

## ***Interactive comment on “Anthropogenic carbon in the eastern South Pacific Ocean” by L. Azouzi et al.***

### **Anonymous Referee #1**

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General Comments: I found this manuscript a bit uninspired and disjointed. The first sections were focused on a new cruise conducted in the southeastern Pacific. The cruise cuts diagonally through several well understood oceanographic regimes, but the descriptions of the measured properties along the section were confusing. For example, on page 3, line 18 - What does this mean, two oxygen minimum zones? There is only one OMZ it just varies in magnitude from one location to the next. This whole discussion seems to ignore the fact that this cruise cuts through several very different biogeochemical provinces and consider the 3-D view of the region. The authors talk about this earlier but I do not understand why this theme is not carried through the rest of the discussion. The descriptions here have a very 2-D presentation that does not seem to recognize the regional patterns. For example, rather than just say that there

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are 2 OMZ's why don't they say that the south pacific OMZ is stronger under the upwelling regions off of South America and the equatorial Pacific and weaker under the subtropical gyre.

The next sections describe the distribution of the anthropogenic CO<sub>2</sub>. This was the most interesting part of the manuscript. There was a nice attempt to analyze why the observed distributions were observed. I think the manuscript could have done much more along these lines.

The final sections compare TROCA anthropogenic CO<sub>2</sub> estimates along two older WOCE lines to delta C\* estimates determined in 2002. There is also a short discussion on the similarity of the WOCE CFCs. What is the point of these sections? Is it to compare the two techniques? The conclusion seems to be that the techniques are generally consistent. There is only a superficial link made to the previous parts of the manuscript so this section just seems to be filler for the paper.

There is no conclusions section of the manuscript which is how I generally felt about the manuscript in general. What are we supposed to conclude from this work? What did we learn that was new? I think the authors are capable of a much more thorough analysis than a basic description of hydrographic properties that have been understood for many years or an anthropogenic methods comparison that has also been done several times in previous manuscripts.

Specific Comments: Page 2, Line 16; the eastern equatorial pacific is one of the largest sources of CO<sub>2</sub> to the atmosphere, how can you say it is a sink for CO<sub>2</sub>?

Page 2, Line 22; poorest in what?

Page 3, top; how do you know that the storage and transportation of the samples did not change the C<sub>t</sub>? It would help to see some evaluation of the deep data with the WOCE data to show that the data are consistent.

Page 5, lines 15-20; why wouldn't the anthropogenic CO<sub>2</sub> follow the water masses in

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the east and the west?

Section 3.4.3; there is no text in this section!!

Figure 4; what is the point of this figure? I am not sure what we are supposed to learn from this and it is barely mentioned in the text.

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**BGD**

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