

Too hot, too dry, too wet



***The roller coaster of extreme weather in a climate-changing world
What we might face and what we can do about it***

**Delia Lake/Linda Morris Kelley and Wordsmith Jarvinen/Keith Eric Grant
February 26, 2022**

Intense Wildfires

December 2021 – January – February 2022

- Winter fire season?
 - Colorado fire, Big Sur, CA
 - Marshall Fire, Boulder, CO
 - Suburban
 - 100 mph winds
 - 1084 homes destroyed
 - Over \$500 million in residential damage
- Summer
 - Waiharara, NZ
 - sending ash up to 50km from the fire ground!



<https://www.teaomaori.news/2000ha-scrub-fires-covering-ngai-takoto>

Dixie fire, July 2021, Sierra Mountains, CA



Dixie Fire, CA , July 2021. Burned almost 1 million acres.

<https://www.theguardian.com/us-news/2021/dec/25/what-the-numbers-tells-us-about-a-catastrophic-year-of-wildfires>

Remains of neighborhoods of homes, of families and communities

Boulder County, CO, and Lytton, BC



Photo: Hart Van
Denburg/AP/Shutterstock



<https://www.nytimes.com/2021/07/10/world/canada/canadian-wildfire-british-columbia.html>

Global wildfires in 2021



July, 2021

<https://www.iccrom.org/news/message-those-countries-currently-affected-wildfires>

4 million km² burned each year

According to the European Space Agency, “**fire affects an estimated four million square kilometres** (1.5 million sq miles) of Earth’s land each year”.

Yearly fires

400,000,000 hectares
(990,000,000 acres)



About half the
size of the US



Larger than the
area of India



About four times
the size of Nigeria



Source: European Space Agency | August, 18 2021



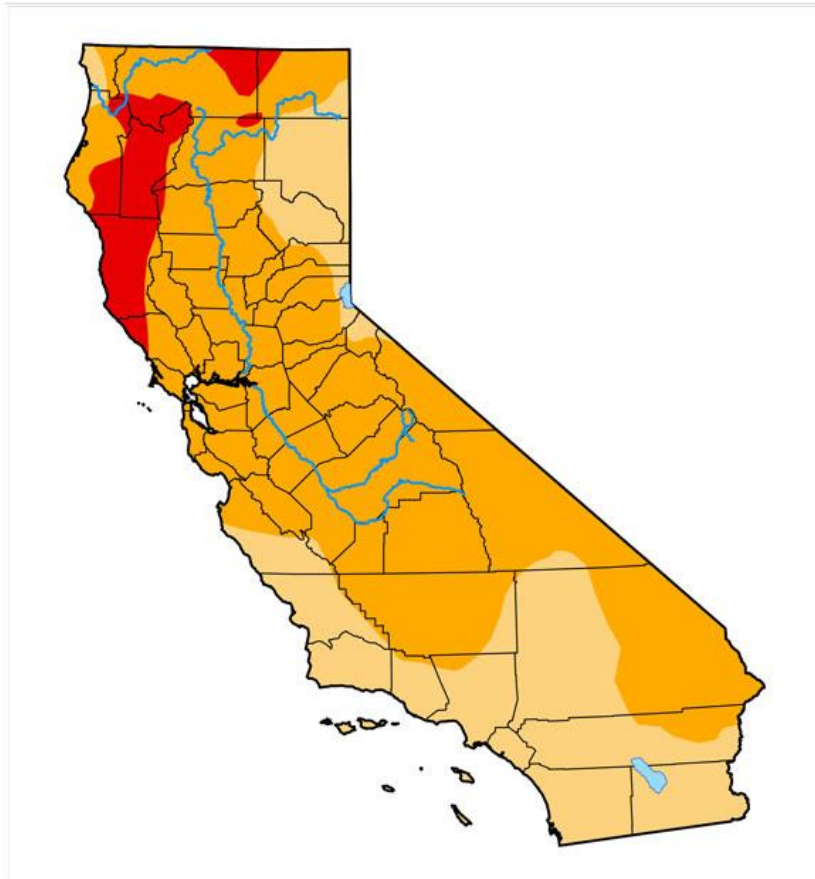
@AJLabs ALJAZEERA

What's going on in the atmosphere?



Drought in California, US

U.S. Drought Monitor California



February 22, 2022

(Released Thursday, Feb. 24, 2022)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	68.77	6.70	0.00
Last Week 02-15-2022	0.00	100.00	99.57	66.39	1.39	0.00
3 Months Ago 11-23-2021	0.00	100.00	100.00	92.43	80.28	28.27
Start of Calendar Year 01-04-2022	0.00	100.00	99.30	67.62	16.60	0.84
Start of Water Year 09-28-2021	0.00	100.00	100.00	93.93	87.88	45.66
One Year Ago 02-23-2021	0.70	99.30	84.88	56.98	29.54	3.75

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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CPC/NOAA



droughtmonitor.unl.edu

The first 2 months of 2022 are the driest in California history, and likely the worst in 1000 years.

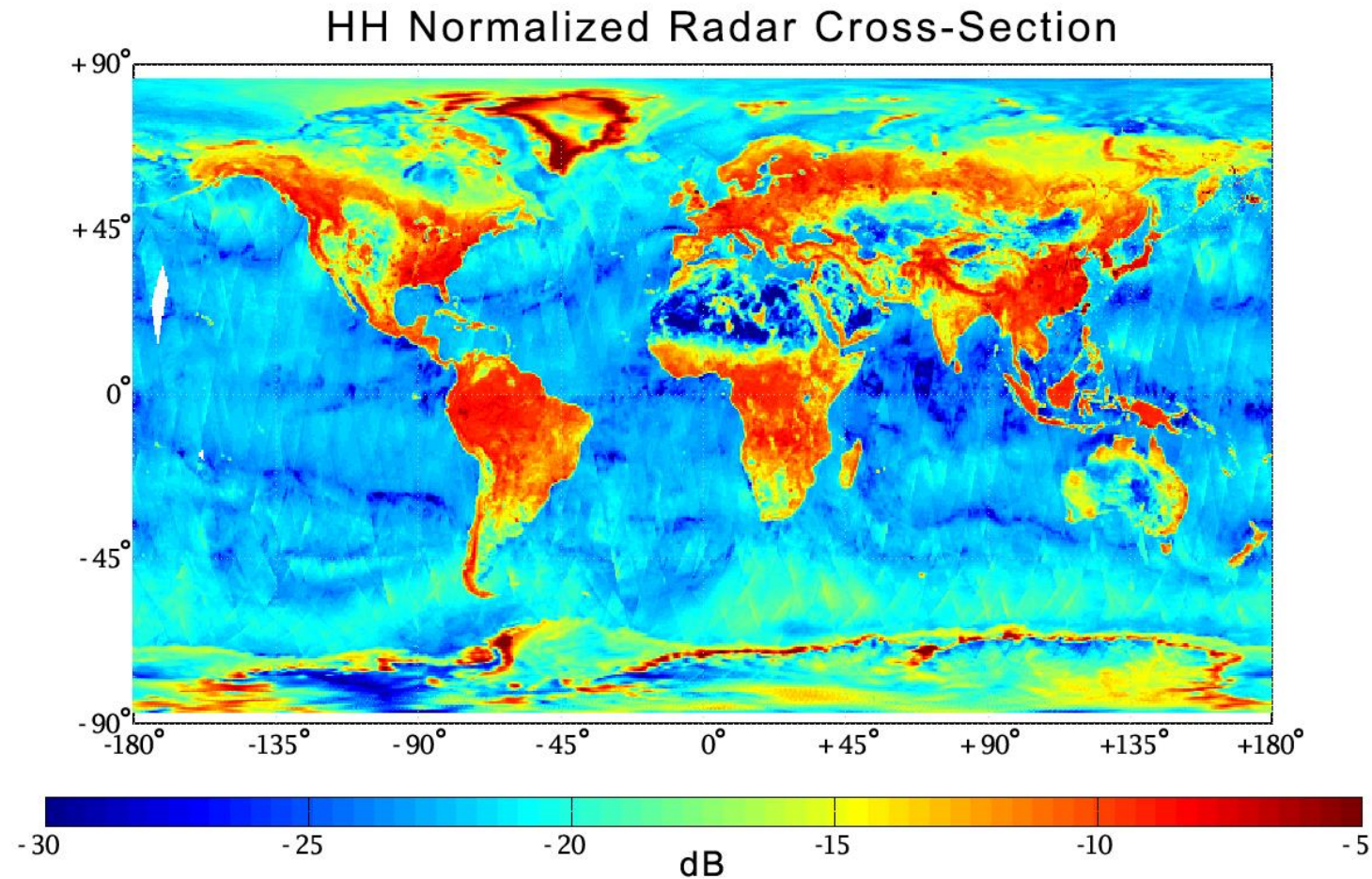
Variations on a drought theme

- Not all droughts are created equal... nor do they have the same conditions
 - Long-term drought = chronic illness for the land
 - Flash drought = fast onset from extreme heat and wind causing rapid evaporation of moisture in soil



<https://www.ucsusa.org/resources/drought-and-climate-change>

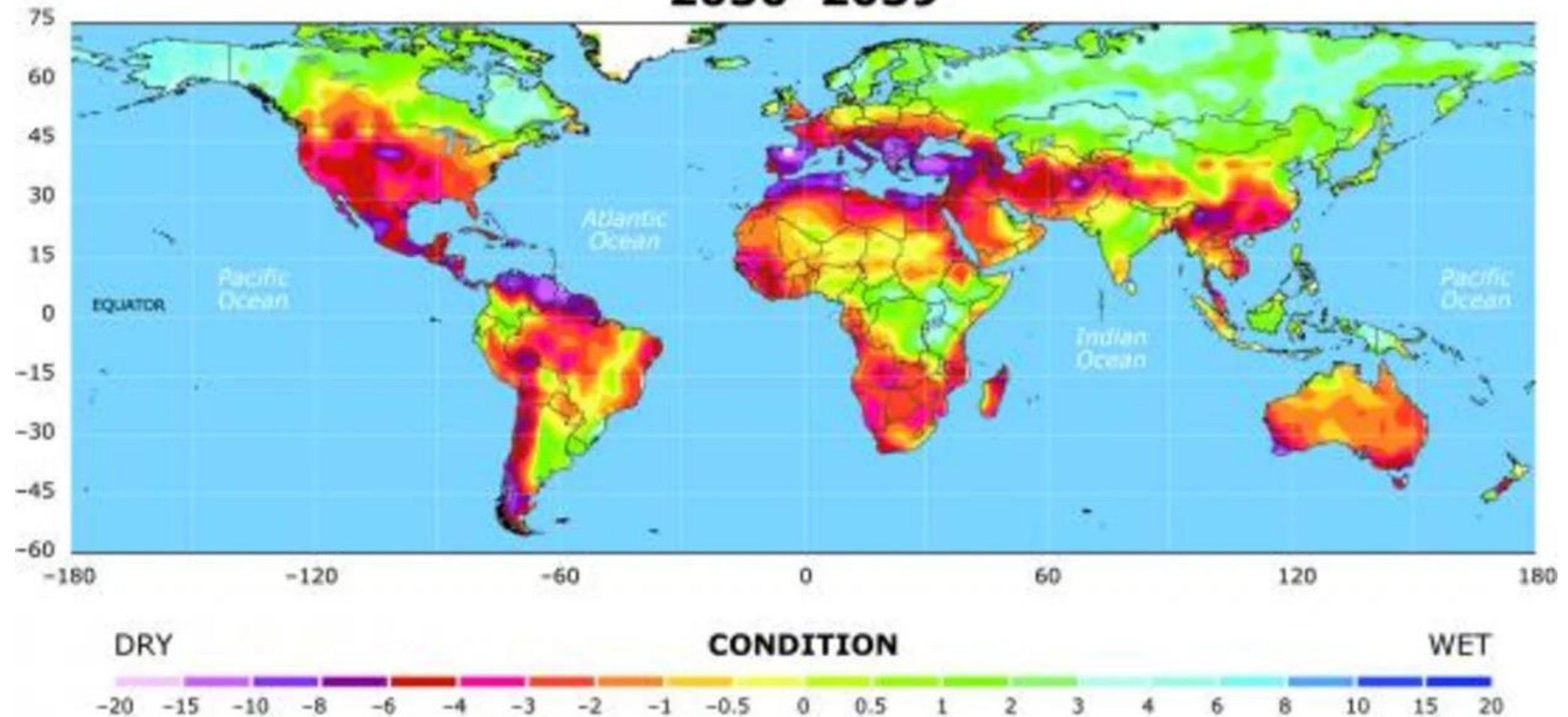
NASA Soil Moisture Map, 2015



<https://www.nasa.gov/jpl/smap/nasa-soil-moisture-mission-produces-first-global-maps>

Projection of future drought

2030–2039



Soil microbes

- Fungi
- Bacteria
- Viruses



<https://www.earth.com/news/soil-microbes-communicate-battle/>

Flooding and mudslides in 2021



Liege, Belgium, July 2021



<https://www.bloomberg.com/news/features/2021-07-16/photos-germany-s-record-flooding-show-devastation>

Erfstadt, Germany, July 2021



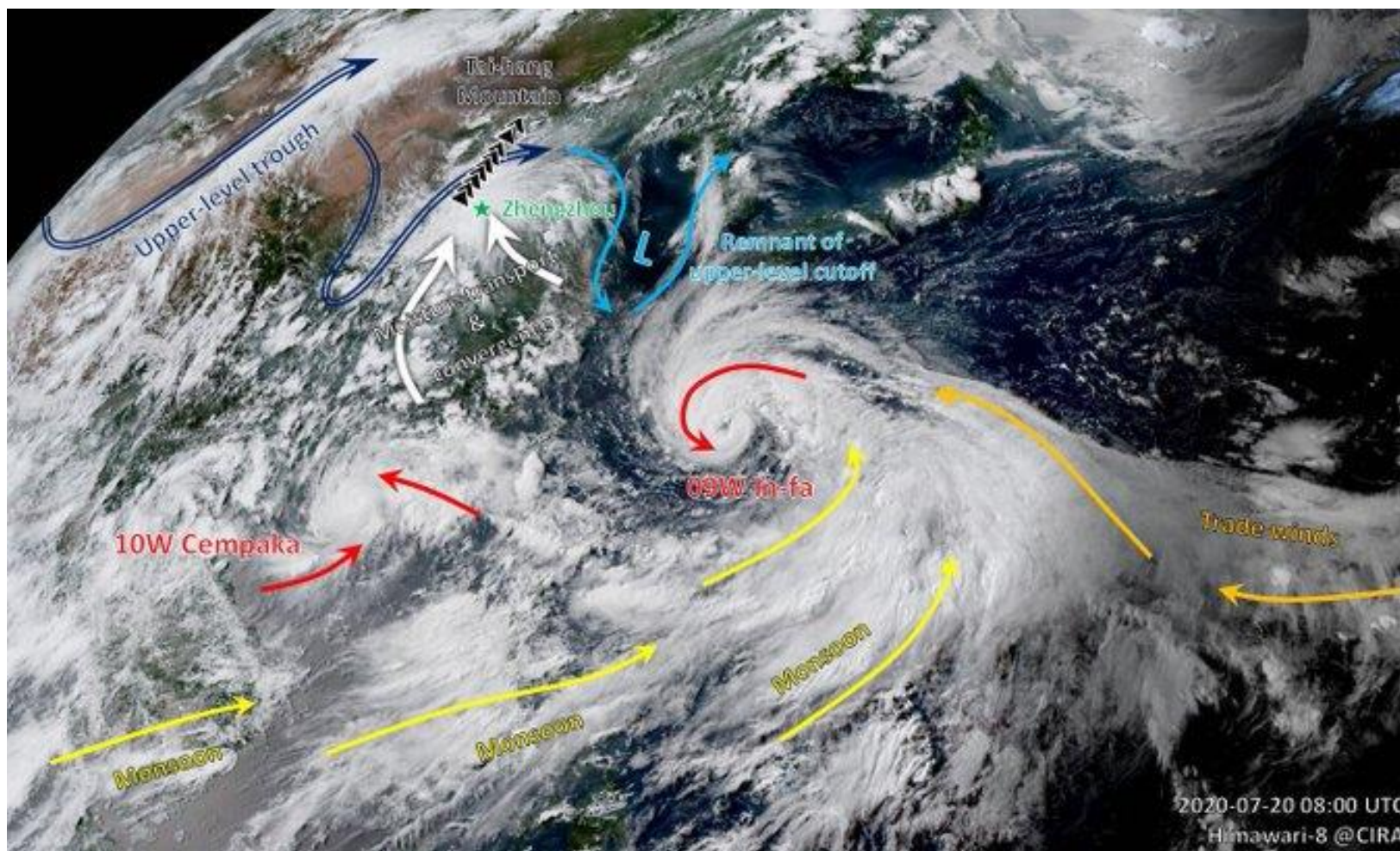
<https://www.bloomberg.com/news/features/2021-07-16/photos-germany-s-record-flooding-show-devastation>

Zhengzhou, China, July 20, 2021



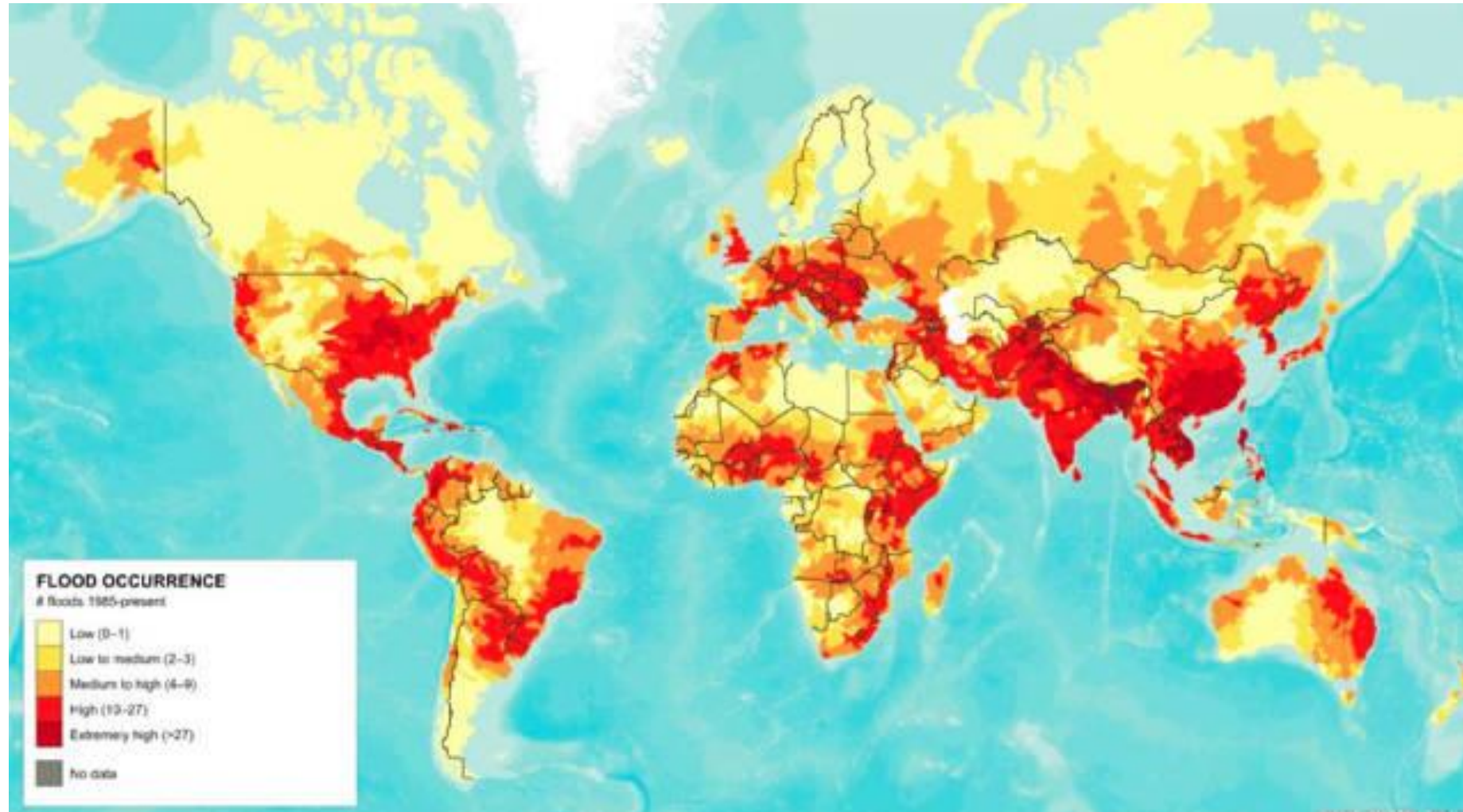
<https://yaleclimateconnections.org/2021/07/extreme-rainfall-in-china-over-25-inches-falls-in-24-hours-leaving-33-dead/>

July 21, 2021



https://twitter.com/Minghao_Zhou/status/1417714731826270209?ref_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwterm%5E1417714731826270209%7Ctwgr%5E%7Ctwcon%5Es1_&ref_url=https%3A%2F%2Fd-33549709631458736221.ampproject.net%2F202142035002%2Fframe.html

Water risks and flood-prone areas



<https://deezfloods.weebly.com/location.html>

Mudslide - I-70, Glenwood Canyon, CO



<https://www.nbcnews.com/news/us-news/mudslide-scenic-colorado-highway-tests-limits-aging-infrastructure-era-climate-n1278771>

Mudslide - British Columbia, November 2021



<https://www.thestar.com/news/canada/2021/11/15/trapped-between-mudslides-in-bc-people-are-banding-together-to-help-each-other.html>

Burn scar - Angora Fire, Lake Tahoe, CA (June 2007)



<https://earthobservatory.nasa.gov/images/18555/angora-fire>

We are failing ourselves, and the rest of the inhabitants of our planet

We are suffering from a failure of imagination. Among other things,

- We imagine human-centric solutions
- We imagine non-human causes
- We imagine parts, ignoring the whole



We ask many questions that mask root problems

What questions should we be asking?



Where might we start?

- **Problems that are outcomes of our successes**

- Agriculture production
- Eradication of mosquito-borne diseases
- Housing
- Fossil fuels
- Transportation

- **Recovery and restoration**

- Stop forest clear cutting
- Smart building and rebuilding

- **Designs for multi-solving better lifestyles**

- Homes
- Business
- Food/agriculture
- Mobility – technologies, and migration
- Energy sources, transmission, and use
- Collaborations – solve pressing problems of today in ways that better prepare us for a future where humanity can thrive

- **Scaling solutions**

- **Cease human warring against nature**

