Web Applications - Google Earth Engine

EE406: Contemporary Economic Issues
Semester 1/ 2021
Faculty of Economics, Thammasat University

Global Forest Change

- https://glad.earthengine.app/view/global-forest-change
- https://storage.googleapis.com/earthenginepartners-hansen/GFC-2020-v1.8/download.html
- University of Maryland - Department of Geographical Sciences
- Results from time-series analysis of Landsat images characterizing **forest extent** and **change**.
- Trees are defined as vegetation taller than **5m** in **height** and are expressed as a percentage per output grid cell as '2000 Percent Tree Cover'.
- '**Forest Cover Loss**' is defined as a stand-replacement disturbance, or a change from a forest to non-forest state, during the **period 2000–2020.**
- '**Forest Cover Gain**' is defined as the inverse of loss, or a non-forest to forest change entirely within the **period 2000–2012**.
- '**Forest Loss Year**' is a disaggregation of total 'Forest Loss' to annual time scales.
- Reference 2000 and 2019 imagery are median observations from a set of quality assessment-passed growing season observations.

GFSAD1000: Cropland Extent 1km Multi-Study Crop Mask

Global Food-Support Analysis Data

- https://code.earthengine.google.com/?scriptPath=Examples%3ADatasets%2FUSGS_GFSAD1000_V1
- The GFSAD is a NASA-funded project to provide **high-resolution global cropland data** and **their water use** that contributes towards global food security in the twenty-first century.
- The GFSAD products are derived through multi-sensor remote sensing data (e.g., Landsat, MODIS, AVHRR), secondary data, and field-plot data and aims at documenting cropland dynamics.
- At a nominal **1km scale**, V0.1 provides the spatial distribution of a **disaggregated five-class global cropland** extent map derived from four major studies: Thenkabail et al. (2009a, 2011), Pittman et al. (2010), Yu et al. (2013), and Friedl et al. (2010).
- V1.0 is a 5-class product that provides information on **global cropland** extent and **irrigated** versus **rainfed cropping**.
- There is **no crop type** or **crop type** dominance information.
- **Cropping intensity** (single, double, triple, and continuous crops) can be obtained for every pixel using time-series remote sensing data.
- The GFSAD1000 nominal 2010 product was created with data **from 2007 to 2012**.

Cropland Data Layer (CDL) - USDA NASS

AgKit4EE

- https://code.earthengine.google.com/?accept_repo=users/czhang11/agkit4ee
- https://github.com/czhang11/agkit4ee
- AgKit4EE is a toolkit to facilitate the use of the **Cropland Data Layer (CDL)** product of **USDA NASS** through **Google Earth Engine (GEE)** platform.
- It contains a variety of frequently used mapping and modeling functions for CDL product such as **crop sequence modeling, crop frequency modeling**, confidence layer modeling, and **land use change statistics**.

Detection of oil palm plantations in Indonesia, Malaysia and Thailand

- https://www.nature.com/articles/s41597-021-00867-1?fbclid=IwAR1S9QPXLB_uAk37AGVRTA6hF-y6S56AkkQVrNZlUfXa7MHv1CZe9t-x_LQ
- https://olhadanylo.users.earthengine.app/view/oilpalmseasia
- We use **Sentinel 1 imagery** to generate an **oil palm plantation map** for **Indonesia**, **Malaysia** and **Thailand** for the year 2017.
- In addition to location, the **age of the oil palm plantation** is critical for **calculating yields**.
- Here we have used a **Landsat time series** approach to determine **the year** in which the oil palm plantations are **first detected**, at which point they are 2 to 3 years of age.

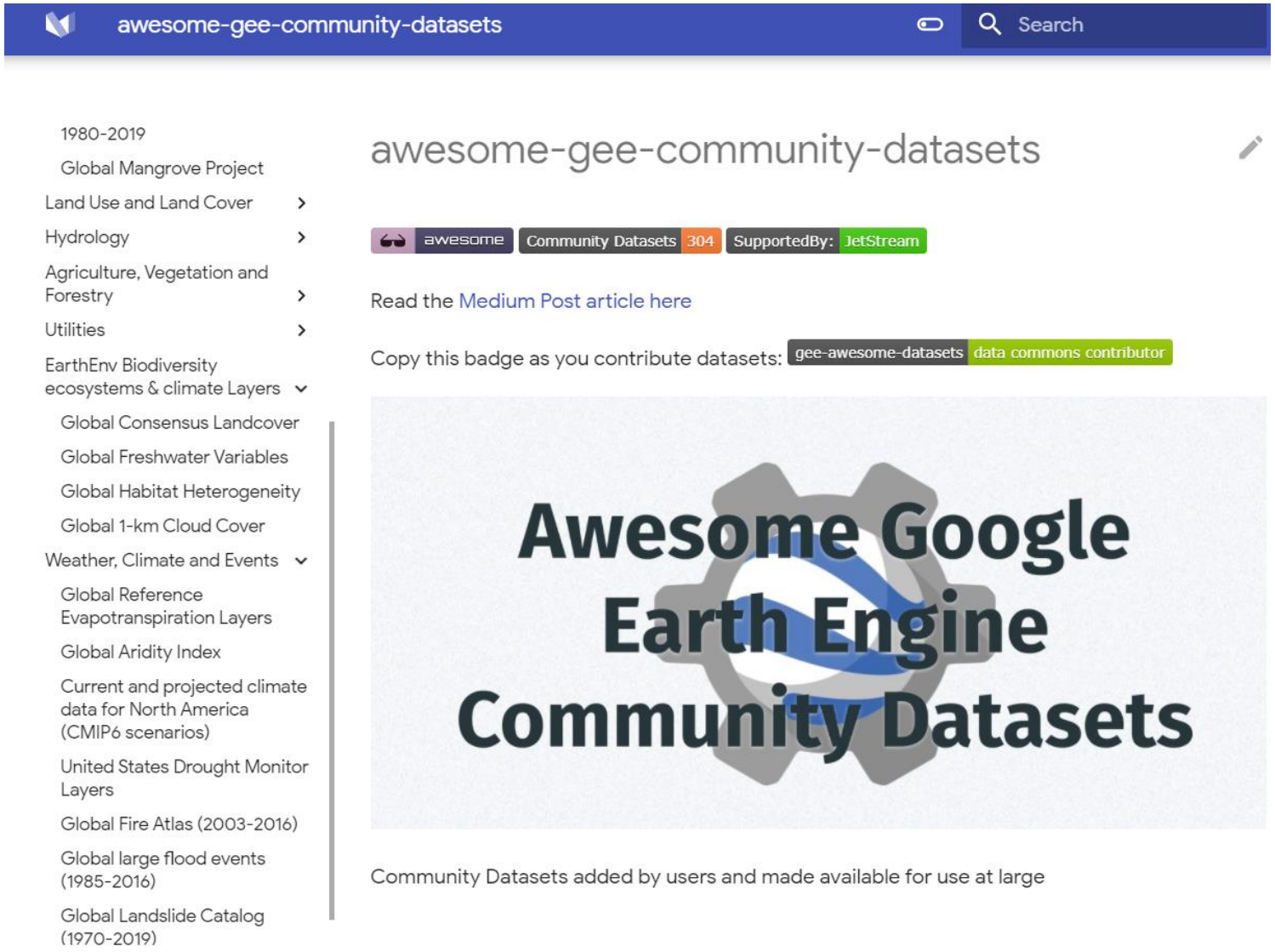
Multi-temporal Composites for Crop Classification

- https://courses.spatialthoughts.com/end-to-end-gee.html

Multi-temporal Composites for Crop Classification

- https://courses.spatialthoughts.com/end-to-end-gee.html#multi-temporal-composites-for-crop-classification

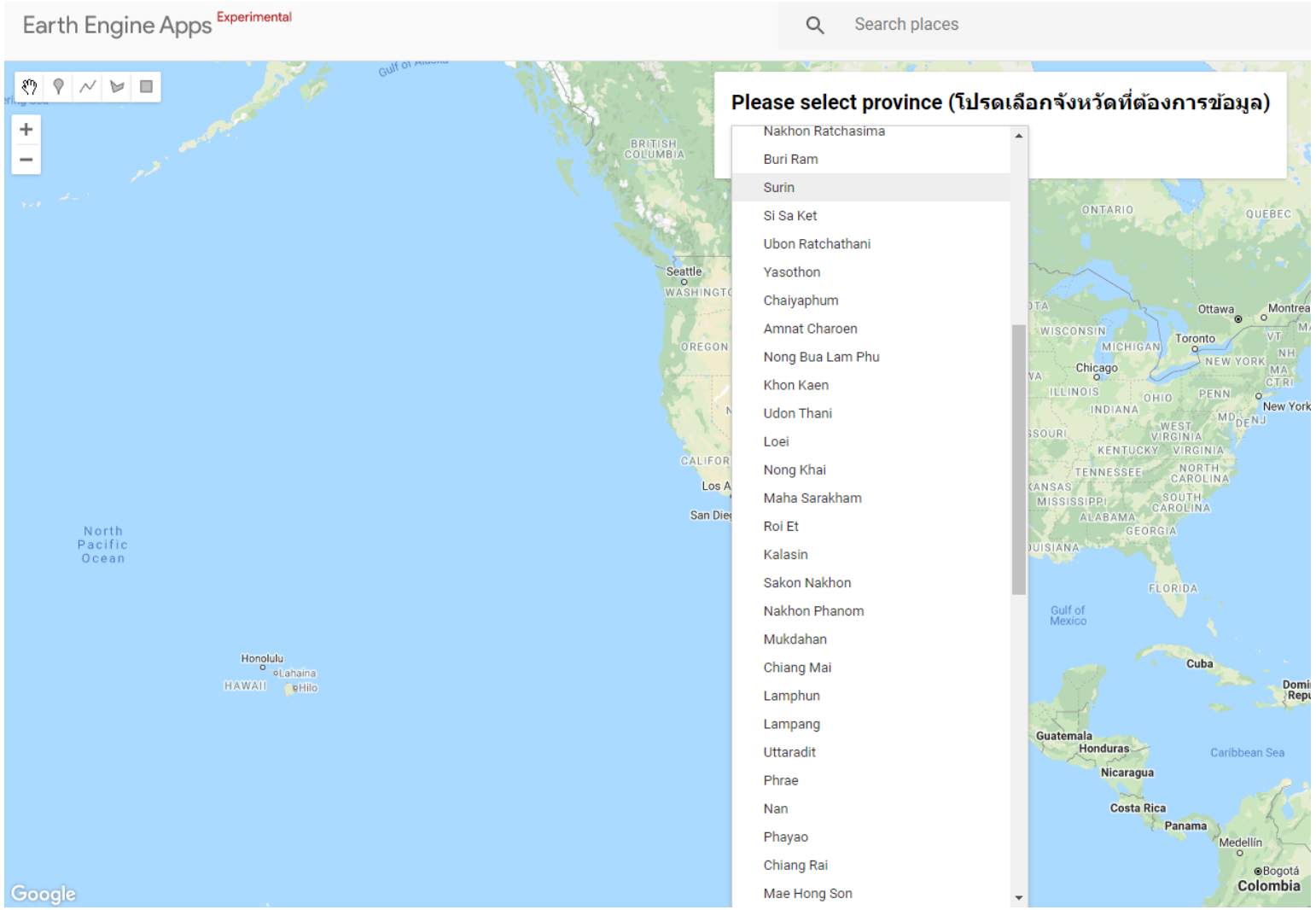
Awesome-GEE-Community-Datasets



- https://samapriya.github.io/awesome-gee-community-datasets/

Thailand's Time Series Datasets

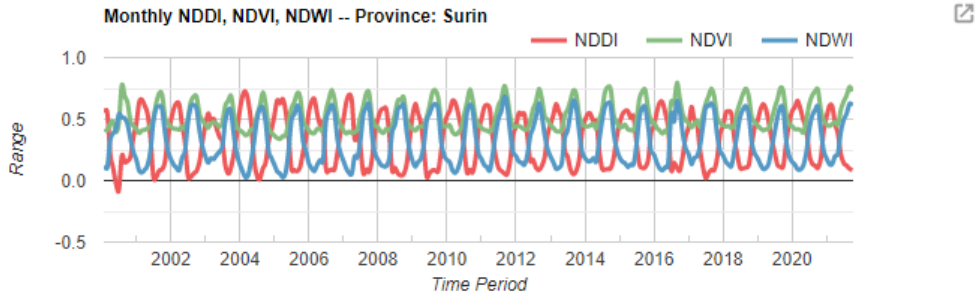
- https://nattapong.users.earthengine.app/view/thailand-monthly-indicators-satellite-data
- This app generates the provincial datasets, which include time series data obtained from satellites.



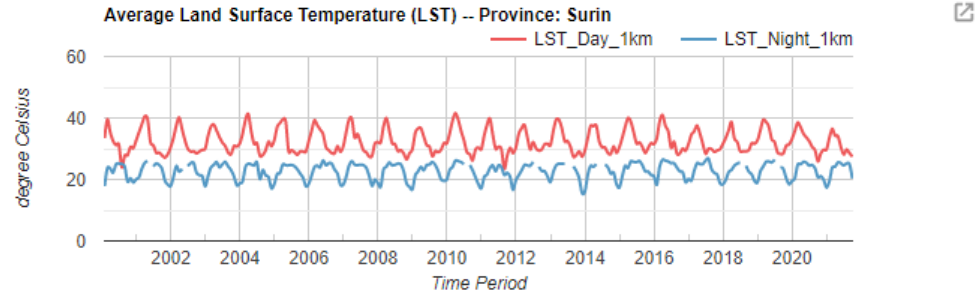
Earth Engine Apps Experimental

Time series obtained from satellite data (ข้อมูลดาวเทียมของจังหวัด)

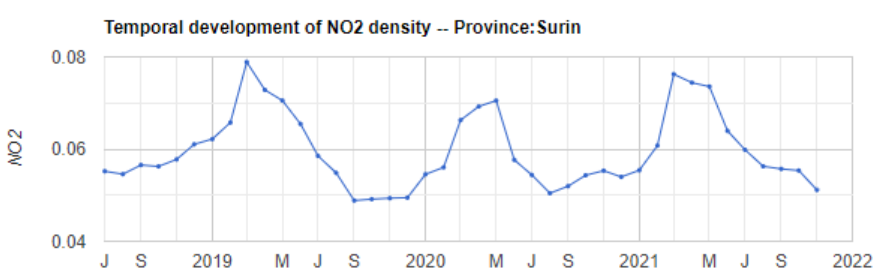
Developed by Nattapong Puttanapong, Faculty of Economics, Thammasat University (nattapong@econ.tu.ac.th)



Reference: https://developers.google.com/earth-engine/datasets/catalog/MODIS_006_MOD09A1 and https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2006GL029127



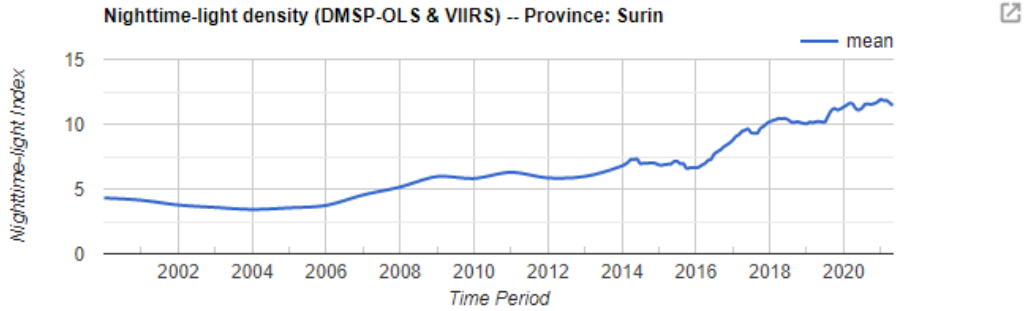
Reference: https://developers.google.com/earth-engine/datasets/tags/surface-temperature and https://www.mdpi.com/2072-4292/12/9/1471/htm



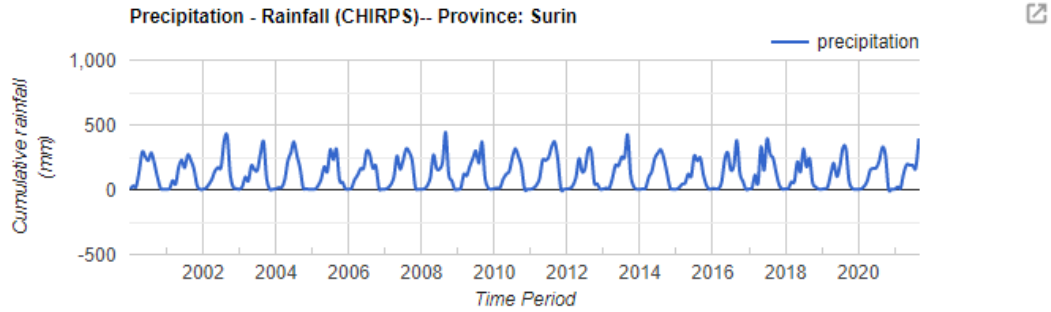
Reference: https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS_S5P_NRTI_L3_NO2

Earth Engine Apps Experimental

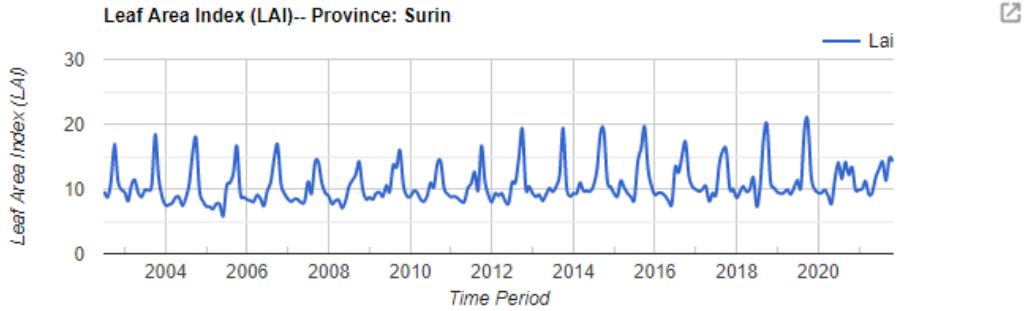
Reference: https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS_Landcover_100m_Proba-V-C3_Global



Reference: https://developers.google.com/earth-engine/datasets/tags/nighttime and https://www.iirs.gov.in/iirs/sites/default/files/StudentThesis/S_6027253_Reshma_Jeswani_MSc_Thesis.pdf



Reference: https://developers.google.com/earth-engine/datasets/catalog/UCSB-CHG_CHIRPS_DAILY



Reference: https://developers.google.com/earth-engine/datasets/tags/lai