have deduced that the ice ages

are

during an ice-age cycle is estimated as 5

gone through extended periods when

triggered by recurring variations in

°C ± 1 °C (9 °F ± 2 °F).

temperatures were much lower than

Earth’s orbit that primarily alter the

\*Note that in geological terms Earth has

today and thick blankets of ice covered

regional and seasonal distribution of

been in an ice age ever since the Antarctic

large areas of the Northern Hemisphere.

solar energy reaching Earth. These

Ice Sheet last formed about 36 million

These long cold spells, lasting in the

relatively small changes in solar energy

years ago. However, in this document we

most recent cycles for around 100,000

are reinforced over thousands of years by

have used the term in its more colloquial

years, were interrupted by shorter warm

gradual changes in Earth’s ice cover (the

usage indicating the regular occurrence of

‘interglacial’ periods, including the past

cryosphere), especially over the Northern

extensive ice sheets over North America

10,000 years.

Hemisphere, and in atmospheric

and northern Eurasia.

composition, eventually leading to large

least the last 2.6 million years, Earth has

\*

ice cores, and other data show that for at

observations, and modelling, scientists

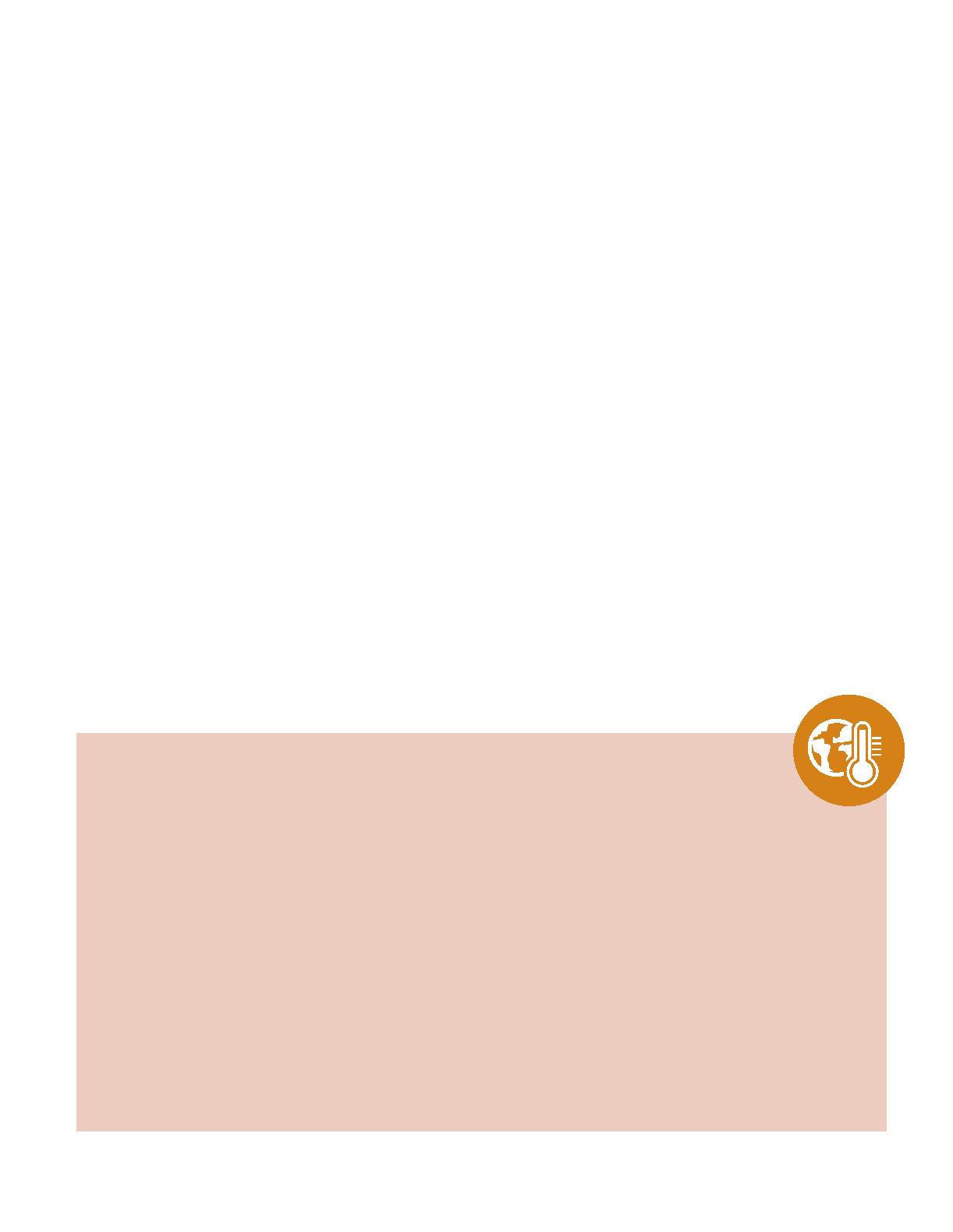
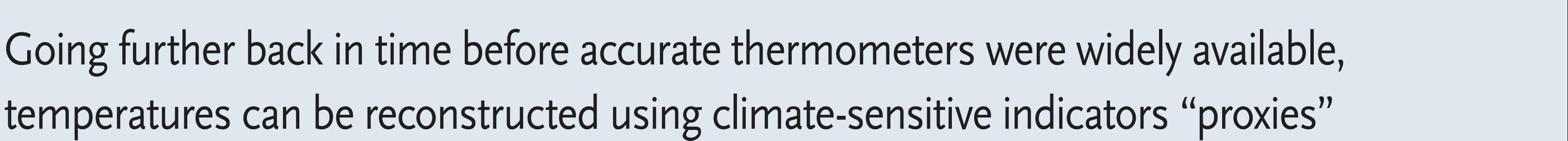
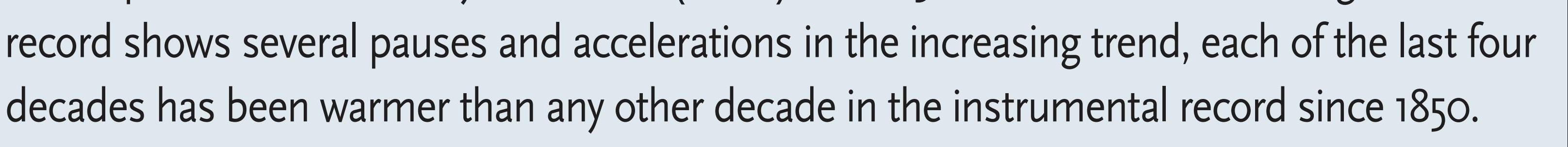
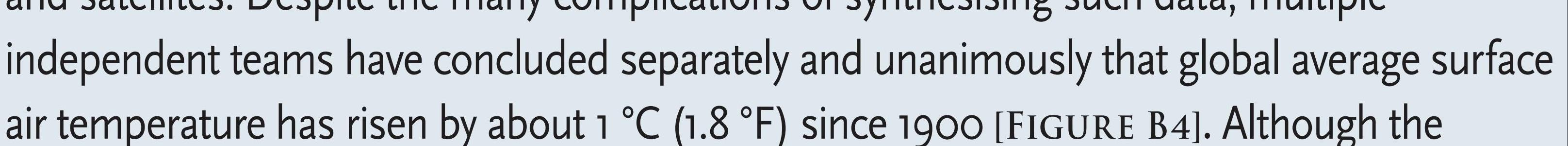
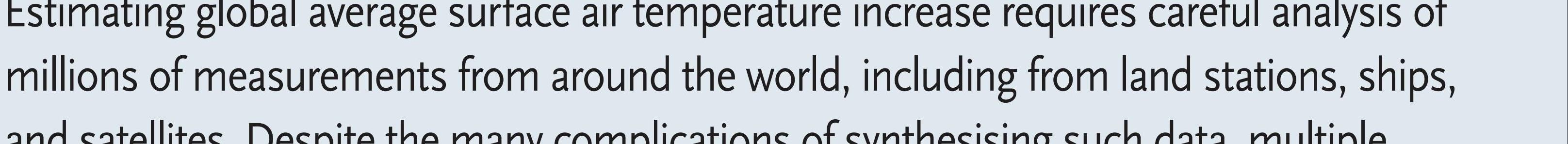
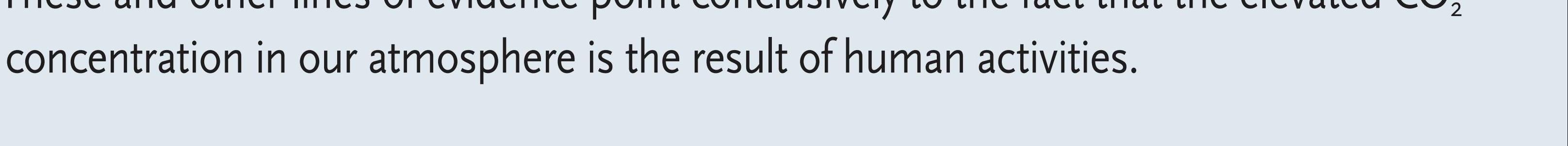
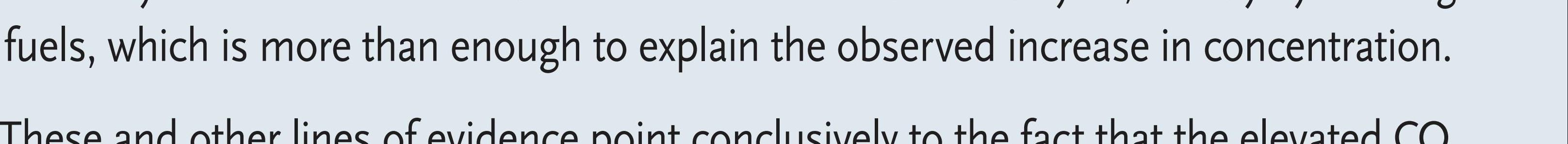
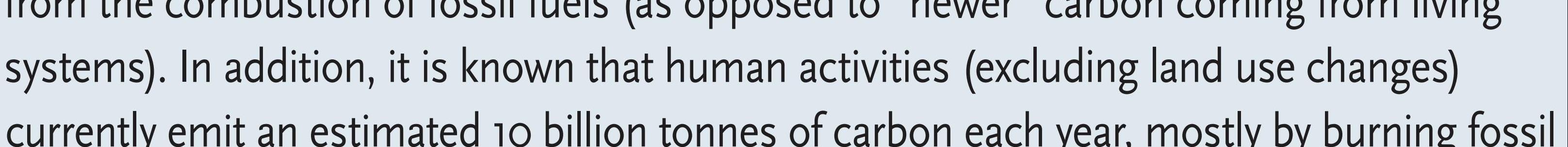
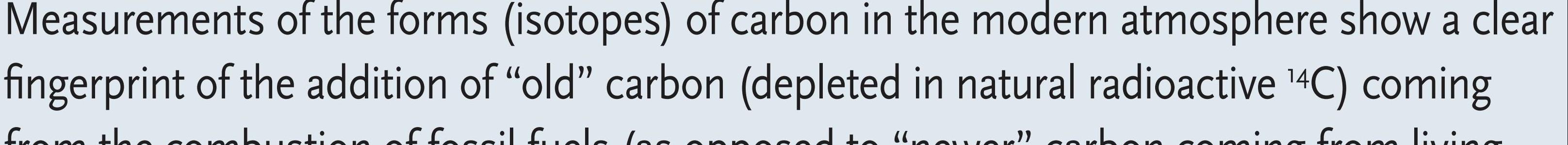
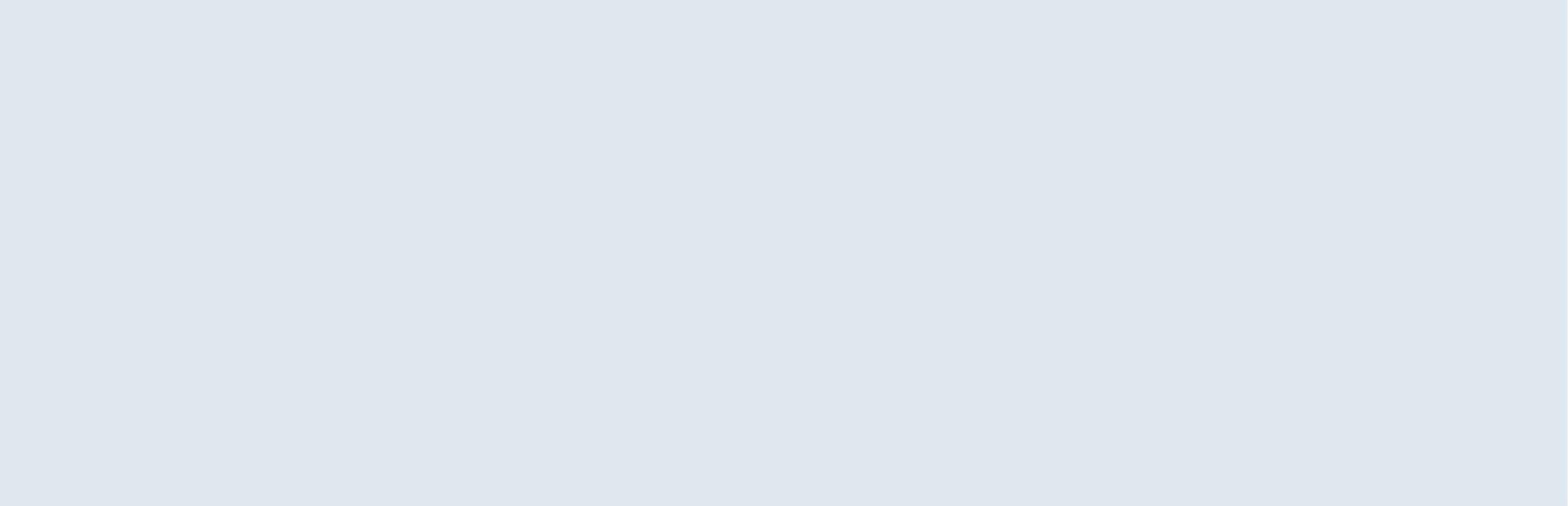
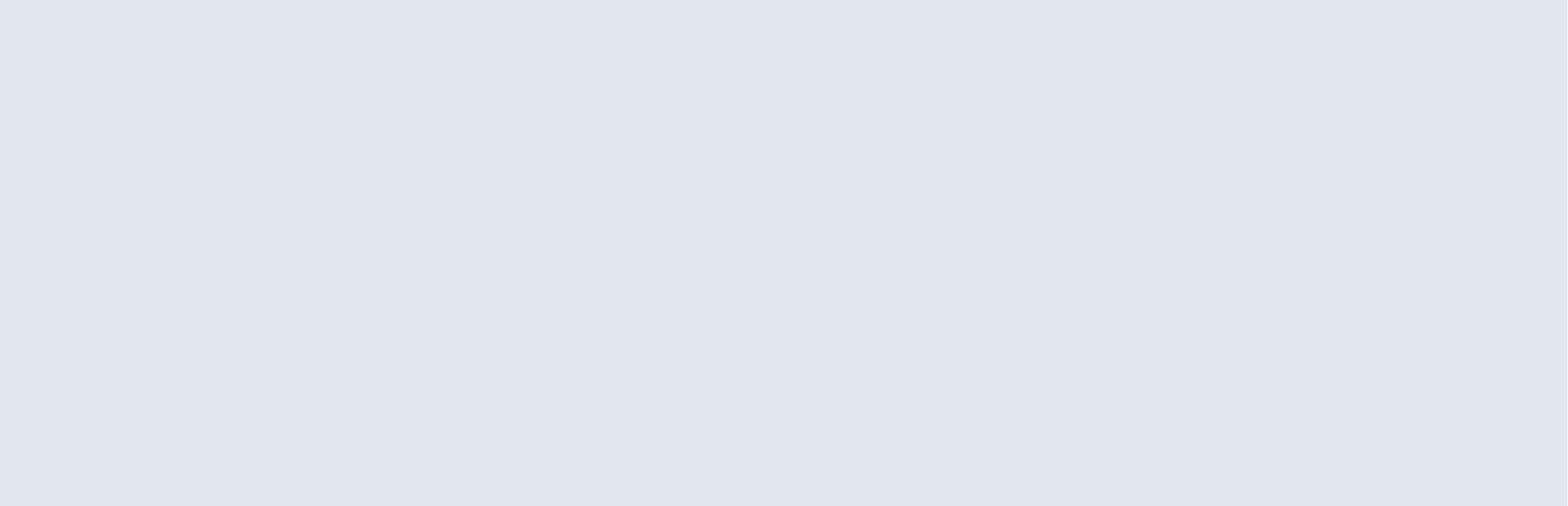
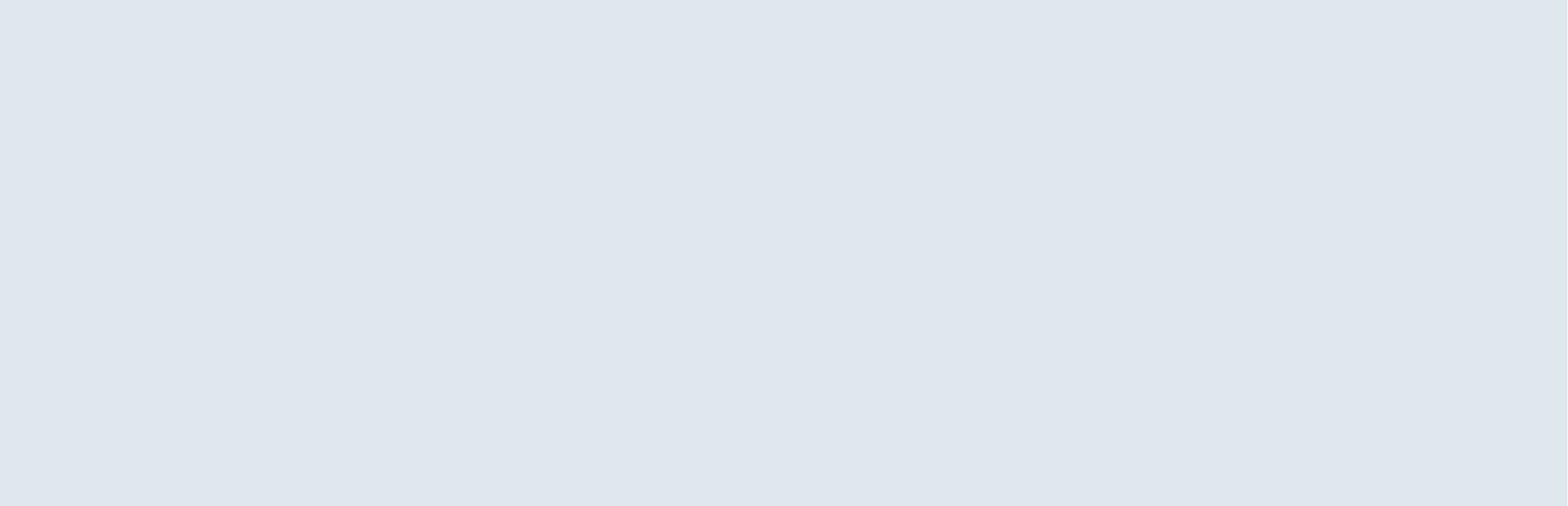
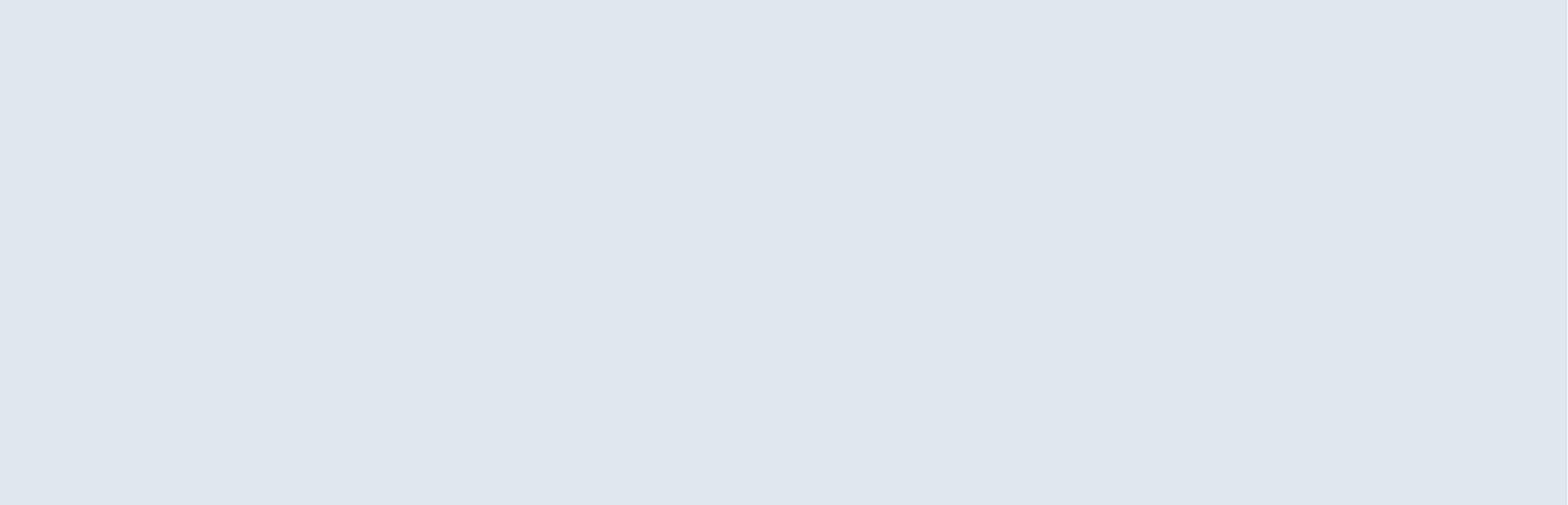
The average global temperature change

Detailed analyses of ocean sediments,

Through a combination of theory,

changes in global temperature.

Learn about the ice ages:



mation (orange).

National Centers for Environmental Infor-

Oceanic and Atmospheric Administration

for Space Studies (red), and US National

Space Administration Goddard Institute

(maroon), US National Aeronautics and

Data from UK Met Ofﬁce Hadley Centre

NOAA Climate.gov, based on IPCC AR5.

averaged from 1961−1990. Source:

global average surface temperature,

perature changes are relative to the

(HadCRUT4) dataset. The tem-

range (grey bars) for the maroon

values, including the uncertainty

panel shows decadal average

the three analyses, and the bottom

shows annual average values from

available data sets. The top panel

three independent analyses of the

from 1850 to 2019 derived from

land and ocean measurements

shown in this plot of combined

surface temperature has risen, as

Earth’s global average

Figure B.

