



**SCOPE • CM**

# **SCM-03:**

**Land Surface Albedo from geostationary satellites**

# SCM-03: the project team

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## **EUMETSAT (Darmstadt, Germany)**

- Alessio Lattanzio (project coordinator)
- Rob Roebeling



## **NOAA's NCDC (Asheville, NC, US)**

- Jessica Matthews
- Ken Knapp
- William Hankins



## **JMA (Tokyo, Japan)**

- Masaya Takahashi



# Project Plan: 2014-2018

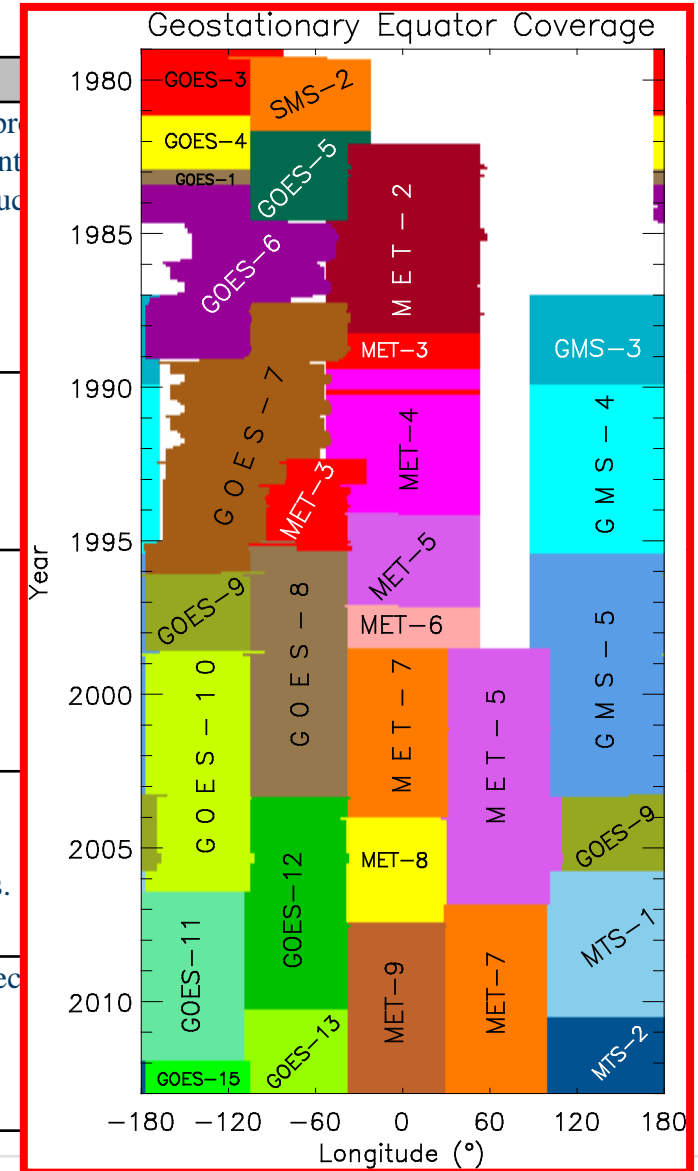
Task	Year	Actors
<ul style="list-style-type: none"> <li>- Updates to retrieval scheme including inclusion of common cloud mask approach, utilization of common method of inter-calibration, e.g., DCC method, implementation of common NWP data, implementation of other product output changes such as temporal resolution and format;</li> <li>- Adaptation of retrieval scheme to the SEVIRI and other instruments;</li> <li>- Set up of validation procedures for Level-2 product.</li> </ul>	2014	EUM  EUM EUM, JMA, NOAA
<ul style="list-style-type: none"> <li>- Technical assessment of the improved retrieval scheme;</li> <li>- Implementation of updated retrieval scheme at all three agencies;</li> <li>- Processing of data with existing validation counterpart;</li> <li>- Validation of test products.</li> </ul>	2015	EUM EUM, JMA, NOAA EUM, JMA, NOAA EUM, JMA, NOAA
<ul style="list-style-type: none"> <li>- Adaptation and re-implementation of algorithm following validation exercise;</li> <li>- Processing of Level-2 data product for GEO tapestry;</li> <li>- Establish user documentation and prepare for public distribution;</li> <li>- Development of Level-3 product inclusive of user consultation.</li> </ul>	2016	EUM EUM, JMA, NOAA EUM, JMA, NOAA EUM, NOAA
<ul style="list-style-type: none"> <li>- Produce and validate Level-3 product and redistribute to partners;</li> <li>- Perform user driven studies on usage of the product to increase utilization;</li> <li>- Arrange distribution of L2 and L3 products from European, Japanese and US sites.</li> </ul>	2017	EUM EUM , JMA, NOAA EUM, JMA, NOAA
<ul style="list-style-type: none"> <li>- Update common calibration with results from SCOPE-CM inter-calibration project and rerun full data record;</li> <li>- Study product improvements with respect to utilization aspects.</li> </ul>	2018	EUM, JMA, NOAA  EUM, JMA, NOAA

# Project Plan: 2014-2018

Task	Year	Actors
<ul style="list-style-type: none"> <li>- Updates to retrieval scheme including inclusion of common cloud mask approach</li> </ul>	2014	EUM
<b>2014: Improvement and homogenization of Level2</b>		
<ul style="list-style-type: none"> <li>- Set up of validation procedures for Level-2 product.</li> </ul>		EUM
<b>2015: Assessment new Retrieval scheme (Level 2) Implementation in the 3 agencies and validation</b>		
<ul style="list-style-type: none"> <li>- Validation of test products.</li> </ul>		EUM, JMA, NOAA
<b>2016: Processing full "tapestry" (Level 2) Development of Level 3</b>		
<b>2017: Run and validate Level 3</b>		
<b>2018: Update calibration (GSICS) full re-processing and generation of the CDR</b>		

# Project Plan: 2014-2018

Task	
<ul style="list-style-type: none"> <li>- Updates to retrieval scheme including inclusion of common cloud mask approach, utilization of common method of inter-calibration, e.g., DCC method, implementation of common NWP data, implementation of other product output changes such as temporal resolution and format;</li> <li>- Adaptation of retrieval scheme to the SEVIRI and other instruments;</li> <li>- Set up of validation procedures for Level-2 product.</li> </ul>	
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# Project Plan: 2014

Task	Sub-Tasks	Period	Actors
<b>Change of Level 2 product specifications</b>	<ul style="list-style-type: none"> <li>• Generation of a daily product instead of a 10 days composite</li> <li>• NetCDF4 format, Climate Forecast standard compliant: full definition and implementation of data and metadata</li> </ul>	Q1	NCDC (EUM)
<b>Residual Cloud Removal</b>	<ul style="list-style-type: none"> <li>• Investigate different approaches for cloud detection and removal (usage of the IR channel, seasonal variation, surface type, etc.) that could be included in the GSA retrieval scheme.</li> <li>• Investigate available cloud mask products at the proper spatial and temporal resolution for all GEO platforms involved.</li> </ul>	Q1-Q3	EUM, JMA, NOAA
<b>Inter-calibration</b>	<ul style="list-style-type: none"> <li>• Apply common methods for inter-calibration of the VIS channel. Existing GSICS methodology such as Deep Convective Clouds will be examined to allow progress with the production of an albedo time series. At a later stage, results from the SCOPE-CM project on inter-satellite calibration will be used for further improvements.</li> </ul>	Q1-Q3	EUM, JMA, NOAA
<b>NWP Data</b>	<ul style="list-style-type: none"> <li>• Establish a common set of NWP data</li> </ul>	Q2	EUM, JMA, NOAA
<b>Inclusion of other GEO instruments</b>	<ul style="list-style-type: none"> <li>• Investigate available options for best usage of the SEVIRI instrument in the current retrieval scheme</li> <li>• Investigate potential inclusion of further instruments.</li> </ul>	Q3-Q4	EUM EUM, JMA, NOAA
<b>Implementation of changes to the GSA software</b>	<ul style="list-style-type: none"> <li>• Implement potential changes to the input image data ingestion due to new methods for residual cloud removal, inter-calibration and new instruments.</li> <li>• Develop software changes as needed.</li> </ul>	Q4	EUM EUM, JMA, NOAA
<b>Validation</b>	<ul style="list-style-type: none"> <li>• Start development of a common protocol for evaluation of the resulting time series (see for instance Fell et al., 2012), encompassing: methods, validation datasets, software.</li> </ul>	Q4	EUM, JMA, NOAA
<b>Reporting and Planning</b>	<ul style="list-style-type: none"> <li>• Report to SEP, establish web content and create work plan for 2015.</li> </ul>	Q1, Q3 Q4	EUM, JMA, NOAA

# Project Plan: commitments for Q1 2014

Task	Sub-Tasks	Period	Actors
<b>Change of Level 2 product specifications</b>	<ul style="list-style-type: none"> <li>• Generation of a daily product instead of a 10 days composite</li> <li>• NetCDF4 format, Climate Forecast standard compliant: full definition and implementation of data and metadata</li> </ul>	Q1	NCDC (EUM)
<b>Residual Cloud Removal</b>	<ul style="list-style-type: none"> <li>• Investigate different approaches for cloud detection and removal (usage of the IR channel, seasonal variation, surface type, etc.) that could be included in the GSA retrieval scheme.</li> <li>• Investigate available cloud mask products at the proper spatial and temporal resolution for all GEO platforms involved.</li> </ul>	Q1-Q3	EUM, JMA, NOAA
<b>Inter-calibration</b>	<ul style="list-style-type: none"> <li>• Apply common methods for inter-calibration of the VIS channel. Existing GSICS methodology such as Deep Convective Clouds will be examined to allow progress with the production of an albedo time series. At a later stage, results from the SCOPE-CM project on inter-satellite calibration will be used for further improvements.</li> </ul>	Q1-Q3	EUM, JMA, NOAA
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# Project Plan: 2014 current status

Task	Sub-Tasks	Period	Actors
<b>Change of Level 2 product specifications</b>	<ul style="list-style-type: none"> <li>• Generation of a daily product instead of a 10 days composite</li> <li>• NetCDF4 format, Climate Forecast standard compliant: full definition and implementation of data and metadata</li> </ul>	Q1	NCDC (EUM)
<b>Residual Cloud Removal</b>	<ul style="list-style-type: none"> <li>• <b>Investigate</b> different approaches for cloud detection and removal (usage of the IR channel, seasonal variation, surface type, etc.) that could be included in the GSA retrieval scheme.</li> <li>• <b>Investigate</b> available cloud mask products at the proper spatial and temporal resolution for all GEO platforms involved.</li> </ul>	Q1-Q3	EUM, JMA, NOAA
<b>Inter-calibration</b>	<ul style="list-style-type: none"> <li>• <b>Apply</b> common methods for inter-calibration of the VIS channel. Existing GSICS methodology such as Deep Convective Clouds will be examined to allow progress with the production of an albedo time series. At a later stage, results from the SCOPE-CM project on inter-satellite calibration will be used for further improvements.</li> </ul>	Q1-Q3	EUM, JMA, NOAA
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<b>Reporting and Planning</b>	<ul style="list-style-type: none"> <li>• Report to SEP, establish web content and create work plan for 2015.</li> </ul>	Q1,Q3 Q4	EUM, JMA, NOAA



# Project Plan: 2014 Status details

## **Generation of daily products (Level 2): NCDC**

Information from the daily inversion are already available. They only need to be stored into an output file

## **NetCDF4 Output format CF conventions (Level 2): NCDC**

a prototype from Native to NetCDF4 has been already developed (lower priority: moved end of the year).

## **Cloud Mask (Level 2): EUM**

Cooperation with the CMSAF for a Cloud Mask dataset for MFG and applicable to other GEO (GOES, GMS). A beta dataset covering a small portion of the disk has been already delivered for testing.

Investigate other methods (see following slides)

## **Cloud Removal (Level2 -> Level3): EUM**

Currently investigating post-processing cloud removal strategies (background DHR map, seasonal variaiton).

## **Inter-calibration (Level 2): EUM/NCDC/JMA**

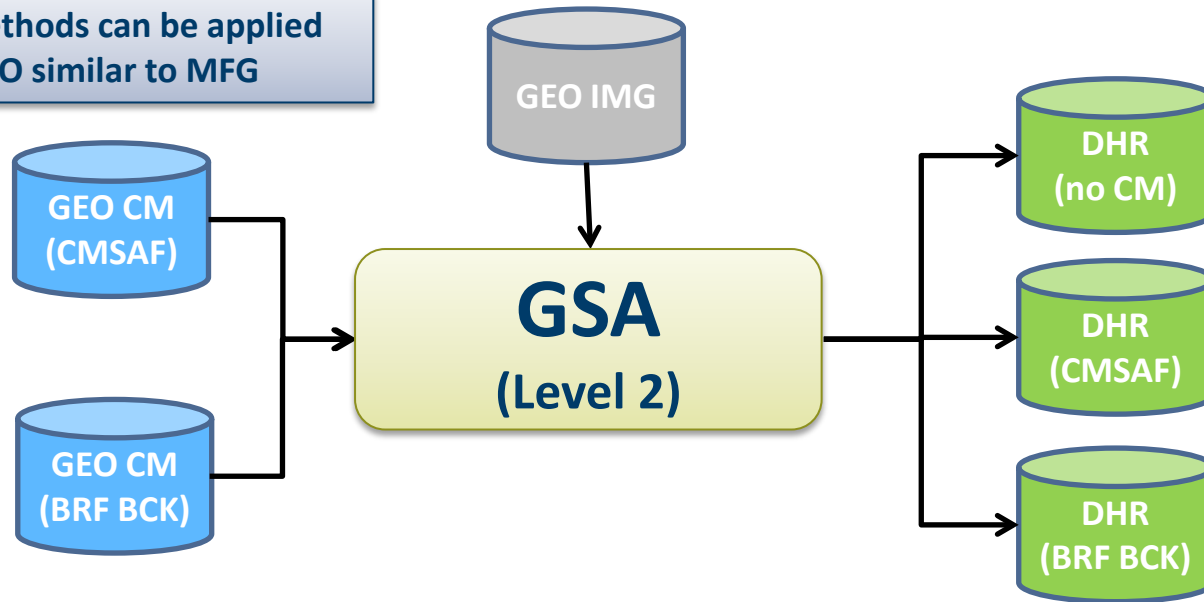
Cooperation with GSICS has started. Colleagues in EUM working on DCC method for MET7. Similar activities on going in US and Japan.

## **Reporting and Web: EUM/NCDC/JMA**

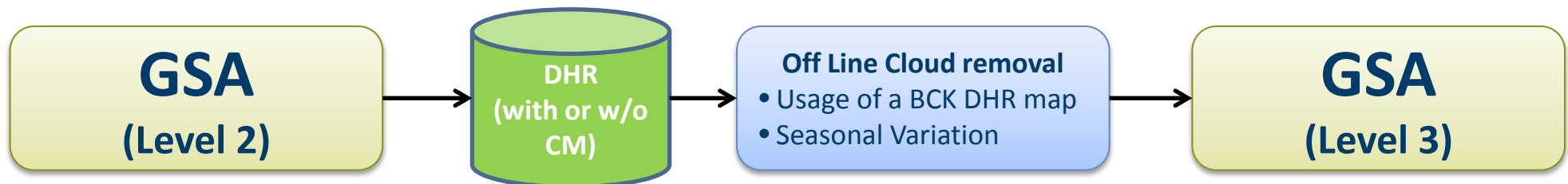
Report to Executive panel. Cooperation with the SCOPE-CM secretariat for setting up the SCOPE-CM web page.

# Cloud Removal for Level 2 and pre-Level 3

Both methods can be applied to all GEO similar to MFG

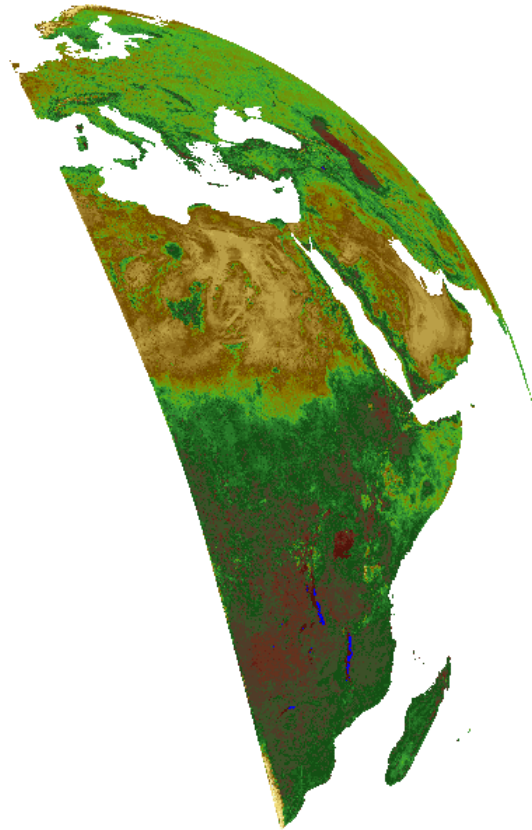


## Level 3



# Cloud detection: background BRF map

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**BRF Background map obtained from all available MVIRI VIS images for May 2001**

BCK\_BRF 200105\_0600

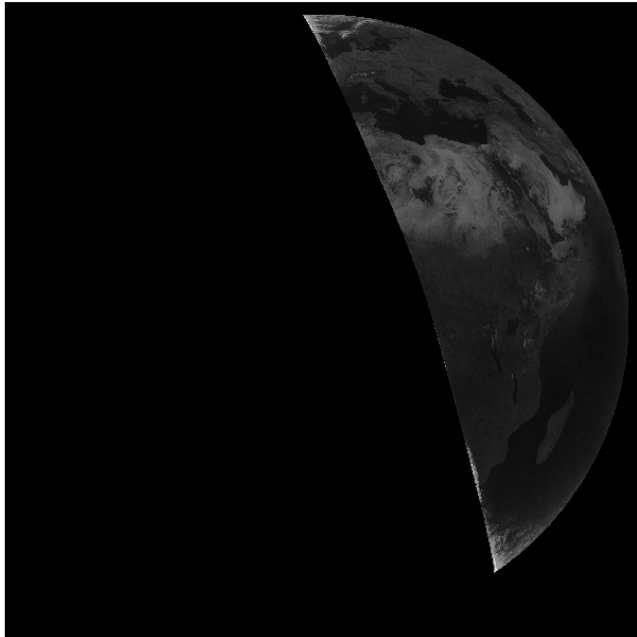
# Cloud detection: Cloud mask

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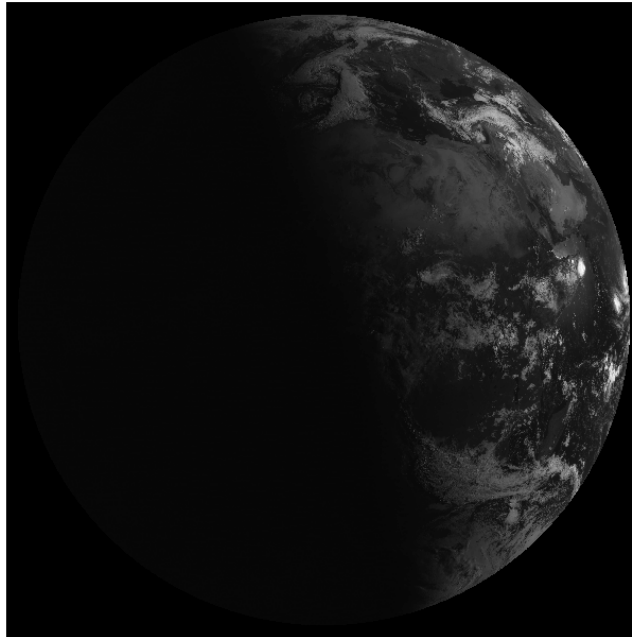
Usage of a simple threshold (depending on SZA) method for detecting cloud from a background map

Enhancement : include IR information

BCK\_BRF 200105\_0600



IMG 20010501 0600



CM 20010501 0600



# Project: External interfaces

## Dependencies (input to SCM-03)

Item	Actor	Task
Residual Cloud Removal	CMSAF	<ul style="list-style-type: none"><li>• Provide a cloud mask (or CM algorithm) for MFG</li><li>• Cooperate for extending the method to other GEO (GOES, GMS)</li></ul>
Inter-calibration	GSICS/ SCOPE-CM	<ul style="list-style-type: none"><li>• Application to DCC method for MFG,GOES and GMS (pre MODIS era)</li></ul>

## Links (output from SCM-03)

BRF	QA4ECV	<ul style="list-style-type: none"><li>• EUM to provide Bi-directional Reflectance Factor (BRF) with retrieval uncertainties from MFG.</li></ul>
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