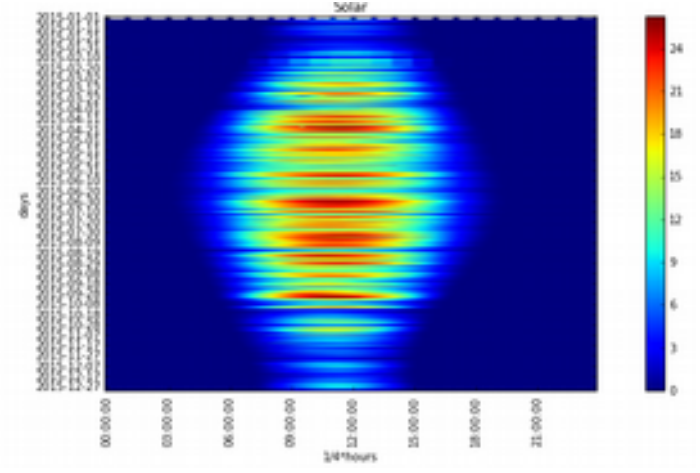
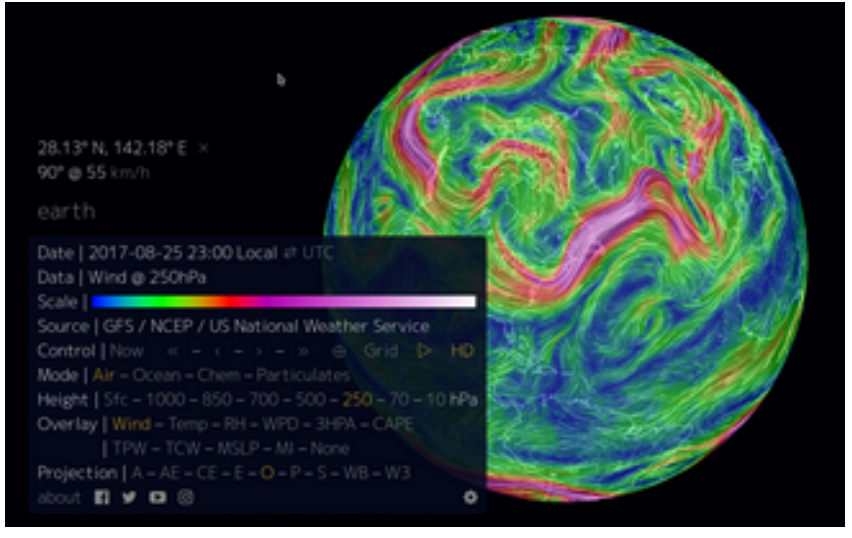
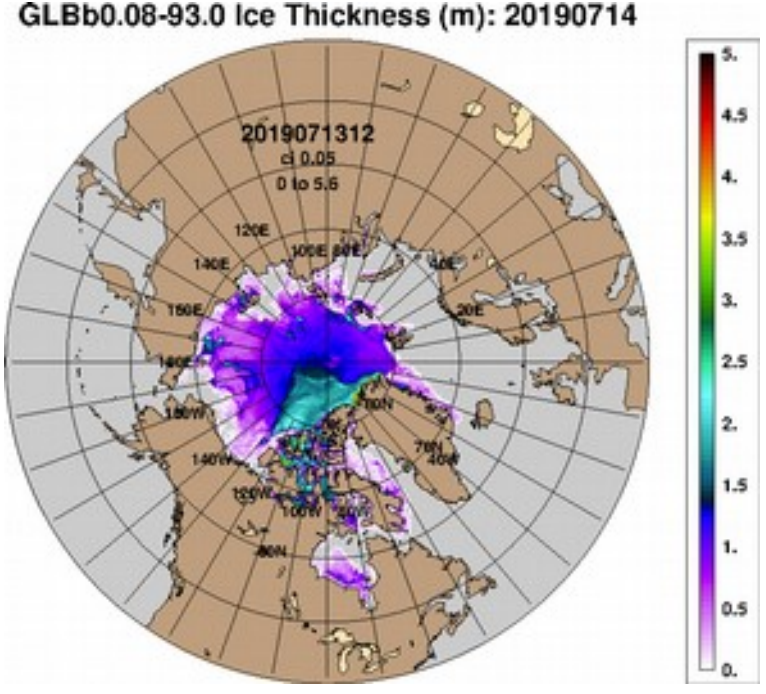
Digitale Werkzeuge zum Verständnis von Klima und Wetter



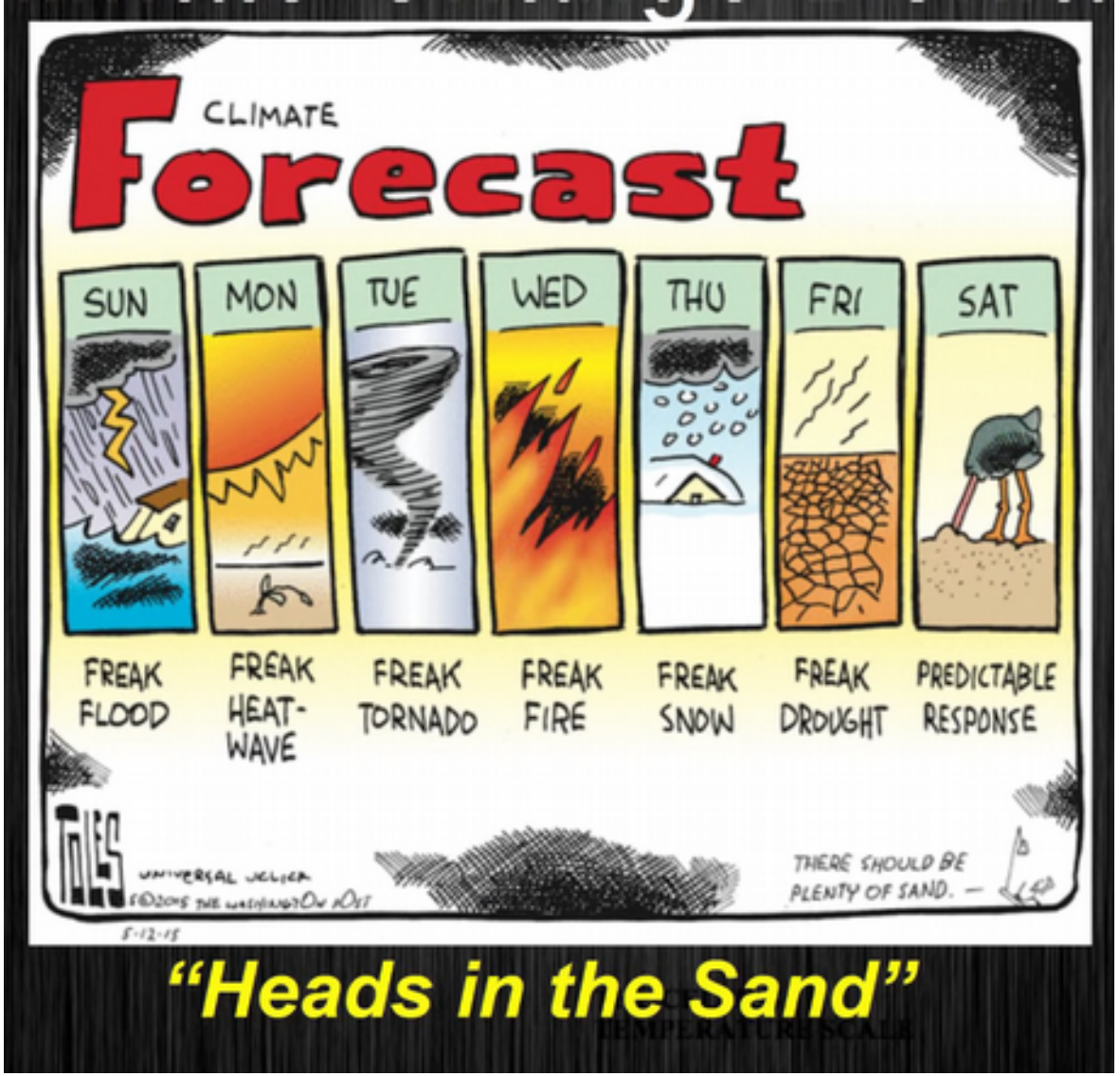




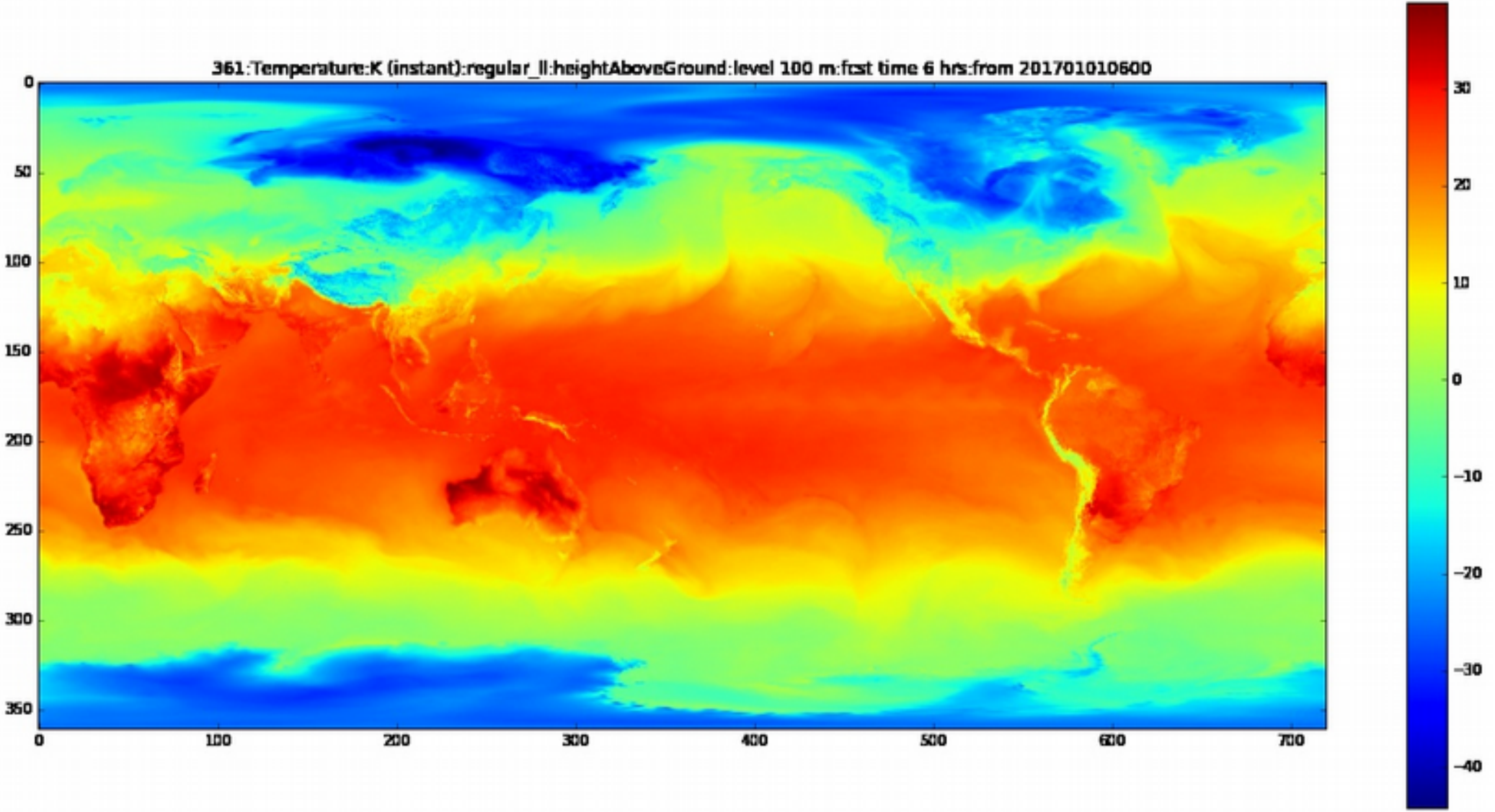
Warum dieser Vortrag

- Der Klimawandel bestimmt das Tempo der Veränderungen
  - Sonne und Wind sind entscheidende Größen der Energiewende
- Es gibt immer noch Skeptiker und Leugner des Klimawandels
- Wir können die Veränderungen (im Internet) sehen

- Kopf in den Sand stecken ist die einfache Lösung



Quelle: Michael Mann https://youtu.be/P-qNUSEAXxk?t=20m41s

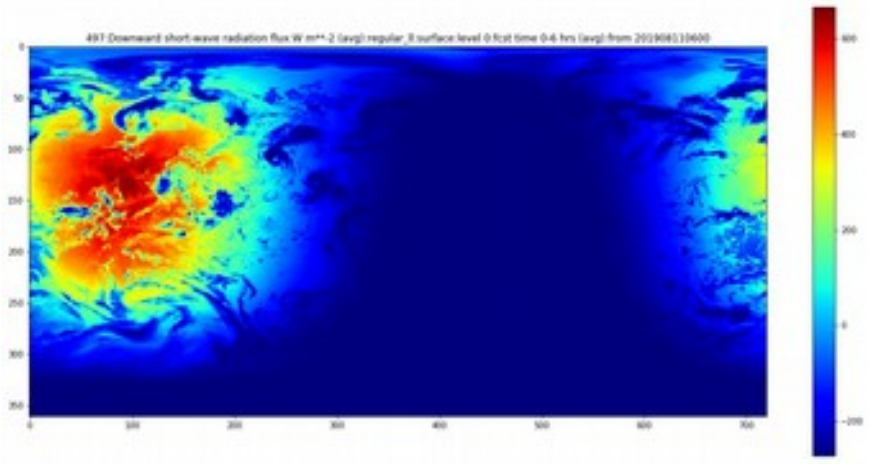


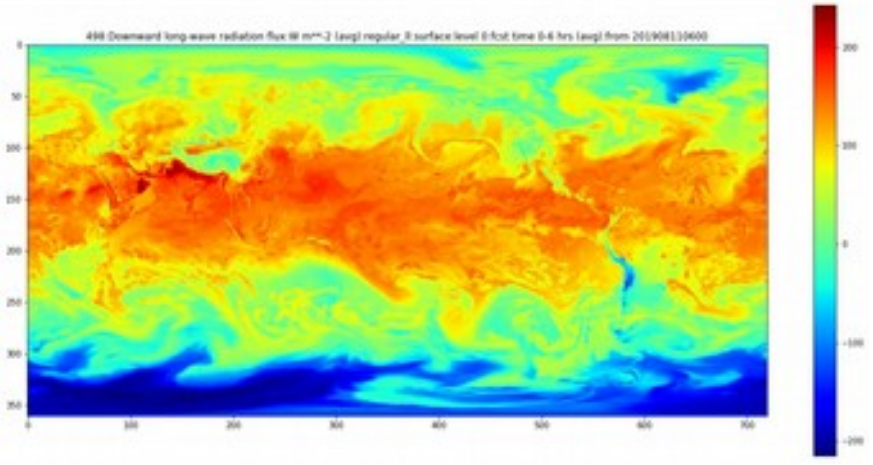
Quelle: noaa.gov

Kurzwellige Strahlung

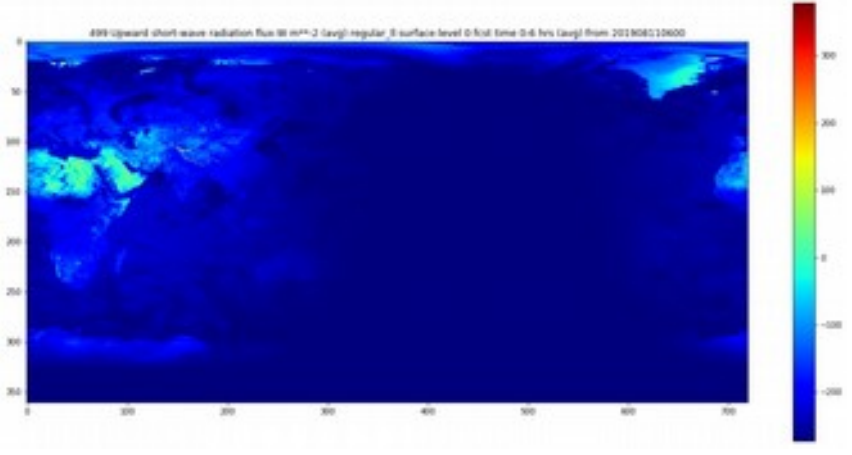
Langwellige Strahlung

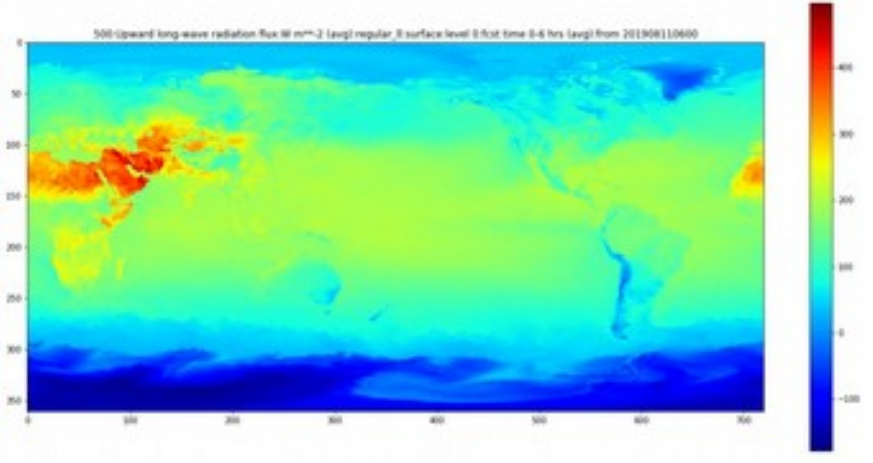
Down





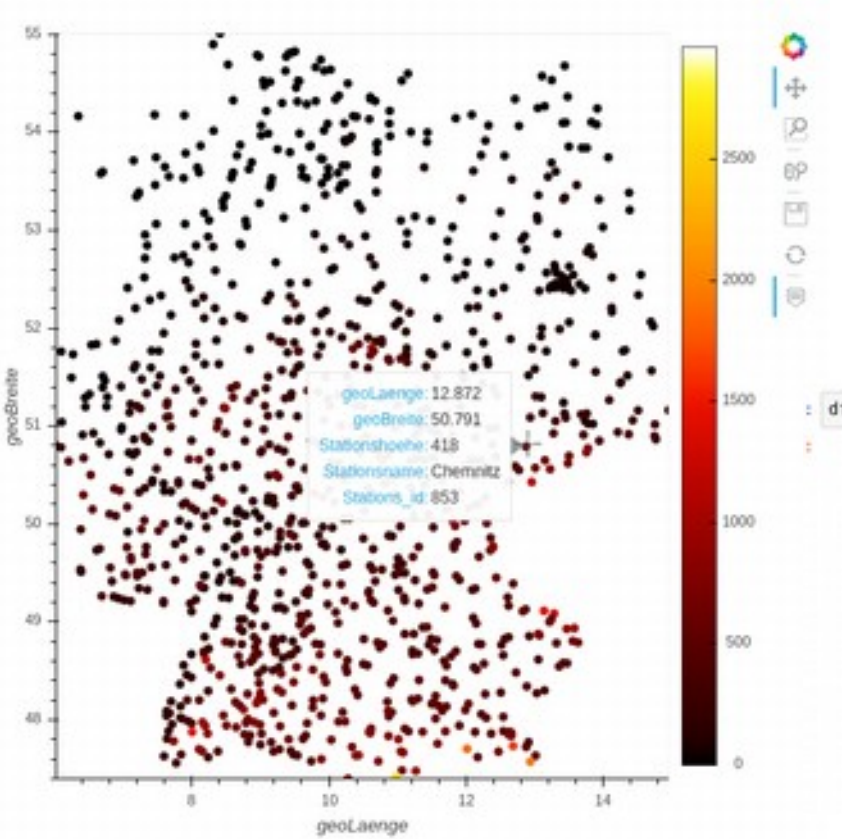
Up

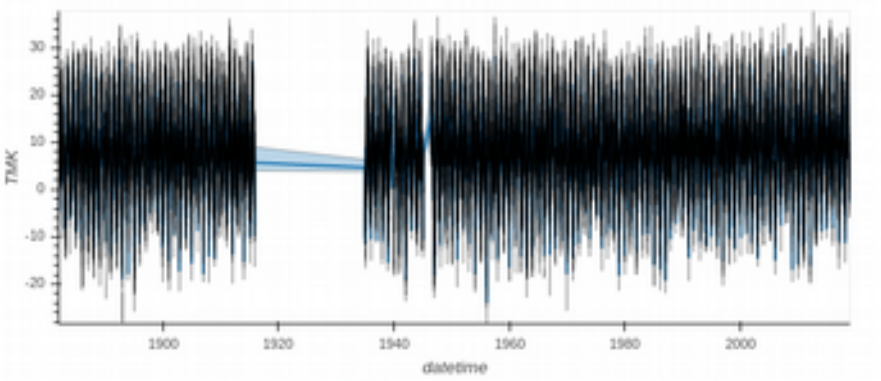




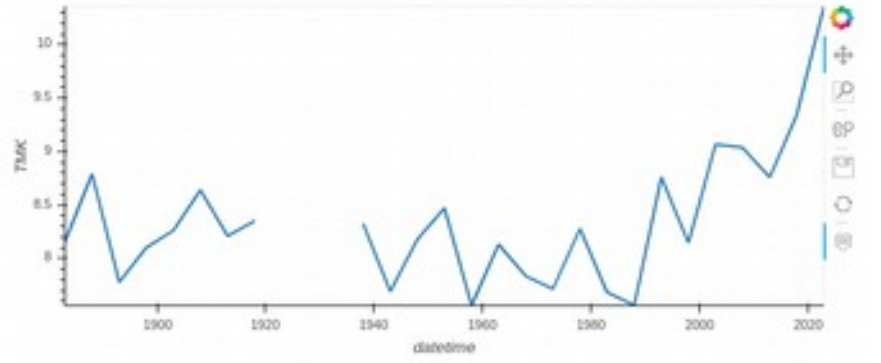
https://github.com/kolossos/energy-tests/blob/master/Dokumente/energy/11-pygrib02-pandas-Matplotlib.ipynb

Daten des deutschen Wetterdienstes



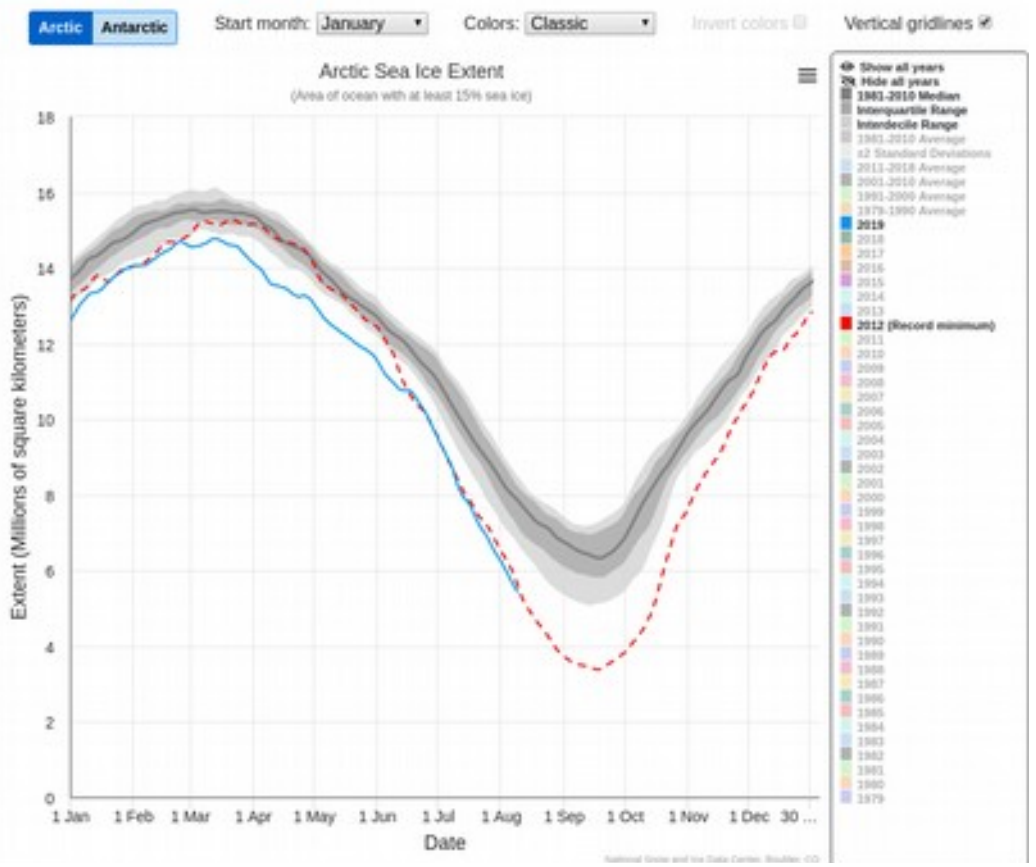



```
df.resample("5Y").mean().hvplot(x="datetime",y=["TMK"])
```

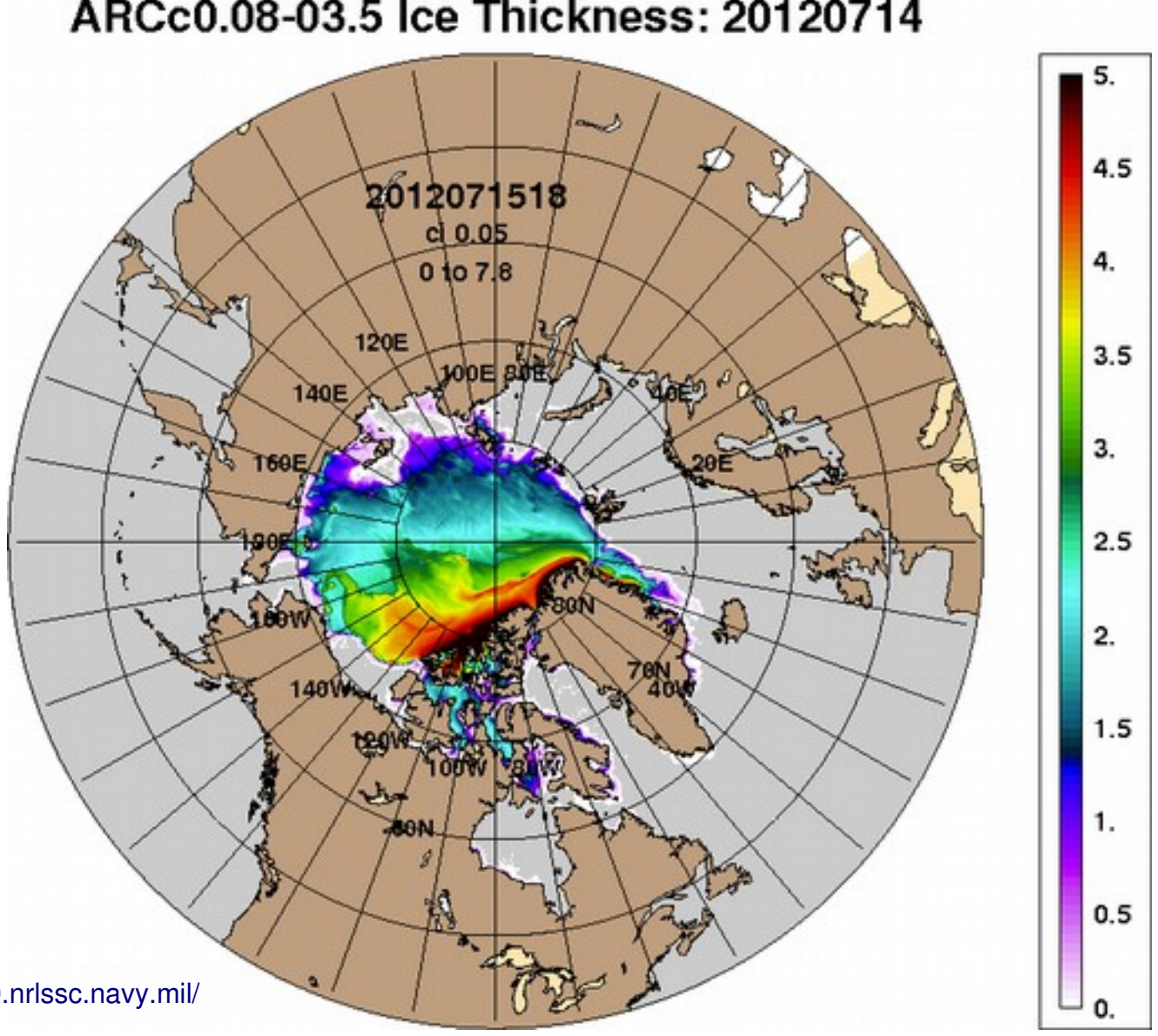


opendata.dwd.de
https://github.com/kolossos/energy-tests/blob/master/Dokumente/energy/Intake01-DWD05-daily%20hist.ipynb
https://github.com/kolossos/energy-tests/blob/master/Dokumente/energy/dwd02-climate.yml

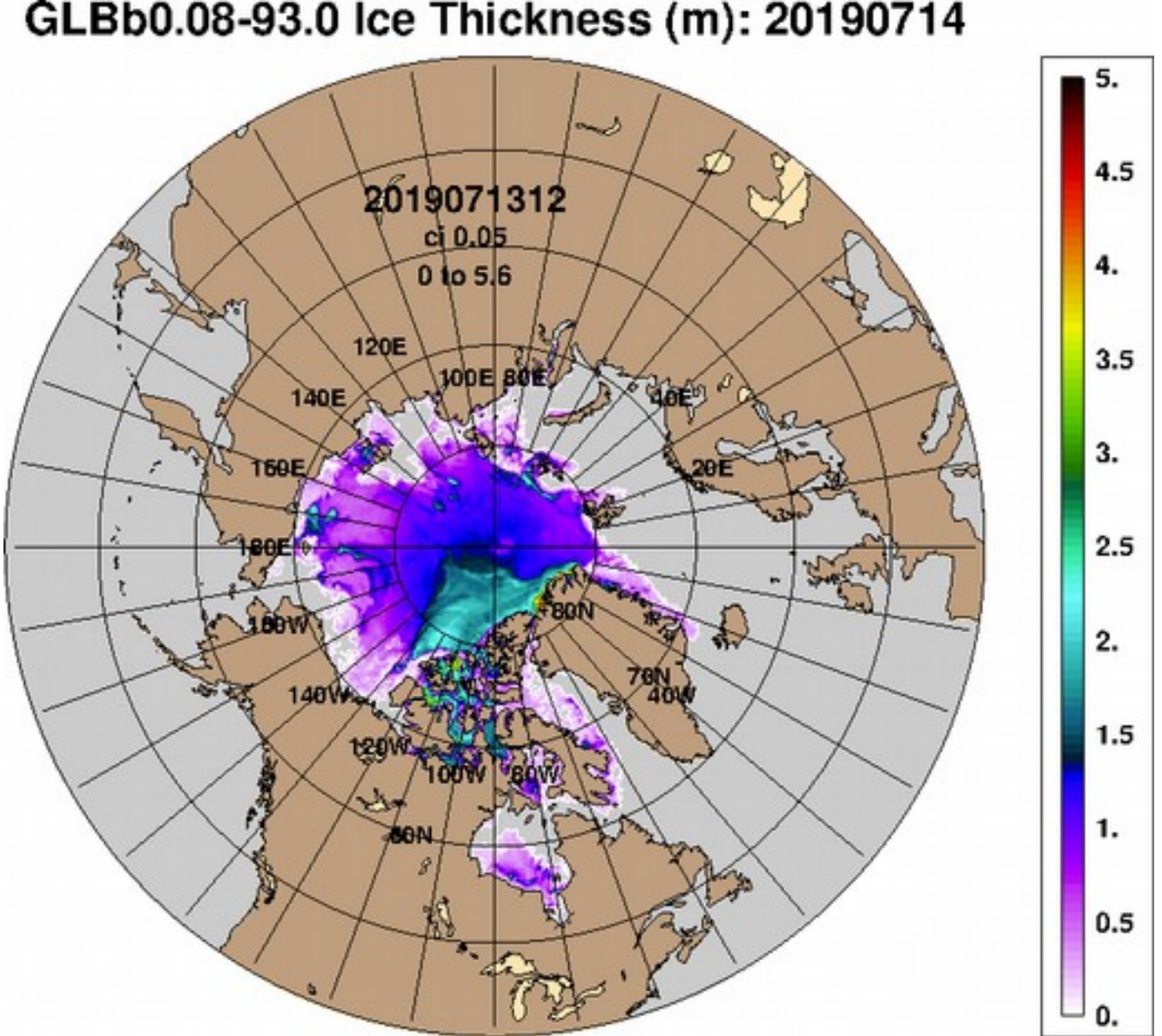
Fläche des Eises am Nordpol



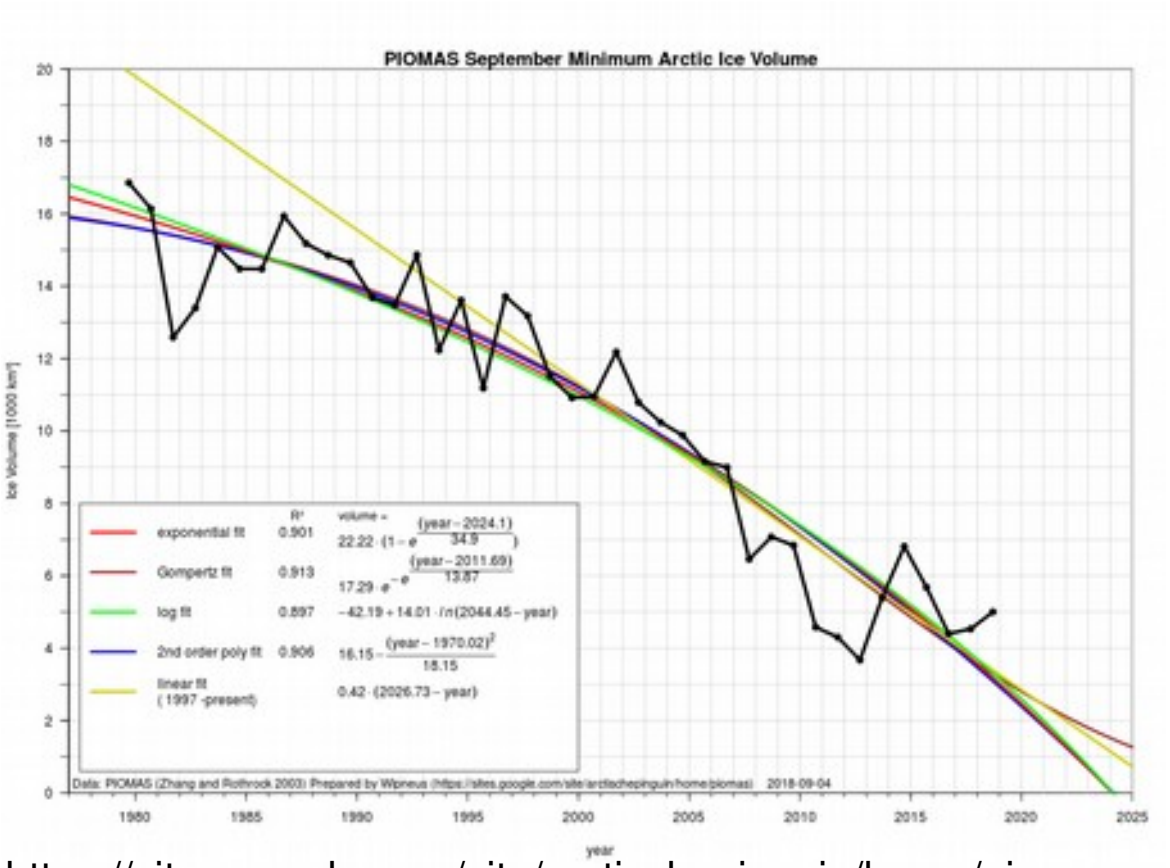
http://nsidc.org/arcticseaicenews/charctic-interactive-sea-ice-graph/

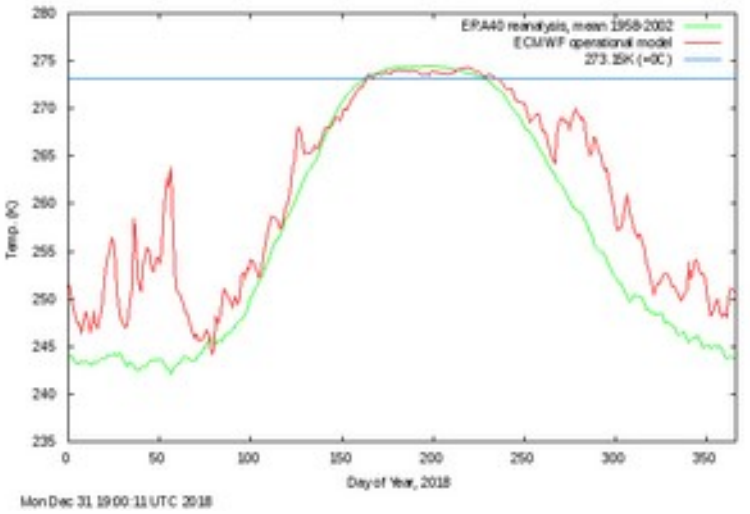


- https://www7320.nrlssc.navy.mil/


GLBb0.08-93.0 Ice Thickness (m): 20190714
2019071312
ci 0.05
0 to 5.6
120E
140E
160E
180E
160W
140W
120W
100W
80W
100E
80E
60E
40E
20E
80N
70N
60N
40W
5.
4.5
4.
3.5
3.
2.5
2.
1.5
1.
0.5
0.

Arktisches Eis



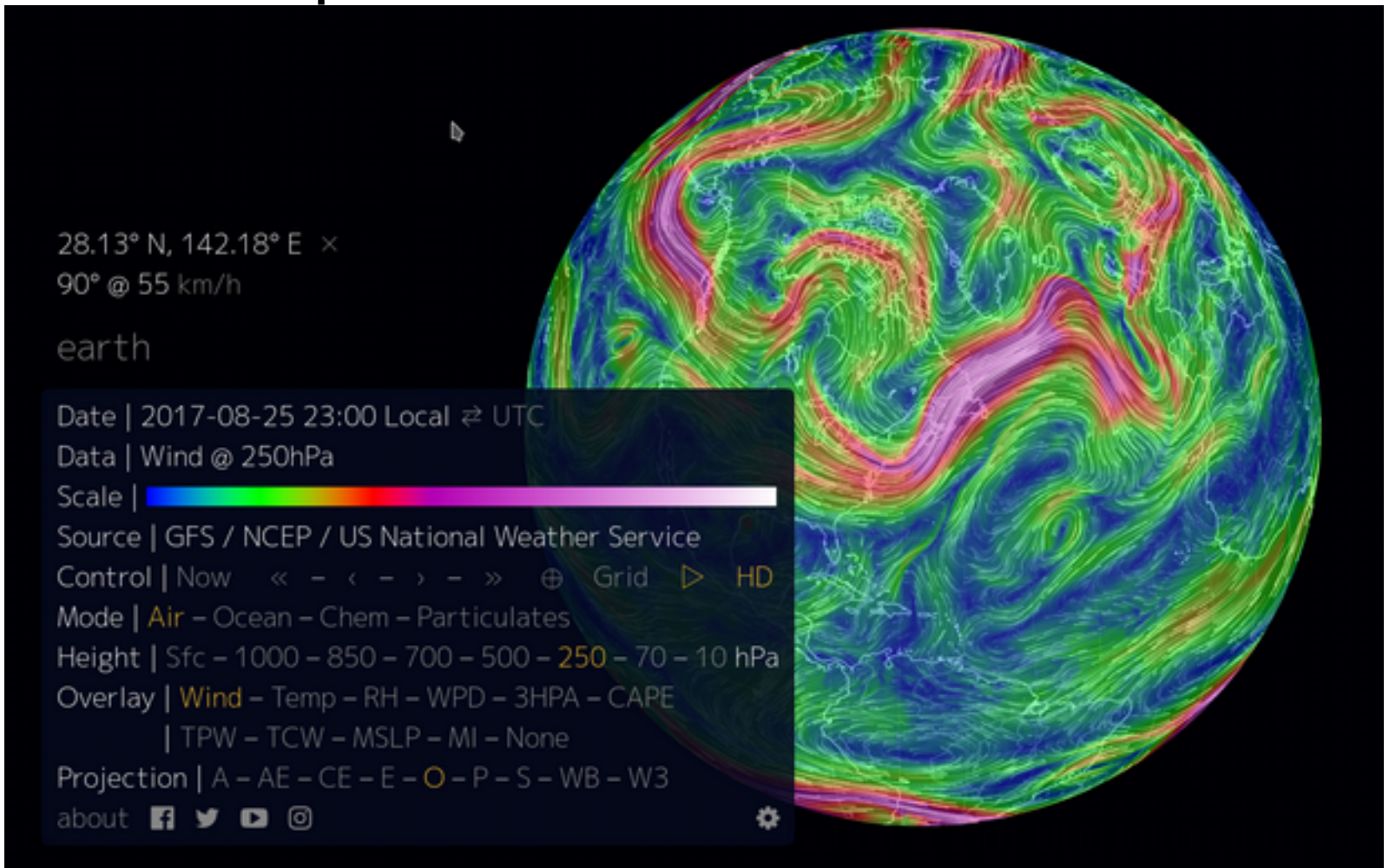


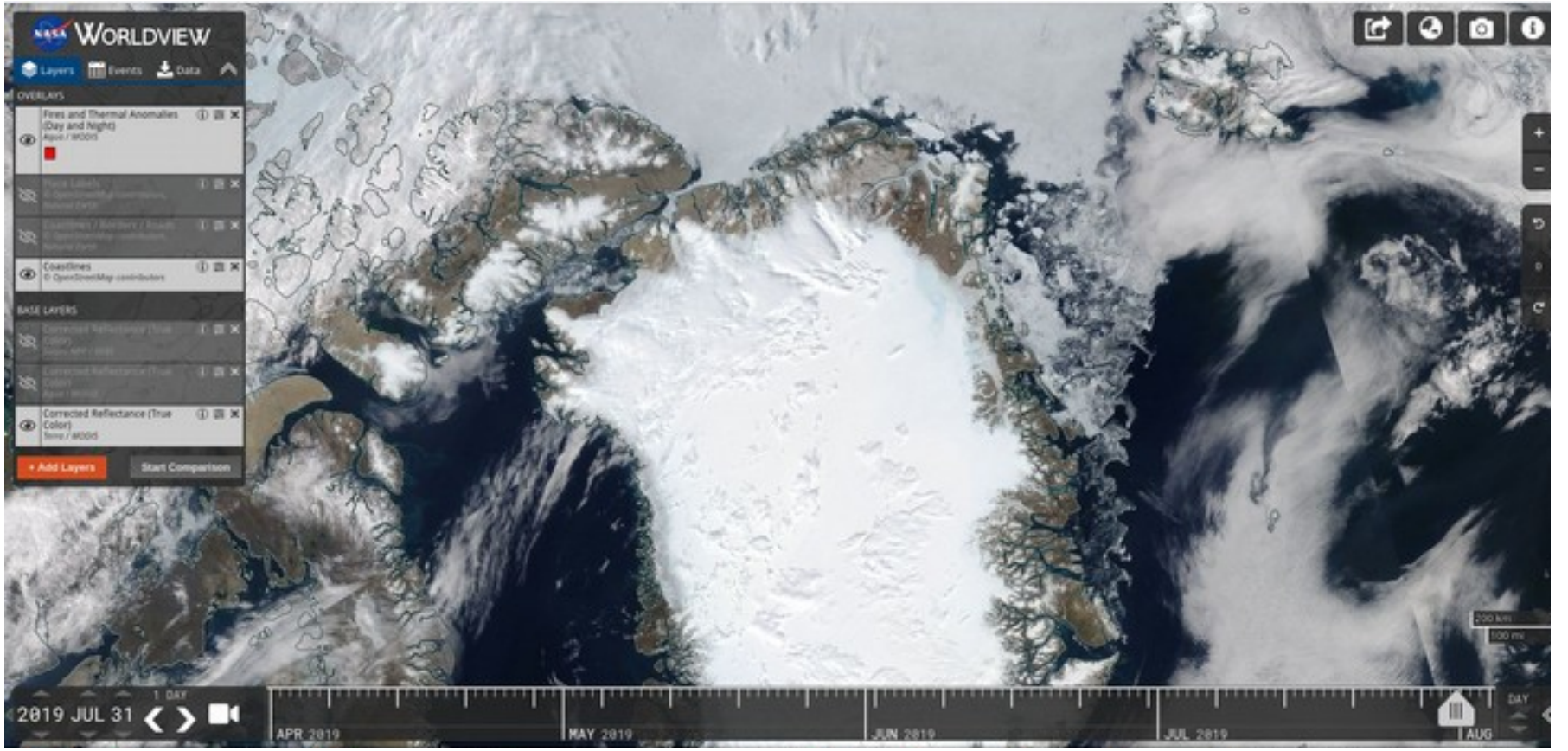
Dänisches Meteorologisches Institut:

Mittlere Temperatur nördlich von 80°N (2018)

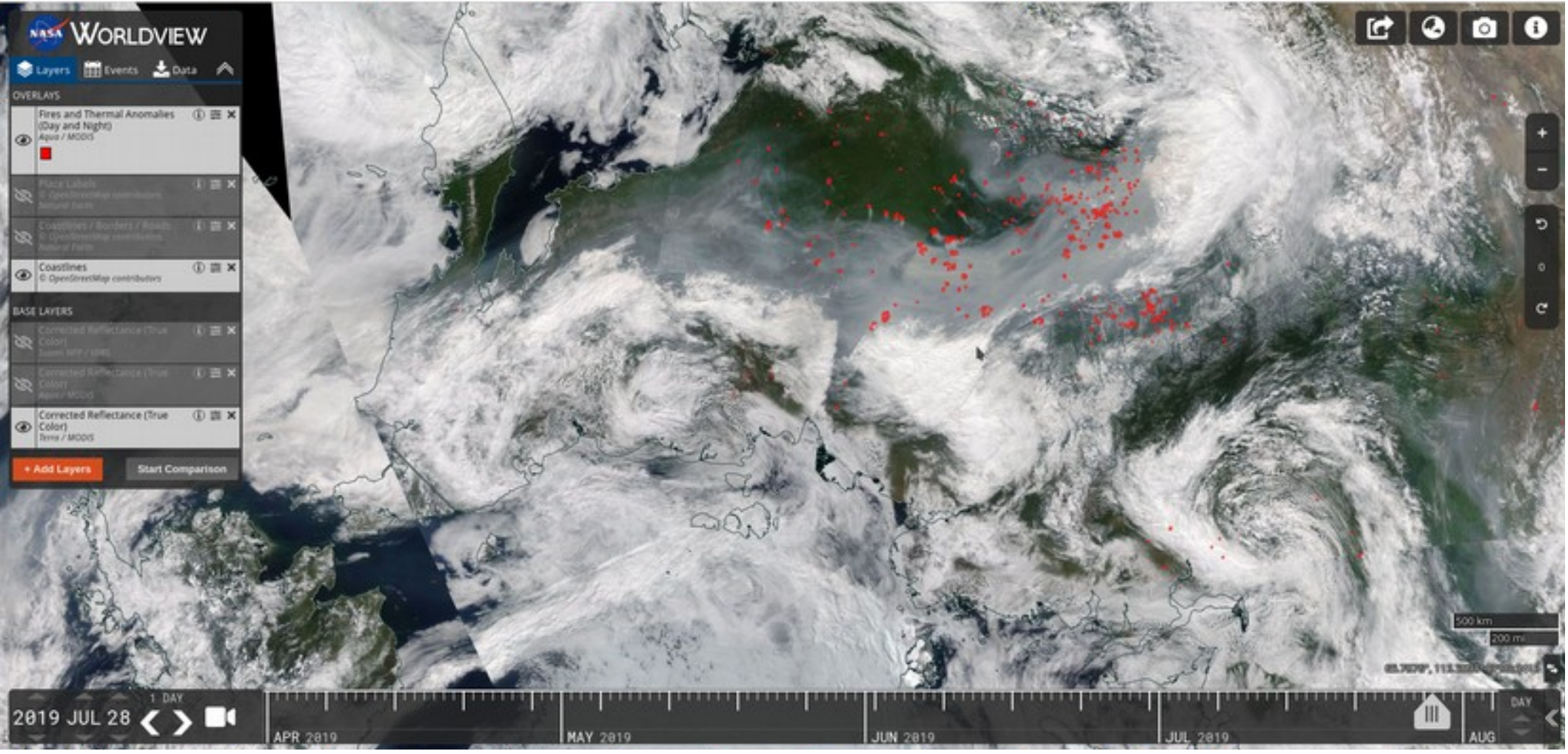
https://sites.google.com/site/arctischepinguin/home/piomas

https://earth.nullschool.net





- https://worldview.earthdata.nasa.gov



- https://worldview.earthdata.nasa.gov

Vielen Dank für die Aufmerksamkeit!

https://github.com/kolossos/energy-tests/wiki

Am 20. September: globalclimatestrike.net