

GHG-CCI QSR Oct-Dec 2011

1. Overall Project Status

The GHG-CCI project (www.esa-ghg-cci.org) has made significant progress during the reporting period (details are given below; for 1st year achievements see QSR #4). The project is on track in terms of meeting its objectives. No major problems have been encountered. A successful progress meeting (PM3) has been held in October at LSCE near Paris (focus: status of data products, schedule optimization for 2nd year, achieving consensus on GHG-CCI inputs for the 2nd CCI Co-location meeting at ESRIN esp. w.r.t. future phases of CCI / CCI System development; note that PM3 has been held in combination with a meeting of the MACC/GHG team in order to ensure close interaction between GHG-CCI and its main user). No major problems have been identified w.r.t. quality and quantity of the required input data needed for ECV generation. It has been identified that IUP requires access to MERIS L1 data for the first few years of the ENVISAT mission (for later years these data are already available at IUP) and this issue is being solved in close and good cooperation with ESA.

2. Main progress during reporting period

Focus of the reporting period was (i) to held Progress Meeting 3 (PM3) where a number of important aspects have been discussed (see above), (ii) to contribute to the 2nd Co-location meeting which was held at ESRIN (several presentations have been given by GHG-CCI Science Leader M. Buchwitz and also other GHG-CCI team members have provide important inputs esp. w.r.t. future phases of CCI / CCI System development (more on this see below)), (iii) to generate and submit the first version of the GHG-CCI System Requirements Document (SRD), (iv) to present GHG-CCI at the WCRP OSC in Denver, USA, in Oct. 2011 (by J.P.Burrows), (v) to present GHG-CCI at the AGU Fall Meeting in San Francisco, USA, in Dec. 2011 (oral presentation by M. Buchwitz), (vi) to contact IPCC AR5 WG1 Lead Authors providing GHG-CCI relevant material (e.g., a review based on peer-reviewed publications), (vii) to compile Optional Proposals for GHG-CCI (submitted to ESA on 16.Dec.2011), (viii) to compile the 2nd GHG-CCI Newsletter highlighting major 1st year achievements, and (ix) to strengthen international cooperation (e.g., iLEAPS via ESA ALANIS-Methane, participation of several GHG-CCI team members at the Dec. 2011 GOSAT meeting organized by JAXA/NIES/NASA; discussion with several representatives of organizations involved in / interested in GHG observations from space incl. exchange of data products at AGU (e.g., NOAA, JPL, Univ. Michigan), WCRP OSC, and other activities (e.g., information exchange IUP - EarthNetworks, ULE discussions with Chinese TanSat team on potential future collaboration, combined ULE – Chinese Institute of Atmospheric Physics ESA Dragon3 proposal focusing on retrieval algorithm comparisons, etc.)).

Algorithm improvements are currently ongoing as planned as not all critical user requirements have already been met. Focus is on meeting the challenging accuracy requirements (see URD and AIECAR available on the GHG-CCI website). This is an important requirement as small biases of the CO₂ and CH₄ retrievals can be misinterpreted as greenhouse gas source/sink signals when used by the user community within surface flux inverse modeling frameworks or other approaches (e.g., CCDAS). The satellite data product generation with the improved algorithms for the Round Robin evaluation will be finished end of February 2012.

For GHG-CCI the most important outcomes of the 2nd CCI Co-location meeting were those related to the discussions on the envisaged CCI System. This stimulated discussions within the GHG-CCI team on how to optimally contribute to future phases of CCI (in terms of maximum benefit to cost ratio). As a result a first version of a GHG-CCI SRD has been compiled and submitted to ESA (note that GHG-CCI has no Task 5 which implies that the SRD is not a formal deliverable). In this document high level requirements and recommendations are given and an outline is given how the GHG-CCI contribution to the CCI System could look like. In addition to requirements related to data product archiving and user interface related aspects (which are supposed to be common for all ECV projects) it has been identified how to optimally use and integrate the existing highly complex and evolving scientific data processor currently being further developed within GHG-CCI: (i) the fastest approach would be the delivery of (existing and future “externally” generated) L2 products to the CCI System, (ii) the transfer of the scientific L1-2 processors to

the CCI System ideally via “copy, install and run” e.g., using remote access by the GHG-CCI retrieval experts (or by other means). This requires an appropriate computer system similar to those currently used at the various institutions but providing enhanced processing power and disc space as well as access to all required input data (satellite, ECMWF, etc.). In any case a reimplementaion of the complex and evolving scientific processors by external non-experts is not recommended, e.g., because this will result in low (or even negative) benefit and high costs (see presentation of M. Buchwitz at the 2nd CCI Co-location meeting available on the CCI website of this meeting).

3. Future activities

As described above, the Round Robin phase of GHG-CCI ends end of August 2012. This requires that the final version of the RRDP has to be available end of February 2012. After this date no new data products will be accepted. From March to July 2012 the careful evaluation of these data products will take place (incl. detailed and comprehensive validation) with the goal to decide on the best algorithms in August 2012. To achieve this, a number of deliverables are due end of February 2012 (RRDP, update of PSD and ATBD, DBT3). From March-July 2012 this RRDP data set will be evaluated by the GHG-CCI Validation team (documentation: PVASR, due end of July 2012) and the Retrieval team (document AIECAR, also due end of July 2012). The final decision will be made based on all information available in August 2012 (e.g., PVASR, AIECAR) following the procedure outlined in the GHG-CCI Round Robin Evaluation Protocol (RREP). The final decision including justification will be documented in a short additional document called Algorithm Selection Report (ASR) due end of August 2012. In the following six months (September 2012 - February 2013) the CRDP will be generated (i.e., the first GHG-CCI ECV data base) using the selected algorithms followed by a 3 months validation period. After this the ECV data set will be made available to all interested users.

*** End of Report ***