

# 100 years of international cooperation in hydrography

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## Preamble

This manuscript is a reprint of the original paper previously published in 2021 in the Journal of Applied Hydrography (Hydrographische Nachrichten, <https://www.dhyg.de/index.php/de/hydrographische-nachrichten>): Ehlers, P. (2021). 100 years of international cooperation in hydrography. *Hydrographische Nachrichten · Journal of Applied Hydrography*, 119, 62–70. <https://doi.org/10.23784/HN119-10>

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## Abstract

Peter Ehlers was to give a speech at the 2<sup>nd</sup> Session of the Assembly (2020) in Monaco, which was to mark the 100<sup>th</sup> anniversary of the International Hydrographic Organization (IHO). Sadly, the speech was cancelled due to the exceptional circumstances posed by the COVID-19 pandemic. His words were left unspoken. Nevertheless, as Peter Ehlers still had something of significance to say, we are now publishing the manuscript of his intended speech.

**Keywords**

IHB · IHC · EIHC · GEBCO · RHC

## Resumé

Peter Ehlers devait prononcer un discours lors de la 2<sup>ème</sup> session de l'Assemblée (2020) à Monaco, qui devait marquer le 100<sup>ème</sup> anniversaire de l'Organisation hydrographique internationale (OHI). Malheureusement, le discours a été annulé en raison des circonstances exceptionnelles provoquées par la pandémie de COVID-19. Ses propos n'ont pas pu être prononcés. Néanmoins, comme Peter Ehlers avait encore quelque chose d'important à dire, nous publions aujourd'hui le manuscrit du discours qu'il avait prévu de prononcer.

## Resumen

Peter Ehlers iba a dar un discurso durante la 2<sup>a</sup> Sesión de la Asamblea (2020) en Mónaco, que iba a señalar el 100<sup>º</sup> aniversario de la Organización Hidrográfica Internacional (OHI). Por desgracia, hubo que cancelar el discurso debido a las circunstancias excepcionales generadas por la pandemia del COVID-19. Sus palabras quedaron sin pronunciarse. A pesar de ello, como Peter Ehlers aún tenía algo relevante que decir, publicamos ahora el manuscrito del discurso que tenía previsto. (IHO) practices to support its member states, how it can improve its own policies, and how the IHO and member states can collaborate to support their needs and those of people who are at greatest risk of climate change-related hazards.

## 1 Call for cooperation

Maybe that some time in future the past 100 years will be noticed as the initial period of globalisation. The bad experiences from two world wars led to ever closer international cooperation, which aimed to

maintain peace, but also intensified the exchange of information on many technical issues and promoted common, uniform standards. The different parts of the world came closer and closer together. This was particularly evident in the economic relationships that

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were characterised by ever-increasing world trade. Since world trade is predominantly carried out by sea, safety of navigation has become increasingly important, also in the interest of protecting the marine environment. A basic requirement is the availability and provision of current and precise hydrographic information. While in old times states used to keep hydrographic information more like a secret treasure – it is no coincidence that the first Danish hydrographer Jens Sorensen was called »Spy and Hydrographer« – since the end of the 19<sup>th</sup> century the voices increased that advocated closer international cooperation. At international maritime conferences 1889 in Washington and St. Petersburg in 1908 and 1912 the advantages of uniformity in nautical charts and publications through international cooperation were highlighted. However, only after the First World War time had come for a first International Hydrographic Conference (IHC), which was initiated by the British and French hydrographers and held in London in 1919.

## 2 The IHB Statutes

The 1919 conference in principle adopted a proposal to establish an International Hydrographic Bureau (IHB) as a permanent international body to maintain a close association among the participating hydrographic offices. For preparing the statutes and specific directions of the IHB a special committee was appointed which after the conference elaborated draft Statutes. By April 1921 they were approved by 19 States. The Statutes formally established the IHB and defined as its object a close and permanent association between the hydrographic services of the Member States to coordinate their efforts with a view to rendering navigation easier and safer in all the seas of the world, causing the national offices to adopt the rules taken by an international hydrographic conference, obtaining uniformity as far as possible in hydrographic documents, and advancing the theory and practice of the science of hydrography. In order to discuss questions concerning hydrography and in particular to review and guide the work of the IHB, an ordinary IHC was to be arranged originally every six years, but it was changed to five years before the first instance. The IHB, which was a consultative body only should be controlled by a Directing Committee, composed of three Directors of different nationalities, elected by the IHC, a Secretary General and further staff. The director elected with the highest number of votes should be the President of the Committee, acting as *primus inter pares*. The expenses should be borne by subscriptions from the Member States, divided into shares which are dependent on the total tonnage of a Member State. English and French are determined as official languages. The Statutes declared that Monaco should be the official seat, following an invitation of Prince Albert I. These Statutes did not create an international organisation in the modern

understanding but were restricted to jointly setting up and operating a bureau to be led by a triumvirate with decisive powers and supervised only in long intervals by meetings of the »owners« who acted as shareholders. From the very beginning the question as to whether such a construction was adequate and efficient for international cooperation was raised again and again.

## 3 Start-up and persistence in hard times

Following the approval of the Statutes the first three Directors were elected by postal ballot. The counting of the ballots took place on 21 June 1921 at a meeting of the special committee in London in the presence of representatives of several States. This date has to be seen as the official date of the establishment of the IHB. The Directors immediately moved to Monaco and started work, concentrating in particular on internal administrative measures. A quite urgent issue was the relationship with the League of Nations. On 5 October 1921 the Council of the League adopted a resolution stating that the IHB »shall be placed under the direction of the League«. Step by step the general and technical work of the IHB progressed including the collection of surveys carried out, their methods and progress, studies relating to navigation, lights, tides and magnetism as well as information on the methods and processes used for compilation, updating and publication of charts and other nautical documents. For distributing all relevant information about new developments to hydrographic offices (HO), the IHB started in 1923 to publish the International Hydrographic Review, and to edit Special Publications. On specific technical and administrative subjects Circular Letters were sent out. Annual Reports describing progress made, including a business and financial report, provided further information and were complemented from 1927 by an IHB Yearbook. In addition, from 1928 prompt information was disseminated by the International Hydrographic Bulletin, which initially was published monthly. A Repository of Technical and Administrative Resolutions was gradually built up.

The first IHC organised by the IHB, which was counted as the second IHC after 1919, took place in the Oceanographic Museum of Monaco in 1926 with the participation of 42 delegates from 21 of 22 Member States and two non-Member States. The conference agenda addressed 69 topics, including charts, sailing directions, lists of lights, notices to mariners, catalogues, geographical names, instruments, ocean currents, tides and hydrographic surveys, but also modifications of the Statutes, the financial administration and the election of the Directors and the Secretary General for the next five-year period. As not all issues could be fully examined a Supplementary Conference, counted as the first Extraordinary International Hydrographic Conference (EIHC), was held in April 1929 discussing among other issues for the

first time the problem of copyright of hydrographic publications. During the conference, the foundation stone for new premises of the IHB was laid. After completion the building was inaugurated by Prince Louis II of Monaco on 14 January 1931, so that in 1932 the 3<sup>rd</sup> IHC could be held in the chartroom of the IHB premises. At that conference a specific proposal dealt with the definition of hydrography as the »science by which data concerning the true configuration of the earth, as far as navigation demands, are determined and laid down in charts, Sailing Directions and appertaining publications«. This definition reflects the perception at that time that hydrographic data were relevant for navigation only. The conference also accepted responsibility for the production of the General Bathymetric Chart of the Oceans (GEBCO), originally initiated by Prince Albert I, which since then has been a subject of particular interest.

In the 1930s the IHB negatively suffered from the world economic crisis and adverse political developments. Several Member States withdrew from the IHB. A considerable decrease of the contributions decreased forced the IHB to reduce salaries and the expenses for publications. The difficult financial situation dominated the 4<sup>th</sup> IHC in 1937, which was only attended by 20 representatives from twelve of 17 Member States. Amongst the various resolutions adopted, was the decision to compile a standard dictionary of hydrographic terms, a task that has quickly proved to be permanent, and therefore continues to this day.

The situation became far more difficult with the outbreak of World War II. Four more States withdrew their membership, two Directors went to their home countries, several staff members left the IHB. The one remaining IHB Director, Pierre de Vanssay de Blavous (France), carried on conducting and maintaining the work as best possible under wartime constraints despite of discussions to suspend all activities and to stop the payment of contributions. In December 1943 and August 1944 the building was severely damaged by bombing, but recovery plans were initiated soon and repairs were carried out by August 1945.

#### 4 Securing a firm basis

At the end of 1945 the IHB could return to normal operation. The Hydrographic Dictionary was published in which hydrography was now defined more comprehensive, but still concentrating on navigational purposes. Relations with other international organisations were renewed or newly established. In spring 1947 the 5<sup>th</sup> IHC could be held, 16 of 17 Member States participated together with observers from seven former Member States as well as from the recently established United Nations, UNESCO and some other international organisations. Spanish was introduced as a third conference language. Initiatives to considerably re-organise the IHB resulted in a revised version of the Statutes without changing the legal character, the leading principles and the general structure. A proposal to become an integrated

entity within the framework of the United Nations was rejected as the conference was in favour of having an independent international organisation of mere technical character, free from general political issues. In the following years quite a number of States returned to IHB membership. The 6<sup>th</sup> IHC in 1952 was attended by 26 out of then 30 Member States, two non-Members and twelve international organisations, proving the great interest in the work of the IHB. The conference was also used to disseminate broader information by lectures given by participants and by an exhibition of instruments, which as a side effect became increasingly important at following IHCs.

At the 7<sup>th</sup> IHC in 1957 again items relating to constitutional and administrative issues were brought forward, in particular concerning the legal status of the IHB. Therefore, the burdensome process for elaborating a formal convention to achieve recognition of the IHB as an intergovernmental organisation was initiated. After laborious inter-sessional approaches, the issue was re-discussed at the 8<sup>th</sup> IHC in 1962 with participants from 35 of now 41 Member States and three non-Member States. The conference approved that a convention should be prepared to be adopted some months later on an extraordinary IHC. However, it took additional five years before the 9<sup>th</sup> IHC in 1967 finally approved the text of an IHO convention. The legal adoption process took further three years, but at last on 22 September 1970 the IHO Convention entered into force. And by this the IHO came into existence as a truly intergovernmental organisation with its own juridical personality. The convention maintained full continuity with the preceding IHB Statutes by taking up their substantial principles, basic objects, goals and functions. The IHC became now the assembly of the members of the organisation and the IHB, composed of the Directing Committee and the professional staff, the executive body or secretariat of the organisation, whereas the additional post of Secretary General was waived. As the Convention was more or less restricted to some main principles and provisions, it was supplemented by General Regulations and Financial Regulations, containing specific rules of procedure. In addition, a Host Agreement was drawn up, which after lengthy negotiations was signed by Monaco and France in 1978.

#### 5 Consolidation in a changing world

Although the period after 1957 was essentially marked by the struggle for a convention, a new focus was also set on other topics. In the 1960s and 1970s great significance was attached to the improvement of hydrographic surveys. This included specifications for hydrographic survey operations, the compilation of an index of those areas, which had not been surveyed to a standard appropriate for modern navigation requirements, but also the development of a curriculum reflecting the basic standards of excellence, which should be common to all surveys. Together with the International Federation of Surveyors (FIG) a joint Inter-

national Advisory Board on Standards of Competence for Hydrographic Surveyors was established.

At the 9<sup>th</sup> IHC in 1967 a first step was made to establish an international charting system, initially confined to charts at small scale. After the publication of the first INT charts in 1972, the 10<sup>th</sup> IHC extended the concept to medium and large scale charts, so that international shipping could navigate along all the major sea routes and enter all major ports of any country by using standardised INT charts.

It became more and more obvious that hydrographic data and information were not required for navigation only, but also for other purposes related to the use and protection of the seas and as a basic tool for countries to manage their marine areas. Whereas the fishery industry had since long been interested in specific hydrographic data, the increasing offshore activities, aiming at the exploitation of hydrocarbons, created a growing need for precise hydrographic data.

Another issue that took more and more prominence was technical assistance in the field of hydrography. The 10<sup>th</sup> IHC in 1972 explicitly decided that the IHB should serve as a source of technical advice and as a coordinating body for the promotion of measures to establish or strengthen the hydrographic capabilities of developing countries, taking into account that at least 50 coastal States had no hydrographic services at all, whereas the hydrographic capabilities in many other developing countries were extremely limited.

In the field of navigation and oceanography cooperation with other international organisations became more and more important. The IHO closely collaborated *inter alia* with the IMCO, now the IMO, the IOC of UNESCO, IALA, WMO, and also participated in the UN conferences on the law of the sea, starting in 1973 with the aim to elaborate a new convention. To strengthen the cooperation between neighbouring HOs the 9<sup>th</sup> IHC formally accepted and encouraged the establishment of Regional Hydrographic Commissions (RHC) to cooperate in the solution of common regional problems of charting, research or data collection. At the beginning of the 1970s six RHCs were active. The IHO membership steadily increased and in 1972 reached 43, the 10<sup>th</sup> IHC was attended by 37 of the 43 Member States, six non-Member States and 24 intergovernmental and other international as well as national organisations and associations. Due to the large number of participants the IHC could no longer be held at the IHB premises, but was organised in the »Centre des Rencontres Internationales«. As an important platform for the hydrographic community the conference was supplemented by lectures, an exhibition of hydrographic, oceanographic and navigational instruments and products, and the visit of several hydrographic vessels. In 1977 the 11<sup>th</sup> IHC introduced Russian as a fourth working language together with English, French and Spanish.

As the workload steadily grew, the IHB made more and more use of the knowledge and experience by

groups, formed of specialists from Member States. If appropriate such groups were established in partnership with cooperating international organisations. Confusingly, the naming of these bodies differed between working groups, ad hoc groups, commissions, committees and even advisory boards. Due to increasing tasks and responsibilities in the 1960s the IHB staff, not including the Directing Committee, had been expanded to 19 persons, but in the 1970s was reduced again to 15 persons because of economic menaces, despite considerable increase in contributions to be paid by the Member States.

## 6 New challenges

In the 1980s the IHO had to face new challenges. Hydrographic activities were more and more influenced by technological developments, in particular by the increasing use of computers, which opened a wide field for digitisation. Close international cooperation gained further weight. The workload of expert groups constantly became heavier. In the mid-1980s there existed ten commissions, committees, sub-committees and working groups in total. A decade later the working load had further increased. The 1993 Annual Report cited 24 commissions, committees and working groups of the IHO, including joint bodies with other organisations, and contacts with 37 international organisations and associations. Yet the now existing eight RHCs also took on specific projects, which they carried out for the benefit of the whole hydrographic community, in particular as concerns INT charts. Additionally, because of increasing activities in Antarctica, in 1992 the 14<sup>th</sup> IHC established a Permanent Working Group on Cooperation Concerning Hydrographic Surveys and Charting in Antarctica. The efforts were intensified to increase awareness in developing countries that hydrography was needed for the safety of navigation as well as for tasks relating to the marine environment, coastal research and coastal engineering. These technical assistance activities included contacts with Governments, expert missions and workshops together with other organisations, training courses at several maritime academies and the encouragement of HOs to transfer excess equipment to needy nations.

The setting up of a committee on the exchange of digital hydrographic and charting data between HOs by the 12<sup>th</sup> IHC (1982) may be marked as the very beginning of the development of an electronic chart system. Some time later the considerations led to the creation of an IMO/IHO Harmonization Group on ECDIS. At the beginning of the 1990s the development of ECDIS became a major issue of the work of the IHO and resulted in the elaboration of precise standards and specifications. The 14<sup>th</sup> IHC (1992) set up a special committee to examine matters related to the establishment of a Worldwide Electronic Chart Data Base (WEND) as an indispensable prerequisite to introduce Electronic Navigational Chart (ENC) services. In November 1995, the IMO Convention on

Safety of Life at Sea was amended for an electronic chart display and information system to be accepted as satisfying the chart carriage requirements, referencing the IHO performance standards for ECDIS. An important milestone in the history of hydrography and navigation was the introduction of the first operational ENC service, offered by the regional electronic navigational chart centre PRIMAR in Norway in 2000, which was opened by King Harold of Norway.

Another crucial issue was the publication of nautical documents by private publishers, resulting in the decision that no HO may grant permission for reproduction, if the area in question includes data collected by another HO, as the data belong to the originator.

Since the entry into force of the IHO Convention the IHC repeatedly discussed internal matters of the organisation, in particular concerning the most effective structure and composition of the Directing Committee. The 13<sup>th</sup> IHC (1987) even amended the convention to introduce a new election procedure. However, this amendment never came into effect, as the necessary quorum for formal approval was not achieved. Another issue were the service conditions which at the 14<sup>th</sup> IHC led to the approval of further convergence with the relevant conditions in the UN system.

In the 1980s the annual income of the IHO grew steadily because of increasing membership. At the end of the decade 57 States were members of IHO. Yet the workload of the IHB and all the different expert bodies significantly increased accordingly. The output of publications informing about the results of the various activities tripled, not the least thanks to the acquisition of modern printing equipment and computerisation that speedily advanced in the 1990s. The internet dramatically facilitated communication. More and more digital versions of publications and documents were made available. The use of the Spanish language was enhanced, when the 14<sup>th</sup> IHC tasked the IHB to use Spanish for certain periodical publications, Circular Letters and correspondence.

## 7 Facing the third millennium

In late 1996, 75 years after its inauguration, the IHB premises were moved to the opposite side of the harbour to the new location 4 Quai Antoine 1<sup>er</sup>. This heralded a phase of great change. With about 300 delegates from 52 of 63 Member States, 18 non-Member States and 15 organisations and associations the 15<sup>th</sup> IHC (1997) was larger than ever before. The conference was marked by the growing awareness that changing and adapting to new developments had become more and more urgent in order to survive in the future. A more systematic internal structure of the IHO and a clear strategic orientation were needed. The conference adopted clear principles for the formation of inter-sessional subsidiary bodies and general guidelines for the creation of RHCs, which were understood as part of the IHO. With regard to the question of how to cope with future challenges in the field of hydrography to be prepared for entering

the 21<sup>st</sup> century, an inter-sessional Strategic Planning Working Group (SPWG) was established.

Acknowledging that the copyright of the data belongs to the HO that is the originator of the data which are included in a chart or a nautical publication, the 15<sup>th</sup> IHC approved principles to be applied by HOs when permitting private publishers to reproduce charts or nautical publications. Furthermore, new rules for the exchange and the reproduction of nautical products on the basis of bilateral agreements between HOs were accepted.

The growing importance of assisting countries in developing hydrographic capabilities was reflected in 1998 by a UN General Assembly Resolution on oceans and the law of the sea, which on the occasion of the International Year of the Ocean for the first time made reference to hydrography and explicitly invited States to carry out hydrographic surveys and to provide nautical services. The IHO concentrated on capacity building activities by conducting technical assistance visits and accompanying development projects to be implemented with the support of donor organisations. Not the least these activities encouraged additional States to establish hydrographic services and to become members of the IHO. In 2000 the membership had increased to 69 Member Governments. At the same time twelve Regional Hydrographic Commissions and the Committee for Antarctica existed, covering most of the major sea areas worldwide.

In a time of globalisation when maritime transport was steadily growing and the risks for the marine environment in case of casualties were expanding, accurate hydrographic information became more important than ever for safe navigation. It was only logical that the IMO in 2000 revised Chapter V of the International Convention for the Safety of Life at Sea (SOLAS) to introduce new regulations that oblige Contracting Governments to carry out nautical and hydrographic services in the manner most suitable for navigation. Charts and nautical publications must be issued by or on behalf of a relevant Government institution. These regulations, which entered into force in 2002, may be seen as a quantum leap for HOs. For the first time international law created an obligation for States to maintain hydrographic services, as well as a firm commitment to cooperate, standardise and coordinate activities on a worldwide scale. The increasing interest in hydrographic matters was also shown when in 2001 the IHO, though for good reasons still not interested in becoming a UN organisation, was granted observer status to the UN General Assembly.

Based on an analysis of the strengths and weaknesses of the organisation and the opportunities and threats facing it, the SPWG developed strategic goals and priorities of IHO, examined necessary structural or constitutional changes to enhance the future effectiveness, proposed a strategic planning cycle and presented a strategic plan. To speed up the process the results of the SPWG were discussed at a supple-

mentary conference, the 2<sup>nd</sup> EIHC, in 2000. The conference adopted the proposed new Strategic Plan, which highlighted as main strategic issues the transition to the digital era, a global hydrographic data coverage, the response to developments of Government policy, the adequate funding for the provision of hydrographic services, the building up of effective national organisations and the provision of services other than for navigation. For implementing this plan, a work programme for the next five-year period and the future planning cycle were approved. The SPWG continued to study especially the need of structural changes and was tasked by the 16<sup>th</sup> IHC (2002) to carry out a study on the need to revise the IHO Convention.

Considerations, which had started in the 1970s, that hydrographic data were not only important for navigation, became more and more evident. The demand grew for hydrographic data for other purposes, especially for fishing, offshore activities, coastal protection, harbour construction, and marine scientific research; non-navigational applications had to include the determination of national maritime boundaries, coastal zone management, modelling of marine areas, study of habitats, assessment of the state of the marine environment and exercise of national rights in maritime zones. Accordingly, the IHO understood the provision of hydrographic data for geomatic applications as an important new policy direction.

## 8 Renewing the IHO

The work to reform and modernise the IHO, especially done by the SPWG, came to a conclusion by a 3<sup>rd</sup> EIHC in 2005 in agreeing on far reaching amendments of the IHO Convention. The main objectives of the amendments were to maintain the strengths, eliminate the weaknesses, achieve the vision, mission and objectives of the IHO and establish a more effective and cost-effective system. The new version of the convention clarifies that the IHO is the competent international organisation for hydrography and defines its vision, mission and objects. The organisational structure and procedures are drastically changed. The IHC is now named the Assembly, being the principal organ of the IHO, and has all the powers of the organisation unless otherwise regulated. The period between ordinary sessions of the Assembly is reduced to three years. In addition to the Assembly a Council is created. It is composed of one fourth, but not less than 30 Member States. The functions of the Council are to guide and coordinate the IHO activities during the inter-Assembly period. The term International Hydrographic Bureau (IHB) is replaced by the term Secretariat, which comprises of a Secretary General as the chief administrative officer, Directors and other personnel. Supplementary detailed provisions were adopted by the 17<sup>th</sup> IHC in 2007, including General Regulations and Rules of Procedures for the Assembly, the Council and the Finance Committee. In anticipation of the Convention

amendments, which had not yet entered into force, the 17<sup>th</sup> IHC also decided on a new structure for the subordinate bodies by establishing the Hydrographic Services and Standards Committee (HSSC) and the Inter-Regional Coordination Committee (IRCC) as main committees. The hitherto unclear legal nature of the existing 15 RHCs was explicitly regulated, as being regional bodies established by Member States, but recognised by the Assembly. A special status was maintained for the Hydrographic Commission on Antarctica.

Capacity building, in particular, gained more and more importance and was strongly influenced by the RHCs and further enhanced by annual UN General Assembly Resolutions on the Law of the Sea, which repeatedly welcomed the work of the IHO and its Regional Commissions. The importance of international cooperation and the support for developing States in building up hydrographic capabilities became highly obvious after the tsunami disaster in December 2004 and was reconfirmed in response to the earthquake and tsunami in Japan in 2011. The 18<sup>th</sup> IHC in 2012 agreed on revised guidelines and procedures with the aim of helping Member States to develop contingency plans in case of anticipated disasters.

In 2005 the UN General Assembly explicitly welcomed the adoption by the IHO of a »World Hydrography Day« to be celebrated annually on 21 June, as the date of creation of the IHB, with the aim of giving suitable publicity to its work and of increasing the coverage of hydrographic information on a global basis.

Especially concerning ECDIS, the collaboration with IMO became even more intensive, as the work of the IHO depended on the acceptance of performance standards and carriage requirements to be determined by IMO. As a first step, in 2006 the IMO made the carriage of ECDIS mandatory for high speed craft. Three years later in 2009 the mandatory carriage for other than high speed craft was introduced by IMO in a phased manner from 2012 onwards. In the light of this development the 17<sup>th</sup> (2007) and 18<sup>th</sup> IHC (2012) underlined the importance of full ENC coverage and the need in many parts of the world for improving the collection, quality and availability of hydrographic data.

In order to manage the many different seaborne uses and interests, the need for precise marine data became more and more evident, not the least as an indispensable basis for the development of marine spatial planning programmes. Hydrographic data were seen as an important part of an adequate marine data infrastructure. HOs had to move from map production as their primary focus to the management and operation of, or the participation in, marine spatial data infrastructures (SDI) from which nautical charts and other products were derived. The 4<sup>th</sup> EIHC (2009) adopted a Marine Spatial Data Infrastructure Policy, in 2011 the IHB launched a specific IHO Publication on »Spatial Data Infrastructure – the Marine Dimension«, which explained the way that HOs might provide hydrographic-related data as part of the national SDI.

Another further remarkable step towards the modernisation of the IHO was made by the 4<sup>th</sup> EIHC. The starting point was a new definition of hydrography as »the branch of applied sciences which deals with the measurement and description of the physical features of oceans, seas, coastal areas, lakes and rivers, as well as with the prediction of their change over time, for the primary purpose of safety of navigation and in support of all other marine activities, including economic development, security and defence, scientific research, and environmental protection«. The broad new definition was reflected in the revised Strategic Plan that was not a mere updating of the earlier version but introduced a new systematic approach and the use of modern management tools, which was to be implemented by a new structured Working Programme, including annual performance monitoring. The 4<sup>th</sup> EIHC also invited the relevant RHCs to encourage through appropriate liaison bodies the consistent use of hydrographic standards and mutual cooperation for the enhancement of safety in navigable inland waters within and between regions, as no other organisation was in a position to foster this harmonisation.

In the 2000s cooperation with private industry steadily became closer. The exchange of information and experience with stakeholders from academia, industry, government and non-governmental organisations was intensified through stakeholders' forums. A special information session, held at the 5<sup>th</sup> EIHC (2014), in particular dealt with the collection of bathymetric data collated by private crowd-sourcers, as new technologies could be used by private entities leading to the development of open-sea-map behaviours.

The conferences in 2012 and 2014 devoted particular attention to the progressively increased workload and scope of the IHO, which was mainly due to the rising number of Member States, more RHCs and more regular RHC meetings, secretariat functions for IHO bodies, the implementation and management of the capacity building programme, the maintenance of the very comprehensive IHO documentation and website, the introduction of programme performance monitoring, the involvement in outreach activities and the active recruitment of new Member States, implementation measures related to ECDIS, participation in the development of the IMO e-navigation strategy and representation in a number of new intergovernmental initiatives. At the same time the transition from paper to digitally-based hydrographic products and the broader use of the IHO data transfer standard placed an increased responsibility and obligation on the IHO to ensure the reliable maintenance of the standard.

## 9 IHO today

After twelve years the necessary quorum for the approval was met and the Protocol of Amendments to the IHO Convention entered into force on 8 November 2016. The new structure of the IHO was put in place

without significant problems. The IHC now became the IHO Assembly. As an additional powerful organ, the Council was established to act in operational control of the organisation for the inter-sessional period. And the former IHB was renamed to IHO Secretariat. The now 87 Member States held the first Assembly meeting in spring 2017, adopted the necessary organisational and procedural adaptation measures, approved the composition of the Council, and elected Mathias Jonas, the former head of the Nautical Hydrographic Department of the BSH (Federal Maritime and Hydrographic Agency, Germany) as Secretary General as well as two assisting Directors. The Assembly also dealt with numerous technical issues, such as the use of ECDIS, information to mariners about submarine cables, improvement of the availability of bathymetric data worldwide, including crowd sourcing, and participation in geospatial information management activities. Some months later the Council started its annual meetings, focusing on strategic planning, the Work Programme and financial control, including the approval of the budget for the following year. Due to the global effects of the COVID-19 pandemic the second Assembly was moved from April to November 2020 and was only conducted as a remote event by combining Assembly Circular Letters to be decided on in advance and virtual assembly sessions. This hybrid format resulted in 52 decisions, including the future of the paper chart, the further development of the technical standardisation of ENC's, as well as the Work Programme and budget for the next three year-period. Thus, IHO's ability to remain agile and decisive under extraordinary conditions was demonstrated, though the paramount benefit of in-person meetings was recognised by all online participants.

## 10 Conclusion

At its 100<sup>th</sup> anniversary the IHO, which has begun as a Bureau with 19 shareholders, has become the competent global organisation for hydrography, comprising of 94 Member States from all parts of the world, and with an annual budget that increased from originally 242,000 Swiss francs to 3.6 million euros. Over the past 100 years, IHO has consistently succeeded in modernising itself, adapting and expanding its range of tasks and activities in the light of new developments and challenges. Despite all changes and modifications, however, an unbroken continuity has been maintained. It has been proved advantageous that the IHO is not a political, but a technical organisation only. Nor has it been a hindrance that the IHO is of consultative nature only, as technical standards reflect the state of the art and therefore in the end are accepted and applied even if they are not legally binding. While the IHO, for well-considered reasons, is not part of the UN system, it is nevertheless an indispensable element in global efforts concerning safety of navigation and the sustainable development of the oceans.

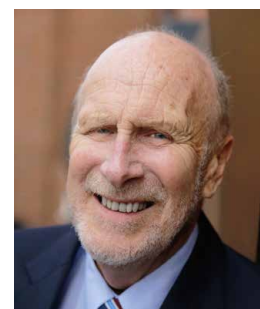
## Author's biography

Prof. Dr. Dr. h.c. Peter Ehlers was born 1943. He studied law at Marburg and Kiel University. After having written his doctoral (PhD) dissertation about IMO he joined the German maritime administration in 1970. He worked for many years in the Maritime Transport Department of the Federal Ministry of Transport where he became Deputy Director General. From 1989 to 2008 he was the President of the German Federal Maritime and Hydrographic Agency (BSH). He represented his country in various international maritime organizations, e. g. IMO, IHO, UNESCO-IOC, Helsinki-Commission; he was twice Chairman of the Helsinki Commission and chaired two International Hydrographic Conferences of IHO. He became a member of numerous German maritime institutions and organizations. He retired in 2008.

Since 1992 he taught law of the sea at Hamburg and Rostock University. In 2002 he became Professor at Hamburg University; in 2007 he was awarded Dr. h.c. at Rostock University. Until its closure in 2014 he was a member of the Board of Directors of the International Max-Planck Research School for Maritime Affairs, Hamburg.

After his retirement he was appointed Chairman of EUROGOOS, an association of European oceanographic institutes; the chairmanship terminated end of 2013. From 2011 to February 2022 he was a member of the Board of Governors of the World Maritime University, Malmö. He is teaching as a guest lecturer for law of the sea and marine environment law at the World Maritime University, Malmö, and the International Law Institute, Malta. In 2018 the Federal Minister of Transport and Digital Infrastructure appointed him as ombudsman for the safety of traditional ships.

In 2016 he became an officer of the German Federal Order of Merit, awarded by the German Federal President.



Peter Ehlers