

Loftslag

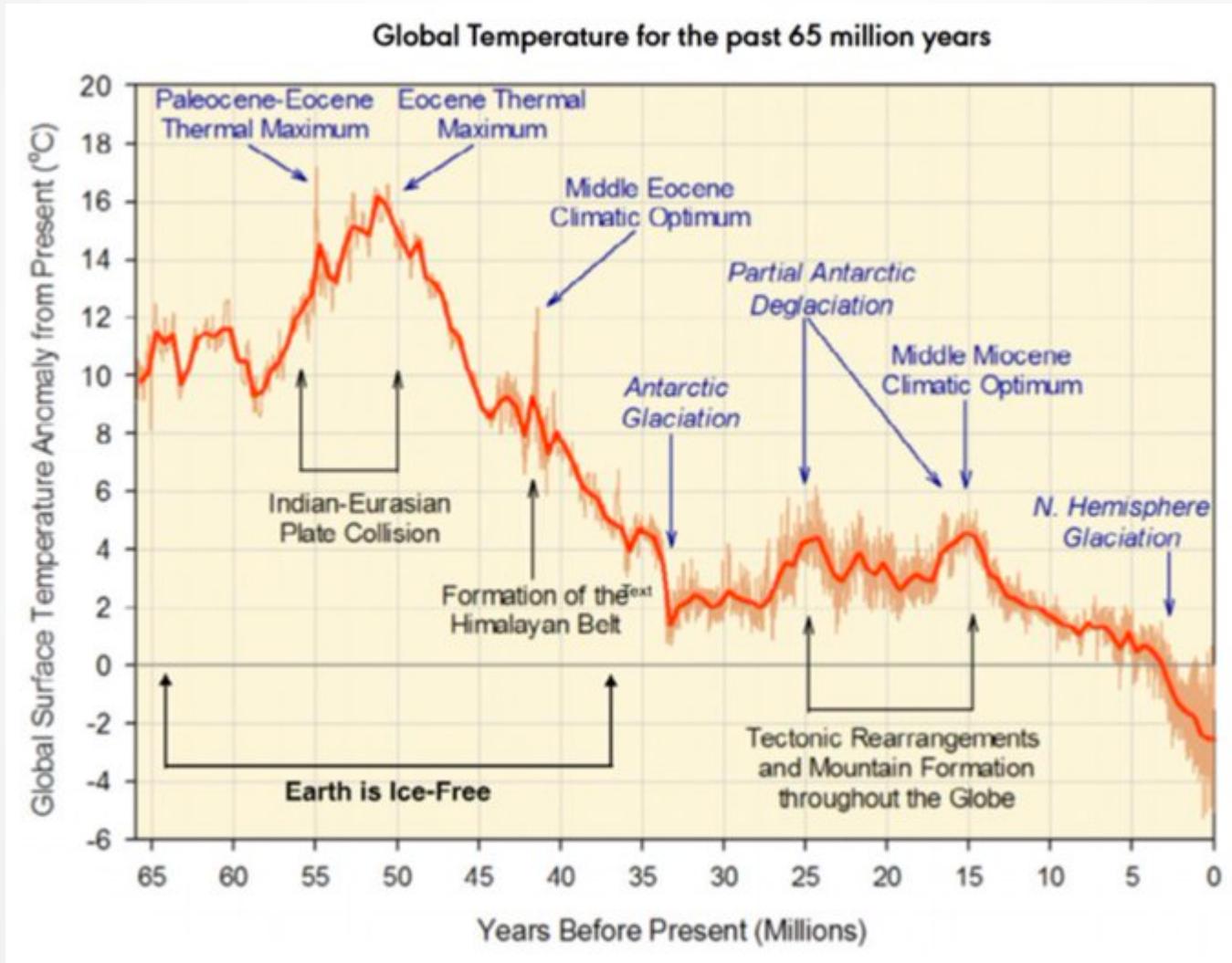
Loftslagsbreytingar á Íslandi

Hitastig

Friðrik Daníelsson
21.2.2021

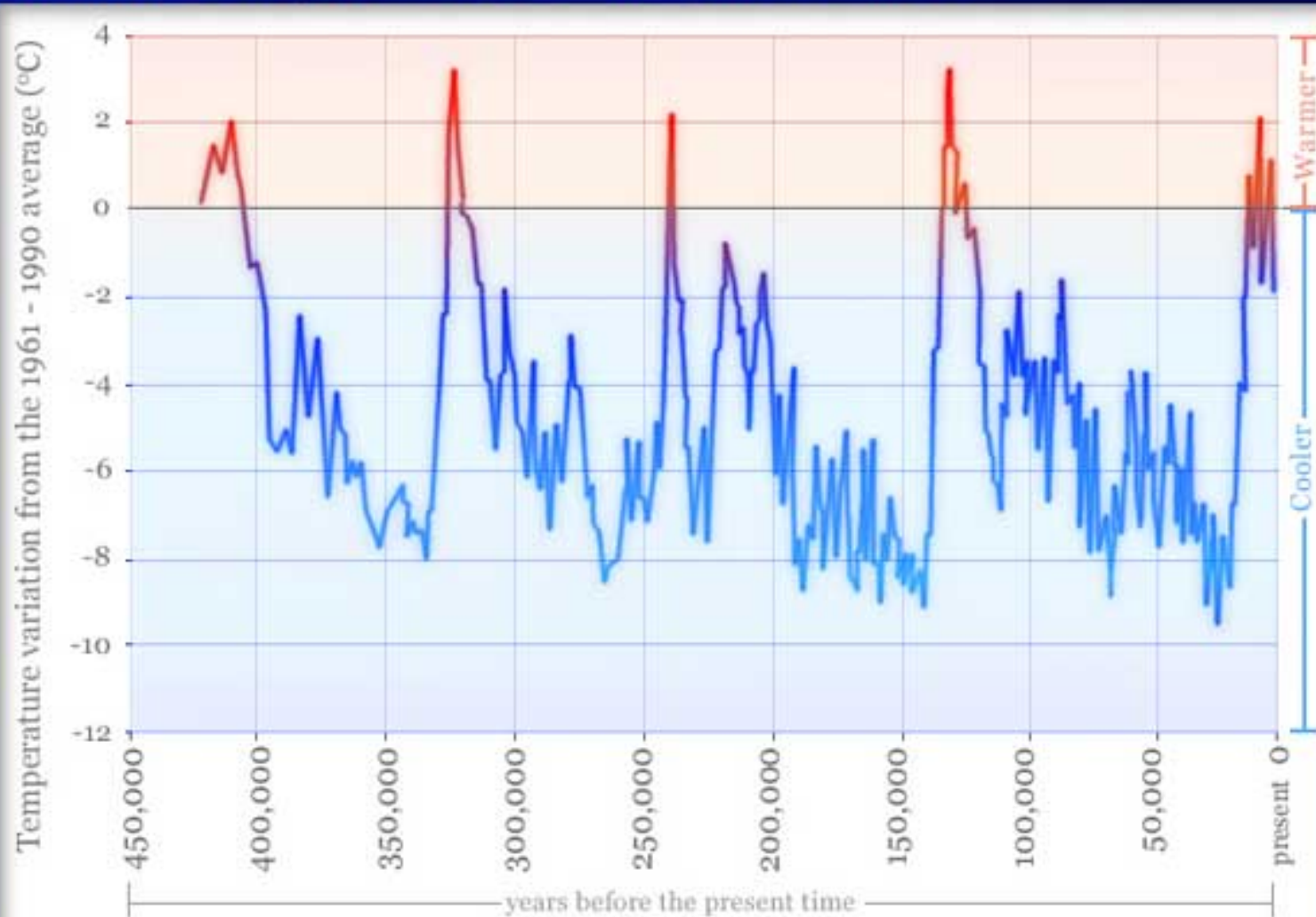
Hnattitastig Jarðar í 65 milljón ár

Hitinn hefur lækkað um nærri 15°C (Patrick Moore)



5 hlýindaskeið á 425.000 árum

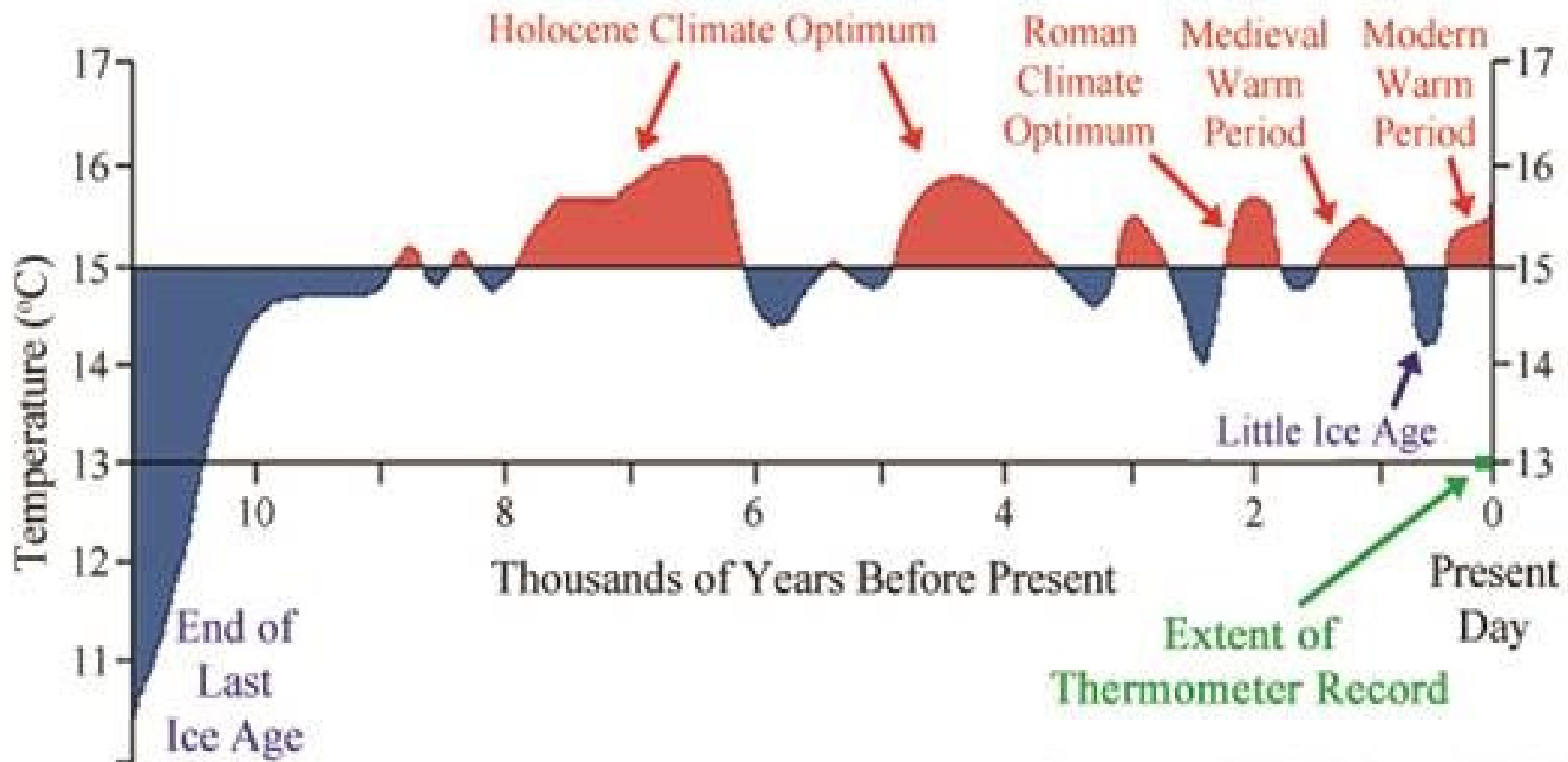
Global Temperatures for the past 425,000 years



Hitasveiflur síðustu 10.000 ára

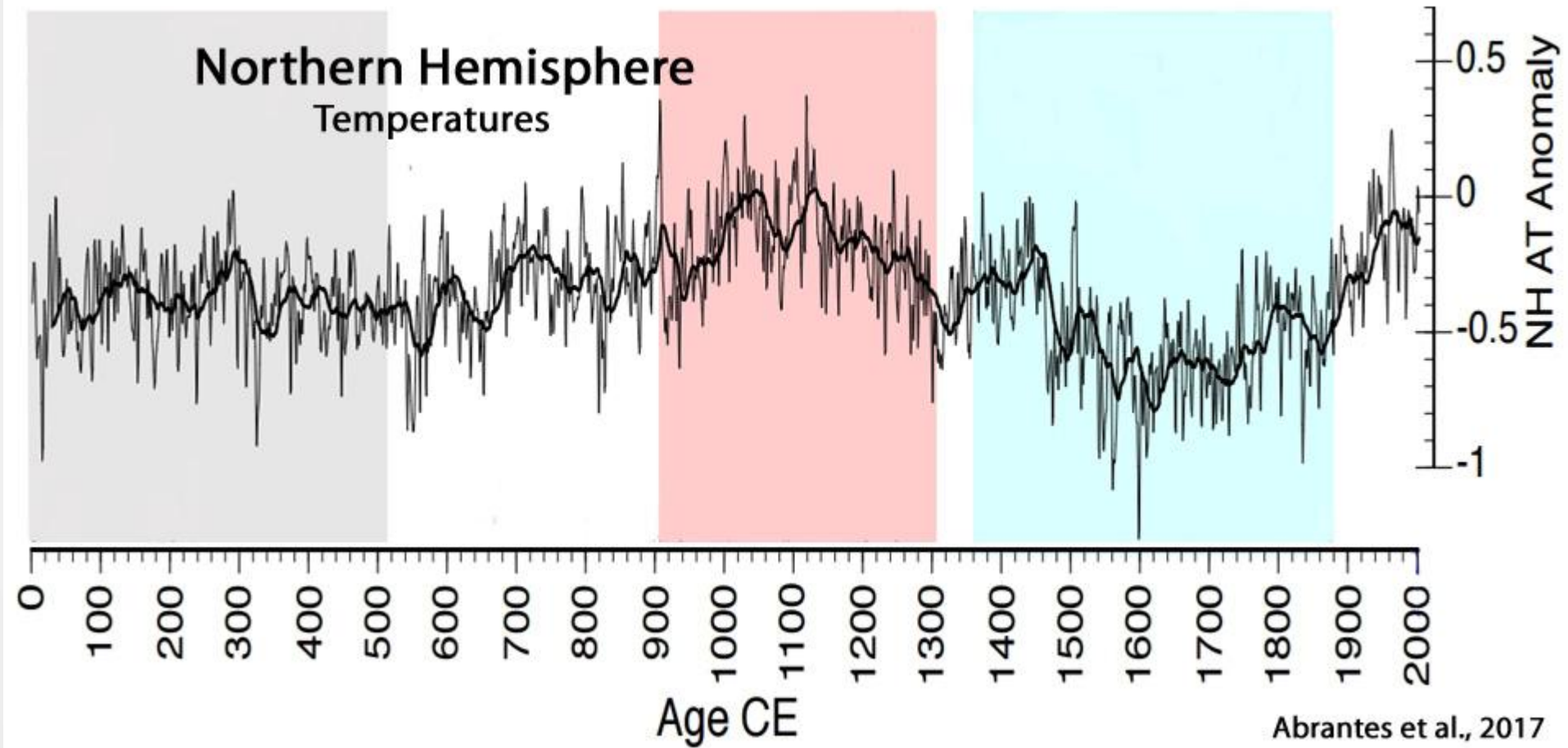
Hlýjast fyrir 4-5000 og 6-8000 árum

Temperatures of the Last 10,000 Years
(Ice core data from Crete site in central Greenland)



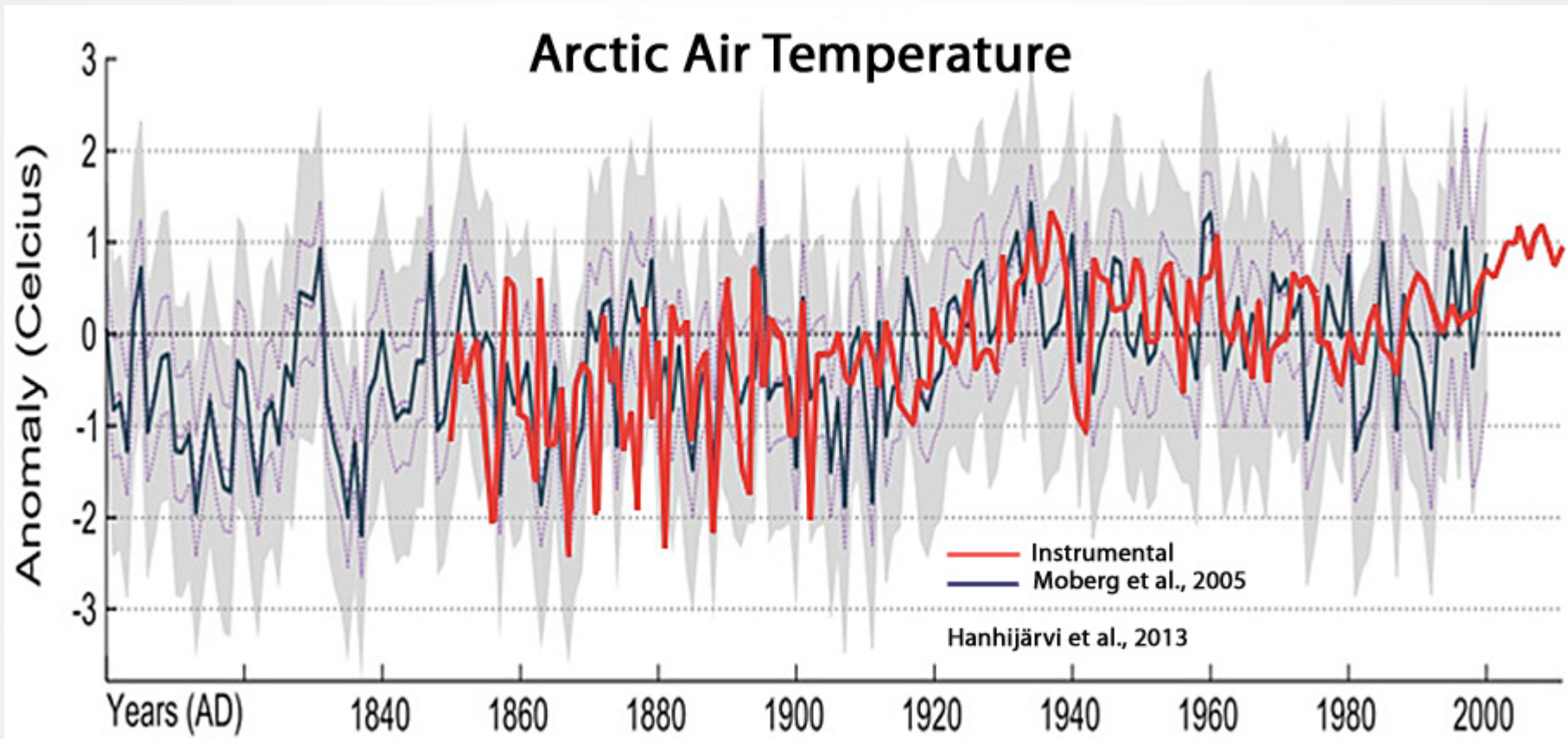
Hitastigssveiflur á Norðurhveli

Síðustu 2000 árin, hlýjast um 1130



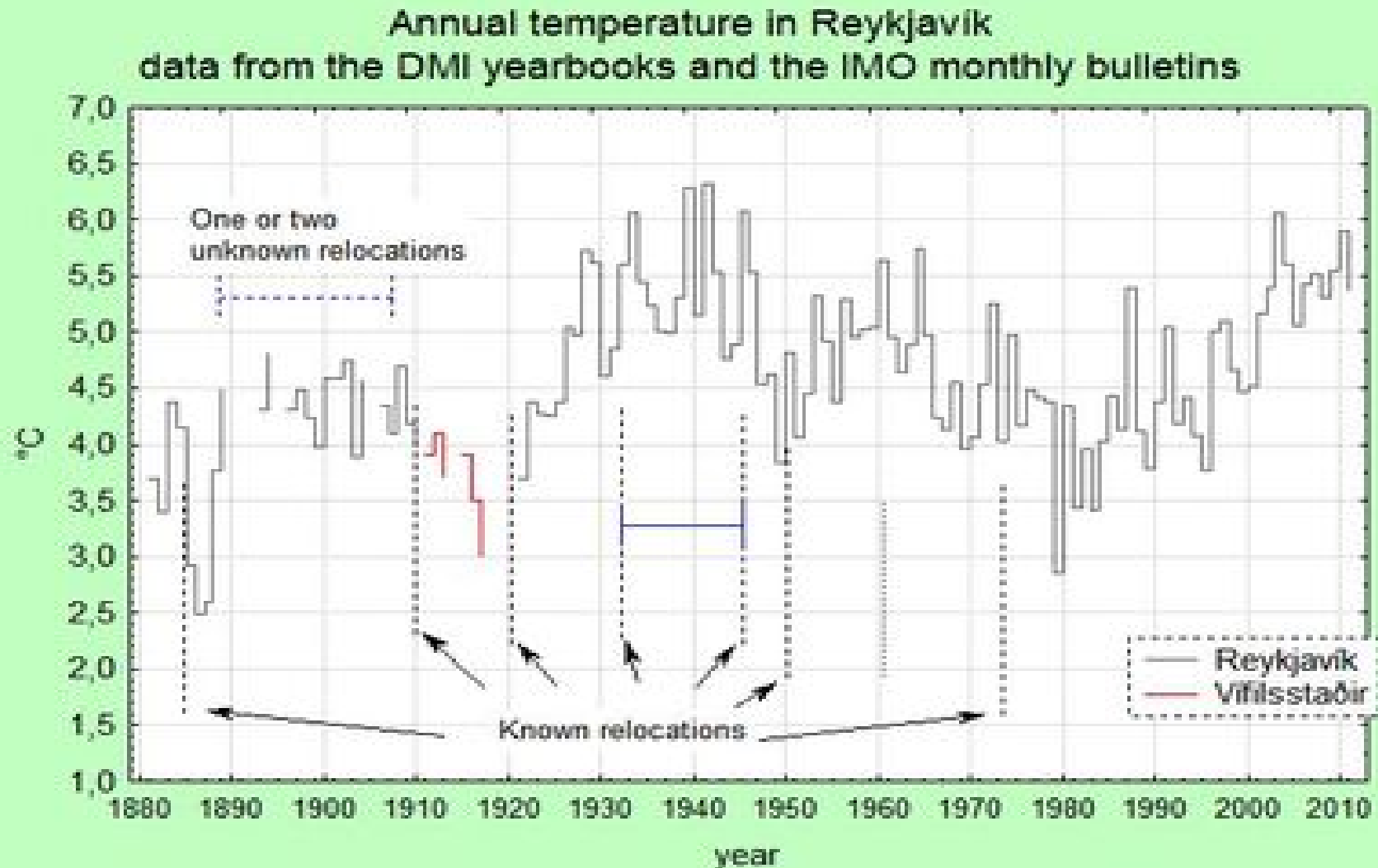
Hitastigsfrávik á Norðurskautssvæði

Frá 1800, hlýjast um 1940

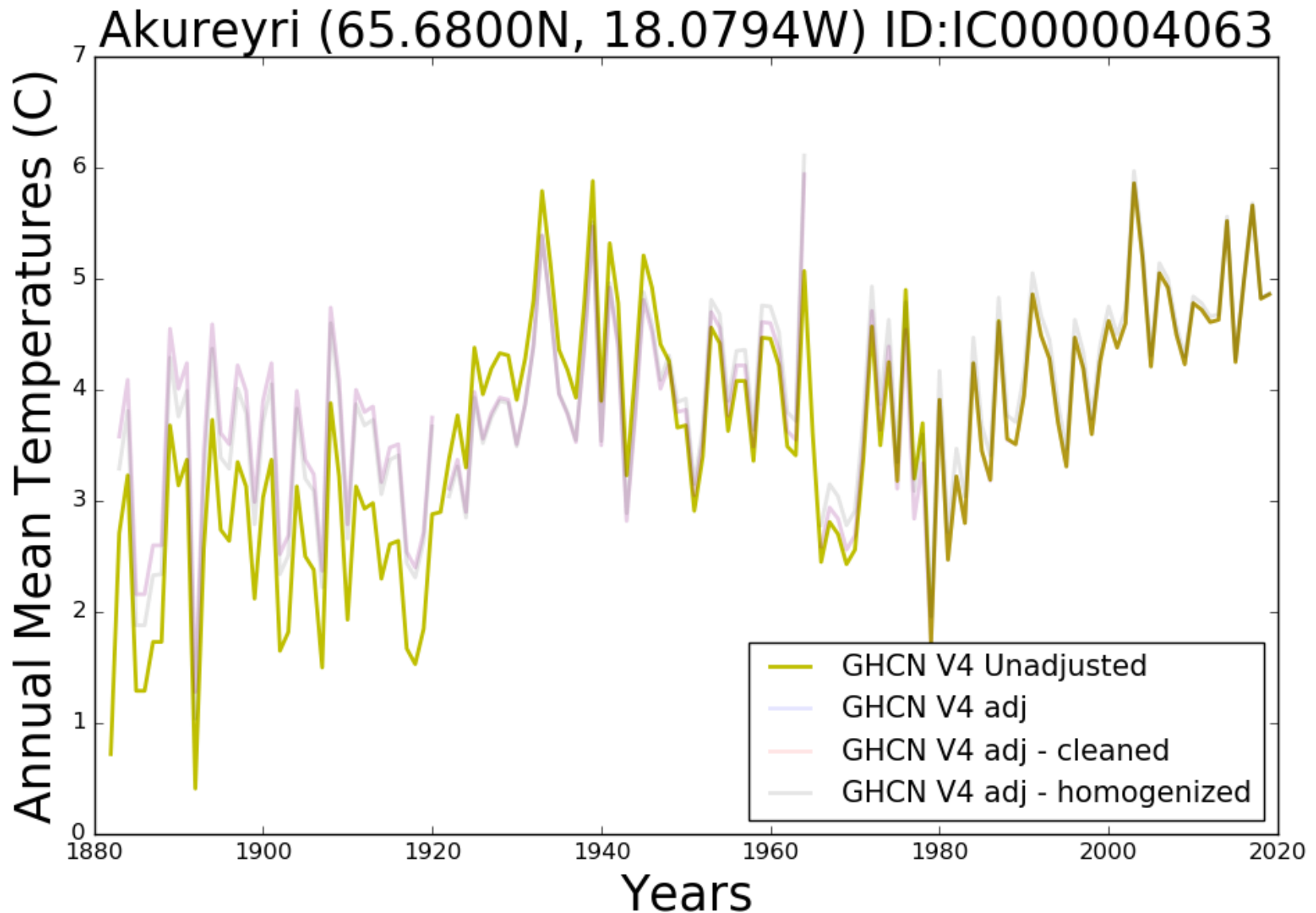


Ársmeðalhitastig, Reykjavík, 1881-2011.

Hungurdiskar (Iceland Weather blog) Trausti Jónsson, 21.3.2012.

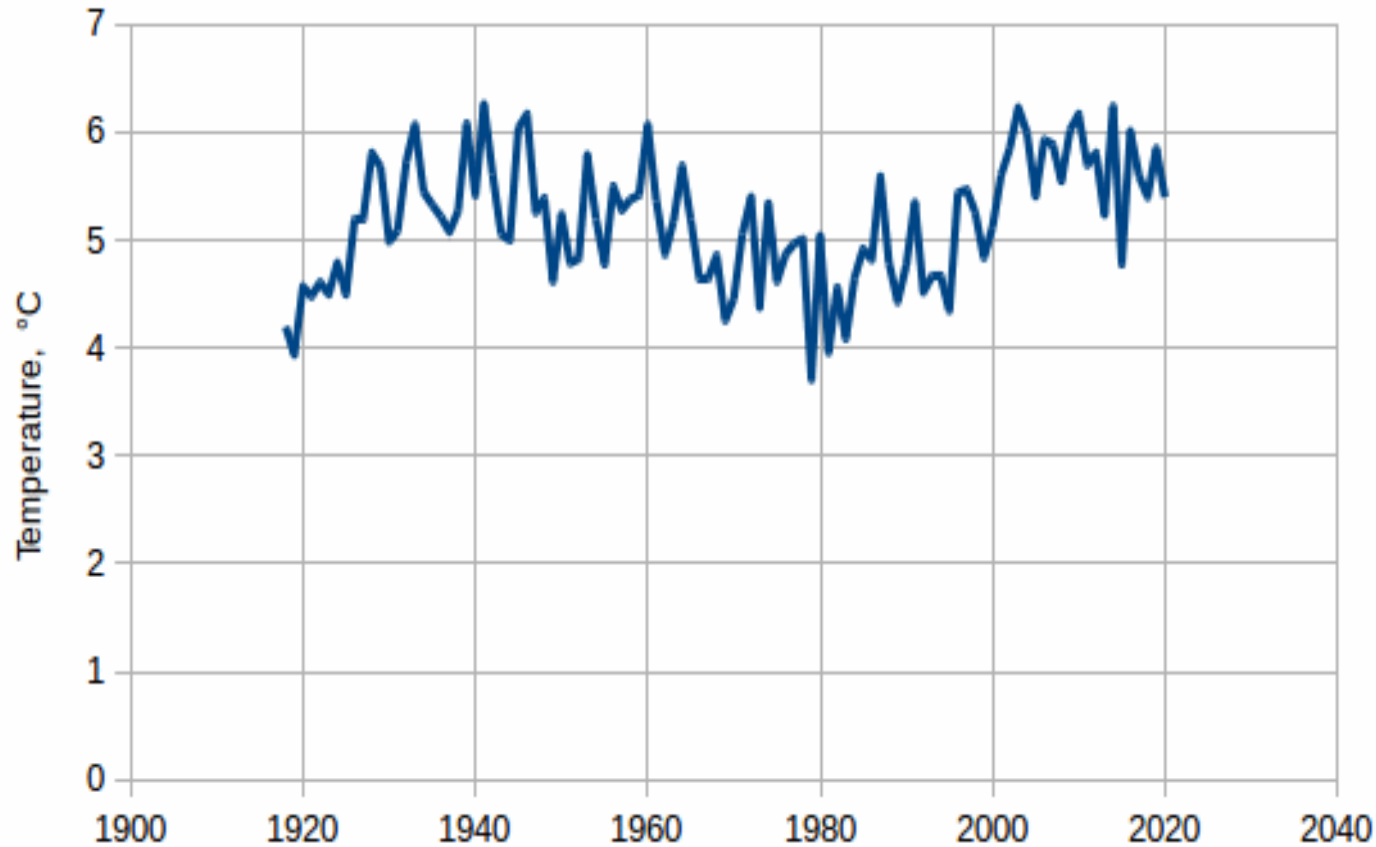


Hitastig Akureyri (NASA Giss)



Ársmeðalhiti á Stórhöfða 1918-2020

Hitatölur frá Veðurstofu Íslands. Hlýjast 1941=6,26 Kaldast 1979=3,71 C°
(Frjálst land)

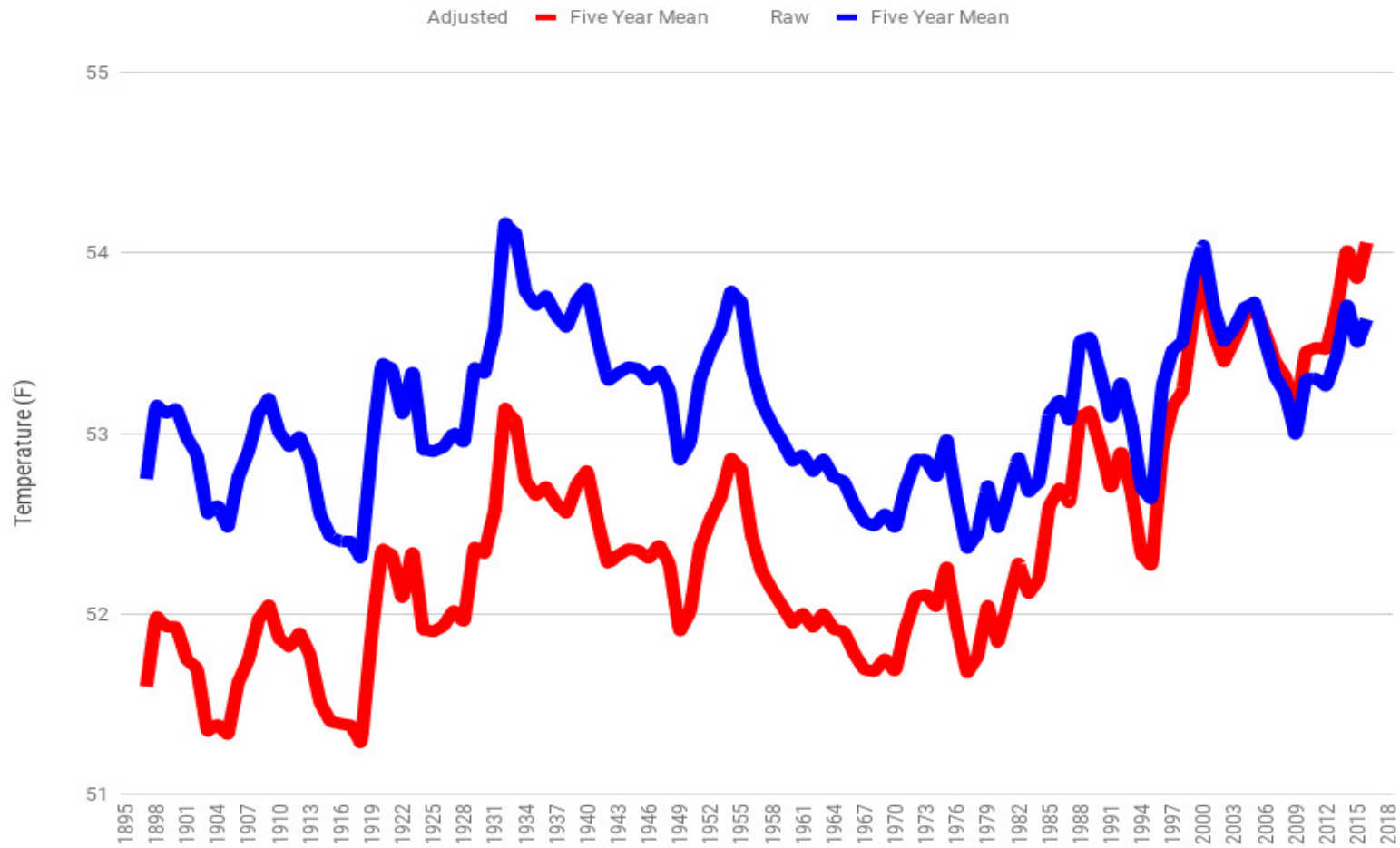


Annual mean temperature 1918-2020, Storhofdi, Vestmannaeyjar

Ársmeðalhitastig, Bandaríkin

Blátt: Bein óbreytt mæligildi. Rautt: Breytt, „aðlöguð“ mæligildi

Average Monthly Temperature At All US Historical Climatology Network Stations



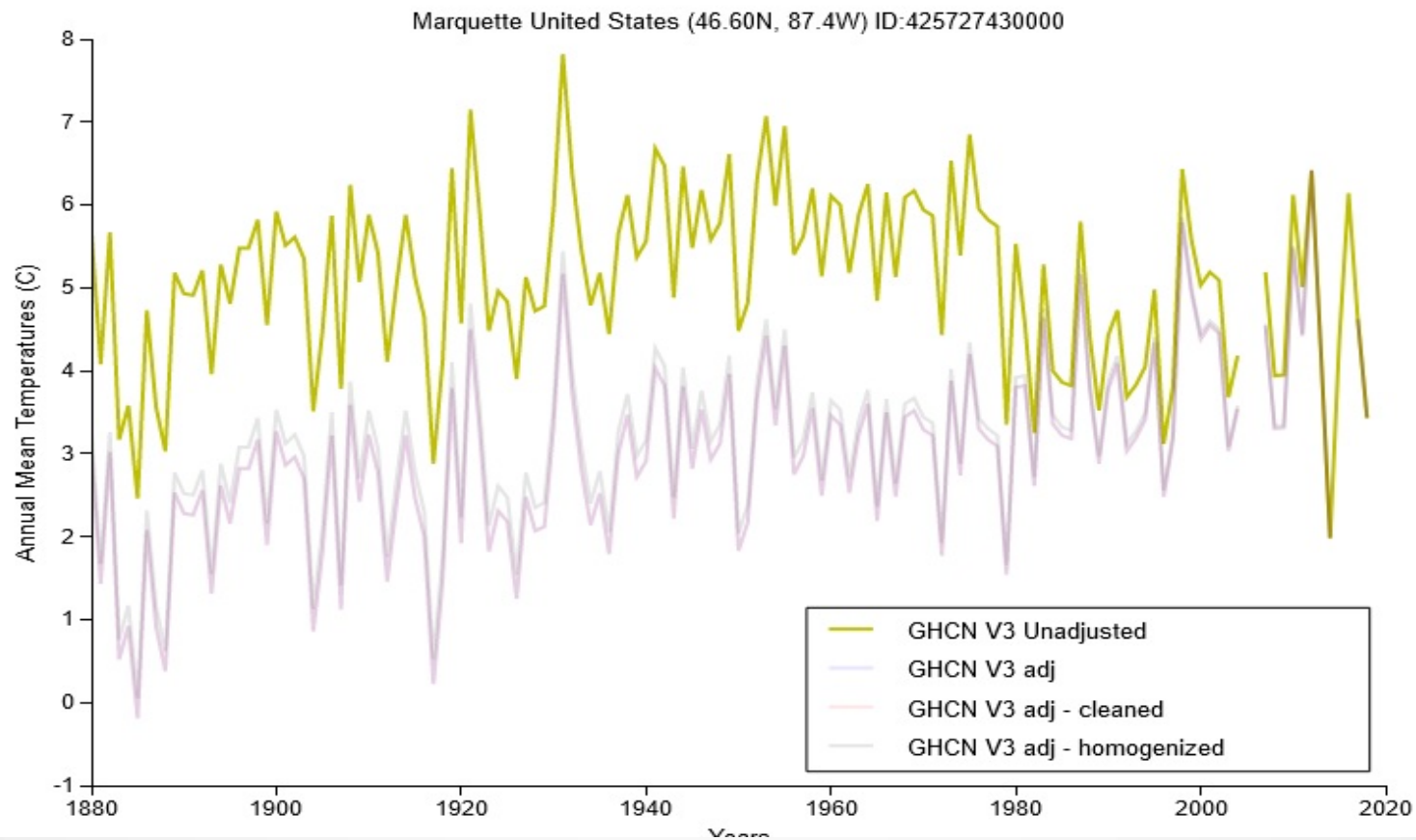
Meðalárshiti, Marquette, Bandaríkin

Gulgræni ferillinn er aflesnar óaðlagðar hitamælingar

GISS Surface Temperature Analysis (v3)

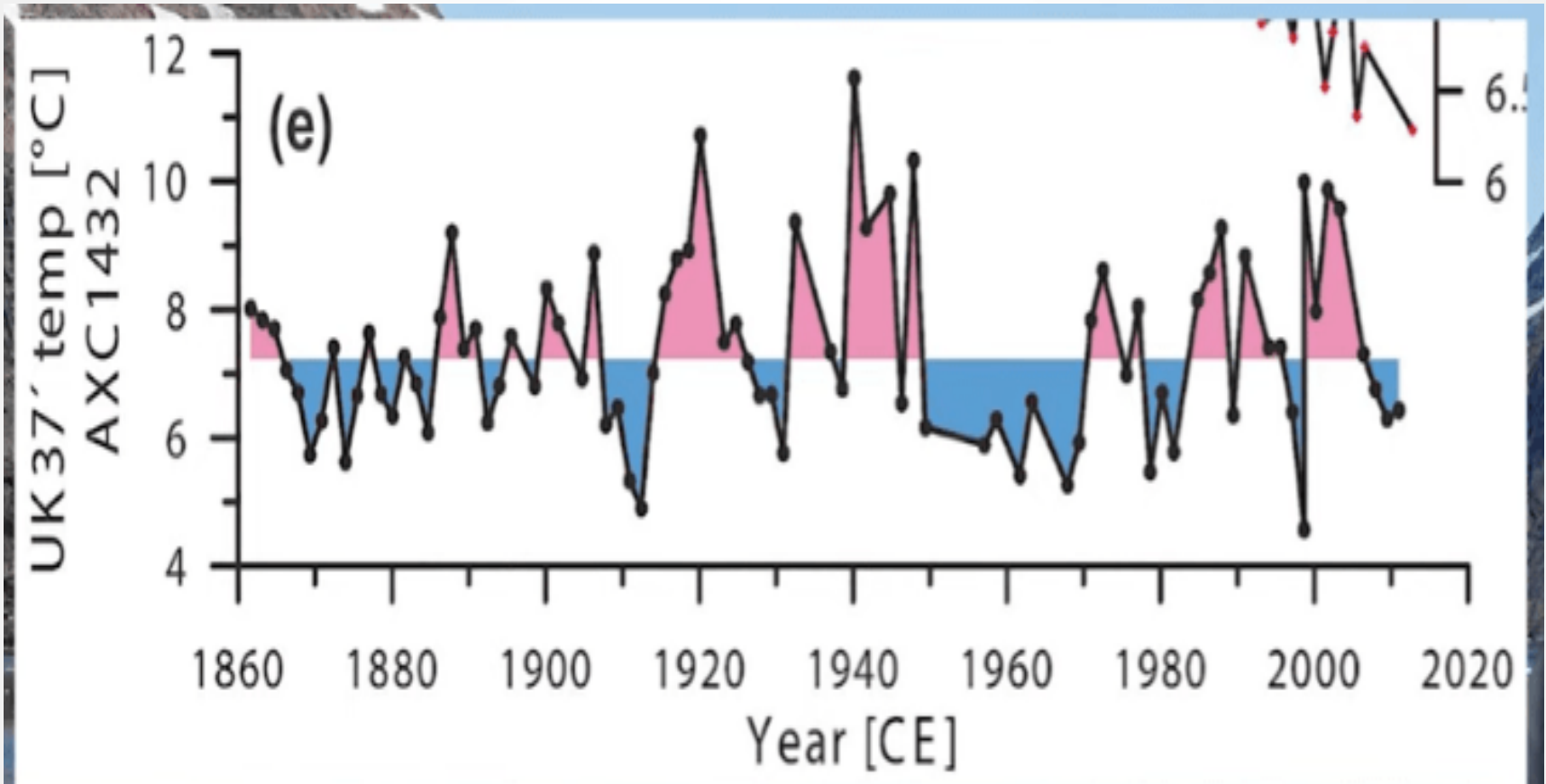
Station Data: Marquette United States (46.60N, 87.4W)

Notice: This page contains GISTEMP v3 data.
As of June 2019, the current GISTEMP version is v4 and may be accessed at data.giss.nasa.gov/gistemp.



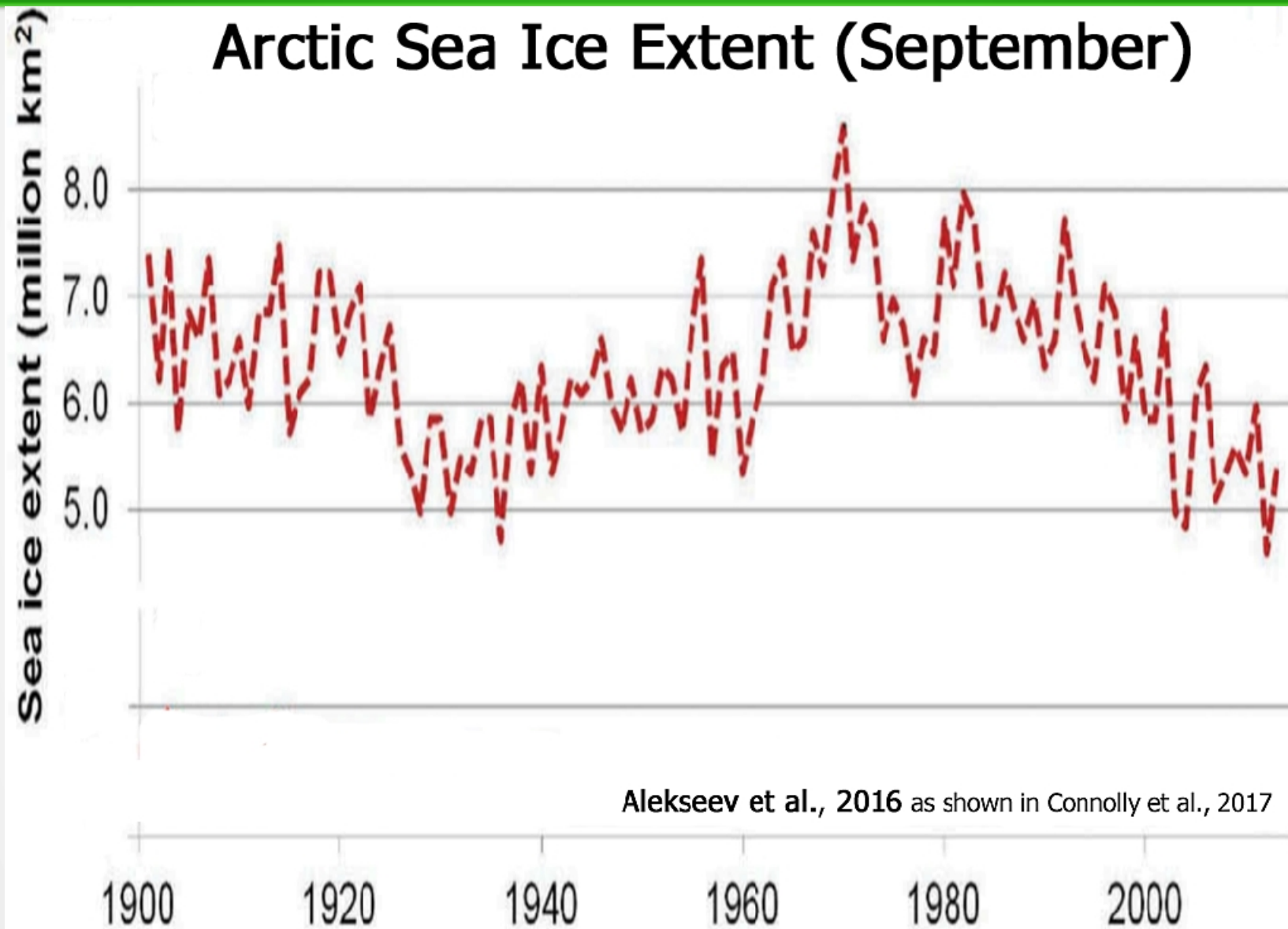
Yfirborðshiti sjávar, Austur Grænland

<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019PA003692>



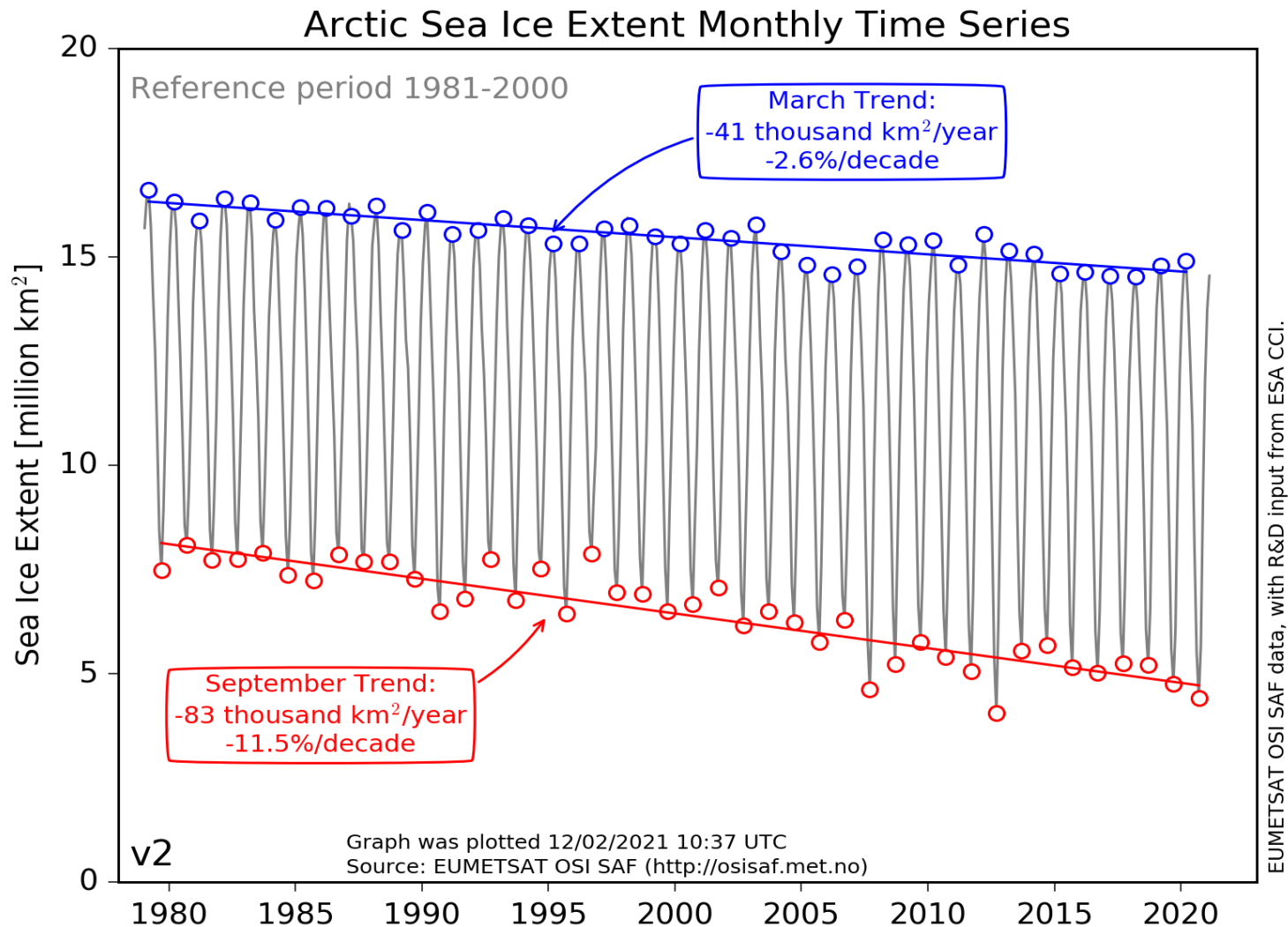
Wangner et al. 2020

Norðurskautsís, útbreiðsla 1900 -2016



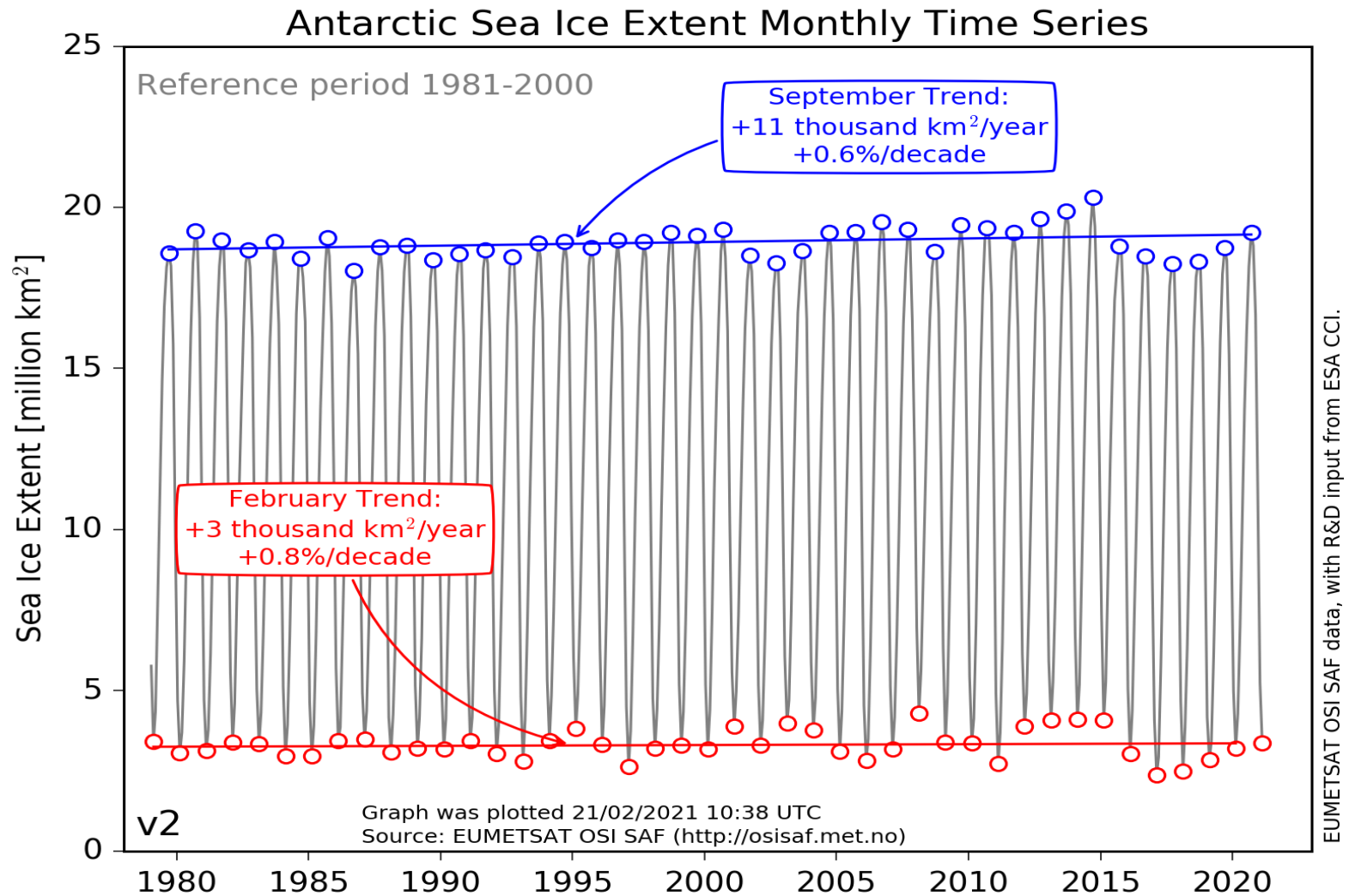
Hafís, Norðuríshaf, 1981-2021.

Minnstur 2006 (vor) og 2012 (haust)



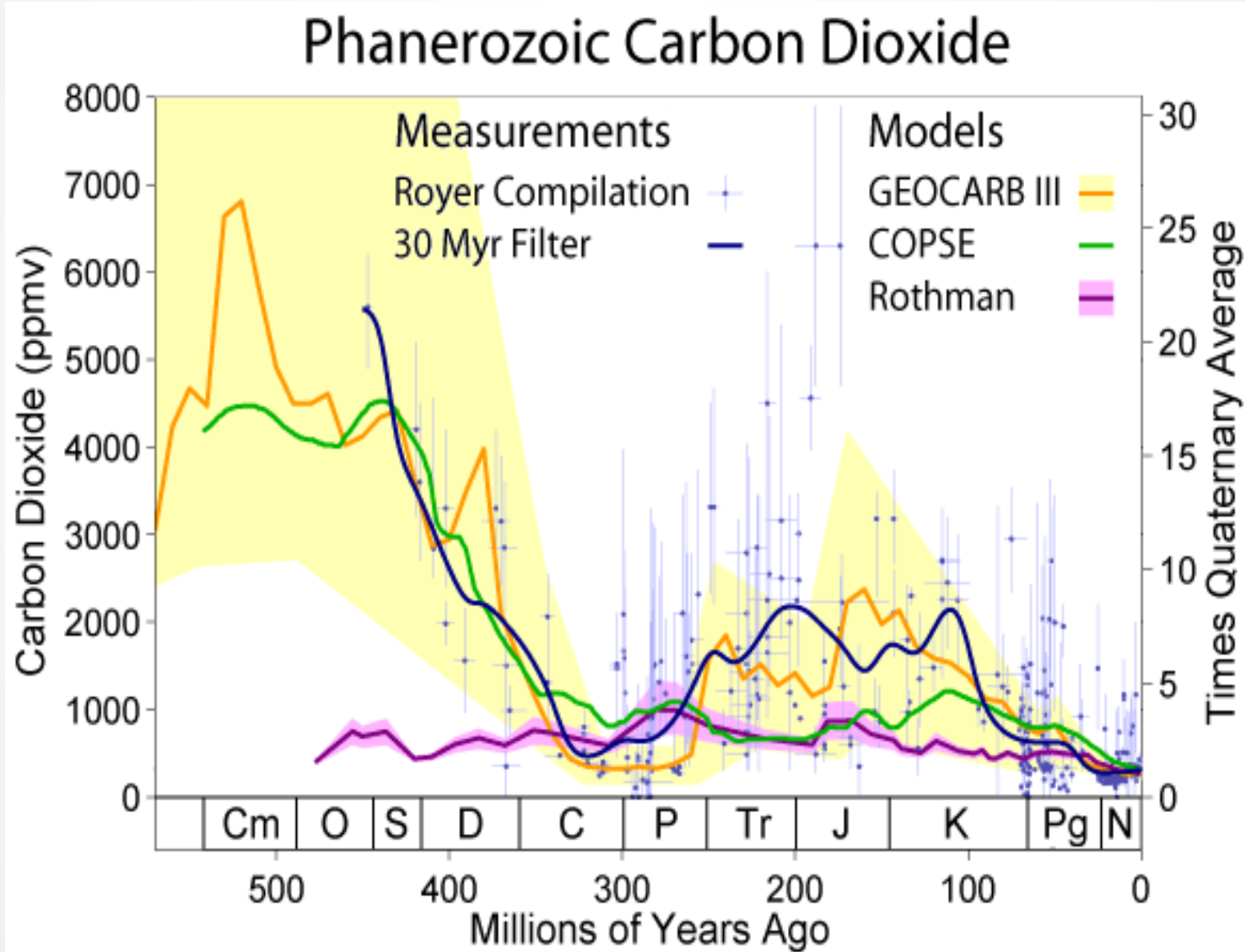
Hafís, Suðuríshaf, 1981-2021.

Vaxandi 1981-2021



Styrkur koltvísýrings í lofthjúpunum

í milljónustu hlutum rúmmáls GEOCARB III (Berner and Kothavala 2001)



Hitabreytingar hafa verið óháðar breytingum á styrk CO₂ í 570 milljón ár (Patrick Moore)

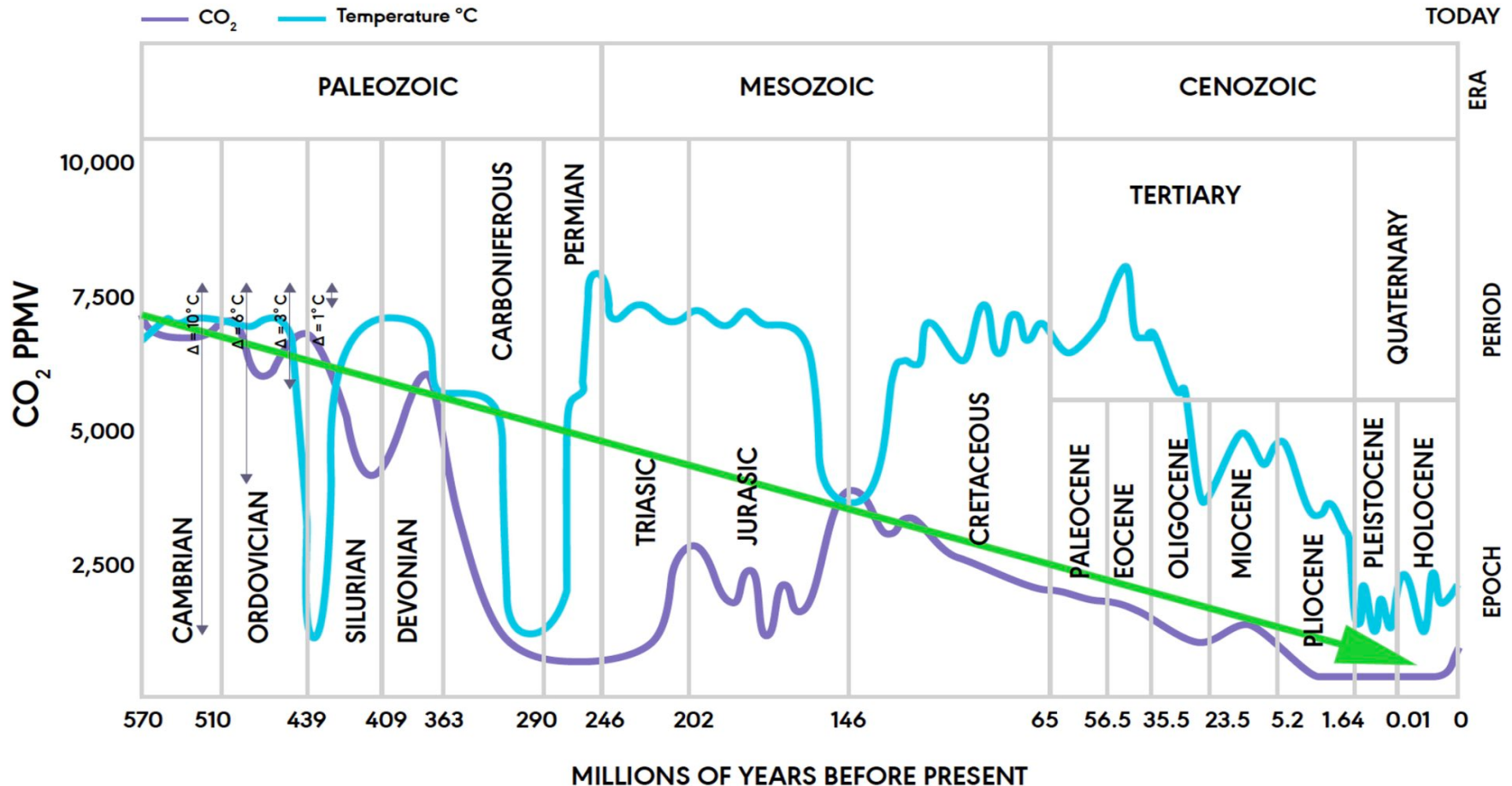
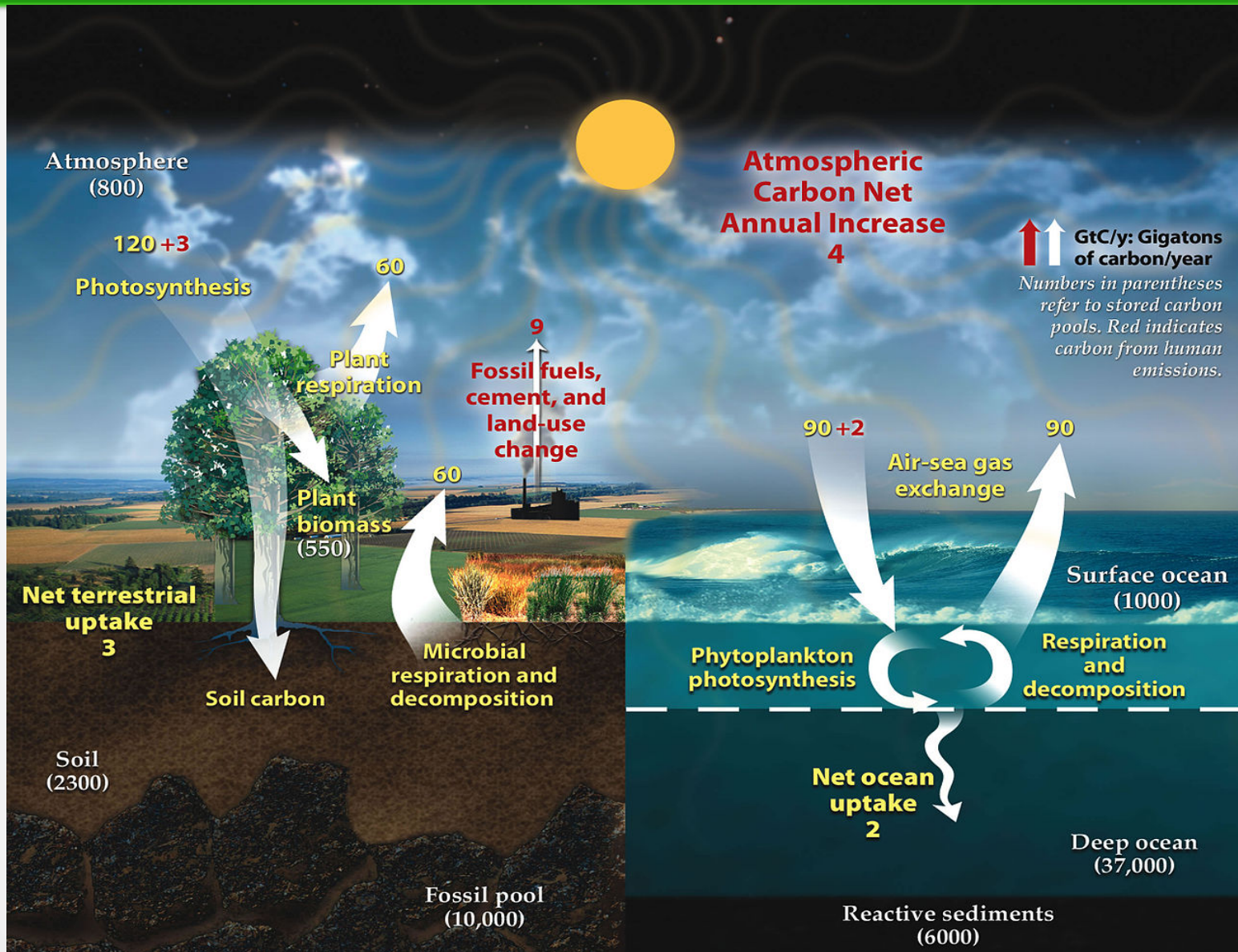


Figure 2. The graph of CO₂ and temperature shown in Figure 1 with the trend in CO₂ concentration in the global atmosphere represented by the green arrow. Note the uptick at the far right of the graph representing the reversal of the 600 million-year downward trend due primarily to emissions of CO₂ from the use of fossil fuels for energy. Note that even today, at 400 ppm, CO₂ is still far lower than it has been during the most of this 600 million history.

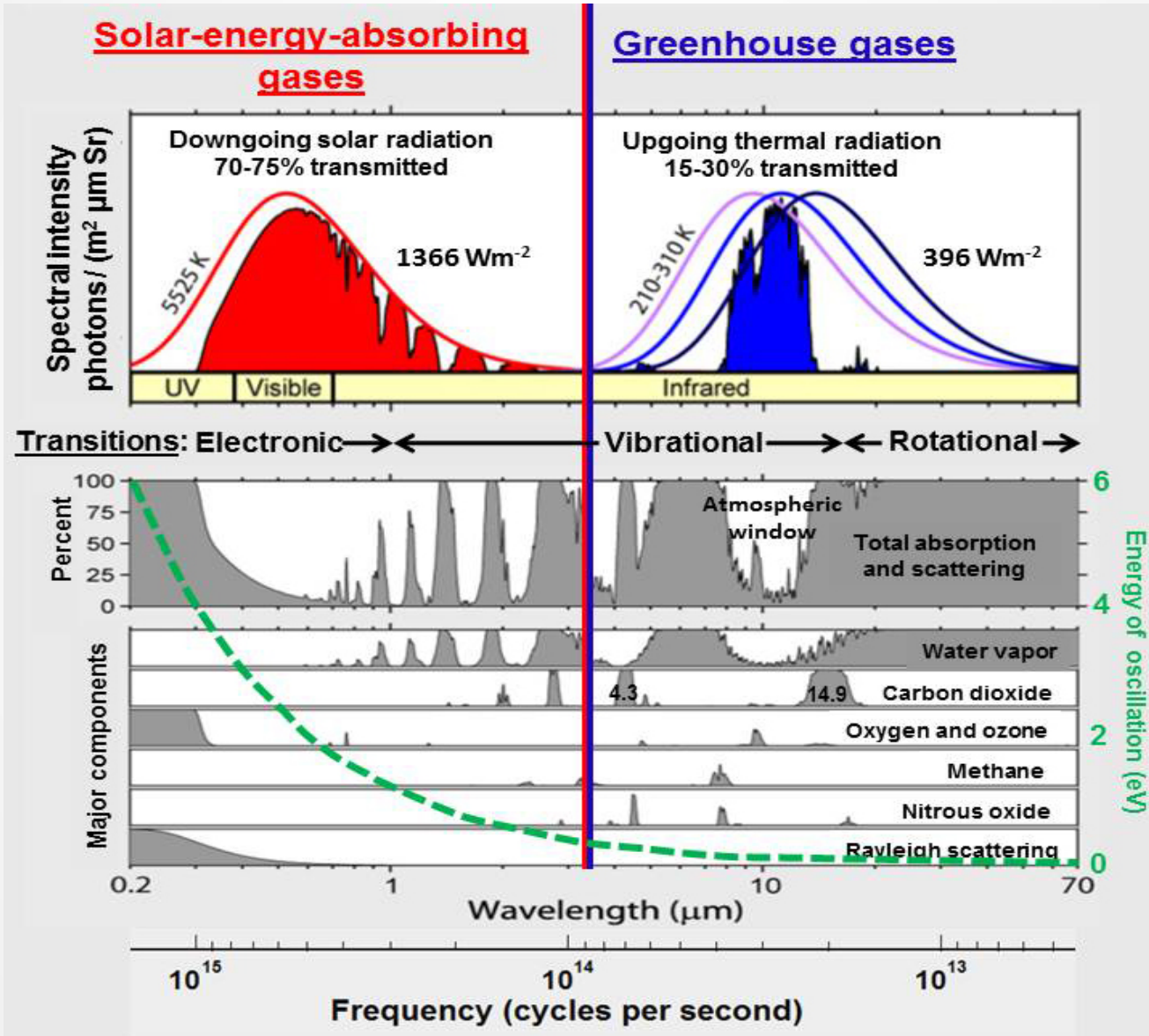
Kolefnishringrás Jarðaryfirborðs



Uptaka andrúmslofts á innrauðri geislun frá jarðaryfirborði

Absorbtion of infrared radiation by atmosphere („greenhouse effect“).

ResearchGate (Rohde)



Loftslagsbreytingar

Hitabreytingar

- Hæsti hiti frá lokum síðustu ísaldar var fyrir 8 þúsund árum
- Hæsti hiti frá Landnámi var um 1130, hæsti síðustu 100 árin um 1940, næsthæsti um 2003
- Hlýnun á Íslandi 1918-1941 og 1979-2003
- Kólnun á Íslandi 1960-1979 og 2014-2020
- Hæsti hiti á Norðurhveli (1920-2020) var um 1940
- Breyting á sjávarborðshreyfingum lítil (1920-2020)
- Hitabeltislægðir ekki marktækt meiri (1920-2020)
- Skógareldar ekki meiri eða algengari (1920-2020)
- Veðuröfgar svipaðar og áður (1920-2020)

Áhrif koltvísýrings á hitafar

- Aukning í magni koltvísýrings í lofthjúpunum hefur hverfandi áhrif á hitastig á Jörðinni
- Lofthjúpurinn tekur nú þegar upp mesta þá hitageislun sem CO₂ getur tekið upp
- CO₂ og hitastig hafa sveiflast óháð hvort öðru í amk. 600 milljón ár
- CO₂ lofthjúpsins óx úr 0,03 í 0,04 % milli 1920 og 2020
- CO₂ lofthjúpsins var um 1 % þegar mest þróun jurtalífs varð
- Jörðin grænkar, gróðurvöxtur eykst með hærri CO₂ styrk
- Hrjóstrug og köld svæði gróa upp með hærri CO₂ styrk
- Sjávarsúrnum hverfandi, sjórinn er basískur og getur ekki orðið súr