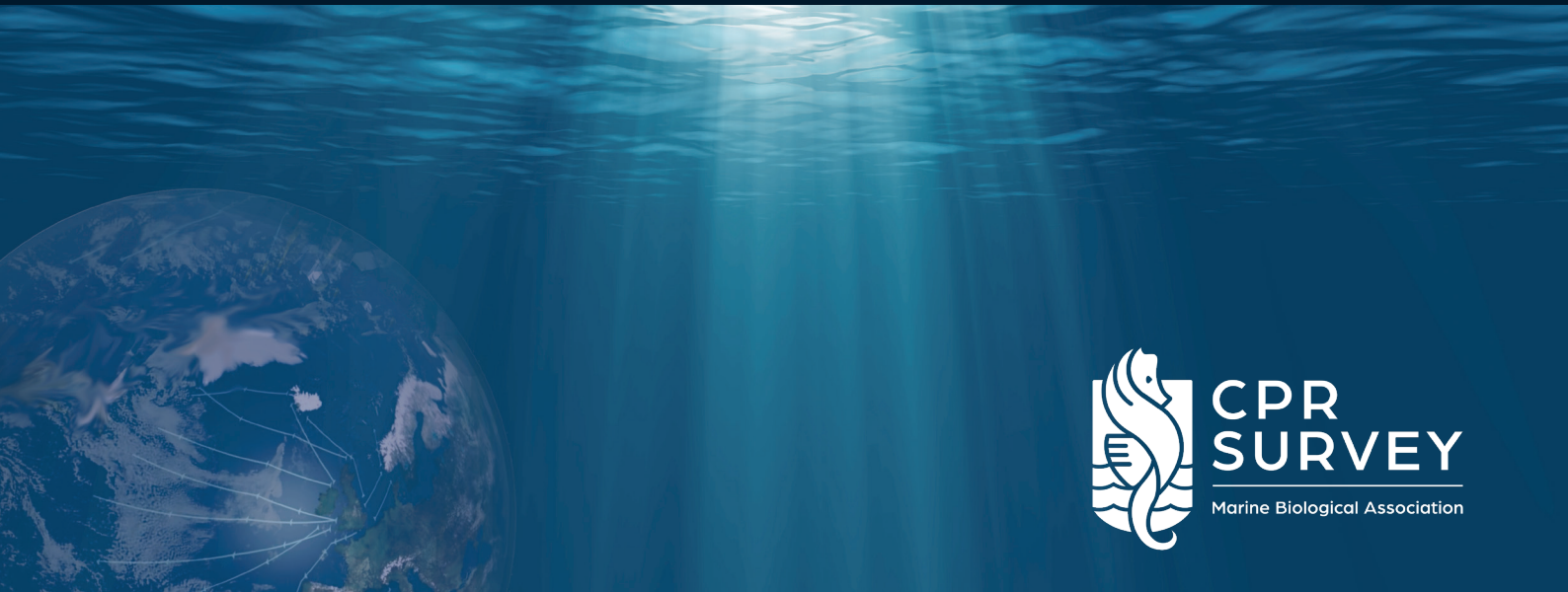


The Continuous Plankton Recorder Survey

MONITORING THE HEALTH OF OUR OCEAN SINCE 1931



**CPR
SURVEY**

Marine Biological Association

“ The CPR is one of the most reliable, robust samplers that can be used over large spatial scales – and remains one of the most cost-effective methods for large scale plankton surveys ”

- Towing our ocean since 1931
- >7.3 million miles of ocean surveyed
- A GUINNESS WORLD RECORDS for the greatest distance sampled by a marine survey
- Plankton used as indicator species to monitor ocean health
- Experienced Plankton Taxonomists
- Data freely available for download and collaborations encouraged
- >60+ year global archive of towed silks for use in the future
- World-class scientists
- High impact scientific research
- Research used to inform national and international management policy



GUINNESS WORLD RECORDS® holder
for the 'Greatest Distance Sampled
by a Marine Survey'

RECORD
HOLDER

CONTENTS

| | |
|----|----------------------|
| 02 | OVERVIEW |
| 03 | CONTENTS |
| 04 | WELCOME |
| 05 | ABOUT US |
| 06 | OUR NETWORK OF SHIPS |
| 08 | OUR SERVICES |
| 09 | ADAPTIONS OF A CPR |
| 10 | THE CPR |
| 12 | WHAT ARE PLANKTON? |
| 14 | PLANKTON ANALYSIS |
| 16 | RESEARCH |
| 27 | DIGITAL IMAGING |
| 28 | POLICY |
| 29 | DATA |
| 30 | IN THE MEDIA |

welcome



Welcome to the latest report for the Continuous Plankton Recorder Survey, based in Plymouth, UK at the Marine Biological Association (MBA). Here, I would like to share some of what we do, why we do it, and to say a big thank you to all our supporters, from our funders to the merchant shipping and portside teams, without you our work would not be possible.



The CPR Survey is unique, a global plankton monitoring programme working in conjunction with ships of opportunity (therefore minimising our carbon footprint), producing an open access dataset of plankton distribution in our ocean.



This incredible dataset has been used by students, scientists and policy-makers, we actively encourage and promote its use in order to accelerate scientific progress. Our research has focused on diverse themes including climate change (including impacts of rising CO²), human health, biodiversity and non-native species, fisheries and better management of the marine environment. I hope you enjoy reading about our highlights.

For further information check out www.cprsurvey.org or contact us at cprsurvey@mba.ac.uk

David Johns, Head of the CPR Survey

about us



cprsurvey@mba.ac.uk



Established in 1931, the Continuous Plankton Recorder (CPR) Survey is the longest running, most geographically extensive marine ecological survey in the world. The Survey is a globally recognised leader on the impacts of environmental change on the health of our ocean. Providing the scientific and policy communities with a long-term measure of the ecological health of marine plankton.

Since 2018, the CPR Survey has been operated by the internationally renowned Marine Biological Association. Established in 1884, this Learned Society has conducted globally significant research into our ocean and the life it supports. As one of the world's longest running Learned Societies, it is dedicated to promoting its research to drive change.

OUR FUNDERS

Defra., Natural Environment Research Council, UK., Dept of Fisheries and Oceans Canada, Woods Hole Oceanographic Institution, USA., National Oceanic and Atmospheric Administration, USA., Horizons Europe, EU., Institute of Marine Research, Norway., Environment Agency, UK., Marine Institute, Ireland., Natural England, UK., Natural Resources Wales, UK., National Science Foundation, USA., Joint Nature Conservation Committee, UK., Agri-Food and Biosciences Institute NI, UK., North Pacific Marine Science Organisation, USA., North Pacific Research Board, USA., Gulf Watch Alaska., British Antarctic Survey, UK., Faculty of Marine Science, Marine Environment, Ruppin Academic Centre, Israel.

our network of volunteer ships

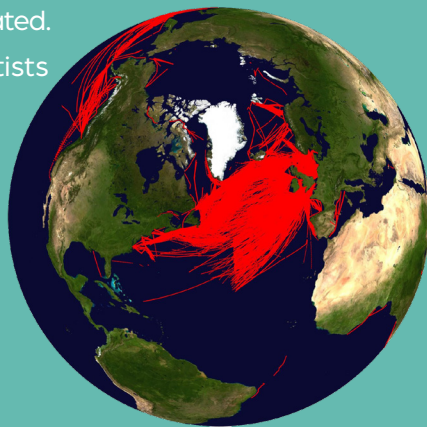
Operations Team ✉ ppr@mba.ac.uk

As our global marine survey approaches an incredible milestone of 100 years of operations in 2031, we wish to acknowledge the fantastic co-operation of over 350 ships that have participated.

We have sampled over 7.3 million miles of ocean providing excellent data for scientists and policy makers.

The CPR Survey roots are firmly in the North Sea and Eastern Atlantic. As well as maintaining our traditional sampling areas, we have expanded the reach of the Survey to the Polar regions, Pacific, South Atlantic, Mediterranean, and even the Great African Lakes.

We currently have 24 ships towing a CPR which is greatly appreciated by many who have an interest in our seas!



>7.3 million

NAUTICAL MILES
TOWED

38

MONTHLY TOWS
BY SHIPS

350

SHIPS
COLLABORATED WITH SINCE 1931

COST EFFECTIVE , PROVEN AND RELIABLE



The CPR Survey would not be physically or economically possible without the generous support of ships, owners, charterers, Captains managers, port operatives and agents. We are incredibly grateful to all those involved, helping in our operational activities – we could not do it without your continuing support.

our services

Operations Team ✉ ppr@mba.ac.uk



COURSES AND TRAINING

We offer an IMarEST approved CPR Technical Training course as well as a Volunteer Ship's Liaison course.



SUPPLY

Our plankton filter silks are custom designed, handmade, quality controlled and supplied to the global CPR Survey community.



LOGISTICS AND SUPPORT

For your CPR Survey: including supply, training, help in setting up new routes, securing volunteer ships and ongoing support.

adaptations of a cpr

case studies

In addition to the standard 500nm tows, the CPR is adaptable to be used by a variety of ship types and research requests.

RESEARCH VESSELS

Developed the short multi-tow methodology, allowing a CPR to be deployed on short transits, using a single filtering silk. Thus making on board operation simpler.



SAILING VESSELS

Devised a double-tow rope methodology to overcome unpowered winches. Propeller modified to compensate for the low hull speed of the vessel, increasing the mechanical efficiency.

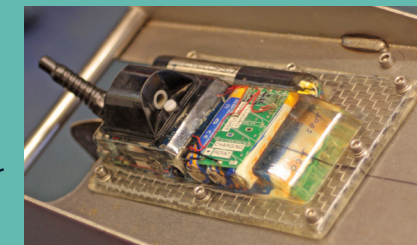


MARINE AND FRESHWATER

The CPR sampler is adaptable to be towed in freshwater lakes. We towed in Lake Tanganyika, Africa, 762m above sea level in a collaboration looking for *vibrio cholerae*.

ARRAY FOR INSTRUMENTATION

In addition to the traditional biological sampling, the towed body can be equipped with a range of sensing capabilities to extend its utility for integrated observing.



the continuous plankton recorder

A PLATFORM FOR INTEGRATED OCEAN OBSERVING

Key Statistics

Length x width x height :
100 x 36 x 42 cm

Weight: 85kg

Tow depth: 5 – 10 metres

Tow speed: 8 – 25 knots

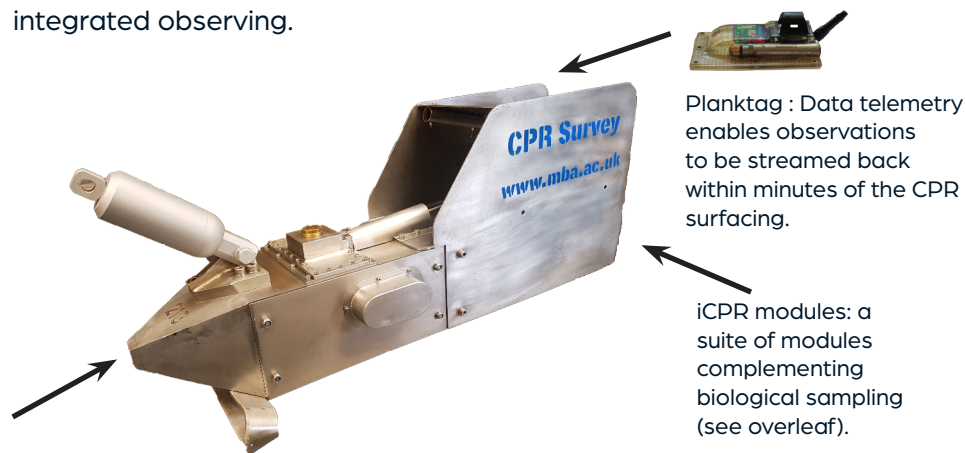
Aperture size: 1.27 cm²

Collects: Biological material:
Phyto- and Zooplankton,
Planktonic Bacteria and Viruses.
Digital imaging (from 10 to 200µm).

Measures: GPS, Position in water
column and shocks / vibrations
(6-axis Accelerations), Time,
Depth, Salinity (Conductivity),
Temperature, Fluorescence
(Chlorophyll-a).

Power: Self-powered by impellers

In addition to the traditional biological sampling undertaken by the CPR, the towed body can be equipped with a range of sensing capabilities to extend its utility for integrated observing.



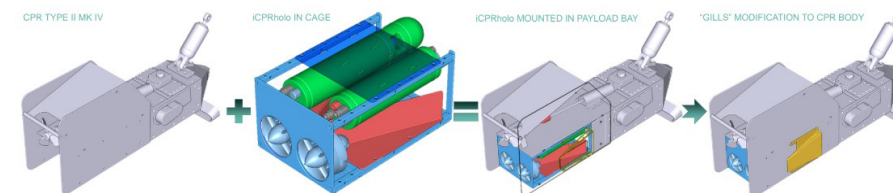
Planktag : Data telemetry enables observations to be streamed back within minutes of the CPR surfacing.

iCPR modules: a suite of modules complementing biological sampling (see overleaf).

Seawater enters via the aperture. Plankton are captured on a filter silk band then covered by a further silk band housed in an internal mechanism. The continuously moving band is wound through the CPR on rollers turned by gears, which are powered by a propeller allowing for up to 500nm per internal to be towed.

**COST EFFECTIVE, PROVEN AND
RELIABLE SINCE 1931**

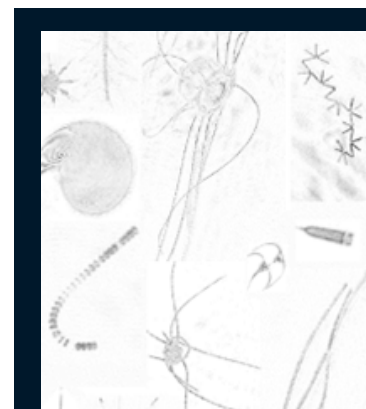
THE iCPR



The integrated CPR (iCPR) embodies our vision to both continue to collect samples using our consistent methodology, but also innovate to increase our capability and bring new research possibilities to the wider community. From a single instrument, the iCPR becomes a platform for Integrated Ocean Observing. The main feature of our new equipment is enabling us to take hundreds of thousands of plankton images per tow.

CAPABILITIES:

- No crew interaction required.
- Generates own power using impellers.
- High-precision positioning (GPS data).
- Measures performance (pitch/roll, depth, shocks, etc.)
- Measures environmental parameters (Temperature, Salinity, Chlorophyll-a)
- Takes plankton images.



WHAT ARE PLANKTON?

The word plankton comes from the Greek word *planktos*, which means 'wanderer' or 'drifter'. It refers to a diverse collection of organisms found in water that are unable to propel themselves against currents or tides.

PHYTOPLANKTON

Phytoplankton are microscopic single-celled algae, they obtain their energy primarily through photosynthesis.

Diatoms are characterised by the unique feature of possessing a glass-like cell wall made of silica. Diatoms can be solitary or live in colonies and may be shaped like long chains, circles, stars or zigzags. They photosynthesise to generate energy. Some species may produce toxins that can accumulate in shellfish, resulting in poisoning when eaten.

Dinoflagellates are single-celled organisms with two flagella. They can have characteristics of both plants and animals, obtaining energy through photosynthesis or ingestion of prey. Like diatoms, some species can produce toxins and reproduce in such large numbers (known as a bloom) to cause a 'red tide'.

ZOOPLANKTON

Zooplankton are the animal-like plankton, these feed on phytoplankton and can range in size from microscopic to 30 metres long!

They range from single-celled organisms such as radiolaria, to the eggs or larvae of fish and crustaceans.

Holoplankton spend their entire lives as plankton, which, include jellyfish, krill and copepods. Copepods, a type of crustacean, comprising of >12,500 described species, they outnumber insects in abundance and are of global biological importance.

Meroplankton are temporary plankton and includes the larval stages of crabs, starfish, clams, worms, and other bottom-dwelling animals.

Eucampia,
a chain
forming
diatom

*Jellyfish are the largest
plankton in the ocean,
with some reaching up
to 30m!*

WHY ARE THEY IMPORTANT?

Produce over 50% of world's oxygen*

Their activity in the ocean helps regulate the absorption of carbon from the atmosphere to the ocean.

A food source for vast majority of marine life (and subsequently anything that feeds on them).

The oxygen, nutrients, and biomass they produce sustains terrestrial life e.g. humans.

*Source NASA

The oxygen,
nutrients, and
biomass plankton
produce sustains
life on earth

plankton analysis

"The CPR Survey operates in much of the world's ocean, this gives our Analysts the expertise to identify many different types of plankton. We analyse microbes up to fish larvae, using traditional light microscopy and molecular techniques"

“ Our Analysts record over 800 phytoplankton and zooplankton taxonomic entities ”

Senior Analyst Marianne Wootton ✉ mawo@mba.ac.uk

PLANKTON SKILLS

Considered an International Centre of Excellence for planktonic taxa identification, and with decades of experience in 'on-silk' CPR, traditional net-caught and Utermöhl sample analysis, the plankton team receive work from national and international governmental bodies, scientific institutions, and private clients.

Our long-term monitoring programme of phytoplankton, zooplankton and ichthyoplankton gives us a great insight into species distribution, allowing us to identify the occurrence of non-native organisms in a region.

SERVICES

We offer a range of services including all aspects of plankton identification, enumeration, sampling and other related subjects. We regularly run training events, ranging from bespoke one-to-one tuition up to international workshops.



SPECIALIST OUTREACH

We provide lectures for higher education and wildlife groups, we sit on expert panels and engage with the media. Our expert team are able to speak on a wide range of topics from ocean plastics and marine taxonomy, to global warming and our changing planet.

PLANKTON ARCHIVE

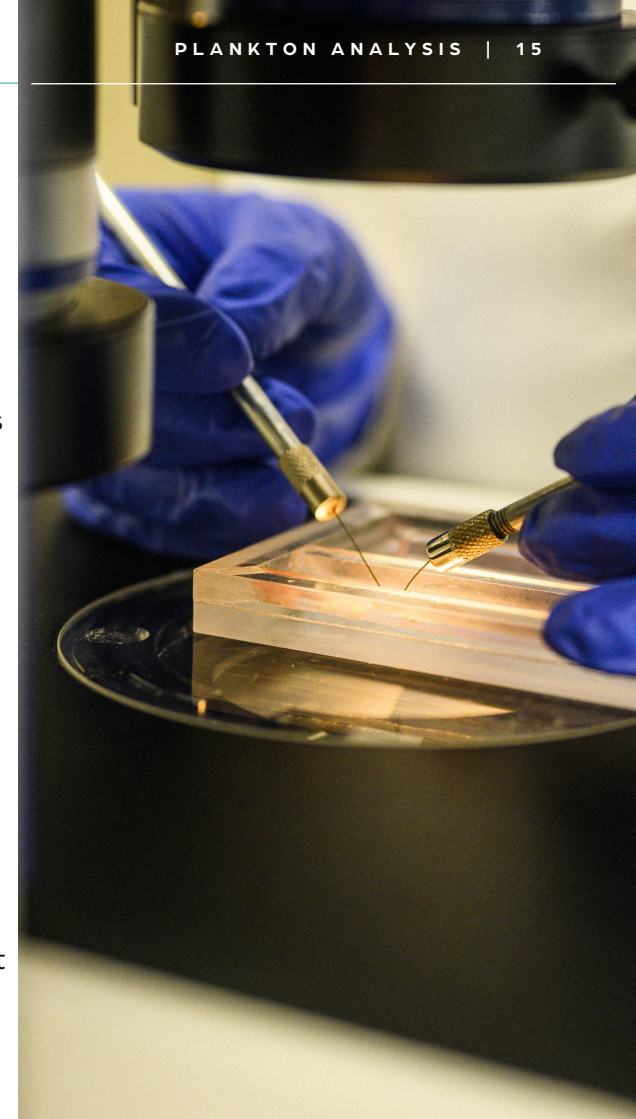
Housing the world's largest catalogued plankton archive, with samples dating back to the late 1950s, we hold thousands of samples from around the world. These are available for various types of retrospective analysis (such as microscopic, molecular and isotopic).

QUALITY AND EXCELLENCE

Our skills are routinely assessed by participating in external programmes such as the International Phytoplankton Intercomparison (IPI) exercise and members of our team write and organise the International Zooplankton Ringtest, on behalf of the North East Atlantic Marine Biological Analytical Quality Control (NMBACQ) Scheme. We sit on various International expert panels where we offer advice and guidance.

SUSTAINABILITY

Caring for our planet is imbedded in our culture. We were the first marine laboratory to achieve a silver Laboratory Efficiency Assessment Framework award (LEAF). LEAF laboratories reduce their carbon emissions, helping to address the climate and ecological emergencies, whilst creating an environment that supports research quality.



research

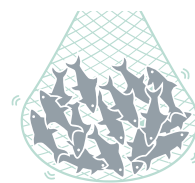
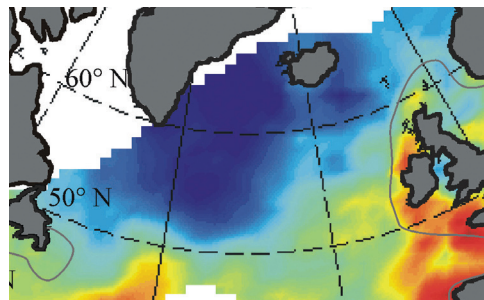
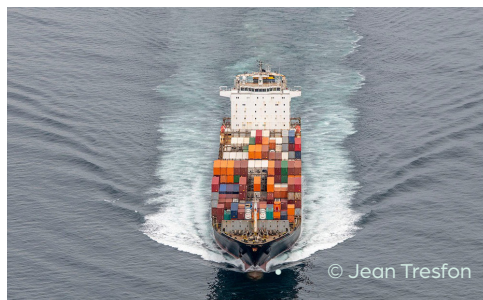
The CPR Survey is a global leader in assessing the impacts of environmental change in our ocean. Our research has focussed on diverse themes: climate change (including impacts of rising carbon dioxide), human health, biodiversity and non-native species, fisheries and better management of the marine environment.

CPR data have been used in >2k publications, covering everything from looking at individual species to basin scale, long term ecological processes

✉ cprsurvey@mba.ac.uk

Many scientific firsts and insights have developed from examining and interrogating the CPR Survey's extensive time series:

- We were the first to identify large scale shifts in plankton species assemblages in the North Sea attributed to ocean warming.
- The first to identify changes in plankton due to ice melt in the Arctic.
- The first to identify the extent of microplastics in the ocean, including the first record of marine litter.
- We have provided primary evidence of changes in global ocean biology for the last two IPCC reports and the UN's first World Ocean Assessment.

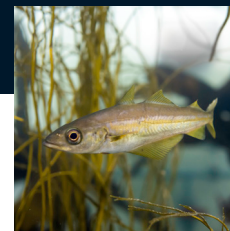
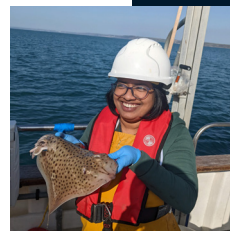
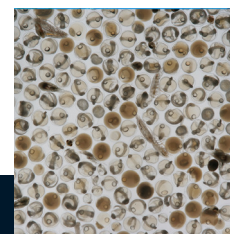


FISHERIES

Plankton form the very base of the marine food web, and as such changes in their populations directly impact many fish communities.

By continued monitoring we can assess plankton stocks, and work with ecosystem managers to ensure our resources are properly managed.

“The CPR was originally designed in the 1930s to support fisheries.”



SIR ALISTER HARDY

Sir Alister Hardy (1896–1985) Inventor of the CPR



Alister Hardy was appointed as an assistant naturalist in the Fisheries Laboratory, Lowestoft in August 1921. He focused his research on developing an understanding of the diet and feeding habits of North Sea herring. He initiated experiments with a Plankton Indicator, then as the zoologist on the RRS *Discovery*

voyage (to explore the Antarctic between 1925 and 1927) through his studies of zooplankton and its relationship with predators, he designed and later built a mechanism called the Continuous Plankton Recorder or CPR.

“Almost a century later we are still using CPR data to explore the links between important fish stocks and their prey.”

“Healthy oceans and seas are essential to human existence and life on Earth.”

i Our work aligns with the European Union’s Sustainable Development Goals (SDG), particularly SDG 14 Life Below Water.

SDG 14 aims to protect and ensure the sustainable use of oceans. This includes reducing marine pollution and ocean acidification, end overfishing and conserve marine and coastal ecosystems.

SDG 14 is strongly related to other SDGs as oceans sustain coastal economies and livelihoods, contribute to food production and function as a carbon sink.



MARINE LITTER

Marine litter consists predominantly of plastics and is an increasing global concern because of its worldwide distribution and potential impact on the environment and human health.

The CPR not only collects biological organisms but also plastics found in the surface waters.

The term ‘micro-plastics’ was first used after examining CPR samples, and the very first scientific recording of marine litter (a plastic bag) was recorded on a CPR tow in 1957.

Through monthly surveys, our data has shown there has been a rise in open ocean plastics abundance since the 1950s. The CPR Survey represents an unparalleled time series going beyond its intended scope.

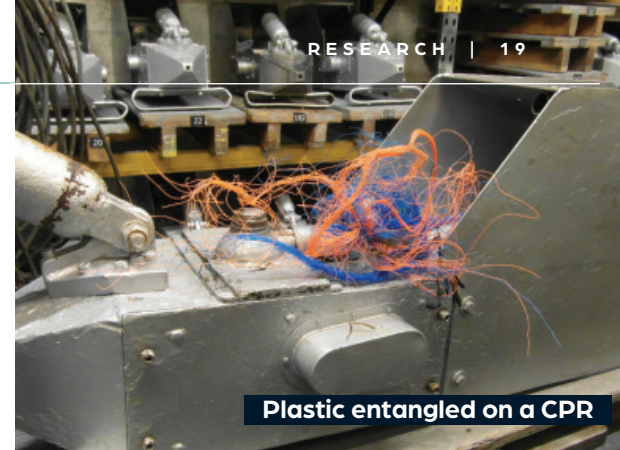
An extensive archive of samples are kept, allowing scientists to look back in history and we welcome collaborations.

AWARD-WINNING RESEARCH

Lead author, Dr Clare Ostle’s Nature paper highlighting the rise of Ocean Plastics, received the UKRI CLASS Acts Award paper with the highest number of citations.

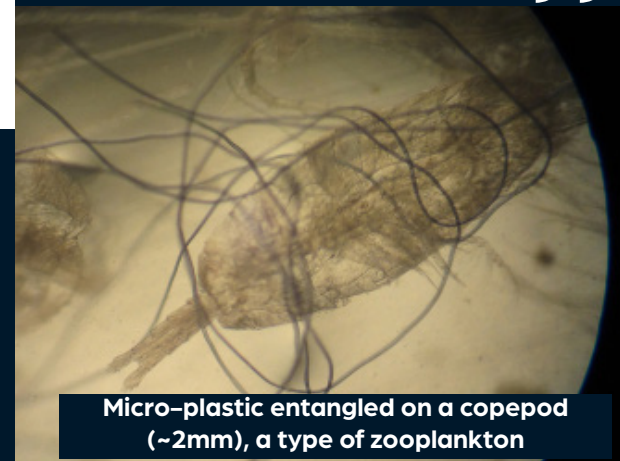


Scan QR code to read paper



Plastic entangled on a CPR

“The CPR Survey is unique in that it can look back historically to track the presence, and increase, of plastics in our ocean.”



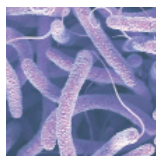
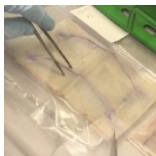
Micro-plastic entangled on a copepod (~2mm), a type of zooplankton

HUMAN HEALTH



We have developed techniques to look at CPR samples and identify pathogenic bacteria and viruses. These organisms not only impact marine life directly, but can have harmful effects on humans – for example food poisoning.

By tracking their preferred environmental conditions we are able to develop better early-warning systems.



HARMFUL ALGAL BLOOMS



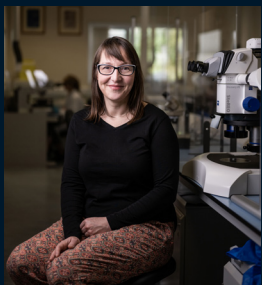
Several species of the marine diatom *Pseudo-nitzschia* can produce neurotoxins that are responsible for the seafood-borne illness amnesic shellfish poisoning in humans, and marine wildlife, resulting in mortalities and prolonged closures of fisheries leading in economic losses to coastal communities.

Using genetic sequencing on our archived CPR samples, we have been able to uncover patterns of genetic diversity and to speciate plankton communities in rarely sampled areas of the ocean.



Scan QR code to read paper

EXTRACTING DNA FROM FORMALIN PRESERVED SAMPLES



Using DNA-based identification tools, such as meta-barcoding, can identify whole communities of thousands of taxa from a single water sample, at exceptional speed or that are difficult to identify by light microscopy from CPR samples.

CPR samples are preserved in formalin which chemically modifies DNA and makes it difficult to recover. Our CPR Molecular Team, led by Dr Rowena Stern (left), have developed techniques to extract and amplify the polymerase chain reaction and utilise a DNA sequence on CPR samples.



MARINE POLLUTION

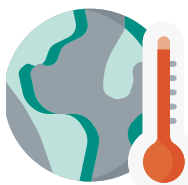
Plankton can offer a way to monitor historical marine pollution trends. Most plankton are sensitive to environmental changes, which means they are excellent indicators of contamination. This could be used to predict trends in human health and to monitor the impact of human activity on marine ecosystems.

Our archived plankton samples were analysed for ocean pollution monitoring. Rising levels of man-made chemicals, from personal care products and plastics increased from 2002 to 2020. The study showed the most polluted samples were taken from nearshore areas closest to human activity where terrestrial runoff (excess water from land flows into the ocean) and seafood farming were most present. In these places, there were higher levels and greater numbers of different chemicals found in plankton living in nearshore environments.

This data can also be used to study the connection between ocean pollution and the rates of childhood and adult chronic illnesses.



Scan QR code to read paper



CLIMATE IMPACTS

Our ocean is under threat from a changing climate, and plankton have been shown to respond rapidly to climate impacts, particularly rising sea temperatures.

These impacts propagate through the marine ecosystem, and by studying plankton communities throughout the world's ocean, we can provide insight to future scenarios. Over recent decades we have seen plankton populations shifting polewards and changes in seasonality, linked to increased sea temperatures. These changes act as an additional stressor on an already perturbed ecosystem, by understanding these changes we are better placed to manage our precious ocean.



CLIMATE CHANGE DRIVING CHANGES OF PLANKTON

Our research has shown the warming up of the North Atlantic is causing plankton to shift and change in abundance, indicating a threat to the earth's climate.

Data including *in-situ* chemical measurements and biological observations were gathered from 1982 to 2020. The data agreed with predictions that, within the subpolar regions of the North Atlantic, the abundance of diatoms is increasing, while there is a decrease observed in the subtropics.

The ocean carbon sink (the absorption of more carbon than it releases) is being impacted. This could have a knock-on effect on the global carbon cycle and the regulation of the earth's climate.

The data suggest that, if ocean temperatures continue to rise and changes in plankton mixing and abundance continues, global declines of plankton productivity could occur and have a long term impact on our entire ocean ecosystem.



Scan QR code to read paper

“ Our ocean is under threat from a changing climate, by studying plankton communities throughout the world's ocean, we can provide insight to future scenarios. ”



TROPHIC MIS-MATCH

Decades of research have revealed that zooplankton are critical components of the marine ecosystem and have shown sensitivity to the changing ocean.

Researchers analysed key responses of zooplankton to ocean warming, shifts in phenology, range, body size and other variables.

Data has shown that the phenology of plankton is moving 5–10 days earlier per decade, faster than animals further up the food web (such as adult fish, seabirds, marine reptiles and mammals) which are shifting earlier by 0–2.5 days per decade.

Climate change could lead to 'trophic mismatch', where the timing of predators is out of sync with their prey, with major consequences for fisheries and ecosystems.



Scan QR code to read paper

WHAT IS PHENOLOGY?

The study of the timing of regular seasonal events, for plants and animals, from year to year. For example the timing of the first snow drops appearing.

When out of sync it can lead to trophic mismatch with issues in food availability.





NON-NATIVE SPECIES

There has been growing concern regarding the spread of marine organisms throughout the world's ocean. With extensive marine traffic, and the effects of climate change, new areas are now accessible and suitable for species that are potentially more competitive than native species. We need to monitor our seas so that we can set management plans and prevent economic or environmental harm from these 'non-natives'.

The CPR Survey operates throughout the world's ocean meaning our experienced team are ideally placed to spot not only new species, but plankton new to a region.

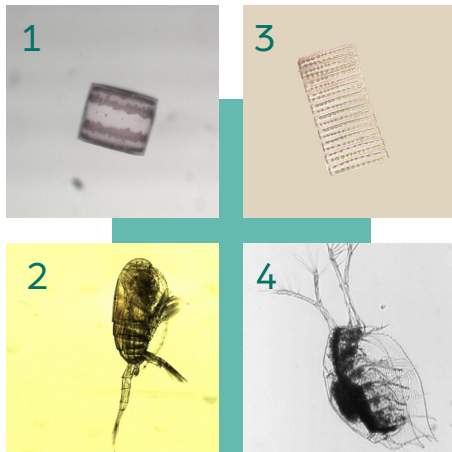
We have shown that ballast water transport and warming ocean temperatures have caused movement of some species.

“ The CPR Survey acts as an early-warning system on the lookout for non-natives which could cause environmental or economic harm ”

CPR SURVEY OCCURRING NON-NATIVES

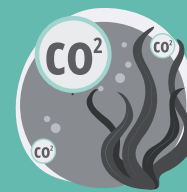
Species and likely causes of geographical spread:

1. The diatom *Coscinodiscus wailesii* and 2. the small copepod, *Pseudodiaptomous marinus*; anthropogenic causes such as ballast waters.
3. The Pacific Ocean diatom, *Neodenticula seminae*; reduction in ice cover.
4. The cladocera, or water flea, *Penilia avirostris*; increasing sea surface temperatures and potentially ballast water.



IPOLICY

We work closely with partners to scan for species on the UK's non-native watch list for UK Marine Strategy and EU Marine Strategy Framework. We also work with the Marine Climate Change partnerships (MCCIP) and ICES working groups on non-natives.



OCEAN ACIDIFICATION

Increasing atmospheric carbon dioxide levels result in a rise in ocean acidification, causing some vulnerable organisms to be negatively impacted. By monitoring >800 plankton taxa over 90 years we are able to see how they are adapting to a changing chemical environment.

The CPR Survey routinely identifies key ocean acidification indicator taxa, those with calcified structures are likely to be the most susceptible to a change in pH, such as molluscs and echinoderm larvae.

Consistent monitoring of such species is key to determining change, as multiple stressors impact their environment.

Some species have increased in their abundances (or frequency of occurrence) whilst some have decreased. The shifts are due to the changing chemistry and warming of the ocean.

Scan the QR code on the right to read the full paper.



Scan QR code to read paper

INNOVATIVE APPROACH FOR ANALYSING HISTORICAL DATA



Regime shifts have previously been characterised using a variety of community metrics (indicator species abundances, taxonomic composition and chlorophyll biomass) but left the functional traits of plankton unassessed.

Using CPR Survey data and functional traits we revealed a new understanding of plankton regime shifts in the North Sea.

Intriguingly results showed a relative lack of change in the functional traits of plankton during the 1980s regime shift, despite the clear detection of the event using a variety of other metrics.

The results also showed the functional traits of plankton across the whole North Sea changed more after the 1996–2003 regime shift, compared to the 1980s shift.

Previous works using different metrics indicated that the two regime shifts were events of similar importance, which differs from the results of our research.

Our research highlights the usefulness of functional traits approaches and the importance of using a variety of models to analyse data so we can better define what regime shifts are and how they work.



Scan QR code to read paper

WHAT IS A REGIME SHIFT?

Plankton communities (groups) in the ocean are changing world-wide, altering the functions and services of the ecosystems they support. Abrupt and dramatic changes in plankton communities, where composition, abundance and function are significantly changed, are often referred to as regime shifts.

“With CPR data you can always revisit historical data, look at it from a different angle and through a different lens, to provide new understanding. To apprehend things as complex as ecosystems, you really need this diversity of angles, viewpoints and methodologies.”

Dr Nicholas Djeghri, Postdoctoral Research Assistant



digital imaging

“The CPR Survey has now a new sampler with increased capabilities. The iCPR is equipped with a bespoke holographic camera able to generate precise digital images of the plankton encountered by the sampler”

Senior Numerical Ecologist and Data Scientist Dr Pierre H  laou  t [✉ pihe@mba.ac.uk](mailto:pihe@mba.ac.uk)

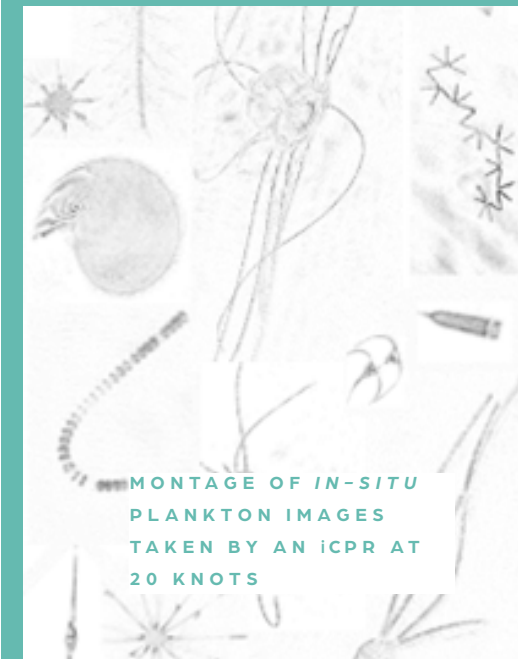
DIGITAL HOLOGRAPHY

Digital holography opens up new possibilities in terms of data acquisition as it allows for in-situ particle imaging without disrupting the standard operating methodology of the CPR. In-situ images (i.e. holograms) allow biological contents to be visualised without disintegrating cell structures. This allows us to see organisms that are hard to capture using a traditional sampling technique (such as delicate gelatinous organisms).

INTERNATIONAL COLLABORATIONS

Handling the large number of images and associated metadata constitutes one of the greatest challenges and requires the fostering of collaborations with world leading institutes in the field of digital imagery. SINTEF Ocean is a Norwegian research organisation carrying out research and innovation related to ocean realm for national and international industries. This collaboration acted as a catalyst to complete our procedures to process our holograms through a range of sequential algorithms that refine/define the final image.

“We are now capable of generating hundreds of thousands of images per tow, all analysed using machine learning and Artificial Intelligence”



MONTAGE OF IN-SITU PLANKTON IMAGES TAKEN BY AN iCPR AT 20 KNOTS

policy

The CPR Survey has co-evolved with policy, playing an integral part in providing relevant, targeted evidence for UK, European and International decision-makers. Data and research from the Survey have informed high profile and strategic global marine assessments.

✉ cprsurvey@mba.ac.uk

The consistent and extensive dataset provided by the CPR Survey has proven indispensable in providing much needed information in a number of both national and international marine policy requirements. CPR data provide an indicator of ocean health for the UK Marine Strategy, EU Marine Strategy Framework Directive policies, and are also included in ongoing assessments by Defra mNCEA, ICES, OSPAR QSR, MCCIP and used as evidence in IPCC reports (see glossary).

The CPR team work closely with national and international colleagues to ensure our data can be applied to new societal questions, building on the Survey's original aims and keeping our work relevant.



our data

Our data are available for free and used by scientists, policy makers and environmental managers across the world.

Data requests ✉ cprsurvey@mba.ac.uk

>250k
sample records

>175 million
biological records

>800
plankton taxa

Our open data policy helps produce the best quality science

The CPR Survey is of global importance and our data are used by scientists, policy makers and environmental managers across the world.

The CPR Survey has an open and accessible data policy, following the **FAIR** (**f**indable, **a**ccessible, **i**nteroperable and **r**eusable) principles. We recognise the power of collaborative research, and welcome data requests from researchers across the globe.

Increasing the number of scientists that can access and work with CPR Survey datasets will accelerate the progress of marine ecological science and understanding; enhancing the societal benefit derived from Survey data.

The results have included the globally first documented studies of large-scale ecological regime shifts, biogeographic, phenological and trans-arctic migrations in the marine environment in response to climate.

Our data are used to examine strategically important science topics such as climate change, human health, fisheries, biodiversity, pathogens, invasive species and ocean acidification.

We produce an annual CPR dataset update, as well as welcoming requests for bespoke datasets.



Scan QR code to read more

CPR Survey science is at the forefront of evidence provision for high-level policy and management advice.

GLOSSARY

Defra: Department for Environment, Food & Rural Affairs. UK government running **mNCEA:** Natural Capital and Ecosystem Assessment Programme.

ICES: International Council for the Exploration of the Sea. An intergovernmental marine science organisation, meeting societal needs for impartial evidence on the state and sustainable use of our seas and oceans.

OSPAR: the mechanism by which 15 Governments & the EU cooperate to protect the marine environment of the North-East Atlantic.

MCCIP: Marine Climate Change Impacts Partnership. The primary independent source of marine climate change impacts evidence and adaptation advice in the UK.

The Intergovernmental Panel on Climate Change (**IPCC**) is the United Nations body for assessing the science related to climate change.

“ World class science demands communication. Engaging with a variety of audiences is at the heart of what we do. ”

in the media

✉ comms@mba.ac.uk

Sharing our world-class science is key to our mission, and we are happy to handle enquiries from across all media platforms. Our scientists are available for media interviews on recent marine biological findings and areas of marine science that are topical.

We discussed ocean warming and plankton, the ‘unsung heroes’ of the sea on BBC Countryfile.



>8k
SOCIAL MEDIA
followers @cprsurvey

2.5 billion
REACH
of MBA
media readers

>1k
MENTIONS OF MBA
by international media annually

Discovery Channel Canada’s series, Daily Planet, featured the collaboration between the Survey and shipping companies.



CPR Researcher, Dr Clare Ostle, awarded for highly cited research paper published in Nature, on the rise of ocean plastics.



Scan QR code to read paper



GUINNESS WORLD RECORDS holder for the ‘Greatest Distance Sampled by a Marine Survey’



Scan QR code to read more



CPR Survey recognised as a high priority in UK Sustained Scientific Ocean Observation Priorities report.



Scan QR code to read more

membership



Are you interested in finding out more about marine biology?

The Marine Biological Association is one of the world’s longest-running societies dedicated to promoting research into our ocean and the life they support.


As a Member of the MBA you are part of a dynamic global community of marine biologists from over 40 countries.

Whether you’re a student, professional, or just passionate about marine biology, we have a whole host of Membership benefits waiting for you.

Find out more www.mba.ac.uk/our-membership



Scan QR code to read paper



Established in 1931, the Continuous Plankton Recorder (CPR) Survey is the longest running, most geographically extensive marine ecological survey in the world. We collect plankton data coupled with physical, chemical and biological observations with the resulting data providing information on the biogeography and ecology of the planktonic community. The Survey is a globally recognised leader on the impacts of environmental change on the health of our ocean. We provide the scientific and policy communities with a basin-wide and long-term measure of the ecological health of our ocean.



Follow us @cprsurvey

**CPR Survey
Marine Biological Association
The Laboratory, Citadel Hill
Plymouth, PL1 2PB, UK**

**Tel: +44(0)1752 426493
cprsurvey@mba.ac.uk
www.cprsurvey.org
© Marine Biological Association 2024**