

Are There Limits to Growth?

- The idea of continual growth – particularly economic growth – is widespread in today's world.
- But the question comes up, "Are there limits to growth?"

“There are no great limits to growth because there are no limits of human intelligence, imagination, and wonder.”

Ronald Reagan
40th President of the U.S.

“The ultimate resource is people — skilled, spirited, and hopeful people who will exert their wills and imaginations for . . .the benefit of us all.”

Julian Simon in
The Ultimate Resource

“[T]here is nothing in the past which gives any credence whatever to the view that human ingenuity cannot in time circumvent material human difficulties.”

Solly Zuckerman
Former chief scientific adviser to the UK government

- There are some who say, “No. Limits don’t exist.”
- They assert that growth can go on indefinitely because human intelligence and imagination, along with an optimistic attitude, will inevitably overcome any challenge.
- They often draw from past experience in support of this view, claiming that human ingenuity has overcome challenges in the past.

"[W]e are drawing on the world's resources faster than they can be restored, and we are releasing wastes and pollutants faster than the Earth can absorb them or render them harmless."

Meadows, Randers, and Meadows in
A Synopsis: Limits to Growth: The 30-Year Update

"[C]ontemporary change is both quantitatively and qualitatively distinctive. . . [C]umulative 'normal' change has come to a head to produce an unprecedented degree of change in our times."

Johnston, Taylor, and Watts in
Geographies of Global Change

"Economic thought did not adjust to the changed conditions it helped to create: thereby it continued to legitimate, and indeed indirectly to cause, massive and rapid ecological change."

J.R. McNeill in
An Environmental History of the Twentieth-Century World

- Others disagree.
- They say that resources are being used and wastes are being produced at an unsustainable rate.
- They say that, as a result, the past is not an appropriate guide to the future.

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- So, which is it?
- Are there limits or not?

An Example: Phoenix, Arizona



<https://www.geekwire.com/2015/silicon-desert-phoenix-quickly-quietly-becoming-hub-innovator/>

<https://roselawgroupreporter.com/2013/02/phoneix-area-housing-todays-land-sales-tomorrows-growth>



- Here is an example, from June 2023.
- Phoenix is a city in Arizona that has been growing for decades, and it has the largest population growth of any city in the United States. Today, it is the fifth most populous city in the country.
- The metropolitan area is huge, and building houses has been prominent

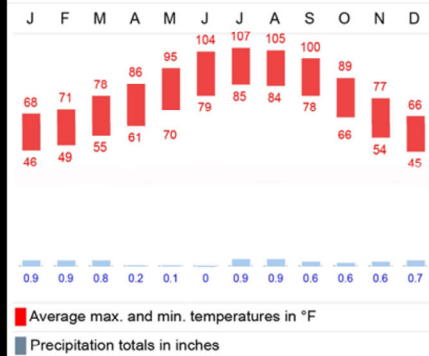
An Example: Phoenix, Arizona



<https://www.northstarmeedingsgroup.com/Destination-Guides>

Phoenix

Climate chart (explanation)



https://en.wikipedia.org/wiki/Phoenix,_Arizona

- But Phoenix is also in the Sonoran Desert.
- Summer daytime temperatures are generally over 100 degrees.
- Annual rainfall is about seven inches.

Arizona announces limits on construction in Phoenix area as groundwater disappears

By Ella Nilsen, CNN
Updated 5:56 PM EDT, Thu June 1, 2023



https://www.cnn.com/2023/06/01/us/arizona-phoenix-groundwater-limits-development-climate/index.html?fbclid=IwAR1hCtIq-qyKYO0WrgOE3uJlJbubRJ4LYCuxYcZOU9c_IGVpYXPhWBxPg

- The groundwater supporting the Phoenix area can't meet additional development.
- So, while developments that have already been approved will go forward, developers that are seeking to build new construction will have to demonstrate they can provide an "assured water supply" for 100 years using water from a source that is not local groundwater.
- It appears that the availability of water is posing a limit to growth in the region.

Arizona, Low on Water, Weighs Taking It From the Sea. In Mexico.

A \$5 billion plan to desalinate seawater in Mexico and pipe it to Phoenix is testing the notion that desert cities can keep growing as the Earth warms.

- Desalinate ocean water.
- Pipe the water to Phoenix.
- Go through a national monument and a UNESCO biosphere reserve.
- Threaten fisheries in the Gulf of California.
- Costs of the project itself are high.



<https://www.nytimes.com/2023/06/10/climate/arizona-desalination-water-climate.html>

- So drawing from the idea that there are no limits and human ingenuity can overcome any challenge, the idea is to continue the growth by desalinating ocean water and piping it to the Phoenix area.
- The desalination plant would be in Mexico, and the pipeline would be over 200 miles long and would have to climb over 2000 feet in elevation.
- Piping the water would take a lot of energy, as would the desalination itself.
- So the water would be very expensive.
- The pipeline would go through a national monument and a UNESCO biosphere reserve, threatening the desert ecosystem.
- The desalination would flood the northern Gulf of California with waste brine that is very salty, threatening one of Mexico's most productive fisheries.

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“The water is going into the U.S., but the environmental impacts stay in Mexico.” (Nélida Barajas Acosta, head of an environmental group called CEDO Intercultural)

“The deal with water in Arizona is not how much water there is, It's how much do we want to pay for it.” (Terry Lowe, the city's water resources director)

<https://www.nytimes.com/2023/06/10/climate/arizona-desalination-water-climate.html>

- One factor is that while the freshwater goes to the U.S., the environmental impacts stay in Mexico, especially the salty brine that is the waste from the desalination process.
- And it's going to be expensive.

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But what is the cost?

- So, it may be the case that human intelligence, ingenuity, and a "can-do" attitude can overcome any challenge to the growth that is central to the way upon which humans are currently dependent.
- But what is the cost, not just to the pocketbook but to the environment?

References

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