

Climate Change Graphs

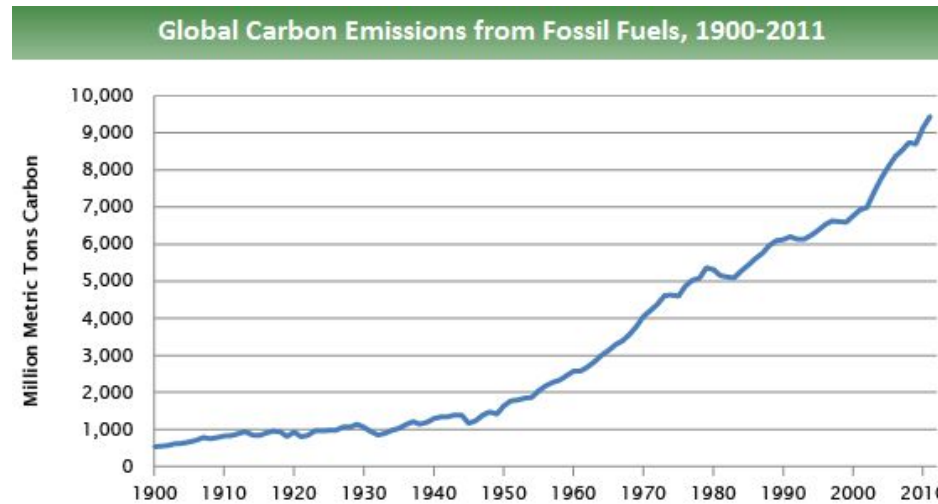
This document provides original climate change graphs and planning worksheets to use when creating an illustrated graph. Each title contains a link to the original graph, where you can access the data and a short description.

Graphs contained in this document include:

- I. Global Carbon Emissions from Fossil Fuels, 1900-2011
- II. Atmospheric CO₂ Levels: 2005-Present (direct measurement)
- III. Atmospheric CO₂ Levels During Last Three Glacial Cycles (indirect measurement)
- IV. Global Land-Ocean Temperature Index
- V. Average September Extent of Arctic Sea Ice, since 1979
- VI. Antarctic Ice Mass Variation, since 2002
- VII. Greenland Ice Mass Variation, since 2002
- VIII. Sea Level Rise: 1993-Present (satellite data)
- IX. Sea Level Rise: 1870-2000 (coastal tide gauge data)
- X. Global Surface Temperature (top, blue) Vs. Sun's Energy Received at the Top of Earth's Atmosphere (red, bottom), From 1978 to 2009

Brainstorming Sheet: Global Carbon Emissions from Fossil Fuels, 1900-2011

Access original graph at <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>.



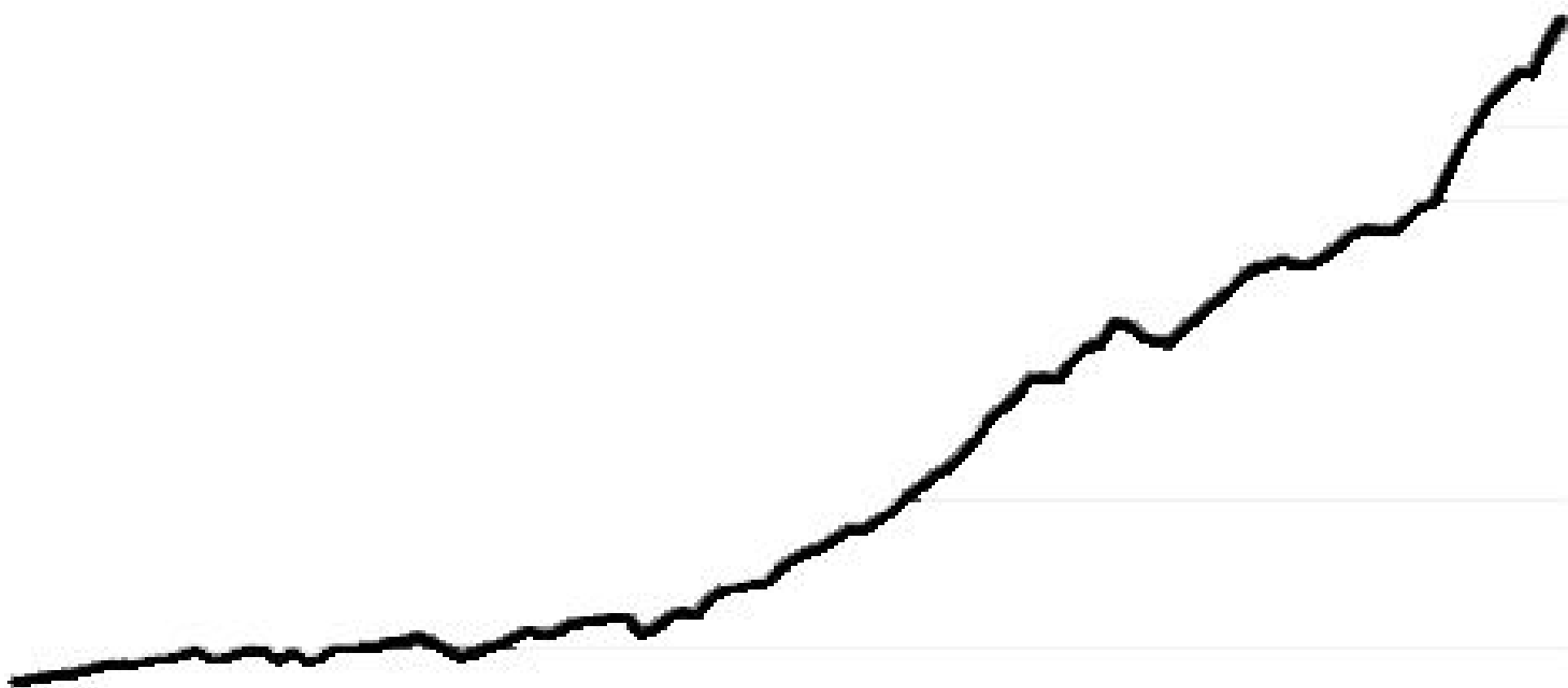
Source: Boden, T.A., Marland, G., and Andres R.J. (2015). *Global, Regional, and National Fossil-Fuel CO2 Emissions*. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, doi 10.3334/CDIAC/00001_V2015

Spaces for thumbnail sketches of ideas for final illustrated graph (blank box for creative positioning/use of graph, if applicable)

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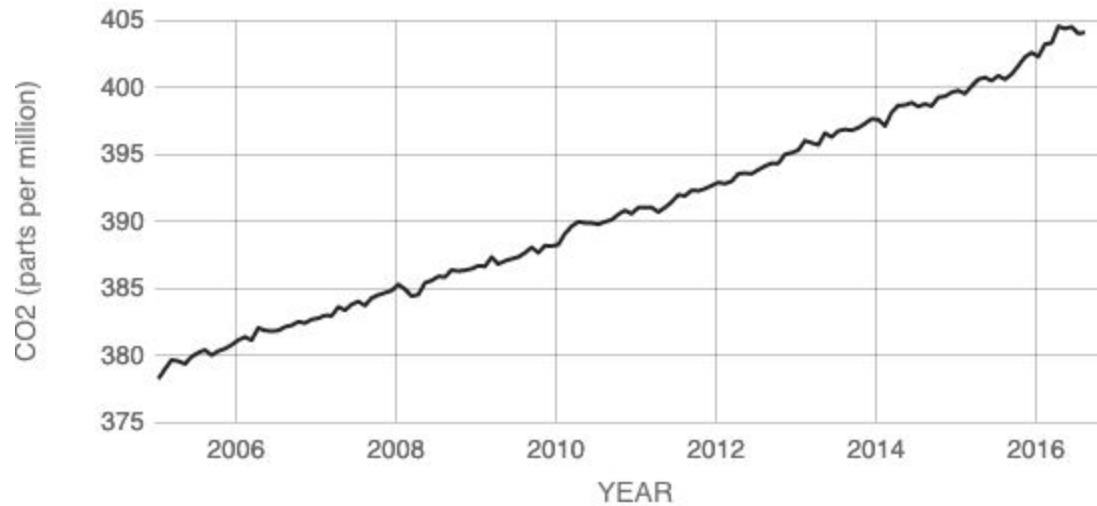
Graph Template

For use when creating full-scale illustrated graph. May be printed and traced or photocopied onto a transparency and cut out for use with watercolor paper, etc.



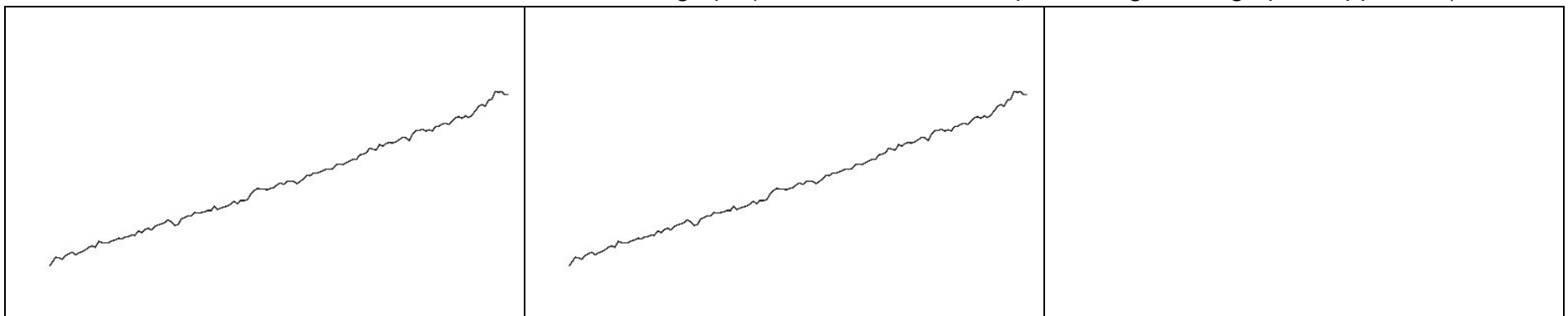
Brainstorming Sheet: Atmospheric CO₂ Levels: 2005-Present (direct measurement)

Access original graph at <http://climate.nasa.gov/vital-signs/carbon-dioxide/>.



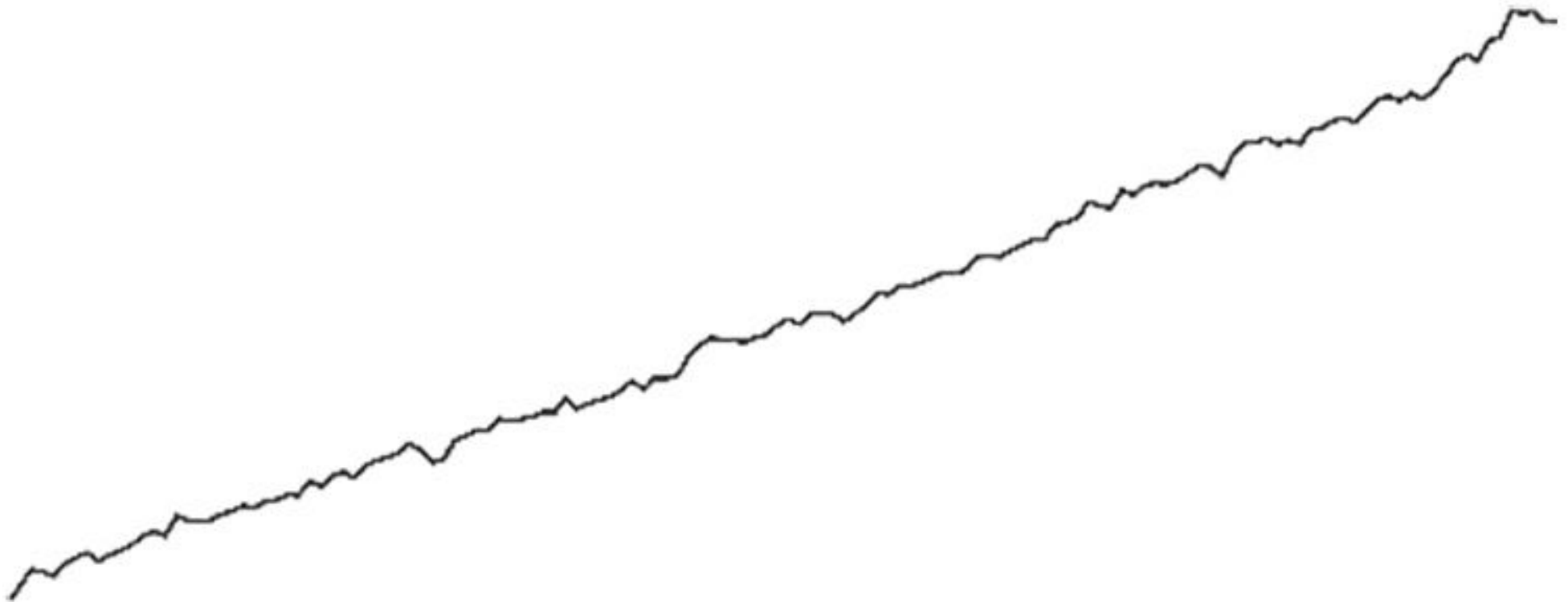
Source: climate.nasa.gov

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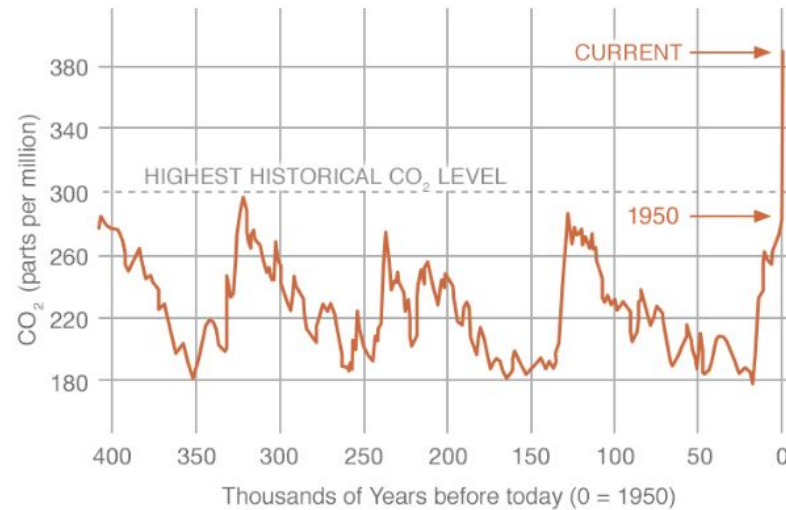
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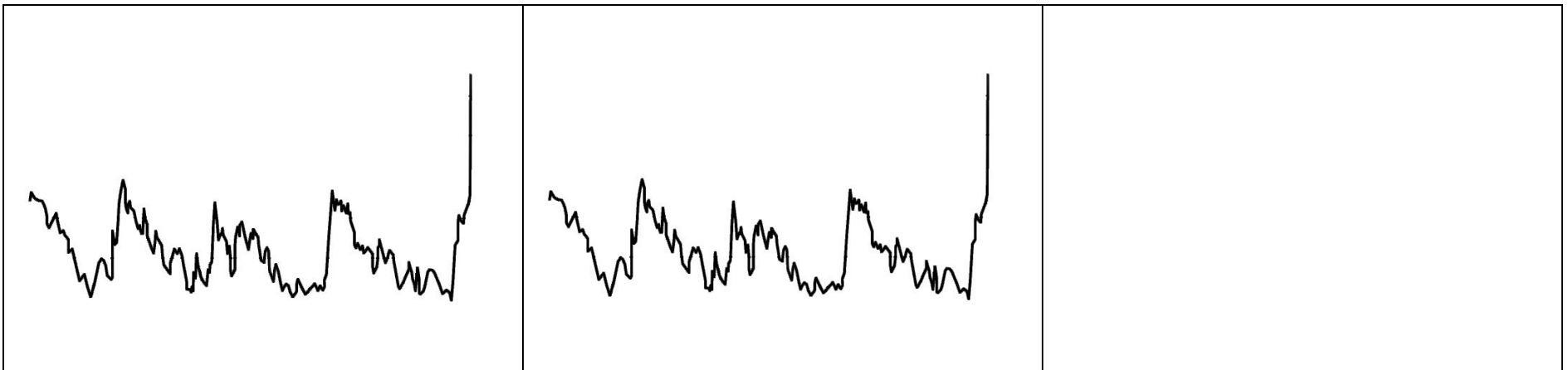
Brainstorming Sheet: Atmospheric CO₂ Levels During Last Three Glacial Cycles (indirect measurement)

Access original graph at <http://climate.nasa.gov/vital-signs/carbon-dioxide/>.



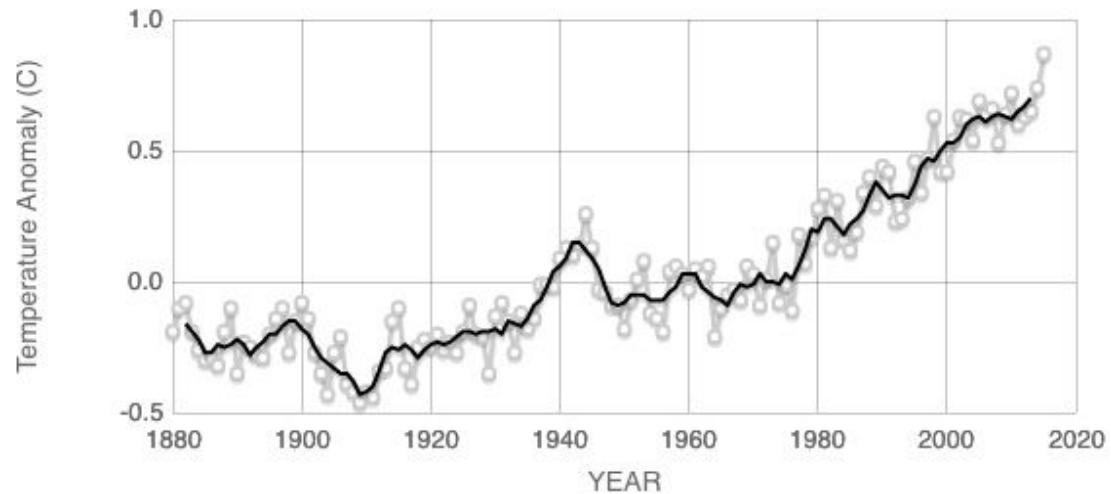
Data source: Reconstruction from ice cores. Credit: NOAA

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Brainstorming Sheet: Global Land-Ocean Temperature Index

Access original graph at <http://climate.nasa.gov/vital-signs/global-temperature/>.



Source: climate.nasa.gov

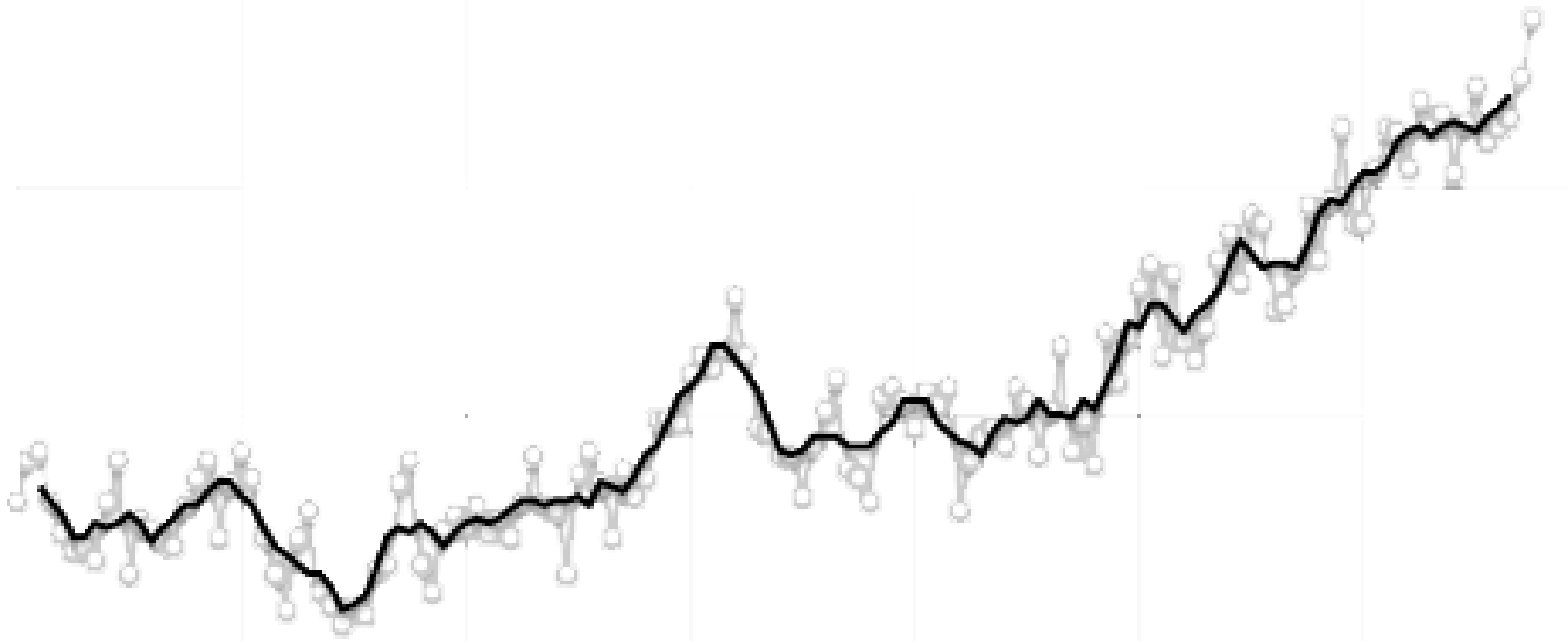
Data source: NASA's Goddard Institute for Space Studies (GISS). Credit: NASA/GISS

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Graph Template

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Brainstorming Sheet: Average September Extent of Arctic Sea Ice

Access original graph at <http://climate.nasa.gov/vital-signs/arctic-sea-ice/>.

Data Source: Satellite Observations. Credit: NSIDC

Create thumbnail sketches of ideas for final illustrated graph (blank box for creative positioning/use of graph, if applicable).

		
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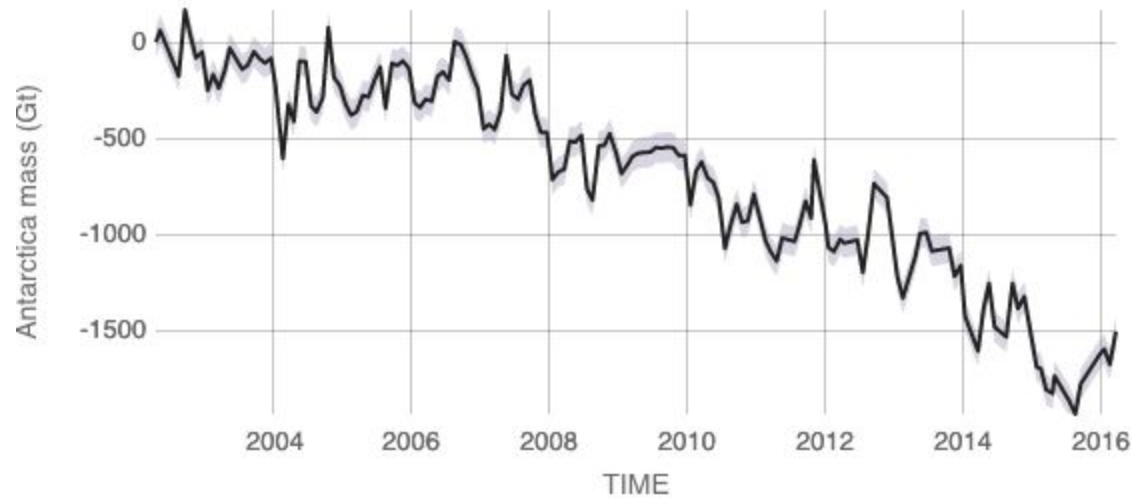
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Brainstorming Sheet: Antarctica Ice Mass Variation, since 2002

Access original graph at <http://climate.nasa.gov/vital-signs/land-ice/>.



Source: climate.nasa.gov

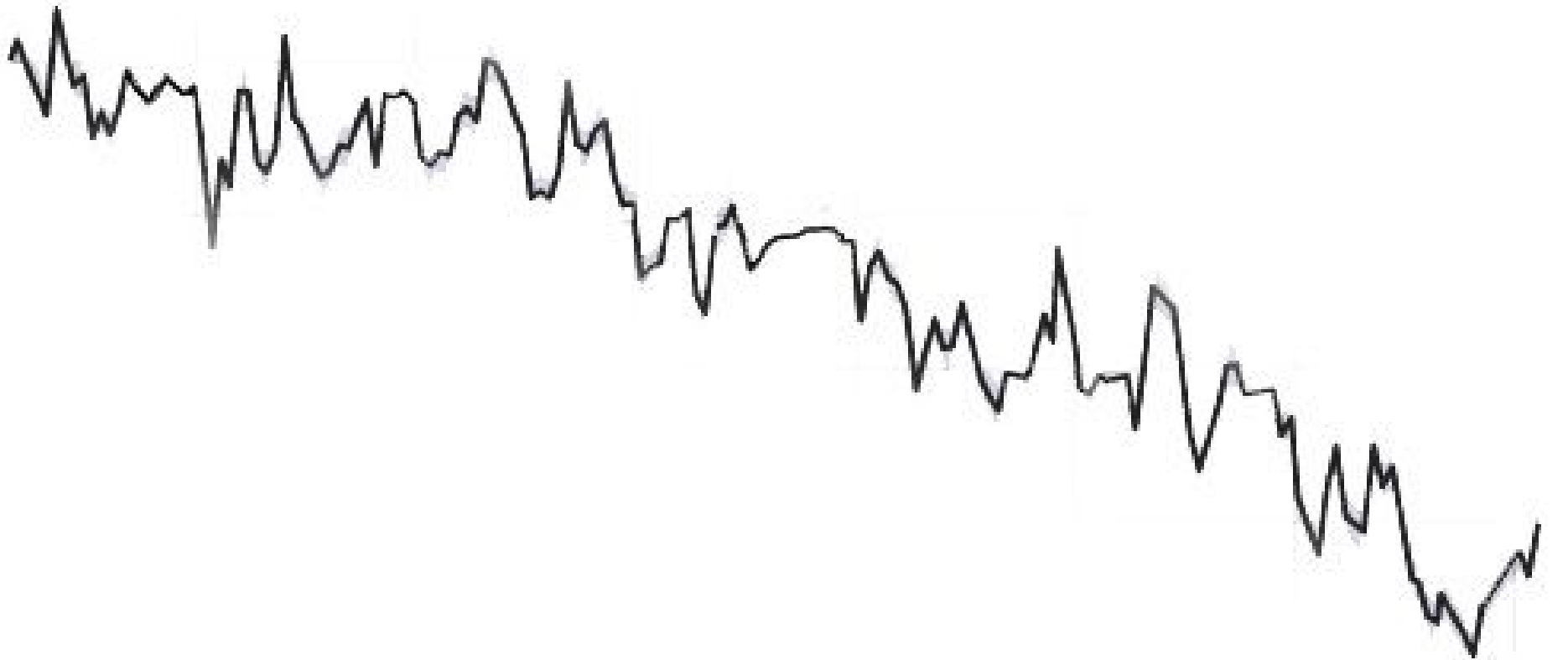
Data source: Ice mass measurement by NASA's GRACE satellites. Credit: NASA

Create thumbnail sketches of ideas for final illustrated graph (blank box for creative positioning/use of graph, if applicable).

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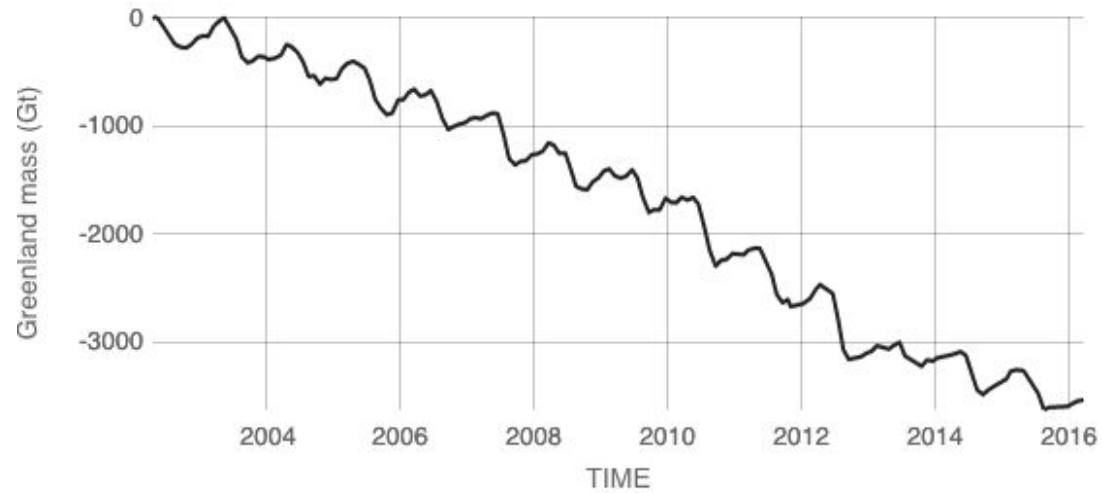
Graph Template

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Brainstorming Sheet: Greenland Ice Mass Variation Since 2002

Access original graph at <http://climate.nasa.gov/vital-signs/land-ice/>.



Source: climate.nasa.gov

Data source: Ice mass measurement by NASA's GRACE satellites. Credit: NASA

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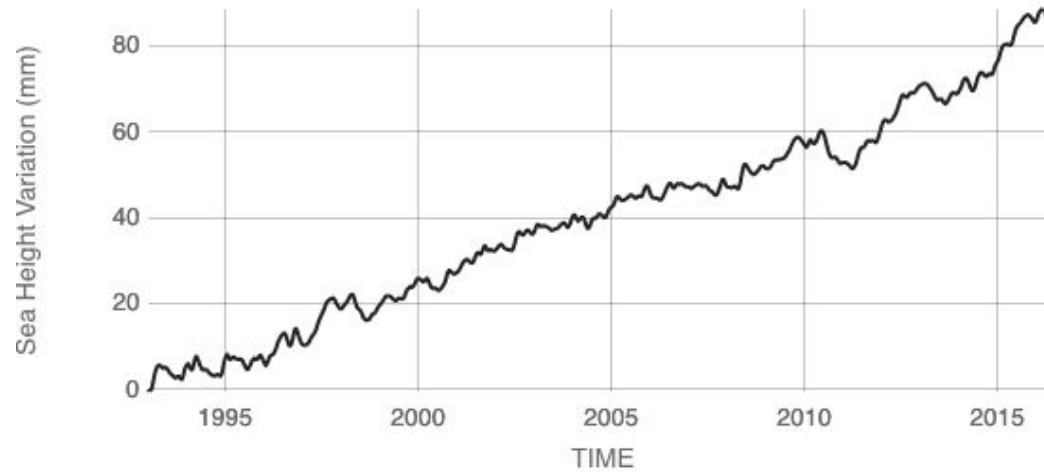
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Graph Template

For use when creating full-scale illustrated graph. May be printed and traced or photocopied onto a transparency and cut out for use with watercolor paper, etc.

Brainstorming Sheet: Sea Level Rise Satellite Data (1993-Present)

Access original graph at <http://climate.nasa.gov/vital-signs/sea-level/>.



Source: climate.nasa.gov

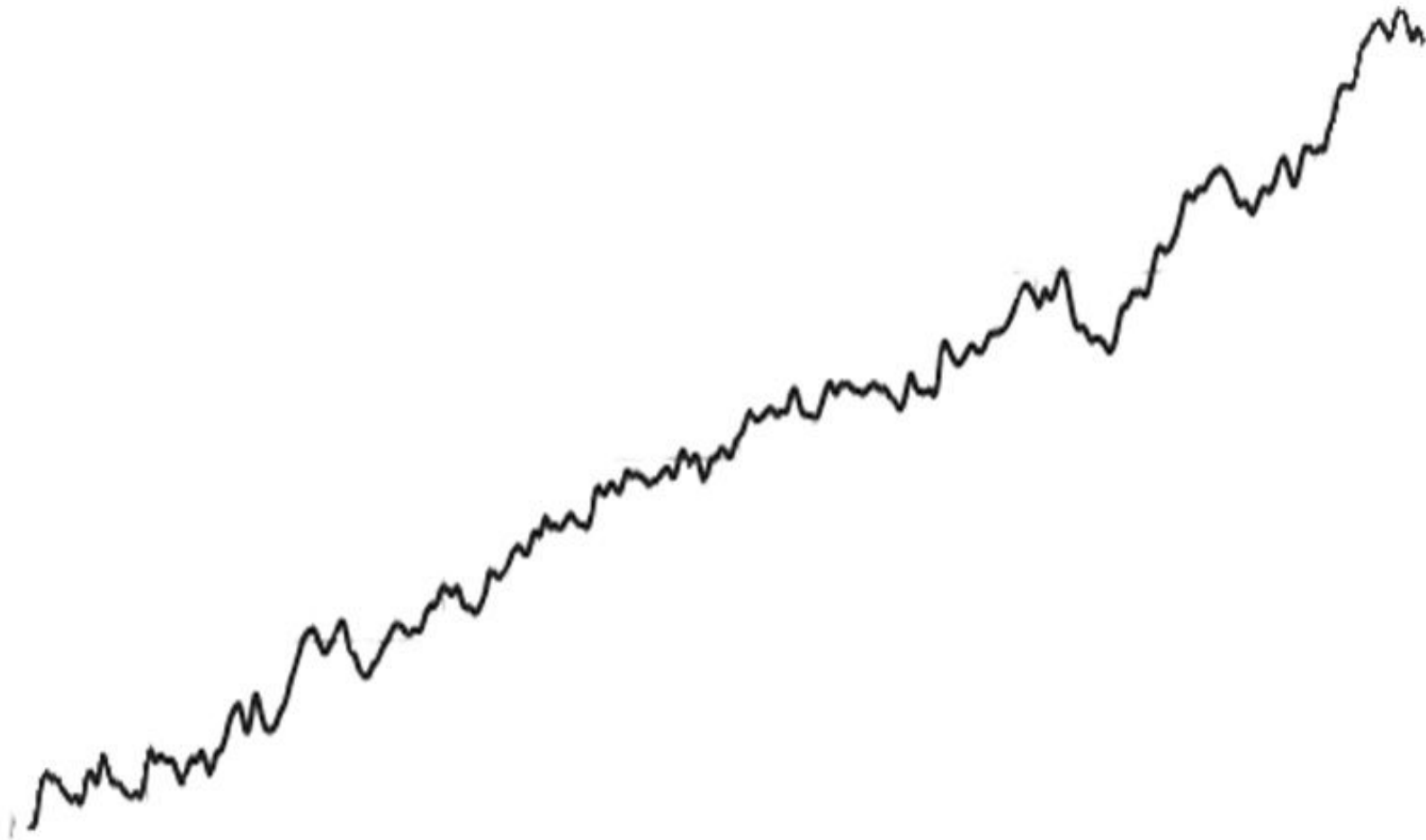
Data source: Satellite sea level observations. Credit: NASA Goddard Space Flight Center

Create thumbnail sketches of ideas for final illustrated graph (blank box for creative positioning/use of graph, if applicable).

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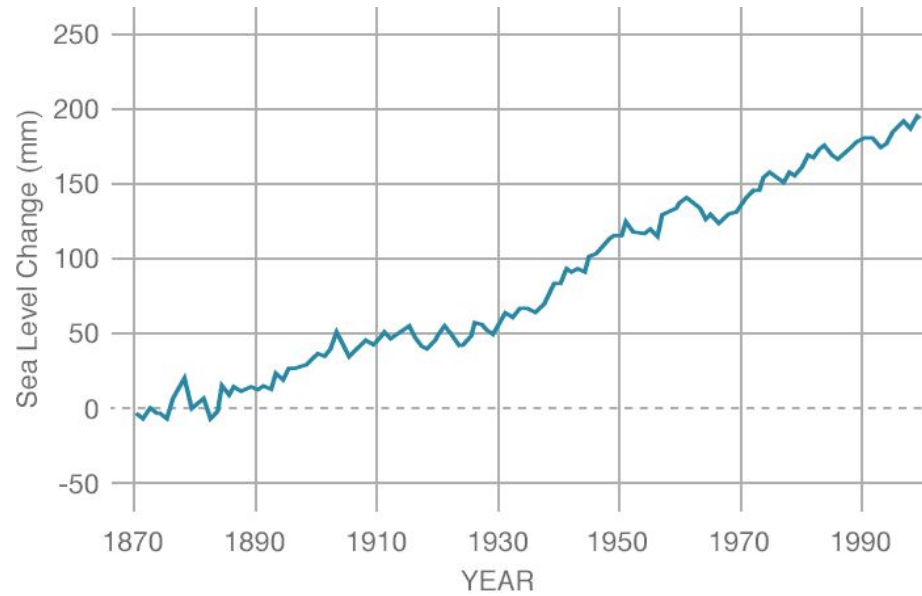
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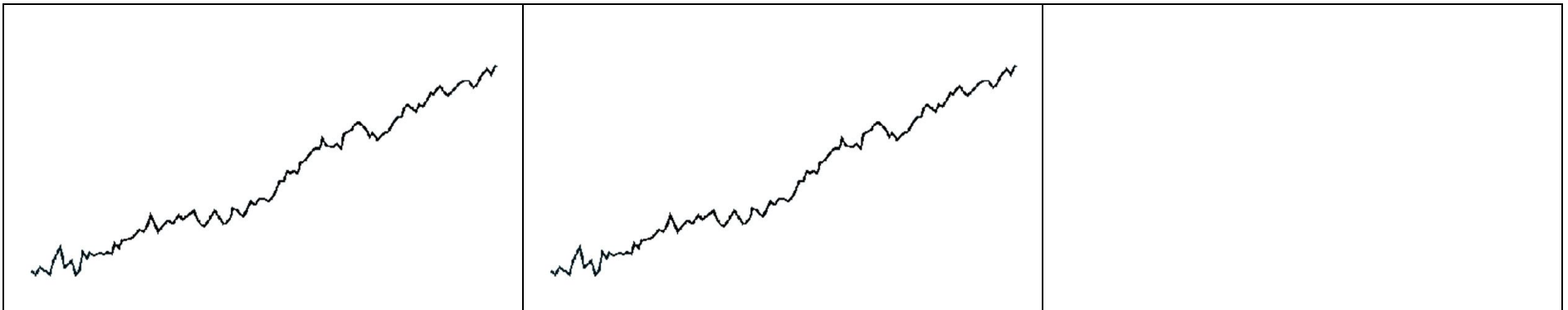
Brainstorming Sheet: Sea Level Rise Ground Data (1870-2000)

Access original graph at <http://climate.nasa.gov/vital-signs/sea-level/>.



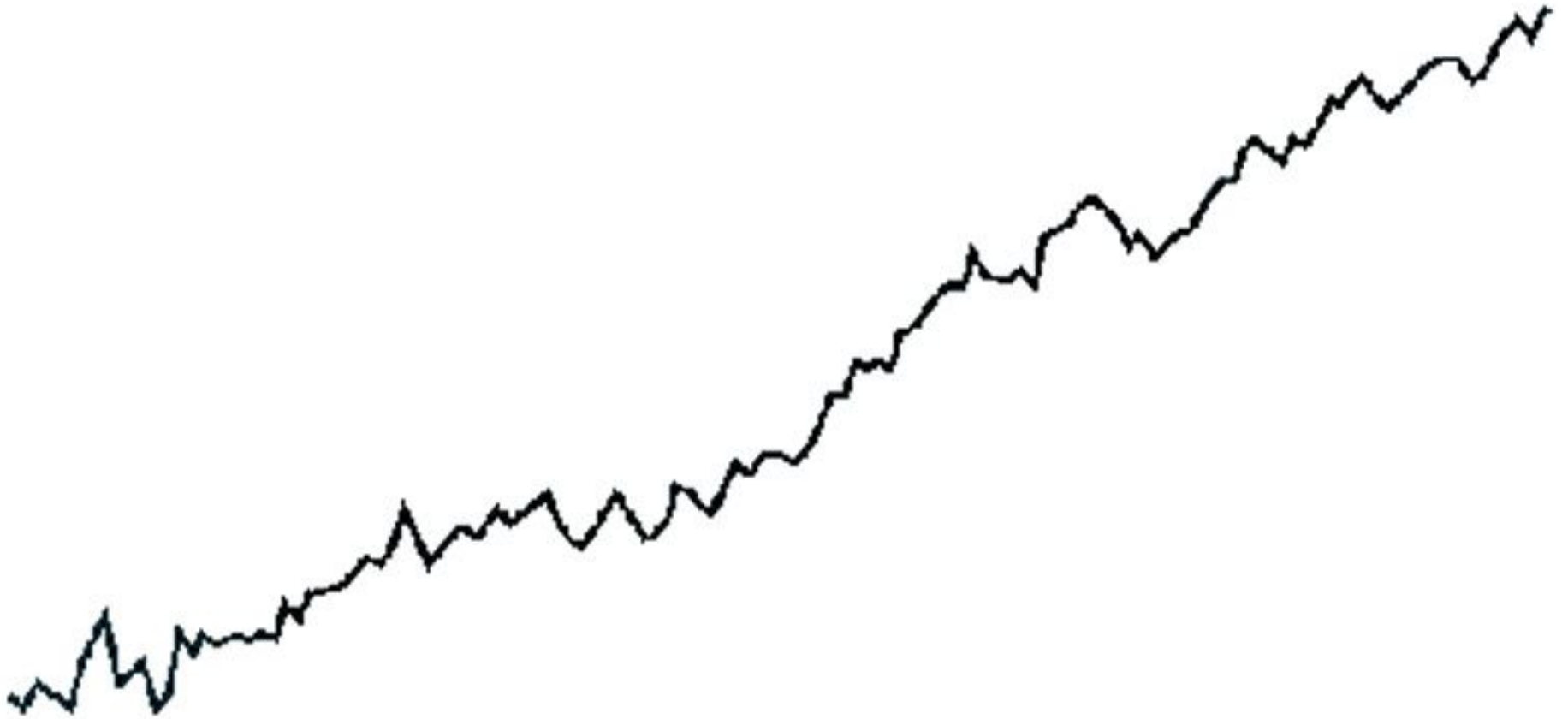
Data source: Coastal tide gauge records. Credit: [CSIRO](#)

Create thumbnail sketches of ideas for final illustrated graph (blank box for creative positioning/use of graph, if applicable).



Graph Template

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Brainstorming Sheet: Global surface temperature vs. sun's energy received at the top of Earth's atmosphere, from 1978 to 2009

Access original graph at <http://climate.nasa.gov/faq/>, under the question "Is the sun causing global warming?".

Spaces for thumbnail sketches of ideas for final illustrated graph (blank box for creative positioning/use of graph, if applicable).

Use detailed, jagged curve(s) or simplify and just use best-fit curve(s)

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Graph Template

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