

**Report to the 34th General Assembly
FIG Working Week 2011 in Marrakech, Morocco**

FIG Commission 4 – Hydrography

End of Term Report 2007–2010

1. General and activities

2007

The Commission chair and all four vice chairs were on the move throughout the year. While all were involved in offshore survey operations at various times throughout 2007 we still managed to write papers, participate and/or chair sessions at various FIG and hydrographic meetings.

ACCO Meeting, Slovakia

In the fall of 2006, a new Advisory Committee of Commission Officers (ACCO) was established to serve out a four-year term, from 2007-2010. Subsequently, a meeting was called for early 2007 for all newly appointed Commission Chairs (who are the members of ACCO) to gather together under one roof and with direction from FIG Council, work towards finalizing their proposed 2007-2010 work plans.

IHO Conference Monaco

Andrew Leyzack and Gordon Johnston attended this meeting early in the year. Gordon brought along his IHO Capacity Building Committee and International Advisory Board (IAB) hat and representing FIG we were privileged to join in the IHO General Assembly as observers. The conference provided an excellent opportunity for the Commission Chair to meet with other members of the FIG/IHO/ICA IAB to discuss training, competency and certification issues. It was also an opportunity to drum up interest in the regional conference in Costa Rica.

Working Week, Hong Kong

This was the first working week where a newly formed commission met to kick off the new work plan. David Neale and Gordon Johnston presented during a session on the Economic Benefits of Hydrography. John McCarthy offered an anecdotal treatment of a lifelong career in Hydrography- drawing from Steve Ritchie's "No Day too Long", John's paper argued that to a hydrographer "No Day Was Long Enough". Andrew co-authored and presented a paper with HK Poly U Instructor Steve Lam on Marine Information Systems. The Port of Hong Kong's Hydrographic Service hosted a tour of their facility and the HK national delegate Lesly Lam organized a good workshop for both Commissions 4 and 5 to network. The annual Commission 4 meeting as well as two strategic planning meetings for Costa Rica was held during this event.

South East Asian Surveyors Conference, NZ

Past Commission 4 Chair Adam Greenland attended this FIG-sponsored event. A significant hydrographic component contributed to the session content of this conference.

6th FIG Regional Conference, Costa Rica

This regional conference was focused on providing answers to specific challenges faced within Central America, particularly within the coastal zone. Commission 4, was called upon to deliver technical sessions dealing with Coastal Zone Management (CZM), the Administration of Marine Spaces and Capacity Building. On the latter issue, our IHO liaison, Capt. Hugo Gorziglia was keen to participate and to make contact with local stakeholders in regards to promoting the benefits of developing hydrographic capacity within the region because to date, Costa Rica has not established a national hydrographic office.

Commission 4 Newsletter

Starting in 2007, in cooperation with Reed Publishing we initiated a quarterly Commission 4 Newsletter publication in Hydro International. In exchange for regular contributions to Hydro International, the publisher has agreed to provide a free subscription to all Commission 4 delegates.

2008

Commission 4 members participated at two events this year: FIG Working Week 2008 in Sweden and Canadian Hydrographic Conference and National Surveyors Conference 2008 in Canada. A Commission 4 workshop on Administering Marine Spaces was held at the latter. Vice Chair of Administration and Communications, Mr. David Neale was appointed to the FIG/IHO/ICA International Advisory Board on the Standards of Competence for Hydrographic Surveyors and Nautical Cartographers. Vice Chair, Dr. Michael Sutherland (Working Group 4.3- Administering Marine Spaces) was nominated chair-elect and approved by the General Assembly at Stockholm. Publication 43- Costa Rica Declaration on Pro-Poor Coastal Zone Management of which Commission 4 was a contributor was published and presented at this year's Working Week in Stockholm.

Working Week, Stockholm

The annual Commission 4 meeting was held and three technical sessions were hosted by Commission 4:

- Coastal Zone Management (Joint with Commissions 7 and 8)
- Hydrographic Information Management
- Hydrographic Surveying in Practice

Of interest to Commission 4 was a technical tour hosted by the Swedish Maritime Administration of their new vessel traffic service (VTS).

CHC/NSC 2008, Victoria

The theme of this conference was "Bringing Land and Sea Together". Sponsored by FIG, Commission 4 hosted Workshop on Administering Marine Spaces. The goals of the workshop were to inform conference participants of international efforts with regard to administering marine spaces and the role of FIG as a source for knowledge and good practice; to solicit feedback from conference participants; and to foster links between the ACLS and FIG in

respect to their ongoing efforts to promote an administrative framework (including the Marine Cadastre) for Canada Offshore Lands.

Commission 4 Newsletter

In exchange for our regular contributions to Hydro International (4 newsletters were published), the publisher continued to provide a free subscription to all Commission 4 delegates.

2009

Our participation at Working Week in Israel, the Regional Meeting in Viet Nam and the IHO Conference in Monaco helped further the work of all working groups.

FIG Working Week, Eilat

Commission 4's annual meeting and 2 technical sessions were well-attended, the latter featuring a total of 9 presentations from Canada, Israel, Nigeria and the UK. Topics ranged from sea level monitoring to the measurement and monitoring of shoreline, marine cadastre and the acquisition of bathymetry and sea bed morphology from multi beam sonar. Hydrographic Education in Israel was profiled during a Commission 2 session on Good Educational Practices. Commission 4 would like to extend a special thanks to Dr. John Hall (Israel), author of The National Bathymetric Survey of Israel, Almost Completed for his lively discussion, hospitality and contributions towards Commission 4's activities in Eilat.

In keeping with our MoU with the IHO, Commission 4 has sought to engage FIG delegates, hydrographic stakeholders and agencies in countries to which there is no representation in IHO. In this regard we were able to meet with the Director General of the Survey of Israel, Dr. Hiam Srebro (responsible for charting Israeli waters) who subsequently agreed to enter into dialogue with the IHO on the matter of membership.

US Hydro 2009

Although there were no specific commission activities at this meeting, Jerry Mills our US delegate reported back to us on this conference. His report can be found on the FIG website.

IHO Conference

The commission continued to support the IHO on matters pertaining to promoting Hydrography as an investment (working group on the Economic Benefits of Hydrography) and hydrographic standards and training. Mr. Gordon Johnston (UK) attended this conference on behalf of FIG and Commission 4. As an FIG representative and chair of the FIG/IHO/ICA International Advisory Board on the Standards of Competence for Hydrographic Surveyors and Nautical Cartographers, Mr. Johnston submitted proposals to the IHO Inter Regional Coordination Committee (IHO-IRCC) for adoption: That the IRCC adopt the Board's decision to drop the word "Advisory" from the Board's title; that the IRCC adopt a cost recovery mechanism for the Board; and that the IRCC agree to the introduction of Individual Recognition System elements into the S-5 and M-8 standards.

World Hydrography Day- Nigeria

Chair-elect Michael Sutherland was invited by the Nigerian Hydrographer through commission 4 delegate, Angela Etunovbe to participate at a World Hydrography event in Lagos. There, Michael delivered a speech on Hydrography and the Environment.

7th FIG Regional Conference, Hanoi, Vietnam

The relevance of this meeting for Commission 4 was in-line with the scope of our work on the Administration of Marine Spaces and Capacity Building- The Economic Benefits of Hydrography. Three technical sessions were offered: Coastal Zone Issues, Economic Benefits of Hydrography and Hydrographic Capacity Building. The first session on Coastal Zone Issues focused on the measurement and mapping of oil spills in Viet Nam waters. Included was a presentation on the development of a prototype marine cadastre which in summary one would note the importance of such a system for managing marine/land rights where environmental threats appear to be a serious concern. In this situation a marine cadastre would enable Viet Nam to map and assess oil spills against specific land use rights within a spatial context, using hydrographic information for base-mapping.

The second session featured invited papers on case studies on the economic benefits of hydrography from Cameroon, Canada and Ireland including a presentation on appropriate hydrographic education. The third and final session on Hydrographic Capacity Building included a contribution from the IHO, a case study on the development of a hydrographic office in Croatia from Jeppesen Marine and focus on building capacity in small island developing states. The latter touched proposed alternatives for a “made-in-the-Caribbean” approach for the region.

A general meeting was held to discuss the proposed technical program for Sydney, the development of FLASH sessions (shortened presentations of 4-5 slides) in lieu of poster presentations, specific objectives for working group 4.1- Hydrographic Surveying in Practice and proposed final publications for all working groups. The meeting was attended by commission officers: Dr. Michael Sutherland, Dr. David Neale, Mr. Gordon Johnston, and Ms. Venessa O’Connell.

Commission 4 Newsletter

5 newsletters were published in Hydro International and the publisher continued to provide a free subscription to all Commission 4 delegates.

2010

The FIG Congress in Sydney, Australia was the main focal point for 2010. Commission 4 presented nine sessions, five of which were collaborative with other commissions- 5, 7 and 8. These joint sessions featured work on vertical reference frames (datums), positioning at sea, coastal zone issues, capacity building, competencies and the administration of marine spaces. A number of presentations were from peer reviewed papers and two sessions were offered as virtual poster or “Flash” sessions:

- Positioning Techniques for Hydrography
- Vertical Reference Frame
- Hydrographic Surveying in Practice with High Resolution Data

- Hydrographic Capacity Building
- Economic Benefits of Hydrography
- Nautical Charting and Marine Cartography
- Administration of Marine Spaces.
- Measuring and Monitoring the Coastal Zone
- Coastal Zone Issues

The latter two were offered as flash sessions, a new approach to FIG conferences whereby poster sessions are given as short presentations with a limited number of slides.

All of the sessions were well attended and in some cases were subject to standing room only. Notable speakers included Cdr. Roderick Nairn the RAN Hydrographer of Australia and chair of Australasian Hydrographic Surveyors Certification Panel (AHSCP), who presented a paper their hydrographer certification program. Dean Battilana from the Royal Australian Navy's Hydrographic School presented a paper by CHS's David Dodd entitled Hydrographic Surveying Using the Ellipsoid as the Vertical Reference Surface. The paper which is co-authored by Mike Gourley of CARIS and Jerry Mills of NOAA will be the subject matter of a new (2011-2014) working group to be lead by Jerry Mills.

For the benefit of hydrographic-types and others interested in getting out on the water for a day, a technical tour was organized by Sydney Ports and co-hosted by Sydney Ports, Newcastle Port Corporation and the Royal Australian Navy. The tour (which was oversubscribed) provided delegates with on-the-water demonstrations of three different multibeam sonar systems, aboard three different survey vessels plus a tour of Fort Denison (completed in 1855) one of the best known landmarks of Sydney Harbour and site of one of Australia's oldest permanent tide gauge stations (est. 1870). On display was an original Harrison tide recorder (John Harrison invented the first ship's chronometer for determining longitude). We offer thanks to the Newcastle Port Corporation (who steamed their survey vessel, *John Shortland*, some 170km south for the occasion), Sydney Port and the Royal Australian Navy for hosting technical tours aboard their respective vessels. Additionally we thank the Australasian Hydrographic Society and the SSSI for rallying the support of their membership in this conference.

The annual general meeting plus an executive meeting of commission officers were held, the latter included discussions on the development of the 2011-2014 work plan and as new Commission 4 publications.

The FIG "Handover" Meeting and Ceremony was held on 26 November in Copenhagen. The meeting served as transitioning event for the incoming and outgoing Commission chairs to meet and move forward into the next work term (2011-2014). Here, the Commission 4 Work Plan was further developed.

Four newsletters as well as an *Insider's View* article on the Economic Benefits of Hydrography were published in Hydro International. Guidelines for the Planning, Management and Execution of Hydrographic Surveys in Ports and Harbours, FIG Publication No. 56 was published in the fall. The Economic Benefits of Hydrography, FIG Publication No. 57, was published as a web-only document. A summary document highlighting the work of Working Group 4.4, Capacity Building and the Economic Benefits of Hydrography it is available at <http://www.fig.net/pub/figpub/pub57/figpub57.htm> .

2. Working Group Reports

Working Group 4.1, Hydrographic Surveying in Practice

The chair of this working group, Mr. John McCarthy was unable to fully carry out the proposed work plan due to other professional commitments. Given the catch-all nature of the working group's theme, we did however manage to pull together several technical sessions at various FIG meetings. Through this working group, the commission strengthened its links with the Australasian Hydrographic Society.

The working group did engage the International Federation of Hydrographic Societies (IHFS) on the revision and publication of a new edition of the IFHS Special Publication 3 (SP3), entitled A Career in Hydrographic Surveying. Commission 4 was interested in seeing this publication updated as it was considered to be a valuable resource to young surveyors considering a career in hydrography. To this end, the commission was willing to offer funding and WG 4.1 was willing to assist the IHFS in the interest of getting this valuable publication updated. The IHFS claim to have moved ahead with a new edition of the publication and have kindly declined our assistance however, at this time only a summary fact sheet has been posted to the IHFS website. The Australasian Hydrographic Society have recently decided not to keep chasing the IHFS to update SP3 but instead to move forward with their own publication entitled a Hydrography as a Career.

The chair's ongoing contact with the IHFS was attributed to renewed interest in proceeding with a best practice document. At the Regional Meeting in Viet Nam it was decided that a guide on port hydrography would be produced. FIG Publication No. 56 Guidelines for the Planning, Management and Execution of Hydrographic Surveys in Ports and Harbours, was subsequently published in print and e-copy. It is a contemporary update of the (1994) FIG Publication No. 8, a report entitled Hydrography, Ports and Harbours. Simon Ironsides (New Zealand) and Venessa O'Connell (Australia), both members of the Australasian Hydrographic Society -IHFS spearheaded this publication.

Simon Ironsides and Andrew Leyzack for John McCarthy, Chair FIG WG 4.1

Working Group 4.2, Standards and Guidelines

ISO Standards

Throughout its term the working group served as the commission's liaison with the FIG Standards Network. As part of this activity, the work group contributed to a review of ISO TC211 work items: n2397 (nwip 19130- Imagery Sensor Models) as it applied to hydrographic applications and n2424 on Production Management.

Metadata

The working group has researched application of the Federal Geographic Data Committee (USA) Content Standard for Geospatial Metadata (FGDC-STD-001-1998) as a suitable standard for compiling metadata for hydrography. Various "front-end" graphic user interfaces (GUI) as well as validation routines were investigated. The FGDC standard maps

to a regional North American profile of ISO 19113:2003, *Geographic Information- Metadata* which was published in 2009.

IHO Standards

The working group also monitored the development of new and emerging hydrographic standards including S-100, reviewed the new edition of IHO S44, International Hydrographic Survey Standards (version 5) in 2008 and performed a partial review of the IHO's New Manual of Hydrography.

Individual Recognition

The development of standards for individual recognition and occupational certification has been an ongoing. Some jurisdictions (US, Germany and Australasia) have already implemented programs and the matter has been brought to the attention of the FIG/IHO/ICA International Board on the Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC). Beginning with a 2006 workshop entitled "Pathways to Professionalism"; commission 4 has endorsed the concept of an occupational certification for hydrographers, endeavouring to monitor and facilitate a focal point for discussion and shared experience in this regard. The workgroup informed and encouraged FIG council to endorse the concept of Individual Recognition and in turn the IBSC was requested by FIG to study the matter. Further to the approval of the IHO Inter-Regional Coordination Committee (IHO-IRCC) at the IHO Conference in 2009, the IBSC have introduced guidelines for individual recognition in the 2010 11th Edition of S-5 and S-8, standards for education and training.

During the 2011-2014 work term, the commission plans to cooperate with IHO in further development and expansion of S-100, particularly hydrographic-related spatial information management.

Andrew Leyzack, Chair FIG WG 4.2

Working Group 4.3, Administering Marine Spaces

The working group's objectives for the term included academic publications by working group members, participation in Conferences and workshops and ongoing cooperation with other Commissions.

- Publication of academic work related to the objectives of Commission 4.3, by members of Working Group 4.3:
- Sutherland, M. (2009). "The Marine Cadastre." Published in Lighthouse: The Journal of Canadian Hydrographic Association, Edition No. 75, Fall/Winter 2009, pp. 5-6.
- Sutherland, M., D. Lane, Y. Zhao and W. Michalowski (2009). "A spatial model for estimating cumulative effects at aquaculture sites". In *Aquaculture Economics & Management* 13:4, 294 — 311.
- Sutherland, M., P. Dare and K. Miller (2008). "Monitoring Sea Level Change in the Caribbean." In *Geomatica*, Vol. 62, No. 4, pp. 428-436.
- Sutherland, M. (2008). "Laying claim to marine spaces in the Caribbean." In *The Journal of Ocean Technology*, Vol. 3, No. 1, pp. 18-23.

Members of the working group participated in the following conferences/meetings:

- Sutherland, M. (2010) – Participant as special invited guest: Expert Consultation on the implementation of the Caribbean Sea Commission, Centre for Resource Management and Environmental Studies (CERMES), University of the West Indies, Cave Hill Campus, Barbados. Sponsored by the Government of Finland, July 7-9.
- Sutherland, M. (2010). "Global Marine Spatial Data Infrastructure: Towards its realisation". Presented at the e-navigation Workshop on Creating a Framework for Data Access and Information Services under the Scope of SOLAS", Monaco, November 3rd to 5th.
- Sutherland, M. and S. Nichols (2010). "St. Margaret's Bay Marine Cadastre Prototype Case Study". In *Spatial Planning in Coastal Regions: Facing the Impact of Climate Change*. FIG Publication No. 55, International Federation of Surveyors, Copenhagen, pp. 47-49.
- Neale, D. (2010). "Sea level rise and land challenge in SIDS". FIG Publication No. 55, International Federation of Surveyors, Copenhagen, pp. 42.
- Sutherland, M. (2009). "Developing a Prototype Marine Cadastre". FIG 6th Regional Conference, Hanoi, Viet Nam, October – Oral presentation.
- Sutherland, M. (2009). "Developing a Prototype Marine Cadastre for Chedabucto Bay, Nova Scotia". Presented at the International Federation of Surveyors' (FIG) Working Week, Eilat, Israel, May, 11 pages.
- Sutherland, M. (2009). "The environmental benefits of hydrography". Presented at the Nigerian World Hydrography Day Celebrations, Abuja, Nigeria, 22nd June – Invited Speaker.
- Sutherland, M. (2008). "Spatial information support for climate change adaptation and mitigation: some Canadian experiences". Presented at the CASLE Workshop on Risk Assessment for Climate Change, University of the West Indies, St. Augustine, Trinidad and Tobago, June – Invited Speaker.
- Sutherland, M. (2007). "Coastal zone management as strategy for pro-poor land management and administration". Presented at the 6th FIG Regional Conference, San Jose, Costa Rica, November – Plenary Speaker.

In 2008 Commission 4.3 collaborated with other Commissions in the publication of FIG Publication No. 43, *The Costa Rica Declaration*. Commission 4.3 is working in conjunction with Commission 8 to publish a FIG document on coastal zone issues in relation to coastal communities. The publication is earmarked for release at the FIG Congress in Sydney, Australia.

Projects:

- The Chair of Working Group 4.3 is part of a project that has received CAD\$990K approx. in funding for a 5-year period to do research on developing mitigation and adaptation strategies to deal with the effects of climate change on coastal communities in the Caribbean and Canada. Hydrographic and GIS Geomatics are part of the project. The project is being executed by researchers from the University of New Brunswick, University of Ottawa and the University of the West Indies. Outcomes from this project informed [and will inform] activities of the Working Group.
- The Chair of Working Group 4.3 was part of a project with the University of New Brunswick that developed a prototype marine cadastre. Outcomes from this project informed activities of the Working Group.

Michael Sutherland, Chair FIG WG 4.3

Working Group 4.4, Capacity Building and the Economic Benefits of Hydrography

From the outset the concept was to develop links between Hydrography and the benefits of having good quality up to date Hydrographic data, charts and coverage. Initially there was a definite lack of publications, papers and articles that made the link and so the initial plan was to generate papers to promote the concept. In 2007 and 2010 a number of papers were written and delivered at FIG events including the Working Week in Hong Kong, the FIG Regional meetings in Costa Rica and Vietnam and finally the Congress in Australia . At this time it became clear that simply publishing some papers in proceedings would not be sufficient and so aim for a full FIG publication that would cover the topic and include a number of the papers and presentations in a compilation booklet.

Simply publishing the papers from the various proceedings would not be sufficient and so the Work Group developed the objective to consolidate a series of papers and to augment them with an overview and commentary in support. However at the same time FIG was reducing the burden of hard copy publications and a decision was made to create the output as a web enabled publication. The final phase of compiling the papers, developing a commentary and introduction was completed at the end of October 2010.

The result is a new web-based publication, FIG No. 57. The Economic Benefits of Hydrography <http://www.fig.net/pub/figpub/pub57/figpub57.htm>
It contains an outline of the overall concept and the principle theme with links to select edited papers on the FIG Surveyor's Reference Library. The publication also illustrates Capacity Building for Hydrographic purposes with content submitted by educational institutions and National governments as well as some case study papers.

There are many people to thank for their efforts in supporting this Work Group but special mention goes to David Neale (Trinidad) and to Andrew Leyzack (Canada).

Gordon Johnston- Chair FIG WG 4.4

Andrew Leyzack
Chair, FIG Commission 4

February 2011