High Emission Scenarios

Simulating the extremes of future anthropogenic greenhouse gas forcing

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Net Anthropogenic CO$_2$ Emissions

Emissions (GtC/yr)

Year

-20 0 20 40 60 80

1900 2000 2100

A1FI
Commitment
Washington et al.
SRES Markers
IAM Database
Past Emissions
Global Carbon Emissions

Year

Data CDIAC
Data BP & CDIAC
Data IEA
IPCC markers
CurrentMix (B2pop)
AllCoal (A2pop)
A1FI

Global Carbon Emissions


Gt C
2100-2000 Temperature Change (K)

Temperature Change (K)

Arctic land region

Northern Pacific

CurrentMix (B2 pop) AllCoal (A2 pop)

Temperature Change (K)

Mediterranean

CurrentMix (B2 pop)

AllCoal (A2 pop)
\[ \frac{dH}{dt} \approx a(T - T_0) + b \frac{dT}{dt} \]
2100-2000 Precipitation Change (%)

2000 1000 0 100 200

P (mm/yr)

Present A1B A1FI CurrentMix AllCoal

P (mm/yr)

Present A1B A1FI CurrentMix AllCoal

CurrentMix (B2 pop)

AllCoal (A2 pop)
Conclusions

• High emission scenarios give pathways to double A1FI CO₂ concentrations by 2100

• CCSM3 shows no variation in global sensitivity up to 2000ppm

• Total arctic sea ice loss seen as early as 2050 in All-Coal emissions scenario

• CESM simulations for a full range of hypothetical scenarios in preparation