84 pt  
29.92 qt  
7.481 gal  
1728 in.<sup>3</sup>  
0.037 yd<sup>3</sup>  
436,984 grain H<sub>2</sub>O  
998.85 oz H<sub>2</sub>O  
62.427 lb H<sub>2</sub>O

**cubic feet per minute (ft<sup>3</sup>/min) =**

471.9 cm<sup>3</sup>/s  
0.472 L/s  
28.317 L/min  
1699 L/h  
29.92 qt/min  
1795.32 qt/h  
0.125 gal/s  
7.481 gal/min  
448.83 gal/h  
10.772 gal/d  
60 ft<sup>3</sup>/h  
998.85 oz H<sub>2</sub>O/min  
62.427 lb H<sub>2</sub>O/min

**cubic feet per second (ft<sup>3</sup>/s) =**

28.317 L/s  
1699 L/min  
101,941 L/h  
7.481 gal/s  
448.83 gal/min  
26.930 gal/h  
60 ft<sup>3</sup>/min  
3600 ft<sup>3</sup>/h  
646.400 gal/d

**cubic inch (in.<sup>3</sup>) =**

16.387 g H<sub>2</sub>O  
16.387 mL

---

0.0164 L  
16.387 cm<sup>3</sup>  
0.00001639 m<sup>3</sup>  
 $1.639 \times 10^{-5}$  m<sup>3</sup>  
0.554 fl oz  
0.0346 pt  
0.0173 qt  
0.00433 gal  
0.000579 ft<sup>3</sup>  
 $5.79 \times 10^{-4}$  ft<sup>3</sup>  
0.00002143 yd<sup>3</sup>  
 $2.143 \times 10^{-5}$  yd<sup>3</sup>  
0.578 oz H<sub>2</sub>O  
0.036 lb H<sub>2</sub>O

**cubic meter (m<sup>3</sup>) =**

33,815 fl oz  
2113 pt  
1057 qt  
264.2 gal  
61.023 in.<sup>3</sup>  
35.31 ft<sup>3</sup>  
1.308 yd<sup>3</sup>  
2204.6 lb H<sub>2</sub>O  
1,000,000 g H<sub>2</sub>O  
1,000,000 mL  
1,000,000 cm<sup>3</sup>  
1000 dm<sup>3</sup>  
1000 L  
1 st

**cubic millimeter (mm<sup>3</sup>) =**

0.001 mL

**cubic yard (yd<sup>3</sup>) =**

764.559 L  
764.600 cm<sup>3</sup>  
0.7646 m<sup>3</sup>  
0.7646 st  
1615.79 pt  
807.89 qt  
201.97 gal  
46.656 in.<sup>3</sup>  
27 ft<sup>3</sup>  
1685.5 lb H<sub>2</sub>O

**cubic yards per minute (yd<sup>3</sup>/min) =**

12.743 L/s  
764.559 L/min

---

3.37 gal/s  
201.97 gal/min  
0.45 ft<sup>3</sup>/s  
27 ft<sup>3</sup>/min

**cup =**  
236.58 mL  
236.58 cm<sup>3</sup>  
48 tsp  
16 tbsp  
8 fl oz  
2 gi  
8.344 oz H<sub>2</sub>O

**decare =**  
1196 yd<sup>2</sup>  
0.2471 A  
1000 m<sup>2</sup>  
10 a  
0.1 ha

**deciare =**  
11.96 yd<sup>2</sup>  
10 m<sup>2</sup>

**decigram (dg) =**  
1.5432 grain  
100 mg  
10 cg  
0.1 g

**deciliter (dL) =**  
3.381 fl oz  
0.211 pt  
0.106 qt  
6.103 in.<sup>3</sup>  
100 mL  
10 cL  
0.1 L

**decimeter (dm) =**  
3.937 in.  
0.328 ft  
10 cm  
0.1 m

**decistere (dst) =**  
3.531 ft<sup>3</sup>  
0.1 m<sup>3</sup>  
0.1 st

**dekagram (dag) =**  
0.353 oz  
10 g

**dekaliter (daL) =**  
2.642 gal  
1.135 pk  
0.284 bu  
610.25 in.<sup>3</sup>  
0.3531 ft<sup>3</sup>  
10 L

**dekameter (dam) =**  
393.7 in.  
32.808 ft  
1000 cm  
10 m

**dekastere (dast) =**  
353.1 ft<sup>3</sup>  
13.08 yd<sup>3</sup>  
10 m<sup>3</sup>  
10 st

**doppel zentner (dz) =**  
100 kg  
1.0 ql  
220.46 lb

**dram, avdp (dr) =**  
1.771 g  
27.343 grain  
0.0625 oz

**dram, fluid, B.I. (fl dr<sub>BI</sub>) =**  
3.552 cm<sup>3</sup>  
0.961 fl dr  
0.217 in.<sup>3</sup>  
60 minim<sub>BI</sub>

**dram, fluid, U.S. (fl dr) =**  
3.696 mL  
60 minim  
0.125 fl oz  
0.225 in.<sup>3</sup>

**fathom (fath) =**  
1.829 m  
6 ft  
2 yd

---

**foot (ft) =**

304.8 mm  
30.480 cm  
0.305 m  
12 in.  
0.333 yd

**foot of water pressure =**

304.79 kg/m<sup>2</sup>  
0.434 lb/in.<sup>2</sup>  
62.427 lb/ft<sup>2</sup>  
0.886 in. Hg  
0.0295 atm

**feet per minute (ft/min) =**

0.5080 cm/s  
0.305 m/min  
18.29 m/h  
0.0183 km/h  
0.0167 ft/s  
0.0114 mph

**feet per second (ft/s) =**

30.48 cm/s  
18.29 m/min  
1.097 km/h  
0.0114 mi/min  
0.682 mph  
0.593 kn

**gallon, B.I. (gal<sub>BI</sub>) =**

4.545 L  
4.803 qt  
1.201 gal  
277.420 in.<sup>3</sup>  
0.161 ft<sup>3</sup>  
4 qt<sub>BI</sub>

**gallon, U.S. (gal) =**

3785.4 mL  
3.785 L  
3785.4 cm<sup>3</sup>  
0.00379 m<sup>3</sup>  
3785.4 g H<sub>2</sub>O  
3.785 kg H<sub>2</sub>O  
256 tbsp  
128 fl oz  
32 gi

8 pt  
 4 qt  
 0.833 gal<sub>BI</sub>  
 231 in.<sup>3</sup>  
 0.134 ft<sup>3</sup>  
 0.00495 yd<sup>3</sup>  
 58,416 grain H<sub>2</sub>O  
 133.52 oz H<sub>2</sub>O  
 8.345 lb H<sub>2</sub>O

**gallons per minute (gal/min) =**

0.0631 L/s  
 3.875 L/min  
 5.45 t H<sub>2</sub>O/d  
 6.009 ton, short H<sub>2</sub>O/d  
 0.134 ft<sup>3</sup>/min  
 8.021 ft<sup>3</sup>/h  
 0.00223 ft<sup>3</sup>/s  
 1000 gal/min flow yields 1 A-ft in 5 h 26 min

**gill, B.I. (gi<sub>BI</sub>) =**

142.066 cm<sup>3</sup>  
 8.669 in.<sup>3</sup>  
 1.665 cup  
 1.201 gi  
 5 fl oz<sub>BI</sub>

**gill, U.S. (gi) =**

118.291 mL  
 0.118 L  
 4 fl oz  
 0.25 pt  
 7.218 in.<sup>3</sup>  
 0.5 cup  
 8 tbsp

**grain, avdp (grain) =**

64.8 mg  
 0.0648 g  
 0.0000648 kg  
 $6.48 \times 10^{-5}$  kg  
 1.0 grain tr  
 0.0417 dwt  
 0.0366 dr  
 0.00229 oz  
 0.00208 oz tr  
 0.000143 lb  
 $1.43 \times 10^{-4}$  lb

---

**grain, troy (grain tr) =**

1.0 grain

**grains per B.I. gallon (grain/gal<sub>BI</sub>) =**

14.26 ppm

**grains per U.S. gallon (grain/gal) =**

17.12 ppm

142.86 lb/1,000,000 gal

**gram (g) =**

15.432 grain

0.564 dr

0.0353 oz

0.0322 oz tr

0.0022 lb

0.0338 fl oz H<sub>2</sub>O

0.0021 pt H<sub>2</sub>O

1,000,000 μg

1000 mg

10 dg

0.001 kg

1.0 mL H<sub>2</sub>O

1.0 cm<sup>3</sup> H<sub>2</sub>O

0.001 L H<sub>2</sub>O

**grams per liter (g/L) =**

58.416 grain/gal

0.134 oz/gal

0.999 oz/ft<sup>3</sup>

8.345 lb/1000 gal

0.0624 lb/ft<sup>3</sup>

1000 ppm

3.785 g/gal

**hectare (ha) =**

107,640 ft<sup>2</sup>

2.471 A

10,000 m<sup>2</sup>

10,000 ca

100 a

1.0 hm<sup>2</sup>

**hectogram (hg) =**

3.527 oz

0.220 lb

100 g

10 dag

0.1 kg

---

**hectoliter (hL) =**

26.418 gal

3.531 ft<sup>3</sup>

2.838 bu

100 L

10 daL

0.1 m<sup>3</sup>

**hectometer (hm) =**

328 ft 1 in.

109.36 yd

100 m

10 dam

**hundredweight, long (cwt, long) =**

50.802 kg

0.0508 t

1792 oz

112 lb

0.05 ton, long

1.12 cwt, short

**hundredweight, short (cwt, short) =**

45.359 kg

0.0454 t

1600 oz

100 lb

0.05 ton, short

0.893 cwt, long

**inch (in.) =**

25,400 μm

25.40 mm

2.540 cm,

0.0254 m

0.0833 ft

0.0278 yd

**inch of mercury (in. Hg) =**

344.07 kg/m<sup>2</sup>

0.489 lb/in.<sup>2</sup>

70.45 lb/ft<sup>2</sup>

1.129 ft H<sub>2</sub>O

0.0334 atm

**inch of water (in. H<sub>2</sub>O) =**

25.40 kg/m<sup>2</sup>

0.578 oz/in.<sup>2</sup>

0.0361 lb/in.<sup>2</sup>

---

5.201 lb/ft<sup>2</sup>  
0.0735 in. Hg  
0.00246 atm

**kilogram (kg) =**

15.432 grain  
35.274 oz  
2.2046 lb  
0.0011 ton, short  
1.057 qt H<sub>2</sub>O  
1,000,000 mg  
1000 g  
10 hg  
0.001 t  
1.0 L H<sub>2</sub>O

**kilograms per hectare (kg/ha) =**

0.892 lb/A

**kiloliter (kL) =**

264.17 gal  
35.314 ft<sup>3</sup>  
1,000,000 mL  
1000 L  
10 hL  
1.0 m<sup>3</sup>  
2204.6 lb H<sub>2</sub>O  
1000 kg H<sub>2</sub>O

**kilometer (km) =**

3280.84 ft  
1093.61 yd  
0.621 mi  
0.540 INM  
100,000 cm  
1000 m  
10 hm  
0.1 mym

**knot (kn) =**

1.0 INM/h  
1.15 mph

**liter (L) =**

202.9 tsp  
67.6 tbs  
33.81 fl oz  
4.23 cup

---

2.113 pt  
1.057 qt  
0.908 qt, dry  
0.264 gal  
35.27 oz H<sub>2</sub>O  
2.2046 lb H<sub>2</sub>O  
61.025 in.<sup>3</sup>  
0.0353 ft<sup>3</sup>  
0.00131 yd<sup>3</sup>  
1000 mL  
1000 cm<sup>3</sup>  
10 dL  
1.0 dm<sup>3</sup>  
0.001 m<sup>3</sup>  
1000 g H<sub>2</sub>O  
1.0 kg H<sub>2</sub>O

**liters per minute (L/min) =**

0.0044 gal/s  
0.264 gal/min  
15.852 gal/h  
0.0353 ft<sup>3</sup>/min  
2.119 ft<sup>3</sup>/h

**meter (m) =**

39.37 in.  
3.281 ft  
1.094 yd  
0.199 rod  
1000 mm  
100 cm  
10 dm  
0.001 km  
0.0001 mym

**meters per minute (m/min) =**

0.0547 ft/s  
3.281 ft/min  
0.0373 mph  
1.667 cm/s  
0.06 km/h

**meters per second (m/s) =**

3.281 ft/s  
196.86 ft/min  
0.0373 mi/min  
2.237 mph  
0.06 km/min  
3.60 km/h

---

**microgram ( $\mu\text{g}$ ) =**  
0.00001543 grain  
 $1.543 \times 10^{-5}$  grain  
0.001 mg  
0.000001 g  
 $10^{-6}$  g

**microliter ( $\mu\text{L}$ ) =**  
0.001 mL  
0.000001 L  
 $10^{-6}$  L  
 $1.0 \text{ mm}^3$

**micrometer ( $\mu\text{m}$ ) =**  
0.00003937 in.  
 $3.937 \times 10^{-5}$  in.  
1000 nm  
0.001 mm  
0.000001 m  
 $10^{-6}$  m

**mile (mi) =**  
160,935 cm  
1609.35 m  
1.609 km  
0.161 mym  
5280 ft  
1760 yd  
320 rod  
0.870 INM

**miles per hour (mph) =**  
44.70 cm/s  
26.82 m/min  
1.609 km/h  
1.467 ft/s  
88 ft/min  
0.870 kn

**miles per minute (mi/min) =**  
2682.25 cm/s  
1.609 km/min  
96.561 km/h  
88 ft/s  
60 mph

**milligram (mg) =**  
0.0154 grain  
1000  $\mu\text{g}$   
0.001 g

---

**milligrams per liter (mg/L) of water =**  
1 ppm (by weight)

**milliliter (mL) =**  
0.203 tsp  
0.0338 fl oz  
0.002 pt  
0.001 qt  
0.061 in.<sup>3</sup>  
0.035 oz H<sub>2</sub>O  
0.002 lb H<sub>2</sub>O  
1000 mm<sup>3</sup>  
1.0 cm<sup>3</sup>  
0.001 L  
1.0 g H<sub>2</sub>O  
20 drops (±, depending on viscosity  
temperature, dropper bore, and force of  
propulsion)

**millimeter (mm) =**  
0.0394 in.  
1,000,000 nm  
1000 μm  
0.1 cm  
0.001 m

**million gallons per day =**  
43.81 L/s  
2628.75 L/min  
11.57 gal/s  
694.44 gal/min  
41,667 gal/h  
1.547 ft<sup>3</sup>/s  
92.83 ft<sup>3</sup>/min  
5569.67 ft<sup>3</sup>/h  
133,700 ft<sup>3</sup>/d

**minim, B.I. (minim<sub>BI</sub>) =**  
59.194 mm<sup>3</sup>  
0.0592 cm<sup>3</sup>  
0.961 minim  
0.00361 in.<sup>3</sup>  
0.0167 fl dr<sub>BI</sub>

**minim, U.S. (minim) =**  
0.0616 mL  
0.00376 in.<sup>3</sup>  
0.0167 fl dr

---

**myriagram (myg) =**

22.046 lb  
10.000 g  
10 kg

**myrialiter (myL) =**

2641.7 gal  
353.14 ft<sup>3</sup>  
283.78 bu  
83.86 bbl  
10.000 L

**myriameter (mym) =**

6.214 mi  
10.000 m  
10 km

**myriare =**

247.1 A  
1.000.000 m<sup>2</sup>  
100 ha

**nanogram (ng) =**

0.000000001 g  
10<sup>-9</sup> g

**nanometer (nm) =**

0.000000001 m  
10<sup>-9</sup> m  
10 Å

**nautical mile (INM) =**

1852 m  
1.852 km  
6076.115 ft  
2025.37 yd  
1.151 mi

**ounce, avdp (oz) =**

28.3495 g  
0.02835 kg  
0.00002835 t  
2.835 × 10<sup>-5</sup> t  
437.5 grain  
16 dr  
0.0625 lb  
0.00003125 ton, short  
3.125 × 10<sup>-5</sup> ton, short  
0.00002790 ton, long

---

$2.790 \times 10^{-5}$  ton, long  
0.911 oz tr  
0.959 fl oz H<sub>2</sub>O

**ounce, fluid, B.I. (fl oz<sub>BI</sub>) =**

28.416 cm<sup>3</sup>  
1.734 in.<sup>3</sup>  
0.961 fl oz  
8 fl dr<sub>BI</sub>

**ounce, fluid, U.S. (fl oz) =**

29.573 g H<sub>2</sub>O  
29.573 mL  
0.0296 L  
29.573 cm<sup>3</sup>  
0.00002957 m<sup>3</sup>  
 $2.957 \times 10^{-5}$  m<sup>3</sup>  
1.043 oz H<sub>2</sub>O  
0.0652 lb H<sub>2</sub>O  
8 fl dr  
0.125 cup  
0.0625 pt  
0.0313 qt  
0.00781 gal  
6 tsp  
2 tbsp  
1.804 in.<sup>3</sup>  
0.00104 ft<sup>3</sup>

**ounce, troy (oz tr) =**

31.103 g  
480 grain  
17.555 dr  
20 dwt  
1.097 oz  
0.0833 lb tr

**parts per billion (ppb), by weight =**

1.0 ng/mL H<sub>2</sub>O  
1.0 µg/L H<sub>2</sub>O  
3.785 µg/gal H<sub>2</sub>O  
28.316 µg/ft<sup>3</sup> H<sub>2</sub>O  
0.001 mg/L H<sub>2</sub>O  
1.233 g/A-ft H<sub>2</sub>O  
0.001 ppm (by weight)  
0.0000001 ‰  
10<sup>-7</sup> ‰  
0.000001 ‰  
10<sup>-6</sup> ‰

**parts per hundred (pph), by weight =**

1.0 g/100 mL H<sub>2</sub>O  
 10 g/1000 mL H<sub>2</sub>O  
 10 g/L H<sub>2</sub>O  
 4.54 g/lb  
 4.73 g/pt H<sub>2</sub>O  
 37.85 g/gal H<sub>2</sub>O  
 283.17 g/ft<sup>3</sup> H<sub>2</sub>O  
 10 mL/1000 mL  
 10 mL/L  
 37.85 mL/gal  
 10 cm<sup>3</sup>/L  
 7.85 cm<sup>3</sup>/gal  
 1.28 fl oz/gal  
 1.34 oz/gal H<sub>2</sub>O  
 9.988 oz/ft<sup>3</sup> H<sub>2</sub>O  
 0.624 lb/ft<sup>3</sup> H<sub>2</sub>O  
 1.0 ‰  
 10 ‰<sub>w</sub>

**parts per million (ppm), by weight =**

1.0 μg/mL H<sub>2</sub>O  
 1.0 mg/L H<sub>2</sub>O  
 1.0 mg/kg  
 3.785 mg/gal H<sub>2</sub>O  
 0.001 g/L H<sub>2</sub>O  
 0.00378 g/gal H<sub>2</sub>O  
 0.0283 g/ft<sup>3</sup> H<sub>2</sub>O  
 0.378 g/100 gal H<sub>2</sub>O  
 1.0 g/m<sup>3</sup> H<sub>2</sub>O  
 1233 g/A-ft  
 0.001 mL/L  
 0.00378 mL/gal  
 0.378 mL/100 gal  
 1.0 mL/1,000,000 mL  
 1.0 mL/1000 L  
 0.0584 grain/gal H<sub>2</sub>O  
 0.0702 grain/gal<sub>BI</sub> H<sub>2</sub>O  
 0.437 grain/ft<sup>3</sup> H<sub>2</sub>O  
 0.134 oz/1000 gal H<sub>2</sub>O  
 0.999 oz/1000 ft<sup>3</sup> H<sub>2</sub>O  
 1.0 lb/1,000,000 lb H<sub>2</sub>O  
 0.0000624 lb/ft<sup>3</sup> H<sub>2</sub>O  
 6.24 × 10<sup>-5</sup> lb/ft<sup>3</sup> H<sub>2</sub>O  
 2.718 lb/A-ft H<sub>2</sub>O  
 8.345 lb/10<sup>6</sup> gal H<sub>2</sub>O  
 0.008 pt/1000 gal

---

0.0599 pt/1000 ft<sup>3</sup>

1.303 qt/A-ft

0.326 gal/A-ft

0.0001 ‰

0.001 ‰

**parts per thousand (ppt), by weight =**

1.0 mg/mL H<sub>2</sub>O

1.0 g/L H<sub>2</sub>O

3.785 g/gal H<sub>2</sub>O

28.316 g/ft<sup>3</sup> H<sub>2</sub>O

15.432 grain/L H<sub>2</sub>O

0.134 oz/gal H<sub>2</sub>O

0.999 oz/ft<sup>3</sup> H<sub>2</sub>O

0.1 ‰

1.0 ‰

**parts per trillion (ppt), by weight =**

1.0 pg/mL H<sub>2</sub>O

1.0 ng/L H<sub>2</sub>O

0.001 µg/L H<sub>2</sub>O

0.000001 ppm (by weight)

10<sup>-6</sup> ppm (by weight)

0.000000001 ‰

10<sup>-10</sup> ‰

0.000000001 ‰

10<sup>-9</sup> ‰

**peck, B.I. (pk<sub>BI</sub>) =**

9092 cm<sup>3</sup>

0.00909 m<sup>3</sup>

1.032 pk

554.84 in.<sup>3</sup>

0.321 ft<sup>3</sup>

8 qt<sub>BI</sub>

2 gal<sub>BI</sub>

**peck, U.S. (pk) =**

8.810 L

8 qt. dry

0.25 bu

537.605 in.<sup>3</sup>

0.311 ft<sup>3</sup>

**pennyweight, troy (dwt) =**

1.555 g

24 grain

0.05 oz tr

0.00417 lb tr

**picogram (pg) =**

0.000000000001 g

$10^{-12}$  g

**pint, B.I. (pt<sub>BI</sub>) =**

568.26 cm<sup>3</sup>

34.678 in.<sup>3</sup>

1.201 pt

1.032 pt, dry

4 gi<sub>BI</sub>

**pint, U.S. dry (pt, dry) =**

550.6 cm<sup>3</sup>

0.551 L

33.600 in.<sup>3</sup>

1.164 pt

0.582 qt

0.5 qt, dry

**pint, U.S. liquid (pt) =**

473.17 mL

473.17 cm<sup>3</sup>

0.473 L

0.000473 m<sup>3</sup>

$4.73 \times 10^{-4}$  m<sup>3</sup>

473.17 g H<sub>2</sub>O

32 tbsp

16 fl oz

4 gi

2 cup

0.859 pt, dry

0.430 qt, dry

0.5000 qt

0.1250 gal

28.875 in.<sup>3</sup>

0.0167 ft<sup>3</sup>

16.688 oz H<sub>2</sub>O

1.043 lb H<sub>2</sub>O

**pound, avdp (lb) =**

453.592 g

0.454 kg

0.000454 t

$4.54 \times 10^{-4}$  t

453.592 mL H<sub>2</sub>O

453.592 cm<sup>3</sup> H<sub>2</sub>O

0.454 L H<sub>2</sub>O

7000 grain

256 dr

16 oz  
14.583 oz tr  
1.215 lb tr  
0.0005 ton, short  
15.338 fl oz H<sub>2</sub>O  
0.959 pt H<sub>2</sub>O  
0.479 qt H<sub>2</sub>O  
0.120 gal H<sub>2</sub>O  
27.680 in.<sup>3</sup> H<sub>2</sub>O  
0.0160 ft<sup>3</sup> H<sub>2</sub>O

**pound, troy (lb tr) =**

373.241 g  
0.373 kg  
0.000373 t  
 $3.73 \times 10^{-4}$  t  
5760 grain  
240 dwt  
210.66 dr  
13.166 oz  
12 oz tr  
0.823 lb  
0.000411 ton, short  
 $4.11 \times 10^{-4}$  ton, short  
0.000367 ton, long  
 $3.67 \times 10^{-4}$  ton, long

**pounds per acre (lb/A) =**

1.121 kg/ha

**pounds per million gallons of water =**

0.120 ppm (by weight)

**pound of water per minute =**

0.4536 L/min  
0.120 gal/min  
0.0160 ft<sup>3</sup>/min

**quart, B.I. (qt<sub>BI</sub>) =**

1.136 L  
1.201 qt  
1.032 qt. dry  
69.355 in.<sup>3</sup>  
2 pt<sub>BI</sub>

**quart, U.S. dry (qt, dry) =**

1101 cm<sup>3</sup>  
1.101 L  
2.328 pt

2 pt. dry  
1.164 qt  
67.200 in.<sup>3</sup>

**quart, U.S. liquid (qt) =**

946.34 g H<sub>2</sub>O  
946.34 mL  
0.946 L  
946.34 cm<sup>3</sup>  
0.000946 m<sup>3</sup>  
9.46 × 10<sup>-4</sup> m<sup>3</sup>  
64 tbsp  
32 fl oz  
8 gi  
4 cup  
2 pt  
0.859 qt. dry  
0.25 gal  
57.749 in.<sup>3</sup>  
0.0334 ft<sup>3</sup>  
33.376 oz H<sub>2</sub>O  
2.086 lb H<sub>2</sub>O

**quintal (ql) =**

220.46 lb  
100.000 g  
100 kg  
10 myg  
1.0 dz

**rod =**

5.029 m  
198 in.  
16.5 ft  
5.50 yd

**square centimeter (cm<sup>2</sup>) =**

0.155 in.<sup>2</sup>  
0.00108 ft<sup>2</sup>  
100 mm<sup>2</sup>  
0.0001 m<sup>2</sup>

**square decimeter (dm<sup>2</sup>) =**

15.50 in.<sup>2</sup>  
100 cm<sup>2</sup>  
0.01 m<sup>2</sup>

**square dekameter (dam<sup>2</sup>) =**

119.6 yd<sup>2</sup>  
100 m<sup>2</sup>

---

**square foot (ft<sup>2</sup>) =**  
929.03 cm<sup>2</sup>  
0.0929 m<sup>2</sup>  
144 in.<sup>2</sup>  
0.111 yd<sup>2</sup>  
0.00002296 A  
 $2.296 \times 10^{-5}$  A  
0.0000003587 mi<sup>2</sup>  
 $3.587 \times 10^{-8}$  mi<sup>2</sup>  
square 12 in. per side

**square hectometer (hm<sup>2</sup>) =**  
107,600 ft<sup>2</sup>  
2.471 A  
10,000 m<sup>2</sup>  
100 dam<sup>2</sup>  
100 a  
1.0 ha

**square inch (in.<sup>2</sup>) =**  
645.16 mm<sup>2</sup>  
6.452 cm<sup>2</sup>  
0.00694 ft<sup>2</sup>  
0.00077 yd<sup>2</sup>

**square kilometer (km<sup>2</sup>) =**  
10,764,000 ft<sup>2</sup>  
1,196,000 yd<sup>2</sup>  
247.1 A  
0.386 mi<sup>2</sup>  
1,000,000 m<sup>2</sup>  
10,000 a  
100 hm<sup>2</sup>  
100 ha

**square meter (m<sup>2</sup>) =**  
1550.007 in.<sup>2</sup>  
10.764 ft<sup>2</sup>  
1.196 yd<sup>2</sup>  
0.000247 A  
 $2.47 \times 10^{-4}$  A  
0.000003861 mi<sup>2</sup>  
 $3.861 \times 10^{-7}$  mi<sup>2</sup>  
10,000 cm<sup>2</sup>  
100 dm<sup>2</sup>  
1.0 ca  
0.01 a

**square mile (mi<sup>2</sup>) =**  
2,590,000 m<sup>2</sup>

---

259 ha  
2.590 km<sup>2</sup>  
27,878,000 ft<sup>2</sup>  
3,098,000 yd<sup>2</sup>  
102,400 rod<sup>2</sup>  
640 A

**square millimeter (mm<sup>2</sup>) =**  
0.00155 in.<sup>2</sup>  
0.01 cm<sup>2</sup>

**square rod (rod<sup>2</sup>) =**  
25.29 m<sup>2</sup>  
25.29 ca  
0.253 a  
272.25 ft<sup>2</sup>  
30.25 yd<sup>2</sup>

**square yard (yd<sup>2</sup>) =**  
8361.3 cm<sup>2</sup>  
0.836 m<sup>2</sup>  
1296 in.<sup>2</sup>  
9 ft<sup>2</sup>  
0.000207 A  
 $2.07 \times 10^{-4}$  A  
0.0000003228 mi<sup>2</sup>  
 $3.228 \times 10^{-7}$  mi<sup>2</sup>

**stere (st) =**  
1.308 yd<sup>3</sup>  
1.0 m<sup>3</sup>

**stone =**  
6.350 kg  
14 lb

**tablespoon (tbsp) =**  
14.79 mL  
14.79 cm<sup>3</sup>  
3 tsp  
0.50 fl oz

**teaspoon (tsp) =**  
4.929 mL  
4.929 cm<sup>3</sup>  
0.333 tbsp  
0.167 fl oz

**ton, long =**  
1016.05 kg  
1.016 t  
35,840 oz

---

2240 lb  
20 cwt, long  
1.120 ton, short

**ton, metric (t) =**  
2204.62 lb  
0.984 ton, long  
1.102 ton, short  
1000 kg  
1000 L H<sub>2</sub>O  
10 ql  
10 dz

**ton, short =**  
907.184 kg  
0.907 t  
32,000 oz  
29,167 oz tr  
2430.56 lb tr  
2000 lb  
20 cwt, short  
0.893 ton, long

**ton (short) of water per 24 h =**  
0.907 t/24 h  
37.80 L/h  
83.333 lb/h  
0.166 gal/min  
9.986 gal/h  
1.335 ft<sup>3</sup>/h

**yard (yd) =**  
91.44 cm  
0.914 m  
36 in.  
3 ft  
0.182 rod  
0.000568 mi  
 $5.68 \times 10^{-4}$  mi

---

## Conversion Tables

### *Distance (miles and kilometers)*

#### Miles to kilometers

mi	km	mi	km	mi	km
1	1.61	10	16.09	100	160.94
2	3.22	20	32.19	150	241.40
3	4.83	30	48.28	200	321.87
4	6.44	40	64.37	300	482.80
5	8.05	50	80.47	400	643.74
6	9.66	60	96.56	500	804.67
7	11.27	70	112.65	600	965.61
8	12.87	80	128.75	700	1126.54
9	14.48	90	144.84	800	1287.48
				900	1448.41
				1000	1609.35

#### Kilometers to miles

km	mi	km	mi	km	mi
1	0.62	10	6.21	100	62.14
2	1.24	20	12.43	150	93.21
3	1.86	30	18.64	200	124.27
4	2.49	40	24.85	300	186.41
5	3.11	50	31.07	400	248.55
6	3.73	60	37.28	500	310.68
7	4.35	70	43.50	600	372.82
8	4.97	80	49.71	700	434.96
9	5.59	90	55.92	800	497.10
				900	559.23
				1000	621.37

---

*Capacity (gallons and liters)*

Gallons to liters

gal	liters	gal	liters
1	3.785	10	37.853
2	7.571	20	75.707
3	11.356	30	113.560
4	15.141	40	151.413
5	18.927	50	189.267
6	22.712	60	227.120
7	26.497	70	264.973
8	30.283	80	302.827
9	34.068	90	340.680
		100	378.533

Liters to gallons

liters	gal	liters	gal
1	0.264	10	2.642
2	0.528	20	5.284
3	0.793	30	7.926
4	1.057	40	10.568
5	1.321	50	13.209
6	1.585	60	15.852
7	1.849	70	18.494
8	2.114	80	21.136
9	2.378	90	23.778
		100	26.417

*Temperature*<sup>a</sup>

## Fahrenheit to Celsius

°F	°C	°F	°C
212.0	100.0	75.0	23.9
200.0	93.3	74.0	23.3
190.0	87.8	73.0	22.8
180.0	82.2	72.0	22.2
170.0	76.7	71.0	21.7
160.0	71.1	70.0	21.1
150.0	65.6	69.0	20.6
140.0	60.0	68.0	20.0
130.0	54.4	67.0	19.4
120.0	48.9	66.0	18.9
110.0	43.3	65.0	18.3
100.0	37.8	64.0	17.8
98.6	37.0	63.0	17.2
95.0	35.0	62.0	16.7
90.0	32.2	61.0	16.1
89.0	31.7	60.0	15.6
88.0	31.1	59.0	15.0
87.0	30.6	58.0	14.4
86.0	30.0	57.0	13.8
85.0	29.4	56.0	13.3
84.0	28.9	55.0	12.8
83.0	28.3	50.0	10.0
82.0	27.8	45.0	7.2
81.0	27.2	40.0	4.4
80.0	26.7	35.0	1.7
79.0	26.1	32.0	0
78.0	25.6	0.0	-17.8
77.0	25.0	-40.0	-40.0
76.0	24.4		

<sup>a</sup>Formula for conversion of temperatures:

$$^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$$

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$$

$$1.8\ ^{\circ}\text{C} = ^{\circ}\text{F} - 32$$

$$^{\circ}\text{K} = ^{\circ}\text{C} + 273$$

$$^{\circ}\text{R} = ^{\circ}\text{F} + 460$$

## Celsius to Fahrenheit

°C	°F	°C	°F	°C	°F
100.0	....212.0	66.0	....150.8	32.0	....89.6
99.0	....210.2	65.0	....149.0	31.0	....87.8
98.0	....208.4	64.0	....147.2	30.0	....86.0
97.0	....206.6	63.0	....145.4	29.0	....84.2
96.0	....204.8	62.0	....143.6	28.0	....82.4
95.0	....203.0	61.0	....141.8	27.0	....80.6
94.0	....201.2	60.0	....140.0	26.0	....78.8
93.0	....199.4	59.0	....138.2	25.0	....77.0
92.0	....197.6	58.0	....136.4	24.0	....75.2
91.0	....195.8	57.0	....134.6	23.0	....73.4
90.0	....194.0	56.0	....132.8	22.0	....71.6
89.0	....192.2	55.0	....131.0	21.0	....69.8
88.0	....190.4	54.0	....129.2	20.0	....68.0
87.0	....188.6	53.0	....127.4	19.0	....66.2
86.0	....186.8	52.0	....125.6	18.0	....64.4
85.0	....185.0	51.0	....123.8	17.0	....62.6
84.0	....183.2	50.0	....122.0	16.0	....60.8
83.0	....181.4	49.0	....120.2	15.0	....59.0
82.0	....179.6	48.0	....118.4	14.0	....57.2
81.0	....177.8	47.0	....116.6	13.0	....55.4
80.0	....176.0	46.0	....114.8	12.0	....53.6
79.0	....174.2	45.0	....113.0	11.0	....51.8
78.0	....172.4	44.0	....111.2	10.0	....50.0
77.0	....170.6	43.0	....109.4	9.0	....48.2
76.0	....168.8	42.0	....107.6	8.0	....46.4
75.0	....167.0	41.0	....105.8	7.0	....44.6
74.0	....165.2	40.0	....104.0	6.0	....42.8
73.0	....163.4	39.0	....102.2	5.0	....41.0
72.0	....161.6	38.0	....100.4	4.0	....39.2
71.0	....159.8	37.0	....98.6	3.0	....37.4
70.0	....158.0	36.0	....96.8	2.0	....35.6
69.0	....156.2	35.0	....95.0	1.0	....33.8
68.0	....154.4	34.0	....93.2	0	....32.0
67.0	....152.6	33.0	....91.4		

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