

We thank the referee for her/his review and comments.

Referee: This study conducts Observation System Simulation Experiments for an optimal observation system of surface ocean pCO₂. The results give an important information to future observational strategy. The manuscript is well organized and the description is easy to follow. Followings are just a few points to be possibly improved.

The authors mentioned the analysis period is from 2008 to 2010. But they also mentioned data for the period 2001-2010 from SOCAT were used (line 96 and Table 1). How the data in 2001-2007 were used?

In Figure 1, the same color bar in all panels would be better to easily compare data numbers from respective data source and to avoid unnecessary white space.

Labels on horizontal axes in Figures 7g, 7h, 8g and 8h are different from those in the other panels.

Authors: We thank the reviewer for the positive evaluation of our study.

The SOCAT data for a particular month or even year are very sparse. Here we use SOCAT data from a larger period (2001-2010) than the period targeted by the reconstruction (2008-2010) for three reasons: 1. to benefit from a larger data set for Neural Network calibration; 2. to capture interannual variability from a long historical record of SOCAT data; 3. to see how SOCAT data can be enhanced by adding other observational platforms to the effort. While the data from 2001 to 2010 are used in training, the reconstruction focuses only on the years 2008 to 2010. We clarified this in the manuscript, lines 104-107 in the revised version.

Thank you for the comment on Fig. 1. We changed the colour bar.

Thank you to letting us know that labels in Fig. 7 and 8 need to be corrected. We modified it in the revised version.