Attribute Number	Attribute Name	Acronym
2.1	Amount of Pressure Change	AMPRCH
2.2	Atmospheric Pressure Accuracy	ATPACC
2.3	Azimuth Degrees of Sea Surface Current Direction	DEGCUR
2.4	Azimuth Degrees of Significant Swell Direction	DEGSWL
2.5	Azimuth Degrees of Significant Wave Direction	DEGWAV
2.6	Azimuth Degrees of Surface Wind Direction	DEGWND
2.7	Beaufort Force	BEAUFOR
2.8	Category of Convergent Boundaries	CATCON
2.9	Category of Front	CATFRO
2.10	Category of Sea Surface Current Direction	CATCUR
2.11	Category of Significant Swell Wave Height	CATSWH
2.12	Category of Significant Swell Direction	CATSWD
2.13	Category of Significant Wave Height	CATSEH
2.14	Category of Significant Wave Direction	SIWADE
2.15	Category of Significant Weather	CATSWE
2.16	Category of Surface Visibility	CATVIS
2.17	Category of Tropical Cyclone	CATCYC
2.18	Category of Warning	CATWRN
2.19	Change in Significant Swell Height	CHSWHE
2.20	Change in Significant Swell Period	CHSWPE
2.21	Change in Significant Wave Height	CHWAHE
2.22	Change in Significant Wave Period	CHWAPE
2.23	Change in Surface Wind Direction	CHAWDI
2.24	Change in Surface Wind Speed	CHCWDS
2.25	Characteristic of Pressure Change	CHPRCH
2.26	Compass Point of Surface Wind Direction	COMDIR
2.27	Direction of Expected Movement	DREXMO
2.28	Expected Change in Intensity	EXPINT
2.29	Front Level	FROLEV
2.30	Frontal Development	FRODEV
2.31	Height of Cloud Base	HCLOBA
2.32	Height of Storm Surge	HEISUR
2.33	Height Probability	HTPROB
2.34	Ice Concentration	ICECON
2.35	Icing Intensity	ICIINT
2.36	Isallobar Time Interval	ISLOTM
2.37	Issue Time	ISSTIM
2.38	Length Units	LUNITS
2.39	Low Water Level	LOWLVL
2.40	Lower Isobaric Level	LOWLEV
2.41	Metarea Number	METNUM
2.42	Next Update Time	NUPTIM
2.43	Observation Source	OBSRCE
2.44	Observation Source Identification	OBSIDS
2.45	Observation Source Status	OBSTAT

2.46	Relative Maximum Wave Height	RELHGT
2.47	Saffir-Simpson Category	SAFSIM
2.48	Significant Swell Wave Height	SSWHGT
2.49	Significant Swell Wave Period	SWLPRD
2.50	Significant Wave Height	SIWAHE
2.51	Significant Wave Period	SIWAPE
2.52	Speed of Expected Movement	SPEXMO
2.53	Speed of Surface Current	SPSUCU
2.54	Swell Height Change Time Interval	SWHTTI
2.55	Swell Period Change Time Interval	SWPETI
2.56	Temperature Accuracy	TMPACC
2.57	Thickness Height	THKNSS
2.58	Tidal Datum	LEVREF
2.59	Total Cloud Cover	TCLOCO
2.60	Tsunami Wave Arrival Time	ARRTIM
2.61	Tsunami Wave Period	TSUPER
2.62	Upper Isobaric Level	UPRLEV
2.63	Valid Time	VALTIM
2.64	Value of Atmospheric Pressure	VALPSR
2.65	Value of Dew-point Temperature	VALTDT
2.66	Value of Height Contour	VALHGT
2.67	Value of Sea Surface Temperature	VALSST
2.68	Value of Surface Wind Gust	VALGST
2.69	Value of Surface Wind Speed	VAWISP
2.70	Value of Temperature	VALTMP
2.71	Velocity Units	VUNITS
2.72	Visibility Range	VIZRNG
2.73	Warning End Time	WRNEND
2.74	Warning Start Time	WSTART
2.75	Watch/Warning Type	WTCWRN
2.76	Water Height Units	HUNITS
2.77	Wave Height Change Time Interval	WAHETI
2.78	Wave Period Change Time Interval	WASWTI
2.79	Wind Average Period	WNDAVP
2.80	Wind Change Time Interval	WNDTIM

2.1 Amount of Pressure Change (AMPRCH)

Amount of Pressure Change: Definition: The value that the pressure has changed during the three hours preceding the time of observation.

Unit: hectopascal (hPa)

Resolution: 0.1 hPa

Format: sxx.x, s: sign, negative values only

Example: 01.7 for an atmospheric pressure of 1.7 hPa.

References:
WMO-No. 485, Appendix II-4

Remarks: None.

2.2 Atmospheric Pressure Accuracy (ATPACC)

Atmospheric Pressure Accuracy: Definition: Pressure (force per unit area) exerted by the atmosphere on any surface by virtue of its weight; it is equivalent to the weight of a vertical column of air extending above a surface of unit area to the outer limit of the atmosphere. (WMO-No. 182, A2930)

The extent to which the results of the readings of an instrument approach the true value of the calculated or measured quantities, supposing all possible corrections are applied. (WMO-No. 182, A0270)

Minimum value: 0

Unit: hectopascal (hPa)

Resolution: 0.1 hPa

Format: xxxx.x

Example: 0000.2 for an atmospheric pressure tendency of 0.2 hPa

References: WMO-No. 182

Remarks: None.

2.3 Azimuth Degrees of Sea Surface Current Direction (DEGCUR)

Azimuth Degrees of Sea Surface Current Direction: Definition: The observed sea surface current direction in degrees, from 000 to 360.

Unit: degrees

Resolution: 5 degrees

Format: xxx

Example: 000 for North, 090 for East, etc.

References: None.

Remarks: Values must not be less than 000 or more than 360.

2.4 Azimuth Degrees of Significant Swell Direction (DEGSWL)

Azimuth Degrees of Significant Swell Direction: Definition: The observed first swell direction in degrees, from 000 to 360.

Unit: degrees

Resolution: 5 degrees

Format: xxx

Example: 000 for North, 090 for East, etc.

References: None.

Remarks: Values must not be less than 000 or more than 360.

2.5 Azimuth Degrees of Significant Wave Direction (DEGWAV)

Azimuth Degrees of Significant Wave Direction: Definition: The observed significant wave direction in degrees, from 000 to 360.

Unit: degrees

Resolution: 5 degrees

Format: xxx

Example: 000 for North, 090 for East, etc.

References: None.

Remarks: Values must not be less than 000 or more than 360.

2.6 Azimuth Degrees of Surface Wind Direction (DEGWND)

Azimuth Degrees of Surface Wind Direction: Definition: The observed wind direction in degrees, from 000 to 360.

Unit: degrees

Resolution: 5 degrees

Format: xxx

Example: 000 for North, 090 for East, etc.

References: None.

Remarks: Values must not be less than 000 or more than 360.

2.7 Beaufort Force (BEAFOR)

Beaufort Force: Definition: Wind force scale, originally based on the state of the sea, expressed in numbers from 0 to 12. (WMO-No. 182, B0620)

1) **Calm**
   WMO Definition: Absence of air motion or wind with a speed of less than 1 knot (Beaufort scale wind force 0). (WMO-No. 182, C0030)

2) **Light air**
   WMO Definition: Wind with a speed between 1 and 3 knots (Beaufort scale wind force 1). (WMO-No. 182, L0500)

3) **Light breeze**
   WMO Definition: Wind with a speed between 4 and 6 knots (Beaufort scale wind force 2). (WMO-No. 182, L0510)

4) **Gentle breeze**
   WMO Definition: Wind with a speed between 7 and 10 knots (Beaufort scale wind force 3). (WMO-No. 182, G0200)

5) **Moderate breeze**
   WMO Definition: Wind with a speed between 11 and 16 knots (Beaufort scale wind force 4). (WMO-No. 182, M1680)

6) **Fresh breeze**
   WMO Definition: Wind with a speed between 17 and 21 knots (Beaufort scale wind force 5). (WMO-No. 182, F1200)

7) **Strong breeze**
   WMO Definition: Wind with a speed between 22 and 27 knots (Beaufort scale wind force 6). (WMO-No. 182, S3120)

8) **Near gale**
   WMO Definition: Wind with a speed between 28 and 33 knots (Beaufort scale wind force 7). (WMO-No. 182, N0150)

9) **Gale**
   WMO Definition: Wind with a speed between 34 and 40 knots (Beaufort scale wind force 8). (WMO-No. 182, G0010)

10) **Strong gale**
    WMO Definition: Wind with a speed between 41 and 47 knots (Beaufort scale wind force 9). (WMO-No. 182, S3130)

11) **Storm**
    WMO Definition: Wind with a speed between 48 and 55 knots (Beaufort scale wind force 10). (WMO-No. 182, S2950 (2))

12) **Violent storm**
    WMO Definition: Wind with a speed between 56 and 63 knots (Beaufort scale wind

force 11). (WMO-No. 182, V0340)

13) **Hurricane**
WMO Definition: Name given to a warm core tropical cyclone with maximum surface wind of 118 km per hour (64 knots, 74 mph) or greater (hurricane force wind) in the North Atlantic, the Caribbean and the Gulf of Mexico, and in the Eastern North Pacific Ocean. (WMO-No. 182, H0860 (1))

References:
WMO-No.471, Annex 2.B, Multilingual List of Terms used in Weather and Sea Bulletins

WMO-No. 558, Annex I.2, Multilingual List of Terms used in Weather and Sea Bulletins
WMO/TD-No. 850

Remarks: None.

2.8 Category of Convergent Boundaries (CATCON)

Category of Convergent Boundaries: Definition: The particular type of boundary in which air masses have similar densities.

1) **Intertropical convergence zone**
   Definition: Narrow zone where the trade winds of the two hemispheres meet.
   WMO-No. 182, I0800

2) **Squall line**
   Definition: A non-frontal line or narrow band of thunderstorms (with or without squalls).
   WMO-No. 182, S2510

3) **Trough line**
   Definition: A line along which pressures are lower than the surrounding area in the cyclonic curvature of the isobars or contours is a minimum.
   WMO-No. 182, T1670

4) **Trough**
   Definition: Narrow An elongated area of relatively low pressure.
   WMO-No. 182, T1660

5) **Shear line**
   Definition: Line along which there is an abrupt change in the horizontal wind component parallel to this line.
   WMO-No. 182, S0920

1) **Convergence line**
   Definition: Line along which horizontal convergence is a maximum.
   WMO-No. 182, C3060

2) **Monsoon trough**
   Definition: Trough over the Indian subcontinent during the summer monsoon, oriented northwest to southeast about 500km southwest of the Himalayas.
   WMO-No. 182, M1950

   The portion of the intertropical convergence zone which extends into or through a monsoon circulation; this line coincides with the maximum cyclonic curvature vorticity, with southwesterly monsoonal flow prevailing south of the trough axis.
   http://www.nhc.noaa.gov/news/20110519_tafb_unifiedSurfaceAnalysis.pdf

3) **Tropical wave**
   Definition: A trough or cyclonic curvature maximum in the trade wind easterlies. The wave may reach maximum amplitude in the lower middle troposphere or may be the reflection of an upper tropospheric cold low or an equatorward extension of a mid-latitude trough.
   NOAA National Weather Service Instruction 10-604, June 2012, Operations and Services, Tropical Cyclone Weather Services Program, NWSPD 10-6

References: WMO-No. 182

Remarks: None.

2.9 Category of Front (CATFRO)

Category of Front: Definition: The specific type of interface or transition zone between air masses of different densities (WMO-No. 182, F1290(1))

1) **Cold front**
   Definition: Any non-occluded front which moves in such a way that cold air replaces relatively warmer air.
   WMO-No. 182, C2210

2) **Warm front**
   Definition: Any non-occluded front which moves in such a way that warm air replaces cold air.
   WMO-No. 182, W0100

3) **Occluded front**
   Definition: A composite of two fronts, formed as a cold front overtakes a warm front of quasi-stationary front.
   WMO-No. 182, O0070

4) **Quasi-stationary front**
   Definition: A front which is stationary or nearly so (conventionally, moving with a speed less than five knots).
   WMO-No. 182, S2760

5) **Convergence line**
   Definition: Line along with the horizontal convergence is a maximum.
   WMO-No. 182, C3060

6) **Dry line**
   Definition: Narrow zone, other than a warm, cold, or occluded front, across which there is a distinct gradient in the moisture content of the air near the Earth's surface.
   WMO-No. 182, D1330

References:
WMO-No. 558, Appendix I.4

Remarks: None.

2.10 Category of Sea Surface Current Direction (CATCUR)

Category of Sea Surface Current Direction: Definition: A current that does not extend more than a few (2-3 meters) below the surface. Direction toward which the surface current flows.

1) **North**
   Definition: 337-022 degrees (true north)

2) **North-East**
   Definition: 023-067 degrees (true north)

3) **East**
   Definition: 068-112 degrees (true north)

4) **South-East**
   Definition: 113-157 degrees (true north)

5) **South**
   Definition: 158-202 degrees (true north)

6) **South-West**
   Definition: 203-247 degrees (true north)

7) **West**
   Definition: 248-292 degrees (true north)

8) **North-West**
   Definition: 293-336 degrees (true north)

References:
WMO-No. 558, Part I, 3.2.2
WMO-No. 471, 2.3.2
WMO/TD-No. 850, p. 26
IHO Hydrographic Dictionary (web*), HR-1090, surface current

Remarks: None.

2.11 Category of Significant Swell Wave Height (CATSWH)

Category of Significant Swell Wave Height: Definition: The average heights of the 1/3 highest swell waves (WMO-No. 702, p. 9)

1) **Low**
   Definition: 0-2 m

2) **Moderate**
   Definition: 2-4 m

3) **Heavy**
   Definition: over 4 m

References:
WMO-No. 8, Part II, 4.2.12.5

Remarks: This standard terminology is equivalent to the Douglas Sea Scale (UK Met National Meteorological Library and Archive Fact sheet 6, version 01).

The units of this attribute are not defined by the LUNITS attribute.

2.12 Category of Significant Swell Direction (CATSWD)

Category of Significant Swell Direction: Definition: The direction from which first swell waves are originating. (WMO-No. 471, Annex 6.f, 6-22)

1) **North**
   Definition: 338-022 degrees (true north)

2) **North-East**
   Definition: 023-067 degrees (true north)

3) **East**
   Definition: 068-112 degrees (true north)

4) **South-East**
   Definition: 113-157 degrees (true north)

5) **South**
   Definition: 158-202 degrees (true north)

6) **South-West**
   Definition: 203-247 degrees (true north)

7) **West**
   Definition: 248-292 degrees (true north)

8) **North-West**
   Definition: 293-337 degrees (true north)

References:
WMO-No. 471, 1.2.1.1
WMO-No. 558, Appendix I.4
WMO/TD-No. 850

Remarks: None.

2.13 Category of Significant Wave Height (CATSEH)

Category of Significant Wave Height: Definition: The categories of wave weight used for observations (WMO-No. 8, Part II, 4.2.12.5)

1) **Calm (glassy)**
   Definition: 0 m

2) **Calm (rippled)**
   Definition: 0-0.1 m

3) **Smooth (wavelets)**
   Definition: 0.1-0.5 m

4) **Slight**
   Definition: 0.5-1.25 m

5) **Moderate**
   Definition: 1.25-2.5 m

6) **Rough**
   Definition: 2.5-4 m

7) **Very Rough**
   Definition: 4-6 m

8) **High**
   Definition: 6-9 m

9) **Very High**
   Definition: 9-14 m

10) **Phenomenal**
    Definition: over 14 m

References:
WMO-No. 8, Part II, 4.2.12.5

Remarks: This standard terminology is equivalent to the Douglas Sea Scale (UK Met National Meteorological Library and Archive Fact sheet 6, version 01).

The units of this attribute are not defined by the LUNITS attribute.

2.14 Category of Significant Wave Direction (SIWADE)

Category of Significant Wave Direction: Definition: The direction from which the 1/3 highest swell waves are originating. (WMO-No. 471, Annex 6.f, 6-22; WMO-No. 702, p. 9)

1) **North**
   Definition: 337-022 degrees (true north)

2) **North-East**
   Definition: 023-067 degrees (true north)

3) **East**
   Definition: 068-112 degrees (true north)

4) **South-East**
   Definition: 113-157 degrees (true north)

5) **South**
   Definition: 158-202 degrees (true north)

6) **South-West**
   Definition: 203-247 degrees (true north)

7) **West**
   Definition: 248-292 degrees (true north)

8) **North-West**
   Definition: 293-336 degrees (true north)

References:
WMO-No. 471, 1.2.1.1
WMO-No. 558, Appendix I.4
WMO/TD-No. 850
http://w1.weather.gov/glossary/index.php?letter=s

Remarks: None.

2.15 Category of Significant Weather (CATSWE)

Category of Significant Weather: Definition: The type of weather that may affect the safety during the navigation of a ship.

1) **Area of heavy swell**
   Definition: Area where the significant swell wave height is above 4m.

2) **Area of complex sea state**
   Definition: Area where the direction of the significant waves opposes the surface current, causing steep and erratic wave conditions.

3) **Area of strong winds (6 and 7 Beaufort)**
   Definition: Area where winds are 6 and 7 Beaufort force.

4) **Area of reduced visibility**
   Definition: An area where horizontal visibility is degraded to less than 6 nm by fog, smoke, dust, heavy precipitation, or any other phenomena.

5) **Area of poor visibility**
   Definition: Area where the visibility is 2 nautical miles or less. The WMO category 'very poor' visibility is included in this definition.

6) **Area of gales (8 Beaufort or more)**
   Definition: Area where winds are Beaufort 8 or higher.

7) **Area of continuous precipitation**
   Definition: Area where precipitation is steadily falling.

8) **Area of squally weather**
   Definition: Atmospheric phenomenon characterized by an abrupt and large increase of wind speed with the duration of the order of minutes which decreases rather suddenly. It is often accompanied by showers or thunderstorms.

9) **Area of heavy showers**
   Definition: Area of showers with a precipitation rate of 10 mm/h or more
   WMO-No. 8, Part 1, Chapter 14

10) **Area of thunderstorms**
    Definition: Sudden electrical discharges manifested by a blast of light (lightning) and a sharp or rumbling sound (thunder). Thunderstorms are associated with convective clouds (cumulonimbus) and are, more often, accompanied by precipitation in the form of rain showers or hail, or occasionally snow, snow pellets, or ice pellets.
    WMO-No. 182, T0940

11) **Area of fog**
    Definition: An area where horizontal visibility is degraded by the suspension of very small, usually microscopic water droplets in the air.
    WMO-No. 182, S1460

12) **Area of snow**

Definition: An area with precipitation of ice crystals, isolated or agglomerated, falling from a cloud.
WMO-No. 182, S1460

13) **Area of freezing spray**
Definition: An area with where sea spray is transported through the air at temperatures below 0°C.
WMO-No. 182, F1170

14) **Area of freezing precipitation**
Definition: An area where precipitation drops freeze on impact to form a coating of clear ice (glaze) on the ground and on exposed objects.
WMO-No. 182, F1150

15) **Area of water-spouts (tornadic or otherwise)**
Definition: An area where spouts occurring over water are forecast. A spout is a phenomenon consisting of an often violent whirlwind, revealed by the presence of a cloud column or inverted cloud cone (funnel cloud), protruding from the base of a cumulonimbus, and of a 'bush' composed of water droplets raised from the surface of the sea.
WMO-No. 182, W0260
WMO-No. 182, S2460

16) **Area of fog**
Definition: An area where horizontal visibility is degraded by the suspension of very small, usually microscopic water droplets in the air.
WMO-No. 182, S1460

References:
WMO/TD-No. 850
WMO-No. 306, Code Table 4683

Remarks: None.

2.16 Category of Surface Visibility (CATVIS)

Category of Surface Visibility: Definition: The categories of horizontal surface visibility as defined by the WMO.

1) **Very poor**
   Definition: Less than 0.5 nautical miles
   IHO/IMO/WMO S-53, 2009, 8.5.4

2) **Poor**
   Definition: 0.5 to 2 nautical miles
   IHO/IMO/WMO S-53, 2009, 8.5.4

3) **Moderate**
   Definition: 2.1 to 5 nautical miles
   IHO/IMO/WMO S-53, 2009, 8.5.4

4) **Good**
   Definition: Greater than 5 nautical miles
   IHO/IMO/WMO S-53, 2009, 8.5.4

References:
IHO/IMO/WMO S-53, 8.5.4

Remarks: The units of this attribute are not defined by the LUNITS attribute. The WMO definition of 'Moderate' surface visibility was adjusted to remove the ambiguity of 'Moderate' and 'Poor' visibility both possibly equaling 2.0 nautical miles.

2.17 Category of Tropical Cyclone (CATCYC)

Category of Tropical Cyclone: Definition: Specifies the type and intensity of the tropical cyclone.

1) **Tropical disturbance**
   Definition: Light surface winds with indications of cyclonic circulation.
   WMO-No. 182, T1510

2) **Tropical depression**
   Definition: Wind speed up to 33 knots.
   WMO-No. 182, T1510

3) **Tropical storm**
   Definition: Maximum wind speed of 34 to 47 knots.
   WMO-No. 182, T1510

4) **Severe tropical storm**
   Definition: Maximum wind speed of 48 to 63 knots.
   WMO-No. 182, T1510

5) **Tropical cyclone**
   Definition: Maximum wind speed of 64 knots or more.
   WMO-No. 182, T1510

6) **Hurricane**
   Definition: Maximum wind speed of 64 knots or more.
   WMO-No. 182, T1510

7) **Typhoon**
   Definition: Maximum wind speed of 33 knots or more in the Bay of Bengal, Arabian Sea, South-East Indian Ocean, South Pacific; else maximum wind speed of 64 knots or more.
   WMO-No. 182, T1510

8) **Super typhoon**
   Definition: Typhoon having maximum sustained winds of 130 knots (150 mph) or greater.
   NOAA National Weather Service Instruction 10-604, June 8, 2012

9) **Post-tropical cyclone**
   Definition: A cyclone that no longer possesses sufficient tropical characteristics to be considered a tropical cyclone. Post-tropical cyclones can continue carrying heavy rains and high winds.
   NOAA National Weather Service Instruction 10-604, June 8, 2012

10) **Subtropical cyclone**
    Definition: A non-frontal low pressure system that has characteristics of both tropical and extratropical cyclones. Like tropical cyclones, they are non-frontal, synoptic-scale cyclones that originate over tropical or subtropical waters, and have a closed surface wind circulation about a well- defined center. In addition, they have organized

moderate to deep convection, but lack a central dense overcast. Unlike tropical cyclones, subtropical cyclones derive a significant proportion of their energy from baroclinic sources, and are generally cold-core in the upper troposphere, often being associated with an upper-level low or trough. In comparison to tropical cyclones, these systems generally have a radius of maximum winds occurring relatively far from the center (usually greater than 60 n mi), and generally have a less symmetric wind field and distribution of convection.
NOAA National Weather Service Instruction 10-604, June 6, 2013

11) **Remnant low**
Definition: A class of post-tropical cyclone that no longer possesses the convective organization required of a tropical cyclone and has maximum sustained winds of less than 34 kt. The term is most commonly applied to the nearly deep-convection-free swirls of stratocumulus in the eastern North Pacific.
NOAA National Weather Service Instruction 10-604, June 8, 2012

References:
WMO-No. 558, Appendix I.4, Symbols and Depictions Used on Radio-Facsimile Charts for Marine Purposes

Remarks: None.

2.18 Category of Warning (CATWRN)

Category of Warning: Definition: Category of watch, warning, or advisory issued by the local weather authority.

1) **Small Craft**
   Definition: Thresholds governing the issuance of Small Craft Advisories are specific to geographic areas. A Small Craft Advisory may also be issued when sea or lake ice exists that could be hazardous to small boats. There is no precise definition of a small craft. Any vessel that may be adversely affected by Small Craft Advisory criteria should be considered a small craft. Other considerations include the experience of the vessel operator, and the type, overall size, and sea worthiness of the vessel. (w1.weather.gov/glossary/index.php?word=small+craft+advisory)

2) **Strong Wind**
   Definition: Wind speed of 20 to 33 knots inclusive.
   (http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=11&toc=show)

3) **Gale**
   Definition: Wind with a speed between 34 and 47 knots (Beaufort scale wind force 8 and 9)
   (WMO-No. 182, G0010, WMO-No. 182, S3130)

4) **Storm Force Wind**
   Definition: Wind with a speed between 48 and 55 knots (Beaufort scale wind force 10)
   (WMO-No. 182, S2950 (2))

5) **Hurricane Force Wind**
   Definition: An extratropical low or an area of sustained winds (averaged over a ten minute period, momentary gusts may be higher) in excess of 64 knots or higher (74 mph).
   (http://w1.weather.gov/glossary/index.php?letter=h)

6) **Tropical Depression**
   Definition: A non-frontal, synoptic scale cyclone originating over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation; maximum wind speed of 34 to 47 knots.
   (WMO-No. 182, T1510)

7) **Tropical Storm**
   Definition: A non-frontal, synoptic scale cyclone originating over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation; maximum wind speed of 34 to 47 knots.
   (WMO-No. 182, T1510)

8) **Hurricane**
   Definition: A non-frontal, synoptic scale cyclone originating over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation; maximum wind speed of 64 knots or more.

(WMO-No. 182, T1510)

9) **Tropical Cyclone**
Definition: A non-frontal, synoptic scale cyclone originating over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation; a storm maximum wind speed of 64 knots or more in the South-West Indian Ocean, or a storm with maximum wind speed of 34 knots or more in the Bay of Bengal, Arabian Sea, South-East Indian Ocean, or South Pacific.
(WMO-No. 182, T1510)

10) **Typhoon**
Definition: A non-frontal, synoptic scale cyclone originating over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation; maximum wind speed of 64 knots or more.
(WMO-No. 182, T1510)

11) **Volcanic Ash**
Definition: Dust or particles emitted by a volcano during an eruption. They may remain suspended in the atmosphere for long periods and be carried by winds to different regions of the Earth.
(WMO-No. 182, V0480)

12) **Freezing Spray**
Definition: Sea spray transported through the air at temperatures below 0°C.
(WMO-No. 182, F1170)
Ice accretion rate greater than 2.1 cm/3hr.
(http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=11&toc=show)

13) **Heavy Freezing Spray**
Definition: Sea spray transported through the air at temperatures below 0°C.
(WMO-No. 182, F1170)
Ice accretion greater than 12 cm/3hr.
WMO/TD-No. 850, 8.3.12

14) **Squall**
Definition: Forecast or observed wind gusts of 34 knots or greater that are associated with a line, or an organized area, of thunderstorms.
(http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=12&toc=show)

15) **Tornado**
Definition: Tornados are forecast or observed over a localized marine area, or an existing tornado is moving from land to an adjacent marine area.
(http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=12&toc=show)

16) **Waterspout**
Definition: Conditions favorable for the development of waterspouts over a marine

area.
(http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=12&toc=show)
A waterspout is a spout occurring over water; its behavior is characterized by a tendency to dissipate upon reaching shore.
WMO-N. 182, W0260

17) **High Water Level**
Definition: Warns mariners and coastal populations of potential impacts caused by abnormally high water levels or waves along coastal or shoreline areas.
(http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=12&toc=show)

18) **Strong Ice Pressure**
Definition: Conditions where a ship moves through the ice and is not able to navigate; ice ridges may be actively building.
(http://www.ec.gc.ca/glaces-ice/default.asp?lang=En&n=E568E9D7-1)

19) **Rapid Closing of Leads**
Definition: Leads at least 10 nm wide, 25 nm long, and containing no more than three tenths of ice are expected to become blocked by six tenths or more of a grey-white ice or older within a 12 hour period.
(http://www.ec.gc.ca/glaces-ice/default.asp?lang=En&n=E568E9D7-1)

20) **Reduced Visibility**
Definition: An area of poor or very poor visibility (less than 2 nm).
(IHO/IMO/WMO S-53, 2009, 8.5.4)

21) **Special**
Definition: Conditions are favorable for the development of any undefined marine weather-related phenomenon that could pose a hazard to marine navigation or safety.
(http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=12&toc=show)

References:
WMO-No. 182
Ice Bulletins (and Warnings) and Iceberg Bulletins (http://www.ec.gc.ca/glaces-ice/default.asp?lang=En&n=E568E9D7-1)
Guide to Environment Canada Marine Weather Forecasts: Synoptic Warnings (http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=11&toc=show)
Guide to Environment Canada Marine Weather Forecasts: Localized Warnings and Watches (http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2EC4EC51-1&offset=12&toc=show)
WMO- No. 588, 2.2.4.7. 2012 Edition

Remarks: None.

2.19 Change in Significant Swell Height (CHSWHE)

Change in Significant Swell Height: Definition: The trend of the difference between the swell heights before and after a period of time.

1) **Building**
   Definition: Swell height increased over the last time interval

2) **Subsiding**
   Definition: Swell height decreased over the last time interval

References: None.

Remarks: None.

2.20 Change in Significant Swell Period (CHSWPE)

Change in Significant Swell Period: Definition: The trend of the difference between the swell period before and after a period of time.

1) **Increasing**
   Definition: Swell period grew longer over the last time interval

2) **Decreasing**
   Definition: Swell period grew shorter over the last time interval

References: None.

Remarks: None.

2.21 Change in Significant Wave Height (CHWAHE)

Change in Significant Wave Height: Definition: The trend of the difference between wave height before and after a period of time.

1) **Building**
   Definition: Wave heights increased over the last time interval

2) **Subsiding**
   Definition: Wave heights decreased over the last time interval

References: None.

Remarks: Time interval indicated by WAHETI attribute.

2.22 Change in Significant Wave Period (CHWAPE)

Change in Significant Wave Period: Definition: The trend of the difference between wave period before and after a period of time.

1) **Increasing**
   Definition: Wave height grew over the last time interval

2) **Decreasing**
   Definition: Wave heights grew smaller over the last time interval.

References: None.

Remarks: Time interval indicated by WASWTI attribute.

2.23 Change in Surface Wind Direction (CHAWDI)

Change in Surface Wind Direction: Definition: Description of how the wind direction has differed since the last reporting period.

1) **Wind Shift**
   WMO Definition: Sudden change of wind direction. (WMO-No. 182, W1160)

2) **Veering Wind**
   WMO Definition: Clockwise change of wind direction, in either hemisphere. (WMO-No. 182, V0130)

3) **Backing Wind**
   WMO Definition: Counter-clockwise change of wind direction, in either hemisphere. (WMO-No. 182, B0060)

References:
WMO-No. 471, Annex 2.B, Multilingual List of Terms used in Weather and Sea Bulletins
WMO-No. 558, Appendix I.2, Multilingual List of Terms used in Weather and Sea Bulletins
WMO/TD-No. 850

Remarks: Attribute not mandatory if wind is steady.

2.24 Change in Surface Wind Speed (CHCWDS)

Change in Surface Wind Speed: Definition: The magnitude of the difference between surface wind speed before and after a period of time.

1) **Increasing**
   Definition: Surface wind speed grew in value over the last time interval

2) **Decreasing**
   Definition: Surface wind speed is smaller since it was recorded before the last time interval.

References: None.

Remarks: Time interval indicated by WNDTIM attribute.

2.25 Characteristic of Pressure Change (CHPRCH)

Characteristic of Pressure Change: Definition: Characteristic of pressure tendency during the three hours proceeding the time of observation. (WMO)-No. 485, Appendix II-4)

1) Increasing, then decreasing; atmospheric pressure the same as or higher than three hours ago

2) Increasing, then steady; or increasing, then increasing more slowly; atmospheric pressure now higher than three hours ago

3) Increasing (steadily or unsteadily); atmospheric pressure now higher than three hours ago

4) Decreasing or steady, then increasing; or increasing, then increasing more rapidly; atmospheric pressure now higher than three hours ago

5) Steady, atmospheric pressure the same as three hours ago

6) Decreasing, then increasing; atmospheric pressure the same as or lower than three hours ago

7) Decreasing, then steady, or decreasing, then decreasing more slowly, atmospheric pressure now lower than three hours ago

8) Decreasing (steadily or unsteadily); atmospheric pressure now lower than three hours ago

9) Steady or increasing, then decreasing; or decreasing, then decreasing more rapidly; atmospheric pressure now lower than three hours ago

References:
WMO-No. 485, Appendix II-4

Remarks: None.

2.26 Compass Point of Surface Wind Direction (COMWND)

Compass Point of Surface Wind Direction: Definition: The observed wind direction, expressed in quadrants of cardinal direction.

1) **North**
   Definition: 349-011 degrees (true north)

2) **North-North-East**
   Definition: 012-033 degrees (true north)

3) **North-East**
   Definition: 034-056 degrees (true north)

4) **East-North-East**
   Definition: 057-078 degrees (true north)

5) **East**
   Definition: 079-101 degrees (true north)

6) **East-South-East**
   Definition: 102-123 degrees (true north)

7) **South-East**
   Definition: 124-146 degrees (true north)

8) **South-South-East**
   Definition: 147-168 degrees (true north)

9) **South**
   Definition: 169-191 degrees (true north)

10) **South-South-West**
    Definition: 192-213 degrees (true north)

11) **South-West**
    Definition: 214-236 degrees (true north)

12) **West-South-West**
    Definition: 237-258 degrees (true north)

13) **West**
    Definition: 259-281 degrees (true north)

14) **West-North-West**
    Definition: 282-303 degrees (true north)

15) **North-West**
    Definition: 304-326 degrees (true north)

16) **North-North-West**
    Definition: 327-348 degrees (true north)

References:
WMO/TD-No. 577
WMO-No. 471, 2.2.3

Remarks: None.

2.27 Direction of Expected Movement (DREXMO)

Direction of Expected Movement: Definition: Movement or expected movement of a feature with reference to one of the eight points of compass.

1) **North**
   Definition: 337-022 degrees (true north)

2) **North-East**
   Definition: 023-067 degrees (true north)

3) **East**
   Definition: 068-112 degrees (true north)

4) **South-East**
   Definition: 113-157 degrees (true north)

5) **South**
   Definition: 158-202 degrees (true north)

6) **South-West**
   Definition: 203-247 degrees (true north)

7) **West**
   Definition: 248-292 degrees (true north)

8) **North-West**
   Definition: 293-336 degrees (true north)

References:
WMO-No. 558, Appendix I.4

Remarks: None.

2.28 Expected Change in Intensity (EXPINT)

Expected Change in Intensity: Definition: Specifies the expected change in intensity of the feature in the upcoming 24 hours.

1) **Much weakening**
   Definition: The intensity of a feature is forecast to significantly decrease over the forecast period.

2) **Weakening**
   Definition: The intensity of a feature is forecast to decrease over the forecast period.

3) **No change**
   Definition: The intensity of a feature is forecast to remain the same for the forecast period.

4) **Intensification**
   Definition: A feature is forecast to increase its strength of the strength of its associated attributes (i.e.: wind, atmospheric pressure)

5) **Strong intensification**
   Definition: A feature is forecast to significantly increase its strength or the strength of its associated attributes (i.e.: wind, atmospheric pressure)

6) **Not observed previously**
   Definition: The intensity change is unknown because there are no prior observations to reference.

7) **Undetermined**
   Definition: The intensity change is unknown.

References: WMO-No. 306, Code Table 0252

Remarks: Attribute should only be used for tropical storms and centers of depression.

2.29 Front Level (FROLEV)

Front Level: Definition: The level from the surface vertically into the atmosphere at which the front exists.

1) **Surface**
   Definition: The front exists at the Earth's surface.

2) **Above surface**
   Definition: The front exists at some altitude above the Earth's surface.

References: None.

Remarks: Level above surface is defined by issuing agency.

2.30 Frontal Development (FRODEV)

Frontal Development: Definition: The stage of development in which a front exists at a particular time.

1) **Developing**
   Definition: Process of formation or intensification of a front or frontal zone by physical (e.g. radiation) or kinematic (e.g. air motion) influences.
   WMO-No. 182, F1430

2) **Dissipating**
   Definition: Process of dissolution or dissipation of a front or frontal zone by physical (e.g. radiation) or kinematical (e.g. air motion) influences.
   WMO-No. 182, F1440

References: WMO-No. 182

Remarks: None.

2.31 Height of Cloud Base (HCLOBA)

Height of Cloud Base: Definition: Height above the Earth's surface of the base of the lower cloud layer whose amount exceeds a specific value.

1) 0 to 50m
2) 50 to 100m
3) 100 to 200m
4) 200 to 300m
5) 300 to 600m
6) 600 to 1000m
7) 1000 to 1500m
8) 1500 to 2000m
9) 2000 to 2500m
10) 2500m or more, or no clouds
11) Height of base of cloud not known or base of clouds at level lower and tops at a level higher than that of the station

References:
WMO-No. 306, Code table 1600

Remarks: A height exactly equal to one of the values at the ends of the ranges shall be coded in the higher range, e.g. a height of 600 m shall be reported by code figure 6 (600-1000 m).

2.32 Height of Storm Surge (HEISUR)

Height of Storm Surge: Definition: The difference between the actual water level under influence of a meteorological disturbance (storm tide) and the level which would have been attained in the absence of the meteorological disturbance (astronomical tide). (WMO-No. 182, S2960)

Minimum value: 0

Unit: defined in the HUNITS attribute, e.g. meter

Resolution: 0.5 units

Format: xx.x

Example: 01.5 for a storm surge height of 1.25 to 1.74 m.

References:
WMO-No. 471, 2.3.2
WMO-No. 558, Part I, 3.2.2

Remarks: None.

2.33 Height Probability (HTPROB)

Significant Wave Period: Definition: The probability of exceeding the maximum water level forecast during tsunami wave event.

Minimum value: 0

Unit: percent

Resolution: 1 percent

Format: xxx

Example: 025 for a 25 percent probability of exceeding forecast height

References: None.

Remarks: The wave height is specified with RELHGT and HUNITS

2.34 Ice Concentration (ICECON)

Percent of Ice: Definition: The value of ice concentration which defines the ice edge contour.

Minimum value: 0

Unit: Percentage of Ice

Resolution: 1 percent

Format: XX

Example: 15 for 15% ice density

References: WMO-No. 182, I1050

Remarks: None.

2.35 Icing Intensity (ICIINT)

Icing Intensity: Definition: Rate at which ice accretion occurs, expressed in units of depth per unit time (WMO-No. 182, I0220)

1) **Light**
   Definition: 1 cm/3hr

2) **Moderate**
   Definition: 1-5 cm/3hr

3) **Severe**
   Definition: 6-12 cm/3hr

4) **Very severe**
   Definition: > 12 cm/3hr

References:
WMO/TD-No. 850, 8.3.12

Remarks: Several countries have their own scales for ice accretion. This definition only reflects WMO icing level definitions.

2.36 Isallobar Time Interval (ISLOTM)

Isallobar Time Interval: Definition: The specific time interval over which atmospheric pressure has changed

Minimum value: 0

Unit: Hours

Resolution: 1 Hour

Format: XX

Example: 06 for 6 hours

References: WMO-No. 182, I1050

Remarks: None.

2.37 Issue Time (ISSTIM)

Valid Time: Definition: The time, expressed in Universal Time Coordinated (UTC) at which an object and its attributes are issued from the weather forecast office.

Unit: Years, months, days, hours, minutes, seconds

Resolution: 1 second

Format: YYYYMMDDTHHMMSS, where Y is year, M is month, D is day, H is hour, M is minute, and S is second

Example: 19850412T183059 denotes 18 hours, 30 minutes, and 59 seconds on 12 April 1985.

References: None.

Remarks: All times are in UTC (Universal Time Coordinated).

2.38 Length Units (LUNITS)

Length Units: Definition: The units for description of length or height.

1) Meters
2) Kilometers
3) Feet
4) Miles
5) Nautical miles

References: None.

Remarks: Defines the units of length for other attributes for the object to which LUNITS is assigned. A different attribute is used to describe wave height units.

2.39 Low Water Level (LOWLVL)

Thickness Height: Definition: The vertical difference between the tidal datum and the forecast negative low water level.

Unit: Meters

Resolution: 0.1 m

Format: -XX.X

Example: -01.2 for 1.2 m water level below the tidal datum

References: None.

Remarks: All values are negative because the water level is forecast to be less than the accepted tidal datum.

2.40 Lower Isobaric Level (LOWLEV)

Lower Isobaric Level: Definition: The lower isobaric level for which thickness is measured.

1) 1000 mb
2) 925 mb
3) 850 mb
4) 700 mb
5) 500 mb
6) 300 mb
7) 250 mb
8) 200 mb
9) 150 mb
10) 100 mb

References: WMO-No. 183, M0100

Remarks: None.

2.41 Metarea Number (METNUM)

Metarea Number: Definition: The internationally accepted division of the oceans and seas into regions where a designated country is responsible for coordinating and transmitting maritime safety weather information.

1) **I**
   Definition: The North Atlantic Ocean east of 35°W, from 48°27'N to 75°N including the North Sea and Baltic Sea sub-area, excluding the area bounded by 65°N to 5°W.
   Issuing service: United Kingdom

2) **II**
   Definition: Atlantic waters east of 35°W, from 7°N to 48°27'N, and east of 20°W from 7°N to 6°S, including the Straits of Gibraltar.
   Issuing service: France

3) **III**
   Definition: The Mediterranean and Black Seas, east of the Straits of Gibraltar.
   Issuing service: Greece

4) **IV**
   Definition: The western part of the North Atlantic Ocean eastwards of the North American coast to 35W, from 7N to 67N, including the Gulf of Mexico, the Caribbean Sea and the sea area between 7N and the South American coastline eastwards to the French Guyana/Brazil frontier in 4º30N.
   Issuing service: United States of America

5) **V**
   Definition: Atlantic waters west of 20°W from 35°50'S to 7°N, narrowing in the coastal strips at the extremities to the Uruguay/Brazil frontier in 33°45'S and the French Guyana/Brazil frontier in 4°30'N.
   Issuing service: Brazil

6) **VI**
   Definition: The South Atlantic and Southern Oceans south of 35º50S, and from 20W to the longitude of Cape Horn, 67º16W, including the coastal strip to the Uruguay/Brazil frontier in 33º45S.
   Issuing service: Argentina

7) **VII**
   Definition: The South Atlantic and Southern Oceans south of 6°S from 20°W to the coast of Africa, thence south to the Cape of Good Hope; the South Indian and Southern Oceans south of 10°30'S from the Cape to 55°E, thence south of 30°S to 80°E.
   Issuing service: South Africa

8) **VIII (N)**
   Definition: The area of the Indian Ocean enclosed by lines from the Indo-Pakistan frontier in 23°45'N 68°E to 12°N 63°E, thence to Cape Gardafui; the east African coast south to the equator, thence to 95°E, to 6°N, thence NE-wards to the

Myanmar/Thailand frontier in 10N 98°30'E.
Issuing service: India

9) **VIII (S)**
Definition: The east African coast from the equator south to 10°30'S, thence to 55°E, to 30°S, to 95°E, to the equator, to the east African coast.
Issuing service: Mauritius (scheduled forecast), La Reunion (tropical cyclone warnings), Australia (tropical cyclone warnings East of 90E)

10) **IX**
Definition: The Red Sea, Gulf of Aden, Arabian Sea and Persian Gulf, north of Area VIII.
Issuing service: Pakistan

11) **X**
Definition: The South Indian and Southern Oceans east of 80°E and south of 30°S to 95°E, to 12°S, to 127°E; thence the Timor Sea, South Pacific and Southern Oceans south of 10°S to 141°E to the equator, to 170°E, to 29°S, thence SW-wards to 45°S in 160°E, then the 160°E meridian.
Issuing service: Australia

12) **XI**
Definition: The Indian Ocean, China Sea and North Pacific Ocean northward of Area X and on the equator to longitude 180°, eastward of Area VIII and the Asian continent to the North Korea/Russian Federation frontier in 42°30'N 130°E, thence to 135°E, NE-wards to 45°N 138°E, to 45°N 180°.
Issuing service: China, Japan

13) **XII**
Definition: The eastern part of the Pacific Ocean, west of the North and South American coast and east of 120°W, from 3°24'S to the equator, thence to 180°, to 50°N thence NW-wards to 53°N 172°E, NE-wards following the marine frontier between United States and Russian Federation waters to 67°N.
Issuing service: Greece

14) **XIII**
Definition: Sea areas enclosed north of Area XI and west of Area XII; also all Arctic waters from 170W westwards to 20°E.
Issuing service: Russian Federation

15) **XIV**
Definition: The South Pacific and Southern Oceans south of the equator, bounded by Area X to the west, Area XII to the north and Area XV to the east.
Issuing service: New Zealand

16) **XV**
Definition: The South Pacific and Southern Oceans south of 18°21'S following the coast of Chile to the longitude of Cape Horn in 67°16'W, and 120°W.
Issuing service: Chile

17) **XVI**
Definition: The South Pacific Ocean between 18°21'S and 3°24'S bounded by the coast of Peru and 120°W.
Issuing service: United States of America

18) **XVII**
Definition: 67°N and 168°58'W to 90°N and 168°58'W, 90°N and 120°W to south to the Canadian Coastline along the 120°W meridian. The Arctic Ocean from south-west corner 67°N, 44°E to north-east corner 80°N, 165°W.
Issuing service: Canada

19) **XVIII**
Definition: A position on the Canadian Coastline at the 120°W meridian to 90°N and 120°W, 90°N and 35°W to 67°N and 35°W.
Issuing service: Canada

20) **XIX**
Definition: From a position on the Norwegian Coastline at 65°N to: 65°N and 5°W, 75°N and 5°W, west to a position on the Greenland Coastline. From the border between Norway and Russia (Inland) to: 69°47.68'N and 30°49.16'E, 69°58.48'N and 31°06.24'E, 70°22'N and 31°43'E, 71°N and 30°E. From this co-ordinate (71°N - 30°E) further north along the 30°E Meridian to: 90°N and 30°E, 90°N and 35°W, south to the Greenland coastline along the 35°W meridian.
Issuing service: Norway

21) **XX**
Definition: From the border between Norway and Russia (Inland) to: 69°47.68'N and 30°49'16''E, 69°58.48'N and 31°06'24''E, 70°22'N and 31°43'E, 71°N and 30°E. From this co-ordinate (71°N - 30E) further north along the 30°E Meridian to: 90°N and 30°E, 90°N and 125°E, then south to the Russian Federation Coastline along the 125°E meridian.
Issuing service: Russian Federation

22) **XXI**
Definition: From a position on the Russian Federation Coastline at the 125°E meridian to: 90°N and 125°E, 90°N and 168°58'W, 67°N and 168°58'W, west to a position on the Russian Federation Coastline along the 67°N.
Issuing service: Russian Federation

References:
JCOMM Home Page
http://weather.gmdss.org/index.htm, Accessed April 2014.

Remarks: None.

2.42 Next Update Time (NUPTIM)

Valid Time: Definition: The time, expressed in Universal Time Coordinated (UTC) an object and its attributes are scheduled to be updated.

Unit: Years, months, days, hours, minutes, seconds

Resolution: 1 second

Format: YYYYMMDDTHHMMSS, where Y is year, M is month, D is day, H is hour, M is minute, and S is second

Example: 19850412T183059 denotes 18 hours, 30 minutes, and 59 seconds on 12 April 1985.

References: None.

Remarks: All times are in UTC (Universal Time Coordinated).

2.43 Observation Source (OBSRCE)

Observation Source: Definition: The type of platform reporting an observation.

1) Buoy
2) Ship
3) Satellite
4) Upper air
5) Land-based station
6) Tide gauge
7) Other

References: None.

Remarks: None.

2.44 Observation Source Identification (OBSIDS)

Observation Source Identification: Definition: The unique identifier given to a particular observation source to distinguish it from other observation sources or stations.

Format: text, limited to letters (capital and lower case), numbers, spaces, and hyphens; text length is limited to 20 characters

Example: ACYN – 8534720

References: None.

Remarks: Text length is limited to 20 characters.

2.45 Observation Source Status (OBSTAT)

Observation Source Status: Definition: The operational status of the observation platform.

1) Fully operational
2) Partially operational
3) Drifting
4) Broken
5) Offline
6) Discontinued
7) Manual observations
8) Unknown

References: None.

Remarks: “Manual observations” status refers to observations made by a human observer; normally a ship or land-based report.

2.46 Relative Maximum Wave Height (RELHGT)

Relative Wave Height: Definition: The predicted vertical difference between the tidal datum, usually Highest Astronomical Tide (HAT) or Lowest Astronomical Tide (LAT), and the maximum water level reached during tsunami wave event.

Minimum value: 0

Unit: Defined by HUNITS

Resolution: 0.1 units

Format: XX.X

Example: 03.4 for 3.4 meters

References: None.

Remarks: None.

2.47 Saffir-Simpson Category (SAFSIM)

Saffir-Simpson Category: Definition: The internationally accepted classification for tropical storm intensity based on maximum sustained wind speed. (WMO Tropical Cyclone Fact Sheet http://www.wmo.int/pages/mediacentre/factsheet/tropicalcyclones.html, Accessed 4.2014)

1) **Category 1**
   Definition: 64-82 kt

2) **Category 2**
   Definition: 83-95 kt

3) **Category 3**
   Definition: 96-112 kt

4) **Category 4**
   Definition: 113-136 kt

5) **Category 5**
   Definition: > 137 kt

References:
WMO Tropical Cyclone Fact Sheet
http://www.wmo.int/pages/mediacentre/factsheet/tropicalcyclones.html, Accessed 4.2014
Remarks: None.

2.48 Significant Swell Wave Height (SSWHGT)

Significant Swell Wave Height: Definition: The average height of the 1/3 highest waves. (WMO-No. 702, p. 9)

Minimum value: 0

Unit: defined in the LUNITS attribute, e.g. meter

Resolution: 1 unit

Format: xx

Example: 3 for a significant swell wave height of 2.5 m to 3.4 m

References:
WMO-No. 471, 1.2.1.1
WMO-No. 558, Appendix I.4

Remarks: None.

2.49 Significant Swell Wave Period (SWLPRD)

Significant Swell Wave Period: Definition: The average period of the 1/3 highest waves (WMO-No. 702, p. 9)

Minimum value: 0

Unit: second (s)

Resolution: 1 s

Format: xx

Example: 03 for a significant wave period of 2.5 s to 3.4 s

References: WMO-No. 471, 1.2.1.1

Remarks: Wind values are rounded to the nearest whole unit.

2.50 Significant Wave Height (SIWAHE)

Significant Wave Height: Definition: The average height of the 1/3 highest waves. (WMO-No. 702, p. 9)

Minimum value: 0

Unit: defined in the LUNITS attribute, e.g. meter

Resolution: 1 unit

Format: xx

Example: 03 for a significant wave height of 2.5 m to 3.4 m

References:
WMO-No. 471, 1.2.1.1
WMO-No. 558, Appendix I.4

Remarks: Wave height values are rounded to the nearest whole unit.

2.51 Significant Wave Period (SIWAPE)

Significant Wave Period: Definition: The average period of the 1/3 highest waves (WMO-No. 702, p. 9)

Minimum value: 0

Unit: second (s)

Resolution: 1 s

Format: xx

Example: 03 for a significant wave period of 2.5 s to 3.4 s

References: WMO-No. 471, 1.2.1.1

Remarks: Period values are rounded to the nearest whole unit.

2.52 Speed of Expected Movement (SPEXMO)

Speed of Expected Movement: Definition: The expected speed of the movement of a meteorological feature.

Minimum value: 0

Unit: Defined in the VUNITS attribute, e.g. meters per second (m/s)

Resolution: 1 unit of speed, as defined by VUNITS attribute

Format: xx

Example: 03 for a speed of 2.5 to 3.4 m/s.

Remarks: None.

2.53 Speed of Surface Current (SPSUCU)

Speed of Surface Current: Definition: The speed of a current that does not extend more than a few (2-3 meters) below the surface. (IHO Hydrographic Dictionary (web*), HR-1090, surface current)

Minimum value: 0

Unit: Defined in the VUNITS attribute, e.g. meter per second (m/s)

Resolution: 1 m/s or 1 knot

Format: xx

Example: 03 for a speed of 2.5 to 3.4 m/s.

References:
WMO-No. 471, 2.3.2
WMO-No. 558, Part I, 3.2.2

Remarks: None.

2.54 Swell Height Change Time Interval (SWHTTI)

Swell Height Change Time Period: Definition: The time over which swell heights are compared to determine changes in their values.

Minimum value: 0

Unit: Hours

Resolution: 1 hour

Format: XX

Example: 12 for 12 hours, 03 for 3 hours

References: None.

Remarks: None.

2.55 Swell Period Change Time Interval (SWPETI)

Swell Period Change Time Period: Definition: The time over which wave periods are compared to determine changes in their values.

Minimum value: 0

Unit: Hours

Resolution: 1 hour

Format: XX

Example: 12 for 12 hours, 03 for 3 hours

References: None.

Remarks: None.

2.56 Temperature Accuracy (TMPACC)

Temperature Accuracy: Definition: A physical quantity characterizing the mean random motion of molecules in a physical body. (WMO- No. 182, T0150)

The extent to which the results of the readings of an instrument approach the true value of the calculated or measured quantities, supposing all possible corrections are applied. (WMO-No. 182, A0270)

Minimum value: 0

Unit: degrees Celsius (C)

Resolution: 0.1 C

Format: x.x

Example: 0.2 for a temperature accuracy of 0.2 C

References:
WMO- No. 182, T0150
WMO-No. 182, A0270

Remarks: None.

2.57 Thickness Height (THKNSS)

Thickness Height: Definition: Vertical distance measured between two isobaric surfaces (WMO-No. 182, T0820

Unit: Meters

Resolution: 10 m

Format: XXXX

Example: 0500 for 500 m or 1540 for 1540 m

References: WMO-No. 182, M0100
WMO-No. 182, T0820

Remarks: None.

2.57 Tidal Datum (LEVREF)

Tidal Datum: Definition: The level from which the heights of tide are referenced. (IHO Special Publication No. 13, Fifth Edition, Hydrographic Dictionary,1233)

1) **Mean low water springs (MLWS)**
   Definition: The average height of the low waters of spring tides. Also called spring low water. (IHO Dictionary, S-32, 5th Edition, 3150)

2) **Mean lower low water springs (MLLWS)**
   Definition: The average height of the lower low water springs at a place. (IHO Dictionary, S-32, 5th Edition, 3146)

3) **Mean sea level (MSL)**
   Definition: The average height of the surface of the sea at a tide station for all stages of the tide of a 10-year period, usually determined from hourly height readings measured from a fixed predetermined reference level. (IHO Dictionary, S-32, 5th Edition, 3156)

4) **Lowest low water**
   Definition: An arbitrary level conforming to the lowest tide observed at a place, or somewhat lower.

5) **Mean low water (MLW)**
   Definition: The average height of all low waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3147)

6) **Lowest low water springs**
   Definition: An arbitrary level conforming to the lowest water level observed at a place at spring tides during a period of time shorter than 19 years (Hydrographic Service, Royal Australian Navy)

7) **Approximate mean low water springs**
   Definition: An arbitrary level, usually within plus or minus 0.3m from that of the mean low water springs (MLWS). (Hydrographic Service, Royal Australian Navy)

8) **Indian spring low water (ISLW)**
   Definition: An arbitrary tidal datum approximating the level of the mean of the lower low water at spring tides. Also called Indian tidal plane. (IHO Dictionary, S-32, 5th Edition, 2427)

   A tidal datum approximating the lowest water level observed at a place, originated by G.W. Darwin for the tides of India at a level below MSL being equal to the sum of amplitudes of the harmonic constituents M2, S2, K1, and O1; usually below that of the lower low water at spring tides. Also called the Indian tide plane. (Hydrographic Service, Royal Australian Navy)

9) **Low water springs**
   Definition: An arbitrary level, approximating that of mean low water springs (MLWS). (Hydrographic Service, Royal Australian Navy)

10) **Approximate lowest astronomical tide**
Definition: An arbitrary level, usually within plus or minus 0.2m from that of the lowest astronomical tide (LAT). (Hydrographic Service, Royal Australian Navy)

11) **Nearly lowest low water**
Definition: An arbitrary level approximating the lowest water level observed at a place, usually equivalent to the Indian spring low water (ISLW). (Hydrographic Service, Royal Australian Navy)

12) **Mean lower low water (MLLW)**
Definition: The average height of the lower low waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3145)

13) **Low water**
Definition: An approximation of mean low water adopted as the reference level for a limited area, irrespective of better determinations at a later date. Used mostly in harbour and river engineering.

Used in inland (non-tidal) waters. It is generally defined as a level which the daily mean water level would fall below less than 5% of the time and by no more than 0.2 meters during the navigation season. A single level surface is usually chosen as the low water datum for a whole lake. On a river, low water datum is a sloping surface which approximates the river surface at a low state. (Canadian Hydrographic Service)

14) **Approximate mean low water**
Definition: An arbitrary level, usually within plus or minus 0.3m from that of mean low water (MLW). (Hydrographic Service, Royal Australian Navy)

15) **Approximate mean lower low water**
Definition: An arbitrary level, usually within plus or minus 0.3m from that of the mean lower low water (MLLW). (Hydrographic Service, Royal Australian Navy)

16) **Mean high water (MHW)**
Definition: The average height of all high waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3141)

17) **Mean high water springs (MHWS)**
Definition: The average height of the high waters of spring tides. Also called spring high water. (IHO Dictionary, S-32, 5th Edition, 3144)

18) **High water**
Definition: The highest level reached at a place by the water surface in one tidal cycle. Also called high tide. (IHO Dictionary, S-32, 5th Edition, 2251)

19) **Approximate mean sea level**
Definition: An arbitrary level, usually with plus or minus 0.3m from that of mean sea level (MSL). (Hydrographic Service, Royal Australian Navy)

20) **High water springs**

Definition: An arbitrary level, approximating that of mean high water springs (MHWS). (Hydrographic Service, Royal Australian Navy)

21) **Mean higher high water (MHHW)**
Definition: The average height of higher high waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3140)

22) **Equinoctial spring low water**
Definition: The level of low water springs near the time of an equinox.

23) **Lowest astronomical tide (LAT)**
Definition: The lowest tide level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions. (IHO Dictionary, S-32, 5th Edition, 2936)

24) **Local datum**
Definition: An arbitrary datum defined by a local harbour authority, from which levels and tidal heights are measured by this authority.

25) **International Great Lakes datum 1985 (IGLD1985)**
Definition: A vertical reference system with its zero based on the mean water level at Rimouski/Pointe-au-Père, Quebec, over the period 1970 to 1988.

26) **Mean water level**
The average of all hourly water levels over the available period of record.

27) **Lower low water large tide (LLWLT)**
Definition: The average of the lowest low waters, one from each of 19 years of observations.

28) **Higher high water large tide (HHWLT)**
Definition: The average of the highest high waters, one from each of 19 years of observations.

29) **Nearly highest high water**
Definition: An arbitrary level approximating the highest water level observed at a place, usually equivalent to the high water springs.

30) **Highest astronomical tide (HAT)**
Definition: The highest tidal level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions. (IHO Dictionary, S-32, 5th Edition, 2244)

References: S-57 Ed. 3.1, Appendix A, Chapter 2, 2.238

Remarks: None

2.59 Total Cloud Cover (TCLOCO)

Total Cloud Cover: Definition: Height above the Earth's surface of the base of the lower cloud layer whose amount exceeds a specific value.

1) 0
2) 1 okta or 1/10 or less, but not zero
3) 2 oktas or 2/10-3/10
4) 3 oktas or 4/10
5) 4 oktas or 5/10
6) 5 oktas or 6/10
7) 6 oktas or 7/10-8/10
8) 7 oktas or 9/10
9) 8 oktas or 10/10
10) Sky obscured or cloud amount cannot be determined
11) No measurements made

References:
WMO-No. 306, Code table 2700

Remarks: None.

2.60 Tsunami Wave Arrival Time (ARRTIM)

Valid Time: Definition: The time, expressed in Universal Time Coordinated (UTC), at which a tsunami is forecast to arrive at a specified coastal location.

Unit: Years, months, days, hours, minutes, seconds

Resolution: 1 second

Format: YYYYMMDDTHHMMSS, where Y is year, M is month, D is day, H is hour, M is minute, and S is second

Example: 19850412T183059 denotes 18 hours, 30 minutes, and 59 seconds on 12 April 1985.

References: None.

Remarks: All times are in UTC (Universal Time Coordinated).

2.61 Tsunami Wave Period (TSUPER)

Significant Wave Period: Definition: The forecast period of a tsunami wave train.

Minimum value: 0

Unit: minute (min)

Resolution: 1 min

Format: HHmm, where HH are hours and mm are minutes

Example: 0125 for a tsunami wave period of one hour and 25 minutes

References: WMO-No. 471, 1.2.1.1

Remarks: Period values are rounded to the nearest whole minute.

2.62 Upper Isobaric Level (UPRLEV)

Upper Isobaric Level: Definition: The upper isobaric level for which thickness is measured.

1) 1000 mb
2) 925 mb
3) 850 mb
4) 700 mb
5) 500 mb
6) 300 mb
7) 250 mb
8) 200 mb
9) 150 mb
10) 100 mb

References: WMO-No. 183, M0100

Remarks: None

2.63 Valid Time (VALTIM)

Valid Time: Definition: The time, expressed in Universal Time Coordinated (UTC) for which an object and its attributes are valid or for which an observation was recorded.

Unit: Years, months, days, hours, minutes, seconds

Resolution: 1 second

Format: YYYYMMDDTHHMMSS, where Y is year, M is month, D is day, H is hour, M is minute, and S is second

Example: 19850412T183059 denotes 18 hours, 30 minutes, and 59 seconds on 12 April 1985.

References: None.

Remarks: All times are in UTC (Universal Time Coordinated).

2.64 Value of Atmospheric Pressure (VALPSR)

Value of Atmospheric Pressure: Definition: Pressure (force per unit area) exerted by the atmosphere on any surface by virtue of its weight; it is equivalent to the weight of a vertical column of air extending above a surface of unit area to the outer limit of the atmosphere. (WMO-No. 182, A2930)

Minimum value: 0

Unit: hectopascal (hPa)

Resolution: 1 hPa

Format: xxxx

Example: 0998 for an atmospheric pressure of 998 hPa.

References:
WMO-No. 485, Appendix II-4

Remarks: None.

2.65 Value of Dew-Point Temperature (VALTDT)

Value of Dew-Point Temperature: Definition: Temperature to which a volume of air must be cooled at constant pressure and constant moisture in order to reach saturation; any further cooling causes condensation.

Unit: degrees Celsius (C)

Resolution: 0.1 C

Format: sxx.x, s: sign, negative values only

Example: 12.2 for a temperature of 12.2 C

References:
WMO-No. 182, D0420

Remarks: None.

2.66 Value of Height Contour (VALHGT)

Value of Height Contour: Definition: Line joining points of equal values of a function of two variables (height).

Unit: Defined in the LUNITS attribute, e.g. meter (m)

Resolution: 1 unit

Format: xxxxx

Example: 00100 for a height of 100m

References:
WMO-No. 182, I1440

Remarks: None.

2.67 Value of Sea Surface Temperature (VALSST)

Value of Sea Surface Temperature: Definition: A physical quantity characterizing the mean random motion of molecules in a physical body. (WMO- No. 182, T0150)

Unit: degrees Celsius (C)

Resolution: 0.1 C

Format: sxx.x, s: sign, negative values only

Example: 12.2 for a temperature 12.2 C

References:
WMO-No. 485, Appendix II-4

Remarks: None.

2.68 Value of Surface Wind Gust (VALGST)

Value of Surface Wind Gust: Definition: Sudden, brief increase of the wind speed over its mean value. Peak gust is the maximum observed wind speed over a specified time interval. With hourly weather reports, the peak gust refers to the wind extreme in the last full hour.

Minimum value: 0

Unit: defined in the VUNITS attribute, e.g. meter per second (m/s)

Resolution: 1 unit of wind speed, as defined in the VUNITS attribute

Format: xxx

Example: 003 for a surface wind speed of 2.5 m/s to 3.4 m/s, or 13 for a surface wind speed of 12.8 kt

References: WMO-No. 306, Vol. 1 15.5.5

Remarks: Wind values are rounded to the nearest whole unit.

2.69 Value of Surface Wind Speed (VAWISP)

Value of Surface Wind Speed: The absolute value measuring surface wind speed.

Minimum value: 0

Unit: defined in the VUNITS attribute, e.g. meter per second (m/s)

Resolution: 1 unit of wind speed, as defined in the VUNITS attribute

Format: xxx

Example: 003 for a surface wind speed of 2.5 m/s to 3.4 m/s, or 13 for a surface wind speed of 12.8 kt

References:
WMO-No. 471, 2.2.3
WMO-No. 558, Part I, 3.2.2

Remarks: Wind values are rounded to the nearest whole unit.

2.70 Value of Temperature (VALTMP)

Value of Temperature: Definition: A physical quantity characterizing the mean random motion of molecules in a physical body. (WMO- No. 182, T0150)

Unit: degrees Celsius (C)

Resolution: 0.1 C

Format: sxx.x, s: sign, negative values only

Example: 12.2 for a temperature of 12.2 C

References:
WMO-No. 485, Appendix II-4

Remarks: None.

2.71 Velocity Units (VUNITS)

Velocity Units: Definition: The units for description of velocity.

1) Meters per second (mps)
2) Kilometers per hour (kph)
3) Nautical miles per hour (knots)

References: None.

Remarks: Defines the units of velocity for other attributes for the object to which VUNITS is assigned.

2.72 Visibility Range (VIZRNG)

Visibility Range: Definition: Greatest distance expressed numerically that a black object of suitable dimensions can be seen and recognized against the horizon sky during daylight or could be seen and recognized during the night if the general illumination were raised to the normal daylight level.

Unit: defined in the LUNITS attribute, e.g. nautical miles (nm)

Resolution: 0.1 units

Format: XXXX.X, where X is an integer

Example: 1000.0 for 1000 meters, or 0005.5 for 5.5 nautical miles

References: None.

Remarks: None.

2.73 Warning End Time (WRNEND)

Valid Time: Definition: The time, expressed in Universal Time Coordinated (UTC), at which an individual watch or warning expires for a particular area.

Unit: Years, months, days, hours, minutes, seconds

Resolution: 1 second

Format: YYYYMMDDTHHMMSS, where Y is year, M is month, D is day, H is hour, M is minute, and S is second

Example: 19850412T183059 denotes 18 hours, 30 minutes, and 59 seconds on 12 April 1985.

References: None.

Remarks: All times are in UTC (Universal Time Coordinated).

2.74 Warning Start Time (WSTART)

Valid Time: Definition: The time, expressed in Universal Time Coordinated (UTC), at which an individual watch or warning goes into effect for a particular area.

Unit: Years, months, days, hours, minutes, seconds

Resolution: 1 second

Format: YYYYMMDDTHHMMSS, where Y is year, M is month, D is day, H is hour, M is minute, and S is second

Example: 19850412T183059 denotes 18 hours, 30 minutes, and 59 seconds on 12 April 1985.

References: None.

Remarks: All times are in UTC (Universal Time Coordinated).

2.75 Watch/Warning Type (WTCWRN)

Watch/Warning Type: Definition: The classification defining the severity of the watch or warning.

1) **Advisory**
   Definition: Highlights special weather conditions that are less serious than a watch or warning. Advisories are for events that may cause significant inconvenience, and if caution is not exercised, it could lead to situations that may threaten life and/or property.

2) **Watch**
   Definition: A watch is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location, and/or timing is still uncertain. It is intended to provide enough lead time so that those who need to set their plans in motion can do so.

3) **Warning**
   Definition: A warning is issued when a hazardous weather or hydrologic event is occurring, is imminent, or has a very high probability of occurring. A warning is used for conditions posing a threat to life and property.

References: NOAA National Weather Service Glossary (w1.weather.gov/glossary)

Remarks: None.

2.76 Water Height Units (HUNITS)

Water Height Units: Definition: The units for description of vertical wave and water level values.

1) Meters
2) Feet

References: None.

Remarks: Defines the units of height for other attributes for the object to which HUNITS is assigned.

2.77 Wave Height Change Time Interval (WAHETI)

Wave Height Change Time Period: Definition: The time over which wave heights are compared to determine changes in their values.

Minimum value: 0

Unit: Hours

Resolution: 1 hour

Format: XX

Example: 12 for 12 hours, 03 for 3 hours

References: None

Remarks: None

2.78 Wave Period Change Time Interval (WASWTI)

Wave Period Change Time Period: Definition: The time over which wave periods are compared to determine changes in their values.

Minimum value: 0

Unit: Hours

Resolution: 1 hour

Format: XX

Example: 12 for 12 hours, 03 for 3 hours

References: None

Remarks: None

2.79 Wind Average Period (WNDAVP)

Wind Average Period: Definition: The period of time over which wind is averaged for the observation.

Minimum value: 0

Unit: minutes

Resolution: 1 minute

Format: xxx

Example: 010 for 10 minutes

References: None.

Remarks: None.

2.80 Wind Change Time Interval (WNDTIM)

Wind Change Time Period: Definition: The time over which wind speed and direction are compared to determine changes in their values.

Minimum value: 0

Unit: Hours

Resolution: 1 hour

Format: XX

Example: 12 for 12 hours, 03 for 3 hours

References: None

Remarks: None