

水文与水资源工程专业英语

Professional English for Hydrology and Water Resources Engineering

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Program

- 14 lessons for 7 lectures
- 4 lessons for literature search in computer room
- 6 lessons for translation by yourself
- 4 lessons for presentation
- 2 lessons for summarize

14节授课

4节上机：检索文献，软件下载

6节：自习，课下翻译

4节：分组汇报

2课时总结

Rules

- ! *Please be on time and do not absent*
- ! *Do your work by yourself*
- ! *Comply with the rules in classroom*

Marking

- *Attendance & Class participation 10%*
- *Assignment (homework and exercises) 30%*
- *Final exam 60%*

成绩

到课 10%

作业 30%

考试 60%

开卷考试

Importance

- **Accumulate and enlarge professional knowledge**
 - ✓ *Obtain research information in our field*
 - ✓ *Know the development & advance of our subjects*
- **Express your ideas**
 - ✓ *Publish our research results by journal articles*
- **International communication**
 - ✓ *Participate international conferences*
 - ✓ *Join international groups or workshops*

Objectives

- *Enlarge our vocabulary of technical terms on hydrology and water resources engineering*
- *Deepen the understanding of hydrogeological concepts*
- *Practice reading*
- *Translation training*
- *Learn to write an abstract*
- *Learn to search English literatures*
- *Learn to search information from professional literatures*

References

Textbook

陈植华, 专业英语

J.C. Nonner, Introduction to Hydrogeology, 2006

Reference

《科技英语》类书目

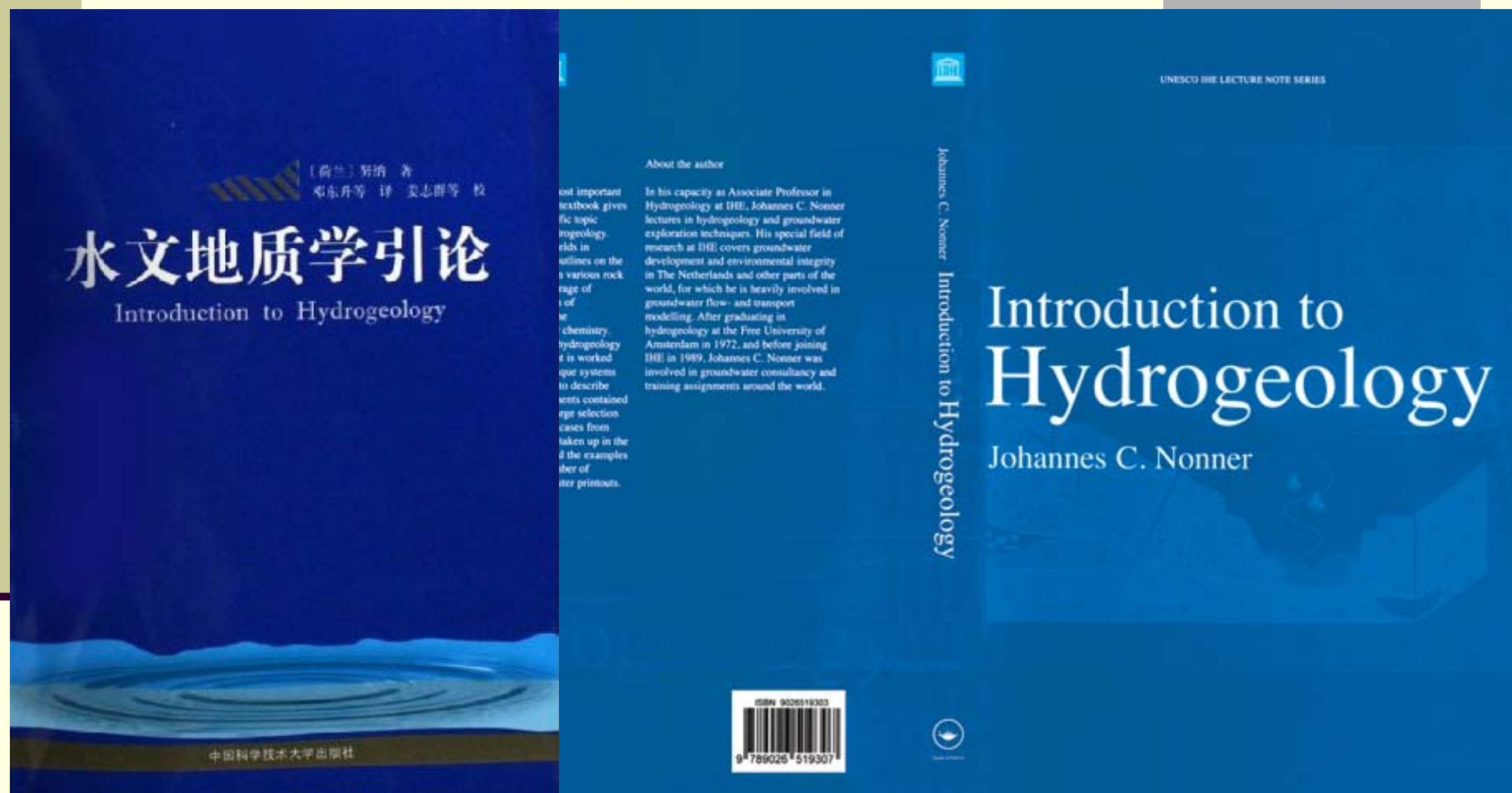
地质矿产术语分类代码—水文地质学

水文基本术语与符号标准

全国科学技术名词审定委员会, 水利科技名词, 1997

<http://water.usgs.gov/glossaries.html>

<http://webworld.unesco.org/water/ihp/db/glossary/glu/indexen.htm>

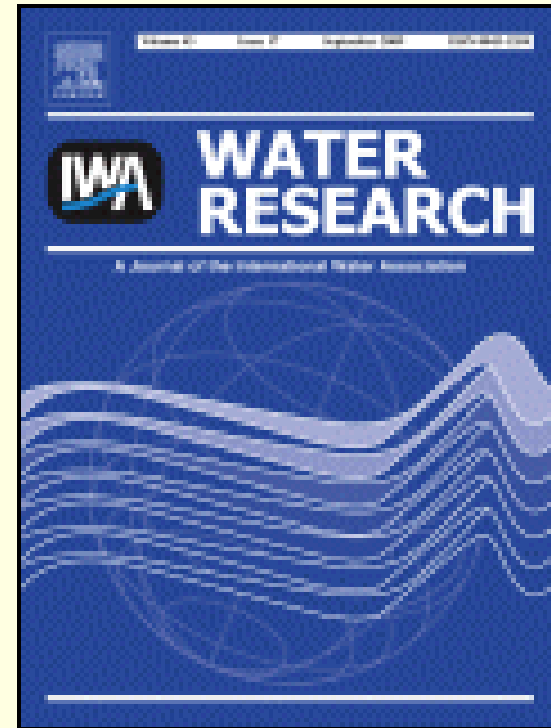


Journals(1)

Water Research
WATER RES

Impact Factor:3.587

Can be downloaded from
Elsevier



<http://www.sciencedirect.com/science/journal/00431354>

Journals(2)

Water Resources Research

Water Resour. Res.

水资源研究

Impact Factor:2.398

<http://www.agu.org/journals/wr/>

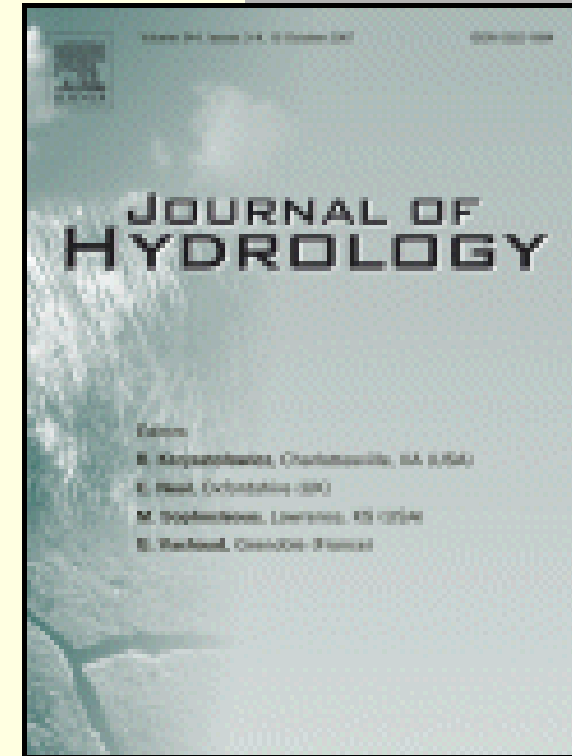


Journals(3)

Journal of hydrology
J HYDROL

Impact Factor:2.305

Can be downloaded from
Elsevier



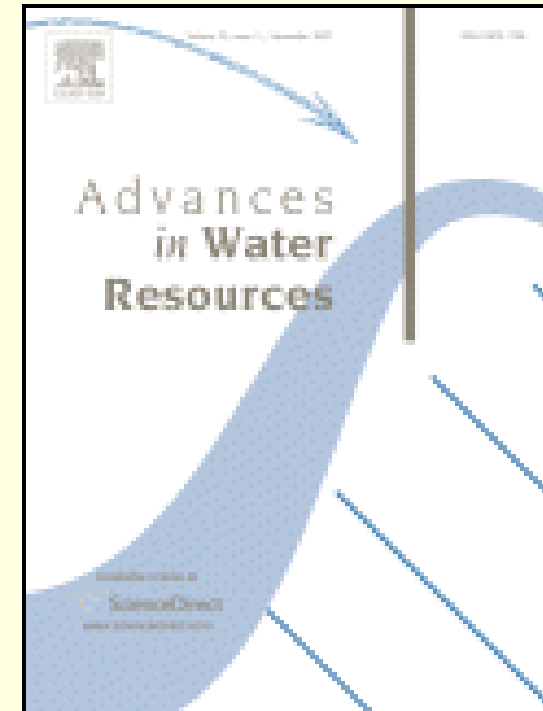
<http://www.sciencedirect.com/science/journal/00221694>

Journals(4)

Advance in Water Resources
ADV WATER RESOUR

Impact Factor:2.235

Can be downloaded from
Elsevier



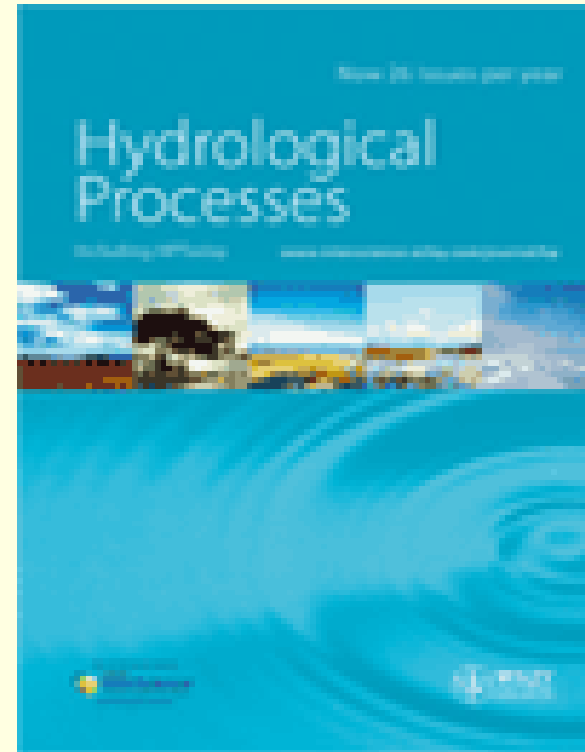
http://www.elsevier.com/wps/find/journaldescription.cws_home/422913/description#description

Journals(5)

Hydrological Processes
HYDROL PROCESS

Impact Factor:2.002

Can be downloaded from
Wiley InterScience



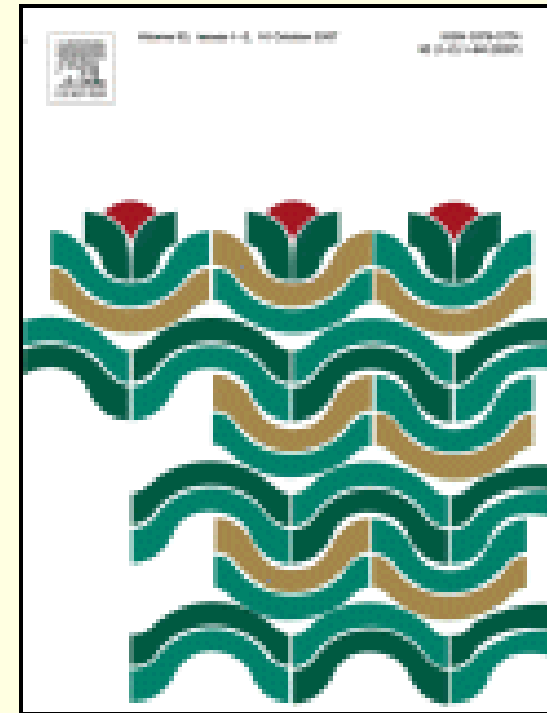
<http://www3.interscience.wiley.com/cgi-bin/jhome/4125>

Journals(6)

Agricultural Water Management
AGR WATER MANAGE

Impact Factor:1.646

Can be downloaded from
Elsevier



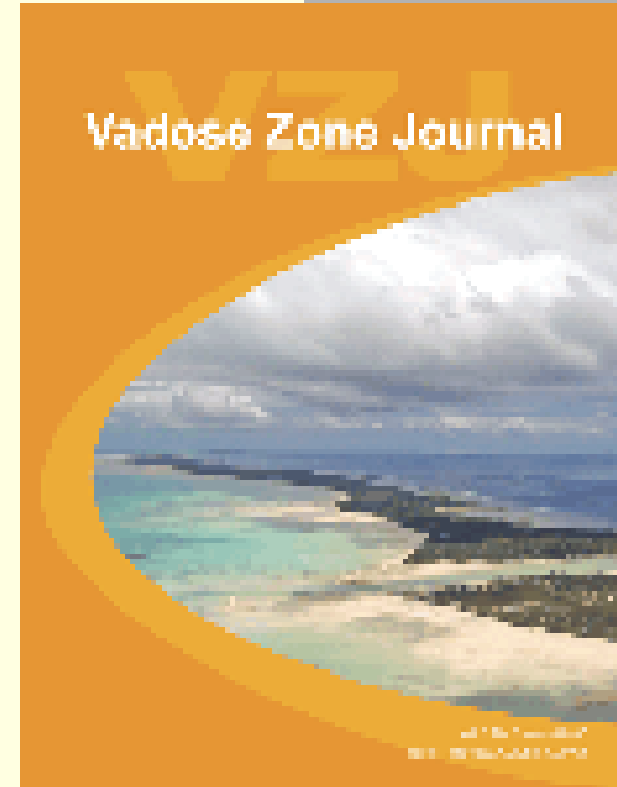
http://www.elsevier.com/wps/find/journaldescription.cws_home/503297/description#description

Journals(7)

Vadose Zone Journal
VADOSE ZONE J

Impact Factor:1.441

Can be downloaded from
GeoScienceWorld



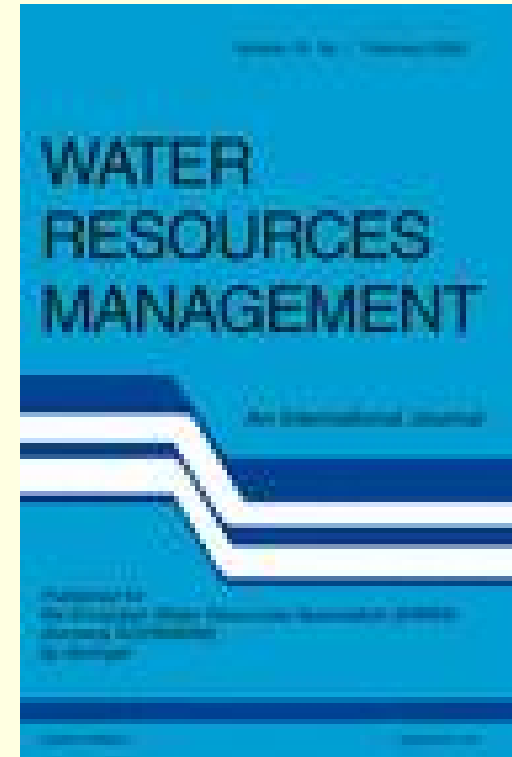
<http://www.blackwell-synergy.com/loi/gwat?cookieSet=1>

Journals(8)

Water Resources Management
WATER RESOUR MANAG

Impact Factor:1.35

Can be downloaded from
Springer



<http://www.springerlink.com/content/103011/>

Journals(9)

Ground water

Impact Factor:1.304

Can be downloaded from
BlackWell Synergy



<http://www.blackwell-synergy.com/loi/gwat?cookieSet=1>

Journals(10)

Hydrogeology Journal
HYDROGEOL J

Impact Factor:1.1

Can be downloaded from
Springer



<http://www.springerlink.com/content/102028/?p=7e8dfe11ecb545b68c423c39dad8bcf9&pi=43>

Literature Database

ACS

AGU

ASME & ASCE

Blackwell

EBSCO

Elsevier

Frontiers in China

GeoScienceWorld

IWA

Nature

OCLC FirstSearch

Science

Springer Link

The screenshot displays the library website of China University of Geosciences. The header includes the university's logo and name in Chinese and English. A navigation bar shows the current location: 首页->资源检索->西文电子期刊. The main content area is divided into two columns. The left column lists various library services with green square icons, including: 馆藏书目查询, 数据库, 中文电子期刊, 西文电子期刊, 电子图书, 特色数据库, 全国期刊联合目录, CALIS资源, 网上免费资源, and 高校教参书全文数据库. The right column lists specific literature databases in a grid format: ACS, AGU, ASME & ASCE, Blackwell, EBSCO, Elsevier, Frontiers in China, GeoScienceWorld, IWA, Nature, OCLC FirstSearch, Science, and Springer Link. The footer contains the copyright notice: Copyright©2006 中国地质大学图书馆技术部.

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(452-86-412)

3856.1 SLCC Central China -
CLOS trial (761-00-316)

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按关键词全文检索 高级检索

ti:(groundwater) AND ti:(management) ... 提交

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标题 (ti)	与	
摘要 (su)	或	sign (622)
作者 (au)	非	39,970)
ISSN (issn)	(
ISBN (isbn))	973)
DOI (doi)	* (通配字符)	
	"" (exact)	787)

特色图书馆

中国在线科学图书馆 (25,127)	工程学 (141,858)
俄罗斯在线科学图书馆 (452,647)	人文、社科和法律 (148,564)
	数学和统计学 (236,863)
	医学 (616,985)
	物理和天文学 (415,846)
	Professional Computing and Web Design (3,958)

SpringerLink_2

去除 Search For (Boolean) > ti:(groundwater) AND ti:(management) 关闭突出显示

详细列表 简单列表

共 86 条 首页 | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 下页

☒ 可访问所有内容 ☒ 可访问部分内容 ☐ 不能访问任何内容

1. 期刊文章 添加加入标记条目中

Groundwater resources management under environmental constraints in Shiroishi of Saga plain, Japan

文章类型	Original Article
DOI	10.1007/s00254-005-0109-9
期刊	Environmental Geology
期	Volume 49, Number 4 / 2006年2月
作者	Nguyen Cao Don, Nguyen Thi Minh Hang, Hiroyuki Araki, Hiroyuki Yamanishi, Kenichi Koga
Subject Collection	地球和环境科学
摘要节选	...well as shearing of structures. To minimize such an environmental effect, groundwater management should be considered in this area. In this study, a new integrated...
全文	PDF (772 kb) HTML
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2. 图书章节 添加加入标记条目中

Groundwater Development and Management of Coastal Aquifers (including Island Aquifers) through Monitoring and Modeling Approaches

DOI	10.1007/978-1-4020-5729-8_10
图书	Groundwater
作者	A. Bobba

检索 高级

ti:(groundwater) AND ti:(man:...

(在所有内容之内检索)

起始字母

a b c d e f g h i j k l m n
p q r s t u v w x y z 空格 更

内容发行状态

开始在线发行™ (2)
已出版发行 (84)

SpringerLink Date

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半年内 (10)
一年内 (18)

内容类型

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图书章节 (17)
期刊文章 (68)

学科

Elsevier_1

The screenshot displays the ScienceDirect website interface. At the top left is the ScienceDirect logo. To the right, there is a login section for Athens/Institution with fields for User Name and a checkbox for Remember me. Below the logo is a green navigation bar with links: Home, Browse, Search, My Settings, Alerts, and Help. The main search area features a 'Quick Search' section with input fields for 'Title, abstract, keywords', 'Author' (with an example 'e.g. j s smith'), 'Journal/book title', 'Volume', 'Issue', and 'Page'. There are 'Clear' and 'Go' buttons. On the left, under 'Browse', it shows '8,564,541 Articles' and options to 'Browse by title' (with an alphabetical index A-Z) and 'Browse by subject'. The 'Physical Sciences and Engineering' category is expanded, listing sub-fields like Chemical Engineering, Chemistry, Computer Science, Earth and Planetary Sciences, Energy, Engineering, Materials Science, Mathematics, and Physics and Astronomy. On the right, the 'Why Register?' section explains the benefits of registration for personalization and alerting services. Below this is a 'Quick Links' section with 'Favorite Journals / Books' (including a 'Manage Favorites' link) and 'Quick Links in ScienceDirect' (including Alerts, Recall Saved Searches, Top-25 articles in my subject area, and ScienceDirect Info site). At the bottom right, there is a section for 'Quick Links on the Web'.

Elsevier_2

All Sources Journals Books **Advanced Search** | [Expert Search](#)

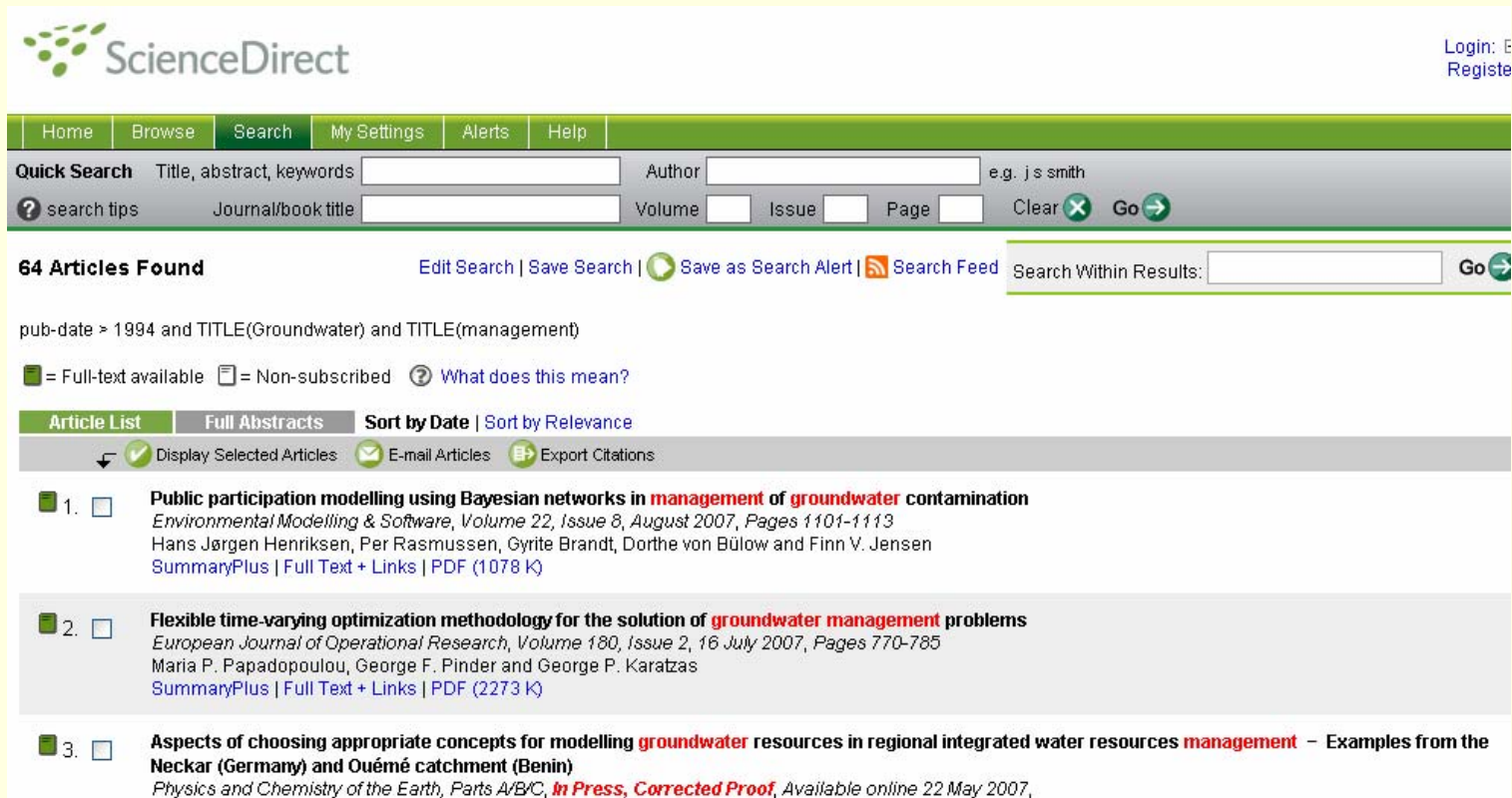
Term(s): Groundwater within: Title
 AND management within:
 Include: ☒ Journals ☒ All Books
 Source: All sources
 Select one or more:
Subject: - All Sciences -
 Agricultural and Biological Sciences
 Arts and Humanities
 Biochemistry, Genetics and Molecular Biology
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Dates: ☒ 1997 to: Present ☐ All Years

Search **Clear** **Recall Search** [? Search Tips](#)

Search History

Elsevier_3



ScienceDirect

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64 Articles Found Edit Search | Save Search | Save as Search Alert | Search Feed Search Within Results: Go →

pub-date > 1994 and TITLE(Groundwater) and TITLE(management)

☒ = Full-text available ☐ = Non-subscribed ? What does this mean?

Article List Full Abstracts Sort by Date | Sort by Relevance

Display Selected Articles E-mail Articles Export Citations

- ☒ ☐ **Public participation modelling using Bayesian networks in management of groundwater contamination**
Environmental Modelling & Software, Volume 22, Issue 8, August 2007, Pages 1101-1113
 Hans Jørgen Henriksen, Per Rasmussen, Gyrite Brandt, Dorthe von Bülow and Finn V. Jensen
[SummaryPlus](#) | [Full Text + Links](#) | [PDF \(1078 K\)](#)
- ☒ ☐ **Flexible time-varying optimization methodology for the solution of groundwater management problems**
European Journal of Operational Research, Volume 180, Issue 2, 16 July 2007, Pages 770-785
 Maria P. Papadopolou, George F. Pinder and George P. Karatzas
[SummaryPlus](#) | [Full Text + Links](#) | [PDF \(2273 K\)](#)
- ☒ ☐ **Aspects of choosing appropriate concepts for modelling groundwater resources in regional integrated water resources management – Examples from the Neckar (Germany) and Ouémé catchment (Benin)**
Physics and Chemistry of the Earth, Parts A/B/C, **In Press, Corrected Proof**, Available online 22 May 2007,

Georef_1

高级检索 从 - 傲游 [Maxthon]

文件(E) 编辑(E) 查看(V) 收藏(A) 快捷组(G) 选项(O) 工具(T) 窗口(W) 帮助(H) 傲游网址(N)

地址 http://csa.lib.tsinghua.edu.cn/ids70/advanced_search.php 搜索

百度一下... 欢迎访问中国... 高级检索 从

CSA ILLUMINA
China and the Path to Environmental Sustainability

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(groundwater or or)
and (management or or)
and (or or)

检索提示: e.g., wildcard*, exact phrase; use Keywords for a single search of Title, Abstract, Descriptor
For best results searches should be performed using English terms.

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受限于: ☐ 最新更新 ☐ 仅期刊文章 ☐ 仅英文

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描述符, DI=
专著题目, MT=
主办人, SP=
会议, CF=
作者, AU=
关键词, KW=
出版国家, CP=
出版年, PY=
出版日期, PD=
出版类型, PT=
出版者, PB=
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可用性, AV=
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国际标准刊号, IS=
地图, MP=
子文件, SF=
报告编号, RP=
描述符, DI=
摘要语言, SL=
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文摘, AB=
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前一个 1 2 3 4 5 下一个

记录号

☐ 1. [Groundwater nitrate spatial and temporal patterns and correlations; influence of natural controls and nitrogen management](#)
Hong, Nan; White, Jeffrey G; Weisz, Randy; Gumpertz, Marcia L; Duffera, Miressa G; Cassel, D Keith
Vadose Zone Journal, vol.6, no.1, pp.53-66, Feb 2007
To use shallow groundwater NO (sub 3) -N concentration as an indicator of groundwater quality requires understanding its patterns, correlations, and controls across space and time. Within a study comparing variable-rate and uniform N management, our ...
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AGU_1

<http://www.agu.org/servlet/EASI>

The screenshot shows the AGU Earth And Space Index (EASI) Search Engine interface. At the top, the AGU logo is displayed alongside five circular icons representing Earth, Oceans, Atmosphere, Space, and Planets. Below the logo, a tagline states: "AGU is a worldwide scientific community that advances, through unselfish cooperation in research, the understanding of the Earth and space for the benefit of humanity."

The main content area is titled "AGU Earth And Space Index (EASI) Search Engine". It includes a search bar with a dropdown menu for "Field to Search:" and a text input for "Query Terms:". The "Field to Search:" dropdown is open, showing options: Title, Author, Affiliation, Abstract, Publication Date, Keywords, Index Terms, and DOI/Article ID. The "Query Terms:" input field is empty.

Below the search bar, there is a section for "All Journals" with a list of journals: Earth Interact. (1997-), Eos Trans. AGU (1988-), and G-cubed (1999-). A note below the list states: "* Terr. Magn. 1896-, J. Geophys. Res. 1949-".

On the right side of the "All Journals" list, there is a note: "Use Ctrl-Click (PC) or Cmd-Click (Mac) to select/deselect".

Below the "All Journals" list, there is a "Sort Results by:" section with three radio buttons: "First Author" (selected), "Date", and "Relevance".

Below the "Sort Results by:" section, there is a "Show Results as:" section with a dropdown menu showing options: "Title/Authors/Date", "Citation", "Citation + Abstract", and "Refer (EndNote)".

At the bottom right, there are two buttons: "Search" and "Reset".

On the left side of the interface, there is a sidebar with various links: "Related Pages", "Search Options", "Journals", "Books", "Eos", "Digital Library", "Tools for Authors", "AGU Electronic Archive", "Key Statistics", "Policies", "AGU Permissions and Copyright Information", "E-Alerts", "Advertising", "Subscribe", "AGU Members", "Institutions", "Resources", "Library FAQ", and "Library Contents".

AGU_2

Search Status

[Return to Search](#)

Your search is underway.

Database name ("AGU-EASI") is highlighted when search is complete (unless there are no matches).

- Click on the database "AGU-EASI" when highlighted to view results
- To modify search, press 'Return to Search' or Back button [Note for Safari users: If presented with a "Are you sure ..." dialog, press 'Cancel' and 'Return to Search' again.]

Database	Status:	# Matches
[click to view results]	0 Minutes 9 Seconds	(max. 200)
AGU-EASI	Search Complete	200

Search Results

[Back](#)

Displaying records 1 to 20 of 200 records matching query:

The Baseflow-Duration Curve, a Technique for the Study of Groundwater Discharge from a Drainage Basin [\[Full Abstract +Article\]](#)

G. Kunkle,
1962-04-01

Some Effects of the Unsaturated Zone on Nonsteady Free-Surface Groundwater Flow as Studied in a Scaled Granular Model [\[Full Abstract +Article\]](#)

D. Van De Leur,
1962-10-01

Radionuclides in Groundwater at the Savannah River Plant Waste Disposal Facilities [\[Full Abstract +Article\]](#)

S. Reichert,
1962-10-01

A Theory of Groundwater Motion in Small Drainage Basins in Central Alberta, Canada [\[Full Abstract +Article\]](#)

J. Tóth,
1962-10-01

Discussion of a Paper by J. Tóth, 'A Theory of Groundwater Motion in Small Drainage Basins in Central Alberta, Canada' [\[Full Abstract +Article\]](#)

S. Davis,
1963-04-01

AGU_3

JGR

Journal of Geophysical Research

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Abstract

Cited By (7)

The Baseflow-Duration Curve, a Technique for the Study of Groundwater Discharge from a Drainage Basin

George R. Kunkle








Research Council of Alberta Edmonton, Alberta, Canada

The baseflow-duration curve provides a technique for the comparative study of base runoff from the same or different drainage basins. The curve is a cumulative frequency curve showing the percentage of time that specified base flows were equaled or exceeded during a given time period. Daily base flows are obtained from a hydrograph separation of base and surface runoff. Although the separation may not be precise, the value of the technique as a comparative tool is not lost as long as a consistent method of separation is followed. When bank storage is present within a basin, the base runoff can be separated on the hydrograph into two components, designated bank- and basin-storage discharge. These are differentiated on the baseflow-duration curve by the shape of the curve. Thus, the baseflow-duration curve allows comparisons not only of total base runoff but also of the base runoff components. Examples illustrating the use of the technique show that (1) the texture of the surficial deposits largely controls the discharge from basin storage, (2) the width of the permeable deposits adjacent to the river greatly influences the amount of bank storage discharged, (3) the mean annual amount and variation of bank storage may be several times that of basin storage, and (4) one typical water year provides enough hydrologic data for a valid comparative study of base runoff from segments of the same drainage basin.

Received 8 December 1961; .

Citation: Kunkle, G. R. (1962), The Baseflow-Duration Curve, a Technique for the Study of Groundwater Discharge from a Drainage Basin, *J. Geophys. Res.*, 67(4), 1543–1554.

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JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 67, NO. 4, PAGES 1543 - 1554, 1962

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- 转换链接目标为现有 PDF
- 属性(P)

The Baseflow-Duration Curve, a Technique for the Study of Groundwater Discharge from a Drainage Basin

George R. Kunkle

Research Council of Alberta Edmonton, Alberta, Canada

Abstract

Baseflow-duration curve provides a technique for the comparative study of base runoff from the same or different drainage basins. The curve is a cumulative frequency curve showing the percentage of time that specified base flows were equaled or exceeded during a given time period. Daily base flows are obtained from a hydrograph separation of base flow and surface runoff. Although the separation may not be precise, the value of the technique as a comparative tool is not lost as long as a consistent method of separation is followed. If bank storage is present within a basin, the base runoff can be separated on the hydrograph into two components, designated bank- and basin-storage discharge. These are differentiated on the baseflow - duration curve by the shape of the curve. Thus, the baseflow-duration curve allows comparisons not only of total base runoff but also of the runoff components. Examples illustrating the use of the technique show that (1) the nature of the surficial deposits largely controls the discharge from basin storage, (2) the nature of the permeable deposits adjacent to the river greatly influences the amount of bank storage discharged, (3) the mean annual amount and variation of bank storage may be several times that of basin storage, and (4) one typical water year provides enough hydrologic data for a valid comparative study of base runoff from segments of the same drainage basin.

Task

From one of the literature databases, search and download one paper that you are interested. You should translate it before the end of this course.

You will choose some good sentences from your selected paper and present how to translate them.

Task

Download one software about groundwater or hydrology, and translate its manual by group composed of 5 or 6 persons. You will present the use of this software in classroom one by one.

Type of professional English publication

- *Journal paper*
- *Conference paper/Conference poster*
- *Scientific report*
- *Annual report*
- *Dissertation*
- *Book*

Characteristics of professional English

Language

Conciseness

no redundancy and cliché

limit modifiers

no affection Words

Clarity

single meaning

clear and understandable

Precise structure

语言特点

简洁

没有冗余和陈词滥调

没有过度的修饰

没有具感情色彩的词语

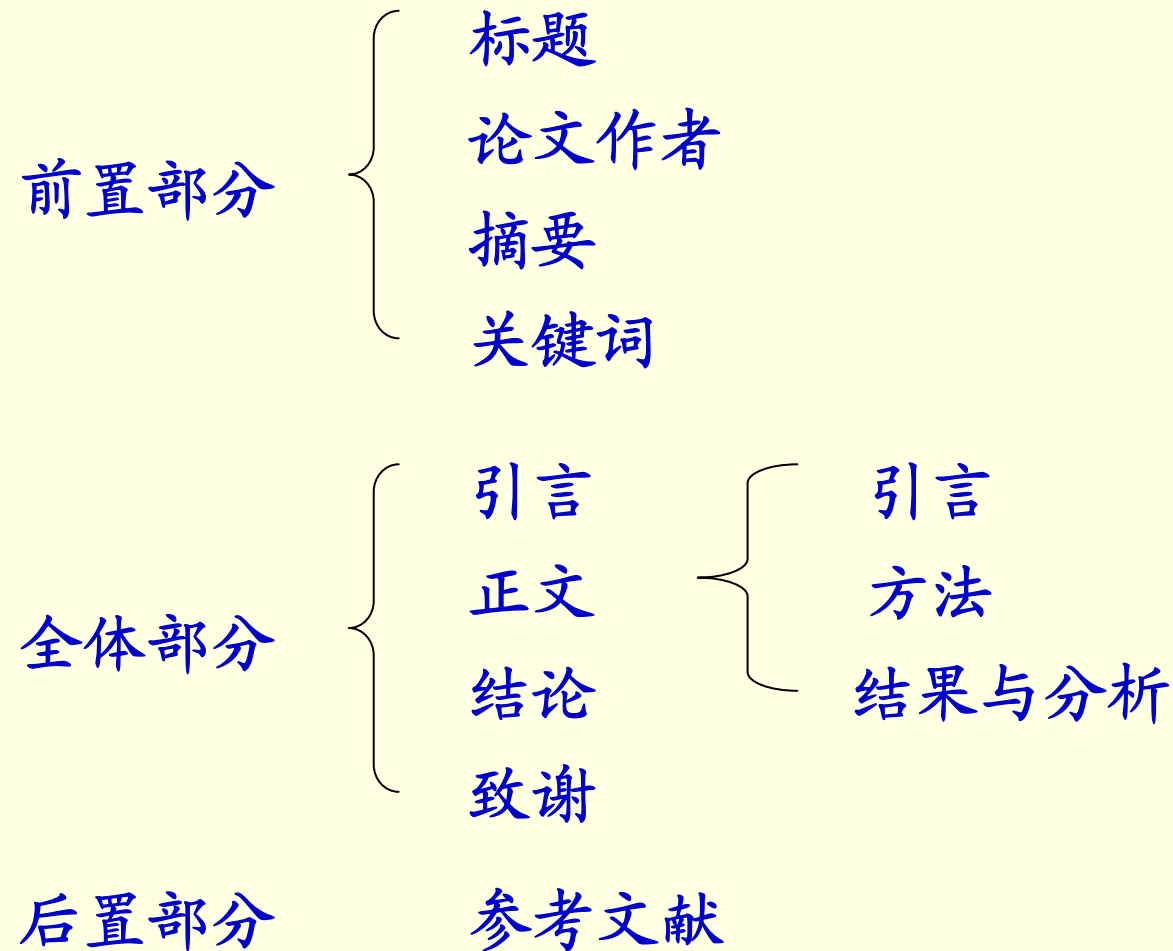
明了

每句表达单个意义

清楚易懂

结构严谨

Structure of paper



Example

Five score years ago, a **great** American, in whose **symbolic** shadow we stand, signed the Emancipation Proclamation. This **momentous** decree came as a **great** beacon light of hope to millions of Negro slaves who had been **seared** in the flames of **withering** injustice. It came as a **joyous** daybreak to end the **long** night of captivity.

Abstracted from *I have a dream* by Martin Luther King

译文：一百年前，一位**伟大的**美国人签署了《解放宣言》。由他**象征的**庇护，我们站了起来。这一**历史性的**赦令犹如灯塔之光，犹如结束囚禁**长夜的**欢乐黎明，给数百万一直煎熬在**不公正对待的**炽炽火焰中的黑人带来**极大的**希望。

大量比喻

The tragedy of the Aral Sea is by no means unique. Around the world countless rivers, lakes and wetlands are succumbing to dams, river diversions, rampant and other pressures. Collectively they underscore what is rapidly emerging as of the greatest challenges facing humanity in the decades to come: how to satisfy the thirst of a world population pushing nine billion by the year 2050, while protecting the health of the aquatic environment that sustains all terrestrial life.

Abstracted from *Water Troubled* written by Sandra Postal

译文：咸海的悲剧绝不是孤立的。全世界无数的河流、湖泊和湿地正在向改道、衰落、失控和其他不利状况发展。这一切揭示了今后几十年人类将会迅速面临的最大挑战是：如何在保障所有陆地生命赖以生存的水环境的良好状态的同时满足2050年世界90亿人口的饮水问题。

语言没有润饰，直切主题（水危机）；逻辑严密，第一句题目句，提出一种看法，第二句为支持句，用事实去证明看法，第三句从陈述的事实推论结局。

Characteristics of professional English

Words

Professional term

only one meaning

Affix & Etyma

Acronym

Mathematical symbol

词汇特点

专业术语

意义单一

词缀和词根

缩略语

数学符号

科技论文的词汇一般由三部分组成：

普通词汇，占有绝大部分；

半技术词汇，即随不同专业学科有不同意义的词。如单词*power*，在数学中词义是“幂、乘方”，在电力工程中是“电力、功率”；

专业词汇，词义单一，用法稳定，只隶属于特定学科的词。如化学中的“*chloride*（氯化物）”，水文地质学中的“*aquifer*（含水层）”。

相同语义在科技论文和普通英语中的不同表达方式

语 义	科技论文表达方式	普通英语表达方式
状态良好	<i>be in condition</i>	<i>be all right</i>
不 同 意	<i>argue with</i>	<i>will not hear of</i>
修 复	<i>renovate</i>	<i>repair</i>
令人厌恶的	<i>repugnant</i>	<i>unsavory</i>
老 手	<i>experienced operator</i>	<i>veteran</i>

所有词汇都倾向于书面体化而摒弃通俗化或口语化

Characteristics of professional English

Grammar

impersonal & objective

It ...

passive voice

nonrestrictive verb

infinitive

gerund

participle

语句特点

非人称语气和客观态度

常用It...结构

多用被动语态

大量使用非限定性动词

不定式

动名词

分词

It...that...

在用It...that...非人称语气表述这一事实的时候，并非只是为了从形式上避开人的介入，它所传达的信息是：这种结论不管是谁做出的，叙述的是已被反复验证并成为公认的客观事实。

It has been proved ***that*** agriculture is main contributor to watershed pollution.

已证明农业是流域污染的主要因素。

被动语态

按照英语习惯，要想突出的东西总是置于句首，所以科技文体在叙述受体时自然会采用被动语态。据统计，在科技论文体中，被动语态出现的频率在30% ~ 40%。

Because rainfall and river flows **are not distributed** evenly throughout the year or across the continents, the task of adapting water to human use is not an easy one. Many rivers are tempestuous and erratic, running high when water **is needed** least and low when it **is needed** most.

由于年内降雨以及各大陆河流流量分布不均匀，供人类用水的取水是一件棘手的事情。许多河流桀骜不驯又反复无常，不需要水时，水位高涨，而最需要水时，水位又变得低平。

名词化结构

因为科技论文体强调存在的事实而非某一动作，常需要把某些动作意义的词转化为名词化结构。

It is conceivable that soil will be *degenerating* with improper use.

It is conceivable that there will be soil *degradation* with improper use.

人们相信土壤因不当使用会发生退化。

前者用一种动作形式来叙述，给人的印象是“土壤在退化中”。
后者采用名词化结构，说明土壤退化是一种客观事实。

Characteristics of professional English

Grammar

Imperative sentence

Formulation

If-clause

*Long sentence with concision
and clarity*

Ellipsis sentence

语句特点

较多使用祈使句

较多使用公式化表达式

条件语句较多

长句较多,但一般比较简
洁清晰

省略句多

省略句

科技论文体叙述的对象比较单一，并列句中主语和谓语常是一致的，因此，常可以承前省略主语和谓语，达到简洁的目的。

The types of containers used for commercial facilities will depend *on* the methods used for collecting the wastes and *on* the available space.

用于商业场所的集装箱类型取决于收集废物的方法和可获得的空地。

第二个句子承前省略了主语和动词。（=*and the types of containers used for commercial facilities will depend on the available space*）

省略句

科技论文体演绎推理频繁，常由主述句叙述的事实推出某些结果，而这些结果往往是“一因多果”中之一或者是显而易见的。对于这种模糊因果关系的表达常采用分词短语形式代替结果状语子句。

The area of irrigated land worldwide has increased more than thirty fold in past two centuries, turning near-deserts such as southern California and Egypt into food baskets.

全球受灌溉土地的面积在过去两个世纪增加了30多倍，把诸如南加州和埃及这样的半沙漠区域变成了粮仓。

长句

为说明客观事物多方面的属性，在表述过程中常常需要围绕中心词增加限制性和扩展性成分，可借助于“that”和“which”引导的限定性和非限定性从句，使句子的平均长度增加。

在科技论文写作中，学会采用which引导的非限定性从句来扩展句子是非常重要的。

长句

Aquifers are overdrawn in several key regions of the United States, including California's Central Valley, **which** supplies half of the nation's fruits and vegetables, and the southern Great Plains, **where** grain and cotton farmers are steadily depleting the Ogallala, one of the planet's greatest aquifers.

美国几个重要农产区的地下含水层存在透支情况，这包括提供全国近一半水果和蔬菜供应量的加州中央谷，同时在大草原南段，棉农和粮农正在逐步开采殆尽地球上最大含水层之一的Ogallala含水层。

科技文体在篇章布局上遵从形式逻辑的要求，通常采用标题、子标题、编号等形式对文章进行逻辑划分，形成了固定的写作体裁。在每一自然段落中，总有一个题目句概括出该段落的重点。题目句常在段落之首，有时在段落之尾，较少出现在段落的中间。若干个自然段会形成一个逻辑（或结构）段落，用以从不同角度来解说某一层面的核心内容。全篇则由若干个逻辑段落组成，层层推进，逐步阐明文章标题所表明的中心思想。

Decoupled fresh—saline groundwater circulation of a coastal carbonate aquifer: Spatial patterns of temperature and specific electrical conductivity

Title

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Saline groundwater;
Density stratified
groundwater;
Geothermal convection

Summary The coastal carbonate aquifer of the eastern Yucatan Peninsula discharges groundwaters to the Caribbean Sea. Temperature and specific electrical conductance (SEC) are used as natural tracers to gain new insight into the fresh and saline groundwater circulation along an 80 km section of the Caribbean coastline. The aquifer is density stratified, with a cooler freshwater lens overlying a warmer saline water zone. Non-conduit sites generally have lower temperatures and SEC in the freshwater lens than conduit sites. In conduits <1 km from the coast, there is a very rapid increase in both fresh water temperature and SEC indicating very active mixing with the underlying warm saline water. Further inland, the rates of change of SEC and temperature are lower, and conduit morphology and network geometry are important controls on salinisation along the conduit flow paths. Turbulent mixing is enhanced by flow around obstacles where the conduit spans the mixing zone (sites 1–4 km inland), but mixing is limited where the conduit is entirely filled with fresh water (sites >4 km inland). Within the shallow saline water zone, temperature decreases exponentially with distance from the coast, with near equilibrium with the fresh waters reached at ~10 km inland, a distance coincident with the known limit of conduit development. This pattern is indicative of the progressive cooling of warm seawater moving inland from the coast, a flow direction opposite to that of both the conventional freshwater flow entrainment and geothermal convection models of coastal aquifer circulation.

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