Supplementary Material

# An updated synthesis of ocean total alkalinity and dissolved inorganic carbon measurements from 1993 to 2023: the SNAPO-CO2-v2 dataset

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This document includes Figures S1-S10 and Table S1-S4 providing the supplementary information that supports description of data presented in the main article.

**Figure S1:** Locations of all $A_T$ and $C_T$ data (1993-2023) in the SNAPO-CO2-v2 dataset. Color code is for Year. Figures produced with ODV (Schlitzer, 2018).
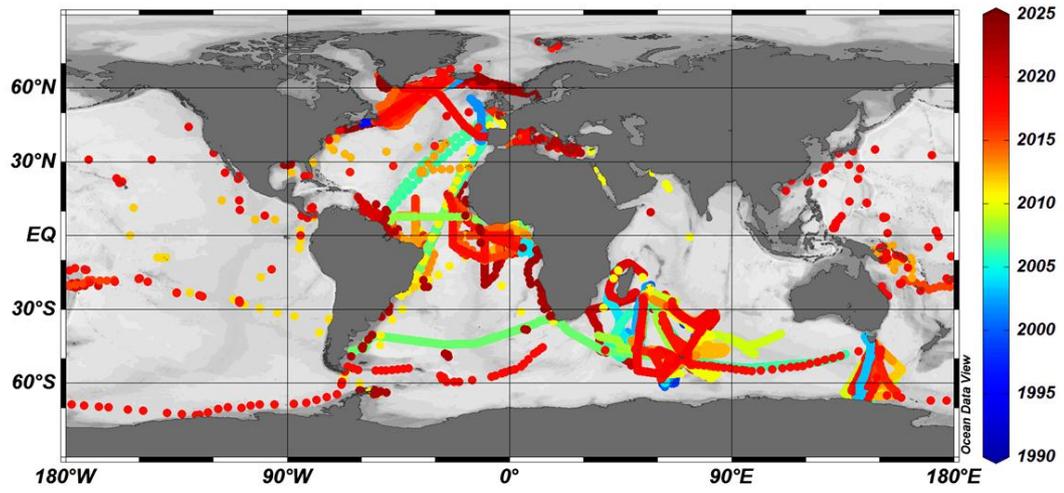
**Figure S2:** Results of CRM measurements in 2005-2024. The plot shows the differences of $A_T$ versus $C_T$ (Measured minus CRM reference) for 1308 CRM bottles and different CRM Batches analyzed in 2005-2024. Results for Batches 64 to 197 are in grey and recent Batches 204 and 208 are in red. For all 1308 analysis standard-deviations of the differences were $\pm3.13$ µmol.kg$^{-1}$ for $A_T$ and $\pm3.43$ µmol.kg$^{-1}$ for $C_T$ (or $\pm2.69$ µmol.kg$^{-1}$ and $\pm2.88$ µmol.kg$^{-1}$ for 1242 analysis when excluding few outliers). Differences higher than $\pm5$ µmol.kg$^{-1}$ were excluded for processing sample analyses but kept in this plot.
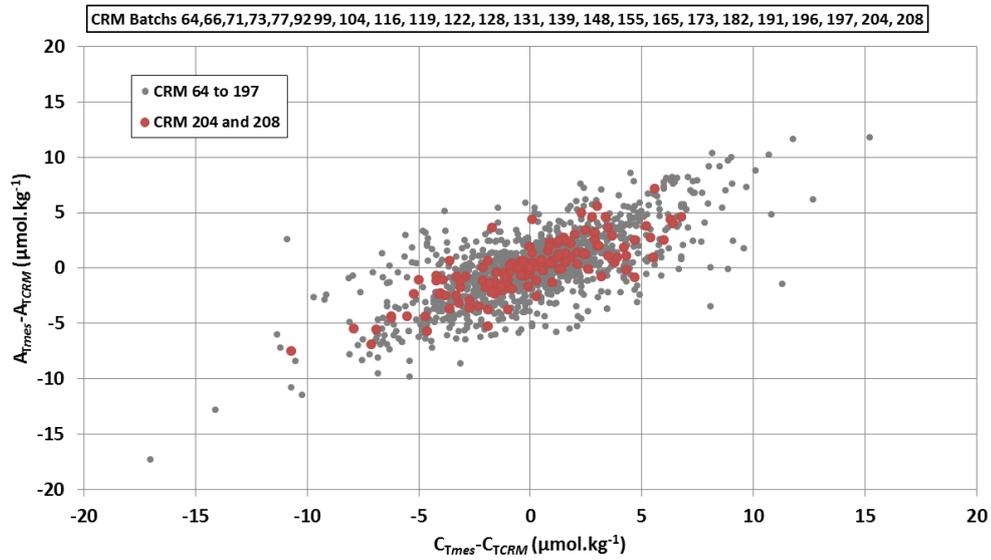
**Figure S3:** Example of Quality control (to assign secondary flags). Relationships of $A_T$/salinity (left) and $A_T$/$C_T$ (right) from MINERVE cruises over 2002-2018. All data are shown including Flag 2 (Good, blue), Flag 3 (Questionable, red) and Flag 4 (Bad, brown). Figures produced with ODV (Schlitzer, 2018).
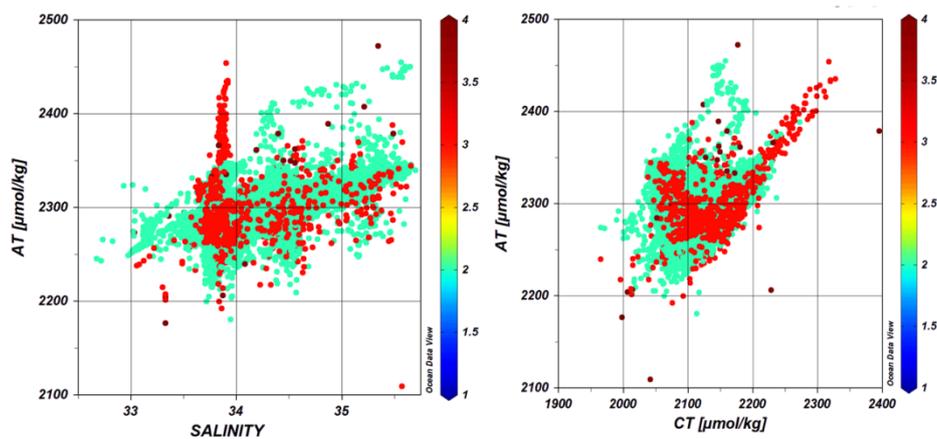
**Figure S4:** Profiles of $A_T$ and $C_T$ in the western tropical Atlantic (near the Amazon River plume) for 2 cruises conducted in September 2021 (Stations from AMAZOMIX on 15-Sept-2021 and TARA-Microbiome on 2-Sept-2021). Location of the selected stations are shown in the inserted map (color code is for day) produced with ODV (Schlitzer, 2018). Mean values of the properties at 1000m are listed in Table 4 (main text).
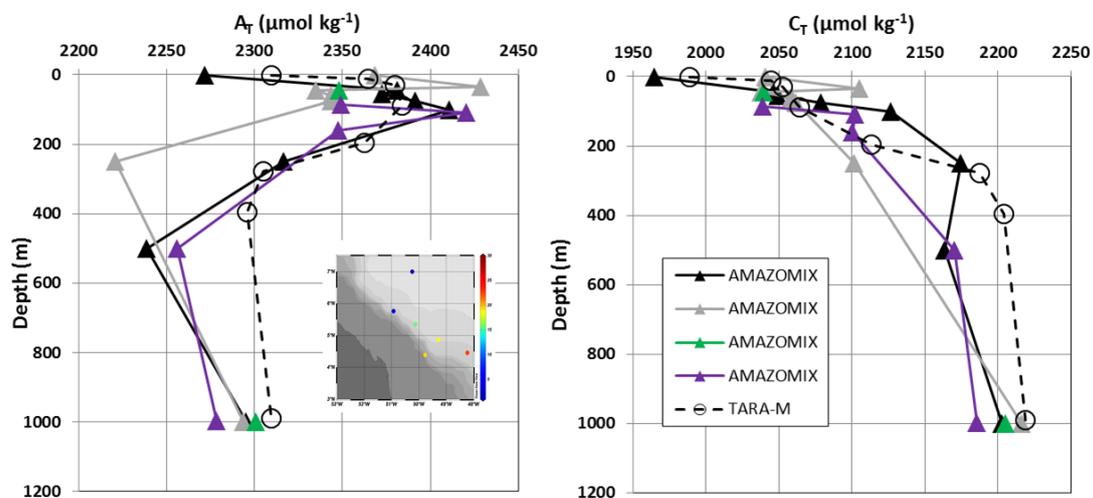
**Figure S5:** Diurnal cycle of total alkalinity ($A_T$) measured in 2018, 2019 and 2021 at Cratère station in a coral reef at Mayotte Island. Discrete samples were measured at LOCEAN (black and grey diamonds) or at La Réunion University (open diamonds).
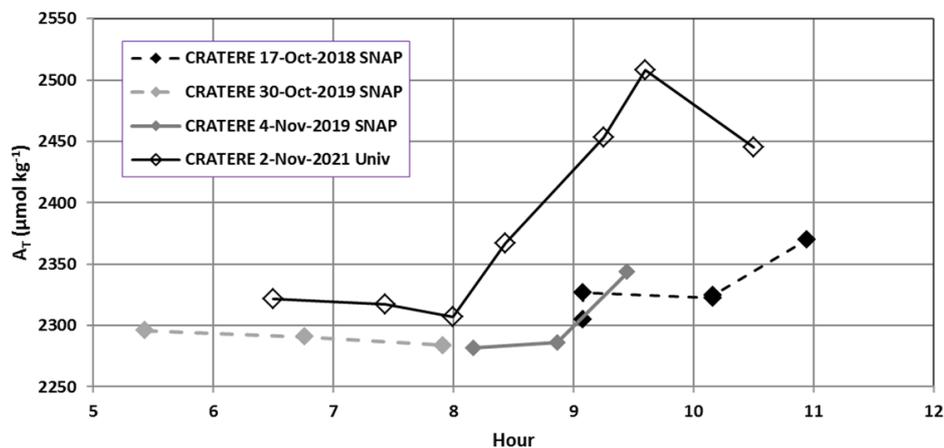
**Figure S6:** Top: Anomalies of SST in the Mediterranean Sea in July 2022 (from Huang et al, 2017, last access 8 November 2022). Middle: Time-series (1990-2023) of sea surface temperature anomalies (in °C) from monthly data (Huang et al, 2017) at location 8°E-42°N (near the DYFAMED time-series). The dashed lines identify the trends over 1990-2010 in blue (+0.017 ± 0.007°C.yr$^{-1}$) and over 2010-2023 in red (+0.068 ± 0.014 °C.yr$^{-1}$). Bottom: Time-series (1998-2023) of sea surface temperature (in °C) from the observations in the SNAPO-CO2-v2 dataset in the Ligurian Sea (cruises DYFAMED, ANTARES, MOOSE-GE). The trend over 1998-2022 is in red (+0.084 ± 0.020 °C.yr$^{-1}$). In summer 2022, the observed temperature was up to 27.5°C and anomalies up to +3°C as recorded in 2003.

20 Jul 2022
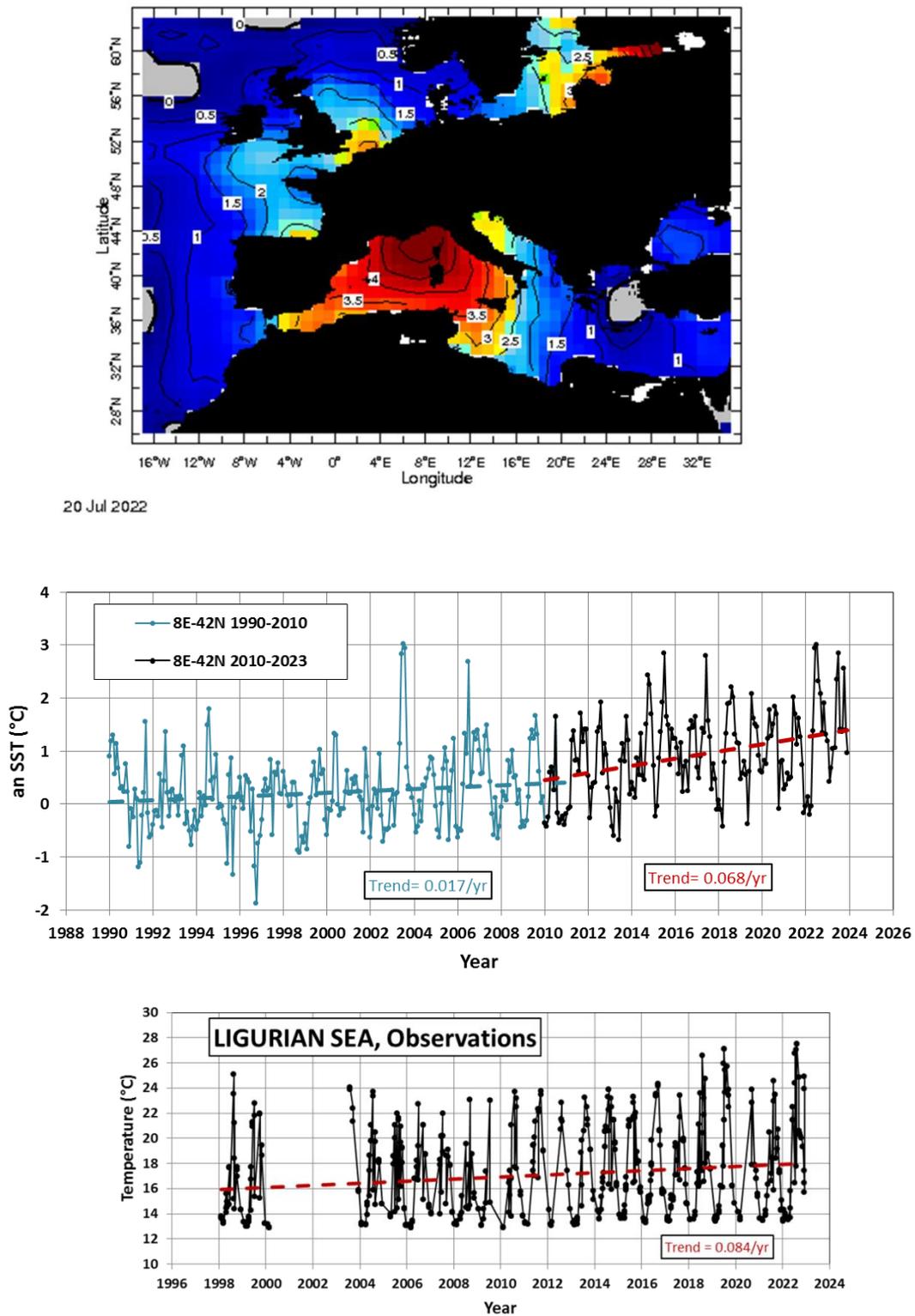
**Figure S7:** Hovmoller section of $C_T$ (μmol kg$^{-1}$) in the layer 0-300m over 1998-2023 in the Ligurian Sea around the DYFAMED station (43°N-8°E). Section produced with ODV (Schlitzer, 2018).
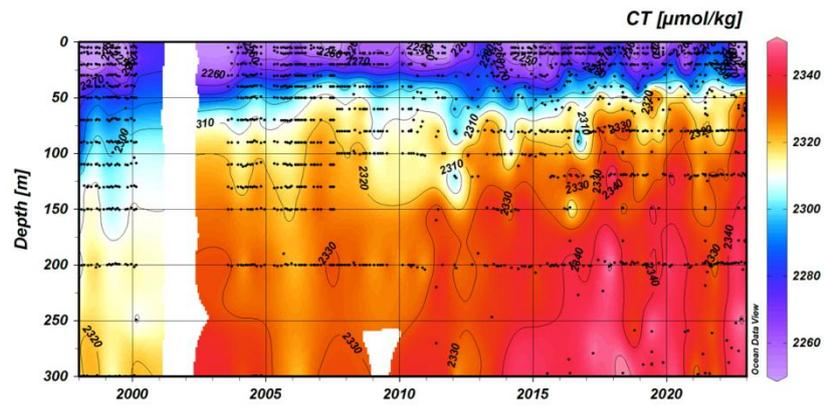
**Figure S8:** Top: Data in SNAPO-CO2-v1 (green) and new data in v2 (brown) from the SURATLANT cruises in 1993-2023 in the North Atlantic. Figure produced with ODV (Schlitzer, 2018). The white box identified the region of selected data around 60°N (the NASPG) for the seasonal cycle (bottom figure) and the trend analysis described in the main text. Bottom: Seasonal cycles of $A_T$ (open symbols) and $C_T$ (black circles) in the NASPG. The grey line represents the seasonal cycle for $C_T$.
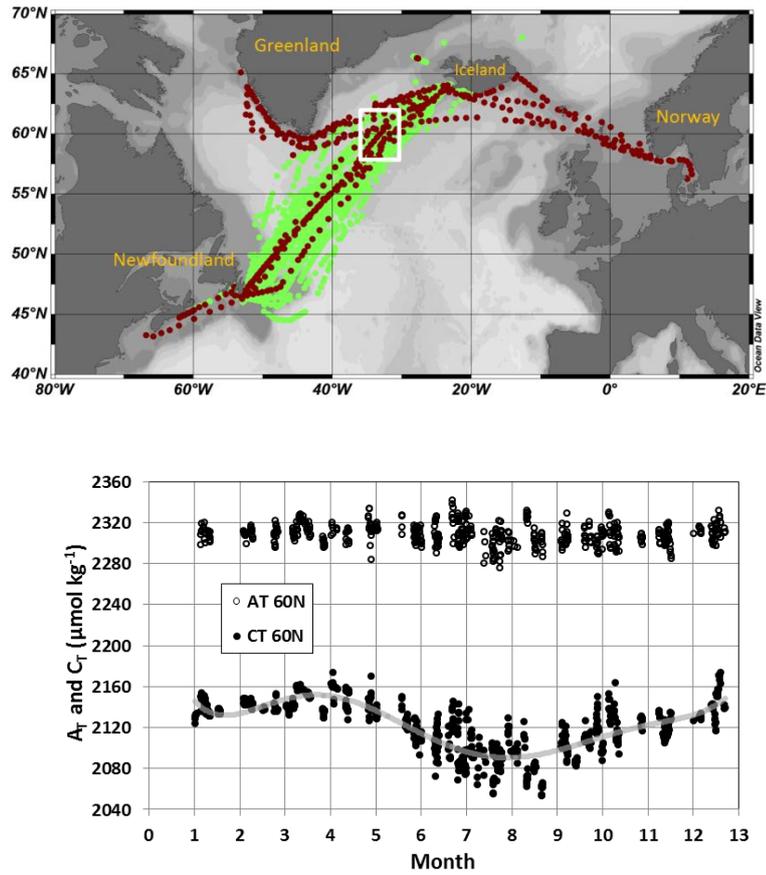
**Figure S9:** Top: Data in SNAPO-CO2-v1 dataset (green) and new data in version v2 (brown) in the Tropical Atlantic. Middle: Distribution of sea surface (0-10m) $C_T$ (µmol kg$^{-1}$) in the tropical Atlantic. The black boxes identified the region of selected data for the time-series presented below. Bottom: Example of time-series of average $C_T$ concentrations in the northern and southern western sectors (for Salinity > 32). The trends for each region are indicated (see also Table 7 in the main text). Figure produced with ODV (Schlitzer, 2018).
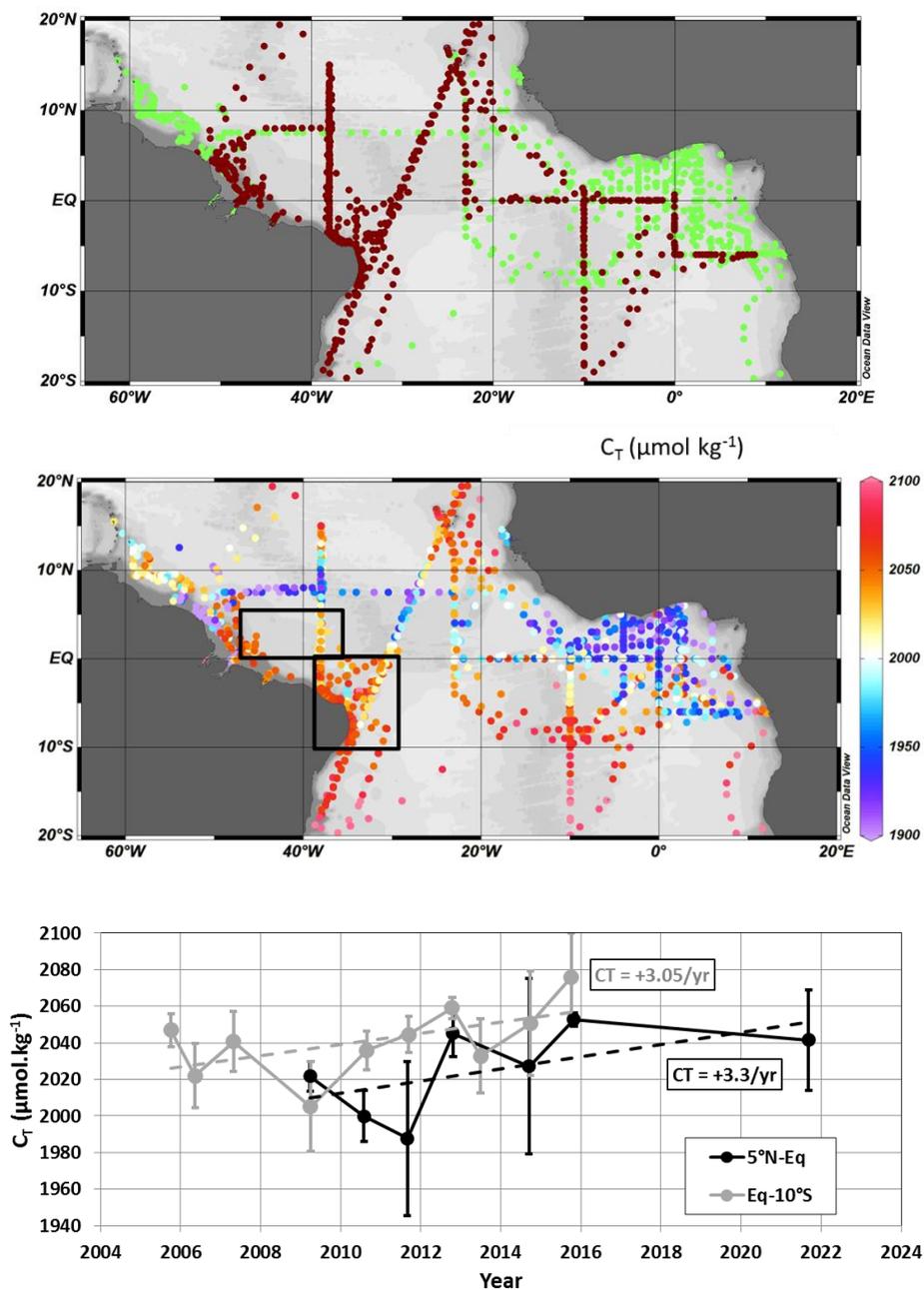
**Figure S10:** Top: Data in the SNAPO-CO2-v1 dataset (green) and new data in version v2 (brown) in the South eastern Indian Ocean. Figure produced with ODV (Schlitzer, 2018). The orange circle (60°S/151°E) identified the region reoccupied in 2011-2012. Bottom: A view of the seasonality of SST (grey circles) and $C_T$ (black circles) from average data in October 2011, January 2012 and October 2012 around 60°S/151°E (orange circle in the map).
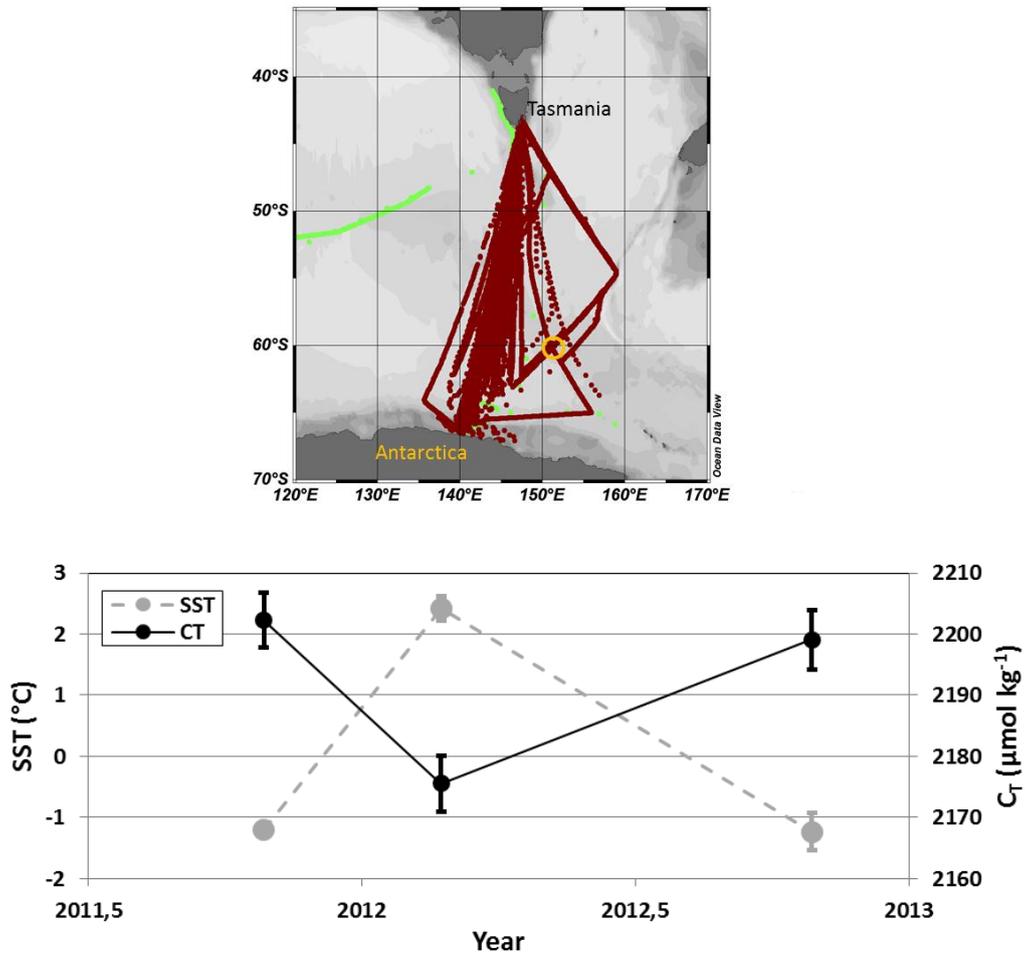
Table S1a: List of new cruises added in the SNAPO-CO2-v2 dataset. The cruises in SNAPO-CO2-v1 are recalled in TableS1b.

| Cruise/Project | Year Start | Year End | Region | Sampling | Nb data | PI ($A_T$-$C_T$) | Laboratory |
|---|---|---|---|---|---|---|---|
| STEP | 2016 | 2017 | Arctic | Water Column | 33 | Lansard Bruno | LSCE |
| SURATLANT AX1 | 2017 | 2023 | North Atlantic | Surface | 255 | Reverdin Gilles | LOCEAN, Paris |
| SURATLANT AX2 | 2018 | 2023 | North Atlantic | Surface | 224 | Reverdin Gilles | LOCEAN, Paris |
| VOS-ATL | 2005 | 2010 | Atlantic | Surface | 192 | Lefèvre Nathalie | LOCEAN, Paris |
| MISSRHODIA-1 | 2017 | 2017 | Gulf Mexico | Water Column | 8 | Rabouille Christophe | LSCE, Gif/Yvette |
| ACIDHYPOS | 2022 | 2022 | Gulf Mexico | Water Column | 10 | Lansard Bruno | LSCE, Gif/Yvette |
| CAMFIN-WATL | 2010 | 2015 | Trop Atlantic | Surface | 192 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-BR | 2009 | 2015 | Trop Atlantic | Surface | 194 | Lefèvre Nathalie | LOCEAN, Paris |
| BIOAMAZON | 2013 | 2014 | Trop Atlantic | Surface | 62 | Lefèvre Nathalie | LOCEAN, Paris |
| AMAZOMIX | 2021 | 2021 | Trop Atlantic | Water Column | 180 | Ternon Jean-François | MARBEC, IRD Sète |
| PIRATA-FR | 2019 | 2019 | Trop Atlantic | Surface | 93 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2020 | 2020 | Trop Atlantic | Surface, Water Column | 58 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2021 | 2021 | Trop Atlantic | Surface, Water Column | 79 | Reverdin Gilles | LOCEAN, Paris |
| PIRATA-FR | 2022 | 2022 | Trop Atlantic | Surface, Water Column | 118 | Lefèvre Nathalie, L.Coppola | LOCEAN, Paris |
| CO2ARVOR | 2009 | 2010 | Atlantic, Coastal | Surface, Water Column | 621 | Bozec Yann | SBR, Roscoff |
| SOMLIT-Roscoff | 2020 | 2022 | Coastal North Atlantic | Surface and 60m | 207 | Bozec Yann | SBR, Roscoff |
| SOMLIT-Brest | 2020 | 2022 | Coastal North Atlantic | Surface | 251 | Bozec Yann | SBR, Roscoff |
| TONGA | 2019 | 2019 | Trop Pacific | Water Column | 226 | Gazeau Frédéric | LOV , Villefranche/Mer |
| CARBODISS | 2018 | 2023 | Coastal Indian | Surface | 85 | Tribollet Aline | LOCEAN, Paris |
| OISO-29 | 2019 | 2019 | South Indian | Surface | 1624 | Lo Monaco Claire | LOCEAN, Paris |
| OISO-30 | 2020 | 2020 | South Indian | Surface | 1390 | Lo Monaco Claire | LOCEAN, Paris |
| OISO-31 | 2021 | 2021 | South Indian | Surface | 2244 | Lo Monaco Claire | LOCEAN, Paris |
| MINERVE | 2002 | 2018 | Southern Ocean | Surface | 12335 | Touratier Franck | IMAGES, Perpignan |
| COCORICO2 | 2020 | 2022 | Atl., Med Sea Coastal | Surface | 589 | Petton Sebastien | IFREMER, Brest |
| SOMLIT-PointB | 2019 | 2023 | MedSea Coastal | Surface + 50m | 716 | Comeau Steeve | LOV , Villefranche/Mer |
| SOLEMIO | 2018 | 2022 | MedSea Coastal | Water Column | 271 | Wagener Thibaut | MIO, Marseille |
| ANTARES | 2017 | 2023 | MedSea | Water Column | 506 | Lefèvre Dominique | MIO, Marseille |
| MOLA | 2018 | 2023 | MedSea Coastal | Water Column | 193 | Conan Pascal | LOM/OOB, Banyuls |
| DYFAMED | 2018 | 2023 | MedSea | Water Column | 541 | Coppola Laurent | LOV , Villefranche/Mer |
| MESURHOBENT | 2010 | 2011 | MedSea Coastal | Surface and sub-surface | 25 | Bozec Yann | SBR, Roscoff |
| ACCESS | 2012 | 2012 | MedSea | Water Column | 16 | Rabouille Christophe | LSCE, Gif/Yvette |
| CARBODELTA | 2013 | 2013 | MedSea | Water Column | 14 | Rabouille Christophe | LSCE, Gif/Yvette |
| DICASE | 2014 | 2014 | MedSea | Water Column | 22 | Rabouille Christophe | LSCE, Gif/Yvette |
| MISSRHODIA-2 | 2018 | 2018 | MedSea | Surface and sub-surface | 13 | Rabouille Christophe | LSCE, Gif/Yvette |
| DELTARHONE1 | 2022 | 2022 | MedSea | Water Column | 9 | Lansard Bruno | LSCE, Gif/Yvette |
| MOOSE-GE 2021 | 2021 | 2021 | MedSea | Water Column | 451 | Coppola Laurent | LOV , Villefranche/Mer |
| MOOSE-GE 2022 | 2022 | 2022 | MedSea | Water Column | 447 | Coppola Laurent | LOV , Villefranche/Mer |
| MOOSE-GE 2023 | 2023 | 2023 | MedSea | Water Column | 475 | Coppola Laurent | LOV , Villefranche/Mer |

Table S1b: List of cruises in the SNAPO-CO2-v1 dataset (Metzl et al, 2024a)

| Cruise/Project | Year Start | Year End | Region | Sampling | Nb data | PI ($A_T$-$C_T$) | Laboratory |
|---|---|---|---|---|---|---|---|
| AWIPEV-CO2 | 2015 | 2021 | Arctic | Surface and sub-surface | 195 | Gattuso Jean-Pierre | LOV , Villefranche/Mer |
| SURATLANT+RREX | 1993 | 2017 | North Atlantic | Surface | 2832 | Reverdin Gilles | LOCEAN, Paris |
| OVIDE | 2006 | 2018 | North Atlantic | Surface, Water Column | 397 | Metzl Nicolas | LOCEAN, Paris |
| STRASSE | 2012 | 2012 | North Atlantic | Water Column | 205 | Reverdin Gilles | LOCEAN, Paris |
| EUREC4A-OA | 2020 | 2020 | North Atlantic | Surface, Water Column | 135 | Reverdin Gilles | LOCEAN, Paris |
| PROTEUS | 2010 | 2010 | North Atlantic coastal | Water Column | 27 | Le Menn Marc | SHOM, Brest |
| CHANNEL | 2012 | 2015 | English Channel | Surface | 696 | Bozec Yann | SBR, Roscoff |
| SOMLIT-Brest | 2008 | 2019 | Coastal North Atlantic | Surface | 1174 | Bozec Yann | SBR, Roscoff |
| SOMLIT-Roscoff | 2009 | 2019 | Coastal North Atlantic | Surface and 60m | 801 | Bozec Yann | SBR, Roscoff |
| ECOSCOPA | 2017 | 2019 | Coastal North Atlantic | Surface | 67 | Petton Sebastien | IFREMER, Brest |
| PENZE | 2011 | 2020 | River Brittany | Surface and sub-surface | 148 | Bozec Yann | SBR, Roscoff |
| AULNE | 2009 | 2010 | River Brittany | Surface | 27 | Bozec Yann | SBR, Roscoff |
| ELORN | 2009 | 2009 | River Brittany | Surface | 28 | Bozec Yann | SBR, Roscoff |
| BIOZAIRE | 2003 | 2004 | Trop Atlantic | Water Column | 87 | Metzl Nicolas | LOCEAN, Paris |
| EGEE | 2005 | 2007 | Trop Atlantic | Surface | 199 | Metzl Nicolas | LOCEAN, Paris |
| PIRATA-FR | 2009 | 2010 | Trop Atlantic | Surface, Water Column | 80 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2011 | 2011 | Trop Atlantic | Surface | 62 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2012 | 2012 | Trop Atlantic | Surface, Water Column | 68 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2013 | 2013 | Trop Atlantic | Surface | 61 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2014 | 2014 | Trop Atlantic | Surface, Water Column | 67 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2015 | 2015 | Trop Atlantic | Surface | 62 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2016 | 2016 | Trop Atlantic | Surface, Water Column | 57 | Lefèvre Nathalie | LOCEAN, Paris |
| PIRATA-FR | 2017 | 2017 | Trop Atlantic | Surface | 58 | Lefèvre Nathalie | LOCEAN, Paris |
| PLUMAND | 2007 | 2007 | Trop Atlantic | Surface | 38 | Lefevre Nathalie | LOCEAN, Paris |
| OUTPACE | 2015 | 2015 | Trop Pacific | Water Column | 240 | Wagener Thibaut | MIO, Marseille |
| PANDORA | 2012 | 2012 | Solomon Sea | Water Column | 178 | Metzl Nicolas | LOCEAN, Paris |
| TARA PACIFIC | 2016 | 2018 | Tropical Pacific and NATL | Surface and sub-surface | 325 | Douville Eric | LSCE, Gif/Yvette |
| TARA OCEANS | 2009 | 2012 | Global Ocean | Surface + 400m | 123 | Gattuso Jean-Pierre | LOV , Villefranche/Mer |
| TARA-MICROBIOM | 2021 | 2022 | Atlantic | Surface, Water Column | 216 | Reverdin Gilles | LOCEAN, Paris |
| ACE | 2016 | 2017 | Southen Ocean | Surface, Water Column | 135 | Metzl Nicolas | LOCEAN, Paris |
| MOBYDICK | 2019 | 2019 | Southern Ocean | Water Column | 64 | Lo Monaco Claire | LOCEAN, Paris |
| CLIM-EPARSES | 2019 | 2019 | Indian | Surface | 790 | Lo Monaco Claire | LOCEAN, Paris |
| OISO | 1998 | 2018 | South Indian, Southern Ocean | Surface | 24950 | Metzl Nicolas | LOCEAN, Paris |
| | | | | | | | |
| DYFAMED | 1998 | 2017 | MedSea | Water Column | 2118 | Coppola Laurent | LOV , Villefranche/Mer |
| BOUSSOLE | 2014 | 2019 | MedSea | Surface + 10m | 172 | Boutin Jacqueline | LOCEAN, Paris |
| SOMLIT-PointB | 2007 | 2015 | MedSea Coastal | Surface + 50m | 2397 | Gattuso Jean-Pierre | LOV , Villefranche/Mer |
| ANTARES | 2010 | 2016 | MedSea | Water Column | 502 | Lefèvre Dominique | MIO, Marseille |
| MOLA | 2010 | 2013 | MedSea Coastal | Water Column | 66 | Conan Pascal | LOM/OOB, Banyuls |
| SOLEMIO | 2016 | 2018 | MedSea Coastal | Water Column | 212 | Wagener Thibaut | MIO, Marseille |
| MOOSE-GE | 2010 | 2019 | MedSea | Water Column | 1847 | Coppola Laurent | LOV , Villefranche/Mer |
| LATEX | 2010 | 2010 | MedSea | Water Column | 51 | Anne Petrenko | MIO, Marseille |
| CARBORHONE | 2011 | 2012 | MedSea | Water Column | 706 | Bozec Yann | SBR, Roscoff |
| CASCADE | 2011 | 2011 | MedSea | Water Column | 218 | Durrieu de Madron Xavier | CEFREM, Perpignan |
| DEWEX | 2013 | 2013 | MedSea | Water Column | 367 | Conan Pascal | LOM/OOB, Banyuls |
| SOMBA | 2014 | 2014 | MedSea | Water Column | 203 | Louanchi Ferial | ENSSMAL, Alger |
| AMOR-BFLUX | 2015 | 2015 | MedSea Coastal | Water Column | 6 | Lansard Bruno | LSCE, Gif/Yvette |
| PEACETIME | 2017 | 2017 | MedSea | Water Column | 233 | Gazeau Frédéric | LOV , Villefranche/Mer |
| PERLE | 2018 | 2021 | MedSea | Water Column | 805 | Wagener Thibaut | MIO, Marseille |

Table S2: List of CRM Batch numbers used for new cruises added in the SNAPO-CO2-v2 dataset

| Cruise/Project | Year Start | Year End | Region | CRM Batch Number |
|---|---|---|---|---|
| STEP | 2016 | 2017 | Arctic | 155, 165 |
| SURATLANT AX1 | 2017 | 2023 | North Atlantic | Nan |
| SURATLANT AX2 | 2018 | 2023 | North Atlantic | 165,173,182 |
| VOS-ATL | 2005 | 2010 | Atlantic | 66, 71, 73, 77, 83, 104 |
| MISSRHODIA-1 | 2017 | 2017 | Gulf Mexico | 165 |
| ACIDHYPOS | 2022 | 2022 | Gulf Mexico | 204 |
| CAMFIN-WATL | 2010 | 2015 | Trop Atlantic | 104, 119, 131, 139 |
| PIRATA-BR | 2009 | 2015 | Trop Atlantic | 92,104, 111,131,139 |
| BIOAMAZON | 2013 | 2014 | Trop Atlantic | 139 |
| AMAZOMIX | 2021 | 2021 | Trop Atlantic | 197 |
| PIRATA-FR | 2019 | 2019 | Trop Atlantic | 182 |
| PIRATA-FR | 2020 | 2020 | Trop Atlantic | 191 |
| PIRATA-FR | 2021 | 2021 | Trop Atlantic | 196 |
| PIRATA-FR | 2022 | 2022 | Trop Atlantic | 156 |
| CO2ARVOR | 2009 | 2010 | Atlantic, Coastal | 83,92,  97, 99 |
| SOMLIT-Roscoff | 2020 | 2022 | Coastal North Atlantic | 196, 208 |
| SOMLIT-Brest | 2020 | 2022 | Coastal North Atlantic | 196, 208 |
| TONGA | 2019 | 2019 | Trop Pacific | 182 |
| CARBODISS | 2018 | 2023 | Coastal Indian | 173, 191 |
| OISO-29 | 2019 | 2019 | South Indian | 155, 165, 173 |
| OISO-30 | 2020 | 2020 | South Indian | 173 |
| OISO-31 | 2021 | 2021 | South Indian | 182, 191 |
| MINERVE | 2002 | 2018 | Southern Ocean | 66,72, 73, 76, 82, 83, 88, 95, 99, 104, 111, 116, 131, 182 |
| COCORICO2 | 2020 | 2022 | Atl., Med Sea Coastal | 156, 196, 197, 204, 208 |
| SOMLIT-PointB | 2019 | 2023 | MedSea Coastal | 182,191,196,197,204,208 |
| SOLEMIO | 2018 | 2022 | MedSea Coastal | 191, 196, 204, 208 |
| ANTARES | 2017 | 2023 | MedSea | 165, 182, 196, 204, 208 |
| MOLA | 2018 | 2023 | MedSea Coastal | 182, 197, 208 |
| DYFAMED | 2018 | 2023 | MedSea | 182, 191, 197 |
| MESURHOBENT | 2010 | 2011 | MedSea Coastal | 99, 111 |
| ACCESS | 2012 | 2012 | MedSea | 116 |
| CARBODELTA | 2013 | 2013 | MedSea | 122 |
| DICASE | 2014 | 2014 | MedSea | 131 |
| MISSRHODIA-2 | 2018 | 2018 | MedSea | 173 |
| DELTARHONE1 | 2022 | 2022 | MedSea | 204 |
| MOOSE-GE 2021 | 2021 | 2021 | MedSea | 197 |
| MOOSE-GE 2022 | 2022 | 2022 | MedSea | 204 |
| MOOSE-GE 2023 | 2023 | 2023 | MedSea | 208 |

Table S3: List of DOI (cruises or data when available) for new cruises in the SNAPO-CO2-v2 dataset.

| Cruise/Project | Year Start | Year End | Region | Doi |
|---|---|---|---|---|
| STEP | 2016 | 2017 | Arctic | https://doi.org/10.17600/16000900, https://doi.org/10.18142/338 |
| SURATLANT AX1 | 2017 | 2023 | North Atlantic | https://doi.org/10.17882/54517 |
| SURATLANT AX2 | 2018 | 2023 | North Atlantic | https://doi.org/10.17882/54517 |
| VOS-ATL | 2005 | 2010 | Atlantic | https://doi.org/10.17882/58407 |
| MISSRHODIA-1 | 2017 | 2017 | Gulf Mexico | |
| ACIDHYPOS | 2022 | 2022 | Gulf Mexico | |
| CAMFIN-WATL | 2010 | 2015 | Trop Atlantic | https://doi.org/10.17882/62418 |
| PIRATA-BR | 2009 | 2015 | Trop Atlantic | https://doi.org/10.17882/58406 |
| BIOAMAZON | 2013 | 2014 | Trop Atlantic | https://doi.org/10.17882/62417 |
| AMAZOMIX | 2021 | 2021 | Trop Atlantic | https://doi.org/10.17600/18001364 |
| PIRATA-FR | 2019 | 2019 | Trop Atlantic | https://doi.org/10.17882/83682, https://doi.org/10.17600/18000875, https://doi.org/10.18142/14 |
| PIRATA-FR | 2020 | 2020 | Trop Atlantic | https://doi.org/10.17882/90742, https://doi.org/10.17600/18000690, https://doi.org/10.18142/14 |
| PIRATA-FR | 2021 | 2021 | Trop Atlantic | https://doi.org/10.17600/18001227, https://doi.org/10.18142/14 |
| PIRATA-FR | 2022 | 2022 | Trop Atlantic | https://doi.org/10.17882/92386, https://doi.org/10.17600/18001832, https://doi.org/10.18142/14 |
| CO2ARVOR | 2009 | 2010 | Atlantic, Coastal | https://doi.org/10.17600/9070070, https://doi.org/10.17600/9480110,https://doi.org/10.17600/9480170, https://doi.org/10.17600/10070040 |
| SOMLIT-Roscoff | 2020 | 2022 | Coastal North Atlantic | |
| SOMLIT-Brest | 2020 | 2022 | Coastal North Atlantic | |
| TONGA | 2019 | 2019 | Trop Pacific | https://www.seanoe.org/data/00770/88169/ |
| CARBODISS | 2018 | 2023 | Coastal Indian | |
| OISO-29 | 2019 | 2019 | South Indian | https://doi.org/10.17600/18000972, https://doi.org/10.25921/8ajx-za24 |
| OISO-30 | 2020 | 2020 | South Indian | https://doi.org/10.17600/18000679, https://doi.org/10.25921/n2g0-pp38 |
| OISO-31 | 2021 | 2021 | South Indian | https://doi.org/10.17600/18001254, https://doi.org/10.25921/7sb2-k852 |
| MINERVE | 2002 | 2018 | Southern Ocean | https://doi.org/10.18142/128 |
| COCORICO2 | 2020 | 2022 | Atl., Med Sea Coastal | https://doi.org/10.17882/96982 |
| SOMLIT-PointB | 2019 | 2023 | MedSea Coastal | https://doi.org/10.1594/PANGAEA.727120 |
| SOLEMIO | 2018 | 2022 | MedSea Coastal | https://doi.org/10.17882/72356 |
| ANTARES | 2017 | 2023 | MedSea | https://doi.org/10.18142/233 |
| MOLA | 2018 | 2023 | MedSea Coastal | https://doi.org/10.18142/234 |
| DYFAMED | 2018 | 2023 | MedSea | https://doi.org/10.18142/131, https://doi.org/10.17882/43749 |
| MESURHOBENT | 2010 | 2011 | MedSea Coastal | https://doi.org/10.17600/10450020 |
| ACCESS | 2012 | 2012 | MedSea | https://doi.org/10.17600/12450070 |
| CARBODELTA | 2013 | 2013 | MedSea | https://doi.org/10.17600/13450060 |
| DICASE | 2014 | 2014 | MedSea | https://doi.org/10.17600/14007100 |
| MISSRHODIA-2 | 2018 | 2018 | MedSea | https://doi.org/10.17600/18000473, https://doi.org/10.17882/73204 |
| DELTARHONE1 | 2022 | 2022 | MedSea | https://doi.org/10.17600/18002027 |
| MOOSE-GE 2021 | 2021 | 2021 | MedSea | https://doi.org/10.17600/18001333 |
| MOOSE-GE 2022 | 2022 | 2022 | MedSea | https://doi.org/10.17600/18001854 |
| MOOSE-GE 2023 | 2023 | 2023 | MedSea | https://doi.org/10.17600/18002686 |

Table S4: List of references for new cruises in the SNAPO-CO2-v2 dataset.

| Cruise/Project | Year Start | Year End | Region | References (Publications) |
|---|---|---|---|---|
| ANTARES | 2017 | 2023 | MedSea | Wimart-Rousseau et al (2023), Wimart-Rousseau (2021) |
| BIOAMAZON | 2013 | 2014 | Trop Atlantic | Lefèvre et al (2017a), Bonou et al (2016), Bonou et al (2022) |
| CAMFIN-WATL | 2010 | 2015 | Trop Atlantic | Bonou et al (2016), Lefèvre et al (2017b), Bonou et al (2022) |
| CARBODELTA | 2013 | 2013 | MedSea | Dumoulin et al (2018) |
| CO2ARVOR | 2009 | 2010 | Atlantic, Coastal | Bozec et al (2012) |
| COCORICO2 | 2020 | 2022 | Atl., Med Sea Coastal | Petton et al (2024) |
| DICASE | 2014 | 2014 | MedSea | Rassmann (2016), Rassmann et al (2016), Dumoulin et al (2018), Pozzato et al (2018) |
| DYFAMED | 2018 | 2023 | MedSea | Wimart-Rousseau et al (2023), Wimart-Rousseau (2021) |
| MINERVE | 2002 | 2018 | Southern Ocean | Laika et al (2009), Brandon et al (2022) |
| MISSRHODIA-2 | 2018 | 2018 | MedSea | Ait Ballagh et al (2021), Dumoulin et al (2022) |
| OISO-29 | 2019 | 2019 | South Indian | Leseurre et al (2022), Metzl et al (2022) |
| OISO-30 | 2020 | 2020 | South Indian | Metzl et al (2022) |
| OISO-31 | 2021 | 2021 | South Indian | Metzl et al (2024c, subm.) |
| PIRATA-BR | 2009 | 2015 | Trop Atlantic | Lefèvre et al (2014) , Bonou et al (2022) |
| PIRATA-FR | 2019 | 2019 | Trop Atlantic | Lefèvre et al (2021) |
| PIRATA-FR | 2020 | 2020 | Trop Atlantic | Lefèvre et al (2023) |
| SOLEMIO | 2018 | 2022 | MedSea Coastal | Wimart-Rousseau et al (2020), Barré et al (2023, 2024), Wimart-Rousseau (2021) |
| SURATLANT AX2 | 2018 | 2023 | North Atlantic | Leseurre (2022) |
| VOS-ATL | 2005 | 2010 | Atlantic | Bonou et al (2022) |