Concept note

TECHNICAL TRAINING: SYNTHETIC APERTURE RADAR APPLIED IN RICE AND FOREST MONITORING
Hanoi, 20th – 22nd February 2019

1. Background

CEOS was established in September, 1984 in response to a recommendation from a Panel of Experts on Remote Sensing from Space and set up under the aegis of the G7 Economic Summit of Industrial Nations Working Group on Growth, Technology, and Employment. This Panel recognized the multidisciplinary nature of space-based Earth observations and the value of coordinating international Earth observation efforts to benefit society. The original function of CEOS was to coordinate and harmonize Earth observations to make it easier for the user community to access and use data.

Mekong region and Viet Nam specifically is vulnerable to climate change because of growing populations facing climate change and anthropogenic impacts. By putting the focus on this specific region, CEOS Chair objective is to enhance contribution and cooperation of the CEOS agencies in the region, to identify potential Earth Observation users and to respond effectively to their needs by achieving integration across the full range of Earth Observations, by promoting the sharing of CEOS agency data, and by improving access to and use of such data.

As the 2019 CEOS Chair Agency, Vietnam Space Center the CEOS (VNSC) has recognized the importance of food securities and sustain forest ecosystem are key to shape up the resilience of region to climate change. The two main thematic areas has been identified and be prioritized in 2019 are Carbon Observations, including forested regions; and observation for agriculture.

For the above thematic areas, support of the CEOS's Working Group for Capacity Building and Data Democracy (WPCapD) will be required for Training and Capacity Building activities in the region. The training and capacity building will focus on SAR data processing and land applications since advanced application of SAR data in tropical area is very essential, and it could leverage the earlier ESA-NASA land cover training activities. Therefore, VNSC has proposed a SAR training in Hanoi for Vietnamese researcher to applied SAR technology for rice and forest monitoring. To take advantage of contribution from SAR experts from other space agencies (CNES, CSIRO, DLR), the workshop will be organized along with the DataCube workshop in February, 2019 at VNSC.

As Vice-Chair of WGCapD, NASA take the coordination role to support VNSC in capacity building request. CNES and CESBIO with long term support Vietnam in SAR application will take the lead and provide technical support. Experts team from CESBIO, CNES and SCIRO will prepare training material and give lectures.

Under NASA coordination, SERVIR-Mekong program, the USAID- NASA funded project in the Mekong region, which led by Asian Disaster Preparedness Center (ADPC), was invited to work with VNSC to organize this training.

2. Training objectives

Building capacity for Vietnamese remote sensing technical experts from academies and universities in applying SAR data and processing technology support rice monitoring, and forest monitoring, under coordination and support of CEOS WGCapD.

3. Expected outcome

After the 03 days training, participants will learn to

- Understand the physical information content of SAR data and statistical properties of SAR images applied in rice and forest monitoring.
- Access and download available SAR data portal and free soft wares.
- Able to perform exercises with general SAR pre-processing and processing steps
- Able to conduct time series processing with Sentinel – 1 data for rice monitoring or forest monitoring.

4. Target participants

Remote sensing experts from Academy in VAST, ministries and universities in Viet Nam includes: VNSC, FIPI, National Center for remote sensing (MONRE), STI, NIAPP, VNU, Can Tho University, Hue University…

5. Organizing partners

CEOS: CEOS was established in September, 1984 in response to a recommendation from a Panel of Experts on Remote Sensing from Space and set up under the aegis of the G7 Economic Summit of Industrial Nations Working Group on Growth, Technology, and Employment. This Panel recognized the multidisciplinary nature of space-based Earth observations and the value of coordinating international Earth observation efforts to benefit society. Accordingly, the original function of CEOS was to coordinate and harmonize Earth observations to make it easier for the user community to access and use data. CEOS initially focused on interoperability, common data formats, the inter-calibration of instruments, and common validation and inter-comparison of products. However, over time, the circumstances surrounding the collection and use of space-based Earth observations have changed.

NASA: Founded in 1958, the National Aeronautics and Space Administration is an independent agency of the United States Federal Government responsible for the civilian space program, as well as aeronautics and aerospace research.

CNES: Founded in 1961, the Centre National d'Etudes Spatiales (CNES) is the French government agency responsible for shaping and implementing national space policy. Its role is to develop and manage space systems and applications.

CESBIO: The objectives of CESBIO are to contribute to the progress in the understanding of the functioning of continental surfaces and their interactions with the climate and man, with an emphasis on the utilization of remotely sensed data. It is imperative to not only develop physical models, but also to be capable to provide scenarios of the evolution of these surfaces and their properties under climatic and anthropic pressures.

CSIRO: The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is an independent Australian federal government agency responsible for scientific research. Its chief role is to improve the economic and social performance of industry for the benefit of the community.

SERVIR-Mekong: SERVIR-Global network of regional geospatial support hubs is an initiative of the United States National Aeronautics and Space Administration (NASA) and the United States Agency for International Development (USAID). SERVIR-Mekong is a geospatial data for development program designed to respond to the needs of the Lower Mekong countries. It builds the capacity of governments and other key stakeholders in the Lower Mekong countries to employ publicly available satellite imagery and geospatial technologies for decision making related to climate change, environmental management, and disaster risk management. SERVIR-Mekong is implemented by the Asian Disaster Preparedness Center (ADPC) and its technical partners Spatial Informatics Group (SIG), Stockholm Environment Institute (SEI), and Deltares.

6. Training date and venue

Date: February 20 – 22nd 2019
Venue: Room – 903, VNSC - Building A6, 18 Hoang Quoc Viet

7. Tentative agenda

Time		Content	Trainer
Day 1. February 20th, 2019			
AM	9:00 - 9:15 9:15 - 10:15 10:15 - 10:30 10:30 – 12:00 (TBD)	- Opening remarks - CSIRO: Introduce on Datacube program (1 hour) - Coffee break - Possible session: demonstration Datacube portal, to inspire and engage user into Datacube (simple demonstration about Datacube for rice/ no rice mapping) (TBD)	VNSC/CESBIO CSIRO
PM	14:00 – 15:00 15:00 – 17:00	Introduction to SAR remote sensing: - Physical content to SAR data (understand characteristic of rice and forest with SAR data) - Statistic properties of SAR image (everything related and SAR data filtering…) - How to access data portal (ESA SciHub, PEPS) and softwares (OTB, QGIS).	CESBIO
Day 2 . February 21st, 2019			
AM	9:00 – 12:00	Practice with OTB and QGIS: - Provide materials (including softwares, and subsets of time series Sentinel-1 data for a) rice monitoring, b) forest monitoring, and exercises to be performed) , help trainee to understand the theory and the processing steps - Processing steps (Pre-processing: calibration, geocoding, filtering, …)	CNES/CESBIO

PM	14:00 – 17:00	To practice S1 time series analysis, two applications will be considered: a. Forest monitoring using Sentinel-1 b. Rice monitoring using Sentinel-1 Time series processing includes: - Back scattering analysis - Calculation of temporal change	CESBIO/CNES
Day 3. February 22nd 2019			
AM	9:00 – 12:00	Participants continue working on their group exercises	
PM	14:00 – 16:30 **15:00 – 16:00** **16:00 – 16:30**	Finish group work Group work presentation Closing and certificate	 CESBIO and VNSC