European Maritime Safety Agency

Request for Change

EO-Processing

Appendix 1 - Update webservices to allow EMSA client-applications to query EO acquisitions using polygons

Business Requirements

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Definitions and acronyms

CSN: CleanSeaNet service

CSW: Catalogue Service for the Web

EO: Earth Observation

EICD: External Interface Control Document

EODC: Earth Observation Data Centre

EOP: Earth Observation Product

ICD: Interface Control Document

RfC: Request for Change

SAR: Synthetic Aperture Radar

SEG: SafeSeaNet Ecosystem Graphical Interface

SWW: SAR Wind and Wave

SP: Service Providers

TBD: To Be Defined

1. Objective of the change

The objective of this request for change is to update EODC-Processing CSW webservice in order to allow EMSA client-applications to retrieve EO services data that intercepts a given query polygon (and not the polygon's bounding box).

2. Service Requirements

2.1 Informative Requirement

Title: EO Acquisition definition			
Issue JIRA Number: EODC4G-136	**Requirement order ID in RFC:** 01	**External Reference:** N/A	**Priority:** N/A
Service: All		**Version:** 1.0	
Application: EO-Processing		**Type:** Informative	
Sub-Service: N/A			
Components: N/A			
An EO Acquisition, that is exposed to SEG by the EODC CSW, defines what is an EO Service as well as the associated image and coverage (footprint).			

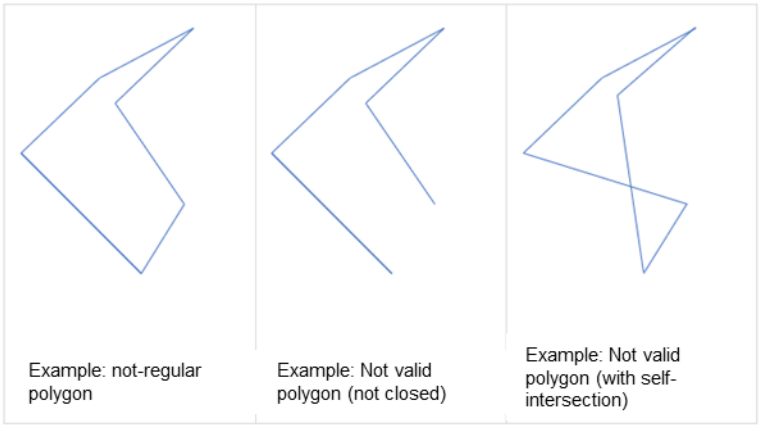
Title: Update Terminology			
Issue JIRA Number: EODC4G-139	**Requirement order ID in RFC:** 02	**External Reference:** N/A	**Priority:** N/A
Service: All		**Version:** 1.0	
Application: EO-Processing		**Type:** Informative	
Sub-Service: N/A			
Components: N/A			

Following terminology shall be used for the present Request for Change (RfC):

Polygon: refers to any Area of Interest (AOI) that is used to query EO data. A polygon may be:

- Regular: square or rectangle, with 4 vertexes;
- not-regular polygon: can have sides of any length up to a maximum 1000 vertexes. Not-regular polygons are defined as closed and without self-intercepting lines.
- Containing holes: can be a regular or not-regular polygon with holes inside (e.g. donut shaped polygon), i.e. a smaller polygon inside the main one. The area, inside the smaller polygon, will not be part of the intercepting area.

  Example of not-regular polygon and 2 not-valid polygons.

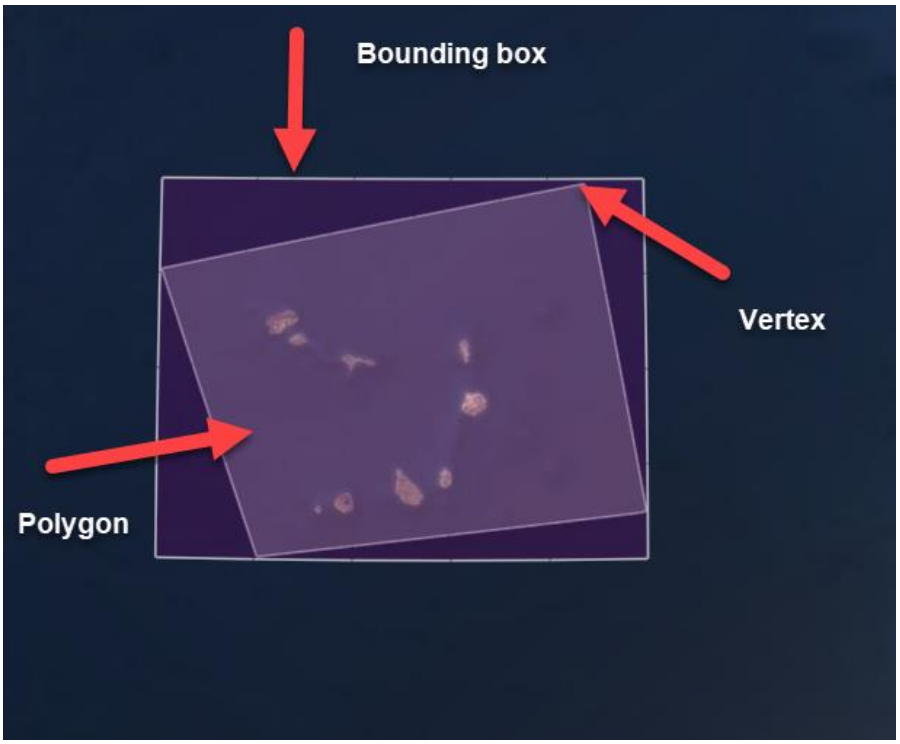


Circle: When a user draws a “circle”, what is really defining is an approximation of a circle using a not-regular polygon with several vertexes that are plotted over a theoretical circle line. In case of SEG, these polygons are defined by 33 vertexes (note this value should not be considered as a maximum number of vertexes for a circular polygon).

Vertex: (plural: vertexes) refers to a point where two lines meet to form an angle. A vertex is defined by coordinates (Latitude and Longitude).

Bounding box: refers to a regular polygon that contains a defined AOI used to query EO data. It is defined by 4 vertexes in a rectangular/squared shape.

Below an image that supports these definitions.



Title: Description of use case in SEG			
Issue JIRA Number: EODC4G-140	**Requirement order ID in RFC:** 03	**External Reference:** N/A	**Priority:** N/A
Service: All		**Version:** 1.0	
Application: EO-Processing		**Type:** Informative	
Sub-Service: N/A			
Components: N/A			

In SEG; users may query for EO acquisitions (based on a polygon. This polygon may be:

- Defined by user- using SEG available tools to define a polygon;
- Imported from other sources such as CGD (e.g. Alert areas);
- Imported by user from a geographical defined format.

Current situation: SEG cannot query using a polygon so a bounding box is used. Due to this, users may retrieve more results than requested.

2.2 Functional requirements

Title: Update EODC-Processing capabilities			
Issue JIRA Number: EODC4G-141	**Requirement order ID in RFC:** 04	**External Reference:** N/A	**Priority:** Must Have
Service: All		**Version:** 1.0	
Application: EO-Processing		**Type:** Functional	
Sub-Service: N/A			
Components: N/A			

EODC-Processing webservices, shall be able to retrieve only EO Acquisitions that intersect or are contained inside the query polygon.

Correct implementation of the requirement will imply that acquisitions that are not contained / intersected by defined query polygon but are intersecting the bounding box of the query polygon, are not retrieved by EODC-Processing webservices.

Acceptance criteria:
SCENARIO 1: regular polygon Latitude: [40,41]; Longitude: [-34,-33]. Period of time: November 2020 with EO acquisitions provided in Production environment. Pre-condition: retrieve how many EO Acquisitions are covered or intersect the defined polygon.
Expected result: EODC-Processing queries and returns the EO acquisitions that are contained or intersect by the defined.

SCENARIO 2: CSN Alert Area: IS_BASELINE. Period of time: November 2020 with EO acquisitions provided in Production environment. Pre-condition: retrieve how many EO Acquisitions are covered or intersect the defined polygon.
Expected result: EODC-Processing queries and returns the EO acquisitions that are contained or intersect by the defined.

SCENARIO 3: CSN Alert Area: DE_Alert_Zone. Period of time: November 2020 with EO acquisitions provided in Production environment. Pre-condition: retrieve how many EO Acquisitions are covered or intersect the defined polygon.
Expected result: EODC-Processing queries and returns the EO acquisitions covered by this polygon.

SCENARIO 4:
Bounding box covers 30 EO acquisitions
Polygon covers: 0 EO acquisitions
Expected result: 0 EO acquisitions

SCENARIO 5:
Bounding box covers 30 EO acquisitions
Polygon covers: 30 EO acquisitions
Expected result: 30 EO acquisitions

SCENARIO 6:
Bounding box covers 100 EO acquisitions
Polygon covers: 30 EO acquisitions
Expected result: 30 EO acquisitions

Title: Requests in SEG supported Coordinate and Projections systems			
Issue JIRA Number: EODC4G-142	**Requirement order ID in RFC:** 05	**External Reference:** N/A	**Priority:** Must Have
Service: All		**Version:** 1.0	
Application: EO-Processing		**Type:** Functional	
Sub-Service: N/A			
Components: N/A			

SEG users can display the data in several coordinate and Projection systems namely:

- EPSG:4326;
- EPSG:3395;
- EPSG:3857;
- EPSG:32661;
- EPSG:32761.

EODC-Processing webservices shall support any request from any of the supported SEG Projection and coordinate systems.

Acceptance criteria:
Requests for EO acquisitions, in each of the supported SEG projection/coordinate systems, provides the expected number of EO acquisitions.

2.3 Non-Functional requirements

Title: Performance of EODC to provide EO acquisitions			
Issue JIRA Number: EODC4G-143	**Requirement order ID in RFC:** 06	**External Reference:** N/A	**Priority:** Must Have
Service: All		**Version:** 1.0	
Application: EO-Processing		**Type:** Performance	
Sub-Service: N/A			
Components: N/A			
The performance of EODC Webservice, when returning all EO acquisitions information, based on polygons or bounding boxes, shall be in a maximum of 3 seconds.			
Acceptance criteria: • Scenario 1: Query that returns 50 EO Acquisitions • Scenario 2: Query that returns 100 EO Acquisitions • Scenario 3: Query that returns 500 EO Acquisitions • Scenario 4: Query not regular polygon, 50 vertexes (polygons and time period to be selected by EMSA); • Scenario 5: Query not regular polygon, 400 vertexes (polygons and time period to be selected by EMSA); • Scenario 6: Query not regular polygon, 100000 Km^2 area size (polygons and time period to be selected by EMSA); • Scenario 7: Query not regular polygon: an Alert Area from CGD (polygons and time period to be selected by EMSA); **Expected result:** results returned in maximum 3 seconds for abovementioned scenarios.			

Title: Limitation on area size of polygon			
Issue JIRA Number: EODC4G-144	**Requirement order ID in RFC:** 07	**External Reference:** N/A	**Priority:** Must Have
Service: All Services consuming EO data		**Version:** 1.0	
Application: EO-Processing		**Type:** Capacity	
Sub-Service: N/A			
Components: N/A			
The maximum size of a polygon is the entire earth.			
Acceptance criteria: Scenario 1: EODC returns the correct number of EO acquisitions for 3 days of EO Acquisitions (3 days to be defined by EMSA) for a polygon covering the entire earth's surface. Scenario 2: EODC returns the correct number of EO acquisitions for one month of EO acquisitions (month to be defined by EMSA) for the following areas: - 5 different CSN Alert areas to be defined by EMSA; - 1 Alert areas for Tour d'Horizon (polygon to be selected by EMSA).			

Title: Limitation on number of vertexes of a polygon			
Issue JIRA Number: EODC4G-145	**Requirement order ID in RFC:** 08	**External Reference:** N/A	**Priority:** Must Have
Service: All Services consuming EO data		**Version:** 1.0	
Application: EO-Processing		**Type:** Capacity	
Sub-Service: N/A			
Components: N/A			
The EO Processing webservices, used to provide EO acquisition information to other applications., shall be able to query EO acquisitions using a polygon with up to 1000 vertexes.			
Acceptance criteria: EODC return the correct number of EO acquisitions for one month of EO acquisitions (month to be defined by EMSA) for the following areas: - 5 different CSN Alert areas (polygons to be selected by EMSA); - 1 Alert areas for Tour d'Horizon (polygon to be selected by EMSA); - 1 circle area defined in SEG. (centre position and radius to be defined by EMSA).			

2.4 Documentation requirements

Title: Update Interface Control Document (ICD)			
Issue JIRA Number: EODC4G-146	**Requirement order ID in RFC:** 09	**External Reference:** N/A	**Priority:** Must Have
Service: All		**Version:** 1.0	
Application: EO-Processing		**Type:** Documentation	
Sub-Service: N/A			
Components: N/A			
The contractor shall issue technical documentation that: - updates the EODC ICD with the changes to the webservice(s).			
Acceptance criteria: Document shall be accepted by EMSA.			

Title: Documentation formatting			
Issue JIRA Number: EODC4G-147	**Requirement order ID in RFC:** 10	**External Reference:** N/A	**Priority:** Must Have
Service: All		**Version:** 1.0	
Application: EO-Processing		**Type:** Documentation	
Sub-Service: N/A			
Components: N/A			
The Documentation shall be sent to EMSA in MS Word format with track changes of all the changes to the document.			
Acceptance criteria: Documents must be delivered in MS Word format and with track changes.			