European Commission

Paper and GEE script:
https://twitter.com/RemoteSens_MDPI/status/984708980076232704

ΔrNBR
(Google Earth Engine)

- Manual -

Andreas Langner

Joint Research Centre

April 3, 2018

Software Open Access

Andi1974/Forest-degradation-monitoring: Delta-rNBR Forest Canopy Disturbance Mapping Approach

Andreas Langner

- Bug fix within country selection
- Adding option to process user-defined polygons

Preview

Forest-degradation-monitoring-v1.5.zip

Andi1974-Forest-degradation-monitoring-04f8e85
- Delta-rNBR.txt 115.4 kB
- DeltaNBR.pdf 8.7 MB
- LICENSE 35.1 kB
- README.md 1.1 kB

Files (8.4 MB)

Name	Size	
Andi1974/Forest-degradation-monitoring-v1.5.zip	8.4 MB	Preview Download

md5:f70fe307fe792e41c5a6012c276ccf56

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Publication date:
April 3, 2018

DOI:
DOI 10.5281/zenodo.1211400

Related identifiers:
Supplement to:
https://github.com/Andi1974/Forest-degradation-monitoring/tree/v1.5

License (for files):
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Versions

Version v1.5 10.5281/zenodo.1211400	Apr 3, 2018
Version v1.4 10.5281/zenodo.1187063	Mar 2, 2018
Version v1.3 10.5281/zenodo.1179772	Feb 20, 2018
Version v1.2 10.5281/zenodo.1116885	Dec 15, 2017
Version v.1.1 10.5281/zenodo.1014894	Oct 17, 2017

View all 6 versions

Cite all versions? You can cite all versions by using the DOI 10.5281/zenodo.1014728. This DOI represents all versions, and will always resolve to the latest one. Read more.

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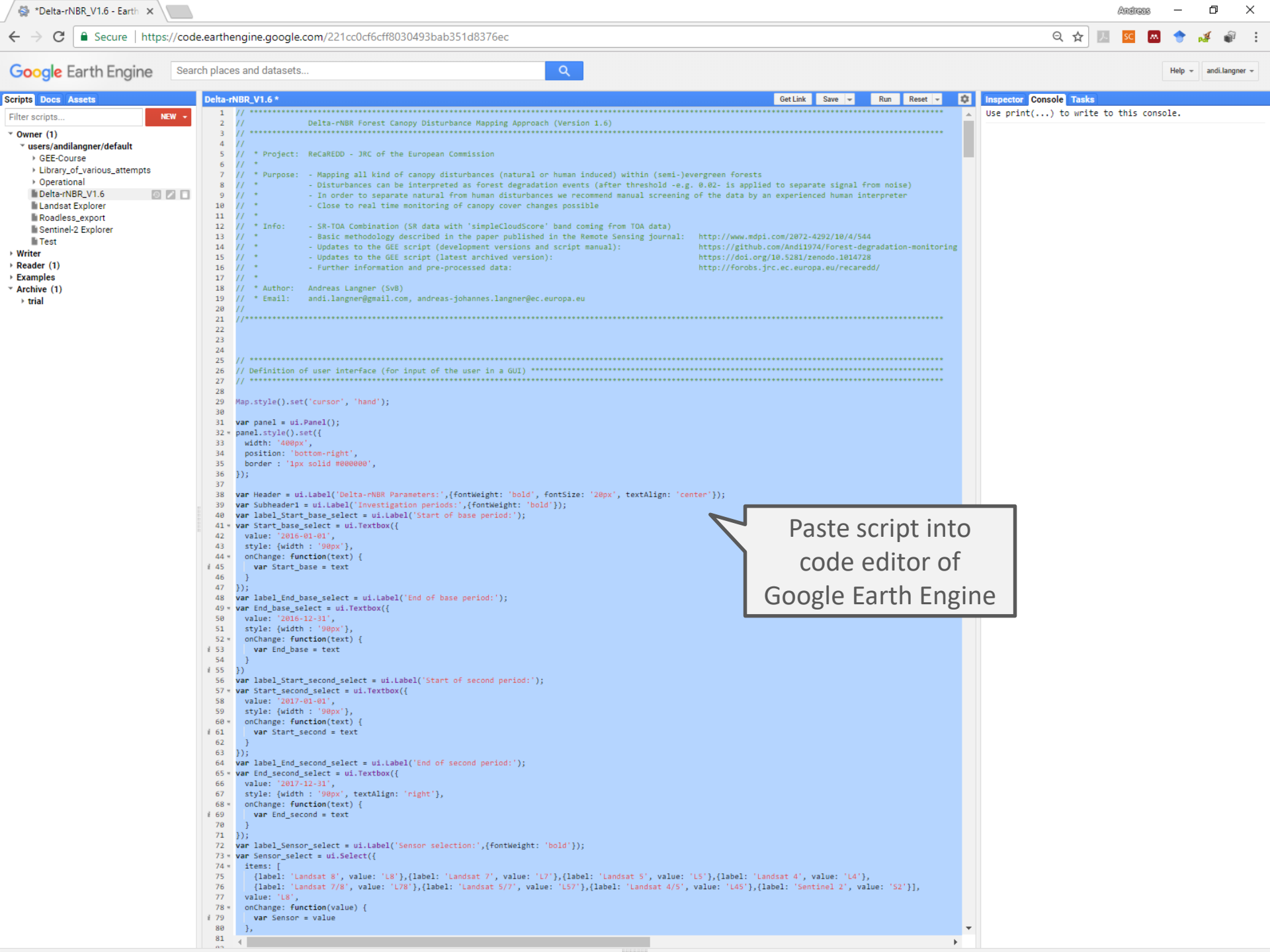
File Edit Format View Help

```
// ********************************************************************************************************************************************************
//              Delta-rNBR Forest Canopy Disturbance Mapping Approach (Version 1.6)
// ********************************************************************************************************************************************************
//
//  * Project:  ReCaREDD - JRC of the European Commission
//  *
//  * Purpose:  - Mapping all kind of canopy disturbances (natural or human induced) within (semi-)evergreen forests
//  *           - Disturbances can be interpreted as forest degradation events (after threshold -e.g. 0.02- is applied to separate signal from noise)
//  *           - In order to separate natural from human disturbances we recommend manual screening of the data by an experienced human interpreter
//  *           - Close to real time monitoring of canopy cover changes possible
//  *
//  * Info:     - SR-TOA Combination (SR data with 'simpleCloudScore' band coming from TOA data)
//  *           - Basic methodology described in the paper published in the Remote Sensing journal:   http://www.mdpi.com/2072-4292/10/4/544
//  *           - Updates to the GEE script (development versions and script manual):                 https://github.com/Andi1974/Forest-degradation-monitoring
//  *           - Updates to the GEE script (latest archived version):                                https://doi.org/10.5281/zenodo.1014728
//  *           - Further information and pre-processed data:                                         http://forobs.jrc.ec.europa.eu/recaredd/
//  *
//  * Author:   Andreas Langner (SvB)
//  * Email:    andi.langner@gmail.com, andreas-johannes.langner@ec.europa.eu
//
//********************************************************************************************************************************************************



// ********************************************************************************************************************************************************
// Definition of user interface (for input of the user in a GUI) ******************************************************************************************
// ********************************************************************************************************************************************************

Map.style().set('cursor', 'hand');

var panel = ui.Panel();
panel.style().set({
  width: '400px',
  position: 'bottom-right',
  border : '1px solid #000000',
});

var Header = ui.Label('Delta-rNBR Parameters:',{fontWeight: 'bold', fontSize: '20px', textAlign: 'center'});
var Subheader1 = ui.Label('Investigation periods:',{fontWeight: 'bold'});
var label_Start_base_select = ui.Label('Start of base period:');
var Start_base_select = ui.Textbox({
  value: '2016-01-01',
  style: {width : '90px'},
  onChange: function(text) {
    var Start_base = text
  }
});
var label_End_base_select = ui.Label('End of base period:');
var End_base_select = ui.Textbox({
  value: '2016-12-31',
  style: {width : '90px'},
  onChange: function(text) {
    var End_base = text
  }
})
var label_Start_second_select = ui.Label('Start of second period:');
var Start_second_select = ui.Textbox({
  value: '2017-01-01',
  style: {width : '90px'},
  onChange: function(text) {
    var Start_second = text
  }
});
```

Open ‘Delta-rNBR.txt’ file and copy all script


*Delta-rNBR_V1.6 - Earth
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https://code.earthengine.google.com/221cc0cf6cff8030493bab351d8376ec
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Docs
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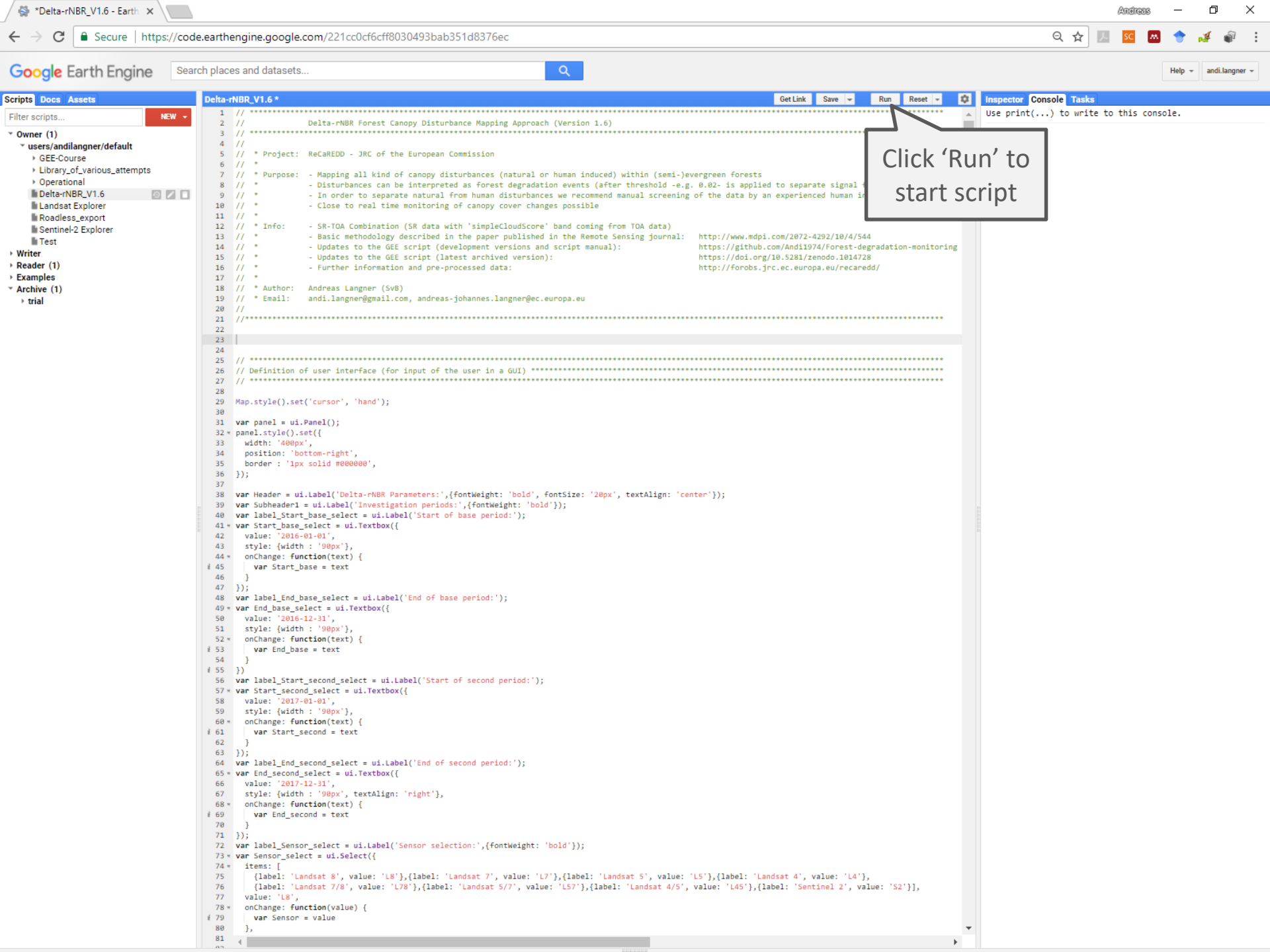
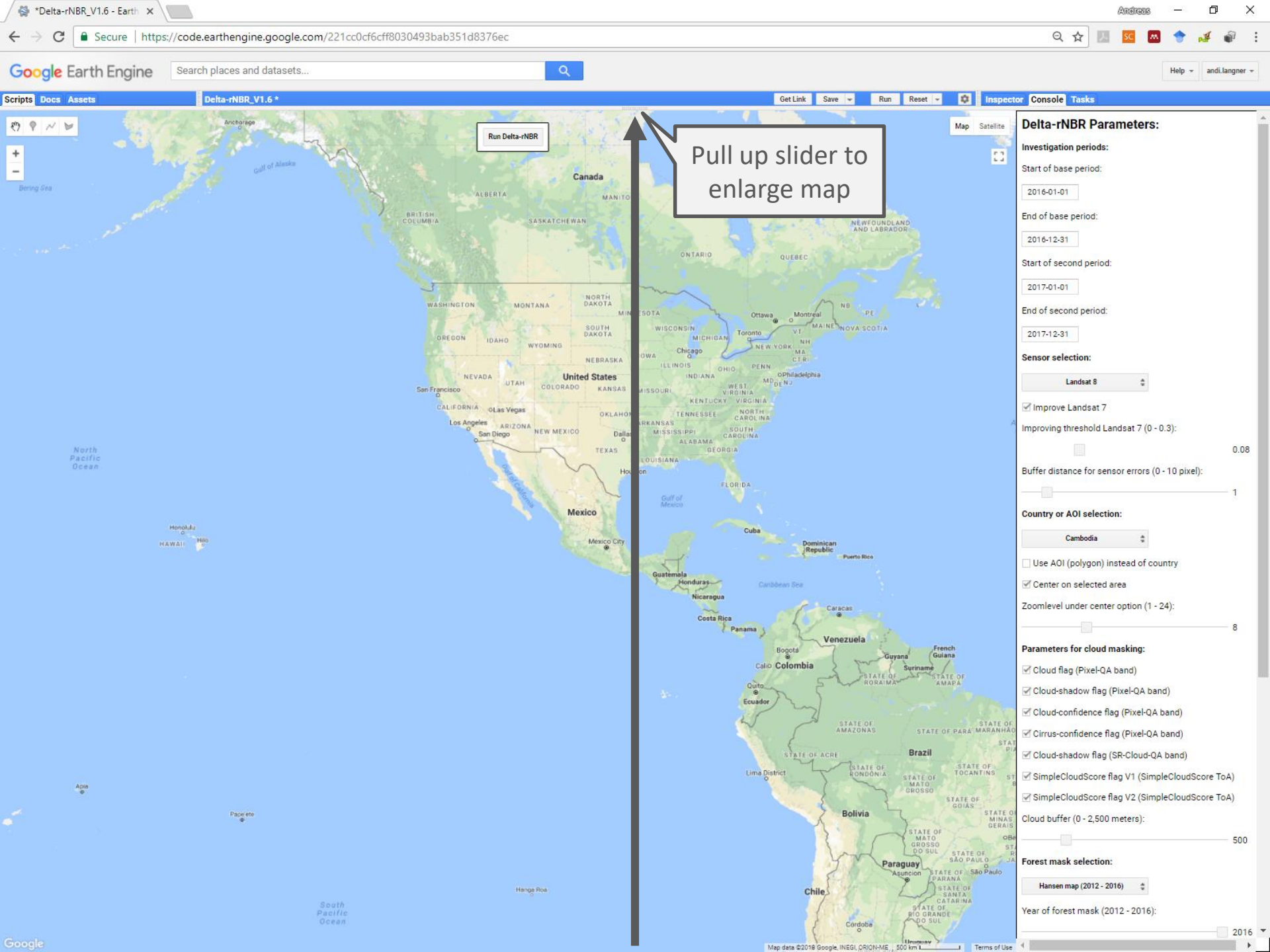
users/andilangner/default
GEE-Course
Library_of_various_attempts
Operational
Delta-rNBR_V1.6
Landsat Explorer
Roadless_export
Sentinel-2 Explorer
Test
Writer
Reader (1)
Examples
Archive (1)
trial
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Use print(...) to write to this console.
Paste script into code editor of Google Earth Engine


Click ‘Run’ to start script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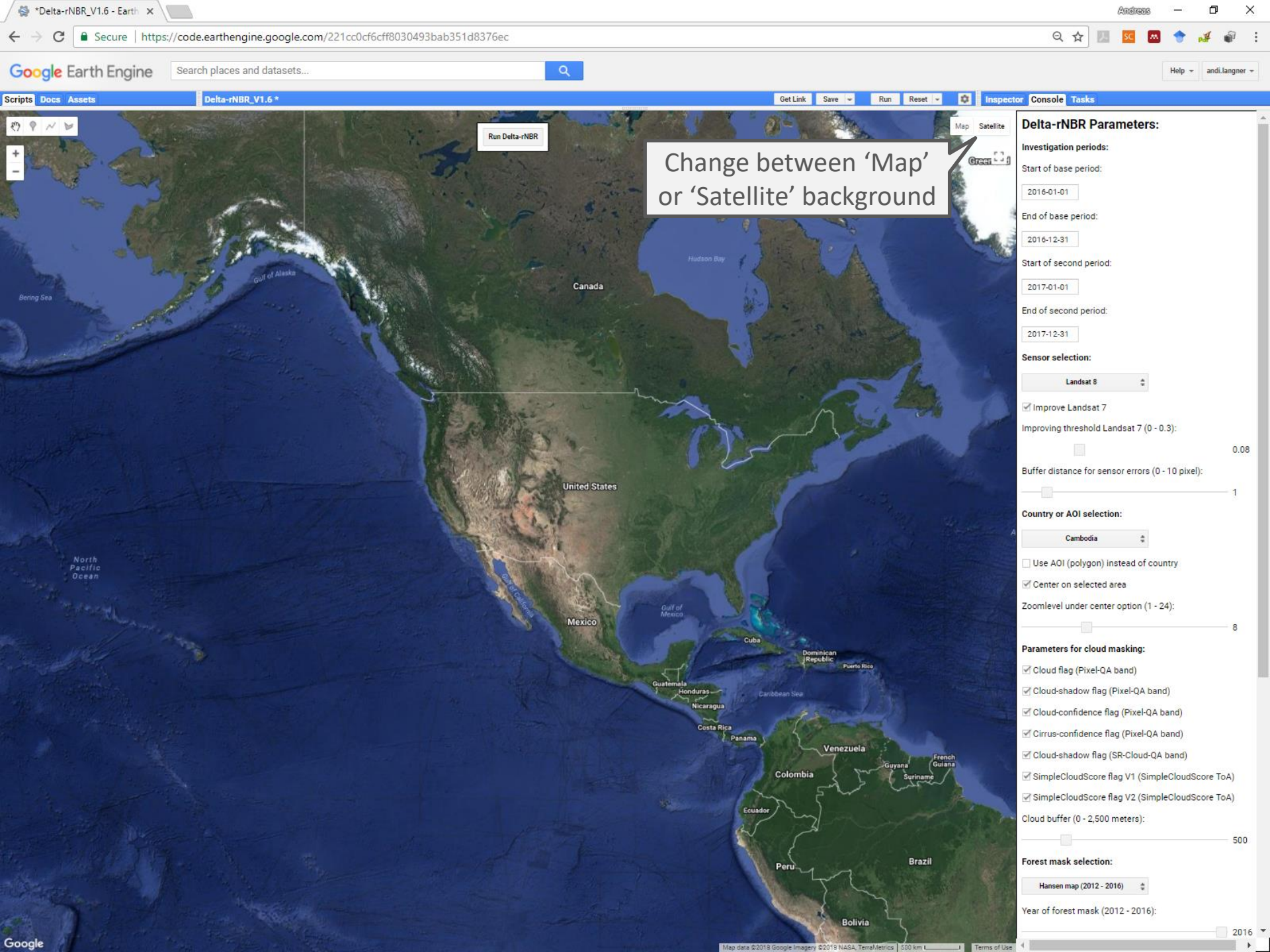
Help
andi.langner
Scripts
Docs
Assets
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Pull up slider to enlarge map
Map
Satellite
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Canada
United States
Mexico
Brazil
Bolivia
Paraguay
Chile
Colombia
Venezuela
Ecuador
Cuba
Dominican Republic
Puerto Rico
Guatemala
Honduras
Nicaragua
Costa Rica
Panama
Caribbean Sea
Gulf of Mexico
North Pacific Ocean
South Pacific Ocean
Gulf of Alaska
Bering Sea
Google
Terms of Use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Help
andi.langner
Scripts
Docs
Assets
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Map
Satellite
Green
Change between 'Map' or 'Satellite' background
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Canada
United States
Mexico
Cuba
Dominican Republic
Puerto Rico
Guatemala
Honduras
Nicaragua
Costa Rica
Panama
Venezuela
Colombia
Guyana
Suriname
French Guiana
Ecuador
Peru
Brazil
Bolivia
Hudson Bay
Gulf of Alaska
Bering Sea
North Pacific Ocean
Gulf of Mexico
Caribbean Sea
Google
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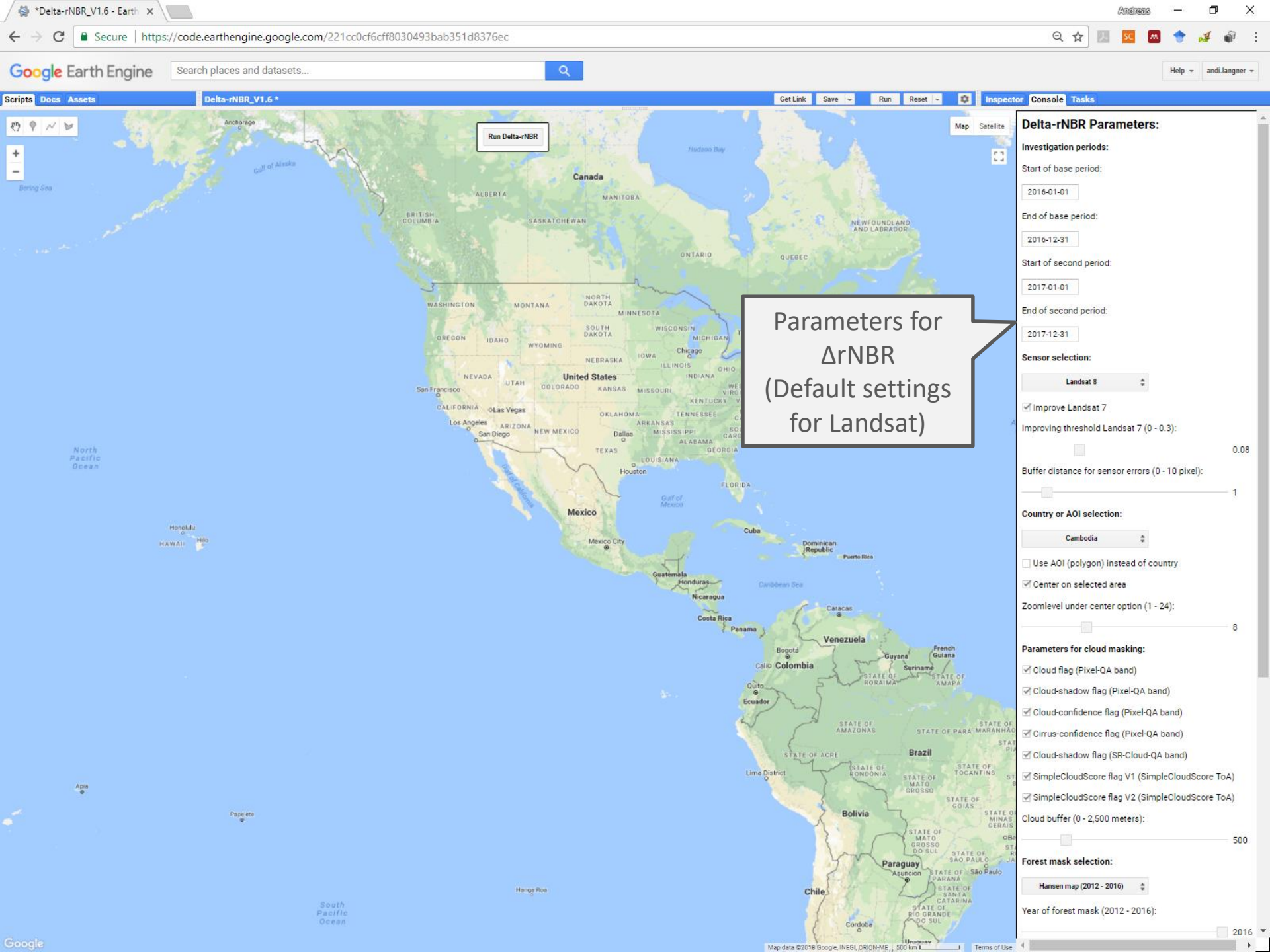
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Help
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Scripts
Docs
Assets
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Map
Satellite
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Parameters for ΔrNBR (Default settings for Landsat)
Canada
United States
Mexico
Brazil
Bolivia
Paraguay
Chile
Venezuela
Colombia
Ecuador
Peru
Cuba
Dominican Republic
Puerto Rico
Guatemala
Honduras
Nicaragua
Costa Rica
Panama
Caribbean Sea
Gulf of Mexico
North Pacific Ocean
South Pacific Ocean
Google
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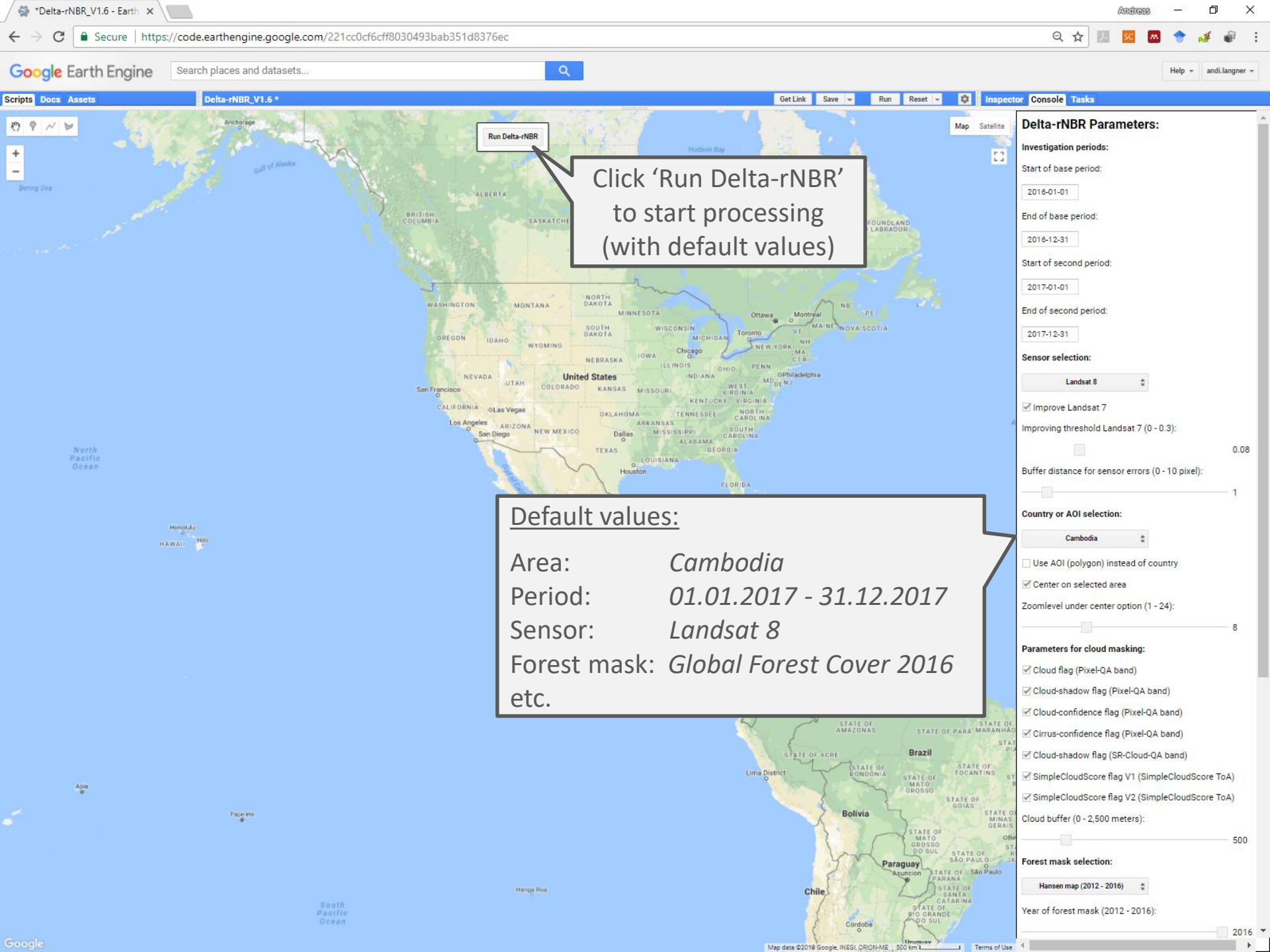
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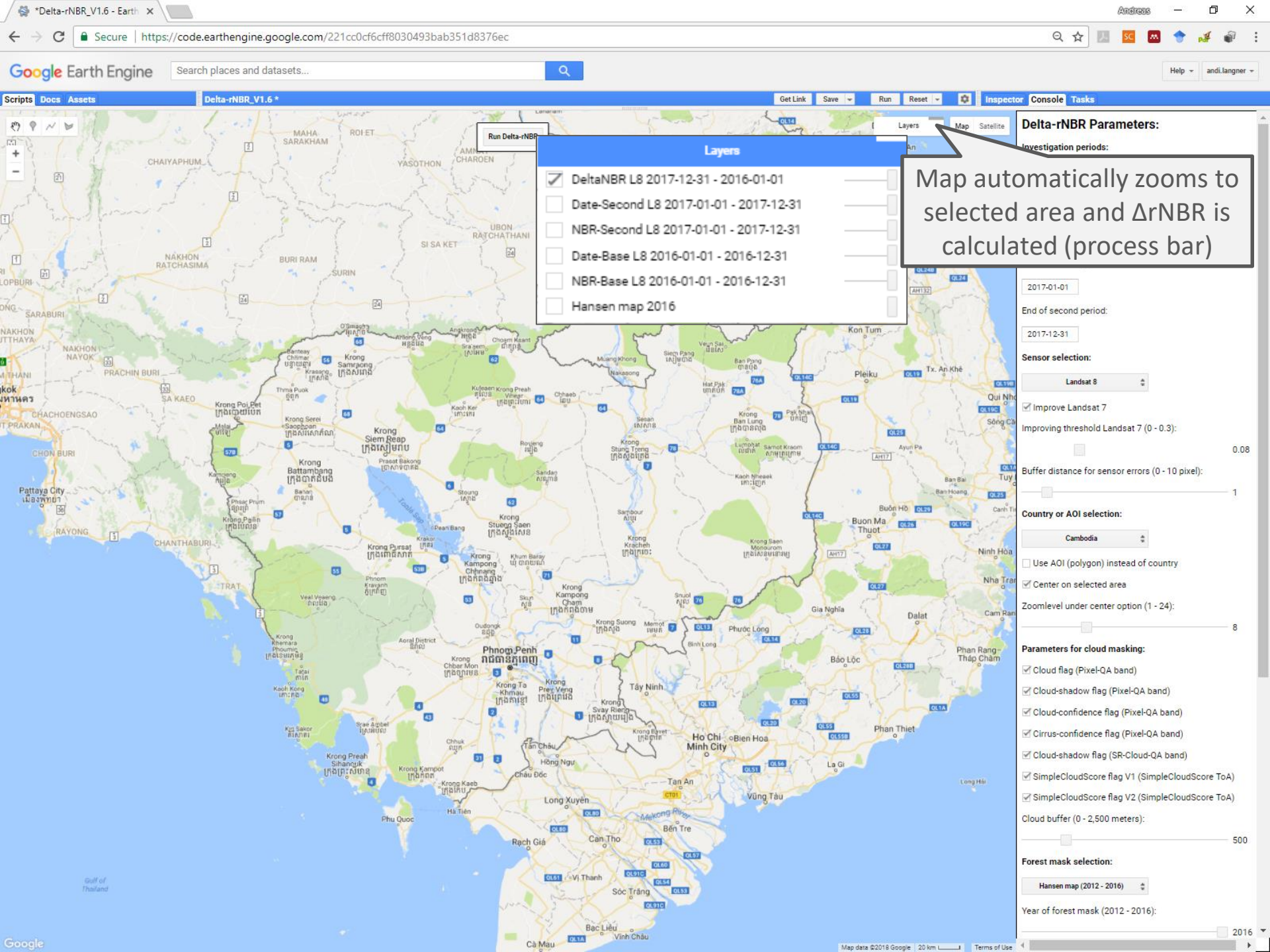
Scripts
Docs
Assets
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Click ‘Run Delta-rNBR’ to start processing (with default values)
Map
Satellite
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Default values:
Area: Cambodia
Period: 01.01.2017 - 31.12.2017
Sensor: Landsat 8
Forest mask: Global Forest Cover 2016
etc.
United States
Brazil
Bolivia
Paraguay
Chile
Google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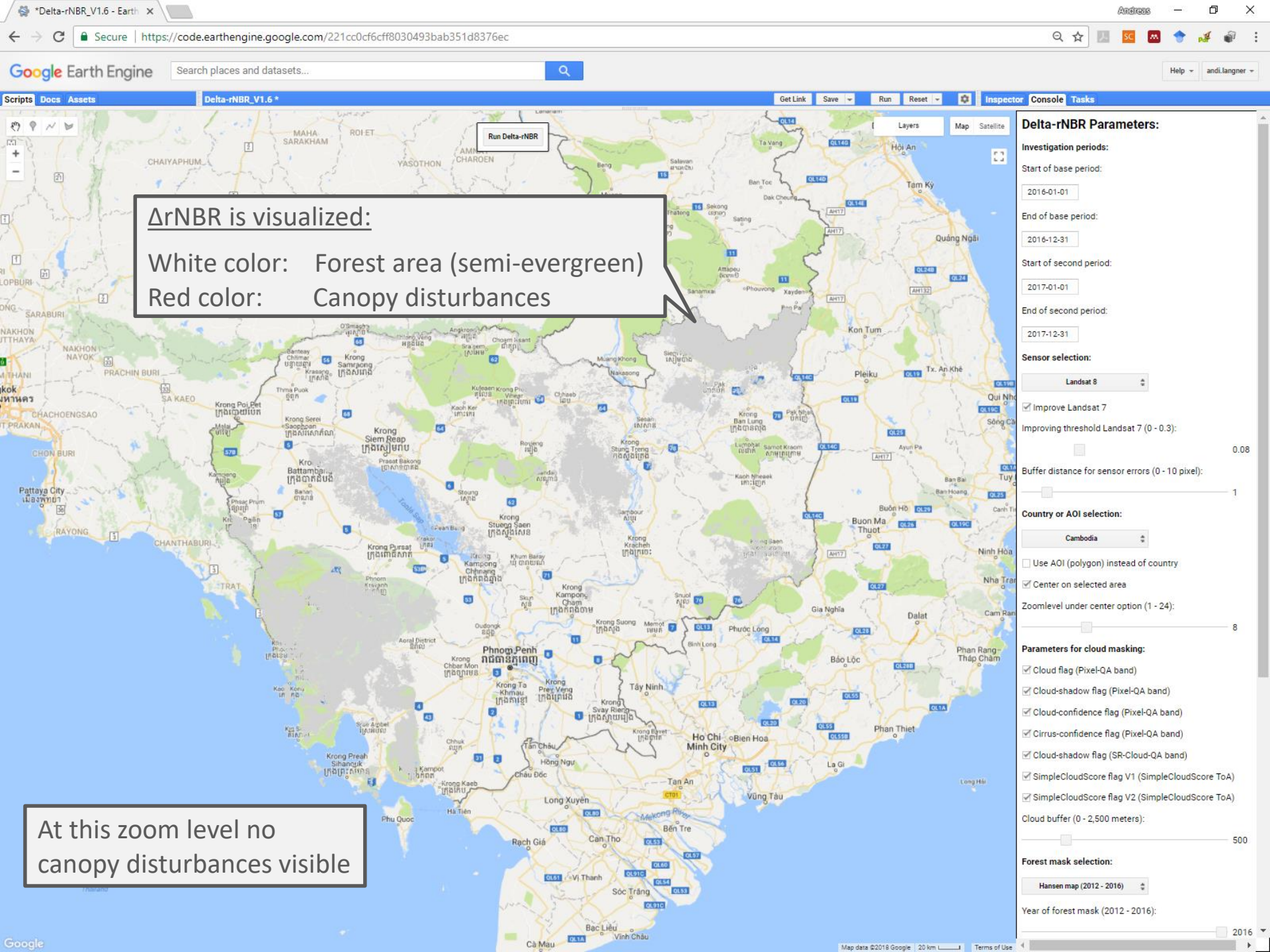
Search places and datasets...
Scripts Docs Assets
Delta-rNBR_V1.6 *
Get Link Save Run Reset
Inspector Console Tasks
Run Delta-rNBR
Layers
Map Satellite
Layers
DeltaNBR L8 2017-12-31 - 2016-01-01
Date-Second L8 2017-01-01 - 2017-12-31
NBR-Second L8 2017-01-01 - 2017-12-31
Date-Base L8 2016-01-01 - 2016-12-31
NBR-Base L8 2016-01-01 - 2016-12-31
Hansen map 2016
Map automatically zooms to selected area and ΔrNBR is calculated (process bar)
Delta-rNBR Parameters:
Investigation periods:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Phnom Penh
Ho Chi Minh City
Pattaya City
Google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Help
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Scripts
Docs
Assets
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Layers
Map
Satellite
ΔrNBR is visualized:
White color: Forest area (semi-evergreen)
Red color: Canopy disturbances
At this zoom level no canopy disturbances visible
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Phnom Penh
Ho Chi Minh City
Google
Map data ©2018 Google
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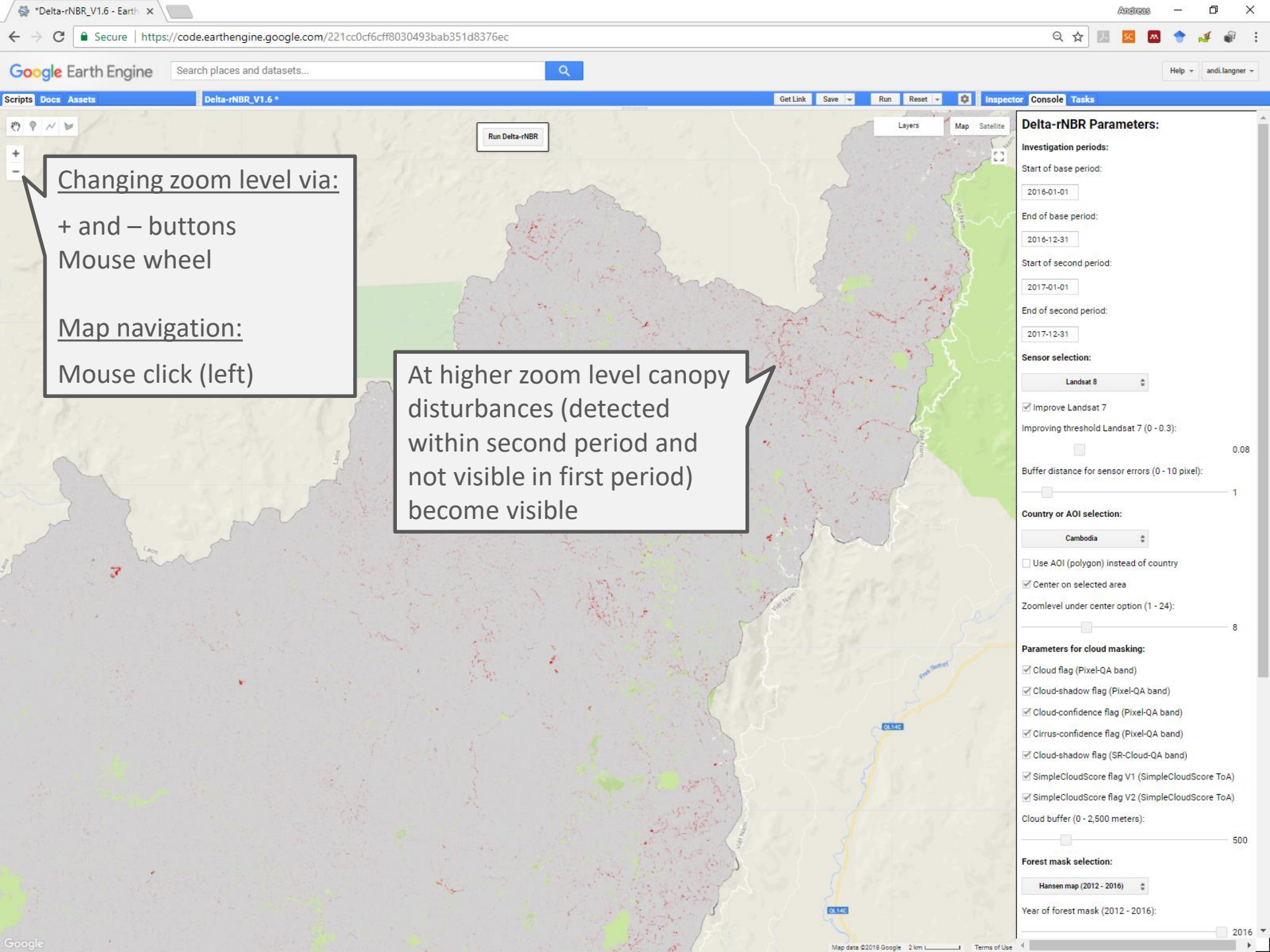
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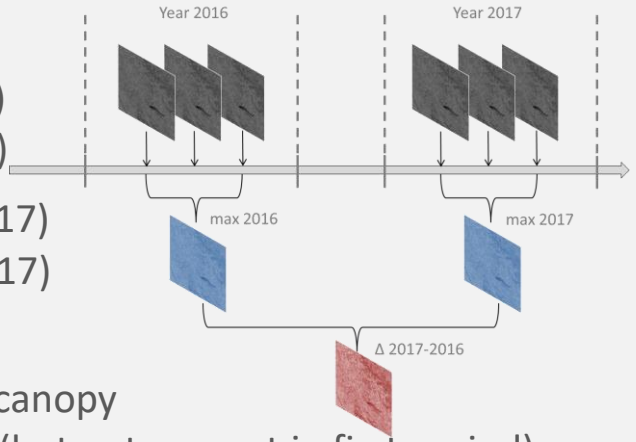
Scripts
Docs
Assets
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Layers
Map
Satellite
Changing zoom level via:
+ and – buttons
Mouse wheel
Map navigation:
Mouse click (left)
At higher zoom level canopy disturbances (detected within second period and not visible in first period) become visible
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Laos
Viet Nam
QL14C
Google
Map data ©2018 Google
2 km
Terms of Use

ΔrNBR parameters:

Investigation periods:

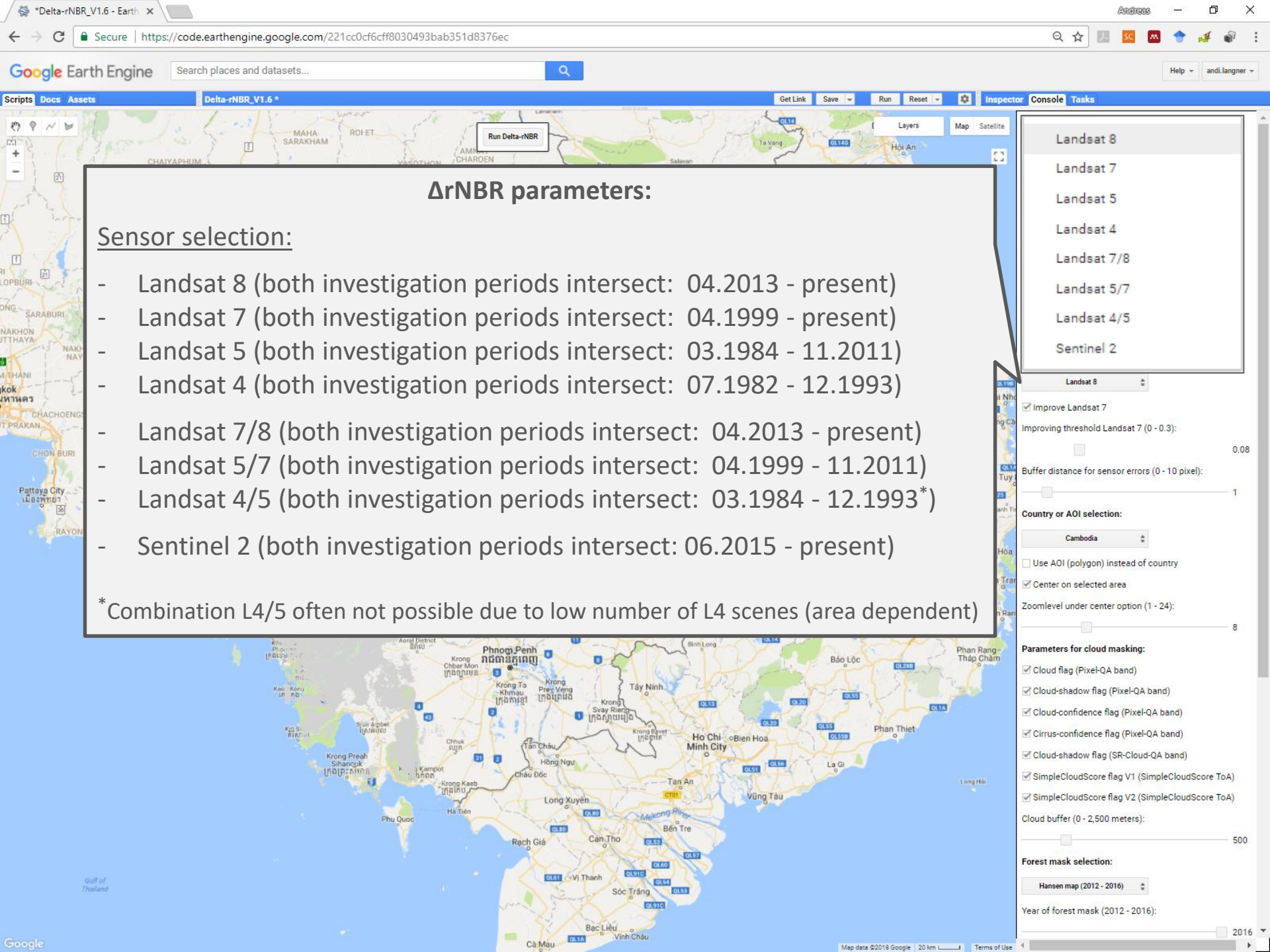
Start of base period (e.g. 01.01.2016)
End of base period (e.g. 31.12.2016)

Start of second period (e.g. 01.01.2017)
End of second period (e.g. 31.12.2017)



→ ΔrNBR will only show changes in canopy cover occurring in second period (but not present in first period)

→ Selected periods have to fit to the choice of the satellite sensors (non fitting sensor/period combinations result in error messages)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Help
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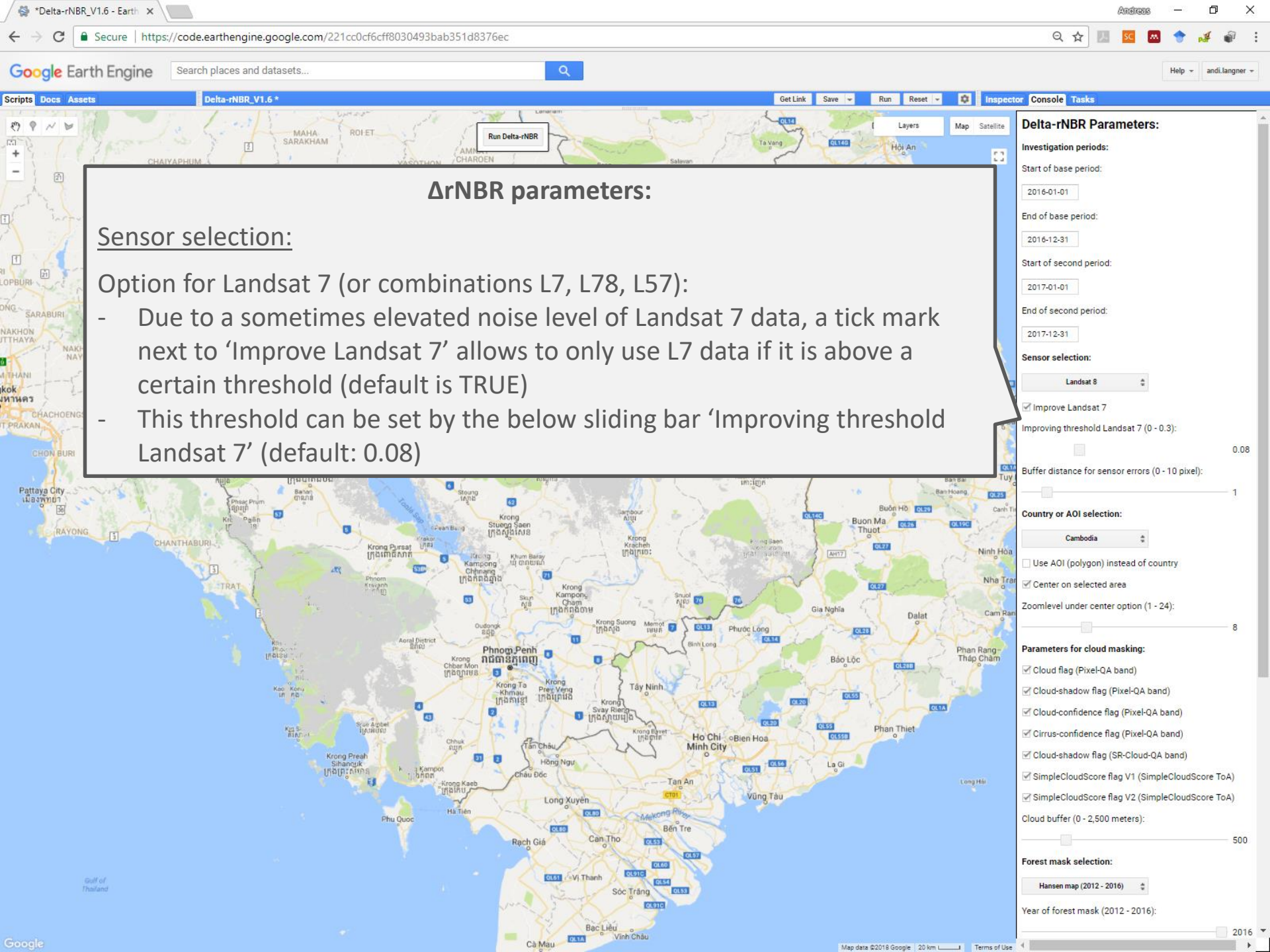
Scripts
Docs
Assets
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Layers
Map
Satellite
ΔrNBR parameters:
Sensor selection:
- Landsat 8 (both investigation periods intersect: 04.2013 - present)
- Landsat 7 (both investigation periods intersect: 04.1999 - present)
- Landsat 5 (both investigation periods intersect: 03.1984 - 11.2011)
- Landsat 4 (both investigation periods intersect: 07.1982 - 12.1993)
- Landsat 7/8 (both investigation periods intersect: 04.2013 - present)
- Landsat 5/7 (both investigation periods intersect: 04.1999 - 11.2011)
- Landsat 4/5 (both investigation periods intersect: 03.1984 - 12.1993*)
- Sentinel 2 (both investigation periods intersect: 06.2015 - present)
*Combination L4/5 often not possible due to low number of L4 scenes (area dependent)
Landsat 8
Landsat 7
Landsat 5
Landsat 4
Landsat 7/8
Landsat 5/7
Landsat 4/5
Sentinel 2
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Phnom Penh
Ho Chi Minh City
Tây Ninh
Biên Hòa
Vũng Tàu
Long Xuyên
Can Tho
Rạch Giá
Sóc Trăng
Bạc Liêu
Cà Mau
Pattaya City
Hội An
Phan Thiet
Phan Rang-Tháp Chàm
Google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Google Earth Engine
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Help
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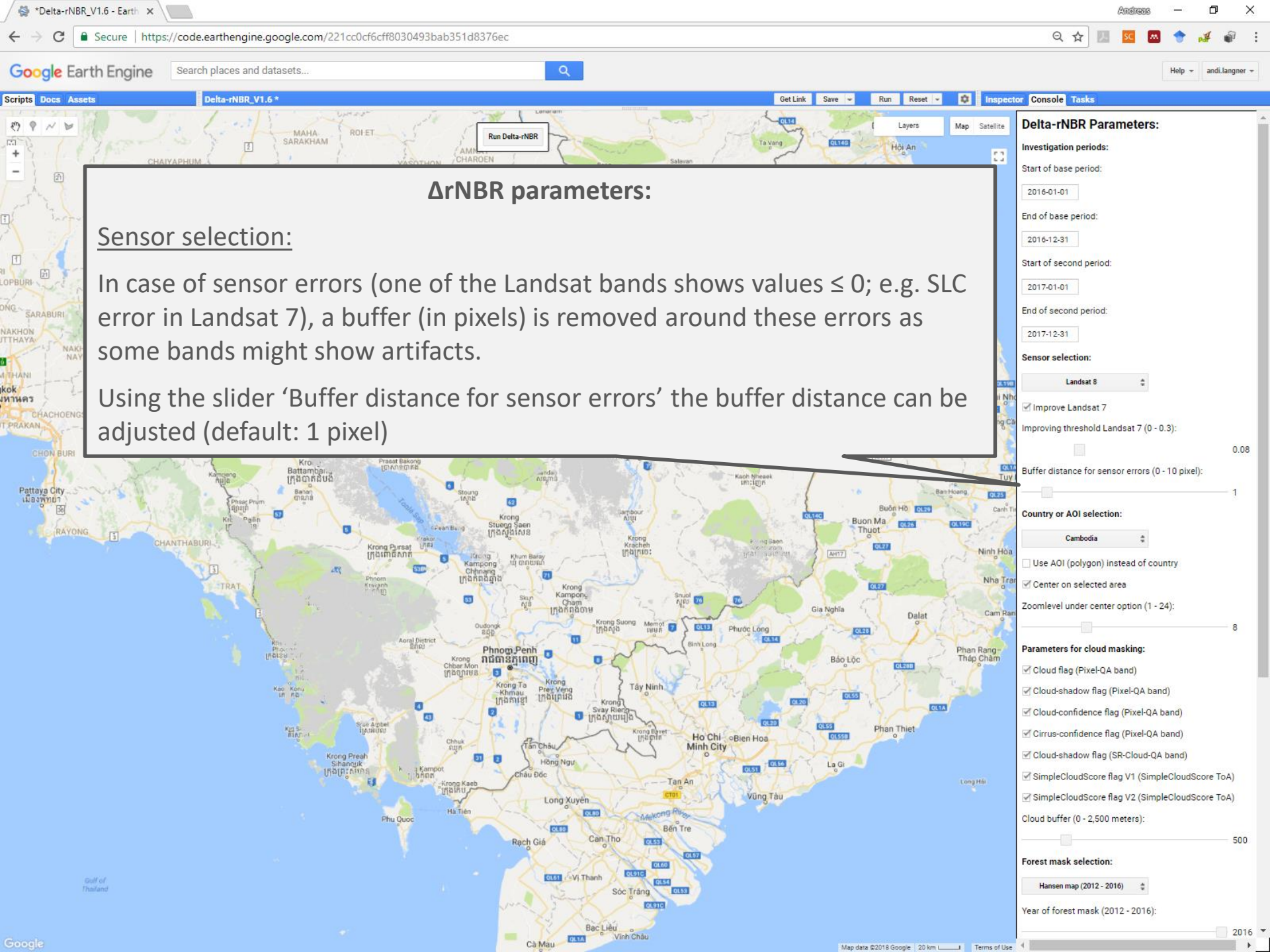
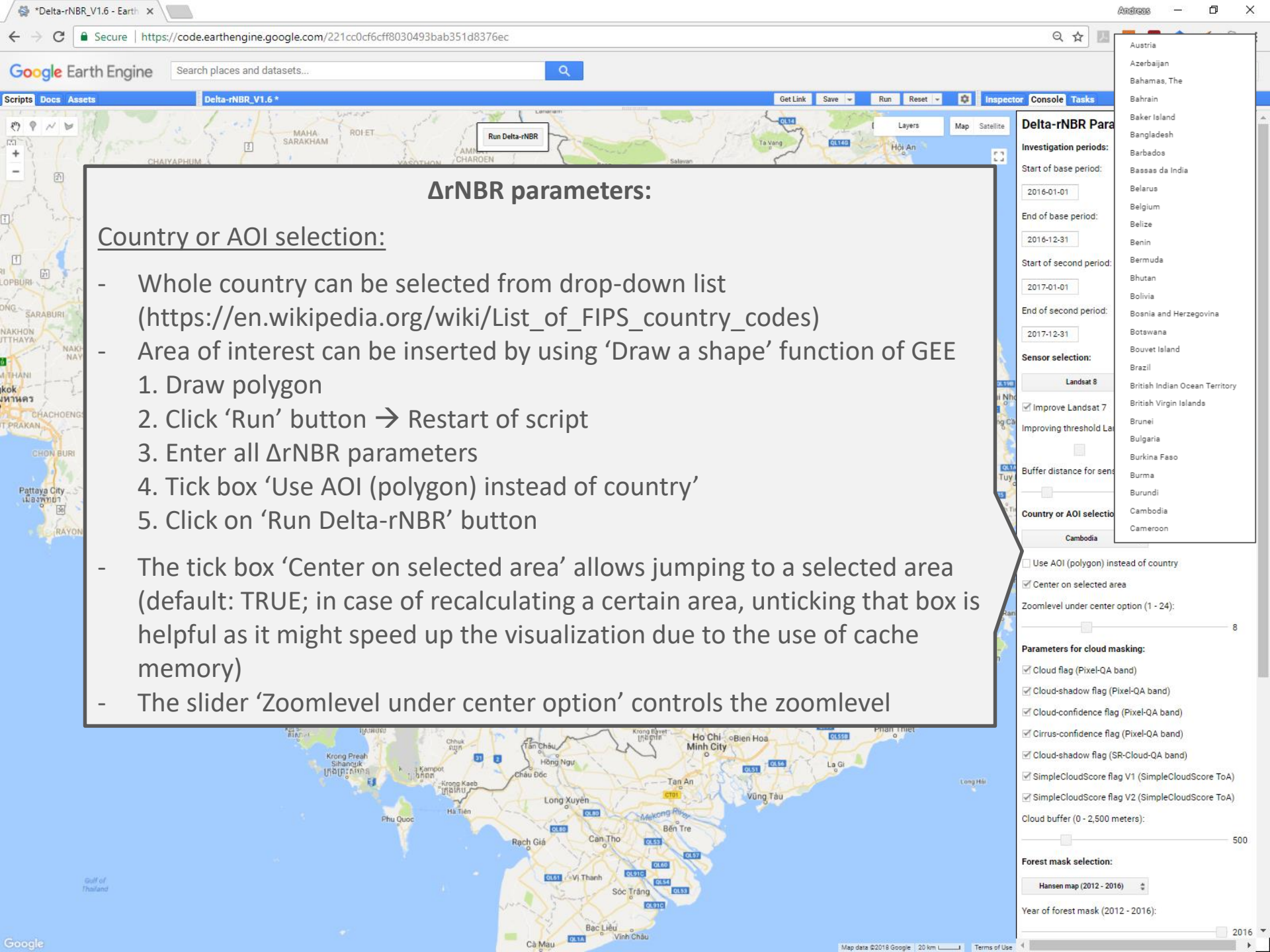
Scripts Docs Assets
Delta-rNBR_V1.6 *
Get Link Save Run Reset
Inspector Console Tasks
Run Delta-rNBR
Layers Map Satellite
ΔrNBR parameters:
Sensor selection:
Option for Landsat 7 (or combinations L7, L78, L57):
- Due to a sometimes elevated noise level of Landsat 7 data, a tick mark next to 'Improve Landsat 7' allows to only use L7 data if it is above a certain threshold (default is TRUE)
- This threshold can be set by the below sliding bar 'Improving threshold Landsat 7' (default: 0.08)
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Phnom Penh
Ho Chi Minh City
Google

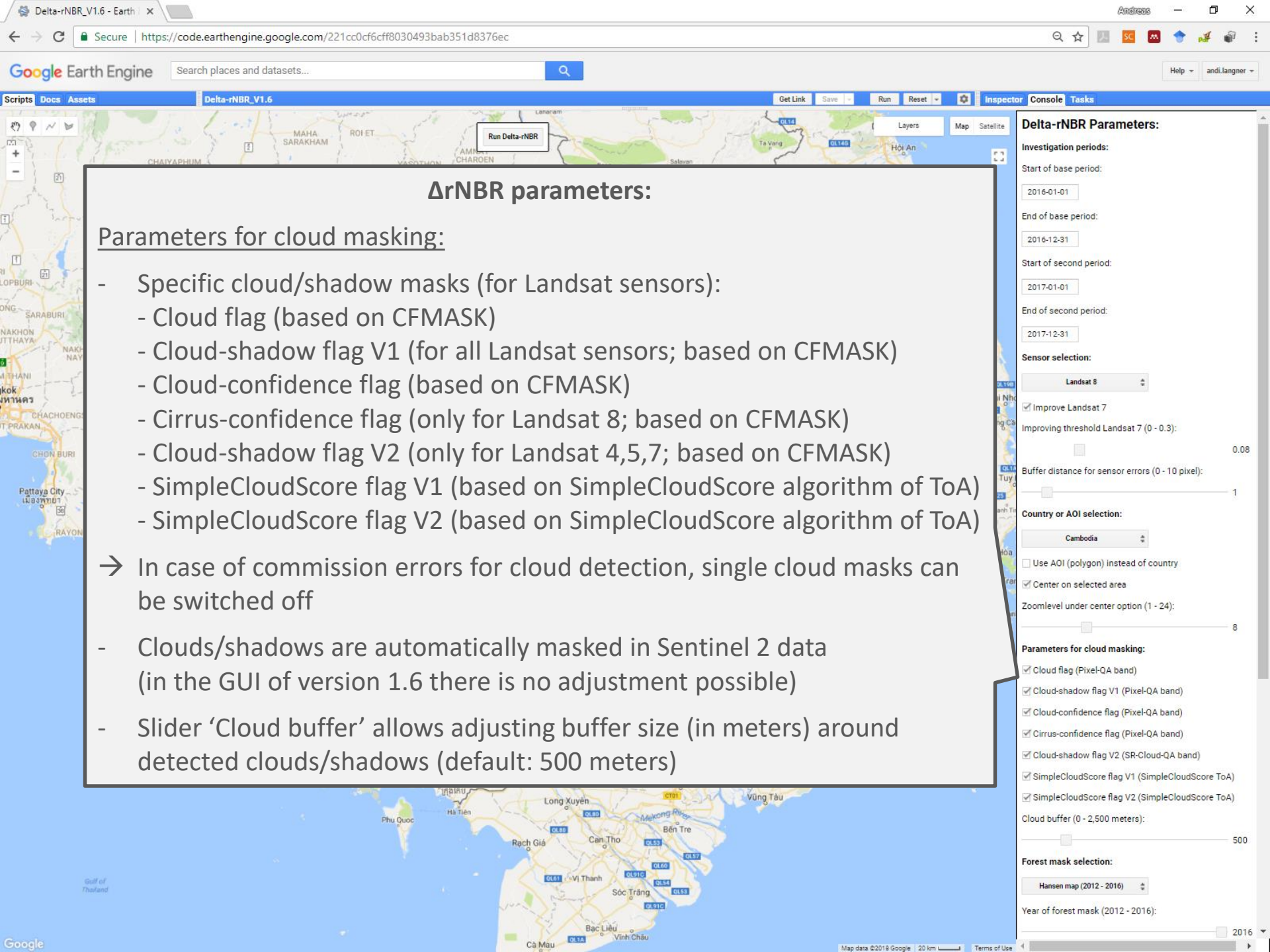

*Delta-rNBR_V1.6 - Earth
Andreas
Secure | https://code.earthengine.google.com/221cc0cf6cff8030493bab351d8376ec
Google Earth Engine
Search places and datasets...
Help
andi.langner
Scripts
Docs
Assets
Delta-rNBR_V1.6 *
Get Link
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Layers
Map
Satellite
ΔrNBR parameters:
Sensor selection:
In case of sensor errors (one of the Landsat bands shows values ≤ 0; e.g. SLC error in Landsat 7), a buffer (in pixels) is removed around these errors as some bands might show artifacts.
Using the slider 'Buffer distance for sensor errors' the buffer distance can be adjusted (default: 1 pixel)
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016
Phnom Penh
Ho Chi Minh City
Pattaya City
Google



ΔrNBR parameters:

Country or AOI selection:

- Whole country can be selected from drop-down list (https://en.wikipedia.org/wiki/List_of_FIPS_country_codes)
- Area of interest can be inserted by using ‘Draw a shape’ function of GEE
  1. Draw polygon
  2. Click ‘Run’ button → Restart of script
  3. Enter all ΔrNBR parameters
  4. Tick box ‘Use AOI (polygon) instead of country’
  5. Click on ‘Run Delta-rNBR’ button
- The tick box ‘Center on selected area’ allows jumping to a selected area (default: TRUE; in case of recalculating a certain area, unticking that box is helpful as it might speed up the visualization due to the use of cache memory)
- The slider ‘Zoomlevel under center option’ controls the zoomlevel


Delta-rNBR_V1.6 - Earth
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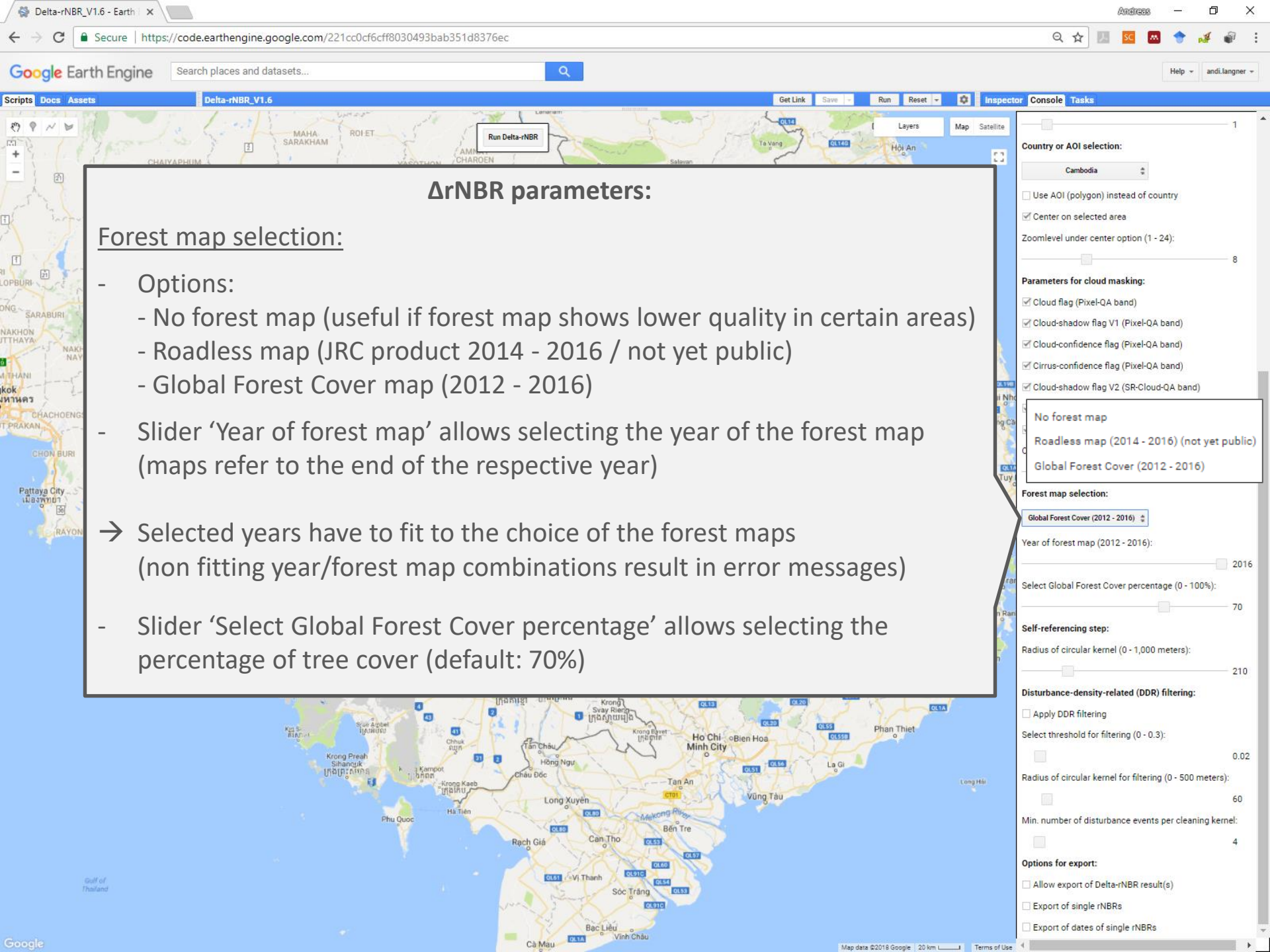
Search places and datasets...
Scripts Docs Assets
Delta-rNBR_V1.6
Get Link Save Run Reset
Inspector Console Tasks
Run Delta-rNBR
Layers Map Satellite
ΔrNBR parameters:
Parameters for cloud masking:
- Specific cloud/shadow masks (for Landsat sensors):
- Cloud flag (based on CFMASK)
- Cloud-shadow flag V1 (for all Landsat sensors; based on CFMASK)
- Cloud-confidence flag (based on CFMASK)
- Cirrus-confidence flag (only for Landsat 8; based on CFMASK)
- Cloud-shadow flag V2 (only for Landsat 4,5,7; based on CFMASK)
- SimpleCloudScore flag V1 (based on SimpleCloudScore algorithm of ToA)
- SimpleCloudScore flag V2 (based on SimpleCloudScore algorithm of ToA)
→ In case of commission errors for cloud detection, single cloud masks can be switched off
- Clouds/shadows are automatically masked in Sentinel 2 data (in the GUI of version 1.6 there is no adjustment possible)
- Slider 'Cloud buffer' allows adjusting buffer size (in meters) around detected clouds/shadows (default: 500 meters)
Delta-rNBR Parameters:
Investigation periods:
Start of base period:
2016-01-01
End of base period:
2016-12-31
Start of second period:
2017-01-01
End of second period:
2017-12-31
Sensor selection:
Landsat 8
Improve Landsat 7
Improving threshold Landsat 7 (0 - 0.3):
0.08
Buffer distance for sensor errors (0 - 10 pixel):
1
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag V1 (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag V2 (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest mask selection:
Hansen map (2012 - 2016)
Year of forest mask (2012 - 2016):
2016


Delta-rNBR_V1.6 - Earth
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Delta-rNBR_V1.6
Get Link Save Run Reset
Inspector Console Tasks
Run Delta-rNBR
Layers Map Satellite
ΔrNBR parameters:
Forest map selection:
- Options:
- No forest map (useful if forest map shows lower quality in certain areas)
- Roadless map (JRC product 2014 - 2016 / not yet public)
- Global Forest Cover map (2012 - 2016)
- Slider 'Year of forest map' allows selecting the year of the forest map (maps refer to the end of the respective year)
→ Selected years have to fit to the choice of the forest maps (non fitting year/forest map combinations result in error messages)
- Slider 'Select Global Forest Cover percentage' allows selecting the percentage of tree cover (default: 70%)
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag V1 (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag V2 (SR-Cloud-QA band)
No forest map
Roadless map (2014 - 2016) (not yet public)
Global Forest Cover (2012 - 2016)
Forest map selection:
Global Forest Cover (2012 - 2016)
Year of forest map (2012 - 2016):
2016
Select Global Forest Cover percentage (0 - 100%):
70
Self-referencing step:
Radius of circular kernel (0 - 1,000 meters):
210
Disturbance-density-related (DDR) filtering:
Apply DDR filtering
Select threshold for filtering (0 - 0.3):
0.02
Radius of circular kernel for filtering (0 - 500 meters):
60
Min. number of disturbance events per cleaning kernel:
4
Options for export:
Allow export of Delta-rNBR result(s)
Export of single rNBRs
Export of dates of single rNBRs
Ho Chi Minh City
Can Tho
Long Xuyen
Rach Gia
Vung Tau
Phan Thiet
Pattaya City
Phu Quoc
Gulf of Thailand
Google

ΔrNBR parameters:

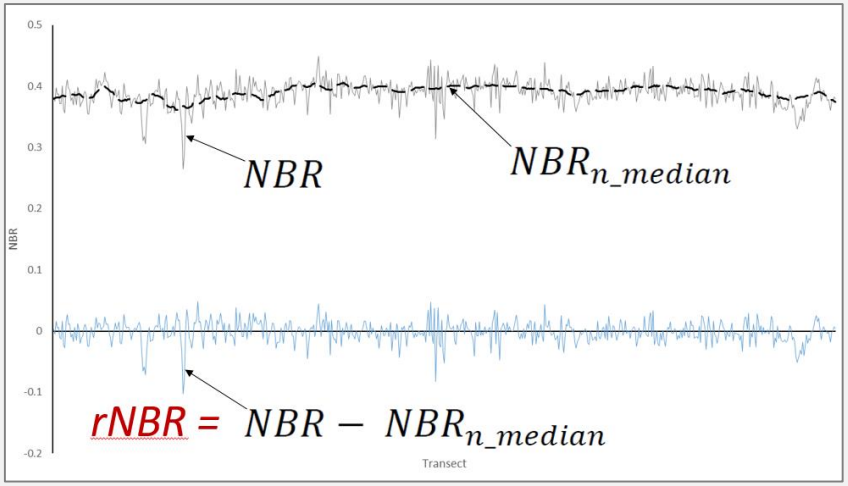
Self-referencing step:

- Radius of circular kernel in meters (default: 210 meters)
- While keeping small-scale changes in NBR values, it removes smooth (large-scale) changes in NBR values
- As a result any large-scale trend of the rNBR trend-line (influenced by varying atmospheric conditions, e.g. haze; or topographic effects) shows no gradient and rNBR values are centered around 0 for undisturbed forest canopy

→ Necessary for inter-scene comparison

→ The smaller the kernel radius, the better the atmospheric or topographic adjustment

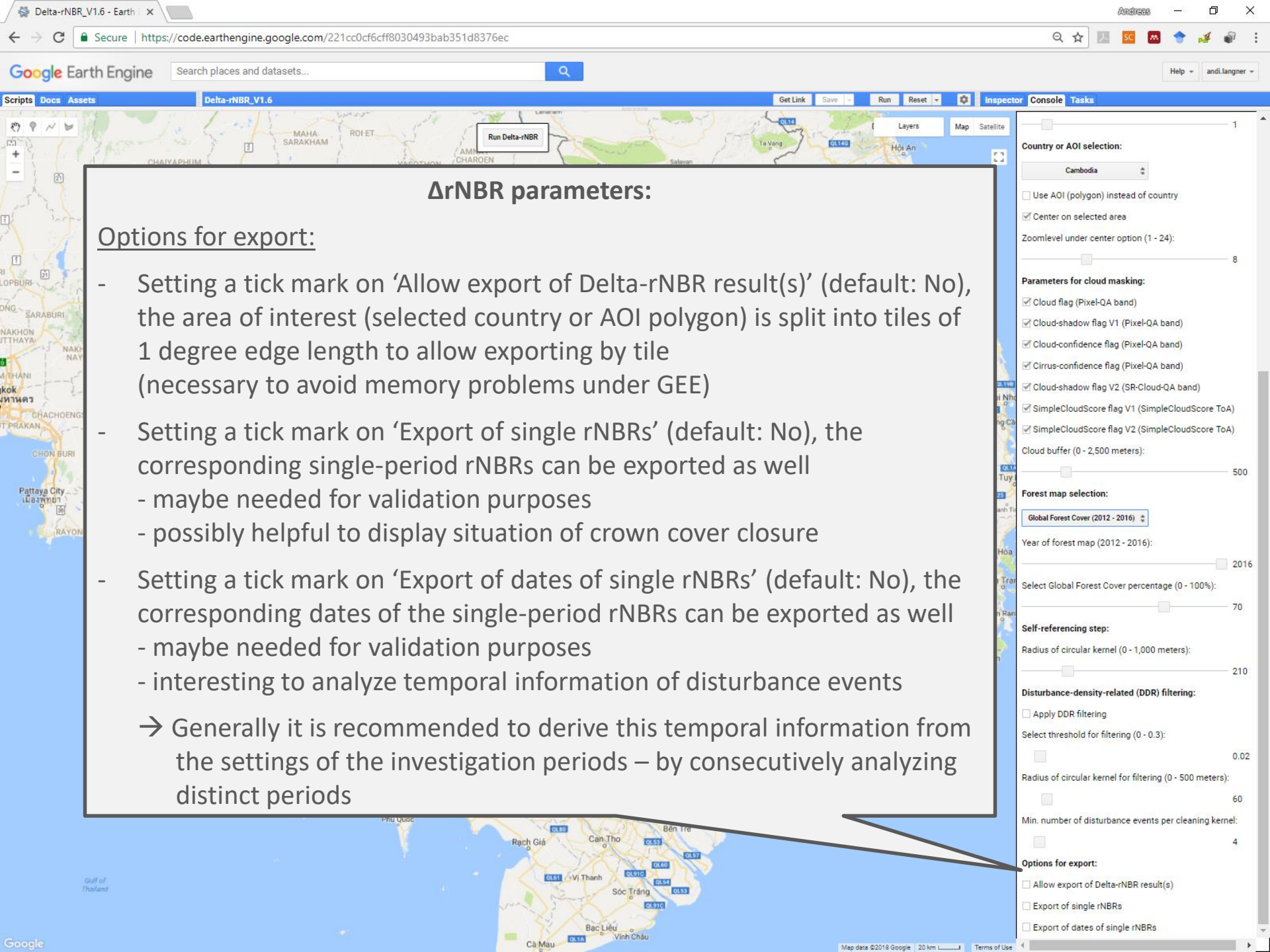
→ Trade-off: Disturbances covering more than half of the kernel window result in artifacts (high quality forest mask normally already detects such disturbances)



ΔrNBR parameters:

Disturbance-density-related (DDR) filtering:

- Setting a tick mark on ‘Apply DDR filtering’ (default: No), it is possible to remove noise (e.g. signals stemming from single trees shedding their leaves, etc.)
- For that purpose the user has to analyze the signal/noise (ideally by exporting a non-filtered map to a GIS):
  - Strength of the signal of interest? (red arrow)
  - Strength of the noise signal? (blue arrow)
    (*Problem: often similar strength, so application of simple threshold not feasible*)
  - Average density of the signal of interest?
  - Average density of the noise signal?
- Using above information, the user can modify the three sliders:
  - ‘Select threshold for filtering’
    (threshold to define potential signal)
  - ‘Radius of circular kernel for filtering’
    (kernel in which signals are density analyzed)
  - ‘Min. number of disturbance events’
    (all signals/kernel are kept if condition is met)


Delta-rNBR_V1.6 - Earth
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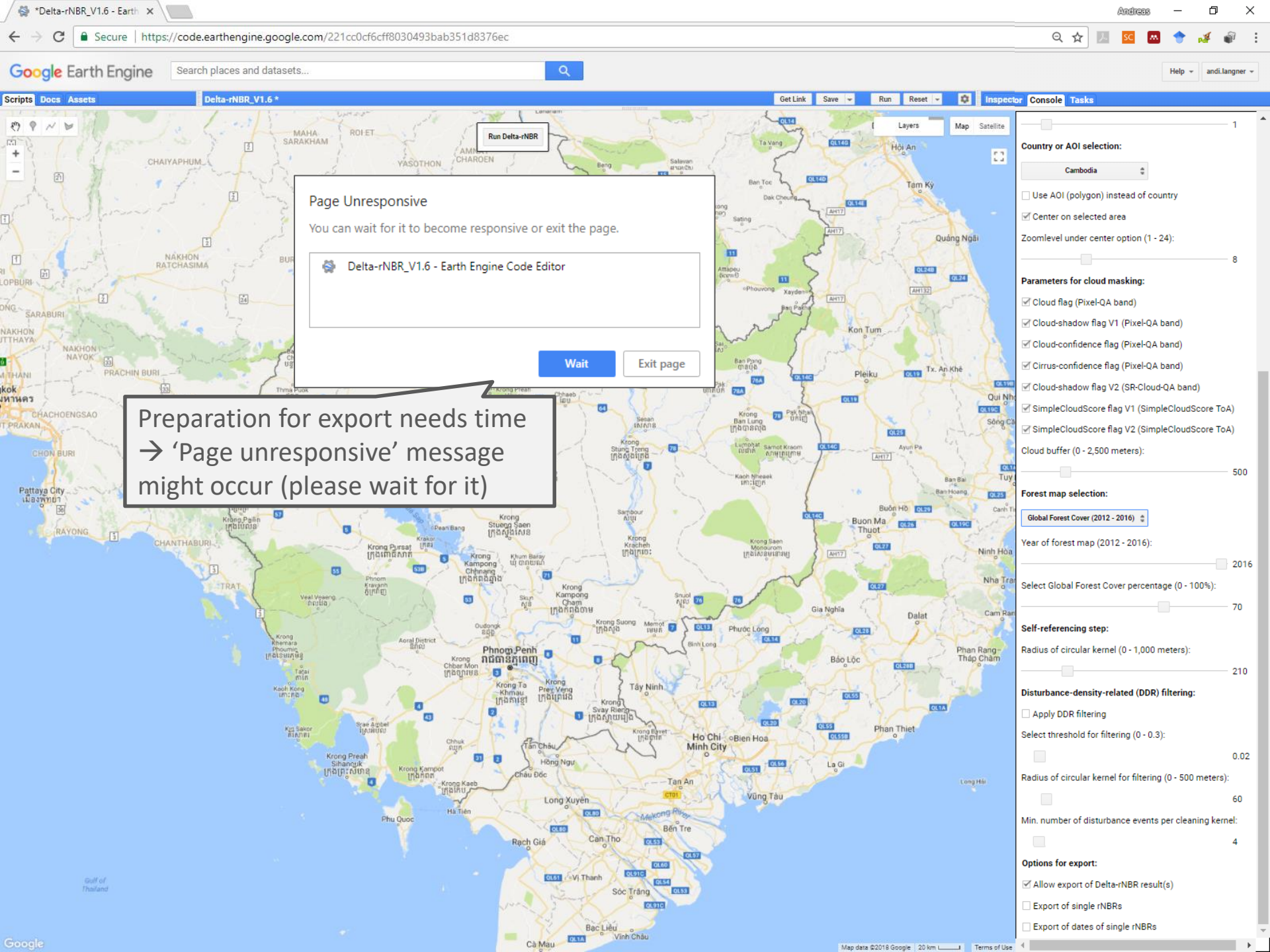
Delta-rNBR_V1.6
Get Link Save Run Reset
Inspector Console Tasks
Run Delta-rNBR
Layers Map Satellite
ΔrNBR parameters:
Options for export:
- Setting a tick mark on 'Allow export of Delta-rNBR result(s)' (default: No), the area of interest (selected country or AOI polygon) is split into tiles of 1 degree edge length to allow exporting by tile (necessary to avoid memory problems under GEE)
- Setting a tick mark on 'Export of single rNBRs' (default: No), the corresponding single-period rNBRs can be exported as well
- maybe needed for validation purposes
- possibly helpful to display situation of crown cover closure
- Setting a tick mark on 'Export of dates of single rNBRs' (default: No), the corresponding dates of the single-period rNBRs can be exported as well
- maybe needed for validation purposes
- interesting to analyze temporal information of disturbance events
→ Generally it is recommended to derive this temporal information from the settings of the investigation periods – by consecutively analyzing distinct periods
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag V1 (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag V2 (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest map selection:
Global Forest Cover (2012 - 2016)
Year of forest map (2012 - 2016):
2016
Select Global Forest Cover percentage (0 - 100%):
70
Self-referencing step:
Radius of circular kernel (0 - 1,000 meters):
210
Disturbance-density-related (DDR) filtering:
Apply DDR filtering
Select threshold for filtering (0 - 0.3):
0.02
Radius of circular kernel for filtering (0 - 500 meters):
60
Min. number of disturbance events per cleaning kernel:
4
Options for export:
Allow export of Delta-rNBR result(s)
Export of single rNBRs
Export of dates of single rNBRs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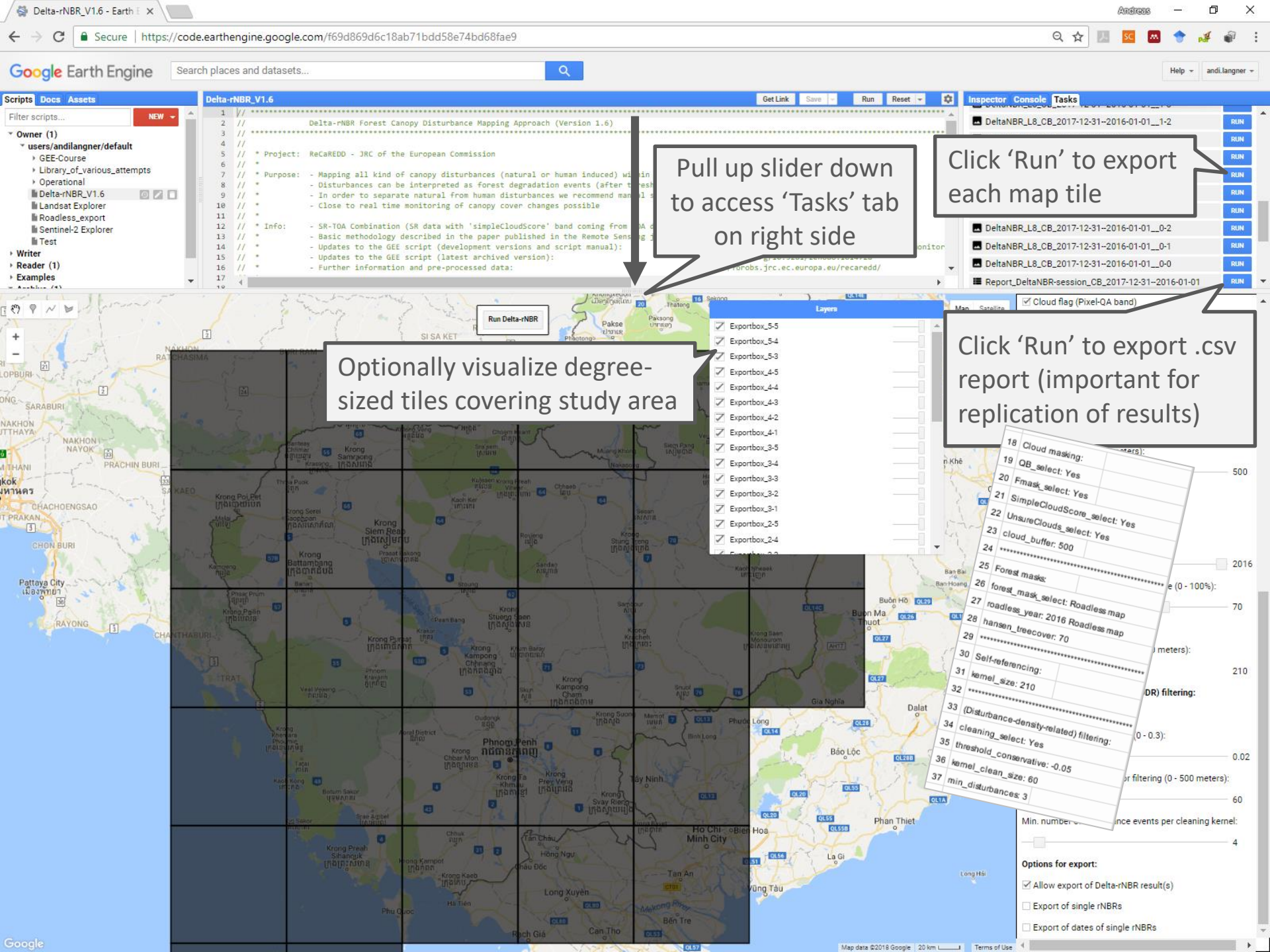
Save
Run
Reset
Inspector
Console
Tasks
Run Delta-rNBR
Layers
Map
Satellite
Page Unresponsive
You can wait for it to become responsive or exit the page.
Delta-rNBR_V1.6 - Earth Engine Code Editor
Wait
Exit page
Preparation for export needs time
→ 'Page unresponsive' message
might occur (please wait for it)
Country or AOI selection:
Cambodia
Use AOI (polygon) instead of country
Center on selected area
Zoomlevel under center option (1 - 24):
8
Parameters for cloud masking:
Cloud flag (Pixel-QA band)
Cloud-shadow flag V1 (Pixel-QA band)
Cloud-confidence flag (Pixel-QA band)
Cirrus-confidence flag (Pixel-QA band)
Cloud-shadow flag V2 (SR-Cloud-QA band)
SimpleCloudScore flag V1 (SimpleCloudScore ToA)
SimpleCloudScore flag V2 (SimpleCloudScore ToA)
Cloud buffer (0 - 2,500 meters):
500
Forest map selection:
Global Forest Cover (2012 - 2016)
Year of forest map (2012 - 2016):
2016
Select Global Forest Cover percentage (0 - 100%):
70
Self-referencing step:
Radius of circular kernel (0 - 1,000 meters):
210
Disturbance-density-related (DDR) filtering:
Apply DDR filtering
Select threshold for filtering (0 - 0.3):
0.02
Radius of circular kernel for filtering (0 - 500 meters):
60
Min. number of disturbance events per cleaning kernel:
4
Options for export:
Allow export of Delta-rNBR result(s)
Export of single rNBRs
Export of dates of single rNBRs
Phnom Penh
Ho Chi Minh City
Google


Delta-rNBR_V1.6 - Earth
Secure | https://code.earthengine.google.com/f69d869d6c18ab71bdd58e74bd68fae9
Google Earth Engine
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Scripts Docs Assets
Filter scripts...
NEW
Owner (1)
users/andilangner/default
GEE-Course
Library_of_various_attempts
Operational
Delta-rNBR_V1.6
Landsat Explorer
Roadless_export
Sentinel-2 Explorer
Test
Writer
Reader (1)
Examples
Delta-rNBR_V1.6
Get Link
Save
Run
Reset
// Delta-rNBR Forest Canopy Disturbance Mapping Approach (Version 1.6)
// * Project: ReCaREDD - JRC of the European Commission
// * Purpose: - Mapping all kind of canopy disturbances (natural or human induced)
// * - Disturbances can be interpreted as forest degradation events (after
// * - In order to separate natural from human disturbances we recommend
// * - Close to real time monitoring of canopy cover changes possible
// * Info: - SR-TOA Combination (SR data with 'simpleCloudScore' band coming from
// * - Basic methodology described in the paper published in the Remote Sens
// * - Updates to the GEE script (development versions and script manual):
// * - Updates to the GEE script (latest archived version):
// * - Further information and pre-processed data:
Inspector Console Tasks
DeltaNBR_L8_CB_2017-12-31--2016-01-01__1-2
DeltaNBR_L8_CB_2017-12-31--2016-01-01__0-2
DeltaNBR_L8_CB_2017-12-31--2016-01-01__0-1
DeltaNBR_L8_CB_2017-12-31--2016-01-01__0-0
Report_DeltaNBR-session_CB_2017-12-31--2016-01-01
RUN
Pull up slider down to access 'Tasks' tab on right side
Click 'Run' to export each map tile
Run Delta-rNBR
Layers
Exportbox_5-5
Exportbox_5-4
Exportbox_5-3
Exportbox_4-5
Exportbox_4-4
Exportbox_4-3
Exportbox_4-2
Exportbox_4-1
Exportbox_3-5
Exportbox_3-4
Exportbox_3-3
Exportbox_3-2
Exportbox_3-1
Exportbox_2-5
Exportbox_2-4
Optionally visualize degree-sized tiles covering study area
Click 'Run' to export .csv report (important for replication of results)
Cloud flag (Pixel-QA band)
18 Cloud masking:
19 QB_select: Yes
20 Fmask_select: Yes
21 SimpleCloudScore_select: Yes
22 UnsureClouds_select: Yes
23 cloud_buffer: 500
24 **********
25 Forest masks:
26 forest_mask_select: Roadless map
27 roadless_year: 2016 Roadless map
28 hansen_treecover: 70
29 **********
30 Self-referencing:
31 kernel_size: 210
32 **********
33 (Disturbance-density-related) filtering:
34 cleaning_select: Yes
35 threshold_conservative: -0.05
36 kernel_clean_size: 60
37 min_disturbances: 3
500
2016
70
210
0.02
60
4
Options for export:
Allow export of Delta-rNBR result(s)
Export of single rNBRs
Export of dates of single rNBRs
Google