

Kapitel 11.

Summary, incl. proposals and recommendations

11.1. Introduction

In the last few decades, the geosciences have been an important factor in the development of society, especially in the production of raw materials, energy supply, supply of clean drinking water, and the environment in general. In order to ensure continued development, geosciences are included in the process initiated by the Ministry of Research and Information Technology to establish a national research strategy. The Ministry assisted by the Danish Natural Science Research Council (SNF) is responsible for the strategy work of the natural sciences, including the geosciences.

In addition, the Ministry of Research and Information Technology has appointed a subcommittee to broadly analyze the geosciences, including the significance of the geosciences to society, and collaborative relationships in general.

The committee work is timely as changes in the geographic location of the former two geological surveys have been precipitated by the merging of the surveys and the formation of GEUS. These relocations will be of importance both to GEUS and to the University of Copenhagen.

The proposed creation of a Geocentre involves the following institutions:

Geological Survey of Denmark and Greenland (GEUS) under the Ministry of Environment and Energy (GEUS is a merger of the former Geological Survey of Denmark (DGU) and the Geological Survey of Greenland (GGU)). Geological Institute (GI), Geographical Institute (GRI), and Geological Museum (GM) under the Faculty of Science at the University of Copenhagen, and the Danish Lithosphere Centre (DLC) which is a research initiative established by the Danish National Research Foundation. DLC is presently housed by GI and former GGU at the Øster Voldgade complex and is administered by GEUS.



11.2. *Purpose and background*

The purpose of the committee work has been to investigate the possibility of creating a scientific centre of international status in Denmark, to undertake research, education and advisory functions within the geosciences. In this report the centre is referred to as the Geocentre.

The aim of the National Research Strategy is to ensure closer collaboration between the universities and the sector research institutions. Such closer relationships will enhance both the social relevance and quality of research and the education of undergraduates. Ultimately, society also benefits as the net result is an improvement in the quality of the advice provided for the political and administrative authorities and better qualified graduates as future employees in the industry and the public advisory and administrative sector.

A unique opportunity to realize such a collaboration has arisen within the geosciences due to the recent merger between DGU and GGU to form GEUS. It is well-known that the full benefits of such a merger are only derived if the merged institutions are located within the same physical premises. At present, GGU profits from sharing premises with GI and GRI, under the auspices of the University of Copenhagen. This close collaboration between GGU and the university with regard to teaching and research - not least with respect to the exploration of Greenland - would be further strengthened by locating GEUS within these premises.

In the opinion of the committee, the formation of a Geocentre as a centre for geosciences will represent a breakthrough for closer collaboration between public sector research and basic research in other fields. The organization suggested in this report may thus provide a model for such future development.

11.3. *The profile of the Geocentre*

The institutions making up the Geocentre cover a broad spectrum of geoscientific subjects. The profiles of the individual institutions and their priority areas will be established according to the development plans of the individual institutions.

With the creation of a Geocentre, the following will become the dominant research areas; in a number of these fields, the centre will be amongst the leading geoscience research institutions internationally.

Geology of the Earth's crust
Geology of sedimentary basins
Palaeobiology

Groundwater
Surficial geology and geomorphology, including the
Greenland ice-cap
Circulation of nutrients and energy in ecological systems
Urban and regional geography

These geoscience subjects are of major importance to society, for example with respect to mineral and hydrocarbon exploration, drinking water quality, provision of raw materials, monitoring climate change, environmental monitoring and planning, and planning of land-use. It is of the utmost importance that society obtains the most qualified research and advice in these areas and that furthermore students in these fields receive the most relevant and up-to-date training. In the opinion of the committee, Danish research, education and advisory functions within the geosciences are best promoted by grouping the said institutions into a Geocentre. It should be stressed that the formation of a Geocentre represents the most appropriate solution for the geoscience institutions located in the Copenhagen area given that major physical and organizational changes are, in any case, underway.

The creation of a Geocentre will open up a range of perspectives within research, education and advisory matters:

- A research centre with strong research groups and modern laboratories will be extremely attractive to foreign researchers and this will strengthen the internationalization of Danish research within the geosciences.
- The centre will act as the gateway to geoscience research in the Arctic region and provide logistics for international scientific expeditions.
- Research that spans institutional and political borders is able to combine the basic research strengths of the universities with the more user-oriented know-how of the public sector research institutions.
- An integrated and coordinated use and development of the laboratory facilities will ensure the optimal utilization of resources and provide possibilities for joint investment in advanced and expensive equipment.
- The Geocentre will be able to offer a broad range of scientific subjects within geology, geography and applied geophysics for the c. 1000 students at BSc. and MSc. levels.
- A large number of specialists will be available to assist the research training of 50-100 PhD-students, supported by a full range of specialized laboratories.



- Senior research scientists from the public sector research institute will be able to act as part-time teachers within a number of applied subjects.
- The large number of scientists representing wide professional skills combined with sophisticated laboratory facilities will ensure the optimal background for advising the authorities.
- University scientists will be able to advise on topics within their areas of special expertise; this may include both major fact-finding initiatives and ad hoc evaluations.
- Interdisciplinary skills at the Geocentre will increase the understanding of the interaction between nature and society in connection with advisory assignments concerning raw materials, environment, physical planning and assistance to developing countries.
- The presence of both basic research and applied research and development in a joint research environment will increase the interaction with industry.

There will be a continued need for close cooperation between the various units of the Geocentre and the Technical University of Denmark (DTU), a number of other university institutes, especially at the University of Aarhus (AU), and other public sector research institutions, e.g. the National Environmental Research Institute (DMU). Indeed, the creation of such a Geocentre can only result in a general rise in the level of geoscience research in Denmark since the centre will represent a better qualified partner for "external" collaboration. The structure of the centre will, in itself, facilitate such collaboration.

Internationally, the Geocentre will also represent a more attractive partner for scientific collaboration since it will exceed the "critical mass" with respect to science, administration and economy. It will thus be ideally suited for collaboration with foreign research institutions in major projects. The centre will also be in a position to assume leadership in large international programmes, such as the EU framework programmes. The centre will furthermore be able to undertake the leadership of geoscience research in the Arctic.

The committee has analyzed the tasks of the Geocentre in order to specify the advantages (and possible disadvantages) with respect to locating the Geocentre institutions at the same site. The advantages can be broadly described as:

- Physical and economic advantages of large-scale operations
- Research advantages
- Teaching advantages
- Advisory advantages.

11.4. ***The tasks of the Geocentre***



The physical advantages are primarily the strengthening and rationalization of service functions such as library functions, laboratories, instrument storage and management, scientific collections, field equipment, canteen facilities, etc. These advantages are the result of more intensive usage, avoiding unnecessary overlap, joint investment in expensive and advanced equipment, and reducing running costs, e.g. energy, cleaning, security etc.

On the research side, the advantages of the Geocentre result from the fact that the work programmes for GEUS and the strategy plans for the University can be prepared in parallel, thus allowing for joint projects, shared work loads, agreements regarding staffing, purchase of equipment, student assistance, etc. In addition, the common working environment allows for a free exchange of professional ideas and opinions during chance meetings in corridors as well as at joint workshops and symposia, in laboratories, the library, the canteen, etc.

With respect to teaching, the Geocentre will stimulate researchers at GEUS to become part-time university teachers and increase the chances for senior research scientists at GEUS to become professors. The creation of the centre will also give the university more ready access to scientists from a broader scientific environment for teaching purposes.

Within the sphere of advisory work, agreements concerning job rotation and leave of absence will enable employees at the University of Copenhagen to more readily undertake advisory duties for national authorities and the private sector.

A number of the advantages outlined above will to some extent also be present without the creation of a physically united Geocentre. It is the opinion of the committee, however, that a Geocentre with a coordinating body at the level of senior management will to a larger extent provide the opportunity of realizing and fully utilizing the potential of the participating institutions.

In order to avoid any disadvantages that may arise from the creation of a Geocentre, it is essential that clear guidelines for the organization of the centre and the terms of references are established. Otherwise, the Geocentre may not attain the desired synergy but may result in increased bureaucracy and inefficiency. It is important to continue and further develop cooperation with partners outside the centre, both nationally and internationally, in order to avoid any tendencies towards a blinkered, complacent outlook.



11.5. **The organi- zation of the Geocentre**

In the mandate of the committee, it is stipulated that no changes must be made to the position of GEUS as a scientific, advisory institution under the Ministry of Environment and Energy nor to the position of the university institutes under the Faculty of Science at the University of Copenhagen with their research and teaching commitments. It has been the aim of the committee within this framework to outline an organizational model which benefits as much as possible from the joint building facilities while, at the same time, respecting the competent bodies of the respective ministries.

The committee suggests that a Geocentre management is established in order to coordinate the joint assignments of the centre. It is proposed that the Geocentre management consists of 5 members, 2 from the University of Copenhagen, 2 from GEUS, and one member appointed by the Ministry of Research and Information Technology, who has to be approved by the Board of Governors of GEUS and the Faculty of Science at the University of Copenhagen following the recommendation of the management. The Geocentre management performs its duties within the terms of legislation covering the cooperating institutions.

It is suggested furthermore that:

- The Geocentre management chooses its own chairman and establishes its own procedures.
- The managers of GM and DLC are affiliated to the Geocentre management.
- The Geocentre management may initiate and stimulate joint projects, partly through coordination of the planning by the participating institutions and partly by granting resources in agreement with the rules of competence of the involved parties.
- The rules of procedures covering the activities of the Geocentre should stipulate the cooperation and coordination sphere of the Geocentre management and the centre.
- The Geocentre management is assisted by a secretariat staffed by the participating institutions.

11.6. **The building facilities and financing of the Geocentre**

The committee has investigated various possibilities for the physical location of a Geocentre. On economic grounds, primarily, a location in the building complex at Øster Voldgade 10 is recommended. This location, close to the Geological Museum at Øster Voldgade 5-7, will provide the optimal setting for the centre seen both from a short term and long term perspective. It will furthermore provide an outstanding location in central Copenhagen and form part of the surrounding scientific and museum environment. Construction and rebuilding of

the centre will stretch over a 4 year period from 1996 until 2000.

The total expenses connected with locating the Geocentre at Øster Voldgade are estimated to be 190 million Danish kroner. The final decision on the establishment of a Geocentre, and the division of the financial load, is ultimately linked to the overall national budget priorities, particularly concerning construction, when the budgets for 1997 and subsequent years are negotiated. In this context, the ranking of special fields of interest of the individual ministries must be taken into account, especially with respect to the professional and political research priorities specified under the National Research Strategy. If the decision is made to establish the centre, the expenses will be divided over a four year period.

The committee has drafted a financing model for the distribution of the establishment costs, including the secondary costs connected with moving and construction work. The Ministry of Education has expressed prior intention of financing its share of the expenditure through already appropriated means.

Should the financial backing not be forthcoming, it is the intention of the Ministry of Environment and Energy to locate GEUS (the merged institutions DGU and GGU) in one building complex at Thoravej. According to the Ministry of Environment and Energy, the full advantage of the merger of the two institutions will only be obtained through locating the institutions in the same building. The University of Copenhagen, however, fears that the removal of the former GGU from the Øster Voldgade complex will have consequences for research and teaching due to the diminishing of the research environment. DLC has stated that this institute intends to remain at Øster Voldgade should GEUS be located at Thoravej.