From: T.Osborn@uea.ac.uk (by way of Tim Osborn <T.Osborn@uea.ac.uk>)
To: t.osborn@uea.ac.uk
Subject: No Subject
Date: Thu, 29 Aug 1996 00:35:39 +0100

From: CPCMB::F055 11-JUL-1995 10:53:56.46
To: MX%"pierce@cirrus.ucsd.edu"
CC: F055
Subj: Re: Hi and questions

Dave

You're right, smoothing the P-E field is a much bigger change than adding a bit of noise, or the statistical model feedback. But some papers give the indication that the strong instability/variability of the thermohaline circulation under traditional mixed boundary conditions cannot possibly occur when a more realistic SST condition is used. Yet that's not true of some current models - e.g.:

- some LSG/EBM configurations still oscillate,
- the Manabe & Stouffer 1988 coupled model had two stable states,
- Mikolajewicz and Maier-Reimer 1994 still could collapse NADW even with a reduced coupling of 16 W/m**2/K (I note your caveat about the lack of scale dependence though),
- the Stocker et al 1992 zonally averaged coupled model had multiple equilibria,
- the OPYC/ECHAM2 coupled run (Lunkeit et al) shows what appears to be a temporary collapse of NADW.

The answer is that the stability depends on the relative buoyancy forcing of heat and fresh-water, as you've pointed in both you're papers. Freeing up the SST increases the stabilising (not static stability, but stability of the model's state) effect of the heat flux - but doesn't GUARANTEE that it will be stronger than the fresh-water flux effect. To be realistic, the fresh-water flux used should ideally be the observed flux - I agree that a diagnosed field hides model errors. Its similar to the flux correction or no flux correction dilemna of coupled models - do you want a realistic state with unrealistic processes, or a possibly unrealistic state with realistic processes. Either way, the response of the model to perturbations cannot be guaranteed to be realistic. The best current way is to do both. Then, with luck, the real world will lie between the two answers obtained.

The SALFLU_EBM file is not readable yet, although it is there.

You have some interesting papers on your WWW page - the Marginal Sea model looks very innovative. Also, the LSG/EBM experiment with the open Panama Isthmus shows good results. What P-E forcing field did you use for that run, and what small-scale coupling coefficient?

Cheers,

Tim Tim Osborn, CRU, UEA, UK