SAFNWC/PPS package:

PGE01, PGE02, PGE03

Cloud Mask, Cloud Type, CTTH

SAFNWC User Workshop

Madrid 2015-02-23

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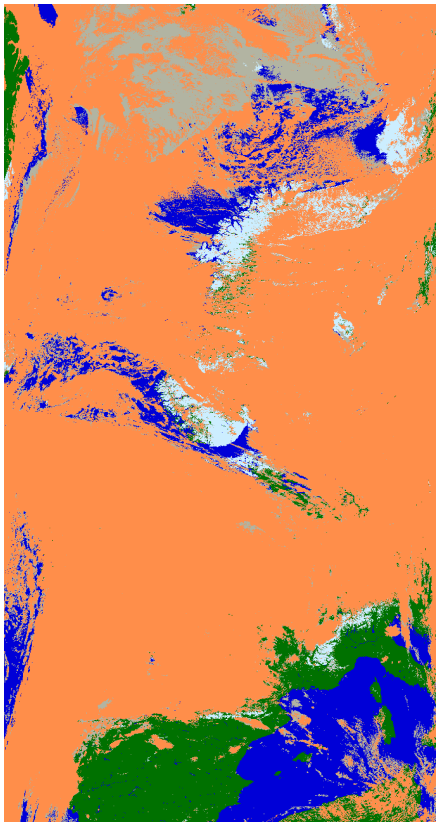
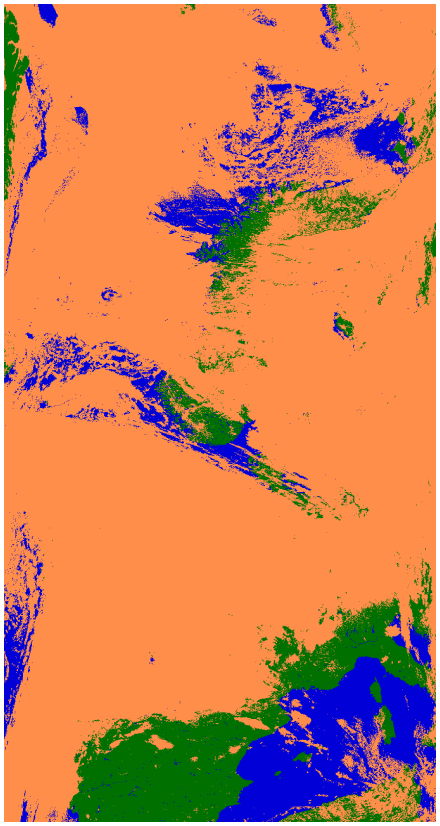
SMHI

Cloud Mask

- Two different products (extended and binary)
- Thresholding using luts with cloudfree simulations, nwp data
- 2014 improvments: new tests, restructured logic, bugfixes, simulated new thresholds.
- Plans for 2017: refactoring for easier maintainance



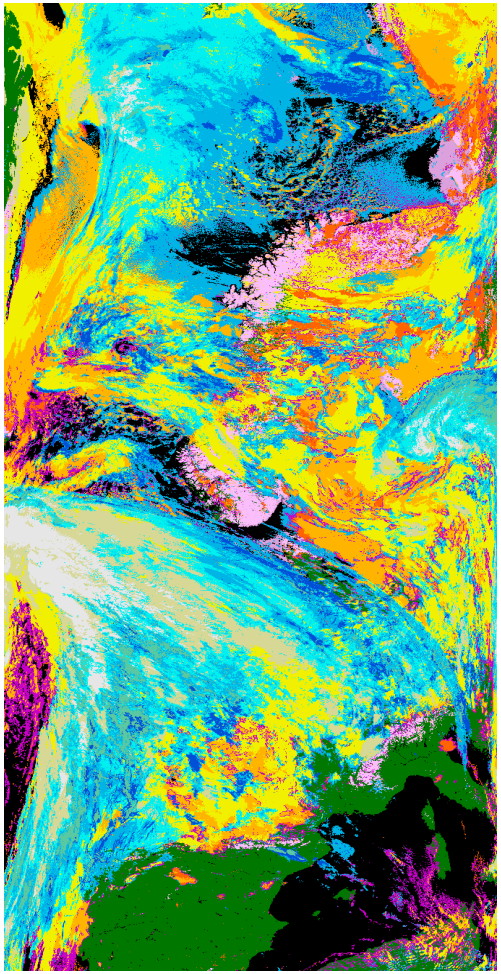
Extended cloudmask:
Cloudfree: land/sea
Snow or ice
Cloudfilled
Cloud contaminated



Binary cloudmask:
Cloud/ not cloud

Cloud Type

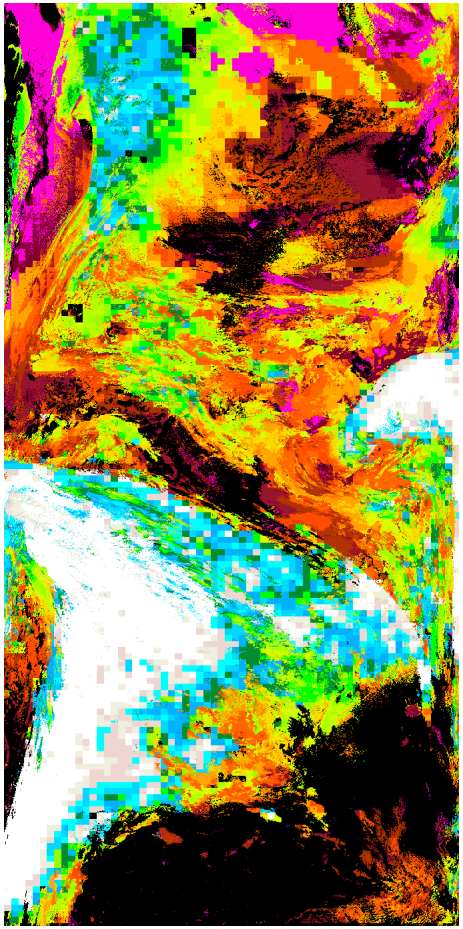
- Thresholding using cloudfree simulations and nwp data.
- Not much changes in last years.
- Improvements planned for 2017.



Cloud type

CTTH

- Two methods:
  - Opaque clouds:
    - 11micron brightness temperature (bt11) vs. nwp temperature profile.
  - Semi transparent clouds:
    - Curve fitting of bt11-bt12 vs. bt11
- Improvments in pps v2014:
  - Faster
  - Higher retrieval rate 75% -> 98%
  - Better accuracy
- Future improvements:
  - Possibly new algorithm, if:
    - Fast enough for nowcasting
    - Better accuracy



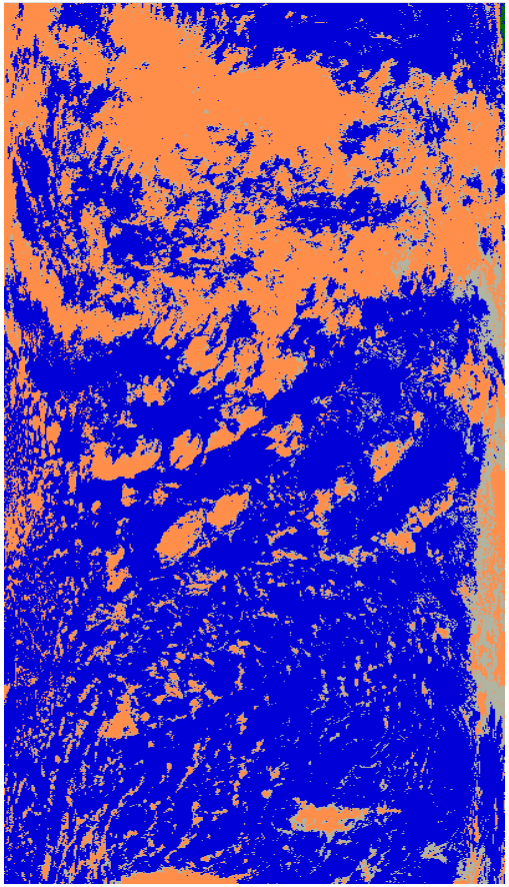
CTTH

SMHI

Cloud Mask (Prob)

- Planned for release 2017
- Cloud probabilities, not mask
- Trained with calipso-data
- Developed by cm-saf (Karl-Göran Karlsson)
- Currently only for AVHRR instruments

noaa15



Standard cloudmask

Probabilistic cloudmask

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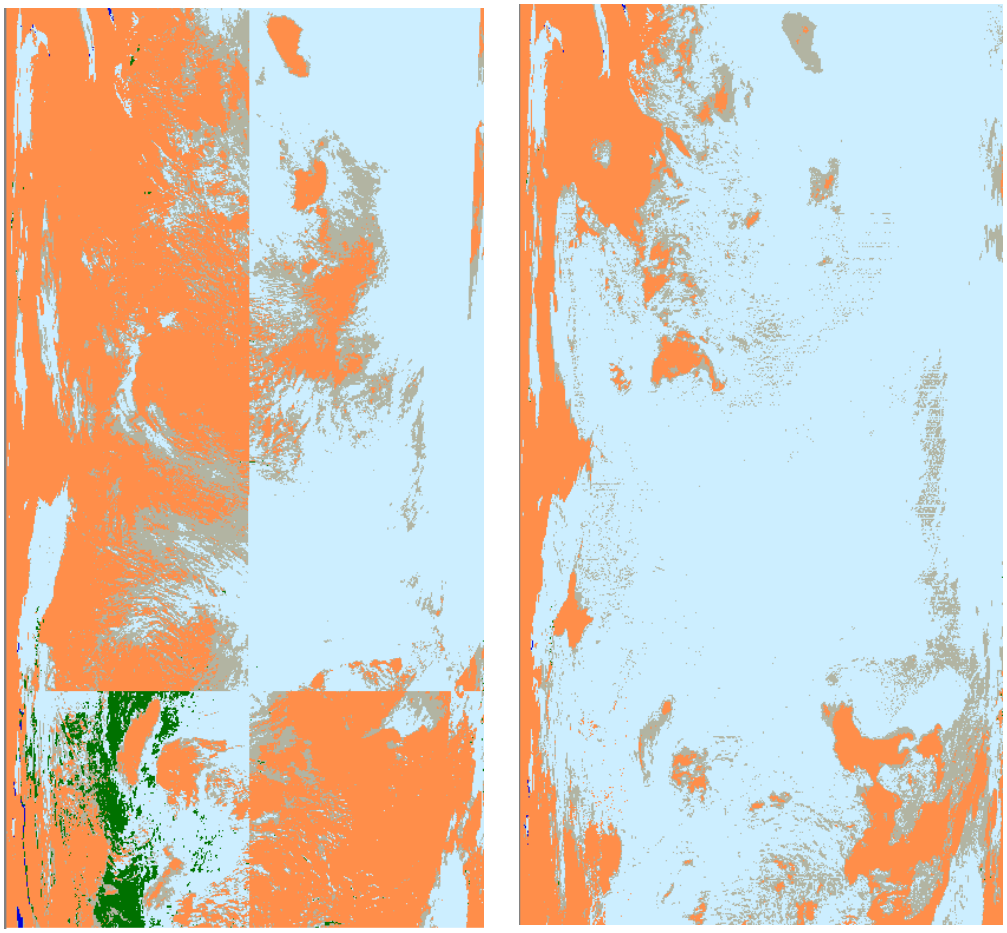
Patch 2014 cloudmask:

- During CM-saf feedback-loop, several problems for pps CMA were detected. Result: v2014 patch.
  - 1.6-satellites bug fixes
  - Sunglint: problem
  - Desert: problem
  - Cumulus detection

Noaa17 Antarctica day 1.6 channel bugfix

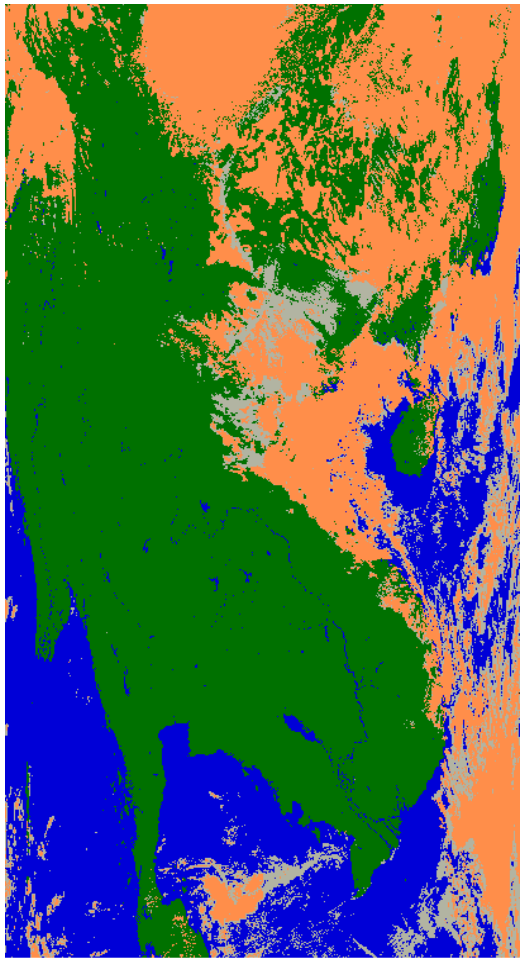


PPS official v2014

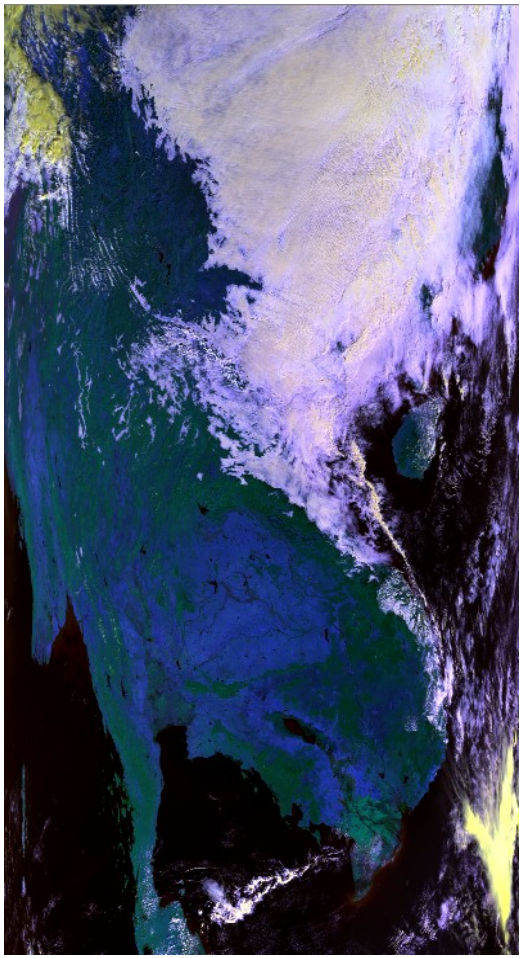
PPS v2014 patch

General cloudmasking for 1.6-satellites & cumulus detection (1.6 and 3.7)

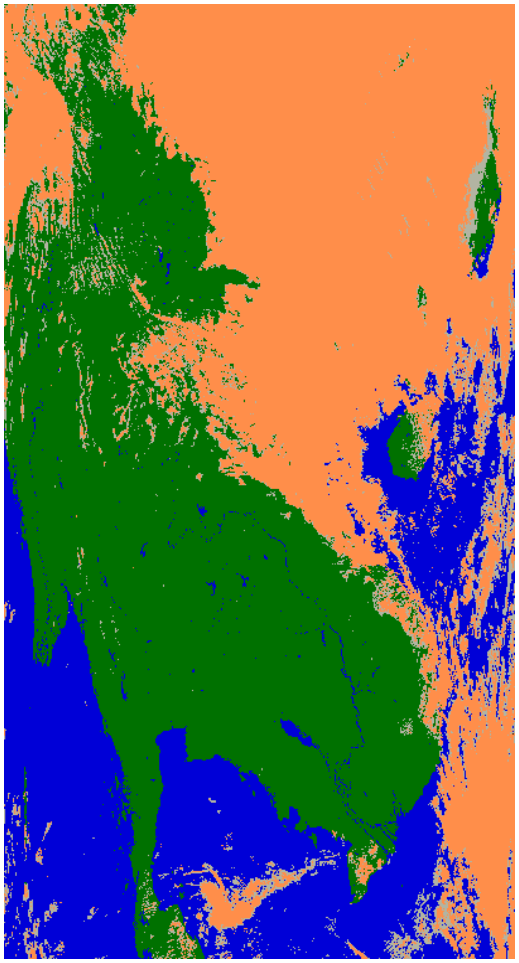
Noaa17 South-East Asia day



PPS official v2014



RGB: ch 0.6, 0.9 and 1.6

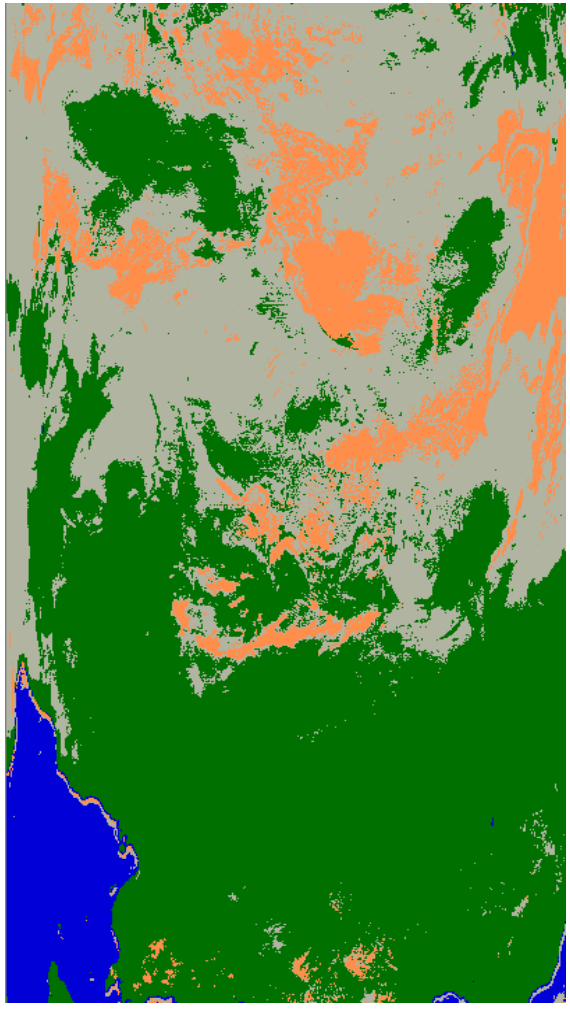


PPS v2014 patch

SMHI

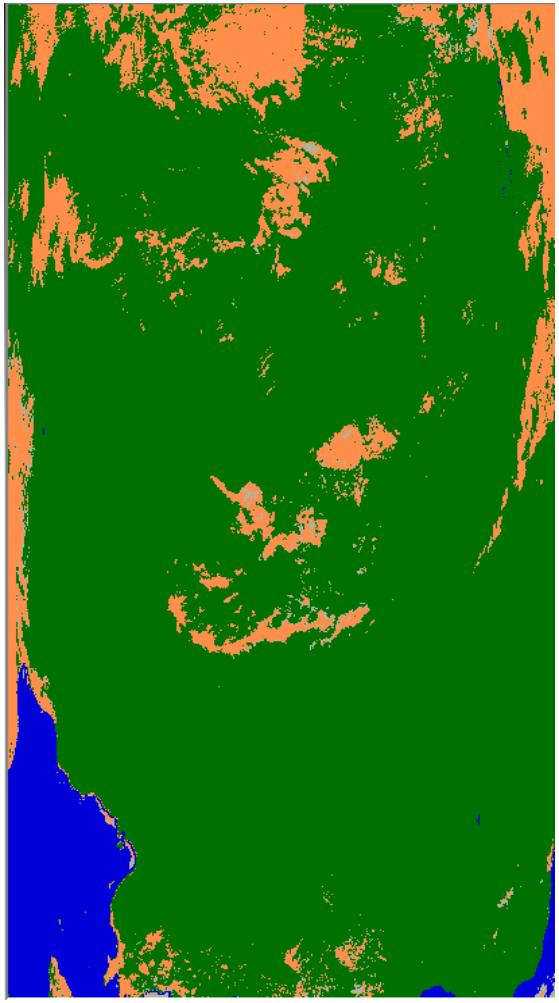
False (cold) clouds over desert (1.6 and 3.7)

Noaa14 North Africa day



PPS official v2014

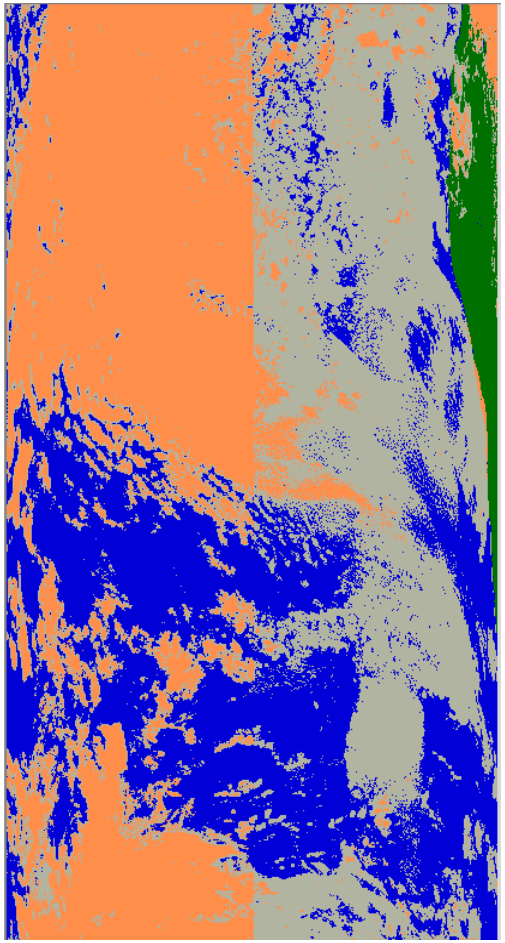
RGB ch 0.6, 0.9, 12



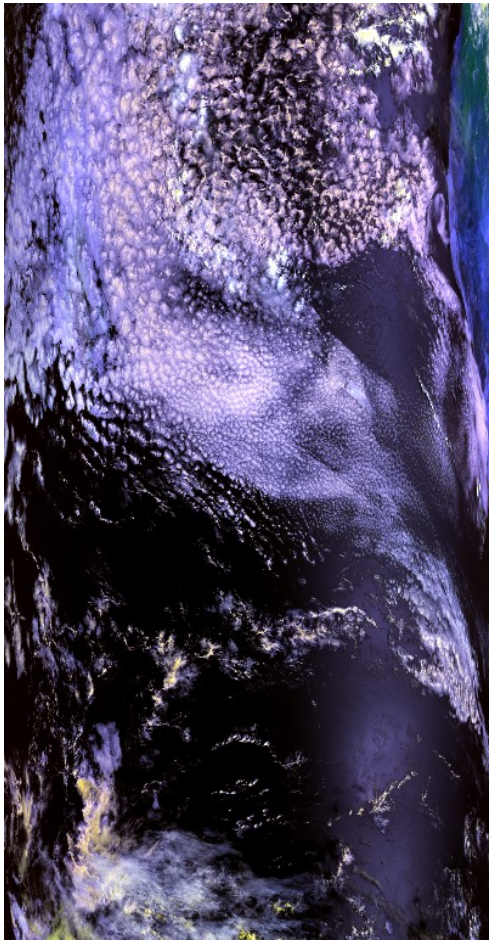
PPS v2014 Patch

Sunglint (1.6 and 3.7)

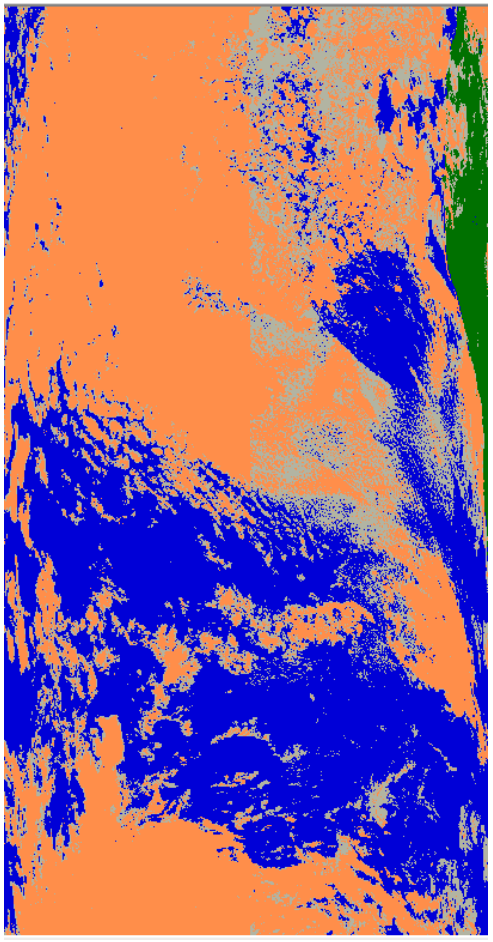
Metop-A day



PPS official v2014



RGB, 06,09 and 1.6



PPS v2014 patch

SMHI

Patch 2014 - Validation with calipso

- Global gac orbits, 100 Noaa18
- Kuipers:

  1: Perfect classification

  0: Random classification

  -1: No pixel correctly classified

SUB-REGION	CLARA-A1 (PPS 2010+)	CLARA-A2 (PPS 2014)	CLARA-A2 (PPS 2014+++)
All regions	0.56	0.61	0.64
All regions - DAY	0.60	0.65	0.66
All regions - NIGHT	0.55	0.60	0.64
All regions - TWILIGHT	0.47	0.52	0.56

SMHI

Patch 2014, NOAA17

Kuipers:

1: Perfect classification

0: Random classification

-1: No pixel correctly classified

SUB-REGION	CLARA-A1 (PPS 2010+) NOAA-18	CLARA-A2 (PPS 2014) NOAA-17	CLARA-A2 (PPS 2014+++) NOAA-17
All regions	0.56	**0.50**	0.57
All regions - DAY	0.60	**0.58**	0.64
All regions - NIGHT	0.55	**0.43**	0.47
All regions - TWILIGHT	0.47	0.51	**0.61**