
Climate Change Initiative Extension (CCI+) Phase 2
New Essential Climate Variables (NEW ECVS)
High Resolution Land Cover ECV (HR_LandCover_cci)

User Workshop Report
(UWR)

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Changelog

Issue	Changes	Date
1.0	First issue	08/05/2024

Detailed Change Record

Issue	RID	Description of discrepancy	Sections	Change

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1 Introduction

1.0 Executive summary

In order to disseminate Phase 1 products and collect the Climate Community feedback to inform the user requirements for the Phase 2 new products, the Climate Research Group has coordinated two primary activities:

- Webinar hosted by the AI for Good Neural Network on Tuesday 12 March 2024.
- In person splinter session in EGU General Assembly at Vienna on Wednesday 17 April 2024.

The design, structure and details of the session are described in this report. The feedback received from these events has been compiled and integrated into [RD1].

1.1 Purpose and scope

This document outlines the activities related to the first User Workshop of Phase 2, scheduled for the beginning of the 1st cycle of Phase 2. It provides details on timing, locations, attendees, agenda with the presentations, and how the sessions were designed and developed.

1.2 Applicable documents

Ref	Document ID	Document Title	Issue/Rev	Date
[AD1]		Technical Proposal	1.1	12/07/2023

1.3 Reference documents

Ref	Document ID	Document Title	Issue/Rev	Date
[RD1]	URD_v1	User Requirement Document	1.0	06/06/2004

1.4 Acronyms and abbreviations

AI	Artificial Intelligence
CCI	Climate Change Initiative
CMUG	Climate Modelling User Group
CRC	Climate Research Community
EGU	European Geosciences Union
SDG	Sustainable Development Goals

2 User workshop events

2.1 Design of user workshop

Originally, the project's initial requirements aligned the Kick-off meeting and the first user workshop with the co-location and CMUG meetings in the fall season 2023. However, as the project started in January 2024, it became evident that the User Requirement Workshop should take advantage of existing events to maximize researchers' participation and should be held at the beginning of Phase 2 (no later than KO+3). During the Kick-off meeting of Phase 2, different options for organizing the User Workshop were discussed. Considering that the next CCI co-location would be too late for the first cycle, a review of cross-cutting events, both general and specific to the Climate Research Community, to be organized before May 2024 was carried out. Finally, it was decided to organize an in-person splinter session at the European Geophysical Union General Assembly (EGU) (April 17, 2024) which would be open to a diverse potential and transversal audience able to use the project products for many applications, of course, including climate modeling. In addition, it was also agreed to hold an additional virtual webinar under the AI for Good platform (<https://aiforgood.itu.int/>).

Taking into account the differences in format and audience foreseen for both activities, each agenda and program structure was adapted to the specific public and the nature of the events. The agenda for the webinar focused on the processing chain, while the agenda for the in-person meeting placed more emphasis on product

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features and usefulness, encouraging interactivity with the audience. Details of both events are included in the next sections.

It is important to note that a second User Workshop is planned to be conducted at the end of the 2nd cycle of Phase 2.

2.2 Webinar AI for Good

This virtual workshop took place on Tuesday 12 March 2024 (16:15 to 17:45 CET) as a webinar offered by the platform AI for Good. This community platform is designed to help users build connections with innovators and experts, link innovative ideas with social impact opportunities, and bring the community together to advance the SDGs using AI.

The event was scheduled for early afternoon to accommodate simultaneous participation for European, American and Asian audiences (Figure 1).



Figure 1: Slogan of the webinar User Workshop

This event was disseminated through ESA's social media channels, personal invitations from project members, and the AI for Good platform itself (see Section 3).

Given the allocated time of 1h 30 min and the diverse audience, the session was structured to begin with a presentation focused on the CCI+ initiative and the HRLC project. Special emphasis was placed on detailing the processing chain involved in Phase 1 production. Following this, a specific demonstration was conducted to guide participants on accessing and downloading products from the ESA portal, accompanied by a description of their format and properties. Finally, an invitation to respond to the user requirement questionnaire was shared with the audience. This live event included a 30-minute networking event hosted on the AI for Good Neural Network, which offered the opportunity to ask questions, interact with the panellists and participants and build connections.

The session was conducted by Prof. Maria Antonia Brovelli (Professor Politecnico di Milano) and presentations were made by Clement Albergel (ESA Scientist), Prof. Lorenzo Bruzzone (Professor University of Trento) and Massimo Zanetti (Researcher Fondazione Bruno Kessler).

The agenda of the event was the following:

<https://aiforgood.itu.int/event/new-climate-change-initiative-high-resolution-land-cover-map-from-the-european-space-agency/>

Part of the presentation can be found at:

https://aiforgood.itu.int/wp-content/uploads/2021/06/Albergel_ESA_CCI_HRCL_Webinar.pdf

The whole presentation is available at AI for Good YouTube (212 visualizations):

<https://www.youtube.com/watch?v=boMabFHLRJI>

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The attendance was around 50 people and during the 30 min networking some questions related to the product were asked such as will the CCI landcover data also be on Google Earth Engine or will the data be made with global coverage?

2.3 In-person User Workshop at EGU

This workshop took place at the EGU General Assembly 2024 Vienna (Austria) on Wednesday, 17 April, 10:45-12:30, room 2.97 (<https://meetingorganizer.copernicus.org/EGU24/session/50975>) as a splinter session. The aim of this conference is bringing together geoscientists from all over the world to one meeting covering all disciplines of the Earth and Space sciences and provide a forum where to discuss ideas. The event was strategically scheduled mid-week to ensure maximum conference attendee participation (Figure 2).

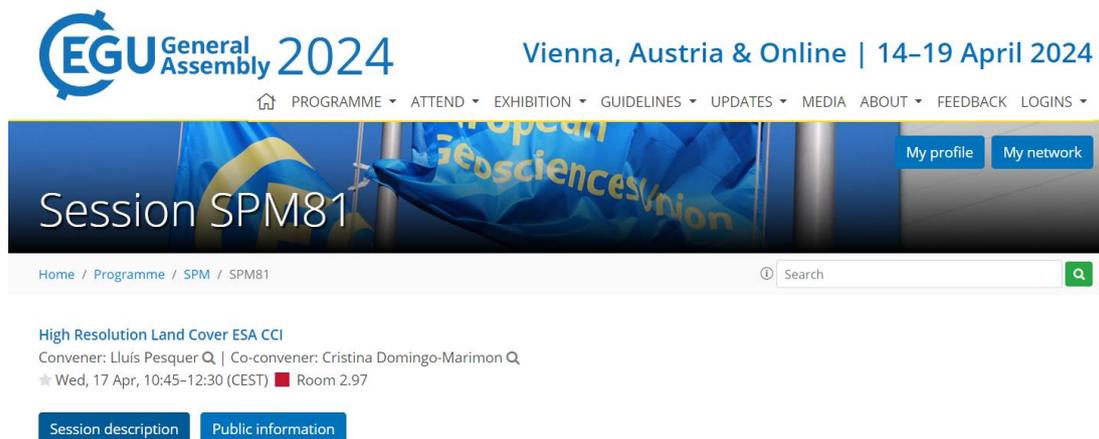


Figure 2: Website of the in-person User Workshop at EGU

Promotion of the event was carried out through various channels, including EGU General Assembly webpage, partners and ESA's social media platforms, email distribution lists of Climate Research Group members and project webpage (see Section 3).

With nearly 2 hours allocation, the session was designed to offer a broad overview of the generated products, avoiding specific details of the processing chain while highlighting enhancements compared to similar products and also the ancillary data (second best class, probability of the first and second best classes). The session started with an introductory presentation on the CCI+ initiative by Clement Albergel followed by three comprehensive presentations. Lorenzo Bruzzone presented the products developed and the processing challenges that have

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been overcome, Catherine Ottlé showed how the data have been used to map the Plant Functional Types required by the ORCHIDEE land surface model and the benefit of the products compared to the previous Medium Resolution one. Finally, Lluís Pesquer presented the added value of the high-resolution land cover maps to analyse the landscape diversity.

The agenda of this session was:

Moderator: Cristina Domingo Marimon, CREAM		
10:45 - 10:50	Presentation of the Workshop	Cristina Domingo, CREAM
10:50 - 11:00	ESA CCI+ projects	Clement Albergel, ESA
11:00 - 11:20	Phase 1: Methodology and HRLC products	Lorenzo Bruzzone, Univ.Trento
11:20 - 11:35	Use of HRLC in Land Surface Models (ORCHIDEE)	Catherine Ottlé, LSCE
11:35 - 12:05	Interactive questionnaire	All participants
12:05 - 12:20	Use of HRLC in Landscape analysis	Lluís Pesquer, CREAM
12:20 - 12:30	Open discussion and final remarks	All participants

The primary objective of this in-person user workshop was to foster interaction with attendees, allowing discussions on phase 1 product characteristics and other needs to be considered for Phase 2. To facilitate this interactive environment, an interactive questionnaire was conducted by Cristina Domingo using Mentimeter. an interactive presentation software enabling real-time engagement with the audience which responds using their own devices at the same moment. A set of 19 questions was prepared in advance by the Climate group to guide the discussion. Questions were organized in five sections: i) on the study areas; ii) on the product classification; iii) on the use of HRLC products; iv) on the uncertainties and second class products; v) on the CCI products (Figure 3). A total of 13 participants attended the workshop.

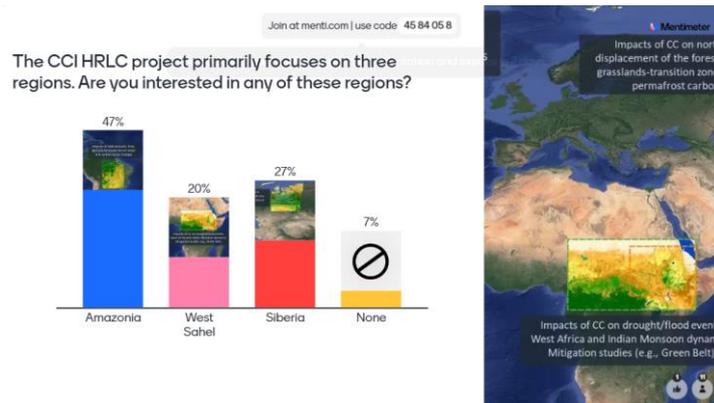


Figure 3. Example of Mentimeter slide showing the results of the audience to a question.

In addition to the user workshop, and taking advantage of ESA's presence at EGU exhibition area with booth X202, two additional complementary activities were organized. These activities were included as part of ESA booth presentations held on Tuesday and on Thursday, during which the project and its products were showcased to the audience of the exhibit booth for 15 minutes (Figure 4 and Figure 5). The video of the project was regularly displayed on the screens at the ESA booth. These sessions were followed by 10-16 people.

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Tuesday 16 April

10:15–10:30	EarthCODE – Earth Science Collaborative Open Development Environment Anca Angheloa, <i>ESA Open Science Platform Engineer</i>
10:30–10:45	The power of content Mali Cecere, <i>ESA Editor</i> / Declan Perry, <i>ESA Editor</i> / Hayret Abdula Keary, <i>ESA EO Services Coordinator</i>
10:45–11:00	DeepESDL (Earth System Data Lab) Ewelina Dobrowolska, <i>ESA Earth Observation Specialist</i> / Martin Reinhardt, <i>University of Leipzig</i>
12:30–12:45	The Copernicus Space Component: Overview and Insights on the New Data Space Ecosystem Maria Milagro, <i>ESA Copernicus Space Component Technical Expert</i> / Alexandru Razvan Cosac, <i>ESA Copernicus Ground Segment Engineer</i>
13:30–13:45	Downscaling CMIP data Claas Teichmann, <i>Scientist, GERICS</i>
15:45–16:00	The PhilEO Geospatial Foundation Model Suite Caspar Fibaek, <i>ESA Research Fellow for Φ-lab</i>
16:00–16:15	DestinE meet the team Claudia Vitolo, <i>ESA EO Digital Twin Earth Application Scientist</i>
16:15–16:30	New ESA CCI High Resolution Land Cover and Land Cover-Change Maps Lorenzo Bruzzone, <i>Professor at University of Trento</i> / Clement Albergel, <i>ESA Climate Applications Scientist</i>
16:30–16:45	Application examples from ESA's Φ -experience Emmanouil (Manos) Lagoudakis, <i>ESA Earth Observation Data Visualisation Expert</i>
16:45–17:00	Ocean Virtual Laboratory Lucile Gaultier, <i>OceanDataLab France</i>
18:00–18:15	ESA User Services in the age of Earth Observation Adriana Tocci, <i>ESA EOHlp Information and Help Desk Operator</i>
18:15–18:30	The Copernicus Space Component: Overview and Insights on the New Data Space Ecosystem Maria Milagro, <i>ESA Copernicus Space Component Technical Expert</i> / Alexandru Razvan Cosac, <i>ESA Copernicus Ground Segment Engineer</i>

Figure 4. Program of ESA booth at EGU on Tuesday

Thursday 18 April

10:15–10:30	Using Earth Observation to Map and Connect Schools to the Internet Caspar Fibaek, <i>ESA Research Fellow for Φ-lab</i>
10:30–10:45	The Network of Resources Discovery Portal and Sponsorship Process Francesco Barchetta, <i>NoR Prime Contractor for the ESA Network of Resources Initiative</i>
12:30–12:45	ESA Climate Office Mentoring Scheme – What is it and how to apply Sarah Connors, <i>ESA Climate Applications Scientist</i>
13:30–13:45	CMIP in Policy Sarah Connors, <i>ESA Climate Applications Scientist</i>
15:45–16:00	ESA Climate Office Upcoming Invitations to Tender Sarah Connors, <i>ESA Climate Applications Scientist</i>
16:00–16:15	DestinE meet the team Claudia Vitolo, <i>ESA EO Digital Twin Earth Application Scientist</i>
16:15–16:30	New ESA CCI High Resolution Land Cover and Land Cover-Change Maps Lorenzo Bruzzone, <i>Professor at University of Trento</i> / Lluís Pesquer Mayos, <i>Researcher at CREAM</i>
16:30–16:45	Teaching geography with satellite images using Copernicus Browser Andras Zlinszky, <i>Community Evangelist for Sinergise</i>
18:00–18:15	M00C – Cubes and Clouds Anca Angheloa, <i>ESA Open Science Platform Engineer</i>
18:15–18:30	Smos demo for Space weather Raffaele Crapolicchio, <i>ESA Operations Management Support-Smos</i>

Figure 5. Program of ESA booth at EGU on Thursday

3 Dissemination of the User Workshop

As anticipated, all activities were promoted through various communication and dissemination channels. These events were featured on the project webpage and communicated via personal emails to project member contacts or project member institutions. For instance, AI for Good webinar was intensively promoted through AI for Good networks (<https://twitter.com/AlforGood/status/1764939315979710538>) (Figure 6).

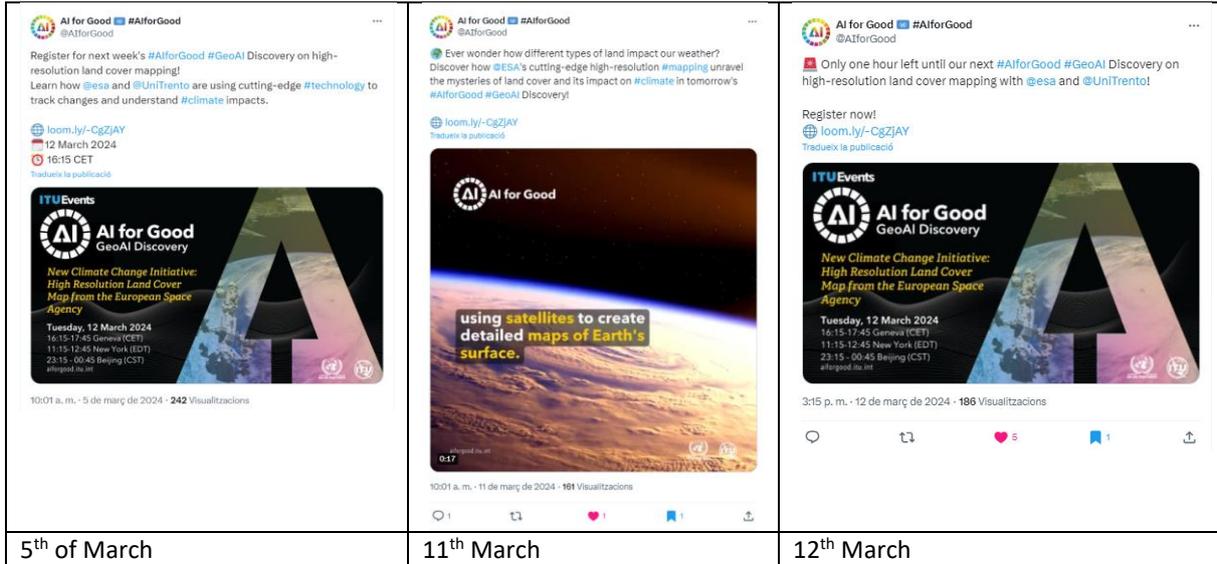


Figure 6. Tweets made from AI for Good profile advertising the workshop

FBK partner also announced the event in its webpage: <https://rsde.fbk.eu/esa-cci-hrlc-webinar-aiforgood/> (Figure 7).

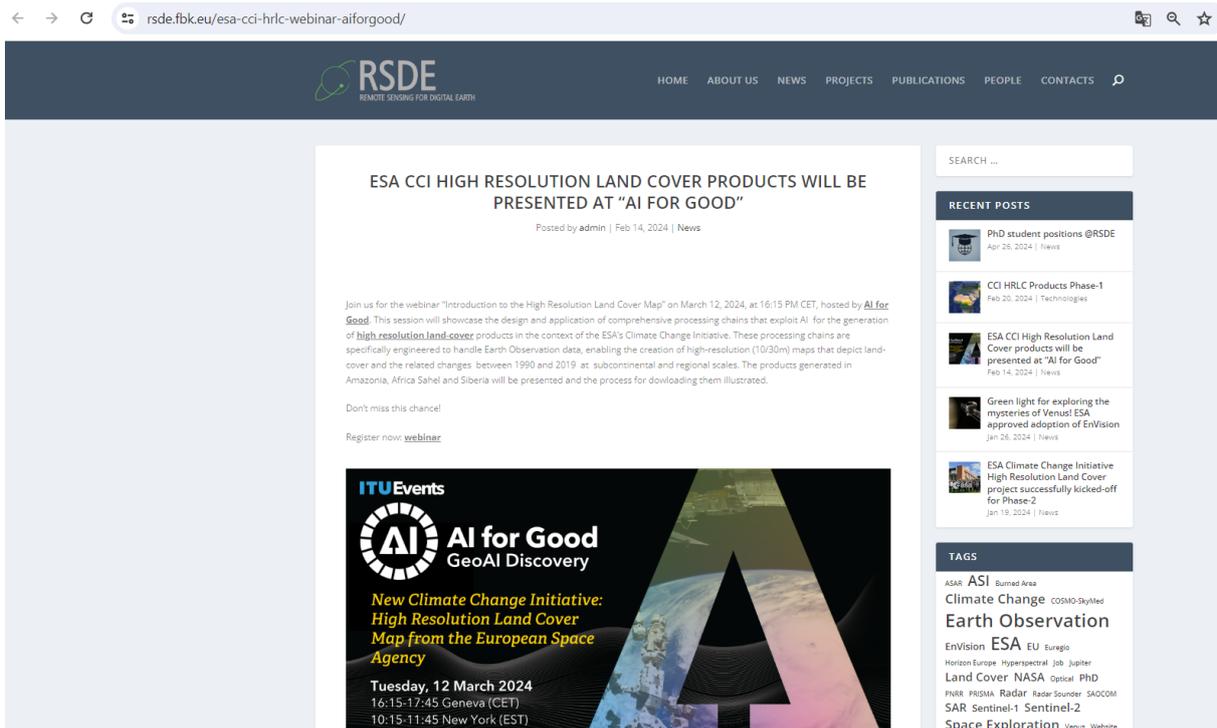


Figure 7. Announcement AI for Good workshop at FBK webpage

Additionally, the ESA climate office shared multiple announcements across its social media platforms on different days (Figure 8 and Figure 9) and some partners reposted these announcements.

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<https://climate.esa.int/en/news-events/webinar-introduction-high-resolution-land-cover-map-from-the-european-space-agency/>

<https://twitter.com/esaclimate/status/177042016646926781?s=20>

Figure 8: Communication announcements for User Workshop: online (left) and in person (right).

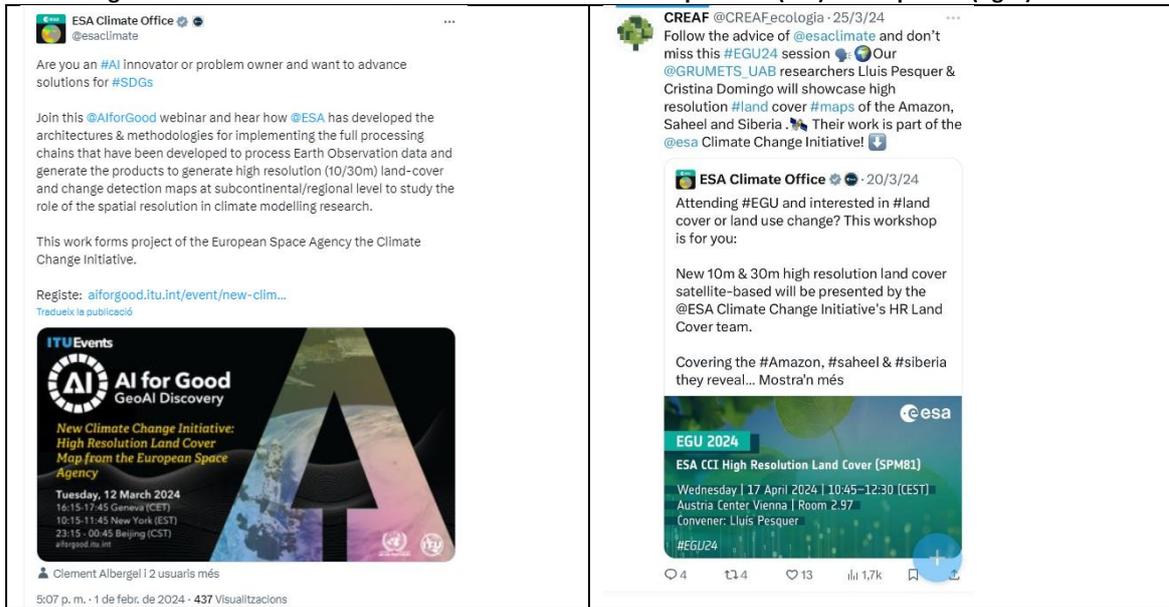


Figure 9. Announce made by ESA Climate Office trough X social network and repost from CREAM (<https://twitter.com/esaclimate/status/1753087746170617887>)

Furthermore, informational emails were distributed through the mailing list of the Climate Community. The Climate Community distribution list comprises 186 subscribers. Two emails were sent out:

- Friday 22nd March an Invitation to EGU workshop (90% successful deliveries, 48.8% successful opens) (Figure 10).
- Monday 15th April a reminder of EGU workshop (92.8% successful deliveries, 36.9% successful opens)

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Save the date!
 Wednesday 17th April, 2024 -10:45
 EGU General Assembly, room 2.97
<https://meetingorganizer.copernicus.org/EGU24/session/50975>

CCI+ High Resolution Land Cover product presentation and user workshop

Dear all,

The main goal of the *HR Land Cover ECV* project (<https://climate.esa.int/en/projects/high-resolution-land-cover/>) is to study in detail the role of the spatial resolution in the mapping of land cover and land cover changes to support climate modelling research. Following the successful completion of Phase 1 and the recent commencement of Phase 2, we are pleased to present the products generated and open them to the scientific community.

The High Resolution Land Cover CCI+ project has been instrumental in producing high resolution (10-30m) land-cover and change detection maps at subcontinental/regional level. These maps aim to enhance the understanding of the impact of spatial resolution of LC and LCC in the context of climate modelling research. The project's focus has primarily been on three study regions: the Amazon, African Sahel and North-Eastern Siberia.

For each of these regions, the available datasets include HRLC maps at 10 m spatial resolution for 2019 as well as HRLC and LCC maps at 30 m spatial resolution covering the period from 1990 to 2019.

The *HR Land Cover ECV* project invites the Climate Research Community members to participate in an in-person meeting scheduled for Wednesday, 17th April 2024 from 10:45 to 12:15 (CEST) at EGU conference.

Figure 10: Part of an email distribution list User Workshop invitation to Climate Research Community

4 Conclusions

The design and execution of the User Workshop during Phase 2 involved some planning to ensure participation. Consequently, the organization took advantage of existing events, such as the European Geophysical Union (EGU) General Assembly and the AI for Good platform.

ESA Climate office, the coordinators and the partners of the consortium carried out announcements of these activities (including links for downloading the products) in social media, blogs, mailing list and other communication channels.

The webinar organized on the AI for Good platform provided a virtual platform for global participation, accommodating attendees from Europe, America and Asia. With a dedicated agenda and a live networking session, the webinar engaged participants and facilitated discussion of the project's objectives and outcomes.

Similarly, the face-to-face User Workshop held at the EGU General Assembly provided an opportunity for direct interaction with attendees, encouraging discussions on product features and user requirements for Phase 2. Through presentations and an interactive questionnaire were actively involved in the discussion.

Complementary activities, including presentations at the ESA booth, further broadened of the project and its products, showcasing them to a diverse audience at the conference.

These two activities allowed to explain the details of the HRLC Phase 1 products and to disseminate the questionnaire for collecting feedback from the Climate Community and a wider research community. The collected feedback is explained in [RD1].

Overall, the dissemination of the user workshop through a variety of channels was successful.