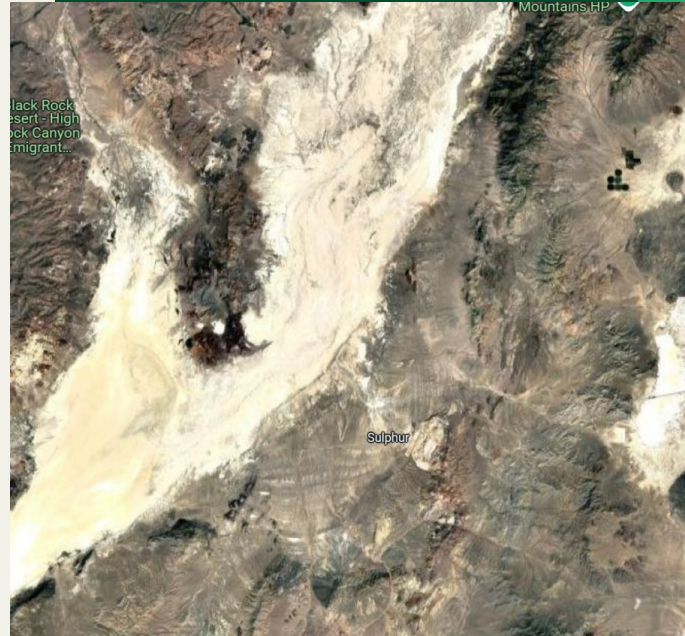


SENTINEL-2 Applications in Surface Mineral Mapping



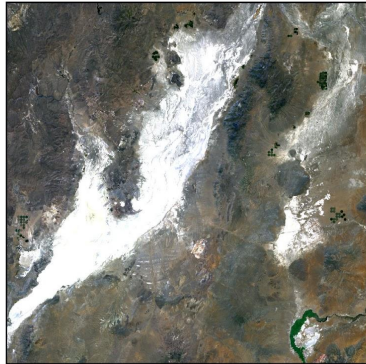
WHAT I DID:

01. Downloaded image from 10/02/2024
02. Ensured minerals were present at the surface
03. Researched & chose band ratios to use
04. Completed the band ratios
05. Overlaid the “bright” areas to create 1 geologic map

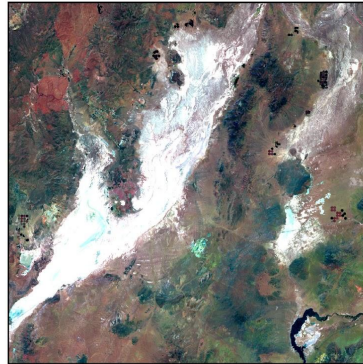


Surface Mineral Detection: **SENTINEL-2 Imagery of Black Rock Desert & Desert Valley in Nevada, U.S.A.**

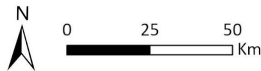
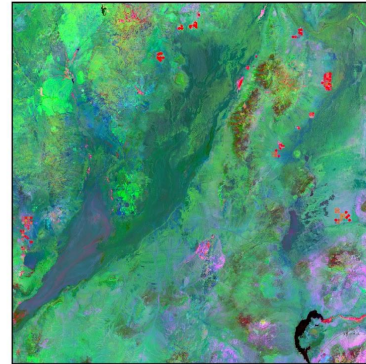
True Color Composite (4-3-2)



False Color Composite (12-4-2)



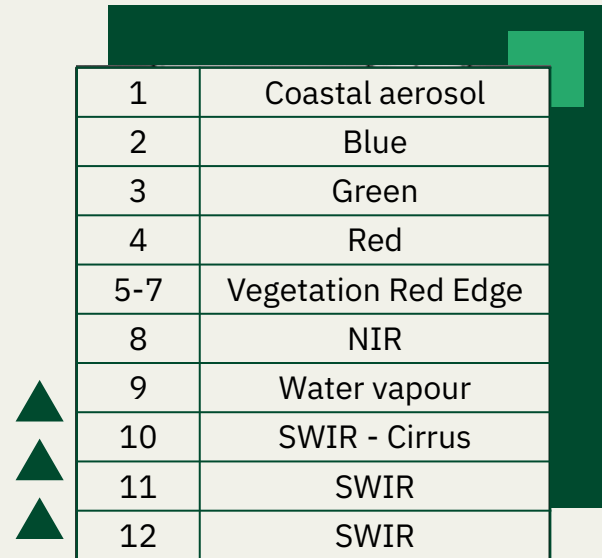
ERDAS IMAGINE Mineral
Composition Index



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Copernicus Sentinel data 2024. Retrieved from
Copernicus Browser 15 April 2025, processed by ESA.

What are band ratios?

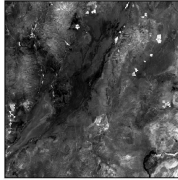
- Creating a new band of data by simply dividing two bands of digital numbers
- This new band cancels what is similar amongst the original bands and highlights what contrasts



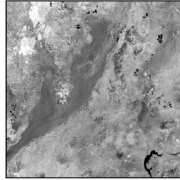
1	Coastal aerosol
2	Blue
3	Green
4	Red
5-7	Vegetation Red Edge
8	NIR
9	Water vapour
10	SWIR - Cirrus
11	SWIR
12	SWIR

**Surface Mineral Detection:
SENTINEL-2 Imagery of Black Rock Desert & Desert Valley
in Nevada, U.S.A.**

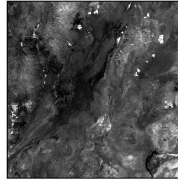
Iron Ore 11/12



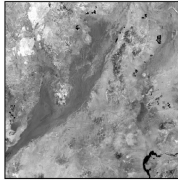
Copper Ore 11/8



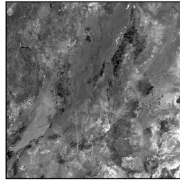
Laterite 11/12



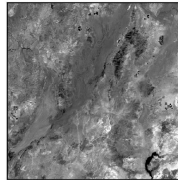
Ferric Oxides 11/8



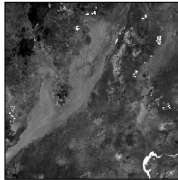
Iron Oxide 5/1



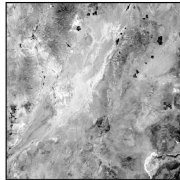
Iron Oxide 4/2



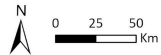
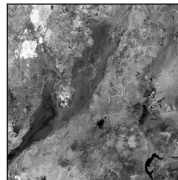
Halite 8/11



Ferrous Silicates 12/11



Eisenhydroxid 12/5

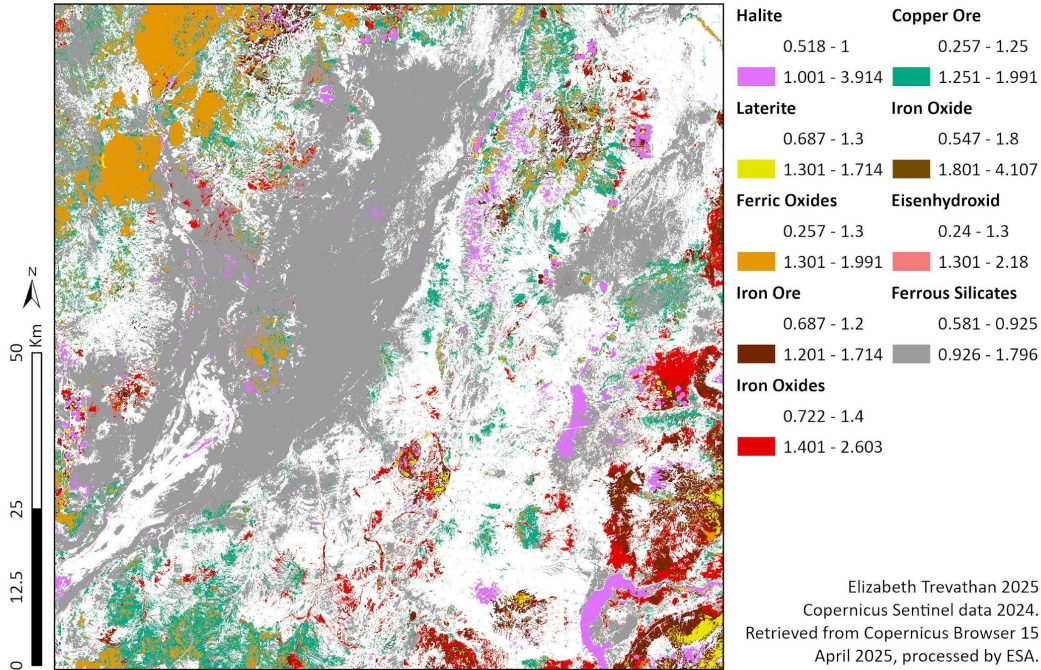


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Copernicus Sentinel data 2024. Retrieved from
Copernicus Browser 15 April 2025, processed by ESA.

What are these minerals?

NAME	RATIO	MINERAL
Iron Ore	11/12	Iron can be extracted – hematite & magnetite
Copper Ore	11/8	Copper can be extracted – bornite, covellite, & chalcocite
Laterite	11/12	Aluminum can be extracted – quartz with iron oxides & aluminum clay minerals
Ferric Oxides	11/8	Hematite
Iron Oxide	5/1 or 4/2	Hematite, magnetite, goethite, limonite
Halite	8/11	Halite = salt
Ferrous Silicates	12/11	Olivine (igneous rocks found in the mantle – basalt)
Eisenhydroxid	12/5	Iron hydroxide – iron oxides with hydrogen (goethite)

Surface Mineral Detection: SENTINEL-2 Imagery of Black Rock Desert & Desert Valley in Nevada, U.S.A.



Thank You!

