

Custom (Geo)processing Tools in ArcGIS Pro

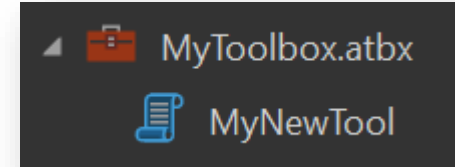
Alexis HUART – GIS Emergency support

Alexis.huart@geneva.msf.org



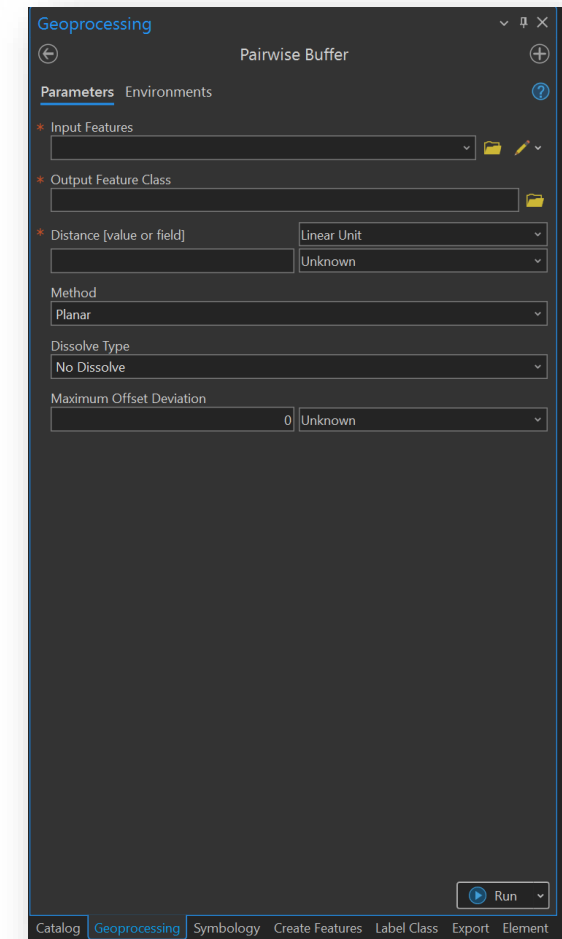
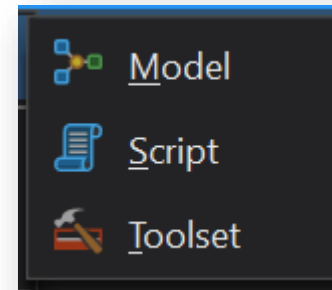
→ Toolbox

- One container for all the tools
- .atb .atbx



→ Tool – (Geo)processing

- **Python script** or **model builder** embedded in ArcGIS Pro GUI
- Interaction with AGP (via Arcpy)
- Interaction with other software's
- ...



➔ Use case?

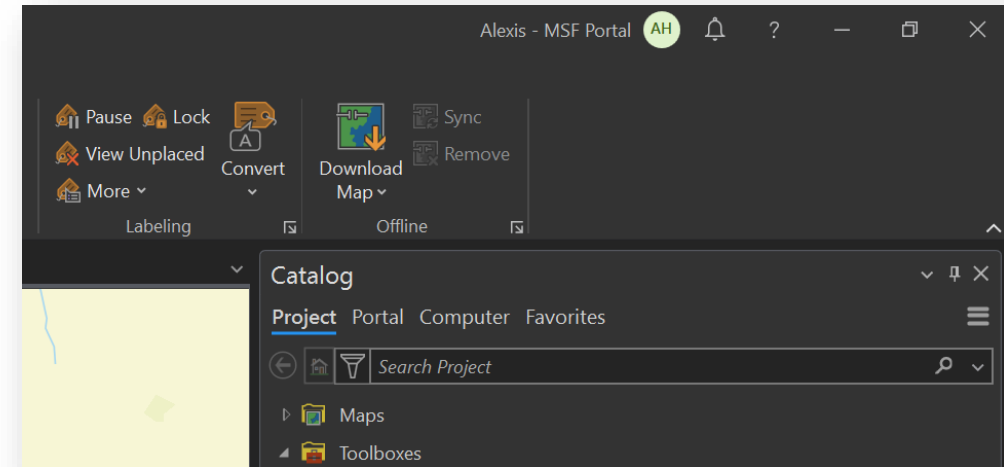
- Automate repetitive tasks
- Combine complex workflows into one click
- Specific needs not covered by standard tools
- ...

➔ Why use AGP processing?

- All of ours GIS specialists have AGP installed
- Python environment ready to use with Arcpy and ArcGIS API for Python
- Credential to AGOL-PORTAL available
- Simple tools maintenance and diffusion (Onedrive sync)
- ...

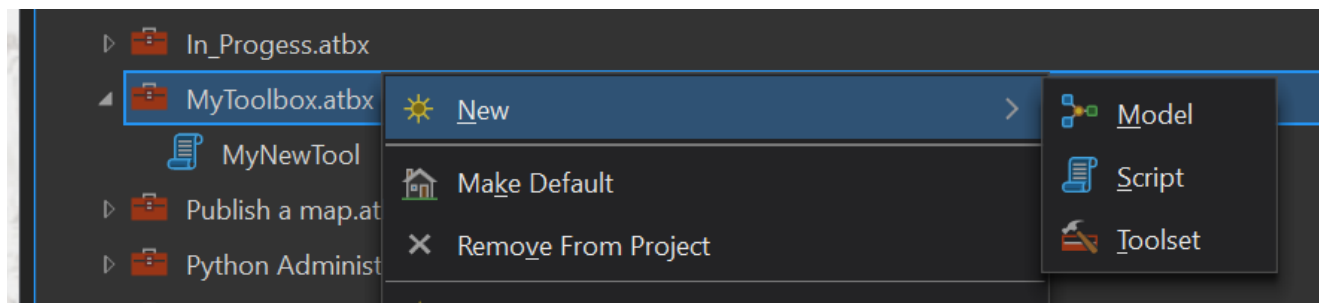
➔ Limitations

- AGP may be slow for complex python script
- Environnement cloning for external librairies

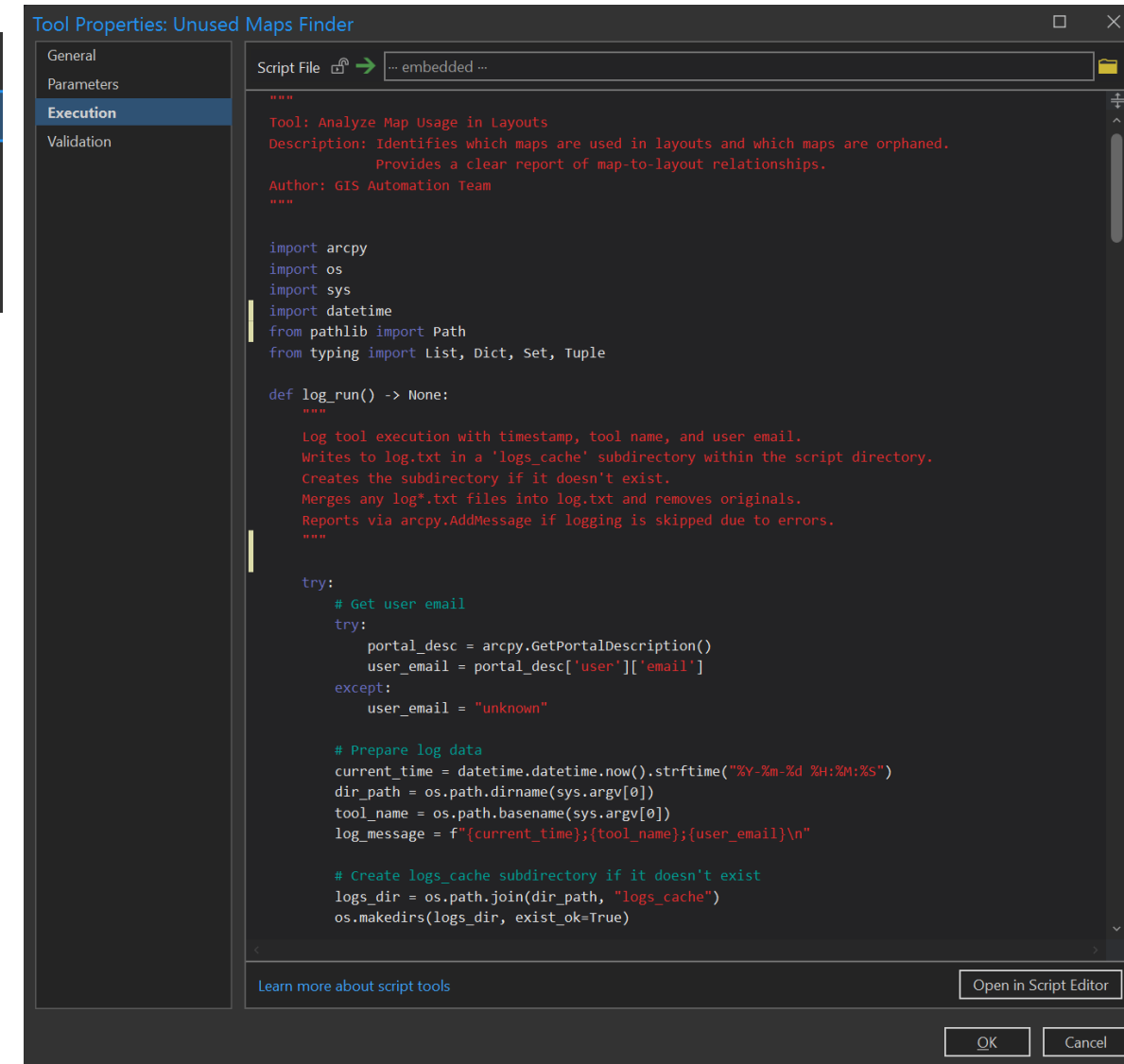




How to create a tool



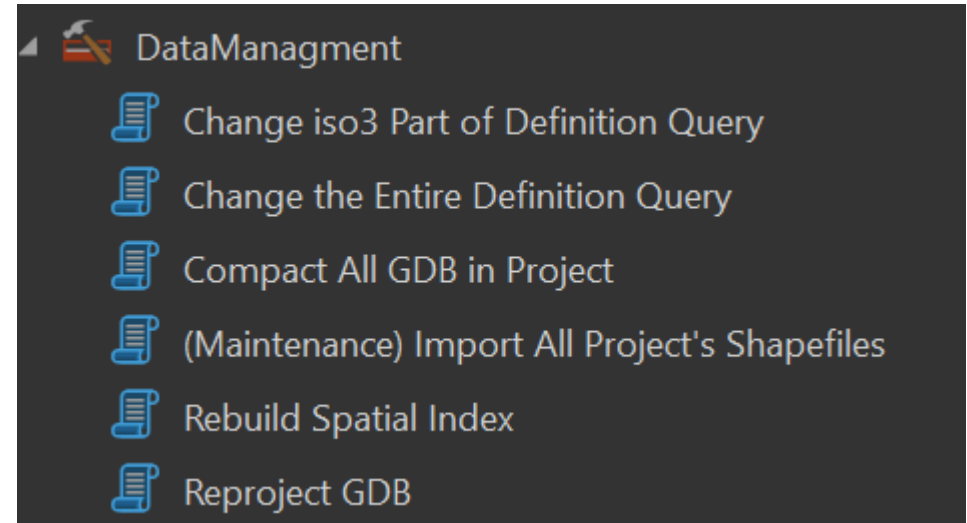
- ➔ General
- ➔ Parameters
- ➔ Execution
- ➔ Validation



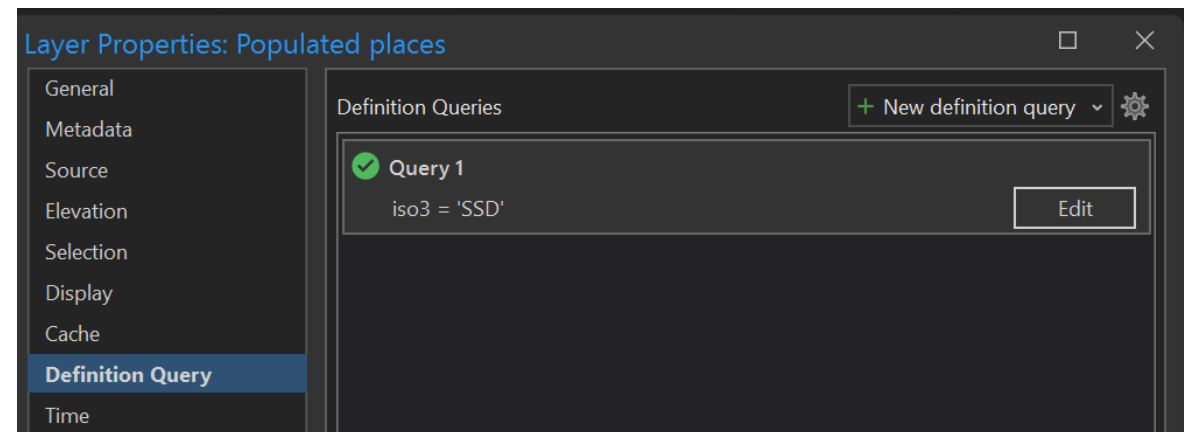
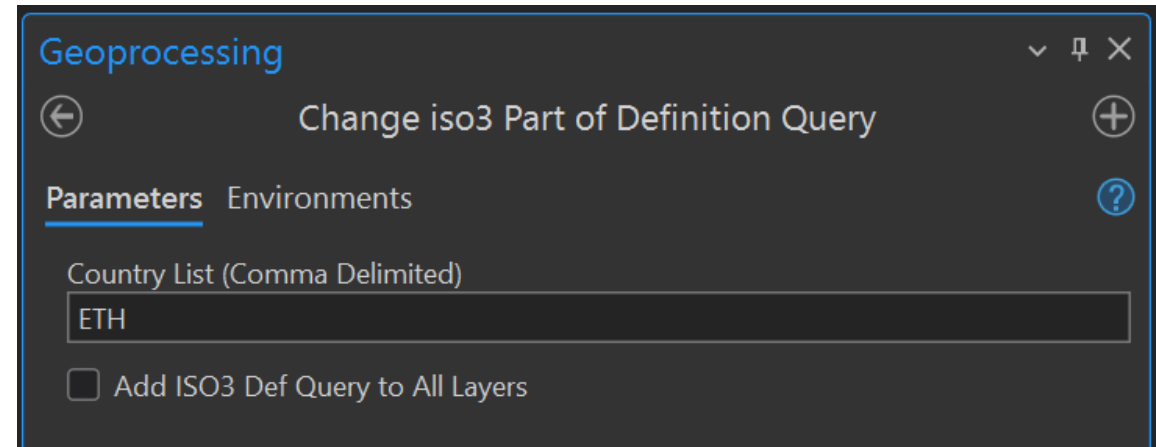
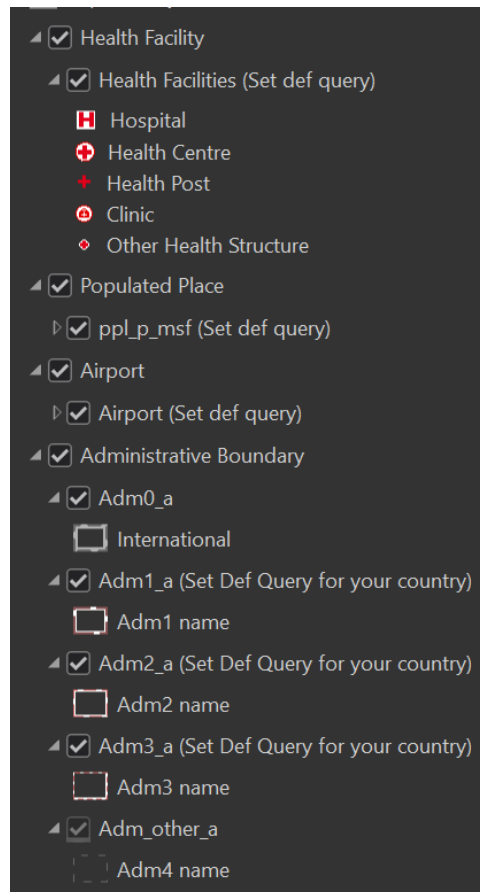


MSF custom tools

Data management

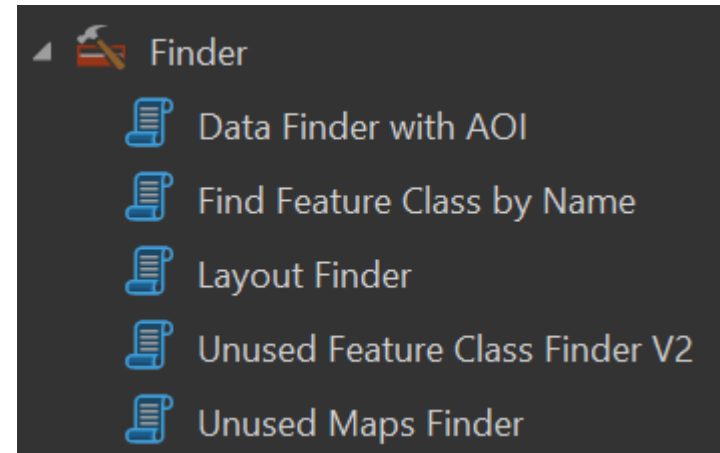


→ Change ISO3 Definition Query



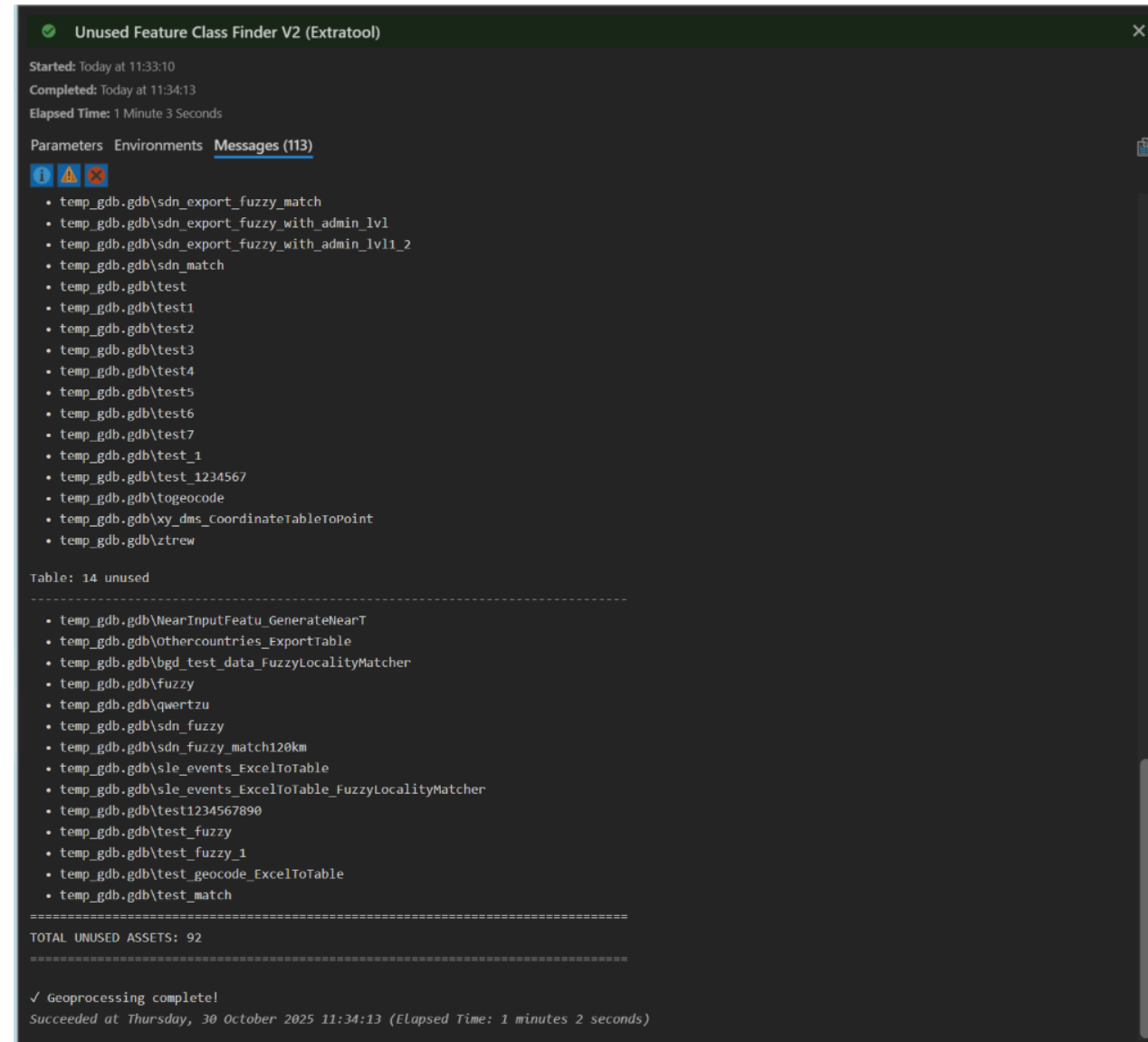
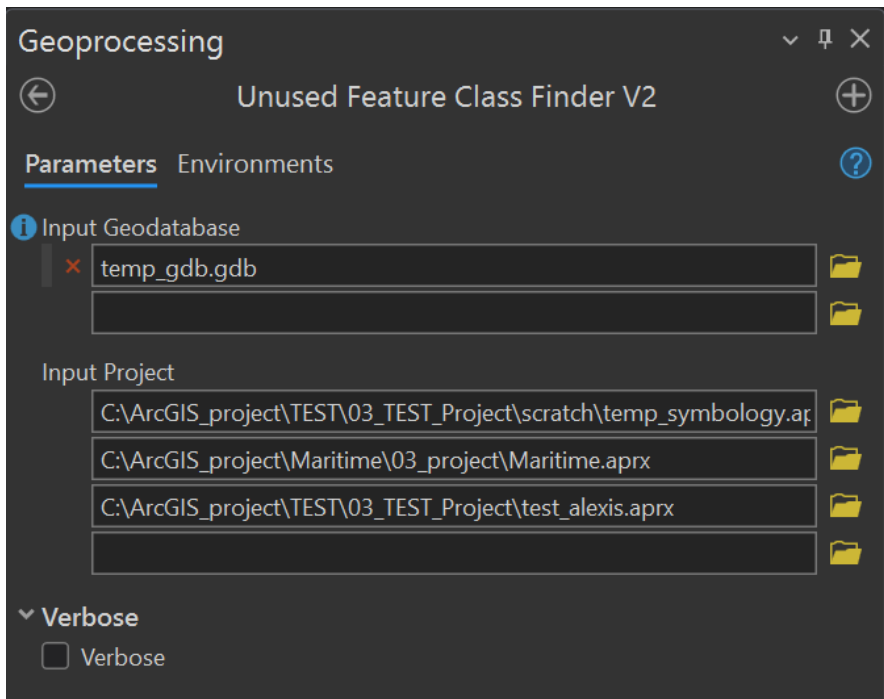


FINDERS



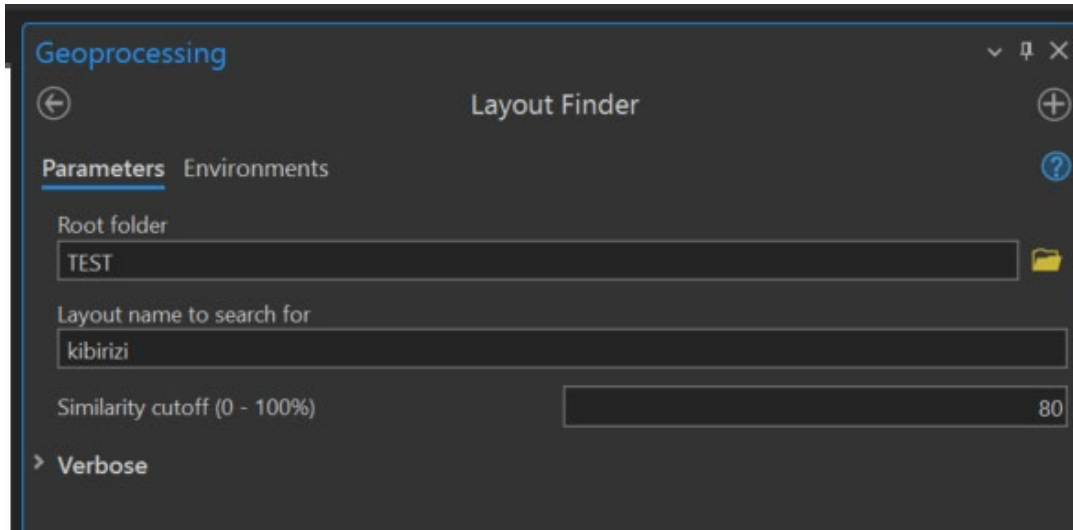
➔ Unused Feature Class Finder

- List the FC not used in the selected project(s)
- Clean the GDB



→ Layout Finder

- Find a specific layer across aprx's within a specific folder and subfolders



PROPRIETES

Nom du document :
cod_ref_kibirizi_A3L_18Sep2024

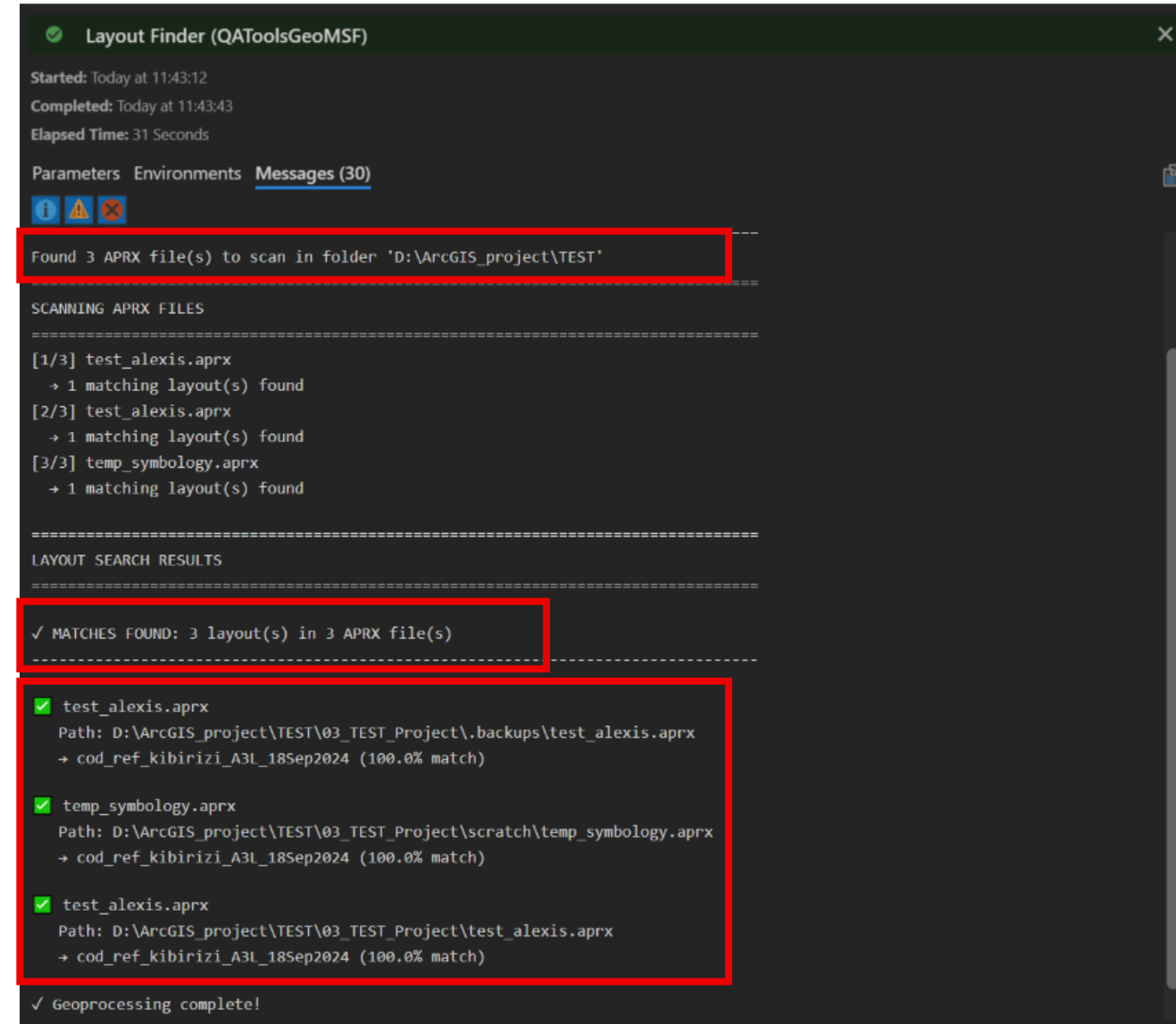
Date de Création : 05.11.2025

Type de produit : Carte de
référence

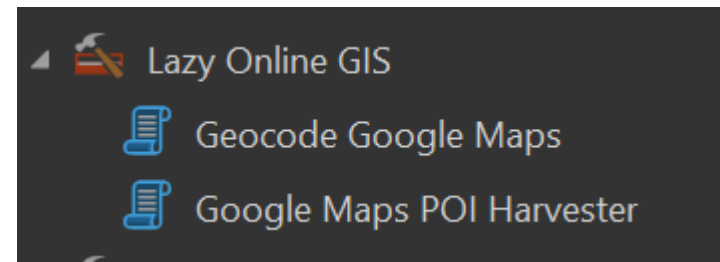
Réalisé par :

gis.urgence@paris.msf.org

Format d'impression : A3 Paysage

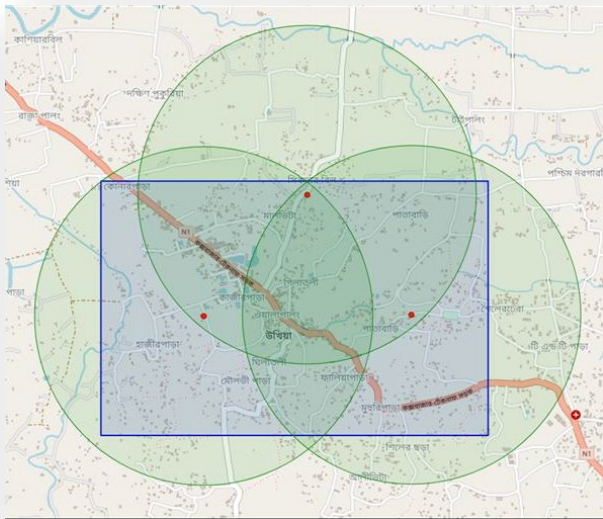


LAZY ONLINE GIS



➔ Google Maps POI Harvester

- Collect Google maps POI
- Limitation :
 - Cost \$\$\$ (API call)
 - Need Python env cloning
 - Request 3 times the same area (buffer around point)



Geoprocessing

Google Maps POI Harvester

Parameters Environments

Input AOI (polygon)
BGD_AOI

Google Maps POI groups

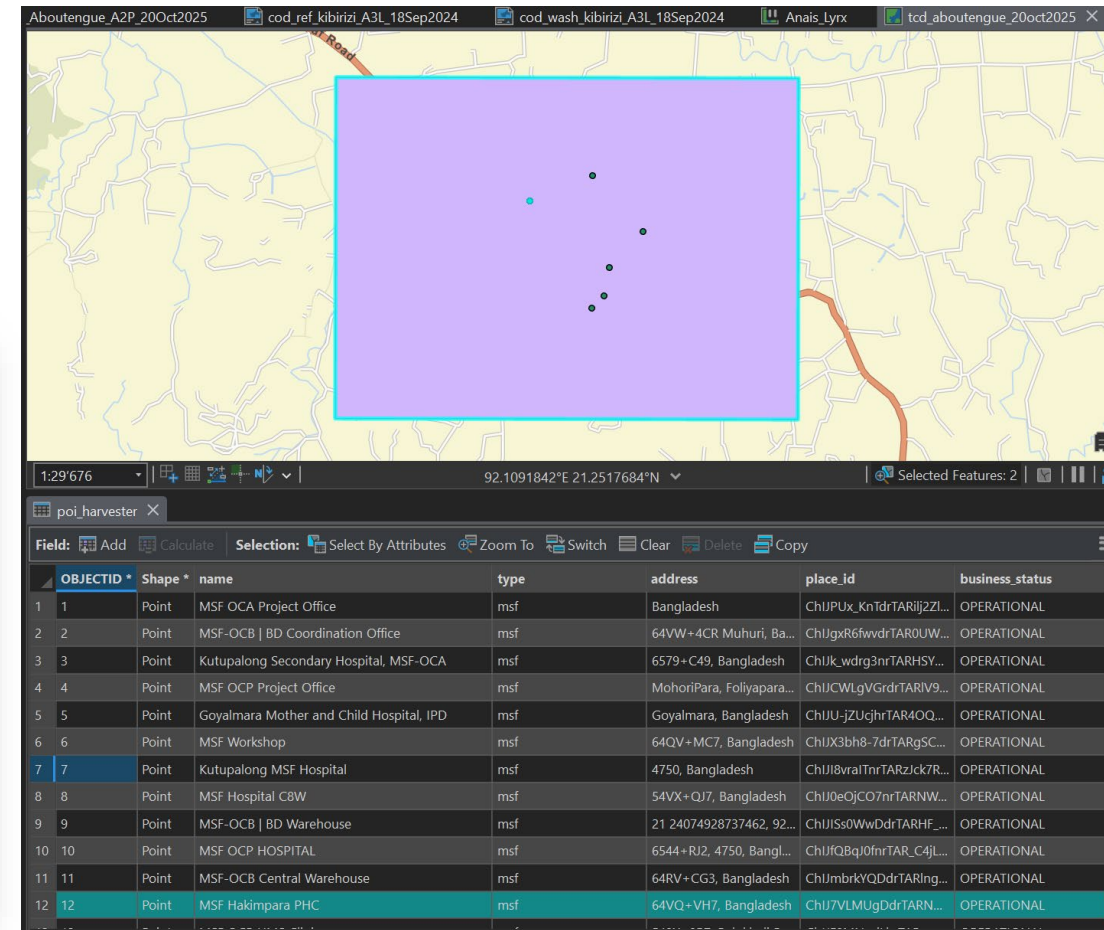
Google Maps Free text search
msf

Output Feature Class Path
poi_harvester

r/gis • 9mo ago
Throwboi321

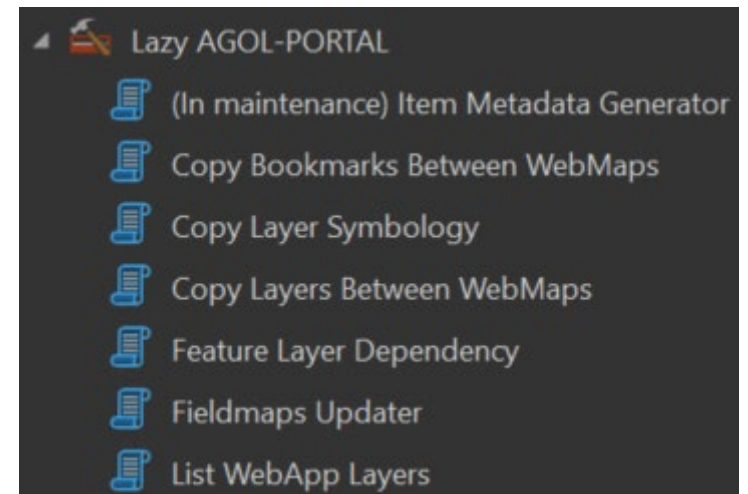
"The closer [to] the railway station the less tasty the Kebab is" - A Study

["The closer \[to\] the railway station the less tasty the Kebab is" - A Study : r/gis](#)



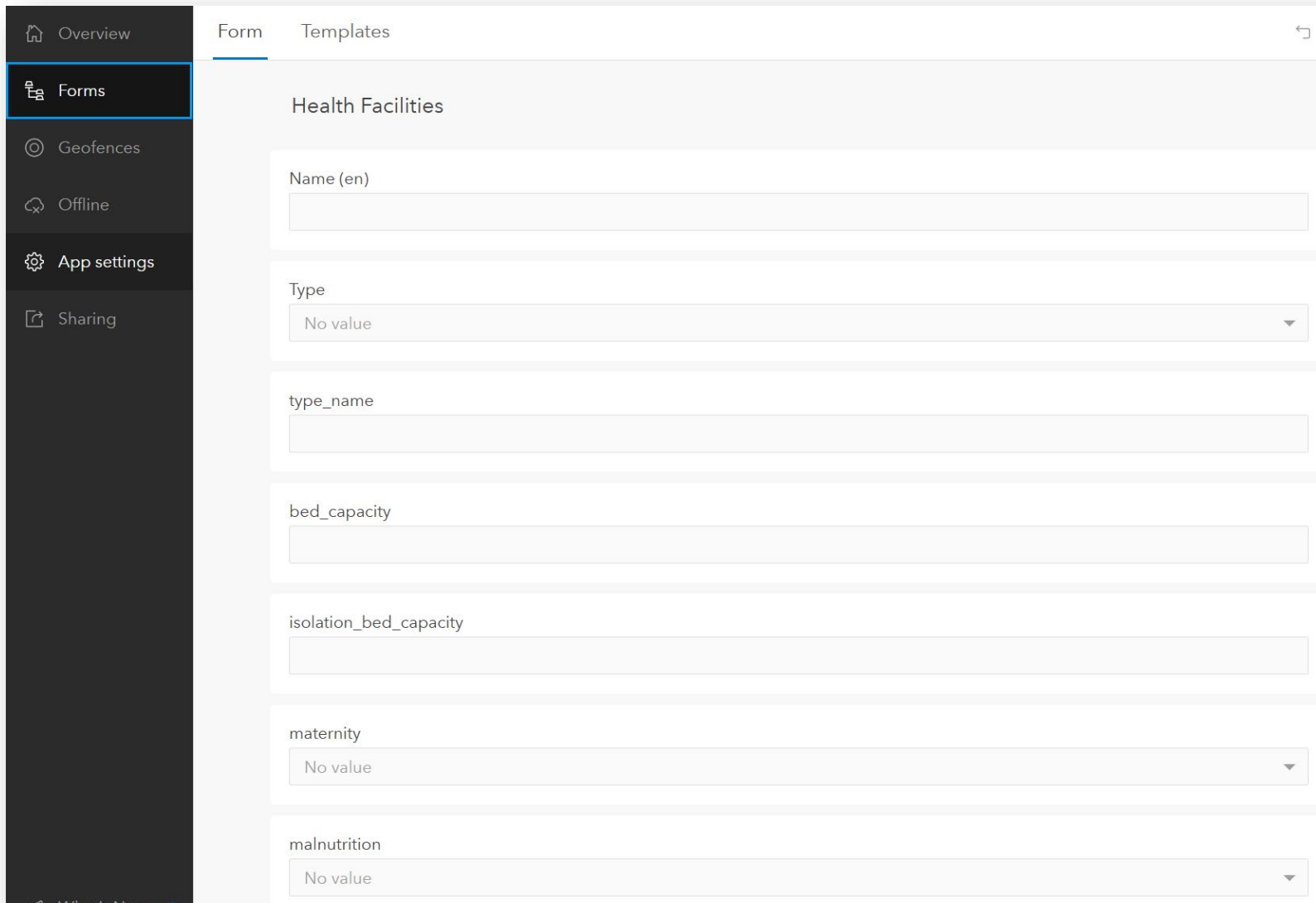


LAZY AGOL-PORTAL



➔ Fieldmaps Updater

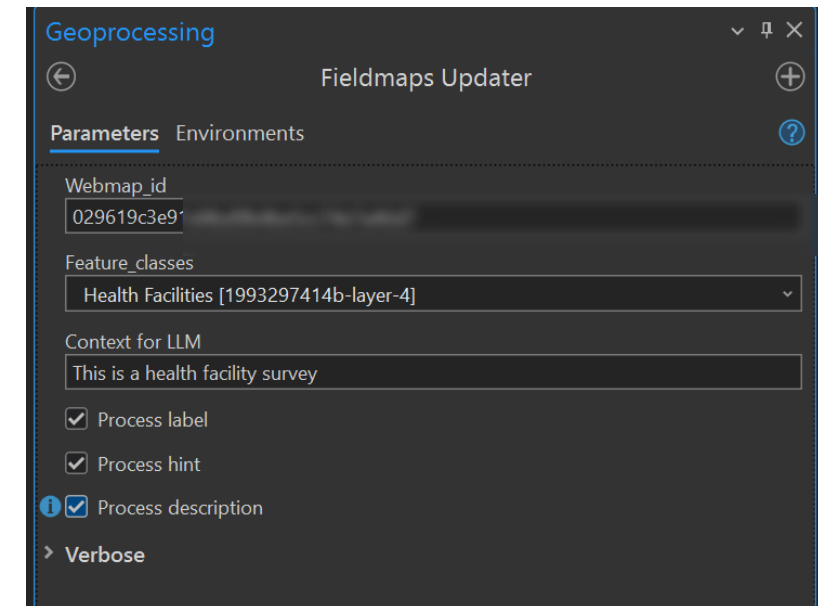
- Generate label, hint and description in Fieldmaps forms (via LLM + prompt)



The screenshot shows the 'Form' tab of the Fieldmaps Updater interface. The form is titled 'Health Facilities' and contains several input fields and dropdown menus. The left sidebar shows navigation options: Overview, Forms (selected), Geofences, Offline, App settings, and Sharing.

Form fields:

- Name (en):
- Type:
- type_name:
- bed_capacity:
- isolation_bed_capacity:
- maternity:
- malnutrition:



The screenshot shows the 'Geoprocessing' panel for the 'Fieldmaps Updater' tool. The 'Parameters' tab is active, showing the following settings:

- Webmap_id: 029619c3e9...
- Feature_classes: Health Facilities [1993297414b-layer-4]
- Context for LLM: This is a health facility survey
- Process label: ☒
- Process hint: ☒
- Process description: ☒
- Verbose: ☐

➔ Fieldmaps Updater

- Generate label, hint and description in Fieldmaps forms (via LLM + prompt)

Overview

Forms

Geofences

Offline

App settings

Sharing

Form

Templates

Health Facilities

Facility Name

What is the name of the health facility?

The official English name of the health facility.

Health Facility Type

No value

Specify the type of the health facility such as hospital, health centre, etc.

Type Name

Specify the name for the type given.

Provide a descriptive name for the type of health facility selected.

Bed Capacity

What is the total bed capacity?

Enter the total number of beds available in the facility.

Isolation Bed Capacity

What is the isolation bed capacity?

Number of beds specifically allocated for isolation purposes.

Maternity Services

```

Fieldmaps Updater (QAToolsGeoMSF)

Started: Today at 18:59:54
Completed: Today at 19:01:24
Elapsed Time: 1 Minute 30 Seconds

Parameters  Environments  Messages (15)

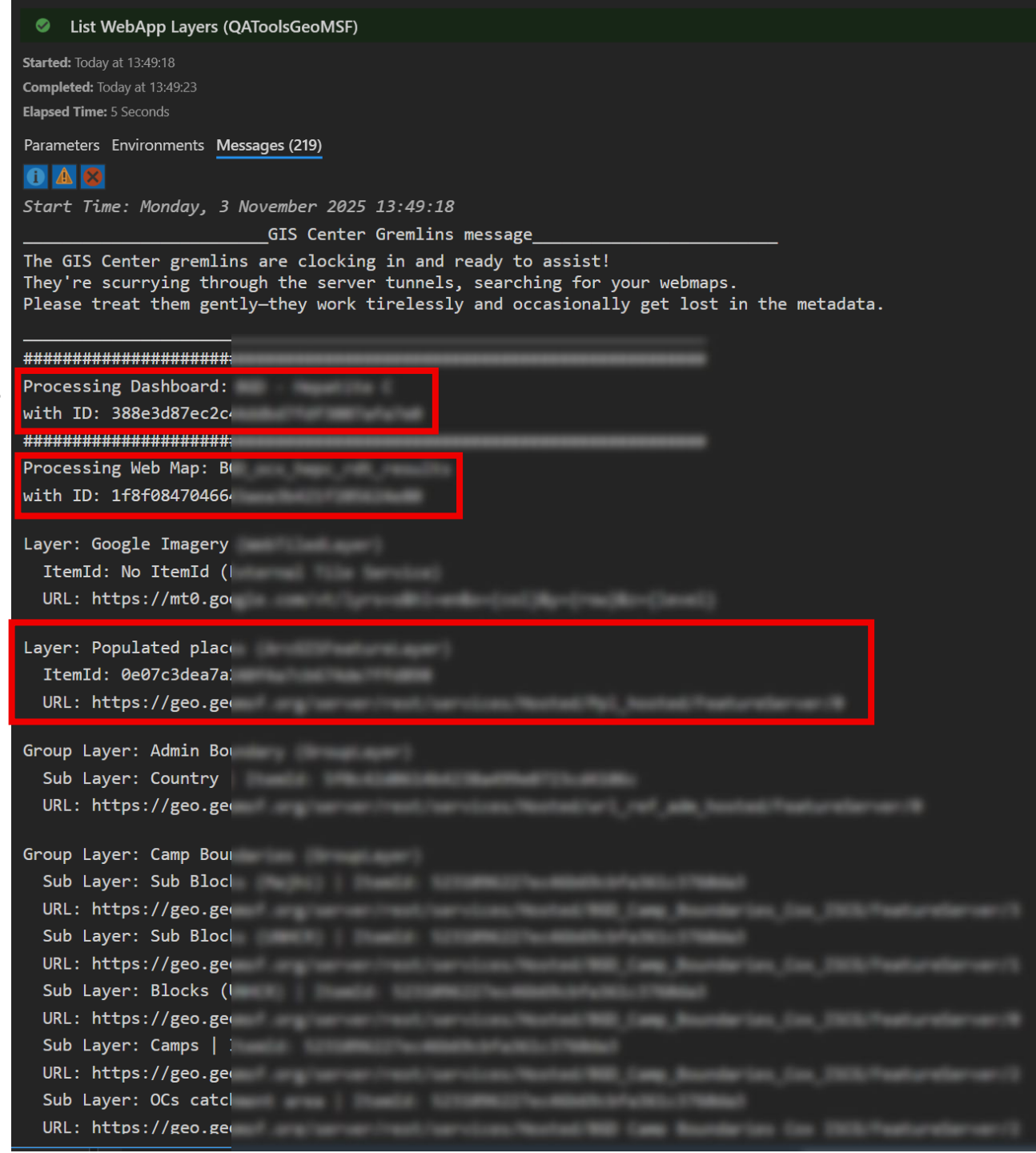
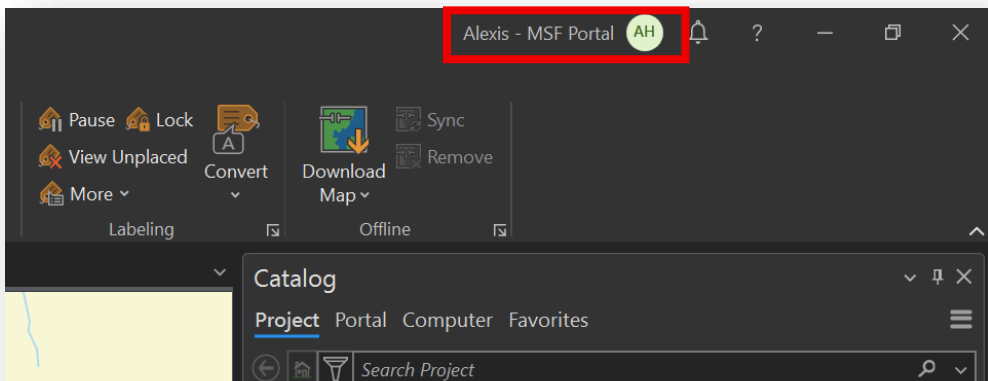
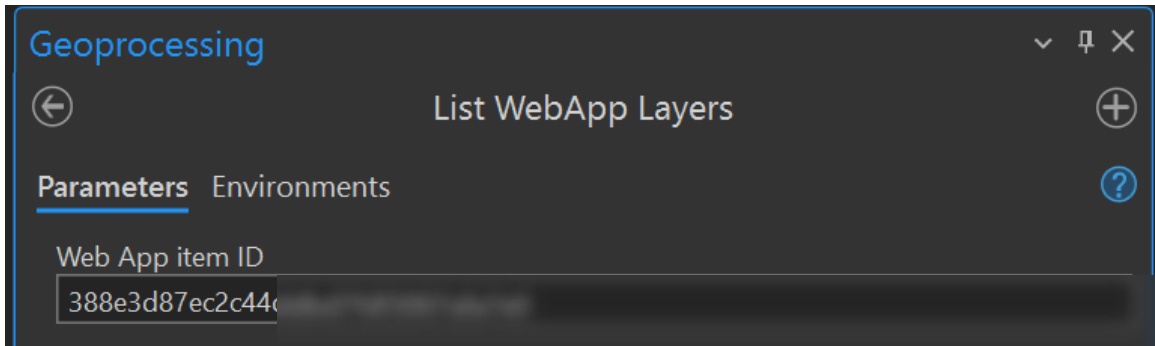
Start Time: Sunday, 8 March 2026 18:59:54
Health Facilities [1993297414b-layer-4]
----- Processing layer 'Health Facilities' -----
Fields fetched for layer 'Health Facilities'.
Embedded formInfo found for layer 'Health Facilities'.
Extracting fields from embedded form in layer 'Health Facilities'.
Fields extracted from form for layer 'Health Facilities'.

--- Sending request to the LLM ---
Updated field info list length: 13.
Field mapping created for layer 'Health Facilities'.
Total embedded form fields updated: 13.
Embedded form updated for layer 'Health Facilities'.
Updating webmap with 1 modified layers.
WebMap updated with embedded form changes.
All forms processed successfully.
Succeeded at Sunday, 8 March 2026 19:01:24 (Elapsed Time: 1 minutes 30 seconds)

```

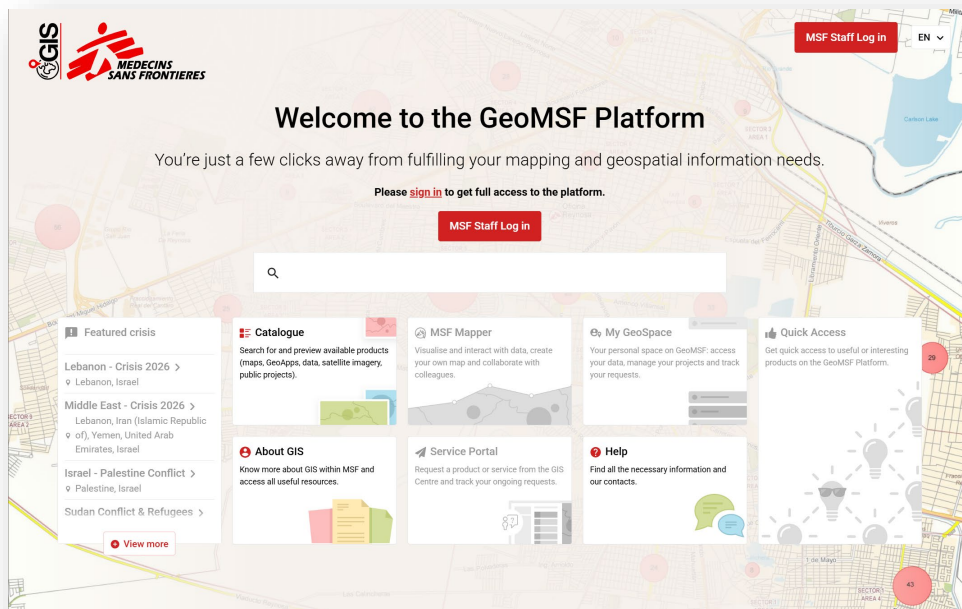
→ List Layers in Web App

- List all the webmaps and layers in a WebApp (Dashboard, XP Builder)
- Avoid opening Network Inspection /Developer Tools (F12)



→ Catalogue Publisher

- Publish a map to our catalogue on **geo.msf.org**
- Interact with :
 - AGP (Collect metadata from layout)
 - Azure AD
 - FME
 - Sharepoint



Geoprocessing

Catalogue Publisher - v1.3.1

Parameters

Environments

Content Type

Map

Update map file (overwrite existing file)

Update map metadata

File

C:\Users\ahuart\OneDrive - MSF\Desktop\maps_test\LBN_idp_gov_baalbek

Creation date

08.03.2026

Confidentiality

Public

Title

Baalbek Governorat

Map description

This is a map of Baalbek Governorat

Key product

Reference Map

Reference Product

General RefMap

Bounding box

35.863974, 33.629574, 36.664367, 34.566846

Scale of the Map

Country

Format

PDF

Print dimension

A3

→ And many more...

- ▲  Lazy Online GIS
 -  Geocode Google Maps
 -  Google Maps POI Harvester
-  LLM (Large Language Model)
- ▲  Webservices
 -  FeatureServer (editable) and Hosted (fast rendering) Switcher
 -  FeatureServer (editable) and MapServer (fast rendering) Switcher
 -  Portal-Replica Switcher

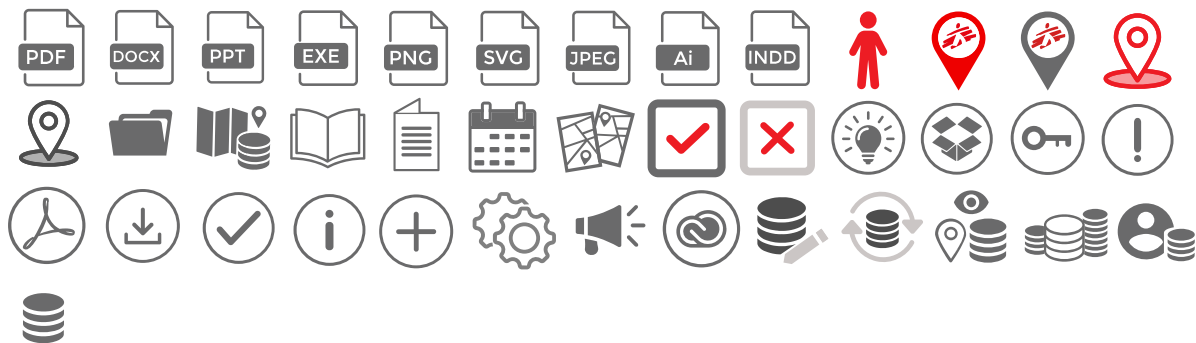
- ▲  DataManagment
 -  (Maintenance) Import All Project's Shapefiles
 -  Change iso3 Part of Definition Query
 -  Change the Entire Definition Query
 -  Compact All GDB in Project
 -  Rebuild Spatial Index
 -  Reproject GDB
- ▲  Export
 -  Export All Layouts into .PAGX
 -  Export All Maps into .MAPX
 -  GPX Export Line (OsmAnd)
 -  GPX Export Waypoints (OsmAnd)
- ▲  Finder
 -  Data Finder with AOI
 -  Find Feature Class by Name
 -  Layout Finder
 -  Unused Feature Class Finder V3
 -  Unused Maps Finder

- ▲  Lazy AGOL-PORTAL
 -  Copy Apps with Web Maps
 -  Copy Bookmarks Between WebMaps
 -  Copy Layer Symbology
 -  Copy Layers Between WebMaps
 -  Copy MDC App
 -  Feature Layer Dependency
 -  Fieldmaps Updater
 -  Item Metadata Generator
 -  List WebApp Layers
- ▲  Lazy GIS
 -  (Maintenance) Layer Label Translator
 -  Activity Box Creator
 -  Adjust Map Label Sizes
 -  Apply Extent and Scale
 -  Create Replica Simplified
 -  Echantillonnage spatiale
 -  Email Replacer
 -  Fuzzy Locality Matcher
 -  Get Layout Bbox
 -  Google Translate Attribute Table
 -  Sync Back and Recreate Replica
 -  Update Mini-maps

THANK YOU FOR YOUR
ATTENTION !

Alexis.huart@geneva.msf.org





- Guidance & Support 
- Collaborative Mapping 
- LnD, Comm & CM 
- Mapping & Spatial Analysis 
- Roster & Field deployments 
- Earth Observation 



- Data Management 
- Field & Mobile Solutions 
- GeoApps - AGOL & Portal 
- GeoApps - Custom 
- GeoMSF Platform 
- Infrastructure 



THEMES & SUBTHEMES



OPS

- MSF presence & activities
- Other actors presence & activities



POPULATION

- Refugees/IDPS/people on the move
- Population estimation
- People in need of humanitarian help
- Tribes/ethnies



SUPPLY

- Procurement
- Warehousing



LOGISTICS

- Transport & Access
- Facility management
- ICT
- Food & NFI distribution
- Assets management
- Air operations management



SECURITY & SAFETY

- Security Incidents, hotspots & damage assessment
- Armed group territorial control
- Authorities & Security agencies
- MSF evacuation routes & security zones
- Mine action



HEALTH

- Infectious disease
- Consultation
- Hospitalization
- Vaccination
- Community-based activities
- Non-communicable disease
- Health promotion
- Emergency care
- Nutrition



GEOGRAPHICAL CONTEXT

- Hydrology
- Elevation
- Land cover & use



WATSAN

- Water supply
- Hygiene & sanitation
- Vector control



PLANETARY HEALTH

- Technological & natural disaster
- Technological & natural hazard
- Medops adaptations
- Footprint mitigation



ADVOCACY & COMMUNICATION

- Evidence documentation
- Communication
- Advocacy