

Table S2: Overview of reported OA measurements in the OSPAR regions which are NOT included in Table S1.

| Transect/ station | OSPAR region | Start | Depth | Frequency (sample) | Institution | Variables | Sustained funding |
|---|--------------|--|----------------------------|---------------------------|--|------------------------------------|-------------------|
| R/V Belgica (BE) | II | 1985 - (pH) 2014 - (TA) 2020 - (DIC) | Surface | Monthly (discrete) | Royal Belgian Institute of Natural Sciences | pH, TA, DIC, O ₂ , nuts | Y |
| Routine monitoring (DE) | II | 1990 (pH)- 2014 /TA)- | Surface, bottom (discrete) | Variable | The Federal Maritime and Hydrographic Agency | pH, TA | Y |
| Routine monitoring (DE) | II | 1985 (pH)- 2016 (TA)- | Surface (discrete) | Weekly-monthly (discrete) | Niedersächsischer Landesbetrieb für Wasserwirtschaft, KN | pH, TA | Y |
| Routine monitoring (DE) | II | 2003 | Surface, full water depth | Variable | Landesamt für Landwirtschaft, Umwelt und ländliche Räume | pH | Y |
| MARENET (DE) | II | 2013- | Fixed depths | Continuous (sensor) | The Federal Maritime and Hydrographic Agency | pH | Y |
| M/S Magnus Heinason (DK) | I | 2018 | Full water depth | Seasonal (discrete) | Faroe Marine Research Institute | DIC, TA | |
| Greenland Ecosystem Monitoring - MarinBasis Zackenberg (DK) | I | 2002 | Full water depth | Seasonal (discrete) | Greenland Institute of Natural Resources | DIC, TA | |

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| National Monitoring program (DK) | II | 1980s | Variable | Variable (discrete) | Danish Environmental Agency | pH, TA, O ₂ , nuts | Y |
| FICARAM section (ES) | IV, V | 2001- | Full water depth | Typically, twice per decade (discrete) | Instituto de Investigaciones Mariñas, IIM-CSIC | pH, TA, O ₂ , nuts | N |
| GIFT stations (ES) | IV | 2005- | Full water depth | Periodically (discrete) | Instituto de Ciencias Marinas de Andalucía, ICMAN-CSIC | pH, TA, O ₂ , nuts | N |
| GIFT mooring (ES) | IV | 2012- | Fixed depth | Continuous (sensor) | ICMAN-CSIC | pH | N |
| RADPROF (ES) | IV | 2014- | Full water depth | Annual (discrete) | Instituto Español de Oceanografía, IEO-CSIC | pH, TA, O ₂ , nuts | Y |
| RadVIGO (ES) | IV | 2018- | Full water depth | Monthly (discrete) | IEO-CSIC | pH, TA, O ₂ , nuts | N |
| RadCoruña (ES) | IV | 2014- | Full water depth | Monthly (discrete) | IEO-CSIC | pH, TA, O ₂ , nuts | Y |
| RadCAN (ES) | IV | 2017- | Full water depth | Seasonally (discrete) | IEO-CSIC | pH, TA, O ₂ , nuts | N |
| North Atlantic-59.5°N (ES/RU) | I, II, III, V | 2009, 2016 | Full water depth | Sporadic (discrete) | Instituto de Oceanografía y Cambio Global-ULPGC/Shirshov Inst. of oceanography | pH, DIC, TA, O ₂ , nuts | N |
| OVIDE section (ES/FR) | IV, V | 2002- | Full water depth | Every two years (discrete) | IIM-CSIC/LPO-IFREMER | pH, TA, O ₂ , nuts | N |
| Le Buron/Dinard (FR) | III | 2013-2014 | Surface, bottom | Every 2 weeks | | pH, O ₂ , nuts | N |

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| pk30/Gironde (FR) | IV | 1997- | Surface, bottom | Monthly | | pH, O ₂ , nuts | Y |
| Pk52/Gironde (FR) | IV | 1997- | Surface, bottom | Monthly | | pH, O ₂ , nuts | Y |
| Pk86/Gironde (FR) | IV | 1997- | Surface, bottom | Monthly | | pH, O ₂ , nuts | Y |
| Transect of station B1 to B7 (FR) | III | 2010-2018 | Surface, bottom | 3/ yr (discrete) | OFB | pH, nuts | N |
| Transect of stations D1 to D6 (FR) | III | 2010-2018 | Surface, bottom | 3/ yr (discrete) | OFB | pH, nuts | N |
| Bay of Douarnenez (FR) | III | 2010-2018 | Surface | Every 2 weeks | OFB | pH, nuts | N |
| Molène (FR) | III | 2010-2018 | Surface | Every 2 weeks (discrete) | OFB | pH, nuts | N |
| Sein (FR) | III | 2010-2018 | Surface | Every 2 weeks (discrete) | OFB | pH, nuts | N |
| Marel Iroise/ Marel st. Anne (FR) | III | 1999 (pH)- 2008 (pCO ₂)- | Surface | Semi-continuous (sensors) | IR-ILICO | pH, pCO ₂ , O ₂ | Y |
| SMILE/Luc sur Mer (FR) | II | 2015- | Surface | Semi-continuous (sensor) | IFREMER, Univ. Caen, AESN, | pH, nuts | Y |
| ASTAN (FR) | III | 2007- | Surface | Semi-continuous (sensor) | Station biologique de Roscoff | pH, pCO ₂ , O ₂ | Y |
| SMART (FR) | III | 2016- | Surface | Semi-continuous (sensor) | IFREMER | pH, pCO ₂ | Y |

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| MAREL CARNOT (FR) | II | 2004-2014 | Surface | Semi-continuous | IFREMER | pH | N |
| International Bottom Trawl Survey (IBTS) (FR) | II | 1978- | Full water depth | Annual (discrete) | IFREMER | pH, O ₂ | Y |
| Channel Ground Fish Survey (CGFS) (FR) | II, III | 1988- | Full water depth | Annual (discrete) | IFREMER | pH, O ₂ | Y |
| PELGAS (FR) | III, IV | 2000- | Full water depth | Annual (discrete) | IFREMER | pH, O ₂ | Y |
| EVHOE (Evaluation Halieutique Ouest de l'Europe) (FR) | III, IV | 1987- | Full water depth | Annual (discrete) | IFREMER | pH, O ₂ | Y |
| Campagnes dédiées Habitats pélagiques DCSMM (FR) | II, III | 2018 | Surface | One campagne (discrete) | IFREMER/CNRS | pH, O ₂ | Y |
| R/V Celtic Explorer (IE) | III, V | 2017- | Surface | Semi-continuous (sensor) | Marine Institute | pCO ₂ | Y |
| COMPASS Mace Head obs., mooring (IE) | III | 2019- | Surface, bottom | Semi-continuous (sensor), monthly (discrete) | Marine Institute | pCO ₂ , pH, DIC, TA, O ₂ , nuts | N |

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| Winter Environmental Survey (IE) | III | 2012- | Surface, bottom | Winter (discrete) | Marine Institute/ National University of Ireland, Galway | DIC, TA, nuts | N |
| Southern Rockall Through Annual Climate Section (IE) | III, V | 2009- | Full water depth | Annual (discrete) | Marine Institute/ National University of Ireland, Galway | DIC, TA, nuts, CFC | N |
| R/V in Icelandic waters (IS) | I | 1995- | Surface | Continuous quarterly (sensor) | Marine and Freshwater Research Institute | pCO ₂ | Y |
| Iceland Sea mooring (IS) | I | 2013- | Surface | Continuous (sensor) | Marine and Freshwater Research Institute | pCO ₂ , pH | Y |
| National monitoring program, 18 stations (NL) | II | 2018- | Surface | Monthly (discrete) | NIOZ Royal Netherlands Institute for Sea Research / Rijkswaterstaat | pH, DIC, TA, O ₂ , nuts | N |
| Torungen-Hirtshals section (NO) | II | 2011- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Arendal station (NO) | II | 2017- | Full water depth | Monthly (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Utsira-Orkney section (NO) | II | 2021- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Svinøy section (NO) | I | 2011- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |

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| Gimsøy section (NO) | I | 2011, 2013- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Skrova station (NO) | I | 2015- | Full water depth | Monthly (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Hola CWC reef station (NO) | I | 2015- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Stjernesund station (NO) | I | 2019- | Full water depth | 2/yr (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Hardanger reef station (NO) | II | 2016- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Fugløya-Bjørnøya section (NO) | I | 2011- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| NE Barents Sea section (NO) | I | 2012- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Vardø-N section (NO) | I | 2012- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |
| Isfjorden section (NO) | I | 2019- | Surface | Sporadic (discrete) | Institute of Marine Research | DIC, TA, pH, nuts | N |
| IsA, Isfjorden station (NO) | I | 2019- | Full water depth | Sporadic (discrete) | Institute of Marine Research | DIC, TA, pH, nuts | N |
| Hinlopen section (NO) | I | 2015- | Full water depth | Annual (discrete) | Institute of Marine Research | DIC, TA, nuts | N |

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| Barents Sea mooring, M5 (NO) | I | 2019- | 50-70 m | Continuous (sensor) | Institute of Marine Research | pH | N |
| Barents Sea mooring, A-TWAIN800 (NO) | I | 2019- | 30 m/ 700 m | Continuous (sensor) | Institute of Marine Research | pH | N |
| Argo-bøye 6903574 (NO) | I | 2020- | 0-2000 m | Continuous (sensor) | Institute of Marine Research/ NORCE Norwegian Research Centre | pH | N |
| Argo-bøye 6903549 (NO) | I | 2019- | 0-2000 m | Continuous (sensor) | Institute of Marine Research/ NORCE Norwegian Research Centre | pH | N |
| Argo-bøye 6903550 (NO) | I | 2019- | 0-2000 m | Continuous (sensor) | Institute of Marine Research/ NORCE Norwegian Research Centre | pH | N |
| Argo-bøye 6903551 (NO) | I | 2019- | 0-2000 m | Continuous (sensor) | Institute of Marine Research/ NORCE Norwegian Research Centre | pH | N |
| Fram Strait section (NO) | I | 2011- | Full water depth | Annual (discrete) | Norwegian Polar Institute/ Institute of Marine Research | DIC, TA, nuts | N |
| Kongsfjorden stations (NO) | I | 2012- | Full water depth | Annual (discrete) | Norwegian Polar Institute/ Institute of Marine Research | DIC, TA, nuts | N |

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| R/V Kronprins Haakon (NO) | I | 2018- | Surface | Continuous (sensor) | Norwegian Polar Institute | pCO ₂ | N |
| Kongsfjorden mooring, Kb3 (NO) | I | 2019- | 25-30 m | Continuous (sensor) | Norwegian Polar Institute | pCO ₂ | N |
| Oslo-Kiel section (NO) | II | 2017- | Surface | Continuous (sensor) | Norwegian Institute for Water Research | pCO ₂ , pH | N |
| Oslo-Kiel section (NO) | II | 2010- | Surface | Seasonal (discrete) | Norwegian Institute for Water Research | DIC, TA, nuts | N |
| Torbjørn-skjær, VT3 station (NO) | II | 2017- | 0-30 m | Monthly (discrete) | Norwegian Institute for Water Research | DIC, TA, nuts | N |
| Bergen-Kirkenes section (NO) | I, II | 2017- | Surface | Continuous (sensor) | Norwegian Institute for Water Research | pCO ₂ , pH | N |
| Skinnbrok-leia, VT71 station (NO) | I | 2018 | 0-30 m | Monthly (discrete) | Norwegian Institute for Water Research | DIC, TA, nuts | N |
| Straumsfjorden, VR54 station (NO) | I | 2018- | Full water depth | Monthly (discrete) | Norwegian Institute for Water Research | DIC, TA, nuts | N |
| Tromsø-Longyearbyen section (NO) | I | 2017- | Surface | Continuous (sensor) | Norwegian Institute for Water Research | pCO ₂ , pH | N |

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| Tromsø-Longyearbyen section (NO) | I | 2010- | Surface | Seasonal (discrete) | Norwegian Institute for Water Research | DIC, TA, pH, nuts | N |
| M/S Trans Carrier (NO) | I, II | 2005-09 2018- | Surface | Continuous (sensor) | NORCE Norwegian Research Centre | pCO ₂ | N |
| R/V G.O. Sars (NO) | I, II | 2004- | Surface | Continuous (sensor) | NORCE Norwegian Research Centre | pCO ₂ | N |
| Korsfjorden station (NO) | II | 2007- | Full water depth | 4-6/yr (discrete) | NORCE Norwegian Research Centre | DIC, TA, nuts | N |
| Ytre Hardanger station (NO) | II | 2015- | Full water depth | 4-6/yr (discrete) | NORCE Norwegian Research Centre | DIC, TA, nuts | N |
| A29 (75 °N) section (NO) | I | 1993- | Full water depth | Typical twice per decade (discrete) | NORCE Norwegian Research Centre/ University of Bergen | DIC, TA, O ₂ , nuts, tracers | N |
| Station M station (NO) | I | 2011- | Surface (2011-21), 200-500 m (2013-) | Semi-continuous (sensor) | NORCE Norwegian Research Centre/ University of Bergen | pCO ₂ , pH | N |
| M/S Nuka/ Tukuma Arctica (NO) | I, II, V | 2004 (pCO ₂)- 2015 (TA)- | Surface | Continuous (pCO ₂), discrete (TA) | University of Bergen | pCO ₂ , TA | N |
| Caminha/VRSA (PT) | IV | 2013 | Surface | One survey (discrete)) | IPMA | pH, nuts | N |
| SNMB (PT) | IV | 2015, 2017- | Surface | Monthly (discrete) | IPMA | pH, O ₂ , nuts | N |

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| SMHI station Å17 (SE) | II | 2007- | Full water depth | Monthly (discrete) | Swedish Meteorological and Hydrological Institute | pH, TA, O ₂ , nuts | Y |
| SMHI station ANHOLT E (SE) | II | 1993- | Full water depth | Monthly (discrete) | Swedish Meteorological and Hydrological Institute | pH, TA, O ₂ , nuts | Y |
| SMHI station N14 Falkeberg (SE) | II | 2007- | Full water depth | Monthly (discrete) | Swedish Meteorological and Hydrological Institute | pH, TA, O ₂ , nuts | Y |
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| Western Channel Obs. (E1) (UK) | II | 2008- | Surface and bottom | Every 2 weeks (discrete) | Plymouth Marine Laboratory | DIC, TA | N |
| Western Channel Obs. (L4 and E1) (UK) | II | 2008- | Surface | Weekly (sensor) | Plymouth Marine Laboratory | pCO ₂ | N |
| Atlantic Meridional transect (UK) | III, IV, V | 1995-2018 | Surface (pCO ₂), full water depth (pH, DIC, TA) | Annual (sensor, discrete) | Plymouth Marine Laboratory | pCO ₂ , pH, DIC, TA, O ₂ , nuts | N |
| COMPASS Loch Ewe (UK) | III | 2018- | Surface | Semi-continuous (sensor), weekly (discrete) | Marine Scotland Science | pCO ₂ , DIC, TA; O ₂ , nuts | N |
| COMPASS Loch Creran (UK) | III | 2019- | Fixed depth | Semi-continuous (sensor) | The Scottish Association of Marine Science | pCO ₂ , pH | N |
| R/V Endeavour (UK) | II, III | 2011-2015 | Surface | Semi-continuous (sensor, discrete) | Centre for Environment, Fisheries and Aquaculture Science | pCO ₂ , DIC, TA | N |

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| Smartbuoys (UK) | II | 2010-2013 | Fixed depths | Monthly (discrete) | Centre for Environment, Fisheries and Aquaculture Science | DIC, TA, O ₂ | N |
| Extended Ellet Line (UK) | I, III | 1996- | Full water depth | Every 5 years | National Oceanography Centre, Southampton | DIC, TA, nuts | N |
| The Porcupine Abyssal Plain Sustained Observatory (PAP-SO) (UK) | V | 2003- | Surface | Continuous (sensor) | National Oceanography Centre, Southampton | pCO ₂ , pH, O ₂ , nuts | N |
| M/S UK-Caribbean (UK) | V | 2003-2019 | Surface | Continuous (sensor) | University of Exeter | pCO ₂ , O ₂ , nuts | N |
| Faroe-Shetland Channel (UK) | I, II | ? | Full water depth | Every 5 years | Marine Scotland Science | DIC, TA, O ₂ , nuts | N |