

# **Appendix R to Tender Specifications**

## **Overview of the CGD Central Geographical Database**

V. 1.1 – 2015-07-07

# 1 Introduction

The Central Geographical Database (CGD) is one of EMSA central registry services. The purpose of this service is to manage centrally geographical area information.

The geographical areas to be managed by the registry are those having an official meaning for the EMSA Maritime applications, in particular

- Having a formal semantic
- To be kept under configuration control
- That can only be managed by authorised users

The following chapters describe the CGD management interface and the web service service.

# 2 CGD Management interface

The CGD provides a web user interface for authorised users to manage geographical areas.

The user can perform CRUD operations on the geographical areas he/she is entitled to manage. The picture below provides an overview of the CGD management interface.

When a user log-in, the CGD tool shows the areas displayed on the map and a table on the bottom allowing to manage the areas.

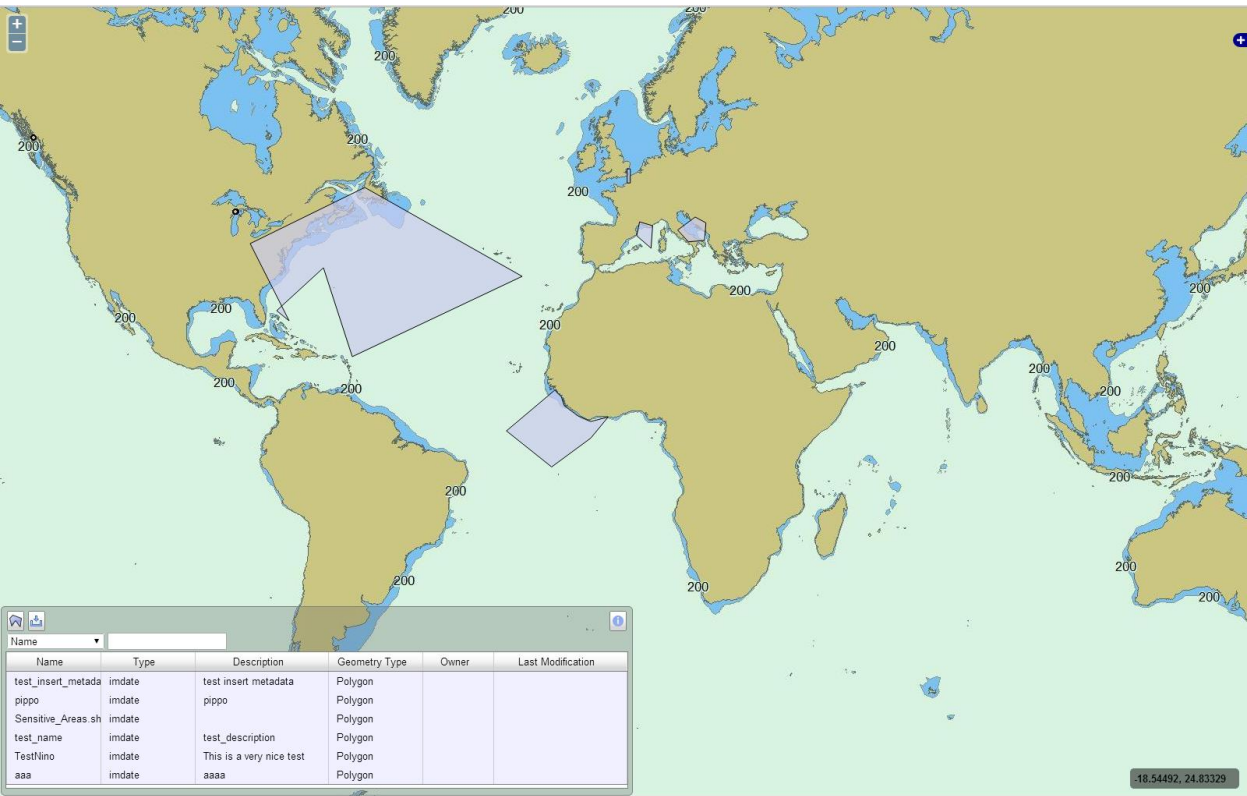


Figure 1 CGD GUI

The table below implements the live search on each of the table fields. The user can choose a field and start typing a string, and the values will be filtered accordingly. The areas displayed on the map section of the GUI also will be updated according.

Areas on the map and table records are bi-directionally linked. If you click on the table, the tool zooms on the area on the map and vice-versa.

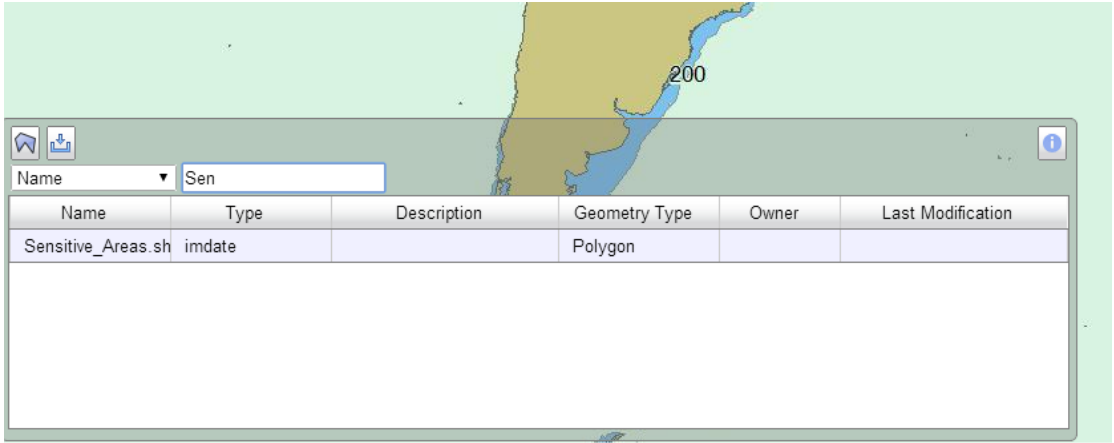


Figure 2 Live search

Right clicking on the table record provides access to the list of actions available:

- Remove area
- Edit area
- Clone area

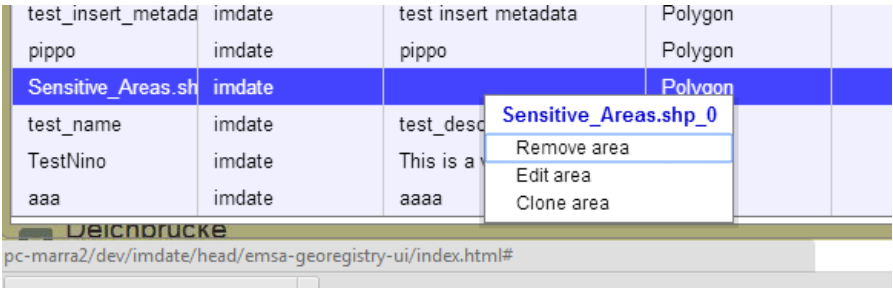


Figure 3Context menu

The same list of actions are also available by right clicking on the area on the map.

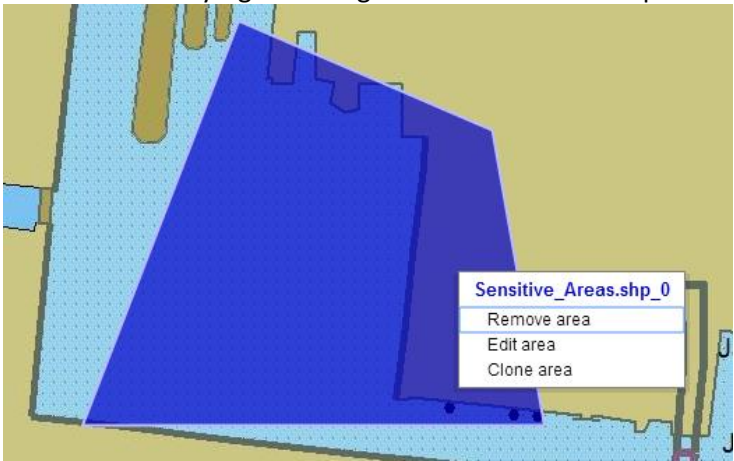


Figure 4 Map context menu

2.1 Main actions on the areas: remove, edit, clone

**Remove**, simply removes the area from the registry.

**Edit**, will cause the following to appear (see below)

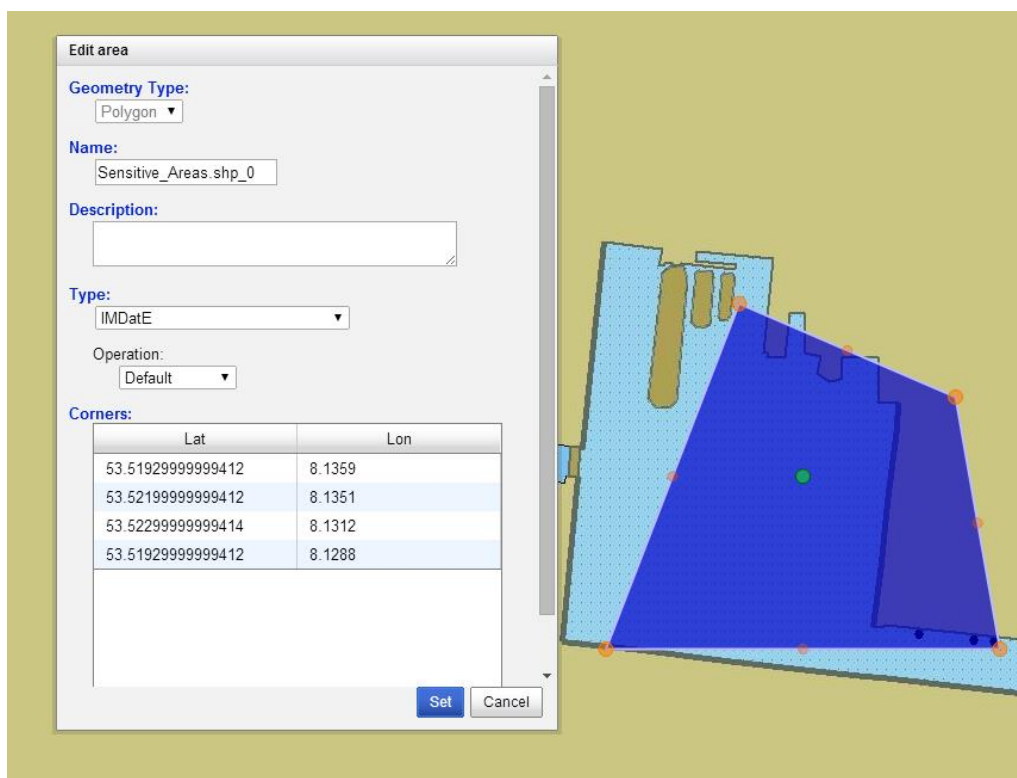


Figure 5 Edit area dialogue

This feature allows the user to:

- Edit the area graphically using the points on the map, in particular:
  - Map points and points in the table are synchronised
  - For each segment in the map area, a *small point* appears allowing to easily drag it around and add a new point with one click (see figure below). After the new segment was formed a new small point appears (see red arrow below) for each new segment created
  - A point can be deleted by selecting it on the map and clicking on the cancel button on the keyboard
- Point can also be added, edited and deleted by using the table
- Change the attributes, e.g. name description, using the text box
- Change the area type, by using a drop down menu. For each area type the system is aware (through configuration files) of the *custom attributes* needed for that area. Therefore when the user switches the area type, the list of custom attributes is automatically displayed (see [Figure 7](#))

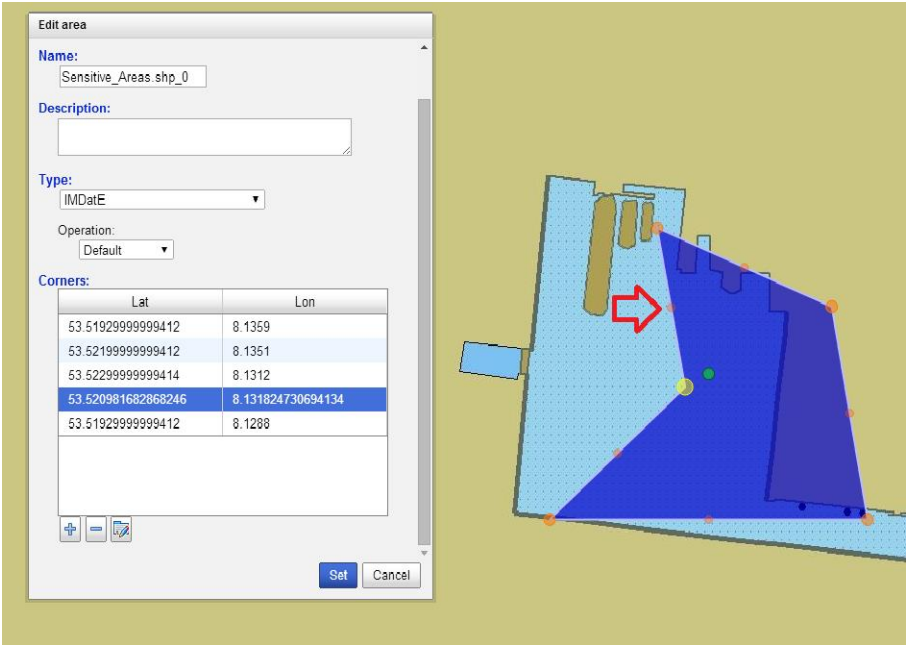


Figure 6 Vertex selection

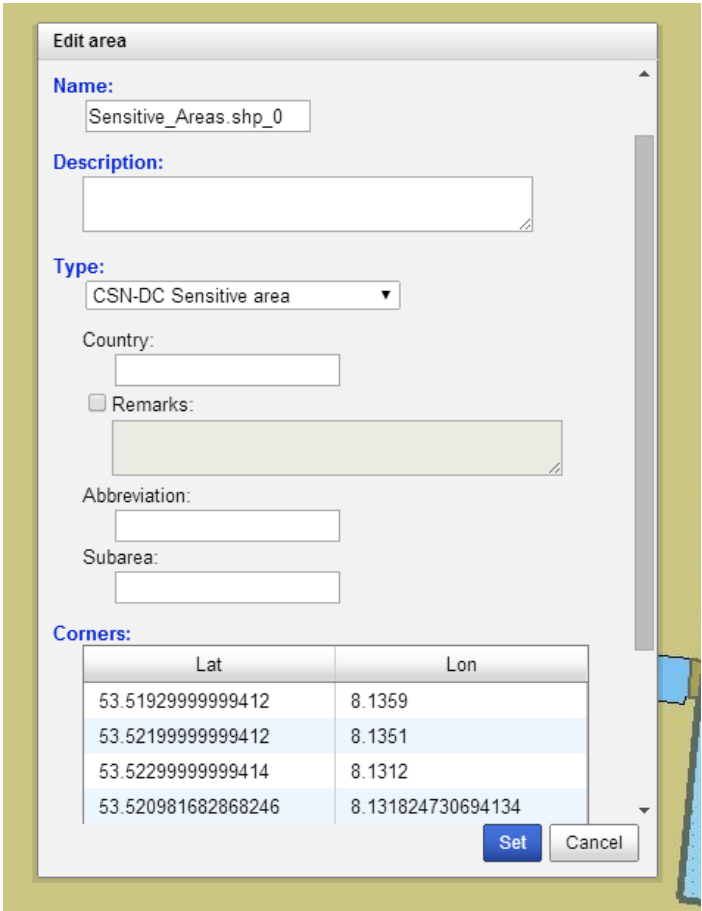


Figure 7 Custom attributes

The clone function will simply clone the currently selected area and allowing to create a new version, starting from an existing area.

## 2.2 Creating and importing an area

To create a new area, simply start from drawing the polygon on the map. This function is accessed by clicking on the *Draw Area* icon on the top left side of the area list table.

The user can draw the area on the map, and once the area has been completed, the popup window appears, allowing completing the area definition, using the same logic as in the edit area explained above. Thus, the user may choose area name, description and all other common editable attributes (there are common attributes like user and modification date, which are automatically set by the system), define area type, once the area type has been defined, access a specialised set of fields that depend on the area type and possibly set them (as in [Figure 7](#)).

Importing an area using **Shapefile** is accessed by clicking on the *Import Area* button on the top left of the area list table.

IN terms of general workflow, for each record of the shapefile:

- A new area will be created
- the geometry of the shapefile will be user to define the geometry of the area
- if the shapefile contains attributes matching the names of the common attributes, they will be extracted and mapped automatically onto the common attributes
- any shapefile attribute that does not match the existing list of common attributes will be stored as a XML snippet (see above)

From the GUI, the import function opens a file browser on the local computer. The user must choose both the .shp and .dbf file types.

Once pre-loaded a popup window Import Area appears as in the following figure, listing all areas and their attributes. Areas are also displayed on the map. The following is an example using the CSNDC coverage requirements.

At this stage, the following pre-filtering operations are allowed (list on the table and map area as usual synchronised):

- Check all / uncheck all
- Select one of many areas (rows) either using the check boxes on the table, or by CTRL-clicking on the map
- Check selected / uncheck selected (see example in [Figure 9](#))
- Proceed with the import

The result of the import will be as in [Figure 10](#).

By clicking on the specific record and activating the “I” icon on the top right side of the area list table, the user can access the type specific (alias custom attributes) metadata. The user may still edit them using the procedure described in the Edit Area section.

The import from shapefile will work as follows:



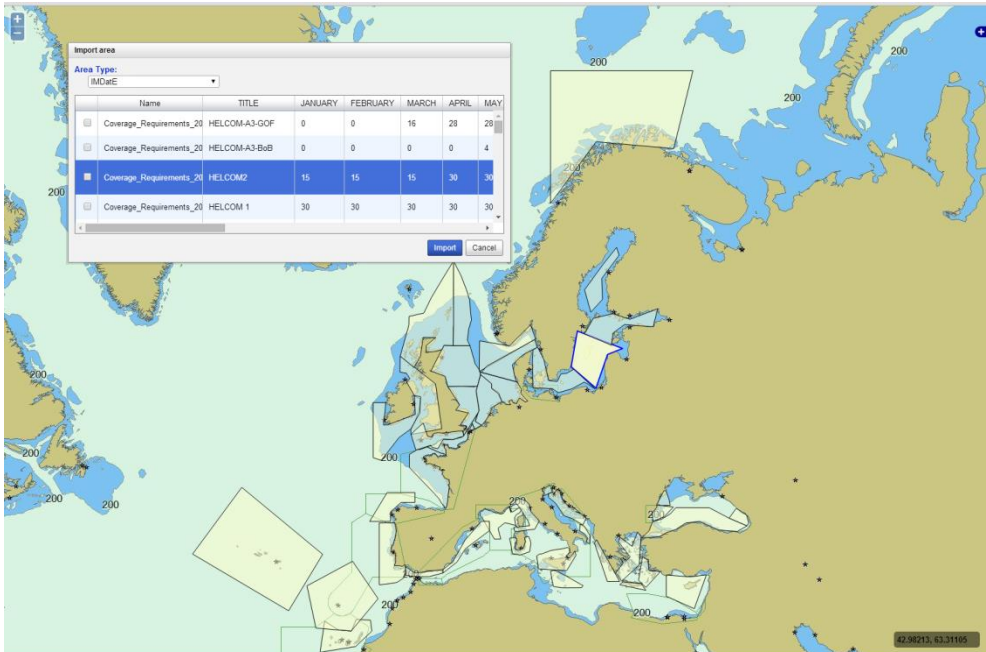


Figure 8 – Example of importing CSNDC Coverage Requirements areas

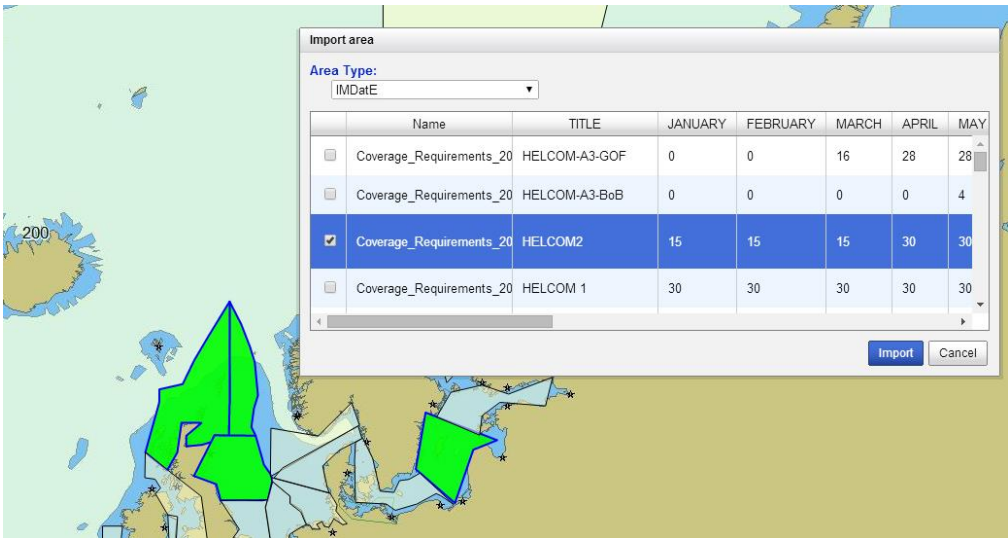


Figure 9 Example of selection of multiple areas before finalising the import

Name	Type	Description	Geometry Type	Owner	Last Modification
aaa	imdate	aaaa	Polygon		
Sensitive_Areas.shp_0_cloned	imdate	rr2	Polygon	YOU	2014-05-22T10:16:29Z
Coverage_Requirements_2010_Monthly	imdate		Polygon	YOU	2014-05-22T10:35:49Z
Coverage_Requirements_2010_Monthly	imdate		Polygon	YOU	2014-05-22T10:35:49Z
Coverage_Requirements_2010_Monthly	imdate		Polygon	YOU	2014-05-22T10:35:49Z
Coverage_Requirements_2010_Monthly	imdate		Polygon	YOU	2014-05-22T10:35:49Z

Figure 10 – example of newly imported data

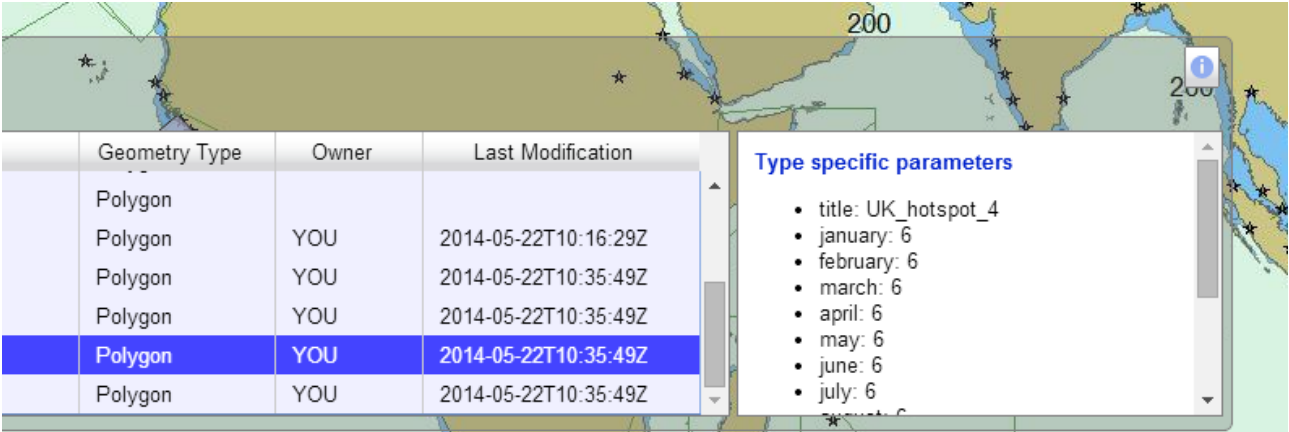


Figure 11 Display of type specific information

### 3 GeoRegistry web service

The service is implemented as a OGC Web Feature Service (WFS). This is a standard specification for the management of geographical objects. The service has been tailored for the CGD requirements. This is described in the following sections/

**IMDatE Module**  
[imdate-georegistry-proxy](#)

**Methods summary**

Name	Description
ows	Wrapper for wfs invocation providing authorisation functionality



### 1.1.1 ows

#### Description

Wrapper for wfs invocation.

#### Style

HTTP/POST

#### Input

The inputs of this method are the arguments defined by the following table.

Argument	Type	Occurs	Description
user	String	1..1	Username
POST CONTENT	Byte array	1..1	XML text the wfs invocation request

#### Output (JSON)

The outputs of this method are the arguments defined by the following table.

Argument	Type	Occurs	Description
response	String	1..1	XML response from wfs server

#### 1.1.1.1 WFS Service specifications

Here are provided the schema informations about the content of the request and response for the service wrapped by the servlet described in this paragraph.

#### Schema GeoRegistrySchema.xsd

schema location: [GeoRegistrySchema.xsd](#)

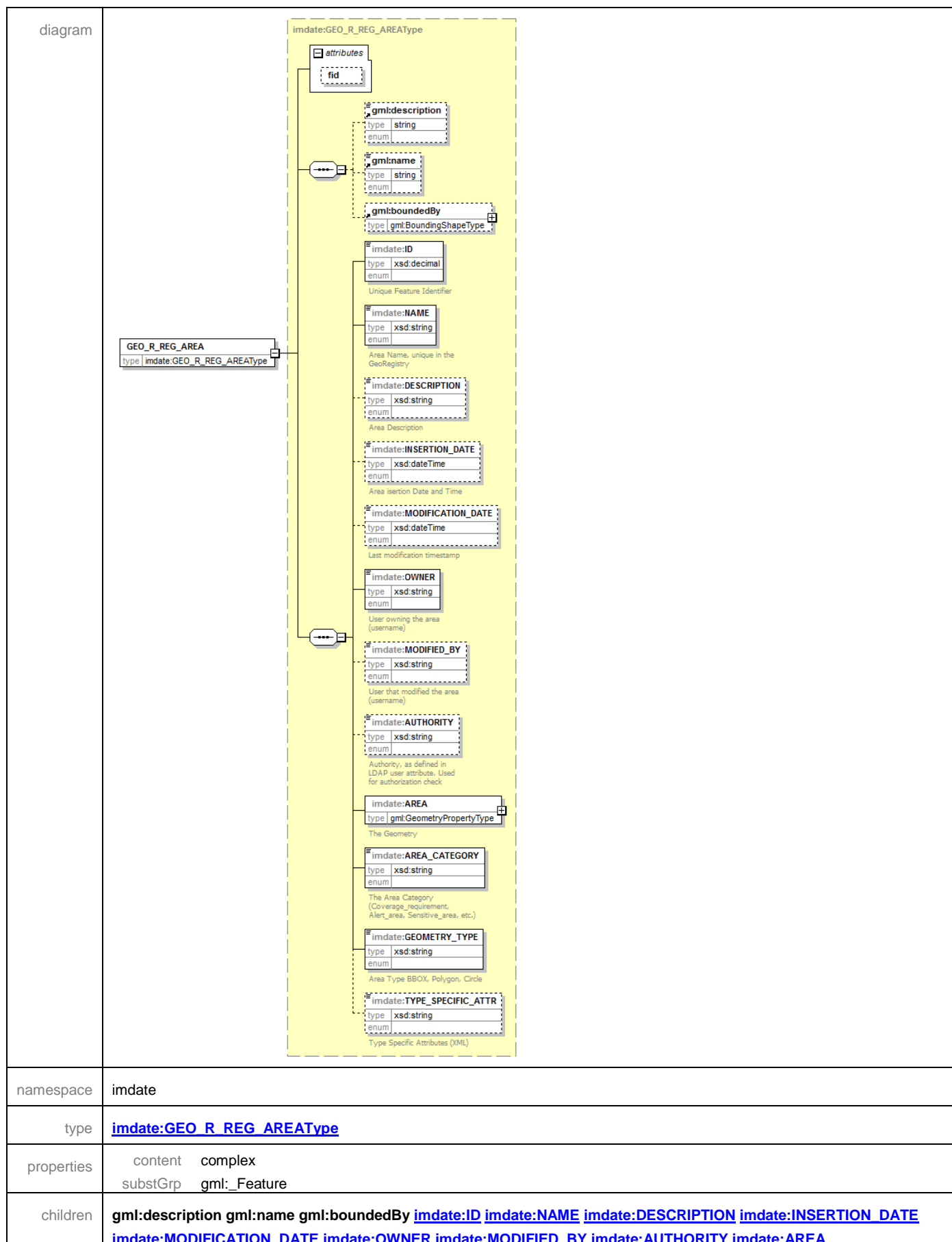
attribute form default:

element form default: **qualified**

targetNamespace: **imdate**

Elements      Complex types

[GEO R REG AREA](#)    [GEO R REG AREAType](#)



	<a href="#">imdate:AREA_CATEGORY</a> <a href="#">imdate:GEOMETRY_TYPE</a> <a href="#">imdate:TYPE_SPECIFIC_ATTR</a>					
attributes	Name fid	Type <b>xsd:ID</b>	Use optional	Default	Fixed	annotation
source	<xsd:element name="GEO_R_REG_AREA" type="imdate:GEO_R_REG_AREAType" substitutionGroup="gml:_Feature"/>					

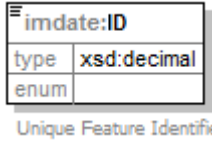
complexType **GEO\_R\_REG\_AREAType**

diagram	
namespace	imdate
type	extension of <b>gml:AbstractFeatureType</b>
properties	base <b>gml:AbstractFeatureType</b>
children	<b>gml:description</b> <b>gml:name</b> <b>gml:boundedBy</b> <a href="#">imdate:ID</a> <a href="#">imdate:NAME</a> <a href="#">imdate:DESCRIPTION</a> <a href="#">imdate:INSERTION_DATE</a> <a href="#">imdate:MODIFICATION_DATE</a> <a href="#">imdate:OWNER</a> <a href="#">imdate:MODIFIED_BY</a> <a href="#">imdate:AUTHORITY</a> <a href="#">imdate:AREA</a>

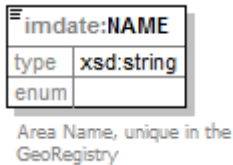
	<a href="#">imdate:AREA_CATEGORY</a> <a href="#">imdate:GEOMETRY_TYPE</a> <a href="#">imdate:TYPE_SPECIFIC_ATTR</a>					
used by	element <a href="#">GEO_R_REG_AREA</a>					
attributes	Name fid	Type <b>xsd:ID</b>	Use optional	Default	Fixed	annotation
source	<pre> &lt;xsd:complexType name="GEO_R_REG_AREAType"&gt;   &lt;xsd:complexContent&gt;     &lt;xsd:extension base="gml:AbstractFeatureType"&gt;       &lt;xsd:sequence&gt;         &lt;xsd:element name="ID" type="xsd:decimal" nillable="false" minOccurs="1" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;Unique Feature Identifier&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;         &lt;xsd:element name="NAME" type="xsd:string" nillable="false" minOccurs="1" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;Area Name, unique in the GeoRegistry&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;         &lt;xsd:element name="DESCRIPTION" type="xsd:string" nillable="true" minOccurs="0" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;Area Description&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;         &lt;xsd:element name="INSERTION_DATE" type="xsd:dateTime" nillable="true" minOccurs="0" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;Area insertion Date and Time&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;         &lt;xsd:element name="MODIFICATION_DATE" type="xsd:dateTime" nillable="true" minOccurs="0" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;Last modification timestamp&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;         &lt;xsd:element name="OWNER" type="xsd:string" nillable="false" minOccurs="1" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;User owning the area (username)&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;         &lt;xsd:element name="MODIFIED_BY" type="xsd:string" nillable="true" minOccurs="0" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;User that modified the area (username)&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;         &lt;xsd:element name="AUTHORITY" type="xsd:string" nillable="true" minOccurs="0" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;Authority, as defined in LDAP user attribute. Used for authorization check&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;         &lt;xsd:element name="AREA" type="gml:GeometryPropertyType" nillable="false" minOccurs="1" maxOccurs="1"&gt;           &lt;xsd:annotation&gt;             &lt;xsd:documentation&gt;The Geometry&lt;/xsd:documentation&gt;           &lt;/xsd:annotation&gt;         &lt;/xsd:element&gt;       &lt;/xsd:sequence&gt;     &lt;/xsd:extension&gt;   &lt;/xsd:complexContent&gt; &lt;/xsd:complexType&gt; </pre>					

	<pre>&lt;xsd:element name="AREA_CATEGORY" type="xsd:string" nillable="false" minOccurs="1" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;The Area Category (Coverage_requirement, Alert_area, Sensitive_area, etc.)&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt; &lt;xsd:element name="GEOMETRY_TYPE" type="xsd:string" nillable="false" minOccurs="1" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Area Type BBOX, Polygon, Circle&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt; &lt;xsd:element name="TYPE_SPECIFIC_ATTR" type="xsd:string" nillable="true" minOccurs="0" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Type Specific Attributes (XML)&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt; &lt;/xsd:sequence&gt; &lt;/xsd:extension&gt; &lt;/xsd:complexContent&gt; &lt;/xsd:complexType&gt;</pre>
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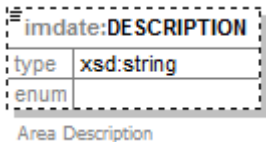
element **GEO\_R\_REG\_AREAType/ID**

diagram	
namespace	imdate
type	<b>xsd:decimal</b>
properties	isRef 0 content simple nillable false
annotation	documentation Unique Feature Identifier
source	<pre> &lt;xsd:element name="ID" type="xsd:decimal" nillable="false" minOccurs="1" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Unique Feature Identifier&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt; </pre>

element **GEO\_R\_REG\_AREAType/NAME**

diagram	
namespace	imdate
type	<b>xsd:string</b>
properties	isRef 0 content simple nillable false
annotation	documentation Area Name, unique in the GeoRegistry
source	<pre> &lt;xsd:element name="NAME" type="xsd:string" nillable="false" minOccurs="1" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Area Name, unique in the GeoRegistry&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt; </pre>

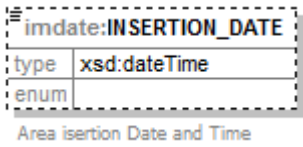
element **GEO\_R\_REG\_AREAType/DESCRIPTION**

diagram	
namespace	imdate
type	<b>xsd:string</b>
properties	isRef 0 minOcc 0

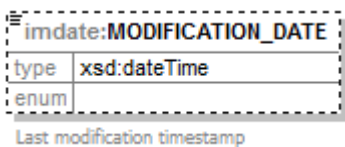


	maxOcc 1 content simple nillable true
annotation	documentation Area Description
source	<pre>&lt;xsd:element name="DESCRIPTION" type="xsd:string" nillable="true" minOccurs="0" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Area Description&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt;</pre>

#### element **GEO\_R\_REG\_AREAType/INSERTION\_DATE**

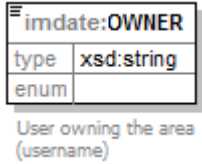
diagram	
namespace	imdate
type	<b>xsd:dateTime</b>
properties	isRef 0 minOcc 0 maxOcc 1 content simple nillable true
annotation	documentation Area isertion Date and Time
source	<pre>&lt;xsd:element name="INSERTION_DATE" type="xsd:dateTime" nillable="true" minOccurs="0" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Area isertion Date and Time&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt;</pre>

#### element **GEO\_R\_REG\_AREAType/MODIFICATION\_DATE**

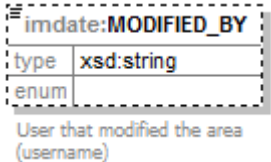
diagram	
namespace	imdate
type	<b>xsd:dateTime</b>
properties	isRef 0 minOcc 0 maxOcc 1 content simple nillable true
annotation	documentation Last modification timestamp
source	<pre>&lt;xsd:element name="MODIFICATION_DATE" type="xsd:dateTime" nillable="true" minOccurs="0" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Last modification timestamp&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt;</pre>

	<code>&lt;/xsd:annotation&gt;</code> <code>&lt;/xsd:element&gt;</code>
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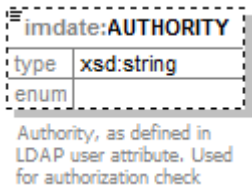
### element **GEO\_R\_REG\_AREAType/OWNER**

diagram	
namespace	imdate
type	<b>xsd:string</b>
properties	isRef 0 content simple nillable false
annotation	documentation User owning the area (username)
source	<pre>&lt;xsd:element name="OWNER" type="xsd:string" nillable="false" minOccurs="1" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;User owning the area (username)&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt;</pre>

### element **GEO\_R\_REG\_AREAType/MODIFIED\_BY**

diagram	
namespace	imdate
type	<b>xsd:string</b>
properties	isRef 0 minOcc 0 maxOcc 1 content simple nillable true
annotation	documentation User that modified the area (username)
source	<pre>&lt;xsd:element name="MODIFIED_BY" type="xsd:string" nillable="true" minOccurs="0" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;User that modified the area (username)&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt;</pre>

element **GEO\_R\_REG\_AREAType/AUTHORITY**

diagram	 <p>Authority, as defined in LDAP user attribute. Used for authorization check</p>										
namespace	imdate										
type	xsd:string										
properties	<table><tr><td>isRef</td><td>0</td></tr><tr><td>minOcc</td><td>0</td></tr><tr><td>maxOcc</td><td>1</td></tr><tr><td>content</td><td>simple</td></tr><tr><td>nillable</td><td>true</td></tr></table>	isRef	0	minOcc	0	maxOcc	1	content	simple	nillable	true
isRef	0										
minOcc	0										
maxOcc	1										
content	simple										
nillable	true										
annotation	<p>documentation</p> <p>Authority, as defined in LDAP user attribute. Used for authorization check</p>										
source	<pre>&lt;xsd:element name="AUTHORITY" type="xsd:string" nillable="true" minOccurs="0" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Authority, as defined in LDAP user attribute. Used for authorization check&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt;</pre>										

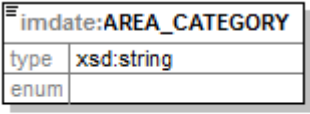
element **GEO\_R\_REG\_AREAType/AREA**

<p>diagram</p>	
<p>namespace</p>	<p>imdate</p>
<p>type</p>	<p><b>gml:GeometryPropertyType</b></p>
<p>properties</p>	<p>isRef 0</p> <p>content complex</p> <p>nullable false</p>

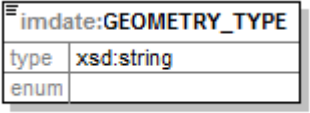
children	gml:_Geometry					
attributes	Name	Type	Use	Default	Fixed	annotation
	xlink:type	xsd:string			simple	
	href		optional			
	role		optional			
	arcrole		optional			
	title		optional			
	show		optional			documentation
						The 'show' attribute is used to communicate the desired presentation of the ending resource on traversal from the starting resource; it's value should be treated as follows: new - load ending resource in a new window, frame, pane, or other presentation context replace - load the resource in the same window, frame, pane, or other presentation context embed - load ending resource in place of the presentation of the starting resource other - behavior is unconstrained; examine other markup in the link for hints none - behavior is unconstrained
						documentation
						The 'actuate' attribute is
	actuate		optional			

		used to communicate the desired timing of traversal from the starting resource to the ending resource; it's value should be treated as follows: onLoad - traverse to the ending resource immediately on loading the starting resource onRequest - traverse from the starting resource to the ending resource only on a post-loading event triggered for this purpose other - behavior is unconstrained; examine other markup in link for hints none - behavior is unconstrained
	remoteSchema optional	
annotation	documentation The Geometry	
source	<pre>&lt;xsd:element name="AREA" type="gml:GeometryPropertyType" nillable="false" minOccurs="1" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;The Geometry&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt;</pre>	

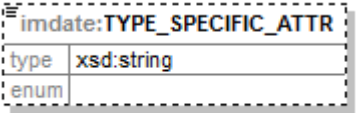
**element GEO\_R\_REG\_AREAType/AREA\_CATEGORY**

diagram	 <p>The Area Category (Coverage_requirement, Alert_area, Sensitive_area, etc.)</p>
namespace	imdate
type	<b>xsd:string</b>
properties	isRef 0 content simple nillable false
annotation	documentation The Area Category (Coverage_requirement, Alert_area, Sensitive_area, etc.)
source	<pre> &lt;xsd:element name="AREA_CATEGORY" type="xsd:string" nillable="false" minOccurs="1" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;The Area Category (Coverage_requirement, Alert_area, Sensitive_area, etc.)&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt; </pre>

**element GEO\_R\_REG\_AREAType/GEOMETRY\_TYPE**

diagram	 <p>Area Type BBOX, Polygon, Circle</p>
namespace	imdate
type	<b>xsd:string</b>
properties	isRef 0 content simple nillable false
annotation	documentation Area Type BBOX, Polygon, Circle
source	<pre> &lt;xsd:element name="GEOMETRY_TYPE" type="xsd:string" nillable="false" minOccurs="1" maxOccurs="1"&gt;   &lt;xsd:annotation&gt;     &lt;xsd:documentation&gt;Area Type BBOX, Polygon, Circle&lt;/xsd:documentation&gt;   &lt;/xsd:annotation&gt; &lt;/xsd:element&gt; </pre>

**element GEO\_R\_REG\_AREAType/TYPE\_SPECIFIC\_ATTR**

diagram	 <p>Type Specific Attributes (XML)</p>
namespace	imdate



type	<b>xsd:string</b>
properties	<div><div>isRef</div><div>0</div></div> <div><div>minOcc</div><div>0</div></div> <div><div>maxOcc</div><div>1</div></div> <div><div>content</div><div>simple</div></div> <div><div>nillable</div><div>true</div></div>
annotation	<div>documentation</div> <div>Type Specific Attributes (XML)</div>
source	<div>&lt;xsd:element name="TYPE_SPECIFIC_ATTR" type="xsd:string" nillable="true" minOccurs="0" maxOccurs="1"&gt;</div> <div>&lt;xsd:annotation&gt;</div> <div>&lt;xsd:documentation&gt;Type Specific Attributes (XML)&lt;/xsd:documentation&gt;</div> <div>&lt;/xsd:annotation&gt;</div> <div>&lt;/xsd:element&gt;</div>

## ABOUT THE EUROPEAN MARITIME SAFETY AGENCY

The European Maritime Safety Agency is one of the European Union's decentralised agencies. Based in Lisbon, the Agency provides technical assistance and support to the European Commission and Member States in the development and implementation of EU legislation on maritime safety, pollution by ships and maritime security. It has also been given operational tasks in the field of oil pollution response, vessel monitoring and in long-range identification and tracking of vessels.

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