// NetCDF TEMPLATE FOR INTEGRAL WAVE PARAMETERS IN DELAYED MODE - EXAMPLE FOR SPOTTER BUOY FROM NSW

netcdf NCEI\_TimeSeries\_Orthogonal {

dimensions:

TIME = 1; //.................................................... REQUIRED - Number of time steps in the time series

timeSeries = 1; //............................................. REQUIRED - Number of time series (=1 for single time series)

variables:

int **timeSeries(timeSeries)** ; //.............................................................................. REQUIRED - If using the attribute below: cf\_role. Data type can be whatever is appropriate for the unique feature type.  
 timeSeries:long\_name = "Unique identifier for each feature instance"; //.... REQUIRED  
 timeSeries:cf\_role = "timeseries\_id"; //......................................................... REQUIRED

double **TIME(TIME)** ;//................................................................ The data type for time should be double (IMOS).

TIME:long\_name = "**time**" ; //............................................... REQUIRED (IMOS) - Provide a descriptive, long name for this variable.

TIME:standard\_name = "**time**" ; //......................................... REQUIRED (CF) - Do not change

TIME:units = "**days since 1950-01-01 00:00:00 UTC**" ; //... REQUIRED (CF and IMOS) - Use approved CF convention with approved UDUNITS.

TIME:calendar = "**gregorian**" ; //.......................................... REQUIRED - If the calendar is not default calendar, which is "gregorian".

TIME:sampling\_period\_timestamp\_location="**end**" ; //........ REQUIRED - The location of the timestamp within the sampling period assigned to the resulting value. The options are: "**start**", "**middle**", "**end**". (DBCP)

TIME:axis = "**T**" ; //................................................................ REQUIRED (CF) - Do not change.

TIME:comment = "**additional information about time**" ; //............. RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

double **LATITUDE(TIME)** ;//.......................................................................................................... The data type for latitude should be double (IMOS).

LATITUDE:long\_name = "**latitude of each observation**" ; //.................................................. REQUIRED (IMOS) - Provide a descriptive, long name for this variable.

LATITUDE:standard\_name = "**latitude**" ; //.............................................................................. REQUIRED (IMOS) - This is fixed, do not change.

LATITUDE:units = "**degrees\_north**" ; //................................................................................... REQUIRED - CF recommends degrees\_north, but at least must use UDUNITS.

LATITUDE:axis = "**Y**" ; //.......................................................................................................... REQUIRED - Do not change.

LATITUDE:valid\_min = **-90.0** ; //.............................................................................................. RECOMMENDED - The minimum value for this variable.

LATITUDE:valid\_max = **90.0** ; //.............................................................................................. RECOMMENDED - The maximum value for this variable.

LATITUDE:\_FillValue = **-9999.0** ;//.......................................................................................... REQUIRED - If there could be missing values in the data.

LATITUDE:reference\_datum = "**WGS84 coordinate reference system; EPSG:4326**" ; // ... REQUIRED IN IMOS CONVENTION, BUT NON-CF.

LATITUDE:comment = "**additional information about latitude**" ; //................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

double **LONGITUDE(TIME)** ; //....................................................................................................... The data type for longitude should be double (IMOS).

LONGITUDE:long\_name = "**longitude of each observation**" ; //............................................ REQUIRED (IMOS) - Provide a descriptive, long name for this variable.

LONGITUDE:standard\_name = "**longitude**" ; //......................................................................... REQUIRED (IMOS) - This is fixed, do not change.

LONGITUDE:units = "**degrees\_east**" ; //.................................................................................... REQUIRED - CF recommends degrees\_east, but at least use UDUNITS.

LONGITUDE:axis = "**X**" ; //........................................................................................................ REQUIRED - Do not change.

LONGITUDE:valid\_min = **-180.0** ; //.......................................................................................... RECOMMENDED - The minimum value for this variable.

LONGITUDE:valid\_max = **180.0** ; //........................................................................................... RECOMMENDED - The maximum value for this variable.

LONGITUDE:\_FillValue = **-9999.0** ;//........................................................................................ REQUIRED - If there could be missing values in the data.

LONGITUDE:reference\_datum = "**WGS84 coordinate reference system; EPSG:4326**" ; //... REQUIRED IN IMOS CONVENTION, BUT NON-CF.

LONGITUDE:comment = "**additional information about longitude**" ; //................RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WSSH(TIME)** ; //...................................................................................................... REQUIRED - This is **Hm0** and is a **CORE** variable (IMOS).

WSSH:long\_name = "**sea surface wave spectral significant height**" ; //................. REQUIRED - Provide a descriptive, long name for this variable.

WSSH:units = "**m**" ; //................................................................................................. REQUIRED - Use UDUNITS.

WSSH:valid\_min = **0.f** ; //............................................................................................ RECOMMENDED - Pre-defined conservative value limit for this variable.

WSSH:valid\_max = **100.f** ; //....................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WSSH:\_FillValue = **-9999.** ; //.................................................................................... REQUIRED - If there could be missing values in the data.

WSSH:coordinates = "**TIME LATITUDE LONGITUDE**" ; //............................... REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WSSH:method = "**Spectral analysis method**" ; //...................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WSSH:ancillary\_variables = "**WAVE\_quality\_control**" ; //.... REQUIRED - List other variables providing information about this variable.

WSSH:comment = " " ; //.................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WPFM(TIME)** ; //.................................................................................................... REQUIRED - This is **Tm/Tm01** and is a **CORE** variable (IMOS).

WPFM:long\_name = "**sea surface wave spectral mean period**"; //........................ REQUIRED - Provide a descriptive, long name for this variable.

WPFM:standard\_name = "**sea\_surface\_wave\_mean\_period\_from\_variance\_spectral\_density\_first\_frequency\_moment**"; //........... REQUIRED - The standard name from CF Tables.

WPFM:units = "**s**" ; //................................................................................................. REQUIRED - Use UDUNITS.

WPFM:valid\_min = **0.f** ; //.......................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WPFM:valid\_max = **50.f** ; //........................................................................................ RECOMMENDED - Pre-defined conservative value limit for this variable.

WPFM:\_FillValue = **-9999.** ; //.................................................................................. REQUIRED - If there could be missing values in the data.

WPFM:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WPFM:method = "**Spectral analysis method**" ; //.................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WPFM:ancillary\_variables = "**WAVE\_quality\_control**" ; //.. REQUIRED - List other variables providing information about this variable.

WPFM:comment = "**The first wave period is calculated as m0/m1 where m0 and m1 are the zeroth order and first order moments of the wave spectrum**" ; //........ RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WPPE(TIME)** ; //...................................................................................................... REQUIRED - This is **Tp** and is a **CORE** variable (IMOS).

WPPE:long\_name = "**peak wave spectral period**" ; //.............................................. REQUIRED - Provide a descriptive, long name for this variable.

WPPE:standard\_name = "**sea\_surface\_wave\_period\_at\_variance\_spectral\_density\_maximum**" ; //.......... REQUIRED - The standard name from CF Tables.

WPPE:units = "**s**" ; //................................................................................................... REQUIRED - Use UDUNITS.

WPPE:valid\_min = **0.f** ; //............................................................................................ RECOMMENDED - Pre-defined conservative value limit for this variable.

WPPE:valid\_max = **50.f** ; //......................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WPPE:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - If there could be missing values in the data.

WPPE:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WPPE:method = "**Spectral analysis method**" ; //..................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WPPE:ancillary\_variables = "**WAVE\_quality\_control**" ; //... REQUIRED - List other variables providing information about this variable.

WPPE:comment = "**Period of the peak of the energy spectrum**" ; //..................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **SSWMD(TIME)** ; //..................................................................................................... REQUIRED - This is **Dm** and is a **CORE** variable (IMOS).

SSWMD:long\_name = "**spectral sea surface wave mean direction**"; //.................... REQUIRED - Provide a descriptive, long name for this variable.

SSWMD:standard\_name = "**sea\_surface\_wave\_from\_direction**"; //......................... REQUIRED - The standard name from CF Tables.

SSWMD:units = "**degree**" ; //....................................................................................... REQUIRED - Use UDUNITS.

SSWMD:reference\_datum = "**true north**" ; //.............................................................. REQUIRED - Replace with magnetic or true north. True north is preferable. If providing magnetic north then also provide true north in DM by applying the magnetic declination correction.

SSWMD:magnetic\_declination = **12.86** ; //........... RECOMMENDED (IMOS) - Magnetic declination calculated at this location and time, ADD IT ONLY IF the true north variable was converted from magnetic north.

SSWMD:compass\_correction\_applied = **13** ; //..... RECOMMENDED if reference\_datum = true north (IMOS) and this variable was generated by compass correction applied to original compass measurement. Usually equals to magnetic declination. ADD IT ONLY IF the true north variable was converted from magnetic north.

SSWMD:positive = "**clockwise**" ; //...............................................................................REQUIRED - Defines the sign of the direction. Values are either clockwise or anticlockwise.

SSWMD:valid\_min = **0.f** ; //........................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

SSWMD:valid\_max = **360.f** ; //....................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

SSWMD:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - If there could be missing values in the data.

SSWMD:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

SSWMD:method = "**Spectral analysis method**" ; //..................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

SSWMD:ancillary\_variables = "**WAVE\_quality\_control**" ; //... REQUIRED - List other variables providing information about this variable.

SSWMD:comment = "**Direction (related to the true north) from which the mean period waves are coming from. (MAKE IT CLEAR HERE IS THE VARIABLE IS TRUE NORTH DIRECT FROM THE INSTRUMENT OR IF IT WAS CALCULATED FROM MAGNETIC NORTH!)**" ; //........ RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **SSWMD\_MAG(TIME)** ; //....... RECOMMENDED AND ONLY FOR NON-GPS BUOYS - This is **Dm** and is a **CORE** variable. The magnetic north needs to be indicated in the variable name by “\_MAG” (IMOS).

SSWMD\_MAG:long\_name = "**spectral sea surface wave mean direction**"; //.................... REQUIRED - Provide a descriptive, long name for this variable.

SSWMD\_MAG:standard\_name = "**sea\_surface\_wave\_from\_direction**"; //.......................... REQUIRED - The standard name from CF Tables.

SSWMD\_MAG:units = "**degree**" ; //........................................................................................ REQUIRED - Use UDUNITS.

SSWMD\_MAG:reference\_datum = "**true north**" ; //.............................................................. REQUIRED - Replace with magnetic or true north. True north is preferable. If providing magnetic north then also provide true north in DM by applying the magnetic declination correction.

SSWMD\_MAG:magnetic\_declination = **12.86** ; //.................................................................. RECOMMENDED (IMOS) - Magnetic declination calculated at this location and time, only if this true north variable was converted from magnetic north.

SSWMD\_MAG:compass\_correction\_applied = **13** ; //............................................................ RECOMMENDED if reference\_datum = true north (IMOS) and this variable was generated by compass correction applied to original compass measurement. Usually equals to magnetic declination.

SSWMD\_MAG:positive = "**clockwise**" ; //...............................................................................REQUIRED - Defines the sign of the direction. Values are either clockwise or anticlockwise.

SSWMD\_MAG:valid\_min = **0.f** ; //........................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

SSWMD\_MAG:valid\_max = **360.f** ; //....................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

SSWMD\_MAG:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - If there could be missing values in the data.

SSWMD\_MAG:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

SSWMD\_MAG:method = "**Spectral analysis method**" ; //..................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

SSWMD\_MAG:ancillary\_variables = "**WAVE\_quality\_control**" ; //... REQUIRED - List other variables providing information about this variable.

SSWMD\_MAG:comment = "**Direction (related to the magnetic north) from which the mean period waves are coming from. (MAKE IT CLEAR HERE THAT THE VARIABLE IS MAGNETIC NORTH DIRECT FROM THE INSTRUMENT!)**" ; //........ RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WPDI(TIME)** ; //.................................................................................................... REQUIRED - This is **Dp** and is a **CORE** variable (IMOS).

WPDI:long\_name = "**spectral peak wave direction**"; //........................................ REQUIRED - Provide a descriptive, long name for this variable.

WPDI:standard\_name = "**sea\_surface\_wave\_from\_direction\_at\_variance\_spectral\_density\_maximum**"; //....... REQUIRED - The standard name from CF Tables.

WPDI:units = "**degree**" ; //....................................................................................... REQUIRED - Use UDUNITS.

WPDI:reference\_datum = "**true north**" ; //.............................................................. REQUIRED - Replace with magnetic or true north.

WPDI:magnetic\_declination = **12.86** ; //.................................................................. RECOMMENDED (IMOS) - Magnetic declination calculated at this location and time.

WPDI:compass\_correction\_applied = **13** ; //............................................................ REQUIRED if reference\_datum = true north (IMOS) - compass correction applied to original compass measurement. Usually equals to magnetic declination.

WPDI:positive = "**clockwise**" ; //.............................................................................. REQUIRED - Defines the sign of the direction. Values are either clockwise or anticlockwise.

WPDI:valid\_min = **0.f** ; //........................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WPDI:valid\_max = **360.f** ; //...................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WPDI:\_FillValue = **-9999.** ; //.................................................................................. REQUIRED - If there could be missing values in the data.

WPDI:coordinates = "**TIME LATITUDE LONGITUDE**" ; //............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WPDI:method = "**Spectral analysis method**" ; //.................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WPDI:ancillary\_variables = "**WAVE\_quality\_control**" ; //... REQUIRED - List other variables providing information about this variable.

WPDI:comment = "**Direction (related to the magnetic north) from which the peak period waves are coming from.**" ; //........... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WMDS(TIME)** ; //..................................................................................................... REQUIRED - This is **DmSpr** and is a **CORE** variable (IMOS).

WMDS:long\_name = "**spectral sea surface wave mean directional spread**"; //..... REQUIRED - Provide a descriptive, long name for this variable.

WMDS:standard\_name = "**sea\_surface\_wave\_directional\_spread**"; //................... REQUIRED - The standard name from CF Tables.

WMDS:units = "**degree**" ; //........................................................................................ REQUIRED - Use UDUNITS.

WMDS:reference\_datum = "**true north**" ; //............................................................... REQUIRED - Replace with magnetic or true north.

WMDS:magnetic\_declination = **12.86** ; //................................................................... RECOMMENDED (IMOS) - Magnetic declination calculated at this location and time.

WMDS:compass\_correction\_applied = **13** ; //............................................................. REQUIRED if reference\_datum = true north (IMOS) - compass correction applied to original compass measurement. Usually equals to magnetic declination.

WMDS:positive = "**clockwise**" ; //...............................................................................REQUIRED - Defines the sign of the direction. Values are either clockwise or anticlockwise.

WMDS:valid\_min = **0.f** ; //........................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WMDS:valid\_max = **360.f** ; //...................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WMDS:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - If there could be missing values in the data.

WMDS:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WMDS:method = "**Spectral analysis method**" ; //..................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WMDS:ancillary\_variables = "**WAVE\_quality\_control**" ; //... REQUIRED - List other variables providing information about this variable.

WMDS:comment = "**?**" ; //.................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WPDS(TIME)** ; //........................................................................................................ REQUIRED - This is **DpSpr** and is a **CORE** variable (IMOS).

WPDS:long\_name = "**spectral sea surface wave peak directional spread**"; //........ REQUIRED - Provide a descriptive, long name for this variable.

WPDS:standard\_name = "**sea\_surface\_wave\_directional\_spread\_at\_variance\_spectral\_density\_maximum**"; //........ REQUIRED - The standard name from CF Tables.

WPDS:units = "**degree**" ; //.......................................................................................... REQUIRED - Use UDUNITS.

WPDS:reference\_datum = "**true north**" ; //................................................................ REQUIRED - Replace with magnetic or true north.

WPDS:magnetic\_declination = **12.86** ; //.................................................................... RECOMMENDED (IMOS) - Magnetic declination calculated at this location and time.

WPDS:compass\_correction\_applied = **13** ; //.............................................................. REQUIRED if reference\_datum = true north (IMOS) - compass correction applied to original compass measurement. Usually equals to magnetic declination.

WPDS:positive = "**clockwise**" ; //.................................................................................REQUIRED - Defines the sign of the direction. Values are either clockwise or anticlockwise.

WPDS:valid\_min = **0.f** ; //............................................................................................. RECOMMENDED - Pre-defined conservative value limit for this variable.

WPDS:valid\_max = **360.f** ; //........................................................................................ RECOMMENDED - Pre-defined conservative value limit for this variable.

WPDS:\_FillValue = **-9999.** ; //.................................................................................... REQUIRED - if there could be missing values in the data.

WPDS:coordinates = "**TIME LATITUDE LONGITUDE**" ; //............................... REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WPDS:method = "**Spectral analysis method**" ; //...................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WPDS:ancillary\_variables = "**WAVE\_quality\_control**" ; //.... REQUIRED - List other variables providing information about this variable.

WPDS:comment = "**?**" ; //.................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **TEMP(TIME)** ; //...................................................................................................... REQUIRED - This is **Temperature** and is a **CORE** variable but only for buoys that have a temperature sensor (IMOS).

TEMP:long\_name = "**sea water temperature at sea surface**" ; //........................... REQUIRED - Provide a descriptive, long name for this variable.

TEMP:standard\_name = "**sea\_water\_temperature**" ; //........................................... REQUIRED - The standard name from CF Tables.

TEMP:units = "**degrees\_Celsius**" ; //........................................................................ REQUIRED - Use UDUNITS.

TEMP:valid\_min = **0.f** ; //........................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

TEMP:valid\_max = **40.f** ; //......................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

TEMP:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - If there could be missing values in the data.

TEMP:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

TEMP:observation\_type = "**measured**" ; //............................................................... REQUIRED - Add details if temperature is measured or calculated.

TEMP:ancillary\_variables = "**TEMP\_quality\_control**" ; //..................................... REQUIRED - List other variables providing information about this variable.

TEMP:comment = "ADD EXAMPLE!" ; //............................................................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

byte **WAVE\_quality\_control(TIME)** ; //.................................................................................................. REQUIRED - This is the primary quality control flag.

WAVE\_quality\_control:long\_name = "**primary Quality Control flag for wave variables**" ; //... REQUIRED - Provide a descriptive, long name for this variable.

WAVE\_quality\_control:valid\_min = **1b** ; //...................................................................................... REQUIRED - Pre-defined conservative value limit for this variable.

WAVE\_quality\_control:valid\_max = **9b** ; //..................................................................................... REQUIRED - Pre-defined conservative value limit for this variable.

WAVE\_quality\_control:\_FillValue = **-127b** ; //................................................................................ REQUIRED - If there could be missing values in the data.

WAVE\_quality\_control:flag\_values = **1b, 2b, 3b, 4b, 9b** ; //........................................................... REQUIRED - The values for the flag coding. (IOC)

WAVE\_quality\_control:flag\_meanings = "**good not\_evaluated questionable bad missing**" ; //... REQUIRED - The meanings of the flag values. (IOC)

WAVE\_quality\_control:quality\_control\_convention = "**Ocean Data Standards, UNESCO 2013 - IOC Manuals and Guides, 54, Volume 3 Version 1**" ; //... REQUIRED. Not the IMOS standard flags.

byte **TEMP\_quality\_control(TIME)** ; //............................................................................................................ REQUIRED - This is the primary quality control flag.

TEMP\_quality\_control:long\_name = "**primary Quality Control flag for temperature variable**" ; //... REQUIRED - Provide a descriptive, long name for this variable.

TEMP\_quality\_control:valid\_min = **1b** ; //................................................................................................. REQUIRED - Pre-defined conservative value limit for this variable.

TEMP\_quality\_control:valid\_max = **9b** ; //................................................................................................ REQUIRED - Pre-defined conservative value limit for this variable.

TEMP\_quality\_control:\_FillValue = **-127b** ; //.......................................................................................... REQUIRED - If there could be missing values in the data.

TEMP\_quality\_control:flag\_values = **1b, 2b, 3b, 4b, 9b** ; //..................................................................... REQUIRED - The values for the flag coding. (IOC)

TEMP\_quality\_control:flag\_meanings = "**good not\_evaluated questionable bad missing**" ; //............. REQUIRED - The meanings of the flag values. (IOC)

TEMP\_quality\_control:quality\_control\_convention = "**Ocean Data Standards, UNESCO 2013 - IOC Manuals and Guides, 54, Volume 3 Version 1**" ; //... REQUIRED. Not the IMOS standard flags.

// ------------------------------------------------------------------ R E C O M M E N D E D V A R I A B L E S --------------------------------------------------------------------------------

float **WHTH(TIME)** ; //....................................... RECOMMENDED - This is **Hsig** and is a **DESIRABLE** variable. Although, if this variable is provided, all attributes here are REQUIRED!

WHTH:long\_name = "**sea surface wave significant height from time domain analysis**"; //... REQUIRED - Provide a descriptive, long name for this variable.

WHTH:standard\_name = "**sea\_surface\_wave\_significant\_height**"; //..................... REQUIRED - The standard name from CF Tables.

WHTH:units = "**m**" ; //................................................................................................ REQUIRED - Use UDUNITS.

WHTH:valid\_min = **0.f** ; //........................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WHTH:valid\_max = **100.f** ; //...................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WHTH:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - If there could be missing values in the data.

WHTH:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WHTH:method = "**Time domain analysis method**" ; //............................................ REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WHTH:ancillary\_variables = "**WAVE\_quality\_control**" ; //... REQUIRED - List other variables providing information about this variable.

WHTH:comment = "**….**" ; //................................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WMXH(TIME)** ; //....................................... RECOMMENDED - This is **Hmax** and is a **DESIRABLE** variable. Although, if this variable is provided, all attributes here are REQUIRED!

WMXH:long\_name = "**maximum height of waves on the water body**"; //............ REQUIRED - Provide a descriptive, long name for this variable.

WMXH:standard\_name = "**sea\_surface\_wave\_maximum\_height**"; //.................... REQUIRED - The standard name from CF Tables.

WMXH:units = "**m**" ; //............................................................................................... REQUIRED - Use UDUNITS.

WMXH:valid\_min = **0.f** ; //........................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WMXH:valid\_max = **100.f** ; //...................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WMXH:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - if there could be missing values in the data.

WMXH:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WMXH:method = "**Time domain analysis method**" ; //............................................ REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WMXH:ancillary\_variables = "**WAVE\_quality\_control**" ; //... REQUIRED - List other variables providing information about this variable.

WMXH:comment = "…." ; //................................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WPMH(TIME)** ; //....................................... RECOMMENDED - This is **Tz** and is a **DESIRABLE** variable. Although, if this variable is provided, all attributes here are REQUIRED!

WPMH:long\_name = "**average upcross wave period**"; //........................................ REQUIRED - Provide a descriptive, long name for this variable.

WPMH:standard\_name = "**sea\_surface\_wave\_zero\_upcrossing\_period**"; //......... REQUIRED - The standard name from CF Tables.

WPMH:units = "**s**" ; //.................................................................................................. REQUIRED - Use UDUNITS.

WPMH:valid\_min = **0.f** ; //............................................................................................ RECOMMENDED - Pre-defined conservative value limit for this variable.

WPMH:valid\_max = **50.f** ; //....................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WPMH:\_FillValue = **-9999.** ; //.................................................................................... REQUIRED - if there could be missing values in the data.

WPMH:coordinates = "**TIME LATITUDE LONGITUDE**" ; //............................... REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WPMH:method = "**Time domain analysis method**" ; //............................................. REQUIRED - Add details of analysis method used to calculate the variable.

WPMH:ancillary\_variables = "**WAVE\_quality\_control**" ; //.... REQUIRED - List other variables providing information about this variable.

WPMH:comment = "**....**" ; //............................. RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WPSM(TIME)** ; //....................................... RECOMMENDED - This is **Tm02 (or spectral Tz)** and is a **DESIRABLE** variable. Although, if this variable is provided, all attributes here are REQUIRED!

WPSM:long\_name = "**sea surface wave mean period from variance spectral density second frequency moment**"; //....................... REQUIRED - Provide a descriptive, long name for this variable.

WPSM:standard\_name = "**sea\_surface\_wave\_mean\_period\_from\_variance\_spectral\_density\_second\_frequency\_moment**"; //...... REQUIRED - The standard name from CF Tables.

WPSM:units = "**s**" ; //................................................................................................. REQUIRED - Use UDUNITS.

WPSM:valid\_min = **0.f** ; //........................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WPSM:valid\_max = **100.f** ; //...................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WPSM:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - if there could be missing values in the data.

WPSM:coordinates = "**TIME LATITUDE LONGITUDE**" ; //............................... REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WPSM:method = "**Spectral analysis method**" ; //..................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WPSM:ancillary\_variables = "**WAVE\_quality\_control**" ; //... REQUIRED - List other variables providing information about this variable.

WPSM:comment = "**The square root of ratio of the zeroth and second-order moment of the non-directional wave spectrum.** " ; //............. RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WPTH(TIME)** ; //....................................... RECOMMENDED - This is **Tsig** and is a **DESIRABLE** variable. Although, if this variable is provided, all attributes here are REQUIRED!

WPTH:long\_name = "**wave period of H1/3**"; //......................................................... REQUIRED - Provide a descriptive, long name for this variable.

WPTH:standard\_name = "**sea\_surface\_wave\_significant\_period**"; //...................... REQUIRED - The standard name from CF Tables.

WPTH:units = "**s**" ; //..................................................................................................... REQUIRED - Use UDUNITS.

WPTH:valid\_min = **0.f** ; //.............................................................................................. RECOMMENDED - Pre-defined conservative value limit for this variable.

WPTH:valid\_max = **100.f** ; //.......................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

WPTH:\_FillValue = **-9999.** ; //...................................................................................... REQUIRED - if there could be missing values in the data.

WPTH:coordinates = "**TIME LATITUDE LONGITUDE**" ; //................................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WPTH:method = "**Time domain analysis method**" ; //............................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WPTH:ancillary\_variables = "**WAVE\_quality\_control**" ; //...... REQUIRED - List other variables providing information about this variable.

WPTH:comment = "**The average period of the highest 1/3 of waves from time domain analysis.** " ; //.......... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **WPTE(TIME)** ; //....................................... RECOMMENDED - This is **T10** and is a **DESIRABLE** variable. Although, if this variable is provided, all attributes here are REQUIRED!

WPTE:long\_name = "**sea surface wave mean period of highest tenth**"; //................. REQUIRED - Provide a descriptive, long name for this variable.

WPTE:standard\_name = "**sea\_surface\_wave\_mean\_period\_of\_highest\_tenth**"; //.... REQUIRED - The standard name from CF Tables.

WPTE:units = "**s**" ; //......................................................................................................... REQUIRED - Use UDUNITS.

WPTE:valid\_min = **0.f** ; //.................................................................................................. RECOMMENDED - Pre-defined conservative value limit for this variable.

WPTE:valid\_max = **100.f** ; //.............................................................................................. RECOMMENDED - Pre-defined conservative value limit for this variable.

WPTE:\_FillValue = **-9999.** ; //.......................................................................................... REQUIRED - if there could be missing values in the data.

WPTE:coordinates = "**TIME LATITUDE LONGITUDE**" ; //..................................... REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

WPTE:method = "**Time domain analysis method**" ; //................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

WPTE:ancillary\_variables = "**WAVE\_quality\_control**" ;//........... REQUIRED - List other variables providing information about this variable.

WPTE:comment = "**The average period of the highest 1/10 of waves from time domain analysis.** " ; //.................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **THMAX(TIME)** ; //....................................... RECOMMENDED - This is **Tmax** and is a **DESIRABLE** variable. Although, if this variable is provided, all attributes here are REQUIRED!

THMAX:long\_name = "**period of the highest wave**"; //.......................................... REQUIRED - Provide a descriptive, long name for this variable.

THMAX:standard\_name = "**sea\_surface\_wave\_period\_of\_highest\_wave**"; //...... REQUIRED - The standard name from CF Tables.

THMAX:units = "**s**" ; //................................................................................................ REQUIRED - Use UDUNITS.

THMAX:valid\_min = **0.f** ; //.......................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

THMAX:valid\_max = **100.f** ; //..................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

THMAX:\_FillValue = **-9999.** ; //.................................................................................. REQUIRED - if there could be missing values in the data.

THMAX:coordinates = "**TIME LATITUDE LONGITUDE**" ; //............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

THMAX:method = "**Time domain analysis method**" ; //.......................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

THMAX:ancillary\_variables = "**WAVE\_quality\_control**" ; //.. REQUIRED - List other variables providing information about this variable.

THMAX:comment = "**The wave period associated with Hmax.** " ; //...................... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

float **TP2(TIME)** ; //....................................... RECOMMENDED - This is **TP2 (or Tp5)** and is a **DESIRABLE** variable. Although, if this variable is provided, all attributes here are REQUIRED!

TP2:long\_name = "**sea\_surface\_wave\_period\_at\_second\_largest\_peak\_of\_variance\_spectral\_density**"; //...... REQUIRED - Provide a descriptive, long name for this variable.

TP2:units = "**s**" ; //................................................................................................. REQUIRED - Use UDUNITS.

TP2:valid\_min = **0.f** ; //.......................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

TP2:valid\_max = **100.f** ; //...................................................................................... RECOMMENDED - Pre-defined conservative value limit for this variable.

TP2:\_FillValue = **-9999.** ; //................................................................................... REQUIRED - if there could be missing values in the data.

TP2:coordinates = "**TIME LATITUDE LONGITUDE**" ; //.............................. REQUIRED - A blank-separated list of the names of the relevant variables that include spatio-temporal coordinate information.

TP2:method = "**Spectral analysis method**" ; //.................................................... REQUIRED - Add details of analysis method used to calculate the variable. (DBCP)

TP2:ancillary\_variables = "**WAVE\_quality\_control**" ; //.... REQUIRED - List other variables providing information about this variable.

TP2:comment = "**The peak wave period as computed by the Read method. TP5 has less statistical variability than Tp because it is based on spectral moments.**";//.... RECOMMENDED - Add useful, additional information here like miscellaneous information about the data, not captured elsewhere.

// global attributes: (in yellow - content can be found in the [global\_attributes](https://universitytasmania.sharepoint.com/:x:/r/sites/ARDCNationalInfrastructureforin-situwaveobservations/Shared%20Documents/General/Work_Package_2/Data_Metadata_Standards/global_attributes_partners_PLEASE_FILL_IN.xlsx?d=w76c7d5a70a6740a783ebe6ff45af5982&csf=1&web=1&e=LGjzhq) spreadsheet)

:abstract = " " ; // CHECK SPREADSHEET; //.......REQUIRED - A paragraph describing the dataset: type of data contained in the dataset, how the data was created, the creator of the dataset, the project for which the data was created, the geospatial coverage of the data, the temporal coverage of the data. (IMOS)

:acknowledgement = " " ; // CHECK SPREADSHEET; //.......REQUIRED - Information about how to acknowledge the source of the material. For data produced under the IMOS project, the field must be filled as shown in the example. If relevant, also credit other organisations involved in collection of this particular data stream. (IMOS)

:author = " " ; // CHECK SPREADSHEET; //...................REQUIRED - Name of the person responsible for the creation of the dataset. Convention is last name and then first name separated by a comma. (IMOS)

:buoy\_specification\_url = "[link to the buoy specification document online] " ; //.................RECOMMENDED - Point to a manual online that provides complete buoy specifications.

:cdm\_data\_type = "**Station**"; //................REQUIRED - The data type, as derived from Unidata's Common Data Model Scientific Data types and understood by THREDDS. (ACDD)

:citation = " " ; // CHECK SPREADSHEET; //...................REQUIRED - The citation to be used in publications using the dataset should follow the format: “IMOS. [year-of-datadownload], [Title], [Data access URL], accessed [dateof-access]”. (IMOS)

:Conventions = "**CF-1.6**"; //....................REQUIRED - Name of the format convention used by the dataset. (IMOS)

:data\_centre = "**Australian Ocean Data Network (AODN)**" ; //..................................REQUIRED - Data centre in charge of the data management or party who distributed the resource. (IMOS)

:data\_centre\_email = "**info@aodn.org.au**" ; //..................................REQUIRED - Data Centre contact e-mail address. (IMOS)

:date\_created = "**2021-12-06T13:30:00Z**" ; //..................................REQUIRED - The date in UTC on which the file was created. (IMOS)

:disclaimer = " " ; // CHECK SPREADSHEET; //....REQUIRED - Statement limiting the liability of the data provider. (IMOS)

:firmware\_version = "**5555**" ;//........................RECOMMENDED - The version of the software used inside the buoy to do the processing of the data.

:geospatial\_lat\_min = **-32.90296** ; //.......................................... REQUIRED - Describes a simple lower latitude limit. (ACDD)

:geospatial\_lat\_max = **-32.90156** ; //......................................... REQUIRED - Describes a simple upper latitude limit. (ACDD)

:geospatial\_lon\_min = **151.79807** ; //......................................... REQUIRED - Describes a simple lower longitude limit. (ACDD)

:geospatial\_lon\_max = **151.79918** ; //........................................ REQUIRED - Describes a simple upper longitude limit. (ACDD)

:geospatial\_lat\_units = "**degrees\_north**" ; //.................. REQUIRED - Units for the latitude axis described in "geospatial\_lat\_min" and "geospatial\_lat\_max" attributes. Use UDUNITS compatible units. (ACDD)

:geospatial\_lon\_units = "**degrees\_east**"; //..................... REQUIRED - Units for the longitude axis described in "geospatial\_lon\_min" and "geospatial\_lon\_max" attributes. Use UDUNITS compatible units. (ACDD)

:hull\_serial\_number = "**98765**" ; //............REQUIRED - The serial number of the hull. Spotter and Triaxys have only one serial number for both hull and eletronic\_box. In this case, repeat number in both attributes. (CDIP)

:institution = " " ; // CHECK SPREADSHEET; //........................REQUIRED - Name of the institute or facility where the original data was produced. (IMOS)

:instrument = "**SOFAR Spotter-V2**" ; //........................REQUIRED - The make and model of the instruments from which the data has been collected (IMOS). Options are (and in this format): "**SOFAR Spotter-V1**", "**SOFAR Spotter-V2**", "**Datawell DWR MkIII**", "**Datawell DWR-G4**", "**Datawell DWR4**", "**TRIAXYS**"

:instrument\_burst\_duration = **1800** ; //....................... REQUIRED - The recording duration in seconds. (IMOS)

:instrument\_burst\_interval = **3600** ; //....................... REQUIRED - The recording interval in seconds. (IMOS)

:instrument\_burst\_unit = "**s**" ; //....................... REQUIRED – Do not change; The unit for instrument burst duration and interval which is seconds. (IMOS)

:instrument\_sampling\_interval = **0.4** ; //....................... REQUIRED - The sampling interval in seconds. (IMOS)

:license = "**http://creativecommons.org/licenses/by/4.0/**"; //........................REQUIRED - Describe the restrictions to data access and distribution. (IMOS)

:platform = "**moored surface buoy**" ; // OR SHOULD IT BE MOORING?....... REQUIRED - The platform that contains the instrument, platform description. They are listed in Reference Table 3 of the File Naming Convention document. (IMOS)

:principal\_investigator = " " ; // CHECK SPREADSHEET; //.............REQUIRED - Name of the principal investigator in charge of the platform. Convention is last name and then first name separated by a comma. (IMOS)

:principal\_investigator\_email = " " ; // CHECK SPREADSHEET; //....REQUIRED - Email of the principal investigator in charge of the platform. Convention is last name and then first name separated by a comma. (IMOS)

:project = " " ; // CHECK SPREADSHEET; //........................ REQUIRED - The scientific project that produced the data. (IMOS)

:source = "**Integral wave parameters measured and/or calculated by Sofar buoys using GPS information.**" ; //......RECOMMENDED - General description of how the buoy works or the method of production of the original data. If it is observational, source should characterize it. Attention that this will change depending on the buoy model/type. This attribute is defined in the CF Conventions. (ACDD)

:standard\_name\_vocabulary = "**NetCDF Climate and Forecast (CF) Metadata Convention CF standard name table v78**" ; //............ REQUIRED - Table number used for CF standard names. (IMOS)

:site\_name = "**Stockton**" ; //........................REQUIRED - The name of the station where the buoy is deployed.

:time\_coverage\_duration = "**P1Y4M6DT12H30M5S**" ; //...... RECOMMENDED - Describes the duration of the data set. Use ISO 8601:2004 for date and time (https://aquadocs.org/bitstream/handle/1834/4467/54\_2.pdf?sequence=1&isAllowed=y). (ACDD)

:time\_coverage\_end = "**2021-04-09T09:00:00Z**" ; //.......................... REQUIRED - Describes the time in UTC of the last data point in the data set. Use ISO 8601:2004 for date and time. (ACDD)

:time\_coverage\_start = "**2019-12-06T10:30:00Z**" ; //......................... REQUIRED - Describes the time in UTC of the first data point in the data set. Use ISO 8601:2004 for date and time. (ACDD)

:title = " " ; // CHECK SPREADSHEET; //................... REQUIRED - Short description of the dataset. (IMOS)

:watch\_circle = **10** ; //........................ RECOMMENDED - The radius in meter around the mooring which can be a range of the buoy location . (DBCP)

:water\_depth = **12.0** ; //........................REQUIRED - The depth in meters of the location where the buoy is deployed. (IMOS)

:water\_depth\_reference = "**The Australian Height Datum (AHD)**" ; //........................RECOMMENDED - The reference datum.

:water\_depth\_source = "**chart**" ; //........................RECOMMENDED - How the water depth measurement is made. The options are: "**chart**", "**GPS**", "**echosounder**".

:water\_depth\_units = "**m**" ; //........................RECOMMENDED - The units for the depth of the location where the buoy is deployed. (IMOS)

:wave\_buoy\_type = "**directional**" ; //........................REQUIRED - The type of the buoy, options are either ‘**directional**’ or ‘**non-directional**’.

:wave\_motion\_sensor\_type = "**GPS**" ; //........................REQUIRED - The sensor type used to measure waves/surface displacement, options are either ‘**GPS**’ or ‘**accelerometer**’.

:wave\_sensor\_serial\_number = "**123ABC**" ;//........……............... REQUIRED - The serial number for the wave sensor. (DBCP)

}