

Aquatic Sciences and Fisheries Information System

ASFIS SUBJECT CATEGORIES AND SCOPE DESCRIPTIONS

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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ASFA-1

PREFACE

The Aquatic Sciences and Fisheries Information System (ASFIS) is an international co-operative information system for the collection and dissemination of information covering the science, technology and management of marine and freshwater environments.

The Aquatic Sciences and Fisheries Abstracts (ASFA) Bibliographic Database is the principal information product of the ASFIS system. It contains more than 750,000 bibliographic references dealing with the science, technology and management of marine and freshwater environments.

This document is one of the guidelines (in the ASFIS Reference Series) prepared in support of the Aquatic Sciences and Fisheries Information System (ASFIS).

The *ASFIS Reference Series* publications comprise the rules, authority lists, formats, codes, and procedures on which the system is based.

The designations employed and the presentations of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities or concerning the delimitations of its frontiers or boundaries.

Note for Indexers:

The Subject Category Codes used in this publication are the same as the codes used in the last edition except that the number 1 now precedes all of the ASFA-1 subject category codes, the number 2 precedes all of the ASFA-2 subject category codes, and the number 3 now precedes all of the ASFA-3 subject category codes. In addition two new subject category codes have been added to the Aquaculture section; they are 1587 "Diseases of cultured organisms" and 1588 "Effects of aquaculture on the environment".

Subject categories for the specialized subsets ASFA Aquaculture Abstracts and ASFA Marine Biotechnology Abstracts are included in this document for information only; it is not intended that ASFA input centres should allocate records for either of these publications as this is done by the publisher.

Note for Searchers:

For retrieval on most electronic systems, e.g. Dialog and ASFA CD-ROM, the ASFA subject category codes are presented as they appear in this publication.

Acknowledgements

Credit for preparing this revision of the ASFA Subject Categories and Scope Descriptions goes to Jonathan Sears of Cambridge Scientific Abstracts, and Richard Pepe of FAO who edited/amended the manuscript.

ASFIS SUBJECT CATEGORIES AND SCOPE DESCRIPTIONS

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INTRODUCTION

The ASFA database is an indexed and abstracted collection of bibliographic references which can be accessed in print or by computer retrieval techniques. The categorization scheme presented in this document is applied to the groupings of the records in the ASFA journals and database, giving the subject headings and their hierarchical numerical codes.

The purpose of these subject categories and scope descriptions is twofold: (1) to guide indexers in the appropriate allocation and cross-referencing of records entered to the database; (2) to assist searchers in retrieving records from the database; on most host computer systems and in ASFA on CD-ROM these subject category codes may be included in search strategies to enhance retrieval, and can be considered as broad descriptors. The scope descriptions define the subject areas included and excluded by each category, and give cross-references to other related categories. In the scope notes delineating each category, "use" may be taken to mean "use or cross-refer to", or "also consider", depending on the emphasis of each individual paper.

In its application by indexers to create ASFA database records, the scheme presented must be used in conjunction with the guidelines presented in the document *ASFIS Guidelines for Subject Categorization and Indexing (ASFIS-5)*.

The ASFA database is used to create a number of printed abstract journals (see list below). This revision contains the changes rendered necessary by the publication, in 1990, of *ASFA-3, Aquatic Pollution and Environmental Quality*, as a separate journal; prior to 1990, these subjects had been included in both ASFA-1 and ASFA-2. Although there have been no changes in the total scope of the database, this revision concentrates on giving more detailed scope notes particularly for records which should be allocated to more than one section in the database, or to more than one ASFA journal. This revision also responds to emerging fields of scientific interest such as biotechnology and global change. The scope of the three main ASFA publications and two sub-sets can be summarized as follows:

ASFA-1, Biological Sciences and Living Resources (monthly) covers biological and ecological aspects of marine, brackish and freshwater environments, including fisheries and living resources, aquaculture, aquatic communities and legal and socio-economic studies related to aquatic organisms.

ASFA-2, Ocean Technology, Policy and Non-Living Resources (monthly) covers physical and chemical oceanography and limnology, marine geophysics and geochemistry, marine technology, ocean policy and non-living resources.

ASFA-3, Aquatic Pollution and Environmental Quality (bimonthly) covers all aspects related to pollution and environmental quality of oceans, estuaries, and inland waters.

ASFA Aquaculture Abstracts (bimonthly) covers the science, practice, management and economics of the culture and husbandry of aquatic organisms by man. Subject categories and scope notes for this publication are as in ASFA-1 categories 1581-1586.

ASFA Marine Biotechnology Abstracts (quarterly) covers the application of molecular biology and genetics to marine and aquatic organisms.

A checklist of key areas is given for each category as a subject-specific guide for indexers. More extensive instruction on indexing for ASFA is given in *ASFIS-5, ASFIS Guidelines for Subject Categorization and*

Indexing.

ASFA-1, BIOLOGICAL SCIENCES AND LIVING RESOURCES SUBJECT CATEGORIES

GENERAL ASPECTS

- 1101 General works
- 1102 Institutes and organizations
- 1103 Information services
- 1104 Personal
- 1105 Research programmes, expeditions and vessels
- 1106 Conferences and other meetings
- 1107 History and development
- 1108 Education
- 1109 Books, atlases and charts
- 1110 Translations

- 1121 LAW, POLICY, ECONOMICS AND SOCIAL SCIENCES

BIOLOGY: GENERAL

- 1181 General
- 1182 Methods and instruments
- 1183 Taxonomy and morphology
- 1184 Reproduction and development
- 1185 Genetics and evolution
- 1186 Physiology, biochemistry, biophysics
- 1187 Palaeontology

MICROBIOLOGY

- 1201 General
- 1202 Geographical distribution
- 1203 Taxonomy and morphology
- 1204 Reproduction and development
- 1205 Genetics and evolution
- 1206 Physiology, biochemistry, biophysics

BOTANY

- 1221 General
- 1222 Geographical distribution
- 1223 Taxonomy and morphology
- 1224 Reproduction and development
- 1225 Genetics and evolution
- 1226 Physiology, biochemistry, biophysics

ASFA-1

INVERTEBRATE BIOLOGY: GENERAL

- 1241 General
- 1242 Geographical distribution
- 1243 Taxonomy and morphology
- 1244 Reproduction and development
- 1245 Genetics and evolution
- 1246 Physiology, biochemistry, biophysics

MALACOLOGY

- 1261 General
- 1262 Geographical distribution
- 1263 Taxonomy and morphology
- 1264 Reproduction and development
- 1265 Genetics and evolution
- 1266 Physiology, biochemistry, biophysics

CARCINOLOGY

- 1281 General
- 1282 Geographical distribution
- 1283 Taxonomy and morphology
- 1284 Reproduction and development
- 1285 Genetics and evolution
- 1286 Physiology, biochemistry, biophysics

ENTOMOLOGY

- 1301 General
- 1302 Geographical distribution
- 1303 Taxonomy and morphology
- 1304 Reproduction and development
- 1305 Genetics and evolution
- 1306 Physiology, biochemistry, biophysics

CHORDATE BIOLOGY: GENERAL

- 1321 General
- 1322 Geographical distribution
- 1323 Taxonomy and morphology
- 1324 Reproduction and development
- 1325 Genetics and evolution
- 1326 Physiology, biochemistry, biophysics

ICHTHYOLOGY

- 1341 General
- 1342 Geographical distribution
- 1343 Taxonomy and morphology

- 1344 Reproduction and development
- 1345 Genetics and evolution
- 1346 Physiology, biochemistry, biophysics

ORNITHOLOGY

- 1361 General
- 1362 Geographical distribution
- 1363 Taxonomy and morphology
- 1364 Reproduction and development
- 1365 Genetics and evolution
- 1366 Physiology, biochemistry, biophysics

MAMMALOLOGY

- 1371 General
- 1372 Geographical distribution
- 1373 Taxonomy and morphology
- 1374 Reproduction and development
- 1375 Genetics and evolution
- 1376 Physiology, biochemistry, biophysics

AQUATIC ECOLOGY

- 1381 General
- 1382 Ecological techniques and apparatus
- 1383 Biogeography and biogeographic regions

AUTECOLOGY

- 1421 Migrations and rhythms
- 1422 Environmental effects
- 1423 Behaviour
- 1424 Age and growth
- 1425 Nutrition and feeding habits

POPULATION STUDIES

- 1441 Population structure
- 1442 Population dynamics
- 1443 Population genetics

AQUATIC COMMUNITIES

- 1461 Plankton
- 1462 Benthos
- 1463 Habitat community studies
- 1464 Other aquatic communities

PRODUCTIVITY, ECOSYSTEMS, SPECIES INTERACTIONS

- 1481 Productivity
- 1482 Ecosystems and energetics

- 1483 Species interactions: general
- 1484 Species interactions: parasites and diseases
- 1485 Species interactions: pests and control

FOULING AND BORING

- 1541 Biology of fouling and boring organisms
- 1542 Prevention and control

PRACTICAL ASPECTS OF FISHERIES

- 1561 General
- 1562 Fishing vessels and harbours
- 1563 Fishing gear and methods
- 1564 Instruments, tools, equipment
- 1565 Policy, legislation and sociology
- 1566 Fishery charts, grounds and water areas
- 1567 Fishery oceanography and limnology

AQUACULTURE

- 1581 General
- 1582 Fish culture
- 1583 Shellfish culture
- 1584 Culture of other aquatic animals
- 1585 Plant culture
- 1586 Aquaria
- 1587 Diseases of cultured organisms
- 1588 Effects of aquaculture on the environment

FISHABLE STOCKS

- 1601 General
- 1602 Surveying and prospecting
- 1603 Fishery statistics and sampling
- 1604 Stock assessment and management
- 1605 Sport fishing

AQUATIC PRODUCTS AND THEIR UTILIZATION

- 1621 General
- 1622 Primary products
- 1623 Processing methods, instruments and factories
- 1624 Secondary products
- 1625 Non-edible products
- 1626 Food technology
- 1627 Food quality and standards

MARKETING AND ECONOMICS OF AQUATIC PRODUCTS

- 1641 General
- 1642 Storage, transport and packing

- 1643 Marketing
- 1644 Economics
- 1645 Commodity and trade statistics

ASFA-2, OCEAN TECHNOLOGY, POLICY AND NON-LIVING RESOURCES SUBJECT CATEGORIES

GENERAL ASPECTS

- 2101 General works
- 2102 Institutes and organizations
- 2103 Information services
- 2104 Personal
- 2105 Research programmes and expeditions
- 2106 Conferences and other meetings
- 2107 History and development
- 2108 Education
- 2109 Books, atlases and charts
- 2110 Translations

LAW, POLICY, ECONOMICS AND SOCIAL SCIENCES

- 2121 General
- 2122 Legislation
- 2123 Conservation
- 2124 Coastal zone management
- 2125 Recreation
- 2126 Sociology
- 2127 General papers on resources

DESCRIPTIVE OCEANOGRAPHY AND LIMNOLOGY

- 2141 General
- 2142 Methods and instruments
- 2144 Regional studies, expeditions and data reports
- 2146 TSD distribution, water masses and circulation
- 2148 Palaeo-studies
- 2150 Ice

DYNAMICAL OCEANOGRAPHY AND LIMNOLOGY

- 2161 General
- 2162 Methods and instruments
- 2163 Air-water boundary layer
- 2164 Ocean circulation and currents
- 2165 Benthic boundary layer
- 2166 Internal waves and microstructure
- 2167 Tides, surges and sea level
- 2168 Wind waves

ASFA-1

- 2169 Fluid mechanics
- 2170 Nearshore dynamics
- 2171 Dynamics of lakes and rivers

CHEMISTRY AND GEOCHEMISTRY

- 2181 General
- 2182 Methods and instruments
- 2183 Physics and chemistry
- 2184 Composition of water
- 2185 Organic compounds
- 2186 Chemistry of suspended matter
- 2187 Geochemistry of sediments
- 2188 Atmospheric chemistry

UNDERWATER ACOUSTICS

- 2201 General
- 2202 Methods and instruments
- 2203 Propagation of sound
- 2204 Reverberation
- 2205 Noise and bioacoustics

UNDERWATER OPTICS

- 2221 General
- 2222 Methods and instruments
- 2223 Optical properties
- 2225 Underwater viewing

MARINE METEOROLOGY AND CLIMATOLOGY

- 2241 General
- 2242 Observations and measurements at sea
- 2243 Structure, mechanics and thermodynamics
- 2244 Air-sea coupling
- 2245 Ship routing and icing

GEOLOGY AND GEOPHYSICS

- 2261 General
- 2262 Methods and instruments
- 2263 Topography and morphology
- 2264 Sediments and sedimentation
- 2265 Sedimentary structures and stratigraphy
- 2266 Tectonics and crustal structure
- 2267 Gravity and geodesy
- 2268 Heat flow
- 2269 Geomagnetism
- 2270 Seismology

- 2271 Coastal morphology
- 2272 Petrology and chemistry of rocks
- 2273 Palaeontology
- 2274 Coral reefs

MARINE TECHNOLOGY

- 2281 General
- 2282 Materials technology, corrosion, fouling and boring
- 2283 Soil mechanics
- 2284 Hydrodynamics, wave, current and ice forces

VESSELS, UNDERWATER VEHICLES AND BUOYS

- 2301 Surface vehicles
- 2302 Underwater vehicles
- 2303 Buoys and buoy systems

OFFSHORE AND COASTAL STRUCTURES

- 2321 General
- 2322 Drilling and production rigs
- 2323 Storage systems and tanker terminals
- 2324 Artificial islands
- 2325 Pipelines
- 2326 Sea floor installations
- 2327 Coast defences and harbour works

MAN-IN-THE-SEA AND DIVING

- 2341 General
- 2342 Physiology and medicine
- 2343 Diving systems
- 2344 Life support
- 2345 Pressure chambers
- 2346 Dangerous organisms

SUPPORT SERVICES, TECHNIQUES AND EQUIPMENT

- 2381 Cables
- 2382 Communication telemetry
- 2383 Data acquisition and processing
- 2384 Dredging
- 2385 Hydrographic survey and cartography
- 2386 Mooring and dynamic positioning
- 2387 Navigation
- 2388 Ocean operations and safety
- 2389 Power systems
- 2390 Search and salvage
- 2391 Tools, rigging and deck machinery
- 2392 Warning services against catastrophes

2393 Remote sensing

RESOURCES

2401 General
2402 Freshwater from the sea
2403 Chemicals from sea water
2404 Minerals
2405 Oil and gas
2406 Energy from the sea

COMMERCE, TRADE AND ECONOMICS

2421 Marketing and economics: general
2422 Storage and transport
2423 Marketing
2424 Applied economics
2425 Commodity and trade statistics

ASFA-3, AQUATIC POLLUTION AND ENVIRONMENTAL QUALITY SUBJECT CATEGORIES

AQUATIC POLLUTION

- 3501 General
- 3502 Methods and instruments
- 3503 Characteristics, behaviour and fate
- 3504 Effects on organisms
- 3505 Prevention and control

ENVIRONMENTAL QUALITY

- 3521 Mechanical and natural changes
- 3522 Protective measures and control
- 3523 Conservation, wildlife management and recreation
- 3524 Public health, medicine, dangerous organisms

ASFA AQUACULTURE ABSTRACTS
SUBJECT CATEGORIES
(Specialized ASFA Subset)

- 1581 General
- 1582 Fish culture
- 1583 Shellfish culture
- 1584 Culture of other aquatic animals
- 1585 Plant culture
- 1586 Aquaria
- 1587 Diseases of cultured organisms
- 1588 Effects of aquaculture on the environment

ASFA MARINE BIOTECHNOLOGY ABSTRACTS
SUBJECT CATEGORIES
(Specialized ASFA Subset)

GENERAL ASPECTS

- 100 General works
- 110 Institutes and organizations
- 120 Conferences, meetings, etc.
- 130 New books

140 PATENTS

MOLECULAR BIOTECHNOLOGY

- 150 General
- 160 Methods and instruments
- 170 Microorganisms (viruses, bacteria, fungi, yeasts)
- 180 Microalgae
- 190 Macroalgae and higher plants
- 200 Shellfish and other aquatic animals (excl. fish)
- 210 Fish

SUPPORTING TECHNOLOGY

- 220 General
- 230 Sensors and communication
- 240 Instrumentation and process engineering
- 250 Deep-sea technology

260 IMMOBILIZATION

270 CELL/TISSUE CULTURE (INCL. HYBRIDOMA)

AQUACULTURE/FISHERIES

- 290 General
- 300 Microorganisms
- 310 Plant culture
- 320 Shellfish culture (molluscs, crustacea)
- 330 Fish culture

- 340 Other animals
- 350 Aquariology

MEDICAL/VETERINARY

- 360 Vaccines
- 370 Antibiotics
- 380 Pharmaceuticals
- 390 Toxins
- 400 Hormones
- 410 Enzymes
- 420 Other

430 FERMENTATION

440 BIOFOULING/CORROSION/ADHESIVES

450 CHEMICAL/MINERAL PRODUCTS

460 ENERGY APPLICATIONS

470 FOOD PRODUCTS

480 ENVIRONMENTAL APPLICATIONS

ASFA-1, BIOLOGICAL SCIENCES AND LIVING RESOURCES SCOPE DESCRIPTIONS

GENERAL ASPECTS

1101 General works

General or multidisciplinary works dealing with several aspects of aquatic sciences, or relevant to the overall scope of ASFA-1 or ASFA-1 in combination with other ASFA parts, e.g. text books, encyclopaedias, bibliographies, thesauri, atlases, dictionaries and glossaries.

For general works on law, policy, socioeconomics and resources applicable to ASFA-1, use 1121

For multidisciplinary works on the physical environment where relevant to ASFA-1, use 1381

For multidisciplinary works on the physical environment but not relevant to ASFA-1, use ASFA-2, 2141

For multidisciplinary works on biology, use 1181

For multidisciplinary works on ecology, use 1381

For multidisciplinary works on pollution, use ASFA-3, 3501

For multidisciplinary works on fisheries, use 1561 or the most appropriate category from 1561 to 1645

For multidisciplinary works on aquaculture, use 1581

1102 Institutes and organizations

General, multidisciplinary or organizational works, annual reports and reviews of research institutes, laboratories, government agencies, aquaria, museums, water authorities, university departments and other bodies relevant to ASFA-1 or ASFA-1 in combination with other ASFA parts, including reports of national and international organizations, e.g. FAO, ICES, IOC, UNEP, ICLARM etc.

If the organization is subject-focused, cross-refer to the appropriate category(-ies).

For multidisciplinary research programmes, use 1105

For historical accounts, use 1107

For education, use 1108

(Index the name or acronym of the organization in the identifier field)

1103 Information services

Works dealing with libraries, abstract journals, databases, online information systems, current-awareness bulletins and services, information technology, bibliometrics, lexicography, etc. CD-ROM, Internet and other electronic media.

If subject-focused, cross-refer to the appropriate category(-ies).

ASFA-1

(Index the name or acronym of the service or product in the identifier field)

1104 Personal

Biographies, obituaries, directories, etc. of people involved in aquatic sciences and/or fisheries.
If subject-focused, cross-refer to the appropriate category(-ies).

(Index the individual's last name and initials in the identifier field)

1105 Research programmes, expeditions and vessels

General reports and plans of research programmes and of multinational expeditions dealing with aquatic sciences and/or fisheries, including international programmes, e.g. BIOMASS, JGOFS, GLOBEC.
Research vessels, underwater vehicles and buoys used in multidisciplinary expeditions and cruises.

If subject-focused, cross-refer to the appropriate category(-ies).

For reports containing detailed results of the physical environment only, use ASFA-2, 2144

For fishing vessels, use 1562

For exploratory surveys for fishery purposes, use 1602

(Index the specific name of the cruise, vessel, etc. in the identifier field.

Index the region covered by a cruise or expedition as a geographic descriptor)

1106 Conferences and other meetings

General reports, prospectuses, programs, or monographic entries of all types of meetings, congresses, conferences, workshops, exhibitions, fairs, symposia, etc. concerned with aquatic sciences and/or fisheries.

This section should only be used as a cross-reference. The primary allocation should be under the appropriate specialized subject category.

Do not cross-refer each paper in a conference to 1106 - this is only for the main or monographic entry which covers the entire conference. For individual contributions, use the appropriate subject category.

For a proceedings published as a book, cross-refer also to 1109

(Use the descriptor "conferences" when indexing the main or monographic entry of a proceedings)

1107 History and development

Works detailing the history and development of the aquatic and fishery sciences as scientific disciplines and their application to the exploitation of living resources.

If subject-focused, cross-refer to the appropriate category(-ies)

For institutes and organizations, use 1102

1108 Education

Only works dealing with general education and training on aquatic sciences.

For training courses on specialized subjects, use the appropriate subject category.

For reports on universities, use 1102

1109 Books, atlases and charts

This section should only be used as a cross-reference. The primary allocation for a monographic entry for books etc. should be under the appropriate specialized subject category. For analytical entries citing individual chapters or papers in a book etc., use the appropriate subject category; do not cross-refer to 1109 (only the monographic entry should be cross-referred to 1109).

For books relevant to the overall scope of ASFA-1, use 1101.

For a proceedings published as a book, cross-refer also to 1106

1110 Translations

This section should only be used as a cross-reference for monographic translations. The primary allocation for a monograph (report, etc.) which has been translated from a publication in a different language should be under the appropriate specialized subject category, with a cross-reference to this category, 1110.

In the Notes field, indicate the languages of the original and translated publication, followed by brief bibliographic data of the original publication, as follows: "Transl. Ru-En: -- "

(Index "translations" as a descriptor and use as a lead term)

NOTE: This category is not used for cover-to-cover journal translation series.

1121 LAW, POLICY, ECONOMICS AND SOCIAL SCIENCES

General or multidisciplinary works, textbooks, literature reviews, etc. concerning the exploration, evaluation and exploitation of living aquatic resources and environments.

Works concerned with ocean law, policy, economics, political and social sciences, and their application in the allocation, management and use of aquatic organisms and resources. International agreements, treaties and conventions.

Policy and legislation relevant to the overall scope of ASFA-1, or ASFA-1 in combination with other ASFA parts. Law of the Sea, particularly the law as it concerns research activities in territorial waters and living resource exploitation activities.

For detailed work on non-living resources only, use the relevant ASFA-2 category

For detailed work on living resources only, use the appropriate Fisheries and Aquaculture categories of ASFA-1

For policy, legislation and social aspects related to fisheries, use 1565

For fishery economics, use 1644

For policy and regulations related to food quality standards, use 1627

For policy and legislation relevant to environmental changes, use ASFA-3, 3522

For policy and legislation related to pollution, use ASFA-3, 3505

For policy related to research programmes, use 1105

BIOLOGY: GENERAL

(Geographic location and Latin taxonomy should be indexed wherever possible for all biology, ecology, fisheries and aquaculture papers, in addition to the topics listed below for each subject category)

1181 General

ASFA-1

General or multidisciplinary textbooks, encyclopaedias, bibliographies, thesauri, dictionaries, data synopses, aquatic flora/fauna, and other general works on the biology of aquatic organisms. Collecting, mounting and maintenance of biological collections of aquatic organisms.

For culture and tending of living aquatic plants and animals in aquaria, use 1586

For multidisciplinary works at the ecosystem level, aquatic ecology, biological oceanography, etc., use 1381

1182 Methods and instruments

Methods and instruments used in the biological studies of organisms applicable to several taxonomic categories.

For methods related to individual species or groups of species, use the appropriate biology category(-ies) below

For general ecological methods and instruments, use 1382

(Index the specific techniques where possible, e.g. "chromatographic techniques", "electrophoresis")

1183 Taxonomy and morphology

General works on taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. dealing with several groups of aquatic organisms.

1184 Reproduction and development

General works on reproduction and development dealing with several groups of aquatic organisms.

Reproductive physiology dealing with several groups of aquatic organisms should be first allocated to 1184 and cross-referred to 1186

For population dynamics, use 1442

1185 Genetics and evolution

General works on genetics and evolution dealing with several groups of aquatic organisms. Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For pharmaceutical genetic/biotechnology applications, use 1625

For population genetics, use 1443

1186 Physiology, biochemistry, biophysics

General works on physiology, biochemistry and biophysics dealing with several groups of aquatic organisms. Metabolism, respiration, cytochemistry, histochemistry, etc.

For diving physiology use ASFA-2, 2342

1187 Palaeontology

Palaeontology related to biological aspects of aquatic organisms. Descriptions of fossil forms.

For geological aspects, palaeoenvironments, or biostratigraphy, use ASFA-2, 2148 and/or 2273, and/or 2265

(Index Latin names and geological time periods)

MICROBIOLOGY (Including aquatic viruses, bacteria, fungi, and yeasts)

For photosynthetic protists(Chromista, microalgae), Cyanophyta(Cyanobacteria, blue-green algae) see 1221-1226

For non-photosynthetic protists (Protozoa), see 1241-1246

1201 General

General textbooks, life histories, data synopses, methodology and other multidisciplinary works on aquatic fungi, yeasts, bacteria and viruses.

For methods used in specific fields, e.g. taxonomy, see the relevant categories 1202-1206 below

For general biological methods, use 1182

For palaeontology, use 1187

For environmental effects on organisms, use/cross-refer to 1422

For pollution effects on organisms, use ASFA-3, 3504

For food webs and energy cycles, use 1482

For microorganisms in plankton, use 1461

For microbial pollution, use the appropriate category from ASFA-3, 3501-3505

For microbiological aspects of aquaculture, use the appropriate category from 1581 to 1588

For microbiology related to food technology, use 1626

For microbiology related to public health, use ASFA-3, 3524

For microbiology related to corrosion, fouling etc., use ASFA-1, 1541-1542 and ASFA-2, 2282

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1202 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of aquatic microorganisms as specified above.

For geographical distribution of microalgae, use 1222

For biogeography, use 1383

For vertical distribution and migrations, use 1421

(Index the geographic location)

1203 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of aquatic microorganisms, as specified above.

For taxonomy and morphology of microalgae, use 1223

(For new genera index also at a broader taxonomic level)

1204 Reproduction and development

Reproduction/division and development of microorganisms as specified above.

For microbial reproductive physiology, use 1204 and cross-refer to 1206

For reproduction and development of microalgae, use 1224

1205 Genetics and evolution

Genetics and evolution of microorganisms as specified above. Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics and evolution of microalgae, use 1225

For population genetics, use 1443

For pharmaceutical/biotechnology applications, use 1625

1206 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of microorganisms as specified above.
Metabolism, respiration, cytochemistry, histochemistry, etc.

For physiology and biochemistry of microalgae, use 1226

For physiological aspects of environmental effects, cross-refer to 1422

For productivity and energy cycles, use 1481 and 1482

For bioactive compounds, use also 1625

BOTANY

1221 General

General textbooks, life histories, aquatic flora, data synopses, methodology and other multidisciplinary works on algae (micro- and macroalgae) and higher aquatic plants. Includes photosynthetic protists and Cyanophyta (Cyanobacteria, blue-green algae).

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant categories 1222-1226 below

For viruses, bacteria, fungi and yeasts, use 1201-1206

For general biological methods, use 1182

For palaeontology, use 1187

For environmental effects on algae and higher aquatic plants, use/cross-refer to 1422

For pollution effects on algae and higher aquatic plants, use ASFA-3, 3504

For ecological aspects of nutrition, use 1425

For population structure, use 1441

For population dynamics, use 1442

For phytoplankton ecology studies, use 1461
 For phytobenthos ecology studies, use 1462
 For seagrass, kelp, mangrove, macrophyte and other aquatic plant community/habitat studies, use 1463 and 1464
 For productivity, ecosystems, cycles etc., use 1482
 For weed infestations and plant control, use 485
 For fouling organisms, use ASFA-1, 1541 or 1542, and ASFA-2, 2282
 For algal and plant culture, use 1585
 For pharmaceutical/biotechnology applications, use 1625
 For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.
 For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.
 For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1222 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of algae and higher aquatic plants as specified above.

For biogeography, use 1383
 For vertical distribution and migrations, use 1421

(Index the geographic location)

1223 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of algae and higher aquatic plants as specified above.

(For taxonomy and new genus/new species studies index also at a broader taxonomic level (Phylum))

1224 Reproduction and development

Reproduction and development of algae and higher plants as specified above.
 Pollination, germination, gametogenesis, sporogenesis, etc.

For reproductive physiology, use 1224 and cross-refer to 1226
 For reproduction related to population structure or population dynamics, use 1441 or 1442
 For reproduction related to aquaculture, use 1585

1225 Genetics and evolution

Genetics and evolution of algae and higher plants as specified above. Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, use 1443
 For genetics related to aquaculture, use 1585
 For pharmaceutical/biotechnology applications, use 1625

1226 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of algae and higher plants as specified above. Metabolism, respiration, cytochemistry, histochemistry, etc.

For ecophysiology and environmental effects, cross-refer to 1422

For productivity and energy cycles, use 1481 and/or 1482

For biochemistry of food resources and processing, use 1622-1627

For bioactive compounds, use also 1625

INVERTEBRATE BIOLOGY: GENERAL (Excluding Malacology, Carcinology, and Entomology)

1241 General

General textbooks, life histories, faunas, data synopses, methodology and other multidisciplinary works on aquatic invertebrates, except Mollusca (use 1261), Crustacea (use 1281), Urochordata and Cephalochordata (use 1321), but including Hemichordata (Enteropneusta, Pterobranchia). Includes non-photosynthetic protists (Protozoa).

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant categories 1242-1246 below

For general biological methods, use 1182

For palaeontology, use 1187

For environmental effects on aquatic invertebrates, use/cross-refer to 1422

For pollution effects on aquatic invertebrates, use ASFA-3, 3504

For behaviour, use 1423

For age and growth, use 1424

For ecological aspects of nutrition, use 1425

For population structure, use 1441

For population dynamics, use 1442

For zooplankton ecology studies, use 1461

For zoobenthos ecology studies, use 1462

For coral reef community/habitat studies, use 1463

For productivity, ecosystems, cycles etc., use 1481-1482

For pests and control, use 1485

For fouling organisms, use ASFA-1, 1541 or 1542, and ASFA-2, 2282

For aquatic invertebrate culture, use the appropriate aquaculture category, 1581-1588

For pharmaceutical/biotechnology applications, use 1625

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1242 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of aquatic invertebrates as specified above.

For biogeography, use 1383
For vertical distribution and migrations, use 1421

(Index the geographic location)

1243 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of larval and adult aquatic invertebrates as specified above.

(For taxonomy and new taxa index also at a broader taxonomic level (Phylum))

1244 Reproduction and development

Reproduction and development of aquatic invertebrates as specified above.
Gametogenesis, fertilization, embryology, etc.

For reproductive physiology, use 1244 and cross-refer to 1246
For reproductive behaviour, use 1423 and cross-refer to 1244
For reproduction related to population structure or population dynamics, use 1441 or 1442
For reproduction related to aquaculture, use 1581-1588

1245 Genetics and evolution

Genetics and evolution of aquatic invertebrates as specified above. Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, use 1443
For genetics related to aquaculture, use 1581-1588
For pharmaceutical/biotechnology applications, use 1625

1246 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of aquatic invertebrates as specified above. Metabolism, respiration, cytochemistry, histochemistry, etc.

For ecophysiology and environmental effects, cross-refer to 1422
For productivity and energy cycles, use 1481 and/or 1482
For biochemistry of food resources and processing, use 1622-1627
For bioactive compounds, use also 1625

MALACOLOGY

1261 General

General textbooks, life histories, faunas, data synopses, methodology and other multidisciplinary works on

aquatic molluscs.

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant category 1262-1266 below

For general biological methods, use 1182

For palaeontology, use 1187

For environmental effects on aquatic molluscs, use/cross-refer to 1422

For pollution effects on aquatic molluscs, use ASFA-3, 3504

For behaviour, use 1423

For age and growth, use 1424

For ecological aspects of nutrition, use 1425

For population structure, use 1441

For population dynamics, use 1442

For zooplankton ecology studies, use 1461

For zoobenthos ecology studies, use 1462

For productivity, ecosystems, cycles etc., use 1481-1482

For pests and control, use 1485

For fouling organisms, use ASFA-1, 1541 or 1542, and ASFA-2, 2282

For aquatic mollusc culture, use 1583

For pharmaceutical/biotechnology applications, use 1625

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1262 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of aquatic molluscs.

For biogeography, use 1383

For vertical distribution and migrations, use 1421

(Index the geographic location)

1263 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of larval and adult aquatic molluscs.

(For taxonomy and new taxa index also at a broader level (Class))

1264 Reproduction and development

Reproduction and development of aquatic molluscs. Gametogenesis, fertilization, embryology, etc.

For reproductive physiology, use 1264 and cross-refer to 1266

For reproductive behaviour, use 1423 and cross-refer to 1264

For reproduction related to population structure or population dynamics, use 1441 or 1442

For reproduction related to mollusc culture, use 1583

1265 Genetics and evolution

Genetics and evolution of aquatic molluscs. Heredity, nucleic acids, genes, gene sequencing, genomes,

genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, use 1443

For genetics related to aquaculture, use 1583

For pharmaceutical/biotechnology applications, use 1625

1266 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of aquatic molluscs. Metabolism, respiration, cytochemistry, histochemistry, etc.

For ecophysiology and environmental effects, cross-refer to 1422

For productivity and energy cycles, use 1481 and/or 1482

For biochemistry of food resources and processing, use 1622-1627

For bioactive compounds, use also 1625

CARCINOLOGY

1281 General

General textbooks, life histories, faunas, data synopses, methodology and other multidisciplinary works on aquatic crustaceans. For convenience, sea spiders (Pycnogonida) and horseshoe crabs (Merostomata) are included here.

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant section 1282-1286 below

For general biological methods, use 1182

For palaeontology, use 1187

For environmental effects on aquatic crustaceans, use/cross-refer to 1422

For pollution effects on aquatic crustaceans, use ASFA-3, 3504

For behaviour, use 1423

For age and growth, use 1424

For ecological aspects of nutrition, use 1425

For population structure, use 1441

For population dynamics, use 1442

For zooplankton ecology studies, use 1461

For zoobenthos ecology studies, use 1462

For productivity, ecosystems, cycles etc., use 1481-1482

For pests and control, use 1485

For aquatic crustacean culture, use 1583

For pharmaceutical/biotechnology applications, use 1625

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1282 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of aquatic crustaceans.

For biogeography, [use](#) 1383
For vertical distribution and migrations, [use](#) 1421

(Index the geographic location)

1283 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of larval and adult aquatic crustaceans.

(For taxonomy and new taxa index also at a broader level (Class))

1284 Reproduction and development

Reproduction and development of aquatic crustaceans. Gametogenesis, fertilization, embryology, etc.

For reproductive physiology, [use](#) 1284 and cross-refer to 1286
For reproductive behaviour, [use](#) 1423 and cross-refer to 1284
For reproduction related to population structure or population dynamics, [use](#) 1441 or 1442
For reproduction related to crustacean culture, [use](#) 1583

1285 Genetics and evolution

Genetics and evolution of aquatic crustaceans. Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, [use](#) 1443
For genetics related to aquaculture, [use](#) 1583
For pharmaceutical/biotechnology applications, [use](#) 1625

1286 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of aquatic crustaceans. Metabolism, respiration, cytochemistry, histochemistry, etc.

For ecophysiology and environmental effects, cross-refer to 1422
For productivity and energy cycles, [use](#) 1481 and/or 1482
For biochemistry of food resources and processing, [use](#) 1622-1627
For bioactive compounds, [use](#) also 1625

ENTOMOLOGY

1301 General

General textbooks, life histories, faunas, data synopses, methodology and other multidisciplinary works on aquatic insects and related taxa which live at least during a part of their life cycle in the aquatic environment, including other aquatic Uniramia and Arachnida: Acari (mites) and Araneae (spiders).

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant categories 1302-1306 below

For general biological methods, [use](#) 1182
For palaeontology, [use](#) 1187

For environmental effects on aquatic insects, use/cross-refer to 1422
 For pollution effects on aquatic insects, use ASFA-3, 3504
 For behaviour, use 1423
 For age and growth, use 1424
 For ecological aspects of nutrition, use 1425
 For population structure, use 1441
 For population dynamics, use 1442
 For zooplankton ecology studies, use 1461
 For zoobenthos ecology studies, use 1462
 For productivity, ecosystems, cycles etc., use 1481-1482
 For pests and control, use 1485
 For aquatic insect culture, use 1584
 For insects as bait in sport fishing, use 1605
 For pharmaceutical/biotechnology applications, use 1625
 For human diseases carried by aquatic insect vectors, e.g. malaria, use ASFA-3, 3524
 For infestation of aquatic products by insects, use 1621-1627
 For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.
 For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

1302 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of aquatic insects.

For biogeography, use 1383
 For vertical distribution and migrations, use 1421

(Index the geographic location)

1303 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of larval and adult aquatic insects.

(For taxonomy and new taxa index also at a broader level (Class))

1304 Reproduction and development

Reproduction and development of aquatic insects. Gametogenesis, fertilization, embryology, etc.

For reproductive physiology, use 1304 and cross-refer to 1306
 For reproductive behaviour, use 1423 and cross-refer to 1304
 For reproduction related to population structure or population dynamics, use 1441 or 1442
 For reproduction related to pest control, use 1485
 For reproduction related to culture of aquatic insects, use 1584

1305 Genetics and evolution

Genetics and evolution of aquatic insects. Heredity, nucleic acids, genes, gene sequencing, genomes,

genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, [use](#) 1443

For genetics related to aquaculture, [use](#) 1584

For pharmaceutical/biotechnology applications, [use](#) 1625

1306 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of aquatic insects. Metabolism, respiration, cytochemistry, histochemistry, etc.

For ecophysiology and environmental effects, cross-refer to 1422

For productivity and energy cycles, [use](#) 1481 and/or 1482

For pests and pest control purposes, [use](#) 1485

For bioactive compounds, [use](#) also 1625

CHORDATE BIOLOGY: GENERAL (Excluding Ichthyology, Ornithology, Mammalogy)

1321 General

General textbooks, life histories, faunas, data synopses, methodology and other multidisciplinary works on aquatic chordates including Urochordata, Cephalochordata (Branchiostoma, lancelets, *Amphioxus*), amphibians, and aquatic reptiles but excluding fish ([use](#) 1341), aquatic birds ([use](#) 1361), aquatic mammals ([use](#) 1371) and Hemichordata (Enteropneusta, Pterobranchia) ([use](#) 1241).

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant categories 1322-1326 below

For general biological methods, [use](#) 1182

For palaeontology, [use](#) 1187

For environmental effects on aquatic chordates, [use](#)/cross-refer to 1422

For pollution effects on aquatic chordates, [use](#) ASFA-3, 3504

For behaviour, [use](#) 1423

For age and growth, [use](#) 1424

For ecological aspects of nutrition, [use](#) 1425

For population structure, [use](#) 1441

For population dynamics, [use](#) 1442

For zooplankton ecology studies, [use](#) 1461

For zoobenthos ecology studies, [use](#) 1462

For productivity, ecosystems, cycles etc., [use](#) 1481-1482

For pests, [use](#) 1485

For aquaculture, [use](#) 1584

For aquaria and dolphinaria, [use](#) 1586

For pharmaceutical/biotechnology applications, [use](#) 1625

For dangerous organisms, [use](#) ASFA-3, 3524 and/or ASFA-2, 2346

For parasites and diseases of cultured organisms, [use](#) 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, [use](#) 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1322 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of aquatic chordates other than fish (use 1342), aquatic birds (use 1362), aquatic mammals (use 1372), and Hemichordata (use 1242).

For biogeography, use 1383

For vertical distribution and migrations, use 1421

(Index the geographic location)

1323 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of larval and adult aquatic chordates other than fish (use 1343), aquatic birds (use 1363), aquatic mammals (use 1373), and Hemichordata (use 1243).

(For taxonomy and new taxa index also at a broader level (Class))

1324 Reproduction and development

Reproduction and development of aquatic chordates other than fish (use 1344), aquatic birds (use 1364), aquatic mammals (use 1374), and Hemichordata (use 1244). Gametogenesis, fertilization, embryology, etc.

For reproductive physiology, use 1324 and cross-refer to 1326

For reproductive behaviour, use 1423 and cross-refer to 1324

For reproduction related to population structure or population dynamics, use 1441 or 1442

For reproduction related to aquaculture, use 1584

1325 Genetics and evolution

Genetics and evolution of aquatic chordates other than fish (use 1345), aquatic birds (use 1365), aquatic mammals (use 1375) and Hemichordata (use 1245). Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, use 1443

For genetics related to aquaculture, use 1584

For pharmaceutical/biotechnology applications, use 1625

1326 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of aquatic chordates other than fish (use 1346), aquatic birds (use 1366), aquatic mammals (use 1376) and Hemichordata (use 1246). Metabolism, respiration, cytochemistry, histochemistry, etc.

For ecophysiology and environmental effects, cross-refer to 1422

For productivity and energy cycles, use 1481 and/or 1482
For biochemistry of food resources and processing, use 1622-1627
For bioactive compounds, use also 1625

ICHTHYOLOGY

1341 General

General textbooks, life histories, faunas, data synopses, methodology and other multidisciplinary works on fish including lampreys and hagfishes (Agnatha or Cyclostomi), cartilaginous fish: sharks, rays, skates and chimaeras (Chondrichthyes or Elasmobranchii), and bony fish (Osteichthyes, Teleostei).

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant categories 1342-1346 below

For general biological methods, use 1182
For palaeontology, use 1187
For environmental effects on fish, use/cross refer to 1422
For pollution effects on fish, use ASFA-3, 3504
For behaviour, use 1423
For age and growth, use 1424
For ecological aspects of nutrition, use 1425
For population structure, use 1441
For population dynamics, use 1442
For zooplankton ecology studies, use 1461
For zoobenthos ecology studies, use 1462
For productivity, ecosystems, cycles etc., use 1481-1482
For pests, use 1485
For fish culture, use 1582
For fish in aquaria, use 1586
For pharmaceutical/biotechnology applications, use 1625
For dangerous organisms, use ASFA-3, 3524
For fishery aspects, use the appropriate categories under Fisheries
For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.
For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.
For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1342 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of fish.

For biogeography, use 1383
For vertical distribution and migrations, use 1421
For distribution relevant to fisheries, use 1567 and/or the relevant category from 1601-1605

(Index the geographic location)

1343 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of adult and larval stages of fish.

(For taxonomy and new taxa index also at a broader level (Class or Order))

1344 Reproduction and development

Reproduction and development of fish. Gametogenesis, fertilization, embryology, maturation, etc.

For reproductive physiology, use 1344 and cross-refer to 1346

For reproductive behaviour, use 1423 and cross-refer to 1344

For reproduction related to population structure or population dynamics, use 1441 or 1442

For reproduction related to fish culture, use 1582

1345 Genetics and evolution

Genetics and evolution of fish. Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, use 1443

For genetics related to fish culture, use 1582

For pharmaceutical/biotechnology applications, use 1625

1346 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of fish. Metabolism, respiration, cytochemistry, histochemistry, etc.

For ecophysiology and environmental effects, cross-refer to 1422

For productivity and energy cycles, use 1481 and/or 1482

For biochemistry of food resources and processing, use 1622-1627

For bioactive compounds, use also 1625

ORNITHOLOGY

1361 General

General textbooks, life histories, faunas, data synopses, methodology and other multidisciplinary works on birds which spend at least part of their life cycle as components of the aquatic ecosystem.

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant categories 1362-1366 below

For general biological methods, use 1182

For environmental effects on aquatic birds, use/cross-refer to 1422

For pollution effects on aquatic birds, use ASFA-3, 3504

For behaviour, use 1423

For age and growth, use 1424

For ecological aspects of nutrition, use 1425

For population structure, use 1441

For population dynamics, use 1442

For avian pests, use 1485

For culture of aquatic birds, use 1584

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

1362 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of aquatic birds.

For biogeography, use 1383

For migrations, use 1421

(Index the geographic location)

1363 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of aquatic birds.

(For taxonomy or new taxa index also at a broader level (Class or Order))

1364 Reproduction and development

Reproduction and development of aquatic birds. Gametogenesis, fertilization, embryology, maturation, etc.

For reproductive physiology, use 1364 and cross-refer to 1366

For reproductive behaviour, use 1423 and cross-refer to 1364

For reproduction related to population structure or population dynamics, use 1441 or 1442

For reproduction related to culture of aquatic birds, use 1584

1365 Genetics and evolution

Genetics and evolution of aquatic birds. Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, use 1443

For genetics related to culture of aquatic birds, use 1584

1366 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of aquatic birds (metabolism, respiration, cytochemistry, etc.)

For ecophysiology and environmental effects, cross-refer to 1422

For productivity and energy cycles, use 1481 and/or 1482

MAMMALOLOGY

1371 General

General textbooks, life histories, faunas, data synopses, methodology and other multidisciplinary works on cetaceans and other aquatic mammals: whales, dolphins, porpoises (Cetacea); manatees, dugongs (Sirenia); seals, sea lions, walruses (Pinnipedia); otters/aquatic mustelids (Lutrinae: *Lutra*, *Lontra*, *Lutrogale*, *Aonyx*, *Pteroneura*, *Enhydra*); hippopotami (Hippopotamidae); beavers (*Castor*); capybara (*Hydrochaeris*); nutria/coypu (*Myocaster*); water voles (*Arvicola*); muskrats (*Ondatra*); desmans (*Desmana*,

Galemys); platypus (*Ornithorhynchus*); polar bear (*Ursus maritimus*).

For methods used in specific fields, e.g. taxonomy, genetics, use the relevant categories 1372-1376 below

For general biological methods, use 1182

For environmental effects on aquatic mammals, use/cross-refer to 1422

For pollution effects on aquatic mammals, use ASFA-3, 3504

For behaviour, use 1423

For age and growth, use 1424

For ecological aspects of nutrition, use 1425

For population structure, use 1441

For population dynamics, use 1442

For whaling and fishery aspects, use the appropriate category under Fisheries

For aquariology of aquatic mammals, use 1586

For conservation, use ASFA-3, 3523

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

1372 Geographical distribution

Geographical (horizontal) distribution, new records, check lists, range extension, etc. of aquatic mammals.

For behavioural aspects of stranding cross-refer to 1423

For biogeography, use 1383

For migrations, use 1421

For distribution related to whaling or hunting use the relevant category from 1601-1605
(Index the geographic location)

1373 Taxonomy and morphology

Taxonomy, identification, nomenclature, new taxa, morphology, anatomy, cytology, ultrastructure, etc. of aquatic mammals.

(For taxonomy or new taxa index also at a broader level (Class or Order))

1374 Reproduction and development

Reproduction and development of aquatic mammals. Gametogenesis, fertilization, pregnancy, parturition, embryology, maturation, etc.

For reproductive physiology, use 1374 and cross-refer to 1376

For reproductive behaviour, use 1423 and cross-refer to 1374

For reproduction related to population structure or population dynamics, use 1441 or 1442

For reproduction related to aquariology of aquatic mammals, use 1586

1375 Genetics and evolution

Genetics and evolution of aquatic mammals. Heredity, nucleic acids, genes, gene sequencing, genomes, genotypes, chromosomes, karyology, ploidy, mutation, hybridization, etc. Speciation, bioselection.

For population genetics, use 1443

For genetics related to culture of aquatic mammals, use 1584

1376 Physiology, biochemistry, biophysics

Physiology, biochemistry and biophysics of aquatic mammals. Metabolism, respiration, cytochemistry, histochemistry, etc.

For ecophysiology and environmental effects, cross-refer to 1422

For productivity and energy cycles, use 1481 and/or 1482

For biochemistry of processing and utilization, use 1622 or 1624

For food technology, use 1626

AQUATIC ECOLOGY

* Throughout ecology sections, cross-refer to biology categories as appropriate

1381 General

General textbooks, encyclopedias, bibliographies, thesauri, dictionaries and other multidisciplinary works on aquatic ecology, biological oceanography and limnology. General ecological aspects of global change. Biodiversity.

For more specific ecological studies, see relevant categories below.

For pollution studies, use ASFA-3, 3501-3505

For environmental changes and control, use ASFA-3, 3521 or 3522

For conservation, use ASFA-3, 3523

For public health and dangerous organisms, use ASFA-3, 3524

For effects of aquaculture on the environment, use ASFA-1, 1588

(Index type of environment: rivers, estuaries, littoral zone, etc.; habitat: salt marshes, coral reefs, etc.; geographic location)

1382 Ecological techniques and apparatus

Techniques, methods, apparatus and instruments applied in aquatic ecology and biological oceanography and limnology.

For tagging and marking for migration studies, use 1421

For age determination methods, use 1424

For methods of determination of recruitment and fecundity, use 1442

For methods of distinguishing subpopulations, use 1443

For methods and instruments for plankton studies, use 1461

For methods and instruments for benthos studies, use 1462

For methods and instruments for determination of productivity, use 1481

For pollution detection methods and instruments, use ASFA-3, 3502

(Index the name or type of method or technique)

1383 Biogeography and biogeographic regions

Studies of phyto- and zoogeographic regions and provinces throughout the world, the history of faunal and floral communities, continental movements and transport of organisms in relation to worldwide geographical distribution. Includes palaeobiogeography (for which, cross-refer to 1187).

For geographical distribution or new records of individual species or taxa, use the relevant category from 1202-1372; include under 1383 only if the study deals with faunal provinces, biogeographic regions, etc.

For vertical distribution, migrations and movements, use 1421

For geographical or vertical distribution of fishable stocks, use 1601-1605

AUTECOLOGY

* Cross-refer to biology and fisheries categories where appropriate

1421 Migrations and rhythms

Homing, orientation, horizontal migrations and changes of locality; vertical distribution and movements, circadian and other rhythms; tagging and marking experiments and techniques.

For tagging and marking experiments used for purposes other than the study of migrations and movements, use the following categories:

For growth studies, use 1424

For longevity studies, use 1441 or 1424

For fishing mortality and stock assessment studies, use 1604

1422 Environmental effects

Effects of local environmental factors on organisms. Species tolerance of environmental parameters such as salinity and temperature. Environmental determinants of ecophysiological characteristics. Generally used for cross-references to a specific biology or ecology category relevant to the aspect of the organism or community.

For ecophysiology, use also relevant physiology ---6 category from 1206-1376

For effects of pollution on organisms, use ASFA-3, 3504

For effects of man-made and major natural environmental changes and phenomena, global change, disasters, etc., use ASFA-3, 3521

1423 Behaviour

All aspects of behaviour of aquatic animals, except migrations, homing and orientation behaviour (use 1421), and feeding behaviour (use 1425). Includes acoustic, aggressive, agonistic, avoidance, chromatic, cleaning, communication, competitive, display, exploratory, flight, hydrostatic, learning, locomotion, parental, protective, reproductive, settling, sexual, social, territorial, and vocalization behaviours of aquatic animals.

Cross-refer to the appropriate biology category

For reproductive behaviour, use 1423 and cross-refer to the appropriate ---4 category from 1204-1374

For behaviour of parasites, use 1484

For schooling behaviour in relation to population studies, use 1441

For acoustic properties of animal sounds, use ASFA-2, 2205

(Index the specific type of behaviour)

1424 Age and growth

Age and ageing processes of individual species. Age determination in organisms (scale- and otolith reading, marking experiments for growth studies, etc.). Patterns and rate of growth. Von Bertalanffy's

growth curves. Relation of growth to feeding. Length-weight relationships.

Cross-refer to the appropriate biology category (---1) from 1201-1371

For feeding and growth, use also 1425

For age composition and age determination of population, use 1441

For growth studies in aquaculture, use the relevant category from 1581-1588

For stock assessment of fishery resources, use 1604

1425 Nutrition and feeding habits

Feeding ecology and feeding behaviour of aquatic organisms. Forms of nutrition, photo- and chemotrophic autotrophs, phototrophic heterotrophs, predatory, parasitic, saprophytic. Types of food materials, methods of procuring food. Utilization of food. Studies of stomach contents and estimates of quantity of food taken.

Cross-refer to the appropriate biology category

For feeding in aquaculture, use the relevant category from 1581-1588

For digestive physiology, use ---6 category from 1205-1375

For predator-prey relationships, use 1483

For food webs and ecosystems, use 1482

POPULATION STUDIES

1441 Population structure

Structure of exploited and unexploited natural populations at a given time. Structural characteristics; population size and number (abundance); taxonomic composition of population and samples (catch); sex ratios; age composition and age determination; size and weight (volume) distribution; aggregation (schooling) and isolation.

Cross-refer to the appropriate biology category

For cultured populations, use the relevant category from 1581-1588

For stock assessment, use 1604

1442 Population dynamics

Dynamics of exploited or unexploited natural populations. Change of populations over time. Dynamical characteristics: natality, recruitment and methods of measuring natality and recruitment. Age at recruitment, size at recruitment. Fecundity, measuring methods of fecundity, spawning, maturity stages. Mortality (natural, fishing, total ..), and methods for mortality estimates. Longevity. Increment of groups or entire stocks.

For cultivated populations, use the relevant category from 1581-1588

For stock assessment, use 1604

Cross-refer to the appropriate biology category

1443 Population genetics

Identification of sub-populations of unit stocks, principles and criteria for identification: taxonomic, geographic and ecological criteria. Sub-specific categories (races, tribes, varieties). Methods of distinguishing sub-specific characteristics: blood groups, colour patterns, gillraker counts, gut length, tagging experiments, electrophoresis, molecular methods, etc. Population genetics, selection in natural populations.

Cross-refer to the appropriate biology category

For selection for aquaculture purposes, use the relevant category from 1581-1588

For genetics and evolution of individual species or specific types of organisms, use the relevant genetics/evolution (---5) category from 1205 to 1375

For population genetics of fishable stocks cross-refer to 1604.

AQUATIC COMMUNITIES

1461 Plankton

Studies of phytoplankton and zooplankton organisms and communities in freshwater, brackishwater, hypersaline, and marine environments (including nannoplankton, cryoplankton, holoplankton, bacterioplankton, ichthyoplankton, meroplankton, saproplankton). Plankton sampling, special equipment for plankton studies. Plankton surveys, cruise reports, charts of distribution. Check lists and community composition. Temporal and spatial variation and succession. Remote sensing/ground truth of chlorophyll distribution. Global change and plankton ecology.

For vertical migrations cross-refer to 1421

For production, eutrophication and algal blooms, enter under 1481 and cross-refer to 1461

For man-induced eutrophication, use also ASFA-3

For effect of plankton blooms on quality of seafood, use 1627 and/or ASFA-3, 3524

For toxic effects, use 1485 and/or ASFA-3, 3524

For biology of individual species or taxa, use/cross-refer to the relevant category from 1201-1376

For aquaculture of planktonic organisms, use the relevant category from 1581-1588

For ichthyoplankton surveys for fishery purposes, use the relevant category from 1601-1605

For pollution effects on plankton, use ASFA-3, 3504

(Index habitat type, geographic location)

1462 Benthos

Studies of phyto-, macro-, meio-, and zoobenthos; benthic communities and organisms in freshwater, brackish, marine and hypersaline environments. Methods and equipment used for those studies. Surveys and check lists of benthic communities. Temporal and spatial variation and succession of benthic species.

Ecology of burrowing, tube-dwelling animals, infauna, interstitial organisms, meiobenthos, phytobenthos, zoobenthos. Bioturbation.

For biology of individual species or taxa, use/cross-refer to the relevant category from 1201-1376

For bioturbation and sediment geochemistry, use also ASFA-2, 2187

For pollution effects on benthos, use ASFA-3, 3504

(Index habitat type, geographic location)

1463 Habitat community studies

ASFA-1

Studies of specific defined habitats such as coral reefs, salt marshes, salt lakes, mangrove swamps, macrophyte stands, free-floating macrophytes, microbial mats, algal mats, rock pools, temporary pools, algal turfs, kelp forests, riparian environments, swamps, wetlands, etc.

(Index habitat type, geographic location)

1464 Other aquatic communities

Studies of aquatic communities other than plankton, benthos and 'defined' habitats. Physical environment of organisms, littoral zonation, etc. Studies which encompass numerous habitats.

(Index habitat type, geographic location)

PRODUCTIVITY, ECOSYSTEMS, SPECIES INTERACTIONS

1481 Productivity

Primary production, measurements, C¹⁴ methods. Relation between primary production and nutrients, temperature, light conditions, eutrophication, etc. Secondary production: primary consumers, secondary consumers, turnover rates. Algal blooms. Total productivity, rates of processes, seasonal changes in production. Global change and biological production.

For plankton production, cross-refer to 1461

For benthic production, cross-refer to 1462

For biogeochemical cycles, use 1482

For aquaculture productivity, use 1581-1588

For fishery productivity/yield, use 1604

1482 Ecosystems and energetics

Ecological succession, climax, ecotones, niches, energy cycles, biogeochemical cycles. Oligotrophic, mesotrophic, autotrophic ecosystems, food chains and webs. Energy flow through populations, communities and ecosystems. Trophodynamics. Global change and biogeochemical cycles, etc.

For biogeochemistry, allocate also to ASFA-2, 218-- as appropriate.

1483 Species interactions: general

Studies of species interactions such as competition, predator-prey relationships, commensalism, mutualism, cooperation, etc.

For behaviour, use 1423

For parasites and diseases, use 1484 (and 1581-1588 if applicable to aquaculture)

(Index the type of interaction)

1484 Species interactions: parasites and diseases

Parasites and diseases of wild aquatic organisms; effects on infected organisms; biology of parasite and disease causing organisms. Parasite-host interactions. Prophylaxis and therapy. Papers should be cross-referred to the biology category relevant to the host.

(Index the type of disease (e.g. bacterial, viral) and other appropriate disease-related concepts (e.g. fish

diseases, disease control, disease detection). Refer to DISEASES term cluster in ASFA thesaurus. Index whether endo- or ectoparasites and body organ(s) affected.

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For descriptions of new species/taxa of parasites, enter first under the appropriate taxonomy (---3) category from 1183-1373 and cross-refer to 1484

For human diseases, use ASFA-3, 3524

1485 Species interactions: pests and control

* Although included under the heading "Species interactions", this section includes studies of pest organisms whether or not interactions with other species are mentioned.

Causes, effects and biology of aquatic organisms causing harm or nuisance to humans. Outbreaks and infestations of pests. Aquatic weeds and their control. Physical, chemical and biological control measures. Biology and control of aquatic hosts of parasites affecting humans, e.g. malaria and schistosomiasis.

For fouling and boring organisms, use 1541 or 1542, and ASFA-2, 2282

For control of undesirable species in fisheries, use 1601-1605

For control of undesirable species in aquaculture, use 1581-1588

For effects of pesticides on non-target species, use ASFA-3, 3504

For health-related aspects of malaria, schistosomiasis, filariasis and other human parasites with aquatic stages, use ASFA-3, 3524.

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

FOULING AND BORING

1541 Biology of fouling and boring organisms

All aspects of the biology of fouling and boring organisms, i.e. species which attach themselves to, bore into, corrode or otherwise degrade surfaces of substrates and structures.

Papers entered under this section should generally be assigned also to ASFA-2, 2282

Papers dealing with biofouling on the surface of cultured organisms, e.g. molluscs, should not be allocated to ASFA-2, but fouling on aquaculture structures and equipment should be allocated to both ASFA-1 and ASFA-2.

For strictly engineering aspects of fouling such as drag and loading on structures, use ASFA-2 only

For biological aspects, life cycle, reproduction etc., cross-refer to the appropriate biology category

For ecology of sessile and benthic species which do not consider fouling etc. aspects, use 1462

For other pests and control, use 1485

For productivity of fouling organisms, cross-refer to 1481

(Index the taxonomic names of fouling organisms)

1542 Prevention and control

Studies on, and methods for the control of, fouling, boring and corroding organisms.

Papers entered under this section should also be assigned to ASFA-2, 2282

For strictly engineering aspects of fouling such as drag and loading on structures, use ASFA-2 only
For other pests and control, use 1485

(Index the taxonomic names of fouling organisms)

PRACTICAL ASPECTS OF FISHERIES

1561 General

General textbooks, encyclopaedias, bibliographies, thesauri, dictionaries and other multidisciplinary works on fisheries and exploitation of aquatic organisms. Annual fishery reports. Whaling, hunting and harvesting.

For more specific works on fisheries, see the relevant sections below

For general works on aquaculture, use 1581

For general works on *both* fisheries and aquaculture, use 1561 and cross-refer to 1581

For fishable stocks, use 1601-1605

For marketing and economics, use 1641-1645

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

(Index organism names, types of fishery (e.g. tuna fisheries, flatfish fisheries, crab fisheries) and fishing techniques (e.g. trawling, longlining) and geographic location)

1562 Fishing vessels and harbours

Descriptions, plans, building, construction materials, maintenance, seaworthiness, resistance, fuel economy, propulsion, steering and layout of fishing craft. Accidents, fishing vessel safety, and safety during fishing operations. Designs, descriptions or layout of ports and harbours used for fishing operations.

Papers entered under this section describing engineering aspects of fishing or fishery survey vessels may be also assigned to ASFA-2, 2301

For research vessels, use 1105

For fishing gear, use 1563

For fishing effort statistics, use 1603

For control of fouling and boring organisms, use 1542 and ASFA-2, 2282

For storage of fishery products, use 1642

(Index the type of fishing vessel and geographic location of fishing harbours. Index vessel name as an identifier)

1563 Fishing gear and methods

Description, operation and efficiency of fishing gear: nets, lines, hooks, pots, etc. Selectivity of fishing gear. Descriptions and studies of fishing methods, including net fishing, line fishing, electric fishing, light fishing, pot fishing, spear fishing, trap fishing, etc. Experimental fishing. Attracting techniques including FADs (Fish Aggregating Devices) and artificial reefs.

For gear selectivity as a tool in stock management or as a factor in stock assessment, use 1604

For FADs and artificial reefs used in resource management, use 1601-1605

(Index the type of gear or method)

1564 Instruments, tools, equipment

Instruments for fish detection, net sonde, fish lupe, sonar echosounders. Tools and equipment for handling gear and fish: winches, powerblocks, pumps, lights, etc.

For instruments for processing living resources, use 1623

For storage of fish on board, use 1642

(Index the type of instrument)

1565 Policy, legislation and sociology

Legislative bodies, treaties, acts, laws, statutes, regulations, agreements, penal codes referring to fisheries. Fishery protection, fishing rights and fishery policy. Works on Law of the Sea, Exclusive Economic Zone, Code of Conduct for Responsible Fishing, and territorial waters as related to living resources. Policy and legislation of subsidies and taxes, credits and insurances. Fishing permits. Quota regulations. Sociological studies of fishermen and women in fisheries, fishing communities, traditional and artisanal fisheries. Cooperatives and other associations of fishermen. Labour-related aspects.

For fish stock assessment and management, use 1604

For mesh, quota, season, and size-limit regulations, use 1604

1566 Fishery charts, grounds and water areas

Charts, maps and geographic information systems for use in fishing operations. Descriptions and nomenclature of fishing grounds. GIS.

For demarcation of fishing rights, use 1565

For fishery oceanography/limnology, use 1567

(Index geographic location)

1567 Fishery oceanography and limnology

Relationship of oceanographic, meteorological and limnological conditions to fisheries. Forecasting of fisheries based on oceanographic, meteorological and limnological observations. Effects of physicochemical parameters of water masses to fishable stocks, e.g. upwelling, El Nino phenomena.

Allocate also to ASFA-2 if physical oceanography/limnology is emphasized.

Allocate also to ASFA-3 if pollution or environmental quality are considered with respect to fisheries.

(Index parameters, phenomena, species, fishery type, geographic location)

AQUACULTURE

ASFA-1

* The scope descriptions for categories 1581-1588 below pertain to both the Aquaculture section of ASFA-1, and also to *ASFA Aquaculture Abstracts*.

1581 General

General textbooks, dictionaries, synopses, thesauri and other works on aquaculture in general. For specific studies (fish, shellfish, other animals, plants, aquaria) see the relevant sections below. Documents dealing with more than one of these categories (e.g. fish and shrimp culture) should be allocated to 1581.

Excluded are laboratory culture studies designed solely to determine life cycles or developmental stages of non-cultivated organisms (for which use the relevant biology category), unless techniques are emphasized which can be applied in aquaculture.

Studies on the culture of organisms for biomedical research are included within the aquaculture section.

The following topics may apply to the general (1581) or specific (1582-1588) aquaculture categories:

1. Methods, instruments, systems:

a) Improvement of habitat, biota and environment in open systems, bays, lagoons, vallicultura, lakes, rivers, reservoirs, etc. Prevention of entry into an unfavourable environment.

b) Ponds and other artificial closed systems: choice of site, construction, water supply and control of biota.

2. Structure, dynamics and selection of the cultured populations:

a) Constitution and composition of stocks, and artificial regeneration, modification and formation of stocks (choice and trial of species, selective breeding, induced breeding, hatchery and nursery practice, seeding ova, spawn).

b) Biotechnology, molecular biology and genetics of cultured organisms; transgenic organisms.

3. Release of stock in open systems, including transplantation, stocking, and ranching.

4. Tending the stocks in closed systems: pond management; protective measures (including control and prevention of diseases, pests, predators and undesirable species), feeding, management of water supply.

5. Rehabilitation of spoiled or derelict stocks, repopulation measures for conservation, restocking of polluted or stressed waters, stocking of waters for sport fishing, stocking of waters for biological control (e.g. herbivorous fish) or pollution control (e.g. seaweed biofilters). Creation of wetlands for pollution control.

6. Combination of aquaculture or stocked fisheries with other activities: agriculture (integrated aquaculture), water supply reservoirs, power plant thermal effluents, etc.

7. Biology of cultured organisms, including genetics, physiology, endocrinology, nutrition, parasites and diseases of cultured organisms, and reproduction.

8. Related aspects, including pollution, ecology, oceanography, limnology, administration, legislation, processing, quality control, economics, rural and economic development. Men and women in aquaculture.

9. Statistics of cultured organisms.

10. Effects of aquaculture on the environment

For experimental laboratory culture for investigations on life cycle stages, development, etc., use the relevant Biology category.

For papers dealing with FADs (fish aggregating devices), and artificial reefs use the appropriate sections of ASFA-1, 1561-1567

For aquaculture related to pollution to effects on environmental quality, use 1588, and allocate also to ASFA-3

For medical and other non-edible products, bioactive compounds and biotechnology products, use 1625

For processing of aquaculture products, use 1623

For quality control of aquaculture products and food poisoning, use 1627

For aquaculture economics, marketing, etc. use 1641-1645

For fish production related to artificial reefs, use 1601-1605

For harvest of natural seaweed beds, use 1601-1605

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

(Index organism names, types of aquaculture (e.g. mass culture, seaweed culture, polyculture) and aquaculture techniques (e.g. cage culture, hybrid culture) and geographic location)

1582 Fish culture

As for 1581 especially for the culture and husbandry of fish species, restocking of waters with fish and the combination of fish culture with other activities; biology of cultured organisms. Ranching.

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1583 Shellfish culture

As for 1581, especially for the culture and husbandry of shellfish (crustaceans, including *Artemia*, *Daphnia*, etc. and molluscs) for food, shells, pearls, etc.

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1584 Culture of other aquatic animals

As for 1581 especially for the culture and husbandry of aquatic animals other than fish (use 1582) and shellfish (use 1583), for food, their residuals, or other special products.

Includes culture of rotifers, turtles, alligators, crocodiles, ducks and other aquatic birds, sea urchins, sponges, sea cucumbers, aquatic insects, tunicates, worms.

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

ASFA-1

For dolphinaria, husbandry of cetaceans etc., use 1586

For experimental laboratory culture for investigations on life cycle stages, development, etc., use the relevant Biology category.

1585 Plant culture

As for 1581 especially for the culture of algae and higher aquatic plants for food or secondary products. Biotechnology applications to algal etc. culture.

Excludes rice cultivation, unless with reference to combination with culture of other aquatic organisms, e.g. rice-shrimp culture, rice-fish-duck culture, etc.

For control and harvest of aquatic weeds, use 1485

For biotechnology and properties of non-edible products, aquatic drugs, antibiotics, etc., use 1625.

For the harvesting of natural seaweed beds, use 1601-1605

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1586 Aquaria

Culture and tending of aquatic organisms in aquaria, dolphinaria, ornamental ponds, etc. Maintenance of aquaria. Methods and equipment used in aquaria.

For transportation of aquarium species, use 1642, and cross-refer to 1586.

For sales and economics of aquarium species, use 1641-1645, and cross-refer to 1586.

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

1587 Diseases of cultured organisms

Description, diagnosis, therapy, management, and prevention of diseases relating to cultured organisms (e.g. fish culture, shellfish culture, etc.)

Includes the biology, pathology, physiology, histology, immunology, and pharmacology relating to cultured aquatic organisms and their diseases; fish health management; effects on infected organisms; biology of parasite and disease causing organisms, and the impact of disease on the aquaculture industry. Parasite-host interactions. Prophylaxis and therapy. Papers should be cross-referred to the biology category relevant to the host.

(Index the type of disease (e.g. bacterial, viral) and other appropriate disease-related concepts (e.g. fish diseases, disease control, disease detection). Refer to DISEASES term cluster in ASFA thesaurus. Index whether endo- or ectoparasites and body organ(s) affected.

For fish diseases, cross-refer to 1484 and 1346, if appropriate

For shellfish diseases, cross-refer to 1484 and 1583, if appropriate

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For human diseases, use ASFA-3, 3524

1588 Effects of aquaculture on the environment

Effects of aquaculture practices which result in physical, chemical or biological deterioration of the environment.

Includes the effects of aquaculture waste releases (e.g.: effluents containing organic matter and nutrients), consequences of introduction of non-native species and genetically modified organisms, use of hazardous chemical compounds, overuse and salinization of freshwater supplies, and habitat modifications including degradation of mangrove forests, wetlands and other ecologically sensitive areas.

For aquaculture related to pollution/environmental quality, allocate also to ASFA-3, 3521 or other appropriate ASFA-3 category(s).

FISHABLE STOCKS

1601 General

General works on fishable stocks of a qualitative rather than quantitative nature, e.g. vertical or horizontal distribution of fishable stocks, availability of potential fishery resources, etc. General papers concerning fishways, fish passage structures, etc. (cross-refer to 1421 for migrations). Includes stocks of whales and other hunted and harvested species.

For environmental effects on fisheries, use 1567 and cross-refer to 1422

For pollution effects on fisheries, use also ASFA-3, 3504

For fishery surveys, use 1602

For catch data, use 1603

For stock identification and assessment, use 1604

For sport fishing, use 1605

For fisheries economics and marketing, use 1641-1645

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

(Index organism names, types of fishery (e.g. tuna fisheries, flatfish fisheries, crab fisheries) and fishing techniques (e.g. trawling, longlining) and geographic location)

1602 Surveying and prospecting

Surveys for determination of fishery resources including seaweed resources; commercial and potential fishery surveys, exploratory fishing, acoustic surveys, including surveys with echointegrators, aerial and satellite surveys, ground surveys, counts, etc. Prospecting of future catch or harvest based on such surveys.

For stock assessment based on surveys, use 1604

1603 Fishery statistics and sampling

Fish, shellfish, whaling etc. catch statistics, landing statistics, by-catch, discard statistics, seaweed (i.e. natural beds) harvesting statistics. Statistical and sampling methods used in fishery biology. Data on fishing effort and catch per unit effort (CPUE). Sampling programmes and data from samples drawn from commercial catches or on board research vessels, etc. Sampling of information and data on fishing gear and fishing operations. Conversion factors, especially for landed weight to whole weight.

For aquaculture statistics, use 1581-1588
For commodity and trade statistics, use 1645

1604 Stock assessment and management

Principles and methods of living resource stock size estimation, abundance, biomass, etc. Seaweed resource evaluation. Interpretation of acoustic, optic, meristic counts, statistical surveys, and exploratory fishing (direct methods). Virtual Population Analysis (VPA) or cohort analysis. Genetic and biotechnology methods for stock identification and assessment. Interpretation of egg and larvae (ichthyoplankton) surveys, tagging and marking studies. Stock assessment based on changes in parameters of the population: changes in sex ratio, age and size composition, natural and fishing mortality, and changes in abundance of predators and prey. Assessment based on statistics and samples of the commercial catch. Increment and yield assessment. Identification of unit stock. Methods of management of aquatic stocks. Regulation of fisheries based on stock assessment and effects of regulations. Selectivity of fishing gear and its effects on the stocks. Experiments on aquatic populations, computer simulation. GIS (Geographic Information Systems) used for fishery resource assessment and development.

For population structure, use also 1441
For population dynamics, use also 1442
For subpopulations, population genetics, use also 1443
For productivity studies, use 1481
For fishery policy and legislation, use 1565
For assessment and management of cultivated stocks, use the relevant category from 1581-1588
For exploratory fishing, acoustic and optic surveys, use 1602
For prospecting catches on the basis of surveys, use 1602
For fishery statistics, catch and effort statistics and sampling, use 1603
For fishery economics, use 1644
For effects of pollution on fisheries, use also ASFA-3, 3504
For environmental effects on fisheries, use 1567 and cross-refer to 1422

1605 Sport fishing

Works on fishery biology, census, assessment and management of fishable stocks important to sport fishing. Bait fisheries.

Exclude popular articles.

For legislation and fishing permits, use 1565
For stocking natural waters use the relevant category from 1581 to 1586
For conservation/recreation aspects of sport fishing, use also 1523
For economic aspects of sport fishing, use also 1644

AQUATIC PRODUCTS AND THEIR UTILIZATION

1621 General

General and multidisciplinary works on the utilization and technology of living aquatic products. Importance of fishery products in human health, nutrition and physiology. General and multidisciplinary works on the seafood industry.

For effluents of seafood plants, use also ASFA-3, 3501-3505

For specific studies of primary (un-processed) or secondary (processed) products, processing, food technology, quality and standards, biotechnology applications, and non-edible living resources, use relevant category 1622-1627 below.

1622 Primary products

Composition and properties of primary (un-processed) edible aquatic products, including frozen products. Physical and mechanical, chemical, nutritional and organoleptic changes of properties (through storage, cultural practices, pollution, additives), spoilage (changes in microbial flora, autolytic enzymatic action).

For food quality and standards, use 1627.

(Index the type of product)

1623 Processing methods, instruments and factories

Processing equipment and materials. Fish plant planning, design and operation. Handling and storage equipment and facilities.

(Index the method or equipment, type or product)

1624 Secondary products

Composition and properties of secondary (processed) edible aquatic products, including changes to properties, i.e. storage effects, insect infestation, spoilage, etc. Dried, salted, smoked, semipreserved (including marinated, boiled, fried, etc.), fermented (silage, etc.), canned, minced/comminuted, irradiated, powdered, etc., intended for human or animal consumption. Fish meal and oil, edible seaweed products and other secondary products not mentioned above.

For medicinal and pharmaceutical products, use 1625

(Index the type of product)

1625 Non-edible products

Composition and properties of non-edible products of aquatic organisms. Pharmaceutical products, medicinal products, bioactive compounds, vaccines, antibiotics, antifungal agents, antitumour agents, vitamins. Tanned products, ornamental products, fertilizers, fuels, adhesives and other biomaterials and substances. Biotechnology applications related to non-edible products of aquatic organisms.

For bioactive compounds of aquatic organisms, cross-refer to the appropriate physiology section

(Index the type of product)

1626 Food technology

Including processing and storage technology. Handling, chilling, chemical preservation, primary conversion (heading, gutting, filleting), drying, salting, smoking, marinating, fermenting, canning, mincing/comminuting, irradiating, reducing and other processes not mentioned above.

For quality standards and control, use 1627

1627 Food quality and standards

Control systems (organization, inspection, quality assurance schemes, etc.), codes of practice, specifications, standards, control methodology, quality assessment and testing techniques, hygiene/sanitation, food poisoning and toxicity. Effects of pollution on quality of aquatic products.

For parasites and diseases of cultured organisms, use 1587 and cross-refer to 1484, if appropriate.

For parasites and diseases of wild organisms, use 1484 and cross-refer to 1587, if appropriate.

For food poisoning related to public health, use also ASFA-3, 3524

MARKETING AND ECONOMICS OF AQUATIC PRODUCTS

1641 General

General or multidisciplinary textbooks, bibliographies, dictionaries and other works on marketing and economics of aquatic products, fisheries and aquaculture. For specific studies on storage, transport, packing, marketing, economics, and commodity and trade statistics, use the relevant categories 1642-1645 below.

1642 Storage, transport and packing

Port (landing) markets, inland wholesale markets, stationary retail shops, mobile sales units. Storage, transportation and packing equipment and facilities.

For economics of transport and storage, use also 1644

For storage effects on aquatic products, use the relevant category from 1621-1627

1643 Marketing

Marketing of fisheries, aquaculture, and other aquatic products; quantitative aspects of marketing, demand and supply in domestic and international markets, prices, trade methods, and customs. Propaganda and advertising for aquatic products. Export promotion. Marketing margins. Management of marketing organization. Marketing planning and market research into consumer-related aspects of aquatic products. For accounting, use 1644

1644 Economics

Economics of fisheries and aquaculture; special business problems of aquaculture and fishing. Economics of leasing fishing grounds and aquaculture sites. Taxation, levies and insurance. Calculation of costs and profitability. Valuation of resources. Costs of different phases of work (cost-items). Accounting, business statistics, short-term planning and financing. Administration and organization of fishing enterprises. Economics of transport and storage of aquatic products.

For stock management, use 1604

1645 Commodity and trade statistics

Statistics of aquatic products, trade of living aquatic resource products and their prices. Regional, national and international commerce in aquatic products.

**ASFA-2, OCEAN TECHNOLOGY, POLICY AND NON-LIVING RESOURCES
SCOPE DESCRIPTIONS**

ASFA-1

GENERAL ASPECTS

2101 General works

General or multidisciplinary works, textbooks, review articles, encyclopaedias, bibliographies, thesauri, atlases, dictionaries, glossaries, etc. dealing with several aspects of the physical sciences and/or technology of oceans, lakes, rivers, etc., relevant to the overall scope of ASFA-2 or ASFA-2 in combination with other ASFA parts.

For general works on law, policy, socioeconomics and resources applicable to ASFA-2, use 2121

For multidisciplinary works on physical oceanography/limnology, use 2141

For multidisciplinary works on marine meteorology, use 2241

For multidisciplinary works on marine geology/geophysics, use 2261

For multidisciplinary works on pollution, use ASFA-3, 3501

2102 Institutes and organizations

General, multidisciplinary or organizational works, annual reports and reviews of research institutes, laboratories, government agencies, museums, water authorities, university departments and other bodies relevant to ASFA-2 or ASFA-2 in combination with other ASFA parts, including reports of national and international organizations, e.g. IHO, IOC, SCOR, WMO, etc.

If the organization is subject-focused, cross-refer to the appropriate category(-ies).

For multidisciplinary research programmes, use 2105

For education, use 2108

For historical accounts, use 2107

(Index the name or acronym of the organization in the identifier field)

2103 Information services

Works dealing with libraries, abstract journals, databases, online information systems, current-awareness bulletins and services, information technology, bibliometrics, lexicography, etc. CD-ROM, Internet, and other electronic media.

If subject-focused, cross-refer to the appropriate category(-ies).

(Index the name or acronym of the service or product in the identifier field)

2104 Personal

Biographies, obituaries, directories, etc. of people whose work embraces the ASFA-2 scope.

If subject-focused, cross-refer to the appropriate category(-ies).

(The individual's last name and initials should be indexed in the identifier field)

2105 Research programmes and expeditions

General reports and plans of research programmes and of multinational expeditions, e.g. JGOFS, TOGA, TOPEX, WOCE.

For reports containing detailed results on the physical environment, use 2144, or if exclusively geology (e.g. ODP), use 226-- category(-ies).

If subject-focused, cross-refer to the appropriate category(-ies).

For descriptions of research vessels, use 2301

For descriptions of underwater vehicles, use 2302

For descriptions of oceanographic/meteorological data buoys, use 2303 and 2142/2242 as relevant

(The region covered by a cruise or expedition should be indexed as a geographic descriptor. The specific name of the cruise, vessel, etc. should be indexed in the identifier field)

2106 Conferences and other meetings

General reports, prospectuses, programs, or monographic entries of all types of meetings, congresses, conferences, workshops, exhibitions, fairs, symposia, etc. concerned with the physical sciences of oceans, lakes, rivers, etc., and with marine technology.

This section should only be used as a cross-reference. The primary allocation should be under the appropriate specialized subject category. Do not cross-refer each paper in a conference to 2106 - this is only for the main or monographic entry which covers the entire conference. For individual contributions, use the appropriate subject category.

For a proceedings published as a book, cross-refer also to 2109

(use the descriptor "conferences" when indexing the main or monographic entry of a proceedings)

2107 History and development

Works detailing the history and development of the physical aquatic sciences as scientific disciplines and their application to the exploitation of non-living resources.

If subject-focused, cross-refer to the appropriate category(-ies)

For institutes and organizations, use 2102

2108 Education

Only for works dealing with general education and training on aquatic sciences.

For training courses on specialized subjects, use the appropriate subject category.

For reports on universities, use 2102

2109 Books, atlases and charts

This section should only be used as a cross-reference. The primary allocation for a monographic entry for books etc. should be under the appropriate specialized subject category. For analytical entries for individual

chapters or papers in a book etc., use the appropriate subject heading, do not cross-refer to 2109 (only the monographic entry should be cross-referred to 2109).

For books relevant to the overall scope of ASFA-2, use 2101

For a proceedings published as a book, cross-refer also to 2106

2110 Translations

This section should only be used as a cross-reference for monographic translations. The primary allocation for a monograph (report, etc.) which has been translated from a publication in a different language should be under the appropriate specialized subject category, with a cross-reference to this category, 2110.

In the Notes field, indicate languages of the original and translated publication, followed by brief bibliographic data of the original publication, as follows:

"Transl. Ru-En: -- "

(Enter "translations" as a descriptor and use as a lead term)

NOTE: This section is not used for cover-to-cover journal translation series.

LAW, POLICY, ECONOMICS AND SOCIAL SCIENCES

2121 General

General and multidisciplinary works, textbooks, review articles etc. concerned with ocean law, policy, economics, political sciences, sociology, and their application in the allocation, management and use of the oceans, coastal zones, and inland waters.

For policy related to research programmes, use also 2105

For policy related to pollution, use ASFA-3, 3501

For applied economics of specific non-living resources, use 2424

For general works on living resources use ASFA-1, 1121 or 1565 for fishery legislation

2122 Legislation

National and international legislation dealing with aquatic environments. Law of the Sea (UNCLOS), particularly the law as it concerns research activities in territorial waters, mineral exploitation activities and navigational rights. International agreements, treaties and conventions.

For legislation concerning pollution, use ASFA-3, 3505

For fishery legislation, use ASFA-1, 1565

2123 Conservation

Policy and legislation relating to conservation, environmental restoration, etc. Allocate also to ASFA-3,

3523.

2124 Coastal zone management

Policy, law, regulation and socioeconomics concerning the use of coastal land areas, waterfronts and coastal waters. Impact of offshore activities on these areas. Urban-marine environment management. Planning, boundary problems and conflicts. Regulation of coastal development and human impact. Multiple use of coastal environments and resources. Coastal zone issues related to global change.

For environmental impact, use ASFA-3, 3521-3524

For conservation, use 2123 and ASFA-3, 3523

For pollution, use ASFA-3, 3501-3505

2125 Recreation

Policy and socioeconomic studies of recreation in aquatic environments.

For construction of marinas, use 2327

For sport fishing, use ASFA-1, 1605

2126 Sociology

Works dealing with the sociological aspects of oceanographers and people employed in the offshore engineering industries. Medical services, labour, etc. Technology transfer. Sociopolitical aspects of marine technology and resource development.

For sociological aspects of fisheries, use ASFA-1, 1565

2127 General papers on resources

General or multidisciplinary works concerning the sociopolitical aspects of exploration, evaluation and economics of non-living resources. Water resources management, water use conflicts, river/lake basin development.

For detailed works on living resources, use ASFA-1

For detailed works on exploration and exploitation of non-living resources, use the relevant category from 2401-2406

For applied economics of non-living resources, use 2424

DESCRIPTIVE OCEANOGRAPHY AND LIMNOLOGY

2141 General

General or multidisciplinary works, textbooks, review articles, conference proceedings, encyclopaedias, bibliographies, thesauri, atlases, dictionaries and glossaries etc. on the physical sciences of the oceans, lakes, rivers, etc. Dimensions, geographical division, and nomenclature. Hydrosphere and hydrologic cycle studies. Saline intrusion in rivers and lakes.

Ground water is not included unless specific connections to natural surface aquatic environments are made.

For specific studies on descriptive oceanography and limnology, use the relevant category from 2142-2150

ASFA-2

below.

For theoretical and dynamical studies, use 2161-2171

2142 Methods and instruments

General works on sampling techniques; instrument packages designed for measurements of two or more parameters; water bottles, sensors, bathythermographs, bathymeters, etc. Surface instruments, sensors etc. used in connection with satellite and aerial oceanography/limnology (for which cross-refer also to 2393).

For modelling enter under the relevant parameter. Include here only general modelling methods

For instruments and methods for a single parameter, use the specific category below

For meteorological methods, use 2242

For research vessels and other platforms, use the relevant category from 2301-2303

For diving, use the relevant category from 2341-2346

For communication telemetry, use 2382

For data acquisition and processing, use 2383

For mooring of oceanographic instruments, use also 2386

For deck machinery, e.g. winches, use 2391

For satellite/aerial sensing, use also 2393

(Index the parameters, equipment, methodology and geographic location)

2144 Regional studies, expeditions and data reports

Descriptions of oceans, seas, and lakes; descriptive oceanographic and limnological surveys; named current systems (Gulf Stream, Kuroshio, etc.); natural regions (polar oceanography, equatorial oceanography, tropical oceanography, etc.). Multidisciplinary oceanographic and limnological studies, i.e. involving physical and chemical (and biological) aspects of specific regions or features.

Where relevant to biology, ecology, or fisheries, papers entered here should also be allocated to the relevant ASFA-1 section (e.g. 1381, 1461, 1481, 1567)

Cruise plans and reports, data reports, observations and data collected from fixed stations, e.g. light vessels, weather ships, data buoys, shore stations; aerial and satellite observations and data.

For planning of large-scale multinational and national surveys, use 2105

For wave data, use 2168

For remote sensing, cross-refer to 2393

Descriptions of fishing grounds entered in ASFA-1, 1566 should also be entered here

(Index parameters, methods, feature types, geographic location)

2146 TSD distribution, water masses and circulation

Variation in space and time of temperature, salinity, and density: the factors which determine these distributions. Heat and water budget: water masses, T/S diagrams, TSD, CTD data, thermal structure, etc.; indicators of water masses, including indicator species. Hydrography (i.e. water masses, physicochemical properties, circulation). General circulation treated descriptively rather than mathematically.

For thermal structure, etc. of surface layer, use 2163

For mathematical treatment of ocean dynamics, [use](#) 2164
For thermal structure, etc. of benthic layer, [use](#) 2165
For large-scale meteorological aspects of air-sea interaction, [use](#) 2244
For small-scale aspects of air-sea interaction, [use](#) 2163
For hydrology (i.e. continental surface water dynamics, hydrogeology), [use](#) 2171
For hydrographic surveying (cartography, charting etc.), [use](#) 2385
For indicator species related to pollution, [use](#) ASFA-3, 3504

(Index parameters, methods, feature types, geographic location)

2148 Palaeo-studies

Palaeoceanography, -climatology, -salinity, -ecology, -environments, -limnology, etc. Papers concerned with evidence of sea level stands in the geological past. Reconstructions of palaeodepositional environments based on fossil and geological data.

For palaeomagnetism, [use](#) 2269
For palaeontology, [use](#) 2273

(Index parameters, methods, feature types, geological time periods, geographic location)

2150 Ice

Properties of sea, river, and lake ice; classification and terminology; ice observations and forecasting; seasonal distribution and charts. Global change and ice cover.

Excludes glaciers, snow and permafrost, unless specifically related to aquatic environments.

For meteorology and climatology, [use](#) 2241-2245
For icing-up of ships and structures, [use](#) 2245 (and 2301, 2321-2327 as relevant)
For engineering properties of permafrost, [use](#) 2283
For ice forces on structures, [use](#) 2284
For ice as a source of fresh water, [use](#) 2402

(Index parameters, methods, feature types, geographic location)

DYNAMICAL OCEANOGRAPHY AND LIMNOLOGY

2161 General

General and multidisciplinary works, textbooks, review articles etc. on numerical applications of the movement of water in the ocean, lakes, rivers, etc.

For descriptive applications, [use](#) 2141-2146
For specific dynamical applications, use the relevant category below

2162 Methods and instruments

Works describing techniques for the measurement and modelling of fluid motion (except for waves, for which [use 2168](#)) - current meters, flowmeters, turbulence meters. Mathematical techniques and numerical modelling applicable to dynamic phenomena of oceans, estuaries, rivers, and lakes, etc.

For acoustic current measurement and meters, [use also 2202](#)

(Index the method, phenomena, type of feature, geographic location)

2163 Air-water boundary layer

Dynamical and thermal structure of the atmospheric (marine) boundary layer and the surface (mixed) layer of the ocean: the air-sea interface, air-water interface in lakes and rivers.

Turbulent fluxes of heat, moisture and momentum in the atmosphere, wind profiles and wind stress; Flow of air over water. Theory of surface waves, wind waves. Process of evaporation and heat exchange across the air-water interface. Turbulence in the surface layer; mixing and the mixed layer depth; the thermocline, fronts, streaks, windrows, etc.

For large-scale meteorological aspects of air-sea interaction, [use 2244](#)

For chemistry and transfer of gases at air-water interface, [use 2188](#)

For chemistry of spray, [use 2188](#)

For refraction of radiation at air-sea interface, [use 2223](#)

For practical aspects of wind-waves, [use 2168](#)

(Index the phenomena, method, type of feature, geographic location)

2164 Ocean circulation and currents

Mathematical models of ocean circulation and currents. Indirect methods of current measurement; presentation of current observations, current field. General theory of ocean currents, boundary currents, eddies and rings, upwelling, convergence and divergence. Theories of ocean circulation.

For direct methods of current measurement, [use 2162](#)

For multidisciplinary descriptions of named current systems, [use 2144](#)

For air-sea coupling, [use 2244](#)

For effects of currents on structures, [use 2284](#)

For nearshore currents and estuarine dynamics, [use 2170](#)

For circulation in lakes and river currents, [use 2171](#)

(Index phenomena, method, type of feature, geographic location)

2165 Benthic boundary layer

Interface between the ocean (lakes, rivers, etc.) and the earth beneath, extending from the top of the Ekman layer down to a few centimetres below the sediment surface. Works on the dynamical and thermal structure of the benthic boundary layer; bottom currents, bottom temperature, bottom friction, bottom turbulence. Momentum exchange.

For chemistry of sediment-water interface, [use 2187](#)

For heat flow observations, [use 2268](#)

For sediments and sedimentation, [use 2264](#)

(Index phenomena, methods, type of feature, geographic location)

2166 Internal waves and microstructure

Internal waves in oceans and lakes: observations, analysis, generation, modelling, etc. Effects of internal waves, breaking, microstructure, staircases, salt fingers.

(Index phenomena, methods, type of feature, geographic location)

2167 Tides, surges and sea level

The tide in oceans and other bodies of water; tidal observations, analysis, modelling and prediction; tidal streams, tide tables and atlases, tide gauges and recorders. Tides in estuaries, tidal bores. Lake tides. Global change and sea level.

Surges, tsunamis, and seiches.

Sea level, mean sea level, seasonal variations and secular changes.

For warning services for surges, tsunamis, etc., use 2392

For palaeo-studies, use 2148

For tidal currents in estuaries, bays etc., use 2170

For tidal bores, use also 2170

For lake tides, use also 2171

For coastal geodesy, use 2267

For sea level change due to global change, use also ASFA-3, 3521

(Index phenomena, methods, type of feature, geographic location)

2168 Wind waves

Studies on wind-generated surface waves and practical applications such as design wave, wave spectra, wave climate, wave measurement and recording, and wave prediction.

For papers on *theory* of wave generation, propagation, wave-wave interaction, etc., use 163

For wave dynamics on beaches, use 2170

For papers on wave forces and loading on structures, use 2284

For waves as a source of energy, use 2406

(Index phenomena, methodology, type of feature, geographic location)

2169 Fluid mechanics

Aspects of fluid mechanics relevant to oceanography and limnology which are not covered elsewhere in sections 2161-2171

(Index phenomena, methodology, type of feature, geographic location)

2170 Nearshore dynamics

Circulation in coastal waters, bays, fjords, inlets, straits, estuaries: littoral currents, rip currents, tidal currents, waves on beaches. Edge waves.

For coastal dynamics and erosion/accretion, use also 2271 and 2264

For coastal sediment transport, use also 2264

For tidal bores, use also 2167

(Index phenomena, methodology, type of feature, geographic location)

2171 Dynamics of lakes and rivers

Water movement in lakes, reservoirs, ponds, etc; currents, seiches, stratification. Currents in rivers, channel flow. Interactions between ground water and surface rivers and lakes, etc. Hydrology of rivers and lakes. Inland flooding and flood control.

Exclude hydrology/ground water studies strictly related to water supply and treatment

For lake tides, use also 2167

(Index phenomena, methodology, type of feature, geographic location)

CHEMISTRY AND GEOCHEMISTRY

2181 General

General and multidisciplinary works, textbooks, review articles etc. on the chemistry of oceans, lakes, rivers, etc. General biogeochemical studies.

For specific chemical/geochemical applications, use the relevant categories 182-187 below.

For biochemistry, use the relevant ASFA-1 category

For papers concerned with primary production, use ASFA-1, 1481

For biogeochemical cycles, use also ASFA-1, 1482

(Index physicochemical phenomena, substances, methodology, type of feature, geographic location)

2182 Methods and instruments

Analytical techniques and sampling procedures: *in situ* measurements; sample collection and storage, artificial seawater, Standard Seawater. Salinometers, chromatography, spectroscopy, titration, etc. Calibration. Chemical data processing techniques.

For chemical analysis of pollutants, use ASFA-3, 3502

(Index physicochemical phenomena, substances, methodology, equipment, type of feature, geographic location)

2183 Physics and chemistry

Physical and chemical properties of water as a substance: thermodynamics of seawater, equations of state, seawater as an electrolyte. Salinity, chlorinity and electrical conductance. Temperature, density and pressure. Sigma-T; Delta-T; specific gravity. Conversion tables (e.g. Knudsen's). Density, surface tension, compressibility, viscosity. Thermal properties - specific heat, latent heat, thermal conductivity, calorimetric properties - osmotic pressure, diffusion, physical behaviour of gases, freezing point, vapour pressure. Electrical properties - electrical conductivity, electromagnetic behaviour.

For chemistry of specific water bodies, use the relevant category from 2184-2186

For compression waves (underwater acoustics), use the relevant category from 2201-2205

For radiance (underwater optics), use the relevant category from 2221-2225

For chemistry of suspensions and suspended particles, use 2186

For corrosion, scaling, etc., use 2282

(Index physicochemical properties, substances, phenomena, water type, methodology)

2184 Composition of water

Chemical composition of specific sea, estuary, river, lake etc. water bodies; major and minor elements, nutrients, dissolved salts, gases, carbonate system, history of seawater, inorganic compounds. Radiochemistry: C¹⁴ dating; residence times and mixing. Nutricline.

For physics and chemistry of water as a substance, use 2183

For organic chemistry, use 2185

For chemistry of suspensions and suspended particles, use 2186

For chemistry of sediments, use 2187

(Index physicochemical properties, substances, phenomena, water type, methodology, geographic location)

2185 Organic compounds

Dissolved and suspended organic compounds. Hydrocarbons, carbohydrates, lipids, nucleic acids, organometallic compounds, proteins, chlorophylls, humic substances, etc.

For suspended organic chemistry, use also 2186

For organic chemistry of sediments, use also 2187

(Index physicochemical properties, substances, phenomena, water type, methodology, geographic location)

2186 Chemistry of suspended matter

Chemistry of suspended particulate matter, organic and inorganic. Distribution of suspended matter in oceans, rivers, lakes, etc. Turbidity, nepheloid layer. Marine snow and settling particulates, including shells of radiolarians, foraminiferans, etc. Sediment trap studies.

For suspended organic chemistry, use also 2185

For chemistry of sediments, use 2187

For optical measurement of turbidity, use 2222

(Index physicochemical properties, substances, phenomena, water type, methodology, geographic location)

2187 Geochemistry of sediments

Chemistry and mineralogy of sediments. Sediment-water interface; chemistry of pore (interstitial) water; deposition of ferromanganese nodules and other accretions. Diagenesis. Methanogenesis. Radiochemistry of sediments. Geochemical effects of bioturbation. Geochemistry of hydrothermal deposits.

For organic chemistry of sediments, use also 2185

For chemistry of suspended matter, use 2186

For sedimentology treated non-chemically, use 2264

For petrology and chemistry of rocks, use 2272

For mineral resource exploration/exploitation, use 2404

(Index physicochemical properties, substances, phenomena, water type, methodology, geographic location)

2188 Atmospheric chemistry

Chemical composition and physicochemical properties of the atmosphere insofar as it relates to the chemistry of oceans, estuaries, rivers, lakes, etc. The air-water interface; surface films and surface active agents; gas exchange; chemicals from rain, dust and extraterrestrial material; bubble bursting, aerosol formation, salt nuclei, spray. Troposphere/ocean chemical interaction. Global change and atmospheric chemistry.

For heat and moisture transfer across the air-sea interface, use 2163

For meteorology, use 2241-2245

(Index physicochemical properties, substances, phenomena, water type, methodology, geographic location)

UNDERWATER ACOUSTICS

2201 General

General and multidisciplinary works, textbooks, review articles etc. on sound in, through and above water, air-water interface, sediment-water interface, etc.

For specific works on acoustics of oceans, estuaries, rivers, lakes, etc., use the relevant category from 2202-2205 below.

(Index acoustic and other properties, phenomena, water type, methodology, geographic location)

2202 Methods and instruments

Echosounding and ranging, sidescan sonar, hydrophones, transducers, pingers, acoustic transponders. Signal processing, calibration. Relevant papers on fish detection (ASFA-1, 1564) should be duplicated here.

For acoustic techniques in geology, use also 2262

For acoustic current measurement and meters, use also 2162

(Index acoustic and other properties, phenomena, water type, methodology and geographic location)

2203 Propagation of sound

Properties, observations and modelling of underwater sound generation and propagation: sound velocity, attenuation, absorption, reflection, scattering.

(Index acoustic and other properties, phenomena, water type, methodology, geographic location)

2204 Reverberation

Properties, observations and modelling of reverberation and scattering by water surface, bottom, fish, bubbles, etc., deep scattering layer.

(Index acoustic and other properties, phenomena, water type, methodology, geographic location)

2205 Noise and bioacoustics

Properties, observations and modelling of noise caused by waves, sediment movements, ships, etc.; biological noise. Noise caused by organisms should also be entered in ASFA-1 - use the relevant category under Biology and/or 1421 and/or 1423.

(Index acoustic and other properties, phenomena, water type, methodology, organisms, geographic location)

UNDERWATER OPTICS

2221 General

General and multidisciplinary works on light in, through and above water, ice, air-water interface, etc. including atmospheric optical phenomena related to the aquatic environment.

For specific optical properties, use 2223

For specific works on optics of oceans, estuaries, rivers, lakes, etc., use the relevant category from 2222-2225

(Index optical and other properties, phenomena, water type, methodology, geographic location)

2222 Methods and instruments

Techniques of underwater light measurement: photometry, radiance and irradiance collectors; Secchi disc: nephelometer.

For observations on turbidity and chemistry, use also 2186

(Index optical and other properties, phenomena, water type, methodology, geographic location)

2223 Optical properties

Properties, observations and modelling of light in oceans, estuaries, rivers, lakes, etc. Light attenuation, absorption, scattering: radiation, radiance, irradiance, reflection at surface (albedo), refraction, radiative transfer: optical classification: colour, fluorescence, polarization. Light underwater. Effects of clouds and atmospheric parameters on solar radiation properties of aquatic environments.

For solar and terrestrial radiation as components of heat budget, use 2146
(Index optical and other properties, phenomena, water type, methodology, geographic location)

2225 Underwater viewing

Visibility underwater: illumination and light sources; photography, television. Vision in the sea. Underwater cameras.

MARINE METEOROLOGY AND CLIMATOLOGY

2241 General

General and multidisciplinary works, textbooks, review articles etc. on meteorology and climatology related to problems in oceanography and limnology, marine technology, and the biology of aquatic organisms and fisheries. Climates of the oceans. Climate prediction, climate change, greenhouse effect, global warming.

Weather studies of continental areas are excluded except where associated with the marine/aquatic environment, e.g. teleconnections between sea surface temperature and rainfall over land.

For more specific studies, use 2242-2245 below.

For past climates, use also 2148

For human impact on climate and global change, use also ASFA-3, 3521

For air-sea(-ice) interaction, air-sea coupling, ocean-atmosphere system, etc., use 2244

(Index phenomena, water type, methodology, geographic location)

2242 Observations and measurements

Practical marine/aquatic meteorology and climatology; weather instruments, visual observation methods, Beaufort Scale and sea state scales; platform sensors - meteorological data buoys, ocean weather ships, selected ships/ships of opportunity. Weather forecasting. Data compilations. Satellite and aerial meteorological techniques.

For measurement of sea surface temperature, use also 2142 (for methodology) and/or 2146 (for observations)

For Beaufort Scale and sea state scale, use also 2168

For weather ships, use also 2301

For data buoys, use also 2303

For satellite/aerial sensing, use also 2393

(Index phenomena, parameters, water type, methodology, equipment, geographic location)

2243 Structure, mechanics and thermodynamics

Physical properties, observations and modelling of the atmospheric processes and events which interact with oceans, estuaries, rivers, lakes etc; radiation and temperature, atmospheric pressure, moisture in the atmosphere, precipitation, humidity, clouds, fog, etc. Motion in the atmosphere, wind systems, local winds, hurricanes, waterspouts, etc. Exclude strictly atmospheric studies which do not deal directly with the

aquatic environment.

General circulation models (GCMs) which include tropospheric and/or ocean dynamics. Atmospheric circulation where this includes an oceanic component.

For dynamic and thermal structure of the atmospheric boundary layer, use also 2163

(Index phenomena, water type, methodology, geographic location)

2244 Air-sea coupling

Properties, observations and modelling of large-scale ocean-atmosphere interactions: effects of surface anomalies on atmospheric circulation, etc. ocean-atmosphere system. Dynamic treatment of the ocean and atmosphere as a single coupled system. Air-sea (-ice) interaction.

For small-scale air-sea interactions, use 2163

For climate change, use also ASFA-3, 3521

(Index phenomena, water type, methodology, geographic location)

2245 Ship routing and icing

Ice-breaking, ice-navigation, etc. Icing-up of ships and structures.

For ice forces on structures, use 2284

GEOLOGY AND GEOPHYSICS

2261 General

General and interdisciplinary works, textbooks, review articles, etc. on the geology and geophysics of ocean basins, continental margins, river and lake basins etc. Regional geological studies of aquatic environments. Reports of expeditions (e.g. ODP).

Geological studies of present-day continental or island regions are included if information on their earlier marine or aquatic settings are a significant component. Includes stratigraphic, sedimentologic, lithologic and petrologic interpretation of fluvial, lacustrine, deltaic, estuarine, reefal, shelf and marine palaeoenvironments, and evolution of ancient and modern sedimentary basins.

For specific geological and geophysical studies, use the relevant category from 2262-2274 below.

(Index phenomena, features, substances, water type, methodology, geographic location)

2262 Methods and instruments

Techniques employed in geological and geophysical exploration. Sampling devices - grabs, dredges, corers. Seismic refraction and reflection. Deep-sea drilling. Drilling equipment and technology. Gravimeters, magnetometers, heat-flow probes. Satellite and aerial sensing techniques.

For sidescan sonar and echosounding, use also 2202

For bottom photography, use also 2225

For drilling vessels, use 2301

For hydrographic surveying and cartography, use 2385

For oil and gas production drilling, use also 2405

For satellite/aerial sensing, use also 2393

(Index properties, equipment, features, phenomena, substances, water type, methodology, geographic location)

2263 Topography and morphology

Topographic, bathymetric and morphological studies of geological features of oceans, estuaries, rivers, lakes, etc. Continental margins: shelf, slope, rise, canyons, cones. Submarine features, bottom topography. Ocean basins: abyssal plains, mid-ocean ridges, fracture zones, trenches and island arcs, seamounts. Morphology and physiography of rivers and lakes.

For coastal morphology, use 2271

(Index features, water type, methodology, geographic location)

2264 Sediments and sedimentation

Observations, analysis and modelling etc. of sediments, sedimentary processes and properties. Texture, lithology and distribution of sediments. Erosion, transport and deposition of unconsolidated sediments. Bed load and bed forms - sand ripples, sand waves, deltas, etc. Sedimentary environments. Erosion of river and lake beds and banks. Scouring. Slides and slumping. Particle flux.

For chemistry of sediments, use 2187

For engineering/physical and mechanical properties of sediments, use 2283

For dynamics of sediment transport in benthic boundary layer, use also 2165

For coastal dynamics and erosion/accretion, use also 2170 and 2271

For geological hazards for structures, use 2283

(Index features, phenomena, substances, water type, methodology, geographic location)

2265 Sedimentary structures and stratigraphy

Observations, analysis and modelling etc. of sedimentary rocks - stratification and form, current bedding, folding, unconformities, etc. Succession and interpretation. Petroleum geology.

For benthic boundary layer dynamics, use 2165

For palaeo-studies, use 2148

(Index features, phenomena, substances, water type, geological time period, methodology, geographic location)

2266 Tectonics and crustal structure

Observations, modelling etc. of geodynamics, plate tectonics, seafloor spreading, continental drift: hot spots, upper mantle, lithosphere, asthenosphere. Tectonophysics, vertical tectonics, crustal adjustment, rifting, orogeny etc. The extent to which structural geology beneath the ocean is included is equivalent to the interests and scope of the Ocean Drilling Program.

For seismic events, use 2270

(Index features, phenomena, water type, geological time period, methodology, geographic location)

2267 Gravity and geodesy

Observations, modelling etc. of the earth's gravity in oceans, estuaries, lakes, rivers etc. Gravimetry. Gravity anomalies, gravity exploration. Earth tides.

Marine and coastal geodesy: measurement and determination of the geoid, datum levels, geodetic coordinates.

For tides and sea level, use 2167

For bathymetry, use 2262 and/or 2263

For hydrographic surveying and cartography, use 2385

For positioning and navigation, use 2387

For satellite altimetry, use also 2393

(Index features, phenomena, water type, methodology, geographic location)

2268 Heat flow

Thermal budgets of submarine crust, heat transfer between mantle, bedrock, sediment and water. Geothermal properties relevant to the marine/aquatic environment. Temperature-related aspects of hydrothermal vents, hot springs, etc.

For geothermal power relevant to the marine/aquatic environment, use also 2406

(Index features, phenomena, water type, methodology, geographic location)

2269 Geomagnetism

Magnetic anomalies, magnetic surveys, palaeomagnetism, polar wandering.

(Index features, phenomena, water type, methodology, geographic location)

2270 Seismology

Measurement and recording of natural seismic events, e.g. earthquakes, faulting, submarine volcanoes, crustal oscillation. Data on strength, epicentre, Richter scale, extent, properties of seismic waves, etc. Seismometers, tiltmeters. P-waves, S-waves, L-waves.

For acoustics, use the relevant category from 2201-2205

For seismic methods, use 2262

For seismic stratigraphy, use 2265

For tectonics, use 2266

(Index features, phenomena, water type, methodology, geographic location)

2271 Coastal morphology

Coastal classification of beaches and shoreline development, changes in coastal morphology over time, erosion, accretion. Geomorphology of bays, deltas, estuaries, lagoons, inlets, barrier islands, barrier beaches, sandy beaches, rocky shores, cliffs, coastal features, etc.

For coastal dynamics and erosion/accretion, use also 2170 and 2264

For longshore currents, use 2170

For waves on beaches, use 2170

For sediment transport, use 2264

For shore protection, use 2327

(Index features, phenomena, water type, methodology, geographic location)

2272 Petrology and chemistry of rocks

Geochemistry of igneous, metamorphic, and sedimentary rocks. Mineralogy.

For geochemistry of sediments, use 2187

For tectonics, use 2266

For mineral resources, use 2404

(Index features, phenomena, water type, methodology, geographic location)

2273 Palaeontology

Geological aspects of marine/aquatic fossil organisms, including palynology, biostratigraphy and micropalaeontology.

For biology of fossil forms, use also ASFA-1, 1187

For palaeoceanography, use also 2148

For stratigraphy, use 2265

For continental drift, use 2266

(Index features, phenomena, water type, geological period, species, methodology, geographic location)

2274 Coral reefs

Geological aspects of coral reefs, atolls, lagoons and barrier reefs. Reef formation and erosion, damage, etc.

For damage to reefs by human impact, storms, etc., use also ASFA-3, 3521

For habitat, communities, etc. of reefs, use ASFA-1, 1463

(Index features, phenomena, water type, species, methodology, geographic location)

2281 General

General and multidisciplinary works, textbooks, review articles etc. on offshore engineering, and papers concerned with general problems encountered in the application of the various branches of engineering in the marine/aquatic environment.

For specific studies, use the relevant category(-ies) below.

For technology of vessels, underwater vehicles and buoys within the scope of ASFA-2, use the relevant

category from 2301-2303

For papers on offshore and coastal structures, use the relevant category from 2321-2327

For vessels used in the offshore industry, use 2301 and other relevant category, e.g. 2405

(Index phenomena, materials, equipment, methodology, geographic location)

2282 Materials technology, corrosion, fouling and boring

Materials in ocean engineering, requirements, properties and selection; metals, non-metals, buoyant materials. Corrosion and corrosion prevention/control. Cathodic protection, sacrificial anodes. Fouling, boring, scaling, biodeterioration etc. and their control.

Papers on biology of fouling, corroding and boring organisms entered under this section should also be assigned to ASFA-1, 1541 or 1542, however strictly engineering studies should only be assigned to ASFA-2. Papers dealing with biofouling on the surface of cultured organisms, e.g. molluscs, should not be allocated to ASFA-2, but fouling on aquaculture structures and equipment should be allocated to both ASFA-1 and ASFA-2.

(Index phenomena, materials, equipment, methodology, geographic location)

2283 Soil mechanics

Marine geotechnology, engineering properties of soils and sediments, their effects on structures and construction methods: iceberg, current and wave scouring, earthquake effects on structures, etc. Piles and foundations, bearing capacity. Geological hazards such as landslides, slumping.

2284 Hydrodynamics, wave, current and ice forces

Effects of water movement and wind on fixed, floating, semisubmersible or tethered structures, platforms, piles, pipelines, coast defences, etc.: wave forces, current forces, wind forces (wind pressure), ice loads. Towing/transport dynamics of offshore structures.

For other practical aspects of waves such as wave climate, wave measurement, and wave prediction, use 2168
For environmental loading and hydrodynamics of ships, use 2301 and cross-refer to 2284

(Index phenomena, materials, equipment, methodology, geographic location. Index proper name of vessels etc. in identifier field)

VESSELS, UNDERWATER VEHICLES AND BUOYS

2301 Surface vehicles

Research vessels, survey vessels, drilling vessels, support vessels, tenders for submersibles, crane barges, pipelay barges, lifeboats, mining ships, diving support vessels, supply boats, dredgers, icebreakers, protection vessels, tugs, weather ships. Aspects of catamarans, hovercraft, hydrofoils, swath ships, sailing vessels etc. relevant to the scope of ASFA.

Excluded are theoretical or general studies of ship design, naval architecture and engineering not applicable to the vessels listed above, or to other categories falling within the scope of ASFA.

Papers describing any type of vessel used for fishing or fishery surveys should be assigned to ASFA-1, 1562, and only included in ASFA-2 if dealing with engineering, fouling, navigation or other topics within the ASFA-2 scope.

ASFA-2

(Index vessel type, applications, equipment, methodology, geographic location. Index proper name of vessels in the identifier field)

2302 Underwater vehicles

Design, specifications, equipment, performance, operations etc. of manned and unmanned underwater vehicles, submersibles, tethered, towed and cable-controlled vehicles, towed seabed vehicles, bottom crawlers, observation chambers, diving bells.

Manipulators, thrusters, hulls, propulsion and manoeuvring systems etc.

For underwater cameras, television, etc., use 2225

For support ships, use 2301

For seafloor habitats, use 2326

For diving and life support systems in underwater vehicles, use 2343 and 2344

For underwater navigation, use 2387

For use of underwater vehicles for inspection, maintenance and repair, use also categories from 2321-2327 and/or 2281-2284 as relevant

For applications of underwater vehicles in the mining industry, use also 2404

For applications of underwater vehicles in the oil and gas industry, use also 2405

(Index vehicle type, applications, equipment, methodology, geographic location. Index proper names of vehicles in the identifier field)

2303 Buoys and buoy systems

Oceanographic/meteorological data buoys, large navigation buoys. Buoy systems, design and components.

For offshore loading buoys, use 2323

For buoy mooring lines and systems, use 2386

For buoy data acquisition/communication, use also 2382 and 2383

For navigation lights, beacons, etc., use 2387

(Index buoy type, applications, equipment, methodology, geographic location. Index proper names of buoys and systems in the identifier field)

OFFSHORE AND COASTAL STRUCTURES

2321 General

General and multidisciplinary works, textbooks, review articles etc. on offshore structures, coast defences, river engineering etc. Engineering problems, e.g. stress, structural mechanics, loading, welding, joints, fatigue strength, crack propagation, fractures, strain, inspection/maintenance/repair, etc. when specifically related to structures in marine, coastal or other aquatic environments.

For materials technology, corrosion, fouling, scaling, boring etc., use 2282

For wave, wind, current, ice forces on structures, use 2284

For specific types of structures, use the relevant categories from 2322-2327 below

(Index structure type, applications, equipment, methodology, geographic location)

2322 Drilling and production rigs

Description, design, construction, specifications, equipment, facilities, operations, inspection/maintenance/repair, etc. Includes semisubmersibles, jackets, caissons, floating structures, tension-leg (tethered) platforms, articulated columns, jackup rigs, risers, subsea completion systems, wellheads, etc. Topside structures, drilling towers, helidecks, accommodation, flare stacks, etc.

For materials technology, corrosion, fouling, scaling, boring etc., use 2282

For drilling equipment, use also 2262

For wave, wind, current, ice forces on structures, use 2284

For drilling vessels (e.g. *JOIDES Resolution*), use 2301

For oil and gas operations, use 2405

(Index structure type, applications, equipment, methodology, geographic location (including oil/gas field).
Index proper names of structures in the identifier field)

2323 Storage systems and tanker terminals

Description, design, construction, specifications, equipment, facilities, operations, inspection/maintenance/repair, etc. Includes offshore and coastal terminals, tankers used as fixed storage facilities, loading buoys.

(Index structure type, applications, equipment, methodology, geographic location including oil/gas field)

2324 Artificial islands

Description, design, construction, specifications, equipment, facilities, operations, inspection/maintenance/repair, etc. Includes airports, deep-water terminals, power plants, ice islands, etc.

For dredging, use 2384

(Index structure type, applications, equipment, methodology, geographic location including oil/gas field)

2325 Pipelines

Description, design, construction, specifications, equipment, facilities, operations, inspection/maintenance/repair, routing, etc. Includes sewage outfalls, oil and gas pipelines, flowlines, hoses, pipe laying, pigging, pipeline protection, trenching, burial, etc.

For trawl collisions with pipelines, use also ASFA-1, 1562

For materials, corrosion, fouling, scaling, boring etc., use 2282

For geotechnology, use 2283

For wave, current, ice forces, use 2284

For pipelay ships, use also 2301

For pollution aspects of outfalls, use ASFA-3, 3501-3524

For dredging, etc., use also 2384

For oil and gas operations, use also 2405

(Index pipeline type, applications, equipment, methodology, geographic location including oil/gas field)

2326 Sea floor installations

Description, design, construction, specifications, equipment, facilities, operations, inspection/maintenance/repair, site investigation, etc. Includes seafloor habitats, engineering aspects of

mariculture works.

For mariculture works, use also ASFA-1, 1581-1588

(Index installation type, applications, equipment, facilities, methodology, geographic location)

2327 Coast defences and harbour works

Description, design, construction, specifications, equipment, facilities, operations, inspection/maintenance/repair, etc. Includes breakwaters, groynes, jetties, causeways, harbour installations, marinas, erosion control structures and revegetation.

For coastal zone management, use 2124

For materials, corrosion, fouling, scaling, boring, etc., use 2282

For geotechnology, use 2283

For wave, wind, current, ice forces, use 2284

For river engineering, levees, weirs, etc., use 2321

For revegetation, use also ASFA-3, 3522

(Index structure type, applications, equipment, facilities, methodology, geographic location)

MAN-IN-THE-SEA AND DIVING

2341 General

General and multidisciplinary works, textbooks, literature reviews, etc. on diving and man-in-the-sea. Working underwater, diving aspects of underwater archaeology, diving surveys. Diver safety and diving regulations.

Exclude popular articles.

For more specific studies, use categories 2342-2346 below

For history of diving cross-refer to 2107

For diving vessels, use 2302

For diving support ships, use 2301

(Index diving technique, equipment, applications, geographic location)

2342 Physiology and medicine

Effects of hydrostatic pressure, narcosis, decompression, speech distortion, hypothermia, etc. on performance, cardiovascular system, respiration, brain function, body temperature, etc. Treatment of diving-

related stress and injuries. Breathing mixtures.

Exclude hyperbaric medicine (pressurization and oxygen therapy, etc.) for non-diving medical conditions.

For vision in the sea, use 2225

For breathing apparatus, use 2344

(Index diving technique, diving physiology)

2343 Diving systems

Description, design, specifications, equipment, operation, performance, etc. Includes free and hard-hat diving: suits, tanks, skin-diving, SCUBA, pressurized suits.

For submersibles, use 2302

For seafloor habitats, use 2326

(Index diving technique, equipment, applications, geographic location)

2344 Life support

Description, design, specifications, equipment, operation, performance, etc. of life support systems used by divers and in underwater vehicles: breathing apparatus, oxygen supply, removal of carbon dioxide (CO₂ scrubbers), waste treatment, etc.

For breathing mixtures, use 2342

(Index diving technique, equipment, applications, geographic location)

2345 Pressure chambers

Description, design, specifications, equipment, operation, performance, etc.
Includes decompression chambers, simulated dives, saturation diving systems.

(Index diving technique, equipment, applications, geographic location)

2346 Dangerous organisms

Hazardous organisms which bite, sting, or wound in some way. Shark attacks.
Papers included under this section should also be assigned to ASFA-3, 3524.

(Index diving technique, type of hazard, organisms, geographic location)

SUPPORT SERVICES, TECHNIQUES AND EQUIPMENT

2381 Cables

Description, design, specifications, equipment, operation, performance, etc.
Includes power and communication cables, connector devices, cable design, handling, and damage.
Submarine cables and cable-laying. Shark bite, cable protection.

Excludes mooring and towing cables.

For trawl collisions with submarine cables, use also ASFA-1, 1562

For cable ships, use also 2301

For mooring cables, cable dynamics, etc., use 2386

For towing cables, use 2391

2382 Communication telemetry

Communication telemetry relevant to oceanography, marine meteorology, ocean engineering, etc.

Telecommunications: satellite, radio, telephone, television, telex, fax, microwave, Morse code, ship-to-shore, submersibles and diver communication systems, etc. Data transmission.

For navigation systems, use 2387

For satellite sensing, use 2393

(Index communication system, equipment, application, geographic location. Index proper names of satellites, etc. in identifier field)

2383 Data acquisition and processing

Data acquisition and processing systems employed in oceanography, marine meteorology and ocean engineering. Data processing computer hardware and software, data loggers, plotters, converters, data applications of GIS (Geographic Information Systems) etc.

For information services, use 2103

For oceanographic equipment, use 2142

For meteorological equipment, use 2242

For GIS related to living resources assessment and development, use the appropriate categories for Fisheries, ASFA-1 1601-1605, and Aquaculture, ASFA-1, 1581-1588

For GIS related to non-living resources assessment and development, use 2401-2406 or 2121-2127

For GIS related to pollution and environmental quality, use the appropriate categories of ASFA-3

(Index applications, techniques, parameters, geographic location. Index proper names, acronyms of systems etc. in the identifier field)

2384 Dredging

Channel clearance, excavation, harbour works, handling of dredged materials, mud, slurry, etc. Dredging equipment.

For dredging vessels, use also 2301

For mining, use 2404

(Index equipment, operations, vessel type, environment, geographic location. Index vessel name in the identifier field)

2385 Hydrographic survey and cartography

Papers on hydrographic surveying relevant to oceanography, cartography, bathymetric charts etc. General works on geographic information systems (GIS). Nautical charts. Archaeological surveying.

For specific applications of GIS enter under the relevant category and cross-refer to 2385

For hydrographic survey ships, use also 2301

For hydrography, use 2144 or 2146

(Index instruments, systems, operations, vessel type, geographic location. Index vessel name in the identifier field)

2386 Mooring and dynamic positioning

Includes anchors and mooring cables, cable dynamics, single-point mooring, dynamic positioning, dynamic anchoring.

For position fixing and navigation, use 2387

(Index instruments, systems, operations, vessel type, geographic location. Index vessel name in the identifier field)

2387 Navigation

General papers on navigation systems, position fixing, etc. relevant to oceanography and ocean engineering, including underwater navigation. Navigational aids, e.g. lights, signals, beacons, radio, radar, Decca, Loran, satellites, navigational charts, computers, etc.

(Index instruments, systems, operations, vessel type, geographic location. Index vessel names in the identifier field)

2388 Ocean operations and safety

Safety at sea, safety devices and standards, safety on oil rigs, vessels, etc. Offshore protection. Ship handling and seamanship, station keeping, handling equipment at sea. Transportation of personnel, supplies, etc. for offshore operations.

For safety of fishing vessels, or during fishing operations, use ASFA-1, 1562

For safety during processing of fishery products, use ASFA-1, 1623

For policy aspects of offshore protection, use 2121/2122

For safety/standby vessels, use also 2301

(Index operations, vessel type, geographic location. Index vessel name as identifier)

2389 Power systems

Power systems, sources, and transmission for use in oceanographic, meteorological, and ocean engineering equipment and vehicles: batteries, fuel cells, radioisotopes, nuclear, combustion.

For waves and currents as a source of power, use 2406

(Index equipment, applications, vessel type. Index vessel names in the identifier field)

2390 Search and salvage

Search and salvage methods and equipment: attachment, lifting, flotation, recovery of cargo and

equipment, removal of debris.

For salvaging vessels, use also 2301

For hydrographic surveying, use 2385

(Index operations, equipment, vessel type, geographic location. Index vessel names in identifier field)

2391 Tools, rigging and deck machinery

Wire rope, winches, davits, cranes, towing booms, towing lines, etc.

(Index operations, equipment, vessel type, geographic location. Index vessel names in identifier field)

2392 Warning services against catastrophes

National and international services in operation for warning of storm surges, tsunamis, hurricanes, cyclones, floods, etc.

(Index phenomena, geographic location)

2393 Remote sensing (Remote geosensing used before 1995)

General works concerned with the collection of data by a sensing device which is not in contact with the object being sensed, and the evaluation of the collected data, which is then termed information (i.e. map or statistics). Platforms (e.g. satellites, spacecraft, aircraft, balloons etc.) and sensors (e.g. cameras, radiometers, radar etc.) description, design, specifications, equipment, operation, performance, etc. Oceanography, limnology, geology, meteorology etc. from space.

For specific applications, use the relevant category(ies) and cross-refer to 2393.

(Index sensing platform, parameters, phenomena, instruments, geographic location. Index proper names of satellites, systems, programs etc. in the identifier field)

RESOURCES

2401 General

General and multidisciplinary works, textbooks, review articles, etc. on non-living resources, their exploration and exploitation. For specific studies, use the relevant categories 2402-2406 below.

For policy, legislation, sociology, etc. relating to non-living resources, use 2121/2122/2126

For general papers on water resource management, use, development etc., use 2127

For vessels used in exploration and exploitation of non-living resources, use also 2301

For effects of exploitation on the environment, use ASFA-3

(Index processes, equipment, materials, methodology, geographic location)

2402 Freshwater from the sea

Desalination by distillation, electrodialysis, evaporation, ion exchange, membranes, osmosis, etc.; water from icebergs, submarine springs.

(Index processes, equipment, materials, methodology, geographic location)

2403 Chemicals from sea water

Extraction of dissolved minerals in seawater.

(Index processes, equipment, materials, methodology, geographic location)

2404 Minerals

Surveys, exploration and exploitation of mineral resources in marine and freshwater environments, including coastal regions. Bottom deposits: phosphorite, ferromanganese nodules, sand and gravel, aggregates, placers, diamonds, ores, coal, metalliferous sediments, etc. Deep-sea mining techniques and equipment.

For chemistry of these minerals, use 2187 or 2272

For Law of the Sea and mineral resources, use also 2122

For sediments and sedimentology, use 2264

For mining vessels, use also 2301

For dredging, use 2384

For oil and gas, use 2405

For commerce, trade and economics of mineral resources, use 2421-2425

(Index minerals, techniques, equipment, geographic location)

2405 Oil and gas

Surveys, exploration and exploitation of petroleum and natural gas resources in marine and freshwater environments, including coastal regions, oil sands, etc. Resource extent and depletion. Offshore oil and gas industry, equipment manufacturers and suppliers, etc. National and regional reviews of offshore oil and gas activity.

For Law of the Sea and oil and gas resources, use 2122

For drilling techniques and equipment, use 2262

For petroleum geology, use 2265

For drilling vessels, use also 2301

For drilling rigs and production platforms, use 2322

For commerce, trade and economics of oil and gas, use 2421-2425

(Index techniques, equipment, geographic location including oil/gas field)

2406 Energy from the sea

Theoretical aspects, surveys and assessment of renewable energy resources from the sea: wave power, tidal power, current power, OTEC, thermal and salinity gradients. Design, construction and performance of

devices for energy extraction/conversion.

Include wind power only in marine/coastal locations.

Include geothermal energy only where applicable to marine/aquatic settings.

For solar power devices, use 2389

(Index energy type, equipment, techniques, geographic location)

COMMERCE, TRADE AND ECONOMICS

2421 Marketing and economics: General

General and multidisciplinary works, textbooks, review articles etc. on marketing, commerce, trade and economics of non-living aquatic resources.

For specific studies, use the relevant category 2422-2425 below.

(Index resource, marketing/economics applications, country names)

2422 Storage and transport

Storage and transportation of oil and gas, minerals, etc. on board cargo ships, ULCC, VLCC, etc. Load-on-top, tanks, handling methods. Administration of transport and storage of non-living resources.

For offshore and coastal storage systems and tanker terminals, use 2323

(Index resource, storage/transport applications, geographic location)

2423 Marketing

Marketing of non-living resources, quantitative aspects of advertising, marketing, supply and demand in domestic and international markets, prices, trade methods and customs.

(Index resource, marketing applications, country names)

2424 Applied economics

Economics of non-living resources industries, cost/profit analysis, valuation of resources, accounting, business statistics, short-term planning and finance. Taxation, levies and insurance.

(Index resource, economic applications, country names)

2425 Commodity and trade statistics

Commercial trade statistics of non-living resources. International trading.

(Index resource, trade applications, country names)

ASFA-3, AQUATIC POLLUTION AND ENVIRONMENTAL QUALITY SCOPE DESCRIPTIONS

AQUATIC POLLUTION

3501 General

General and multidisciplinary works on aquatic pollution and water quality, including sewage, chemical, oil, microbial, radioactive, industrial, agricultural, aquacultural, acid, thermal and other contaminants of marine, brackish and freshwater environments. Papers on waste disposal and dumping in natural waters. Sewage treatment, air pollution and soil pollution where clearly related to pollution of natural waters.

Other general aspects related specifically to aquatic pollution and environmental quality corresponding to sections 1101-1110 in ASFA-1 and ASFA-2: institutes and organizations, information services, personal, research programmes and expeditions, history and development, education, books, atlases and charts, and translations.

Groundwater¹ pollution studies (except strictly water supply aspects) are included only where related to surface freshwater, estuarine and coastal marine environments, or where groundwater methodology, analysis etc. are also applicable to natural surface waters. Where not directly related to the natural aquatic environment, the following are excluded: studies of groundwater (karsts, aquifers, wells), municipal and industrial water quality, contamination, treatment and supply, sludge, drinking water.

Naturally occurring metals, hydrocarbons, radioactive substances, or pollutants used as tracers should be

¹ The term "groundwater" in these guidelines, and in the ASFA thesaurus, does not refer to "pore water", "interstitial water", or "soil water", for all of which "pore water" is used.

included in the appropriate section of ASFA-1 or ASFA-2.

(Index pollutants, environment, methodology, organisms, geographic location)

3502 Methods and instruments

Analytical and detection methods and instruments, pollution monitoring and surveillance methodology, including chemical fingerprinting and use of bioindicators. Bioassay and biomonitoring methods.

For bioindicators (indicator species), use also 3504

For methods used for pollution prevention and control, use 3505

(Index pollutants, environment type, habitat, methodology, organisms, geographic location)

3503 Characteristics, behaviour and fate

Physical/chemical studies of aquatic pollution, including surveys, baseline studies, distribution, dispersion, geochemical cycling, weathering, degradation etc. Studies on eutrophication/nutrient loading due to human impacts should be included here. Fate of contaminants, including chemical reactions, photolysis, metabolism/biogeochemical cycling by organisms.

For eutrophication, consider also ASFA-1, 1461/1481/1482, and ASFA-2, 2181-2188.

For metabolism of contaminants by organisms, use 3504.

(Index pollutants, environment type, habitat, methodology, organisms, geographic location)

3504 Effects on organisms

Effects of pollution, including thermal pollution, on the biology of aquatic organisms and communities, including fisheries and aquaculture. Studies on the level and toxicity of pollutants in organisms.

Xenobiotic metabolizing systems or other physiological responses should also be allocated under the appropriate biology (i.e. physiology) ---6 category of ASFA-1.

For bioindicators (indicator species) of pollution, use both 3502 and 3504

For pollution effects on fisheries, use also ASFA-1, 1601-1605

For pollution effects on aquaculture, use also ASFA-1, 1581-1588

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

(Index pollutants, environment type, habitat, methodology, organisms, geographic location)

3505 Prevention and control

Pollution prevention, mitigation and control measures, including remedial action, clean-up, education, legislation, and national and international policy. Bioremediation, oil dispersants, skimmers, booms etc.

For pollution detection methods, analytical techniques, bioassays, use 3502

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

(Index pollutants, control measures/legislation, environment type, habitat, methodology, organisms, geographic location)

ENVIRONMENTAL QUALITY

3521 Mechanical and natural changes

Impact of man-made changes such as dams, barriers, dredging, construction and dumping. Effects of aquaculture on the environment such, impact of introduced species and genetically modified species, salinization of freshwater, effects on mangrove forests and wetlands, displacement of coastal communities. Causes and effects of natural physical and chemical changes in the aquatic environment, including climatic factors, natural disasters, geochemical changes, water flow, storms, wave action, tides and ice; effects of storms, monsoons, flooding, etc. on waters, substrates and organisms. Environmental impacts of global change.

For effects of aquaculture on the environment, use also ASFA-1, 1588

(Index causes, impacts, environment type, habitat, methodology, organisms, ecosystem, geographic location)

3522 Protective measures and control

Protective measures against environmental changes mentioned above in 3521, including environmental impact policy and legislation. Mitigation, contingencies. Revegetation for coastal erosion control.

For revegetation for coastal erosion control, use also ASFA-2, 2327

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

(Index causes, impacts, control measures/legislation, environment type, habitat, methodology, organisms, geographic location)

3523 Conservation, wildlife management and recreation

Studies of conservation and management of natural aquatic environments and endangered species. Wildlife and national parks; wildlife management; recreational aspects of the aquatic environment. Policy and legislation relevant to conservation, wildlife management and recreation. Wetland restoration, habitat reclamation, etc.

For conservation policy/legislation, use also ASFA-2, 2123

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

(Index conservation etc. aspects, legislation, environment type, habitat, methodology, organisms, geographic location)

3524 Public health, medicines and dangerous organisms

Medical aspects and hazards pertaining to natural aquatic environments, including malaria, schistosomiasis, filariasis, red and brown tides, noxious algal blooms, etc.; food poisoning due to aquatic organisms; human pathogens, biological toxins and dangerous organisms.

For microbial contamination of aquatic environments by human pathogens, use also the appropriate category from 3501-3505.

For pest control, use ASFA-1, 1485

For effects of aquaculture on the environment, use 3521 and also ASFA-1, 1588

(Index public health etc. aspects, types of disease, methodology, organisms, geographic location)

ASFA-3

ASFA-3

NOTES ON SPECIAL MULTIDISCIPLINARY AREAS

The scope notes given below bring together the appropriate categories for the multidisciplinary areas of Global Change and Biotechnology. These scope notes are also itemized under the respective ASFA-1, -2, and -3 subject categories in the main text.

Global Change - only include if directly relevant to the aquatic environment.

For biodiversity and other ecological aspects related to global change, use ASFA-1, 1381 or other ecology categories

For role of plankton in the carbon cycle and atmospheric CO₂, use ASFA-1, 1461, 1481, and/or 1482

For strictly climatological studies, use ASFA-2, 2241-2245 if relevant

For interaction between the atmosphere and the ocean, general circulation models, ENSO phenomena etc., use ASFA-2, 2244

For sea level rise, use ASFA-2, 2167

For impact on coastal zone, use ASFA-2, 2124

For atmospheric chemistry, greenhouse gases, use ASFA-2, 2188 if relevant

For physical oceanography and global change, use ASFA-2, 2141-2150 or 2161-2171

For global warming and ice-cap melting, use ASFA-2, 2150 if relevant

For environmental impact of global change, use ASFA-3, 3521 if relevant

Biotechnology

(For *ASFA Marine Biotechnology Abstracts* subject categories see page 19)

For molecular biology of aquatic organisms, use the relevant ASFA-1 biology category (e.g. genetics, physiology)

For bioactive properties of metabolites, potential for medical applications (vaccines, antibiotics, antifungal agents, antitumour agents, etc.), use ASFA-1, 1625

For genetic engineering etc. of cultured organisms, use the relevant aquaculture category, ASFA-1 1581-1588

For culture of microalgae, use ASFA-1, 1585

For microbial molecular biology involving breakdown of pollutants, bioremediation, etc., use ASFA-3

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