

## ***Interactive comment on “A two-dimensional model of the methane cycle in a sedimentary accretionary wedge” by D. E. Archer and B. A. Buffett***

**G. Dickens (Referee)**

jerry@rice.edu

Received and published: 16 March 2012

Archer and colleagues have submitted “companion” manuscripts regarding the distribution of methane across continental margins perpendicular to the coast.

I like the general approach behind both manuscripts; they are interesting and make one think.

I have given lengthy, very detailed and constructive comments on the other “passive margin” manuscript.

Criticisms on the companion manuscript permeate throughout this manuscript. In fact,

C348

and in several regards, primary criticisms on the other manuscript are amplified in this, the “active margin” manuscript.

Until they amend the other manuscript, and extend such corrections to this manuscript, there is limited return in giving a detailed review. At best, the manuscript might be accepted pending major revisions.

I will, however, stress two examples in regards to appropriate referencing, a criticism of the other manuscript.

1/ Page 2968: There have been numerous studies of methane cycling on active margins. For example and recently, Chatterjee et al. (JGR, 2011), who modeled carbon cycling for sites on Cascadia Margin. Although one might criticize the modeling in this (and other papers), it is totally incorrect to imply that colleagues have not considered methane cycling on active margins. In fact, if one takes the time to read and understand the Chatterjee et al. (JGR, 2011) paper, and if the model in the present manuscript is correctly documented, one should realize why and where the sub-seafloor carbon cycle is being modeled incorrectly (e.g., why observations and simulations do not match in Figure 12).

2/ Page 2983: Is this a joke? On what planet does one suggest that Archer (2007) framed and discussed seafloor methane release during the PETM appropriately and then mention caveats all with no other references? I’ll be honest: the papers by Paganini ... Archer ... (Science, 2006) and Archer (2007) put this very topic backwards by at least 5 years because they were written by prominent authors, because they completely ignored existing work, data and ideas, and because they promulgated problematic alternatives for carbon injection rather than thinking about things creatively (see discussion in Dickens, Clim. Past, 2011). Thankfully, science is what it is, and people (apparently including now Archer) are finally considering concepts articulated 10 years ago (e.g., Dickens, EPSL, 2003), such as the supply of POC to slopes is crucial to methane accumulation in the time domain.

C349

Sincerely,  
Gerald Dickens

---

Interactive comment on Biogeosciences Discuss., 9, 2967, 2012.

C350