

Climate (and Other) Myths Advanced by Attendees at General Plan Review Committee and Planning and Zoning Committee Meetings

Video of 11 December 2024 General Plan Review Committee:

<https://www.facebook.com/cityofprescottaz/videos/1185751506307788>

Video of 9 January 2025 Planning & Zoning Commission Meeting:

<https://www.youtube.com/watch?v=39BEC9Ae9y0>

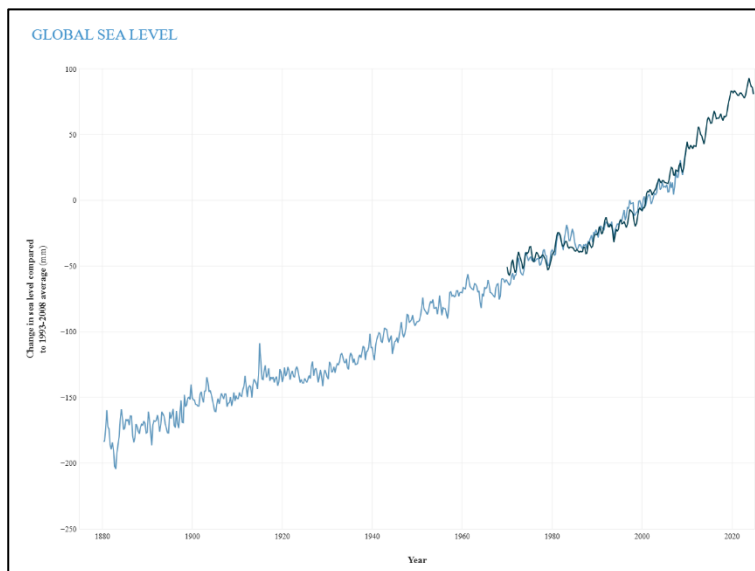
As a citizen of Prescott, and as a scientist with decades of experience as a professional ecologist and conservation biologist, I have been very concerned by the misinformation about the science of climate change that has been shared by some members of the public – and even by some members of city committees – at recent official meetings. Good public policy should be based upon our best understanding of reality, and in many cases that means the best scientific understanding that we can manage at the present time. In the interest of setting the specific record straight, and as importantly of providing a few examples of the kinds of statements that have been made to justify removal of parts of the draft 2025 General Plan, I offer the following responses.

At 1:07:07 in the 11 December meeting video, a member of the public claimed that, “Every 10 years we’ve been told that disastrous events are just around the corner, that we need immediate action; New York and California are going to be under water.” At the 9 January P & Z Commission meeting, the same citizen claimed that, “... for six decades we’ve been fed a regular diet of climate change predictions that never happened.”

I suspect that the speaker was referring on 11 December to the projections for different coastal areas in the face of rising sea levels that have been published now for decades. These projections are simply based on the well-known elevation contours of the world’s landforms and the projections of sea level at different times in the future. And they do indeed show that large parts of the coastal areas of California, the Eastern Seaboard of the U.S., and especially Florida will be under water – typically shown for the year 2050 or 2100 – if sea level rises at the same rate measured for the last 140 years or so. Loss of these land areas will be even faster if glaciers and polar ice caps melt even faster as greenhouse gas concentrations rise. Media sources often show graphics of these projections, and city and state governments also publicize them. For example, the New York Mayor’s office of Climate and Environmental Justice notes that, “Since 1900, sea level in New York City has risen by about 12 inches and is projected to continue to increase as much as 5.4 feet by 2100, leading to increased frequency and intensity of coastal flooding” (<https://climate.cityofnewyork.us/challenges/coastal-surge-flooding/>). Referring to research by NOAA, The Palm Beach Post reports that, “Relative sea level along the U.S. coastline is projected to rise, on average, 10-12 inches in the next 30 years, which is the same amount of increase that we saw over the last 100 years” (<https://www.palmbeachpost.com/story/news/environment/2023/08/23/flooding-sea-level-oceans-rise-climate-change-emissions-noaa-predictions/70640635007/>).

It is indisputable that sea level rise has been well-documented with historical data, and that the observed trends have been in pretty good agreement with projections.

Sea level rise varies geographically due to the influence of the shapes of the major ocean basins and even with subsidence of the land itself in some places. But the trends for specific locations are generally very consistent with the averages over large areas. The graph at right shows global average sea level from 1880 to 2023, relative to the 1993-2008 average.



You can see that global mean sea level has risen about 8–9 inches (210 –240 mm) since 1880, and the driving forces include both meltwater from glaciers and ice sheets as well as the thermal expansion of seawater as it warms. Perhaps even more alarming, the graph also shows that the *rate* of sea level rise is itself increasing over time. (Sources: www.climate.gov/news-features/understanding-climate/climate-change-global-sea-level, Church and White (2011; <https://link.springer.com/content/pdf/10.1007/s10712-011-9119-1.pdf>), and <https://uhslc.soest.hawaii.edu/data/?fd>).

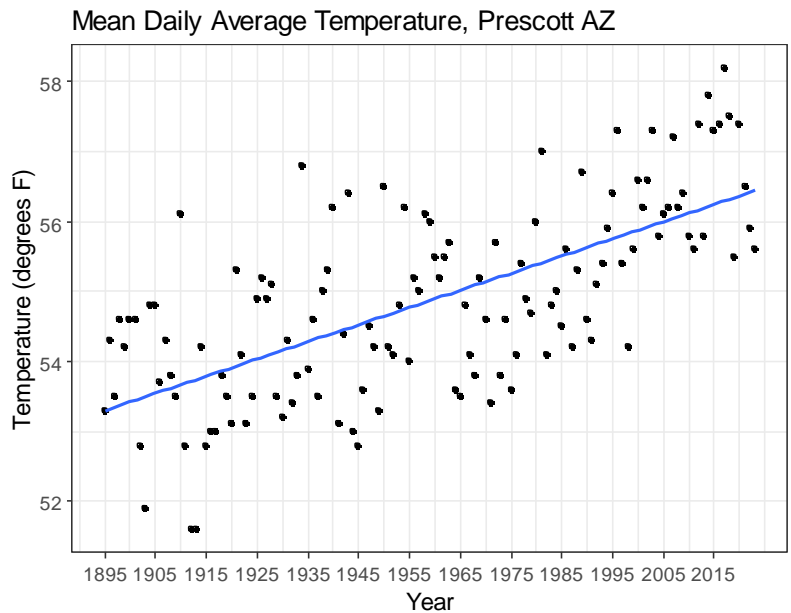
At 1:07:17 in the meeting video, the same speaker claimed that, “If you love landmarks, Plymouth Rock is at the same sea level it has been since 1620.”

This is another bogus claim that has been making the rounds on twitter, facebook, and other social media sites for years, and it too has been debunked again and again. **Plymouth Rock cannot provide an accurate measure of sea-level rise in large part because it has been broken, split, and moved several times since 1620!** The top portion was removed to Town Square in 1774 and later in 1834 to Pilgrim Hall Museum. The two halves of the Rock were reunited on the waterfront under a granite canopy in 1880, and later it was entirely excavated and lowered onto the shoreline in 1920. Moreover, the surface of the rock is indeed regularly under water at high tide. The tide gauge at Boston (just 40 miles from Plymouth Rock) has recorded an average rise of 2.89 mm/year since 1921, for a total of 297.7 mm (11.72 inches) over that 103-year span. See *Reuters Fact Check: Plymouth Rock cannot provide an accurate measure of sea level. July 7, 2022.* (<https://www.reuters.com/article/fact-check/plymouth-rock-cannot-provide-an-accurate-measure-of-sea-level-idUSL1N2YO100/>)

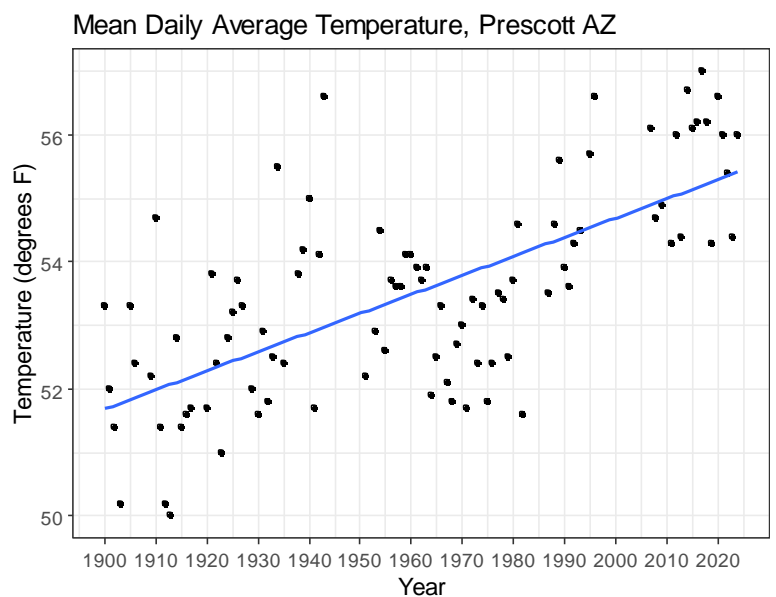
Finally, this speaker claimed at about 1:07:27 in the 11 December video, and again at about 2:08:20 in the recording of the 9 January P & Z Commission meeting, that, “In 1900 the hottest

day was 103 degrees; in 2023 after decades of development, paving, and urban heat effect, the hottest day was 104 degrees – a nearly unchanged statistic in over a century.”

The speaker’s claim here is simply for **single days** in 1900 and 2023, but she provided no source for the claim. However, the complete record of weather data for our region clearly shows that the yearly average temperature has increased significantly over that period. The figure at right shows the average daily temperature for the years 1895 to 2023, with a best-fit linear regression line. The data source is the PRISM Climate Group (prism.oregonstate.edu), which gathers climate observations from a wide range of monitoring networks including the U.S. National Weather Service and interpolates between reporting stations to provide more spatially precise data. The data shown are for the vicinity of the Prescott airport, but direct measurements from Prescott, while collected more sporadically, are in very good agreement with this more complete dataset. **The relationship indicates an increase of about 3.02 degrees F over the 123 years from 1900 to 2023.**

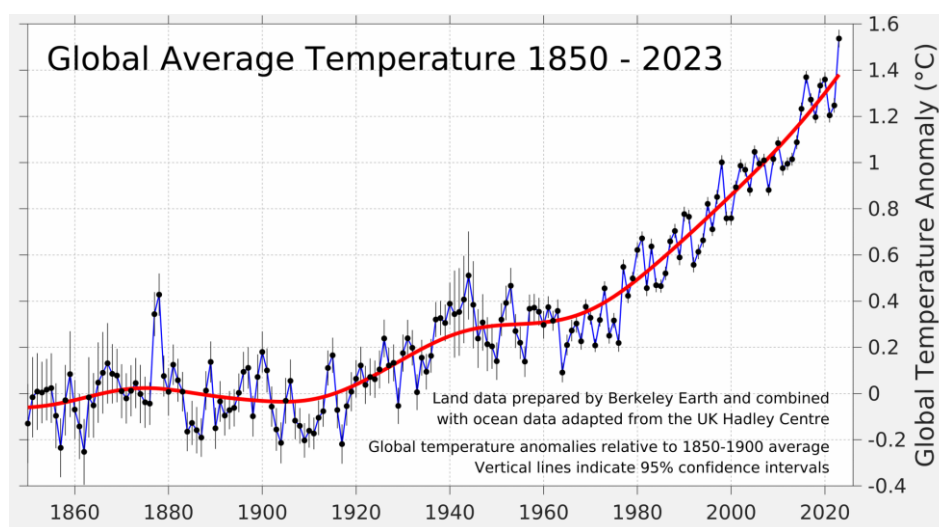


Early in the 2025 General Plan process, some members of the newly-appointed Review Committee expressed skepticism about the temperature projections from the recently-released Quad Cities Climate Profile because they were based on “models” rather than on temperature measurements from Prescott itself. But this was a misinterpretation of the data source. As explained above, the PRISM group combines data from many reporting stations to estimate the temperatures at locations that have no records for a particular time period, using well-known relationships between elevation and temperature, humidity, etc. But to evaluate the skepticism of some Review Committee members, I repeated the analysis above using only historical data for 1900 through 2024 obtained directly from the Prescott reporting station by the National Weather Service. I did not include data from any of the 32 years with missing monthly averages, since missing data from some months would influence the yearly averages. **The results from that analysis are shown at right, and indicate a 3.72 degree Fahrenheit increase in mean**



temperature over the 124 year period. To some extent, the small differences in the amount of increase in mean temperature reflect the different locations (near the airport for my first analysis, vs. Prescott itself for the second one. But the trend is very similar and in the same direction regardless of the data source: Prescott's temperature is increasing.

As the Quad Cities Climate Profile report commissioned by the Prescott City Council and delivered to the council by the CLIMAS group at the University of Arizona in February 2023 also showed, these data are in good agreement with the global temperature trends measured over the past and projected into the future. Careful analyses of the climate system have been prepared now for decades, and though they vary to a minor degree, they all show the same basic pattern, and climate scientists have arrived at an exceedingly strong consensus: the climate is warming, and human activity is the primary driver of that warming. Below is one such analysis, showing just the historical record:



<https://berkeleyearth.org/wp-content/uploads/2024/01/AnnualPlot-2023-1.png>

On a related issue, the same citizen speaker also criticized the suggestion of dark skies policies in the Prescott area (at 1:05:31 in the video from 11 December), and proposed that these be deleted from the General Plan as government overreach.

Such policies produce great benefits for wildlife and energy efficiency, but do dark skies policies also produce economic benefits for their communities? There is considerable reason to think that they do indeed. Mitchell and Galloway (*Dark Sky Tourism: Economic Impacts on the Colorado Plateau Economy, USA*. Tourism Review, 2019) used a ten-year forecast of visitors to dark skies national parks on the Colorado Plateau and estimated that “non-local tourists who value dark skies will spend \$5.8 billion over 10 years in the Colorado Plateau. These tourist expenditures will generate \$2.4 billion in higher wages and create over 10,000 additional jobs each year for the region.” And a 2023 survey by Colorado College found that 47% of respondents in Great Sand Dunes National Park and Preserve (a Gold Tier International Dark Sky Park) said that they “would reduce their future visitation if light pollution became more like neighboring municipalities. The researchers estimated that the region could see a GDP loss between \$190,000 and \$325,000 per year if light pollution significantly increased

(<https://digitalcc.coloradocollege.edu/record/7959?v=pdf>). For a summary of these and other studies from the southwest, see <https://www.milespartnership.com/how-we-think/article/dark-sky-tourism-part-1-how-embracing-night-sky-can-benefit-dmos> and <https://www.nps.gov/subjects/night skies/economic.htm>. Shouldn't Prescott consider the pursuit of policies that would **simultaneously** enhance economic vitality, environmental quality, *and* the quality of life for its citizens? Before rejecting such well-founded proposals, shouldn't the facts be examined?

Members of Prescott city government and staff, as well as the general public, have no doubt seen the kinds of climate change denial myths quoted above many times, as well as the kinds of science-based responses that I make here. Believe me, I've written these kinds of responses myself literally scores of times over the last 35 years or so. Why bother? Because "A lie can travel around the world and back again while the truth is lacing up its boots" as is often said. **It's important precisely because** we've heard and read these myths so many times, and because we need to base public policy upon the best scientific understanding of how the world works.

It seems to me that the draft 2025 General Plan has been prepared by a dedicated staff who have done a good job of incorporating the elements of land use, economy, public health and welfare, environment, natural resources, etc. *as required by state law*. Moreover, they have invited public suggestions and have incorporated many of those offered by citizens with expertise in the areas covered by the different chapters. And so I'm very concerned about misinformation offered by citizens and even members of city committees in the service of partisan political ideology or for the benefit of particular segments of our community at the expense of others. We have a chance to do something great for Prescott here. Let's keep our eyes on the prize, for the sake of those who come after us.

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