Propagation Trends 2014-2015

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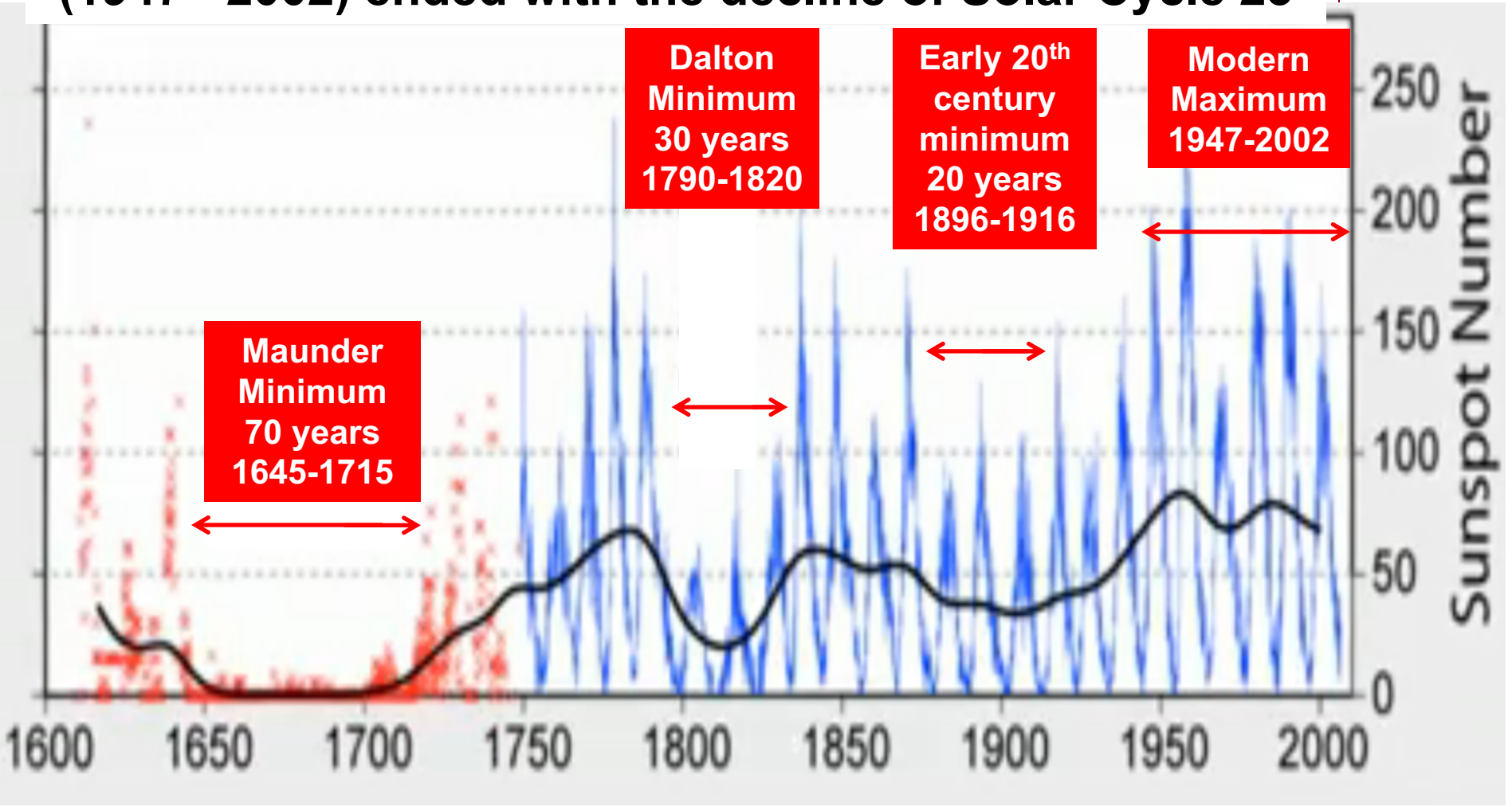
400 Years of Sunspot Observations

55 years of unusually high sunspot activity (1947 - 2002) ended with the decline of Solar Cycle 23



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The 80 year Gleissberg cycle is clearly visible in this data

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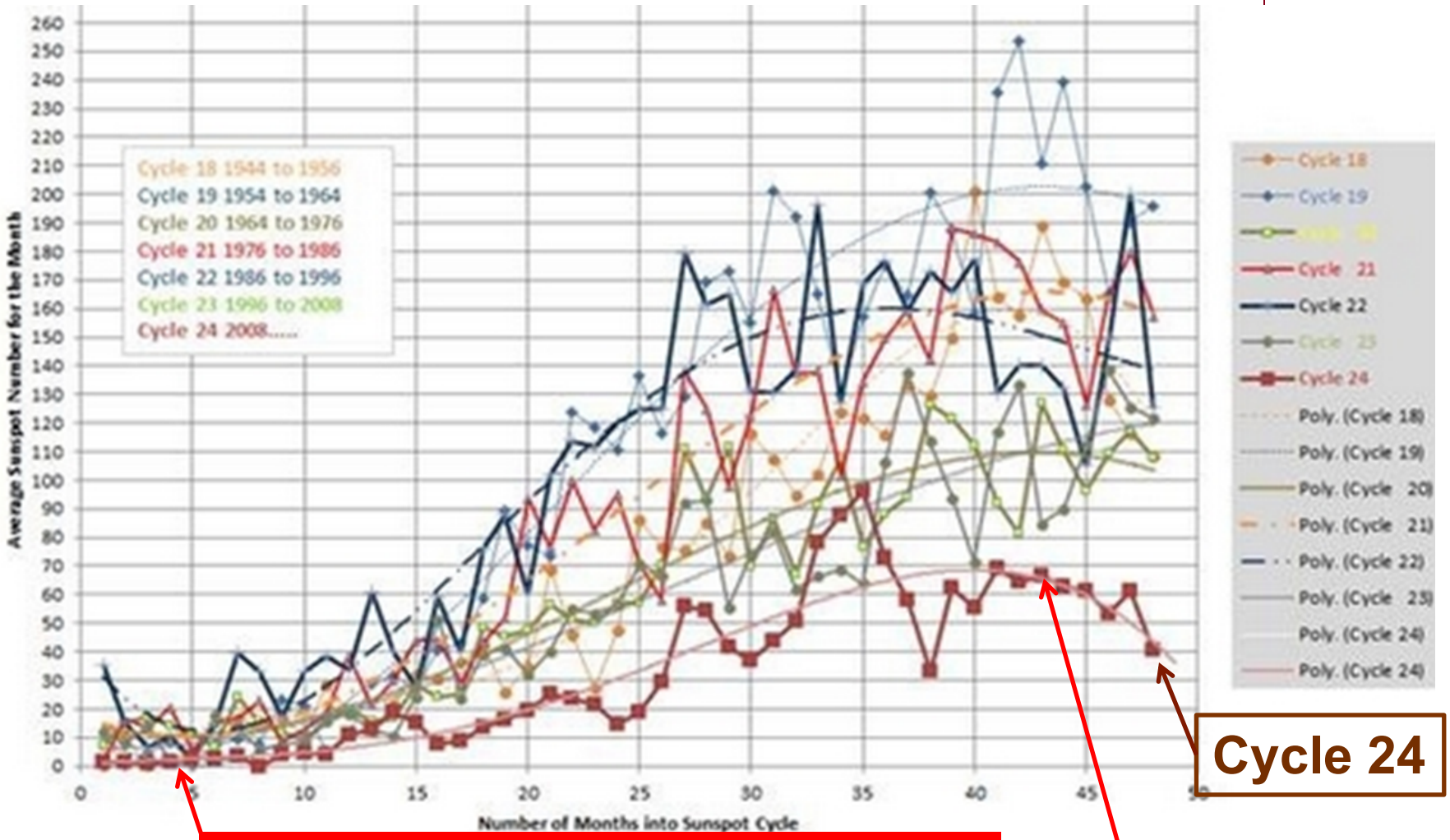
Solar Cycle 24

compared to all solar cycles since 1944



Cycle 24

The lowest solar minimum in 100 years

The weakest solar cycle maximum in 100 years

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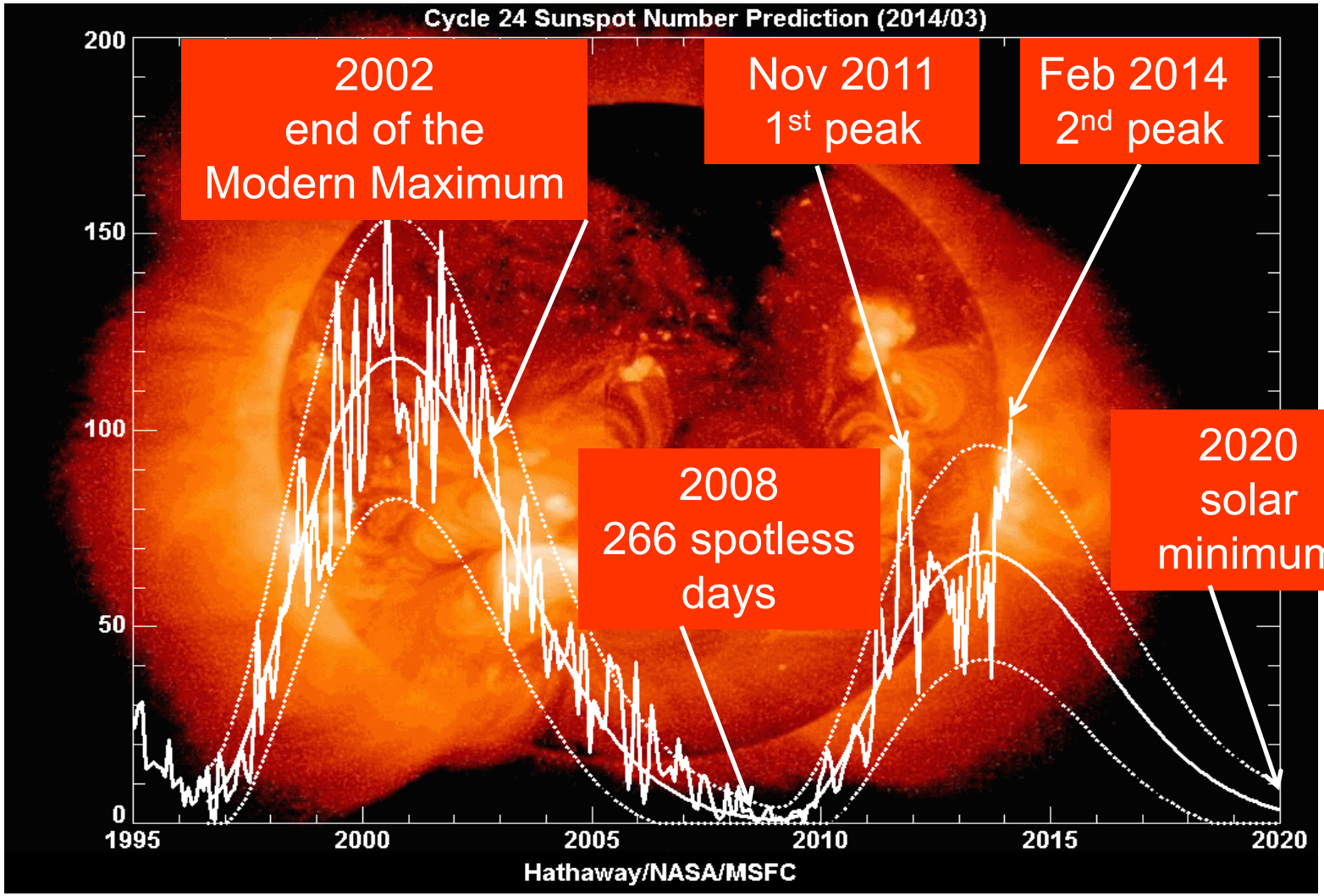
Solar Cycle 24 Progress

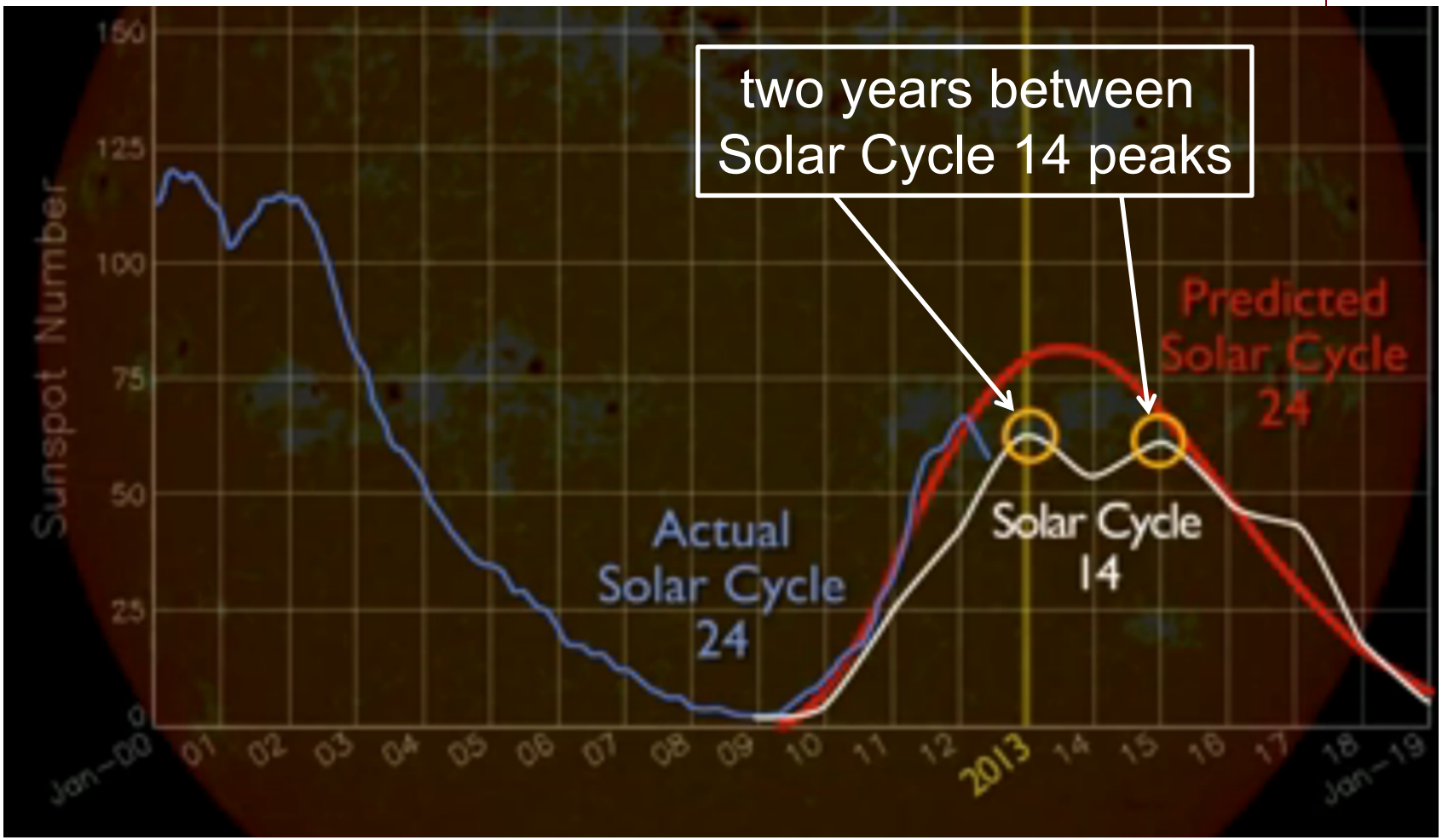
the ongoing second peak is stronger than expected



http://solarscience.msfc.nasa.gov/images/ssn_predict_l.gif

Solar Cycle 24

compared to similar Solar Cycle 14



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Ongoing Solar Cycle 24 is also double peaked

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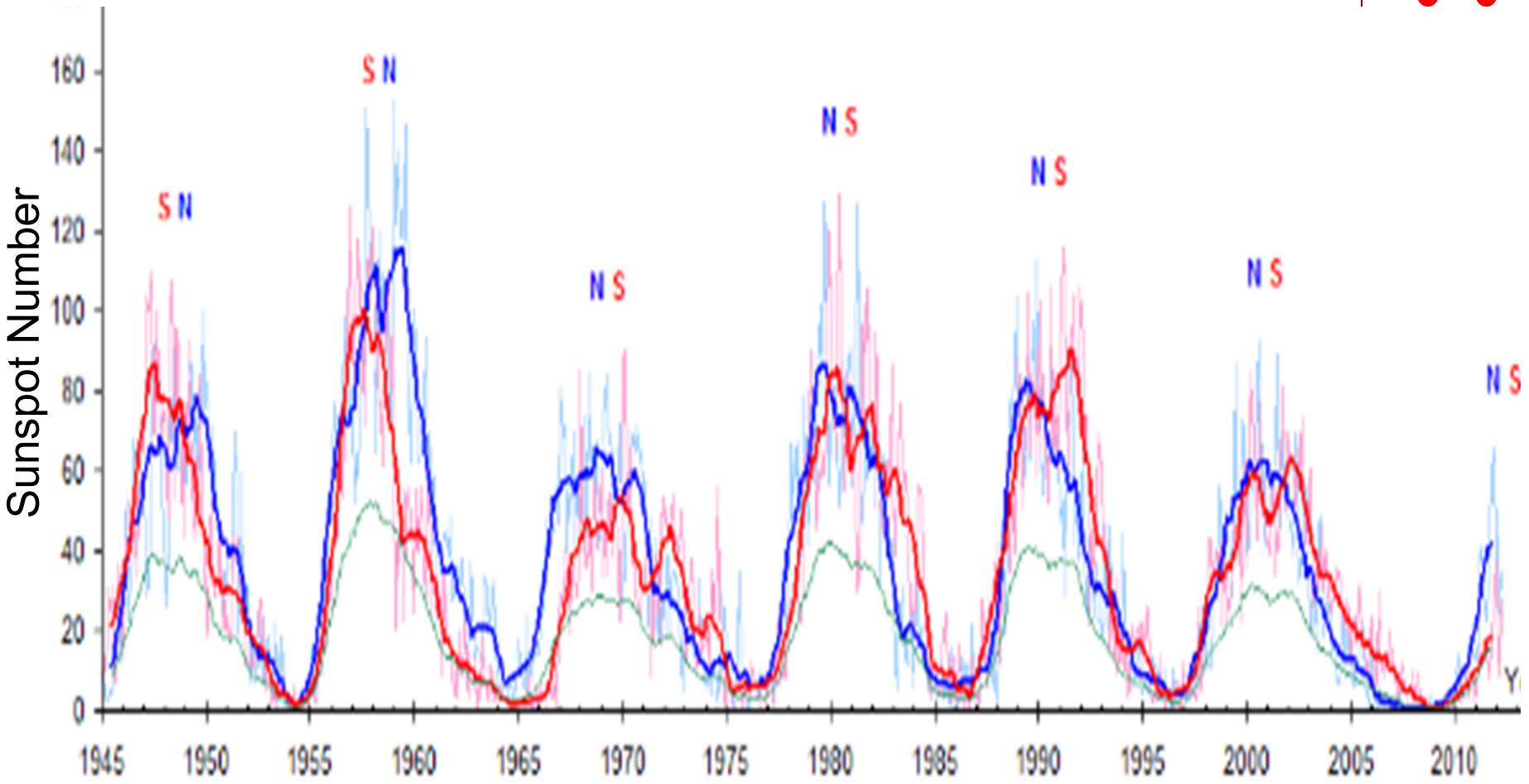
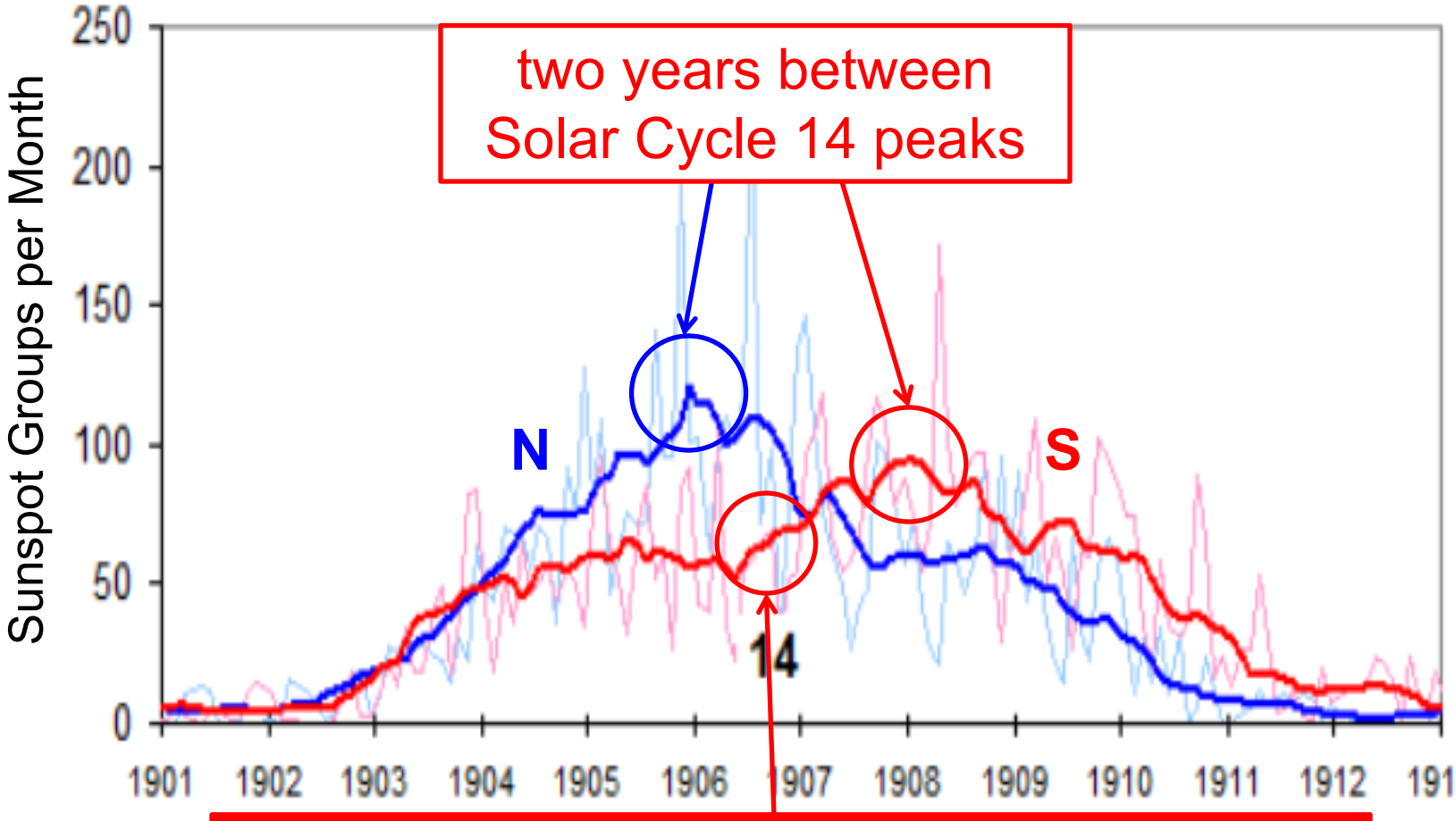
Why are there often two solar cycle peaks?



The northern and southern solar hemisphere solar cycle peaks never occur at the same time

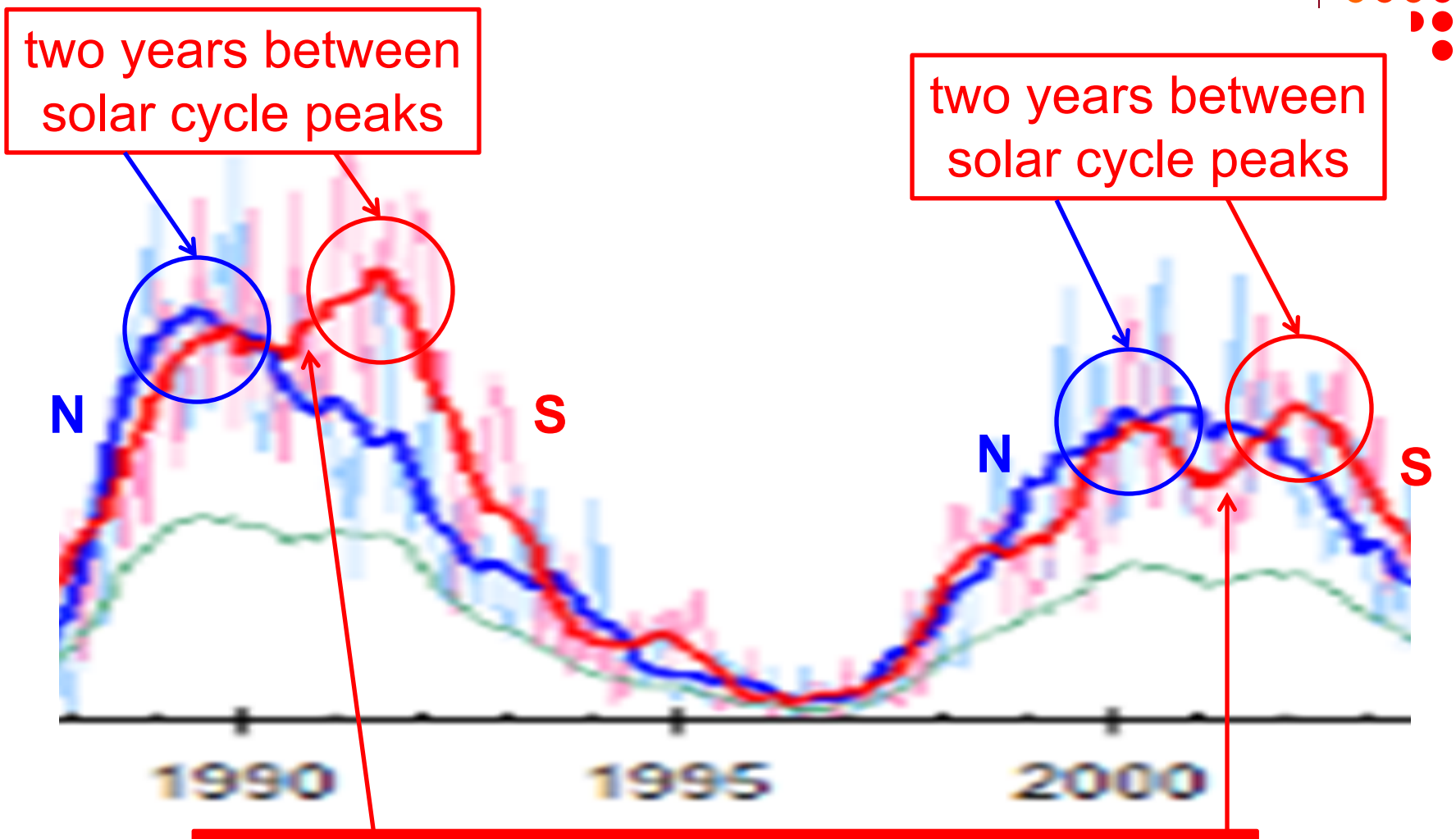
Solar Cycle 24 is similar to Cycle 14

the solar southern hemisphere sunspot peak occurred two years after the northern hemisphere sunspot peak



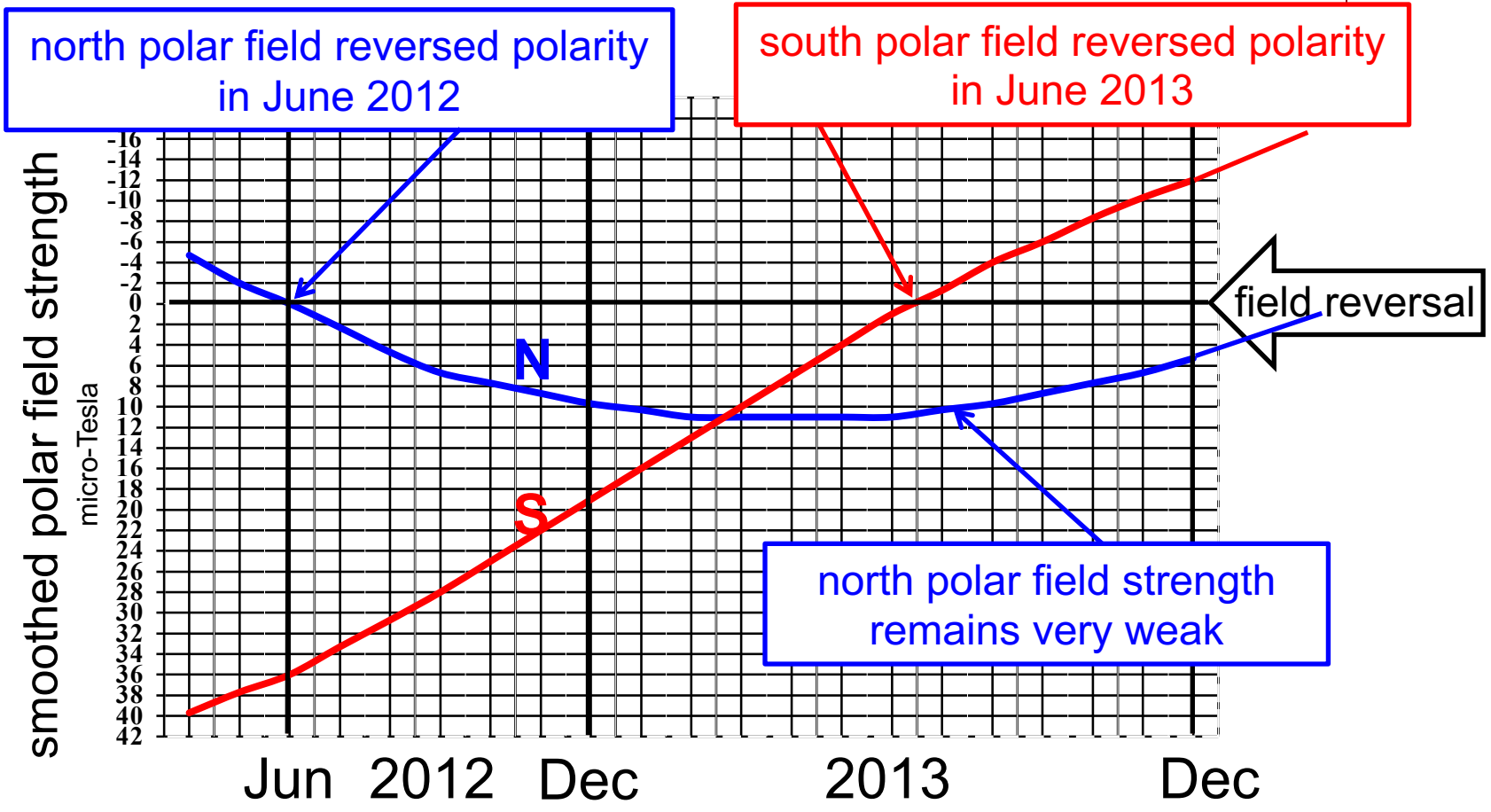
The Last Two Solar Cycles also had Double Peaks

but much higher than Solar Cycle 24



Solar North-South Polar Field Reversal

solar maximum usually occurs after <u>both</u> polar fields have reversed polarity



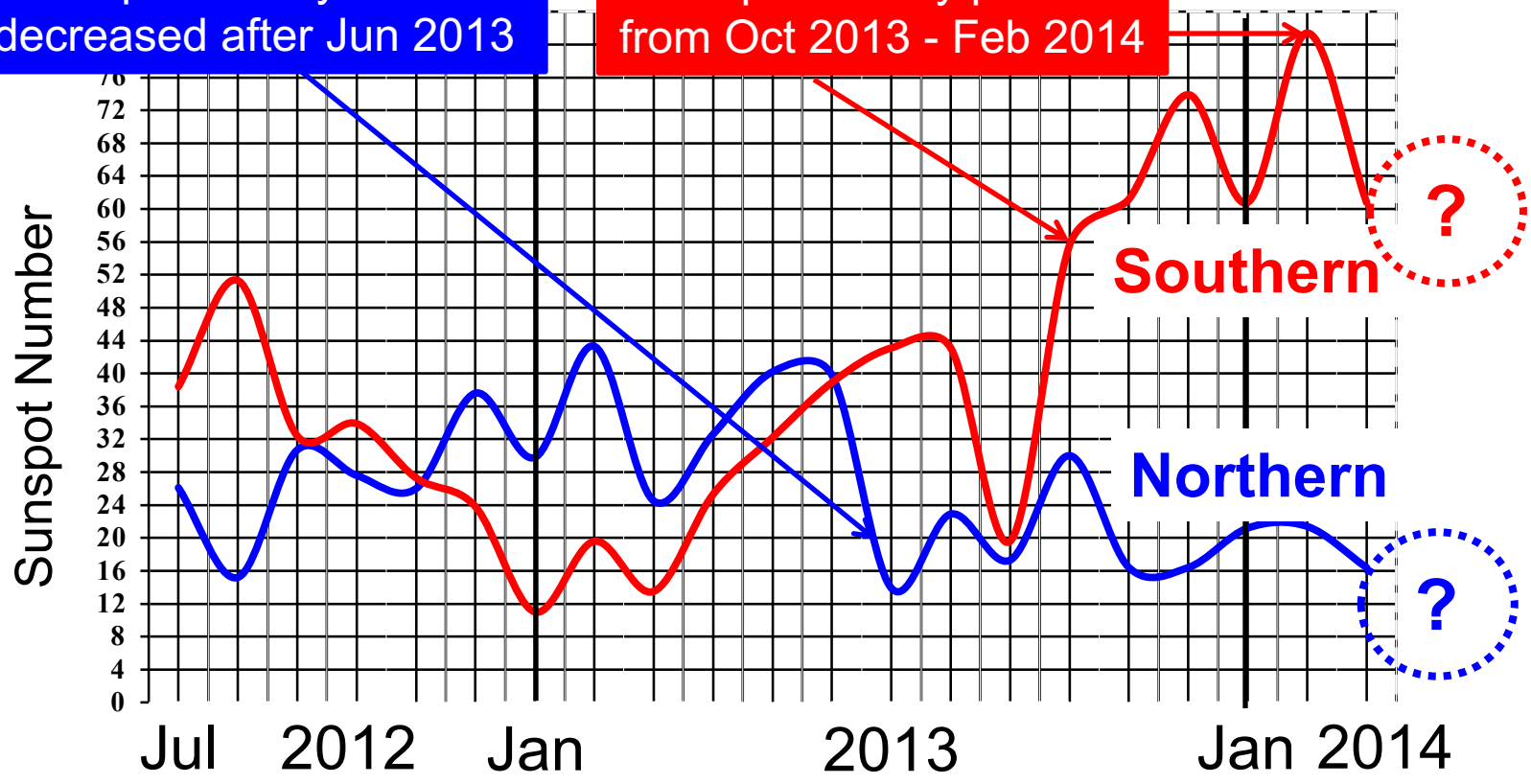
Both poles had reversed polarity by June 2013

Sunspot Activity in each Solar Hemisphere

Solar Cycle 24 achieved its second peak from Oct 2013 through Feb 2014

Northern hemisphere sunspot activity further decreased after Jun 2013

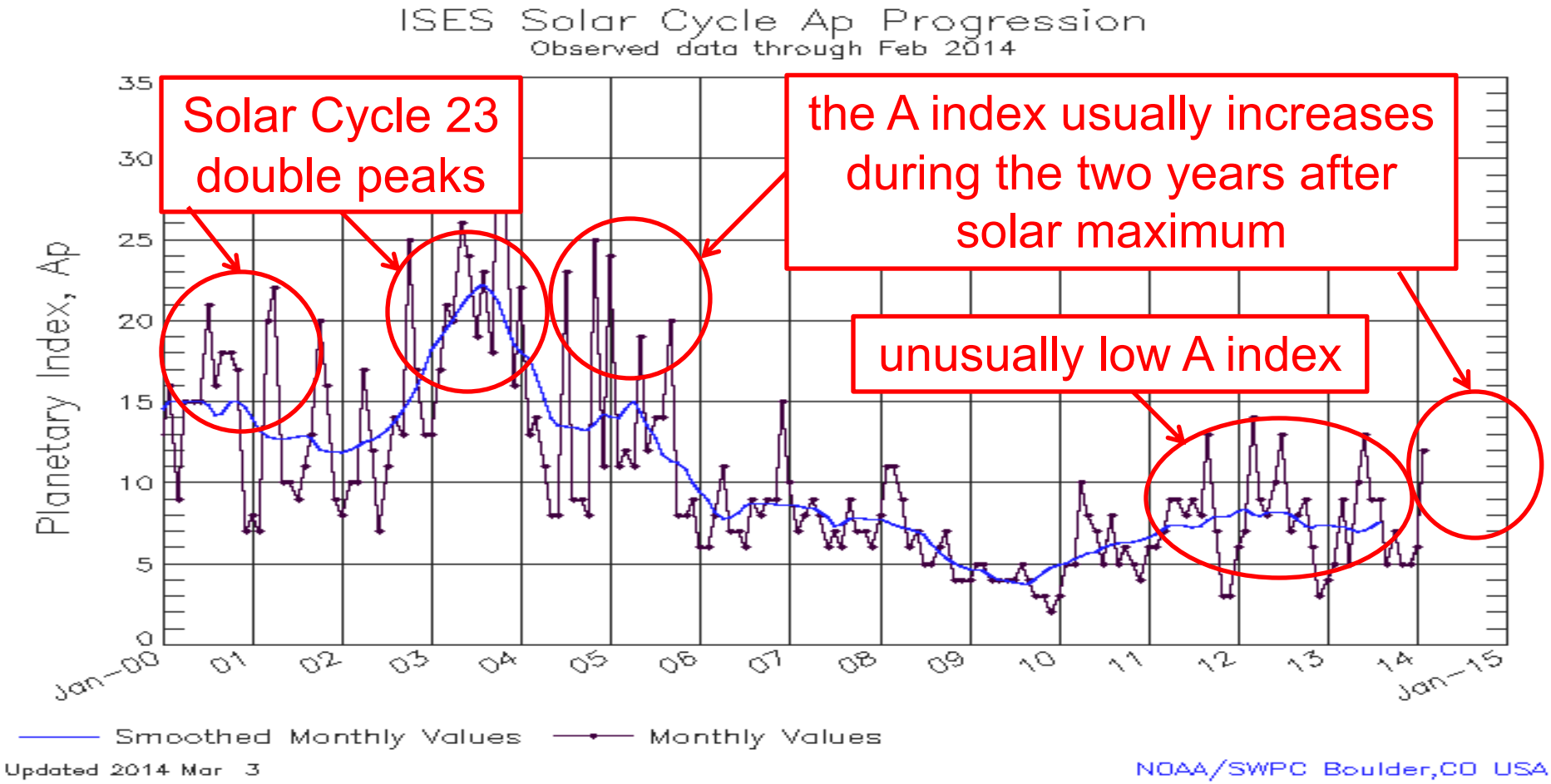
Southern hemisphere sunspot activity peaked from Oct 2013 - Feb 2014



Southern hemisphere sunspot activity is now significantly greater than northern hemisphere activity

Weak Solar Cycle 24 has been unusually favorable for 160 and 80 Meters

The A-index has been much lower than prior sunspot cycles



The A-Index may increase moderately for the next two years

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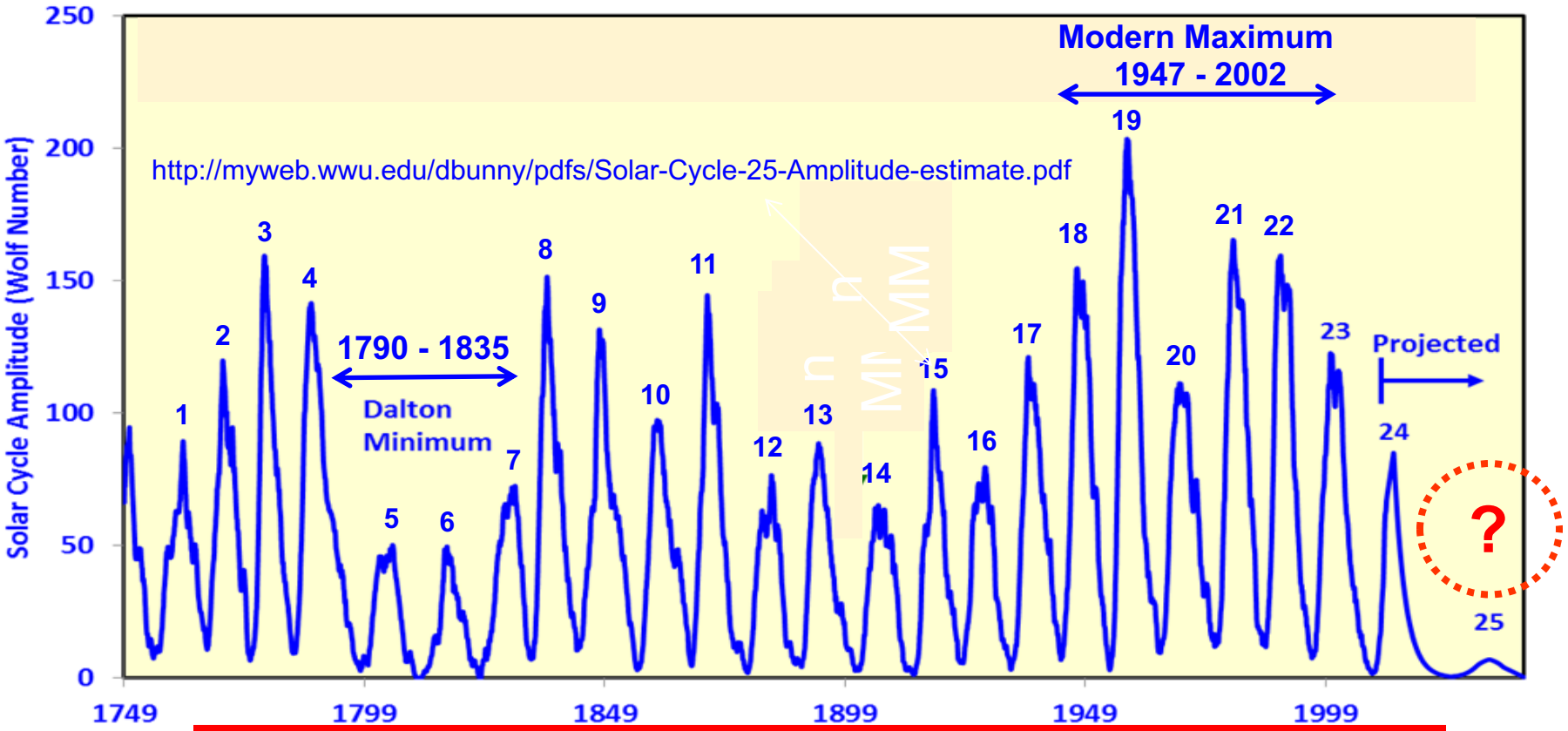
A Long Range Estimate of Solar Cycle 25

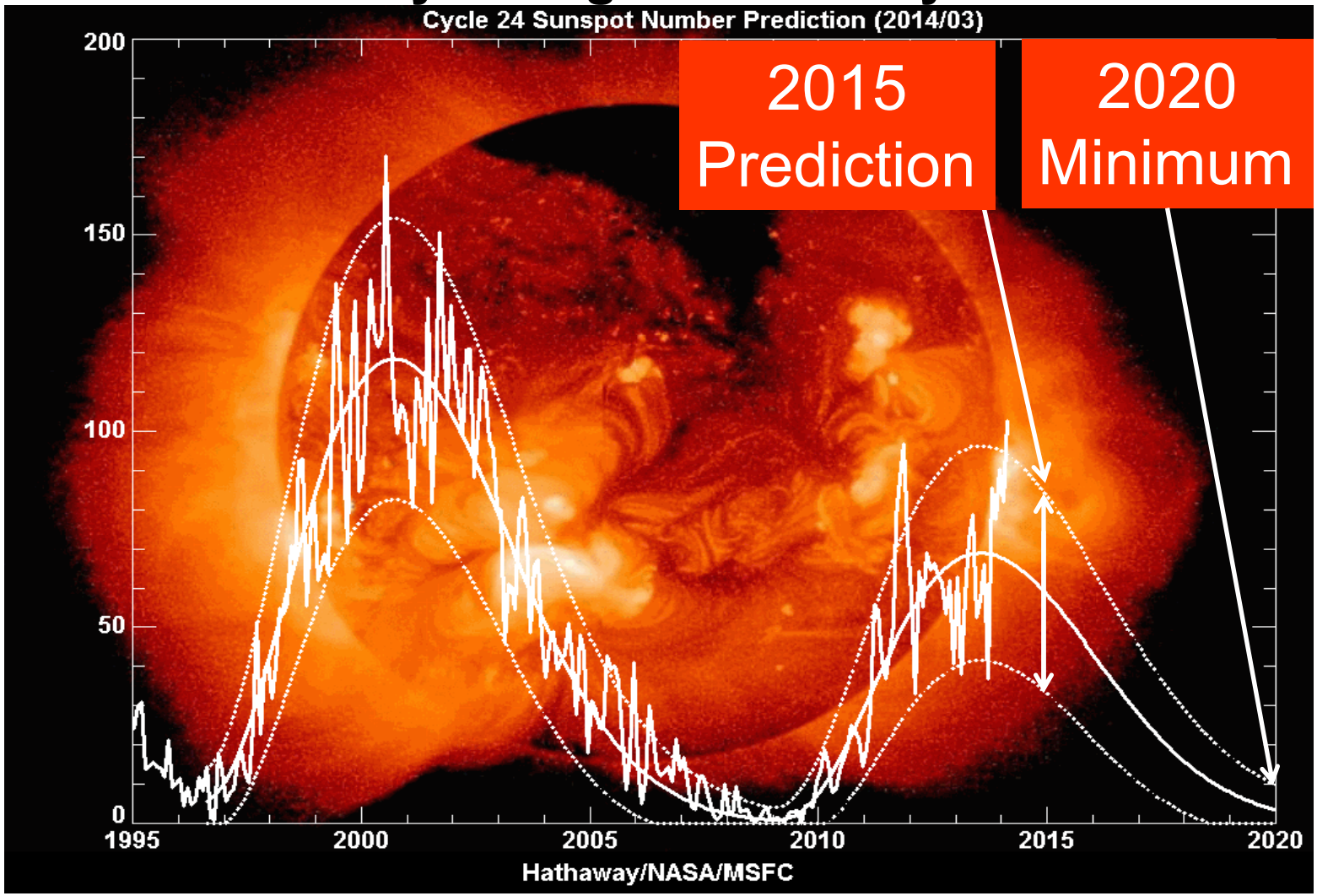
could sunspots nearly disappear by 2025?



some solar scientists expect Cycle 25 to be the weakest solar cycle (SSN=7) in more than 300 years

Solar Cycle 24 Prediction

the slow decline to solar minimum in 2020 is likely to begin later this year



http://solarscience.msfc.nasa.gov/images/ssn_predict_l.gif