

Table 1: Exchange data format - JONAS project proposal.

Object name	Object field	Required	Object Type	Dimension	Field definition	Example
/	group				General description of the field	
format_version	attribute	Yes	string(10)		Format specification version	e.g.”EDF1.0”
author	attribute	Yes	string(30)		Creator of the HDF5 file	e.g.”Ricardo DUARTE”
institution	attribute	Yes	string(50)		Data provider Institution	e.g.”University of Algarve, SIPLAB”
country_code	attribute	Yes	string(5)		Country and region codes according to ISO 3166	e.g.”PT for Portugal”
contact	attribute	Yes	string(50)		Contact for all external queries in the future	e.g.”e-mail:rjduarte@ualg.pt”
start_date	attribute	Yes	integer(20)		Data when the analysis started according to ISO 8601	e.g.”20190131 for the 31st of January 2019”
end_date	attribute	Yes	integer(20)		Data when the analysis ended according to ISO 8601	e.g.”20190231 for the 31st of February 2019”
date_of_creation	attribute	Yes	integer(20)		File creation date according to ISO 8601	e.g.”20190310 for the 10th of March 2019”
purpose	attribute	Optional	string(500)		Objective of the experimental/numerical analysis	e.g.”Evaluation of the underwater noise at Azores archipelago included in JONAS project”
data_uuid	attribute	Yes	string(30)		Data unique identification number, linking exchange data with raw data using: ”country_code-year-month_day-datatype-file_number/total_files	e.g.”PT-2020-0615-EXP-0001-0010”
data_type	attribute	Yes	string(20)		Indication whether is experimental, numerical or combined data	e.g.”Combined”
comments	attribute	Optional	string(300)		Generic observations	e.g.”Complete dataset”
/analysis_metadata	group				General description of the file metadata	
/experimental	group	Yes			General description of the experimental metadata	
setup	attribute	Optional	string(20)		Description of the deployment: Autonomous - AUT; Cable Mounted - CM; Combined - COMB; Bottom Frame - BF; From Vessel - FV; Glider - GLD Mooring with floating buoy - MFB; Other - OTH	e.g.”CM” and ”BF”
/recorder	group				General description of the recorder	
recorder_manufacturer	attribute	Optional	string(100)		Recorder manufacturer	e.g.”MarSensing Lda.”
recorder_serial_number	attribute	Optional	string(100)		Recorder serial number	e.g.”SN45736”
recorder_model	attribute	Optional	string(100)		Recorder model	e.g.”SR-1”
builtin_hydrophone	attribute	Optional	string(5)		Recorder and the hydrophone are one	e.g.”Yes”
/hydrophone	group				General description of the hydrophones	
hydrophone_manufacturer	dataset	Optional	string(100)	hydrophone_count	Hydrophone manufacturer	e.g.”MarSensing Lda.”
hydrophone_sensitivity	dataset	Yes	float(10)	hydrophone_count	Hydrophone sensitivity provided by the manufacturer in $dBre1V/\mu Pa$	e.g.”-185”
hydrophone_serial_number	dataset	Optional	string(100)	hydrophone_count	Hydrophone serial number	e.g.”SN-SR1-2019-2”
hydrophone_model	dataset	Optional	string(100)	hydrophone_count	Hydrophone model	e.g.”SR1”
/calibration	group				General description of the equipment calibration for each hydrophone	
calibration_frequency_count	dataset	Yes	integer(2)	hydrophone_count	Number of frequencies used to calibrate hydrophones	e.g.”1”
calibration_datetime	dataset	Yes	integer(20)	hydrophone_count	Date and time when the system was calibrated according to ISO 8601	e.g.”20180101 for the 1st of January of 2018”
calibration_factor	dataset	Yes	float(5)	hydrophone_count x calibration_frequency_count	Factor to convert raw data from volts to dB re $1\mu Pa$	e.g.”1000”
calibration_procedure	dataset	Yes	string(300)	hydrophone_count	Procedure used to calibrate hydrophones according to ICES codes. See the entire ICES code list at: ” vocab.ices.dk/?ref=1591 ”	e.g.”CPC”
reference_frequencies	dataset	Yes	float(5)	hydrophone_count x calibration_frequency_count	Calibration frequencies in Hz	e.g.”100”
/numerical_model	group	Yes			General description of the numerical model metadata	
ais_database	attribute	Yes	string(100)		Description of the AIS database used in the numerical models.	e.g.”AISHub - www.aishub.net ”
source_levels	dataset	Yes	integer(10)		Description of the emitted source levels in dB by vessel category according to their AIS ship type code First line indicating the ship type and second line the corresponding source level	e.g.”[50 60 80; 170 120 180] ”
bathymetry_database	attribute	Yes	string(100)		Description of the bathymetry database	e.g.”GEBCO - www.gebco.net ”
temperature_database	attribute	Yes	string(100)		Description of the water column temperature database	e.g.”COPERNICUS - www.copernicus.eu ”
salinity_database	attribute	Yes	string(100)		Description of the water column salinity database	e.g.”COPERNICUS - www.copernicus.eu ”
sound_speed_profile_model	attribute	Yes	string(100)		Description of model used to calculate the sound speed profile	e.g.”K.Mackenzie-nine-term equation”
propagation_model	attribute	Yes	string(10)		Description of the propagation model	e.g.”Kraken”
numeric_data_calibration	attribute	Yes	string(50)		Description of the experimental data file used to calibrate numerical models.	e.g.”data_uidn:xxxx-xxxx-xxxx-xxxx”
/ambient_noise_dataset	group	Yes			General description of ambient noise	
/position	group	Yes			General description of the location	
hydrophone_count	dataset	Yes	integer(2)		Number of hydrophones	e.g.”1”
total_number_of_grid_points	dataset	Yes	integer(10)		Total number of points in the numerical grid	e.g.”1000”
longitude	dataset	Yes	float(10)	hydrophone/grid_count x time_count	Longitude coordinates vector in decimal degrees	e.g.”[40.446,...,41.115]”
latitude	dataset	Yes	float(10)	hydrophone/grid_count x time_count	Latitude coordinates vector in decimal degrees	e.g.”[79.982,...,81.281]”
depth	dataset	Yes	float(10)	hydrophone/grid_count x time_count	Depth vector according to the mean reference sea level in meters	e.g.”10”
/frequency	group	Yes			General description of ambient noise frequencies	
frequency_count	dataset	Yes	integer(10)	frequency_count	Number of frequencies	e.g.”2”
frequency_band_definition	dataset	Yes	float(5)	frequency_count	Describes the frequency band used and base	e.g.”1/3-octave-band in base 2”
frequency	dataset	Yes	float(5)	frequency_count	Frequencies in Hz at which the SPL is calculated	e.g.”63” and ”126”
/time	group	Yes			General description of ambient noise time	
time_duty_on	attribute	Yes	integer(10)		Duration that the device is recording	e.g.”30 minutes”
time_duty_off	attribute	Yes	integer(10)		Duration that the device is not recording.	e.g.”30 minutes”
time_count	dataset	Yes	float(10)		If the device is always recording type ”0”	e.g.”1250”
time	dataset	Yes	float(10)	time_count	Number of time entrances since start_datetime Time vector in POSIX time seconds	e.g.”[1562151105,...,1562153100]”
/sound_pressure_levels	group	Yes			General description of sound pressure levels (spl)	
averaging_time	attribute	Yes	integer(5)		Averaging time in seconds	e.g.”1”
spl_values	dataset	Yes	float(10)	hydrophone/grid_count x frequency_count x time_count	SPL over time for all covered frequency bands in dB re $1\mu Pa^2/Hz$ Using: $SPL(f) = 10\log_{10}\left(\frac{P_{ss}}{B\Delta f^2 f_{ref}^2}\right) - S(f)$	e.g.”[25,...,30]”
/sound_pressure_levels_stats	group	Yes			General description of sound pressure levels statistics	
percentile_count	dataset	Yes	integer(2)	percentile_count	Number of percentiles	e.g.”7”
percentile_list	dataset	Yes	integer(50)		List of percentiles	e.g.”5,10,25,50,75,90,95”
percentile_values	dataset	Yes	float(10)	hydrophone/grid_count x frequency_count x percentile_count	SPL considered percentiles in [dB re $1\mu Pa^2$]	e.g.”[74,...,81]”