

Outline

- ▶ Greenhouse gases
- ▶ Atmospheric CO₂
 - ▶ Where we are
 - ▶ Where we are going
 - ▶ Correct solution to lower Atmospheric CO₂
- ▶ Fair question.
- ▶ Ocean is not a sink for atmospheric CO₂
- ▶ Summary
- ▶ Acknowledgments

Greenhouse gases

Compound	Formula	Concentration in atmosphere ^[25] (ppm)	Contribution (%)
Water vapor and clouds	H ₂ O	10–50,000 ^(A)	36–72%
Carbon dioxide	CO ₂	~400	9–26%
Methane	CH ₄	~1.8	4–9%
Ozone	O ₃	2–8 ^(B)	3–7%

notes:
(A) Water vapor strongly varies locally^[26]
(B) The concentration in stratosphere. About 90% of the ozone in Earth's atmosphere is contained in the stratosphere.

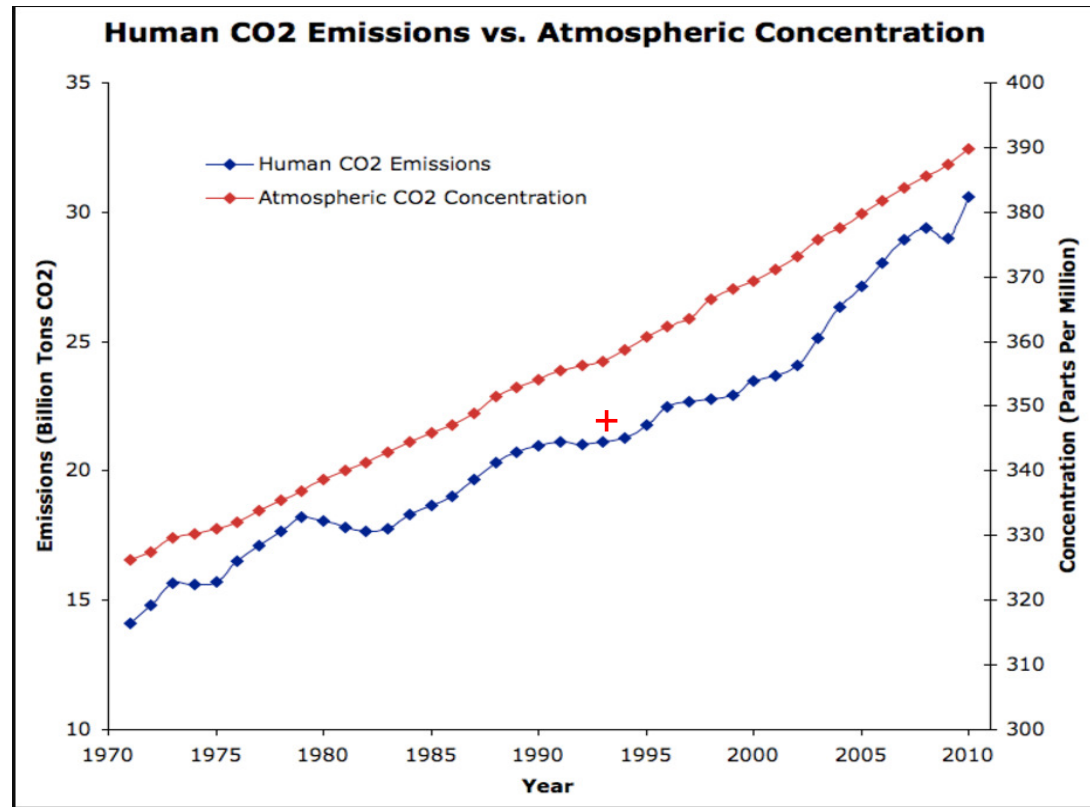
Carbon dioxide is the only issue to be concerned about

Where we are

- ▶ There *appears* to be a correlation between human CO2 emissions and atmospheric emissions
- ▶ Evidence suggest this is misleading
- ▶ Established statistical standards direct us to conclude that this doesn't rise to the level of significance

Where we are

2008 $r_{xy}=0.87$



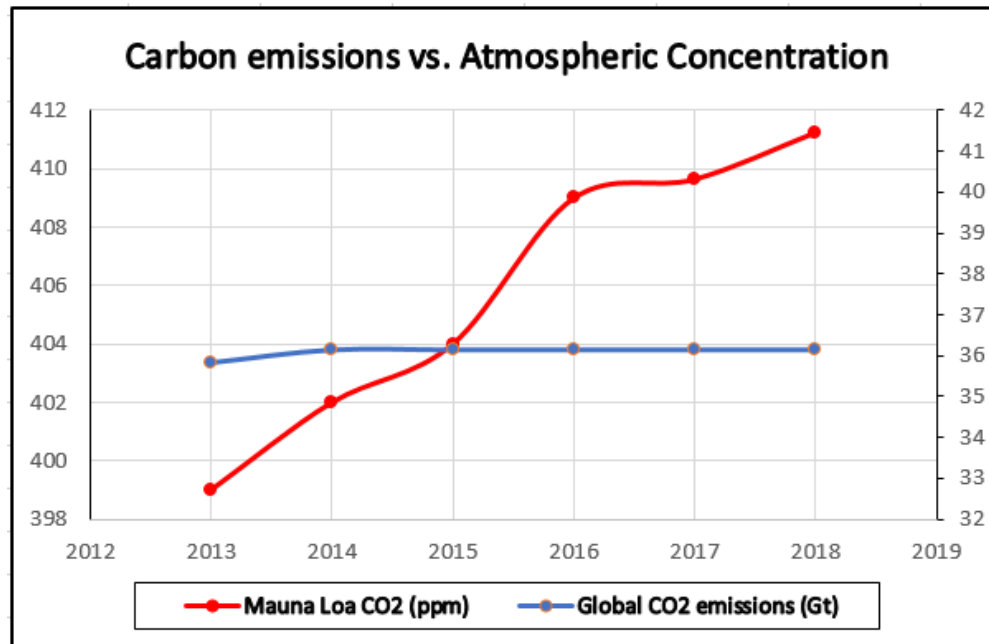
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Where we are

- ▶ After wasting \$2 trillion over 15 years we have no reduction in atmospheric CO2
- ▶ Emissions are flat however atmospheric CO2 continues to rise
- ▶ The correlation between emissions and atmospheric CO2 is becoming less significant.

Where we are

2018 $r_{xy}=0.72$

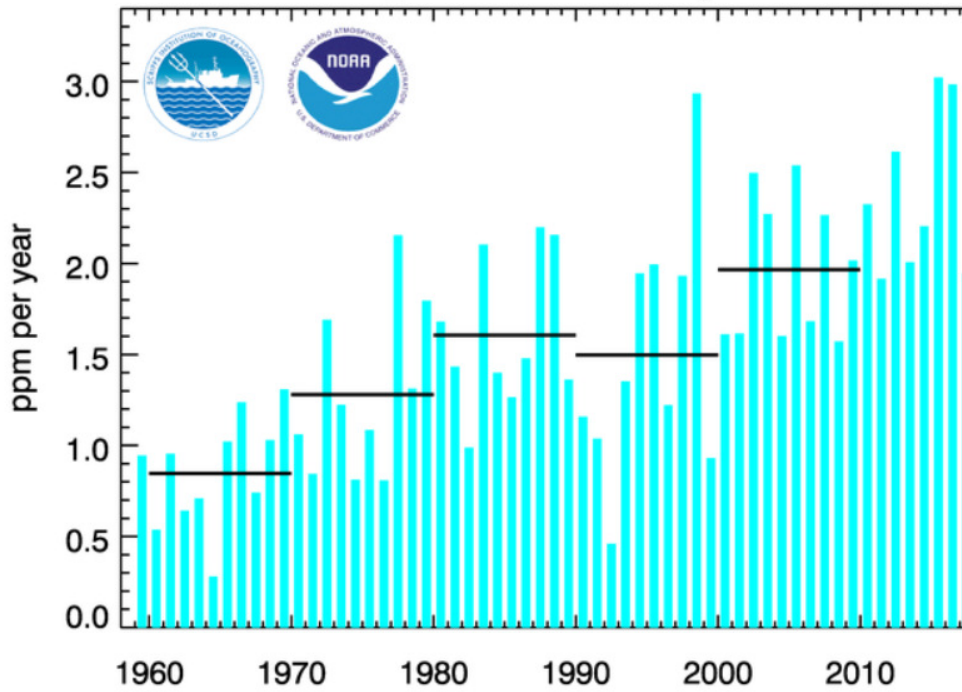


Mauna Loa World repository for CO2 data

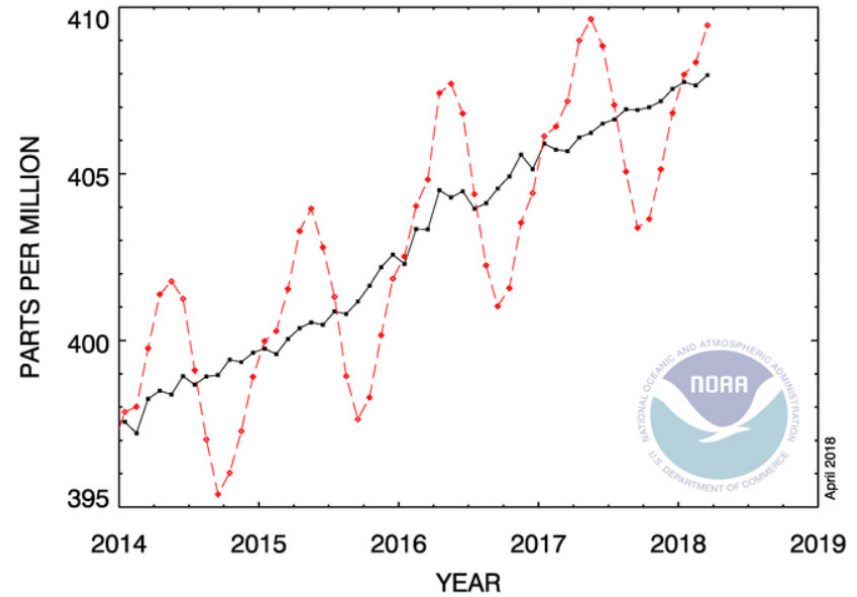
- ▶ CO₂ continues to rise
- ▶ The *rate of rise* is increasing.
- ▶ Despite the fact that Human emissions are flat

Growth Rate

annual mean growth rate of CO₂ at Mauna Loa



RECENT MONTHLY MEAN CO₂ AT MAUNA LOA



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Where we are going

► Facts

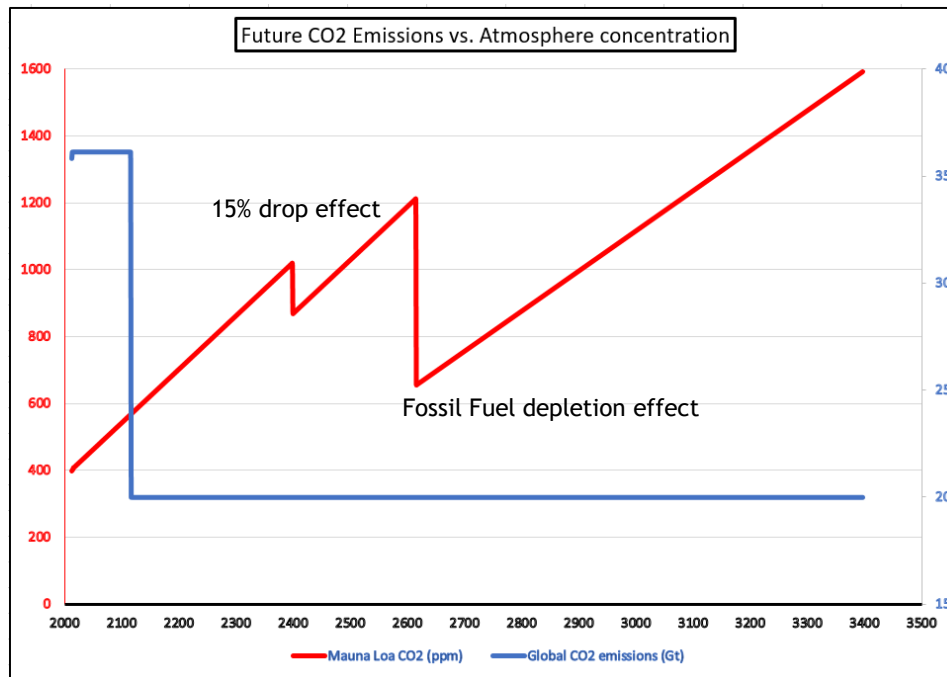
- Current proposed solutions take 500 years for effect.
- Increased emissions and reduced photosynthesis (deforestation) have increased the effective time from 5 years to 500 years.
- Most work is on carbon emission reduction
 - Reforestation efforts in China and North America ongoing.
- CO₂ that is not consumed in photosynthesis is added to the atmosphere.

Where we are going

- ▶ Assumptions moving forward
 - ▶ Keep current carbon emissions level at 32 billion metric tons annually.
 - ▶ Decreases of carbon emissions will be offset by increases in population
 - ▶ Atmospheric CO₂ stays the same slope.
 - ▶ After 100 years no more fossil fuels so carbon emissions drop by 30%

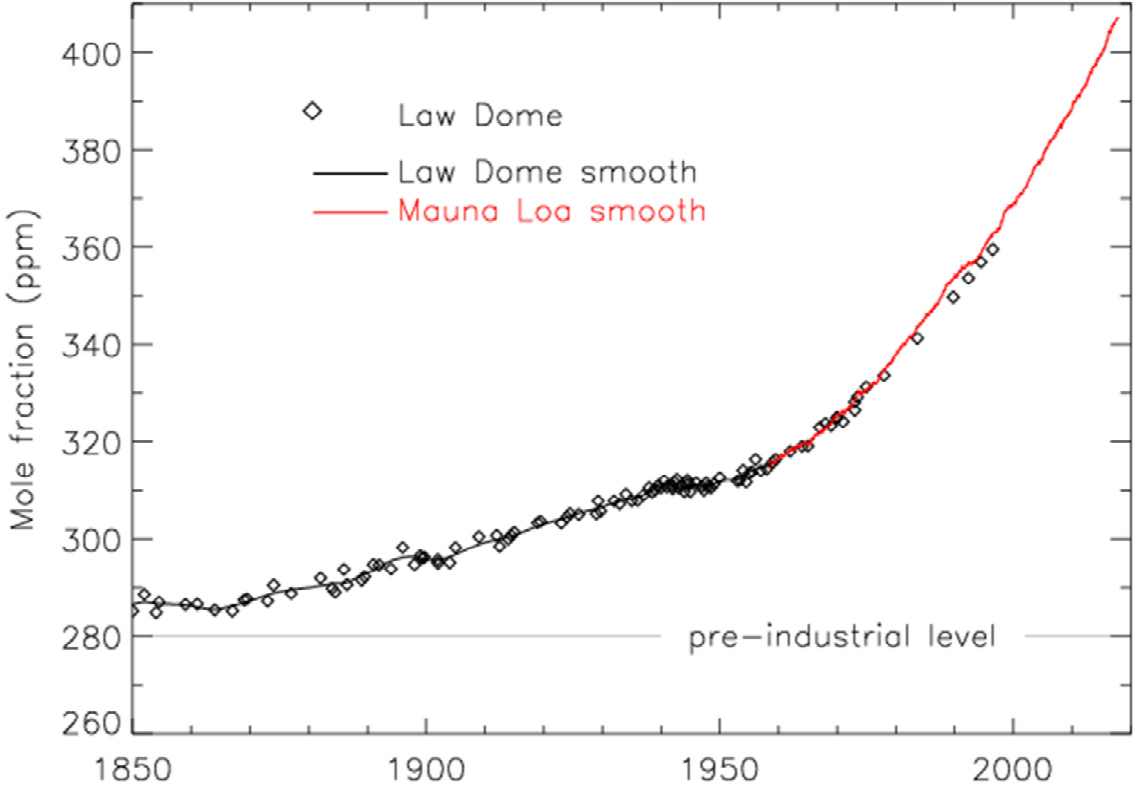
Future

- ▶ CO₂ emissions correlation shrinks with passing of time.
- ▶ **Correlation goes to zero at year 2100**



Mauna Loa CO2 data

Last 160 years of atmospheric CO2



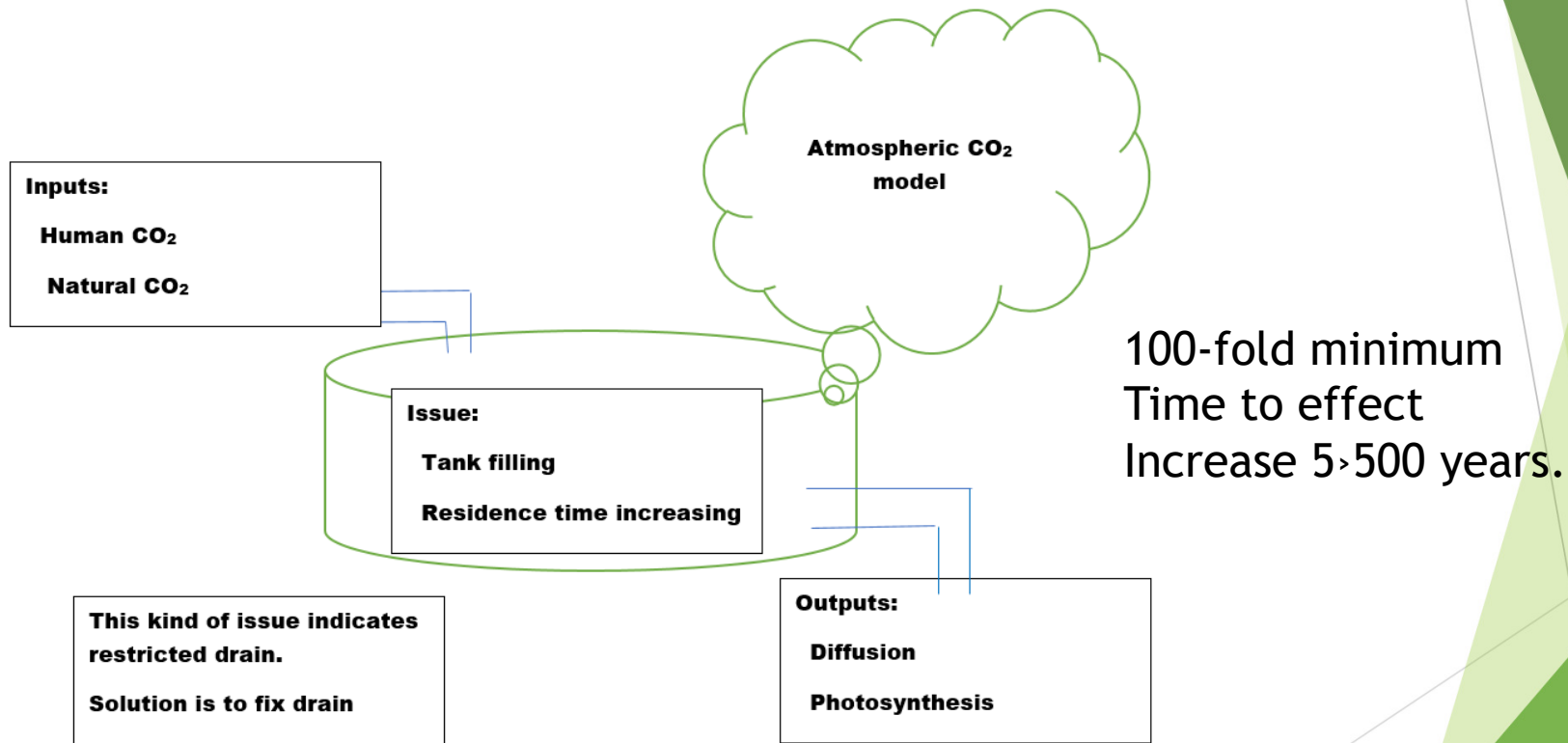
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Mauna Loa CO₂ data

- ▶ What happened in 1950?
- ▶ Human and Natural emissions currently account for 363 ppm out of 411 ppm of CO₂
 - ▶ Increased photosynthesis from earths warming is consuming unaccounted for CO₂ from Human activity.
- ▶ What accounts for the 48 ppm difference?

Atmospheric CO₂ Tank Model



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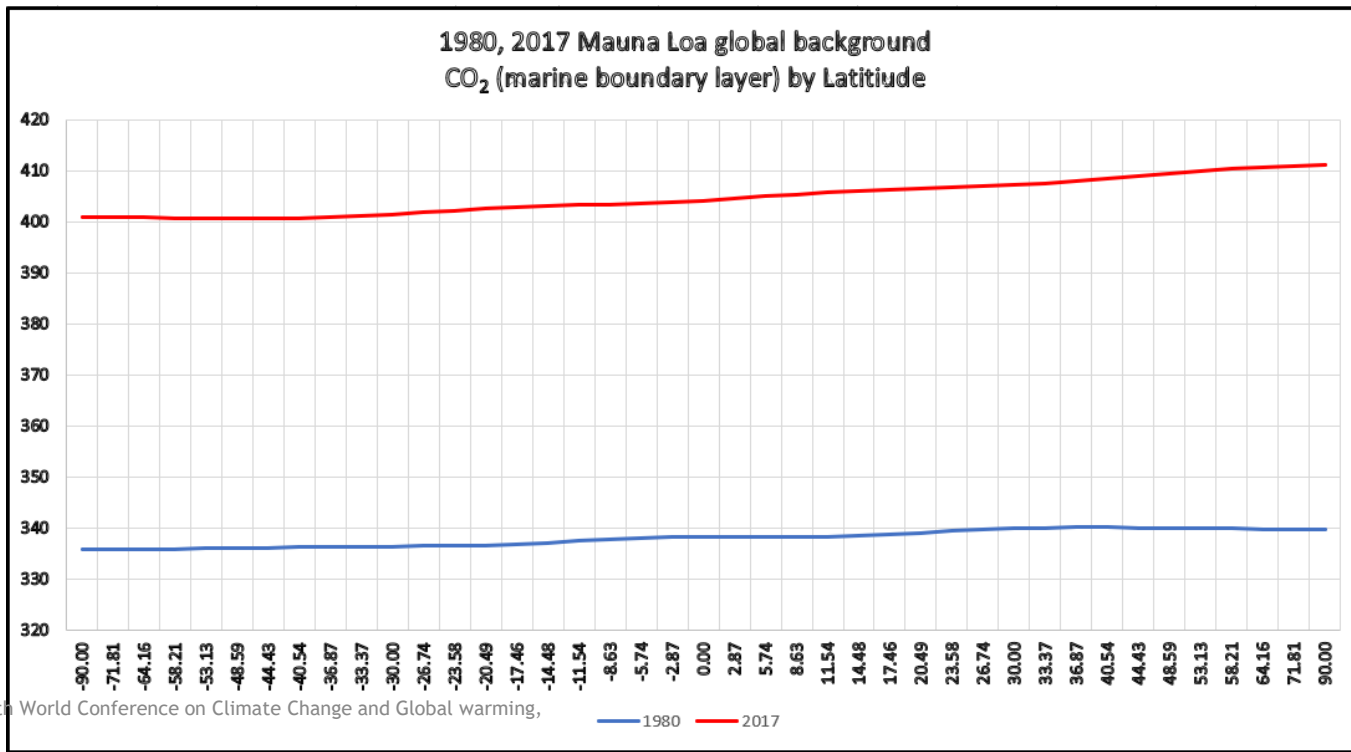
What Photosynthesis issue could account for that 48 ppm?

Solution - Fix the Drain!

- ▶ If your kitchen sink wont drain removing the faucet wont help.
- ▶ Removing the incoming plumbing wont help.
- ▶ Removing your neighbors plumbing wont help.
- ▶ **Need to unclog the drain!**

Atmospheric CO₂ is uniform by latitude

- Solutions can be implemented anywhere in the world.



Courtesy
Mauna Loa

Photosynthesis consumption issues

- ▶ City sprawl accounts for 1 billion tons of lost CO₂ consumption
- ▶ IPCC forestry section estimates additional 2-3 billion tons lost CO₂ consumption each year from bio-mass burning (natural and human caused)
- ▶ Deforestation of 30 million acres annually in Amazon Rain-forest is 90 million tons lost CO₂ consumption. Total of 60 billion tons lost since 1950.
- ▶ More than 600 billion tons lost annual CO₂ consumption from Amazon Rain-forest switching to Oxygen sink and CO₂ producer
 - ▶ 19x human and natural CO₂ sources

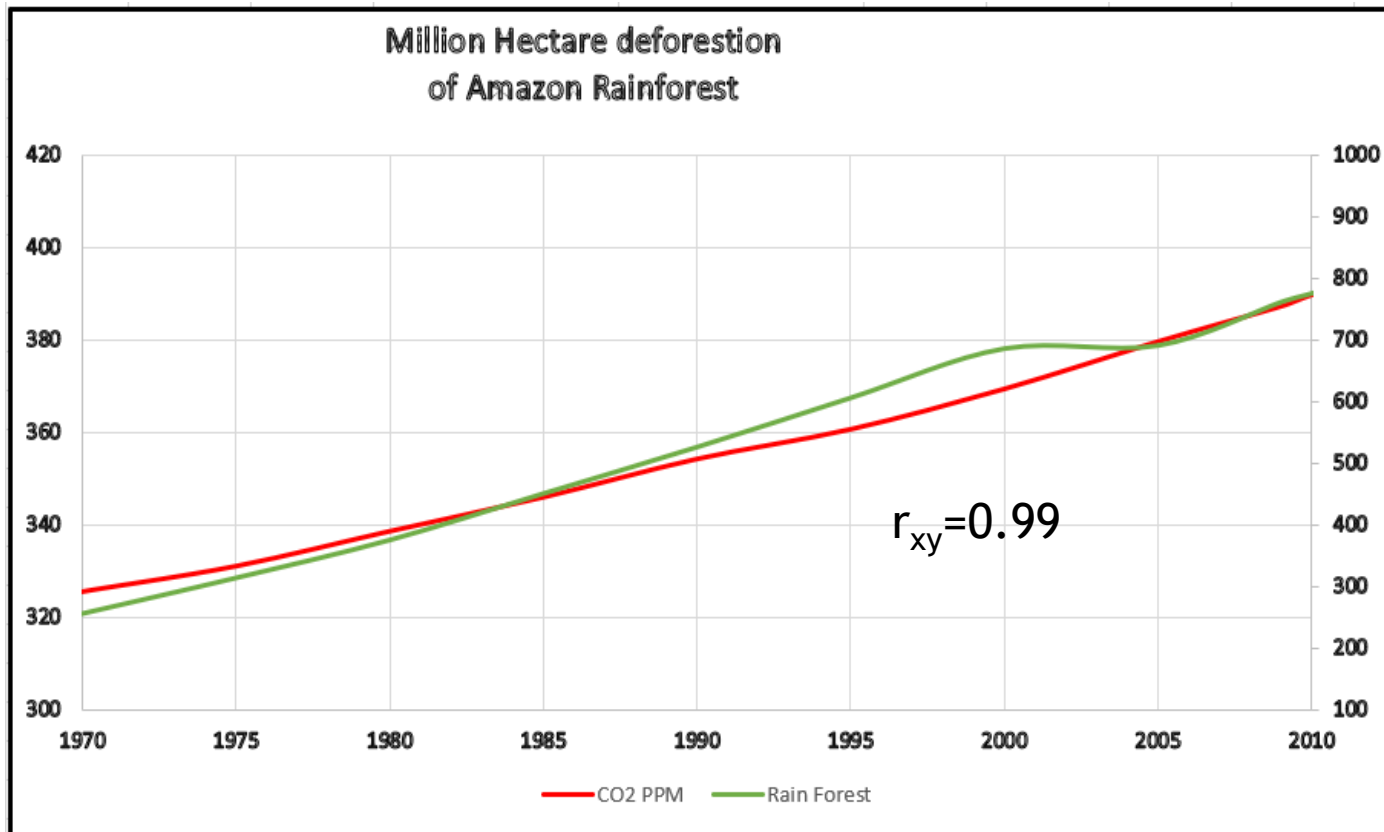
Photosynthesis consumption issues

- ▶ CO₂ emission breakdown
 - ▶ 11 billion tons of human emissions
 - ▶ 3 billion tons deforestation
 - ▶ 21 billion tons natural emissions,
 - ▶ half are from the switch over of the Amazon to an oxygen sink and carbon dioxide producer.
 - ▶ That is 2.0 tons per acre.

Amazon Rain-Forest

- ▶ **Atmospheric CO₂ is highly correlated with Amazon deforestation**
- ▶ **CO₂ Emissions effect is 363 ppm**
- ▶ **Rain-forest deforestation accounts for recent 48 ppm**

Amazon Rain-Forest



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Amazon Rain-forest

2 Billion acres deforested since 1950.

1950 start deforestation

1957 Atmospheric Carbon Dioxide started current increase

1970's trees and plants toppling over.

Burning of bio-mass each acre causes minimum 1 billion CO₂ release annually (6 months)

The massive release caused plants to grow too fast causing toppling and massive decay.

Amazon Rain-forest

1990's Switch over to oxygen sink and carbon dioxide producer.

Massive decay causing the rain-forest to change to an oxygen sink and carbon dioxide producer.

One billion annual tons of carbon dioxide from biomass burning.
60 billion tons annual CO₂ consumption lost from deforestation.

600 billion tons annual CO₂ consumption loss from the switch over.

10-15 billion tons emissions from decay per annum

We have lost 20%+ of Earths Oxygen production



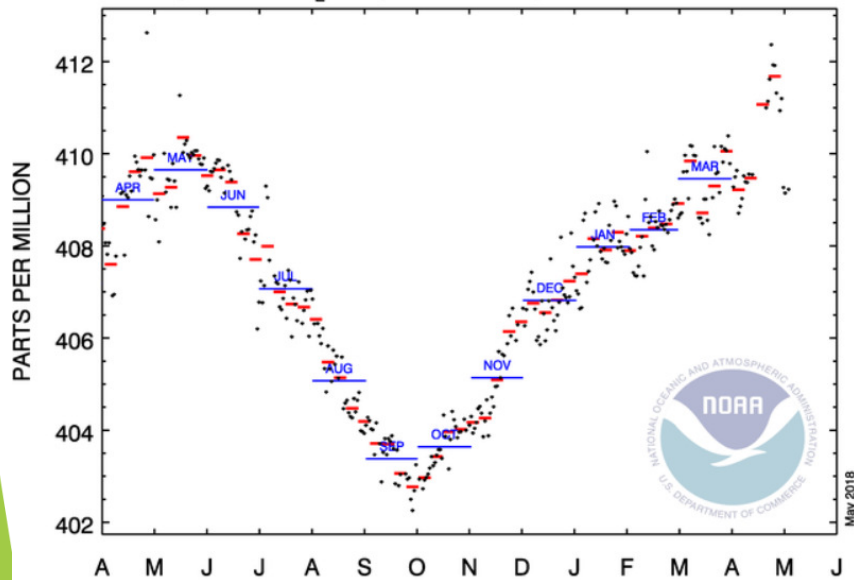
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Mauna Loa seasonal trend contradiction

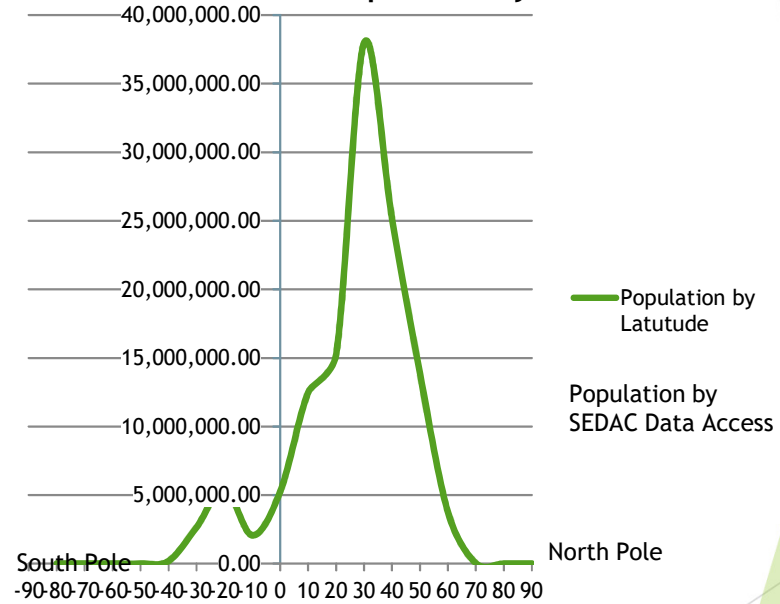
- ▶ CO₂ decreases during Northern Hemisphere summer when there is more economic activity
- ▶ **CO₂ increases during southern hemisphere summer and decreases during their winter.**

Mauna Loa seasonal trend contradiction

One year of CO₂ daily and weekly means at Mauna Loa



World Population by latitude



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Correct solution for Atmospheric CO₂

- ▶ Moratorium on Rain-forest deforestation starting now! All nations need to put pressure on Brazil and all south America to stop this. Not one more acre.
- ▶ Plant native trees and shrubs all over the world. 1 billion new in 2019-2020. **Increase Photosynthesis!**
- ▶ Stop deforestation in India and anywhere that is not sustainable.

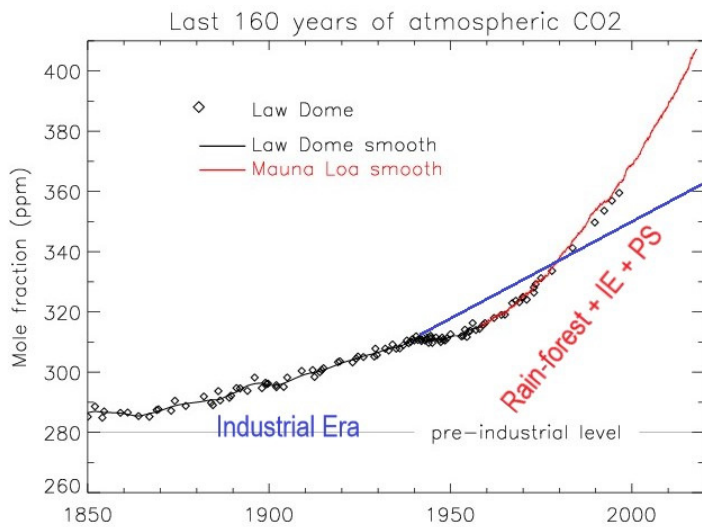
Planting Ideas

1. Provide space where public can come and plant trees and shrubs. All government-owned lands. Very small cost. Need website with document for each planting area.
2. Plant shrubs in all freeway medians and sides. This is revenue plus. Plant native shrubs at a minimal spacing so all light is used in photosynthesis. This will take in 1 ton of CO₂ emissions per acre per year right at the source. The space would not need to be mowed every week in the summer.
3. Get schools involved and planting massive number of trees and shrubs. In their property and the government property as in 1 above.
4. Parks can add trees and shrubs.
5. Tax incentive for business to plant trees and shrubs. Flat roofs which can structurally handle dirt can plant shrubs at minimum spacing and water using drip irrigation.
6. Wild fire attention. Get a retainer for the Jet plane and use it from the start on any wild fire.

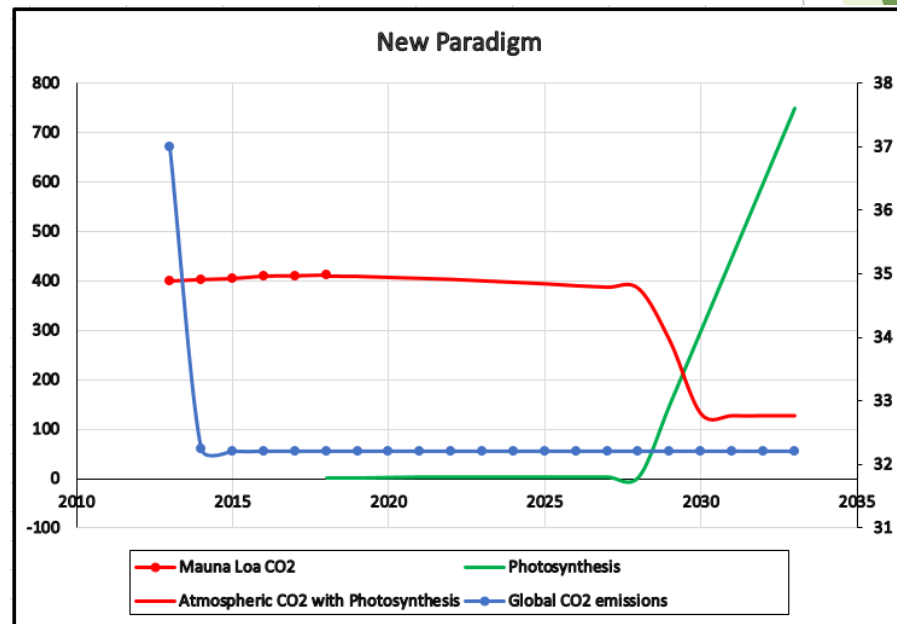
This all-government policy document is on the home page of cctruth.org

New Paradigm

- ▶ We have worked on Carbon Emissions.
- ▶ Lets work on Photosynthesis. Atmospheric CO₂ decrease by 2031.
- ▶ Drain atmospheric CO₂ like a bathtub.



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Fair Question

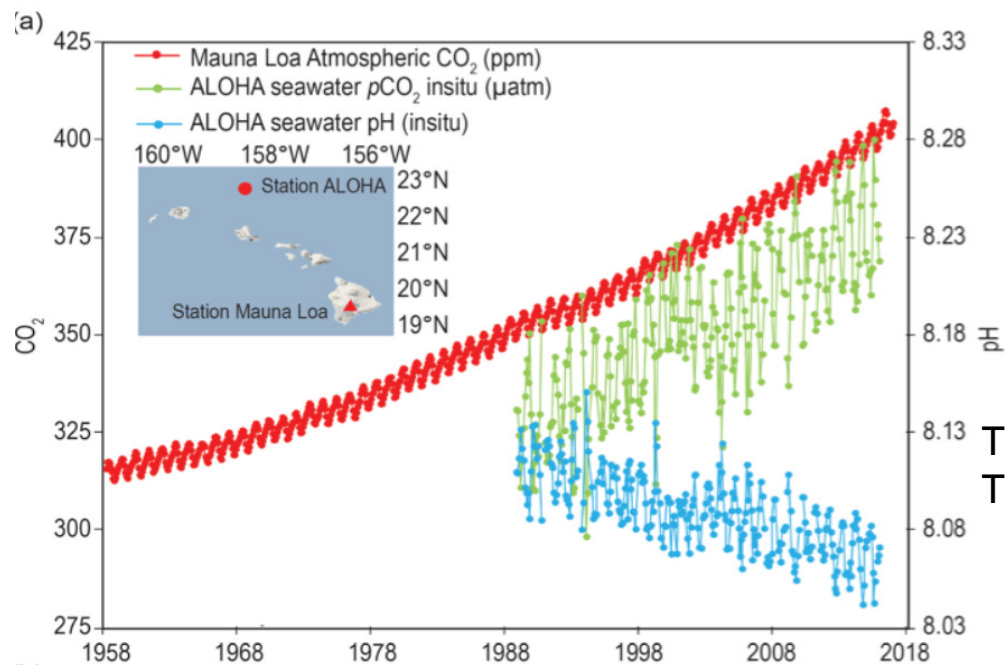
- ▶ How much carbon emissions reduction equates to how much Atmospheric CO₂ reduction?
 - ▶ Land based photosynthesis consumes 15% of current emissions
 - ▶ Land based is 50% of world-wide photosynthesis
 - ▶ Therefore we need to reduce emissions to 16 billion tons to get equilibrium
- ▶ *This question should have been addressed at the beginning of climate change research*

Ocean not a sink for atmospheric CO₂.

- ▶ Carbon dioxide diffusion in air is 2 cm per month.
 - ▶ This is the rate limiting constraint.
 - ▶ Diffusion across ocean/air boundary is 14.8 cm per day.
 - ▶ Ocean wave curl and ocean spray capture a small amount of CO₂
 - ▶ Photosynthesis from surface plants capture CO₂ but do not add to ocean CO₂

Ocean CO₂ data

- ▶ Garbage put into the oceans is one of the causes of ocean CO₂ increase
 - ▶ In 2002 the Belgian ship, the Belgica went up the Petite Nèthe river near Antwerpen. The values for CO₂ were in the 7000 range
 - ▶ That river is polluted with manure. Direct cause by decomposing debris for ocean CO₂ increase
- ▶ No correlation to current atmospheric CO₂



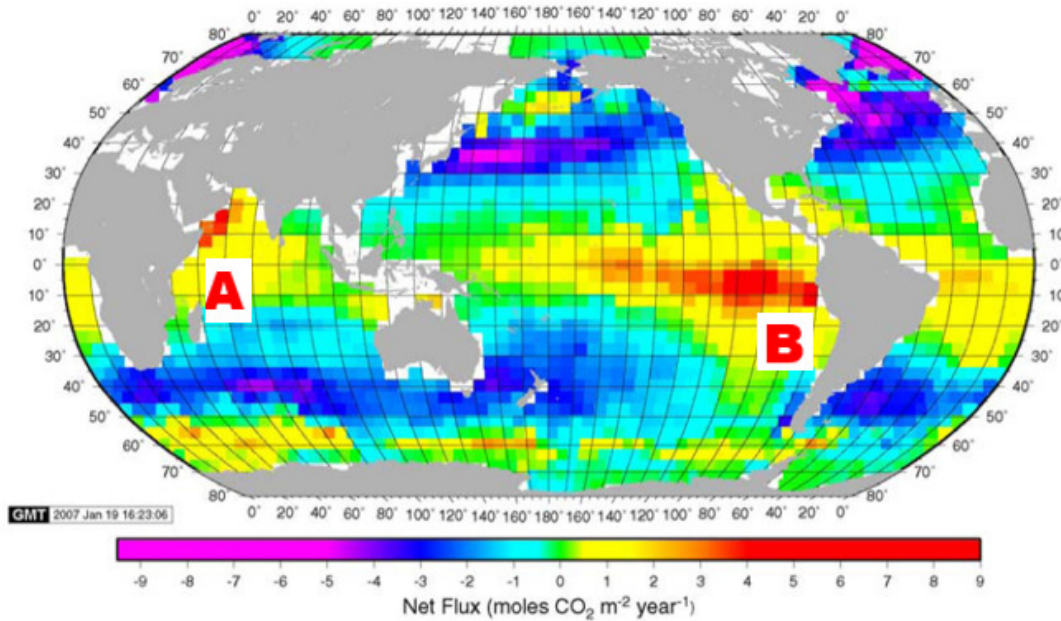
$R_{xy}=0.64$

This is a subset of SOCAT data.
The regression by target applies

Time series of atmospheric CO₂ at Mauna Loa (ppm), surface ocean pCO₂ (μatm) and pH at Ocean Station ALOHA in the subtropical North Pacific Ocean. Mauna Loa data: (ftp://aftp.cmdl.noaa.gov/products/trends/co2/co2_mm_mlo.txt); HOTS/ALOHA data: University of Hawaii (http://hahana.soest.hawaii.edu/hot/products/HOT_surface_CO2.txt).

No correlation to current atmospheric CO₂.

Ocean Flux or decay?



A is polluted rivers in SE Asia
B is most likely Cruise ship human waste decay.

Ocean Dumping Data

- Since 1968 the USA, Canada and Europe have stopped dumping garbage in the ocean.
 - Asian cities still do.
 - Every river in Vietnam is polluted and puts that pollution into the ocean.
- Cruise Lines dump human waste directly into the ocean.
 - Estimated 700 million tons of ocean CO₂ added from decay of human waste last year.
- **This distorts the data and falsely implies oceans are CO₂ sink**

Summary

- ▶ Atmospheric CO₂
 - ▶ Recent rise not caused by CO₂ emissions.
 - ▶ Caused by massive loss of photosynthesis
 - ▶ Mainly Amazon Rain-forest
 - ▶ Does not diffuse into the ocean. Ocean dumping is the cause of Ocean CO₂ rise
- ▶ Solution is to increase photosynthesis.
Unclog the drain!

Acknowledgments

- ▶ International Journal of Chemical Engineering
- ▶ International Journal of Environmental Science and Development
- ▶ 2018 Climate Change Conference Committee