

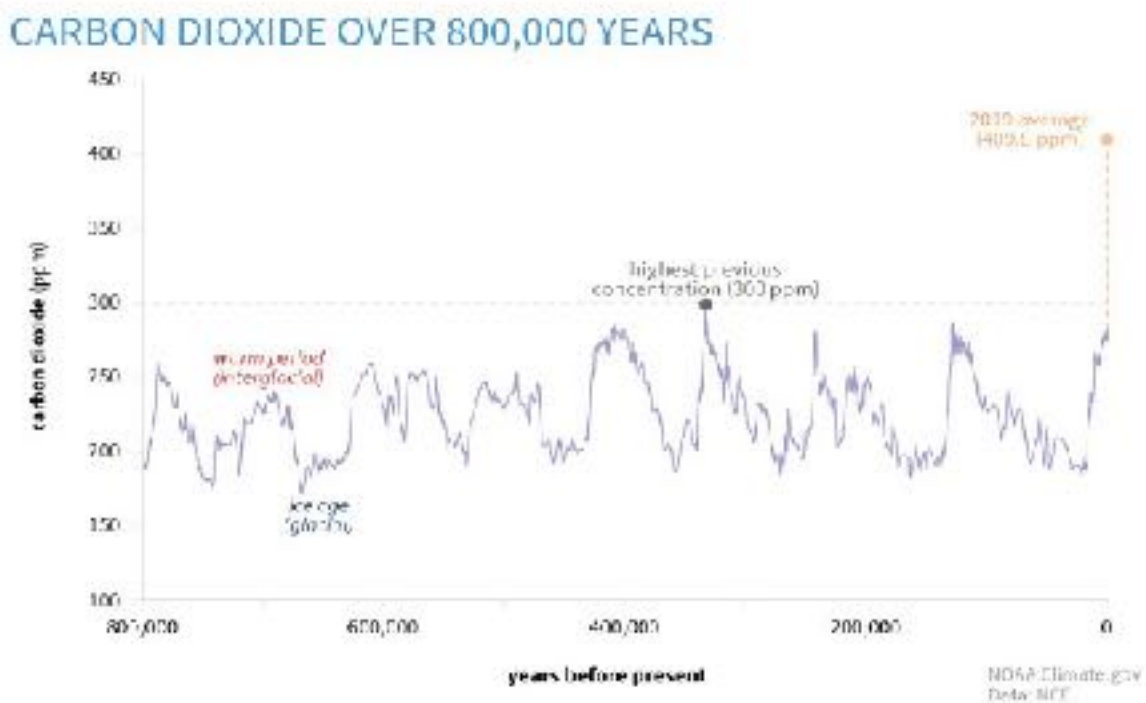
THE CRITICAL ROLE PARROTS PLAY IN ADDRESSING GLOBAL CARBON CRISIS

By Debbie Goodrich, President; Flight Club Foundation.

Parrots have survived nearly 28 million years of natural climate change processes with minimal losses in diversity and no evidence of morphological change (Waterhouse 2006). However, the Order, Psittaciformes, now suffers the largest diversity decline of all bird species since the advent of the industrial revolution (Taberes, et al 2020). This order of animal exemplifies the nature of the climate crisis created by industry—the over-production of carbon dioxide never seen in natural systems previously and destruction of natural carbon sink ability. Continuing utilizing the vernacular climate change in educational settings from zoos to governance has only created conflict in understanding a natural, planetary process vs. the man-made problems that carbon dioxide production creates. Utilizing the vernacular “climate change” to now describe the man-made crisis causes confusion offering no measurable means to a solution. This article introduces a measurable name to this specific problem, Global Carbon Crisis, and offers a measurable solution that offers a successive-approximation approach to address the problem, Global Carbon Index.

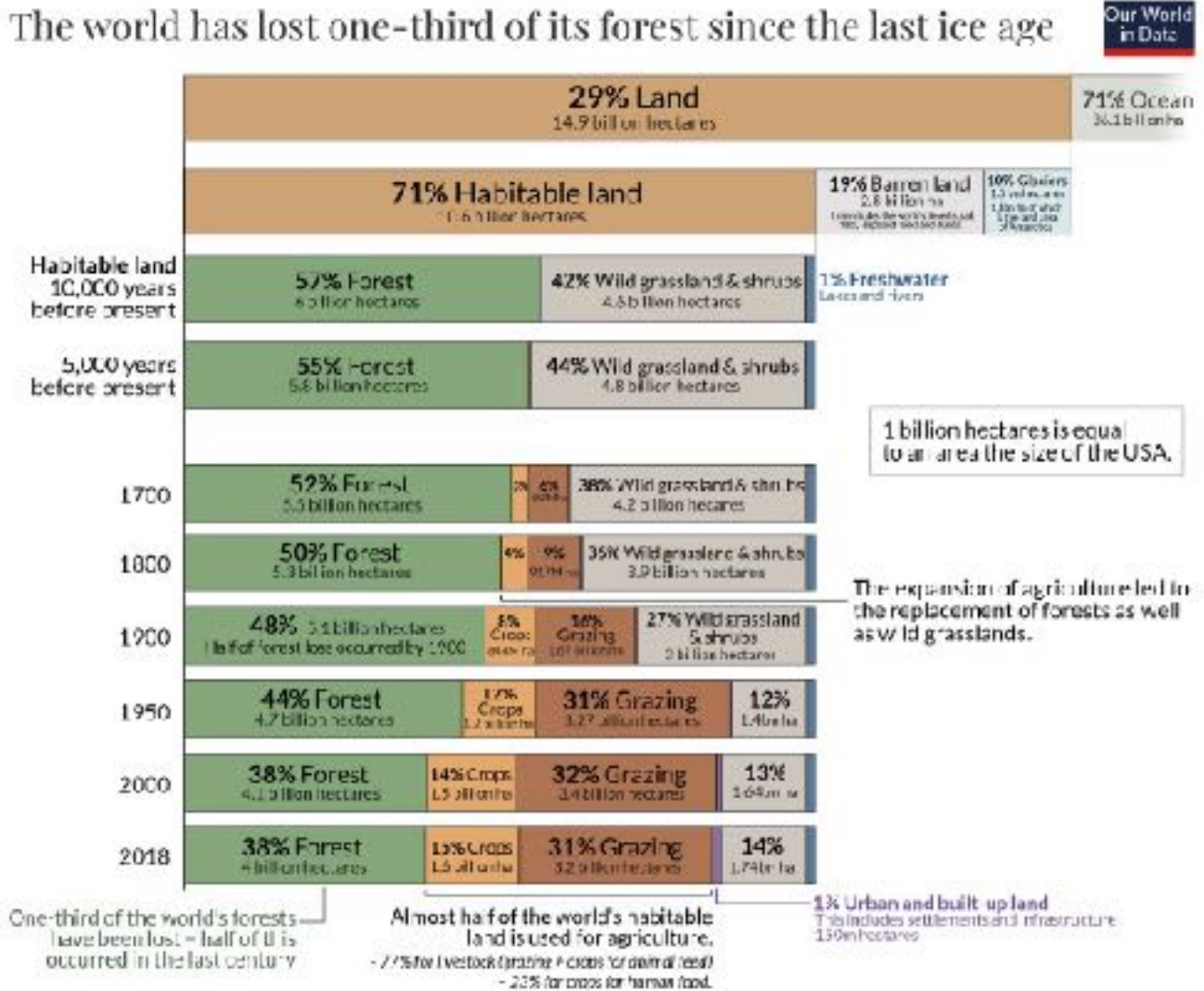
Climate change is a natural planetary process, driven primarily by the carbon cycle that takes roughly 100,000 years to complete called Millennial Cycles and are based on solar radiation at Earth’s poles with CO₂ influencing lag time (USDA 2021). This process can further be broken down into Century Cycles that are direct interactions between CO₂ production and the Deep Sea Current ranging around 1500 years. The current carbon dioxide levels in the atmosphere are far beyond any measure we have seen historically as seen by this graph by NOAA from GERG ICE CORE DATA and more (Fig. 1).

Figure 1. Historical CO₂ production, conglomerated, NOAA.



land. The capacity to “scrub” changes as climate changes. Currently, the ocean holds 50 times more carbon than the atmosphere and 20 times more than land and plants (Brusseler 2022). The ocean removes up to one third total excess carbon through natural carbon absorption processes. Excess carbon dioxide, however, disrupts calcium carbonate creation leading to a more acidic ocean with less ability to remove atmospheric carbon dioxide. By contrast, the largest land-based carbon sink the world, the Amazonian forest, is now producing CO2 in many areas that have been deforested (Gatti et al 2021).

Figure 2. Land coverage of forests and forest destruction.



Data sources: Forests data from FAO, Food and Agriculture Organization (FAO) and Williams, M. (2003), Deforesting the earth: From prehistory to global crisis. AgBioForum data post 1950 from UN FAO, pre 1950 data from The History Database of the Global Environment: HYDE. OurWorldInData.org - Research and data to make progress against the world's largest problems. License: CC BY in the public domain. Rating: L

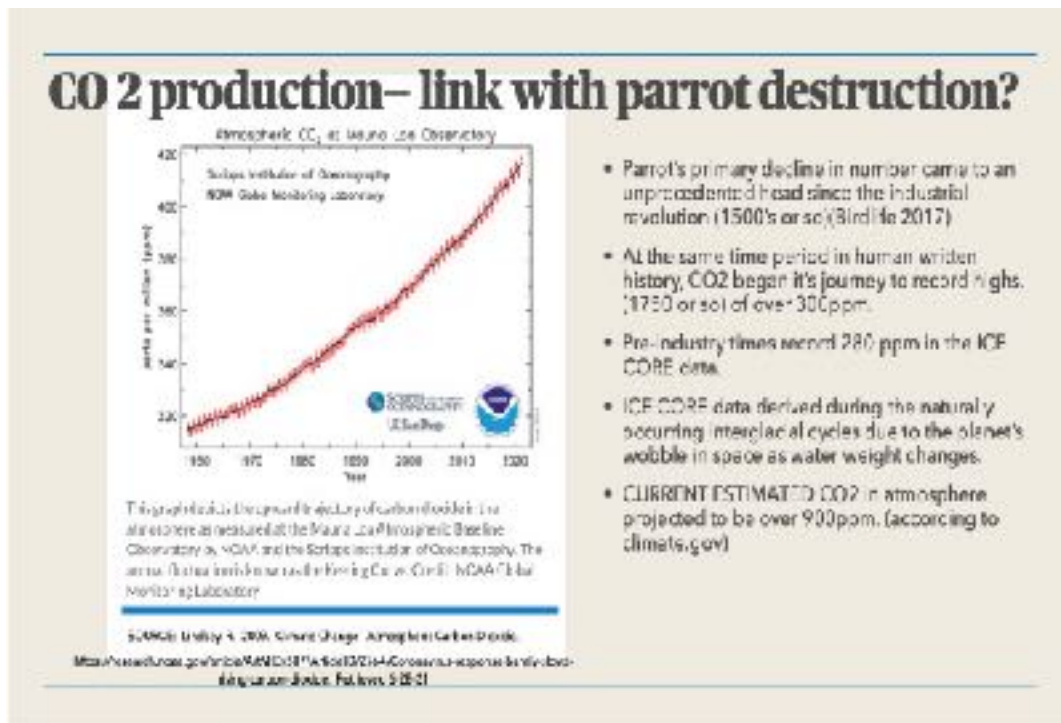
We have lost over one-third of our global forest coverage (Ritchie 2021). This removes a major ability for the planet to absorb atmospheric CO2. Forests also help collect moisture over land to produce the rain needed to produce more forests and fresh water. Figure 2 shows the drastic reduction vs. the overall, current planetary landmass. We can see how the pressure to utilize crops vs. grazing is increasing but has not prevented or allowed forest growth to return as well.

It is clear that for humanity to survive, forests are needed. According to George Olah et al. (2016), the number one contribution to the loss of species diversity in parrots as a global perspective is overall human in nature: large scale agriculture first, deforestation, urbanization, logging, invasive species and finally capture. Where are parrots found? In the places, the resources, the forests humanity will need for utter survival, places humans prefer to live due to diverse opportunity parrots utilized for millions of years. Parrot conservation pushes humanity back and does so with small successes as seen in programs like Armonía increasing blue throat macaw populations while increasing cattle ranching on the same property (Armonía 2021)(1).

The working paper from the Overseas Development Institute in 2015 puts in perspective the driving forces of deforestation clearly and precisely. It states the practice of reducing the price of natural resources below the marginal cost to societies effects investment and consumption practices. If price is low to degrade those resources, it allows resource inefficiency, overcapitalization and overconsumption and pushes out incentives to support sustainable management. The two primary areas of forest loss are equally the two highest levels of diversity and density in parrot populations: Brazil (with soy, cattle ranching) and Indonesia (with palm oil production).

Thus, the relationship between parrots and Global Carbon Crisis is born. It truly remains a fact that if parrot populations can remain stable in these high-pressure areas, the future ability of the planet to absorb atmospheric carbon on the land-based sinks will remain as well as we see in Figure 3. Currently, our measurement is over 420ppm, a level of dissolved CO2 are now comparable to the Pliocene Climatic Optimum when forests occupied what is now the Tundra. Before the advent of the Industrial Revolution, CO2 levels remained consistently around 280ppm (NOAA 2022).

Figure 3. Correlations with parrots and CO2 production. (NOAA 2022)



Psittaciformes lived through many climate changes including the Pliocene Climatic Optimum survived catastrophic levels of CO₂ that occurred at the time (over 400ppm). They have survived massive planetary volcanic events as well. In fact, those who state our anthropogenic factors are not at play, blame volcanic activity on our current CO₂ levels instead.

So, let us take a quick peek into that history. The worst volcanic events in the history of planet reside in what are known as super-volcanoes. Episodes such Mt. St. Helens eruption in 1980, while significant, pale in contrast to the events of the Yellowstone Explosions that occurred 2.1 millions years ago (MYA), 1.4 MYA and 640,000 years ago much less that of the even more massive Toba explosion 74,000 years ago. Figure 4 gives a rough idea of how much ash covered the United States. Keep in mind, volcanic activity produces significant CO₂ levels. The larger the event, the more CO₂ ejects into the atmosphere. Figures 4 shows you solely the size of volcanic events in the US regarding ash distribution with Yellowstone eruptions being the largest. Yellowstone is known as a Super-volcanic event that erupted as recently as 640,000 years ago. Despite this devastating events and larger event comparisons globally in Figure 5, parrots have survived with little to no evolutionary change and diversity impact at that time.

Figure 4. Known Ash Bed Boundaries for several US eruptions 2005. Source: [usgs.gov/media/images/map-known-ash-fall-boundaries-several-us-eruptions](https://www.usgs.gov/media/images/map-known-ash-fall-boundaries-several-us-eruptions).

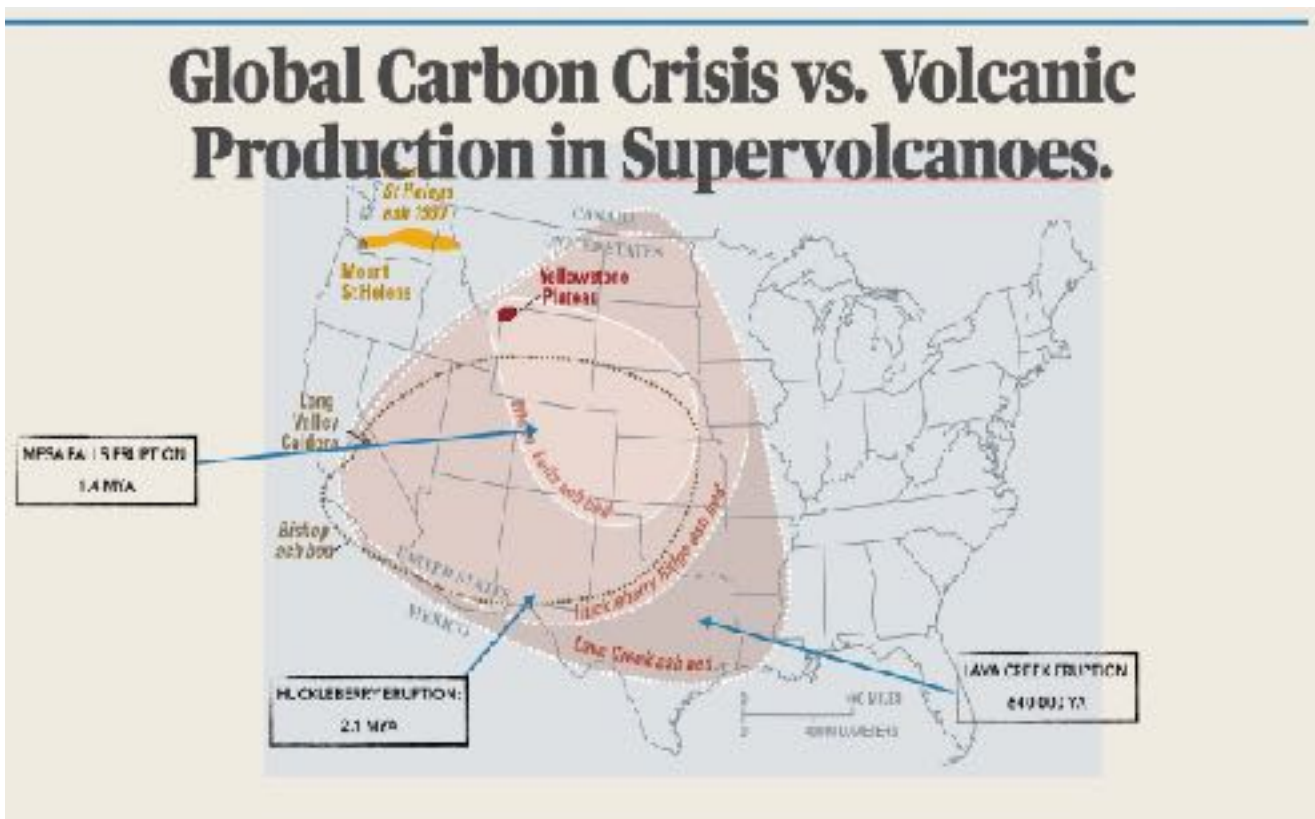
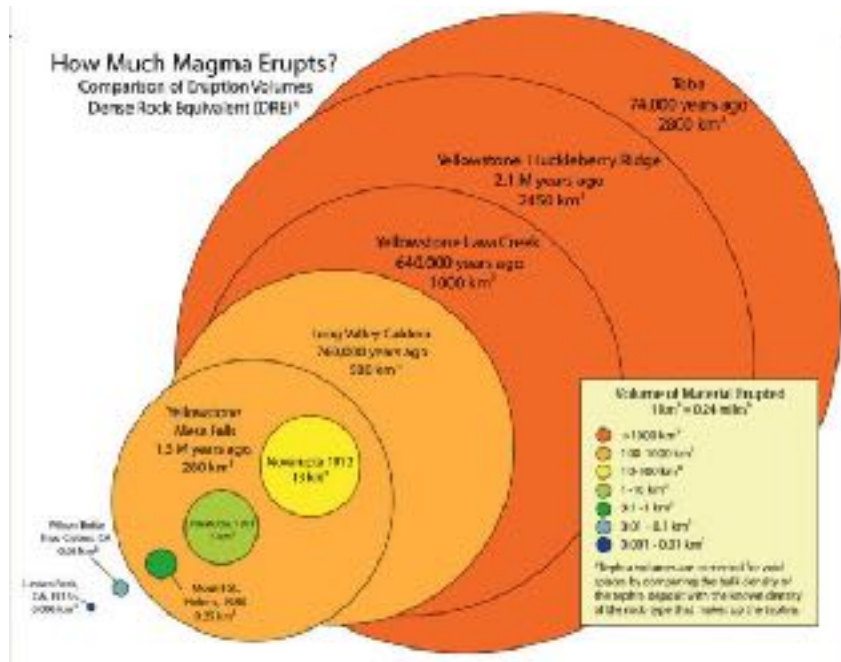
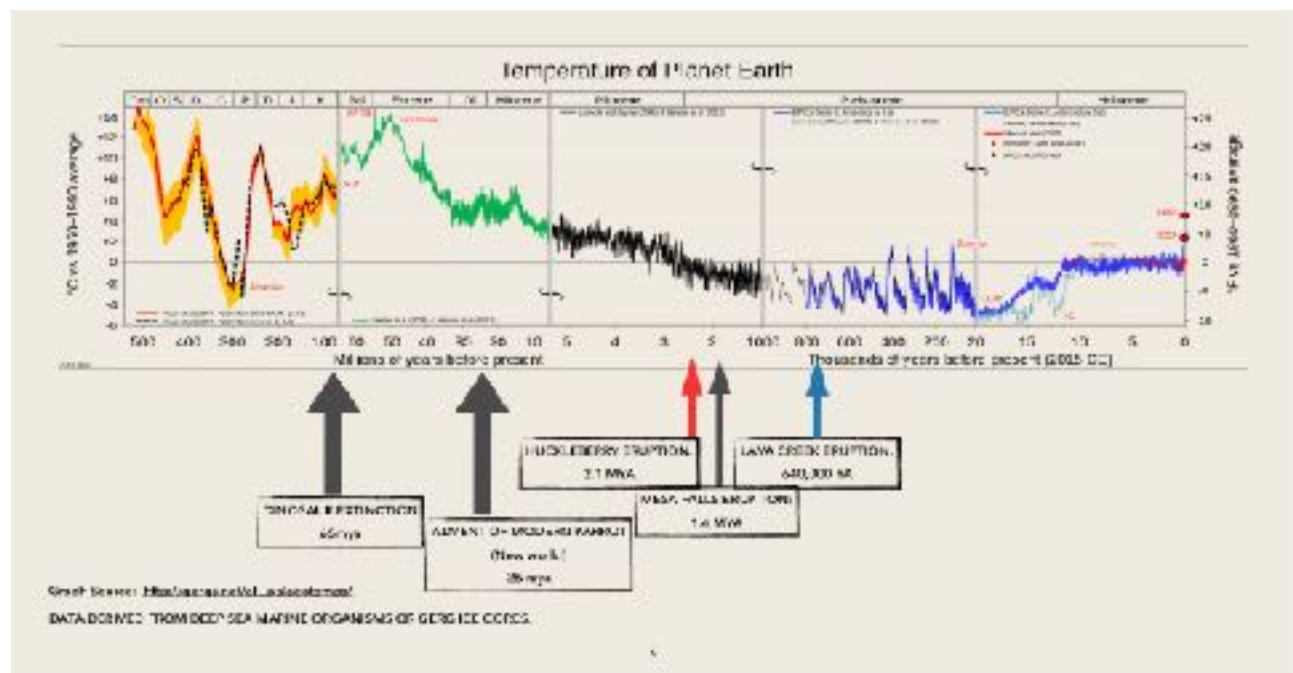


Figure 5. The largest super-volcanic events of the world amount of Magma production.
Source: <https://www.usgs.gov/media/images/comparison-eruption-sizes-using-volume-magma-erupted>



CO2 increases generally relate to increased planetary temperatures that we see derived in Figure No. 6. The data in Fig. 6 is logarithmic in scale. Before the asteroid event of dinosaurs, the temperature stability is widely unknown due to lack of true polar ice caps. We see stability once formed and equally see how significant supervolcanic events have been in destabilizing temperatures. Despite these massive events, modern parrots such as the Blue And Gold Macaw not only survived but equally did not require evolutionary change to do so.

Figure 6. Temperature fluctuations of the planet with GERG ICE CORE DATA pointing out the volcanic activity and advent of parrots. **Source:** http://gergs.net/all_palaeotemps/



According to Nobel Peace Prize immunologist, Peter Doherty (2013), birds foretell the fate of the human race. They have helped us identify DDT hazards, teflon hazards, and protected miners. According to Kenneth Rosenberg et al. in 2021, we lost over 3 billion birds in the United States alone and we are one of the top producers in the world of dissolved CO₂. The correlation between the decline of Psittaciformes and the production of CO₂ should be used as the litmus test of human survivability in during the Global Carbon Crisis issue we have created artificially.

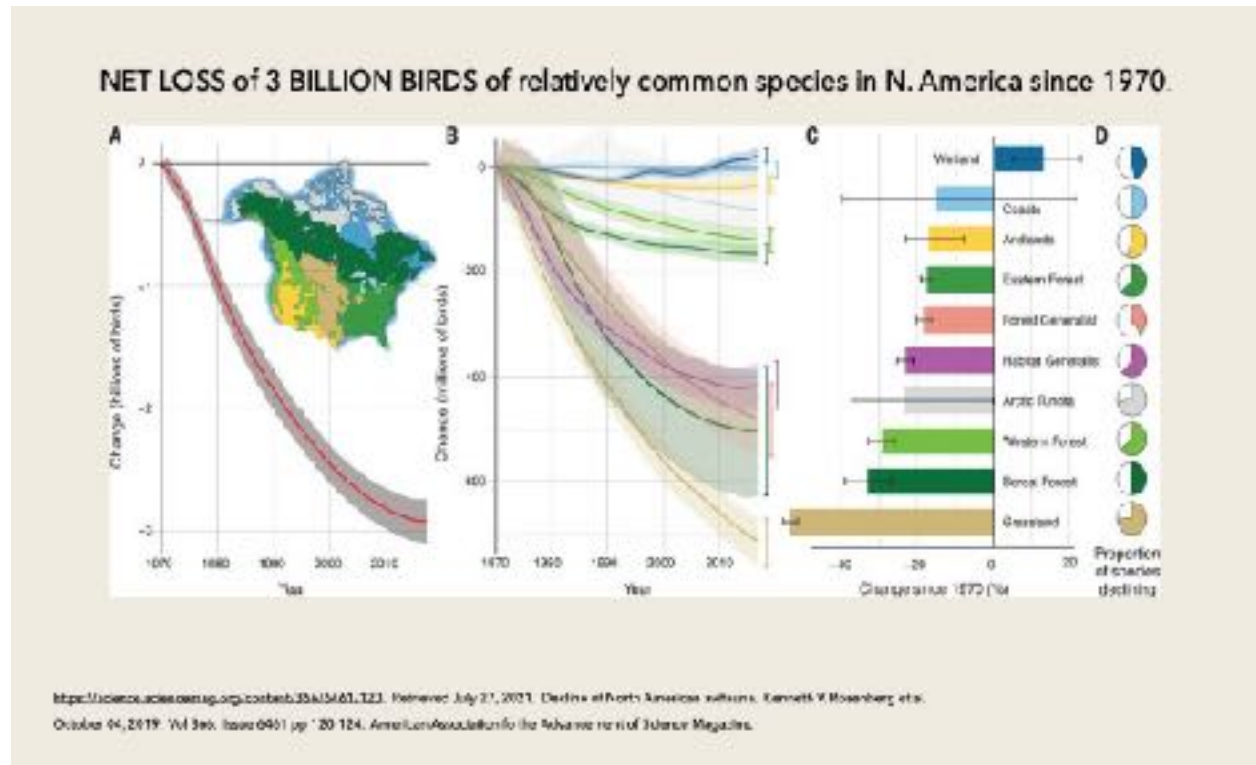


Figure 7. Bird losses in N. America since 1970. (Rosenburg 2021)

Now that the role of parrots in Global Carbon Crisis has been discussed and identified, we need to determine how to achieve the approximal goals discussed at the beginning. To do this, we need a unit of measure for Global Carbon Crisis, the Global Carbon Index.

The Global Carbon Index (CGI) is a unit of measure that looks at the overall production of dissolved Carbon Dioxide gas into the atmosphere vs. a targeted producer of CO₂ emissions. Technology already contains the ability to target CO₂ emissions on many scales from companies to cities to countries. The global carbon atlas, carbon budget, interactive tool looking at carbon production at these levels is found at www.theconversation.com/mapping-global-carbon-emissions-32040. Highlighted are Figures 8 -10 looking at production first in all countries and then with a concentration in the United States.

The Global Carbon Index (GCI) measurement could look much like this:

$$\text{GCI} = \frac{\text{Targeted CO}_2 \text{ gas Emitter Measurement at X moment}}{\text{Total Global CO}_2 \text{ Emission Measurement at X moment}}$$

From this calculation, we can create a percentage and ask for approximal percentage change over time. CGI is a measurable, approximal way to ask for change that everyone can understand perhaps starting with small percentage requests at first vs. large, sweeping steps that do not consider impacts of their solution. The ability to deliver this calculation does not require new infrastructure nor actual investment as Figures 8-10 once more clearly show how well we can target CO2 tracking system already (source: <https://theconversation.com/mapping-global-carbon-emissions-32040>.)

Figure 8-10: Global Carbon Emissions as determined by CDIAC, Global Carbon Budget 2014 and the Global Carbon Atlas.

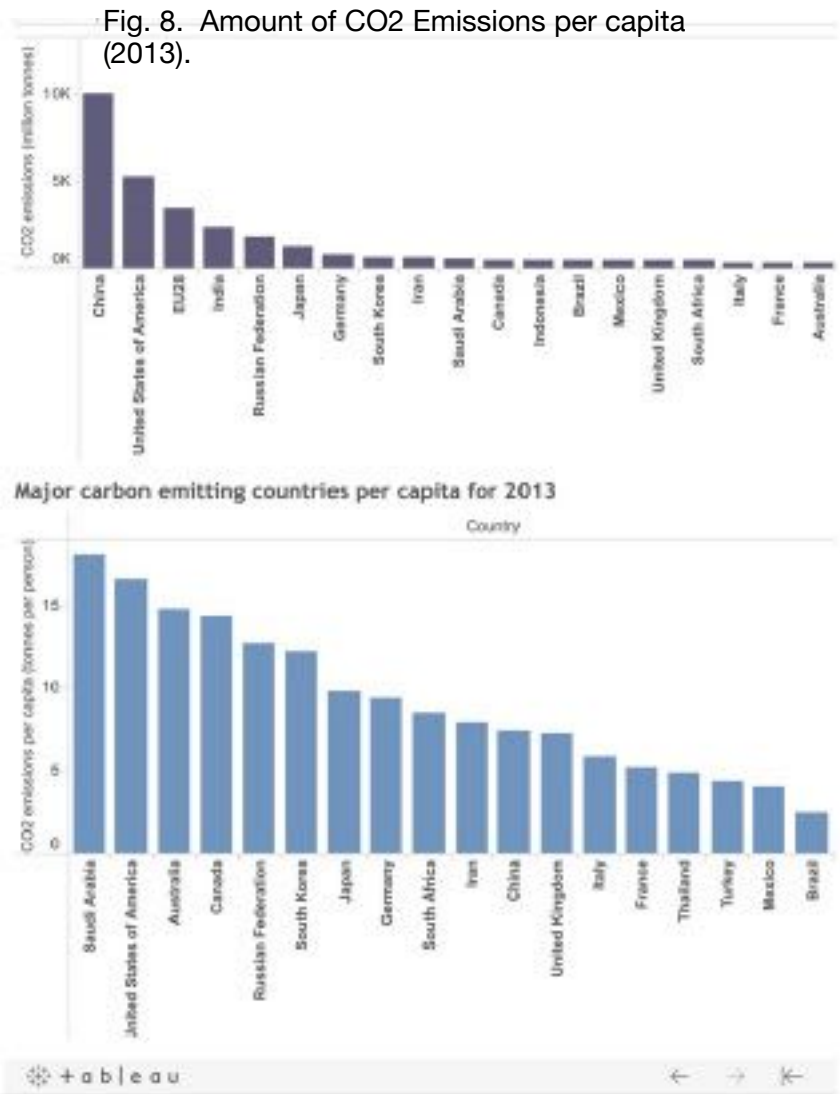


Fig. 9. Amount of CO2 accumulated production per country from 1960-2013. As of 2024, China now leads overall accumulated production.

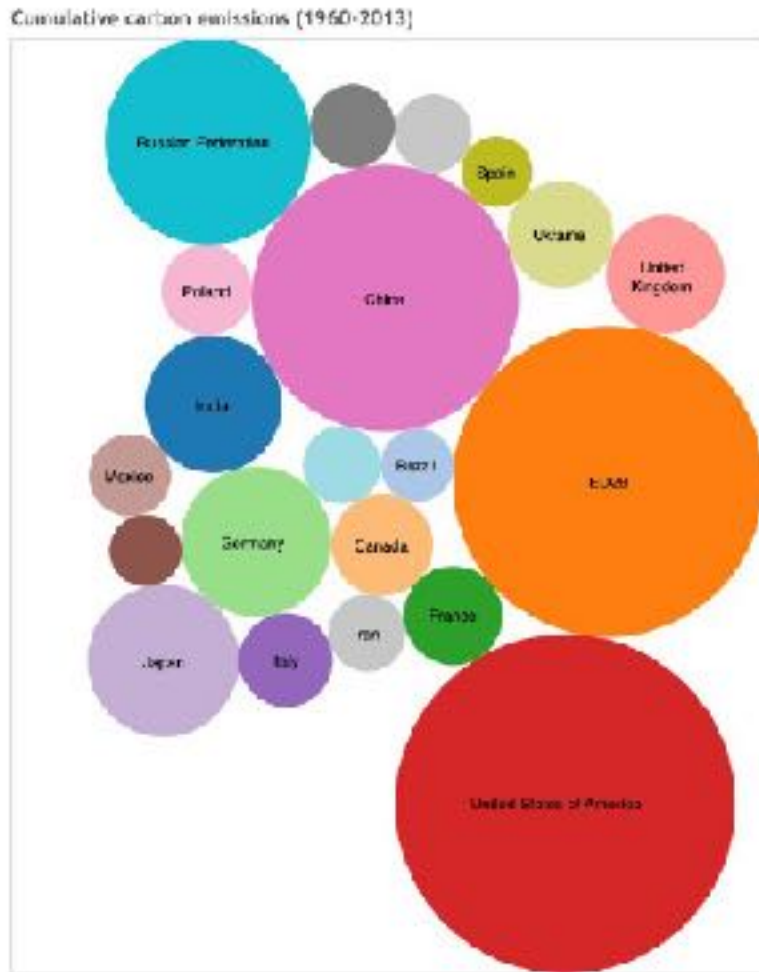


Fig. 10. Using the interactive, online platform above, a person can target a specific country and look at their cumulative emissions. See source below.



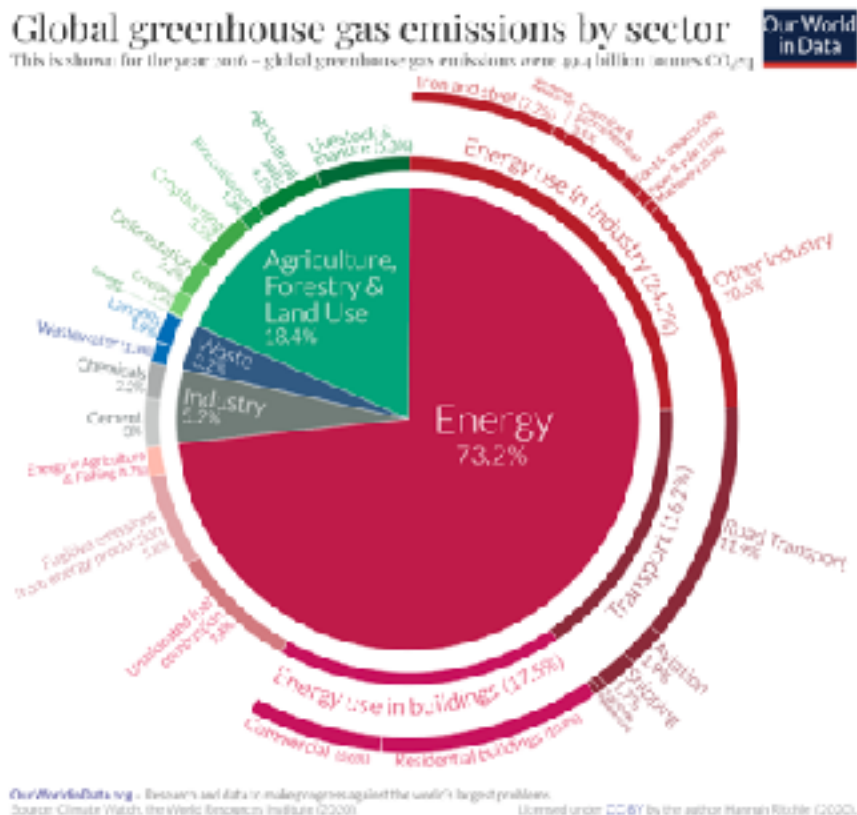
Utilizing the correct nomenclature to the current climate crisis that needs addressing dismisses needs needs for further debate if our production of CO2 is affecting natural climate change. After all, we cannot “combat climate change” since we have proven it naturally occurs in an interglacial cycle with or without our production or scrubbing ability.

Using the measurable outcomes like GCI using technology already in place removes need to invest large sums of money; focuses the problem that is measurable; and upholds industry requirements to combat a man-made problem that accelerated the natural climate change. We currently have no idea what 422ppm dissolved in the atmosphere is going to do. We do know it has never, in the history of the planet emitted or recorded over 330ppm in the catastrophies I have pointed out.

Instead of focusing on “green energy” solutions, the focus should target the highest priority problem—removing the artificial CO2 still being created. After all, natural, planetary processes for carbon scrubbing are ceasing carbon sink ability completely and are now also emitting CO2 (See Washington Post, Pruitt-Young 2021). This is expected at the apex of naturally-occurring climate change processes along with overall planetary instability leading to more fires, more drought, larger storms, etc.

Believing “car emissions” are the primary source of CO2 production is incorrect at best. Planned Obselence is far worse where companies are manufacturing items to not last as long using vast resources to to create each item. According to Figure 11, transportation by vehicles globally accounts for 11.9% of emissions vs. the grid(17.5%), manufacturing (24.2%) or agriculture (18.4%).

Figure 11. Global Greenhouse Gas Emissions by Sector.



[\[Clicking on this visualization will open it in higher resolution\]](#)

[Download the data used in this visualization \(xlsx\)](#)

Utilization of GCI using any means necessary now vs. creating new, unknown-mass-impact technology is imperative. Ensuring emitters hold to their actual reduction vs. paying off their production and still continuing on.

Work with parrots shows us what works and what does not in regards to increasing desired behavior. Positively Reinforcing small, successive steps is the clearest, most forward solution that also encourages innovation. Taxation, or positive punishment, must be so severe for the tool to work, the behavior is never utilized again. Asking regulators to uphold strictly reductions in GCI and massive taxation for lack of reduction is our solution to the Global Carbon Crisis.

Global Carbon Crisis is artificially created by anthropogenic factors. Parrots are not surviving Global Carbon Crisis that have survived many natural global crises in the past. Calling the problem the correct problem to drive the solution is what we need to save parrots and mankind alike.

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