

WEBINAIRE TRACCS

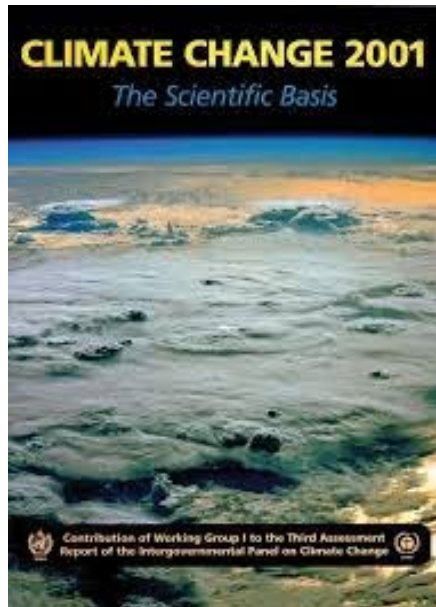
TRANSFORMER LA MODÉLISATION DU CLIMAT
POUR LES SERVICES CLIMATIQUES



" CALOTTES POLAIRES – POURQUOI INTÉGRER UNE
COMPOSANTE LENTE DU SYSTÈME CLIMATIQUE DANS
LES MODÈLES DU SYSTÈME TERRE ? "

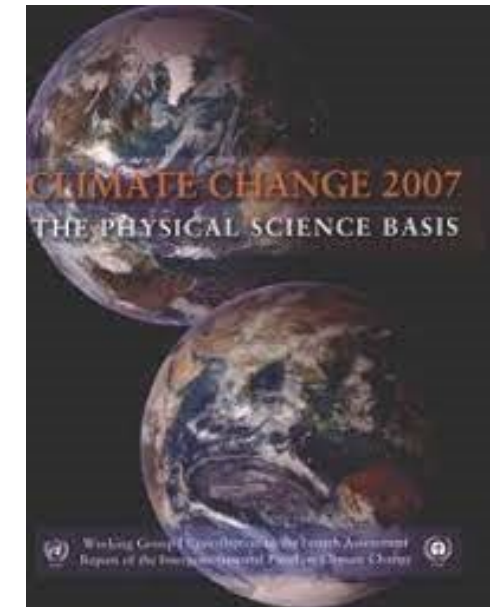
GAËL DURAND

Un changement de paradigme



Projections of global average sea level rise

Contributions	IPCC 2001	IPCC 2007
Thermal Expansion	+0.11 to+0.43 m	+0.13 to+0.32 m
Glaciers	+0.01 to +0.23 m	+0.08 to +0.15 m
Greenland	-0.02 to +0.09 m	+0.01 to +0.08 m
Antarctica	-0.17 to +0.02 m	-0.12 to -0.02 m
Total*	0.11 to 0.77 m	0.21 to 0.48 m



« No significant trend in the contribution of Ice Sheets on sea level rise during the 21st century »

« Larger values cannot be excluded, but understanding of these effects is too limited to assess their likelihood or provide a best estimate or an upper bound for sea level rise. »

- Grandes amplitudes et retraits rapides
- Fiat lux et facta est lux
- Une brève histoire de la modélisation des calottes polaires
- Quels fronts de sciences aujourd'hui
- TRACCS-PC9-ISCLIM : comment allons nous les attaquer ?

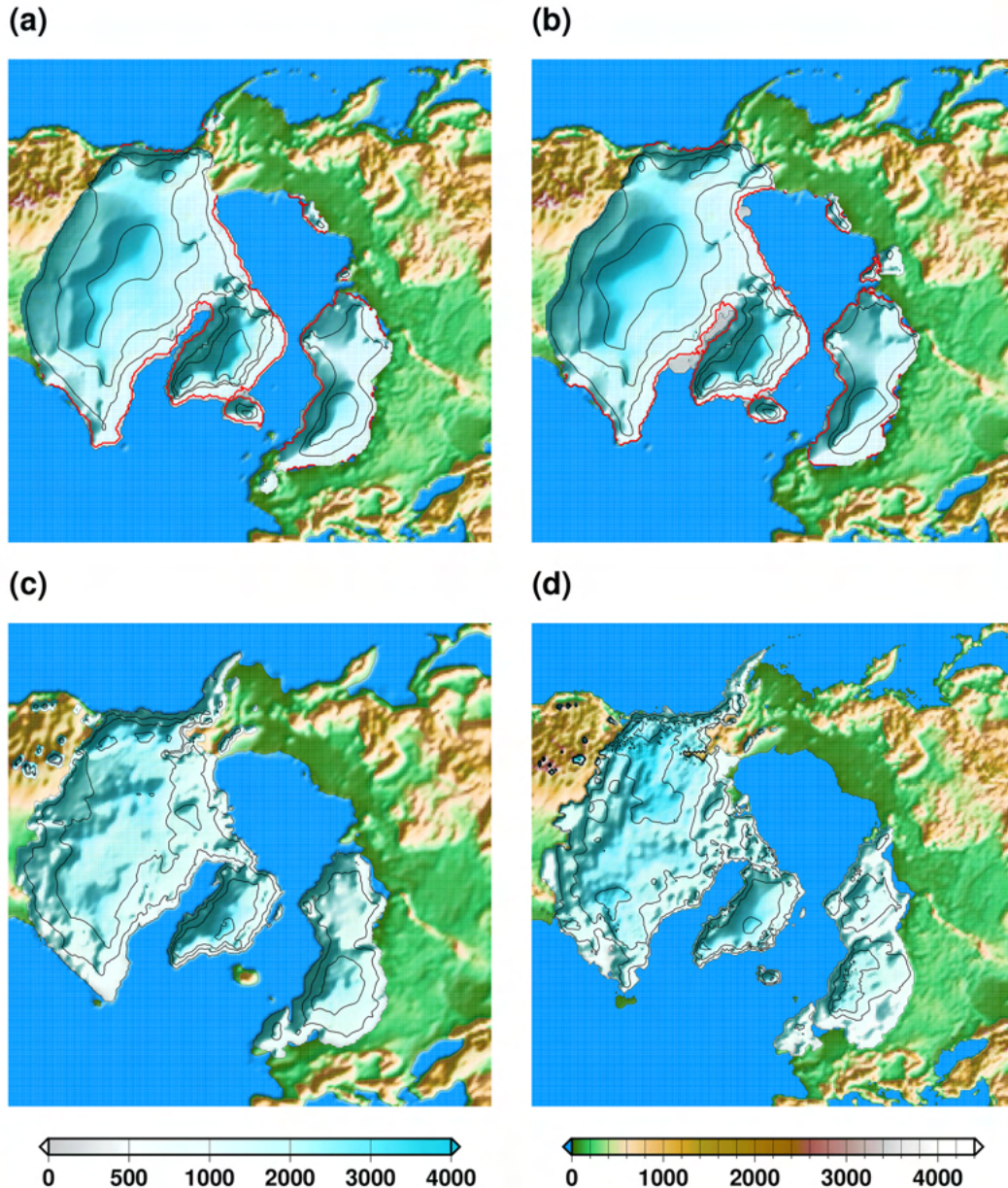
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Aux longues échelles de temps...

Dernier maximum glaciaire

Calottes Fennoscandienne et Laurentide sur
l'hémisphère nord

Le niveau de la mer est approx 130 m plus bas.

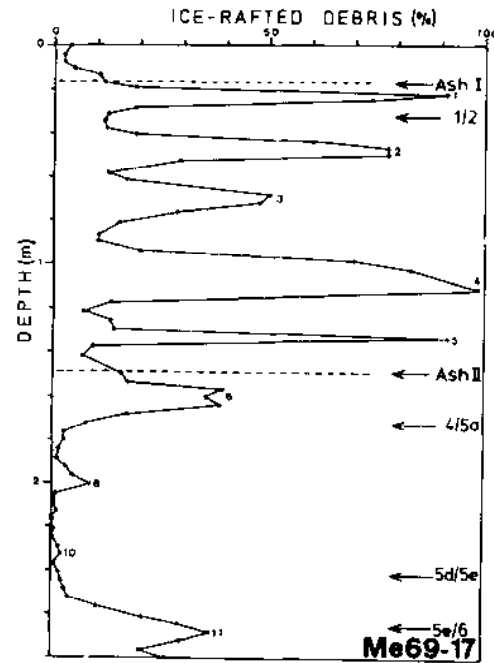


Des “purges” glaciaires

Des observations paleo, des mécanismes

Origin and Consequences of Cyclic Ice Rafting in the Northeast Atlantic Ocean during the Past 130,000 Years

HARTMUT HEINRICH



Heinrich 1988

The problem of junction stability that Hughes' work has emphasized is important. Large shifts in the position of the ice sheet–ice shelf junction produce relatively large changes in the thickness of an ice sheet. In this paper we attempt to obtain, for the two dimensional problem, the basic equations that determine the position of the region in which an ice sheet turns into a floating ice shelf; we also examine the conditions that must be satisfied if the ice sheet is even to exist.

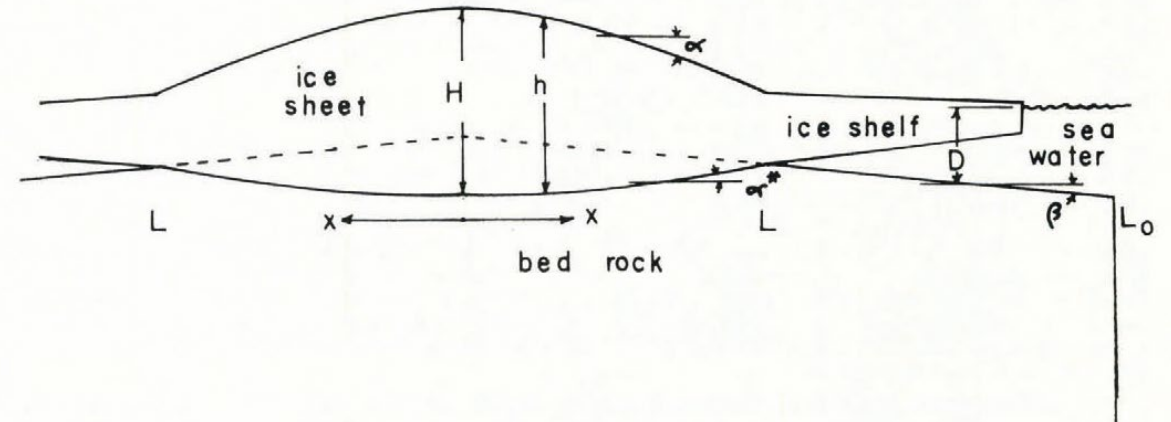


Fig. 1. Cross-section of ice sheet with attached ice shelves.

Weertman 1974

Une prophétie ?

West Antarctic ice sheet and CO₂ greenhouse effect: a threat of disaster

J. H. Mercer

If the global consumption of fossil fuels continues to grow at its present rate, atmospheric CO₂ content will double in about 50 years. Climatic models suggest that the resultant greenhouse-warming effect will be greatly magnified in high latitudes. The computed temperature rise at lat 80° S could start rapid deglaciation of West Antarctica, leading to a 5 m rise in sea level.

Mercer 1978

Nature Vol. 271 26 January 1978

believes that the quasi-cyclical pattern of climatic fluctuations in the recent past, which is shown by the oxygen isotope record from the Greenland Ice Sheet¹⁴, implies that this cooling will soon level out, to be followed by a period of rapid warming as the natural climatic trend is reinforced by the effects of increasing atmospheric CO₂. In fact, the cooling since 1940 seems to have been mainly confined to middle and high latitudes in the Northern Hemisphere, and some investigators believe that the southern part of the Southern Hemisphere has warmed during the same interval. Damon and Kunen¹⁵ have studied climatic records from 67 Southern Hemisphere stations that meet certain specifications and that have records that go back to 1954 or earlier. They find that since 1943 temperatures have changed little between the equator and lat 45° S, except in Australia and New Zealand which, as other workers also point out^{16,17}, have warmed by about 1° C since the 1940s. South of lat 45° S, however, they conclude that average annual temperatures increased between the 1960–64 and 1970–74 pentads, particularly in West Antarctica where they rose about 2° C at Argentine Island (lat 65° S), McMurdo (lat 78° S), and Byrd (lat 80° S) (Fig 2). Thomas^{18,19} observation