



Photo: ESA

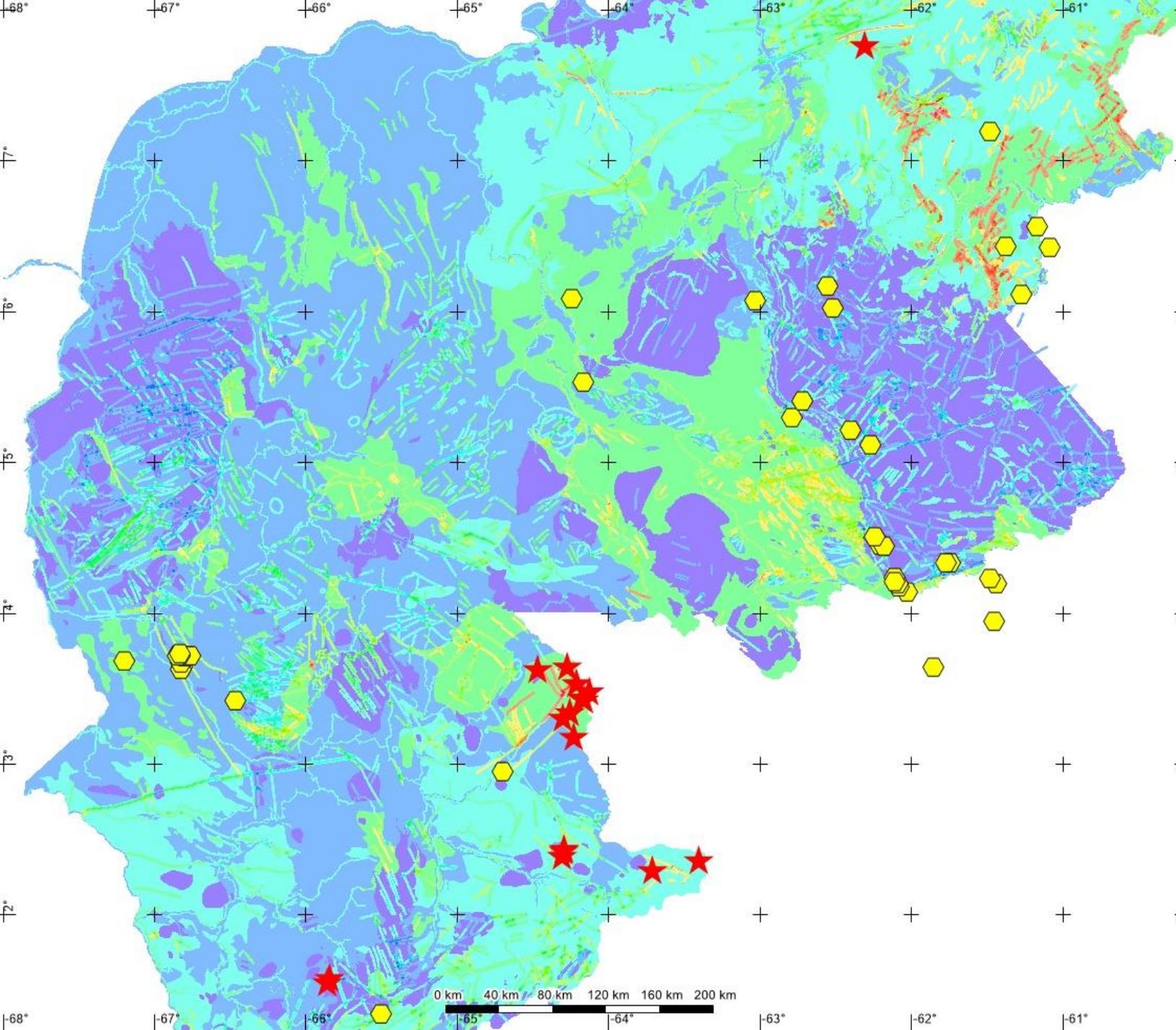
Earth Observation and Geology for Monitoring Artisanal and Small-Scale Mining



ASM-Alert is a project of GAF AG, Munich in association with the Institute of Environmental Security, The Hague with the support of the European Space Agency (ESA) under activity line 5 "EO for a Civil Security". The tool aims at the target domains of ecocide, crime against humanity, criminal threats, money laundering and smuggling. The tool combines state-of-the-art EO observation and analysis, platform technology and geological "intelligence".



ASM ALERT
TOOL
Atlas of
sample
Images



Titel:
Gold potential map of the Guiana shield

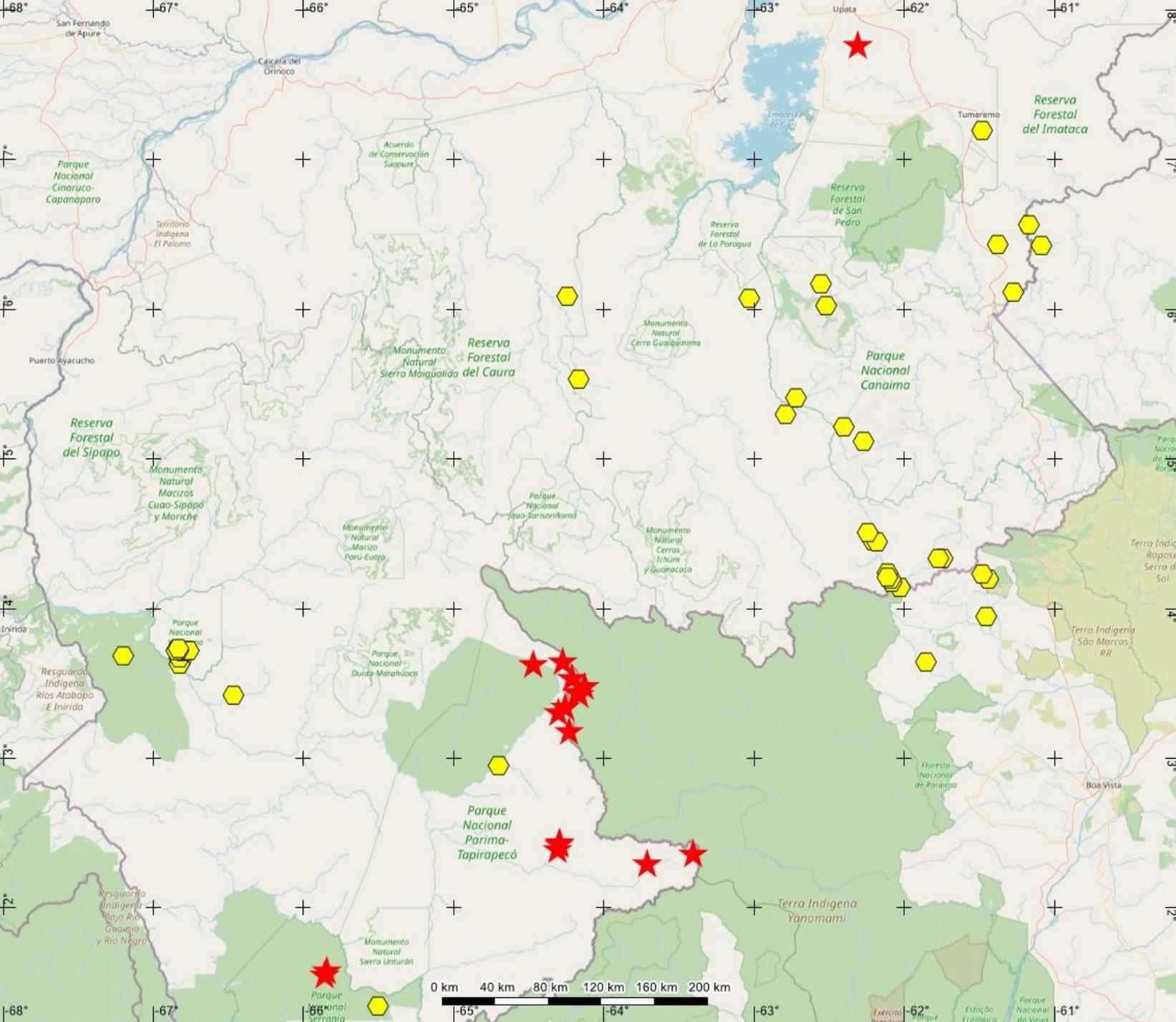
Legend:
Yellow hexagon: Known gold occurrences
Red star: Points of interest

Date of record:
n/a

Approx. Scale:
1/5 000 000

Source:
USGS





Titel:

Open Street Map background map

Legend:



Known gold occurrences



Points of interest

Date of record:

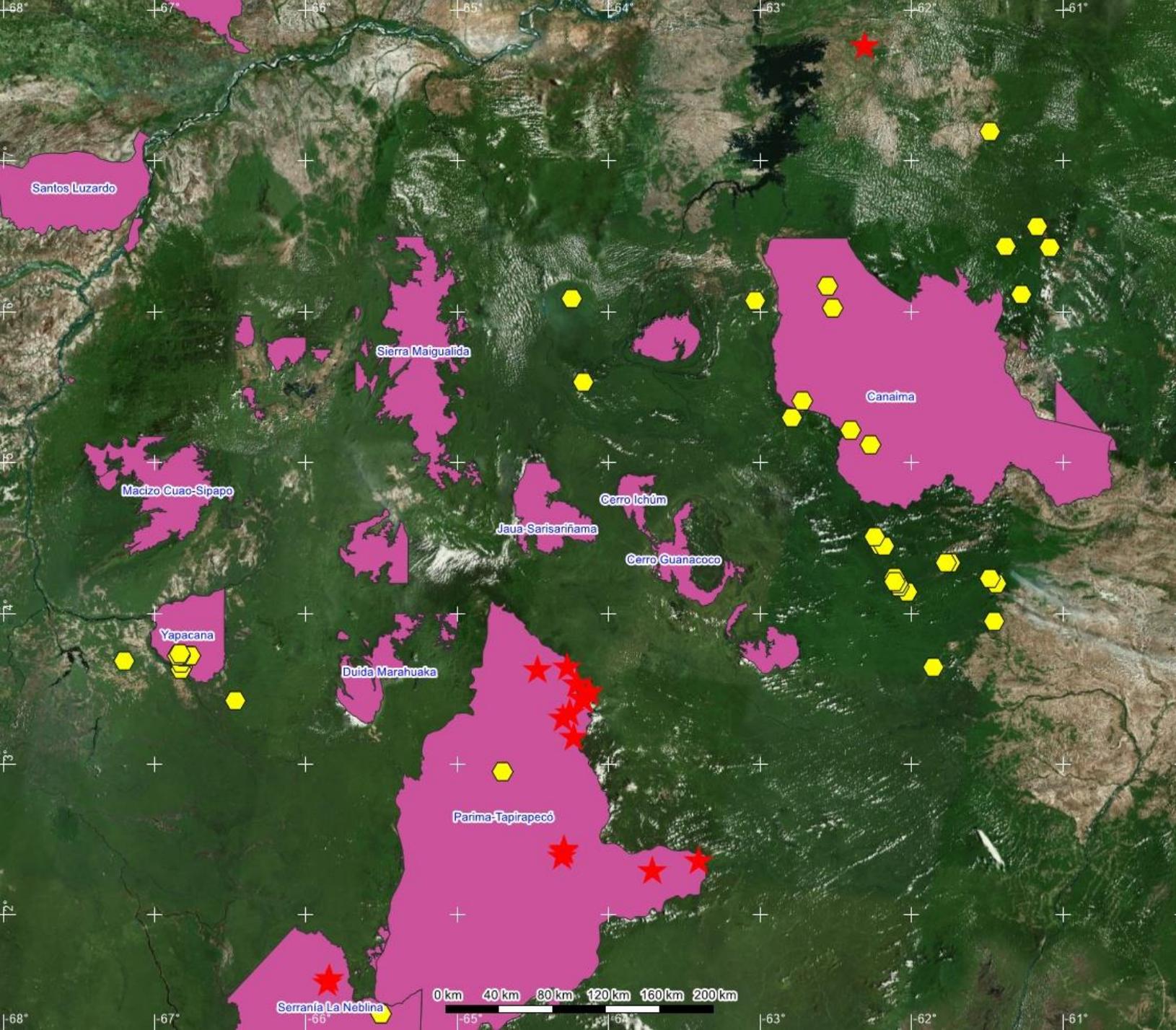
n/a

Approx. Scale:

1/5 000 000

Source:

Open Street Map organisation



Titel:

Nature reserves of the Guiana shield

Legend:

-  Known gold occurnces
-  Points of interest
-  Nature reserves

Date of record:

n/a

Approx. Scale:

1/5 000 000

Source:

Ecological Center, Departement of Geografic Informations (ecoSIG), of the Venezuelan Institut for Scientific Research (IVIC) and the International Center for Tropical Ecology (CIET)

Background satellite image: BING

Titel:

Alluvial ASM, Brasil border, Guiana shield

Legend:

Open water ponds with muddy (tan colours) or dark green water (fresh)

Open soil surfaces very bright-white to very bright tan colors

Water ponds and open soil concentrate along river bed, that bears muddy (beige) water

Date of record: n/a **Approx. Scale:** 1/ 25 000 **Source:** Background satellite image: BING



Titel:

Alluvial ASM, Brasil border, Guiana shield

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Open water ponds with muddy (tan colours) or dark green water (fresh)

Open soil surfaces very bright-white to very bright tan colors

Water ponds and open soil concentrate along river bed, that bears muddy (beige) water

Date of record: 2021 Nov 24 **Approx. Scale:** 1/ 25 000 **Source:** Background satellite image: Sentinel 2A



Titel:

Alluvial ASM, Brasil border, Guiana shield

Legend:

Open water ponds with muddy (tan colours) or dark green water (fresh)

Open soil surfaces very bright-white to very bright tan colors

Water ponds and open soil concentrate along river bed, that bears muddy (beige) water

Date of record: 2022 Jan 03 **Approx. Scale:** 1/ 25 000 **Source:** Background satellite image: Sentinel 2A





Titel:

Alluvial ASM, Border of the Canaima Natural Park, Guiana shield

Legend:

Open water ponds with muddy (tan colours)

Settlement with iron sheet roofs directly at the left river border

Deforestation away from settlement to West > workings for an airstrip?

Date of record: n/a

Approx. Scale:

1/ 25 000

Source: Background satellite image: BING



Titel:

Alluvial ASM, Border of the Canaima Natural Park, Guiana shield

Legend:

Open water ponds with muddy (tan and greenish colours) left and right of river

Open soil indicated by large, irregular, very bright surfaces around and intermingled with water ponds

W-E trending airstrip not finalised (see last map)

N-S, new, ca 400 m long open soil strip > to short for airstrip?

Date of record: 2020 Feb 03

Approx. Scale:

1/ 25 000

Source: Background satellite image: Sentinel 2A



Titel:

Alluvial ASM, Border of the Canaima Natural Park, Guiana shield

Legend:

Open water ponds with muddy (tan and greenish colours) left and right of river

Open soil indicated by large, irregular, very bright surfaces around and intermingled with water ponds

New little pond (less than 50 diameter, dark brown) directly at river shore

Date of record: 2020 Sep 20

Approx. Scale:

1/ 25 000

Source: Background satellite image: Sentinel 2A



Titel:

Alluvial ASM, SW Boder of Yapacana Natural Park, Guiana shield

Legend:

Right and bottom: Open soil indicated by dense arrays of spots, forming large, irregular, very bright surfaces within dense forest

Centre-left: Large smooth surface of open soil with a piste running over it

Date of record: 2020 Jan 10

Approx. Scale: 1/ 25 000

Source: Background satellite image: Sentinel 2A

Titel:

Alluvial ASM, SW Boder of
Yapacana Natural Park, Guiana
shield

Legend:

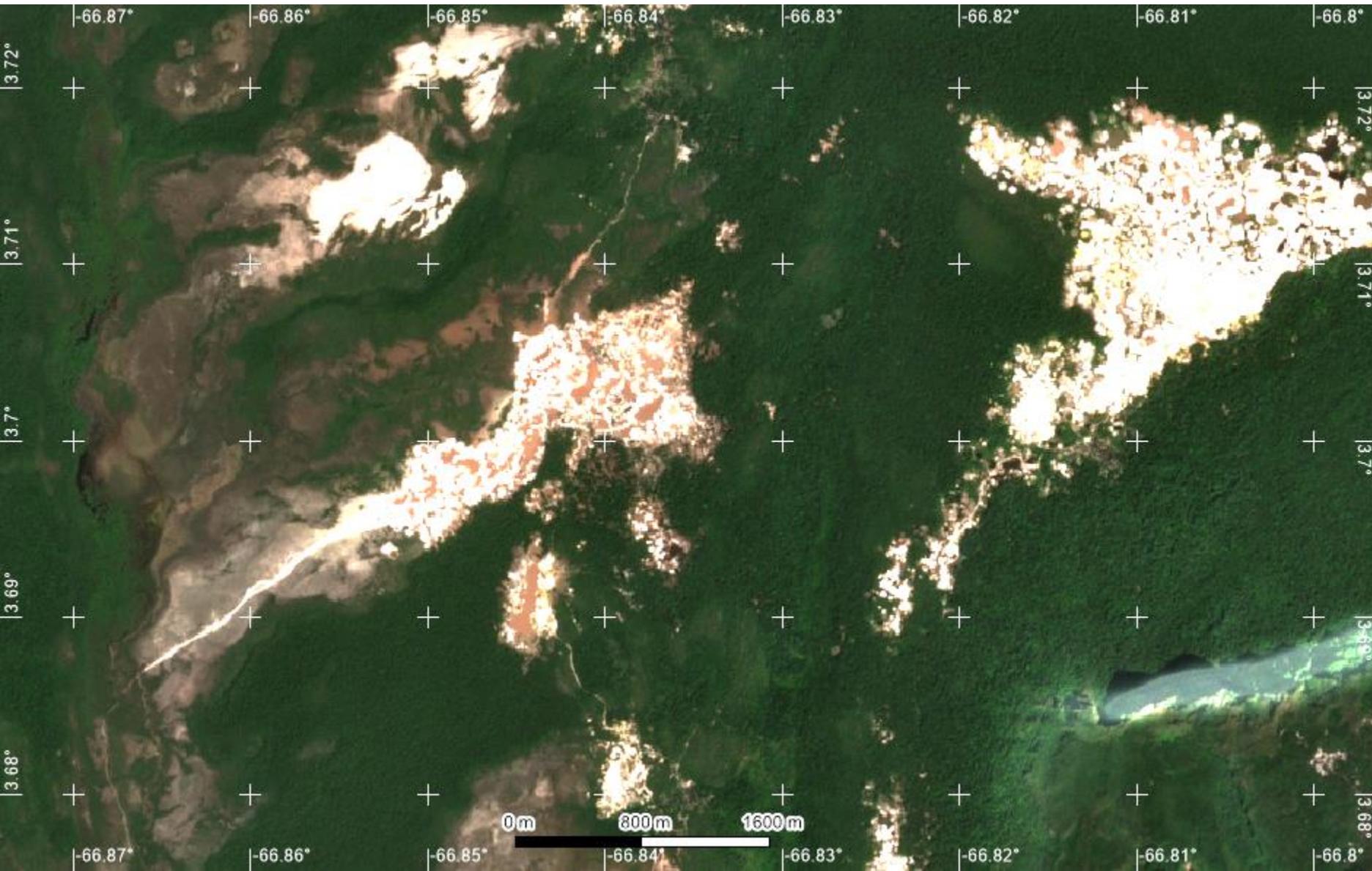
Open soil indicated by dense
arrays of spots, forming large,
irregular, very bright surfaces
within dense forest

Strong growth of mining surface
since 2020 (see last map)

Date of record: 2022 Mar 30

Approx. Scale: 1/ 25 000

Source: Background satellite
image: Sentinel 2A





Titel:

Cyanidation Plant, Northern Venezuela

Legend:

Two large rectangular ponds each > 1 ha, partly filled with muddy soil, partly with water

Soil heaps in vicinity of ponds (small dots)

Housing and basins near the northern rim of estate

Red square outlines next maps

Date of record: 2021 Nov 20

Approx. Scale: 1/ 5 000

Source: World View 1, PAN chromatic

**Titel:**

Cyanidation Plant, Northern
Venezuela

Legend:

Large rectangular ponds partly filled
with muddy soil, partly with water
with conveyor belt coming from the
houses north and distributing tailings
over three pourings

Left and Upper left: Soil heaps with 5-
10 m diameter, are transported via
white piste into the leftmost house

A mineral processing chain is
recognized: Open soil goes into the
leftmost house and the tailing leaves
the rightmost house in the image to
be deposited in the pond

Date of record: 2021 Nov 20

Approx. Scale: 1/ 1 000

Source: World View 1, PAN chromatic



Titel:

Cyanidation Plant, Northern Venezuela

Legend:

Left: Ponds partly filled with muddy soil, partly with water

Soil heaps with 5-10 m diameter

Soil heaps with up to 50 m diameter. On top of the upper-right heap an excavator is recognizable

Date of record: 2021 Nov 20

Approx. Scale: 1/ 1 000

Source: World View 1, PAN chromatic





Titel:

Cyanidation Plant, Northern
Venezuela

Legend:

Basins with diameters of 20 to 5 m are
distributed in between and around
the housing

These probably are flotation ponds

Date of record: 2021 Nov 20

Approx. Scale: 1/ 500

Source: World View 1, PAN chromatic



Titel:
Deforestation or mining, Central Paraima Tapirapeco National Park

Legend:
Airstrip near river

River running from upper left to centre bottom

10 to max 100 m ovoid and round spots of deforestation respectively open soil dissiminated over the AOI

Red square outlines next maps

Date of record: 2020 Sep 21
Approx. Scale: 1/ 5000
Source: World View 1, RGB
Slightly overdosed



Titel:

Deforestation or mining, Central Paraima Tapirapeco National Park

Legend:

10 to max 100 m ovoid and round spots of deforestation respectively open soil dissiminated- here example near the river. Obviously parts of the deforested areas, are newly overgrown by bushes

Date of record: 2020 Sep 21

Approx. Scale: 1/ 1000

Source: World View 1, RGB
Slightly overdosed



Titel:

Deforestation or mining, Central Paraima Tapirapeco National Park

Legend:

10 to max 20 m ovoid spots of deforestation - here example more far away from the river. The chain like alignment could point to exploration works?

Date of record: 2020 Sep 21

Approx. Scale: 1/ 500

Source: World View 1, RGB
Slightly overdosed



Titel:

Alluvial ASM, Easter Paraima Tapirapeco National Park

Legend:

Ponds and orange – rose open soil along the shores of a little river points to alluvial mining activity. In the south arm of the river a few larger ponds with dark water appear.

In the northern river arm several ponds are obviously empty and dry

Red square outlines next maps

Date of record: 2022 Apr 28

Approx. Scale: 1/ 5000

Source: Pleiades, RGB





Titel:

Alluvial ASM, Easter Paraima Tapirapeco National Park

Legend:

Dark water pond with „thin bars“ of ca. 5-10 m length running towards shore or towards „islands“ of open soil are interpreted as probable installations in water – however image is not 100% sharp and not 100% conclusive

Date of record: 2022 Apr 28

Approx. Scale: 1/ 500

Source: Pleiades, RGB



Titel:

Alluvial ASM, Easter Paraima Tapirapeco National Park

Legend:

Ponds with muddy or dar water along river shores., partly the river shore itself is deforested.

Red square outlines next maps

Date of record: 2022 Apr 28

Approx. Scale: 1/ 5000

Source: Pleiades, RGB

0m 100m 200m 300m 400m



Titel:

Alluvial ASM, Easter Paraima Tapirapeco National Park

Legend:

Water pond with „thin bars“ of ca. 5-10 m length sectioning and separating the central pond

Right of the pond a small hut is visible

Lower right pond very muddy and nearly dried out

2.371°
Upper left pond probably dark and clear, probably out of use since longer time

River at the upper rim is also seperated into sections by straigth, thin bars

Date of record: 2022 Apr 28

Approx. Scale: 1/ 500

Source: Pleiades, RGB

0m 10m 20m 30m 40m