



NEWS & ANNOUNCEMENTS

INTERNATIONAL GEOLOGICAL CORRELATION PROGRAMME

Project No. 200: Sea-level correlations and applications

1986 Annual Report on Scientific Progress November 5, 1986

The international activities of IGCP 200 have been particularly numerous since the last annual report.

In December 1985, at UNESCO Headquarters, D.T. Pugh (as Chairman) and P.A. Pirazzoli took part in the preparation of a draft implementation

plan for the establishment of the Global Sea Level Observing System (GLOSS), which was adopted by IOC in March 1986. This plan identifies 250 tide-gauge stations which should form a basic network of permanent sea-level observing stations. Of the 250 stations proposed, 150 are already operating, whereas the remaining 100 have to be implemented. GLOSS will provide high-quality standardized data from which sea-level data products will be pro-

duced for international, regional and national research programmes.

In January and February 1986 the thematic working group "Shelf Research" organized an international cruise on board the oceanographic research vessel *Professor Shtokman* of the USSR Academy of Sciences. This expedition was specially devoted to paleogeographic shelf investigations in the western Indian Ocean, where previous sea-level data were scarce or non-existent. Research was carried out along selected transects, across the Seychelles and Amirantes Banks, or perpendicular to the coasts of northern Madagascar. In the Seychelles area lagoonal peat samples were cored from the sea float, about 60 m below sea level. Reports on this cruise and preliminary results have already been published by *Episodes* (9, 1: 30-31), the *Journal of Coastal Research* (2, 3: 363-367) and *Géochronique* (19: 17).

In March 1986 about 40 scientists from 10 countries attended a conference on sea-level changes and their consequences, organized at Cork (Ireland), as a contribution to themes 13 (Evolution of coastal landforms) and 14 (Applied aspects of sea level) of IGCP 200. Twenty-eight papers and posters were presented. Models predicting a sea-level rise in the near future and factors which might increase or decrease the rate of a sea-level rise were discussed. Several papers dealt with the morphological changes liable to be induced in coastal areas by a change in sea level, with problems in coastal management and the cost of coastal defenses likely to be incurred with various types of a rise in sea level. Interesting coastal features were visited during two field excursions. The proceedings of the Cork meeting are expected to appear in 1987 in an issue of *Progress in Oceanography*.

In April 1986 four members of the Executive Board and some 30 participants in IGCP 200 took part in the symposium "Global Changes in Africa during the Quaternary: Past, Present and Future" in Dakar (Sénégal), which was attended by 185 scientists from 40 countries. A 527-page volume reproduces extended abstracts of the papers given at this meeting. This publication is available from ORSTOM (*Travaux et Documents*, No. 197. Address: ORSTOM, Librairie Diffusion, 70 route d'Aulnay, 93140 Bondy, France). Reports on the meeting have been published by *Episodes* (9, 2: 114-115), *IMS News* (No. 43) and *Géochronique* (20: 9-10).

In July 1986 about 55 participants from 8 countries attended the "International Symposium on

sea-level changes and Quaternary shorelines" in São Paulo (Brazil), co-sponsored by the IGCP Projects Nos. 200 and 201 and by the INQUA Shorelines Commission. Some 25 papers were read and about 30 people took part in a field trip along the Paraná and Santa Catarina coastlines, for which a 124-page field guide had been prepared. The proceedings of the meeting are expected to appear in a volume of "Quaternary of South America and Antarctic Peninsula".

In August 1986 a regional meeting was organized in Canberra (Australia) during the 12th Sedimentological Congress. Several field excursions of the Congress were related to sea level.

In September 1986 about 80 participants from 13 countries took part in the First International Symposium "Cities on the Sea: Past and Present", held in Haifa (Israel). The meeting was successful in bringing together historians, archaeologists, geographers, geologists and coastal engineers, mostly working in the Mediterranean area. During the field excursions interesting indications of relative sea-level changes during historical times were shown at archaeological sites along the coast (Akko, Caesarea, Dor). Extended abstracts of the papers given are available at the Center of Maritime Sciences of the University of Haifa in a 206-page volume. The full papers related to IGCP 200 are expected to appear in the volume "Archaeology, sea level and coastal changes."

Lastly, the 1986 annual meeting of IGCP 200 was organized in October by the Institute of Oceanology of Academia Sinica in Qingdao (China) during the Symposium "Sea-level changes and applications." This successful meeting, which was attended by more than 100 people from 19 countries, made possible this first and very fruitful contact between sea-level scientists from China and from abroad. The 32 papers given in Qingdao and Yantai were representative of a very wide range of geographical areas, methods of approach and time scales in sea-level research.

The area best represented in the Abstracts volume was indeed that of the coasts of China. Among the 50 papers announced, however, only six could be given personally and often summarized the results obtained by others' coworkers. In addition, over 15 full papers in English were available in preprint form. Other papers on Asia were devoted to Hong Kong, Korea, Japan and Indonesia. Europe was represented with eight papers on Fennoscandia, the North Sea coasts and the Mediterranean; the Americas with papers on Arctic Alaska,

eastern Canada, Connecticut, South Carolina, California, Brazil and Argentina. Other papers dealt with the Great Barrier Reef, the western Indian Ocean, the North Pacific Ocean and with global processes.

The time scales investigated varied from the early Quaternary to the most recent decades, with several attempts even being made to project into the near future. Among the methods of dating, the Electron Spin Resonance (3 papers) appears very promising in the range between 10 and 10^6 years.

From a thematic point of view, coastal and shelf geomorphology, neotectonics, stratigraphy, karstology, oxygen isotopes and palaeoclimatology have proved valuable as approaches to sea-level research.

An important aspect which emerged from the Qingdao meeting (as well as from the Cork meeting) is that of coastal management, with some papers attempting to define the impact on coastal lowlands of an assumed sea-level rise. For the time being, however, determination of the eustatic component of sea-level change remains a challenging problem, the present weak eustatic component being obscured by much stronger tectonic, glacio-isostatic, oceanographic and atmospheric effects.

Well-organized field excursions took place in Qingdao (8 October) and Yantai (11 October). They were attended by 32 and 40 participants respectively, including 11 members of the Executive Board, delegates of 16 national working groups (Argentina, Australia, Canada, China, Finland, France, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Spain, the United Kingdom, the USSR, Yugoslavia), the provisional working group of Hong Kong, the INQUA Neotectonic Commission and the CCCO (IOC-SCOR) as well as individual participants from Sweden and the USA.

Progress reports and information were given by members of the International Working Group (for more details see the 1986 Administrative Report). It was regretted that the high costs of most international meetings prevent scientists from developing countries (and in many cases also from developed countries) from attending them. It was also regretted that no new national correspondent to Project 200 had been appointed by the IGCP Committee of the USA since the resignation of J.K. Kraft in October 1985.

Discussion mainly concerned future international sea level activities after the scheduled conclusion in 1987 of IGCP 200. The final reports that will be presented next year by the coordinators of

various regional and thematic working groups of the Project are expected to demonstrate excellent progress in many topics of sea-level research and it is essential to find how our activities can be continued after 1987.

Several scenarios can be considered in 1988.

1. The continuation of IGCP 200 "on an extended term".
2. A new 5-year IGCP sea-level project.
3. A 2-3 year transition project, focused on specific goals, in order to preserve the momentum of IGCP 200 and prepare future activities in the framework of the "Global Change" programme.
4. A new project on sea level under the umbrella of INQUA.
5. The creation of an international society for sea-level research.
6. The dismantlement of the present structures and a disbandment, with participants in IGCP 200 joining other groups or projects (INQUA Shorelines Commission, Global Sedimentary Geology Program, OSNLR, *etc.*).

The lack of financial support makes scenario no. 1 unattractive. Scenarios 3 and 4 depend on the identification of possible sources of financial support. For the scenarios 2, 3 and 4, new proposals and a new project leader are needed. Nobody seems in favour of scenario no. 6.

During the discussion it was stressed that many major areas of the world have not yet been studied and that new programmes of sea-level research are needed in several countries (*e.g.* China, Argentina, Sri Lanka), whereas new sea-level research may not be perceived as an urgent necessity in other countries (*e.g.* Scandinavia).

Some participants have suggested that a new project should focus on a specific central theme (*e.g.* coastal lowlands) and/or on regions, knowledge of which is still scant (*e.g.* Asia, Latin America), whereas other participants would prefer to increase collaboration with physical oceanographers and climatologists and to develop modelling and applications. It was also considered that Holocene sea-level research is a key for geologists to understanding the past (oil industry) and for climatologists, present and near-future trends.

In order to prepare the decision to be taken at the final meeting of the Project in 1987, the leader of IGCP 200 calls for new proposals to be circulated and discussed during the next few months, and hopes to see the emergence of a fresh project with a new Project leader.

Activity Planned in 1987

The final meeting of IGCP 200 will be held in Halifax and Ottawa (Canada) in July-August 1987. In Halifax the "International Field and Symposium Meeting on Quaternary Sea-Level Correlation and Applications" (19-30 July) will give all the participants an opportunity to present their contributions to IGCP 200 and to take part in discussions on future sea-level activities. In Ottawa, during the INQUA Congress, IGCP 200 will co-

sponsor Special Sessions 13 (August 3: shoreline change and its impact on coastal development) and 16 (August 4: sea-level changes as a measure of climatic and geodynamic processes) and contribute to the Special Session 18 (August 4: global change).

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IGU (INTERNATIONAL GEOGRAPHICAL UNION)

Study Group on Marine Geography Barcelona, Spain, September 1986

Lines of Research

Interest in the economy of the sea and the relations between marine resource exploitation and management of coastal areas has been growing steadily in recent years among geographers. This has partly been an effect of the convergence of political strategies and technological progress which led, in 1982, to the conclusion of the Law of the Sea Convention, which stimulated discussions in all countries, as well as promoting national political behaviour, economic enterprises and further progress in new fields of marine technology. In such a framework, geographical researchers are being involved in the investigation of a wide range of processes affecting deep-sea areas, as well as coastal zones and littoral regions. The world-scale at which such investigations should be accomplished and the need of an overall exchange of information, assembling experiences from different national frames, strongly suggest a more specific and systematic attention of IGU through the activation of a Study Group on new aspects of Marine Geography. The Group could focus its attention on a few selected themes of research, which are briefly described hereunder.

A. Geopolitical implications of the Law of the Sea

The Law of the Sea Convention has left unsolved some traditional problems and raised some new

ones in relation to the activation of new legal institutes and the transformation of pre-existing ones. On these grounds, attention should focus (i) on the implications of conflicts between international and national laws and (ii) on resulting behaviour in the exploitation of marine resources. Such problems as the delimitation of inland waters, territorial waters, continental shelf and the establishing of the exclusive economic zone require a geographical approach in two ways: (i) for the way in which they should be regulated by the Law of the Sea Convention and consequent problems, and (ii) for the implications related to their inclusion in national legislation. As far as national situations are concerned, the Study Group should carry investigations at two different scales. At a regional scale, marine and coastal areas pertaining to one single country or a limited number of countries facing the same basin could be considered. This would include archipelagic and inland areas, which appear of peculiar relevance when they involve difficult international relations, as in the Mediterranean. At a global scale, large and emerging oceanic areas such as the Pacific seem worthy of a thorough and coordinated investigation, requiring contribution from a large number of countries.

B. Geoeconomic problems related to the contemporary oceanic world

The evolution in the utilization of merchant fleets, the development of new poles of maritime interchange, and many other factors related to the uses of marine areas have changed both the role and weight of maritime routes and navigational spaces.

A general geoeconomic approach has become necessary for the comprehension of the contemporary oceanic world.

C. Sea-land connections

Various aspects of the uses of biological, energy and mineral resources at sea should be examined in the effects they produce in the form of connections between the sea and land. Objects of specific investigation could be (i) the setting of industrial chains based on sea-land productive cycles and (ii) the spatial division of labour originating from stages of production located offshore and stages located along coastal areas as well as inland, (iii) the organization of sea transport networks, (iv) the transformations that coastal areas undergo in terms of industrial structures and service activities somehow linked with sea uses.

D. Nearshore planning

The spreading offshore of human activities by means of permanent or semi-permanent installations as harbour terminals, floating workshops, pipelines, etc., stimulate a growing demand for coastal planning, based on unprecedented integration between shore and offshore. This leads to the identification of a sea-land area which, on a geographical basis, may be classified as a coastal region, thus being the object of coastal planning. Aspects concerning coastal planning will be approached only in their connections with the uses and management.

E. Deep-sea areas regionalization

Present deep-sea uses and future large-scale

mining of polymetallic sulphides are leading to structures located in deep-sea areas. Settlements on islands and platforms will result in new patterns of interrelations between man and the marine environment, thus forming new deep-sea regions. These processes are being encouraged by jurisdictional zones provided for by the Law of the Sea and are apt to deeply change relations between man and the sea, as well as sea-land interactions, especially in the near future. These assumptions seem to justify the inclusion of such aspects in the Group's fields of interest. According to the advancement of deep-sea regionalization it would be fit to envisage planning extended to the EEZ.

Approaches and Objectives

The proposed Study Group could operate along three distinct approaches:

(i) *thematic approach*, including the identification of models of analysis and planning, the elaboration of methodologies, the studying of problems related to the application of the Law of The Sea;

(ii) *regional approach*, including a series of case studies in oceanic and nearshore, leading to planning and decision-making behaviour; and

(iii) *educational approach*, with the objective of training geographers specialized in marine studies, with particular emphasis on the uses of resources, geopolitical issues and planning.

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COASTAL SEDIMENTS '87

Final plans for COASTAL SEDIMENTS '87, an international specialty symposium on advancements in scientific understanding of coastal sediment processes, are nearly complete for a mid-May 1987 meeting in New Orleans.

Response to the Call for Papers was greater than anticipated, with over 250 abstracts from 22 countries submitted, a result of the fact that the last Coastal Sediments conference was held ten years ago—a hiatus which was obviously too long. The technical program committee had the herculean task of reviewing the many abstracts, a job made even more difficult by the fact that most of them

were of high quality and only 160 could be accepted to fit the 3-day program format. Therefore, many good papers were necessarily rejected.

COASTAL SEDIMENTS '87 will be divided into three concurrent thematic sessions: (1) Fundamentals of Coastal Sediment Transport, (2) Engineering and Coastal Sedimentary Processes, and (3) Coastal Geologic Processes. A poster session consisting of 18 papers is also planned. Keynote speakers will be Professor Robert G. Dean and Professor L. Don Wright.

A special panel discussion on "The Effects of Seawalls on the Coast," composed of G. Griggs,

K. Horikawa, O.H. Pilkey, and J.R. Weggel, with P.D. Komar as moderator, is scheduled for Wednesday, May 13, 1987.

COASTAL SEDIMENTS '87 will be held at the Holiday Inn Crowne Plaza Hotel in New Orleans on May 12-14, 1987. On May 11 th, three short courses will be offered: (1) Coastal Sediments—Coastal Modelling, (2) Barrier Shoreline Geology and Protection in Louisiana: a Short Course, and (3) Coastal Sediment Movement. Several post-conference

tours of the Port of New Orleans and the Louisiana coast are also planned. Details on the courses and tours as well as the final technical program will be available in a final conference brochure by February 1987.

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