



SCARBOn Data Management Plan

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Project acronym SCARBOn

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List of abbreviations

Abbreviation	Definition
AIT	Acceptance, Integration, and Testing Report
APO	Administrative Project Officer
CC0	Creative Commons Public Domain Dedication
CC BY	Creative Commons Attribution International Public License
COORD	Project Coordinator
DMP	Data Management Plan
EXCOM	Executive Committee of the Project
GHG	Green House Gases
HaDEA	Health and Digital Executive Agency
L	Data Processing Levels
M	Month of Project Implementation
NanoCarb	Name of existing interferometer instrument
NanoCarb-P	NanoCarb design for airborne prototype
NanoCarb-S	NanoCarb design for space application
PEDR	Plan for the Exploitation and Dissemination of Results
SPEXone	Name of existing Compact Aerosol Sensor
TRL	Technology Readiness Level
WP	Work Package

List of reference/applicable documents

Document title	Document author	Date of issuance
SCARBOn Consortium Agreement	Airbus Defence and Space SAS	Version 4 – 8/12/2023
Grant Agreement, Project 101135301 – SCARBOn – HORIZON-CL4-2023-SPACE-01	European Health and Digital Executive Agency (HaDEA)	V1.0 - 20/11/2023
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SCARBOn D8.2 PEDR	GRANT Garant s.r.o.	V2.0 – 28/06/2024

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1 Executive Summary

1.1 SCARBO On Overview

SCARBO On (Space CARBOn Observatory Next step) is an innovation action project funded under the Horizon Europe Programme. It is the continuation of the Horizon 2020 SCARBO project. SCARBO On is a multidisciplinary project carried out by a gender-diverse team, through a consortium including the space industry, SMEs and scientific institutes. It is led from Toulouse, France by Airbus Defence and Space. The SCARBO On project started in January 2024, with a total 30 months of implementation.

The main objective of the SCARBO On collaborative project is to mature the SCARBO On overall system based on a constellation of small satellites – with a miniaturised static spectrometer concept (NanoCarb) coupled with aerosol sensors (SPEXone) - that will be able to monitor greenhouse gases (GHG) – notably CO₂, and CH₄ as well – from space. The instruments together will deliver daily accurate global measurements to monitor the diurnal variations of fossil CO₂ emission. This CO₂ and CH₄ anthropogenic emissions monitoring data aims to be a valuable contributor to the European Commission's endeavour to fight climate change. The monitoring data will foster the development of added-value services and will represent a state-of-the-art European alternative to the burgeoning non-European commercial initiatives.

The SCARBO On project maturation is articulated over the detailed technical definition of the NanoCarb instrument, the industrial definition of both instruments and the constellation concept confirmation, targeting an operational system availability before the end of the decade. The design of the NanoCarb instrument will be upgraded and refined following the outcomes of the previous SCARBO study, and its performances will be carefully modelled. An instrument breadboard will provide valuable data during an airborne campaign, which will be used together with modelled data to verify the instrument design. This will allow raising the instrument TRL to at least 5 by the end of the project. Furthermore, data processing at levels L1 to L4 will validate the concept capability to monitor GHG plumes from space.

1.2 Document summary

This report represents a public version of the SCARBO On Data Management Plan (DMP), which was originally submitted as a part of deliverable D8.3 in June 2024 and updated in June 2025. The report was produced by SCARBO On project partner GRANT Garant. This document encompasses the effective handling of data generated throughout the project lifecycle, adhering to the EU Horizon Europe programme requirements.

Taking into account the principles of the EU Open Science policy, the SCARBO On DMP summarises the information on various digital research datasets of the project and their characteristics in the framework of FAIR data management. SCARBO On-generated datasets are largely linked to the airborne campaign as a key component of the NanoCarb performance demonstration. SCARBO On datasets will be mostly deposited in institutional repositories of consortium partners which enable storage of large data quantities originated from the project.

2 DMP principles and objectives

2.1 DMP principles

SCARBO is an innovation action project funded under the Horizon Europe (HE) programme. In accordance with the general obligations of an HE project a Data Management Plan (DMP) needs to be submitted to the granting authority no later than M6 of project implementation. This report represents a public version of SCARBO DMP deliverable D8.3, which was submitted to HaDEA in June 2024 and updated a year after in June 2025. The SCARBO DMP adheres closely to the guiding principles of the EU Open Science Policy as outlined in the Grant Agreement (GA). In the scope of data management, the SCARBO project aims to:

- Deliver a comprehensive **DMP** and regularly update it, with a periodical update planned in M18 (June 2025)
- Handle its data in line with the **FAIR** principles;
- Deposit its data, as soon as possible, **in a trusted repository**
- **Ensure open access** to the research data via the repository under the latest available version of the Creative Commons Attribution International Public License (CC BY) or Creative Commons Public Domain Dedication (CC0), provided this openness does not harm **beneficiary's legitimate interests or contradict any other constraints** (in particular the EU competitive interests or the beneficiary's obligations under the GA, notably Article 13.1);
- Provide information via the repository about **any research output or any other tools and instruments needed to re-use or validate the data**
- Have its **metadata** open under (CC 0), providing basic information about the dataset origin and including links for related publications and other research outputs

2.2 DMP objectives and implementation

The SCARBO DMP is produced by SCARBO partner GRANT Garant (GG). The main objectives of the DMP are to:

- Identify main datasets that will be produced
- Ensure data management in line with the EU Open Science Policy and FAIR data principles
- Provide a living platform for data management updates and enhancements

The SCARBO DMP covers digital research data generated within the project (including sensitive data) as well as other research outputs.

Over the course of the 30 months of SCARBO implementation, several digital research datasets from different consortium partners will be produced. Providing a viable data management plan to guide the project consortium through the processes of data storage, availability, accessibility, and re-use is essential. The DMP should aid the consortium in achieving efficient implementation of research objectives and facilitates effective communication and dissemination of project results.

SCARBO data management issues are overseen by the partner GG. Additionally, sensitive data issues (namely their sharing within the consortium) are handled by the COORD.

GG prepares and updates the DMP based on information provided by individual partners, with the aim to fulfil the set objectives. In M5 and M17, a consortium screening activity, under the guidance of GG, was performed in the form of an internal questionnaire survey targeted at Executive Committee (EXCOM) members. The information collected represents the backbone of the DMP deliverable.

GG guides all partners through the data life cycle process and informs them about relevant data management obligations. Topics related to data management, presented by GG and the COORD, are regularly discussed within the monthly SCARBOn EXCOM meetings.

At the partner level, the SCARBOn EXCOM members are responsible for addressing data management issues within their institution and are the primary points of contact for GG and the COORD regarding data management issues. The responsibility for dataset description, data collection, storage, deposition and archiving procedures, as well as ensuring data handling compatibility with EC obligations, lies with the dataset owners, represented by the EXCOM members. Data deposition to repositories should be preceded by a prior notice to the SCARBOn EXCOM.

2.3 SCARBOn Data Summary

The SCARBOn activities are structured into nine work packages, whilst seven of them are dedicated to scientific innovation actions.¹ WP2 defines technical and operational requirements for the NanoCarb-S (space) instrument. WP3 is destined to validate the concept of the NanoCarb-S instrument. On the other hand, WP4 and WP5 activities are focused on the NanoCarb-P (prototype) prototyping, demonstration through the airborne campaign, and subsequent campaign data exploitation. Consolidation of the SCARBOn satellite constellation system architecture, managed by the COORD, is the central issue of the WP7, with the WP6 activities overseeing SPEXone instrument accommodation within the planned satellite platform. Finally, WP9 consolidates the project findings and prepares a roadmap for further developments.

Throughout the project screening of M5, the consortium has identified several datasets and research outputs that will be produced in the SCARBOn project. These can be divided into three categories: a) public datasets, b) sensitive research datasets that include sensitive information (according to Article 13.1 of the GA) and will not be made public, and c) other research outputs.

Potential dataset evolution will occur during the project – updates on the datasets will be proposed accordingly, with a DMP update set for M18.

2.3.1 SCARBOn Public Datasets

SCARBOn public datasets (as presented in the tables below) consist of project-generated numerical data combined with image data. SCARBOn data are mostly produced by **direct measurement and field work**. Direct measurement/field work data will be involved in DAT_1, DAT_2, DAT_4 and DAT_6 – i.e. datasets closely connected to the performance of the SCARBOn airborne campaign which itself aims to demonstrate end-to-end performance of the NanoCarb-P in a realistic environment.

The core NanoCarb-P instrument data will be produced by **UGA** within the **DAT_4** dataset that includes raw acquisitions from NanoCarb-P CO₂ and CH₄ cameras acquired during the

¹ WP1 deals with project management issues and WP8 is dedicated to communication, dissemination and exploitation activities.

SCARBO campaign. Such data are collected to assess the and demonstrate the NanoCarb-P performances over reference targets.

UGA will simultaneously produce **DAT_2** dataset which will comprise context RGB images acquired during the flight campaign with the context commercial camera. Such data are used to co-register NanoCarb-P acquisitions and control the field of view.

Simultaneously, **ONERA's** commercial hyperspectral camera will be used during the airborne campaign to produce hyperspectral data of the scene flown over (**DAT_6**) in order to help to disentangle albedo and greenhouse gases column when processing data acquired by NanoCarb.

The NanoCarb-P performance evaluation will be supported on ground by the actions of **BIRA-IASB (DAT_1)**. The dataset of the Belgian team will include Fourier-transform infrared interferograms and spectra measured by BIRA-IASB mobile FTIR spectrometer, together with meteorological data, collected during the side-by-side measurements with the NanoCarb-P and during the flight campaign. Based on the FTIR spectra, the atmospheric column-averaged dry air mole fractions of the target trace gases (CO₂, CH₄) will be retrieved (using the PROFFAST analysis software) and provided. BIRA-IASB data are collected for NanoCarb-P inter-comparison and validation purposes and might serve for other GHG satellite-tracking projects.

On the other hand, **UGA** datasets DAT_5 and DAT_3 are not based on direct measurement data. Calibration data of the NanoCarb-P instrument (**DAT_3**) will be obtained partially on ground, partially by **lab acquisition** in order to check the NanoCarb-P cameras for the airborne campaign (including Instrumental Spectral Response Function, radiometric gain map, and geometric calibration). This data might be useful to researchers interested in comparing NanoCarb performances and characteristics, or to re-process campaign data.

UGA NanoCarb-P L1 data for CO₂ and CH₄ band (**DAT_5**) will be produced by **computation** from L0 (raw acquisition) data originated from the SCARBO airborne campaign (DAT_4) and will be later exploited by WP5 activities of CNRS - NanoCarb-P L2 data (**DAT_7**). Both datasets could be valuable to anyone interested in comparing NanoCarb performances with other specialized imaging spectrometers/instruments.

Finally, **CNRS** will produce NanoCarb-S L2 data Performance Assessment dataset (**DAT_8**), including performance simulation and L2 error maps.

From the very nature of the SCARBO innovation (spectrometer sensors coupled with satellite tracking), SCARBO datasets will entail large quantities of data. Most datasets are expected to be of a **size** more than 5 GB, with UGA and ONERA datasets exceeding 500 MB.

Table 1 SCARBOn public datasets – part A

Dataset No.	DAT_1	DAT_2	DAT_3
Name	Ground-based FTIR spectrometer data	Context RGB images acquired from the SCARBOn airborne campaign	NanoCarb-P calibration data
Owner	BIRA-IASB	UGA	UGA
WP/task	4/4.5	4/4.4	4/4.3 and 4.4
Description	Fourier-transform infrared interferograms and spectra, and meteorological data measured during the side-by-side measurements with the NanoCarb prototype and during the flight campaign, and the column averaged dry air mole fractions of the target trace gases CO ₂ and CH ₄ retrieved from these spectra.	Visible coloured images acquired during the SCARBOn airborne campaign with the context commercial camera. Data are used to co-register NanoCarb-P acquisitions and control the field of view.	Calibration dataset used to process NanoCarb-P acquisition from the airborne campaign, including Instrumental Spectral Response Function, radiometric gain map, and geometric calibration. Data are collected in laboratory or at ground to check camera and data status, then the NanoCarb-P acquisitions (L0->L1 and L1->L2) will be exploited.
Type of data	Numeric	Numeric, images	Numeric, images
Data format	netCDF-4 format Bruker Opus binary format	Binary data	FITS files with header or HDF5 files
Repository	BIRA-IASB data repository	OSUG (Observatoire des Sciences de l'Univers de Grenoble) repository or ONERA repository	OSUG (Observatoire des Sciences de l'Univers de Grenoble) repository or ONERA repository
Open Access	YES	YES	NO (availability upon direct request)
Reasons for closed data	x	x	Potential use of the NanoCarb instrument for further commercial exploitation
Metadata available	YES	YES	YES

Table 2 SCARBOn public datasets - part B

Dataset No.	DAT_4	DAT_5	DAT_6
Name	NanoCarb-P L0 data from the campaign	NanoCarb-P L1 data from the campaign exploitation	Airborne campaign hyperspectral data
Owner	UGA	UGA	ONERA
WP/task	4/4.4	5/5.1	4/4.4
Description	Raw acquisitions from NanoCarb-P CO2 and CH4 cameras acquired during the SCARBOn campaign	NanoCarb-P Level 1 data for CO2 and CH4 band retrieved from L0 NanoCarb campaign data. L1 data are ready to be inversed to retrieve L2 CO2 and CH4 total column.	Data will be acquired by the ONERA's commercial hyperspectral imager and will consist in hyperspectral data of the scene flown over.
Type of data	Numeric, images, non-structured data	Numeric, images, non-structured data	Images
Data format	Binary data	Binary data	raw data ENVI header, xls, txt, doc
Repository	OSUG (Observatoire des Sciences de l'Univers de Grenoble) repository or ONERA repository	OSUG (Observatoire des Sciences de l'Univers de Grenoble) repository or ONERA repository	ONERA repository (ONERA institutional space at Recherche Data Gouv repository)
Open Access	NO (availability upon direct request)	NO (availability upon direct request)	NO (availability upon direct request)
Reasons for closed data	Potential use of the NanoCarb instrument for further commercial exploitation	Potential use of the NanoCarb instrument for further commercial exploitation	Data originate from dual-use instrument (hyperspectral imager)
Metadata	YES	YES	YES

Table 3 SCARBOn public datasets - part C

Dataset No.	DAT_7	DAT_8
Name	NanoCarb-P L2 data from the campaign exploitation	NanoCarb-S L2 data Performance Assessment
Owner	CNRS	CNRS
WP/task	5/5.2	3/3.4
Description	NanoCarb-P Level 2 data for CO2 and CH4 band retrieved from L1 data	NanoCarb-S L2 performance simulation and L2 error maps
Type of data	Numeric (values of XCO2 and associated averaging kernels)	Numeric (values of XCO2 and associated averaging kernels)
Data format	netcdf	netcdf
Repository	SCARBOn Zenodo community	SCARBOn Zenodo community
Open Access	YES	YES
Reasons for closed data	x	x
Metadata	YES	YES

2.3.2 SCARBOn Sensitive Datasets

Some SCARBOn partners will produce or use datasets that include sensitive information, as defined in Article 13.1 of the Grant Agreement. Such datasets will be kept confidential during the implementation of the project and for at least five years after the end of the project, according to the standard time-limit mentioned in the Grant Agreement.

The storage and archiving of sensitive datasets are the sole responsibility of the data owner. Sensitive data will be disclosed to project partners if needed for the implementation of the action. Sharing of sensitive data within the consortium is governed by SCARBOn internal rules - prior notification to the COORD is required for sensitive data sharing. The SCARBOn internal project repository may be used for the exchange of sensitive data among project partners, with the possibility of limiting access to selected users only.

The following sensitive datasets have been identified within the SCARBOn project.

Table 4 SCARBOn Sensitive Datasets - part A

Sensitive dataset No.	SEN_1	SEN_2	SEN_3
Name	NanoCarb-P test dataset	SPEXone definition data pack	SPEXone exterior CAD file
Owner	Absolut	Airbus-NL	Airbus-NL
WP/task	4/4.3	6/6.1	6/6.1
Basic description	Raw data underpinning D4.2, data will include parameters of the NanoCarb-P thermal cycling and calibration tests.	The data pack contains: Instrument Control Unit requirements, an Interface Control Document on the interfaces between the SPEXone instrument and the satellite platform (includes instrument description), A Concept of Operations and Calibration approach.	A digital 3D CAD model of the exterior of the instrument. It contains details of a specific instrument design.
Sensitivity	Data regarded sensitive (according to the art. 13.1) due to IPR protection and possible commercial exploitation	Data regarded sensitive (according to the art. 13.1) due to IPR protection of the instrument design and design methodologies, and due to possible commercial exploitation	Data regarded sensitive (according to the art. 13.1) due to IPR protection of the instrument design and design methodologies, and due to possible commercial exploitation

Table 5 SCARBO n Sensitive Datasets - part B

Sensitive Dataset No.	SEN_4	SEN_5
Name	SPEXone Production and tooling guidelines	SCARBO n Constellation System Topology
Owner	Airbus-NL	AIRBUS-F
WP/task	7/7.2	7/7.1
Basic description	These data include instrument series production AIT and Verification Plan, as well as design concepts for Tooling, Ground Support Equipment (GSE) and design modifications for series production.	Constellation definition dataset – from satellite accommodation up to constellation topology
Sensitivity	Data regarded sensitive (according to the art. 13.1) due to IPR protection of the instrument design and design methodologies, and due to possible commercial exploitation	Data regarded sensitive (according to the art. 13.1) due to possible commercial exploitation

2.3.3 SCARBO n “other research outputs”

Besides the SCARBO n datasets described above, the consortium anticipates production of other research outputs. Notably, the partner Absolut will produce a public version of its deliverable D4.2 on NanoCarb-P Test Report (**ORO_1**) that will be based on Absolut sensitive dataset SEN_1. This output will comprise public version of the AIT report on the NanoCarb-P thermal cycling and calibration tests that will be performed before the airborne campaign. The AIT report will demonstrate manufacturability of the NanoCarb key components and allow to validate instrument performance model for flight instrument design and for the flight campaign preparation. The AIT report (**ORO_1**) will comprise numeric data, texts and images collected through direct measurements and expert knowledge.

To support SCARBO n openness towards its target groups (as defined within SCARBO n PEDR), some SCARBO n deliverables submitted to the EC with a sensitive dissemination level of publication will be published as executive summary at the project website. Alongside, for most of its WP8 deliverables, including this DMP, SCARBO n will produce a comprehensive public version. These public reports will be uploaded at the project website and stored at SCARBO n ZENODO community. Simultaneously, SCARBO n deliverables with public dissemination level will be uploaded on the project website.

Table 6 SCARBO_n Other Research Outputs

Other research output No.	ORO_1
Name	NanoCarb-P Test Report
Owner	Absolut
WP/task	4/4.3
Description	Public version of the D4.2 – Acceptance, Integration, and Testing Report (AIT) of the NanoCarb-P before airflight campaign (cameras spectral, radiometric and geometric calibration results)
Type of data	Numeric, text, images
Data format	pdf
Repository	ZENODO
Open Access	YES
Reasons for closed data	x
Metadata available	YES

2.4 FAIR data

The SCARBOn project is built on collaborative work and sharing of knowledge. It adheres to the data policy principle of achieving maximum openness as early and widely as possible. All SCARBOn research data will be managed responsibly in accordance with the FAIR principles and Horizon Europe obligations, while safeguarding legitimate interests of the consortium and ensuring security standards for its sensitive data.

2.4.1 Findability

To ensure **findability**, all SCARBOn public data and other research outputs will be assigned persistent identifier, preferably DOIs, through selected trusted repositories.

Metadata frameworks will accompany these datasets and will be openly accessible under the public domain dedication CC0. Metadata will provide information about the following: datasets (description, date of deposit, author(s), venue and embargo); Horizon Europe funding, grant project name, acronym and number; licensing terms; persistent identifiers for the dataset, the authors involved in the action, and, if possible, for their organisations and the grant. Where applicable, the metadata will include persistent identifiers for linked publications and other research outputs. Metadata will be stored within the repositories in JSON format and will be harvestable. For UGA datasets DAT_1, DAT_2, DAT_3 and DAT_4, a repository is yet to be selected (two options available – see the Table 1 and 2),

Simultaneously, SCARBOn datasets might use keywords to enhance the findability of data.

2.4.2 Accessibility

The **storage** of SCARBOn datasets will not be centralised. Each partner is responsible for its dataset storage. All consortium partners have been informed about the EC standards and obligations in relation to Open Science policy and they are to define where and how their datasets are deposited. SCARBOn public datasets and other research outputs are intended to be deposited into trusted repositories as soon as possible and, at the latest, by the end of the project. If the given dataset underpins a scientific publication, it will be deposited no later than the time of publication. Most partners will use their respective institutional repositories.

BIRA-IASB will follow its usual practice and use its repository for DAT_1 deposition, with 10 years of data availability ensured.

ONERA data will be deposited to its institutional space (so called ONERA repository) delimited at the French multidisciplinary repository Recherche Data Gouv.

UGA will produce large quantities of data and will exceed usual data limits of repositories (e.g. ZENODO). A repository for DAT_2, DAT_3, DAT_4 and DAT_5 is yet to be defined – a selection will be probably made from UGA Observatoire des Sciences de l'Univers de Grenoble (OSUG) or the ONERA repository.

CNRS is currently assuming SCARBOn ZENODO community to be used for DAT_7 and DAT_8 deposition, however, possible size limitations need to be taken into account.

As of now, the Absolut output (ORO_1), as well as all SCARBOn WP8 public version deliverables are assumed to be stored at ZENODO repository, a trusted open-source repository with metadata openly available under CC0 licence, as mandated by Horizon Europe. Datasets on Zenodo will receive DOIs and can be linked to related publications or

datasets. Data availability for the deposited data will follow the general conditions of the repository. A SCARBOn ZENODO community was created to unify all SCARBOn depositions at one place so as to enhance project visibility, and promote the exchange of ideas within the field of space science and industry.

SCARBOn sensitive datasets (chapter 3.2.2) will be stored at their owner's document management system and will use their identifiers. For the purpose of sharing of sensitive datasets within the consortium, the sensitive datasets might be stored at the SCARBOn internal repository (managed by the COORD) once the COORD is notified.

SCARBOn consortium acknowledges the EC Open Science and Open Access guidelines. Project aim is to manage its data in line with the principle of "as open as possible, as closed as necessary". Currently, for most SCARBOn datasets, open access is not deemed possible due to their sensitivity level (according to the art. 13.1 of the GA) stemming from IPR protection of the instruments used and their further commercial exploitation.

As for SCARBOn public datasets DAT_1 (produced by BIRA-IASB), DAT_2 (produced by UGA) and DAT_7 & DAT_8 (produced by CNRS) open access will be ensured at the time of the dataset publication. Accordingly, Absolut ORO_1 will be available upon open access with no restrictions.

UGA datasets (DAT_3, DAT_4, DAT_5) are currently planned to stay closed within the repository due to the legitimate interest of the beneficiary – i.e., potential use of the NanoCarb instrument for further commercial exploitation. After the end of the project, however, access to these datasets might be given upon direct written request to the UGA data owner. UGA datasets are assumed to be available in this restricted access mode for 3 to 5 years.

Also, ONERA data (DAT_6) will stay closed due to their origin of a dual-use hyperspectral instrument. Access to this dataset is, however, possible upon direct written request to the data owner.

However, the decision to keep some SCARBOn data closed is subject to periodic review and may change.

2.4.3 Interoperability

As for SCARBOn public datasets, the interoperability will be supported by standard data formats used within the discipline:

- For DAT_1: netCDF-4 format that requires NetCDF software – see Unidata Program Center
- For DAT_2: binary data with description Readme file
- For DAT_3: FITS files with header or HDF5 files
- For DAT_4: binary data with description Readme file
- For DAT_5: binary data with description Readme file
- For DAT_6: ENVI header data, doc, txt, xls
- For DAT_7 & DAT_8: netCDF

Absolut output ORO_1, as well as other SCARBO public version deliverables will be stored in pdf format.

The scientific links between the datasets will be described, if possible. Proper citation of datasets (including the identifiers) will be enhanced.

2.4.4 Re-use

In order to support **the re-use of data**, the SCARBO consortium will use metadata to enable the replicability of datasets across different contexts. For non-self-explanatory data, various strategies will be implemented:

- For DAT_1: A readme file describing the measurement and data analysis methodology will be provided. Documentation in the netCDF meta data fields facilitates re-use of the data.
- For DAT_2, DAT_3 DAT_4, and DAT_5: A pdf document with name of directory and description/link of the different files will be provided.
- For DAT_6: A readme file and/or a doc file will provide information on the image product (correction level, physical unit, spectral bands, noise model). A quality file will be created as well.
- For DAT_7 & DAT_8: Header of the netCDF file will be provided

SCARBO datasets in open access are assumed to be **licensed** under the latest available version of a Creative Commons Attribution International Public Licence (CC BY) or Creative Commons Attribution Share-Alike (CC-BY-SA), requiring attribution of authorship. Metadata will be licensed under Creative Commons Public Domain Dedication (CC0).

SCARBO public datasets are assumed to be usable by third parties immediately after their publication (for DAT_1, DAT_2, DAT_7 & DAT_8), and after the end of the project (for DAT_3 to DAT_5). For DAT_6 which originates from a dual-use instrument, a third-party usage might be limited by ONERA internal procedures concerning the handling of dual-use instrument data. However, it is presumed that data might be accessible following a direct request procedure at ONERA.

2.4.5 Other issues

The **costs** associated with the support of the FAIR principles in the SCARBO project will comprise mostly personnel costs dedicated to data management. Otherwise, the repositories that have been selected offer free data storage services. A specific data steward position has not been established within the project. However, data management issues are guided by the COORD and performed by the partner GG within the WP8. At the partner level, data management belongs to the responsibilities of the EXCOM members.

The **long-term preservation** of SCARBO public datasets is guaranteed for at least 5 years after the end of the project due to general conditions of the selected repositories.

The issue of **data security** belongs to data owners' responsibilities and partners should follow their institutional policy on security. It is advisable that all partners consult their organization's IT professionals to establish and manage data security, ensuring that the appropriate safeguards are in place.

For (sensitive) data sharing, partners must also consider the issue of encrypting data files before transfer. Notification of the COORD should take place before any sensitive data sharing (see chapter 3.2.2).

Regarding **ethical or legal issues**, no SCARBO n digital research datasets involve personal data. Most SCARBO n datasets are not perceived as being directly linked to security issues. As an exception, DAT_6 of ONERA will originate from a hyperspectral camera that has been classified as a dual-use instrument (according to the EU dual-use regulation 428/2009). Handling of these data will follow the usual internal procedures of ONERA.

3 Conclusions

This document encompasses SCARBOn provisions for effective handling of data generated throughout the project lifecycle, adhering to the EU Horizon Europe programme requirements.

The SCARBOn DMP is a living document that will guide the project consortium through the entire data lifecycle, while respecting in one hand the protection of intellectual property and in other hand the principles of the EU Open Science policy and the FAIR principles of data management. The DMP will be updated by its author upon need.

The completion of the Data Management Plan, which is based on true collaboration of all the consortium partners, represents a contribution to the successful realization of the SCARBOn objectives. It aligns with the European Commission's vision of fostering a competitive and knowledge-driven economy while ensuring that the rights of all stakeholders are protected and that data is managed responsibly.

SCARBOn commitment to ongoing updates and adaptations of these above-described plans of the DMP will ensure that the project remains responsive to emerging challenges and opportunities so as to not only achieve project goals but also contribute to broader scientific and societal advancements.