

**4<sup>th</sup> Meeting of the IHO TIDES, WATER LEVEL AND CURRENTS Working Group (TWCWG4)**  
**And**  
**XVI<sup>th</sup> Meeting of the IOC GLOBAL SEA LEVEL OBSERVING SYSTEM GROUP OF EXPERTS**  
**(GLOSS-GE XVI)**  
**Busan, Korea, 8-13 April 2019**

Monday - 8 April – TWCWG4				
Time	Agenda	Event/Topic	Lead	Remarks
0800		Registration	KHOA	
0900	1 1.1 1.2 1.3	Opening Opening address (Mme Gwenaële Jan) Welcome remarks (Director Huh Yong (KHOA)) IHO comments (Mr David Wyatt)	Chair KHOA IHO	
0930	2 2.1 2.2 2.3 2.4 2.5	Administrative Arrangements Adoption of the Agenda Conduct of Sessions Meeting administration Report of Intersessional Activities Matters arising from TWCW3/Review of Action Items	Chair/Sec Chair/Sec KHOA Chair Sec	
1015		Tea/coffee break		
1045	3 3.1 3.2 3.3 3.4	Product Specification Presentations Progress update brief : S-104 Progress update brief : S-111 S-111 test data Coast Pilot/textual information with the S-111 data	AUS USA/CAN JPN UNH	
1145		Official TWCWG4 photograph	KHOA	
1200		Lunch break		
1330	3 3.1 3.2 3.3 3.4	Product Specification Presentations Progress update brief : S-104 Progress update brief : Recent Progress in the S-111 Product Specification and Data' S-111 test data Coast Pilot/textual information with the S-111 data	AUS USA  JPN UNH	
1415	4 4.1 4.2 4.3 4.4 4.5	Product Specification Work Packages Progress report on current datasets (S-111) Progress report on water level information (S-104) Feedback from first encoding tests (with different data sets) Application of encoding tool(s) to additional datasets Engagement with S-100WG	USA/CAN AUS USA/AUS/DEU/ FRA/JPN/NLD CAN/USA  Chair	Objectives for the meeting Status on S-1XX Progress, problems, open discussion
1500		Tea/coffee break		
1530	4 4.1 4.2 4.3 4.4 4.5	Product Specification Work Packages (cont.) Progress report on current datasets (S-111) Progress report on water level information (S-104) Feedback from first encoding tests (with different data sets) Application of encoding tool(s) to additional datasets Engagement with S-100WG	USA/CAN AUS USA/AUS/DEU/ FRA/JPN/NLD CAN/USA  Chair	Objectives for the meeting Status on S-1XX Progress, problems, open discussion
1700		Close		
1900		Dinner at Shilla Stay	KHOA	
Tuesday - 9 April – TWCWG4				
Time	Agenda	Event/Topic	Lead	Remarks
0900	4 4.1 4.2 4.3	Product Specification Work Packages (cont.) Progress report on current datasets (S-111) Feedback from first encoding tests (with different data sets) Application of encoding tool(s) to additional datasets	USA/CAN USA/AUS/DEU/ FRA/JPN/NLD CAN/USA	Objectives for the meeting Status on S-1XX Progress, problems, open discussion

	4.4	Engagement with S-100WG	Chair	
1030		Tea/coffee break		
1100	5 5.1 5.2 5.3	Programme Matters Standard Constituent List Standard for Digital Tide Tables Compare Tidal Predictions	GBR USA USA	
1200		Lunch		
1330	5 5.1 5.2 5.3	Programme Matters (cont.) Standard Constituent List Standard for Digital Tide Tables Compare Tidal Predictions	GBR USA USA	
1500		Tea/coffee break		
1530	5 5.4 5.5 5.6 5.7	Programme Matters (cont.) Exchange of Harmonic constants/predictions Establishment and Maintenance of VRF Inventory of Tide gauges Actual Tides On-line Links status	GBR/USA GBR/NLD IHO IHO	
1630		Close		
Wednesday - 10 April – TWCWG4				
Time	Agenda	Event/Topic	Lead	Remarks
0900	5 5.4 5.5 5.6 5.7 5.8	Programme Matters (cont.) Exchange of Harmonic constants/predictions Establishment and Maintenance of VRF New organization and status of vertical datum change Inventory of Tide gauges Actual Tides On-line Links status	GBR/USA GBR/NLD FIN IHO IHO	
1030		Tea/coffee break		
	6 6.1 6.2	IHO Resolutions and Charting Specifications Review of relevant IHO Resolutions Review of relevant IHO Charting Specifications	IHO IHO	
1200		Lunch		
1330		Review draft TWCWG Work Plan Review of Action Items from TWCWG3 Venue and dates for 5 <sup>th</sup> TWCWG meeting Closing Remarks	Chair/IHO Chair/IHO Chair/IHO Chair	
1500		Technical visit (KHOA and Busan Tidal Station)	KHOA	
Thursday - 11 April – JOINT SESSION				
Time	Agenda	Event/Topic	Lead	Remarks
0830	1 1.1 1.2	Opening Opening remarks Approval of agenda	Chairs Secretary	
0845	2 2.1 2.2 2.3	Programme Matters Data Exchange Long term data sets for determination of global sea level rise/variation Communicating long term sea level changes	Chairs Jones/Stone/García/ Rickards/Mathews/ Thompson Borck	Stone to lead for TWCWG
1000		Tea/coffee break		
1030	2.5	Determining ellipsoidal height of MSL at the coast	Kuilman	
1100	3 3.1 3.2 3.3 3.4	National Project presentations Ellipsoidal height of chart datum in bench marks Installing GNSS sensors at water level stations and tying ellipsoidal elevations to tidal datums Approach for the Application of S-111 (Surface current prediction) S-104 and tidal observations (topic tbd)	Tsuchiya Stone KHOA KHOA	10 minutes per presentation
1200		Lunch		
1330	3 3.5	National Project presentations	Hammarklint	

	3.6	Baltic Sea Chart Datum 2000 – a common reference level for nautical charts and sea level information in the Baltic Sea	Ravndal	10 minutes per presentation
	3.7	Common reference frame for Norway – ocean topography in a long fjord	Mononen	
	3.8	Shipbourne GNSS – geoid model validation in the Bay of Bothnia		
1415	4	Capacity Building/Development	Farre/Jayaswal	
	4.1	IHO Tides, Water Levels and Currents Workshop training material		
	4.2	Opportunities for coordination and cooperation in delivery	Chairs/All	
1500		Tea/coffee break		
1530	5	Historical data recovery/data archaeology	Chairs/Donato	
1630	6	Consideration for further Joint meetings	Chairs/All	
	7	Review of Actions	Secretary	
	8	Closing remarks	Chairs	
1700		Close		
1900		Dinner at Shilla Stay	KHOA	
Friday - 12 April – GLOSS-GE XVI				
Time	Agenda	Event/Topic	Lead	Remarks
0900	1	Organization of the session	Mitchum/Aarup	
	1.1	Opening of the session: Opening speech - Director Kim June-sik (KHOA) Welcome address - Dr. Youn-Ho Lee (KOC)		
	1.2	Practical arrangements		
	1.3	Adoption of the agenda		
	2	Update of GLOSS implementation plan	Mitchum	
1015		Official GLOSS-GE XVI photograph	KHOA	
1030		Tea/coffee break		
1100	3	Review of progress on actions from GE-XV	Mitchum/Aarup	
	3.1	GLOSS best practices document	Mitchum	
	3.2	Review of GLOSS manuals incl. QA/QC Manual	Rickards/Perez	
1230		Lunch		
1400	3.3	GLOSS data access	Mitchum	
	3.4	GLOSS metadata	Mitchum	
	4	Status of GLOSS networks	Matthews	
1530		Tea/coffee break		
1600	5	GLOSS data access and status reporting	Thompson	
	5.1	Unified access of sea level data	Thompson/Rickards	
	5.2	Station metadata	Mitchum	
	5.3	Sea level station monitoring facility	Hernandez	
1730		Close		
Saturday - 13 April – GLOSS-GE XVI				
Time	Agenda	Event/Topic	Lead	Remarks
0900	6	GNSS @ TGs	Woppelmann	
	6.1	Review of continuous GPS stations	Woppelmann/Schone	
	6.2	TIGA status	Schone	
1030		Tea/coffee break		
1100	7	National and regional sea level activities – presentation of a select set of national/regional reports	All	
	8	Relationship between GLOSS GE and IAPSO CMSLT	Mitchum	
1230		Lunch		
1400	9	Linkages between GLOSS and other programmes and bodies	Mitchum	
	10	Intersessional actions for GLOSS-GE 2019–2021	Mitchum	
1530		Tea/coffee break		

1600	11	JCOMM Reform	Aarup	
	12	UN Decade of Ocean Science for Sustainable Development, 2021-2030	Aarup	
	13	Any other business	Aarup	
	14	Date and place of the next session	Aarup	
	15	Closure	Aarup	
1730		Close		

## Notes:

1. UN identification letter codes used for countries.
2. Pass venues for TWLWG - TWLWG1 – Niterói, Brazil  
TWLWG2 – Stavanger, Norway  
TWLWG3 – Jeju Island, Republic of Korea  
TWLWG4 – Fish Hoek, South Africa  
TWLWG5 – Helsinki, Finland  
TWLWG6 – Wollongong, Australia  
TWLWG7 – Silver Spring, MD, USA  
Pass venues for SCWG - SCWG1 – Silver Spring, MD, USA  
SCWG2 – Québec City, Canada  
SCWG3 – Tokyo, Japan  
Pass venues for TWCWG - TWCWG1 – Niterói, Brazil  
TWCWG2 – Victoria, Canada  
TWCWG3 – Viña del Mar, Chile  
TWCWG4 – Busan, Republic of Korea

Plan to continue to late April/early May timings, subject to external influences, such as need to coordinate with other IHO bodies and host preference.