

CARBON TIME SERIES STATIONS: GLOBAL

International Ocean Carbon Coordination Project (www.ioccp.org)

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Mooring/Station/ Ship name	Date of operation	Location	Description	Frequency (i.e. monthly, continuous)	PI	Country
Atlantic						
Stations monitored from ships						
Iceland Sea	1983-	68°N 12.66°W	Profile, pCO ₂ and TIC, O ₂ and nutrients	4/year	J. Olafsson	Iceland
Irminger Sea	1983-	64.3N,28°W	Profile, pCO ₂ and TIC, O ₂ and nutrients	4/year	J. Olafsson	Iceland
Labrador Sea (Bravo)	1993-	57N,53W		1/year	K. Azetsu-Scott	Canada
JetSet		53N, 4E46' Marsdiep tidal channel	DIC, Alkalinity	weekly	H. Zemmeling	Netherlands
L4/Plymouth Quest	2005-2009	W. English Channel	Time series station since 1988, pCO ₂ added in 2005.	Weekly	N. Hardman-Mountford	UK
E1/Plymouth Quest	2005-2009	W. English Channel	Time series station since 1903, pCO ₂ added in 2005.	Monthly	N. Hardman-Mountford	UK
NW Atlantic Hydro Station S	1983-	32N, 65W		Monthly	A. Dickson	USA
NW Atlantic BATS/OPF/BTM	1988-	32N 65W			N. Bates	Bermuda/ USA
NE Atlantic ESTOC	1995-	29N,16W	European Station for Time series in the Ocean at the Canary Islands	Monthly	M. Gonzalez/M. Santana	Spain
RV Islandia/CV	2007-	17.5°N, 24.3°W		Monthly	D. Wallace A. Körtzinger	Germany

Cariaco time series station/R.V. "Hermano Ginés"	1996-	10° 30' N, 64° 40' W (Cariaco Basin, Atlantic)	Water column core measurements up to 1310 m, including carbon measurements: POC, DOC, CO ₂ , TOC	Monthly, on going	Time series: F. Muller-Karger CO ₂ measurements: Y.M. Astor	Venezuela
Stations monitored by moorings						
Central Irminger Sea (CIS)	2003-	59.7°N, 39.7°W		Continuous	A. Körtzinger	Germany
Baltic Sea	2000-	Östergarns-holm	SAMI pCO ₂ mooring and air CO ₂ flux measurements	Continuous	A. Rutgersson Owenius	Sweden
Norwegian Sea OWS Station M	1992-	66°N, 2°E (Arctic)	Water column and surface measurements	Continuous	I. Skjelvan T. Johannessen	Norway
Ste Anna	2002-2010	Upper Scheldt estuary	Fixed station for continuous measurements of pCO ₂ , salinity and temperature	Continuous	A. Borges	Belgium
K1	2001/2002 2004-2007	56.5°N, 52.6°W (near Bravo)	Long-term mooring	Continuous	A. Körtzinger	Germany
Porcupine Abyssal Plain (PAP)	2003-	49N, 16.5W	Long term mooring	Continuous	A. Körtzinger	Germany
MAREL-Iroise	Feb 2003-	48°22' N 4°33' W	Hourly measurements by a CARIOCA sensor (modified for coastal measurements) at 1.5m depth	Continuous	E. Bucciarelli	France
Scotian Shelf	2007-	44.68N 63.61W	CARIOCA buoy	Hourly 2007-	H. Thomas	Canada
Martha's Vineyard, MA	2002-	43°N	pCO ₂	Continuous	W. McGillis	USA
MINAS	2005-	43°N, 11°W	Multidisciplinary Iberian North Atlantic Station. CARIOCA buoy with sensors of CO ₂ , O ₂ , S, T, Chla.	Continuous	F.F. Perez	Spain
NW Atlantic BATS/OPF/BTM	1988-	32°N 65°W			N. Bates	Bermuda/USA

Grays Reef, Georgia (NDBC 41008)	2006-	31.4°N, 80.9°W		Continuous	C. Sabine	USA
BTM	2005-	31.5°N, 64°W	MAPCO ₂ system	Continuous	C. Sabine/N. Bates	USA
CV	2007-	17.5°N, 24.3°W		Daily	D. Wallace A. Körtzinger	Germany
Pacific						
Stations monitored from ships						
NE Pacific OSP / Line P	1970's-	50N,145W	DIC/T Alk at 5 stations along Line P (Miller). pCO ₂ (Wong)	3/year	C.S. Wong L. Miller	Canada
K2	2001-	47N,160E	0 - bottom, 36 layers DIC, TA, pH, CFCs	2 – 3/year	M. Honda M. Wakita	Japan
A-line (A4, A7)	1996-	42.25°N, 145.125°E (A4) and 41.50°N, 145.50°E (A7)	DIC, TA, 13C 0 - 3000m, 12 layers *part of A-line monitoring program (http://ss.hnf.affrc.go.jp/a-line/index_e.html) *reference: Ono et al., JO 61, 1075-1088, 2005.	4-6/year	T. Ono	Japan
Santa Monica Bay, CA	2003-	33.9N, 118.7 W		Bi weekly	A. Leinweber	USA
NW Pacific HOT	1988-	22.75N,158W	shipboard cruises	Monthly	D. Karl	USA
SEATS	1999-	115.67°E 18.25°N (in the South China Sea)	Dissolved inorganic carbon and total alkalinity are measured at 25 discrete depths throughout the water column (from surface to 3500m).	Seasonal	W.-C. Chou	China (Taiwan)
Munida time series transect	Jan 1998-	SW Pacific	Surface transect (45.77S 170.72E – 45.83S 170.50E), water column measurements at 45.83S 170.50E	6 per year	K. Currie	New Zealand

JMA's monitoring program by RV Ryofu Maru and RV Keifu Maru	2003-	North Pacific 137°E(P9), 30°N-5°N, mostly 5° intervals	DIC, 13C, pH, CFCs* 0 - 2000m, 22 layers * measured in selected cruises	Seasonal Jan-Feb, April- May, June-July, Oct-Nov	M. Ishii S. Minato	Japan
JMA's monitoring program by RV Ryofu Maru and RV Keifu Maru	2003-	North Pacific 165°E(P13), 50°N - 28°N, mostly 2-3° intervals	DIC, TA*, CFCs* 0 - 2000m, 22 layers	Annual June-July	M. Ishii S. Minato	Japan
JMA's monitoring program by RV Ryofu Maru and RV Keifu Maru	2003-	North and Eq Pacific 165°E(P13), 28°N - 3°S, mostly 2-3° intervals	DIC, 13C, pH*, CFCs* 0 - 2000m, 22 layers	Biannual Jan-Feb, June-July	M. Ishii S. Minato	Japan
JMA's monitoring program by RV Ryofu Maru and RV Keifu Maru	2003-	Eq Pacific 165°E - 142°E, 0°, mostly 5° intervals	DIC, pH* 0 - 2000m, 22 layers	Biannual Jan-Feb, June-July	M. Ishii S. Minato	Japan
155E Line	2002 -	North Pacific 155°E, 44°N -0°	0 - bottom, 36 layers DIC, TA, pH, CFCs	~1/year	M. Wakita	Japan
Stations monitored by moorings						
Cape Elizabeth (NDBC 446041)	2006-	47.3N, 124.8W		Continuous	C. Sabine	USA
NW Pacific JKEO	2007-	38N, 146.5E	MAPCO ₂ system	Continuous	C. Sabine M. Cronin	USA
California Current MBARI M1	1996-	36.75N, 122W		Continuous	F. Chavez	USA
California Current MBARI M2	1996-	36.75N, 122W		Continuous	F. Chavez	USA
Santa Monica	2002-	33.9N, 118.7 N		Continuous	N. Gruber	USA

NW Pacific KEO	2006-	32N, 145E	MAPCO ₂ system	Continuous	C. Sabine M. Cronin	USA
MOSEAN	2005-	22.75N,158W	MAPCO ₂ system	Continuous	C. Sabine D. Karl	USA
Kaneohe Bay, Hawaii	2005-	21.4N, 157W		Continuous	C. Sabine	USA
TAO / TRITON	2003-	0, 125W	MAPCO ₂ system	Continuous	C. Sabine	USA
TAO / TRITON	2003-	0, 140W	MAPCO ₂ system	Continuous	C. Sabine	USA
TAO / TRITON	1997-	0,155W	MBARI pCO ₂ system	Continuous	F. Chavez C. Sabine	USA
TAO / TRITON	2005-	0, 170W	MAPCO ₂ system	Continuous	C. Sabine	USA
TAO / TRITON	1997-	2S 170W	MBARI pCO ₂ system	Continuous	F. Chavez C. Sabine	USA
Stratus	2006-	85W, 20S	MAPCO ₂ system	Continuous	C. Sabine R. Weller	USA
Indian						
Stations monitored from ships						
GOA time series station	2003-2012 (Funded)	15N 72E	Sampling of CO ₂ parameters were started in end of 2006 and will continue until 2012.	Monthly	S. W. A. Naqvi	India
East coast time series	2007-2012 (Funded)	15-20N 80-85E	5 transects will be occupied along east coast of India between 15 to 20N and samples are collected along 5 transects of 10 kms wide.	Seasonal	M.D Kumar	India
Bay of Bengal time series	2008-2013 (Proposed)	20N, 90E	Permanent mooring and weekly sampling using automated samplers and seasonal visit to the station.	Seasonal	VVSS Sarma	India

Southern Ocean						
Stations monitored by moorings						
PULSE time series	2008? -	47S 142E	Sub-Antarctic mooring	Continuous	B. Tilbrook (CO ₂)	Australia
NIWA Southern Biophysical Mooring	March 2005– (for SAMI)	SW Pacific, sub-antarctic surface water	Permanent mooring, including SAMI-CO ₂ instrument	Continuous	K. Currie S. Nodder	New Zealand
Marian Cove, King Sejong Station, King George Island	2003-	62°13'S, 58°47'W	Surface measurements	Continuous	Y.C. Kang	Korea
Stations monitored from ships						
Zhongshan Station	1984-	69°S, 75°W	Water column including DIC, pH, ²³⁴ Th, DO, Chl, nutrients, biomass	Annual	L. Chen	China
Changcheng Station	1984-	62°S, 59°W	Water column including DIC, pH, ²³⁴ Th, DO, Chl, nutrients, biomass	Annual	L. Chen	China
Mediterranean						
Stations monitored from ships						
Mediterranean DYFAMED	1991-2001; 2003 – present	43N,7.9E	Water column discrete AT and CT	Monthly	C. Goyet	France
Stations monitored by moorings						
STARESO	2006-2008	Calvi (Corsica)	Shallow mooring for pCO ₂ and temperature measurements (Pro-Oceanus) over a Posidonia seagrass meadow (water column depth 10m) the Mediterranean Sea	Daily	A. Borges	Belgium
GIFT	2005-ongoing	35.861N, 5.977W 35.912N, 5.746W 35.987N, -5.368W	Time series composed by three stations located in the Strait of Gibraltar aimed at assessing biogeochemical cycles between North Atlantic and Mediterranean Sea	Seasonal	E. Huertas	Spain