ANNEX B – S-412 Attribute Encoding Guide

Annex B contains a list of all attributes defined within the IHO Registry WMO Weather Domain. Each attribute description follows the basic format, providing details about the data type, allowable encoding values, camel case, etc.

Attribute Number	Register Dictionary	Attribute Name	Camel Case
2.001	WxFCD	Agency Name	agencyName
2.002	WxFCD	Air Velocity	airVelocity
2.003	WxFCD	Azimuth Degrees	azimuthDegrees
2.004	WxFCD	Beaufort Force	beaufortForce
2.005	WxFCD	Cardinal Direction	cardinalDirection
2.006	WxFCD	Category of Convergent Boundary	categoryOfConvergentBoundary
2.007	WxFCD	Category of Front	categoryOfFront
2.008	WxFCD	Category of Low	categoryOfLow
2.009	WxFCD	Category of Precipitation	categoryOfPrecipitation
2.010	WxFCD	Category of Reduced Visibility	categoryOfReducedVisibility
2.011	IHO Hydro	Cause of Ice Accretion	causeOfIceAccretion
2.012	WxFCD	Contact Information	contactInformation
2.013	WxFCD	Country	country
2.014	WxFCD	Coverage	Coverage
2.015	WxFCD	Date Time End	dateTimeEnd
2.016	WxFCD	Date Time Range	dateTimeRange
2.017	WxFCD	Date Time Start	dateTimeStart
2.018	WxFCD	Definition	definition
2.019	WxFCD	Direction From	directionFrom
2.020	WxFCD	Direction To	directionTo
2.021	WxFCD	Display Name	displayName
2.022	WxFCD	Display Track	displayTrack
2.023	WxFCD	Distance of Unit Measurement	distanceOfUnitMeasurement
2.024	WxFCD	Email Address	emailAddress
2.025	WxFCD	Feature Identifier	featureIdentifier
2.026	WxFCD	Feature Name	featureName
2.027	WxFCD	Feature Reference	featureReference
2.028	IHO Hydro	File Reference	fileReference
2.029	IHO Hydro	Forecasted Change in Intensity	forecastedChangeInIntensity
2.030	IHO Hydro	Frontal Development	frontalDevelopment
2.031	IHO Hydro	General Change	generalChange
2.032	IHO Hydro	Graphic	graphic
2.033	WxFCD	Gust Velocity	gustVelocity
2.034	WxFCD	Headline	headline
2.035	WxFCD	Height/Length Units	heightLengthUnits
2.036	WxFCD	Horizontal Visibility Range	horizontalVisibilityRange
2.037	WxFCD	Icing Rate	icingRate
2.038	WxFCD	Information	Information

2.039	WxFCD	Interval Value	intervalValue
2.040	WxFCD	Issued Date Time	issuedDateTime
2.041	IHO Hydro	Issuing Service Name	issuingServiceName
2.042	WxFCD	Language	language
2.043	WxFCD	Language Text	languageText
2.044	WxFCD	Mailing Address	mailingAddress
2.045	IHO Hydro	Maximum Pressure Value	maximumPressureValue
2.046	WxFCD	Maximum Sustained Wind Speed	maximumSustainedWindSpeed
2.047	WxFCD	Message Category	messageCategory
2.048	WxFCD	Message Identifier	messageIdentifier
2.049	WxFCD	Message Type	messageType
2.050	IHO Hydro	Meteorological Observation	meteorologicalObservation
2.051	WxFCD	Minimum Pressure Value	minimumPressureValue
2.052	WxFCD	Movement	movement
2.053	WxFCD	Name	name
2.054	WxFCD	Name Definition	nameDefinition
2.055	IHO Hydro	Next Update Date Time	nextUpdateDateTime
2.056	WxFCD	Observation Source	observationSource
2.057	WxFCD	Oceanographic Observation	oceanographicObservation
2.058	WxFCD	Period	period
2.059	WxFCD	Period Value	periodValue
2.060	WxFCD	Picture Caption	pictureCaption
2.061	WxFCD	Picture Information	pictureInformation
2.062	WxFCD	Pictorial Representation	pictorialRepresentation
2.063	WxFCD	Potential Tornadic Activity	potentialTornadicActivity
2.064	WxFCD	Precipitation Rate	precipitationRate
2.065	WxFCD	Pressure Change Rate	pressureChangeRate
2.066	WxFCD	Primary Swell Wave Direction	primarySwellWaveDirection
2.067	WxFCD	Primary Swell Wave Height	primarySwellWaveHeight
2.068	WxFCD	Primary Swell Wave Period	primarySwellWavePeriod
2.069	IHO Hydro	Probability of Heights Exceeding	probabilityOfHeightsExceeding
2.070	WxFCD	Probability Percentage	probabilityPercentage
2.071	WxFCD	Probability Threshold	probabilityThreshold
2.072	WxFCD	Probability of Speed Exceeding	probabilityOfSpeedExceeding
2.073	IHO Hydro	Saffir-Simpson Category	saffirSimpsonCategory
2.074	IHO Hydro	Secondary Swell Wave Direction	secondarySwellWaveDirection
2.075	WxFCD	Secondary Swell Wave Height	secondarySwellWaveHeight
2.076	WxFCD	Secondary Swell Wave Period	secondarySwellWavePeriod
2.077	WxFCD	Significant Wave Height	significantWaveHeight
2.078	WxFCD	Source Date	sourceDate
2.079	WxFCD	Speed	speed
2.080	WxFCD	Speed Units	speedUnits
2.081	WxFCD	Station Identifier	stationIdentifier
2.082	WxFCD	Status	status
2.083	WxFCD	Telephone Number	telephoneNumber
2.084	WxFCD	Text	text

2.085	WxFCD	Temperature	temperature
2.086	WxFCD	Temperature Parameter	temperatureParameter
2.087	WxFCD	Thickness of Ice Accretion	thicknessOfIceAccretion
2.088	WxFCD	Time Interval	timeInterval
2.089	WxFCD	Time Units	timeUnits
2.090	WxFCD	Trend	trend
2.091	WxFCD	Valid Date Time	validDateTime
2.092	WxFCD	Value of Atmospheric Pressure	valueOfAtmosphericPressure
2.093	WxFCD	Value of Temperature	valueOfTemperature
2.094	WxFCD	Value of Wind Speed	valueOfWindSpeed
2.095		Visibility Range	visibilityRange
2.096	WxFCD	Wave Height	waveHeight
2.097	WxFCD	Wave Height Change	waveHeightChange
2.098	IHO Hydro	Wave Height Value	waveHeightValue
2.099	WxFCD	Wave Direction	waveDirection
2.100	WxFCD	Wave Period	wavePeriod
2.101	WxFCD	Wave Period Change	wavePeriodChange
2.102	IHO Hydro	Weather Message	weatherMessage
2.103	IHO Hydro	Wind Average Period	windAveragePeriod
2.104	IHO Hydro	Wind Direction	windDirection
2.105	WxFCD	Wind Direction Change	windDirectionChange
2.106	WxFCD	Wind Direction Trend	windDirectionTrend
2.107	WxFCD	Wind Wave Direction	windWaveDirection
2.108	WxFCD	Wind Speed	windSpeed
2.109	WxFCD	Wind Speed Change	windSpeedChange
2.110	WxFCD	Wind Speed Range	windSpeedRange
2.111	WxFCD	Wind Velocity	windVelocity
2.112	WxFCD	Wind Wave Height	windWaveHeight
2.113	WxFCD	Wind Wave Period	windWavePeriod
2.114	WxFCD	Wind Warning Probability	windWarningProbability
2.115	WxFCD	Wind Warning Threshold	windWarningThreshold
2.116	WxFCD	WMO Header	wmoHeader

2.001 Agency Name

Definition:
The name of an agency, entity or organization.

Reference:

Item Type:
Simple Attribute (data type: text)

Camel Case:
agencyName

Remarks:
Maximum of 300 characters.

2.002 Air Velocity

Definition:
The magnitude and directional component of air in motion relative to the Earth's surface. Only the horizontal component is considered.

Reference:
WMO-No. 182, W0930

Item Type:
Complex attribute type

Camel Case:
airVelocity

Sub-Attribute:
windDirection
windSpeed

Remarks:

2.003 Azimuth Degrees

Definition:
The horizontal direction or bearing of a celestial point from a terrestrial point, expressed as the angular distance from a reference direction. It is usually measured from 000 at the reference direction clockwise through 360.

References:
Bowditch

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
azimuthDegrees

Unit:
degrees

Resolution:
1 degrees

Format:
xxx

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

Remarks:
Values must not be less than 000 or more than 359.

Particular attention should be given to the definition of an attribute using azimuthDegrees. It could be used as direction from or direction to.

2.004 Beaufort Force

Definition:
Wind force scale, originally based on the state of the sea, expressed in numbers from 0 to 12.

Item Type:
Simple Attribute (data type: Enumeration)

Reference:
WMO-No. 182, B0620

Camel Case:
beaufortForce

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

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

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

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

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

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

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

8) **gale**

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

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

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

11) **violent storm**
Definition: Wind with a speed between 56 and 63 knots (Beaufort scale wind force 11). (WMO-No. 182, V0340)
Camel Case: violentStorm

12) **hurricane force**
Definition: Wind with a speed 64 knots and above (Beaufort scale wind force 12). (WMO-No. 182, H0860 (1))
Camel Case: hurricaneForce

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

Remarks:

2.005 Cardinal Direction

Definition:
Principal and intermediate compass points.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
cardinalDirection

1) **north (N)**
   Definition: 348.75-011.25 degrees (true north)
   Camel Case: north

2) **north-northeast (NNE)**
   Defintion: 011.25-033.75 degrees
   Camel Case: northNortheast

3) **northeast (NE)**
   Definition: 033.75-056.25 degrees
   Camel Case: northeast

4) **east-northeast (ENE)**
   Definition: 056.25-078.75 degrees
   Camel Case: eastNortheast

5) **east (E)**
   Definition: 078.75-101.25 degrees
   Camel Case: east

6) **east- southeast (ESE)**
   Definition: 101.25-123.75 degrees
   Camel Case: eastSoutheast

7) **southeast (SE)**
   Definition: 123.75-146.25 degrees
   Camel Case: southeast

8) **south-southeast (SSE)**
   Definition: 146.25-168.75 degrees
   Camel Case: southSoutheast

9) **south (S)**
   Definition: 168.75-191.25 degrees
   Camel Case: south

10) **south-southwest (SSW)**
    Definition: 191.25-213.75 degrees

Camel Case: southSouthwest

11) **southwest (SW)**
Definition: 213.75-236.25 degrees
Camel Case: southwest

12) **west-southwest (WSW)**
Definition: 236.25-258.75 degrees
Camel Case: westSouthwest

13) **west (W)**
Definition: 258.75-281.25 degrees
Camel Case: west

14) **west-northwest (WNW)**
Definition: 281.25-303.75 degrees
Camel Case: westNorthwest

15) **northwest (NW)**
Definition: 303.75-326.25 degrees
Camel Case: northwest

16) **north-northwest (NNW)**
Definition: 326.25-348.75 degrees
Camel Case northNorthwest

Remarks:
Sixteen points of compass are based on true direction and not relative direction.

A direction exactly equal to one of the values at the ends of the ranges shall be coded in the higher range, e.g. direction of 326.25 shall be reported by value 16 (north-northwest).

Particular attention should be given to the definition of an attribute using cardinalDirection. It could be used as direction from or direction to.

2.006 Category of Convergent Boundary

Definition:
Type of interface or transition zone between air masses of similar densities.

Reference:
WMO-No. 182

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
categoryOfConvergentBoundary

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

2) **intertropical convergence zone**
   Definition: Narrow zone where the trade winds of the two hemispheres meet (WMO-No. 182, I0800)
   Camel Case: intertropicalConvergenceZone

3) **monsoon trough**
   Definition: 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 monsoon flow prevailing south of the trough axis (NWSI 10-604)
   Camel Case: monsoonTrough

4) **shear line**
   Definition: Line along which there is an abrupt change in the horizontal wind component parallel to this line (WMO-No. 182, S0920)
   Camel Case: shearLine

5) **squall line**
   Definition: A non-frontal line or narrow band of thunderstorms (with or without squalls) (WMO-No. 182, S2510)
   Camel Case: squallLine

6) **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 (NWSI, 10-604)
   Camel Case: tropicalWave

7) **trough**
   Definition: A line along which pressures are lower than the surrounding area in the

cyclonic curvature of the isobars or contours is a maximum (WMO-No. 182, T1670)
Camel Case: trough

Remarks:

2.007 Category of Front

Definition:
Specifies the type of frontal system.

Reference:
WMO-No. 182

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
categoryOfLow

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
   Camel Case: coldFront

2) **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
   Camel Case: dryLine

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

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

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

Remarks:

2.008 Category of Low

Definition:
Specifies the type of non-tropical low pressure system.

Reference:
WMO-No. 182

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
categoryOfLow

2) **extra-tropical cyclone**
   Definition: Low-pressure system which develops in latitudes outside the tropics or is associated with an obvious baroclinic structure.
   WMO-No. 182, E1380
   Camel Case: extraTropicalCyclone

2) **post-tropical cyclone**
   Definition: Generic term describing a cyclone that no longer possesses sufficient tropical characteristics to be considered a tropical cyclone.
   NWSI 10-604
   Camel Case: postTropicalCyclone

4) **thermal low**
   Definition: A depression resulting from high temperatures due to intense heating of the Earth's surface.
   WMO-No. 182, T0480
   Camel Case: thermalLow

4) **polar low**
   Definition: Small, shallow depression which forms mainly in winter over some high-latitude seas within a polar or arctic air mass. Its motion is approximately the same as the air stream in which it is embedded.
   WMO-No. 182, P1090
   Camel Case: polarLow

Remarks:

2.009 Category of Precipitation

Definition:
Type or physical state of an ensemble of particles consisting of a fall.

Reference:
WMO-No. 182, P1360

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
categoryOfPrecipitation

1) **rain**
   Definition: Precipitation of liquid water particles, either in the form of drops of more than 0.5 mm in diameter, or of smaller widely scattered drops (WMO-No. 182, R0730)
   Camel Case: rain

2) **drizzle**
   Definition: Fairly uniform precipitation in very fine drops of water (diameter less than 0.5 mm) very close to one another, falling from a cloud (WMO-No. 182, D1140)
   Camel Case: drizzle

3) **freezing rain**
   Definition: Precipitation drops freezing on impact to form a coating of clear ice (glaze) on the ground and on exposed objects (WMO-No. 182, F1150)
   Camel Case: freezingRain

4) **freezing drizzle**
   Definition: Precipitation, in the form of drizzle, freezing on impact to form a coating of clear ice (glaze) on the ground and on exposed objects.
   Camel Case: freezingDrizzle

5) **hail**
   Definition: Precipitation of either transparent, or partly or completely opaque particles of ice (hailstones), usually spheroidal, conical or irregular in form and of diameter very generally between 5 and 50 millimetres, which falls from a cloud either separately or agglomerated into irregular lumps (WMO-No. 182, H0030)
   Camel Case: hail

6) **snow**
   Definition: Precipitation of ice crystals, isolated or agglomerated, falling from a cloud (WMO-No. 182, S1460)
   Camel Case: snow

7) **sleet**
   Definition: Precipitation of rain, which passes through a freezing layer and changes into transparent or partly or completely opaque particles of ice. (WMO-No. 182, I0150)

Camel Case: sleet

8) **other/unknown precipitation**
Definition: Precipitation of unknown composition or differing from common precipitation types.
Camel Case: otherUnknownPrecipitation

Remarks:
Duplication of categoryOfPrecipitation values is not permitted.

2.010 Category of Reduced Visibility

Definition:
Type or category of atmospheric particles that reduce the horizontal surface visibility.

Reference:
WMO-No. 182

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
categoryOfReducedVisibility

1) **dust**
   Definition: Hze caused by the suspension in the atmosphere of small sand or dust particles (WMO-No. 182, S0040)
   Camel Case: dust

2) **fog**
   Definition: Suspension of very small, usually microscopic water droplets in the air, generally reducing the horizontal visibility at the Earth's surface to less than 1 km (WMO-No. 182, F0690)
   Camel Case: fog

3) **haze**
   Definition: Suspension in the atmosphere of extremely small, dry particles which are invisible to the naked eye but numerous enough to give the sky an opalescent appearance (WMO-No. 182, H0170)
   Camel Case: haze

4) **smoke**
   Definition: Suspension in the atmosphere of small particles produced by combustion (WMO-No. 182, S1410)
   Camel Case: smoke

5) mist
   Definition: Suspension in the air of microscopic water droplets or wet hygroscopic particles which reduce the visibility at the Earth's surface. (WMO-No. 182, M1520)
   Camel Case: mist

6) **other/unknown**
   Definition: Suspension in the atmosphere of very small unknown.
   Camel Case: otherUnknown

Remarks:
Duplication of categoryOfReducedVisibility values is not permitted.

2.011 Cause of Ice Accretion

Definition:
The environmental phenomena causing ice accretion.

Reference:
NWS Observing Handbook No. 1

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
causeOfIceAccretion

1) **icing from freezing spray**
   Definition: Accumulation of ice from ocean spray freezing to the outer surface of an object.
   Camel Case: icingFromOceanSpray

2) **icing from fog**
   Definition: Accumulation of ice from fog freezing to the outer surface of an object.
   Camel Case: icingFromFog

3) **icing from rain**
   Definition: Accumulation of ice from rain freezing to the outer surface of an object.
   Camel Case: icingFromRain

4) **icing from drizzle**
   Definition: Accumulation of ice from drizzle freezing to the outer surface of an object.
   Camel Case: icingFromDrizzle

5) **icing from freezing rain**
   Definition: Accumulation of ice from freezing rain freezing to the outer surface of an object.
   Camel Case: icingFromFreezingRain

6) **icing from freezing drizzle**
   Definition: Accumulation of ice from freezing drizzle freezing to the outer surface of an object.
   Camel Case: icingFromFreezingDrizzle

Remarks:
Duplication of causeOfIceAccretion values is not permitted.

2.012 Contact Information

Definition:
Information about where inquires can be sent.

Reference:

Item Type:
Complex attribute type

Camel Case:
contactInformation

Sub-Attributes:
mailingAddress
phoneNumber
emailAddress
agencyName

Remarks:

2.013 Country

Definition:
An identifier indicating the nationality an agency belongs to.

Reference:

Item Type:
Simple Attribute (data type: ISO 3166-1)

Camel Case:
country

Remarks:

2.014 Coverage

Definition:
Percentage used to indicate how much of a geographic area a feature is affecting or forecasted to affect within a defined geographic area.

Reference:
NWSI 10-811

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
coverage

Minimum value:
0%

Maximum value:
100%

Resolution:
1%

Format:
xxx%

Example:
3% for 3%; 78% for 78%

Remarks:
None

2.015 Date Time End

Definition:
The end of a time range, expressed in Universal Time Coordinated (UTC).

Reference:

Item Type:
Simple Attribute (data type: DateTime)

Camel Case:
dateTimeEnd

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.

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

2.016 Date Time Range

Definition:
The range of time a feature is valid for.

Reference:

Item Type:
Complex attribute type

Camel Case:
dateTimeRange

Sub-Attributes:
dateTimeStart
dateTimeEnd

Remarks:

2.017 Date Time Start

Definition:
The beginning of a time range, expressed in Universal Time Coordinated (UTC).

Reference:

Item Type:
Simple Attribute (data type: DateTime)

Camel Case:
dateTimeStart

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.

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

2.018 Definition

Definition:
A formal and concise statement of the meaning of a word, phase, etc.

Reference:
definition. (n.d.). *Collins English Dictionary - Complete & Unabridged 10th Edition*. Retrieved May 14, 2018 from Dictionary.com website http://www.dictionary.com/browse/definition

Item Type:
Simple Attribute (data type: text)

Camel Case:
definition

Remarks:
Maximum of 300 characters.

2.019 Direction From

Definition:
The directional characteristics of a feature, described as the direction the feature is coming from.

References:

Item Type:
Complex attribute type

Camel Case:
directionFrom

Sub-Attributes:
cardinalDirection
azimuthDegrees

Remarks:

2.020 Direction To

Definition:
The directional characteristics of a feature, described as the direction the feature is moving toward.

References:

Item Type:
Complex attribute type

Camel Case:
directionTo

Sub-Attributes:
cardinalDirection
azimuthDegrees

Remarks:

2.021 Display Name

Definition:
A statement expressing if a feature name is to be displayed in certain system display settings or not.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: Boolean)

Camel Case:
displayName

Remarks:
Where it is allowable to encode multiple instances of a feature for a single feature instance, only one feature name instance can indicate that the name is to be displayed (display name set to True)

2.022 Display Track

Definition:
A statement expressing if a feature's track through time is to be displayed in certain system display settings or not.

Reference:

Item Type:
Simple Attribute (data type: Boolean)

Camel Case:
displayTrack

Remarks:

2.023 Distance Unit of Measurement

Definition:
A specified amount of a quantity, as of length, by comparison with which any other quantity of the same kind is measured or estimated.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
distanceUnitOfMeasurement

3) **kilometers**
Definition: A unit of length, the common measure of distances equal to 1000 metres, and equivalent to 3280.8 feet or 0.621 mile.
Camel Case: kilometers

5] **nautical miles**
Definition: A unit of distance used chiefly in navigation, equal to 6080.20 feet (1853.25 metres) in the U.S., now replaced by the international nautical mile.
Camel Case: nauticalMiles

2.024 Email Address

Definition:
The email address of an entity.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: text)

Camel Case:
emailAddress

Remarks:
Maximum of 300 characters.

2.025 Feature Identifier

Definition:
An identifier referencing an object or feature that is external to the dataset, expressed in Uniform Resource Name (URN) format.

Reference:
RFC 2141, URN Syntax. R. Moats. IETF RFC 2141, May 1997. URL: http://www.rfc-editor.org/info/rfc2141

Item Type:
Simple Attribute (data type: URN)

Camel Case:
featureIdentifier

Remarks:

2.026 Feature Name

Definition:
Provides the name of an entity, defines the national language of the name, and provides the option to display the name at various system display settings.

Reference:
IHO Registry, Hydro Domain

Item Type:
Complex attribute type

Camel Case:
featureName

Sub-Attributes:
displayName
language
name

Remarks:

2.027 Feature Reference

Definition:
Reference to an object or feature that is external to the dataset.

References:

Item Type:
Complex attribute type

Camel Case:
featureReference

Sub-Attributes:
featureIdentifier
dateTimeRange

Remarks:

2.028 File Reference

Definition:
The string encodes the file name of an external text file that contains the text in English.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: Text)

Camel Case:
fileReference

Remarks:
Maximum of 300 characters is allowed.

2.029 Forecasted Change In Intensity

Definition:
Specifies the expected change in intensity of a feature in the upcoming 24 hours.

Reference:
WMO-No. 306, Code Table 0252

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
forecastedChangeInIntensity

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

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

3) **no change in intensity**
   Definition: The intensity of a feature is forecast to remain the same for the forecast period.
   Camel Case: noChangeInIntensity

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

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)
   Camel Case: strongIntensification

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

7) **undetermined intensity change**
   Definition: The intensity change is unknown.
   Camel Case: undeterminedIntensityChange

Remarks:

2.030 Frontal Development

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

Reference:
WMO-No. 182

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
frontalDevelopment

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

2) **front 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
   Camel Case: frontDissipating

Remarks:

2.031 General Change

Definition:
A description of the trend of a feature over time.

Reference:

Item Type:
Complex attribute type

Camel Case:
generalChange

Sub-Attributes:
trend
timeInterval

Remarks:

2.032 Graphic

Definition:
Pictorial information such as a photograph, sketch or other graphic, optionally accompanied by descriptive information about the graphic and the location relative to its subject from which it was made.

Reference:
IHO Registry, Hydro Domain

Item Type:
Complex attribute type

Camel Case:
graphic

Sub-Attributes:
pictorialRepresentation
sourceDate
pictureCaption
pictureInformation

Remarks:

2.033 Gust Velocity

Definition:
The magnitude and directional component of gust wind vectors.

Reference:

Item Type:
Complex attribute type (Data type: airVelocity)

Camel Case:
gustVelocity

Sub-Attribute:
windDirection
windSpeed

Remarks:

2.034 Headline

Definition:
Words set at the head of a passage or page to introduce or categorize.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: text)

Camel Case:
Headline

Remarks:

2.035 Height/Length Units

Definition:
This attribute encodes the units of measurement for heights and lengths.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
heightLengthUnits

1) **metres**
   Definition: Heights/lengths are specified in metres (SI units of length)
   Camel Case: metres

2) **feet**
   Definition: Heights/lengths are specified in feet (imperial unit of length)
   Camel Case: feet

Remarks:

2.036 Horizontal 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.

Item Type:
Complex attribute type

Camel Case:
horizontalVisibilityRange

Sub-Attributes:
visibilityRange
distanceUnitOfMeasurementt

Remarks:

2.037 Icing Rate

Definition:
An integer value that represents the rate of accretion, expressed in centimetres per hour.

Reference:

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
icingRate

Resolution:

Units
cm/hr

Format:
xxx, positive values only

Example:
12 for 12

Remarks:

2.038 Information

Definition:
Textual information about a feature. The information may be provided as a string of text or as a file name of a single external text file that contains the text.

Reference:
IHO Registry, Hydro Domain

Item Type:
Complex attribute type

Camel Case:
information

Sub-Attributes:
languageText
fileReference
headline

Remarks:

2.039 Interval Value

Definition:
An integer value that represents an interval.

Reference:

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
intervalValue

Resolution:

Format:
xxx, positive values only

Example:
12 for 12

Remarks:
Units for the intervalValue is defined by timeUnits, or another enumerated attribute within the associated complex attribute.

2.040 Issued Date Time

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

Reference:
NWSI 10-303, 5.8

Item Type:
Simple Attribute (data type: DateTime)

Camel Case:
issuedDateTime

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.

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

2.041 Issuing Service Name

Definition:
The identifier that indicates which organization issued meteorological or oceanographic data.

Reference:

Item Type:
Complex Attribute (data type: languageText)

Camel Case:
issuingServiceName

Remarks:

2.042 Language

Definition:
The method of human communication, either spoken or written, consisting of the use of words in a structured and conventional way.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: Text)

Camel Case:
language

Remarks:
The language is encoded by a character code following ISO 693-3.

2.043 Language Text

Definition:
A combination of written text and a language indication.

Reference:

Item Type:
Complex attribute type

Camel Case:
languageText

Sub-Attributes:
language
text

Remarks:

2.044 Mailing Address

Definition:
The physical address a parcel may be sent to.

Reference:

Item Type:
Simple Attribute (data type: text)

Camel Case:
mailingAddress

Remarks:
Maximum of 300 characters.

2.045 Maximum Pressure Value

Definition:
The maximum pressure associated with a high pressure system.

Reference:

Item Type:
Simple Attribute (data type: Real)

Camel Case:
maximumPressureValue

Minimum value:
0

Unit:
hectopascal (hPa)

Resolution:
0.1 hPa

Format:
xxxx.x

Example:
998.1 for an atmospheric pressure of 998.1 hPa; 1021.6 for an atmospheric pressure of 1021.6 hPa

Remarks:

2.046 Maximum Sustained Wind Speed

Definition:
When applied to a particular weather system, refers to the highest average wind (at an elevation of 10 metres with an unobstructed exposure) associated with that weather system at a particular point in time.

Reference:
NWSI 10-604

Item Type:
Complex attribute type (Data Type: windSpeed)

Camel Case:
maximumSustainedWindSpeed

Sub-Attributes:
valueOfWindSpeed
speedUnits
windAveragePeriod

Remarks:

2.047 Message Category

Definition:
A designation meant to categorize message types.

Reference:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
messageCategory

1) **warning**
   Definition: A notification highlighting the imminent risk of or a high probability of an event which threatens the safety of navigation. It is intended to highlight conditions that pose a threat to life and property
   Camel Case: warning

2) **watch**
   Definition: A notification issued to alert mariners that the risk of or a high probability of an event has increased significantly, but its occurrence, location and/or timing is still uncertain. It is intended to provide enough lead time so that a mariner can take appropriate action.
   Camel Case: watch

5) **advisory**
   Definition: A notification issued to caution mariners that conditions that affect the safety of life and property at sea are possible or likely. Advisories are for event that may cause significant inconvenience, and if caution is not exercised, it could lead to situations that may threaten life and/or property.
   Camel Case: advisory

4) **outlook**
   Definition: A notification issued to notify mariners of an event, or series of events, further in time.
   Camel Case: outlook

5) **statement**
   Definition: A generic notification
   Camel Case: statement

Remarks:

2.048 Message Identifier

Definition:
A unique identifier distinguishing one message from another.

Reference:

Item Type:
Simple Attribute (data type: Text)

Camel Case:
messageIdentifier

Remarks:

2.049 Message Type

Definition:
An indication of the type of message

Reference:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
messageType

1) **new**
   Definition: a message that has not been previously disseminated
   Camel Case: new

2) **cancellation**
   Definition: a message indicating a previous message has been discontinued.
   Camel Case: cancellation

3) **repetition**
   Definition: a rebroadcasted message
   Camel Case: repetition

4) **update**
   Definition: a message containing corrected information for a previously disseminated message.
   Camel Case: update

Remarks:

2.050 Meteorological Observation

Definition:
An observation of current meteorological conditions

Reference:

Item Type:
Complex attribute type

Camel Case:
meteorologicalObservation

Sub-Attributes:
horizontalVisibilityRange
icingRate
temperature
valueOfAtmosphericPressure
gustVelocity
windVelocity
thicknessOfIceAccretion

Remarks:

2.051 Minimum Pressure Value

Definition:
The minimum pressure associated with a low pressure system.

Reference:

Item Type:
Simple Attribute (data type: Real)

Camel Case:
minimumPressureValue

Minimum value:
0

Unit:
hectopascal (hPa)

Resolution:
0.1 hPa

Format:
xxxx.x

Example:
998.1 for an atmospheric pressure of 998.1 hPa; 1021.6 for an atmospheric pressure of 1021.6 hPa

Remarks:

2.052 Movement

Definition:
The speed and directional characteristics of a feature.

References:

Item Type:
Complex attribute type

Camel Case:
movement

Sub-Attributes:
speed
speedUnits
directionTo
dateTimeRange

Remarks:

2.053 Name

Definition:
The individual name of a feature.

Reference:
S-57 Edition 3.1, Appendix A – Chapter 2, page 2.158, November 2000
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: text)

Camel Case:
name

Remarks:
Maximum of 300 characters.

2.054 Name Definition

Definition:
An indication of the name and definition of a modeled concept.

Reference:

Item Type:
Complex attribute type

Camel Case:
nameDefinition

Sub-Attributes:
name
definition

Remarks:

2.055 Next Update Date Time

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

Reference:
NWSI 10-315, 5.4

Item Type:
Simple Attribute (data type: DateTime)

Camel Case:
nextUpdateDateTime

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.

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

2.056 Observation Source

Definition:
The type of platform reporting an observation in real or near real time.

Reference:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
observationSource

1) **floating observation station**
   Camel Case: floatingObservationStation

2) **marine vessel**
   Camel Case: marineVessel

3) **satellite**
   Camel Case: satellite

4) **upper air**
   Camel Case: upperAir

5) **land-based station**
   Camel Case: landBasedStation

6) **tide gauge**
   Camel Case: tideGuage

7) **other observation source**
   Camel Case: otherObservationSource

Remarks:

2.057 Oceanographic Observation

Definition:
An observation of current oceanographic conditions

Reference:

Item Type:
Complex attribute type

Camel Case:
windWavePeriod
windWaveHeight
windWaveDirection
primarySwellWaveDirection
primarySwellWaveHeight
primarySwellWavePeriod
secondarySwellWaveDirection
secondarySwellWaveHeight
secondarySwellWavePeriod
temperature
significantWaveHeight

Remarks:

2.058 Period

Definition:
The time over which a value occurs.

Reference:

Item Type:
Complex attribute type

Camel Case:
period

Sub-Attribute:
periodValue
timeUnits

Remarks:

2.059 Period Value

Definition:
The value component of a period of time.

Reference:

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
periodValue

Minimum value:
0

Unit:
Defined in the timeUnits attribute

Format:
xx

Remarks:

2.060 Picture Caption

Definition:
Short description of the purpose of a graphic.

Reference:
IHO Registry, Hydro Domain

Item Type:
Complex attribute type (Data type: languageText)

Camel Case:
pictureCaption

Sub-Attributes:
text
language

Remarks:

2.061 Picture Information

Definition:
A set of information to provide credits to picture creator, copyright owner, etc.

Reference:
IHO Registry, Hydro Domain

Item Type:
Complex attribute type (Data type: languageText)

Camel Case:
pictureInformation

Sub-Attributes:
text
language

Remarks:

2.062 Pictorial Representation

Definition:
A reference to a pictorial representation of the feature

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: Text)

Camel Case:
pictorialRepresentation

Remarks:
The string encodes the file name of a single external graphic file. The “pictorial representation” could be a drawing or a photo.

2.063 Potential Tornadic Activity

Definition:
An indication of the potential of phenomena consisting of violent whirlwinds, 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.

Reference:
WMO-No. 182, S2460

Item Type:
Simple Attribute (data type: Boolean)

Camel Case:
potentialTornadicActivity

Remarks:
A 'true' value indicates that the potential for tornadic activity exists. A 'false' value indicates that the potential for tornadic activity does not exist.

2.064 Precipitation Rate

Definition:
The rate or intensity of which precipitation is falling or is forecasted to fall.

Reference:
WMO No. 8, Ch 14, Annex

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
precipitationRate

1) **light precipitation**
   Definition: Precipitation rates less than 2.5 millimetres per hour (WMO No. 8, Ch 14, Annex)
   Camel Case: lightPrecipitation

2) **moderate precipitation**
   Definition: Precipitation rates between 2.5 and 10.0 millimetres per hour (WMO No. 8, Ch 14, Annex)
   Camel Case: moderatePrecipitation

3) **heavy precipitation**
   Definition: Precipitation rates over 10 millimetres per hour (WMO No. 8, Ch 14, Annex)
   Camel Case: heavyPrecipitation

4) **unknown precipitation rate**
   Definition: Precipitation rates are not known.
   Camel Case: unknownPrecipitationRate

Remarks:
Duplication of precipitationRate values is not permitted.

2.065 Pressure Change Rate

Definition:
The time interval at which atmospheric pressure changes over.

Reference:
WMO No. 182, P1690

Item Type:
Complex attribute type

Camel Case:
pressureChangeRate

Sub-Attributes:
valueOfAtmosphericPressure
timeInterval

Remarks:

2.066 Primary Swell Wave Direction

Definition:
Directional component of primary swell in degrees and cardinal directions.

Reference:

Item Type:
Complex attribute type (Data Type: directionFrom)

Camel Case:
primarySwellWaveDirection

Sub-Attributes:
azimuthDegrees
cardinalDirection

Remarks:

2.067 Primary Swell Wave Height

Definition:
Height component of primary swell waves.

Reference:

Item Type:
Complex attribute type (Data Type: waveHeight)

Camel Case:
primarySwellWaveHeight

Sub-Attributes:
heightLengthUnits
waveHeightValue

Remarks:

2.068 Primary Swell Wave Period

Definition:
Time interval between two primary swell wave crests.

Reference:
WMO-No. 702, 1.2.1.1

Item Type:
Complex attribute type (Data Type: period)

Camel Case:
primarySwellWavePeriod

Sub-Attributes:
periodValue
timeUnits

Remarks:

2.069 Probability of Heights Exceeding

Definition:
Wave height attributes that indicate the probability of wave heights (significant wave, wind waves, swell waves) exceeding a specified threshold.

Reference:

Item Type:
Complex attribute type

Camel Case:
probabilityOfHeightsExceeding

Sub-Attributes:
probabilityThreshold
heightLengthUnits
probabilityPercentage

Remarks:

2.070 Probability Percentage

Definition:
Percentage value representing the probability a defined parameter and threshold will be exceeded.

References:

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
probabilityPercentage

Minimum value:
0%

Maximum value:
100%

Resolution:
1%

Format:
xxx%

Example:
3% for 3%

Remarks:
None

2.071 Probability Threshold

Definition:
Value represents the value of an environmental parameter that has been exceeded or forecasted to be exceeded.

Reference:

Item Type:
Simple Attribute (data type: Real)

Minimum value:
0

Resolution:
0.1 units

Format:
XX.X or XX

Camel Case:
probabilityThreshold

Remarks:
If probabilityThreshold is used to indicate a wind speed, probabilityThreshold cannot exceed a value of hurricane force (64kts, 119 kph, 74 mph,33 m/s) .

2.072 Probability of Speed Exceeding

Definition:
Indicate the probability of speeds (i.e. gusts, surface wind) exceeding a specified threshold.

Reference:

Item Type:
Complex attribute type

Camel Case:
probabilityOfSpeedExceeding

Sub-Attributes:
probabilityThreshold
speedUnits
probabilityPercentage

Remarks:

2.073 Saffir-Simpson Category

Definition:
The internationally accepted classification for tropical cyclone intensity based on maximum sustained wind speed.

Reference:
NWSI 10-604

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
saffirSimpsonCategory

1) **Saffir Simpson category 1**
   Definition: 64-82 knots
   Camel Case: saffirSimpsonCategory1

2) **Saffir Simpson category 2**
   Definition: 83-95 knots
   Camel Case: saffirSimpsonCategory2

3) **Saffir Simpson category 3**
   Definition: 96-112 knots
   Camel Case: saffirSimpsonCategory3

4) **Saffir Simpson category 4**
   Definition: 113-136 knots
   Camel Case: saffirSimpsonCategory4

5) **Saffir Simpson category 5**
   Definition: greater than 137 knots
   Camel Case: saffirSimpsonCategory5

Remarks:

2.074 Secondary Swell Wave Direction

Definition:
Directional component of secondary swell in degrees and cardinal directions.

Reference:

Item Type:
Complex attribute type (Data Type: directionFrom)

Camel Case:
secondarySwellWaveDirection

Sub-Attributes:
azimuthDegrees
cardinalDirection

Remarks:

2.075 Secondary Swell Wave Height

Definition:
Height component of secondary swell waves.

Reference:

Item Type:
Complex attribute type (Data Type: waveHeight)

Camel Case:
secondarySwellWaveHeight

Sub-Attributes:
heightLengthUnits
waveHeightValue

Remarks:

2.076 Secondary Swell Wave Period

Definition:
Time interval between two secondary swell wave crests.

Reference:
WMO-No. 702, 1.2.1.1

Item Type:
Complex attribute type (Data Type: period)

Camel Case:
secondarySwellWavePeriod

Sub-Attributes:
periodValue
timeUnits

Remarks:

2.077 Significant Wave Height

Definition:
Height component of significant waves.

Reference:

Item Type:
Complex attribute type (Data Type: waveHeight)

Camel Case:
significantWaveHeight

Sub-Attributes:
heightLengthUnits
waveHeightValue

Remarks:

2.078 Source Date

Definition:
The production date of the source, e.g. the date of measurement

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: text)

Camel Case:
sourceDate

Example:

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

2.079 Speed

Definition:
The speed of the movement of a feature.

Reference:

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
speed

Minimum value:
0

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

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

Format:
xx

Example:
3 for a speed of 2.5 to 3.4 m/s; 11 for a speed of 10.5 to 11.4 m/s

Remarks:

2.080 Speed Units

Definition:
The units for description of speed.

References:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
speedUnits

1) **metres Per Second (mps)**
   Camel Case: metresPerSecond

2) **kilometres per hour (kph)**
   Camel Case: kilometresPerHour

3) **miles per hour (mph)**
   Camel Case: milesPerHour

4) **nautical miles per hour (knots)**
   Camel Case: nauticalMilesPerHourKnots
   Alias: Knots

Remarks:
Defines the units of speed for other attributes.

2.081 Station Identifier

Definition:
The name or identifier of an environmental sensor (i.e. a land-based weather station)

Reference:

Item Type:
Simple Attribute (data type: Text)

Camel Case:
stationIdentifier

Remarks:

2.082 Status

Definition:
The operational status of an observation platform.

Reference:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
status

29) **fully operational**
Definition: Entire observation platform, and instruments, are operating in accordance with, or exceeding, manufacturer specifications.
Camel Case: fullyOperational

30) **partially operational**
Definition: At least one instrument that is part of an observation platform is not operating to manufacturer specification.
Camel Case: partiallyOperational

31) **drifting**
Definition: floating platform at the mercy of environmental elements, whether intention or not.
Camel Case: drifting

32) **broken**
Definition: Some or all instruments associated with an observation platform are damaged.
Camel Case: broken

33) **offline**
Definition: Some or all instruments associated with an observation platform are damaged.
Camel Case: offline

34) **discontinued**
Definition: observation station, suite of instruments, or an individual instrument, for a particular location, has been removed and is no longer at the particular location.
Camel Case: discontinued

35) **manual observation**
Definition: Manual observations: observations made by a human observer.
Camel Case: manualObservation

36) **unknown status**
Definition: Status of an observation platform, suite of instruments, or individual instrument is not known or unspecified
Camel Case: unknownStatus

Remarks:

2.083 Telephone number

Definition:
The telephone number of an entity.

Reference:
IHO Registry, Hydro Domain

Item Type:
Simple Attribute (data type: text)

Camel Case:
telephoneNumber

Remarks:
Maximum of 300 characters.

2.084 Text

Definition:
A non-formatted digital text string.

Reference:

Item Type:
Simple Attribute (data type: text)

Camel Case:
text

Remarks:
Maximum of 300 characters.

2.085 Temperature

Definition:
The physical quantity characterizing the mean random motion of molecules in a physical body.

References:
WMO-No. 182, T0150

Item Type:
Complex attribute type

Camel Case:
temperature

Sub-Attributes:
temperatureParamter
valueOfTemperature

Remarks:

2.086 Temperature Parameter

Definition:
The physical body of which temperature is measured.

Reference:
WMO-No. 182, T0150

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
timeUnits

1) **sea surface temperature**
   Definition: Temperature of the surface layer of a body of water
   WMO-No. 182, S3830
   Camel Case: seaSurfaceTemperature

2) **air temperature**
   Definition: The temperature indicated by a thermometer exposed to the air in a place sheltered from direct solar radiation.
   WMO-No. 182, A1390
   Camel Case: airTemperature

3) **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.
   WMO-No. 182, D0420
   Camel Case: dewPointTemperature

Remarks:

2.087 Thickness of Ice Accretion

Definition:
The depth, measured in centimetres, of accreting ice.

References:

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
thicknessOfIceAccretion

Minimum value:
0

Unit:
centimetres

Format:
xx

Remarks:

2.088 Time Interval

Definition:
A range of times for which a phenomena is valid.

References:

Item Type:
Complex attribute type

Camel Case:
timeInterval

Sub-Attributes:
timeUnits
intervalValue
validDateTime

Remarks:

2.089 Time Units

Definition:
Measurement unit of time, as defined by the International System of Units (SI).

Reference:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
timeUnits

4) **seconds**
   Definition: The duration of 9192631770 periods of the radiation cooresponding to the transition between two hyperfine levels of the ground state of the cesium 133 atom. (NIST Special Publication 330)
   Camel Case: seconds

5) **minutes**
   Definition: 60 seconds (NIST Special Publication 330)
   Camel Case: minutes

6) **hours**
   Definition: 60 minutes or 3600 seconds (NIST Special Publication 330)
   Camel Case: hours

7) **days**
   Definition: 24 hours or 86400 seconds (NIST Special Publication 330)
   Camel Case: days

Remarks:

2.090 Trend

Definition:
A description of a change through time.

Reference:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
trend

1) **increasing**
   Definition:
   Camel Case: increasing

2) **decreasing**
   Definition:
   Camel Case: decreasing

3) **no change**
   Definition:
   Camel Case: noChange

Remarks:
Time interval indicated by timeInterval attribute.

2.091 Valid Date 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.

Reference:
NWSI 10-303, 5.10

Item Type:
Simple Attribute (data type: DateTime)

Camel Case:
validDateTime

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.

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

2.092 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.

Reference:
WMO-No. 182, A2930
WMO-No. 485, Appendix II-4

Item Type:
Simple Attribute (data type: Real)

Camel Case:
valueOfAtmosphericPressure

Minimum value:
0

Unit:
hectopascal (hPa)

Resolution:
0.1 hPa

Format:
xxxx.x

Example:
998.1 for an atmospheric pressure of 998.1 hPa; 1021.6 for an atmospheric pressure of 1021.6 hPa

Remarks:

2.093 Value of Temperature

Definition:
The value representing the physical quantity characterizing the mean random motion of molecules in a physical body.

Reference:
WMO- No. 182, T0150
WMO-No. 485, Appendix II-4

Item Type:
Simple Attribute (data type: Real)

Camel Case:
valueOfTemperature

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

Remarks:

2.094 Value of Wind Speed

Definition:
The ratio value of the distance covered by the air to the time taken to cover it at the surface.

Reference:
WMO-No. 182, W1200
WMO-No. 471, 2.2.3
WMO-No. 558, Part I, 3.2.2

Item Type:
Simple Attribute (data type: Real)

Camel Case:
valueOfWindSpeed

Minimum value:
0

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

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

Example:
A surface wind speed of 2.5 m/s shall be encoded as 2.5; or 13.0 for a surface wind speed of 13.0 kt

Remarks:

2.095 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.

Reference:

Item Type:
Simple Attribute (data type: Real)

Camel Case:
visibilityRange

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

Resolution:
0.1 units

Format:
XXXX.X, where X is an integer

Example:
1000.0 for 1000 metres, or 5.5 for 5.5 nautical miles

Remarks:

2.096 Wave Height

Definition:
Height component of waves.

Reference:

Item Type:
Complex attribute type

Camel Case:
waveHeight

Sub-Attributes:
heightLengthUnits
waveHeightValue

Remarks:

2.097 Wave Height Change

Definition:
The change in the height component of waves.

Reference:

Item Type:
Complex attribute type (Data Type: generalChange)

Camel Case:
waveHeightChange

Sub-Attributes:
trend
timeInterval

Remarks:

2.098 Wave Height Value

Definition:
The average height of waves.

References:
IHO Hydrographic Dictionary, 5926
WMO-No. 471, 1.2.1.1
WMO-No. 558, Appendix I.4

Item Type:
Simple Attribute (data type: Integer)

Camel Case:
waveHeightValue

Minimum value:
0

Unit:
defined in the heightLengthUnits attribute, e.g. metre

Resolution:
1 unit

Format:
xx

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

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

2.099 Wave Direction

Definition:
Directional component of waves in degrees and cardinal directions.

Reference:

Item Type:
Complex attribute type (Data Type: directionFrom)

Camel Case:
waveDirection

Sub-Attributes:
azimuthDegrees
cardinalDirection

Remarks:

2.100 Wave Period

Definition:
Time interval between two wave crests.

Reference:
WMO-No. 702, 1.2.1.1

Item Type:
Complex attribute type (Data Type: period)

Camel Case:
wavePeriod

Sub-Attributes:
periodValue
timeUnits

Remarks:

2.101 Wave Period Change

Definition:
The change in the wave period of waves at two time values separated by a time interval.

Reference:

Item Type:
Complex attribute type (Data Type: generalChange)

Camel Case:
wavePeriodChange

Sub-Attributes:
trend
timeInterval

Remarks:

2.102 Weather Message

Definition:
A weather or sea bulletin that highlights conditions that impact the safety of navigation.

Reference:
WMO 558

Item Type:
Complex attribute type

Camel Case:
weatherMessage

Sub-Attributes:
nameDefinition
langaugeText
messageCategory
messageType
headline

Remarks:

2.103 Wind Average Period

Definition:
The period of time over which wind is averaged.

Reference:
WMO-No. 182, W1200

Item Type:
Complex attribute type (Data Type: period)

Camel Case:
windAveragePeriod

Sub-Attribute:
periodValue
timeUnits

Remarks:

2.104 Wind Direction

Definition:
The directional component, measured from which the wind blows, of air in motion relative to the Earth's surface.

Reference:
WMO-No. 182, W0930

Item Type:
Complex attribute type (Data Type: directionFrom)

Camel Case:
windDirection

Sub-Attribute:
azimuthDegrees
cardinalDirection

Remarks:

2.105 Wind Direction Change

Definition:
Directional change of surface wind vectors over a given time interval.

Reference:

Item Type:
Complex attribute type

Camel Case:
windDirectionChange

Sub-Attribute:
windDirectionTrend
timeInterval

Remarks:

2.106 Wind Direction Trend

Definition:
Description of how the wind direction has differed between two time values separated by a Time Interval.

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

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
changeInWindDirection

1) **wind shift**
   Definition: Sudden change of wind direction. (WMO-No. 182, W1160)
   Camel Case: windShift

2) **veering wind**
   Definition: Clockwise change of wind direction, in either hemisphere. (WMO-No. 182, V0130)
   Camel Case: veeringWind

3) **backing wind**
   Definition: Counter-clockwise change of wind direction, in either hemisphere. (WMO-No. 182, B0060)
   Camel Case: backingWind

1) **no change in wind direction**
   Definition: Wind direction has not noticeably changed over the last time interval.
   Camel Case: noChangeWindDirection

Remarks:
Attribute not mandatory if wind is steady.

Time interval indicated by timeInterval attribute.

2.107 Wind Wave Direction

Definition:
Directional component of wind waves in degrees and cardinal directions.

Reference:

Item Type:
Complex attribute type (Data Type: directionFrom)

Camel Case:
windWaveDirection

Sub-Attributes:
azimuthDegrees
cardinalDirection

Remarks:
None

2.108 Wind Speed

Definition:
Also referred to as mean speed, which is the ratio of the distance covered by the air to the defined finite time interval taken to cover it.

Reference:
WMO-No. 182, W1200

Item Type:
Complex attribute type

Camel Case:
windSpeed

Sub-Attribute:
valueOfWindSpeed
speedUnits
windAveragePeriod

Remarks:

2.109 Wind Speed Change

Definition:
Change in wind speed for a given time interval.

Reference:

Item Type:
Complex attribute type (Data Type: generalChange)

Camel Case:
windSpeedChange

Sub-Attributes:
trend
timeInterval

Remarks:

2.110 Wind Speed Range

Definition:
Wind speed category for a tropical cyclone.

Reference:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
windSpeedRange

1) **less than 34 knots**
   Definition:
   Camel Case: lessThan34Knots

2) **34 knots – 63 knots**
   Definition:
   Camel Case: 34Knots63Knots

3) **Greater than or equal to 64 knots**
   Definition:
   Camel Case: greaterThanOrEqualTo64Knots

Remarks:

2.111 Wind Velocity

Definition:
The combined magnitude and directional components of wind.

Reference:
WMO-No. 182, W1200

Item Type:
Complex attribute type (Data Type: airVelocity)

Camel Case:
windVelocity

Sub-Attribute:
windDirection
windSpeed

Remarks:

2.112 Wind Wave Height

Definition:
Height components of wind waves.

Reference:

Item Type:
Complex attribute type (Data Type: waveHeight)

Camel Case:
windWaveHeight

Sub-Attributes:
heightLengthUnits
waveHeightValue

Remarks: None

2.113 Wind Wave Period

Definition:
Time interval between wave crests of wind generated waves.

Reference:
WMO-No. 702, 1.2.1.1

Item Type:
Complex attribute type (Data Type: period)

Camel Case:
windWavePeriod

Sub-Attributes:
periodValue
timeUnits

Remarks:

2.114 Wind Warning Probability

Definition:
Attribute that indicates the probability of wind speeds (gusts and/or surface wind) exceeding a specified warning threshold.

Reference:

Item Type:
Complex attribute type

Camel Case:
windWarningProbability

Sub-Attributes:
windWarningThreshold
probabilityPercentage

Remarks:

2.115 Wind Warning Threshold

Definition:
Value represents the wind warning that has been exceeded or forecasted to be exceeded.

Reference:

Item Type:
Simple Attribute (data type: Enumeration)

Camel Case:
windWarningThreshold

1) **near gale force wind warning**
   Definition: Wind warning issued by a weather forecasting agency where wind speeds between 28 and 33 knots (Beaufort scale wind force 7) are forecasted to occur or are presently occurring.
   (WMo 558, Vol1, 2.2.4.1)
   Camel Case: nearGaleForceWindWarning

2) **gale force wind warning**
   Definition: Wind warning where wind speeds between 34 and 47 knots (Beaufort scale wind force 8 and 9) are forecasted or occurring.
   (WMo 558, Vol1, 2.2.4.1)
   Camel Case: galeForceWindWarning

3) **storm force wind warning**
   Definition: Wind warning where wind speeds between 48 and 55 knots or over (Beaufort scale wind force 10 or higher) are forecasted or occurring.
   (WMO 558 Vol1, 2.2.4.1)
   Camel Case: stormForceWindWarning

4) **hurricane force wind warning**
   Definition: Wind warning where sustained wind speeds 64 knots or higher are forecasted or occurring.
   (WMO 558, Vol1, Table 7)
   Camel Case: hurricaneForceWindWarning

Remarks:

2.116 WMO Header

Definition:
An established scheme used throughout the world for identifying meteorological products. These codes are defined in the WMO Manual 386.

Reference:
WMO No 386

Item Type:
Simple Attribute (data type: Text)

Camel Case:
wmoHeader

Remarks: