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

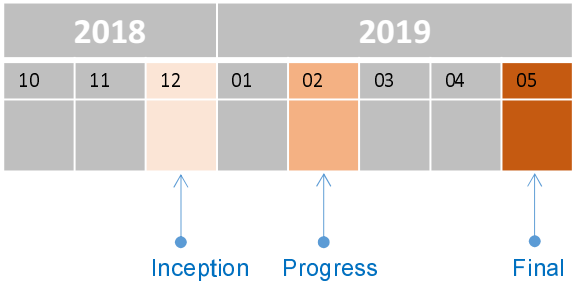
Flowchart of the Methodology and Important Key Information

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)

Target Crops

Rice, Corn, Sugar cane & Cassava

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



Reports to Submit & Deadlines

Define Crop Cultivation Areas

Remote Sensing Vegetation Health indices:
- Normal Difference Vegetation Index (NDVI)
- Normal Difference Water Index (NDWI)
- Vegetation Health Index (VHI)
- Evapotranspiration (ET)

Develop standard criteria for identifying crop health in normal conditions over a specific of time (week, month and year) using MODIS historical data

Obtain standard criteria for further crop health monitoring

Results

GeoTIFF, SHP

Geospatial Database System

Crop Cultivation Area Weekly updating (GISTDA)

Historical field data (2003-2018)
Crop Cultivation Calendar (GISTDA)

Field Survey Validation

Accuracy Assessment

≥70%

No

Yes

Crop GIS web-based monitoring system

Technology Transfer by Training Course and Capacity Building

- Crop Growth Process
- Crop Health Anomaly

SHP, JPG

Able to allocate abnormal heath crop

Mobile Responsive

To support Agricultural Practices

Users

Prepared and updated on Thu Jan 17 14:22:19 ICT 2019 by vivarad@gmail.com

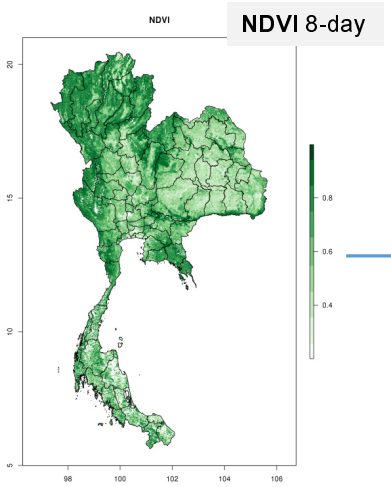
MRT

- Mosaicking
- Resampling

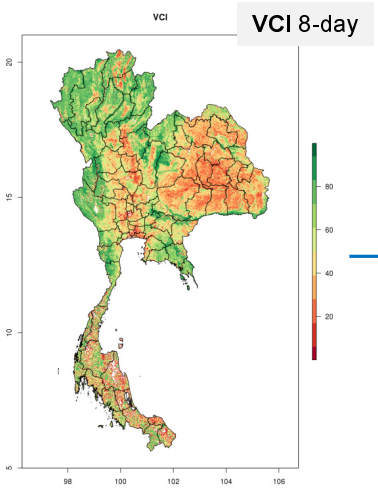
2018/337

MOD09A1

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



NDVI 8-day



VCI 8-day

MRT

- Mosaicking
- Resampling

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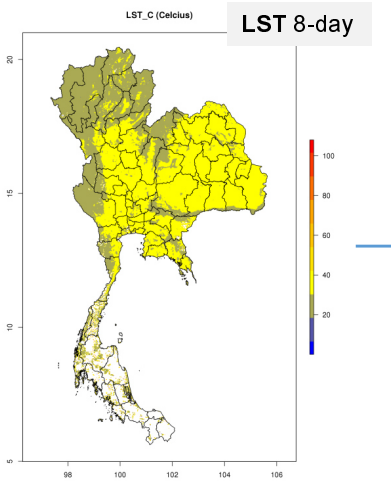
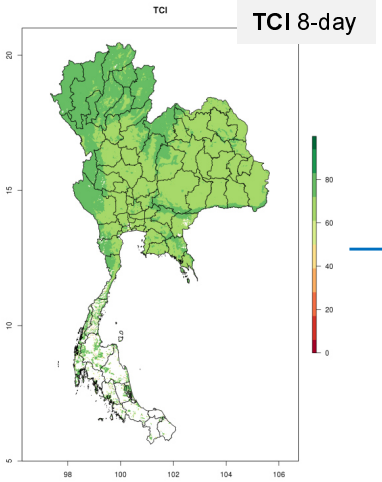
MOD11A2

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



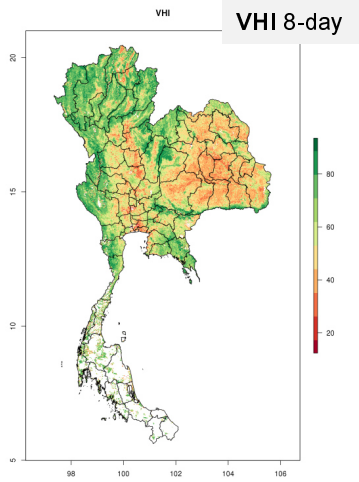
LST 8-day



TCI 8-day

Main Indices for Crop Health Monitoring – A Sample (1/2)

(Weekly, Monthly and Yearly)



VHI 8-day

MRT

- Mosaicking
- Resampling

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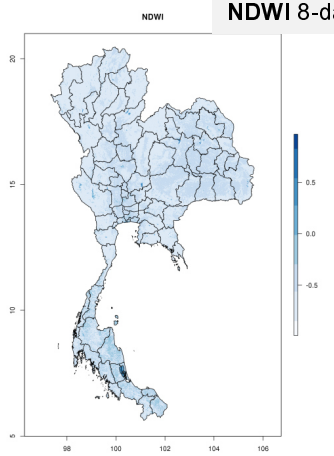
MOD09A1

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



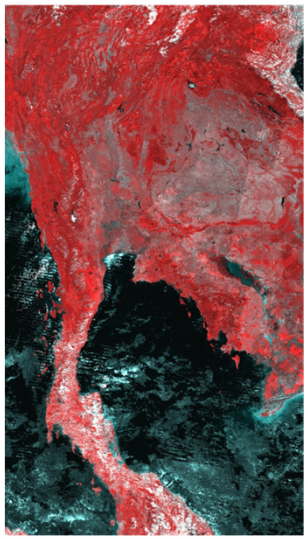
NDWI 8-day

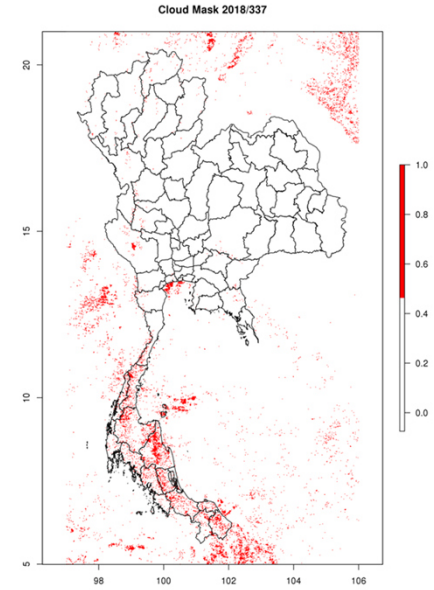
Main Indices for Crop Health Monitoring – A Sample (2/2)

(Weekly, Monthly and Yearly)

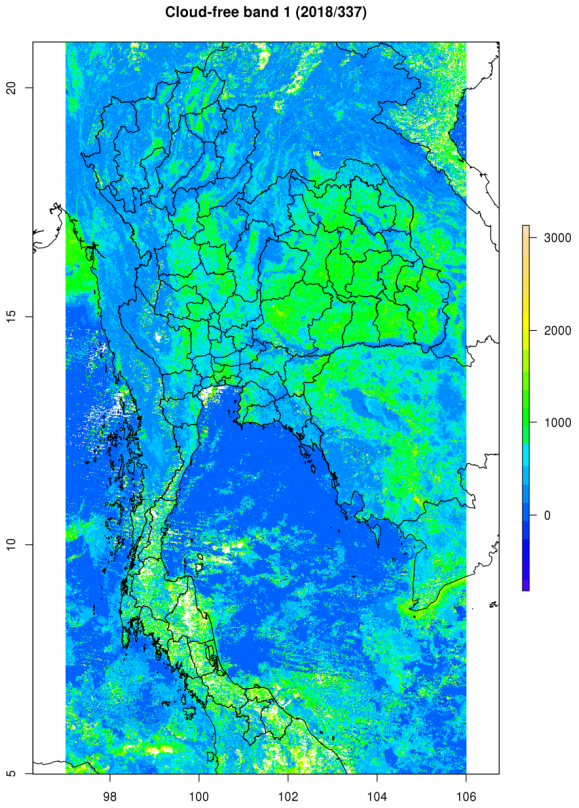
Cloud Masking

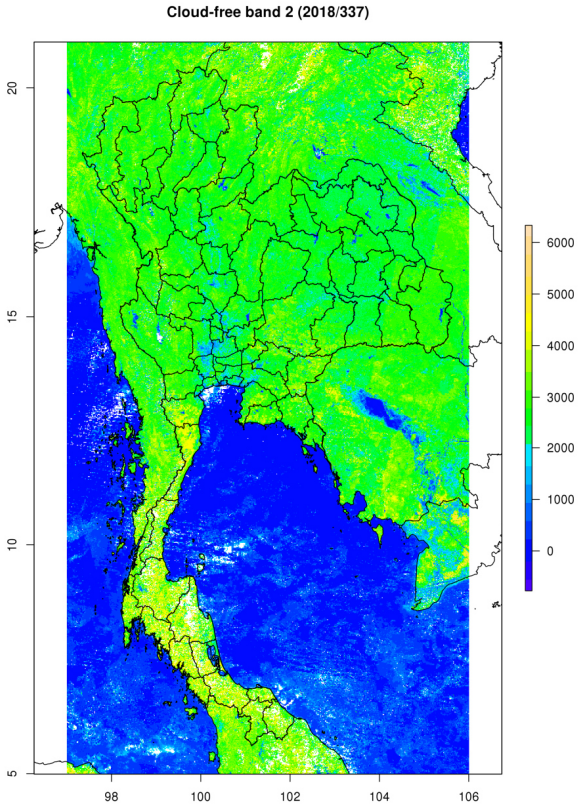
2018/337

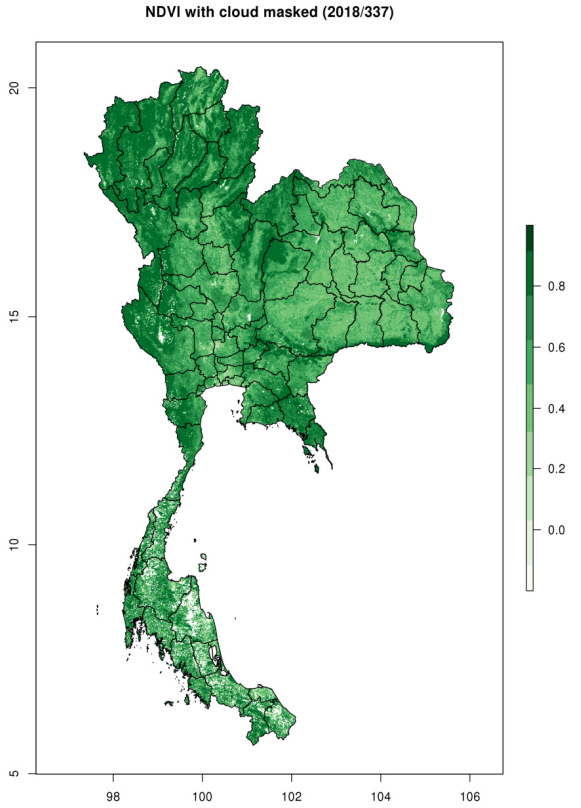




Cloud-Free NDVI Image







Cloud-Free NDVI Image

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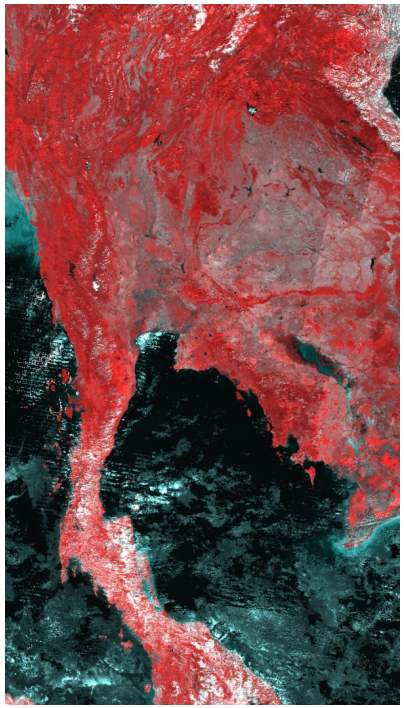
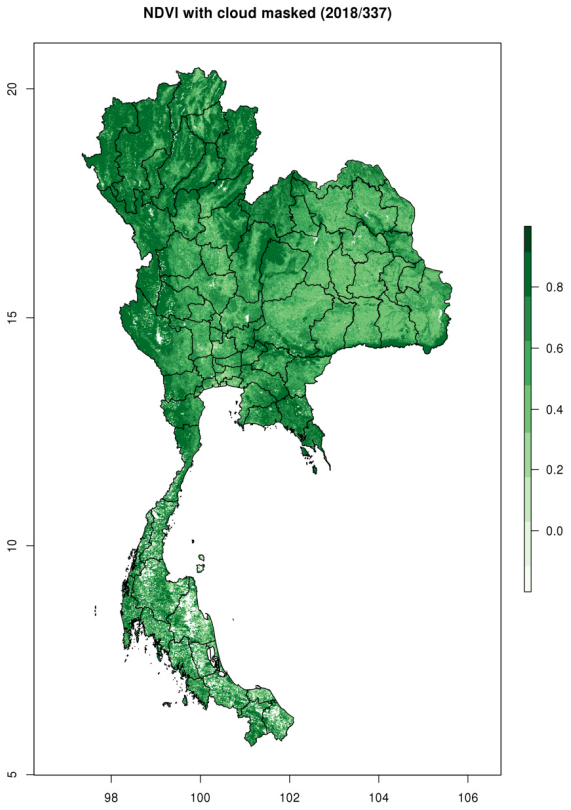
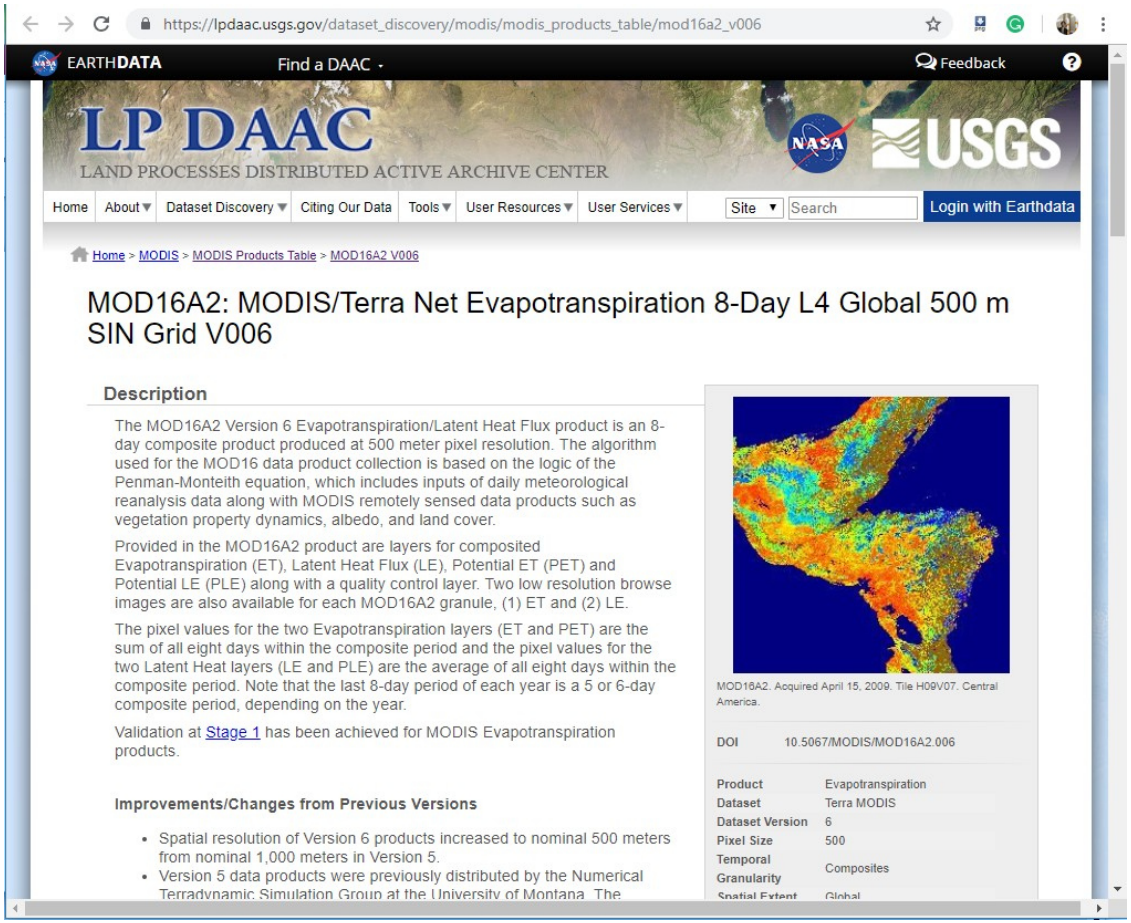


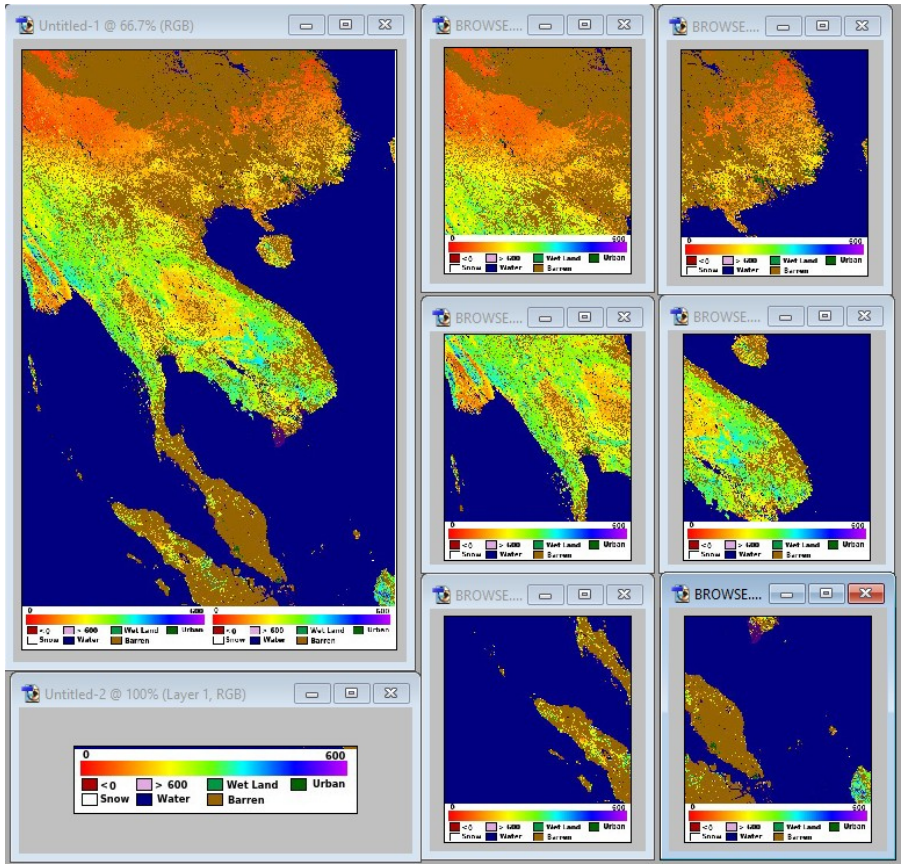


Evapotranspiration mapping using MOD16A2



Evapotranspiration mapping using MOD16A2

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



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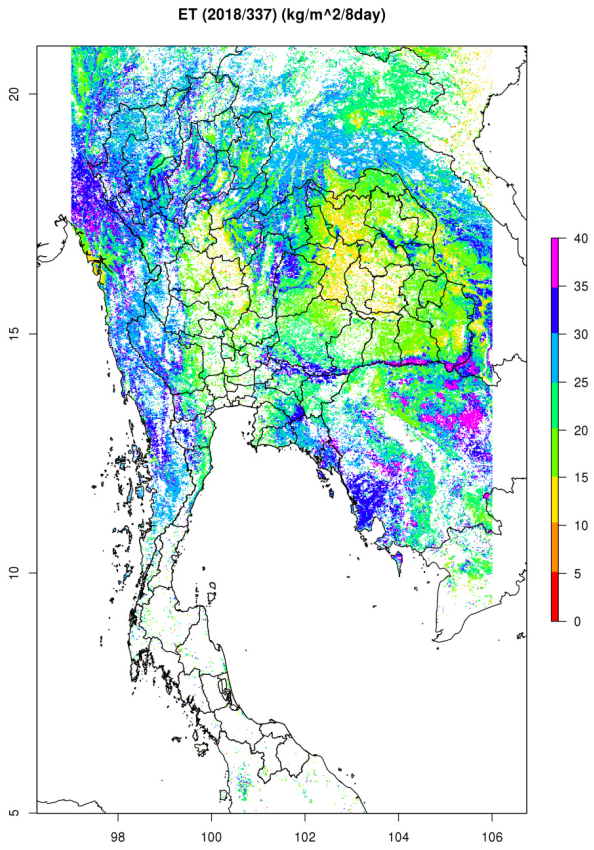
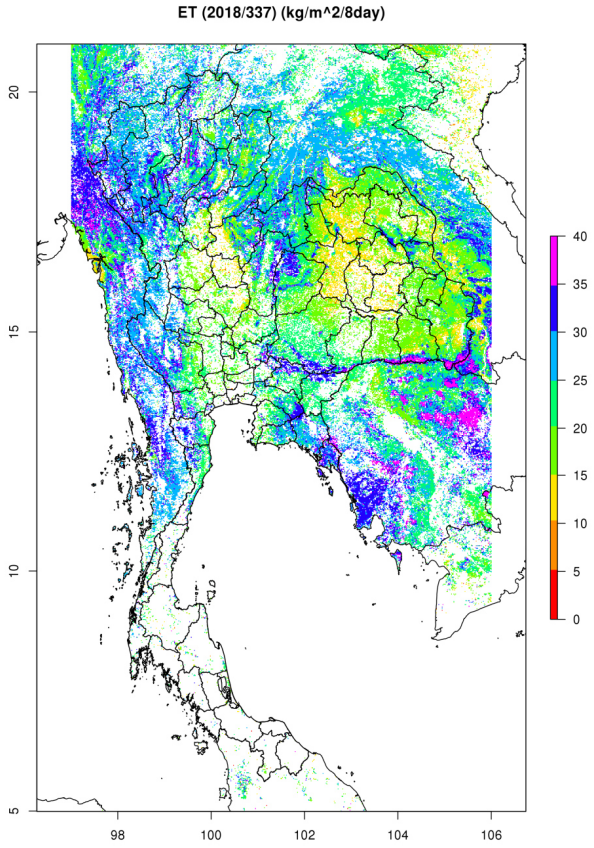
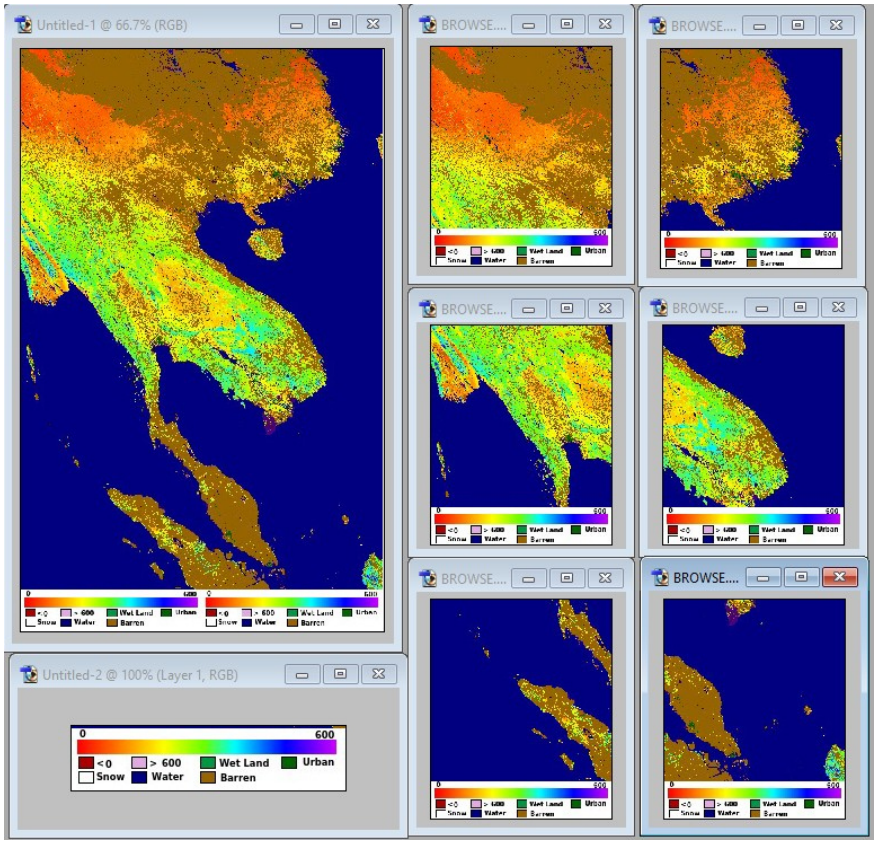
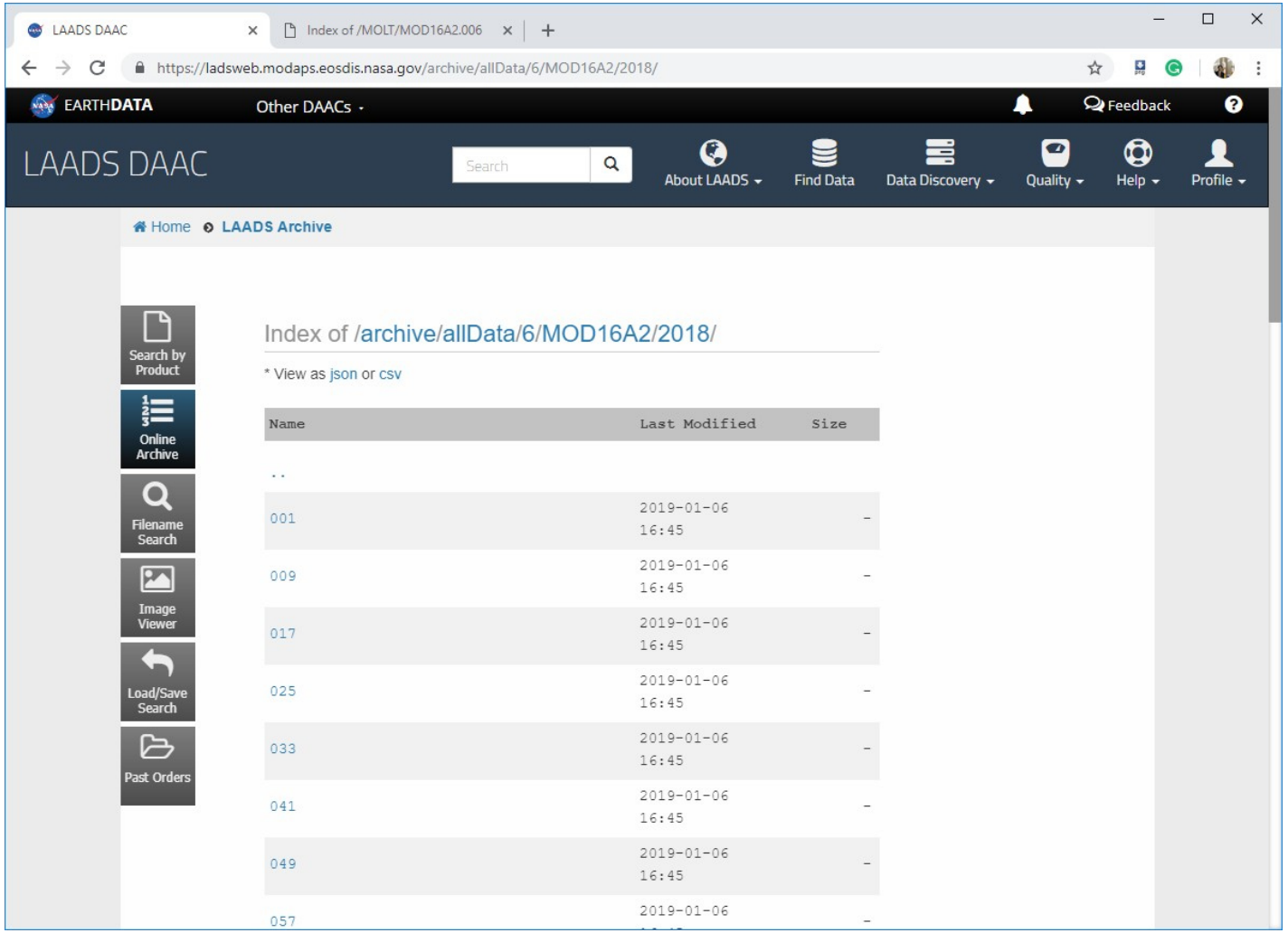
Evapotranspiration mapping using MOD16A2



Evapotranspiration mapping using MOD16A2



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Other DAACs
Feedback
LAADS DAAC
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About LAADS
Find Data
Data Discovery
Quality
Help
Profile
Home
LAADS Archive
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Online Archive
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Image Viewer
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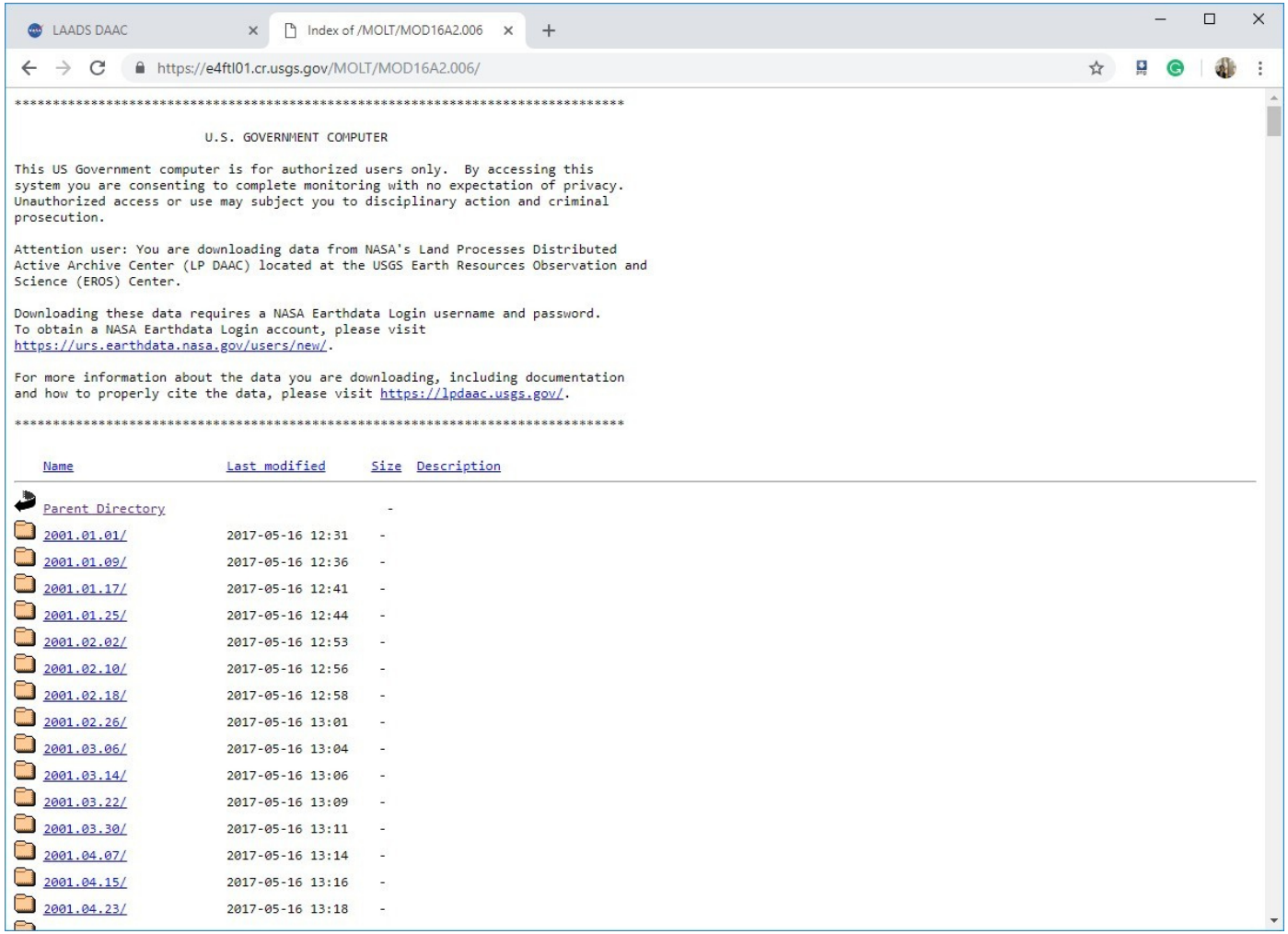

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