



6th ICA Mountain Cartography Workshop

Cartography of high mountain areas

Test of digital cliff drawing

Loïc GONDOL

Arnaud LE BRIS

François LECORDIX

IGN France

Context

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

Context

Information
retrieval

Cartographic
representation

Prospects

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

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Extraction of lacking information

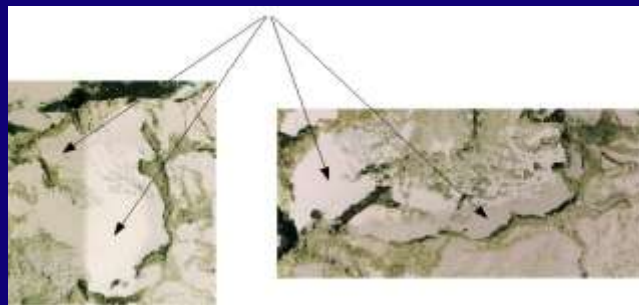
→ Out of aerial (ortho)images



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)

Context

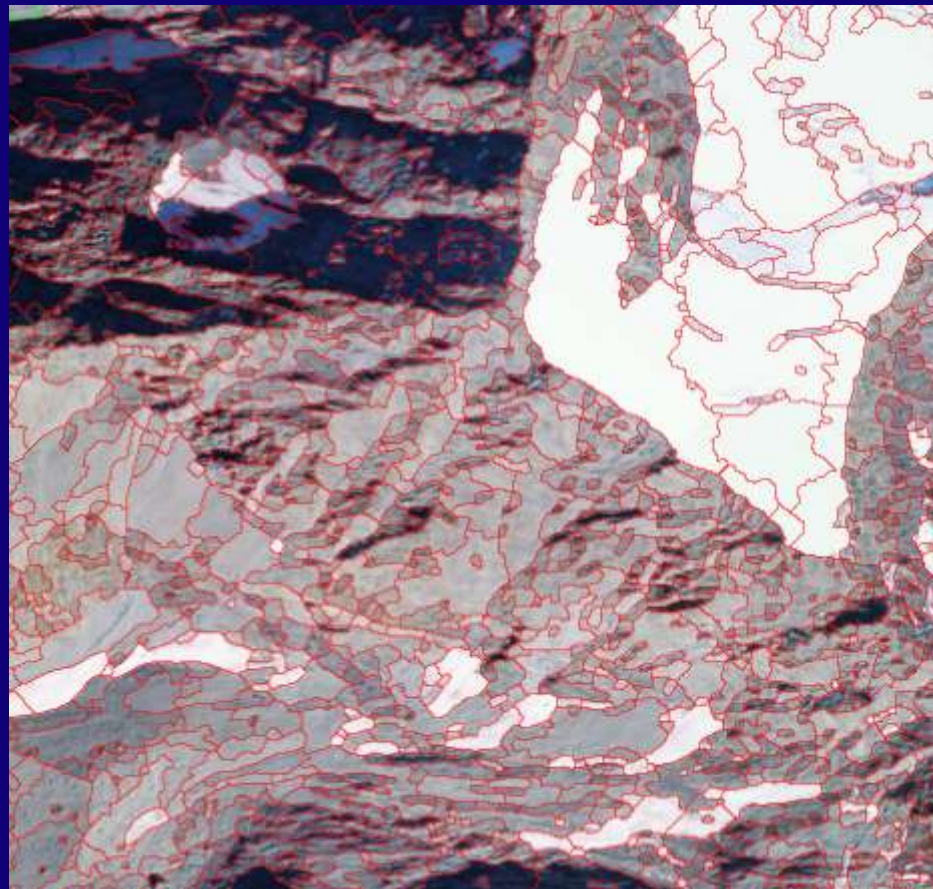
Information
retrieval

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Extraction of lacking information (2)

- 2 steps
- 1) Segmentation into homogeneous regions



Context

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Extraction of lacking information (3)

- Combination of data sources



Orthoimage

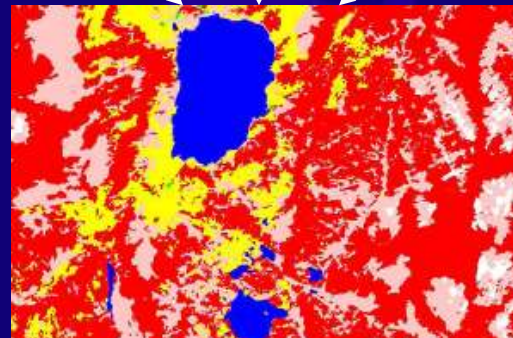


DTM



Corine Land Cover

Probabilities



Context
Information
retrieval
Cartographic
representation
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Extraction of lacking information (4)

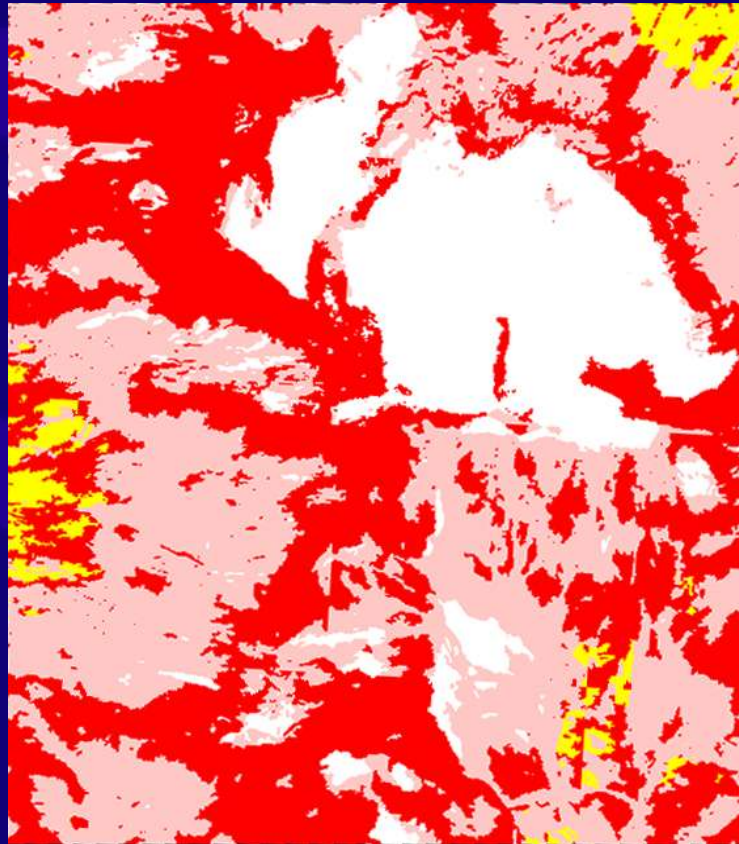
2) Semi-automatic classification

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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 screes 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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Digital cartography of high mountain areas

- Target : affect a symbolisation to data.
→ Get the most expressive possible result

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Map prototype



Aerial orthoimage



Current IGN map

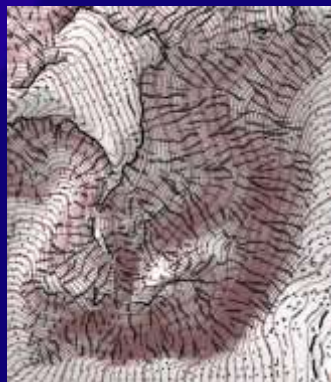
Rocky areas

Context

Information
retrieval

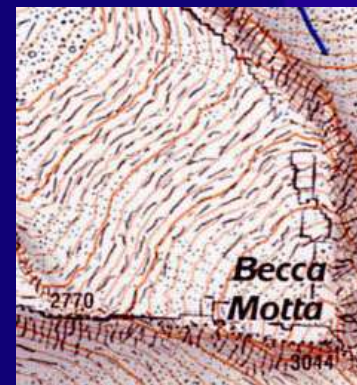
Cartographic
representation

Prospects



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

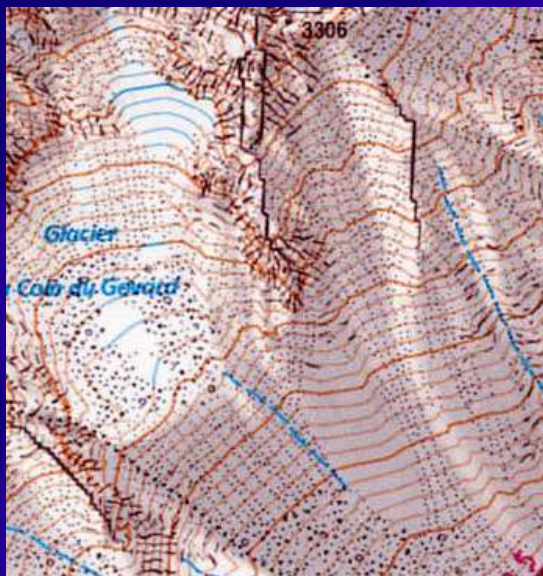
Screes areas

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Growing points symbols along
the steepest slope lines



Pattern suggesting rocks
randomly disposed

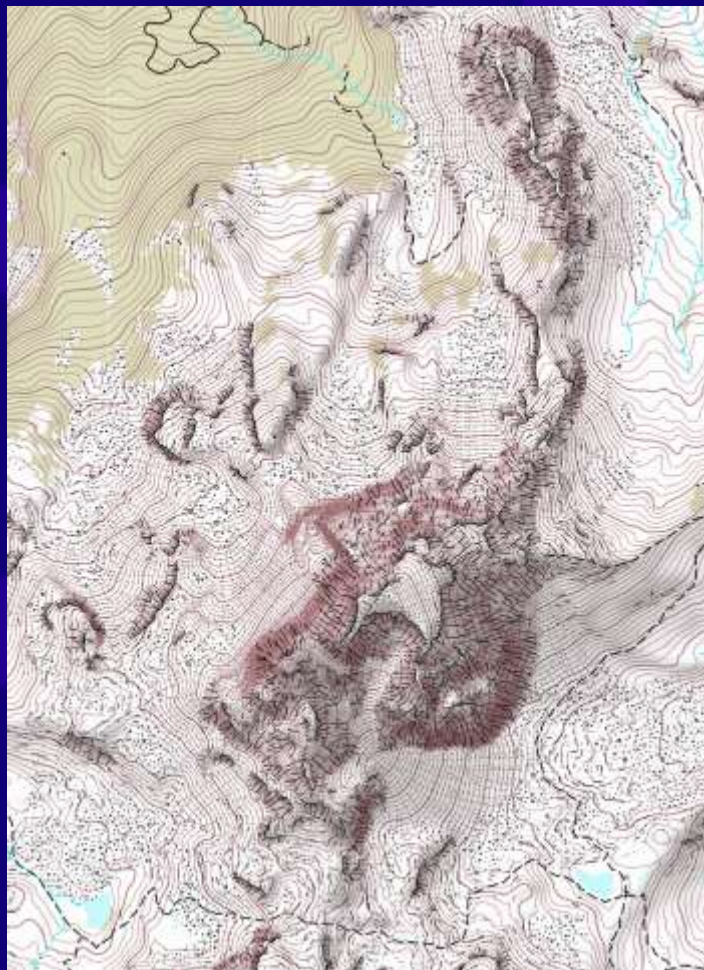
Ridge-line representation

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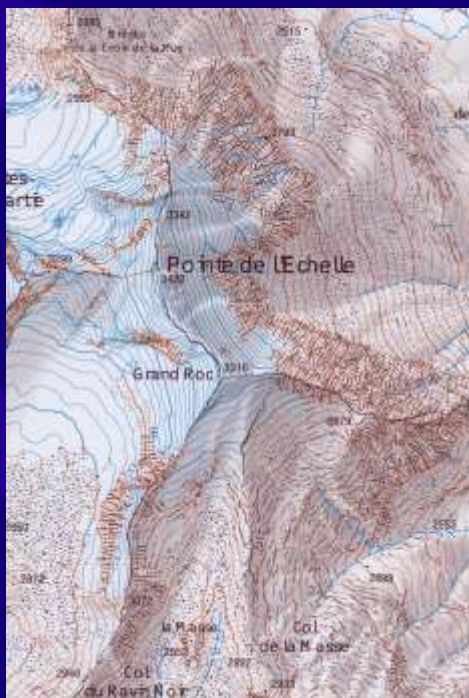
Upper borders in rocky areas



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



Interactive control

→ Currently, **interactive control**

- ...

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Thank you !