

Changes that work and don't. What ARE we missing?

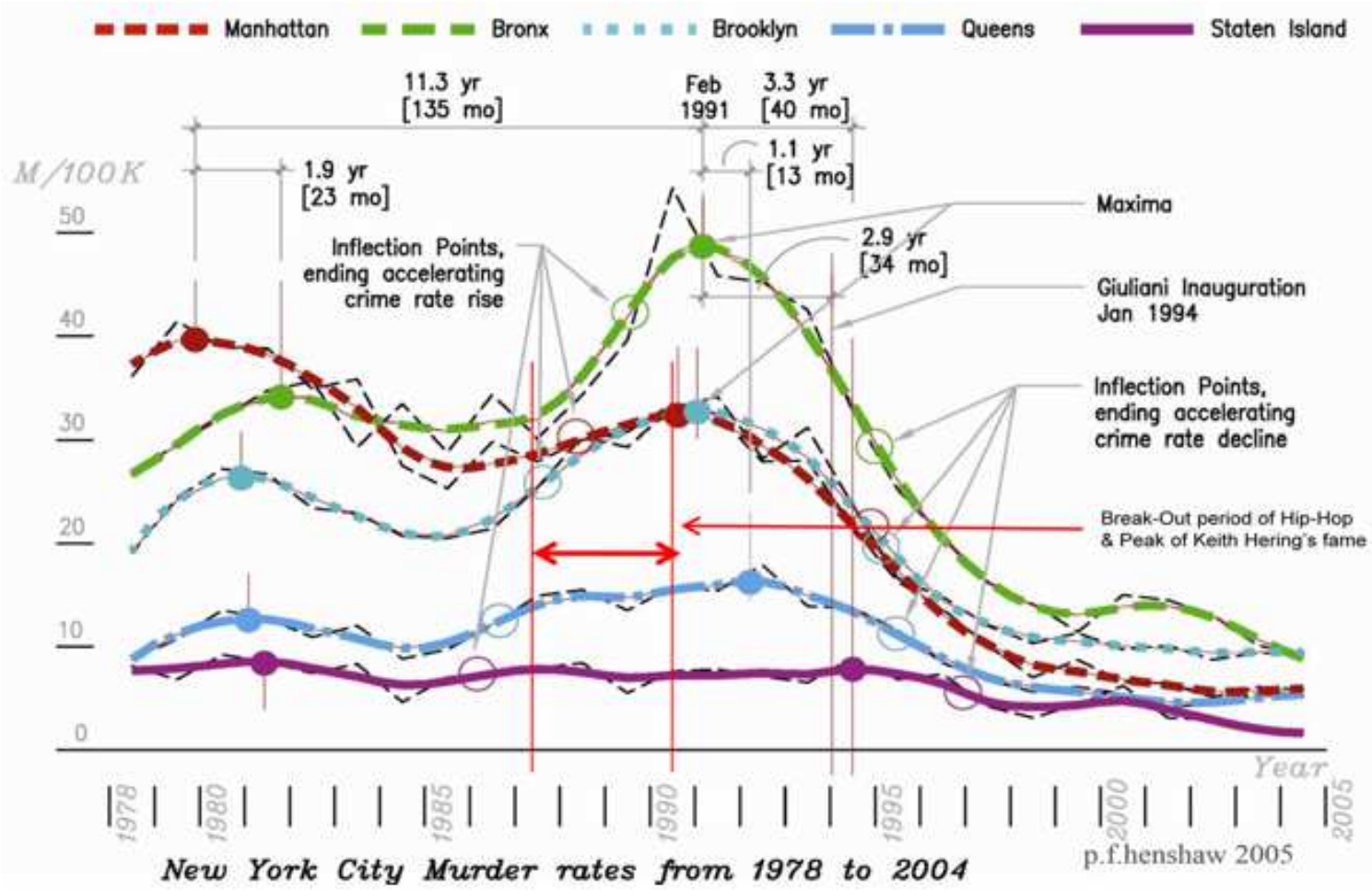
**Much of the world
looks healthy and
well cared for**

**In other places, not
so much!**



Changes that work and don't. What ARE we missing?

Note the sidebar texts are all placeholders



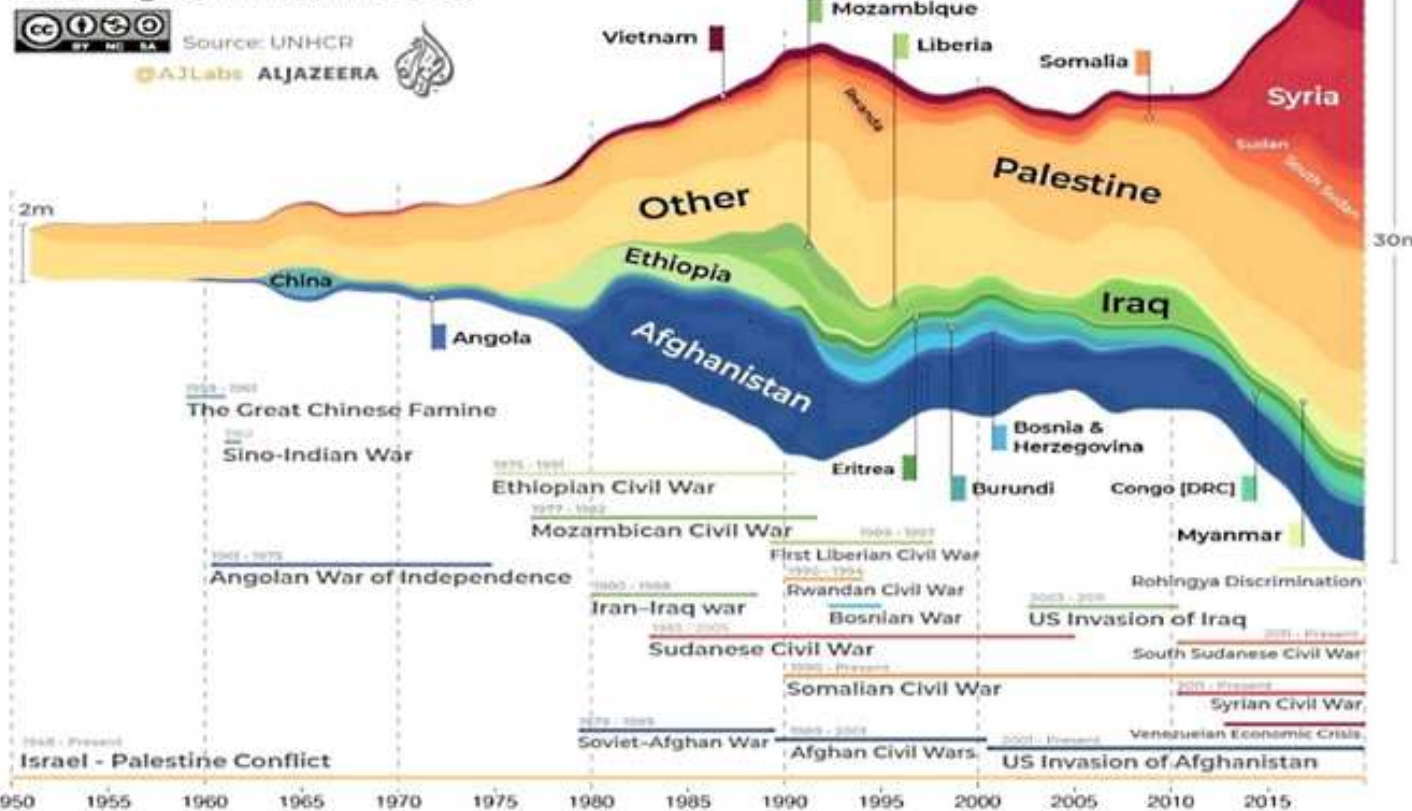
Crack came and went; the murder rates went up and down.

Transforming NYC Culture in amazing ways.

Changes that work and don't. What ARE we missing?

The Emergence of the World Refugee Crisis

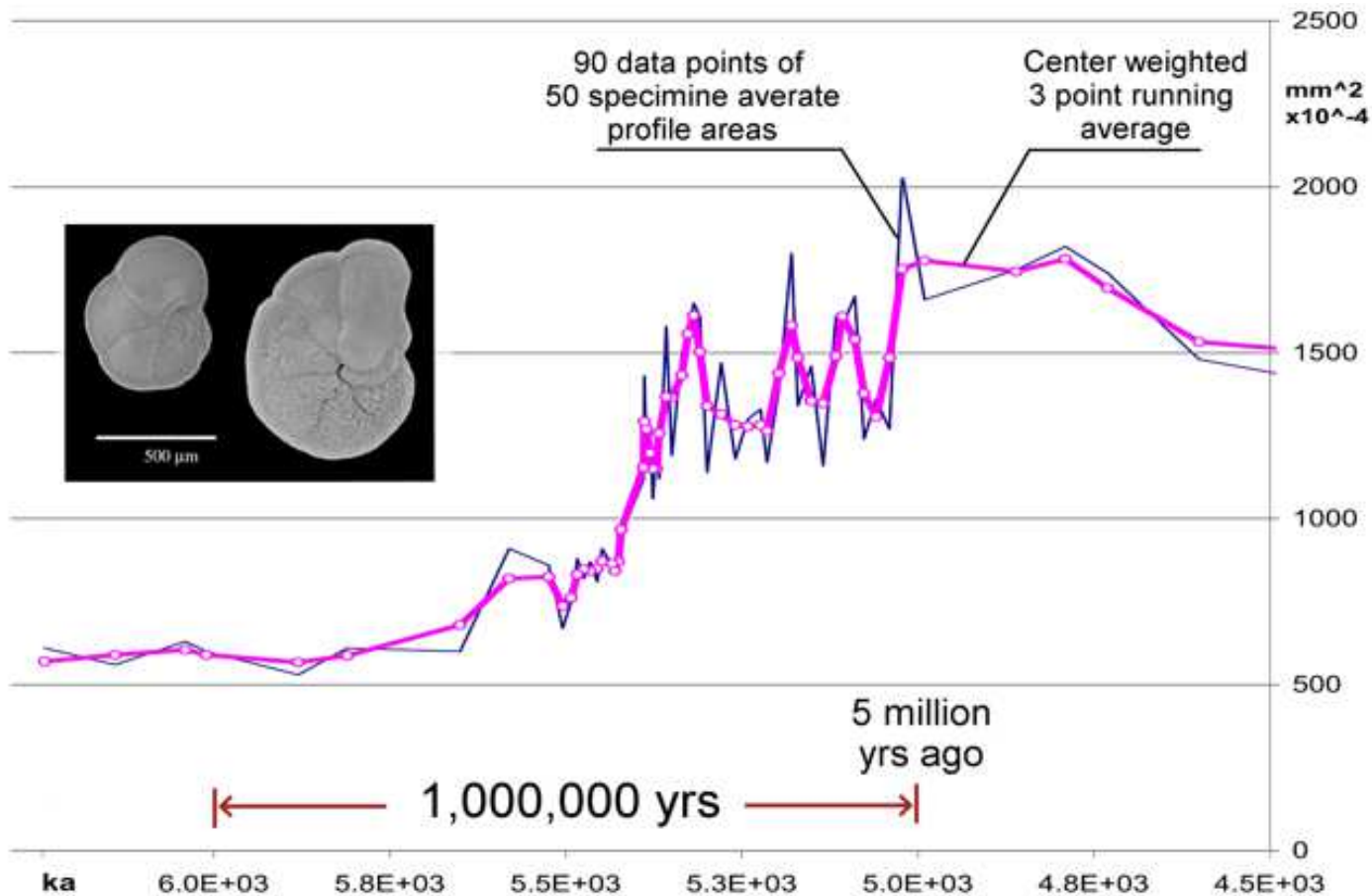
The number of refugees worldwide has continued to grow reaching 30 million in 2020.



For 250 Million Years, marine animal diversity has grown exponentially.

The end of the Dinosaurs just a bump on the curve.

The 50-year economic boom goes up and up too

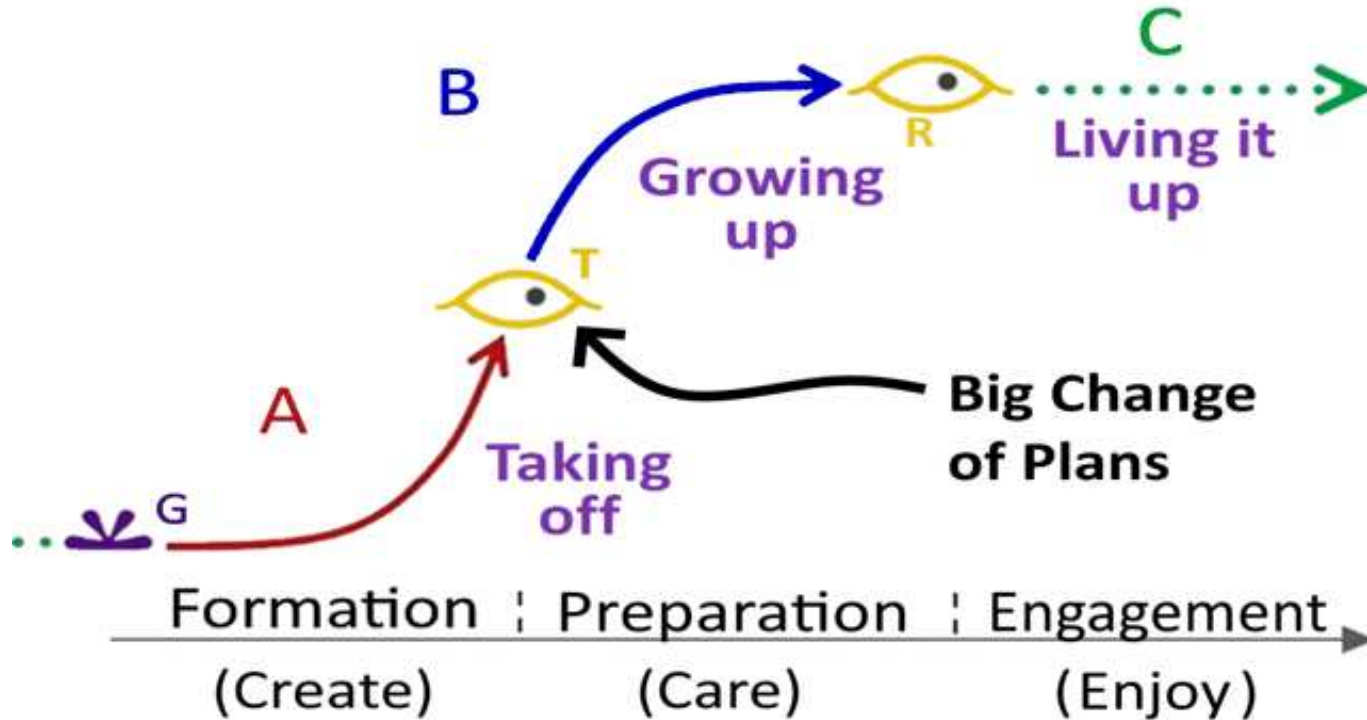


The money and the impacts all grow together, all part of the same thing.

We don't look at the impacts if we can help it, but now they're exponential threats.

The 50-year economic boom goes up and up too

Nature's Integral

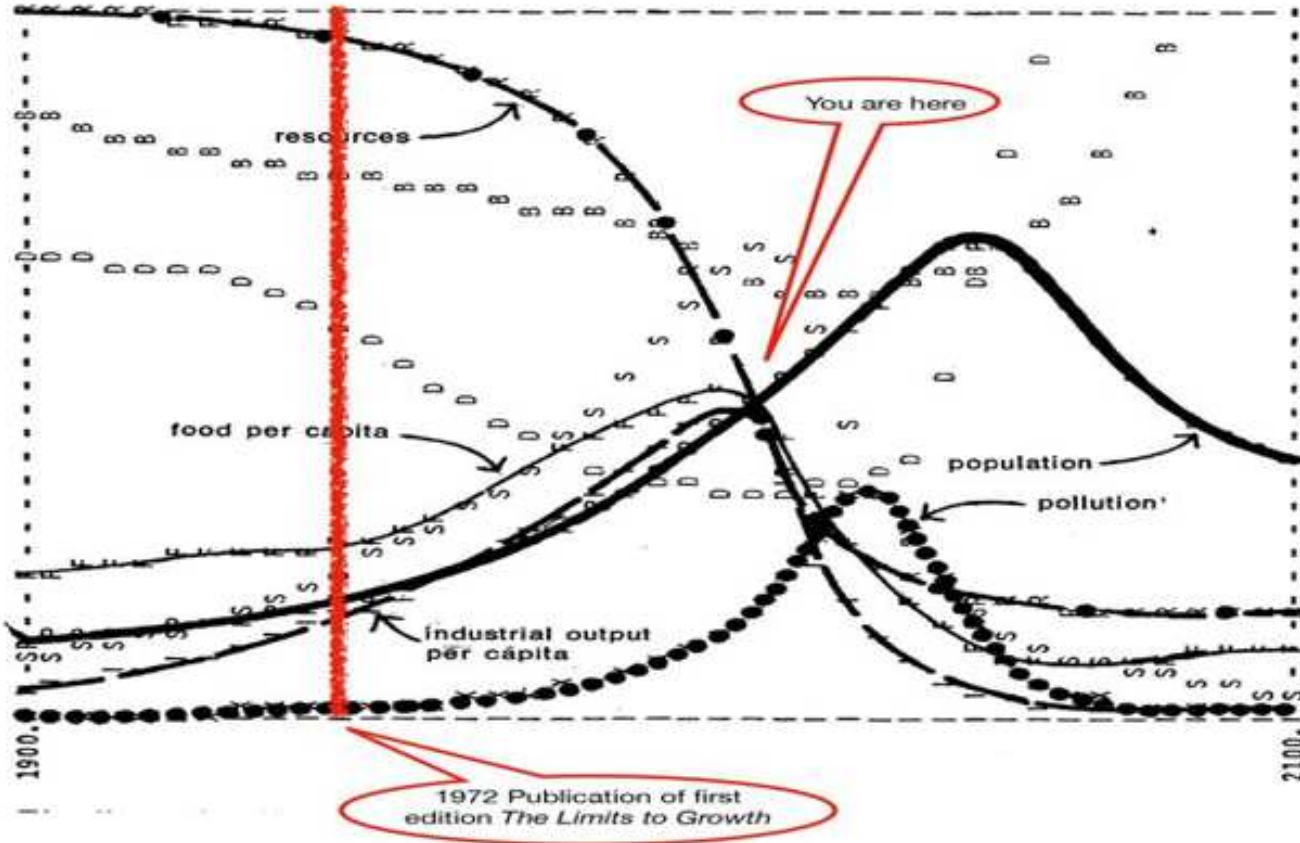


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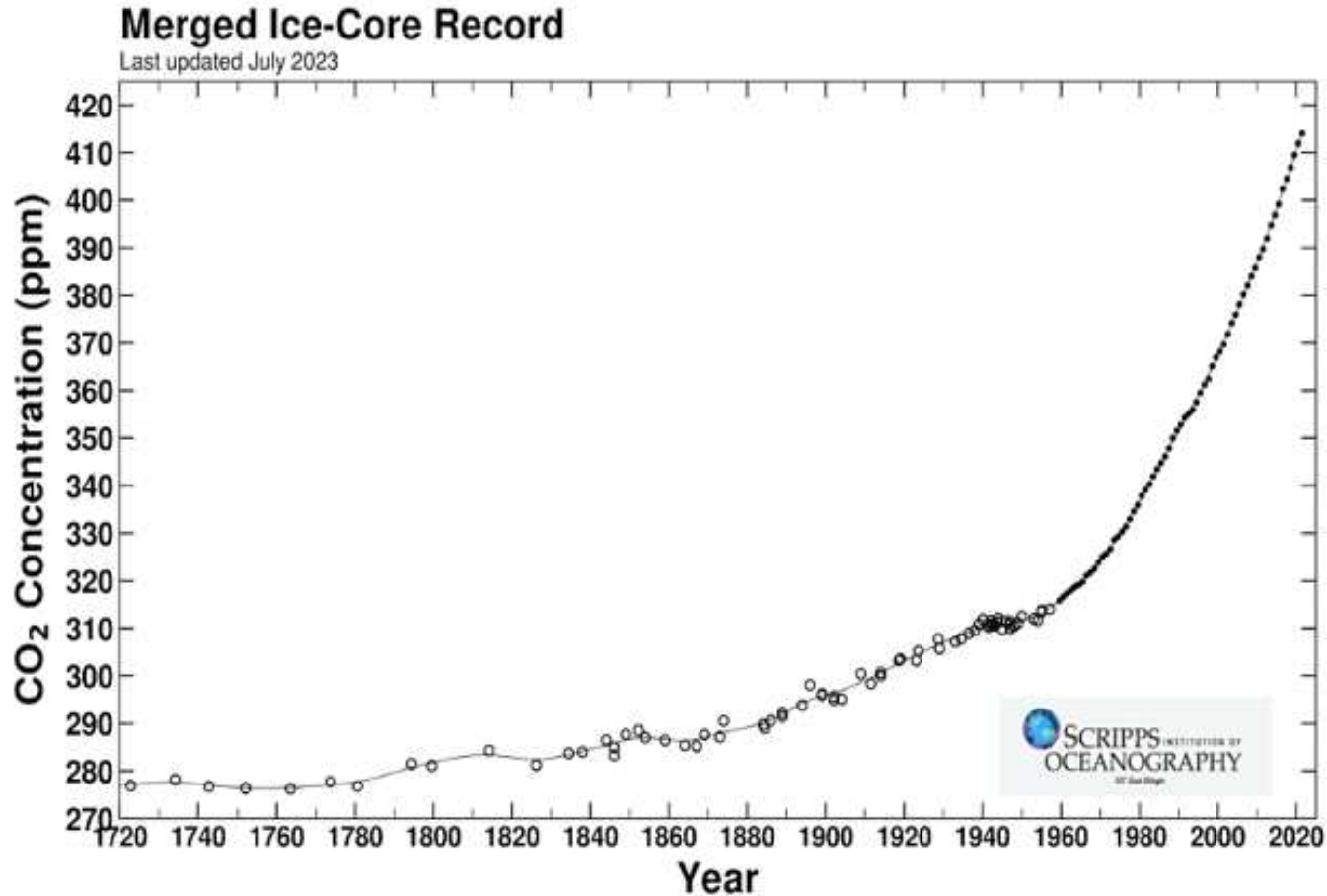
Figure 35 WORLD MODEL STANDARD RUN



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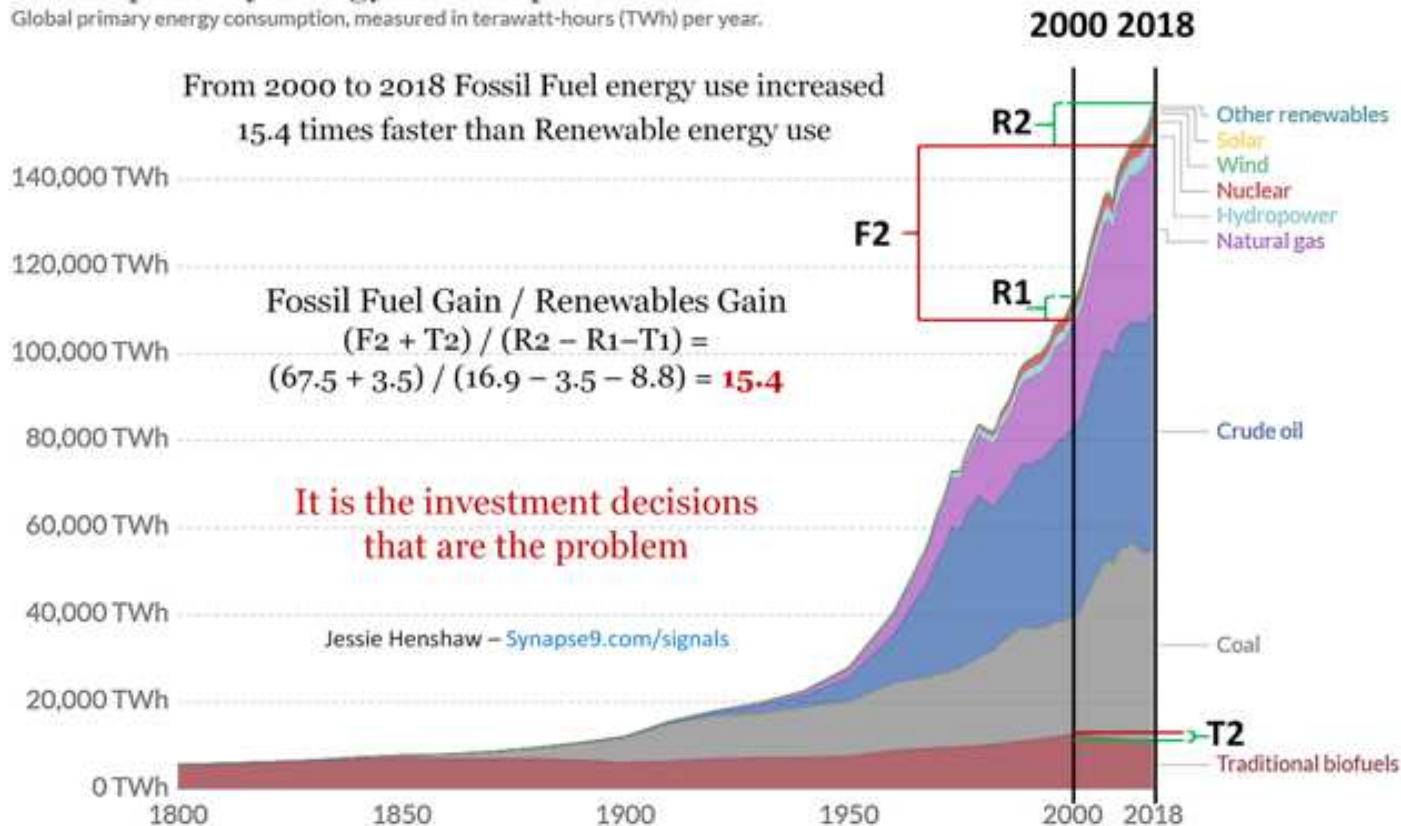
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Global primary energy consumption

Global primary energy consumption, measured in terawatt-hours (TWh) per year.



Source: Vaclav Smil (2017) and BP Statistical Review of World Energy

<https://ourworldindata.org/energys>

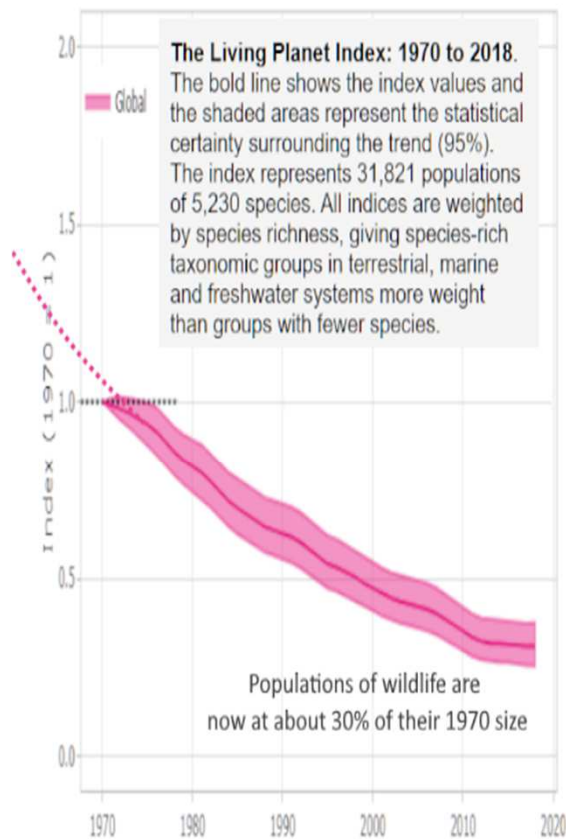
CC BY

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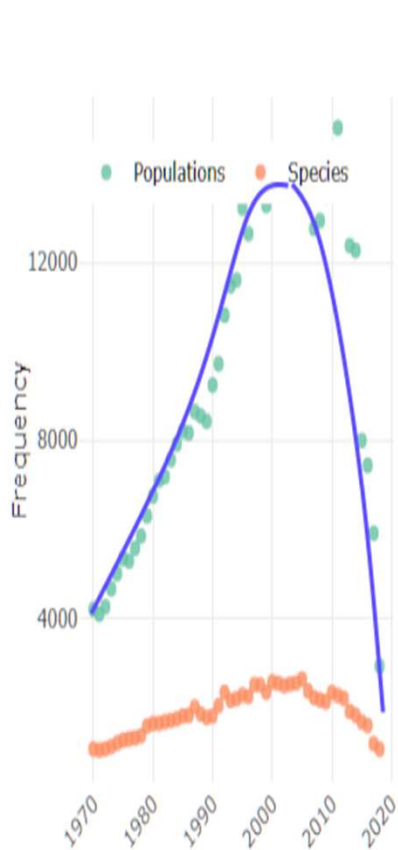
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Animal life went down 70% too

Total Wild Population



Species v. Populations



Sampling Locations



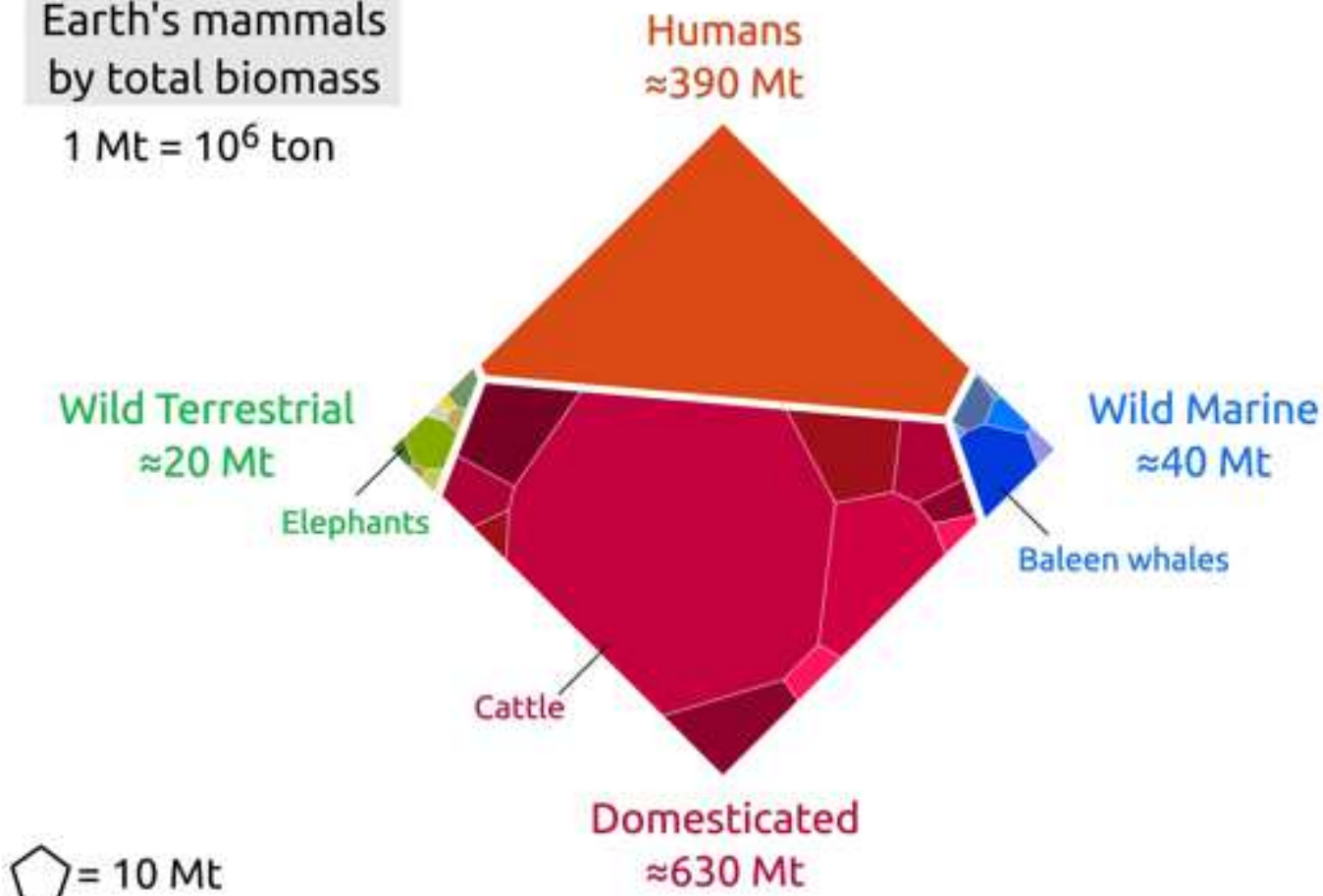
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Humans Crowded out nearly ALL Mammal Life

Earth's mammals
by total biomass

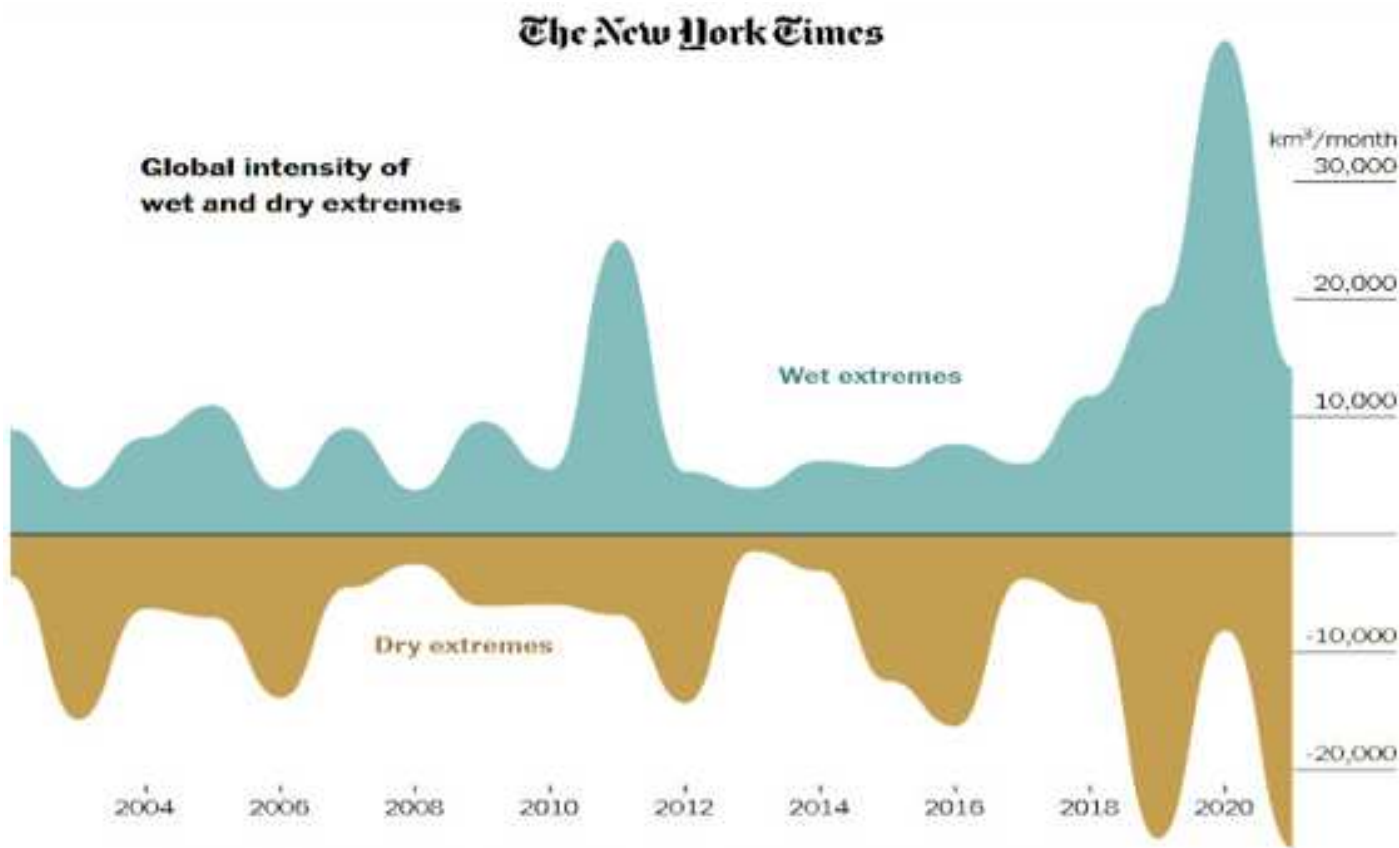
1 Mt = 10^6 ton



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Climate with ever-increasing extremes

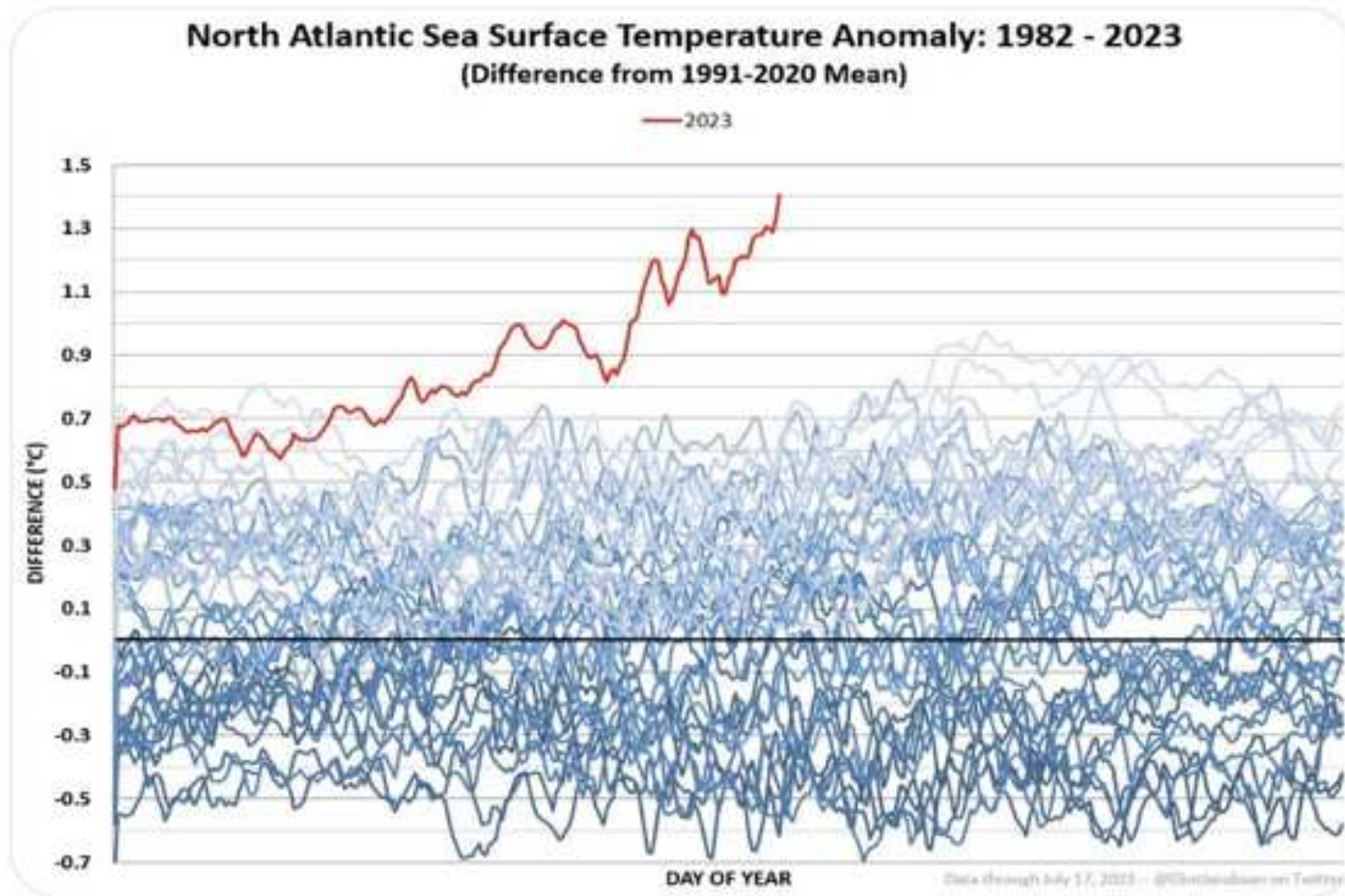


Source: Rodell and Li, Nature Water (2023), based on analysis of NASA Grace and Grace-FO data. Note: Multi-year events are assigned to the year with peak intensity.

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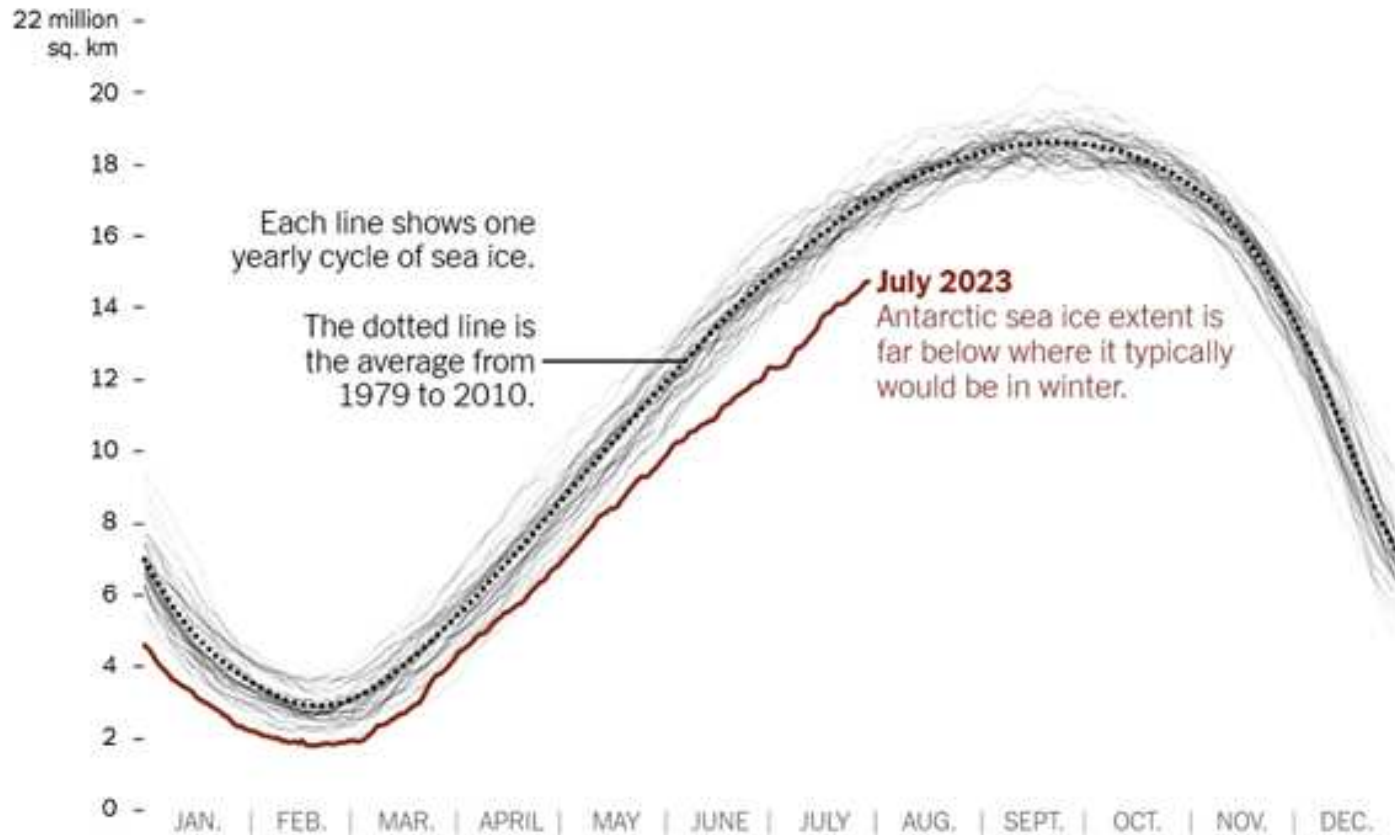
A radical departure in heating the North Atlantic



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A radical departure in Loss of Antarctic Ice

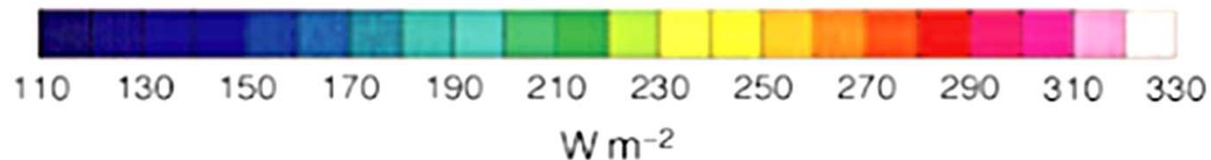
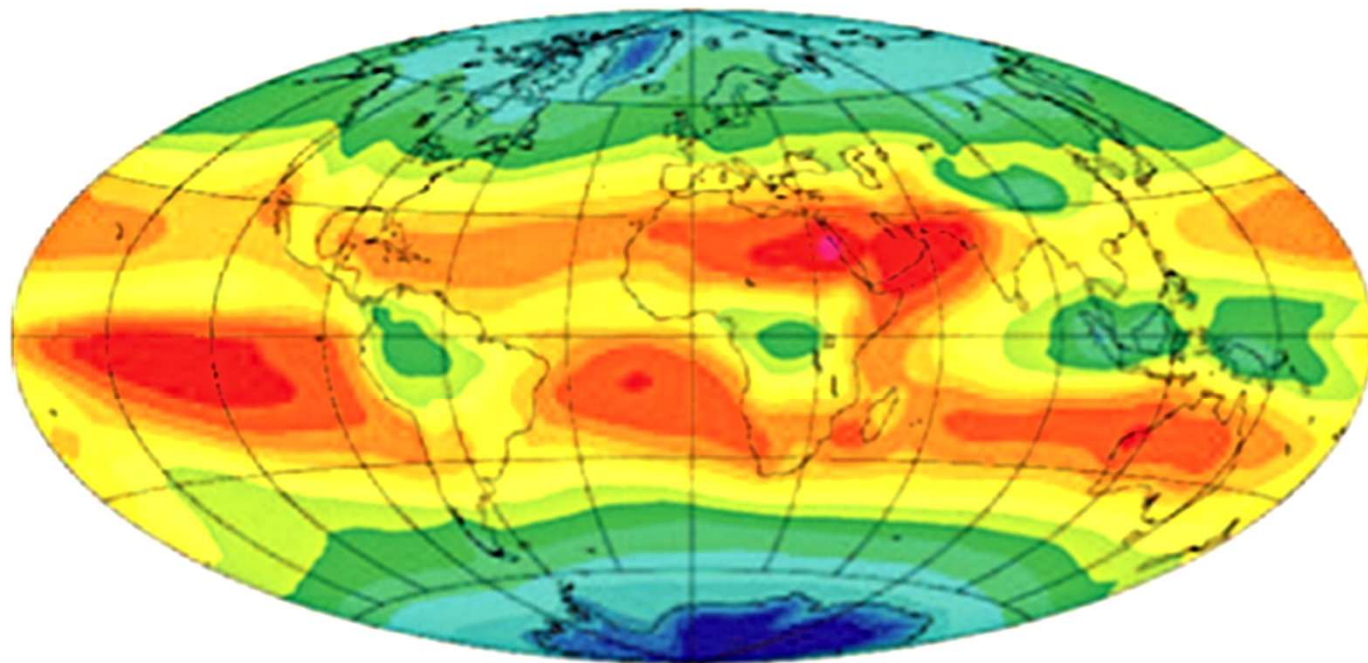


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Heat escaping, at stratosphere penetrations over the oceans

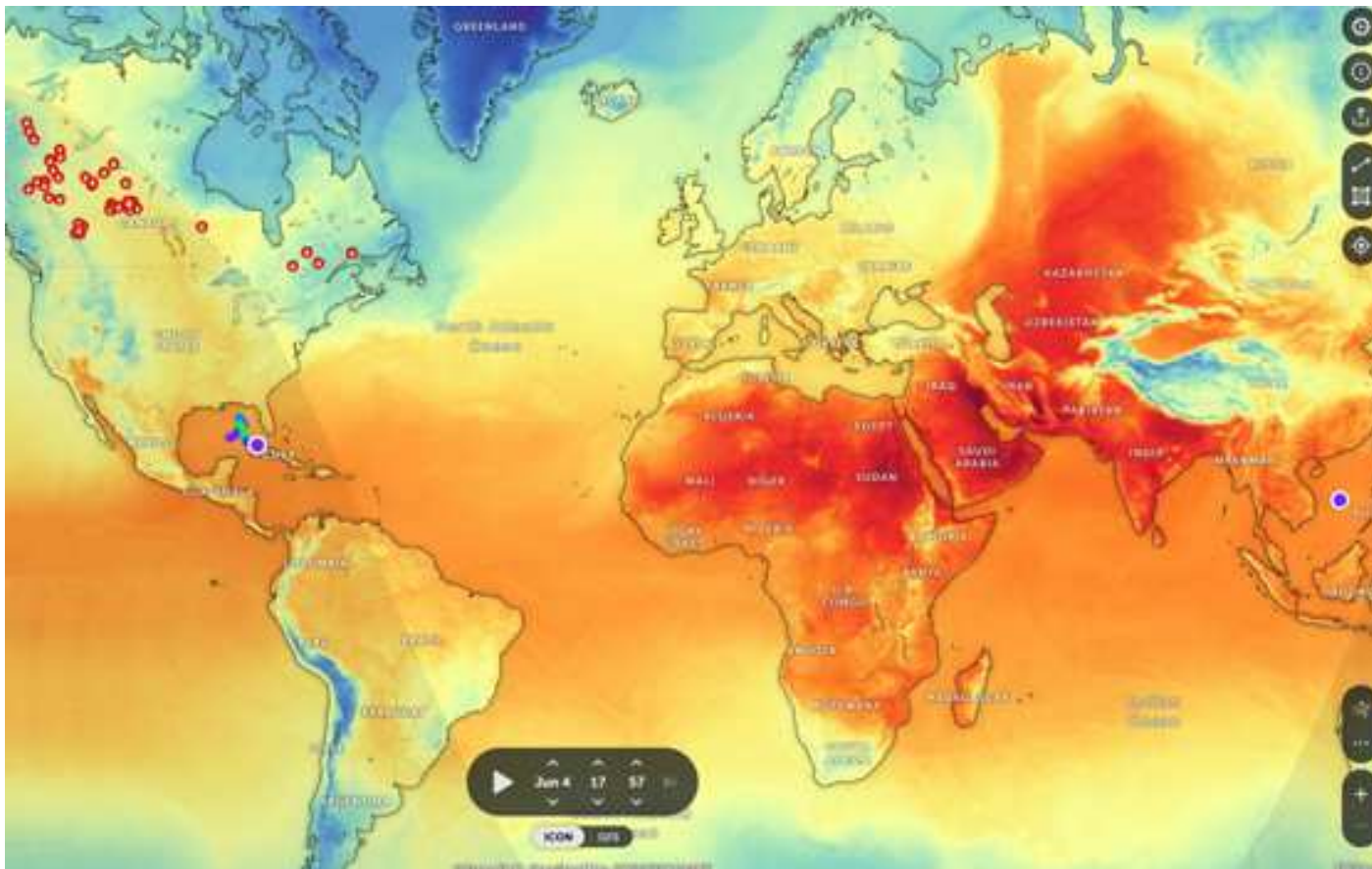
Outgoing Longwave Radiation



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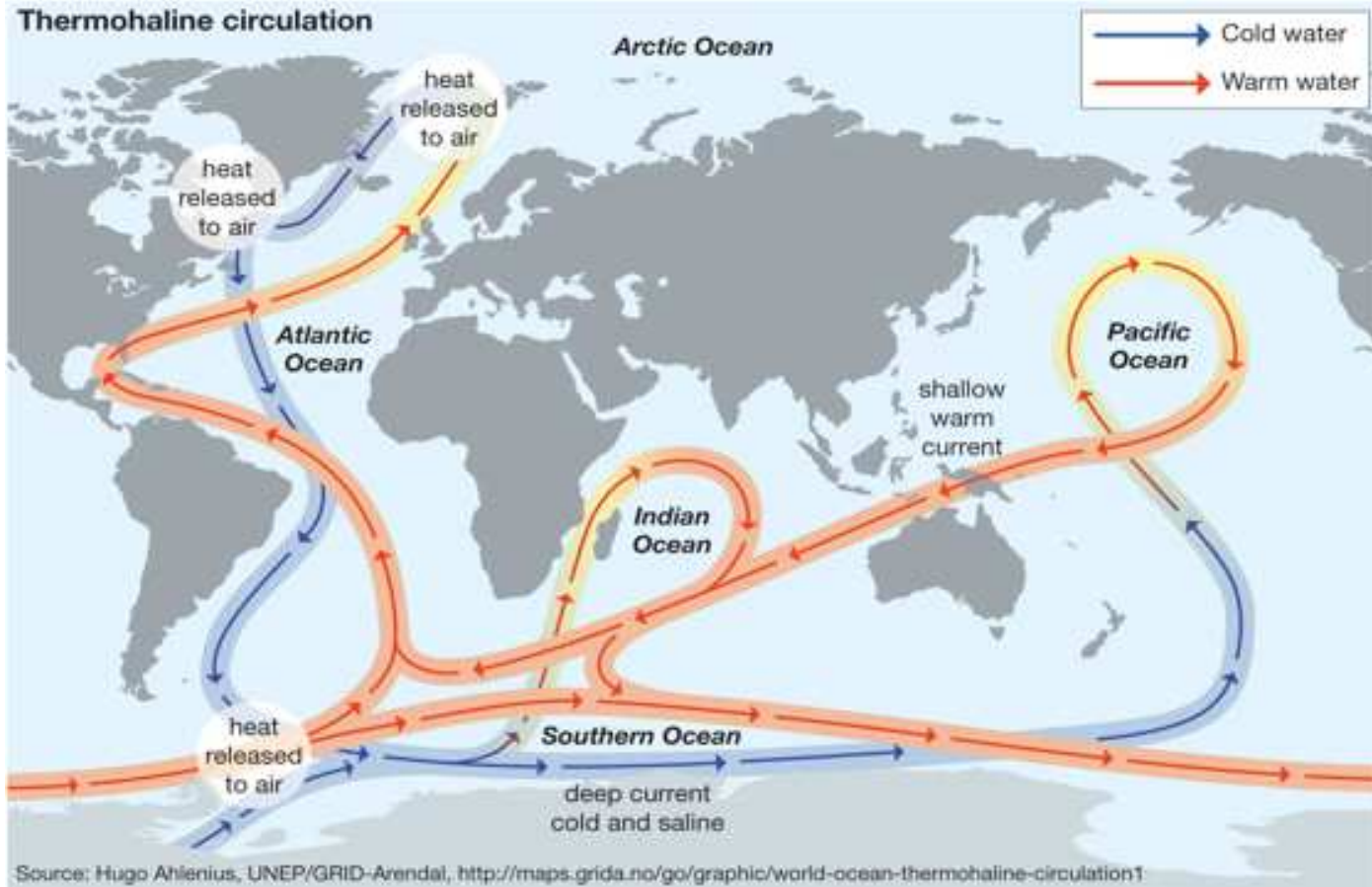
A map of where the heat is building up on land/not escaping



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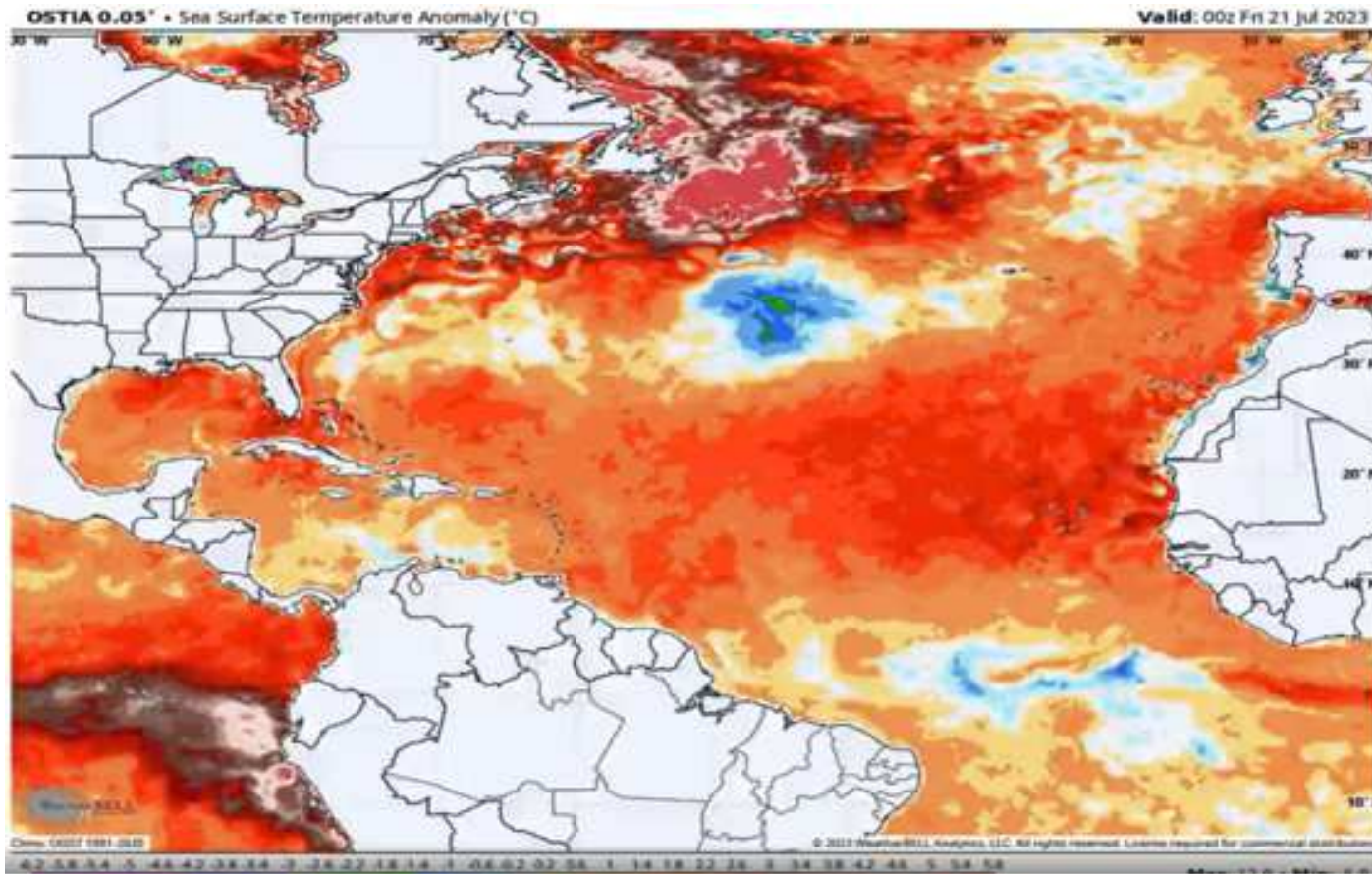
The great deep ocean heat sink, the AMOC, may be detaching



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What changes do you see? What are hiding from us?

Slides & ref's:

These Slides: [https://synapse9.com/JLHtalk-slides-What do you see.pdf](https://synapse9.com/JLHtalk-slides-What%20do%20you%20see.pdf)

Review Draft for the SRBS paper: <https://synapse9.com/ISSS-23/May20-GrowthInContext-RevDraft.pdf>

Natural Systems - Design & Steering <https://synapse9.com/ISSS-22/HNS1-MS-Design&Steering.pdf>

Elinor Ostrom's Nobel Lecture - <https://www.nobelprize.org/prizes/economic-sciences/2009/ostrom/lecture/>

Gerald Midgley's model talk - <https://lnu.se/en/meet-linnaeus-university/current/events/2021/seminar-midgley-210304/>