

Snowfall doesn't mean climate change is a hoax

To understand the weather changes that the media push as exceptional (which they're not), it also pays to have some understanding of what cyclical patterns affecting the planet are and how they interplay. That's climate, and it's not just a forecast of a week or two. There is no "quick" definition to make someone who is ignorant (not meaning thick as two short planks) of this knowledge to become fully aware of what is going on.

That is why far too many jump to the conclusion "Ha ha! - see the snow? - how warm does that make the planet, then? - Global warming, my arse - it's just a sophisticated hoax!"

The trouble is that *it is* complicated and can't be dumbed down easily. That takes a lot of study, which far too many people have an aversion to. In today's society, "quick answers" are required as a norm, and that aversion to understanding through study is as undesirable as contracting leprosy.

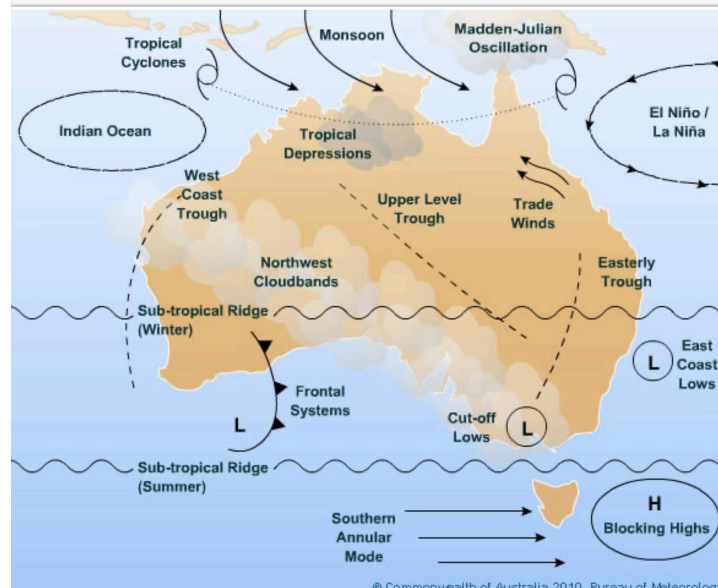
So, in resistance to that societal demand (like, perhaps, opposing "wokeness"), how about trusting the majority of scientists who advise that global warming through climate change caused by anthropogenic disturbance is true? And yes, weird stuff might appear to contradict your understanding, but that stuff is often a good indicator, ironically, of the truth of the overall problem.

To start with, weather does not have the same definition as climate.

In Australia, learning the effects and interplay of La Niña, El Niño, the Indian Ocean Dipole

Australian Climate Influences

Australia's climate can vary greatly from one year to the next. The schematic below, and links on the right, present the main - but not all - influences upon the Australian climate. Influences will have varying levels of impact in different regions at different times of year. For details, please see the associated text.



(IOD), Southern Annular Mode (SAM), the Madden Julian Oscillation (MJO), Monsoon periods and Trade Winds is like learning what the Standard Model Lagrangian equation is from the basic understanding of $2 + 2 = 4$ and perhaps what even an equation means in the first place; maybe like this one:

$$\begin{aligned}
\mathcal{L}_{SM} = & -\frac{1}{2}\partial_\nu g_\mu^a \partial_\nu g_\mu^a - g_s f^{abc} \partial_\mu g_\nu^a g_\mu^b g_\nu^c - \frac{1}{4}g_s^2 f^{abc} f^{ade} g_\mu^b g_\nu^c g_\mu^d g_\nu^e - \partial_\nu W_\mu^+ \partial_\nu W_\mu^- - \\
& M^2 W_\mu^+ W_\mu^- - \frac{1}{2}\partial_\nu Z_\mu^0 \partial_\nu Z_\mu^0 - \frac{1}{2\epsilon_w^2} M^2 Z_\mu^0 Z_\mu^0 - \frac{1}{2}\partial_\mu A_\nu \partial_\mu A_\nu - ig_{cw}(\partial_\nu Z_\mu^0(W_\mu^+ W_\nu^- - W_\nu^+ W_\mu^-) - \\
& Z_\nu^0(W_\mu^+ \partial_\nu W_\mu^- - W_\mu^- \partial_\nu W_\mu^+) + Z_\nu^0(W_\nu^+ \partial_\mu W_\mu^- - W_\mu^- \partial_\nu W_\nu^+)) - ig_{sw}(\partial_\nu A_\mu(W_\mu^+ W_\nu^- - \\
& W_\nu^+ W_\mu^-) - A_\nu(W_\mu^+ \partial_\nu W_\mu^- - W_\mu^- \partial_\nu W_\mu^+) + A_\mu(W_\nu^+ \partial_\nu W_\mu^- - W_\mu^- \partial_\nu W_\nu^+)) - \\
& \frac{1}{2}g^2 W_\mu^+ W_\mu^- W_\nu^+ W_\nu^- + \frac{1}{2}g^2 W_\mu^+ W_\nu^- W_\nu^+ W_\mu^- + g^2 c_w^2 (Z_\mu^0 W_\nu^+ + Z_\nu^0 W_\mu^- - Z_\nu^0 Z_\mu^0 W_\nu^+ W_\mu^-) + \\
& g^2 s_w^2 (A_\mu W_\nu^+ + A_\nu W_\mu^- - A_\mu A_\nu W_\nu^+ W_\mu^-) + g^2 s_w c_w (A_\mu Z_\nu^0 (W_\mu^+ W_\nu^- - W_\nu^+ W_\mu^-) - \\
& 2A_\mu Z_\mu^0 W_\nu^+ W_\nu^-) - \frac{1}{2}\partial_\mu H \partial_\mu H - 2M^2 \alpha_h H^2 - \partial_\mu \phi^+ \partial_\mu \phi^- - \frac{1}{2}\partial_\mu \phi^0 \partial_\mu \phi^0 - \\
& \beta_h \left(\frac{2M^2}{g^2} + \frac{2M}{g} H + \frac{1}{2}(H^2 + \phi^0 \phi^0 + 2\phi^+ \phi^-) \right) + \frac{2M^4}{g^2} \alpha_h - g\alpha_h M (H^3 + H\phi^0 \phi^0 + 2H\phi^+ \phi^-) - \\
& \frac{1}{8}g^2 \alpha_h (H^4 + (\phi^0)^4 + 4(\phi^+ \phi^-)^2 + 4(\phi^0)^2 \phi^+ \phi^- + 4H^2 \phi^+ \phi^- + 2(\phi^0)^2 H^2) - gMW_\mu^+ W_\mu^- H - \\
& \frac{1}{2}g\frac{M}{c_w} Z_\mu^0 Z_\mu^0 H - \frac{1}{2}ig (W_\mu^+ (\phi^0 \partial_\mu \phi^- - \phi^- \partial_\mu \phi^0) - W_\mu^- (\phi^0 \partial_\mu \phi^+ - \phi^+ \partial_\mu \phi^0)) + \\
& \frac{1}{2}g (W_\mu^+ (H \partial_\mu \phi^- - \phi^- \partial_\mu H) + W_\mu^- (H \partial_\mu \phi^+ - \phi^+ \partial_\mu H)) + \frac{1}{2}g\frac{1}{c_w} (Z_\mu^0 (H \partial_\mu \phi^0 - \phi^0 \partial_\mu H) + \\
& M (\frac{1}{c_w} Z_\mu^0 \partial_\mu \phi^0 + W_\mu^+ \partial_\mu \phi^- + W_\mu^- \partial_\mu \phi^+) - ig\frac{s_w^2}{c_w} M Z_\mu^0 (W_\mu^+ \phi^- - W_\mu^- \phi^+) + ig s_w M A_\mu (W_\mu^+ \phi^- - \\
& W_\mu^- \phi^+) - ig\frac{1-2c_w^2}{2c_w} Z_\mu^0 (\phi^+ \partial_\mu \phi^- - \phi^- \partial_\mu \phi^+) + ig s_w A_\mu (\phi^+ \partial_\mu \phi^- - \phi^- \partial_\mu \phi^+) - \\
& \frac{1}{4}g^2 W_\mu^+ W_\mu^- (H^2 + (\phi^0)^2 + 2\phi^+ \phi^-) - \frac{1}{8}g^2 \frac{1}{c_w^2} Z_\mu^0 Z_\mu^0 (H^2 + (\phi^0)^2 + 2(2s_w^2 - 1)^2 \phi^+ \phi^-) - \\
& \frac{1}{2}g^2 \frac{s_w^2}{c_w} Z_\mu^0 \phi^0 (W_\mu^+ \phi^- + W_\mu^- \phi^+) - \frac{1}{2}ig^2 \frac{s_w^2}{c_w} Z_\mu^0 H (W_\mu^+ \phi^- - W_\mu^- \phi^+) + \frac{1}{2}g^2 s_w A_\mu \phi^0 (W_\mu^+ \phi^- + \\
& W_\mu^- \phi^+) + \frac{1}{2}ig^2 s_w A_\mu H (W_\mu^+ \phi^- - W_\mu^- \phi^+) - g^2 \frac{s_w}{c_w} (2c_w^2 - 1) Z_\mu^0 A_\mu \phi^+ \phi^- - g^2 s_w^2 A_\mu A_\mu \phi^+ \phi^- + \\
& \frac{1}{2}ig s_{ij} \lambda_{ij}^a (\bar{q}_i^a \gamma^\mu q_j^a) g_\mu^a - \bar{e}^\lambda (\gamma^\mu + m_e^\lambda) e^\lambda - \bar{\nu}^\lambda (\gamma^\mu + m_\nu^\lambda) \nu^\lambda - \bar{u}_j^\lambda (\gamma^\mu + m_u^\lambda) u_j^\lambda - \bar{d}_j^\lambda (\gamma^\mu + m_d^\lambda) d_j^\lambda + \\
& ig s_w A_\mu \left(-(\bar{e}^\lambda \gamma^\mu e^\lambda) + \frac{2}{3}(\bar{u}_j^\lambda \gamma^\mu u_j^\lambda) - \frac{1}{3}(\bar{d}_j^\lambda \gamma^\mu d_j^\lambda) \right) + \frac{ig}{4c_w} Z_\mu^0 \{ (\bar{\nu}^\lambda \gamma^\mu (1 + \gamma^5) \nu^\lambda) + (\bar{e}^\lambda \gamma^\mu (4s_w^2 - \\
& 1 - \gamma^5) e^\lambda) + (\bar{u}_j^\lambda \gamma^\mu (\frac{4}{3}s_w^2 - 1 - \gamma^5) u_j^\lambda) + (\bar{d}_j^\lambda \gamma^\mu (1 - \frac{8}{3}s_w^2 + \gamma^5) d_j^\lambda) \} + \\
& \frac{ig}{2\sqrt{2}} W_\mu^+ \left((\bar{\nu}^\lambda \gamma^\mu (1 + \gamma^5) U^{lep}_{\lambda\kappa} e^\kappa) + (\bar{u}_j^\lambda \gamma^\mu (1 + \gamma^5) C_{\lambda\kappa} d_j^\kappa) \right) + \\
& \frac{ig}{2\sqrt{2}} W_\mu^- \left((\bar{e}^\kappa U^{lep\dagger}_{\kappa\lambda} \gamma^\mu (1 + \gamma^5) \nu^\lambda) + (\bar{d}_j^\kappa C_{\kappa\lambda}^\dagger \gamma^\mu (1 + \gamma^5) u_j^\lambda) \right) + \\
& \frac{ig}{2M\sqrt{2}} \phi^+ \left(-m_e^\kappa (\bar{\nu}^\lambda U^{lep}_{\lambda\kappa} (1 - \gamma^5) e^\kappa) + m_\nu^\lambda (\bar{\nu}^\lambda U^{lep}_{\lambda\kappa} (1 + \gamma^5) e^\kappa) + \right. \\
& \left. \frac{ig}{2M\sqrt{2}} \phi^- \left(m_e^\lambda (\bar{e}^\lambda U^{lep\dagger}_{\lambda\kappa} (1 + \gamma^5) \nu^\kappa) - m_\nu^\kappa (\bar{e}^\lambda U^{lep\dagger}_{\lambda\kappa} (1 - \gamma^5) \nu^\kappa) - \frac{g}{2} \frac{m_\lambda^\lambda}{M} H (\bar{\nu}^\lambda \nu^\lambda) - \right. \right. \\
& \left. \left. \frac{g}{2} \frac{m_\lambda^\lambda}{M} H (\bar{e}^\lambda e^\lambda) + \frac{ig}{2} \frac{m_\lambda^\lambda}{M} \phi^0 (\bar{\nu}^\lambda \gamma^5 \nu^\lambda) - \frac{ig}{2} \frac{m_\lambda^\lambda}{M} \phi^0 (\bar{e}^\lambda \gamma^5 e^\lambda) - \frac{1}{4} \bar{\nu}_\lambda M_{\lambda\kappa}^R (1 - \gamma_5) \bar{\nu}_\kappa - \right. \right. \\
& \left. \left. \frac{1}{4} \bar{\nu}_\lambda M_{\lambda\kappa}^R (1 - \gamma_5) \bar{\nu}_\kappa + \frac{ig}{2M\sqrt{2}} \phi^+ \left(-m_d^\kappa (\bar{u}_j^\lambda C_{\lambda\kappa} (1 - \gamma^5) d_j^\kappa) + m_u^\lambda (\bar{u}_j^\lambda C_{\lambda\kappa} (1 + \gamma^5) d_j^\kappa) \right) + \right. \right. \\
& \left. \left. \frac{ig}{2M\sqrt{2}} \phi^- \left(m_d^\lambda (\bar{d}_j^\lambda C_{\lambda\kappa}^\dagger (1 + \gamma^5) u_j^\kappa) - m_u^\kappa (\bar{d}_j^\lambda C_{\lambda\kappa}^\dagger (1 - \gamma^5) u_j^\kappa) - \frac{g}{2} \frac{m_\lambda^\lambda}{M} H (\bar{u}_j^\lambda u_j^\lambda) - \frac{g}{2} \frac{m_\lambda^\lambda}{M} H (\bar{d}_j^\lambda d_j^\lambda) + \right. \right. \\
& \left. \left. \frac{ig}{2} \frac{m_\lambda^\lambda}{M} \phi^0 (\bar{u}_j^\lambda \gamma^5 u_j^\lambda) - \frac{ig}{2} \frac{m_\lambda^\lambda}{M} \phi^0 (\bar{d}_j^\lambda \gamma^5 d_j^\lambda) \right) \right)
\end{aligned}$$

It's not an easy pathway from one understanding to the other. Perhaps another day, maybe next year, when I get a decent pause. Now I've really got to get back to my latest essay, which has little all to do with mathematics for a change but a lot to do with a similarly incomprehensible bunch of variables - that I think I've just about got a fair grasp of now myself.

Now, go and buy yourself some solar panels and save yourself a bundle.

References:

NASA, *Glossary*, Climate NASA, accessed 14 August 2025, *Glossary A–Z*, (online) available at: https://climate.nasa.gov/glossary/?page=0&per_page=9999&order=title+asc&search=&alpha=A-Z:title.

CSIRO and Bureau of Meteorology, *Australia's Changing Climate, Climate Change in Australia*, 2015. (Online PDF) Retrieved from https://www.climatechangeinaustralia.gov.au/media/ccia/2.2/cms_page_media/176/A_USTRALIAS_CHANGING_CLIMATE_1.pdf.

NBC News, "Climate story" (author not provided), NBC News, *NBC News*, (online) retrieved via <https://www.nbcnews.com/id/wbna46195122> [author and date unspecified].

Hurwitz et al., "Title unknown," *EGU General Assembly Conference Abstracts*, 2023, EGU General Assembly 2023 (Paper 2511931), accessed via *Astrophysics Data System (ADS)*, abstract 2023 EGUGA..2511931H.

Joint Institute for the Study of the Atmosphere and Ocean (JISAO), "Pacific Decadal Oscillation (PDO)," *Research at JISAO*, University of Washington, accessed 14 August 2025, <http://research.jisao.washington.edu/pdo/>.