

## **A combined global ocean pCO<sub>2</sub> climatology combining open ocean and coastal areas.**

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Citation:

This product is free to be used. Please cite the data as:

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Method:

The pCO<sub>2</sub> climatology was created by merging 2 published and publicly available pCO<sub>2</sub> datasets covering the open ocean (Landschützer et al 2016) and the coastal ocean (Laruelle et al 2017). Both fields were initially created using a 2-step neural network technique. In a first step, the global ocean is divided into 16 biogeochemical provinces using a self-organizing map. In a second step, the non-linear relationship between variables known to drive the surface ocean carbon system and gridded observations from the SOCAT open and coastal ocean datasets (Bakker et al 2016) is reconstructed using a feed-forward neural network within each province separately. The final product is then produced by projecting driving variables, e.g., surface temperature, chlorophyll, mixed layer depth, and atmospheric CO<sub>2</sub> onto oceanic pCO<sub>2</sub> using these non-linear relationships (see Landschützer et al 2016 and Laruelle et al 2017 for more detail). This results in monthly open ocean pCO<sub>2</sub> fields at 1°x1° resolution and coastal ocean pCO<sub>2</sub> fields at 0.25°x0.25° resolution. To merge the products, we divided each 1°x1° open ocean bin into 16 equal 0.25°x0.25° bins without any interpolation. The common overlap area of the products has been merged by scaling the respective products by their mismatch compared to observations from the SOCAT datasets (see Landschützer et al 2020)

Content:

MPI-ULB-SOM\_FFN\_clim.nc

The netcdf file contains:

- lat: latitude in degrees north (89.875°S – 89.875°N with 0.25° resolution)
- lon: longitude in degrees east (179.875°W-179.875°E with 0.25° resolution)
- time: month of year
- pco2: The merged climatological pCO<sub>2</sub> field

#### Inquiries:

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#### References:

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