

## SPECIES

Reference list of species mentioned in this report (sorted by common (English) name within categories)

Common (English) name	Scientific name	Common (English) name	Scientific name
<b>Mammals</b>		<b>Lower animals</b>	
Bottle-nose dolphin	<i>Tursiops truncatus</i>	Amphipod	<i>Corophium volutator</i>
Common dolphin	<i>Delphinus delphis</i>	Auger shell	<i>Turritella communis</i>
Common seal	<i>Phoca vitulina</i>	Bivalve mollusc	<i>Tellinella ferruginosa</i>
False killer whale	<i>Pseudorca crassidens</i>	Blue mussel	<i>Mytilus edulis</i>
Fin whale	<i>Balaenoptera physalus</i>	Brittlestar	Amphiuridae
Grey seal	<i>Halichoerus grypus</i>	Brittlestar	Ophiuroidea
Harbour porpoise	<i>Phocoena phocoena</i>	Brown shrimp	<i>Crangon crangon</i>
Killer whale	<i>Orcinus orca</i>	Thick trough shell	<i>Spisula solida</i>
Long-finned pilot whale	<i>Globicephala melaena</i>	Clam	<i>Spisula subtruncata</i>
Minke whale	<i>Balaenoptera acutorostrata</i>	Clams	<i>Spisula</i> sp.
Risso's dolphin	<i>Grampus griseus</i>	Cockle	<i>Cerastoderma edule</i>
Sperm whale	<i>Physeter macrocephalus</i>	Common shore crab	<i>Carcinus maenas</i>
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	Common whelk	<i>Buccinum undatum</i>
White-sided dolphin	<i>Lagenorhynchus acutus</i>	Common winkle	<i>Littorina littorea</i>
		Crawfish	<i>Palmurus</i> sp.
<b>Birds</b>		Cumacean	<i>Eudorella emarginata</i>
Black guillemot	<i>Cepphus grylle</i>	Cumacean	<i>Pseudocuma longicornis</i>
Black-headed gull	<i>Larus ridibundus</i>	Dead man's fingers	<i>Alcyonium digitatum</i>
Black scoter	<i>Melanitta nigra</i>	Dog whelk	<i>Nucella lapillus</i>
Common coot	<i>Fulica atra</i>	Edible crab	<i>Cancer pagurus</i>
Common gull	<i>Larus canus</i>	Great scallop	<i>Pecten maximus</i>
Common tern	<i>Sterna hirundo</i>	Hermit crab	<i>Eupagurus</i> sp.
Curlew	<i>Numenius arquata</i>	Horse shoe worm	<i>Phoronis</i> sp.
Eider duck	<i>Somateria mollissima</i>	Lobster	<i>Homarus gammarus</i>
Gannet	<i>Sula bassanus</i>	Lugworm	<i>Arenicola marina</i>
Goldeneye	<i>Bucephala clangula</i>	Masked crab	<i>Corystes</i> sp.
Great skua	<i>Catharacta skua</i>	Native/flat oyster	<i>Ostrea edulis</i>
Greater black-backed gull	<i>Larus marinus</i>	Northern prawn	<i>Pandalus borealis</i>
Grebes	<i>Podiceps</i> sp.	Norway lobster (Dublin Bay prawn)	<i>Nephrops norvegicus</i>
Guillemot	<i>Uria aalge</i>	Ocean quahog	<i>Arctica islandica</i>
Herring gull	<i>Larus argentatus</i>	Pacific oyster	<i>Crassostrea gigas</i>
Kentish plover	<i>Charadrius alexandrinus</i>	Polychaete worm	<i>Lanice conchilega</i>
Kittiwake	<i>Rissa tridactyla</i>	Polychaete worm	<i>Machellona</i> sp.
Lesser black-backed gull	<i>Larus fuscus</i>	Polychaete worm	<i>Marenzelleria</i> sp.
Little auk	<i>Alle alle</i>	Polychaete worm	<i>Nephtys</i> sp.
Little tern	<i>Sterna albifrons</i>	Polychaete worm	<i>Nereis</i> sp.
Mallard	<i>Anas platyrhynchos</i>	Polychaete worm	<i>Owenia fusiformis</i>
Northern fulmar	<i>Fulmarus glacialis</i>	Polychaete worm	<i>Pectinaria</i> sp.
Northern gannet	<i>Morus bassanus</i>	Polychaete worm	<i>Sabellaria</i> sp.
Oystercatcher	<i>Haematopus ostralegus</i>	Razor clam	<i>Ensis directus</i>
Puffin	<i>Fratercula arctica</i>	Red whelk	<i>Neptunea antiqua</i>
Razorbill	<i>Alca torda</i>	Scallop	<i>Placopecten</i> sp.
Red shank	<i>Tringa totanus</i>	Sea mouse	<i>Aphrodita aculeata</i>
Red-breasted merganser	<i>Mergus serrator</i>	Sea urchin	<i>Brissopsis lyrifera</i>
Shag	<i>Phalacrocorax aristotелиs</i>	Sea urchin	<i>Echinocardium</i> sp.
Shelduck	<i>Tadorna tadorna</i>	Sea urchin	<i>Psammechinus miliaris</i>
Swan	<i>Cygnus</i> sp.	Smooth artemis	<i>Dosinia lupinus</i>
Tufted duck	<i>Aythya fuligula</i>	Spider crab	<i>Maja squinado</i>
Velvet scoter	<i>Melanitta fusca</i>	Striped venus	<i>Chamelea gallina</i>
		Surf clam	<i>Spisula solidissima</i>
<b>Fish</b>		Tellin	<i>Abra alba</i>
Anglerfish	<i>Lophius piscatorius</i>	Tellin	<i>Abra</i> sp.
Arctic char	<i>Salvelinus alpinus</i>	Tellin	<i>Tellina fabula</i>
Brill	<i>Scophthalmus rhombus</i>	Trough shell	<i>Maetra corallina</i>
Cod	<i>Gadus morhua</i>	Velvet crab	<i>Liocarcinus puber</i>
Dab	<i>Limanda limanda</i>	Wedge shell	<i>Donax vitalis</i>
Eel	<i>Anguilla anguilla</i>		
Flounder	<i>Platichthys flesus</i>	<b>Plants</b>	
Haddock	<i>Melanogrammus aeglefinus</i>	Bladder wrack	<i>Fucus vesiculosus</i>
Halibut	<i>Hippoglossus hippoglossus</i>	Eelgrass	<i>Zostera marina</i>
Herring	<i>Clupea harengus</i>	Eelgrass	<i>Zostera noltii</i>
Horse mackerel	<i>Trachurus trachurus</i>	Ginger	<i>Hedychium gardeneri</i>
Lemon sole	<i>Microstomus kitt</i>	Japanese seaweed	<i>Sargassum muticum</i>
Mackerel	<i>Scomber scombrus</i>	Knotted wrack	<i>Ascophyllum nodosum</i>
Megrim	<i>Lepidorhombus whiffiagonis</i>	Kelp	<i>Laminaria digitata</i>
Mullet	<i>Crenimugil labrosus</i>	Kelp	<i>Laminaria hyperborea</i>
Norway pout	<i>Trisopterus esmarki</i>	Maërl	<i>Lithothamnion</i> sp.
Plaice	<i>Pleuronectes platessa</i>	Micro alga	<i>Chattonella antiqua</i>
Rainbow trout	<i>Oncorhynchus mykiss</i>	Micro alga	<i>Chattonella marina</i>
Ray	<i>Dasyatis</i> sp.	Micro alga	<i>Chattonella verruculosa</i>
Round-nose grenadier	<i>Coryphaenoides rupestris</i>	Micro alga	<i>Chrysochromulina polyplepis</i>
Saithe	<i>Pollachius virens</i>	Micro alga	<i>Coscinodiscus concinnus</i>
Salmon	<i>Salmo salar</i>	Micro alga	<i>Coscinodiscus</i> sp.
Sandeel	<i>Ammodytes</i> sp.	Micro alga	<i>Fibrocapsa japonica</i>
Sea trout	<i>Salmo trutta</i>	Micro alga	<i>Gyrodinium aureolum</i>
Sea bass	<i>Dicentrarchus labrax</i>	Micro alga	<i>Phaeocystis</i> sp.
Skate	<i>Raja batis</i>	Micro alga	<i>Prymnesium parvum</i>
Skate	<i>Raja</i> sp.	Oarweed	<i>Laminaria digitata</i>
Sole	<i>Solea solea</i>	Serrated wrack	<i>Fucus serratus</i>
Sprat	<i>Sprattus sprattus</i>	Wrack	<i>Fucus</i> sp.
Spurdog	<i>Squalus acanthias</i>		
Starry skate	<i>Raja radiata</i>	<b>Other organisms</b>	
Thick-lipped grey mullet	<i>Crenimugil labrosus</i>	Bacteria	<i>Escherichia coli</i>
Thornback ray	<i>Raja clavata</i>	Parasitic protozoan	<i>Labyrinthula macrocystis</i>
Turbot	<i>Psetta maxima</i>		
Whiting	<i>Merlangius merlangus</i>		
Witch	<i>Glyptocephalus cynoglossus</i>		

## ABBREVIATIONS

$\mu$ (prefix)	micro, 10 <sup>-6</sup>	km	Kilometre
$\Sigma$ PCB	Sum of concentrations for individual chlorinated biphenyl congeners	km <sup>2</sup>	square kilometre
$\Sigma$ (prefix)	Sum (of concentrations)	km <sup>3</sup>	Cubic kilometre
°C	Degrees Celsius	LC <sub>50</sub>	Lethal concentration at which 50% of the population of test organisms die
4NSC	Fourth International Conference on the Protection of the North Sea, Esbjerg Denmark 1995	Lw	Lipid weight
5NSC	Fifth International Conference on the Protection of the North Sea due to be held in 2002	M	Molar mass
ACFM	Advisory Committee on Fisheries Management (ICES)	M (prefix)	Mega, 10 <sup>6</sup>
ACG	Assessment Coordination Group (OSPAR)	MAGP	Multi-Annual Guidance Programme (For Fisheries)
AHTN	7-acetyl-1,1,3,4,4,6-hexamethyl-1,2,3,4-tetrahydronaphthalene	MARPOL	International Convention for the Prevention of Pollution from Ships (1973/1978)
AMAP	Arctic Monitoring and Assessment Programme	MBT	Monobutyltin
ASCOBANS	Agreement on Small Cetaceans of the Baltic and North Sea	MEPC	IMO Marine Environmental Protection Committee
ASMO	Environmental Assessment and Monitoring Committee (OSPAR)	Mm	Millimetre
ASP	Amnesic Shellfish Poisoning	MMC	Ministerial Meeting of the (OSPAR) Commission
atm	1 atmosphere = 1.013 x 10 <sup>5</sup> Pascal	MMHg	Monomethylmercury
BAT	Best Available Techniques	MON	Ad Hoc Working Group on Monitoring (OSPAR)
BC	Before Christ	MPA	Marine Protected Area
BDE-47	A brominated diphenyl ether	n (prefix)	nano, 10 <sup>-9</sup>
BEP	Best Environmental Practice	NAO	North Atlantic Oscillation
BFR	Brominated flame retardant	NATO	North Atlantic Treaty Organization
Bq	Becquerel (1 disintegration per second)	NERC	Natural Environment Research Council (UK)
BRC	Background / Reference Concentration	NIVA	Norwegian Institute for Water Research
BSH	Bundesamt für Seeschifffahrt und Hydrographie (Germany)	nm	Nautical mile
CAMP	Comprehensive Atmospheric Monitoring Programme (OSPAR)	NPE	Nonylphenol ethoxylate
CB	Chlorinated Biphenyl	NSP	North Sea Project
CEFAS	Centre for Environment, Fisheries and Aquaculture Science (UK)	NSTF	North Sea Task Force
CHB	Chlorinated bornane (congener)	OBTMs	Oil-based muds
cm	Centimetre	OPE	Octylphenol ethoxylate
CPs	Chlorinated paraffins	OSPAR Commission	The term 'OSPAR Commission' is used in this report to refer to both the OSPAR Commission and the former Oslo and Paris Commissions. The 1972 Oslo Convention and the 1974 Paris Convention were replaced by the 1992 OSPAR Convention when it entered into force on 25 March 1998
d	Day	p (in pCO <sub>2</sub> )	Partial pressure
DBT	Dibutyltin	p (prefix)	pico, 10 <sup>-12</sup>
DDD	pp'-dichlorodiphenyldichloroethane	PAH	Polycyclic Aromatic Hydrocarbon
DDE	1,1-dichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethene	PARCOM	Paris Commission (now part of the OSPAR Commission)
DDT	4,4'-dichlorodiphenyl-1,1,1-trichloroethane	PBB	Polybromobiphenyls
DeBDE	Decabromodiphenylether	PBDEs	Polybrominated diphenyl ethers
DIN	Dissolved Inorganic Nitrogen	PCBs	Polychlorinated Biphenyls
DON	Dissolved organic nitrogen	PCDD	Polychlorodibenzodioxins
dw	Dry weight	PCDF	Polychlorodibenzofuranes
EAC	Ecotoxicological Assessment Criteria	PCT	Polychlorinated terphenyls
EC	European Commission	PON	Particulate organic nitrogen
EEA	European Environment Agency	PRAM	Programmes and Measures Committee (OSPAR)
EEZ	Exclusive Economic Zone	PSP	Paralytic Shellfish Poisoning
EROD	E-thoxyresorufin-O-deethylase	PVC	polyvinyl chloride
ERSEM	European Regional Seas Ecosystem Model	QSR	Quality Status Report
EU	European Union	QSR 2000	Quality Status Report for the entire OSPAR maritime area published by OSPAR in 2000
fw	fat weight	RID	Comprehensive Study on Riverine Inputs and Direct Discharges (OSPAR)
G (prefix)	Giga, 10 <sup>9</sup>	s	Regional Task Team (OSPAR)
GDR	German Democratic Republic	SIME	Second (time)
GOOS	Global Ocean Observation System	SOC	Working Group on Concentrations, Trends and Effects of Substances in the Marine Environment (OSPAR)
HCB	Hexachlorobenzene	SPM	Southampton Oceanography Centre
HCH	Hexachlorocyclohexane	Sv	Suspended Particulate Matter
HHCB	1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-(g)-2-benzopyrane	t	Sievert (1 J kg <sup>-1</sup> x (modifying factors))
ICES	International Council for the Exploration of the Sea	T (prefix)	Tonne
ICRP	International Commission on Radiological Protection	TAC	Tera, 10 <sup>12</sup>
IMM 1997	Intermediate Ministerial Meeting on the Integration of Fisheries and Environmental Issues (5NSC)	TBT	Total Allowable Catch
IMO	International Maritime Organization	TEQ	Tributyltin
IMPACT	Working Group on Impacts on the Marine Environment (OSPAR)	UN	Toxic equivalent
IMR	Institute for Marine Research (Norway)	UNCED	United Nations
INPUT	Working Group on Inputs to the Marine Environment (OSPAR)	UNEP	UN Conference on Environment and Development
IPCC	UN Intergovernmental Panel on Climate Change	W	United Nations Environment Programme
IUPAC	International Union for Pure Applied Chemistry	ww	Watt
IWC	International Whaling Commission	yr	Wet weight
JAMP	Joint Assessment and Monitoring Programme (OSPAR)		Year
kg	Kilogramme		

## GLOSSARY

Advection	The transfer of heat or matter by horizontal movement of water masses
Anoxia	A complete absence of oxygen
Anthropogenic	Caused or produced by human activities
ASP biotoxins	The toxin domoic acid (and isomers) produced by certain species of diatoms that, if transmitted through the food web, causes a syndrome known as Amnesic Shellfish Poisoning (ASP) because it is mainly caused after the ingestion of shellfish with amnesia being the main symptom
Background concentrations of natural compounds	The concentration of a natural compound that would be found in the environment in the absence of human activity. Natural compounds are those produced by biosynthesis from natural precursors or by geochemical, photochemical or chemical processes.
Background/Reference Concentrations (BRCs)	The following operational definitions have been used by OSPAR to determine Background/ Reference Concentrations (BRCs): concentrations reflecting geological times (obtained from layers of buried marine sediments) or concentrations reflecting historical times (obtained from measurements carried out prior to significant anthropogenic inputs of the respective substance; relevant for nutrients only) or concentrations from pristine areas (preferably areas far from known sources and normally having very low concentrations)
Benthos	Those organisms attached to, living on, or in the seabed. Benthos is categorised by its diameter into: <ul style="list-style-type: none"> <li>- nanobenthos: passes through 63 µm mesh</li> <li>- microbenthos: passes through 100 µm mesh</li> <li>- meiobenthos: within the 100 – 500 µm range</li> <li>- macrobenthos: passes through 1 cm mesh but is retained on 1000 – 500 µm mesh</li> <li>- megabenthos: visible, sampled using trawls and sieves</li> </ul>
Bioaccumulation	The accumulation of a substance within the tissues of an organism. This includes 'bioconcentration' and uptake via the food chain.
Bioassay	The use of an organism for assay purposes. Generally referring to a technique by which the presence of a chemical is quantified using living organisms, rather than chemical analyses
Bioavailability	The extent to which a substance can be absorbed into the tissues of organisms. Possibly the most important factor determining the extent to which a contaminant will enter the food chain and accumulate in biological tissues
Bioconcentration	The net result of the uptake, distribution and elimination of a substance by an organism due to water-borne exposure
Biomagnification	The process whereby concentrations of certain substances increase with each step in the food chain
Biomass	The total mass of organisms in a given place at a given time
Biota	Living organisms
Bloom	An abundant growth of phytoplankton, typically triggered by sudden favourable environmental conditions (e.g. excess nutrients, light availability, reduced grazing pressure)
By-catch	Non-target organisms caught in fishing gear
Climate	The long-term average conditions of the atmosphere and/or ocean
Contaminant	Any substance detected in a location where it is not normally found
Continental margin	The ocean floor between the shoreline and the abyssal plain, including the continental shelf, the continental slope and the continental rise
Continental shelf	The shallowest part of the continental margin between the shoreline and the continental slope; not usually deeper than 200 m
Continental slope	The steeply sloping seabed from the outer edge of the continental shelf to the continental rise
Contour current	An ocean current flowing approximately parallel to the bathymetric contours on the ocean bottom
Diagenesis	The chemical and physical processes, in particular compaction and cementation, involved in rock formation after the initial deposition of a sediment
Diel vertical migration	Daily (24 hour) migrations undertaken by pelagic animals that generally move up towards the surface at dusk and then return to deeper water at dawn
Discards	Fish and other organisms caught by fishing gear and then thrown back into the sea
Dissolved Organic Carbon (DOC)	Carbon in organic compounds that are in solution in sea water
Diversity	The genetic, taxonomic and ecosystem variety in organisms in a given marine area
DSP biotoxins	A group of toxins produced by some marine dinoflagellates that, if transmitted through the food web, cause a syndrome known as Diarrhetic Shellfish Poisoning (DSP) because it is mainly caused after the ingestion of shellfish and with diarrhoea being the main symptom
Dumping	The deliberate disposal in the maritime area of wastes or other matter from vessels or aircraft, from offshore installations, and any deliberate disposal in the maritime area of vessels or aircraft, offshore installations and offshore pipelines. The term does not include disposal in accordance with MARPOL 73/78 or other applicable international law of wastes or matter incidental to, or derived from, the normal operations of vessels or aircraft or offshore installations (other than wastes or other matter transported by or to vessels of offshore installations for the purpose of disposal of such wastes or other matter or derived from the treatment of such wastes or other matter on such vessels or aircraft of offshore installations)
Ecotoxicological assessment criteria (EAC)	The concentrations that, according to existing scientific knowledge, approximate to concentrations below which the potential for adverse effects is minimal
Ecosystem	A community of organisms and their physical environment interacting as an ecological unit
Ecosystem approach	The ecosystem approach (to fisheries management) involves a consideration of all the physical, chemical and biological variables within an ecosystem, taking account of their complex interactions. In the management of living resources this means that the decisions are based upon the best available scientific knowledge of the functions of the ecosystem, including the interdependence of species and the interaction between species (food chains) and the abiotic environment of the ecosystem. It could therefore imply a widening of the multi-species approach, currently used in fisheries, to encompass not only fish but also other organisms which directly or indirectly depend on fish or on which fish depend, as well as other significant biotic and abiotic environmental factors
Emission	A release into air
Endemic	Native, and restricted, to a particular locality or specialised habitat
Endocrine disrupter	An exogenous substance that causes adverse health effects in an intact organism, or its progeny, consequent to changes in endocrine function. In applying this definition to the marine environment it will be necessary to consider substances that are likely directly or indirectly to affect the hormonal regulation in whole organisms by the mimicking of hormones or by affecting enzyme systems responsible for hormone equilibria. The upper layers of the sea with sufficient light penetration for net photosynthesis to occur
Euphotic zone	The upper layers of the sea with sufficient light penetration for net photosynthesis to occur
Eutrophication	The enrichment of water by nutrients causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned, and therefore refers to the undesirable effects resulting from anthropogenic enrichment by nutrients
Exclusive Economic Zone (EEZ)	An area in which a coastal state has sovereign rights over all the economic resources of the sea, seabed and subsoil (see Articles 56 – 58, Part V, UNCLOS 1982)
Fisheries management	In adopting Annex V to the 1992 OSPAR Convention, on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area, OSPAR agreed that references to 'questions relating to the management of fisheries' are references to the questions on which action can be taken under such instruments as those constituting: <ul style="list-style-type: none"> <li>- the Common Fisheries Policy of the European Community;</li> <li>- the corresponding legislation of Contracting Parties which are not Member States of the European Union;</li> <li>- the corresponding legislation in force in the Faroe Islands, Greenland, the Channel Islands and the Isle of Man; or</li> <li>- the North East Atlantic Fisheries Commission and the North Atlantic Salmon Commission;</li> </ul> whether or not such action has been taken. For the avoidance of doubt, in the context of the OSPAR Convention, the management of fisheries includes the management of marine mammals
Focus areas	An area of special attention in the QSRs. They may consist of a typical and valuable habitat for marine life, may be under (anthropogenic) stress, may be of strategic or economic importance, or scientific research may have resulted in a relatively large amount of information on the area
Food web	The network of interconnected food chains along which organic matter flows within an ecosystem or community
Fossil fuel	Mineral fuels (coal and hydrocarbons) rich in fossilised organic materials which are burnt to provide energy
Fronts	The boundary zone between two water masses differing in properties, such as temperature and salinity. Fronts can be either convergent or divergent
Geochemical	Relating to the natural chemistry of the Earth
Glacial periods	Cool to cold climatic periods, characterised by advancing ice sheets and caps, within the Quaternary Period

Cyre	Large-scale ocean circulation pattern generated by the interaction of winds and the rotation of the earth
Harmful Algal Blooms (HAB)	Blooms of phytoplankton that result in harmful effects such as the production of toxins that can affect human health, oxygen depletion and kills of fish and invertebrates and harm to fish and invertebrates e.g. by damaging or clogging gills
Hazardous substances	Substances which fall into one of the following categories: (i) substances or groups of substances that are toxic, persistent and liable to bioaccumulate; or (ii) other substances or groups of substances which are assessed by OSPAR as requiring a similar approach as substances referred to in (i), even if they do not meet all the criteria for toxicity, persistence and bioaccumulation, but which give rise to an equivalent level of concern
Hepatopancreas	The combined stomach and pancreatic glands typical of crustaceans
Hydrography	The study of water characteristics and movements
Imposex	A condition in which the gender of an organism has become indeterminate as a result of hormonal imbalances or disruption, as in the case of the effect of tributyltin on gastropods
Inshore waters	Shallow waters on the continental shelf, a term usually applied to territorial waters within 6 miles of the coasts
Interglacial periods	Warm to temperate periods between glaciations within the Quaternary Period
Internal waves	Waves occurring on density surfaces within the ocean and most commonly generated by the interaction between tidal currents and the sea bed structure
Intrusion	Water that is intermediate in density between two contiguous water masses and so flows between them
Isotope	A form of an element chemically identical to another but with a different atomic weight
Key species	A species whose loss would have a detrimental or disproportionate effect on the structure, function and/or biological diversity of the ecosystem to which it belongs
London Convention	The 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter. The Convention is administered by the International Maritime Organization
MARPOL 73/78	The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto
Mesoscale eddy	An eddy with dimensions of 10 – 200 km
Meteorology	The study of weather and climate
Microbial food web	The food web that is sustained by picoplankton cells that are too small to be filtered from the water by suspension feeders
Multi-species approach	A form of management that takes into account interaction between the different components in the food webs of the ecosystems
North Atlantic Oscillation (NAO)	The North Atlantic Oscillation index is defined as the difference in atmospheric pressure at sea level between the Azores and Iceland and describes the strength and position of westerly air flows across the North Atlantic
Nutrients	Dissolved phosphorus, nitrogen and silica compounds
Organohalogenes	Substances in which an organic molecule is combined with one or more of the halogen group of elements (i.e. fluorine, chlorine, bromine, iodine)
Pelagic deposits	Deep ocean sediments containing no significant terrigenous component and derived mainly from the sinking of lithogenic and biological particles formed in the oceanic water column
Phytoplankton	The collective term for the photosynthetic members of the nano- and microplankton
Plankton	Those organisms that are unable to maintain their position or distribution independent of the movement of the water. Plankton is categorised by its diameter into: - picoplankton: < 2 µm - nanoplankton: 2 – 20 µm - microplankton: 20 – 200 µm - macroplankton: 200 – 2000 µm - megaplankton: > 2000 µm
Pollutant	A substance (or energy) causing pollution
Pollution	The introduction by man, directly or indirectly, of substances or energy into the maritime area which results, or is likely to result, in hazards to human health, harm to living resources and marine ecosystems, damage to amenities or interference with other legitimate uses of the sea
Post-spawning	Pertaining to a population of organisms following breeding
Production, primary	The assimilation of organic matter by autotrophs (i.e. organisms capable of synthesising complex organic substances from simple inorganic substrates; including both chemoautotrophic and photoautotrophic organisms). Gross production refers to the total amount of organic matter fixed in photosynthesis and chemosynthesis by autotrophic organisms, including that lost in respiration. Net production is that part of assimilated energy converted into biomass and reflects the total amount of organic matter fixed by autotrophic organisms less that lost in respiration
Production, secondary	The assimilation of organic matter by heterotrophic organisms (organisms unable to synthesise organic compounds from inorganic substrates)
Radionuclide	Atoms that disintegrate by emission of electromagnetic radiation, i.e. emit alpha, beta or gamma radiation
Recruitment (fisheries)	The process by which young fish enter a fishery, either by becoming large enough to be retained by the gear in use or by migrating from protected areas into areas where fishing occurs
Remineralisation	The conversion of a substance from an organically bound form back to a water-soluble inorganic form, resulting in the release of inorganic nutrients (e.g. nitrate, phosphate), carbon dioxide or methane back into solution
Safe biological limits	Limits (reference points) for fishing mortality rates and spawning stock biomass, beyond which the fishery is unsustainable. Other criteria which indicate when a stock is outside safe biological limits include age structure and distribution of the stock and exploitation rates. A fishery which maintains stock size within a precautionary range (a range within which the probability of reaching any limits is very small) would be expected to be sustainable
Salinity	A measure of the total amount of dissolved salts in sea water
Slope current	A current that follows the shelf break along a continental margin
Standing crop	The biomass of organisms per unit volume at a given time
Subduction	The process by which crustal material is returned to the upper mantle and occurs where dense oceanic crust slips beneath less dense continental crust
Sverdrup	A unit of transport used in oceanography to quantify flow in ocean currents. It is equivalent to 10 <sup>6</sup> m <sup>3</sup> /s
Thermocline	A boundary region in the sea between two layers of water of different temperature, in which temperature changes sharply with depth
Topography	The land forms or surface features of a geographical area
Total allowable catch (TAC)	The maximum tonnage, set each year, that may be taken of a fish species within an area. In the EU, the TAC is a central part of the Common Fisheries Policy. It establishes the total amount of each species that may be caught in EU waters annually. Each year the Council of Ministers establishes TACs for each species, and then each Member State is allocated a quota for each species
Toxaphene	A chlorinated insecticide with an average chemical composition of C <sub>10</sub> H <sub>10</sub> C <sub>18</sub> . Primarily used in cotton farming
Toxin	A biogenic (produced by the action of living organisms) poison, usually proteinaceous
Trace organic compounds	A compound containing carbon as an essential component and present in the environment in minute quantities only. There are no known natural sources of some organochlorine compounds (such as PCBs, DDT and herbicides), while others (such as some PAHs) do have natural sources
Trench	A narrow, elongated U-shaped depression of the deep ocean floor between an abyssal plain and the continental margin where subduction of oceanic crust occurs
Trophic	Pertaining to nutrition
Upwelling	An upward movement of cold, nutrient-rich water from ocean depths; this occurs near coasts where winds persistently drive water seawards and in the open ocean where surface currents are divergent
Vas deferens	The sperm duct
Vitellogenin	A protein in blood plasma used as a biomarker for exposure to endocrine disrupters that promote the development of female sex characteristics
Water column	The vertical column of water extending from the sea surface to the seabed
Water mass	A body of water within an ocean characterised by its physicochemical properties of temperature, salinity, depth and movement
Zooplankton	The animal component of the plankton; animals suspended or drifting in the water column including larvae of many fish and benthic invertebrates

## REFERENCES

## Chapter 1 References

North Sea Task Force 1993. North Sea Quality Status Report 1993. Oslo and Paris Commissions, London; Olsen and Olsen, Fredensborg, Denmark. 132 pp.

## Chapter 2 References

Aure, J., Danielsen, D. and Sætre, R. 1996. Assessment of eutrophication in Skagerrak coastal waters using oxygen consumption in fjordic basins. *ICES J. Mar. Sci.* 53: 589–595.

Backhaus, J.O. 1984. Estimates of the variability of low frequency currents and flushing times of the North Sea. ICES Hydrography Committee, Copenhagen, C.M. 1984/C: 24.

Bacon, S. and Carter, D.J.T. 1991. Wave climate changes in the North Atlantic and North Sea. *Int. J. Climat.* 11: 545–558.

Bacon, S. and Carter, D.J.T. 1993. A connection between mean wave height and atmospheric pressure gradient in the North Atlantic. *J. Climat.* 13: 423–436.

Barrett, E.C., Beaumont, M.J. and Corlyon, A. M. 1991. Satellite-derived rainfall atlas of the North Sea 1978–87. University of Bristol, 164 pp.

Becker, G.A. 1990. Die Nordsee als physikalisches System. In *Warnsignale aus der Nordseewissenschaftliche Fakten*. J.L. Lozan, W. Lenz, E. Rachor, B. Watermann and Westerhagen H. (Eds.). Paul Parey, Berlin and Hamburg. 428 pp.

Becker, G.A., Frohse, A. and Damm, P. 1997. The Northwest European Shelf temperature and salinity variability. *Dt. Hydrogr. Z.* 49: 145–161.

Becker, G. and Schulz, A. 2000. Atlas of the North Sea surface temperature. *Dt. Hyd. Z. (Supl.)*, in press.

Boon, J., van der Kaaij, T., Vos, R.J. and Gerritsen, H. 1997. Modelling of suspended particulate matter (SPM) in the North Sea; Model set-up and first sensitivity analysis. Delft Hydraulics report Z2025.

Breton, M., Salomon, J.C. and Guéguénat, P. 1992. Sixth international biennial conference on physics of estuaries and coastal areas. Margaret River, Western Australia.

Dickson, R.R., Meincke, J., Malmberg, S.-A. and Lee, A. 1988. The 'Great Salinity Anomaly' in the northern North Atlantic 1968–1982. *Prog. Oceanogr.* 20: 103–151.

Dooley, H.D. and Furnes, G.K. 1981. Influence of the wind field on the transport of the northern North Sea. In: *The Norwegian coastal current*; R. Sætre and M. Mork (Eds.). University of Bergen Vol. 1, pp. 57–71.

Dupont, J.-P., Lafite, R. and Eisma, D. 1991. Comparaison de la dynamique du matériel en suspension dans les eaux côtières de la Manche orientale et de la baie méridionale de la mer du Nord. In: *Estuaries and coasts: Spatial and temporal intercomparisons*; M. Elliott and Ducrottoy, J.P. (Eds.). Olsen and Olsen, Fredensborg, Denmark, pp. 57–62.

Eisma, D., 1981. Supply and deposition of suspended matter in the North Sea. *Spec. Publ. Int. Ass. Sedimentol.* 5: 415–428, Blackwell, Oxford.

Eisma, D. and Irion, G. 1988. Suspended matter and sediment transport. In: *Pollution of the North Sea: An assessment*; W. Salomons et al. (Eds.). Springer, Berlin, pp. 20–33.

Ellet, D.J. and Turrell, W.R. 1992. Increased salinity levels in the NE Atlantic. *ICES 1992/C*: 20.

Flather, R. 1987. Estimates of extreme conditions of tide and surge using a numerical model of the north-west continental shelf. *Estuar. coastal Shelf Sci.*, 24: 69–93.

Furnes, G.K. and Saelen, O.H. 1977. Current and hydrography in the Norwegian Coastal Current off Utsira during JONSDAP 76. Norwegian Coastal Project, Rep. 2/77, University of Bergen, Norway.

Furnes, G.K., Hackett, B. and Sætre, R. 1986. Retroflexion of Atlantic water in the Norwegian Trench. *Deep Sea Res.* 33: 247–265.

Furnes, G.K. 1992. Climatic variations of oceanographic processes in the north European seas: A review of the 1970s and 1980s. *Cont. Shelf Res.* 12: 235–256.

Hardisty, J. 1990. The British Seas, an introduction to the new oceanography and resources of the north-west European continental shelf. Routledge, London. 272 pp.

Heath, M.R., Henderson, E.W., Slessor, C., and Woodward, E.M.S. 1991. High salinity in the North Sea. *Nature*, 352: 116.

HELCOM, 1996. Third Periodic Assessment of the State of the Marine Environment of the Baltic Sea, 1989–93. Background document. Balt. Sea Environ. Proc. No. 64 B.

Hurrell, J. 1995. Decadal trends in the North Atlantic Oscillation regional temperatures and precipitation. *Science*, 269: 676–679.

ICES. 1983. Flushing times of the North Sea. *Coop. Res. Rep. Cons. int. Explor. Mer.* No. 123. 159 pp.

IPCC (Intergovernmental Panel on Climate Change), 1996. Climate Change 1995. The Science of Climate Change. Houghton, J.T., Meira Filho, L.G., Callander, B.A., Harris, N. Kattenberg, A., Maskell, K. (Eds.) Cambridge University Press, Cambridge, 572 pp.

Iversen S.A., Skogen, M.D., Svendsen, E. 1998. Influx of Atlantic Water and Feeding Migration of Horse Mackerel. *ICES C.M.* 1998/R:18. pp. 9.

Johannessen, J.A., Svendsen, E., Sandven, S., Johannessen, O.M. and Lygre, K. 1989. Three-dimensional structure of mesoscale eddies in the Norwegian coastal current. *J. phys. Oceanogr.*, 19: 3–19.

Lenhart, H.J. and Pohlmann, T. 1997. The ICES-boxes approach in relation to results of a North Sea circulation model. *Tellus* 49A, 139–160.

Ljøen, R. and Svansson, A. 1972. Long-term variations of sub-surface temperatures in the Skagerrak. *Deep Sea Res.* 19: 277–288.

Ljøen, R. 1981. On the exchange of deep waters in the Skagerrak basin. In: *The Norwegian Coastal Current*, M. Mork (Ed.) pp. 340–356.

North Sea Task Force 1993. North Sea Quality Status Report 1993. Oslo and Paris Commissions, London. Olsen and Olsen, Fredensborg, Denmark, 132 pp.

Otto, L., Zimmerman, J.T.F., Furnes, G.K., Mork, M., Sætre, R. and Becker, G. 1990. Review of the physical oceanography of the North Sea. *Neth. J. Sea Res.* 26: 161–238.

Philippart, M.E. and Gebraad, A.W. 1997. A new storm surge forecasting system, Operational Oceanography, the challenge for European co-operation. In: *Proc. of the First International Conference on EuroGOOS*, J.H. Stel et al. (Eds.), Elsevier, Amsterdam, pp. 487–495.

Pohlmann, T. and Puls, W. 1994. Currents and transport in water. In: *Circulation and contaminant fluxes in the North Sea*, J. Sündermann (Ed.). Springer, Berlin, pp. 345–402.

Prandle, D. 1978. Residual flows and elevations in the southern North Sea. *Proc. R. Soc. Lond. A.*, 359: 189–228.

Prandle, D. 1984. A modelling study of the mixing of 137Cs in the seas of the European continental shelf. *Phil. Trans. R. Soc.*, London, A310: 407–436.

Prandle, D. 1990. RRS 'Challenger' cruise 66B/90, 3–7 June 1990. Measuring the flux of contaminants through the Strait of Dover. Proudman Oceanogr. Lab. Cruise Report, No. 9, 17 pp.

Prandle, D., Ballard, G., Flatt, D., Harrison, A.J., Jones, S.E., Knight, P.J., Loch, S., McManus, J.P., Player, R. and Tappin, A. 1996. Combining modelling and monitoring to determine fluxes of water, dissolved and particulate metals through the Dover Strait. *Cont. Shelf Res.* 16: 237–257.

Rodhe, J. 1987. The large-scale circulation in the Skagerrak, interpretation of some observations. *Tellus* 39A: 245–253.

Rydberg, L., Haamer, J. and Liungman, O. 1996. Fluxes of water and nutrients within and into the Skagerrak. *J. Sea Res.* 35: 23–38.

Salomon, J.C. and Breton, M. 1993a. An Atlas of long term currents in the Channel. *Oceanologica Acta, (Channel Symposium: Fluxes and processes with a macrotidal sea)*. Vol. 16/No. 5-6: 439–448.

Salomon, J.C., Breton, M., Guéguénat, P. 1993b. Computed residual flow through the Dover Strait. *Oceanologica Acta, (Channel Symposium: Fluxes and processes with a macrotidal sea)*. Vol. 16/No. 5-6: 449–456.

Skogen, M.D., Svendsen, E., Berntsen, J., Aksness, D. and Ulvestad, K.B. 1995. Modelling the primary production in the North Sea using a coupled three-dimensional physical-chemical-biological ocean model. *Estuar. Coast. Shelf Sci.* 41: 545–565.

Smith, J.A., Damm, P.E., Skogen, M.D., Flather, R.A. and Pätch, J. 1996. An investigation into transports and the long-term residual circulation of the North-West European Shelf using three hydrodynamic models. *Deut. Hydrogr. Z.* 48: 325–348.

Svendsen, E. and Magnusson, A.K. 1992. Climatic variability in the North Sea. *ICES Mar. Sci. Symp.*, 195: 144–158.

Svendsen, E., Aglen, A., Iversen, S.A., Skagen D.W. and Smestad, O. 1995. Influence of climate on recruitment and migration of fish stocks in the North Sea. In: *Climate change and northern fish populations*, R.J. Beamish (Ed.). *Can. Spec. Publ. Fish. Aquat. Sci.* 121: 641–653.

Turrell, W.R. 1992. New hypotheses concerning the circulation of the northern North Sea and its relation to North Sea fish stock recruitment. *ICES J. Mar. Sci.* 49: 107–123.

UK Department of Energy 1989. Metocean parameters (wave parameters). Supporting document for offshore installations: guidance on design, construction and certification - environmental considerations. HMSO, OTH 89 300.

Vincent, P. and Le Provost, C. 1988. Semi-diurnal tides in the Northeast Atlantic from a finite element model. *J. Geophys. Res.* 93: 543–555.

von Storch, H. (Ed.) 1996. The WASA project: Changing storm and wave climate in the north-east Atlantic and adjacent seas? *GRSS 96/E/61*, 16 pp.

WASA Group 1998. Changing waves and storms in the North-East Atlantic? *Bull. Am. Meteor. Soc.* 79: 741–761.

## Chapter 3 References

4NSC 1995. Progress Report. 4th International Conference on the Protection of the North Sea. Esbjerg, Denmark, 8–9 June 1995. Andersen J. and Niilonen T. (Eds.). Ministry of the Environment and Energy, Danish Environmental Protection Agency, Copenhagen. 247 pp.

- 5NSC 1997. Assessment report on Fisheries and Fisheries related Species and Habitat Issues. Svelle M., Aarefjord, H., Heir, H.T. and Øverland, S. (Eds.) Intermediate Ministerial Meeting on the integration of Fisheries and Environmental Issues, 13-14 March 1997, Bergen, Norway, Ministry of Environment, Norway, Fifth North Sea Conference Secretariat. 127 pp.
- Britannica 1999. Book of the year - Britannica World Data, 1997. Encyclopaedia Britannica, London. 920 pp.
- Cotter J. *et al.* 1999. On-board sampling of fish landed and discarded by commercial vessels. EU Contract ref. EC 95/094. 290 pp.
- CWSS 1998. Stade Declaration on Trilateral Wadden Sea Plan 1997. Common Wadden Sea Secretariat, Wilhelmshaven, 100 pp.
- De Jong, F., Bakker, J.F., van Berkel, C.J.M., Dankers, N.M.J.A., Dahl, K., Gätje, C., Marenic, H. and Potel, P. 1999. Wadden Sea Quality Status Report. Wadden Sea Ecosystem No. 9. Common Wadden Sea Secretariat, Trilateral Monitoring and Assessment Group, Quality Status Report Group, Wilhelmshaven, Germany. 259 pp.
- Department of the Environment, Transport and the Regions (UK) 1997. Maritime Statistics. The Stationery Office, London. 63 pp.
- Duursma, E.K. (Ed.) 1999. Dumped chemical weapons in the sea - options. Dr. A.H. Heineken Foundation for the Environment, Amsterdam, 60 pp.
- EC 1991. Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment. OJ L 135, 30/05/1991 p. 0040-0052.
- EC 1992. Council Directive 92/112/EEC of 15 December 1992 on procedures for harmonizing the programmes for the reduction and eventual elimination of pollution caused by waste from the titanium dioxide industry. OJ L 048, 26/02/1993, p. 68.
- EC 1998. Regulation EC/850/98 of 30 March 1998 for the Conservation of Fishery Resources through Technical Measures for the Protection of juveniles of marine organisms. OJ L 318, 27/11/1998, p. 63.
- European Environment Agency. 1995. Europe's Environment - The Dobris Assessment, D. Stanners and P. Bourdeau (Eds.). European Environment Agency, Copenhagen. 676 pp.
- Eurostat 1997a. Decline in births halted in 1996. Principle demographic trends in the EU 1996. Eurostat, Statistics in focus, Population and Social conditions - Theme 3, No. 10. pp. 1-4.
- Eurostat 1997b. Beyond the predictable: demographic changes in the EU up to 2050. Eurostat, Statistics in focus, Population and Social conditions - Theme 3, No. 7. pp. 1-8.
- Eurostat 1998. Pesticide use in the EU. Eurostat, Statistics in focus, Environment, No. 3. pp. 1-12.
- Fischer Weltatlas 1999. Fischer Taschenbuchverlag, Frankfurt am Main. 665 pp.
- Grote Bosatlas 1988. Wolters-Noordhoff, Groningen, The Netherlands.
- Hooke, N. 1997. Maritime Casualties 1963 - 1996. Lloyd's Maritime Information Services LLP, London. 741 pp.
- ICES 1992. Effects of Extraction of Marine Sediments on Fisheries. ICES Cooperative Research Report, No. 182, 78 pp.
- ICES 1994. Report of the Working Group on ecosystem effects of fishing activities. ICES C.M. 1994/Assess/Env:1. 109 pp.
- ICES 1997. Report of the Working Group on the effects of extraction of marine sediments on the marine ecosystem. ICES C.M. 1997/E:4. 81 pp.
- ICES 1999a. Report of the ICES Advisory Committee on Fishery Management, 1998. Parts 1 and 2. ICES Cooperative Research Report, No. 229. 796 pp.
- ICES 1999b. Report of the ICES Advisory Committee on the Marine Environment, 1998. ICES Cooperative Research Report, No 233. 375 pp.
- Jacobsen M., Egelund L., Hovdan H., Aabel J.P. 1998. Nedbrytning av rorledninger over tid. Ølje-og Energidepartementet Report (preliminary report).
- Jennings, S., Alvsvag, J., Cotter, A.J., Ehrlich, S., Greenstreet, S.P.R., Jarre-Teichmann, A., Mergardt, N., Rijnsdorp, A.D. and Smedstad O. 1999. Fishing effects in Northeast Atlantic shelf seas: patterns in fishing effort, diversity and community structure. III. International fishing effort in the North Sea: an analysis of spatial and temporal trends. *Fish. Res.* 40:125-134.
- North Sea Task Force 1993. North Sea Quality Status Report 1993. Oslo and Paris Commissions, London. Olsen and Olsen, Fredensborg, Denmark. 132 pp.
- OSPAR 1995. Nutrients in the Convention Area. Oslo and Paris Commissions, London. 60 pp.
- OSPAR 1997a. Point and Diffuse Sources. Dumping at Sea in 1994. Oslo and Paris Commissions, London, 76 pp.
- OSPAR 1997b. Litter in the coastal and marine environment. OSPAR Commission, meeting document No. IMPACT 97/3/1, 11 pp.
- OSPAR 1998a. The extent and impact of fisheries directed at gastropods and bivalves. OSPAR Commission, meeting document No. IMPACT 98/4/1. 17 pp. + 18 annexes.
- OSPAR 1998b. Impact of marine sand and gravel extraction. OSPAR Commission, meeting document No. IMPACT 98/14/1, Annex 16, 13 pp.
- OSPAR 1999a. Point and diffuse sources. Dumping of Wastes at Sea in 1995 and 1996. OSPAR Commission. London. 104 pp.
- OSPAR 1999b. Point and diffuse sources. Part II. Discharges, waste handling and air emissions from offshore installations, 1996-1997. OSPAR Commission. London. 54 pp.
- Port of Rotterdam 1999. Port of Rotterdam Statistics 1998. Municipality of Rotterdam. Available: <http://www.port.rotterdam.nl/port/GB/statistieken/goederen4.pdf> [11 July 2000].
- Quell, A. and Klimsa, O. 1997. Gefährdung der marinen Umwelt durch Unfälle im Zusammenhang mit dem Transport seewassergefährdender Güter auf Seeschiffen; eine Risikoanalyse für das deutsche Seegebiet. Dipl. Thesis. Hochschule Bremerhaven. 119 pp.
- Rijnsdorp, A.D., Buys, A.M., Storbeck, F. and Visser, E. 1997. The micro-distribution of the Dutch beam trawl fleet fishery between April 1993 and March 1996. RIVO-DLO Report C019/97.
- Schöneich, H. (Ed.) 1998. Jahrbuch Bergbau, Erdöl und Erdgas Petrochemie, Elektrizität, Umweltschutz, Verlag Glückauf, Essen, 1200 pp.
- UBA 1996. Einflüsse der Fischerei und Aquakultur auf die marine Umwelt. UBA Texte 46-96 Umweltbundesamt, Berlin. 136 pp.
- Wirtschaftsbehörde Hamburg 1998. Free and Hanseatic City of Hamburg. State Ministry of economic affairs, Department of ports services and economic infrastructure.

#### Chapter 4 References

- 4NSC 1995. Progress Report. 4th International Conference on the Protection of the North Sea. Esbjerg, Denmark, 8-9 June 1995. Andersen J. and Nilonen T. (Eds.). Ministry of the Environment and Energy, Danish Environmental Protection Agency, Copenhagen. 247 pp.
- Abrahamsson, K. and Ekdahl, A. 1996. Volatile halogenated compounds and chlorophenols in the Skagerrak. *J. Sea Res.* 35: 73-79.
- Baeyens, W. 1998. Evolution of trace metal concentrations in the Scheldt estuary (1978-1995). A comparison with estuarine and ocean levels. *Hydrobiologia*, 366: 157-167.
- Baeyens W. and Leermakers M. 1998. Elemental mercury concentrations and formation rates in the Scheldt estuary and the North Sea. *Mar. Chem.* 60: 257-266.
- Bailly du Bois, P. P. Guegueniat, R. Gandon, R. Leon and Baron Y. 1993. Percentage contribution of inputs from the Atlantic, Irish Sea, English Channel and Baltic into the North Sea during 1988. *Neth. J. Sea Res.* 31: 1-17.
- Bakke, T., Gray, J.S., Lichtentaler, R.G. and Palmork, K.H. 1996. Environmental surveys in the vicinity of petroleum installations on the Norwegian Shelf - 1995. Norwegian Pollution Control Authority, Rapport 97:13. 60 pp (in Norwegian, English summary).
- Bakker, J., van de Zande, T. and Smedes, F. 1996. Verontreinigingsgraad van en contaminantgehalte in sediment in de Waddenzee in 1993. Rijksinstituut voor Kust en Zee, The Hague, Report RIKZ-96.027, 49 pp.
- Bakker, J.F., Bartelds, W., Becker, P.H., Bester, K., Dijkhuizen, D., Frederiks, B. and Reineking, B. 1999. Marine Chemistry. Chapter 4 in: *Wadden Sea Quality Status Report 1999*. pp. 85-117. De Jong, F. *et al.* Wadden Sea Ecosystem No. 9. Common Wadden Sea Secretariat, Trilateral Monitoring and Assessment Group, Quality Status Report Group, Wilhelmshaven, Germany. 259 pp.
- Berdowski, J.J.M., Baas, J., Bloos, J.P.J., Visschedijk, A.J.H. and Zandveld, P.Y.J. 1997. The European emission inventory of heavy metals and persistent organic pollutants for 1990. TNO Report UBA-FB, Apeldoorn. 239 pp.
- Bester, K., Hühnerfuss, H., Lange, W. and Theobald, N. 1997. Results of non-target screening of lipophilic organic pollutants in the German Bight. I: Benzothiazoles. *Sci. Total Environ.* 207: 111-118.
- Bester, K., Biselli, S., Gatermann, R., Hühnerfuss, H., Lange, W., and Theobald, N. 1998. Results of non target screening of lipophilic organic pollutants in the German Bight. III: Identification and quantification of 2,5-dichloroaniline *Chemosphere*, 36: 1973-1983.
- Bonn Agreement, 1999. Bonn Agreement Aerial Surveillance Programme - Annual report on aerial surveillance for 1998. Bonn Agreement. London. pp. 11.
- Boon, J.P. *et al.* (Eds.) 1997. In vitro biotransformatie van organohalogeenvoerbindingen in zeezoogdieren en vogels. Mogelijke gevolgen voor bioaccumulatie en genotoxiciteit. III. Gebromeerde vlamvertragers (polybromdifenylenethers & polybroom bifenylen). Nederlands Instituut voor Onderzoek der Zee, BEON Rapport 97-6.
- Boon, J.P., Smith, D.E.C., Lewis, W.E., Klamer, H.J.C., Pastor, D., Westr, P.G., and de Boer, J. 1998. In vitro biotransformatie van organohalogeenvoerbindingen in zeezoogdieren en vogels. Mogelijke gevolgen voor bioaccumulatie en genotoxiciteit. IV. Polychloor terfenylen (PCT's). BEON Rapport 98-1. 38 pp.
- Camplin, W.C. 1992. Radioactivity in surface and coastal waters of the British Isles, 1990. Aquatic Environment Monitoring Report (29). MAFF, Directorate of Fisheries Research, Lowestoft, UK. 68pp.
- Capone, D.G., and Carpenter, E.J. 1982. Nitrogen fixation in the marine environment. *Science*, 217: 1140-1142.
- Christensen, P.B. (Ed.), Møhlenberg, F., Lund-Hansen, L.C., Borum, J., Christiansen, C., Larsen, S.E., Hansen, M.E., Andersen, J., and Kirkegaard, J. 1998. The Danish Marine Environment: Has action improved its state? Marine research programme HAV90. Nr.62, pp.120. (Translated from Danish by D.I. Barry).

- Daan, R. and Mulder, M. 1996. Long term effects of OBM cutting discharges at 12 locations on the Dutch Continental Shelf. Netherlands Institute for Sea Research, NIOZ Report 1996-6.
- Dahlgaard, H., 1995. Transfer of European coastal pollution to the Arctic: Radioactive tracers. *Mar. Pollut. Bull.* 31: 3-7.
- Evers, E.H.G., Dulfer, J.W., Schobben, H.P.M., van Hattum, B., Scholten, M.C.Th., Frintrop, P.C.M., van Steenwijk, J.M. and van der Heijdt, L.M. 1997. Oil and oil constituents. An analysis of problems associated with oil in the aquatic environment. National Institute for Coastal and Marine Management, RIKZ Report 97.032, The Hague, pp. 148.
- Goerke, H. and Weber, K. 1998. The bioaccumulation of organochlorine residues in *Lania conchilega* (Polychaeta) and its geographical variation between the English Channel and the German Bight. *Chemosphere*, 37: 1283-1298.
- ICES, 1997. Toxaphene in the marine environment. In: Report of the ICES Advisory Committee on the Marine Environment, ICES Copenhagen. Annex 5, pp. 141-149.
- International Commission on Radiological Protection, 1991. 1990 Recommendations of the International Commission on Radiological Protection. Annual Report. ICRP 21(1-3). Pergamon Press, Oxford, 201 pp.
- Kerry, J., Hiney, M., Coyne, R., NicGabhainn, S., Gilroy, D., Cazabon, D. and Smith, P. 1995. Fish feed as a source of oxytetracycline resistant bacteria in the sediments under fish farms. *Aquaculture*, 131: 101-103.
- Kerry, J., Coyne, R., Gilroy, D. and Smith, P. 1996. Spatial distribution of oxytetracycline and elevated frequencies of oxytetracycline resistance in sediments beneath a marine salmon farm following oxytetracycline therapy. *Aquaculture*, 145: 31-39.
- Kershaw, P. J., D. C. Denoon and Woodhead, D. S. 1999. Observations on the redistribution of plutonium, americium and curium in Irish Sea sediments, 1978-1995: Concentrations and inventories. *J. Environ. Radioact.* 44: 191-221.
- Köster, H.W., Marwitz, P.A., Berger, G.W., van Weers, A.W., Hagel, P. and Nieuwenhuize, J. 1990. Oriënterend onderzoek naar polonium-210 en andere natuurlijke radionucliden in Nederlandse aquatische ecosystemen. RIVM, Bilthoven.
- Laane, R.W.P.M. (Ed.), 1992. Background concentrations of natural compounds in rivers, sea water, atmosphere and mussels. Report DGGW - 92.033.
- Laane, R.W.P.M., G. Groeneveld, A. De Vries, A.J. Van Bennekom and Sydow, J.S. 1993. Nutrients (P, N, Si) in the Channel and the Strait of Dover: Seasonal and year to year variation, and fluxes to the North Sea. In: Transport of carbon and nutrients in lakes and estuaries, Kempe, S., E.T. Degens, and D. Eisma (Eds.), Hamburg. SCOPE/UNEP, 74 (part 6), pp. 273-294.
- Laane, R.W.P.M., Southward, A.J., Slinn, D.J., Allen, J., Groeneveld, G. and de Vries, A. 1996a. Changes and causes of variability in salinity and dissolved inorganic phosphate in the Irish Sea, English Channel, and Dutch coastal zone. *ICES J. Mar. Sci.* 53: 933-944.
- Laane, R.W.P.M., Svendsen, E., Radach, G., Groeneveld, G., Damm, P., Pätsch, J., Danielssen, D. S., Føyn, L., Skogen, M., Ostrowski, M. and Kramer, K.J.M. 1996b. Variability in fluxes of nutrients (N, P, Si) into the North Sea from Atlantic Ocean and Skagerrak caused by variability in water flow. *Deut. Hydrogr. Z.* 48: 401-419.
- Laane, R.W.P.M., Sonneveldt, H., van der Weyden, A., Loch, J. and Groeneveld, G. 1998. Trends in the spatial and temporal distribution of metals (Cd, Cu, Zn and Pb) and organic compounds (PCBs and PAHs) in the Dutch coastal zone sediments from 1981-1996: possible sources and causes for Cd and PCBs. *J. Sea Res.* 41: 1-17.
- Lipshultz, F. and Owens, N.J.P. 1996. An assessment of nitrogen fixation as a source of nitrogen to the North Atlantic Ocean. *Biogeochemistry*, Howarth, R.W. (Ed.), Vol. 35, 261-274.
- Lohse L. *et al.* 1993. Nitrogen cycling in North Sea sediments: interaction of denitrification and nitrification in offshore and coastal areas. Publication 56 of the project Applied Research, the Netherlands Institute for Sea Research (BEWON).
- Longva, O. and Thorsnes, T. (Eds.) 1997. Skagerrak in the past and at the present - an integrated study of geology, chemistry, hydrography and microfossil ecology. Geological Survey of Norway, Special Publication 8, 100 pp.
- Magnusson, K., Ekelund, R., Dave, G., Granmo, Å, Förlin, L., Wennberg, L., Samuelsson, M.-O., Berggren, M., and Brorström-Lundén, E. 1996. Contamination and correlation with toxicity of sediment samples from the Skagerrak and Kattegat. *J. Sea Res.*, 35: 223-234.
- NIVA 1995. Summary report on levels of polychlorinated dibenzofurans/dibenzo-p-dioxins and non-ortho polychlorinated biphenyls in marine organisms and sediments in Norway. Report No. TA-1242/1995. pp. 19.
- Nixon, S.W., Ammermann, J.W., Atkinson, L.P., Berounsky, V.M., Billen, G., Boicourt, W.C., Boynton, W.R., Church, T.M., Ditoro, D.M., Elmgren, R., Gaerber, J.H., Giblin, A.E., Jahnke, R.A., Owens, N.J.P., Pilson, M.E.Q. and Seitzinger, S.P. 1996. The fate of nitrogen and phosphorus at the land-sea margin of the North Atlantic Ocean. *Biogeochemistry*, 35: 141-180.
- North Sea Task Force 1993. North Sea Quality Status Report 1993. Oslo and Paris Commissions, London. Olsen and Olsen, Fredensborg, Denmark. 132 pp.
- OSPAR 1996. Report of the third OSPAR workshop on ecotoxicological assessment criteria. The Hague, 25-29 November 1996. 34 pp. + 30 annexes.
- OSPAR 1997a. Report of the results of the one-off DIFFCHEM survey. OSPAR Commission, meeting document No ASMO 97/4/13 31 pp.
- OSPAR 1997b. Agreed Background/Reference Concentrations for Contaminants in Sea Water, Biota and Sediment. Agreed Ecotoxicological Assessment Criteria for Trace Metals, PCBs, PAHs, TBT and some Organochlorine Pesticides. OSPAR Commission, meeting document No. OSPAR 97/15/1, Annexes 5 and 6.
- OSPAR 1997c. Report of the Working Group on Concentrations, Trends and Effects of Substances in the Marine Environment, OSPAR Commission, meeting document No. SIME(2) 97/12/1.
- OSPAR 1997d. Comprehensive Atmospheric Monitoring Programme (CAMP) Data report on the results of measurements made at coastal stations in 1995. Oslo and Paris Commissions.
- OSPAR 1997e. Data Report on the Comprehensive Study on Riverine Input and Direct Discharges (RID) in 1995. Oslo and Paris Commissions.
- OSPAR 1997f. Dumping at Sea in 1994. Oslo and Paris Commissions, 75 pp.
- OSPAR 1997g. Report on discharges, waste handling and air emissions from offshore installations for 1984-1995. Oslo and Paris Commissions. pp 45-66.
- OSPAR 1997h. Report on Discharges of Radioactive Substances by Non-Nuclear Industries. Oslo and Paris Commission. 59 pp.
- OSPAR 1997i. Responses to Questionnaire on monitoring being carried out on TBT. OSPAR Commission, meeting documents Nos. SIME(2) 97/3/13 and SIME(2) 97/3/13-Add.1.
- OSPAR 1997j. OSPAR/ICES Workshop on the overall evaluation and update of background/reference concentrations for nutrients and for contaminants in sea water, biota and sediments. OSPAR Commission, meeting document No. ASMO 97/4/Info.1. 60 pp.
- OSPAR 1997k. Background document concerning the identification of anthropogenic sources of PAH emissions as a basis for making decisions on measures. OSPAR Commission, meeting document No. DIFF 97/7/1. 15 pp.
- OSPAR 1998a. Data Report on the Comprehensive Study of Riverine Inputs and Direct Discharges (RID) in 1996. OSPAR Commission.
- OSPAR 1998b. Summary Report of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID) in 1990-1995. OSPAR Commission. 9 pp. + tables and annexes.
- OSPAR 1998c. Integrated Assessment of Inputs to the OSPAR Convention Area 1990-1996. Outcome of INPUT Special Assessment Workshop, The Hague 26-27 March 1998. OSPAR Commission, meeting document ASMO 98/5/9. 122 pp.
- OSPAR 1998d. Report of the ASMO Modelling Workshop on Transport and Fate of Contaminants. 4-7 November 1997, The Hague. OSPAR Commission.
- OSPAR 1998e. Report on waste from the titanium dioxide industry, 1979-1994. OSPAR Commission. 35 pp.
- OSPAR 1998f. Assessment of PCB fluxes and inventories relevant to the OSPAR Convention Area. OSPAR Commission, meeting document No. INPUT(1) 98/7/1. 34 pp.
- OSPAR 1998g. Trace metals and organochlorines in sediments from the Western Scheldt. OSPAR Commission, meeting document No. ASMO 98/4/Info.2. 19 pp.
- OSPAR 1998h. National pilot study on inputs of oil and PAHs via rivers. OSPAR Commission, meeting document No. INPUT(1) 98/5/1.
- OSPAR 1998i. Estimations of discharged amounts of chemical substances in produced water in the Norwegian sector in 1996. OSPAR Commission, meeting document No. SEBA 98/5/Info.11.
- OSPAR 1998j. Report concerning PAHs, Organohalogenes and substances other than oil in aqueous discharges from offshore installations in the Dutch sector in 1996. OSPAR Commission, meeting document No. SEBA 98/5/4.
- OSPAR 1998k. Report on liquid discharges from nuclear installations in 1996. OSPAR Commission. Report Point and Diffuse Sources pp. 25-44.
- OSPAR 1998l. Sources, inputs and temporal trends of radioactive discharges from nuclear installations for the years 1989 to 1995. OSPAR Commission, meeting document No. PRAM 98/6/4.
- OSPAR 1998m. Technetium-99 Contamination in the North Sea and in Norwegian Coastal Areas 1996 and 1997. OSPAR Commission, meeting document No. PRAM 98/6/Info.1.
- OSPAR 1999. Discharges from refineries, 1981-1997. Discharges, Waste Handling and Air Emissions from Offshore Installations for 1996-1997. OSPAR Commission. 54 pp.
- OSPAR 2000. Report of an assessment of trends in the concentration of certain metals, PAHs and other organic compounds in the tissues of various fish species and blue mussels. OSPAR Commission Ad Hoc working group on monitoring, 1998.
- Petersen G., A. Iverfeldt, and Munthe, J. 1995. Atmospheric Hg species over central and northern Europe. Model calculations and comparison with observations from the Nordic air and precipitation network. *Atmosph. Environ.* 29: 47-67.
- Poole, A. J., Denoon, D. C. and Woodhead, D. S. 1997. The distribution and inventory of Cs-137 in sub-tidal sediments of the Irish Sea. *Radioprotection - Colloques*, 32, C2, 263-270.
- Preston, M.R., 1997. Sewage and nutrients in the marine environment: Stimulants for good or vectors for harm? In: *Marine chemistry an environmental analytical chemistry approach*, Gianguzza, A., Pelizzetti, E. and Sammartano, S. (Eds.). Kluwer Academic Publ. Dordrecht, pp. 259-273.

- Radach, G. and Genkeler, J. 1997. Gridding of the NOWESP data sets, Nr. 27. *Berichte aus dem Zentrum für Meeres- und Klimaforschung* Reihe B: Ozeanographie, Institut für Meereskunde, Hamburg, 375 pp.
- Radach, G. and Heyer, K. 1997. A cadmium budget for the German Bight in the North Sea. *Mar. Pollut. Bull.* 34: 375–381.
- Radach, G. and Lenhart, H.J. 1995. Nutrient dynamics in the North Sea: fluxes and budgets in the water column derived from ERSEM. *Neth. J. Sea Res.* 33: 301–335.
- Raisbeck, G.M., F. Yiou, Z.Q. Zhou, L. Kilius and Kershaw, P.J. 1997. Marine discharges of 129-I by the nuclear reprocessing facilities of La Hague and Sellafield. *Radioprotection - Colloques*, 32, C2, 91–95.
- SOAEFD. 1996. Environmental monitoring of the seas around Scotland 1970–1993. HMSO, Edinburgh.
- Salomon, J.C., Breton, M., and Guegueniat, P. 1995. A 2D long term advection dispersion model for the Channel and southern North Sea. Part B: Transit time and transfer function for Cap de La Hague. *J. Mar. Syst.* 6: 515–527.
- Samuelson, O.B., Torsvik, V. and Ervik, A. 1992. Long-range changes in oxytetracycline concentration and bacterial resistance towards oxytetracycline in a fish farm sediment after medication. *Sci. Total Environ.*, 114: 25–36.
- Schallier, R., Lahousse, L. and Jacques, T.G. 1996. Surveillance aérienne: pollutions marines causées par les navires dans la Zone d'Intérêt de la Belgique en Mer du Nord. Rapport d'activité 1991–1995. Unité de Gestion du Modèle Mathématique de la mer de Nord, Bruxelles. 51 pp.
- Scholten, M., Kramer, K. and Laane, R. 1998. Distribution of dissolved metals (Cd, Cu, Pb and Zn) in the North Sea: temporal and geographical trends (1980–1989). *ICES J. Mar. Sci.* 55: 825–834.
- Seitzinger, S.P. and Giblin, A.E. 1996. Estimating denitrification in North Atlantic continental shelf sediments. *Biogeochemistry*, 35, 235–274.
- Theobald, N., Gaul, H. and Ziebarth, U. 1996. Distribution of organic pollutants in the North Sea and adjacent Seas. *Dtsch. Hydrogr. Z. Suppl.*, 6: 81–93.
- USEIA. 1998. Online publication of the United States Energy Information Administration, North Sea Oil Production, November 1998. Available: <http://eia.doe.gov/> [November 1998].
- van den Hout, K.D. (Ed.) 1993. The impact of atmospheric deposition of non-acidifying pollutants on the quality of European forest soils and the North Sea. Main report of the ESQUAD project. Report by Delft Hydraulics, RIVM, DLO and IMW-TNO; IMW-TNO report nr R93/329, Delft, pp. 143.
- Van Pul, W., Nijenhuis, W. and de Leeuw, F. 1998. Deposition of heavy metals to the Convention waters of OSPAR. RIVM Report 722401016.
- Vyncke, W., Roose, P., Hillewaert, H., Guns, P., Van Hoeyweghen, P., Baeten, H. and Hoenig, M. 1997. Trace metals and organochlorines in sediments from the Western Scheldt (1990–1995). Fisheries Research Station, Oostende, Report Nr 244.
- Wilken R.D. and Wallschläger, D. 1996. The Elbe river: a special example for a European river contaminated heavily with mercury. In: *Global and Regional Mercury Cycles: Sources, fluxes and mass balances*, Baeyens W.F.J., Ebinghaus, R. and Vasiliev, O. (Eds.). Kluwer Academic Publ., Dordrecht, pp. 317–328.
- Chapter 5 References**
- 5NSC 1997. Assessment report on Fisheries and Fisheries related Species and Habitat Issues, Svelle M., Aarefjord, H., Heir, H.T. and Øverland, S. (Eds.) Intermediate Ministerial Meeting on the integration of Fisheries and Environmental Issues, 13–14 March 1997, Bergen, Norway. Ministry of Environment, Norway, Fifteenth North Sea Conference Secretariat. 127 pp.
- Allen, Y., Scott, A.P., Matthiessen, P., Haworth, S., Thain, J.E. and Feist, S. 1999. Survey of estrogenic activity in United Kingdom estuarine and coastal waters and its effects on gonadal development of the flounder *Platichthys flesus*. *Environ. Toxicol. Chem.* 18: 1791–1800.
- Allen, Y., Thain, J., Matthiessen, P., Scott, A.P., Haworth, S. and Feist, S.W. 1997. A survey of oestrogenic activity in UK estuaries and its effects on gonadal development of the flounder *Platichthys flesus*. ICES CM 1997/U:0.
- AMAP. 1999. Report of the Workshop on Combined Effects of Contaminants in the Marine Environment, Arctic Monitoring and Assessment Program, Copenhagen, 16–17 November 1998. AMAP Report 99:1. AMAP Oslo. 94 pp.
- Brouwer, A., Reijnders, P.J.H., and Koeman, J.H. 1989. Polychlorinated biphenyl (PCB)-contaminated fish induces vitamin A and thyroid hormone deficiency in the common seal (*Phoca vitulina*). *Aquat. Toxicol.*, 15: 99–106.
- Cabioch, F., Le Toquin, A., Boindiresque, C.-F., Meinesz, A. and Verlaque, M. 1992. Guide des Algiers des mers d'Europe. Delachaux et Niestlé, 231 pp.
- Camphuysen, C.J., Ensor, K., Furness, R.W., Garthe, S., Huppoo, O., Leaper, G., Offringa, H. and Tasker, M.L. 1993. Seabirds feeding on discards in winter in the North Sea. Netherlands Institute for Sea Research, Den Burg, Texel. NIOZ-Rapport 1993–8.
- Critchley, A.T. 1983. *Sargassum muticum*: A taxonomic history including world-wide and Western Pacific distributions. *J. Mar. Biol. Assoc. U.K.* 63: 617–625.
- De Jong, F., Bakker, J.F., van Berkel, C.J.M., Dankers, N.M.J.A., Dahl, K., Gätje, C., Marencic, H. and Potel, P. 1999. Wadden Sea Quality Status Report. Wadden Sea Ecosystem No. 9. Common Wadden Sea Secretariat, Trilateral Monitoring and Assessment Group, Quality Status Report Group, Wilhelmshaven, Germany, 259 pp.
- De Jonge, V.N. 1994. Wind driven tidal and annual gross transport of mud and microphytobenthos in the Ems estuary, and its importance for the ecosystem. In: *Changes in fluxes in estuaries*, K.R. Dyer and R.J. Orth (Eds.), Olsen and Olsen, Fredensborg, Denmark, pp 29–40.
- De Smet, W.M.A., 1997. Five centuries of sperm whale strandings along the Flemish coast. *Bull. Inst. Roy. Sci. Nat. Belgique*, Biologie, 67 (Suppl.): 11–14.
- Desbrow, C.; Routledge, E.; Brighty, G.C.; Sumpter, J.P.; Waldock, M. 1998. Identification of estrogenic chemicals in STW effluent. I. Chemical fractionation and in vitro biological screening. *Environ. Sci. Technol.* 32: 1549–1558.
- Essink, K. 1993. Ecologische effecten van baggeren en storten van baggerspecie in het Eems-Dollard estuarium. Rijkswaterstaat, Dienst Getijdewateren. Rapport DGW-93.020.
- Essink, K. 1997. RIACON. Risk Analysis of Coastal Nourishment Techniques. National Institute for Coastal and Marine Management/RIKZ, Report RIKZ-97.031
- European Commission 1994–98. Kvaliteten af Badevand; badesasonen 1993–1997 (In Danish), reports EUR 18166, EUR 15976, EUR 16755, EUR 17629, EUR 18166; EC, Luxembourg.
- Foelsvik, N., J.A. Berge, E.-M. Brevik and Walday, M. 1998. Quantification of organotin compounds and determination of imposex in populations of dog whelks (*Nucella lapillus*) from Norway. *Chemosphere*, 38: 681–691.
- Forbes, V.E. and Forbes, T.L. 1997. Dietary absorption of sediment-bound fluoranthene by a deposit-feeding gastropod using the <sup>14</sup>C:<sup>51</sup>Cr dual-labelling method. *Environ. Toxicol. Chem.* 16: 1002–1009.
- Förlin, L. et al. 1996. Effects of contaminants in roundnose grenadier (*Coryphaenoides rupestris*) and Norway lobster (*Nephrops norvegicus*) and contaminant levels in mussels (*Mytilus edulis*) in the Skagerrak and Kattegat compared to the Faeroe Islands. *J. Sea Res.* 35: 209–222.
- GESAMP 1993. Impact of oil and related chemicals on the marine environment. Group of Experts on the Scientific Aspects of Marine Pollution. GESAMP Report. No. 50. International Maritime Organization, London. 180 pp.
- Gray, J.S., T. Bakke, H.J. Beck and Nilssen, I. 1999. Managing the environmental effects of the Norwegian oil and gas industry: From conflict to consensus. *Mar. Pollut. Bull.* 38: 525–530.
- Greenstreet, S.P.R. and Hall, S.J. 1996. Fishing and the ground-fish assemblage structure in the north-western North Sea: an analysis of long-term and spatial trends. *J. Animal Ecol.* 65: 577–598.
- Hagström, Å., Nielsen, T.G., Petersen, J.K., Forbes, T.L. 1996. Havets Usynlige Liv: Tema-rapport, Miljø og Energi ministeriet, Danmarks Miljøundersøgelser. (in Danish).
- Hammond, P.S., H. Benke, P. Berggren, D.L. Borchers, S.T. Buckland, A. Collet, M.P. Heide-Jørgensen, S. Heimlich-Boran, A.R. Hiby, M.F. Leopold and Øien, N. 1995. Distribution and abundance of the Harbour Porpoise and other small cetaceans in the North Sea and adjacent waters. Life 92-2/UK/027, final report, Sea Mammal Research Unit, National Environment Research Council, Cambridge.
- Harries, J.E., Sheahan, D.A., Jobling, S., Matthiessen, P., Neall, P., Routledge, E., Rycroft, R., Sumpter, J.P., Tylor, T. 1997. Survey of Estrogenic activity in UK inland waters. *Environ. Toxicol. Chem.* 16: 534–542.
- Hylland, K., Schaanning, M., Skei, J., Berge, J.A., Eriksen, J.Ø., Sköld, M., Gunnarsson, J. 1997. Interactions between eutrophication and contaminants: Partitioning, bioaccumulation and effects on sediment-dwelling organisms. National Environmental Monitoring Programme (Norway), Report 709/97.
- Hüppoo, O., 1997. Langzeit-Veränderungen der der Brutbestände Helgoländer See- und Küstenvogel. *SEEVOGEL*, Zeitschrift Verein Jordsand, Hamburg, 18: 38–44.
- Hüppoo, O., and Garthe, S. 1995. Vögel und Fischerei in der Nordsee. In: *Aktuelle Probleme der Meeresumwelt*, Vorträge des 8. wissenschaftlichen Symposiums. 3. - 4. Juni 1998 in Hamburg. *Dt. hydrogr. Z., Suppl.* 2: 109–115.
- ICES 1997a. Report of the ICES Advisory Committee on the Marine Environment, 1997. Coop. Res. Rep. 222: 11–21.
- ICES 1997b. Report of the Study Group on the Precautionary Approach to Fisheries Management. ICES CM 1997/Assess:7.
- ICES 1998a. Report of the Working Group on the Ecosystem Effects of Fishing Activities. International Council for the Exploration of the Seas, Committee Meeting, 1998 / ACFM / ACME:1 Ref E, 263.
- ICES 1998b. Report of the Working Group on Introductions and Transfers of Marine Organisms. ICES CM 1998/ACME:4, 73 pp.
- ICES 1999a. Report of the ICES Advisory Committee for Fishery Management, 1998. Coop. Res. Rep 229.
- ICES 1999b. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 1999/ACFM:8
- ICES 1999c. Report of the ICES Advisory Committee on the Marine Environment, 1998. ICES Coop. Res. Rep. 233, Annex 8, pp. 297–327.
- ICES 1999d. Report of the ICES Advisory Committee on the Marine Environment, 1998. ICES Coop. Res. Rep. 233, Section 12 and Annex 9.
- Ide, I., Witten, E.P., Fischer, J., Kalbfus, W., Zellner, A., Stroben, E. and Waterman, B. 1997. Accumulation of organotin compounds in the common whelk *Buccinum undatum* and the red whelk *Neptunea antiqua* in association with imposex. *Mar. Ecol. Prog. Ser.*, 152: 197–203.

- Jak, R.G. and Scholten M.C.T. 1994. Mesocosm-experimenten TNO Den Helder. Indicaties voor het ontstaan van eutrofiëringsverschijnselen. In: *Effecten van verschuivingen van nutriëntenconcentraties op biota in de Nederlandse kustwateren*. C.J.M. Philippart *et al.*, Rijksinstituut voor Kust en Zee/RIKZ, BEON Rapport nr. 94-1.
- Jak, R.G. and Michielsen B.F. 1996. Algenbegrazing: een nadere analyse van de invloed van toxicanten op het ontstaan van eutrofiëringsproblemen. Rijksinstituut voor Kust en Zee/RIKZ, BEON Rapport nr. 96-4.
- Jak, R.G., Ceulemans M., Scholten M.C.T. and van Straalen N.M., 1998. Effects of tributyltin on a coastal North Sea plankton community in enclosures. *Environm. Toxicol. Chem.*, 17: 1840-1847.
- Jones, J.J. and Franklin, A., 1998. Monitoring and surveillance of non-radioactive contaminants in the aquatic environment and activities regulating the disposal of wastes at sea, 1995 and 1996. *Sci. Ser., Aquat. Environ. Monit. Rep.*, CEFAS, Lowestoft, (51), 116 pp.
- Knutzen, J. and Hylland, K. 1998. Monitoring of Sandefjords fjorden and inner Meifjorden 1997-1998. Micro-pollutants and effects in fish and shellfish. Norwegian Institute for Water Research (NIVA), NIVA 3934-1998.
- Lang, T., Damm, U., Dethlefsen, V. 1995. Changes in the sex ratio of North Sea dab (*Limanda limanda*) in the period 1981-1995 ICES CM 1995/G:25 Ref E.
- Law, R. and Rowell, C.A. 1993. Cohort-structured populations, selection responses, and exploitation of the North Sea cod. In: *The exploitation of evolving resources*, T.K. Stokes, J. M. McGlade and R. Law (Eds.), Lecture notes in Biomathematics 99, Springer, Berlin, pp. 155-173.
- Lindeboom, H.J. and de Groot, S.J. 1998. IMPACT-II: The effects of different types of fisheries on the North Sea and Irish Sea benthic Ecosystems. NIOZ Rapport 1998-1. Den Burg, The Netherlands.
- Lindesjö, E. *et al.* 1996. Histopathological and immunohistochemical studies in roundnose grenadier (*Coryphaenoides rupestris*) in the Skagerrak, *North Sea. Mar. Environ. Res.* 42: 229-233.
- Longva, O. and Thorsnes, T. (Eds.) 1997. Skagerrak in the past and present - an integrated study of geology, chemistry, hydrography and microfossil ecology. Geological Survey of Norway, Special Publication 8, 100 pp.
- Mensink, B.P., Everaarts, J.M., Kralt, J. and ten Hallers-Tjabbes, C.C. 1996. Tributyltin exposure in early life stages induces the development of male sexual characteristics in the common whelk, *Buccinum undatum*. *Mar. Environ. Res.*, 42: 151-154.
- Nienhuis, P.H. and A.C. Smaal (Eds.) 1994. The Oosterschelde estuary (The Netherlands): A case-study of a changing ecosystem. *Hydrobiologia* 282/283: 1-597.
- North Sea Task Force. 1993. North Sea Quality Status Report 1993. Oslo and Paris Commissions, London. Olsen and Olsen, Fredensborg, Denmark. 132 pp.
- OSPAR 1997. Agreed Ecotoxicological Assessment Criteria for Trace Metals, PCBs, PAHs, TBT and some Organochlorine Pesticides. OSPAR Commission, meeting document No. OSPAR 97/15/1, Annex 6.
- Rademaker, M., M. Reckermann, U. Tillmann, A. Tillmann-Mayer, F. Volijn, W. Zevenboom, Houtp, P. 1998. *Fibrocapsa japonica* and *Heterosigma akashiwo*: new observations. Harmful Algal News, an IOC Newsletter on toxic algae and algal blooms. 17: 8-10.
- Reijnders, P.J. H. and Reineking, B. 1999. Mammals. In: *Wadden Sea Quality Status Report 1999*. De Jong, F. *et al.* (Eds.), Wadden Sea Ecosystem No. 9. Common Wadden Sea Secretariat, Trilateral Monitoring and Assessment Group, Quality Status Report Group. Wilhelmshaven, Germany. pp. 160-164.
- Rice, J. and Gislason, H. 1996. Patterns of change in the size spectra of numbers and diversity of the North Sea fish assemblage, as reflected in survey models. *ICES J. Mar. Sci.* 53: 1214-1225.
- Richter, R. 1996. Verbreitung des Makrozoobenthos in den sublitoralen Gebieten der östlichen und nördlichen Deutschen Bucht in Vergleich zu früheren Untersuchungen. Dipl. Thesis, Carl von Ossietzky Universität Oldenburg.
- Riegman, R., Flameling I.A. and Noordeloos A.A.M. 1998. Size differential uptake of ammonium, nitrate and urea and phytoplankton growth in the North Sea during spring 1994. *Mar. Ecol. Prog. Ser.*, 173: 85-94.
- Rijnsdorp, A.D. 1992. Long-term effects of fishing in North Sea plaice. Ph.D Thesis, University of Amsterdam, 220 pp.
- Rijnsdorp, A.D., van Leeuwen, P.I., Daan, N. and Heesen, H.J.L. 1996. Changes in abundance of demersal fish species in the North Sea between 1906-1909 and 1990-1995. *ICES J. Mar. Sci.*, 53: 1054-1062.
- Rijnsdorp, A.D., Vethaak, A.D. 1997. Changes in reproductive parameters of North Sea plaice and sole between 1960 and 1995. *ICES C.M.* 1997/U:14.
- Rijnsdorp, A.D. Buys A.M., Storbeck F. and Visser E. 1997. The micro distribution of the Dutch beam trawl fleet fisheries between April 1993 and March 1996; RIVO-DLO report C 019/97.
- Roe, T.I., Johnson, S. and Nortug, T. submitted. Bioavailability of polycyclic aromatic hydrocarbons in the North Sea. *Environ. Toxicol. Chem.*
- Rogers, S.I., Rijnsdorp, A.D., Damm, U. and Vanhee, W. 1998b. Demersal fish populations in the coastal waters of the UK and continental NW Europe from beam trawl survey data collected from 1990 to 1995. *J. Sea Res.* 39: 79-102.
- Skjoldal, H. R. *et al.* 1997. The Norwegian North Sea Coastal Water: Eutrophication - Status and Trends. Norwegian State Pollution Control Authority.
- Skov, H. 1991. Trends in the oil contamination of seabirds in the North Sea. *SULA*, 5 (special issue): 22-23.
- Skov, H., Christensen, K.D. and Durinck, J. 1996. Trends in marine oil pollution in Denmark 1984-1995: An analysis of beached bird surveys, Arbejdsrapport nr. 1996, Ornisc Consult A/S.
- Smeenk, C. 1997. Strandings of sperm whales *Physeter macrocephalus* in the North Sea: History and patterns. *Bull. Inst. Roy. Sci. Nat. Belgique, Biologie*, 67-suppl.: 15-28.
- Ten Hallers-Tjabbes, C.C. 1979. Sexual dimorphism in *Buccinum undatum* (L.). *Malacol.* 18: 13-17.
- Ten Hallers-Tjabbes, C.C., Kemp J.F. and Boon J.P. 1994. Imposen in whelks (*Buccinum undatum*) from the open North Sea: Relation to shipping traffic intensities. *Mar. Pollut. Bull.*, 28: 311-313.
- Tunberg, B.G. and Nelson, W.G. 1998. Do climatic oscillations influence cyclical patterns of soft bottom macrobenthic communities on the Swedish west coast? *Mar. Ecol. Prog. Ser.* 170: 85-94.
- USEPA 1991. Sediment toxicity identification evaluation: Phase I (Characterization), Phase II (Identification), and Phase III (Confirmation) Modifications of Effluent Procedures, G.T. Ankley, M.K. Schubauer-Berigan, J.R. Dierkes, and M.T. Lukasewycz (Ed.), EPA-600/6-91/007.
- Van Berchum, A.M. and Wattel G. 1997. De Oosterschelde, van estuarium naar zeearm. Bekkenrapportage 1991-1996. Rijksinstituut voor Kust en Zee, Rapport RIKZ-97.034. 96 pp.
- Van Dalen, J.A. and Essink K. 1997. RIACON Risk Analysis of coastal nourishment techniques in The Netherlands. National evaluation Report. National Institute for Coastal and Marine Management/RIKZ, Report RIKZ-97.022.
- Vrieling, E.G., Koeman R.P.T., Nagasaki K., Ishida Y., Peperzak L., Gieskes W.W.C. and Veenhuis M. 1995. *Chattonella* and *Fibrocapsa* (Raphidophyceae): first observation of, potentially harmful, red tide organisms in Dutch coastal waters. 33: 183-191.
- Vroon, J., Storm C. and Coosen J. 1997. Westerschelde, stram of struis? Eindrapport van het project OOSTWEST, een studie naar de beïnvloeding van fysieke en verwante biologische patronen in een estuarium. Rijksinstituut voor Kust en Zee, Rapport RIKZ-97.023. 106 pp.
- Walker, P.A. and Hyslop, J.R.G. 1998. Sensitive skates and resilient rays - spatial and temporal shifts in ray species composition in the Central and North-western North Sea between 1930 and the present day. *ICES J. Mar. Sci.* 55: 392-402.

#### Chapter 6 References

- 5NSC 1997. Assessment report on Fisheries and Fisheries related Species and Habitat Issues. Svelle M., Aarefjord, H., Heir, H.T. and Overland, S. (Eds.) Intermediate Ministerial Meeting on the integration of Fisheries and Environmental Issues, 13-14 March 1997, Bergen, Norway, Ministry of Environment, Norway, Fifth North Sea Conference Secretariat. 127 pp.
- RA, 1998. Prioritisation of human pressures for the Greater North Sea Quality Status Report 1999: An interactive and iterative Multi Criteria Analysis approach. Results and methodology. Resource Analysis, Delft The Netherlands. Report no. RA/98-332, 27 pp.

