

GLOBE Aerosols

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Content

- Aerosols
- Climate (change)
- Aerosols and climate

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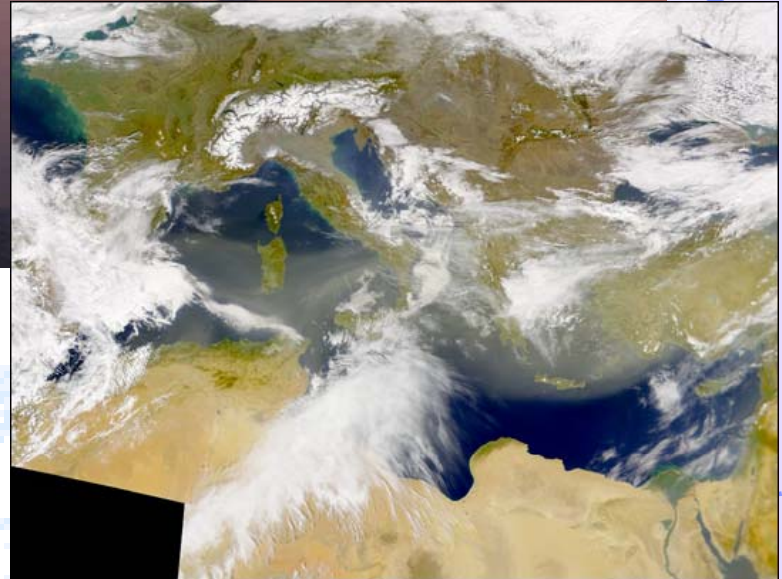
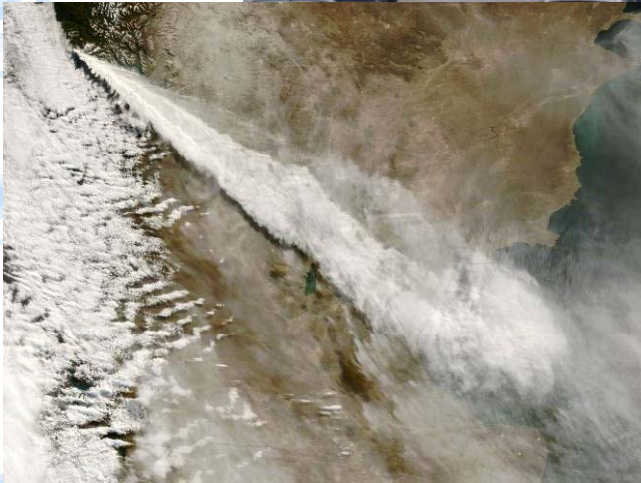
Aerosols

- Particles in the atmosphere
 - Dust
 - Soot
 - Seasalt
 - Volcanic ash
 - Sulphate aerosol (SO_4^{2-})
 - etc.....

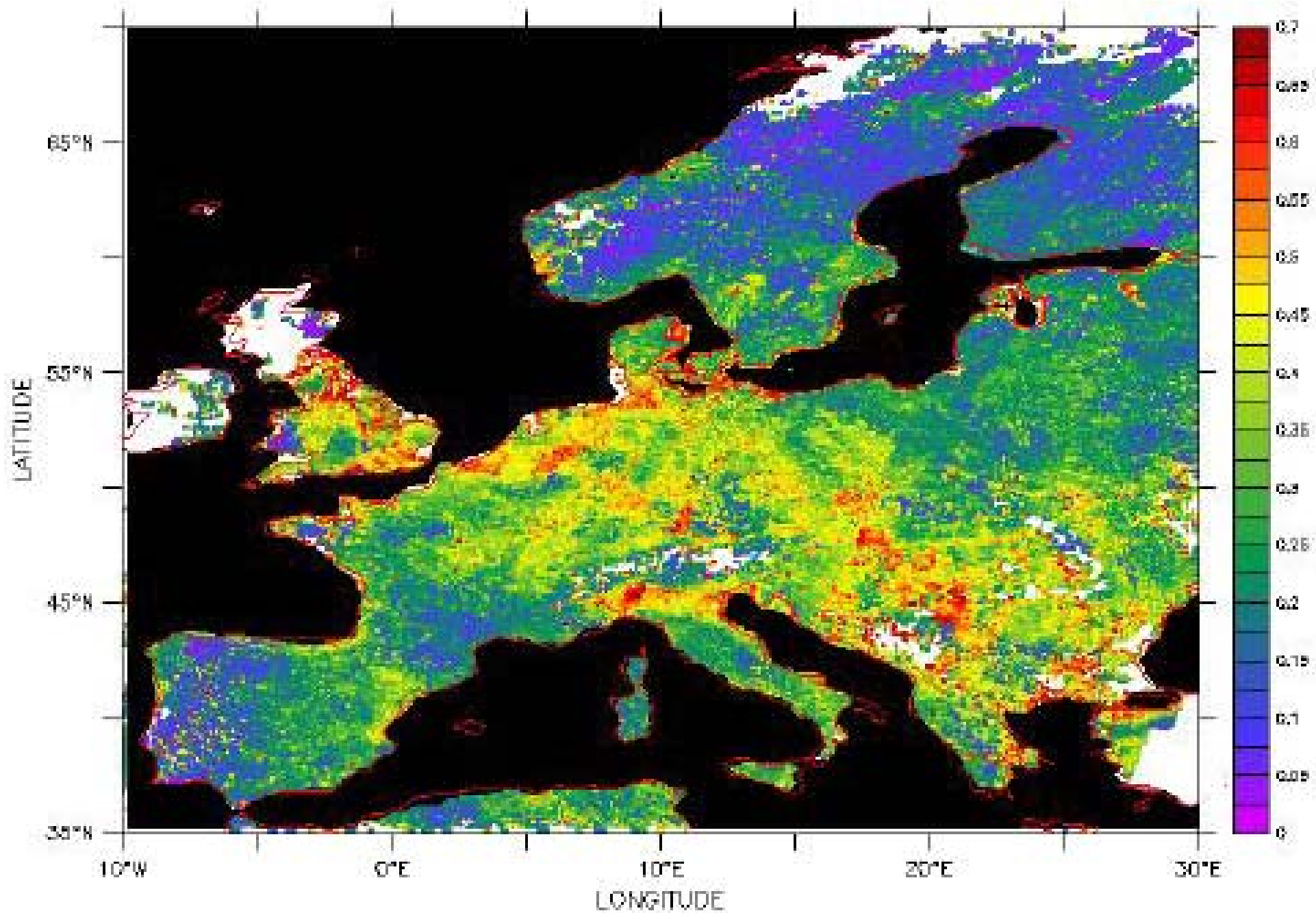
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Brand meubelzaak Amsterdam



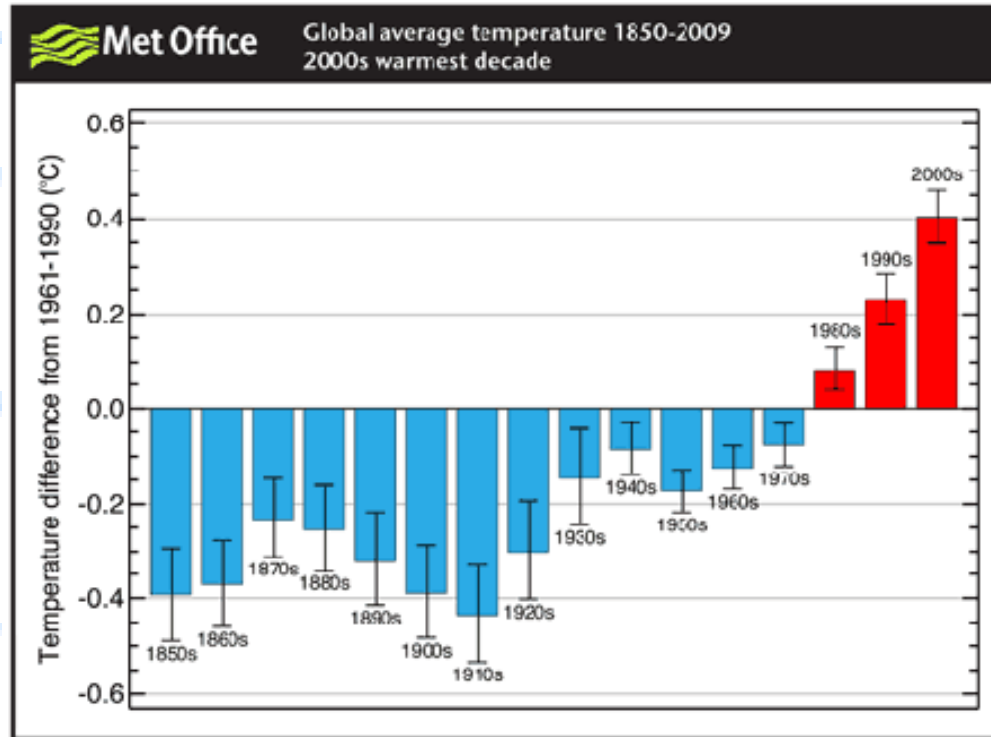
Koninkrijk Nederlands Met



AOD 555NM

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Climate



WMO world mean temperature (10 year average)

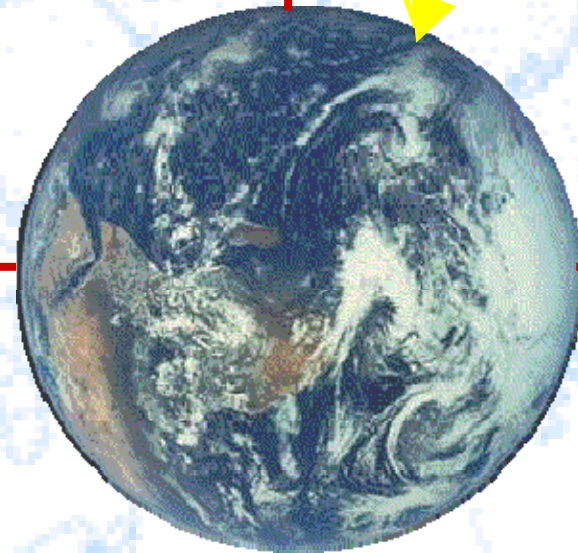
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.... **Radiative forcing**



Reflection 30%

IR radiation
(T) (70%)



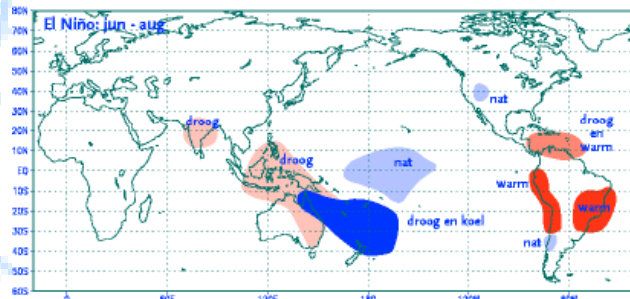
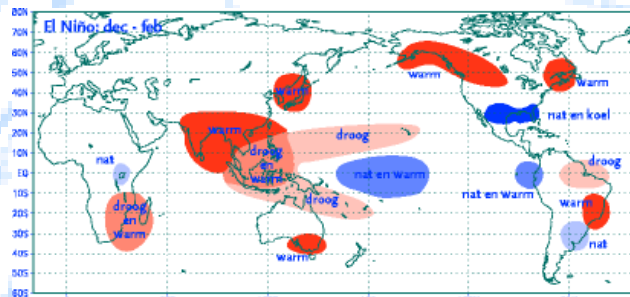
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Natural climate factors



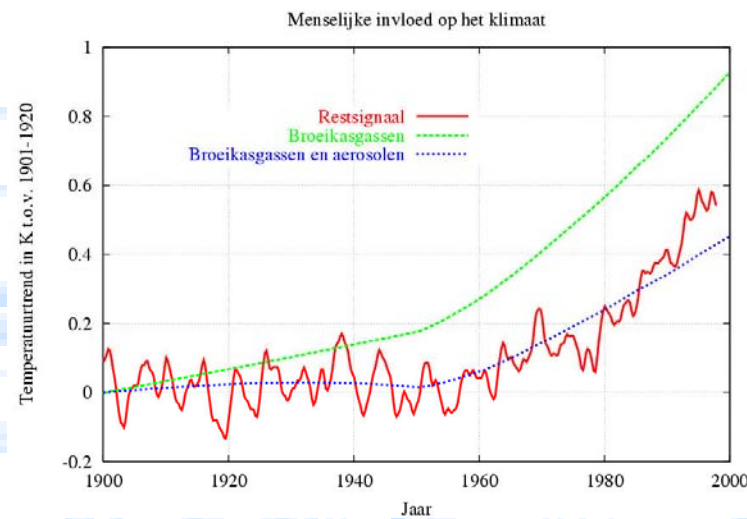
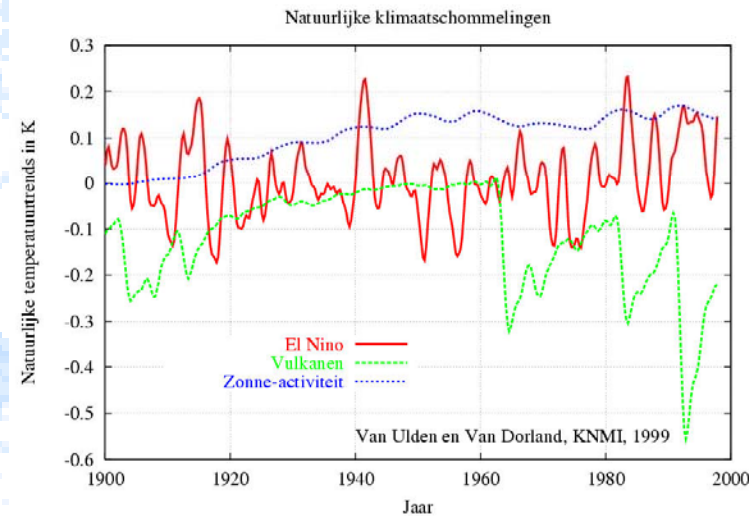
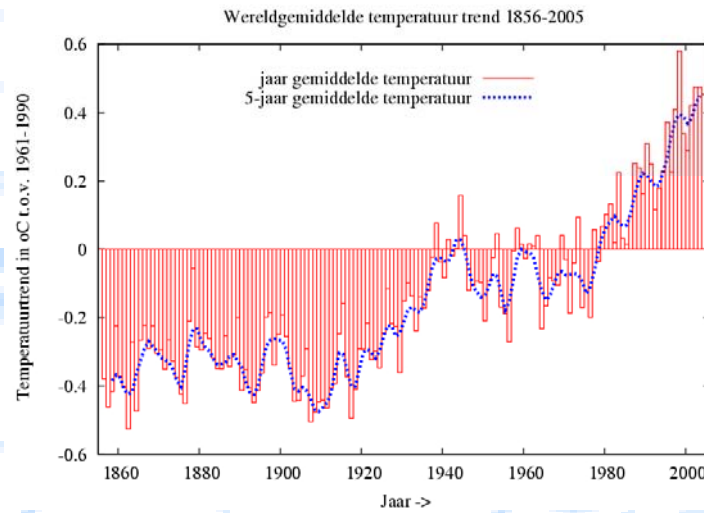
1. Vulcanoës

2. Solar activity



3. El Niño

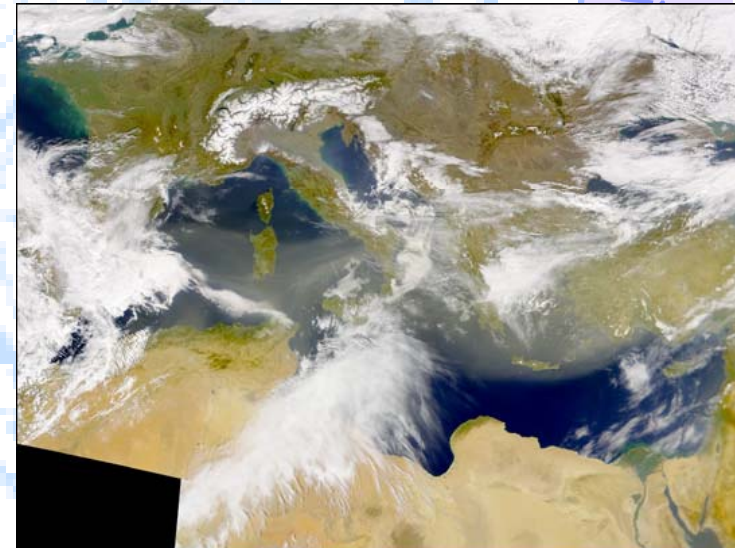
... Do we understand climate change?



Aerosols: two effects

Direct effect (albedo)

- White aerosols: reflection of sunlight
- Black aerosols: absorption of sunlight



Indirect effects

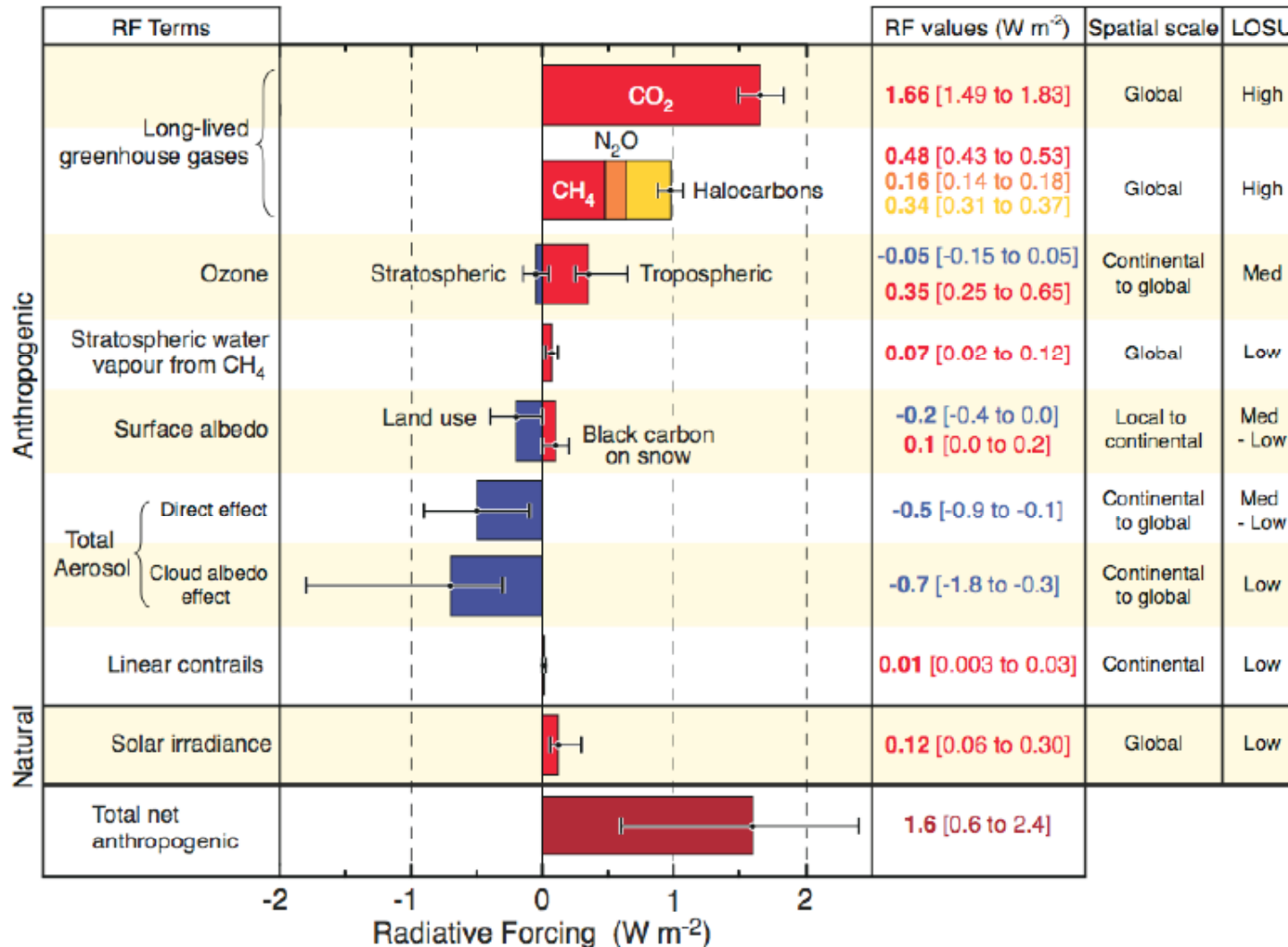
- White aerosols:
 - 1) White clouds due to smaller droplets
 - 2) Longer lifetime
- Black aerosols:
 - 1) Evaporation of clouds
 - 2) Stable atmosphere, suppression of convection



Radiative forcing



Radiative Forcing Components



©IPCC: 2007: WG1-AR4

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Measuring aerosols



Science questions

- How do aerosols effect the climate
- Establish dense global network of aerosol observations
- Sources of aerosol
- Annual and daily cycle of AOT
- Transport of aerosol plumes
- Satellite validation

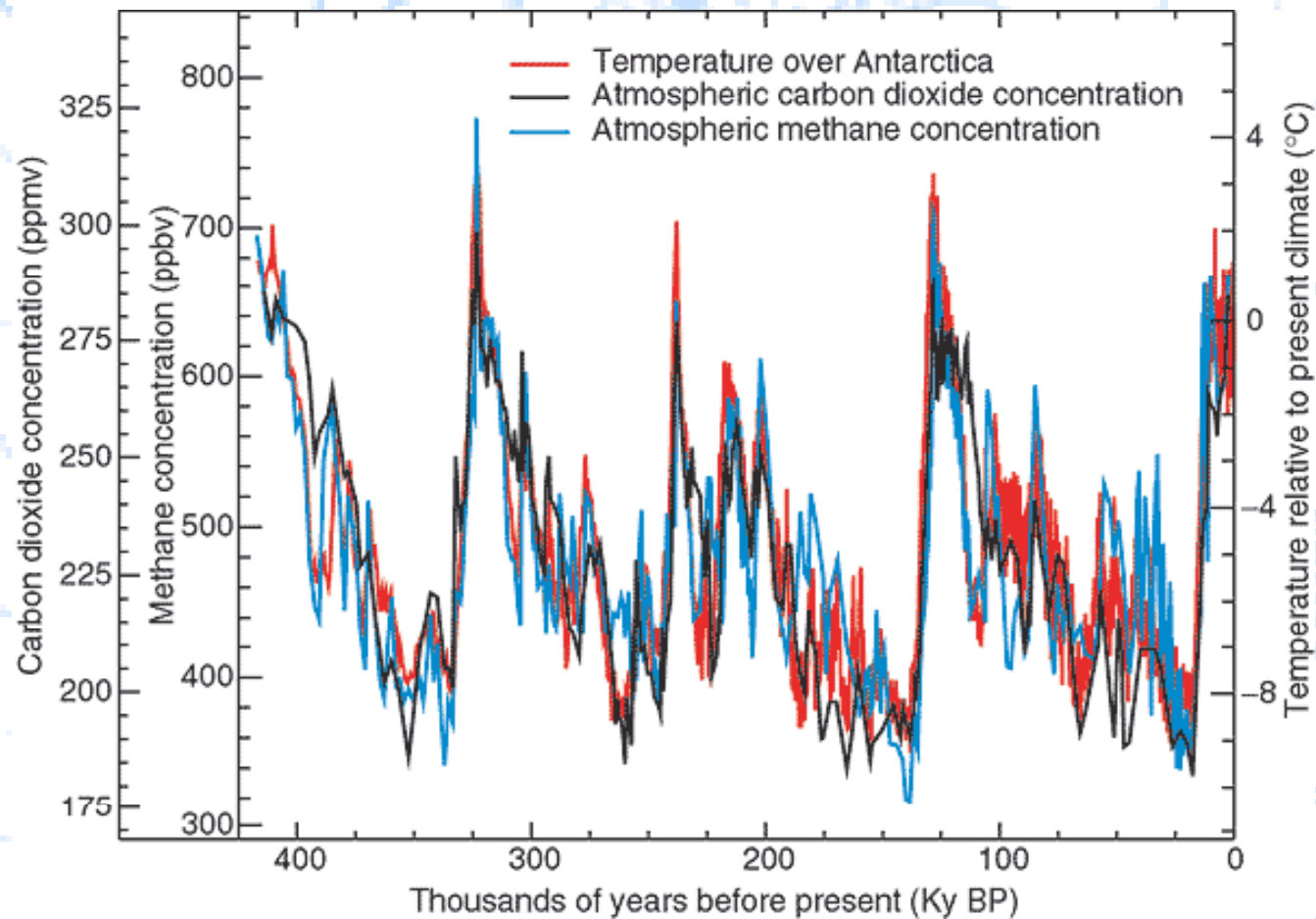
Questions????

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Temperatuur historie



..Temperatuurprojecties

