The European Commission's science and knowledge service

Joint Research Centre

Analysing the OTSC CwRS satellite image use

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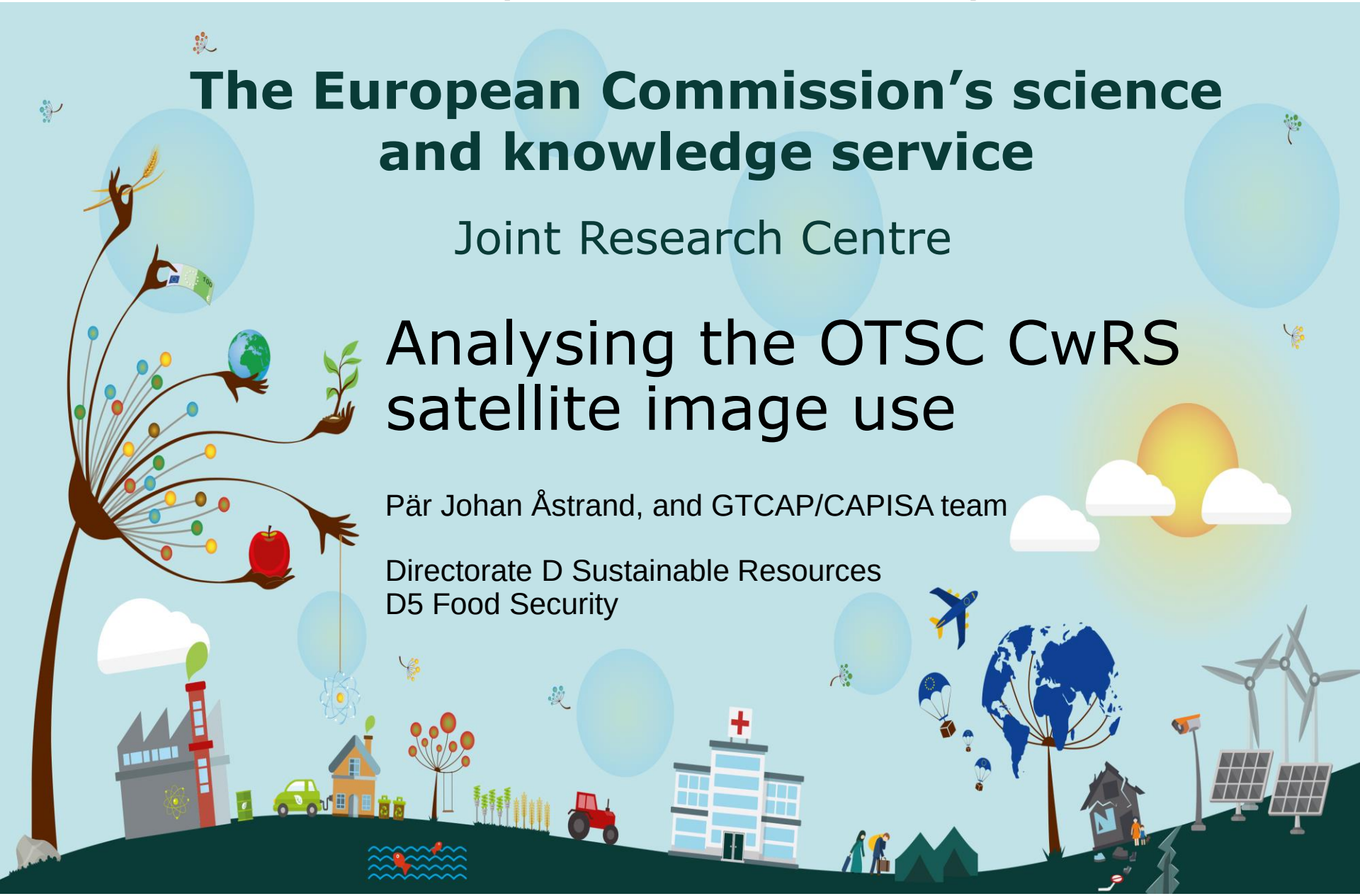


Preamble

In order to make any analysis of the OTSC CwRS satellite image use there is a need of:

- Adequate reporting, data gathering, and supporting IT system

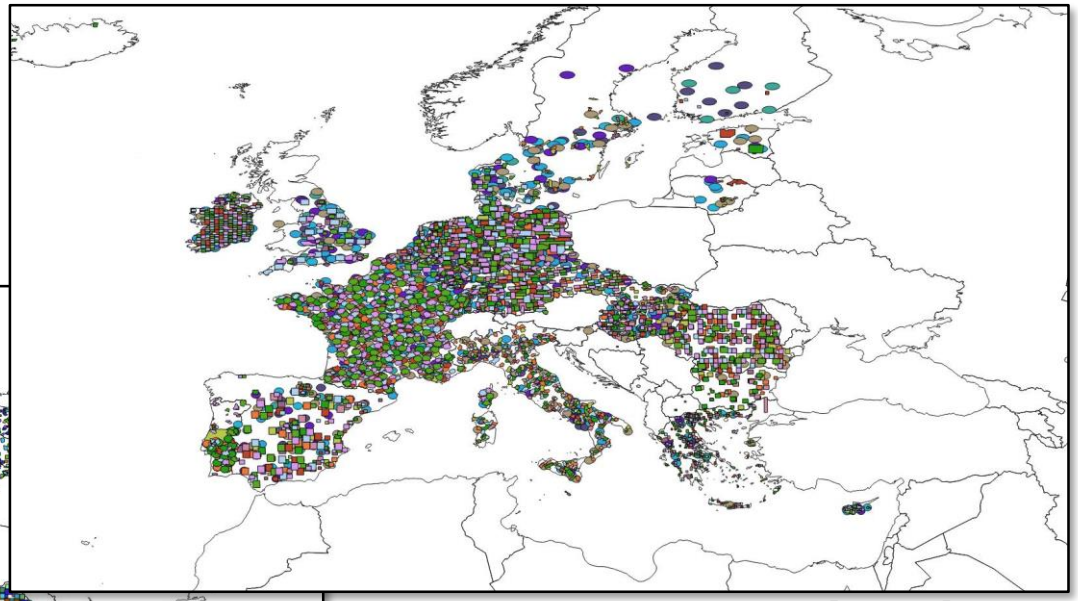
=>

Check of Effective & Efficient image use,

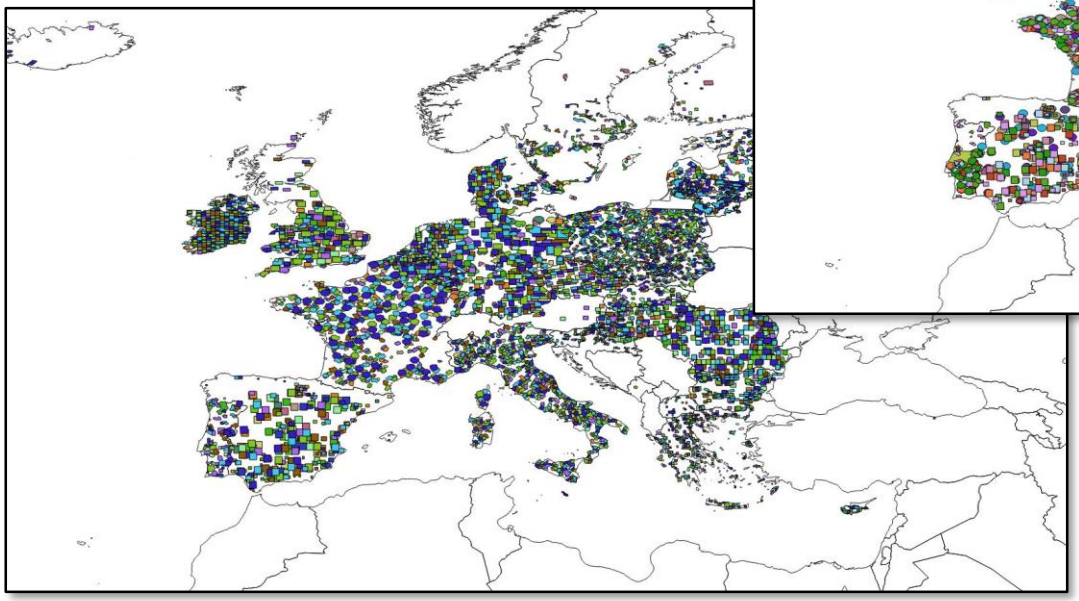
and/or plan for any changes

Outline of presentation

- CwRS Campaigns data reporting
- Analysis
- Remedial action
- Some conclusions



HR-HHR imagery through time



VHR imagery through time

Data reporting; history, legacy, evolution

- Data collection and yearly CwRS QC exercise
  - Performed by external contractor to JRC
  - QC scrutiny on 1 zone imagery and diagnosis
- 2007+ MS PA internal QC
- G^{4}CAP comprehensive data collection by JRC
  - pre Image Request (preIRs), post Image Requests (postIR), and Campaign Result statistics introduced 2016
  - and interactive detailed update of all image acquisition workflow through Campaign
- some issues raised in 2018 IACS workshop
- in parallel: yearly reporting to DG AGRI (H.3)
  - available July year after Campaign;
  - Article 9(1) of Regulation (EU) No 809/2014

Purpose of reporting (1)

- Data volumes evolution - there is a need to understand MS methods, the no. and type of images used and how they fit the checks, also considering the CAP evolution ...

- There is a need to make a good use of the funds

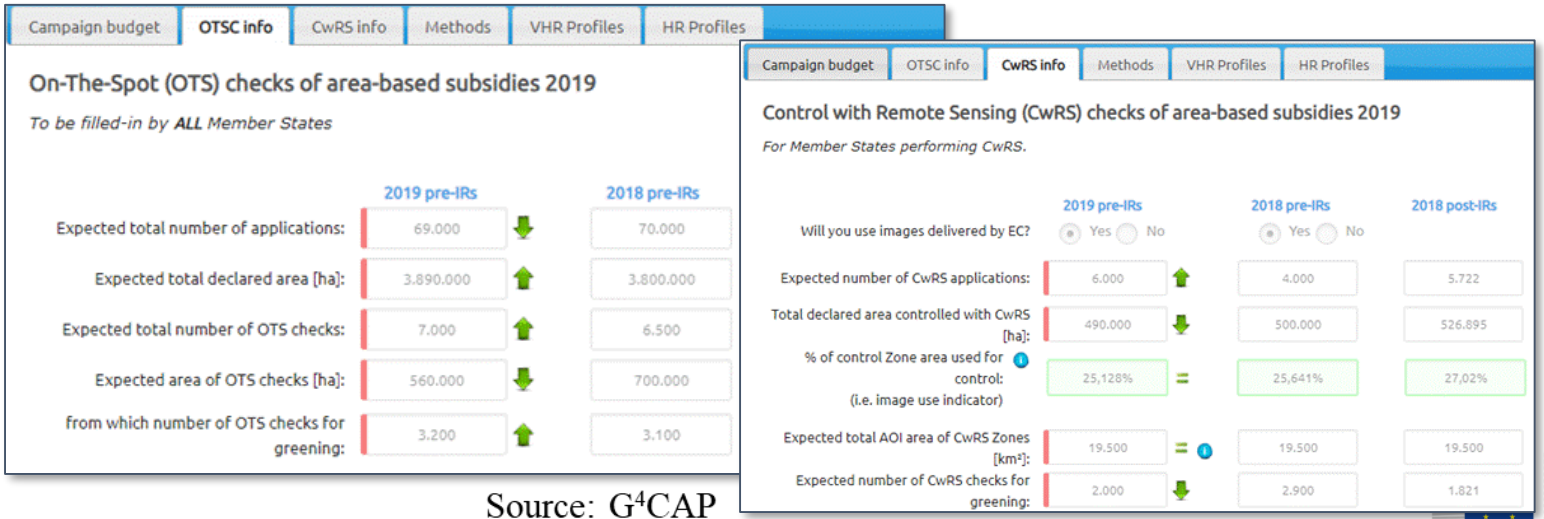
Purpose of reporting (2)

- Manage ever occurring changes
  - Reduction due to some MS Regions starting "Checks by Monitoring (CbM)" (Regulation (EU) 809/2014 as amended in May, 2018; §40a)
  - Allow for use of HHR Time Stacks for small parcels in the CbM
- Other disruptions …

Available data through G⁴CAP - SOS

SOS = Start of season

- Information on hand at Campaign start
- preIR allows recording of:
  - ✓Each MS requests (i.e. expected values for the Campaign)
  - ✓Control method applied, and MS comments/justification for such method
  - ✓Choice of image type and image profiles

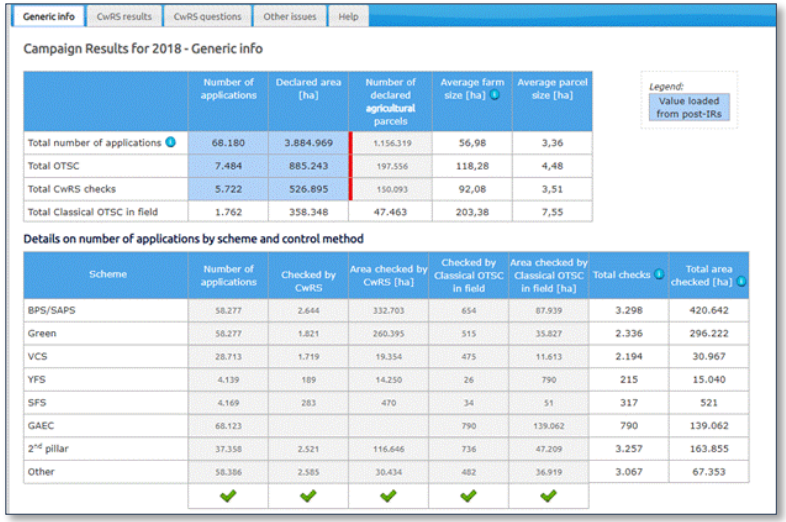


Source: G⁴CAP

Available data through G⁴CAP - EOS

EOS = End of Season

- Information on hand at Campaign end
- G⁴CAP allows recording of:
  - ✓postIR; each MS values (i.e. final values for the Campaign)
  - ✓Campaign Result stats for each MS
- cf. DG AGRI H3 statistics (July after Campaign);



Generic info | CwRS results | CwRS questions | Other issues | Help

Campaign Results for 2018 - Generic info

	Number of applications	Declared area [ha]	Number of declared agricultural parcels	Average farm size [ha]	Average parcel size [ha]
Total number of applications	68.180	3.884.969	1.156.319	56,98	3,36
Total OTSC	7.484	885.243	197.556	118,28	4,48
Total CwRS checks	5.722	526.895	150.093	92,08	3,51
Total Classical OTSC in field	1.762	358.348	47.463	203,38	7,55

Legend: Value loaded from post-IRs

Details on number of applications by scheme and control method

Scheme	Number of applications	Checked by CwRS	Area checked by CwRS [ha]	Checked by Classical OTSC in field	Area checked by Classical OTSC in field [ha]	Total checks	Total area checked [ha]
BPS/SAPS	58.277	2.644	332.703	654	87.939	3.298	420.642
Green	58.277	1.821	260.395	515	35.827	2.336	296.222
VCS	28.713	1.719	19.354	475	11.613	2.194	30.967
YFS	4.139	189	14.250	26	790	215	15.040
SFS	4.169	283	470	34	51	317	521
GAEC	68.123			790	139.062	790	139.062
2nd pillar	37.358	2.521	116.646	736	47.209	3.257	163.855
Other	58.386	2.585	30.434	482	36.919	3.067	67.353

Source: G⁴CAP

Overview of parameters on hand …

- preIRs, postIRs, and Campaign results;
- data volumes requested;
- No. of zones, type of imagery, profiles, number of acquisition windows; => methods
- Acquisition time for imagery
- S2 requests (S2alert, and external)
- % use of imagery within control zone
- % ortho imagery returned to JRC
- % rate of control
- cost of imagery / OTSC area for each MS
- etc.

Analysis - hypothesis

Effectiveness - "Doing the right things"

- Assumed OK since MS complete their 5% OTSC without substantial weaknesses

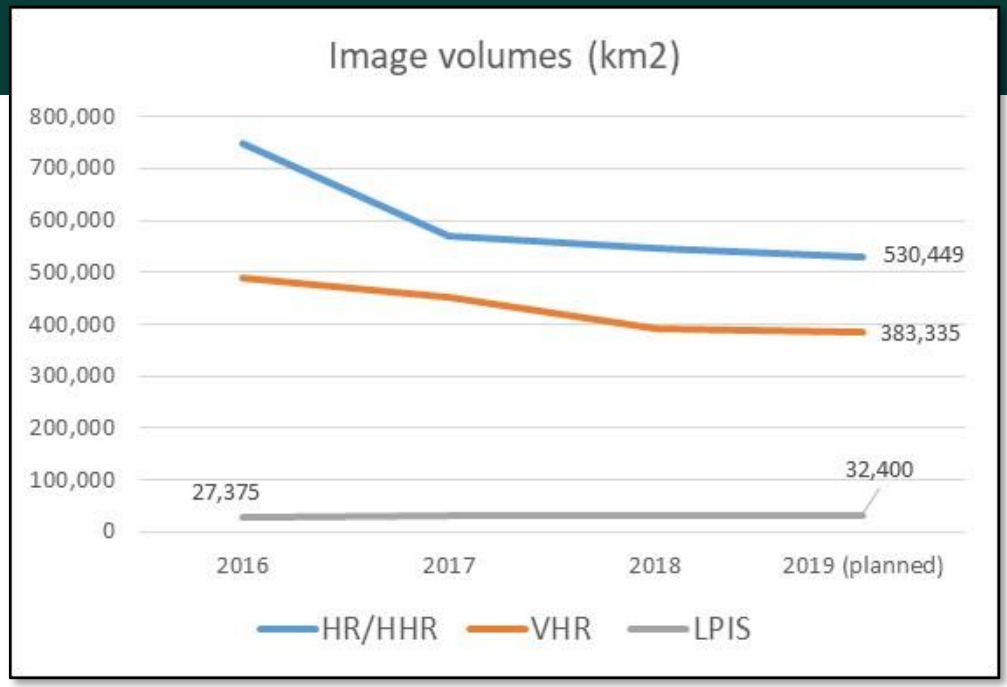
Efficiency - "Doing the things right"

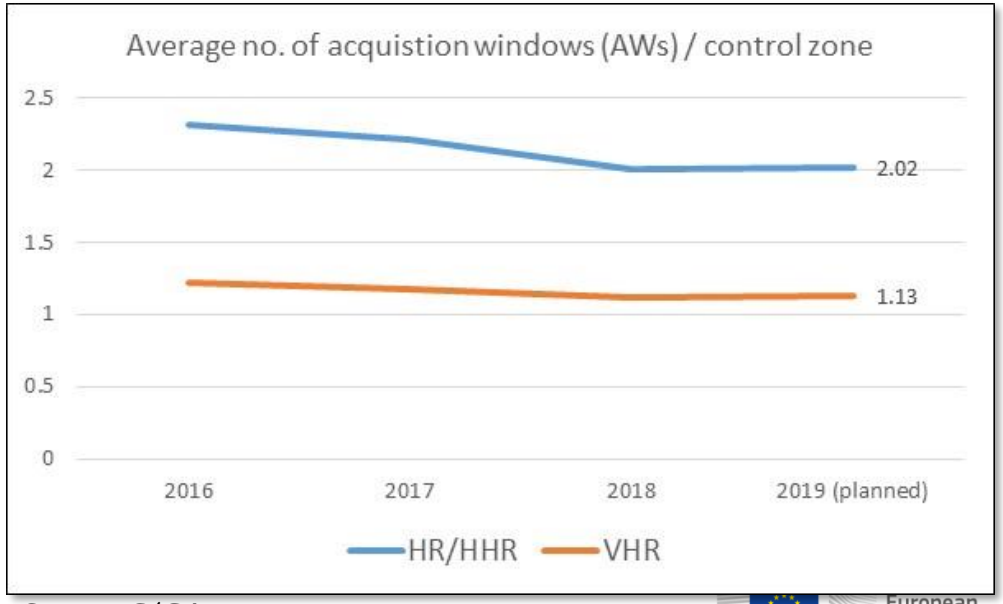
- Check of G⁴CAP parameters to assess:
  - data volume evolution vis-à-vis response to change
  - actual % use of imagery within control zone, and that all imagery handled to MS is processed
- Use of external data to verify parameters:
  - MS rate of control

Reg. 809/2014 Art. 30(a); 5% SAPS/BPS

Analysis - trends

- HHR volume decreases after introduction of S2 in 2016
- Slight decrease in VHR (reduction of VHR2 which move to HHR, and in 2019 some reduction due to CbM)
- Last 3 campaigns however show quite stable values
- LPIS after ECA request for increase for 2017 stable

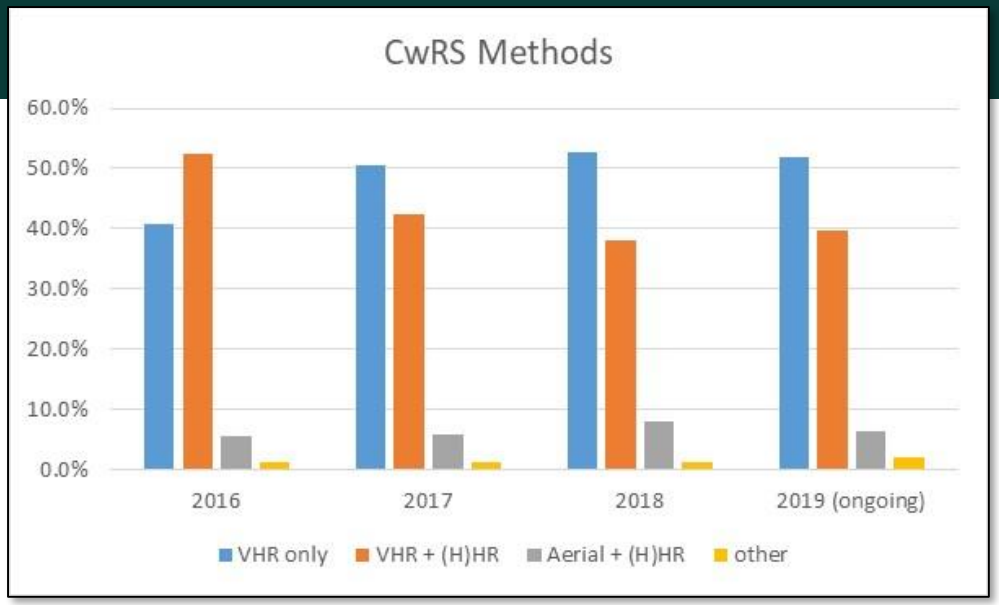


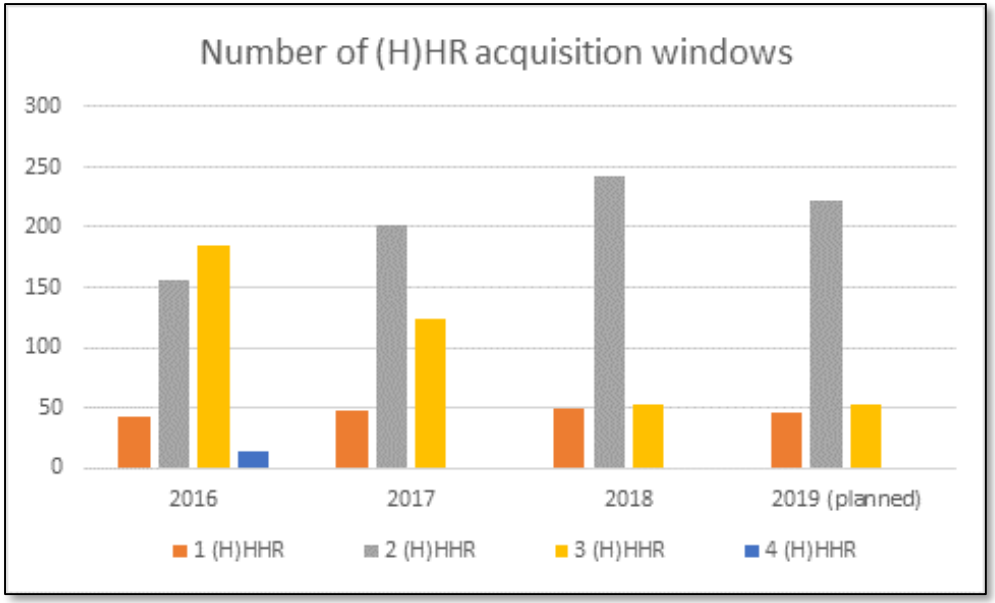


Source: G4CAP

Analysis - methods

- Main two methods are VHR, and VHR+2(H)HHR;
- However VHR alone increasing, and VHR+(H)HHR decreasing
- 4th HHR acq. window disappears, and 3rd much reduced

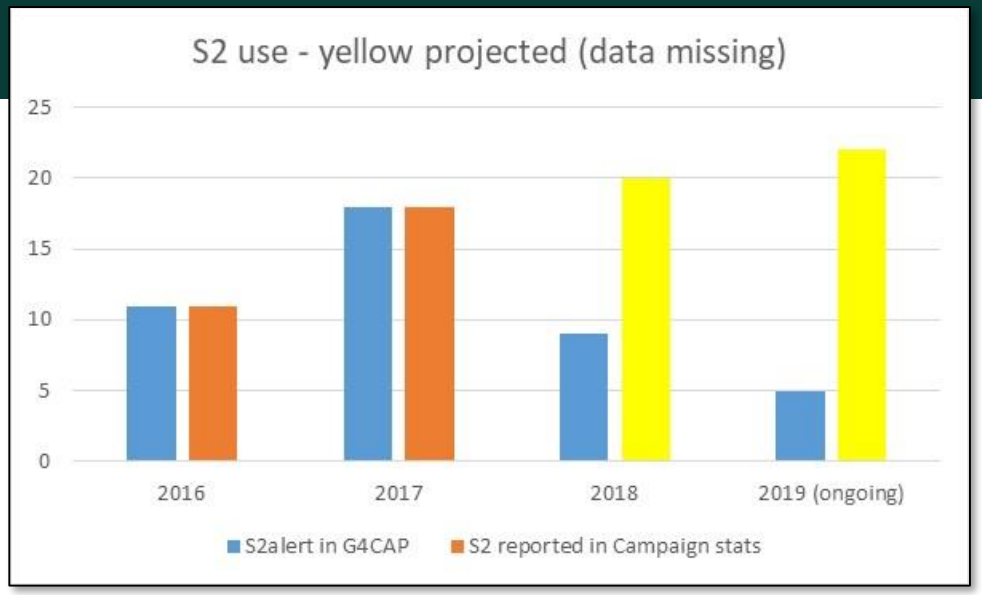


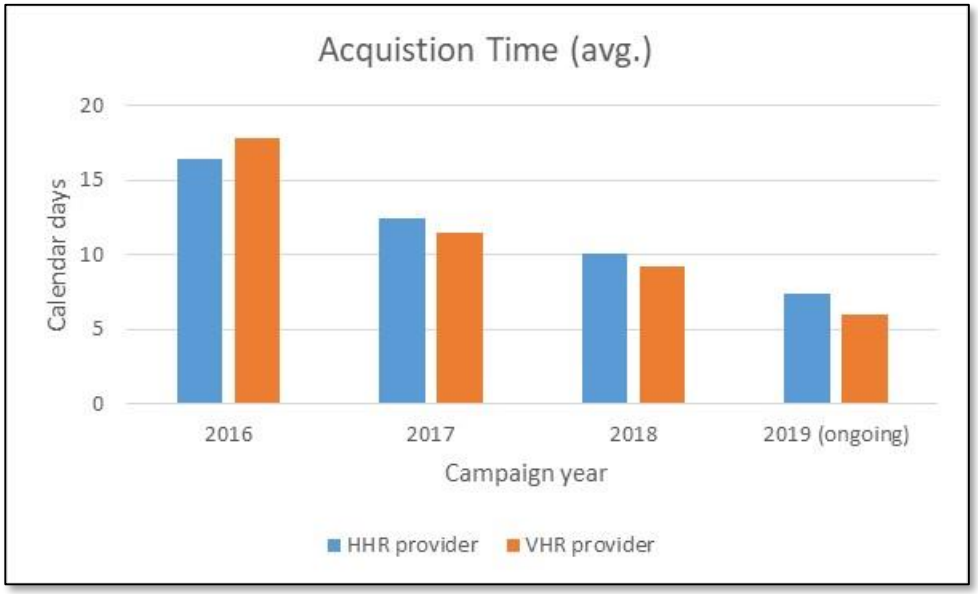


Source: G4CAP

Analysis - events

- S2 introduction is responsible for HR elimination and HHR reduction
- Average acquisition time for VHR is better than HHR – is it true?
  - Depends on latitude and acq. window …

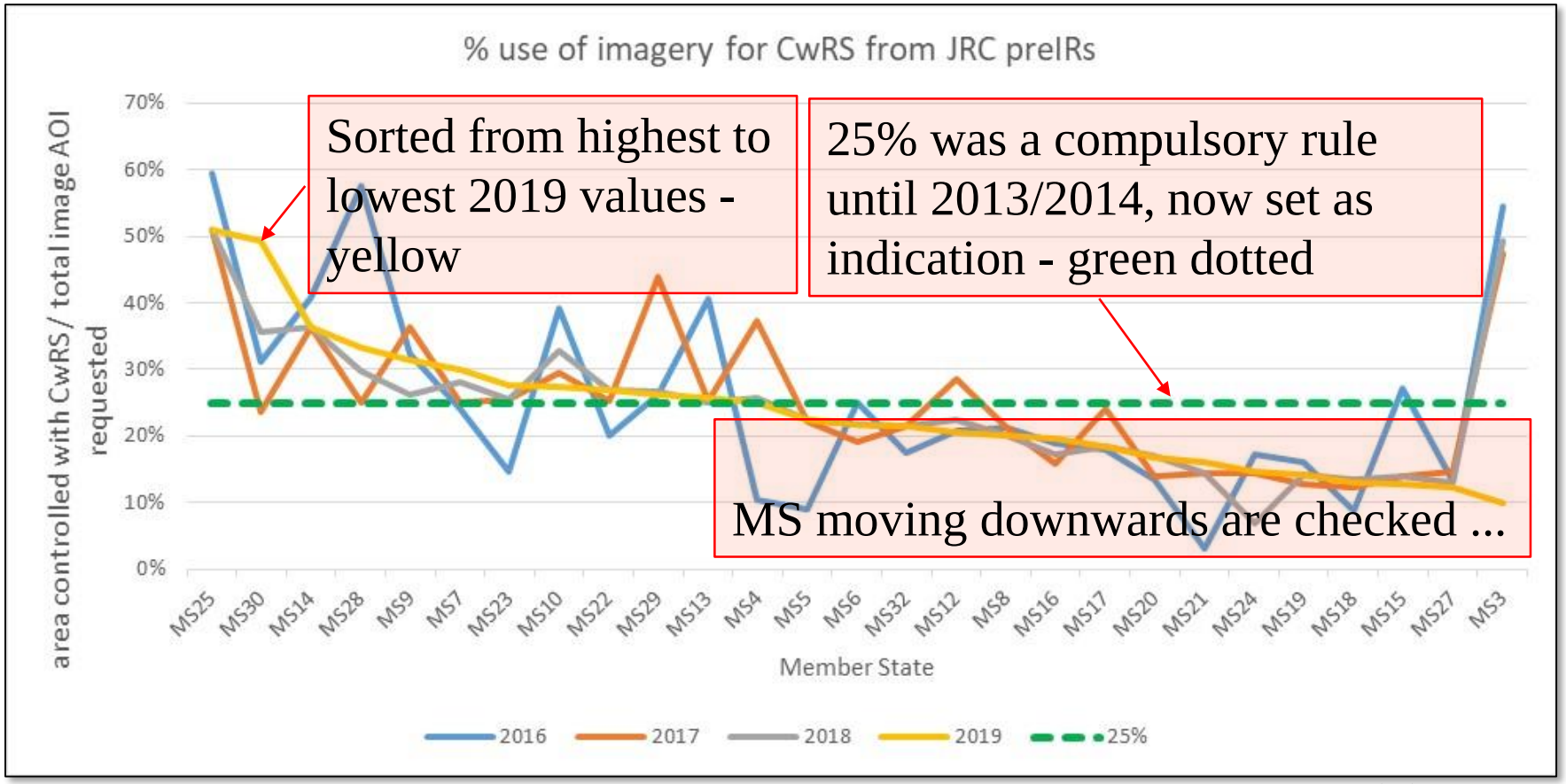




Source: G4CAP

Analysis - % use of image area; comparison

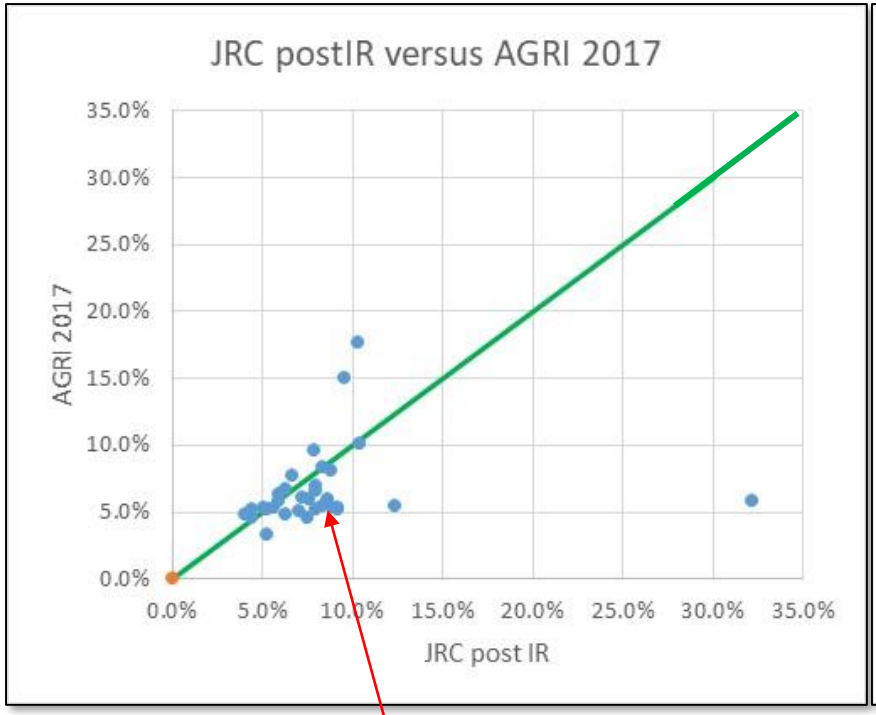
- area controlled with CwRS / total image area requested

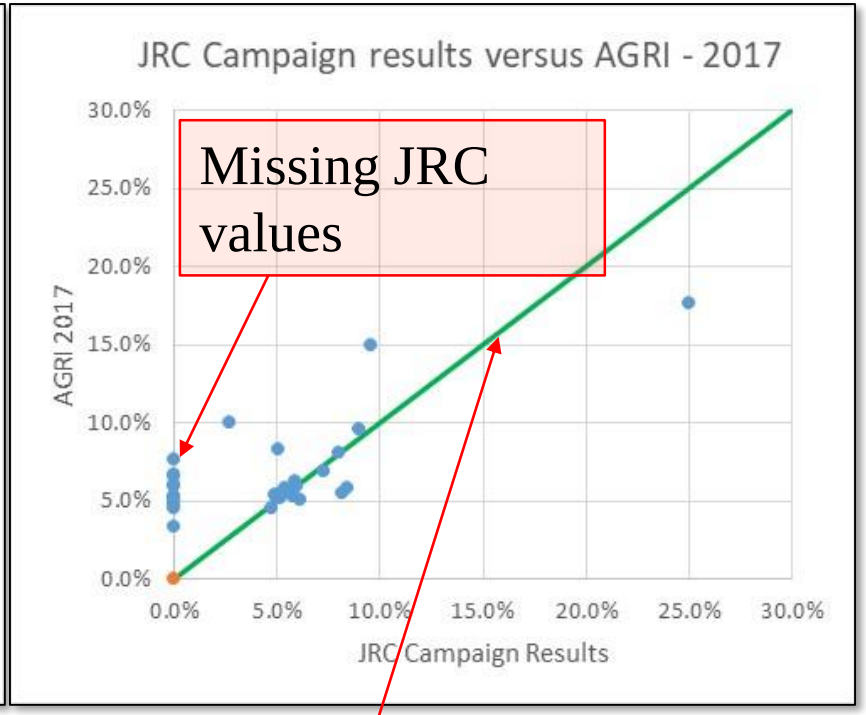


Source: G4CAP

Analysis - % rate of control; ext. verification

- the 5% rate of control SAPS/BPS (Reg. (EU) No 809/2014)





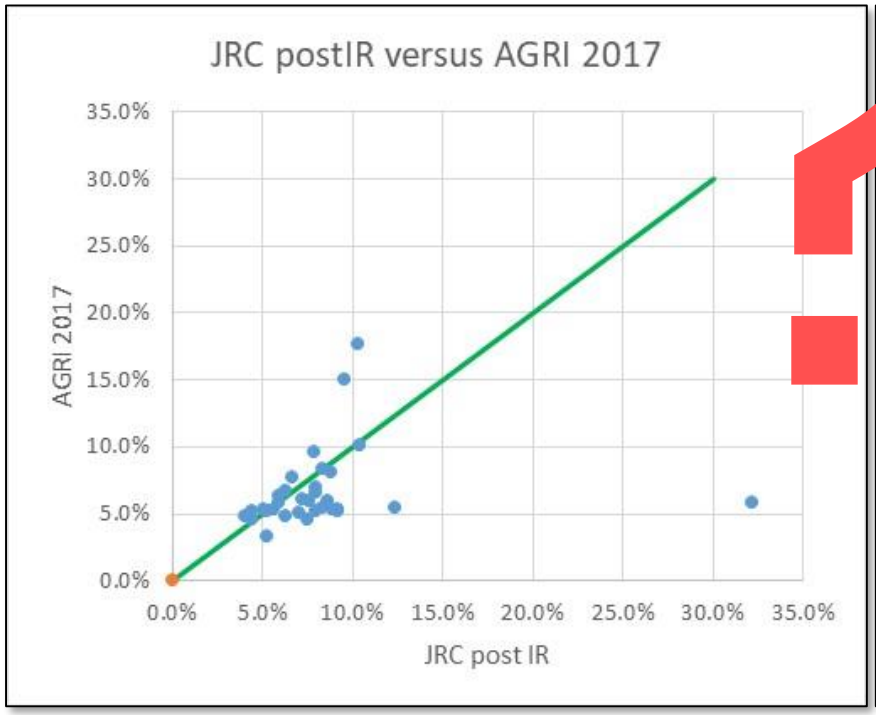
Missing JRC values

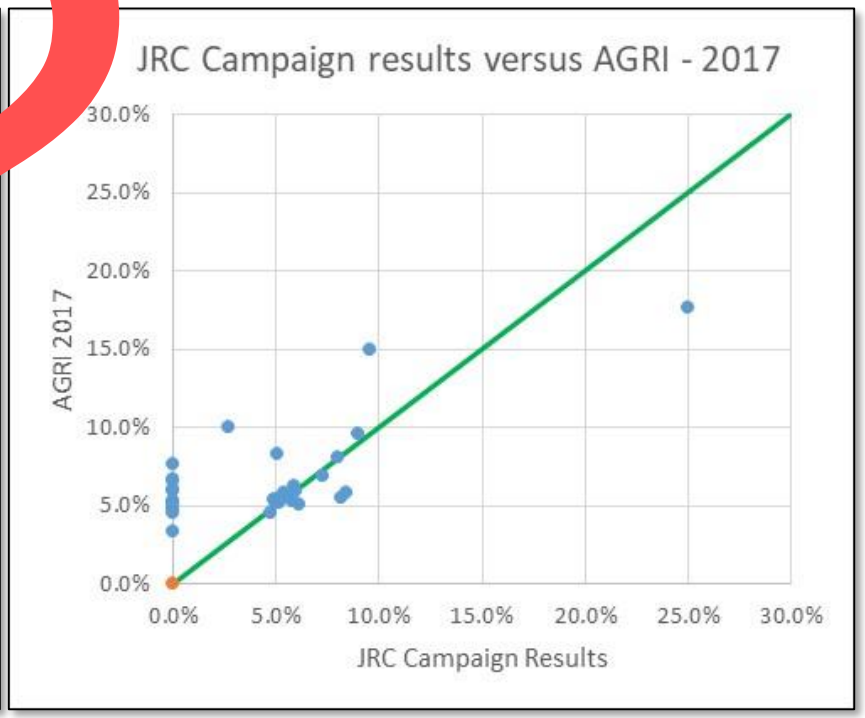
Source: G4CAP

JRC values higher since some MS group the schemes

JRC - AGRI values should be correlated when reducing and comparing BPS/SAPS rate

Analysis - applicability





Source: G4CAP

Pro memorie: 2018 Workshop findings

- CAP enlargement 2004, and CAP reform in 2015 caused huge image increase;
  - MS do follow guidelines !
  - but need to use method that fits their reality !
- MS seek a 'fit for purpose' and an EC 'accepted' method of control,
  - blocking factor for changing !
- MS argued that they need to know their "image share" as early as possible to plan efficiently;
  - the MS needs for effective controls should be the driver !
- Optimization of the VHR window positioning in time, shows a reduction of VHR acquisition windows;
- Sentinel2 has substituted all the "old" HR, and also some of the HHR;

Findings (1)

- we expected to see a stabilization if absence of change
  - indeed the last 3 campaigns show quite stable requests – convergence / stabilization of methods?
  - but still need to think and justify your method clearly upon G4CAP image request
- but we expected to see a change if there is one
  - S2 introduction in OTSC is a change – there is a clear reduction of HHR after S2 introduction - why not more – is there a need of > 2 HHR / zone. Can S2 do more job?
- Further reduction on VHR2 (counts for some 13% of VHR total)
  - needed for measurement? Needed since better acq stats than HHR ?

Findings (2)

- actual % use of imagery within control zone
  - need to follow up on MS below 25% and those decreasing but there is a need to consider farming landscape, schemes and control choices
  - MS needs to think of this parameter when entering image requests in G4CAP.
- all imagery handled to MS is processed
  - Rate of return for VHR and HHR and LPIS QA imagery is > 96% i.e. amount of unprocessed data very low; however big problem of delays in OIR
- MS rate of control (compulsory 5% SAPS/BPS)
  - Strong need for follow up!

Remedial Action / workplan

- JRC
  - Some further considerations on the way forward
  - Issue a dedicated instruction for past campaign(s) to:
    - fill gaps … (e.g. on S2, on % rate of control)
    - streamline JRC and AGRI data reporting
  - Possibly bilateral contact for critical data

- MS/PA
  - Fill in preIRs, postIRs, and Campaign results modules in G^{4}CAP correctly and completely
  - Fill in past campaign(s) results according to above dedicated instruction

Conclusion

- Correct and timely data reporting is essential

=> Correct image distribution/MS in CwRS

=> Correct use of funds

=> Preparedness for changes (new CAP)

=> Preparedness for other disruptions (…)

But some further work needed…

Thank you for your attention

Any questions?

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