



Survey about DSM generation from Pléiades

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Context

Pléiades data are more and more used in several application fields

Lots of applications require the use of relief information

Methods to generate Digital Surface Models are now mature

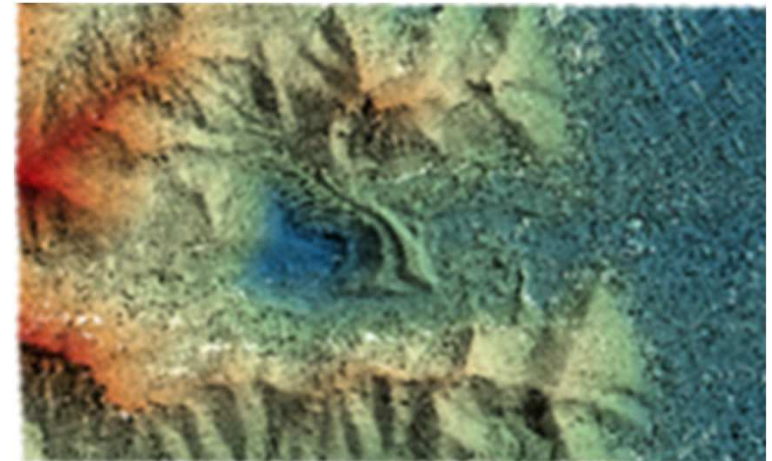
Scientific french community and public entities have no easy-to-use tool or service to generate elevation information from Pléiades

The thematic data centers ForM@Ter (Solid Earth) and Theia-Land (Continental Surfaces) are willing to offer this support

DSM proposed from Pléiades

Characteristics

- Z precision around 1.5 m for a stereo pair and slopes less than 20%
- Planimetric precision around 9 meters (absolute) – 1 meter (relative)
- Spatial resolution between 0.5 and 10 m



Post-processing

- Filtering of outliers
- Interpolation on a regular grid - GeoTIFF grid with elevation (Z)
- Some areas cannot be measured and are set to « no data value »
- A radiometric image is delivered (P or P+XS)

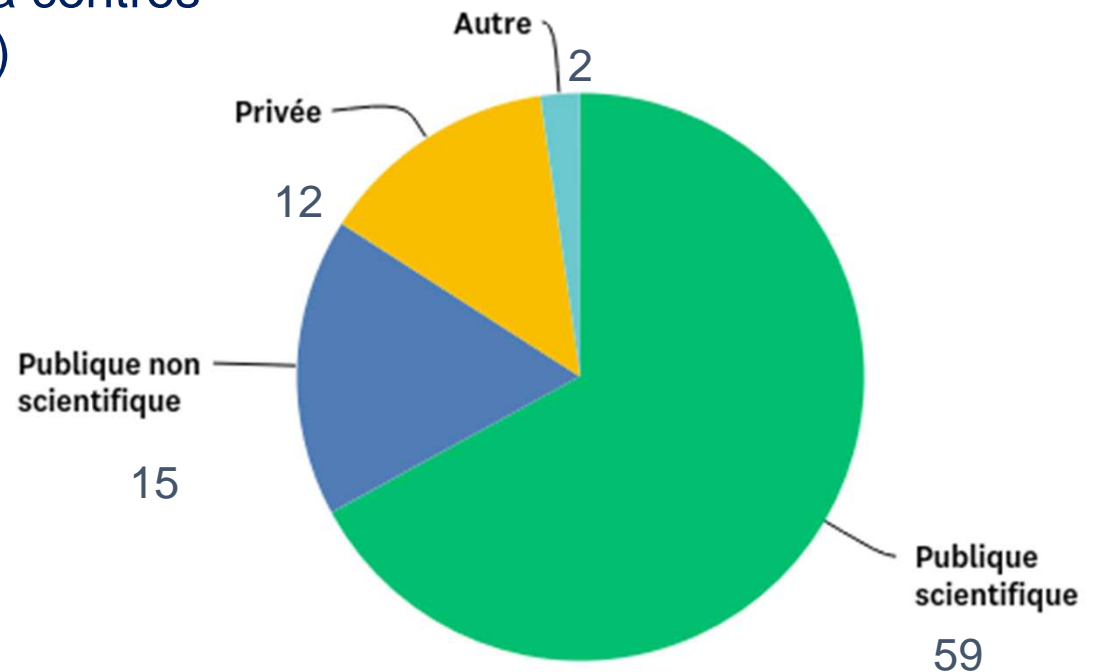
Survey for the French users

A survey was launched in July 2019 through

- THEIA and ForM@Ter thematic data centres
- Geomatic community (Decryptageo)
- CNES partners for applications

Results: 88 Answers

- 79 interested
- 7 able to produce by themselves
- 2 non interested

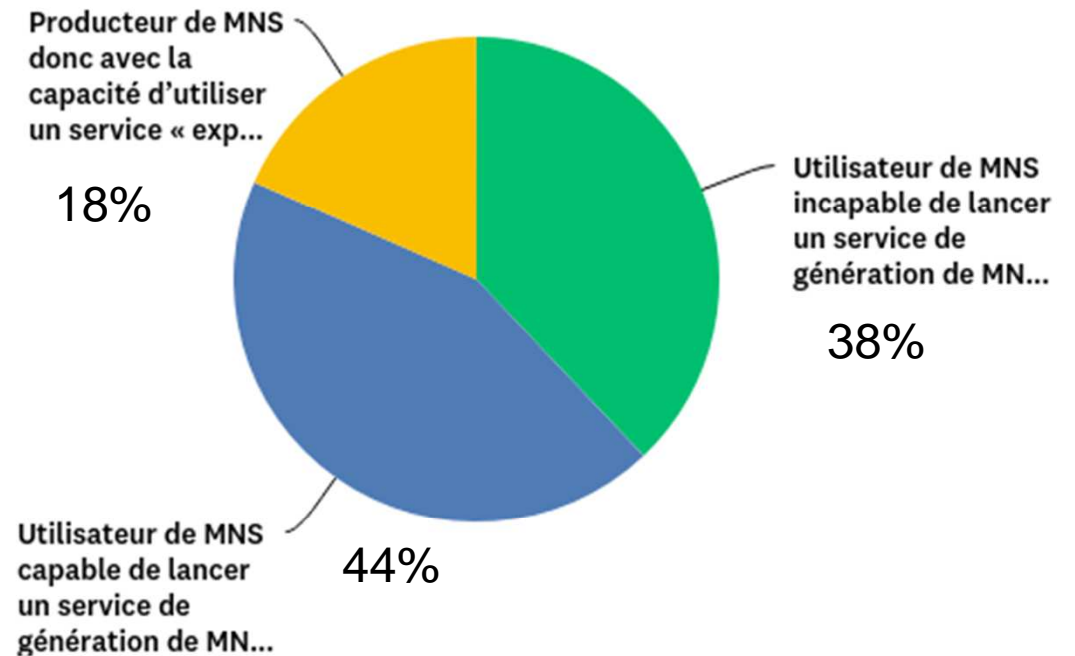


Level of service requested

38% cannot use an online service

44% would use a simplified service

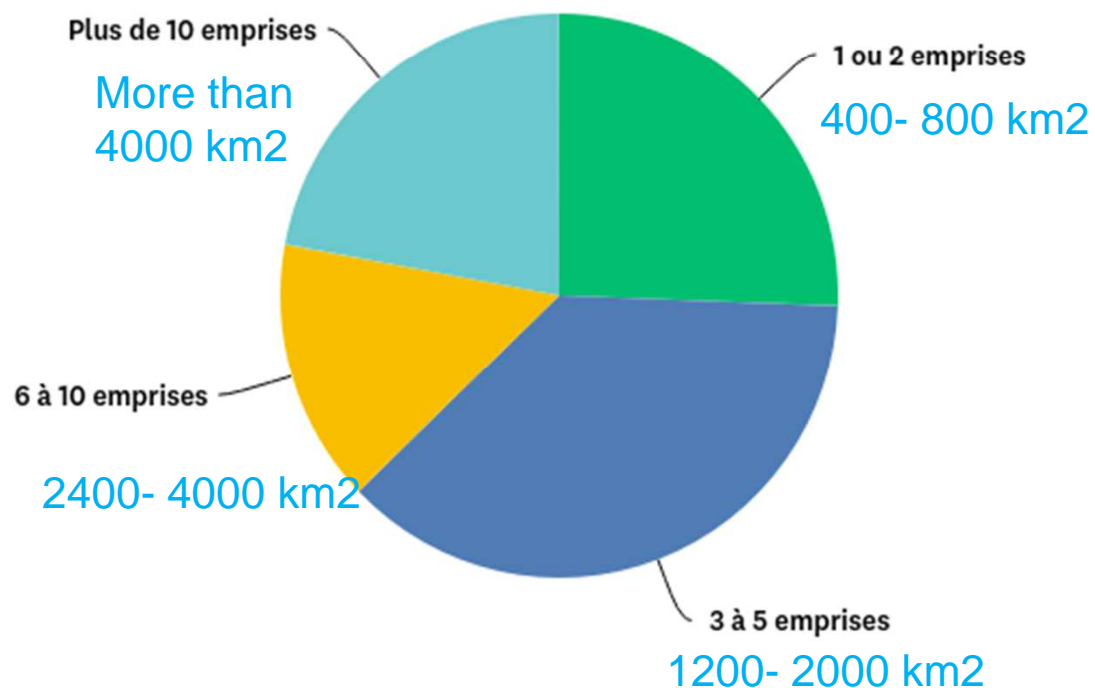
18% would use an expert service



CAPABILITY for TASKING: 44% need support to specify stereo tasking

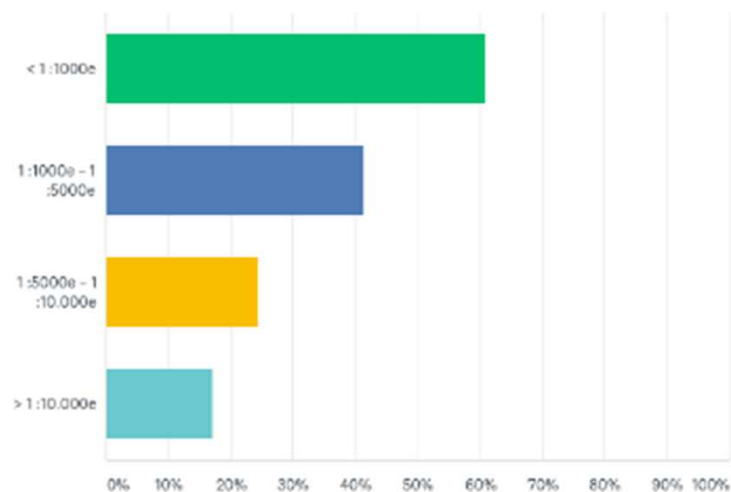
Annual needs

More than 500 Pléiades (20kmx20km) footprints each year for these 86 users: 200 000 km²



Precision requested

Several feedbacks mostly related to the precision of positioning in planimetry that needs to be improved (mainly for urban applications)



50% need a very precise scale 1/1000 for their applications

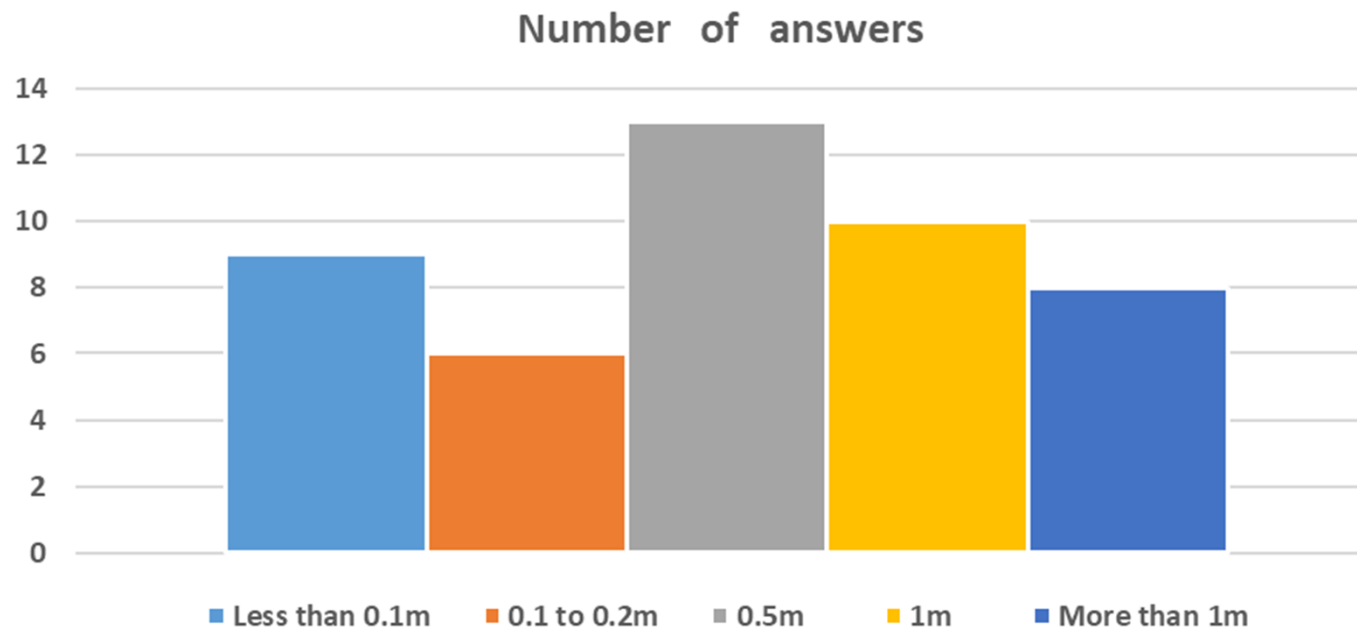
Needs for products derived from DSMs

55 / 88 users have additional needs:

- **Buildings and/or Vegetation height (30 answers)**
- **Whole Digital Elevation model (5 answers)**
- **Digital Terrain model (10)**
- **Other needs (8)**
 - Height of dams or ancient walls
 - Interpolation, precision, water mask, slopes computation
 - Fusion with other Z information

Need for Z change detection

- 64 /88 users are interested in Z change detection
- Precision in Z variation requested by users difficult to obtain with Pléiades



Lessons learnt

- **Various types of entities** - answers are representative of people familiar to EO
- **More than 1/3 need support for stereo-tasking and end-to-end service (not only on-line processing)**
- **Most users also need**
 - Elevation or 3D classification
 - Z Change detection
- **Precision remains a challenge for some applications**

