

MAP: This is a map of sea level using local tide gauges. You move to the Swedish coast and are puzzled to find the people there are not worried about Sea Level Rise...Why not?

Touch on the interactive map to get information

Overview of topics

- Where is sea level changing now? >
- Tide stations >

NOAA Tide Station Histories

First lets explore around the coast of the eastern United States. Click on some of the tide station dots. What is sea level doing here?

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NOAA Tide Station Histories

Now lets go over to your new home in Sweden. Click on one of the purple or blue dots by Scandinavia. What is happening to sea level in this location? How can this be? Hypothesize... OK let's travel back in time to see what might have happened

Tide Station = Ratanj Sweden
Sea level change = -7.75 +/- 0.39 mm/year
Sea level change = -2.54 ft/century
Measurement period = 1892-2011
[More info](#)

Overview of topics

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- [Tide stations](#) >

We are back ~20,000 years. What is going on in this area?

Eurasian Ice Sheet 20,000 years ago

The ice sheet shown here covered what is now Northern Europe and Scandinavia during the Last Glacial Maximum. Often referred to as the Fennoscandia this large ice sheet was part of the northern hemisphere glaciation of the last ice age. Image one shows the maximum glacial extent and image two shows the ice sheet thickness, which at its thickest is close to the current elevation of the Greenland.

Cancel Audio Silent

What about deglaciation 20k to 5k...

- [Overview of deglaciation](#)
- [Deglaciation of North America](#)
- [Deglaciation of Europe](#)
- [Eurasian Ice Sheet 20,000 years ago](#) ✓

Overview of topics

- What about climate in the past? >
- What about cold periods? >
- [Eurasian Ice Sheet 20,000 years ago](#) >

The last map showed how ice covered this whole area, this is ice thickness. Touch to see how thick the ice was. Seems like a lot, but how much is that really? Can you think of a comparison?

Stay on this map but toggle the arrow on the bar on the bottom of the map.

Overview of topics

- What about climate in the past? >
- What about cold periods? >
 - Eurasian Ice Sheet 20,000 years ago >

Ice Sheet Thickness (m) GM: mapped and modelled

© Overduin et al., 2004 Eurasian Ice Sheet at Last Glacial Maximum

Lets return to the present, and visit Greenland's ice sheet. Click around to see how high the ice is on top of Greenland right now. How does this compare to the amount of ice that was over Sweden 20,000 years ago?

Overview of topics

- What about the Polar Regions? >
- Greenland Ice Sheet Thickness >

Greenland Ice Sheet Thickness

Now let's take off the ice and look at the Greenland surface below the ice? The center of the ice sheet is where the ice is the thickest. See how it is pressed down below sea level – that is from all the ice layered on top of it.

Overview of topics

- What about the Polar Regions? >
- Look under the Greenland Ice Sheet >

NSIDC Elevations Under the Greenland Ice Sheet

What would happen if the ice were to melt? Very slowly over thousands of years the land would come back up. This is what is happening in Scandinavia right now. The land is rising several times faster than the sea is rising...

Overview of topics

- What about the Polar Regions? >
- Look under the Greenland Ice Sheet >

NSIDC Elevations Under the Greenland Ice Sheet

Interactive that reviews isostasy

Sea Level and Glacial Rebound

120,000 years ago

Laurentide Ice Sheet
Greenland & North America

Temperature
~(+6m)
Time

Snow
~(+6m)
Lithosphere
Present day sea level

What do you think is going on?
Underneath the hard outside layer the earth is soft and the ice is heavy and pushes it down. This is 20,000 years after Sweden was under ice – wow the land is still rising back up!
To learn more go to <http://polarexplorer.ccnmtl.columbia.edu>
Select 'Sea Level and Glacial Rebound'

polarexplorer.ccnmtl.columbia.edu

Sea Level and Glacial Rebound

21,000 years ago

Laurentide Ice Sheet
Greenland & North America

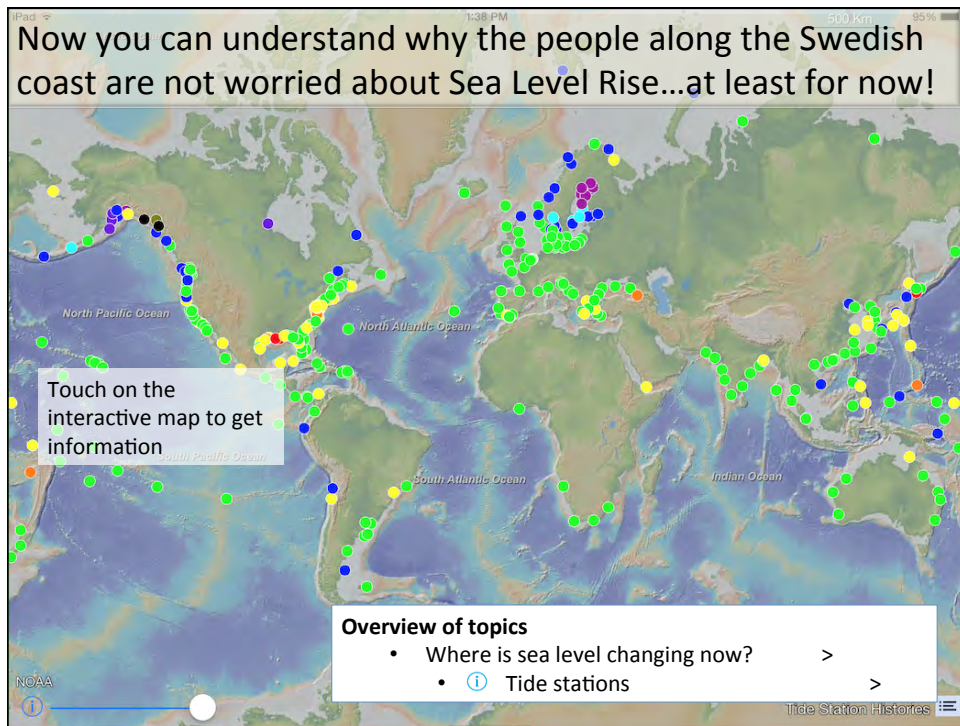
Temperature
~(-120m)
Time

Ice sheet
Peripheral bulge
Burden
Lithosphere subsidence
Asthenosphere outward flow
Present day sea level
~(-120m)

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Select 'Sea Level and Glacial Rebound'


Sea level continued to drop as the ice sheet

Now you can understand why the people along the Swedish coast are not worried about Sea Level Rise...at least for now!



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NOAA
Tide Station Histories

The image shows a world map with numerous colored dots representing tide stations. A callout box points to a cluster of dots along the Swedish coast. The map includes labels for the North Pacific Ocean, North Atlantic Ocean, South Atlantic Ocean, and Indian Ocean. A NOAA logo is in the bottom left, and 'Tide Station Histories' is in the bottom right.