



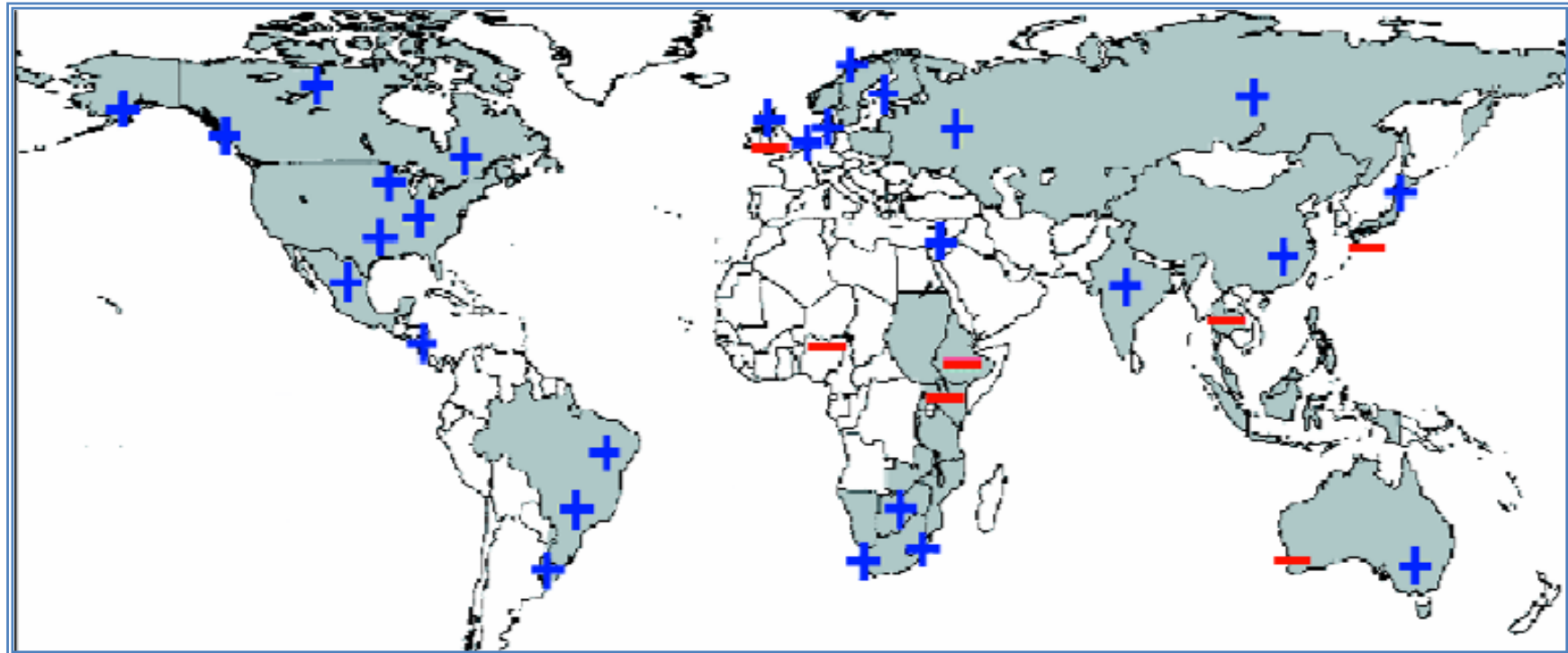
Changes in Precipitation, Increased Drought 降水变化，干旱增加

- Significantly **increased precipitation** in eastern parts of North and South America, northern Europe and northern and central Asia. (降水增加显著区域)
- The **frequency of heavy precipitation events** has increased over most land areas - consistent with warming and increases of atmospheric water vapour (强降水事件发生频率增加)
- **Drying** in the Sahel, the Mediterranean, southern Africa and parts of southern Asia.
- **More intense and longer droughts** observed since the 1970s, particularly in the tropics and subtropics. (干旱)

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Proportion of heavy rainfalls: *increasing in most land areas*

强降雨比例：在大部分陆地地区都增加

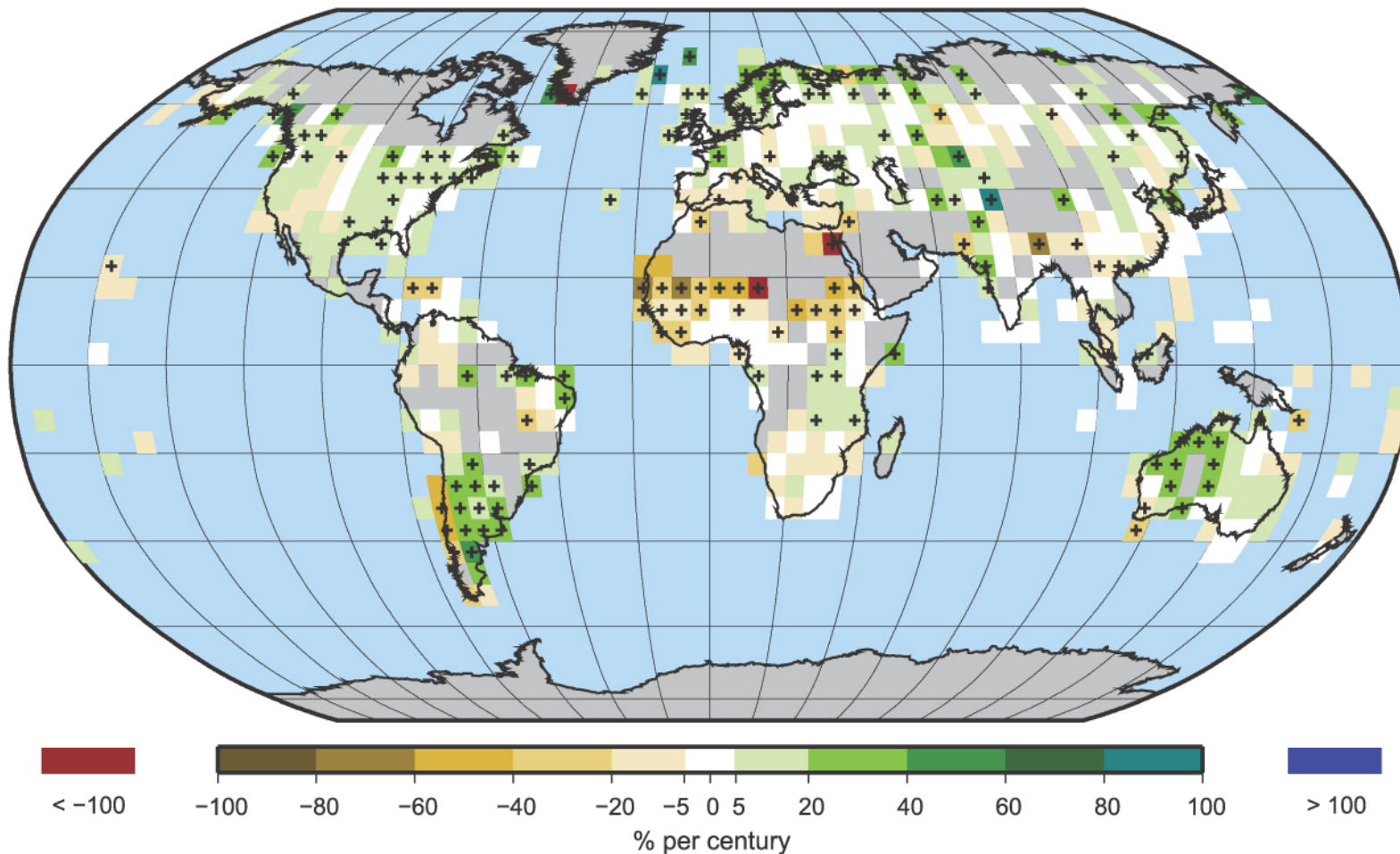


Regions of disproportionate changes in heavy and very heavy precipitation

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The precipitation trend (降水趋势)

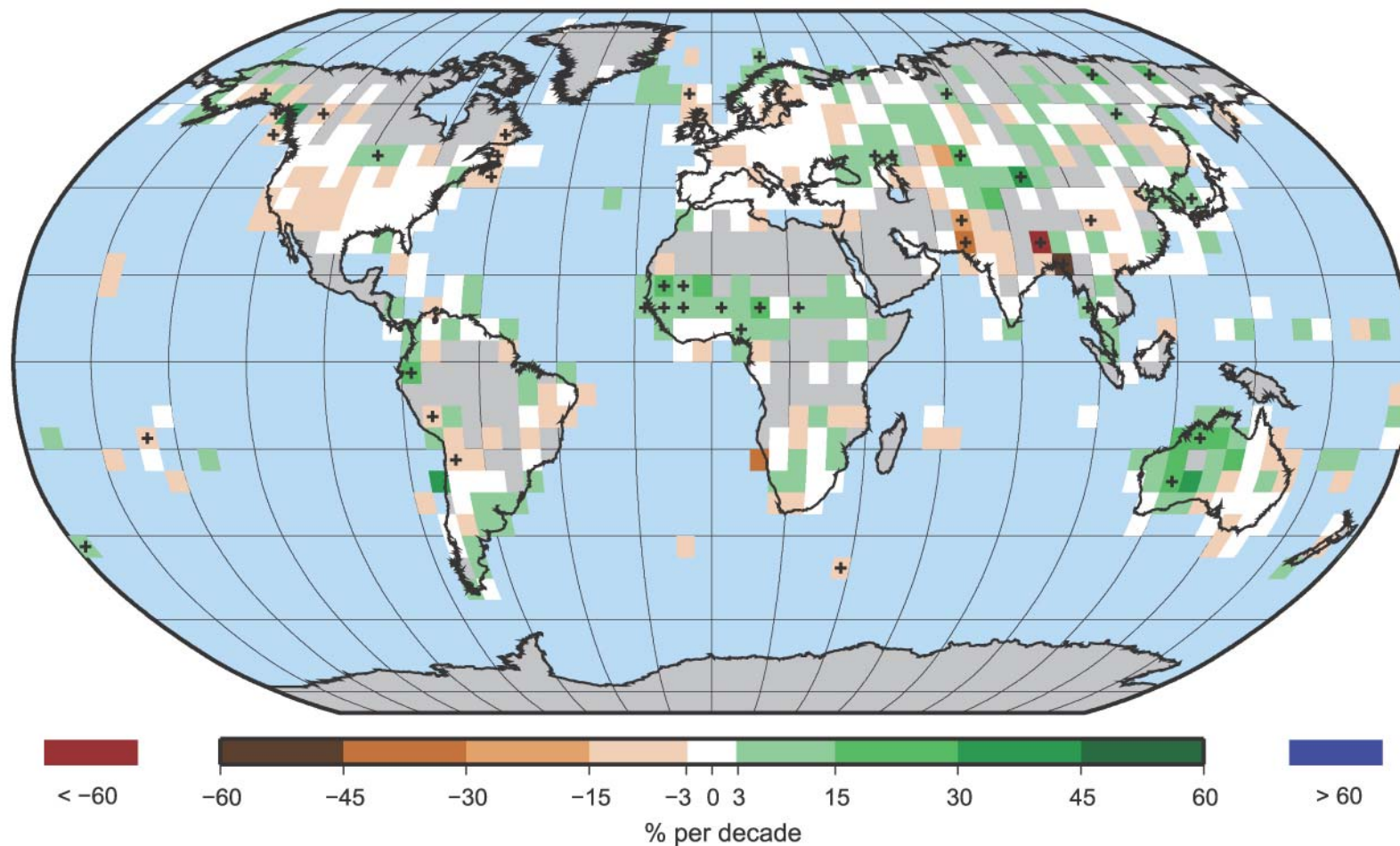
Trend in Annual Precipitation, 1901 to 2005



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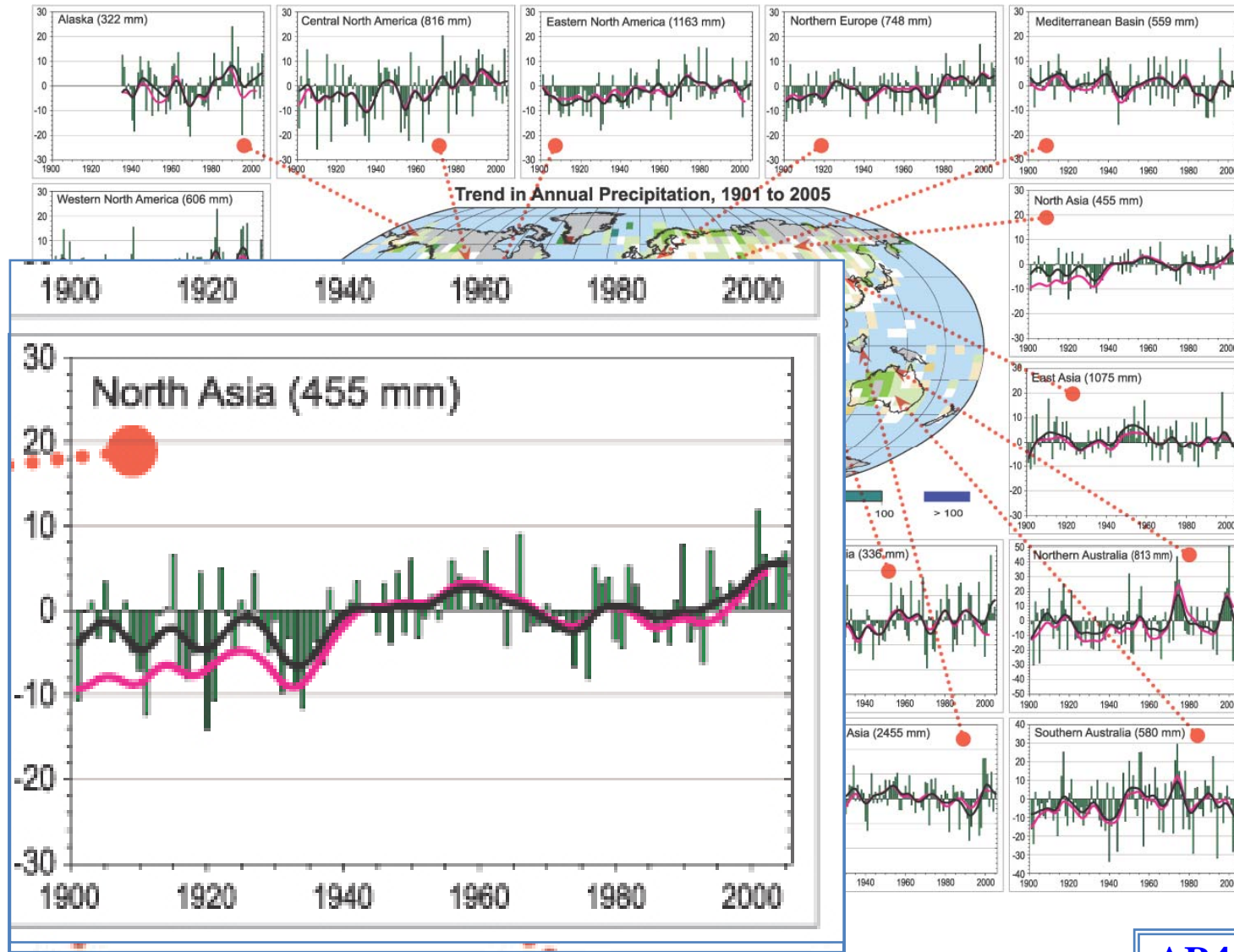
The precipitation trend (降水趋势)

Trend in Annual Precipitation, 1979 to 2005



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The precipitation trend (降水趋势)

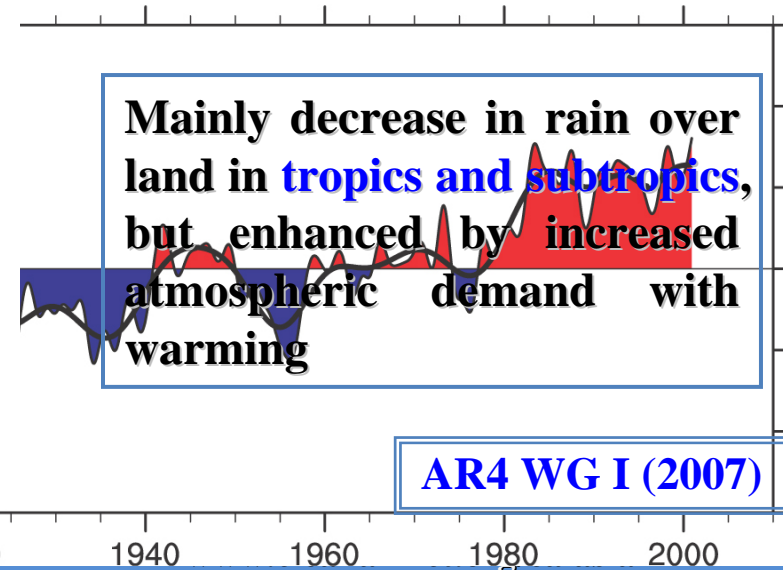
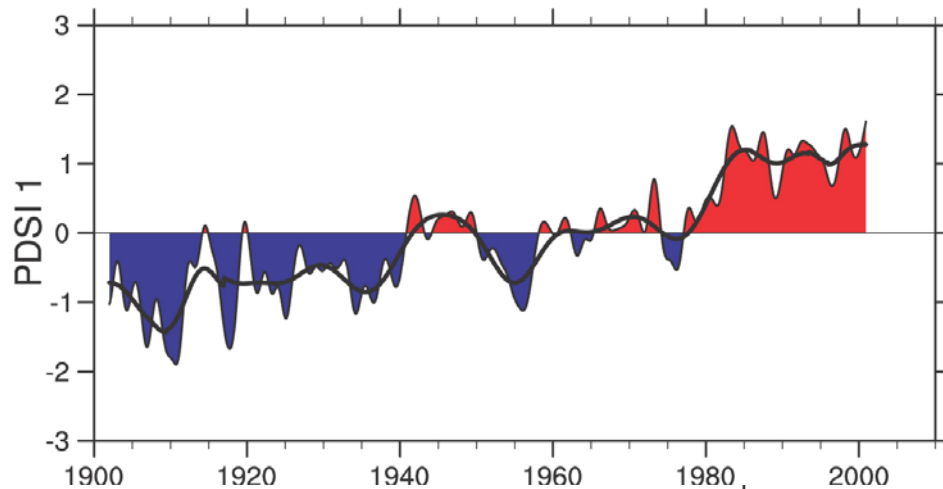
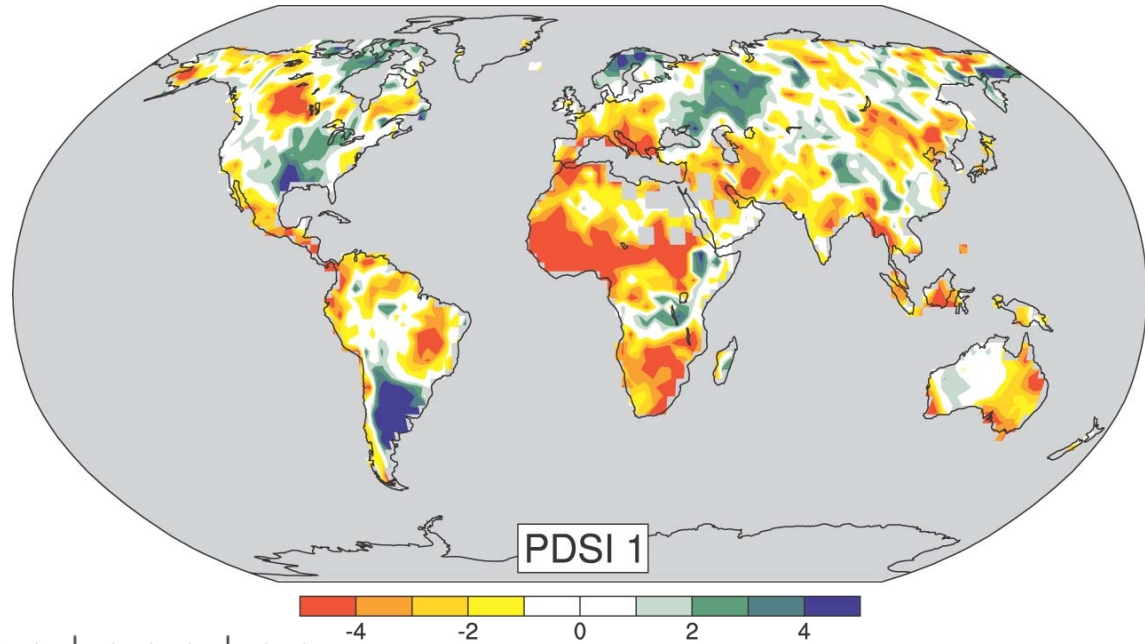


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Drought is increasing most places

大部分地区干旱增加

The most important spatial pattern of the monthly Palmer Drought Severity Index (帕尔默干旱指数 PDSI) for 1900 to 2002.



Mainly decrease in rain over land in **tropics and subtropics**, but enhanced by increased atmospheric demand with warming

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Other changes in Extreme Events 极端天气事件

- ☑ Widespread changes in **extreme temperatures** observed
- ☑ **Cold** days, cold nights and **frost less frequent**
- ☑ **Hot** days, hot nights, and **heat waves more frequent**
- ☑ Observational evidence for an **increase of intense tropical cyclone activity** in the North Atlantic since about 1970, correlated with increases of tropical sea surface temperatures

- ☑ 极端温度
- ☑ 冷日,冷夜和霜冻事件越来越少!
- ☑ 热日,热夜和热浪事件越来越多!
- ☑ 热带气旋强度增加

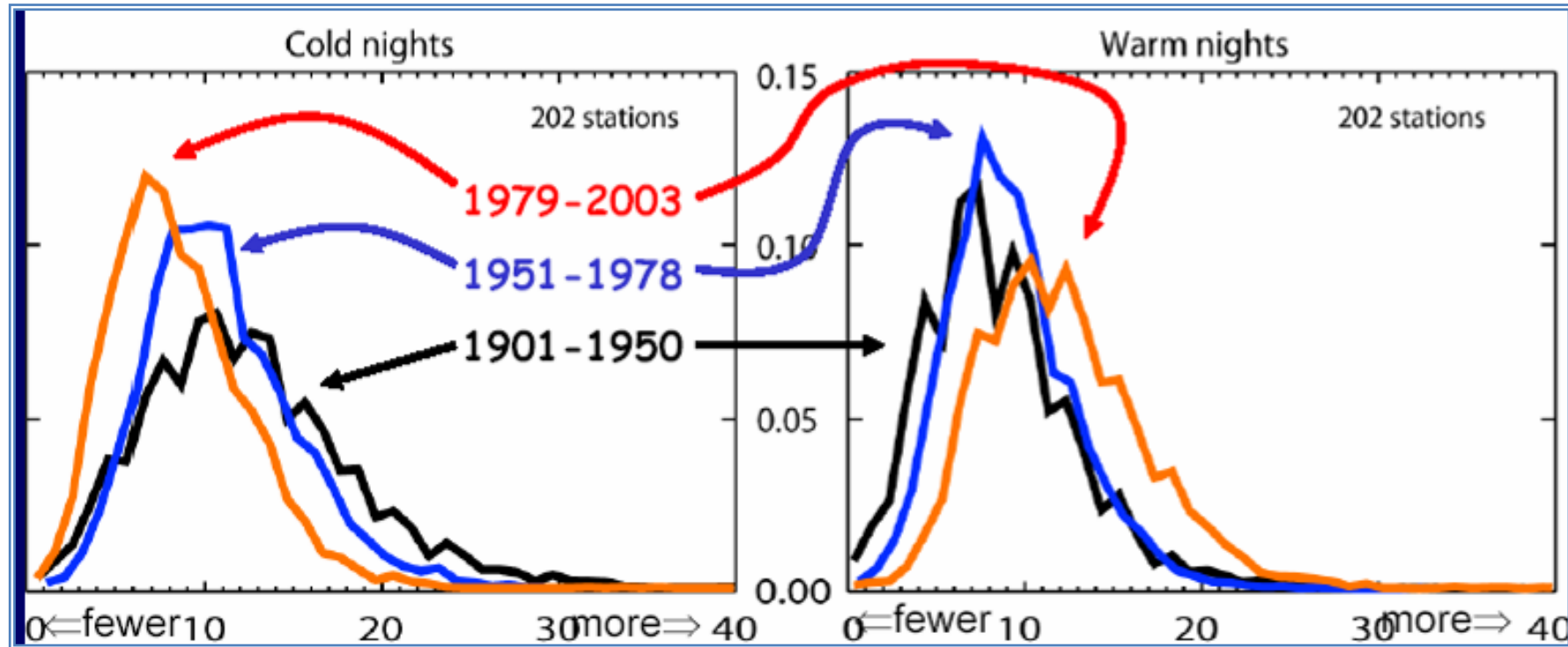
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极端天气事件

现象及趋势走向	20世纪后期发生极端天气时间的可能性(特别是60年代后期)	人类活动对所观测到趋势的贡献可能性	根据估算21世纪活动对未来趋势的影响可能性
大部分陆地变得更热, 寒冷天气减少	很有可能	有可能	确实影响
大部分陆地变得更热, 热天出现更频繁	很有可能	有可能 (夜间)	确实影响
大部分陆地变得更热, 热浪频繁	有可能	较可能	很有可能
大部分陆地过量降水事件频繁	有可能	较可能	很有可能
受干旱影响地区增加	在很多地区可能	较可能	有可能
密集热带风暴活动增加	在有些地区可能	较可能	有可能
极高海平面情况增加 (除海啸)	可能	较可能	有可能

Warm nights are increasing cold nights decreasing 炎热夜晚增加，寒冷夜晚减少

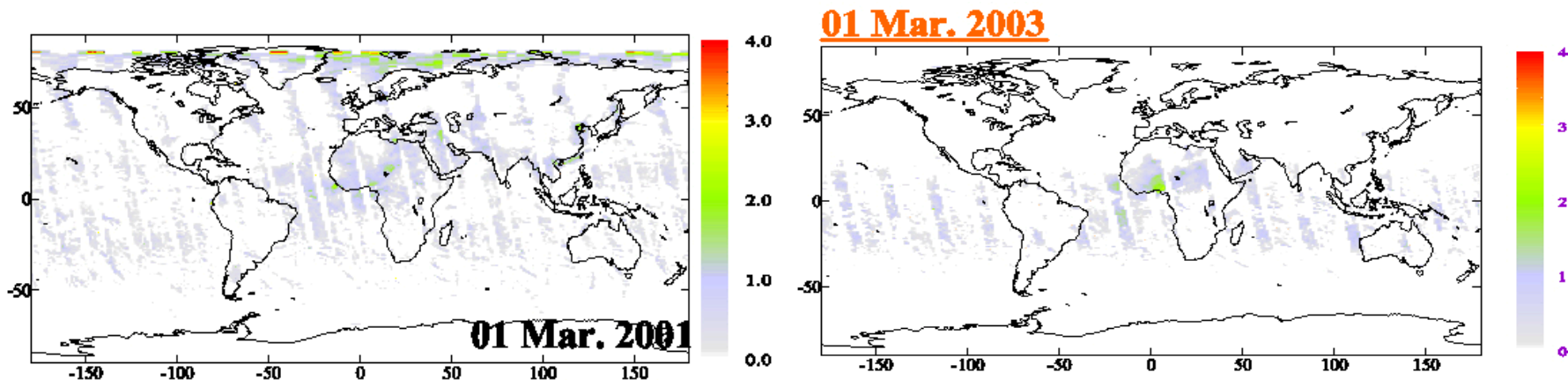


Frequency of occurrence of cold or warm temperatures for 202 global stations for 3 time periods:
1901 to 1950 (black), 1951 to 1978 (blue) and 1979 to 2003 (red).

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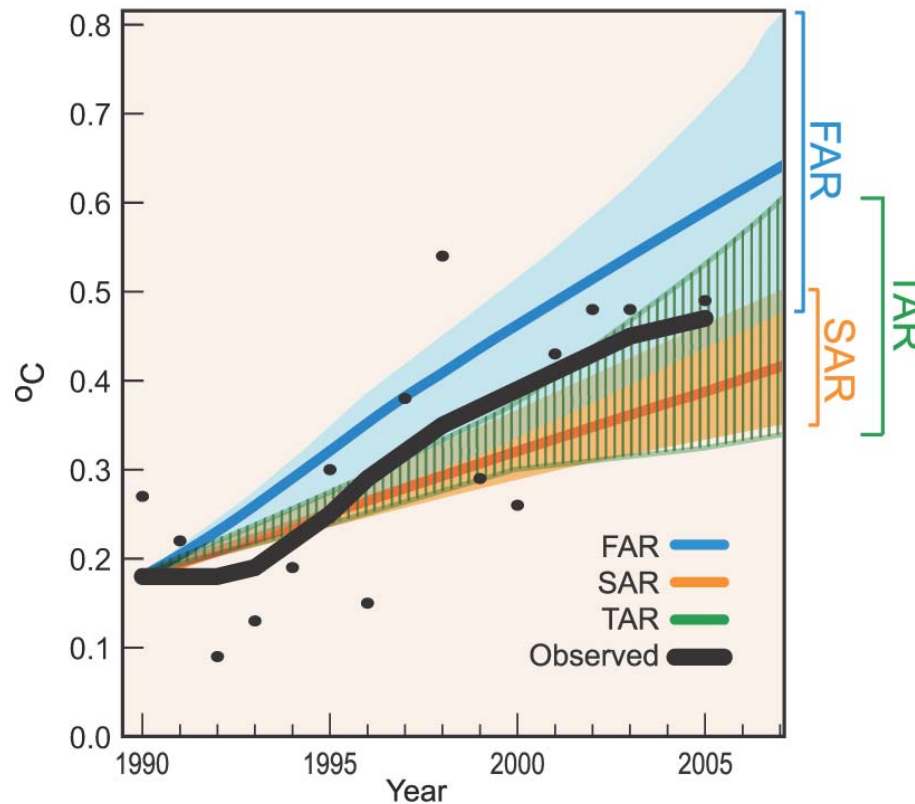
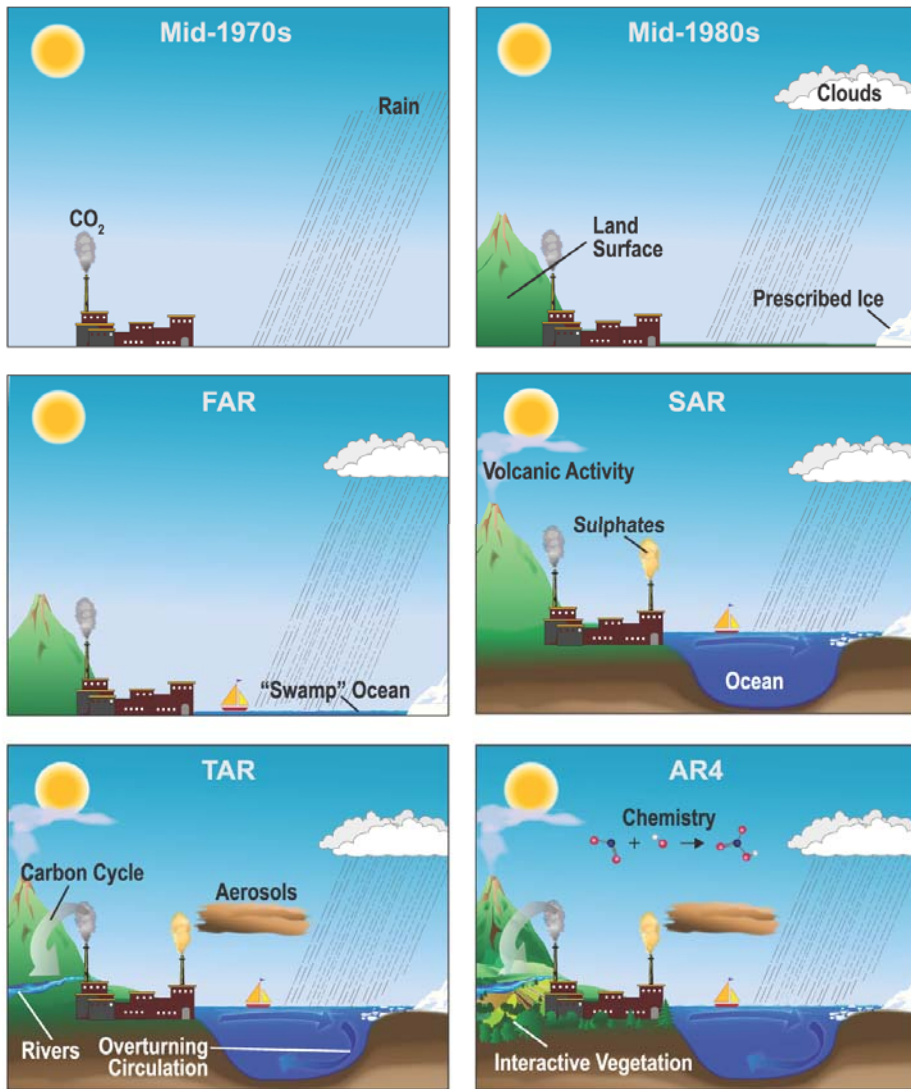
Some aspects of climate have not been observed to change:

- ☐ Tornadoes
- ☐ Dust-storms
- ☐ Hail
- ☐ Lightning
- ☐ Antarctic sea ice



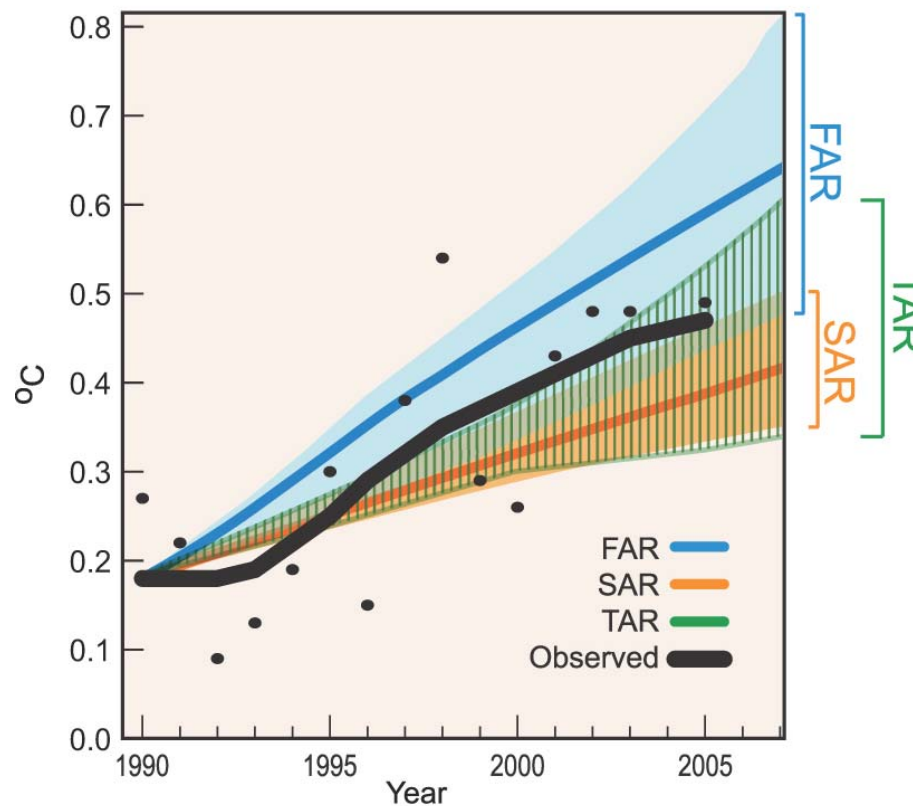
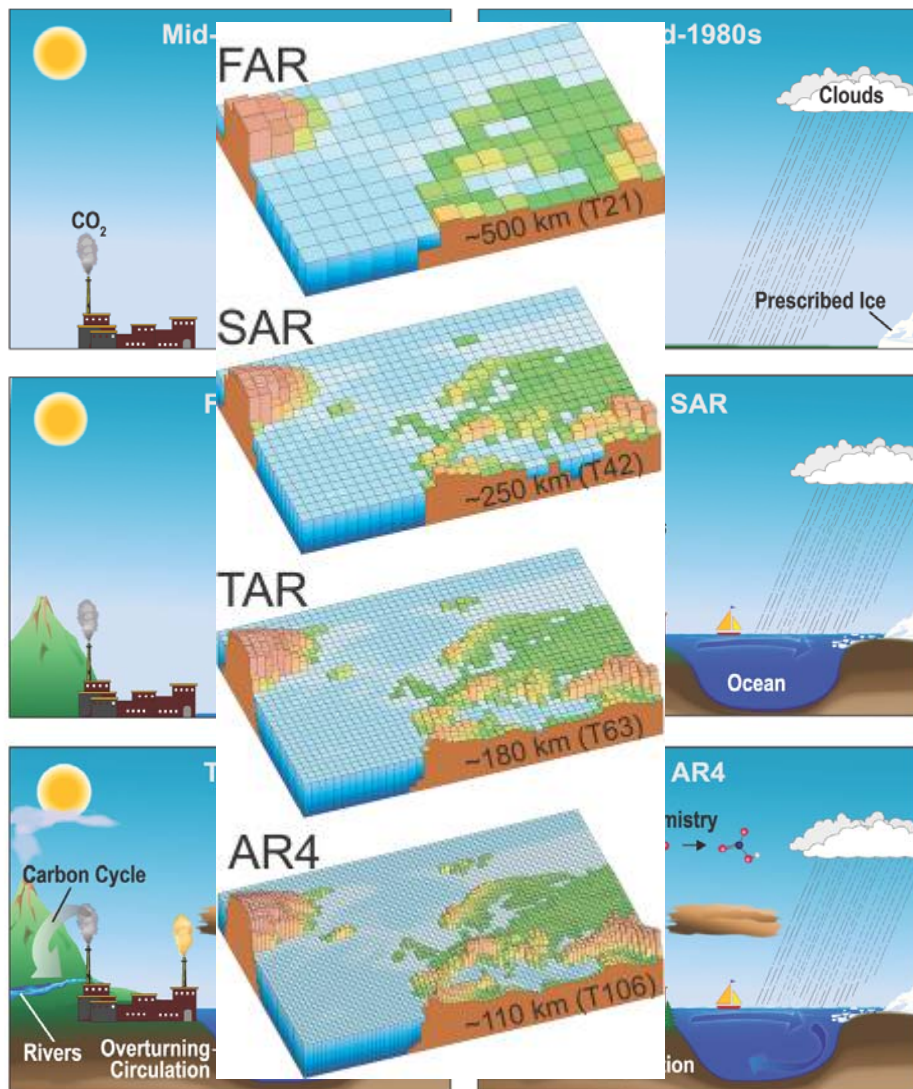
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The World in Global Climate Models

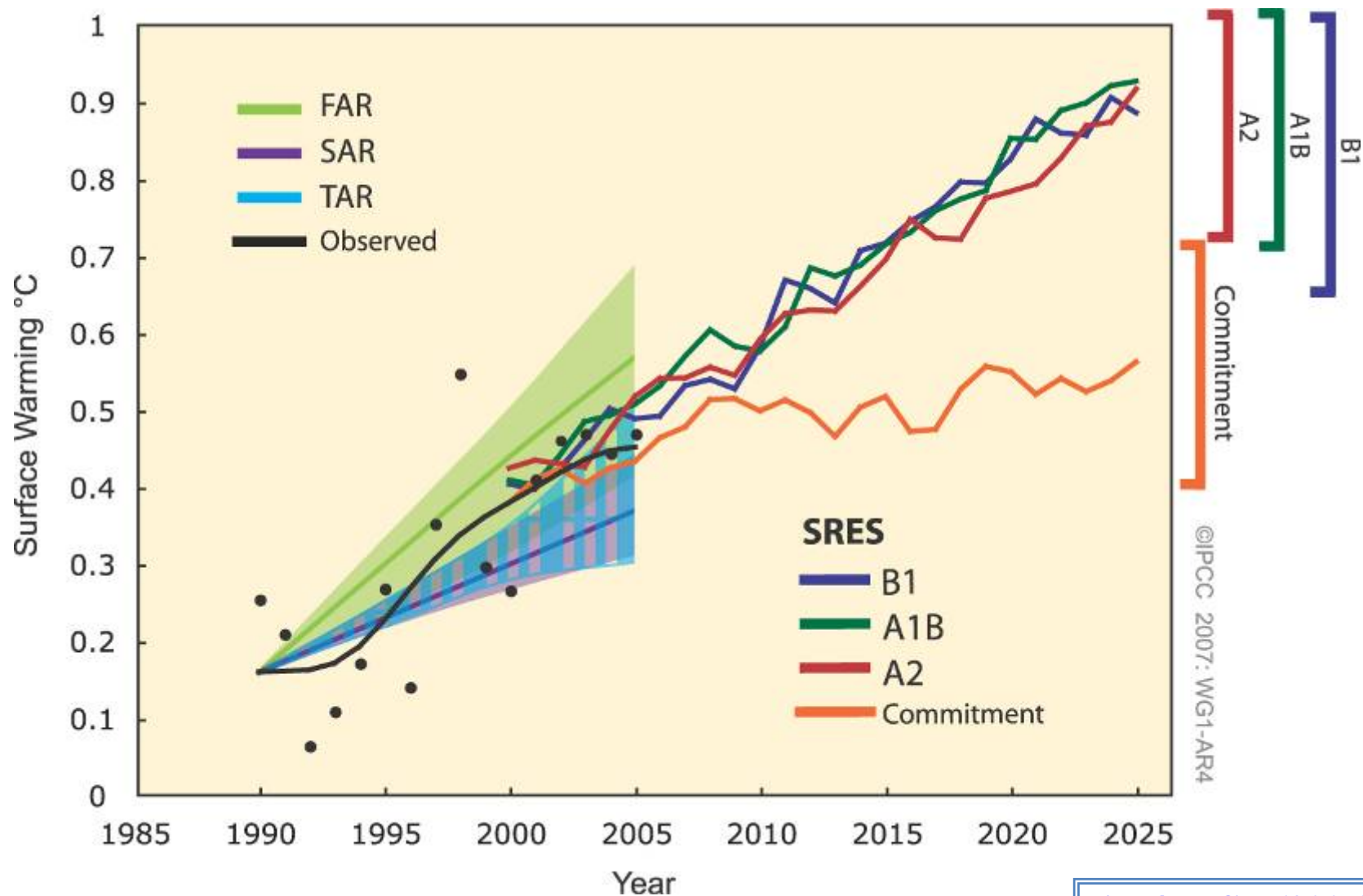


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The World in Global Climate Models



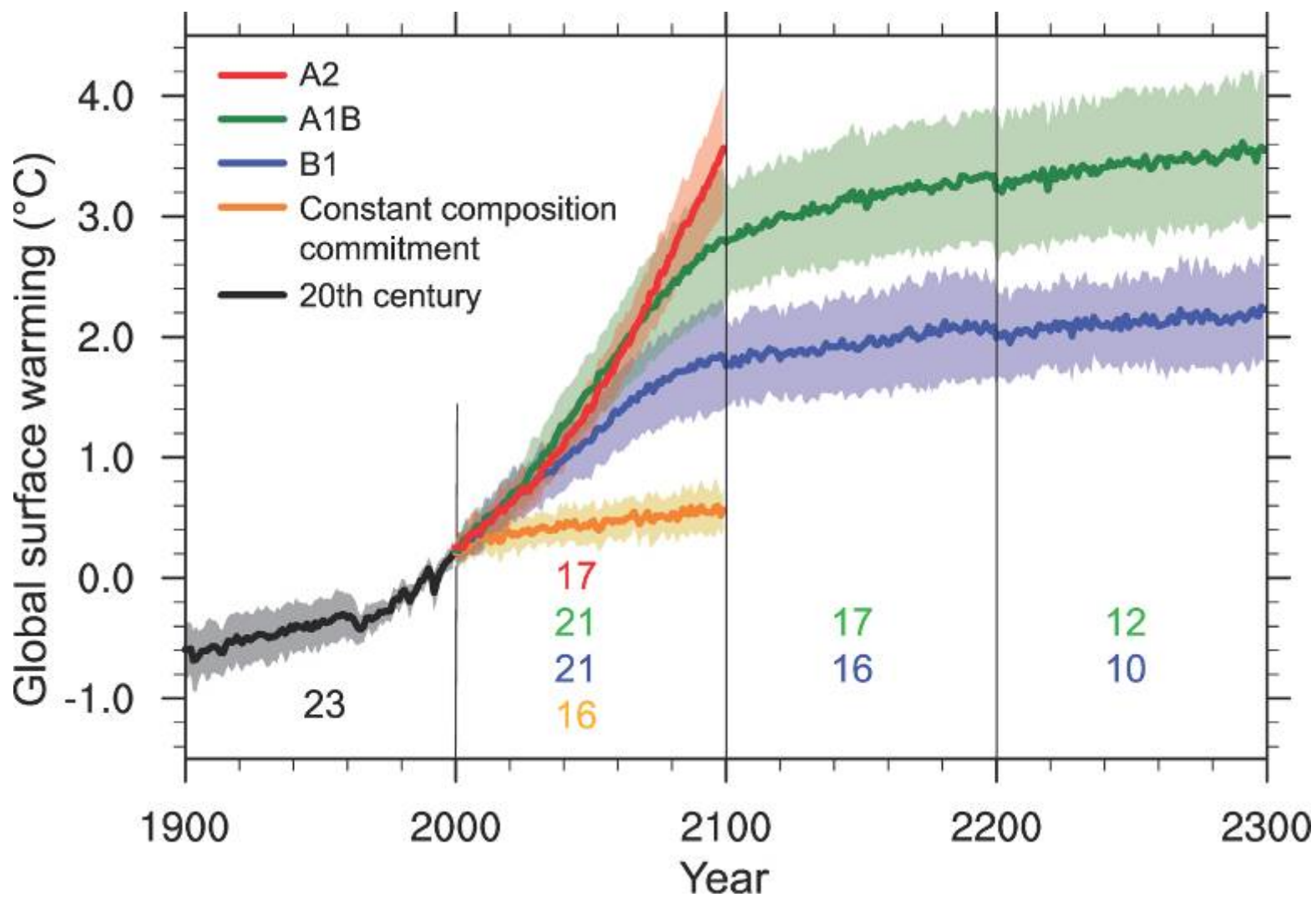
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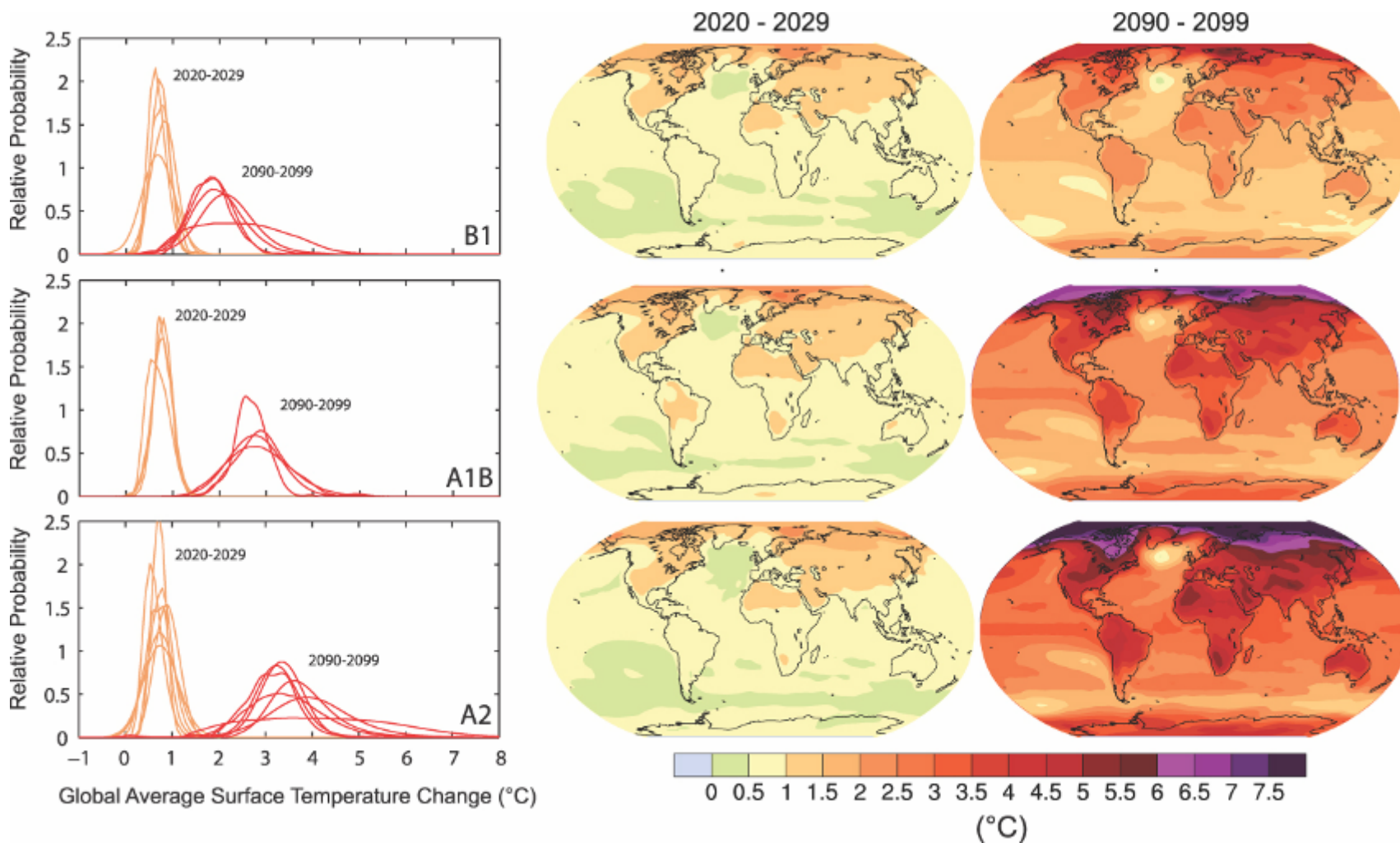
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Future Trends: Global Surface Temperatures 未来趋势：全球温度



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