

## Weblinks

Below we have provided a selection of weblinks that will help you gain a more in-depth understanding of some of the issues we have covered in *Marine Ecology: Processes, Systems, and Impacts*. More importantly these websites open the door to specific regional examples of marine ecology at work, current issues, and data that you can download and use.

**Antarctic & Arctic:** There are many websites dealing with Arctic and Antarctic issues. However, by going to the following websites it is possible to follow links to this wealth of information and direct links to the organizations at which Polar research is conducted:

<http://www.antarctica.ac.uk>

<https://www.arcus.org/>

<http://nsidc.org/index.html>

<http://www.scar.org>

**Antarctic living resources:** This is the website of the Commission for the Conservation of Antarctic Marine Living Resources:

<https://www.ccamlr.org/en> It contains information on Southern Ocean ecosystems and efforts to take an ecosystem approach to management of fishery resources there.

**Aquaculture:** The Food and Agriculture Organisation of the United Nations compiles and publishes downloadable data and figures on the cultivation of aquatic organisms around the world <http://www.fao.org>. To find out more about aquaculture research visit the University of Stirling, Institute of Aquaculture website <http://www.aquaculture.stir.ac.uk>.

**Benthos:** The virtual handbook written by Tom Brey of the Alfred Wegener Institute is a mine of information regarding benthic ecology and production processes: this can be cited as: T. Brey 2001. *Population Dynamics in Benthic Invertebrates. A Virtual Handbook*. Version 01.2. <http://www.thomas-brey.de/science/virtualhandbook/navlog/index.html> Alfred Wegener Institute for Polar and Marine Research, Germany.

**Biodiversity research:** DIVERSITAS is a major international program dealing

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with biodiversity and eco system processes, as well as the links between eco-system services and society. Many marine and intertidal aspects are included in this program <http://www.diversitas-international.org/>.

**Bioluminescence webpage:** <http://www.lifesci.ucsb.edu/biolum/>. A site full of excellent information on the biology of bioluminescence with pictures and video clips.

**Carbon cycle:** For a general introduction to the marine carbon cycle and the links between chemistry and biology and global climate change see: [http://earthguide.ucsd.edu/virtualmuseum/climatechange1/06\\_3.shtml](http://earthguide.ucsd.edu/virtualmuseum/climatechange1/06_3.shtml)

**Climate change:** A wealth of information about global climate change can be found at the website of the Intergovernmental Panel on Climate Change: <http://www.ipcc.ch/>. The North Atlantic Oscillation website, <https://www.ldeo.columbia.edu/res/pi/NAO/> provides everything you wanted to know about this climate pattern, describing the underlying mechanism, plotting data and linking to other useful NAO web resources.

**Coccolithophorids:** For a detailed introduction into the biology, biogeochemistry, and geology of this important group of phytoplankton go to: <http://www.soes.soton.ac.uk/staff/tt/>.

**Consequences of climate change:** A global analysis of the current and predicted effects of climate warming can be found at <http://www.ipcc.ch>. This site contains lots of informative reports and illustrations of the predicted effects of global warming.

**Conservation:** The website of the Society for Conservation Biology <https://conbio.org/about-scb/who-we-are> provides up-to-date access to key issues affecting the conservation of all natural resources. The Marine Conservation Society of the United Kingdom <http://www.mcsuk.org> and Marine Conservation Biology Institute USA <https://marine-conservation.org/> provide lots of useful links to other organizations, conservation work opportunities and projects, and scientific information on current topical issues.

**Coral reefs:** For a global perspective on coral reefs see <http://www.reefbase.org/main.aspx> **Deep-Sea:** NOAA Vents programme. <https://www.pmel.noaa.gov/eoi/>. A site dedicated to information and research on the geology and biology of hydrothermal vents, with lots of

pictures and video clips.

**Diatoms:** A key resource for anyone wanting to learn more about diatoms is the International Society for Diatom Research, which includes links to many other diatom websites: <https://www.isdr.org/>.

**Estuaries:** The website of the Estuarine Research Federation <https://www.cerf.science/> provides information from the world's largest estuarine science organization, including publications, education, and links.

**European Network of Excellence:** MarBEF is a major network of European marine ecologists that involves over 80 different institutes. This is an excellent starting point for finding out what is going on in Europe and an ideal starting point for finding placement work opportunities or employment <https://www.marbef.org/>

**Evolution & Diversity:** The Tree of Life Web Project (ToL) is a collaborative effort of biologists from around the world. On more than 3000 worldwide web pages, the project provides information about the diversity of organisms on Earth, their evolutionary history (phylogeny), and characteristics. <http://tolweb.org/tree/>.

**Exploitation of non-biological resources and renewable energy:** For exploitation of non-renewable offshore resources and alternative forms of energy generation such as windfarms see <https://www.thecrownestate.co.uk>. This website has links to reports and information regarding the amount of material removed from the seabed and the potential of wind and wave energy to meet future energy requirements.

**Flagellates:** A website dealing with flagellates that are important in microbial processes in marine systems, and well introduced at [http://tolweb.org/notes/?note\\_id=50](http://tolweb.org/notes/?note_id=50).

**Fisheries:** Up-to-date global fisheries statistics including biological and economic information is available through <http://www.fao.org>. Regional information for Europe is available at <http://www.ices.dk> where it is possible to download a database of European fisheries statistics. Current research in the US can be accessed through <http://www.noaa.gov/fisheries.html> which is a highly informative website with respect to current issues in fisheries and gives access to free to use photographic images. A particularly informative industry-run

website can be found at <http://www.fishingnj.org>, which gives the fishers' angle on current issues. A more commercial perspective is given at <https://www.seafish.org.uk> where you will also find excellent seafood recipes. Other informative research websites include those of the Centre for Environment, Fisheries, and Aquaculture Science <http://www.cefas.co.uk>, Fisheries Research Services Aberdeen <http://www.scotland.gov.uk/topics/marine>, the Australian Institute of Marine Science <http://www.aims.gov.au>. Visit the Worldfish Center website for more information about Asian and African fisheries and projects <http://www.worldfishcenter.org>.

**Habitat listing:** The MarLIN database held at the Marine Biological Association of the United Kingdom gives access to a wealth of information about intertidal and subtidal coastal habitats with links to primary and 'grey' literature that is invaluable for learning and research <http://www.marlin.ac.uk>.

**Harmful algal blooms:** Information about algal blooms and harmful algal blooms, red tides, and algal toxicity can be found at: <http://www.who.edu/science/redtide/> as well as <http://www.bigelow.org/hab/>.

**Longterm data sets:** There are a number of long-term oceanographic data sets for which biological, chemical, and physical data are collected to examine seasonal, inter-annual, and even decadal variations:

Hawaii Ocean Time-series (HOTS)

[http://hahana.soest.hawaii.edu/hot/hot\\_jgofs.html](http://hahana.soest.hawaii.edu/hot/hot_jgofs.html)

Bermuda Atlantic Time-series (BATS) <http://bats.bios.edu/>

Monterey Bay time-series study

[http://www.mbari.org/bog/Projects/centralcal/summary/ts\\_summary.htm](http://www.mbari.org/bog/Projects/centralcal/summary/ts_summary.htm).

VOS Underway pCO<sub>2</sub> Program

<https://www.pmel.noaa.gov/co2/file/Coastal+uwpc2>

Continuous Plankton Recorder Survey: <https://www.cprsurvey.org/>

**Mangroves:** For mangroves, see

<http://www.ncl.ac.uk/tcmweb/tcm/mglinks.htm>. A site listing most of the major websites dealing with mangroves and wetlands.

**Maps of major marine environments:**

<http://www.oceansatlas.org/>

<http://www.teachers.ash.org.au/jmresources/marine/environments.html>

**Marine systems:** GLOBEC

[https://en.wikipedia.org/wiki/Global\\_Ocean\\_Ecosystem\\_Dynamics](https://en.wikipedia.org/wiki/Global_Ocean_Ecosystem_Dynamics) is the International Geosphere-Biosphere Programme (IGBP) core project responsible for understanding how global change will affect the abundance, diversity, and productivity of marine populations. This web site gives summaries of recent GLOBEC-related work and access to data.

**Meiofauna:** The website of the International Association of Meibenthologists and all you wanted to know about meiofauna <https://www.meiofauna.org/>.

**Microbial loop:** Background information about the microbial loop and why it is important can be found at: <https://archive.bigelow.org/bacteria/>.

**Satellite imagery:** The Sea-viewing Wide Field-of-view Sensor (SeaWiFS) Project <https://oceancolor.gsfc.nasa.gov/SeaWiFS/> uses satellite observations to provide quantitative data on global ocean bio-optical properties. This website provides an overview of the project, has some excellent summary maps and even enables you to produce mapped globes from a perspective of your choice.

**Seagrasses:** WCMC Global Seagrass Database. <https://www.unep-wcmc.org/resources-and-data/world-atlas-of-seagrasses> Based around the world atlas of seagrasses, the website gives some introductory information, but most interestingly has a series of online maps showing the distribution of seagrass species around the world.

**Seaweeds or macroalgae:** Probably the best starting point for any seaweed-related enquiries. <http://www.seaweed.ie>. Algaebase <https://www.algaebase.org/> has details on 57 000 algal species, 1500 images, 33 000 bibliographic items, 104 000 distributional algal records, and a 27 000-word online glossary.