

Release Notes for SAFNWC/PPS version 2014-patch20150327

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0) About this release

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NB! The threshold tables have been changed, so make sure you use the new files in directory cst. If you re-run old scenes, make sure you remove all old intermediate files.

This is release v2014-patch20150327 of the SAFNWC/PPS software package. It contains three sub-packages, packed in three tar-balls (versioning of the individual packages are git/svn-release tags):

- ahamap-r1_71
- acpg_v2014-patch20150327
- cpp-svn45

In addition the PPS-v2014-patch20150327 release contains a "reference dataset".

These packages from v2014 are still valid:

- pps_nwp-v0.4.10
- acpg_testdata-r3_07 (example data)
- cpp_ancdata_v2014 (necessary for CPP-processing)

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1) Why you should care!

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- *) Globally improved performance for CloudMask.
- *) Some smaller technical improvements and bug corrections.

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2) Summary of main changes since version 2014
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- Globally improved performance for CloudMask.
- *) Generally increased POD cloudy and Hitrate.
 - *) Improved snow/ice detection. Less cirrus over water and cold water are classed as ice/snow. Specially at coast.
 - *) Improved detection of small cumulus.
 - *) Less false clouds:
 - 1) in areas with fractional clouds.
 - 2) over desert.
 - 3) in Arcitic/Antarctic.
 - 4) in sunglint conditions.

Smaller improvements for CTTH and CPP.

Some smaller technical improvements and bug corrections, the major ones are:

- *) Bug-fix while calling programs with --satday/--sathour.
 - *) Calling programs with --startline/--endline affect the time in the output filenames.
 - *) A new alternative way to call GAC-scripts.
- See below for details and more technical changes.

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3) Installation
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This patch, v2014-patch20150327 is not supposed to be installed on top of v2014. This patch is to be installed like a new release of PPS, for ahamap, acpg and cpp.

The installations of 3rd party s.w. and pps_nwp can be reused from PPS v2014.

Please find descriptions in Installation_Notes_PPS_v2014_pach20150327.txt, and in installation notes for each binary distribution, respectively.

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4) Configuration changes since PPS version 2014
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pps_basic_configure.py:
There are some changes only related to CmaskProb:
Added DO_LATLON_IN_NETCDF_CMAprob.
Can add PGE01c in IMAGES[satid].

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5) Software changes since PPS version 2014
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AHAMAP:

- * Changes to allow using pillow instead of PIL. But PIL can still be used too.
- * Added metopB processing in the GAC parts.
- * Corrected launch date for some satellites.

CPP:

- * Two changes for CLARA-A2 preparation:
 - (i) cap COT between 0.1 and 100 for better L3 lin and log averaging, and adjust CWP accordingly
 - (ii) set tau_wgt_clim for 1.63 micron channel equal to that for the 3.83 micron channel, i.e. 2.5
- * Updated channel radiance coefficients: new values and new satellites. Removed the default fallback coefficients.
- * Added NPP-VIIRS channel coefficients. (before default was used for NPP)

ACPG:

Cloud Mask:

- * A bug in the calculation of thresholds for channel 1.6 was corrected. The bug resulted in very strange square cloud-patterns over antarctica.
- * A bug resulting in false clouds over sea at day time was corrected.
- * The SST-test for night implemented but previously not used is now used over water.
- * Two bugs causing false clouds in sunglint conditions was corrected.
- * A bug causing coasts to be detected as clouds was corrected.
- * A t11 max limit was introduced to most cloudtests. For cold cloud tests it was set to 293.15K. This specially decrease the amount of false clouds over warm desert during day.
- * The t11 snow max limit was updated for sea and coast pixels. The threshold varies between 271.5K and 278K.
- * During day the texture tests are updated with an extra check against r09 reflectance. These test often caused 5x5 (3x3) pixels around a truly cloudy pixel also beeing classed as cloudy. This is no longer the case and areas with fractional clouds will appear less cloudy.
- * A new test scheme has been introduced, for dark and cold areas. (Mostly arctic/antarctic)
- * To achieve improved performance: A number of tests has been added, or replaced, in all the test schemes, together with some tuning. New tests are:
 - cloudMaskDarkColdArctic
 - warmCloudTestTrop
 - coldVeryHighCloudTest700
 - coldHighCloudTest850
 - brightCloudTestMediumTemperature3AB
 - watercloudTestOverColdGround_v2014

cirrusOverWatercloudTestOverColdGround_v2014
 brightCloudTest3A_NoT11Ts
 reflectingCloudTestSea_v2014
 coldThinCirrusPrimaryTest
 sstTwilighttimeTest
 snowTestForClearPixels
 aerosolTests
 brightCloudsInSunlint_2014
 snowTestForClearPixels3A
 cirrusOverSnowice3A
 cirrusOverSnowice
 cirrusOverSnowiceNight
 arcticcoldwatercloudTest
 ClearDesertTest
 SpatialBrightCloudTest_2014

- * The dynamic t37t12 threshold used for day land conditions, which was new in v2014, did not performed as expected. They have been replaced by a fall-back solution using semi-static offsets proportional to channel 3.7 reflectivity. The dynamic thresholds might be re-introduced in PPS v2017.
- * The reference emissivity used has been changed from 0.8 to 0.98. Which also means that most of the threshold tables in directory cst has been changed.
- * An interface to calling pps_prob_cma has been included: ppsCmaskProb.py/ppsGacCmaskProb.py To be called as the corresponding Cloud Mask scripts. (Though pps_prob_cma itself is not included in PPS, it is only used in CM-SAF so far.)

CTTH:

- * Derive height even if rttov cloudfree simulations are missing
- * Save calculation time, merely a coding change
- * For CTTH-segments: Changed gain for geoheight, to avoid values being too big for the datatype used.

Interface related changes:

- * When calling python scripts with startline/endline, adapt the filenames for products and intermediate files, so that the times corresponds the lines actually used.
- * Bug-fix: Calling programs with --satday --sathour did not have any effect at all. Now it works for indata from hrpt-files.
- * Fixing bugs in file naming for modis.
- * Corrected minor errors in output file format.
- * Make one colour palette each for lwp, iwp and cwp. (Though the same colours are still used.)
- * A new alternative way to call GAC-scripts. Specially useful when running pygac instead of ppsMakeGacAvhrr.py
 The two alternative ways to call:
 python ppsGacCmask.py -f
 <path>/NSS.GHRR.NC.D83182.S1050.E1236.B1041920.GC
 python ppsGacCmask.py -f <path>/S_NWC_sunsatangles_noaa7_99999_19830701T1050125Z_19830701T1236240Z.h5

Smaller improvements:

- * Select NWP-file for the middle time of the swath, instead of for the start time of the swath.
- * After having read avhrr/viirs data; check if all the channels only contain nodata. In that case, stop the processing.
- * Added a small rttov-interface test program.
- * Smaller updates in regression test.

Smaller bug-corrections:

- * Made the usage of nodata for seaice independent of system and data source.
- * In cloud products I/O: Take care of no-data in a better way, while scaling down, to avoid false warnings about 'values too large to be stored'.
- * Previously processing stopped by mistake if NWP_MAX_FORECAST_LEADTIME had a value < 12. Also updated comments about NWP in pps_basic_configure.py

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6) Third Party Software
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'pillow' can be used instead of 'PIL'.

There are no other changes concerning the use of third party software. See release note for v2014 for information about third party software.

If you use the installation with binaries, they will include the third party software that you need. Installation from source code provides you have the necessary 3rd-party software installed. See also the software users manual!

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7) Documentation
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Some of the documents have been updated since v2014. You will find the most recent versions on the NWCSAF Help Desk.

Especially we want to emphasize that there are new versions of ATBD/1 and of the validation report.

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8) Reference data
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One sets of reference data with final results and intermediate (temporary) output of PPS running version 2014 on the test data is available:

PPS_refdata_v2014_patch20150327_c14475.tgz

There are three cases of hrtp data, noaa18, metop02 and npp. There are one Global Metop case and one GAC case. The hrtp noaa18 and metop02 cases use OSISAF ice concentration data.

It contains intermediate and final output of running the PPS on the test data included in the acpg-subpackage. This reference dataset was generated on the development environment at SMHI (Red Hat Enterprise Linux Client release 7.0 (Maipo) with gcc/fortran 4.8.2).

The following local environment was used:

AHAMAP Version: r1_71
ACPG Version : v2014-patch20150327
CPP Version : svn-45
pps_nwp version: 0.4.10

AAPP: 6.8
RTTOV: 11.1
GRIB-API: 1.9.16

HL-HDF: 0.8.1
HDF5 Version : 1.8.12
PROJ Version : 4.8.0
Python version: 2.7.5
pillow : 2.0.0 (replacing PIL)
ZLIB Version : 1.2.7
jpeg: 6b

Python packages:
pygrib version: 2.0.0
(<http://code.google.com/p/pygrib/downloads/list>)
h5py version: 2.3.1
(<http://code.google.com/p/h5py/downloads/list>)
pyresample version: 0.7.13
(<http://code.google.com/p/pyresample>)
pyproj version: 1.9.4
(<http://pypi.python.org/pypi/pyproj>)
scipy version: 0.12.1
(<http://www.scipy.org/Download>)
NumPy version: 1.7.1
(<http://www.scipy.org/Download>)
netcdf-python version: 1.1.0
(<https://github.com/Unidata/netcdf4-python>)

The following settings are used:
SM_COASTALZONE_LIMIT = 0
SM_LANDSEA_FRACTION_MAX = 255

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9) References to v2014 release notes
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For the following information please see
Release_Notes_PPSv2014.txt:

- * Changes from PPS v2012 to PPS v2014
- * Configuration of the PPS-system
- * Optional software packages (ImageViewer)
- * More information on Third Party s.w.
- * Known open issues and disclaimers (no difference from v2014 to this patch)

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