

IOTWS / WG2 – Message Formats Content

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Below is draft of the suggested message Formats Content for Sea Level. The table is broken up into the attribute, which is the information to be gathered or transmitted, notes that provide some explanation of the attribute then whether this is considered static metadata, dynamic metadata or sea level data.

- Static Metadata is the information that might be best stored in a centralised database. It is not information that changes often that therefore does not need to be sent with every message. There are a couple of exceptions to this definition and they are primarily identifiers of the data that form the links between different data types.
- Dynamic Metadata is information that relates to the core data, but which is not essential to its immediate use. It is also data that will change on a regular basis. This could be transmitted at a different frequency to the core data.
- Core Data is the key identifiers, sea level data and information directly relevant to its interpretation. This would form the basis of the primary Message Format
- The need for a particular attribute in a particular data stream is indicated by Y, N, D or NE. These represent
(Y) Yes it is essential,
(N) No it is not needed or relevant to this data set,
(D) Desirable to be included,
(NE) Not essential which means it is nice to include but not that important if it is not.

The premise behind this model is that the using CREX as the code method all nations can chose what data is transmitted but that it recommended that all data in the Core Data set that is identified with a (Y) should be exchanged by all participants. Some people may desire to transmit more quality flag or diagnostic information and these would be marked by a (D) and those attributes marked by a (N) would be transmitted via a separate lower frequency metadata stream or be stored in a centralised database. Once agreement is reached work will commence of development of the Core Data code.

Recommendation – That the Working Group 2 member nations endorse the data content design so that the process of development of a formal CREX code can be developed. This does not bind nations to use all attributes and new ones can be added if desired but provides a basic framework for the code development and approval through JCOMM and CBS.

	ATTRIBUTE	NOTES	STATIC META DATA	DYNAMIC META DATA	CORE DATA
	STATION INFO				
L1	Network Id.	Network identifier to ensure traceability of Station Identifiers e.g. WMO, GLOSS	Y	D	D
L2	Station, Platform or Sensor Id.	This is the unique identifier either international or within a network. If there is a true unique id there may be no need for the Network Id, or could be the geostationary satellites PID. If this identifier is not internationally unique then a network id will be essential.	Y	Y	Y
L3	Station Name	Desirable to have a plan language id for stations	Y	Y	N
L4	Latitude	High Resolution	Y	Y	D
L5	Longitude	High Resolution	Y	Y	D
L6	GIS Datum	This identifies the reference system the Lat and Long are traceable to	Y	N	N
L7	Hydro-graphic Datum	Sea Level Datum, or chart datum.	Y	N	D
L8	Owner/Agent	The organisation with responsibility for the station, and is the contract for questions and metadata	Y	Y	N
	DATA ACQUISTION SYSTEM	This information may be required for each component of the system, including data acquisition, software and multiple sensors			
A1	Data Acquisition Hardware Manufacturer	Identifier for the acquisition hardware	Y	D	N
A2	Data Acquisition Hardware Model	Identifier for the acquisition hardware	Y	D	N
A3	Data Acquisition Hardware Version	Identifier for the acquisition hardware	Y	D	N

A4	Data Acquisition Hardware Serial #	Identifier for the acquisition hardware	Y	D	N
A5	Software Manufacturer	Identifier for the software Manufacture of acquisition and coding software e.g. could be built into system	Y	D	N
A6	Software Program Name	Identifier for the software program's name of acquisition and coding software e.g. could be built into system	Y	D	N
A7	Software Version	Identifier for the software version of acquisition and coding software e.g. could be built into system	Y	D	N
A8	Software Serial #	Identifier for the software serial number of acquisition and coding software e.g. could be built into system	Y	D	N
A9	Internal Temperature	The temperature of the data acquisition electronics. This can be used for diagnosis of equipment failure or data loss	N	D	D
A10	Battery Voltage	The voltage of the system, be it on mains power, solar or battery	N	N	D
A11	Siting	The broad nature of the siting for determining the usefulness of data in events. For example whether the gauge is in a Harbour, open Ocean, river mouth etc	Y	D	N
Q1	Quality Flag – Operational Status	Rating for the operational status of the data acquisition system (Good, adequate, poor, dead) indicating satisfactory operation based on e.g. battery voltage, internal temp and other engineering information. This could be used as an alternate to the transmission of A9 and A10	N	D	D
Q2	Last maintenance	Date of most recent maintenance	Y	D	N
Q3	Last Calibration	Date of most recent calibration	Y	D	N
	SENSORS	This information may be required for each sensors			
W1	Water Level Sensor Type	The measurement technology. This is useful for a quick assessment of the quality, reliability and appropriate of the observation e.g. Radar, acoustic, bubbler, pressure, stick	Y	D	N
W2	Water Level Sensor Manufacturer	Additional information that would reveal more information regarding the quality, reliability and appropriateness of the observations.	Y	D	N

W3	Water Level Sensor Model	Additional information that would reveal more information regarding the quality, reliability and appropriateness of the observations.	Y	D	N
W4	Water Level Sensor Version	Additional information that would reveal more information regarding the quality, reliability and appropriateness of the observations.	Y	D	N
W5	Water Level Sensor Serial Number	Additional information that would reveal more information regarding the quality, reliability and appropriateness of the observations.	Y	D	N
W6	Water Level Sensor Difference to Chart Datum	Distance between height of sensor and chart datum	Y	N	N
W8	Water Level Filters	The method of averaging, filtering or anti aliasing of sampling e.g. Mechanical damped, analogue or digital filters	Y	Y	N
Q4	Quality Flag - Water Level Measurement	Overall rating for instrument and method, this could be an alternate for W1, W8 and A11	Y	D	N
	MESSAGE INFO				
M1	Message Number	A sequential number to allow rapid identification of missing messages	N	N	D
M2	Message Year Message Month Message Day Message Hour Message Minute	UTC - This is the time the message is sent not the time of the sampling and is important to ensure that communication and/or processing delays do not confuse the timeliness of the data. This may be deleted if a Message Number is used.	N	N	Y
M3	Reporting Rate	This is the time between sent messages not the time between data samples e.g. 5 min	Y	Y	N
M4	Number of Observations in message	Number of actual observations in message, to assist in the determining the value of the data. Alternately blanks could be included for missing samples. e.g. 10 observations, 5 previous minutes of data from previous message	Y	D	D

		and 5 most recent.			
M5	Number of expected Observations	The number of observations that should be sent in the message block this may include historical data. i.e. Number of samples that should be collected.	Y	D	N
M6	Tide*	The predicted tide level at the sea gauge relative hydro datum	Y	D	N
Q5	Quality Flag - Check Sum	Ensure complete and accurate transmission of messages	N	N	Y
	SAMPLING INFO	This information will need to be sent or accessible for each water level instrument.			
S1	Sample Year Sample Month Sample Day Sample Hour Sample Minute Sample Second	UTC – The commencement time for the first sample in the message package. This could be expressed as the differential time to message time M1	N	D	D
S2	Sampling Freq	10Hz, 1Hz, 0.1Hz etc	Y	Y	N
S3	Sample Averaging Period	The sample averaging period this may not be the entire period between observation times. e.g. 1 sec, 10 sec, 1 min average collected every two minutes	Y	Y	N
S4	Sampling Timing	The time stamping of the sample. That is when in sequence the sample is reference, the beginning, middle or end of the sampling period	Y	Y	N
S5	Time between Samples	Time between each averaged samples. e.g. a three minute sample has a time between samples of six minutes	Y	Y	N
S6	Water Level	Sea/Water level from sensor	N	N	Y
S7	Units	The units the water level is reported in	Y	Y	N
S8	Tide Difference	Difference between the Tide and Water Level	N	N	D
S9	Number of Samples collected	For averaged samples the number of samples the number of samples collected during the sampling period	N	Y	D
S10	Number of Samples Used	For averaged samples the number of samples that were used in	N	Y	D

	in calculations	calculating the average and other statistical parameters. This would need to be determined on site.			
S11	Maximum Value in Sample Set	For averaged samples the maximum value within the sample. This would need to be determined on site.	N	D	D
S12	Minimum Value in Sample Set	For averaged samples the minimum value within the sample. This would need to be determined on site.	N	D	D
S13	Standard Deviation of Sample Set	For averaged samples the Standard Deviation within the sample. This would need to be determined on site.	N	D	Y
Q6	Quality Flag – Standard Error	This could be a combined flag based on the variation in the sample and the number of samples collected, if using arithmetic averaging this may be the Standard Error. It would replace S9, S13 and possibly S11 and S12 This would need to be determined on site	N	D	D
Q7	Quality Flag - Range	This could be a combined flag based on the maximum and minimum values for the sample. It would replace S11 and S12 This would need to be determined on site	N	D	D
	OTHER	These parameters should be sampled and reported on the same basis as other data. If not on the same basis then sampling times will need to be included.			
O1	Sea Surface Temp	Useful for Oceanography, there may be more than one of these	N	N	D
O2	Barometer	Required for Tsunami discrimination and ocean meteorology	N	N	D
O3	Air Temp	Metrology and correction of acoustic measurements, there may be more than one of these	N	N	D
O4	Wind Speed	Useful of Tsunami discrimination	N	N	D
O5	Wind Direction	Useful of Tsunami discrimination	N	N	D
O6	Relative Humidity	Useful for Meteorology	N	N	NE
O7	Current	Possibly at several depths, there may be more than one of these.	N	N	NE
O8	Salinity	Useful for Oceanography	N	N	NE
O9	CO2	Useful for Oceanography	N	N	NE

