VIIth IHO TIDAL COMMITTEE MEETING
Wollongong, Australia 26 – 28 June 2006

Final Report

1. OPENING

The meeting was opened at 0900 on 26th June 2006 in the Australian Hydrographic Office, Wollongong. The list of participants is given in Annex A.

Captain Rod Nairn, Royal Australian Navy, the Australian Hydrographer, welcomed the delegates attending the VIIth Meeting of the IHO Tidal Committee. He wished them a successful and productive meeting, and briefly outlined the history of the Australian Hydrographic Service, which is celebrating its 86th anniversary this year.

Captain Robert Ward, Royal Australian Navy, Chairman of the CHRIS Committee outlined the plans he envisaged for the TC to sit under the proposed Hydrographic Services and Standards Committee (HSSC) as tasked by the Strategic Planning Working Group (SPWG). He emphasised the importance of the TC agenda relating to the work of CHRIS, and highlighted the need for close liaison between the two groups over technical formatting issues of common interest.

The Chairman thanked Captain Nairn for kindly hosting the TC Meeting and for the splendid arrangements provided by the Australian Hydrographic Service. He extended special thanks to Mr Jasbir Randhawa for the outstanding administrative and secretarial support provided in advance of the meeting.

The Chairman extended a warm welcome to the delegates from Chile, China, and New Zealand representing their countries for the first time. It was with regret he learned that Mr Wayne Jones was unable to represent Australia due to poor health, but warmly welcomed Ms Zarina Jayaswal in his place.

During the morning of June 26th a Tidal Seminar was held with presentations made by several delegates and observers attending the meeting. A detailed list of the subjects presented is given in Annex B.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 Adoption of the Agenda

The Agenda was presented to the delegates for consideration and accepted without modification. See Annex C.

2.2 Conduct of the sessions, timetables and documentation

The timetable was explained and presented to the delegates. See Annex D.

Apologies for absence were received from Japan, Portugal, South Africa and Spain and from the regular official observer, Mr Bohdan Pillich.

2.3 Report on Intersessional Activities

The Chairman mentioned the work undertaken in connection with the inclusion of Nodal Corrections for the Standard Constituent List, and thanked Mr Bernard Simon (France) for his invaluable support. He referred to the CLs issued by the IHB in respect of the revised TORs and amendments to the TRs, and the contact made with the Chairman of the CSPCWG concerning the amendments to the M-4 Articles. He concluded by mentioning the letter he had written to the chairman of TSMAD concerning the adoption of the Standard Exchange Format for Harmonic Constants.

2.4 Minutes of the VIth IHO TC Meeting

The Minutes of the VIth IHO TC Meeting were accepted without amendment.

2.5 Matters arising from the VIth IHO TC Meeting

There were no matters arising out of the Minutes of the VIth IHO TC Meeting other than the intersessional activities mentioned in 2.3 above. All Action Items from the VIth TC Meeting had been successfully completed and would also be reflected in the agenda items for this meeting.

3. PROGRAMME MATTERS

3.1 Update on Standard Constituent List

The Chairman and Mr Bernard Simon (France) had added the nodal corrections to the Standard Constituent List and included detailed explanation of the construction of compound shallow water constituents to enable the derivation of the nodal corrections to be understood.

The list will be reviewed at each subsequent TC meeting and individual MS will have the opportunity to add new constituents, but full details of XDOs and nodal corrections will be required. The updated list has been posted on the IHO website.

3.2 Format for Exchange of Harmonic Constants

The proposed format for the exchange of harmonic constants is currently being actively worked on by the Chairman of TSMAD Sub Working Group at the UK Hydrographic Office. The final solution in ASCII, and possibly XML as well, will be tabled for endorsement at the next TSMAD Meeting scheduled for September 2006. The Chairman emphasised the need to create a digital format to enable the data to be automatically uploaded into a structured database, thereby avoiding manual inputting with the potential for human error.

3.3 XML Format for Tidal Data

Mr Dan Pillich (Observer) submitted the following report to the Chairman stating that the EU project to develop its prototype is now finished and was completed on schedule early last year.

He provided a CD-ROM with all the public deliverables, papers and presentations, which was made available for each of the delegates.

Tides and currents were only a small part of it, but they were successfully incorporated as well. This was one EU project which achieved something tangible and he enjoyed working with scientists again.

There is a follow-up project aiming to develop MXML further, it is called MOTIIVE. SevenCs was invited to participate in it, however the management declined.

3.4 Digital Tide Tables

Delegates were reminded of the Agenda Item 5.6 from the IInd TC meeting in Valparaiso which encouraged HOs to actively pursue the development of digital tidal products which would have intelligence and functionality built into them.

Delegates were encouraged to embrace the new digital culture positively and actively as mariners are increasingly turning to a digital solution for tidal predictions as opposed to paper tide tables.

Mr Bernard Simon (France) demonstrated the French solution “Worldtide”, but noted that the product is not yet commercially available. Details are contained in Annex E. In the interests of safety of navigation at sea it was considered essential that digital tide tables made use of the latest sets of harmonic constants from which HOs were publishing their national predictions. The TC concluded the most effective solution might be for MS to make available their latest harmonic constants, using the most efficient transfer protocol, to a central body which would then make available the National Standard Port predictions via the internet. The most suitable data

format might well be S100 in place of S57. This concept could call for careful harmonisation, stewardship and governance and will be put to the IHO in the Chairman's forthcoming report later this year.

3.5 Tidal Table Construction

Mr Charles O'Reilly (Canada) raised the question concerning the uniformity of the style and presentation of Secondary Port data in National Tide Tables. Existing TR G3.1 contains no detailed guidance at present, and the Committee felt a Special Publication, along the lines of M-12 for light lists, would need to be created. To this end delegates were encouraged to submit practical recommendations to enable specifications to be drawn up for a standardised presentation of Secondary Port data, which could be promulgated by CL from the IHB to canvass the interest and opinions of MS. The emphasis would need to focus on ECDIS where overlapping interests with other IHO WGs, such as TSMAD, are known to exist.

3.6 Tidal Stream Data in Chart Panels

Mr Juan Fierro (Chile) raised the question of the presentation of tidal stream data on navigational charts when the observations were not necessarily obtained at the optimum spring tidal conditions. Although observations need to be taken at springs and in calm weather the results of the analysis need to be adjusted to represent the mean spring and neap rates. Chart 5011 (INT 1) promulgating the symbols used on navigational charts and Chart Specification B407.3 makes it clear that charted tidal stream data are to be shown for mean spring and neap tidal states.

UK experiences have shown that ADCPs mounted on the seabed have had difficulty providing reliable observations at the 5m depth in strong tidal stream conditions, but Canada has known of good data obtained in narrow channels with ADCPs observing horizontally. It was agreed that tidal stream data should be presented dynamically in an ECDIS.

3.7 Vertical Datum Management/Naming Convention

Chart Datum has to be defined without ambiguity. The Committee decided that using a designated epoch (such as CD2000) would be the preferred methodology to be adopted. The chosen epoch would be at the discretion of each MS based on their perceived national interests. The individual designations then become metadata in essence to be used in S100 and would not need to be quoted necessarily on the paper chart. Chart Datum would continue to be accurately defined in relation to the Land Levelling System with details published in national tide tables and on the largest scale navigational charts.

The Committee concluded that the IHO be asked to consider creating a new TR on this issue, explaining the rationale and offering advice on how to achieve it. The Chairman in conjunction with Lt Cdr Steve Shipman (IHB) undertook to complete the first draft for discussion at the VIIIth TC Meeting in 2007.

3.8 Vertical Reference Framework

The Chairman gave an update on the UKHO "VORF" project which aims to deliver a demonstrator by autumn 2006. It will have accuracies of +/– 0.2m out to 20km from the coast, and +/– 0.3m from 20km offshore to the edge of the UK continental shelf. A production model would be considered depending upon the success of the demonstrator. The vertical data for open sea areas will be taken from satellite altimetry thereby enabling the area coverage to be expanded on a global scale. However, coverage would be restricted in areas where the spheroidal separation is not known to the desired order of accuracy within the coastal zone (i.e. – within 20 km of the coastline). France is known to be conducting a similar project, and Canada is proposing to create a similar project.

Lt Cdr Steve Shipman (IHB) gave an update on similar work being undertaken by FIG and IAG – details are contained in Annex F.

3.9 Update on IOC/GLOSS Program

Mr Juan Fierro (Chile) gave a comprehensive presentation on the latest GLOSS work programme – details are contained in Annex G. Lt Cdr Steve Shipman (IHB) gave a brief outline of the GE9 meeting he attended as the IHOTC representative in Paris in February 2005. The full report is available on the internet at http://unesdoc.unesco.org/images/0014/001400/140083e.pdf. He stated that the IHB, as reported by GLOSS, has continued to seek the supply of additional tidal data from North Africa into the MEDGLOSS network in order to improve tsunami models. He also maintains close contact with Thorkild Aarup in the GOOS Project Office who acts as the secretary of GLOSS.

3.10 Global Sea Level Rise effects

Global sea level rises of 1-2mm per year were still being quoted by Prof. Philip Woodworth (PSMSL). But the Chairman has detected a reduction in tidal ranges over the past 10 years of between 10 and 20cm for Standard Ports around UK which are being routinely analysed each year. Indicators are that with the expansion of the Atlantic Ocean under the influences of global warming it is becoming more sluggish and is responding less vigorously to the tide raising forces.

The Chairman asked delegates if they had detected similar trends in tidal ranges in their national waters. Mr John Broadbent (Observer) reported that similar evidence had occurred in the Gulf of Carpentaria. Mr Bernard Simon (France) presented a series of results at Brest showing that the amplitude of the M2 tide varied cyclically. Similar cyclical variations were reported by Mr Bill Mitchell (Observer) for the Pacific Islands. Mr Noralf Slotsvik (Norway) had not detected any significant changes in tidal range other than in Oslo Fjord where there is considerable land uplift. The Committee concluded that a much longer span than 10 years would be necessary to be certain that the oceanic characteristics alluded to by the Chairman were valid.

3.11 Tidegauge Networks for Tsunami Warnings

This item was covered in considerable detail by the presentations given by Mr Charles O'Reilly (Canada) and Mr Bill Mitchell (Observer). Opinion was canvassed in order to establish whether European countries were considering a cooperative tsunami warning service. The IOC is the primary body concerned and they have initiated such activity for the Mediterranean and set up a WG for the North Atlantic. PSMSL are building up a UK tsunami warning system.

3.12 Update on IHO Strategic Planning Working Group

Lt Cdr Steve Shipman (IHB) gave a comprehensive update on the developments since the VIth TC Meeting in Lisbon – see details contained in Annex H. The organisational structure, subject to approval at the XVIIth IHC in May 2007, should be in place from January 2009. No radical changes are envisaged to the primary working practices undertaken by the present TC.

3.13 IHO 5-Year Work Plan for the TC

The Chairman presented his draft response to the IHB Directing Committee's request to complete the Task Identification Form in order that delegates would have the opportunity to contribute any additional items. After much enlightened discussion the proposed draft was accepted with only one minor amendment. The completed Task Identification Form, which the Chairman is required to submit by 1 August 2006, is contained in Annex I.

3.14 Review of relevant IHO Technical Resolutions

All TRs were reviewed in detail. The only amendment necessary at this time was to A6.2 paragraph 3 – the following sentence being added: "the tidal constituents should also be supplied to the producer nation upon request together with the national tidal predictions" and the preceding words "an explanation of this change be also mentioned" being deleted.

A CL will be issued by the IHB to seek the approval of MS.

3.15 Review of relevant IHO Charting Specifications

All relevant IHO Charting Specifications were reviewed in detail. The following amendments were proposed:

B-302.2 replace first paragraph with:

"**The plane of reference** for all heights, except drying heights, must be a High Water (HW) datum, such as "Mean High Water Springs (MHWS)" or "Mean Higher High Water (MHHW)". Where there is little appreciable tide at the adjacent shoreline then Mean Sea Level may be the reference plane.

B-380.1 replace "mean high water springs" with "Highest Astronomical Tide"

B-406.4 add "in metres and decimetres" at the end of the first sentence.

B-407.3 add "The table should be in the form of the specimen below but national variations are acceptable" as a new paragraph immediately below the first paragraph.

3.16 French Manual of Tides

Volume 1 of the Tidal Manual, "Coastal Tides" written by IHOTC member, Bernard Simon of France, has been commissioned and edited by the Institut Océanographique in Paris and will be printed by SHOM. The IHO has funded the translation of the French text into English. Lt Cdr Steve Shipman (IHB) will act as the technical adviser to the translator and will also oversee the proof reading of the completed text. He will seek the support of IHOTC members in these tasks. Australia, Norway and the UK volunteered their services to proof read an individual chapter. The French text is now ready for printing and the English text should be available by the end of September 2006.

The Institut Océanographique has put a team together to prepare Volume 2, "Ocean Tides", in French and the IHO will fund the translation into English which should be completed by the end of 2007.

The IHB will seek the support of Spanish speaking countries to prepare a Spanish text in due course.

4. Any Other Business

No items were raised.

5. Review of Action Items

Item 3.5 – All delegates to submit specifications for standard presentation of Secondary Port data to the Chairman by 1 June 2007.

Item 3.7 – Chairman to prepare draft TR on Naming Convention for Chart Datum for discussion at the VIIIth TC Meeting.

Item 3.13 – Chairman to submit completed Task Identification Form to the IHB by 1 August 2006.

Item 3.14 – Lt Cdr Steve Shipman (IHB) to arrange for CL to be issued to cover the proposed amendments to TR A6.2.

Item 3.15 – Lt Cdr Steve Shipman (IHB) to contact the Chairman of the CSPCWG to inform him of the proposed amendments to M-4.

6. Venue and date of the VIIIth IHO TC Meeting

The Chairman undertook to contact Canada requesting they host the VIIIth TC Meeting in November 2007. India and Malaysia, in that priority, would be considered as alternative venues.

7. Adoption of Draft Report

The draft report was prepared and discussed on the final morning. The subsequent amendments would be incorporated into the final draft and circulated to the delegates for comment at the earliest opportunity. The Final Report would then be posted on the IHO website.

8. Closing Remarks

The Chairman thanked the Australian Hydrographic Service for the excellent facilities provided for the meeting. He made particular reference to the administrative support provided and the splendid social programme arranged, and the generosity of the hospitality received. Captain Rod Nairn expressed how much Australia appreciated the efforts of the delegates to promote IHO issues. Lt Cdr Steve Shipman (IHB) on behalf of the Directing Committee of the IHB thanked the Australian Hydrographic Service for hosting the VIIth TC Meeting. Finally, Lt Juan Olivares (Chile) expressed the gratitude of the Chilean Navy for the opportunity to be represented at the meeting.

The VIIth TC Meeting was then closed at 1200 on 28th June 2006.

LIST OF PARTICIPANTS

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TIDAL SEMINAR

- **WGS84 Ellipsoid as the Vertical Reference for Seabed Mapping**
  Mr Noralf Slotsvik, Norwegian Hydrographic Service

- **Status of the European Sea Level Service, ESEAS**
  Dr Palle Bo Nielsen, Royal Danish Administration of Navigation and Hydrography

- **Atlantic Tsunami Storm Surge Warning System – East Coast of Canada**
  Mr Charles O'Reilly, Canadian Hydrographic Service

- **Australian Tsunami Network**
  Mr Bill Mitchell, Australian National Tidal Centre

- **Australian National Tidal Centre – Role and Activities**
  Mr Bill Mitchell, Australian National Tidal Centre

- **Tidal Activities in Queensland**
  Mr John Broadbent, Maritime Safety Queensland

Agenda

1. Opening

a. Welcoming address

2. Administrative Arrangements

a. Adoption of the Agenda
b. Conduct of the Sessions
c. Report on Intersessional Activities
d. Minutes of the VIth IHO TC Meeting
e. Matters arising from the VIth IHO TC Meeting

3. Programme Matters

3.1 Update on Standard Constituent List
3.2 Format for Exchange of Harmonic Constants
3.3 XML Format for Tidal Data
3.4 Digital Tide Tables
3.5 Tide Table Construction
3.6 Tidal Stream Data in Chart Panels
3.7 Vertical Datum Management / Naming Convention
3.8 Vertical Reference Framework
3.9 Update on IOC/GLOSS Program
3.10 Global Sea Level Rise effects
3.11 Tidegauge Networks for Tsunami Warnings.
3.12 Update on IHO Strategic Planning Working Group
3.13 IHO 5-Year Work Plan for the Tidal Committee
3.14 Review of relevant IHO Technical Resolutions
3.15 Review of relevant IHO Charting Specifications
3.16 French Manual of Tides

4. Any Other Business

5. Review of Action Items

6. Venue and date of the VIIIth IHO TC Meeting

7. Adoption of Draft Report

8. Closing remarks

VIIth IHO TIDAL COMMITTEE MEETING
WOLLONGONG, AUSTRALIA, 26-28 JUNE 2006

TIMETABLE

	JUNE 26	JUNE 27	JUNE 28
09.00 - 09:30	**1. Opening** Address from Chairman of CHRIS Welcoming address	**Program Matters continued:** 3.7 Vertical Datum Management/Naming Convention 3.8 Vertical Reference Framework 3.9 Update on IOC/GLOSS Program 3.10 Global Sea Level Rise effects	**Program Matters continued:** **5. Review of Action Items** **6. Date and venue of the VIIIth IHO TC Meeting**
09:30 - 11:00	**TIDAL SEMINAR**		
11:00 - 11:20	Tea/coffee break	Tea/coffee break	Tea/coffee break
11:20 - 13.00	**TC Meeting commences** **2. Administrative Arrangements** Adoption of the Agenda / Conduct of the Sessions Report of Intersessional Activities Minutes of VIth IHO TC Meeting Matters arising from VIth IHO TC Meeting **3. Program Matters** 3.1 Update on Standard Constituent List	3.11 Tidegauge Networks for Tsunami Warnings 3.12 Update on IHO Strategic Planning Working Group 3.13 IHO 5-Year Work Plan for the TC	**7. Adoption of Draft Report** **8. Closure**
13:00 - 13:15	Official photograph		
13:00 - 14:00	Lunch break	Lunch break	Lunch break
14:00 – 15:20	**Program Matters continued:** 3.2 Format for Exchange of Harmonic Constants 3.3 XML Format for Tidal Data 3.4 Digital Tide Tables	**Program Matters continued:** 3.14 Review of relevant IHO Technical Resolutions 3.15 Review of relevant IHO Charting Specifications 3.16 French Manual of Tides	Brief tour of the Australian Hydrographic Office (1400 – 1500)
15:20 - 15:40	Tea/coffee break	Tea/coffee break	
15:40 - 17:00	**Program Matters continued:** 3.5 Tide Table Construction 3.6 Tidal Stream Data in Chart Panels	**Program Matters continue:** **4. Any Other Business**	
17:00	End of first day session	End of second day session	
18:00 - 19:00	Reception at Rydges Hotel, hosted by the Australian Hydrographer		
19:00 - 22:00	----------	Official Dinner at Harbourfront Restaurant, hosted by the Australian Hydrographer	

worldtide

A worldwide tide prediction software

functions

Tide predictions

- **Everywhere at a given latitude and longitude at sea**

- **In more than 5000 ports**

Model construction

Computing harmonic constants at each regulary spaced point of a defined mesh grid

Input data

- **Worldwide numerical model**
- **Harmonic constants provided by hydrographic offices**
- **Harmonic constants issued from other organisms**
- **Harmonic constants issued from heights analysis**
- **Harmonic constants issued from IHO data bank**
- **SHOM Coastline**

Treatment guidelines

Seeking the best guess of harmonic constants at the given point by surface interpolation between the surrunding available data.

Taking into account:

- **The coastline**
- **The confidence level of harmonic constants**

Confidence index

Computing weighted average of the different indexes of the surrounding sources:

French tide table main ports: 10

French tide table scondary ports: 8

Foreign Hydrographic offices sources: 7

Other foreign sources: 6

IHO data banck: 5

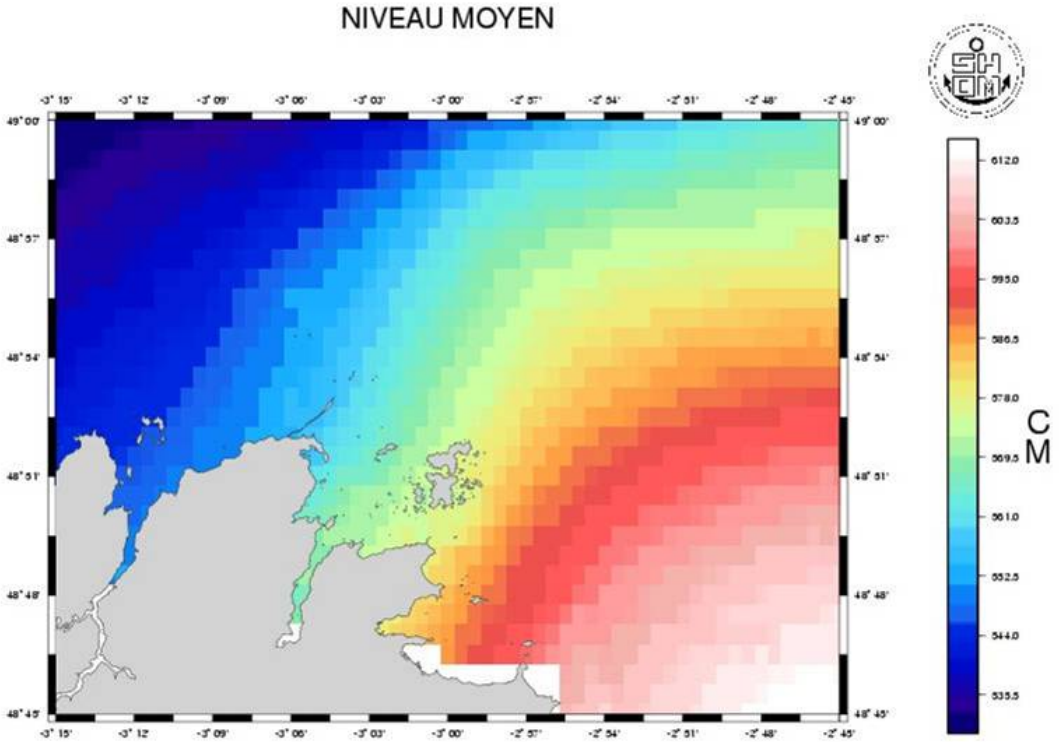
Worldwide numerical model : maximum 4

User manual

Demonstration

- ***Common tidal computation***

- ***Model construction***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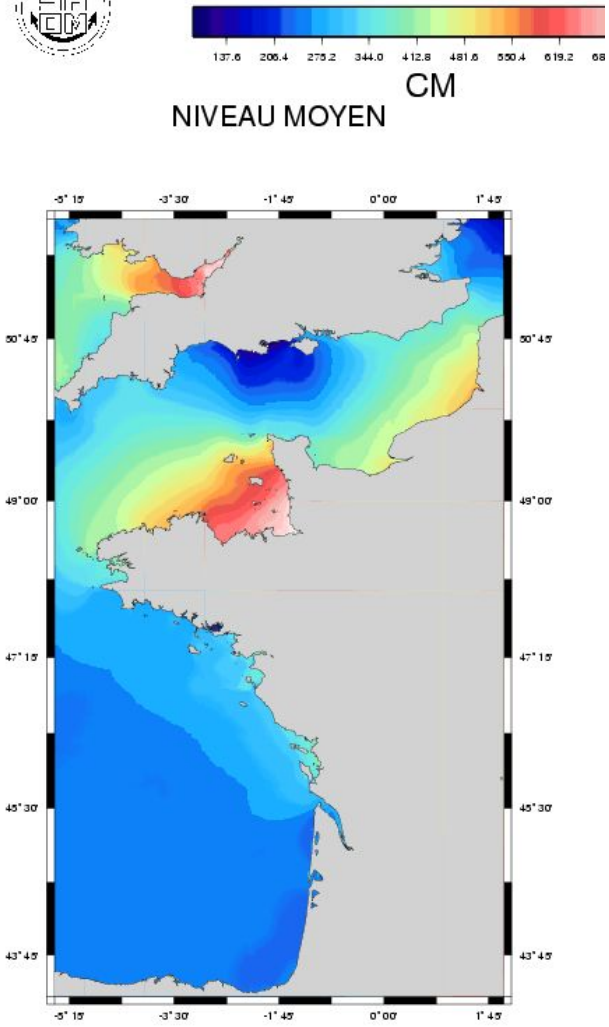
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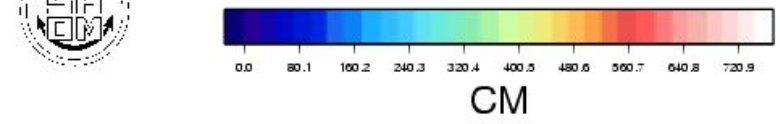

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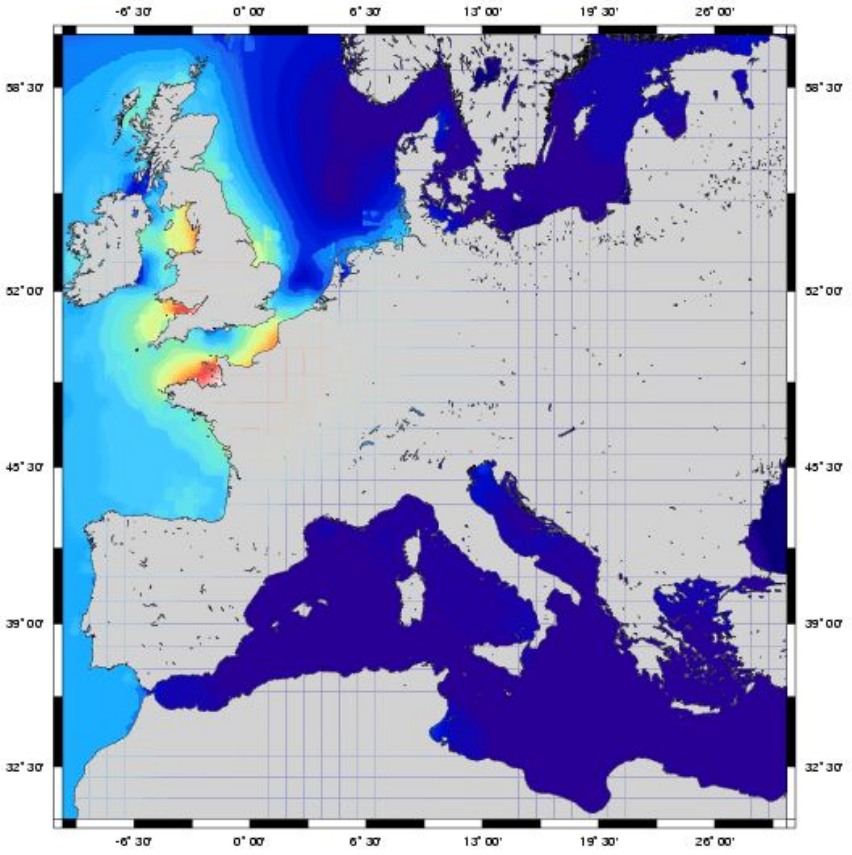


Report by PAH on co-operation with other groups working with tidal data and vertical reference frames.

FIG

Commission 4 (Hydrography) of the International Federation of Surveyors (FIG) at the FIG Congress in 2002 set up WG 4.2 to prepare a "Vertical Reference Handbook". As reported to the last meeting of the IHOTC this WG has continued to meet during each of the annual FIG working weeks and by correspondence between these meetings. The work is being led by Ruth Adams of the UKHO with contributions of FIG and other representatives from IHO MS. The final document is expected to be presented to the next FIG Congress in Munich in October this year. I am currently expecting to attend this meeting.

Adam Greenland, a senior hydrographic surveyor, formerly with the Port of London Authority and now with Land Information New Zealand (LINZ) will stand down as chairman of Commission 4 and it is expected that the current vice chairman, Andrew Leyzack of Canada, will be elected as Chairman. An excellent level of cooperation between the IHO and FIG has been developed through the work of Adam Greenland and IHB Director Hugo Gorziglia and it is hoped that this cooperation will continue.

IAG

As reported to the Lisbon meeting of the IHOTC the International Association of Geodesy (IAG) established an inter-commission (Commission 1 on Reference Frames and Commission 2 on Gravity Field) project ICP1.2 on vertical reference frames to look at the establishment of a unified global reference frame. ICP1.2 is chaired by Johannes Ihde who also chairs the WG on the European Combined Geodetic Network (ECGN) which was seen as a precursor to a global framework. ICP1.2 have held a series of short meetings in the sidelines of other IAG meetings and also held a 2 day workshop in Prague in April this year. Unfortunately I was unable to attend the workshop due to illness but continue to participate in the work of the group.

Global Sea Level Observing System (GLOSS)

Thorkild Aarup (IOC) and Juan Fierro (SHOA)

E-mail: t.aarup@unesco.org
jfierro@shoa.cl

Why Measure Sea Level Changes?

•Coastal management requires understanding of past and future changes in sea level and related ocean conditions

• Practical applications – e.g. to predict flood risks, coastal navigation etc.

Different Time-Scales

- Rapid changes due to tsunamis
- Daily changes due to tides and surges
- Seasonal changes
- Interannual changes e.g. due to ENSO
- Long term changes due to climate change

Causes of Sea Level Change

- Local processes in river/coastal regimes
- Ocean circulation changes
- Regional and global climate changes
- Geological processes

The GLOSS Programme

- Established by IOC in mid-1980s with the aim of improving the quantity and quality of sea level data to PSMSL and other sea level centres.

- Original aim: Development of GLOSS Core Network of 300 sea level stations for range of ocean/climate science and practical applications.

- Global select set of gauges spaced 500-1000 km apart. Geographically balanced. Open ocean locations. Best technology.

THERE ARE 4 GLOSS DATA STREAMS

1. Delayed mode, quality controlled Mean Sea Level (MSL) data to the PSMSL
2. Delayed mode, quality controlled higher-frequency data (e.g. hourly heights) to a GLOSS Data Centre (PSMSL or UHSLC)
3. Fast data to GLOSS Fast Centre at UHSLC & International Tsunami Warning Centers
4. GPS data to TIGA Centre at Potsdam (Germany) initiated by IGS/PSMSL in 2001.

What are the elements of GLOSS ?

Coordination mechanism re. global sea level obs. (GLOSS Group of Experts)

Global data standards & archiving facilities with QC of data

Technical manuals and training material

Technical advice and special workshops on technical issues

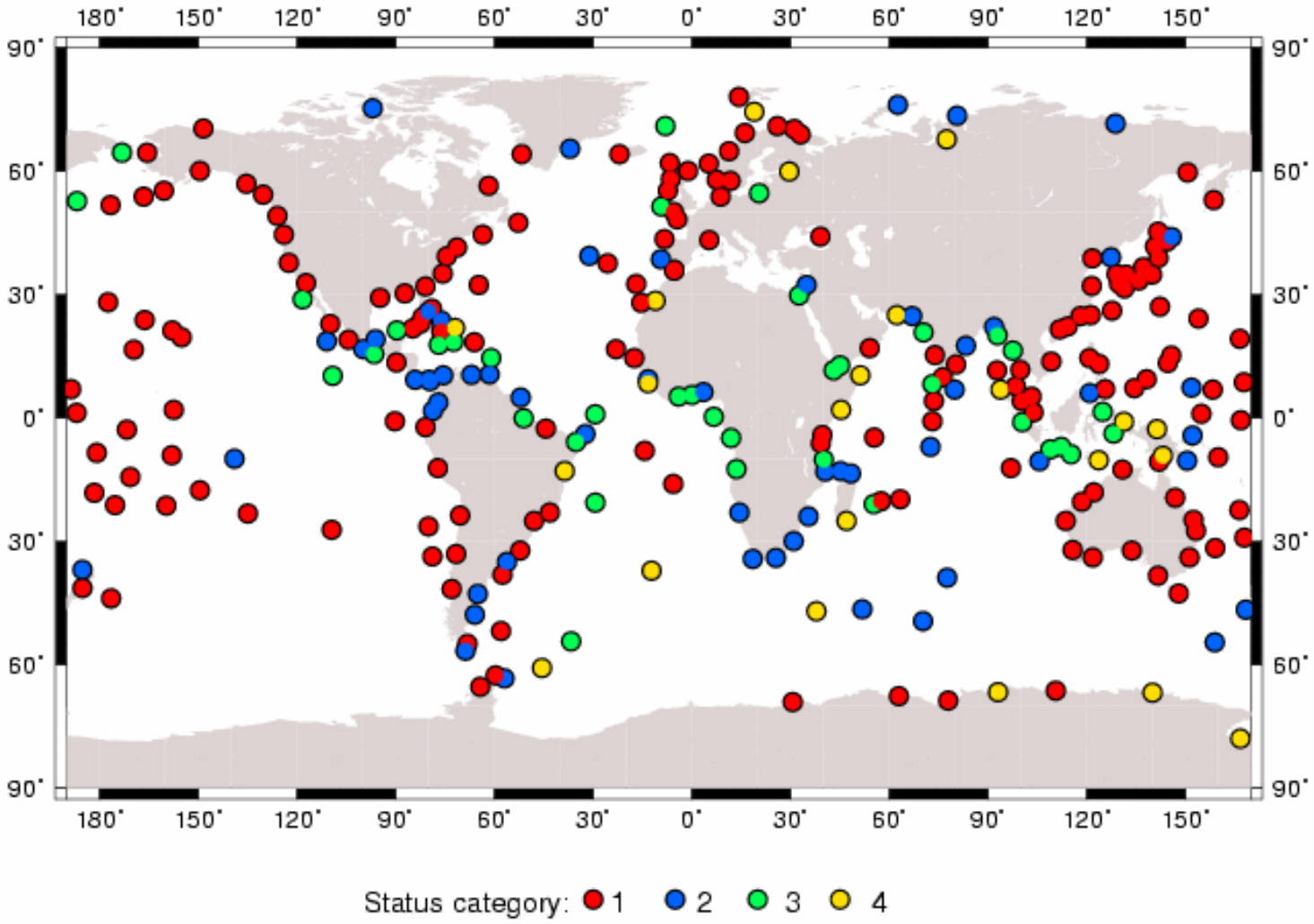
Training courses on analysis & uses of sea level observations

Provision of hardware (gauges, gps, transmitters..)

GLOSS Progress

- Progress with the GLOSS programme was reviewed at the GLOSS GE9 meeting (24-25 February 2005, Paris) Report: http://unesdoc.unesco.org/images/0014/001400/140083e.pdf
- The meeting issued an important Communique concerning GLOSS development and its role in Tsunami Warning Network development. (http://www.pol.ac.uk/psmsl/reports.gloss/ge9/ge9.communique.doc)

GLOSS status within the PSMSL dataset. October 2005



GLOSS Progress – tide gauge installations, training courses,(cont)

GLOSS alone

- 6 real-time station upgrades underway (Mozambique (2); South Africa (3) and Pakistan (1))
- Sea level training course at the Japan Meteorological Agency (Tokyo, 15-26 May 2006).
- Update and publication of IOC Manual on Sea Level Measurement and Interpretation developed by the GLOSS Technical Subcommittee (3rd quarter of 2006).

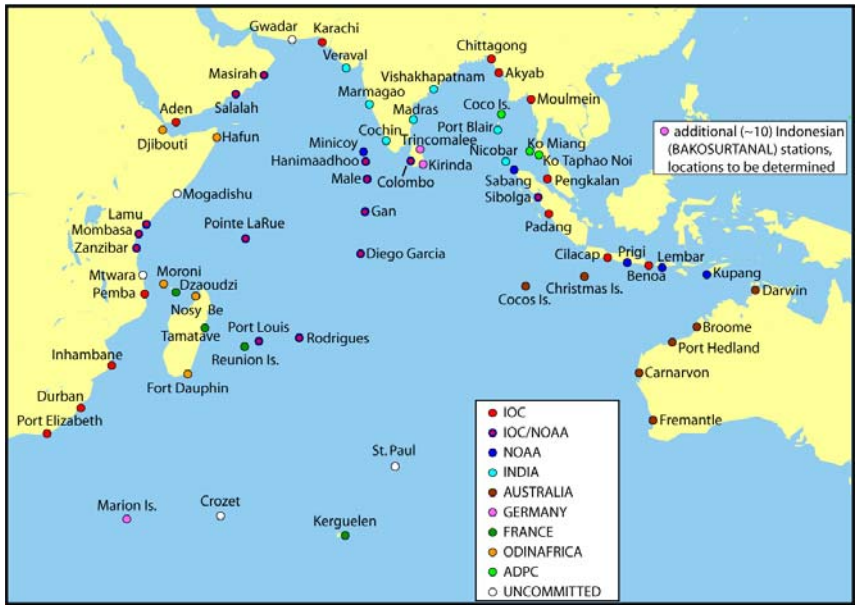
OdinAfrica project in collaboration with GLOSS

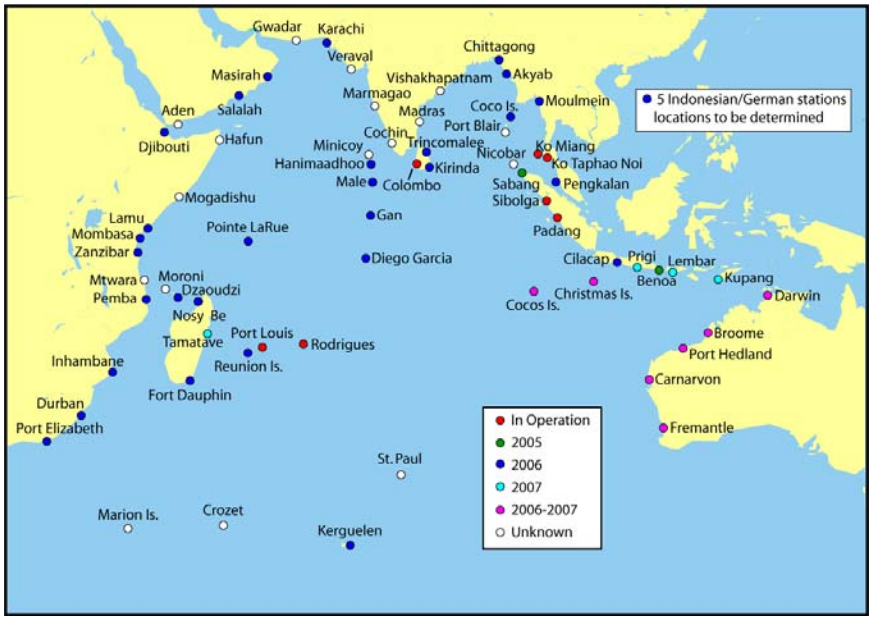
- OdinAfrica III - Some 10 stations are targeted for installations under this project. 5 gauge installations are expected to be done in 2nd half of 2006 (i.e. Nouakchott, Takoradi, Port Sonora (Limbe), Pointe Noire, Djibouti).
- Technical visit to other proposed OdinAfrica station sites under way (i.e East Africa and North Africa).
- Sea level training course in November 2006 in Oostend.

Indian Ocean Tsunami Warning System and GLOSS

- 17 gauges are being upgraded for high frequency data transmission (15 minute transmission frequency) by IOC under a contract with the University of Hawaii Sea Level Center. (See also report from 6th North Indian Ocean Hydrographic Commission (NIOHC) meeting).

Planned Tide Gauge Installations/Upgrades in the Indian Ocean





Issues for the IHO TC

- Take note of (i) the GLOSS GE9 report (http://unesdoc.unesco.org/images/0014/001400/140083e.pdf); (ii) the GLOSS GE9 Communique concerning GLOSS development and its role in Tsunami Warning Network development (see http://www.pol.ac.uk/psmsl/reports.gloss/ge9/ge9.communique.doc)
- Encourage nations to participate in the GLOSS program and submit data to the international GLOSS data centers
- Endorse on-going GLOSS and regional sea level station upgrade initiatives reiterating the multiple use of tide gauge data
- Note results and recommendations from the WCRP workshop: Understanding Sea Level Rise and Variability (Paris, 6-9 June 2006) (See http://copes.ipsl.jussieu.fr/Workshops/SeaLevel/index.html)

STRATEGIC PLANNING WORKING GROUP (SPWG)

The SPWG reported its work to the 3rd EIHC held in Monaco in April 2005. Following discussions during the Conference a set of amendments to the IHO Convention were approved. These amendments have now been passed by the Government of Monaco to IHO Member States (MS) for ratification. The amendments will not come into force until they have been ratified by $^{2}/_{3}$ of the Member States, i.e. 51 MS. As of now 5 MS have ratified the amendments. The process could take some time as in some cases this requires parliamentary action.

In brief these changes provide for the election of a Secretary General and 2 Directors as opposed to the current 3 Directors. The 5-yearly International Hydrographic Conference (IHC) will be replaced by a 3-yearly Assembly and an annual Council. The International Hydrographic Bureau will become the IHO Secretariat.

The 3rd EIHC also revised the TORs of the SPWG to cover the review of the working documents of the IHO and to report to the XVIIth IHC in May 2007. This work has now been finalised and the final report is being prepared. The report will recommend 2 main committees: The Hydrographic Services and Standards Committee (HSSC) and the Inter-regional Co-ordination Committee (IRCC). Under the HSSC there will be 2 Co-ordinating Sub-Committees: Symbology and Data Presentation Standards (SDPS) and Data Acquisition and Transfer Standards (DATS). It is proposed that the Tidal Committee will become the "Tides and Vertical Datums Working Group" under the Co-ordinating Sub-Committee on Data Acquisition and Transfer Standards. These proposals will be debated at the IHC next year and may be adopted as they stand or in an amended form.

This work on the working documents is not dependent on the ratification of the amendments to the Convention and it is expected that the SPWG will seek the adoption of the new structure from January 2009.

TASK IDENTIFICATION FORM

TO REACH IHB 01 AUGUST 2006

From: GROUP: Tidal Committee
To: IHB
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Name of the Task:
Convene meetings at regular intervals and discuss tidal issues to the mutual benefit of all MS.
Report outcome of discussion to Member States.
Maintain Standard List of Harmonic Constituents.
Prepare and review Tidal related Technical Resolutions in IHO Publication M-3.

Short description of the activity:
To resolve tidal issues of common interest and promote a consistent approach to the resolution of tidal and vertical datum differences between MS.

Brief description of the associated deliverables:
Publish in electronic format on the IHO web site, a Standard List of Harmonic Constituents.
Provide expert advice on vertical datums and tidal related issues.
Provide advice to IHB on tidal related Technical Resolutions.

Timing (that is to indicate in which year the activity will take place):
Meetings held at approx 18-month intervals – May 2009; Oct 2010 and May 2012.

Identification of indicators that could be used to assess effectiveness:
Information to be collected from MS via an IHB CL and analysed to assess the increase in:
MS publishing charts to LAT (as required under TR A2.5);
MS publishing tidal and tidal stream data in the recommended format;
MS analysing tidal data to an accepted standard of accuracy;
MS computing tidal predictions to an accepted standard of accuracy and in an agreed standard format.

Estimated resources from regular IHB budget:
T&S costs of PA(H) attending TC Meetings – depends upon the selected venue for the meeting, but an average estimate would be approx £5K per meeting.

Estimated global resources from direct MSs contribution:
T&S costs for each MS representative to attend TC meetings – depends upon the selected venue for the meeting, but an average estimate for the average total number of delegates would be approx £60K per meeting.

Date: 14 July 2006

Name : Cdr John Page, RN

Signature: