

Web Processing Service (WPS)

0.2.0

Examples of Operations:

Following are various examples of WPS service requests implemented in the Spatial Data Infrastructure of Spain .

- **WPS Standard Operations**

There are three defined requests in the WPS standard: GetCapabilities, DescribeProcess and Execute.

- **GetCapabilities**

GetCapabilities provides a list of available operations in WPS; in our case the request would be the following:

<http://www.idee.es/WPS/services?REQUEST=GetCapabilities&version=0.4.0&service=WPS>

The reply is an XML document that contains service metadata including a brief description of all the implemented processes:

```
<?xml version="1.0" encoding="UTF-8"?>
<wps:Capabilities xmlns:wps="http://www.opengeospatial.net/wps"
xmlns:ows="http://www.opengeospatial.net/ows"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
version="0.4.0"
xsi:schemaLocation="http://www.opengeospatial.net/wps
..\wpsGetCapabilities.xsd">
<ows:ServiceIdentification
xmlns:ows="http://www.opengis.net/ows">
<ows:ServiceType>WPS</ows:ServiceType>
<ows:ServiceTypeVersion>0.2.0</ows:ServiceTypeVersion>
<ows>Title>deegree WPS Server</ows>Title>
<ows:Abstract>
deegree WPS Server developed by University of Bonn,
Department of Geography and Wupperverband, Stabsbereich
GIS
</ows:Abstract>
<ows:Keywords>
<ows:Keyword>WPS</ows:Keyword>
<ows:Keyword>geospatial</ows:Keyword>
<ows:Keyword>geoprocessing</ows:Keyword>
</ows:Keywords>
<ows:Fees>NONE</ows:Fees>
<ows:AccessConstraints>NONE</ows:AccessConstraints>
</ows:ServiceIdentification>
<ows:ServiceProvider xmlns:ows="http://www.opengis.net/ows">
<ows:ProviderName>
University of Bonn, Institute of Geography, Working Group
GIS & Wupperverband, Stabsbereich GIS
</ows:ProviderName>
```



```
<ows:ProviderSite xlink:href="http://www.giub.uni-bonn.de"
xlink:type="simple" />
<ows:ServiceContact>
<ows:IndividualName>
Christian Heier & Christian Kiehle
</ows:IndividualName>
<ows:PositionName>
Information System Scientists
</ows:PositionName>
<ows:ContactInfo>
<ows:Phone>
<ows:Voice>+49 288 73-2098</ows:Voice>
<ows:Facsimile>+49 288 73-2098</ows:Facsimile>
</ows:Phone>
<ows:Address>
<ows:DeliveryPoint>
Meckenheimer Allee 166
</ows:DeliveryPoint>
<ows:City>Bonn</ows:City>
<ows:AdministrativeArea>ON</ows:AdministrativeArea>
<ows:PostalCode>53155</ows:PostalCode>
<ows:Country>Germany</ows:Country>
<ows:ElectronicMailAddress>
kiehle@giub.uni-bonn.de
</ows:ElectronicMailAddress>
</ows:Address>
</ows:ContactInfo>
</ows:ServiceContact>
</ows:ServiceProvider>
<ows:OperationsMetadata xmlns:ows="http://www.opengis.net/ows">
<ows:Operation name="DescribeProcess">
<ows:DCP>
<ows:HTTP>
<ows:Get
xlink:href="http://localhost:8083/deegree/services?"
xlink:type="simple" />
</ows:HTTP>
</ows:DCP>
</ows:Operation>
<ows:Operation name="GetCapabilities">
<ows:DCP>
<ows:HTTP>
<ows:Get
xlink:href="http://localhost:8083/deegree/services?"
xlink:type="simple" />
</ows:HTTP>
</ows:DCP>
</ows:Operation>
<ows:Operation name="Execute">
<ows:DCP>
<ows:HTTP>
<ows:Post
xlink:href="http://localhost:8083/deegree/services"
xlink:type="simple" />
</ows:HTTP>
</ows:DCP>
</ows:Operation>
</ows:OperationsMetadata>
<wps:ProcessOfferings>
<wps:Process processVersion="1">
<ows:Identifier xmlns:ows="http://www.opengis.net/ows">
FeaturesUnion
</ows:Identifier>
<ows:Title xmlns:ows="http://www.opengis.net/ows">
FeaturesUnion
</ows:Title>
<ows:Abstract xmlns:ows="http://www.opengis.net/ows">
Create a buffer around a GML geometry. Accepts a
```



```
geometry and provides a GML geometry output for the
buffered feature.
</ows:Abstract>
<ows:Metadata xlink:title="spatial"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="geometry"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="FeaturesUnion"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="GML"
xmlns:ows="http://www.opengis.net/ows" />
</wps:Process>
<wps:Process processVersion="1">
<ows:Identifier xmlns:ows="http://www.opengis.net/ows">
GetLineOfSightTxt
</ows:Identifier>
<ows:Title xmlns:ows="http://www.opengis.net/ows">
GetLineOfSightTxt
</ows:Title>
<ows:Abstract xmlns:ows="http://www.opengis.net/ows">
Obtene la linea de visibilidad
</ows:Abstract>
<ows:Metadata xlink:title="spatial"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="geometry"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="FeaturesUnion"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="GML"
xmlns:ows="http://www.opengis.net/ows" />
</wps:Process>
<wps:Process processVersion="1">
<ows:Identifier xmlns:ows="http://www.opengis.net/ows">
GetLineOfSightPng
</ows:Identifier>
<ows:Title xmlns:ows="http://www.opengis.net/ows">
GetLineOfSightPng
</ows:Title>
<ows:Abstract xmlns:ows="http://www.opengis.net/ows">
Obtene la linea de visibilidad
</ows:Abstract>
<ows:Metadata xlink:title="spatial"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="geometry"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="FeaturesUnion"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="GML"
xmlns:ows="http://www.opengis.net/ows" />
</wps:Process>
<wps:Process processVersion="1">
<ows:Identifier xmlns:ows="http://www.opengis.net/ows">
GetProfileTxt
</ows:Identifier>
<ows:Title xmlns:ows="http://www.opengis.net/ows">
GetProfileTxt
</ows:Title>
<ows:Abstract xmlns:ows="http://www.opengis.net/ows">
Obtene el perfil
</ows:Abstract>
<ows:Metadata xlink:title="spatial"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="geometry"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="FeaturesUnion"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="GML"
xmlns:ows="http://www.opengis.net/ows" />
```

```

</wps:Process>
<wps:Process processVersion="1">
<ows:Identifier xmlns:ows="http://www.opengis.net/ows">
GetProfilePng
</ows:Identifier>
<ows:Title xmlns:ows="http://www.opengis.net/ows">
GetProfilePng
</ows:Title>
<ows:Abstract xmlns:ows="http://www.opengis.net/ows">
Obtene el perfil
</ows:Abstract>
<ows:Metadata xlink:title="spatial"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="geometry"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="FeaturesUnion"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="GML"
xmlns:ows="http://www.opengis.net/ows" />
</wps:Process>
<wps:Process processVersion="1">
<ows:Identifier xmlns:ows="http://www.opengis.net/ows">
Buffer
</ows:Identifier>
<ows:Title xmlns:ows="http://www.opengis.net/ows">
Buffer
</ows:Title>
<ows:Abstract xmlns:ows="http://www.opengis.net/ows">
Create a buffer around a GML geometry. Accepts a GML
geometry and provides a GML geometry output for the
buffered feature.
</ows:Abstract>
<ows:Metadata xlink:title="spatial"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="geometry"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="buffer"
xmlns:ows="http://www.opengis.net/ows" />
<ows:Metadata xlink:title="GML"
xmlns:ows="http://www.opengis.net/ows" />
</wps:Process>
</wps:ProcessOfferings>
</wps:Capabilities>

```

Of all the operations that can be seen in XML, the following are of special interest:

- GetLineOfSightTxt. Provides line of sight in a file with ASCII format.
- GetLineOfSightPng. Provides a line of sight in a file with an image in a PNG format.
- GetProfileTxt. Provides a profile using a series of points and displays it in an ASCII file with the height values.
- GetProfilePng. Provides a profile using a series of points and displays the file with an image using a PNG format.

• DescribeProcess

DescribeProcess allows WPS clients to ask and receive a description about one or more of the processes that can be Executed. This description includes entry parameters and the entry and exit formats and can be used to

automatically build an interface that can capture the value of the parameters. The request structure of DescribeProcess is as follows:

<http://www.idee.es/WPS/services?REQUEST=DescribeProcess&version=0.4.0&service=WPS&Identifier=GetLineOfSightPng>

The reply contains the parameters with the format and a description:

```
<?xml version="1.0" encoding="UTF-8"?>
<wps:ProcessDescriptions
xmlns:wps="http://www.opengeospatial.net/wps"
xmlns:ows="http://www.opengis.net/ows"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.opengeospatial.net/wps
..\wpsDescribeProcess.xsd">
<wps:ProcessDescription processVersion="1"
statusSupported="true"
storeSupported="true">
<ows:Identifier>GetLineOfSightPng</ows:Identifier>
<ows:Title>GetLineOfSightPng</ows:Title>
<ows:Abstract>Obtene la linea de visibilidad</ows:Abstract>
<ows:Metadata xlink:title="spatial" />
<ows:Metadata xlink:title="geometry" />
<ows:Metadata xlink:title="FeaturesUnion" />
<ows:Metadata xlink:title="GML" />
<wps:DataInputs>
<wps:Input>
<ows:Identifier>URLCoverageServer</ows:Identifier>
<ows:Title>URLCoverageServer</ows:Title>
<ows:Abstract>URLCoverageServer</ows:Abstract>
<wps:LiteralData>
<ows:DataType
ows:reference="urn:ogc:def:dataType:OGC:1.0:String">
String
</ows:DataType>
<wps:SupportedUOMs />
<ows:AllowedValues />
</wps:LiteralData>
<wps:MinimumOccurs>1</wps:MinimumOccurs>
</wps:Input>
<wps:Input>
<ows:Identifier>coordinate</ows:Identifier>
<ows:Title>coordinate</ows:Title>
<ows:Abstract>coordinate</ows:Abstract>
<wps:LiteralData>
<ows:DataType
ows:reference="urn:ogc:def:dataType:OGC:1.0:String">
String
</ows:DataType>
<wps:SupportedUOMs />
<ows:AllowedValues />
</wps:LiteralData>
<wps:MinimumOccurs>1</wps:MinimumOccurs>
</wps:Input>
<wps:Input>
<ows:Identifier>obs_elev</ows:Identifier>
<ows:Title>obs_elev</ows:Title>
<ows:Abstract>obs_elev</ows:Abstract>
<wps:LiteralData>
<ows:DataType
ows:reference="urn:ogc:def:dataType:OGC:1.0:Float">
Float
</ows:DataType>
<wps:SupportedUOMs />
<ows:AllowedValues />
</wps:LiteralData>
```

```

<wps:MinimumOccurs>0</wps:MinimumOccurs>
</wps:Input>
<wps:Input>
<ows:Identifier>max_dist</ows:Identifier>
<ows:Title>max_dist</ows:Title>
<ows:Abstract>max_dist</ows:Abstract>
<wps:LiteralData>
<ows:DataType
ows:reference="urn:ogc:def:dataType:OGC:1.0:Float">
Float
</ows:DataType>
<wps:SupportedUOMs />
<ows:AllowedValues />
</wps:LiteralData>
<wps:MinimumOccurs>0</wps:MinimumOccurs>
</wps:Input>
<wps:Input>
<ows:Identifier>width</ows:Identifier>
<ows:Title>width</ows:Title>
<ows:Abstract>width</ows:Abstract>
<wps:LiteralData>
<ows:DataType
ows:reference="urn:ogc:def:dataType:OGC:1.0:Float">
Float
</ows:DataType>
<wps:SupportedUOMs />
<ows:AllowedValues />
</wps:LiteralData>
<wps:MinimumOccurs>0</wps:MinimumOccurs>
</wps:Input>
<wps:Input>
<ows:Identifier>height</ows:Identifier>
<ows:Title>height</ows:Title>
<ows:Abstract>height</ows:Abstract>
<wps:LiteralData>
<ows:DataType
ows:reference="urn:ogc:def:dataType:OGC:1.0:Float">
Float
</ows:DataType>
<wps:SupportedUOMs />
<ows:AllowedValues />
</wps:LiteralData>
<wps:MinimumOccurs>0</wps:MinimumOccurs>
</wps:Input>
</wps>DataInputs>
<wps:ProcessOutputs>
<wps:Output>
<ows:Identifier>LineOfSight</ows:Identifier>
<ows:Title>LineOfSight</ows:Title>
<ows:Abstract>LineOfSight</ows:Abstract>
<wps:ComplexOutput
defaultSchema="http://schemas.opengis.net/gml/3.0.0/base/gml.xsd" />
</wps:Output>
</wps:ProcessOutputs>
</wps:ProcessDescription>
</wps:ProcessDescriptions>

```

- **Execute**

With Execute clients can execute a specific process implemented by the server using the values of the entry parameters provided and receiving exit values.

Line of sight and profile requests are displayed as images, to request it as a text all that is needed is to change the identifiers of GetLineOfSightPng

o Getting line of sight

The following parameters are defined:

- URLCoverageServer. URL with the coverage to calculate line of sight.
- Coordinate. Coordinates where the observer is located. They must be separated by a comma.
- obs_elev. Observer elevation (in meters).
- max_dist. Maximum distance to which the line of sight or radius (in meters) must be calculated. It is not recommended to make line of sight requests over 400m due to a Grass bug
- width. Width of image to be generated.
- height. Height of image to be generated.

Request completed:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<wps:Execute service="WPS" version="0.4.0" store="false"
status="false"
xmlns:wps="http://www.opengeospatial.net/wps"
xmlns:ows="http://www.opengis.net/ows"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.opengeospatial.net/wps..wpsExecut
e.xsd
">
<ows:Identifier>GetLineOfSightPng</ows:Identifier>
<wps>DataInputs>
<wps:Input>
<ows:Identifier>URLCoverageServer</ows:Identifier>
<ows:Title>URLCoverageServer</ows:Title>
<ows:Abstract>URLCoverageServer</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:String"
uom="urn:ogc:def:dataType:OGC:0.0:String">
http://www.ideo.es/wcs/IDEE-WCSUTM30N/
wcsServlet?SERVICE=WCS&REQUEST=GetCoverage&VERSION=1.0.0
&
;CRS=EPSG:23030&BBOX=712461.8652285055,4738163.997958366,721
507.9159160
347,4744280.36201192&COVERAGE=MDT25_peninsula_ZIP&RESX=2
5&RESY=
25&FORMAT=AsciiGrid&EXCEPTIONS=XML
</wps:LiteralValue>
</wps:Input>
<wps:Input>
<ows:Identifier>coordinate</ows:Identifier>
<ows:Title>coordinate</ows:Title>
<ows:Abstract>coordinate</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:String"
uom="urn:ogc:def:dataType:OGC:0.0:String">
719308.08135,4740507.74909
</wps:LiteralValue>
</wps:Input>
<wps:Input>
<ows:Identifier>obs_elev</ows:Identifier>
<ows:Title>obs_elev</ows:Title>
<ows:Abstract>obs_elev</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:Float"
uom="urn:ogc:def:dataType:OGC:0.0:Float">
```

10

```

</wps:LiteralValue>
</wps:Input>
<wps:Input>
<ows:Identifier>max_dist</ows:Identifier>
<ows:Title>max_dist</ows:Title>
<ows:Abstract>max_dist</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:Float"
uom="urn:ogc:def:dataType:OGC:0.0:Float">
400
</wps:LiteralValue>
</wps:Input>
<wps:Input>
<ows:Identifier>width</ows:Identifier>
<ows:Title>width</ows:Title>
<ows:Abstract>width</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:Float"
uom="urn:ogc:def:dataType:OGC:0.0:Float">
880
</wps:LiteralValue>
</wps:Input>
<wps:Input>
<ows:Identifier>height</ows:Identifier>
<ows:Title>height</ows:Title>
<ows:Abstract>height</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:Float"
uom="urn:ogc:def:dataType:OGC:0.0:Float">
595
</wps:LiteralValue>
</wps:Input>
</wps>DataInputs>
<wps:OutputDefinitions>
<wps:Output format="text/xml" encoding="UTF-8"
schema="http://schemas.opengis.net/gml/3.0.0/base/gml.xsd"
uom="urn:ogc:def:dataType:OGC:0.0:Integer">
<ows:Identifier>LOS</ows:Identifier>
<ows:Title>LOS</ows:Title>
<ows:Abstract>LOS</ows:Abstract>
</wps:Output>
</wps:OutputDefinitions>
</wps:Execute>

```

o Getting the profile

The following parameters are defined:

- Resolution.
- Profile. Pairs of points separated by commas through which the profile is to be calculated.
- URLCoverageServer. URL with the coverage to be used to calculate the line of sight.

Request completed:

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<wps:Execute service="WPS" version="0.4.0" store="false"
status="false"
xmlns:wps="http://www.opengeospatial.net/wps"
xmlns:ows="http://www.opengis.net/ows"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

```



```
xsi:schemaLocation="http://www.opengeospatial.net/wps..wpsExecute.xsd
">
<ows:Identifier>GetProfilePng</ows:Identifier>
<wps>DataInputs>
<wps:Input>
<ows:Identifier>Resolution</ows:Identifier>
<ows:Title>Resolution</ows:Title>
<ows:Abstract>Resolution</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:Double"
uom="urn:ogc:def:dataType:OGC:0.0:Double">
100
</wps:LiteralValue>
</wps:Input>
<wps:Input>
<ows:Identifier>Profile</ows:Identifier>
<ows:Title>Profile</ows:Title>
<ows:Abstract>Profile</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:String"
uom="urn:ogc:def:dataType:OGC:0.0:String">
720881.20793,4737909.94751,720861.25339,4737944.15525,720835.597
56,47
37961.25911,720701.61714,4738021.12259,720681.6626,4738049.62904
,720607.545
77,4738086.68739,720584.7406,4738095.23932,720533.42897,4738086.
68734,72052
4.87706,4738052.47958,720507.7732,4738021.12246,720487.81868,473
8009.71986,
720456.46158,4737995.46661,720422.25384,4737975.51206,720388.046
1,4737958.4
0816,720385.19546,4737952.70686,720311.07866,4737944.15487,72028
8.27351,473
7921.34969,720288.27352,4737898.54452,720285.42289,4737875.73934
,720271.169
67,4737855.78481,720268.31905,4737830.12899,720268.31906,4737804
.47317,7202
71.16972,4737787.3693,720251.21521,4737773.11605,720228.41004,47
37773.11604
,720202.75422,4737778.81731,720188.501,4737753.16148,720162.8451
9,4737741.7
5888,720137.1894,4737707.55111,720128.63747,4737690.44722,720105
.83232,4737
673.34333,720083.02716,4737650.53814,720045.96877,4737641.98618,
720043.1181
3,4737622.03165,720023.16363,4737599.22647,720000.35846,4737584.
97322,71996
6.15071,4737582.12255,719946.19619,4737576.42124
</wps:LiteralValue>
</wps:Input>
<wps:Input>
<ows:Identifier>URLCoverageServer</ows:Identifier>
<ows:Title>URLCoverageServer</ows:Title>
<ows:Abstract>URLCoverageServer</ows:Abstract>
<wps:LiteralValue
dataType="urn:ogc:def:dataType:OGC:0.0:String"
uom="urn:ogc:def:dataType:OGC:0.0:String">
http://www.idee.es/wcs/IDEE-WCSUTM30N/
wcsServlet?SERVICE=WCS&REQUEST=GetCoverage&VERSION=1.0.0
&
;CRS=EPSG:23030&BBOX=719153.7163877804,4736940.727420838,721
662.2850917
999,4738636.86200795&COVERAGE=MDT25_peninsula_ZIP&RESX=2
5&RESY=
25&FORMAT=AsciiGrid&EXCEPTIONS=XML
</wps:LiteralValue>
</wps:Input>
```

```

</wps:DataInputs>
<wps:OutputDefinitions>
<wps:Output format="text/xml" encoding="UTF-8"
schema="http://schemas.opengis.net/gml/3.0.0/base/gml.xsd"
uom="urn:ogc:def:dataType:OGC:0.0:Integer">
<ows:Identifier>Profile</ows:Identifier>
<ows:Title>Profile</ows:Title>
<ows:Abstract>Profile</ows:Abstract>
</wps:Output>
</wps:OutputDefinitions>
</wps:Execute>

```

○ WPS Response

The response consists of a GML that includes the address of the file to be downloaded or an error in case there was an error in the request.

```

<?xml version="1.0" encoding="UTF-8"?>
<wfs:FeatureCollection numberOfFeatures='1'
xmlns:gml="http://www.opengis.net/gml"
xmlns:wfs="http://www.opengis.net/wfs"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:null="null">
<gml:featureMember>
<result gml:id="idURL">
<URL>
http://idee.unizar.es/resourcesService/repository/default/relayTemp
Images/G
RASSFILE_1192448606984.png
</URL>
</result>
</gml:featureMember>
</wfs:FeatureCollection>

```

● URLs and where to perform testing

WPS includes a client to perform request Execute tests and see the results the address is the following:

<http://www.ideo.es/WPS/client/client.html>

Attach the XML of the Execute petition and SEND