

Growth Constant Fingerprints of Economically Driven Climate Change

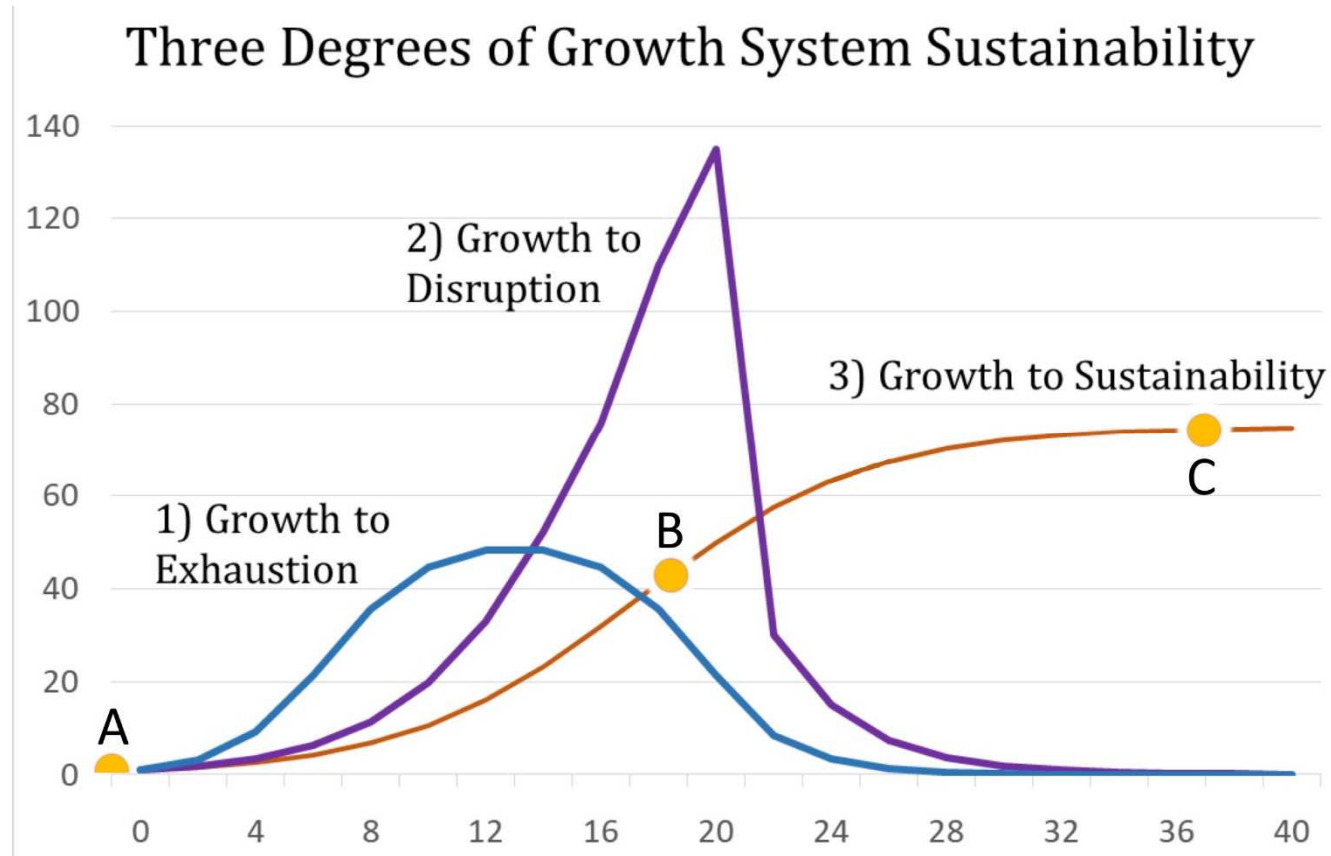
From its origin in 1780 to its major post WWII acceleration

Paper and Supplemental Material Figures.

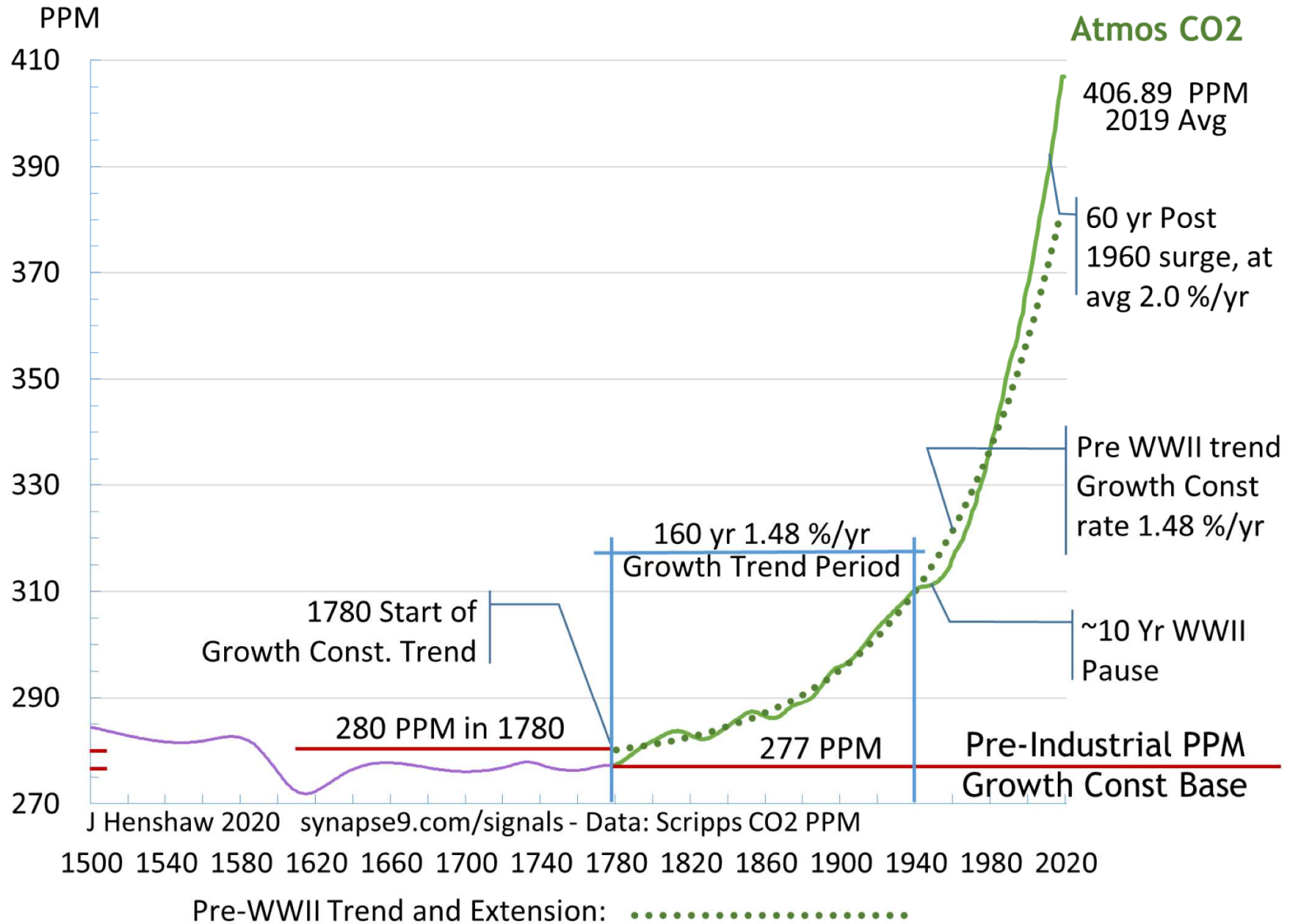
Key Words: natural systems physics, climate, human fingerprints, economic drivers, self-organization, growth constant states, coupling CO₂ & warming

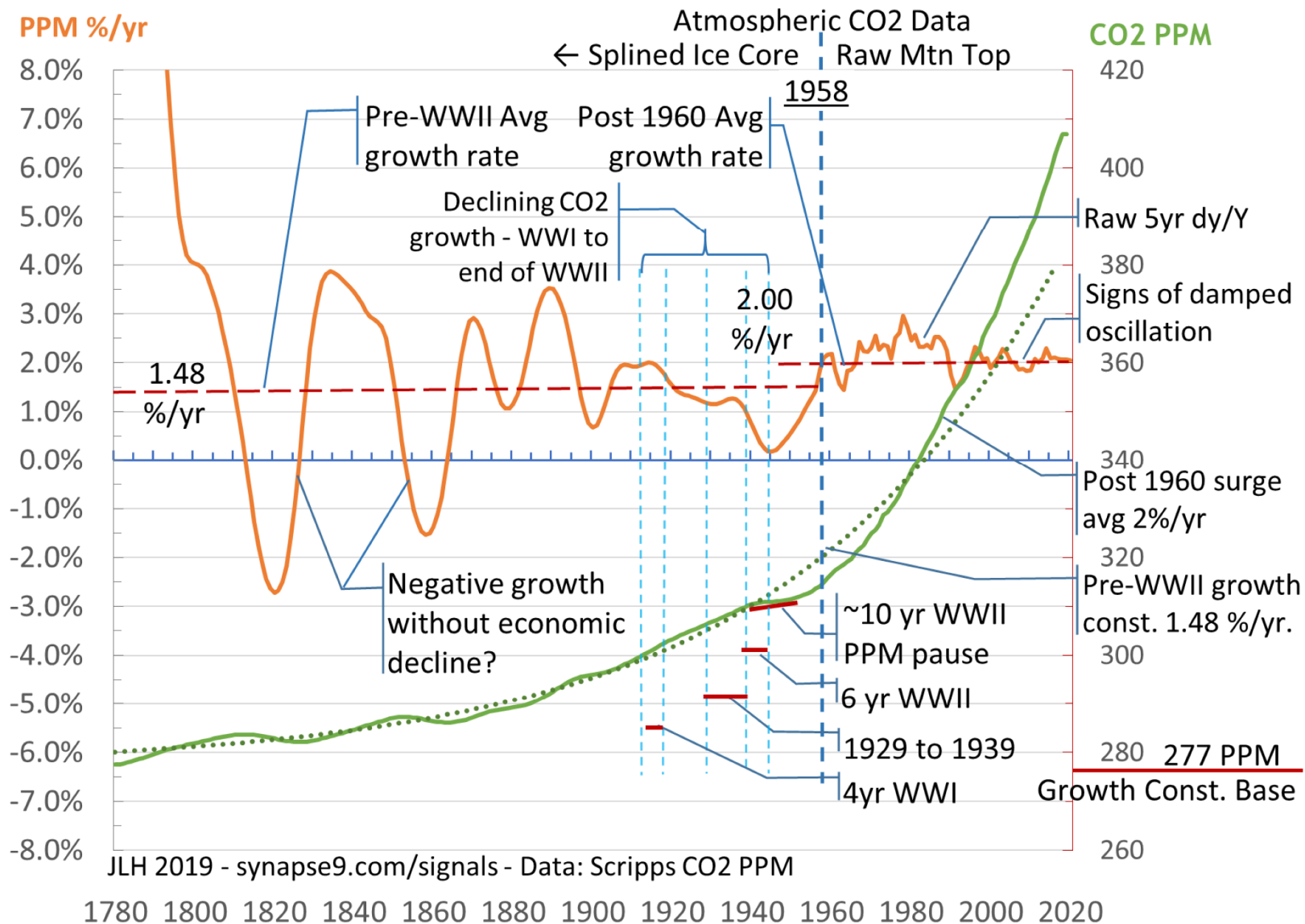


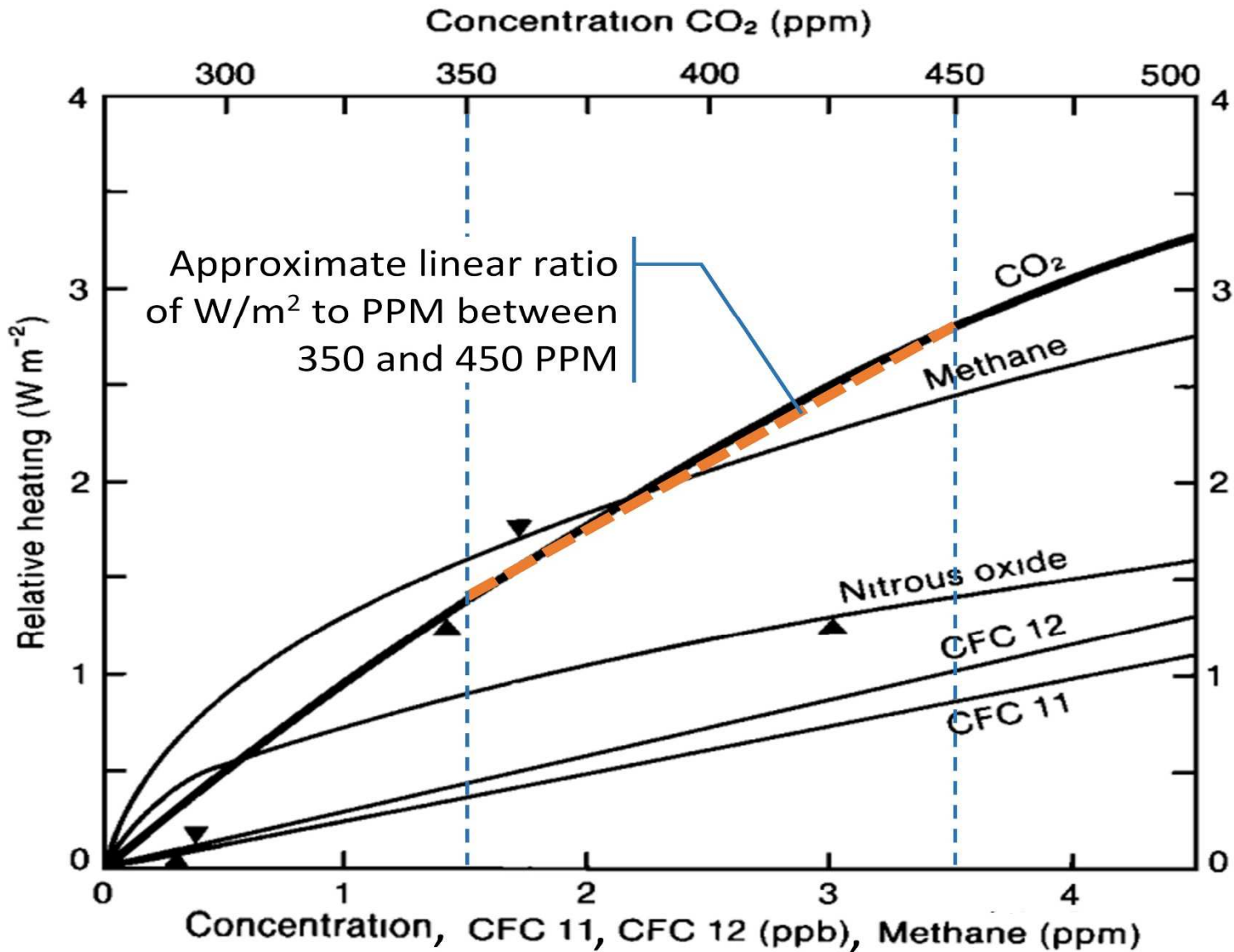
- Imagine the world economy as a kind of global storm, with many centers, organized as a whole to take advantage of any opportunity to grow.



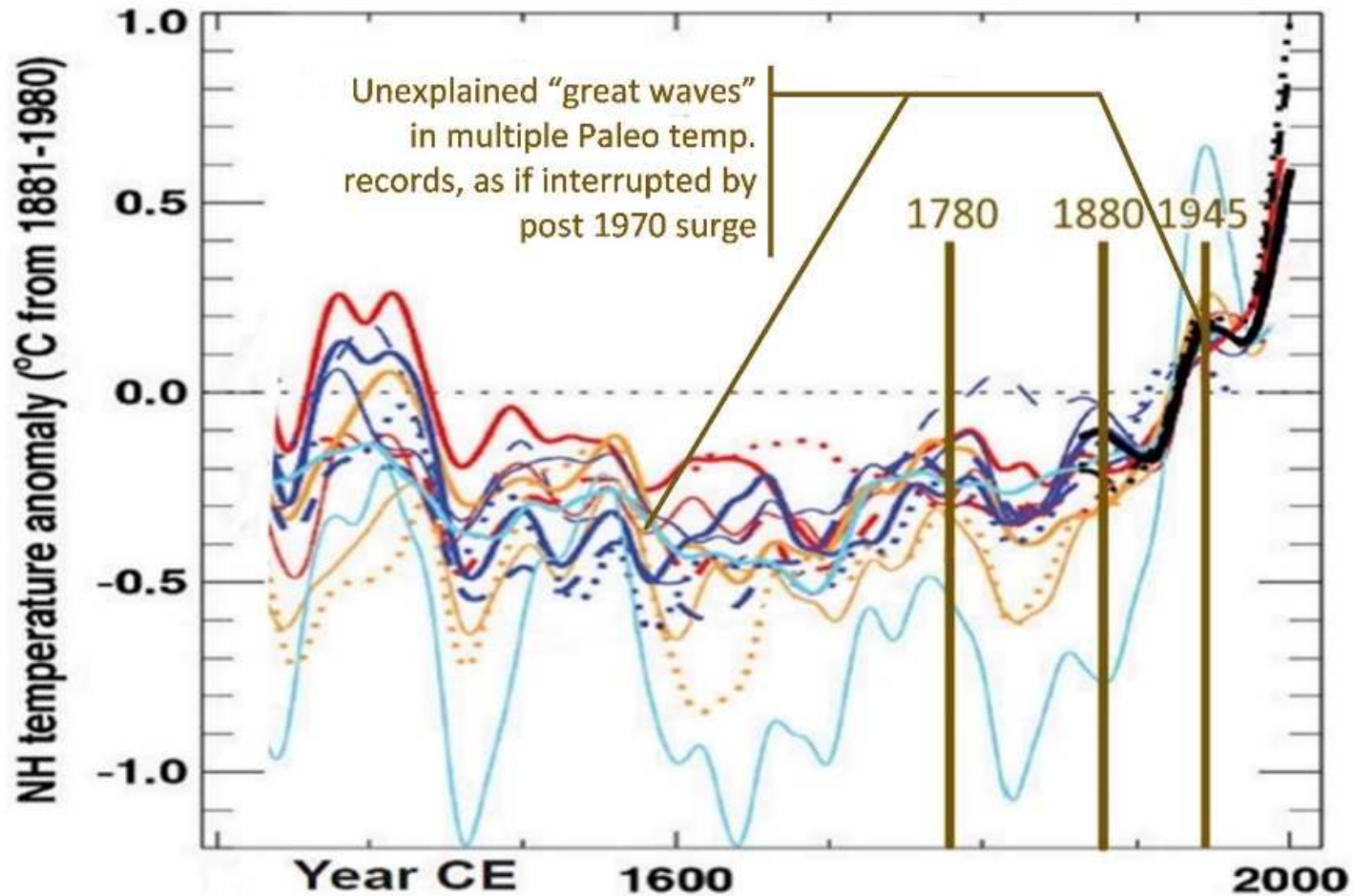
The generic stages of “living-systems” development found in emerging growth systems that lead to exhaustion, disruption, or a sustainable climax.

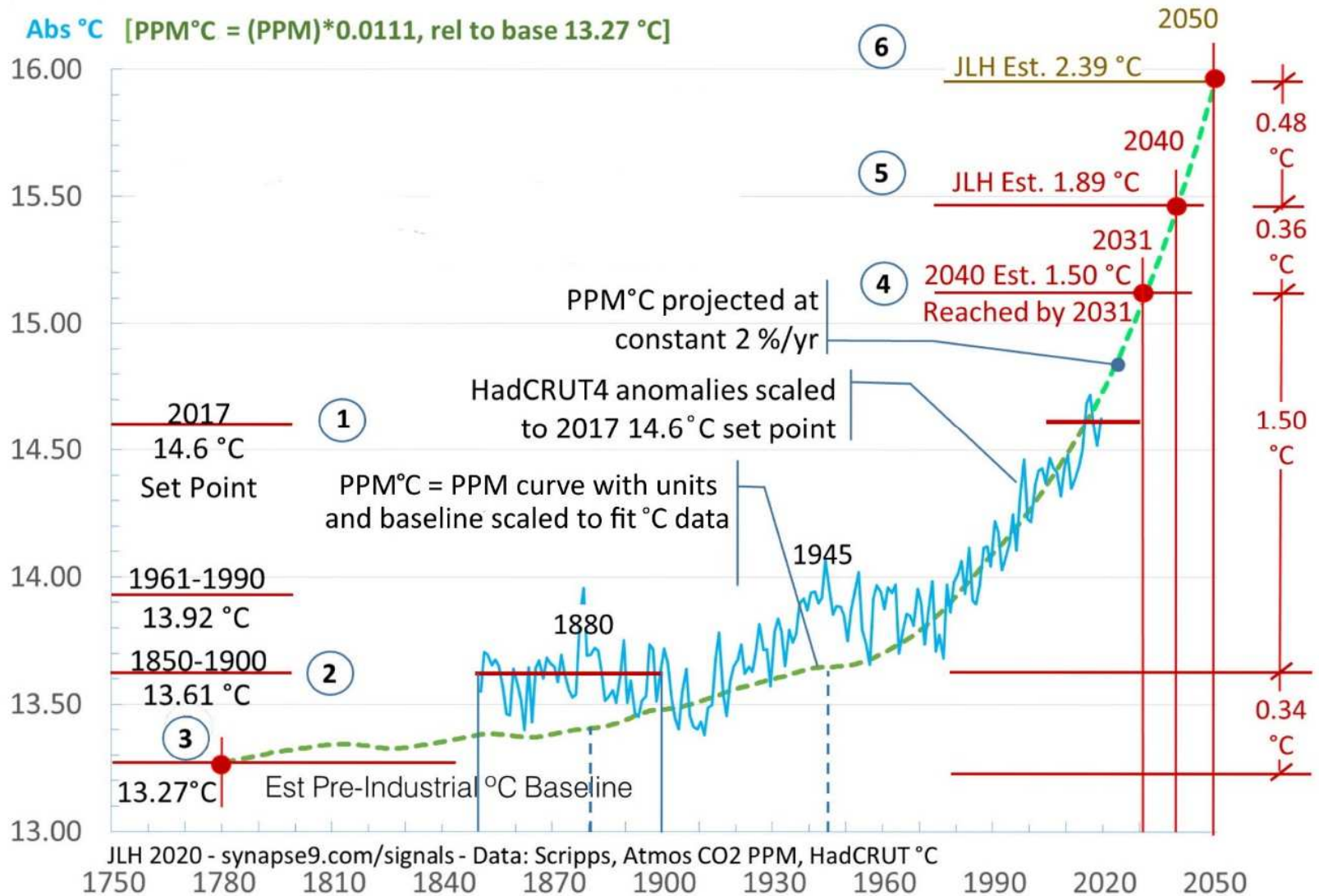






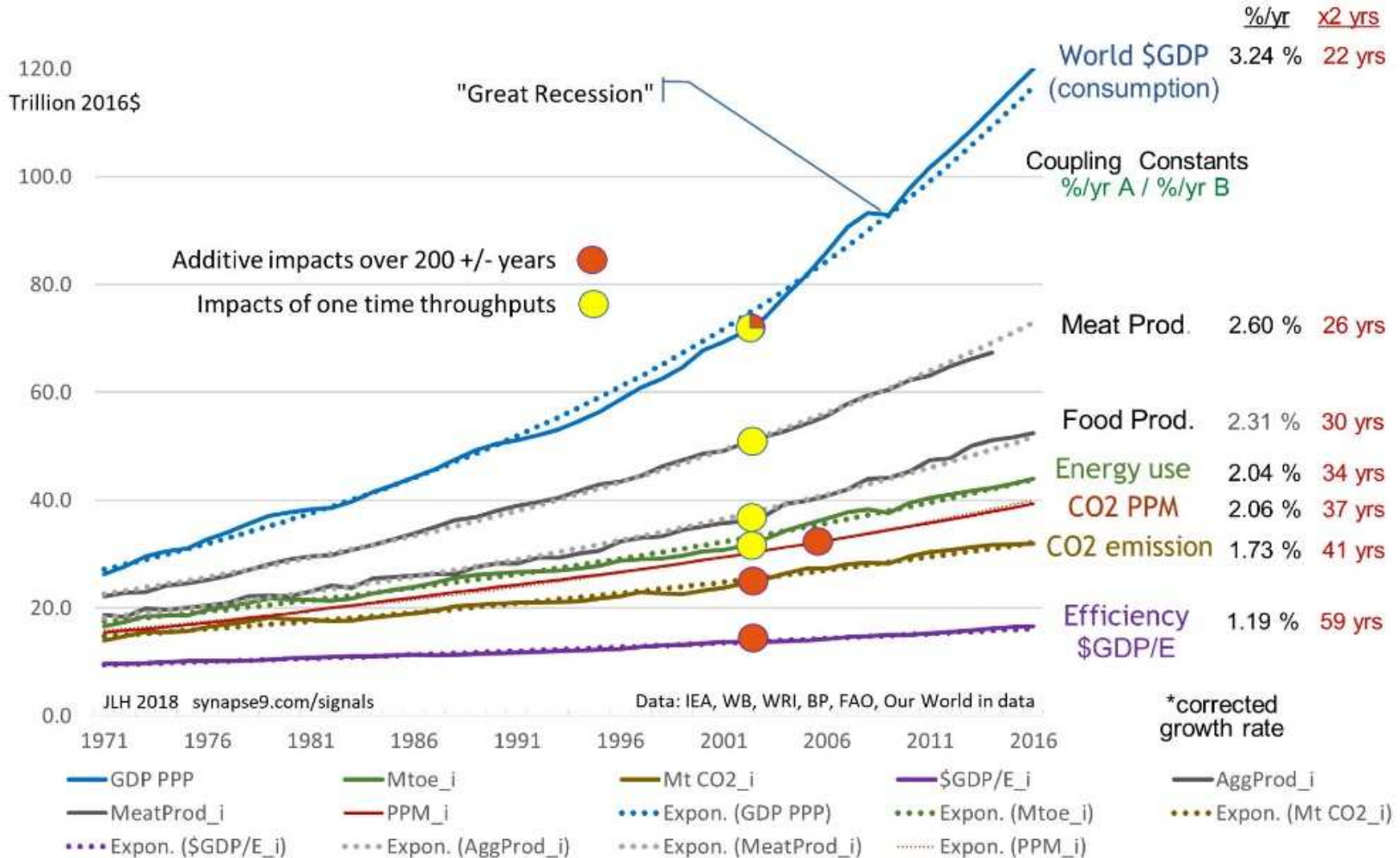
**NOAA Reconstructed Northern Hemisphere Temperatures
(section cut from 2000 yr graph)**



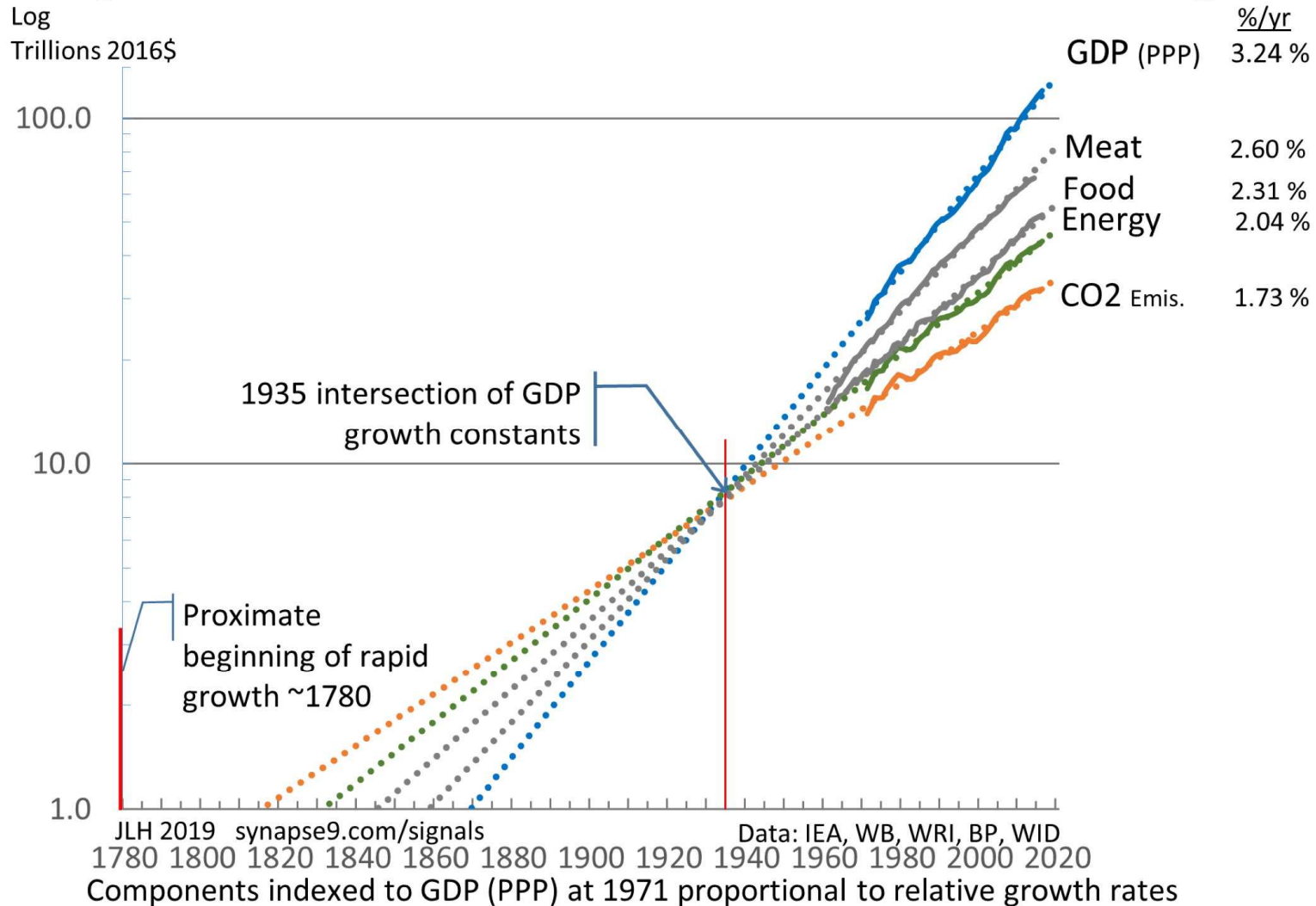


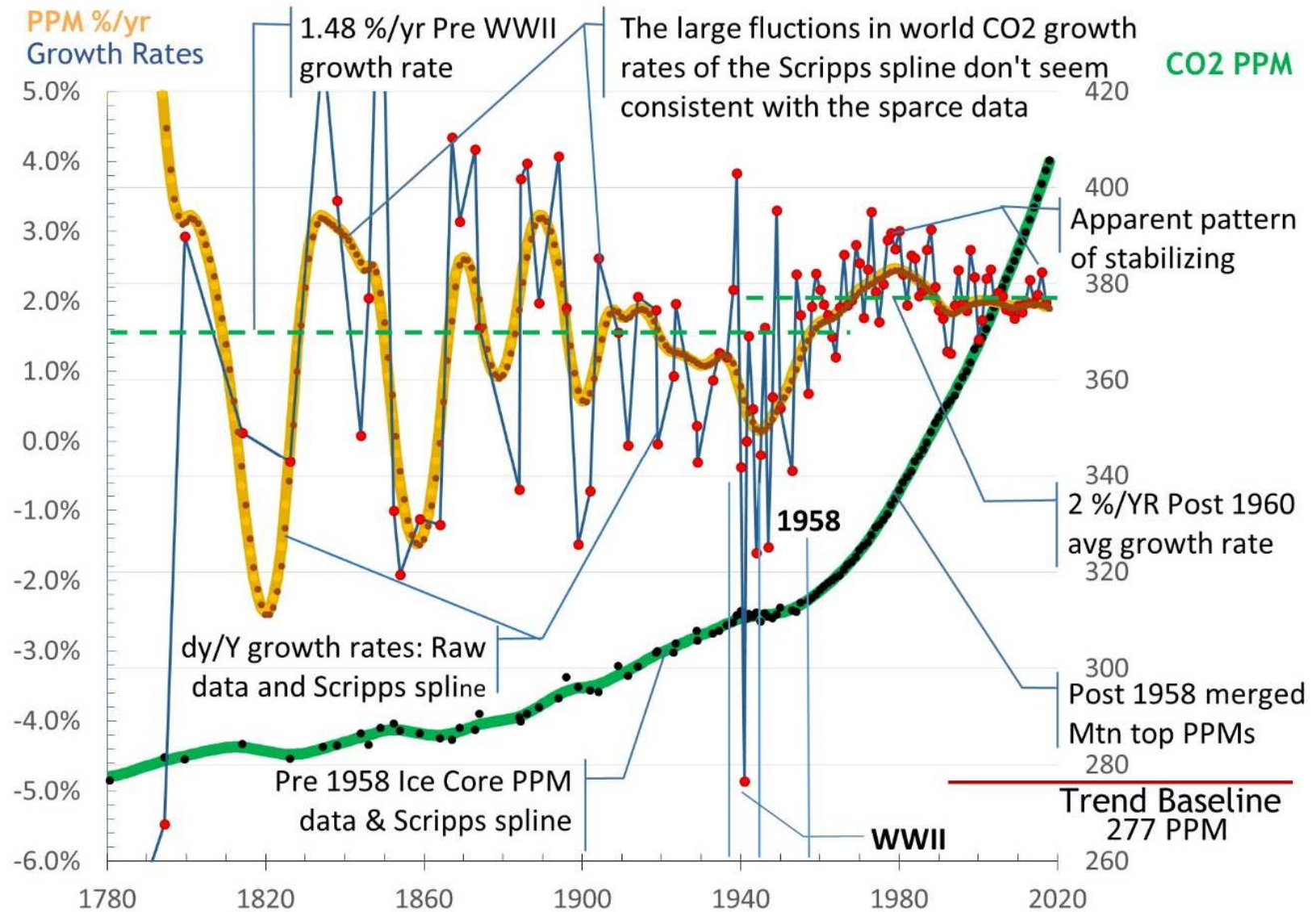
Growth Constants of the World Economy Indexed by Growth Rate

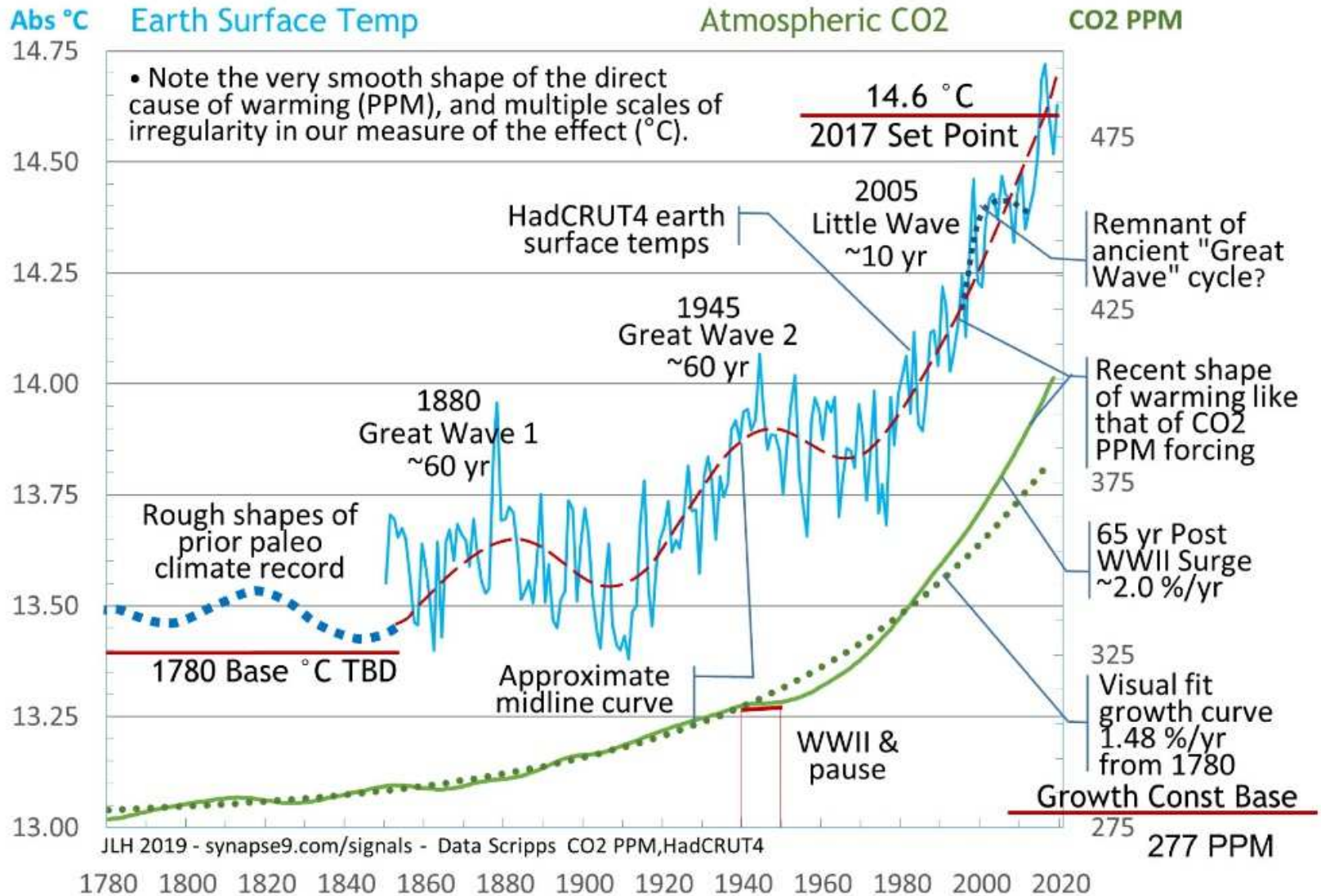
Components indexed to GDP(PPP) at 1971 proportional to relative growth rates

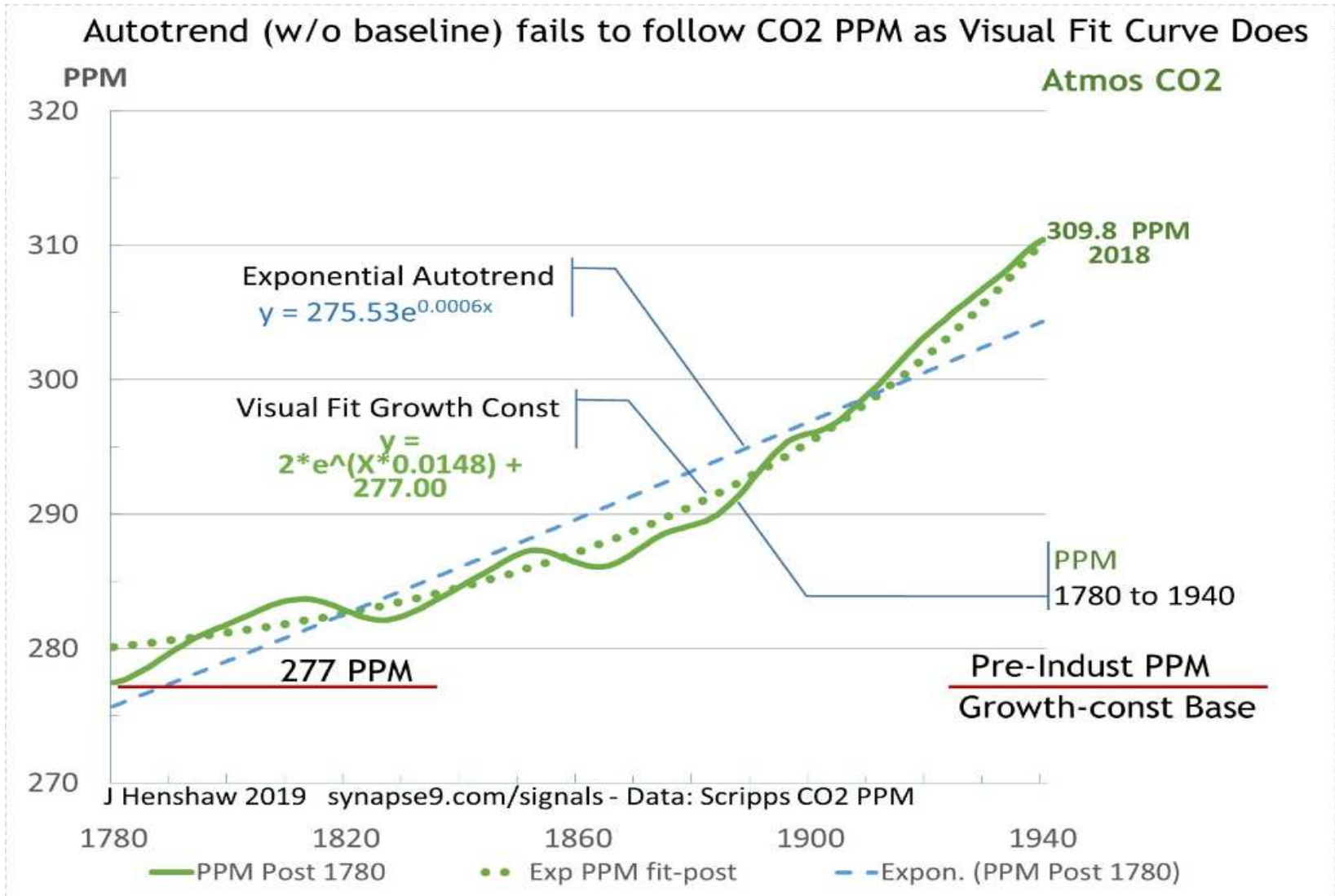


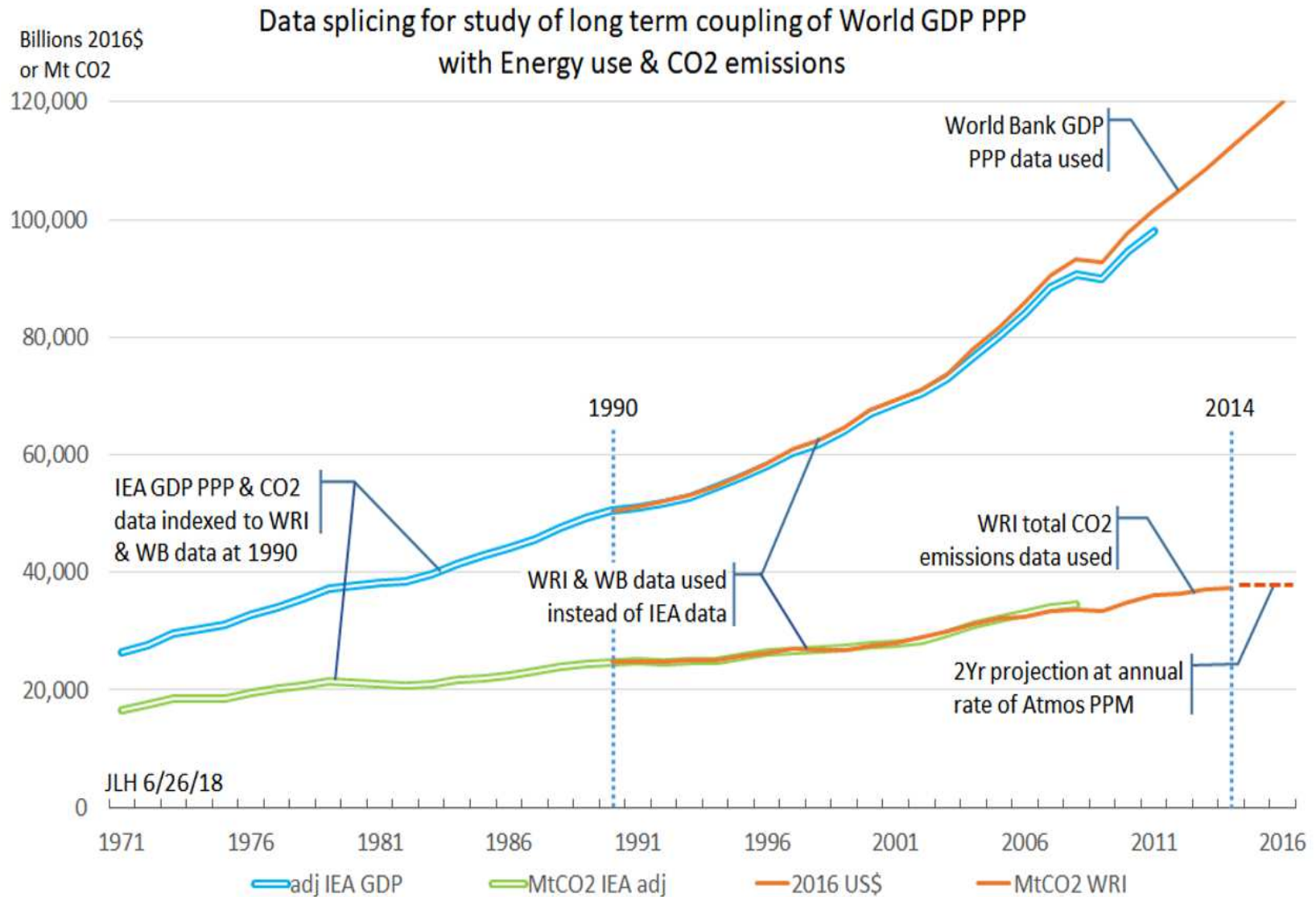
Log Plot: World Growth Constants Backcast to Show Virtual Origin

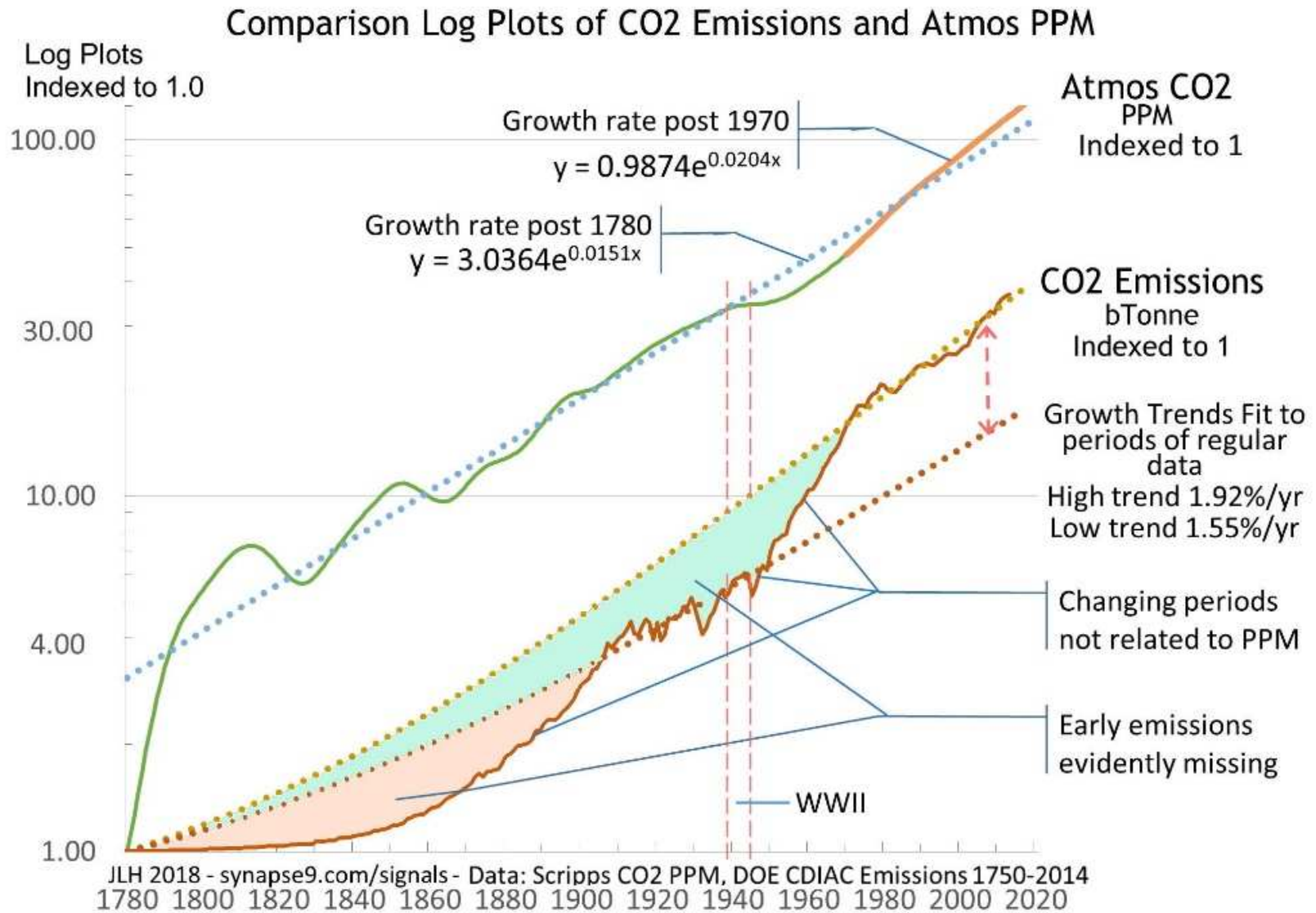






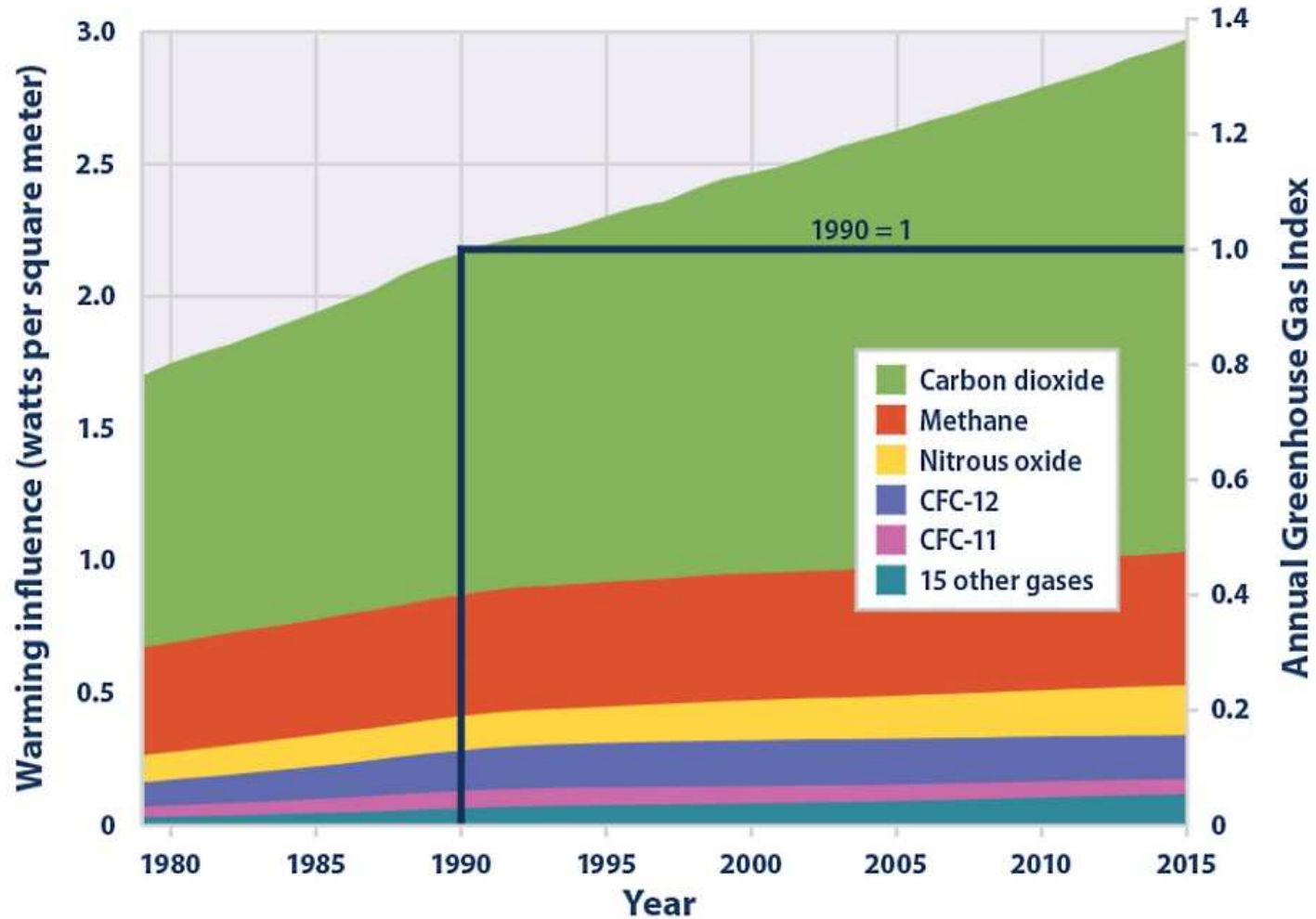


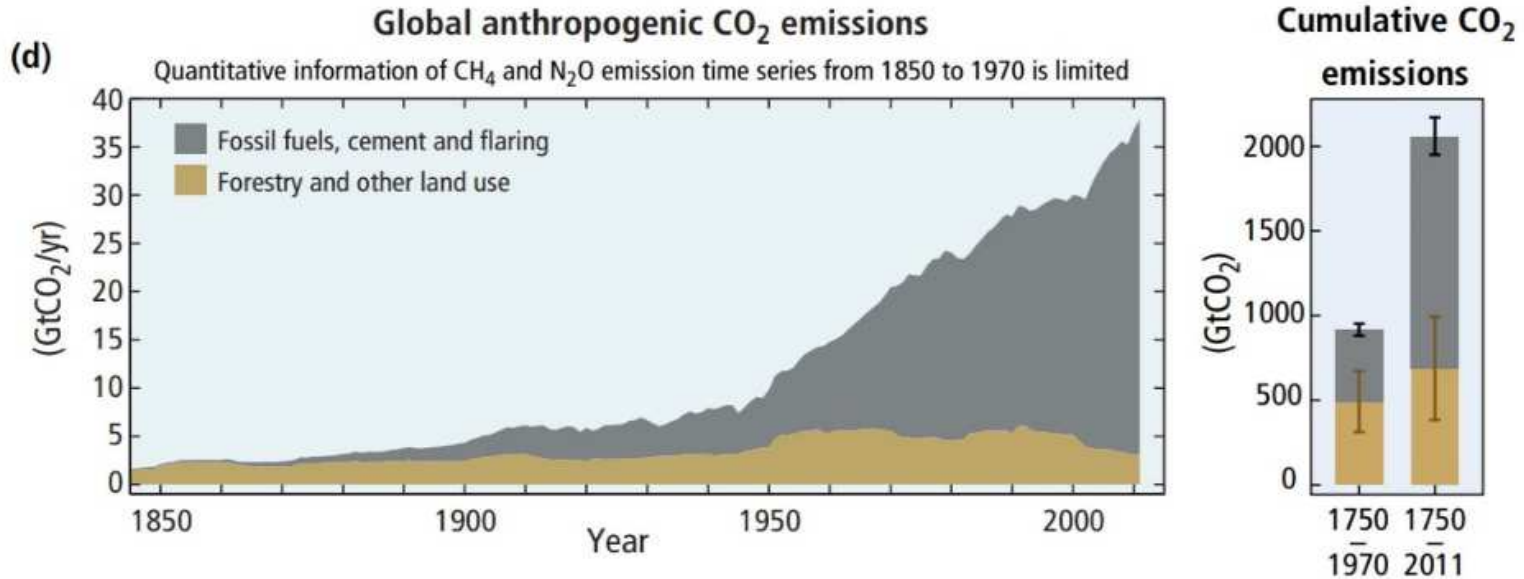


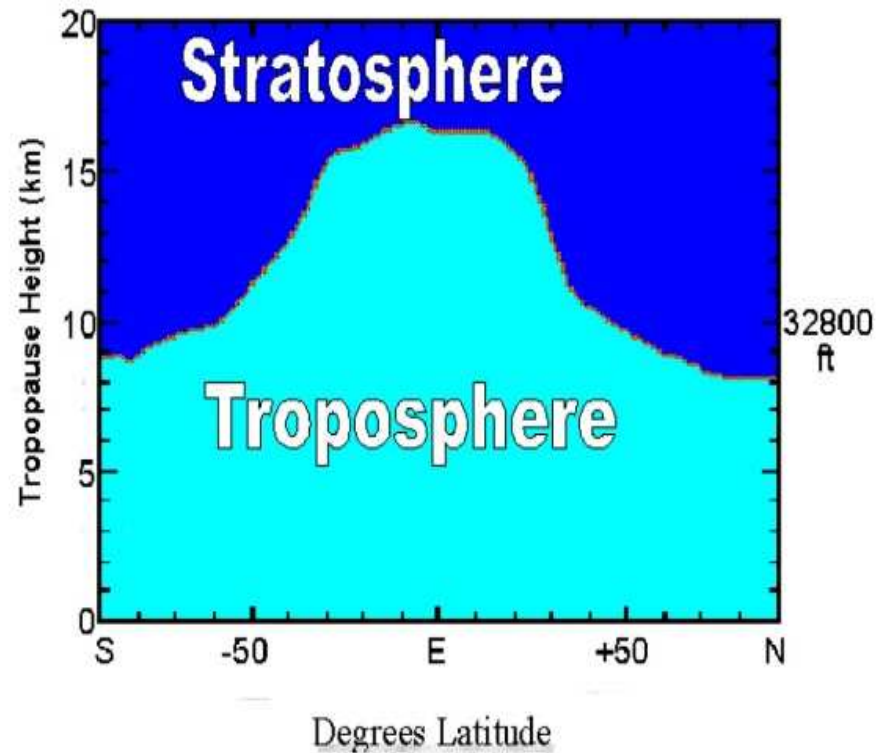
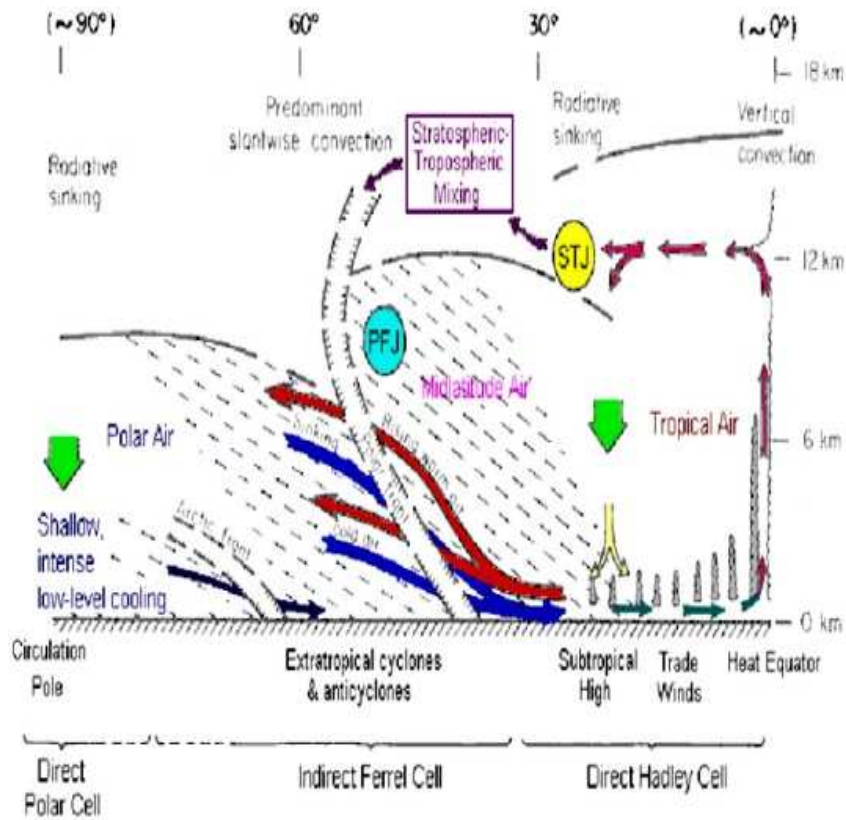


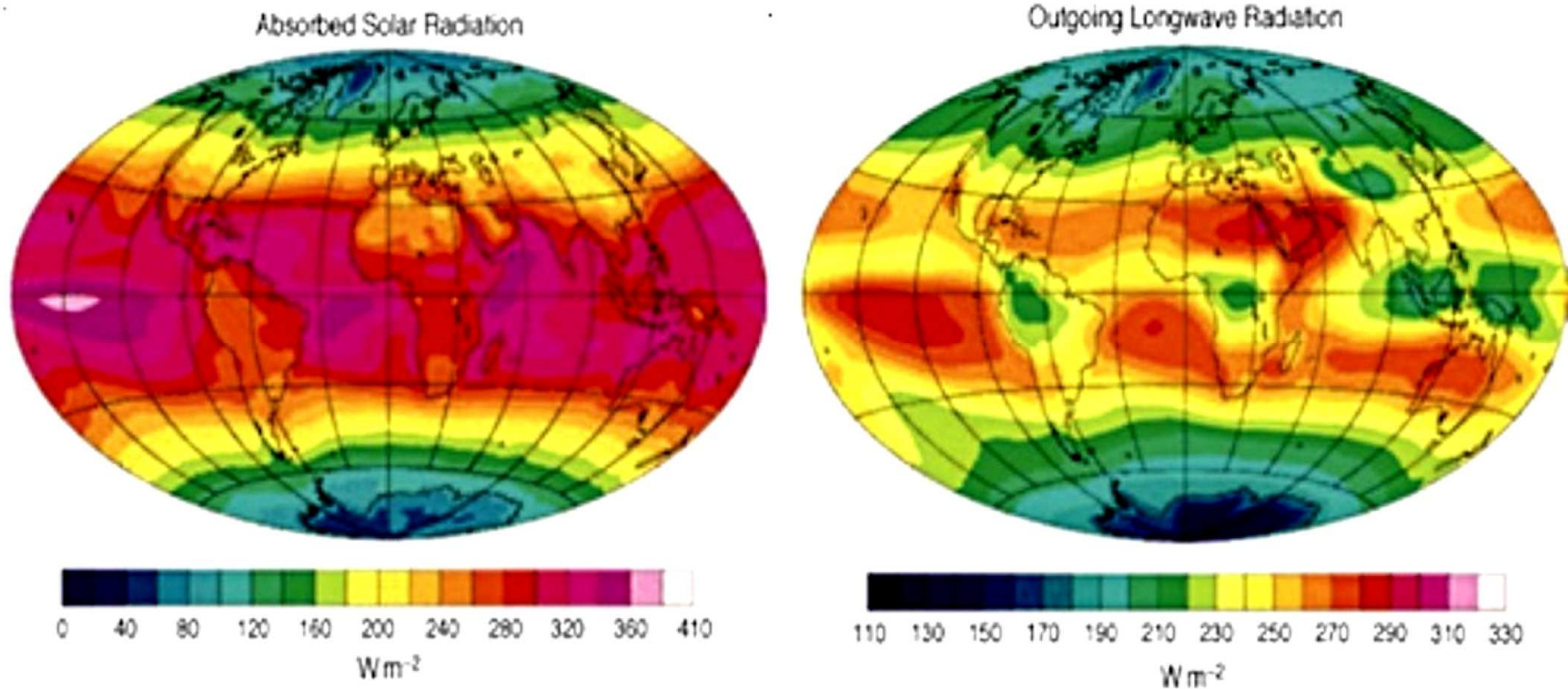
(EPA 2017)

Figure 1. Radiative Forcing Caused by Major Long-Lived Greenhouse Gases, 1979-2015







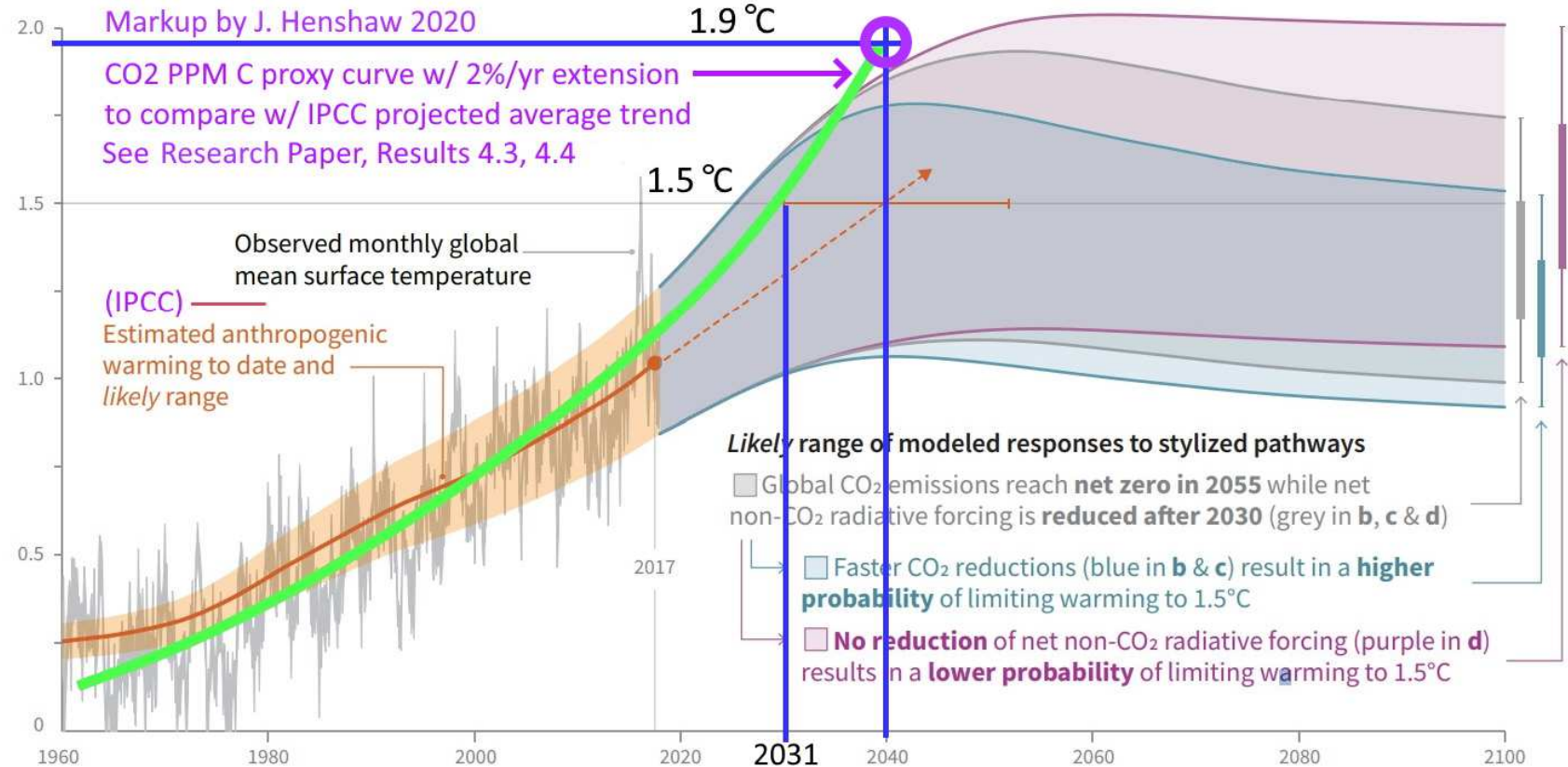


a) Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways

IPCC Oct 8 2018 Report on 2040 climate, p 8

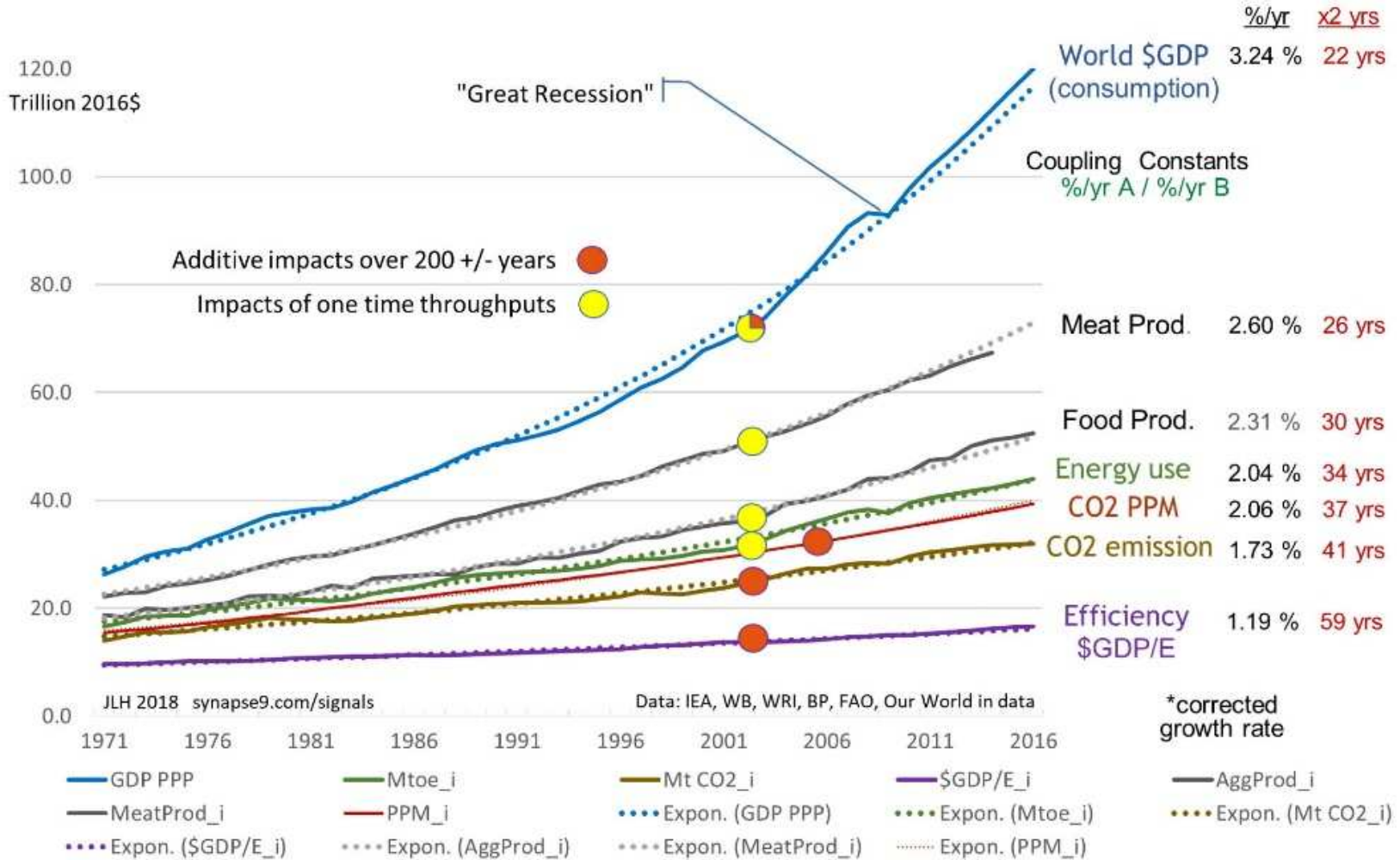
Global warming relative to 1850-1900 (°C)

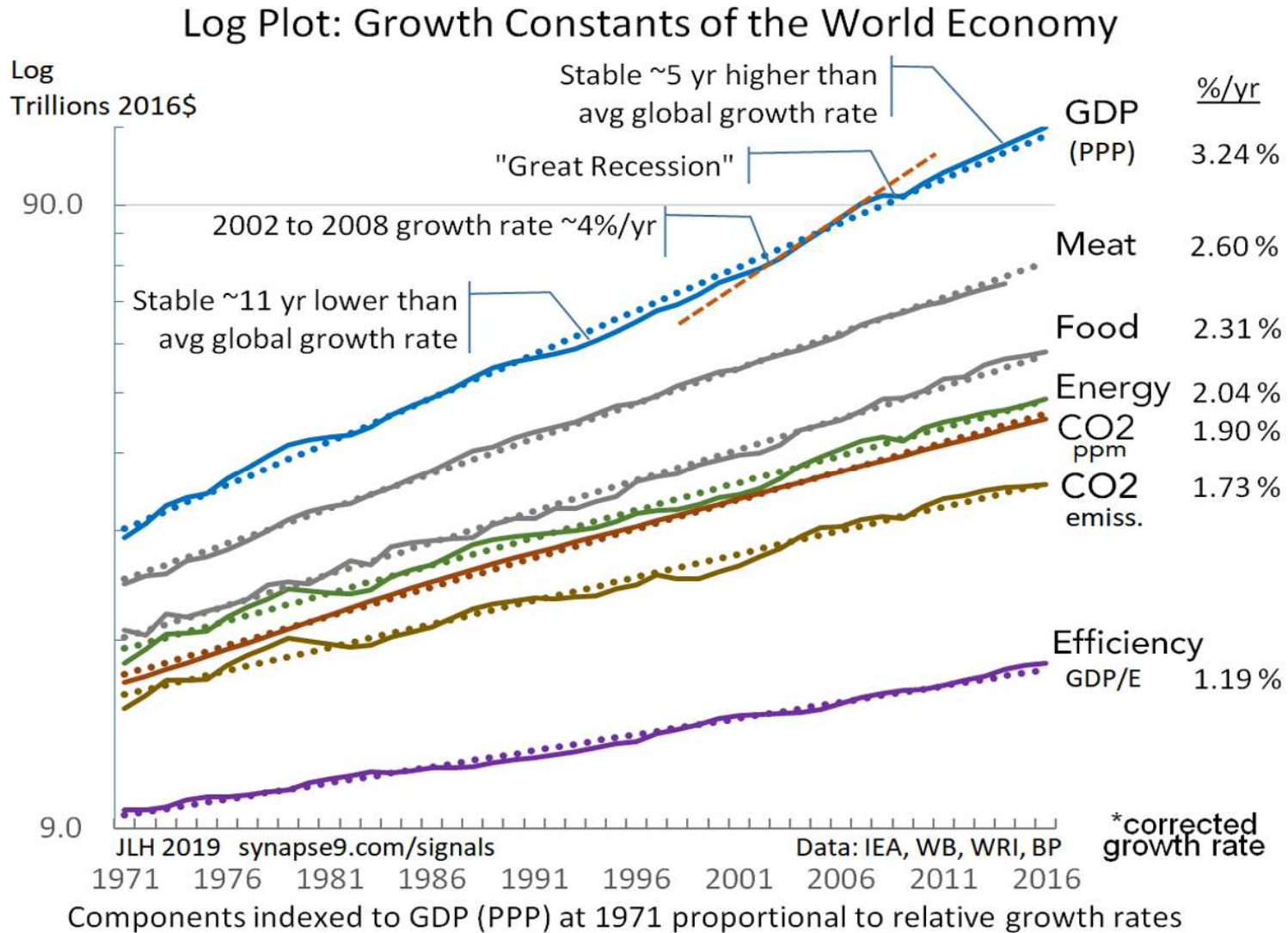
https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_High_Res.pdf



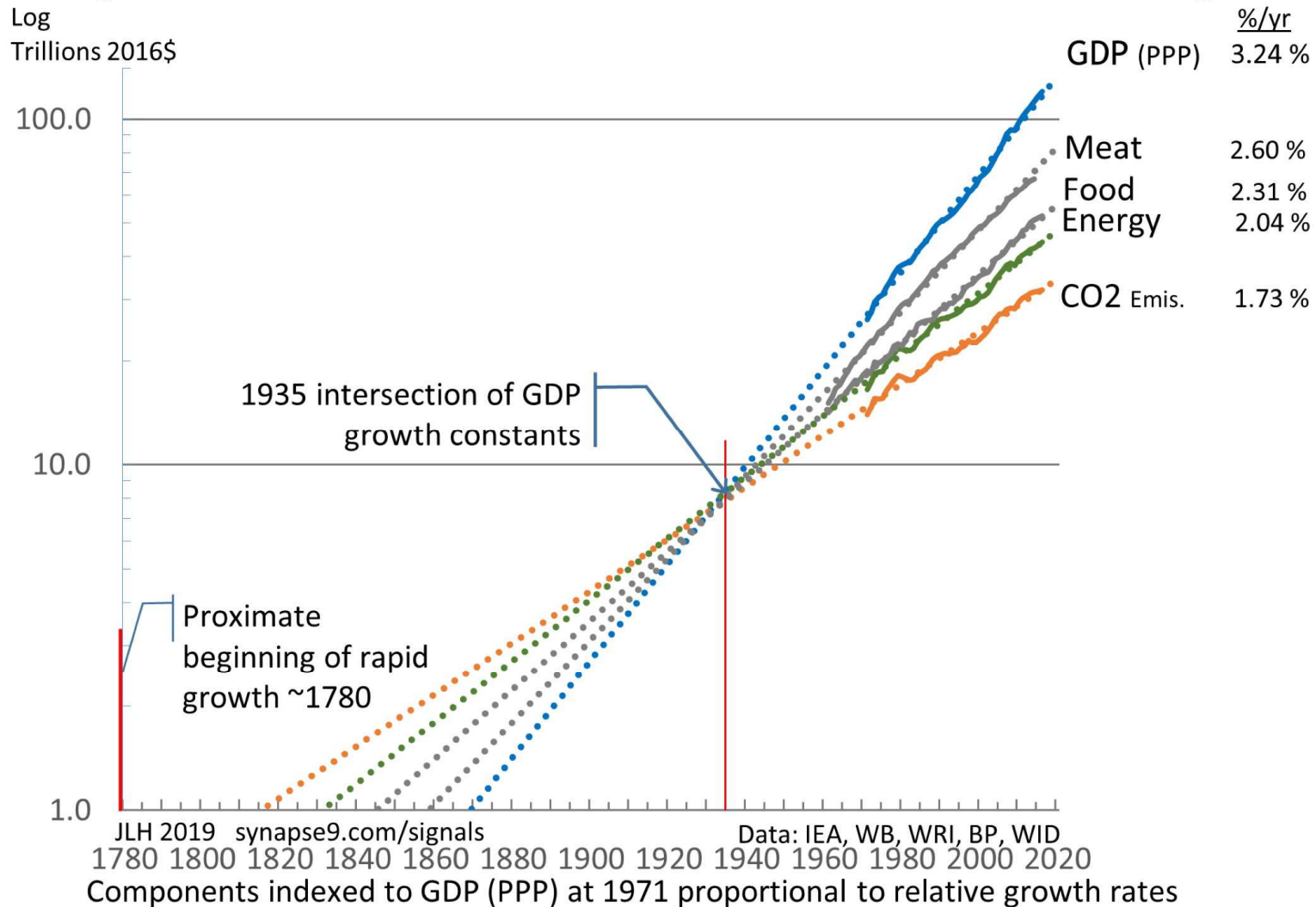
Growth Constants of the World Economy Indexed by Growth Rate

Components indexed to GDP(PPP) at 1971 proportional to relative growth rates





Log Plot: World Growth Constants Backcast to Show Virtual Origin



Log plot: Environ Var's Indexed to GDP and Backcast to Virtual Origin

Log Plot

Trillions 2016\$ - components indexed to GDP at 1971,
in proportion to relative growth rates

