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Supplement of

An updated synthesis of ocean total alkalinity and dissolved inorganic carbon measurements from 1993 to 2023: the SNAPO-CO_2-v2 dataset

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This document includes Figures S1-S11 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).

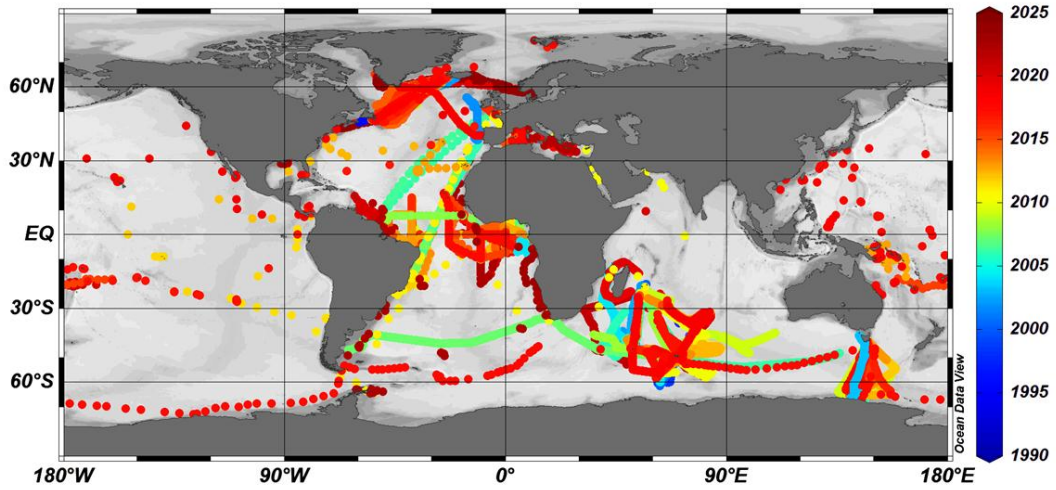


Figure S2: Results of CRM measurements in 2005-2024. The plot shows the differences of A_T versus C_T (Measured minus CRM reference) for 1308 CRM bottles and different CRM Batches analyzed in 2005-2024. Results for Batches 64 to 197 are in grey and recent Batches 204 and 208 are in red. For all 1308 analysis standard-deviations of the differences were ±3.13 µmol.kg^{-1} for A_T and ±3.43 µmol.kg^{-1} for C_T (or ±2.69 µmol.kg^{-1} and ±2.88 µmol.kg^{-1} for 1242 analysis when excluding few outliers). Differences higher than ±5 µmol.kg^{-1} were excluded for processing sample analyses but kept in this plot.

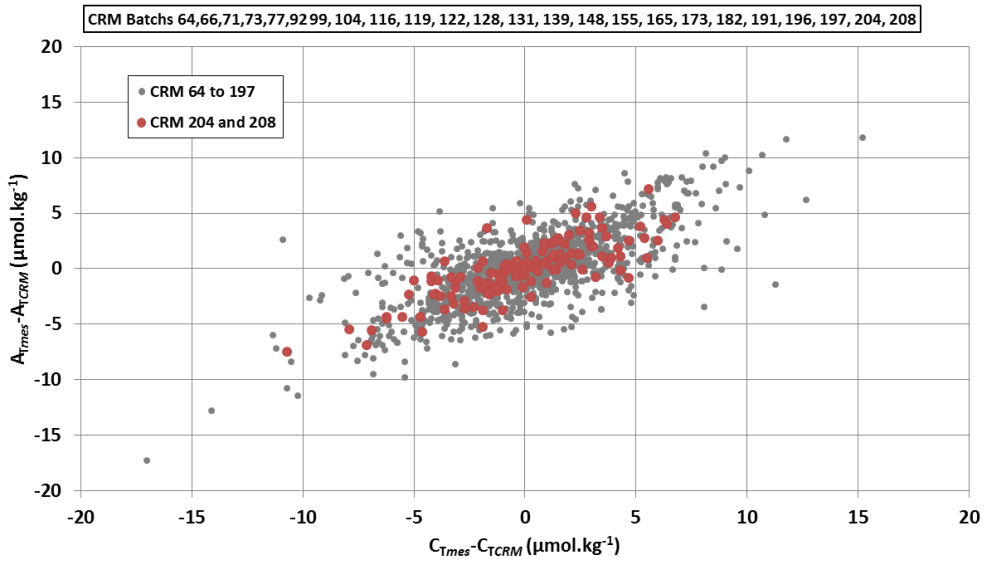


Figure S3: Example of Quality control (to assign secondary flags). Relationships of A_T/salinity (left) and A_T/C_T (right) from MINERVE cruises over 2002-2018. All data are shown including Flag 2 (Good, blue), Flag 3 (Questionable, yellow) and Flag 4 (Bad, brown). Figures produced with ODV (Schlitzer, 2018).

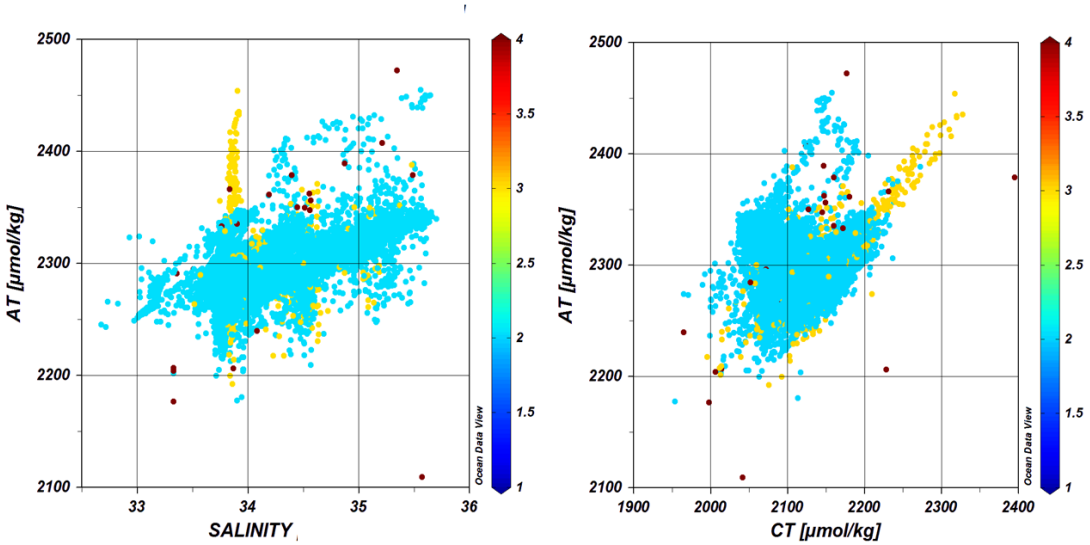


Figure S4: Profiles of A_T and C_T in the western tropical Atlantic (near the Amazon River plume) for 2 cruises conducted in September 2021 (Stations from AMAZOMIX on 15-22-Sept-2021 and TARA-Microbiome on 1-Sept-2021). The location of the selected stations are shown in the inserted map (TARA-Microbiome in red, AMAZOMIX in blue) produced with ODV (Schlitzer, 2018). Mean values of the properties at 1000m are listed in Table 4 (main text).

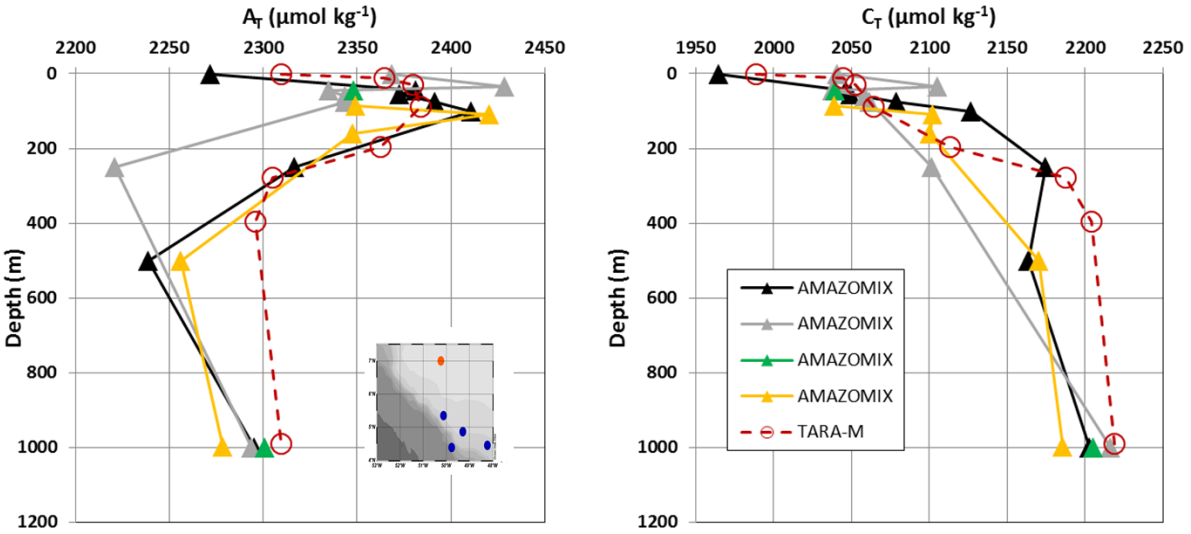


Figure S5: Diurnal cycle of total alkalinity (A_T) measured in 2018, 2019 and 2021 at Cratère station in a coral reef at Mayotte Island. Discrete samples were measured at LOCEAN (black and grey diamonds) or at La Réunion University (open diamonds).

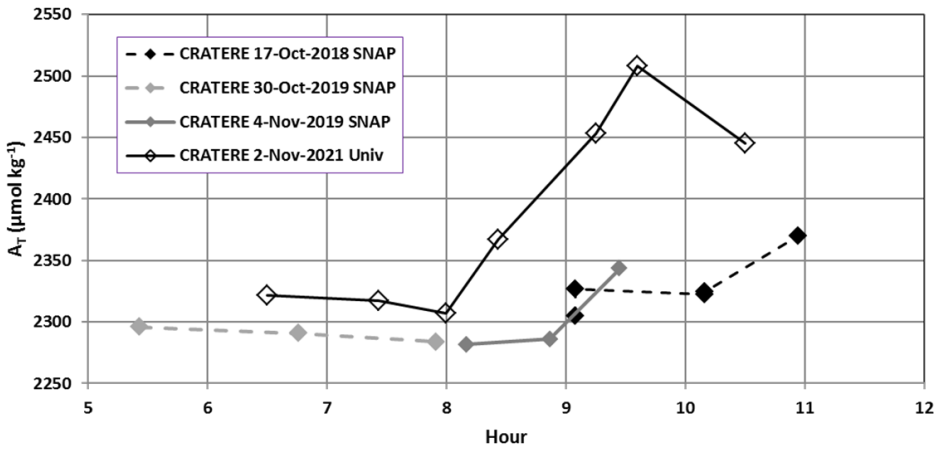
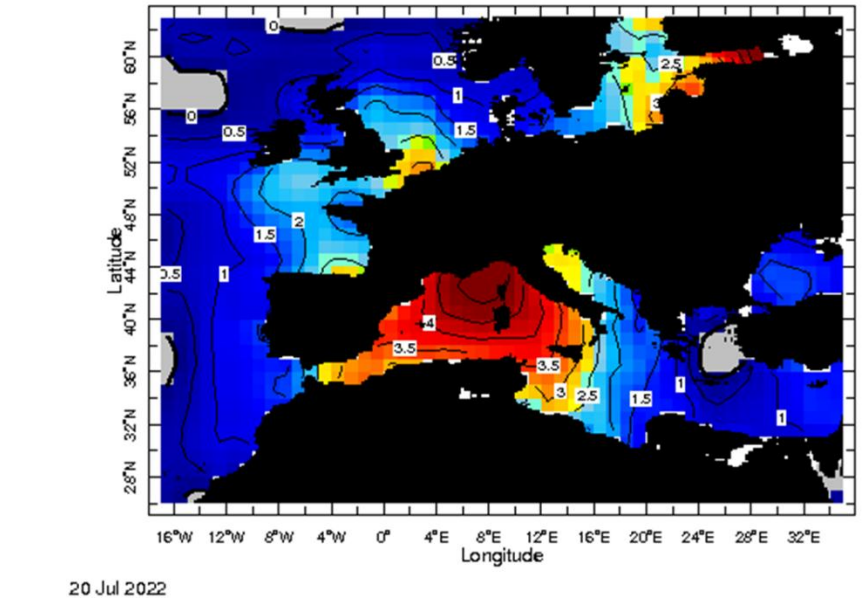
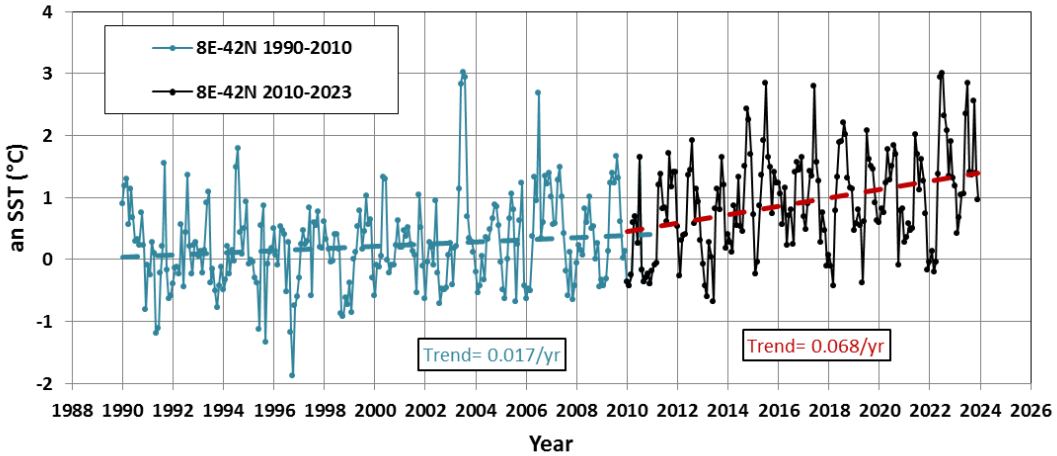


Figure S6: Top: Anomalies of SST in the Mediterranean Sea in July 2022 (from Huang et al, 2017, last access 8 November 2022). Middle: Time-series (1990-2023) of sea surface temperature anomalies (in °C) from monthly data (Huang et al, 2017) at location 8°E-42°N (near the DYFAMED time-series). The dashed 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.





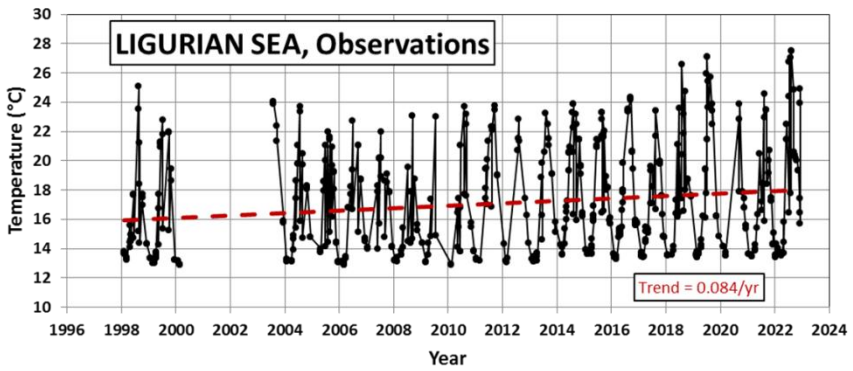


Figure S7: Hovmoller section of C_T (µmol kg^{-1}) in the layer 0-300m over 1998-2023 in the Ligurian Sea around the DYFAMED station (43°N-8°E). Section produced with ODV (Schlitzer, 2018).

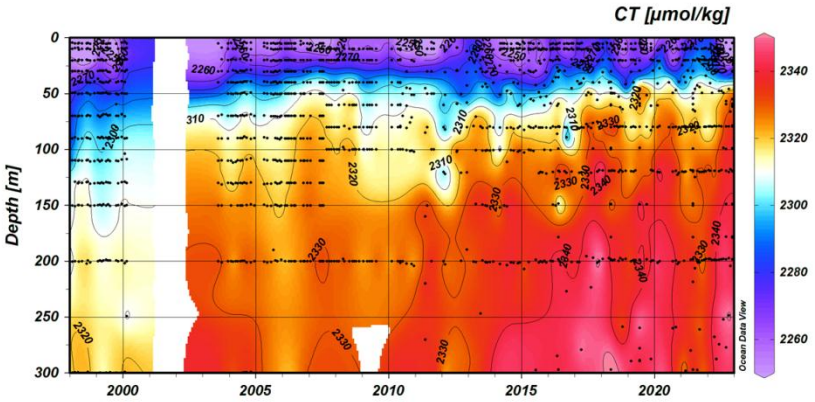


Figure S8: Top: Data in SNAPO-CO2-v1 (green) and new data in v2 (brown) from the SURATLANT cruises in 1993-2023 in the North Atlantic. Figure produced with ODV (Schlitzer, 2018). The white box identified the region of selected data around 60°N (the NASPG) for the seasonal cycle (middle and bottom figure) and the trend analysis described in the main text. Middle: 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. Bottom: Time-series of temperature and salinity around 60°N showing a reverse trend in recent years (2022-2023).

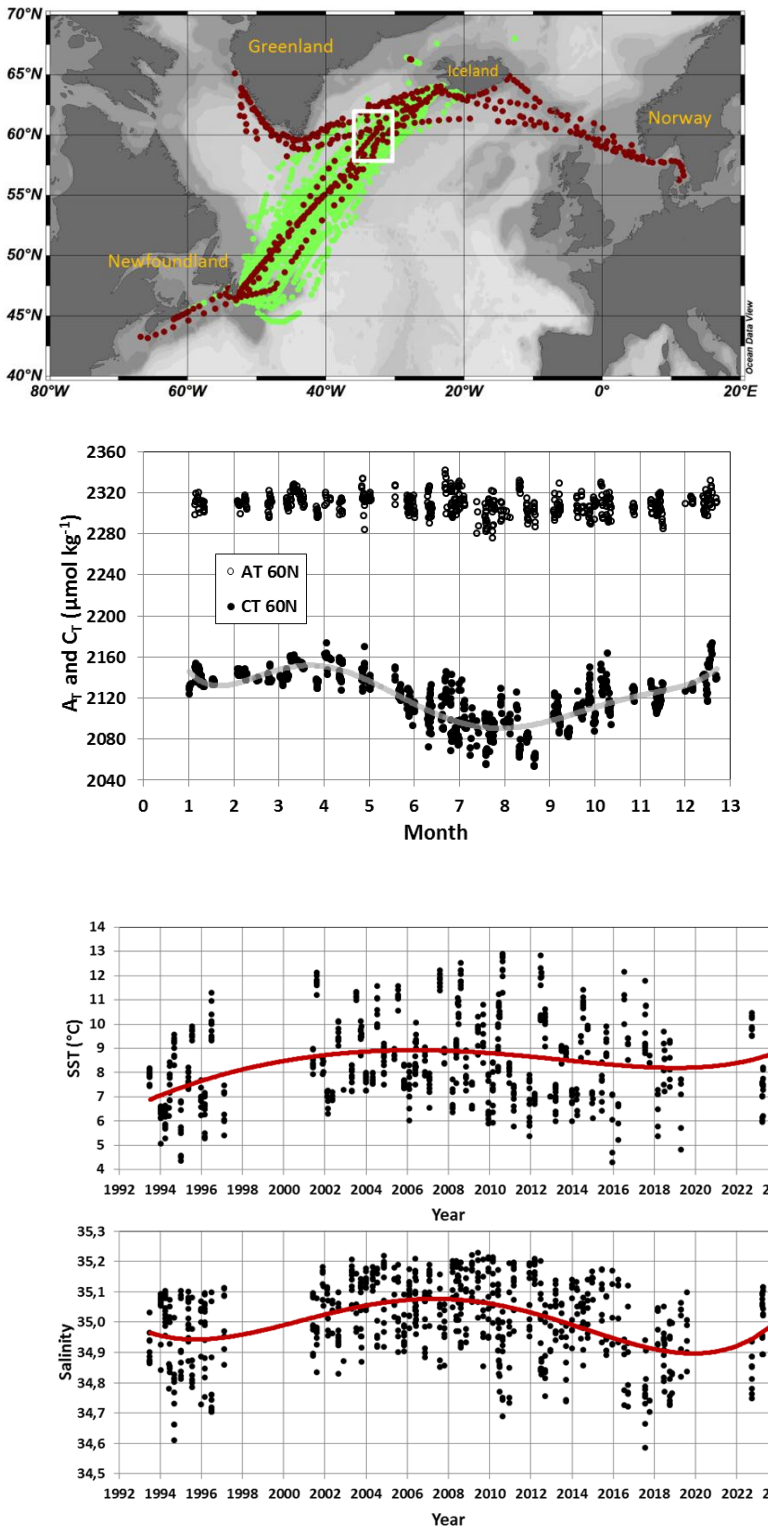


Figure S9: Top: Data in SNAPO-CO2-v1 dataset (green) and new data in version v2 (brown) in the Tropical Atlantic. Middle: Distribution of sea surface (0-10m) C_T (µmol kg^{-1}) in the tropical Atlantic. The black boxes identified the region of selected data for the time-series presented below. Bottom: 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).

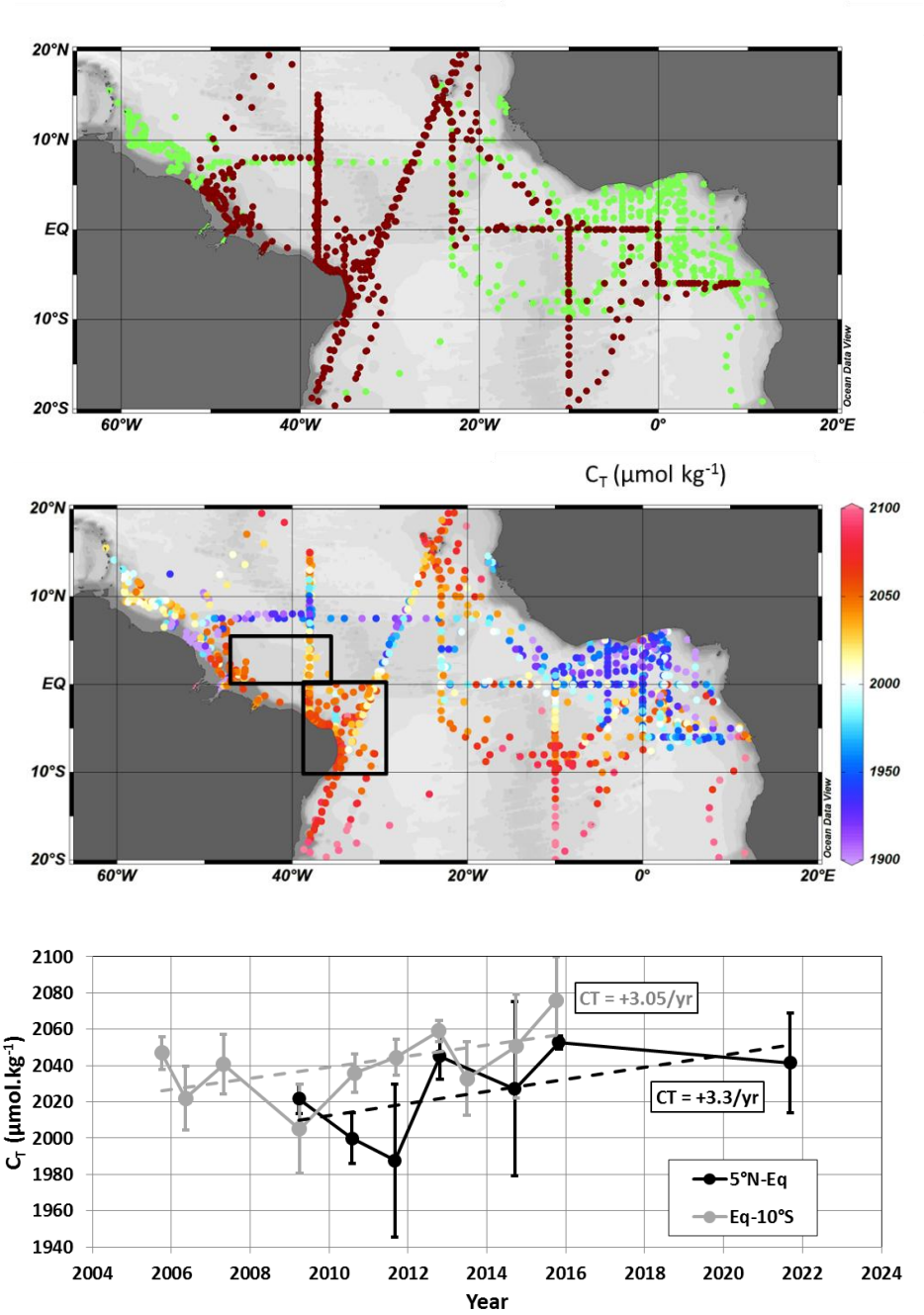


Figure S10: Top: Data in the SNAPO-CO2-v1 dataset (green) and new data in version v2 (brown) in the South eastern Indian Ocean. Figure produced with ODV (Schlitzer, 2018). The orange circle (60°S/151°E) identified the region reoccupied in 2011-2012. Middle: A view of the seasonality of SST (grey circles) 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). Bottom: Time-series of temperature (black circles) and salinity (grey circles) around 60°S in October showing a decrease of temperature and an increase of salinity in recent years.

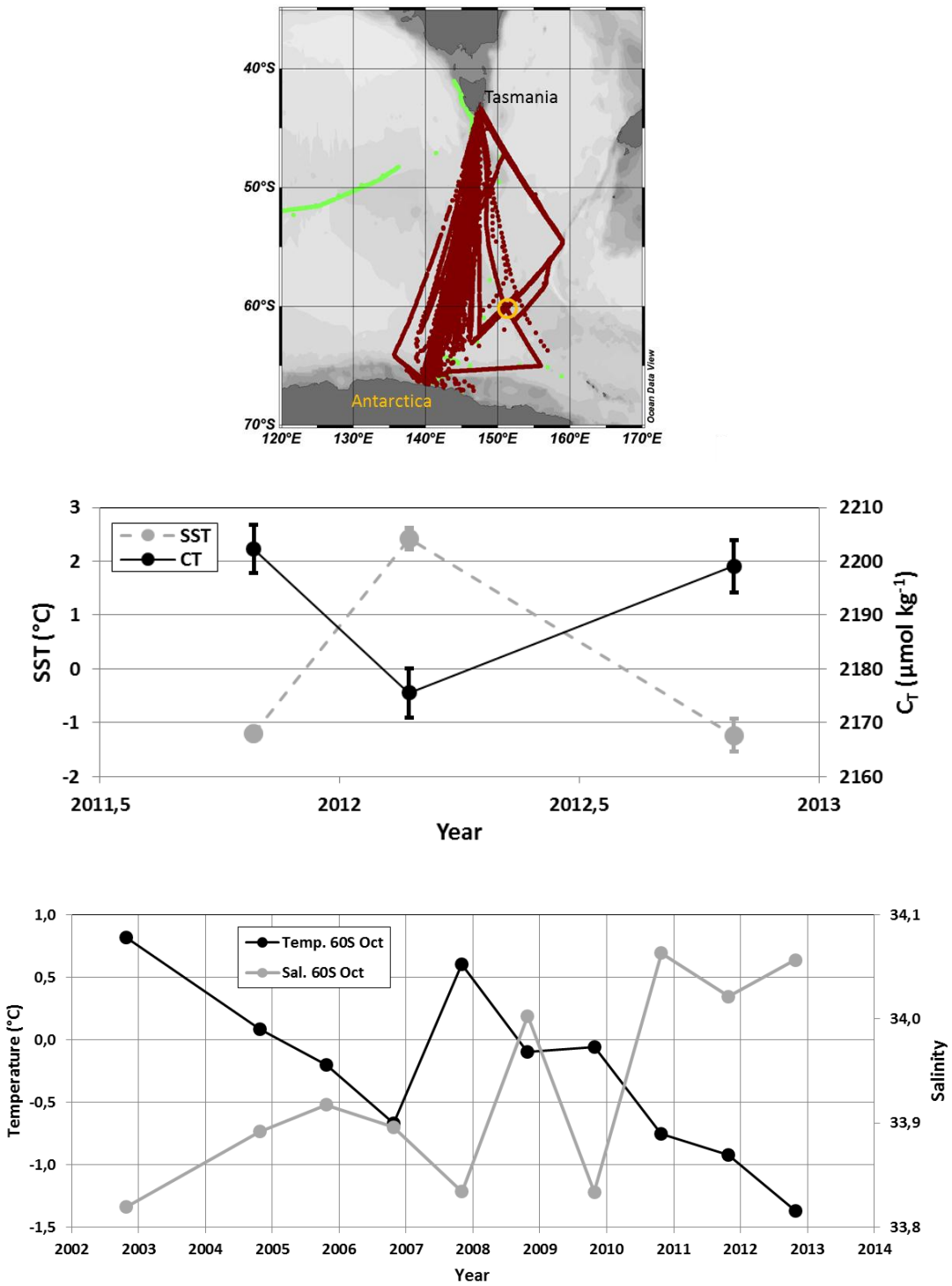


Figure S11: Time-series of average temperature (°C) in selected MARCATS regions for different periods when data are available for ten years or more. A warming is detected in all regions except at high latitudes (Greenland and Adélie).

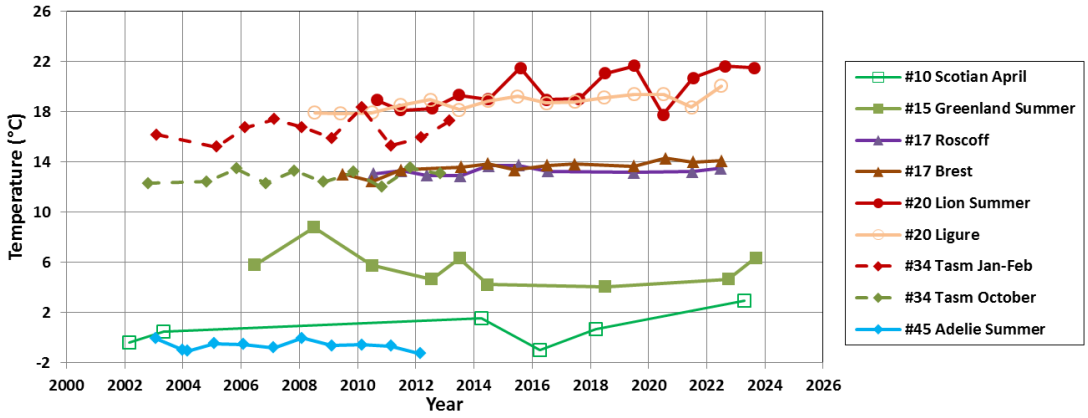


Table S1a: List of new cruises added in the SNAPO-CO2-v2 dataset. The cruises in SNAPO-CO2-v1 are recalled in TableS1b.

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)

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