

LPIS QA methodology



www.jrc.ec.europa.eu

Serving society
Stimulating innovation
Supporting legislation

Joint
Research
Centre

Outline

Observations on the 2013 exercise:

- Procedure
- Imagery
- Inspection
- Assessment and evaluation

Changes to the 2014 LPIS QA

- nominal
- documentation
- automated screening

Changes to the 2015 LPIS QA

- the proposals of the Baveno WS
- effective

Conclusions

Joint
Research
Centre

2

JRC procedure

http://mars.jrc.ec.europa.eu/mars/content/download/3220/16218/file/22_WD_JRC.pdf

ETS reporting packages are analysed to identify topics that might bias the LPIS QA results.

- unrepresentative scope
- selective inspection
- unreliable measurements
- mitigated processing

The subsequent mission “fills the gaps”.

As this is an internal inspection, correct ETS implementation should not cause any concern.

Workload: 3-5 working days

Findings on image quality

http://mars.jrc.ec.europa.eu/mars/content/download/3328/16647/file/4-Image_quality_KickOff2014.pdf

Image quality is essential... poor image quality

causes extra costs (RFV)

requires more skilled operators (mitigation)

introduces extra risks (@re-performance)

“best practice”: image quality control is the key remedy:

- Technical specifications could need investigation
- External data: (before delivery/use), formal acceptance of:
 - predecessors (ancillary data)
 - final ortho product
- Ensure that all procedures are applied correctly
 - Assign responsibility for the quality
 - Step by step control
- Metadata needs to be extended with quality metadata

Findings on CAPI

http://mars.jrc.ec.europa.eu/mars/content/download/3329/16650/file/5-CAPI_Luketic.pdf

Key skill is understanding:

- eligibility conditions from an image perspective
- CAPI Limitations and role of RFV
- applicable mapping rules

These are essentially connected to your eligibility profile.

Make the appropriate decision during the process.

- Individually
- Fall-back tier (4 eyes)

Successes from technology viewpoint

- evidence of investments
 - IT tools
 - internal QC
- dedicated inspectors
- good skills and understanding of
 - LPIS as a whole
 - local eligibility needs and alignment with the LPIS needs

Remaining weaknesses and remedies

- some gaps in the understanding of methodology training?
- avoiding RFV
optimise selection of zones?
- analysis without “out-of-the box” thinking
second opinions?
- No/insufficient actions on addressing issues
 - (historic) geometric errors in GIS
 - regional variations



Slide 7 http://mars.jrc.ec.europa.eu/mars/content/download/3097/15762/file/Martin_UK-NI.pdf

Changes to the 2014 guidance



ETS v5.3

2014 assessment with 2013 version?

YES:

NO changes in the

- quality elements, measures (Annex I) and thresholds
- activity procedure (Annex II)
- eligibility rules (Annex III)
- templates and schemas

Both assessments correctly applied: direct comparability of all results

If 2013 ETS performed incorrectly => address and accommodate

What has changed?

Nominal :

Deadline 2014 ETS reporting package: Sat 31 January 2015

in practice: Mon 2 February 2015

⇒ All info (assessment report / remedial action plan / packages) at the same date

Documentation changes

WikiCAP

- new chapter “specific examples of calculation”
 - Scoping (from Baveno training and introduction of Annex I)
 - QE1b, (from revised Baveno ppt)
 - QE6, (from revised ETS4.3 support pages)
- Revised “critical defect” illustrations, screening results,...
- Errata correction

Annex I : introductory part moved (to new chapter above)

Annex II :

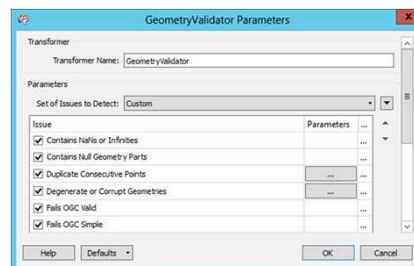
- initial acceptance of orthoimage moved from Annex II (WikiCAP)
- check for the correctness of the presence of critical defects (the four-eye control diagram changed)

11

Automatic screening

WikiCAP :

- New Chapter on LPIS QA portal operation
- Better control of upload package (no closure with invalid files)
- Data content tests
 - complete inventory of errors
 - Trial-outs ongoing on ETS 2013



12



Baveno proposals

- Crop measurement becomes default
 - Experience from Spain: cost benefit ???
- Sampling linkage
 - No change in 2014
 - QE7 obsolete from 2015
- Peer review
 - MS raise concerns about validity / disputes
- Dedicated LPIS QA zoning
Proposal repeated in following slides

?

DECLINED

DECLINED

ACCEPTED

Dedicated LPIS QA zoning

Original discussion: use of CwRS zones causes minimum impact

- Specifications are roughly similar (area measurement)
 - No extra financial impact for existing CwRS programs
 - No extra planning provisions need for CwRS programs
- CTS guarantees sufficient OTSC density (QE7)
- Perfect integration from IACS processes possible
- OTSC risk is (mostly) unrelated to LPIS quality so can be ignored

In practice

- CwRS program maximizes area (5% OTSC) in a time-window
 - Several MS use proprietary aerial
 - Use of IKONOS (phasing out)
 - Viewing angles
- Some OTSC zones do not respect the CTS OTSC density
 - Low QE7 sample
 - Too spread out for field observations
- Misunderstanding OTSC risk zone and LPIS QA impact
 - Unrepresentative sample
- Some MS use square scenes, other administrative boundaries
- Acquisition windows do not necessarily match
 - crop identification vs land cover delineation
- Some OTSC and LPIS administrations do not collaborate
UNACCEPTABLE in IACS

Proposal - for discussion

Independent and random LPIS QA zone selection

Two image options

a/ image provision through JRC-CID

b/ image provision through national aerial contract

Both options:

15kmx15km random scenes provided as part of JRC sampling process

a/ on-the-fly during the campaign

b/ at the beginning of the year

Hold 100-150 applications linked to the random OTSC sample

Zone determination

1. Numbers controlled by representativeness of 15kmx15km scene
 - 1 zone up to 150kmx150km of territory
 - minimum distance of 250km between zone
 - Max. 3-5 zones f(parcel density, population), followed by homogeneity test
2. Scene boundary tuned by parcel distribution(ensuring efficiency) ?
- 3.a CID zones (tbd with image providers)
 - 100% cloud and haze free
 - Nadir view only so location on orbit
 - Stratified by weather probability
 - Decision made daily triggered by image provider supply
 - => Dynamic sample pre-selection
- 3.b aerial zones
 - Scene locations delivered to MS at once
 - MS responsible for image acquisition and quality
 - =>Static sample pre-selection

19

Q&D feasibility

Rule for zone numbers per LPIS
 $\leq (nP * \mu) / (0.05 * A * d) \{+ e\}$

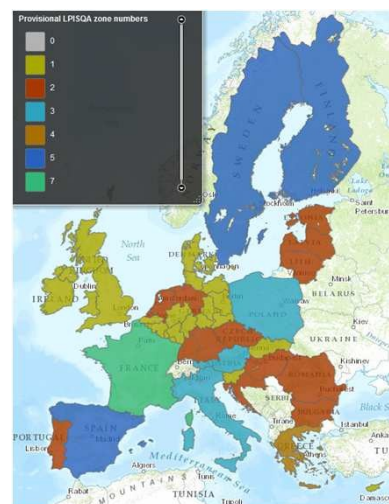
Where

- nP: LPIS QA sample size
- μ : mean parcel area (in ha)
- A: scene area (= 22500ha)
- d: density of agricultural area
- $\{+ e\}$: optional term to ensure
 22500km²/territory > 25%

In practice:

Total EU: ca 83 LPIS QA scenes
 CID allocation ca 0.5 M€)

Provisional number of zones
 See map



20

Conclusions

- Still some surmountable weaknesses in the LPIS QA implementation
- No methodological changes for 2014: ETSv5.3 remains
- Zone Selection and Image quality are the major concern for 2015:
- LPIS QA post 2015 remains BPS based. Greening information not yet included.



Thank you!