REPUBLIC OF TURKEY

MINISTRY OF ENVIRONMENT, URBANIZATION, AND CLIMATE CHANGE

GENERAL DIRECTORATE OF GEOGRAPHIC INFORMATION SYSTEMS

METADATA GUIDANCE DOCUMENT

January, 2024

CONTENTS

List of Figures

List of Tables

ABBREVIATIONS

Ministry	:	Republic of Turkey Ministry of Environment, Urbanization and Climate Change
CBS	:	Coğrafi Bilgi Sistemleri (Geographic Information Systems)
CBSGM	:	Coğrafi Bilgi Sistemleri Genel Müdürlüğü (General Directorate of Geographic Information Systems)
FTP	:	File Transfer Protocol
SQL	:	Structured Query Language
TUCBS	:	Türkiye Ulusal Coğrafi Bilgi Sistemi (Turkey National Geographic Information System)
UCBP	:	Ulusal Coğrafi Bilgi Platformu (National Geographic Information Platform)
UCBS	:	Ulusal Coğrafi Bilgi Sistemi (National Geographic Information System)
WMS	:	Web Map Service
WMTS	:	Web Map Tile Service
WFS	:	Web Feature Service
WCS	:	Web Coverage Service
TÜİK	:	Türkiye İstatistik Kurumu
MV	:	Metaveri (Metadata)
SQL	:	Structured Query Language
XML	:	Extensible Markup Language

1. INTRODUCTION

1.1.Purpose

Based on this document and the Presidential Decree No. 49 on Geographic Information Systems, the "TUCBS General Conceptual Model", "TUCBS Technical Interoperability Procedures and Principles" and "TUCBS Implementation Rules" documents provide the basic principles for the preparation of this guide, It is aimed to provide guidance on metadata (data information) production for geographic data producers, to provide information on metadata transfer to the National Geographic Information Platform Metadata Registration Portal and metadata search, verification, metadata query and metadata management operations of geographic data.

1.2. Scope

In the fifth paragraph of Article 13 titled Geographic Data Services, Data Information of the Presidential Decree No. 49 on Geographic Information Systems, "(5) Data information is produced electronically in accordance with the standards determined by the Ministry during the production of geographic data and is submitted to the National Geographic Information Platform." in the first paragraph of Article 14 of the said decree titled National Geographic Information Platform, Geographic Data Access, Sharing and Use (1) The geographic data and data information of the public institutions and organizations included in the National Geographic Data Responsibility Matrix in this matrix are shared through the National Geographic Information Platform within the framework of the authorization made in the National Geographic Data Sharing Matrix. Public institutions and organizations can also share geographic data and data information from their own Institutional data sharing platforms".

It includes guidance on metadata (data information) production for geographic data producers and users, metadata transfer to the National Geographic Information Platform Metadata Registration Portal, metadata search, verification and metadata query and metadata management operations for geographic data.

2. LEGISLATIVE INFRASTRUCTURE

It is very important for public institutions/organizations, universities and local governments, which are the producers of geographical data, to create and record the data together with its metadata from the moment it is produced in order to prevent duplicate data production.

With the Decree Law No. 644 published in 2011, the General Directorate of Geographical Information Systems was established, and with the action numbered 75 "Establishment of TUCBS Infrastructure" under the title of "Modernization in Public Administration" of the Information Society Strategy (2006-2010), the General Directorate of Geographical Information Systems started to create a portal for public institutions and organizations to present the geographical information they are responsible for to users through a common infrastructure and to determine content and exchange standards for geographical data.

Among the duties and authorities defined in the Presidential Decree No. 1 on Presidential Organization, published in the Official Gazette by the Ministry of Environment, Urbanization, and Climate Change of the Republic of Turkey on July 10, 2018, are:

" *To carry out and oversee the establishment, utilization, and development of the National Geographic Information System; to support the establishment, use, and integration of City Information Systems related to local governments' planning, mapping, infrastructure, and superstructure activities with the National Geographic Information System.*'".

In the same decree, Article 108, clauses (b) and (g) state;

- *To promote and coordinate the effective and efficient use of modern geographical information technologies throughout the country,*
- *To establish and operate the portal where spatial data produced by official and private institutions and organizations within the scope of the National Geographic Information System are presented,*

the duties and authorities have been granted to the General Directorate of Geographic Information Systems.

The *"Presidential Decree No. 49 on Geographic Information Systems*" was published in the Official Gazette dated 07.11.2019 and numbered 30941.With this decree, it is aimed to ensure coordination between public institutions and organizations regarding Turkey's National Geographic Information System and its infrastructure, to establish goals and strategies, to determine the procedures, principles and standards for the production and updating, management, use, access, security, sharing and distribution of geographic data and information within the geographic data themes, and to determine the duties, powers and responsibilities of the boards, public institutions and organizations, real and legal persons established within the scope of the decree.

Pursuant to the Decree, all institutions and organizations share the geographic data they are responsible for and produce with the National Geographic Information Platform in accordance with the definition documents together with their metadata. Thus, it will be ensured that the data required to be received from different institutions will be received through a single platform. In this context, both time and cost savings will be achieved.

The following issues are targeted with the National Geographic Information Platform:

- Ensuring that geographical data in the area of responsibility are compatible with the definition documents,
- Determining the access and sharing status of the geographic data produced,
- Ensuring that the metadata of geographic data comply with national metadata standards,
- Ensuring that the web services to be created (in OGC standards) are created in accordance with the criteria specified in the TUCBS interoperability guide,
- Ensuring the creation of harvest services in national standards that ensure that standard metadata, including map services of geographic data, are automatically delivered to the National Geographic Information Platform,
- Ensuring the creation of catalog services with metadata search/find/use functions from the National Geographic Information Platform to provide access to geographic data related to other institutions and organizations,
- Ensuring secure network connections with the TUCBS infrastructure.

- Prevention of duplicate geographic data production,
- Reducing costs,
- All geographical data is recorded,
- Making important contributions to the development of the country by making the right decisions by analyzing geographical data,
- To be able to produce geographical data that the country needs but is not yet produced,
- Ensuring that geographic data produced by public institutions using public resources are shared with other stakeholder public institutions and organizations and local administrations in a fast, up-to-date and secure manner.

For the sharing of geographic data included in the National Geographic Data Responsibility Matrix in subparagraphs (a) and (b) of Article 1 of the "Law on Geographic Information Systems and Amendments to Certain Laws" numbered 7221 published in the Official Gazette dated 20.02.2020 and numbered 31045;

- *Sharing, access and use among public institutions and organizations according to the National Geographic Data Sharing Matrix is free of charge,*
- *Provided that the provisions regarding national security and the provisions of the legislation on intellectual, industrial and commercial rights are reserved and the appropriate opinion of the institution responsible for producing data is obtained, within the scope of collaborations for revenue sharing on data mining and new data production, sharing with institutions, organizations and universities can be made free of charge,*

provision is included.

The Regulation on the Establishment and Management of the National Geographic Information System (20.03.2015 - R.G. 29301) was repealed by the Presidential Decree dated 09.02.2021 and numbered 3531 published in the Official Gazette dated 10.02.2021 and numbered 31391.

14.02.2020 dated 14.02.2020 and numbered 7221, subparagraph (b) of the first paragraph of Article 1 of the Law on Geographic Information Systems and Amendments to Certain Laws, subparagraph (f) of the first paragraph of Article 5, Article 7, the fourth paragraph of Article 18 and subparagraph (c) of the first paragraph of Article 108 of the Presidential Decree No. 1 on the Organization of the Presidency, Based on subparagraphs (h) and (ı), the National Geographic Data Responsibility The Geographic Data License Regulation, which determines the working procedures and principles of domestic and foreign private law legal entities that will produce all geographic data in the Matrix, was published in the Official Gazette dated 10.02.2021 and numbered 31391 and entered into force.

49 numbered Presidential Decree on Geographic Information Systems, and the permissions regarding the collection, production, sharing or sale of all geographic data in the National Geographic Data Responsibility Matrix, which shows the geographic data themes in the list numbered (1) attached to the Presidential Decree on Geographic Information Systems and the public institutions and organizations responsible for these themes, by real persons and private legal entities, were determined by the Regulation on Geographic Data Permissions, which entered into force after being published in the Official Gazette dated 10.02.2021 and numbered 31391.

With this regulation; those who are granted licenses within the scope of the Geographic Data License Regulation are excluded from the scope of the permit, and the collection, production, sharing or sale of geographic data within the scope of the national geographic data responsibility matrix by public legal entities is subject to the permission of the Ministry.2020 dated 14.02. 2020 and numbered 7221 on Geographical Information Systems and Amendments to Certain Laws, real and private legal entities were exempted from the permission fee within the scope of the second paragraph of Article 1 of the Law on Geographical Information Systems and Amendments to Certain Laws, and real and private legal entities were obliged to pay a data permission fee in case they trade the data they will produce within the scope of the activities they carry out for public institutions and public legal entities.

In this context, with the digital life accelerated by the pandemic that started in 2019, the importance of presenting and providing geographic data from a common platform has increased, and with the

published geographic data permission and license regulations, it is aimed to record all activities for data collection in the field in Turkey by the responsible Ministry, and to ensure the security and control of location data sharing made mandatory by technology.

With the National Geographical Information System of Turkey studies carried out in this context, it will be ensured that all studies carried out on immovable properties in Turkey will be made available to citizens and awareness will be raised about the protection of values, and all private sector studies operating in these areas will be controlled, data will be secured and shared through UCBP.

Data information must be produced electronically in accordance with the standards determined by the Ministry during the production of geographic data and must be up-to-date and submitted to the National Geographic Information Platform. Geographic data, geographic data services and data information (metadata) to be submitted to the National Geographic Information Platform are published on the National Geographic Information Platform after the Ministry checks whether they comply with the standards in the definition documents.

3. WHAT IS METADATA?

The concept of metadata is defined as "structured information that enables an information source to be explained, easily found, used and managed". In this context, in the most general sense, metadata is often defined as data about data or information about information.

The prefix meta, used in many information technology applications, means "underlying definition or description".

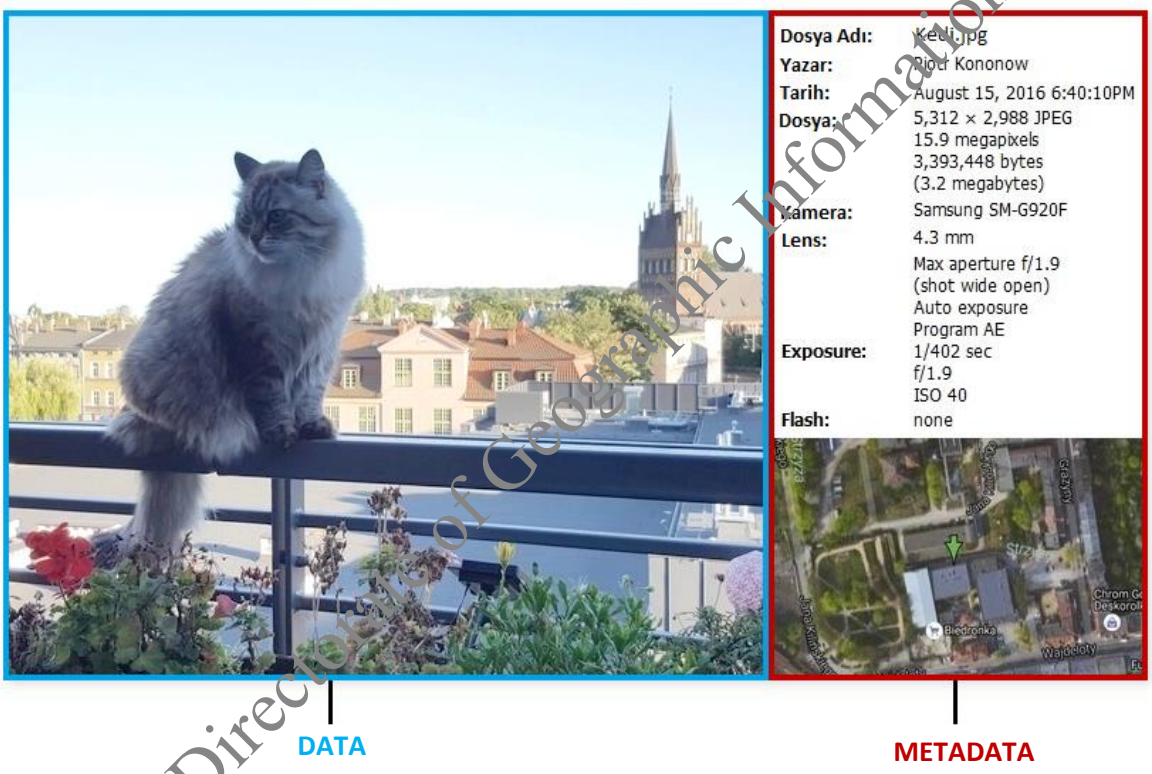


Figure 1:Metadata Example

Metadata summarizes the basic information necessary for the user to find and process the data more easily and facilitates the management of the data. If we try to explain the concept of metadata with an example, as can be seen in

Figure 1, the calibration values and shooting information of a camera that takes photographs are the most basic examples of metadata of the camera in question.

In the most general sense, metadata provides the user with the ability to filter the desired data among the available data and makes it much easier to find the desired information or document.

3.1 Metadata Types

Basically, metadata can be divided into three basic types:

- Descriptive metadata describes the source data for identification and specification purposes.

- Structural metadata provides information about how the components of the data come together. For example, how many pages come together to form a section.

- Administratively, metadata provides information to help with resource management. Examples of this type of metadata include the date and method of production, file type and other technical information, as well as the people who can access the data.

3.2 Usage Areas of Metadata

Metadata has traditionally been used in library catalogs to describe the scope and content of data and data sets.

Metadata also helps with the organization of electronic resources, digital identity, resource archiving and preservation. Web pages usually contain metadata in the form of meta tags. Meta tags (elements) refer to page descriptions, keywords, document authors, and the last modified date.

Within the scope of telecommunication activities, a wide range of metadata, including internet traffic, is collected by official organizations from various countries. All this collected data is used for traffic analysis and mass surveillance purposes.

3.3 Geographic Data Metadata

Metadata for geographic data is a type of metadata used for objects with indirect or direct geographic content. It provides information to the user about the suitability of geographic data for its intended use. Thus, users both decide whether the data is suitable for the purpose before using the data and have information about the data during the use of the data. They can also examine the accuracy and reliability of their decisions based on this data after use. Within the scope of

geographical information, metadata may be related to a single map or aerial photograph, or it may be related to a single object class or an attribute type.

The ISO/TC 211 committee defines geographic metadata as *"[This standard] provides information about the identity, content, quality, geographic and temporal characteristics, scope, geographic reference, description, distribution and other characteristics of geographic data and services"* in its standard ISO 19115 "Geographic Information - Metadata".

The US Federal Geographic Data Committee (FGDC) defines geographic metadata as follows:

"A metadata record is an information file, usually in XML format, that captures key characteristics of a data or information resource. It contains answers to the who, what, when, when, where, why and how of the resource. Geographic metadata commonly documents Geographic Information System (GIS) files, geodatabases and digital geographic data such as satellite imagery. It can also be used for documenting geographic resources, including data catalogs, mapping applications, data models and related websites..."

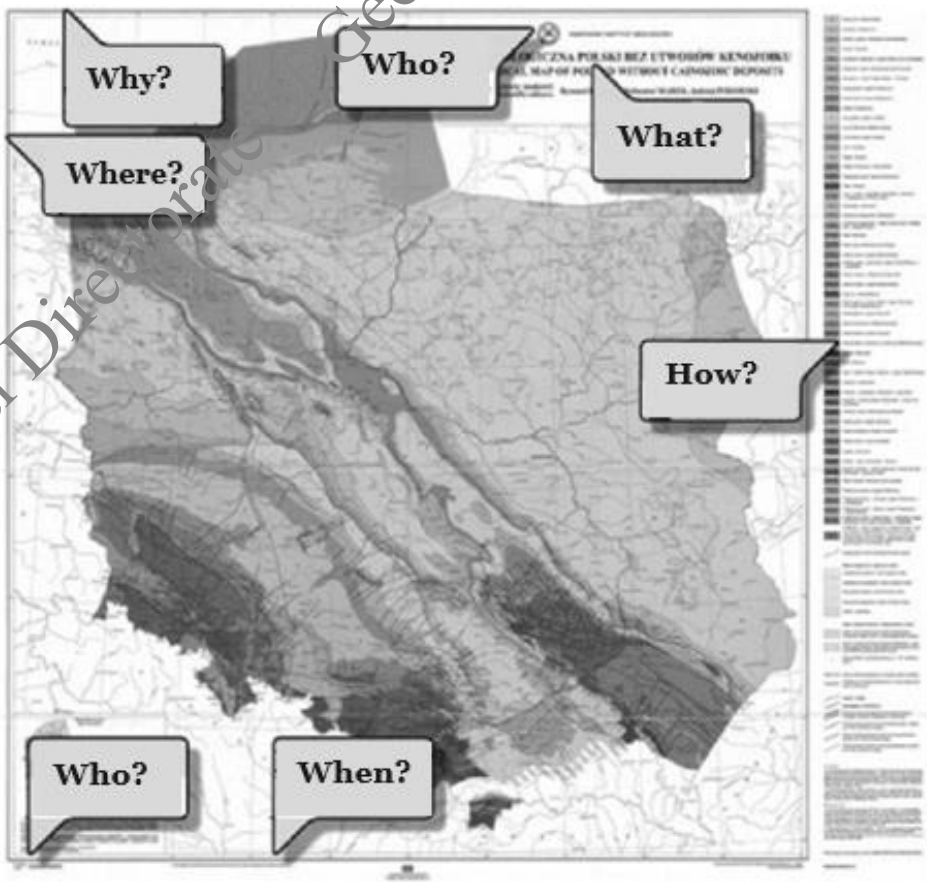


Figure 2: Geographic Metadata Example

If the basic components of geographical metadata are to be defined in general, the questions to be asked and the answers to be received are as follows. (Figure 2);

- ✓ What - Title, a brief description of the geographic resources available,
- ✓ Who? - Publisher, owner,
- ✓ Where? - Geographical coordinates,
- ✓ Why? - Purpose of production and use of data,
- ✓ When - Time and update information,
- ✓ How - Data source, data access, data use

3.4 Metadata Task and Features

Metadata is a fundamental element of a geographic data infrastructure and plays a crucial role in building and managing these infrastructures. Metadata increases the longevity and value of existing geographic resources by fulfilling the following roles:

- ➢ ***Inventory Role***: Metadata allows data providers to produce their data to the appropriate standards and conditions to save time and money by avoiding duplicate data production.
- ➢ ***Documentation Role:*** Documenting and reporting descriptive metadata increases the usability of geographic data.
- ➢ ***Promotion Role:*** Data producers are informed about other data providers and their data.
- ➢ Furthermore, metadata enables the end-user to easily **search**, **find** and **access** the data they want through appropriate mechanisms. These mechanisms are:

- ***Discovery:*** Metadata provides structured information about the "actual" content of geographic resources (geographic data and services), allowing the user to perform structured searches.
- ***Search:*** Metadata provides the information necessary for the user to evaluate the data discovered. Thus, it can be determined whether the geographic data and services discovered fulfill the desired requirements (data quality, spatial, thematic and temporal resolution, etc.).

➢ ***Utilization:*** Metadata provides the user with sufficient and complete information (information about the distributor (name, address), regulatory information, fees, if any, etc.) so that they can use the data appropriately and smoothly.

Content details of Geographic Data Query with Metadata are presented in Table-1.

Table 1:Geographic Data Queries with Metadata

WHAT	Name of Data Source Summary of Data Source Type of Data Source Detailed Information About Data Source Data Set Identifier Associated Data Source Copyright Holder Language of Data Source Metadata Standard Name and Version Metadata Language Metadata Character Set Metadata File Identifier	**HOW**	Keywords Defined Keywords Baseline Standard Conformance Degree Service Type Dataset Format Thematic Accuracy Logical Consistency Positional Accuracy
		WHO	Terms of Access and Conditions of Use Public Access Restrictions Data Controller Role of the Data Controller Metadata Controller
WHERE	Geographic Boundaries Geographic Grid Region Scale-Application Level Reference System Spatial Presentation Type	**WHY**	Intended Use of the Data Set Data Origin
	WHEN	Publication Date Update Date Production Date Update Interval Metadata Date Metadata Updated Date	

4. METADATA COMPONENTS

Metadata components; The number of mandatory fields varies in 10 main headings according to the selected resource type. Single Data Layer and Spatial Data Series are defined with 45 metadata components, 34 of which are mandatory. For the Spatial Data Set, it is defined with 43 metadata components, 31 of which are mandatory (Table 2).

The main metadata components of the Metadata Registration Portal are listed below;

1. Metadata
2. Identity Information
3. Classification
4. Keywords
5. Positional
6. Time
7. Quality and Accuracy
8. Compliance
9. Limitations
10. Institutional

Table 2 provides detailed information on metadata components. A comparison table between TS EN ISO 19115-1 and TS EN ISO 19115-3 metadata components is also included.

Metadata components have been prepared by taking into account the priorities of institutions and organizations in Turkey regarding geographic data management.

Table 2:ISO 19115 Metadata Components Comparison

Metadata Registration Portal Components		Mandatory (Z) Mandatory in Certain Situations (C) Optional (O))	ISO 19115-1 Metadata Components	ISO Mandatory(M) Conditional (C) Optional (O)
ı1.Metadata	Metadata Owner Organization	Z		
	Metadata Organization Logo Address	O		
	Metadata Catalog	Z		
	Source Type	Z	Resource type / Coupled resource / Coupled resource type/	C
	Metadata History	Z	Metadata date stamp	M
	Metadata Language	Z		
	Name of Institution	Z	Metadata point of contact	M
	Electronic Mail Address	Z		
2. Credentials	Resource Title	Z	Resource Title **/	M
	Resource abstract	Z	Resource abstract **	M
	Service Type	Z		
	Link	Z	Resource on-line link	O

Metadata Registration Portal Components		Mandatory (Z) Mandatory in Certain Situations (C) Optional (O))	ISO 19115-1 Metadata Components	ISO Mandatory(M) Conditional (C) Optional (O)
2. Credentials	Connection Type	O		
	Username	O		
	User Password	O		
	Unique Identifier (Code)*	C		
	Unique Identifier (Name Universe)*	C		
	Combined Resources	O		
	Source Language*	C	Resource language **	C
3. Classification	Title Category	Z	Resource topic category **	C
4. Keywords	Select Theme	Z	Keywords	O
	Select Keyword	Z		
4.1. Non-System Keywords	Keyword	Z		
	Keyword Theme	Z		
	Date Type	Z		
	Reference Date	O		

Metadata Registration Portal Components		Mandatory (Z) Mandatory in Certain Situations (C) Optional (O))	ISO 19115-1 Metadata Components	ISO Mandatory(M) Conditional (C) Optional (O)
5. Positional	**Coordinate Information**	**Z**	**Geographic location ****	**C**
6. Time	**Update Interval (Table)**	**O**	**Additional extent (vertical, temporal) ****	**O**
	Production Date	**O**	**Resource reference date * ***	**O**
	Publication Date	**O**		
	Updated Date	**O**		
7.Quality and Accuracy	**Background Information**	**Z**	**Resource lineage * ***	**O**
	Spatial Resolution (Table)	**O**	**Spatial resolution**	**O**
8.Compliance	**Availability (Table)**	**O**		
9.Limitations	**Public Access Restrictions**	**Z**	**Constraints on resource access and use ****	**O**
	Terms of Access and Use	**Z**		
10. Institutional	**Data Controller (Table)**	**Z**	**Resource point of contact ****	**O**
	Role	**Z**		**O**
	Name of Institution	**Z**		**O**
	Electronic Mail Address	**Z**		**O**

Metadata Registration Portal Components		Mandatory (Z) Mandatory in Certain Situations (C) Optional (O))	ISO 19115-1 Metadata Components	ISO Mandatory(M) Conditional (C) Optional (O)
XML File	**Unique Identifier (fileIdentifier)**	**Z**	**Resource identifier**	**O**
XML File	**UTF8*** (Predefined)**	**Z**		
	ISO19115* (Predefined)**	**Z**		
	Data Controller (Table)	**Z**		
	Role	**Z**		
TUCBS Standard	**Coordinate Reference Systems and Geographic Grid Systems**	**Z**	**Metadata reference information**	**M**
*** It is a mandatory field if the source type *Single Data Layer and Spatial Data Series* is selected.**				
**** Corresponds to Dublin Core components.**				
*****Metadata comes predefined for XML files.**				

5. METADATA LEVELS ACCORDING TO TUCBS DATA DEFINITION DOCUMENTS

Under the coordination of the General Directorate of Geographical Information Systems, studies to determine the standards for 32 geographical data themes have been completed in order to share and use geographical data in accordance with the principles of interoperability among all public institutions, local governments and universities. With the studies carried out, it is aimed to establish a data structure suitable for technological developments at national level and to ensure that the geographical information for which public institutions are responsible is shared with users in a way to meet the needs of institutions and sectors and according to the determined content and exchange standards.

Table 3 summarizes the metadata levels of geographic data within the scope of 32 geographic data themes. Detailed information can be accessed from the **Metadata** section in Geographic Data Themes Definition Documents.

Table 3:Metadata Levels in TUCBS Geographic Data Themes Definition Documents

Geographic Data Theme Name	LEVEL OF METADATA IN GEOGRAPHIC DATA THEMES DEFINITION DOCUMENTS
Address	The prescribed metadata level for the address data theme is "Neighborhood".
Infrastructure	Electricity Network implementation scheme metadata information will be defined at country level for transmission and at distribution region level for distribution. - Oil-Gas-Chemical Network implementation scheme metadata information will be defined at country level for transmission and at license region level for distribution. - Water Network implementation scheme metadata will be defined at water supply region level. - Waste Water Network implementation scheme metadata will be defined at administrative unit level. - Electronic Communication Network implementation scheme metadata will be defined at provincial level. - Thermal Network implementation scheme metadata information will be defined at heating region level. - Administrative and Social Services application scheme metadata will be defined at province level. - Environmental Management Facilities application scheme metadata will be defined at province level.
Land Use	In the Land Use data theme, metadata should be kept at Project Area level for Existing Land Use and Plan Boundary level for Planned Land Use.
Land Cover	A single metadata should be kept for all data in the Land Cover data theme.
Atmosphere Data	The metadata level in the Atmospheric Data theme is Turkey. Project Area for Existing Atmospheric Data, Plan Boundary level metadata should be kept for Planned Atmosphere Data.
Building	The prescribed metadata level for the building data theme is "Neighborhood".
Biography Regions	In the Biogeographic Regions data theme, metadata should be kept at Biogeographic Region level.
Environmental Monitoring Facilities	In the Environmental Monitoring Facilities data theme, metadata information should be kept at the level of country borders.
Geographical Place Names	The metadata level for the Geographic Place Names data theme is "Turkey".
Sea and Salt Water Areas	In the Marine and Saline Water Areas data theme, metadata should be kept at the study area level.
Natural Risk Zones	In the Natural Risk Zones data theme, metadata information should be kept at the project area level.

Geographic Data Theme Name	LEVEL OF METADATA IN GEOGRAPHIC DATA THEMES DEFINITION DOCUMENTS
Species Distribution	Metadata at the Species Distribution Dataset level should be kept in the Species Distribution data theme.
Energy Sources	In the Energy Resources data theme, metadata should be kept at the level of License Area for Fossil Fuels, License-Project Area for Renewable Energy Resources, Provincial border for Wastes, Country border for Energy Resources Potential Raster, District border for Biomass Potential Raster, Country border for Energy Statistics.
Habitat Regions	In the Habitat Regions data theme, metadata should be kept at the Habitat and HabitatDistributionDataset level.
Hydrography	In the Hydrography theme, metadata information should be kept at basin level.
Administrative Units	For Abstract Administrative Units, each hierarchical level will have a metadata record at the level of the next higher administrative unit. There will be only one metadata record for Institutional Administrative Units. There will be only one metadata record for Maritime Administrative Units.
Human Health and Safety	The metadata level foreseen for the Human Health and Safety data theme is "Geographical Area of Responsibility of Institutions".
Statistical Reporting Regions	The metadata level for Statistical Reporting Regions is Turkey.
Geology	In the geology theme, metadata information should be kept at the 1/25000 level.
Cadastre	The metadata level for the cadastral data theme is "Cadastral Study Area".
Public Administration Regions	In the Public Administration Regions data theme, metadata should be kept at the administration restriction and regulation region level.
Protection Regions	In the Protected Areas data theme, metadata information should be kept at the registered area level.
Mines	Metadata for mines geographic objects will be presented on a Turkey-wide basis.
Geographic Data Theme Name	**LEVEL OF METADATA IN GEOGRAPHIC DATA THEMES DEFINITION DOCUMENTS**
Meteorology Data	The metadata level in the meteorology data theme is Turkey. Project Area for Existing Meteorological Data, For Planned Meteorology Data, metadata should be kept at the Plan Boundary level.
Population Distribution - Demography	Population Distribution - Country level metadata should be kept in the Demography data theme.
Orthoimage	Metadata information in the Orthoimage theme should be kept at the project area level.

Industrial Facilities	In the Industrial Facilities data theme; metadata should be kept at the regional level in Organized Industrial Zones and at the district level in areas other than Organized Industrial Zones.
Agriculture Facilities	In the Agricultural Facilities data theme; metadata should be kept at district level.
Soil	In the soil data theme, metadata information should be kept at the project area level.
Transportation Networks	The metadata level foreseen for the transportation data theme is generally "Institution Responsibility Area" and the details are presented below. - The metadata level foreseen for the General Directorate of Highways is "Project Area" - The metadata level foreseen for the Republic of Turkey State Railways is "Project Area". - The metadata level for local governments is "Provincial and/or District Boundaries". - The metadata level foreseen for Special Provincial Administrations is "Special Administration Responsibility Area" - The metadata level foreseen for Turkish Republic State Railways is "Project Area". - The metadata level foreseen for the General Directorate of Forestry is "Regional Directorate Responsibility Area". - The metadata level foreseen for the General Directorate of State Hydraulic Works is "Area of Responsibility of Regional Directorate". - The metadata level for the General Directorate of Mapping is "Provincial Borders".
Height	Metadata information in elevation contact should be kept at 1/25000 plot level

6. METADATA MANAGEMENT OPERATIONS

The main purpose of metadata management is to create all geographic data produced in our country together with their metadata and to be able to query, access and use them through the National Geographic Information Platform.

For this purpose, geographic data producer institutions and real and legal persons produce geographic data in accordance with the standards. They create geographic data services and metadata of these data in accordance with the standards and save them in the National Geographic Information Platform. Users search for metadata from the National Geographic Information Platform to access information about the data they need, by whom, when and how it was produced, and view the result. If they wish, they can request the data by connecting to the address where the geographic data is served and use the data within their authorization.

Institutions and real and legal persons can act as both data producers and data users in this process. Therefore, this platform created within the scope of TUCBS should not only be considered as an infrastructure where data belonging to institutions are shared. Through this infrastructure, the data of other institutions and organizations can be accessed from a single point and the necessary data can be obtained from this platform.

Figure 3 shows the data sharing process of the geographic data produced using the TUCBS infrastructure.

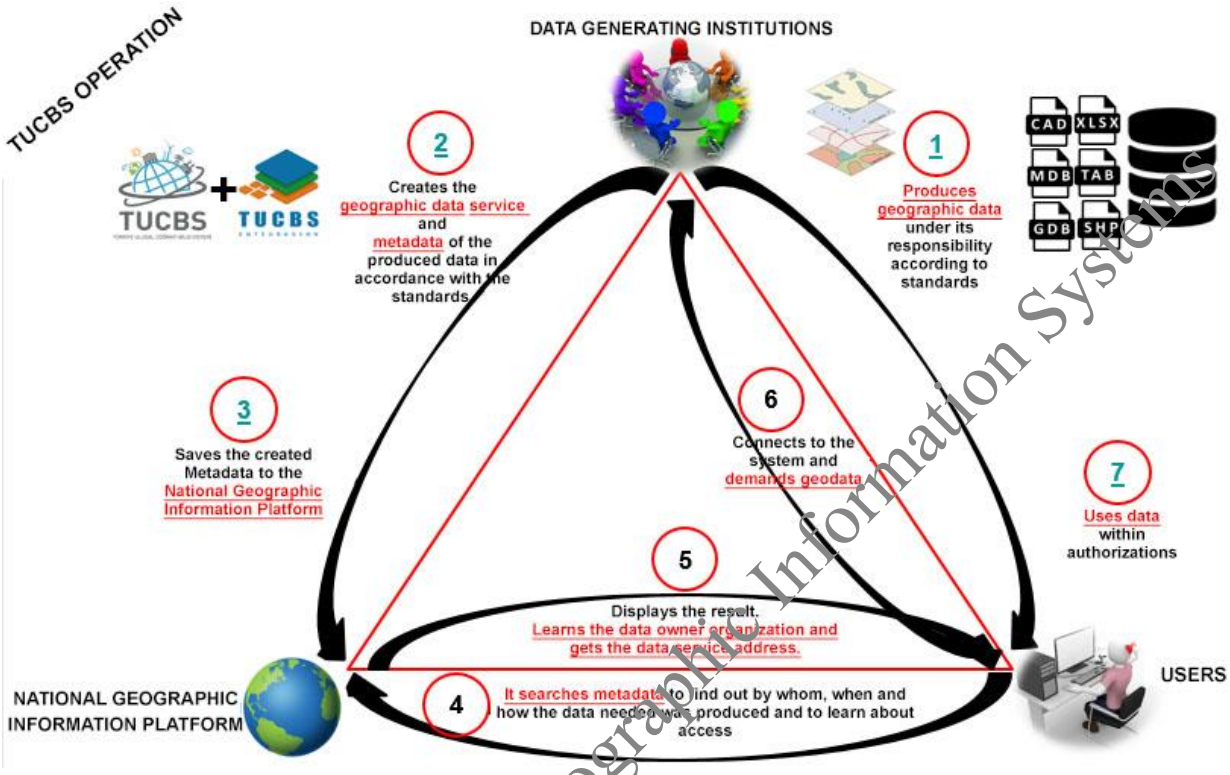


Figure 3:Sharing of Generated Geographic Data Using TUCBS Platform

7. METADATA MANAGEMENT OPERATIONS: USER REGISTRATION

National Geographic Information Platform (https://atlas.gov.tr) Metadata Registration Portal is an application that generates, updates and manages the identification information of the geographical data produced by the center, affiliated, related, associated institutions and organizations and other institutions and organizations using the portal and the geographical data produced within the portal application, such as by which institution, how, when, in what detail and precision, in accordance with national and international standards. Access to the National Geographic Information Platform is provided via internet browser.

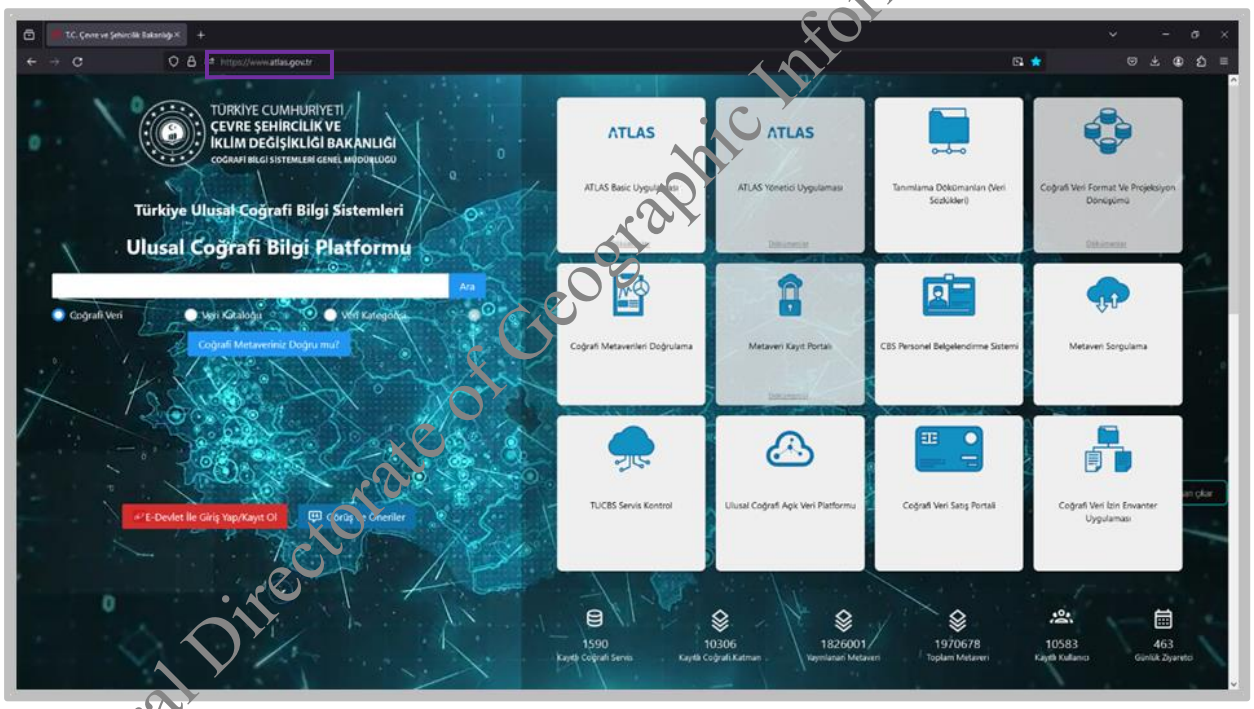


Figure 4:National Geographic Information Platform Login Screen

Registration to the National Geographic Information Platform is made via Türkiye e-Government Gateway. Clicking on the Login/Register with Türkiye E-Government button opens the Türkiye e-Government Gateway Identity Verification System interface.

Figure 5:Türkiye e-Government Gateway Authentication System

After entering the T.R. Identity Number and Türkiye e-Government Password through the Identity Verification System, click on the 'Login' button. At this stage, the Atlas Portal must be granted access to personal information.

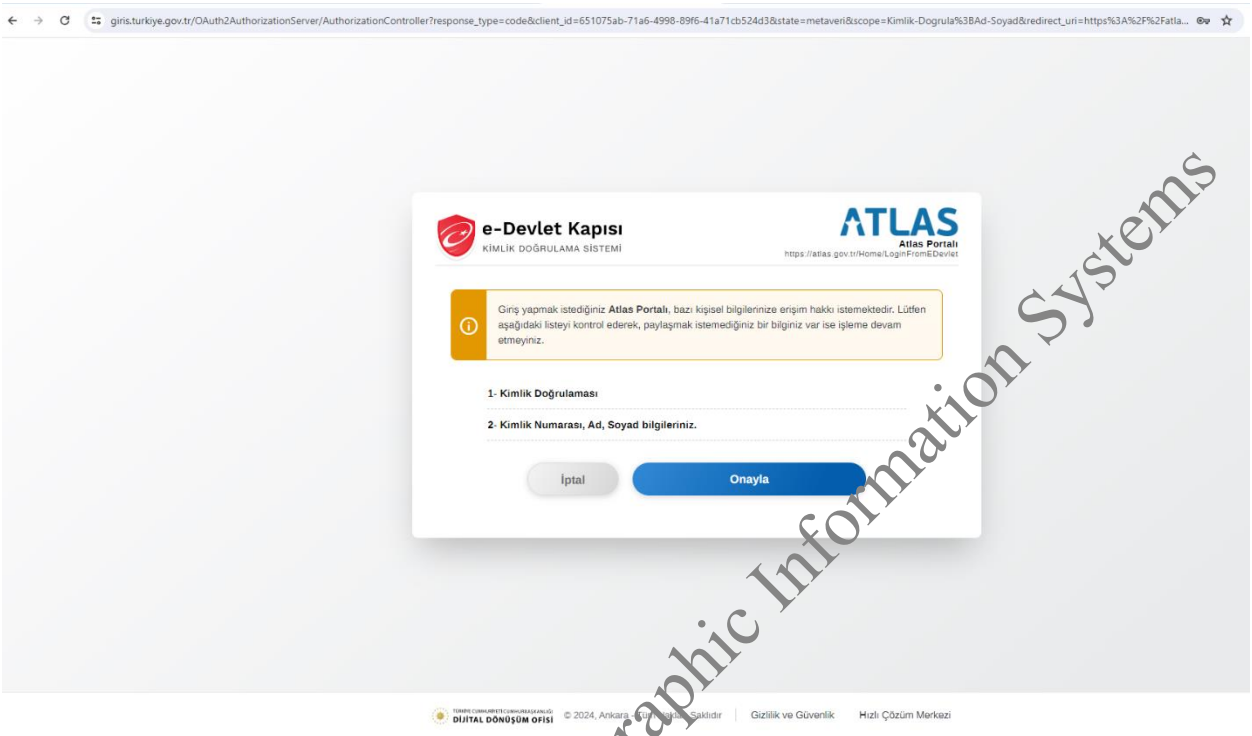


Figure 6: Türkiye e-Government Gateway Approval Screen

After the Türkiye e-Government Gateway is granted access to personal information, it is redirected to the National Geographic Information Platform and the Registration Application Form must be filled in completely.

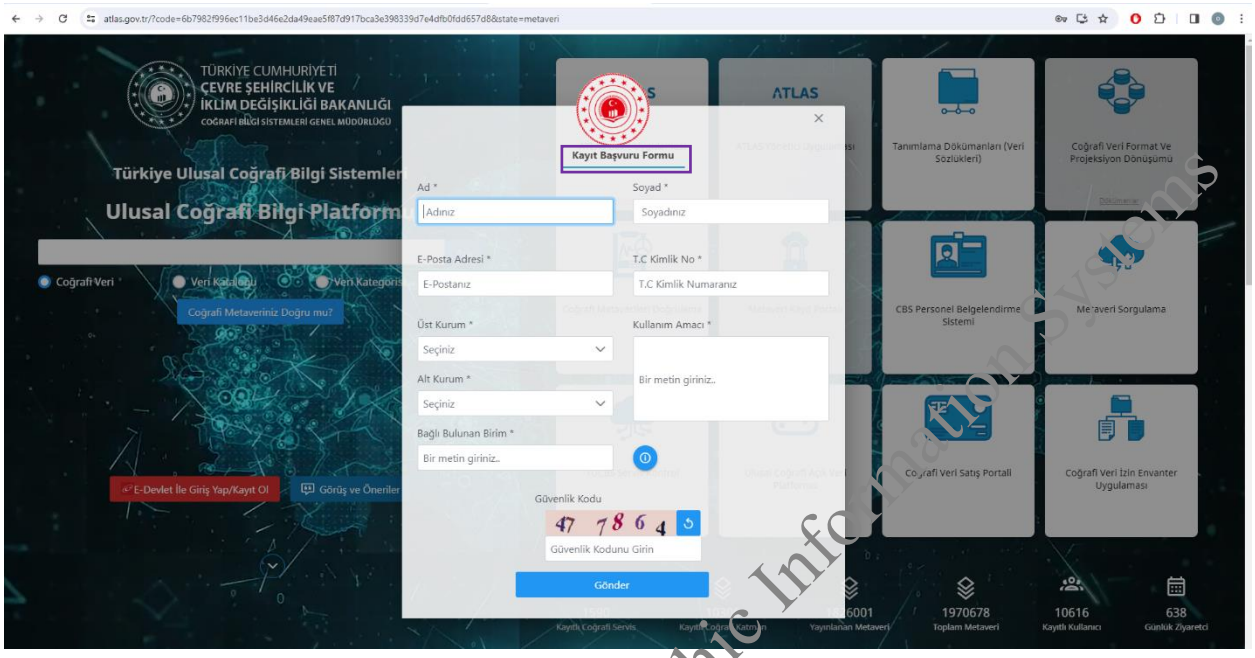


Figure 7:National Geographic Information Platform User Registration Page - User Application Form

The information required to fill in the User Application Form is listed below. By writing a description in the form of "Metadata" for the purpose of use and entering the security code, Send Request is marked and the registration process is completed.

- Name
- Surname
- Institutional Electronic Mail Address
- T.C. Identity Number
- Top Institution
- Sub-Agency
- Intended Use

After the user registration application is completed, an activation code is sent to the e-mail address specified in the Registration Application Form.

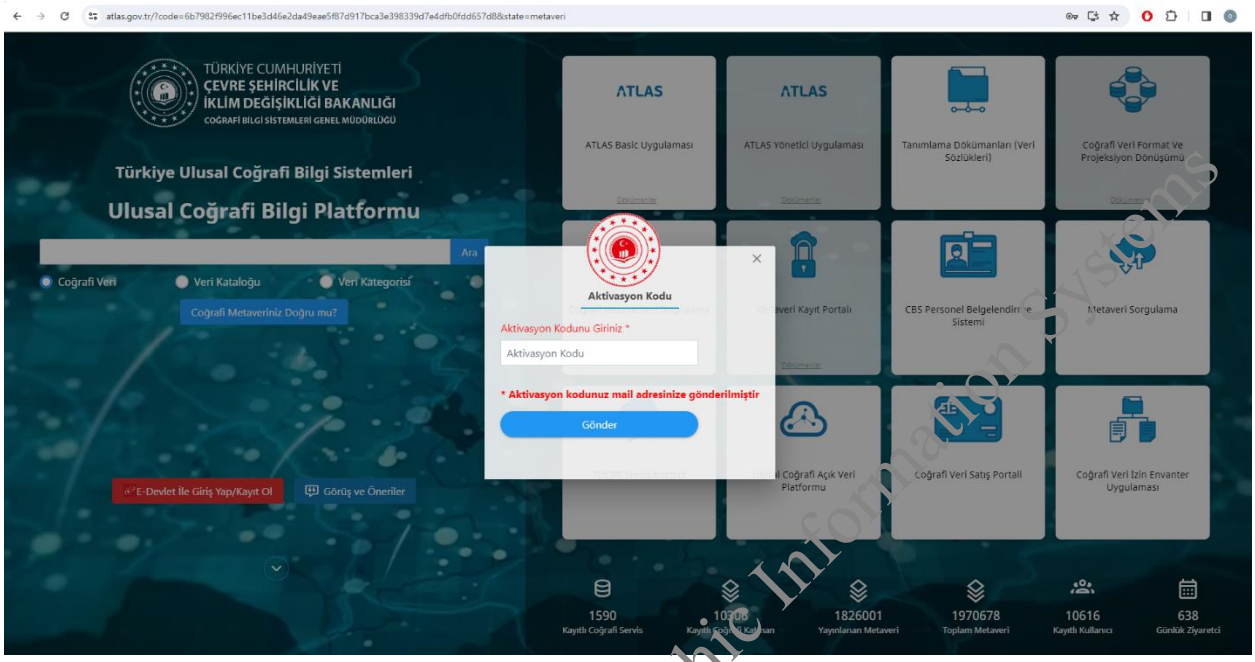


Figure 8:National Geographic Information Platform User Registration Page - Activation Code

By entering the activation code sent to the specified e-mail address and pressing the 'Send' button, the registration application request is forwarded to the relevant units.

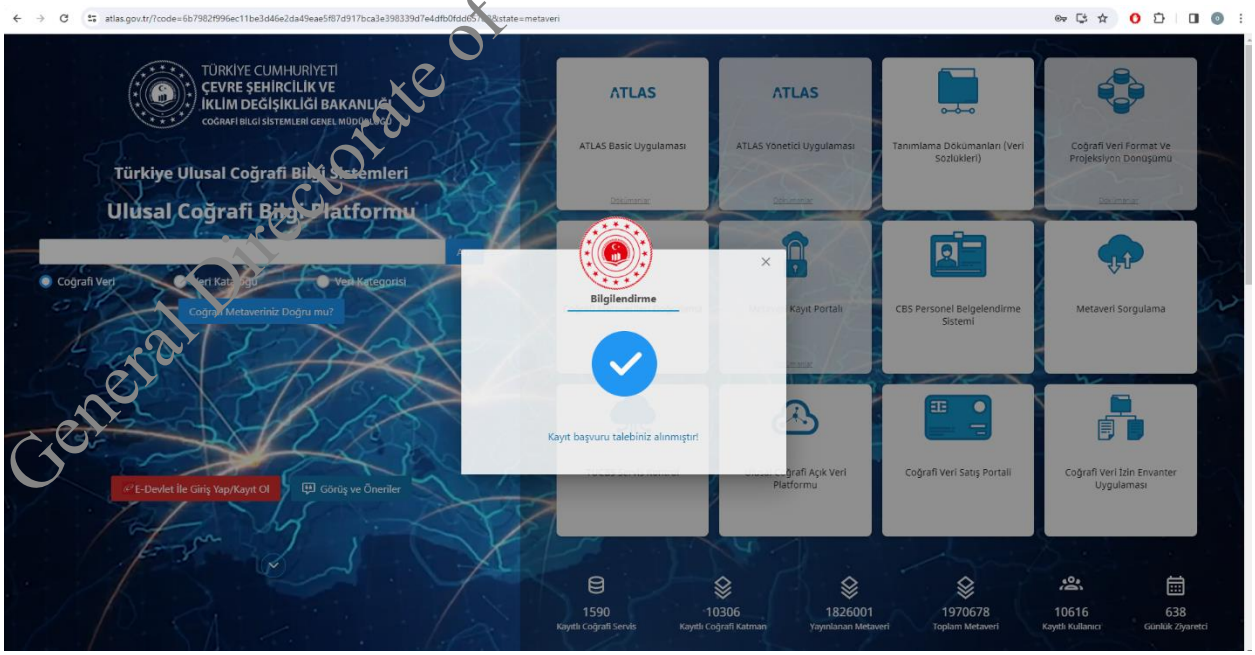


Figure 9:National Geographic Information Platform User Registration Page - Request Approval

The registered user is authorized and informed by the system administrator for metadata management operations. The user authorized for metadata management operations logs in to the application with the Login/Register with E-Govermentbutton (https://atlas.gov.tr/#).

In addition, the National Geographic Information Platform can also be accessed through the e-GovermentGateway (www.turkiye.gov.tr) . After logging in to the E-GovermentGateway with T.R. Identity Number and Password, a search is made with the keyword 'Atlas Portal'.

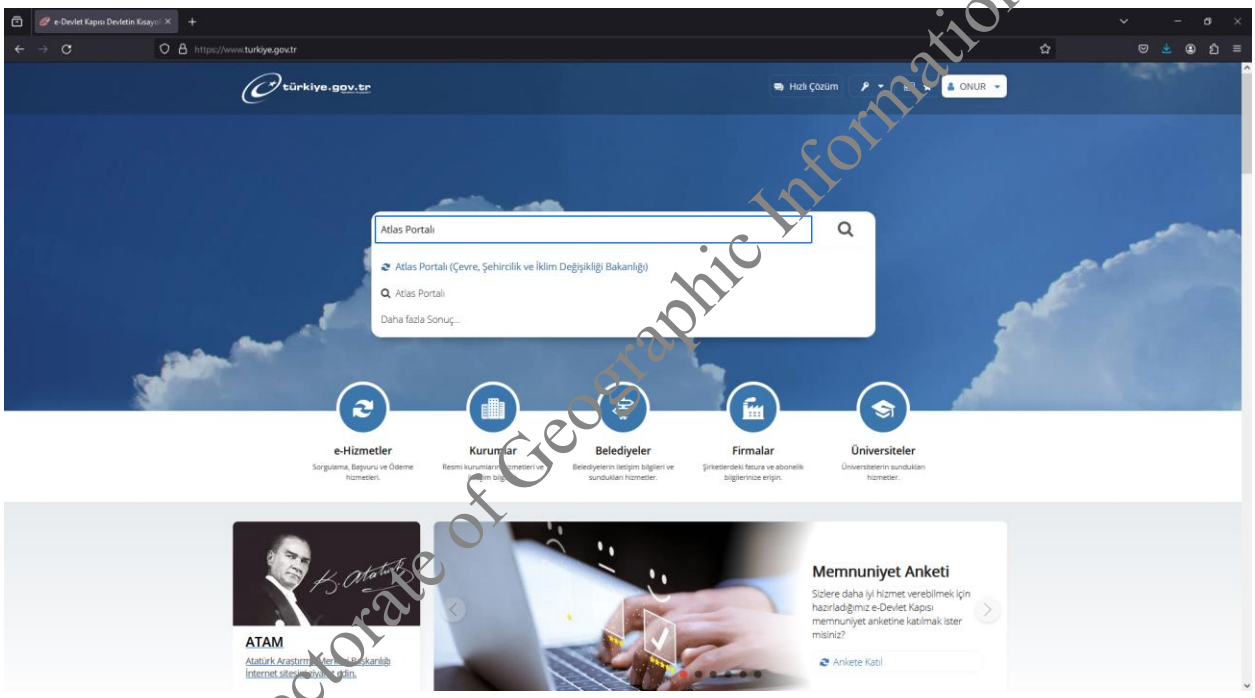


Figure 10:e-GovermentGateway - Atlas Portal

When you click on the 'Atlas Portal' application, you can access the National Geographic Information Platform with the 'Go to Application' button in the window that appears.

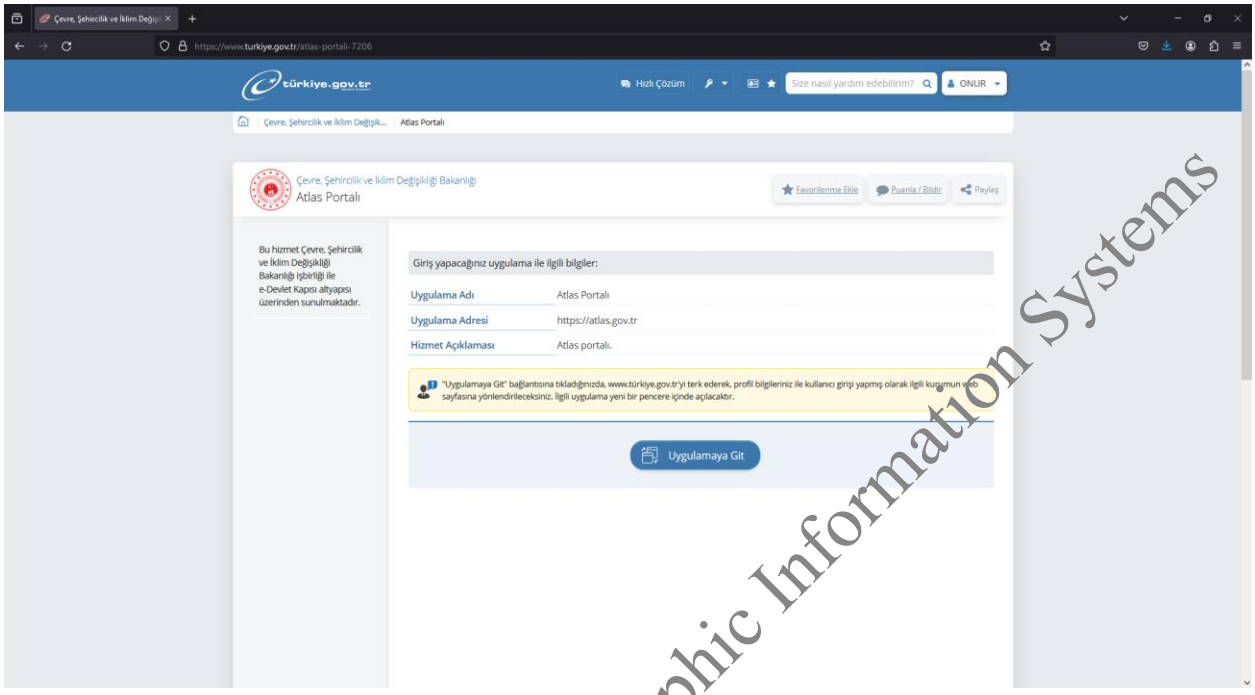


Figure 11:e-GovermentGateway - Access to Atlas Portal Application

After logging in to the National Geographic Information Platform, access to the metadata adding/editing application is provided by clicking on the Metadata Registration Portal in Figure 12

In order for the user authorized to add metadata to create metadata, the geographic data must be served from the GIS application (WMS, WMTS, WFS, WCS) (https://atlas.gov.tr/#).

Figure 12:National Geographic Information Platform Metadata Registration Portal

8. CREATING METADATA (WITH PROCESS STEPS)

Figure 13:Metadata Management Panel

After logging in to the National Geographic Information Platform and selecting the Metadata Registration Portal (https://mv.atlas.gov.tr), select **Add New** to create metadata and **Metadata List** to view or update previously created metadata (https://mv.atlas.gov.tr/Metadata).

Figure 14: Adding New Metadata Procedures

To add new metadata, the tabs shown in Figure 14 (Metadata, Credential, Classification, Keywords, Spatial, Time, Quality and Accuracy, Conformance, Limitations, Organizational) must be filled in order. Fields with **(*)** next to them must be filled. If not filled, the system will not accept it and it will not be approved by the administrator. When filling in the fields, the headings with the ( ) emblem next to them have a content information box.

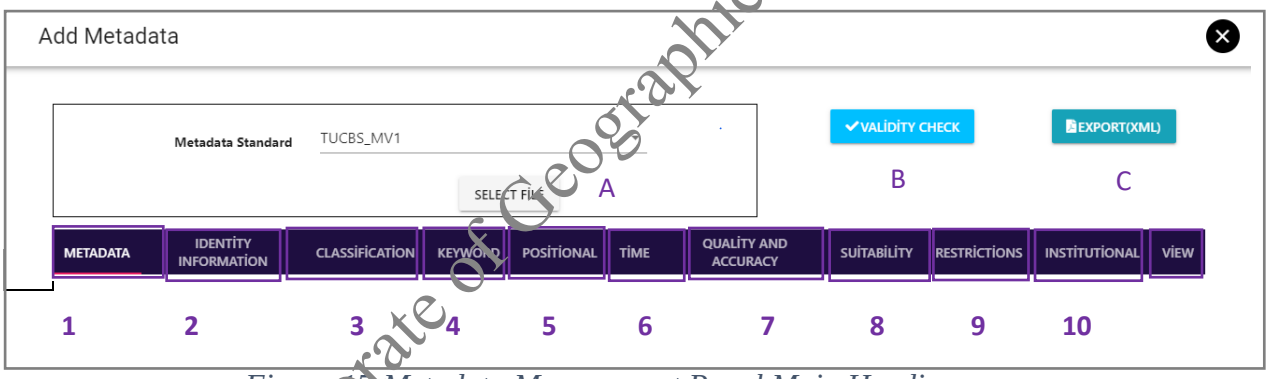


Figure 15:Metadata Management Panel Main Headings

A. Select File: It is used to add the ready XML file, it is detailed in the related section.

B. Validity Check: It provides control for the prepared metadata to meet the mandatory fields, the metadata whose validity check is successful will be saved in the system.

C. Output: It is used to save the prepared metadata as xml after all metadata process steps from 1 to 10 are filled.

8.1. Metadata

In this tab, the attribute information of the metadata to be added to the system by the metadata owner institution (logo of the institution, metadata catalogue, resource type, metadata date and language) and the person to be contacted for the metadata should be entered. After entering the e-mail address, it can be added with the plus ( ) button, more than one e-mail address to the system (Figure 16).

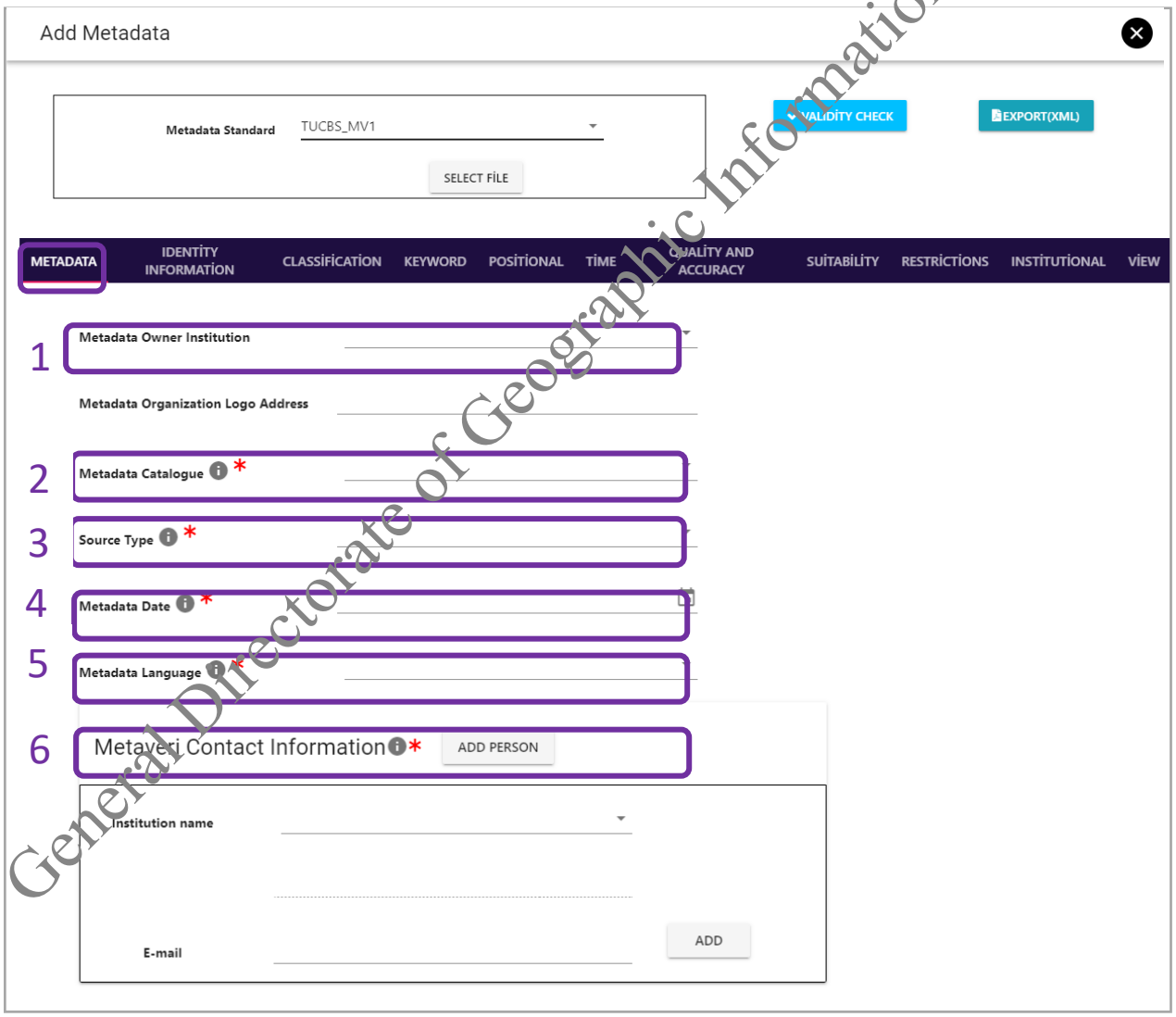


Figure 16:Adding New Metadata Process Metadata Tab

1. Information about the institution where the user is registered is automatically displayed

2. Select the appropriate one from the ***Metadata Catalog*** available in the system and described in the table (Page 31-34). During the Metadata Catalog selection, 20 of the 22 catalog information in Table 4 are listed.

3. According to the source type of the geographic data, the appropriate one from ***single data layer, spatial data set, spatial data series*** is selected (Page 39).

4. Select the date the metadata was created or updated (Page 35)

5. Select the metadata language (Page 35)

6. The e-mail address of the metadata owner organization is added. (Page 35)

Metadata Catalog: Used for the classification of geographic data. During the creation of metadata, one of the catalogs that express the data should be selected. There are 22 catalogs created for TUCBS based on ISO 19115 metadata catalogs. The catalogs are listed in alphabetical order in the table.

Table 4:Metadata Catalogs

Catalog Name	Description
Disaster	Information related to disasters. Examples: disaster location, evacuation zone, disaster prevention facility, disaster relief activities
Biota	The totality of plant and animal life found in a particular area or environment. Examples: wildlife, vegetation, biological sciences, ecology, wilderness, marine life, wetlands, habitat.
Environment	Environmental resources, protection and prudent use. Examples: environmental pollution, waste storage and treatment, environmental impact assessment, environmental risk monitoring, nature reserves, landscape.
Seas	Covers the characteristics of salt water bodies, excluding inland waters. Examples: tides, tsunamis, coastal information, reefs

Catalog Name	Description
Other	It is used for geographical data that is not included in other catalogs.
Economy	Economic activities, conditions and employment are specified. Examples: production, labor, income, trade, industry, tourism and ecotourism, forestry, fishing, commercial or subsistence hunting, exploration and exploitation of resources such as minerals, oil and gas.
ViewingBasicMapsBaselineMaps	Refers to basic maps. Examples: baseline maps, topographic maps, images, unclassified images, annotations
Inland waters	Characteristics of inland waters, drainage systems and their properties. Examples: rivers and glaciers, salt lakes, water use plans, dams, flows, floods, water quality, hydrological information.
Contact us	energy, water and waste systems and communications infrastructure and services. Examples: hydroelectric, geothermal, solar and nuclear energy sources, water treatment and distribution, sewage collection and disposal, electricity and gas distribution, data communications, telecommunications, radio, communication networks
intelligenceMilitaryFields	military bases, structures, activities. Examples: barracks, training areas, military transportation, information gathering
Climatology Meteorology Atmospheric Phenomena	Refers to atmospheric processes and phenomena. Examples: cloud cover, weather, climate, atmospheric conditions, climate change, precipitation.
Location	It covers spatial information and services. Examples: addresses, geodetic networks, control points, postal zones and services, place names

Catalog Name	Description
PlanningCadastre	Information used for appropriate actions for the future use of land. Examples: land use maps, zoning plans, cadastral surveys, land ownership
Health	Health, health care, human ecology and security. Examples: illness and disease, factors affecting health, hygiene, substance abuse, mental and physical health, health services
Borders	Legal land definitions, maritime boundaries. Examples: political and administrative boundaries, territorial waters, port security zones.
Agriculture	The raising of animals and/or the cultivation of plants. Examples: agriculture, irrigation, aquaculture, fields, herding, pests and diseases affecting crops and livestock.
Transportation	Means and aids for the transportation of persons or goods. Examples: roads, airports/airways, shipping routes, tunnels, nautical charts, vehicle or ship location, aviation charts, railways
Society	It covers characteristics of society and cultures. Examples: settlements, anthropology, archaeology, education, traditional beliefs, manners and customs, demographic data, recreation areas and activities, social impact assessments, crime and justice, census information
Space	It covers more than 100 km of the Earth's surface.
Structure	Man-made structures. Examples: buildings, museums, places of worship, factories, residences, monuments, shops, towers
Geoscientific knowledge	Information about earth sciences. Examples: geophysical properties and processes, geology, minerals, sciences related to the composition, structure and origin of earth rocks,

Catalog Name	Description
	earthquake risks, volcanic activity, landslides, gravity information, soils, permafrost, hydrogeology, erosion.
Elevation	Indicates data above or below the vertical datum. Examples: elevation, bathymetry, digital elevation models, slope, derived products.

Source Type: Refers to the type of data described in the metadata. Depending on the data, the resource type may be a single data layer, a spatial data set, or a spatial data series.

- **Singular Data Layer**: It refers to geographic services that enable geographic data to be presented to the user in the internet environment. In addition, this option should be selected as the source type if geographic data containing the same attribute information are presented on a single layer. For example, geographic data in the same theme group such as buildings, parcels, etc., which are presented with services such as Web Feature Service (WFS), Web Map Service (WMS), etc. are evaluated within this option. For another example, if a layer (bridge, tunnel, stop, etc.) in a data group (transportation) that is a spatial data set is to be presented individually independent of the data set, a separate service and metadata should be prepared for each.
- **Spatial Data Set**: It is the layer/dataset consisting of data representing the relevant detail class. Spatial datasets are multiple geographic data with different attribute information presented together in the same service. If it is desired to display the data in such a data set separately, metadata should be created separately for each data group in the set, and for this, the relevant data group in the data set should be selected using the single data layer option. For example, building data set, transportation data set, country border, province border, district border, neighborhood border in the administrative unit data set can be published as geographic data set.
- **Spatial Data Series**: It is the presentation of the attribute data of the same data group produced by various times and techniques with geographic services. In this concept, data representing the same detail class can be stored with multiple data sets. It can be selected when used with a

data set or layer. The size or region of the data can be defined by example. For example, the topographic data set can be divided into several data sets with sheet sections, or Orthophoto data series published by years can be used. Likewise, when TÜİK population information is grouped by years, spatial data will be created.

Metadata Date (*): Indicates when the metadata record was created or updated.

Metadata Language (*): What language the metadata is expressed in.

Metadata Contact (*): Information of the organization and persons who added and modified the metadata. Name of the organization, in free text, e-mail address for contact.

8.2. Identity Information

In this tab, attribute information and web service information of the metadata source are entered (Figure 17Figure 17).

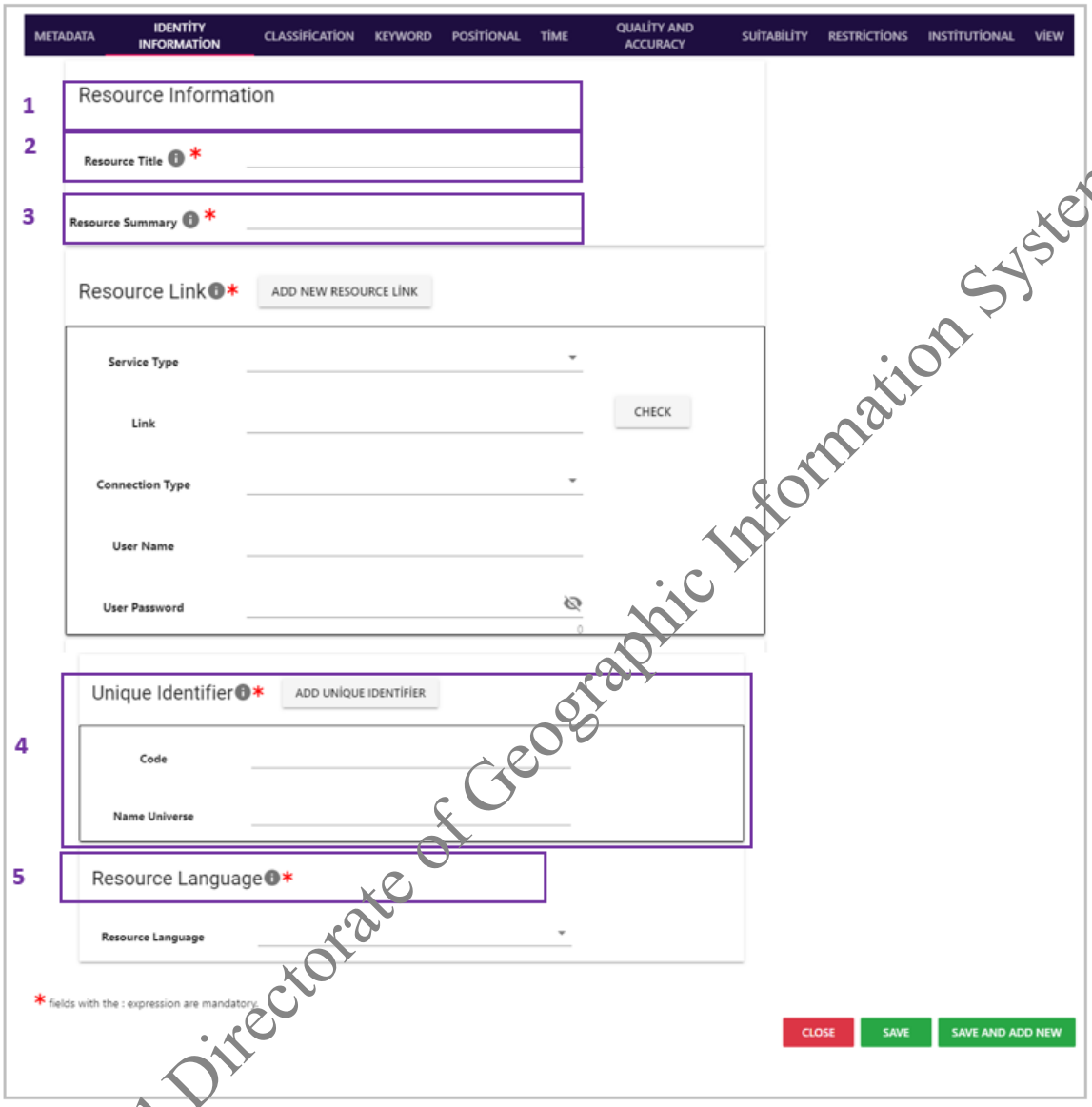


Figure 17:Adding New Metadata Process Credential Tab

1.Source Title (*): This field should be the characteristic and little known name of the source. It is important that the metadata source title is unique and that no other metadata with the same name is created.

2.Resource Summary (*): A short summary describing the content of the source.

3.Resource Link (*): The resource locator identifies the link(s) that connect to the resource and/or provide extra information about the resource.

4.Unique Identifier (*): Should be a unique value that identifies the source. Usually, it is a mandatory code set by the data owner, and the name space must carry the value of the identifier code

5.Source Language: Specifies the language used in the source.

If the Spatial Data Set is selected in the resource type section under the Metadata tab, the Unique Identifier and Resource Language sections are not available, and the Merged Resources / Link section is optionally selected (

Figure 18).

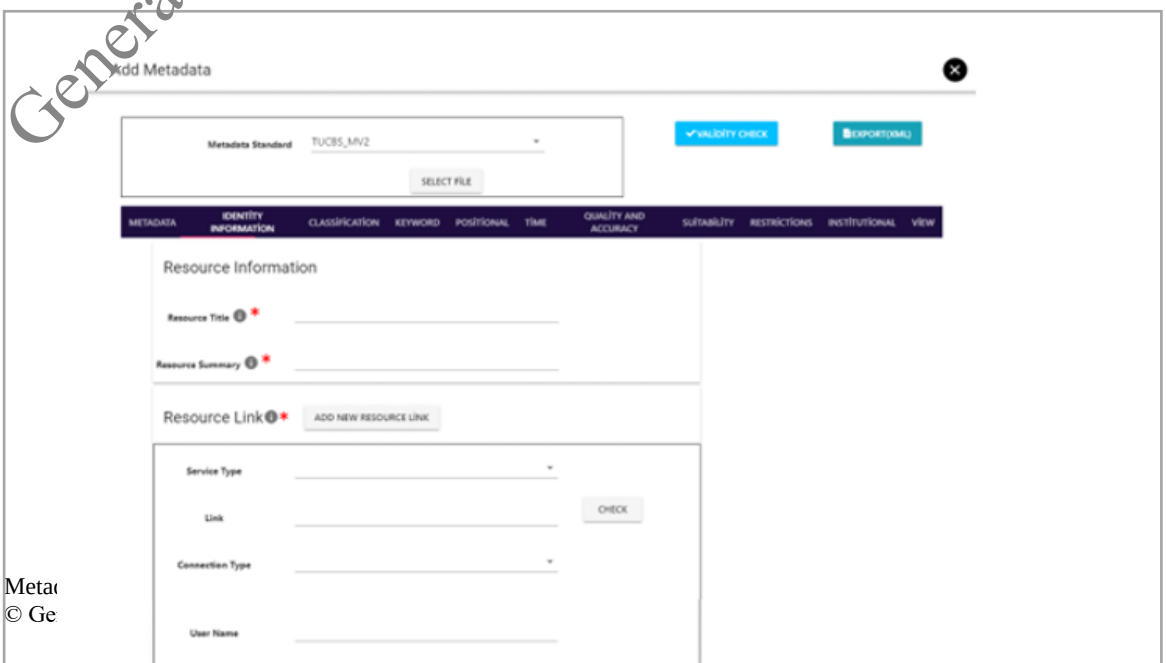


Figure 18: Adding New Metadata Process Credential Tab Spatial Data Set

1. Link: In case of selecting the Source Type Spatial Data Set, it is used in case of adding additional service information for geographic data.

8.3 Classification

Select the title category to which the metadata belongs (Figure 19)

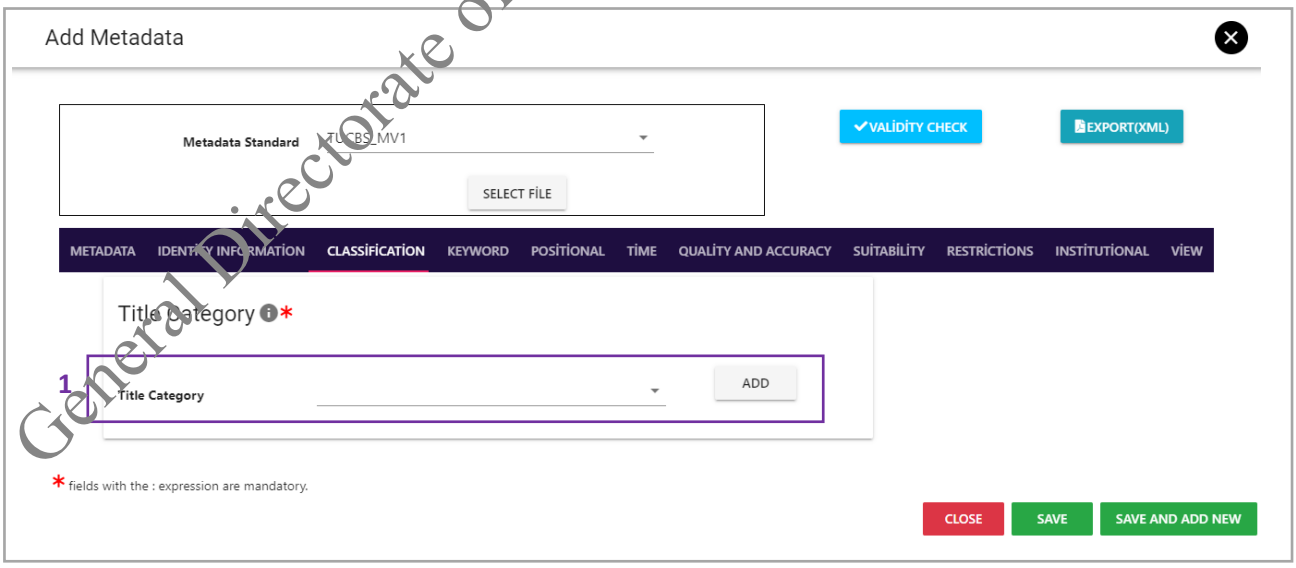


Figure 19:Manual Metadata Addition Process Classification Tab

1. **Title Category (*):** Title category is a part of a high-level classification system to support grouping and subject-based searching of existing spatial data sources. In the Classification tab, when selecting the Title Category, 10 of the 52 title categories specified in Table 5 are listed. When creating metadata, only 1 selection can be made according to the Title Category (Figure 19).

The table regarding the classification system used during metadata creation is shown in the table below with its relationships. After selecting the Theme group of a geographic data according to TUCBS Geographic Data Definition Documents from this table, the sub-theme information of the relevant theme is used when creating metadata.

There are 32 geographic data themes and 52 sub-themes in the TUCBS classification system (Table 5).

Table 5:Title Categories Used in Classification (Geographic Data Themes and Subthemes)

Theme No	Theme	Subtheme (Category)
1	Coordinate Reference Systems and Geographic Grid Systems	Coordinate Reference Systems
		Geographic Grid Systems
2	Administrative Units	Administrative Units
3	Geographical Place Names	Geographical Place Names
4	Cadastre	Cadastre
5	Building	Building
6	Address	Address
7	Height	Height
8	Orthoimage	Orthoimage_5000_Alt
		Orthoimage_5000_Upper
9	Transportation Networks	Road Transportation Network (Intercity)
		Road Transportation Network (Local)
		Railway Network
		Air Transportation Network
		Maritime and Inland Waterways Transportation Network
		Urban Rail Systems and Cable Transportation Network
10	Hydrography	Hydrography
11	Geology	Geology
		Hydrogeology
		Geophysics
12	Land Cover	Land Cover

Theme No	Theme	Subtheme (Category)
13	Land Use	Current Land Use
		Planned Land Use
14	Soil	Soil
15	Protection Zones	Protection Zones
16	Natural Risk Zones	Natural Risk Zones
17	Infrastructure	Electricity
		Oil / Gas / Chemical
		Wastewater
		Su
		Electronic Communication
		Thermal
		Environmental Management Facilities
		Basic Administrative and Social Services (POI)
18	Energy Sources	Energy Sources
		Energy Statistics
19	Mines	Mines
20	Human Health and Safety	Security
		Human Health
		Environmental Quality
21	Population Distribution - Demography	Population Distribution - Demography
22	Environmental Monitoring Facilities	Environmental Monitoring Facilities
23	Industrial Facilities	Industrial Facilities
24	Agriculture Facilities	Agriculture Facilities

Theme No	Theme	Subtheme (Category)
25	Public Administration Regions	Public Administration Regions
26	Species Distribution	Species Distribution
27	Habitat Zones	Habitat Zones
28	Biogeography Regions	Biogeography Regions
29	Marine and Saltwater Areas	Marine and Saltwater Areas
30	Atmosphere Data	Atmosphere Data
31	Meteorology Data	Meteorology Data
32	Statistical Reporting Regions	Statistical Reporting Regions

8.4 Keyword

A keyword is a formalized, commonly used word or phrase that describes the topic. When subject categories are too superficial for detailed searches, keywords allow searching the entire text. Keywords are entered with the help of predefined or free options. The more keywords, the easier it is for users to access the data. There is no number limitation in keyword entry.

When a different keyword is desired to be added, the relevant fields such as province name, district name, subject, title, institution information, theme information and data type etc. are filled in and added. The keyword is important in terms of searching and accessing geographic data from the metadata.

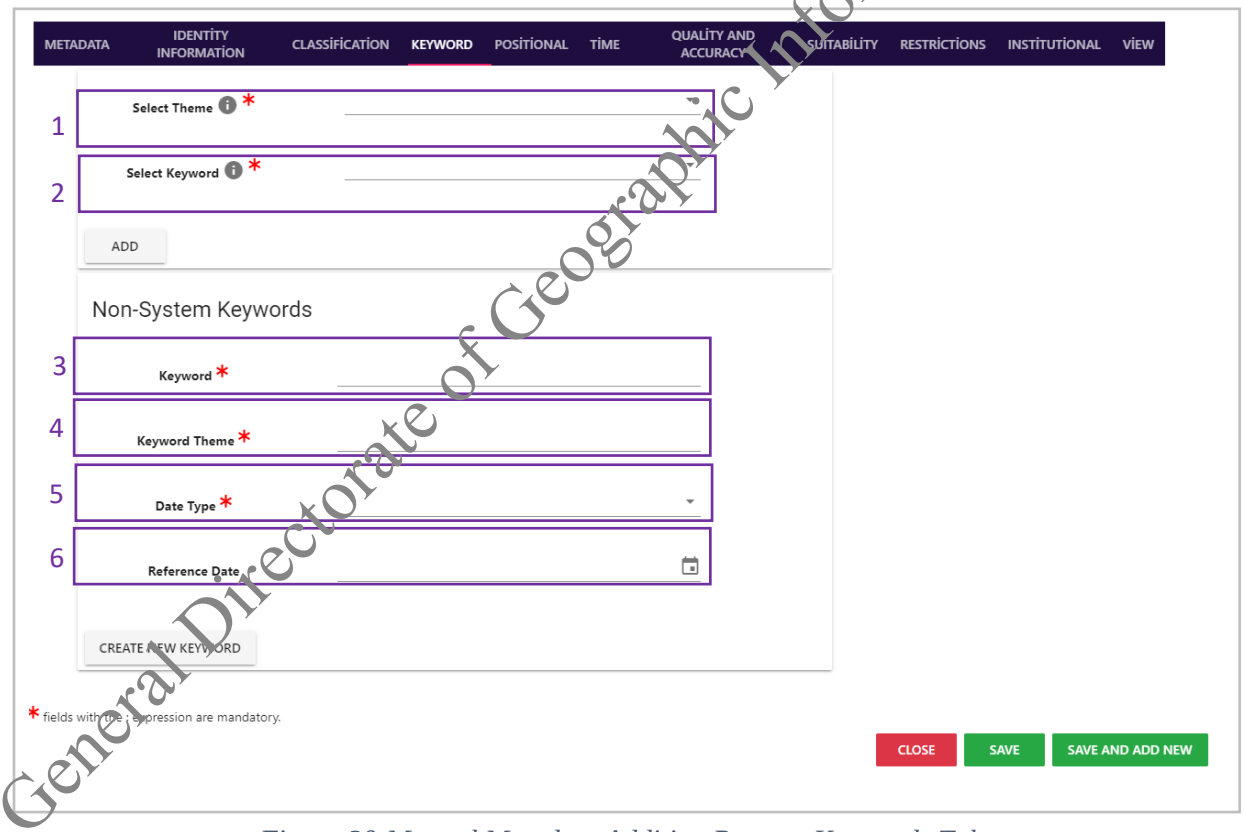


Figure 20:Manual Metadata Addition Process Keywords Tab

1. **Select Theme (*):** Select one of the 32 geographic data themes suitable for the data.
2. **Select Keyword (*):** Add the appropriate keyword for the selected theme from 52 sub-theme information.
3. **Keyword (*):** To select keywords that are not defined in the system, information such as province name, district name, subject, title, institution information, theme information and data type etc. must be added.
4. **Keyword Theme (*):** Keyword theme is selected according to the information created.
5. **Date Type (*):** Select the appropriate one from Creation Date, Publication Date and Update Date.
6. **Reference Date (*):** To add keywords outside the system, the reference date that is appropriate for the specified date type can be selected.

8.5 Positional

The boundaries of the metadata must be defined in the web service of the source by specifying the north, south, east and west coordinates of the area covered by the data. When a web service (WMS, WMTS, WFS, WCS) prepared in this way is entered into the system, these boundaries are automatically called using the ***Get Metadata Boundaries*** button and the metadata boundary box is created and the coordinates that appear on the screen are defined to the system with the add button. If it is not desired to get the boundaries in the web service, the boundaries of the data should be selected from the map in the plugin by pressing the Ctrl key (Figure 21). Thus, the location information of the metadata can be added more than once.

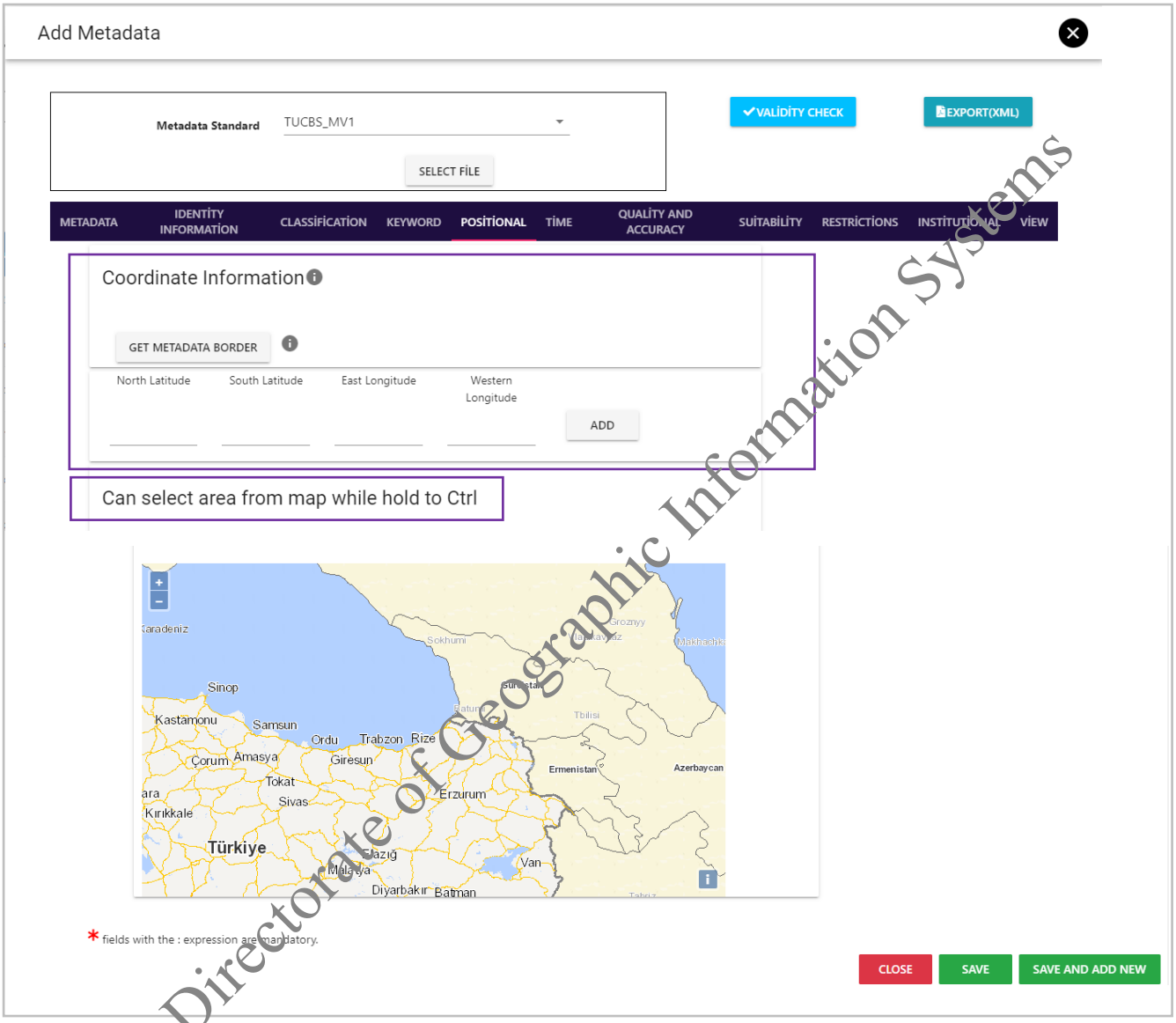


Figure 21:Manual Metadata Addition Process Positional Tab

8.6 Time

The production start-end, publication and update dates of geographic data can be added (Figure 22).

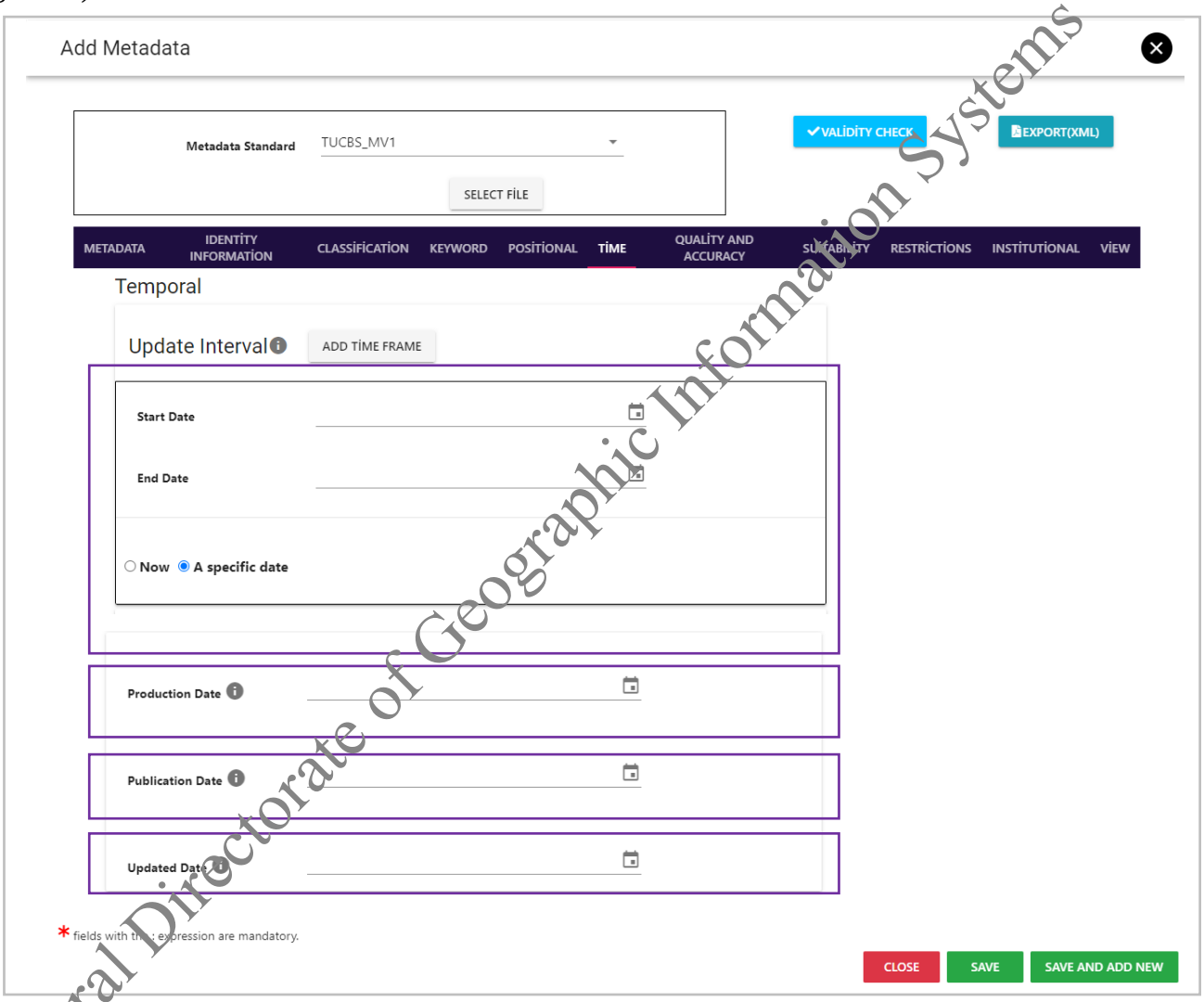


Figure 22:Manual Metadata Addition Process Time Tab

1. **Timeframe:** Specifies the time period covered by the content of the data source. The date when the data started to be generated and the date when the data generation was completed should be added.

2. **Production Date: Date of creation of the** Data source.

3. **Publication Date: Date the** Data Source was published and entered into force after its creation.

4. **Update Date:** The date the data source was last updated.

8.7 Quality and Accuracy

For all metadata such as **Singular Data Layer**, **Spatial Data Series** and **Spatial Data Set**, **Quality and Accuracy**, **History Information** is a mandatory field to be filled in as indicated in Table 6, and information can be added to the **Spatial Resolution** field if desired (Figure 23).

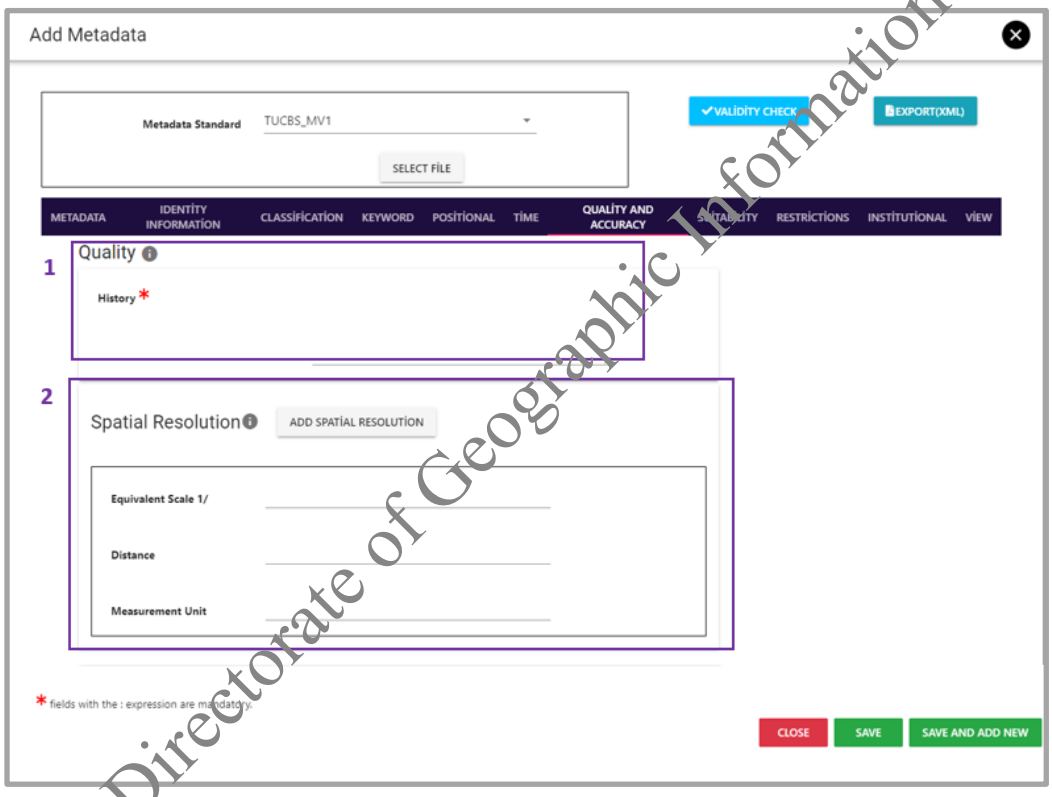


Figure 23:Manual Metadata Addition Process Quality and Accuracy Tab

1. **Background Information**: TUCBS data quality components should be added to the Historical Information field as specified in Table 7.

2. **Spatial Resolution:** Scale etc. resolution information of geographic data can be added

Table 6:Data Quality Components

Component	Subcomponent	Description
Objective		The purpose for obtaining the data is explained.
Usage		The uses of data are explained.
Origin of Data		The generation and source of the data is specified.
Source schema address of the data		https://tucbs-public-api.csb.gov.tr/tucbs/Kurumsal%20Kaynak%20Veritaban%C4%B1%20%C5%9Eemalar%C4%B1/
Identification document address of the data		https://tucbs-public-api.csb.gov.tr/tucbs/tucbs_tanimlama_dokumanlari/
WFS		https://gis-prod-api.csb.gov.tr/trk_cbsgm_std_il_wfs
Completeness of Data	Redundancy	Excess data in the data set
	Deficiency	Missing data in the data set
Logical Coherence	Conceptual coherence	How well a dataset follows the rules of its conceptual schema
	Definition set consistency	How well values fit into value domains
	Format consistency	The degree to which the data is stored in accordance with the claimed physical structure of the dataset

Component	Subcomponent	Description
	Topology consistency	Accuracy of the topological characteristics of the dataset
Positional Accuracy	Absolute or external accuracy	Reported coordinate values are correct or close to values considered correct
	Relative or internal accuracy	closeness of the relative positions of features in the dataset
	Gridded data location accuracy	The closeness of the gridded data location values to the values considered correct or accurate
Temporal Accuracy	Accuracy of time measurement	Accuracy of time measurement of temporal references of an element
	Temporal coherence	Accuracy of sequential events or sequences
	Temporal validity	Validity of the data with respect to the present
Thematic Accuracy	Classification accuracy	Comparison of details and attributes in a dataset, compliance with TUCBS catalog and category lists
	Non-quantitative attribute accuracy	Accuracy of non-quantitative attributes
	Quantitative attribute accuracy	Accuracy of quantitative attributes
Availability		Specific quality information about the suitability of the dataset for a particular application

Table 7:Data Quality Requirements

Data Quality Requirements
Objective : [ ]
Usage : [ ]
Data Origin : [ ]
Data Source Schema Address: [https://tucbs-public-api.csb.gov.tr/tucbs/Kurumsal%20Kaynak%20Veritaban%C4%B1%20%C5%9Eemalar%C4%B1/]
Data Identification Document Address : [https://tucbs-public-api.csb.gov.tr/tucbs/tucbs_tanimlama_dokumanlari/]
WFS : [https://gis-prod-api.csb.gov.tr/trk_cbsgm_std_il_wfs**]**
Completeness of Data : [ ]
Redundancy : [ ]
Deficiency : [ ]
Logical Consistency : [ ]
Conceptual Coherence : [ ]
Definition Set Consistency : [ ]
Format Consistency : [ ]
Topology Consistency : [ ]
Positional Accuracy : [ ]
Absolute Truth : [ ]
Relative Accuracy : [ ]
Raster Data Location Accuracy : [ ]
Temporal Accuracy : [ ]
Accuracy at Relevant Time : [ ]
Temporal Coherence : [ ]
Temporal Validity : [ ]
Thematic Accuracy : [ ]
Classification Accuracy : [ ]
Accuracy of Quantitative Attribute Information : [ ]
Accuracy of Non-quantitative Attribute Information : [ ]
Availability : [ ]

Spatial resolution is the ability to distinguish between neighboring objects on the ground. Spatial resolution is a function of the design of the sensor and its height above the surface and indicates the degree of spatial detail of the image. Spatial resolution in units of length is expressed by . The smaller the spatial resolution, the more detailed objects appear. In short, spatial resolution is the size of the pixels that make up the image (Figure 21).

8.8. Relevance

It refers to the degree of conformity of the Single Data Layer / Spatial Data Series / Spatial Data Set with the TUCBS Standard it targets. Geographic Data Themes Definition Documents explain the structure and presentation of geographic data together with schema rules, and the data to be shared is expected to comply with the theme standards and therefore the schema rules. It is a necessity to address the conformity assessment in this respect.

On the other hand, some geographic data may be the subject of more than one theme due to their characteristics. This type of data group should comply with the rules of all themes to which it is related, the data structure should contain the features specified in the relevant theme, and the suitability of the data should be determined and specified separately for each theme.

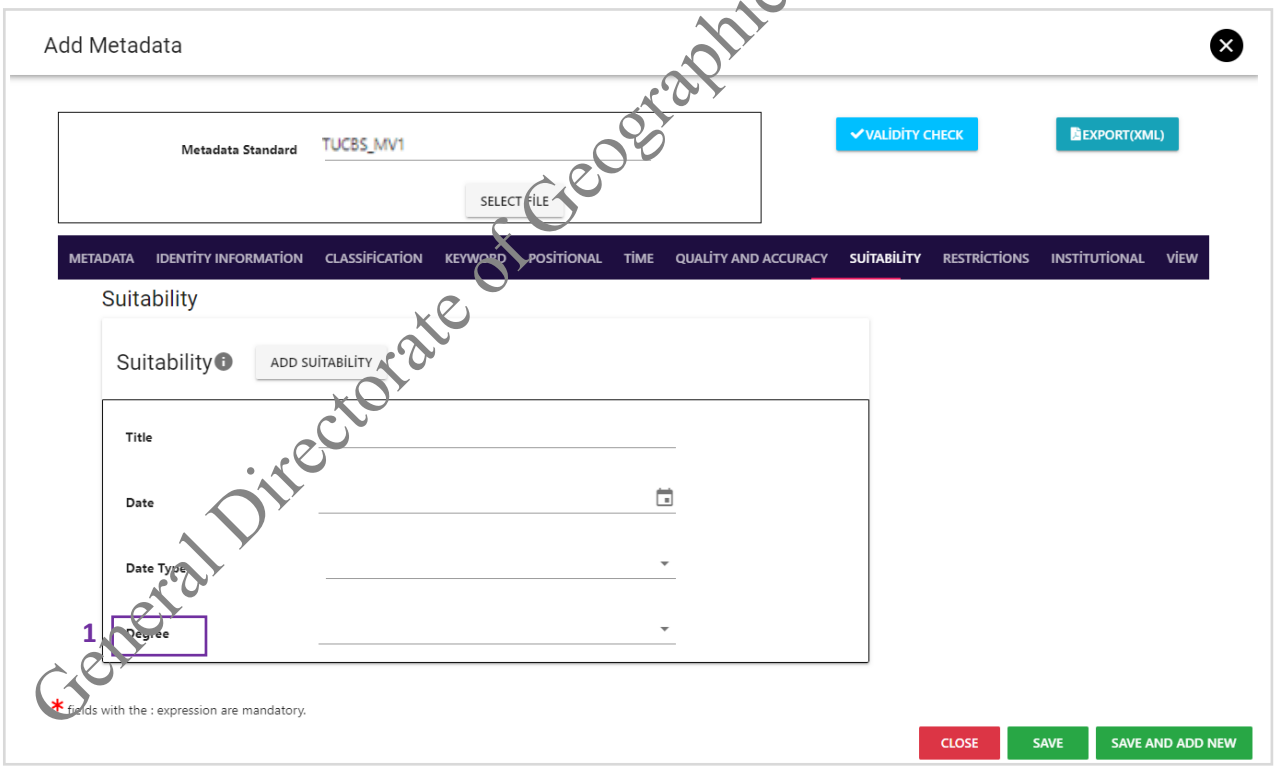


Figure 24:Add New Metadata Process Conformance Tab

1. **Degree of Appropriateness**: The appropriate one of the following values is selected for evaluation.

- **Appropriate:** If compliance with TUCBS schema rules has been measured and reported,
- **Not Applicable:** If compliance with TUCBS schema rules has been measured and reported as not applicable,
- **Assessment Work in Progress:** If the measurement of compliance with TUCBS schema rules is ongoing,
- **Not assessed:** If the conformance to TUCBS schema rules has not been subject to any assessment.

Only one of these values should be selected and the title, date, date type (creation date, last update date and publication date) and degree of conformity measurement should be specified (Figure 24).

For example, if the geodata produced on 20.02.2020 has a Conformity Rating of Not Evaluated on the Creation Date, it should be specified for that date. If studies have been initiated in accordance with the TUCBS schema rules as of March 2020, the Evaluation Work In Progress information should be added and the metadata should be updated.

When the work is completed, the metadata should be updated by adding the information Conforming or Not Conforming according to the result to be obtained.

8.9. Limitations

Access to data services, usage conditions and restrictions are entered as decided by the data producer or data owner (Figure 25), and metadata is published according to the confidentiality levels and conditions set in the restrictions section. Therefore, metadata is published.

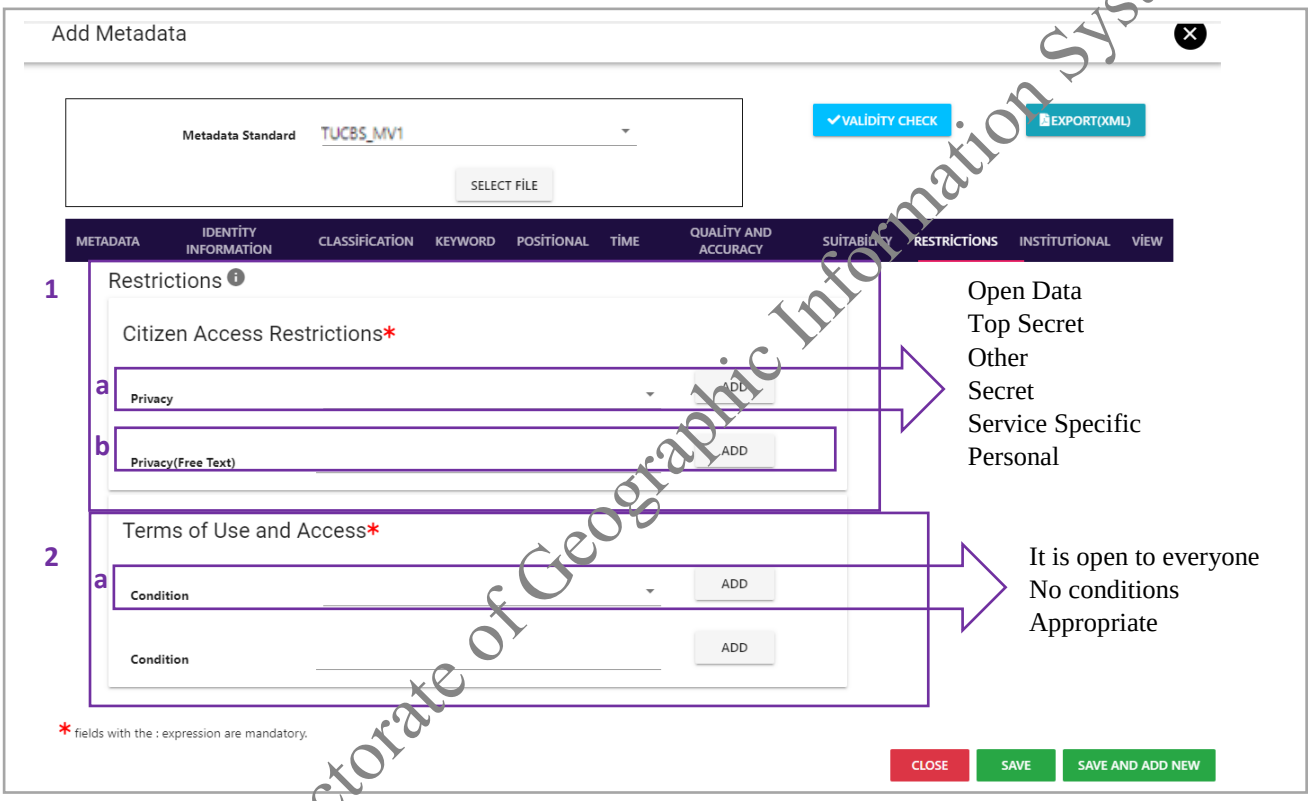


Figure 25:Add New Metadata Process Limitations Tab

1. Public Access Restrictions

a. Privacy;

- ***Open Data***: Data that is free of any copyright and can be used, edited and distributed by anyone.
- ***Top Secret***: Any information that is not intended to be known by persons other than those who have a need to know and which, if disclosed without authorization, would be prejudicial to the security of the State, national existence and integrity, internal and external messages, reports, documents, tools, equipment, installations and places that would be extremely harmful to our interests in terms of life, that would provide benefits to a foreign state, or that are of extraordinary importance in terms of security.

- ***Other**:* Data whose degree of confidentiality is separately defined by the organization
- ***Secret***: It is used for messages, reports, documents, tools, equipment, facilities and places which are not intended to be known by persons other than those who need to know and which, if disclosed without authorization, could seriously harm the security of the State, national existence and integrity, our internal and external interests, or provide benefits to a foreign state.
- ***Service Specific:*** This term is used for messages, reports, documents, tools, equipment, facilities and places that do not need to be protected with top secret, confidential or special confidentiality degrees due to the information they contain, but which are not intended to be known by anyone other than those who need to know.
- ***Personal:*** It is not a degree of confidentiality, but it means that the document can be opened by certain persons (the supervisor or only the personnel authorized by him/her) at the place where it is going and in the initial transactions, and that it cannot be opened by any other person.
- ***Special:*** Used for messages, reports, documents, tools, equipment, facilities and places which, if disclosed without authorization, would prejudice the interests and prestige of the State or provide benefits to a foreign state.
- ***Unclassified:*** The degree of confidentiality given to information, documents, papers, messages and documents that do not carry classified information in terms of the subjects they contain, but are related to the State service.

b. Confidentiality (Free Text)

- This section is reserved for the institution/municipality to write information about confidentiality or articles such as laws. *For example*: For Information Purposes. Cannot be used in official transactions. The data cannot be reproduced and made available to third parties and published in any way. In the event that it is determined that the data is used for commercial purposes, legal proceedings will be initiated against those concerned.

2. Access and Terms of Use

a. Condition

- It is open to everyone,
- No conditions,
- The appropriate one is selected from the conditional headings.

8.10. Institutional

Contact information of the unit responsible for the metadata is added. In some cases, the metadata owner and the data producer may be different units, the appropriate option should be selected from the list according to the producer, owner, author status of the data in the role field (Figure 26).

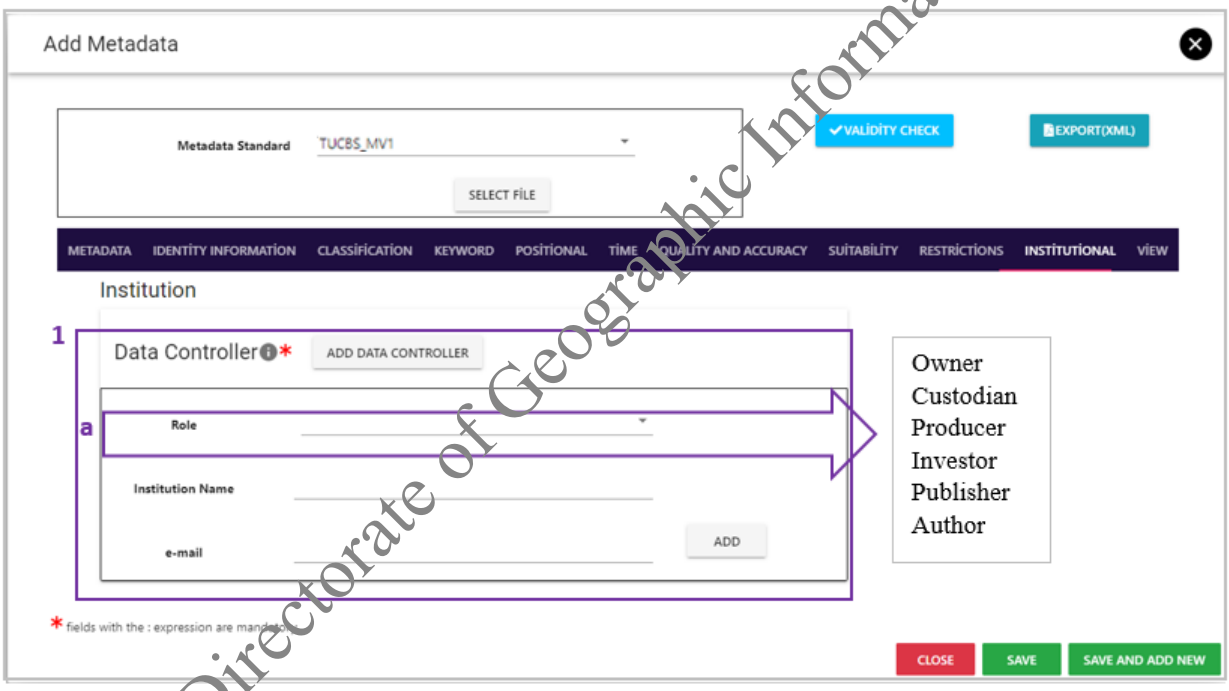


Figure 26:Add New Metadata Tab Corporate Tab

1. Data Controller

a. Role

- **Mediator:** Refers to a class of entities that mediates access to the resource and for which the resource is intended or useful.
- **Principal Investigator**: Refers to the key party responsible for gathering information and conducting research.
- **Distributor**: Refers to the party that distributes the resource.
- **Supporting**: Refers to the party who speaks about the resource because they support it.

- **Editor**: Refers to the party who reviews or modifies the resource to improve the content.
- **Rights Holder**: Refers to the state of having or managing rights over the resource.
- **Contact Person**: Refers to the party that can be contacted to obtain information about the resource.
- **Collaborator**: Refers to the party outside the researcher who helps to produce the resources.
- **Processor**: Refers to the party that processes the data in such a way that the source is changed.
- **Contributor**: Refers to the party contributing to the resource.
- **Source Provider**: Refers to the party providing the resource.
- **User**: Refers to the party using the resource.
- **Stakeholder**: Refers to a party with an interest in the source or its use.
- **Co-Author**: Refers to the party who co-authored the source.
- **Owner (Sahip)**: Refers to the party that owns the resource.
- **Custodian (Saklayıcı)**: The party that accepts accountability and responsibility for the resource and ensures that the resource is properly maintained and protected.
- **Producer (Üretici)**: Refers to the party that creates the resource.
- **Investor (Yatırımcı)**: Refers to the party providing monetary support for the resource.
- **Publisher (Yayıncı)**: Refers to the party that published the resource.
- **Author (Yazar)**: Refers to the author of the source.

1. Organization Name: The name of the person responsible for the Data.

1. E-mail: Email address of the data controller.

8.11. View

After the metadata processing steps are completed (mandatory fields and optional fields), the metadata created is retrieved in XML file format by selecting the appropriate one from Output Standard TUCBS_MV1 and TUCBS_MV2 (Figure 27).

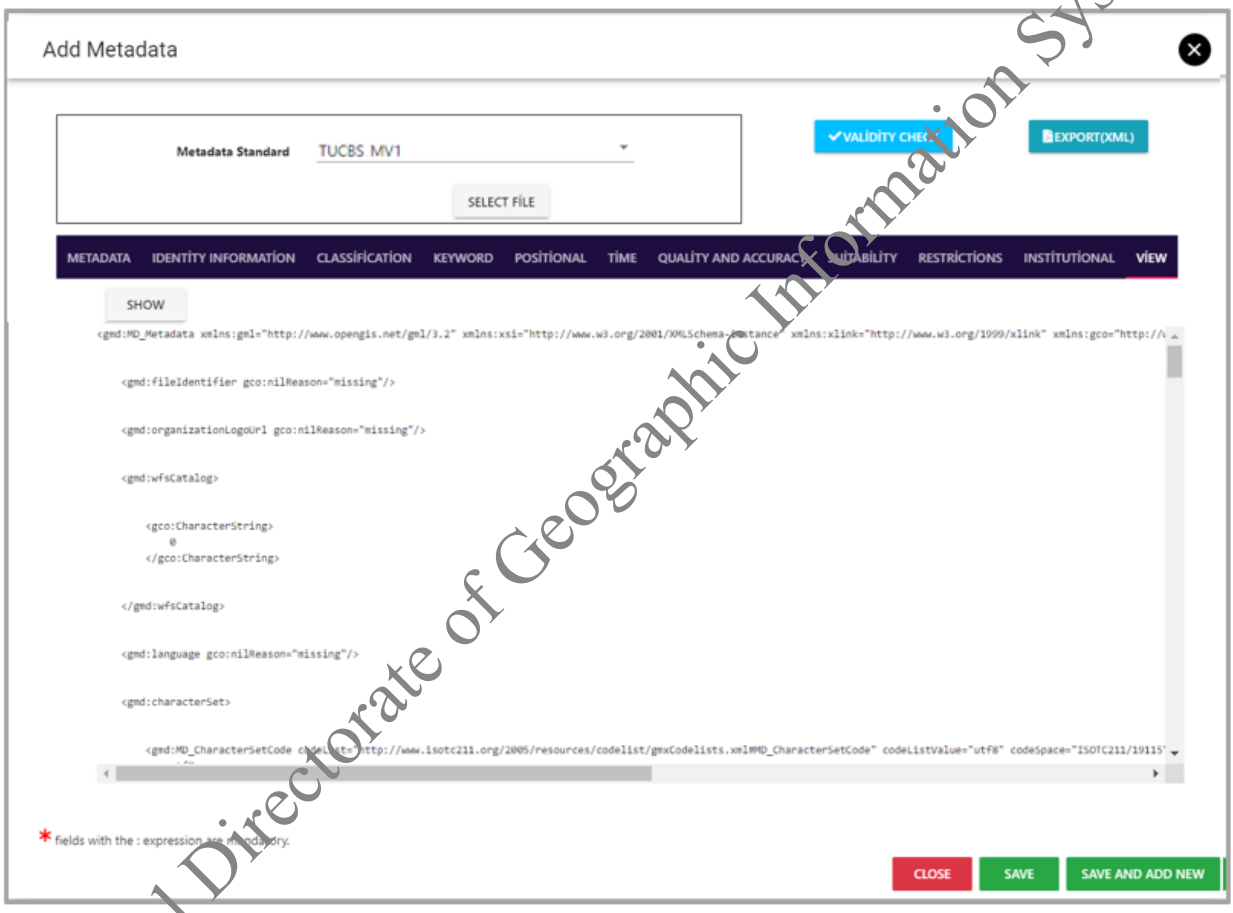


Figure 27:Adding New Metadata View Tab

After filling in the required fields in all tabs, **Validity Check** is performed according to the TUCBS_MV2 standard, and if there is no deficiency, the metadata is registered with **Save** (Figure 29). During the process of adding new metadata, if the saving process will be performed by using a viewable geographic data service (WMS, WMTS), the metadata is saved to the system by adding a downloadable geographic data service (WFS, WCS) as shown in Figure 28. Although this feature

in UCBP prevents duplicate metadata entries, it is not recommended for data sharing since user authorization is required for downloadable geographic data services.

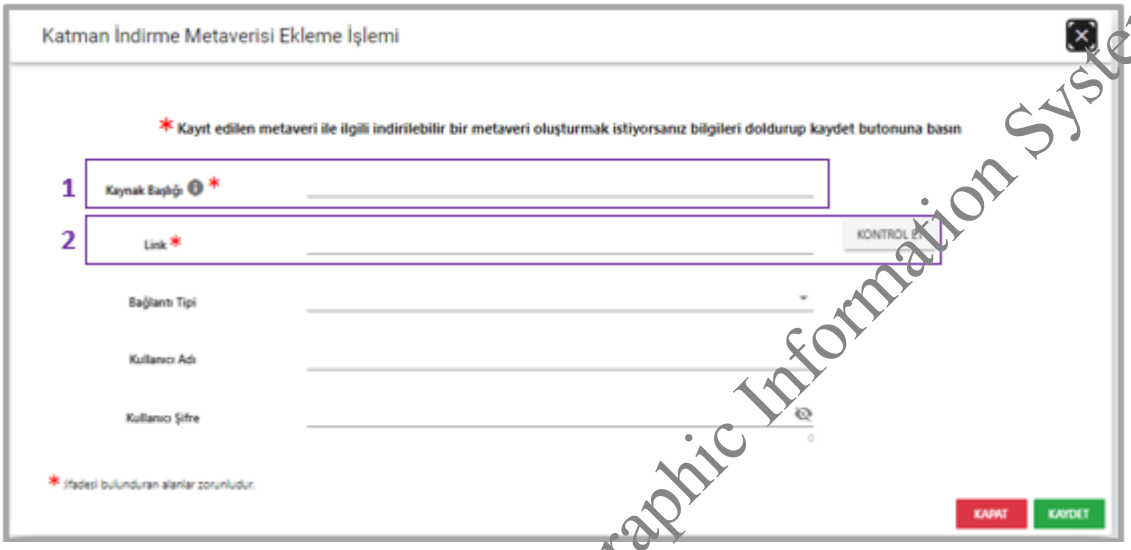


Figure 28:Adding New Metadata Layer Download Service Information

1. **Resource Title:** Used for the process of saving the recorded metadata with the addition of a downloadable geodata service.
2. **Link:** The link address of the geographic data service in question.

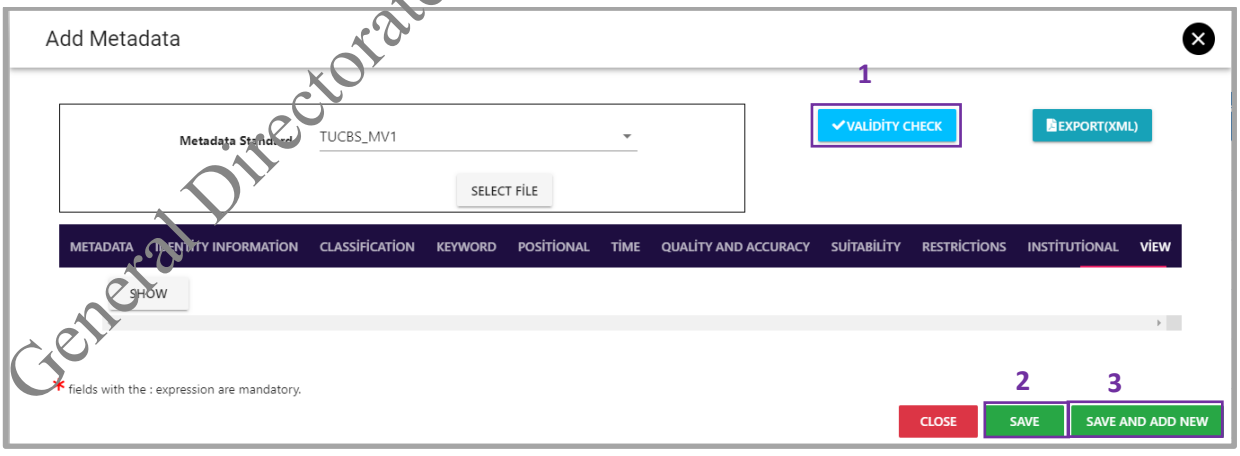


Figure 29:Adding New Metadata Process Validity Check and Save

1. **Validity Check**: Metadata is checked for compliance with the relevant metadata standard (TUCBS_MV2) before registration. If the validity check is not provided, it should be checked that there is no missing information in mandatory fields.

2. **Save**: The metadata whose conformity is checked is saved to the system.
3. **Save and Continue:** It is used to continue the process of adding new metadata, except for the metadata that has been checked for compliance and saved to the system.

9. CREATING METADATA VIA XML UPLOAD

With this metadata upload method, the metadata XML file (Figure 30) created for the institutions or produced by the institution with its own systems is selected with the *Select File* button and when it is uploaded to the system with the *Load* button, the information of the metadata is automatically filled in the blanks in the tabs.

The file is selected, the XML file is uploaded, **Validity Check** is performed, all metadata addition tabs are checked and the metadata is transferred to the system via **Save**.

When uploading the file in XML format, the appropriate metadata standard (TUCBS_MV1 and TUCBS_MV2) should be selected.

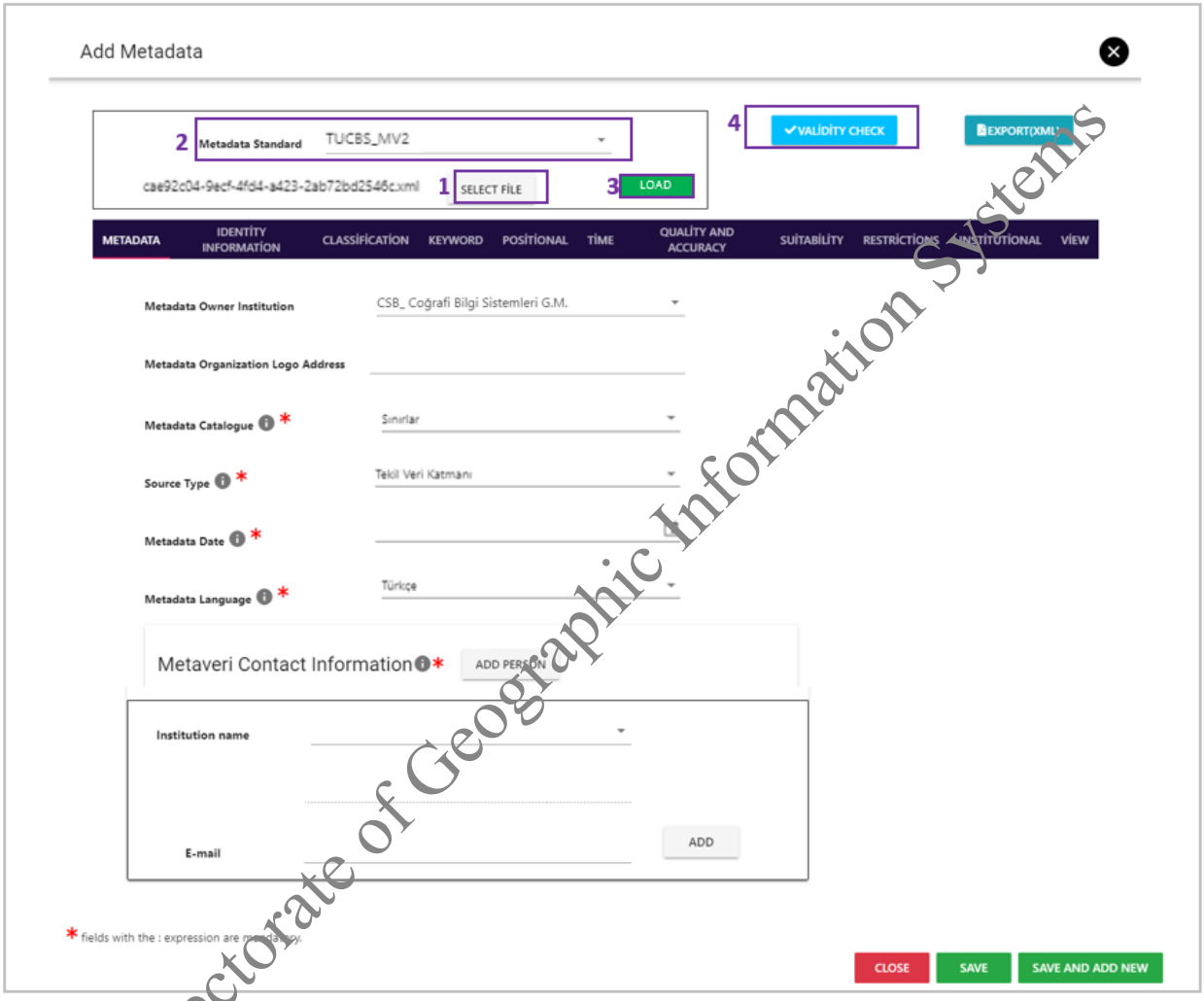


Figure 30:Adding Metadata via XML Loading

1. The file is selected.
2. XML standard is selected.
3. XML file is loaded
4. Validity check according to TUCBS_MV2 standard
5. All metadata addition process steps are checked
6. Metadata is saved
7. It is used to save the metadata and continue the process of adding new metadata.

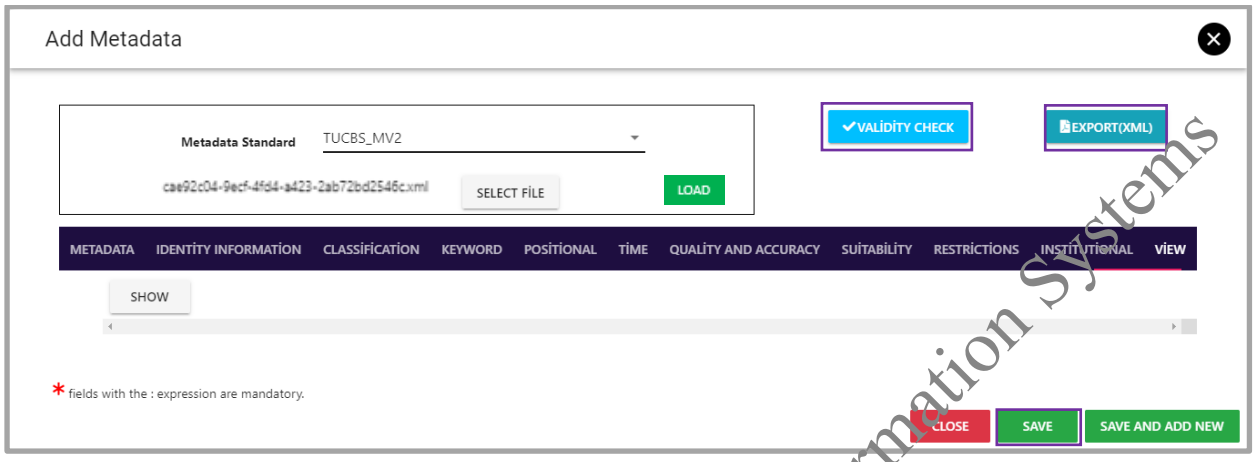


Figure 31:Adding Metadata via XML Upload Validity Check and Save

9.1 Metadata

In TUCBS_MV1 and TUCBS_MV2 manual metadata addition process, regardless of the XML standard selected, mandatory fields are expected to comply with TUCBS_MV2.

If the TUCBS_MV1 metadata comes from the catalog service, it is used as it is, and only the date of registration is taken as the metadata date since the date information is mandatory in TUCBS_MV2 (Figure 32).

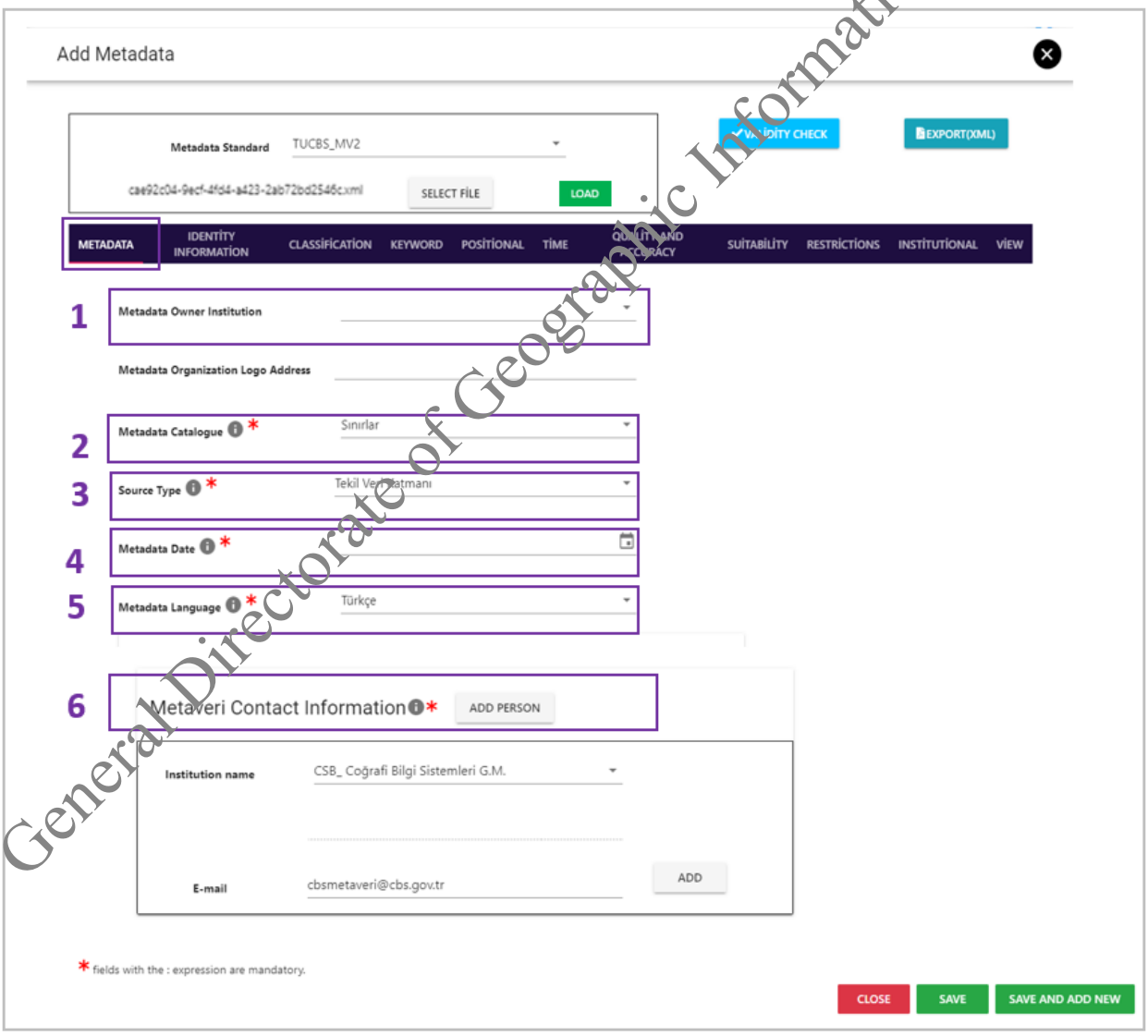


Figure 32:Metadata Tab

The XML file of the Metadata Catalog (

Figure 33) in the Metadata tab is given below.


```
▼<mdb:wfsCatalog>
    <gco:CharacterString>29</gco:CharacterString>
  </mdb:wfsCatalog>
```

Figure 33:Metadata Catalog XML File

Table 8:Metadata Catalog and Code List

Code	Catalog Name	Description
4	Other	It is used for geographical data that are not included in other catalogs.
24	Agriculture	The raising of animals and/or the cultivation of plants. Examples: agriculture, irrigation, aquaculture, fields, herding, pests and diseases affecting crops and livestock.
27	Biota	The totality of plant and animal life found in a particular area or environment. Examples: wildlife, vegetation, biological sciences, ecology, wilderness, marine life, wetlands, habitat.
29	Borders	Legal land definitions, maritime boundaries. Examples: political and administrative boundaries, territorial waters, port security zones.
31	Climatology Meteorology Atmospheric Phenomena	Refers to atmospheric processes and phenomena. Examples: cloud cover, weather, climate, atmospheric conditions, climate change, precipitation.
33	Economy	Economic activities, conditions and employment are specified. Examples: production, labor, income, trade, industry, tourism and ecotourism, forestry, fishing, commercial or subsistence hunting, exploration and exploitation of resources such as minerals, oil and gas.
35	Height	Indicates data above or below the vertical datum. Examples: elevation, bathymetry, digital elevation models, slope, derived products.
37	Environment	Environmental resources, protection and moderate use. Examples: environmental pollution, waste storage and treatment, environmental impact assessment, environmental risk monitoring, nature reserves, landscape.
39	Geoscientific knowledge	Information about earth sciences. Examples: geophysical properties and processes, geology, minerals, sciences related to the composition, structure and origin of earth rocks, earthquake risks, volcanic activity, landslides, gravity information, soils, permafrost, hydrogeology, erosion.
41	Health	Health, health care, human ecology and security. Examples: illness and disease, factors affecting health, hygiene, substance abuse, mental and physical health, health services

Code	Catalog Name	Description
43	ViewingBasicMapsPresentMaps	Refers to basic maps. Examples: baseline maps, topographic maps, images, unclassified images, annotations
45	intelligenceMilitaryFields	Includes military bases, structures, activities. Examples: barracks, training areas, military transportation, information gathering
47	Inland waters	Characteristics of inland waters, drainage systems and their properties. Examples: rivers and glaciers, salt lakes, water use plans, dams, flows, floods, water quality, hydrological information
49	Location	It covers spatial information and services. Examples: addresses, geodetic networks, control points, postal zones and services, place names
51	Seas	Covers the characteristics of salt water bodies, excluding inland waters. Examples: tides, tsunamis, coastal information, reefs
53	PlanningCastro	Information used for appropriate actions for the future use of land. Examples: land use maps, zoning plans, cadastral surveys, land ownership
55	Society	It covers characteristics of society and cultures. Examples: settlements, anthropology, archaeology, education, traditional beliefs, manners and customs, demographic data, recreation areas and activities, social impact assessments, crime and justice, census information
57	Structure	Man-made structures. Examples: buildings, museums, places of worship, factories, residences, monuments, shops, towers
59	Transportation	Means and aids for the transportation of persons or goods. Examples: roads, airports/airways, shipping routes, tunnels, nautical charts, vehicle or ship location, aviation charts, railways
61	Contact	It covers energy, water and waste systems and communications infrastructure and services. Examples: hydroelectric, geothermal, solar and nuclear energy sources, water treatment and distribution, sewage collection and disposal, electricity and gas distribution, data communications, telecommunications, radio, communication networks
63	Space	It covers more than 100 km of the Earth's surface.
65	Disaster	Information related to disasters. Examples: disaster location, evacuation zone, disaster prevention facility, disaster relief activities

The XML file for the Resource Type Figure 34 in the Metadata tab is given below.

Figure 34:Resource Type XML File

The XML file for the Metadata Date (Figure 35) in the Metadata tab is given below.

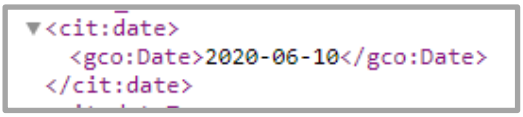


Figure 35:Metadata History XML File

The XML file for the Metadata Language (Figure 36) in the Metadata tab is given below.

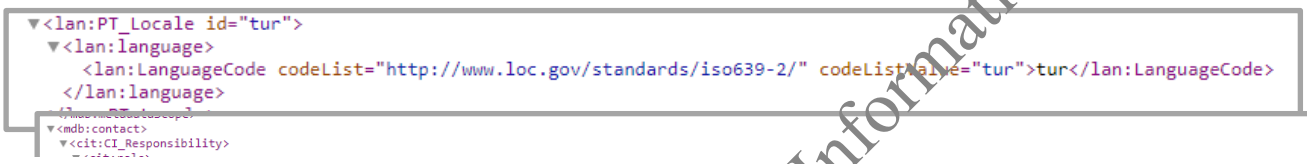


Figure 36:Metadata Language XML File

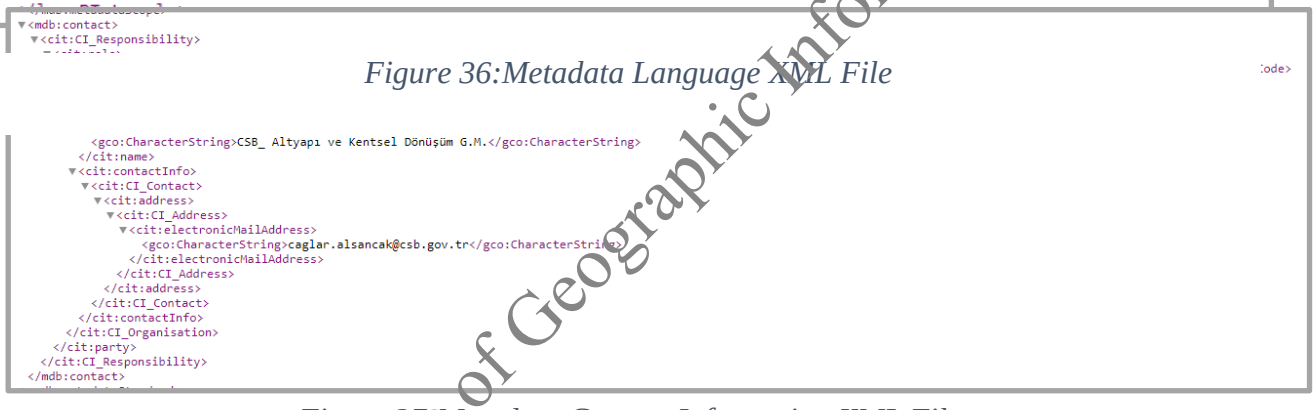


Figure 37:Metadata Contact Information XML File

The XML file of the Metadata Contact Information (Figure 37) in the Metadata tab is given below.

9.2 Credentials

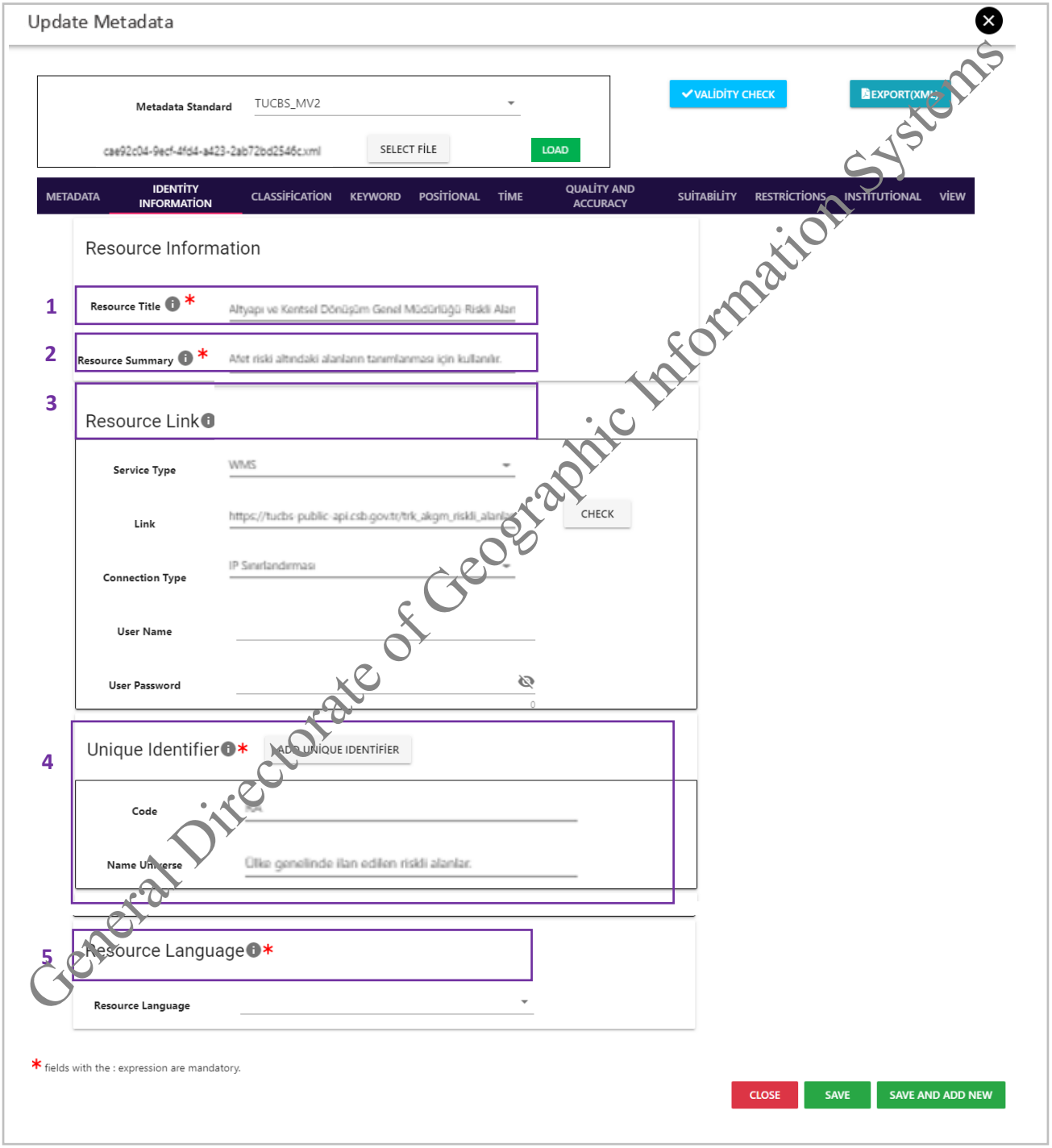


Figure 38:Credential Tab

The XML file for the Resource Header (Figure 39) in the Credential tab is given below.

```
▼<mri:citation>
  ▼<cit:CI_Citation>
    ▼<cit:title>
       <gco:CharacterString>Riskli Alanlar</gco:CharacterString>
     </cit:title>
    ▼<cit:identifier>
```

Figure 39:Resource Title XML File

The XML file for the Resource Summary (Figure 40) in the Credential tab is given below.

```
▼<mri:abstract>
   <gco:CharacterString>6306 sayılı kanun kapsamında zemin veya üzerindeki yapılaşmanın risk taşıması nedeniyle belirlenmektedir</gco:CharacterString>
 </mri:abstract>
```

Figure 40:Resource Summary XML File

The XML file for the Resource Link (Figure 41) in the Credential tab is given below.

```
▼<mdb:distributionInfo>
  ▼<mrd:MD_Distribution>
    ▼<mrd:transferOptions>
      ▼<mrd:MD_DigitalTransferOptions>
        ▼<mrd:onLine>
          ▼<cit:CI_OnlineResource>
            ▼<cit:linkage>
               <gco:CharacterString>https://tucbs-public-api.csb.gov.tr/...k_akgm_riskli_alanlar_wms</gco:CharacterString>
             </cit:linkage>
            ▼<cit:function>
               <cit:CI_OnLineFunctionCode codeList="http://standards.iso.org/iso/19115/resources/Codelists/cat/codelists.xml#CI_OnLineFunctionCode"/>
             </cit:function>
           </cit:CI_OnlineResource>
         </mrd:onLine>
       </mrd:MD_DigitalTransferOptions>
     </mrd:transferOptions>
   </mrd:MD_Distribution>
 </mdb:distributionInfo>
```

Figure 41:Resource Link XML File

The XML file for the Unique Identifier (Figure 42) in the Credential tab is given below.

```
▼<mcc:codeSpace>
   <gco:CharacterString>ÜLKE GENELİNDE İLAN EDİLEN RİSKLİ ALANLAR</gco:CharacterString>
 </mcc:codeSpace>
```

Figure 42:Unique Identifier XML File

9.3 Classification

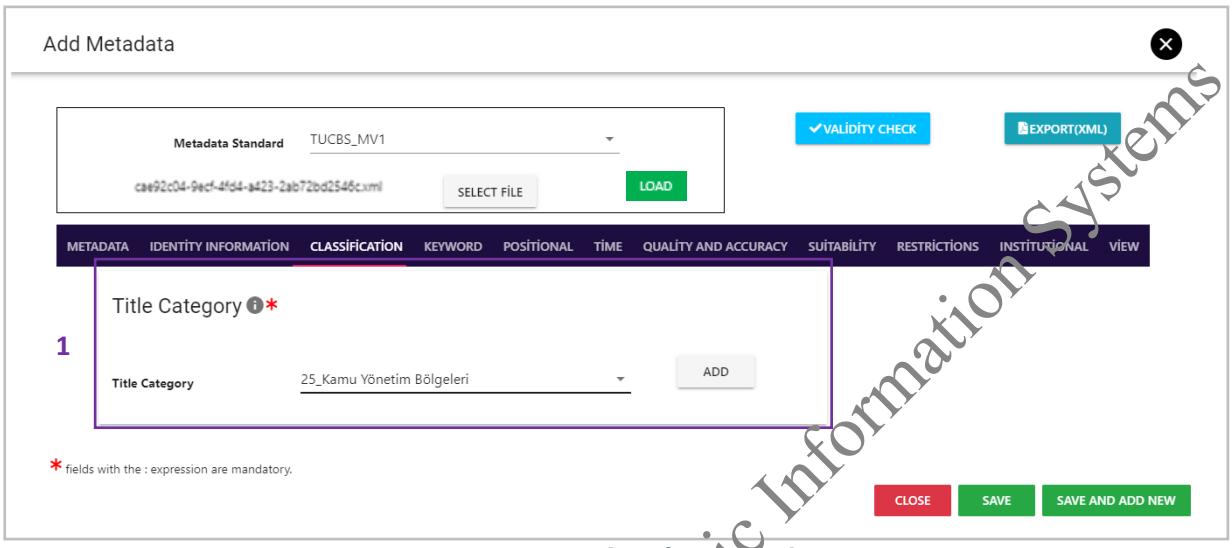


Figure 43:Classification Tab

The XML file for the Title Category (Figure 44) in the Classification tab is given below.

```
▼<mri:topicCategory>
    <mri:MD_TopicCategoryCode>25_Kamu Yönetim Bölgeleri</mri:MD_TopicCategoryCode>
  </mri:topicCategory>
```

Figure 44:Title Category XML File

9.4 Keywords

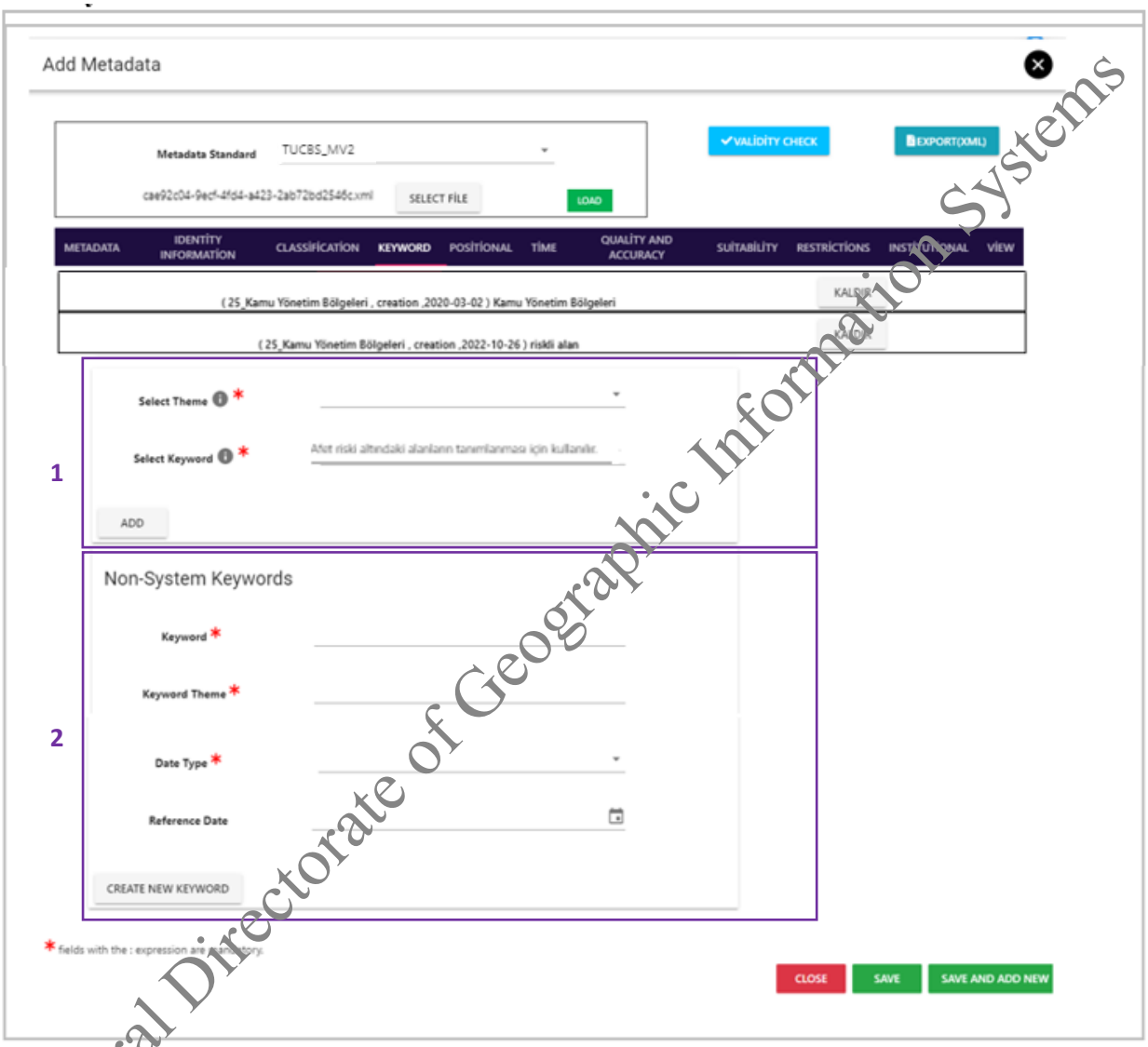


Figure 45:Keywords Tab

The XML file of the added keywords (Figure 45-1 and Figure 45-1) that appear under Keywords is given below.

1

```
<mri:descriptiveKeywords>
  <mri:MD_Keywords>
    <mri:keyword>
      <gco:CharacterString>Kamu Yönetim Bölgeleri</gco:CharacterString>
    </mri:keyword>
    <mri:thesaurusName>
      <cit:CI_Citation>
        <cit:title>
          <gco:CharacterString>25_Kamu Yönetim Bölgeleri</gco:CharacterString>
        </cit:title>
        <cit:date>
          <cit:CI_Date>
            <cit:date>
              <gco:Date>2020-03-02</gco:Date>
            </cit:date>
            <cit:dateType>
              <cit:CI_DateTypeCode codeList="http://standards.iso.org/iso/19115/resources/Codelists/cat/codelists.xml#CI_DateTypeCode" codeListValue="creation">creation</cit:CI_DateTypeCode>
            </cit:dateType>
          </cit:CI_Date>
        </cit:date>
      </cit:CI_Citation>
    </mri:thesaurusName>
  </mri:MD_Keywords>
</mri:descriptiveKeywords>
```

2

```
<mri:MD_Keywords>
  <mri:keyword>
    <gco:CharacterString>riskli alan</gco:CharacterString>
  </mri:keyword>
  <mri:thesaurusName>
    <cit:CI_Citation>
      <cit:title>
        <gco:CharacterString>kamu yönetim bölgeleri</gco:CharacterString>
      </cit:title>
      <cit:date>
        <cit:CI_Date>
          <cit:date>
            <gco:Date>2020-06-10</gco:Date>
          </cit:date>
          <cit:dateType>
            <cit:CI_DateTypeCode codeList="http://standards.iso.org/iso/19115/resources/Codelists/cat/codelists.xml#CI_DateTypeCode" codeListValue="creation">creation</cit:CI_DateTypeCode>
          </cit:dateType>
        </cit:CI_Date>
      </cit:date>
    </cit:CI_Citation>
  </mri:thesaurusName>
</mri:MD_Keywords>
</mri:descriptiveKeywords>
```

Figure 46:Keywords XML File

9.5 Positional

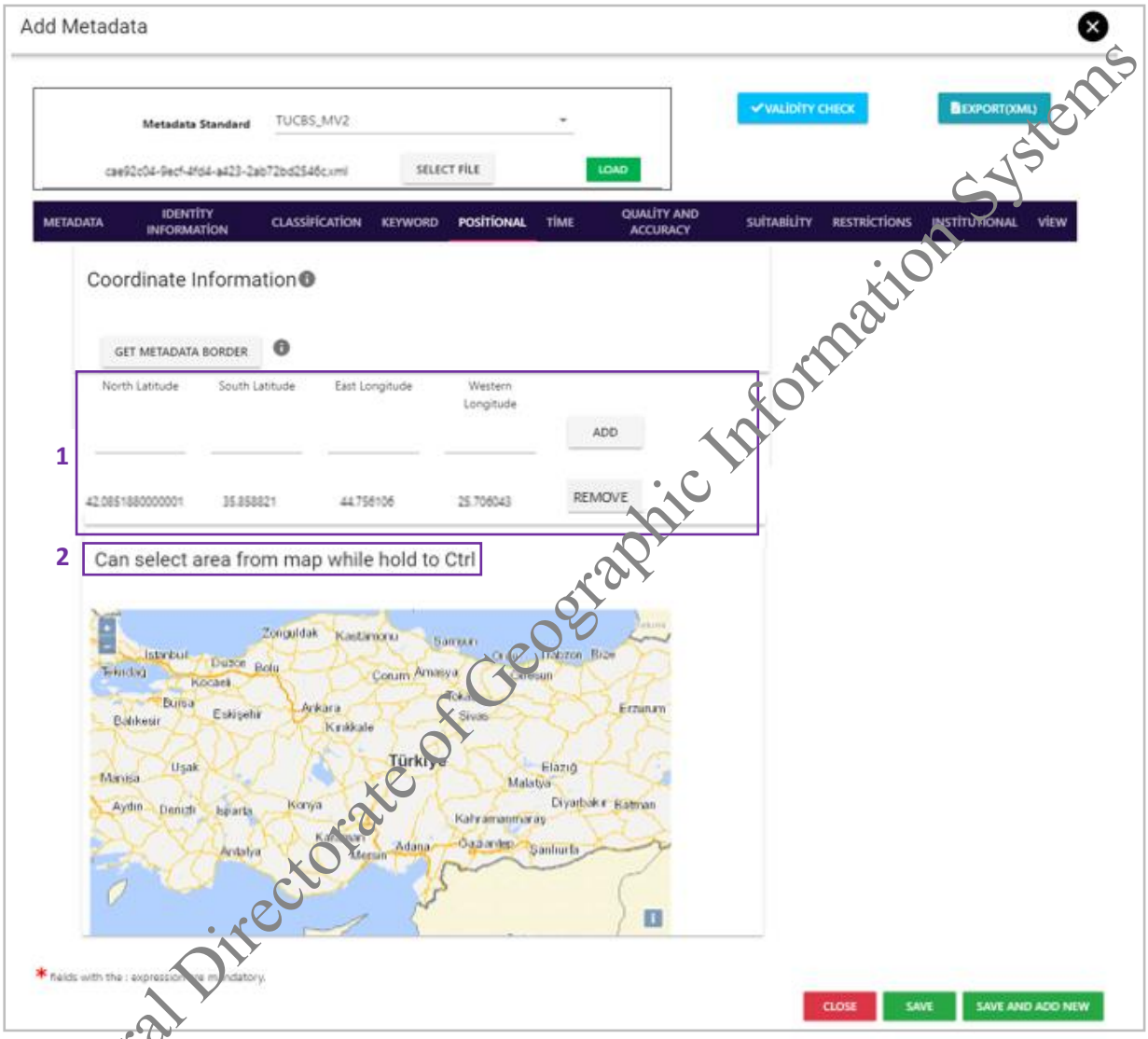


Figure 47:Positional Tab

The XML file for Coordinate Information (Figure 48) under the Spatial tab is given below.

```
▼<gex:geographicElement>
  ▼<gex:EX_GeographicBoundingBox>
    ▼<gex:westBoundLongitude>
       <gco:Decimal>26.56324</gco:Decimal>
     </gex:westBoundLongitude>
    ▼<gex:eastBoundLongitude>
       <gco:Decimal>44.303772</gco:Decimal>
     </gex:eastBoundLongitude>
    ▼<gex:southBoundLatitude>
       <gco:Decimal>36.208438</gco:Decimal>
     </gex:southBoundLatitude>
    ▼<gex:northBoundLatitude>
       <gco:Decimal>41.685287</gco:Decimal>
     </gex:northBoundLatitude>
   </gex:EX_GeographicBoundingBox>
 </gex:geographicElement>
```

Figure 48:Coordinate Information XML File

9.6 Time

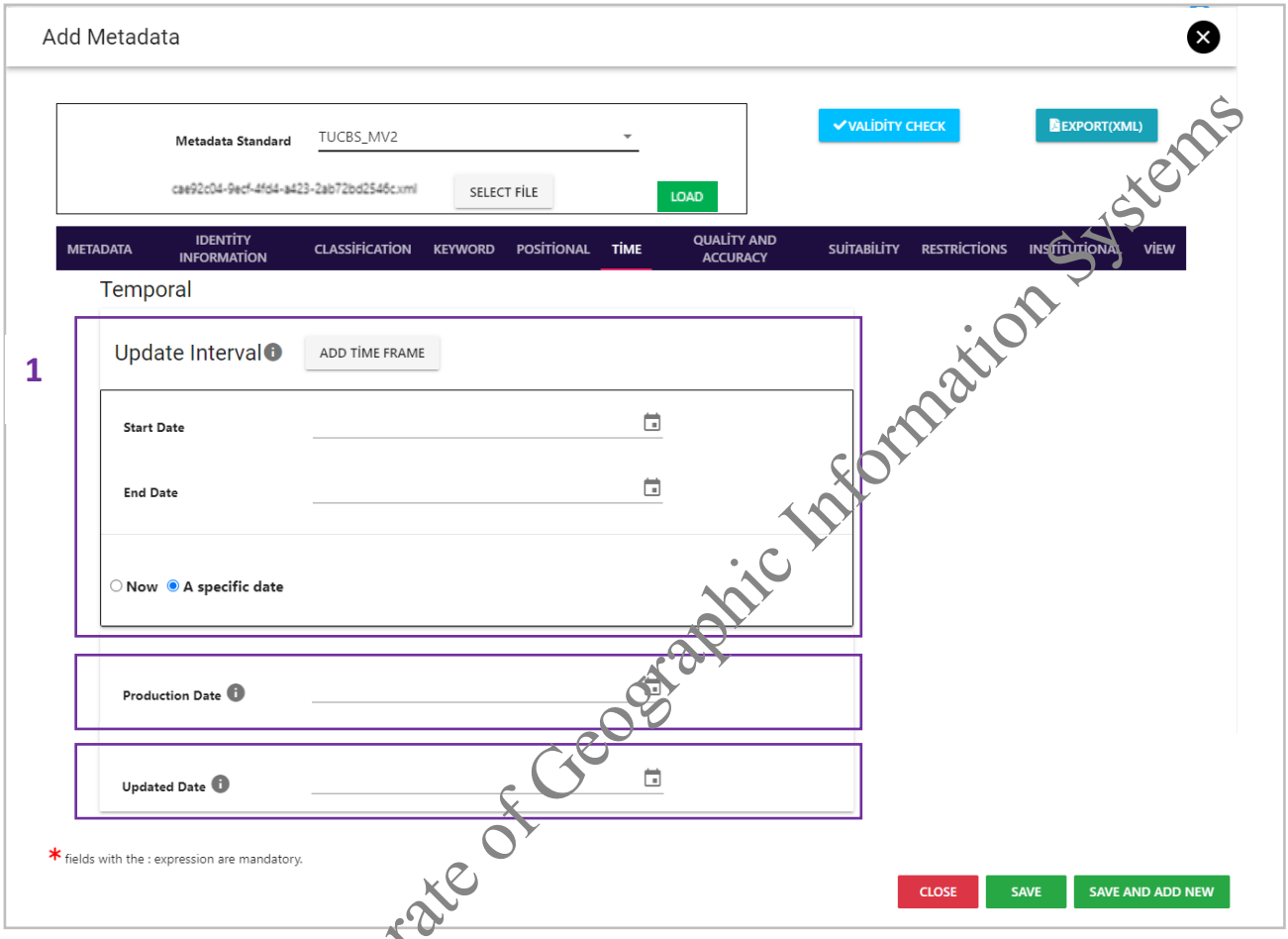


Figure 49:Time Tab

The XML file for the Update Interval (Figure 50) under the Time tab is given below.

```
▼<gex:temporalElement>
  ▼<gex:EX_TemporalExtent>
    ▼<gex:extent>
      ▼<gml:TimePeriod>
          <gml:beginPosition/>
          <gml:endPosition/>
        </gml:TimePeriod>
      </gex:extent>
    </gex:EX_TemporalExtent>
  </gex:temporalElement>
```

Figure 50:Update Interval XML File

9.7 Quality and Accuracy

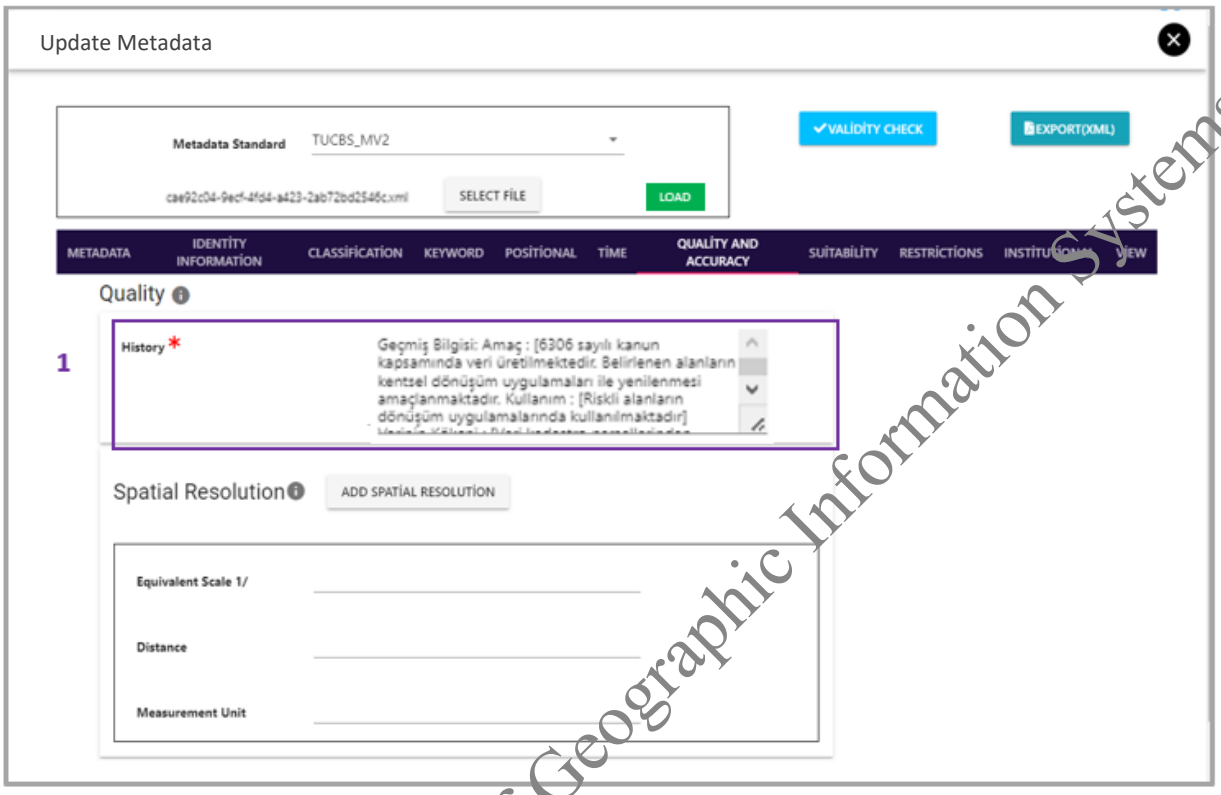


Figure 51:Quality and Accuracy Tab

The XML file for the History Information (Figure 52) under the Quality and Accuracy tab is given below.

```
▼<mdb:resourceLineage>
  ▼<mrl:LI_Lineage>
    ▼<mrl:statement>
       <gco:CharacterString>Amaç : [6306 sayılı kanun kapsamında veri üretilmektedir. Belirlenen alanların kentsel dönüşüm uygulamaları ile
       yenilenmesi amaçlanmaktadır. Kullanım : [Riskli alanların dönüşüm uygulamalarında kullanılmaktadır] Verinin Kökeni : [Veri kadastro
       parsellerinden üretilmektedir.] Verinin Eksiksizliği (Completeness) : [Veri tamdır. Tüm Türkiye'yi kapsar.] Fazlalık : [Veri kurumsal açıdan
       fazla değildir] Eksiklik : [Veri eksiksiz olarak üretilmektedir.] Mantıksal Tutarlılık (Logical Consistency) : [6306 sayılı kanun kapsamında
       tanımlanmış standartlarda üretilen veridir.] Kavramsal Tutarlılık : [Kurumsal standartlarda kavramsal şema kurallarına uygun olarak
       üretilmiştir.] Tanım Kümesi Tutarlılığı : [Mevzuat kapsamında tanımlanan kavramsal şema kurallarına uygun olarak üretilmektedir] Format
       Tutarlılığı : [Üretilen veri seti aynı veri yapısında ve aynı formattadır] Topoloji Tutarlılığı : [Veri kümesinin topolojik karakteristiğinin
       doğruluğu bulunmaktadır.] Konumsal Doğruluk (Positional Accuracy) : [Konumsal doğruluk 1 metre altıdır.] Mutlak Doğruluk : [1m ve altı] Bağıl
       Doğruluk : [] Raster Veri Konum Doğruluğu : [] Zamansal Doğruluk (Temporal Accuracy) : [Zamansal doğruluk vardır. Veri günceldir.] İlgili
       zamandaki doğruluk : [Veri belirtilen zamanda doğrudur] Zamansal tutarlılık : [Olaylar ve sıralanışları ilgili zamanda doğrudur] Zamansal
       geçerlilik : [Veri şimdiki zamanda doğrudur] Tematik Doğruluk (Thematic Accuracy) : [Hastalık türlerine, sebeplerine ve sonuçlarına göre
       sınıflandırmalar gerçekleştirilmekte olup öznitelik bilgileri tutulmaktadır.] Sınıflandırma Doğruluğu : [İlgili mevzuat kapsamında
       sınıflandırma doğruluğu bulunmaktadır. ] Nicel öznitelik bilgilerinin doğruluğu : [Nicel öznitelik bilgilerinin doğruluğu bulunmaktadır] Nicel
       olmayan öznitelik bilgilerinin doğruluğu : [Nicel olmayan öznitelik bilgilerinin doğruluğu bulunmaktadır.]</gco:CharacterString>
    </mrl:statement>
  </mrl:LI_Lineage>
</mdb:resourceLineage>
```

Figure 52:History Information XML File

9.8 Compliance

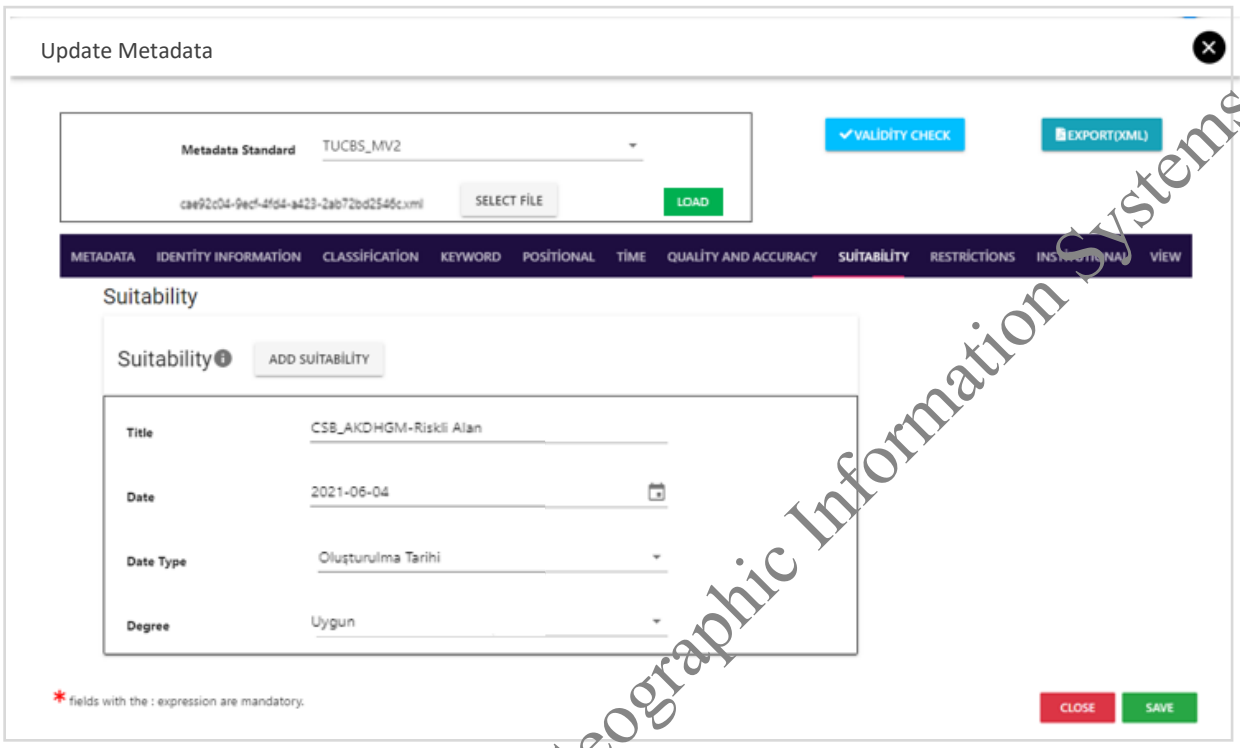


Figure 53:Eligibility Tab

The XML file for Conformity (Figure 54) under the Conformity tab is given below.

Figure 54:Conformity XML File

9.9 Limitations

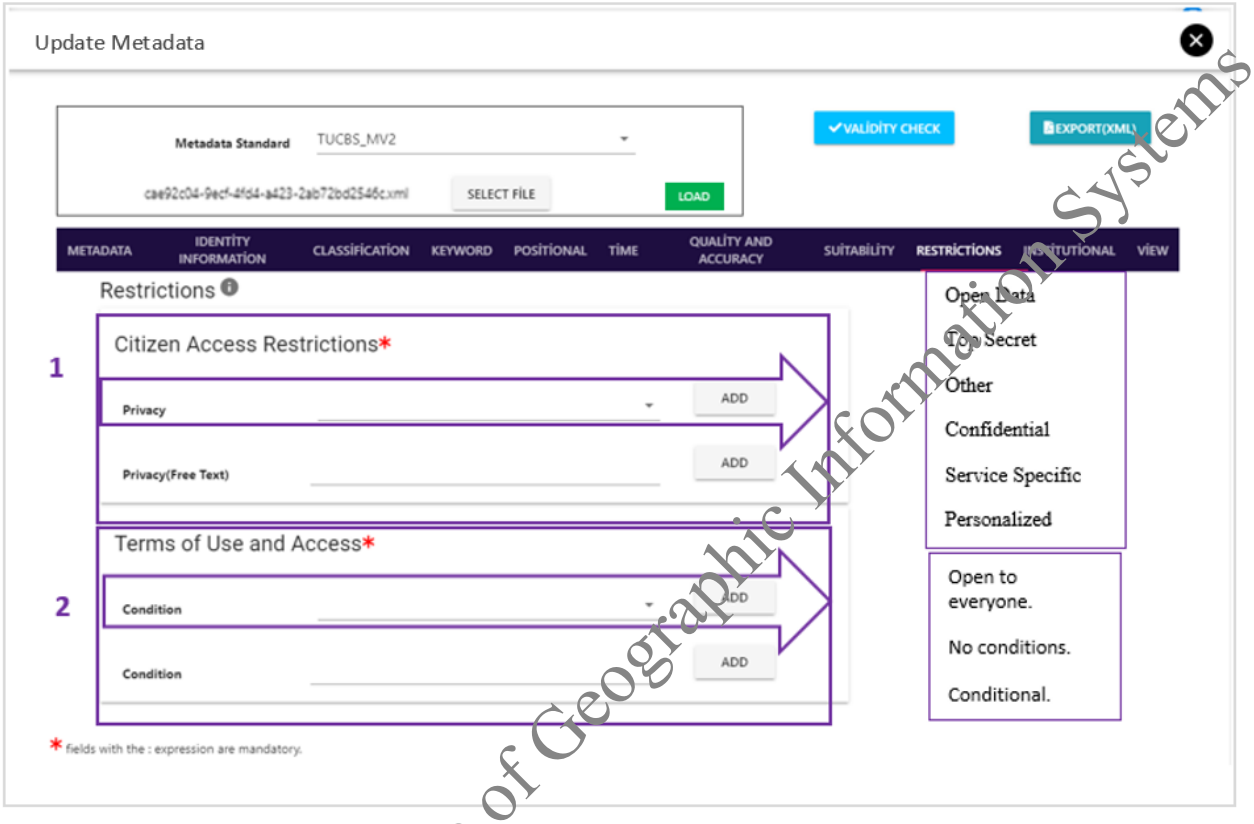


Figure 55:Limitations Tab

The XML file for Public Access Restrictions (Figure 56) under the Restrictions tab is given below.

```
▼<mco:MD_Constraints>
  ▼<mco:useLimitation>
    <gco:CharacterString>Açık Veri</gco:CharacterString>
  </mco:useLimitation>
</mco:MD_Constraints>
</mri:resourceConstraints>
```

Figure 56:Public Access Restrictions XML File

The XML file of the Terms of Access and Conditions of Use (Figure 57) under the Restrictions tab is given below.

```
▼<mco:MD_LegalConstraints>
  ▼<mco:otherConstraints>
      <gco:CharacterString>Herkese açıktır.</gco:CharacterString>
    </mco:otherConstraints>
  </mco:MD_LegalConstraints>
```

Figure 57:Access and Terms of Use XML File

9.10 Institutional

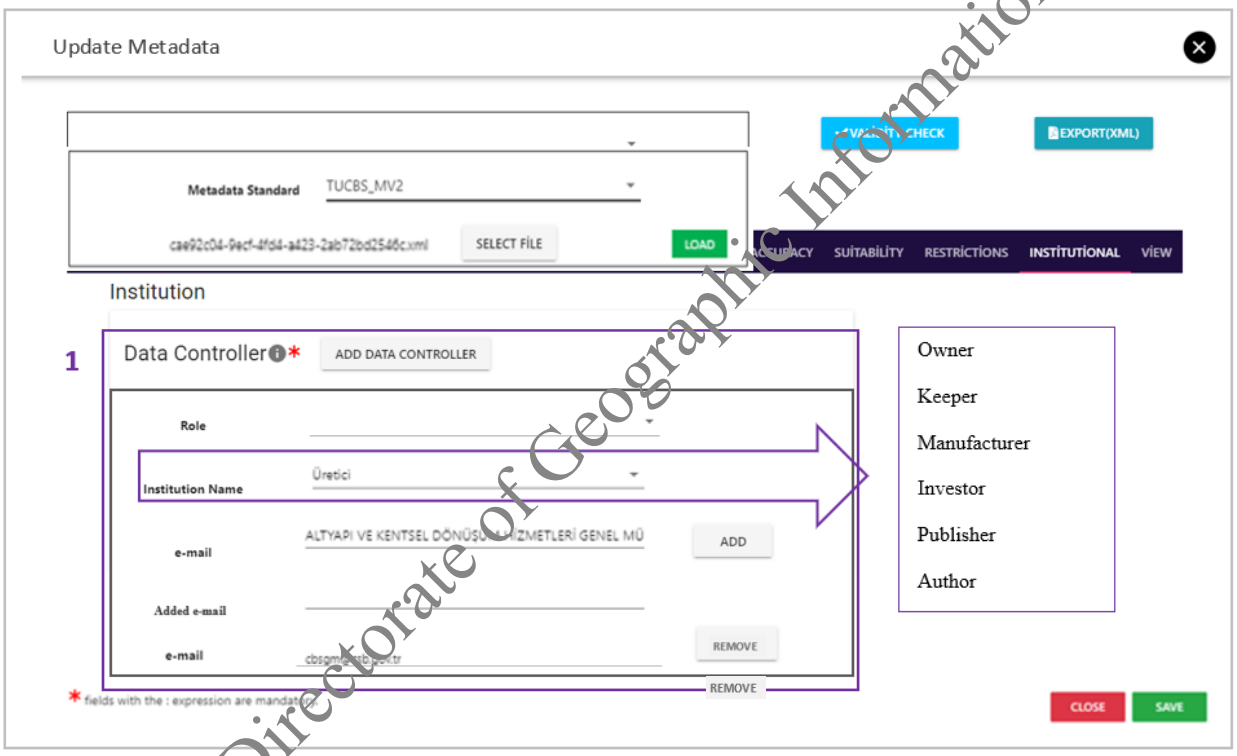


Figure 58:Institutional Tab

The XML file of the Data Controller (Figure 58-1) under the Institutional tab is given below.

Figure 59:Data Controller XML File

9.11 View

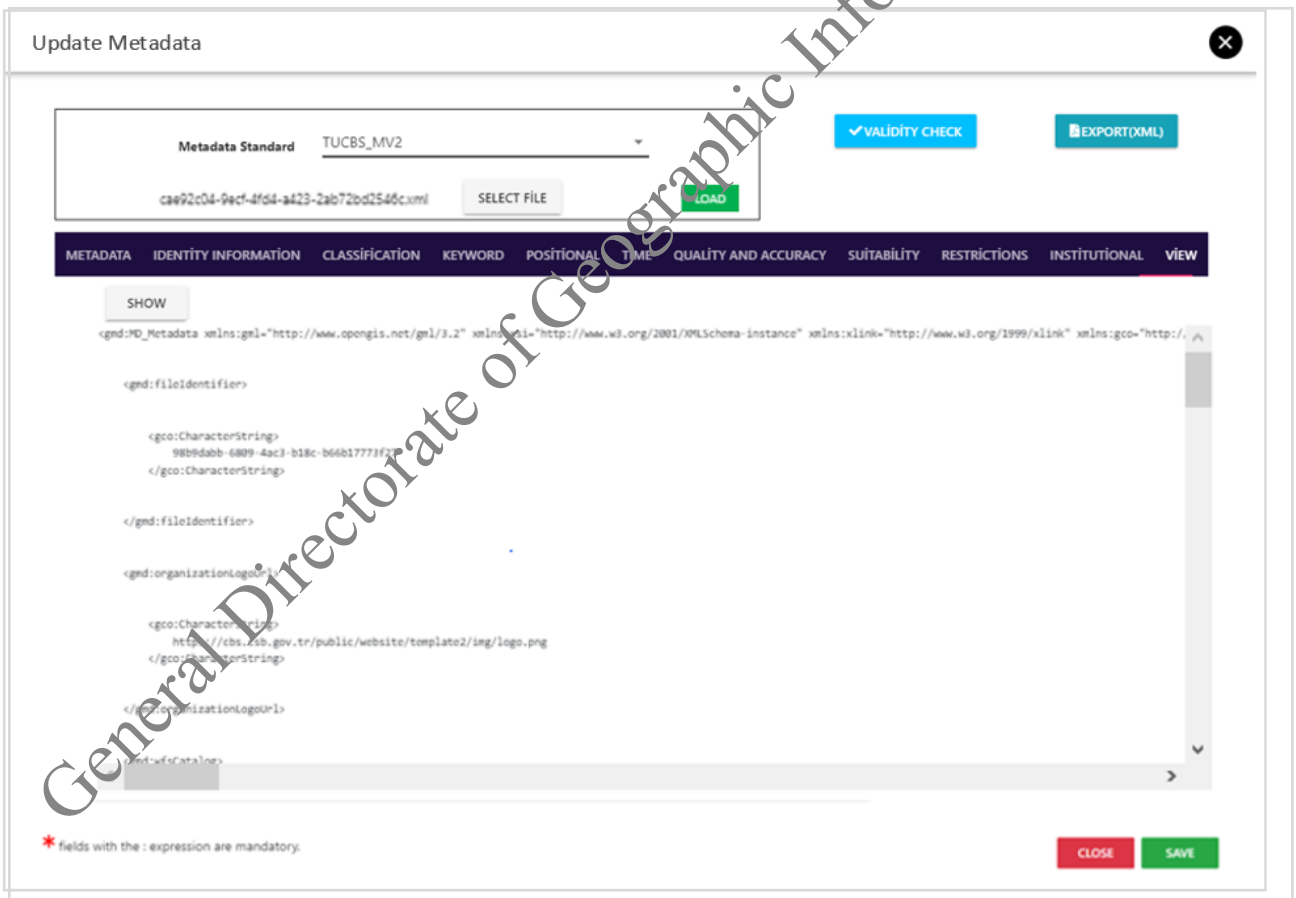
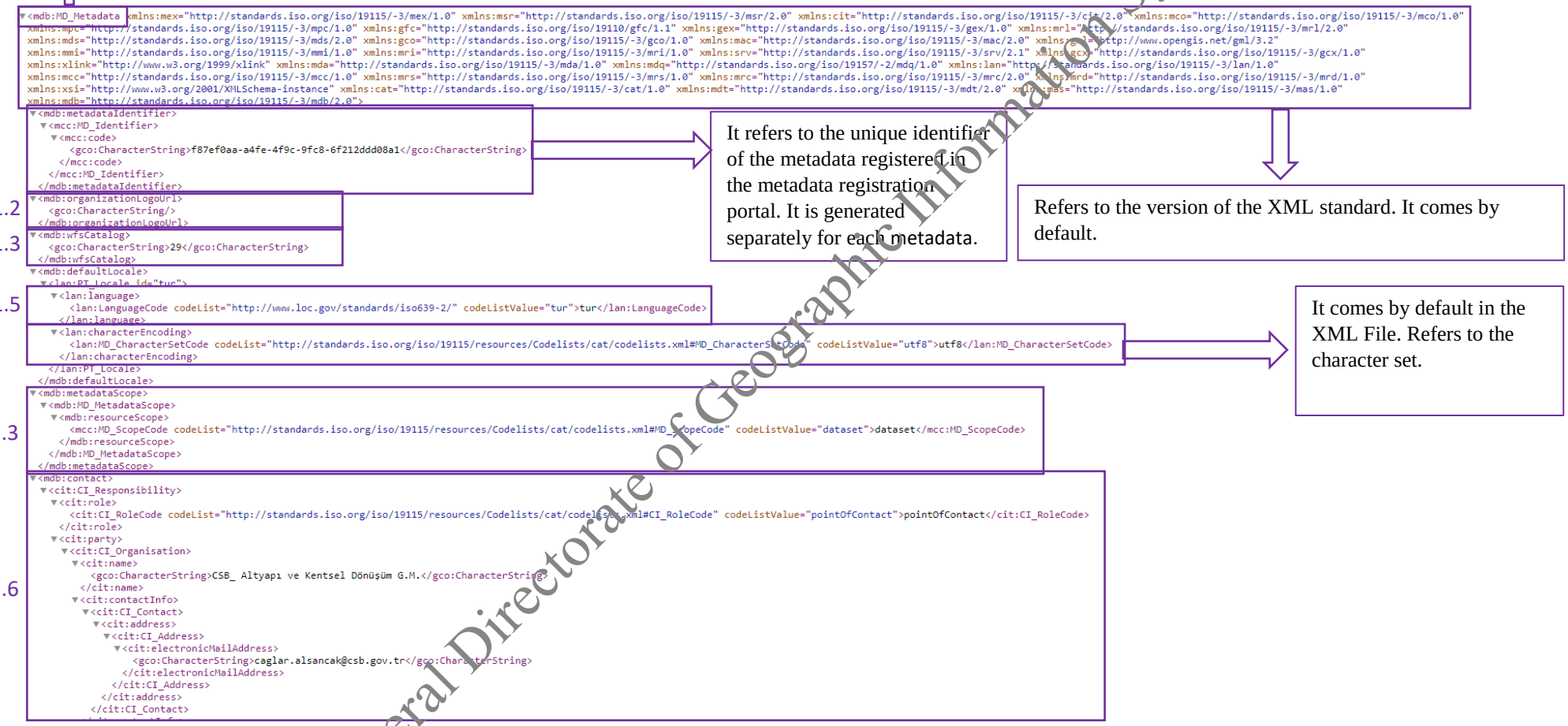


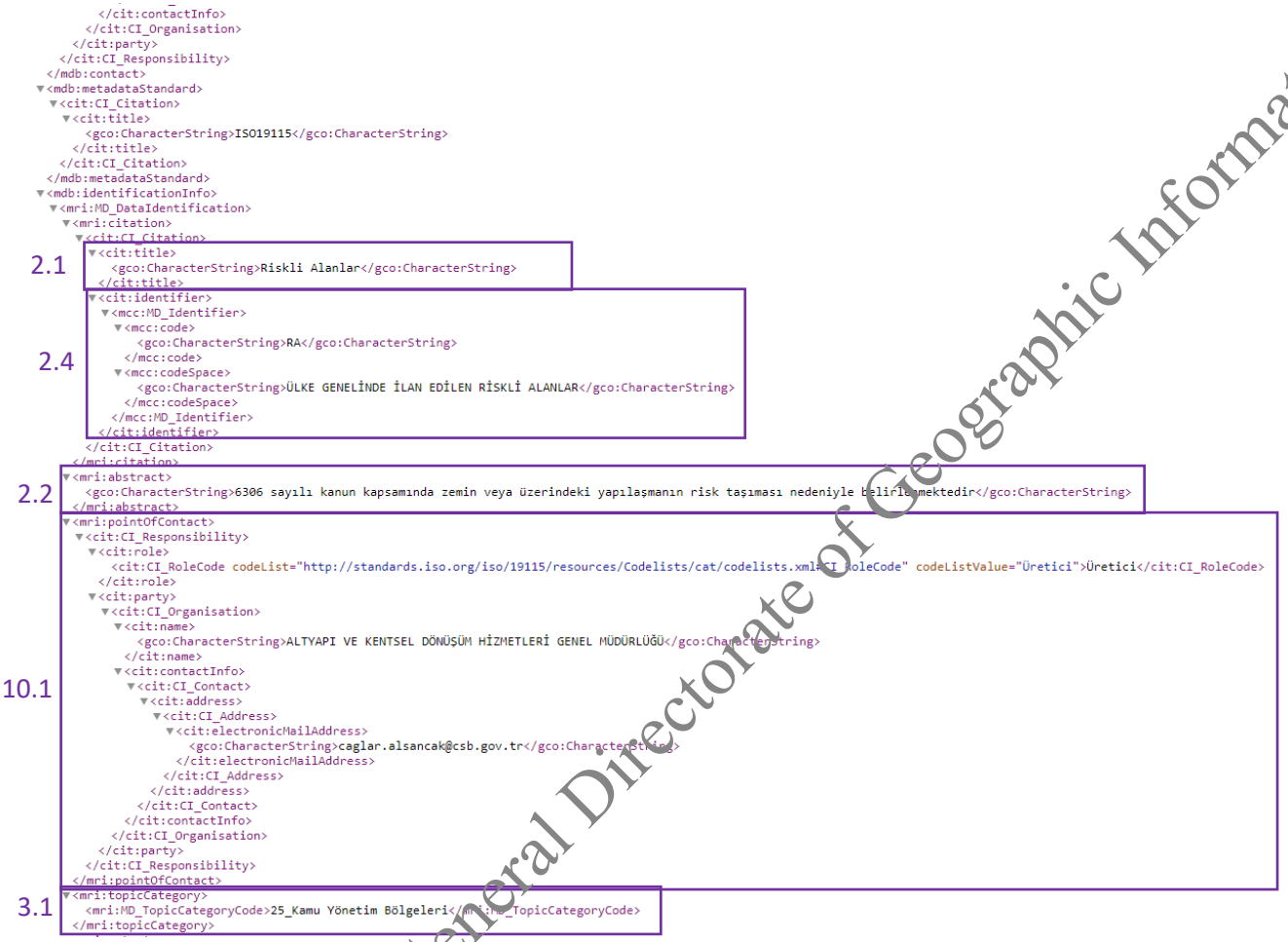
Figure 60:View Tab

A preview of the XML file of the metadata created according to the information entered is shown in Figure 60

The entire XML file created after entering the metadata information is shown below.

METADATA XML INITIALISATION





5.1

```
▼<mri:extent>
 ▼<gex:EX_Extent>
  ▼<gex:geographicElement>
   ▼<gex:EX_GeographicBoundingBox>
    ▼<gex:westBoundLongitude>
       <gco:Decimal>26.56324</gco:Decimal>
     </gex:westBoundLongitude>
    ▼<gex:eastBoundLongitude>
       <gco:Decimal>44.303772</gco:Decimal>
     </gex:eastBoundLongitude>
    ▼<gex:southBoundLatitude>
       <gco:Decimal>36.208438</gco:Decimal>
     </gex:southBoundLatitude>
    ▼<gex:northBoundLatitude>
       <gco:Decimal>41.685287</gco:Decimal>
     </gex:northBoundLatitude>
   </gex:EX_GeographicBoundingBox>
  </gex:geographicElement>
```

6.1

```
  ▼<gex:temporalElement>
   ▼<gex:EX_TemporalExtent>
    ▼<gex:extent>
     ▼<gml:TimePeriod>
        <gml:beginPosition/>
        <gml:endPosition/>
      </gml:TimePeriod>
     </gex:extent>
    </gex:EX_TemporalExtent>
  </gex:temporalElement>
 </gex:EX_Extent>
</mri:extent>
```

4.1

```
▼<mri:descriptiveKeywords>
 ▼<mri:MD_Keywords>
  ▼<mri:keyword>
     <gco:CharacterString>Kamu Yönetim Bölgeleri</gco:CharacterString>
   </mri:keyword>
  ▼<mri:thesaurusName>
   ▼<cit:CI_Citation>
    ▼<cit:title>
       <gco:CharacterString>25_Kamu Yönetim Bölgeleri</gco:CharacterString>
     </cit:title>
    ▼<cit:date>
     ▼<cit:CI_Date>
      ▼<cit:date>
         <gco:Date>2020-03-02</gco:Date>
       </cit:date>
      ▼<cit:dateType>
         <cit:CI_DateTypeCode codeList="http://standards.iso.org/iso/19115/resources/Codelists/cat/codelists.xml#CI_DateTypeCode" codeListValue="creation">creation</cit:CI_DateTypeCode>
       </cit:dateType>
     </cit:CI_Date>
    </cit:date>
   </cit:CI_Citation>
  </mri:thesaurusName>
 </mri:MD_Keywords>
</mri:descriptiveKeywords>
▼<mri:descriptiveKeywords>
 ▼<mri:MD_Keywords>
  ▼<mri:keyword>
     <gco:CharacterString>riskli alan</gco:CharacterString>
   </mri:keyword>
  ▼<mri:thesaurusName>
   ▼<cit:CI_Citation>
    ▼<cit:title>
```

8

```
▼<mdb:dataQualityInfo>
  ▼<msr:DQ_DataQuality>
    ▼<mdq:scope>
      ▼<mcc:MD_Scope>
        ▼<mcc:level>
          <mcc:MD_ScopeCode codeList="http://standards.iso.org/iso/19115/resources/Codelists/cat/codelists.xml#MD_ScopeCod"/>
        </mcc:level>
      </mcc:MD_Scope>
    </mdq:scope>
    ▼<mdq:report>
      ▼<mdq:DQ_UsabilityElement>
        ▼<mdq:result>
          ▼<mdq:DQ_ConformanceResult>
            ▼<mdq:specification>
              ▼<msr:CI_Citation>
                ▼<cit:title>
                  <gco:CharacterString>CSB_ Altyapı ve Kentsel Dönüşüm G.M.-Riskli Alan</gco:CharacterString>
                </cit:title>
                ▼<cit:date>
                  ▼<cit:CI_Date>
                    ▼<cit:date>
                      <gco:Date>2021-04-13</gco:Date>
                    </cit:date>
                    ▼<cit:dateType>
                      <cit:CI_DateTypeCode codeList="http://standards.iso.org/iso/19115/resources/Codelists/cat/codelists.xml#CI_DateTypeCode" codeListValue="creation">creation</cit:CI_DateTypeCode>
                    </cit:dateType>
                  </cit:CI_Date>
                </cit:date>
              </msr:CI_Citation>
            </mdq:specification>
            ▼<mdq:pass>
              <gco:Boolean>true</gco:Boolean>
            </mdq:pass>
          </mdq:DQ_ConformanceResult>
        </mdq:result>
      </mdq:DQ_UsabilityElement>
    </mdq:report>
  </msr:DQ_DataQuality>
</mdb:dataQualityInfo>
```

7.1

```
▼<mdb:resourceLineage>
  ▼<mrl:LI_Lineage>
    ▼<mrl:statement>
      <gco:CharacterString>Amaç : [6306 sayılı kanun kapsamında veri üretilmektedir. Belirlenen alanların kentsel dönüşüm uygulamaları ile yenilenmesi amaçlanmaktadır. Kullanım : [Riskli alanların dönüşüm uygulamalarında kullanılmaktadır] Verinin Kökeni : [Veri
      kadastro parsellerinden üretilmektedir.] Verinin Eksiksizliği (Completeness) : [Veri tamdır. Tüm Türkiye'yi kapsar.] Fazlalık : [Veri kurumsal açıdan fazla değildir] Eksiklik : [Veri eksiksiz olarak üretilmektedir.] Mantıksal Tutarlılık (Logical
      Consistency) : [6306 sayılı kanun kapsamında tanımlanmış standartlarda üretilen veridir.] Kavramsal Tutarlılık : [Kurumsal standartlarda kavramsal şema kurallarına uygun olarak üretilmiştir.] Tanım Kümesi Tutarlılığı : [Mevzuat kapsamında tanımlanan
      kavramsal şema kurallarına uygun olarak üretilmektedir] Format Tutarlılığı : [Üretilen veri seti aynı veri yapısında ve aynı formattadır] Topoloji Tutarlılığı : [Veri kümesinin topolojik karakteristiğinin doğruluğu bulunmaktadır.] Konumsal Doğruluk
      (Positional Accuracy) : [Konumsal doğruluk 1 metre altıdır.] Mutlak Doğruluk : [1m ve altı] Bağıl Doruluk : [] Raster Veri Konum Doğruluğu : [] Zamansal Doğruluk (Temporal Accuracy) : [Zamansal doğruluk vardır. Veri günceldir.] İlgili zamandaki doğruluk :
      [Veri belirtilen zamanda doğrudur] Zamansal tutarlılık : [Olaylar ve sıralanışları ilgili zamanda doğrudur] Zamansal geçerlilik : [Veri şimdiki zamanda doğrudur] Tematik Doğruluk (Thematic Accuracy) : [Hastalık türlerine, sebeplerine ve sonuçlarına göre
      sınıflandırmalar gerçekleştirilmekte olup öznitelik bilgileri tutulmaktadır.] Sınıflandırma Doğruluğu : [İlgili mevzuat kapsamında sınıflandırma doğruluğu bulunmaktadır. ] Nicel öznitelik bilgilerinin doğruluğu : [Nicel öznitelik bilgilerinin doğruluğu
      bulunmaktadır] Nicel olmayan öznitelik bilgilerinin doğruluğu : [Nicel olmayan öznitelik bilgilerinin doğruluğu bulunmaktadır.]</gco:CharacterString>
    </mrl:statement>
  </mrl:LI_Lineage>
</mdb:resourceLineage>
</mdb:MD_Metadata>
```

METADATA XML END

Figure 61:Sample TUCBS_MV2 XML File

10. CHECKING AND PUBLISHING METADATA

Metadata prepared by metadata producers and transferred to the system through the TUCBS Metadata Registration Portal are opened for publication after they are checked by the Ministry and determined to be suitable for publication.

Control operations are carried out by examining whether the metadata produced comply with the conditions specified in TUCBS standards. For this purpose, the compliance of the mandatory fields under the headings of metadata, credential, classification, keywords, spatial, spatial, time, quality and accuracy, conformity, limitations and institutional are examined. There are 45 metadata components in total, 31 of which are mandatory under the 10 main headings.

After a metadata delivered to the system is examined within the framework of the above-mentioned rules, two situations arise.

- Metadata components comply with the specified rules,
- Metadata components do not comply with the specified rules.

In the first case, metadata prepared in accordance with TUCBS metadata rules are opened for publication by the Ministry's metadata officer.

In the second case, the Ministry contacts the unit that delivered the metadata to the system and the metadata contact person in order to make the necessary corrections on the metadata that are found not to comply with the TUCBS metadata rules. The reasons for not publishing the metadata are stated and the relevant person is told how to make the necessary corrections. When the necessary corrections are made at this stage and it is seen that the metadata is suitable for publication, it is opened for publication like the metadata in the first case.

The issues that the Ministry metadata authorities will pay particular attention to can be listed as follows.

- Whether the coordinates of the data boundaries in the service to which link information is sent are appropriate,
- Whether the classification (catalog, theme, category) work is done appropriately according to the attributes of the data by the metadata creator,

- Whether the keywords that enable the data to be searched and found are prepared to describe the data,
- Whether the source title and source summary reflect the characteristics of the data,
- Whether the data quality information is prepared in accordance with the rules set out in this document,
- Whether public access restrictions and conditions of access and use are determined according to the attributes, characteristics and "open data" understanding of the data.

Ministry officials may contact the metadata institution representative by examining the metadata in content other than the specified issues.

11. AUTOMATIC METADATA GENERATION

An application (Metadata Generator) has been prepared that connects to PostgreSQL, Oracle and SQL Server databases and automatically generates metadata in XML format according to the TUCBS_MV1 standard from the relevant tables or virtual (view) tables and optionally saves the metadata created in the geographical catalog service created with GeoNetwork.Metadata Generator application can automatically harvest metadata to GeoNetwork application after generating metadata.

The current version and source codes of the GeoNetwork metadata catalog service are available at the address shown below.

- Application Download Address

https://geonetwork-opensource.org/downloads.html

Detailed information about the technical installation and use of GeoNetwork is available in the 'Metadata Catalog Service and GeoNetwork' document.

The GeoNetwork version used in the documents can be accessed at the address below.

FTP Information:

ftp://91.93.170.251

FTP Username: Integration *(Login without password)*

File Contents:

- Geonetwork Windows Installer
- JAVA JAR Windows Installer
- Metadata Generator- PostgreSQL
- Metadata Generator- Oracle
- Metadata Generator- SQL Server
- Metadata SQL Scripts
- Ubuntu Image File

Automatic metadata generation is a metadata generation method that has a lower margin of error compared to other methods due to its features such as preventing user source errors, being able to generate a large number of metadata in a short time interval, having a small workforce, updating the metadata when the data is updated, and being independent from the person.

11.1 Creating the Virtual Table Containing the Information of Metadata XML Files

In order to create metadata XML files, virtual tables containing metadata information must be created for each layer whose metadata will be published in the database. Finally, the virtual tables generated for each layer must be merged in order to be used in the Metadata Generator.

These SQL Scripts have been prepared for frequently used databases (PostgreSQL, Oracle, SQL Server) and are available in the Metadata SQL Scripts file in FTP. The Scripts in this file are examples and the Institution should fill the relevant fields with its own data.

The issues to be considered in the creation of these virtual tables are as follows;

1. SQL Scripts suitable for the database to be used should be used.
2. The name of the virtual table to be created for each layer is **mv_[LAYER_NAME]** and the field in question must be updated according to the relevant layer name.
3. The name of the table where the metadata will be created is **[TABLE_NAME]** and the field in question should be updated according to the relevant table name.
4. For ease of use, **[TABLE_ABBREVIATION]** can be used for each **[TABLE_NAME]** for which metadata will be created. The field in question must be updated according to the relevant table abbreviations.
5. In case of receiving data from more than one table in a layer, the JOIN parameter must be used. This parameter is used to associate two tables to each other through certain columns. In this case, **[LINK_PARAMETERS]** in the Script must be filled correctly.
6. BBOX must be created for each metadata virtual table to be created. To access BBOX values from a column in the database, **[GEOMETRY_COLUMN]** must be updated. If there is no geometry in the database, the BBOX of the data is created by updating the **[NUMERICAL_VALUE]** field.

7. While creating the virtual table where the metadata will be generated, adding data for columns that do not have a counterpart in the database should be done via Script. For example, if there is no relevant data in the database for the **'sorumlu_eposta'** column to be created in the virtual table, the **'sorumlu_eposta@ulasim.com'** address in the Script should be updated. This process can be applied for all other columns.

8. The virtual tables that will be used to generate the metadata XML files for each layer must be concatenated with each other using the UNION ALL method. This merged data forms the **'mv_generator'** virtual table.

If these steps are followed correctly, the virtual table (mv_generator) will be created which will be used to generate the metadata.

11.2 Application Configuration Settings

There is a parameter code fragment containing the mandatory fields of the metadata, prepared for use in the Metadata Generator application. Tag fields are changed according to the content of the metadata. The fields can be written as text or can be pulled from a database table. Parameter.json file should be opened with editors such as Notepad, Sublime Text, Notepad++ and the related changes should be edited and saved.

The configuration file for the PostgreSQL database, which contains configuration information, is given on pages 89-90. The same configuration file is available for SQLServer and Oracle databases, only the Connection Strings are created differently.

```
{  "General": {
    "MetadataFolder": "TUCBSMetaveri",
    "PostgresqlConnectionString":
"PORT=[PORT];DATABASE=[DATABASE];HOST=[HOST];PASSWORD=[PASSWORD];USER
ID=[USER ID]",
    "TopicCategory": "{T@TopicCategory}",
    "TUCBSCatalog": "{t@tucbs_katalog}",
    "OrganizationURL": "{t@kurum_logo}",
    "OnlineResources": [
      {
        "Name": "{T@online_resource}"
      }
    ],
    "Language": "tur",
    "useLimitation": "{T@useLimitation}",
    "otherConstraints": "{T@otherConstraints}",
    "BaslikKategorisi": "{t@baslik_kategorisi}",
    "KaynakTipi": "{t@kaynak_tipi}",
    "WebServisTipi": "{t@servis_tipi}"
  },
  "CatalogServer": {
    "saveToCatalog": "[GEONETWORK STATUS]",
    "url": "[GEONETWORK URL]",
    "username": "[GEONETWORK USERNAME]",
    "password": "[GEONETWORK PASSWORD]",
    "p_catalogOverwriteSameUUID": "[UUID STATUS]"
},
  "Kurum": {
    "Name": "{t@kurum_adi}",
    "OrganizationEmail": "{T@kurumsal_eposta}",
    "Organization2Email": "{T@kurumsal_2eposta}",
    "YetkiTipi": "{T@YetkiTipi}",
    "Role": "{t@Role}"
  },
  "Table": {
    "TableName": "mv_generator",
    "Criteria": "guid is not null",
    "KeywordsColumns": [
      {
        "Name": "{T@kw1}"
      },
      {
        "Name": "{T@kw2}"
      },
      {
        "Name": "{T@kw3}"
      },
      {
```

```
      "Name": "{T@kw4}"
    },
    {
      "Name": "{T@kw5}"
    },
  ],
  "Abstract":"{t@ozet_metin}",
  "GUID": "{T@guid}",
  "MetadataName": "{T@metaveri_adi}",
  "ResponsibleMail": "{T@sorumlu_eposta}",
  "Responsible2Mail": "{T@sorumlu_2eposta}",
  "BBOX": {
    "westLongitute": "{T@st_xmin}",
    "eastLongitude": "{T@st_xmax}",
    "northLatitude": "{T@st_ymax}",
    "southLatidude": "{T@st_ymin}"
  },
    "Amac": "{T@Amac}",
    "Kullanim": "{T@Kullanim}",
    "Koken": "{T@Koken}",
    "Kaynaksema": "{T@Kaynaksema}",
    "Tanimlamadokumani": "{T@Tanimlamadokumani}",
    "Eksiksizlik": "{T@Eksiksizlik}",
    "Fazlalik": "{T@Fazlalik}",
    "Eksiklik": "{T@Eksiklik}",
    "Mantiksaltutarlilik": "{T@Mantiksaltutarlilik}",
    "Kavramsaltutarlilik": "{T@Kavramsaltutarlilik}",
    "Tanimkumesitutarlilik": "{T@Tanimkumesitutarlilik}",
    "Formattutarlilik": "{T@Formattutarlilik}",
    "Topolojitutarlilik": "{T@Topolojitutarlilik}",
    "Konumsaldogruluk": "{T@Konumsaldogruluk}",
    "Mutlakdogruluk": "{T@Mutlakdogruluk}",
    "Bagildogruluk": "{T@Bagildogruluk}",
    "Rasterkonumdogruluk": "{T@Rasterkonumdogruluk}",
    "Zamansaldogruluk": "{T@Zamansaldogruluk}",
    "Ilgilizamandogruluk": "{T@Ilgilizamandogruluk}",
    "Zamansaltutarlilik": "{T@Zamansaltutarlilik}",
    "Zamansalgecerlilik": "{T@Zamansalgecerlilik}",
    "Tematikdogruluk": "{T@Tematikdogruluk}",
    "Siniflandirmadogruluk": "{T@Siniflandirmadogruluk}",
    "Niceloznitelikdogruluk": "{T@Niceloznitelikdogruluk}",
    "Nicelolmayanoznitelikdogruluk": "{T@Nicelolmayanoznitelikdogruluk}"
  }
}
```

The points to be considered for the Metadata Generator to work correctly are as follows:

1. The *"PostgresqlConnectionString", "OracleConnectionString" or "MSSQLConnectionString"* tags in the relevant configuration file in the Metadata Generator appropriate for the database type are updated with the database information from which the software will receive the data.

    - *For PostgreSQL*: "PostgresqlConnectionString": "PORT=**[PORT]**;DATABASE=**[DATABASE]**;HOST=**[HOST]**;PASSWORD=**[PASSWORD]**;USER ID=**[USER ID]**"
    - *For Oracle*: "OracleConnectionString": "data source =(DESCRIPTION= (ADDRESS= (PROTOCOL=TCP) (HOST=**[HOST]**) (PORT=**[PORT]**)) (CONNECT_DATA= (SERVER=dedicated) (SERVICE_NAME=**[SERVICE NAME]**)));Password=**[PASSWORD]**;User Id=**[USER ID]**;"
    - *For SQLServer* : "MSSQLConnectionString": "Server=**[HOST]**;Database=**[DATABASE]**;User Id=**[USER ID]**;Password=**[PASSWORD]**;"
        - **[PORT]:** The port where the database application is served on the server.
        - **[DATABASE]:** The name of the database where the data information is located.
        - **[HOST]:** The name of the server where the database application is located.
        - **[USER ID]:** The name of the authorized user in the database application.
        - **[PASSWORD]:** The password of the authorized user in the database application.
        - **[SERVICENAME]:** It is the parameter used to access Oracle databases.

2. The "*CatalogServer*" tag contains information about the catalog service application (GeoNetwork) from which the generated metadata XMLs will be harvested. This information includes the address of the GeoNetwork application, authorized user name and password, and harvest settings parameters.

   - "CatalogServer": {
     "saveToCatalog": "**[GEONETWORK STATUS]**",
     "url": "**[GEONETWORK URL]**",
     "username": "**[GEONETWORK USERNAME]**",
     "password": "**[GEONETWORK PASSWORD]**",
     "p_catalogOverwriteSameUUID": "**[UUID STATUS]**"
     },

     - **[GEONETWORK STATUS]:** This parameter controls whether the generated XML is harvested to GeoNetwork or not. It can be **true** or **false**.
     - **[GEONETWORK URL]:** The access address of the GeoNetwork application.
     - **[GEONETWORK USERNAME]:** The name of the authorized user in the GeoNetwork application.
     - **[GEONETWORK PASSWORD]:** The password of the authorized user in the GeoNetwork application.
     - **[UUID STATUS]:** This parameter allows to update previously created and harvested metadata. It can be **true** or **false**.

Table 9 contains the descriptions of the tags in the configuration file and the columns of the virtual table created in the database.

Table 9:Configuration File and Virtual Table Contents

TITLE		CONTENT / DESCRIPTION	TUCBS MANDATORY FIELD EQUIVALENTS
General[1]	MetadataFolder	The name of the folder where XML files should be extracted.	
	PostgresqlConnectionString	Write the database connection sentence to connect to.	
	TopicCategory	Title category is written (*http://inspire.ec.europa.eu/metadata-codelist/TopicCategory*)	Title Category
	OnlineResources	Web service (WMS, WFS) address is written.	Source Link
	Language	Metadata language is written. It does not need to be changed. (*http://www.loc.gov/standards/iso639-2/*)	Metadata Language
	useLimitation	Text specified for Public Access Restrictions.	Public Access Restrictions
	otherConstraints	The text specified for Terms of Access and Conditions of Use is written.	Terms of Access and Use
	TUCBSCatalog	Enter the catalog name in TUCBS.	
	OrganizationURL	The address of the organization logo is written.	
	TitleCategory	Title category is written.	
	SourceType	The source type of the data is written.	
	WebServiceType	Published web service types are written.	
CatalogServer	saveToCatalog	Select whether the metadata will be written to the catalog service or not. With the **true** option, the catalog is also written to the service, with the **false** option only the XML file is generated without writing to the catalog service.	
	url	Enter the address of the catalog service. Örn: (*http://192.168.1.10:8080/geonetwork*)	
	Username	GeoNetwork user name.	
	Password	GeoNetwork password is written.	
	p_catalogOverwriteSameUUUID	Overwrite selection overwrites the file with the same name.	
Institution	Name	Enter the name of the organization.	Metadata Contact Person (Organisation Name)
	OrganizationEmail	Unit / Responsible e-mail address is written.	Metadata Contact Person (E-Mail Address)
	Organization2Email	Unit / Responsible e-mail address is written.	
	AuthorizationType	Authorization type of the institution is written.	
	Role	The role value is written. It does not need to be changed.	
Table	TableName	Type the name of the table whose metadata will be created	

[1] In TUCBS_MV1 XML standard, metadata date is not defined as mandatory. When XML files are saved to the system, the metadata entry date is taken as the metadata date.

TITLE		CONTENT / DESCRIPTION	TUCBS MANDATORY FIELD EQUIVALENTS
	Criteria	If filtering is desired according to a SQL where criterion in the connected table, it is written in this section.	
	KeywordsColumns	Keywords are written.	Keyword
	GUID	Unique identifier created in the database.	Unique Identifier
	MetadataName	Write the metadata name.	Source Information (Source Title)
	Abstract	Metadata summary information is written.	Source Information (Source Summary)
	ResponsibleMail	Unit / Responsible e-mail address is written.	Institutional Responsible Unit (Contact Address)
	Responsible2Mail	Unit / Responsible e-mail address is written.	
	BBOX	The min/max X and Y values are written so that the boundary frame can be drawn.	Borders
Data Quality*	Purpose	Purpose of metadata.	Data Quality
	Usage	The use of metadata.	Data Quality
	Origin	The origin of metaverine.	Data Quality
	Sourcesema	The source schema address of the data.	Data Quality
	Description.	The address of the geographic data description document of the data.	Data Quality
	Completeness	The presence or absence of details, their attributes and relationships.	Data Quality
	Redundancy	Redundancy of data presented.	Data Quality
	Deficiency	Data is unavailable or incomplete.	Data Quality
	Logical consistency	Conformity of data structure, attributes and relationships to logical rules.	Data Quality
	Conceptual consistency	Compliance with conceptual schema rules.	Data Quality
	Definitionconsistency	Conformance of database records to the definition set.	Data Quality
	Formateconsistency	Storage of data in accordance with the physical structure of the data.	Data Quality
	Topology	The accuracy of the topological characteristic of a dataset.	Data Quality
	Spatial Accuracy	Accuracy of the position of details.	Data Quality
	Absolute accuracy	The closeness of the specified coordinate values to the actual or accepted coordinate values.	Data Quality
	Relative Accuracy	The closeness of relative positions to actual or assumed coordinate values.	Data Quality
	Raster position accuracy	The closeness of raster data position values to their accepted or actual values.	Data Quality

TITLE		CONTENT / DESCRIPTION	TUCBS MANDATORY FIELD EQUIVALENTS
	Temporal accuracy	Accuracy of temporal attributes and relations of details.	Data Quality
	Temporal accuracy	Data accuracy at the specified time.	Data Quality
	Temporal accuracy	If specified, the accuracy of events and their sequence at the relevant time.	Data Quality
	Temporal validity	Accuracy of data at the relevant time.	Data Quality
	Thematic accuracy	Accuracy of quantitative and non-quantitative attributes, classification of details and relationships.	Data Quality
	Classification accuracy	Accuracy of the classification of uses on a layer-by-layer basis, representationally classifying them.	Data Quality
	Quantitative attributeaccuracy	Accuracy of quantitative attribute information of the data.	Data Quality
	Non-quantitative attribute accuracy	Accuracy of non-quantitative attribute information of the data.	Data Quality

11.3 Using Metadata Generator

After the necessary changes in the configuration file are completed, MetadataGenerator.exe in the application file is run and the metadata generation process is started. The application opening interface is shown in Figure 62, Figure 63 and Figure 64 according to the database type. The application interface shows the SQL Script to be run on the database and the number of metadata to be created. The letter E (Yes) must be pressed to start the process, otherwise the process can be canceled by pressing the letter h (No). The generated XML files are saved in the **TUCBS Metadata** file in the application file location. When the process is complete, a warning appears that the process was successful (Figure 65).

Figure 62:Metadata Generator - PostgreSQL Interface

Figure 63:Metadata Generator - SQL Server Interface

Figure 64:Metadata Generator - Oracle Interface

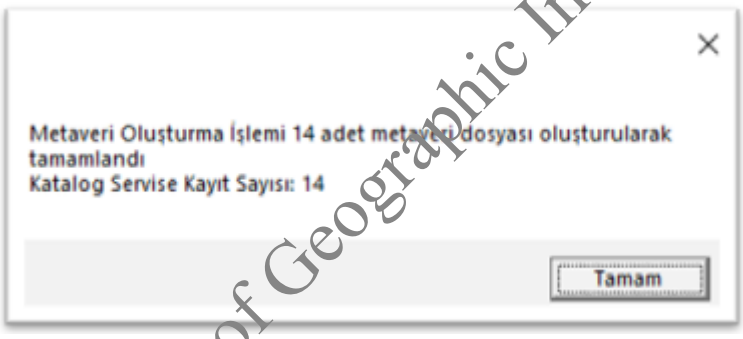


Figure 65:Metadata Generator Process Result Screen

12. GEOGRAPHIC METADATA VALIDATION

Access to the portal is provided by entering the address of the National Geographic Information Platform (https://atlas.gov.tr) application link via the internet browser (Figure 66).

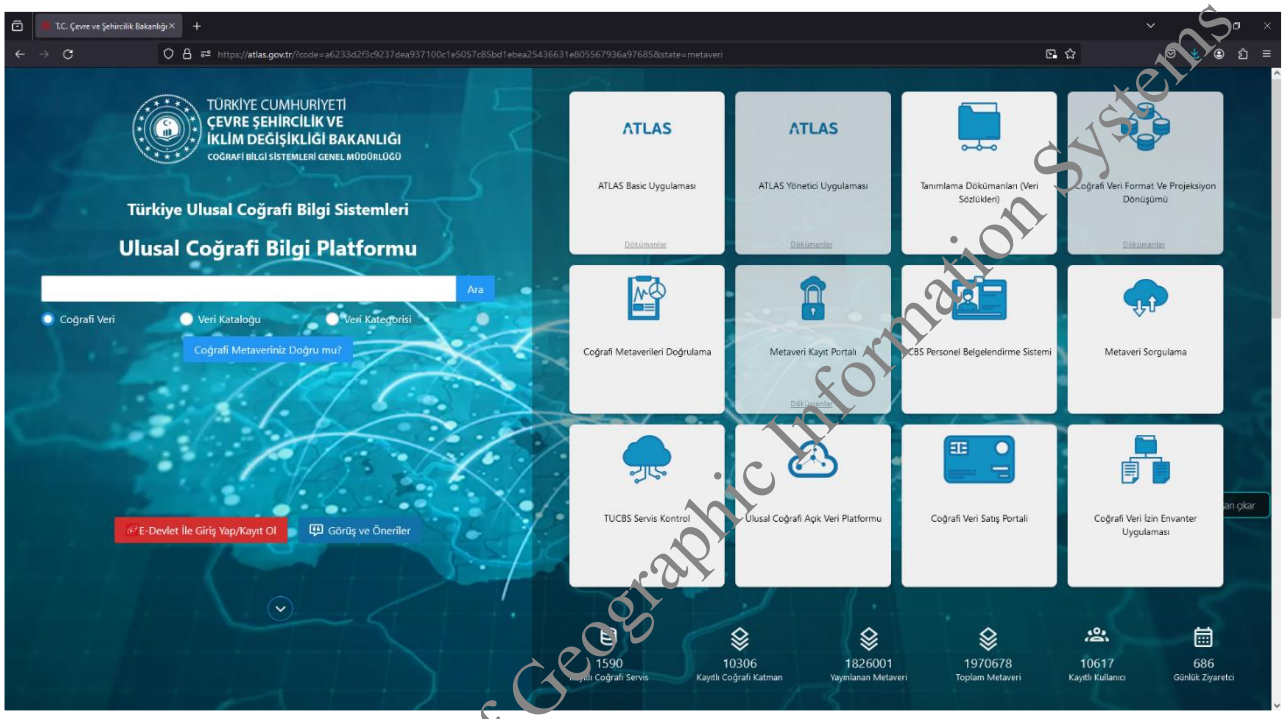


Figure 66:National Geographic Information Platform Geographic Metadata Validation

Is your geographic metadata correct in Figure 66? It can be done by selecting Verification of Geographic Metadata in Figure 68 or by selecting Go to Detail.

Metadata validation is performed by adding the xml file of the metadata to be validated on the page to be opened or by copying the metadata to be validated to the field related to the metadata content. Metadata Validation results are listed on the screen.

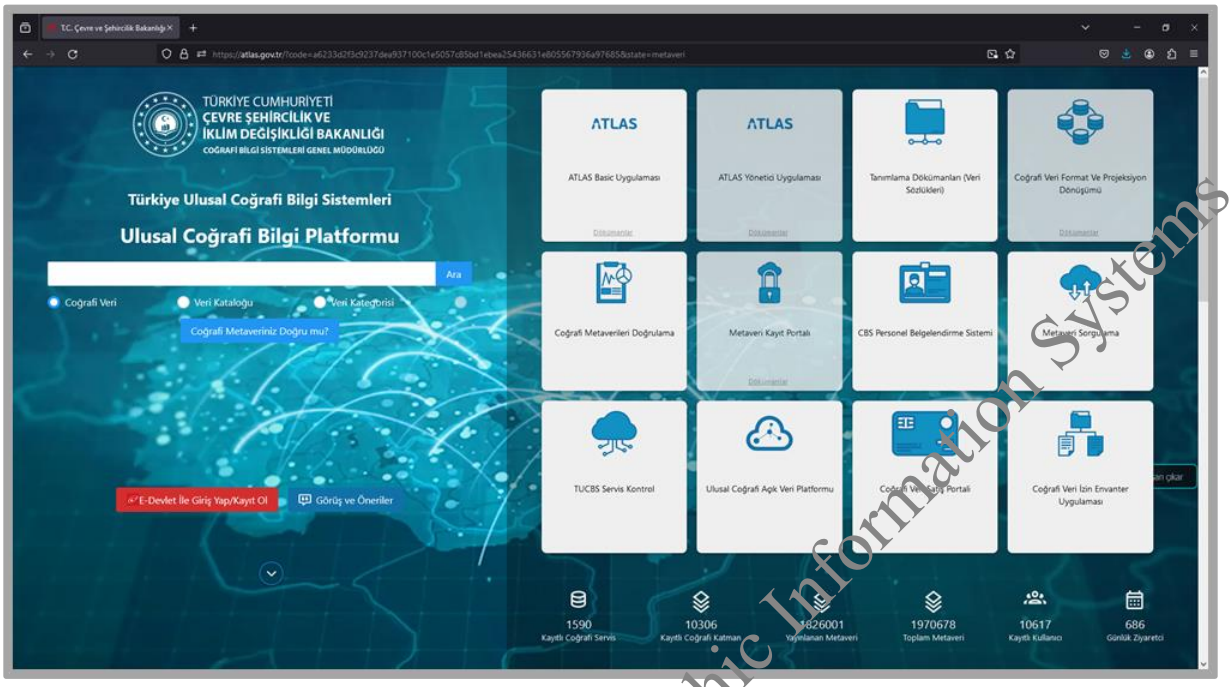


Figure 67:National Geographic Information Platform Geographic Metadata Validation Screen

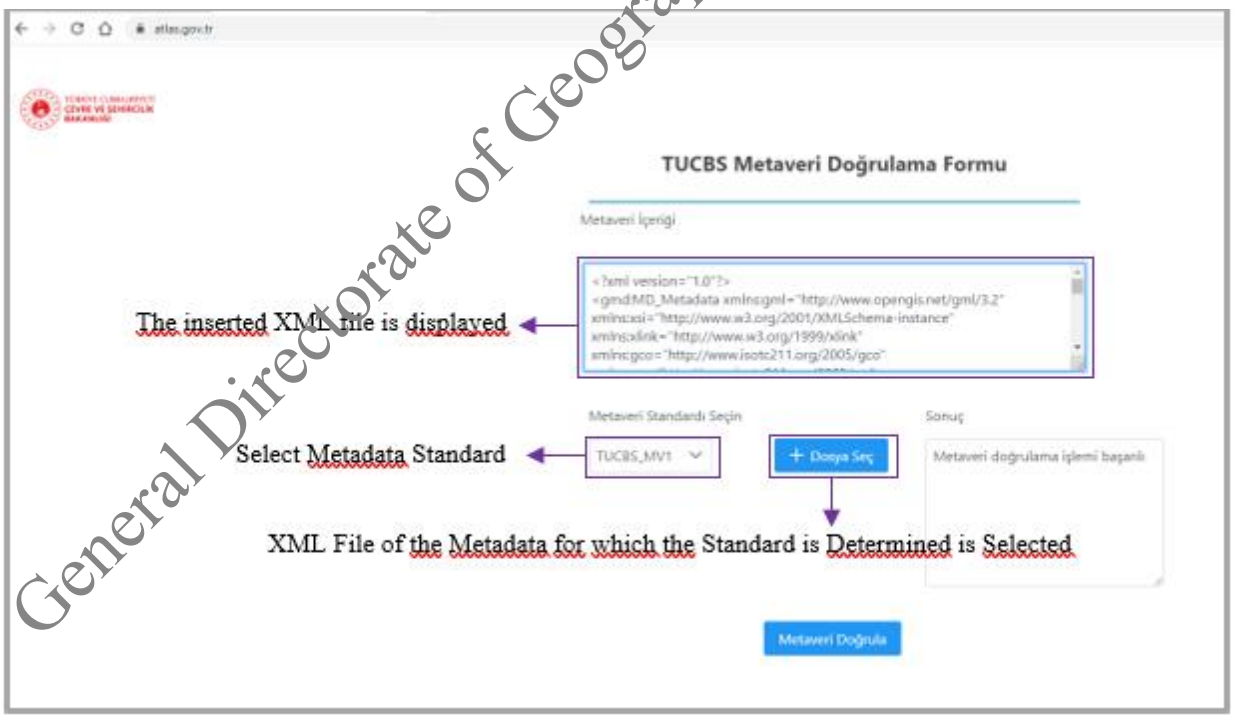


Figure 68: National Geographic Information Platform Geographic Metadata Validation Login

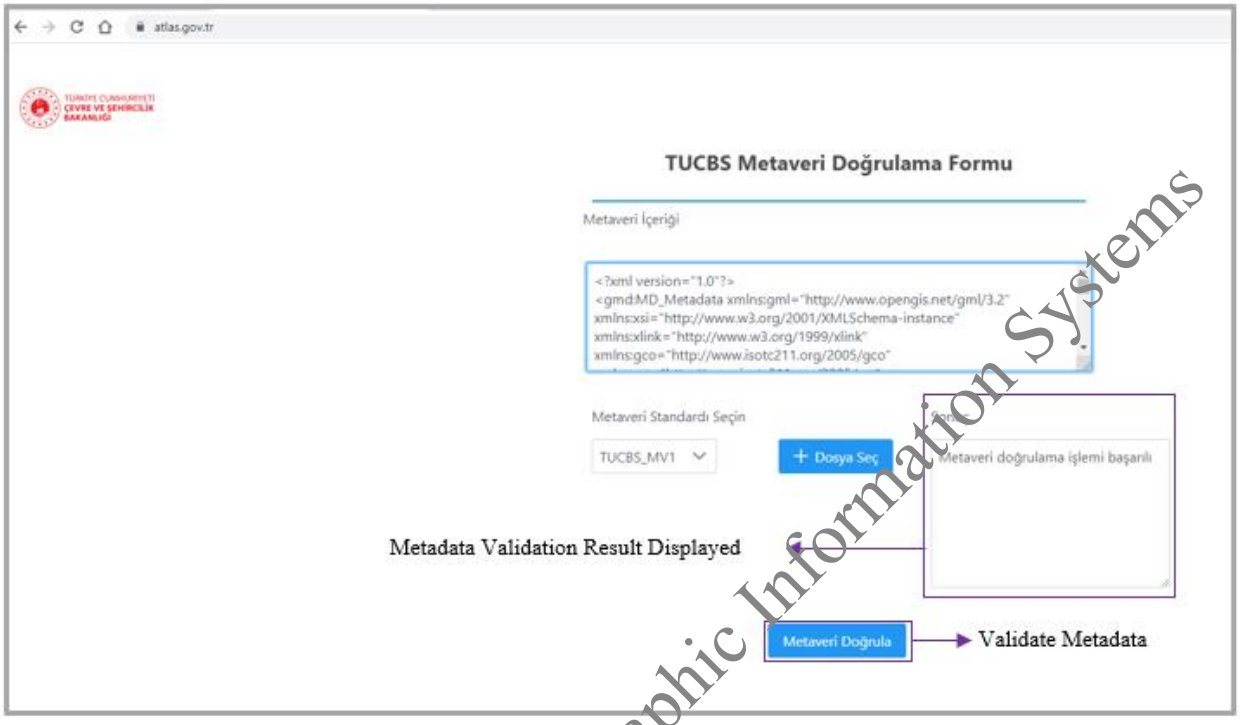


Figure 69: TUCBS Metadata Verification Result

13.METADATA QUERY

The portal can be accessed by entering the National Geographic Information Platform (https://atlas.gov.tr) application link via the internet browser.In the Metadata Query process, Go to Detail is selected and the keyword or Metadata ID number is specified for the metadata to be queried on the page that opens. User information is added as specified in the application (Username: metaveri and Password Metaveri.2020!), metadata query results are listed on the screen.

In the query process with the keyword Urban, 81 metadata were found.

To download the application code, click on the tab indicated in Figure 72 and follow the instructions on the page that opens to download and run the application code.

Figure 70:National Geographic Information Platform Metadata Query

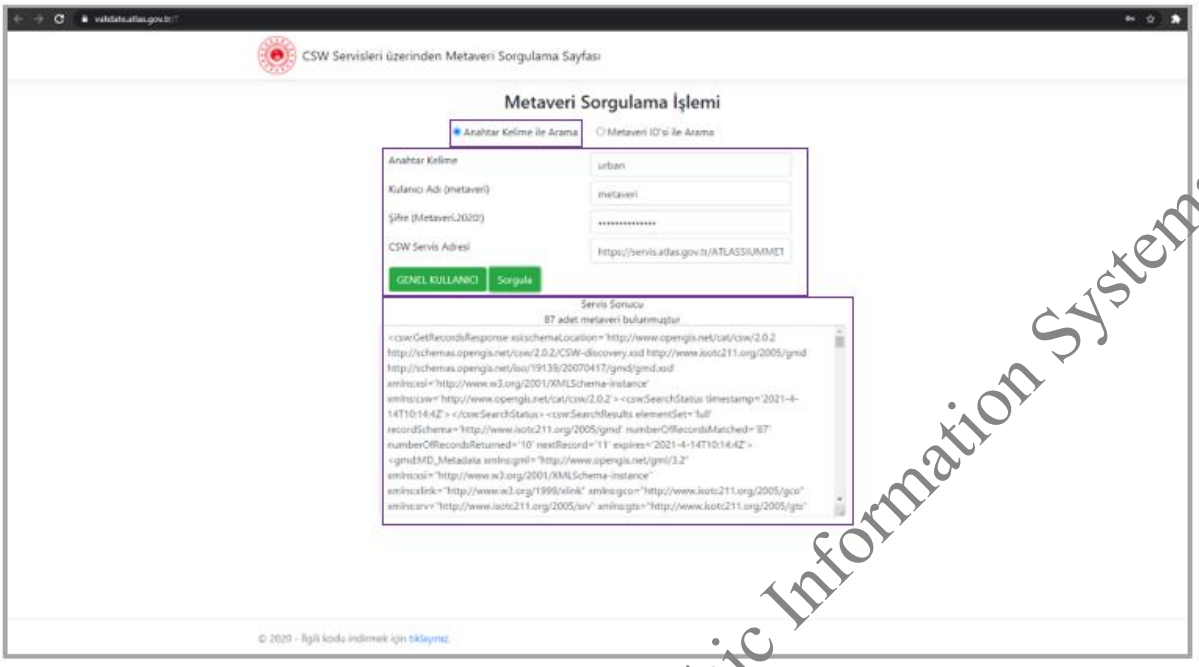


Figure 71:National Geographic Information Platform Metadata Query with Keyword Urban

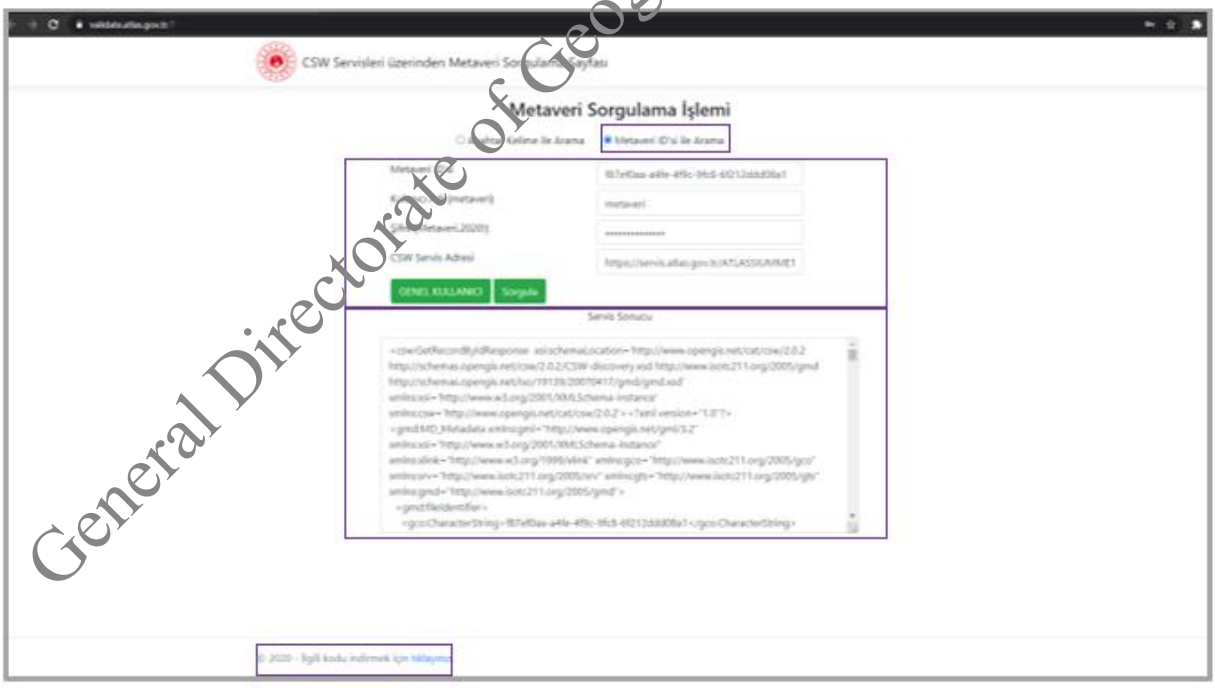


Figure 72:Metadata Query with National Geographic Information Platform ID

14. METADATA SEARCH

Access to the portal is provided by entering the address of the National Geographic Information Platform (https://atlas.gov.tr) application link via internet browser. In this area, metadata can be searched without user login (Figure 73).

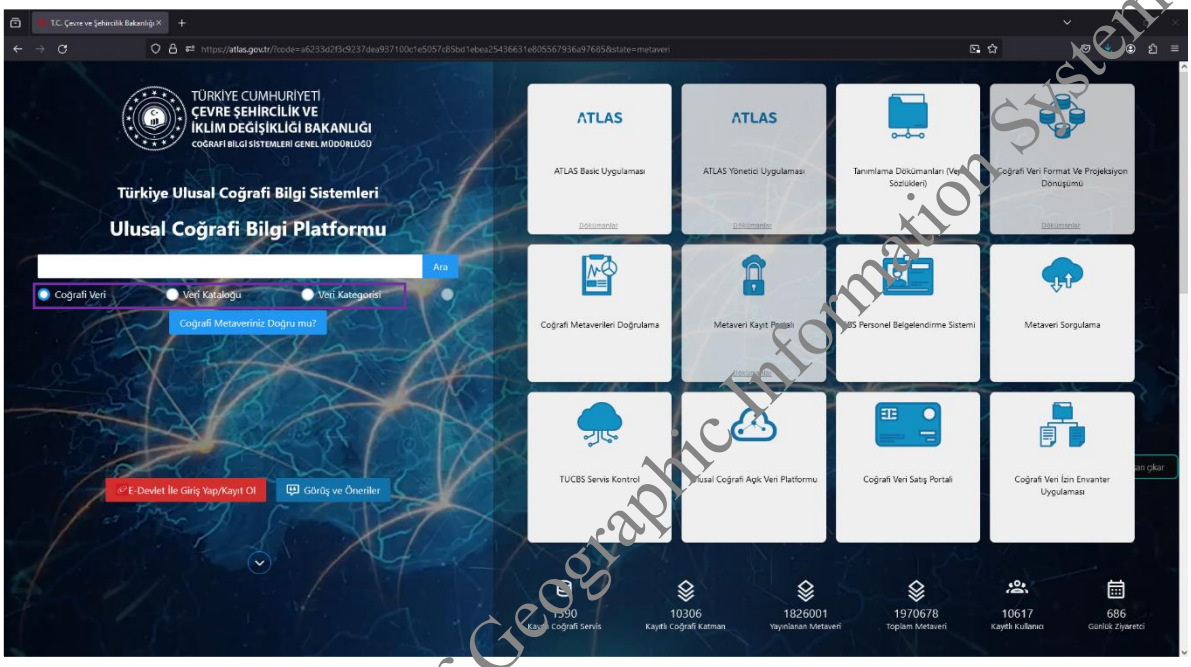


Figure 73: National Geographic Information Platform Metadata Search

Metadata search can be made through any of the Geographic Data, Data Catalog, Data Category fields (Figure 73).

When metadata search is performed in the Geographic Data option; keyword information and the words specified in the metadata source title are searched through the system and query results are displayed according to these criteria.

Metadata search is important for quick access and use of geographic data.

When searching with the words *'risky area'* in the Geographic Data option, 3 metadata registered in the system and open to general users are displayed.

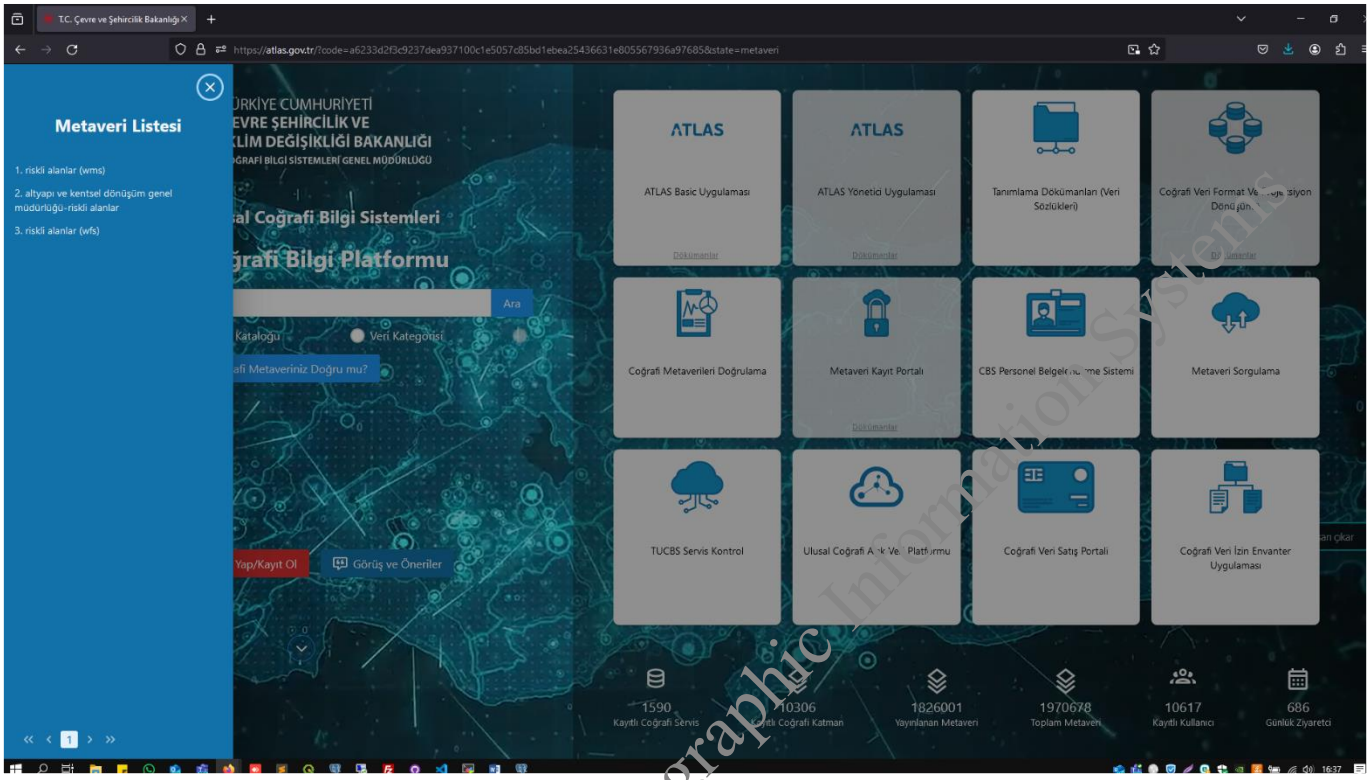


Figure 74:National Geographic Information Platform Metadata Search by Selecting Geographic Data and Selecting Risk Area

When the Data Catalog option is searched by selecting Location, 42 metadata registered in the system and open to general users are displayed.

Figure 75:Metadata Search by Selecting National Geographic Information Platform Data Catalog

When we search by selecting Elevation_5000_Upper in the Data Category option, 2340 metadata registered in the system and open to general users are displayed..

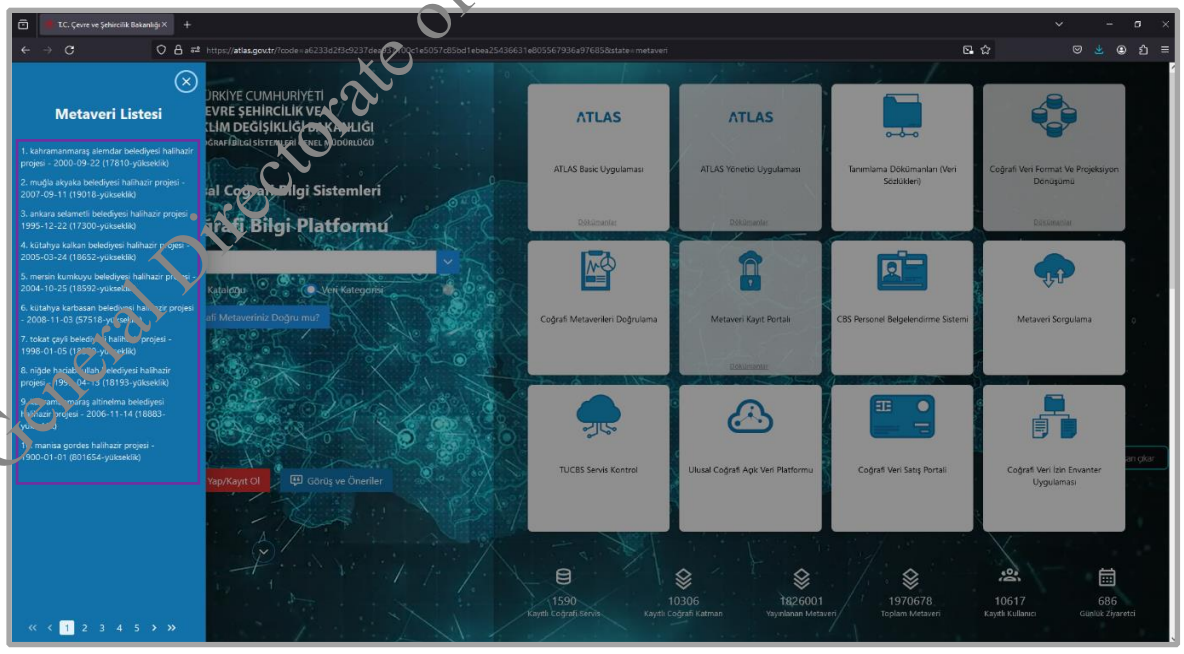


Figure 76:National Geographic Information Platform Metadata Search by Selecting Data Category

When we search by typing srtm in the Geographic Data option, the display of the metadata found on Atlas Basic is shown in Figure 77, Figure 78, Figure 79, Figure 80 and Figure 81.

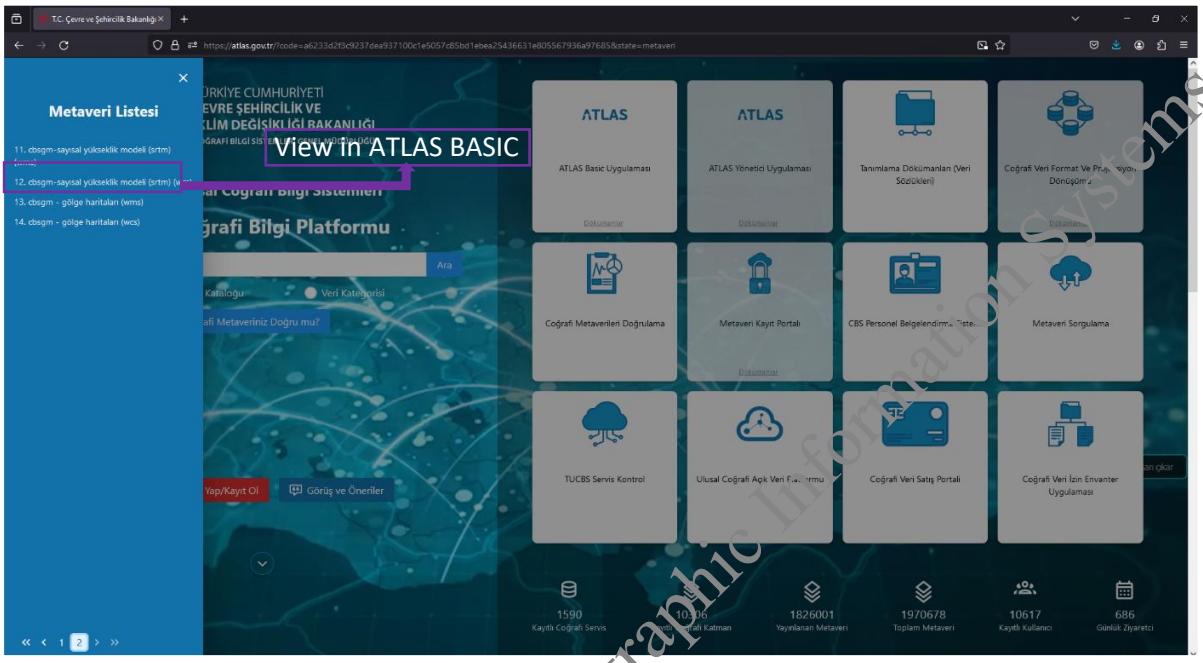


Figure 77: National Geographic Information Platform Data Category srtm Metadata Search

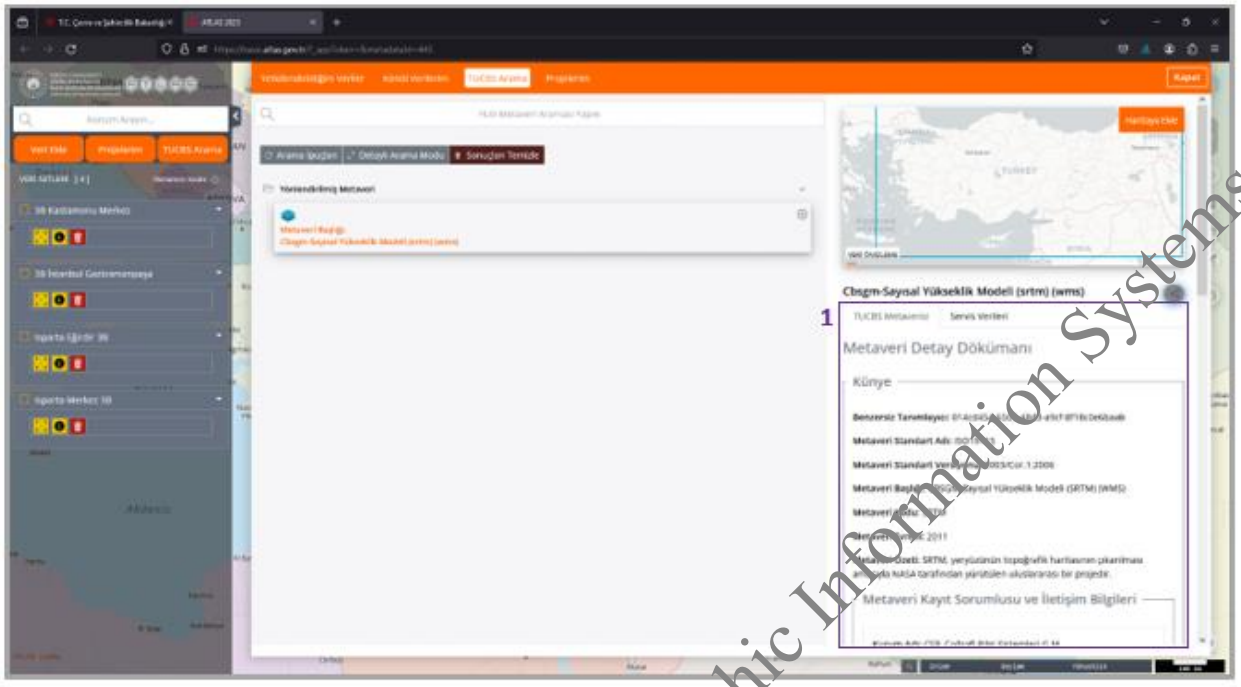


Figure 78:National Geographic Information Platform Data Category srtm and Displaying the Search Metadata

Imprint information of the searched metadata is available in Basic Atlas, TUCBS Metadata tab (Figure 78-1).

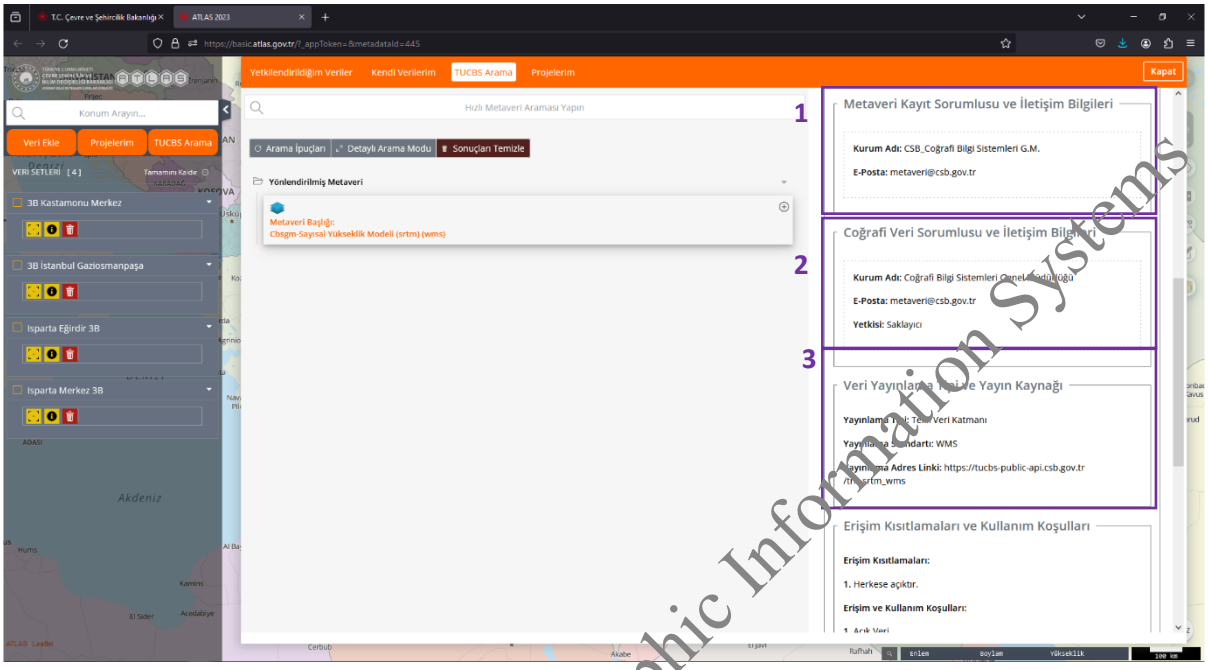


Figure 79:Examination of Metadata Displayed on National Geographic Information Platform ATLAS BASIC

The 'Metadata Registrar' (Figure 79-1), 'Geographic Data Registrar and Contact Information' (Figure 79-2) and 'Data Publication Type and Publication Source' (Figure 79-3) information of the searched metadata are available on the TUCBS Metadata Tab.

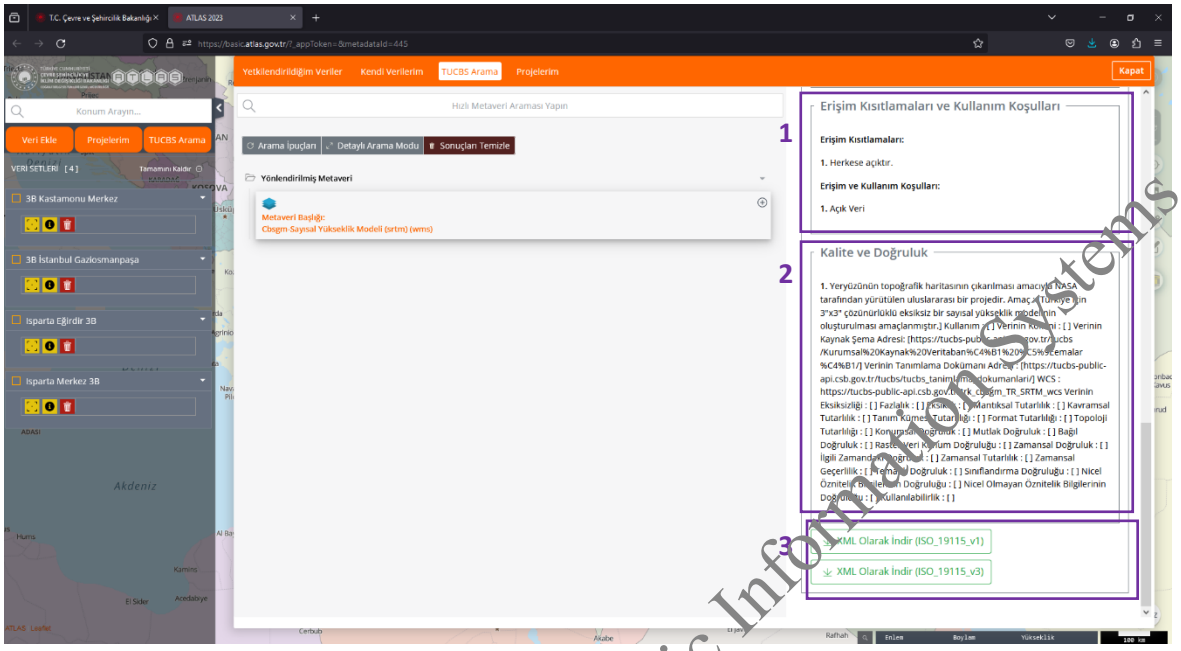


Figure 80:Examination of Metadata Displayed on National Geographic Information Platform ATLAS BASE

'Access Restrictions and Terms of Use' (Figure 80-1) and 'Quality and Accuracy' (Figure 80-2) of the searched metadata are available under the TUCBS Metadata tab. The XML file of the metadata in question can also be downloaded under the same tab (Figure 80-3).

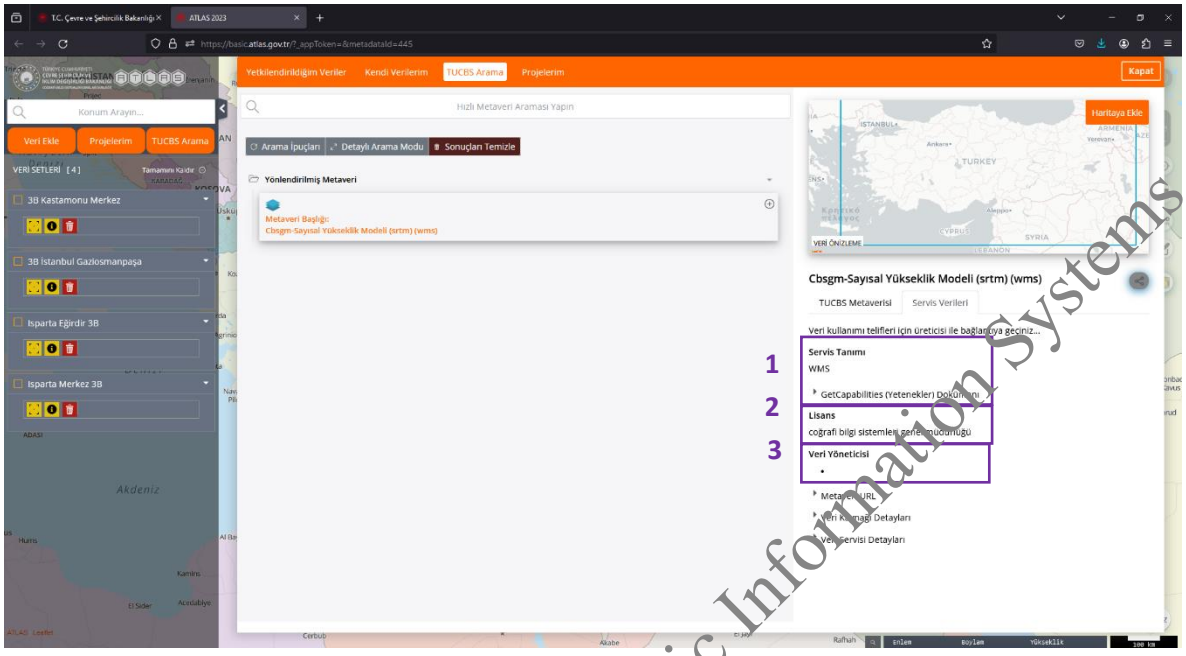


Figure 81:National Geographic Information Platform ATLAS BASIC Displayed Metadata Inspection Service Data

The Service Description (Figure 81-1), License (Figure 81-2) and Data Manager (Figure 81-3) information of the searched metadata is available under the Service Data tab.

15. CONCLUSION AND EVALUATION

In this document; it is stated that the number of mandatory fields varies under 10 main headings according to the type of resource selected for metadata components, and information about various metadata creation methods according to the selected metadata example is provided.

Based on the Presidential Decree No. 49 on Geographical Information Systems, "TUCBS General Conceptual Model", "TUCBS Technical Interoperability Procedures and Principles" and "TUCBS Implementation Rules" documents have formed the basic principles for the preparation of this guide.

According to the document prepared to provide guidance on the production of metadata (data information) for geographic data producers, transferring metadata to the National Geographic Information Platform Metadata Registration Portal and metadata search, verification, metadata query and metadata management operations of geographic data, metadata should be available for public use after metadata creation.

Based on Turkey National Geographic Information System Metadata Definition Document, the sample metadata prepared through the National Geographic Information Platform Metadata Registration Portal is given in Annex-1.

As a general approach, metadata should be available for public use. Spatial data should be stored and updated within the responsible institution/organization in a distributed database architecture. Geographic data services and metadata used in general business and operations within the organization should be made available through the National Geographic Information Platform.

As the spatial data are updated, the metadata related to these data should also be updated by the responsible institution/organization and sent to the platform in question. Users should be able to access and query metadata on all geographic data through the National Geographic Information Platform.

16. APPENDICES

1. Annex-1: Metadata Example

Metadata Registration Portal Components		Sample Metadata
1. Metadata	**Metadata Owner Organization**	CSB_ Geographic Information Systems G.M.
	Metadata Organization Logo Address	https://seeklogo.com/images/1/cevre-ve-sehircilik-bakanligi-yeni-logo-03A150A86D-seeklogo.com.png
	Metadata Catalog	PlanningCastro
	Source Type	Spatial Data Set
	Metadata History	2019-01-03
	Metadata Language	Turkish
	Name of Institution	General Directorate of Geographic Information Systems
	Electronic Mail	tucbsentegrasyon@csb.gov.tr
	Electronic Mail	cbsmetaveri@csb.gov.tr
2. Identity Information	**Source Title**	Ankara Urban Atlas
	Source Summary	Urban Atlas of Ankara province
	Service Type	WMS
	Link	https://tucbs-public-api.csb.gov.tr/trk_cbsgm_sehir_atlasi_wms
	Connection Type	No
	User Name	No
	User Password	No
	Link	Source Type is Spatial Data Set and there is no additional service information for geographic data.
3. Classification	**Title Category**	13_Current Land Use
4. Keywords	**Theme**	Land Use
	Keyword	Ankara
	Keyword	Land Use

Metadata Registration Portal Components		Sample Metadata
	Keyword Theme	Ankara Urban Atlas
4. Keywords	**Date Type**	Creation Date
	Reference Date	2020-04-23
5. Positional	**North Latitude**	40.78026415
	South Latitude	38.71951904
	Eastern Longitude	33.94445804
	West Longitude	30.79138187
6. Time	**Start Date**	2018-01-01
	End Date	2019-01-01
	Production Date	2018-01-16
	Publication Date	2019-01-03
	Update Date	No
7. Quality and Accuracy	**Background Information**	Objective : [Determination of land use status in urban areas] Usage : [Analysis, planning, monitoring urban development, monitoring land changes, etc.] Data Origin : [True Orthophoto] Completeness of Data : [Full] Redundancy : [There were 27 classes according to the standards, it was increased to 36 classes according to the needs of the country, this can be accepted as redundancy, otherwise there is no data redundancy] Deficiency : [complete (The attributes and relationships of the details are complete.)] Logical Consistency : [85%] Conceptual Consistency : [85%] Definition Set Consistency : [85%] Format Consistency [85%] Topology Consistency : [Consistent] Positional Accuracy : [GSD=10 cm] Absolute Accuracy : [85%] Relative Accuracy : [Raster Data Position Accuracy : [GSD=10 cm] Temporal Accuracy : [85%] Accuracy at the relevant time : [85%] Temporal consistency : [85%] Temporal validity : [85% data is correct at the relevant time] Thematic Accuracy : [85%] Classification Accuracy : [85%] Accuracy of quantitative attribute information : [85%] Accuracy of non-quantitative attribute information : [%85]
	Equivalent Scale 1/	No
7. Quality and Accuracy	**Distance**	No
	Unit of Measure	Yok

Metadata Registration Portal Components		Sample Metadata
8. Compliance	**Header**	Land Use Status Atlas
	History	2019-01-03
	Date Type	Publication Date
	Degree	Suitable
9. Limitations	**Privacy**	Open Data
	Confidentiality (Free Text)	No
	Condition	No conditions
	Condition	For Information Purposes. Cannot be used in official transactions. The data cannot be reproduced and made available to third parties and published in any way. In the event that it is determined that the data is used for commercial purposes, legal proceedings will be initiated against those concerned.
10. Institutional	**Role**	Manufacturer
	Name of Institution	General Directorate of Geographic Information Systems
	Electronic Mail	kubra.ekinci@csb.gov.tr