

Climatic change and transportation: the scientific basis

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Overview

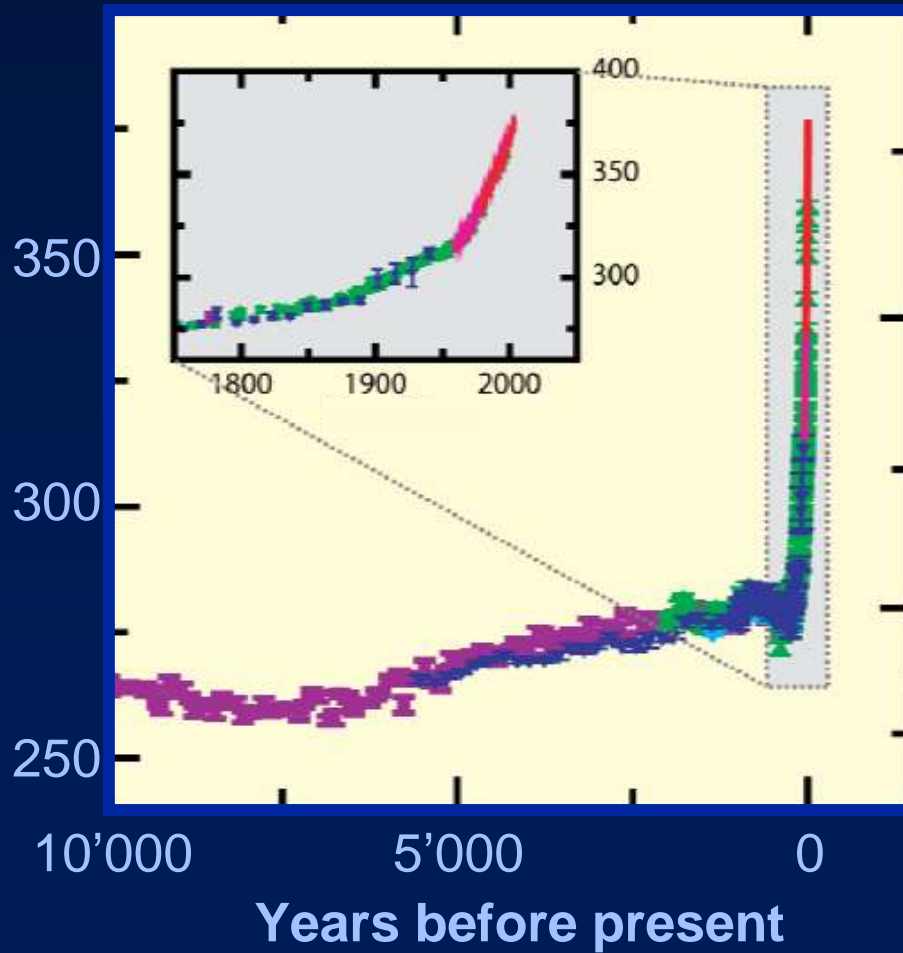
- Anthropogenic climate change
- Climate projections to 2100
- Impacts relevant for the transport sector
- Conclusions

1

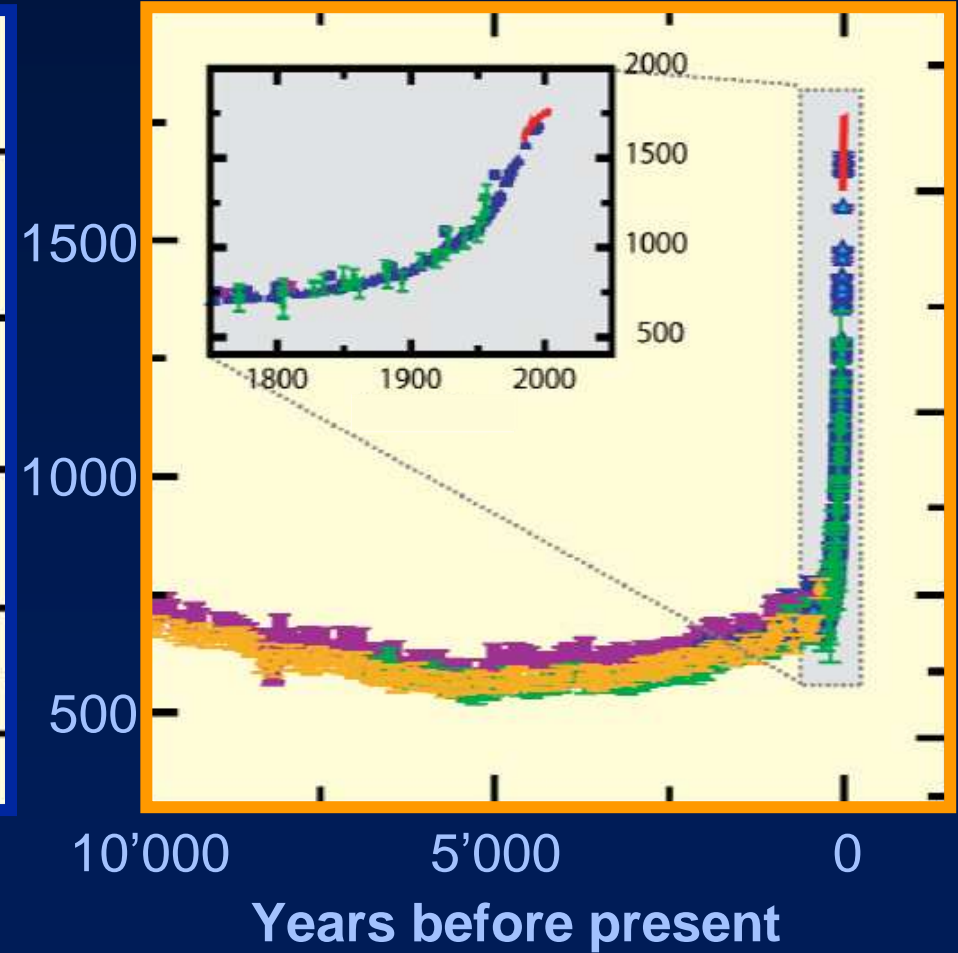
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CO₂ and CH₄ concentrations

CO₂ ppmv

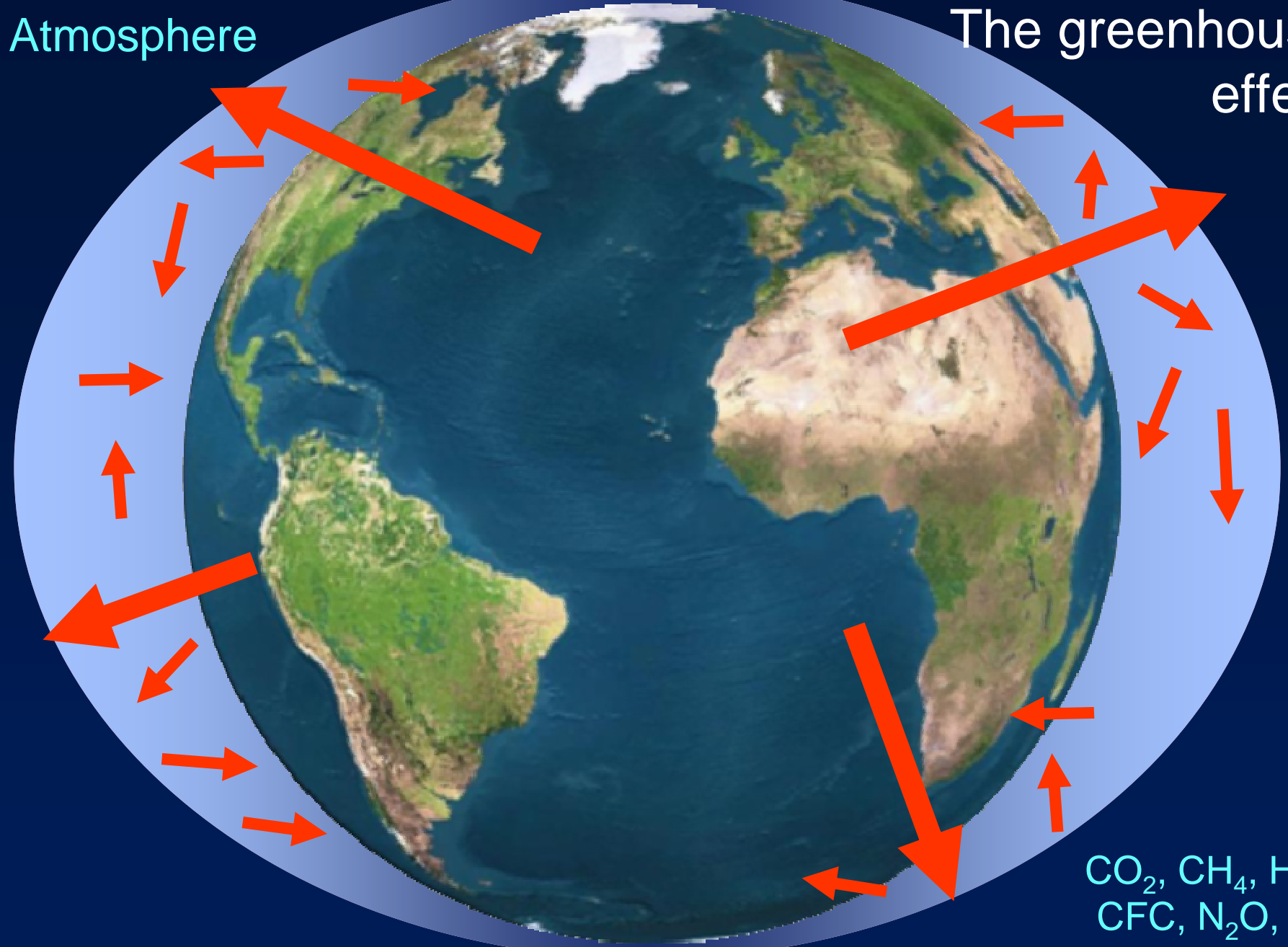


CH₄ ppbv



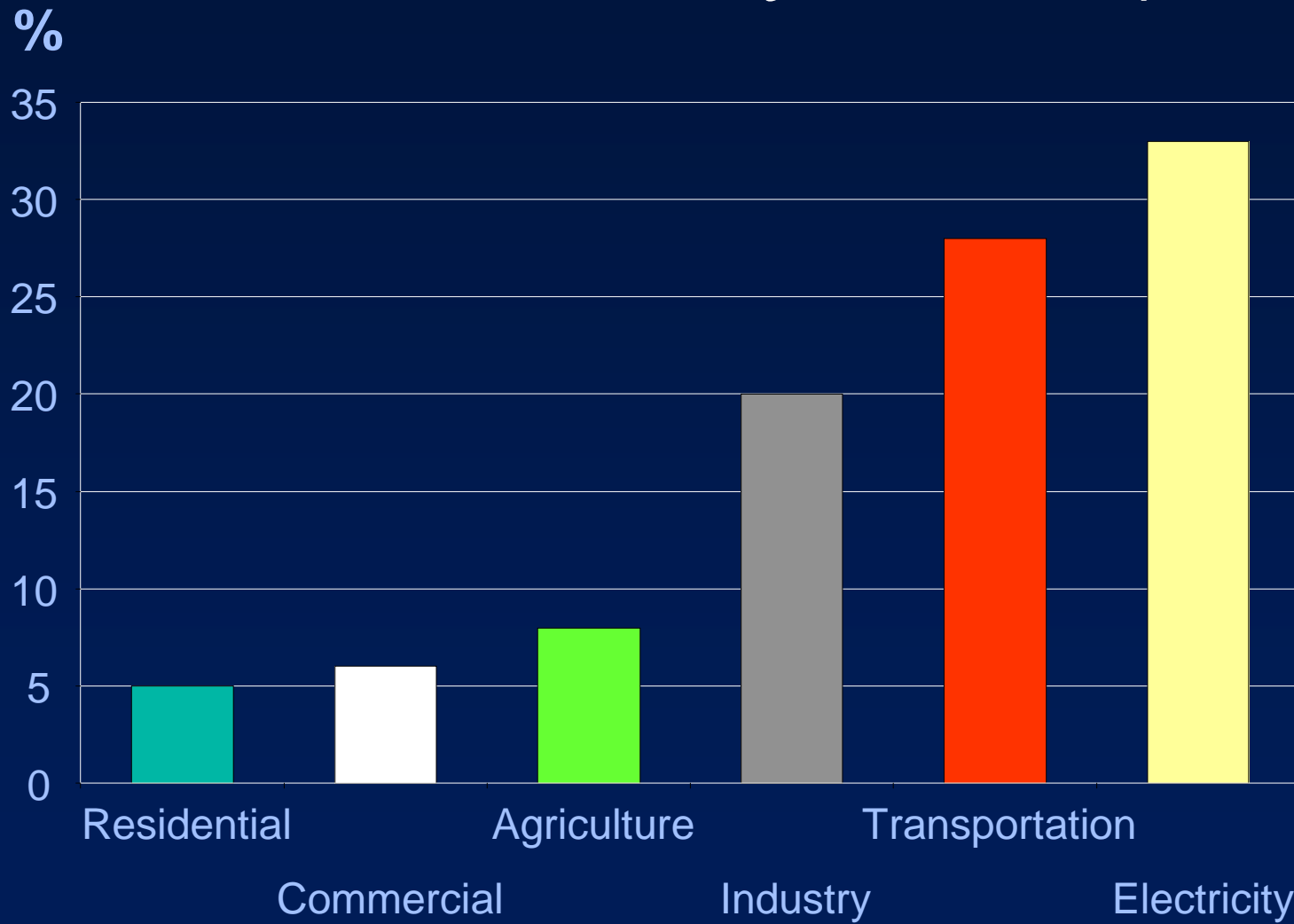
Atmosphere

The greenhouse effect

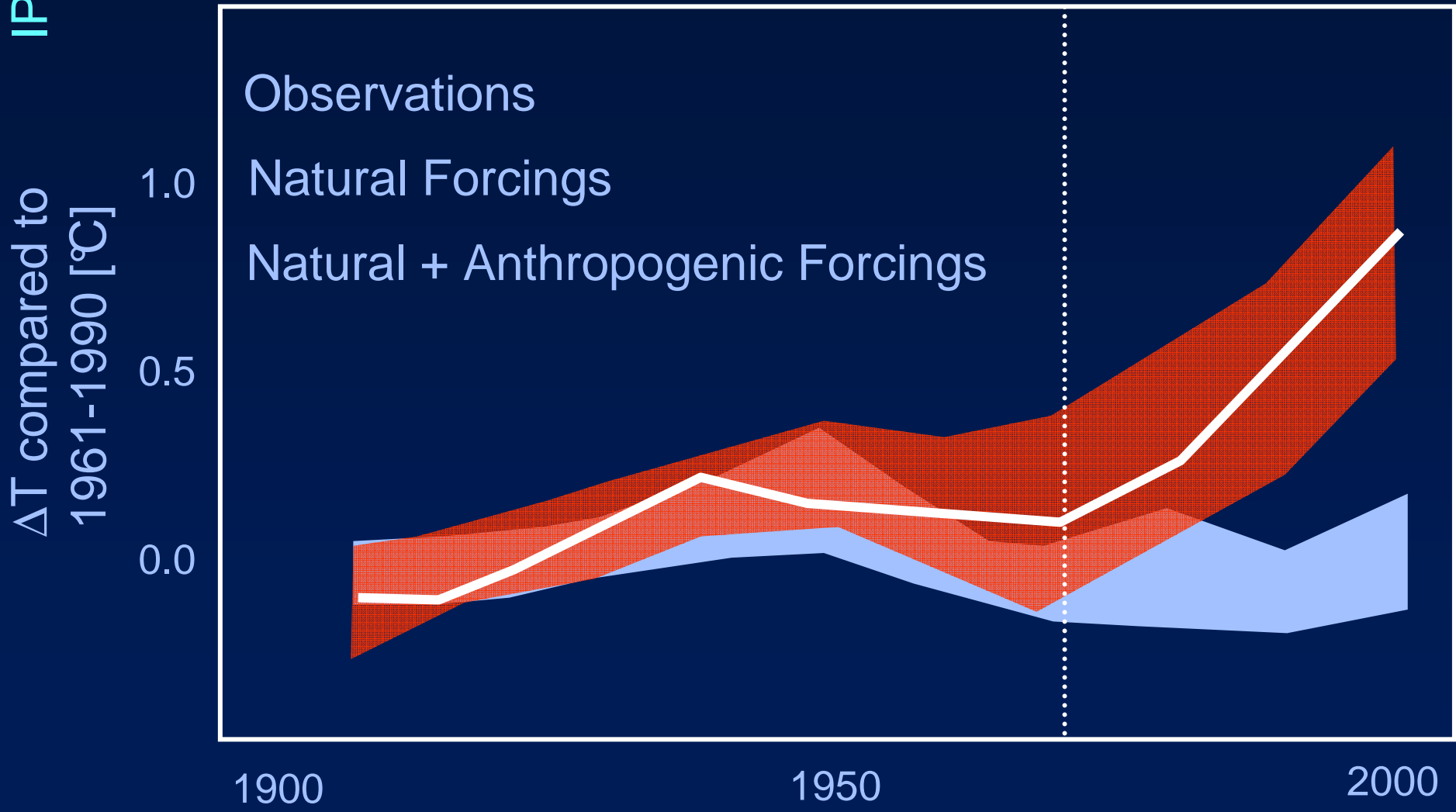


CO_2 , CH_4 , H_2O
 CFC , N_2O , ...

CO₂ emissions in the United States, by sector (2008)



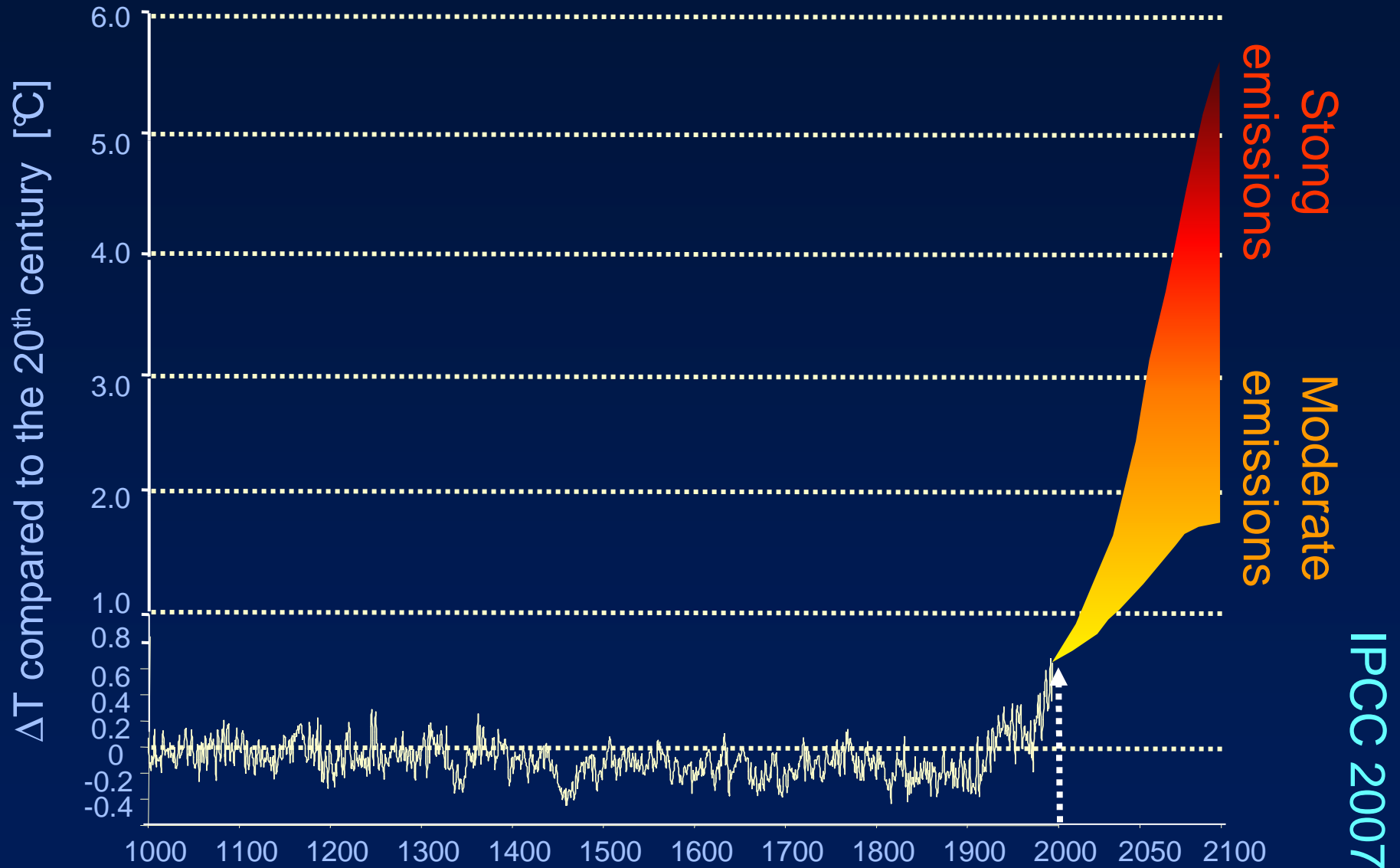
Why human activities are partially responsible ...



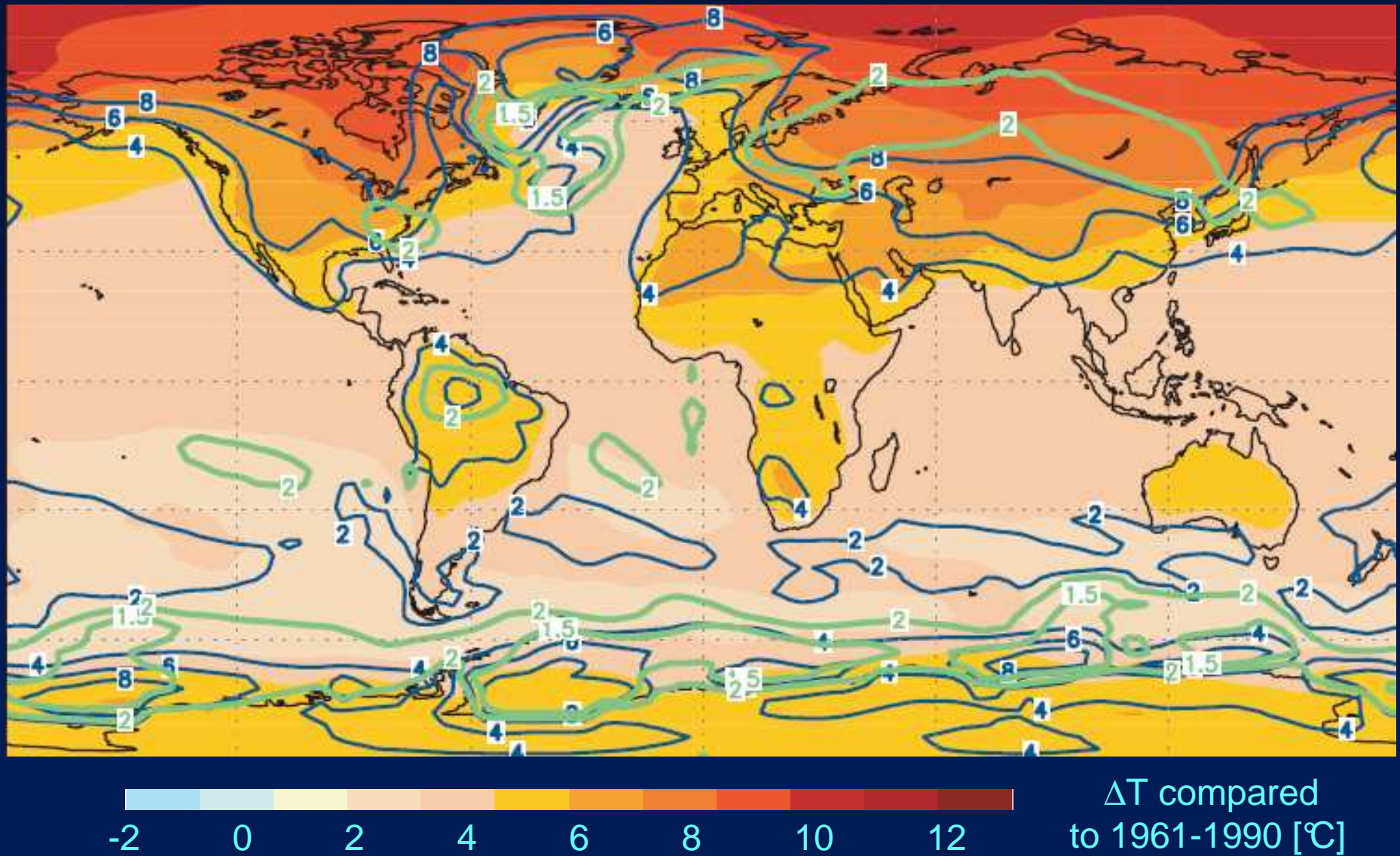
2

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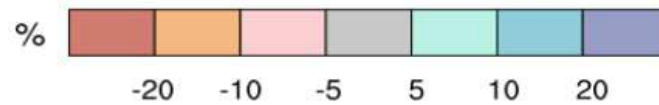
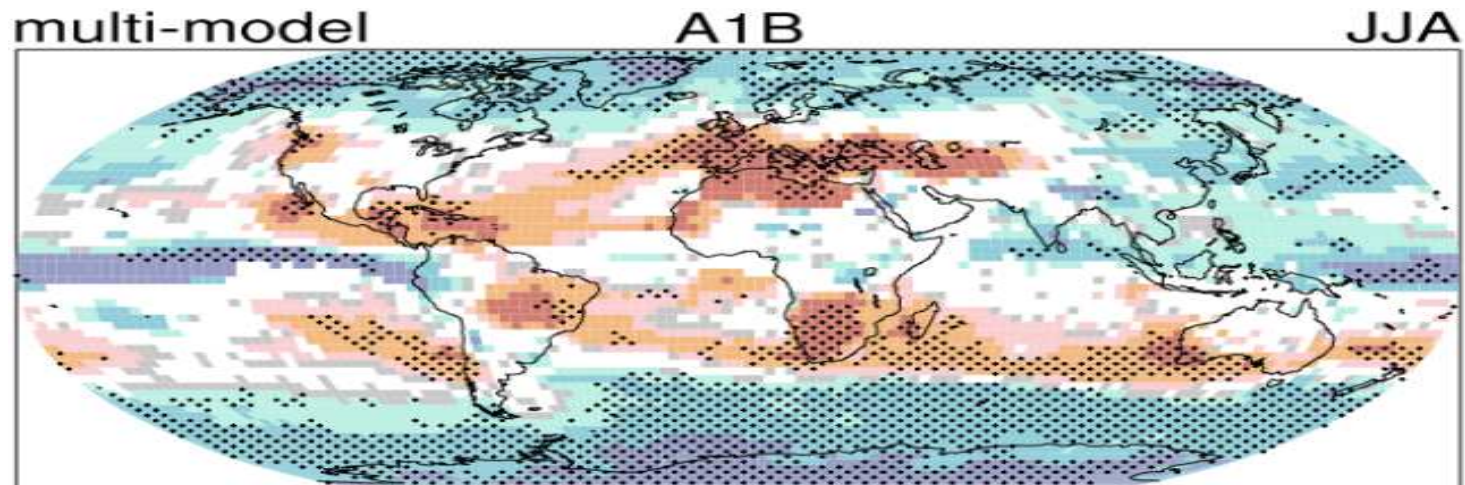
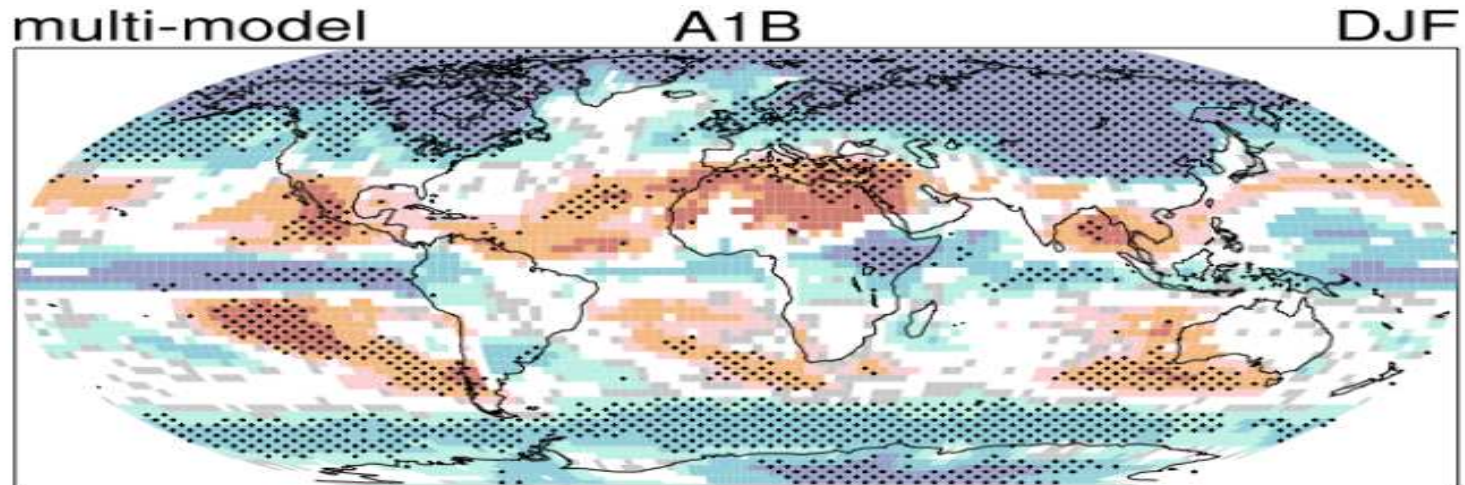
Climate futures



Warming by 2100 (IPCC A-2 Scenario)



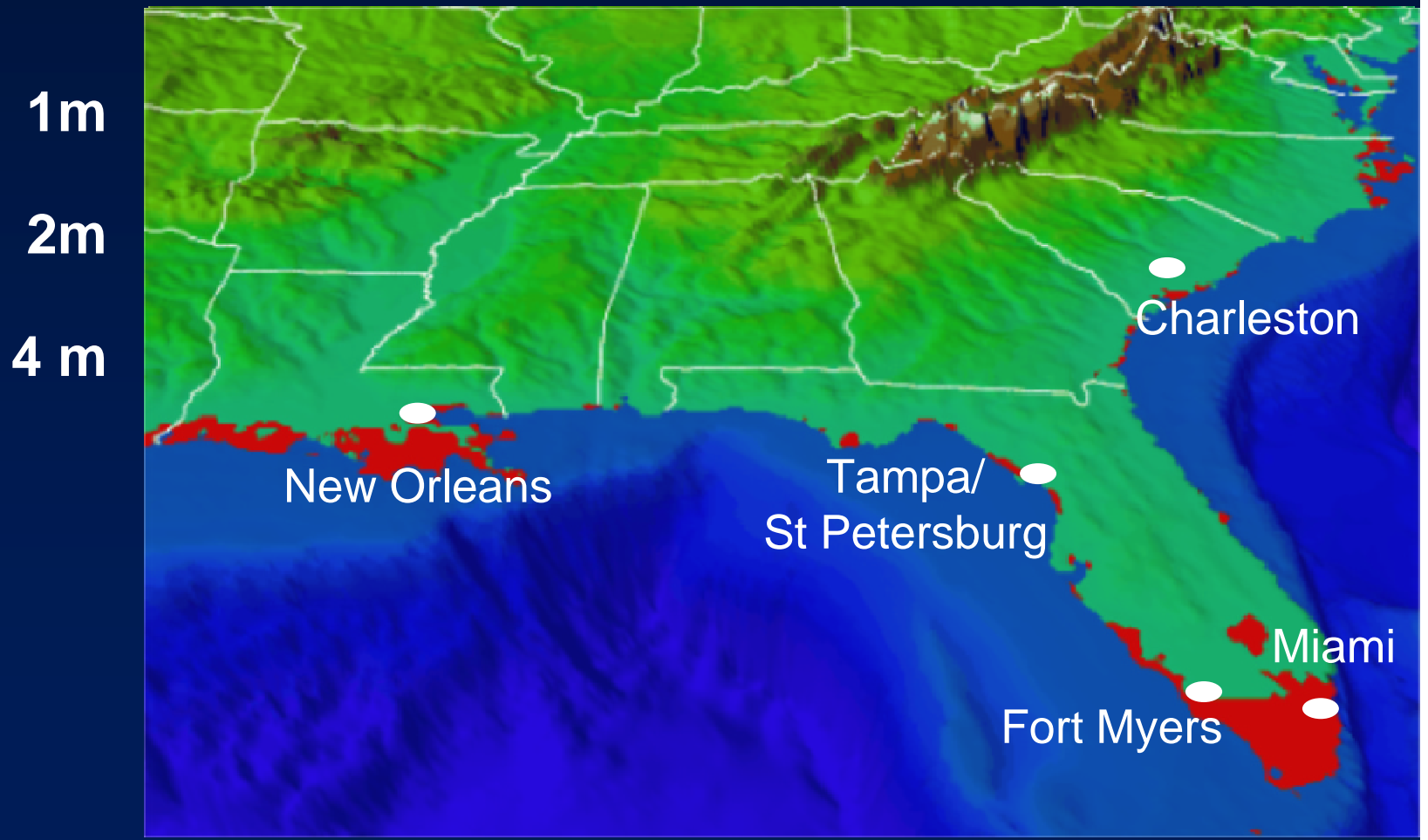
Precipitation change by 2100



3

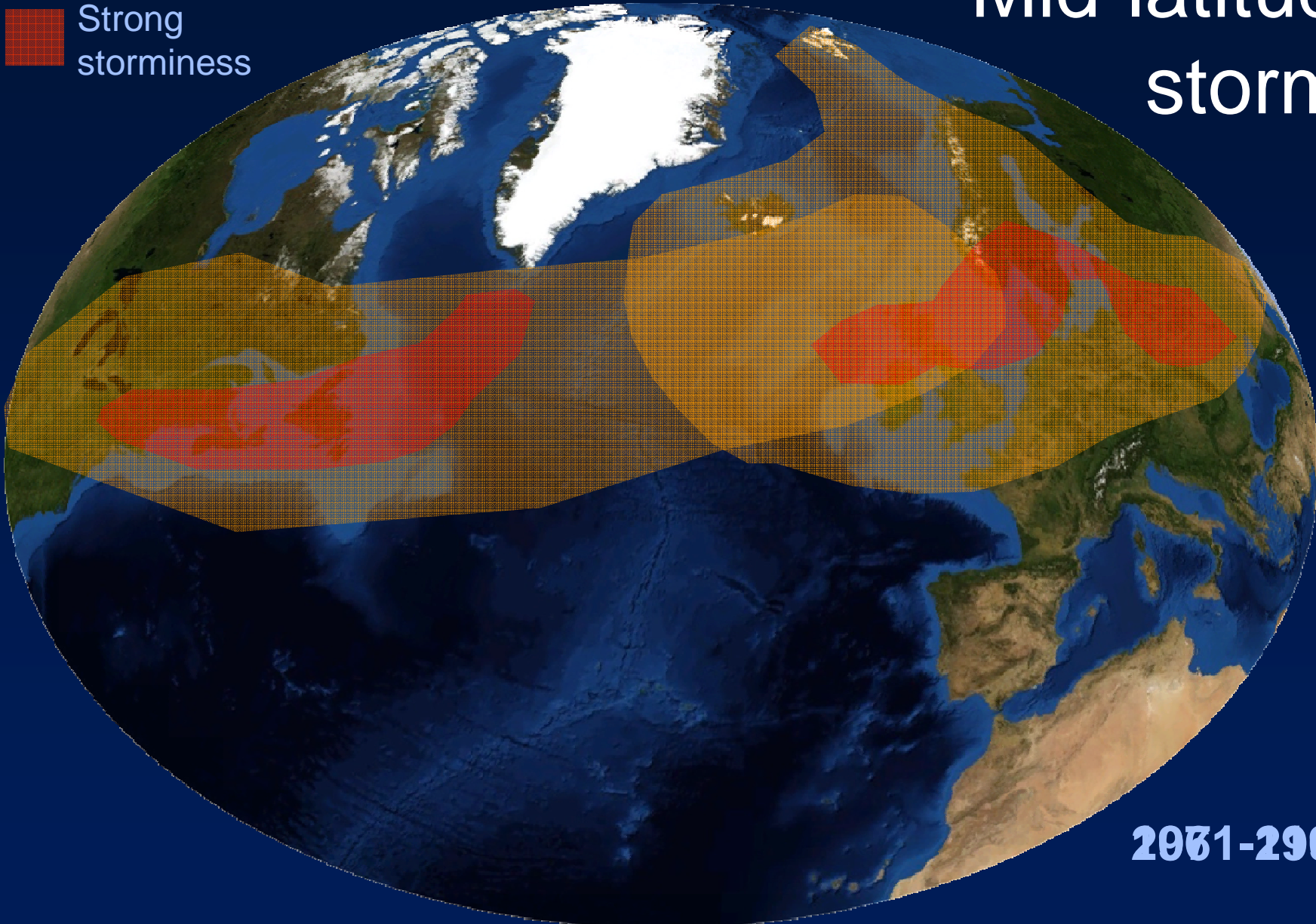
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New coastal geography in the US Gulf States: sea-level rise and storm surges



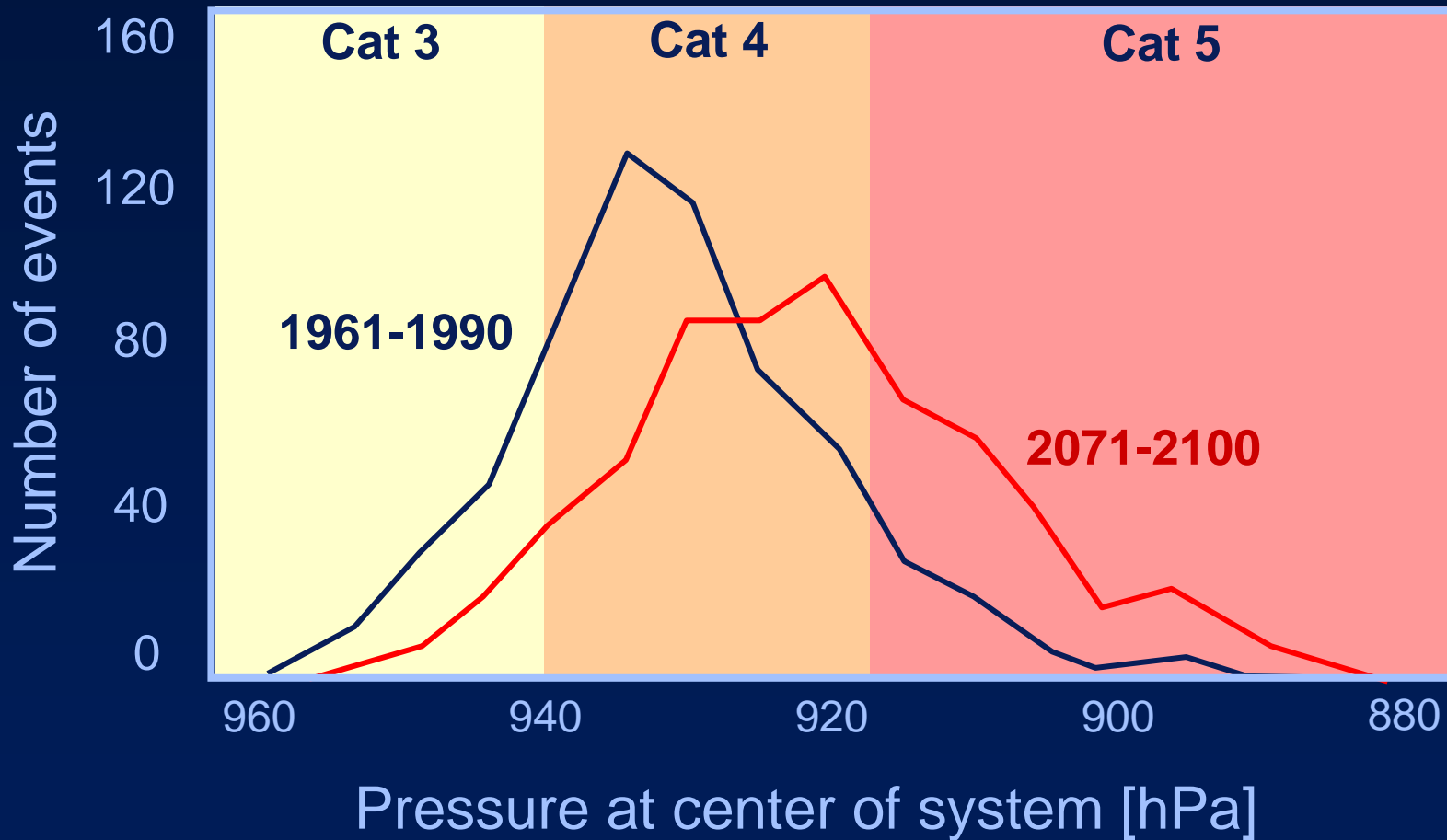
- Moderate storminess
- Strong storminess

Mid-latitude storms



1961-1990

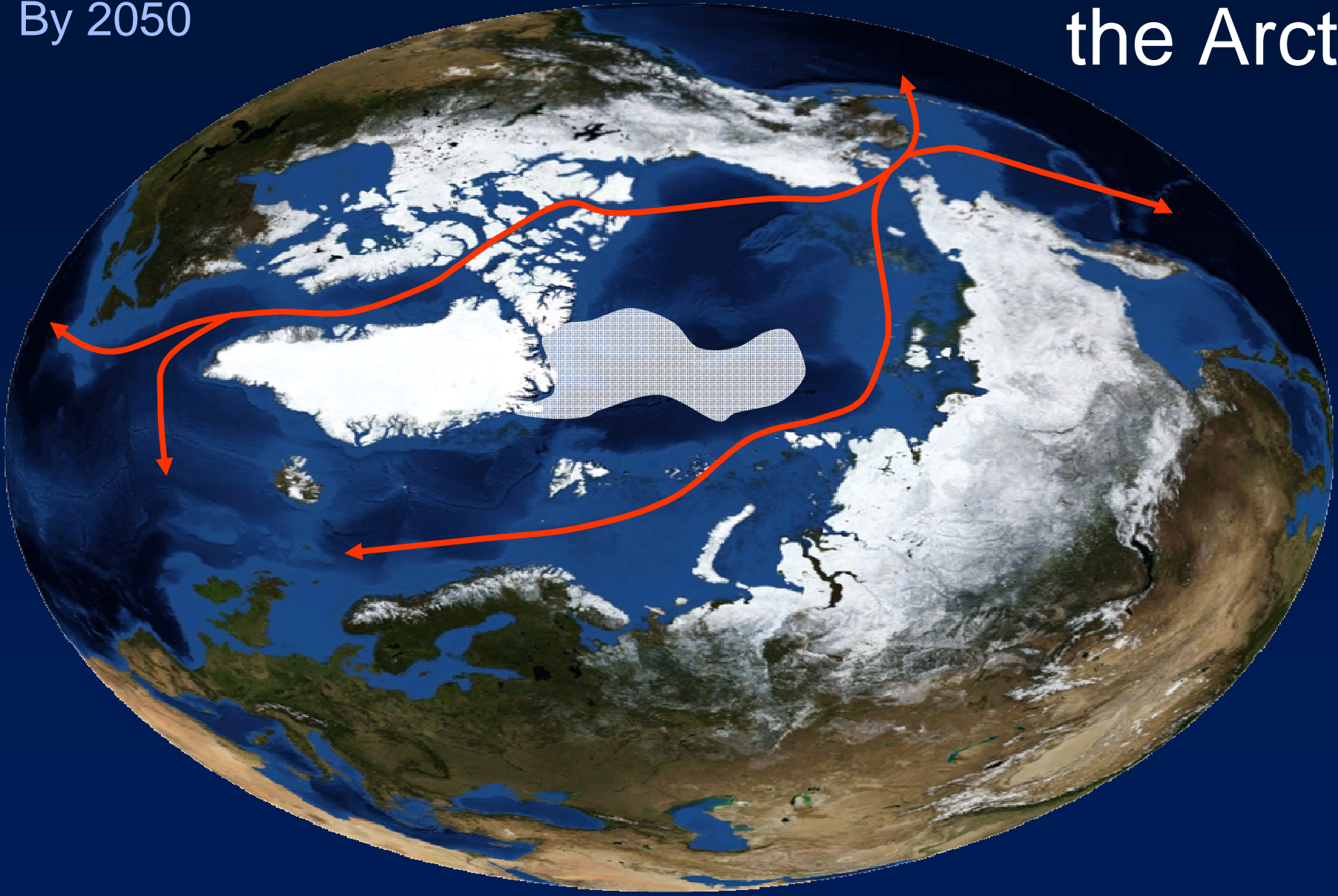
Tropical storms



K. Emmanuel, Science: 2006

New navigation routes in the Arctic

By 2050



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Outlook for the transport sector

- Transport is particularly sensitive to extremes of weather that could increase in a future, warmer, climate
- Positive changes can also be anticipated, such as longer periods without frost or snow that today often lead to disruptions and accidents
- The evolution of the transportation sector is highly dependent on changes in other sectors of the economy
 - ◆ As a result, climate impacts on transportation may be less important than structural changes in transportation systems in the future

Climatic change and transportation: the scientific basis

MANY THANKS FOR
YOUR ATTENTION!

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www.unige.ch/climate