



THE CHANGING EARTH

Klimawandel in der Erdneuzeit - Was sagen uns Modelle und Fossilien im Vergleich

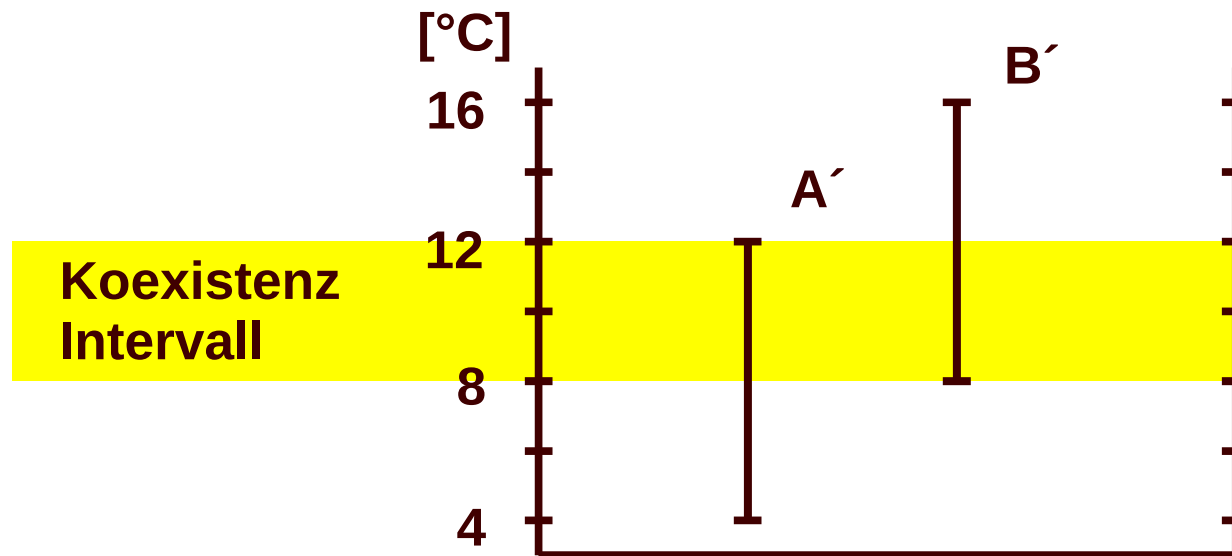
Uhl, D., Herrmann, M., Micheels, A.,
Schneck, R. & Mosbrugger, V.

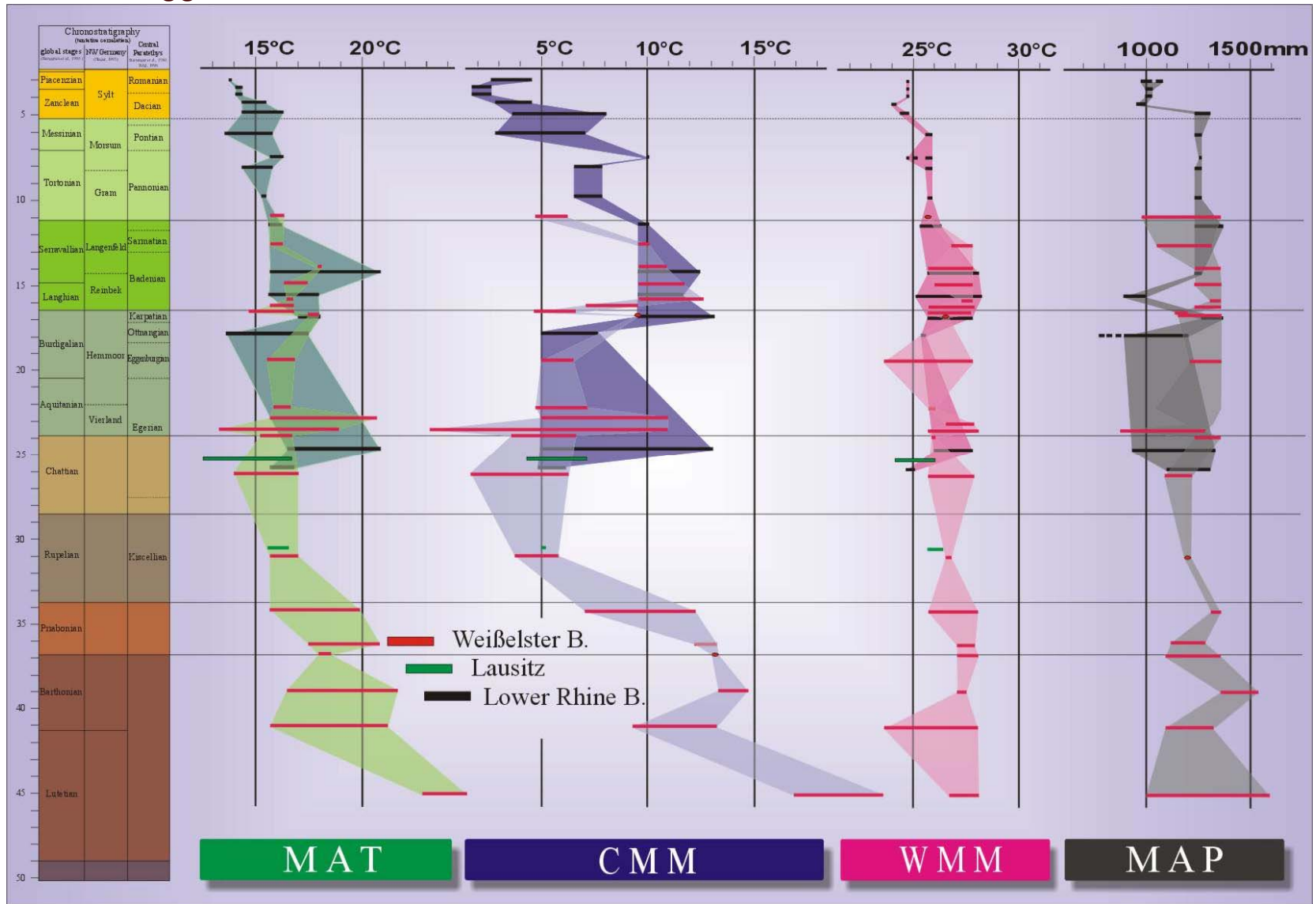


Vergleich mit nächsten lebenden Verwandten

Fossiles Taxon A → Nächster lebender Verwandter A'

Fossiles Taxon B → Nächster lebender Verwandter B'





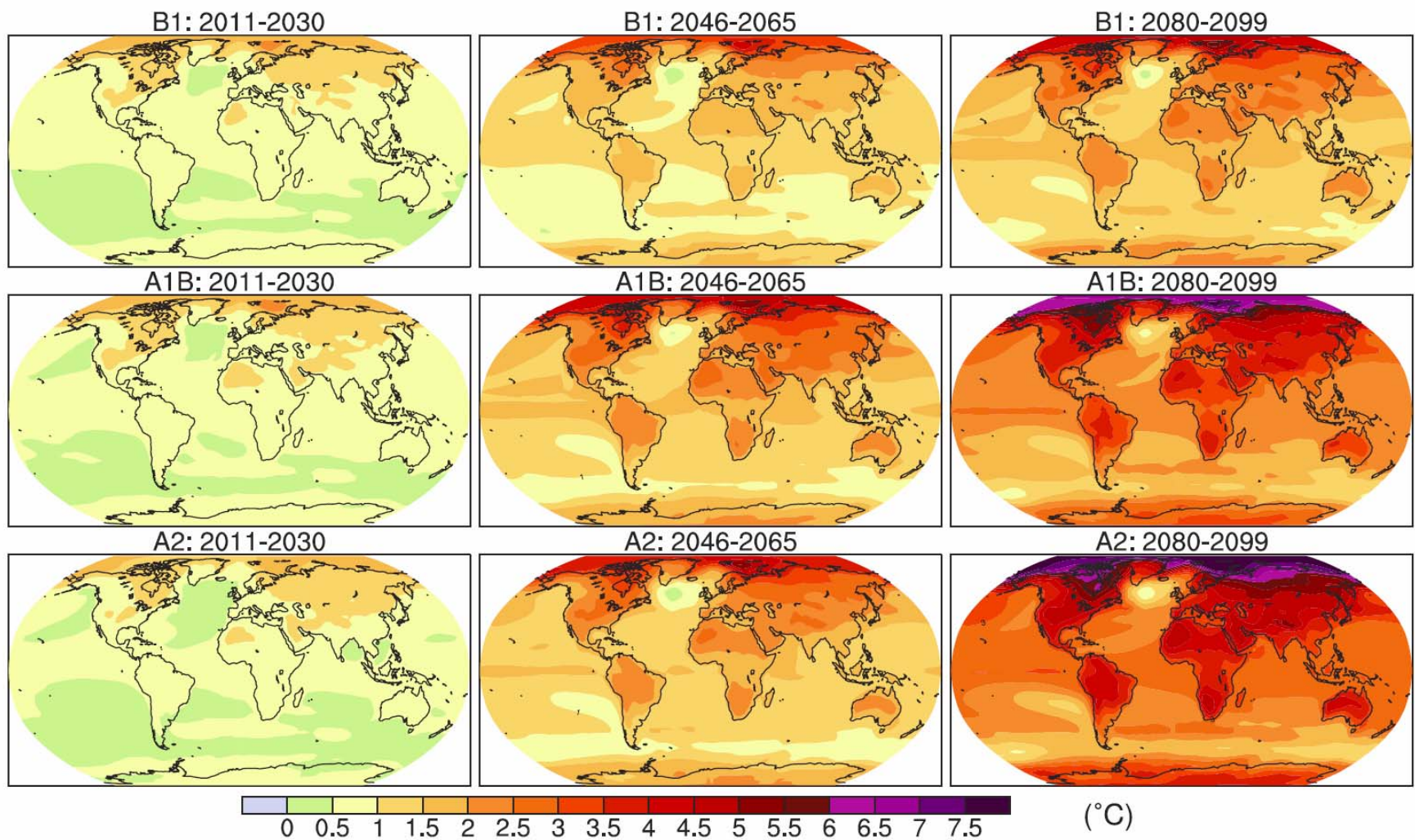
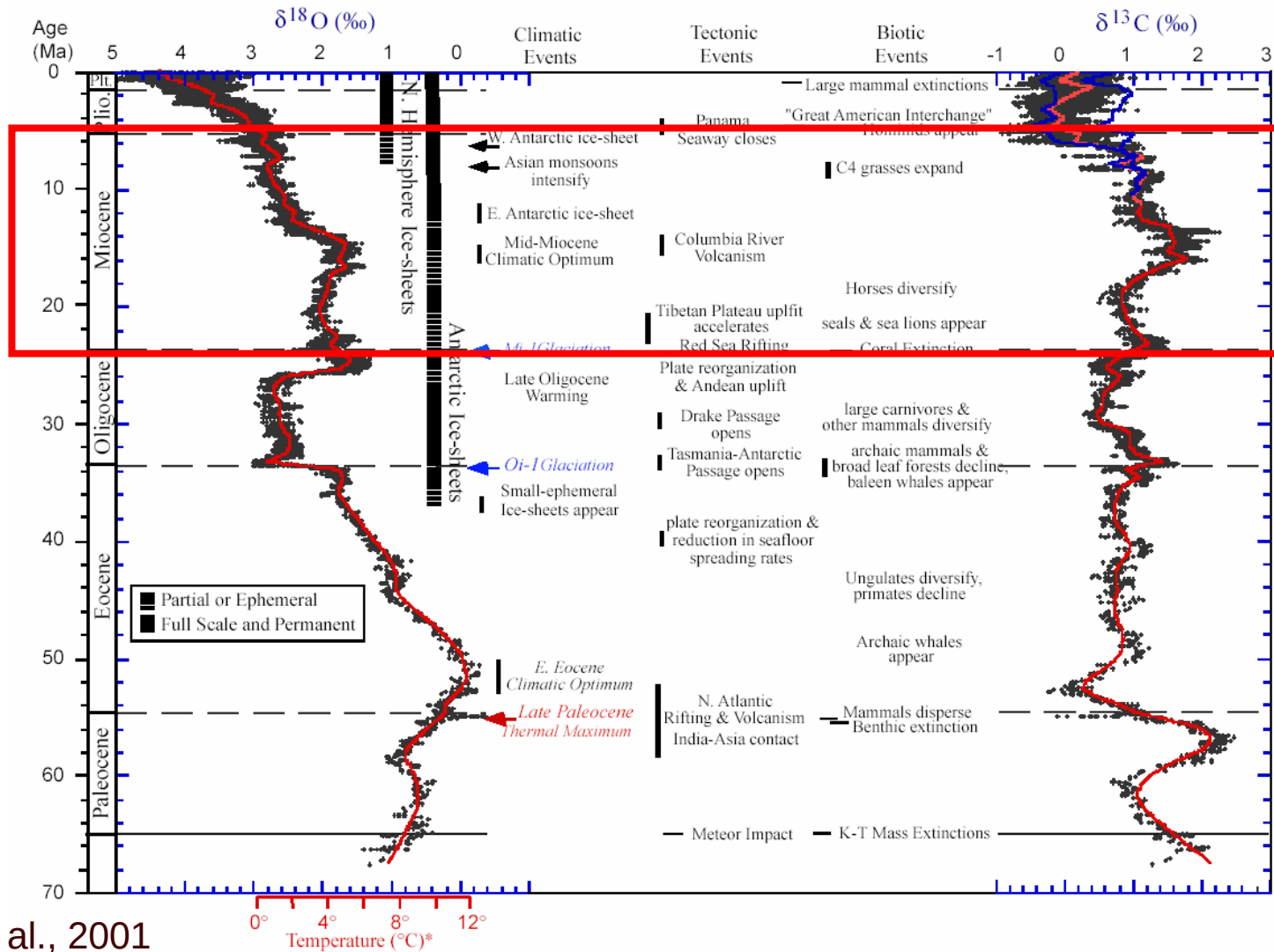
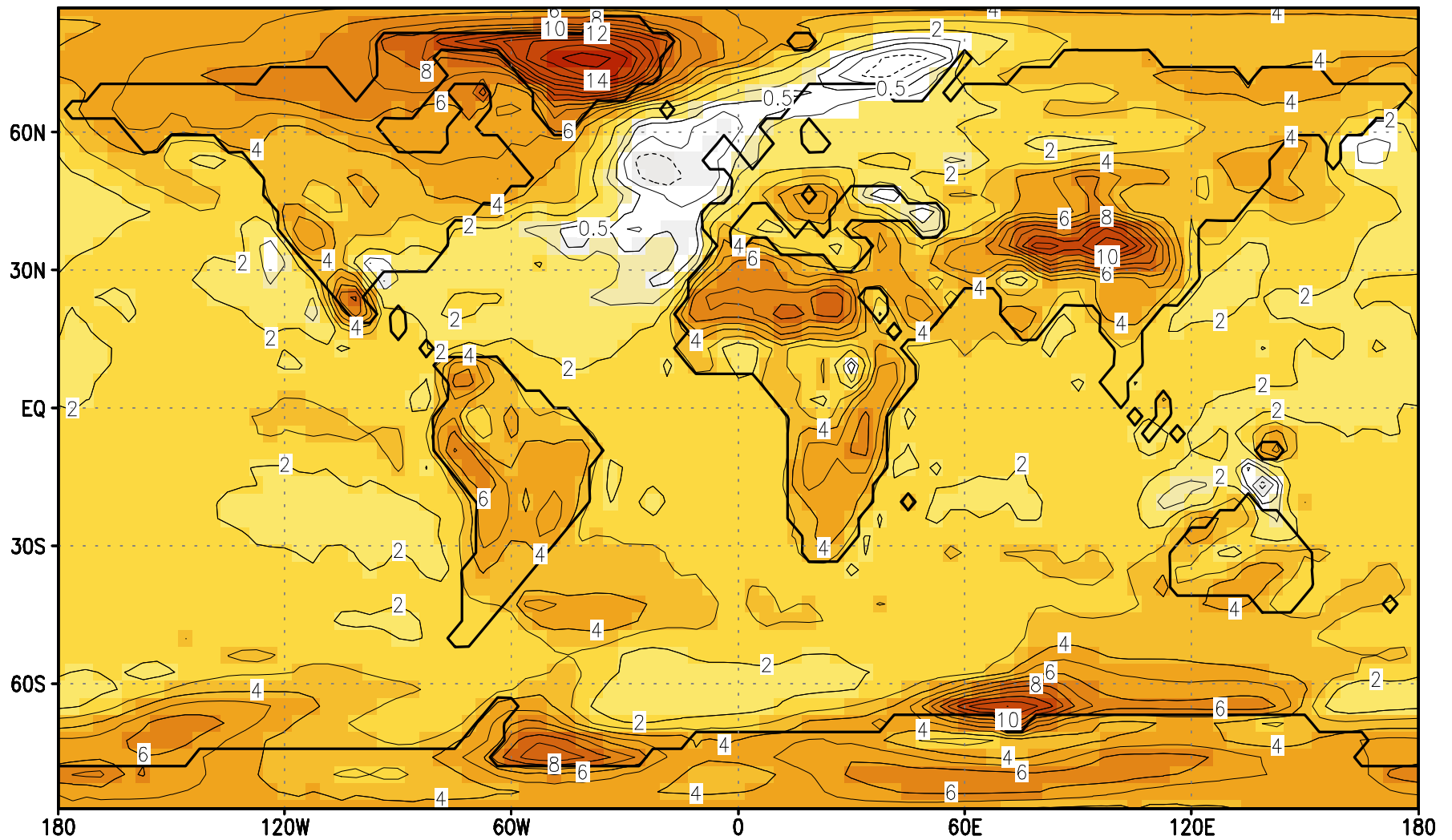


Figure 10.8. Multi-model mean of annual mean surface warming (surface air temperature change, °C) for the scenarios B1 (top), A1B (middle) and A2 (bottom), and three time periods, 2011 to 2030 (left), 2046 to 2065 (middle) and 2080 to 2099 (right). Stippling is omitted for clarity (see text). Anomalies are relative to the average of the period 1980 to 1999. Results for individual models can be seen in the Supplementary Material for this chapter.

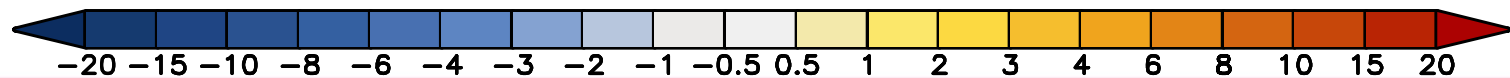
IPCC 2007



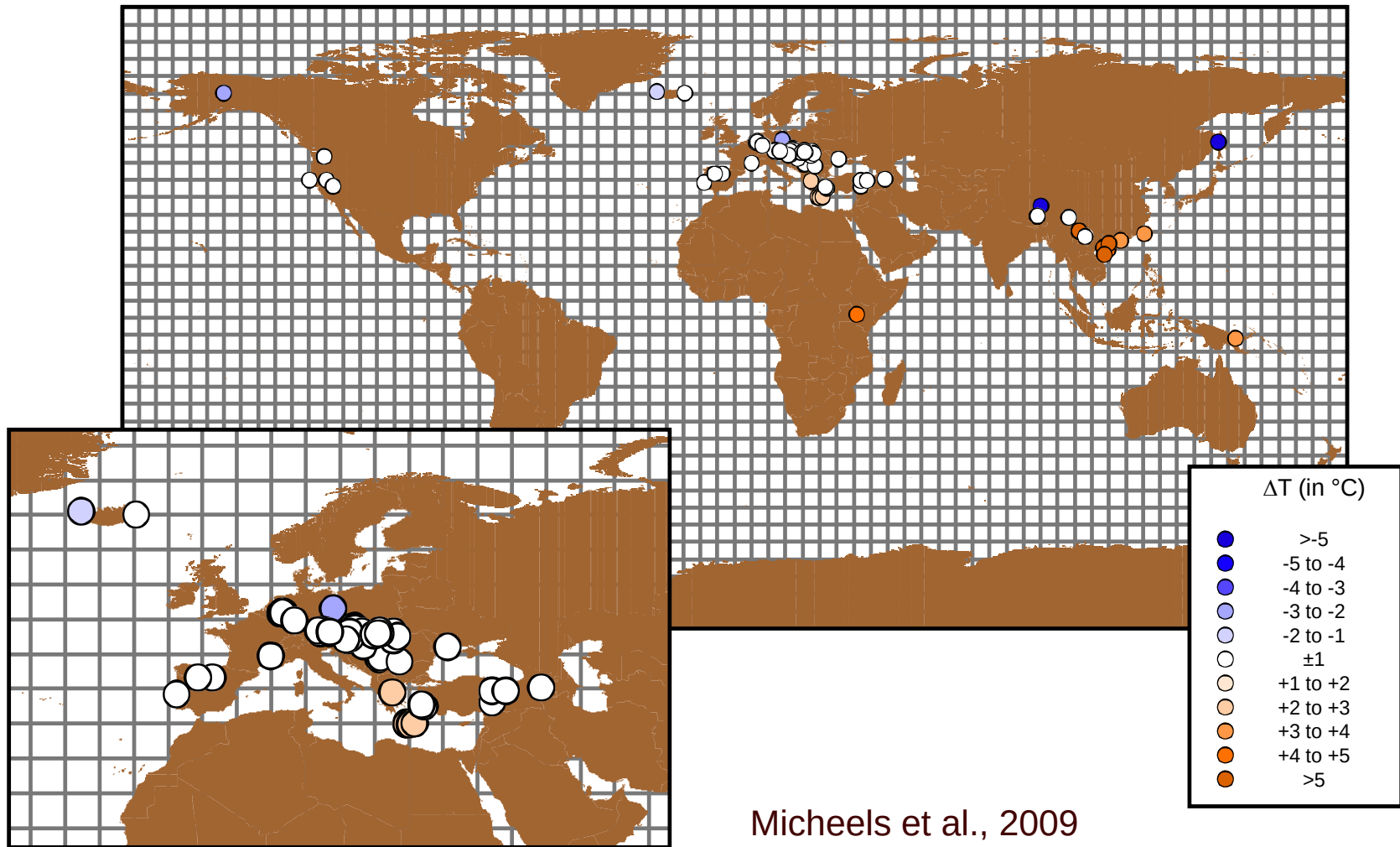
Zachos et al., 2001

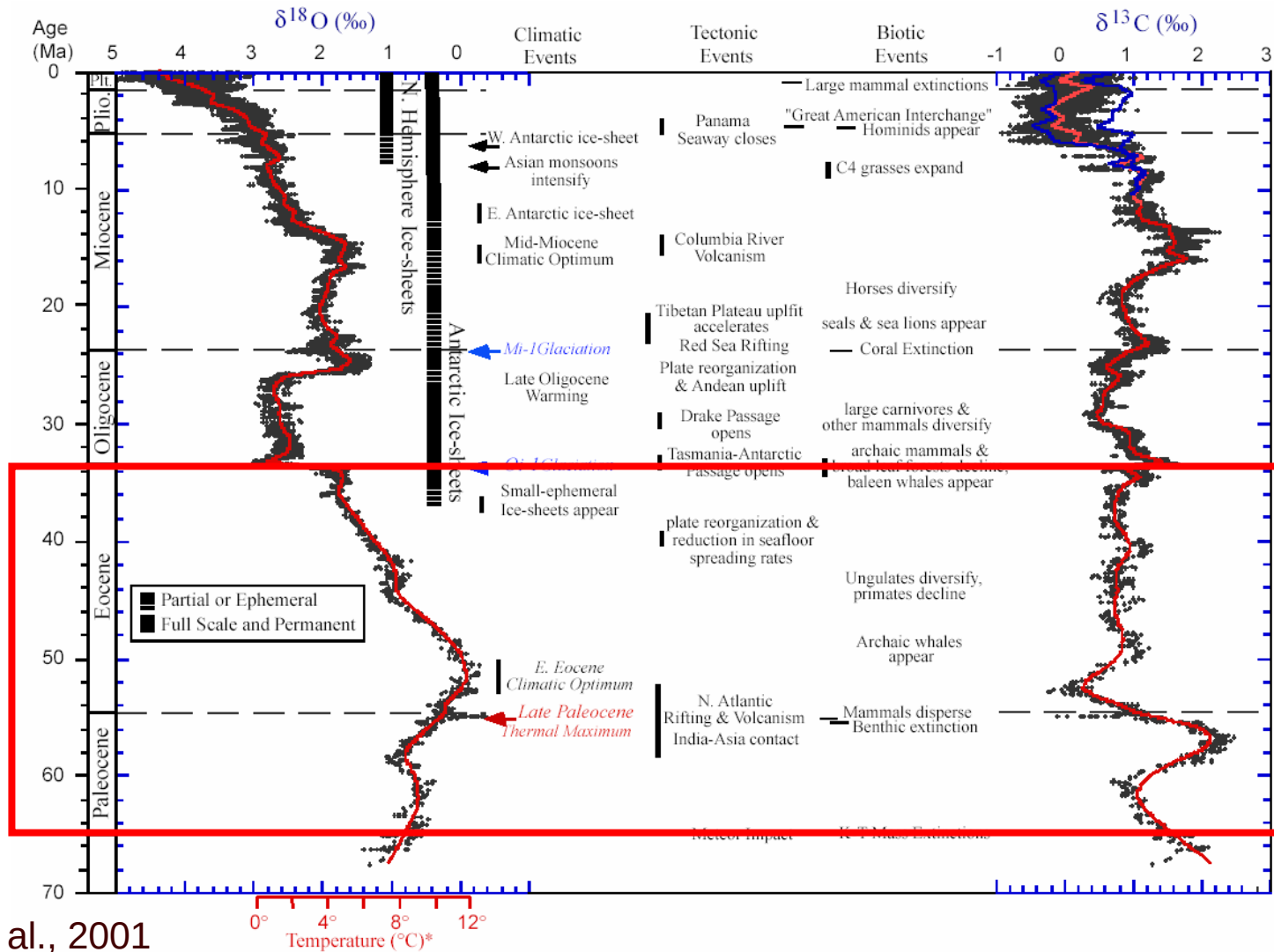


Micheels et al., 2009

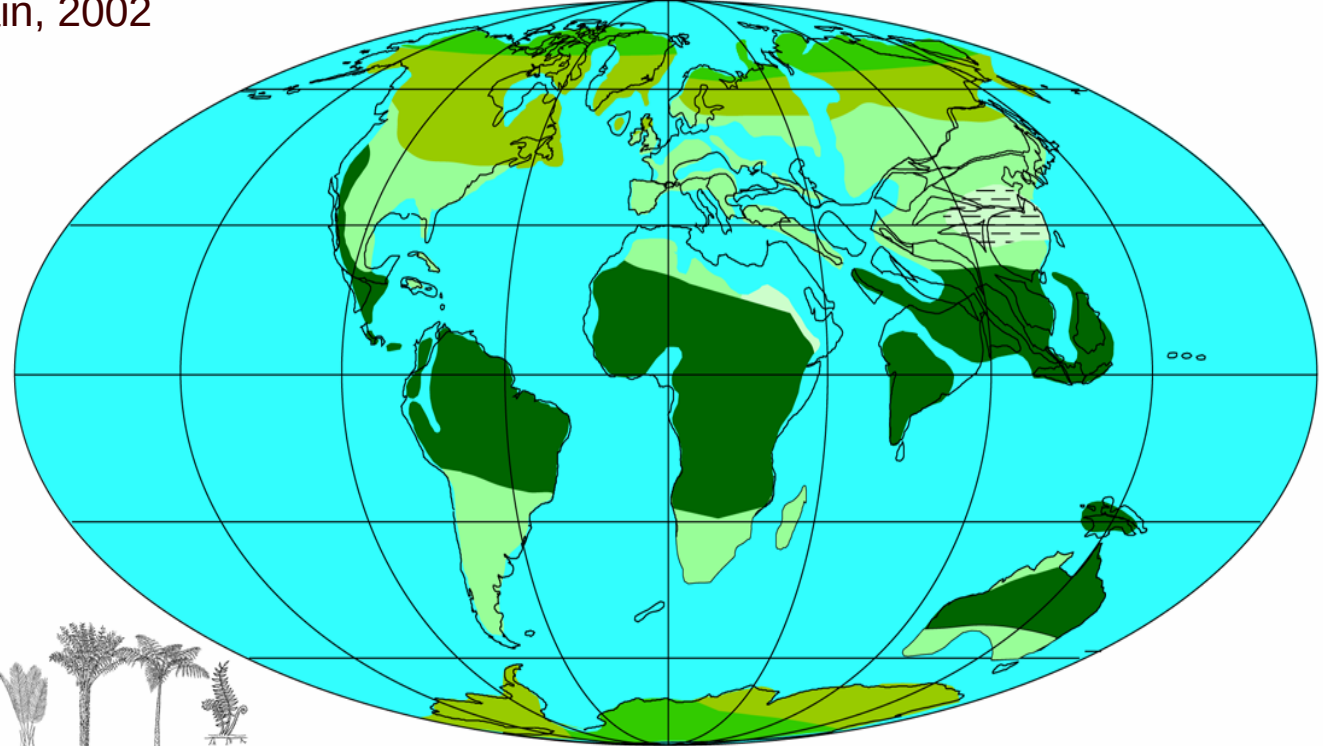


Mean annual Temperature

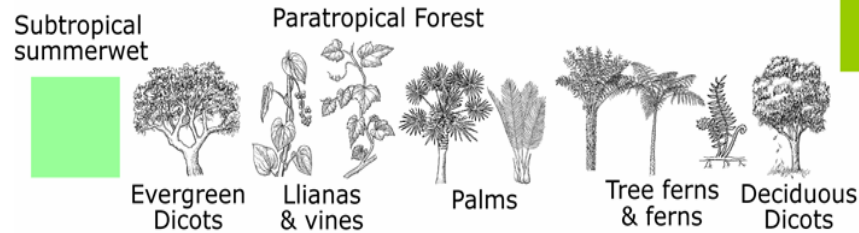




Zachos et al., 2001

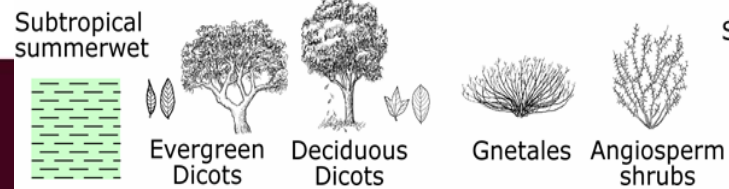


Evergreen Dicots Lianas & vines Palms Tree ferns & ferns



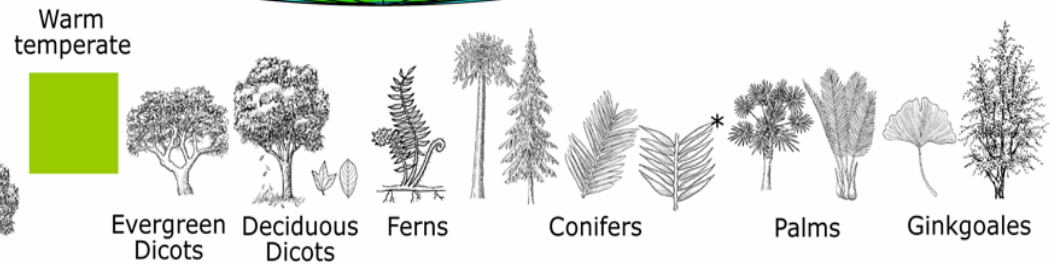
Evergreen Dicots Lianas & vines Palms Tree ferns & ferns Deciduous Dicots

Woody Savanna → Semi-desert

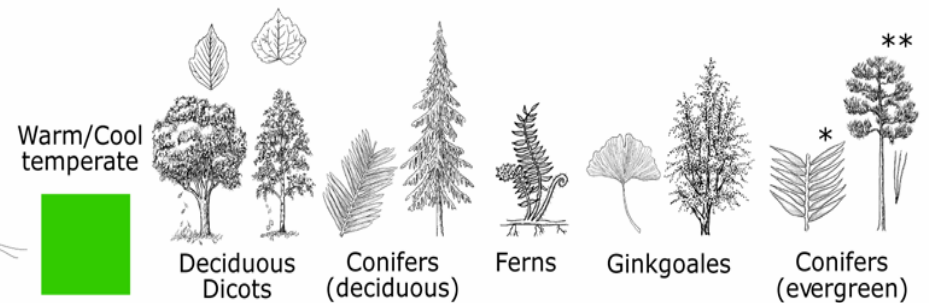


Evergreen Dicots Deciduous Dicots Gnetales Angiosperm shrubs

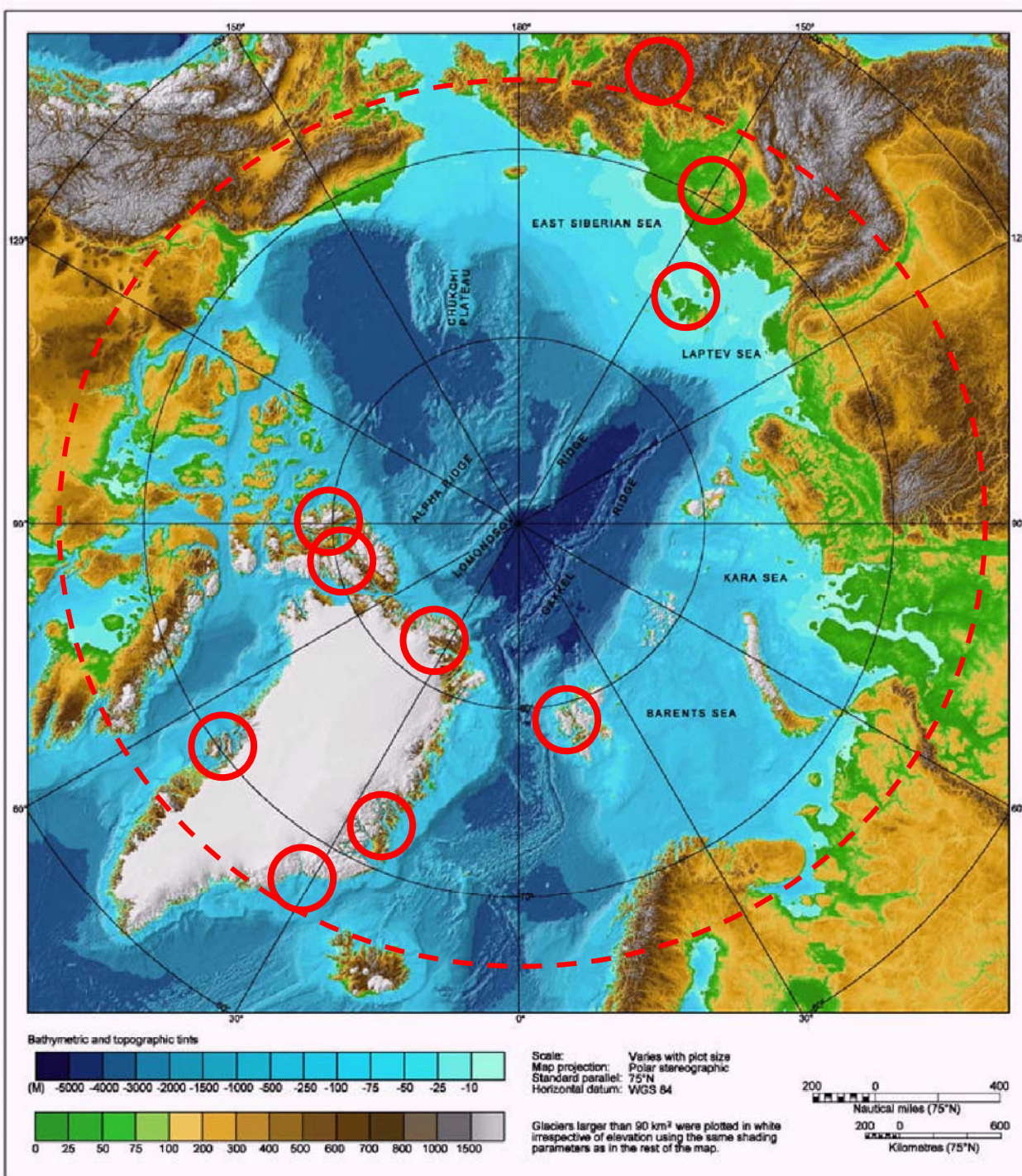
Subtropical desert



Evergreen Dicots Deciduous Dicots Ferns Conifers Palms Ginkgoales



Deciduous Dicots Conifers (deciduous) Ferns Ginkgoales Conifers (evergreen)



Jacobsson et al.,
2003

Spitzbergen (Paleozän – Obereozän/Unteroligozän)

gemäßigtes Klima

Mittlere Jahrestemperatur 9 - 11°C

Temperatur kältester Monat -1 - 3°C

Temperatur wärmster Monat 18 - 19°C

Uhl et al., 2007

Ellesmere Island/Axel Heiberg (Eozän)

gemäßigtes Klima

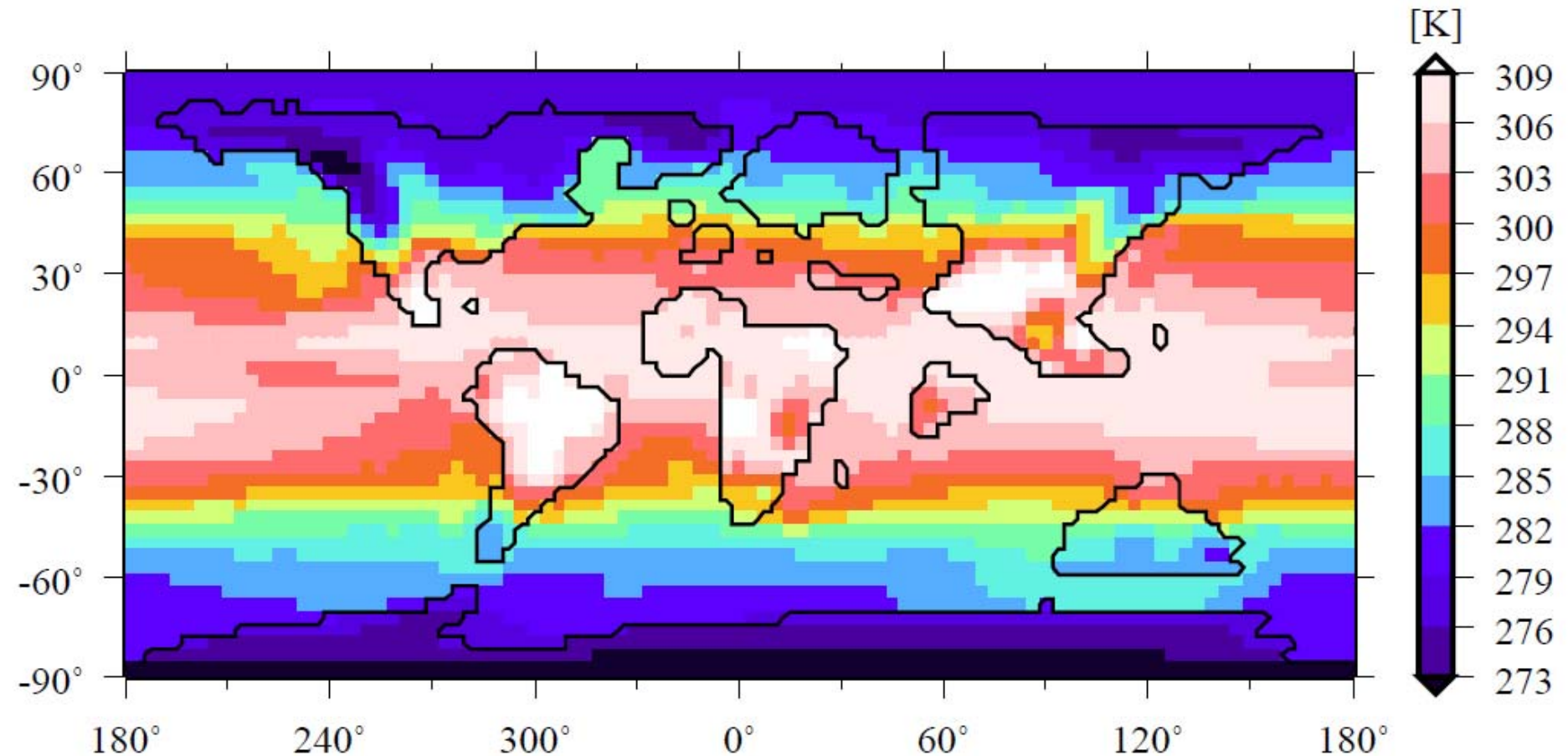
Mittlere Jahrestemperatur 12 - 15°C

Temperatur kältester Monat 0 - 4°C

Temperatur wärmster Monat > 25°C

Basinger et al., 1994

Paleozän-Eozän Temperatur im Modell



Heinemann et al., 2009

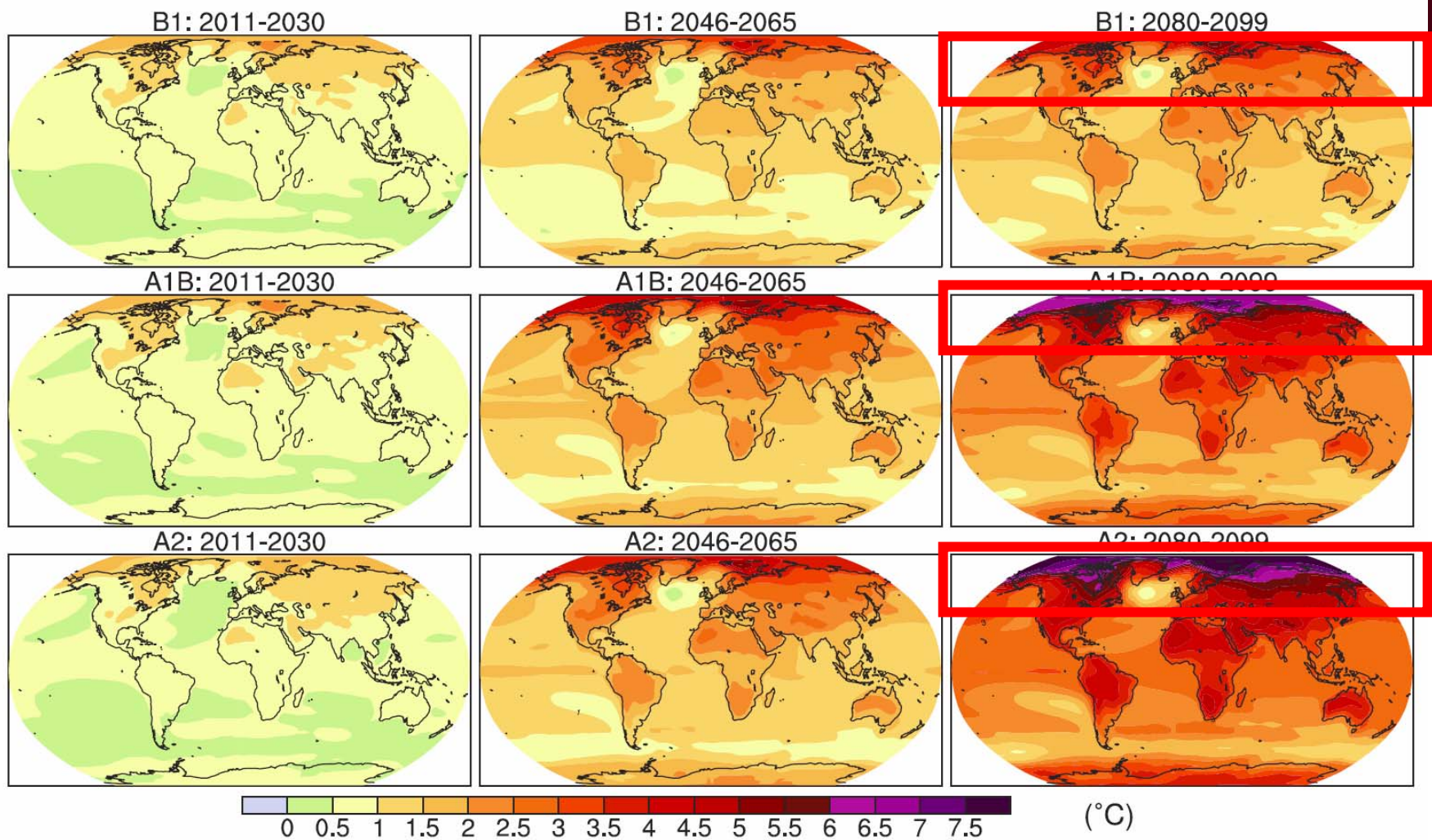


Figure 10.8. Multi-model mean of annual mean surface warming (surface air temperature change, °C) for the scenarios B1 (top), A1B (middle) and A2 (bottom), and three time periods, 2011 to 2030 (left), 2046 to 2065 (middle) and 2080 to 2099 (right). Stippling is omitted for clarity (see text). Anomalies are relative to the average of the period 1980 to 1999. Results for individual models can be seen in the Supplementary Material for this chapter.

IPCC 2007

- Fossile Pflanzen (und Tiere) können uns wichtige Informationen zum Klima der Vorzeit liefern.
 - Die Ergebnisse von Klimamodellierungen können mit Hilfe dieser Ergebnisse validiert werden.
- Speziell vergangene globale Treibhausklimata können von aktuellen Klima-Modellen **nicht** in allen Bereichen korrekt abgebildet werden.
- In hohen Breiten unterschätzen aktuelle Klima-Modelle die Paläo-Temperaturen → Auch Projektionen in die Zukunft unterschätzen wahrscheinlich die Erwärmung in den Polargebieten!