“Designing MRDB and multi-scale DCMs: sharing experience between governmental mapping agencies”

21-22 March 2013, Barcelona, hosted by the Institut Cartografic de Catalunya

Cécile Duchêne, Jantien Stoter, Dirk Burghardt
GENESIS AND OBJECTIVE OF THE SYMPOSIUM

• Generalisation workshop in Istanbul, September 2012
  => many NMAs working on building MRDBs and using them to produce multi-scale DCMs
  => interest of several NMAs for a meeting to share experience

• Previous meetings of the same kind hosted by the ITC (2005) and Swisstopo (2010)

• Invitation through classical ICA and EuroSDR channels

• The meeting took place in Barcelona, hosted by the ICC (Catalonia)
23 people from 12 NMAs attended the symposium

- Represented NMAs (country/region):
  - IGN-B (Belgium)
  - ICC (Catalonia)
  - GST (Denmark)
  - NLS (Finland)
  - IGN-F (France)
  - AdV (German regions)
  - OSGB (Great Britain)
  - OSI (Ireland)
  - Kadaster NL (Netherlands)
  - IGN-S (Spain)
  - Swisstopo (Switzerland)
  - USGS (USA-visioconference)
ORGANISATION OF THE SYMPOSIUM

• 1.5 day meeting
  – Each NMA made a presentation
  – Breakout discussions

• Content of presentations:
  – Include a « derivation scheme » (operational/planned): DLM1 ↔ DCM1 ↔ DCM2 ↔ ...
  – Describe whole production architecture (operational/planned)
  – And/or focus on particular aspect(s):
    • building an MRDB
    • workflow for a particular DCM
    • delivery on the web, etc.
Different approaches & focuses in NMAs (1/4)
« Derivation schemes » presented by NMAs

- ICC (Catalonia)
- OSGB (Great Britain)
- Swisstopo (Switzerland)
- IGN-B (Belgium)
- OSI (Ireland)
- AdV (German regions)
- IGN-F (France)
- NLS (Finland)
- IGN-S (Spain)
- GST (Denmark)
Different approaches & focuses in NMAs (1/4)

- Derivation schemes: star vs ladder?
STAR VS LADDER?

« Star » approach

« Ladder » approach

Mixed approaches

[EuroGeographics, 2005]
« Derivation schemes » presented by NMAs

ICG (Catalonia)

OSGB (Great Britain)

Swisstopo (Switzerland)

IGN-B (Belgium)

OSI (Ireland)

AdV (German regions)

IGN-F (France)

NLS (Finland)

IGN-S (Spain)

GST (Denmark)
Different approaches & focuses in NMAs
(1/4)

• Derivation schemes: star vs ladder?
  – Most NMAs have a mixed approach (confirms survey by [Foerster et al. 2010])
Different approaches & focuses in NMAs

(1/4)

• Derivation schemes: star vs ladder?

• Distinguish DLMs and DCMs? (and model vs cartographic generalisation)
  – Some NMAs do, some others don’t
« Derivation schemes » presented by NMAs

DLM (Catalonia) DCM

OSGB (Great Britain) Swisstopo (Switzerland)

IGN-B (Belgium)

OSI (Ireland) AdV (German regions)

IGN-F (France)

NLS (Finland) IGN-S (Spain)

GST (Denmark)

23 August 2013 2013 ICA/EuroSDR Barcelona NMA Symposium report
Different approaches & focuses in NMAs (1/4)

- Derivation schemes: star vs ladder?

- Distinguish DLMs and DCMs? (and model vs cartographic generalisation)

- Used tools?
  - Always commercial software + ad hoc developments
  - Developments: home made most of the time, sometimes outsourced to software providers
Different approaches & focuses in NMAs

(1/4)

• Derivation schemes: star vs ladder?

• Distinguish DLMs and DCMs? (and model vs cartographic generalisation)

• Used tools?

• Degree of automation
  – Semi-automatic (scripts chained manually) (e.g. NLS-Finland, all lods)
  – Automatic stage + manual edits (e.g. Swisstopo, IGN-F 10k => classical 25k)
  – Fully automatic (e.g. OSGB 1.25-10k => light 25k; IGN-F 10k => light 25k; KNL 10k=>50k;)
DEGREE OF AUTOMATION

Automated + manual edits

Swisstopo 1:25k

Fully automated

OSGB

Source data (2.5-10k)  
OS VectorMap® District Beta (light 1:25k)

IGN-France

« Scan express » (light 1:25k)

Kadaster NL

Source data (10k)  
50k DCM

Ordnance Survey © Crown Copyright
Different approaches & focuses in NMAs

(2/4)

- Degree of automation and cartographic quality expectations
  - Cartographic quality expectations have changed in some NMAs...
    Idea: the users might prefer more up to date information with lowest graphical quality
    ⇒ Compromises are made regarding
      • the level of refinement
      • acceptance rate of graphical errors remaining on the map
  - ... but not in all NMAs/not for all products
    other strategies exist with higher amount of manual corrections to improve graphical quality
  - Challenge to find the right balance to satisfy user requirements
Different approaches & focuses in NMAs (3/4)

- MRDB management (links btw lods)
  - Several NMAs have begun to manage MRDBs and believe in incremental updating
  - But some issues related to the management of unique IDs
    - Lack of tools e.g. to manage unique IDs not internal to the software
    - Other identified problems: cf. presentation of IGN-Belgium + breakout session report
  - To date, in production:
    - Some automated tools to detect relevant changes
    - Propagation of updates is not automated

- Incremental updating vs full re-derivation
  - Both approaches exist even in a same NMA
  - Depends notably on degree of automation, expected data stability over time for users
Different approaches & focuses in NMAs (4/4)

• Maps for delivery on the web
  – All NMAs now deliver both paper and web maps, and have geoportals
    Although considered map scales are still mainly « traditional » (paper) scales
  – Some NMAs concentrated on web delivery first, others on automation first
    => more or less sophisticated viewers/geoportals
  – Topics studied in several NMAs:
    • homogeneizing symbols across scales for web maps
    • producing dedicated content & symbols for backdrop maps
    • services to enable online customisation
Different approaches & focuses in NMAs (4/4)

- Maps for delivery on the web
  - All NMAs now deliver both paper and web maps, and have geoportals
  - Although considered map scales are still mainly "traditional" (paper) scales
  - Some NMAs concentrated on web delivery first, others on automation first
    => more or less sophisticated viewers/geoportals

- Topics studied in several NMAs:
  - Homogenizing symbols across scales for web maps
  - Producing dedicated content & symbols for backdrop maps
  - Services to enable online customisation

USGS viewer
• Maps for delivery on the web
  – All NMAs now deliver both paper and web maps, and have geoportals
    Although considered map scales are still mainly « traditional » (paper) scales
  – Some NMAs concentrated on web delivery first, others on automation first
    => more or less sophisticated viewers/geoportals
  – Topics studied in several NMAs:
    • homogeneizing symbols across scales for web maps
    • producing dedicated content & symbols for backdrop maps
    • services to enable online customisation
MAJOR RECENT ACHIEVEMENTS

• Survey by [Foerster et al. 2010]:
  – “full automated generalisation processes do not exist”
  – only 5 out of the 11 considered NMAs had made major steps towards automation

• Today
  – 11 out of the 12 NMAs present in Barcelona have automated generalisation in production
  – Automated generalisation is good enough to provide acceptable products without or with minor manual edits

⇒ Full/almost full automation is partly enabled by changing view on the problem: solutions do not need to be perfect but “good enough”

⇒ But also: gap btw research and production partly filled, thanks to
  – Maturity in research
  – Investment of NMAs in development
  – Progress made by commercial software
  – Collaboration between researchers/NMAs/software vendors [e.g. this workshops series, EuroSDR project]
Six topics discussed

• Incremental updates (and need for keeping links between lods)
• Cartographic quality vs up-to-dateness
• Sharing experience on generalisation tools
• On-demand mapping: how far can we go?
• Future challenges for NMAs
• Possible further collaborations between NMAs
Six topics discussed

- Incremental updates (and need for keeping links between lods)
- Cartographic quality vs up-to-dateness
- Sharing experience on generalisation tools
- On-demand mapping: how far can we go?
- Future challenges for NMAs
- Possible further collaborations between NMAs
Identified future challenges for NMAs (1/3)

- Technical challenges
  - On-demand mapping: exploiting MRDB for specific requirements
    - + on-the-fly generalisation would increase flexibility
  - Incremental automatic update
  - Supporting “analytical products” (especially at smaller scales):
    - analytical products = product mixing NMA data (backdrop) + user/third party data
  - Management of 3D data
Identified future challenges for NMAs (2/3)

- Challenges regarding resources and business models
  - Resources
    - pressure about more products in shorter time with less resources
    - how to minimize cost to capture data, maintain data
  - Responsibility
    - Some NMA have outsourced part of their work → risk that know how gets lost
  - Business models
    - debate about free data (should NMA give their data free)
    - OSM, Google, etc. => it seems data have less value – How to cope with that?
      ⇒ services on top of the data?
      ⇒ better cartographic quality?
      ⇒ how to convince (especially young) people that good cartographic products enable better decision making?
Identified future challenges for NMAs (3/3)

• Challenges regarding user requirements
  – Is there a high value in high quality cartographic data?
    • assumption: quality cartographic products enable better decision making
    • does lower cartographic quality satisfy user requirements as well?
  – Need to invest more time to understand user requirements
CONCLUSION / FUTURE

• All participants found the meeting useful and are interested in having this kind of meetings regularly

• Also a means of doing benchmarking for the community

• Material available
  – Presentations available on generalisation.icaci.org, « Previous events » section
  – Reports from breakout sessions not yet published, expected soon
  – No written report (yet), but...
  – ...a chapter of the new ICA book on generalisation is about generalisation within NMAs (chapter 11)
    • Contains written contributions from 7 NMAs present in Barcelona + JRC
    • Contains a section summarising main achievements and future challenges. Input: written contributions + presentations and discussions in Barcelona
Thank you!
Questions?
DEGREE OF AUTOMATION

Automated + manual edits

Swisstopo 1:25k

Fully automated

OSGB

Ordnance Survey © Crown Copyright

Source data (2.5-10k)

OS VectorMap® District Beta (light 1:25k)

IGN-France

« Scan express » (light 1:25k)

Kadaster NL

Source data (10k)

50k DCM

Full automation possible depending on:
– considered scales,
– used/developed tools,
– level of exigence in cartographic quality,
– density of buildings kept in urban zones