

Infrared payloads in CubeSats at VLEO missions

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Could the infrared payload add value to the earth observation information?

ANALYSIS

In order to proceed with the comparison between the 60 EO market opportunities, the 5 market needs and the 7 types of images, two different graphs have been created. To do so, each market opportunity has been given an identifier.

In the first graph, the market opportunities are placed considering the minimum temporal resolution and the minimum geolocation accuracy required in each situation to get the best service in terms of image.

In the second graph, the market opportunities, as well as the type of images that can be obtained through Earth observation payloads, are placed according to their market needs in spatial and spectral resolution (directly dependable to the type of technology).

The geolocation accuracy need is not considered in neither graph because it has been assumed that for all the EO market opportunities has to be very high.

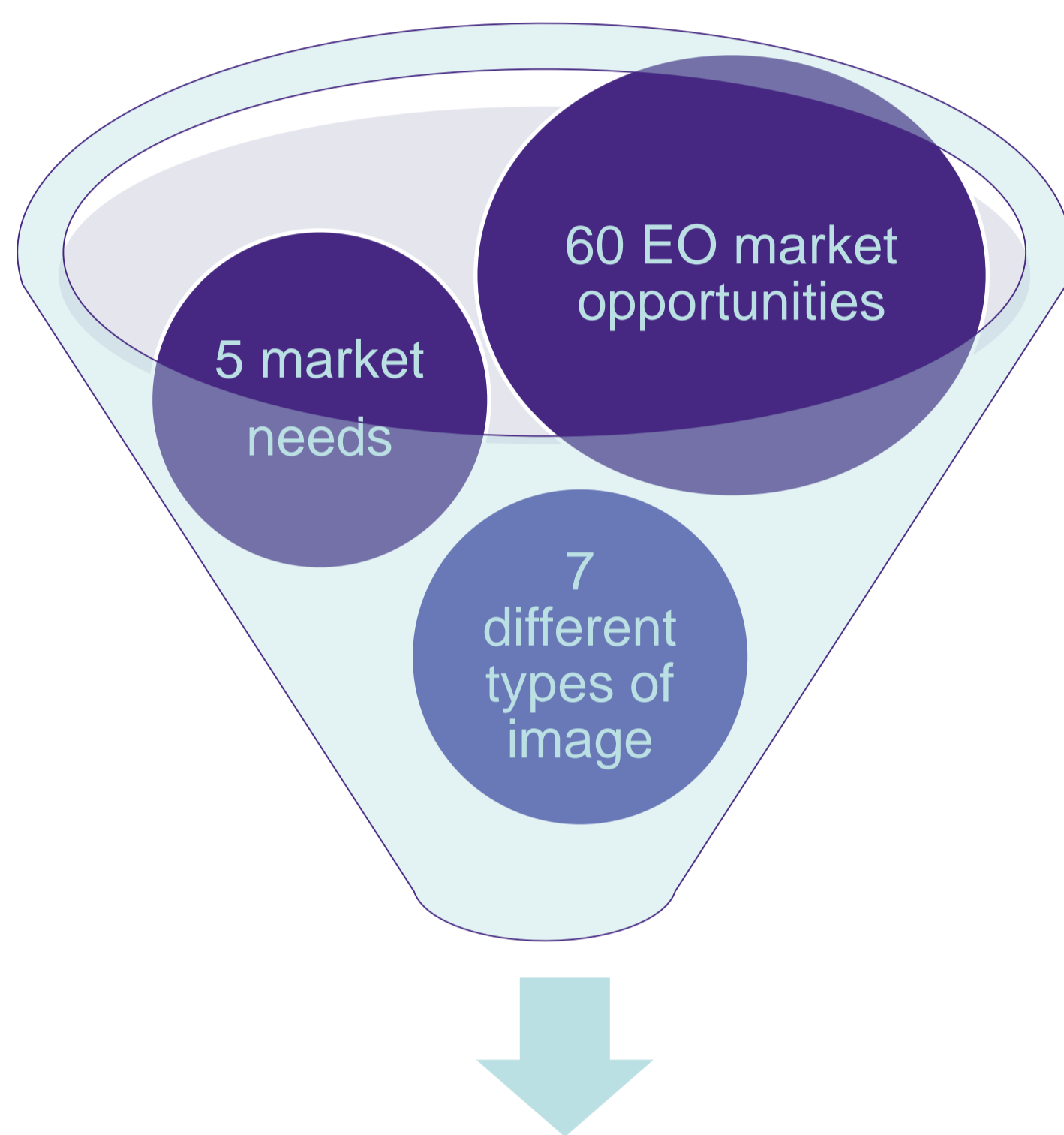
INITIAL DATA

Types of images:

- Panchromatic
- Multispectral (Visible)
- Multispectral (Visible + NIR)
- Multispectral (Visible + NIR + SWIR)
- Panchromatic sharpening
- Hyperspectral
- Thermal

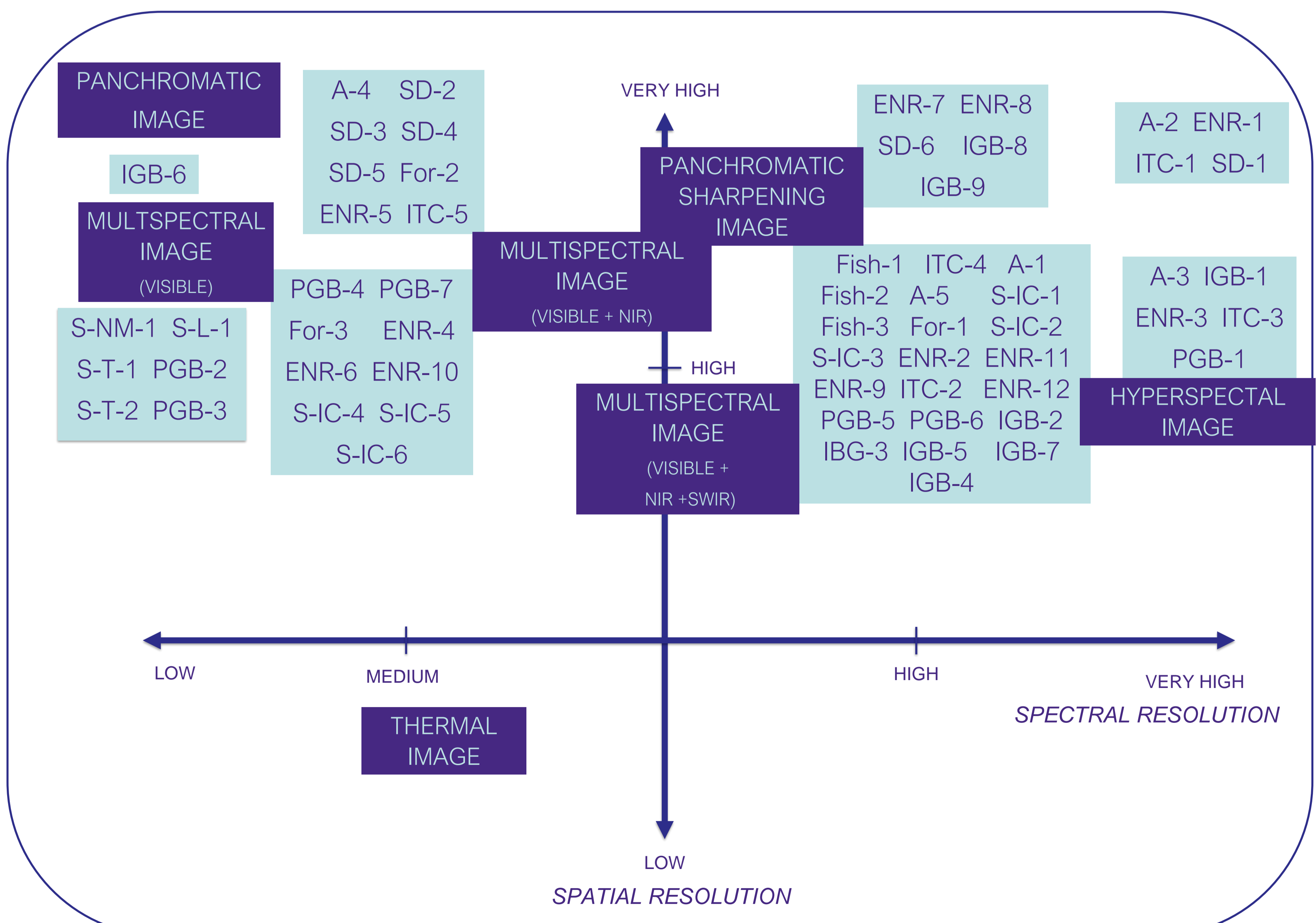
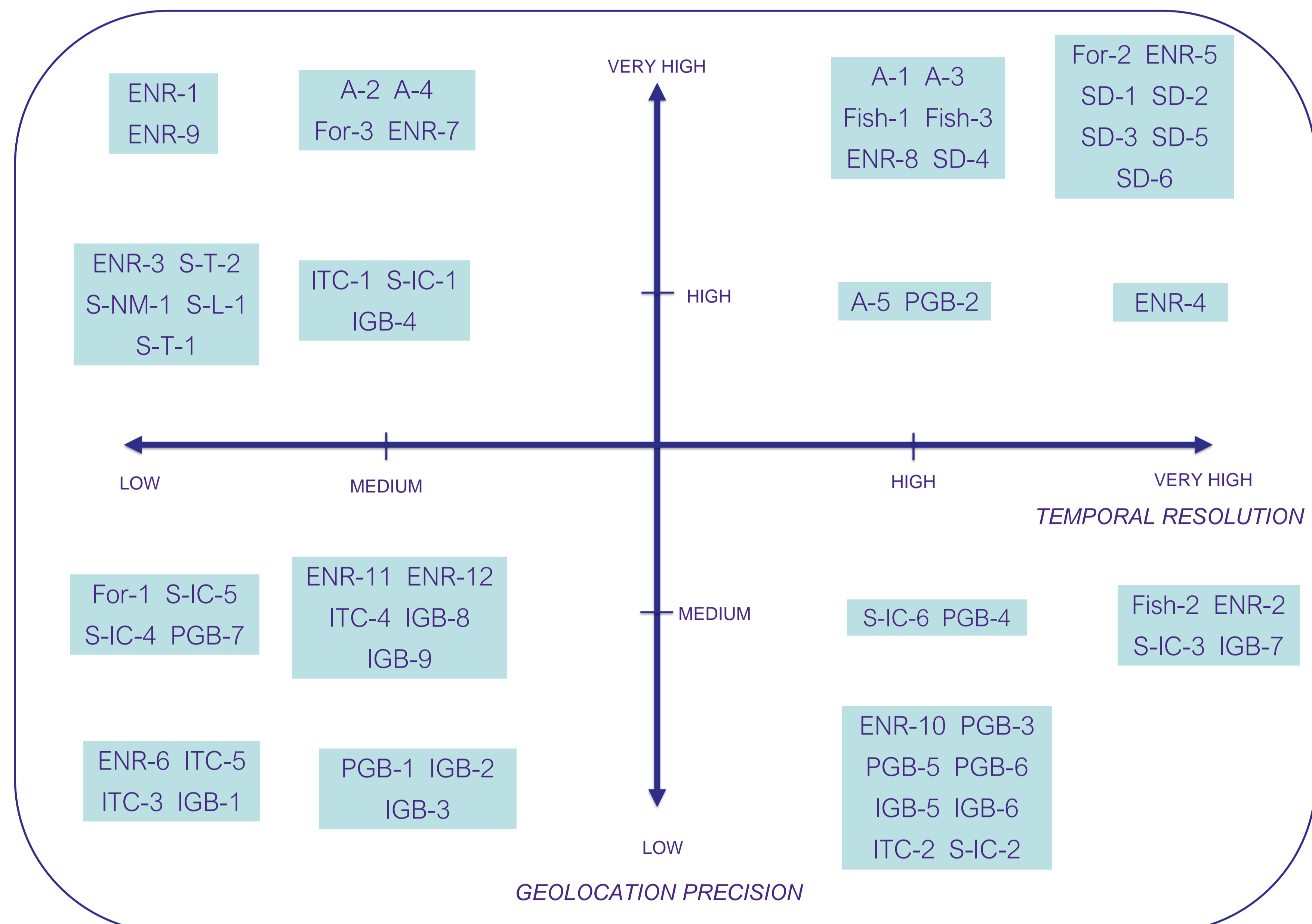
Market needs:

- Spatial resolution
- Spectral resolution
- Temporal resolution
- Geolocation precision
- Geolocation accuracy



MARKET NEEDS CATEGORIES

	Spatial resolution	Spectral resolution	Temporal resolution	Geolocation precision	Geolocation accuracy
Very high	≤ 1 m	15-220 bands	≤ 24h	< 5 m	< 5 m
High	2-15 m	6-15 bands	2 - 4 days	5-10 m	5-10 m
Medium	15-50 m	4-6 bands	4-16 days	10-50 m	10-50 m
Low	> 50 m	≤ 3 bands	> 16 days	> 50 m	> 50 m



CONCLUSIONS

- Most of the opportunities require a minimum **high spatial resolution** image.
- High potential of **thermal images**, but it will be necessary to **improve the spatial resolution**.
- For the opportunities related to **mapping, cartography, and soil sampling** the **hyperspectral image** is promising.
- Attractive to include the **SWIR band** in the multispectral image.

