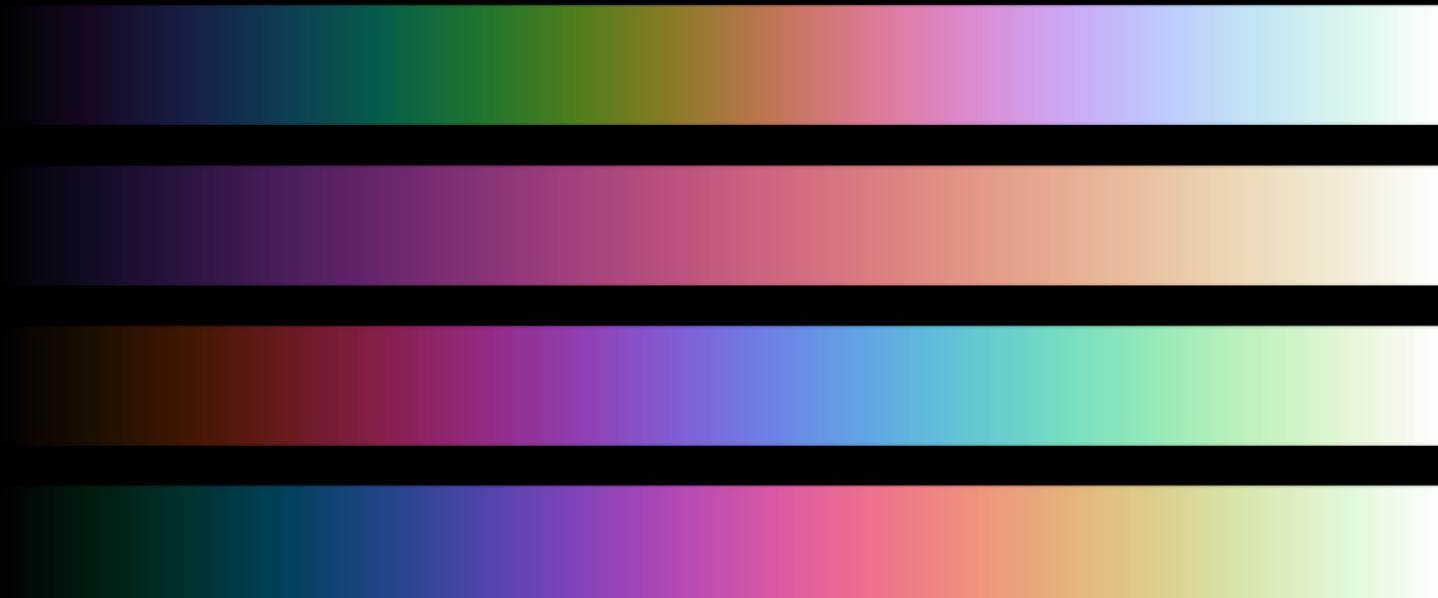


SCIENCE VISUALIZATIONS

 <https://github.com/zmlabe/ClimatePython> 

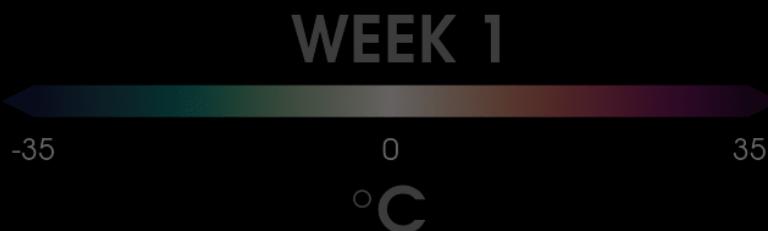
ZACHARY LABE (@ZLABLE)



PALETTABLE CUBEHELIX

RESOURCES

- 
1. <https://betterfigures.org/>
 2. <https://www.climate-lab-book.ac.uk/>
 3. <http://colorbrewer2.org/>



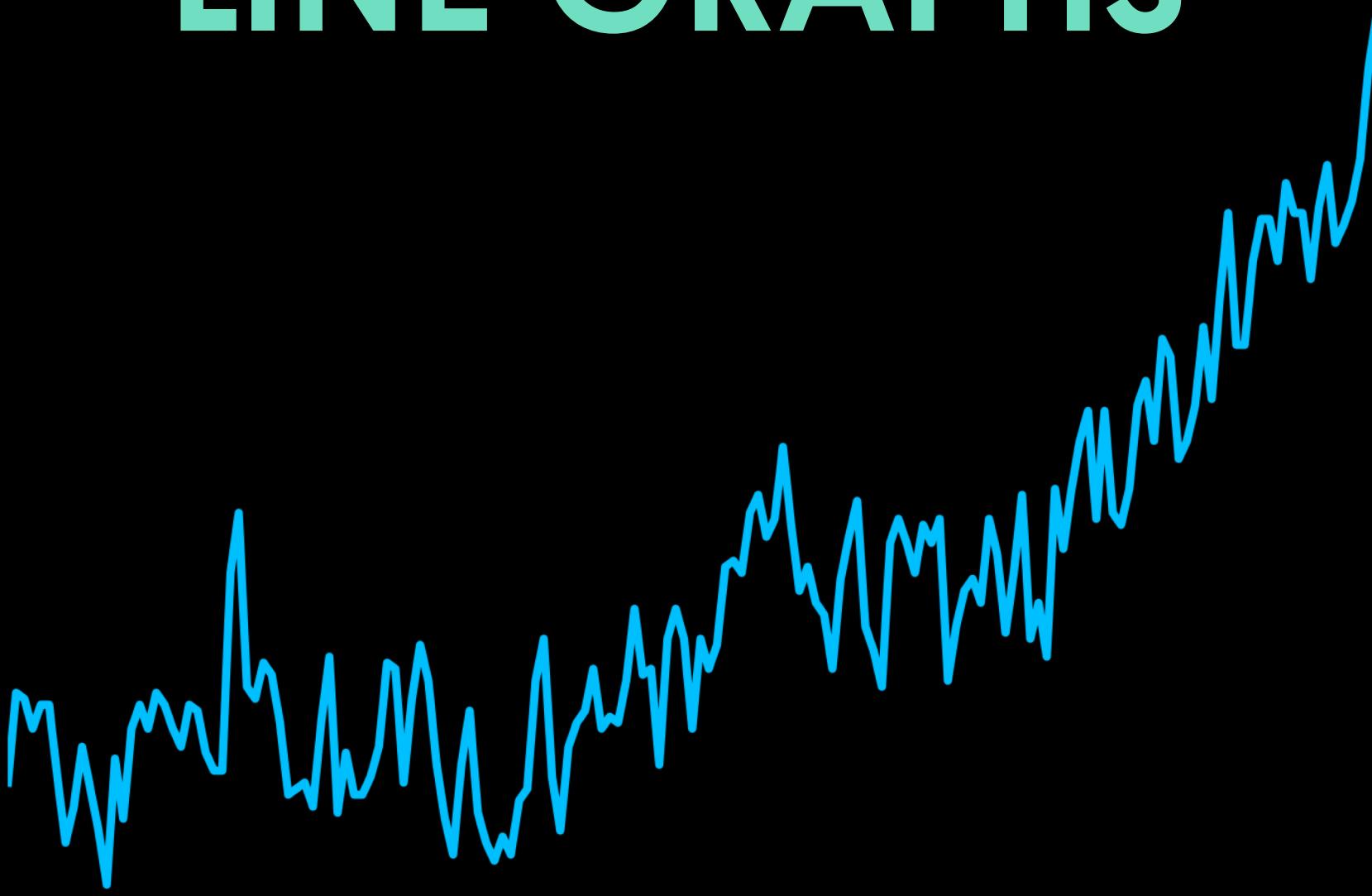
LINE GRAPHS

Temperature Anomaly ($^{\circ}\text{C}$)

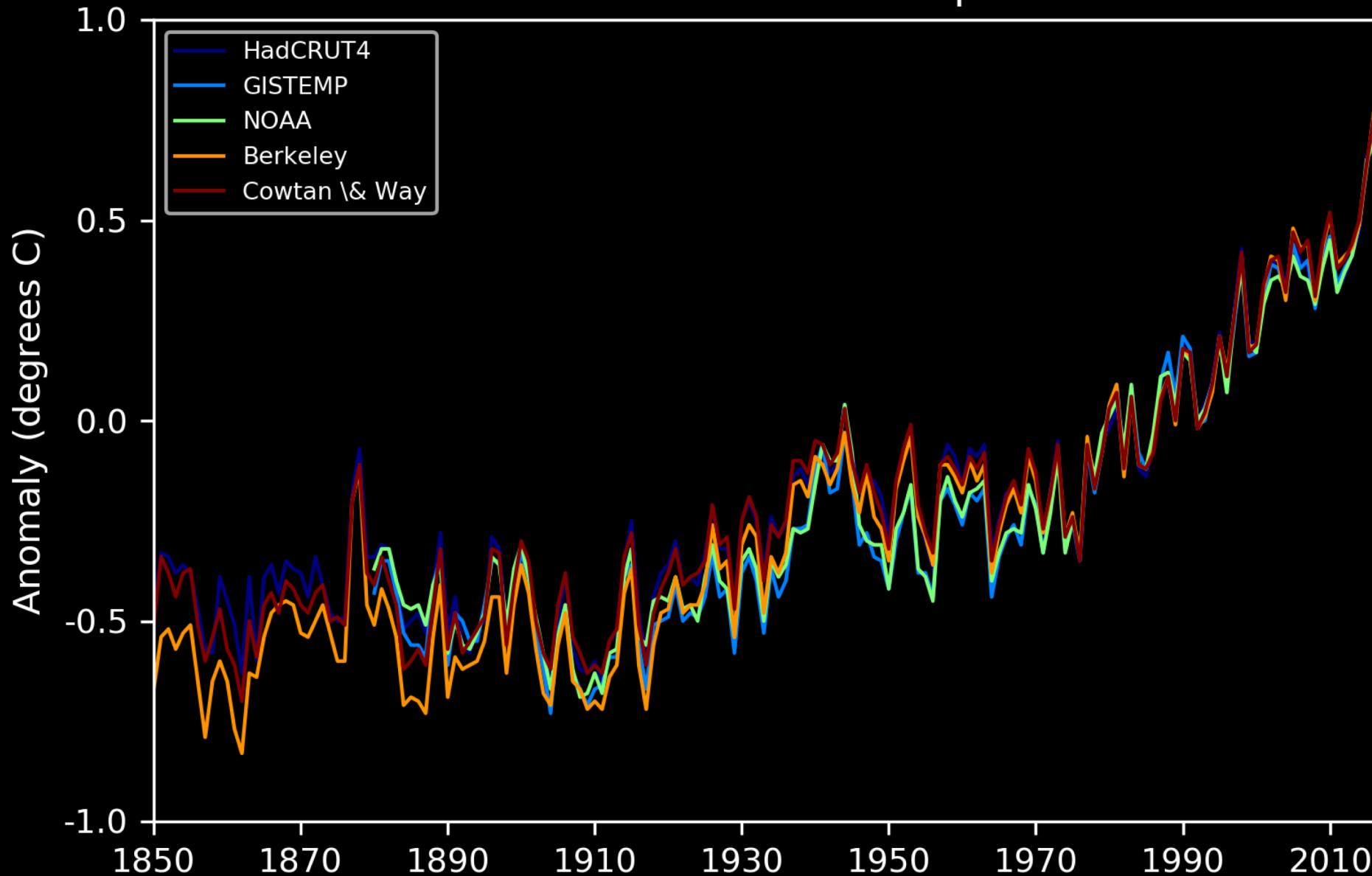
0.75

0.0

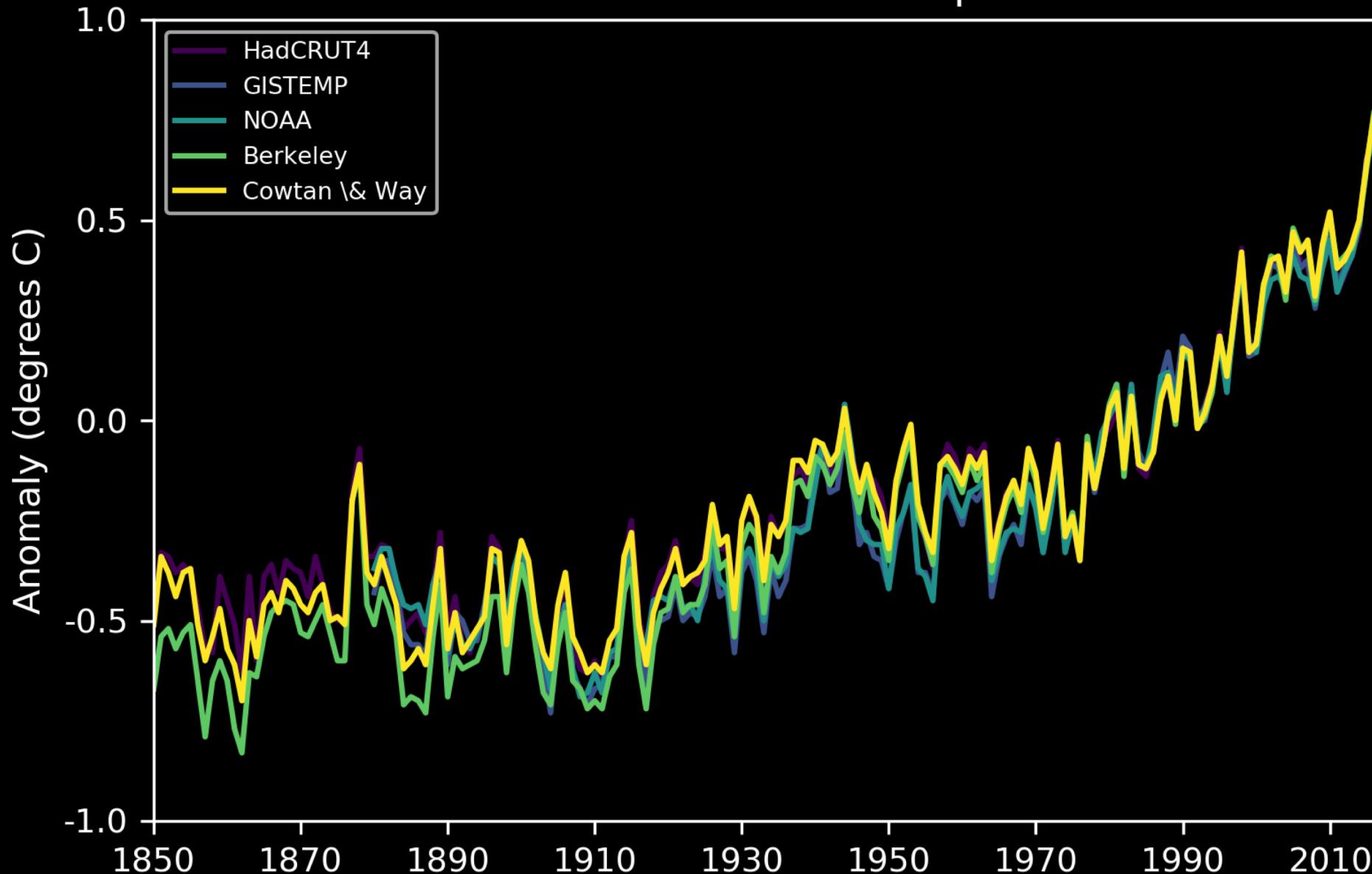
-0.75



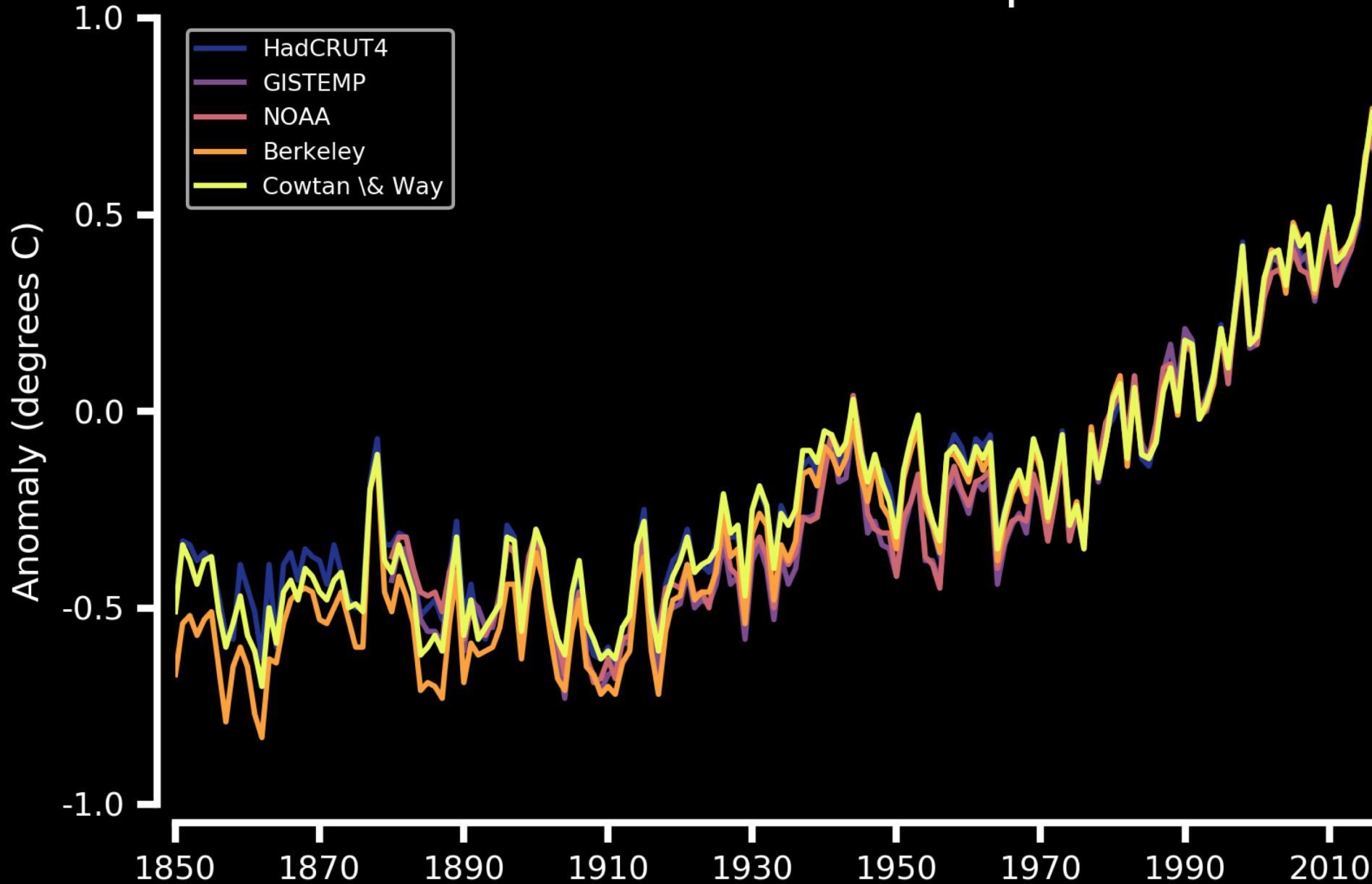
Annual Mean Global Temperature



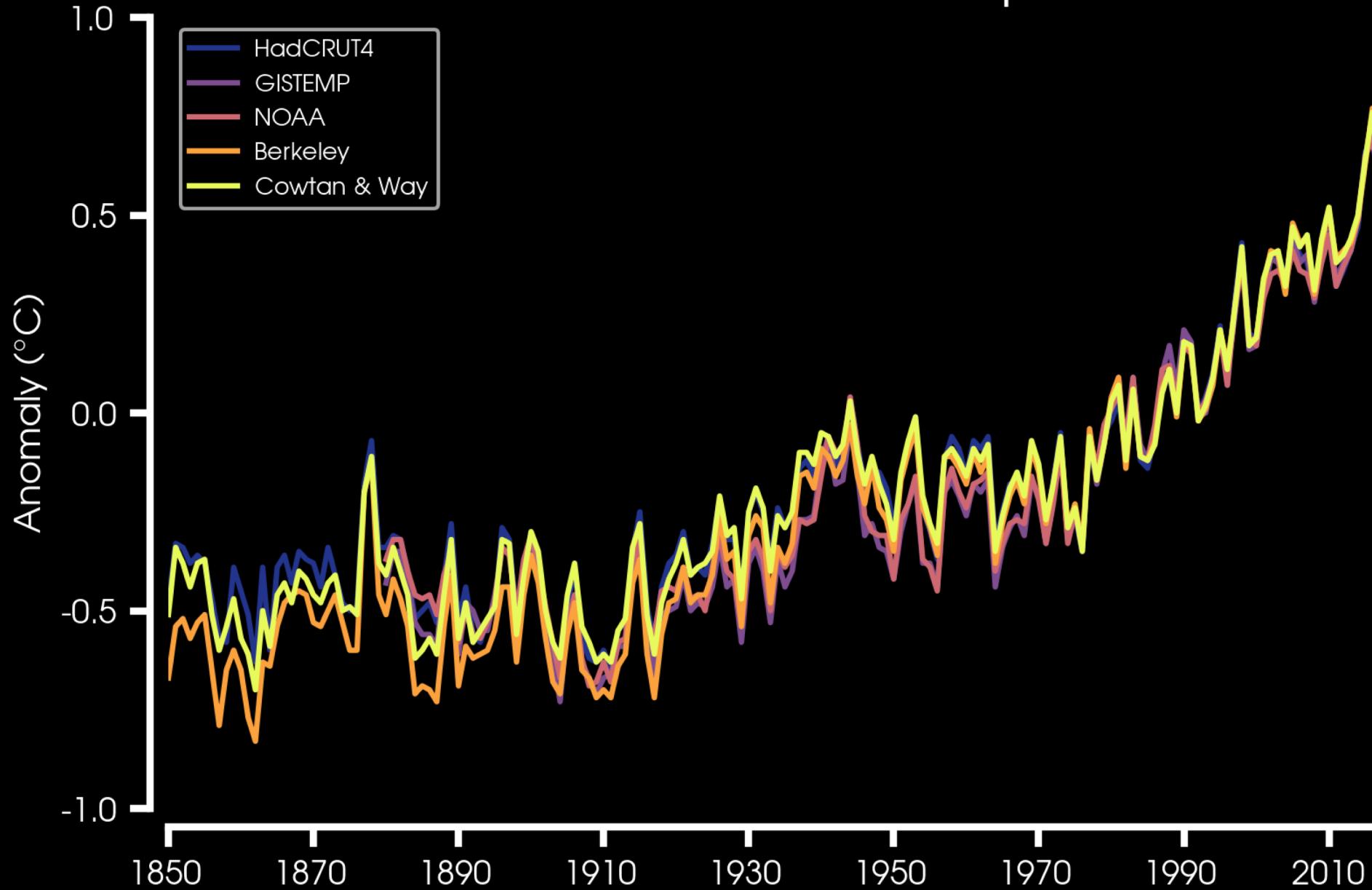
Annual Mean Global Temperature



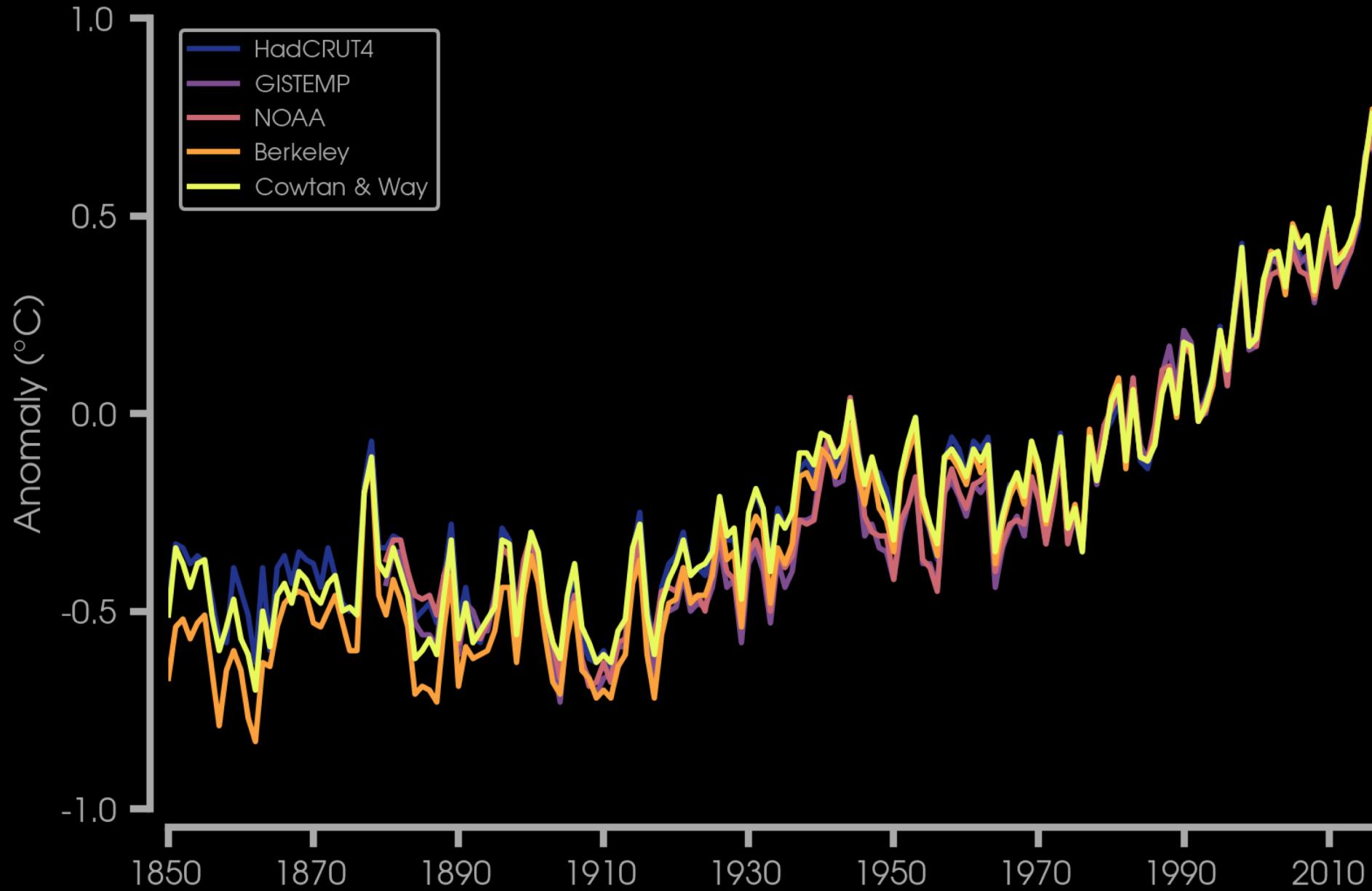
Annual Mean Global Temperature



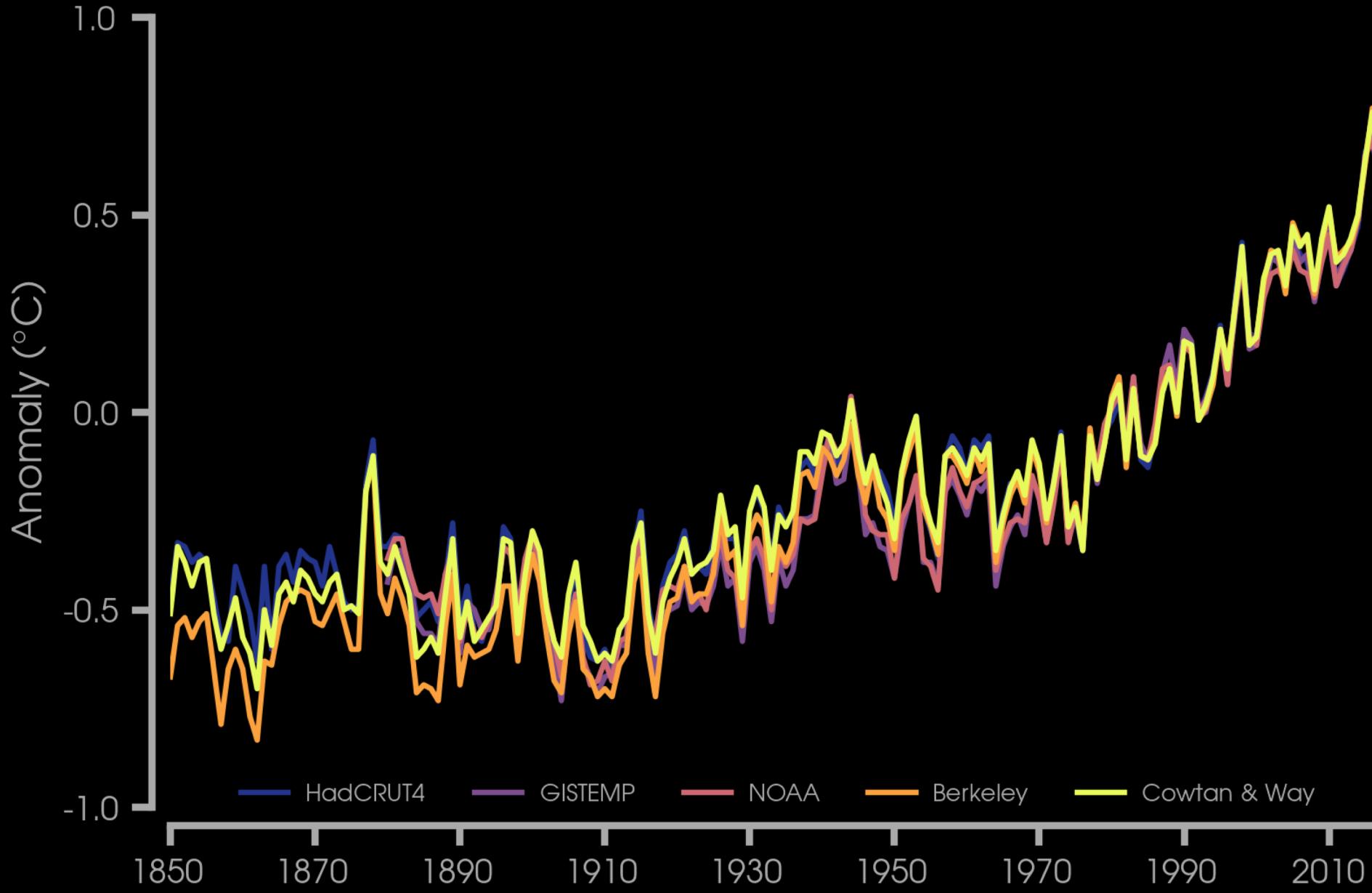
Annual Mean Global Temperature



ANNUAL MEAN GLOBAL TEMPERATURE

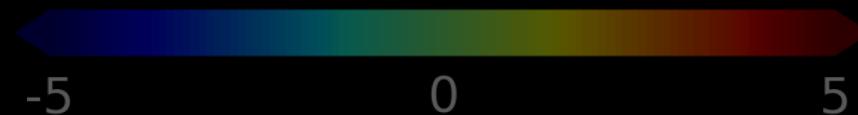


ANNUAL MEAN GLOBAL TEMPERATURE

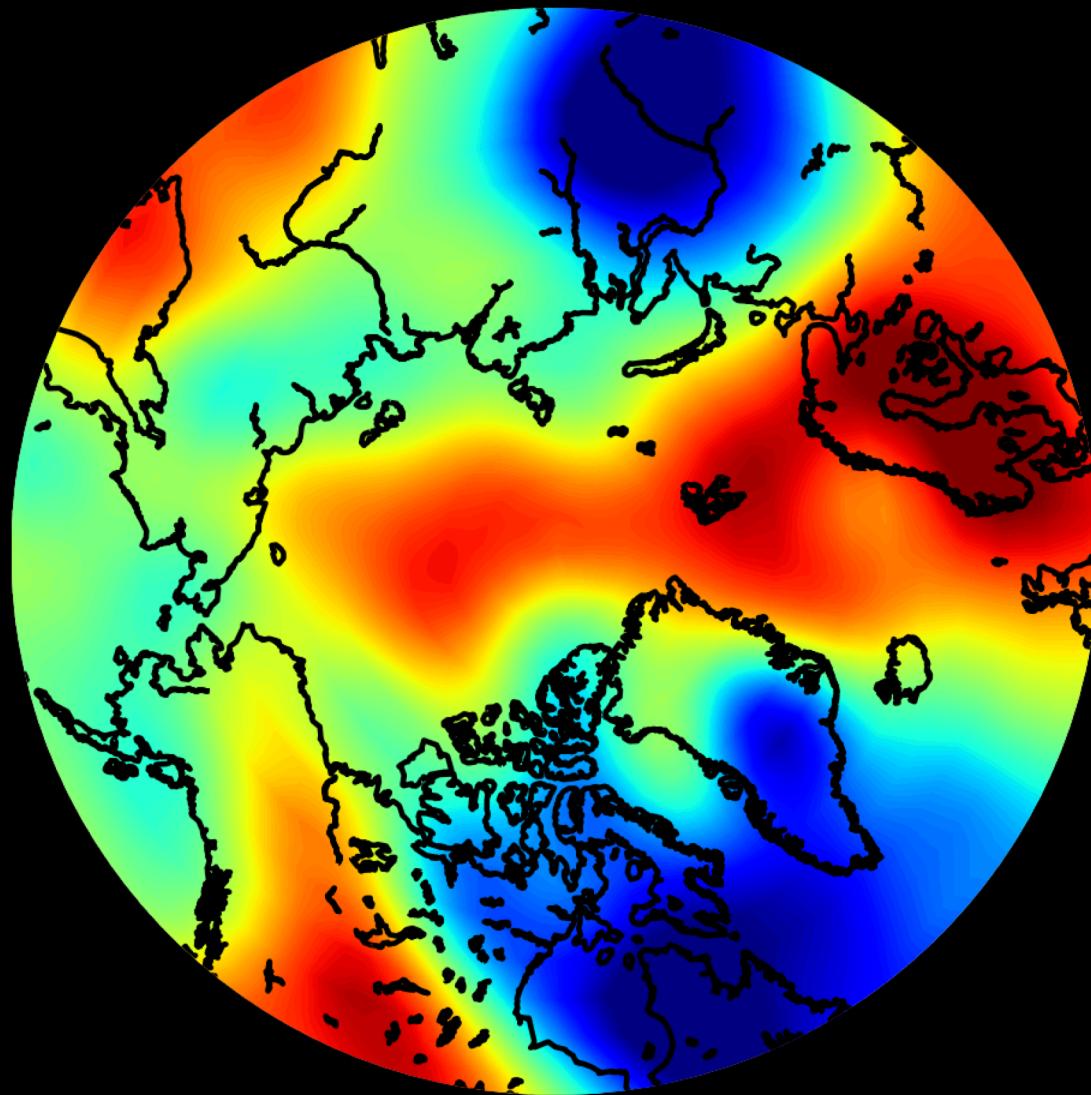


925 mb Temperature Anomaly - MAY 2018

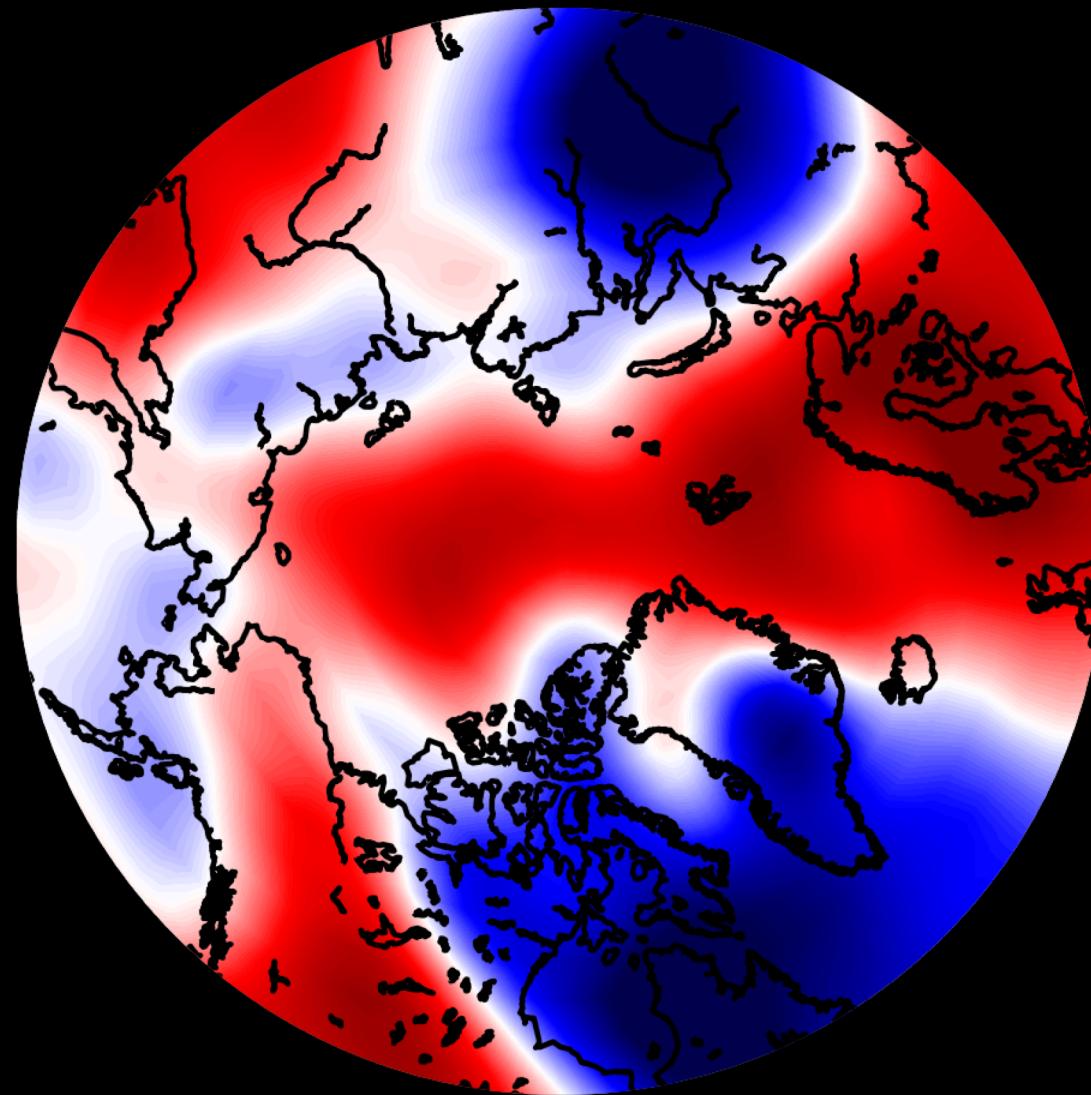
MAP PLOTS



925 mb Temperature Anomaly - MAY 2018

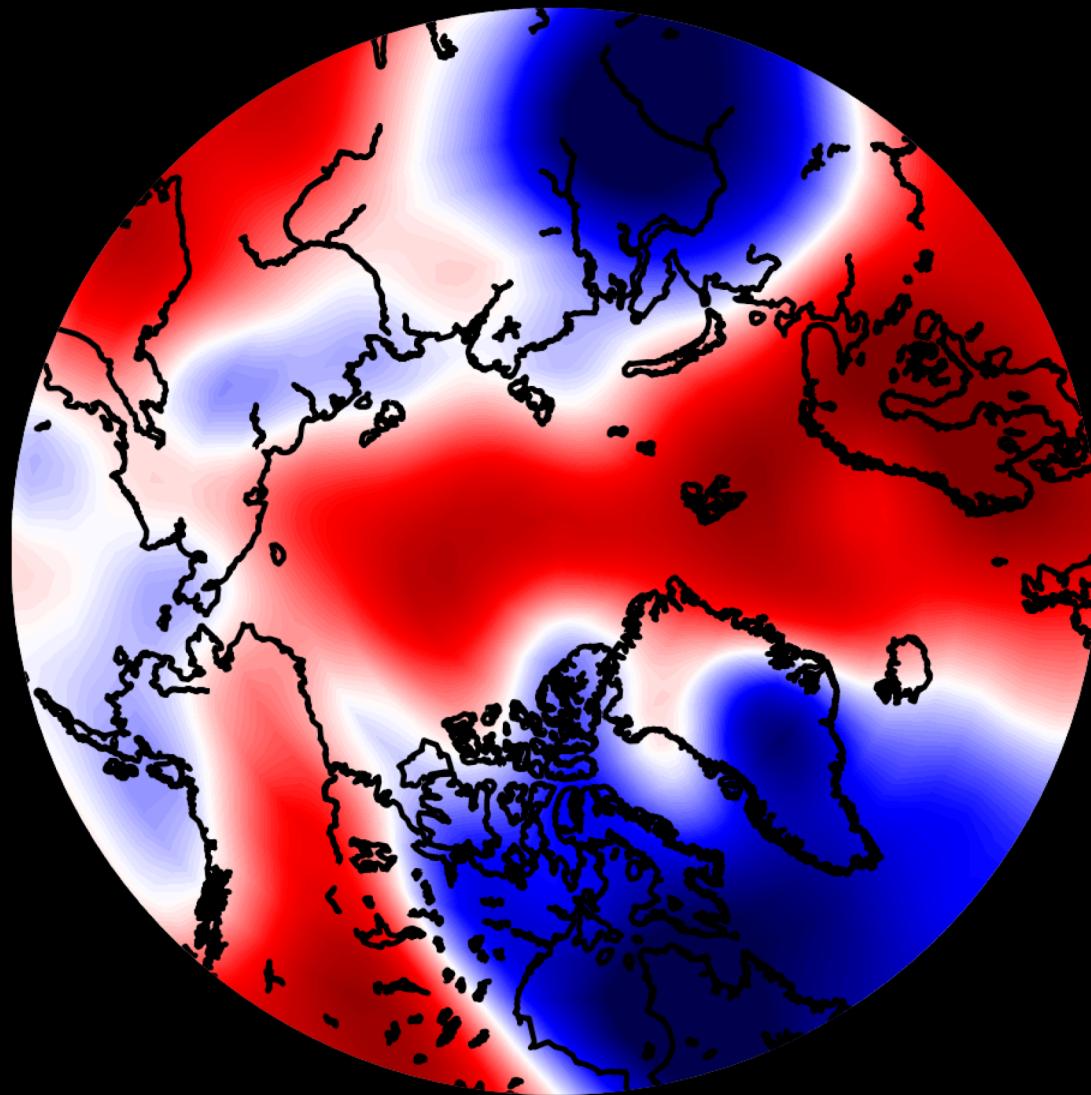


925 mb Temperature Anomaly - MAY 2018



YIKES – THE FONT!

925 mb TEMPERATURE ANOMALY - MAY 2018



°C

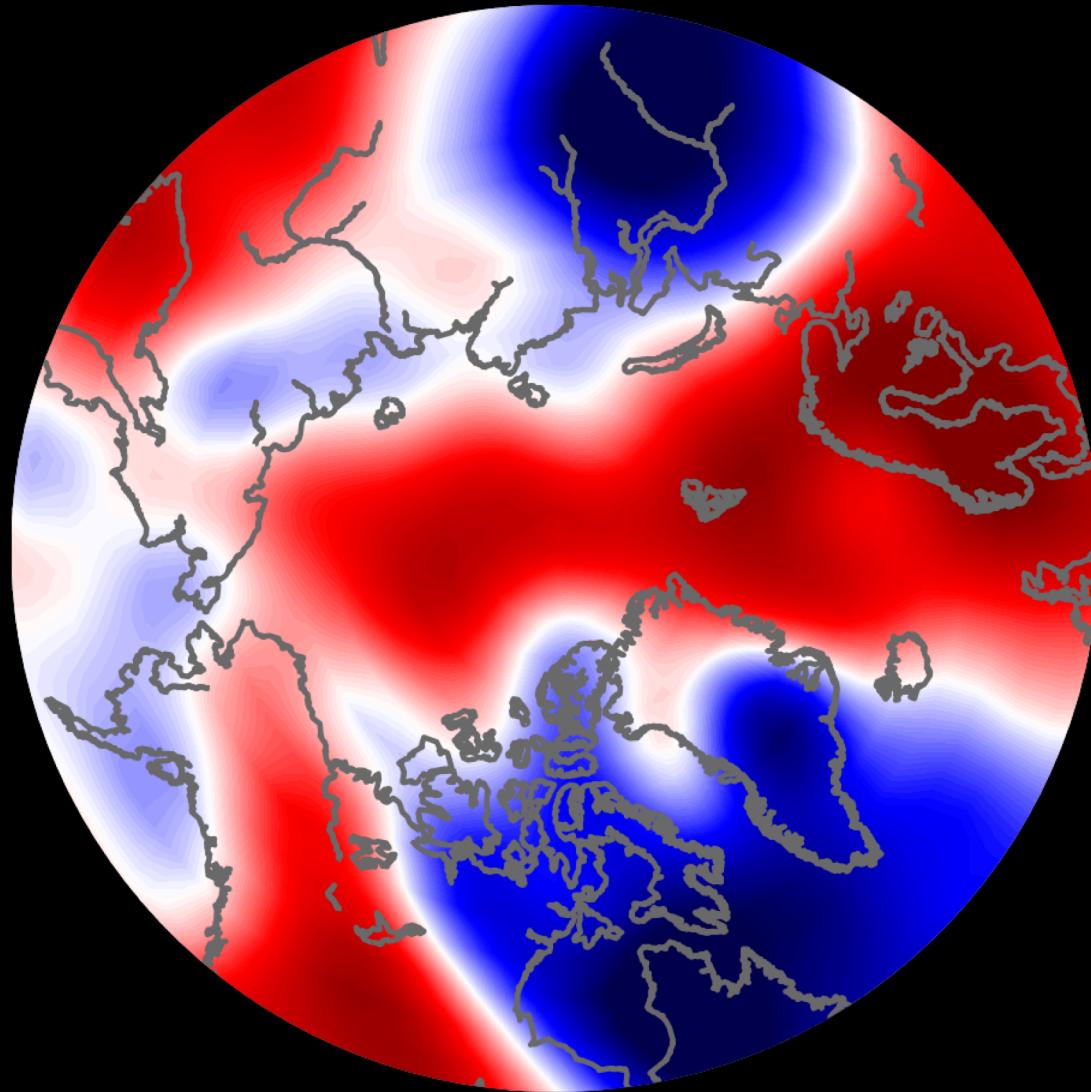
-5

0

5

YIKES – SOFTEN COASTLINES!

925 mb TEMPERATURE ANOMALY - MAY 2018



°C

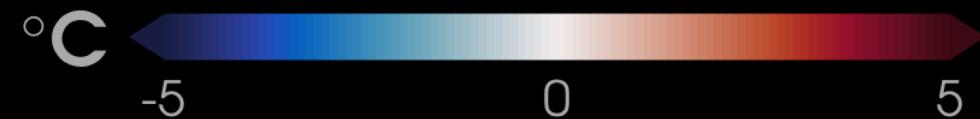
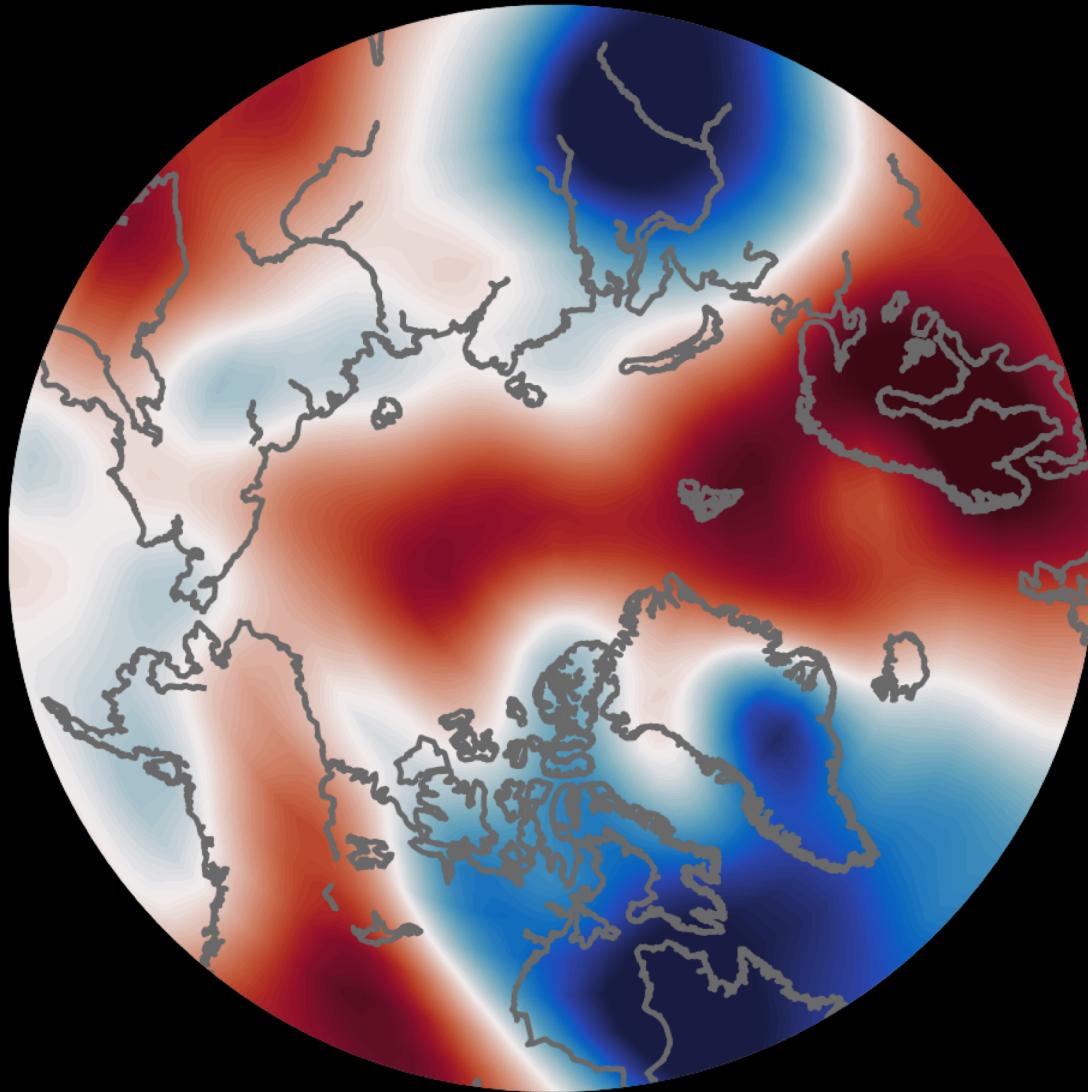
-5

0

5

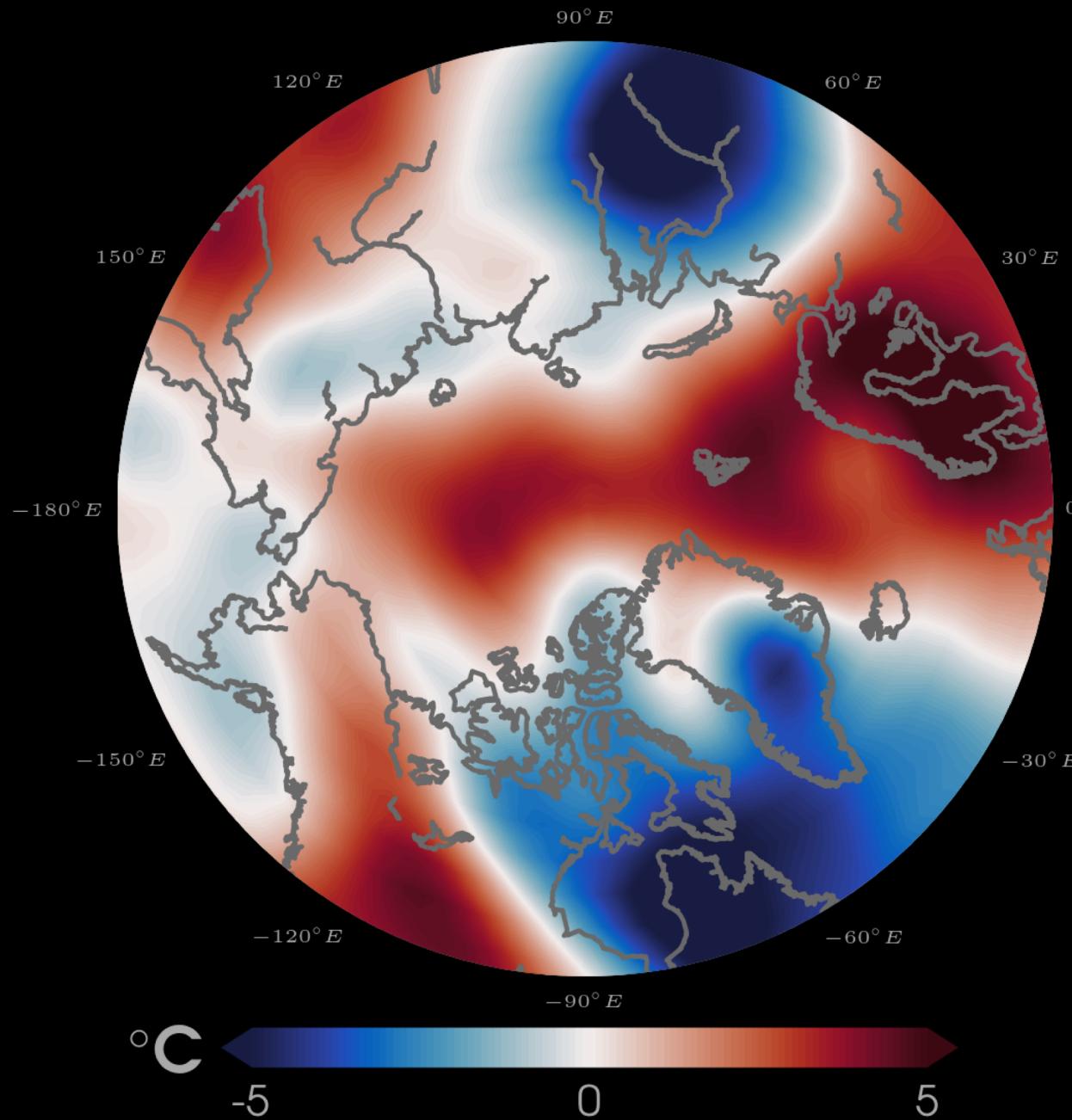
YIKES – FIRE IN THE ARCTIC!

925 mb TEMPERATURE ANOMALY - MAY 2018

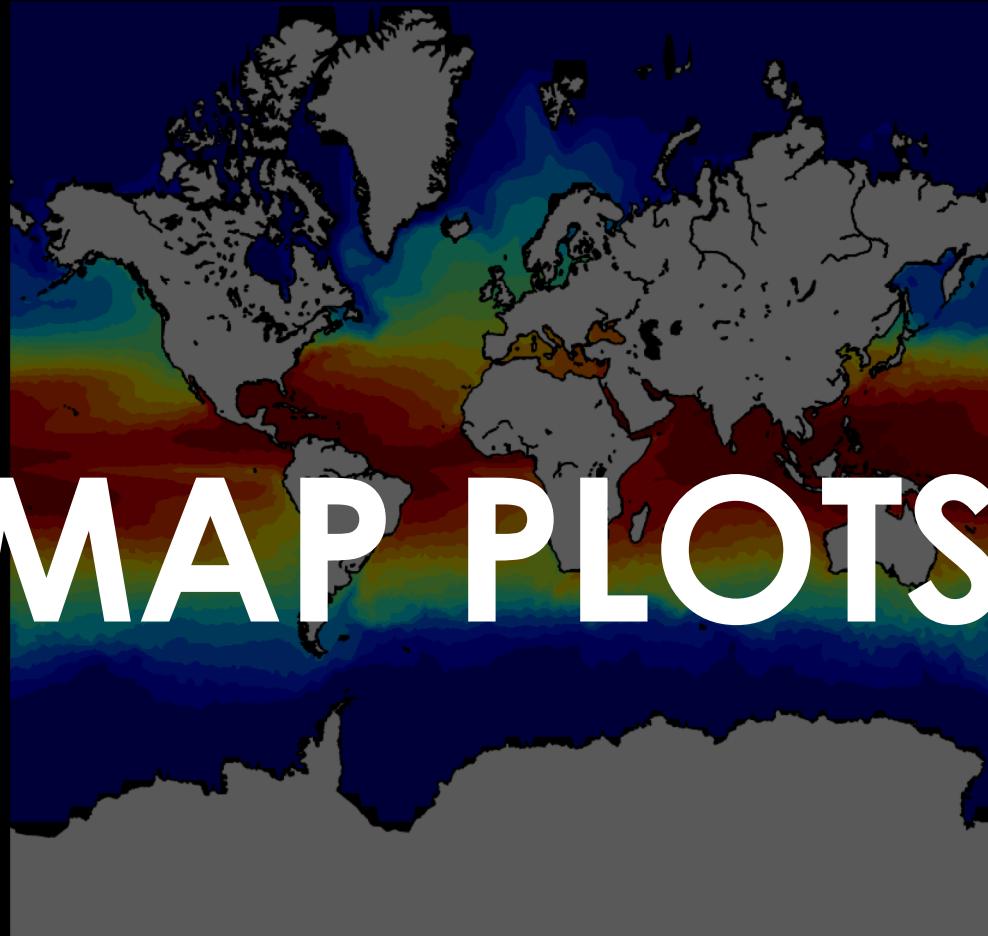


OKAY - MINOR DETAILS

925 mb TEMPERATURE ANOMALY : MAY 2018

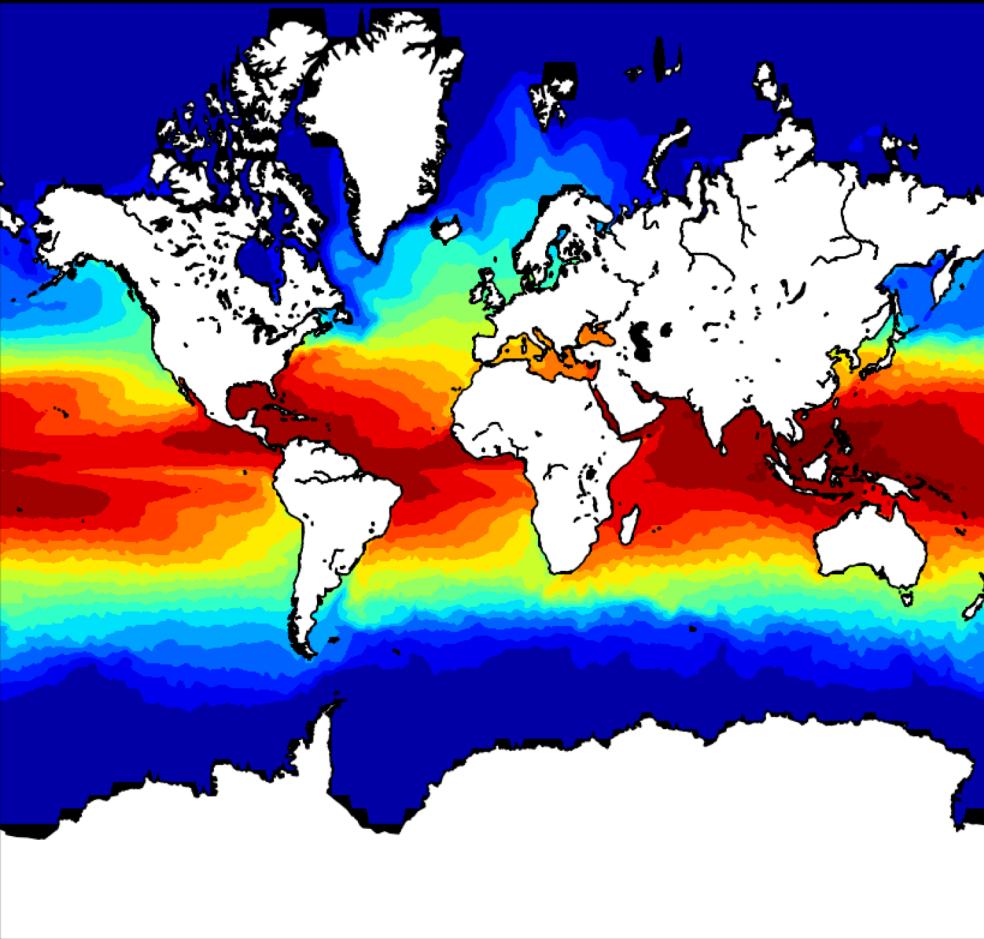


MAP PLOTS



Sea Surface Temperature

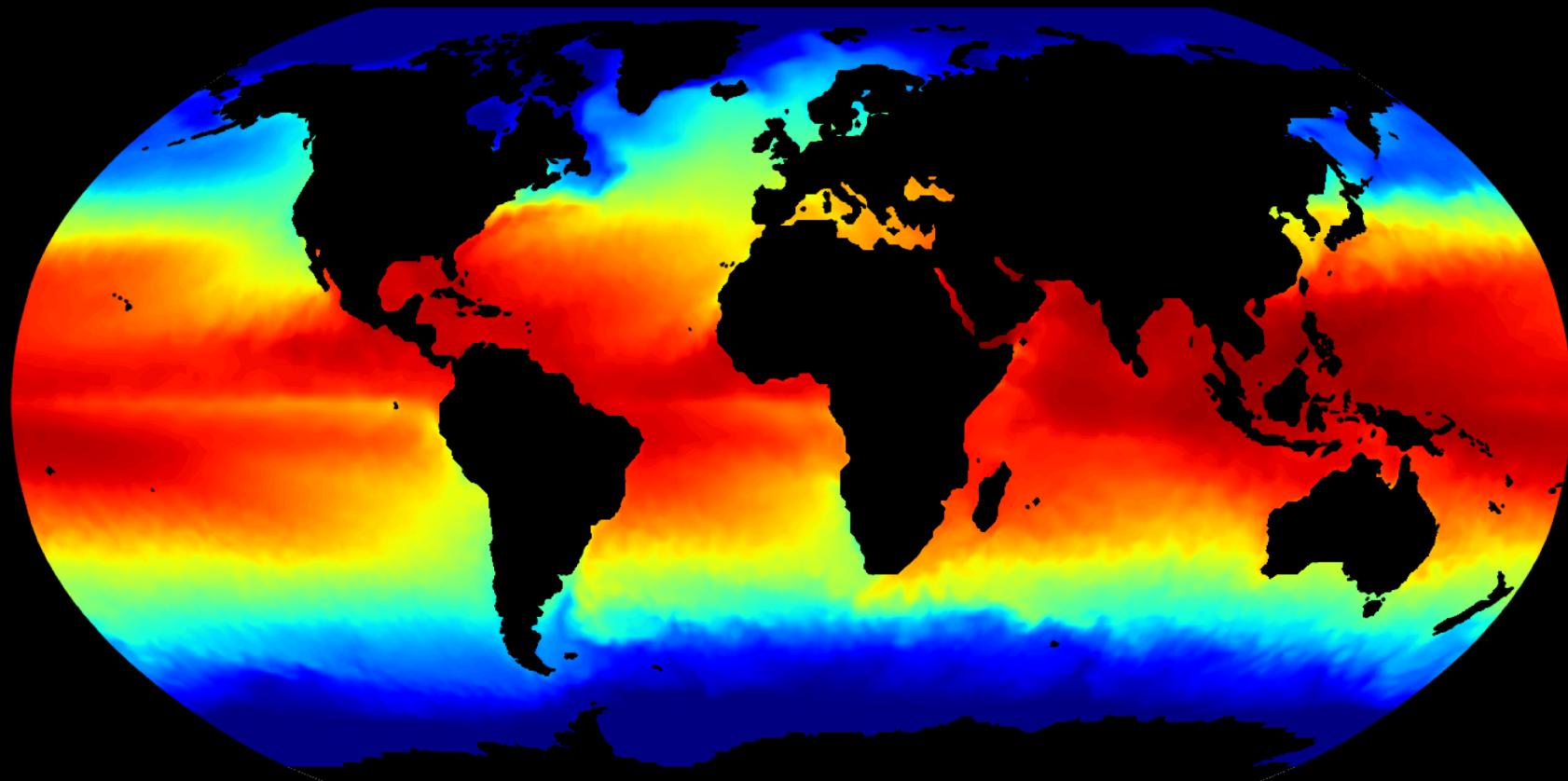




Sea Surface Temperature



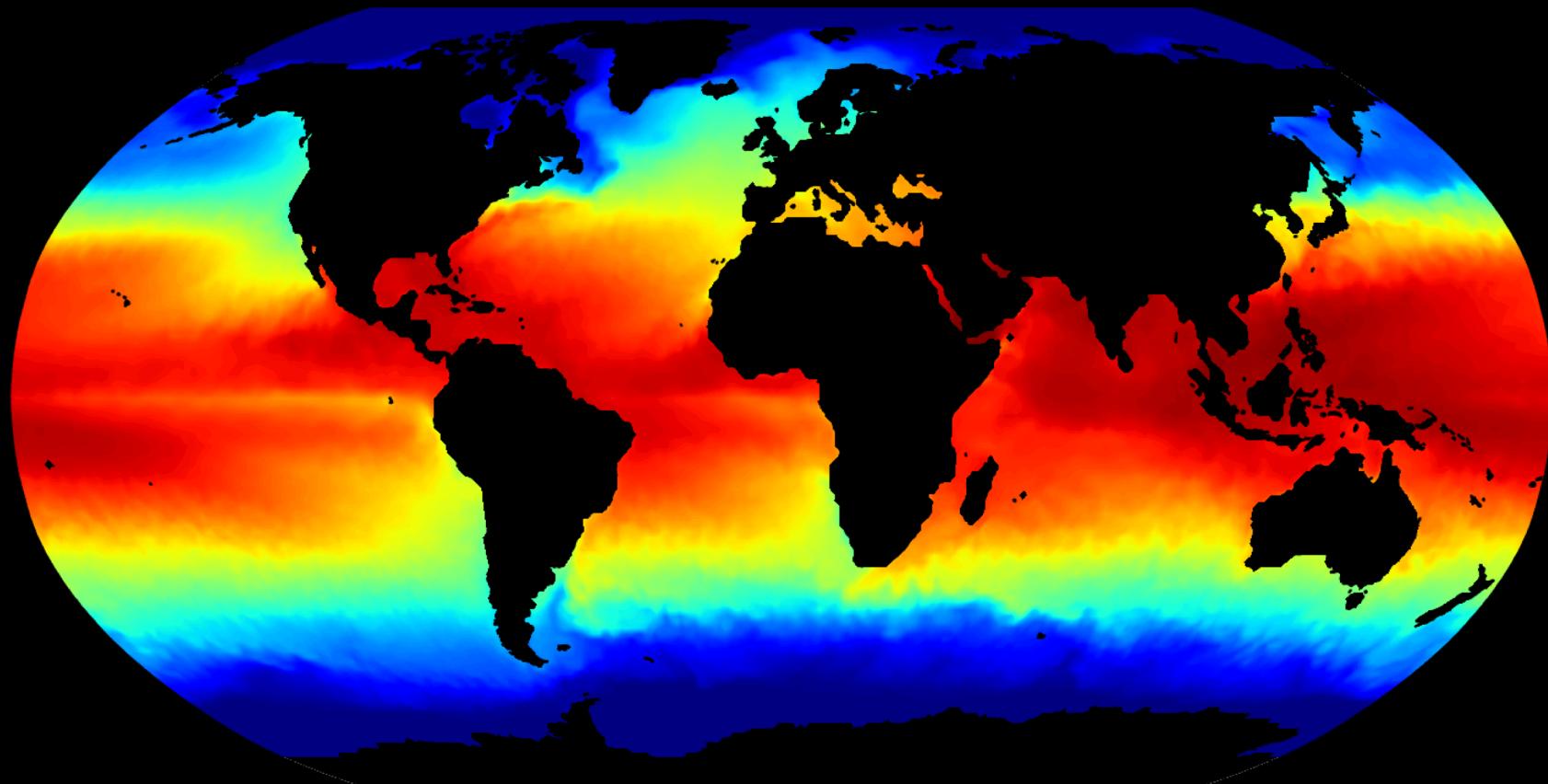
YIKES – WHAT IS THIS MAP!



Sea Surface Temperature



YIKES – FONT IS BLEH!



SEA SURFACE TEMPERATURE

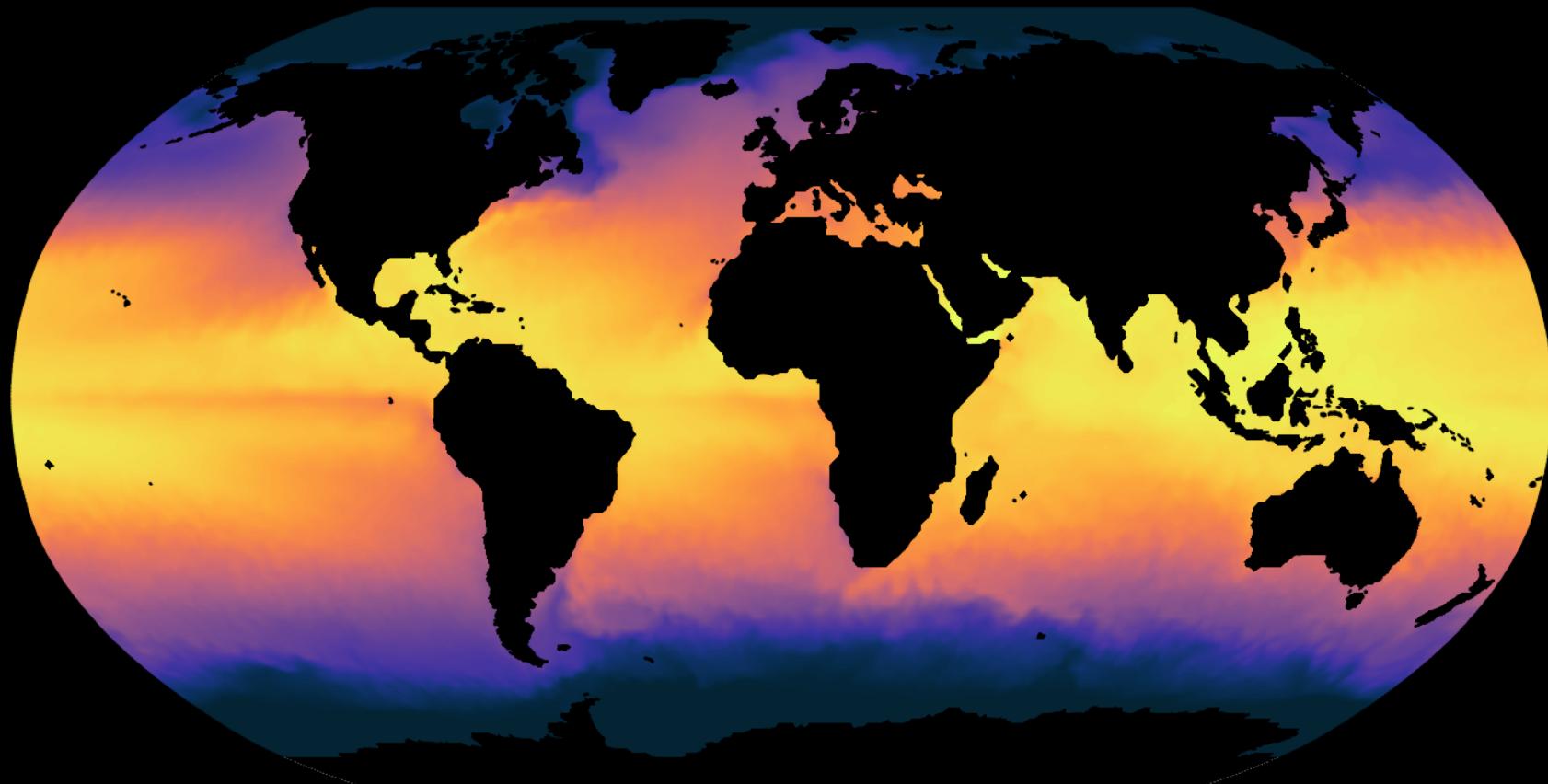


0

30

°C

YIKES – COLOR!



SEA SURFACE TEMPERATURE

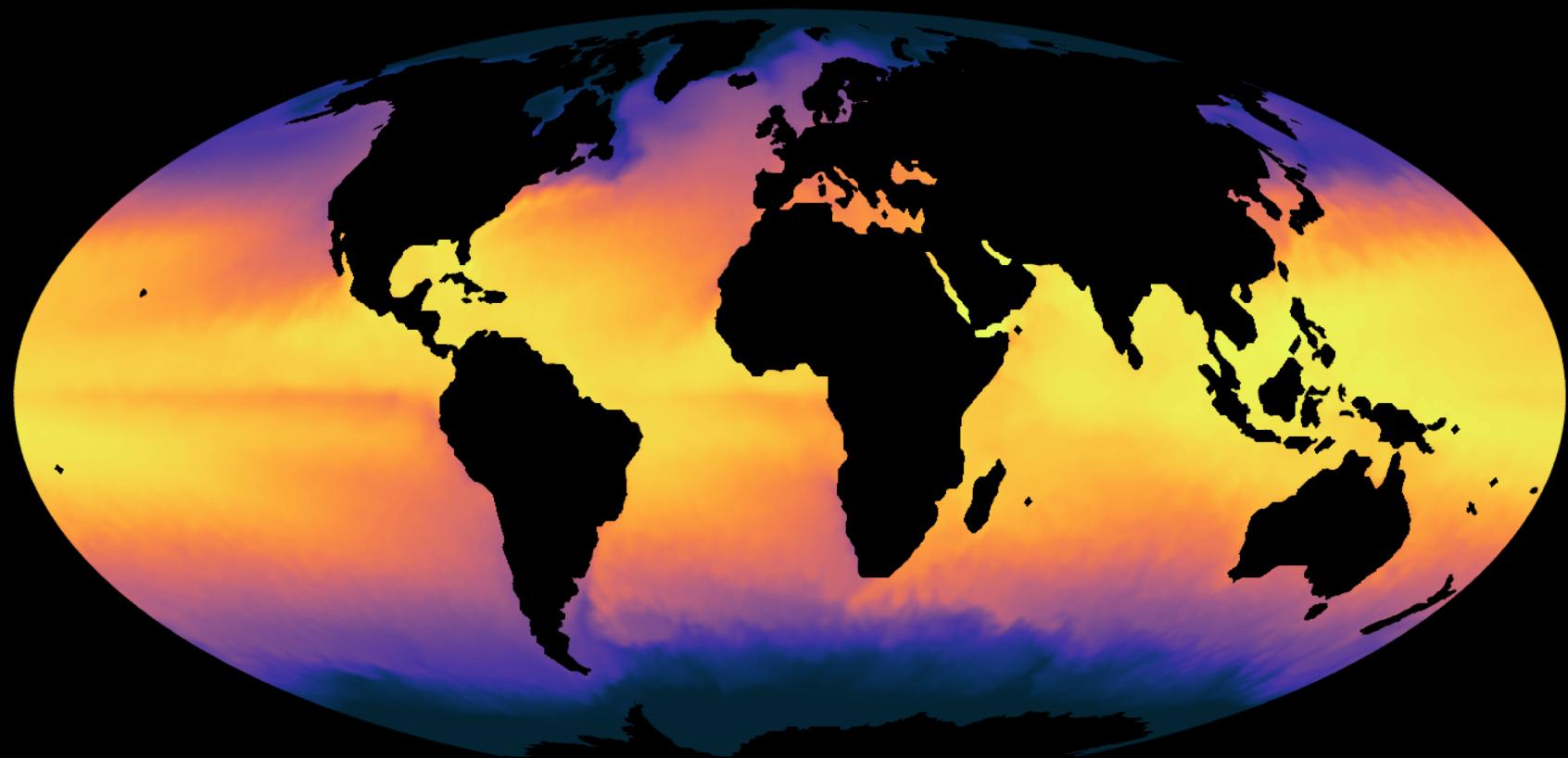


0

30

°C

YIKES – MAP PROJECTION!



SEA SURFACE TEMPERATURE



0

30

°C

```
adjust_spines(ax, [ 'left', 'bottom' ])
ax.spines[ 'top' ].set_color( 'none' )
ax.spines[ 'bottom' ].set_linewidth(2)
ax.spines[ 'right' ].set_color( 'none' )
ax.spines[ 'left' ].set_linewidth(2)
ax.tick_params(axis= 'both', direction= 'out', length=5.5, width=2,
               which= 'major', pad=3, labelcolor= 'darkgrey')
```

Adjusting axes (spines)

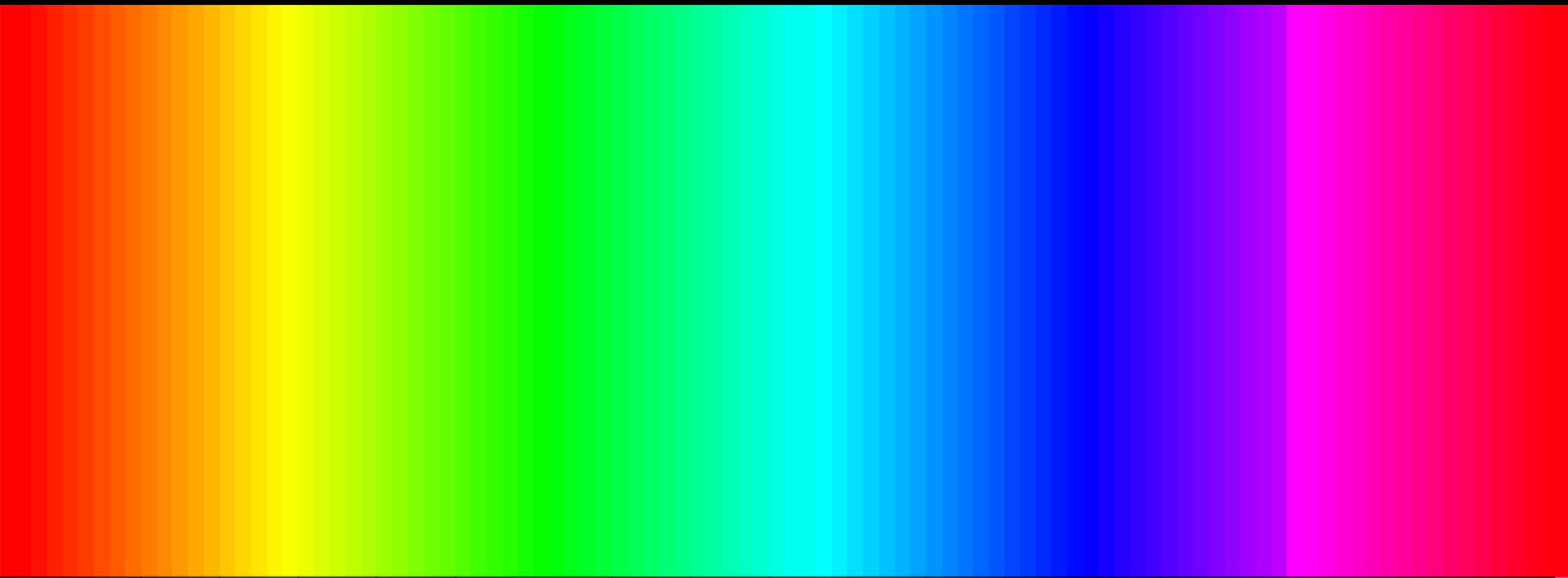
```
matplotlib.rc( 'savefig', facecolor= 'black' )
matplotlib.rc( 'axes', edgecolor= 'darkgrey' )
matplotlib.rc( 'xtick', color= 'darkgrey' )
matplotlib.rc( 'ytick', color= 'darkgrey' )
matplotlib.rc( 'axes', labelcolor= 'darkgrey' )
matplotlib.rc( 'axes', facecolor= 'black' )
plt.rc( 'text', usetex=True)
plt.rc( 'font', **{ 'family': 'sans-serif', 'sans-serif': [ 'Avant Garde' ] })
```

```
adjust_spines(ax, [ 'left', 'bottom' ])
ax.spines[ 'top' ].set_color( 'none' )
ax.spines[ 'bottom' ].set_linewidth(2)
ax.spines[ 'right' ].set_color( 'none' )
ax.spines[ 'left' ].set_linewidth(2)
ax.tick_params(axis= 'both', direction= 'out', length=5.5, width=2,
               which= 'major', pad=3, labelcolor= 'darkgrey')
```

Changing font styles

```
matplotlib.rc( 'savefig', facecolor= 'black' )
matplotlib.rc( 'axes', edgecolor= 'darkgrey' )
matplotlib.rc( 'xtick', color= 'darkgrey' )
matplotlib.rc( 'ytick', color= 'darkgrey' )
matplotlib.rc( 'axes', labelcolor= 'darkgrey' )
matplotlib.rc( 'axes', facecolor= 'black' )
plt.rc( 'text', usetex=True)
plt.rc( 'font', **{ 'family': 'sans-serif', 'sans-serif':[ 'Avant Garde' ]})
```

#endrainbow



#endrainbow



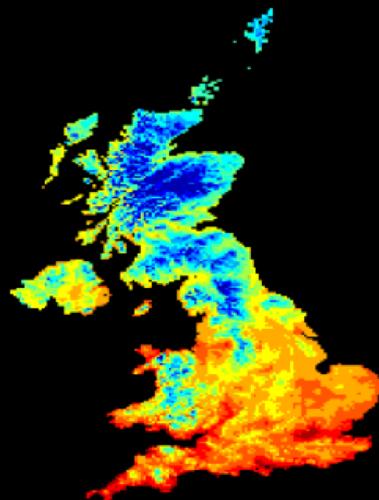
#endrainbow



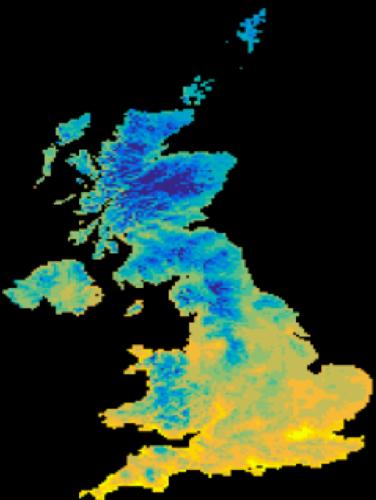
#endrainbow



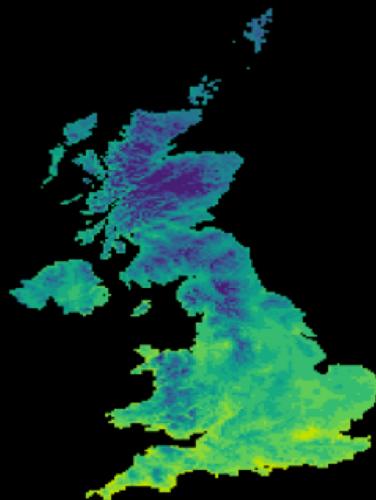
Not all color-blind vision is the same!



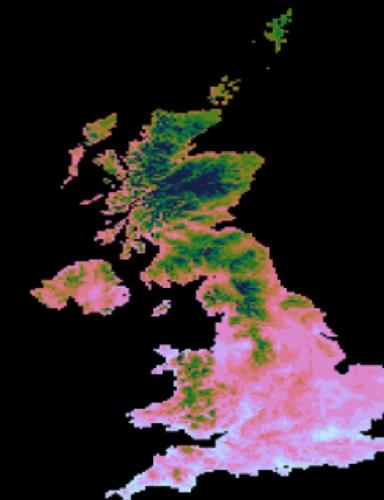
Mean annual temperature [°C]



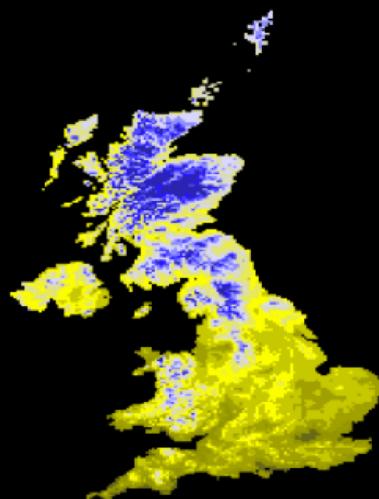
Mean annual temperature [°C]



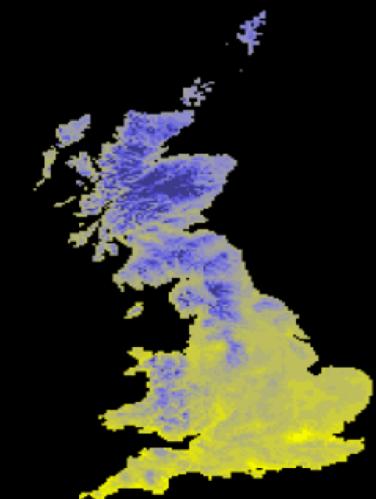
Mean annual temperature [°C]



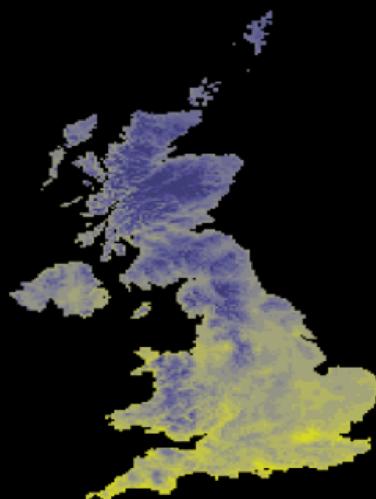
Mean annual temperature [°C]



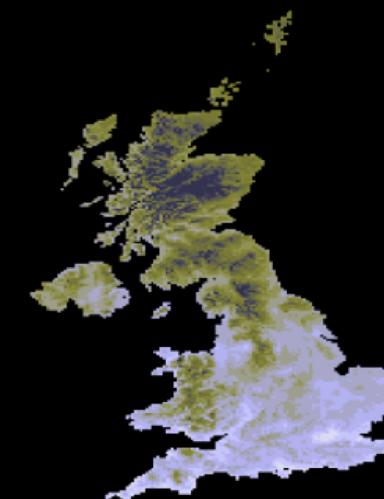
Mean annual temperature [°C]



Mean annual temperature [°C]



Mean annual temperature [°C]



Mean annual temperature [°C]



OTHER OPTIONS

thermal

haline

solar

ice

gray

c oxy

deep

dense

algae

matter

turbid

speed

amp

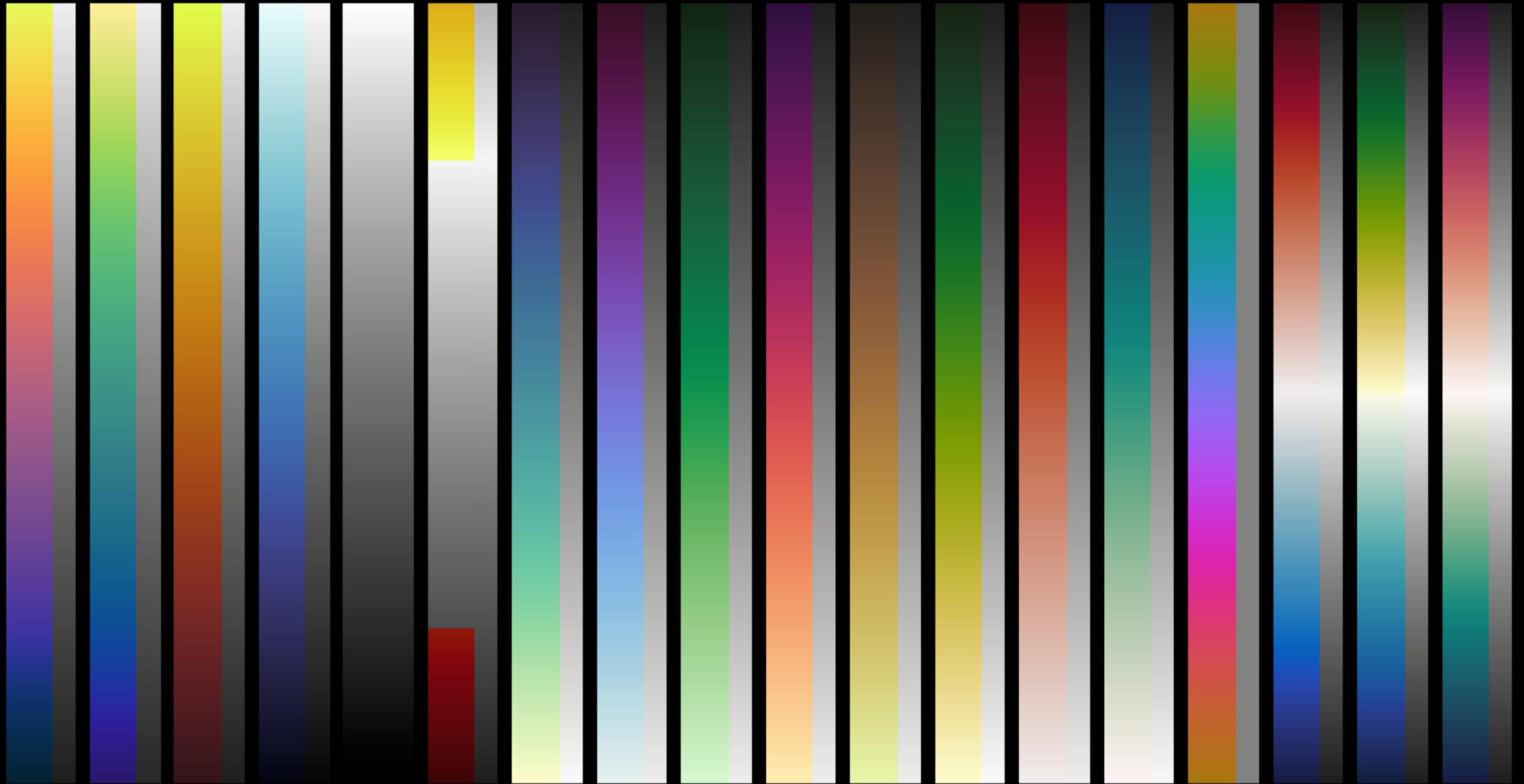
tempo

phase

balance

delta

curl



thermal

haline

solar

ice

gray

oxy

deep

dense

algae

matter

turbid

speed

amp

tempo

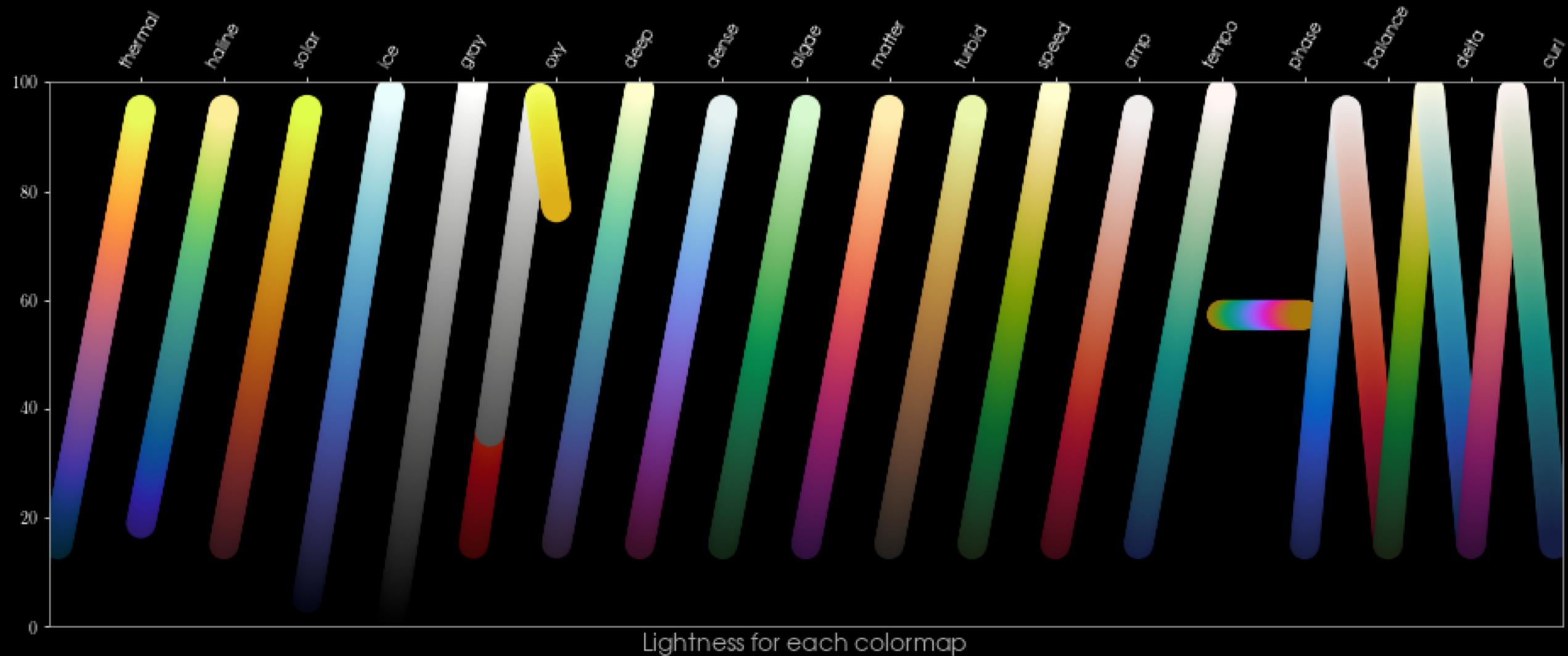
phase

balance

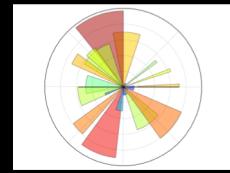
delta

curl

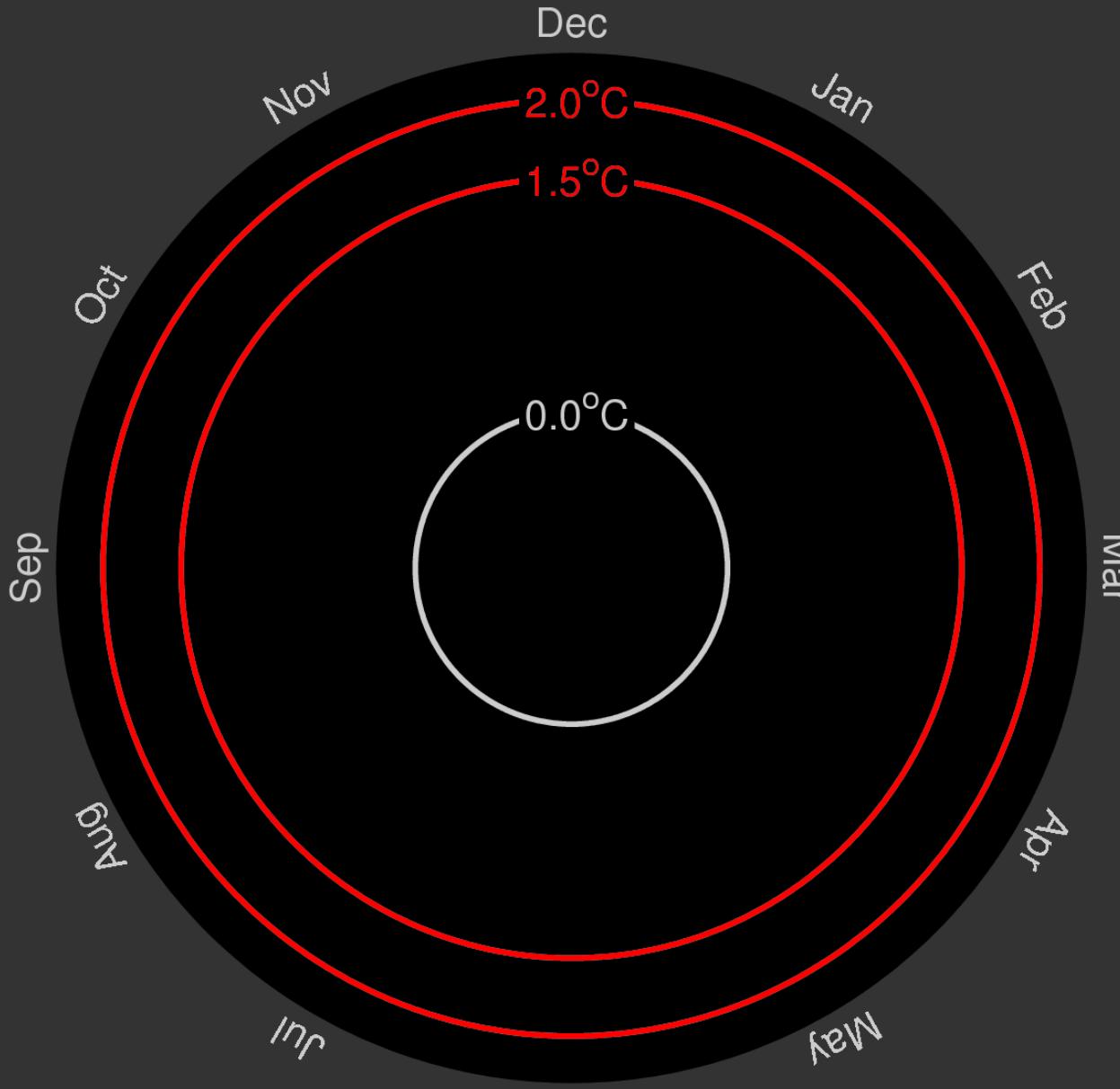
CMOCEAN



ALTERNATIVES

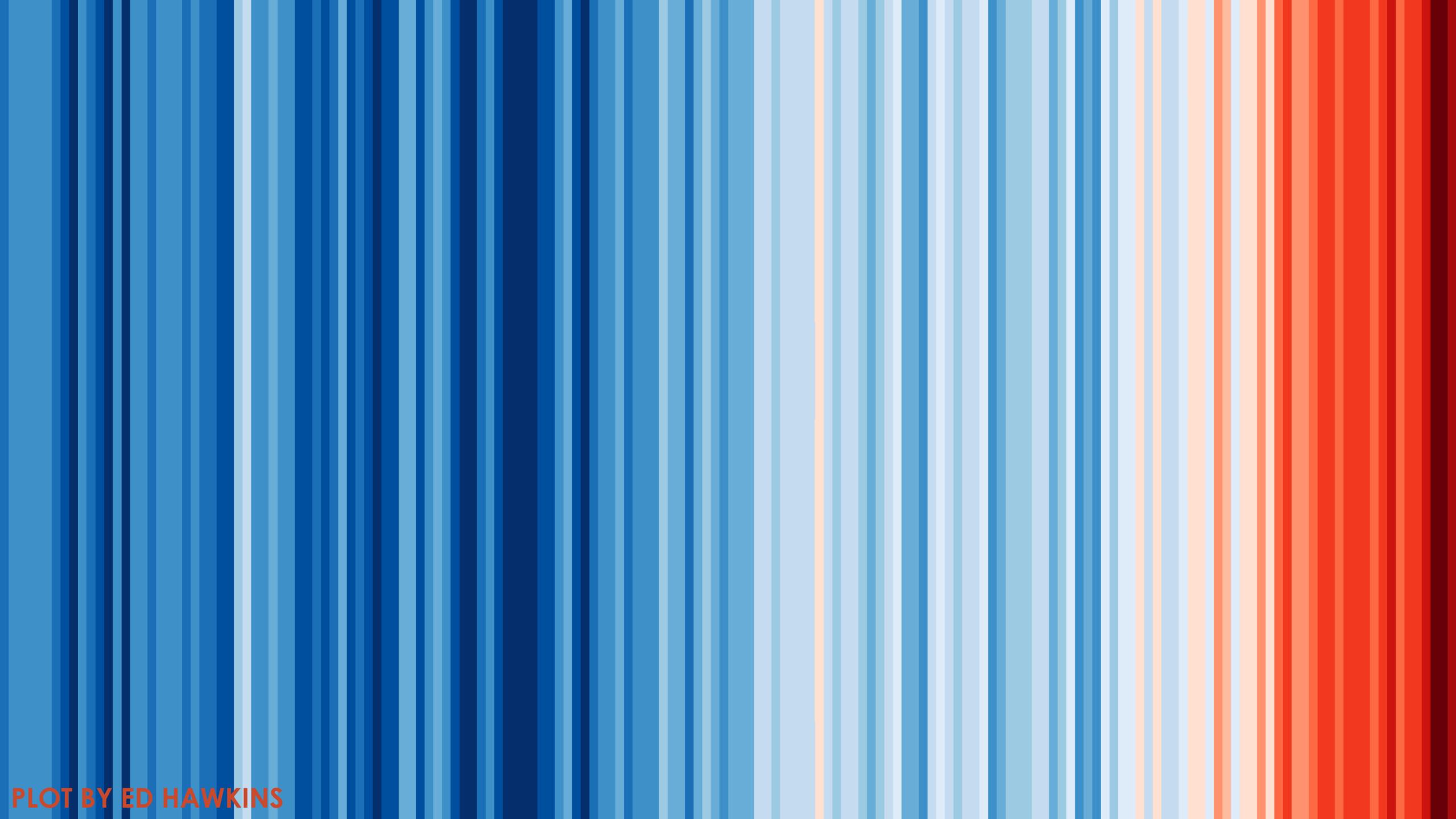
1. Seaborn. 
2. Plotly. 
3. ggplot. 
4. Matplotlib v2. 

Global temperature change (1850–2017)



CHECK

Simple is best.
Color has meaning.
Data is visual.



PLOT BY ED HAWKINS