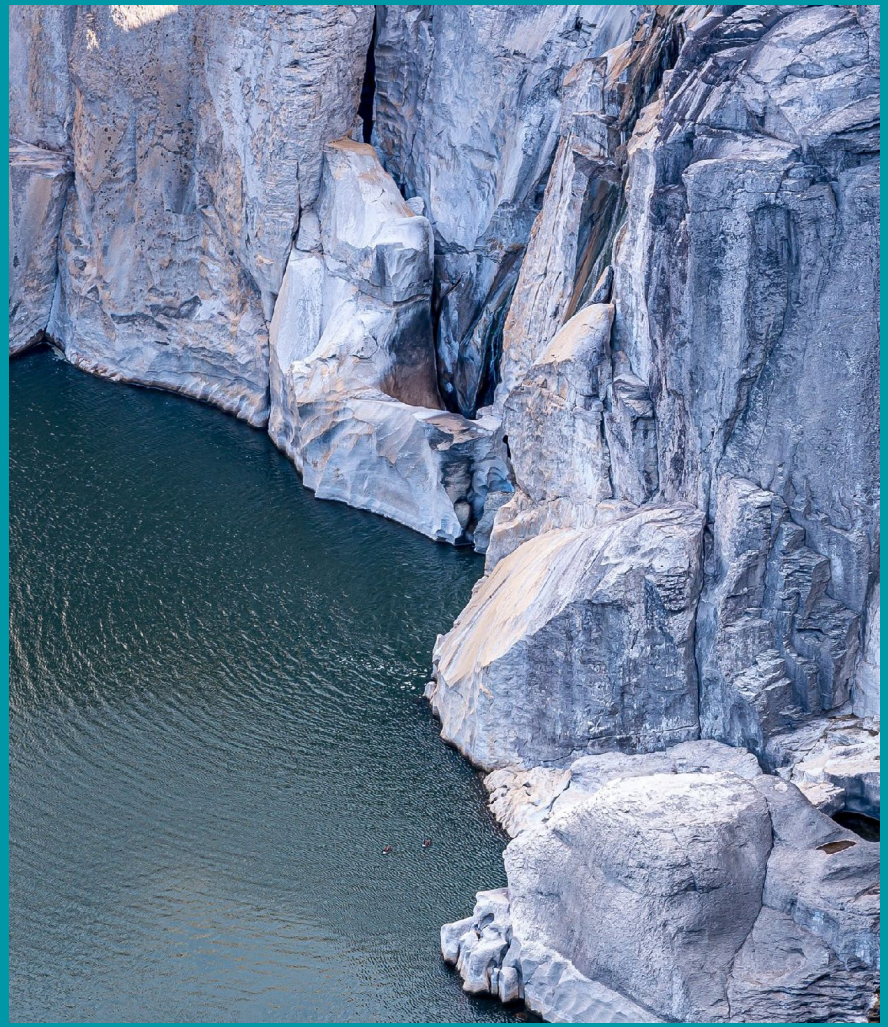

Climate Restoration for Humanity Flourishing July 2022

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Climate Restoration is for all humanity

Climate Restoration is our common goal

1. We all want to restore a "safe harbor" climate that humans have actually survived long-term, with CO2 roughly 280 ppm.

2. We also all want to restore a sustainable population, because we want to sustain humanity.

3. Have you ever heard an expert claim that the UN net-zero and population goals leave even a decent chance for humanity to survive?

   In five years of asking, I've never heard that said.

Climate Restoration is possible now

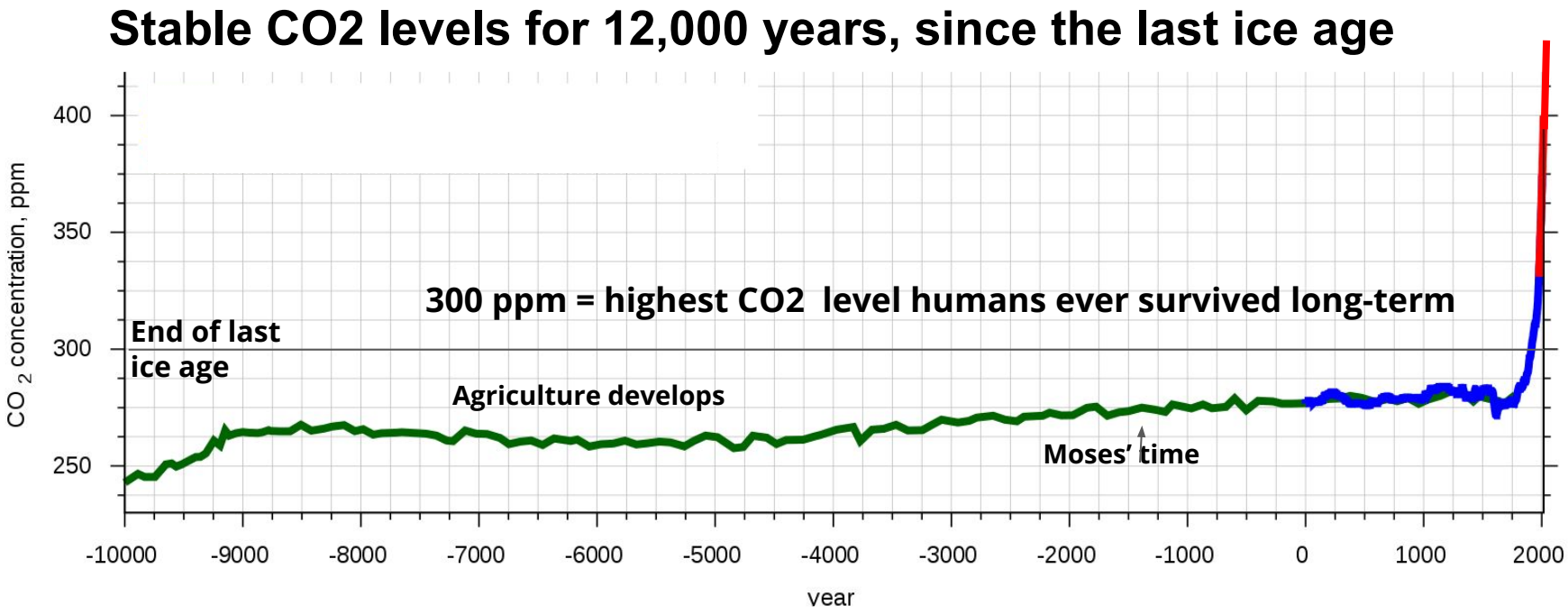
4 Achieving our climate and population safe-harbor goals can be done, and is being started now. The technology and finance exist; they need to be promoted and scaled.

5 Nature has removed a trillion tons of CO2 10 times in the last million years, preceding ice ages. We can do it too, faster.

6 Climate restoration will require investment of about $2 billion per year, less than 1% of the transition to clean energy. We will do both.

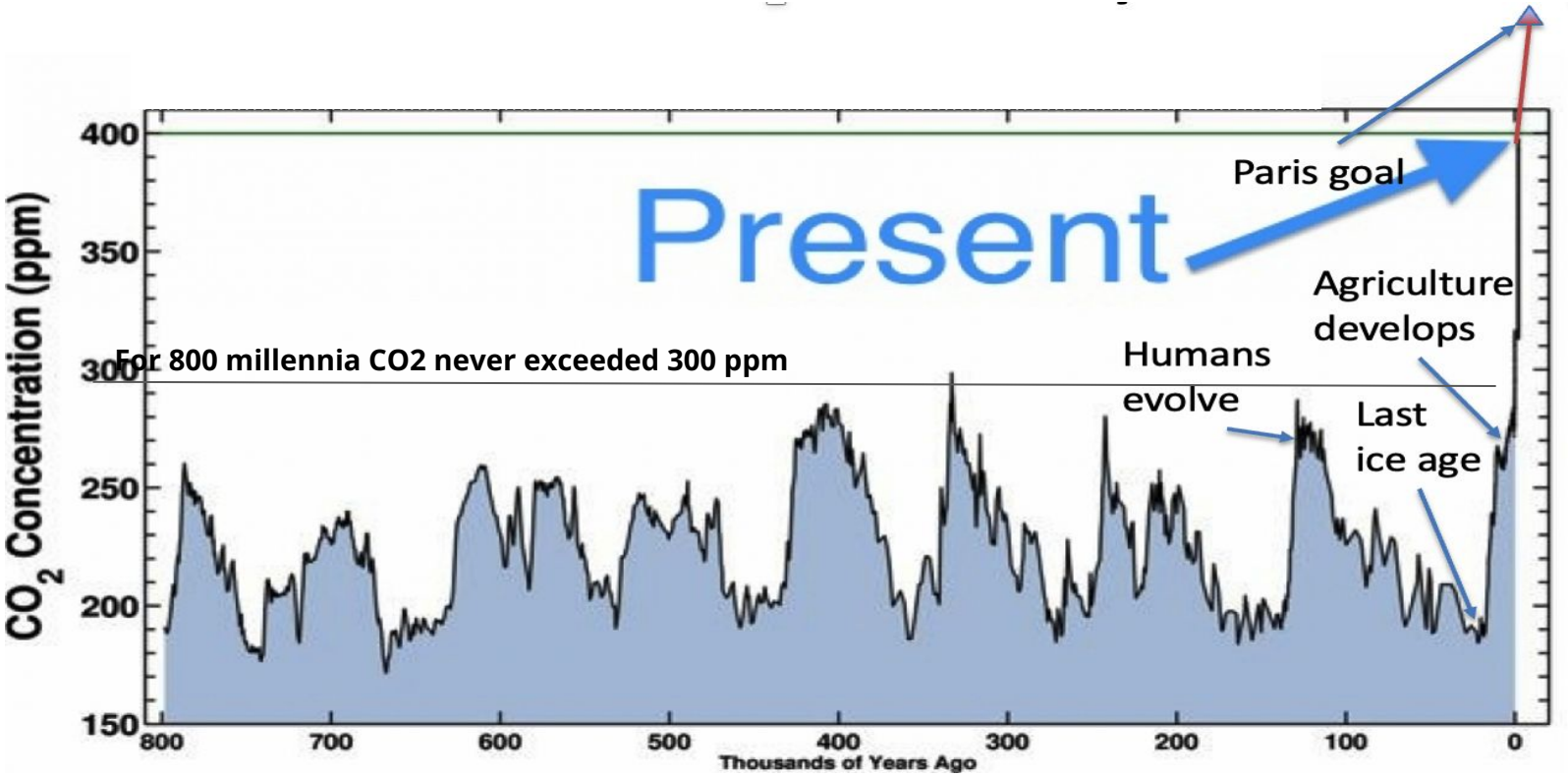
Committing to climate restoration and sharing about it is today's critical action.

Our climate “safe harbor “ is 280 ppm



CO2 growth trend matches population growth trend.
Coincidence?

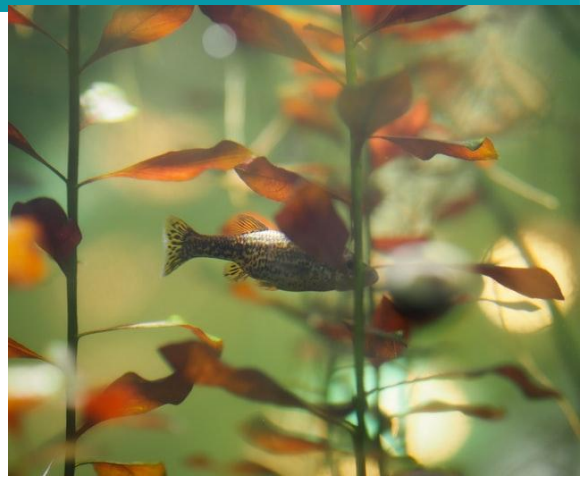
Nature removed massive CO_2 10 times in the last million years. We can do it too!



Nature uses two CDR methods (Yes—Silver bullets)

Nature's two major ways to remove CO2

- Ocean photosynthesis
- Limestone



We can replicate these natural processes, producing commercially viable by-products

- Fish and seaweed
- Concrete for roads and buildings

Three criteria for climate-restoration solutions

Climate restoration solutions must satisfy these 3 criteria:

1. Permanent —the CO_2 stays out of the atmosphere for at least 100 years

2. Scalable —the method must be able to remove at least 25 billion tons of CO_2 a year

3. Financially viable—funding for at-scale carbon removal must exist now.

The Big Four Climate Restoration Solutions

The Big Four: They're permanent, scaleable, and financially viable

- Ocean iron fertilization
- Synthetic limestone
- Seaweed
- Methane oxidation

We also all want to restore a sustainable population because we want to sustain humanity.

Nature’s fastest CDR pathway is Ocean iron fertilization (OIF)

Ocean Photosynthesis

Limited by iron availability

Adding this missing nutrient in precise locales leads to beneficial blooms of green plants and algae (phytoplankton).

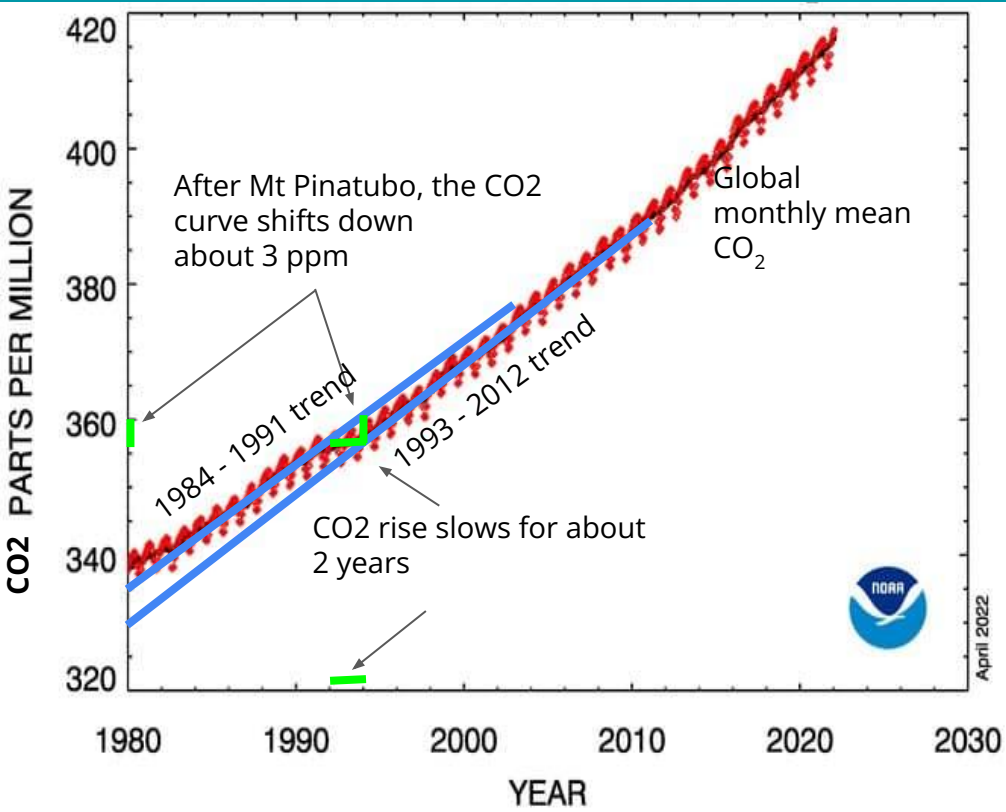
Nature adds iron locally and intermittently via dust storms and volcanoes.

Robust photosynthesis removes CO2 from the ocean and air.

It also revives fisheries.

1% of the ocean area would be fertilized periodically and restored to health.

OIF demo: Nature removed 2 ppm CO2 following Mt Pinatubo eruption



NOAA CO2 data shows the Earth's CO2 increase almost stopped for about 2 years after the Mt. Pinatubo eruption. The hiatus most likely resulted from ocean iron fertilization from volcanic dust in the ocean.

The reduction lasted at least 30 years. It will likely last hundreds or thousands of years.

New unpublished analysis

Limestone is nature's long-term CDR pathway

Limestone

E.g. The White Cliffs of Dover

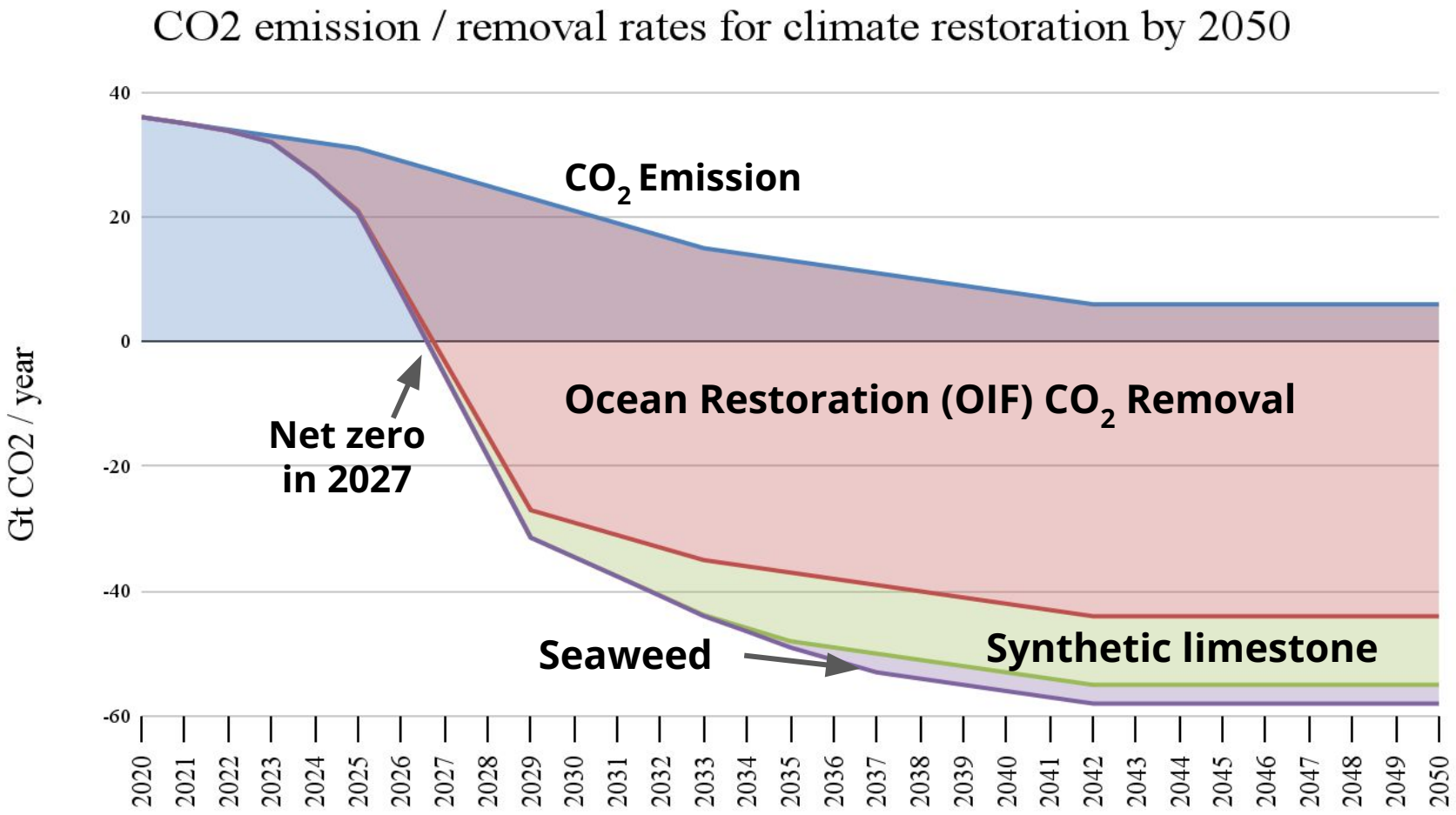
99.9% of Earth's carbon is held in limestone on the seafloor from shells and skeletons.

Oysters make limestone….
So can we!

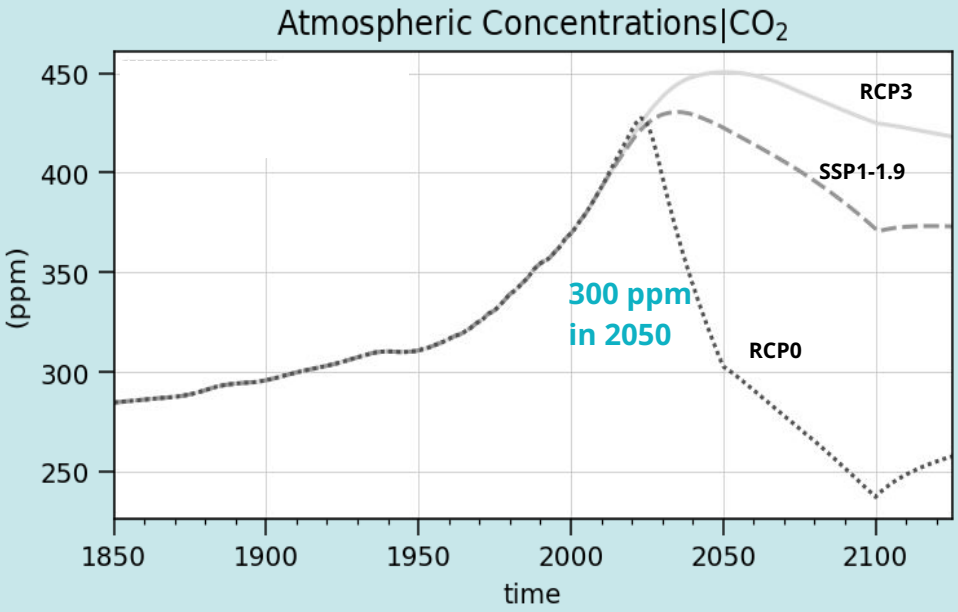
Synthetic limestone is a climate restoration solution.

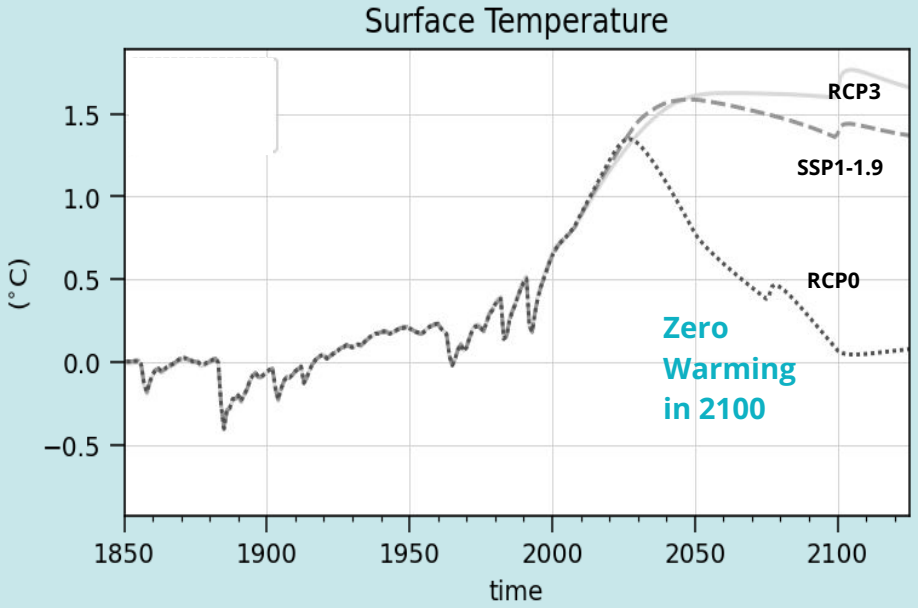
Our mission: Leave our children a world we are proud of!

Three Carbon Removal Pathways Are Underway Now



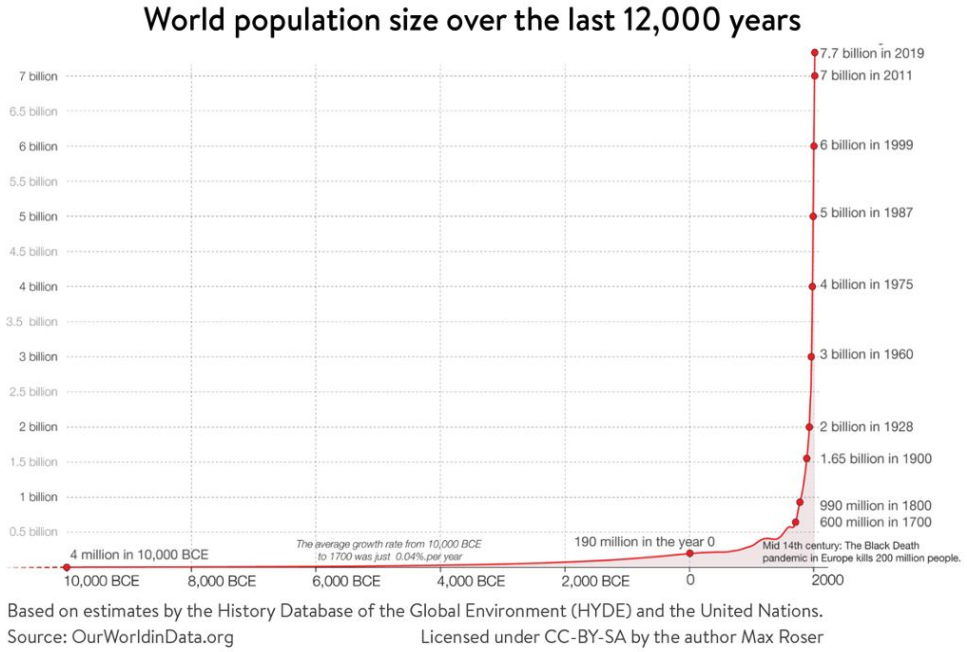
Modeling shows 300 ppm by 2050 and Zero Warming by 2100





Population is the cause. Small families are the solution

Global population now is 10 times higher than the stable levels before 1750. If we had maintained a sustainable population, CO2 levels would still be safe.



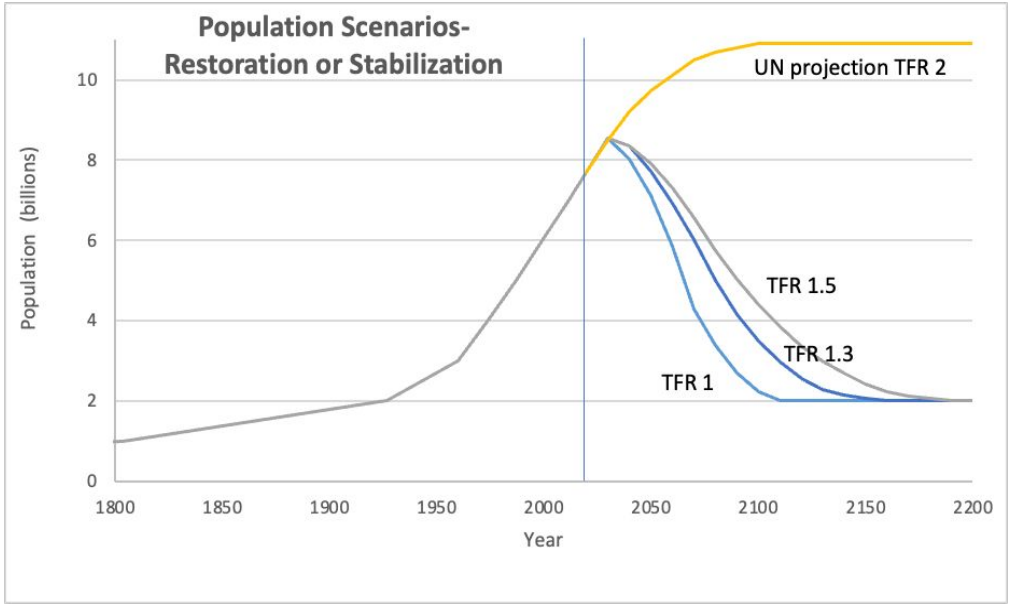
Nature uses “child survival rates” to keep populations in balance with resources.

We tripled our child survival rate, from 30% to 95%... but neglected to reduce birth rates correspondingly.

Small families—averaging 1.3 children per woman—through 2100 will restore a sustainable population.

We can restore a sustainable population by 2100

30 nations already have birth rates (TFR-total fertility rate) of 1.5 or lower. Today's global TFR is 2.3, down by 3 from 5.2 in 1960. Italy has a TFR of 1.3. To get global TFR down by one, to 1.3 this decade, we need to make small families desirable.



Women between 15 and 40 are only 15% of the population.

They can create a sustainable population (or not).

We need to empower them to do so.

We have the technology and finance to restore the climate

The good news:

The “big four” solutions are ready to scale up to restore the climate by 2050.
Cost: $2 billion per year of commercial investment

What’s needed now:

Update our climate goal to climate restoration.
Encourage multiple wealthy investors to invest in climate restoration solutions.

Methane removal can quickly cool the planet

Methane is responsible for about one third of today's global warming.
We now know how to remove it from the atmosphere!

Scientists are concerned that, as the Arctic thaws, its large stockpile of methane threatens to "burst" into the air. When that happened before, an estimated one-third of all species on Earth went extinct.

What can we do?

- Nature removes methane all the time, oxidizing it into water and CO2
- We are enhancing nature's methods to double the speed of methane removal.
- "Enhanced Atmospheric Methane Oxidation" (EAMO) could:
    - Remove significant amounts of methane—turning the clock on global warming back by 15 years, and
    - Ensure that a methane burst will not become catastrophic—by being ready to oxidize the gas before it damages ecosystems and harvests.

Solar radiation management (SRM) can speed up restoration

The goal of solar radiation management is to cool our planet by reflecting sunlight away. In 1991, natural SRM from Mt Pinatubo's eruption cooled the Earth by 0.5°C.

- SRM could be a backup in case we don't restore the climate. More SRM research is a responsible action.
- SRM accelerates restoration but does not restore the climate by itself. It does not reduce GHG emission, GHG levels, or ocean acidification.

Benefits of SRM: As an adjunct to climate restoration, SRM could save lives and ecosystems. It could cool the climate rapidly, and slow glacier melt in the Arctic and Himalayas.

Risks:

- "Termination shock:" In the absence of climate restoration, halting SRM risks rapid heat rebound.
- Legal shock: Anyone who doesn't like the weather could blame, and sue SRM implementers.
- "Moral hazard:" SRM could reduce focus on today's net-zero goal.

What can you do?

Commit yourself to climate restoration and a sustainable population; Bring in the organizations you belong to.

Share your commitment with your family and friends.
Help make “climate restoration” a household term!

Amplify your voice: Work with the Foundation for Climate Restoration (F4CR.org). Join or start a local group and get trained to support key policies and education.