International Cartographic Association
Association Cartographique Internationale

Directory
2011–2015

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Cover photo: ICA Executive Committee and commission chairs (2011–2015), composition by Manuela Schmidt.

Please send all additions, corrections and modifications to the Secretary General & Treasurer (sg@icaci.org).

This booklet contains information related to the organisation of the International Cartographic Association. It provides succinct information about the organisation for the period 2011–2015.

The International Cartographic Association (ICA) is the pre-eminent international body for Cartography and Geographic Information (GI) Science. It is the world authoritative body for Cartography, the discipline dealing with the conception, production, dissemination and study of maps. Its mission is to promote the discipline and profession of Cartography in an international context.

Since being founded in 1959, ICA has worked with national and international governmental and commercial bodies, and with other international societies, to achieve its aims. To do this an Executive Committee is elected every four years at a General Assembly. The Executive Committee, under the leadership of the President, develops and implements plans for conferences, publications, links to sister societies and outreach programmes.

The ICA has developed a scientific research programme, which addresses a number of areas:

- Geographic Information;
- Metadata and SDIs;
- Geospatial Analysis and Modelling;
- Usability;
- Geovisualization and Visual Analytics;
- Map Production;
- Cartographic Theory;
- History of Cartography and GI Science;
- Neocartography;
- Education;
- Society.

This programme is conducted through Commissions and Working Groups. The Commissions and Working Groups hold regular fora and publish books and special issues of journals to grow their research and development areas.

The hallmark of the ICA has always been inclusiveness, and the organisation strives for global reach and international inclusion. What can be said about the ICA is that it is focused on cooperation and collaboration in the wide field of Cartography and GI Science.

Georg Gartner
President, International Cartographic Association

Section I – Strategic Documents

Foreword[1]

The International Cartographic Association is led by its Executive Committee, which undertakes the plans and activities that are endorsed by the General Assembly of member nations for implementation in the four years following each General Assembly. The Executive Committee is supported by the Chairs and vice-Chairs of Commissions and Working Groups, the Editor of ICA News, the Chairs of the Publications Committee, the Awards Committee, and the Statutes Committee.

During the twenty-first century, the plans and activities of the Association have been directed by the Strategic Plan. The document you are now reading is a new edition of the Strategic Plan. It builds upon the previous plan (2003-2011) which included a review of the Association and provided a considered framework for developing the Association and advancing its aims. The previous work included an independent analysis by former ICA Vice-President David Rhind, presented at the 15th Conference/9th General Assembly in Bournemouth, UK, in 1991, and published in the Proceedings (Rhind, 1991). Professor Rhind's ideas and earlier contributions to EC discussions led to various changes, including a new set of aims, which is still in place today.

This was followed by the publication of a formal Strategic Plan for 2003-2011, prepared by the ICA Executive Committee, with input from the Commission Chairs, and edited by former ICA President Michael Wood. A preliminary version was reviewed by former ICA President Joel Morrison, former ICA Vice-President Judy Olson and David Rhind. The Strategic Plan for 2003-2011 was adopted by the Delegates at the ICA General Assembly in Durban, South Africa in 2003.

This document contains the Association's Strategic Plan for 2011-2019. It further develops the 2003-2011 Strategic Plan, and is presented as a set of guidelines for the management and development of the ICA over the next eight years. This Strategic Plan was developed by the 2007-2011 Executive Committee, with inputs from Commission and Working Group Chairs and vice-Chairs. The initial document was further developed by a review group consisting of ICA Secretary-General & Treasurer David Fairbairn, former ICA Secretary-General & Treasurer Ferjan Ormeling, former ICA President Bengt Rystedt and Michael Wood.

The Executive Committee of the International Cartographic Association presented this 2011-2019 Strategic Plan for approval at the Association's 15th General Assembly, Paris, France, on July 8th, 2011. It was subsequently endorsed by delegates representing member nations at the General Assembly and it forms the basis for developing strategic plans for growing and advancing the Association.

William Cartwright
President
Paris, France, July 8th, 2011

[1] Although this document appears on the ICA website it is directed primarily at the ICA community – officers and others working within the Association Some of the following account may seem self-evident, but it is included for new members and as a benchmark against which misunderstandings may be compared.

1 The ICA Strategic Plan: 2011-2019

If ICA is to preserve its authoritative international role in Cartography and the relevant fields within GIScience Science, a radical plan is required which will continue to stimulate a wide range of research and professional activities and confront challenges identified. This plan, directed at the ICA community, is written to maintain and develop ICA's standing. It also addresses the development and use of Cartography and GIScience (GI).

This Strategic Plan has been written to identify strategic goals that ICA must strive to achieve over the eight year period 2011 to 2019. The previous Strategic Plan (2003-2011) served ICA well, and is available for reference via the ICA Website. Its structure, aim and outcomes have been used to inform development of the current document, and its successes are noted in Appendix 1. It should be noted that the current Strategic Plan will be supplemented by Operational Plans, which will be drafted by the Executive Committee and Commission and Working Group chairs after each General Assembly. Such Operational Plans will present specific goals which can be used to assess the progress of ICA towards its strategic goals, and also to govern its day-to-day business. Each Operational Plan will cover the four year period between General Assemblies, but will be subject to significant review every two years.

Values

- The International Cartographic Association respects the freedom and universality of science, the equality of individuals and cultures[2], and appreciates creativity and critical thinking.
- In terms of operating principles ICA abides by United Nations recommendations on membership and freedom of scientific enquiry, and the ICSU declaration on the universality of science.
- ICA seeks the highest quality in theory, technology, standards guidelines and research.
- ICA recognises its responsibilities to recognise, lead and develop the disciplines of Cartography and GIScience for the benefit of society and humankind.

Vision*:*

- The aim of ICA is to ensure that Cartography and GI are employed to maximum effect and full potential for the benefit of society and science through promotion and representation of the discipline and profession of Cartography and GI science internationally.

Mission

To see ICA:

- recognised by the wider scientific community and society as the world authoritative body for Cartography and GI science, serving society in education and professional practice, motivating individuals and organisations throughout the world.
- play a leading role in the International Council of Science (ICSU), United Nations bodies and the Joint Board for Geospatial Information Societies (JBGIS).
- receiving professional and scientific recognition from individuals in all related fields
- use its knowledge, experience and expertise to remain relevant and authoritative in the representation of geography in its widest context.

[2]*Evidence:* ICA is a non-governmental organisation acknowledged by the United Nations, and follows the rules of the International Council of Science (ICSU).

- seeking the highest quality in scientific investigation, technical processes, and academic enquiry.
- raising the profile of Cartography and GI science to enable them to become indispensable in all scientific and societal activities.
- maintaining pre-eminence, but also collaborating with a range of communities, in promoting research and scholarship in the disciplines of Cartography and GI science.
- implementing its vision through its constituent parts – its member nations, Executive Committee, its Commissions and Working Groups, and appointed Committees.
- attracting membership from national Cartographic and GI science societies, universities, government, and business and commercial organisations from every country of the world.
- recognised for outstanding service to its members.

***Objectives**:*

- To contribute to the understanding and solution of world problems through the use of Cartography and GI science in decision-making processes.
- To foster the national and international use of geospatially referenced environmental, economic and social information.
- To encourage introduction of a focused geospatial basis for national and international statistical information.
- To provide global fora for discussion of Cartography and GI science.
- To participate in meetings, dissemination and publication in concert with sister societies and international organizations including the UN, sharing its vision with these organisations.
- To facilitate the transfer of new Cartographic and GI knowledge between and within nations, especially to developing nations, and to undertake Capacity Building, notably for communities in need.
- To perform or to promote multi-national Cartographic and GI research, including collaborative and trans-disciplinary research, in order to solve scientific and applied problems.
- To maintain a contemporary Research Agenda which is recognized as a leading and authoritative document addressing humankind.
- To enhance education in Cartography and GI science in the broadest sense through publications, seminars, conferences, competitions and exhibitions.
- To develop and promote the use of professional and technical standards, guidelines and applications of theory in Cartography and GI science.
- To demonstrate the utility of Cartography and GI science to all professions.
- To offer its expertise and knowledge of technical developments to other organisations e.g. governments, statistical bodies, GI management organisations etc.
- To support map-related research in specific topics such as child education, history, theory, and assistance for the visually-impaired.
- To maintain a repository of knowledge disseminated through the work of Commissions and Working Groups, Conferences, Workshops, publications and the Research Agenda.

Implementing the Plan

Growing from the Association's Vision and Mission, a number of strategies are outlined in this document. These may involve future changes to the organisation and proposals to improve structure and membership benefits: the strategies will have measurable goals so that success can be quantified. They will govern activity within ICA for an eight-year period

(2011-2019). It is expected that these strategies will be supplemented by an Operational Plan which will establish shorter-term, achievable targets over a sequence of 2 four-year periods.

Thus, strategic objectives and operational targets will be established, each supporting the other. The former, whilst quantifiable, are intended to establish the direction of the organisation, whilst the latter are more concerned with day-to-day activities and management tasks. Commissions are expected to contribute to the specific development of the Operational Plans.

Both the strategic and operational objectives will, ideally, direct the activities of the Commissions (and be incorporated into their Terms of Reference), and improve organisation in other areas of ICA activity.

2 Cartography and GIScience and the International Cartographic Association

The International Cartographic Association (ICA) is "the world authoritative body for Cartography, the discipline dealing with the conception, production, dissemination and study of maps." The mission of the Association is to promote the discipline and profession of Cartography and GIScience in an international context. The ICA is the prime international body for Cartography and GIScience (see www.icaci.org for more information).

A history of Service, Growth and Achievement

The ICA was founded on June 9, 1959, in Bern, Switzerland. The idea to form an international cartographic association was the concept of Carl Mannerfelt (Sweden). Formation occurred after a number of preparatory conferences were held from 1956 to 1959, during which the association was discussed.: the Esselte conference, Stockholm 1956; the Rand McNally conference, Chicago 1957; and the DGfK conference, Mainz (Germany) 1958. The first General Assembly (I) was held in Paris in 1961, at which the Statutes and organisation of the Association were confirmed. Later conferences have been held around the world from India (Delhi, 1968) to South Africa (Durban 2003), from Italy (Stresa, 1970) to Mexico (Morelia, 1987), from Australia (Perth, 1984) to China (Beijing 2001), and to Chile (Santiago, 2009). The map, below, illustrates the global reach of the ICA conferences and associated General Assemblies.

Figure 1. Location of ICA conferences to 2009. Map courtesy of Bernhard Jenny.

The first President was Professor Eduard Imhof, of ETH Zurich, Switzerland, who held this position between 1961 and 1964. Presidents who followed were:

- Brigadier Dennis Thackwell, United Kingdom (1964-1968);
- Professor Konstantin Salichtchev, USSR (1968-1972);

- Professor Arthur H. Robinson, USA (1972-1976);
- Professor Ferdinand Ormeling, Netherlands (1976-1984);
- Professor Joel Morrison, USA (1984-1987);
- Professor Fraser Taylor, Canada (1987-1995);
- Dr Michael Wood OBE, United Kingdom (1995-1999);
- Professor Bengt Rystedt, Sweden (1999-2003);
- Professor Milan Konečný, Czech Republic (2003-2007); and
- Professor William Cartwright, Australia (2007-2011).

The ICA operates around an Executive, which consists of a President, up to seven vice-Presidents, and a Secretary-General & Treasurer. Further important roles include the Editor of *ICA News*, a webmaster, and the chairs of sub-committees. All of these positions are voluntary. The Executive is elected by popular vote at the General Assembly, which takes place every four years.

To achieve its aims the ICA operates through a number of Commissions and Working Groups. It works with national and international governmental and commercial bodies, and with other international scientific societies. It works closely with sister organisations through its membership of the Joint Board of Geospatial Information Societies (JBGIS). Commissions and Working Groups carry out the detailed work of the ICA. These organisations have addressed the full range of scientific, technical and social research, which is the mark of ICA activity.

The ICA promotes the generation of extensive publications, generally through its Commissions and Working Groups. This activity provides a focus for Commissions and Working Groups and allows for knowledge about advances in contemporary thinking and research to be disseminated. The publications include books, ICA-recognised journals and *ICA News*.

The ICA bestows awards for outstanding service to the ICA and to Cartography generally. There are currently two major award categories:
- Honorary Fellowships – awarded to recipients who have made outstanding contributions to the ICA; and
- Carl Mannerfelt Gold Medal – the highest award of the ICA, recognising excellence in scholarship and research in Cartography and GI Science.

In addition, Diplomas for Outstanding Service to ICA may be awarded.

The ICA also rewards excellence in map design and production. At each International Cartographic Conference, the Barbara Petchenik Children's World Map Competition is held. Based on an exhibition of submitted children's maps from around the world, this commemorates the work undertaken in the area of children and Cartography by the late Professor Barbara Petchenik.

The activities of the ICA are important for promoting and advancing the theory and praxis of Cartography. Throughout its history, ICA has brought together researchers, government mapping agencies, commercial cartographic publishers, software developers, educators, earth and environmental scientists, and those with a passion for maps. The cartographic world has changed significantly since 1959 – the role and impact of ICA has been steadfast. Proud of its traditions, ICA looks forward to the next decades with the hope that they will be as vibrant and valuable as the first decades of its history.

Contemporary Cartography

As well as being statutory and commercial, the early aims and achievements of the ICA were scholarly and scientific, embracing Cartography as a discipline. With the increasing influence of new technology (especially computing and electronic communication) on map production and use, Cartographers began examining more technical and management support topics. In 1959 the Cartographic profession within the national agencies and commercial companies was distinctive and unchallenged. Now, developments in technology have helped 'democratise' the Cartographic process (by means of user-friendly graphics packages for presentation, with GI Systems for geographic data exploration and analysis, and with networks for data provision, advanced geographic data handling, visualisation and representation). This has led to a renewed interest in the discipline and the profession therefore continues to flourish with products still ranging from paper maps to maps and atlases on the Internet, sitting alongside less formal products. Such democratisation may carry its dangers (e.g. lack of appropriate basic knowledge of Cartography and GIScience), but, more importantly, increasingly interactive Internet mapping systems are quietly helping people rediscover their mapping instinct, and learn to **use** Cartography (in its widest sense) rather than just pre-printed maps. Not only are more maps used today but there is a growing pool of rudimentary 'Cartographers', and Cartography has regained its stature as a discipline of importance, interest, innovation and impact. The 'renaissance' of Cartography in recent years has resulted in a dynamic combination of the mapping impulse, the technology used in handling and disseminating geospatial data, the increasingly diverse and expanding role of Cartography in everyday life, and the wide-ranging and innovative application areas and uses for maps.

The dynamism of Cartography

Not all members of the general public who exploit the potential of Cartography (exploratory, analytical and communicative) are trained or competent in its use. Some, notably researchers in Analytical Cartography (mathematical and analytical theory) and the developers of GI system technologies, have exploited what have been referred to as the 'deep structure' of Cartography, to the enormous benefit of science and society. Many new Cartographic products (such as maps and atlases on the Internet) are considerably enhanced by (and even depend on) the functionality of such systems. Many of the problems associated with GI systems such as mathematical Cartography, human-map interaction and generalisation, for example, have been studied for decades or even centuries, and still apply. Cartography now, therefore, embraces 'GIScience Science', defined as "the set of fundamental issues arising from the use of… GI systems" such as "scale, accuracy and the relationships between humans and computers" (Longley et al 2001). It is obvious that, like GI system developers, those involved in creating new dynamic and interactive maps and mapping systems are equally dependent on GIScience Science.

It is clear that the landscape of Cartography has changed in the last decade. Map production technology is now readily available to more and the maps themselves are much more varied in terms of their provenance, appearance, and authority. Patterns of map use have also become much more diverse. In addition, the use of geographic data, traditionally represented using maps, has been extended and has led to further development in its visualisation and analysis. The role of geographic data in a wide range of human, social, economic, scientific, and environmental activities has increased. The result is that Cartography is being produced, used, managed, disseminated, analysed, and archived by more people than ever before, through the use of a more diverse set of technologies, operating within a greater number of scientific

paradigms than before. Significant challenges exist which an international association devoted to Cartography and GIScience must address.

ICA's focus

These challenges can only be faced at an international level: the global initiatives, for example the Millennium Development Goals, and a range of other societal projects promoted by the United Nations, along with the developments leading to a truly 'spatially-enabled society', need to be addressed in a coherent and common manner, in which Cartography is important and where ICA can lead. The adoption of new and more global aims, reflecting the international vision of ICA's foundation years, has led to a more expansive policy of interaction with sister societies and with international organisations. The ICA now sees itself as part of a wider international initiative, addressing the problems of our planet and is increasingly involved in scientific and technical matters such as geospatial data standards and infrastructures, multi-scale issues, Internet and satellite mapping, and geospatial analysis and modelling. The intention of such activities is to promote the efforts of the ICA by participating in and contributing to major international research, now expressed in the ICA Research Programme. These, and other, fields detailed above, are addressed by its Commissions and Working Groups.

Changes in the ICA community catchment

The roots of ICA are in the national committees (where they exist) and their associated cartographic/scientific societies, often the primary source of ICA officers, commission members and funding. So intimate is this nourishing relationship that it does not take long for ICA to be affected by changes in the economic health and well-being of these organisations. For these reasons, we recognise that ICA is a member-led association, and its success depends on the success of its members as they embrace, promote, develop, and use Cartography and GIScience in their own nation. Potentially, such organisations will change, affecting the relationship of member nations with ICA.

The wider picture and the 'Fields' of Cartography

ICA recognises a number of fields within which it operates. These are broad fields of human activity to which ICA can contribute and from which many influences on ICA's strategy and regular operations can be sourced. The fields are: Science and Technology, Education, Professional Practice, Society, and Art.

1. **Science (including technology):** this field covers the development of the scientific and technological basis of Cartography, GI science and geoinformatics.
2. **Education:** this field addresses the development and promotion, through education at all levels, of the truths of what we know and have discovered about our subject.
3. **Professional Practice:** this considers the provision of support for two groups of professionals,
    a) those who describe themselves as professionally active – as their main occupation - in a specific area of Cartography and GI science.
    b) those who use systems or procedures from Cartography and GI science as part of their professional activity, e.g. environmental managers, utility managers, planners.
4. **Society (social and organisational):** a field which seeks to promote applications of Cartography and GIScience in any area that can be beneficial to Society in general. It also covers the way in which regulation, legislation and political decision-making affect, and are affected by, Cartographic and GI data handling practice.

5. **Arts:** the exploration of aspects of design and aesthetics in cartographic artefacts, along with the impact of creativity on the map production process and map use. This can involve collaboration with members of the Arts communities, who represent geography using methods that are different to those employed in the Cartography and GIScience community or who theorise about 'other' geographies.

Further discussion about how these fields affect the operations of ICA, notably the work done by its Commissions, are specified in Section 4. In addition, Appendix 2 shows, in more detail, the most important perceived changes within these fields – changes which inform this Strategic Plan, and the Operational Plans to be developed. At this stage it is sufficient to indicate that ICA must regularly scan, monitor, understand and respond to contemporary development and changes in each of these fields, to determine their effect on ICA. Similarly, the work of ICA can be usefully organised under these fields so that we can contribute to their progress and promote an ICA perspective in them, now and in the future.

3 The ICA today: strengths, weaknesses, opportunities, threats

This section which is intended to give an authoritative picture of where ICA stands in 2011 is presented as a SWOT analysis (strengths, weaknesses, opportunities, threats) which is standard practice in strategic planning. The strengths and weaknesses relate to internal practice, the opportunities and threats are externalities over which ICA has less control. This SWOT analysis was performed using some of the challenges specified in Section 2, the points made in the Strategic Plan 2003-2011, along with some of the successes and problems from that plan, and some updated input from more recent consultation. Those three issues perceived as being most important in each section are highlighted and worked through a standard SWOT matrix in order to develop strategic objectives (see Section 4).

Strengths

- Knowledge within ICA is special and unique, accumulated during over 50 years of growth.
- ICA's leadership is recognised internationally and its presence is also widespread.
- The communications and information presentation methods of ICA, notably its website and regular bulletin, *ICA News*, are excellent.
- The current membership structure is sound.
- There is strong support from member nations and affiliate members.
- ICA's current organisational structure is 'bottom-up' and therefore not regarded as 'distant'.
- The Association has good relations with sister societies in Geospatial Information, through the JBGIS.
- It is run by a core of dedicated, talented, volunteer workers.
- The institutions of most ICA officers willingly offer support.
- Commissions and Working Groups can show noted achievements and research output – some have received wide international acclaim.
- ICA is willing to consider its position and promote its identity through documents such as this Strategic Plan, its Research Agenda, and its regular analysis of its scope and role.

Weaknesses

- The vision and mission need updating.
- The Association's ability to record and respond to the changing operational fields is not good.
- The organisation depends largely on voluntary workers from supportive institutions and voluntary executive officers (some less active than others).
- There is more pressure in general on dedicated individuals.
- Insufficient nominations for key posts: only candidates with financial support can afford to stand for office.
- There is a lack of incentives to motivate officers, including Commission chairs.
- Commission terms of reference can be weak and ill defined and not all work equally well.
- Funding can be irregular and unpredictable: the reliance on national funding and fee payment has not built headroom in the budget; subscriptions from (and engagement with) non-governmental organisation can be irregular.
- The growth in membership has been modest.

- Thus, financial resources are limited (there should be sufficient reserve funds for one whole year).
- Poor finances require sections of the ICA to find additional funds elsewhere.
- Senior officers may have to restrict their travels (for both financial and time reasons), although the necessity for increased travel is part of the new international community.
- There are too many aims – and ICA tries to do too much.
- Communication can be difficult at irregular intervals, with uncertain destinations.
- The recent publishing record has been poor.
- ICA's role in the international community is perhaps less prominent than it should be.
- Major conferences still suffer from financial uncertainties.
- There have been recent signs of loss of active member nations.
- The organisation has been characterised as being open to new technology but closed to new concepts.

Opportunities

- The discipline of Cartography has an instinctive (map-related) attraction for many.
- Cartography is based on well-established traditions – and is moving into a new phase of evolution.
- The subject retains its traditional nature and strengths *but is expanding* from the purely presentational to provide more effective visual-thinking/decision-support tools.
- It continues to evolve with contemporary technology.
- Through maps, Cartography is increasing in level of usage in science and society, as it offers effective solutions for the problems of science and society.
- The new emerging activities in collaborative data collection, access and use (e.g. GeoWeb of Volunteered GIScience (VGI)) and open source technologies could welcome the input of an international organisation in Cartography.

Threats

- With the introduction of computing and the growth of GI systems, the perception of Cartography is less clear to many than it was in the past.
    - Definitions may be dated and open to different interpretations.
    - Cartography is primarily regarded as consisting of traditional static paper images.
    - The subject is believed by some to have become wholly or partially redundant with the growth of GI systems.
    - Cartography is assumed by some to be only the output phase of a GI system.
    - There is low awareness, outside our discipline, of how the modern subject has developed.
    - Previous scientific studies related to mapping, such as research into map reading, could be included in GI science.
    - There is inadequate explanation of our new field (i.e. beyond static paper maps).
    - The rationale of Cartography is doubted by some rival groups.
- There is possible loss of recognition of world leadership through changing outside views of the nature and relevance of Cartography.
- There is a view that a real reduction in the numbers of 'traditional' professional practising map-makers (Cartographers) is assumed to imply the demise of Cartography itself.
- Democratisation of 'Cartography' is believed to reduce the necessity for experts.
- Cartography may be losing some status and identity by being seen as a subset of GI systems/GI science.

- Cartography is not benefitting specifically from funding opportunities in research, in supportive production agencies etc.
- Technological, social and political changes can be difficult to read and react to.
- A breakdown of inter-disciplinary boundaries has led to a blurring of responsibilities for Cartography.
- There is an instability in the model of operations in some governmental and commercial agencies.
- Our subject's ability to absorb new communities of volunteered GIScience suppliers, and the open source software community, is limited.

The SWOT analysis is used to determine strategic objectives as reported in the next section.

4 Determining and meeting the strategies

The SWOT analysis reveals a number of issues which ICA must address, in particular the challenges outlined in the previous 'weaknesses' and 'threats' sections. This section attempts to synthesise some of these challenges, suggests initial goals and methods of addressing them. Because this section concentrates on the organisation itself, it is more focussed on internal challenges ('weaknesses'), but 'threats' are also considered here, along with preliminary ideas of addressing them using 'strengths' and 'opportunities'. The approach is based on a matrix seeking worthwhile conjunctions of the strengths with opportunities (using strengths to take advantage of opportunities) and threats (using strengths to avoid threats), and the weaknesses similarly (take advantage of opportunities to overcome weaknesses, and reduce weaknesses by avoiding threats). The intention is to determine 6-8 strategic objectives from the matrix.

	Strengths: 1. The communications and information presentation methods 2. Current organisational structure is 'bottom-up' 3. Commissions can show noted achievements and research output	**Weaknesses:** 1. Lack of incentives to motivate officers 2. Membership of ICA is not expanding as it could 3. ICA has too many aims
Opportunities: 1. Cartography has an instinctive (map-related) attraction 2. Cartography is increasing in level of usage in science and society 3. The new emerging activities in Geo-Web of Volunteered Geographic Information (VGI) and open source technologies	S1-O1: appeal to lay public for individual membership S1-O2: advertise the role of Cartography better S2-O1: let map users suggest the agenda of activities S2-O3: new groups can self-organise under the ICA umbrella S3-O1: use the Research Agenda to explore new activities S3-O2: promote Commissions activities in current areas using current structure S3-O3: Commissions can show strengths in possible new areas	W2-O1: target other membership categories W2-O2: target decision makers in affiliated organisations W2-O3: target geographers and geoscientists in new areas
Threats: 1. Some believe the field old-fashioned and that maps are traditional, static, paper 2. There is declining funding	S1-T1: we have the strength to change our image in the media S1-T2: publicise our results	W1-T2: re-direct money for incentives, including personal assistance to some officers, on a basis of equity

for Cartographic activities, from research to production 3. Our subject's ability to absorb new communities is limited	better to stem decline in funding S2-T1: the strength to change our image can be sought from within S2-T3: change our ability to absorb new communities from within S3-T1: improve communication of novel achievements S3-T3: - Commission achievements can assist in bringing in new structures	 W2-T2: - increase membership dues to ensure financial stability W2-T3: strengthen efforts to engage new communities W3-T1: reduce number of aims, but have attractive objectives W3-T2: reduce number of aims W3-T3: have revised aims covered by new communities

The following broad strategic objectives were sourced from this matrix:

1. Widening the awareness of map production and use – to maximise Cartographic activity in the public arena (e.g. by education, by public engagement and exhibitions, by encouragement of activities by national members): quantifiable objectives, more Cartography courses, more attendance at relevant exhibitions
2. Ensure publicity for achievements – at all levels e.g. a formal publication of achievements, higher quality of outputs in scientific literature, higher profile in the media: quantifiable objective, publish achievements
3. Embrace new communities – to use our strengths in independent Commissions to approach and work with new communities, including Volunteered GIScience and crowdsourcing groups: quantifiable objectives, higher ICA presence in the alternative cartographic community.
4. Examine all aspects of membership in order to increase number of members – new categories, expanding range of affiliate members, recruiting more national mapping agencies, membership fees, publicity for recruitment: quantifiable objective, to increase membership
5. Maintain financial stability – funds are not large enough to support long-term commitments to projects, but funds must be dispersed to maintain tax-free status: quantifiable objectives, balance of income and expenditure
6. Continue to monitor Commission structure and effectiveness: quantifiable objective, higher level of Commission activities, more active members in Commissions
7. Target geoscientists for joint activities – both at Commission level (most promising), and at EC level (through JBGIS, initiatives of other organisations, running joint workshops): quantifiable objective, increase number of joint activities and outcomes
8. Incentives for officers – primarily to ensure that people are willing to stand for office, and mainly at a financial level (e.g. use part of Commission budget for chair's expenses, preferential registration rate for ICC for officers): quantifiable objectives, more activity by officers

5 The effect of Strategic Planning on ICA

The adoption of strategic objectives outlined in Section 4 above will have impact on ICA's procedures and structure. In addition, the subsequent Operational Plans, described at the end of Section 1 are integral to the successful implementation of the Strategic Plan. Example operational objectives which may inform the development of Operational Plans are suggested in Appendix 3. The Operational Plans are the responsibility of each new Executive Committee (elected every four years).

This section considers the impacts of the Strategic Planning process, and concludes the document. The intention of the Strategic Plan is to ensure that ICA will become more professional in nature, and will undertake its mission with efficiency and relevance.

In terms of ways forward, the following immediate actions result from the Strategic Goals identified at the end of Section 4.

Maximising cartographic activity:

- *Increase the number of workshops and courses promoted by ICA, notably by its Commissions.*
- *Strive for high level of Commission activities and sufficient strength of Commission membership.*
- *Improve publicity (using ICA publications and the website) for both ICA and other cartographically-related meetings/exhibitions/activities to increase number of participants at these events.*
- *Engage with a wide range of other groupings to ensure the widest possible involvement of ICA with new activities in cartographic production, map use and alternative communities.*

Supporting capable officers through the following proposals:

- *Introduce motivational schemes (financial and career-path) for future ICA officers.*
- *Encourage members of minority groups, young people, and people from developing countries, to become involved in the ICA.*
- *Investigate new forms of identifying senior officers and potential commission members.*
- *Examine the possibility of having some paid officers, e.g. webmaster, executive director (although this would create an imbalance with volunteers), whilst acknowledging that ICA cannot currently afford to have paid officers.*

Achieving good quality outputs from ICA:

- *Maintain the high standards of ICA News and the ICA website.*
- *Improve the proceedings and publications from the ICC conferences and workshops.*
- *Promote the achievements of ICA more effectively*
- *Encourage Commission chairs to collaborate in activities which will lead to high-profile dissemination of results.*

Raising ICA's profile:

- *Increase membership, especially with affiliate members.*
- *Undertake more collaboration with a wide range of organisations, including UN and sister societies*

- *Improving communication between ICA officers and membership and provide for a continuous forum for discussion rather than a bi-annual one.*
- *Use ICA publications, website and conferences to raise awareness of ICA activities.*

Establishing efficient internal structures whilst maintaining the 'bottom-up' approach
- *Examining the scope, value and structure of Commissions, and their groupings.*
- *Ensure longer term financial planning and resource allocation, balancing income and expenditure.*

Approval, revision, timetable and resources

Approval and revision. This draft plan was circulated to members of ICA before the General Assembly in Paris 2011. Suggested modifications were welcomed and incorporated where appropriate. A session of the General Assembly discussed and voted on the acceptance of the Strategic Plan.
Once approved, it was expected that the new Executive Committee, along with the newly elected Commission Chairs, would quickly develop an Operational Plan to cover the period 2011-2015, with time dedicated at the International Cartographic Conference in 2013 to assess and modify the Operational Plan where necessary.

Resources. Both the Strategic Plan and the Operational Plans will require resources to implement. A provisional budget will also need to be approved by the General Assembly in 2011: this will direct resources towards the strategic objectives, and have the flexibility to also direct resources to operational objectives. The resources available will be directly dependent on the fundamental income stream – the membership fee. The current unit value (since 2007) is €250.

The ICA Strategic Plan 2011-2019 has been written to give direction and set achievable and quantifiable objectives. The Strategic Plan will set the agenda which ICA will adopt to meet its mission in the long term, and (through the Operational Plans) will have considerable influence on the day-to-day operation of ICA.

6 Conclusion

The first ICA Strategic Plan was presented to ensure that ICA preserved "its authoritative international role in Cartography (and in the associated fields of GIScience Science)." It was suggested that important changes within the organisation were necessary in order for the challenges of a new millennium to be met. The changes were to be introduced whilst ICA continued to operate its wide range of research and professional activities.

Because it was the first Strategic Plan, a significant portion of the document looked backwards in time to determine how ICA had reached its current position. This second Strategic Plan, presented here, does reflect on history and also assesses the impact of the first Plan, but the intention is to look forward. The General Assembly, as the primary decision-making body in ICA, expects to have a working document available which can guide the development of the Association into the future. The General Assembly meets every four years: it has a strategic role to play in guiding ICA, and this Strategic Plan is intended to present targets, create policy, visualise the future and expand the activities of ICA. It should be referred to throughout the eight year period of its authority, by all those involved in ICA – the Commission chairs, the national and affiliate members, the Executive Committee, the leaders of other ICA committees, the conference organisers, and the individual members of the representative national bodies which make up the General Assembly.

In addition, during those eight years, there will be a need for guidance for the day-to-day operations of ICA. Addressing the same groups of people involved, it is expected that shorter term operational plans will be developed by each new Executive Committee, to assist in directing the ongoing work of ICA.

The Strategic Plan is presented here as a working document, to be supplemented by an Operational Plan. The Strategic Plan is robust and visionary yet realistic: its goals should be worth striving for, and should be capable of being achieved.

Appendices

Appendix 1 Strategic Plan 2003-2011 outcomes

The SWOT analysis undertaken in the 2003-2011 Strategic Plan was somewhat unstructured, but it did present a number of challenges: the success of these is considered in this Appendix.

ICA was charged with:

- ***remaining relevant to its constituency***. The ICA 'constituency' was considered to include national members, with varying characteristics; affiliate members, which come from commercial, academic and institutional backgrounds; interested parties for whom ICA acts in an advisory and supportive capacity, including international non-governmental organisations and national governments; and other user groups. Relevance was maintained by scanning the operational fields, by individual and group input into the basic working units of the association – its Commissions and Working Groups, by leadership from the Executive Committee, and by feedback from the membership. The relevance was reflected by the ICA's outputs including international and regional conferences, workshops and Commission meetings, participation in international initiatives, engagement with sister societies, dissemination of ICA News and other publications, collaboration with ICA-recognised journals, and the ICA website. ***[achieved: members, relevance, outputs considered to have met this challenge; ongoing]***

- ***asserting use and ownership of Cartography.*** It was felt that the increasingly seamless nature of science has led to some overlap of membership and interests between sister societies. It was noticed that some have interests in Cartographic representation and analysis (through geographical visualisation tools or GI systems). Like language, Cartography cannot be 'owned'. It has many users and applications. But the ICA was asked to continue to offer authoritative world leadership for the whole of Cartography, its on-going strengths being reflected in the research fields of the research agenda and its Commissions and Working Groups. Collaboration with other organisations is still regarded as essential to ensure continued recognition of ICA's 'footprint' within the fields of human activity. ***[achieved: leadership and research activity both healthy; ongoing]***

- ***increasing the visibility of the organisation*.** This challenge was to be addressed at two levels. Firstly, more general education of the public as to what Cartography **is** (for the exploration, analysis and representation of GIScience) and what it **is not** (drawing maps for paper production) would allow ICA to establish recognition as the representative organisation **for** the discipline. Secondly, ICA was charged with promoting itself **within** the discipline and achieve status as the pre-eminent organisation in the field of Cartography and GIScience within the range of GIScience organisations. ***[partly achieved: ICA has a high profile in official GI organisations, less so in informal organisations and wider society; ongoing]***

- ***making better use of increasingly limited human resources*.** Although the organisation's wider constituency may remain large and even increase, it was recognised that the number of active members was likely to decrease in the short term. The pool of potential members of commissions was specifically highlighted. It was suggested that the ICA must take a more professional approach and consider the establishment of some paid posts. ***[not achieved; ongoing]***

- ***responding effectively to global geospatial initiatives.*** The increasing number of world-wide initiatives demanding the application of Cartographic/GI science expertise was noted. It was felt to be increasingly important for ICA to organise priorities of response to, and procedures for action with, groups such as Digital Earth, ISCGM, Global Spatial Data Infrastructure (GSDI), ISO, UNGIWG, and JBGIS. ***[achieved: MoUs and other linkages established with other organisations to address world-wide initiatives]***

- ***widening the field of Cartography to include GIScience Science.*** Although the concepts underlying Cartography have always been much wider, the ICA was founded during the heyday of printed paper maps, and naturally, its first concerns were with their conception, production and study. The design of maps and mapping systems (real and virtual) remains a priority, but recent years have seen more technical commission themes which reflect overlapping interests with, and the disappearance of boundaries between, other mapping sciences. However, it is Cartographic approaches which have played the major role in sourcing, developing and applying the theory and practice of geographic data handling. It was felt appropriate, therefore, that the International Cartographic Association should include Geographical Information Science as part of its vision. ***[partly achieved: although not incorporated into the Association name, GIscience is accepted by the members of ICA and individuals associated with it; ongoing]***

Thus, 5 of the 6 challenges have been successfully addressed. It can be noted that these challenges are not absolutely quantifiable, which makes it difficult to determine how successfully they have been met. The strategic objectives outlined in the Strategic Plan 2011-2019 will be more quantifiable and achievable.

Appendix 2 Changes within specific operational fields

This section examines what influences are affecting the nature of Cartography and GIScience. Organised under the headings of the 'fields' presented in Section 1, these issues have an impact on our discipline. They may also, however, impinge on the ICA as an organisation, and thus have influence on the strategic and operational goals which this Strategic Plan presents. The SWOT analysis has taken many of these changes into account.

Science (including technology):

New scientific networks:

- More interdisciplinary use of, and utilisation by, Cartography
- Scientific enquiry operational on the Web
- More effective literature and data search to assist in research

Technological changes:

- Storage and archival improvements
- Improvement of web-based communication
- User-friendly mapping packages and flexible platforms for engagement (inc. mobile devices)
- Development of location-aware devices, and integration of contemporary real-world and archival data-driven systems

Education and Professional practice:

- Change in nature of both amateur and professional practice in all geosciences leading to varying demands for educational courses

- Decline in specific courses (at all levels) directed towards singularly Cartographic education
- Increasing demand for Continuing Professional Development
- Recognition of continuing need for the training of personnel in developed and developing countries
- Role of Cartography in secondary schools is still uncertain and subject to broader curriculum change

Society (Social and Organisational):

Changing societal needs, services and infrastructures will, in turn, affect mapping needs:

- Informal educational facilities for different age ranges
- Different business environments
- Different holiday and recreational patterns
- Daily needs of society (including everyday activities undertaken by consumers, citizens and office holders)
- New relationships between society and the environment driving Cartographic applications in climate change research, disaster management, emergency planning
- Growing awareness of spatial relationships and of the spatial context of location-based services
- New technical possibilities in social networking and related Cartographic data handling
- Wider availability of smart machines and sensors
- Organisations will be more specialised – leading to need for more co-operation

Arts

- Increasing use of Cartographic images and sources in artistic endeavour, including multi-media and digital art
- Widening of design possibilities in representing multi-dimensional data and creating representations on novel platforms
- The design of Cartographic interfaces for both private (e.g. desktop access to geobrowsers) and public (e.g. map products to guide navigation by public transport) use, and map design in general, requires creativity which may be sourced in art

Appendix 3 Using the Strategic Plan to create Operational Plans

As was suggested at the end of Section 1, ICA intends to create Operational Plans, governing shorter term objectives, which will be informed by the strategic objectives listed in Section 4 above.

The creation of Operational Plans will use the discussion of ICA's operational fields, as specified in Section 1, and explored further in Appendix 2. In this way, a series of operational objectives can be presented, which will form the basis of the Operational Plans. The objectives listed below, and the action points which derive from them, are examples which are intended to assist the developers of the Operational Plans.

It is expected that many of these action points will be used to direct Commissions and Working Groups, who are expected to prepare plans themselves, with objectives which can be monitored and achieved during their four year term. Some of the action points below,

however, are specified as being the responsibility of other parts of ICA – the Executive Committee, the Local Organising Committee of the International Cartographic Conference, the sub-committees of ICA (Awards, Publications, Statutes), and the membership itself.

Science

objectives:

Promoting Cartography and GI science as individual subjects and clarifying the relationship between them as well as with other geosciences by:

- *Strengthening the profile of scientific commissions in ICA.*
- *Promoting international co-operation in scientific research on Cartography and GI science, including fora for scientific discussions, dissemination of information and scientific publishing in Cartography and GI science.*

Actions:

- Keep to the published advisory guidelines to improve the co-operation between the EC (Executive Committee), the LOC (Local Organising Committee) and the commissions.
- Maintain the ICA research agenda on key themes within Cartography and GI science (EC).
- Maintain research into spatial representation and visualisation facilities for spatial exploration, modelling and analysis (specific Commissions, primarily those with a scientific emphasis).
- Review past studies and develop new research in map use, cognition, and aids to map-reading and decision-making (specific Commissions, primarily those with an emphasis on user issues).
- Organise commission and cross-commission meetings (all Commissions).
- Continue to support the international journal programmes on Cartography and GI science (all parts of ICA).
- Update information on ICA publications, definitions and other related material in the ICA and the commission home pages (Publications Committee).
- Activate interactions between ICA and other scientific geographic societies as well as those in computer science and statistics (EC).
- Organise a scientific bookshop display during ICA conferences (LOC)
- Update information on ICA and Cartography definitions and glossaries (all Commissions).

Education

objectives:

- *Investigate ways to strengthen and monitor education programmes in Cartography, GI science and related subjects at all levels (university, high school, elementary, life-long learning).*
- *Investigate fora for discussions of education programs and curricula in Cartography and GI science.*
- *Develop information networks and online courses on Cartography and GI science.*
- *Offer educational courses for students on Cartography and GI science for example in developing countries and for regional purposes.*
- *Offer 'master classes' in GI systems/mapping to guide managers in spatial decision-making*
- *Investigate methods (and funding sources) to encourage the participation of students and other young members in ICA activities.*

Actions:

- Analyse existing university curricula in Cartography and GI science (specific Commissions, primarily those with an emphasis on education).
- Help widen the Cartographic/GI science knowledge base and skills into new segments of Society (specific Commissions, primarily those with an emphasis on education and societal issues).
- Increase efforts directed to capacity-building, especially in developing countries, especially with reference to human resource development (specific Commissions, primarily those with an emphasis on education and outreach; those structures of ICA charged with, or volunteering for, organising workshops).
- In co-operation with commercial suppliers, develop online courses on Cartography and GI science to support and complement existing courses (specific Commissions, primarily those with an emphasis on education).
- Facilitate provision of geographic data for educational use (specific Commissions, primarily those with an emphasis on education).
- Support appropriate United Nations activities by providing geographic expertise (Executive Committee).

Professional Practice

objectives:

- *Encourage wider application of Cartographic principles within information technology.*
- *Promote the transfer of GI technology and standards for professional use.*
- *Strengthen the profile of professional practice commissions in ICA.*
- *Promote the presentation of 'best practice' in the field of Cartography and GI science.*
- *Provide possibilities for interaction between practitioners during the ICA conferences.*

Actions:

- Analyse commission structure and propose new commissions in order to maintain a balance between theory and practice (EC, national members).
- Organise workshops on specific topics (specific Commissions, primarily those with an emphasis on management and practical uses of Cartography).
- Organise high quality technical exhibitions and expert panels during the conferences to attract practitioners to participate and exchange ideas (LOC, EC).
- Encourage national associations and universities to translate proceedings of conferences and symposia into local languages, publish the translations on the web and link them to the ICA page (national members, webmaster).
- Facilitate the exchange of experts between and within developed and developing countries and revive the ICA 'Third World' policy (specific Commissions, primarily those with an emphasis on management and practical uses of Cartography, and education; those structures of ICA charged with, or volunteering for, organising workshops).
- Support United Nations by providing geographic expertise (EC).

Society

objectives:

- *Promote awareness of sustainability by disseminating information and knowledge on Cartography and GI science globally.*
- *Contribute to the understanding and solution of local and worldwide problems through the use of Cartography and geographic data.*

- *Encourage under-represented groups, especially women, young people and people from developing countries to be involved in the ICA.*
- *Integrate research, teaching and professional practice.*

Actions:

- Promote production of atlases on specific global themes aiming to strengthen decision support based on relevant and reliable GIScience (specific Commissions, primarily those with an emphasis on practical uses of Cartography and GIScience handling, and map production).
- Provide guidelines on the use of geographic data on the Internet (specific Commissions, primarily those with an emphasis on technological development in Cartography and GIScience handling).
- Develop navigation tools for visually impaired people (specific Commissions, primarily those with an emphasis on user issues, and impaired map users).
- Participate in research and development projects aimed at personal security, public services and well-being (specific Commissions, primarily those with an emphasis on technological development in Cartography and GIScience handling, and on map use).
- Where requested, support appropriate United Nations activities by providing geographic expertise (EC, all Commissions).

Arts

objectives:

- *Promote the use of Cartography in artistic endeavour.*
- *Examine the creativity involved in Cartography on new platforms, and with new interfaces.*
- *Examine how the arts might inform about practices that view and use Cartography and GI science in ways that are innovative and creative.*

Actions:

- Continue to promote the links between Cartography and the arts, notably by means of exhibitions and trans-disciplinary meetings, workshops and projects.
- Create a Web resource on the interaction between Cartography and art (specific Commissions, primarily those with an emphasis on Cartography and art)
- Ensure map design and aesthetics are integrated into Cartographic education and production (specific Commissions, primarily those with an emphasis on art, education, and young cartographers; Affiliate Members)

BACKGROUND TO THE ICA RESEARCH AGENDA

Maps and geographic information (GI) have special power through their ability to connect and integrate data sets by the inherent geographical location, and present the information contents in a user-friendly and understandable visual and tactual way. Such ability has long been recognized as an intrinsic property of the map artefact, as well as contemporary geodatabases. The power of maps and geographic data handling has been recently recognized in many real world applications and strategic decision making situations related to current topics like crisis management, early warning systems, efforts for supporting sustainability and decreasing global poverty.

The international cartographic association (ICA), as a globally well represented and internationally visible organization, has a special position and role as a promoter of the development of cartography and GI science. Research and development in ICA aim in general to create theory and methods for cartography and GI handling. By applying theories and methods in various fields, new tools can be created for cartographic and GI practice. Such topics are addressed at the main work-forums of ICA, its Commissions. These organizations are formally established by vote at the quadrennial ICA General Assemblies, although interim Working Groups can also be established between General Assemblies by the ICA Executive Committee (EC) to address specific short-term issues.

The idea of the ICA Research Agenda on Cartography and GI Science was initially considered at ICA Executive Committee meetings during the 1990s but the specific decision to work on a structured Research Agenda was taken at the London EC meeting in 2001, with a plan to organize a session on the issue at the International Cartographic Conference in Beijing in 2001. This session included several valuable presentations (including those from Professors Gruenreich, Meng, Mullen and Ormeling). The work plan for the Research Agenda development was made during the Mexico City EC meeting in 2005. It was realized that several ICA Commissions had overlapping research concerns while some new challenging topics were outside of any Commission's field. A formal Research Agenda would have a significant role in informing Commission members, General Assembly Delegates and ICC attendees, of the integrated nature of research activity in Cartography and GI Science, the expanding scope of research and the role of ICA in promoting such activity. It should be realized that the content of the agenda represents a snapshot in time. Agenda like these should anyhow be considered to be living documents adapting to new technological and methodological developments over time. This paper consists of two major parts, the content of the research agenda and the current 'implementation' by the ICA's Commissions and Working groups.

THE GOAL OF THE RESEARCH AGENDA

The goal of this agenda is primarily to give some guidelines for the Commissions' work as well as to lead to tighter cooperation between Commissions. The agenda can also support the development of the flexible Commission structure of ICA. From a practical point of view the agenda may outline the future contents of the proposed International Yearbook for cartography and GI science.

More widely, the agenda is written in order to show ICA's actual and potential contribution to scientific research within our global society, and to serve as a moderator for discussions in that forum. In order to implement its own strategic

mission, ‘to ensure that geospatial information is employed to maximum effect for the benefit of science and society’ (ICA Strategic Plan, 2003), ICA must have a clear agenda for research covering all fields and topics under the title Cartography and GI Science. This agenda, therefore, documents current research activity in these fields, suggests areas where more intensive or renewed effort is required, and also discusses the methods by which some of this research can be undertaken – within ICA Commissions, through international collaboration with sister societies, and under suggested programmes of integrated research stimulated, we hope, by the presentation of this summary. It also reveals the gaps, e.g. items important for the agenda but not intensively covered by the research activities of the Commission and Working Groups.

PROCESS OF DEVELOPING THE RESEARCH AGENDA

The first preliminary study on research topics within the remit of ICA was made in the 2003 Budapest meeting of the EC and Commission chairs, who tried to outline the topics of interest to each Commission. The work was continued in 2005 in the Mexico City EC meeting as well as in A Corun˜a in 2005 in two brainstorming sessions for Commission and Working Group chairs and co-chairs, and the first draft documents outlining the research interests of Commissions were created. In the meetings the Mind Map technique was used and, based on that work, the first draft document was written, presented to the 2006 Moscow EC meeting, discussed and subsequently sent to the Commissions for comments. Commissions have been asked to provide additional text with relevant literature references on the topics that they feel important. The second draft was discussed in the EC meeting in Brno in 2007 and the plan for finalizing the agenda as well as publishing it in the Moscow ICC Proceedings was made. Before presentation, another round of comments among the Commission chairs has been organized. After the Moscow conference the new Terms of Reference of the Commissions and Working groups were analyzed based on their ‘relevance for research’. Via an online survey among the chairs of the Commissions and Working Groups these were matched with the content of the research agenda, revealing gaps and overlap among Commission and Working Group research activities.

THE STRUCTURE OF THE RESEARCH AGENDA

The scope of the agenda is wide including both Cartographic and GI Science issues. Depending on the background of the interested researcher, the entire field can be approached by several ways. It is impossible to make a generic structure of the topics that fits all opinions. It is also impossible to create a non-overlapping hierarchy of research topics. What has been done on the basis of common discussions has now been organized under subtitles or keywords. The definitions as presented by ICA (2003), have also influenced the scope of this agenda – a primary intention is to ensure that the topics discussed here fall within the accepted extent of Cartography and GI Science, and that we can also see synergies with closely related fields, notably in spatial data collection and handling.

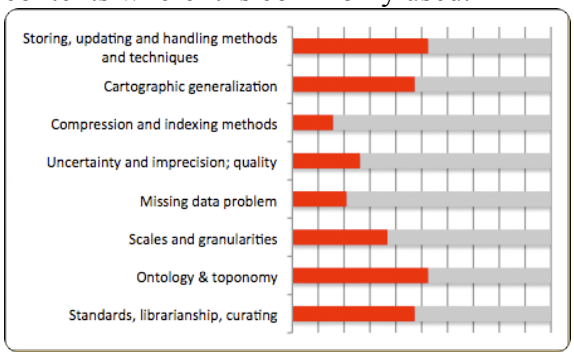
KEYWORDS

The keywords have been extracted from the mind maps produced in the brainstorming sessions referred above. Short discussion on the keywords has been added in order to explain the role and/or meaning of each keyword. In the following text the important research topics are in bold. References to supporting fields of science or technologies are written in italic. It must be kept in mind that the

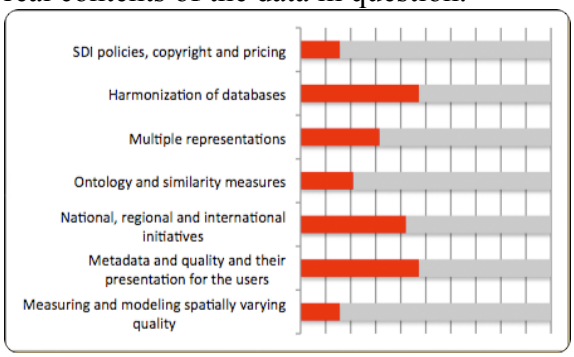
topics cannot be organized totally hierarchically under the main keywords, but there are several topics that could be linked to more than one keyword.

The keywords are:

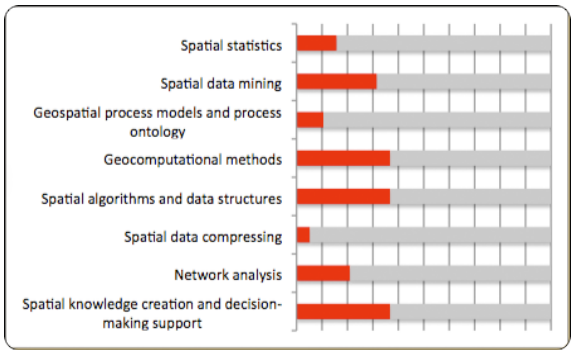
1. Geographic information: we have decided to mainly use ‘geographic information’ in this document. Geospatial Information is considered as a synonym, and Geospatial is used in contexts where it is commonly used.



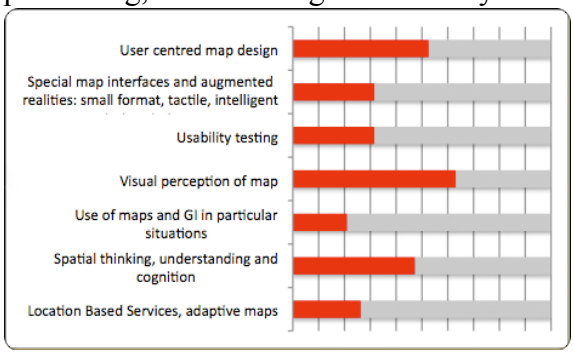
2. Metadata and SDIs: in the text spatial data infrastructures (SDIs) have a synonym of ‘geospatial data infrastructure’; by adding the geoprefix we can emphasize the real contents of the data in question.



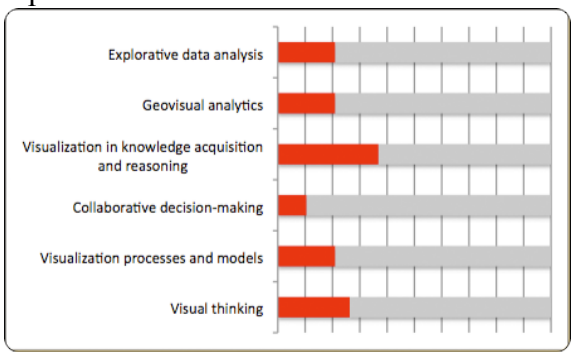
3. Geospatial analysis and modelling: the emphasis is on the extraction of added value from the processing of spatial data on maps and the use of analysis and modelling techniques to initiate, support and supplement the mapping process.



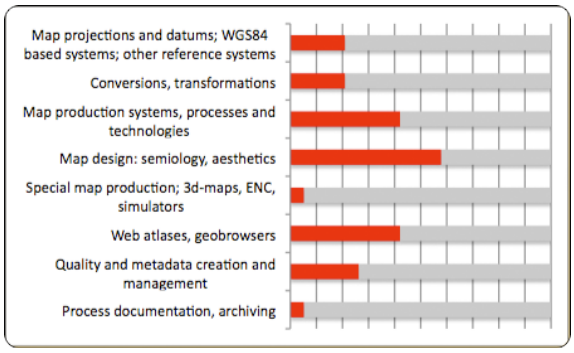
4. Usability: this keyword covers a range of issues which connect the human user of spatial data with its representation, its processing, its modelling and its analysis.



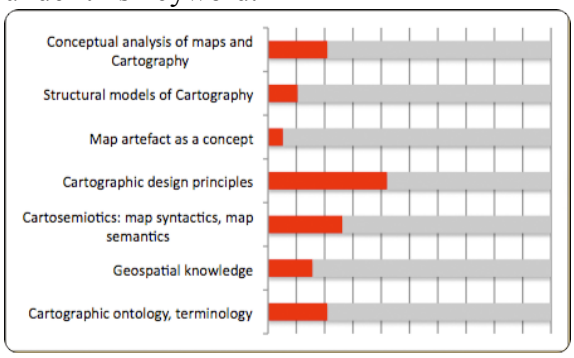
5. Geovisualization, visual analytics: here the visual representation of spatial data, in map and in other forms, is discussed, along with methods of using such representations.



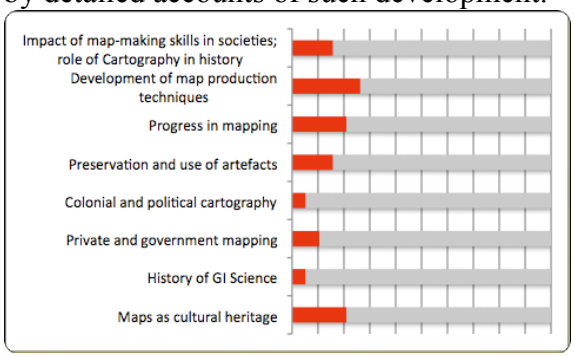
6. Map production: this keyword stands for the numerous stages in mapping and map production as technical processes, but also production of various map types from atlases to Internet maps.



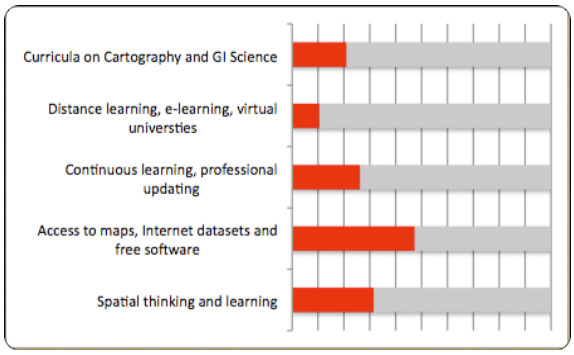
7. Cartographic theory: the fundamental concepts which form the basis of all our spatial data handling are incorporated under this keyword.



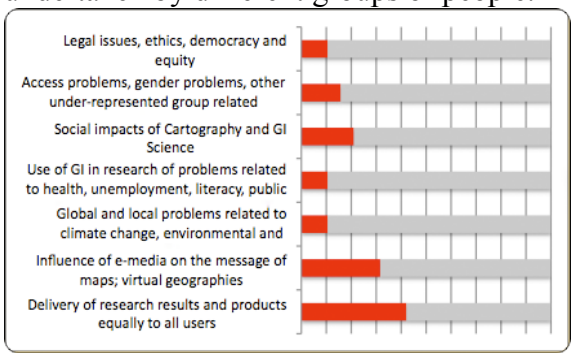
8. History of cartography and GI science: the importance of the development of methods and practices throughout history was recognized in the brainstorming session: all current-day activity is informed by detailed accounts of such development.



9. Education: to ensure a valid and viable future for our current activity, we need to research and implement methods to educate and train future generations: methods of doing this fall under this research heading.



10. Society: a dominant research topic throughout has been the examination of how such spatial data handling is grounded in societal structures and how it is undertaken by different groups of people.



GEOGRAPHIC INFORMATION

Geographic information is the core of both cartography/mapping and GI science/GI systems applications. Geographic information can be studied from various points of view: modelling, storing, processing and semantics. Geographic information represents the natural and manmade, tangible and intangible world. Two main established models are used to represent various phenomena: discrete objects and field models. In addition to precise, crisp data, GI can also be imprecise and imprecise information needs special modelling approaches. Thus, it is important to consider research into **imprecise geospatial data models,** such as **fuzzy models** and **rough sets**.

Geographic information needs to be stored and handled as data in databases. The main methods of storage involve raster and vector organization. Spatial databases tend to be huge and spatial queries need to be supported by adequate **spatial indexing.** Some solutions already exist – like quadtrees and R-trees – but the topic is still relevant for further study in the context of GI. The dimensionality of spatial data – two-, three- and sometime four-dimensional in nature – adds to the complexity of handling such data. Advanced indexing methods exist but they need to be applied to the context of GI (see also the section on 'Geospatial analysis and modelling').

Databases need to be continuously updated and the techniques for updating are problematic. Basically two main approaches exist:

1. Continuous updating, usually used when maps are derived from larger scale maps (e.g. detailed municipal large scale maps), and supplemented by other updating methods such as field-based methods.
2. Updating based on digital images by using change detection methods or replacing maps entirely by newly interpreted ones. Thus research is needed to address **incremental updating and versioning** of vector format geographic databases and updating of map databases by using digital images and **change detection methods** on images.

Geographical databases themselves are huge, and via the Internet one can reach even more information in integrated databases than is possible to manage. Using new methods of **spatial data mining and visual data mining** users can create new information and knowledge from the stored data. Satellite images as well as other gridded data products can also be mined and novel information and knowledge can be extracted from them by **image mining and automated knowledge extraction.**

Satellite data and orthophotos are often used without interpretation as additional information in image maps. When combining interpreted, usually vector, and noninterpreted, usually raster, information together, problems of **scales and granularities appear.**

The distribution of geospatial data across the Internet is becoming widespread, but there are many barriers to simple and effective access to geospatial data. **Open geospatial consortium standards for serving data** are designed to assist, but they are not universally applied: there are implications of the contemporary geobrowser (e.g. Google Earth) model for cartographers to address, in handling, compiling and presenting geospatial data.

The semantics of GI links research to various application fields with related taxonomies of concepts. **Ontology** is an approach that aims to produce a common

framework for different terminologies. **Toponymy** is related to GI in the sense of semantics as well. These topics affect attribute tagging, name (including geographical name) determination and processing flow lines in geodatabases.

METADATA AND SDIS

Complete geospatial data infrastructures (SDIs) consist of contemporary, comparable and integrated GI at global, regional or national levels along with services that enable an efficient use of the information. There are numerous research issues associated with the design, implementation and use of SDIs. **Spatial data infrastructures policy** including the political and administrative procedures required to initiate and maintain SDIs can be studied in order to enhance their utility. In practical terms there are problems such as **copyright and pricing policies. Harmonization** of databases can be based on appropriately applied **ontology schemas** and developed **similarity measures.** The fact that detailed geographic data are collected at different levels (municipal, regional, national) means that SDIs are likely to contain **multiple representations** in order to obtain the vertical integration. Effective **generalization** of maps as well as organization of multiple representations in databases could rationalize the production of topographic maps and assist in updating of databases. Such generalization requires significant consideration of conceptual schema, geometrical and spatial properties and visual appearance. It can be undertaken in real time **(on-the-fly generalization)** and it has links with Geovisualization and with the modelling described in the next section.

Metadata is the key for geospatial data infrastructures at both national and global levels, and the derivation, storage, scope and use of metadata have been addressed through mature national and **ISO standards** on metadata of GI (ISO 19115:2003) as well as its extension to gridded and imagery data (ISO 19115-2:2007). A special part of metadata describes **quality information.** There is also an ISO standard on geographic data quality (ISO 19113:2002) with definitions of quality elements and measures to be used. However, the **uncertainty** issues are not solved only by publishing standards and by forcing the data producers to document metadata of the produced datasets. The users need to be able to evaluate also **the uncertainty of the results of the analyses** in which they combine several datasets of different quality. Thus evaluation of the uncertainty of the GI analysis results and estimating **the risks of subsequent decision-making** are further research issues of importance.

Metadata is inherently multivariate and **metadata representation by multivariate visualization methods,** along with the usability of such visualizations needs to be examined. The linkages among metadata, data quality and visualization are potentially valuable. The metadata standard for gridded and imagery data, for example, introduces the ‘two-dimensional quality coverage concept’ and the ‘spatially varying quality concept’. These could be used for other data set types as well.

The **visualization of data quality** in general, and such **spatially varying quality** in particular, are examples of how **map quality** – including **generalization quality** – can be addressed.

GEOSPATIAL ANALYSIS AND MODELLING

Using geospatial analysis we try to describe, explain and predict geographical phenomena. Theories and methods adopted from mathematics, statistics, computer graphics and information theory have been integrated with GI Science approaches to

yield a mature and useful toolbox for such analysis.

Spatial statistics represents one of the most important and core methodologies. Although not a new area in GI science, there is a scope to expand its applications considerably. In **spatial data mining** it is one of the core techniques and specific topics such as **geostatistics, spatial autoregressive processes and point processes** deliver techniques of considerable interest. When applied to **multivariate analysis,** further specialist methods such as traditional principal components analysis and factor analysis, or more recent self-organizing maps and k-means clustering analysis can be used.

The development of realistic **geospatial process models** and those which incorporate time **(spatio-temporal models)** in a realistic manner will lead to improved representations of the real world. The models themselves must be understandable, applicable to a range of data sets and situations and must be capable of integration with others in processing workflows: **geospatial process ontology** needs development to ensure compatibility and interoperability.

Several computational methods can be used in implementing these geospatial modelling and analysis methods. Intelligent agents, cellular automata, neural networks and fuzzy logic are examples of **geocomputational methods,** which have not yet been adopted as standard computational solutions in GI applications. **Algorithm development** is often undertaken on an ad hoc basis for specific tasks, but it may well use particular **spatial data structures,** such as Voronoi and TIN models, or use particular approaches, such as **data compression** (e.g. wavelets) or **network analysis** based on *graph theory.* The latter, in particular its extensions (e.g. labelling and weighting of graphs), has not been researched and applied enough in spatial problem solving.

All these techniques to get spatial information and **create spatial knowledge,** related to data quality and risk issues, can be implemented to support **spatial decision-making.**

USABILITY OF MAPS AND GI

The starting point in the study of usability is the users themselves. These may be professional users such as administrative personnel and planners; some important groups of dedicated map users including children, the visually impaired, tourists, military, mass media, Internet users, ubiquitous/mobile users; along with occasional and amateur users.

Because of the large number and variation of users, map design should always be user oriented **(user-centred design)** and be based on good knowledge about the elements of usability. Today, maps are most often digital and interactive and thus users are able to dynamically retrieve data for display and analysis from data bases. The representation of information needs to be different for different user groups. The previous situation where maps were graphical presentations with limited data contents that needed interpretation no longer applies. The limitation of the map now is more often the **small size of the screen** in the display equipment. The **design of map interfaces** for Internet, mobile devices etc. creates a most demanding design problem. The special users of maps like visually impaired people would enjoy also various forms of interaction using **tactual and audio interfaces** to maps. For navigation and way finding applications even more exciting interfaces have been developed like **augmented realities in helmets** and **intelligent clothes.** The creation of **usability tests** – both qualitative and quantitative – for new maps and other

visualizations, for example **multivariate visualization techniques,** is a challenging field.

Understanding cartographic communication is the starting point for both map design and usability analysis. **Cognition** and **visual perception** have been analysed in order to get theoretical basis for **map design rules.** Perception of maps leads to information acquisition and learning about the topic. Research in *psychology* and *physiology,* which cartographers should be aware of, continuously reveals new knowledge about the human perception processes: it would seem valuable to follow this and ensure that visual perception, as well as **audio and tactual perception** is taken into account. *Learning theories* based on contemporary approaches to perceptual studies also support **map design** and **map use research.**

The users themselves are finding, querying, reading and applying maps in different ways than before. Research into methods of **data assimilation** and **use of maps and geospatial data in particular situations** (e.g. personal navigation) is necessary to assess the impact of contemporary displays in, for example, satellite navigation systems, public map displays and through unconventional media such as mobile devices. The role and meaning of **mental maps, cartoids and cartograms** are emphasized among researchers of **cartographic communication.** The skill of **spatial thinking** and **spatial understanding** of problems must be kept as the basis of map design.

It is clear that an increasingly large number of map users are accessing cartographic products through mobile and position-enabled devices. It is absolutely essential that such forms of map use, here related to the broad field of **location based services,** are effectively undertaken, and both the technology and the use of location based services are areas of prime concern to cartographic researchers. **Adaptive maps** modify themselves according to their location as well as the preferences and situation of the user. Contemporary research on *navigation systems,* satellite systems like the global navigation satellite system and other *positioning methods* should be carefully examined by cartographers to detect synergies.

GEOVISUALIZATION AND VISUAL ANALYTICS

Because there will always be a demand for paper mapping, studies of the **effectiveness of static two-dimensional products,** as well as (for example) three-dimensional scale models products are always needed. But Geovisualization techniques have extended the map medium to embrace **dynamic, three- and four-dimensional data representation** using methods which are interactive, capable of being supplemented by augmented and virtual realities, integrated with geodatabases, and flexible in application, platform, scale and content. In many cases these involve multidimensional and multivariate representations such as parallel coordinates plots and star diagrams, along with interactive techniques such as brushing.

A research agenda for Geovisualization was published by the ICA Commission on Visualization in 2001, and progress since then has addressed research areas such as **representation methods** (including virtual environments), **database linkages for visualization** and **cognitive issues** in Geovisualization and knowledge acquisition through visualization.

The more recent subject of **'visual analytics'** extends the geovisualization metaphor further to embrace integrated **data mining** and the development of **decision making** techniques through **spatial thinking, visualization, analytical**

reasoning and **knowledge engineering.** Further new visualization developments in the field of *games and simulators* can be profitably examined in order to adopt novel and effective tools and methods for geovisualization. Visualization is tightly linked to analysis by the means of **explorative analysis.**

The importance of **collaborative decision making** supported by spatial representations and data sets is growing in many areas of human activity. For example, instead of one planner and decision-maker there is a group of people at the same time around the same planning/decision-making task or accessing the same representation. Collaborative methods try to support these kinds of situations. In collaborative visualization instead of one person, there is a group of persons who are able to see the visualizations at the same time. This can happen in one space (for example, on a large or multi-screen or in a virtual reality cave automatic virtual environment) or in many places. Using the Internet it is possible to transfer both the visualization and the interactions of several users to allow for remote collaboration. There are technical issues such as updates, synchronization of the data transfers and management of conflicts, which need to be solved. Collaborative tools as well as single user tools enjoy the existence of **multi-media.**

It is important to realize that the focus of research in Geovisualization is not on the technical execution of the representation (although this is fundamental to the process), but is more directed to the data management to enable this, to possible tasks and application areas, and most notably to the role of the user in the **visualization process.** Thus, the impact of the visualization on **knowledge acquisition** (does the map present unknown information, or is it used to display and confirm previously known information?), its role as an **investigative tool** (is the map for private study, or is it part of a more public decision making process?), and its **didactic capabilities** (is the map being used interactively or is being read passively?) can be researched through **models of visualization.**

MAP PRODUCTION

Map production has long been a core practice of cartography. Based on *geodetic, photogrammetric, remote sensing or laser scanning* based methods, topographic map production is a part of the *surveying* process. In each country, topographic mapping has its own traditions, including selection of the **map projections and datum.** Nowadays in many countries the geocentric **WGS84 based systems** are applied, but it is still an important part of cartography to know the properties and applications of various projections and manage their application and the **conversions** between them. In practice many GIS software tools offer transformations from projections and coordinate systems to others, while mobile and ubiquitous applications might sometimes require **transformations on the fly.** Map projections and transformations, along with associated mathematical studies of **distortion,** are valid areas of cartographic research. It is noteworthy that it is not only topographic mapping which must address these issues: the importance of **reference frames to mobile applications,** and the study of **transformations of raster imagery** (from satellite, aerial platforms and ground-based) are also essential, as is the reference system adopted within GI layers.

Map production technology is a rapidly developing field. The new mapping technologies of *satellite remote sensing, laser-scanning technologies and advanced global navigation satellite system technologies* offer both fast and accurate acquisition of topographic data. However

they also give new challenges for research and development as well as innovations for several application areas. A continuously developing range of field and remote data collection techniques ensures that **map production flow lines** must be able to handle spatial data varying in source, format, scale, quality, reliability and area of coverage.

The role of cartographic knowledge as applied to map production is still important. **Map design,** already mentioned in connection with usability, covers issues such as symbolization, text and label placement, generalization, colour selection and layout design. Such tasks always require understanding of the data compilation, the information compatibility and skills for aesthetic design. In cases of multi-lingual countries and production of printed maps, label placement is a challenging subtask in map design. Collection and standardization of **place names** as such is an important part of map production and has important links to **ontology** and **information management** issues.

The applications of map production processes and their development are core topics for public and private mapping organizations. There is a continuous interest in rationalizing and modernizing the production of maps and geospatial data sets. Such processes can differ depending on the map type: topographic or thematic, large or small scale, printed or digital. In topographic map production processes, the actual problems can come from **quality management** and **harmonization** needs, whichmay themselves be guided by the requirements of geospatial data infrastructures. In many countries there are attempts to rationalize and synchronizemunicipal and national mapping by trying to harmonize the data contents and take care about the quality management of production. **Quality models, up-to date metadata descriptions** and associated **process documentation** are central issues.

An enormous number of different categories of maps can be, and are, produced by a variety of methods. Thematic maps address particular concerns and portray specific data. Each category may have research issues associated with it. Some examples from specific ICA Commissions include: mountain maps, which must efficiently portray **threedimensional representations;** marine charts, which must incorporate ongoing developments in **electronic nautical charting;** environmental maps, which are valuable contributors to **risk mapping** for early warning applications; military mapping, which can also assist in civil crisis management, but is also responsible for planning and execution of complex, technologically advanced military manoeuvres and campaigns, both in real-time and in **simulators.** Examples of other thematic map categories which could benefit from applied research work include tourist maps, orienteering maps, advertising maps, artistic maps, fantasy maps, geological and geophysical maps, cadastral maps, personalized maps, aeronautical maps, poverty maps, maps in text books, and mass media maps. Some thematic maps have global relevance because of the application: maps supporting scientific investigations into immediate problems, such as climate change and sealevel rise, are among the most important of these.

Other mapping functions for which production (perhaps as well as compilation and design) is a major issue include **atlases** and **atlas information systems.** The future of atlases has been debated for a long time, since the first versions of digital and interactive atlases were introduced. Multimedia atlases came soon after and now the concepts of Atlas Information Systems and **web-atlases** have been introduced and supplemented, supported

by **geobrowsers** such as Google Earth and Wikipedia. Technologies to support the cartographic and GI data handling requirements of such products have to develop. Tactile and audio maps need special design and production technology; they cannot be side products of regular maps and are often not easily derived from the data.

The established tasks of map production, in addition to being subject to variability in data handled, method of representation and application area, are subject to overriding practical issues such as **economic, legal and security matters** (including confidentiality). Legal issues include **copyright, privacy, liability and illegal use detection** (using cartographic traps). Economic issues which can be researched include production models and map marketing. Finally, once the maps have been produced or the databases have been implemented, there is a need to manage the archive which they represent. This covers areas such as **archiving, updating, metadata extraction** and **recording** and further **librarianship** issues. As unique documents which need specialist curators and library resources for acquisition, storage and consultation, the role of maps in the contemporary library is changing. And as spatial data becomes increasingly available in non-standard media, the role of the curator must expand to incorporate new skills.

CARTOGRAPHIC THEORY

Fundamental cartographic theory has been addressed by the ICA Commission on theoretical cartography over many years, recognising that from a methodological point of view, **conceptual analysis** in Cartography is very important. Various **structural models** of cartography (or its parts) have attempted to describe the process of mapping as a science, an academic discipline, a technology, or an inherent human impulse. Furthermore, the tasks of **cartographic design** can be deconstructed, and the **map artefact** itself (e.g. is it a model, a language, a communication channel, a decoration or an archive?) can be examined.

Since the mid-1990s, **cartosemiotics** has undergone development. It has general (theoretical) and applied (useroriented) subdivisions, the latter encountered in both cartographic and non-cartographic traditions. Outside of the cartographic tradition, cartosemiotics may be applied in biology, geography, ecology, geology, linguistics, etc. The **map semiotic approach** to Cartography allows us to examine **map syntactics** (which links the graphical representation with *aesthetics* and other parameters of design), **map semantics** with **map sigmatics** (indeed this can form the basis of many studies of cartographic ontology) and **map pragmatics** (which attempts to cover the entire area of human experiences with maps, from perception and cognition, through use for navigation, to employment in *artistic, cultural and literary works).* Such an investigation can improve the effectiveness of representations and data modelling.

There are various communication and visualization models as presentation forms in Cartography. Furthermore, cartographic representation entails **conceptual modelling** of the world and can thus itself be studied as a **cognitive process.** The new term **'conception-analytical approach'** is a research area which has significant links to diverse conceptual models and spatial data handling in GI systems. More properly allied to spatial analysis, analytical cartography makes use of the spatial representations which cartography produces in order to examine patterns, trends and measures in the data. Analysis transforms geospatial data into knowledge. The nature of such **map/cartographic/geospatial knowledge** must be recognized, along with methods

for describing and managing that knowledge. Cartographic theory may also assist in producing **cartographic ontologies,** which can be fundamental to the exploitation of cartographic databases and their applications. **Terminology** within cartographic fields themselves can be identified and developed: for example, glossaries of definitions and terms used in specialist areas.

HISTORY

Cartography and the visualization of GI have a long and well-documented history. Considerable research is ongoing into a range of issues which can be regarded as dealing with the history of cartography. These include the **impact of map-making skills in societies** throughout history, the way in which maps and GI have been used (both practically and for political and symbolic purposes), and the **development of methods of production** and the **effect of changing technology.**

In addition, historical studies have examined **'progress' in mapping** (e.g. increasing accuracies, scale, content, reliability throughout history – although not necessarily unidirectional) and have also been concerned with the **preservation of the artefacts** themselves. Within these broad approaches, specific issues can be identified. The history of **printing technology** is of considerable interest; the role of **colonial cartography** has been immense, especially in the 19th and 20th centuries; the dichotomy between **private and government mapmaking** has been fluid over many centuries. Such specific issues can be added to by considering the way in which recent and **contemporary history of cartography** is being addressed. It is important to document the rapidly changing and artefactpoor recent **history of GI science** and digital cartography.

In addition to the history of cartography as a discipline, **the role of cartography in history** has been researched by cartographers. Here the task of mapping, the role of maps, the propensity to map and the resultant impact of maps on a wide range of other human activities have all been recorded.

Perhaps the most active research area currently which has links to this section is considering **maps as cultural heritage,** part of the patrimony and cultural inheritance of a society. But such maps are more than artistic relics – they are working documents which can be used for cultural investigation over a wide range of fields (including *history, genealogy, archaeology, politics, architecture, sociology and geography).* There are significant applications in this field for the application of contemporary digital techniques, and specialist geospatial databases have been created based on historical data, but capable of being examined using modern scientific cartographic analysis.

SOCIETY

Society is one of the five main 'areas of operation' of ICA and it also offers many interesting research topics from **legal issues** (including copyright and privacy questions) to **ethics, democracy and equity.** However, accessibility to cartographic and geographic datasets and GI services is a global problem – not all members of society with an interest or need to access geospatial data are in front of a desktop computer. **Access problems** for many make it impossible to get information and participate in the developing digital society. **Gender problems** together with other problems of **under-represented groups and equity issues** are a continuous topic. Within ICA these topics have been long recognized and from the research point of view it could be interesting to analyse the effects of the

development of virtual services in an e-government context on the equity of individuals. **Virtual geographies** might also develop people's ability in spatial thinking. Modelling the world, either in an individual or on a collective basis, is one example of **social impacts** that should be seriously studied.

The heading 'Society' covers the collection, handling and representation of many highly varied socio-economic spatial datasets which can be studied using cartography and GI methods. Particularly important areas which are subject to significant contemporary mapping and geospatial data handling activity and research include **health, unemployment, literacy, public services, cultures, age and human rights.**

As a globally visible and well represented organization, ICA can support and enhance the use of such geospatial datasets in the research of **social questions at a global scale.** Such approaches need the support and cooperation of national and international institutions and organizations, including national mapping agencies, global non-governmental organizations and world development bodies, including United Nations bureaux.

With the help of the Internet, maps are now distributed to users in very different ways than they were only a decade ago. This has introduced a host of research questions related to use of electronic networks for map distribution and **the influence of the medium on the message of maps.** In addition, the question arises as to which medium should properly be used in cartography to assure the distribution of maps to the broadest possible audience. Likewise, questions must be asked about **copyright and licensing of maps** that are distributed through the Internet and how sophisticated online map servers will be maintained. This question has links to SDI as well.

From the audience point of view it is most important that **the research results are delivered equally to the users,** whoever they may be or wherever they are.From a practical viewpoint, it is clear that many of the highly skilled operations associated with cartography and GI handling require training and experience. This, itself, is an area of concern for ICA. In the research context, however, education can be divided into scientific education in universities, education at schools and continuous education as a part of the profession (the latter also includes training and practical 'on-the-job' knowledge acquisition). Research in these areas has examined **curricula,** practices in **distance learning, e-learning** and **professional updating, access to maps** and spatial data, **use of maps** to promote attitudes and behaviours (e.g. spatial thinking), and establishment of a profile for cartography which allows it to be applied and integrated with other subjects at school and in society.

University curricula have been changed during the past years: it is clear that GI systems and GI science have taken over a place in the classroom from cartography. The impact of new technologies and political pressures, such as the introduction of the Bologna pattern of study at European universities, has lessened the appeal of cartography. However, cartography is a subject which can and should play a larger role in curricula at many schools and universities. Curricula need continuous updating because of the rapidly developing technology and increasing methodology and theoretical knowledge. International cartographic association must follow the developments at universities and also try to influence the **development of educational programs.** Universities in less developed countries could enjoy **distance learning and virtual education,** as long as the methods and content match research findings in this general area.

Cartography and GI science as school subjects have taken some space in school teaching mainly in the geography and environmental programs. International cartographic association should also try to influence to this change, particularly in developing countries. Schools should be able to enjoy **Internet datasets and free software.** Especially in elementary school education, **spatial thinking and learning** enhanced by using maps are interesting topics. These topics are related with more general research into pedagogic learning, but could be recognized more in cartographic research as well.

CONCLUDING REMARKS: HOW TO IMPLEMENT THE RESEARCH AGENDA?

The purpose of this research agenda has been to identify and briefly elucidate some current and potential research issues which fall under the terms of reference of ICA and individuals and groups who work under its remit. Primarily this includes the Commissions of ICA each of which is charged with undertaking research work in their area. This agenda is intended to encourage the Commissions to consider their research areas, and to examine possible overlaps and cooperation possibilities with other Commissions. Furthermore, it will assist in identifying those areas of cartographic research which are not currently covered by any Commission and which need further encouragement. Finally, this document should disseminate the agenda of ICA to other organizations, both those with which we can undertake research collaboratively and those for whom the results of ICA sponsored research will be of value.

Clearly, therefore, we believe that this research agenda should be reflected upon by the constituent Commissions of ICA. One of the major responsibilities of the elected chairs of the Commissions is to develop a 'Terms of Reference' document which should explicitly list the deliverables expected over the four-year period of the Commission's existence (the Commissions can be reelected). Such deliverables should yield valid research results. A further duty of a Commission chair is to invite and manage a group of experts and interested individuals to achieve the deliverables. The work programme can be completed through focused research meetings and conferences (which can be during and around the time of biennial international cartographic conferences or at other times), through ongoing communications within the Commission, and through collaboration with Commissions in sister societies. Alternatively it is hoped that this agenda can be used in a positive way by those individuals who are submitting proposals for funding to regional, national and international organizations.

In all cases, ICA expects the results of research to be widely disseminated for the benefit of itself, the wider cartographic community and society in general. The presentation of a Commission report is required at each quadrennial ICA General Assembly of Delegates and the opportunities to present research findings in the conference arena exist. Publication of research work in academic and scientific journals would also be expected, along with more informal communication through Commission websites.

REFLECTION

Is the agenda as presented here complete? Can it be complete? The answer to both questions should be no for several reasons. First of all, creating the agenda has taken many years due to the organizational workflow with organizations like the ICA. Second, the technology push is stronger than ever and new hypes pass by every few months. However, some hypes prove to be of structural importance, so even when an hype some attention is required. An

example is the Google Earth/Maps type of developments.

Another ‘hype’ not found in the agenda, but picked up by some Commission and Working Group activities is for instance related to Web 2.0. With Mash-ups one can create customized and privatized maps. In combination with other Web 2.0 facilities such as wiki’s, blogs, photo sharing, podcasting, social software like facebook, folksonomy and (geo)tagging, as well as RSS feeds users contribute to the collection of georeferenced materials available via the web. This trend has been ‘classified’ as neo-geography or when we relate it to the maps ‘neo-cartography’. Would it be possible to bring these often informal data collection processes of Web 2.0 together with the formal world of for instance the National Atlas or Topographic Maps, such that both worlds could benefit and one might even think of update via the people?

Map design in a neogeography environment will require innovations of the traditional approaches. The strength of maps is their ability to select from reality and abstract the selection via a well designed symbolization. This results in maps that are characterized by their relative emptiness, by visual hierarchy and have a particular appealing style. Both selection and abstraction are challenged by the current Web2.0 products. A challenge among many other for ICA’s Commissions and Working Groups. And these challenges will keep the research agenda alive.

Section II – Statutes and By-Laws

A) Aims of the Association

Article 1.
The International Cartographic Association (ICA) has the following aims:

a) Advancing the study of cartographic or geographic information (GI) science issues. In particular it is concerned with the processing**,** storage and analysis of source material and the design, construction, reproduction and display techniques of maps and associated forms of graphic communications. To this end, co-operation with different branches of geodetic, geographic and other scientific research disciplines is desirable.
b) Initiating, fostering and co-ordinating research in cartography and GI science, involving the co-operation between different nations, the exchange of ideas and documents, the furtherance of education and training in cartography and GI science, and encouraging the dissemination of cartographic and GI science knowledge.
c) Organising international and regional conferences, meetings, exhibitions and outreach programmes, etc., and participation in similar meetings facilitated by other organisations.
d) Establishing commissions and working groups to work on issues of particular interest to cartography and GI science.
e) Promoting and ensuring equity in all matters and at all levels of responsibility within the Association and amongst its members.
   The ICA subscribes to the 1958 declaration of the 8th General Assembly of the International Council for Science (ICSU) concerning non-discrimination on the basis of politics, nationality, religion, race or gender.

B) Incorporation into an existing international scientific organisation

Article 2.
The ICA may be affiliated with other international organisations.

C) National representation

Article 3. National representation and membership of the Association.
Any nation which pursues a cartographic or GI science activity can be accepted as a member nation of the ICA provided that it agrees to participate financially in supporting the Association and in collaborating actively in its scientific and technical activities. Each nation can only be represented by one single organisation, which should preferably be the national society or committee for cartography or GI science. Thus, a *member nation* is represented by a *national member organisation* such as one of these. Furthermore, the ICA can accept requests for *affiliated membership* from international or national scientific, technical or other organisations made for the purpose of collaborating in its activities, and without compromising the principle of single representation of each nation in the official functioning of the Association or affecting the methods of voting as described in Articles 4, 26 and By-law 5. Application to become a member nation or affiliate member shall be made by letter to the Secretary General and Treasurer and may be approved by the Executive Committee subject to ratification at the next General Assembly of Delegates.

Article 4. Delegates and voting rights
Every member nation has the right to one vote in the General Assembly of Delegates. For this purpose, each member nation is represented at the General Assemblies of the Association by a principal delegate and by a deputy, who may vote in the absence of the principal

delegate. However, at the request of the Executive Committee, the General Assembly may withdraw the right to vote from member nations which have not paid their contribution for the previous three years.

Article 5. Activities and reports
The task of each national member organisation is to facilitate and co-ordinate, within in its nation, the study and development of the different aspects of cartography and GI science. Every member nation or affiliate member, either individually or in conjunction with one or more of the other member nations or other affiliate members, can submit motions (see Article 10) to the Association which are appropriate to the Association for discussion.
Each national member organisation agrees to send a report to each General Assembly on the cartographic and GI science activities in the country during the previous four years.

D) Official Organisations of the Association

Article 6.
Official organisations of the Association are:

- the General Assembly of Delegates (See Articles 7-11)
- the Executive Committee (See Articles 12-14)
- the Office of the Secretary General and Treasurer (or Secretariat) (See Article 16)
- Commissions and Working Groups (see Article 24)
- the Publication Committee (See Article 27)
- the Statutes and By-laws Committee (See Article 28)
- the Selection of Award Recipients Committee (See By-law 4)
- the ICA Foundation for Supporting Cartography and Geographic Information Committee.

E) The General Assembly of Delegates

Article 7. Composition of the General Assembly of Delegates
The General Assembly of Delegates is formed from the principal delegates of each national member organisation and their deputies, who are able to attend, and the members of the Executive Committee. If the Executive Committee so permits, additional delegates may attend the General Assembly of Delegates as observers.
A member nation, which is represented on the Executive Committee, can nominate that committee member as its principal delegate with the right to vote.
Normally, the President of the Association will preside at the General Assembly.

Article 8. Authority of the General Assembly of Delegates
The General Assembly of Delegates

- decides on the policy and Statutes and By-laws of the Association
- ratifies the membership of new members, which have been considered and approved by the Executive Committee
- elects the President, the Secretary General and Treasurer, the Vice-Presidents and two auditors
- receives the reports of the Executive Committee and the Commissions and Working Groups for the previous period of office
- decides on the budget and the resources available for the following (four-year) period
- determines the programme of activities in general and decides, in principle, on planned activities or meetings, including the next meeting of the General Assembly

- establishes Commissions, elects the chairpersons of Commissions and approves the terms of reference, subject to the provisions of Article 24

Article 9. Meetings of the General Assembly of Delegates
The General Assembly of Delegates will normally meet every four years.
At each General Assembly the time and place of the next meeting will be decided or, if this is impractical, the decision will be made by the Executive Committee.
In special circumstances, with the agreement of the Executive Committee, the President has the right to call an Extraordinary General Assembly. The President is also obliged to do so if one third of the member nations demand it.
As a rule, the General Assembly will be held in conjunction with an International Cartographic Conference (ICC).

Article 10. Agenda
The agenda of every General Assembly of Delegates is decided upon by the Executive Committee. It will be communicated to the representative of each member nation three months before the General Assembly of Delegates takes place.
In order to make this feasible, national member organisations who want to bring an issue to the agenda must propose a motion on that issue in writing to the Secretary General and Treasurer at least five months before the date of the General Assembly. See also By-law 8.
Motions not listed on the agenda cannot be brought to that Assembly for a decision. However, the President is entitled to accept such motions, but for discussion only.

Article 11. Voting
Decisions at the General Assembly shall be taken by a show of hands and by a simple majority vote, of those delegates present, who have the right to vote.
However, if at least two delegates make a request, the vote shall be taken by ballot. Should there be an equal division of vote, the President shall cast the deciding vote. Voting by proxy will not be permitted and no delegate shall represent or vote for any other member nation.
Voting by correspondence will be permitted only in accordance with Articles 28 and 30.

F) The Executive Committee

Article 12. Composition of the Executive Committee
The Executive Committee of the Association consists of the following members:
- The President of the Association, who presides over all regular and extraordinary General Assemblies, the meetings of the Executive Committee, International Cartographic Conferences and acts as the main representative of the Association
- A Past President, who shall serve for one term following the term of President. The office of Past President may remain vacant
- Five to seven Vice-Presidents, the exact number to be decided at the General Assembly of Delegates. They assist the President in the performance of his or her different duties. In case of inability to carry out duties, the President may delegate to a Vice-President the authority to perform presidential duties. If the President is unable to do this, or cannot preside over a meeting of the Executive Committee, the Executive Committee may elect an Acting President.
- A Secretary General and Treasurer, who is responsible for the administration and the general running of the Association

The duties to be conducted by Executive Committee members are specified in the

reference document *Duties and Responsibilities of ICA Officers* (section 5 of this Directory)

Article 13. Election of the Executive Committee
No member nation may have more than one representative on the Executive Committee.
The President, the Vice-Presidents and the Secretary General and Treasurer shall be elected by the General Assembly of Delegates and shall hold office until the end of the following General Assembly. They can be re-elected, but with the following restrictions:

- the President may not serve for three consecutive terms
- the Vice-Presidents and the Secretary General and Treasurer may not serve for three consecutive terms

In the event of a vacancy arising in the Executive Committee in the period between two General Assemblies, the Executive Committee, after consultation with the member nation which the person represented, will appoint a replacement from the same member nation to serve until the next General Assembly at which a new Executive Committee is elected. If a vacancy arises in the Presidency, an Acting President will be elected by the Executive Committee. The Secretary General and Treasurer shall organise the election as soon as possible following the vacancy.

Article 14. Authority of the Executive Committee
The Executive Committee is responsible for the general functioning of the Association and represents it wherever necessary.
A quorum of half the members of the Executive Committee, plus one, is required to validate decisions of the Committee. It prepares and organises the General Assembly of Delegates, oversees the International Cartographic Conferences and other meetings, and compiles reports on them. It may form Working Groups. It prepares guidelines and rules for the formation and operation of Commissions and Working Groups, including their functioning and reporting, and the managing of funds allocated for their support. It examines and, if necessary, modifies proposed terms of reference, in discussion with the proposed Commission chairpersons before presentation to the General Assembly for decision.
As a rule, it meets once a year, but may meet whenever deemed necessary, at the invitation of the President or by request from at least three of its members.
The members of the Executive Committee perform their duties without remuneration.
The time and place of the International Cartographic Conference between General Assemblies may be determined by the Executive Committee.

Article 15. Domicile of the Association
The domicile of the Association is determined by the President.

Article 16. Secretariat
A secretariat may be installed, either at the meeting place of the General Assembly of Delegates or at the domicile of the President or of the Secretary General and Treasurer.
Such a secretariat may have paid employees, whose salaries are to be determined by the Secretary General and Treasurer with the approval of the Executive Committee.

Article 17. Auditors
The Auditors are elected by the General Assembly of Delegates for the period between two successive General Assemblies. The Secretary General and Treasurer submits to them, in good time, all necessary documents to enable them to render to the General Assembly, a complete report on the accounts, and on the financial position of the Association. This report has to be presented to the Executive Committee before the Delegates meet.

The Auditors have, at all times, the right to carry out any checks and inspections which seem necessary to them. They perform their duties without remuneration.
They can be re-elected.

G) Budgets, Funds

Article 18. Budget
The amount of the annual subscription unit will be determined periodically by the General Assembly of Delegates by means of a by-law (By-law 2). This subscription provides the operating budget for the Association.

Article 19. Use of funds
The income of the Association is to be devoted to paying for:

- the cost of administration
- travel costs within the limits decided by the President and/or the Secretary General and Treasurer
- the remuneration of any paid staff in the office of the Secretary General and Treasurer
- any purchase designed to achieve the general purposes of the Association as approved by the General Assembly
- scholarships, travel awards and other contributions from the ICA Fund for Supporting Cartography and Geographic Information

Article 20. Payment of subscriptions
Each national member organisation and affiliate member is responsible for paying the annual subscription.
If a national member organisation has not paid its subscription for three consecutive years, the Executive Committee may decide that it shall be given observer status until payment is made. If they refuse to pay they will cease to form part of the Association by a decision taken by the General Assembly of Delegates.
The Executive Committee can institute *individual membership* of ICA. This may be introduced at a later date and regulated by the By-laws.

H) Organisation of activities

Article 21. Execution of activities
According to Articles 1, 5, 8 and 14 the Association organises different types of activities in order to achieve its aims. The details of such activities are to be decided by the Executive Committee. However, major events should be endorsed by the General Assembly of Delegates.

Article 22. International Cartographic Conferences
International Cartographic Conferences (ICC) may be called by the Executive Committee independently of the regular General Assemblies of Delegates, but preferably they should, if possible, be co-ordinated with them regarding time and location (see Article 9).
The General Assembly of Delegates entrusts, to one of the member nations, the organisation of an ICC. The host nation shall decide the programme subject to the approval of the Executive Committee.

Article 23. Joint meetings
Special meetings, called 'joint meetings', may be organised together with other organisations. The Executive Committee decides, in each case, on the time, place and working programme of such joint meetings.

Article 24. Commissions, Working Groups and Task Forces
The General Assembly of Delegates may establish commissions for the execution of important cartographic and GI science tasks. The tenure of office of a Commission is limited to the period between two General Assemblies, but may be extended for another period by a vote at a General Assembly of Delegates.
A Commission is chaired by an individual, who is to be elected at each General Assembly. A Commission chairperson

may not serve more than two consecutive terms. The General Assembly shall, at the same time, approve terms of reference for that Commission. A commission also includes a number of other members invited by its chairperson. A number of corresponding members may also be selected. In the event of a vacancy in the chair of a Commission occurring between General Assemblies, a new chairperson shall be appointed by the Executive Committee having regard to the recommendations of the members of the Commission. After approval of the Executive Committee a Commission may allocate a part of its work to a national institution, official or private, or to individual persons.
Between two successive General Assemblies the Executive Committee may form Working Groups, whose chairpersons it appoints and whose mandate it defines. Commissions and Working Groups are required to present reports of their work to each General Assembly of Delegates.
The General Assembly may authorize participation by the Association in formal joint Working Groups with other international organisations.
The President may set up Task Forces for solving special tasks or projects that have to be performed urgently.

Article 25. Invitation of additional persons as observers
The President of the Association is entitled to invite to General Assemblies, International Cartographic Conferences, Symposia or Joint Meetings, suitable additional persons as observers or guests, including persons who are not from a member nation of the ICA.

Article 26. Voting at meetings other than General Assemblies
At Commission and Working Group meetings, all participants have the right to vote on purely scientific or technical questions. But if the issue is on the general conduct or on the administration or financial matters of the Association, it should be handled by General Assemblies. Meetings at which decisions are made shall be documented by minutes. Conferences, symposia and joint meetings may adopt resolutions. All participants have the right to one vote each in the adoption of a resolution.

Article 27. Publications
All publications of the Association require the approval of the Executive Committee. The Executive Committee will arrange for the publication of a bulletin or newsletter concerning the activities of the Association and its member nations, and facilitate the publication of papers on cartography and GI science.
For consideration of other publications, the Executive Committee shall appoint a Publications Committee consisting of a Chairperson and three members; only one of these four may be a member of the Executive Committee. The President and the Secretary General and Treasurer shall be additional members ex officio. The tenure of office of the Committee shall be the same as the Executive Committee, but the members may be re-appointed. The Publications Committee will examine proposals for publications (including commission reports), and approve plans in terms of production, format and style, budgets and expenditure and distribution arrangements.

I) Changes to the Statutes, duration and dissolution of the Association

Article 28. Changes in the Statutes
Motions concerning changes in the Statutes must be received in writing by the Executive Committee at least five months before the General Assembly of Delegates. Provided this is done, the Executive Committee must present to the General Assembly any motion for changes in Statutes and include the motion on the agenda for the General Assembly (see also Article 10).

The Executive Committee may itself propose motions for changes in the Statutes and the adoption, modification or rescinding of By-laws to be included on the agenda for the General Assembly of Delegates. The Executive Committee may establish a Committee on Statutes and By-laws for advice.
In order for a motion to be accepted, an absolute majority of the voting member nations of the Association is necessary, voting in person or by correspondence.
For votes on changes to the Statutes, a member nation, not represented at a General Assembly, may forward its vote to the President of the Association by letter. For such a vote to be valid it must be received by the Secretary General ten days before the motion is presented to the General Assembly of Delegates.
Changes in Statutes are effective immediately after the General Assembly at which they are adopted.

Article 29. By-laws
Within the framework of these Statutes, the General Assembly of Delegates shall have the power to adopt By-laws. These may be adopted, modified or rescinded by a simple majority of votes expressed by the principle delegates attending the General Assembly.
Changes in By-laws take effect immediately after the General Assembly at which they are adopted.

Article 30. Dissolution of the Association
A decision to dissolve the Association is only valid with the consent of at least two-thirds of the member nations.
In the case of dissolution, the funds of the Association will be placed, by the General Assembly of Delegates or the Executive Committee, at the disposal of one or several international scientific organisations, whose aims are closely related to cartography or GI science.

K) Official Languages

Article 31. Languages
The official languages are French and English. Other additional languages may be used if the necessary translation facilities can be provided.

Article 32. Decisive Language
In cases of doubt on the interpretation of the statutes the French text only shall be used in deciding the meaning given to the Articles.

By-Laws

By-law 1

a) Each member nation subscription to the ICA shall be expressed in 'subscription units'. All adhering member nations are divided into categories, numbered I to VII, and will pay annually the number of subscription units specified in that category.
b) The categories and subscription units shall be as follows:

Category	No. of subscription units
I	1
II	2
III	3
IV	4
V	6
VI	8
VII	10

c) Each member nation shall select the category into which it wishes to be classed. The Executive Committee may refuse a specification if the category chosen is believed to be inappropriate.
d) The amount of the subscription unit, and the currency or currencies in which the subscription will be made, will be determined by the General Assembly on recommendation by the Executive Committee.
e) The subscription for Affiliate members, as defined in By-law 5(a), is set as a minimum of one subscription unit for categories (1) and (2), a minimum for two subscription units for category (3) and (4) and a minimum of ten subscription units for category (5).

By-law 2

The annual subscription is determined to be € 250 (250 Euros) per unit until further notice.

By-law 3

The ICA may grant to outstanding cartographers such awards and honours as are approved by the Executive Committee upon the recommendation of a Committee for the Selection of Award Recipients.

By-law 4

The President shall appoint a Committee for the Selection of Award Recipients after each General Assembly to serve until the next General Assembly. The Committee shall consist of five representatives, each from a different member nation. No more than two representatives can hold concurrent membership of the Executive Committee.

By-law 5

a) For the purpose of affiliation as described in Article 3 the following categories shall apply:
   (1) (International) Educational establishments
   (2) National cartographic or GI science societies other than the national member organisation
   (3) National scientific organisations and technical organisations
   These include academic, research or technical institutes or other scientific or technical bodies, governmental or autonomous, that are users of cartographic data and are demonstrably devoted to the discipline of cartography and GI science to the satisfaction of the Executive Committee.
   (4) Nationally operating private firms/companies
   These include such organisations that are engaged in the development, production or manufacture of cartographic or allied equipment or products and are committed to supporting the interests of the discipline of cartography and GI

science to the satisfaction of the Executive Committee.

(5) Internationally operating private firms/companies

These include such organisations that are engaged in the development, production or manufacture of cartographic or allied equipment or products and are committed to supporting the interests of the discipline of cartography and GI science to the satisfaction of the Executive Committee.

b) Application for affiliation in category (a)(2) must be submitted to the Executive Committee with a letter of support from the member nation.

c) Application for affiliation in categories (a)(1), (a)(2), (a)(3) and (a)(5) must be submitted to the Executive Committee in writing.

By-law 6

ICA member nations and affiliates shall be entitled to the following services:

- Invitation to all ICA International Cartographic Conferences
- One free copy of all ICA publications including the ICA newsletter
- Free copies of National Reports presented to ICA General Assemblies. Free copies of the published collection of presented conference papers when made available, posted to members and affiliates unable to be present at the conference
- Training courses, from time to time, as the need is demonstrated and finance is available
- Preferential treatment in exhibitions of ICA

Upon request, the ICA may assist in sponsoring conferences, seminars and symposia in member nations or in conjunction with affiliates. Assistance may consist of:

- a financial contribution conditional on due recognition being given to the ICA and/or
- support of a member of the Executive Committee of ICA to attend and participate in the meeting

By-law 7

All national and affiliate members may propose one representative for each commission for consideration by the chairperson of that commission.

By-law 8

Nominations for President, Secretary General and Treasurer, and Vice-President of the Executive Committee, and nominations of chairpersons of commissions, duly proposed by their respective member nations, must be received by the Secretary General at least five months prior to the date determined for the General Assembly of Delegates. Such nominations must be accompanied by an indication in writing from the candidate that he/she is willing to serve, supported by a brief CV.

The foregoing Statutes and By-laws are as amended by the 14th General Assembly held in Moscow on the 4th and 9th of August 2007.

Establishment and Purpose

The ICA Executive Committee has decided to establish an ICA 'Solidarity Fund' with the purpose to support students and professionals in cartography and geographic information, and to propagate cartography and geographic information preferably in developing countries, which are member nations of the ICA. The fund is established in accordance with the Swedish Law for Idealistic Organisations and Foundations (SKV 324, 14th edition, July 2006).

Contributions

Annually, part of the ICA budget will be transferred to the Fund by the ICA Secretary General & Treasurer. Donations from any organisation or individual in the cartographic and GI science community are welcome, but may be denied if the donor has claims that contradict the values of ICA as a scientific or non-governmental organisation.

Maintenance

The capital of the Fund is maintained by a committee with three members. One of these shall be the ICA Secretary General & Treasurer and the other two appointed by the ICA Executive Committee. The other two appointed may not be members of the ICA Executive Committee. The Treasurer shall not chair the committee but have the authority to effect transactions decided by the committee. The capital may be invested in shares, bonds or revenue funds with the purpose to get good and safe return. The Executive Committee may specify policy on investments.

Applications

Applications for scholarship, travel awards or other actions for competence development shall be addressed to the ICA Secretary General & Treasurer and decided by the ICA Executive Committee. The application shall contain the name, address and recognised merits of the applicant as well as purpose and expected effects on the personal development or enhancement of cartography and GI science. A written report of how the award has been used is required from the recipient. Any unused part of the award must be repaid.

Applications for scholarships or travel awards are open for cartographers and GI scientists, preferably from developing countries (as defined by the UN). Guidelines for travel awards can be found in the ICA Reference Documents.

Accounting and Auditing

The ICA Secretary General & Treasurer shall handle the accounts in such way that incoming and outgoing contributions, as well as the result of the financial maintenance of the fund, can be reported separately from the main accounts of the Association. The committee as indicated in §3 shall prepare an annual report showing the activities and economic result. The report shall be lodged with the auditors by the end of February each year. The committee is also responsible for completing a tax declaration in accordance with the regulations of the relevant tax authority.

Section III – Operational Guidelines

These guidelines are intended to help the National Member Organisations of the International Cartographic Association, in order to facilitate the work of both parties. The guidelines have been derived by the Executive Committee from the Statutes, By-laws and practices of the Association.

On-going Duties

Each nation can only be represented by one single organisation, which should preferably be the national society or committee for cartography or GI science. Thus, a member nation is represented by a national member organisation (Article 3 of ICA Statutes).
This organisation has to designate to the Secretary-General:& Treasurer

- Contact person for any correspondence;
- Contact person for the payment of subscription fees; and
- Names and contact information for the principal and deputy delegates to the General Assembly of Delegates, one month before the Assembly takes place.

The Contact person for correspondence shall receive a printed copy of ICA News twice a year and must disseminate its content to the cartographic and GI science community of the member nation by appropriate means.
Active National Member Organisations are invited to encourage, on an informal basis and through personal contacts, less active National Member Organisations in participating in ICA activities.
National Member Organisations should support their members in the Executive Committee, the Publications Committee, and the Commissions and Working Groups (including chairs and members), and they should ask these individuals to report to them on their activities.

Duties on Request

The National Member Organisation is responsible for the payment of subscription fees (Article 20) by the due date upon receipt of invoices from the Secretary-General & Treasurer.

On various matters, the President, the Secretary-General & Treasurer, and the Vice Presidents may ask for any kind of contribution (including their opinions) by circular or specific letters. These matters may concern general activities of the ICA, such as the Barbara Petchenik Competition, or technical activities performed by the Commissions or Working Groups.
Furthermore the National Member Organisation shall promote the International Cartographic Conference and encourage submission of abstracts.
The National Member Organisation is consulted regarding applications for affiliate membership from its country in accordance with By-law 5.
It has been decided in principle that a Meeting with National Member Organisations and the Executive Committee will take place at each General Assembly and International Cartographic Conference. A designated delegate of each National Member Organisation is expected to attend.
It is expected that each national member organisation will positively support and promote the development of cartography within their country. Membership of ICA has responsibilities which include an active approach within the country to the ensure that the cartographic community is well-represented in ICA, and that decisions are made democratically reflecting the wishes of the national cartographic community.

Duties Related to the General Assembly

At least five months before a General Assembly of Delegates, the National Member Organisation may propose to the Executive Committee through the Secretary General & Treasurer:

- Motions for inclusion in the agenda of the General Assembly (Article 10),;
- Motions for changes in the statutes (Article 28);
- Nominations for President, Secretary-General & Treasurer, Vice-President, Commission chairs (By-law 8);

- Formation of Commissions, and their terms of reference;
- Bids for future events in accordance with 'Guidelines for International Cartographic Conferences and General Assemblies'.

At least one month before a General Assembly, and using the material provided by the Secretary-General & Treasurer, the National Member Organisation:

- Will designate its principal delegate, who will participate and vote on behalf of the member nation in the General Assembly, and a deputy delegate (Article 4); or
- May vote by correspondence on items on the agenda (Article 11) regarding changes in the statutes (Article 28).

Prior to the General Assembly, the National Member Organisation shall prepare a national report on its cartographic and GI science activities for distribution during the General Assembly (Article 5). The structure of the report is not specified, but the report has to emphasise the main achievements made in the country since the previous General Assembly in research and development, in education and training, in production in both public and private sectors; it also has to reflect on the contribution of the country to the activities of the ICA. Guidelines on the preparation of the National Report are given in a separate document. If the document is in hard-copy form, at least 150 copies have to be sent to the Local Organising Committee for distribution at the General Assembly, and one digital copy to the Secretary General & Treasurer Copies may be provided for all conference delegates if desired.

During the General Assembly (or by correspondence), the principal or deputy delegate has to vote upon items included in the agenda for the particular General Assembly.
After the General Assembly, the National Member Organisation may propose one representative for each Commission and working group (By-law 7) to the relevant chair who makes the decision.

F.J. Ormeling, Secretary General & Treasurer, March 27, 2007
D.J.Fairbairn, Secretary General & Treasurer, May 3, 2011

Glossary

Specific terms used in this document (unless modified by context) shall be interpreted as follows:

a) "ICA" and "Association" means the International Cartographic Association.
b) "The Statutes" and "The By-laws" refer to the current set of Statutes and By-laws, as ratified by the General Assembly of Delegates of the ICA held in Moscow, August 4 and 9, 2007.
c) "member" can refer to either member nation or affiliate member (according to Article 3 of the Statutes), but requires to be clarified in context.
d) "Executive Committee" refers to the Executive Committee of the Association (Articles 12-14).
e) "Officers" are officers of the Association, as defined in Articles 12, 24 and 27 of the Statutes.

PRESIDENT

1) Shall preside (when present) over all regular and extraordinary General Assemblies, meetings of the Executive Committee, and, when appropriate, other activities of the Association (Article 12 of the Statutes). In the case of unavailability, the President may delegate to a Vice-President or the immediate Past-President the authority to perform presidential duties.
2) Is charged with the general management and supervision of the affairs and operations of the Association.
3) Shall assign duties to other members of the Executive Committee when needed.
4) Shall, with the Secretary General & Treasurer, or another officer appointed by the Executive Committee, sign all official ICA documents.
5) Shall present a written and oral report to the General Assembly at the end of the 4-year term of office.
6) Shall determine the domicile of the Association (Article 15).
7) Shall invite to ICA events suitable additional persons, as observers or guests, including persons who are not from a member nation of the ICA.
8) Shall be an additional, ex officio member of the Publications Committee
9) Shall appoint a Committee for the Selection of Award Recipients after each General Assembly to serve until the next General Assembly.
10) Can call a meeting of the Executive Committee at any time deemed to be necessary.
11) Shall represent the Association at those international events which the EC determines.
12) Shall provide a liaison role with sister societies and the Joint Board of Geospatial Information Societies.
13) Shall be the primary contact for formal communication between members and the Executive Committee.

SECRETARY-GENERAL & TREASURER

1) Is responsible for the administration and general operation of the Association.
2) Shall keep full and accurate accounts of all receipts and disbursements of the Association, and shall deposit all monies and other valuable effects in the name and to the credit of the Association in banks as deemed to be appropriate by the Executive Committee.
3) Must submit to the auditors, in good time, all necessary documents to enable them to provide to the General Assembly of Delegates a complete report on the accounts, and on the financial position of the Association.
4) Must submit the accounts to the General Assembly of Delegates.
5) Must fulfil the requirements of the relevant tax authorities.
6) Shall record all facts and minutes of all proceedings of the Executive Committee (or delegate someone to do so).
7) Shall be an ex officio member of the Publications Committee.

8) Shall serve on the ICA Fund for Supporting Cartography and Geographic Information Committee.
9) Shall serve all notices required to members and the Executive Committee.
10) Shall be the custodian of all books, papers, records, correspondence, contracts, and other documents belonging to the Association that he/she shall make available when authorised by the Executive Committee.
11) Shall keep contact with the archiving function at ENSG France, and deliver documents for archiving to ENSG France in a timely manner.
12) Shall notify the members (national and affiliate) and the ICA News Editor of the results of elections and decisions made at the General Assembly immediately after this meeting.
13) Shall keep all members informed of the schedules and deadlines for business of meetings and the General Assembly such that EC and national delegates are aware of their responsibilities and opportunities in driving the business of the association.. This might mean that in early January, reminders shall be sent to the Contact on each National Committee of the deadline for items such as motions, etc. This might also apply to those items which have to be done three months before the General Assembly of Delegates or the International Cartographic Conference.

IMMEDIATE PAST-PRESIDENT

1) Shall serve as an officer of the Association and a member of the Executive Committee.
2) Shall perform such duties as the President may assign.
3) Shall act as the primary liaison between the Executive Committee and the Advisory Board, acting as chair of the latter.

VICE-PRESIDENTS

1) Shall assist and deputise for the President in performing different presidential tasks and perform general duties as a member of the Executive Committee.
2) Shall act as a liaison person to allocated commissions and working groups, and report on such liaison to each Executive Committee meeting. The duties of this 'Executive Liaison' are listed in a separate section below.
3) Other duties which may be undertaken by Vice-Presidents in collaboration with the Secretary General & Treasurer include:
   a. Organising a meeting of the chairpersons of commissions and working groups every two years at each International Cartographic Conference.
   b. Organising a meeting with the heads of national member organisations at each General Assembly and, if possible, at the International Cartographic Conference between two General Assemblies.
   c. Providing assistance to the Secretary General & Treasurer for all practical and final details relating to the refereeing for Travel Awards, liaising between the awardees, the Executive Committee and the Local Organising Committee.
   d. Organising a meeting of students and young persons at each ICC.

Specific guidelines will be provided to undertake these tasks.
Also, Vice-Presidents:
4) Are expected to attend all Executive Committee Meetings (1-2 per year).
5) Are expected to read ICA correspondence and agenda books and react to them as appropriate.
6) Are expected to maintain an overview of ICA Web pages.

7) May be called upon to represent ICA at appropriate events with a contribution towards travel costs from ICA.
8) Shall receive, on request, an honorarium of 500 Euros per annum to contribute to travel and subsistence costs related to EC meetings.
9) Shall receive free registration for each International Cartographic Conference.

COMMISSIONS AND WORKING GROUPS

Commissions are established and renewed by decisions of the General Assembly, responding to proposals from member nations which present Terms of Reference and a nomination for chair. Commissions may be renewed by the General Assembly.. Working Groups are established by the Executive Committee in response to a perceived immediate need for ICA involvement in a topic, or in response to a request from any member nation. EC also define the Terms of Reference and appoint the chair of the Working Group.
All Commissions and Working Groups must:

1) Fulfil the specific terms of reference as approved by the General Assembly of Delegates.
2) Disseminate information on their subject matter to the ICA member nations and to the international cartographic community: Commissions and Working Groups are encouraged to do this through publications, for which advice from the Publications Committee can be sought.
3) Where indicated in their Terms of Reference, continue the provision of experts for workshops in developing countries when requested and devote part of ICA's efforts to the strengthening of cartographic communities in developing countries by disseminating cartographic knowledge in situ.
4) Coordinate their activities with other ICA Commissions, whenever possible.
5) Coordinate activities with Commissions of other international organisations if this is in the interest of the aims and objectives of ICA. In addition, Commissions are encouraged to liaise with bodies such as Commissions of sister societies on the JBGIS; PAIGH, GEOSS and all other international organisations with which ICA has signed Memoranda of Understanding; affiliate members of ICA; and all national and regional mapping agencies.
6) Appoint a vice chair, who will be able to deputise for the chair. This person must be from a different member nation to the Chair.
7) Ensure that the aspects of equal opportunity regarding gender, religion and race, and accessibility, are taken into account in all actions and activities of the Commission.

The Responsibilities of the Commission / Working Group Chairpersons are:

1) Membership:
Under the current Statutes of the Association every member nation and affiliate member may propose a representative in each Commission / Working Group (By-law 7). The representatives have the task of disseminating information about the Commission and raising interest within their national cartographic and GI science community. In addition, Commission and Working Group chairs are entitled to invite and include any individual to become members of the commission / working group (Statutes, Article 24) and should report all changes in membership to the President, the Secretary General & Treasurer and the Executive Committee contact.
The Executive Committee recommends that normally a Commission / Working Group would have a limited number of active members, with a range of membership reflecting ICA's membership profile. Whilst recognising

that many Commissions and Working Groups do work most effectively when their activities are geographically limited, it is at all times essential that a Commission or Working Group is not dominated by one nationality. Meetings of Commissions and Working Groups should be open to any individual, Commissions and Working Groups may include corresponding members with a main task of dissemination of information within their national cartographic and GI science community.

2) Budget and finance
Manage the budget presented by the Secretary-General & Treasurer, request additional funds from the Association if necessary, and inform the President, the Secretary General & Treasurer and the EC contact of all proposed requests for outside funds made to international or other funding agencies.[1]

3) Reports
Submit all official Commission / Working Group statements and a bi-annual report on activities to the Executive Committee liaison person (content below), with a copy to the editor of ICA News to ensure widespread dissemination. A brief report must be presented on the first day of ICA conferences about the activities of Commissions and Working Groups over the previous two years. The commissions are also specifically required to present summary reports of their work during their four-year term of office in advance of each General Assembly of Delegates (Statutes, Article 24), and respond to questions from delegates. Assistance in preparing such reports (in the form of a summary poster and as a compilation of the regular bi-annual reports to EC) will be offered by the Secretary-General & Treasurer.

4) Publications
Work with the Chair of the Publications Committee on all proposed publications of the Commission / Working Group according to the rules of procedure for publications (Statutes, Article 27)

5) Information on activities
Write and inform the Executive Liaison of all Commission / Working Group activities, and at any time raise issues of concern with the Executive Liaison or the President and the Secretary General & Treasurer.

6) Archiving
Ensure that as much information as possible about the activities of the Commission / Working Group be preserved on paper (stamped with an ICA logo), and sent to the Secretary-General for archiving purposes.

7) International Cartographic Conferences
Assist the Local Organising Committee of ICCs to manage the Programme for each ICC. This may involve responding to requests for comment about themes for the conference, but primarily it will require active participation in the review of submissions. It is expected that Commission Chairs will respond promptly to requests to review submissions, assist in determining the status of submissions (accepted refereed, submitted papers, posters), and monitor corrections after review. Commission / Working Group Chairs will also be expected to chair technical sessions during ICCs.

8) Arrange and promote a 'business meeting' of the Commission / Working Group during each ICC. This event will be scheduled

[1] Note that the ICA policy is that members of Commissions / Working Groups should have travel support guaranteed from national sources before they accept a position in an ICA Commission / Working Group. It is understood that this is not always possible, but the ICA would prefer that Commission / Working Group monies should not be used for travel. The request for ICA funds should be made on a project-related basis, for projects that are connected to the terms of reference, especially seminars and publications. Should additional monies for items not initially anticipated be needed, the Executive Committee will consider justified requests for these additional monies that must be specified in the annual report to the Executive Committee. All payments for Commission / Working Group business must be supported by receipts. The President and the Secretary General & Treasurer have to agree before any Commission / Working Group makes application to an international or other agency for funds for support of its activities. The ICA cannot afford to have several of its groups applying independently to the same agency for funding. Such an uncoordinated approach would reflect on the ICA, ultimately jeopardizing all chances for success in raising funds.

in the ICC timetable and will give an opportunity for the Commission / Working Group to meet, to reflect on recent and future activities, and to promote itself to any and all conference participants.

9) Arrange and promote Commission / Working Group activities in the periods between ICCs which assist in meeting the Terms of Reference. Such activities can include 'pre-conference workshops' in a venue close to the ICC, and Commission Chairs can expect some assistance in establishing local contacts to effect such workshops.

10) Attend a briefing/induction meeting immediately after the General Assembly at which they are appointed.

11) Prepare an Operational Plan, which will acknowledge the Terms of Reference approved by the General Assembly and which will be used to set achievable targets for the Commission for a four year period. The Operational Plan may be revised after two years.

EXECUTIVE LIAISON FOR COMMISSIONS AND WORKING GROUPS

The responsibilities of the Executive Liaison are to:

1) Provide assistance to the Commission / Working Group to carry out its terms of reference.
2) Become involved in the work of the Commission / Working Group.
3) Serve as spokesperson for the Commission / Working Group at Executive Committee meetings and be prepared to elaborate on its annual report.
4) Attend, whenever necessary or possible, meetings of the Commission / Working Group.
5) Give the President and Secretary General & Treasurer advice on matters pertaining to the Commission / Working Group which arise between meetings of the Executive Committee.

FORMAT OF COMMISSION AND WORKING GROUP REPORTS

Bi-annual reports on the work of each Commission / Working Group must be submitted to the Secretary-General & Treasurer on 1 January and 1 July each year. A short form is made available by the Secretary-General for completion. Alternatively a fuller text document could form the report, but it must include the following information:

1) Name of Commission / Working Group
2) Chairperson
3) Terms of Reference
4) Co-Chair / Deputy Chair, Members and Corresponding members
5) Activities according to the Terms of Reference
    i. If the work was completed
    ii. If not, the progress made
    iii. If the programme should have been completed
    iv. How this could be achieved
6) Seminars
    i. Time and places of any seminars held
    ii. Attendance
7) Publications
    i. Planned Publications / Publications produced
    ii. Publications submitted to the Publication Committee
    iii. Progress on outstanding publications
8) Meetings
    i. Detail of meetings held
    ii. Attendance
    iii. Outcomes
10) Finance
    i. Details of any expenditure
    ii. Use of ICA funds
    iii. Use of other funds
10) Future of the Commission / Working Group
11) Comments

Adopted by the Executive Committee, August 8, 2007 and July 3, 2011.

1 Introduction

The ICA holds an International Cartographic Conference (ICC) every two years. Normally, a meeting of the General Assembly (GA) of ICA (its main decision-making body) is held in conjunction with, and as an integral part of, an ICC at four-yearly intervals. The GA of Delegates is the forum for the ICA to conduct its business and deal with administrative matters. The ICCs have each been held in a different location with different local organising committees. It is essential that expectations and previous experience be conveyed to each local organising committee, whether it is working independently or in conjunction with a professional conference organising company. With the changes in demands, costs and expectations of delegates, the Executive Committee (EC) has prepared these guidelines to assist future organising committees who are bidding for, or organising, an ICC. The guidelines are not meant to be restrictive or definitive and organisers are free to expand on them provided that minimum requirements are met.

2 Objectives

2.1 The objectives of the ICC are to provide a forum every two years for presentation and exchange of new ideas and technology through plenary, technical and poster sessions, workshops, research student activities and exhibitions. Other more local, but complementary, objectives can also be presented (e.g. 'to bring the regional cartographic community closer to ICA').

2.2 The specific components of an ICC include:

- Opening and closing ceremonies
- Plenary sessions with keynote speakers
- Scientific programme (involving selection, presentation and publication of papers and posters)
- Meetings of ICA Commissions and Working Groups, and other ICA-initiated meetings
- International map exhibition, children's map exhibition, and other local exhibitions
- Technical trade show
- Technical visits or tours
- Social events, including possible 'map use' events

These are each considered in detail in this document.

3 The Role of ICA in International Cartographic Conferences

3.1 The ICA EC invites member nations to bid for the right to host an ICC and GA.

3.2 The EC decides on the location of the ICC between two GAs. The GA decides the location of its meetings, and thus the location of the ICC at which a GA will be held.

3.3 Decisions on the venue are usually made four years in advance of an ICC.

3.4 Member nations lodging bids are expected to invite the President, Secretary General & Treasurer or other members of the EC to inspect facilities and meet proposed key persons and committees prior to decisions being made.

3.5 The bidding may be competitive and it is important that as much information as possible is provided to the EC and the GA. Once a bid has been accepted, a further detailed report is to be provided to the EC, setting out the broad programme and including a budget.

3.6 It is also usual for the successful bidder to invite the EC to visit at least once to discuss the programme and to inspect conference facilities. This visit will normally take place 12 months before the conference. In addition to liaising with the local organising committee, this visit will involve the local organising committee hosting an EC meeting, for which sufficient time must be allocated.

Thus, a three or four day EC visit should be envisaged and its costs included in the budget.

3.7 It is usual that the local costs of the above visits, including accommodation of EC members, are met by the host nation.

3.8 Progress reports are required regularly by the EC every 6 months in the years leading up to the conference. Any problem notified will be responded to by the EC.

3.9 All costs of organising the GA and ICC must be borne by the host nation. No funding is provided by the ICA. Any losses will be borne by the host nation, so it is important to develop a budget before preparing a bid. Any profits are retained by the host nation, with the expectation that they will be subsequently directed towards the development of cartography in that nation. The ICA levy must also be considered in the budget (see Section 7 of these Guidelines).

3.10 Further, costs of language translation, which is essential at the GA where business is conducted in French and English (the official languages of ICA), may be high. Language translation, to meet local circumstances, may also be offered by the local organising committee, but it must be recognised that all presentations during the conference must be in either English or French (see also Section 12.2).

3.11 ICA may call meetings during an ICC to meet its commitments to interested parties (see Section 10.8). Thus, ICA will take responsibility to arrange meetings with National Mapping Agencies, national delegates, Commission and Working Group Chairs, affiliate members etc.
In addition, there may be a meeting of the Joint Board of Geospatial Information Societies (JBGIS).
ICA will contribute to the LOC the costs of registration for any one President or Secretary of each member of JBGIS (see Section 7). The Secretary-General invites such representatives to the ICC and informs the LOC of their attendance.

3.12 ICA has a responsibility to manage the Travel Awards scheme which allows eligible young cartographers to receive assistance to allow for their attendance at an ICC. ICA will pay for the registration of each Travel Award winner, and will offer each winner travel costs and a contribution to accommodation costs.

3.13 ICA will ensure that the contests within the International Map Exhibition, and the Barbara Petchenik Children's Map Exhibition will be managed, in conjunction with the appropriate sub-committee of the local organising committee.

3.14 Although the content of the final programme is the responsibility of the local organising committee, ICA will be involved in the reviewing and selection of papers. In particular, the Chairs of Commissions and Working Groups should be used to solicit and review submitted papers. In addition, the responsibility for chairing sessions during the conference can be allocated to such officers, in addition to local cartographers.
The EC must be given an opportunity to have an input into the technical programme and approve subject areas, themes and keynote speakers, as detailed in Section 10 of these Guidelines.

3.15 ICA will ensure that EC members are available at the main registration desk for the conference, notably during the first day, to welcome delegates to the conference.

4 Lodging a Bid

4.1 Any member nation may lodge a bid to host an ICC or a GA.

4.2 A letter of intent should be sent to the Secretary General & Treasurer, accompanied by completed bid documents containing details on budget, facilities, premises, committee and personnel, and intended registration fees. Such intent should be submitted at least 4.5 years before the event date to allow for inspection visits by EC members (if deemed necessary) and information to be made available to the GA.

4.3 It should be noted that, whilst ICA would expect the organisers of an ICC to promote the conference in an active manner to local cartographers and GI scientists and invite as many as possible to attend, the ICC could give an opportunity to national cartographic bodies to hold regular meetings in parallel as an integrated part of the ICC.

5 Organising Committee

5.1 A Local Organising Committee (LOC) shall be formed, and a Conference Director appointed, as soon as possible after the decision has been made by the GA of Delegates or the EC to award that nation the right to hold an ICC.
To ensure good communication between the LOC and ICA, it is recommended that at least one member of the ICA EC is co-opted as part of the LOC. The LOC is traditionally drawn from a wide range of cartography and GIScience professionals within the country, thus ensuring representation of the many different strands of cartographic activity and expertise in a member nation. It is important that a operational nucleus of motivated persons should form the core of the LOC.

5.2 In view of the huge amount of work involved, professional conference organisers should be considered, especially for handling registrations and accommodation. It is almost essential that the capabilities of an event production specialist should be used to the maximum extent possible for all aspects of the ICC, while at the same time ensuring that the LOC and its sustaining organisations retain overall responsibility for managing the conference.
Other activities, such as catering, security, interpretation services, exhibition and trade show organisation, and travel services may need to be sub-contracted separately.

5.3 It is also advisable to form the following sub-committees:

- A Programme or Scientific Committee with duties to handle the Call for Papers[1], receive submissions, consult with the Chairs of Commissions and Working Groups and any other reviewers, collect full papers, edit proceedings, liaise with the ICA Publications Committee and journal editors, and elaborate the scientific sessions;
- A Technical Trade Show Committee with duties to conduct the technical trade show;
- A Map Exhibition Committee with duties to collect items for the International Map Exhibition, catalogue and display these items, arrange for display of the entries to the Barbara Petchenik Children's World Map Competition and assist in the procedure for voting of the best entry in each category;
- A Social Programme Committee with duties to organise and conduct receptions and other social functions;
- A Technical Tours Committee with duties to organise and conduct a versatile set of technical tours;

It is recommended also that the LOC take responsibility for Pre- and Post-conference Tours and an Accompanying Persons Programme with a set of activities for accompanying persons.

[1] See the Reference Document *Standard Call for Papers*.

The sub-committees shall report regularly to the LOC and the chairpersons of the sub-committees should be full or adjunct members of the LOC.

5.4 Since organising an ICC or a GA is a national commitment, a patron or honorary committee should be considered in order to give the event high profile and sponsors. Patrons should be in a position to promote the ICC in the contact networks of the patron organisation and in its means of public outreach (web sites, internal newslettters), allow personnel of the patron organisation to dedicate time (in working hours) to the ICC, provide to LOC contact data held by the patron organisation, contribute to specific events (e.g. local map exhibitions), and potentially allow the use of venues and space in the possession of the patron organisation for ICC-related activities.

5.5 The role of sponsors can be highlighted: ICCs are an opportunity to advertise and promote the discipline of cartography and GI science, and the integration of commercial and governmental sponsors into the programme is recommended.

6 Time Frame

6.1 The ideal time frame for organising an ICC or a GA is four years.

6.2 ICCs are preferably held during the months of July, August or September. A southern hemisphere conference may be scheduled for October/ November or March/April, but it should be noted that this is often less convenient for participants from the north.

6.3 Precedence indicates that the ideal time period for an ICC is from an opening ceremony on a Monday to a closing ceremony on the following Friday afternoon. A GA meeting may take place on the opening Sunday, with a second meeting on the Friday before the closing ceremony.

7 Budget

7.1 It is important to note that the LOC is solely responsible for the budget of an ICC. Although the EC will contribute advice about costs, and there are significant fixed costs as outlined in this section, all risk and profit/loss is due to the LOC. A preliminary budget should be prepared as soon as possible.

7.2 Since 1980, ICCs have attracted 500 - 1500 delegates and 80 - 200 accompanying persons. These figures should be carefully considered when break-even budgets are prepared.

7.3 It is usually expected that a discount on the registration fee is available for bona-fide students, for retired people, for those who are registering for a period less than the full conference, and for accompanying persons. The LOC is entitled to categorise (and ask for proof of category) in the registration form; and it may also wish to give preferential rates to attendees from developing countries. The category ‘accompanying persons’ must be restricted to those who are not attending any part of the scientific programme. The accreditation of those who primarily serve in booths in the technical trade show must also be considered.

7.4 The following items should be included in the budget:
Major costs associated with an ICC include Hire of the conference venue; charges made by any professional conference company used; printing costs for a wide range of documents associated with the conference; interpretation services with simultaneous translation service; hire of equipment and materials for the technical trade show, registration and payment areas, and management systems used; other online systems for pre-conference

management; costs of supplying a wireless LAN or 'internet café' facility for delegates; panels, display, and security for other exhibitions; signage; promotional efforts including website design, travel made by LOC representatives to promote the ICC; dispatch of publicity material and materials for exhibitions etc.; possible costs of personnel for setting up, administering, managing, purchasing, catering, cleaning and liaising; costs associated with opening and closing ceremonies and other entertainment.
In addition, ICA expect the following costs related to their participation to be covered locally:
a) Local costs of visits by EC members as indicated in Sections 3.4, 3.6 and 3.7.
b) Full accommodation costs for the period of the ICC for the President and the Secretary General & Treasurer.
c) Two nights accommodation during the period of the ICC for each Vice-President and immediate Past President.
d) Free registration at the ICC for each member of the EC.
e) ICA will contribute the costs of registration for the President or one other representative of each member of the Joint Board of Geospatial Information Societies, i.e. FIG, ISPRS, IAG, IGU, IHO, ISCGM, GSDI, IEEE-GRSS and IMTA, but other possible guests may be invited by the LOC.
f) Keynote speakers should be offered a complimentary registration fee.
g) A lunch for those past EC members and their partners that are attending the ICC.
h) A 2% levy on the total amount paid as registration fees to be claimed by ICA, as a contribution to the Solidarity Fund.

8 Mailing List

8.1 A comprehensive mailing list should be prepared for invitation and promotional purposes. Contact with the previous conference should be established to build on existing databases.
8.2 The database should be compiled in a form suitable for providing address labels and e-mail addresses.
8.3 The database should be used for personal invitations, especially to persons in countries where a personal invitation is needed for applications to attend a conference or to obtain a visa.
8.4 At the conclusion of the Conference, the database should be made available to the next Local Organising Committee, with a request that the privacy of this data be maintained.

9 Promotion

9.1 Promotion should be regarded as the key to a successful event.
9.2 In a four-year lead time, a website must be set up and continuously updated, and the following documents produced (and included on the homepage):
a) A publicity document should be distributed at the previous ICC, at other relevant events, and mailed as widely as possible.
b) First call for papers, 20 months prior to the ICC and sent to the full mailing list. It is expected that the Scientific Sub Committee will consult with Commission and Working Group chairs to assist in drafting the Call for Papers.
c) Preliminary programme and invitation with registration form (6 months before the event, to the full mailing list).
9.3 All brochures should contain as much information as available at the time. Potential delegates can be far from the venue and have to make a decision on the basis of what they can read in the information provided.
Maps should be used to show location of venue/hotels, tours and other relevant data.

9.4 Preliminary Programme and Registration forms should contain all details that a delegate/accompanying person will need during the conference period. The registration form should cover all items and be clear and concise. It is expected that the website will incorporate the programmes and frequently updated and expanded publicity material (including preliminary conference schedules), but also links to the registration system, paper submission and accommodation booking possibilities. Some feedback mechanism is essential to allow conference attendees to report queries and potential problems (e.g. clash between presenting and chairing a session).

9.5 The event should be announced on as many conference listings, diaries, and calendars in publications as possible, and through e-mail lists as indicated above. Publicity can also be effective through launch events within the country, participation of national representatives in other conferences and meetings, publication of articles in journals and the popular media, and creation and dissemination of further brochures both nationally and internationally.

9.6 An on-line registration system should be created to allow people to efficiently register their interest, formally register, pay (using a variety of methods, including credit card), and arrange hotel accommodation.

9.7 It is expected that registration fees will be kept relatively low: conference organisers should be aware that delegates expect that the registration fee will be considerably lower than their travel and accommodation costs, which are the main items of expense when attending a conference.

9.8 Early registration should be encouraged by introducing a discount for those registering up to 4 months before the conference. It should be noted that some alignment with the results of the paper reviewing process (see 10.5 below) should be attempted: those submitting papers need to be told of the success or otherwise of their submission before the early registration period expires.

10 Programme and Conference Presentations

10.1 The technical programme needs to reflect the leading edge of cartography and GI science. An overall theme, reflected in a promotional conference title, should be determined. The EC should be involved in the selection of themes and keynote speakers. It is expected that the Chairs of the Commissions also be involved in the programme creation, notably in the reviewing of submissions.

10.2 The programme with GA normally covers six to seven days. Plenary, parallel and poster sessions may be used to achieve a balanced programme bearing in mind Commission and Working Group meetings, other meetings (as specified in Section 3.12) and excursion/tour activities as well.

10.3 Three possible types of submission should be considered by the Programme or Scientific Committee - posters, abstracts and full papers.

10.4 The poster submissions should be a fundamental part of the Programme, and there should be dedicated sessions within the Programme to promote them. Guidelines should be issued in the initial call for papers regarding the format of the posters. It is essential that the poster sessions have an attractive, prominent and easily accessible location

10.5 It is expected that the Call for Papers will encourage initial submissions in three categories – **full papers**, **abstracts**, and **posters**. These can be

submitted in French or English. All submissions will be reviewed by the Programme or Scientific Committee, with assistance from the ICA Commission and Working Group Chairs to determine whether it is, in general, acceptable and what thematic category it should be allocated to (it is advisable to ask authors to specify which theme they think their submission relates to). The review panel of experts , can include EC members, Commission and Working Group Chairs, and any other persons who the local organising committee wishes to approach. The method of organising the refereeing panel is up to the local Programme or Scientific Committee: it can be done using a networked conference management tool, or it can be done 'manually' with some central coordinating person managing distribution of papers and dissemination of comments returned.

10.6 The **full papers** will be reviewed in detail: they should have an early submission date, to allow time for comments and revisions to be made, and it is important that an abstract is also included. It is expected that at least two reviewers will be chosen to comment on each paper submitted as a full paper. A 'double blind' review process is expected. After suggested modifications, all the accepted full papers will be considered for submission to the editors of the three ICA recognised journals (currently *The Cartographic Journal*, *CAGIS*, and *Cartographica*). It is expected that the publication schedule of the journals will allow for the papers to be available just before the conference starts. Where possible, extra copies of these journals should be on sale at the conference.

10.7 Those acceptable full papers not considered by the journals will be reproduced in a publication entitled *Advances in Cartography and GIScience: Selections from ICC20xx*. This paper volume, produced in conjunction with the ICA publisher (Springer Verlag), will also be available for sale at the conference. It will include extended abstracts of those papers printed in the journals.

10.8 It is expected that the majority of submitted papers will be in the form of an **abstract**. Each abstract will also be reviewed by the panel: authors of those abstracts which are accepted will 'write-up' their papers to a full paper length for inclusion in the published *Proceedings* and presentation in the oral technical sessions. The published *Proceedings* will also include the abstracts of the full papers published in both *Advances* and the journals, and will be given to each delegate at the start of the conference. The *Proceedings* can be in paper and/or digital form.

10.9 Accepted **poster** submissions are also expected to be 'written-up' and they will also be included in the *Proceedings* (see also Section 10.4).

10.10 An efficient on-line submission system should be created to allow the Programme or Scientific Committee, authors, referees and the EC to receive, acknowledge, upload and download, make modifications to, and store papers for the conference.

10.11 The *Proceedings* of ICC papers is to be made available to all delegates at registration either on paper or electronic media. If both are provided one may be offered at an extra fee. After the ICC the copyright to the proceedings shall be transferred to the ICA.

10.12 The distinction between fully refereed papers and those selected by abstract should not be noted in the oral presentation sessions, each

being given the same length of time. A standard approach is to offer each speaker 15 minutes, with 3 minutes of questions. This allows for 5 presentations to be fitted into a 90 minute session. However, LOCs are entitled to organise sessions as they wish. Plenary and invited speakers would be expected to be given more time. A session must have a chair, ideally someone who is not presenting during that session. The LOC can expect to call upon Commission and Working Group chairs to act as session chairs at relevant sessions. An additional person may co-chair to deal with audio-visual and/or language issues. Timing of sessions is important as some attendees may want to move from one room to another at the specified time. It is essential, therefore, that strict control is kept on the speaker's progress. If a speaker is not at the session to present, session chairs should suspend the session and resume the schedule when possible.

10.13 A range of other meetings within an ICC should be noted as they will require room allocations. In addition to the technical programme, it is expected that a) each Commission and Working Group of ICA will hold a 'business meeting' which should normally occupy a session (from one to three hours) in the programme: these should be timetabled and offered to the Chair of each Commission or Working Group;
b) the meetings organised by ICA EC - the National and Regional Mapping Organisations session (Section 3.12), a meeting with all national delegates (Section 3.12), a meeting with all Commission and Working Group Chairs (Section 3.12), and a meeting for students and young people (which could take the form of, or include, a 'software install party') - will all require rooms. The scheduling of these meetings within the timetable should be organised with discussion with the Secretary-General.
c) It is ICA's wish that the role of affiliate members and commercial exhibitors in the Technical Trade Show be recognised. A 'Vendor's Breakfast' will be held at the site of the Technical Trade Show, early in the conference. This will be at ICA's expense but will involve a room booking and supply of a small buffet breakfast.

10.14 It is recommended that the poster sessions and all other presentations by young and student contributors be scheduled early in the conference so that they can feel involved in the conference from the beginning and see their work noted early to allow for subsequent discussion with other conference participants later.

10.15 It is now common for Commissions and Working Groups to meet for a short pre-conference workshop in a venue close to the site of the main conference. Such meetings have value in setting the scene for the Commission or Working Group contribution to the main ICC. It is expected that the LOC will be able to assist the Commissions and Working Groups to set up such a meeting by recommending a location (usually a university site) and a 'contact' person. In return, Commission and Working Group chairs are expected to encourage workshop attendees to register for the full conference.

11 Venue

11.1 Several alternatives venues for an ICC could be considered, but it is important to ensure availability, as

suitable sites may be reserved many years in advance. The venue must be capable of a minimum of 1500 seats for opening and plenary sessions with adequate area for registration. It must be possible to run at least 3 parallel sessions in suitably sized rooms. Up-to-date technical and audio-visual equipment and capable staff must be provided. It is important to consider access both for international travel, and to local infrastructure such as hotels and transport links.

11.2 Exhibition space of at least 3 000 square metres is required for map exhibitions and the technical trade show.

11.3 At least four, and preferably more, rooms, each to accommodate up to 50 people, are required for Commission and Working Group meetings.

11.4 A room must be available as an office for the President and Secretary General & Treasurer, with up-to-date office equipment (including a photocopier and printer, for which ICA is willing to pay), and also a meeting room for approximately 15 persons, permanently allocated to the EC.

11.5 A hospitality room or space should be made available for accompanying persons and others to meet while they wait for partners. Self-service coffee/tea facilities should be available in this area.

11.6 An administration room or “Business Centre” should be available, with Internet connections or wireless LAN, photocopying facilities, packaging material and general storage for delegates' goods.

11.7 The delegates will be provided with a designated wireless LAN area to allow for free web and e-mail access during the conference: this ideally would consist of a series of desktop terminals, but delegates should also be able to use the wireless connections of their own portable equipment. In addition some form of 'publicity arrangement', including tables for distributing information about future events, should be provided along with a 'paper-based' message board to allow for announcements to be posted.

12 Facilities

12.1 A method for distribution of material to principal delegates of member nations needs to be in place for the GA. One pigeonhole per nation has proved to be suitable in the past.

12.2 Translation facilities must be provided throughout the GA meetings. Their provision at other times is at the discretion of the LOC: translation is particularly useful if a large number of local delegates attend in a country where neither English nor French is the native language; translation can also be useful at opening and closing ceremonies of ICCs and at keynote or plenary sessions when it is likely that a number of different languages will be used.

12.3 Delegates to the conference should be informed about the locations of the nearest post office, police station, and computer supply shop; and inside the conference building the first aid points, evacuation procedure and location of the EC office.12.4

It is recommended that internet facilities be available in a specific room(s), rather than throughout the building: it is not advisable to allow for Wi-Fi access within the rooms used for presentations. It may be necessary, however, to allow some presenters access to the internet as part of their presentations.

13 Signage and Information

13.1 Adequate signage is very important to assist delegates to get to the venue, to find specific locations and to navigate within the venue. Also, signage should indicate where to access local transportation and the location of pick-up points for tours.

13.2 All rooms and exhibition areas used for the conference should be clearly shown and directions to them marked, particularly when there are parallel sessions or off-site events. A map of all conference venues should be prominently displayed at the venue and included in the conference programme.

13.3 Timetables for the complete programme, including modifications, should be prominently displayed in the registration area. As well, outside each room, a timetable, including modifications, should be displayed to provide information about the session taking place in that room.

13.4 It is expected that some form of 'conference handbook' is produced for the conference attendees, with the schedule of presentations, plans of the venue, timetabling of all events, information about contacts, details about all exhibitions, notices about catering, local information etc. A 'delegates bag' is commonly presented to conference attendees, and the conference handbook will be inserted here, along with the Proceedings and a most-recent list of attendees. Other material – commercial, sponsored, tourist-oriented, updates etc – can also be included in the delegates bag: how this is arranged (e.g. distribution of commercial material in this manner could be charged for) can be determined by the LOC.

13.5 A notice board for the use of individual delegates should be located in the registration area.

14 Technical Tours

14.1 Every effort should be made to provide visits to areas of technical interest. These visits do not have to be only to cartographic or GI science organisations, but may include areas of related interest.

14.2 It is not usual to apply a fee for these visits. However the LOC should decide if costs need to be recovered for items such as transportation.

15 Official Opening and Closing Ceremony

The Official Opening should have a high profile. This is an opportunity to promote cartography and GI science in the host country. Appropriate officials should be invited and given the opportunity to participate. The ICA President welcomes the participants and the President or an invited keynote speaker gives the main address. Entertainment linked to the culture of the host nation has been a successful element in previous opening events.
The ICA document on Closing Ceremonies[2] gives details of the schedule and running order of the closing ceremony.

16 Post-conference Administration

16.1 It is useful for ICA and the LOC of the subsequent ICC to be given information as soon as possible after the conference summarising the number of participants, the number of presentations of each type, statistics about visitor numbers to exhibitions, and a view of the outcomes of the conference.

[2] See the Reference Document *ICA Closing Ceremonies*

16.2 In order to determine the quality of the conference and the opinions of those who attended the conference, a questionnaire seeking views about the experiences of attendees is encouraged. Such a questionnaire can be placed in each delegate's information pack, and the results of the questionnaire survey should be reported to the ICA EC.

17 Next ICC

17.1 Time should be set aside during the ICC for representatives of the following ICC to make a presentation. Contact needs to be made to ascertain their requirements.

17.2 The ICA flag must be handed on to the next ICC hosts and this is usually done at the Closing Ceremony.

17.3 All relevant information that may be useful, such as the database of potential delegates, must be made available to the next organiser.

17.4 Free space in the form of a booth of some 8 square metres in the technical trade show area should be provided to promote the next ICC and for those who have lodged a bid for the next GA of Delegates.

18 Exhibitions

Exhibitions form an integral part of an ICC and provide further opportunities to enhance the status of cartography and GI science. There are several exhibitions required: the International Map Exhibition; a Technical Trade Show; and the exhibition of children's maps (the Barbara Petchenik competition). In addition, local exhibitions connected with the conference are encouraged. To promote the discipline of cartography and GI Science effectively, these exhibitions may be open to the general public, in addition to conference participants. It can be valuable to arrange for visits to the International Map Exhibition, and the children's map exhibition, by local schools.

18.1 International Map Exhibition: Every ICA member nation and affiliate member is invited to participate in the International Map Exhibition. Every exhibitor should be given a reasonable amount of space. In the past a limit of 10 metres panel length (with variable height) per member nation has been used. For the display of atlases, globes and computer-based products, tables may be required. A facility to display a rolling sequence of digital products is required, and more sophisticated computer terminals to allow for free access by participants to documents such as CD atlases can also be provided. Following the event, displayed items may be offered to the host nation, not for sale but for donation to a library or an educational organisation. The exhibitors need to know well in advance if transport or other costs will be incurred inside the host country and who arranges delivery to the venue. The organiser should take necessary measures to prevent customs problems. Unforeseen problems occur frequently, so it is expected that a sub-committee of the LOC specifically concerned with exhibitions will be established. Such a committee will be responsible for ensuring continuous contact between exhibitors and the local site, confirming, for example, safe receipt of exhibition material in all cases. In addition, this sub-committee will be expected to establish (using previous exhibitions as a guide) categories of mapping (e.g. urban maps, topographic maps, tourist maps) such that a formal competition can be held under the auspices of a judging panel, appointed by ICA, but linked to the sub-committee. The

winners of such a competition are recognised at the closing ceremony, and the winning entries should be scanned at the exhibition so they can be incorporated into the ICA website.

18.2 An exhibition for the Barbara Petchenik Children's World Map Competition shall be organised to display the entries. The LOC can expect significant support from an appropriate ICA Commission to ensure the efficient presentation of this competition.

18.3 Voting procedures for selecting the best entries in each category will be specified and overseen by the EC.

18.4 Other map exhibitions: National, local and historical map exhibitions should also be arranged

18.5 Technical exhibitions: A technical or trade show is a very important adjunct to an ICC and may generate income. However, costs should be kept as reasonable as possible if major suppliers are to be attracted. Some may be affiliate members of ICA and are entitled to be offered a favourable location or a discounted rate for space (check with Secretary General & Treasurer): if the trade show is being organised on a commercial basis, the organisers need to be aware that such members are to be given priority. The national members should also be informed of the free space for promoting the next GA (see 16.4 above). Exhibitors should be advised of any potential customs problems or unusual local costs. Special note: It is strongly advised for maximum impact that all exhibitions should be held in the main Conference Complex or as close as possible.

18.6 Security: It is important that the LOC implements adequate security measures for all items and equipment in the exhibitions, as well as personal belongings. This is likely to involve some personal security officer presence at the exhibition of atlases and globes.

18.7 It is normal practice for a printed catalogue of maps in the International Map Exhibition to be produced and presented to each conference delegate. In addition, paper catalogues may be prepared for the Barbara Petchenik Children's Map Competition, and exhibitions of national, local and historical mapping. The technical trade show can be summarised in a CD format catalogue, incorporating information, publicity, advertisements and demonstrations from the exhibitors. Alternatively an electronic catalogue can be created using specialised software.

19 Social Functions

19.1 A programme of social functions should be included to give delegates the opportunity to network.

19.2 As a minimum, a welcome reception and a reception in the area of the technical trade show should be included in the registration fee. A gala dinner or other form of event open for all participants should be arranged at an additional fee.

19.3 Other functions may be sponsored or offered as options. In the past, these have regularly included, as a physical activity, a specially designed orienteering event. In addition, walks, geocaching and historic visits can be considered,

19.4 The social programme also provides an opportunity for the host country to display national talents and culture.

20 Accompanying Persons Programme

20.1 A separate programme for accompanying persons should be provided.

20.2 The programme should include some functions and have others as options. As a general guide, something should be available each day during the event.

20.3 A fee may be established that includes the main conference functions and other events as decided.

20.4 The fee for accompanying persons programme should be modest and calculated to cover marginal costs only.

20.5 A small gift of national significance is sometimes provided for accompanying persons.

21 Safety, Security and Access

21.1 Safety and security for the delegates, accompanying persons, exhibitors and visitors must be assured at all times during the formal conference events. The organiser is recommended to contract a comprehensive insurance to cover all damages.

21.2 Adequate measures must be implemented to ensure that this occurs. In particular, advice to delegates regarding their personal security outside the conference venue should be circulated.

21.3 A safety and security plan must be submitted to the EC prior to the conference.

21.4 Any safety or security concerns that are identified prior to the conference or that arise during the conference must be communicated to the EC and all attendees.

21.5 The local organising committee should recognise that some delegates may potentially have handicaps (e.g. vision, mobility problems) which may lead to requests for assistance. It is expected that the committee will respond positively to requests to greet, accompany and assist such delegates.

21.6 All delegates must be advised of the emergency and evacuation procedures for the building.

22 General

22.1 A range of hotels should be offered. This should include a range of prices from budget to higher categories. It is suggested that one 'student-style' hotel close to the conference centre be made available: all the Travel Award winners will be required to stay there, and other young people will also welcome the opportunity to stay with their colleagues.

22.2 All accommodation should be within 10-15 minutes of the conference venue and close to public transport.

22.3 A map should be included in the registration document showing the location of the conference hotels and other facilities.

22.4 Details of transportation options from airport to the venue should be shown in the registration document, including the relevant time schedules.

22.5 Bank, post and currency exchange services should be provided within the conference complex.

22.6 At the close of the conference packaging material should be available nearby for delegates to mail any goods.

22.7 It would be useful for the conference to provide a ‘baggage room’ for the last day, as some delegates may have to check-out of hotel rooms before the conference programme finishes.

23 General Assemblies

23.1 A GA is held every four years and is the business arm of ICA.
23.2 Every member nation is entitled to send a principal delegate plus a deputy.
23.3 All meetings are open and may be attended by observers. It is usual to reserve seats for invited guests.
23.4 The venue for General Assemblies must allow for setting up in class room style to allow delegates and their deputy to sit together.
23.5 The position of each nation must be identified in the room with a large sign easily visible from the position of the President.
23.6 All proceedings of the GA must be in the official languages of the ICA, English and French. Therefore, simultaneous interpreting services must be provided.
23.7 The opening of the GA should also be of a high profile.
23.8 The format of the GA should be discussed well in advance with the Secretary General & Treasurer, who prepares the agenda and keeps the records of member nations present, their subscription payment status and their voting rights.

24 ICSU Rules (International Council for Scientific Unions)

All potential organisers must be aware that ICA abides by the principles of ICSU in regard to non-discrimination. The ICSU statutes affirm the right and freedom of scientists to associate in international scientific activity without regard to such factors as citizenship, religion, creed, political stance, ethnic origin, race, colour, language, age or sex. This principle must be accepted by a host conference country. The following statement should appear in the publicity and/or registration material, and may be read out by the President during the Opening Ceremony:
"Acceptance of a paper in ICA-sponsored events is a reflection of scientific merit and not a reflection of any political recognition. In terms of operating principles, ICA abides by United Nations recommendations on membership and freedom of scientific enquiry, and the ICSU declaration on the universality of science."

25 Conclusion

These guidelines should be taken as general guidelines for planning and conducting ICCs and GAs. The guidelines may be amended from time to time when necessary.

Original document prepared by Ferjan Ormeling, extended by David Fairbairn; with acknowledgement to the Local Organising Committee for Santiago ICC 2009.

1) The Call for Papers shall be published on the homepage of the International Cartographic Conference (ICC) some 20 months before the Conference. Publishers of national and regional cartographic journals and newsletters are encouraged to publish information about submission of papers for ICCs.
2) The due date for abstracts should be set to allow them to reach the Local Organising Committee (LOC) 11 months before the meeting. Authors should specify whether their papers are to be considered as a general conference paper (non-refereed) or as part of a refereed track. The due date for final versions of all papers should be 4 months before the meeting. All papers will be published as part of the conference proceedings as long as one of the authors has registered for the conference and paid the conference registration fee. (It is expected that the registered author will present the findings from the paper at the conference.)
3) The Call for Papers should inform authors of refereed track papers that after the conference all refereed track papers will be blind reviewed and reports provided to authors for amendment of their manuscript. The final version of accepted refereed track papers will be published in a dedicated Book in the *"Lecture Notes on Geoinformation and Cartography"* and in special Issues of Affiliate Journals of ICA. Member Nations and ICA Commissions are encouraged to take part in the selection of abstracts. If pre-selection is used, the Member Nation or Commission must set an earlier date by which it will receive abstracts. This date must be at least one month, and no more than three months, before abstracts are due to the LOC. The Member Nation or Commission must forward accepted abstracts to the LOC by the date indicated in # 2 above. The LOC will make final judgment on each abstract.
4) The Executive Committee normally approves themes for the ICC two years in advance. These themes should be published in the ICA News in every issue after the previous ICC. The Call for Papers for an ICC should appear in every ICA News until the due date has passed.
6) Wording of the Call for Papers should be as follows:

The Local Organising Committee of the (th) International Cartographic Conference, (place), (year), invites abstracts for papers proposed to be delivered as part of the scientific conference programme.

Abstracts are due to the Local Organising Committee by (insert the date). The address for submission is: (Local Organising Committee Address, FAX number and e-mail address).
Authors are encouraged to propose papers that address one or more of the following conference themes:
1) .....
2) .....
3) .....

Good, up-to-date papers on any other cartographic and GI science subject of interest and value to an international audience will also be considered.

Authors should indicate which themes are being addressed. They should also indicate whether they wish to have their paper considered as part of the refereed stream. But, the Local Organising Committee reserves the right to make the final decision into which specific theme each paper should be placed. Papers not considered to match defined themes will be labelled "other".

Authors will be notified of the acceptance decision within 3½ months after the due date for abstracts, with a request to produce

a full version of the paper. Refereed-track papers will be noted as being a refereed stream paper in the proceedings. These papers will be reviewed post conference and accepted papers subsequently published in the Lecture Notes on Geoinformation and Cartography. Those papers that are not included in the Lecture Notes will be recommended for publication to the editors of ICA-affiliated journals.

The full version (5 to 10 pages) of all papers will be published in the conference proceedings and must be received by the Local Organising Committee by (insert the date) and produced in accordance with the template provided along with the message of acceptance of abstracts. Only papers received by this date are assured of publication in the proceedings, when at least one of the authors has paid the conference registration fee. Please, note that the copyright for the paper will be transferred to ICA. This means that ICA has the right to re-publish the paper, with or without changes, in printed or electronic form. The author, however, has the full right to use the content of non-refereed papers in other works

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The abstract should be 300-500 words long and must be in English or French, the two official ICA languages. Use standard A4 format (21 x 29.7 cm) with 4 cm top and bottom margins and 3 cm side margins, or use 8½ x 11 inch paper with 1½ inch top and bottom margins and 1¼ inch side margins. Centre the title in bold capital letters as the first item, followed by a vertical space and then the name(s) of the author(s). Type the affiliation address (typed as it should appear on a mailing envelope) immediately below each author's name. Immediately below the last line, authors are encouraged (but not required) to include a fax number or their e-mail address, where interested colleagues can reach them. After two line spaces the body of the abstract should be typed with single spacing and no indentation for paragraphs. A single line space should appear between paragraphs.

According to the ICA Statutes, Article 5, and By-LAw 6, each member country must submit a national report to each ICA General Assembly. These national reports must be made available through the Internet and also be provided to all members of the Executive Committee, Commissions and Working Group Chairs, National and Affiliate members (150 copies in total) at the start of the General Assembly. These submitted reports can be provided as paper or digital products.

Each national report must be made available as a .PDF file to the Secretary-General and Treasurer, so that it can be hosted by the ICA website (www.icaci.org), where both contemporary and archived copies of national reports are held.

The format of the report is not specified, but the report has to emphasize the main achievements made in the country since the previous General Assembly, in research and developments, in education and training, in production (in both public and private sectors); it also has to reflect on the contribution of the country to the activities of ICA. Copies may be provided for all conference delegates if a country wishes (this may involve production of up to 1500 copies).

Whether produced as hard copy, in digital form, or as an internet resource, each national report should be made available in PDF format to the Secretary-General & Treasurer, so that it can be hosted by the ICA website (www.icaci.org), where both contemporary and archived copies of national reports are held.

Well-received national reports in the past show some uniformity of material under the following suggested headings:

i) A profile of the member nation and its representation with, and contribution to, ICA;
ii) Activities of the national committee and other cartographic societies within the nation.
iii) Profiles of a range of organisations which contribute to cartographic and GI activity within the nation; these might include reports about
    - the work of national and regional mapping agencies, and specialist agencies (e.g. cadastral, hydrographic, national atlas, geological, planning, and census, mapping bodies etc),
    - military and civilian agencies charged with mapping for defence, navigation, and meteorological purposes;
    - environmental and statutory mapping meeting the needs of the nation;
    - recreational, leisure, educational and thematic map production and use;
        - educational activities in cartography and GI at all levels;
        - research by private and public agencies;
        - examples of cartographic and GI input into a wide range of artistic, social, environmental and scientific activity.

In addition, summary, opinion and specific project-oriented articles can be included. Colour reproductions of sample cartographic products may also be included. The typical length of a national report is 48 printed pages, although clearly considerable flexibility of presentation format results from digital production of the report.

Replaced by the ICA Research Scholarships (September 2014)

A limited number of travel awards to the International Cartographic Conferences of the International Cartographic Association will be made to young cartographers who are nationals from developing countries. ICA generally uses the United Nations interpretation of 'developing country', (http://unstats.un.org/unsd/methods/m49/m49regin.htm#developed). This definition includes all countries in Africa, South and Central America including the Caribbean, and much of Asia and Oceania. The funds for the Travel Awards are primarily sourced from the ICA Foundation for Supporting Cartography and Geographic Information.

Applicants must be giving a paper at ICA for the first time and be 35 years old or less. They must send a full copy of the paper as well as abstract to the Conference Secretary and to the ICA Secretary General & Treasurer in time to arrive 1 December 2012 for the Dresden conference and 1 December 2014 for the Rio de Janeiro conference respectively. In addition, applicants must arrange for a letter of support from a recognised cartographer from the home or other country (due at the same time as the paper; the writer sending it directly to the Secretary General & Treasurer). With the copy of the paper, the applicant must submit a separate sheet with the following information:

- Applicant's name, address, e-mail address, nationality, passport number
- Paper title
- Education beyond high school
- Date of birth (month, year)
- Gender
- Name and address of person submitting letter of support
- Estimated cost of transportation to the conference venue
- Number of days the applicant will be at the conference
- Previous work for ICA, if any (involvement in Commission or Working Group, for example)
- Intended future involvement in ICA (Commission or Working Group interest especially).

Applicants should have at least a certificate beyond their high school education. Papers must be original and clearly written with appropriate citations and credits. Papers should be reports on research studies or other cartography or geographical information science related projects. Co-authorship is acceptable if the applicant is principal author and will be the presenter. Awardees will be expected to be at the conference for a minimum of four days, but are encouraged to be there for the entire conference, and are expected to attend the opening ceremony. They are also encouraged to participate in at least one Commission or Working Group meeting during the conference.

Awards will cover transportation (economy excursion ticket) and registration at the conference. The Executive Committee will make an effort to spread the awards regionally and to include both men and women. Up to 15 awards will be made depending on number and quality of submissions. Preference may be given to applicants from member countries in good standing but the competition is open to young cartographers in all developing countries.

Notification of awards will be provided 7 months prior to the conference.

ICA is willing to respond positively to requests from responsible organizations who seek endorsement of conferences, meetings and symposia. ICA approval is dependent on confirmation of several aspects:

1) Cartography or Geographical Information Science has to be a core item of the conference.
2) The conference must seek international participation.
3) Any member nation of ICA may send attendees.
4) A member of the Executive Committee or a chairperson of a commission or working group appointed by the Executive Committee may participate in the Programme Committee of the conference.
5) An ICA address is given at the opening by an Executive member, a commission or working group chairperson or an official of the national organisation member of ICA.
6) ICA recommends that the conference proceedings are published, with the ICA logo on the front cover.
7) The conference is reported on in ICA News by its organizing committee.

Organisations seeking endorsement must contact the Secretary-General and Treasurer prior to the use of the endorsement. Endorsement of a conference does not necessarily imply ICA financial support.

ICA actively encourages use of its name in titles of conferences as follows: Meetings in calendar years in which there is no International Cartographic Conference can be approved by the EC as being "ICA Regional Symposia". It is possible to attach the name "ICA Regional Symposium" to an existing event, including a commercial event, as long as it is regional (i.e. supra-national), and there is an opportunity to promote ICA.

The Barbara Petchenik Award was created by the International Cartographic Association in 1993 as a memorial for Barbara Petchenik, a past Vice President of the ICA and cartographer who worked through her life with maps related to children. The aim of the contest is to promote the creative representation of the world in graphic form by children.
The awards are given every two years during an ICA Conference or an ICA General Assembly, preferably at least one for each continent, with special consideration to the age of the child producing the drawing. The awarded drawings are submitted to UNICEF for consideration as greeting cards.
Participating nations are encouraged to report on the ways they have used for collecting drawing (video report, etc.) and to collect and archive maps for further research.

Objective of the Competition

The aims of the competition are to promote children's creative representation of the world, to enhance their cartographic awareness and to make them more conscious of their environment. Children participate in the contest on a national level, by producing drawings of the world with a specific theme and sending them in to the national coordinator. The national coordinator has the five best drawings selected and sends them to the ICA Secretariat, where all the selected entries will be collected, photographed and sent on to the International Jury at the International Cartographic Conference. This jury will then select the 8-10 best drawings, distributed over the various age categories, and award the prizes.

Rules of the Competition

- Prior to each ICA conference, ICA member nations will collect maps, on a theme that will be made known in advance, produced by children under 16 years of age.
- The international judging will focus on three criteria: 1) a recognizable message, 2) cartographic content, and 3) the quality of execution.

In other words, judges will be looking for:

- a recognizable connection between the form, shape, and use of cartographic elements which creatively address the competition's theme;
- a recognizable image of all or a large portion of the world in which the shapes and relative locations of land masses and oceans are as correct as can reasonably be expected for the child's age and within the context of the "system of projection" used;
- appropriate cartographic elements such as symbols, colours, names and labels, etc., which help address the Competition's theme;
- clarity and legibility of the point, line and area symbols appropriate to the media of expression, whether on paper or other surfaces, whether drawn or made up of indigenous materials;
- expressive rendering and appropriate use of the perceptual dimensions of colour, i.e. changes in value for quantitative distinctions and changes in hue for qualitative distinctions;
- overall aesthetic quality in such matters as balance and harmony among the image elements.

- The maximum size of a map must not exceed A3 (420 mm x 297 mm or 17 x 11 inches). Any number of "systems of projection" can be used to generate the coastlines and other base material (e.g. international boundaries and graticule). These can include tracing or copying an existing world map or using a computer program.

- Each map must have the following information on a label attached to the back side of the representation: the name, age, school address and country of its author, and the title in either English or French as well as in the author's language.
- The winning entries will be submitted to the UNICEF International Art Committee by the ICA Executive for consideration as greeting card designs. ICA may use them as well. Any participant agrees that his/her representation may be reproduced by ICA or UNICEF or scanned for publication on the Internet by Carleton University without consultation or copyright fees.
- Competition maps are archived at Carleton University's Map Library and are available for web viewing (see http://children.library.carleton.ca/index.htm).

National Coordinator's Guidelines for Handling the Competition

- Each member nation must nominate a coordinator to run the contest in his/her country.
- The name of the coordinator must be received by the ICA Secretary General & Treasurer at least one year prior to the submission date of map entries. Countries in which no national coordinator is identified may participate provided that the Executive Committee receives the name of a country member willing to act as the coordinator for that country.
- Each national committee will select a maximum of five maps to be forwarded to the ICA Secretary General & Treasurer. For the purposes of the national competition, criteria other than those used for the international competition may be considered. The maps selected by the national committees must be sent to the ICA Secretary General and not to the location of the conference. They will be displayed during the conferences of 2013 (Dresden, Germany) and 2015 (Rio de Janeiro, Brazil).
- When submitting their selected entries to the ICA Secretary General & Treasurer, national bodies are requested to include a letter which, for each submission, gives the following information: the name, age, school address and country of its author, and the title in either English or French (the ICA's official languages) as well as in the author's language.
- Each entry must have a label attached to the back side of the representation which includes the name, age, school address and country of its author, and the title in either English or French (the ICA's official languages) as well as the author's language.
- National bodies are responsible for distributing the certificates awarded by the ICA Executive. These certificates will be produced and provided by the ICA Executive.
- Participating nations are encouraged to collect and archive all of the entries in their national competitions and to report to the Commission on their methods of announcing the competition, establishing any other judging criteria, and the selection process used. This information will be of value in evaluating the success of the Competition and in making adjustments in the future.

ICA Guidelines for Coordinating the Competition

- The ICA Executive will send a copy of the Rules of the Competition to each national coordinator.
- The ICA Executive will acknowledge receipt of each country's submission.
- Prior to both conferences, the ICA Executive will establish a judging committee, of optimally five members, made up of representatives of the Cartography and Children Commission, the ICA Executive, and the Local Organizing Committee.
- The ICA Executive will make available to the judging committee a copy of the letter submitted by each national coordinator that accompanied and described his/her country's submission.
- From five to fifteen awards will be given, with a maximum of one per country. Preferably one award will be given to each continent and at least one to children in each of the three age groups; under 9 years, 9 to 12 years, and 13 to 15 years of age.
- If the ICA Conference Organizing Committee is interested in having and advertising a public vote on the Competition entries they should be allowed to do so on three conditions:
  1) that the public vote will not be a criteria for or influence on the ICA judges, because the voting public will likely have no knowledge or appreciation of the competition rules and guidelines;
  2) that the voting slip design be adjudicated by the Cartography and Children Commission, on behalf of the ICA Executive, so that its intent is clear;
  3) that the Local Organizing Committee be responsible for producing the Public Award certificate.
- The results of the judging should normally be conveyed to the ICA Executive on the last day of the conference sessions.
- The production of the awards certificate and its distribution to the appropriate national representatives is the responsibility of the ICA Executive. The national representatives are, in turn, responsible for conveying the certificates to the awardees.
- The work of each national coordinator should be acknowledged by a letter from the ICA Executive.
- Following competition, all the displayed national maps will be deposited by the ICA Executive in the Rare Books Collection at Carleton University, Ottawa, Canada.

The main resource for archiving and viewing competition maps is at http://children.library.carleton.ca/index.htm

The Geographic Documentation Service of the Institut Géographique Nationale (IGN) has agreed to the conservation of the technical documents produced or published by the International Cartographic Association. ICA retains ownership of the documents consigned to IGN. Each document will be identified as belonging to ICA. All documents can be returned upon request from ICA.

The documents will be integrated into the collections of the Documentation Centre of IGN located at:
6 avenue Blaise Pascal
Cité Descartes
77 455 Marne-la Vallée CEDEX 2, France.

Documents to be conserved shall be selected by ICA. A special procedure has been agreed with IGN, which can be requested by the ICA Executive Committee and by Commission chairs to archive material. The documents can pertain to technical works, conference proceedings or periodicals, but also to original correspondence, minutes of meetings, commission reports, print copies of important electronic mail messages or web pages. ICA will stamp or label its documents or files indicating that ICA is the owner.

These documents will be kept on an ICA designated shelf. A database field or heading will indicate the source of each document. The material will be made accessible through electronic catalogues; searching the database may soon be possible via the Internet. ICA documents entrusted to the Documentation Centre shall be consulted in the same manner as other materials at the Centre: use on the premises during opening hours and availability to the public will be without restriction. Direct borrowing is permitted only for professional users registered at the Documentation Centre.

1) Proposals to publish scholarly and other works under the auspices of the ICA – including books; proceedings generated from ICA conferences, symposia, seminars, and workshops; manuscripts generated as a result of Commission or Working Group activities, and all other ICA-related works – should be channeled through the Chair of the ICA Publications Committee, with a copy to the Secretary-General. The Publications Committee will assess the viability of the project, will ensure that there is no overlap with other proposals and, if necessary and feasible, will assist in identifying funding sources for the project.

   The International Cartographic Association currently has a contract with Springer that stipulates that the latter is the Association's official publisher and distributor.

2) For activities that result from the activities of Commissions or Working Groups, the appropriate Chairperson is responsible for:
   a) Completing the ICA Publications Proposal Form (available from the Publication Committee and from the ICA website [under 'Publications'])
   b) Notifying the Publications Committee of the project, using the form mentioned.
   c) Establishing a timeline for the project.
   d) Negotiating a contract with the publisher to finalise publication details, including decisions on organization, design, layout, illustrations, deadlines and other logistics.
   e) Selecting or soliciting authors to contribute to the volume.
   f) Acquiring manuscripts in a timely manner.
   g) Editing and delivering the work on schedule.

   It is essential that both authors and editors check that intended texts are complete and accurate. This is especially important when translations from or into another language are involved. It is the duty of the author or editor to make certain all copyright releases for the project are obtained and submitted to the publisher.
   For all ICA publications, definite deadlines will be necessary (as established with the publisher). These deadlines will be required to conform to the schedules of the ICA and the publisher

3) The final production of the volume, including printing, binding, and distribution, will normally be organised by the publisher in association with the person signing the contract (henceforth called the "contractee"), and subject to the approval of the Publications Committee. It may be necessary for the contractee, in association with the Publications Committee, to work out funding mechanisms for the project.

4) Members of the Publications Committee will be delegated as supervisors for particular projects. Notification of the names of these persons will be circulated, together with an Author's Contract, ICA Publications Proposal Form, and a copy of the Rules for Publication, to the Chairperson of the appropriate Commission or Working Group.

5) The covers and title pages of all publications and co-edited works will include the name of the Association in both English and French, and also the ICA logo.

6) All ICA publications will include a Foreword prepared by an ICA official – normally the President or the Secretary

General, or Chair of the Publications Committee.

7) The financing of ICA works not published through the formal ICA publisher is the responsibility of the Publications Committee, subject to decisions of the Executive Committee. However, owing to the limited ICA financial resources, the contractee is strongly encouraged to acquire financial assistance to offset the costs of any part of the project (illustrations, editing, reproduction, and/or distribution).

8) The ICA will make no remuneration and pay no royalties to an author, unless this is specified in the Author's or Editor's contract. However, the latter will retain the right to personally use published materials in other works provided that such works are not in direct commercial competition with those already published by the ICA.

9) The formal copyright of all ICA publications rests with the association and with Springer (or other designated ICA publishers) who may, jointly, grant reproduction rights to third parties. Any translations into alternative languages will be arranged and authorised in consultation with the Publications Committee.

10) If, subject to the approval of the Publications Committee and where appropriate, Springer, an ICA publication incorporates freely-given sample materials provided by a private organisation, suitable acknowledgement will be made.

11) The ICA has approved the status of several academic journals of cartography as official ICA journals. Such journals have permission to present the ICA logo on their cover and to describe themselves as an official ICA journal.

Springer-Verlag

The official ICA publisher is Springer-Verlag (Springer Science+Business Media), a global publishing company. Springer has priority in publishing ICA material which results from the work of commissions or international cartographic conferences. ICA publications are part of the Springer Book Series "Lecture Notes on Geoinformation and Cartography" as an own subseries. The books published by Springer in conjunction with ICA are authoritative, timely and have a high impact on the scientific community of cartography and GI science. The range of publications can be found at http://www.springer.com/series/10036.

Former Publications

In the past period the following major books have been published with Elsevier:

Maps and the Internet (2003) ed. M.Peterson
ISBN: 978-0-08-044944-9

World metadata standards (2005) ed. H.Moellering, H.Aalders and A.Crane
ISBN: 978-0-08-043949-5

Exploring Geovisualisation (2005) ed. J.Dykes, A.MacEachren and M.-J.Kraak
ISBN: 978-0-08-044531-1

Generalisation of geographic information: cartographic modelling and applications (2007) ed. W.Mackaness, A.Ruas and T.Sarjakoski
ISBN: 978-0-08-045374-3

Other ICA publications

A wide range of publications resulting from commission activities throughout the history of ICA are available. Most are the proceedings of international workshops and seminars on topics related to ICA commissions, such as education, map production, history and atlases. The full list of such publications is available on the ICA website and they can be ordered through the Publications Committee.

Conference proceedings

Starting from the ICC 2011 in Paris a selection of full reviewed contributions to the International Cartographic Conferences are published in the three affiliated journals of ICA and a book in the ICA subseries of the "Lecture Notes on Geoinformation and Cartography". All contributions are published as proceedings in a format and media according to current standards. All Proceedings of International Cartographic Conferences can be obtained through the ICA website after an appropriate processing time.

Official journals of ICA

The International Cartographic Association has officially recognised three academic journals. Such journals are entitled to describe themselves as 'journals of the ICA' and incorporate the ICA logo on their cover. ICA is delighted to be able to show its support for the international cartographic and GI science community which benefits from the regular, high-quality production of these journals of record: *Cartographica, Cartography and Geographic Information Science, The Cartographic Journal.*

Section IV – Reference Book

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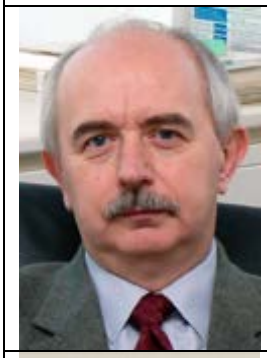	**Secretary-General and Treasurer: László Zentai** Department of Cartography and Geoinformatics Eötvös University H-1117 Budapest, Pázmány Péter sétány 1/A Hungary *phone:* +36 1 3722975 *fax:* +36 1 3722951 *e-mail:* sg@icaci.org http://lazarus.elte.hu/
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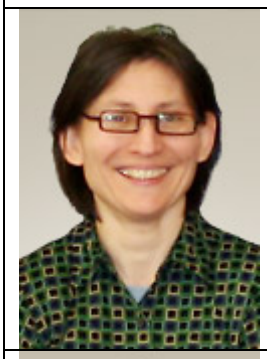	**Vice-President: Anne Ruas** French Institute of Sciences and Technology for Transport Development and Networks France *e-mail:* anne.ruas@ifsttar.fr
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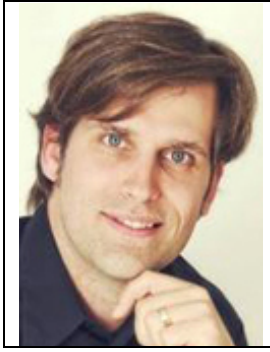	**Vice-chair: Christophe Lienert** ETH Zurich Institute of Cartography Wolfgang-Pauli-Str. 15 CH-8093 Zurich Switzerland phone: +41-76-211 9919 e-mail: lienertc@ethz.ch http://reticah.ethz.ch/web/now.do

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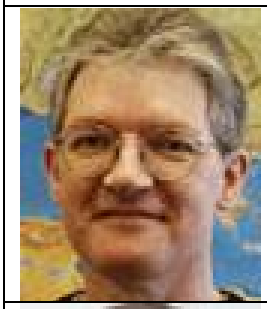

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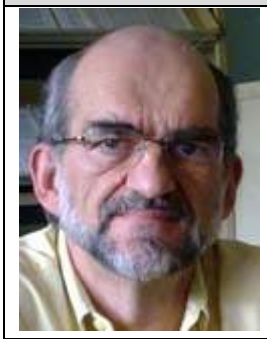	**Chair: Antony Cooper** Built Environment Unit CSIR PO Box 395 Pretoria 0001 South Africa phone: +27 12 841 4121 fax: +27 12 841 3037 e-mail: acooper@csir.co.za
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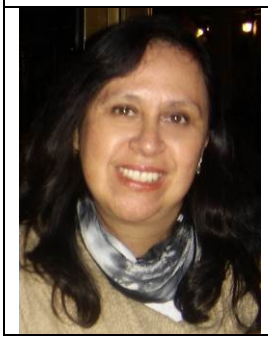

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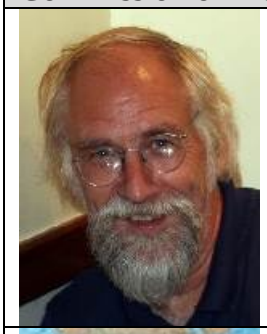	**Chair: Steve Chilton** Centre for Learning and Teaching Enhancement Middlesex University, The Burroughs, Hendon, London NW4 4BT United Kingdom phone: +44 208 411 5355 e-mail: steve8@mdx.ac.uk http://www.middlesex.wikispaces.net/user/view/steve8
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Atlases	Timothy Trainor
Cartography and Children	Sukendra Martha
Cartography in Early Warning and Crisis Management	Liu Yaolin
Cognitive Visualization	Menno-Jan Kraak
Data Quality	Timothy Trainor
Digital Technologies in Cartographic Heritage	Anne Ruas
Education and Training	László Zentai
Generalisation and Multiple Representations	Anne Ruas
Geoinformation Infrastructures and Standards	Derek Clarke
Geospatial Analysis and Modeling	Liu Yaolin
Geovisualization	Menno-Jan Kraak
GI for Sustainability	Sukendra Martha
the History of Cartography	Paulo Menezes
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Map Production and Geo-business	Derek Clarke
Map Projections	Paulo Menezes
Mapping from Remote Sensor Imagery	Liu Yaolin
Maps and Graphics for Blind and Partially Sighted People	Paulo Menezes
Maps and Society	Timothy Trainor
Maps and the Internet	Georg Gartner
Mountain Cartography	Georg Gartner
Neocartography	Menno-Jan Kraak
Open Source Geospatial Technologies	Georg Gartner
Planetary Cartography	László Zentai
Theoretical Cartography	William Cartwright
Ubiquitous Mapping	William Cartwright
Use and User Issues	Derek Clarke

General terms of reference have been defined for commissions and working groups at the Sixth General Assembly (Tokyo, 1980):

1) To disseminate information on their subject matter to the ICA member nations through publications, joint meetings, seminars and websites.
2) To continue the implementation of the ICA Third World Policy by providing experts for workshops in developing countries when requested [The Third World Policy Resolution, adopted by the Fifth General Assembly in Moscow 1976, contains the decision to devote part of ICA's efforts to the strengthening of cartographic communities in Third World Countries by disseminating cartographic knowledge *in situ*].
3) To coordinate their activities with other ICA Commissions, whenever possible.
4) To coordinate activities with Commissions of other international organizations if this is in the interest of the aims and objectives of ICA.
5) To encourage and support under-represented groups to take an active role in professional activities and/or associations at national and international level.

Specific terms of reference for the commissions for 2011–2015 have been voted by the 15th ICA General Assembly in Paris:

Art and Cartography
Chair: Sébastien Caquard (Canada)
Vice-Chair: Barbara Piatti (Switzerland)

- Explore the art element of cartography.
- Art in cartography means much more than designing aesthetically pleasing maps. Exploring the interaction at large between art and cartography entails: developing an inclusive approach of artistic mapping expressions; facilitating and encouraging interaction between cartographers who work with the Art aspects of cartography and artists who produce cartographic artefacts; and developing conceptual elements about the relationships between art and cartography.
- Facilitate interdisciplinary cross-fertilisation of ideas and practices.
- Cartographers, artists, researchers from the humanities need to work collaboratively in order to redefine the contours of the relationships between arts and cartography. Real interdisciplinary activities call for special measures, such as developing a common language and a mutual understanding; promoting the development of hybrid cartographic practices; and promoting diversity in terms of activities and outcomes (e.g. festivals, public lectures, performances, exhibitions, screenings, etc.).
- Produce and disseminate knowledge and artefacts emerging from the interaction of art and cartography by facilitating installations with associated annotated catalogues, developing multiple forms of expression (e.g. blogs, exhibits), publishing special issues of journals, developing and publishing books.

Atlases
Chair: Peter Jordan (Austria)
Vice-Chairs: René Sieber (Switzerland), Qingwen Qi (China)

- Produce a cookbook for the production of (digital) national and regional atlases.
- Promote and support the design, production and use of national, regional, city and thematic atlases and atlas information systems.
- Conduct workshops and / or seminars that present recent and potential atlas developments and innovations.
- Document guidelines and procedures for the design, production and use of national, regional, city and thematic atlases.

- Elaborate and maintain an electronic inventory of national, regional, city and thematic atlases containing the main characteristics of these map works as well as relevant addresses in order to support information exchange between atlas editors as well as to disseminate information on atlases to a wider public.
- Maintain a commission website and update it regularly with the major aims of providing for information exchange between commission members and disseminating information on activities in this field to a wider public.
- Encourage efforts for integrating data for the development of electronic atlases and national and regional atlas information systems by:
    - evaluating metadata standards as they apply to atlas design, creation and dissemination;
    - acknowledging requirements for diverse geographic and temporal data themes;
    - identifying and exploring various alternatives to data integration issues.

Cartography and Children
Chair: José Jesús Reyes Nuñez (Hungary)
Vice-Chair: Diah Kresnawati (Indonesia)

- Disseminating the outcomes of research into map use by children and young people. Deliverable: an enhanced set of online bibliography and web links on cartography and children.
- Developing stronger links between the ICA and relevant international and regional organizations related to Cartography and Children. Deliverable: following the contacts with the Commission for Geography Education of the International Geographical Union and other international/regional organizations.
- Stimulating a debate on the different aspects of cartography for children in interest of collecting and publishing (in digital or/and printed format) the research results. Deliverable: representing the commission in events and publications related to this theme.
- Following the promotion of the use of digital cartography, web cartography and GIS in schools. Deliverable: representing the commission in events and publications related to this theme.
- Providing consultative support to the ICA Executive in relation to the rules and judging of the Barbara Petchenik Children's World Map Competition. Deliverable: appropriate support as required.

Cartography in Early Warning and Crises Management
Chair: Milan Konecny (Czech Republic)
Vice-Chair: Christophe Lienert (Switzerland)

- Provide leadership in the development of concepts, ontologisation and standardization for early warning, hazard, risk and vulnerability mapping.
- Promote the cartographic use of remotely sensed and other geospatial data for early warning and crisis management through scientific conferences, seminars and workshops.
- Investigate psychological condition of end user given by their personal character and situation and psychological condition of rescued persons (with support of ubiquitous and adaptive mapping).
- Foster quality mapping and cartographic modeling, including state-of-the-art visualization technologies, geospatial processing and publishing tools, for early warning and crisis management through topic related publication activities.

- Participate and contribute to global initiatives in early warning and crisis management through the maintenance of a website, newsletters and social network channels.
- Promote the development of dynamic and real-time cartographic visualization concepts and techniques for enhanced operational early warning activities through active collaboration with governmental authorities.
- Establish and cultivate professional networks for exchange of information among stakeholders in the domains of crisis management and early warning.
- Develop mechanisms of command and control systems intergration as well as improve real-time data-centric intelligence based on field sensors for purposes of Crisis Management.
- Develop mapping methodologies and technologies for EW&CM in children perspectives. Promote the process of teaching, understanding and using maps for EW&CM in children aspects.

Cognitive Visualization
Chair: Sara Fabrikant (Switzerland)
Vice-Chair: Amy Griffin (Australia)

- Promote the awareness of cognitive issues in cartography developing human-centered cartographic theory and practice based on sound empirical findings on the use of cartographic displays for spatio-temporal inference and decision-making.
- Define short and medium term research goals that address key issues associated with building a sound theoretical base to support the construction and use of cognitively adequate and perceptually salient visual displays of geographic information.
- Specific envisioned research foci will include (but are not limited to):
    - empirical geovisualization design research (2-3D, static, animated and interactive, virtual and immersive, mobile, etc.);
    - the application of cognitive theories and methods to understanding visuo-spatial displays and tool use for inference and decision-making (including mental maps, space-time behavior, navigation, etc.);
    - the application of visuo-spatial displays and tools to understanding spatial cognition - spatial reasoning, inference and decision making with visuo-spatial displays and tools;
    - cognitive principles supporting human-visualization interaction research.
- Encourage interdisciplinary and international collaboration with cognate disciplines and relevant stakeholders, including other ICA commissions and working groups.

Data Quality
Chair: Xiaoyong Chen (China)
Vice-chair: Ron Li (USA)

- Networking cartographers, geographic information scientists and other researchers involved in geospatial data quality.
- Define short and medium term research goals that address key issues associated with geospatial data quality and its application.
- Encourage a multi-disciplinary and international approach to knowledge creation of uncertainties in geospatial data.
- Foster a new research community centered on modeling and visualizing error propagation in spatial analysis.
- Organize ICC sessions and ICA workshops focusing on geospatial data quality.

- Edit and publish geospatial data quality related reports, books, and special issues with some scientific journals.
- Website of the commission on Geospatial Data Quality.

Digital Technologies in Cartographic Heritage
Chair: Evangelos Livieratos (Greece)
Vice-Chairs: Alastair Pearson (United Kingdom), Carme Montaner (Spain)

- Theoretical deepening and broadening of the issue of cartographic heritage.
- Development of methodologies and standards applied on proper two and three- dimensional digitization of Cartographic heritage objects, materials and documents.
- Study and implementation of analytical tools applied on the comparative research concerning the geometric and thematic content of old maps.
- Digital map libraries and map collections: Archiving, matching, management, networking and accessibility in-situ and in the web.
- Modern information technologies and interactivity in attracting the general public to Cartographic heritage: Implementations in Museology and virtual map exhibitions.

Education and Training
Chair: David Fraser (Australia)
Vice-Chair: David Fairbairn (United Kingdom)

- Work for reaching the general aims conceived in the ICA Statutes.
- Support cartography and cartographic education in developing nations by holding seminars in these nations.
- Develop the existing ICA-sponsored Internet cartography teaching programme (modules), with regional workshops for training the teachers.
- Produce an ICA-sponsored Internet programme for continuing professional development, with regional workshops for training the teachers.
- Produce appropriate publications for dissemination of results of the above efforts and publish it according to the IOF publication policy.
- Promote integration by establishing linkage with the committees on education of sister surveying and mapping disciplines, by maintaining the list of institutions providing cartography course programmes, and interact as much as possible with other ICA commissions and working groups (organize joint meetings).
- Improving dissemination of information on educational theory and practice of cartography to the members across the world.
- Contribute to international forums where applicable.
- Investigate the role of emerging technologies for use in education and training.
- Develop mapping awareness competitions.

Generalization and Multiple Representations
Chair: Dirk Burghardt (Germany)
Vice-Chair: Cecile Duchene (France)

- To foster research and practical experience in multi-scale issues and automated map generalisation and to form a network and focal point for researchers and practitioners in this domain.
- To foster and maintain a liaison with related commissions and working groups within the ICA as well as in related national and international organisations (e.g. ISPRS, IGU, EuroSDR), including: identification of contact persons. timely mutual updating on planned activities,

organisation of joint conference sessions and/or workshops.
- To maintain a World Wide Web site for electronic dissemination of research on multiscale issues and map generalisation, including a membership database, a bibliographic database, examples of research projects and test data, links to related web sites.
- To organise sessions and meetings for exploring the issues named above, including workshops held every two years in conjunction with international cartographic conferences, special sessions and/or panel sessions at international cartographic conferences, in collaboration with local organisers.
- To produce publications for dissemination of the above efforts, including one special issue of a peer-reviewed scientific journal or a book every two years.

Geoinformation Infrastructures and Standards
Chair: Anthony Cooper (South Africa)
Vice-Chair: Jan Hjelmager (Denmark)

- In collaboration with other ICA Commissions, explore research on the impact and use in SDIs of cartography, standards, spatial semantics, ontologies, volunteered geographical information (VGI), virtual globes and other technological developments that might become relevant in future, and identify the associated education needs.
- Continue the work on developing conceptual models of an SDI using various modelling techniques, working in the areas of science, technology and standards.
- Participate at the scientific level with other organizations active in SDIs, standards and geospatial quality.
- Develop reports, conference presentations and/or journal articles on our work and help to arrange workshops, conferences or other meetings on SDIs and standards, and present tutorials at them.
- Organize reporting sessions on the Commission's activities at the 2013 and 2015 International Cartographic Conferences.
- Organize and hold full Commission meetings in 2012, 2013, 2014 and 2015, and mini-meetings of the Commission at suitable meetings.
- Continue to serve as the Category A Scientific Liaison for the ICA to ISO/TC211, Geographic Information/Geomatics, and establish liaisons with various SDI organizations.
- Maintain the Commission website and mailing list.

Geospatial Analysis and Modeling
Chair: Bin Jiang (Sweden)
Vice-chair: Xiaobai Yao (USA)

- To network cartographers, geographic information scientists, and other researchers involved in geospatial analysis and modelling.
- To facilitate the interaction and communication between the computational community and cartographic community for creation of geographic knowledge.
- To foster a new research community centered on visual geospatial analysis and modelling.
- To organize ICC sessions and ICA workshops on geospatial analysis and modelling.
- To edit and publish geospatial analysis and modeling related reports, books, and special issues with some scientific journals.
- Activities including (1) Organization of the 4th ICA workshop and continuation of the ICA workshop series in general; (2) Use of Web 2.0 technologies for networking and recruiting more

members and researchers; (3) Organization of specialty tutorials for young researchers.

Geovisualization
Chair: Gennady Andrienko (Germany)
Vice-Chair: Jason Dykes (UK)

- Promote, develop and report upon the use of cartography in its widest sense in the exploration and analysis of spatial information through interactive visual interfaces.
- Define short and medium term research goals that address key issues associated with this work and its application.
- Encourage a multi-disciplinary and international approach to this work that draws upon and contributes to the efforts of relevant stakeholders (such as international and national organisations promoting and coordinating research), cognate disciplines and commissions and working groups.

GI for Sustainability
Chair: Vladimir Tikunov (Russia)
Vice-Chair: Horst Kremers (Germany)

- To produce a methodological structure for GIS and Cartographic basis of sustainable development (SD) of territories.
- The organization of events (including presentations of projects, holding conferences etc.), on which experts from the different spheres of Cartography, Geoinformation and neighboring disciplines (environmental sciences, regional and cross-border planning etc.) would be involved. In particular to hold conferences that will bring together the different experts interested in sustainable development of territories. The press will be involved for propagation of achievements of cartography and GIS.
- To organise regional workshops and summer-schools on GIS and Cartography for developing projects in Sustainable Development.
- To provide the connections and performance of teamwork, holding conferences, schools with the adjacent organizations - the IGU Commission on Geographical Information Sciences, CODATA (ICSU Committee on Data for Science and Technology), Digital Earth, UNIGIS, ENVIROINFO etc.
- To continue the work on realization of international conferences InterCarto, which since 1994 were annually carried out in Russia and in other countries (http://susgis.net).
- Document and publish best practice results, proceedings of conferences, textbook on geoinformatics contributions to sustainable development.
- To encourage and support the involvement of student cartographers in the commission activities. Since two years there is continuing success of funding student participation in the SD Commission activities.
- Cooperate with other ICA Commissions (e.g. "Education and training", "Management and Economics of Map Production", "Digital Technologies in Cartographic Heritage")

History of Cartography
Chair: Elri Liebenberg (South Africa)
Vice-Chairs: Imre Josef Demhardt (USA), Dr Peter Collier (United Kingdom)

- Investigate the impact of technological innovations (printing methods, topographical surveying, aerial photography, satellite imagery and geographical information systems) on

cartography during the last two centuries.
- Document the recent history of GI science in general and computer-aided mapping and Geographical Information Systems in particular.
- Examine the changing role of maps worldwide as cartographical (as opposed to historical) documents in history during the 19th and 20th centuries.
- Examine the significance of the cartographical work undertaken during the 19th and 20th centuries by the traditional colonial powers and all countries which extended their sovereignty over territory beyond their borders.
- Compile a list of useful sources on the history of cartography since 1800, which do not as yet appear in published catalogues or electronic databases.
- Maintain a dedicated website to act as a database for interested researchers.
- Hold annual meetings/conferences to discuss and monitor research work undertaken.
- Publish research findings in accredited journals and on the Commission website.

Map Design
Chair: Kenneth Field (United Kingdom)
Vice-Chairs: Bernhard Jenny (Switzerland), Alexander Kent (United Kingdom), Anja Hopfstock (Germany)

- To discuss, develop, illustrate and promote the principles of map design.
- To identify examples of good cartographic practice which underpin high quality, effective map design.
- To provide appropriate mechanisms and support for the dissemination of current map design research.
- To develop high quality materials to support cartographers and map-makers in the development of their own maps (e.g., books, exemplars, tutorials).
- To develop support for the design of specific cartographic products that are challenged by new modes of production (e.g., design for maps that use imagery as the base).
- To inform, enthuse and engage with fledgling map-makers (such as neo-cartographers) in a mutual exchange of methods, needs and ideas.
- To maintain a Web site that includes a bibliographical database of map design research, a community identity for those who work in the area of map design, resources to assist map-makers in their design endeavors, and a forum for the exchange of ideas and expertise.
- To work with other ICA Commissions which incorporate a design perspective.
- To have fun designing maps and enthuse others to approach their own work with an eye on design.

Map Production and Geo-business
Chair: Philippe de Maeyer (Belgium)
Vice-Chair: Markus Jobst (Austria)

- Enhance the study on map production- and process management, map economics and geobusiness.
- Research on the impact by the modern communication methods on map production, business models, change management and design thinking.
- Research the impact of Service Oriented Architectures and future technologies on Map-Production, Publishing and Archiving.
- Encourage international collaboration on the study of map production and geobusiness with particular emphasis on bridging research, government and commercial sectors.
- Participate and contribute to activities of other relevant ICA interests groups (e.g. Commission on Use and User

Issues, National Mapping Organisations).
- These terms of reference should be achieved by specific meetings involving the different sectors, knowledge transfer via workshops and the wide usage of publication media.

Map Projections
Chair: Miljenko Lapaine (Croatia)
Vice chair: Lynn Usery (USA)

- Prepare an Operational Plan, which will acknowledge the Terms of Reference approved by the General Assembly and which will be used to set achievable targets for the Commission for a four year period. Organise and maintain the Commission web site.
- Promote and foster research on map projections, coordinate systems, transformations and conversions, and disseminate the outcomes. Expected result: an enhanced set of online bibliographic tools and web links on map projections, coordinate systems, transformations and conversions.
- Organise sessions and meetings at least once a year to stimulate a debate on all aspects of map projections with the aim of collecting and publishing the research results. Expected result: a collection of papers on case studies in map projections.
- Promote the proper use of map projections at all levels of education. Expected result: a publication with recommended approach to map projections at different levels of education.
- Study terminology on map projections and prepare the multilingual dictionary for this area of cartography. Expected result: the dictionary on map projections, coordinate systems, transformations and conversions.
- Provide consultative support in relation to map projections. Expected result: appropriate support as required.
- Last but not least – work for reaching the general aims conceived in the ICA Statutes taking into account the recommendations of the ICA Executive Committee.

Mapping from Remote Sensor Imagery
Chair: Xiaojun Yang (USA)
Vice Chair: Jonathan Li (Canada)

- Promote the original and practical research concerning the development and use of existing and forthcoming aerospace remote sensor systems for topographic and thematic mapping.
- Produce a book with a state-of-the-art review on remote sensors and data processing techniques applied for topographic and thematic mapping. It reviews the latest developments in remote sensors and information extraction techniques, examines the utilities of sensors and techniques for cartographic feature extraction, and showcases latest developments in thematic mapping.
- Network with ISRPS, IAG, FIG, and other ICA commissions with similar interests in applications of remote sensor imagery. Such networking would help organize one or more joint workshops, seminars, or symposia during 2011-2015.
- Develop closer links with international organizations concerned with the use of remote sensor imagery (e.g. UNOOSA, UNEP, PAIGH) for strengthening ICA's presence and developing joint courses or seminars on cartographic applications of remote sensor imagery.
- Promote knowledge transfer at fundamental and advanced levels on the use of remote sensor imagery for cartographic applications related to

natural and built environments, early warning and natural disaster mitigation.
- Prepare promotional materials reflecting the Commission's terms of reference and activities that can be used to support ICA's presence at international forums (e.g. World Map, Map Middle East, meetings of the Joint Board of Geospatial Information Societies (JB GIS), UN meetings, and other regional conferences).

Maps and Graphics for Blind and Partially Sighted People
Chair: Alejandra Coll (Chile)
Vice-Chair: Waldirene Ribeiro (Brazil)

- Exchange and disseminate information on the design of and production technologies for maps and graphics for blind and partially sighted people.
- Study and evaluate developing and appropriate technologies and resources for the improvement of maps and graphics for blind and visually-impaired people.
- Explore the potential value of maps and graphics designed for blind and visually-impaired people to other user groups (e.g. children and those with learning difficulties, Develop closer links with the World Blind Union and extend this co-operation to deaf, mentally retarded children and old people).
- Engage with the International Mobility Conference and other appropriate organizations in order to further world-wide co-operation, communication and education in the use of maps and graphics by blind and visually-impaired people.
- Integrate the workings of this commission more closely with other ICA commissions, in order to expand the topics and facilitate access to information for disabilities people.

Maps and Society
Chair: Chris Perkins (UK)
Vice-chair: Jörn Seeman (Brazil)

- Develop the Maps and Society web site to act as a clearinghouse and one-stop shop for researchers and practitioners in this area.
- Sponsor and organise sessions at future ICA conferences.
- Organize two specialist workshops on topics related to Maps and Society These would be local meetings to generate increased ICA participation from groups in different global contexts.
- Encourage publication in this area, specifically publication of a theme issue of The Cartographic Journal or Cartographica around critical approaches to mapping practice, and publication of a research monograph on Maps and Society.
- Collaborate with representatives of other disciplines in meetings and seminars.
- Hold joint meetings with specific mapping communities focusing upon different mapping encounters. In the next four years these might focus upon: mapping as artistic practice; graphic designer practice; active collaboration with crowdsourcing communities.

Maps and the Internet
Chair: Rex Cammack (USA)
Vice Chair: Pyry Kettunen (Finland), Long Yi (Chile)

- Focus scholarship on disseminating maps and spatial data through distributed data networks. Product: Journal articles and web pages.
- Examine Internet map usage to better serve users in a multi-platform environment. Product: Oral or published report.

- Examine the use of new Internet mapping technologies for social interaction and empowerment with online maps. Product: Oral or published report.
- Examine differences in the application of Internet maps between countries. Product: Oral or published report.
- Examine the role of Internet maps in both the data rich and data poor societies. Product: Oral or published report.
- Examine the potential of Internet map metadata. Product: Oral or published report.
- Examine an international construction kit for Internet maps that supports multinational and multicultural perspectives. Product: Oral and Published report.
- Examine the role of Internet maps in the growing field of Location-based services. Product: Collaboration with Map Use and Ubiquitous mapping Commissions and Published reports
- Promote instruction on Internet mapping through collaboration / coordination with agencies for research and mapping. Product: Materials to be used in workshops.

Mountain Cartography
Chair: Karel Kriz (Austria)
Co-Chair: Lorenz Hurni (Switzerland)

- Further define the topics of Mountain Cartography and promote the methods and knowledge of mountain cartography among scientists and professionals in cartography and related fields.
- Provide an updated, attractive web-site with information about Commission activities, links to other events and theme-specific knowledge.
- Provide an updated web-portal with links to related web-sites and bibliographic information.
- Emphasise cartographic design issues and map related representations in large scale topographic mapping.
- Continue the well-established workshop series.
- Promote publication activities (proceedings, web-proceedings, journal articles and special issues) and common research activities.

Neocartography
Chair: Steve Chilton (UK)
Vice-Chairs: Manuela Schmidt (Austria), Andrew Turner (USA)

- Investigate the emergence of Neocartography and develop a web site to act as a shop window and reference point for researchers and practitioners in this area.
- Organise sessions at future ICA conferences (commencing with ICC2013 in Dresden) and collaborate and with representatives of other disciplines and ICA Commissions in meetings and seminars (eg Maps and Society).
- Organize specialist conferences/workshops on topics related to Neocartography. These would be local meetings to encourage ICA participation from groups who might not normally do so.
- Encourage publication in this area, specifically publication in what may be considered traditional cartography journals - such as the Cartographic Journal, Society of Cartographers Bulletin, and Cartographica.
- Support research into, creation of, and dissemination of information about appropriate web-tools.
- Hold joint meetings with mapping and allied communities. In the first four years these might focus upon participatory community mapping and map design.

Open Source Geospatial Technologies
Chair: Suchith Anand (United Kingdom)
Vice-Chair: Thierry Badard (Canada)

- Maintain a website for the exchange of knowledge, news and information on use and user issues issues in open source geospatial technologies (http://ica-opensource.scg.ulaval.ca/index.php?page=home).
- Maintain an on-line bibliographical database.
- Maintain Web discussion forum.
- Maintain a database of individuals working on, or with expertise in, open source GIS to stimulate exchange of information.
- Produce a major publication on Open Source Geospatial Technologies (either a special issue of a refereed journal or a text book).
- Organize sessions on Open Source GIS at future ICA conferences.
- Participate in / contribute to other workshops / seminars organized by representatives of other disciplines or by other ICA Commissions / Working Groups.
- It is proposed to have four regional senior representatives for the commission (one each from Africa, South America, Asia and Australia).

Planetary Cartography
Chair: Henrik Hargitai (Hungary)
Vice Chair: Kira B. Shingareva (Russian Federation)

- Update of the Multilingual Maps of Terrestrial Planets and their Moons series.
- Participation in Specialized Planetary Cartography GIS projects.
- Planetary Nomenclature / Gazetteer supplements.
- Foundation of a new, bi-annual international children‘s and student‘s drawing competition, with special focus on planetary cartography.
- Development of a curriculum for geography or physics teachers at high school level, in which they can use planetary cartographic products.
- Participation in the making of a textbook on Extraterrestrial Geography at high school and university level, and creation of cartographic products for this available online.
- Online resources.
- Creation of a new, updated website for the commission with various resources for the planetary cartographer community worldwide, including the International Planetary Cartography Database which is a documentation, bibliography and analysis of the international planetary cartography products.
- Making official contacts with the WG of Extraterrestrial Mapping at ISPRS, with IAU Commission on Solar System Nomenclature, with planetary mapping groups in Germany (DLR), the USA (NASA/USGS), China and Japan.

Theoretical Cartography
Chair: Qingyun Du (China)
Vice-Chair: Florian Hruby (Austria)

- Comparing and studying selected topics of theoretical interest in a multi-disciplinary, cross-cultural and historical, methodological perspective.
- Promoting the research topics from carto-semiotics to more general philosophical concerns for cartography theory construction including ontology, epistemology and linguistics etc.
- Promoting the application of theoretical research fruits and relevant adaption and improvement in cartographic and gis practice.

- Establishing an efficient information system to facilitate collaboration among the researchers in the field by maintaining an up-to-date commission website with news important for the membership, reports on the activities of the commission, information on recent publications of interest, on the past and future meetings in the field, etc.
- Promoting the existing glossary in multi-language in the circle of researcher and extending the glossary with the further research interest.
- Conducting workshops or symposia about selected aspects of theoretical cartography in different nations.
- Compiling and publishing reports and collected papers about the work of the commission.

Ubiquitous cartography
Chair: Masatoshi Arikawa (Japan)
Vice-Chair: Yuefeng Liu (China)

- Place the notion of Ubiquitous Mapping based on real-world map interaction and ICT-based context-aware mapping services in the domain of Theoretical Cartography; examining
    - (1) Primal mapping between geomedia (real, graphic and language spaces) and human (cognitive space), and
    - (2) Secondary or ICT-based mapping between geomedia (real, graphic and language spaces) and geodatabase.
- Develop the theory of Map Evolution on ICT enabled socio-cultural environment, by
    - (1) Clarifying similarity and difference in comparing variant systems to establish an evaluation scheme,
    - (2) Revealing significant factors such as ubiquity and egocentrism for Map Evolution on ICT, and
    - (3) Creating map evolutional tree diagrams representing natural selection of maps in past, current and future according to real ICT-based ubiquitous mapping services and socio-cultural environment of different countries, particularly East Asia including Japan, China and Korea.
- Organize regional workshops including site observation to comprehend contemporary situation of ubiquitous mapping.

Use and User Issues
Chair: Corné van Elzakker (Netherlands)
Vice-Chairs: David Forrest (United Kingdom), Kristien Ooms (Belgium), Alexander Pucher (Austria)

- Maintain and expand the website (www.univie.ac.at/icacomuse) for the exchange of knowledge, news and information on use and user issues in cartography and geo-information processing and dissemination.
- Maintain and fill the on-line bibliographical database on use and user issues which is accessible through the website (http://www.univie.ac.at/cartography/project/ica_user/bibliography/index.php/topics).
- Set-up and maintain a database of individuals working on, or with expertise in, the various use and user issues and denote it with keywords (similar to the listings used in the bibliography) to stimulate exchange of information. This database will be accessible through the current website.
- Provide a Web discussion forum through the current website.
- Produce The Handbook for User Research in Geoinformation (textbook publication focusing on methods and techniques of use, user and usability

research in cartography and geo-information processing and dissemination).
- Foster, stimulate and contribute to other publications on use and user issues in cartography and geo-information processing and dissemination.
- Organize (or help organizing) sessions on use and user issues at future ICA conferences.
- Establish one or more “Project Groups” that deal with a specific aspect of use and user issues in cartography and geo-information processing and dissemination. The Project Groups will execute concrete tasks within a given time span.
- Organize (or help organizing) specialist workshops or seminars on focused topics related to use and user issues in cartography and geo-information processing and dissemination.
- Participate in / contribute to other workshops / seminars organized by representatives of other disciplines (e.g. human computer interaction, computer science) or by other ICA Commissions / Working Groups.
- Involve young (PhD) researchers in all Commission activities.

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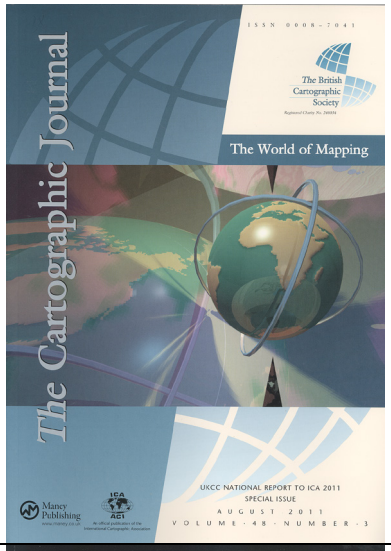

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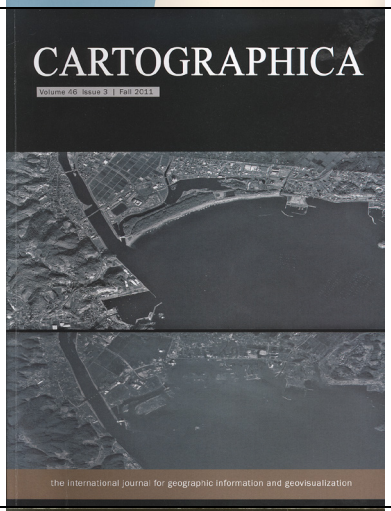

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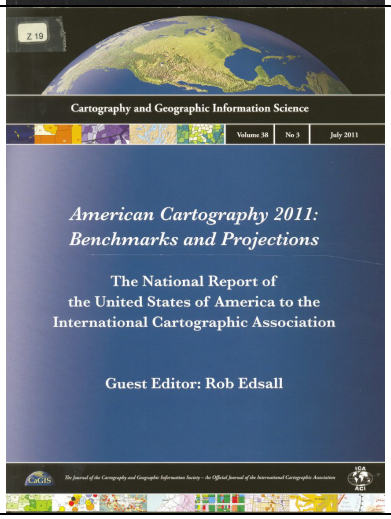

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The editor, Igor Drecki is always willing to receive material for publication from the worldwide cartographic community.

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president's report

Scope
This report provides an overview of the activities of the International Cartographic Association for the period of 2007-2011. It covers general information related to Executive Committee meetings and undertakings, the structure of Commissions and Working Groups, adjunct committees, publications, communications, links with sister societies and international endeavours to advance the Association and its contributions to the international cartography and GI Science community specifically and to society in general.

Executive Committee 2007 - 2011
At the Moscow 2007 General Assembly a new Executive was elected. The Executive comprises:
- William Cartwright, Australia: President
- David Fairbairn, UK: Secretary General & Treasurer
- Georg Gartner, Austria: Vice President
- Pablo Gran, Chile: Vice President (until 2010)
- Zhilin Li, China: Vice President
- Anne Ruas, France: Vice President
- Derek Clarke, South Africa: Vice President
- Menno-Jan Kraak, The Netherlands: Vice President
- Tim Trainor, USA: Vice President
- Milan Konečný, Czech Republic: Past President

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50 years of ica general assemblies 1961-2011

A report on the first General Assembly of member nation delegates to the ICA, held in Paris from 29 May to 3 June, 1961, was published in the *Internationales Jahrbuch für Kartographie (UK) (International Yearbook of Cartography)* printed in Germany in 1961. It deals with the founding of ICA and the subsequent development of the association into a well-governed and established professional international organisation. The text below paraphrases the report in the Yearbook.
The necessity of establishing not only a regional but also an international exchange of methodical and technical achievements in the field of cartography suggests itself more and more. For this reason Dr Carl Mannerfelt (Sweden) invited experts of different countries as early as 1956 to a working session, the so-called Esselte Conference. In 1958, a second session of this kind was held

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Members of the first Executive Committee of the International Cartographic Association elected in Paris, 1961 *(standing from left)*: Stéphane de Brommer (France), Dennis E.O. Thackwell (UK), Granville K. Emminizer (USA), Eduard Imhof (Switzerland), Carl Mannerfelt (Sweden), Erwin Gigas (West Germany) and Carlo Traversi (Italy); in the foreground outgoing members of the "Committee of Six": Lewis J. Harris (Canada) *(left)* and Duncan M. Fitchet (USA) | *Photograph courtesy of ICA archives*

in this issue

ICA President Prof William Cartwright and Prof Pip Forer at the first ICA Regional Symposium on Cartography for Australasia and Oceania run in conjunction with GeoCart'2010 in Auckland, New Zealand, 2010 | *Photography Marney Brennan*

ICA maintains a website (**www.icaci.org**) where most of the information as in this directory is presented, and kept up to date. Apart from the current mission, statutes, terms of reference of the commissions, guidelines for ICA officers, strategic plan, and ICA awardees, the website moreover also informs on planned future activities and on achievements of the past.

The website has important information about ICA conferences: how to bid for them, how to organize them, when to submit papers, etc. Banners of the forthcoming ICA conferences, that link through to their specific conference websites are displayed. Information on participation in the Barbara Petchenik Award for children for these conferences and on getting ICA travel scholarships is also provided. Moreover, the most recent winners of these contests will be listed on the site.
Anyone can subscribe to website updates via e-mail, Twitter or RSS as integrated on the main page.

Updating is easy for the website, and that is why the addresses of ICA officers, commission chairs and national and affiliate members will be more up to date on the website than in this directory.

Through the website it is possible to access the ICA News, which is the newsletter of the ICA, edited by Igor Drecki from the University of Auckland in New Zealand. He will also try to provide the latest news on cartographic and GIS events.

Finally the website provides an easy means for accessing the ICA Executive Committee, the Commissions and Working Groups you can find the relevant e-mail addresses.

Currently, the website is supervised by Webmaster, Felix Ortag and Manuela Schmidt (**website@icaci.org**) of the Cartography and Geo-Mediatechniques section in the Department of Geoinformation and Cartography of the Vienna University of Technology, Vienna, Austria.
ICA expresses its gratitude to the University for its support.

www.icaci.org

The Awards of the International Cartographic Association are introduced in the By-laws 3 and 4 of the Statutes. This note also provides the list of Awardees.

Statutes of the International Cartographic Association

By-law 3
The ICA may grant to outstanding cartographers such awards and honours as are approved by the Executive Committee upon the recommendation of a Committee for the Selection of Award Recipients.
By-law 4
The President shall appoint a Committee for the Selection of Award Recipients after each General Assembly to serve until the next General Assembly. The Committee shall consist of five representatives, each from a different member nation. No more than two representatives can hold concurrent membership of the Executive Committee.

Guidelines

The Committee for the Selection of Award Recipients makes recommendations for two types of awards:
The Carl Mannerfelt Gold Medal
The ICA Honorary Fellowship

The Carl Mannerfelt Gold Medal honours cartographers of outstanding merit who have made significant contributions of an original nature to the field of cartography; it is awarded only on rare occasions in order to emphasise its distinction.

The ICA Honorary Fellowship is for cartographers of international reputation who have made special contribution to the ICA. It includes a bronze medal.

Cartographers should not be awarded when they serve in the Executive Committee, except for very special circumstances. National ICA Committees or Commission chairs may submit nominations for ICA Awards to the Committee until 6 months prior to an ICA Conference. The nominations must be accompanied with draft citations for the nominees.

The Committee for the Selection of Award Recipients submits its proposals to the ICA President with draft citations for the nominees 3 months prior to an international cartographic conference.

2011–2015 Committee for the Selection of Award Recipients

The 2011–2015 Committee for the Selection of Award Recipients is chosen by the President to whom all enquiries should be addressed.

Carl Mannerfelt Gold Medal

Eduard Imhof	Switzerland	1979/80
Arthur H. Robinson	United States	1980
Konstantin A. Salichtchev	Soviet Union	1980
Carl Mannerfelt	Sweden	1981
Ferdinand J. Ormeling	The Netherlands	1987
Jacques Bertin	France	1999
Chen Shupeng	China	2001
Joel L. Morrison	United States	2001
David Rhind	United Kingdom	2005
Ernst Spiess	Switzerland	2005
Jack Dangermond	United States	2007
Ferdinand J. Ormeling	The Netherlands	2009

ICA Honorary Fellowship

Sándor Radó	Hungary	1974
Konstantin A. Salichtchev	Soviet Union	1979/80
Akira Watanabe	Japan	1980
Emil Meynen	Germany	1982
Stanislaw Pietkiewicz	Poland	1982
Dennis E.O. Thackwell	United Kingdom	1983
Harold Fullard	United Kingdom	1984
Rolf Böhme	Germany	1984
David Bickmore	United Kingdom	1987
Olof Hedbom	Sweden	1987 (presented 1997)
Nestor Duch Gary	Mexico	1991
Bernard Gutsell	Canada	1991
Joel Morrison	United States	1991
Helen Wallis	United Kingdom	1991
Rodolfo Nuñez de las Cuevas	Spain	1995
Árpád Papp-Váry	Hungary	1995
Don T. Pearce	Australia	1995
Ernst Spiess	Switzerland	1995
Joseph Wiedel	United States	1995
Richard Dahlberg †	United States	1997
Miroslav Miksovsky	Czech Republic	1997
Christer Palm	Sweden	1997
Roger Anson	United Kingdom	1999
Christopher Board	United Kingdom	1999
Jean-Philippe Grelot	France	1999
Tositomo Kanakubo	Japan	1999
Jaume Miranda i Canals	Spain	1999

D.R. Fraser Taylor	Canada	1999
Judy Olson	United States	2001
Hu Yuju	China	2001
Kei Kanazawa	Japan	2001
Ron Furness	Australia	2001
Bai Bo	China	2001
Harold Moellering	United States	2003
Sjef van der Steen	The Netherlands	2003
Andrzej Ciolkosz	Poland	2003
István Klinghammer	Hungary	2003
Ulrich Freitag	Germany	2003
Liao Ke	China	2003
Ken Lester	South Africa	2003
Wanarat Thothong	Thailand	2005
Alan MacEachren	United States	2005
Michael Wood	United Kingdom	2005
José-Luis Colomer Alberich	Spain	2005
Pinhas Yoeli	Israel	2005
Helen Kerfoot	Canada	2007
Graciela Metternicht	Argentina	2007
Kira Shingareva	Russia	2007
Bengt Rystedt	Sweden	2009
Yasuo Masai	Japan	2011
Monique Pelletier	France	2011
Michael Peterson	United States	2011

Diplomas for outstanding services to ICA

Sture Norberg	Sweden	1997
Lars Ottoson	Sweden	1997
Bengt Rystedt	Sweden	1997
David Carney	Canada	1999
Clifford H. Wood	Canada	1999
Lloyd Bowler	Canada	1999
Ottawa ICC Local Organizing Committee	Canada	1999
Li Li	China	2001
Yang Kai	China	2001
Wang Qian	China	2001
John S. Keates	United Kingdom	2001
Derek Clarke	South Africa	2003
Lindisiqwe Magi	South Africa	2003
Larry Zietsman	South Africa	2003
Antony Cooper	South Africa	2003
Chris Carter	South Africa	2003

Magda Roos	South Africa	2003
Lois O'Brien	South Africa	2003
Heinrich du Plessis	South Africa	2003
Mark van den Berg	South Africa	2003
Mariana French	South Africa	2003
Elize Hayman	South Africa	2003
Durban ICC Local Organizing Committee	South Africa	2003
Ramón Lorenzo	Spain	2005
David Woodward †	United States	2005
Alexander Borodko	Russian Federation	2007
Juan Vidal Garcia	Chile	2009

ICA was founded June 9, 1959, in Bern, Switzerland. Preparatory conferences, during which its foundation was discussed, were held from 1956–1959: the Esselte conference, Stockholm 1956, the Rand McNally conference, Chicago 1957 and the DGfK conference, Mainz (Germany) 1958. The first General Assembly (I) was held in Paris in 1961: that is also when the statutes were accepted. Later conferences were held in:

1. Frankfurt am Main (1962)
2. London/Edinburgh (1964) * II
3. Amsterdam (1967)
4. Delhi (1968) * III
5. Stresa, Italy (1970)
6. Ottawa (1972) * IV
7. Madrid (1974)
8. Moscow (1976) * V
9. College Park MD, USA (1978)
10. Tokyo (1980) * VI
11. Warszawa, Poland (1982)
12. Perth (1984) * VII
13. Morelia, Mexico (1987) * VIII
14. Budapest (1989)
15. Bournemouth, UK(1991) * IX
16. Cologne, Germany (1993)
17. Barcelona (1995) * X
18. Stockholm (1997)
19. Ottawa (1999) * XI
20. Beijing (2001)
21. Durban (2003) * XII
22. A Coruña (2005) * XIII
23. Moscow (2007) * XIV
24. Santiago, Chile (2009)
25. Paris (2011) * XV
26. Dresden (2013)
27. Rio de Janeiro (2015) * XVI

*) also General Assembly, indicated with Roman numerals.

ICA is officially registered as an idealistic non–profit organisation in the Swedish national organisation register since 20 January 2000 (number 885002-1018).

ICA Executive Committees

1961–1964	*President:* Prof. Eduard Imhof (Switzerland) *Secretary General:* Erwin Gigas (Germany/FRG) *Vice Presidents:* Stéphane de Brommer (France), Granville K. Emminizer (USA), Karl Mannerfelt (Sweden), Dennis E. O. Thackwell (United Kingdom), Carlo Traversi (Italy)
1964–1968	*President:* Brig. Dennis E. O. Thackwell (United Kingdom) *Secretary General:* Ferdinand Ormeling (The Netherlands) *Vice Presidents:* Stéphane de Brommer (France), Granville K. Emminizer (USA), H. Knorr (Germany/FRG), J.S. Paintal (India), Konstantin Salichtchev (Soviet Union), Carlo Traversi (Italy)
1968–1972	*President:* Prof. Konstantin Salichtchev (Soviet Union) *Secretary General:* Ferdinand Ormeling (The Netherlands) *Vice Presidents:* Abdelatif Belbachir (Morocco), Umberto Bonapace (Italy), Francois Bonnet-Dupeyron (France), Brice Burroughs (USA), Janusz Klawe (Canada), H. Knorr (Germany/FRG), Dennis E. O. Thackwell (United Kingdom)
1972–1976	*President:* Prof. Arthur A. Robinson (USA) *Secretary General:* Ferdinand Ormeling (The Netherlands) *Vice Presidents:* John C. Bartholomew (United Kingdom), Francois Bonnet-Dupeyron (France), Olof W. Hedbom (Sweden), Skoshichi Nomura (Japan), R. Nuñez de las Cuevas (Spain), Lech Ratajski (Poland), Konstantin Salichtchev (Soviet Union)
1976–1980	*President:* Prof. Ferdinand Ormeling (The Netherlands) *Secretary General:* Olof W. Hedbom (Sweden) *Vice Presidents:* John C. Bartholomew (United Kingdom), Rolf Böhme (Germany/FRG), Andrzej Ciolkosz (Poland), K.L. Khosla (India), A.M. Komkov (Soviet Union) 1977–, M.J. Nikishov (Soviet Union) –1977, Skoshichi Nomura (Japan), Lech Ratajski (Poland) –1977, Arthur A. Robinson (USA)
1980–1984	*President:* Prof. Ferdinand Ormeling (The Netherlands) *Secretary General:* Olof W. Hedbom (Sweden) *Vice Presidents:* E.P. Arzhanov (Soviet Union)1983–, Rolf Böhme (Germany/FRG), Andrzej Ciolkosz (Poland), B.E. Goodrick (Australia), K.L. Khosla (India), A.M. Komkov (Soviet Union) 1983–, P: Legris (France), Joel L. Morrison (USA)
1984–1987	*President:* Prof. Joel L. Morrison (USA) *Secretary General:* Donald T. Pearce (Australia) *Vice Presidents:* Pankaj Kumar Agarwal (India), E.P. Arzhanov (Soviet Union), Nestor Duch Gary (Mexico), Yuju Hu (China), Ferdinand Ormeling (The Netherlands), David W. Rhind (United Kingdom), Fraser Taylor (Canada)
1987–1991	*President:* Prof. Fraser Taylor (Canada) *Secretary General:* Donald T. Pearce (Australia) *Vice Presidents:* E.P. Arzhanov (Soviet Union), Fred W. Christ (Germany/FRG) 1989–, Nestor Duch Gary (Mexico), Jean-Philippe Grélot (France), Yuju Hu (China), Werner Lichtner (Germany/FRG) –1989, Árpád Papp-Váry (Hungary), David W. Rhind (United Kingdom)

1991–1995	*President:* Prof. Fraser Taylor (Canada) *Secretary General:* Jean-Philippe Grélot (France) *Vice Presidents:* Edzard S. Bos (The Netherlands), Tositomo Kanakubo (Japan), Jaume Miranda i Canals (Spain), Judy Olson (USA) 1993–, Árpád Papp-Váry (Hungary), Barbara Bartz Petchenik (USA) –1992, Donald T. Pearce (Australia), Michael Wood (United Kingdom)
1995–1999	*President:* Dr. Michael Wood (United Kingdom) *Secretary General:* Jean-Philippe Grélot (France) *Vice Presidents:* Regina Alaujo de Almeida/Vasconcellos (Brazil),Tositomo Kanakubo (Japan), Milan Konecny (Czech Republic), Jaume Miranda i Canals (Spain), Judy Olson (USA), Bengt Rystedt (Sweden), José G. Solis (Philippines)
1999–2003	*President:* Prof. Bengt Rystedt (Sweden) *Secretary General:* Ferjan Ormeling (The Netherlands) *Vice Presidents:* Milan Konecny (Czech Republic), Li li (China), Elri Liebenberg (South Africa), Robert B. McMaster (USA), Takashi Morita (Japan), Kirsi Virrantaus (Finland), Alberta Auringer Wood (Canada)
2003–2007	*President:* Prof. Milan Konecny (Czech Republic) *Secretary General:* Ferjan Ormeling (The Netherlands) *Vice Presidents:* William Cartwright (Australia), David Fairbairn (United Kingdom), Ramon Lorenzo Martinez (Spain), Robert B. McMaster (USA), Haggai Nyapola (Kenya), Vladimir S.Tikunov (Russia), Kirsi Virrantaus (Finland)
2007–2011	*President:* Prof. William Cartwright (Australia) *Secretary General:* David Fairbairn (United Kingdom) *Vice Presidents:* Derek Clarke (South Africa), Georg Gartner (Austria), Pablo Domingo Gran López (Chile), Menno-Jan Kraak (The Netherlands), Zhilin Li (Hong Kong), Anne Ruas (France), Timothy F. Trainor (USA)
2011–2015	*President:* Prof. Georg Gartner (Austria) *Secretary General:* László Zentai (Hungary) *Vice Presidents:* Derek Clarke (South Africa), Menno-Jan Kraak (The Netherlands), Liu Yaolin (China), Sukendra Martha (Indonesia), Paulo Menezes (Brazil), Anne Ruas (France), Timothy F. Trainor (USA)