

Copernicus Space Component

Technical Operating Arrangement

Between the European Space Agency and the Canadian Space Agency

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Copernicus Space Component Technical Operating Arrangement

between the **European Space Agency (ESA)**, and the **Canadian Space Agency (CSA)**, on behalf of the Government of Canada,

(ESA and CSA hereinafter referred to individually as “Participant” or jointly as the “Participants”)

executing the Cooperation Arrangement concluded between the European Commission and the Canadian Space Agency on Cooperation in the area of data access and use of Sentinel data of the Copernicus of the Union Space Programme.

1 INTRODUCTION

The European Commission, and CSA ('the Sides') signed a Copernicus Cooperation Arrangement called '*Cooperation in the area of data access and use of Sentinel data of the Copernicus of the Union Space Programme*' on 16 May 2022, to ensure the mutual access to the Copernicus Sentinel series of satellite data and to the nationally owned Canadian Earth observation satellite data. This signed cooperation arrangement will be referred to throughout this document as 'the Cooperation Arrangement'. The Cooperation Arrangement reflects the Sides' recognition of the current and potential value of Earth Observation ('EO') data, and identifies areas where CSA and the European Commission see potential for cooperation to help realise this value.

1.1 European context

'Copernicus' is a European programme, providing Earth Observation information for environmental monitoring and civil security. Copernicus data has a wide range of applications, including supporting forecasting, management and mitigation of natural disasters and crisis management, as well as land, ocean, and atmosphere monitoring. The dedicated Copernicus Sentinel missions are being developed to meet the operational needs of the programme.

Copernicus now forms part of the European Union's Space Programme, which was established under Regulation (EU) 2021/696 of the European Parliament and of the Council of 28 April 2021 establishing the Union Space Programme and the European Union Agency for the Space Programme ('the EU Space Programme Regulation'). In line with this Regulation, the European Union, represented by the European Commission, has concluded Contribution Agreements with ESA, the European Organization for the Exploitation of Meteorological Satellites ('EUMETSAT'), the European Environment Agency ('EEA'), the European Centre for Medium-Range Weather Forecasts ('ECMWF'), and Mercator Ocean International on the implementation of the Copernicus component of the EU Space Programme.

These agreements foresee that ESA and EUMETSAT will provide support to the European Union ('EU') for matters concerning the international technical cooperation of Copernicus. In particular, ESA and EUMETSAT will assess the impact of international technical cooperation requests and will implement and be responsible for technical actions with international partners subject to the prior approval of the European Commission and prerequisite funding provided by the EU.

Through these Agreements, the EU entrusts the technical implementation of the Copernicus component of the EU Space Programme to ESA, EUMETSAT, EEA, ECMWF, Mercator Ocean International, in coordination with the European Commission. The Agreements foresee that ESA, EUMETSAT, EEA, ECMWF, Mercator Ocean International will provide support to the EU for the matters concerning the international technical cooperation of Copernicus. In particular, ESA, EUMETSAT, EEA, ECMWF, Mercator Ocean International will assess the impact of international technical cooperation requests and they will implement and be in charge of technical actions with international partners.

On this basis, the European Commission requests ESA, EUMETSAT, EEA, ECMWF, Mercator Ocean International to establish relevant technical operating arrangements with international partners, addressing topics such as reciprocal data access, product development, and issues such as technical data interface specifications.

1.2 The Canadian context

The CSA is an agency of the Canadian Government responsible for the RADARSAT Constellation Mission ('RCM') and other missions, operational and scientific. Access to RCM data is governed by the *Remote Sensing Space System Act* (S.C. 2005, c. 45) administered by Global Affairs Canada.

1.3 Canada – EU Copernicus Cooperation group

The implementation of the technical operating arrangements will be facilitated by a joint 'Copernicus Cooperation group', involving the European Commission, ESA, EUMETSAT, EEA, ECMWF, Mercator Ocean International, CSA and relevant Canadian departments and agencies, including Environment and Climate Change Canada ('ECCC'), Natural Resources Canada ('NRCan'), Agriculture and Agri-Food Canada ('AAFC'), and the Department of Fisheries and Oceans ('DFO'). The members of the Copernicus Coordination group will meet whenever necessary, to oversee and stimulate cooperative activities as mentioned in the Cooperation Arrangement.

2 PURPOSE AND SCOPE OF THE TOA

In the Cooperation Arrangement, the Sides recognise that the EU and Canada are pursuing EO activities in several areas of common interest and that sharing each other's data, based on reciprocity, should provide mutual benefits. The Sides are committed to the principle of full, free and open exchange of EO data and information, subject to applicable restrictions.

This Technical Operating Arrangement ('TOA'), which does not create any rights or obligations, is established to give technical effect to relevant aspects of the Cooperation Arrangement. The Participants will collaborate to carry out the necessary technical activities. These technical activities are described in this TOA.

The TOA will be implemented based on voluntary, non-legally-binding cooperation, without exchange of funds. In the event that either Participant is unable to continue one or several of the activities described in this TOA, it may discontinue its participation in such activities through a written notice to the other Participant. In such a case, the Participants will endeavour to consult each other and provide each other with reasonable notice of their intentions, as required, through the respective mission manager from each mission.

The European Commission wishes to provide CSA with access to Copernicus Sentinel data using high bandwidth connections from data hub to data hub, with a view to fostering the exchange of EO data between Europe and Canada. ESA, acting on behalf of the European Commission, will provide CSA with access to data from the Copernicus missions operated by ESA through an account which is reserved for the European Commission's Copernicus international partners on the Copernicus data access system operated on behalf of ESA. ESA will not provide direct downlink capabilities under this TOA.

CSA intends to provide ESA, for the benefit of Copernicus, with free and open access to processed unclassified synthetic aperture radar ('SAR') data from its nationally owned EO satellites, namely RADARSAT-1 and RADARSAT Constellation Mission ('RCM'). Access will be limited to data archived in Canada and subject to exceptions for National laws, security, privacy, and confidentiality. Use of RADARSAT-1 and RCM data is to be in accordance with the end-user licence agreement ('EULA') accompanying the data. Except as may be otherwise decided by the Participants in the context of the RCM/Sentinel-1 Contingency Plan, which is included in this TOA as Annex A, CSA is not expected to provide direct RCM image tasking nor direct downlink capabilities.

The Participants recognise that they have both developed legacy C-band SAR missions, and that they share important experience in the operations and use of C-band SAR for a wide range of Earth Observation applications. The Participants have jointly decided, within the context of this TOA, a contingency plan to apply in the event of an unavailability of data from either the Copernicus Sentinel missions or the RCM. This 'RCM/Sentinel-1 Contingency Plan' is included in this TOA as Annex A.

The Participants acknowledge that Copernicus emphasises the importance of in-situ observations and complementarity with space-based observations. To the extent

possible and in accordance with its national laws, regulations, policies and licences (applicable to CSA only), CSA intends to support this objective by facilitating access to data and the use of that data. The Government of Canada has ground segment national observatory networks, including geophysical and meteorological networks. This data is expected to support the enhancement of the Copernicus data architecture and the development of global products. CSA intends to co-ordinate access for Copernicus to Canada's in-situ data with Canadian stakeholders.

CSA intends to promote the use of information and data provided by Copernicus with various institutions, the environmental sector and other sectors, academia, and the private sector in accordance with its national laws, regulations, policies and licences.

The Participants accept that any future evolution of the technologies in the infrastructure and operational domain which has the potential to become relevant for the implementation of the present TOA but which goes beyond the current capabilities of the Participants will be duly considered by them, without creating an obligation for the Participants to adopt/ acquire these new technologies. The Participants will consult each other should this case materialise, endeavouring to ensure continuity of the TOA's implementation.

The TOA will take effect on the date on which the second of the two Participants signs the TOA.

2.1 Technical Activities

2.1.1 The main activities which CSA intends to carry out under the TOA are:

- a. Operating a local Copernicus data centre for supporting the creation of value-added information from the Copernicus Sentinel missions and the development of new data products and downstream services in Canada. The data centre will make available Copernicus Sentinel data which covers the geographical area of interest for CSA as identified in Annex B, including the land and marine territories of the countries within that area. This activity is described in further detail at Section 5.1 below;
- b. Promoting and facilitating the uptake in Canada of Copernicus Sentinel data from the data centre by CSA's fellow departments of the Government of Canada, the environmental sector and other sectors, academia and the private sector;
- c. In accordance with its national laws, regulations, policies and licences, provide ESA with free and open access, for the benefit of the Copernicus component of the

European Union Space Programme, to processed unclassified SAR data from RADARSAT-1 and RCM, as described in more detail in Section 4 below;

- d. Working collaboratively with ESA on complementary data calibration and/ or validation activities and on developing products using Copernicus Sentinel data and RADARSAT data; and
- e. Fulfilling, on a reasonable-efforts basis, the terms of the RCM/Sentinel-1 Contingency Plan which is included in this TOA as Annex A.

2.1.2 The main activities which ESA intends to carry out under the TOA are:

- a. Providing to CSA the access reserved for the EU's Copernicus international partners to the Copernicus Data Space Ecosystem, which is managed by ESA, or to any equivalent privileged data access service for Copernicus Sentinel data operated on behalf of ESA for the EU's Copernicus international partners which is put in operation to replace the access to the Copernicus Data Ecosystem after the date of signature of this TOA. The logistics of this data access are described in more detail at Section 5.2 below;
- b. Providing the related technical support required to ensure the correct functioning of this access to Copernicus Sentinel data;
- c. Accessing RADARSAT-1 and RCM data using the access mechanism described at Section 4 below;
- d. Working collaboratively with CSA on complementary data calibration and/ or validation activities and on developing products using Copernicus Sentinel data and RADARSAT data; and
- e. Fulfilling, on a reasonable-efforts basis, the terms of the RCM/Sentinel-1 Contingency Plan which is included in this TOA as Annex A.

2.1.3 Additional areas of technical cooperation may be included in the future, if relevant and endorsed in advance by the European Commission.

2.1.4 The Annexes to this TOA form an integral part of the TOA, but they can be revised and updated through explicit joint decision in writing and such a revision or update will not require a formal signed amendment of the TOA.

2.2 References

An overview of the Copernicus Sentinel missions is available on the Sentinel Online portal at sentinels.copernicus.eu. In particular, the portal contains up to date information on:

- Each of the Copernicus Sentinel missions which is operated by ESA, describing both the space and ground segment aspects, and providing news from the operations;
- Available user-level data from the Copernicus Sentinels, including the contents and format specifications;
- Detailed user handbooks; and
- How to link to the Copernicus Data Space Ecosystem, including registration process, user manuals, and operational news.

The Copernicus Data Space Ecosystem is an open ecosystem which is operated on behalf of ESA to provide free instant access to a wide range of data and services from the Copernicus Sentinel missions and more on our planet’s land, oceans and atmosphere. The Copernicus Data Space Ecosystem is a core part of the Copernicus Space Component which is managed by ESA as part of its entrusted tasks within the European Union Space Programme. The Copernicus Data Space Ecosystem is publicly accessible online at the internet address: <https://dataspace.copernicus.eu/>.

The following documents are referenced in this TOA and provide further supporting information for the cooperation:

- *CSC Operations - ESA Framework - Operations Concept*, [latest version at the date of signature: issue 1.1, ESA- EOPG-EOPGC-TN-19, dated 27 September 2022]. A copy of this document is appended to this TOA at Annex D.
- The European Commission’s legal notice setting out the conditions of the licence under which Copernicus Sentinel data and information may be used: “Legal notice on the use of Copernicus Sentinel Data and Service Information”, accessible online via

https://sentinels.copernicus.eu/documents/247904/690755/Sentinel_Data_Legal_Notice

A copy of this document is appended to this TOA at Annex E.

3 TECHNICAL INTERFACES

CSA will delegate the technical implementation of the data exchange to NRCan’.

Where other Canadian entities (e.g. institutes, ministries, commercial enterprises, etc.) are involved in the implementation of the TOA, CSA will act as the interface to ESA and the contact point for any such entities.

Where ESA identifies a desire to access RADARSAT-1 or RCM data, or data to support calibration and validation, or wishes to discuss complementary calibration/validation activities, CSA will act as the interface for such discussions.

Occasional technical meetings are intended to be held between the Participants, in addition to participation in the Copernicus Cooperation group which will be co-led by the European Commission and CSA. The European Commission will be invited to all meetings between the Participants, and all meeting documentation will be forwarded to the European Commission for information.

4 EUROPEAN ACCESS TO EO SATELLITE DATA AND IN-SITU DATA FROM CANADA

CSA will provide ESA, for the benefit of Copernicus, with a free and open access to processed unclassified SAR data from its nationally owned EO satellites, namely RADARSAT-1 and RCM, via the Earth Observation Data Management System ('EODMS') managed by NRCan. Access will be limited to data archived in Canada and subject to exceptions for National laws, security, privacy, and confidentiality. Use of RADARSAT-1 and RCM data is to be in accordance with the end-user licence agreement ('EULA') accompanying the data. More information available at: [About access to RCM data | Canadian Space Agency \(asc-csa.gc.ca\)](https://www.asc-csa.gc.ca/eng/satellites/radarsat/access-to-data/about.asp) [https://www.asc-csa.gc.ca/eng/satellites/radarsat/access-to-data/about.asp]

CSA will, on a best-efforts basis, facilitate access for Copernicus to networks of climatological, meteorological and other in-situ and EO data in Canada that can support the calibration and validation of satellite Earth observations and images derived from those Earth observations, as well as provide input to the Copernicus Services.

Data from these networks, and other data and information of value to calibration/validation activities and the Copernicus Services will be made available to the Copernicus programme in accordance with national, state/territory laws and regulations, and organisation-level policies and licences.

It is understood that the data made available by CSA and/or its fellow Departments of the Government of Canada in the course of the implementation of this TOA will be made available for use on the Copernicus Data Space Ecosystem, or equivalent publicly

accessible Copernicus data access service. Consequently, the transmission of these data will allow for such a distribution, without restriction. ESA will serve as facilitator for data transmission to the Copernicus Data Space Ecosystem, or equivalent Copernicus data access service.

5 INTERNATIONAL ARCHIVING AND DISSEMINATION CENTRES – DATA MIRROR SITE

5.1 Data Mirror Site

CSA, via the Earth Observation Data Management System (EODMS) managed by NRCan, has developed a regional Copernicus data access/analysis mirror site ('Data Mirror Site') in the context of ESA's Sentinel Collaborative Ground Segment initiative (described in the document 'CSC Operations - ESA Framework - Operations Concept', (latest version: Issue 1.1, ESA- EOPG-EOPGC-TN-19, dated 27 September 2022), a copy of which is appended to this TOA at Annex D), to improve access to, and the exploitation of Copernicus Sentinel data in Canada. CSA will continue to operate the Data Mirror Site in the context of this TOA. CSA has recently made the Data Mirror Site open to the public, on the Amazon Web Services (AWS) Open Dataset Registry.

The Data Mirror Site retrieves data from the ESA-operated Copernicus Sentinel missions from ESA-operated data systems, and then stores and makes the data available to government bodies, industry, academia and general public users, for download and/or online analysis. The Data Mirror Site is intended to access all data products produced by all ESA-operated Copernicus Sentinel missions for a geographical area of interest that includes the land and marine territories of countries identified in the map in Annex B.

The specific data products to be retrieved, and the scope of the geographic region for which data will be retrieved/stored/re-distributed, may change from time to time. CSA will discuss such changes with ESA prior to implementing them in the Data Mirror Site. For the purpose of technical efficiency, simpler geographical boundaries may be employed that encompass an area larger than the specific area of interest.

The Data Mirror Site is intended to be a distributed system, designed according to the characteristics determined by the Participants and based on ESA's previous experience.

NRCan uses a high bandwidth network capable of peering to GEANT (<https://geant.org/>) on the European side (e.g. academic research networks or other), as the backhaul connection from ESA-operated systems to the Data Mirror Site. Such networks are scaled for data of the size of Copernicus Sentinel data products, and are a cost-effective way of

moving large amounts of scientific data. CSA understands that ESA intends to directly connect ESA-operated data systems with the European GEANT network using high-bandwidth connections.

The types and levels of service provided by the Data Mirror Site (such as web service access, direct file download, etc.) will be determined from time to time by CSA in consultation with its fellow Departments of the Government of Canada and ESA.

Access to data will always be provided in a manner consistent with the overarching terms documented in the Cooperation Arrangement.

NRCan has already implemented a simple and user-friendly registration process for the Data Mirror Site, in order to support the onwards distribution of Copernicus Sentinel data in the region and to share aggregated information with ESA and the European Commission. As part of the user registration process, users will be asked to state, by choosing from a drop-down menu, the country in which they operate, the category of user into which they fall, and their intended field of use for the data, to enable CSA to provide ESA with the annual statistics described at Section 5.4 below.

5.2 ESA Support

5.2.1 Access to the Copernicus Data Space Ecosystem

ESA has already provided NRCan with an account on the Copernicus Data Space Ecosystem in the context of the Collaborative Ground Segment ('CollGS') collaboration. NRCan will continue to use this account for downloading Copernicus Sentinel data within the context of this TOA. The Copernicus Data Space Ecosystem provides bulk dissemination capabilities for Copernicus Sentinel data products, as well as a range of hosted local processing services.

If for any reason ESA needs to close the CollGS account currently used by NRCan on the Copernicus Data Space Ecosystem, ESA will provide NRCan with an account reserved for ESA's international Copernicus partners on the Copernicus Data Space Ecosystem or equivalent Copernicus Sentinel data access point operated on behalf of ESA.

NRCan is already directly connected to the Copernicus Data Space Ecosystem.

The Copernicus Data Space Ecosystem will continuously store Copernicus Sentinel data acquired during the previous month(s) at the processing levels set out in the Copernicus Sentinel data portfolio and the associated timeliness as defined in the document 'CSC Operations - ESA Framework - Operations Concept', (latest version: Issue 1.1, ESA- EOPG- EOPGC-TN-19, dated 27 September 2022), a copy of which is appended to this TOA at

Annex D. The Copernicus Data Space Ecosystem enables searching, browsing, previewing and downloading all Copernicus Sentinel data, as well as a range of hosted local processing services.

Access to the Copernicus Data Space Ecosystem is allowed via a web authentication module. ESA has provided NRCan with a username and password to access the Copernicus Data Space Ecosystem. This username and password may be used only by NRCan as designated Department (including its employees and contractors involved in the initiative) for the purpose of the initiative and will not be shared with other natural or legal persons, without prior written consent from ESA.

NRCan will use the Copernicus Data Space Ecosystem access, or equivalent Copernicus Sentinel data access service only for the purpose of its activity in the Data Mirror Site initiative described above. Through registration at the Copernicus Data Space Ecosystem, or to the equivalent Copernicus Sentinel data access service, accessing and/or downloading available content, NRCan will not misuse or interfere with the service of the Copernicus Data Space Ecosystem portal or that of the equivalent Copernicus Sentinel data access service. In particular, NRCan aims at building a mirror archive of Copernicus Sentinel data over its area of interest and hence will not repeat the download of identical datasets from the Copernicus Data Space Ecosystem, or from the equivalent Copernicus Sentinel data access service, but will store downloaded Copernicus Sentinel data for re-use and re-dissemination.

All functionalities and contents offered by the Copernicus Data Space Ecosystem, or by the equivalent Copernicus Sentinel data access service, are provided by ESA on a best efforts-basis. The transmission of content from the Copernicus Data Space Ecosystem, or from the equivalent Copernicus Sentinel data access service, may be interrupted or delayed by ESA e.g. in the event of technical constraints, such as the internet bandwidth. In such case, the download requested by CSA will be enabled as soon as practicable, taking into account other users' requests.

5.2.2 Data Transfer

ESA has already provided appropriate interfaces to transfer Copernicus Sentinel data to NRCan. If required, ESA can support network performance analysis to help fully utilise available bandwidth.

5.3 Time Schedule

ESA will provide Copernicus Sentinel data as they become available in accordance with ESA's data provision plan (e.g. after launch, commensurate with the commissioning and ramp-up plan for data provision).

5.4 Reporting

CSA and designated Departments of the Government of Canada will keep ESA and the European Commission informed about the course and success of the Data Mirror Site.

CSA will arrange to have regular reports submitted to ESA regarding the Data Mirror Site on an annual basis. The annual reports will, as a minimum, contain information regarding:

- The use which CSA and its fellow Departments of the Government of Canada have made of Copernicus Sentinel data during the year, and any applications it has developed;
- Onward use or dissemination of Copernicus Sentinel data, including in particular statistics regarding user activity on the Data Mirror Site;
- Any changes to the pre-decided set up of activities that may have an impact on ESA's support to the activities of CSA or its fellow Departments of the Government of Canada; and
- CSA will provide feedback to ESA on the Copernicus data access mechanism.

More specifically, concerning Data Mirror Site usage statistics, CSA will arrange to provide an annual set of statistics covering as a minimum:

- a) Statistics on the Copernicus Sentinel data offer on the Data Mirror Site:
 - Volume of Sentinel data acquired for the Data Mirror Site from a data access interface operated on behalf of ESA; and
 - Number and volume of Sentinel user-level data products published on the Data Mirror Site, by mission and user-level data type.
- b) Statistics on the level of user-uptake from the Data Mirror Site:
 - Number of registered users on the Data Mirror Site, number of new users, and number of active users during the reporting period, including users' geographic origin, affiliation, thematic activity, and sector of activity;
 - Number and volume of Sentinel user-level data products downloaded by the users via the Data Mirror Site, by mission, by product type, including users'

geographic origin, affiliation, thematic activity, and sector of activity;

- Complementary Sentinel data and information developed by CSA or its fellow Departments of the Government of Canada.

The template for providing this information to ESA is attached at Annex F below.

The collection of these statistics will require NRCan to structure the user registration process so that when users register, they provide the following information to be associated anonymously with their user account:

a) User geographic origin

Users will be asked during the registration process to state the country from which they will primarily download the data.

b) User's organisation

Users will be asked during the registration process to state the type of organisation for which they work, using the following list of categories:

- International public organisation;
- National/regional/local public authority;
- Research and education organisation;
- Business/commercial/professional – Small and medium-sized enterprise ('SME');
- Business/commercial/professional – non-SME;
- Charity or Non-Governmental Organisation ('NGO');
- Natural person – personal interest;
- Other.

c) User thematic activity

Users will be asked to select their main intended area of application for the data from the following list of application areas:

- Land;
- Marine environment, maritime affairs and fisheries;
- Arctic policy and polar areas;
- Transport;
- Energy;
- Environmental compliance;

- Raw materials;
- Air quality and atmospheric composition;
- Health;
- Tourism;
- Climate Change;
- Civil protection and humanitarian aid operations;
- International development and cooperation;
- Migration and home affairs;
- Security;
- Research and innovation;
- Other.

d) User sector of activity

Users will be asked to state their main target sector, using the following categories:

- Public sector (including policy support);
- Business sector;
- Research;
- Education;
- Media and public relations;
- Charities and NGOs;
- Natural persons for non-commercial purposes;
- Other.

NRCan intends to implement an automated means for the Data Mirror Site to collect the required statistical information on Copernicus Sentinel data re-distribution and analysis, and intends to cooperate with ESA on the technical means for ensuring such data is formatted/structured to ensure it is of maximum value.

ESA may pass the information provided in the annual report to a third-party contractor for processing and analysis. The information and an analysis of the statistics will be sent to the European Commission and subsequently made publicly available.

NRCan will design the user registration process so that the statistical information can be collected while preserving the anonymity of the user and always in compliance with national and/or regional legislation for protecting the users' personal data. CSA and

fellow Departments of the Government of Canada will not disclose any personal data (i.e. information from which a natural person can be identified) of its Data Mirror Site users to ESA.

5.5 Sentinel Data Governance

Copernicus Sentinel data made available via the Copernicus Data Space Ecosystem, or equivalent Copernicus Sentinel data access service, are governed by the “Legal notice on the use of Copernicus Sentinel Data and Service Information”, a copy of which is appended to this TOA at Annex E.

In the event that the EU, in the future, designates Copernicus Sentinel data as “sensitive”¹, the access to such Copernicus Sentinel data through the Copernicus Data Space Ecosystem or equivalent Copernicus Sentinel data access service, and its use and distribution may be subject to different licensing conditions.

This also applies for Copernicus Sentinel data already received by CSA or a fellow Department of the Government of Canada through the Copernicus Data Space Ecosystem or equivalent Copernicus Sentinel data access service, in the event the Copernicus Sentinel data are assessed to be “sensitive” after the time of data download.

Where Copernicus Sentinel data are identified as “sensitive”, CSA will endeavour to remove such data from the Data Mirror Site. It is understood that CSA will be unable to retract data which has already been re-distributed.

6 INTERNATIONAL COMPLEMENTARY EXTERNAL VALIDATION SUPPORT

6.1 CSA Activity

Through the CEOS Calibration Validation Working Group, CSA intends to facilitate complementary Copernicus Sentinel data calibration and/ or validation activities in collaboration with ESA, with the aim of improving the quality of both core Copernicus Sentinel core user-level data and of derived higher-level user-level data.

¹ As defined in Art. 13 of the COMMISSION DELEGATED REGULATION (EU) no 1159/2013 of 12 July 2013 supplementing Regulation (EU) No 911/2010 of the European Parliament and of the Council of the European Earth monitoring programme (GMES) by establishing registration and licensing conditions for GMES users and defining criteria for restricting access to GMES dedicated data and GMES service information.

Copernicus Sentinel data required for those projects may be supplied directly from the Copernicus Data Space Ecosystem to the project, or from the Data Mirror Site. In the latter case, reporting and data governance are handled as per Sections 5.4 and 5.5 above.

CSA may conduct these calibration/validation projects together with fellow Departments of the Government of Canada. In such a case, CSA will act as the interface and contact point between ESA and the other entity.

Details of on-going and planned calibration/validation projects will be described in separate documents, describing the involved entities, the scope of the calibration/validation project, applied methodology, expected results and related use/licence conditions, geographic area of interest, mechanism for supply of Copernicus Sentinel data, time schedule and reporting.

Annex C will be updated with a list of the current ongoing and planned projects as and when necessary.

6.2 ESA technical support to complementary validation activity

ESA will provide relevant data sets from the Sentinel -1, -2, -3 and -5p core user-level data (i.e. L1 and L2. In special cases also L0) as they become available, to support joint validation and calibration activities.

6.3 Reporting

Reporting regarding the complementary external validation activities will be defined in related separate technical documentation.

6.4 Copernicus Sentinel Data Governance

Copernicus Sentinel data used by the complementary validation activity are governed by the “Legal notice on the use of Copernicus Sentinel Data and Service Information.”, a copy of which is attached to this TOA at Annex E.

7 GENERAL CONSIDERATIONS

7.1 Access to data from the Copernicus Sentinel, the RADARSAT-1 and the RCM missions is on an “as is” basis. Both Participants disclaim all conditions, representations and warranties of any kind, whether express, implied statutory or otherwise, including but not limited to what concerns the functionalities of the Copernicus Data Space Ecosystem or equivalent Copernicus Sentinel data access service, the RADARSAT-1 and the RCM missions and the data transferred. This disclaimer includes the warranties

regarding availability, continuity, accuracy, integrity, reliability, fitness for or compatibility with a particular purpose or meeting the users' requirements, satisfactory results or non-infringement of third-party rights.

7.2 Neither Participant will be held liable for any damage that may result from the support activities provided under this TOA, including in particular the functionalities of the Copernicus Data Space Ecosystem or equivalent Copernicus Sentinel data access service, the RADARSAT-1 and the RCM missions, the data transfer, and advice and communication by either Participant's personnel.

7.3 Either Participant may at any time review, modify, suspend or terminate the support activities under this TOA, including but not limited to on the occurrence of the following events:

- (i) lack of sufficient funding for sustaining that Participant's missions, and associated facilities and activities;
- (ii) satellite or ground system failure; or
- (iii) suspension or cancellation of planned activities of related Copernicus Sentinel systems and facilities, in order for ESA or the EU to carry out activities considered of a higher priority.

7.4 Both Participants may modify their respective operations plans at any time, according to operational priorities or if it considers corrective action is necessary for ensuring the safety and success of their respective missions.

7.5 This TOA does not create any legally binding obligation between the Participants.

Annex B. Map of CSA region of interest

As referred to in Section 5.1 of the TOA, the map below represents the region of interest for CSA at the date of signing the TOA. The scope of the geographic region for which Copernicus Sentinel data will be retrieved/stored/re-distributed may be changed when required, with a notification sent to ESA.

Canadian observation needs for Sentinel-1 were expressed in 2012 (before the launch of Sentinel-1A) as part of the Collaborative Ground Segment activities. The needs qualified “high priority” by CSA were implemented on Sentinel-1A (and then Sentinel-1A and B).

