

**Development of Automatic Crop Health Monitoring System
using Geospatial Techniques and Satellite Data**

**การพัฒนาระบบประเมินความสมบูรณ์ของพืช (Crop Health)
ด้วยระบบสารสนเทศภูมิศาสตร์และข้อมูลดาวเทียม**

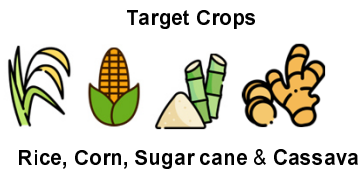
KGEO/KMUTT, January 2019

Last updated on Fri Jan 04 19:08:39 ICT 2019 ICT 2018 by vivarad@gmail.com

UPDATED

Flowchart of the Methodology and Important Key Information

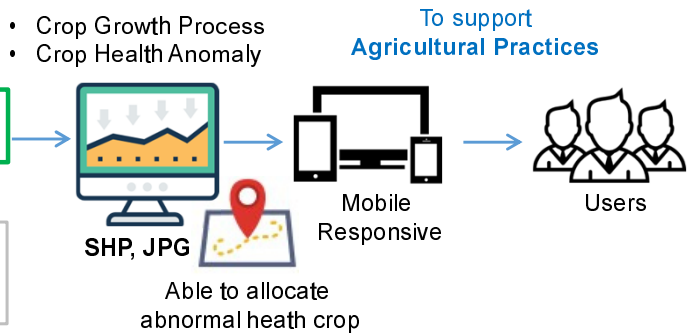
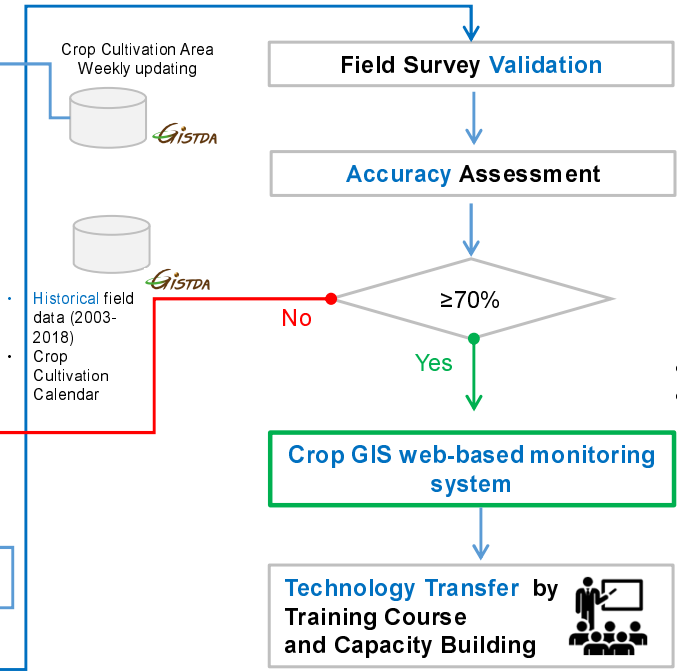
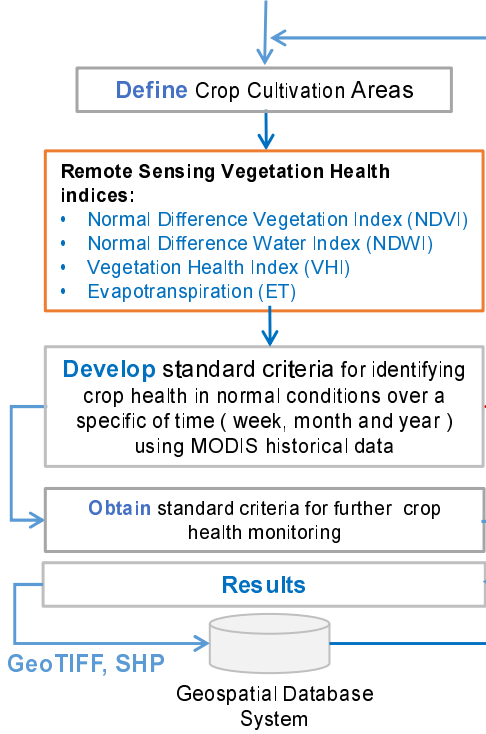
- Data Collections**
- Crop Cultivation Areas (shape file) (source: *GISTDA*)
 - Crop Cultivation Calendar (source: *GISTDA*)
 - GIS Administrative data: Regional, Province, District & Sub-District
 - Historical Data (2003-2018)
 - **MODIS Products** - 1Km Spatial Resolution (source: *MODIS*)
 - Level3 (MOD09A1, MOD11A2 and MOD16A2)
 - Field data for data validation (*GISTDA*)



- **Automatic monitoring** via web application
- **Crops = {Rice, Corn, Sugar cane & Cassava}**
- **Project Duration: 240 days** since Oct. 01, 2018

2018			2019				
10	11	12	01	02	03	04	05

Inception Progress Final
Reports to Submit & Deadlines



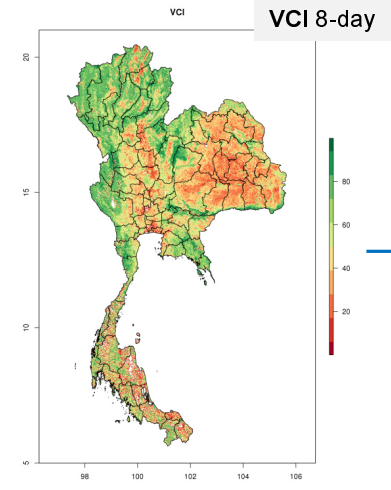
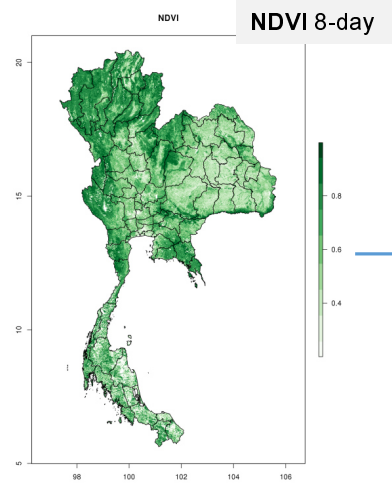
MRT

- Mosaicking
- Resampling

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MOD09A1

Surface Reflectance 8-Day L3
Global 500 m SIN Grid V006



Main Indices for Crop Health Monitoring – A Sample (1/2)
(Weekly, Monthly and Yearly)

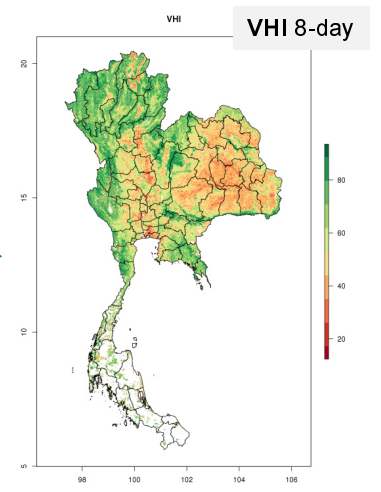
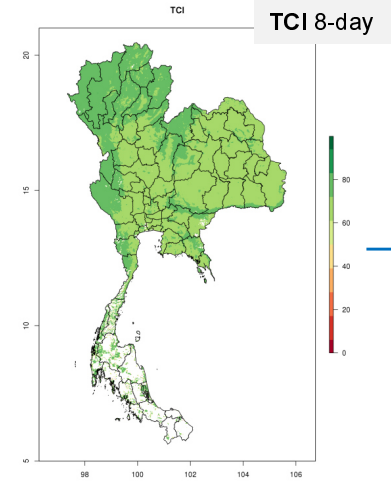
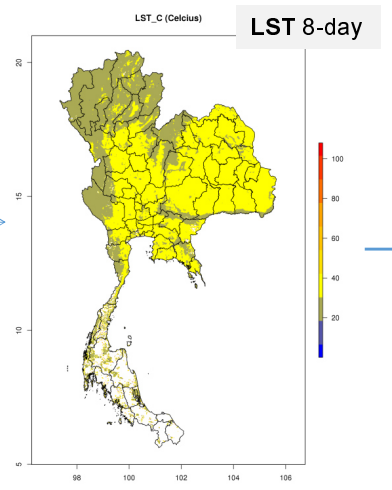
MRT

- Mosaicking
- Resampling

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MOD11A2

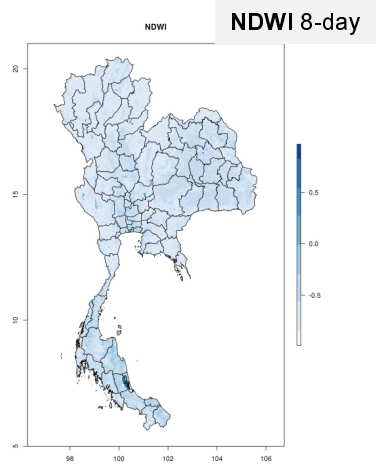
Land Surface
Temperature/Emissivity 8-Day
L3 Global 1 km SIN Grid V006



MRT
• Mosaicking
• Resampling

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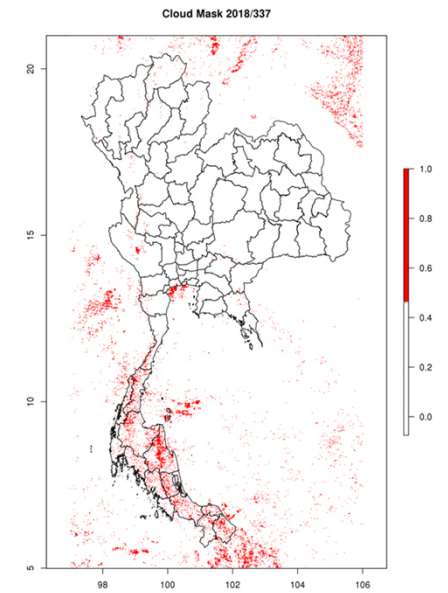
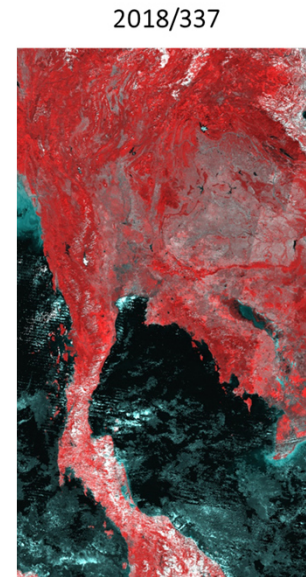
MOD09A1
Surface Reflectance 8-Day L3
Global 500 m SIN Grid V006



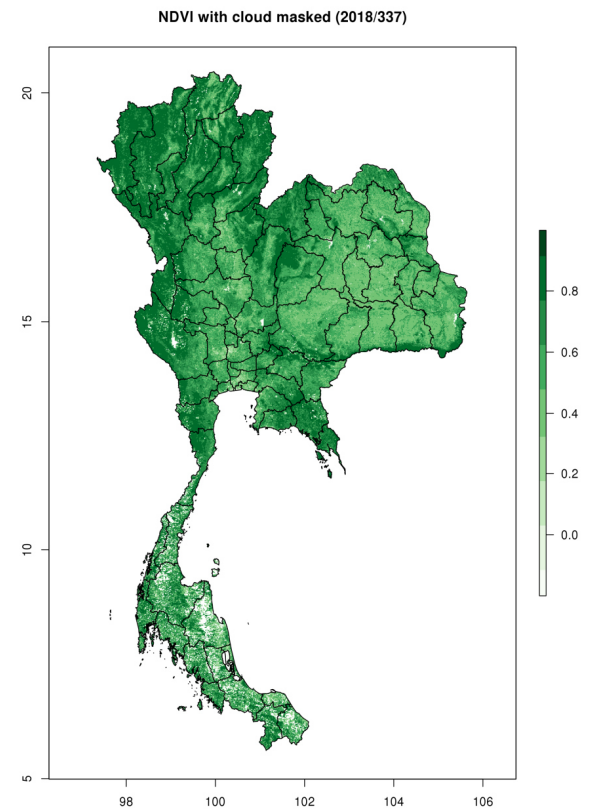
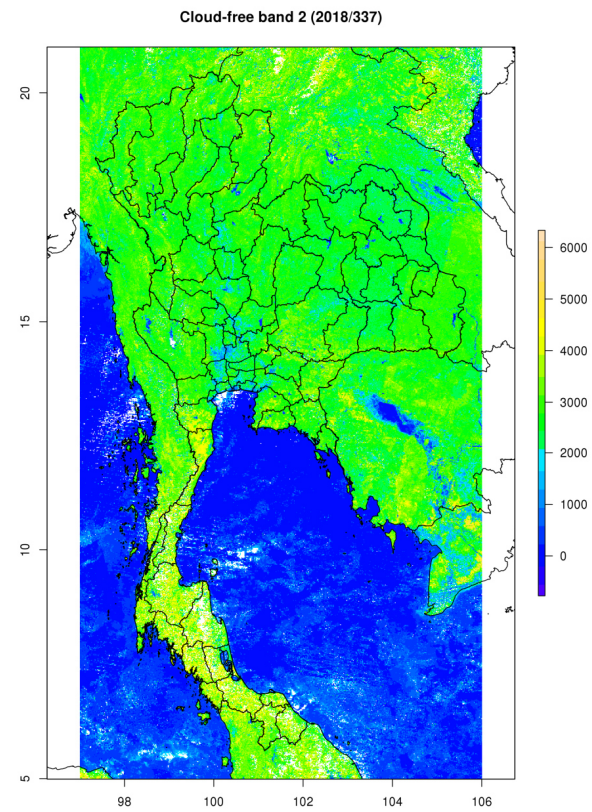
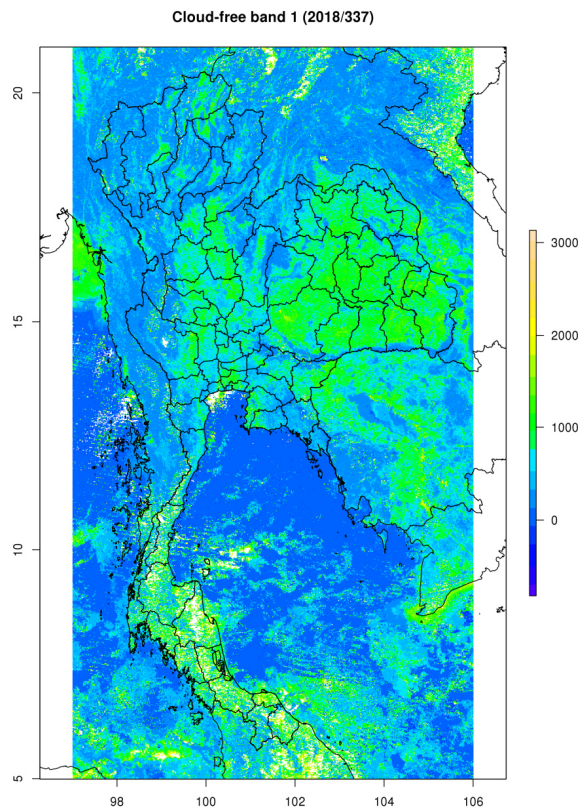
Main Indices for Crop Health Monitoring – A Sample (2/2)

(Weekly, Monthly and Yearly)

Cloud Masking

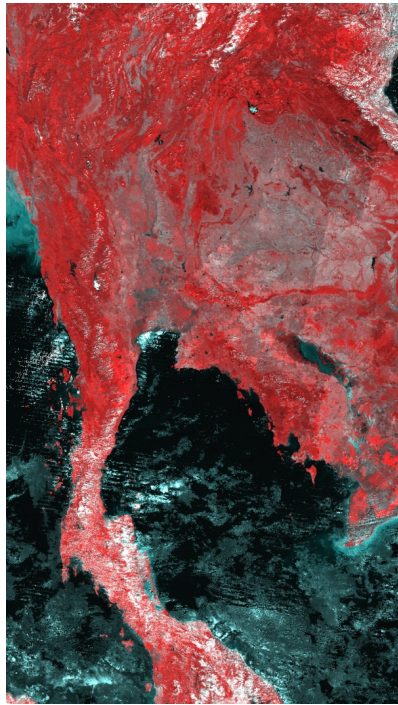


Cloud-Free NDVI Image

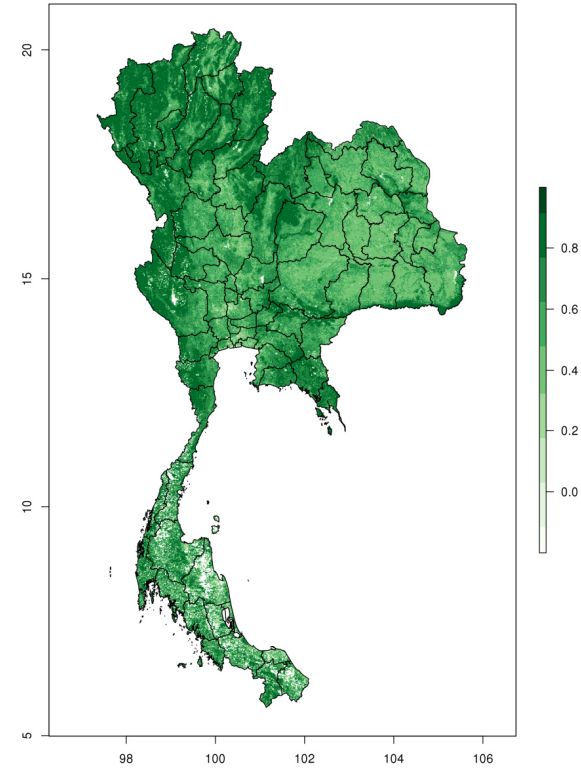


Cloud-Free NDVI Image

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NDVI with cloud masked (2018/337)



Evapotranspiration mapping using MOD16A2

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MOD16A2: MODIS/Terra Net Evapotranspiration 8-Day L4 Global 500 m SIN Grid V006

Description

The MOD16A2 Version 6 Evapotranspiration/Latent Heat Flux product is an 8-day composite product produced at 500 meter pixel resolution. The algorithm used for the MOD16 data product collection is based on the logic of the Penman-Monteith equation, which includes inputs of daily meteorological reanalysis data along with MODIS remotely sensed data products such as vegetation property dynamics, albedo, and land cover.

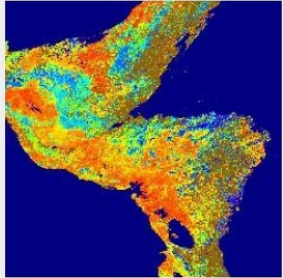
Provided in the MOD16A2 product are layers for composited Evapotranspiration (ET), Latent Heat Flux (LE), Potential ET (PET) and Potential LE (PLE) along with a quality control layer. Two low resolution browse images are also available for each MOD16A2 granule, (1) ET and (2) LE.

The pixel values for the two Evapotranspiration layers (ET and PET) are the sum of all eight days within the composite period and the pixel values for the two Latent Heat layers (LE and PLE) are the average of all eight days within the composite period. Note that the last 8-day period of each year is a 5 or 6-day composite period, depending on the year.

Validation at [Stage 1](#) has been achieved for MODIS Evapotranspiration products.

Improvements/Changes from Previous Versions

- Spatial resolution of Version 6 products increased to nominal 500 meters from nominal 1,000 meters in Version 5.
- Version 5 data products were previously distributed by the Numerical Terradynamic Simulation Group at the University of Montana. The



MOD16A2. Acquired April 15, 2009. Tile H09V07. Central America.

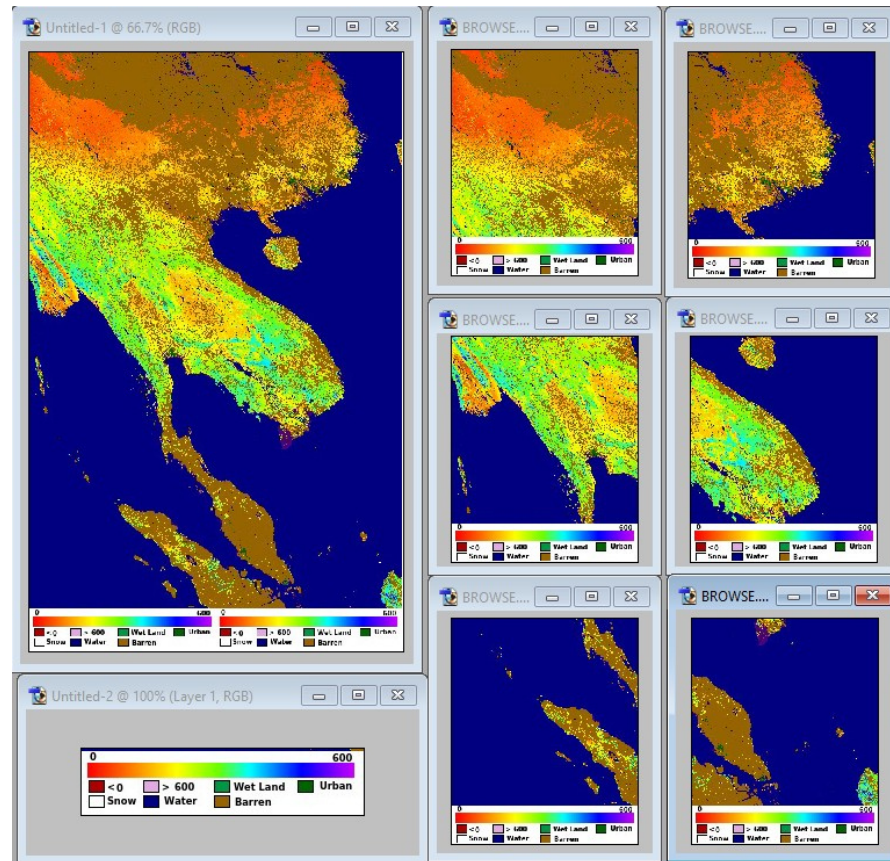
DOI 10.5067/MODIS/MOD16A2.006

Product	Evapotranspiration
Dataset	Terra MODIS
Dataset Version	6
Pixel Size	500
Temporal Granularity	Composites
Spatial Extent	Global

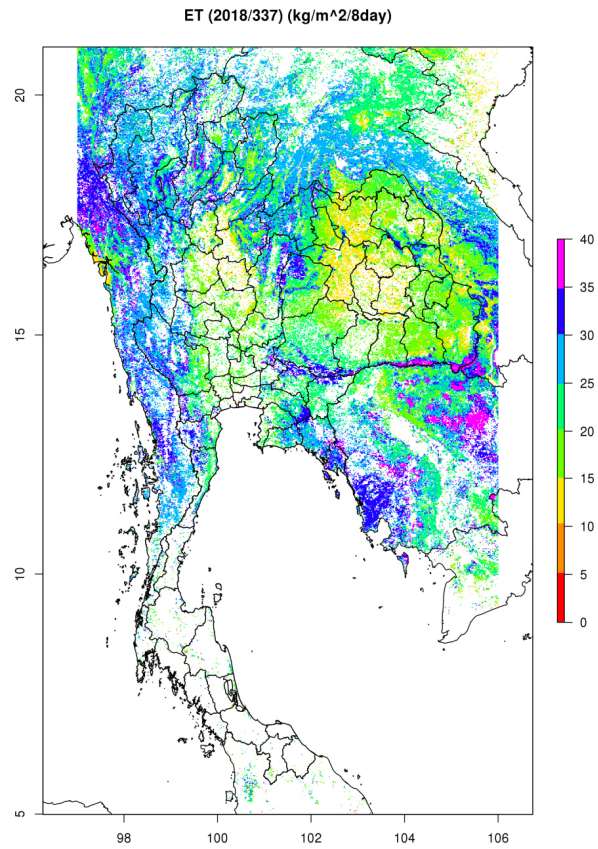
Evapotranspiration mapping using MOD16A2

<https://e4ftl01.cr.usgs.gov/MOLT/MOD16A2.006/2018.12.03/>

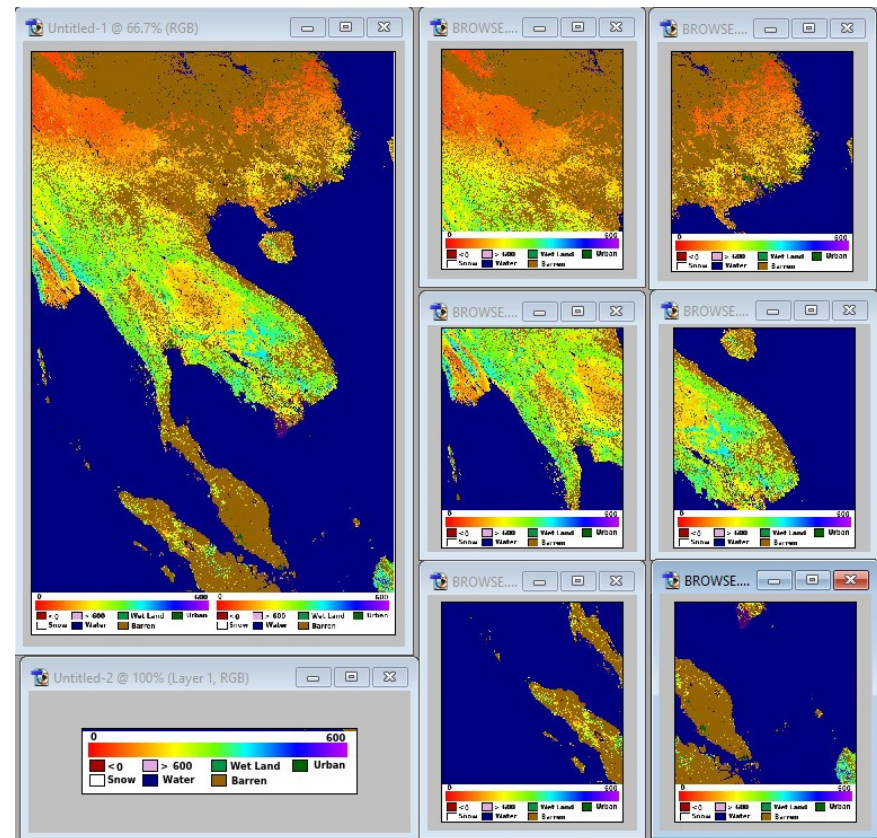
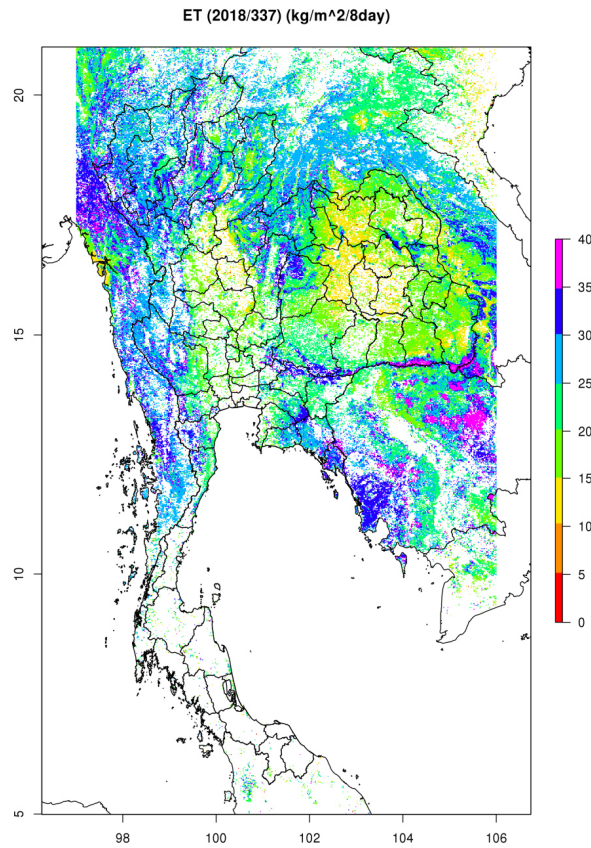
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Evapotranspiration mapping using MOD16A2



Evapotranspiration mapping using MOD16A2



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