



GeoOneHealth 2022

South-East Asia

Symposium on Geospatial Approaches in One Health studies

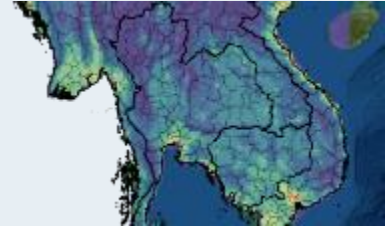
5th December 2022, Phnom Penh Cambodia

This training is organized in the frame of:

- the OHSEA Project (One Health in Practices in South-East Asia), funded by the FSPI (Solidarity Fund for Innovative Projects) under the French Ministry for Europe and Foreign Affairs,
- the Dissemination activities of the EASIMES (Environment Analysis and Surveillance to Improve Malaria Elimination Strategy) Project funded by the Global Fund

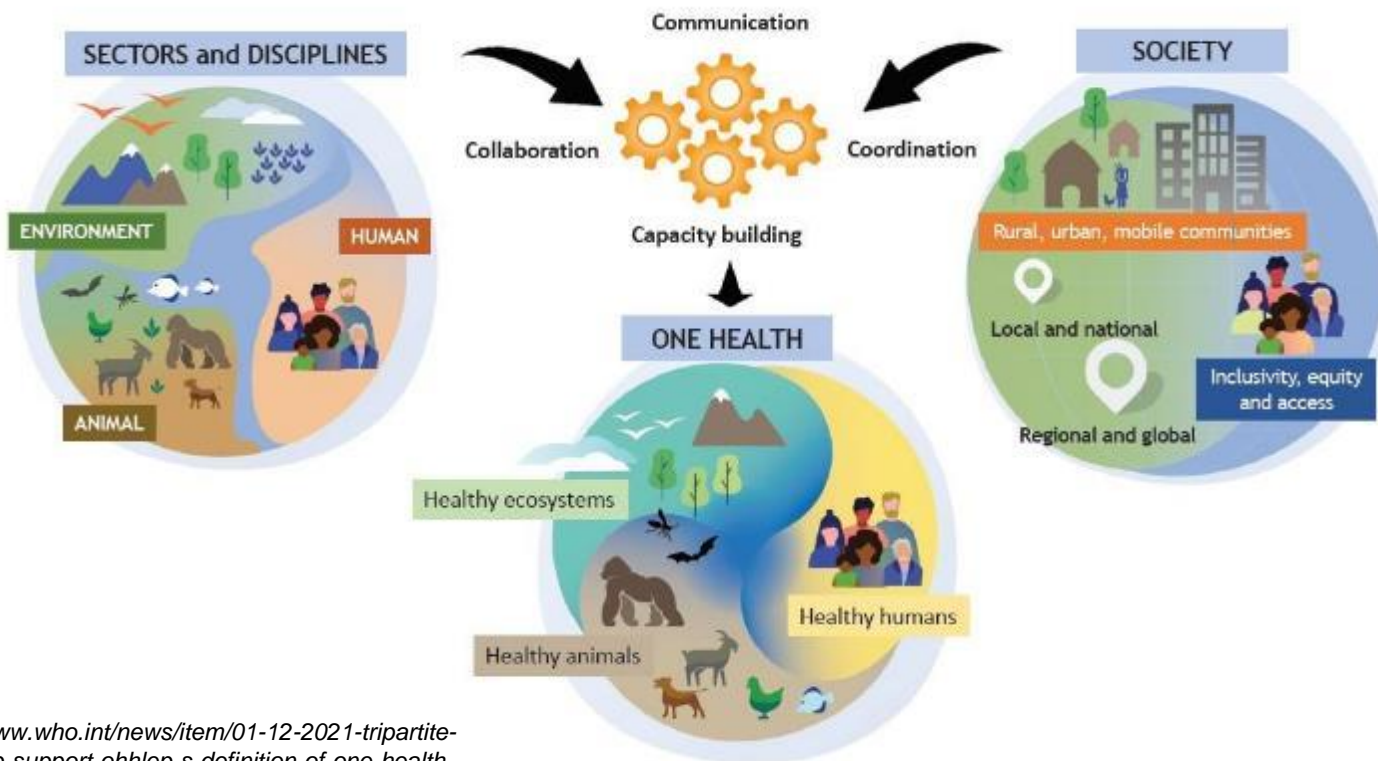


Geospatial approaches for One Health: *definition*



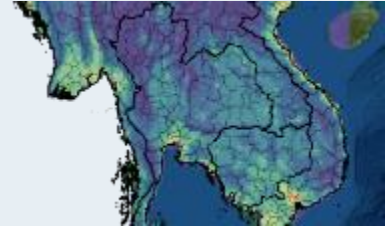
“One Health” arises from the recognition that the **health of humans, domestic and wild animals, plants, and the wider environment** (including ecosystems) are closely linked and inter-dependent.

One Health is defined by the High Level Expert Panel (OHHLEP) states as **an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.**





Geospatial approaches for One Health: *in a changing climate and environment*



Some diseases and health situations are impacted by environmental, meteorological and climate dynamics, from local to global scales, from short events to global changes

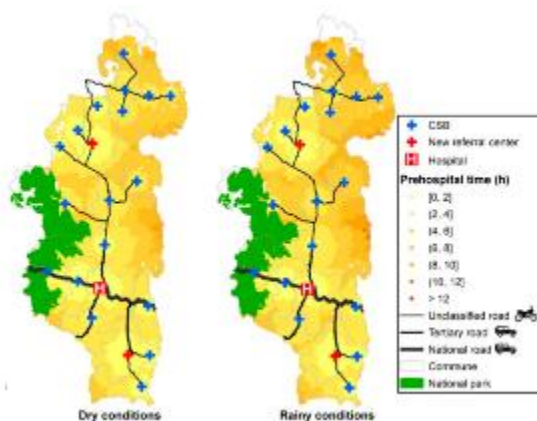
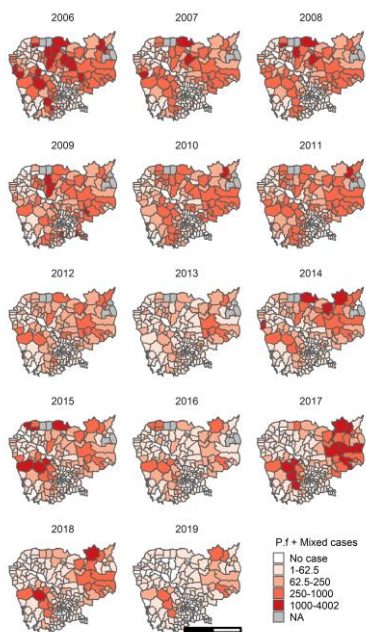
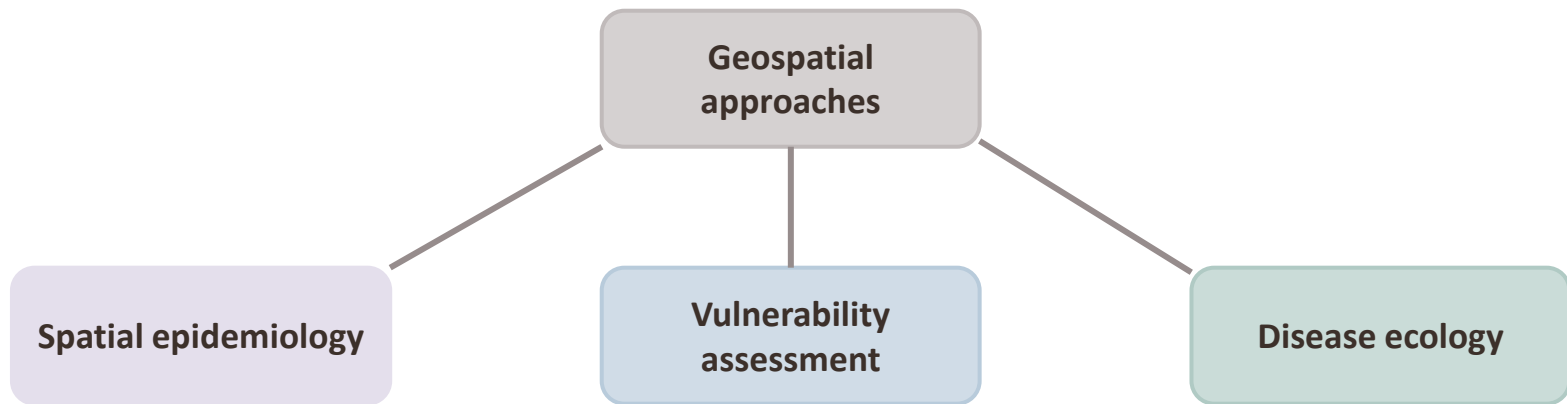
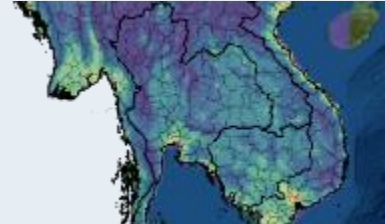
Examples:

- **Impact of climate changes on vector-borne diseases or respiratory diseases**
- **Impact of seasonal rainfall anomalies on tropical diseases**
- **Impact of environmental changes:**
 - loss of biodiversity and emergence of invasive species and virulent pathogens
 - deforestation activities and malaria,
 - urbanization and difficulties in sanitation, emergence of antimicrobial resistance
 - land artificialization, flooding and increased transmission of water-related diseases, also difficulties in accessing health care.

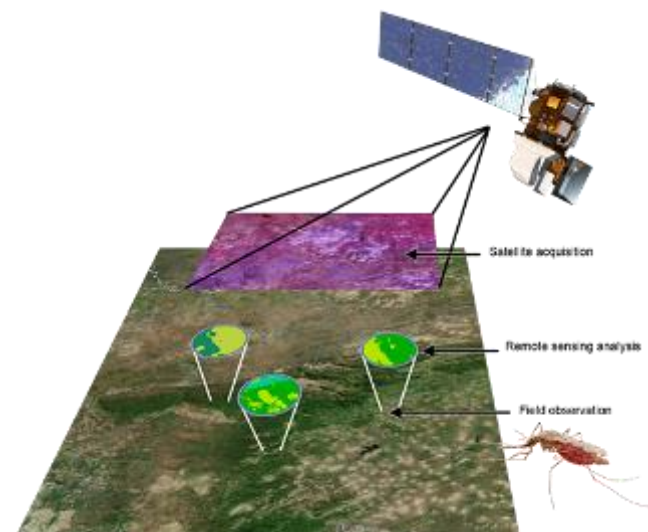




Geospatial approaches for One Health: possible inputs



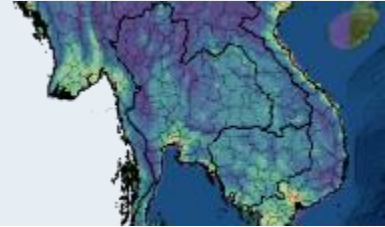
Access to care. From Ihantamalala *et al.*, 2021



Confirmed *P. falciparum* + Mixed case distribution by district, 2006-2019, Cambodia. From Chean *et al.*, 2021



Geospatial approaches for One Health: towards health surveillance



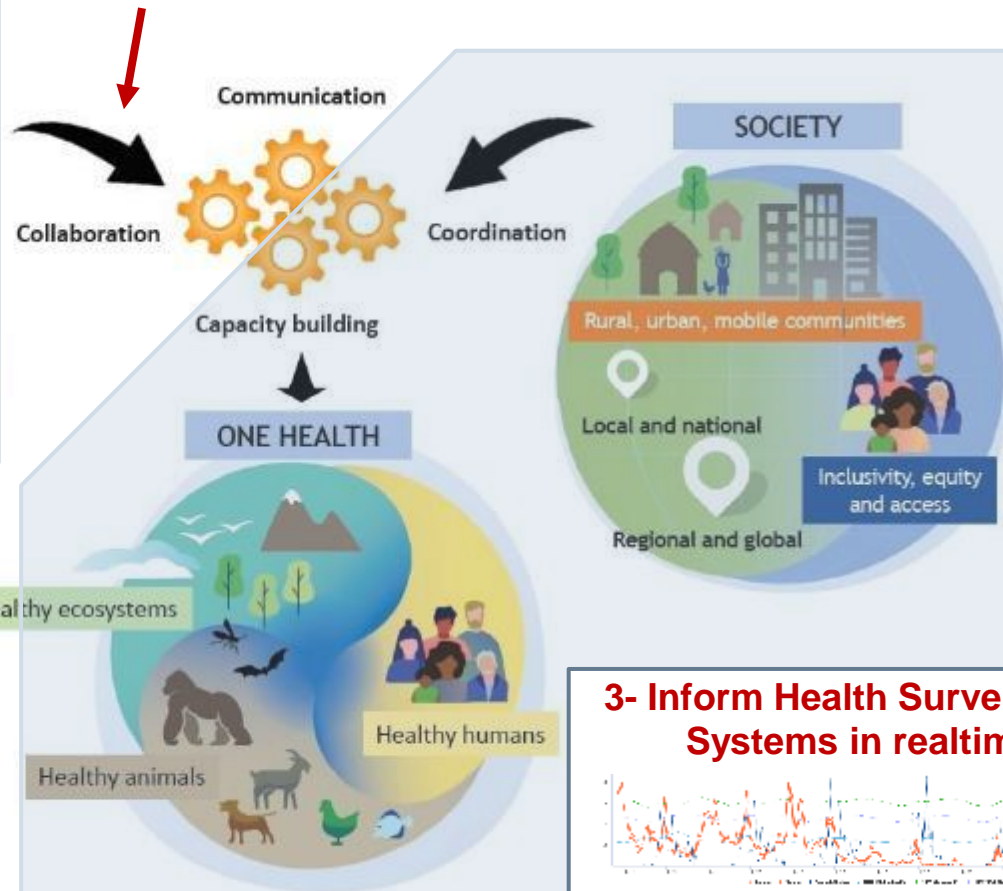
1- Identify the relations between environment, climate and health

-> produce indicators through:

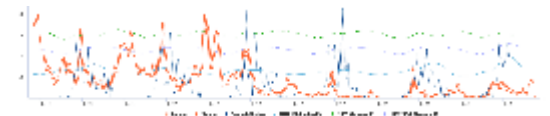
- Earth observation
- In situ measurements
- Local knowledge



2- Monitor environmental, climate and health indicators in realtime

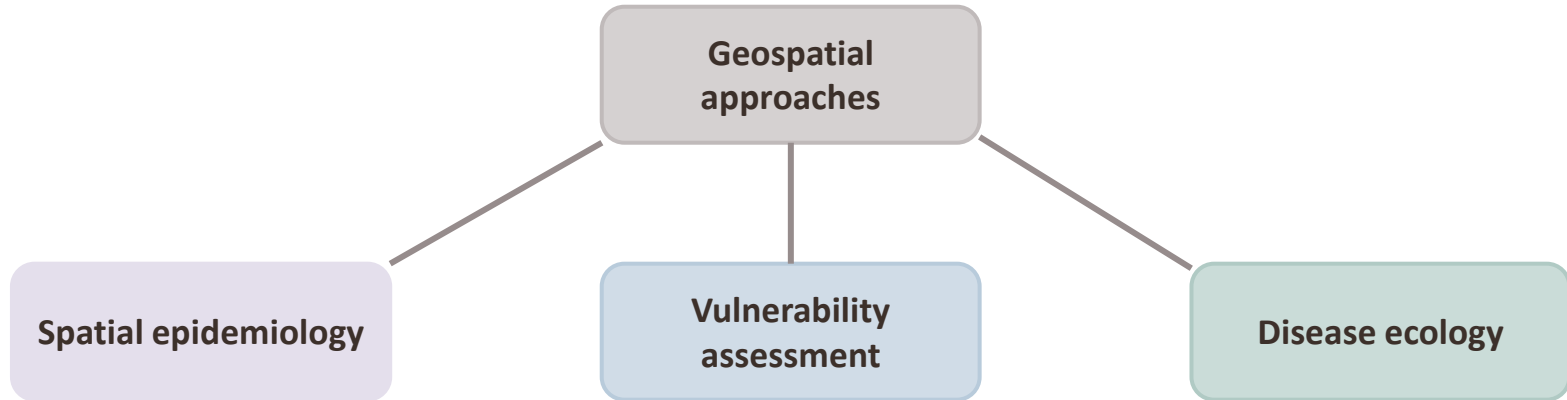
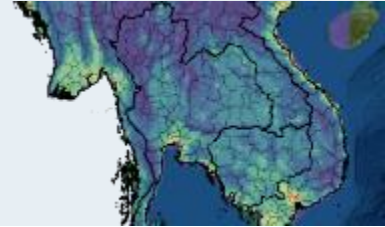


3- Inform Health Surveillance Systems in realtime

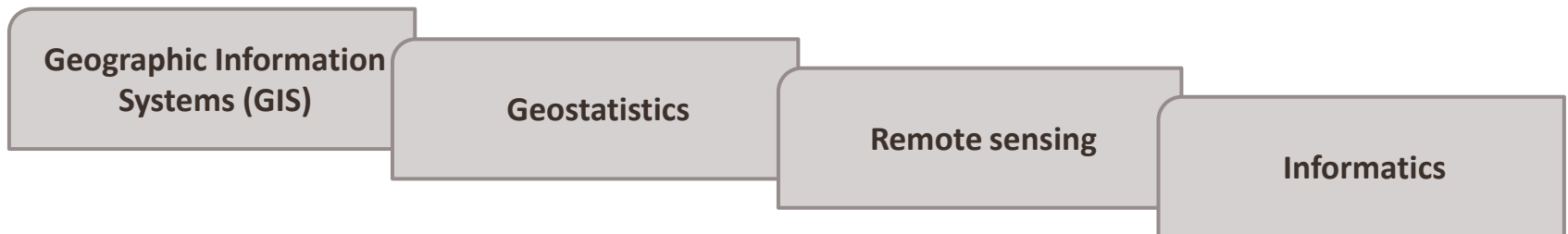




Geospatial approaches for One Health: *tools and methods*



Tools and methods:



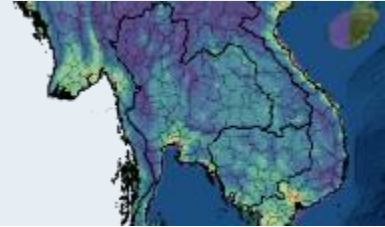
=> Organization of trainings to strengthen capacities



=> with support from 2 projects: FSPI OHSEA and EASIMES (RAI2E)



FSPI OHSEA: One Health in practices in South-East Asia



OHSEA project funded by the Solidarity Fund for Innovative Projects (FSPI) under the French Ministry for Europe and Foreign Affairs

Objectives:

- **establish an inventory of environment – zoonoses in South East Asia;**
- **contribute to the reinforcement of the skills** of students, professionals and decision-makers in a One Health Environment approach (through training in interdisciplinarity and inter-sectoriality)
- **contribute to supporting or consolidating emerging One Health projects in practice;**
- **develop tools for accessing data** to understand and act through the One Health approach.

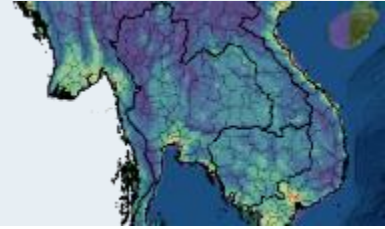


<https://ohsea.ird.fr/en/home/>

OHSEA is also a first step in structuring a research community with a view to setting up actions within the framework of the global **PREZODE Initiative** launched at the One Planet Summit in January 2021.



EASIMES Project



EASIMES Project (2020-2021): Environment Analysis and Surveillance to Improve Malaria Elimination Strategies

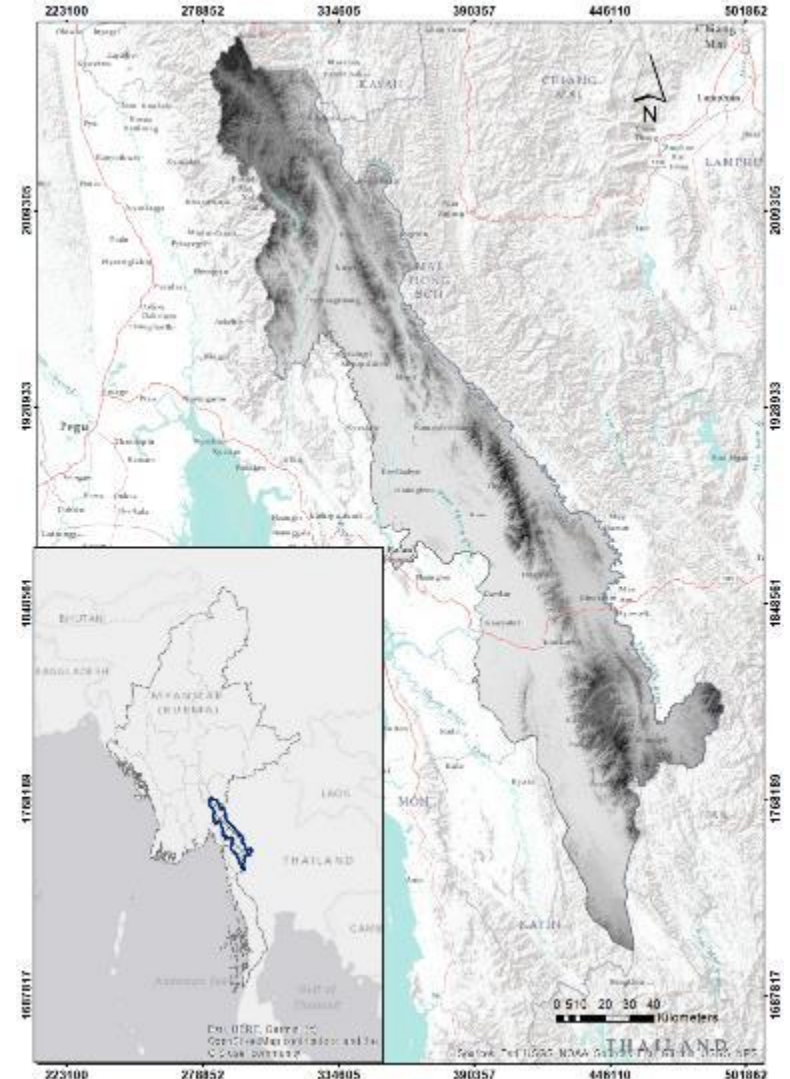
EASIMES aims at improving the understanding of environmental conditions which influence malaria transmission in the forested environments of Eastern Myanmar in order to improve microstratification and active surveillance tools used by control and/or elimination programs.

Based on the malaria surveillance in the Kayin State conducted by the Malaria Elimination Task Force, Shoklo Malaria Research Unit (SMRU), Mae Sot, Thailand

Partners:

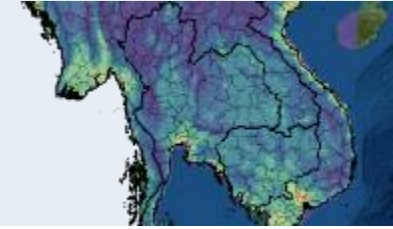
- SMRU, MORU, Mahidol University, Thailand
- IRD France:
 - UMR ESPACE-DEV : GeoHealth Team at Institut Pasteur du Cambodge
 - UMR SESSTIM,

Funding: Global Fund, RAI2E (2019-2021)





EASIMES Dissemination activities



28th November to 2nd December 2022

Training: Mapping and spatial analyses in R for One Health studies



5th December 2022

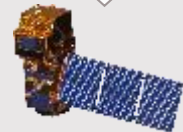
Symposium on Geospatial Approaches in One Health studies

6th December 2022

EASIMES restitution workshop

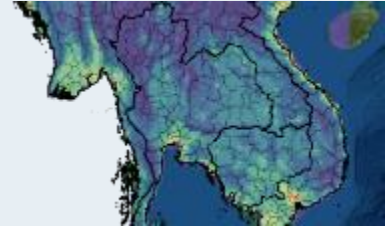
7th to 9th December 2022

Training on the monitoring of environmental dynamics by remote sensing





Training: Mapping and spatial analyses in R for One Health studies, from 28th Nov to 2nd Dec



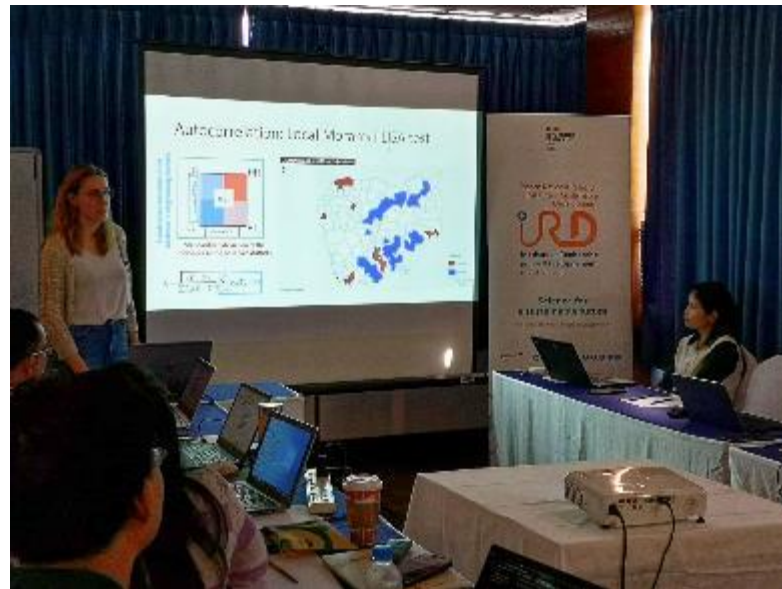
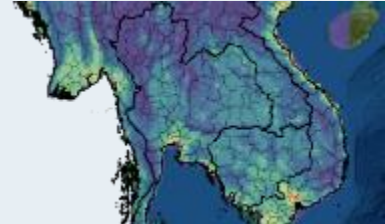
23 Participants:

- **8 from Cambodia:**
 - National Institute of Public Health (NIPH)
 - Institut Pasteur du Cambodge (IPC)
- **1 from Indonesia:** National Research and Innovation Agency of Indonesia (BRIN)
- **3 from Laos:**
 - Center for Malariology, Parasitology and Entomology (CMPE),
 - National University of Laos (NUoL)
- **3 from Myanmar:**
 - Save the Children International,
 - Myanmar Health Assistant Association (MHAA)
- **3 from Thailand:**
 - Ministry of Public Health,
 - Mahidol University
- **4 from Vietnam:**
 - National Institute of Hygiene and Epidemiology (NIHE),
 - National Institute of Malariology, Parasitology and Entomology (NIMPE)
 - Pasteur Institute in Ho Chi Minh city
- **1 from France:** IRD- Espace-Dev

+ 6 trainers from France and Cambodia: IRD-IPC GeoHealth Team + CNRS UAR RIATE

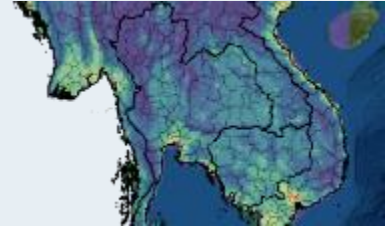


Training: Mapping and spatial analyses in R for One Health studies, from 28th Nov to 2nd Dec





Training: Mapping and spatial analyses in R for One Health studies, from 28th Nov to 2nd Dec

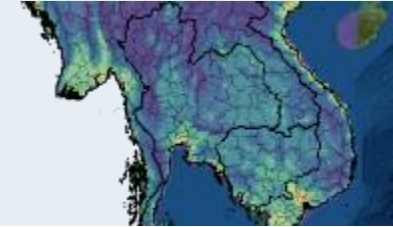


	Monday 28th November <i>Introduction to R</i>	Tuesday 29th November <i>Mapping in R</i>	Wednesday 30th November <i>Geoprocessing in OSM</i>	Thursday 1st December <i>Using OSM and raster data in R</i>	Friday 2nd December <i>Applied exercises in R</i>
8H30-10H00	Arrival of foreign participants in Phnom Penh	Lecture 1: Contribution of mapping and spatial analysis in epidemiological studies and health surveillance (Vincent Herbreteau)	Practical 4: Map layout in R (Chapter 5.2)	Focus on applications: Introduction to geostatistics (Léa Douchet)	Practical 9: Applied exercises
Coffee break		Practical 2: Make a simple map in R (Chapter 5.1)		Practical 6: Data acquisition (Chapter 2.1)	
10H30-12H00		Practical 2: Make a simple map in R (Chapter 5.1)	Practical 5: Using vector data in R (Chapter 3)	Lecture 3: Introduction to OpenStreetMap (OSM) (Lucas Longour)	Practical 9: Applied exercises
Lunch					
13H30-15H00	Workshop introduction	Lecture 2: Graphic semiology (Timothée Giraud)	Focus on applications: Do's and don'ts when mapping (Timothée Giraud)	Practical 7: Import OSM data (Chapter 2.3)	Practical 9: Applied exercises
		Practical 3: Thematic map in R (Chapter 5.1.2 to 5.1.6)	Practical 5: Using vector data in R (Chapter 3)		
Coffee break					
15H30-17H00	Practical 1: Introduction to R (refresher course)	Practical 3: Thematic map in R (Chapter 5.1.2 to 5.1.6)	Practical 5: Using vector data in R (Chapter 3)	Practical 8: Using raster data in R (Chapter 4)	Final discussion about future interactions among participants Awarding of certificates

Online tutorial: <http://rspatial4onehealth.geohealthresearch.org/>



GeoOneHealth2022 symposium

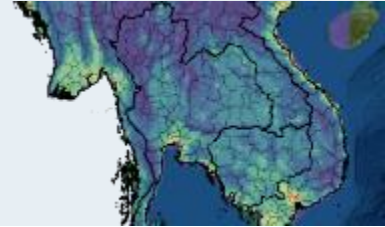


<https://geonehealth2022.sciencesconf.org/>

Session	Speaker	Title
08:30 - 9:00	Vincent Herbreteau Espace-Dev - French National Research Institute for Sustainable Development (IRD), Cambodia and Florian Girond , Institut Pasteur du Cambodge - Cambodian CDC, Cambodia	Introduction
	Session 1	<i>Aedes</i> vectors and dengue
09:00 - 9:20	Sébastien Boyer , Institut Pasteur du Cambodge (IPC), Cambodia	Seen from above: how satellite technology can fill gaps in mosquito biology
09:20 - 09:40	Kien Quoc Do , Pasteur Ho Chi Minh, Vietnam	Prospect of geo-mapping application in Dengue control in South Vietnam
09:40 - 10:00	Palamy Changleuxai , National University of Laos (NUoL), Lao PDR	Investigating the Relationship between Surface Water and Dengue Fever Incidence: A case study in Vientiane Capital, Laos
10:00 - 10:20	Claire Teillet , Espace-Dev - French National Research Institute for Sustainable Development (IRD), France	Remote sensing analysis of the links between urban landscapes and the risk of exposure to <i>Aedes</i> , vectors of arboviruses
10:20 - 10:50	Coffee break	
	Session 2	Malaria
10:50 - 11:10	Ho Quang Phuc , National Institute of Malariology, Parasitology and Entomology (NIMPE), Vietnam	Geographic Information System in malaria surveillance in a context of elimination and post-elimination in Vietnam
11:10 - 11:30	Peeriya Watakulsin , Ministry of Public Health, Thailand	Malaria surveillance in Thailand
11:30 - 11:50	Jordi Landier , SESSTIM - French National Research Institute for Sustainable Development (IRD), France	Forest malaria in Myanmar: tracking landscapes at risk within a hidden diversity of environments
11:50 - 12:10	Florian Girond , Institut Pasteur du Cambodge - Cambodian CDC, Cambodia	Malaria environmental data-driven surveillance system in Eastern Myanmar: development, challenges, and opportunities
12:10 - 14:00	Lunch	



GeoOneHealth2022 symposium

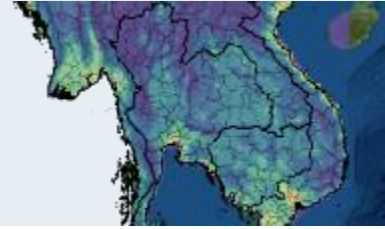


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12:10 - 14:00	Lunch	
	Session 3	Surveillance
14:00 - 14:20	Hai Tuan Nguyen , National Institute of Hygiene and Epidemiology (NIHE), Vietnam	Identification of space-time clusters and hotspots in communicable diseases surveillance in Northern Vietnam
14:20 - 14:40	Chung Nguyen , National Institute of Hygiene and Epidemiology (NIHE), Vietnam	Introduction to the plague surveillance system and proposal for detection and mapping of rodent-related pathogens in the northern provinces of Vietnam bordering China and Laos
14:40 - 15:00	Hannah Holt , University of Health Sciences (UHS), Cambodia	Understanding zoonotic and pandemic risk in relation to swine production systems in Cambodia
15:00 - 15:20	Kennarey Seang , University of Health Sciences (UHS), Cambodia	Using community engagement approaches within a digital health intervention to improve access and retention among people living with HIV (PLWH) in Cambodia
15:20 - 15:50	Coffee break	
	Session 4	Spatial approaches and climate
15:50 - 16:10	Mujiyanto , National Research and Innovation Agency of Indonesia (BRIN), Indonesia	Spatial approach for vector borne and zoonotic diseases research in Indonesia
16:10 - 16:30	Kraichat Tantrakarnapa , Mahidol University, Thailand	Challenge of climate change in public health: Southeast Asia perspectives
16:30 - 16:50	Lea Douchet , Espace-Dev - French National Research Institute for Sustainable Development (IRD), France	Estimating leptospirosis burden in southeast asia and its future evolution based on climate and environmental determinants
16:50 - 17:00	Closing	



Acknowledgements



- **EASIMES:**
 - **Shoklo Malaria Research Unit (SMRU):** François Nosten, Gilles Delmas, Aung Myint Thu, Kevin Jung Yuan-Lee
 - **Global Fund and UNOPS**
- **FSPI OHSEA:**
 - Project coordinators: Clarisse Veylon-Hervet (Embassy of France to Thailand), Serge Morand (CNRS) and Eric Deharo (IRD)
 - French Ministry for Europe and Foreign Affairs through the FSPI (Solidarity Fund for Innovative Projects) program
- **IRD regional representative offices of the French National Research Institute for Sustainable Development (IRD)** in Cambodia, Indonesia, Laos, Thailand and Vietnam