

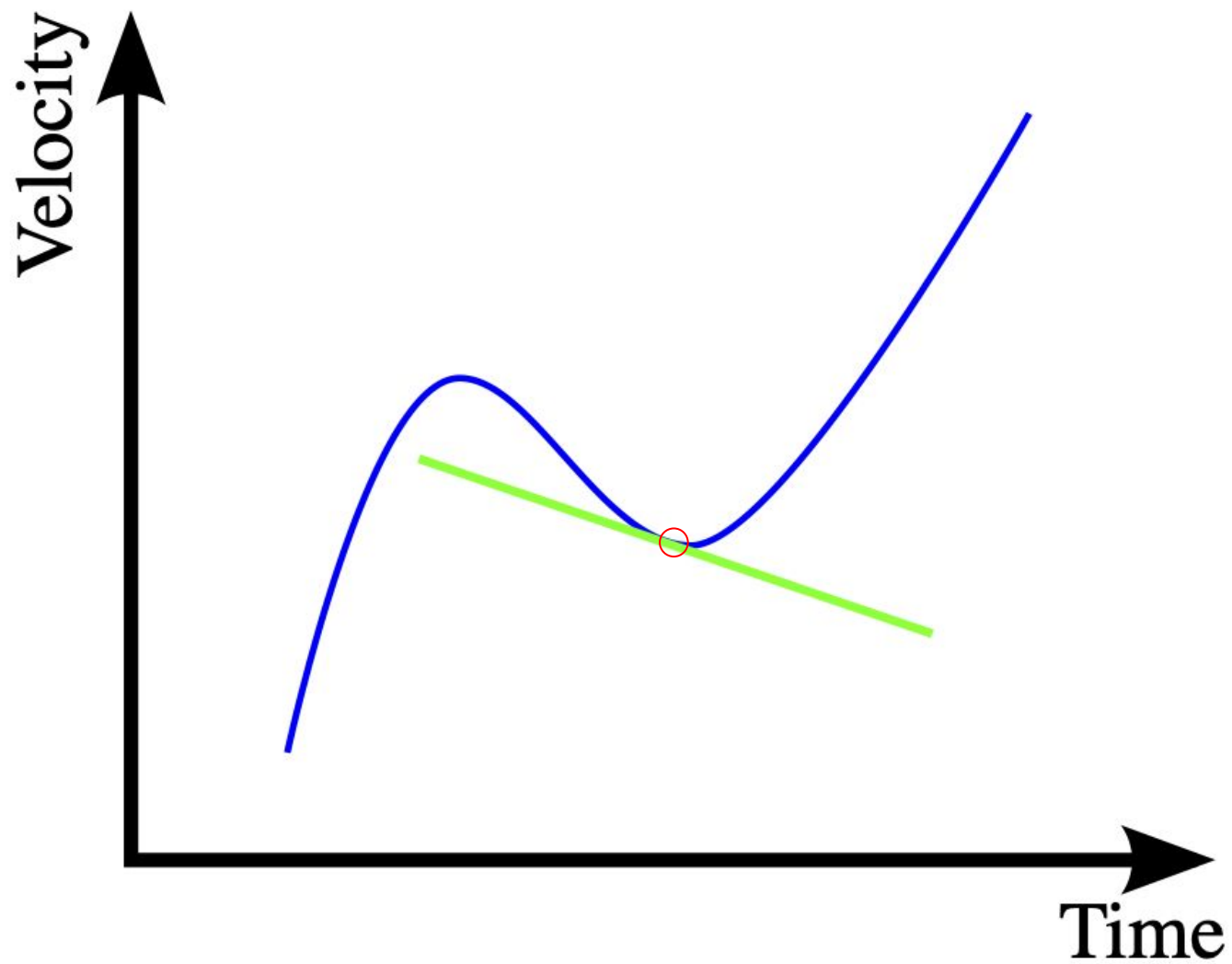


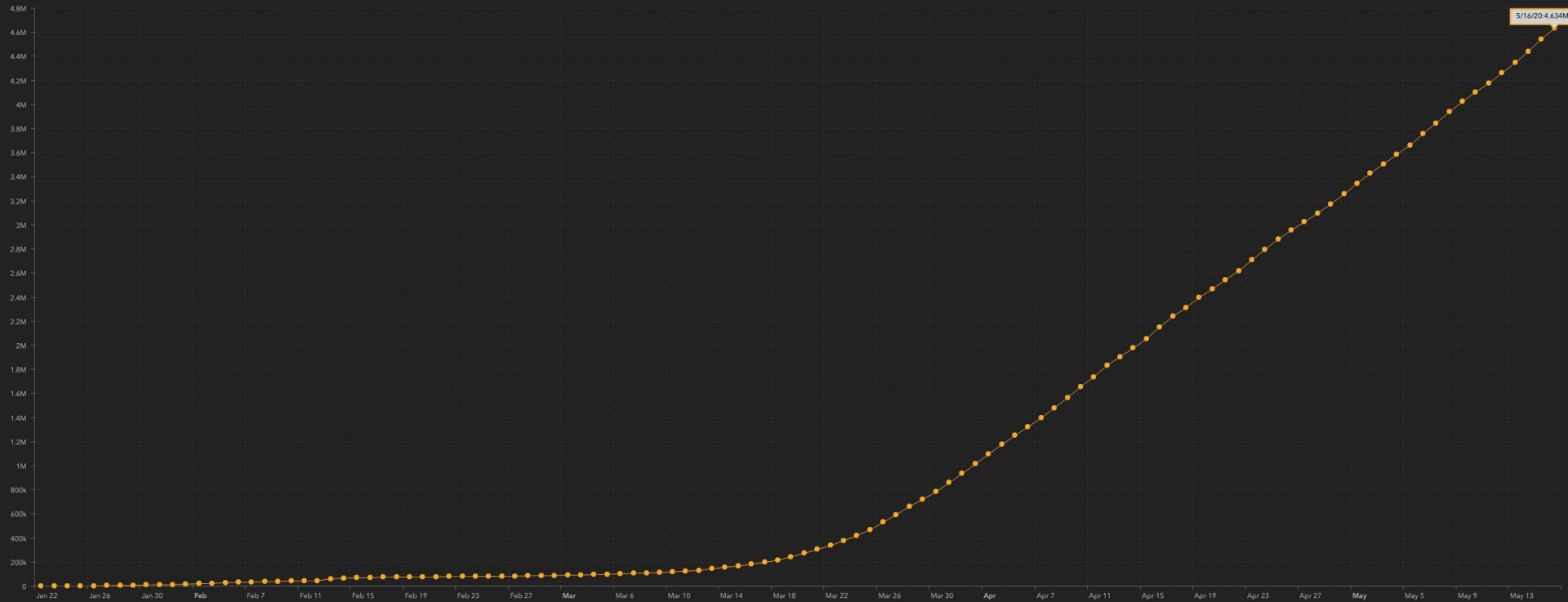
COVID-19 and Climate Change

Data Fast and Slow

S. Diggs
2020-05-18

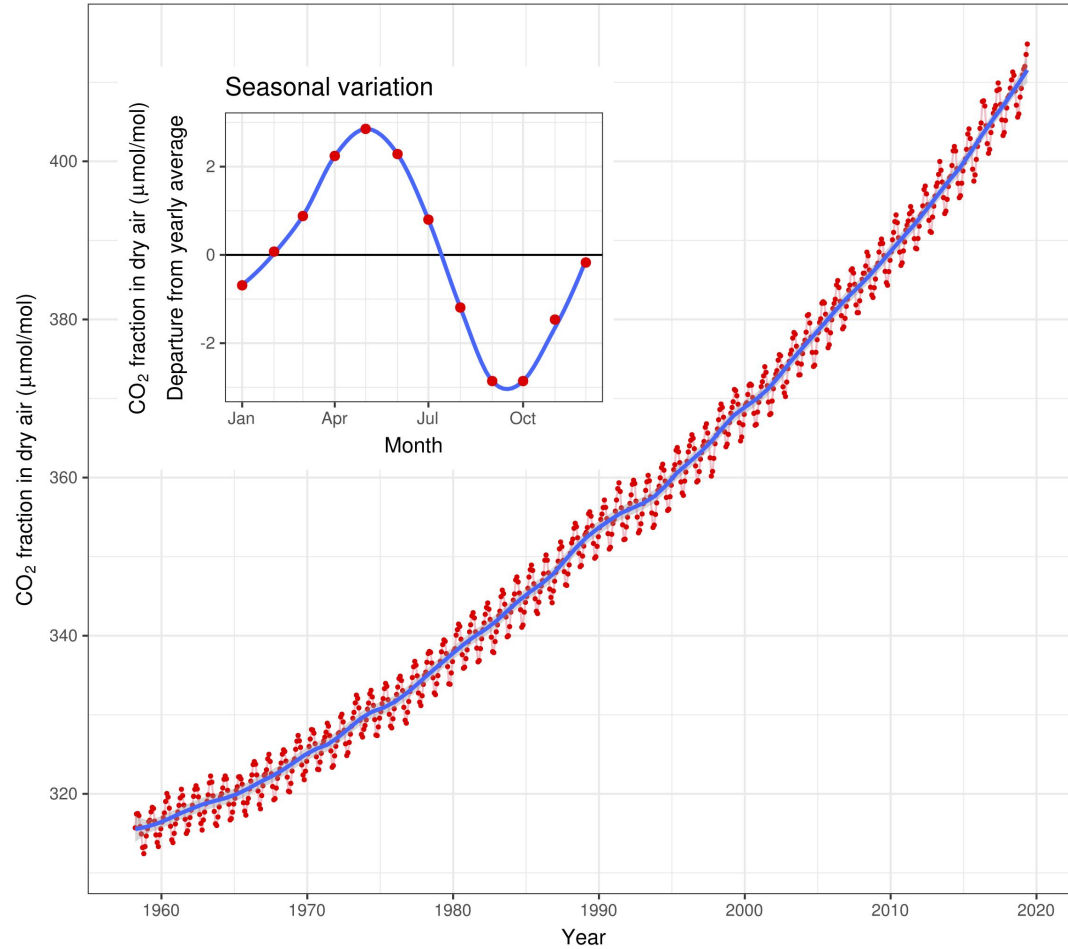






Monthly mean CO₂ concentration

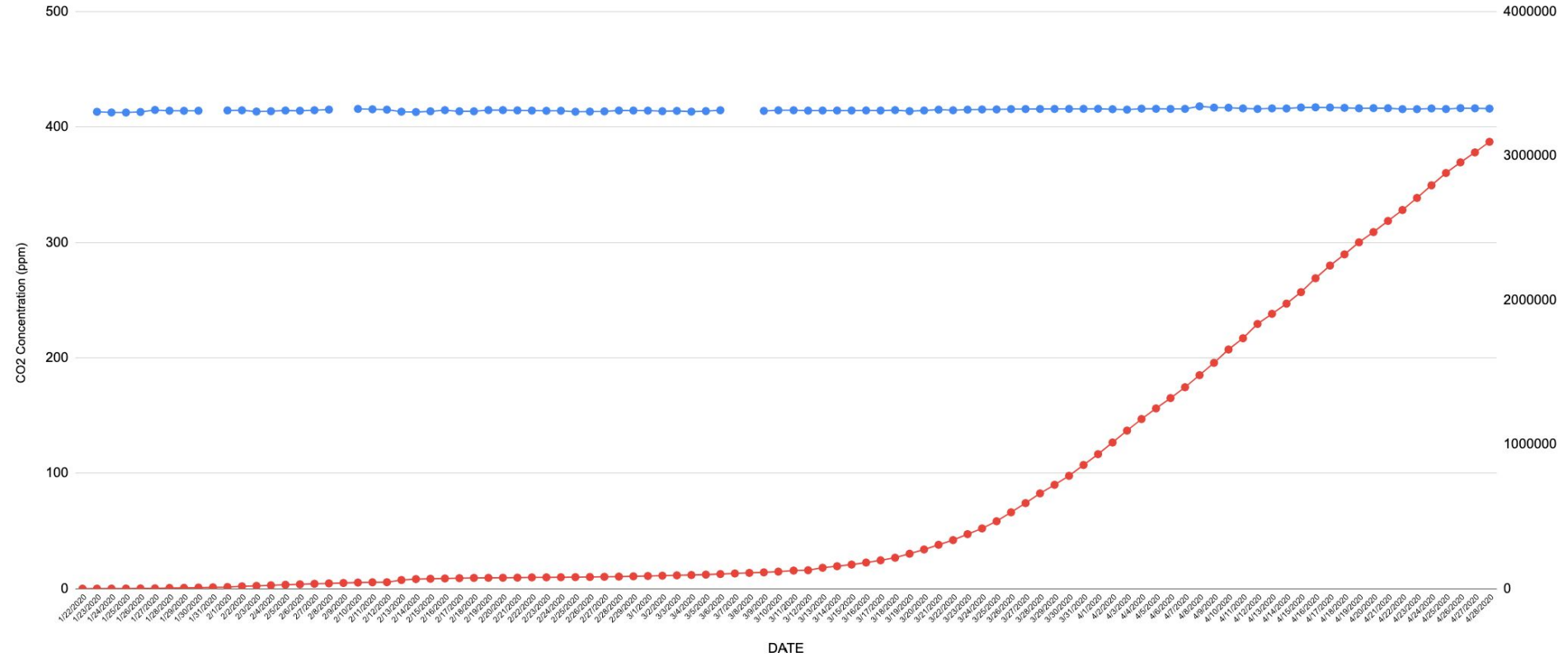
Mauna Loa 1958 - 2019



Data : R. F. Keeling, S. J. Walker, S. C. Piper and A. F. Bollenbacher
Scripps CO₂ Program (<http://scrippsco2.ucsd.edu>). Accessed 2019-07-20

CO2 Concentration (Mauna Loa) | Number of COVID-19 GLOBAL Cases

● CO2 ● # of COVID-19 Cases



COVID-19 = “fast”
CO2 (Climate) = “slow”

WIRED BUSINESS CULTURE GEAR IDEAS SCIENCE SECURITY TRANSPORTATION SIGN IN SUBSCRIBE Q

CORONAVIRUS STATE LOCKDOWN TRACKER FAQS DIY FACE MASK GUIDE: ESSENTIALS HOW TO DISINFECT EVERYTHING NEWSLETTER

How Is the Coronavirus Pandemic Affecting Climate Change?

Sure, emissions have fallen. But a closer look at how the global crisis is influencing the environment reveals some surprising dynamics.



As emissions fall, air quality around the world is skyrocketing. The climate consequences of the coronavirus pandemic go even further. PHOTOGRAPH: NARAYAN MAHAJAN/GETTY IMAGES



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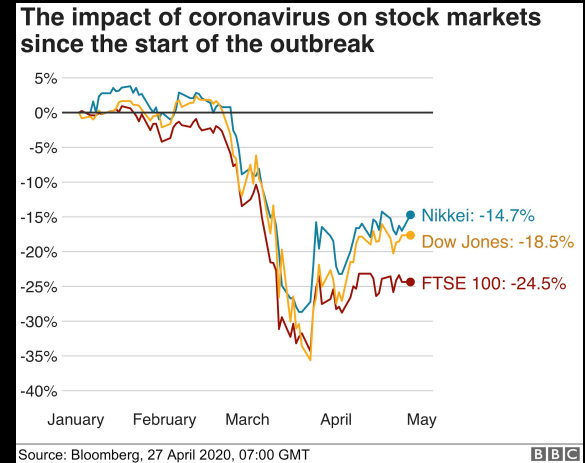
NEWS • PUBLIC AFFAIRS / MARCH 24, 2020

How Climate Change Increases Our Risk For Pandemics

REBECCA THIELE

Article origination IPBS-RJC

Climate change may be putting people at risk for more pandemics like COVID-19. Habitat loss due to climate is bringing animals that can transmit disease in contact with humans more often.



The Washington Post

Headlines from Oct 17, 2019 - Oct 19, 2019

In Kenya, a stampede for help

Kenya's Rift Valley
A stampede in Kenya's Rift Valley, where a massive crowd of people gathered for help, leading to a stampede that killed at least 100 people, according to local officials. The stampede occurred in a dusty area where a large crowd of people gathered for help, leading to a stampede that killed at least 100 people, according to local officials.

Plans to contain virus emerge in bottom-up effort

STATES, HEALTH EXPERTS PLOT NEXT STEPS
As president debates on economy, a second tier rises

With public's money, Trump risks himself as crisis patron

Kenya's Rift Valley
A stampede in Kenya's Rift Valley, where a massive crowd of people gathered for help, leading to a stampede that killed at least 100 people, according to local officials. The stampede occurred in a dusty area where a large crowd of people gathered for help, leading to a stampede that killed at least 100 people, according to local officials.

Small-business relief hurt by a rocky rollout

Small-business relief hurt by a rocky rollout
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Fear grows for federal inmates, guards alike

Fear grows for federal inmates, guards alike
Fear grows for federal inmates, guards alike. Fear grows for federal inmates, guards alike. Fear grows for federal inmates, guards alike. Fear grows for federal inmates, guards alike. Fear grows for federal inmates, guards alike.

Rare voices from Iran relate angst, confusion

Rare voices from Iran relate angst, confusion
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More coverage

More coverage
More coverage. More coverage. More coverage. More coverage. More coverage. More coverage. More coverage. More coverage. More coverage. More coverage.

Small business in the U.S. by day

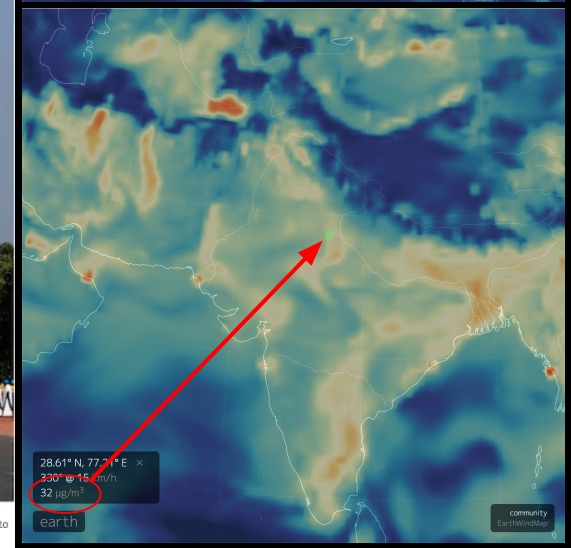
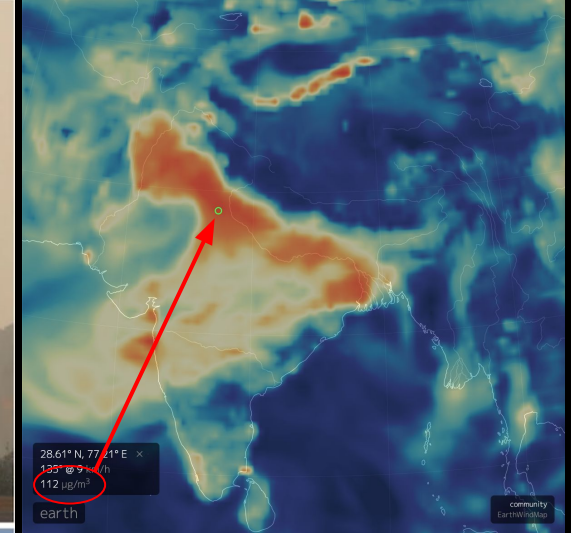
Small business in the U.S. by day
Small business in the U.S. by day. Small business in the U.S. by day. Small business in the U.S. by day. Small business in the U.S. by day. Small business in the U.S. by day.

Danger and anxiety in the skies

Danger and anxiety in the skies
Danger and anxiety in the skies. Danger and anxiety in the skies. Danger and anxiety in the skies. Danger and anxiety in the skies. Danger and anxiety in the skies.

INSIDE TODAY'S POST

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PM2.5 - fine particulate matter [ug / m3] (provided by CAMS)

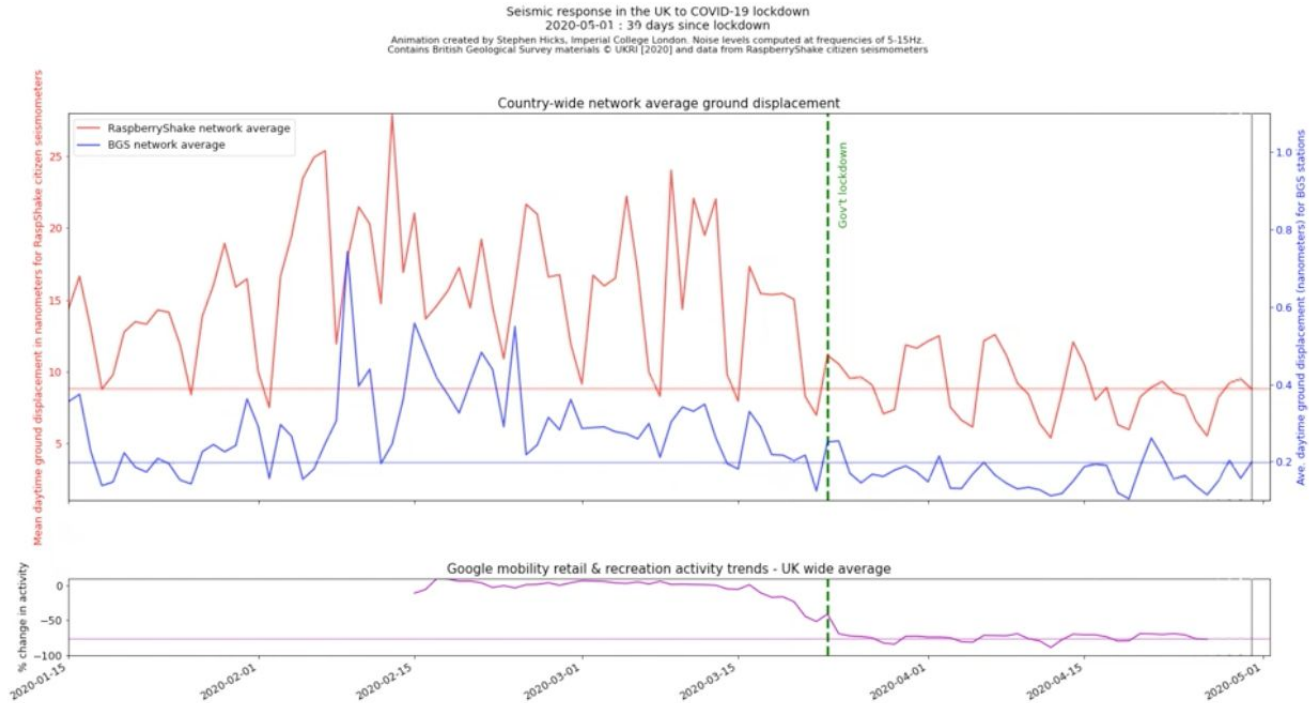
Visualization: earth.nullschool.net

The India Gate war memorial in New Delhi on Oct. 17, 2019, and on April 8, 2020, after air pollution levels dropped during a 21-day nationwide lockdown to slow the spread of the coronavirus. (Anushree Fadnavis and Adnan Aidi/Reuters)

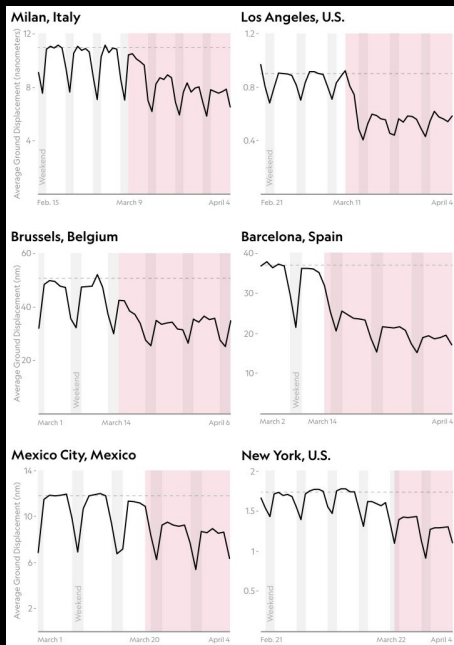
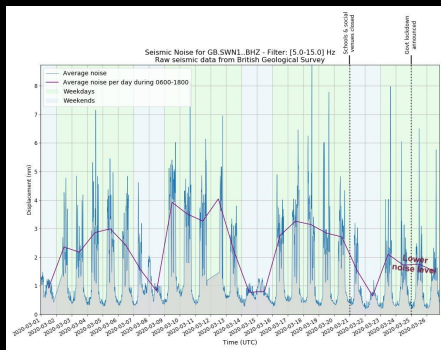
Not necessarily...



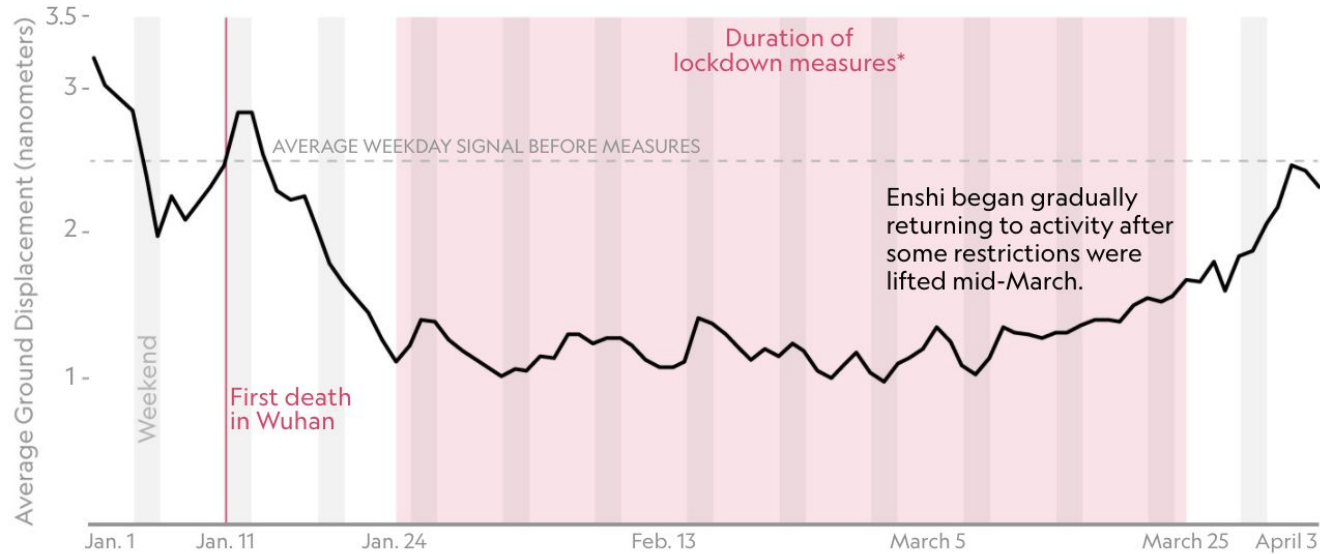
Unexpected Seismic Effects



See how seismic noise dips after Prime Minister Boris Johnson asks people to stay at home



Enshi, Hubei, China



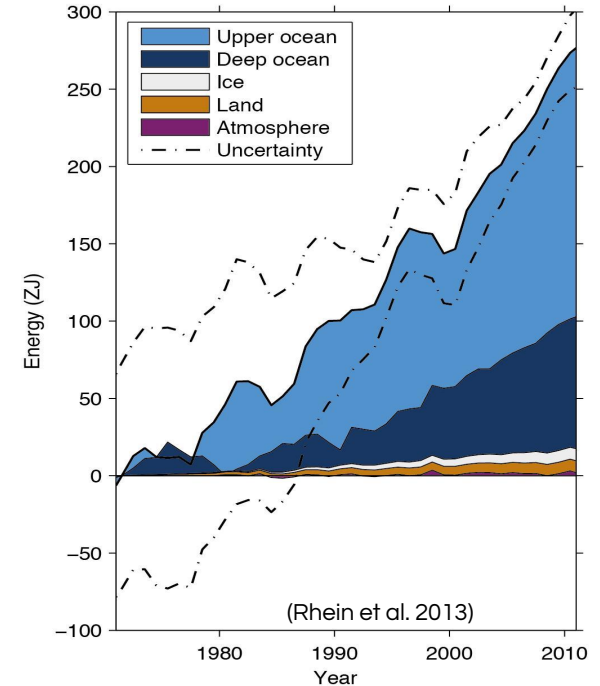
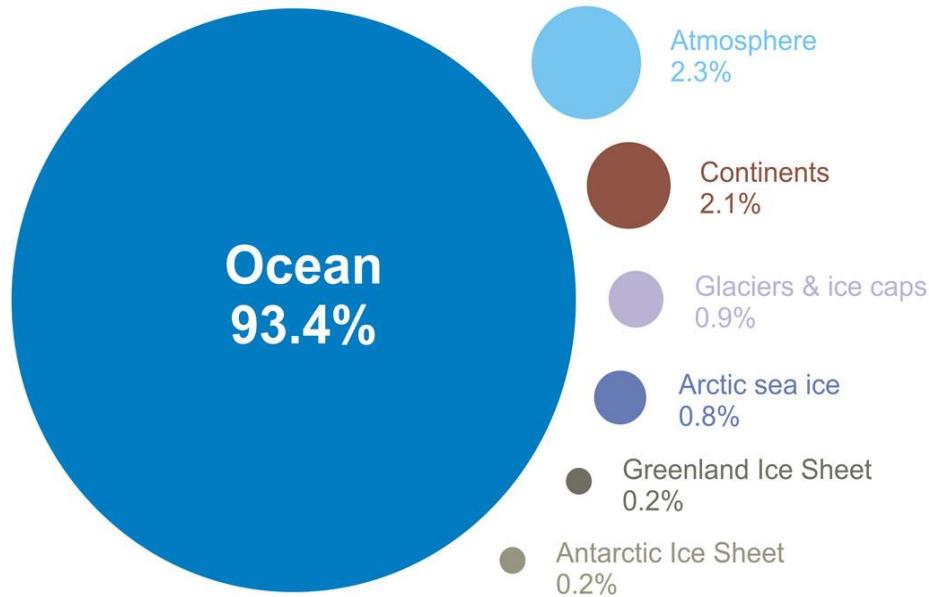
*LOCKDOWN MEASURES INCLUDE STAY-AT-HOME ORDERS, TRAVEL RESTRICTIONS, NON-ESSENTIAL BUSINESS CLOSURES, AND NATIONWIDE LOCKDOWNS.
TAYLOR MAGGIACOMO AND MAYA WEI-HAAS, NG STAFF. SOURCE: TIM CLEMENTS, HARVARD UNIVERSITY

“...knowledge of the oceans is more than a matter of curiosity.
Our very survival may hinge upon it.”

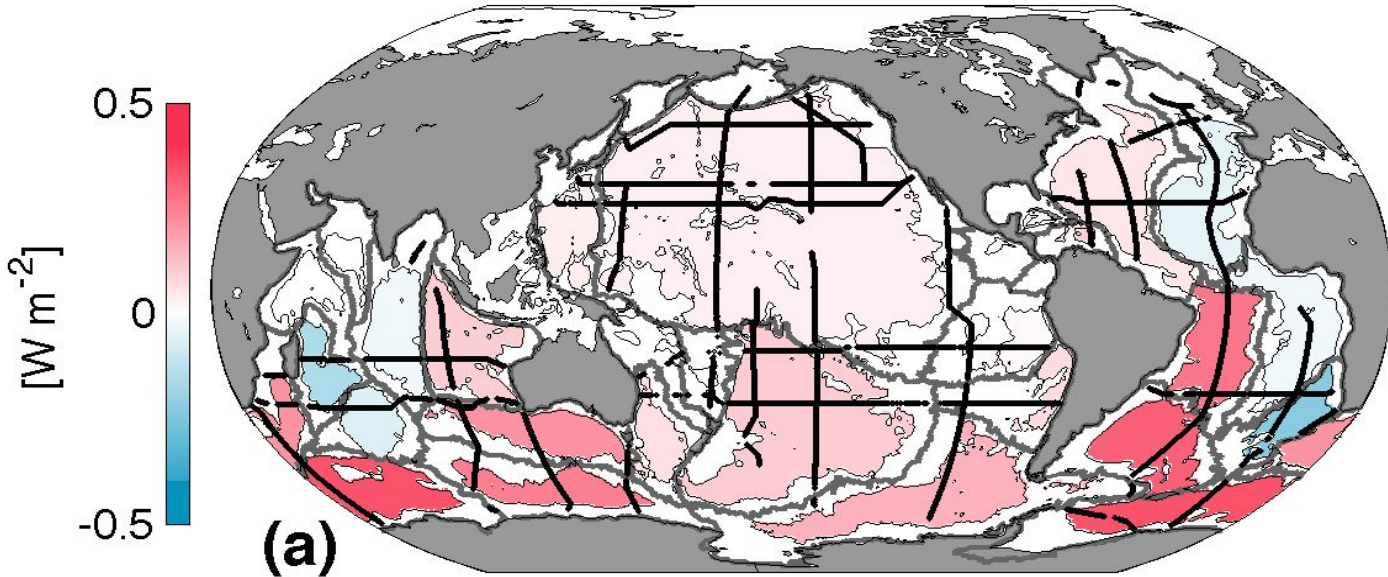
John F. Kennedy (1961)

Oceans are the “flywheel of climate”

Where is global warming going?



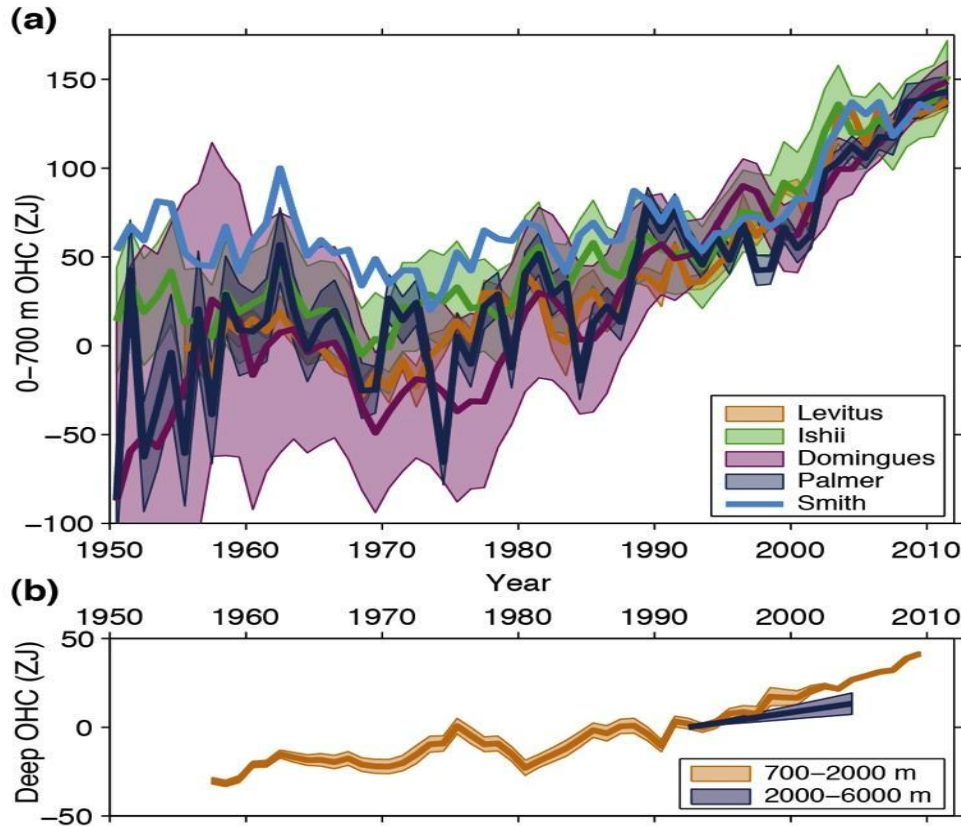
The Deep Ocean is Warming



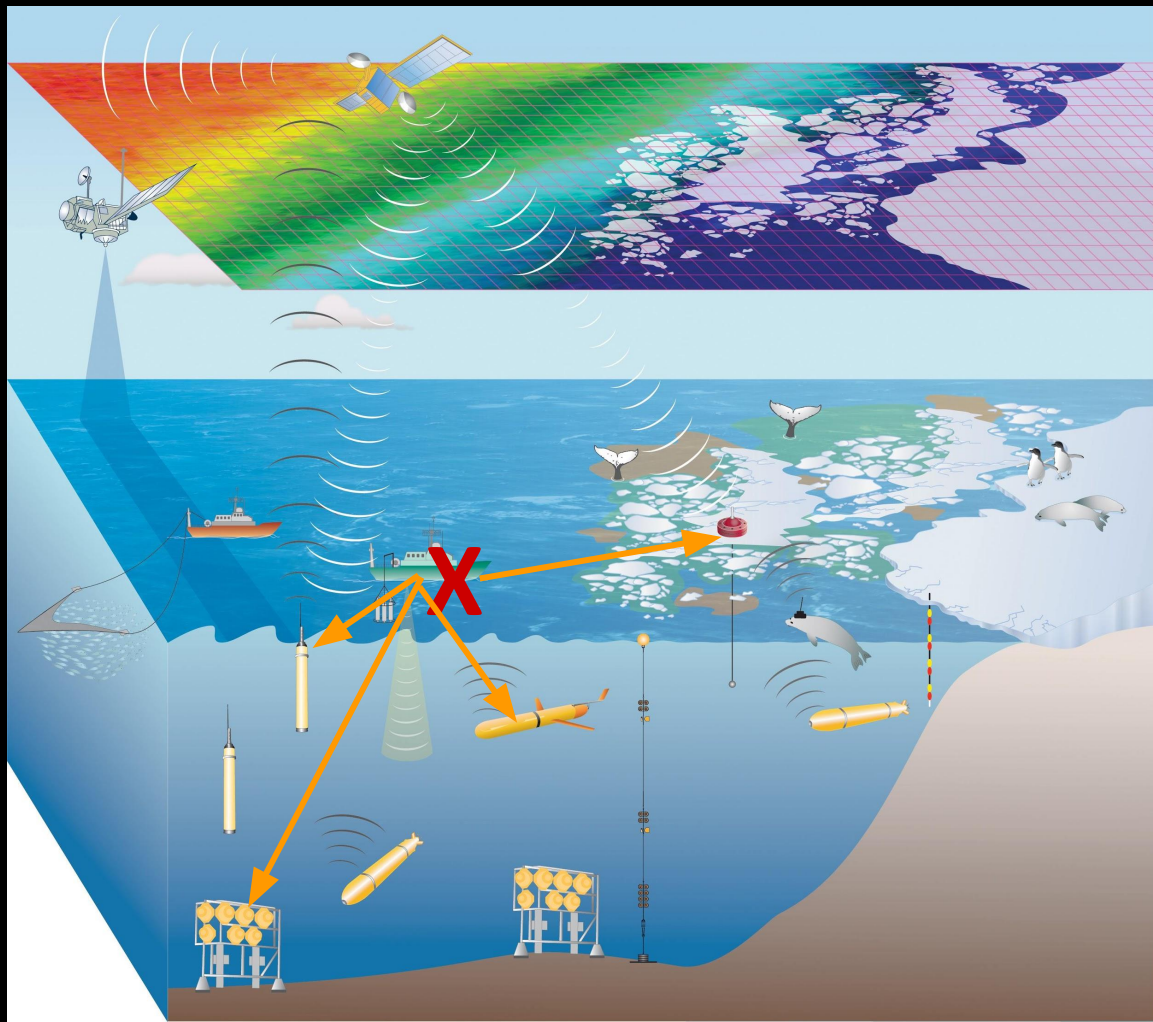
(Purkey and Johnson 2010)

- The deep ocean is warming around the global on decadal time scales
- Strongest warming in the Southern Ocean, weaker but significant warming along the bottom limb of the MOC

Why Should We Care: SLR and Global Energy Budgets



- Deep warming is roughly 10% of ocean warming
- This warming also has a local contribution to SLR (black numbers) and contributes 0.15 mm/yr (~5%) to the global mean sea level rise
- Sea level budgets are used to understand the relative contributions from steric vs. mass changes and to evaluate the accuracy and error of measurements
- Important climate signal that is not well understood



“There are two kinds of forecasters: those who don’t know, and those who don’t know they don’t know.”

John Kenneth Galbraith

OSD, MBT, XBT, CTD, PFL...

THE FUTURE

800000

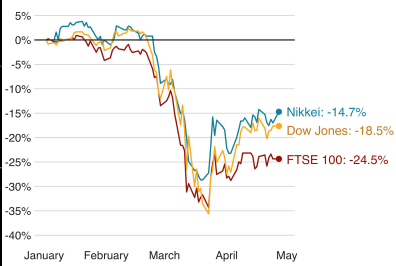
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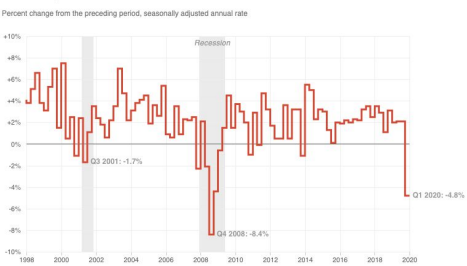
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The impact of coronavirus on stock markets since the start of the outbreak



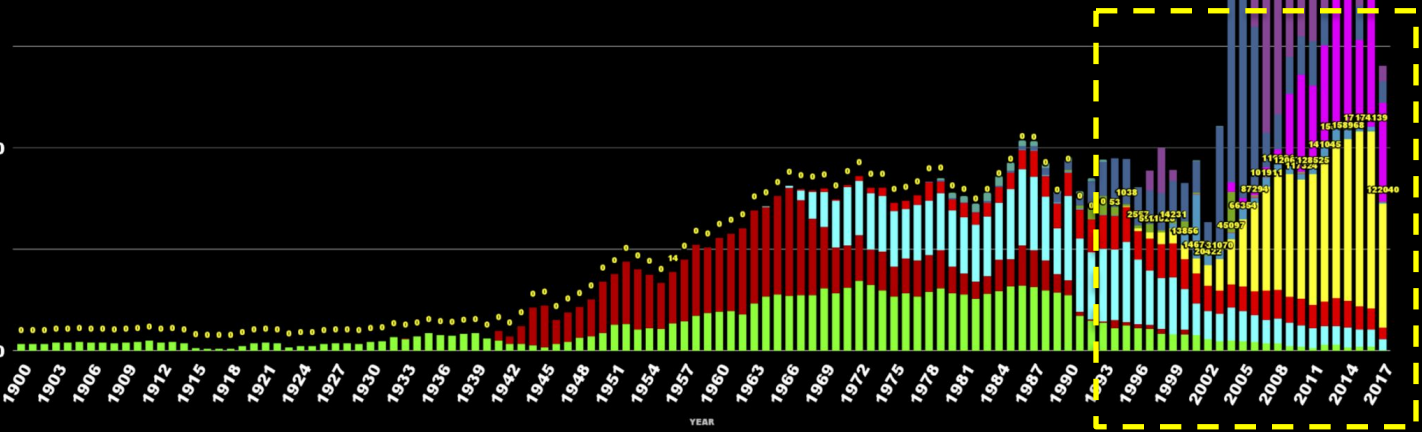
Source: Bloomberg, 27 April 2020, 07:00 GMT

Economy Shrank At 4.8% Rate In 1st Quarter



Source: Bureau of Economic Analysis
Credit: Ruth Taibon/NPR

- DBT
- Pinnipeds
- Mooring
- GLD
- UOR
- XCTD
- DRB
- PFL
- CTD
- XBT
- MBT
- Bottle



Some data repositories are busier than ever

Responding to & Aligning with an Evolving Research Landscape

Daniella Lowenberg
@danilowenberg
Dryad Product Manager
California Digital Library,
University of California



There has been an upsurge in faculty members requesting support for systematic reviews as they are more focused on the literature research part of their work while non-COVID research labs have closed. The medical library here has also created a special guide with resources for clinicians...the science and social science librarians are in the process of creating a guide which will include resources related to the environmental, economic, policy, legislation, demographic, and other areas of impact.

- *Associate University Librarian for Medicine and Social Sciences, Yale*



Data management is, far and away, the most popular workshop we have offered during campus shutdown and we've been invited to speak about making sure open data is usable data to lots of different student and research groups. We see data services as one of our core activities.

- *Medical Data Librarian, Stanford*



BCO-DMO has experienced an increase in data activity while science is quarantined from labs, research cruises, and field sites; in submissions, but also in contributor responsiveness and willingness to work through data questions.

- *Biological & Chemical Oceanography Data Management Office (BCO-DMO)*

Our collaboration areas are thriving... we expect that we will repurpose our budget toward supporting collaborative infrastructure

- *Earth Science Information Partners (ESIP)*



COVID-19 is directly challenging the next generation



?


Eos Science News by AGU

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GEOSCIENCE NEWS

During a Pandemic, Is Oceangoing Research Safe?

With research cruises postponed, scientists are trying to get home safe, and others worry about the fate of their instruments left at sea.



The R/V Endeavor sat in port in Cape Verde to receive supplies. To reduce the risk of infections, anyone who left the ship was not allowed back on board. Credit: Lydia Signorini

By Jenessa Duncombe 1 April 2020

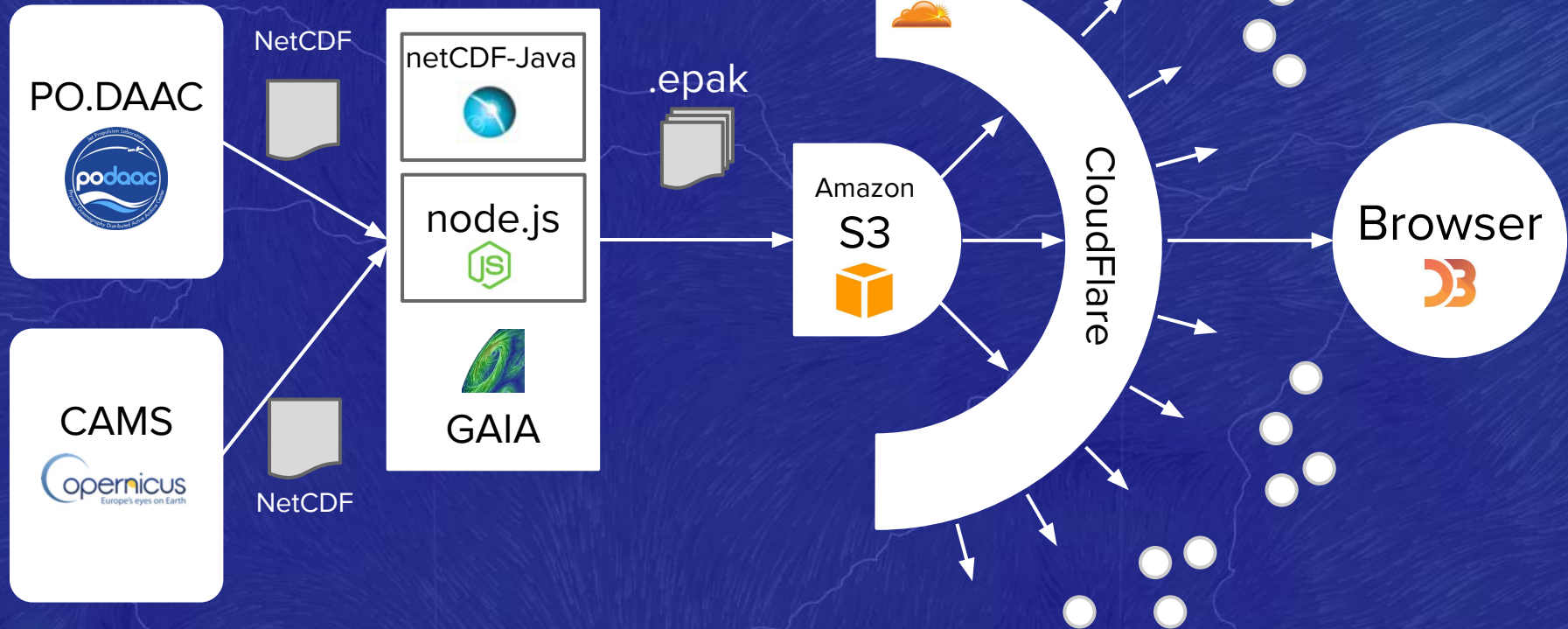
“Take Home” Lessons

- There has been a shift in priorities, consumption patterns, energy use, and behaviors
 - For a brief moment, we have seen what our governments can do, with proper incentives
 - We saw the world transform into a more ecologically balanced biosphere (instantaneous)
 - *What are the lasting implications of this pandemic as it pertains to national priorities and individual behaviors?*
- Data science and curation can enable the “science that can be done now” through effective use of existing data
- Data science and curation are more important than ever

“This nation needs **modern, highly capable data analytics**. This is one of the many shortcomings that has been identified as we went through this outbreak.”

Dr. Robert Redfield
Director, US CDC

earth.nullschool.net

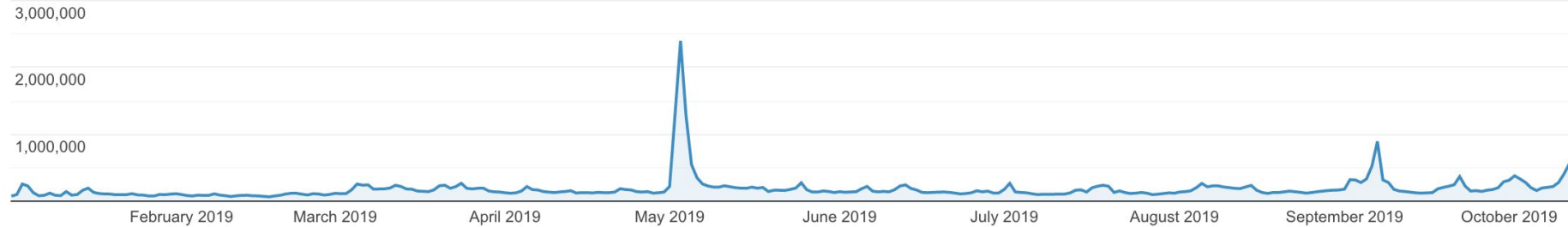


Overview

Users ▼ vs. [Select a metric](#)

Hourly **Day** Week Month

● Users



Users

19,474,715



New Users

18,997,704



Sessions

76,102,651



Number of Sessions per User

3.91



Pageviews

118,853,724



Pages / Session

1.56



Avg. Session Duration

00:02:02

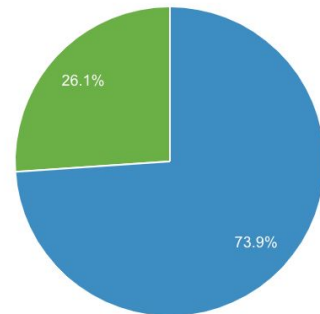


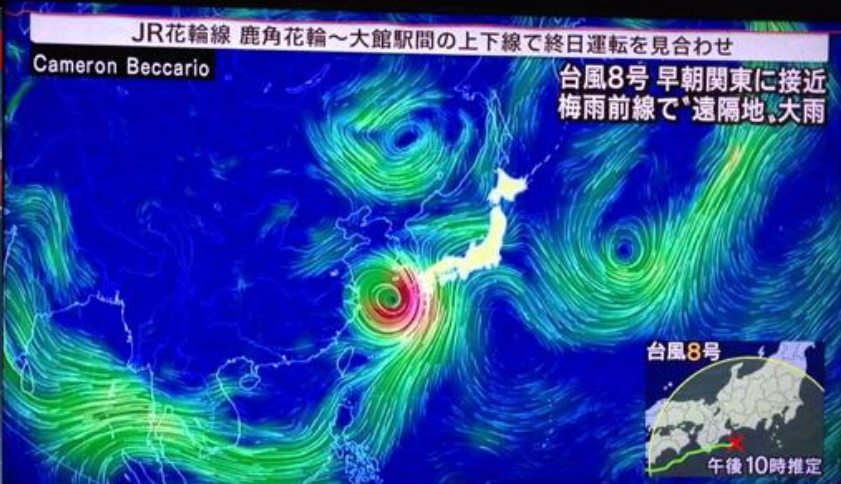
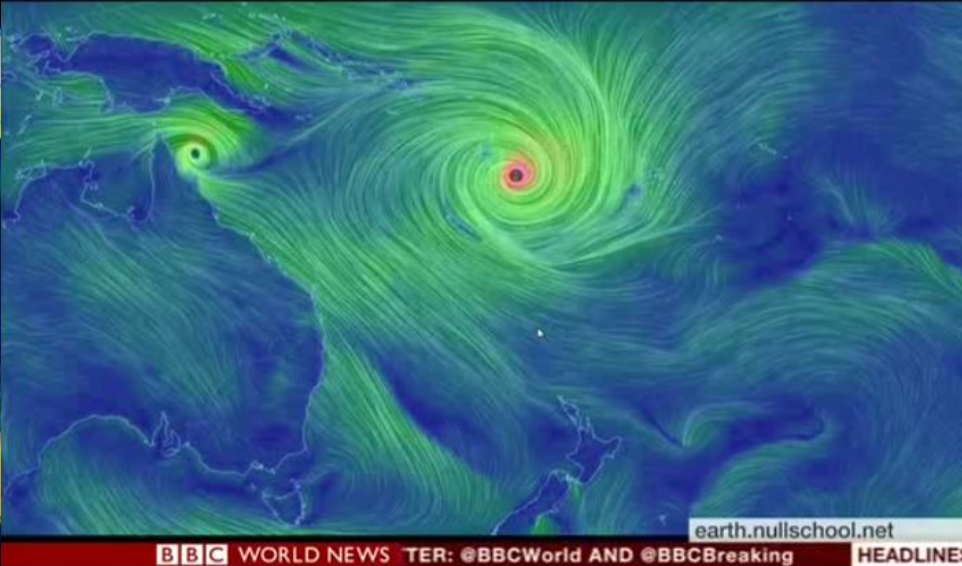
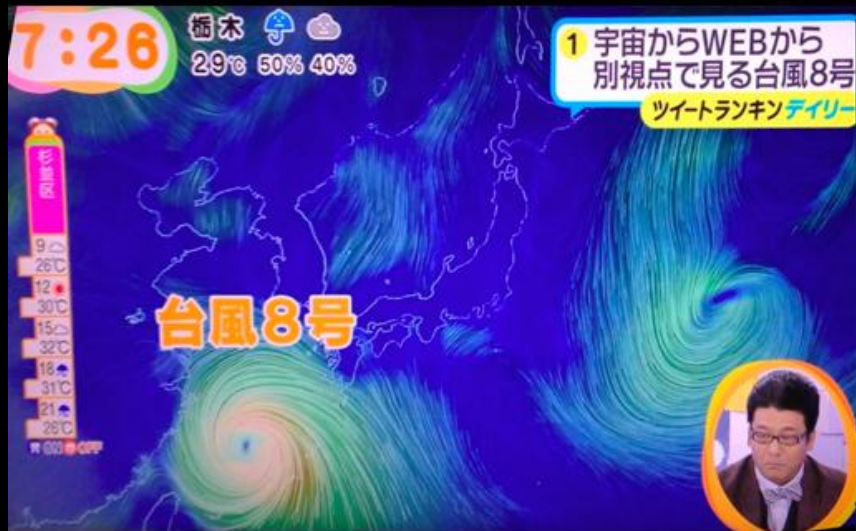
Bounce Rate

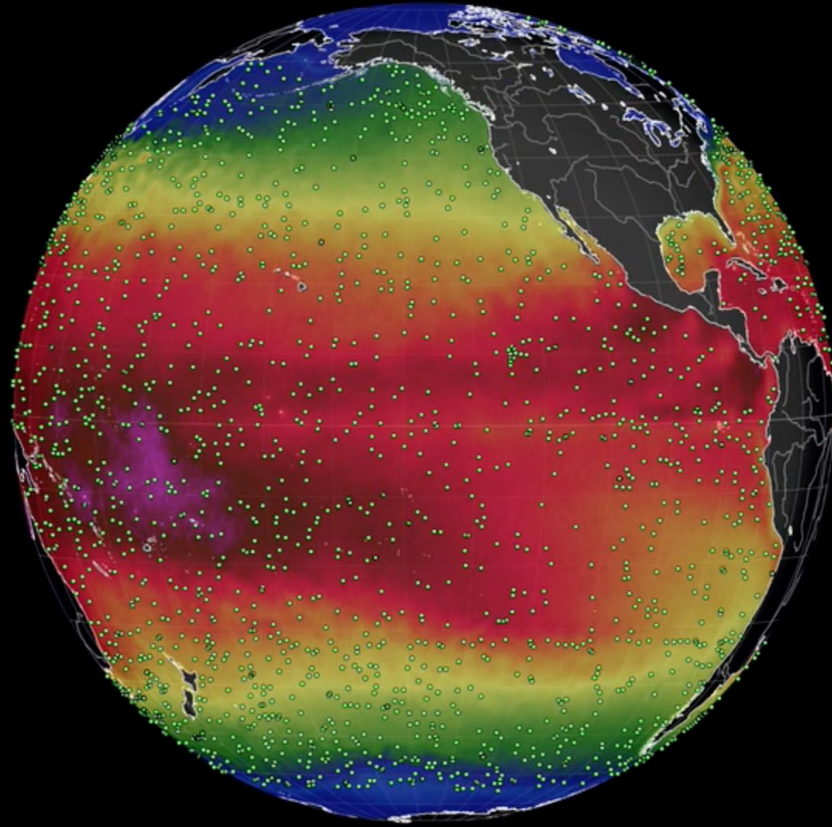
0.43%



■ New Visitor ■ Returning Visitor







“The intuitive mind is a sacred gift and the rational mind is a faithful servant.
We have created a society that honors the servant and has forgotten the gift.”

Albert Einstein



@scdiggs

Photo credit: John H. Moore