



Project:
GEOCARBON

Project full title:
Operational Global Carbon Observing System

European Commission - FP7
Collaborative Project (large scale integrating project) - for specific
cooperation actions (SICA) dedicated to international cooperation partner countries
Grant agreement no.: **283080**

Del. no: 4.1

Deliverable name: Annual updates of SOCAT

Version: V1

WP no: 4

Lead beneficiary: UiB

Delivery date from Annex I (project month): 12

Actual delivery date (project month): 12

1. Introduction

1.1 Short summary

Within GeoCarbon's deliverable D4.1 the input database for the next version of Surface Ocean CO₂ Atlas (SOCAT) has been updated. This SOCAT Version 2 is currently being quality controlled and it is expected to have approx. 60 % more data than the previous version of SOCAT with recent data up to December 2011.

1.2 Rationale for this deliverable

SOCAT is being used to produce the air-sea CO₂ flux estimates on a global level. With regard to the pCO₂-based method, this work package builds on the recent advances made by using novel extrapolation methods, such as neural networks. Using this approach Watson et al. (2009) recently demonstrated that, provided sufficient data-coverage, it is possible to estimate air-sea fluxes of CO₂ over the sub-tropical North Atlantic to a precision of about 10%

1.3 Problems encountered and envisaged solutions

No Problems were encountered.

2 Full description

2.1 Annual update of SOCAT

The Surface Ocean CO₂ Atlas (SOCAT) is a community data product supported by UNESCO/SCOR's IOCCP, SOLAS and IMBER. Partner 15 (UiB) has a significant role within SOCAT since the dataset that SOCAT is based on is assembled at UiB. SOCAT was released in September 2011 with an initial holding of approx. 6.3 million surface ocean fCO₂ measurements ranging from 1968 until 2007 divided over more than 1.850 cruises.

For the first time scientists have now access to a data product that was second level quality controlled by regional and global experts. SOCAT gives access to surface ocean carbon dioxide database in a uniform format where all steps are transparent and documented. For more information on SOCAT please visit www.socat.info.

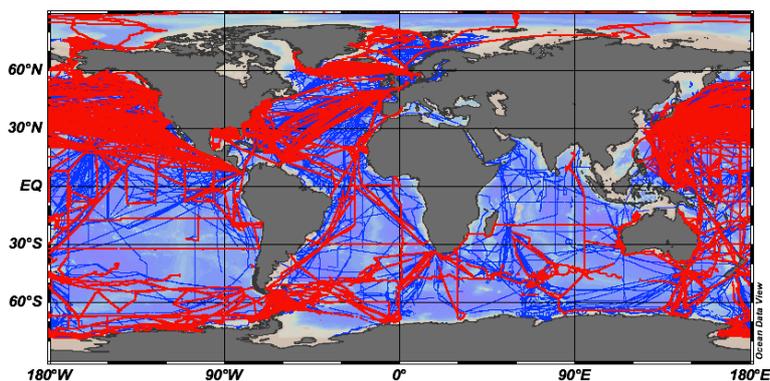


Figure 1: Outlook for SOCAT Version 2. Blue lines indicate data from SOCAT Version 1.5 and red lines indicate data that was added to SOCAT for Version 2.

Figure 1 illustrates data that was added to the input database for SOCAT. Approx. 1150 cruises with more than 4.45 million fCO₂ measurements have been added (around 15 % are updates of data that is already included in SOCAT Version 1.5). New data improves the coverage in many important areas: especially the North and Equatorial Atlantic, North and Equatorial Pacific and the Southern Ocean. Furthermore was more data added to regions that are underrepresented within the current version e.g. the Arctic, Gulf of Mexico and Coastal areas on a global base.

The first version of SOCAT included data up to the end of 2007. Figure 2 illustrates the temporal distribution of just the added data for the next version of SOCAT and shows that a substantial amount of data was measured past the 2007. Figure 2 also illustrates the expected temporal coverage of data from SOCAT Version 1.5 and the input database for SOCAT Version 2.

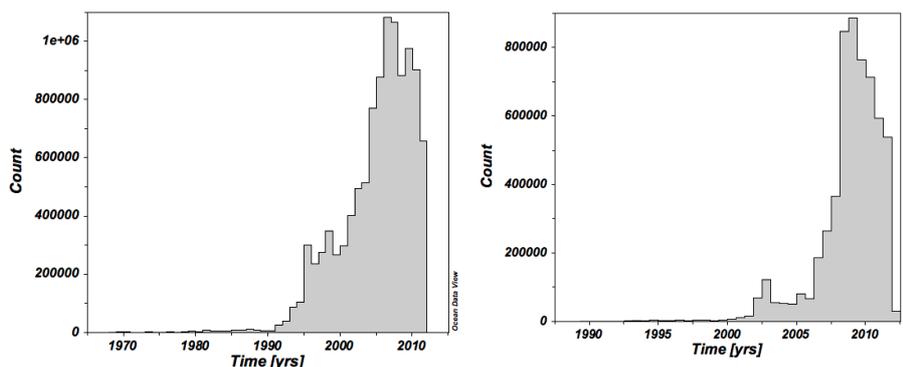


Figure 2: Temporal distribution for SOCAT Version 2 before secondary quality control (left); Temporal distribution of just the newly added fCO₂ data for the SOCAT Version 2 (right).

Data is available according to Intellectual Property Rights (IPR) during the secondary quality control phase. The SOCAT global coordination group agreed on making SOCAT version 2 public by Spring 2013. GeoCarbon members can request data access by contacting Partner 15 (UiB) and will be granted access according to IPR.

The data is available to Partner 2 (UEA) for estimating the air-sea CO₂ flux and for carbon budget computations.