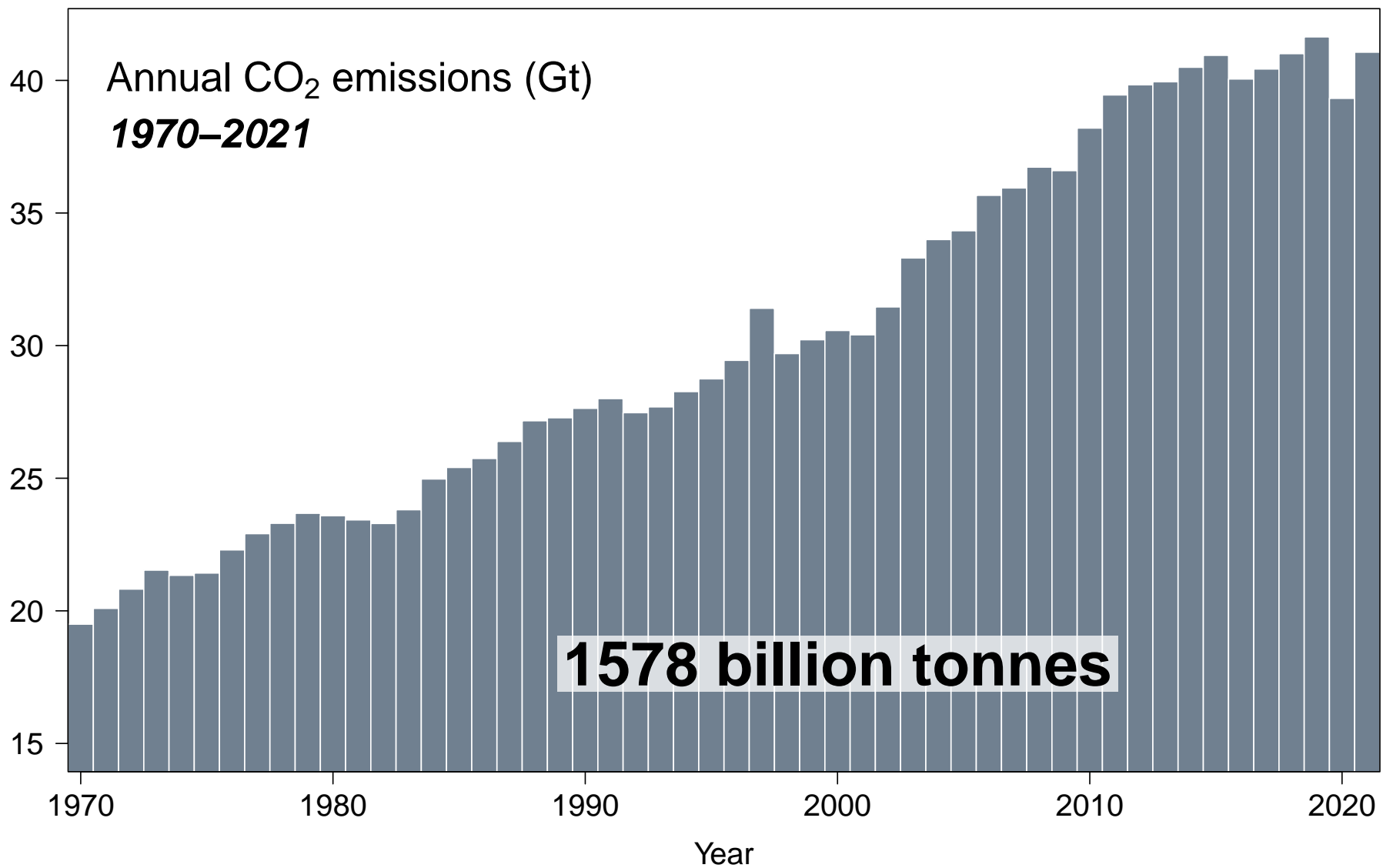
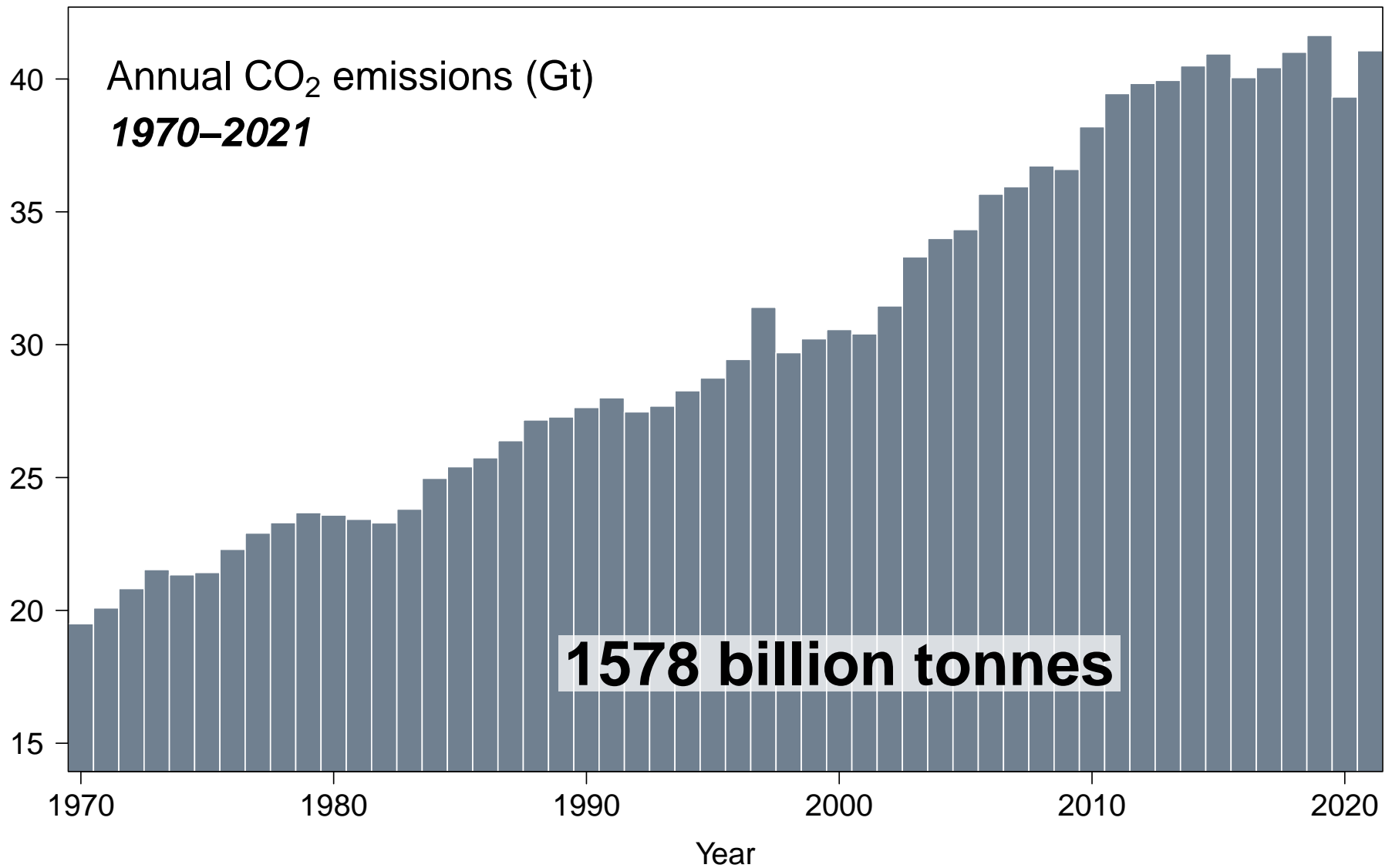


PREDICTING CARBON SEQUESTRATION: FOREST GROWTH AND CLIMATE MITIGATION

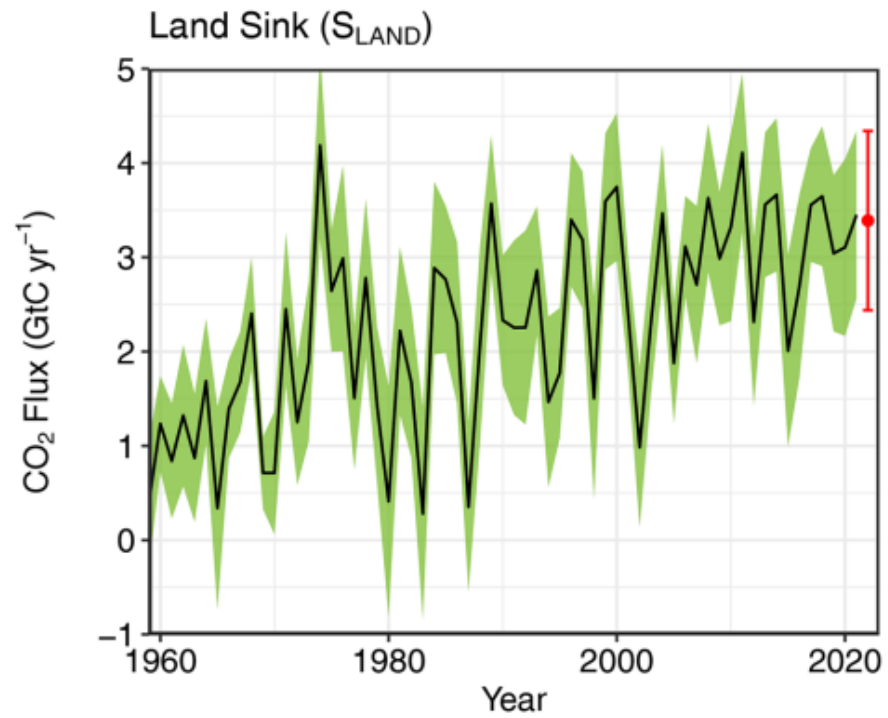
Emmanuel Paradis



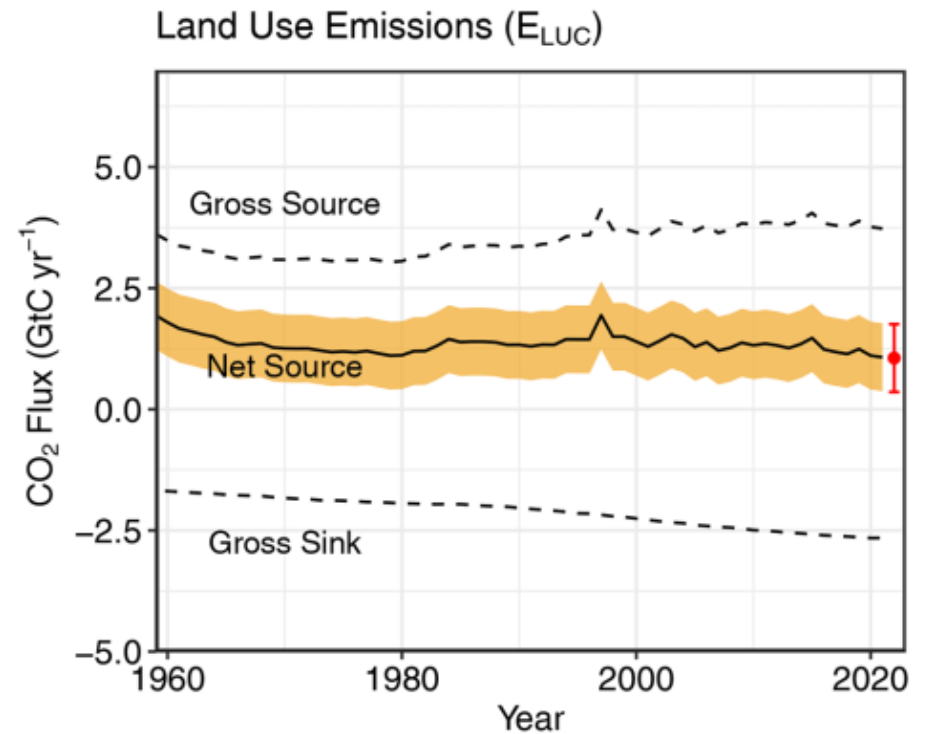
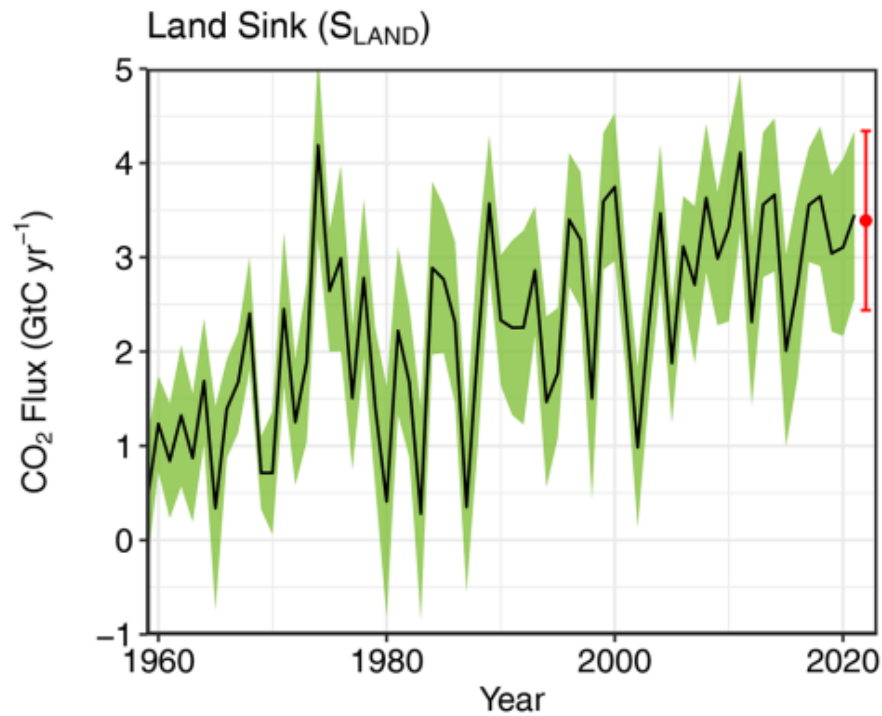


≈ 30 Gt CO₂/year ⇒ 8 Gt C/year

The terrestrial carbon sink



The terrestrial carbon sink



Source: Friedlingstein *et al.* (2022) “Global Carbon Budget 2022”
Earth Syst. Sci. Data 14: 4811–4900.





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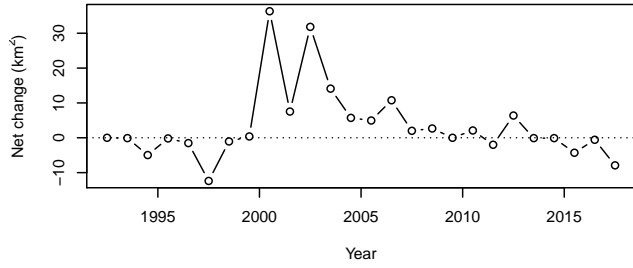
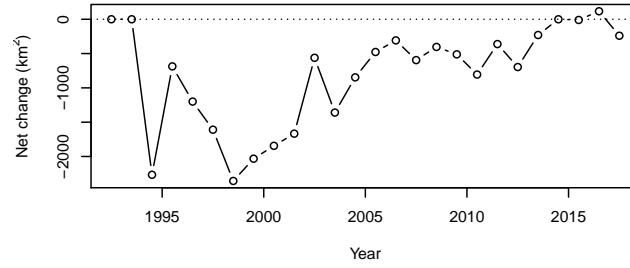
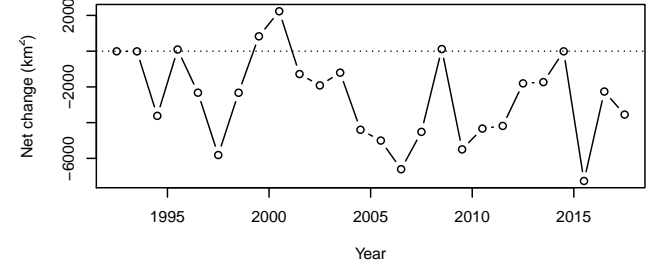
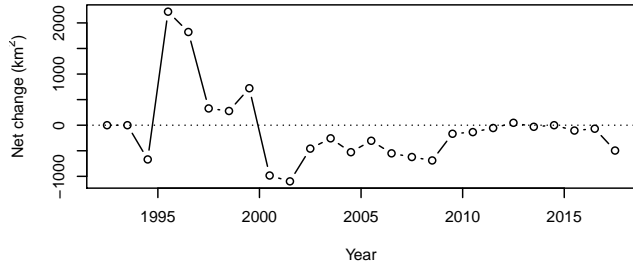
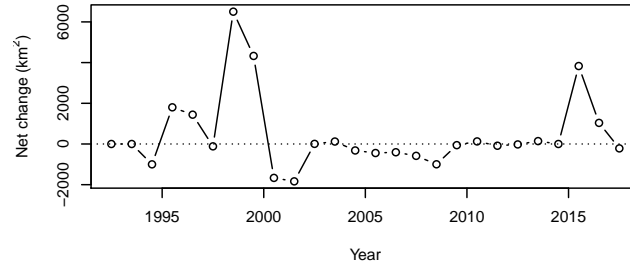
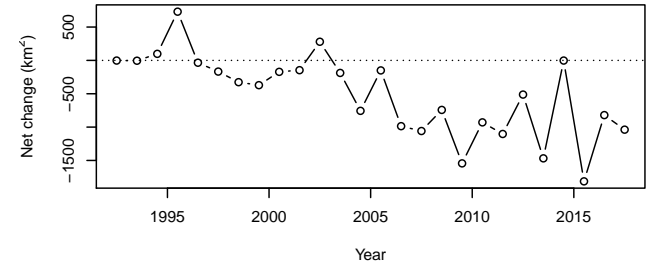
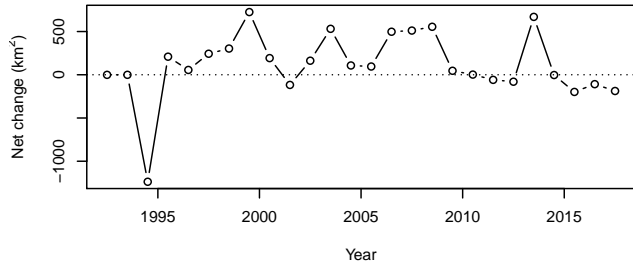
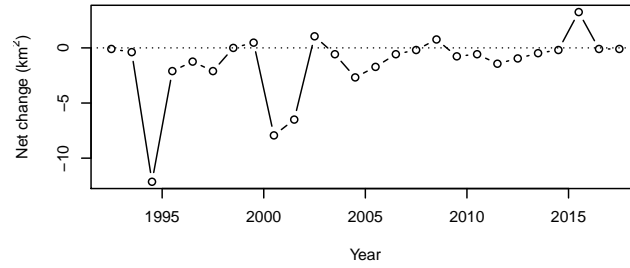
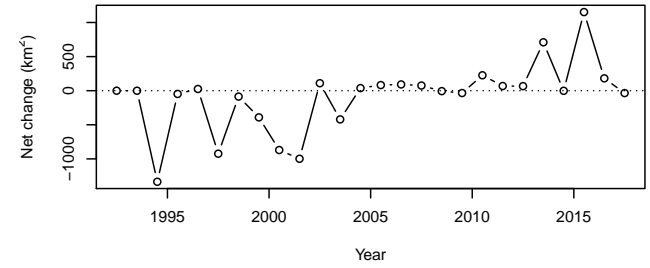
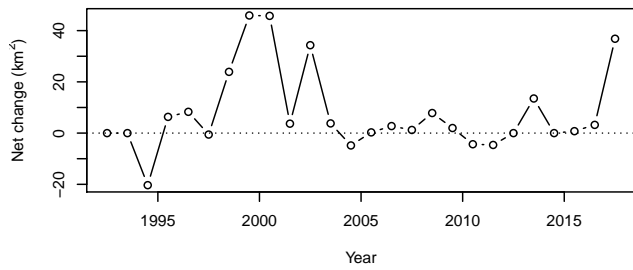
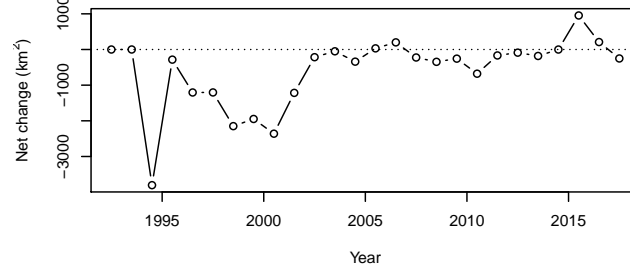


Forest gains and losses in Southeast Asia over 27 years: The slow convergence towards reforestation

Emmanuel Paradis*

ISEM, Univ Montpellier, CNRS, EPHE, IRD, Montpellier, France



Brunei**Cambodia****Indonesia****Laos****Myanmar****Malaysia****Philippines****Singapore****Thailand****Timor Leste****Vietnam**

BIOdiversity MOdelling at Multiple Scales



Leader: Dr. Sissades Tongsim

Partners:



Funding:



Capture and Storage of Carbon in Natural Tropical Forests

Leader: Dr. Emmanuel Paradis

Partners:



Institut de Recherche
pour le Développement
FRANCE



Funding:



**FONDATION
BNP PARIBAS**

Sous l'égide de la Fondation de France

Sustainability Issues Metaverse for building Participatory Learning Environments

Leader: Dr. Alexis Grogoul (IRD, Vietnam)

Partners:



Funding:

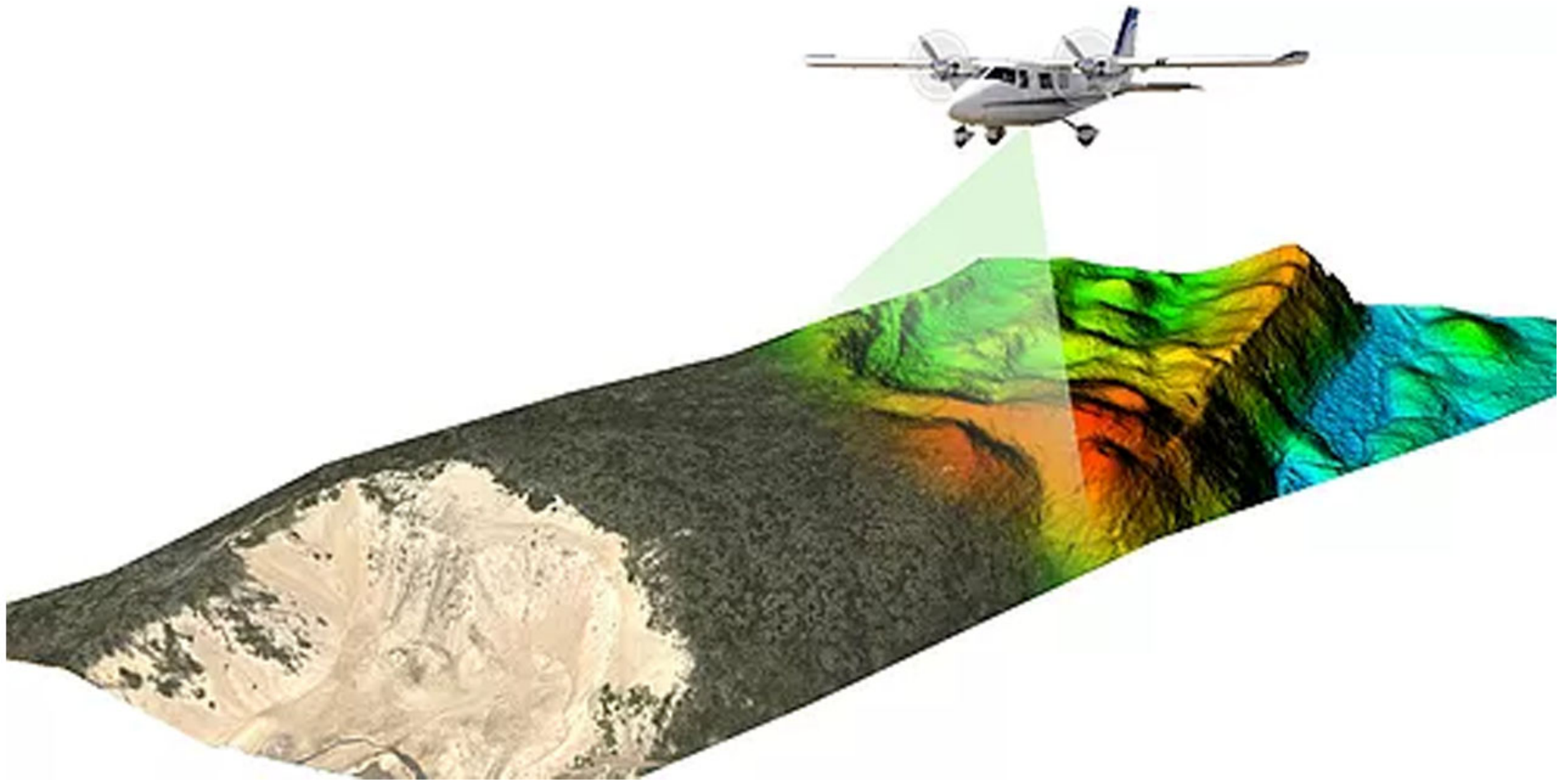


Multidisciplinary – Open science

Main topics/fields:

- Soil microbiomes
- Vegetation dynamics
- Land use modelling*
- Remote sensing analysis*

Lidar: Light Distance And Ranging



Lidar

Landsat

Sentinel



NASA

Launch date: 23 July 1972



NASA

Launch date: 23 July 1972

Biogeosciences, 17, 121–134, 2020
<https://doi.org/10.5194/bg-17-121-2020>
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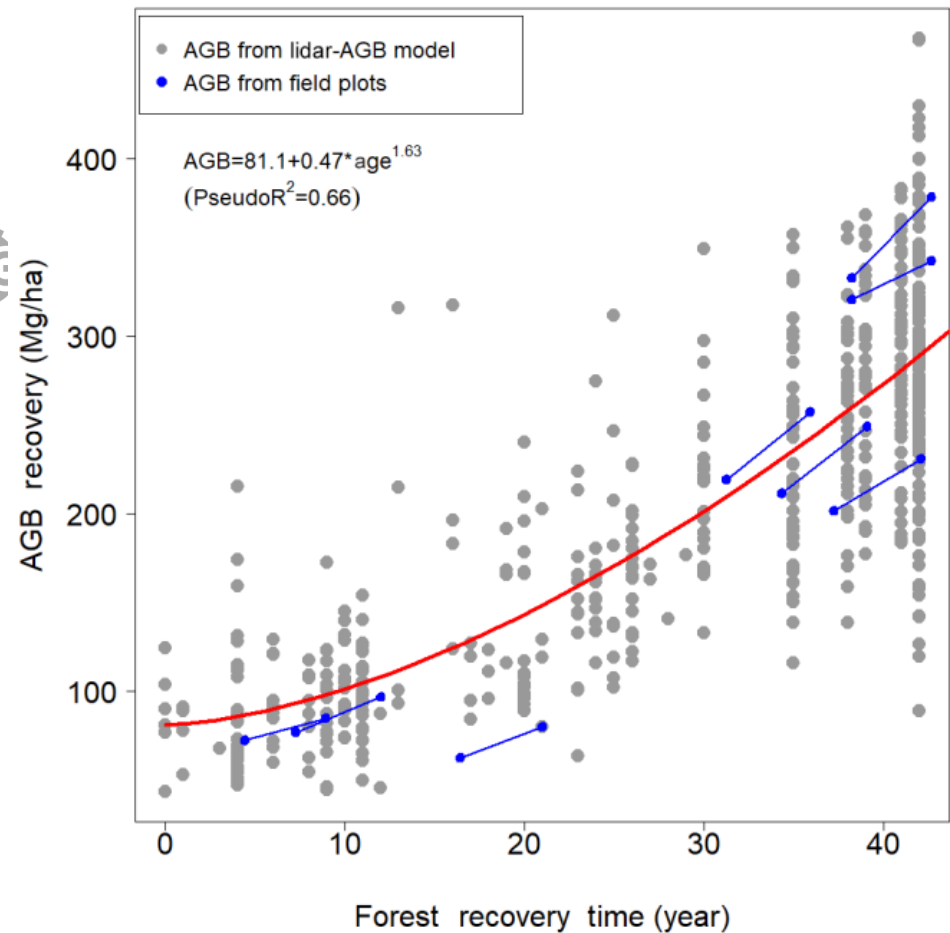


Biogeosciences



Forest aboveground biomass stock and resilience in a tropical landscape of Thailand

Nidhi Jha¹, Nitin Kumar Tripathi¹, Wirong Chanthorn², Warren Brockelman³, Anuttara Nathalang^{3,4}, Raphaël Pélissier⁵, Siriruk Pimmasarn¹, Pierre Ploton⁵, Nophea Sasaki⁶, Salvatore G. P. Virdis¹, and Maxime Réjou-Méchain⁵



Lidar

Landsat

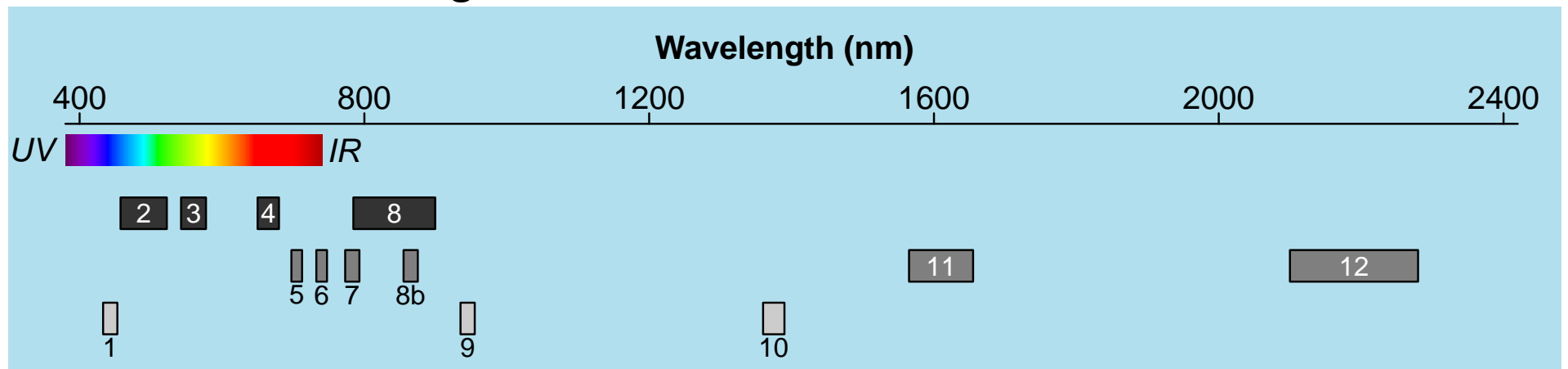
Sentinel



European Space Agency



***Sentinel-2* record images in 13 bands**



SENTINEL 2A

[Track SENTINEL 2A now!](#)

[10-day predictions](#)

SENTINEL 2A is classified as:

[Earth resources](#)

NORAD ID: 40697

Int'l Code: 2015-028A

Perigee: 795.3 km

Apogee: 797.0 km

Inclination: 98.6 °

Period: 100.6 minutes

Semi major axis: 7167 km

RCS: Unknown

Launch date: June 23, 2015

Source: European Space Agency (ESA)

Launch site: FRENCH GUIANA (FRGUI)

SENTINEL 2B

[Track SENTINEL 2B now!](#)

[10-day predictions](#)

SENTINEL 2B is classified as:

[Earth resources](#)

NORAD ID: 42063

Int'l Code: 2017-013A

Perigee: 795.2 km

Apogee: 797.1 km

Inclination: 98.6 °

Period: 100.6 minutes

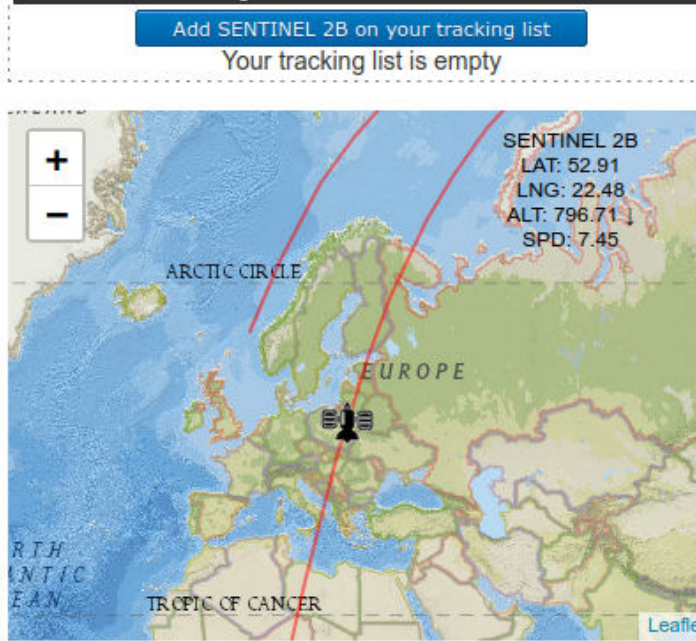
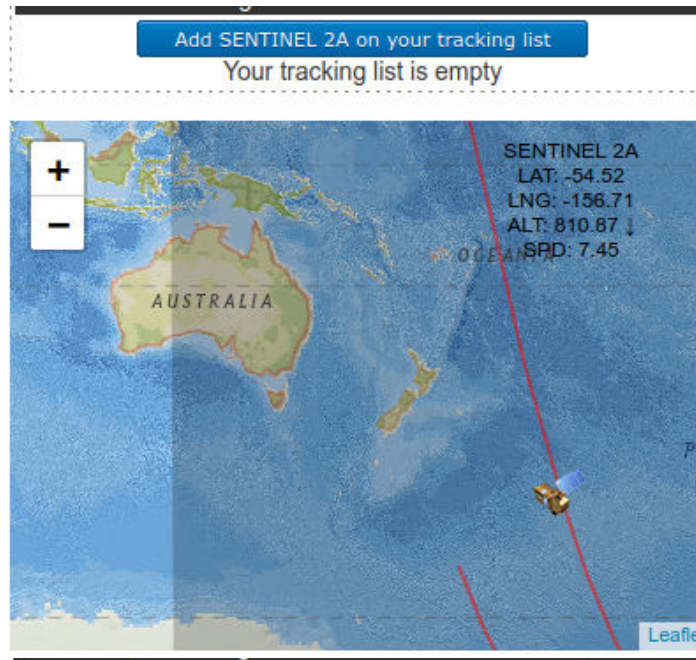
Semi major axis: 7167 km

RCS: Unknown

Launch date: March 7, 2017

Source: European Space Agency (ESA)

Launch site: FRENCH GUIANA (FRGUI)



Source: <https://www.n2yo.com>

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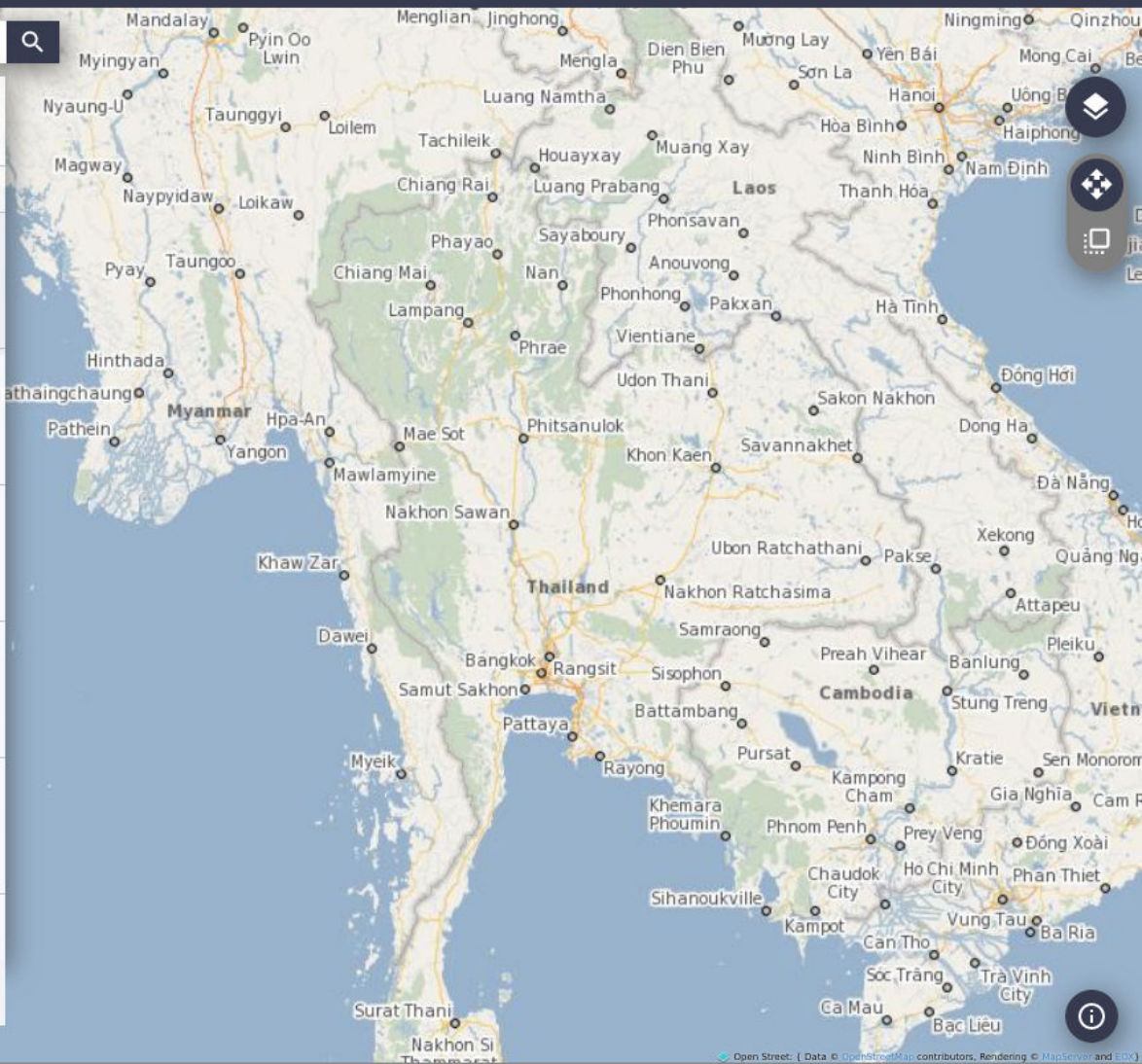
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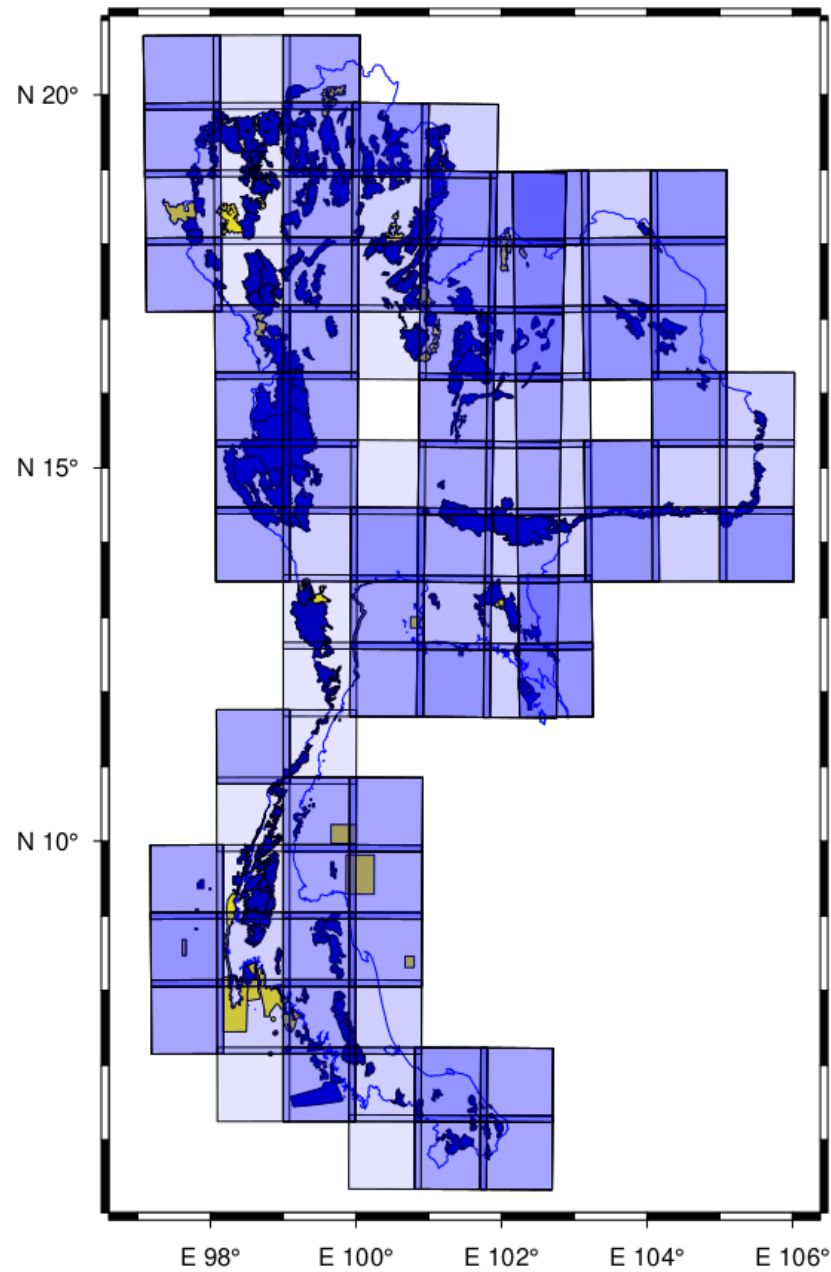
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DD

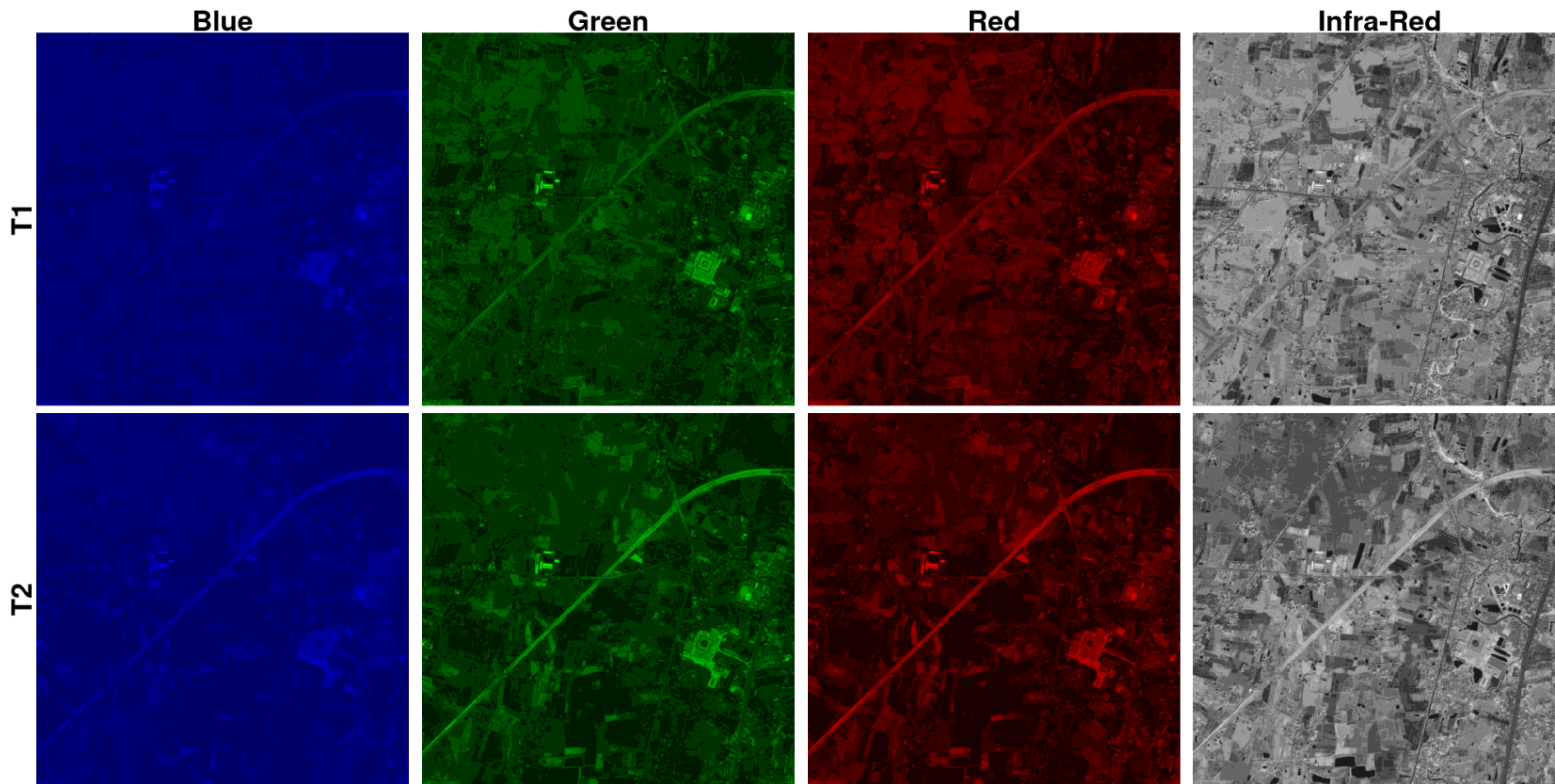


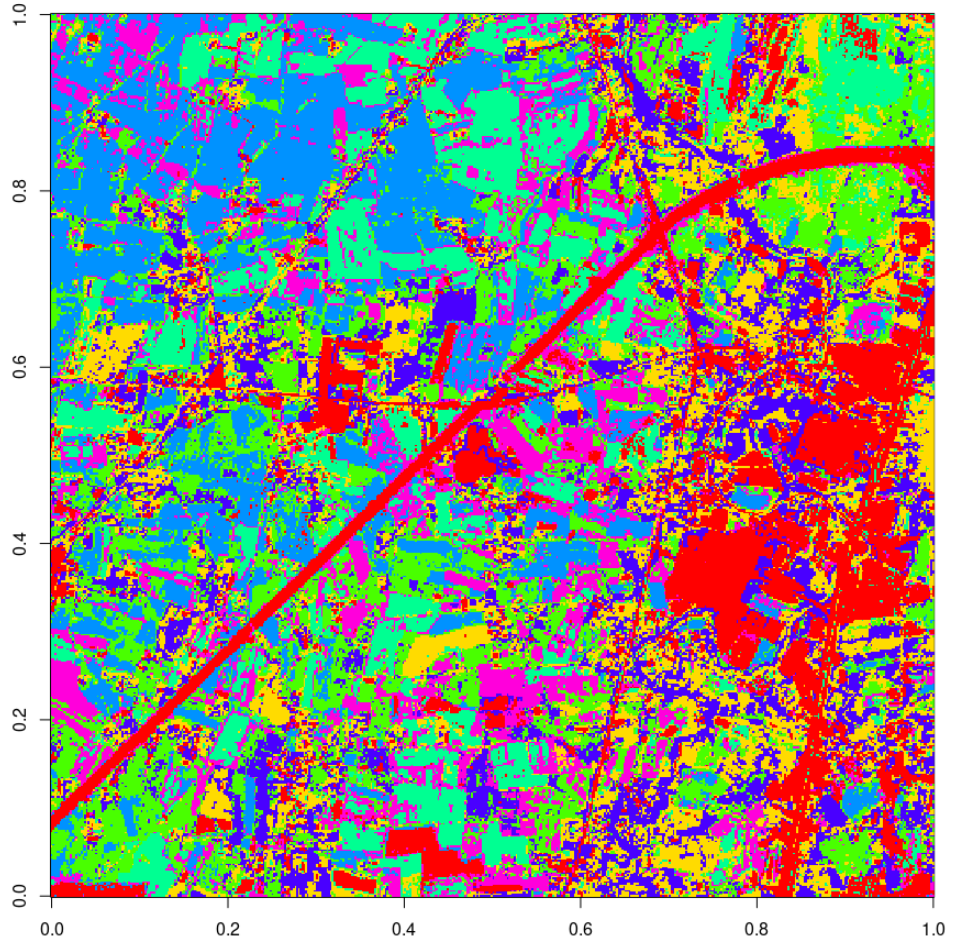
111 436 Sentinel-2 images over Thailand (Jan 2016 – Dec 2022)

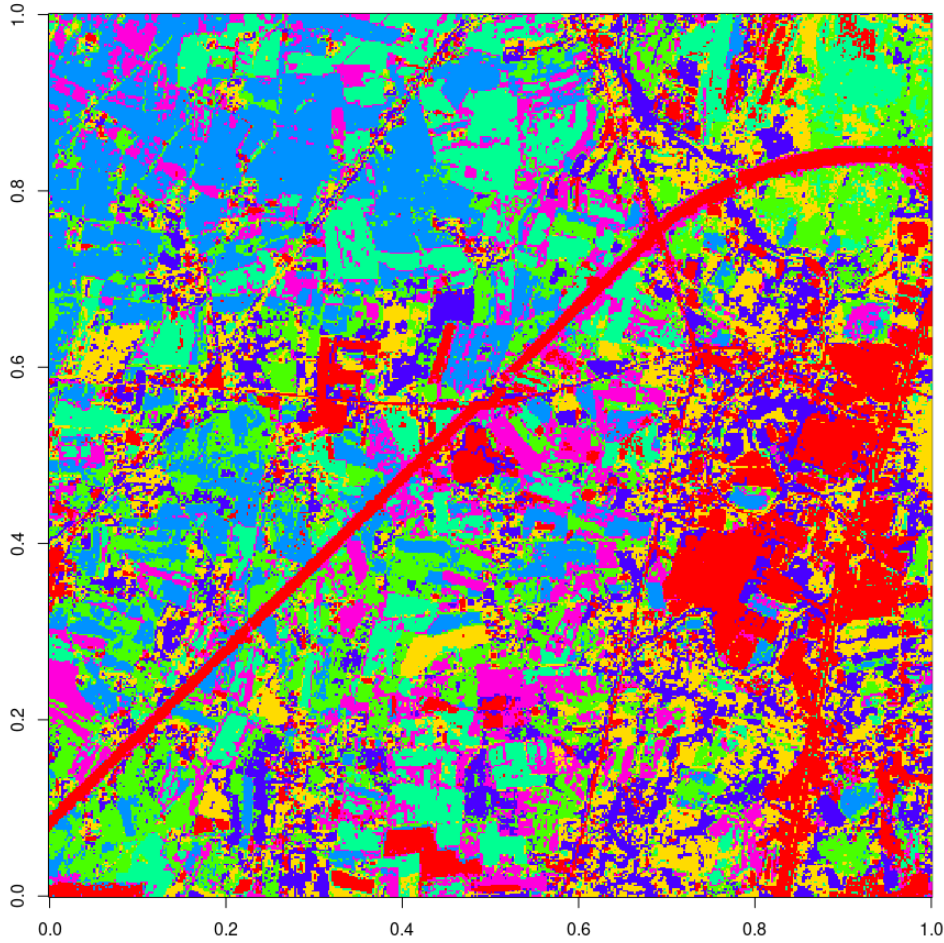




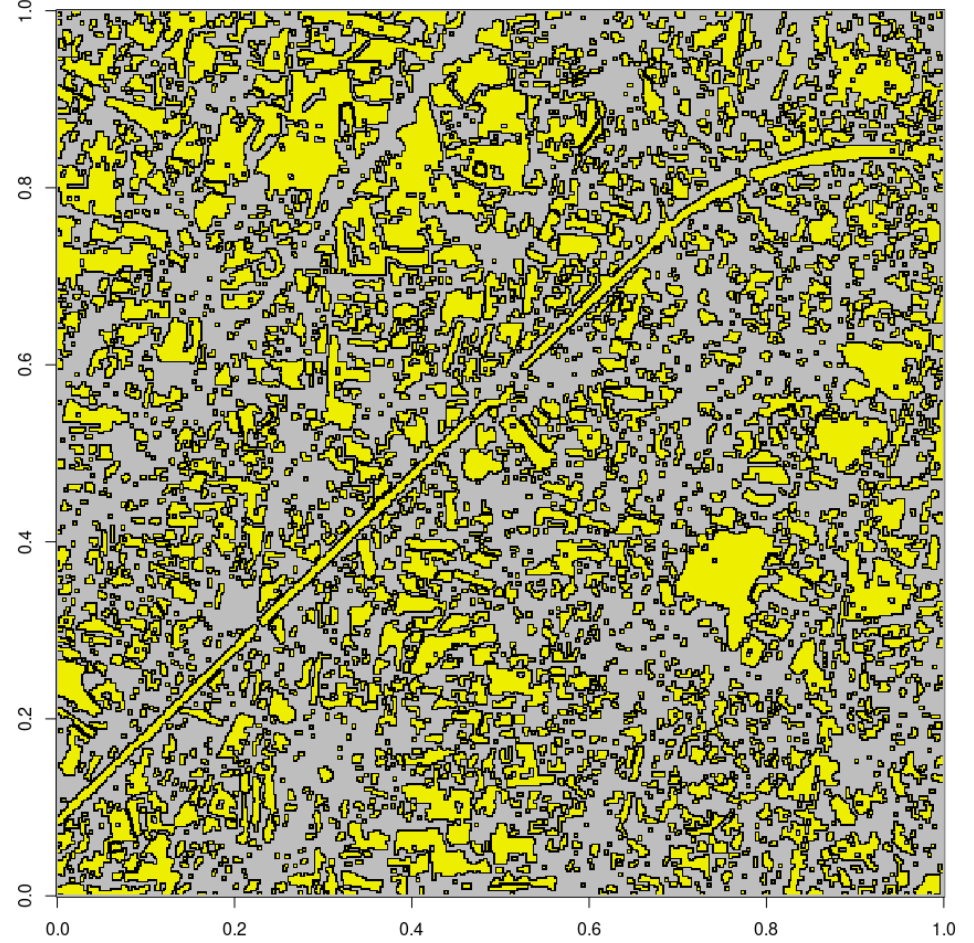




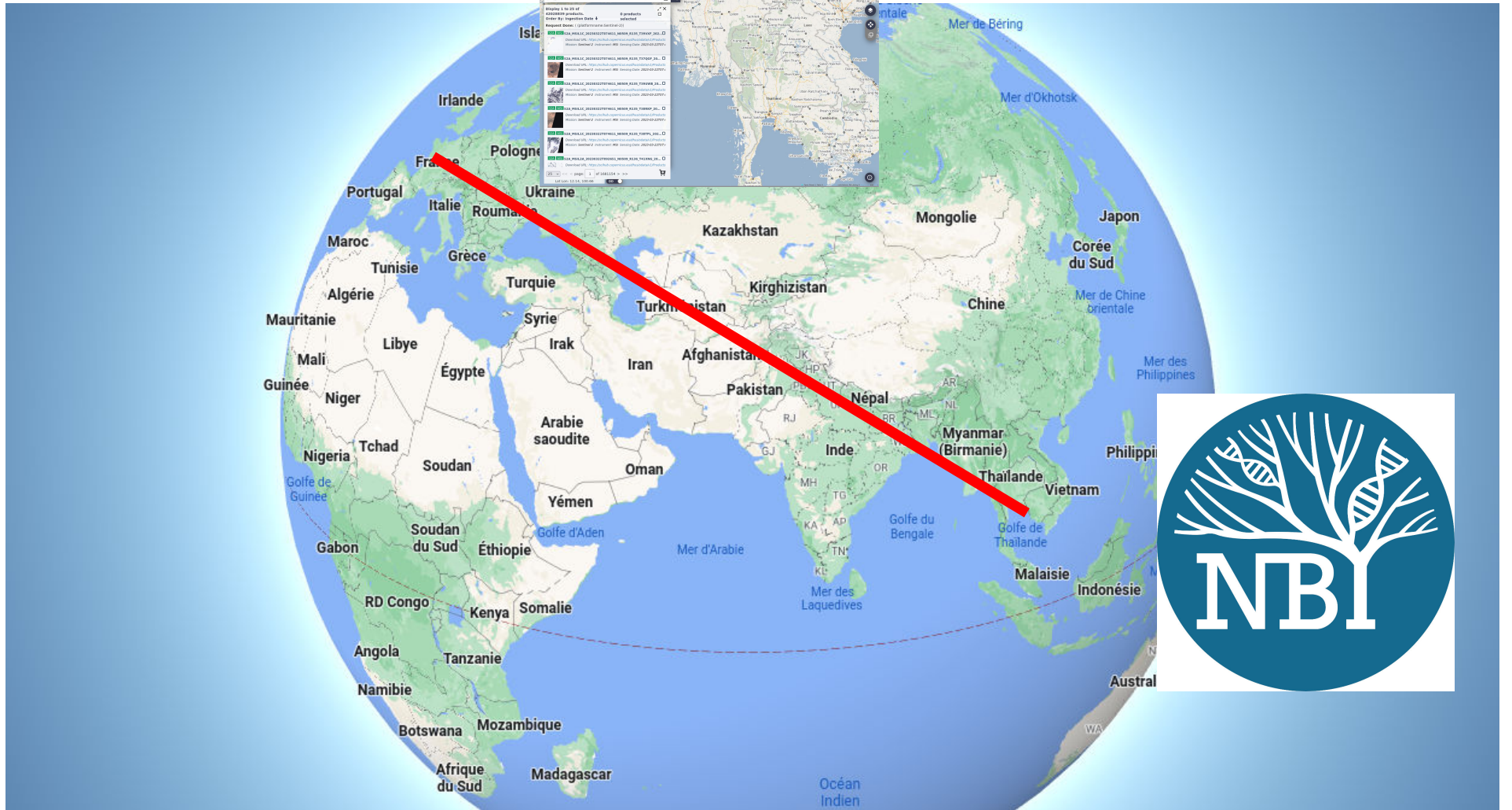


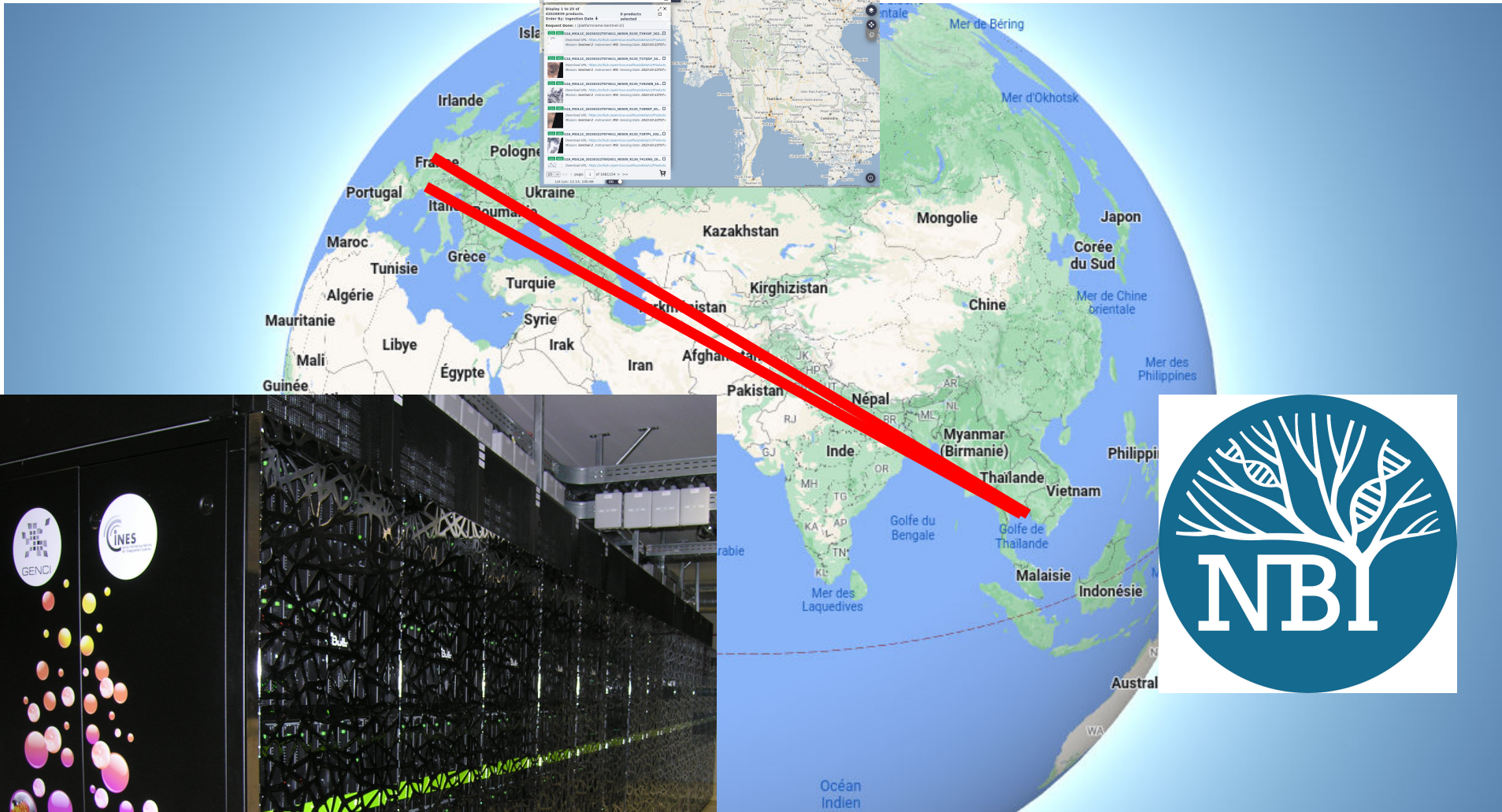


Land use classification



Object identification





Open-source code

The screenshot shows the GitHub interface for the repository 'emmanuelparadis / sentinel'. At the top, there is a search bar and navigation links for Pull requests, Issues, Codespaces, Marketplace, and Explore. Below this, the repository name and 'Public' status are shown, along with 'Pin' and 'Unwatch' buttons. A secondary navigation bar includes links for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. The main content area shows the 'master' branch with 2 branches and 0 tags. A warning box states 'Your master branch isn't protected' with a 'Protect this branch' button. Below this is a commit history table for 'emmanuelparadis a bunch of updates' (4ecea5c on Jan 4, 14 commits). The table lists files and folders with their commit messages and dates. At the bottom, the 'README.md' file is displayed, showing the title 'sentinel' and the start of the text: 'This package has functions to analyse Sentinel data. It has three main components:'.

Search or jump to... / Pull requests Issues Codespaces Marketplace Explore

emmanuelparadis / sentinel Public Pin Unwatch

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

master 2 branches 0 tags Go to file Add file <> Code

Your master branch isn't protected
Protect this branch from force pushing or deletion, or require status checks before merging. [Learn more](#) Protect this branch

emmanuelparadis a bunch of updates 4ecea5c on Jan 4 14 commits

R	fix convergence bug in pkm()	7 months ago
man	a bunch of updates	last month
src	fix convergence bug in pkm()	7 months ago
.gitignore	faster C code for PKM	last year
DESCRIPTION	fix convergence bug in pkm()	7 months ago
NAMESPACE	new functions for colours	8 months ago
README.md	small correction	last year

README.md

sentinel

This package has functions to analyse Sentinel data. It has three main components:

Work in progress

- ▶ Implement these analyses over large areas (KYNP → THA → ASEAN).
- ▶ Integrate topics (microbiomes, vegetation, . . .) to find the factors important for the capture and storage of carbon.
- ▶ Models of land-use changes to assess “carbon strategies”.

Take-Home Messages

- ▶ Deliver advances in our understanding of forest growth and its rôle in climate mitigation.
- ▶ Importance of soil microbes in carbon recycling (potential biotechnological applications).
- ▶ Local impacts of forest restoration projects in climate mitigation (assess carbon credits in the near future).

Acknowledgements

Institutional supports:



Funding:



Sous l'égide de la Fondation de France



Thank you!

Do not hesitate to contact us at NBT!