Cartography of high mountain areas

Test of digital cliff drawing

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New topographic base map (1:25 000)
- new production and update process
- automatic production from digital databases
- fully digital process

Problems:
- Legend items not present in the digital databases but necessary to draw the map (ex: landcover themes)
- Digital representation
Stages carried out for this study

- Extraction of lacking information, necessary to draw the map in mountain areas (Rocks, screes, glaciers)
- Development of a digital cartographic representation, for rocks and screes areas
Extraction of lacking information

→ Out of aerial (ortho)images

But it is not enough…
Problems

- Classes with similar radiometry
  - Rocks / screes, screes / glaciers, shadow / water,…

- Radiometric variations inside a class

→ Introduction of external knowledge
  ex: links landcover / relief (altitude, slope, orientation)
Extraction of lacking information (2)

• 2 steps
1) Segmentation into homogeneous regions
Extraction of lacking information (3)

- Combination of data sources

Orthoimage  DTM  Corine Land Cover

Probabilities
Extraction of lacking information (4)

2) Semi-automatic classification

Red = rocks; Pink = screes; Yellow = pastures; White = glaciers
Further processes for the cartographic representation

- Small areas are filtered out → we keep only relevant areas at 1:25 000
- Classification of rocky areas. They are split up:
  - Following their orientation (with a 20° step)
  - Following the slope value (threshold: 100%)
- Classification of scree areas according to the slope, and extraction of main slope lines
- Upper borders extraction in steep slope rocky areas
- Ridges extraction
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- **Target**: affect a symbolisation to data.
  - Get the most expressive possible result

- **Map prototype**
- **Aerial orthoimage**
- **Current IGN map**
Rocky areas

Hatched pattern for steep slope areas
Angled according to the neighbour steepest slope

Hatched pattern for gentle slope areas
Angled according to the neighbour contour line tangent
Screes areas

Growing points symbols along the steepest slope lines

Pattern suggesting rocks randomly disposed
Ridge-line representation

Upper borders in rocky areas

Crests
Still an on-going work

- Extraction of structure lines, to enrich the representation
- In the automatic extraction, confusion between snow-covered areas and glaciers

Automatic extraction

→ Currently, interactive control

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Thank you!