



**[ The Digital Map of  
Hydropower Station in China ]**

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# **[ 1. Introduction ]**

- **“The digital map of hydropower stations in China” is a important component of the project named “China Hydroelectric Engineering”**
- **This project has been founded by CALIS( China Academic Library Information System)**
- **It is undertaken by Wuhan University Library.**

# The project home page <http://202.114.65.50/slqc/>

中国水力发电工程特色数据库 - Microsoft Internet Explorer

文件(F) 编辑(E) 查看(V) 收藏(A) 工具(T) 帮助(H)

← 后退 → 地址(D) <http://202.114.65.50/tpi/sysasp1/slqc/> 转到 链接 >>

## 中国水力发电工程 特色资源数据库

CALIS

首 页 | 数据库导航 | 地图检索 | 知识库 | 资源导航 | 交互服务 | 帮 助

### 最新动态

USJ

### 用户登录

用户名

密 码

### CALIS 专题特色库

CALIS专题特色库(教育部CALIS项目资助)



[地图检索说明]

检索字段:

### 选择库

- 成果库
- 标准库
- 期刊库

### 本月历史上的事件

- 青海省距李家峡水电站5.5公里的查让山因暴雨发生大面积移动
- 青海龙羊峡水电站遭受山洪袭击,水淹厂房,造成全厂停电

完毕 Internet

# The main page of digital map

地图检索 - Microsoft Internet Explorer

文件(F) 编辑(E) 查看(V) 收藏(A) 工具(T) 帮助(H)

后退 前进 搜索 收藏夹 媒体

地址(D) http://202.114.65.50/mapsearch/FramePage.asp

水电站

抽水蓄能电站

水电站

各流域

长江流域

黄河流域

黑龙江流域

辽河流域

雅鲁藏布江流域

珠江流域

淮河流域

海河流域

额尔齐斯河流域

东南沿海诸河流域

东北地区其他国际

怒江-伊洛瓦底江

澜沧江-湄公河流域

各内流区

青海内流区

新疆内流区

西藏内流区

甘蒙内流区

显示

三甲水电站技术参数

名称	规范名:	三甲水电站
	别名:	<暂无>
	英文名:	Sanjia Hydropower Station
所在地	省:	甘肃
	市:	定西
	县及以下:	临洮县
位置	位于河流:	洮河
	位于流域:	黄河流域
	主要坝型:	混凝土重力坝

电站相关文献资源链接

- [三甲相关期刊论文](#)
- [三甲相关书目记录](#)
- [三甲相关科研成果](#)
- [三甲相关历史事件](#)
- [三甲相关图片资源](#)
- [三甲相关网址链接](#)

查找到的水电站 1 个：  
抽水蓄能电站(带\*号) 0 个！

新安江

水电站名: 新安江 查找

Map navigation icons: Home, Back, Forward, Stop, Refresh, Print, Full Screen, Help, etc.

Windows taskbar: 开始, MSN, 翻译箱, The..., 所用..., The..., Meta..., 地图..., 国航..., 招信..., 16:15

# **[ The goal of this project ]**

- To collect the knowledge and accomplishment in the field of hydroelectric engineering in China completely;**
- To offer information service for professional education, scientific research and the industrial production in this field**
- To introduce the development of hydroelectric engineering in China for the global users via the Internet.**

## **2. The the collection (1/6)**

- **There are more than 370 thousands records in this project database**
  - **The Chinese journals**
  - **The technical parameters**
  - **The standard and specification**
  - **The history records**
  - **Other digital resources**

## **2. The the collection (2/6)**

# **The Chinese journals**

- **To organize 290 titles of Chinese journal that published come from 1911 to 2005.**
- **The subject field of these journals is in hydraulic engineering**
- **More than 350,000 articles have been digitized**

Metadata 1949-1988

Fullpaper 1911-1948 ; 1989-2005

**These digital resources reflect the academic feature of hydroelectric engineering in China.**

## **2. The the collection (3/6)**

### **The Technical parameters**

- **There are 16,606 parameters have been digitized in this project, they are engineering characteristic parameter and equipments performance parameter about China's hydropower stations**

**These resources reflect the technical feature of hydropower station in China**



## **2. The the collection (4/6)**

# **The standard and specification**

- **There are more than 900 metadata of the standard and specification**
- **These technical documents is using in the field of hydroelectric engineering now and have been promulgated by the national, department and enterprise.**

## **2. The the collection (5/6)**

### **The history records**

- **We have collected more than 12,000 items of the news, report, affairs and pictures, which about the history of China hydroelectric engineering**
- **These resources are collected from journals, books, Internet and some special collections.**

**These resources record the process of development in the field of hydroelectric engineering in China.**

## **2. The the collection (6/6)**

# **Other digital resources**

- **Vocabulary**
- **Knowledge**
- **The scientific research accomplishment**
- **The pictures**
- **Bibliography**
- **Audio and video resources**
- **Spatial data**

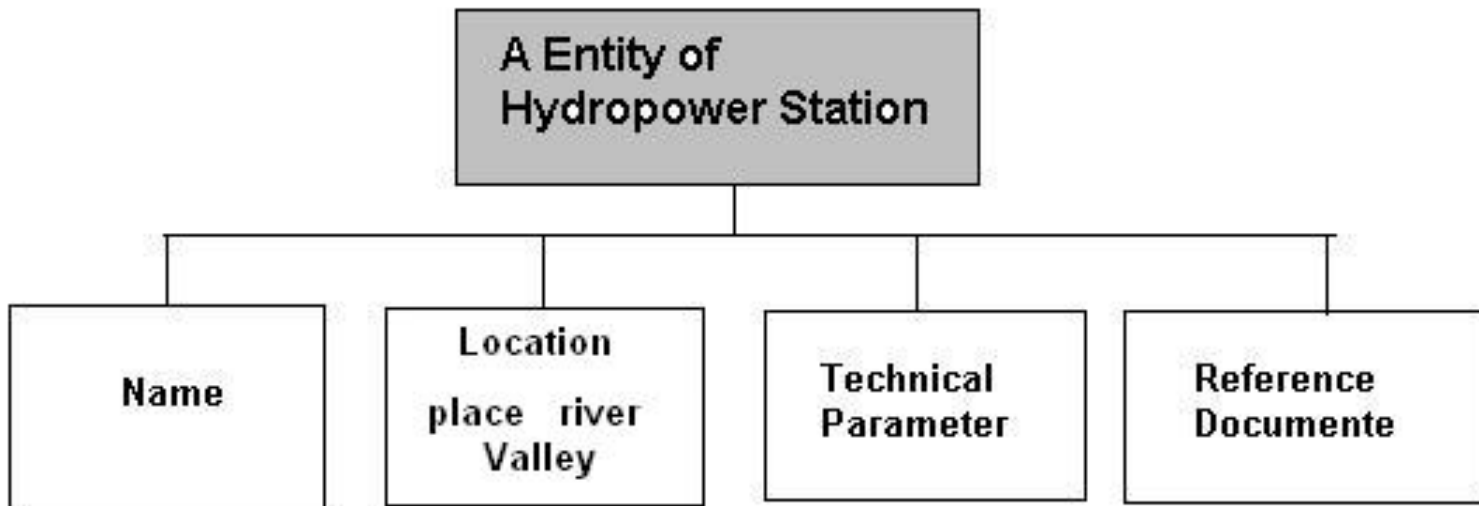
# **3. Analyzing the geographic feature of the resources (1/10)**

- **Usually the geographic feature of data has two kind of form --the spatial and attribute. In GIS the spatial data means “where” and the attribute data means “what”.**
- **In this project, the center topic are very close to the hydropower station in China, and each hydropower station has a typical feature, that is all of them have geo-location itself (place, river, valley). We can set up a entity to describe this geographic feature.**

### 3. Analyzing the geographic feature in digital information

## The entity model of hydropower station

(2/10)



- ❑ This entity model has four kinds of elements: the name, the location, the technical parameters and the reference documents.
- ❑ The element of location has typical characteristic of geography, and it should be described by the spatial data. (Vector & Raster)

### 3. Analyzing the geographic feature in digital information (3/100)

## About the spatial data

**Spatial is the data that have some form of spatial or geographic reference which enables them to be located in two- or three- dimensional space (*Heywood et al., 1998*)**

**‘where’**

**Spatial data have two forms:**

- Vector
- Raster

### 3. Analyzing the geographic feature in digital information (4/10)

## About the spatial data (Vector data)

- **Vector** data can be subdivided into points, lines and areas
  - Point--- To represent the place of hydropower station located in.  
There are more than 500 hydropower station in this system.
  - Line --- To represent river. Including the large and middle size rivers.
  - area --- To represent valley. There are 17 valleys in the system
- **Digitizing** frequently produces vector data. In this project, we don't do digitizing to make the vector data but purchase them from other vender, which is "The national district electronic map" with the ratio is one to one hundred and thousands (1: 100,000). We just use a part of place data and a part of river data (the big and middle size).

### 3. Analyzing the geographic feature in digital information (5/10)

## About the spatial data (Raster data)

- Raster data are usually produced rapidly by scanning  
We have made the raster data by scanning the map.  
(the China's valley's map and China territory map)

Scanning the map of valley (China) -----JPEG

Scanning the map of China territory ----- JPEG

We can use the GIS software to make these raster into vector through the way of registerb



### 3. Analyzing the geographic feature in digital information (6/10)

## About attribute data

Attributes provide information about 'what' a feature is. In GIS spatial data always come with accompanying attributes.

'what'

### Attribute data

- The engineering characteristic parameters
- The equipment performance parameters

These parameters are extracted from “the Chinese Yearbook of Hydroelectric Engineering”

### **3. Analyzing the geographic feature in digital information (7/10)**

**By purchasing and scanning we have held the spatial data and attribute data in the project database, these information can be used to show the hydropower stations, rivers and valleys on the digital map vividly.**

### **3. Analyzing the geographic feature in digital information (8/10)**

## **Research resources**

- **Besides the spatial data and attribute data we have another kind data in this project—the research resources (thesis, books, standard, accomplishment etc.)**
- **We can define research resources — ‘How’**

**Where --- spatial data --- a hydropower station located in**

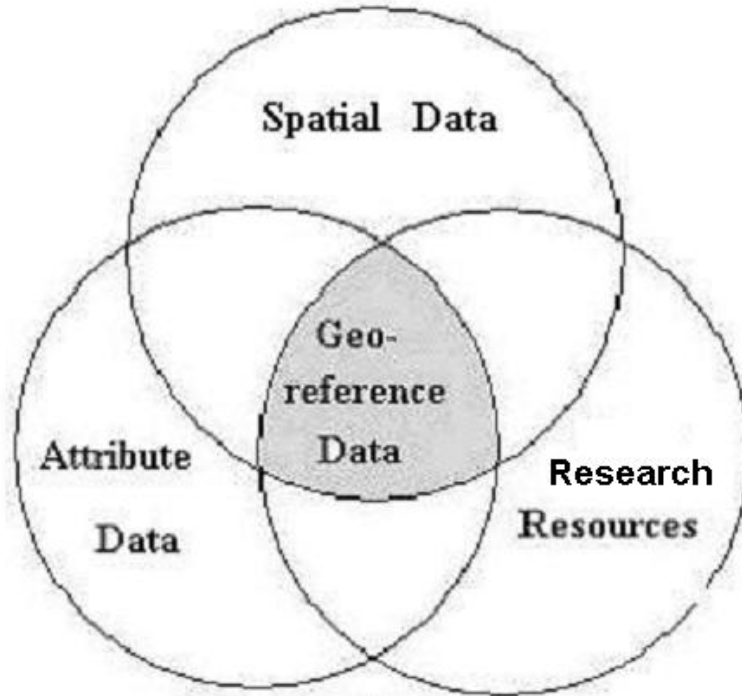
**What --- attribute data --- technical parameters**

**How --- research resources --- accomplishment**

**—This is the relationship between spatial data and research resources**

### 3. Analyzing the geographic feature in digital information (9/10)

## Established the relation model

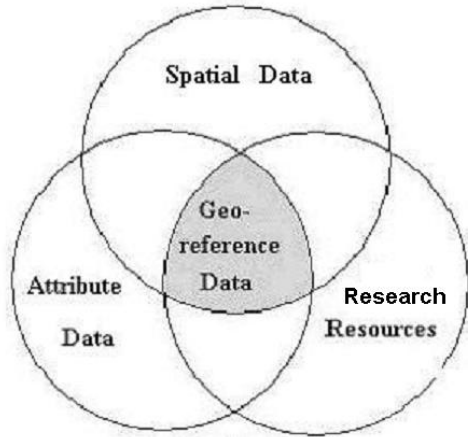


**The relation model**

The object in the geo-reference area should be a set of accomplishment, which will be relative with some hydropower station.

### 3. Analyzing the geographic feature in digital information (10/10)

## A sample of the relation model



**The object is:**

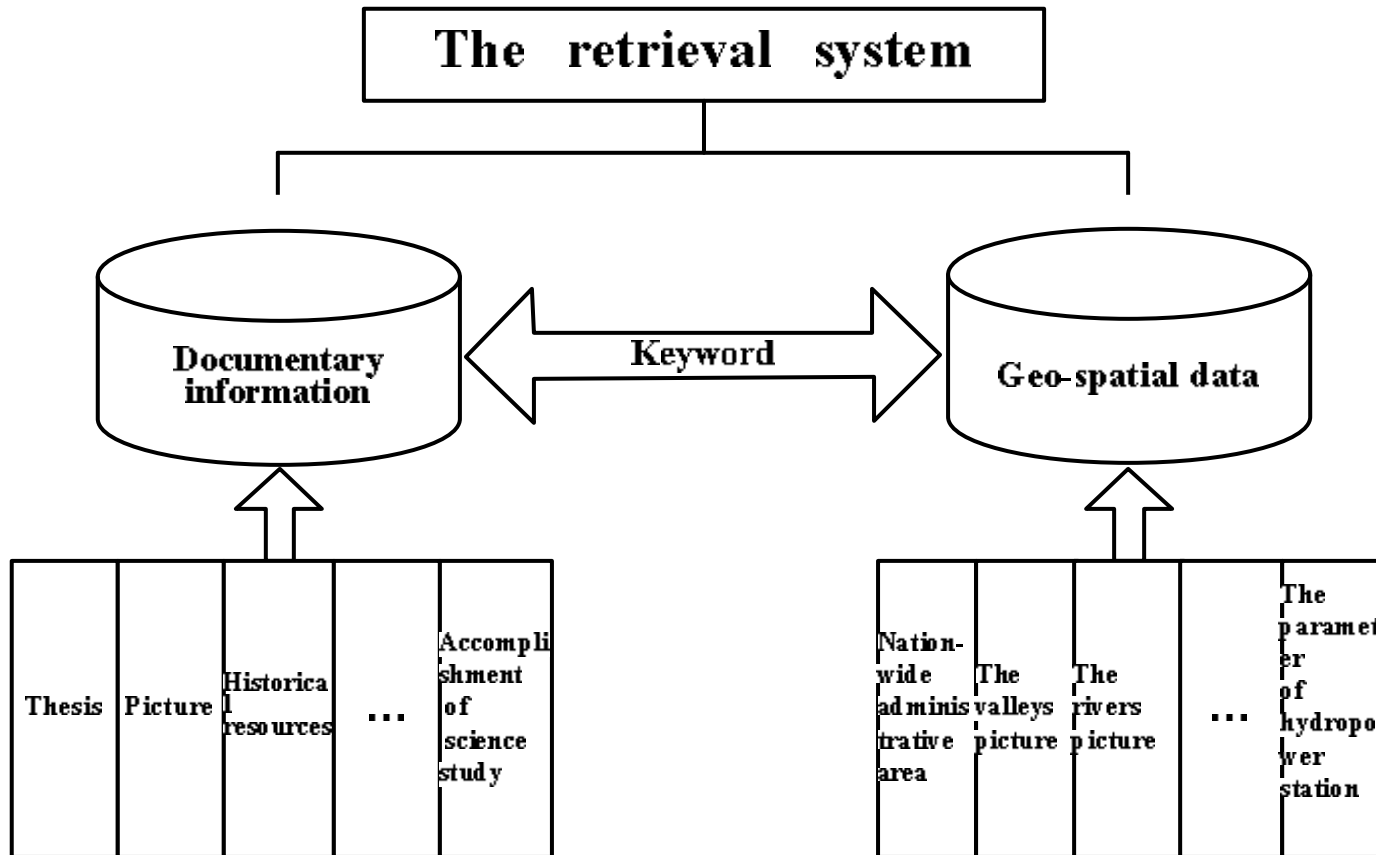
a article that study in the draft tube which using in Three Gorge Hydropower Station.

Area	Element	Content
Spatial data	Place,river,valley, name	SanDouPing, Yangtez River Yangtez river valley
Attribute data	Technical parameter	Draft tube,
Research resources	Thesis	Three Gorge Hydropower Station, Draft tube

**Studying the data model can find out the relationship between different kind of data and help us to construct the retrieval system**

# 4. setting retrieval system (1/3)

## The retrieval system module



## 4. setting retrieval system (2/3)

### Setting up the rule of names

In fact, each hydropower station has several different names.

Types of Name	Example	Function in the System
Standard name	? ? ? ? ?	indexing and shown name in the information system
English name	Three Georges Hydropower Station	for English version
Nickname	? ? ? ? , ? ? ? ? ? ? , ? ? ? ?	non-standard name, synonymous, To find information
Marking name	? ?	abbreviation in digital map

## **4. setting retrieval system (3/3)**

### **Searching route of digital map system**

**Enter digital map system → find a hydropower station**

**→ Interesting in research resources**

**→ system switch names as keywords**

**→ tune to the information system**

**→ searching the information**

**→ send the result to the user**

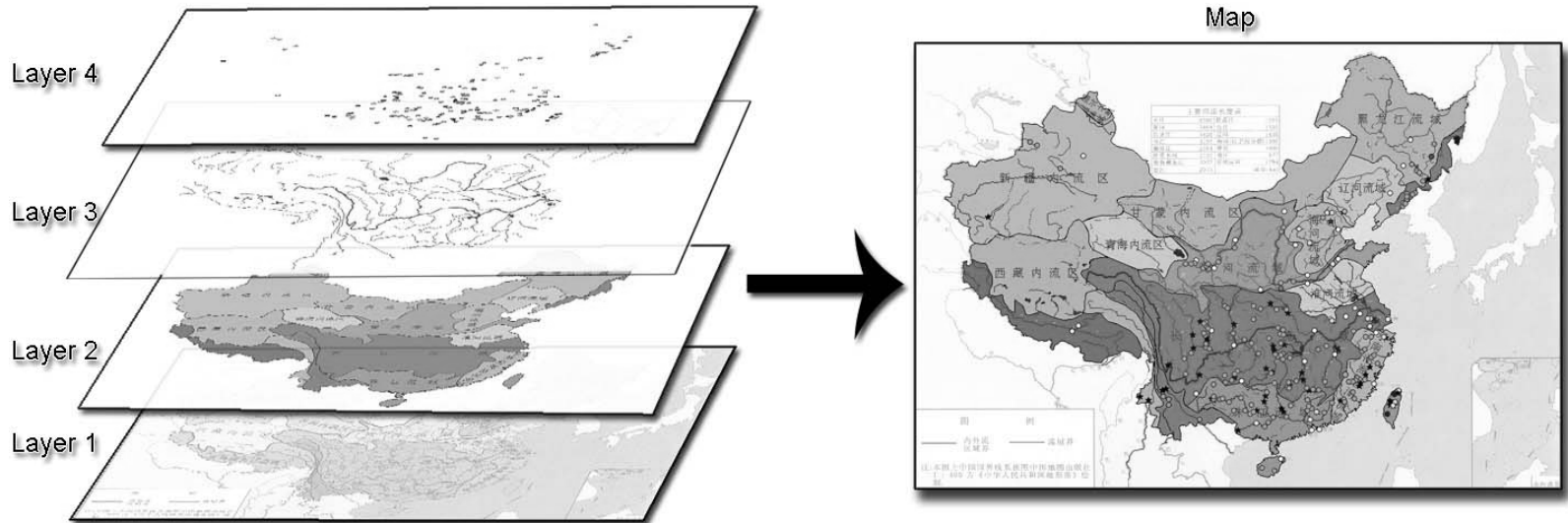


## **6. Forming the digital map (1/2)**

- **In a map, geo-spatial data have been modeled into entities of which there are three kinds: points, lines and areas that as talked above.**
- **The structuring of information in a GIS is most commonly organized in layers of maps. Each layer may contain information of a different nature.**

## 5. Forming the digital map (2/2)

# The layer model of digital map



**We can think the layers are transparency, if stacked them on top of one by one we can make this digital map.**

# 7. Showing the Function of the digital map system (1/7)

The screenshot displays a web browser window titled "地图检索 - Microsoft Internet Explorer". The address bar shows the URL "http://202.114.65.50/mapsearch/FramePage.asp". The main content area features a map of China with numerous small icons representing hydroelectric power stations. To the right of the map is a filter panel with the following sections:

- 水电站**
  - 抽水蓄能电站
  - 水电站
- 各流域**
  - 长江流域
  - 黄河流域
  - 黑龙江流域
  - 辽河流域
  - 雅鲁藏布江流域
  - 珠江流域
  - 淮河流域
  - 海河流域
  - 额尔齐斯河流域
  - 东南沿海诸河流域
  - 东北地区其他国际流域
  - 怒江-伊洛瓦底河流域
  - 澜沧江-湄公河流域
- 各内流区**
  - 青海内流区
  - 新疆内流区
  - 西藏内流区
  - 甘蒙内流区

Below the filter panel is a search box with the text "电站名: 新安江" and a "查找" button. To the right of the search box is a table titled "三甲水电站技术参数":

三甲水电站技术参数	
规范名:	三甲水电站
别名:	<暂无>
英文名:	Sanjia Hydropower Station
省:	甘肃
市:	定西
县及以下:	临洮县
位于河流:	洮河
位于流域:	黄河流域
主要坝型:	混凝土重力坝

Below the table is a section titled "电站相关文献资源链接" with a list of links:

- 三甲相关期刊论文
- 三甲相关书目记录
- 三甲相关科研成果
- 三甲相关历史事件
- 三甲相关图片资源
- 三甲相关网址链接

At the bottom right, a search result box displays "查找到水电站1个; 抽水蓄能电站(带\*号)0个!" and "新安江".

The bottom of the browser window shows the Windows taskbar with various icons and the system clock displaying "16:15".

# 7. Showing the Function of the digital map system (2/7) Zoon in and zoon out ; “Hawk eye”

The screenshot displays a digital map system interface. The main map shows a detailed view of a region with numerous hydroelectric stations and basins. The legend on the right side of the map is as follows:

- 水电站
- 抽水蓄能电站
- 水电站
- 各流域
- 长江流域
- 黄河流域
- 黑龙江流域
- 辽河流域
- 雅鲁藏布江流域
- 珠江流域
- 淮河流域
- 海河流域
- 额尔齐斯河流域
- 东南沿海诸河流域
- 东北地区其他国际
- 怒江—伊洛瓦底江
- 澜沧江—湄公河流
- 各内流区
- 青海内流区
- 新疆内流区
- 西藏内流区
- 甘蒙内流区

At the bottom right, there is a search bar with the text "水电站名:" and a "查找" button. At the bottom left, there are several navigation icons: a star, a square with an 'X', a hand, a magnifying glass with a plus sign, a magnifying glass with a minus sign, a magnifying glass with a square, a magnifying glass with a square, a magnifying glass with a question mark, and a magnifying glass with a question mark.



# 7. Showing the Function of the digital map system (4/7)

## Choosing a hydropower station (Sanmenxia)

水电站

抽水蓄能电站

水电站

各流域

长江流域

黄河流域

黑龙江流域

辽河流域

雅鲁藏布江流域

珠江流域

淮河流域

海河流域

额尔齐斯河流域

东南沿海诸河流域

东北地区其他国际

怒江-伊洛瓦底江

澜沧江-湄公河流域

各内流区

青海内流区

新疆内流区

西藏内流区

甘蒙内流区

**显示**

三门峡水电站技术参数	
名称	规范名: 三门峡水电站
	别名: 三门峡水电厂;三门峡水利枢纽
所在地	英文名: Sanmenxia Hydropower Station
	省: 河南、山西
	市: 三门峡、平陆
	县及以下: <暂无>

**电站相关文献资源链接**

[三门峡相关期刊论文](#)

[三门峡相关书目记录](#)

[三门峡相关科研成果](#)

[三门峡相关技术标准](#)

[三门峡相关图片资源](#)

[三门峡相关网址链接](#)

查找水电站 1 个;  
抽水蓄能电站(带\*号) 0 个!

三门峡

# 7. Showing the Function of the digital map system (5/7)

## The result of retrieval in the TPI system, which related to Sanmenxia

The screenshot displays a web browser window titled "TPI - Microsoft Internet Explorer". The address bar shows the URL: `http://202.114.65.50/tpi/sysasp2/moredatabase/brief.asp#`. The browser interface includes a menu bar (File, Edit, View, Favorites, Tools, Help), a toolbar with navigation buttons, and a search bar. The search results are displayed in a table-like format with the following entries:

序号	数据库	期刊库
21	【数据库】	期刊库
	【篇名】	<u>对潼关高程淤开成因及控制措施的认识</u>
	【作者】	严军;王鹏涛;翟雯航
	【机构】	华北水利水电学院;华北水利水电学院;华北水利水电学院 郑州450011 ;郑州450011 ;郑州450011
	【中文刊名】	水力发电学报
	【年】	2005
	【期】	05
22	【数据库】	期刊库
	【篇名】	<u>三门峡水库运行方式对库区湿地生态系统影响研究</u>
	【作者】	毛战坡;彭文启;周怀东
	【机构】	中国水利水电科学研究院水环境研究所;中国水利水电科学研究院水环境研究所;中国水利水电科学研究院水环境研究所 北京100038 ;北京100038 ;北京100038
	【中文刊名】	水利发展研究
	【年】	2005
	【期】	09
23	【数据库】	期刊库
	【篇名】	<u>潼关高程及三门峡水库运用方式问题探讨</u>
	【作者】	姜乃迁;张翠萍;侯素珍;张原锋;林秀芝
	【机构】	黄委会黄河水利科学研究院;黄委会黄河水利科学研究院;黄委会黄河水利科学研究院;黄委会黄河水利科学研究院;黄委会黄河水利科学研究院 河南郑州450003 ;河南郑州450003 ;河南郑州450003 ;河南郑州450003
	【中文刊名】	泥沙研究
	【年】	2004

# 7. Showing the Function of the digital map system (6/)

## The metadata of a article



TPI - Microsoft Internet Explorer

文件(F) 编辑(E) 查看(V) 收藏(A) 工具(T) 帮助(H)

地址(D) <http://202.114.65.50/tpi/sysasp2/CNKI/detail.asp?dbid=33&Sysid=210240&databasename=期刊库&SQL=&CurrentNum=21>

篇名	对潼关高程抬升成因及控制措施的认识 <a href="#">原文下载</a> <a href="#">在线浏览</a>
作者	严军 王鹏涛 翟雯航
机构	华北水利水电学院;华北水利水电学院;华北水利水电学院 郑州450011 ;郑州450011 ;郑州450011
分类号	TV145.1
关键词	河流泥沙工程学 潼关高程 三门峡水库 抬升成因 控制措施
中文摘要	本文通过分析三门峡水库运用前后潼关高程的变化,揭示了潼关高程抬升的原因;通过分析降低潼关高程的几种措施:调整三门峡水库的运用方式,三门峡水库的改建,潼关至古夺河段机械挖沙,在小北干流适当放淤,以减少上游泥沙等,提出了一些看法和建议。
中文刊名	水力发电学报
issn	1003-1243
期	05
年	2005
页	25-28
来源数据库	中国期刊网
学科	水利水电工程 081504
语种	汉语
版权	本论文版权归出版社及作者所有
文献号	0
光盘号	SCTC0511S1
文件名	SFXB200505005
专题代码	C024
点击率	2

完毕

Internet

16:24



# 7. Showing the Function of the digital map system (7/7)

## The function of linking full paper

The screenshot shows the Adobe Reader interface with a PDF document open. The document is titled "对潼关高程抬升成因及控制措施的认识" (Thinking of raising reasons and controlling measures of elevation at Tongguan). The document is from the "水力发电学报" (Journal of Hydroelectric Engineering), Vol. 24, No. 5, Oct., 2005. The authors are Yan Jun, Wang Pengtao, and Zhai Wenhong. The abstract discusses the reasons for the elevation increase at Tongguan and proposes control measures. The document is displayed in a window titled "Adobe Reader - [对潼关高程抬升成因及控制措施的认识[1].pdf]". The interface includes a menu bar, a toolbar, and a sidebar with navigation options like "签名", "图层", "页面", and "书签". The status bar at the bottom shows the page number "第 1 / 4 页" and the dimensions "8.08 x 11.63 英寸".

Adobe Reader - [对潼关高程抬升成因及控制措施的认识[1].pdf]

文件(F) 编辑(E) 视图(V) 文档(D) 工具(T) 窗口(W) 帮助(H) | ef bio for your PRDLA pr... | 1 封新

打开 保存副本 打印 发送 搜索 | [T] 文本选择工具 | 一个 PDF, 集纳多种文件.

75%

签名 图层 页面 书签

第 24 卷 第 5 期  
2005 年 10 月

水力发电学报  
JOURNAL OF HYDROELECTRIC ENGINEERING

Vol. 24 No. 5  
Oct., 2005

### 对潼关高程抬升成因及控制措施的认识

严 军, 王鹏涛, 翟雯航  
(华北水利水电学院, 郑州 450011)

**摘 要:** 本文通过分析三门峡水库运用前后潼关高程的变化, 揭示了潼关高程抬升的原因, 通过分析降低潼关高程的几种措施, 调整三门峡水库的运用方式, 三门峡水库的改建, 潼关至古寺河段机械挖沙, 在小北干流适当放淤, 以减少上游泥沙等, 提出了一些看法和建议。

**关键词:** 河流泥沙工程学; 潼关高程; 三门峡水库; 抬升成因; 控制措施

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### Thinking of raising reasons and controlling measures of elevation at Tongguan

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**Abstract:** This paper infers the raising reason of elevation at Tongguan by analyzing the variation before and after the construction of the Sanmenxia reservoir. By analyzing the lowering measures of elevation at Tongguan: adjusting the operation mode of the Sanmenxia reservoir, rebuilding of the Sanmenxia reservoir, mechanical excavating sand in river reach of Tongguan to Gaoxuo, reducing the upper reach sediment, depositing sand in the Xiaobei mainstream, some reference opinions and suggestions are pointed out.

**Key words:** river sediment engineering; Tongguan elevation; Sanmenxia reservoir; raising reason; controlling measure

#### 1 概况

三门峡水库是黄河上修建的第一座大型水库, 自 1960 年 9 月正式投入运用至今已 40 余年。由于在原规划设计中对黄河泥沙问题认识不足, 枢纽在 40 多年的实际运行中经历了两次改建和“蓄水拦沙”(1960 年 9 月~1962 年 3 月)、“滞洪排沙”(1962 年 3 月~1973 年 10 月)和“蓄清排浑”(1973 年 11 月至今)等不同运用阶段。

潼关高程是指黄河潼关水文站六号断面 1 000m<sup>3</sup>/s 流量相应的水位。由于潼关断面位于黄河、渭河、北洛河

8.08 x 11.63 英寸

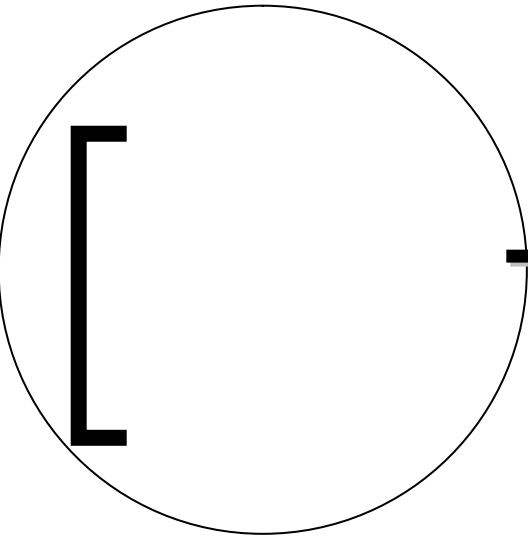
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## **7. Conclusion**

- **Information is no longer simply text and pictures. It has different forms and attributes. So, trying to use and combine different retrieval system in a project architecture will have more benefit for users.**

## **7. The future work**

- **Continue to collect the resources**
- **Began to design English home page**
- **Trying to using the ontology tool to realize the retrieval system on knowledge database**



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**Thank You!**

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