**PRISCAV Project**

**(Attività scientifica di CAL/VAL della missione PRISMA)**

**Scientific Collaboration Agreement**

**between**

Il **Consiglio Nazionale delle Ricerche – Istituto di BioEconomia**, hereafter “CNR”, with headquarter in Sesto, 7 – 00185 Roma, C.F. 80054330586 e P.IVA 02118311006, represented by the Director Prof. Francesco Loreto, born in Siracusa il 04/07/1959, residente in Firenze in Via dei della Robbia n. 60, C.F. LRTFNC59L04I754G

**and**

**Global Change Research Institute of the Czech Academy of Sciences** hereafter “CzechGlobe”, with headquarter in Belidla 986/4a, 603 00 Brno, Czech Republic, represented by the Director Prof. Michal V. Marek, born 17/08/1954.

#### Background and objectives

PRISMA (PRecursore IperSpettrale della Missione Applicativa) is an Italian Space Agency (ASI) hyperspectral mission launched in march 2019. With a swath width of 30 km and with a ground sampling distance of 30 m (hyperspectral), PRISMA measurements can be used for environment monitoring at regional scale but with fine spatial resolution.

In 2019, CNR have signed an agreement with the Agenzia Spaziale Italiana (ASI) for the joint execution of PRISCAV project (Accordo attuativo n° 2019-5-HH.0). The objective of the project is the comprehensive characterization of the performances of the instrument and of the mission, in different operational scenarios and the verification of the durability in time of the performances. The main activity is the creation of a network of instrumented sites dedicated to the scientific CAL/VAL of PRISMA mission. The CAL/VAL strategy is implemented by means of ground truth spectral measurements, airborne measurements and atmospheric characterization on a set of sites 12 sites with different surface properties (snow; sea; internal water; forest and agriculture). The project team ensures the measures and the independent analysis of standard PRISMA products, in close collaboration with the operational mission activities of ASI.

The description of PRISCAV project activities and the detailed work packages breakdown structure is provided by the Operational Agreement (Accordo Attuativo) between CNR and ASI.

This agreement assigns the execution of airborne hyperspectral acquisitions within PRISCAV Project as planned by WPs III.1 and V.1 of the project document to **CzechGlobe**. The detailed description of the terms, activities, tasks and timing are provided in the following paragraphs.

1. **Main objectives of the collaboration**

The collaboration between CNR and CzechGlobe will pursue two main scientific objectives that fits to the main goals of the Priscav project:

1. **Airborne acquisitions of hyperspectral images in the VIS-NIR-SWIR and thermal bands over assigned target areas in Italy** This objective requires that high-quallity and high-spatial and spectral resolution hyperspectral images are acquired over selected target areas in Italy. Those images will be the at the base of the validation of Prisma Hyperspectral images. A collaboration between CNR and CzechGlobe is required to this aim as it will enable the combination of airborne hyperspectral data (collected by CzechGlobe), ground radiance/reflectance data (collected by CNR) as well as critical information on atmospheric properties and Atmospheric Optical Depth (AOD) (acquired by CNR during airborne campaigns). Such collaborative effort is finalized to the availability of scientific information that will address some of the objectives of the PRISCAV Project
2. **Data pre-processing for images geo-referencing** This second objective is to obtain the necessary pre-processing and georeferencing of hyperspectral images that will finally enable spatial validation of Prisma Product that will be made by CNR. CzechGlobe and CNR will collaborate towards this common objective by sharing important ground information and by mean of a strict coordination of activities and objectives
3. **Time of execution / duration and number of airborne campaigns**

CNR must contractually complete overpasses over the Le Rogaie site (Grosseto, Italy) in combination with PRISMA satellite by the end of the PRISCAV project. The current end date of PRISCAV is set at 10/6/2022, but the recent COVID-19 pandemics may postpone the end of the project by at least 6 months.

The overpasses will extend over the are defined as S3-patterns which was already mapped by CzechGlobe during the ESA FlexSense campaign in 2018 and 2019. Overpasses may be repeated in different days during the campaigns or in different campaigns.

Each overpass will be planned to happen in concomitance with PRISMA acquisitions as already done by CzechGlobe aircraft in 2019.

CNR will be responsible for ground activities coordination between ground teams and airborne operators and for contact/agreements with airport and military authorities for logistics and flight authorizations.

1. **Deliverables**

CzechGlobe will provide:

1. Calibrated instrumentation
2. Images acquisitions (raw data)
3. Pre-processed, georeferenced images
4. **Terms of reference and payments**

The total sum allocated to this agreement by CNR is 210.000 € (two hundred ten thousand/00). This sum will be transferred by CNR to CzechGlobe divided in tranches, upon the presentation of a request of payment and after the approval of the financial and activity report of each flight campaign. The payment will be made after the approval and payment of the official financial reporting of CNR to ASI.

The expenses are fixed at 1450 € per flight hour, 300 € for each stand-by day, plus 10.000€ for preliminary data processing and georeferencing per each campaign. Non-atmospherically corrected data will be provided.

CzechGlobe will participate and contribute to the periodic PRISCAV meetings by illustrating the activities made (teleconference will be the preferred method of participation).

1. **Evaluation and approval of technical and financial reports**

The CNR evaluates the content of the CzechGlobe technical and financial reports

These technical and financial reports are approved by the CNR, for the sole purpose of sending ASI requests for payment of the Contribution, if the CNR itself, within 40 days of their receipt, does not make any findings or requests for clarification.

If the CNR finds or ascertain events or happenings, of a technical-scientific or accounting-financial nature, different from the executive plan of the activities, it makes observations to CzechGlobe requesting to implement adequate corrective measures and notifying ASI. The CNR reports to ASI any failure by CzechGlobe to adapt to these corrective provisions.

1. **ELIGIBLE EXPENSES**

Costs directly incurred for the realization of the activities are eligible for reporting.

1. **DURATION**

The present agreement takes effect from the signature date of both parties and will end on 10/06/2022. The same may be extended on the basis of a possible extension of the PRISCAV project.

1. **PROPERTY OF RESULTS**

The results and documentation of any kind produced as part of the activities provided for in this agreement will be the property of both Parties who will have full access to it, without prejudice to the moral rights of the author.

The above results may be communicated to third parties, disclosed or be published after agreement between the parties. In the case of any scientific publications, explicit reference to this Agreement must be made and a copy must be delivered to ASI.

As regards knowledge and patents, it is applied art. 2588 of the italian civil code and art. 65 of Legislative Decree 30 of 2005.

1. **PRIVACY AND CONFIDENTIALITY**

The Parties mutually undertake to process and store data and information, both on paper and computerized media, relating to the performance of activities related to this Agreement, in accordance with the measures and obligations imposed by Italy’s Legislative Decree 30 June 2003 n . 196 "Code regarding the protection of personal data" and the European Regulation on the protection of personal data, GDPR 679/2016.

All technical data relating to the Project will be considered strictly confidential; of the research funded, only the general topic will be disclosed and in any case in agreement with the Parties.

CzechGlobe is required to provide, at the request of the CNR, the data necessary for the technical and administrative monitoring of the funded program.

These data can be requested and must be kept by CzechGlobe for the entire duration of the Project and in any case up to five years after the verification of its realization.

1. **CHANGES TO THE AGREEMENT**

This Agreement may be modified only with the written consent of the Parties, in the event that changes occur to the legal and administrative structure of the parties that do not alter its technical-scientific and financial capacity.

1. **COMMUNICATIONS**

For the purposes of this Agreement, the Parties establish that administrative and scientific communications relating to the execution of the Agreement must be made by certified electronic mail (PEC) or electronic mail (PE) addressed to the following persons:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Partner** | **Reference person for financial issues** | **Mail** | **Reference person for cientific/technical issues** | **Mail** |
| CNR | Alessandro Guercio | protocollo-ammcen@pec.cnr.it alessandro.guercio@cnr.it  | Franco Miglietta | franco.miglietta@ibe.cnr.it |
| CzechGlobe | Martin Pavlík | pavlik.m@czechglobe.cz  | Jan Hanuš | hanus.j@czechglobe.cz  |

1. **SIGNATURE, REGISTRATION AND STAMP DUTY**

The agreement is subject to registration in the event of use, pursuant to Presidential Decree no. 131/86 and subsequent amendments

The cost of registration will be borne by the party requesting it.

The expenses relating to stamp duty will be paid by CNR.

**Consiglio Nazionale delle Ricerche**

Istituto di BioEconomia

The director

Dr Giorgio Matteucci

**CzechGlobe**

The director

Prof. Michal V. Marek