



MED4EBM - Mediterranean Forum For Applied Ecosystem-Based Management

Work Packages 3 and 4. Data Management Toolbox (DMT) for the EB-ICZM-DSSs established by MED4EBM.

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About This Document

The present document describes key technical features of the Data Management Toolbox (DMT) providing computerized tools to rationalize, organise and manage the flow of data from different providers (Data Sources) to the tabular and GIS databases of the four EB-ICZM-DSSs established by MED4EBM Partners. The DMT allows the effective management of all the information for handling the processes of categorization and indexing of the various data sources (Data Providers, Data Sources, Source Datasets) and managing the flow of data from these sources to the two interlinked databases of the four EB-ICZM-DSSs established by MED4EBM Partners (Target Datasets, Source-To-Target Routines) depending on the various types of data available (Dataset Typologies). Through this data structure it is also possible to ensure the bi-unique link between the individual data records entered in the said databases and the respective data source.

1 - Database of Data Sources

The *Database of Data Sources* has been designed and built to allow the effective management of all the information needed to characterize the protocols of categorization and indexing of the various data sources (*Data Providers, Data Sources*), as well as and to manage the flow of data from these sources to the *Integrated Database* of the various EB-ICZM-DSS applications (*Source Datasets, Target Datasets*). This depending on the various types of data available (*Dataset Typologies*). Through this data structure it is also possible to ensure the bi-unique link between the individual data records entered in the Integrated Database and the respective data source. Figure 1 shows the physical scheme of the main tables and relations in the *Database of Data Sources*.

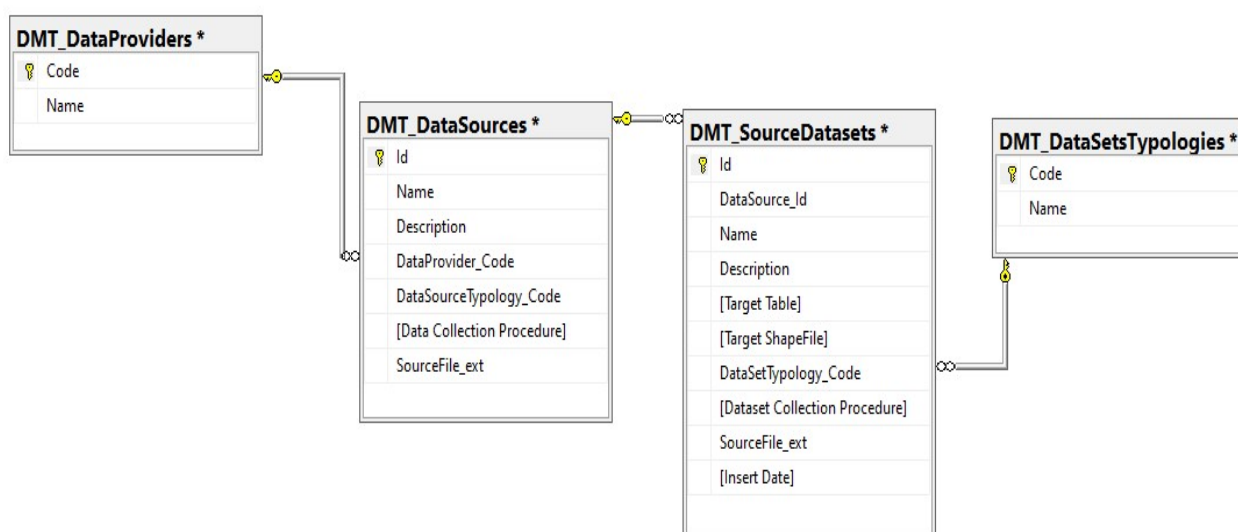


Figure 1

To manage the information contained in the Database of Data Sources more effectively and consistently, the related data structures have been created within the *Integrated Database*.

2 - Data Management Toolbox

The *Data Management Toolbox* has been designed and built as an application for the Microsoft Windows 10 operating system, using the VB.NET language in the Microsoft Visual Studio 2019 development environment (Figure 2). Components and controls included in the DevExpress-DevExtreme package have also been used.

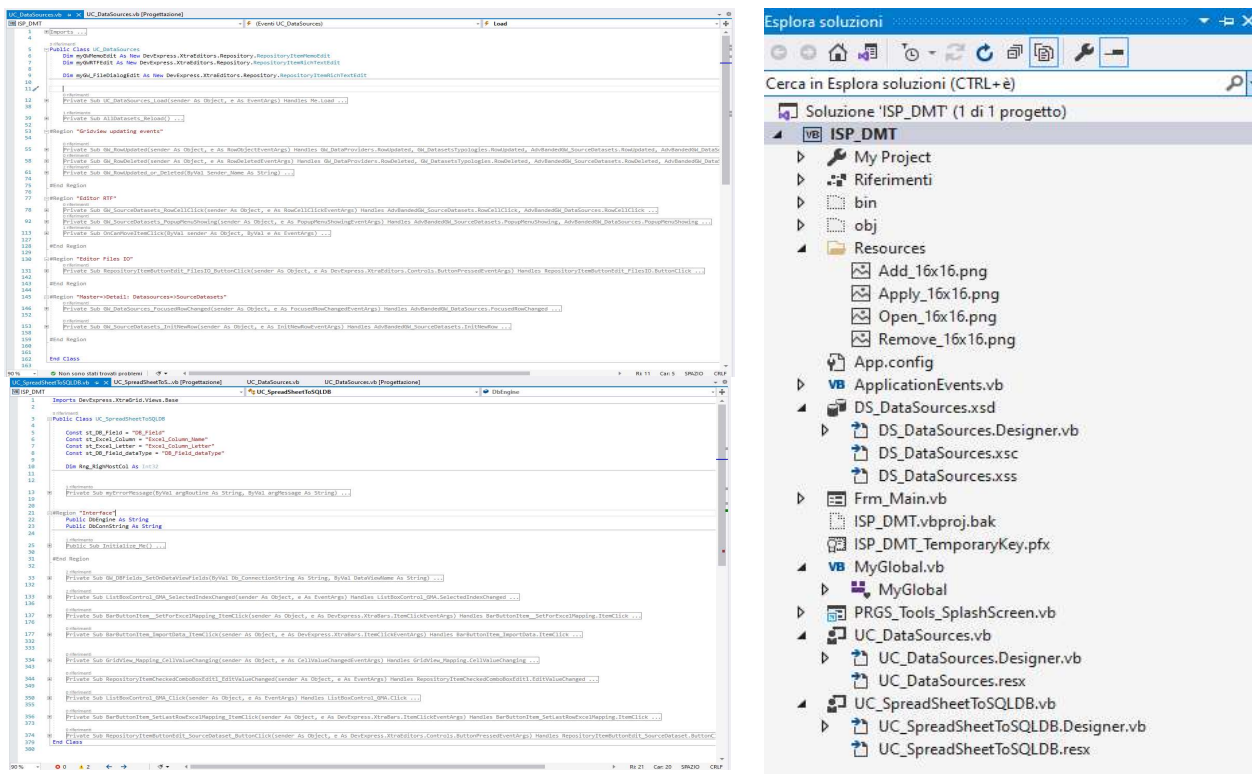


Figure 2

The *Data Management Toolbox* (Figure 3) provides a user-friendly operating environment for the management of all processes related to the cataloguing of *Data Sources* and their *Data Providers*.

DATA SOURCES				SOURCE AND TARGET DATASETS		
Drag a column header here to group by that column				Drag a column header here to group by that column		
Description	Collection procedure	Source		Source Dataset	Management Procedure	Target Dataset
Name		Data Provider		Name		Insert Date
Description	Data Collection Procedure	Data Source Typology		Source File_ext	Dataset Collection Procedure	Target Table
SHAPE FILES		Source file		Description		Target Shape File
		SHP		Administrative Boundaries Lev 0		08/11/2021
		GIS				TUN_adm0.shp
Fisheries Data	Contact the DGPA every month and make the official requests for data related to.....	General Directorate of Fisheries ...				Shapefile to ISP-FTP
		DATA_TABLE		Administrative Boundaries Lev 1		08/11/2021
Agricultural Data		CRDA				TUN_adm1.shp
		DATA_TABLE				Shapefile to ISP-FTP
Meteorological Data	Downloaded from Tutitempo.com website	INSTM		Administrative Boundaries Lev 2		08/11/2021
		DATA_TABLE				TUN_adm2.shp
Agricultural dataset	Collected by CRDA_sfax	CRDA				Shapefile to ISP-FTP
		DATA_TABLE		Sea Ports		08/11/2021
equipe-Agriculture data	collected by CRDA sfax	CRDA				PORTS.shp
		DATA_TABLE				Shapefile to ISP-FTP
Hydrological Data	Collected by INSTM	INSTM		Meteo Station	Meteo Station Shapefile is provided by CRDA	07/12/2021
Data collected from INSTM Oceanographic crew with the use of		DATA_TABLE				MStation.shp
Population and Social dat	Provided by National Institute of Statistics	National Institute of Statistics				Shapefile to ISP-FTP
		DATA_TABLE		Delegations		07/12/2021
						Municip.shp
						Shapefile to ISP-FTP
				Hydrobase Sampling Points		10/12/2021
						Hydrob.shp
						Shapefile to ISP-FTP

Figure 3

Each of the *Data Sources* is associated with the various *Source Datasets* that this very Data Sources provide. The characterization of the *Data Sources* includes all the elements necessary to define the data source management procedure (Figure 4); for example, if the source of the data refers to a periodic monitoring report, the said elements include the frequency of publication report and the procedure to be followed to obtain it (e.g. publication on the website or specific request to be forwarded to the Data Provider) and to extract the data from that report is indicated.

DATA SOURCES			
Drag a column header here to group by that column			
Description	Collection procedure	Source	
Name	Data Collection Procedure	Data Provider	
Description		Data Source Typology	
		Source file	
SHAPE FILES	...	SHP	
		GIS	
Fisheries Data	Contact the DGPA every month and make the official request for data related to.....	General Directorate of Fisheries ...	
		DATA_TABLE	
Agricultural Data	...	CRDA	
		DATA_TABLE	
Metereological Data	Downloaded from TuTitempo.com website	INSTM	
		DATA_TABLE	
Agricultural datatest	Colleted by CRDA_Sfax	CRDA	
		DATA_TABLE	
equipe4agriculture data	colleted by CRDA sfax	CRDA	
		DATA_TABLE	
Hydrological Data	Collected by INSTM	INSTM	
Data collected from INSTM Oceanographic crew with the use of		DATA_TABLE	
Population and Social dat	Provided by National Institute of Statistics	National Institute of Statistics	
		DATA_TABLE	

Figure 4

Similar to what has been seen for *Data Sources*, the characterization of *Source* and *Target Datasets* includes all the elements needed to define the procedure for managing the flow of data from each source to the *Integrated Database* (Figure 5). For example, in the case of a *Data Sources* consisting of data published on the *Data Provider's* website, the various available *Source Datasets* are listed, indicating their description and type (e.g. digital data in tabular form), the *Target Dataset* of the *Integrated Database* (i.e. name of the SQL Server table or name of the Shapefile of the FTP repository), and the protocol for extracting the *Source Datasets* and then feed these into the *Target Dataset* of the *Integrated Database* (as well as any manipulation possibly needed to make the data consistent with the structure of the *Integrated Database*).

Through the user interface of the *Data Management Toolbox* it is also possible to upload directly to the FTP repository of the *Integrated Database* the files containing each of the *Source Datasets*. Special routines of the *Data Management Toolbox* also manage the bi-unique connection between the individual data records entered in the *Integrated Database* and the respective *Source Dataset*.

To give the user the opportunity to highlight some of the information described above, the *Data Management Toolbox* allows you to format the displayed text according to the Rich Text Format standard.

SOURCE AND TARGET DATASETS			
Drag a column header here to group by that column			
Source Dataset	Management Procedure	Target Dataset	
Name	Dataset Collection Procedure	Insert Date	
Source File_ext		Target Table	
Description		Target Shape File	
		Data Import Tool	
Coastal Fishing	Obtained from DGPA without official request by INSTM staff.	06/12/2021	
.xlsx Data about different typology of boats and fishing gear available for the years from		[EditValue is null]	
Fisheries Stats by Species	Obtained from DGPA without official request by INSTM staff.	06/12/2021	
.xlsx Data on fisheries statistics by species from years 2000 to 2020		Fisheries_Statistics	
		Spreadsheet to Db Table	
Shore Fishing	Obtained from DGPA without official request by INSTM staff.	06/12/2021	
.xlsx Data on total landings of targhet spieces years 2000 to 2018			
		Spreadsheet to Db Table	
Fisheries	Obtained from DGPA without official request by INSTM staff.	06/12/2021	
.xlsx Data on work force (number of boats) for years 2000 to 2018		[EditValue is null]	

Figure 5

To further facilitate the planning and management of the flow of data from the various sources to the *Integrated Database*, the *Data Management Toolbox* allows you to group in various ways the information contained in the list of *Data Sources* (e.g. *Data Sources* available at each of the *Data Providers*, Figure 6) and to prepare and print appropriate reports (Figure 7).

Datasets typologies	Data providers	Source datasets	
DATA SOURCES			
Data Provider_Code ▲			🔍
Description	Collection procedure	Source	
Name		Data Provider_Code ▲	
Description	Data Collection Procedure	Data Source Typology_Code	
		Source File_ext	
▼ Data Provider_Code:			
Mappa dei comuni	Acquisire i vari shapefile. Importare ognuno degli shapefile con il Tool: [] .		
		GIS	
▼ Data Provider_Code: APAT			
Coleotteri Carabidi	<ul style="list-style-type: none"> ➤ Contattare gli autori. ➤ Chiedere disponibilità di dati in formato digitale. 	APAT	
Manuale operativo: I Coleotteri Carabidi per la valutazione	<ul style="list-style-type: none"> ➤ Definire procedura di inserimento nella base dati con riferimento al formato dei dati che saranno resi disponibili. ➤ Verificare con gli autori fattibilità ed utilità protocollo di monitoraggio. 	NOT_STRUCTURED	.pdf
Indice EPI Diatomee	<ul style="list-style-type: none"> ➤ Contattare gli autori. ➤ Chiedere disponibilità di dati in formato digitale. 	APAT	
Linee Guida: L'indice Diatomico Di Eutrofizzazione/Polluzi	<ul style="list-style-type: none"> ➤ Definire procedura di inserimento nella base dati con riferimento al formato dei dati che saranno resi disponibili. ➤ Verificare con gli autori fattibilità ed utilità protocollo di monitoraggio. 	NOT_STRUCTURED	
▼ Data Provider_Code: ARPACAL			
Acque di balneazione.	Ogni volta che viene pubblicato il report ARPACAL sulle acque di balneazione:	ARPACAL	
Rapporti periodici ARPACAL sulle acque di balneazione.	<ol style="list-style-type: none"> 1. Estrarre i dati manualmente dal portale delle acque di balneazione https://www.salute.gov.it/portale/temi/p2_4.jsp?area=balneazione 2. Inserire i dati estratti in Excel. 3. Importare nel DB con Import-from-Spreadsheedt-Tool. 	NOT_STRUCTURED	.pdf
Alghe Potenzialm	<ul style="list-style-type: none"> ➤ Contattare gli autori. ➤ Chiedere disponibilità di dati in formato digitale. 	ARPACAL	
Monitoraggio Microalghe Potenzialmente	<ul style="list-style-type: none"> ➤ Definire procedura di inserimento nella base dati con riferimento al formato dei dati che saranno resi disponibili. ➤ Verificare con gli autori fattibilità ed utilità protocollo di monitoraggio. 	NOT_STRUCTURED	.pdf
▼ Data Provider_Code: ISPRA			
Catasto dei rifiuti.	Ogni volta che viene aggiornato il catasto con i dati annuali:	ISPRA	
Catasto Rifiuti gestito da ISPRA ambiente.	<ol style="list-style-type: none"> 1. Estrarre i dati manualmente dalle varie pagine web del portale ISPRA https://www.catasto-rifiuti.isprambiente.it/index.php?pg=ru 2. Inserire i dati estratti in Excel. 3. Importare i dati nei file Excel nel DB con il Tool Excel (nella riga del 	NOT_STRUCTURED	

Figure 6

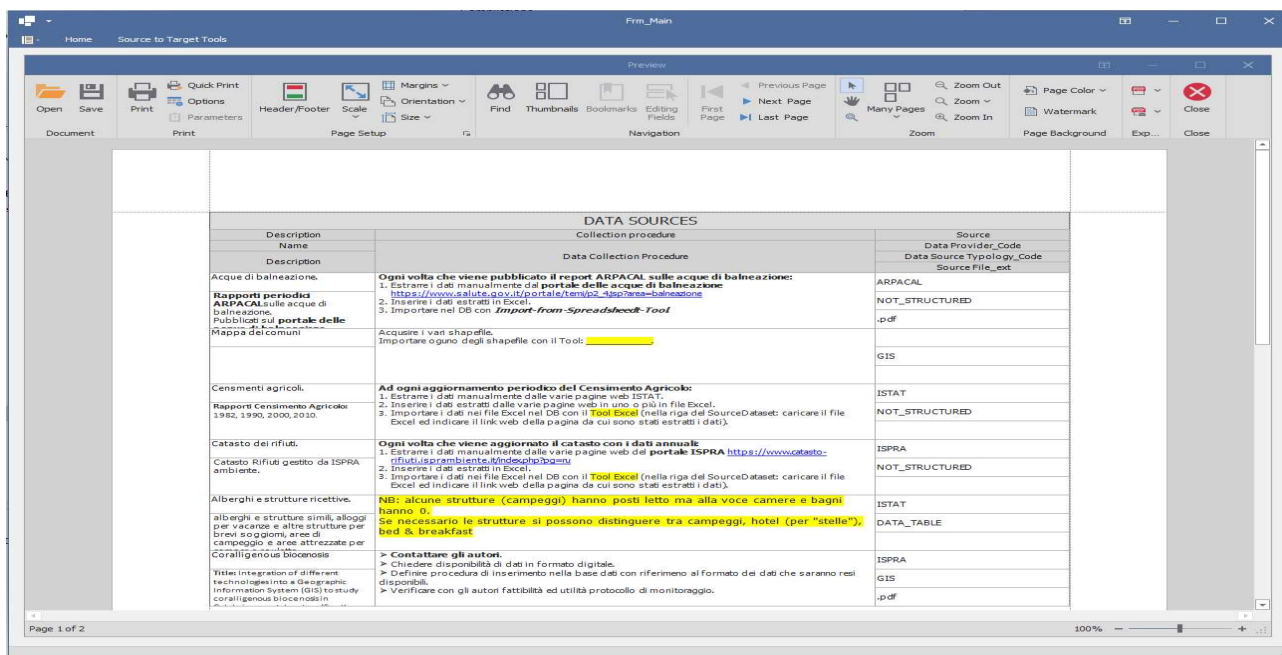


Figura 7

3 - Source-To-Target Routine

Source-To-Target Routines allows the automatic transfer of a wide array of *Source Datasets* into the *Integrated Database*. For example: the automatic importing of any type of dataset stored in in tabular form through a SpreadSheet (Figure 8); importing Shapefiles into the FTP repository of the *Integrated Database* (Figure 9). *Source-To-Target Routines* provide for the writing of all the parameters necessary for its correct management in the various data structures of the PROGES-ISP software.

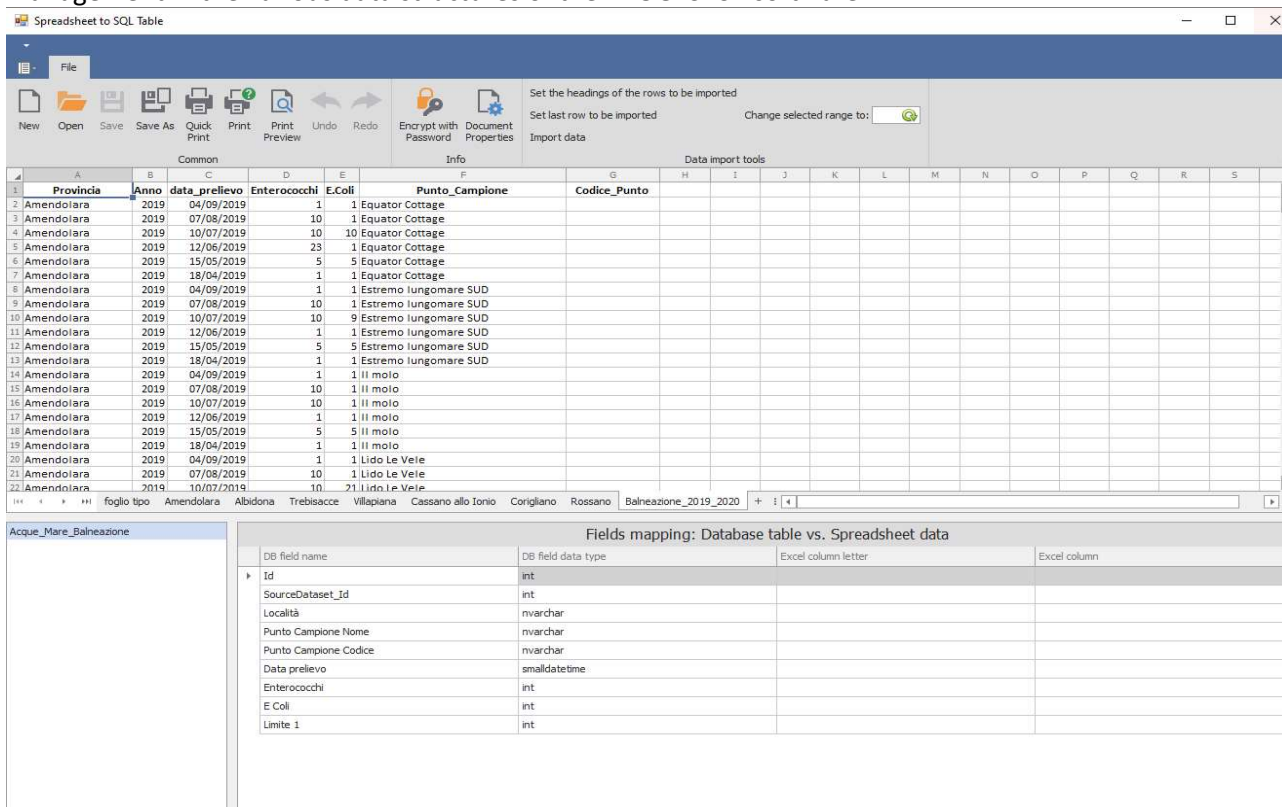


Figure 8

GIS Layer selector. Invoked for Source Dataset: Calabria (Calabria.shp)

Type	Is Visible	Name	Shape File	Description
Base Map	<input checked="" type="checkbox"/>	Calabria	Calabria.shp	
Base Map	<input type="checkbox"/>	Extent	Extent.shp	
Spatial Refere...	<input type="checkbox"/>	Tarsia Crati	tarsia.shp	
Spatial Refere...	<input type="checkbox"/>	Vegetazione foce	vfoce.shp	
Base Map	<input type="checkbox"/>	Italia	Italy.shp	
Spatial Refere...	<input type="checkbox"/>	Bacini Idrografici	bacidrografici.shp	
Spatial Refere...	<input checked="" type="checkbox"/>	Comuni	Comuni.shp	

Record 2 of 7

Select Void Cancel

Figure 9