SERVIR–Mekong

Concept Note

Training for ACRS 2021
Basic Google Earth Engine and application for Rice mapping in the Mekong Delta

Online Format

Date: November 21st, 2021

Place: Can Tho University – Can Tho city , VIETNAM

Training for ACRS 2021
Basic Google Earth Engine and application for Rice mapping in the Mekong delta

Institutional Logos

Acronyms and Abbreviations

AST	Applied Science Team
CEO	Collect Earth Online
GIS	Geographic Information System
GPL	Greening Prey Lang
M&E	Monitoring and Evaluation
MOE	Ministry of Environment
NASA	National Aeronautics and Space Agency
RLCMS	Regional Land Cover Monitoring System
RUPP	Royal University of Phnom Penh
RS	Remote Sensing
SV-SM	SERVIR-Mekong
USAID	U.S. Agency for International Development

1. Training Background

SERVIR-Mekong, supported by USAID and NASA, is a regional demand-driven program that promotes geospatial technology for sustainable development and improve resilience to climate adaptation in the Mekong region. The program is being implemented by the Asian Disaster Preparedness Center (ADPC) and partners. SERVIR-Mekong supports countries in the Lower Mekong region, including Viet Nam, Cambodia, Lao PDR, Myanmar and Thailand.

Google Earth Engine (GEE) platform has been introduced in the Mekong region and Vietnam since 2015 through the capacity building activities of the SERVIR-Mekong project. GEE training in Vietnam aims to introduce the cloud based GEE platform with its basic functions and advantages of GEE, training provided exercises on practical applications on many purposes, included: mapping of forest and land cover changes, water resources management and disasters risk reduction and management, specifically drought monitoring.

With the fact that the GEE technical skill is increased among GEE users in Viet Nam, the basic GEE training can be run by Vietnamese trainers with a little technical support from SERVIR-Mekong experts. By introducing GEE and constantly providing technical support to the GEE community in Viet Nam, SERVIR-Mekong has opened the new approach to use cloud based computing in geo-spatial application in Viet Nam and more effective research projects on natural resource management has been achieved.

Responds to the request of the organizing committee of the 42nd Asian Conference on Remote Sensing 2021 (ACRS2021), which will be host by Can Tho University from November 22nd – 26th, 2021, SERVIR-Mekong will provide 01day training on basic Google Earth Engine for interested participants in Viet Nam and wider GIS and remote sensing communities in Asian region. The training on "Basic Google Earth Engine and application for rice mapping in the Mekong Delta" will inspire students, scientists and young researchers to be more creative, taking advantage of GEE platform and resources for geo-spatial study and applications.

2. Objectives:

Build on basic skill and knowledge in GEE:

- The Google Earth Engine Code Editor platform by investigating a pre-written example JavaScript script.
- Become familiar with geospatial Earth Engine Objects and their associated functions: images and image collections, features and feature collections, and geometries.
- Applied time series image analysis and machine learning for rice mapping, pilot at the Mekong delta.

Expected Skills Development after the training:

- Get familiar with JavaScript and Earth Engine syntax.
- Learn how to access data from the public data catalog, add them to your map window and set the visualization parameters, process and analyze these, and export them to your drive.
- Learn how to write your own functions and map these over image collections.
- Run some pre-programmed analysis application for rice mapping

Required Materials

- An approved Google Earth Engine Account (use your Gmail account)
- Google Chrome installation on your computer that you bring with you to the workshop
- High speed internet access

Prerequisites

Fundamental understanding of basic remote sensing. While no prior programming experience is required to learn Earth Engine, it will be helpful to mastering these concepts. If this is your first time working in a scripting environment, don't worry. Remember to be patient as you learn these concepts: if you learn the basics, you have a solid foundation to build on over time. Enthusiastic to learn and not hesitate to ask questions.

Important: Sign up for Earth Engine: https://earthengine.google.com/signup/

Time and venue

Time: November 21st, 2021.

Training hour: 8:30 AM – 5:00PM

Online Meeting Platform

(Provide by Organizer)

SERVIR-Mekong experts

1. Dr. Ate Poortinga (SERVIR-Mekong / SIG) - Trainer
2. Ms. Nyein Soe Thwal (ADPC) - Trainer
3. Nguyen Hanh Quyen (ADPC) - Coordinator

3. Training Agenda:

Basic Google Earth Engine (GEE) and applications for rice mapping in the Mekong Delta

21/11/2021	Topics / Themes	Resource person
8:30 – 8:40	Opening remarks	ACRS organizer
8:40 – 9:10	Presentation and Demo: Overview of GEE	Ate Poortinga
9:10 – 9:45	Exercise 1: Hello World and Exploring Data Archive	Nyein Soe Thwal
9:45 – 10:00	*Coffee break*	
10:00 – 12:00	Exercise 2: Earth Engine Image Objects and Methods	Nyein Soe Thwal
12:00 – 13:00	*Lunch break*	
13:00 – 14:00	Exercise 3: Writing Custom Functions and Mapping Across Image Collections	Nyein Soe Thwal
14:00 – 15:00	Exercise 4: Exporting Data	Nyein Soe Thwal
15:00 – 15:15	*Coffee break*	
15:15-16:45	Exercise 5: Spectral indices and transformations. Apply different indexes for rice mapping Exercise 6: Machine learning – Rice mapping classification in GEE	Ate Poortinga and Nyein Soe Thwal
16:45 – 17:00	Q&A Test	

4. Trainers

DR. ATE POORTINGA (HYDROLOGIST, SIG)

(https://servir.adpc.net/about/our-team/dr-ate-poortinga)

Ate is an expert in the field of water accounting, remote sensing, GIS, hydrology, and water resource management. After obtaining his PhD degree at Wageningen University in the Netherlands, he worked for over a year with Winrock international in the USAID Vietnam Forests and Deltas (VFD) program. Currently, he still works part-time with VFD program in Hanoi and is part-time employed by the Spatial Informatics Group in SERVIR-Mekong.

Ate is involved in the development of a web-based water accounting scenario platform that allows users to quantify and visualize water supply and demand in a basin across multiple sectors. The system helps users assess outcomes such as whether water supplies are in danger of being over-allocated. Furthermore, he has taken the lead in the development of a tool to assess the biophysical conditions of any specified geographic domain. He is also involved in the knowledge transfer of state-of-the-art remote sensing technologies and tools to local partners.

NYEIN SOE THWAL (GEOSPATIAL DATA SCIENTIST, ADPC)

(https://servir.adpc.net/about/our-team/nyein-soe-thwal)

Nyein works as Geospatial Data Scientist in SERVIR-Mekong program at Asian Disaster Preparedness Center(ADPC). She has received Master of Engineering in computer science from Waseda University(Japan) and Bachelor of Engineering from University of Technology (Yatanarpon Cyber City),Myanmar. She is a machine learning enthusiast who is willing to apply AI in remote sensing field and she interests to analyze big earth geospatial data by using advanced algorithms.

Prior to ADPC, Nyein served as a teaching assistant at Department of Mathematics in Waseda University and worked as an IT engineering at Sustainable Environment Myanmar Co.,Ltd in Myanmar to support geospatial data analysis for environmental impact assessment