



## Data Use Statement for SOCAT

The synthesis and gridded SOCAT products are a result of scientific effort by data providers, data managers and quality controllers. It is important that users of the SOCAT products acknowledge this effort. This will help generate funding for continuation of observational products and promote further sharing of data.

We expect that users of SOCAT data products:

**1) Generously acknowledge the contribution of SOCAT data providers and investigators in the form of invitation to co-authorship**, reference to relevant scientific articles by data providers or by naming data providers in the acknowledgements.

**Specifically, in regional studies invite large data providers, who frequently possess valuable expert knowledge on data and region, to collaborate at an early stage, which may lead to an invitation of co-authorship.**

We recognize that co-authorship is only justified in case of a significant scientific contribution to a publication and that provision of data on its own does not warrant co-authorship.

**2) Cite SOCAT and its data products as:**

- Versions 3-6, 2019 and 2020: Bakker et al. (2016);
- Version 2: Bakker et al. (2014);
- Version 1 (synthesis data products): Pfeil et al. (2013);
- Version 1 (gridded data product): Sabine et al. (2013) and Pfeil et al. (2013).

**3) Include in the acknowledgements:**

'The Surface Ocean CO<sub>2</sub> Atlas (SOCAT) is an international effort, endorsed by the International Ocean Carbon Coordination Project (IOCCP), the Surface Ocean Lower Atmosphere Study (SOLAS) and the Integrated Marine Biosphere Research (IMBeR) program, to deliver a uniformly quality-controlled surface ocean CO<sub>2</sub> database. The many researchers and funding agencies responsible for the collection of data and quality control are thanked for their contributions to SOCAT.'

**4) Report problems to [submit@socat.info](mailto:submit@socat.info).**

**5) Inform [submit@socat.info](mailto:submit@socat.info) of publications in which SOCAT is used.**  
Please, contact the SOCAT investigators for further advice.

## Hypothetical examples of the application of this Data Use Statement

**Regional study** of long term trends of surface water fCO<sub>2</sub> in the West Sea for the years 1990 to 2014 using SOCAT version 3. Most (90%) of the fCO<sub>2</sub> data in this area has been collected by three SOCAT data providers. The researchers contact the three data providers at an early stage in the research and ask if they are interested in a collaboration which may eventually lead to co-authorship on a publication.

- **Outcome 1)** The data providers like the idea and all contribute their expert knowledge on the carbon cycle in the West Sea to the research and become a co-author on a joint publication. The research team cites the relevant SOCAT publication in their publication.
- **Outcome 2)** The data providers do not contribute to the research in any way and do not become co-authors on the publication. The research team cites relevant publications by the data providers and the relevant SOCAT publication in their publication.
- **Outcome 3)** The data providers do not contribute to the research in any way and do not become co-authors on the publication. The research team acknowledges the data providers in the acknowledgements and cites the relevant SOCAT publication in their publication.

**Global study** of long-term trends of surface water fCO<sub>2</sub> in the global oceans for the years 1990 to 2014 using SOCAT version 3. The fCO<sub>2</sub> data have has been collected by all ~100 SOCAT data providers. The researchers contact very large data providers and a scientist active in SOCAT at an early stage in the research and ask if they are interested in a collaboration which may eventually lead to co-authorship on a publication.

- **Outcome 1)** The large data providers and the SOCAT scientist like the idea and all contribute their expert knowledge on the carbon cycle to the research and become a co-author on a joint publication. The research team cites relevant publications by other data providers and the relevant SOCAT publication in their publication.
- **Outcome 2)** The large data providers and the SOCAT scientist do not contribute to the research in any way and do not become co-authors on the publication. The research team cites relevant publications by several data providers and the relevant SOCAT publication in their publication.
- **Outcome 3)** The large data providers and the SOCAT scientist do not contribute to the research in any way and do not become co-authors on the publication. The research team acknowledges the data providers in the acknowledgements and cites the relevant SOCAT publication in their publication.

## References

Bakker, D. C. E., Pfeil, B. Landa, C. S., Metzl, N., O'Brien, K. M., Olsen, A., Smith, K., Cosca, C., Harasawa, S., Jones, S. D., Nakaoka, S., Nojiri, Y., Schuster, U., Steinhoff, T., Sweeney, C., Takahashi, T., Tilbrook, B., Wada, C., Wanninkhof, R., Alin, S. R., Balestrini, C. F., Barbero, L., Bates, N. R., Bianchi, A. A., Bonou, F., Boutin, J., Bozec, Y., Burger, E. F., Cai, W.-J., Castle, R. D., Chen, L., Chierici, M., Currie, K., Evans, W., Featherstone, C., Feely, R. A., Fransson, A., Goyet, C., Greenwood, N., Gregor, L., Hankin, S., Hardman-Mountford, N. J., Harlay, J., Hauck, J., Hoppema, M., Humphreys, M. P., Hunt, C. W., Huss, B., Ibáñez, J. S. P., Johannessen, T., Keeling, R., Kitidis, V., Körtzinger, A., Kozyr, A., Krasakopoulou, E., Kuwata, A., Landschützer,

- P., Lauvset, S. K., Lefèvre, N., Lo Monaco, C., Manke, A., Mathis, J. T., Merlivat, L., Millero, F. J., Monteiro, P. M. S., Munro, D. R., Murata, A., Newberger, T., Omar, A. M., Ono, T., Paterson, K., Pearce, D., Pierrot, D., Robbins, L. L., Saito, S., Salisbury, J., Schlitzer, R., Schneider, B., Schweitzer, R., Sieger, R., Skjelvan, I., Sullivan, K. F., Sutherland, S. C., Sutton, A. J., Tadokoro, K., Telszewski, M., Tuma, M., Van Heuven, S. M. A. C., Vandemark, D., Ward, B., Watson, A. J., Xu, S. (2016) A multi-decade record of high quality fCO<sub>2</sub> data in version 3 of the Surface Ocean CO<sub>2</sub> Atlas (SOCAT). *Earth System Science Data* 8: 383-413. doi:10.5194/essd-8-383-2016.
- Bakker, D. C. E., Pfeil, B., Smith, K., Hankin, S., Olsen, A., Alin, S. R., Cosca, C., Harasawa, S., Kozyr, A., Nojiri, Y., O'Brien, K. M., Schuster, U., Telszewski, M., Tilbrook, B., Wada, C., Akl, J., Barbero, L., Bates, N. R., Boutin, J., Bozec, Y., Cai, W.-J., Castle, R. D., Chavez, F. P., Chen, L., Chierici, M., Currie, K., De Baar, H. J. W., Evans, W., Feely, R. A., Fransson, A., Gao, Z., Hales, B., Hardman-Mountford, N. J., Hoppema, M., Huang, W.-J., Hunt, C. W., Huss, B., Ichikawa, T., Johannessen, T., Jones, E. M., Jones, S., Jutterstrøm, S., Kitidis, V., Körtzinger, A., Landschützer, P., Lauvset, S. K., Lefèvre, N., Manke, A. B., Mathis, J. T., Merlivat, L., Metzl, N., Murata, A., Newberger, T., Omar, A. M., Ono, T., Park, G.-H., Paterson, K., Pierrot, D., Ríos, A. F., Sabine, C. L., Saito, S., Salisbury, J., Sarma, V. V. S. S., Schlitzer, R., Sieger, R., Skjelvan, I., Steinhoff, T., Sullivan, K. F., Sun, H., Sutton, A. J., Suzuki, T., Sweeney, C., Takahashi, T., Tjiputra, J., Tsurushima, N., Van Heuven, S. M. A. C., Vandemark, D., Vlahos, P., Wallace, D. W. R., Wanninkhof, R. and Watson, A. J. (2014) An update to the Surface Ocean CO<sub>2</sub> Atlas (SOCAT version 2), *Earth Syst. Sci. Data*, 6, 69-90, doi:10.5194/essd-6-69-2014.
- Pfeil, B., Olsen, A., Bakker, D. C. E., Hankin, S., Koyuk, H., Kozyr, A., Malczyk, J., Manke, A., Metzl, N., Sabine, C. L., Akl, J., Alin, S. R., Bates, N., Bellerby, R. G. J., Borges, A., Boutin, J., Brown, P. J., Cai, W.-J., Chavez, F. P., Chen, A., Cosca, C., Fassbender, A. J., Feely, R. A., González-Dávila, M., Goyet, C., Hales, B., Hardman-Mountford, N., Heinze, C., Hood, M., Hoppema, M., Hunt, C. W., Hydes, D., Ishii, M., Johannessen, T., Jones, S. D., Key, R. M., Körtzinger, A., Landschützer, P., Lauvset, S. K., Lefèvre, N., Lenton, A., Lourantou, A., Merlivat, L., Midorikawa, T., Mintrop, L., Miyazaki, C., Murata, A., Nakadate, A., Nakano, Y., Nakaoka, S., Nojiri, Y., Omar, A. M., Padin, X. A., Park, G.-H., Paterson, K., Perez, F. F., Pierrot, D., Poisson, A., Ríos, A. F., Santana-Casiano, J. M., Salisbury, J., Sarma, V. V. S. S., Schlitzer, R., Schneider, B., Schuster, U., Sieger, R., Skjelvan, I., Steinhoff, T., Suzuki, T., Takahashi, T., Tedesco, K., Telszewski, M., Thomas, H., Tilbrook, B., Tjiputra, J., Vandemark, D., Veness, T., Wanninkhof, R., Watson, A. J., Weiss, R., Wong, C. S., and Yoshikawa-Inoue, H. (2013) A uniform, quality controlled Surface Ocean CO<sub>2</sub> Atlas (SOCAT), *Earth Syst. Sci. Data*, 5, 125-143. doi:10.5194/essd-5-125-2013.
- Sabine, C. L., Hankin, S., Koyuk, H., Bakker, D. C. E., Pfeil, B., Olsen, A., Metzl, N., Kozyr, A., Fassbender, A., Manke, A., Malczyk, J., Akl, J., Alin, S. R., Bellerby, R. G. J., Borges, A., Boutin, J., Brown, P. J., Cai, W.-J., Chavez, F. P., Chen, A., Cosca, C., Feely, R. A., González-Dávila, M., Goyet, C., Hardman-Mountford, N., Heinze, C., Hoppema, M., Hunt, C. W., Hydes, D., Ishii, M., Johannessen, T., Key, R. M., Körtzinger, A., Landschützer, P., Lauvset, S. K., Lefèvre, N., Lenton, A., Lourantou, A., Merlivat, L., Midorikawa, T., Mintrop, L., Miyazaki, C., Murata, A., Nakadate, A., Nakano, Y., Nakaoka, S., Nojiri, Y., Omar, A. M., Padin, X. A., Park, G.-H., Paterson, K., Perez, F. F., Pierrot, D., Poisson, A., Ríos, A. F., Salisbury, J., Santana-Casiano, J. M., Sarma, V. V. S. S., Schlitzer, R., Schneider, B., Schuster, U., Sieger, R., Skjelvan, I., Steinhoff, T., Suzuki, T., Takahashi, T., Tedesco, K., Telszewski, M., Thomas, H., Tilbrook, B., Vandemark, D., Veness, T., Watson, A. J., Weiss, R., Wong, C. S., and Yoshikawa-Inoue, H. (2013) Surface Ocean CO<sub>2</sub> Atlas (SOCAT) gridded data products, *Earth Syst. Sci. Data*, 5, 145-153. doi:10.5194/essd-5-145-2013.