Corrigendum

Global Warming Science: A Quantitative Introduction to Climate Change and Its Consequences

Updated: Wednesday 19$^{\text{th}}$ February, 2025, 13:49

- Page 17, the last sentence of section 2.1.2: "greenhouses gases" should be "greenhouse gases".

- Page 26, Box 2.1, gas constant on RHS of Clausius-Clapeyron equation is that for water vapor, R_v, so that the displayed equation should read

$$\frac{1}{e^*(T)}\frac{de^*(T)}{dT} = \frac{L}{R_v T^2} \equiv \alpha_{cc}(T),$$

- Page 26, Box 2.1, after displayed equation, units of L are kJ K^{-1} kg^{-1}, so that the sentence should read,

  where $L \approx 2250$ kJ K^{-1}kg^{-1} is the (temperature-dependent) latent heat of vaporization ...

- Page 36, after equation 3.2, ΔF should be ΔF_{now}, so the sentence should read

  ... while the radiative forcings at present and for a doubling of CO$_2$ (ΔF_{now}, $\Delta F_{\times 2}$) can be estimated reliably from radiation models.

- Page 65, units of gravitational acceleration are wrong: should be $g = 9.8$ m s^{-2}.

- Page 85, $+\left[\text{OH}^-\right]$ is missing on the first line of the RHS of equation 5.9 so that the full equation should read:

$$
\begin{aligned}
Alk &\equiv \left[\text{HCO}_3^-\right] + 2\left[\text{CO}_3^{2-}\right] + \left[\text{HBO}_3^-\right] + \left[\text{OH}^-\right] - \left[\text{H}^+\right] \\
&= \left[\text{Na}^+\right] + \left[\text{K}^+\right] + 2\left[\text{Mg}^{2+}\right] + 2\left[\text{Ca}^{2+}\right] - \left[\text{Cl}^-\right] \\
&\quad - 2\left[\text{SO}_4^{2-}\right] - \left[\text{NO}_3^-\right].
\end{aligned}
$$

- In the caption of figure 6.5, the units of F_s should be m/yr, not m/s.

- Page 112: should be "The circulation solution then moves to the right along the green line and thus weakens until the fresh water forcing amplitude is at the critical value of $F_c \approx 4.2$ m/yr" instead of m/s.

- Page 119: the glacier anomaly should be defined relative to equilibrium for equation 11.1 to be correct (thanks to Thomas Haslwanter). So the text there should be

  > Let the glacier length anomaly, defined as its deviation from the length when the glacier was in equilibrium with the temperature prior to the occurrence of climate change, be L', and let the local temperature anomaly relative to that at equilibrium be T'.

  later, when this equation is used to deduce temperature, the text should be corrected with the following parenthetical caveat:

  > For this purpose, we take $L'(t)$ in [11.1] to be the glacier length anomaly relative to that at the year 1960 and $T'(t)$ to be the temperature anomaly relative to that year (although mountain glaciers are were not necessarily in equilibrium at that year).

- Page 134 section 7.4, equation 7.2: the solar radiation in the first equation should be denoted by $S_0/4$ rather than by S,

$$C_{\text{surface}}\frac{dT}{dt} = \frac{S_0}{4}(1 - \alpha(T)) + \epsilon(\text{CO}_2, T_a)\sigma T_a^4 - \sigma T^4$$

- Page 147, El Niño, La Niña box 8.1, after the graphics: "fisherman" should be "fishermen".

- Page 224, second sentence in section 12.6: "utmost important" should be "utmost importance".