

시소러스를 이용한 해양정보검색시스템의  
효율성 향상 연구

A study on the Efficiency of Oceanographic  
Information Retrieval System Using a Thesaurus

1996. 5.

한국해양연구소

# 提 出 文

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본 보고서를 “시소러스를 이용한 해양정보검색시스템의 효율성 향상 연구” 과제의 최종연구 보고서로 제출합니다.

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# 要 約 文

## I. 제 목

시소러스를 이용한 해양정보검색시스템의 효율성 향상 연구

## II. 연구개발의 목적 및 중요성

최근 과학기술분야의 연구개발 결과물로서 정보자료의 생산이 급속히 증가하고 있으며 광범위한 주제의 정보자료를 데이터베이스화하여 관련 주제분야의 연구정보로 활용하기 위해서는 데이터베이스 구축시 색인단계에서 동의어, 유사동의어 등의 적절한 용어통제가 필요하다.

시소러스개발을 통하여 자연어검색시스템의 문제점으로 지적되어온 동의어, 동음이의어, 유사어 등을 디스크립터로 통합시키고, 각 주제어간의 상하계층, 관련관계를 정의하므로써 색인과 검색에서의 효율성을 향상시키고 보다 효과적인 정보관리시스템구축에 기여함을 목적으로 한다.

한국해양연구소는 국내 유일의 종합 해양연구기관으로서 해양의 전 분야에 걸쳐 각종의 방대한 해양정보를 축적하고 있다. 해양분야 시소러스 모델을 개발하는데 있어서, 해양학의 광범위한 학문영역상의 특성에 따라 우선 해양물리분야를 선정하여 시소러스사전을 구축하였다. 본 사업은 해양연구소가 보유하고 있는 문헌정보 데이터베이스와 Aquatic Sciences & Fisheries Abstracts의 초록을 분석, 가공하여 효율적인 정보검색서비스를 제공하고자 하며, 본사업의 구체적인 목적은 다음과 같다.

- 시소러스 사전을 통한 자동색인으로 색인능력의 효율화
- 검색자의 다양한 자연어질문을 디스크립터 변환으로 검색효율 향상
- 검색자에게 동의어, 유사어의 통제기능 및 상하위어, 관련어 확인
- 구조화된 용어로 확장검색능력 부여
- 자동색인의 지식베이스 구축

### III. 연구개발의 내용과 범위

연구개발의 내용과 범위는 다음과 같다.

가. 해양관련 문헌정보데이터베이스와 Aquatic Sciences Fisheries Abstracts 등 관련 DB를 선정하여 주제요소를 분석한다.

나. 시소러스 모델을 설계하는데 있어서 필요한 요소로써 다음의 단계에 따라 연구를 수행한다.

- 자연어 추출을 위한 전산 프로그램 개발
- 합성명사 처리
- 파생주제어 생성
- 발생빈도에 의한 가중치 계산
- 발생위치에 의한 가중치 계산
- 주제어 선정
- 파생주제어 선정
- 주제어 확정

다. 개발된 시소러스 사전을 데이터베이스화하여 해양관련 문헌정보 검색시스템의 검색효율성을 검토한다.

라. 향후 해양관련 문헌정보 데이터베이스 구축시 통일성과 표준성을 제공하는 시소러스로 활용한다.

또한, 연구방법은 다음과 같다.

첫째, 광범위한 해양연구분야의 특성상 특정 주제의 범위를 설정하여 이 분야의 시소러스 모델을 설계한다.(1차년도에는 해양물리분야)

둘째, 해양관련 문헌정보데이터베이스와 ASFA 등의 DB로 부터 1,082건의 초록을 분석하여 주제요소를 추출한다.

셋째, 주제요소로 부터 디스크립터를 선정하고 이를 분석하고 어의체계를 확립하여 동의어, 유사어, 관련어 등을 선정한다.

넷째, 시소러스 모델과 기존의 해양분야 데이터베이스를 비교하여 검색효율성을 평가한다.

다섯째, 시소러스 모델을 보완하고 향후 해양전분야의 시소러스를 개발하는데 기초자료로 활용하고 해양분야 문헌정보 데이터베이스 구축시 활용한다.

#### IV. 기대성과 및 활용방안

첫째, 해양분야 시소러스 모델을 개발하여 데이터베이스 구축시 적절한 색인표목의 선택과 검색시에도 적절한 탐색어의 선택을 지원하여 효율적인 정보검색 및 활용이 가능하게 되어 정보이용의 효율성을 제고시킬 수 있다.

둘째, 시소러스 모델을 활용하여 향후 데이터베이스 구축시 색인작업의 효율성을 증대시키고, 이에 따라 인력, 비용의 절감 및 시간단축 효과를 기대할 수 있다.

셋째, 사업수행을 통해 축적된 시소러스 화일을 바탕으로 타 DB 구축업무에 쉽게 응용할 수 있으며, 시소러스용어집의 발간을 통하여 유관 기관으로의 기술이전 등을 통해 파급효과를 기대할 수 있다.

## SUMMARY

### I. Title

A Study on the Efficiency of Oceanographic Information Retrieval System Using a Thesaurus

### II. Objectives and Significance

The purpose of the study is to build up effective Oceanographic Information Management System through thesaurus construction. The development of thesaurus would help to bring efficiency in indexing and retrieval of natural languages by integrating synonym, homonym, and analogy to the descriptor.

The development of science and technology of a nation is often said to be dependant upon the degree at which scientific information is utilized. For oceanographic research, development of ways for efficient access and utilization of information on oceanography is important.

To this end, in 1996, which is the first year of the present study, 1,082 literature references on physical oceanography retained in the Oceanographic Data Center of KORDI have been entered into the database.

The purpose of this study is as following;

(1) To build up effective retrieval system by auto-indexing through thesaurus

(2) To enhance retrieval efficiency by the conversion of the user's various natural languages question to the descriptor

(3) To give the control function of synonym, homonym, and analogy to the users and the confirmation function of hierarchy, and related words

(4) To grant the function of the extensive retrieval

(5) To build up auto-indexing knowledge-base

### III. Contents and Scope of the Study

(1) To build up the descriptor and non-descriptor of thesaurus file which contains physical oceanography in oceanography. (descriptor 1,334 words, non-descriptor 4,418 words)

(2) To build up the file of ocean zones

(3) To build up thesaurus management system for the entry and revision of the thesaurus

(4) To establish indexing system

(5) To establish retrieval system such as thesaurus and keyword retrieval



#### IV. Objectives and Significance

(1) Promoting the proliferative of information culture through building up effective information and distribution system.

(2) Strengthening competitiveness of the KORDI by making it easy to building up strategic information system.

(3) Saving labor costs paid for manual indexing through the computerization of indexing process.



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제 1 장  
서 론



## 제 1 절 연구개발의 필요성

최근 과학기술분야의 연구개발 결과물으로써 정보자료의 생산이 급속히 증가함에 따라, 광범위한 주제의 정보자료를 데이터베이스화하여 관련 주제분야의 연구정보로 활용하고 이용자의 다양한 요구를 충족시키는 적합정보를 제공하는 것이 기존의 자연어 정보검색시스템에서는 검색효율성에 대한 문제가 제기되며, 통제어휘(controlled vocabulary)를 사용한 검색과의 비교·평가실험에서도 비교적 검색효율이 낮은 것으로 평가되었다.<sup>1)</sup> 일반적인 정보검색은 데이터베이스내의 색인어를 통하여 이루어 지는데 이런 경우 이용자가 정보를 검색하기 위해서는 데이터베이스에 저장된 정보들이 가지고 있는 색인어를 정확하게 입력해야 한다. 예를 들어, 데이터베이스에 "physical oceanography"라는 단어를 색인어로 갖는 정보가 저장되어 있다면 이 정보를 검색하기 위해서 이용자는 반드시 "physical oceanography"라는 색인어로 검색을 해야만 한다. 이 경우 "physical oceanography"와 동의어인 "marine physics"를 색인어로 갖는 정보는 검색되지 않는다. 이러한 추상화과정과 단어간의 형태적 불일치 때문에 생길 수 있는 정보미검색의 문제를 해결하기 위해 고안된 것이 바로 시소러스이다. 즉, 데이터베이스 구축시 색인단계에서 동의어, 유사동의어 등의 적절한 용어통제가 필요하다. 이용자 관점에서 볼 때 정보검색시스템의 가장 중요한 기능은 검색과정의 신속성과 검색된 결과의 정확성이다. 또한 정보검색시스템은 정보 그 자체가 갖는 특성, 즉 여러 개의 정보를 조합해서 새로운 정보를 생성해 낼수 있는 성질을 효과적으로 검색과정에

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1) Elaine Svenonius, "Unanswered Questions in the Design of Controlled Vocabularies." JASIS, Vol.37, No.5 (1986), pp. 333-334.

적용할 수 있어야 한다.

시소러스는 상위 및 하위 개념사이의 전후관계를 명백하게 하기 위하여 공식적으로 조직·통제된 색인어의 어휘로써, 시소러스란 일종의 통제어휘집으로 용어의 동등관계를 디스크립터라고 하는 대표용어로 규정하고 이들 사이의 계층관계와 관련관계를 체계화 해 놓은 것이다.

본연구는 해양물리분야의 시소러스모델을 개발하여 해양정보데이터베이스를 탐색하는데 있어서도 다양한 이용자의 질문어를 디스크립터와 관련 용어로 치환하여 요구정보를 탐색하므로써 검색의 효율성을 높이고자 한다.

## 제 2 절 연구개발의 목적과 범위

한국해양연구소는 국내 유일의 종합 해양연구기관으로서 해양의 전 분야에 걸쳐 각종의 방대한 해양정보를 축적하고 있다. 본 사업은 해양연구소가 보유하고 있는 문헌정보데이터베이스에서 해양물리분야의 주요연구문헌 1,082건을 선정하여 이의 제목과 초록을 분석, 가공하여 해양물리분야 디스크립터(descriptor)로 채택하였으며, 이를 통해 해양물리분야 전공연구자의 검증을 거쳐 관련어를 포함한 시소러스모델을 개발하였으며, 효율적인 정보검색서비스를 제공하고자 하며, 다음과 같이 목표를 설정하여 사업을 수행하였다.

- 해양관련 문헌정보데이터베이스 및 서지정보의 선별, 조사
- 정보의 데이터베이스 구축을 위한 제반 요소 분석
- 해양분야 시소러스 모델 설계를 위한 전산프로그램 개발
- 해양분야 시소러스 모델 개발

- 시소러스에 의한 해양정보 데이터베이스에 대한 효율성검토
- 해양정보검색시스템의 효율적인 서비스 운영

연구개발의 내용과 범위는 다음과 같다.

가. 국내의 문헌을 조사하여 시소러스의 의의, 발달, 구성 및 기능에 관한 이론적 배경 및 시소러스의 작성과정, 즉 용어의 수집, 용어의 선정, 용어상호관계의 결정, 편성 및 갱신법에 관한 이론을 검토한다.

나. 해양연구소의 문헌정보데이터베이스에서 해양물리분야의 주요문헌 1,082건을 선정하여 주제요소를 분석하여 후보용어를 선정한다.

다. 후보용어는 사전에 키워드 개념 및 시소러스에 대한 기초이론을 주지한 해양물리분야 연구자(서울대 해양학과 대학원생)와 함께 어휘를 통제한다.

라. 키워드간의 상호관계는 분류표의 해양관련 부분과 해양학용어집, 과학기술용어집 등을 참조하여 어의체계를 확립하고, 관계기호는 UF(used for), BT(broader term), NT(narrower term), RT(related term, see also related)로 구성한다.

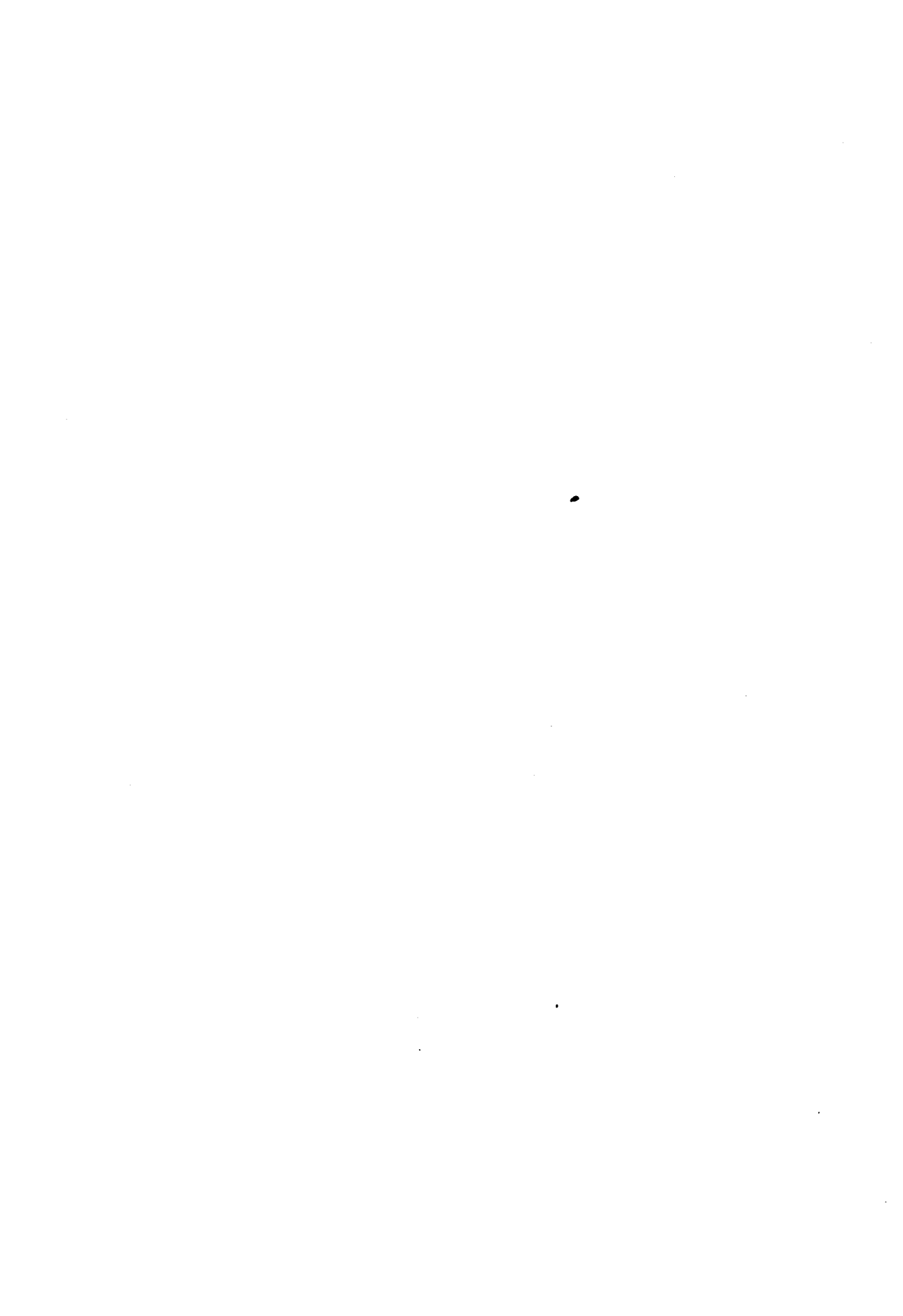
마. 개발된 시소러스 사전을 데이터베이스화하여 해양관련 문헌정보 검색시스템의 검색효율성을 검토한다.

바. 향후 해양관련 문헌정보 데이터베이스 구축시 통일성과 표준성을 제공하는 시소러스로 활용한다.



## 제 2 장

### 시소러스의 이론적 배경





## 제 1 절 시소러스의 정의

국제표준화기구(International Organization for Standardization: ISO)에서는 시소러스에 대한 정의를 기능적인 면과 구조적인 면으로 구분하여 설명하고 있다. “기능적인 면에서 시소러스는 문헌, 색인작성자, 이용자의 자연어를 통제가 가해진 시스템언어(문헌언어, 정보언어)로 변환시킬 때 사용되는 문헌통제표이며, 구조적인 면에서 시소러스는 지식의 어떤 특수한 영역을 포함한 일반적이며, 상위개념의 용어(broader term)와 하위개념의 용어(narrower term)를 의미론적으로 밝힌 동적인 어휘집”<sup>2)</sup>이라고 정의하고 있다.

즉, 시소러스는 문헌정보의 축적과 검색에 있어서 색인작성자와 검색자가 사용하는 용어를 표준화된 어휘로 통일시킨 용어집으로 서로 개념적으로 관련이 있는 용어들을 미리 주제내용 및 어의체계에 따라 계층관계(광의어, 협의어), 동의관계(동의어), 관련관계(관련어)로 표시하여 이용자가 빠른 시간내에 정확하게 정보를 이용할 수 있도록 체계적으로 배열해 놓은 용어통제표라고 할 수 있다.

## 제 2 절 시소러스 개발 현황

국제적으로 시소러스를 정보검색과 관련하여 사용한 효시는 1959년에

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2) International Organization for Standardization, ISO 2788: Guideline for the Establishment and Development of Monolingual Thesauri, 2nd ed. (Geneva: ISO, 1986), p.1.

편찬된 듀퐁(Du Pont)사의 시소러스이다.<sup>3)</sup> 우리나라에서는 1980년 6월 중앙일보사에 의한 “중앙 IR-Thesaurus”가 최초이다.

세계적으로 실용화단계에 있는 시소러스와 국내의 시소러스 개발현황을 살펴보면 다음의 <표 1>, <표 2>와 같다.

<표 1> 세계적으로 실용화단계에 있는 시소러스

시소러스	1차개발	구 축 기 관	분 야
MeSH	1960	NATIONAL LIBRARY OF MEDICINE	의 학
ERIC	1966	EDUCATIONAL RESOURCES INFORMATION CENTER	교 육
JICST 시소러스	1971	日科學技術情報센터	과학기술 중심 종합
INSPEC	1973	INFORMATION SERVICE FOR PHYSICS ELECTRONICS & COMPUTERING	물리·전자공학·컴퓨터
中日 시소러스	1974	中日新聞社	신문기사용 종합
ROOT	1981	BSI(영국공업규격협회)	공업규격·표준
日經 시소러스	1988	日本經濟新聞社	신문기사용 종합

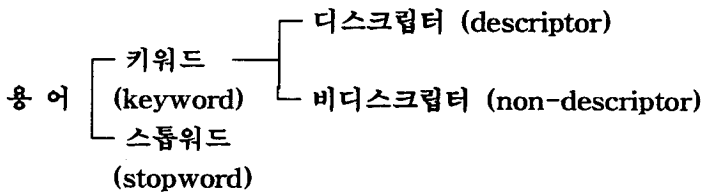
3) F.W. Lancaster, Vocabulary Control for Information Retrieval, 2nd ed. (Washington, D.C.: Information Resources Press, 1986) p.23.

<표 2> 국내의 시소러스

시 소 러 스	년 도	구 축 기 관	분 야
KEDI교육시소러스	1981	한국교육개발원	교 육
농업경제문헌검색어집	1985	한국농촌개발연구원	농 업
과학기술용어시소러스	1992	시스템공학연구소	과 학 기 술
신문기사종합시소러스	1993	한국언론연구원	기 사 용 종 합
국방과학기술시소러스	1994	국방과학연구소	국 방

### 제 3 절 시소러스의 구성

정보검색을 위한 시소러스의 용어는 우리가 사용하고 있는 모든 용어에 대하여 기술하고 있는 것이 아니고, 키워드의 상호관계만을 명시하고 있다. 정보검색에서 용어를 구분하면 다음과 같다.



용어를 살펴보면 키워드란 문헌의 내용을 표현하는 주요어이고, 스톱워드란 불용어으로써 문헌의 내용을 식별하는데 사용될수 없는 단어들인데 전치사, 대명사, 관사 및 접속사 등의 기능어가 포함된다. 그리고 디스크립터란 시소러스의 우선어(preferred term)로써 실제로 색인작업의 일관성을 유지하고 검색의 재현성을 향상시키는데 표목으로 사용되는 검색어이다. 이것은 일명 표준키워드(standard

keyword) 또는 통제키워드라고도 한다. 비디스크립터란 색인의 표목으로서 사용할 수 없는 용어로 반드시 키워드로 참조되는 용어로 이것은 일명 비표준키워드(non-standard keyword) 또는 자유키워드라고도 한다.<sup>4)</sup>

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4) 사공철 등저, 최신정보검색론 (서울: 구미무역출판부, 1990), p.114.

## 제 3 장

### 시소러스사전구축 내용



# 제 1 절 시소러스사전의 개요

## 1. 개요

온라인 정보검색 시스템으로 자연어방식과 통제어방식중에서 어떤 방식이 더 효율적인지에 대한 논란이 많았었다. 그러나 지금까지의 연구결과로는 통제어 방식을 주로하되 자연어방식의 보조를 받는 혼합형이 바람직하다는 이론이 일반화되는 경향이다.

시소러스 구축법으로는 기존의 시소러스를 번역하거나 건명표목표 등에서 어휘를 수집하는 방법 등이 있다. 그러나 국내외를 막론하고 본 시소러스가 목표로 하는 해양학의 모든 주제분야를 망라하는 시소러스를 찾아보기가 어려울 뿐 아니라, 해양학의 학문적 특성은 자연과학의 모든 분야와 상호관련되는 학제적이고 종합적인 학문이므로 해양물리분야를 선정하여 이 분야의 연구문헌을 분석하고 주제요소를 파악하여 디스크립터로 선정하는 시소러스 모델을 지향하고자 하였다. 또한 해양학은 연구중심이 지구대양의 각 지역적 특성을 중시하므로 지역구분을 시소러스 지원파일로 구성하였다.

## 2. 시소러스의 구성 및 구조

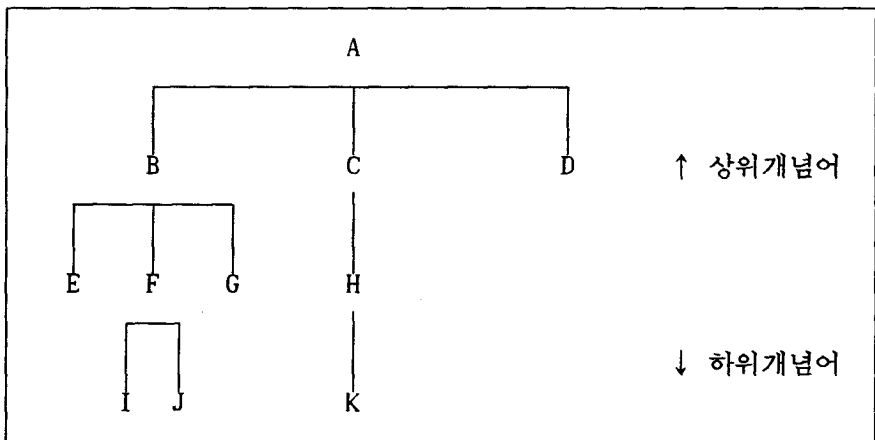
본 시소러스는 <표 3>과 같이 시소러스 고유의 영역인 '시소러스파일'과 해양학의 지역적 연구특성을 보완하기 위해 지역명을 도입한 '시소러스 지원파일'로 구성된다.

<표 3> 시소러스의 구성

- 시소러스파일
  - ① 사전파일
  - ② 동의어파일
  - ③ 상하관계파일
  - ④ 관련관계파일
  
- 시소러스지원파일
  - ① 지역구분파일

2.1 시소러스파일

시소러스파일은 정보검색시 사용되는 일반용어에 대한 상하위 계층관계와 관련관계 등을 정의하며 사전파일, 상하관계파일, 관련관계파일로 구성된다. 구조는 <그림 1>과 같다.



<그림 1> 시소러스의 구조



<그림 1>에서 사전파일은 A, B, C 등 개별 단어의 용어분류코드, 주제분류코드, 한자명, 영문명 등의 프로필 데이터를 관리하는 파일이다. 디스크립터는 바로 이 사전파일에 표제어로 등록된 단어이며 각 디스크립터에 대한 동의어나 유사동의어 등을 나타내는 비디스크립터는 시스템 관리의 편의를 위해 시소러스지원파일의 동의어파일에서 관리된다.

상하관계파일은 A:B, B:F, F:I의 관계이다. 이는 실제로 A-B, F-I의 1:1관계 데이터이며, A가 상위어일 때 F가 하위어의 관계이다. A→B→F→I로 전개되는 계층의 깊이는 최대 6단계이다.

예 1)

	SQE	상하관계용어	관련용어
3단계상위어→	001	. 컴퓨터	
2단계상위어→	002	.. 퍼스컴	
1단계상위어→	003	... 휴대용컴퓨터	
검색어 →	004	.... 랩탑	

예 2)

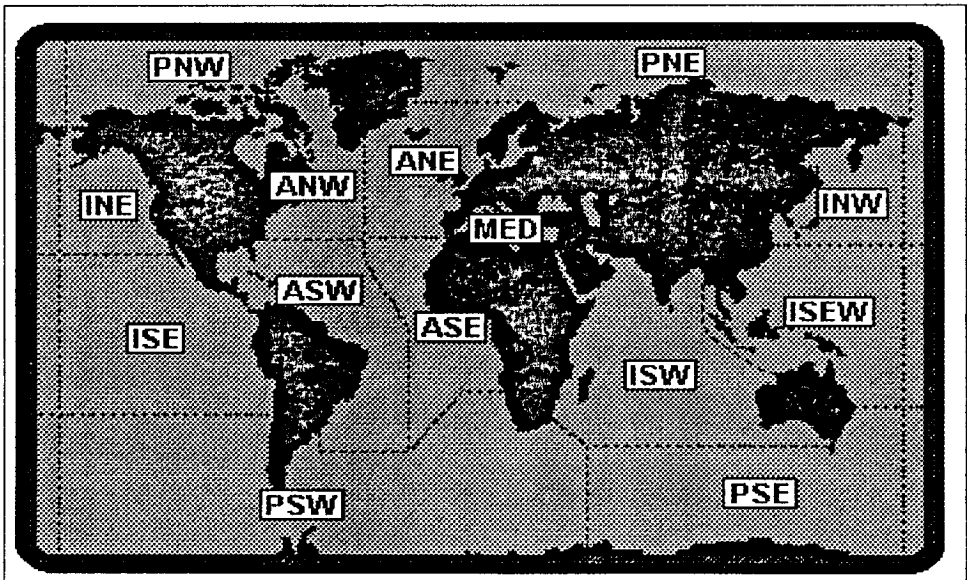
	SQE	상하관계용어	관련용어
2단계상위어→	001	. 컴퓨터	
1단계상위어→	002	.. 퍼스컴	
검색어 →	003	... 휴대용컴퓨터	
1단계하위어→	004	.... 랩탑	
	005	.... 팜톱	
	006	.... 노트북컴퓨터	
	007	.... 노트북패드컴퓨터	

<그림 2> 시소러스 구조의 검색 예

## 2.2 시소러스 지원파일

시소러스 지원파일은 해양학에서 중요시하는 지역적 특성연구를 지원하기 위해서 지역구분파일을 수록하고 있는데, 주요지역구분은 다음의 예와 같으며, 지구해양 지역구분의 개요도는 <그림 3>과 같다.

- 예) Atlantic Northeast (ANE)
- Atlantic Northwest (ANW)
- Atlantic Southeast (ASE)
- Atlantic Southwest (ASW)
- Polar Arctic Eastward (PNE)
- Polar Arctic Westward (PNW)
- Polar Antarctic Eastward (PSE)
- Polar Antarctic Westward (PSW)
- Indian Ocean (ISW)
- Pacific Northeast (INE)
- Pacific Northwest (INW)
- Pacific Southeast (ISE)
- Pacific Southwest (ISEW)
- Mediterranean (MED)



<그림 3> 지구해양의 지역구분 개요도

## 제 2 절 해양물리학분야 용어의 선정

### 1. 키워드의 선정

#### 1.1. 선정 기준

키워드의 선정은 이용자와 색인자간의 단어의 일관성을 유지하기 위하여 단어의 형태를 규정하는 것이다. 키워드의 선정은 용어를 수집, 확인, 평가, 선택하는 4단계를 거쳐서 선정된다.<sup>5)</sup> 소에르겔<sup>6)</sup>은 키워드는 커뮤니케이션, 색인 및 검색의 유용성이라는 기준에 근거하여 선정되어야 한다고 하였다. 그는 탐색의 이용성(Usefulness for searching), 대안적인 해결법(Alternative solutions), 논리적인 구조, 색인 작업시 개념의 사용빈도, 그 개념이 출현하는 수집원(시소러스, 사전, 용어집)의 수, 개념의 일반성(The Selection of concepts of general application)등에 의하여 선정되어야 한다고 주장하였다. 또한, 블라그덴<sup>7)</sup>은 키워드를 선정하는 기준을 다음과 같이 4가지로 제안하였다.

- ① 그 분야 용어의 상대적인 출현빈도
- ② 그 시스템내에서의 그 용어의 사용빈도
- ③ 이미 선정된 용어와의 관련성
- ④ 과학적, 기술적 정확성과 수용성(acceptability)

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5) British Standards Institution, BS5723: Guidelines for Establishment and Development of Monolingual Thesauri, p. 144.

6) Dagobert Soergel, Indexing Languages and the Thesauri: Construction and Maintenance (L.A.: Melville, 1974), pp. 338-339.

7) John F. Blagden, "Thesaurus Compilation Methods: A Literature Review", Aslib Proceedings, Vol. 20, No. 8 (Aug. 1968), p. 353.

한편, 安倍活二<sup>8)</sup>는 키워드 선정기준을 다음과 같이 제시하였다.

- ① 대상분야의 전체문헌 색인작업에 필요한 개념을 포괄하고 있는 용어를 설정한다.
- ② 개념은 서로 다르더라도, 문헌근이 동일하다고 판단될 경우에는 동일한 방법으로 표현한다.
- ③ 하나의 키워드가 표현하는 개념의 범위는 명확해야 한다.
- ④ 키워드의 표현은 표준적이고, 보편적이어야 한다.
- ⑤ 검색에 사용될 것이 개대되는 것이어야 한다.
- ⑥ 키워드의 문헌내 출현빈도가 적정범위 내에 있어야 한다.
- ⑦ 키워드의 총수가 어떤 한도내에 있어야 한다.

이상의 제 견해를 종합하여 보면 키워드는 그 주제분야에서 최신용어로서의 적합성, 관련주제문헌, 또는 정보요구 기대빈도, 이미 승인된 디스크립터와의 관련성, 시소러스가 사용되는 분야와 사용하는 사람의 수준 및 요구 등을 고려하여 선정되어야 할 것이다.

해양물리학 연구분야의 키워드선정은 해양학 주요학술지를 데이터베이스화한 한국해양연구소의 문헌정보시스템에서 해양물리학 주제의 연구문헌 1,082건을 선정하여 분석하였다. 선정된 문헌은 FoxPro 3.0 으로 제목과 초록을 통계처리하여 불용어를 제외한 주요어 목록을 작성하였다. 여기에서 출현횟수와 용어의 발생위치(제목 가중치부여)에 따라 분석하여 선정된 키워드를 디스크립터로 채택하였다. 선정된 디스크립터를 토대로 전문가의 분석과 검증을 통하여 용어의 상호관계를 설정하였다.

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8) 安倍活二, “シソーラスの問題點,” Library and Information Science, No.4 (1976), pp. 73-74.

## 제 3 절 용어의 상호관계 설정

용어간의 의미론적인 관계는 문헌에 특정한 출현 패턴으로 나타난다. 이러한 패턴을 관찰하여 개념적 관계를 판단할 수 있는데,<sup>9)</sup> 용어의 사용패턴으로 부터 판단된 용어간의 관계를 용어관련성(term association)이라고 한다. 관계를 판단하는 대상에 따라서 용어연관성을 단어연관성(word association)이나 개념연관성(concept association)이라고도 일컫는데, 현재는 개념연관성의 중요성이 부각되고 있으며, 용어연관성은 단어연관성과 개념연관성을 포함하는 포괄적인 의미로 사용된다.

### 1. 용어의 종류

시소러스의 중요한 기능중의 하나는 용어간의 상호관계를 나타내고 문헌의 색인시 또는 검색도구를 형식화할 때 이용자로 하여금 가장 적절한 용어를 선택하도록 지원하는 것이다.<sup>10)</sup> 따라서 정해진 규칙에 따라 선정된 키워드는 용어상호간의 어의적인 관계를 분석해야 한다. 시소러스에서는 일반적으로 동의어 관계(Use, UF), 계층어 관계(BT, NT), 관련어 관계(RT) 등의 3가지 기본적인 관계가 용어간의 관계를 나타내는데 사용되고 있다.

#### 1.1 동의어 관계

동의어 관계는 일반적으로 Use와 UF 참조로 표시된다. Use 참조는 색

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9) D. Soerrgel, Indexing Languages and Thesauri: Construction and Maintenance (L.A.: Melville Pub. Co., 1974), p. 449.

10) Harald Borko and C.L. Bernier, Indexing Concepts and Methods, (New York: Academic Press, 1978), p. 98.

인 작성시나 검색시에 채택되지 않은 용어(non-descriptor)로부터 채택된 용어(descriptor)로 안내하여 주는데 사용되는 기호이다. 즉, Use는 동의어, 생략어, 유사동의어, 근사동의어 등의 참조에 사용되고, 그 외에 약어, 일반적인 용어로 부터 특정적인 용어, 도치표목을 일반어 순으로 참조하는 데도 사용된다.

예) ACOUSTIC EQUIPMENT

UF acoustic devices

1.2 계층어 관계

채택된 용어(descriptor)의 계층적인 관계는 탐색자가 일정한 특정적 수준 또는 일반적 수준으로 시소러스를 사용하는 것을 허용하며, 검색시 서로 관련 있는 모든 자료를 검색할 수 있도록 하기 위하여 반드시 설정되어야 한다. 즉, 상위개념과 하위개념을 정하는데 사용되는 계층관계는 검색의 재현율과 정도율을 향상시키는데 있어서 중요한 요인이 되므로<sup>11)</sup> 시소러스 작성에 있어 매우 중요한 작업이다. 계층어 관계는 특정개념어의 상위수준 및 하위수준을 나타내며 그 상하관계는 보통 BT(Broader Term)와 NT(Narrower Term)의 두가지 기호로 사용되고 있다.

상위어(BT)는 정해진 키워드보다 일반적으로 넓은 의미를 나타내며 보다 일반적인 정보를 찾고자 할 때 참조하는 것이며, 하위어(NT)는 범위를 축소하여 보다 구체적인 정보를 찾고자 할 때 참조하는 것이다.<sup>12)</sup>

일반적으로 계층어 관계는 종속관계나 일반적인 사항과 특수한 사항에만 한정되지만 부분과 전체의 관계까지도 확대 적용하고 있다.

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11) J. Aitchison and A. Gilchrist, *Thesaurus Construction: A Practical Manual* (London: Aslib, 1972), p. 39.

12) Borko and Beriner, *op. cit.*, p. 103.

예) ACOUSTIC ARRAYS

BT	ARRAYS
NT	SONAR ARRAYS
NT	transducer arrays
NT	acoustic equipment

1.3 관련어 관계

동어 관계 및 계층어 관계를 제외한 개념적으로 밀접한 관련성을 갖는 용어간의 관계를 관련어 관계 또는 연관관계라고 하며, 주로 RT(Related Term)로 표시한다. 이 관련어 표시는 상위어와 하위어의 관계보다 애매모호하여 어느 용어가 관련어의 표시(RT)를 정당화할 만큼 밀접하게 관련되어 있는가를 결정하는 중요한 일이다.

예) LINEAR WAVES

RT NONLINEAR WAVES

본 연구에서는 해양학 분야 전문학술지에서 해양물리학 주제의 연구문헌 1,082건에서 분석한 키워드와 해양학용어집 등 관련 사전을 참조하여, 디스크립터 1,334건, 비디스크립터 4,418건을 선정하였으며, 비디스크립터는 동의어(UF) 1,097, 관련어(RT) 4,126, 광의어(BT) 448, 협의어(NT) 1,608건으로 중복은 1,190건이다.





## 제 4 장

### 시스템 설계 및 검색효율 분석



# 제 1 절 시소러스 관리시스템 설계

## 1. 내용

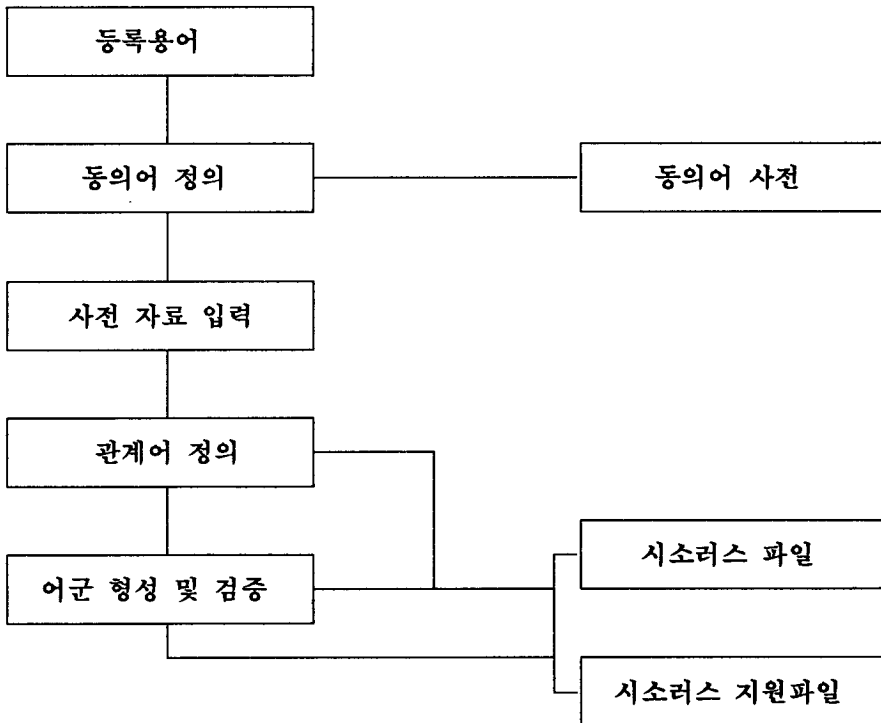
시소러스 관리시스템에서 수행할 내용은 다음과 같이 규정한다.

- ① 시소러스 용어의 등록, 수정을 관리한다.
- ② 시소러스 어군을 조회하고 구조의 변경을 지원한다.
- ③ 시소러스 지원파일의 용어를 관리한다.
- ④ 시소러스 지원파일을 관리한다.

## 2. 시스템 구성

### 2.1 입력

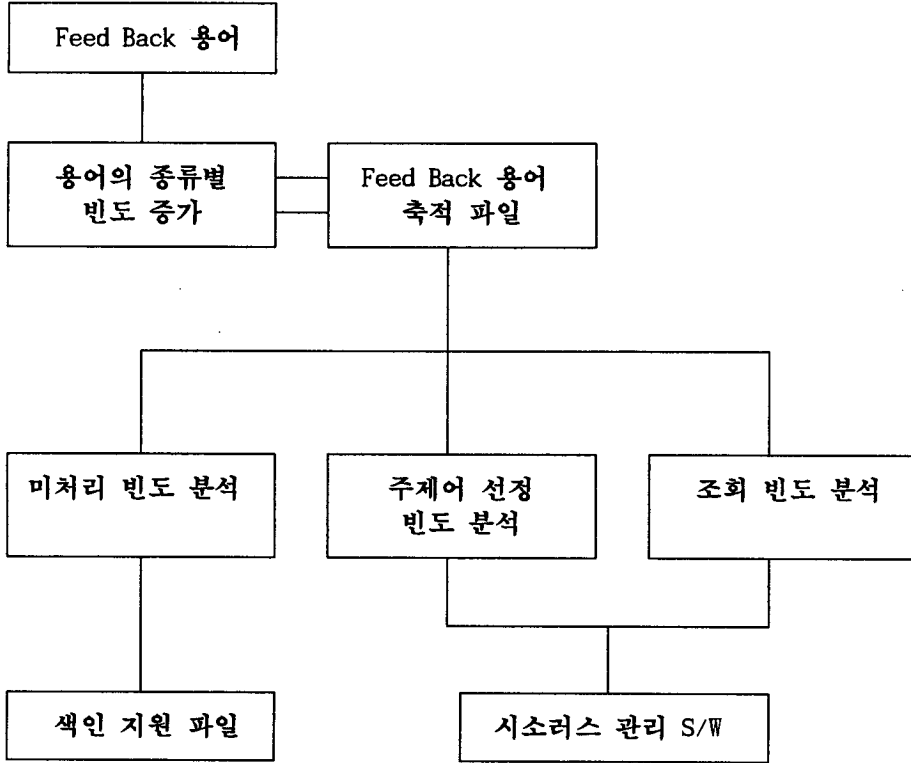
시소러스입력시스템의 시스템구성은 다음의 <그림 4>와 같이 설계한다.



<그림 4> 시소러스 입력시스템

## 2.2 관리

시소러스 관리시스템은 다음의 <그림 5>와 같다.



<그림 5> 시소러스 용어관리시스템

## 제 2 절 검색효율의 평가방법

시소러스는 색인작업의 보조도로 사용되고, 검색을 위한 기본적인 도구로 사용하고자 하는 것이다. 즉, 시소러스는 색인작성자와 검색자 사이의 색인어 사용의 통일을 기하기 위해 사용되며, 검색시 시소러스는 색인어 개념에 대한 용어의 안내, 용어간 상호참조, 적절한 질의어의 선정에 이용되어 검색효율성을 향상시키는 것으로 일반적으로 평가를 받고 있다.

다음의 <표 4>는 NASA 시소러스의 사용평가실험에 관한 것이다.

<표 4> 시소러스의 이용에 의한 검색효율개선 (NASA Thesaurus)<sup>13)</sup>

액세스한 1,000건 중에 포함된 적합 문헌수(추정)	유니텀(자연어) 방식		[NASA Thesaurus] 를 이용한 경우		재현율 향상치 (%)
	재현률(%)	정도율(%)	재현율(%)	정도율(%)	
1,000	1.09		1.60		0.51
545	2.00		2.94		0.94
218	5.00		7.35		2.35
109	10.00		14.70		4.70
54.5	20.00	72.9	29.40	70.4	9.40
36.3	30.00		44.10		14.1
27.2	40.00		58.80		18.8
21.8	50.00		73.50		23.5
18.2	60.00		88.20		28.2
16.0	68.00		100.00		32.0

13) Charles W. Hargrave, "Retrieval Improvement Effected by Use of Thesaurus," Proceedings of the American Society for Information Science, Vol.7 (1970), p. 292.

이상의 실험결과에 의하면 시소러스의 이용으로 정도율은 감소하였으나, 재현율은 향상되어 전체적으로 시스템 효율은 향상되었다.

검색효율은 이용자의 정보요구에 적합한 문헌을 검색하는 시스템의 능력을 의미하는 것으로 검색효율평가의 척도로 재현율과 정확률을 사용하고 있다.

실제 운영하고 있는 데이터베이스 내에서의 어떤 질문에 대한 적합문헌 수는 정확하게 파악할 수 없으므로 이러한 문제를 해결하는 방법으로 절대적인 재현율을 평가할 수 없는 시스템이나 전문데이터베이스에서는 검색효율의 척도로 상대적인 재현율을 이용한다. 상대적인 재현율의 측정은 검색하는 데이터베이스의 수에 따라서 계산하는 방법이 다르다. 한 주제에 대하여 하나의 데이터베이스를 검색할 때는 그 주제를 여러 가지 다른 방법으로 검색한 후 검색된 집합의 합(union)에서의 적합문헌 수를 100%로 간주하여 재현율을 산출하고,<sup>14)</sup> 여러 데이터베이스를 검색할 때에는 하나의 시스템에서 고유하게 검색된 적합문헌 수를 각 시스템에서 고유하게 검색된 적합문헌 수를 각 시스템에서 고유하게 검색된 적합문헌의 총 수로 나누어 재현율을 측정한다.<sup>15)</sup>

본 연구에서는 전자의 방법을 적용하여 종합검색(기본탐색어+계층어+관련어)에서 검색된 적합 기사를 100%로 간주하고 질문지향적 방법인 평균 재현율과 평균정확률을 측정하였다. 질문지향적 방법은 각 질문 i에 대한 재현율과 정확률을 더하여 평균을 내는 것으로 이용자가 시스템으로부터 기대할 수 있는 성능이기 때문에 이용자지향적 방법이라고도 한다.<sup>16)</sup>

14) Ro, Jung Soon, "An Evaluation of the Applicability of Ranking Algorithms to Improve the Effectiveness of Full-Text Retrieval 1", JASIS, Vol. 39, No. 2 (1988), pp. 73-78.

15) Mckinin, E.J. et al., "The Medline/full-Text Research Project", JASIS, Vol. 42, No. 4 (1991), pp. 217-307.

기사의 적합성판정은 각 탐색유형에서 검색된 기사의 원문을 보고 수작업으로 판정하였다.

평균재현율과 평균정확률을 산출하는 공식은 다음과 같다.

$$\text{평균재현율(R)} = \left( \sum_{i=1}^{\infty} \frac{\text{검색된적합문헌수}_i}{\text{적합문헌총수}_i} \right) \times \frac{100}{\text{질문수}}$$

$$\text{평균정확률(P)} = \left( \sum_{i=1}^{\infty} \frac{\text{검색된적합문헌수}_i}{\text{검색문헌총수}_i} \right) \times \frac{100}{\text{질문수}}$$

### 제 3 절 검색효율의 평가결과

검색효율 실험은 한국해양연구소의 Aquatic Sciences & Fisheries Abstracts을 대상으로 하였으며, 탐색어는 27개의 질문을 통하여 재현율을 밝혀냈으며, 10개의 질문을 통하여 정확율을 분석하였다.

<표 5> 기본탐색어의 검색효율

변 수	질문수	평 균	표준편차	최 소 값	최 대 값
재 현 율	27	23.8874	28.6239	0.4920	97.9405
정 확 률	10	45.3743	29.1365	0	76.4562

기본탐색어 검색의 평균재현율의 평균은 23.8874%이고, 최소 0.4920%, 최대 97.9405%이며, 평균정확률의 평균은 45.3743%이고, 최소 0%, 최대 76.4562%로 그 차이가 매우 컸다. 평균재현율과 평균정확률의 최소값이 0%에 가까운 것은 기본 탐색어만으로 검색하면 적합기사가

16) 사공철 등저, 최신정보검색론 (서울 : 구미무역, 1990), p. 218-219.

거의 검색되지 않는 경우가 있기 때문이다.

<표 6> 기본탐색어 + 계층어의 검색효율

변수	질문수	평균	표준편차	최소값	최대값
재현율	27	46.8596	28.5457	6.3008	99.7782
정확률	10	51.3566	29.3520	0	88.4635

기본 탐색어+계층어 확장검색의 평균재현율의 평균은 46.8596%이고, 최소 6.3008%, 최대 99.7782%이며, 평균정확률의 평균은 51.3566%이고, 최소 0%, 최대 88.4635%로 기본 탐색어만으로 검색한 결과와 비교하면, 평균재현율의 최소값과 평균정확률의 최소값·최대값이 같고 평균정확률은 5.9823%, 평균재현율은 22.9722% 향상되었다.

<표 7> 기본탐색어+관련어의 검색효율

변수	질문수	평균	표준편차	최소값	최대값
재현율	27	80.1483	22.3270	6.9756	100.00
정확률	10	47.3954	23.0467	20.000	84.3123

기본 탐색어+관련어 확장검색의 평균재현율의 평균은 80.1483%이고, 최소 6.9756%, 최대 100%이며, 평균정확률의 평균은 47.3954%이고, 최소 20.0000%, 최대 84.3123%로 기본탐색어 검색과 비교하여 평균정확률은 2.0211%만 향상되었으나 평균재현률은 56.2609%가 향상되었다. 평균재현율의 최대가 100%인 것은 관련어 확장검색의 검색결과가 종합검색과 동일한 경우가 있기 때문이다.



<표 8> 기본탐색어+계층어+관련어의 검색효율

변 수	질문수	평 균	표준편차	최 소 값	최 대 값
재 현 율	27	100.0000	0	100.0000	100.0000
정 확 률	10	47.6350	23.9834	9.2095	86.1964

종합검색인 기본탐색어+계층어+관련어 확장검색에서 상대적인 재현율을 산출하기 위하여 검색된 기사 수를 100%로 하여 각각의 검색효율을 측정하였다. 평균정확률의 평균은 47.6350%이고, 최소 9.2095%, 최대 86.1964%로 차이가 매우 컸다. 기본탐색어 검색과 비교하면 평균정확률은 2.2607%, 평균재현율은 76.1126% 향상되었다.

이상에서 탐색어로 선정된 샘플 용어의 검색결과와 분석표는 <표 9>, <표 10>과 같다.

## <표 9> 선정된 탐색어의 검색결과

### <Sample 1>

ACOUSTIC ARRAYS

265

BT ARRAYS  
NT SONAR ARRAYS  
transducer arrays  
transponder arrays

438

RT ACOUSTIC EQUIPMENT  
hydrophones  
seismic arrays  
SONAR  
TRANSDUCERS  
transponders

1450

Total 1717

*(DE, UF) +(BT, NT) 438*

*(DE, UF) +(RT) 1621*

### <Sample 2>

ACOUSTIC IMAGERY

UF acoustic sensing

130

BT IMAGERY  
NT ACOUSTIC TOMOGRAPHY  
sonar imagery

1068

RT acoustic images  
SONAR

893

Total 1805

*(DE, UF) +(BT, NT) 1068*

*(DE, UF) +(RT) 982*

### <Sample 3>

ACOUSTIC MODELS

UF acoustic analogs

192

BT analog models

6

RT ACOUSTICS

674

Total 858

*(DE, UF) +(BT, NT) 198*

*(DE, UF) +(RT) 852*

<Sample 4>

ADVECTION

UF MARINE ADVECTION

328

BT TRANSPORT PROCESSES

NT CONVECTION

horizontal advection

salt advection

VERTICAL ADVECTION

1402

RT AIR

ATMOSPHERIC

CIRCULATION

CIRCULATION

CONVERGENCE ZONES

HEAT TRANSPORT

oceanic convergences

6645

Total 7959

(DE, UF) +(BT, NT) 1596

(DE, UF) +(RT) 6885

<Sample 5>

AMBIENT NOISE

UF background noise (sound)

noise (ambient)

underwater ambient noise

566

BT noise (sound)

NT biological noise

sediment noise

shipping noise

surface noise

566

RT passive sonar

underwater noise

158

Total 586

(DE, UF) +(BT, NT) 566

(DE, UF) +(RT) 586

<Sample 6>

ANEMOMETERS

UF cup anemometers

31

BT MEASURING DEVICES

348

RT FLOWMETERS  
TURBULENCE MEASUREMENT  
wind direction  
wind measuring equipment  
WIND SPEED  
WINDS

1016

Total 1382

(DE, UF) +(BT, NT) 379

(DE, UF) +(RT) 1038

<Sample 7>

ATMOSPHERIC CIRCULATION

UF CIRCULATION  
general circulation

3680

BT atmospheric motion  
NT meridional atmospheric  
circulation

112

RT ADVECTION  
CIRCULATION  
CORIOLIS FORCE  
HEAT TRANSPORT  
OCEAN CIRCULATION  
planetary winds  
SOUTHERN OSCILLATION  
WINDS

4743

Total 4825

(DE, UF) +(BT, NT) 3765

(DE, UF) +(RT) 4743

<Sample 8>

ATMOSPHERIC PHYSICS

UF aeronomy

87

BT physics  
NT cloud physics

206

RT atmospheric electricity  
atmospheric optical  
phenomena  
atmospheric sciences  
EARTH ATMOSPHERE  
METEOROLOGY

1300

Total 1453

*(DE, UF) +(BT, NT) 206*  
*(DE, UF) +(RT) 1362*

<Sample 9>

BACKSCATTER

UF sound backscatter

**401**

BT SOUND SCATTERING

**439**

RT forward scattering  
REVERBERATION  
SCATTEROMETERS

**212** *Total 890*

*(DE, UF) +(BT, NT) 756*  
*(DE, UF) +(RT) 557*

<Sample 10>

BATHYMETRIC DATA

**119**

BT OCEANOGRAPHIC DATA  
NT soundings

**875**

RT automated cartography  
BATHYMETRIC CHARTS  
bathymetric profiles  
BATHYMETRY  
GEOLOGICAL DATA  
limnological data  
plotting  
WATER DEPTH

**1304** *Total 2241*

*(DE, UF) +(BT, NT) 987*  
*(DE, UF) +(RT) 1396*

<Sample 11>

BOTTOM BOUNDARY LAYER

UF BENTHIC BOUNDARY  
LAYER  
benthic layer

**165**

BT BOUNDARY LAYER

**563**

RT benthic currents  
BOTTOM EKMAN LAYER  
bottom mixed layer

deep layer  
red roughness  
WATER COLUMN  
wave-seabed interaction

450 *Total 1003*

*(DE, UF) +(BT, NT) 563*

*(DE, UF) +(RT) 606*

<Sample 12>

CAPILLARY WAVES

UF surface tension waves

37

BT SURFACE WATER WAVES

NT water ripples

523

RT capillarity

GRAVITY WAVES

NONLINEAR WAVES

SURFACE TENSION

wave gauges

470 *Total 930*

*(DE, UF) +(BT, NT) 546*

*(DE, UF) +(RT) 476*

<Sample 13>

CARBON FIXATION

UF carbon assimilation  
carbon dioxide fixation

410

BT PHOTOSYNTHESIS

1999

RT carbohydrates

CARBON DIOXIDE

1554 *Total 3581*

*(DE, UF) +(BT, NT) 2244*

*(DE, UF) +(RT) 1862*

<Sample 14>

CRUISE STATIONS

UF anchor stations  
expedition stations

15

BT oceanographic stations

16

RT CRUISES

EXPEDITIONS  
multiship expeditions  
station keeping  
STATION LISTS  
track charts

463 *Total 492*

(DE, UF) +(BT, NT) 31

(DE, UF) +(RT) 476

<Sample 15>

CURRENT OBSERVATIONS

UF water current data and  
observations

369

BT HYDROGRAPHIC DATA  
NT CURRENT METER DATA

527

RT CURRENT MEASUREMENT  
CURRENT METERS  
near-surface layer

591 *Total 1422*

(DE, UF) +(BT, NT) 870

(DE, UF) +(RT) 942

<Sample 16>

CURRENTS

UF electric currents

3424

NT impressed currents  
telluric currents

6

RT air-water exchanges  
current density  
electric fields  
electricity

75 *Total 3496*

(DE, UF) +(BT, NT) 3424

(DE, UF) +(RT) 3496

<Sample 17>

CYCLONES

UF depressions  
midlatitude cyclones

250

BT low pressure systems  
**30**  
 RT ANTICYCLONES  
 cyclogenesis  
 HURRICANES  
 POLAR FRONTS  
**632** *Total 819*

*(DE, UF) +(BT, NT) 277*  
*(DE, UF) +(RT) 798*

<Sample 18>

DENSITY

UF PHYSICAL DENSITY  
**4157**  
 BT PHYSICAL PROPERTIES  
 NT current density  
 sediment density  
 WATER DENSITY  
**432**  
 RT BUOYANCY  
 DENSITY MEASUREMENT  
 density measuring equipment  
 DIFFUSION  
 gravimetric techniques  
 population density  
 sigma-t  
 specific gravity  
 wet weight  
**3411** *Total 5222*

*(DE, UF) +(BT, NT) 4466*  
*(DE, UF) +(RT) 4916*

<Sample 19>

DENSITY MEASUREMENT

UF hydrometry  
 specific gravity measurement  
**33**  
 BT MEASUREMENT  
**2604**  
 RT densitometers  
 DENSITY  
 density measuring equipment  
 hydrometers  
 sediment density  
 WATER DENSITY  
**4161** *Total 6707*



*(DE, UF) +(BT, NT) 2607*

*(DE, UF) +(RT) 4163*

<Sample 20>

DOPPLER SONAR

UF acoustic doppler sonar

*117*

BT active sonar

*17*

RT ACOUSTIC EQUIPMENT  
acoustic navigation  
DOPPLER EFFECT

*462*

*Total 574*

*(DE, UF) +(BT, NT) 134*

*(DE, UF) +(RT) 558*

<Sample 21>

DRIFTERS

UF floats  
lagrangian drifters

*122*

BT CURRENT MEASURING  
EQUIPMENT

NT SUBSURFACE DRIFTERS  
SURFACE DRIFTERS

*100*

RT CURRENT MEASUREMENT  
DRIFT  
lagrangian current  
measurement

*1526*

*Total 1661*

*(DE, UF) +(BT, NT) 186*

*(DE, UF) +(RT) 1616*

<Sample 22>

DYNAMIC HEIGHT

UF geopotential

*79*

BT POTENTIAL ENERGY

*30*

RT dynamic height anomaly  
DYNAMIC TOPOGRAPHY  
height  
stream functions

*643*

*Total 671*

*(DE, UF) +(BT, NT) 115*

*(DE, UF) +(RT) 643*

<Sample 23>

EKMAN LAYERS

UF ekman boundary layers

*19*

BT BOUNDARY LAYERS

NT BOTTOM EKMAN LAYER

surface ekman layer

*319*

RT LAYERS

vertical shear

*658*

*Total 663*

*(DE, UF) +(BT, NT) 335*

*(DE, UF) +(RT) 658*

<Sample 24>

EQUATIONS OF MOTION

UF euler equations of motion

*53*

BT EQUATIONS

*900*

RT hydrostatic equation

*2*

*Total 902*

*(DE, UF) +(BT, NT) 900*

*(DE, UF) +(RT) 55*

<Sample 25>

GEOPHYSICAL SURVEYS

*135*

BT GEOLOGICAL SURVEYS

NT gravity surveys

*192*

RT GEOPHYSICAL DATA

geophysical equipment

GEOPHYSICAL EXPLORATION

GEOPHYSICS

magnetic exploration

site surveys

*560*

*Total 845*

*(DE, UF) +(BT, NT) 312*

*(DE, UF) +(RT) 684*

<Sample 26>

IMAGING TECHNIQUES

UF IMAGING

203

NT image enhancement

49

RT acoustic holography

image processing

IMAGERY

REMOTE SENSING

2710

*Total 2855*

*(DE, UF) +(BT, NT) 245*

*(DE, UF) +(RT) 2837*

<Sample 27>

KELVIN WAVES

UF double kelvin waves

110

BT TRAPPED WAVES

NT EQUATORIAL TRAPPED  
WAVES

102

RT EQUATORIAL DYNAMICS

NONLINEAR WAVES

277

*Total 466*

*(DE, UF) +(BT, NT) 203*

*(DE, UF) +(RT) 374*

<표 10> 선정된 탐색어의 검색결과 분석표

No	DE,UF Ave.	Dispersion	DE,UF+BT, NT Ave.	Dispersion	DE,UF+RT, Ave.	Dispersion
1	15.4338	71.4647	25.5096	455.8225	94.4088	203.3619
2	7.2022	278.3986	59.1689	151.5189	54.4044	662.7484
3	22.3776	2.2797	23.0769	565.6168	99.3006	366.8106
4	4.1211	390.7098	20.0527	718.6099	86.5058	40.4178
5	96.5870	5285.2202	96.5870	2472.8143	100.0000	394.0900
6	2.2431	468.4792	27.4240	377.7425	75.1085	25.3996
7	76.2694	2743.8655	78.0310	971.6562	98.3005	329.5024
8	5.9876	320.4057	14.1775	1068.1197	93.7370	184.6528
9	45.0561	448.1105	84.9438	1450.4063	62.5842	308.4976
10	5.3101	345.1190	44.0428	7.9344	62.2936	318.7903
11	16.4506	55.3072	56.1316	85.9700	60.4187	389.2571
12	3.9784	396.3715	58.7096	140.4225	51.1827	839.0060
13	11.4493	154.7083	62.6640	249.7791	51.9966	792.5182
14	3.0487	434.2548	6.3008	1645.0163	96.7479	275.5467
15	25.9493	4.2511	61.1814	205.1140	66.2447	193.3101
16	97.9405	5483.8498	97.9405	2609.2583	100.0000	394.0900
17	30.5250	44.0567	33.8217	169.9868	97.4358	298.8577
18	79.6055	3104.4978	85.5227	1494.8353	94.1401	195.7705
19	0.4920	547.3485	38.8698	63.8369	62.0694	326.8466
20	20.3832	12.2800	23.3449	552.9411	97.2125	291.1869
21	7.3449	273.6570	11.1980	1271.7497	97.2907	293.8619
22	11.7734	146.7509	17.1385	883.3438	95.8271	245.8248
23	2.8657	441.9152	50.5279	13.4564	99.2458	364.7145
24	5.8758	324.4206	99.7782	2800.3782	6.9756	5354.2440
25	15.9763	62.5868	36.9230	98.7360	80.9467	0.6374
26	7.1103	281.4738	8.5814	1465.2206	99.3695	369.4545
27	23.6051	0.0797	43.5622	10.8728	80.2575	0.0119
	644.9620	22121.8624	1265.2104	22001.1593	2164.0047	13459.4101
Ave	23.8875	819.3282	46.8596	814.8578	80.1483	498.4967
Sta. Deviation		<u>28.6239</u>		<u>28.5457</u>		<u>22.3270</u>

## 제 5 장

결

론



최근 자연어 정보검색시스템의 이용이 점차 늘어나고 있으나, 자연어 검색시스템이 갖는 망라적인 탐색의 문제점으로 인하여, 시스템의 검색효율을 높여주기 위한 검색용 시소러스의 작성에 관한 연구가 활발히 진행되고 있다.

이미 외국의 경우 여러 주제분야에 걸쳐 수 백종의 시소러스가 개발되어 자동색인 및 정보검색시스템 등에 활용되고 있다. 그러나 우리나라에서는 아직 독자적으로 개발된 것이 없고 다만 몇 군데의 전문도서관과 연구소 등에서 외국의 것을 번역하여 그대로 사용하거나 약간 보완시킨 몇 종의 시소러스가 있는 실정이다. 그 예로서 한국교육개발원의 「KEDI 교육 Thesaurus」 중앙일보사의 「중앙 IR-Thesaurus」, 한국농촌경제연구원의 농업경제분야 시소러스, 국방과학연구소의 「국방과학 시소러스」 등이 있다.

따라서 본 연구에서는 이러한 점을 감안하여 우선 시소러스의 의의 및 발달과정과 그 작성방법을 개괄적으로 살펴본 후 시소러스를 작성하는데 소요되는 비경제적 요인을 제거하기 위한 방법으로 용어의 갱신, 유지, 인쇄가 항상 가능한 시소러스 작성 프로그램에 의한 해양물리학분야를 대상으로 실제로 이용 가능한 시소러스를 개발하였다.

본 연구의 내용을 요약하면 다음과 같다.

1. 시소러스 개발대상 주제분야는 해양물리학분야으로 국한하였다.
2. 후보용어는 해양학 관련잡지에서 해양물리학연구논문 1,082건의 제목과 초록을 분석하였고, 이를 토대로 「해양학용어집」, 「과학기술용어집」, 「과학기술용어대역집」 등을 관련용어의 수집원으로 하였다.
3. 수집원에서 수집된 용어들은 사전에 키워드 개념에 대해 교육을 받은 해양물리학 전공자에 의하여 다시 키워드로 선정되었다.

4. 키워드 간의 상호관계 설정은 주요 키워드를 디스크립터로 선정하고 이를 나무구조형을 형성하여 계층관계를 결정하였다. 그리고 그룹내에서의 동의어 (동의어, 근사동의어, 유사동의어) 및 연관 관계는 기존의 시소러스, 주제명표목표, 학문체계도, 사전 등을 참고로하여 결정하였다. 키워드의 관계결정이 끝난 후에는 최종적으로 해양물리학분야 연구자에게 검토를 의뢰하여 수정한 후 출력하였다.

5. 용어관계기호는 UF, BT, NT, RT로 구성하였으며, 관계어의 복수, 단수처리 및 생략어 등의 용어형태(form of terms)에 관한 세부적인 규정은 TEST 방식을 따랐다.

6. 본 연구에서 키워드로 선정한 용어의 총수는 5,752어이며, 이 가운데 디스크립터는 1,334어, 비디스크립터는 4,418어로 구성되어 있다.

7. 선정된 용어중에서 샘플을 채택하여 검색효율을 분석한 결과, 기본탐색어+계층어+관련어의 종합탐색의 결과는 기본탐색어만으로 탐색한 경우보다 평균재현율이 76.1126%가 향상되었다.

해양학분야의 완전한 용어수집은 너무 방대한 작업이므로 본 연구에서는 용어의 수집범위를 해양학의 하부주제인 해양물리학으로 제한하였으므로 완벽한 시소러스라고 할 수는 없다. 본 연구는 해양학의 종합적인 시소러스 구축을 위한 전단계로서 시소러스 모델적인 연구이므로 해양물리학분야의 시소러스 모델을 통하여 전체 해양학을 포괄하는 종합시소러스의 구축을 위한 토대로 삼고자 한다. 앞으로 시소러스 작성의 완전자동방법에 의한 전문분야별 시소러스의 개발연구가 계속 이루어져야 할 것으로 생각된다. 그리고 시소러스의 개발에 드는 비용 및 시간을 줄이며 특히 전문가의 지적인 노력을 최대한으로 줄일 수 있는 방법으로 해당분야의 이미 작성된 시소러스가 존재한다면 새로이 작성하는 것보다는 기존의 시소러스를



번역 또는 필요한 부분만을 보완하여 작성하는 것이 바람직하다고 생각한다. 그러나 이미 작성된 시소러스는 외국어로 작성되어 있으므로 한글시소러스의 작성시에 발생하는 외래어의 표기문제, 복합어의 문제 등의 연구가 우선적으로 이루어져야 할 것이다. 또한, 본연구에서 일차적으로 선택한 용어에 대해서도 향후 한글화 작업이 이루어져야 할 것이다.



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## 부 록 1.

해양물리학분야의 디스크립터 (영 · 한)



abiotic factors	무생물적 요소
absorption	흡수
absorption coefficient	흡수계수(吸收係數)
abundance	수도(數度)
abyssal circulation	심층류, 심해류
abyssal currents	"
abyssal zone	심해대
accidents	사고
accuracy	정확도
acoustic arrays	음향 어레이
acoustic current meters	음향유속계
acoustic data	음향자료
acoustic equipment	음향기기
acoustic imagery	음향영상
acoustic models	음향모델
acoustic properties	음향 특성
acoustic telemetry	음향원격측정법
acoustic tomography	음향도모그래피
acoustic transducers	음향변환기
acoustics	음향학
acronyms	약성어(略成語)
adiabatic process	단열과정
advection	이류(移流)
aerial photographs	항공사진
aerial photography	항공사진술
aerial surveys	항공탐사
aerosols	연무체, 에어로졸
age of seawater	해수연령
air pollution	대기오염
air sea coupling	대기해양연결
air sea interaction	대기해양상호작용
air water exchange	대기교환
air water exchanges	대기변환
air water interface	대기해수 경계면
air water interfaces	"
airborne sensing	항공기에 의한 탐사
aircraft	항공기
algae	조류(藻類)
algal blooms	조류 대번식(藻類 大繁殖)
algal culture	조류 배양
algorithms	산법, 알고리즘
altimetry	고도, 고도측량
aluminium	알루미늄

ambient noise	배경 소음
anadromous species	소하성종
analysis	분석
analytical errors	분석오차
analytical techniques	분석기술
anemometers	풍향풍속계
annual reports	연보
annual variations	연변화
Antarctic Waters	남극수
Antarctic Zone	남극대
antennas	더듬이, 촉각, 제2촉각, 안테나
Anthozoa	산호충류(珊瑚蟲類), 화충류(花蟲類)
anticyclones	고기압
anticyclonic motion	고기압성 운동
aquaculture	수산양식(水産養殖)
aquaria	양어조, 수족관
aquatic animals	수생동물
aquatic bacteria	수생박테리아
aquatic birds	수생조류
aquatic communities	수생군집
aquatic drugs	수생약품
aquatic mammals	수생포유류
aquatic plants	수생식물
archipelagoes	군도(群島), 다도해
arctic zone	북극대
arrays	배열
artificial reefs	인공모래톱
artisanal fishing	모조어(魚)
astronomy	천문학
atlases	지도책
atmosphere ocean system	대기 해양계
atmospheric chemistry	대기화학
atmospheric circulation	대기순환
atmospheric conditions	기상조건
atmospheric forcing	대기압력
atmospheric fronts	대기전선
atmospheric gases	대기가스, 대기기체
atmospheric physics	대기물리학
atmospheric precipitation	대기강수
atmospheric precipitations	대기침전(작용)
automated recording	자동장치를 갖춘 녹음테이프
automation	자동화
Aves	조류(鳥類)



AXBTs	공중투하 일회용 수심수온측정기
Bacillariophyceae	규조류(硅藻類)
backscatter	후방산란
bacteria	세균, 박테리아
bacterioplankton	박테리아 플랑크톤
barium isotopes	바륨 동위원소
baroclinic flow	경압흐름
baroclinic instability	경압성불안정
baroclinic motion	경압운동
barotropic flow	순압유체류(流)
barotropic instability	순압성불안정
barotropic mode	순압모델
barotropic motion	순압운동
barrier reefs	보초(堡礁)
barrier spits	보초갑(堡礁岬)
baseline studies	바탕선 조사
bathyal zone	반심해성대
bathymetric charts	수심도(水深圖), 해저지형도(海底地形圖)
bathymetric data	수심자료
bathymetric surveys	수심측량
bathymetry	수심, 측심
bathythermographic data	수심수온기록계 자료
bathythermographs	수심수온기록계
bay dynamics	만(灣) 동력학
bays	만(灣)
beaches	해빈(海濱)
behaviour	행동, 행태
Benguela Current	벵겔라 해류
benthic boundary layer	해저경계층
benthic environment	저서(성) 환경
benthos	저서생물
bibliographic information	서지학의 정보
biocenosis	생물군집
biochemistry	생화학(生化學)
biocoenosis	생물군집(生物群集)
biogeochemical cycle	생지화학적 순환
biogeochemistry	생지화학(生地化學)
biogeography	생물지리학(生物地理學)
biological data	생물자료
biological drift	생물표류
biological oceanography	생물해양학
biological production	생물학적 제재
biological properties	생물학적 특성

biological sampling	생체시료
biological surveys	생물학직 조사
biology	생물학
bioluminescence	생물발광(發光)
biomass	생물량(生物量)
biota	생물상(生物相)
biotechnology	생물 공학
Bivalvia	조개류
body size	신체치수
books	책
bottom boundary layer	해저경계층
bottom currents	저층류
bottom Ekman layer	해저 에크만 층
bottom friction	해저마찰(海底摩擦)
bottom pressure	해저면 음력
bottom stress	해저변형력
bottom temperature data	해저온도자료
bottom topography	해저지형
bottom topography effects	해저지형 효과
boundaries	경계
boundary conditions	경계조건
boundary currents	경계류
boundary layers	경계층(境界層)
brackish water	기수(汽水)
brackishwater pollution	기수 오염
breaking waves	쇄파
breeding grounds	사육지
bridges	다리
brines	소금물, 염수(鹽水)
Brunt Vaisala frequency	브런트-바이잘라 주파수
bubbles	기포
buoy motion effects	부표이동효과
buoy systems	부표계
buoyancy	부력(浮力)
buoyancy floats	부력 부표
buoyancy flux	부력속(速)
buoys	뜸, 부표(浮標), 부이
Calanoidea	칼라누스목(橈脚亞目)
calcareous ooze	석회질 연니
calibration	보정, 검정
capillary waves	표면장력파(表面張力波), 모세관 파(波)
carbon cycle	탄소순환
carbon dioxide	이산화탄소

carbon fixation	탄소고정
cartography	제도, 작도법
catalogs	목록
catalogues	목록
catch statistics	포획량 통계자료
census	국세조사, 센서스
cephalopod fisheries	수산두족류
Cetacea	고래목
channel flow	채널 유통
channels	수로(水路), 하도(河道), 해협
charts	해도(海圖)
check lists	대조표, 검사항목명세표
chemical analysis	화학 분석
chemical composition	화학 합성, 화학 조성
chemical equilibrium	화학평형
chemical oceanography	화학해양학
chemical plumes	화학적 플룸
chemical properties	화학적 성질
chemical speciation	화학적 종분화
chemical spills	화학적 유출(물)
chemistry	화학
chlorine compounds	염소 화합물
chlorophyll	엽록소
chlorophyll a	엽록소 a
chlorophylls	엽록소
chromium	크롬
circulation processes	순환과정
classification systems	분류체계
climate	기후
climate prediction	일기예보
climatic change	기후변동
climatic changes	기후변동
climatic conditions	기후상태
climatic effects	기후효과
climatological charts	기후도
climatology	기후학
cloud cover	구름량
coastal boundary layer	연안경계층
coastal currents	연안류(沿岸流)
coastal engineering	해안공학(海岸工學), 연안공학
coastal environments	해안환경
coastal erosion	해안침식(海岸侵蝕)
coastal fisheries	연안어업

coastal inlets	연안 소해협
coastal jets	연안 제트류(流)
coastal lagoons	연안 석호
coastal morphology	연안형태학
coastal oceanography	연안해양학
coastal upwelling	연안용승
coastal water	연안해
coastal waters	연안해
coastal zone	연안역
coastal zone management	연안역 관리
color	색
commercial fishing	어업
commercial species	무역의 종류
communication	통신
communication systems	통신체계
community composition	군집구성
comparative studies	비교조사
computation	계량, 계산
computer programmes	컴퓨터 프로그램
computer programs	컴퓨터 프로그램
computers	컴퓨터
conductivity	전도도(율)
conductivity sensors	전도도 감지장치
conservation equations	보존방정식
continental drift	대륙이동(大陸移動)
continental margins	대륙주변부
continental shelf	대륙붕(大陸棚)
continental shelves	대륙붕(大陸棚)
continental slope	대륙사면(大陸斜面)
control	제어, 방제, 조정, 조정
convection	대류(對流)
convergence zones	수렴대(收斂帶)
copepoda	copepod 요각류
coral	산호
Coriolis force	코리올리 힘, 편향력, 전향력
Coriolis parameters	코리올리변수
corrections	보정
correlation	상관, 대비
correlation analysis	상관분석
correlational analysis	상관분석
Cote d' Ivoire	코트디브와르 공화국
crab fisheries	게 수산업
Cretaceous	백악기

cruise programmes	순항계획
cruise reports	순항보고서
cruise stations	순항지
cruises	순항
Crustacea	갑각강(甲殼綱), 갑각류
cryobiology	빙설생물학
cryoplankton	빙설 플랑크톤
CTD data	전기전도도-수온-수심 자료
CTD observations	" 관측
CTD profilers	" 관측기
current	해류(海流), 조류(潮流), 회전류
current charts	해류도(海流圖)
current data	해류자료
current direction	유향(流向)
current forces	해류 세력
current meandering	해류 사행
current measurement	유속 측정
current measuring equipment	해류측량 장치
current measuring instruments	해류측량 기계
current meter arrays	유속계 배열
current meter data	유속계 자료
current meter moorings	유속계 계류
current meter observations	유속계 관측
current meters	유속계(流速計)
current observations	해류 관측
current profiles	해류단면(海流斷面)
current rings	해류 고리
current sensors	해류감지장치, 조류(潮流)감지장치
current shear	해류 전단응력
current velocity	해류속도
cyclones	(온대성) 저기압, 싸이클론
cyclonic motion	저기압성 운동
cysts	포낭(胞囊), 피낭체(被囊體), 시스트
damage	재해, 피해, 손상
data acquisition	자료수집, 자료획득
data buoys	자료부표
data centre	자료센터
data centres	자료센터
data collection	자료수집
data collections	"
data loggers	데이터 이력 기록기
data processing	자료처리
data reduction	데이터 정리

data reports	자료보고서
data retrieval	자료검색
decomposers	분해자(分解者)
deep currents	심해류
deep sea	심해
deep sea diving	심해잠수
deep sea mining	심해채광
deep water	심층수(深層水), 심해
deep water formation	심해층
deep water masses	심층수괴
deltaic features	삼각주가 있는 지형
demersal fisheries	저서성 어업
density	밀도
density fronts	밀도전선
density gradients	밀도경사
density measurement	밀도측정
density profiles	밀도 단면
density stratification	밀도 성층
depth	깊이, 층, 수심
design	설계
development	발달
diatoms	규조류(硅藻類)
diets	식이(食餌)
diffusion	확산(擴散)
diffusion coefficients	확산계수(擴散係數)
dilution	물힘, 희석(稀釋)
dinoflagellates	와편모조류(渦鞭毛藻類)
direction indicators	방향지시기, 표지
directional spectra	방향스펙트럼
directories	인명부, 규칙서
dispersion	분산(分散)
dissolved gases	용존가스
dissolved organic carbon	용존유기탄소
dissolved oxygen	용존산소
dissolved salts	용존염
distribution	분포, 해판, 배전
distribution records	분배 기록
diurnal variations	일변화(日變化)
divergence zone	발산대
diving	잠수
documentation	문서화(文書化)
documents	문서
domestic wastes	가정쓰레기

dominant species	우점종
doppler effect	도플러 효과
doppler sonar	도플러 수중음파탐지기
double diffusion	이중확산
downwelling	침강
drag	항력(抗力)
drag coefficient	항력계수
dredging	준설(작업)
drift	표류(漂流), 사퇴(砂堆)
drifters	표류자
drifting data buoys	해류속도 자료 부표
drilling	천공
dynamic analysis	역학적 분석
dynamic height	역학적 고도(高度)
dynamic response	동적 반응
dynamic topography	역학적 고저도(力學的 高低圖)
dynamical oceanography	역학적 해양학
dynamics	동력학, 역학
earth atmosphere	지구대기
earth mantle	지구맨틀
earth orbit	지구궤도
earth sciences	지구과학
echo surveys	음향측량
echosounders	음향측심기(音響測深機)
ecological aggregations	생태 집합
ecological associations	생태 협회
ecological balance	생태 조화
ecological distribution	생태분포
ecological zonation	생태적 대상구조
ecology	생태학(生態學)
economics	경제학
ecosystem analysis	생태계 분석
ecosystem disturbance	생태계 혼란
ecosystem dynamics	생태계 역학
ecosystem management	생태계 관리
ecosystem models	생태계 모형
ecosystems	생태계(生態系)
ecotypes	생태형(生態型)
eddy	소용돌이, 회오리
eddies	소용돌이, 회오리
eddy diffusivity	와동확산률
eddy flux	와동연속(連續)
eddy kinetic energy	와동운동에너지

eddy viscosity	와동점성(渦動粘性)
education	교육
education establishments	교육제도
effluents	유출액, 유출하수, 폐수
Ekman layers	에크만 층
Ekman transport	에크만 수송
El Nino	엘니뇨
El Nino phenomena	엘니뇨 사상
electrical conductance	전기 전도계수
electrical conductivity	전기 전도도(율)
electrodes	전극
electromagnetic surveys	전자기 탐사
electromagnetism	전자기(학)
electronic equipment	전기공학 장치
electronics	전기공학
energy balance	에너지 평형
energy budget	에너지수지
energy dissipation	에너지 소산(감쇠)
energy flow	에너지흐름
energy resources	동력 자원
energy spectra	에너지 스펙트럼
engineering	공학
entrainment	동반이행(同伴移行), 연행
environment management	동반이행 관리
environmental charts	환경해도
environmental conditions	환경조건
environmental data	환경자료
environmental degradation	환경 삭평형작용
environmental effects	환경효과
environmental factors	환경요인
environmental impact	환경영향
environmental monitoring	환경 방사능 감시
environmental surveys	환경측량
enzymatic activity	효소활동도
equations	평형상태
equations of motion	운동방정식
equations of state	상태방정식
equatorial circulation	적도순환
equatorial dynamics	적도 역학
equatorial trapped waves	적도 포획파
equatorial waves	적도파
equilibrium	평형(平衡),
equipment	설비, 장비, 장치



errors	오차
estuaries	염하구, 에스추어리, 강하구
estuarine circulation	염하구 순환
estuarine dynamics	염하구 역학
euphotic zone	진광대(眞光帶), 유광층, 투광수층(透光水層), 수광대
eutrophication	부영양화(富營養化)
evolution	진화
exchange capacity	치환능, 교환능
Exclusive Economic Zone	배타적 경제수역
expedition reports	탐험보고서
expeditions	탐험
experimental data	실험자료
experimental research	실험조사
extreme waves	극치파
fate	운명
fetch	취송(吹送)
fiberoptics	섬유 광학
filtration	여과, 거르기
finestructure	미세구조
finite element method	유한요소법
fish	어류
fish catch statistics	어획 통계자료
fish culture	양어
fish detection	어군탐지
fish larvae	어류 유생(幼生)
fisheries	어업
fisheries resources	수산자원
fishery biology	수산생물학
fishery data	수산자료
fishery economics	수산업 경제
fishery management	수산업 관리
fishery oceanography	수산해양학
fishery resources	수산업 자원
fishery sciences	수산과학
fishery surveys	수산업 측량
fjord dynamics	피요르드 동력학
fjords	피요르드, 협만
flood forecasting	홍수예보
flow measurement	유량측정
flow over surfaces	유출표면
flow structures	유상구조
flowmeters	유량계(流量計), 여과량 계측기
fluid dynamics	유체역학

fluid flow	유체흐름
fluid mechanics	유체역학
fluid motion	유체이동
fluorescence	형광
flushing	플러싱, 세척, 강정사육
flushing time	지체시간
foams	거품
food availability	식품 이용도
food chains	먹이사슬
food organisms	생물 양분
food webs	먹이망
forecasting	예보
fossil assemblages	화석 집단
fossil foraminifera	유공충(류) 화석
fossil radiolaria	방산충(아강) 화석
Fourier transforms	푸리에 변환
fresh water	담수(淡水), 민물
friction	마찰
frontal features	전선 특징
frontal zones	전선대
frontogenesis	전선 발생
fronts	전선(前線)
fronts oceanic	대양의 전선
gadoid fisheries	대구과의 물고기 어업
Gastropoda	복족강(腹足綱) (연체동물문)
Gaussian distribution	가우스분포
Gaussian distributions	"
Gaussian processes	가우스과정
geochemical cycle	지화학적 순환
geochemistry	지화학(地化學)
geochronometry	지질 연대 측정(술)
geodesy	측지학(測地學)
geographical distribution	지리적 분포
geography	지리, 지형
geoid	지오이드, 대지수준면(大地水準面)
geological data	지질자료
geological surveys	지질조사
geological time	지질연대
geology	지질학
geomorphology	지형학(地形學)
geophysics	지구물리학
geophysical data	지구물리학 자료
geophysical exploration	지구물리학 탐사

geophysical surveys	지구물리학적 조사
geophysics	지구물리학
Georges Bank	쥘오지 뱅크
geostrophic currents	지형류(地形流)
geostrophic flow	지관류
geostrophic method	지형류 방법
geostrophic motion	지관운동
geostrophic transport	지형류 운송
geostrophy	지형성
geothermal energy	지열에너지
giant waves	거대 파도
glacial features	빙하의 특징
glaciation	빙하작용
glaciology	빙하학(氷河學)
government policjes	행정 정책
government policy	행정권 정책
grain size	입도(粒度)
graphic methods	도형방식, 도식법, 도시법
graphics	제도, 도시(圖示), 도식(圖式)
gravel	자갈
gravity field	중력장
gravity waves	중력파(重力波)
greenhouse effect	온실효과(溫室效果)
groundings	좌초, 집지
growth	성장
Gulf Stream	걸프 스트림, 멕시코만류
gyres	환류(環流)
habitat	서식지, 서식환경
halocline	염분약층
haloclines	염분경사, 염분급변층
halogenated hydrocarbons	할로겐화 탄화수소
harbor models	항만 모형
harbors	항구
harmonic analysis	조화분석(調和分析)
headlands	곶, 돌출부
heat budget	열수지(熱收支)
heat content	열 함유량
heat exchange	열교환
heat flow	열류(量)
heat storage	축열
heat transfer	열전달
heat transport	열수송
heavy metals	중금속

helium	헬륨
historical account	역사적 이야기
history	역사
horizontal distribution	수평분포
horizontal profiles	수평단면
hurricanes	허리케인
hydraulic models	수리모형
hydraulics	수리학(水理學), 수력학(水力學)
hydrobiology	수생생물학
hydrocarbons	탄화수소
hydroclimate	수문기후
hydrodynamic equations	유체역학 방정식
hydrodynamics	유체역학
hydroelectric power plants	수력발전소
hydrographic charts	해양해도
hydrographic data	해양자료
hydrographic sections	해양단면도
hydrographic surveying	수로측량
hydrographic surveys	수로측량(水路測量)
hydrography	수로학(水路學)
hydrologic cycle	물순환
hydrology	수문학(水文學)
hydrostatic pressure	유체정압(流體靜壓), 정수압
hydrostatics	유체정력학의
hydraulic models	수리 모형
ice	얼음
ice conditions	얼음 상태
ice cover	얼음 덮개
ice drift	유빙
ice edge	빙산면
ice floes	부빙
ice loads	빙설하중(해상에 떠있는 얼음벌)
ice navigation	얼음운하
ice observations	빙하관찰
ice shelves	선반얼음
ice thickness	빙하층
ice water interface	얼음-물 경계층
ice water interfaces	"
iceberg scouring	빙산 쓰레기
icebergs	빙산
ichthyology	어류학
ichthyoplankton	어류플랑크톤
icing	얼음의 피막, 빙장, 빙결

image processing	영상 처리
imagery	영상
imaging techniques	영상기술
in situ density	현장 밀도
indicator species	지표종(指標種)
industrial wastes	산업폐기물
industries	산업
inertial currents	관성류(慣性流)
inertial waves	관성파(慣性波)
information retrieval	정보검색
information services	정보서비스
infrared	적외선
infrared imagery	적외선 영상
infrared sensing	적외선 감지
inlets	강어귀, 소해협
inorganic suspended matter	무기 부유물
inshore stations	연안 관측점
instability	불안정도(성)
instrument platforms	기기지지대
instrumentation	계기(計器)화
instruments	기구(器具), 기기(機器)
intercalibration	상호검정
interface	경계면(境界面)
interfacing	(접혀지는 부분의) 심, 경계를 이룸(경계형성)
intermediate water masses	중간층수 질량
internal tides	내부파 조수의 간만
internal wave effects	내부파 효과
internal wave generation	내부파 발생
internal waves	내부파(內部波)
international agreements	국제협정
international cooperation	국제협력
international organizations	국제기구
interspecific relationships	두개의 종사이에서 생기는 관계
intertidal environment	조간대의 환경
inventories	재고조사, 속구목록
Invertebrata	무척추동물(無脊椎動物)
invertebrate zoology	무척추동물학
irradiance	광량(光量), 복사조도, 방사조도(放射照度)
isopleths	등량선, 등치선(等值線)
isopycnic surfaces	등밀도면(等密度面)
isopycnics	등밀도(等密度)
isothermal	등온
isotopes	동위원소

jets	제트류(流)
Kalman filters	칼만(Kalman)여과기
Kelvin Helmholtz instability	켈빈헬름홀츠 불안정성
Kelvin waves	켈빈파
kinematics	운동학
kinetic energy	운동에너지
laboratories	실험실
lagoon fisheries	석호어류
lagoons	석호(澗湖), 기수호(汽水湖)
Lagrangian current measurement	라그랑 해류 측정법
landing statistics	상륙 통계치
Langmuir circulation	랭그뮤어 순환
Laplace equation	라플라스 방정식
Laplace equations	"
larvae	유충
lasers	레이저
latent heat transfer	숨은열의 이동
Law of the Sea	해양법
layers	층
leases	임대차, 임차권
legislation	입법(立法)
lidar	광선 레이더
life cycle	생활환
life history	생활사
light absorption	광흡수
light attenuation	광회박화, 광저하
light effects	광선 효과
light intensity	광선 세기, 빛의 세기
light reflection	광반사
light scattering	빛산란
light transmission	광투과
linear waves	선형파
lipids	지질(脂質), 지방질
literature reviews	논문검색
littoral zone	천해대(淺海帶), 연안대
living resources	생물자원
long term changes	장기 변화
long term records	장기 기록
long term variations	장기 변화
low frequency	저주파
mackerel fisheries	고등어과어류
magnetic properties	자기적 속성
magnetism	자기(磁氣), 자성(磁性)

mangrove swamps	맹그로브 늪
manuals	안내서
map projections	지도 투영법
mapping	지도 작성
maps	지도
marginal basins	대륙주변분지
marginal seas	연해(緣海)
marinas	마리나(요트 계선장)
marine advection	선박 이류, 해양 수평 기류
marine aquaculture	해양수산양식
marine biology	해양생물학(海洋生物學)
marine birds	바다새
marine chemistry	해양 화학
marine crustaceans	해양 갑각류
marine ecology	해양생태학(海洋生態學)
marine ecosystems	해양생태계
marine environment	해양환경
marine environments	"
marine fish	해양어류
marine fisheries	해양어업
marine geology	해양지질학
marine invertebrates	해양 무척추동물
marine mammals	해양 포유동물
marine organisms	해양생물
marine policy	해양정책
marine pollution	해양오염
marine resources	해양자원
marine sciences	해양과학
marine scientists	해양학자
marine technology	해양공학
mass transfer	질량이동
mathematical analysis	수학적 분석
mathematical modelling	수학적 모형
mathematical models	수학적 방법(모형)
mean sea level	평균해수면(平均海面)
meandering	사행
measurement	측량
measuring devices	측정장치
mechanization	전산
merchant ships	상선
mercury	수은
meridional circulation	자오면 순환(南北循環)
meridional oceanic circulation	자오면 해양 순환

mesoscale eddies	중규모 소용돌이
mesoscale features	중규모 현상, 특성
meteorological data	기상 자료
meteorological observations	기상 관측
meteorology	기상학
methodology	공법(工法)학
microstructure	미세구조
microwave imagery	극초단파 영상(영상)
microwave radiometers	극초단파 복사계
microwaves	마이크로파(波)
mid ocean ridges	대양중앙해령
migrations	회유
mineral resources	광물자원, 지하자원
mineral samples	광물표본
mineralogy	광물학
mining	채광, 광산학
mining industry	광업
mixed layer	혼합층(混合層)
mixed layer depth	혼합층깊이
mixed layers	혼합층
mixing	혼합
mixing processes	혼합 과정
model studies	표본 조사
modelling	모형제작
models	모형, 본틀
modes	방식, 모드
molluscan larvae	연체동물 유충
momentum transfer	운동량전달
monitoring	감시관리
monitoring systems	감시관리 시스템
monsoons	계절풍(季節風)
monthly	한 달의
mooring motion effects	계류 운동 효과
mooring systems	계류 시스템
mud	개흙(필), 진흙, 니(泥)
natural resources	천연자원
Navier Stokes equations	네이비어 스톡스 방정식
navigation	항해(航海)
navigational aids	항로표시
navigational charts	항해도
neap tides	조금, 소조(小潮)
nearshore circulation	근접연안류, 연안류계
nearshore currents	연안류(沿岸流)



nearshore dynamics	연안 역학
nearshore sedimentation	연안퇴적물
nekton	유영동물(遊泳動物)
neogene	신세3기
nitrates	질산염
nitrites	아질산염
nitrogen	질소(7번 원소)
nitrogen compounds	질소 화합물
nitrogen cycle	질소순환(窒素循環)
nitrogen fixation	질소고정
nitrogen fixing bacteria	질소고정 박테리아
noise	소음
noise sound	소음
nonlinear waves	비선형파(非線形波)
nonlinearity	비선형성
NORPAX (North Pacific Experiment)	북태평양(순환) 실험계획
Northern Hemisphere	북반구
nuclear physics	분자핵물리학
nuclear power plants	원자력발전소
numerical analysis	수치해석
nursery grounds	유생사육장(幼生飼育場), 유생성육장(幼生成育場)
nutrient content	영양분 내용
nutrient cycles	영양소순환
nutrient deficiency	영양분 결핍
nutrient dynamics	영양분 역학
nutrient enrichment	영양분 질의 향상
nutrients	영양소(營養素), 영양염
nutrients mineral	영양 무기물
obituaries	부고
ocean atmosphere system	해양-대기계
ocean basins	대양분지(大洋盆地), 해분
ocean circulation	해양 순환
ocean currents	해류
ocean dumping	해양 쓰레기
ocean eddies	해양 소용돌이
ocean engineering	해양공학
ocean floor	해저, 대양저
ocean ice atmosphere interactions	해양-해빙-대기 상호작용
ocean ice atmosphere system	해양-해빙-대기 계
ocean ice atmosphere systems	"
ocean stations	해양 관측점
oceanic boundary layer	대양의 경계층
oceanic circulation	해양 순환

oceanic currents	해류
oceanic eddies	대양의 소용돌이
oceanic fronts	해양전선
oceanic response	해양 반응
oceanic turbulence	난류
oceanographic atlases	해양도집
oceanographic data	해양 자료
oceanographic equipment	해양학 연구장비
oceanographic institutions	해양연구기관
oceanographic surveys	해양조사
oceanography	해양학(海洋學)
oceanography, chemical	화학적 해양학
oceanography, physical	물리적 해양학
oceans	해양(海洋), 대양(大洋)
offshore	연해(沿海)
offshore engineering	연해 공학
offshore operations	연해 영향력
offshore structures	연해 구조
oil and gas	기름과 가스
oil and gas exploration	기름과 가스탐사
oil and gas industry	기름 그리고 가스산업
oil pollution	기름오염
oil spills	기름(유류)유출
oil storage	기름 저장
oil wastes	기름 낭비
optical instruments	광학 기계
optical properties	광학 속성
optics	시력, 시각
orbital velocity	궤도속도
organic carbon	유기탄소
organic matter	유기물
organic suspended matter	유기부유물질
organism aggregations	유기체 집합
orthogonals	직교(直交)
oscillations	진동, 승강운동(昇降運動)
outer continental shelf	외대륙붕
outer continental shelves	"
outfalls	하구
outflow	유출(流出)
oxygen	산소
oxygen depletion	산소결핍
oxygen isotopes	산소 동위원소
oxygen profiles	산소 단면

ozone	오존
pack ice	유빙(遊氷)
palaeoceanography	고해양학
palaeoclimatology	고기후학
palaeoceanography	고해양학
paleoceanography	고해양학
paleoceanography	고해양학
parameterization	변수화
particle motion	입자운동
particulate flux	미립자의 유동, 입자성물질유동
pelagic environment	표영환경
pelagic fisheries	원양어업
periodic variations	주기변동
permanent thermocline	영구수온약층
perturbation method	섭동법
pH	수소이온 농도
phosphates	인산염
phosphorus	인 (15번 원소)
phosphorus cycle	인순환
photogrammetry	사진계측
photosynthesis	광합성(光合成)
physical limnology	물리육수(陸水)학
physical oceanography	해양물리학
physical properties	물성(物性)
physicochemical properties	물리화학적 특성
physiochemical properties	생리화학적 특성
physiography	지형(地形)학
phytoplankton	식물플랑크톤, 부유식물
pigments	색소
planetary waves	행성과
plankton	플랑크톤
plankton feeders	플랑크톤 사육자
plankton surveys	플랑크톤 측량
planktonology	부유생물학
plate tectonics	판구조론(板構造論)
plumes	플룸, 물기둥
plumes aquatic	플룸 수생동물
plutonium isotopes	플루토늄 동위원소
polar fronts	한대전선(寒帶前線), 극전선(極前線)
polar oceanography	극지해양학
polar waters	극지해
polar zones	극지대, 극권(極圈)
pollutant dispersion	오염물질 산포도

pollutants	오염물질, 공해물질
pollution	오염
pollution control	오염 관리
pollution dispersion	오염 산포도, 오염분포도
pollution effects	오염효과
pollution monitoring	오염 감시
pollution surveys	오염 측량
polynyas	비빙결수권
population dynamics	개체군 역학(동태론)
port installations	항구 설비
position fixing	위치 고정
positioning systems	위치 장치
potential energy	포텐셜 에너지, 위치에너지
potential temperature	온위(溫位)
potential vorticity	포텐셜와도
power plants	발전소
precipitation	강수(降水), 침전(작용)
predation	포식
prediction	예보
pressure	압력
pressure gradients	압력경도(壓力傾度)
pressure measurement	압력 측정
pressure sensors	압력 감지기
primary production	일차생산(一次生産), 일차생산량
probes instruments	탐침기계
production biological	생산 응용생물학
productivity	생산력
profilers	단면계
profiles	단면(斷面)
progress reports	진행보고서
proteins	단백질
pycnocline	밀도 약층
quality assurance	품질보증
quality control	품질관리
quantitative distribution	정량 분포
quasi geostrophic motion	준(準) 지형성운동
radar	레이더, 전파탐지기
radar altimetry	레이더 고도 측량법
radar imagery	레이더 영상
radiative transfer	복사전달
radio	라디오
radio buoys	라디오 부표
radio telemetry	라디오 원격측정법

radioactive tracers	방사성 추적자
radioactive waste disposal	방사성 폐기물처리
radioisotopes	방사성동위원소
radiometers	방사계, 방사성 측정기
rainfall	강우
ray paths	선로(線路)
recirculating systems	재순환계
recording devices	기록장치
recording equipment	녹음장비
recreational waters	자양강장제 음료, 기분전환용 음료
recruitment	가입(량)
red tides	적조(赤潮)
redox reactions	산화환원 반응
reef formation	암초층
reefs	(암)초, 모래톱(礁)
refractive index	굴절률
regional planning	지역 계획
remote sensing	원격탐사
remote sensing equipment	원격탐사장치
report literature	보고서문학
reports	보고서
research	조사
research and development	조사 그리고 발전
research institutions	연구학회
research programmes	조사프로그램
research programmes	"
research proposals	연구제안
research vessels	조사선
residual flow	잔차류
resistance	저항
resolution	분해능, 해석, 재용해(再溶解)
resource conservation	자원 보존
resource development	자원 발전
resource exploration	자원 탐구
resource management	자원 관리
resources	자원
respiration	호흡(呼吸)
response analysis	반응 분석
resuspended sediments	재부유(성) 퇴적물
reverberation	잔향(殘響)
review articles	비평 기사
reviews	비평
Richardson number	리차드슨 수

rings	고리, 나이테(비늘)
risks	위험, 보험금액
river discharge	강 유출량
river outflow	강 범람
river plumes	강 플룸(물기둥)
river wash	하천 범람지
rivers	하천(河川), 강
rocks	암석
rocky shores	바위가 많은 기슭
Rosby number	로스비 수
Rosby parameter	로스비 변수
rotating fluids	순환하는 유체
runoff	유출량, 유출(流出), 유거(流去), 홍수
safety regulations	안전 규칙
saline intrusion	해수 소택지 침입
salinity	염분(鹽分)
salinity charts	염전 해도
salinity data	염분자료
salinity effects	염분효과
salinity gradients	염분 변화율(경사표)
salinity measurement	염분 측정
salinity profiles	염분 단면
salinity sections	염분 지역
salinity stratification	염분층
Salmonidae	연어과의 물고기
salt budget	소금 예산
salt domes	염구, 암염(岩鹽)
salt fingers	염지현상(鹽指一)
salt flux	염분 유동
salt marshes	소금늪
salt wedges	소금 썩기형
salts	염(鹽), 소금
sampling	채집, 시료채취
sand	모래
sands	"
Sargasso Sea	사르가소해
satellite altimetry	위성 고각(고도)측량
satellite data	위성 자료
satellite mosaics	위성 모자이크
satellite navigation	위성 항공
satellite sensing	위성 감각
satellite technology	위성 과학기술
satellites	위성(衛星)

scaling	척도분석
scallop fisheries	가리비어업
scattering coefficient	산란 계수
scattering layers	산란층
scatterometers	산란계
scientific personnel	자연과학 요원
scientists	과학자
scouring	수중 침식(水中浸蝕), (빙하, 유수에 의한)세굴작용(洗掘作用)
sea ice	해빙(海水)
sea level	해수면(海水面)
sea level changes	해(수)면 변동
sea level measurement	해수면 측정
sea level measuring	해수면 측정
sea level variations	해수면 변화
sea state	해상(海象), 해상상태(海上狀態)
sea surface	해표면
sea surface topography	해수면 굴곡
sea water	해수
seabed	해저
seafloor mapping	해저 지도제작
seafloor spreading	해저확장
seamounts	해저산(海底山)
seasonal distribution	계절적인 분포
seasonal thermocline	계절적 수온약층
seasonal variations	계절변화(季節變化)
seasonality	계절간격 차
seawater	해수
Secchi disc	투명도판(透明度板)
secondary production	2차생산, 2차생산량
sediment analysis	퇴적물 분석
sediment composition	퇴적물 구성
sediment distribution	퇴적물 분포
sediment dynamics	퇴적물 역학
sediment pollution	퇴적물 오염
sediment sorting	퇴적물 종류
sediment texture	퇴적물 조직
sediment transfer	퇴적물 이동
sediment transport	퇴적물운반, 퇴적물 수송
sediment unconsolidated	굳지않은 퇴적물
sediment water interface	해저-해수 경계면
sedimentation	퇴적작용, 침강(沈降)
sedimentology	퇴적학
sediments	퇴적물(堆積物), 침전물(沈澱物)

seismic exploration  
seismic stratigraphy  
seismology  
semidiurnal tides  
sensors  
separation processes  
sewage  
sewage disposal  
shallow water  
shallow water waves  
shear flow  
shear zone  
shelf currents  
shelf dynamics  
shelf edge dynamics  
shelf edge fronts  
shelf fronts  
shelf seas  
shelf waves  
ship design  
ship routeing  
ship technology  
shipboard analysis  
shipboard equipment  
shipbuilding  
shipping  
shipping routes  
ships  
shrimp fisheries  
side scan sonar  
sigma t  
signal processing  
silicon  
sills  
silting  
simulation  
simulations  
site selection  
size distribution  
slope currents  
slope environment  
sludge  
snow

탄성과 탐구  
탄성과 층서  
지진학  
반일주조(半日周潮)  
감지기  
분열 진행, 분리 과정  
오물  
오물 처리  
천해, 천수  
천해파(淺海波)  
전단 유동  
전단응력대  
암초 해류, 대륙붕 해류, 봉류  
대륙붕 역학  
대륙붕단 역학  
대륙붕단 전선  
대륙붕 전선  
대륙붕 바다  
대륙붕과, 붕파  
배 설계  
해로  
조선술, 선박기술  
선상 분석  
선상 장비  
조선  
선적, 해운업  
해로  
배  
새우 어업  
측면 주사 음향기  
시그마 티  
신호 처리  
규모  
셀, 수평판상관입암  
침니  
모의실험  
시뮬레이션  
장소 선택  
규모 분배, 크기분포  
경사 해류  
경사 환경  
스렛지, 반녹은 부빙(浮氷), 찌꺼기  
눈



SOFAR floats	음파수렴역 부표
soils	흙
solar radiation	태양방사선
solitary waves	고립파(孤立波)
solitons	단자(單子)
sonar	음탐기(音探機), 소오나
sonar arrays	음탐기 세트
sonar equipment	음탐기 장치
sonar systems	음탐기 조직
sound attenuation	소리 감소
sound dispersion	소리 분산
sound measurement	소리 측정
sound propagation	소리 전파, 음파 전달
sound reflection	소리 반사
sound scattering	소리 분산
sound spectra	음향 스펙트럼
sound transmission	음향 전달
sound velocity	음속
southern oscillation	남방진동
southern oscillations	"
spatial distribution	공간분포
spatial variations	공간변화
spawning	산란
spawning grounds	산란장(産卵場)
species diversity	종 다양성
spectral analysis	스펙트럼 분석
spectral composition	스펙트럼 구성
spinup	스핀업
splines	운형자
sport fishing	스포츠 낚시
spring	봄
stability	안정도
standing waves	정상파(定常波)
station lists	측점목록
stations	측점(測點), (조사)정점
statistical analysis	통계적 분석
statistical models	통계적 방법, 통계적 모형
STD	염분-수온-수심
STD observations	STD 관측
stochastic processes	확률과정
stock assessment	자원 평가
stocks	자원
Stokes waves	스톡스파

storm surge	폭풍해일(暴風海溢)
storm surges	"
storms	폭풍우(暴風雨)
straits	해협
stratification	성층(구조), 층별화, 층리(層理)
stratified flow	성층류(成層流)
stream flow	하천류량(河川流量)
sub polar environments	아극지대의 환경
submarine canyon	해저협곡(海底峽谷)
submarine canyons	"
submarine features	해저지형
submersibles	잠수함
substrata	기층(基層), (基質)
subsurface currents	지하 배수 흐름
subsurface drifters	수면 하의소해선
subtropical convergence	아열대 수렴대(亞熱帶 收斂帶)
subtropical convergences	"
subtropical gyre	아열대 환류
subtropical zones	아열대
sulphur compounds	황화합물
sulphur isotopes	황동위원소
summer	여름
surface chemistry	표면화학
surface circulation	표면순환
surface currents	표면류(表面流)
surface drifters	표층부표
surface films	표면막
surface gravity waves	표면중력파
surface layer	표면층, 표층
surface layers	"
surface mixed layer	표면혼합층
surface properties	표면 특성
surface roughness	표면 거칠기
surface salinity	표면염도
surface temperature	표면온도
surface tension	표면장력
surface topography	표면굴곡
surface water	지상수, 표층수
surface water waves	표층수파, 표면파
surges	해일
surveys	측량
suspended particulate marker	부유 미립자 기록원
suspended particulate matter	부유 입자물질

swell	너울, 큰 물결
synthetic aperture radar	합성물탐 레이더, SAR
system analysis	체계분석
T S data	수온염분자료
T/S diagrams	수온/염분 도표
telemetry	원격측정(법)(遠隔測定法)
telephone systems	전화시스템
temperature	온도(溫度)
temperature anomalies	온도편차
temperature charts	온도도표
temperature data	온도자료
temperature dependence	온도의존
temperature differences	온도차
temperature effects	온도효과
temperature gradient	온도 기울기, 온도 경도, 온도 구배
temperature gradients	"
temperature measurement	온도측량
temperature profiles	온도분포
temperature sections	온도구분
temporal variability	온도 변이성
temporal variations	온도 변화
terminology	술어학
terrestrial environments	지구환경
thermal conductivity	열전도율
thermal expansion	열팽창
thermal fronts	열전선
thermal plumes	열 기둥
thermal pollution	열오염
thermal power	화력
thermal stratification	열성층
thermal structure	열구조
thermistor chains	서미스터 체인, 다층온도측정기
thermocline	수온약층(水溫躍層)
thermodynamics	열역학
thermohaline circulation	열염분순환(熱鹽分循環)
tidal analysis	조석(潮汐)분석
tidal constituents	분조(分潮)
tidal currents	조류(潮流)
tidal cycle	조석(潮汐)주기
tidal cycles	조석(潮汐)주기
tidal data	조석 자료
tidal datum	조위(潮位) 기준점
tidal dynamics	조석 역학

tidal effects	조석 효과
tidal flats	조석대지, 간석지
tidal mixing	조석 혼합
tidal models	조석 모델
tidal oscillations	조석진동(潮汐振動)
tidal power	조력(潮力) 발전
tidal prediction	조석예보(潮汐豫報)
tidal propagation	조석 전파(전달)
tidal range	조차
tidal records	조석 기록
tide gauges	검조기
tide generating potential	기조력 포텐셜
tides	조석(潮汐)
time series	시계열
time series analysis	시계열 분석
tomography	X선 (단층)촬영법
topographic effects	지형 효과
topographic features	지형
towed bodies	예인체
toxins	독소
trace elements	미량원소
trace metals	미량 금속
tracer techniques	추적자 기술
tracers	추적자
tracking	추적, 추종
trade winds	무역풍
training	훈련
training aids	훈련 원조
training centres	훈련센터
transducers	변환기(전송기)
translations	병진운동
transmission	전파, 송신, 투과, 변속기
transmissometers	투광측정계
transparency	투명도
transport processes	이동과정
trapped waves	포획파(捕獲波)
tritium	삼중수소
trophic levels	영양단계(營養段階)
trophic relationships	영양관계
trophic structure	영양구조
tropical environment	열대환경
tropical meteorology	열대기상학
tropical oceanography	열대해양학

tropical zone	열대
tsunamis	지진해파
tuna fisheries	참치 어업
tunnels	굴
turbidity	탁도(濁度)
turbidity currents	저탁류(底濁)
turbulence	난류(亂流)
turbulence measurement	난류측정
turbulent boundary layer	난류 경계층
turbulent diffusion	난류확산
turbulent entrainment	난류편승(현상)
turbulent flow	난류(亂流)
underwater equipment	수중장비
underwater explosions	수중폭발
underwater object location	수중 목적 위치
underwater structures	수중구조
underwater vehicles	수중운송수단
universities	우주, 은하계
unmanned vehicles	무인비행체
upper ocean	상층해양
upwelling	용승(湧昇)
utilization	이용
vanes	날개
variability	변동성
variations	변이(變異), 변차(變)
velocity	속도
velocity gradients	속도 기울기
velocity microstructure	속도 미세구조
velocity profiles	속도 분포형
ventilation	환기, 교체
vertical advection	연직 이류
vertical distribution	수직분포
vertical mixing	수직혼합
vertical motion	수직운동
vertical profiles	수직단면
vertical profiling	수직단면관측
vertical stability	수직안정
visibility underwater	수중투명도
volcanism	화산작용
volume transport	체적수송량(體積輸送)
vortex shedding	뿔돌이 발산
vortices	소용돌이
vorticity	와도(渦度)

waste disposal	폐기물 처리
waste disposal sites	폐기물 처리부지
water analysis	수질 분석
water analysis chemical	물분석 화학작용
water budget	수리계산(水計算), 물수지(收支)
water circulation	해양순환
water color	수색(水色)
water colour	수색
water column	물기둥, 수주(水柱)
water currents	물의 흐름
water density	(해수)밀도
water depth	수심
water exchange	물교환
water filters	물 여과기(물 거르기)
water levels	수면
water masses	수괴(水塊)
water mixing	물 혼합
water motion	물운동
water movements	물운동
water pollution	수질오염
water pollution control	수질오염관리
water pollution effects	수질오염결과
water pressure	수압
water properties	물의 성질, 해수특성
water quality	수질
water temperature	수온
water types	수형(水型)
water wave motion	파랑운동(파동)
water waves	파랑
wave amplitude	파의 진폭
wave analysis	파랑 분석
wave attenuation	파랑 저하(감쇠)
wave breaking	파랑 절단, 쇄파
wave buoys	파랑 부표
wave damping	파랑 감폭
wave data	파랑 자료
wave dispersion	파분산(波分散)
wave dynamics	파도 역학
wave energy	파에너지
wave followers	파진
wave forces	강제파, 파랑력(물결힘)
wave generation	파랑생성, 파(波)생성
wave height	파고(波高)

wave hindcasting	파랑추산(波浪推算)
wave ice interaction	파빙 상호작용
wave interactions	파랑 상호작용
wave measurement	파랑 측정
wave measuring equipment	파랑 측정기구
wave measuring platforms	파랑 측정단
wave number	파수(波數)
wave power	파력
wave propagation	파랑전파
wave properties	파랑특성
wave reflection	파랑굴절
wave setup	파(波)에 의한 수면상승
wave spectra	파랑 스펙트럼
wave wave interaction	파간 상호작용
wavelength	파장(波長)
waves	파(波), 파도, 파랑
weather forecasting	일기 예보
weather hazards	기상 위험
weather ships	기상 관측선
western boundary currents	서안경계류
WESTPAC	서태평양 해양조사 사업
whitecaps	백파(白波)
wind data	바람자료
wind driven circulation	취송순환
wind driven currents	취송류
wind field	바람장
wind forces	풍력
wind measurement	바람 측량
wind pressure	풍압(風壓)
wind profiles	풍속수직 분포
wind speed	풍속
wind stress	바람응력
wind stress curl	바람응력 와도
wind wave generation	풍랑 발생
wind wave interaction	풍랑 상호작용
wind waves	풍랑(風浪), 풍파
winds	바람
winter	겨울
World Coastal Waters	세계연안해역
wreck location	조난위치
XBTs	일회용수심수온측정기
zoobenthos	저서동물
zooplankton	동물성플랑크톤





## 부 록 2.

### 해양물리학분야의 시소러스



ABIOTIC FACTORS

UF density-independent factors  
 BT ENVIRONMENTAL FACTORS  
 RT DISSOLVED OXYGEN  
 ENVIRONMENTAL EFFECTS  
 LIGHT  
 SALINITY  
 WATER TEMPERATURE  
 ABSORPTION  
 NT LIGHT ABSORPTION  
 sound absorption  
 RT amplitude  
 attenuation  
 reflection  
 TRANSMISSION  
 wave motion

ABSORPTION COEFFICIENT

UF absorptivity  
 RT absorptance  
 emissivity  
 extinction coefficient  
 LIGHT ABSORPTION  
 light penetration  
 OPTICAL PROPERTIES

ABUNDANCE

UF relative abundance  
 RT availability  
 BIOMASS  
 commercial availability  
 FOOD AVAILABILITY  
 NATURAL RESOURCES  
 population number  
 QUANTITATIVE DISTRIBUTION  
 resource availability

ABYSSAL CIRCULATION

BT OCEAN CIRCULATION  
 RT ABYSSAL CURRENTS  
 BOTTOM TOPOGRAPHY  
 EFFECTS

ABYSSAL CURRENTS

BT BOTTOM CURRENTS  
 RT ABYSSAL CIRCULATION  
 benthic currents  
 OCEAN CURRENTS

ABYSSAL ZONE

UF abyssal environment  
 RT abyssobenthic zone  
 abyssopelagic zone  
 bathyspheres  
 BENTHIC ENVIRONMENT  
 PELAGIC ENVIRONMENT  
 TURBIDITY CURRENTS

ACCIDENTS

UF disasters (man-made)  
 man-made disasters  
 NT CHEMICAL SPILLS  
 collisions  
 diving accidents  
 OIL SPILLS  
 radiation leaks  
 RT accident prevention  
 alarm system  
 blowouts  
 capsizing  
 DAMAGE  
 disasters

drowning  
 emergencies  
 emergency vessels  
 fire  
 fire fighting  
 fission products  
 GROUNDINGS  
 hazards  
 injuries  
 liability  
 lifeboats  
 medicine  
 safety devices  
 search and rescue  
 survival at sea

ACCURACY

RT calibration  
 EQUIPMENT  
 INSTRUMENTS  
 MEASUREMENT  
 reliability  
 RESOLUTION  
 tests

ACOUSTIC ARRAYS

BT ARRAYS  
 NT SONAR ARRAYS  
 transducer arrays  
 transponder arrays  
 RT ACOUSTIC EQUIPMENT  
 hydrophones  
 seismic arrays  
 SONAR  
 TRANSDUCERS  
 transponders

ACOUSTIC CURRENT METERS

BT CURRENT METERS  
 RT current sensors  
 eulerian current measurement

ACOUSTIC DATA

RT ACOUSTIC PROPERTIES  
 DATA  
 limnological data  
 OCEANOGRAPHIC DATA  
 sediment properties  
 SOUND VELOCITY  
 WATER PROPERTIES

ACOUSTIC EQUIPMENT

UF acoustic devices  
 acoustic systems  
 instruments (acoustic)  
 BT EQUIPMENT  
 NT sound generators  
 ACOUSTIC ARRAYS  
 acoustic beacons  
 acoustic command systems  
 acoustic tracking systems  
 ACOUSTIC TRANSDUCERS  
 acoustic transponders  
 ACOUSTICS  
 DOPPLER SONAR  
 echo integrators  
 ECHO SURVEYS  
 echosounding  
 electroacoustic devices  
 ELECTRONIC EQUIPMENT  
 fish counters

fishing operations  
 microphones  
 net sounders  
 SONAR  
 SONAR ARRAYS  
 sonar receivers  
 sonar targets  
 sonic tags  
 sound recorders  
 sound waves  
 sub-bottom profiling  
 surveying equipment  
 transponder arrays

ACOUSTIC IMAGERY

UF acoustic sensing  
 BT IMAGERY  
 NT ACOUSTIC TOMOGRAPHY  
 sonar imagery  
 RT acoustic images  
 sodar  
 SONAR

ACOUSTIC MODELS

UF acoustic analogs  
 BT analog models  
 RT ACOUSTICS

ACOUSTIC PROPERTIES

UF sound properties  
 BT PHYSICAL PROPERTIES  
 RT ACOUSTIC DATA  
 acoustic impedance  
 acoustic insulation  
 ACOUSTICS  
 cavitation  
 SEDIMENTS  
 seismic waves  
 SOUND ATTENUATION  
 sound intensity  
 SOUND VELOCITY  
 target strength

ACOUSTIC TELEMETRY

BT TELEMETRY  
 RT acoustic command systems  
 ACOUSTIC EQUIPMENT  
 acoustic tracking systems

ACOUSTIC TOMOGRAPHY

UF tomography (acoustic)  
 BT ACOUSTIC IMAGERY  
 RT acoustic holography

ACOUSTIC TRANSDUCERS

BT TRANSDUCERS  
 NT hydrophones  
 microphones  
 sonar transducers  
 RT ACOUSTIC EQUIPMENT  
 electroacoustic devices  
 piezoelectric transducers

ACOUSTICS

UF underwater acoustics  
 BT physics  
 NT bioacoustics  
 ultrasonics  
 RT ACOUSTIC EQUIPMENT  
 ACOUSTIC MODELS  
 ACOUSTIC PROPERTIES  
 ECHO SURVEYS  
 echoes

electroacoustic devices  
 sonic tags  
 SOUND  
 sound channels  
 sound recorders  
 sound waves  
 underwater noise  
 ACRONYMS  
 RT EQUIPMENT  
 EXPEDITIONS  
 INTERNATIONAL ORGANIZATIONS  
 organizations  
 TERMINOLOGY  
 ADIABATIC PROCESSES  
 UF adiabatic cooling  
 adiabatic heating  
 BT isothermal processes  
 RT adiabatic lapse rates  
 adiabatic temperature gradient  
 potential density  
 POTENTIAL TEMPERATURE  
 THERMODYNAMICS  
 ADVECTION  
 UF MARINE ADVECTION  
 BT TRANSPORT PROCESSES  
 NT CONVECTION  
 horizontal advection  
 salt advection  
 VERTICAL ADVECTION  
 RT AIR  
 ATMOSPHERIC CIRCULATION  
 CIRCULATION  
 CONVERGENCE ZONES  
 HEAT TRANSPORT  
 oceanic convergences  
 AERIAL PHOTOGRAPHS  
 BT photographs  
 RT AERIAL PHOTOGRAPHY  
 MAPPING  
 SATELLITE MOSAICS  
 AERIAL PHOTOGRAPHY  
 BT photography  
 NT satellite photography  
 RT AERIAL PHOTOGRAPHS  
 AERIAL SURVEYS  
 AIRBORNE SENSING  
 AIRCRAFT  
 GEOSENSING  
 helicopters  
 MAPPING  
 PHOTOGRAMMETRY  
 photographic equipment  
 stereophotography  
 AERIAL SURVEYS  
 BT SURVEYS  
 RT AERIAL PHOTOGRAPHY  
 airborne equipment  
 AIRBORNE SENSING  
 AIRCRAFT  
 balloons  
 ELECTRONIC EQUIPMENT  
 FISHERY SURVEYS  
 helicopters  
 ICE COVER  
 ice routing  
 infrared detectors

REMOTE SENSING  
 SATELLITES  
 STOCK ASSESSMENT  
 AEROSOLS  
 UF atmospheric aerosols  
 continental aerosols  
 marine aerosols  
 BT colloids  
 NT radioactive aerosols  
 RT AIR POLLUTION  
 air sampling  
 air-water interface  
 ATMOSPHERIC CHEMISTRY  
 atmospheric particulates  
 bubble bursting  
 dust  
 fallout  
 salt particles  
 spray  
 surface microlayer  
 TURBIDITY  
 AGE OF SEAWATER  
 BT AGE  
 RT residence time  
 SEA WATER  
 subsurface water  
 WATER MASSES  
 AIR POLLUTION  
 UF air contamination  
 air poisoning  
 atmospheric pollution  
 pollution (air)  
 BT POLLUTION  
 RT AEROSOLS  
 AIR  
 air sampling  
 anthropogenic factors  
 ashes  
 atmospheric chemistry  
 atmospheric particulates  
 climatic changes  
 dust  
 fallout  
 fly ash  
 fossil fuels  
 haze  
 odour  
 POLLUTANTS  
 POLLUTION CONTROL  
 public health  
 smoke  
 surface microlayer  
 temperature inversions  
 wastes  
 WATER POLLUTION  
 AIR SEA COUPLING  
 RT air-sea interaction  
 METEOROLOGY  
 ocean-atmosphere system  
 ocean-ice-atmosphere system  
 AIR SEA INTERACTION  
 RT air-sea coupling  
 air-water exchanges  
 air-water interface  
 interactions  
 METEOROLOGY

ocean-atmosphere system  
 SEA SURFACE  
 teleconnections  
 AIR WATER EXCHANGES  
 UF air-sea exchange  
 air-sea transfer  
 sea-air exchange  
 water-air exchange  
 RT air-sea interaction  
 air-water interface  
 air-water temperature difference  
 bowen ratio  
 bubble bursting  
 DRAG  
 electric currents  
 ENERGY  
 energy transfer  
 evaporation  
 gas exchange  
 gases  
 HEAT EXCHANGE  
 moisture  
 moisture transfer  
 MOMENTUM  
 MOMENTUM TRANSFER  
 ocean-atmosphere system  
 PLANKTON  
 salt particles  
 SEA SURFACE  
 sensible heat  
 SURFACE CHEMISTRY  
 SUSPENDED PARTICULATE  
 MATTER  
 TEMPERATURE DIFFERENCES  
 WAVE FOLLOWERS  
 AIR WATER INTERFACES  
 UF naviface  
 BT INTERFACES  
 RT AEROSOLS  
 air bubbles  
 air-sea interaction  
 air-water exchanges  
 air-water temperature difference  
 atmospheric boundary layer  
 energy transfer  
 eolian dust  
 evaporation  
 gas exchange  
 HEAT EXCHANGE  
 LIGHT REFLECTION  
 light refraction  
 moisture transfer  
 MOMENTUM TRANSFER  
 neuston  
 OCEANIC BOUNDARY LAYER  
 pleuston  
 reflectance  
 reflected global radiation  
 SEA SURFACE  
 sensible heat transfer  
 SOLAR RADIATION  
 surface microlayer  
 SURFACE PROPERTIES  
 surface radiation temperature  
 AIRBORNE SENSING  
 UF airborne remote sensing

BT GEOSENSING  
 RT AERIAL PHOTOGRAPHY  
 AERIAL SURVEYS  
 aeromagnetic surveys  
 airborne equipment  
 AIRCRAFT  
 depth measurement  
 helicopters  
 ICE OBSERVATIONS  
 INFRARED IMAGERY  
 laser bathymeters  
 REMOTE SENSING

AIRCRAFT  
 BT vehicles  
 NT helicopters  
 RT AERIAL PHOTOGRAPHY  
 AERIAL SURVEYS  
 air transportation  
 airborne equipment  
 AIRBORNE SENSING  
 airports  
 ALTIMETRY  
 AXBTS  
 ELECTRONIC EQUIPMENT  
 INSTRUMENT PLATFORMS  
 METEOROLOGICAL  
 OBSERVATIONS  
 RADAR ALTIMETRY  
 REMOTE SENSING  
 SURVEYS  
 transportation

ALGAE  
 NT DIATOMS  
 zooxanthellae  
 RT ALGAL BLOOMS  
 ALGAL CULTURE  
 algal mats  
 algal settlements  
 stromatolites

ALGAL BLOOMS  
 UF blooms  
 plankton blooms  
 sea blooms  
 water blooms  
 RT ALGAE  
 biological poisons  
 EUTROPHICATION  
 mortality causes  
 OXYGEN DEPLETION  
 PHYTOPLANKTON  
 PRIMARY PRODUCTION  
 RED TIDES

ALGAL CULTURE  
 UF algae culture  
 algiculture  
 BT AQUACULTURE  
 NT phytoplakton culture  
 RT ALGAE  
 brackishwater aquaculture  
 culture tanks  
 ENERGY RESOURCES  
 fertilizers  
 freshwater aquaculture  
 laboratory culture  
 MARINE AQUACULTURE  
 mass culture

spores

ALGORITHMS  
 RT COMPUTER PROGRAMS  
 MATHEMATICAL MODELS  
 numerical analysis

ALTIMETRY  
 NT laser altimetry  
 RADAR ALTIMETRY  
 SATELLITE ALTIMETRY  
 RT AIRCRAFT  
 altimeters  
 height

ALUMINIUM  
 UF aluminum  
 BT chemical elements  
 RT aluminium compounds  
 aluminium isotopes  
 bauxite  
 ferromanganese nodules  
 metals  
 TRACE METALS

AMBIENT NOISE  
 UF background noise (sound)  
 noise (ambient)  
 underwater ambient noise  
 BT noise (sound)  
 NT biological noise  
 sediment noise  
 shipping noise  
 surface noise  
 RT passive sonar  
 underwater noise

ANADROMOUS SPECIES  
 UF anadromous fish  
 BT amphihaline species  
 RT anadromous migration  
 SPAWNING GROUNDS  
 spawning migrations  
 spawning seasons

ANALYSIS  
 RT biochemical analysis  
 CHEMICAL ANALYSIS  
 core analysis  
 core layer method  
 cost analysis  
 DATA PROCESSING  
 DYNAMIC ANALYSIS  
 economic analysis  
 electroanalysis  
 electrolysis  
 HARMONIC ANALYSIS  
 isentropic analysis  
 microbiological analysis  
 NUMERICAL ANALYSIS  
 SEDIMENT ANALYSIS  
 SHIPBOARD ANALYSIS  
 STATISTICAL ANALYSIS  
 TIDAL ANALYSIS  
 TIME SERIES ANALYSIS  
 volumetric analysis  
 WATER ANALYSIS  
 WAVE ANALYSIS  
 x-ray spectroscopy

ANALYTICAL ERRORS  
 BT ERRORS  
 RT ANALYTICAL TECHNIQUES

ANALYTICAL TECHNIQUES  
 NT activation analysis  
 chromatographic techniques  
 colorimetric techniques  
 electrophoresis  
 gravimetric techniques  
 interferometry  
 ion selective electrode analysis  
 isentropic analysis  
 microscopy  
 polarography  
 spectroscopic techniques  
 stripping analysis  
 titration  
 winkler method

ANEMOMETERS  
 UF cup anemometers  
 BT MEASURING DEVICES  
 RT FLOWMETERS  
 TURBULENCE MEASUREMENT  
 wind direction  
 wind measuring equipment  
 WIND SPEED  
 WINDS

ANNUAL REPORTS  
 BT REPORT LITERATURE  
 RT ANNUAL  
 INTERNATIONAL ORGANIZATIONS  
 museums  
 organizations  
 PROGRESS REPORTS  
 RESEARCH INSTITUTIONS  
 RESEARCH PROGRAMMES

ANNUAL VARIATIONS  
 UF year to year variation  
 yearly changes  
 BT PERIODIC VARIATIONS  
 RT ANNUAL  
 annual range  
 HORIZONTAL DISTRIBUTION  
 regional variations  
 SEASONAL VARIATIONS  
 temporal distribution

ANTARCTIC WATERS  
 UF arctic waters  
 POLAR WATERS  
 RT POLAR OCEANOGRAPHY  
 POLAR ZONES

ANTARCTIC ZONE  
 BT POLAR ZONES

ANTENNAS  
 UF antennulae  
 BT animal appendages  
 RT orientation behaviour  
 sense functions

ANTICYCLONES  
 UF midlatitude anticyclones  
 RT ANTICYCLONIC MOTION  
 atmospheric pressure  
 CLIMATOLOGY  
 CYCLONES  
 isobars  
 sea level pressure  
 WEATHER  
 WINDS

ANTICYCLONIC MOTION

RT ANTICYCLONES  
CYCLONIC MOTION  
FLUID MOTION  
rotation

AQUACULTURE

UF aquaculture industry  
aquatic agriculture  
aquiculture

NT ALGAL CULTURE  
brackishwater aquaculture  
coral farming  
FISH CULTURE  
freshwater aquaculture  
frog culture  
MARINE AQUACULTURE  
pearl culture  
plant culture  
rentée culture  
seaweed culture  
shellfish culture  
sponge culture  
turtle culture  
worm culture

RT acclimatization  
agropisciculture  
aquaculture development  
aquaculture economics  
aquaculture products  
aquaculture regulations  
aquaculture statistics  
aquaculture techniques  
aquatic sciences  
aquatic tourists  
artificial aeration  
artificial feeding  
artificial spawning grounds  
artificial upwelling  
balanced diets  
basic diets  
BREEDING  
brood stocks  
COASTAL LAGOONS  
cost analysis  
culture tanks  
cultured organisms  
dietary deficiencies  
experimental culture  
feeding experiments  
fish ponds  
FOOD ORGANISMS  
forage fish  
habitat improvement  
hatcheries  
inbreeding  
industrial production  
inland lagoons  
manure  
oxbow lakes  
pellet feeds  
predator control  
property rights  
rearing  
seed collection  
seeding (aquaculture)  
shelters  
stocking (organisms)

temperature preferences  
water rights  
water use

AQUARIA

UF aquarium systems  
oceanaria

RT aquaculture equipment  
aquariology  
artificial aeration  
artificial feeding  
batch culture  
captive  
continuous culture  
museums  
ornamental fish  
rearing  
water filtration  
water pumps

AQUATIC ANIMALS

UF animals (aquatic)  
aquatic fauna

NT AQUATIC BIRDS  
aquatic insects  
AQUATIC MAMMALS  
aquatic reptiles  
brackishwater molluscs  
FISH  
freshwater crustaceans  
freshwater molluscs  
MARINE CRUSTACEANS  
MARINE INVERTEBRATES  
marine molluscs

RT animal diseases  
animal fossils  
animal morphology  
animal physiology  
animal populations  
animal products  
aquatic organisms  
BIOGEOGRAPHY  
commercial species  
freshwater ecology  
gills  
HYDROBIOLOGY  
MARINE ECOLOGY  
rare species  
vernacular names  
ZOOBENTHOS  
zoology  
ZOOPLANKTON

AQUATIC BIRDS

UF birds

BT AQUATIC ANIMALS

NT MARINE BIRDS

RT animal products  
avian physiology  
leathers  
flight behaviour  
flying  
imprinting  
migrations  
migratory species  
nesting  
nests  
ornithologists  
ornithology

pecking order  
wings

AQUATIC COMMUNITIES

UF communities(ecological)

NT BENTHOS  
epipsammon  
NEKTON  
neuston  
periphyton  
PLANKTON  
pleuston  
psammon  
seston

RT aquatic environment  
aquatic organisms  
BIOCOENOSIS  
biological charts  
BIOTA  
brackishwater ecology  
climax community  
COMMUNITY COMPOSITION  
ECOLOGICAL ASSOCIATIONS  
ecological succession  
ECOSYSTEM DISTURBANCE  
ECOSYSTEM MANAGEMENT  
ecosystem resilience  
ECOSYSTEMS  
freshwater ecology  
HABITAT  
MARINE ECOLOGY  
niches  
ORGANISM AGGREGATIONS  
synecology

AQUATIC DRUGS

BT drugs

RT botanical resources  
medicine

NATURAL RESOURCES  
plant utilization

AQUATIC MAMMALS

UF mammals

BT AQUATIC ANIMALS

NT MARINE MAMMALS

RT animal oil extraction  
carcasses  
cetology  
COMMERCIAL SPECIES  
culling  
DIVING  
diving physiology  
echolocation  
FISHERY RESOURCES  
foetus  
hunting  
lactation  
mammalian physiology  
mammalogists  
mammalogy  
oceanodromous migrations  
parturition  
pregnancy  
stranding  
vernacular names  
vocalization behaviour  
whaling

AQUATIC PLANTS

UF hydrophytes  
plants  
RT algology  
alkaloids  
aquatic organisms  
BIOGEOGRAPHY  
botanical resources  
botany  
commercial speceis  
FISHERY RESOURCES  
fouling  
freshwater enology  
fungi  
germination  
HYDROBIOLOGY  
livestock food  
MARINE ECOLOGY  
phytobenthos  
phytohormones  
PHYTOPLANKTON  
phytosociology  
plant diseases  
plant morphology  
plant physiology  
plant populations  
plant utilization  
pleuston  
pollen  
pollination  
rare species  
starch  
stomata  
turions  
vernacular names  
weeds  
ARCHIPELAGOES  
UF archipelagic waters  
RT islands  
ocean space  
ARCTIC ZONE  
UF arctic environment  
BT POLAR ZONES  
RT permafrost  
polar meteorology  
POLAR OCEANOGRAPHY  
ARRAYS  
NT ACOUSTIC ARRAYS  
BUOY SYSTEMS  
CURRENT METER ARRAYS  
EQUIPMENT  
seismic arrays  
THERMISTOR CHAINS  
thermocouple arrays  
ARTIFICIAL REEFS  
BT OFFSHORE STRUCTURES  
RT artificial spawning grounds  
attracting techniques  
habitat improvement  
MARINE AQUACULTURE  
reef fish  
reef fisheries  
REEFS  
shelters  
SPORT FISHING  
ARTISANAL FISHING  
UF small scale fishing

BT fishing operations  
RT artisanal whaling  
boats  
canoe fisheries  
canoes  
COASTAL FISHERIES  
estuarine fisheries  
FISHERIES  
fishing  
handlining  
labour  
LAGOON FISHERIES  
lake fisheries  
processed fishery products  
river fisheries  
row boats  
women  
ASTRONOMY  
RT celestial navigation  
EARTH ORBIT  
extraterrestrial material  
moon  
moon phases  
nautical almanacs  
SATELLITES  
solar activity  
solar eclipse  
sun  
ATLASES  
BT DOCUMENTS  
NT OCEANOGRAPHIC ATLASES  
RT BOTTOM TOPOGRAPHY  
CARTOGRAPHY  
CLIMATOLOGICAL CHARTS  
EXPEDITION REPORTS  
gazetneers  
GEOGRAPHY  
geological maps  
GRAPHIC METHODS  
HYDROGRAPHIC CHARTS  
MAPS  
ATMOSPHERIC CHEMISTRY  
BT CHEMISTRY  
RT AEROSOLS  
AIR POLLUTION  
air sampling  
atmospheric evolution  
ATMOSPHERIC GASES  
atmospheric particulates  
atmospheric sciences  
CARBON DIOXIDE  
CLIMATIC CHANGES  
dust  
dust clouds  
EARTH ATMOSPHERE  
fallout  
hydrometeors  
OZONE  
radioactive aerosols  
ATMOSPHERIC CIRCULATION  
UF CIRCULATION  
general circulation  
BT atmospheric motion  
NT meridional atmospheric circulation  
RT ADVECTION  
CIRCULATION

CORIOLIS FORCE  
HEAT TRANSPORT  
OCEAN CIRCULATION  
planetary winds  
SOUTHERN OSCILLATION  
WINDS  
ATMOSPHERIC CONDITIONS  
UF WEATHER  
weather conditions  
BT CLIMATE  
NT STORMS  
RT air temperature  
ANTICYCLONES  
atmospheric depressions  
ATMOSPHERIC PRECIPITATIONS  
atmospheric pressure  
CLOUD COVER  
clouds  
fog  
humidity  
ICE CONDITIONS  
ICING  
lightning  
METEOROLOGY  
RAINFALL  
sea level pressure  
SEA STATE  
troposphere  
WEATHER FORECASTING  
WEATHER HAZARDS  
weather maps  
WIND SPEED  
ATMOSPHERIC FORCING  
RT atmospheric pressure  
HURRICANES  
mixed later depth  
OCEANIC RESPONSE  
response time  
SURFACE MIXED LAYER  
THERMAL STRUCTURE  
WIND STRESS  
ATMOSPHERIC FRONTS  
UF cold fronts  
FRONTS  
meteorological fronts  
occluded fronts  
warm fronts  
BT FRONTS  
RT air masses  
atmospheric boundary layer  
atmospheric convergences  
atmospheric disturbances  
FRONTAL FEATURES  
FRONTOGENESIS  
METEOROLOGY  
troposphere  
WEATHER FORECASTING  
ATMOSPHERIC GASES  
BT gases  
RT ATMOSPHERIC CHEMISTRY  
ATMOSPHERIC PHYSICS  
UF aeronomy  
BT physics  
NT cloud physics  
RT atmospheric electricity  
atmospheric optical phenomena

atmospheric sciences  
 EARTH ATMOSPHERE  
 METEOROLOGY  
 ATMOSPHERIC PRECIPITATIONS  
   UF precipitation(atmospheric)  
   precipitation(meteorology)  
   BT hydro meteors  
   NT acid rain  
   hail  
   SNOW  
   RT clouds  
   glaciers  
   isohyets  
   METEOROLOGY  
   RAIN  
   RAINFALL  
   RIVER DISCHARGE  
   SALINITY  
   water resources  
   watersheds  
   WEATHER  
   weathering  
 AUTOMATED RECORDING  
   UF automated techniques  
   RT analytical techniques  
   automated cartography  
 AUTOMATION  
   DATA BUOYS  
   WATER ANALYSIS  
   WATER PROPERTIES  
 AUTOMATION  
   RT automated cartography  
   automated fishing platforms  
 AUTOMATED RECORDING  
 COMPUTERS  
 CONTROL  
 DATA PROCESSING  
   remote control  
   robots  
 AXBTS  
   BT BATHYTHERMOGRAPHS  
   RT airborne equipment  
   AIRCRAFT  
   MEASURING DEVICES  
   WATER TEMPERATURE  
   XBTS  
 BACKSCATTER  
   UF sound backscatter  
   BT SOUND SCATTERING  
   RT forward scattering  
   REVERBERATION  
   SCATTEROMETERS  
 BACTERIA  
   BT microorganisms  
   NT aerobic bacteria  
   anaerobic bacteria  
   pathogenic bacteria  
   RT agglutinins  
   antigens  
   bacteria collecting devices  
   bacterial counters  
   bacterial diseases  
   bacterins  
   bacteriology  
   bacteriophages  
   bioerosion

BIOLUMINESCENCE  
   chemosynthesis  
   chemotaxonomy  
   culture media  
   DECOMPOSERS  
   endotoxins  
   filter feeders  
   food poisoning  
   microbial contamination  
   microbiological analysis  
   microbiological culture  
   nanoplankton  
   nitrification  
   NITROGEN CYCLE  
   oxidation  
   PHOSPHORUS CYCLE  
   saprophytes  
   single cell proteins  
   spores  
   sterilization  
 BACTERIOPLANKTON  
   UF nanoplankton  
   BT PLANKTON  
   RT BACTERIA  
   filter feeders  
   microorganisms  
   PLANKTON FEEDERS  
 BARIUM ISOTOPES  
   BT ISOTOPES  
   RT BARIUM  
 BAROCLINIC FLOW  
   UF BAROCLINIC MOTION  
   baroclinic waves  
   BT FLUID MOTION  
   RT baroclinic field  
   BAROCLINIC INSTABILITY  
   baroclinic mode  
   BAROTROPIC MOTION  
   INTERNAL TIDES  
   STRATIFIED FLOW  
 BAROCLINIC INSTABILITY  
   BT INSTABILITY  
   RT baroclinic mode  
   BAROCLINIC MOTION  
   BAROTROPIC INSTABILITY  
   energy transfer  
   MESOSCALE EDDIES  
   potential vorticity  
   rossby parameter  
 BAROCLINIC MOTION  
   UF BAROCLINIC FLOW  
   baroclinic waves  
   BT FLUID MOTION  
   RT baroclinic field  
   BAROCLINIC INSTABILITY  
   baroclinic mode  
   BAROTROPIC MOTION  
   INTERNAL TIDES  
   STRATIFIED FLOW  
 BAROTROPIC FLOW  
   UF BAROTROPIC MOTION  
   barotropic waves  
   BT FLUID MOTION  
   RT BAROCLINIC MOTION  
   barotropic field  
   BAROTROPIC MODE

TIDES  
 BAROTROPIC INSTABILITY  
   BT INSTABILITY  
   RT BAROCLINIC INSTABILITY  
   BAROTROPIC MODE  
   energy transfer  
   POTENTIAL VORTICITY  
   unsteady flow  
 BAROTROPIC MODE  
   UF barotropy  
   RT baroclinic mode  
   barotropic field  
   BAROTROPIC INSTABILITY  
   BAROTROPIC MOTION  
   conservation of vorticity  
   FLUID MOTION  
   isobaric surfaces  
   ISOPYCNIC SURFACES  
   isosteric surfaces  
   MODES  
   STRATIFICATION  
 BAROTROPIC MOTION  
   UF BAROTROPIC FLOW  
   barotropic waves  
   BT FLUID MOTION  
   RT BAROCLINIC MOTION  
   barotropic field  
   BAROTROPIC MODE  
   TIDES  
 BARRIER REEFS  
   BT coral reefs  
   RT barrier islands  
   fringing reefs  
   LAGOONS  
 BARRIER SPITS  
   UF bay barriers  
   nehrung  
   BT spits  
   RT barrier islands  
   BAYS  
   coastal lagoons  
   longshore sediment transport  
 BASELINE STUDIES  
   UF baseline surveys  
   ecological baseline studies  
   RT ECOLOGY  
   long-term changes  
   MONITORING  
   POLLUTION  
   POLLUTION EFFECTS  
   reclamation  
   resource availability  
   SURVEYS  
 BATHYAL ZONE  
   RT bathyal-benthic zone  
   bathypelagic zone  
   BENTHIC ENVIRONMENT  
   PELAGIC ENVIRONMENT  
 BATHYMETRIC CHARTS  
   BT HYDROGRAPHIC CHARTS  
   RT bathymeters  
   BATHYMETRIC DATA  
   bathymetric profiles  
   BATHYMETRIC SURVEYS  
   BATHYMETRY  
   bottom topography



depth measurement  
 echosounding  
 geological maps  
 HYDROGRAPHIC SURVEYING  
 HYDROGRAPHIC SURVEYS  
 HYDROGRAPHY  
 isobaths  
 SEAFLOOR MAPPING  
 soundings  
 SUBMARINE FEATURES  
 topographic maps  
 VERTICAL DISTRIBUTION  
 WATER DEPTH  
 BATHYMETRIC DATA  
 BT OCEANOGRAPHIC DATA  
 NT soundings  
 RT automated cartography  
 BATHYMETRIC CHARTS  
 bathymetric profiles  
 BATHYMETRY  
 GEOLOGICAL DATA  
 limnological data  
 plotting  
 WATER DEPTH  
 BATHYMETRIC SURVEYS  
 BT HYDROGRAPHIC SURVEYS  
 RT BATHYMETRIC CHARTS  
 BATHYMETRY  
 CARTOGRAPHY  
 WATER DEPTH  
 BATHYMETRY  
 UF depth sounding (water)  
 sounding (water depth)  
 water depth measurement  
 BT depth measurement  
 NT laser bathymetry  
 RT bathymeters  
 BATHYMETRIC CHARTS  
 BATHYMETRIC DATA  
 bathymetric profiles  
 BATHYTHERMOGRAPHIC DATA  
 UF data (bathythermographic)  
 BT OCEANOGRAPHIC DATA  
 RT bathythermograms  
 BATHYTHERMOGRAPHS  
 TEMPERATURE SECTIONS  
 WATER DEPTH  
 WATER TEMPERATURE  
 BATHYTHERMOGRAPHS  
 UF mechanical bathythermographs  
 BT PROFILERS  
 NT AXBTS  
 XBTS  
 RT bathymeters  
 bathythermograms  
 BATHYTHERMOGRAPHIC DATA  
 depth recorders  
 limnological equipment  
 MEASURING DEVICES  
 OCEANOGRAPHIC EQUIPMENT  
 thermometers  
 WATER DEPTH  
 WATER TEMPERATURE  
 BAY DYNAMICS  
 BT SHELF DYNAMICS  
 RT BAYS

ESTUARINE DYNAMICS  
 NEARSHORE DYNAMICS  
 WAVE DYNAMICS  
 BAYS  
 BT COASTAL INLETS  
 RT BARRIER SPITS  
 BAY DYNAMICS  
 COASTAL ZONE  
 ESTUARIES  
 HEADLANDS  
 inlets (waterways)  
 water bodies  
 BEACHES  
 UF ocean beaches  
 sandy beaches  
 shingle beaches  
 BT coastal landforms  
 NT barrier beaches  
 raised beaches  
 RT beach accretion  
 beach erosion  
 beach features  
 beach morphology  
 beach profiles  
 beach slope  
 COASTAL EROSION  
 COASTAL ZONE  
 coasts  
 dunes  
 GEOMORPHOLOGY  
 intertidal environment  
 islands  
 lake morphology  
 LITTORAL ZONE  
 NEARSHORE DYNAMICS  
 RECREATIONAL WATERS  
 runnels  
 SAND  
 SURF  
 wave processes on beaches  
 BEHAVIOUR  
 UF animal behaviour  
 BEHAVIOUR  
 NT aggressive behaviour  
 agonistic behaviour  
 avoidance reactions  
 chromatic behaviour  
 cleaning behaviour  
 competitive behaviour  
 display behaviour  
 exploratory behaviour  
 feeding behaviour  
 flight behaviour  
 homing behaviour  
 hydrostatic behaviour  
 learning behaviour  
 orientation behaviour  
 parental behaviour  
 protective behaviour  
 reproductive behaviour  
 settling behaviour  
 sexual behaviour  
 social behaviour  
 territoriality  
 vocalization behaviour  
 RT activity patterns

adaptations  
 alarm substances  
 animal communication  
 autecology  
 behavioural responses  
 biological rhythms  
 biotelemetry  
 echolocation  
 ECOLOGY  
 ectocrines  
 ENVIRONMENTAL EFFECTS  
 ethology  
 gravity effects  
 instinct  
 INTERSPECIFIC RELATIONSHIPS  
 intraspecific relationships  
 MIGRATIONS  
 niches  
 phenology  
 pheromones  
 pressure effects  
 SPECIES  
 stimuli  
 synecology  
 synergism  
 TRACKING  
 tropism  
 vertebrate zoology  
 zoology  
 BENTHIC BOUNDARY LAYER  
 UF benthic layer  
 BOTTOM BOUNDARY LAYER  
 BT BOUNDARY LAYERS  
 RT bed roughness  
 benthic currents  
 BOTTOM EKMAN LAYER  
 bottom mixed layer  
 deep layer  
 WATER COLUMN  
 wave-seabed interaction  
 BENTHIC ENVIRONMENT  
 UF benthic regions  
 BT aquatic environment  
 NT abyssobenthic zone  
 bathyal-benthic zone  
 LITTORAL ZONE  
 RT ABYSSAL ZONE  
 BATHYAL ZONE  
 BENTHOS  
 interstitial environment  
 INTERTIDAL ENVIRONMENT  
 lotic environment  
 lotic environment  
 MARINE ENVIRONMENT  
 sediment-water interface  
 SUBSTRATA  
 BENTHOS  
 UF benthic communities  
 benthon  
 epibenthos  
 macrobenthos  
 microbenthos  
 BT AQUATIC COMMUNITIES  
 NT meiobenthos  
 phytobenthos  
 ZOOBENTHOS

RT BENTHIC ENVIRONMENT  
 benthos collecting devices  
 burrowing organisms  
 ECOLOGICAL ZONATION  
 interstitial environment  
 sealloor sampling  
 sessile species  
 SUBSTRATA  
 tube dwellers

BIBLIOGRAPHIC INFORMATION  
 UF annotation  
 bibliographic studies

RT BIBLIOGRAPHIES  
 DOCUMENTATION  
 DOCUMENTS  
 information handling  
 INFORMATION RETRIEVAL

BIOCEANOSIS  
 UF BIOCEANOSIS  
 RT AQUATIC COMMUNITIES  
 BIOTA  
 biotopes  
 COMMUNITY COMPOSITION  
 ECOLOGICAL ASSOCIATIONS  
 HABITAT  
 overcrowding

BIOCHEMISTRY  
 UF physiochemistry  
 BT CHEMISTRY  
 NT cytochemistry  
 histochemistry  
 RT biochemical analysis  
 biochemical composition  
 biochemical phenomena  
 BIOGEOCHEMICAL CYCLE  
 biogeochemistry  
 carbohydrates  
 CARBON CYCLE  
 enzyme inhibitors  
 enzymes  
 metabolism  
 pharmacology  
 physiology  
 PROTEINS  
 specificity  
 vitamins

BIOCEANOSIS  
 UF BIOCEANOSIS  
 RT AQUATIC COMMUNITIES  
 BIOTA  
 biotopes  
 COMMUNITY COMPOSITION  
 ECOLOGICAL ASSOCIATIONS  
 HABITAT  
 overcrowding

BIOGEOCHEMICAL CYCLE  
 BT cycles  
 NT NUTRIENT CYCLES  
 RT biochemical cycles  
 BIOCHEMISTRY  
 biodegradation  
 BIOGEOCHEMISTRY  
 biological clocks  
 chemical degradation  
 detritus  
 GEOCHEMICAL CYCLE

nutrients (mineral)  
 oxidation  
 PHOTOSYNTHESIS  
 PRIMARY PRODUCTION  
 SUSPENDED PARTICULATE  
 MATTER

BIOGEOCHEMISTRY  
 BT GEOCHEMISTRY  
 RT BIOCHEMISTRY  
 BIOGEOCHEMICAL CYCLE  
 BIOLOGY  
 NUTRIENT CYCLES  
 pyrolysis  
 sediment chemistry  
 sulphate reduction

BIOGEOGRAPHY  
 UF chorology  
 phytogeography  
 zoogeography  
 BT GEOGRAPHY  
 RT AQUATIC ANIMALS  
 AQUATIC PLANTS  
 biological charts  
 BIOLOGY  
 botany  
 CLIMATOLOGY  
 CONTINENTAL DRIFT  
 cosmopolite species  
 DISTRIBUTION RECORDS  
 ECOLOGICAL DISTRIBUTION  
 ECOLOGY  
 endemic species  
 endemism  
 faunal provinces  
 GEOGRAPHICAL DISTRIBUTION  
 HYDROCLIMATE  
 ICHTHYOLOGY  
 INVERTEBRATE ZOOLOGY  
 MAPPING  
 MAPS  
 phytosociology  
 SPECIES  
 vertebrate zoology  
 zoology

BIOLOGICAL DATA  
 UF data (biological)  
 BT DATA  
 RT BIOLOGICAL SAMPLING  
 BIOLOGICAL SURVEYS  
 CENSUS

BIOLOGICAL DRIFT  
 UF drift (biological)  
 BT DISPERSION  
 RT biotic barriers  
 FISH LARVAE  
 invertebrate larvae  
 wind-driven currents

BIOLOGICAL OCEANOGRAPHY  
 UF MARINE BIOLOGY  
 MARINE ECOLOGY  
 oceanology (biological)  
 BT ECOLOGY  
 RT AQUATIC ANIMALS  
 AQUATIC COMMUNITIES  
 AQUATIC PLANTS  
 ENVIRONMENTAL FACTORS

HYDROBIOLOGY  
 marine ecologists  
 MARINE SCIENCES  
 OCEANOGRAPHY  
 WATER ANALYSIS

BIOLOGICAL PRODUCTION  
 UF natural increase  
 natural production  
 organic production  
 production (biological)  
 production rate  
 BT PRODUCTIVITY  
 NT PRIMARY PRODUCTION  
 SECONDARY PRODUCTION  
 RT biological pollutants  
 BIOMASS  
 density dependence  
 ECOSYSTEMS  
 ENVIRONMENTAL EFFECTS  
 fertility  
 FOOD CHAINS  
 FOOD WEBS  
 grazing  
 NUTRIENT CYCLES  
 nutrients (mineral)  
 oxygen demand  
 PLANKTON  
 plankton equivalents  
 TROPHIC LEVELS  
 trophodynamic cycle  
 UPWELLING  
 yield

BIOLOGICAL PROPERTIES  
 BT properties  
 NT bioelectricity  
 biological resistance  
 euryhalinity  
 eurythermy  
 fecundity  
 heterosis  
 homolothermy  
 immunity  
 longevity  
 neoteny  
 poikilothermy  
 sexual maturity  
 stenohalinity  
 stenothermy  
 tolerance  
 toxicity  
 vulnerability

RT BIOLUMINESCENCE  
 colour  
 FLUORESCENCE  
 instinct  
 odour  
 organoleptic properties  
 phosphorescence  
 PHYSICOCHEMICAL PROPERTIES  
 taste

BIOLOGICAL SAMPLING  
 UF sampling (biological)  
 BT SAMPLING  
 NT algal settlements  
 larval settlement  
 RT colonization

settling behaviour  
substrate preferences

BIOLOGICAL SURVEYS

BT SURVEYS

NT PLANKTON SURVEYS

RT BIOLOGICAL DATA

BIOLOGICAL SAMPLING

COMMUNITY COMPOSITION

BIOLOGY

UF biological sciences

life sciences (biology)

NT anatomy

botany

CRYOBIOLOGY

crytology

embryology

FISHERY BIOLOGY

functional morphology

genetics

haematology

histology

HYDROBIOLOGY

microbiology

organism morphology

physiology

zoology

RT bioacoustics

BIOGEOCHEMISTRY

BIOGEOGRAPHY

biophysics

BIOTECHNOLOGY

ECOLOGY

LIFE HISTORY

parasitology

BIOLUMINESCENCE

BT luminescence

RT animal physiology

BACTERIA

biological phenomena

BIOLOGICAL PROPERTIES

chemiluminescence

FLUORESCENCE

LIGHT

phosphorescence

photophore

SPECTRAL COMPOSITION

BIOMASS

UF live weight

population abundance (weight)

population size (in weight)

standing crop (in weight)

standing stock (in weight)

BT population characteristics

RT ABUNDANCE

BIOLOGICAL PRODUCTION

plankton equivalents

population density

population number

QUANTITATIVE DISTRIBUTION

STOCK ASSESSMENT

yield

BIOTA

RT AQUATIC COMMUNITIES

BIOCOENOSIS

COMMUNITY COMPOSITION

HABITAT

BIOTECHNOLOGY

UF bioengineering

biological engineering

BT ENGINEERING

RT biosynthesis

biotelemetry

ECOLOGY

fermentation

medicine

ultrastructure

BODY SIZE

RT animal morphology

body regions

body shape

body weight

length-weight relationships

BOTTOM BOUNDARY LAYER

UF BENTHIC BOUNDARY LAYER

benthic layer

BT BOUNDARY LAYER

RT benthic currents

BOTTOM EKMAN LAYER

bottom mixed layer

deep layer

red roughness

WATER COLUMN

wave-seabed interaction

BOTTOM CURRENTS

UF near-bottom currents

BT WATER CURRENTS

NT ABYSSAL CURRENTS

benthic currents

RT bottom erosion

current scouring

DEEP CURRENTS

density flow

lake currents

OCEAN CURRENTS

SCOURING

seabed drifters

seamoats

sediment drifts

SEDIMENT TRANSPORT

SHELF SEAS

SUBMARINE CANYONS

subsurface currents

TURBIDITY CURRENTS

BOTTOM EKMAN LAYER

BT EKMAN LAYERS

RT BENTHIC BOUNDARY LAYER

benthic currents

BOTTOM FRICTION

UF bed friction

BT FRICTION

RT bed roughness

BOTTOM STRESS

DRAG

ENERGY DISSIPATION

FORM DRAG

river beds

tidal friction

wave dissipation

BOTTOM PHESSURE

BT HYDROSTATIC PRESSURE

RT HURRICANES

wave-seabed interaction

BOTTOM STRESS

UF bed shear stress

bed stress

BT stress

RT BOTTOM FRICTION

DRAG

PARTICLE MOTION

reynolds stresses

SEDIMENT DYNAMICS

SEDIMENT TRANSPORT

shear stress

viscosity

BOTTOM TEMPERATURE DATA

BT WATER TEMPERATURE

RT POTENTIAL TEMPERATURE

BOTTOM TOPOGRAPHY

UF ocean bottom topography

ocean floor topography

sea floor topography

underwater topography

BT topography (geology)

NT palaeotopography

RT ATLASES

BATHYMETRIC CHARTS

BATHYMETRY

bottom topography effects

echosounding

isobaths

morphometry

OCEAN BASINS

OCEAN FLOOR

physiographic provinces

SEDIMENT DISTRIBUTION

SUBMARINE FEATURES

TOPOGRAPHIC FEATURES

WATER DEPTH

BOTTOM TOPOGRAPHY EFFECTS

BT TOPOGRAPHIC EFFECTS

RT ABYSSAL CIRCULATION

BOTTOM TOPOGRAPHY

OCEAN CIRCULATION

WATER CURRENTS

wave refraction

BOUNDARIES

UF boundary line

territorial boundaries

NT fishery boundaries

RT contiguous zones

disputes

fishery disputes

INTERFACES

LAW OF THE SEA

ocean space

plate boundaries

surfaces

territorial waters

water rights

BOUNDARY CONDITIONS

RT MATHEMATICAL MODELS

BOUNDARY CURRENTS

BT WATER CURRENTS

NT eastern boundary currents

WESTERN BOUNDARY CURRENTS

RT OCEAN CIRCULATION

OCEAN CURRENTS

wind-driven currents  
**BOUNDARY LAYERS**  
 BT LAYERS  
 NT atmospheric boundary layer  
**BENTHIC BOUNDARY LAYER**  
 coastal boundary layer  
**EKMAN LAYERS**  
 laminar boundary layer  
**OCEANIC BOUNDARY LAYER**  
**TURBULENT BOUNDARY LAYER**  
 RT HEAT TRANSFER  
 HYDRODYNAMICS  
 INTERFACES  
**BRACKISH WATER**  
 BT WATER  
 RT brackish water aquaculture  
 brackish water pollution  
**ESTUARIES**  
**LAGOONS**  
 WATER PROPERTIES  
**BRACKISHWATER POLLUTION**  
 UF estuarine pollution  
**POLLUTION**  
 BT WATER POLLUTION  
 RT BRACKISH WATER  
 brackishwater ecology  
 chemical pollution  
**OIL POLLUTION**  
 pollution monitoring  
**POLLUTANTS**  
**POLLUTION EFFECTS**  
 radioactive contamination  
**THERMAL POLLUTION**  
 wastes  
 water pollution treatment  
**BREAKING WAVES**  
 BT SURFACE WATER WAVES  
 NT breakers  
 RT aeration  
 break-point bars  
 shoaling waves  
 surf zone  
**WAVE BREAKING**  
 wave crests  
 wave dissipation  
 waves on beaches  
**BREEDING GROUNDS**  
 UF breeding sites  
 RT BREEDING  
 nesting  
 sexual isolation  
**BRIDGES**  
 UF rail bridges  
 road bridges  
 RT INSTRUMENT PLATFORMS  
 pontoons  
**SCOURING**  
 transportation  
**TUNNELS**  
**BRINES**  
 UF BRINE  
 BT DISSOLVED SALTS  
 RT CHLORINE COMPOUNDS  
 evaporation  
 fluorine compounds  
 hot brines

mineral industry  
 saline water  
**SEA ICE**  
 solutions  
**BUBBLES**  
 NT air bubbles  
 RT aeration  
 bubble bursting  
 bubbling  
 cavitation  
 debubbling  
**BUOY MOTION EFFECTS**  
 BT motion effects  
 RT BUOY MOTION  
**BUOYS**  
**ERRORS**  
 heave resonance  
 heave response  
 heaving  
**MOORING MOTION EFFECTS**  
 pitch resonance  
 pitch response  
 pitching  
 roll response  
 roll resonance  
 rolling  
 surge response  
 surging  
 yaw response  
 yawing  
**BUOY SYSTEMS**  
 BT vehicles  
 RT ARRAYS  
 buoy mooring systems  
**BUOYS**  
 floating structures  
**INSTRUMENT PLATFORMS**  
**BUOYANCY**  
 BT PHYSICAL PROPERTIES  
 RT ballast  
**BUOYANCY FLOATS**  
**BUOYANCY FLUX**  
 buoyancy materials  
**BUOYS**  
**DENSITY**  
 flotation  
 hysteretic behaviour  
**STABILITY**  
 swim bladder  
**WATER DENSITY**  
**BUOYANCY FLOATS**  
 UF buoyancy spheres  
 floats  
 subsurface buoyancy floats  
 RT ballast  
**BUOYANCY**  
**BUOYS**  
 implosions  
**BUOYANCY FLUX**  
 RT BUOYANCY  
 buoyant jets  
**BUOYS**  
 NT DATA BUOYS  
 fishing buoys  
 marker buoys  
 mooring buoys

navigation buoys  
**RADIO BUOYS**  
 sonobuoys  
 RT anchoring  
 buoy hulls  
 buoy mooring systems  
**BUOY MOTION EFFECTS**  
**BUOY SYSTEMS**  
**BUOYANCY**  
**BUOYANCY FLOATS**  
 drogues  
 mooring lines  
**CALCAREOUS OOOZE**  
 UF ooze (calcareous)  
 BT oozes  
 NT foraminiferal ooze  
 pteropod ooze  
 RT calcium carbonates  
 carbonate sediments  
 coccoliths  
 nanofossil ooze  
**CALIBRATION**  
 BT standardization  
 NT INTERCALIBRATION  
 RT ACCURACY  
 efficiency  
**EQUIPMENT**  
 intercomparison  
**MEASURING DEVICES**  
**OCEANOGRAPHIC EQUIPMENT**  
 testing  
 tests  
 wave tanks  
**CAPILLARY WAVES**  
 UF surface tension waves  
 BT SURFACE WATER WAVES  
 NT water ripples  
 RT capillarity  
**GRAVITY WAVES**  
**NONLINEAR WAVES**  
**SURFACE TENSION**  
 wave gauges  
**CARBON CYCLE**  
 BT NUTRIENT CYCLES  
 RT BIOCHEMISTRY  
**CARBON**  
**CARBON DIOXIDE**  
 chemical cycles  
**GEOCHEMICAL CYCLE**  
 transpiration  
**CARBON DIOXIDE**  
 BT carbon compounds  
 RT ATMOSPHERIC CHEMISTRY  
**CARBON**  
**CARBON CYCLE**  
**CARBON FIXATION**  
 chemical compounds  
**CLIMATIC CHANGES**  
 fossil fuels  
 gases  
**GREENHOUSE EFFECT**  
 hypercapnia  
 oxygen consumption  
**PHOTOSYNTHESIS**  
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 OCEANOGRAPHIC EQUIPMENT  
 WATER CURRENTS  
 CURRENT OBSERVATIONS  
 UF water current data and  
 observations  
 BT HYDROGRAPHIC DATA  
 NT CURRENT METER DATA  
 RT CURRENT MEASUREMENT  
 CURRENT METERS  
 near-surface layer  
 CURRENT PROFILES  
 UF current speed profiles  
 BT VELOCITY PROFILES  
 RT VELOCITY GRADIENTS  
 velocity profilers  
 velocity sections  
 CURRENT RINGS  
 UF anticyclonic eddies  
 anticyclonic rings  
 current meanders  
 cyclonic eddies  
 cyclonic rings  
 gulf stream rings  
 MEANDERS  
 BT OCEANIC EDDIES  
 RT CURRENT MEANDERING  
 OCEAN CURRENTS  
 VORTICES  
 CURRENT SENSORS  
 BT CURRENT MEASURING  
 EQUIPMENT  
 RT ACOUSTIC CURRENT METERS  
 DOPPLER EFFECT  
 FLOWMETERS  
 CURRENT SHEAR  
 BT SHEAR  
 RT shear probes  
 wind shear  
 CURRENT VELOCITY  
 UF current speed  
 BT VELOCITY  
 NT stream flow rate  
 RT CURRENT CHARTS  
 CURRENT DATA

CURRENT FORCES  
 CURRENT MEASUREMENT  
 current roses  
 current vectors  
 electric potential  
 FLOWMETERS  
 ICE DRIFT  
 tide tables  
 VELOCITY GRADIENTS  
 VELOCITY MICROSTRUCTURE  
 velocity profilers  
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 VOLUME TRANSPORT  
 westward intensification

CURRENTS  
 UF electric currents  
 NT impressed currents  
 telluric currents  
 RT air-water exchanges  
 current density  
 electric fields  
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CURRICULA  
 UF syllabuses  
 training programmes  
 RT EDUCATION  
 EDUCATION ESTABLISHMENTS  
 TRAINING CENTRES

CYCLONES  
 UF depressions  
 midlatitude cyclones  
 BT low pressure systems  
 RT ANTICYCLONES  
 cyclogenesis  
 HURRICANES  
 POLAR FRONTS

CYCLONIC MOTION  
 RT ANTICYCLONIC MOTION  
 motion  
 rotation

CYSTS  
 UF dormant stages  
 RT defence mechanisms  
 encystment

DAMAGE  
 RT ACCIDENTS  
 defects  
 failures  
 fire  
 hazards  
 repair

DATA ACQUISITION  
 BT acquisition  
 RT DATA  
 DATA LOGGERS  
 DATA PROCESSING  
 DATA RETRIEVAL  
 data storage  
 GEOSENSING  
 REMOTE SENSING

DATA BUOYS  
 UF meteorological buoys  
 oceanographic buoys  
 rafts  
 BT BUOYS  
 NT DRIFTING DATA BUOYS

WAVE BUOYS  
 RT AUTOMATED RECORDING  
 DATA  
 DATA COLLECTIONS  
 INSTRUMENT PLATFORMS  
 LAGRANGIAN CURRENT  
 MEASUREMENT  
 masts  
 METEOROLOGICAL DATA  
 OCEAN STATIONS  
 OCEANOGRAPHIC DATA  
 OCEANOGRAPHIC EQUIPMENT  
 RECORDING EQUIPMENT  
 WEATHER SHIPS

DATA CENTRE  
 UF data centers  
 BT information centres  
 RT DATA  
 DATA COLLECTIONS  
 DATA PROCESSING  
 DATA RETRIEVAL  
 data storage  
 INVENTORIES  
 libraries  
 sorting centres

DATA COLLECTIONS  
 UF data banks  
 databases  
 BT collections  
 RT CATALOGUES  
 CENSUS  
 DATA  
 DATA BUOYS  
 DATA CENTRES  
 DATA PROCESSING  
 DATA RETRIEVAL  
 data storage  
 DIRECTORIES  
 DOCUMENTATION  
 encyclopaedias  
 information handling  
 INFORMATION RETRIEVAL  
 INVENTORIES  
 libraries  
 long-term changes  
 MONITORING  
 REPORT LITERATURE  
 statistical sampling  
 SURVEYS  
 TRANSLATIONS

DATA LOGGERS  
 RT DATA  
 DATA ACQUISITION  
 EQUIPMENT  
 RECORDING EQUIPMENT

DATA PROCESSING  
 UF automated data processing  
 data analysis  
 data handling  
 NT batch processing  
 DATA REDUCTION  
 DATA RETRIEVAL  
 data storage  
 seismic data processing  
 SIGNAL PROCESSING  
 RT ANALYSIS

AUTOMATION  
 COMPUTER PROGRAMS  
 computers  
 DATA  
 DATA ACQUISITION  
 DATA CENTRES  
 DATA COLLECTIONS  
 IMAGERY  
 STATISTICAL ANALYSIS  
 statistics

DATA REDUCTION  
 BT DATA PROCESSING  
 RT reference levels  
 seismic data processing  
 SPECTRAL ANALYSIS

DATA REPORTS  
 BT REPORT LITERATURE  
 NT STATION LISTS  
 RT CRUISES  
 DATA  
 INSHORE STATIONS  
 multiship expeditions  
 OCEAN STATIONS

DATA RETRIEVAL  
 BT DATA PROCESSING  
 RT COMPUTER PROGRAMS  
 COMPUTERS  
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 DATA ACQUISITION  
 DATA CENTRES  
 DATA COLLECTIONS  
 data storage  
 INFORMATION RETRIEVAL

DECOMPOSERS  
 BT heterotrophic organisms  
 RT BACTERIA  
 biodegradation  
 FOOD CHAINS  
 fungi

DEEP CURRENTS  
 BT SUBSURFACE CURRENTS  
 RT BOTTOM CURRENTS  
 DEEP WATER  
 OCEAN CURRENTS  
 SEDIMENT TRANSPORT  
 WATER DEPTH

DEEP SEA  
 UF DEEP WATER  
 RT aphotic zone  
 BATHYMETRY  
 DEEP CURRENTS  
 hypolimnion  
 SHALLOW WATER  
 SOUND PROPAGATION  
 WATER DEPTH

DEEP SEA DIVING  
 UF dry diving  
 BT DIVING  
 RT breathing mixtures  
 diving physiology  
 mixed gas  
 one-atmosphere systems  
 SUBMERSIBLES  
 underwater exploration  
 underwater medicine

DEEP SEA MINING

UF deep ocean mining  
 BT MINING  
 RT deep-sea drilling  
 ferromanganese nodules  
 fossil fuels  
 LAW OF THE SEA  
 mineral deposits  
 mineral exploration  
 mineral industry  
 MINERAL RESOURCES  
 mining vessels  
 OFFSHORE OPERATIONS  
 phosphonite nodules  
 seabed deposits  
 site surveys  
 subsurface deposits  
 DEEP WATER  
 UF DEEP SEA  
 RT aphotic zone  
 BATHYMETRY  
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 hypolimnion  
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 SOUND PROPAGATION  
 WATER DEPTH  
 DEEP WATER FORMATION  
 RT mistral  
 DEEP WATER MASSES  
 UF bottom water masses  
 BT WATER MASSES  
 RT bottom water  
 DELTAIC FEATURES  
 UF delta structures  
 NT bottomset beds  
 foreset beds  
 topset beds  
 DEMERSAL FISHERIES  
 BT FISHERIES  
 RT bottom trawling  
 bottom trawls  
 crustacean fisheries  
 dredges  
 finfish fisheries  
 flatfish fisheries  
 GADOID FISHERIES  
 gillnets  
 gillnetters  
 grappling gear  
 harvesting machines  
 LAGOON FISHERIES  
 lake fisheries  
 liners  
 lines  
 lobster fisheries  
 longlining  
 MACKEREL FISHERIES  
 MARINE FISH  
 MARINE FISHERIES  
 percid fisheries  
 pole-line fishing  
 redfish fisheries  
 seine nets  
 seiners  
 SHRIMP FISHERIES  
 trawl nets  
 trawlers

DENSITY  
 UF PHYSICAL DENSITY  
 BT PHYSICAL PROPERTIES  
 NT current density  
 sediment density  
 WATER DENSITY  
 RT BUOYANCY  
 DENSITY MEASUREMENT  
 density measuring equipment  
 DIFFUSION  
 gravimetric techniques  
 population density  
 sigma-t  
 specific gravity  
 wet weight  
 DENSITY FRONTS  
 BT OCEANIC FRONTS  
 RT ISOPYCNICS  
 PYCNOCLINE  
 WATER DENSITY  
 DENSITY GRADIENTS  
 RT DENSITY PROFILES  
 density stratification  
 gradients  
 PYCNOCLINE  
 WATER DENSITY  
 DENSITY MEASUREMENT  
 UF hydrometry  
 specific gravity measurement  
 BT MEASUREMENT  
 RT densimeters  
 DENSITY  
 density measuring equipment  
 hydrometers  
 sediment density  
 WATER DENSITY  
 DENSITY PROFILES  
 BT VERTICAL PROFILES  
 RT DENSITY GRADIENTS  
 density sections  
 DENSITY STRATIFICATION  
 PYCNOCLINE  
 WATER DENSITY  
 DENSITY STRATIFICATION  
 BT STRATIFICATION  
 RT buoyant jets  
 dead water  
 DENSITY GRADIENTS  
 density interfaces  
 DENSITY PROFILES  
 GEOSTROPHIC FLOW  
 monin-obukhov length  
 PYCNOCLINE  
 salinity stratification  
 sound channels  
 WATER DENSITY  
 DEPTH  
 BT dimensions  
 NT mixed layer depth  
 sill depth  
 standard depths  
 WATER DEPTH  
 RT contours  
 depth measurement  
 height  
 hypsometric curves

thickness  
 DESIGN  
 UF design engineering  
 BT ENGINEERING  
 NT SHIP DESIGN  
 towed body design  
 RT aquaculture equipment  
 cages  
 engineering drawings  
 high pressure effects  
 RESEARCH  
 specifications  
 structural analysis  
 tolerances  
 DIATOMS  
 BT ALGAE  
 DIETS  
 NT balanced diets  
 basic diets  
 RT animal nutrition  
 artificial feeding  
 deficiency diseases  
 dietary deficiencies  
 digestibility  
 feed efficiency  
 food additives  
 FOOD ORGANISMS  
 nutrition disorders  
 nutritional requirements  
 nutritive value  
 selective feeding  
 single cell proteins  
 vitamin a  
 vitamin b  
 vitamin c  
 vitamin d  
 vitamin e  
 vitamins  
 DIFFUSION  
 BT TRANSPORT PROCESSES  
 NT atmospheric diffusion  
 molecular diffusion  
 thermal diffusion  
 TURBULENT DIFFUSION  
 RT adsorption  
 CHEMICAL PROPERTIES  
 CONSERVATION EQUATIONS  
 DENSITY  
 EQUILIBRIUM  
 evaporation  
 HEAT  
 ion exchange  
 ion transport  
 leaching  
 MASS TRANSFER  
 MIXING PROCESSES  
 MOMENTUM  
 osmosis  
 permeability  
 PHYSICAL PROPERTIES  
 SALTS  
 SEPARATION  
 TURBULENCE  
 WATER CIRCULATION  
 WATER MIXING  
 DIFFUSION COEFFICIENTS

UF diffusivity  
 BT exchange coefficients  
 RT EDDY DIFFUSIVITY  
 DILUTION  
 RT FATE  
   liquids  
   SALINITY  
   SALTS  
 DIRECTION INDICATORS  
 RT compasses  
 DIRECTION  
 MEASURING DEVICES  
 VANES  
 DIRECTIONAL SPECTRA  
 UF directional wave spectra  
 BT SPECTRA  
 RT DIRECTION  
   ENERGY SPECTRA  
   INTERNAL WAVES  
   long-crested waves  
   short-crested waves  
   SURFACE WATER WAVES  
   wave direction  
 DIRECTORIES  
 UF yearbooks  
 BT DOCUMENTS  
 RT algologists  
   animal physiologists  
   aquaculturists  
   bacteriologists  
   biologists  
   botanists  
   carcinologists  
   cetologists  
   consultants  
   DATA COLLECTIONS  
   divers  
   DOCUMENTATION  
   ecologists  
   economists  
   engineers  
   entomologists  
   experts  
   fishermen  
   fishery biologists  
   freshwater ecologists  
   freshwater scientists  
   geneticists  
   geologists  
   glossaries  
   ichthyologists  
   information scientists  
   librarians  
   malacologists  
   mammalogists  
   marine ecologists  
   MARINE SCIENTISTS  
   meteorologists  
   microbiologists  
   mycologists  
   organizations  
   ornithologists  
   physiologists  
   plant physiologists  
   research institutions  
   SCIENTIFIC PERSONNEL

statisticians  
 taxonomists  
 technicians  
 virologists  
 zoologists  
 DISPERSION  
 UF dispersal phenomena  
   dispersing  
   spreading  
 NT BIOLOGICAL DRIFT  
   dye dispersion  
   light dispersion  
   longitudinal dispersion  
   SOUND DISPERSION  
   WAVE DISPERSION  
 RT deloculation  
   dispersants  
   emulsions  
   FATE  
   MIGRATIONS  
   MIXING PROCESSES  
   SEPARATION  
   SUSPENDED PARTICULATE  
   MATTER  
   WATER MIXING  
 DISSOLVED GASES  
 BT gases  
 NT DISSOLVED OXYGEN  
 RT bubble disease  
   CHEMICAL COMPOSITION  
   solubility  
   WATER ANALYSIS  
 DISSOLVED ORGANIC CARBON  
 BT ORGANIC CARBON  
 RT carbon/nitrogen ratio  
   carbon/phosphorus ratio  
   dissolved organic matter  
   total organic carbon  
 DISSOLVED OXYGEN  
 UF DO  
   oxygen content  
 BT DISSOLVED GASES  
 RT ABIOTIC FACTORS  
   aeration  
   aerobic respiration  
   anoxic conditions  
   biochemical oxygen demand  
   CHEMICAL COMPOSITION  
   chemical oxygen demand  
   denxygenation  
   EUTROPHICATION  
   habitat improvement  
   HYDROGRAPHIC SECTIONS  
   HYDROGRAPHY  
   non-conservative properties  
   OXYGEN  
   oxygen demand  
   OXYGEN DEPLETION  
   oxygen minimum layer  
   OXYGEN PROFILES  
   oxygenation  
   solubility  
   solutions  
   WATER PROPERTIES  
   winkler method  
 DISSOLVED SALTS

BT SALTS  
 NT BRINES  
 RT CHEMICAL COMPOSITION  
   CHLORINE COMPOUNDS  
   conservation of salt  
   desalination  
   desalination plants  
   fluorine compounds  
   SALINITY  
   SALT BUDGET  
   SALT FINGERS  
   SALT FLUX  
   salt lakes  
   sodium compounds  
   solutions  
   WATER PROPERTIES  
 DISTRIBUTION  
 NT ecological distribution  
   GAUSSIAN DISTRIBUTION  
   GEOGRAPHICAL DISTRIBUTION  
   geological distribution  
   new records  
   QUANTITATIVE DISTRIBUTION  
   SEDIMENT DISTRIBUTION  
   temporal distribution  
 RT DISTRIBUTION RECORDS  
 DISTRIBUTION RECORDS  
 RT BIOGEOGRAPHY  
   biological charts  
   DISTRIBUTION  
   GEOGRAPHICAL DISTRIBUTION  
   type localities  
 DIURNAL VARIATIONS  
 UF diel variation  
 BT PERIODIC VARIATIONS  
 RT circadian rhythm  
   daily  
   daytime  
   diurnal thermocline  
   nighttime  
   nyctimeral rhythm  
   photoperiodicity  
   photoperiods  
   temporal distribution  
   VERTICAL DISTRIBUTION  
   vertical migrations  
 DIVERGENCE ZONE  
 NT oceanic divergences  
 RT CONVERGENCE ZONES  
   DIVERGENCE  
   UPWELLING  
   WATER MASSES  
 DIVING  
 NT deep-sea diving  
   saturation diving  
   scuba diving  
 RT AQUATIC MAMMALS  
   artificial aeration  
   cetology  
   deployment  
   diving accidents  
   diving bells  
   diving equipment  
   diving hazards  
   diving physiology  
   diving regulations

fishing by diving  
 human physiology  
 life support systems  
 manned vehicles  
 pressure effects  
 recovery  
 RECREATIONAL WATERS  
 search and rescue  
 shark attacks  
 spear fishing  
 surveying underwater  
 underwater exploration  
 underwater medicine  
 underwater photographs  
 underwater photography  
 underwater television  
 VISIBILITY UNDERWATER  
 working underwater  
 DOCUMENTATION  
 UF information sciences  
 NT information handling  
 INFORMATION RETRIEVAL  
 RT BIBLIOGRAPHIC INFORMATION  
 BIBLIOGRAPHIES  
 BIOGRAPHIES  
 DATA COLLECTIONS  
 data storage  
 DIRECTORIES  
 DOCUMENTS  
 encyclopaedias  
 glossaries  
 INFORMATION SERVICES  
 librarians  
 libraries  
 LITERATURE REVIEWS  
 thesaurus  
 DOCUMENTS  
 UF PUBLICATIONS  
 NT ABSTRACTS  
 archives  
 ATLASES  
 audiovisual material  
 BIBLIOGRAPHIES  
 BIOGRAPHIES  
 brochures  
 CATALOGUES  
 COLLECTED PAPERS  
 digital records  
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 encyclopaedias  
 EXPEDITION REPORTS  
 gazeteers  
 glossaries  
 illustrations  
 logbooks  
 MANUALS  
 patents  
 publicity material  
 REPORT LITERATURE  
 sailing directions  
 DOMESTIC WASTES  
 BT wastes  
 RT detergents  
 INDUSTRIAL WASTES  
 organic wastes  
 SEWAGE

sewage treatment  
 soaps  
 waste treatment  
 wastewater aquaculture  
 DOMINANT SPECIES  
 BT SPECIES  
 RT catch composition  
 climax community  
 COMMUNITY COMPOSITION  
 ECOLOGICAL ASSOCIATIONS  
 ecological succession  
 multispecies fisheries  
 SPECIES DIVERSITY  
 DOPPLER EFFECT  
 UF doppler shift  
 RT CURRENT METERS  
 CURRENT SENSORS  
 doppler navigation  
 DOPPLER SONAR  
 electromagnetic radiation  
 FLOWMETERS  
 RADAR  
 SOUND PROPAGATION  
 DOPPLER SONAR  
 UF acoustic doppler sonar  
 BT active sonar  
 RT ACOUSTIC EQUIPMENT  
 acoustic navigation  
 DOPPLER EFFECT  
 DOUBLE DIFFUSION  
 UF diffusive convection  
 double diffusive convection  
 salt finger convection  
 salt fingering  
 BT molecular diffusion  
 RT double diffusive instability  
 HEAT  
 MICROSTRUCTURE  
 SALINITY GRADIENTS  
 SALT FINGERS  
 SALTS  
 TEMPERATURE GRADIENTS  
 VERTICAL MIXING  
 DOWNWELLING  
 BT vertical water movement  
 RT CONVERGENCE  
 MIXING PROCESSES  
 oceanic convergences  
 UPWELLING  
 WATER MIXING  
 DRAG  
 NT FORM DRAG  
 RT air-water exchanges  
 BOTTOM FRICTION  
 BOTTOM STRESS  
 DRAG COEFFICIENT  
 FRICTION  
 WIND STRESS  
 WIND WAVE GENERATION  
 DRAG COEFFICIENT  
 RT bed roughness  
 DRAG  
 KINETIC ENERGY  
 reynolds number  
 SURFACE ROUGHNESS  
 WIND STRESS

WIND WAVE GENERATION  
 DREDGING  
 UF DREDGING  
 excavating  
 RT aggregates  
 canals  
 CHANNELS  
 clam fisheries  
 dredge spoil  
 dredgers  
 ECOSYSTEM DISTURBANCE  
 excavation underwater  
 navigational channels  
 OCEAN FLOOR  
 spoil  
 trenching  
 DRIFT  
 NT ICE DRIFT  
 ship drift  
 RT anchoring  
 CONTINENTAL DRIFT  
 DRIFTERS  
 motion  
 DRIFTERS  
 UF floats  
 lagrangian drifters  
 BT CURRENT MEASURING  
 EQUIPMENT  
 NT SUBSURFACE DRIFTERS  
 SURFACE DRIFTERS  
 RT CURRENT MEASUREMENT  
 DRIFT  
 lagrangian current measurement  
 DRIFTING DATA BUOYS  
 UF drift buoys  
 drifting buoys  
 expendable drifting buoys  
 lagrangian drifting buoys  
 satellite-tracked buoys  
 BT DATA BUOYS  
 RT drifting stations  
 SURFACE DRIFTERS  
 DRILLING  
 UF boring  
 offshore drilling  
 NT deep-sea drilling  
 RT boreholes  
 cores  
 coring  
 drilling equipment  
 drilling platforms  
 fossil fuels  
 heave compensators  
 MARINE GEOLOGY  
 OFFSHORE OPERATIONS  
 oil and gas exporation  
 OIL SPILLS  
 oil wells  
 permits  
 production platforms  
 seafloor sampling  
 sediment sampling  
 SITE SELECTION  
 site surveys  
 templates  
 underwater exploration

well completion

DYNAMIC ANALYSIS

RT ANALYSIS

DYNAMIC HEIGHT

UF geopotential

BT POTENTIAL ENERGY

RT dynamic height anomaly

DYNAMIC TOPOGRAPHY

height

stream functions

DYNAMIC RESPONSE

UF instrument responses

NT heave response

pitch response

roll response

surge response

yaw response

RT frequency

heaving

pitching

resonant frequency

rolling

surging

yawing

DYNAMIC TOPOGRAPHY

UF geopotential topograph

BT topography

RT DYNAMIC HEIGHT

GEOSTROPHIC FLOW

GEOSTROPHIC METHOD

isobaric surfaces

streamlines

surface slope

SURFACE TOPOGRAPHY

DYNAMICAL OCEANOGRAPHY

UF OCEANOGRAPHY

BT OCEANOGRAPHY

RT EQUATORIAL DYNAMICS

ESTUARINE DYNAMICS

FLUID MECHANICS

FLUID MOTION

HYDRODYNAMIC EQUATIONS

marine geodesy

NEARSHORE DYNAMICS

OCEAN CURRENTS

ocean-atmosphere system

seiches

SHELF DYNAMICS

TIDES

WATER WAVE MOTION

DYNAMICS

BT mechanics

NT cable dynamics

SEDIMENT DYNAMICS

structural dynamics

EARTH ATMOSPHERE

UF ATMOSPHERE

terrestrial atmosphere

BT planetary atmospheres

NT stratosphere

tropopause

troposphere

upper atmosphere

RT AIR

atmosphere evolution

ATMOSPHERIC CHEMISTRY

atmospheric motion

ATMOSPHERIC PHYSICS

atmospheric pressure

atmospheric sciences

degassing

EARTH

GREENHOUSE EFFECT

HEAT BUDGET

hygrometry

METEOROLOGY

ocean-atmosphere system

OZONE

EARTH MANTLE

UF mantle

BT earth structure

NT lower mantle

upper mantle

RT CONTINENTAL DRIFT

degassing

earth core

earth crust

mantle convection

moho

peridotite

EARTH ORBIT

RT ASTRONOMY

EARTH

EARTH SCIENCES

NT GEOLOGY

GEOPHYSICS

OCEANOGRAPHY

RT aquatic sciences

atmospheric sciences

CLIMATOLOGY

EARTH

GEOCHEMISTRY

ECHO SURVEYS

UF acoustic surveys

BT SURVEYS

RT ACOUSTIC EQUIPMENT

ACOUSTICS

active sonar

echoes

ECHOSOUNDERS

echosounding

exploratory fishing

fish counters

fish sizing

FISHERY SURVEYS

SONAR

sound recorders

STOCK ASSESSMENT

TRACKING

ECHOSOUNDERS

UF precision depth recorders

precision echosounders

BT active sonar

RT ECHO SURVEYS

echoes

echosounding

fish counters

FISH DETECTION

fishing operations

WAVE MEASURING EQUIPMENT

ECOLOGICAL AGGREGATIONS

UF aggregations

RT aggregations

ENVIRONMENTAL EFFECTS

social behaviour

stimuli

ECOLOGICAL ASSOCIATIONS

UF animal associations

associations (animal)

associations (ecological)

organism associations

RT AQUATIC COMMUNITIES

BIOCOENOSIS

biotopes

climax community

colonies

DOMINANT SPECIES

ecological succession

FOSSIL ASSEMBLAGES

HABITAT

synecology

ECOLOGICAL BALANCE

UF balance (ecological)

balance of nature

biological balance

biological equilibrium

ecosystem stability

stability (ecological)

RT ecological crisis

ECOLOGY

ECOSYSTEMS

ENVIRONMENT MANAGEMENT

environmental legislation

ECOLOGICAL DISTRIBUTION

BT DISTRIBUTION

RT BIOGEOGRAPHY

biological rhythms

ecoclines

ECOLOGICAL ZONATION

ECOLOGY

ECOSYSTEMS

endemic species

ENVIRONMENTAL EFFECTS

euryhalinity

eurythermy

GEOGRAPHICAL DISTRIBUTION

limiting factors

MIGRATIONS

relict species

stenohalinity

stenothermy

ECOLOGICAL ZONATION

UF intertidal zonation

littoral zonation

zonation (ecological)

RT BENTHOS

ecoclines

ECOLOGICAL DISTRIBUTION

exposed habitat

INTERTIDAL ENVIRONMENT

LITTORAL ZONE

phytobenthos

sheltered habitats

SUBSTRATA

TIDES

VERTICAL DISTRIBUTION

ZOOBENTHOS

ECOLOGY

UF aquatic ecology  
 bionomics  
 ecological sciences  
 NT autecology  
 brackishwater ecology  
 ethology  
 freshwater ecology  
 geneecology  
 MARINE ECOLOGY  
 palaeoecology  
 parasitology  
 phytosociology  
 PLANKTONOLOGY  
 radioecology  
 synecology  
 RT behaviour  
 BASELINE STUDIES  
 biolacies  
 BIOGEOGRAPHY  
 BIOLOGY  
 biotelemetry  
 botany  
 ECOLOGICAL BALANCE  
 ecological crisis  
 ECOLOGICAL DISTRIBUTION  
 ecologists  
 ecophysiology  
 ECOSYSTEMS  
 ENVIRONMENT MANAGEMENT  
 ENVIRONMENTAL CONDITIONS  
 FISHERY BIOLOGY  
 ORGANISM AGGREGATIONS  
 phenology  
 photoperiodicity  
 SPECIES  
 zoology  
 ECONOMICS  
 NT econometrics  
 FISHERY ECONOMICS  
 RT bilateral agreements  
 commerce  
 conservation  
 cost analysis  
 costs  
 economic feasibility  
 economic models  
 economists  
 evaluation  
 feasibility  
 feasibility studies  
 financing  
 governments  
 joint ventures  
 management  
 market research  
 marketing  
 NATURAL RESOURCES  
 planning  
 political aspects  
 pricing  
 reclamation  
 RESOURCE DEVELOPMENT  
 RESOURCE MANAGEMENT  
 RISKS  
 SOCIOLOGICAL ASPECTS  
 TRADE

WORLD  
 ECOSYSTEM DISTURBANCE  
 UF disturbance  
 RT AQUATIC COMMUNITIES  
 DREDGING  
 ECOSYSTEMS  
 ECOSYSTEM MANAGEMENT  
 BT management  
 NT ENVIRONMENT MANAGEMENT  
 RT AQUATIC COMMUNITIES  
 ECOSYSTEMS  
 natural populations  
 NATURAL RESOURCES  
 ECOSYSTEMS  
 RT AQUATIC COMMUNITIES  
 aquatic environment  
 bioenergetics  
 BIOLOGICAL PRODUCTION  
 ECOLOGICAL BALANCE  
 ECOLOGICAL DISTRIBUTION  
 ECOLOGY  
 ECOSYSTEM DISTURBANCE  
 ECOSYSTEM MANAGEMENT  
 ecosystem resilience  
 ENERGY FLOW  
 FOOD CHAINS  
 FOOD WEBS  
 niches  
 POLLUTION EFFECTS  
 TROPHIC LEVELS  
 TROPHIC STRUCTURE  
 ECOTYPES  
 UF habitat types  
 RT adaptations  
 biological speciation  
 HABITAT  
 typology  
 EDDIES (LEE)  
 UF EDDIES  
 BT WATER MOTION  
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 UF ekman boundary layers  
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 UF conductance  
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 BT electrical properties  
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 RT engineering drawings  
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 UF plankton entrainment  
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 NT gravity effects  
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 UF equatorial current system  
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- NT ANALYTICAL ERRORS
- RT approximation  
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- UF estuarine oceanography
- BT COASTAL INLETS
- NT partially mixed estuaries  
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- ESTUARINE CIRCULATION
- UF ESTUARINE DYNAMICS
- BT SHELF DYNAMICS
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- UF ESTUARINE CIRCULATION
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- RT aphotic zone
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- RT agricultural pollution  
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- UF bioevolution  
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- BT biological phenomena
- RT biogenesis  
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- UF cation exchange capacity
- RT adsorption  
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 UF eez  
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 exclusive fishing zone  
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 UF wave fetch  
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 UF fibre optics  
 BT TECHNOLOGY  
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 NT water filtration  
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 UF line structure (ocean)  
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 BT SPATIAL VARIATIONS  
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 UF fishes  
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 BT CATCH STATISTICS  
 RT by catch  
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 UF fish farms  
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 BT AQUACULTURE  
 NT bait culture  
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 wild spawning  
 FISH DETECTION  
 UF fish location  
 BT detection  
 RT active sonar  
 ECHOSOUNDERS  
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 SONAR  
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UF ammocetes  
leptocephalus

BT LARVAE

NT fingerings  
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RT BIOLOGICAL DRIFT  
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ICHTHYOPLANKTON  
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UF capture fisheries  
commercial fisheries

NT canoe fisheries  
carangid fisheries  
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DEMERSAL FISHERIES  
estuarine fisheries  
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RT aquatic sciences  
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FISHERY MANAGEMENT  
FISHERY RESOURCES  
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UF fish resources  
FISHERIES RESOURCES

BT LIVING RESOURCES

RT animal products  
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FISHERY BIOLOGY

UF fisheries biology

BT BIOLOGY

RT biometric  
ECOLOGY  
fishery biologists  
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FISHERY OCEANOGRAPHY  
FISHERY RESOURCES  
FISHERY SCIENCES  
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FISHERY DATA

UF data (fisheries)  
fisheries data

BT DATA

NT catch/effort  
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fishing power  
fishing time

RT CATCH STATISTICS  
FISH CATCH STATISTICS  
FISHERY BIOLOGY  
fishery statistics  
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LANDING STATISTICS  
STOCK ASSESSMENT

FISHERY ECONOMICS

BT ECONOMICS

NT aquaculture economics  
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RT cooperatives  
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UF fisheries management

BT RESOURCE MANAGEMENT

RT capture fishery economics  
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FISHERY OCEANOGRAPHY

UF fisheries hydrography  
OCEANOGRAPHY

BT OCEANOGRAPHY

RT ENVIRONMENTAL SURVEYS  
FISHERY BIOLOGY  
FISHERY SCIENCES  
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FISHERY RESOURCES

UF fish resources  
FISHERIES RESOURCES

BT LIVING RESOURCES

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UF fisheries sciences

RT FISHERY BIOLOGY

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   fishery engineering  
   fishery institutions  
   fishery limnology  
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   fishery technology  
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   RT AERIAL SURVEYS  
     age groups  
     catch composition  
   ECHO SURVEYS  
     fish counters  
     fishery charts  
     fishery development  
     fishery institutions  
     fishery limnology  
   FISHERY RESOURCES  
   ICHTHYOPLANKTON  
   ichthyoplankton surveys  
   STOCK ASSESSMENT  
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   UF fiord dynamics  
   BT SHELF DYNAMICS  
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   UF fiords  
     fyords  
   BT COASTAL INLETS  
   RT anoxic conditions  
     anoxic sediments  
     coastal landforms  
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 RT algology  
 AQUATIC ANIMALS  
 aquatic organisms  
 AQUATIC PLANTS  
 carcinology  
 entomology  
 FISHERY BIOLOGY  
 freshwater ecology  
 ICHTHYOLOGY  
 malacology  
 MARINE ECOLOGY  
 MARINE SCIENCES

HYDROCARBONS  
 UF hydrocarbon compounds  
 solid hydrocarbon  
 BT organic compounds  
 NT gas hydrates  
 HALOGENATED HYDROCARBONS  
 petroleum hydrocarbons  
 saturated hydrocarbons  
 unsaturated hydrocarbons  
 RT CARBON  
 carbon compounds  
 chemical compounds  
 fatty acids  
 fish oil extraction  
 fish oils  
 fossil fuels  
 hydrocarbon analysis  
 hydrogen  
 OIL  
 OIL AND GAS  
 oil sands  
 oil shale  
 sapropels

HYDROCLIMATE  
 BT CLIMATE  
 RT bioclimatology  
 BIOGEOGRAPHY  
 climatic zones  
 CLIMATOLOGY  
 phenology

seasons  
 WATER TEMPERATURE  
 HYDRODYNAMIC EQUATIONS  
 RT DYNAMICAL OCEANOGRAPHY  
 EQUATIONS  
 HYDRODYNAMICS  
 hydrostatic equation

HYDRODYNAMICS  
 BT FLUID MECHANICS  
 RT BOUNDARY LAYER  
 coupled bodies  
 CURRENT FORCES  
 HYDRODYNAMIC EQUATIONS  
 HYDROSTATICS  
 navier-stokes equations  
 PHYSICAL LIMNOLOGY  
 PHYSICAL OCEANOGRAPHY  
 spheres  
 STREAM FLOW  
 VORTICITY  
 wakes  
 WATER CIRCULATION  
 WAVE POWER

HYDROELECTRIC POWER PLANTS  
 BT POWER PLANTS  
 NT tidal power plants  
 RT HYDROELECTRIC POWER  
 wave power devices

HYDROGRAPHIC CHARTS  
 UF oceanographic charts  
 BT MAPS  
 NT BATHYMETRIC CHARTS  
 CURRENT CHARTS  
 density charts  
 ice charts  
 SALINITY CHARTS  
 TEMPERATURE CHARTS  
 tidal charts  
 RT ATLASES  
 ENVIRONMENTAL CHARTS  
 HYDROGRAPHIC SECTIONS  
 OCEANOGRAPHIC ATLASES

HYDROGRAPHIC DATA  
 BT DATA  
 NT CTD OBSERVATIONS  
 CURRENT DATA  
 CURRENT OBSERVATIONS  
 ICE OBSERVATIONS  
 SALINITY DATA  
 TEMPERATURE DATA  
 RT HYDROGRAPHY  
 STD OBSERVATIONS  
 str profiles  
 surveying equipment

HYDROGRAPHIC SECTIONS  
 BT vertical sections  
 NT bathymetric profiles  
 density sections  
 oxygen sections  
 SALINITY SECTIONS  
 TEMPERATURE SECTIONS  
 velocity sections  
 RT DISSOLVED OXYGEN  
 hydrographic charts  
 HYDROGRAPHY  
 meridional distribution

OCEANOGRAPHIC ATLASES  
 standard ocean sections  
 VERTICAL PROFILES  
 zonal distribution

HYDROGRAPHIC SURVEYING  
 UF charting  
 BT surveying  
 NT surveying underwater  
 RT BATHYMETRIC CHARTS  
 BATHYMETRY  
 CARTOGRAPHY  
 NAVIGATION  
 NAVIGATIONAL CHARTS  
 RESEARCH VESSELS  
 soundings  
 survey vessels  
 WATER DEPTH

HYDROGRAPHIC SURVEYS  
 BT SURVEYS  
 NT BATHYMETRIC SURVEYS  
 RT archaeology  
 BATHYMETRIC CHARTS  
 BATHYMETRY  
 CARTOGRAPHY  
 NAVIGATION  
 NAVIGATIONAL CHARTS  
 RESEARCH VESSELS  
 site surveys  
 survey vessels  
 WATER DEPTH

HYDROGRAPHY  
 UF descriptive physical oceanography  
 BT PHYSICAL OCEANOGRAPHY  
 RT bathymetry  
 BATHYMETRIC CHARTS  
 core layer method  
 core layers  
 DISSOLVED OXYGEN  
 FISHERY OCEANOGRAPHY  
 HYDROGRAPHIC DATA  
 HYDROGRAPHIC SECTIONS  
 limnology  
 OCEANOGRAPHIC ATLASES  
 OCEANOGRAPHIC SURVEYS  
 PHYSICAL LIMNOLOGY  
 SALINITY  
 STRATIFICATION  
 THERMAL STRATIFICATION  
 THERMAL STRUCTURE  
 WATER  
 WATER CIRCULATION  
 WATER MASSES  
 WATER TEMPERATURE  
 WATER TYPES

HYDROLOGIC CYCLE  
 UF water cycle  
 BT cycles  
 RT ENERGY BUDGET  
 evaporation  
 evapotranspiration  
 HYDROLOGY  
 hydrosphere  
 ICE  
 METEOROLOGY  
 RAINFALL  
 RIVER DISCHARGE

RIVER OUTFLOW  
 SEA WATER  
 transpiration  
 WATER  
 WATER BUDGET  
 WATER CIRCULATION  
 water resources

HYDROLOGY  
 BT GEOLOGY  
 RT bed forms  
 geomorphology  
 drainage water  
 droughts  
 flood control  
 floods  
 freshwater sciences  
 GEOCHEMISTRY  
 glaciers  
 ground water  
 HYDROLOGIC CYCLE  
 hydrosphere  
 inland waters  
 lakes  
 limnological surveys  
 limnology  
 ponds  
 reservoirs  
 RIVERS  
 RUNOFF  
 sediment chemistry  
 stormwater runoff  
 WATER  
 WATER BUDGET  
 water use  
 watersheds

HYDROSTATIC PRESSURE  
 UF PRESSURE  
 WATER PRESSURE  
 BT PRESSURE  
 NT BOTTOM PRESSURE  
 RT decompression  
 ELECTRICAL CONDUCTIVITY  
 high pressure effects  
 hydraulic systems  
 HYDROSTATICS  
 hyperbaric  
 isobaric surfaces  
 isobars  
 pore pressure  
 pressure effects  
 pressure field  
 SOUND VELOCITY  
 WATER  
 WATER DENSITY

HYDROSTATICS  
 BT FLUID MECHANICS  
 RT hydrodynamics  
 hydrostatic equation  
 HYDROSTATIC PRESSURE  
 PRESSURE GRADIENTS

HYDRAULIC MODELS  
 BT scale models  
 NT harbour models  
 RT canals  
 CHANNELS  
 COASTAL ENGINEERING

hydraulic engineering  
 hydraulic structures  
 test equipment  
 wave tanks

ICE  
 UF SLUDGE  
 NT floating ice  
 freshwater ice  
 glaciers  
 lake ice  
 land ice  
 SEA ICE  
 RT ablation  
 air-ice interface  
 cold storage  
 CRYOPLANKTON  
 cryosphere  
 fish storage  
 freezing storage  
 HYDROLOGIC CYCLE  
 ice breakup  
 ICE COVER  
 ice fishing  
 ice jams  
 ice oil interface  
 ice prevention  
 ice properties  
 ice ridges  
 ICE THICKNESS  
 ice volume  
 ICE WATER INTERFACE  
 ICING  
 melting point  
 navigation in ice  
 polar exploration  
 preservation  
 SNOW  
 WATER

ICE CONDITIONS  
 RT ice charts  
 ICE COVER  
 WEATHER

ICE COVER  
 RT AERIAL SURVEYS  
 CLIMATIC CHANGES  
 ICE  
 ice caps  
 ice charts  
 ICE CONDITIONS  
 ICE EDGE  
 ICE OBSERVATIONS  
 ice volume  
 ice-free periods  
 palaeoclimate  
 winterkill

ICE DRIFT  
 UF DRIFT  
 ice movement  
 BT DRIFT  
 RT CURRENT VELOCITY  
 glacial deposits  
 ice islands  
 ICEBERGS  
 PACK ICE  
 rafting  
 WIND STRESS

## ICE EDGE

UF ice limit  
 RT CLIMATIC CHANGES  
 ice charts  
 ICE COVER  
 POLAR OCEANOGRAPHY

## ICE FLOES

UF PACK ICE

## ICE LOADS

UF ice forces  
 BT loads  
 RT ice barriers  
 ice jams  
 ice pressure  
 ice prevention  
 sea walls  
 shore protection

## ICE NAVIGATION

UF navigation in ice

## ICE OBSERVATIONS

UF ice reporting  
 BT HYDROGRAPHIC DATA  
 RT AIRBORNE SENSING  
 ice charts  
 ICE COVER  
 iceberg detection  
 SATELLITE SENSING

## ICE SHELVES

BT floating ice  
 RT ablation  
 calving  
 fast ice  
 ice fronts  
 ice islands  
 ICE THICKNESS

## ICE THICKNESS

BT thickness  
 RT depth measurement  
 ICE  
 ice caps  
 ice ridges  
 ICE SHELVES

## ICE WATER INTERFACE

BT INTERFACES  
 RT freshwater ice  
 ICE  
 ice canopy  
 ice formation  
 lake ice  
 SEA ICE  
 wave ice interaction

## ICE WATER INTERFACES

BT INTERFACES  
 RT freshwater ice  
 ICE  
 ice canopy  
 ice formation  
 lake ice  
 SEA ICE  
 wave-ice interaction

## ICEBERG SCOURING

UF ice scouring  
 BT SCOURING  
 RT bed forms  
 glacial erosion  
 ploughmarks

## ICEBERGS

UF calved ice  
 BT floating ice  
 NT tabular bergs  
 RT ablation  
 calving  
 glaciers  
 ICE DRIFT  
 iceberg detection  
 MARINE ENVIRONMENT  
 melt water  
 water resources

## ICHTHYOLOGY

BT vertebrate zoology  
 RT BIOGEOGRAPHY  
 FISH  
 fish physiology  
 FISHERY BIOLOGY  
 HYDROBIOLOGY  
 ichthyologists

## ICHTHYOPLANKTON

BT ZOOPLANKTON  
 RT fish eggs  
 FISH LARVAE  
 FISHERY SURVEYS  
 ichthyoplankton surveys  
 meroplankton  
 netron collecting devices  
 plankton collecting devices  
 planktonology  
 SPAWNING GROUNDS  
 spawning seasons

## ICING

BT ice accretion  
 RT de-icing  
 deicing equipment  
 freezing  
 ICE  
 ice formation  
 OFFSHORE STRUCTURES  
 ship stability  
 SHIPS  
 splash zone  
 spray  
 surface craft  
 WEATHER  
 WEATHER HAZARDS

## IMAGE PROCESSING

RT IMAGERY  
 IMAGING TECHNIQUES

## IMAGERY

UF images  
 BT REMOTE SENSING  
 NT ACOUSTIC IMAGERY,  
 INFRARED IMAGERY  
 MICROWAVE IMAGERY  
 photography  
 RT DATA PROCESSING  
 image enhancement  
 IMAGE PROCESSING  
 IMAGING TECHNIQUES  
 RESOLUTION

## IMAGING TECHNIQUES

UF IMAGING  
 NT image enhancement  
 RT acoustic holography

## image processing

IMAGERY  
 REMOTE SENSING

## IN SITU DENSITY

BT WATER DENSITY  
 RT in situ measurement  
 in situ temperature  
 knudsen tables  
 potential density  
 SALINITY  
 sigma-t  
 thermosteric anomalies  
 WATER MASSES  
 WATER TEMPERATURE

## INDICATOR SPECIES

UF bioindicator organisms  
 bioindicators  
 indicator organisms  
 BT SPECIES  
 RT biochemical oxygen demand  
 indicators  
 PLANKTON  
 pollution indicators  
 salinity tolerance  
 temperature tolerance  
 test organisms  
 WATER ANALYSIS  
 WATER MASSES  
 WATER QUALITY

## INDUSTRIAL WASTES

UF industrial effluents  
 BT wastes  
 RT chemical pollutants  
 chemical pollution  
 domestic wastes  
 EUTROPHICATION  
 forest industry  
 hazardous materials  
 industrial production  
 MARINE POLLUTION  
 OIL WASTES  
 phenols  
 SEWAGE  
 SEWAGE DISPOSAL  
 waste water  
 WATER POLLUTION

## INDUSTRIES

UF industry  
 NT aquaculture enterprises  
 diving industry  
 fishery industry  
 forest industry  
 mineral industry  
 OIL AND GAS INDUSTRY  
 RT industrial production  
 industrial products  
 products  
 RESOURCE DEVELOPMENT

## INERTIAL CURRENTS

BT WATER CURRENTS

## INERTIAL WAVES

UF gyroscopic waves

BT WATER WAVES

RT INERTIA

inertial oscillations

## INFORMATION RETRIEVAL

BT DOCUMENTATION  
 RT BIBLIOGRAPHIC INFORMATION  
 BIBLIOGRAPHIES  
 CATALOGUES  
 DATA COLLECTIONS  
 DATA RETRIEVAL  
 DOCUMENTS  
 information centres  
 libraries  
 thesaurus  
 INFORMATION SERVICES  
 UF documentation services  
 information analysis services  
 RT COMPUTERS  
 DOCUMENTATION  
 information centres  
 information scientists  
 INFRARED IMAGERY  
 UF INFRARED SENSING  
 ir imagery  
 thermal imagery  
 thermal infrared imagery  
 thermal ir imagery  
 BT IMAGERY  
 RT AIRBORNE SENSING  
 GEOSENSING  
 infrared detectors  
 infrared radiation  
 SATELLITE MOSAICS  
 SATELLITE SENSING  
 surface radiation temperature  
 INFRARED SENSING  
 UF INFRARED IMAGERY  
 INLETS  
 BT COASTAL INLETS  
 RT BAYS  
 canals  
 CHANNELS  
 COASTAL ZONE  
 ESTUARIES  
 FJORDS  
 TIDES  
 TOPOGRAPHIC FEATURES  
 INORGANIC SUSPENDED MATTER  
 UF suspended inorganic matter  
 INSHORE STATIONS  
 UF shore stations  
 BT fixed stations  
 RT DATA REPORTS  
 lightships  
 OCEANOGRAPHIC DATA  
 INSTABILITY  
 UF dynamic instability  
 NT BAROCLINIC INSTABILITY  
 BAROTROPIC INSTABILITY  
 benjamin feir instability  
 double diffusive instability  
 KELVIN HELMHOLTZ INSTABILITY  
 static instability  
 RT capsizing  
 RICHARDSON NUMBER  
 STABILITY  
 unsteady state  
 VERTICAL STABILITY  
 INSTRUMENT PLATFORMS  
 UF instrument carriers

observation platforms  
 platforms  
 BT vehicles  
 NT stabilized platforms  
 WAVE FOLLOWERS  
 RT AIRCRAFT  
 balloons  
 BRIDGES  
 BUOY SYSTEMS  
 DATA BUOYS  
 helicopters  
 ice islands  
 large spar buoys  
 masts  
 radiosondes  
 RESEARCH VESSELS  
 scientific satellites  
 selected ships  
 surface craft  
 survey vessels  
 UNDERWATER VEHICLES  
 WEATHER SHIPS  
 INSTRUMENTS  
 NT accelerometers  
 free fall instrument  
 gyroscopes  
 strain gauges  
 RT ACCURACY  
 efficiency  
 engineering drawing  
 RESOLUTION  
 INTERCALIBRATION  
 BT CALIBRATION  
 RT intercomparison  
 PERFORMANCE ASSESSMENT  
 INTERFACES  
 NT air-ice interface  
 air-water interface  
 density interfaces  
 ice-oil interface  
 ice-water interface  
 oil-gas interface  
 oil-water interface  
 sediment-water interface  
 RT boundary layers  
 BOUNDARIES  
 discontinuity layers  
 FRONTS  
 MIXING PROCESSES  
 surfaces  
 INTERMEDIATE WATER MASSES  
 BT WATER MASSES  
 RT metalimnion  
 THERMAL STRATIFICATION  
 INTERNAL TIDES  
 UF baroclinic tides  
 BT INTERNAL WAVES  
 RT baroclinic mode  
 BAROCLINIC MOTION  
 INTERNAL WAVE EFFECTS  
 RT dead water  
 SOUND PROPAGATION  
 INTERNAL WAVE GENERATION  
 BT WAVE GENERATION  
 RT INTERNAL WAVES  
 lee waves

surface wave-internal wave  
 interactions  
 INTERNAL WAVES  
 UF internal gravity waves  
 BT WATER WAVES  
 NT INTERNAL TIDES  
 lee waves  
 RT billows  
 DIRECTIONAL SPECTRA  
 interfacial waves  
 internal wave breaking  
 INTERNAL WAVE GENERATION  
 MICROSTRUCTURE  
 NONLINEAR WAVES  
 resonant wave interaction  
 SOUND PROPAGATION  
 surface wave internal wave  
 interactions  
 INTERNATIONAL AGREEMENTS  
 UF agreements  
 conventions  
 treaties  
 BT LEGISLATION  
 NT pollution convention  
 seabed conventions  
 RT bilateral agreements  
 contiguous zones  
 countries  
 developing countries  
 fishery regulations  
 fishing rights  
 foreign fishing  
 international law  
 INTERNATIONAL ORGANIZATIONS  
 international policy  
 international waters  
 legal aspects  
 MARINE RESOURCES  
 OCEAN DUMPING  
 ocean policy  
 ocean space  
 political aspects  
 shared stocks  
 territorial waters  
 whaling regulations  
 INTERNATIONAL COOPERATION  
 UF international exchange  
 international relation  
 RT aquaculture development  
 countries  
 developing countries  
 developing projects  
 fishery development  
 INTERNATIONAL ORGANIZATIONS  
 international policy  
 REPORT LITERATURE  
 sorting centres  
 technology transfer  
 TRAINING  
 TRAINING CENTRES  
 INTERNATIONAL ORGANIZATIONS  
 UF international agencies  
 international organisations  
 BT organizations  
 RT ACRONYMS  
 ANNUAL REPORTS

CONFERENCES  
 countries  
 developing countries  
 INTERNATIONAL AGREEMENTS  
 INTERNATIONAL COOPERATION  
 international law  
 international policy  
 ocean policy  
 REPORT LITERATURE  
 RESOURCE CONSERVATION  
 seabed conventions  
 INTERSPECIFIC RELATIONSHIPS  
 UF interspecific interactions  
 NT commensalism  
 competition  
 epibiosis  
 parasitism  
 PREDATION  
 symbiosis  
 RT BEHAVIOUR  
 biological phenomena  
 biotic factors  
 diseases  
 FOOD CHAINS  
 FOOD WEBS  
 intraspecific relationships  
 TROPHIC RELATIONSHIPS  
 INTERTIDAL ENVIRONMENT  
 UF tidal environment  
 BT MARINE ENVIRONMENT  
 RT air exposure  
 BEACHES  
 BENTHIC ENVIRONMENT  
 ECOLOGICAL ZONATION  
 eulittoral zone  
 exposed habitats  
 intertidal sedimentation  
 TIDAL CYCLES  
 TIDAL FLATS  
 tidal waves  
 INVENTORIES  
 UF data catalogues  
 BT CATALOGUES  
 RT DATA  
 DATA CENTRES  
 DATA COLLECTIONS  
 INVERTEBRATE ZOOLOGY  
 BT zoology  
 NT carcinology  
 entomology  
 malacology  
 RT BIOGEOGRAPHY  
 taxonomy  
 IRRADIANCE  
 NT downward irradiance  
 UPWARD IRRADIANCE  
 RT cosine collectors  
 irradiance meters  
 LIGHT  
 light fields  
 optical classification  
 OPTICAL PROPERTIES  
 optical water types  
 radiance  
 RADIATIVE TRANSFER  
 SOLAR RADIATION

volume scattering function  
 ISOPLETHS  
 UF isolines  
 BT map graphics  
 NT contours  
 corange lines  
 cotidal lines  
 isobars  
 isochrones  
 isohalines  
 isohyets  
 isomagnetic lines  
 isopachs  
 ISOPYCNICS  
 isosteres  
 isotherms  
 RT graphs  
 ISOPYCNIC SURFACES  
 RT baroclinic mode  
 barotropic mode  
 isobaric surfaces  
 ISOPYCNICS  
 isosteric surfaces  
 surfaces  
 WATER DENSITY  
 ISOPYCNICS  
 BT ISOPLETHS  
 RT density charts  
 DENSITY FRONTS  
 ISOPYCNIC SURFACES  
 isosteres  
 PYCNOCLINE  
 specific volume  
 WATER DENSITY  
 ISOTOPES  
 UF nuclides  
 NT actinium isotopes  
 aluminium isotopes  
 americium isotopes  
 antimony isotopes  
 argon isotopes  
 arsenic isotopes  
 astatine isotopes  
 BARIUM ISOTOPES  
 berkelium isotopes  
 beryllium isotopes  
 bismuth isotopes  
 boron isotopes  
 bromine isotopes  
 cadmium isotopes  
 caesium isotopes  
 calcium isotopes  
 calcium isotopes  
 californium isotopes  
 carbon isotopes  
 cerium isotopes  
 chlorine isotopes  
 chromium isotopes  
 cobalt isotopes  
 copper isotopes  
 curium isotopes  
 dysprosium isotopes  
 einsteinium isotopes  
 erbium isotopes  
 europium isotopes  
 RT chemical elements

fission products  
 isotope dilution  
 isotope fractionation  
 RADIOACTIVE TRACERS  
 radiometric dating  
 TRACERS  
 JETS  
 UF turbulent jets  
 BT FLUID FLOW  
 NT buoyant jets  
 COASTAL JETS  
 RT jet stream  
 KALMAN FILTERS  
 BT filters  
 KELVIN HELMHOLTZ INSTABILITY  
 UF helmholtz instability  
 shear flow instability  
 shear instability  
 BT INSTABILITY  
 RT billows  
 clear air turbulence  
 trans-synoptic mixing  
 KELVIN WAVES  
 UF double kelvin waves  
 BT TRAPPED WAVES  
 NT EQUATORIAL TRAPPED WAVES  
 RT EQUATORIAL DYNAMICS  
 NONLINEAR WAVES  
 KINEMATICS  
 BT mechanics  
 RT acceleration  
 VELOCITY  
 KINETIC ENERGY  
 BT ENERGY  
 NT EDDY KINETIC ENERGY  
 RT DRAG COEFFICIENT  
 froude number  
 POTENTIAL ENERGY  
 LABORATORIES  
 RT EXPERIMENTAL RESEARCH  
 laboratory equipment  
 RESEARCH INSTITUTIONS  
 SCIENTIFIC PERSONNEL  
 LAGOON FISHERIES  
 BT inland fisheries  
 RT ARTISANAL FISHING  
 barriers  
 brackishwater fish  
 DEMERSAL FISHERIES  
 fishing barriers  
 LAGOONS  
 SHRIMP FISHERIES  
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 LAGOONS  
 NT atoll lagoons  
 COASTAL LAGOONS  
 inland lagoons  
 RT AQUACULTURE  
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 BARRIER REEFS  
 BRACKISH WATER  
 brackishwater environment  
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 LAGOON FISHERIES  
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 LAGRANGIAN CURRENT MEASUREMENT  
 UF lagrangian methods  
 BT CURRENT MEASUREMENT  
 RT DATA BUOYS  
 DRIFTERS  
 drogues  
 rhodamine b-dye  
 ship drift  
 SUBSURFACE DRIFTERS  
 LANDING STATISTICS  
 BT fishery statistics  
 RT CATCH STATISTICS  
 COMMERCIAL FISHING  
 FISHERY DATA  
 fishing time  
 STOCK ASSESSMENT  
 TRADE  
 LANGMUIR CIRCULATION  
 BT FLUID MOTION  
 RT CONVERGENCE  
 DIVERGENCE  
 SURFACE CIRCULATION  
 SURFACE LAYERS  
 VORTICES  
 windrows  
 WINDS  
 LAPLACE EQUATION  
 BT EQUATIONS  
 RT harmonic functions  
 poisson's equation  
 tidal equations  
 LAPLACE EQUATIONS  
 UF LAPLACE EQUATION  
 LARVAE  
 UF larval stages  
 BT developmental stages  
 NT FISH LARVAE  
 invertebrate larvae  
 RT embryos  
 fecundity  
 larval development  
 metamorphosis  
 metoplankton  
 moulting  
 neoteny  
 rearing  
 seed  
 zooplankton culture  
 LASERS  
 UF optical masers  
 pulsed lasers  
 RT electromagnetic radiation  
 holography  
 infrared detectors  
 laser altimetry  
 laser bathymeters  
 laser bathymetry  
 LIDAR  
 light sources  
 luminescence  
 OPTICS

LATENT HEAT TRANSFER  
 BF HEAT EXCHANGE  
 RT bowen ratio  
 evaporation  
 LAW OF THE SEA  
 UF international law of the sea  
 ocean law  
 sea law  
 BT international law  
 RT BOUNDARIES  
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 deep-sea mining  
 environmental legislation  
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 international boundaries  
 international waters  
 legal aspects  
 multiple use of resources  
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 NT BOUNDARY LAYERS  
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 RT deep layer  
 diathermal layer  
 EKMAN LAYERS  
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 STRATIFICATION  
 SURFACE FILMS  
 surfaces  
 temperature inversions  
 LEASES  
 RT OIL AND GAS EXPLORATION  
 LEGISLATION  
 UF regulations  
 NT aquaculture regulations  
 bilateral agreements  
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 environmental legislation  
 fishery industry legislation  
 fishery regulations  
 INTERNATIONAL AGREEMENTS  
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 SAFETY REGULATIONS  
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 RT extended jurisdiction  
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 riparian rights  
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 LIDAR  
 RT hygrometry  
 LASERS  
 meteorological instruments  
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 REMOTE SENSING EQUIPMENT  
 sodar  
 LIFE CYCLE  
 BT cycles  
 RT adults  
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 biological aging  
 biological development  
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 differential distribution  
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 LIFE HISTORY  
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 metamorphosis  
 ontogeny  
 otolith reading  
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 reproduction  
 reproductive cycle  
 scale reading  
 sexual maturity  
 synopsis  
 LIFE HISTORY  
 RT autecology  
 BIOLOGY  
 LIFE CYCLE  
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 LIGHT ABSORPTION  
 UF ABSORPTION  
 BT ABSORPTION  
 RT ABSORPTION COEFFICIENT  
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 LIGHT ATTENUATION  
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 LIGHT TRANSMISSION  
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 UF attenuation  
 BT attenuation  
 RT attenuation  
 beam transmittance  
 extinction coefficient



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 LIGHT ABSORPTION  
 light penetration  
 LIGHT SCATTERING  
 transmittance  
 turbidity  
 water transparency

LIGHT EFFECTS  
 UF photoperiod effects  
 BT ENVIRONMENTAL EFFECTS  
 RT chromatic behaviour  
 light penetration  
 nyctimeral rhythms  
 OPTICAL PROPERTIES  
 photoperiodicity  
 phototaxis  
 phototropism  
 vertical migrations

LIGHT INTENSITY  
 UF light quantity  
 RT LIGHT  
 light penetration  
 OPTICAL PROPERTIES  
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LIGHT REFLECTION  
 UF reflection  
 BT reflection  
 RT air-water interface  
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 LIGHT  
 light dispersion  
 light penetration  
 LIGHT REFLECTION  
 OPTICAL PROPERTIES  
 REFRACTIVE INDEX  
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LIGHT SCATTERING  
 UF SCATTERING  
 NT particle scattering  
 RT FLUORESCENCE  
 LIGHT  
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 SUSPENDED PARTICULATE  
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LIGHT TRANSMISSION  
 BT TRANSMISSION  
 RT LIGHT  
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LINEAR WAVES

UF airy waves  
 infinitesimal waves  
 sinusoidal waves  
 BT WATER WAVES  
 RT NONLINEAR WAVES

LIPIDS  
 BT organic compounds  
 NT complex lipids  
 derived lipids  
 fats  
 steroids  
 waxes  
 RT chemical extraction  
 choline  
 esters  
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 UF atomic physics  
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 BT dietary deficiencies  
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UF OCEAN CIRCULATION

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UF EDDIES  
BT OCEAN CIRCULATION  
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UF oceanographic fronts  
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UF RESPONSE  
RT ATMOSPHERIC FORCING  
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BT TURBULENCE  
RT dye dispersion  
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BT ATLASES  
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UF oceanographic instruments  
BT EQUIPMENT  
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 UF oceanology  
 BT EARTH SCIENCES  
 NT CHEMICAL OCEANOGRAPHY  
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 UF CHEMICAL OCEANOGRAPHY

OCEANOGRAPHY PHYSICAL  
 UF PHYSICAL OCEANOGRAPHY

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 UF SEAS  
 RT MARGINAL SEAS  
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BT ENGINEERING  
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 UF marine structures  
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 BT hydraulic structures  
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BT INDUSTRIES  
 RT diving industry  
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 BT ACCIDENTS  
 RT containment  
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 BT CARBON  
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 NT dissolved organic matter  
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 RT anoxic sediments  
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UF ICE FLOES  
BT floating ice  
RT ice barriers  
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UF PALAEOCEANOGRAPHY  
BT OCEANOGRAPHY  
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BT CLIMATOLOGY  
RT CONTINENTAL DRIFT  
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PALAEOCEANOGRAPHY  
UF PALAEOCEANOGRAPHY  
PALEOCEANOGRAPHY  
UF PALAEOCEANOGRAPHY  
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UF grain motion  
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RT BOTTOM STRESS  
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UF biological resistance

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UF instrument resolution  
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ROCKY SHORES

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 REEF FORMATION  
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 SEDIMENTOLOGY  
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 BT GEOLOGY  
 RT diagenesis  
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 SEDIMENTS  
 UF sedimentary deposits  
 NT anoxic sediments  
 authigenic minerals  
 chemical sediments  
 clastics  
 cohesive sediments  
 littoral deposits  
 oxic sediments

pelagic sediments  
 relict sediments  
 terrigenous sediments  
 volcanogenic deposits  
 RT acoustic properties  
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 allochthonous deposits  
 alluvial deposits  
 arenaceous deposits  
 argillaceous deposits  
 autochthonous deposits  
 biological rafting  
 bioturbation  
 carbonate sediments  
 catagenesis  
 cohesionless sediments  
 cosmic dust  
 detrital deposits  
 detritus  
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 eolian deposits  
 extraterrestrial material  
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 lake deposits  
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 RESUSPENDED SEDIMENTS  
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 SEDIMENT ANALYSIS  
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 SEDIMENT DISTRIBUTION  
 sediment mixing  
 sediment movement  
 sediment noise  
 SEDIMENT SORTING  
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 SEDIMENT TEXTURE  
 SEDIMENT TRANSPORT  
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 sedimentary rocks  
 sedimentary structures  
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 stratigraphic correlation  
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 SEISMIC EXPLORATION  
 UF seismic methods  
 seismic profiling  
 BT GEOPHYSICAL EXPLORATION  
 NT seismic reflection profiling  
 seismic refraction profiling  
 sub-bottom profiling  
 RT GEOLOGICAL SURVEYS  
 seismic energy sources  
 seismic equipment  
 seismic profiles

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 SEISMIC STRATIGRAPHY  
 UF acoustic stratigraphy  
 BT stratigraphy  
 RT seismic profiles  
 seismic refraction profiles  
 stratigraphic correlation  
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 BT GEOPHYSICS  
 RT anisotropic rocks  
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 microearthquakes  
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 richter scale  
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 BT TIDES  
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 UF probes (instruments)  
 probes (sensors)  
 BT ELECTRONIC EQUIPMENT  
 NT TOWED SENSORS  
 RT CONDUCTIVITY SENSORS  
 FLOWMETERS  
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 MEASURING DEVICES  
 OCEANOGRAPHIC EQUIPMENT  
 pH sensors  
 PRESSURE SENSORS  
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 resistivity probes  
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 TRANSDUCERS  
 wave direction sensors  
 SEPARATION PROCESSES  
 NT demineralization  
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 dissolution  
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 solvent extraction  
 RT oil treating  
 SEWAGE  
 UF sewage effluents  
 BT wastes  
 RT bioaeration  
 chemical pollution  
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 DOMESTIC WASTES  
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INDUSTRIAL WASTES  
 organic wastes  
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 SEWAGE DISPOSAL  
 sewage ponds  
 sewage treatment  
 SLUDGE  
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 SEWAGE DISPOSAL  
 UF sewage sludge disposal  
 BT WASTE DISPOSAL  
 RT INDUSTRIAL WASTES  
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 RT CONTINENTAL SHELVES  
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 SHELF SEAS  
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 SURFACE WATER  
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 WATER DEPTH  
 wave refraction  
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 SHALLOW WATER WAVES  
 UF long gravity waves  
 long waves  
 long-period water waves  
 long-period waves  
 BT WATER WAVES  
 NT cnoidal waves  
 solitary waves  
 tidal bores  
 RT NONLINEAR WAVES  
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 STORM SURGES  
 tidal waves  
 TSUNAMIS  
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 SHEAR FLOW  
 BT FLUID FLOW  
 NT stratified shear flow  
 turbulent shear flow  
 RT dynamic viscosity  
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 RICHARDSON NUMBER  
 SHEAR  
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 SHEAR ZONE

RT faults  
 ores  
 SHELF CURRENTS  
 BT WATER CURRENTS  
 RT OCEAN CURRENTS  
 SHELF DYNAMICS  
 SHELF WAVES  
 SHELF DYNAMICS  
 UF coastal circulation  
 shallow-water dynamics  
 shelf circulation  
 BT water circulation  
 NT BAY DYNAMICS  
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 RT coastal counter currents  
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 BT SHELF DYNAMICS  
 RT SHELF EDGE  
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 SHELF EDGE FRONTS  
 BT SHELF FRONTS  
 RT CONTINENTAL SHELVES  
 SHELF DYNAMICS  
 SHELF EDGE  
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 BT OCEANIC FRONTS  
 NT SHELF DYNAMICS  
 RT SHELF DYNAMICS  
 SHELF EDGE DYNAMICS  
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 SHELF SEAS  
 BT MARGINAL SEAS  
 RT BOTTOM CURRENTS  
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 SHELF DYNAMICS  
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 SHELF FRONTS  
 shelf geology  
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 SHELF WAVES  
 BT TRAPPED WAVES  
 RT NONLINEAR WAVES  
 SHELF CURRENTS  
 SHELF DYNAMICS  
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BT DESIGN  
 RT hulls  
 ship hulls  
 ship models  
 ship performance  
 SHIP TECHNOLOGY  
 SHIP ROUTEING  
 UF weather routing  
 NT ice routing  
 RT HURRICANES  
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 wave forecasting  
 WEATHER FORECASTING  
 SHIP TECHNOLOGY  
 UF marine engineering  
 naval architecture  
 naval engineering  
 naval technology  
 SHIPBUILDING  
 BT TECHNOLOGY  
 RT artificial harbours  
 defence craft  
 ENGINEERING  
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 BT WATER ANALYSIS  
 RT ANALYSIS  
 ANALYTICAL TECHNIQUES  
 SHIPBOARD EQUIPMENT  
 UF marine fittings  
 ship fittings  
 BT EQUIPMENT  
 RT diesel engines  
 propulsion systems  
 thrusters  
 SHIPBUILDING  
 UF SHIP TECHNOLOGY  
 SHIPPING  
 RT certification  
 defence craft  
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 ship canals  
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 SHIPS

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 SHIPS  
 BT surface craft  
 NT cable ships  
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 MERCHANT SHIPS  
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 support ships  
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 WEATHER SHIPS  
 RT collision avoidance  
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 ICING  
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 ship mooring systems  
 ship motion  
 ship performance  
 ship stability  
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 SHIPPING  
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 transportation  
 SHRIMP FISHERIES  
 UF cangronid fisheries  
 caridean shrimp fisheries  
 non penaeid shrimp fisheries  
 palaemonid fisheries  
 pandalid fisheries  
 penaeid shrimp fisheries  
 prawn fisheries  
 BT crustacean fisheries  
 RT DEMERSAL FISHERIES  
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 BT active sonar  
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 RT atmospheric pressure  
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 SIGNAL PROCESSING  
 BT DATA PROCESSING  
 RT fourier analysis  
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 SILICON  
 BT chemical elements  
 RT silicates  
 silicon compounds  
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 BT SUBMARINE FEATURES  
 RT FJORDS  
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 sill depth  
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 SILTING  
 UF siltation  
 BT deposition  
 RT navigational channels  
 SEDIMENTATION  
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 RT game theory  
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 UF aquaculture sites  
 site evaluation  
 BT evaluation  
 RT aquaculture facilities  
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 UF size composition  
 BT population structure  
 RT age composition  
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 BT WATER CURRENTS  
 SLOPE ENVIRONMENT  
 RT CONTINENTAL SLOPE  
 SLUDGE  
 UF activated sludge  
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 BT wastes

RT bioaeration  
 MUD  
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 SNOW  
 BT ATMOSPHERIC PRECIPITATIONS  
 RT hail  
 ICE  
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 SOFAR FLOATS  
 BT swallow floats  
 RT SOFAR  
 solar channel  
 SOILS  
 UF EARTH  
 RT agriculture  
 erosion  
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 humus  
 MUD  
 NATURAL RESOURCES  
 SAND  
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 soil erosion  
 soil mechanics  
 SOLAR RADIATION  
 UF diffuse sky radiation  
 global radiation  
 net solar radiation  
 short wave radiation  
 short wave radiation  
 sky radiation  
 BT electromagnetic radiation  
 NT extraterrestrial radiation  
 reflected global radiation  
 RT actinometers  
 air-water interface  
 albedo  
 astronomy  
 CLIMATE  
 CLOUD COVER  
 ENERGY FLOW  
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 solar constant  
 solar eclipse  
 solar power  
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 SOLITARY WAVES  
   BT SHALLOW WATER WAVES  
   RT NONLINEAR WAVES  
 SOLITONS  
   SURFACE GRAVITY WAVES  
 SOLITONS  
   RT SOLITARY WAVES  
 SONAR  
   UF asdic  
   SONAR EQUIPMENT  
   SONAR SYSTEMS  
   BT REMOTE SENSING EQUIPMENT  
   NT active sonar  
   passive sonar  
   RT ACOUSTIC ARRAYS  
   ACOUSTIC EQUIPMENT  
   ACOUSTIC IMAGERY  
   acoustic navigation  
   detection  
   ECHO SURVEYS  
   ELECTRONIC EQUIPMENT  
   FISH DETECTION  
   fishing operations  
   locating  
   military oceanography  
   OCEANOGRAPHIC EQUIPMENT  
   purse seining  
   SONAR ARRAYS  
   sonar imagery  
   sonar receivers  
   sonar targets  
   SOUND PROPAGATION  
   submarines  
   surveying equipment  
   trawling  
   UNDERWATER EQUIPMENT  
   underwater exploitation  
   UNDERWATER OBJECT  
   LOCATION  
 SONAR ARRAYS  
   BT ACOUSTIC ARRAYS  
   RT ACOUSTIC EQUIPMENT  
   OCEANOGRAPHIC EQUIPMENT  
   SONAR  
 SONAR EQUIPMENT  
   UF SONAR  
 SONAR SYSTEMS  
   UF SONAR  
 SOUND ATTENUATION  
   UF acoustic wave attenuation  
   BT WAVE ATTENUATION  
   RT ACOUSTIC PROPERTIES  
   sound absorption  
   sound pressure  
   SOUND SCATTERING  
   SOUND TRANSMISSION  
 SOUND DISPERSION

  UF acoustic wave dispersion  
   BT DISPERSION  
   RT sound diffraction  
   SOUND PROPAGATION  
   sound refraction  
   SOUND SCATTERING  
   SOUND VELOCITY  
 SOUND MEASUREMENT  
   UF acoustic measurement  
   BT MEASUREMENT  
   RT sound intensity  
   SOUND VELOCITY  
 SOUND PROPAGATION  
   UF acoustic wave propagation  
   RT DEEP WATER  
   DOPPLER EFFECT  
   INTERNAL WAVE EFFECTS  
   INTERNAL WAVES  
   SONAR  
   SOUND  
   sound absorption  
   sound diffraction  
   SOUND DISPERSION  
   sound generation  
   SOUND REFLECTION  
   sound refraction  
   SOUND SCATTERING  
   SOUND TRANSMISSION  
   SOUND VELOCITY  
 SOUND REFLECTION  
   UF acoustic wave reflection  
   BT reflection  
   RT SOUND  
   sound absorption  
   SOUND PROPAGATION  
   SOUND SCATTERING  
   target strength  
 SOUND SCATTERING  
   UF acoustic wave scattering  
   SCATTERING  
   NT BACKSCATTER  
   bottom scattering  
   forward scattering  
   RT REVERBERATION  
   SOUND  
   sound absorption  
   SOUND ATTENUATION  
   sound diffraction  
   SOUND DISPERSION  
   SOUND PROPAGATION  
   SOUND REFLECTION  
   sound refraction  
 SOUND SPECTRA  
   UF acoustic spectra  
   BT SPECTRA  
 SOUND TRANSMISSION  
   UF acoustic wave transmission  
   BT TRANSMISSION  
   RT SOUND  
   SOUND ATTENUATION  
   SOUND PROPAGATION  
   THERMOCLINE  
   transmission loss  
 SOUND VELOCITY  
   UF sound speed  
   wave velocity

  BT VELOCITY  
   RT ACOUSTIC DATA  
   acoustic impedance  
   ACOUSTIC PROPERTIES  
   compressibility  
   HYDROSTATIC PRESSURE  
   SALINITY  
   sediment properties  
   solar channel  
   SOUND  
   sound channels  
   SOUND DISPERSION  
   SOUND MEASUREMENT  
   SOUND PROPAGATION  
 SOUTHERN OSCILLATION  
   RT air temperature  
   ATMOSPHERIC CIRCULATION  
   EL NINO PHENOMENA  
   OSCILLATIONS  
   SEA LEVEL  
   sea level pressure  
 SOUTHERN OSCILLATIONS  
   RT air temperature  
   ATMOSPHERIC CIRCULATION  
   EL NINO PHENOMENA  
   OSCILLATIONS  
   SEA LEVEL  
   sea level pressure  
 SPATIAL DISTRIBUTION  
   UF GEOGRAPHICAL DISTRIBUTION  
 SPATIAL VARIATIONS  
   UF VARIATIONS  
   NT FINESTRUCTURE  
   latitudinal variations  
   MICROSTRUCTURE  
   regional variations  
   RT dimensions  
   HORIZONTAL DISTRIBUTION  
   QUANTITATIVE DISTRIBUTION  
   VERTICAL DISTRIBUTION  
 SPAWNING  
   NT wild spawning  
   RT BREEDING  
   NURSERY GROUNDS  
   reproductive behaviour  
   reproductive cycle  
   sexual reproduction  
   SPAWNING GROUNDS  
   spawning migrations  
   spawning populations  
   spawning seasons  
 SPAWNING GROUNDS  
   NT artificial spawning grounds  
   RT ANADROMOUS SPECIES  
   catadromous species  
   fishing grounds  
   ICHTHYOPLANKTON  
   ichthyoplankton surveys  
   NURSERY GROUNDS  
   reids  
   reproductive behaviour  
   SPAWNING  
   spawning migrations  
   spawning populations  
   spawning seasons  
 SPECIES DIVERSITY

UF community diversity  
 diversity index  
 ecological diversity  
 similarity index  
 RT climax community  
 COMMUNITY COMPOSITION  
 DOMINANT SPECIES  
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 SPECTRAL ANALYSIS  
 BT MATHEMATICAL ANALYSIS  
 NT maximum entropy spectral analysis  
 RT DATA REDUCTION  
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 BT OPTICAL PROPERTIES  
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 SPINUP  
 RT ROTATING FLUIDS  
 SPINUP  
 SPLINES  
 RT NUMERICAL ANALYSIS  
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 UF flyfishing  
 recreational fishing  
 spin fishing  
 BT RECREATION  
 RT angling  
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 UF SPRING  
 BT seasons  
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NT ship stability  
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 VERTICAL STABILITY  
 RT ballast  
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 STANDING WAVES  
 UF clapotis  
 stationary waves  
 BT oscillatory waves  
 RT hydraulic jump  
 resonance  
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 WAVE REFLECTION  
 STATION LISTS  
 BT DATA REPORTS  
 RT CRUISE  
 CRUISE STATIONS  
 DATA  
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 STATIONS  
 UF oceanographic stations  
 STATISTICAL ANALYSIS  
 UF chi square test  
 statistical methods  
 statistical tests  
 statistics  
 tests for significant differences  
 BT MATHEMATICAL ANALYSIS  
 NT CORRELATION ANALYSIS  
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 TIME SERIES ANALYSIS  
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 RT ANALYSIS  
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 BT MATHEMATICAL MODELS  
 RT game theory

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 STD OBSERVATIONS  
 RT CTD OBSERVATIONS  
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 RT MATHEMATICAL MODELS  
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 STATISTICAL ANALYSIS  
 TIME SERIES ANALYSIS  
 STOCK ASSESSMENT  
 UF stock evaluation  
 RT AERIAL SURVEYS  
 BIOMASS  
 CATCH STATISTICS  
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 ECHO SURVEYS  
 evaluation  
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 FISHERY DATA  
 FISHERY SURVEYS  
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 STOCKS  
 UF fish stocks  
 wild fish stocks  
 NT brood stocks  
 DEPLETED STOCKS  
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 RT animal populations  
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 STOCK ASSESSMENT  
 STOKES WAVES  
 BT NONLINEAR WAVES  
 STORM SURGES  
 UF storm tides  
 SURGES  
 BT SURFACE WATER WAVES  
 NT hurricane waves  
 negative storm surges  
 RT atmospheric pressure  
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 catastrophic waves  
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 HURRICANES  
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 storm tide warning services  
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 SURFACE GRAVITY WAVES  
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 UF gales  
 BT WEATHER  
 RT floods  
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 HURRICANES  
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 METEOROLOGY  
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 WEATHER FORECASTING  
 WEATHER HAZARDS  
 WINDS  
 STRAITS  
 BT COASTAL WATERS  
 RT CHANNELS  
 TUNNELS  
 WATER EXCHANGE  
 STRATIFICATION  
 NT DENSITY STRATIFICATION  
 SALINITY STRATIFICATION  
 THERMAL STRATIFICATION  
 RT baroclinic mode  
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 BT FLUID FLOW  
 RT baroclinic mode  
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 STRATIFICATION  
 stratified shear flow  
 STREAM FLOW  
 UF river currents  
 river flow  
 BT WATER CURRENTS  
 RT backwaters  
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 RIVER DISCHARGE  
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 SUBMARINE CANYONS  
 BT SUBMARINE FEATURES  
 RT BOTTOM CURRENTS  
 CONTINENTAL SHELVES  
 CONTINENTAL SLOPE  
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 TURBIDITY CURRENTS  
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 SUBMARINE FEATURES  
 UF bottom features  
 submarine topographic features  
 BT topographic features  
 NT abyssal hills  
 abyssal plains  
 archipelagic aprons  
 continental borderland  
 CONTINENTAL MARGINS  
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 CONTINENTAL SHELVES  
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 OCEAN BASINS  
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 RT BATHYMETRIC CHARTS  
 BATHYMETRY  
 BOTTOM TOPOGRAPHY  
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 MARINE GEOLOGY  
 median valleys  
 OCEAN FLOOR  
 physiographic provinces  
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 SUBMERSIBLES  
 UF manned submersibles  
 submersibles (manned)  
 BT manned vehicles  
 NT lookout submersibles  
 wet submersibles

RT deep-sea diving  
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 SUBSTRATA  
 UF substrates  
 RT artificial substrata  
 BENTHIC ENVIRONMENT  
 BENTHOS  
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