Report: NIOHC – Data Management, Database Design and MSDI
Sri Lanka; March 2012

Identification	**Project Number :** 3.5.5/2012
Project Name:	Data Management, Database Design and MSDI
Submitting RHC/Country:	NIOHC
Date:	26th – 30th March 2012
Institution executing the project:	OceanWise Ltd
Name of responsible:	Mr John Pepper
Address:	Varennes, 32 Killams Green, Taunton, Somerset, England TA1 3YQ
Telephone:	00 44 (0) 1823 325045
Fax:	
e-mail:	John.pepper@oceanwise.eu

Financial report				
	Resources			**Comments**
	Requested	**Allocated**	**Spent**	
Contribution by countries involved				
Contribution by other parties				
Contribution expected from CBC Fund	€30,000		€35,748	Since the original bid for funding in Feb 2011 the pound/euro exchange rate has strengthened considerably which explains most of the overspend
Total Cost (Euros)	€30,000		€35,748	
Breakdown of costs				
From CBC Fund (item and amount)				
From other parties (item and amount)				

Results	
	Assessment and Comments
Date of Start	26th March 2012
Date of Finish	30th March 2012
Changes in scope or focus	There were no changes in scope or focus of the training course.
Results achieved (output, product, etc.)	1. Training was delivered in two parts by two commercial organizations with theoretical elements provided by OceanWise and practical elements provided by CARIS:

	• MSDI Practise and principles OceanWise Ltd • Effective Data Management OceanWise Ltd • Standards and Specifications OceanWise Ltd • Cultural and Organisational Change OceanWise Ltd • Technology supporting SDI CARIS • Data Organisation and Design CARIS • Transaction Management CARIS • Interoperability CARIS 2. OceanWise provided student and group classroom instruction, presentations, exercises and group discussion sessions whilst CARIS provided practical classroom sessions in use of technology to model data, configure marine spatial databases, implement and use data and publish and exchange information. 3. The course instructors were: • Mr John Pepper OceanWise • Dr Mike Osborne OceanWise • Mr Julien Barbeau CARIS • Mr Andrew Hoggarth CARIS 4. The course was attended by fourteen students from the NIOHC, and SAIHC regions. Six students from Sri Lanka and one student from each of the following countries: Namibia, South Africa, Comoros, Malawi, Tanzania, Kenya, Oman, Saudi Arabia, and Bangladesh. 4. The course was delivered as a series of modules: • MSDI Practise and principles *(OceanWise) 0.5 day* • Effective Data Management (*OceanWise) 0.5 day* • Standards and Specifications (*OceanWise)1.0 day* • Cultural and Organisational Change *(OceanWise) 0.5 day* • Technology supporting SDI *(CARIS) 0.5 day* • Data Organisation and Design (*CARIS) 1.0 day* • Interoperability (*CARIS) 1.0 day* 5. The training was conducted from Monday to Friday. The training day started at 0830 and completed at 1730 on Monday –Thursday and 1500 on Friday. 6. Each student received the following: • Training Compendium specifically developed for the course (hard and soft copies); • Printed .pdf versions of all notes and presentations; • All PowerPoint presentations delivered • All exercise outcomes by student breakout groups • IHO publications C-17, S-100 in hard and soft format; • MSDI White Paper *(Cooper, Pepper and Osborne - May*

	2010), • Other reference material in soft copy (e.g. SDI, OGC and ISO)
	1. The aim was that students during the course would: • Be introduced to MSDI as the marine component of an SDI • Gain an understanding of the importance and role of data management and databases • Be provided with practical assistance in developing data management skills and best practise • Understand the fundamentals of publishing digital data and e-commerce • Gain an understanding that MSDI encompasses all marine geographic and business information supporting decision making and asset management. • Gain an increased and enhanced understanding of MSDI and its relevance to national, regional, and global development. • Learn how to use tools, solutions and case studies to engage and contribute to future MSDI development. • Gain an understanding of the need for human and organisational change to deliver greater effectiveness and efficiencies. • Develop a new knowledge base within the IHO community which MS's can access and learn from. 2. Evaluation of progress throughout the course, plus a final assessment exercise and completed evaluation forms confirm that the aims were met.
Problems experienced	No significant problems were experienced.
Suggestion for improvement for similar projects	1. Further use of student pre-training competence matrix to ensure level of training is appropriate for individual needs 2. Students should be fluent in the language in which the training is delivered. 3. Amend course documentation to provide a generic course for all RHCs. 4. Translate the course material into French and Spanish for use by other RHC's
Suggestion for follow-up projects	1. Further assistance at national and/or HO level in developing confidence in MSDI planning and implementation 2.Effective data management is an urgent requirement of many MS's 3. Provide an intermediate or advanced level follow-up workshops as required
Information on the long term effect for Hydrography and the	The Hydrographic community does not operate in a vacuum. The information it collects and manages is a vital part of the wider need

sustainable use	of other potential users at the sector, national or regional level. Unlocking the treasure chest of data in a timely, cost effective and efficient manner relies on good "product independent" data management. This and effective data sharing and exchange across multiple players is now a "must do" activity for the IHO community.
Valuation	Results achieved: 4.1
General remarks	This dedicated modular course was the second to be delivered providing HO practitioners (e.g. cartographers, ICT, surveyors, oceanographers and data managers) with the fundamentals of good data management, database design, data publishing and MSDI. It met its aim and with minor work and translation into French and Spanish can be used as generic course for all RHCs.

	Assessment		
	Performance indicator	***Mark***	***Comments***
	Arrangements		
	Organisation of the project	4	Overall marking
	Involvement(contribution) of:		
	National partners	4	In country arrangements were handled by the Sri Lanka National Hydrographic Office; part off the National Aquatic Resources Research and Development Agency (NARA). Despite early challenges and problems associated with a lack of logistical support; all arrangements worked well and the staff of NHO are to be congratulated on the successful administration of the course (which followed back to back with the 12th NIOHC Conference). Students and instructors were accommodated in the Taj Samudra hotel, Galle Face, Colombo which also provided the conference facilities. Accommodation, food and conference facilities were very good. This location should be considered for future courses in Sri Lanka.
	Regional partners	4	UKHO was responsible for most out-of-country administration. This included obtaining the involvement of commercial organizations which added a great deal to the effectiveness and relevance of the training. OceanWise, with Caris was responsible for developing and delivering the course.

	RHC	4	Support and consent for the project and its acceptance by CBSC.
	IHB	-	No direct involvement.
	Commercial	5	The involvement and commitment of the two commercial companies, OceanWise Ltd and Caris were fundamental to the success of the training course.
-	**Efficiency of the project**		
	Goals achieved	4	The students all agreed that the aims of the course had been achieved. The mark has been downgraded to 4 due to the comments relating to the level of understanding of the subject matter by the cohort of students. This can be minimised by undertaking further student knowledge mapping before training begins and for that self assessment to be honest at all times.
	Planned timing	5	Course aims fully achieved in the time allotted.
-	**Future perspectives**		
	Need of similar project (locally, regionally)	5	The nature of this course, to develop an understanding of the need for improved data management and SDI development is a fundamental requirement in almost all RHCs where governments are in general unaware of their responsibilities. It is suggested that this course is thus relevant to most RHCs where that competence does not exist at this time.
	Impact on future development	5	Hopefully a course of this type will serve as a foundation for national and regional capacity building. The course material and instruction, being modular, can be tailored to a particular need. Intermediate and Advanced training will be required as confidence and competence grows across the HO community globally.
-	**Procedure of CBC**		
	Application form		
	Support received		
	Follow up and reporting		

NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION [NIOHC]

Capacity Building Course - Database Design and Management

Taj Samudra Hotel, Colombo, Sri Lanka

Monday 26th – Friday 30th March 2012

Syllabus / Programme v1.0

DAY 1 - Monday 26th March 2012		
Time	**Description**	**Outcome**
0800 - 0830	**Registration at Regency Hall**	Dress code: Suit
0830 - 0900	**Opening Session** • Opening address by Dr Samarasundra, Chairman National Aquatic Resources Research & Development Agency (NARA) • Group photo • Business and social arrangements	
0900 - 0945	**Session1: Introduction - John Pepper (JP)** • Welcome and introductions • Programme • Aims and objectives	*Presentations* and round table speeches by students and lecturers to get to know each other and understand course requirements.
0945 - 1000	**BREAK FOR COFFEE**	
	PART 1: THEORETICAL SESSION FRAMEWORK	
1000 - 1100	**Session 2: Spatial Data Infrastructure - Mike Osborne (MO)** • What it is and what it is not! • Policy and Governance (People) • Technical Standards (Standards) • Information Systems / Services (ICT) • Geographic Content (Data)	*Presentation*s from which students will gain an understanding of spatial data infrastructures (SDI) including the importance and role of data management and databases. *Further learning: To be announced (TBA)*
1100 -1200	**Session 3: Student Perspectives on SDI (MO)** *SDI in countries represented by students* – 5 minute presentations by students to include: • Status of national SDI? • Which organisations are involved? • Role of Hydrographic Office (HO)? • Status of HO to support SDI? • Plans to support SDI development? • Perceived and tangible benefits? • Challenges and obstacles identified?	A student from each country comes to the course prepared to give a 5 minute summary of SDI development in their country. Students will understand how other countries are tackling SDI development and will confirm their understanding of the topic.
1200 -1300	**BREAK FOR LUNCH**	
1300 -1330	**Session 4: Where Are We Now? (JP)** *Lecturer leads group discussions* reviewing the outcomes of Session 3 and introducing students to the conceptual design of SDI, the challenges and obstacles faced to achieve its implementation, and their role and the role of their HO within it.	Students are able to *identify the benefits and opportunities of SDI* and the factors that hinder development, and how these can be overcome by careful design and sympathetic communication with stakeholders. *Further learning: To be announced (TBA)*
1330 -1445	**Session 5: Effective Data Management (MO)** • Data policies and principles • Data management systems • Database design • Conceptual and logical design • Physical implementation	*Presentations* to give a theoretical and practical understanding and appreciation of data management, modelling, database design and implementation. *Further learning: To be announced (TBA)*

1445 -1500	**BREAK FOR TEA**	
1500 -1600	**Session 6: Database Development (MO)** *Lecturer lead group sessions (4-5 students in groups)* to design a simple data management solution including: • Sources of data • Structure and attribution • Relationships between features • Versioning and data outputs	Each group to deliver a *simple design structure* for a database comprising Hydrographic and /or Oceanographic content.
1600-1645	**Session 7: Introduction to Metadata (JP)** • Data audit and inventory • Purpose • Metadata standards • Creation and management • Publication and use in data discovery	*Presentations* on the value and benefit of good metadata. Students understand what metadata is and its importance.
1645 - 1715	**Session 8: Metadata Creation (JP)** *Lecturer lead exercise* to create international standard compliant metadata for a bathymetry dataset. Demonstration of *Mikado* metadata.	Students to complete *simple exercise* to create metadata for bathymetry.
1715 - 1730	**Session 9: Review and Further learning (JP)** Key messages and learning points from day. Explanation of student *group exercise* to investigate the differences between data, information and products	Students understand the main aspects of the day's lessons. *Each group is asked to prepare a 5 minute presentation* on the different types and states of data including their uses, advantages and disadvantages.
DAY 2 - Tuesday 27th March 2012		
Time	**Description**	**Outcome**
0800 - 0830	**Registration at Regency Hall**	Dress code: Casual
0830 - 0900	**Session 1: Presentation of Further learning (JP)** Data types and stages – 5 minute presentations by student groups.	*Presentations* by student groups to all.
0900 -1000	**Session 2: Technical Standards (MO)** • Categories • Description • Importance • Selection	*Presentations* on the importance and role of data standards. Students gain a basic understanding of data standards.
1000 -1015	**BREAK FOR COFFEE**	
1015 -1115	**Session 3: Data Specifications (MO)** • What is a data specification? • The Importance of data specifications • Description of data specifications in MSDI	*Presentations* on the importance and role of data specifications. Students gain a basic understanding of data specifications.
1115 -1215	**Session 4: Data Modelling Exercise (MO)** *Lecturer led exercise* to investigate components of and challenges to effective database design and implementation including the following: • Which data types are scale independent • What data varies with scale? • How do the above factors affect design criteria and use of data?	*Each group to present its findings* to the whole class which should include as a minimum answers to the questions posed.
1215 - 1315	**BREAK FOR LUNCH**	
1315 - 1345	**Session 5: Review of Data Modelling (MO)** *Group presentations and discussion*	Key points and messages identified and understood.

1345 - 1430	**Session 6: Data Publishing [Part 1] (MO)** *Presentations* on product specifications and the work of the Open Geospatial Consortia (OGC)	
1430 - 1445	**BREAK FOR TEA**	
1445 - 1545	**Session 7: Data Publishing [Part 2] (MO)** *Presentation* on Data Exchange and Sharing; Network Services (View and Download) - including experience in Europe	An overview of the effectiveness and efficiencies gained by a joined-up approach through SDI
1545 - 1700	**Session 8: Cultural and Organisational (JP)** *Introductory presentation on "people" issues*	Why are "people" issues so important in the development of MSDI?
1700 - 1715	**Session 9: Review and Further learning (JP)** Key messages and learning points from day. Explanation of *student group exercise*: To identify people and organisational issues affecting their HO and country	Confirm students understand the main aspects of the day's lessons. Student groups to prepare a *5 minute presentation* on organisational issues affecting the implementation of SDI.
DAY 3 - Wednesday 28th March 2012		
Time	**Description**	**Outcome**
0800 - 0830	**Registration at Regency Hall**	Dress code: Casual
0830 - 0915	**Session 1: Presentation of Further learning (JP)** *Breakout Sessions* - Key messages emphasised by groups in *5 minute presentations* as to how they might tackle problems	Ownership in part of people or organisational issues associated with successful data management and SDI
0915 - 1000	**Session 2: Organisational change (JP)** *Presentation* on how to manage the process of change	Ways to engage in the process of Change
1000 - 1045	**Session 3: Ownership of the process (JP)** *Presentation* to reinforce the message and how to take ownership of the process of change	Students have the confidence and knowledge to contribute to the Change process
1045 -1100	**BREAK FOR COFFEE**	
1100 - 1145	**Session 4: Sustainable Change in the Hydrographic Office community (JP)** *Presentation* to identify the key things to ensure change is sustainable	Students appreciate the vale and benefit of change over time
1145-1215	**Session 5: Review (JP & MO)** *Course discussion* on what has been communicated so far, questions and answers	Ensure students have a good level of understanding of the theoretical elements of the course so far
1215 - 1315	**BREAK FOR LUNCH**	
	PART 2: PRACTICAL SESSION FRAMEWORK	
1315 -1415	**Session 6: Technology supporting SDI - Julien Barbeau (JB) & Andy Hoggarth (AH)** *Introduction to CARIS and presentations* on: • Relational Database Management Systems (RDBMS) • Interoperability to form data themes in Marine Spatial Data Infrastructures	Students *gain a basic overview* of CARIS Data Management and Database Design (based on the SHOM model)
1415 - 1545	**Session 7: Data Model (Part 1) (JB/AH)** *Presentation and Practical Exercises* on: • Data Model for elevation data (bathymetry and terrestrial): - Grids and Point Clouds - PostgreSQL and Oracle	Students to *gain a basic understanding* of different data models used for high-resolution data and cartographic vector data through demonstrations and practical exercises

	• Data model for marine cartographic data: - Feature and Spatial Objects - Oracle RDBMS	
1545-1600	**BREAK FOR TEA**	
1600 - 1715	**Session 8: Data Model (Part 2) (JB/AH)**	
1715 -1730	**Session 9: Review of Afternoon Session (JB/AH)**	To ensure a level of understanding of the practical elements discussed
1800 - 2100 Course Meal [to be confirmed]		
DAY 4 – Thursday 29th March 2012		
Time	**Description**	**Outcome**
0830 - 0900	**Registration at Regency Hall**	Dress code: Casual
0900 - 1030	**Session 1: Data Organisation and Design: (JB/AH)** *Presentation and Practical Exercises* on: • Elevation Objects • Usages - Thematic and non-thematic - Scaled and un-scaled • Source and Products - Object catalogues - Mapping between catalogues • Data portrayal • User access control	Students to have concepts of database design (e.g. scale independent data) reinforced through *exercises configuring marine spatial databases*
1030 - 1045	**BREAK FOR COFFEE**	
1045 - 1215	**Session 2: Data Organisation and Design (continued): (JB/AH)**	Students to have concepts of database design (e.g. scale independent data) reinforced through *exercises configuring marine spatial databases*
1215 - 1315	**BREAK FOR LUNCH**	
1300 - 1430	**Session 3: Transaction Management (JB/AH)** *Presentation and Practical Exercises* on: • Multi-user concurrent access • Data Integrity - Feature locking - Isolated projects	Students to *gain practical experience* pertaining to database implementation and use of data.
1430 - 1445	**BREAK FOR TEA**	
1445 - 1615	**Session 4: Metadata (JB/AH)** *Presentation and Practical Exercises on:* • Elevation, source and project information • Data certification / verification • History tracking	Students to *have concepts reinforced* on the importance of metadata (both standards compliant and organisation specific).
1600 - 1715	**Session 5: Interoperability Part 1: (JB/AH)** *Presentation and Practical Exercises* on: • Data and metadata exchange • Application Programming Interfaces (APIs)	Students to *have additional experience* with the use of data standards and practical application of data publishing and information exchange in MSDI
1715-1730	**Session 6: Review of Sessions**	Students Q&A Session
DAY 5 - Friday 30th March 2012		
Time	**Description**	**Outcome**
0830 - 0900	**Registration at Regency Hall**	Dress code: Casual
0900 -1030	**Session 1: Interoperability Part 2: (JB/AH)** *Presentation and Practical Exercises* on: • Open Geospatial Consortium (OGC) Services and Web Mapping	Students to *have additional experience* with the use of data standards and practical application of data publishing and information exchange in MSDI

1030 - 1045	**BREAK FOR COFFEE**	
1045 - 1215	**Session 2: Review of main content of the Training Course (All)** *Written exercise to ascertain level of knowledge and understanding*	Students to individually complete a 1 hour multiple choice questionnaire
1215 - 1315	**LUNCH**	
1315 - 1430	**Session 3: Course Wash-Up (All)** • Review questionnaire results • Review of Aims and Objectives • Review Key Points and Messages • Group Discussion – has the course met your expectations? • Feedback Forms completed by students	Students *to have a basis understanding* and knowledge of the fundamentals of SDI; database design, data management and data publishing
1430 - 1445	**BREAK FOR TEA**	
1445 - 1515	**Closing Session** Dress code: Suit • Certificate giving by Dr Samarasundra, Chairman NARA • Closing address given by Dr Samarasundra, Chairman NARA	
End of the Workshop		

Please note this programme may be subject to change

North Indian Ocean Hydrographic Commission Database Design, Ma
Taj Samudra Hotel, Colombo, Sri Lanka 26 - 30 March 2012

Lecturers: John Pepper and Mike Osborne (OceanWise) and Julien Barbeau (Caris)

Question		a	b	c	d
Name	IHO Member State	The subject matter was generally new to me	The pace of the instruction was appropriate for my needs	The level of instruction was appropriate to me	The time allocated for instruction was adequate
Koswatte	SL	2	4	4	4
Samarakoon	SL	3	2	2	2
Nkinzo	Tanzania	5	5	5	4
Ariyawathra	SL	4	5	5	5
Wijesundara	SL	4	4	4	4
Osborne	RSA	3	5	5	5
Omia	Kenya	2	4	5	2
Maoulida*	Comoros				
Alshamrani	Saudi	3	5	4	4
Eiman	Namibia	5	5	5	5
Al Jabri	Oman	2	4	4	3
Longwe	Malawi	2	2	2	3
Hoque	Bangladesh	2	4	4	3
Perara	SL	3	5	4	4
Weragodadhenna	SL	3	4	5	4
Average		3,1	4,1	4,1	3,7

Key 1 = Strongly Disagree
2 = Disagree
3 = Neither Agree or Disagree
4 = Agree
5 = Strongly Agree

* Absent on last morning due to illness

nagement and MSDI Workshop

e	f	g	h	i	j
The sequence of instruction was logical	The balance between theory and practical was about right	I feel more confident in my understanding of the subjects	Equipment and facilities used were suitable for my needs	The handouts and supporting documents were useful	The quality of the delivery of instruction was good
4	3	4	3	4	4
4	4	3	2	5	4
5	4	5	4	5	5
4	3	5	5	5	5
4	3	4	5	5	4
5	5	5	5	5	5
5	4	4	4	5	5
4	4	4	4	5	4
5	5	5	5	5	5
4	4	5	4	4	4
2	3	3	2	5	4
4	4	4	5	5	4
5	3	4	5	4	5
5	4	5	5	5	5
4,3	3,8	4,3	4,1	4,8	4,5

Capability Matrix for NIOHC Data Management Training

NAME	Koswatte	Samarakoon	Nkinzo	Ariyawathra	Wijesundara
LABEL	Koswatte (SL)	Samarakoon (SL)	Nkinzo (TA)	Ariyawathra (SL)	Wijesundara (SL)
COUNTRY	SL	SL	TA	SL	SL
Competence (JP interpretation)	2	2	2	3	3
Spatial Data Infrastructure	3	2	2	2	2
Data Management	3	2	3	2	2
Database Development	2	2	2	2	2
Metadata	3	2	2	2	2
Data Standards	3	2	2	2	2
Data Modelling	3	1	1	1	1
Data Publishing	2	1	2	1	1
Individual and organisational change	2	1	1	1	1
Average Competency	2,63	1,63	1,88	1,63	1,63
Assessment Scores	15	19	19	14	13

Osborne	**Omia**	**Maoulida**	**Alshamrani**	**Eiman**	**Al Jabri**	**Longwe**
Osborne (ZA)	**Omia (KE)**	**Maoulida (CS)**	**Alshamrani (SA)**	**Eiman (NA)**	**Al Jabri (OM)**	**Longwe (ML)**
ZA	KE	CS	SA	NA	OM	ML
1	2	2	2	1	2	na
1	2	1	1	1	2	na
1	3	1	2	1	3	na
2	2	1	1	1	3	na
2	3	1	1	1	2	na
1	3	1	2	1	2	na
1	3	2	1	1	2	na
1	2	1	1	1	2	na
1	1	1	1	1	2	na
1,25	2,38	1,13	1,25	1,00	2,25	2,00
20	21	na	13	19	16	14

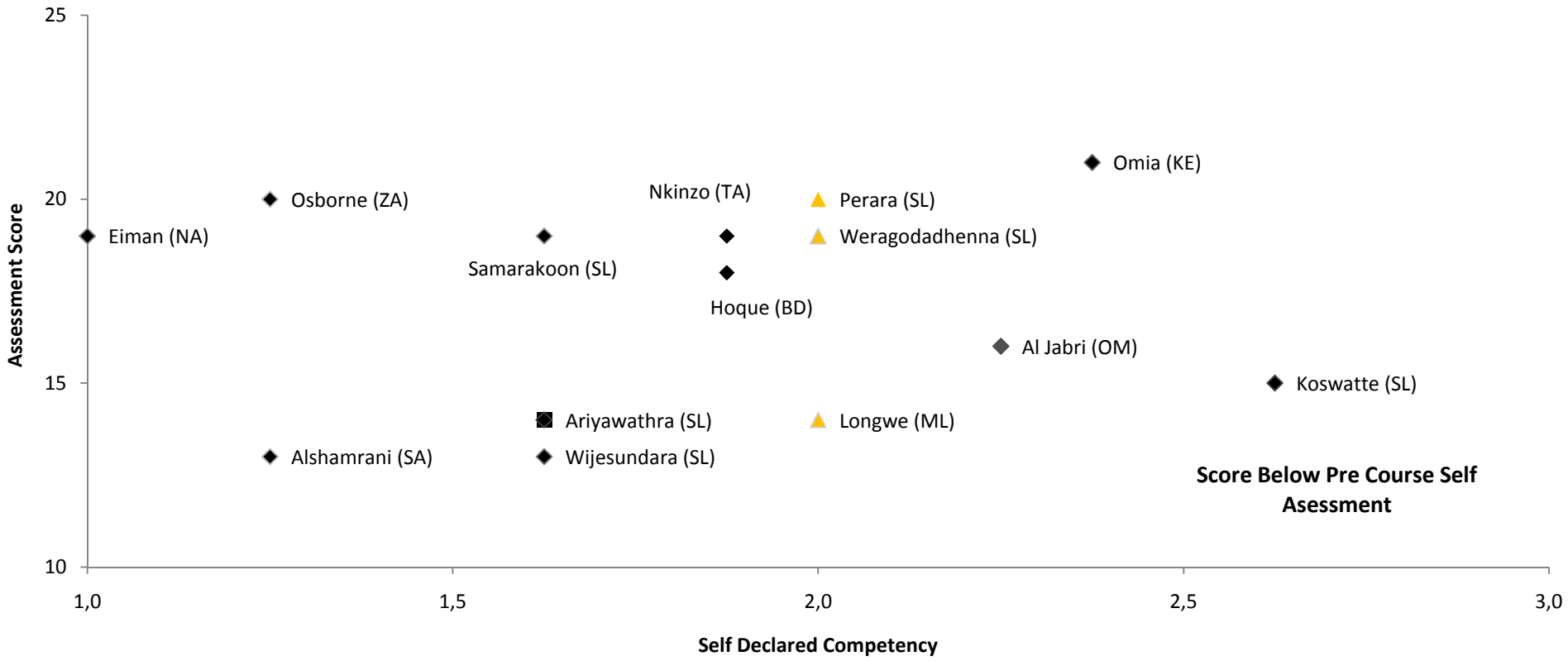
Estimated

Hoque	**Perara**	**Weragodadhenna**
Hoque (BD)	**Perara (SL)**	**Weragodadhenna (SL)**
BD	SL	SL
2	na	na
2	na	na
1	na	na
2	na	na
3	na	na
2	na	na
1	na	na
2	na	na
2	na	na
1,88	2,00	2,00
18	20	19
	Estimated	Estimated

NIOHC MSDI Workshop, Sri Lanka 26 - 30 March 2012

Assessment Score Self Declared Competen c y

Confidential - Internal Use



LIST OF TRAINEES FOR DEVELOPMENT OF A REGIONAL MARINE SPATIAL DATA (MSDI) WORKSHOP
COLOMBO, SRI LANKA – 26 to 30 March 2012

	COUNTRY	NAME	POSITION
1	Bangladesh	CDR Mohammad Minarul Hoque	OIC Bangladesh Navy Hydrographic & Oceanographic Centre
2	Comoros	Said Maoulida	Marine Officer
3	India	CDR Amit Pant	Joint Director of Hydrography (Operations)
4	Kenya	Mrs Grace Oima	Marine Cartographer
5	Malawi	Mr David Longwe	Senior Assistant Cartographer
6	Mozambique	Ms Celia Magaia	Senior Cartographer
7	Myanmar	LTCDR Naing Oo	Head of Geodetic and Hydrographic Division
8	Namibia	Mr Mark Eiman	Hydrographic Surveyor
9	Oman	Khalid Al Jabri	System Administrator, Electronic Charts
10	Republic of South Africa	Mr Sidney Osborne	
11	Saudi Arabia	Saad al Shamrani	Marine Cartographer
12	Saudi Arabia (2)	Engr Bader Mohammed al Sheri	GIC
13	Sri Lanka (1)	Anusha Wijesundara	Hydrographic Surveyor, NHO, NARA
14	Sri Lanka (2)	Saman Koswatte	GIS/RS Lecturer
15	Sri Lanka (3)	Anura Ariyarathna	
16	Sri Lanka (4)	Nilupa Samarakoon	Hydrographic Surveyor, NHO, NARA
17	Tanzania	Mr Edwin Emillian Nkinzo	Surveyor, Ministry of Lands Housing and Human Settlement Development

Note numbers 3 and 6 above were 'no shows'

Email details

Bangladesh	dhydro@bangladeshnavy.org
Comoros (note underscore!)	said_maoulida@yahoo.fr
India	ia-inho-navy@nic.in
Kenya	graceoima@yahoo.com
Malawi	longwedavid@yahoo.com
Mozambique	hchavango@yahoo.com.br
Myanmar	hydro.navy.ygn@mptmail.net.mm
Namibia	mark@namport.com.na
Oman	nhooman@omantel.net.om
Republic of South Africa	hydrosan@iafrica.com
Saudi Arabia	admiralvasan.sa@gmail.com
Sri Lanka (1)	wpanu12@gmail.com
Sri Lanka (2)	koswatte@gmail.com
Sri Lanka (3)	anurarka@gmail.com
Sri Lanka (4)	nilupa.samarakoon@gmail.com
Tanzania	edwinemillian@yahoo.com

LIST OF LECTURERS AT SPATIAL DATA (MSDI) WORKSHOP, COLOMBO, SRI LANKA – 26 to 30 March 2012

	NAME	COMPANY	POSITION	COUNTRY
1	Mr John Pepper	OceanWise Ltd	Consultant/Director	UK
2	Dr Mike Osborne	OceanWise Ltd	Consultant/Director	UK
3	Mr Julien Barbeau	Caris	HPD Products Manager	Canada
4	Mr Andy Hoggarth	Caris	Marketing Manager	Canada

E-mail details

John Pepper john.pepper@oceanwise.eu or info@johnpepperconsultancy.com
Mike Osborne mike.osborne@oceanwise.eu
Julien Barbeau julien.barbeau@caris.com
Andy Hoggarth andrew.hoggarth@caris.com