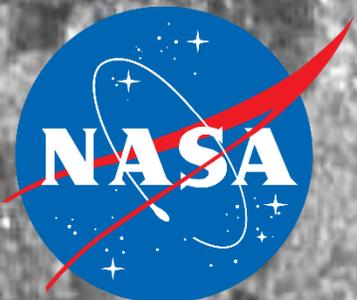


# GIS Applications of SAR Data: Flood Mapping



Heidi Kristenson, GIS Specialist  
Alaska Satellite Facility

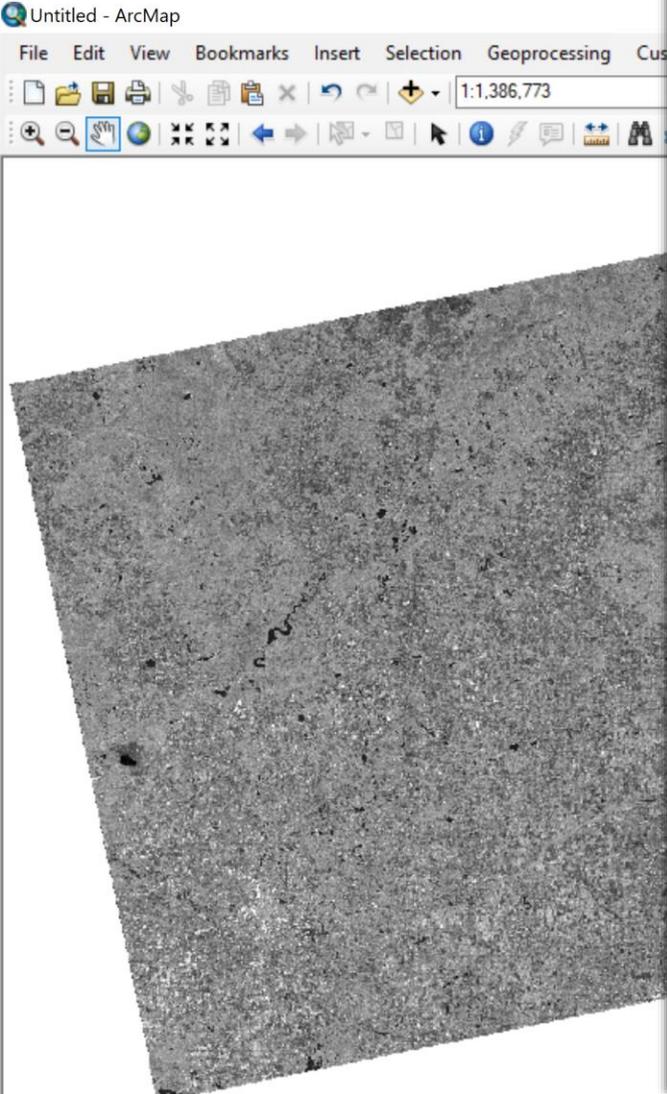
# On-Demand RTC Products from Vertex

**Granules used for Demo:**

[S1B IW GRDH 1SDV 20200515T233216 20200515T233241 021599 02900D FD9E](#)  
[S1B IW GRDH 1SDV 20200527T233217 20200527T233242 021774 02953A 2D69](#)

1. Sign in with [Earthdata](#)
2. Use  button to add products to the On Demand Queue
3. Click on On Demand to view the queue
4. Enter a Project Name and adjust processing options (if desired)
5. Click the Submit Queue button
6. Select On Demand Products Search Type to view products

# RTC-GAMMA Product



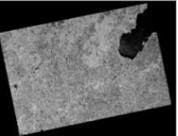
Item Description - S1B\_IW\_20200515T233216\_DVP\_RTC30\_G\_gained\_51FD\_VV

Description Preview

Print Edit Validate Export Import

### S1B\_IW\_20200515T233216\_DVP\_RTC30\_G\_gained\_51FD\_VV.tif

Raster Dataset



Tags

Alaska Satellite Facility, ASF, Synthetic Aperture Radar, SAR, Radiometric Terrain Correction, RTC, Sentinel

#### Summary

This file is a Radiometric Terrain Corrected (RTC) granule of GRD SAR data from the Sentinel-1 mission, processed using GAMMA. Cell values indicate VV gamma-0 amplitude, and pixel spacing is 30 m.

#### Description

This Radiometric Terrain Corrected (RTC) product is derived from a Ground Range Detected (GRD) granule of Synthetic Aperture Radar from the Copernicus Sentinel-1 mission (European Space Agency), processed by ASF DAAC Hyp3 2020 using the hyp3\_rtc\_gamma plugin version 2.3.2 running GAMMA release 20191203. It is provided in WGS 84 / UTM zone 16N coordinates and is corrected for terrain Digital Elevation Model (DEM). The DEM used to generate this product is NED13 at 1/3 arc seconds (about 10 meters) resolution.

Processing Date/Time: 2020-10-07T02:51:35+00:00

In the filename, VV refers to <https://sentinel1.readthedocs.io/en/latest/terminology/>.

The name of the granule is S1B\_IW\_GRDH\_1SDV\_20200515T233216\_20200515T233241\_021599\_029890\_FD9E.

The side-looking geometry of SAR imagery leads to geometric and radiometric distortions, causing foreshortening, layover, shadowing, and radiometric variations due to terrain slope. Radiometric terrain correction converts unprocessed SAR data into geocoded TIFF images with values directly relating to physical properties, alleviating the inherent SAR distortions. The process improves backscatter estimates and provides geolocation information, so images can be used as input for applications such as the monitoring of deforestation, land-cover classification, and delineation of wet snow-covered areas.

Cell values indicate backscatter values. The default display is Stretched - Standard Deviations (choose a number (n) that works best for your particular dataset; the default of n: 2.5 will improve the display, but other values may give a better visualization).

This product was processed using 6 look(s). Multi-looking is the process of coherently averaging together pixels of an image. The effect of multi-looking is to reduce the noise level, thus reducing speckle, at the cost of decreased resolution. Multi-looking is 10-m products.

No speckle filter has been applied to this image. The default is to not apply a speckle filter, but the user can choose to apply a speckle filter. When the filtering option is selected, an Enhanced Lee filter is applied during RTC processing to remove speckle while preserving edges. When applied, the filter is set to a dampening factor of 1, with a box size of 7x7 pixels and 180 looks.

You may wish to explore the filtering options available in ArcGIS rather than ordering imagery with a filter already applied. The options for different speckle filter functions to be applied on the fly (including the filter settings listed above) using the Image window. To learn more about speckle filtering options, refer to <http://desktop.arcgis.com/en/arcmap/latest/manage-data/raster-and-images/speckle-function.htm>, and to learn how apply a function (such as a speckle filter) to a raster, refer to <http://desktop.arcgis.com/en/arcmap/latest/manage-data/raster-and-images/editing-functions-on-a-raster-dataset.htm>.

For areas where there is not a publicly-available digital elevation model (i.e. sea ice), geocoded products without terrain correction are available from <http://hyp3.asf.alaska.edu>.

The Sentinel-1A satellite was launched April 3, 2014, and the Sentinel-1B satellite was launched April 25, 2016. The satellites repeat their 12-day repeat cycle. More information about the mission is available at <https://earth.esa.int/web/guest/missions/esa-operational-missions/sentinel-1>.

Additional information about Sentinel-1 data, imagery, tools and applications is available at <https://asf.alaska.edu/data-sets/sentinel-1>.

#### Credits

ASF DAAC Hyp3 2020 using the hyp3\_rtc\_gamma plugin version 2.3.2 running GAMMA release 20191203. Contains modified Copernicus Sentinel data 2020, processed by ESA.

#### Use Limitations

There are no restrictions on the use of this data, but it must be cited as listed in the credits.

### S1B\_IW\_20200515T233216\_DVP\_RTC30\_G\_gained\_51FD\_VV.tif

File Edit Format View Help

ASF RTC Data Package (GAMMA)

\*\*\*\*\*

This folder contains radiometric terrain corrected (RTC) SAR data from the Sentinel-1 mission, processed using the hyp3\_rtc\_gamma plugin version 2.3.2 running GAMMA release 20191203.

Processing Date/Time: 2020-10-07T02:51:35+00:00

The folder and each of its contents all share the same metadata.

S1X\_yy\_aaaaaaaaaTbbbbbb\_ppo\_RTCzz\_G\_defkimm\_ssss

x: Sentinel-1 Mission (A or B)

y: Beam Mode

yy: Start Date of Acquisition (YYYYMMDD)

aaaaaaa: Start Time of Acquisition (HHMMSS)

bbbbbb: Polarization

pp: Orbit Type: Precise (P), Restituted (R), Terrain Correction Resolution

zz: Gamma-0 (g) or Sigma-0 (s) Output

e: Power (p) or Amplitude (a) Output

f: Unmasked (u) or Water Masked (w)

k: Not Filtered (n) or Filtered (f)

l: Entire Area (e) or Clipped Area (c)

m: Dead Reckoning (d) or DEM Matching (m)

sssss: Product ID

\*\*\*\*\*

The source granule used to generate the products contained in this folder is:

S1B\_IW\_GRDH\_1SDV\_20200515T233216\_20200515T233241\_021599\_029890\_FD9E

Name	Date modified	Type	Size
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VH.tif	10/15/2020 2:47 PM	TIF File	160,412 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VH.tif.xml	10/15/2020 2:47 PM	XML Document	24 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VV.tif	10/15/2020 2:47 PM	TIF File	160,028 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VV.tif.xml	10/15/2020 2:47 PM	XML Document	24 KB

\*\*\*\*\*

# Product Contents #

The side-looking geometry of SAR imagery leads to geometric and radiometric distortions, causing foreshortening, layover, shadowing, and radiometric variations due to terrain slope. Radiometric terrain correction converts unprocessed SAR data into geocoded TIFF images with values directly relating to physical properties, alleviating the inherent SAR distortions. The process improves backscatter estimates and provides geolocation information, so images can be used as input for applications such as the monitoring of deforestation, land-cover classification, and delineation of wet snow-covered areas.

The files generated in this process include:

1. Radiometric Terrain Corrected GeoTIFF data files for each polarization available
2. Browse images (PNG and KMZ format) in grayscale and color (when dual-pol is available)
3. A copy of the DEM used to correct the data (included in standard products; you can choose to omit this layer when custom ordering imagery)
4. An incidence angle map (included in standard products; you can choose to omit this layer when custom ordering imagery)
5. A layover-shadow mask
6. An ArcGIS xml metadata file for each raster layer, displayed in the Item Description (ArcGIS Desktop) or Metadata (ArcGIS Pro)
7. An xml file in ISO 19115-2 format, describing all of the products
8. A shapefile indicating the data and raster extents
9. Log file

See below for detailed descriptions of each of the products.

\*\*\*\*\*

## 1. Radiometric Terrain Corrected data files

S1B\_IW\_20200515T233216\_DVP\_RTC30\_G\_gained\_51FD

File Home Share View

Michigan > S1B\_IW\_20200515T233216\_DVP\_RTC30\_G\_gained\_51FD

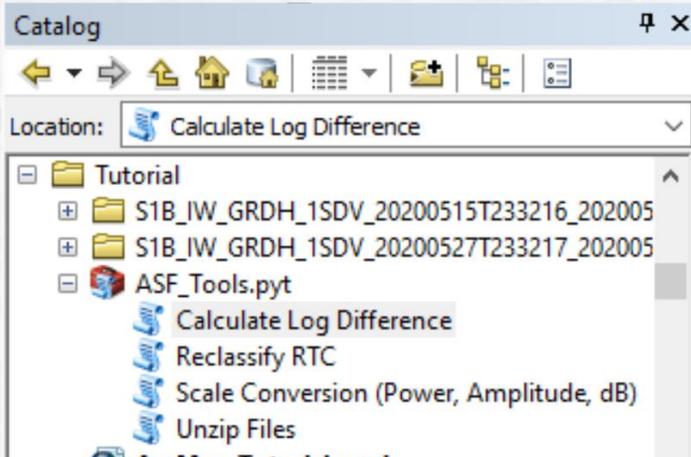
Name	Date modified	Type	Size
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD.kmz	10/15/2020 2:47 PM	KMZ	1,576 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD.log	10/15/2020 2:47 PM	Text Document	130 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD.png	10/15/2020 2:47 PM	PNG File	1,739 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD.png.aux.xml	10/15/2020 2:47 PM	XML Document	1 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD.png.xml	10/15/2020 2:47 PM	XML Document	18 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_README.md.txt	10/15/2020 2:47 PM	Text Document	14 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_Is_map.tif	10/15/2020 2:47 PM	TIF File	128 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_Is_map.tif.xml	10/15/2020 2:47 PM	XML Document	15 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_rgb.kmz	10/15/2020 2:47 PM	KMZ	3,253 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_rgb.png	10/15/2020 2:47 PM	PNG File	4,339 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_rgb.png.aux.xml	10/15/2020 2:47 PM	XML Document	1 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_rgb.png.xml	10/15/2020 2:47 PM	XML Document	18 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_shape.dbf	10/15/2020 2:47 PM	DBF File	1 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_shape.prj	10/15/2020 2:47 PM	PRJ File	1 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_shape.shp	10/15/2020 2:47 PM	SHP File	230 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_shape.shx	10/15/2020 2:47 PM	SHX File	1 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VH.tif	10/15/2020 2:47 PM	TIF File	160,412 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VH.tif.xml	10/15/2020 2:47 PM	XML Document	24 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VV.tif	10/15/2020 2:47 PM	TIF File	160,028 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VV.tif.xml	10/15/2020 2:47 PM	XML Document	24 KB

20 items

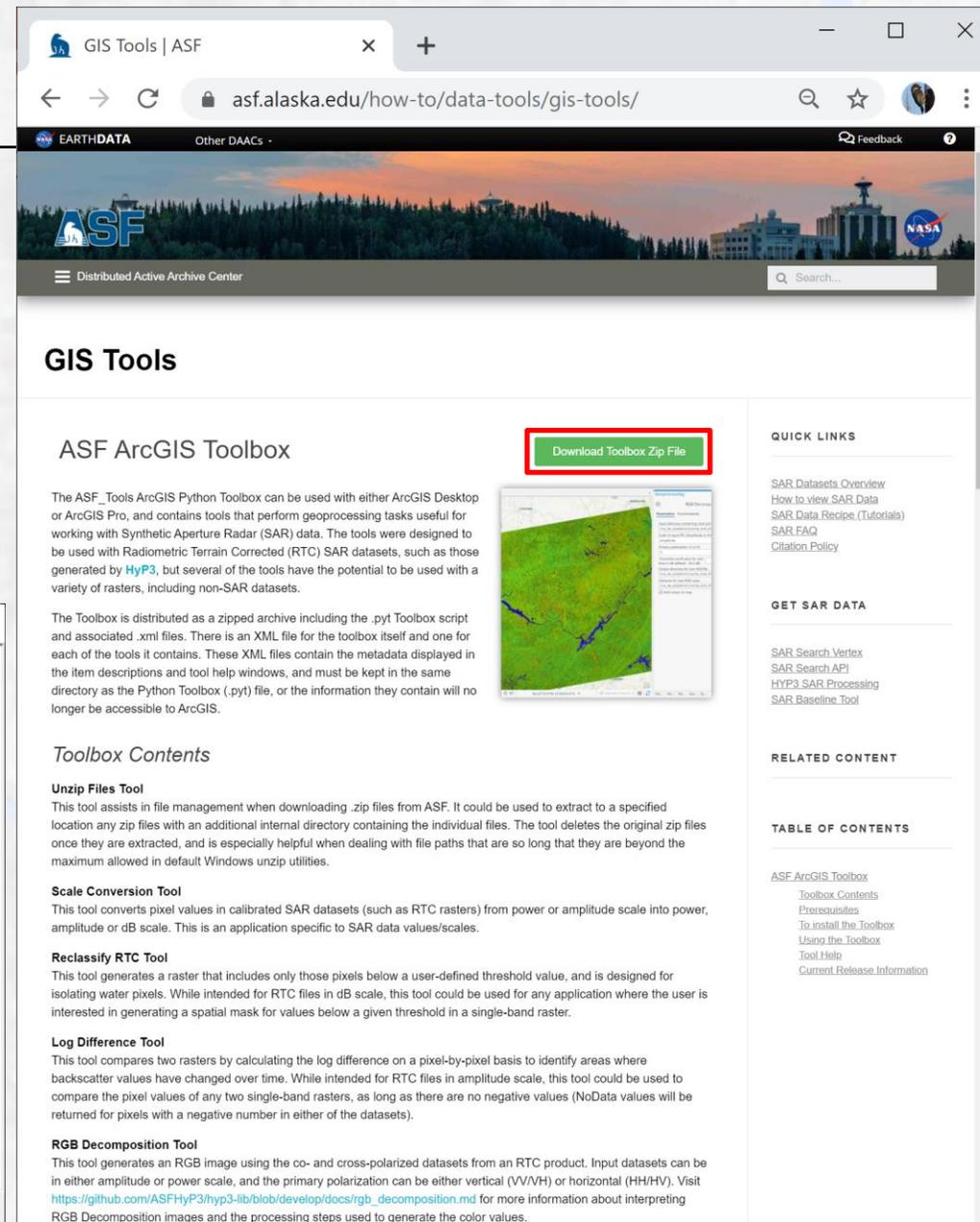
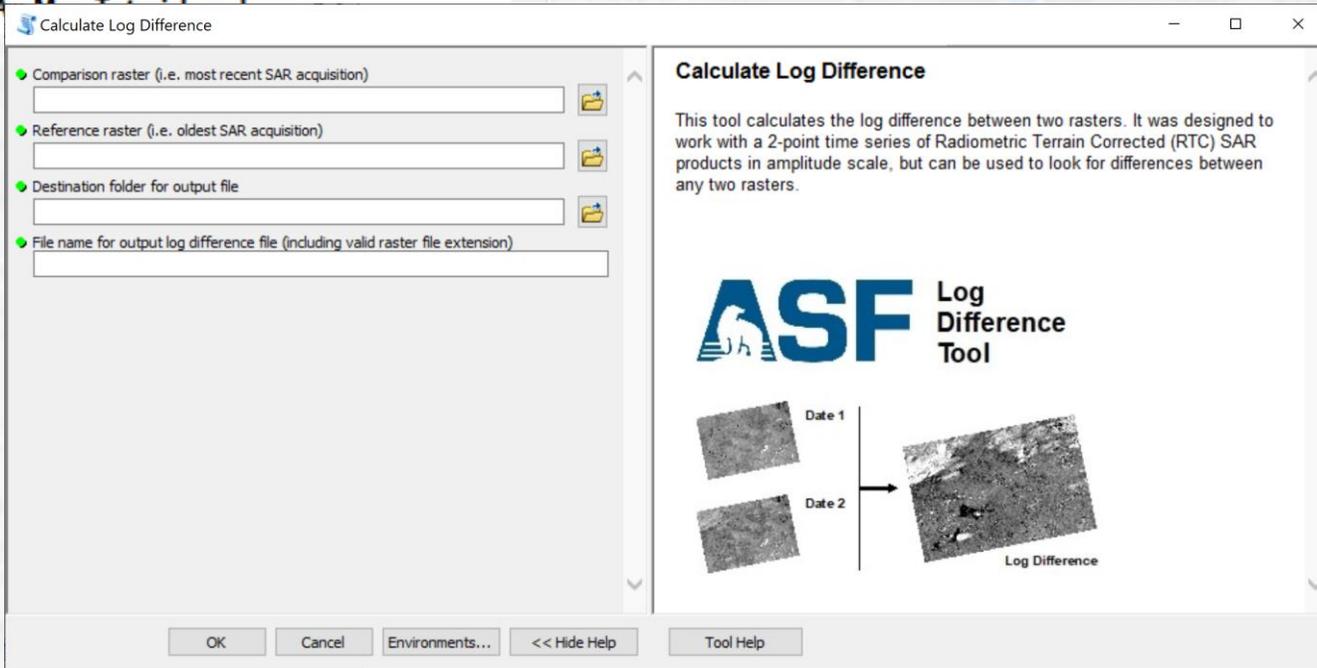
Name	Date modified	Type	Size
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VH.tif	10/15/2020 2:47 PM	TIF File	160,412 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VH.tif.xml	10/15/2020 2:47 PM	XML Document	24 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VV.tif	10/15/2020 2:47 PM	TIF File	160,028 KB
S1B_IW_20200515T233216_DVP_RTC30_G_gained_51FD_VV.tif.xml	10/15/2020 2:47 PM	XML Document	24 KB



# ASF Custom Toolbox for ArcGIS

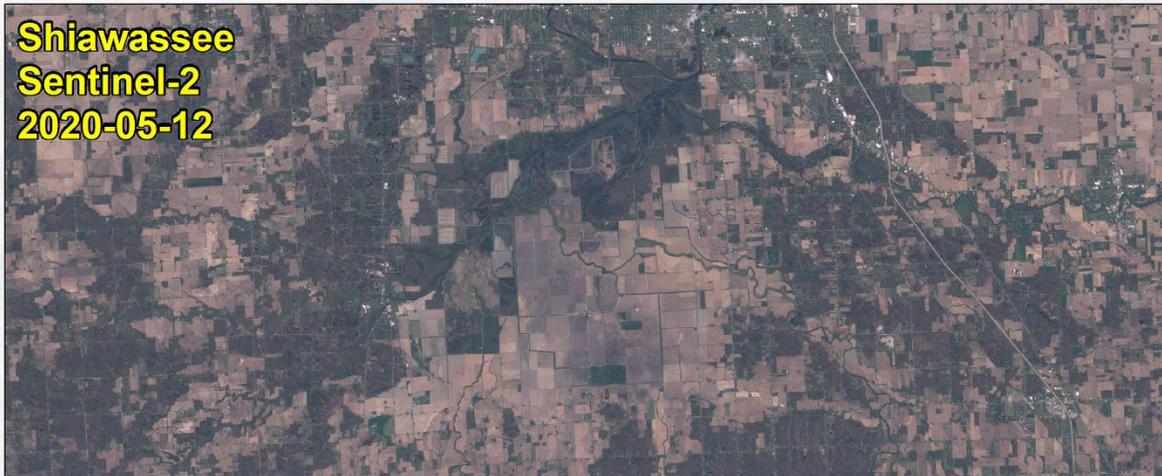


- For ArcMap or ArcGIS Pro
- Designed for use with HyP3 RTC products
  - some tools can be used with other datasets, even non-SAR data



# Case Study: Midlands County, Michigan, USA

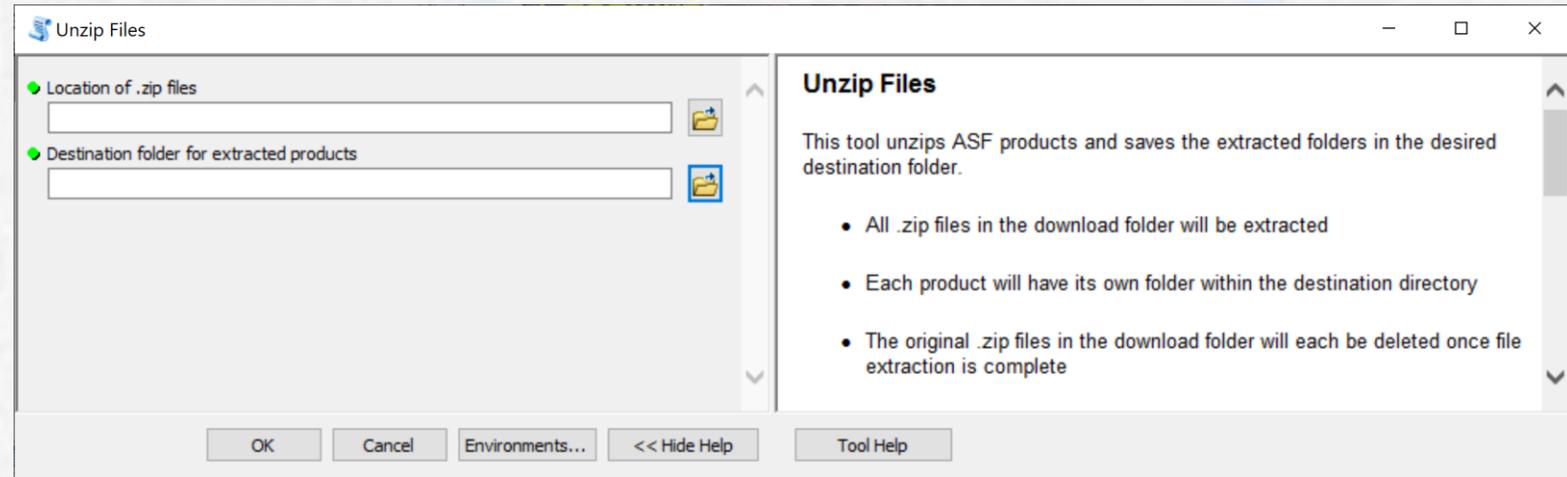
- Heavy rainfall resulted in dam failure and flooding, May 2020



# Unzip RTC Products

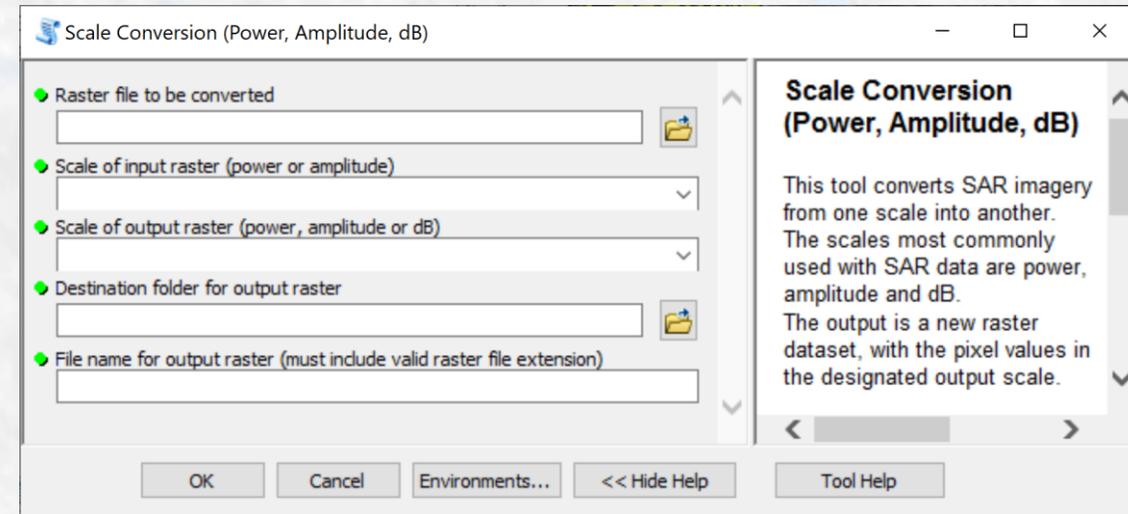
This tool will:

- Unzip any .zip archives in a selected directory
- Save the extracted data in the desired directory
  - can be the same directory that houses the zip archives or a different one
- Delete the zip files

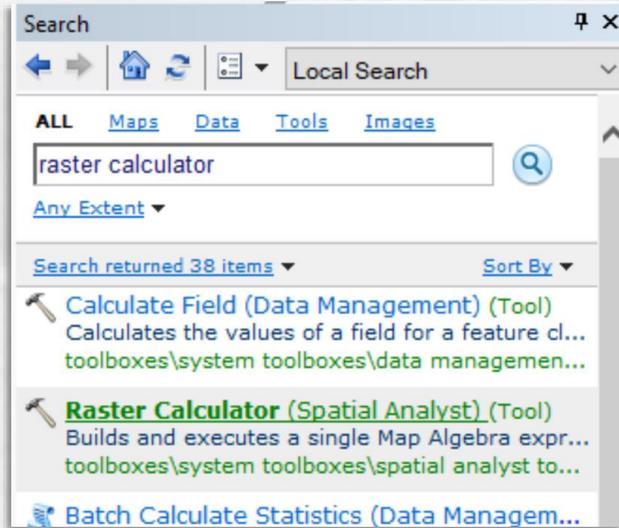


# Convert RTC Products to a Different Scale

- RTC outputs are commonly in power scale
  - Often visualizes poorly
  - Good for numeric analysis
- Amplitude scale (square root of power)
  - Generally good visualization
  - Good for most numeric analysis
- dB scale ( $10 \times \log_{10}$  of power)
  - Good for differentiating among very dark pixels
  - Not suitable for all numeric analyses

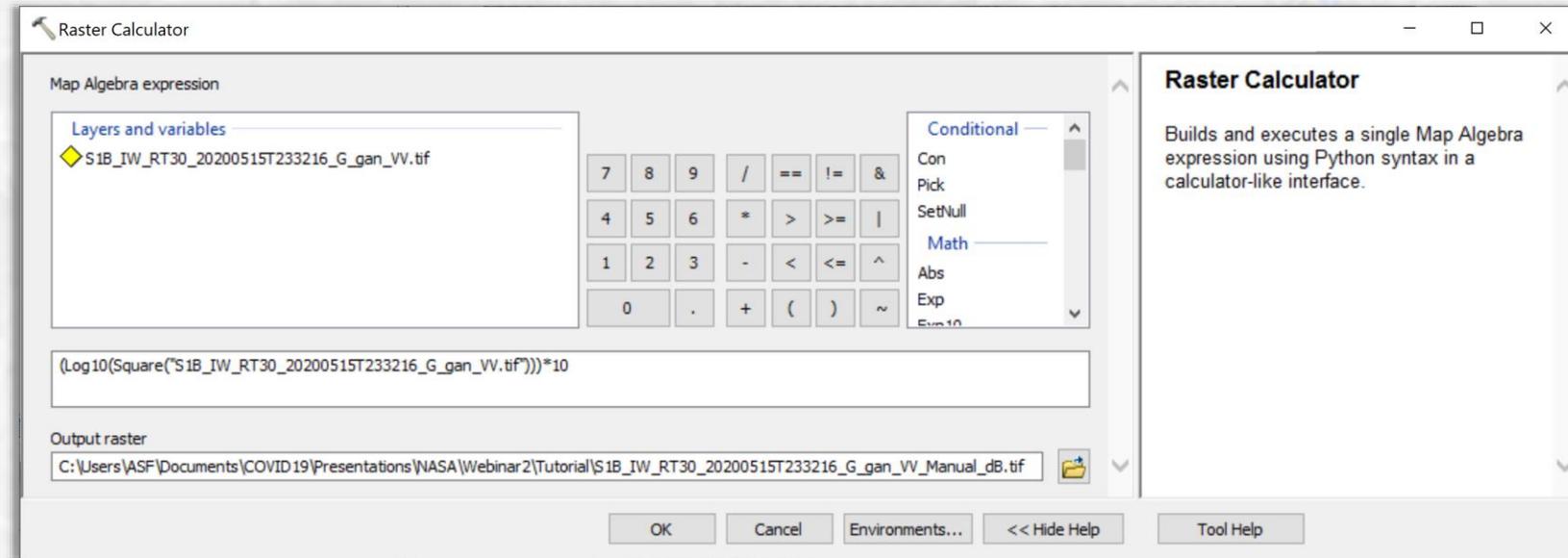


# ArcMap Manual Option: Raster Calculator



- Search for Raster Calculator or find the tool in the Spatial Analyst toolbox

- You must add rasters to the ArcMap project to make them available in the Layers and Variables list
- Enter the formula in the expression field
- Select the destination directory and enter an output raster name, including the .tif extension



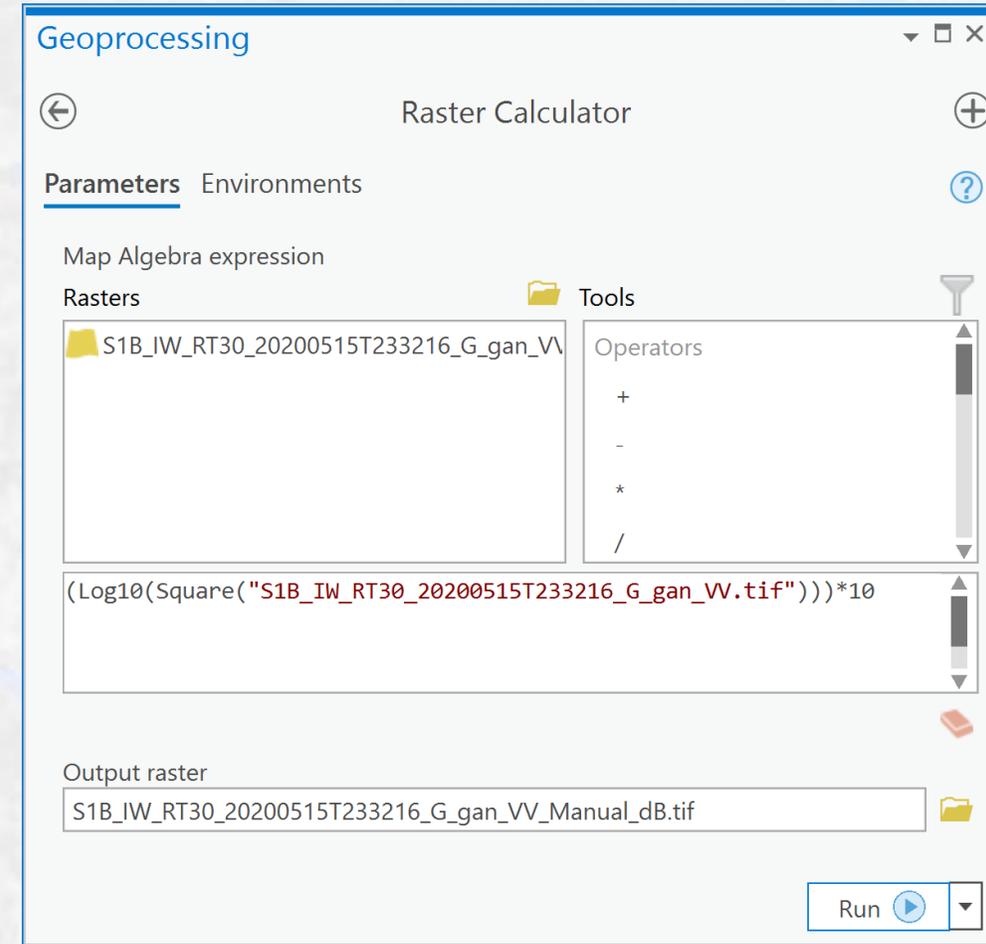
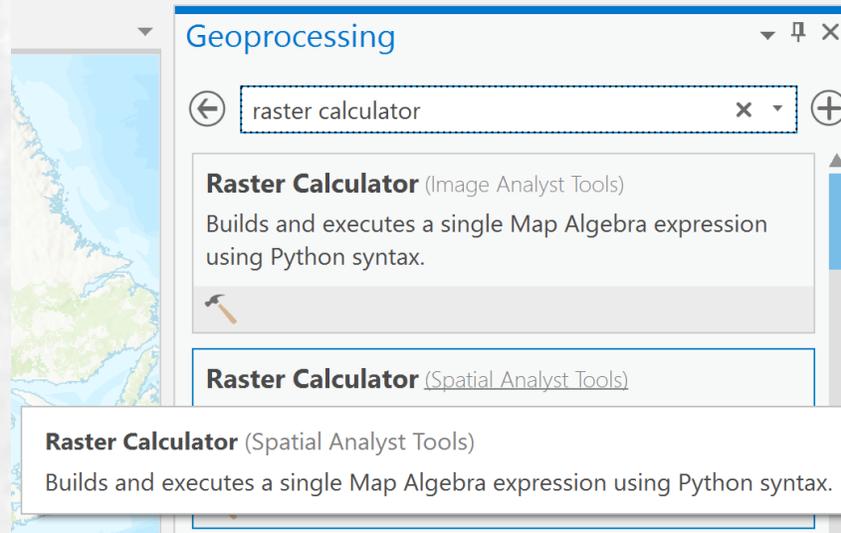
\*To convert power (instead of amplitude) to dB, remove the square function from the equation

$(\text{Log10}(\text{Square}(\text{"S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV.tif"}))) * 10$

# ArcGIS Pro Manual Option: Raster Calculator

- Search for Raster Calculator (Spatial Analyst) in the Geoprocessing pane

- The dialog is similar to ArcMap
- The raster must be in the map to appear in the list of rasters
- Enter the expression and set the output raster directory and name, including the .tif extension



$(\text{Log10}(\text{Square}(\text{"S1B_IW_RT30\_20200515T233216\_G\_gan\_VV.tif"})))) * 10$

# QGIS Manual Option: Raster Calculator

- Select Raster Calculator from Raster menu

Webinar2\_Tutorial - QGIS

Project Edit View Layer Settings Plugins Vector **Raster** Database Web M

Raster Calculator...

Align Rasters...

ASF Tools

Analysis

Projections

Miscellaneous

Extraction

Conversion

Browser

S1B\_IW\_RT30\_20200515T233216\_G\_gan\_lar

S1B\_IW\_RT30\_20200515T233216\_G\_gan\_lar

S1B\_IW\_RT30\_20200515T233216\_G\_gan\_rgl

S1B\_IW\_RT30\_20200515T233216\_G\_gan\_rgl

**Raster Calculator**

**Raster Bands**

S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV@1

**Result Layer**

Output layer: entations\NASA\Webinar2\Tutorial\S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV\_Manual\_db.tif

Output format: GeoTIFF

Selected Layer Extent

X min: 549480.00000 X Max: 838020.00000

Y min: 4708560.00000 Y max: 4927620.00000

Columns: 9618 Rows: 7302

Output CRS: EPSG:32616 - WGS 84 / UTM zone 16N

Add result to project

**Operators**

+ \* sqrt cos sin tan log10 (

- / ^ acos asin atan ln )

< > = != <= >= AND OR

**Raster Calculator Expression**

log10 ( "S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV@1" ^ 2 ) \* 10

Expression valid

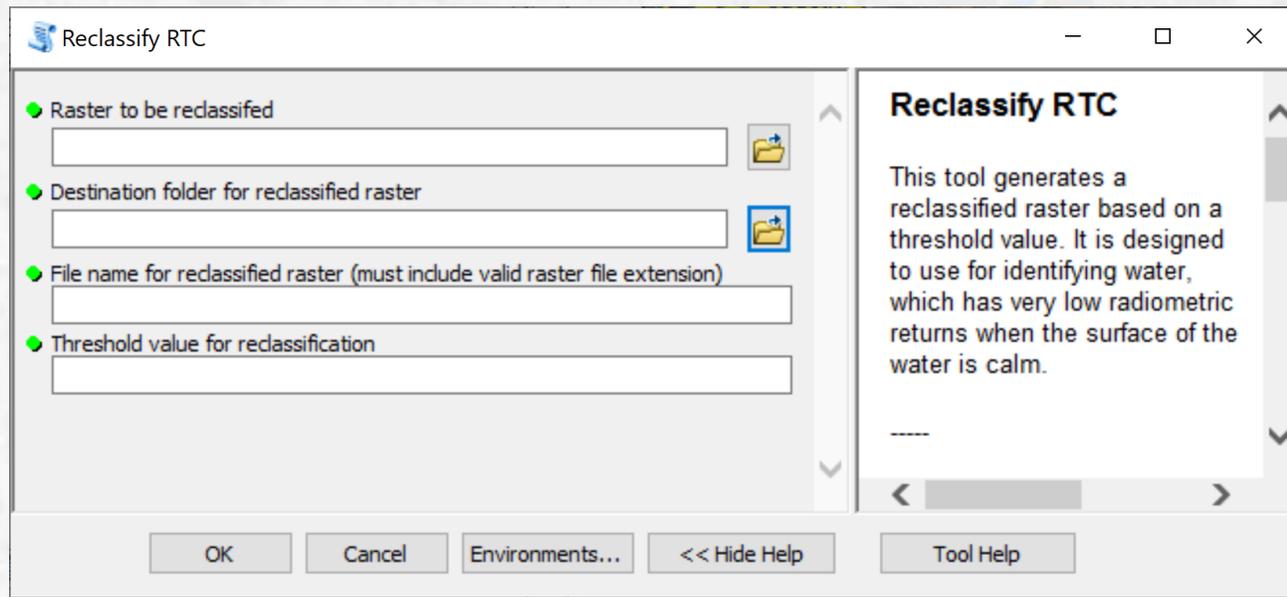
OK Cancel Help

- The interface is similar to ArcGIS, but there are differences in expression syntax
- The raster must be added to the QGIS project to appear in the Raster Bands list. The band is indicated, even for single-band rasters.
- Enter the expression and set the output layer directory and name, output as GeoTIFF

$\log_{10} ( "S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV@1" ^ 2 ) * 10$

# Reclassify RTC – Water Masking

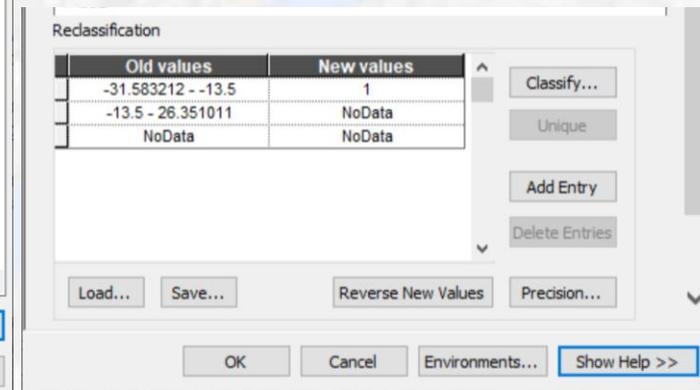
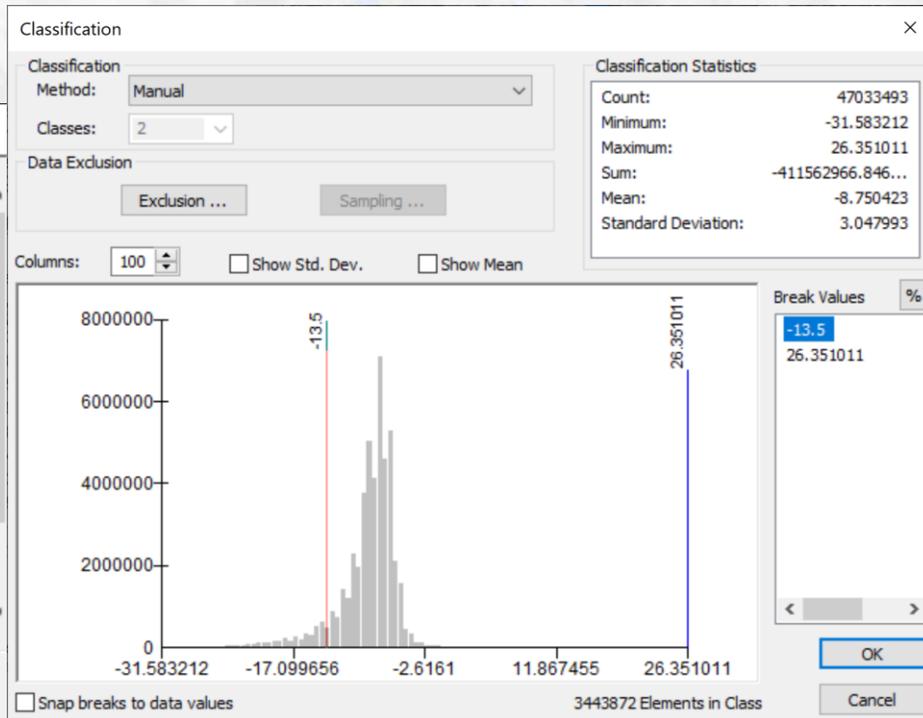
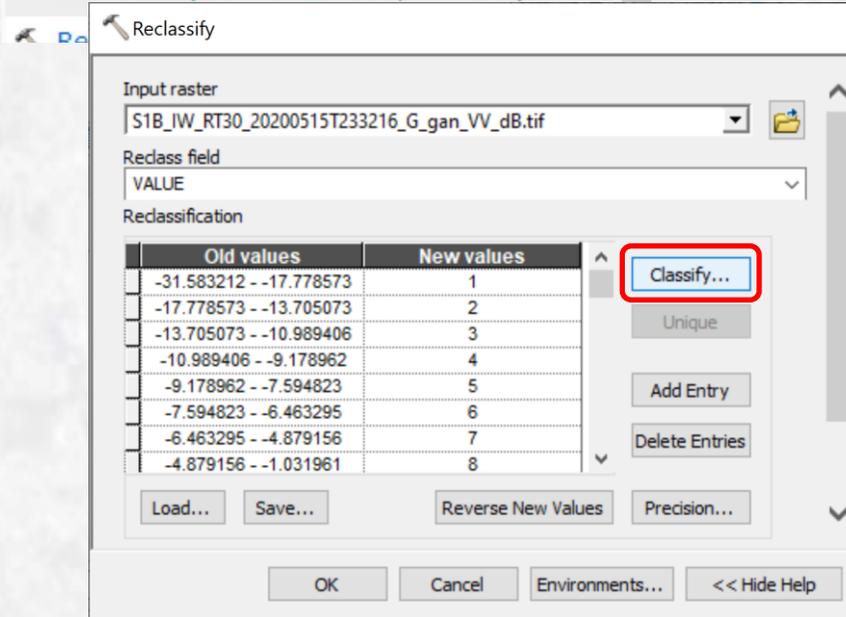
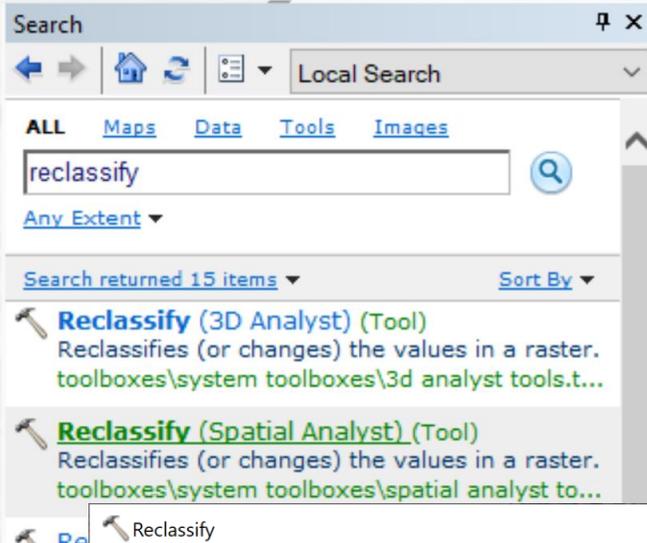
- Set dB threshold to reflect water extent
- Export a mask where pixels with values below the threshold are set to a value of 1 and all other pixels are set to NoData



# ArcMap Manual Option: Reclassify

- Search for Reclassify or find the tool in the Spatial Analyst toolbox

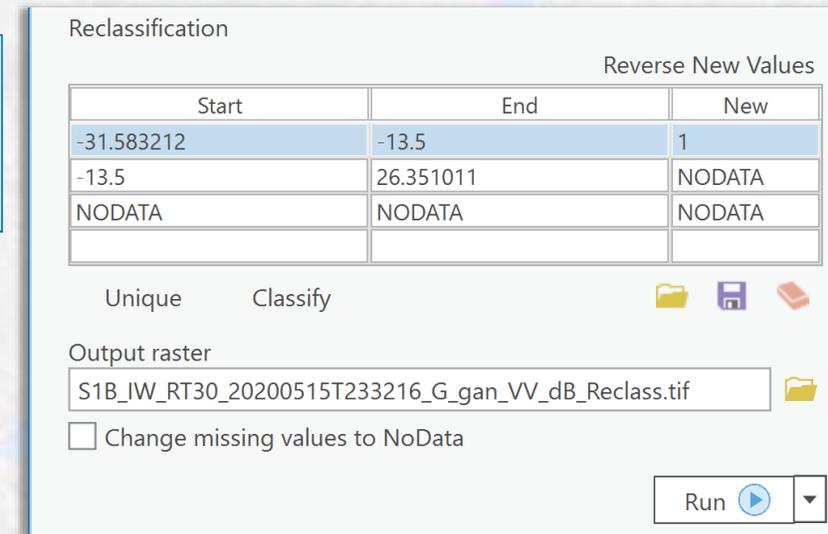
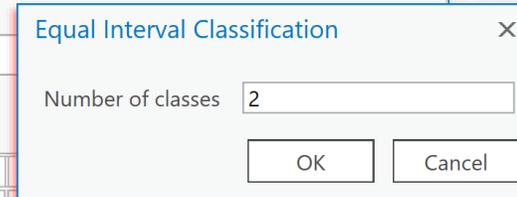
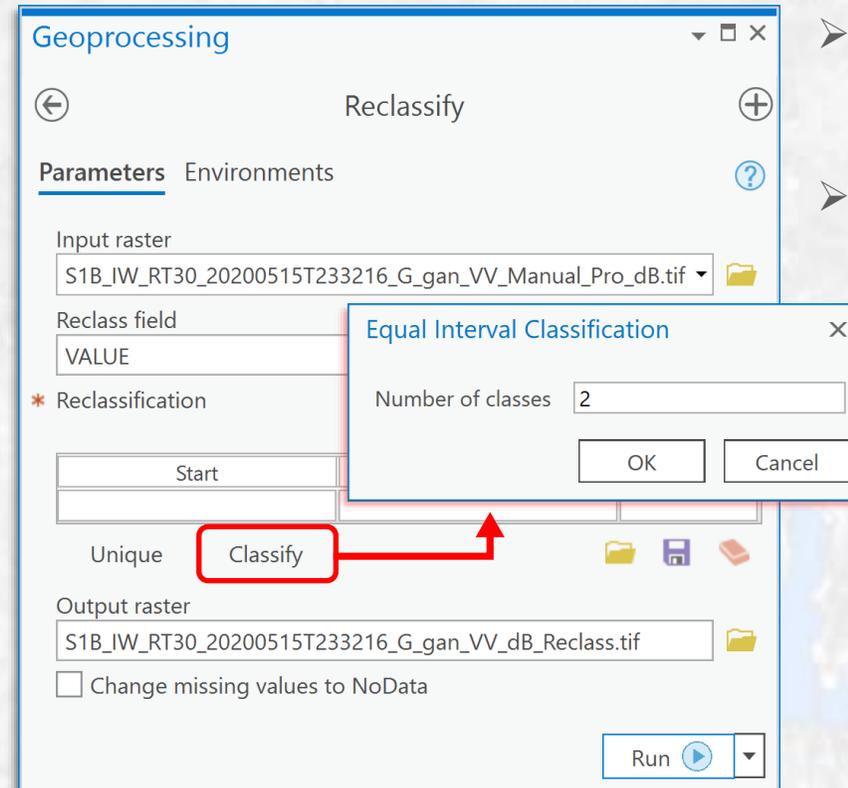
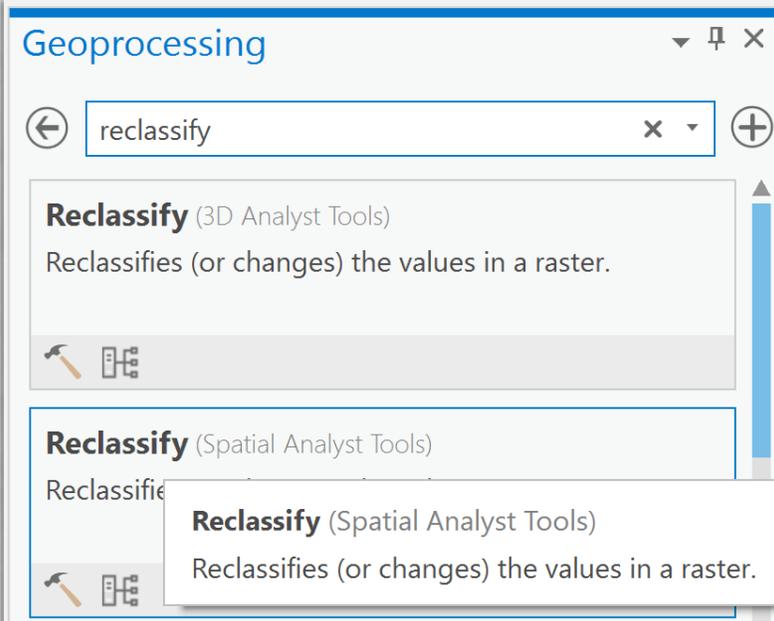
- Select the raster and click the Classify button
- Set the number of classes to 2
- Set the first break value to the desired value (-13.5 in this example)
- Click OK to return to first window
- Set the first range of values to be classified as 1, and the second range of values to be NoData (or 0, if desired)
- Click OK to run the reclassification



# ArcGIS Pro Manual Option: Reclassify

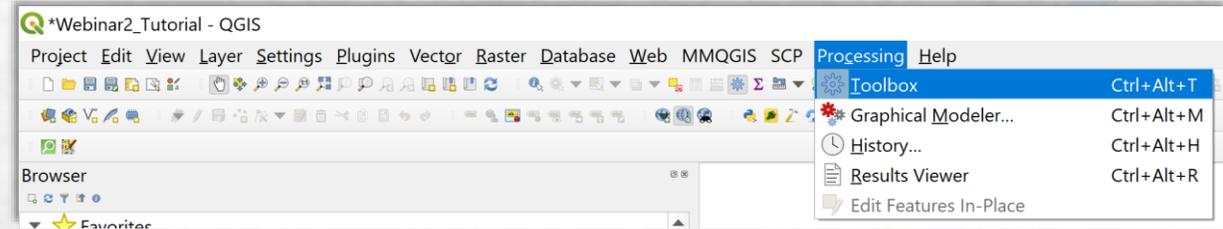
- Search for Reclassify (Spatial Analyst) in the Geoprocessing pane

- Select the raster and click the Classify link
- Set the number of intervals to 2
- Set the first End value to the desired value (-13.5 in this example) and set the New value to 1
- Set the Start value for the second class to the End value of the first class, and enter NODATA (or 0, if desired) for the New value
- Click Run to process the data



# QGIS Manual Option: Reclassify by Table

- Select Reclassify by Table from the Processing Toolbox



- If the Processing Toolbox is not open, select it from the Processing menu
- Select the raster to reclassify
- Click the ellipses next to the Reclassification Table field, and use the Add Row button to add two new rows.
- Populate the rows as shown, using -inf for Min1, inf for Max2, the break value for Max1 and Min2, and -9999 for NoData
- Click the ellipses next to the Reclassified Raster field, select Save to File, and select the filename and destination
- Click Run to process the data

A composite screenshot showing the QGIS interface. On the left is the 'Processing Toolbox' with 'Reclassify by table' selected. In the center is the 'Reclassify by Table' dialog box. The 'Raster layer' field is set to 'S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV\_Manual\_dB [EPSG:32616]'. The 'Reclassification table' field has an ellipsis button next to it. The 'Reclassified raster' field also has an ellipsis button. A 'Fixed table' dialog is open, showing a table with two rows and three columns: Minimum, Maximum, and Value. The first row has values -inf, -13.5, and 1. The second row has values -13.5, inf, and -9999. The 'Add Row' button is highlighted. Below the dialog is a 'Processing algorithm...' window showing the command line for the 'Reclassify by table' algorithm.

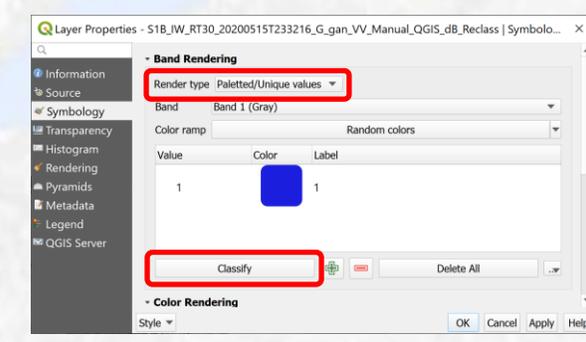
**Fixed table**

Minimum	Maximum	Value
-inf	-13.5	1
-13.5	inf	-9999

**Processing algorithm... 'Reclassify by table' starting...**  
Input parameters:  
'DATA\_TYPE': 5, 'INPUT\_RASTER': 'C:/Users/ASF/Documents/COVID19/Presentations/NASA/Webinar2/Tutorial/S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV\_Manual\_QGIS\_dB.tif', 'NODATA\_FOR\_MISSING': False, 'NO\_DATA': -9999, 'OUTPUT': 'C:/Users/ASF/Documents/COVID19/Presentations/NASA/Webinar2/Tutorial/S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV\_Manual\_QGIS\_dB\_Reclass.tif', 'RANGE\_BOUNDARIES': 0, 'RASTER\_BAND': 1, 'TABLE': [-inf, -13.5, 1, -13.5, inf, -9999] }  
Using classes:  
1) -inf < x ≤ -13.5 → 1  
2) -13.5 < x ≤ inf → -9999  
Execution completed in 2.19 seconds  
Results:  
{ 'OUTPUT': 'C:/Users/ASF/Documents/COVID19/Presentations/NASA/Webinar2/Tutorial/S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV\_Manual\_QGIS\_dB\_Reclass.tif' }  
Loading resulting layers  
Algorithm 'Reclassify by table' finished

*The default NoData value is -9999. You could choose to use 0 for the Max2 value instead, and set that as NoData in the Transparency tab in the Layer Properties if desired.*

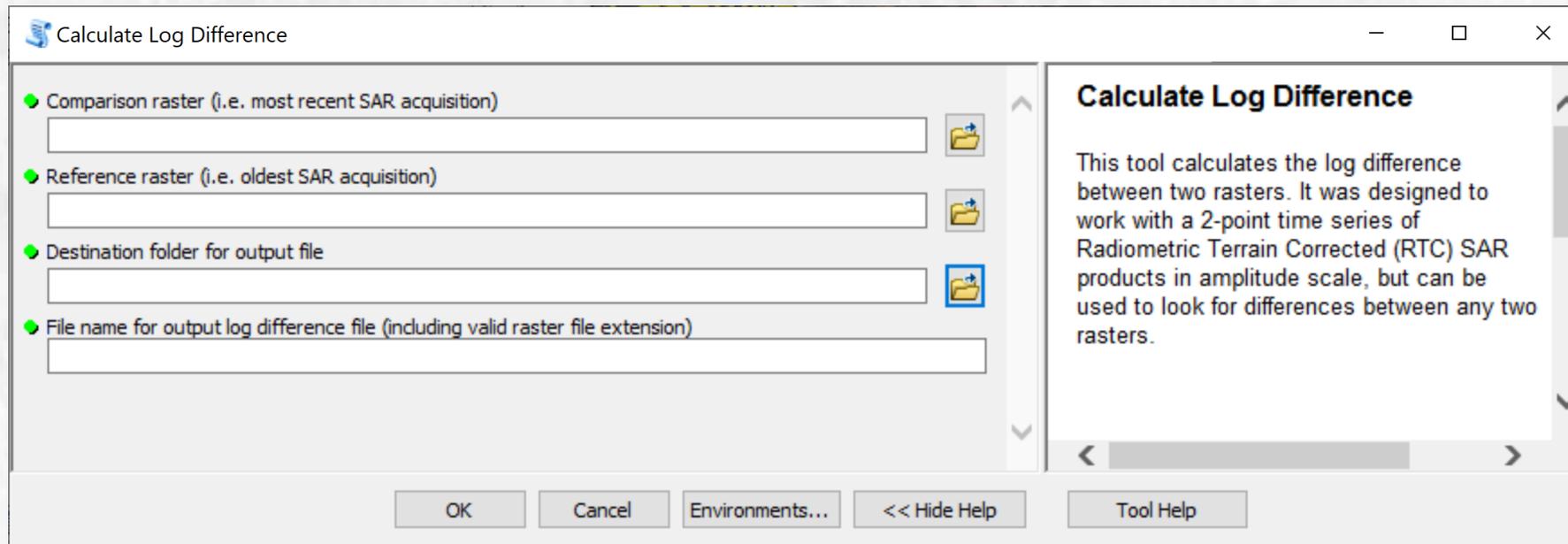
- To visualize the data:
  - Select the Symbology tab in the Layer Properties window
  - Set the Render type to Paletted/Unique values
  - Click the Classify button



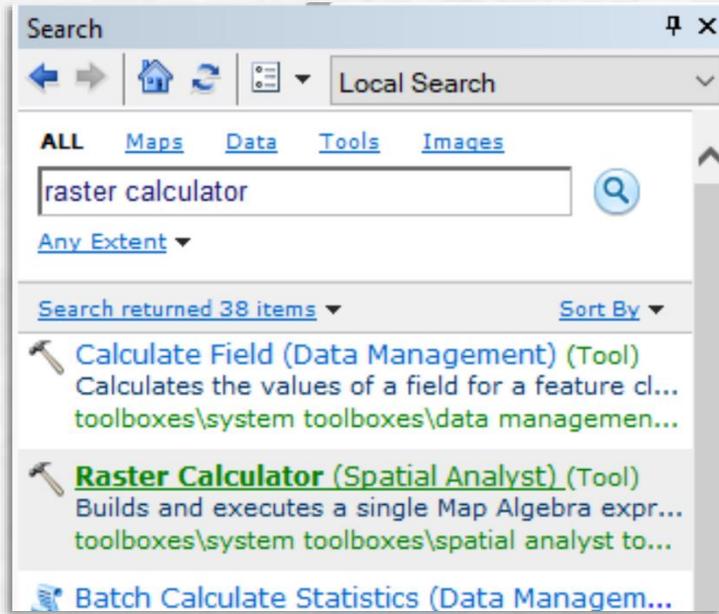
# Log Difference

- Taking the log difference of two different rasters can identify areas of change
  - Designed for use with amplitude scale

$$\text{Log}_{10}(\text{RTC2}/\text{RTC1})$$

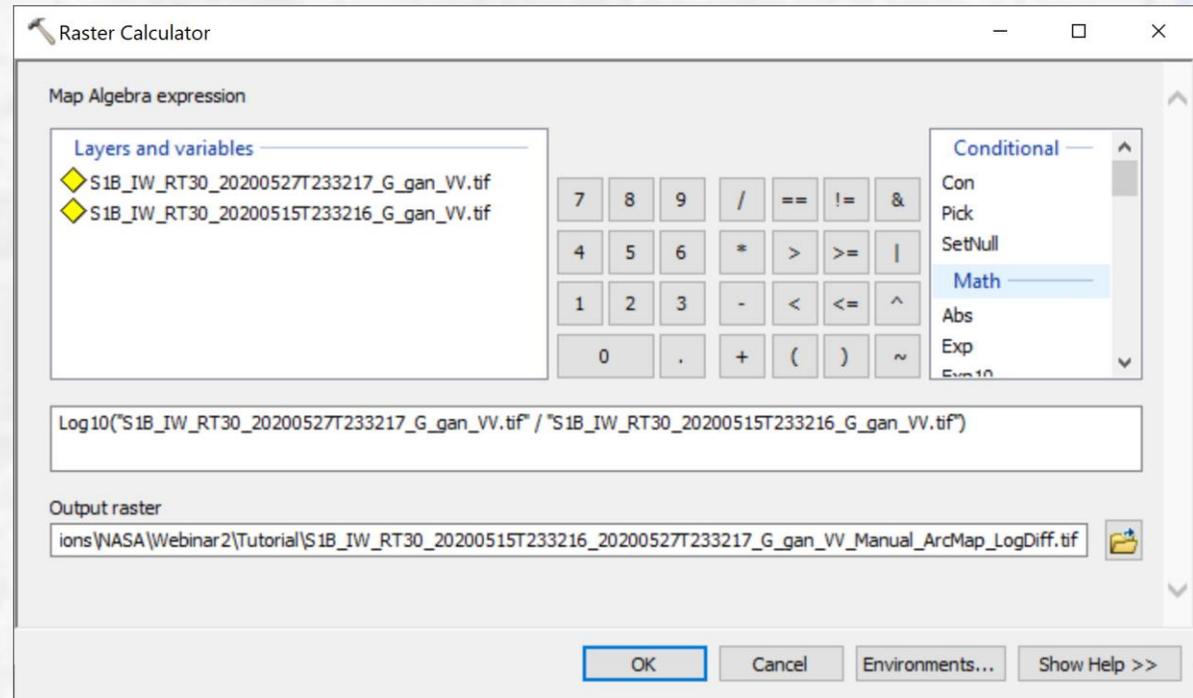


# ArcMap Manual Option: Raster Calculator



- Same approach as for converting scale, but use the log difference formula

- To use the Log10 function, scroll down the list of expressions and double-click Log10
- Divide the newer image by the older image
- Enter the name and directory for the output raster, including the .tif extension

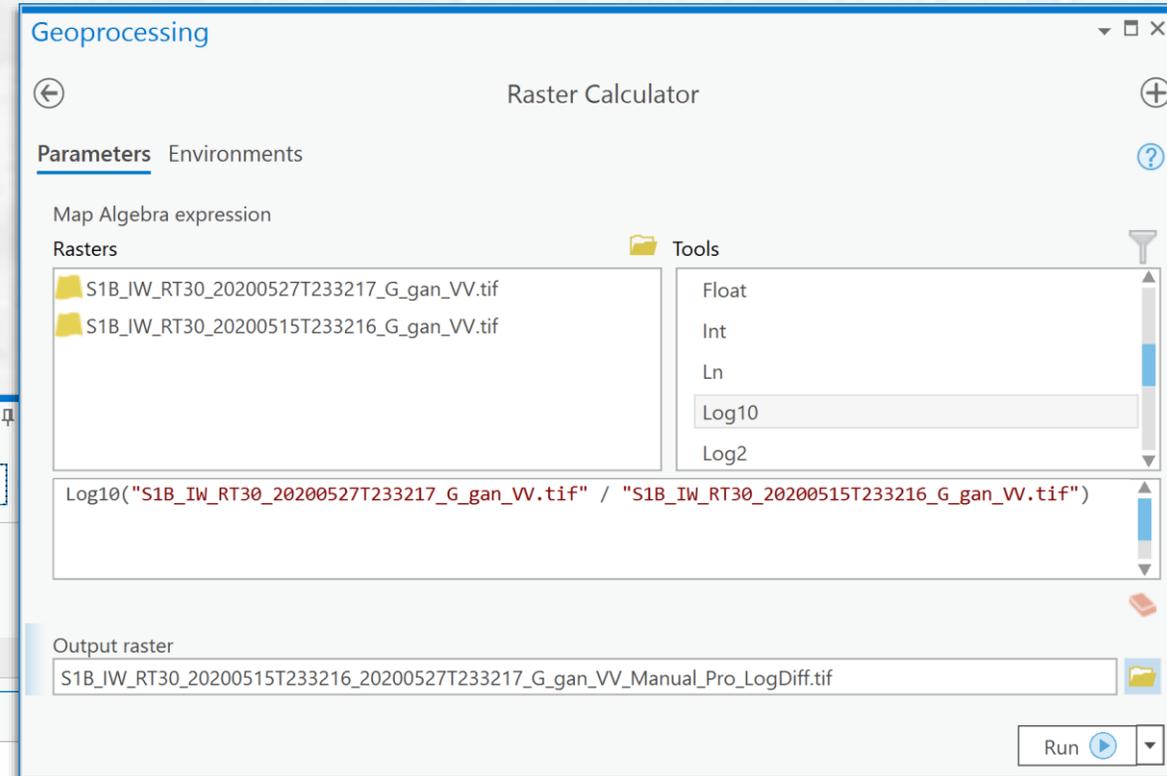
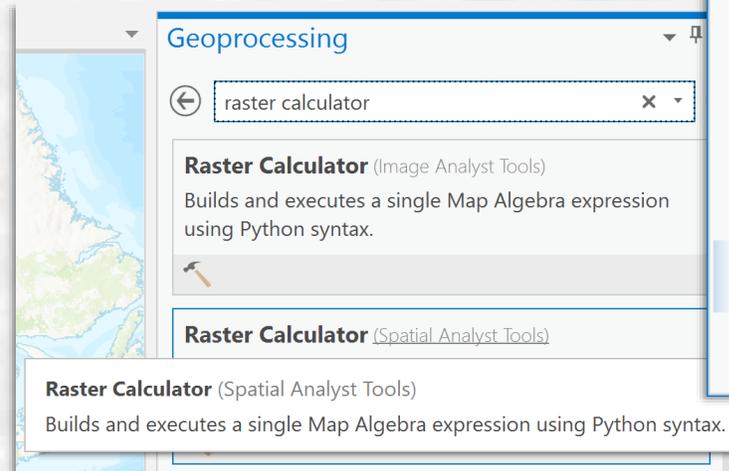


$\text{Log10}(\text{"S1B_IW_RT30\_20200527T233217\_G\_gan\_VV.tif"} / \text{"S1B_IW_RT30\_20200515T233216\_G\_gan\_VV.tif"})$

# ArcGIS Pro Manual Option: Raster Calculator

- Search for Raster Calculator (Spatial Analyst) in the Geoprocessing pane

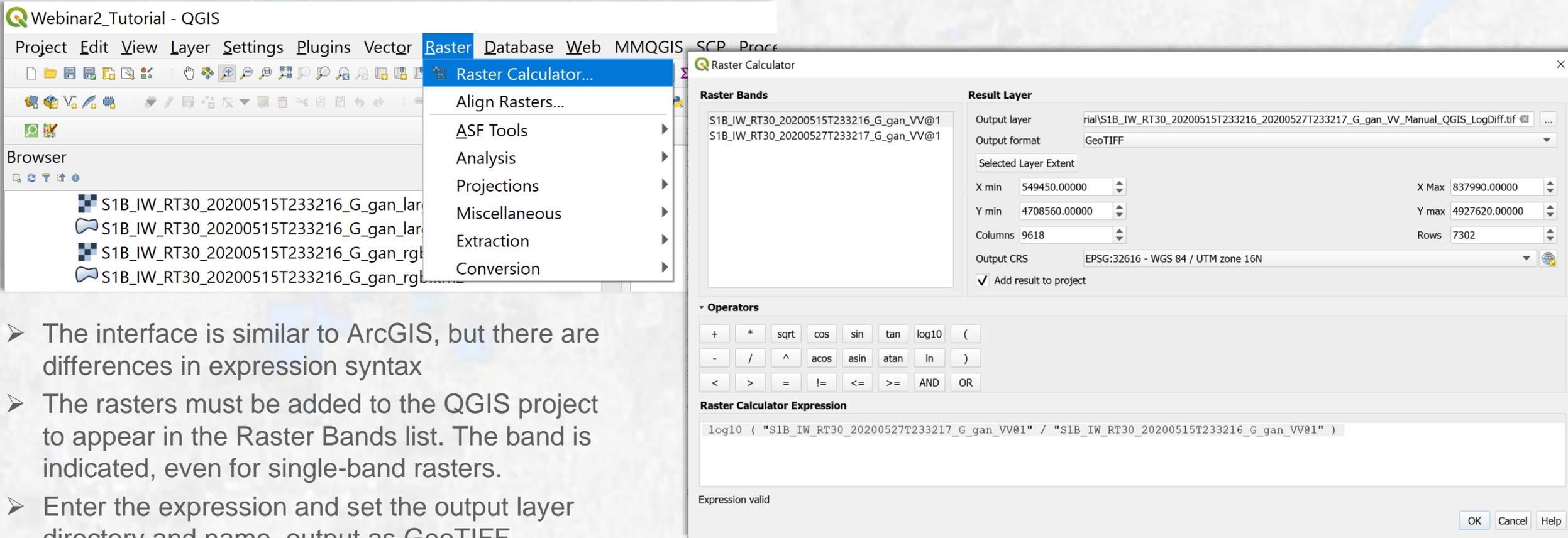
- The dialog is similar to ArcMap
- The rasters must be added to the map to appear in the list of rasters
- Enter the expression and set the output raster directory and name, including the .tif extension



```
Log10("S1B_IW_RT30_20200527T233217_G_gan_VV.tif" / "S1B_IW_RT30_20200515T233216_G_gan_VV.tif")
```

# QGIS Manual Option: Raster Calculator

- Select Raster Calculator from Raster menu



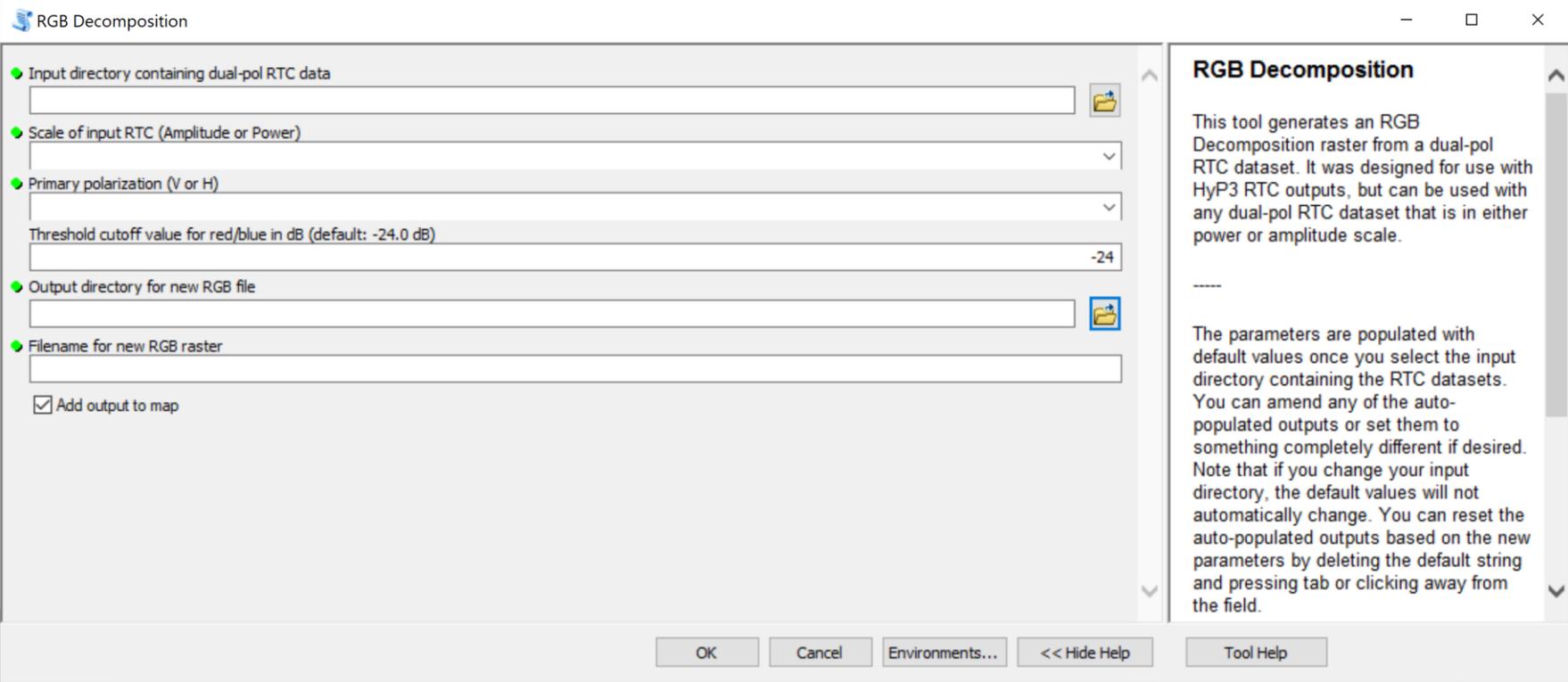
The screenshot shows the QGIS interface with the Raster menu open and the Raster Calculator dialog box displayed. The Raster Bands list contains two rasters: S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV@1 and S1B\_IW\_RT30\_20200527T233217\_G\_gan\_VV@1. The Result Layer settings are: Output layer: rial\S1B\_IW\_RT30\_20200515T233216\_20200527T233217\_G\_gan\_VV\_Manual\_QGIS\_LogDiff.tif, Output format: GeoTIFF, Selected Layer Extent: X min: 549450.00000, X Max: 837990.00000, Y min: 4708560.00000, Y max: 4927620.00000, Columns: 9618, Rows: 7302, Output CRS: EPSG:32616 - WGS 84 / UTM zone 16N, and Add result to project is checked. The Raster Calculator Expression field contains the formula:  $\log_{10} \left( \frac{\text{"S1B\_IW\_RT30\_20200527T233217\_G\_gan\_VV@1"}}{\text{"S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV@1"}} \right)$ . The expression is valid.

- The interface is similar to ArcGIS, but there are differences in expression syntax
- The rasters must be added to the QGIS project to appear in the Raster Bands list. The band is indicated, even for single-band rasters.
- Enter the expression and set the output layer directory and name, output as GeoTIFF

$\log_{10} \left( \frac{\text{"S1B\_IW\_RT30\_20200527T233217\_G\_gan\_VV@1"}}{\text{"S1B\_IW\_RT30\_20200515T233216\_G\_gan\_VV@1"}} \right)$

# Complex Tools: RGB Decomposition

- Complex workflow, based on ASF's method of dual-pol RGB Decomposition: [https://github.com/ASFHyP3/hyp3-lib/blob/master/docs/rgb\\_decomposition.md](https://github.com/ASFHyP3/hyp3-lib/blob/master/docs/rgb_decomposition.md)
- Recent addition to the Toolbox
- In general, water is blue, vegetation is green, urban areas more red
  - Dry and frozen areas can be misleadingly blue



**RGB Decomposition**

• Input directory containing dual-pol RTC data

• Scale of input RTC (Amplitude or Power)

• Primary polarization (V or H)

Threshold cutoff value for red/blue in dB (default: -24.0 dB)

-24

• Output directory for new RGB file

• Filename for new RGB raster

Add output to map

**RGB Decomposition**

This tool generates an RGB Decomposition raster from a dual-pol RTC dataset. It was designed for use with HyP3 RTC outputs, but can be used with any dual-pol RTC dataset that is in either power or amplitude scale.

-----

The parameters are populated with default values once you select the input directory containing the RTC datasets. You can amend any of the auto-populated outputs or set them to something completely different if desired. Note that if you change your input directory, the default values will not automatically change. You can reset the auto-populated outputs based on the new parameters by deleting the default string and pressing tab or clicking away from the field.

OK Cancel Environments... << Hide Help Tool Help

# Complex Tools: Water Mask from RGB Decomposition

- Uses RGB Decomposition values to identify water
- Beta: Can be downloaded from GitHub if you'd like to try it out

This approach will be subject to the same color limitations as RGB Decomposition:

- Desert is often identified as water
- Frozen ground may be interpreted as water

Water Mask from RGB

• RGB Decomposition raster to be used to generate water mask

Cutoff value for blue (default: >25) 25

Cutoff value for green (default: <105) 105

Cutoff value for red (default: >1) 1

• Output directory for new water mask file

• Filename for new RGB raster

Add output to map

**Water Mask from RGB**

This tool generates a water mask from an RGB Decomposition image. The expected input is a 3-band GeoTIFF generated using the RGB Decomposition tool in this toolbox, though any RGB Decomposition GeoTIFF generated using ASF's calculation method can be used.

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There are default cutoff values set for each color band which should work well for most inputs, but adjustments may need to be made to the values to accommodate specific locations and water conditions if the default values don't perform well.

OK Cancel Environments... << Hide Help Tool Help

[https://github.com/ASFHyP3/GIS-tools/tree/RGB\\_WaterMask](https://github.com/ASFHyP3/GIS-tools/tree/RGB_WaterMask)

# Other resources

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- Data Recipe for mapping water using ALOS PALSAR RTC:  
<https://asf.alaska.edu/how-to/data-recipes/how-to-map-regional-inundation-with-spaceborne-l-band-sar-using-arcgis/>
- More information about On-Demand Processing in Vertex:  
<https://asfhyp3.github.io/using/vertex/>
- Webinar recording including some of this content:  
<https://earthdata.adobeconnect.com/p7heudoyqqey/>

# QUESTIONS?

<https://www.asf.alaska.edu/>

<https://www.asf.alaska.edu/contact/>

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Image: Hurricane Florence Color Decomposition, ASF DAAC 2018.  
Contains modified Copernicus Sentinel data 2018, processed by ESA  
Basemap: National Geographic

