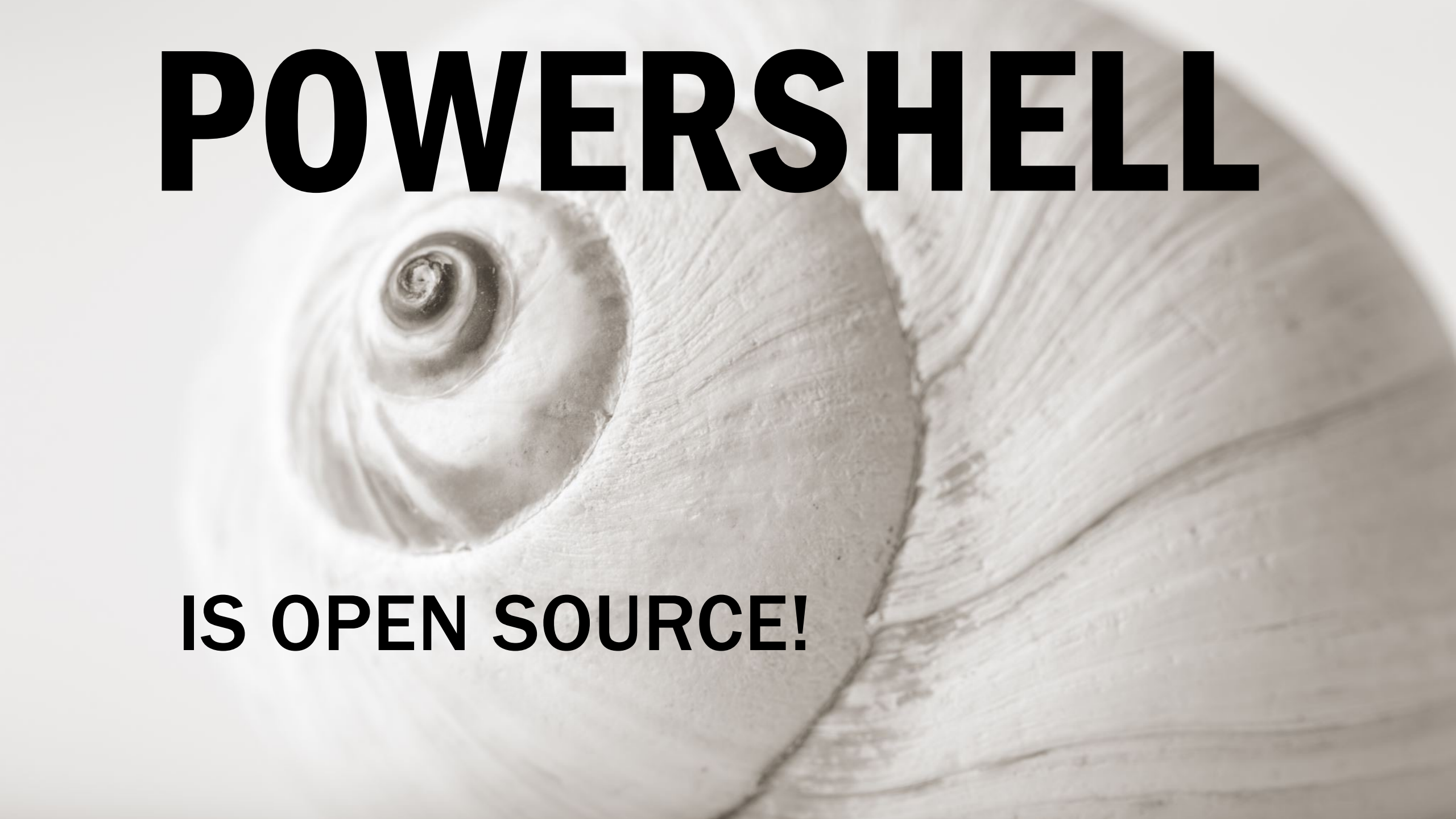
POWERSHELL GDAL & OPEN DATA

SIMON MILES


POWERSHELL
IS OPEN SOURCE!

POWERSHELL

CROSS PLATFORM:

WINDOWS

MAC

LINUX

GDAL

CROSS PLATFORM:

WINDOWS

MAC

LINUX

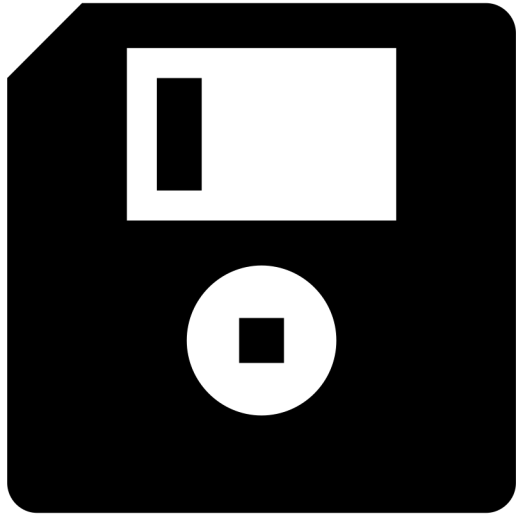
OPEN DATA

CROSS PLATFORM:

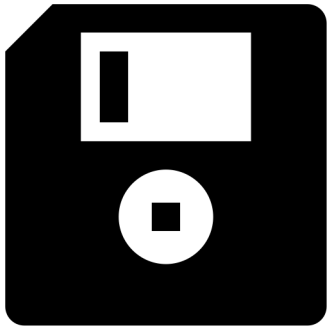
QGIS

ESRI

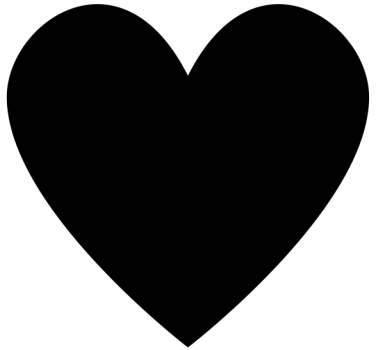
MAPINFO



GOOD START!



POWERSHELL?



POWERSHELL = NO FUSS

EASY TO READ & INDENTS!

```
$today = Get-Date -Format ”yyyy-MM-dd”
write-output "Today's date:  $today”
```

OUTPUT = Today’s date: 2023-09-07

PYTHON

```
from datetime import date
today = date.today()
Print(“Today’s date:”, today)
```

OUTPUT = ERROR!!

.PS1

POWERSHELL SIMPLE COMMANDS START SIMPLE..

```
Write-Output "Welcome to Foss4g:UK 2023 : Basingstoke”
Write-Host   "Welcome to Foss4g:UK 2023 : Basingstoke”

Get-Date -Format "dd-MM-yyyy”
Get-Location

Start-Sleep 5s
Start-Process QGIS.exe
```

POWERSHELL SIMPLE COMMANDS THEN DO MORE..

```
$dir = Get-Location

$logFilePath = "$dir/log.txt”

$message = "This is a log message.”

$message | Out-File -FilePath $logFilePath -Append
```

POWERSHELL SIMPLE COMMANDS & THEN A BIT MORE

```
# Check if the file exists

if (Test-Path -Path $logFilePath -PathType Leaf) {

        Write-Host "The file exists."

} else {

        Write-Host "The file does not exist."

        New-Item -Path $logFilePath -ItemType File
}
```

GDAL

GDAL SIMPLE COMMANDS
START SIMPLE..

```
gdalinfo --version

ogrinfo {source path}

ogr2ogr -f "GML" {output path .gml} {input path .shp}
```

GDAL SIMPLE COMMANDS
THEN DO MORE..

```
PG: “dbname=‘x’ host=‘y’ port=‘5432’ user=‘a’ password=‘b’”

-sql “select fid, ref, date from planning.applicaitons where ref =
’23/00001/FULL’”

-nln “new_name_for_table”
```

OPEN DATA

ALL FOR ONE AND ONE FOR ALL

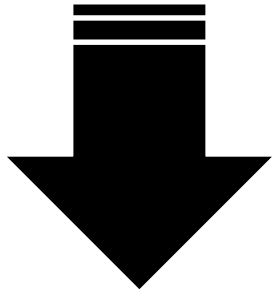
open-source tools are always ready

GDAL + OPEN DATA

```
ogr2ogr -f "ESRI Shapefile" ca.shp https://files.planning.data.gov.uk/dataset/conservation-area.geojson
```

GDAL + PWSH + OPEN DATA

```
ogr2ogr -f "ESRI Shapefile" ca.shp https://files.planning.data.gov.uk/dataset/conservation-area.geojson
```



```
$DownloadUrl = "https://files.planning.data.gov.uk/dataset/conservation-area.geojson"
ogr2ogr -f "ESRI Shapefile" ca.shp $DownloadUrl
```

GDAL + PWSH + OPEN DATA P.1

```
> $DownloadUrl = “https://files.planning.data.gov.uk/dataset/conservation-area.geojson”
> ogr2ogr -f "ESRI Shapefile" ca.shp $DownloadUrl
> Warning 6: Normalized/laundered field name: 'organisation-entity' to 'organisati’
> Warning 6: Normalized/laundered field name: 'documentation-url' to 'documentat'
```

GDAL + PWSH + OPEN DATA P.2

```
> ./basic_example.ps1
> Warning 6: Normalized/laundered field name: 'organisation-entity' to 'organisati’
> Warning 6: Normalized/laundered field name: 'documentation-url' to 'documentat'
```

GDAL + PWSH + OPEN DATA

P.3

Windows BAT example:

```
powershell.exe  ”D:\foss4g23\basic_example.ps1"
```

BUT

NOT ALL OPEN DATA IS

EASY TO USE OPEN DATA

LOVELY BUT....

NATURAL ENGLAND

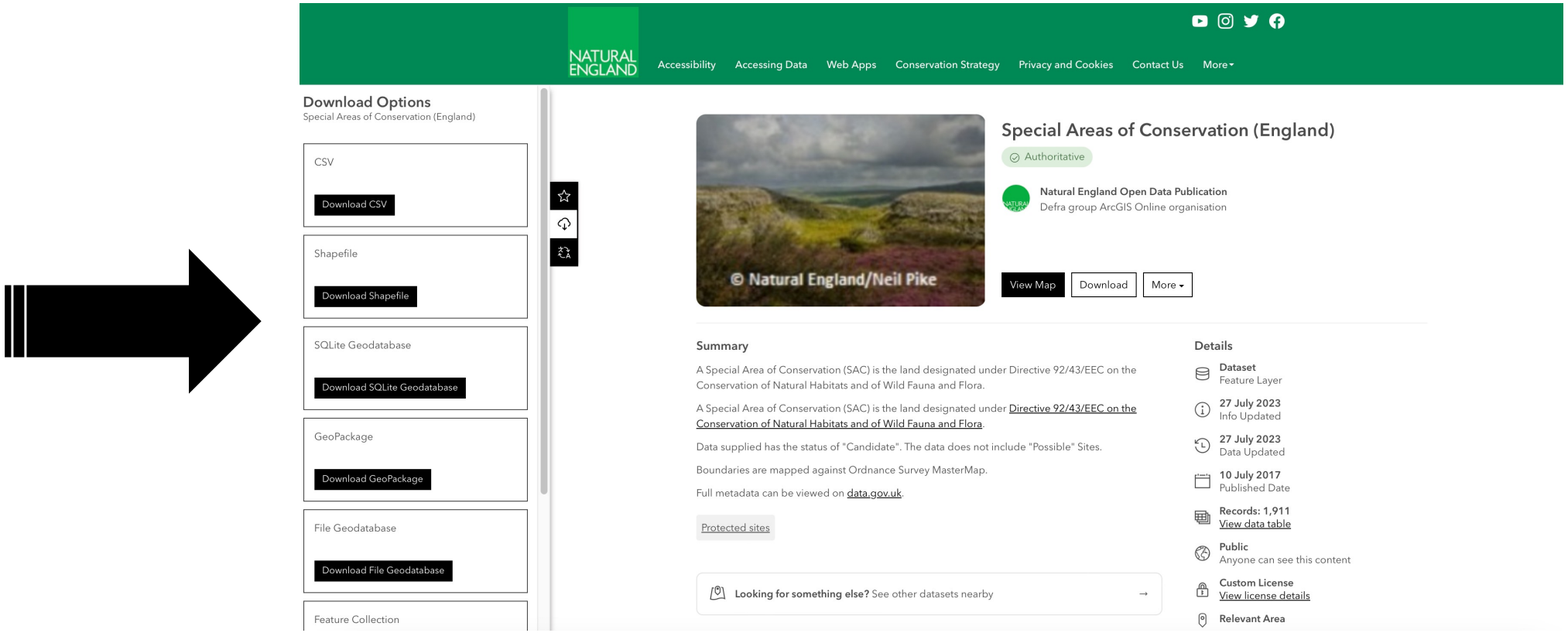
Accessibility | Accessing Data | Web Apps | Conservation Strategy | Privacy and Cookies | Contact Us | More

Special Areas of Conservation (England)

Authoritative

Natural England Open Data Publication
Defra group ArcGIS Online organisation

View Map | Download | More



DOWNLOAD URLS ☑

DYNAMIC URLS ✕

ESRI TO THE RESUE!

ARCGIS SERVER

P.1

ArcGIS REST Services Directory

JSON

Layer: Special Areas of Conservation (England) © Natural England (ID:0)

View In: Map Viewer

Name: Special Areas of Conservation (England) © Natural England

Display Field: SAC_NAME

Type: Feature Layer

Geometry Type: esriGeometryPolygon

Description:

Copyright Text:

Min. Scale: 0

Max. Scale: 0

Default Visibility: true

Max Record Count: 250

Supported query Formats: JSON

Use Standardized Queries: True

Extent:

XMin: 78917.2769999998
YMin: 2907.34699999914
XMax: 750946.5624
YMax: 673659.386499999
Spatial Reference: 27700 (27700)

ARCGIS SERVER

P.2

Is Data Versioned: false

Has Contingent Values: false

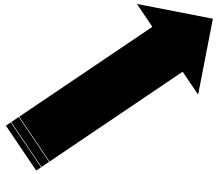
Supports Rollback On Failure Parameter: true

Last Edit Date: 7/27/2023 7:26:26 PM

Schema Last Edit Date: 7/27/2023 7:26:26 PM

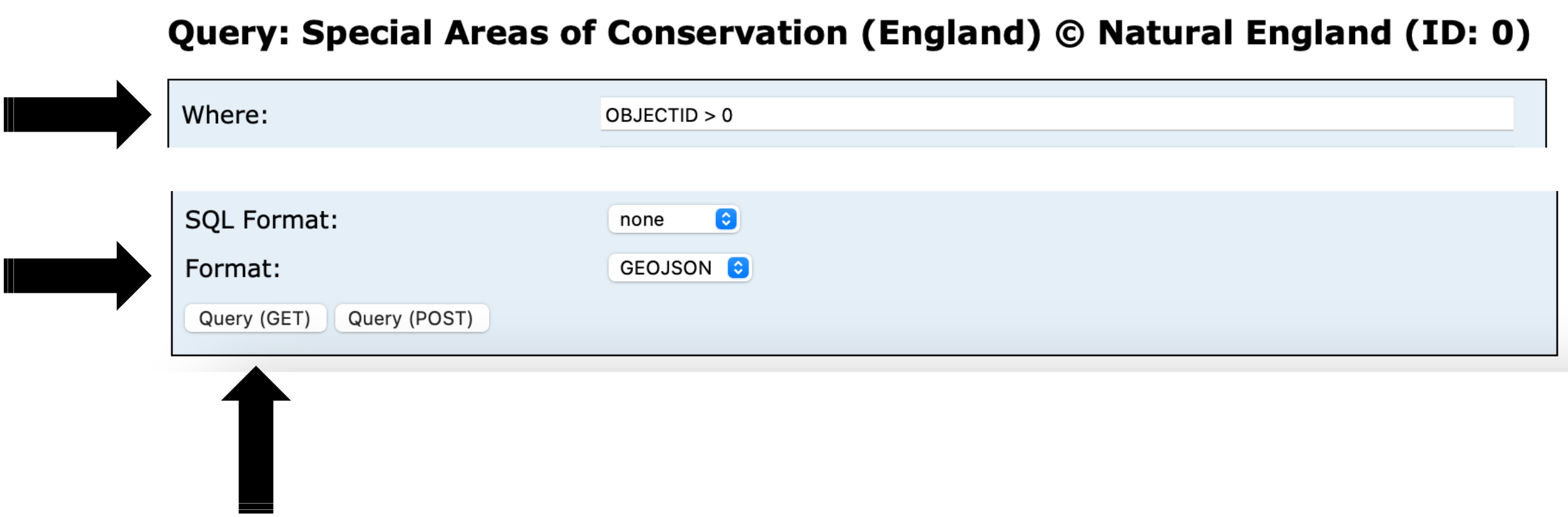
Data Last Edit Date: 7/27/2023 7:09:50 PM

Supported Operations: Query Query Top Features Query Analytic Generate Renderer Validate SQL Get Estimates



ARCGIS SERVER

P.3



ARCGIS SERVER URL....

https://services.arcgis.com/JJzESW51TqeY9uat/arcgis/rest/services/Special_Areas_of_Conservation_England/FeatureServer/0/

query?where=OBJECTID+%3E+1&objectIds=&time=&geometry=&geometryType=esri
GeometryEnvelope&inSR=&spatialRel=esriSpatialRelIntersects&resultType=none&di
stance=0.0&units=esriSRUnit_Meter&relationParam=&returnGeodetic=false&outFiel
ds=&returnGeometry=true&returnCentroid=false&featureEncoding=esriDefault&multip
atchOption=xyFootprint&maxAllowableOffset=&geometryPrecision=&outSR=&defaul
tSR=&datumTransformation=&applyVCSProjection=false&returnIdsOnly=false&retur
nUniqueIdsOnly=false&returnCountOnly=false&returnExtentOnly=false&returnQueryG
eometry=false&returnDistinctValues=false&cacheHint=false&orderByFields=&groupB
yFieldsForStatistics=&outStatistics=&having=&resultOffset=&resultRecordCount=&re
turnZ=false&returnM=false&returnExceededLimitFeatures=true&quantizationParame
ters=&sqlFormat=none&f=pgeojson&token=

GDAL

```
ogr2ogr -f GeoJSON SAC.geojson
"https://services.arcgis.com/JJzESW51TqeY9uat/arcgis/rest/services/Special_Areas
_of_Conservation_England/FeatureServer/0/query?where=OBJECTID+%3E+1&objectIds=&t
ime=&geometry=&geometryType=esriGeometryEnvelope&inSR=&spatialRel=esriSpatialRel
Intersects&resultType=none&distance=0.0&units=esriSRUnit_Meter&relationParam=&re
turnGeodetic=false&outFields=&returnGeometry=true&returnCentroid=false&featureEn
coding=esriDefault&multipatchOption=xyFootprint&maxAllowableOffset=&geometryPrec
ision=&outSR=&defaultSR=&datumTransformation=&applyVCSProjection=false&returnIds
Only=false&returnUniqueIdsOnly=false&returnCountOnly=false&returnExtentOnly=fals
e&returnQueryGeometry=false&returnDistinctValues=false&cacheHint=false&orderByFi
elds=&groupByFieldsForStatistics=&outStatistics=&having=&resultOffset=&resultRec
ordCount=&returnZ=false&returnM=false&returnExceededLimitFeatures=true&quantizat
ionParameters=&sqlFormat=none&f=pgeojson&token="
```

QGIS

POWERSHELL SAC.PS1

```
$esri_base_url = "https://services.arcgis.com/JJzESW51TqeY9uat/arcgis/rest/services"
$esri_serivce = "Special_Areas_of_Conservation_England"
$esri_feature = "FeatureServer/0"
$esri_query =
"query?where=OBJECTID+%3E+1&objectIds=&time=&geometry=&geometryType=esriGeometryEnvelope&i
nSR=&spatialRel=esriSpatialRelIntersects&resultType=none&distance=0.0&units=esriSRUnit_Met
er&relationParam=&returnGeodetic=false&outFields=&returnGeometry=true&returnCentroid=false
&featureEncoding=esriDefault&multipatchOption=xyFootprint&maxAllowableOffset=&geometryPrec
ision=&outSR=&defaultSR=&datumTransformation=&applyVCSProjection=false&returnIdsOnly=false
&returnUniqueIdsOnly=false&returnCountOnly=false&returnExtentOnly=false&returnQueryGeometr
y=false&returnDistinctValues=false&cacheHint=false&orderByFields=&groupByFieldsForStatisti
cs=&outStatistics=&having=&resultOffset=&resultRecordCount=&returnZ=false&returnM=false&re
turnExceededLimitFeatures=true&quantizationParameters=&sqlFormat=none&f=pgeojson&token="
```

POWERSHELL
SAC.PS1

```
$opendata_source = "$esri_base_url/$esri_serivce/$esri_feature/$esri_query"

$output_file_name = "sac.geojson"
```

POWERSHELL SAC.PS1

```
ogr2ogr -f GeoJSON $output_file_name $opendata_source
```

POWERSHELL SAC.PS1

```
$esri_base_url = "https://services.arcgis.com/JJzESW51TqeY9uat/arcgis/rest/services"
$esri_serivce = "Special_Areas_of_Conservation_England"
$esri_feature = "FeatureServer/0"
$esri_query = "query?where=OBJECTID+%3E+1&objectIds=&time=&geometry=&geometryType=esri
$opendata_source = "$esri_base_url/$esri_serivce/$esri_feature/$esri_query"
$output_file_name = "sac.geojson"
ogr2ogr -f GeoJSON $output_file_name $opendata_source
```

POWERSHELL SAC.PS1

```
$esri_base_url = "https://services.arcgis.com/JJzESW51TqeY9uat/arcgis/rest/services"
$esri_serivce = "Special_Areas_of_Conservation_England"
$esri_feature = "FeatureServer/0"
$esri_query = "query?where=OBJECTID+%3E+1&objectIds=&time=&geometry=&geometryType=esri
$opendata_source = "$esri_base_url/$esri_serivce/$esri_feature/$esri_query"
$output_file_name = "sac.geojson"
ogr2ogr -f GeoJSON $output_file_name $opendata_source
$WorkingDir = Get-Location
$CurrentDate = Get-Date -Format "dd-MM-yyyy"
$CurrentTime = Get-Date -Format "HH:mm:ss"
$LogFilePath = "$WorkingDir/log.txt"
$message = "$CurrentDate $CurrentTime : Download successful"
$message | Out-File -FilePath $logFilePath -Append
```

POWERSHELL SAC.PS1

```
log.txt
05-09-2023 10:37:47 : Download successful
```

POWERSHELL
SAC.PS1

CAN WE DO BETTERER?

```powershell

#### VARIABLES START
    $CurrentDate = Get-Date -Format "dd-MM-yyyy"
    $CurrentTime = Get-Date -Format "HH:mm:ss"
    $WorkingDir = Get-Location

#download details
    $esri_base_url =  "https://services.arcgis.com/JJzESW51TqeY9uat/arcgis/rest/services"
    $esri_serivce =  "Special_Areas_of_Conservation_England"
    $esri_feature = "FeatureServer/0"
    $esri_query = "query?where=OBJECTID+%3E+1&objectIds=&time=&geometry=&geometryType=esriGeometryEnvelope&inSR=&spa

    $opendata_source = "$esri_base_url/$esri_serivce/$esri_feature/$esri_query"

#file names and paths etc
    $output_geojson = "sac.geojson"
    $output_shp = "sac.shp"
    $renamed_file_name = "sac_$CurrentDate-$CurrentTime.geojson"
    $LogFilePath = "$WorkingDir/log.txt"

#messaging
    $download_good_log = "$CurrentDate $CurrentTime : Download SUCCESSFUL"
    $download_bad_log = "$CurrentDate $CurrentTime : Download FAILED"
    $rename_log = "$CurrentDate $CurrentTime : File renamed to $renamed_file_name"
    $shp_good_log = "$CurrentDate $CurrentTime : SHP SUCCESSFUL"
    $shp_bad_log = "$CurrentDate $CurrentTime : SHP FAILED"


#### VARIABLES END
```

KEY VARIABLES

FILE NAMES AND PATHS

LOGGING MESSAGES

```
30
31
32  #TEST - Does the file exist in the folder?
33          if (Test-Path -Path $output_geojson -PathType Leaf) {
34              Rename-Item -Path $output_geojson -NewName $renamed_file_name
35              $rename_log | Out-File -FilePath $logFilePath -Append
36          } else {
37          }
38
39          start-sleep 5s
40
41  #DOWNLOAD VARIABLES AND GDAL
42          ogr2ogr -f GeoJSON $output_geojson $opendata_source
43
44
45  #TEST download complete?
46          if (Test-Path -Path $output_geojson -PathType Leaf) {
47              $download_good_log | Out-File -FilePath $logFilePath -Append
48          } else {
49              $download_bad_log | Out-File -FilePath $logFilePath -Append
50          }
51
52  #GDAL change projection
53
54          ogr2ogr -f "ESRI Shapefile"  -t_srs EPSG:27700  $output_shp $output_geojson
55
56
57  #TEST converted to SHP?
58          if (Test-Path -Path $output_shp -PathType Leaf) {
59              $shp_good_log | Out-File -FilePath $logFilePath -Append
60          } else {
61              $shp_bad_log | Out-File -FilePath $logFilePath -Append
62          }
63
64          exit
```

TEST –
GEOJSON EXISTS?
RENAME IT WITH A DATE STAMP

GDAL –
SOURCE URL TO GEOJSON

TEST –
GEOJSON DOWNLOADED?
WRITE TO LOG

GDAL –
GEOJSON TO SHP (27700)

TEST –
SHP EXISTS?
WRITE TO LOG

POWERSHELL

Send emails

Send to Teams

Open apps e.g QGIS or BAT files

Invoke PWSH on remote servers

AWS Lambda

Ping SFTP servers

THANK YOU

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