

全国地层数据库

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符合现代地质科学水平和发展需要的全国地层数据库的建立,是促进地层学研究和地层单位划分管理的规范化、现代化,使我国区域地质填图和地层学研究跨入国际先进行列的一个重要标志。

全国地层数据库的数据源是由地矿部全国地层多重划分对比研究项目(1992—1995)提供的,共含有31个省(市)自治区、6个大区综合研究成果。该成果是按新理论、新观点和新方法清理研究已有的地层资料,包括清理研究各类地层单位名称、地质特征、分布范围。通过各种途径实地核查各地区的各类原始命名剖面(正、副层型)、标准地点、地区的其它代表性剖面,以及各地层单位的重要参考剖面(次层型),并阐明了这些剖面所在的地质、地理概况;明确岩石地层单位的定义、划分及延伸标准、层型及主要参考剖面,以及这些剖面上的重要生物、年代及其接触关系、颜色、层理类型、沉积构造、磁极性、化学特征、矿物、矿产、地质年代(年龄)、变质相等地质特征,各剖面的原始描述内容及有关参考文献等信息。全国地层数据库是在省级地层数据库的基础上通过地层分级存贮多元组合,在基本单元的统一性、共享性、完整性的基础上建立起来的。预计全国共有5500个(正副选新)层型剖面,约25000个次层型剖面,是目前我国唯一容量最大、资料最为完整、严谨、最具权威的地层数据库。

该系统在PC机上采用90年代软件开发的最新潮流——面向对象的程序设计技术,同时考虑了与国际交流和接轨,运用Object Windows程序设计、文件流等一系列技术方法,解决了全国地层清理主要成果卡片的输出。实现了按断代、地层大区、省(市)区的对岩石地层单位有关信息的单项检索及复合交叉等的复杂检索,实现了对岩石地层单位同名、代号、及新建单位有效性的监控及文献检索;同时能够生成以上有关的几十种图形和表格。

系统将为我国今后的基础地质研究、1:50000区调填图、中小比例尺地质编图和找矿工作提供现代地层学依据。全国地层数据库设在地矿部区调处,欢迎国内外客户使用、咨询。

THE NATIONAL STRATIGRAPHICAL DATABASE

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ABSTRACT

The National Stratigraphical Database has been developed by the Ministry of Geology and Mineral Resources of China. The main objective of the database is to manage the information about various stratigraphical unit in whole China so as to carry out the research on stratigraphical multiple division and correlation. The authors introduce the main characteristics and functions of the database system.

INTRODUCTION

According to the decision of the National Stratigraphical Multiplex Division and Correlation Project (1992—1995), a National Stratigraphical Database has been developed, the main target of which is to collect and manage all of stratigraphical cards in China so as to expand the range of the data application. The establishment of the database which conforms to the development needs of geosciences, will promote the modernization and standardization of the stratigraphical research and stratigraphical classification.

DATA SOURCE AND CONTENT

The data of the National Stratigraphical Database are provided by the National Stratigraphical Multiplex Division Project, which were the results of comprehensive research on stratigraphy in 31 provinces (cities or autonomous regions) and 6 geopolitical regions of China. On the basis of the new theories, methods and point of views on stratigraphy, the stratigraphical information will be restudied and checked up.

The information includes the name, geological characteristics, distribution, original sections (holostratotype, and parastratotype) which have been verified through all of methods, standard locality, typical sections of other regions, as well as important reference sections (hypostratotype) of each stratigraphic unit. The general geological and geographical conditions in the area where the sections are located, have been explained. The definition,

extension standard and classification of the stratotype and the principal hypostratotype of lithostratigraphic unit have been defined, and the geological properties, such as the biozone, geological age, contact relation, color, stratification types, sedimentary structure, magnetic pole, chemical characteristics, minerals, mineral resources, isotope age, metamorphic facies as well as various reference materials and original description of each section are presented.

In order to keep the unity, integrity and commonality of the fundamental stratigraphical unit on the basis of the provincial stratigraphical databases, the national stratigraphical database have been built up. There are about 5500 stratotype sections (holostratotype, parastratotype, lectostratotype, neostratotype) 25000 hypostratotype sections in the national stratigraphical database.

MAIN FUNCTIONS OF THE DATABASE SYSTEM

According to the needs of the research on national stratigraphical multiplex division, the main stratigraphical data cards in China, including the lithostratigraphical unit cards, evolution cards of stratigraphical division, stratotype, hypostratotype and reference section cards, as well as bibliography cards used for the national stratigraphical multiplex division are input into the database, on the basis of which, the input, modification, add, deletion and compilation of data can be easily performed.

In each province of China, the provincial stratigraphical databases are also established, which are responsible for storing and managing the stratigraphical data in their own region. The National Stratigraphical Database is responsible for managing the stratigraphical data gathered from the provincial databases. In this way, the storage by different levels and unified management of information can be realized.

The system can be used to output the lithostratigraphical unit cards, draw the evolution maps of stratigraphical division and various synthetic columnar maps for stratotype, hypostratotype and reference sections. In order to reflect the cycle structure, the enlargement for specific part of the maps is available in the system.

The retrieval functions of the system are as follows:

1. Retrieving the lithostratigraphical unit and various kind of stratotype in different levels according to geochronological unit.
2. Retrieving the lithostratigraphical unit and various kind of stratotype in different levels according to stratigraphical regions.
3. Retrieving the lithostratigraphical unit and various kind of stratotype in different levels according to geographical regions, such as province, city, county, etc..
4. The comprehensive retrievals according to above conditions.
5. Retrieving the lithostratigraphical unit card according to the name and number of the selected unit.

6. Retrieving the stratigraphical section card according to the name and number of the selected section.

7. Retrieving the bibliography.

Following supervision functions, that is the supervision for the same name, stratigraphical unit and effectivity of the newly-built unit, are also realized in the system.

CHARACTERISTICS OF THE DATABASE

The object oriented programming techniques are used to construct the database on personal computer, which is a fashionable programming in nineties. To realize the international exchange of information in the future, a series of new techniques, such as object windows, file stream, etc., are also employed. It settles up the problem on inputting qualitative and quantitative data in the card which are the result of the national stratigraphic multiplex division and correlation project, and the complete card of stratigraphic unit can be provided. The information of lithostratigraphic unit can be retrieved with simplex or complex index as consistent with geochronologic unit, stratigraphic division of the first rank and province. The supervision of lithostratigraphic units which have the same name and the same code have been realized, and the effect of new lithostratigraphic unit can be supervised. The reference materials about lithostratigraphic unit can be found out. Meanwhile the dozens of diagrams relevant to the above can be presented.

The database will provide the basis of model stratigraphy for the basic geologic research, the 1 : 50000 regional geological survey, geological mapping with different scale an exploratory work in the future on our country. The national stratigraphical database was built up in Regional Geological Surveying Department, Ministry of Geology and Mineral Resources. The users at home or abroad will be welcome to use and seek advice.

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