

# Database of processed data

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Partners Involved	CNR, BWI, ARPA FVG
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#### 1 Summary

The document describes database was developed for archiving underwater noise raw data in WAV format, and PSL data averaged at 20 second time intervals and corresponding referral data. In addition, agreed procedures for upload/download, validation, data processing, and presentation of output data were implemented in the database. The database was developed in the third reporting period, and all collected data were uploaded in the last reporting period (November 2021).

#### 2 Introduction

Data collected in the frame of the project can be divided into four groups:

- 1. Metadata describing deployment, recovery and calibration
- 2. WAV files SPL (Sound Pressure level) sampled with 48000Hz
- 3. 1/3 octave spectrum for every 20s (or lower) period of SPL (WAV) data
- 4. Averages, statistical and processed data

For three of those categories relational database storage should be applied. WAV files (RAW data) should be stored only on the file system because of external processing and big amount of sequential data. Although meta data about where WAV files are saved (including links to WAV data) should be also stored in the database.

#### 3 FTP network storage

For raw WAV data network storage has been set. Storage is organized on the address data01.izor.hr, and 100 TB of storage is available.





Figure 1 FTP properties from network storage web interfaces

Standard FTP software can be used for connection to network storage and file upload. Naming rule to be used for raw wav files: Files should be stored in folders with following structure:

- First level folder data type (WAV, SPL, PROCESSED)
- Second level folder station name/ID (N1, N2, ...)
- Third level folder month of file beginning (2020\_02, 2020\_03, ...).

idamir@data01.izor.hr - FileZilla _ u x						
Datoteka Uređivanje Prikaz Prijenos Poslužitelj Straničnici Pomoć						
Poslužitelj: data01.izor.hr Korisničko ime: idamir Lozinka: ••••••	Port: Povezati 💌					
Stanje:       Provjera se certifikat         Stanje:       TLS connection established.         Stanje:       Logged in         Stanje:       Dobavljanje spiska sadržaja imenika måpa i datoteka         Stanje:       Directory listing of "/" successful						
Mjesni poslužitelj: /home/damir/Dokumenti/Projekti/Harmonia/vizualizacija/	Udaljeno mrežno mjesto: 🚺 👻					
<pre>&gt; / / Din / I SoundScapeData &gt; Doot &gt; dev &gt; dev &gt; det</pre>						
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upis1a.sql 1.476 sql-datoteka 24.04.20	SoundScapeData Mapa 20.04.2					
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📱 ivankovi@jadran.izor						
/home/damir/Doku> /home/ivankovi/hvizuali 18.604.6 Uobič						
Prijenosi na čekanju (1) Neuspješni prijenosi Uspješni prijenosi						

Figure 2 Connection to network storage using open source software FileZilla



Some steps that should be followed in different phases of data acquiring:

- Hydrophone deployment and recovery
  - Filling deployment and recovery sheets with metadata
  - Upload WAV files, calibration check WAV files, SVR\_CFG.XML file, SYSTEM.LOG file, CTD\_data deployment\_sheet.pdf and recovery\_sheet.pdf to the associated location at the NAS (network attached storage)
  - Inserting metadata to database from deployment\_sheet.pdf and recovery\_sheet.pdf for each station
- 1/3 octave spectrums for every 20s (or lower) period of SPL (WAV) data. Spectrums are generated using external processing software (SPL file extension or SPL files)
  - Uploading 1/3 octave spectrums data to the associated location at the NAS
  - Loading 1/3 octave spectrums files to database and joining with associated metadata
- Database processing procedures
  - Calculation of SPL averages for defined 1/3 octave band and time period
  - Data visualizations and first step validation.







### 5 Database properties and design

Database for data management and processing is relational database with web interface.

General database properties are:

- Linux CentOS 7 (enterprise Linux operating system)
- Oracle 19.3 database, Standard edition 2
- Oracle ORDS for database web interface
- Tomcat 9 application server
- Apache 2 web server, proxy and traffic encryption
- Https protocol for web interface (secured http)
- 128GiB DDR4 Synchronous 2666 MHz
- 2x Intel(R) Xeon(R) Gold 6130 CPU @ 2.10GHz (16 Cores, 32 Threads)
- RAID bus controller MegaRAID SAS-3 3108
- 2x logical volumes (Raid 50) 32TB OS and Database dedicated
- 2x Ethernet Connection X722 for 10GBASE-T
- Permanent Internet link 100Mbps (CARNet)
- UPS uninterruptible power supply

Database have two main parts: Metadata database and Database for loading and process SPL data.

### 6 Metadata database

This part of the database is designed to manage the monitoring station's metadata. The web interface is used with Google maps API 3 for spatial data visualization. All metadata can be inserted using web interface in particular for the station. Design of this part of database is classical with relations between main entities.





Figure 4 Relational diagram of main objects in metadata database

Web interface is used for inserting and data *view*. User can find and filter inserted cruises. For each cruise detailed metadata is available.







### 7 Database for loading and process SPL data

It is specially designed for loading and processing 1/3 octave spectrums of SPL (Sound Pressure level) data. Because of that spectrum files (SPL files) are generated by external software (Blackbox) 1/3 octave spectrum files have to fulfil some requirements to be suitable for importing to the database and for further data processing:

- Black box output files should be in textual format (ASCII) with separated columns (tab or semicolon separation)
- File names have to contain station name to join data with the rest of metadata, and beginning referent time of 1/3 octave spectrums of SPL assuming that step for each 20s spectrum is time-step fixed
- They can contain some number of metadata rows at beginning
- They have to contain timestamp column containing sample offset time from beginning
- Except timestamp column, rest of columns should contain sound pressure levels for predefined 1/3 octave bands in dB (re 1μPA) <sub>RMS</sub> values.

1	N1	#Unique Station name/ID
2	Rovinj	#Station description
3	Stipe Muslim	#Person responsible for deployment
4	44.93868333	#Latitude. Decimal degrees, WGS84
5	13.41166667	#Longitude. Decimal degrees, WGS84
6	40	#Water depth (m)
7	2	#Height above bottom (m)
8	04/07/2019	#Deployment date dd/mm/yyyy UTC
9	24/072019	#Recover date dd/mm/yyyy UTC
10	Sono.Valut.develogi	c#Hydrophone type
11	5321Af6	#Hydrophone unit Id
12	GRAS 42AG	#Calibrator type
13	02/07/2019T11:47	#Calibration and synchronization date and time at begin dd/mm/yyyyThh24:mi UTC
14	0.5	#Calibration offset at begin [dB]
15	02/07/2019T11:47	#Calibration and synchronization date and time at end dd/mm/yyyyThh24:mi UTC
16	0.6	#Calibration offset at end [dB]
17	25/07/2019T08:16	#Check Date and time of data logger dd/mm/yyyyThh24:mi UTC
18	3	#Total Logger Drift in seconds
19	Stipe Muslim	#Person responsible for wav processing
20	<pre>SpectraPlus-st_v5.2</pre>	#Processing program used
21	0.18	#Processing window (sec)
22	30/07/2019	#Procesing date dd/mm/yyyy
23	Time 20 25 31.	5 40 50 63 80 100 125 160 200 250 315 400 500 630 800 1000 1250 1600
24	00:00:00.170 58.	6624 68.4104 64.7379 73.9325 81.6903 88.6102 103.275 107.724 99.932 91.5189 87.4
25	00:00:00.341 63.	9988 68.6719 65.1888 79.6338 85.1357 90.6363 103.361 106.813 100.467 91.1887 88.6
26	00:00:00.512 64.	8091 68.9385 65.1306 87.1784 89.8086 94.8714 103.743 107.172 99.7945 91.0291 88.5
27	00.00.00 687 63	<u>8200 60 0676 65 5167 86 2278 00 6028 07 0508 103 001 106 021 08 0571 00 3310 80 9</u>

Figure 6 Example of 1/3 octave spectrums of SPL file



SPL data loading process is executing by appropriate batch script. Database loads files directly from NAS storage. Option for uploading data using a web browser was skipped because of the big data problem which requires too much time to load data to the database. Data is loaded using external tables. For file containing 126.561 rows, loading process took approx. 1 min.



Figure 7 Example of batch script

Three group of tables are used for processing SPL over each 1/3 octave band:

- Tables containing metadata about already loaded files and log which file is currently loading (green)
- Tables containing SPL loaded data in dB and converted to linear version of SPL data (red).
- Tables containing averaged data for different time periods (yellow).



ZVUK.BUKA_FILE		ZVUK.BUK/	A_LOG		ZVUK.BU	KA_META			
U * B,M,ID         NUMBER           B,FILE_ID         NUMBER           U * FILE_NAME         VARCHAR2 (1)           LOCAL_TIME         VARCHAR2 (2)           POMAK_START         VARCHAR2 (2)           POMAK_KRAJ         VARCHAR2 (2)           VRUEME_POCETAK         DATE           Ø BUKA_FILE_UK1 (B,M_ID, FILE_NAME)         Ø BUKA_FILE_UK1 (B,M_ID, FILE_NAME)	0 BYTE) BYTE) BYTE) BYTE) BYTE)	B_M_ID_NU B_FILE_ID_NU B_SREDNJACI_ID_NU AKCIJA_VAI TEKST_VAI	MBER MBER RCHAR2 (20 BYTE) RCHAR2 (2000 BYTE)		P * B M JD POSTAJA VRIJEME_DD VRIJEME_DO FFT_SIZE S_L_RESOLUTION SMOOTHING_W FFT_OVERLAP TIME_RESOLUTION DUBINA INTERV_USRED	NUMBER VARCHAR2 (40 I DATE DATE NUMBER VARCHAR2 (20 I NUMBER VARCHAR2 (20 I NUMBER NUMBER	BYTE) BYTE) BYTE)		
					🍉 BUKA_META_PK (B_M_	ID)			
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B FILE ID NUMBER	B FILE I	D NUMBER	1	_					
TIME DATE	TIME	VARCHAR2 (20 BYTE)			ZVUK.BUKA_SRED	IJACI		ZVUK.BUKA_SF	EDNJACI_META
K_25 NUMBER K_31 NUMBER K_40 NUMBER K_50 NUMBER K_80 NUMBER K_100 NUMBER K_125 NUMBER K_125 NUMBER K_125 NUMBER K_200 NUMBER K_200 NUMBER	K_25 K_31 K_40 K_50 K_63 K_80 K_100 K_125 K_160 K_200	NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER			K_20 K_20 K_21 K_40 K_63 K_63 K_80 K_100 K_125	NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER		B_SREDNJACI_ID PERIOD	NUMBER VARCHAR2 (20 BYTE)
K_235         NUMBER           K_400         NUMBER           K_500         NUMBER           K_500         NUMBER           K_800         NUMBER           K_1000         NUMBER           K_1250         NUMBER           K_1250         NUMBER           K_2000         NUMBER           K_2000         NUMBER           K_2000         NUMBER           K_2000         NUMBER           K_3150         NUMBER	K_2305 K_305 K_500 K_500 K_800 K_1000 K_1250 K_1600 K_2000 K_2000 K_2500 K_3150	NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER			K_100 K_200 K_250 K_315 K_400 K_500 K_500 K_630 K_800 K_1000 K_1250 K_1600 K_2000	NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER			
K_4000 NUMBER K_5000 NUMBER K_6300 NUMBER K_10000 NUMBER K_10000 NUMBER	K_4000 K_5000 K_6300 K_8000 K_10000 ♦ BUKA_RAV	NUMBER NUMBER NUMBER NUMBER NUMBER V_INDEX1 (B_FILE_D)			K_2500 K_3150 K_4000 K_5000 K_6300 K_8000 K_10000 BROJ_USREDNJENIH TOT	NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER			

Figure 8 SPL spectrums processing tables schema

SPL averages for each 1/3 octave band over various time periods are calculated inside the database. Time periods are user-selected and can be defined as:

- Minutes
- Hours
- Days
- Month

Referent time is pointing to the beginning of the averaged period (e.g. 25.07.2019 12:00 in hourly averages is for period from 25.07.2019 12:00 to 25.07.2019 13:00). Time in database is in UTC. Input SPL files should have time also in UTC. Exceptionally they can use different time zone, but is necessary to mark offset from UTC in that case.



#### 8 Data processing

After uploading SPL file user can insert some additional metadata about uploaded SPL spectrum files:

- Sea depth at station
- FFT size (samples)
- Spectral Line Resolution
- Smoothing Window
- FFT Overlap
- Time Resolution
- Local time.

List of the additional metadata can be easily changed or expanded. Uploaded SPL file sometime contains unwanted part at beginning or end of file (noise during deployment or during recovery of the instrument). Therefore, user can do trimming to uploaded data (using discard before and discard after parameters). After trimming SPL averages are recalculated. All loaded SPL data and SPL calculated averages are accessible via web browser.

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	SI	WW RAW CALCULATE AVERAGES DELETE RAW GRAPH OF THE AVERAGE	
Uploaded SPL: Save stations (+) New station NI	File Files: Save the file Odaberi datoteku Nijeeka.	Station Meta Station Name;hz         time since (yyyy mm.dd hh24: mi): 2019.08.10 06.36         time to: 2019.08.30 06.41           depth: undefined         FFT Size (samples): undefined         Smoothing Window: undefined         FFT Overlap: undefined	Time Resolution: undefined
N2 2019.08.10 - 2019.08.30 (81f, 20d) 2019.03.05 - 2019.03.15 (40f, 9.8d) 2018.08.06 - 2018.08.18 (40f, 15d)	N2_190810063620.zvp (126561) N2_190810123626.zvp (126561) N2_190810183630.zvp (126561) N2_19081003634.zvp (126561)	File Meta File Name: http://www.indefined discard before: undefined discard after: undefined dis	
N3 N4	N2 190811063638.zvp (126561) N2 190811123642.zvp (126561) N2 190811123648.zvp (126561) N2 190811183648.zvp (126561) N2 190812003654.zvp (126561)		
	N2 190812063700. PD (126561) N2 190812123706.zvp (126561) N2 190812183712.zvp (126561) N2 190813003719.zvp (126561) N2 190813003719.zvp (126561)		
	N2_19081303720.2vp (120501) N2_190813123731.zvp (120501) N2_190813183735.zvp (120501) N2_190814003740.zvp (120501) N2_190814005745.zvp (120501)		
	N2_190814123749.zvp (120561) N2_190814183754.zvp (120561) N2_190815003758.zvp (120561) N2_190815003758.zvp (120561)		
	N2 190815123807.zvp (126561) N2 190815183812.zvp (126561) N2 190816003816.zvp (126561) N2 190816063821.zvp (126561)		
	N2 190816123825.zvp (126561) N2 190816183830.zvp (126561) N2 190817003834.zvp (126561) N2 190817063838. PD (126561)		
	N2 190817123843.zvp (126561) N2 190817183847.zvp (126561) N2 190818003852.zvp (126561) N2 190818063856.zvp (126561)		
	N2_190818123901.zvp (120561) N2_190818183905.zvp (120561) N2_190819003910.zvp (120561) N2_190819003914.zvp (120561)		
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	N2_190820003952.zvp (120501) N2_190820123937.zvp (120501)	2008.1208 430 429 429 428 439 449 439 429 438 469 539 539 539 40 429 430 718 719 689 718 519 519 519 519 519 519 510 510 529 520 521 2008.1208 43 43 43 43 45 45 45 51 51 51 51 51 51 51 51 51 51 51 51 51	

Figure 9 Web form for uploaded SPL files management



#### 9 Data visualization

For data visualization, a special interactive view is developed using a Highcharts (Interactive JavaScript Charts) multi-platform charting library. Data retrieved to the client are in JSON (JavaScript Object Notation) format and they are processed on the client-side. User can select data in hierarchical way:

- Station Menu
- List of all available stations.

Data selection for an available period:

- Year
- Month
- Day

Show data using averaging period:

- Day
- Hour
- Minute.

The view is divided into three sections:

- Graph on top represents averaged SPL for appropriate 1/3 octave band over time or it represents a number of samples included in selected averaged period
- Graph in the middle represents averaged SPL spectrum for every 1/3 octave band for selected time period, with time slider and time controls
- The lowest graph represents the spectrogram for a whole loaded period. It is synchronized with the other two graphs. When a user clicks on some data in the spectrogram other two graphs automatically loads data for a clicked (selected) time and selected 1/3 octave band to show a more details.





Figure 10 Visualizations page shows selected point in the SPL spectrogram which is synchronized with SPL spectrum and SPL graph for selected band and time.



#### 10 Archived data in IOF and CNR databases and their availability

All data collected from nine stations during fifteen months' measurements have been archived in original "wav" data in two databases developed at IOF and CNR. According to the agreed data policy in the Soundscape project, "wav" data are classified, and 20 seconds' averaged SPL data are available for the broad community (End users).

Link to the IOF databases with the collection of available 20 seconds' averaged SPL data from all nine measuring stations collected during the recording period (March 1, 2020 – June 30, 2021) is:

FTP://data01.izor.hr/ (connect as: *anonymous* user).

At the Figure 11 there is an example of retrieved folders and data-files with 20 seconds averaged SPL archived t the NAS at the IOF server using *ftp* protocol.

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File Edit View	Transfer Server Bookmarks Help								
## • <b>B</b> T	TT 🕄 🕄 😫 🖏 🐛 🗊 🔍 🔍 🦚								
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Status: In	itializing TLS								
Status: TI	LS connection established.								
Status: Lo	ogged in								
Status: Ki	strieving directory listing								
Status: Re	etrieving directory listing of "/MS01_Aqua_alta"								
Status: Di	irectory listing of "/MS01_Aqua_alta" successful								
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Status: Re	etrieving directory listing of "/MS09_Ivana/2020_05"								
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	2 MSD3 Anona								
	MSUS_Ancona     MSUS_Ancona     MSUS_Ancona								
	MS05 Susak								
	2 MS06 Losini								
	2 MS07 Zirie								
	2 MS08_Split								
	- MS09_Ivana								
ė-	2020_03								
	2020_05								
		Filerin	Filetune	Last modified	Permissions	Chapter/Gro			
4 🔲 🕹 🕨	Filename	Filesizi	- Filetype	Last modified	Permissions	Owner/Gro			
Filename	20200513_000000-spl_soundscape-MS9_IVANA_2020_05-20s.csv	07,38	CSV File	26.1.2022.12:09:00	0555	idamir users			
1	20200513_010000-spi_soundscape-M59_IVANA_2020_05-205.csv	00,04	CSV File	26.1.2022.12:10:00	0000	idamir users			
	20200513_020000-spi_soundscape-M59_IVANA_2020_05-205.csv	07,54	CSV File	26.1.2022.12:10:00	0000	idamir users			
AWAC cot	20200513_030000-spl_soundscape-lvis9_tvArvA_2020_05-20s.csv	07,73	CSV File	26.1.2022.12:10:00	0555	idamir users			
RedWavel_dll	20200513_040000-spi_soundscape+M59_IVAINA_2020_05-205-059	67.21	CSV File	26.1.2022.12:10:00	0000	idamir users			
AWAC Manue	20200513_050000-spi_soundscape-M59_IVANA_2020_05-205-059	66.96	CSV File	26.1.2022. 12:10:00	0000	idamir users			
AWACHIP	20200513_060000-spi_soundscape-MS9_IVANA_2020_05-205-CSV	67.22	CSV File	26.1.2022. 12:10:00	0000	idamir users			
Awac.exe	20200513_0/0000-spi_soundscape-MS9_IVANA_2020_05-20s.csv	67.32	CSV File	26.1.2022. 12:10:00	0000	idamir users			
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	20200513_110000-spt_soundscape-MS9_TVAINA_2020_05-205-CSV	66.95	CSV File	20.1.2022.12:05:00	0555	idamir users			
	20200513_120000-spl_soundscape-ivise_iviArive_2020_05-205.csv	00,00	CSV File	20.1.2022. 12:10:00	0555	idamir users			
	20200513_150000-spl_soundscape-ivise_iviArive_2020_05-205-csv	00,03	CSV File	20.1.2022. 12:10:00	0555	idamir users			
	20200513_140000-spl_soundscape-ivias_ivANA_2020_05-205-csv	00,03	CSV File	20.1.2022. 12:10:00	0555	idamir users			
	20200513_150000-spl_soundscape-ivias_ivANA_2020_05-20s.csv	00,94-	CSV File	20.1.2022. 12:10:00	0555	idamir users			
	20200513_100000-spl_soundscape-Wise_IVANA_2020_05-20s.csv	66.02	CSV File	26.1.2022.12:10:00	0555	idamir users			
	20200513_1/0000-spl_soundscape-Wi39_IVANA_2020_05-20s.csv	66.02	CSV File	26.1.2022.12.10.00	0555	idamir users			
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Secure/Local file						Direction P	Permoto file	Size Brievity Status	
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Figure 11 An example of selected folders and data-files with 20 seconds averaged SPL data using *ftp* protocol



General overview off the number of collected data by time at the all nine measuring stations is shown at the Figure 6 (data format) and Tables 1, 2, 3 and 4 (data sets by station and deployment).

Table 1	General overview of the number of collected data by time at the measuring stations
	MS1 Aqua Alta and MS2 Azalea

Measurement station	Data set No.	Measurement period	Data recording days	Total operate days per station
	1	2020/02/21 - 2020/03/11	19	
	2	2020/04/09 - 2020/06/11	64	
	3	2020/06/15 – 2020/08/12	59	
MS1 AQUA ALTA	4	2020/08/12 – 2020/11/18	99	448
MS2 AZALEA	5	2020/11/18 – 2021/03/03	106	
	6	2021/03/11 – 2021/03/16	6	
	7	2021/05/04 – 2021/08/06	95	
	1	2020/02/29 – 2020/04/30	62	
	2	2020/05/31 – 2020/07/18	49	
	3	2020/08/01 – 2020/10/10	71	275
	4	2020/10/24 – 2020/12/20	58	375
	5	2021/01/30 – 2021/04/03	64	
	6	2021/04/25 – 2021/07/04	71	



# Table 2The general overview of the number of collected data by time at the measuring stationsMS3 Ancona and MS4 Paloma

Measurement station	Data set No.	Measurement period	Data recording days	Total recording days per station
	1	2020/02/21 – 2020/04/22	62	
	2	2020/06/10 – 2020/09/10	93	
MS3 ANCONA	3	2020/09/29 – 2021/01/11	105	387
	4	2021/02/17 – 2021/05/05	78	
	5	2021/05/14 – 2021/07/11	49	
	1	2020/02/21 – 2020/03/05	14	
	2	2020/03/11 – 2020/04/27	48	
	3	2020/04/27 – 2020/06/10	45	
	4	2020/06/10 – 2020/08/13	65	
	5	2020/08/13 – 2020/10/14	63	
MS 4 PALOMA	6	2021/02/05 – 2021/03/01	24	336
	7	2021/03/18 – 2021/04/04	18	
	8	2021/04/08 – 2021/04/23	16	
	9	2021/05/01 – 2021/05/10	10	
	10	2021/06/17 – 2021/07/19	33	



# Table 3The general overview of the number of collected data by time at the measuring<br/>stations MS5 Susak and MS6 Lošinj

Measurement station	Data set No.	Measurement period	Data recording days	Total recording days per station
	1	2020/03/05 – 2020/04/09	36	
	2	2020/04/11 – 2020/06/11	62	
	3	2020/06/14 – 2020/08/09	57	
	4	2020/08/13 – 2020/10/18	67	491
IVISS SUSAK	5	2020/10/20 – 2021/01/15	88	481
	6	2021/01/18 – 2021/03/17	59	
	7	2021/03/17 – 2021/06/01	73	
	8	2021/06/04 – 2021/07/12	39	
	1	2020/02/22 – 2020/04/09	48	
	2	2020/05/07 – 2020/06/11	36	
	3	2020/06/14 – 2020/08/09	57	
MS6 LOŠINJ	4	2020/08/13 – 2020/10/18	67	466
	5	2020/10/20 – 2021/01/15	88	400
	6	2021/01/18 – 2021/03/17	59	
	7	2021/03/18 – 2021/06/01	76	
	8	2021/06/04 – 2021/07/08	35	



## Table 4The general overview of the number of collected data by time at the measuring<br/>stations MS7 Žirje, MS8 Split and MS9 Ivana

Measurement station	Data set. No.	Measurement period	Data recording days	Total recording days per station
	1	2020/05/05 – 2020/08/01	89	
	2	2020/08/01 – 2020/11/29	121	
MS7 ŽIRJE	3	2020/12/04 – 2021/04/04	122	383
	4	2021/05/19 – 2021/07/08	51	
MS8 SPLIT	1	2020/02/24 – 2020/05/06	73	
	2	2020/05/06 – 2020/07/01	57	
	3	2020/07/01 – 2020/09/29	91	397
	4	2020/11/25 – 2021/03/26	122	
	5	2021/05/14 – 2021/07/06	54	
MS9 IVANA D MS9* IVANA E	1	2020/03/10 – 2020/05/08	60	
	2	2020/05/08 – 2020/07/22	76	
	3*	2020/12/14 – 2021/05/09	147	351
	4*	2021/05/09 – 2021/07/15	68	

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In order to maximize the usability of Data sets, data format has been explained in this document. Furthermore, more information about the result of processing data can be found in deliverable D3.6.3 and produced monthly spatial maps of underwater described, which uploaded at the Tools4MSP web portal (<u>http://data.tools4msp.eu/tools4msp/</u>) and described in deliverables D.5.3.1 and D5.3.2 published at the Soundscape web pages.