

## ***Interactive comment on “Ventilation changes in the western North Pacific since the last glacial period” by Y. Okazaki et al.***

**Y. Okazaki et al.**

okazakiy@jamstec.go.jp

Received and published: 10 November 2011

We have revised our manuscript following to comments and suggestions by Anonymous Referees. We thank for their useful comments. Both referees pointed out that (1) ambiguity of  $\Delta 14C$  change during H1 and (2) lack of discussion on the horizontal gradient of  $\Delta 14C$  change. We have modified discussions to soften assertion as well as adding recently published  $\Delta 14C$  records from the eastern North Pacific by Lund et al. (2011). Flow path of the major deep water masses are along the western margin of ocean basins (deep western boundary current). Thus,  $\Delta 14C$  records in the western North Pacific is important to determine the principal glacial-deglacial ventilation changes in the North Pacific. On the other hand,  $\Delta 14C$  in the eastern North Pacific has longer residence time of deepwater and may be sensitive for local ventilation sig-

C1797

nals. We suggest that this feature is a principle factor for the horizontal anomalies of  $\Delta 14C$  in the North Pacific.

Replying comments to Anonymous Referee #1

Major comments: 1. Interpretation of Figure 5 and discussion in Section 3.3. We have modified discussion in Section 3.3. to soften assertion and mentioned that ventilation data of both cores MD01-2420 and ODP 887 at 17 ka was single. 2. Discussion on  $\Delta 14C$  difference in terms of horizontal gradient Recently published  $\Delta 14C$  records from the eastern North Pacific by Lund et al. (2011) were added in Fig. 5 following to suggestion by Anonymous Referee #2. Discussion on the east-west  $\Delta 14C$  gradient was added in Sections 3.3. and 3.4.

Other specific comments: 1. Page 2724, Line 26: Replace “likely” with “possibly”. Done. 2. Page 2725, top paragraph: Why “~2500-3000 m”? We have changed the sentence in order to specify the depth range: “This deep water may have yielded the large  $\Delta 14C$  differences during H1 between MD01-2420 (2101 m) and ODP 887 (3647 m) by enhancing ventilation in the intensified GNPIW during the early H1 between 17 and 17.5 kyr B.P. (Fig. 5).” 3. Page 2725, line 19-22: Split the sentence. Done 4. Overall: Expand the discussion a bit more. We have modified discussions in Section 3.3. and 3.4.: added (1) discussion on east-west gradient of  $\Delta 14C$  in the North Pacific, (2) explanation of water masses, and (3) supplemental words. . Replying comments to Anonymous Referee #2

Major comments: 1. Compare W8709-13PC data by Lund et al. (2011) with ODP 887 and MD01-2420 data in Fig. 5. W8709-13PC data has been added in Fig. 5. We discussed horizontal  $\Delta 14C$  gradient in Sections 3.3. and 3.4. by referring W8709-13PC data. 2. Caution for interpretation of 17 ka ventilation records Following description is inserted in Section 3.3.: “Note that the comparison is based on a single data.” 3. To moderate the assertion about deglacial ventilation history. We have modified discussion in Section 3.3. to soften assertion.

C1798

Other specific comments: 1. AMOC was not shutdown but strong reduction during H1. Replaced “shutdown” with “slowdown”. 2. Characterization of water mass is loose. Yes. In physical oceanography, a water mass extending to 2000 m should not be called an intermediate-water. However, in paleoceanography field, the term “intermediate water” has been used for calling such water masses (e.g., Glacial North Atlantic Intermediate Water (GNAIW) and Glacial North Pacific Intermediate Water (GNPIW) ). We described brief explanation of the water masses in Section 3.3.

Interactive comment on Clim. Past Discuss., 7, 2719, 2011.

C1799

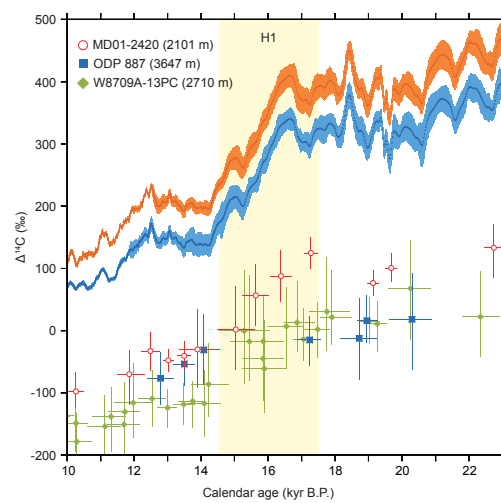


Fig. 5. Okazaki et al.

Fig. 1.

C1800