

Review of Valles Marineris HRSC DTM and ORIs

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1 Packages

```
library( 'raster' )  
  
## Loading required package: sp
```

2 Inventory

```
system2( 'ls', args = '-s --block-size=MB ../dat/VM-HRSC', stdout = TRUE )  
  
## [1] "total 9605MB" "9605MB VM-HRSC-DTM-Mosaic.tif"  
## [3] " 1MB VM-HRSC-ORI-mosaic-tiles"  
  
system2( 'ls',  
  args = '-s --block-size=MB ../dat/VM-HRSC/VM-HRSC-ORI-mosaic-tiles',  
  stdout = TRUE )  
  
## [1] "total 128523MB" " 1MB _maplayers.qlr"  
## [3] "4285MB tile_-005+000.tif" "4285MB tile_-005-001.tif"  
## [5] "4285MB tile_-005-002.tif" "4285MB tile_-005-003.tif"  
## [7] "4285MB tile_-006+000.tif" "4285MB tile_-006-001.tif"  
## [9] "4285MB tile_-006-002.tif" "4285MB tile_-006-003.tif"  
## [11] "4285MB tile_-007+000.tif" "4285MB tile_-007-001.tif"
```

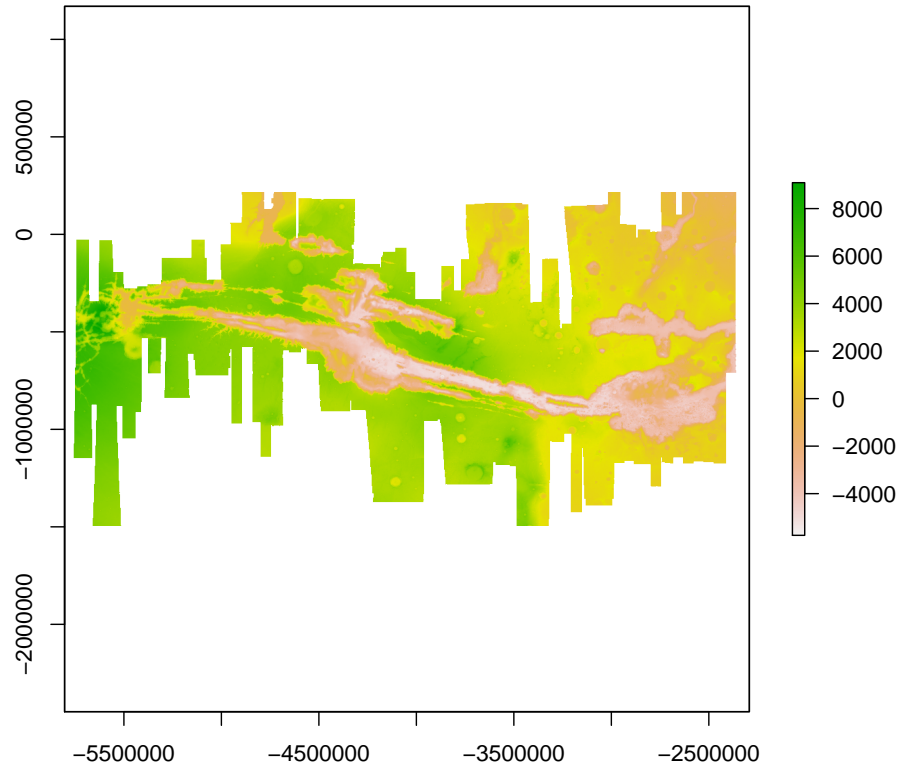
```
## [13] "4285MB tile_-007-002.tif" "4285MB tile_-007-003.tif"
## [15] "4285MB tile_-008+000.tif" "4285MB tile_-008-001.tif"
## [17] "4285MB tile_-008-002.tif" "4285MB tile_-008-003.tif"
## [19] "4285MB tile_-009+000.tif" "4285MB tile_-009-001.tif"
## [21] "4285MB tile_-009-002.tif" "4285MB tile_-009-003.tif"
## [23] "4285MB tile_-010+000.tif" "4285MB tile_-010-001.tif"
## [25] "4285MB tile_-010-002.tif" "4285MB tile_-010-003.tif"
## [27] "4285MB tile_-011-001.tif" "4285MB tile_-011-002.tif"
## [29] "4285MB tile_-011-003.tif" "4285MB tile_-012-001.tif"
## [31] "4285MB tile_-012-002.tif" "4285MB tile_-012-003.tif"
```

3 DTM

```
dtm = raster( './dat/VM-HRSC/VM-HRSC-DTM-Mosaic.tif' )
dtm

## class      : RasterLayer
## dimensions : 34181, 70241, 2400907621  (nrow, ncol, ncell)
## resolution : 50, 50  (x, y)
## extent     : -5804218, -2292168, -1493824, 215225.9  (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000 +units=m +no_defs
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-DTM-Mosaic.tif
## names      : VM.HRSC.DTM.Mosaic

plot( dtm )
```

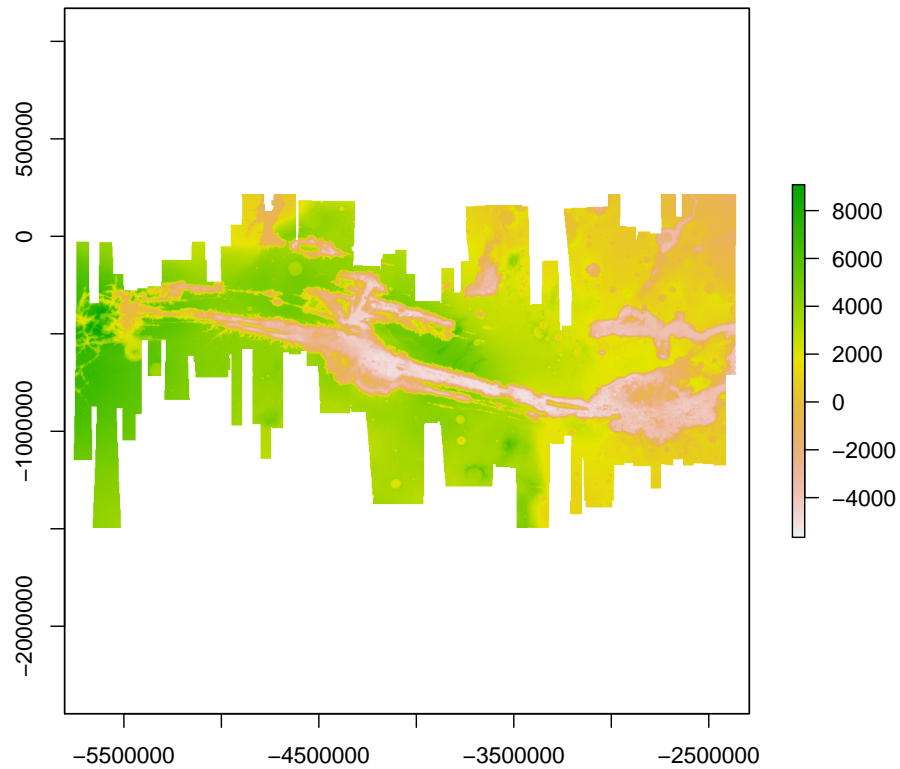


The DTM is very big. Any operation on it takes ages. I want to reproject it to lon/lat to check coordinates, but before I reduce the size:

```
dtm_sml = aggregate( dtm, 10 )
dtm_sml

## class      : RasterLayer
## dimensions : 3419, 7025, 24018475  (nrow, ncol, ncell)
## resolution : 500, 500  (x, y)
## extent     : -5804218, -2291718, -1494274, 215225.9  (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000 +units=m +no_defs
## source     : /tmp/RtmpTXV1Vd/raster/r_tmp_2021-05-18_182054_8432_70916.grd
## names      : VM.HRSC.DTM.Mosaic
## values     : -5927.309, 9147.112  (min, max)

plot( dtm_sml )
```



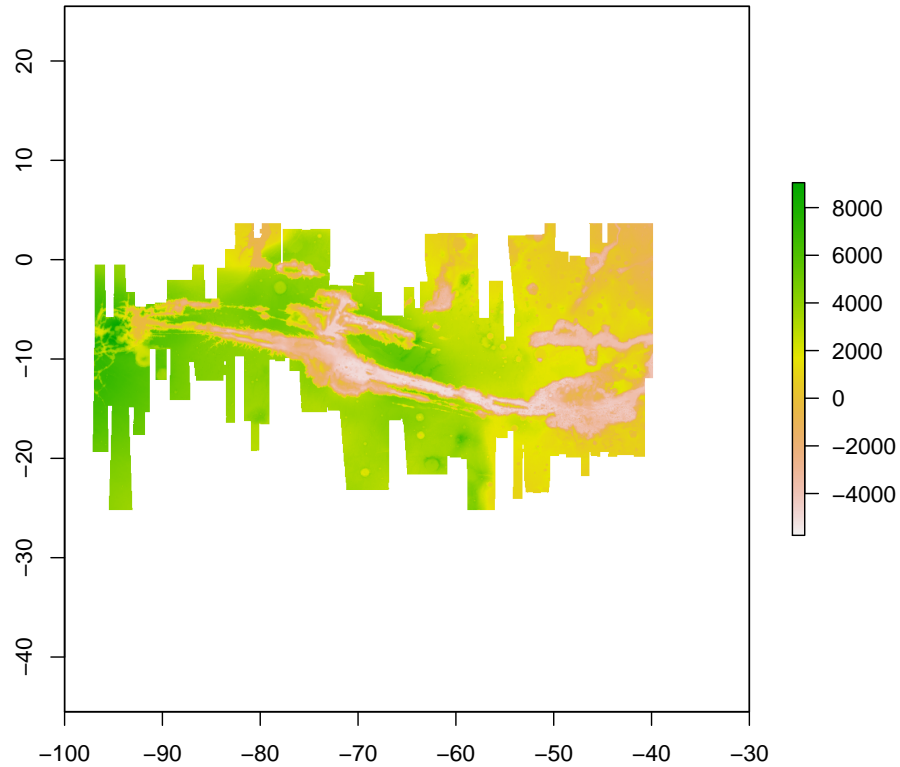
```

dtm_lonlat = raster( nrow = 3400, ncol = 7000 )
xmin( dtm_lonlat ) = -100
xmax( dtm_lonlat ) = -30
ymin( dtm_lonlat ) = -30
ymax( dtm_lonlat ) = 10
dtm_lonlat = projectRaster( dtm_sml, dtm_lonlat,
                           crs='+proj=lonlat +R=3396000' )
dtm_lonlat

## class      : RasterLayer
## dimensions : 3400, 7000, 23800000 (nrow, ncol, ncell)
## resolution : 0.01, 0.01176471 (x, y)
## extent     : -100, -30, -30, 10 (xmin, xmax, ymin, ymax)
## crs        : +proj=longlat +datum=WGS84 +ellps=WGS84 +towgs84=0,0,0
## source     : memory
## names      : VM.HRSC.DTM.Mosaic
## values     : -5897.058, 9132.781 (min, max)

plot( dtm_lonlat )

```



4 Mosaic tiles

We print and plot all 30 tiles:

```

tiles = system2( 'ls',
                 args = '../dat/VM-HRSC/VM-HRSC-ORI-mosaic-tiles',
                 stdout = TRUE )

tiles

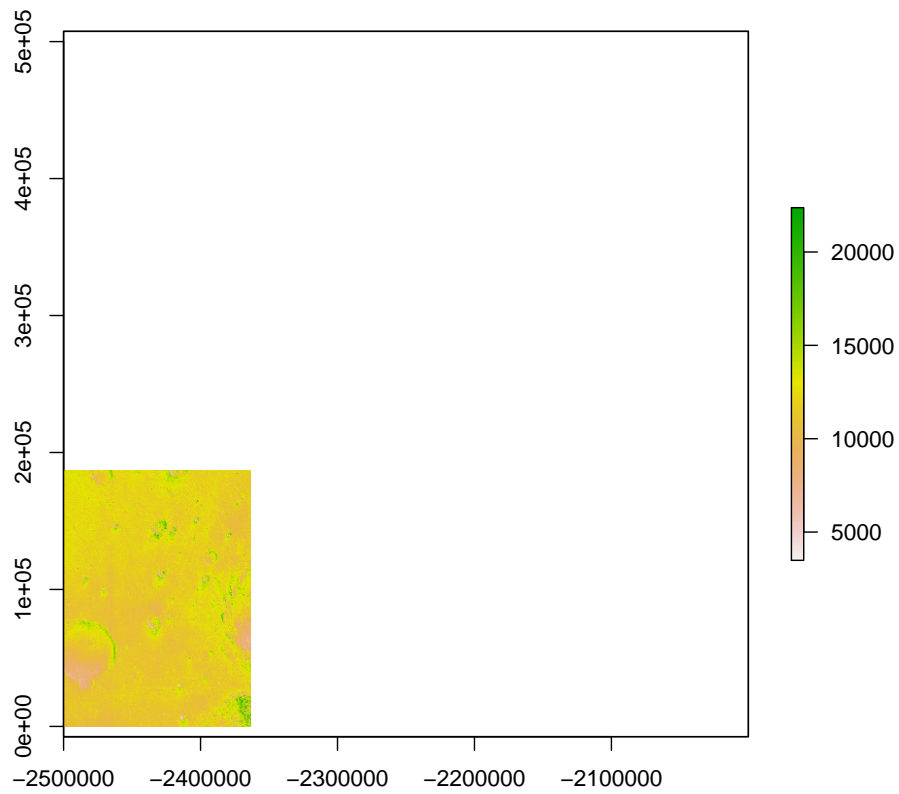
## [1] "_maplayers.qlr"      "tile_-005+000.tif" "tile_-005-001.tif"
## [4] "tile_-005-002.tif"  "tile_-005-003.tif" "tile_-006+000.tif"
## [7] "tile_-006-001.tif"  "tile_-006-002.tif" "tile_-006-003.tif"
## [10] "tile_-007+000.tif"  "tile_-007-001.tif" "tile_-007-002.tif"
## [13] "tile_-007-003.tif"  "tile_-008+000.tif" "tile_-008-001.tif"
## [16] "tile_-008-002.tif"  "tile_-008-003.tif" "tile_-009+000.tif"
## [19] "tile_-009-001.tif"  "tile_-009-002.tif" "tile_-009-003.tif"

```

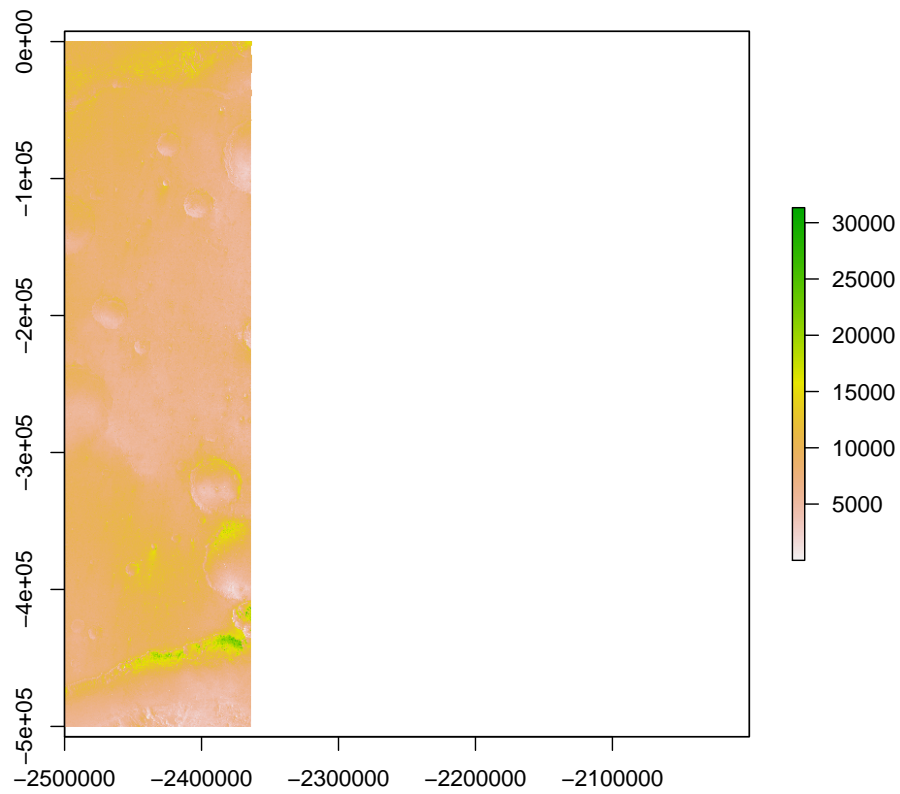
```
## [22] "tile_-010+000.tif" "tile_-010-001.tif" "tile_-010-002.tif"
## [25] "tile_-010-003.tif" "tile_-011-001.tif" "tile_-011-002.tif"
## [28] "tile_-011-003.tif" "tile_-012-001.tif" "tile_-012-002.tif"
## [31] "tile_-012-003.tif"
```

```
for( i in 2:31 ) { # 31 ) {
  print( tiles[i] )
  tile = raster( paste( '../dat/VM-HRSC/VM-HRSC-ORI-mosaic-tiles', tiles[i],
                        sep = '/' ) )
  print( tile )
  plot( tile )
}
```

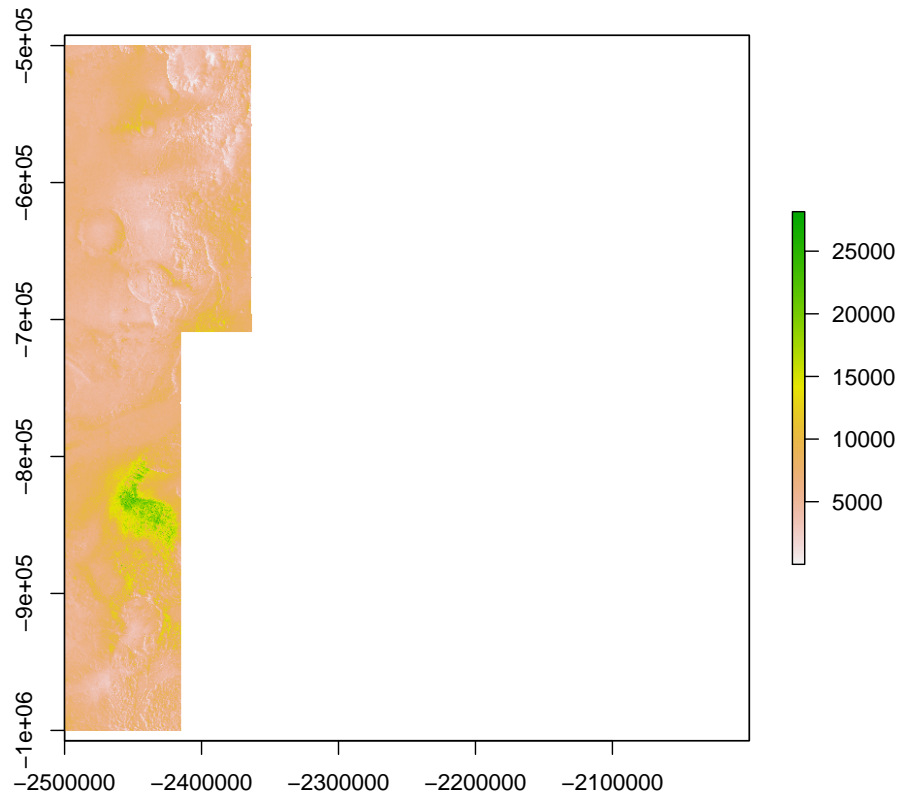
```
## [1] "tile_-005+000.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -2500006, -2000006, -6.25, 499993.8 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-005+000.tif
## names      : tile_.005.000
## values     : 0, 28000 (min, max)
```



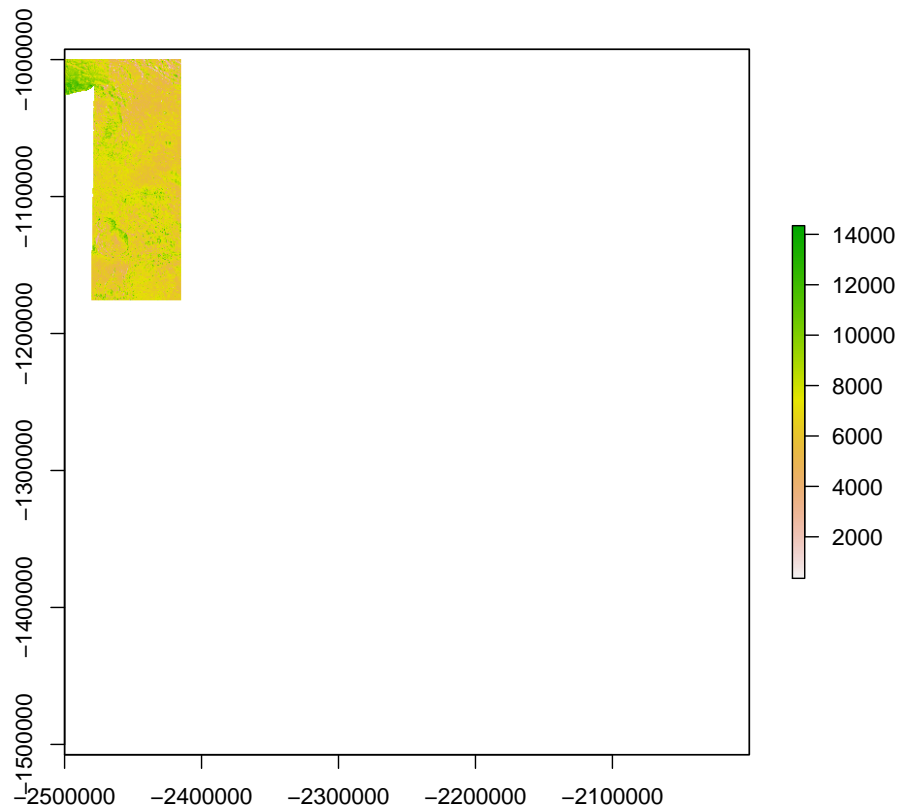
```
## [1] "tile_-005-001.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -2500006, -2000006, -500006.2, -6.25 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-005-001.tif
## names      : tile_.005.001
## values     : 0, 28000 (min, max)
```



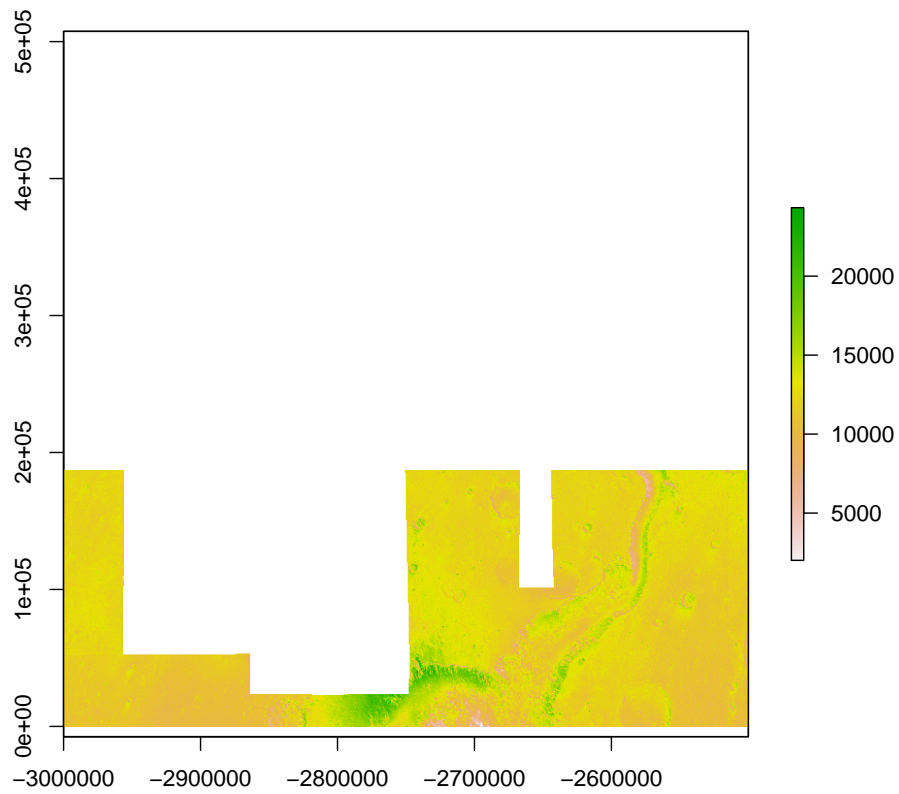
```
## [1] "tile_-005-002.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -2500006, -2000006, -1000006, -500006.2 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-005-002.tif
## names      : tile_.005.002
## values     : 0, 28000 (min, max)
```

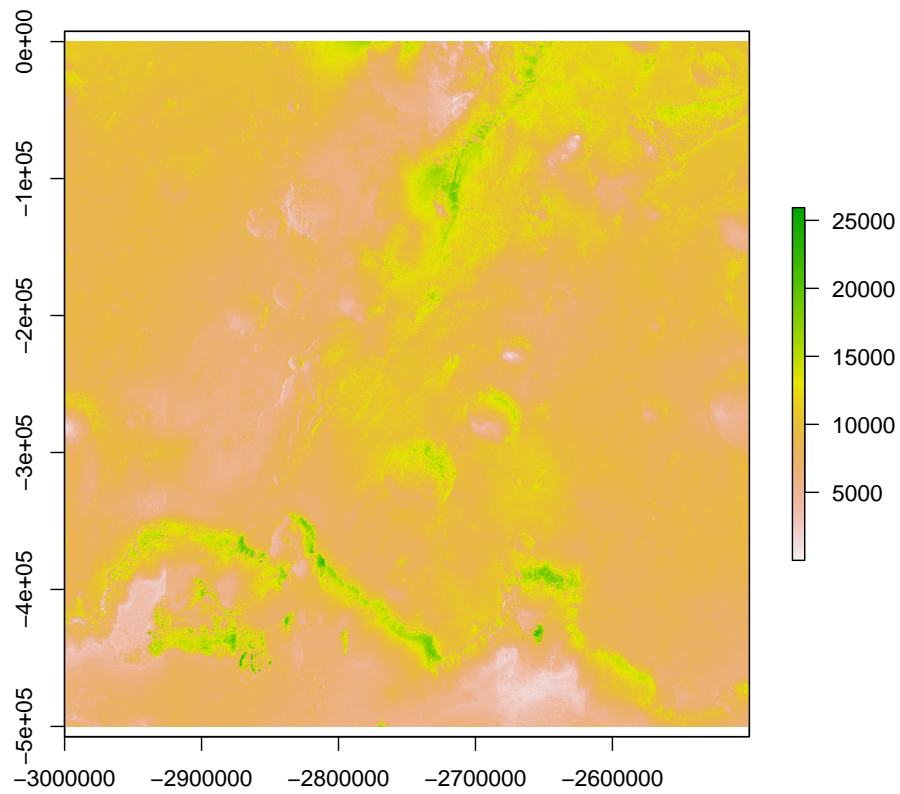
```
## [1] "tile_-005-003.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -2500006, -2000006, -1500006, -1000006 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-005-003.tif
## names      : tile_.005.003
## values     : 0, 28000 (min, max)
```



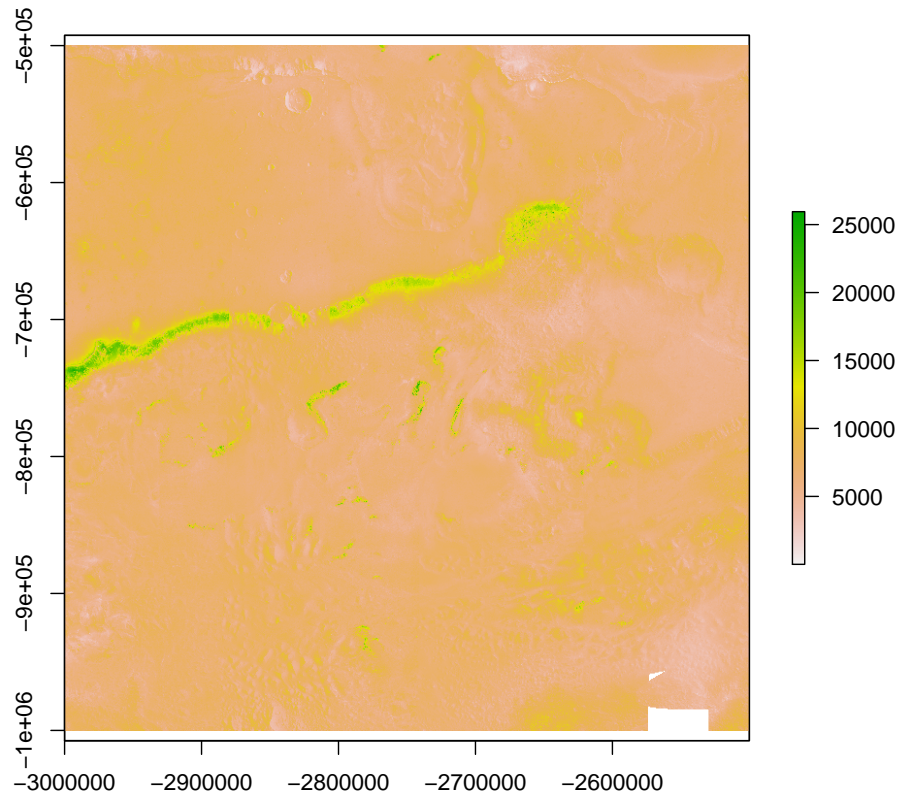
```
## [1] "tile_-006+000.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -3000006, -2500006, -6.25, 499993.8 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-006+000.tif
## names      : tile_.006.000
## values     : 0, 28000 (min, max)
```



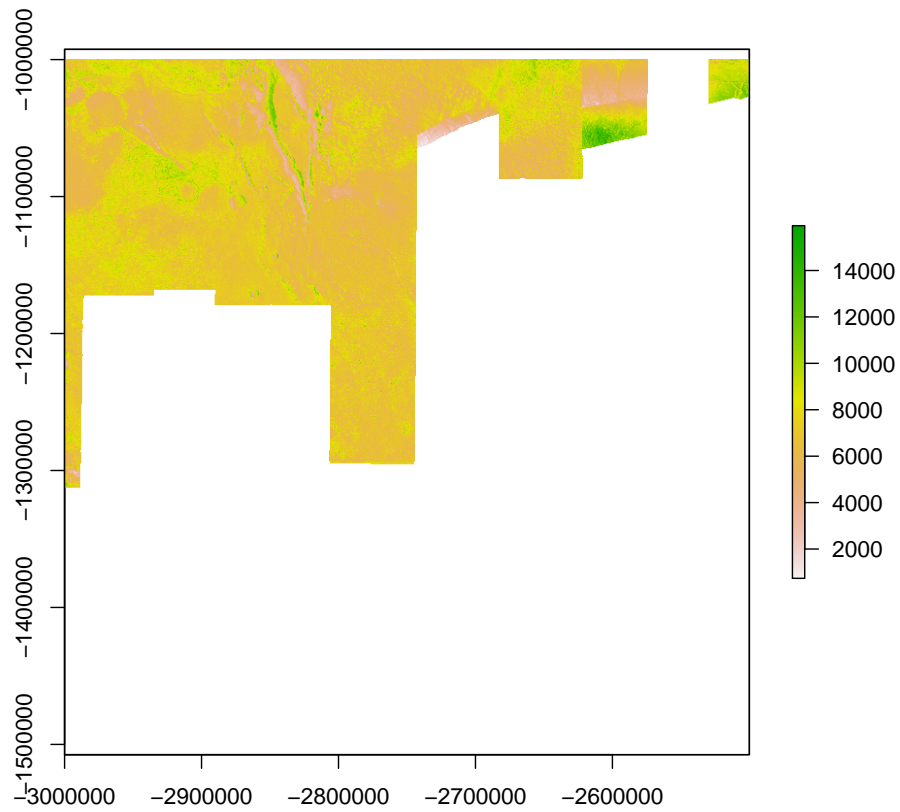
```
## [1] "tile_-006-001.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -3000006, -2500006, -500006.2, -6.25 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-006-001.tif
## names      : tile_.006.001
## values     : 0, 28000 (min, max)
```



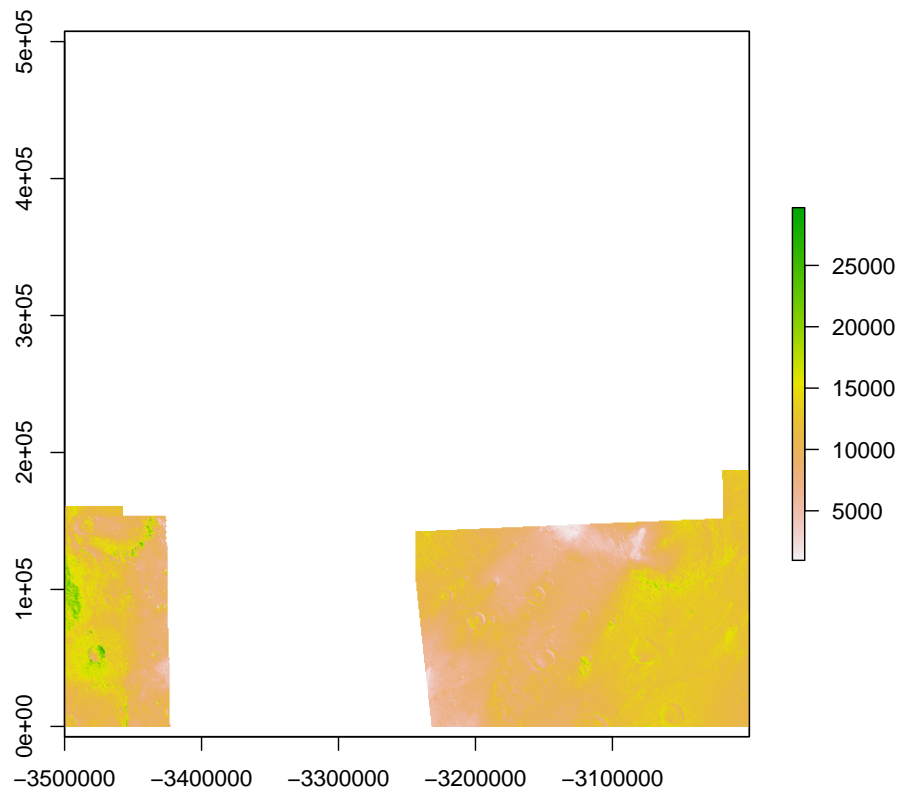
```
## [1] "tile_-006-002.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -3000006, -2500006, -1000006, -500006.2 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-006-002.tif
## names      : tile_.006.002
## values     : 0, 28000 (min, max)
```



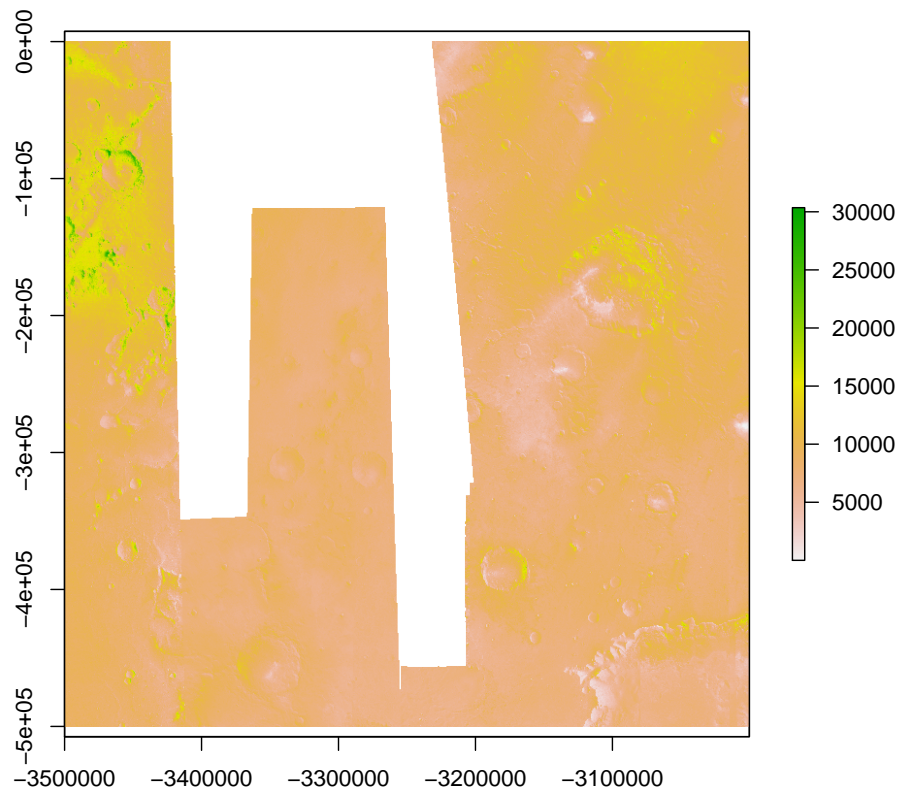
```
## [1] "tile_-006-003.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -3000006, -2500006, -1500006, -1000006 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-006-003.tif
## names      : tile_.006.003
## values     : 0, 28000 (min, max)
```



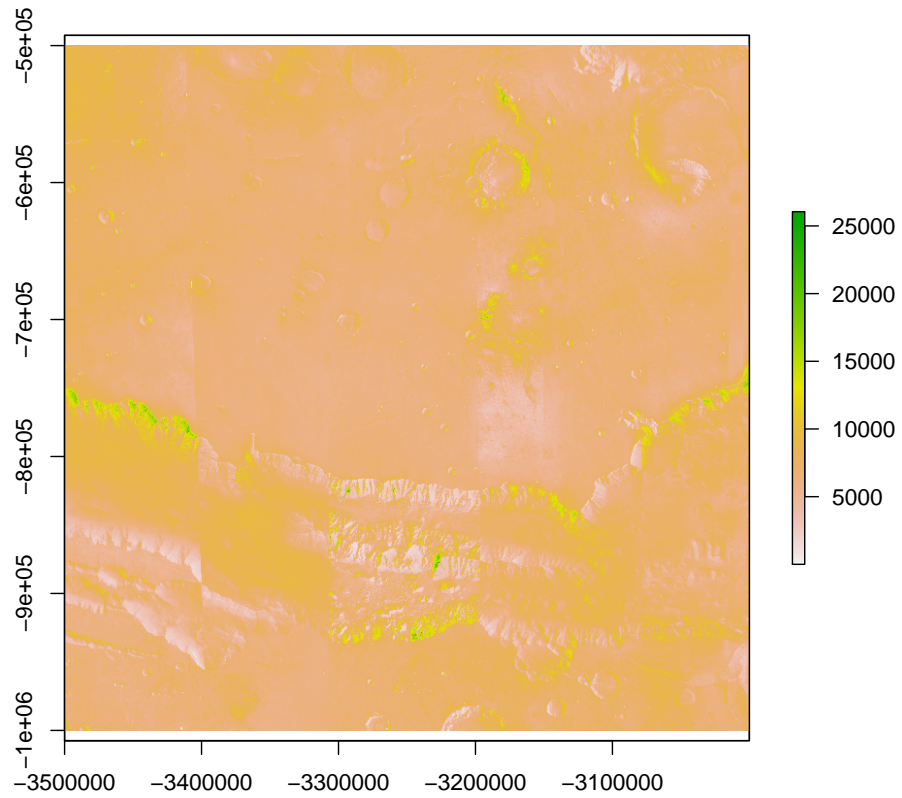
```
## [1] "tile_-007+000.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -3500006, -3000006, -6.25, 499993.8 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-007+000.tif
## names      : tile_.007.000
## values     : 0, 28000 (min, max)
```



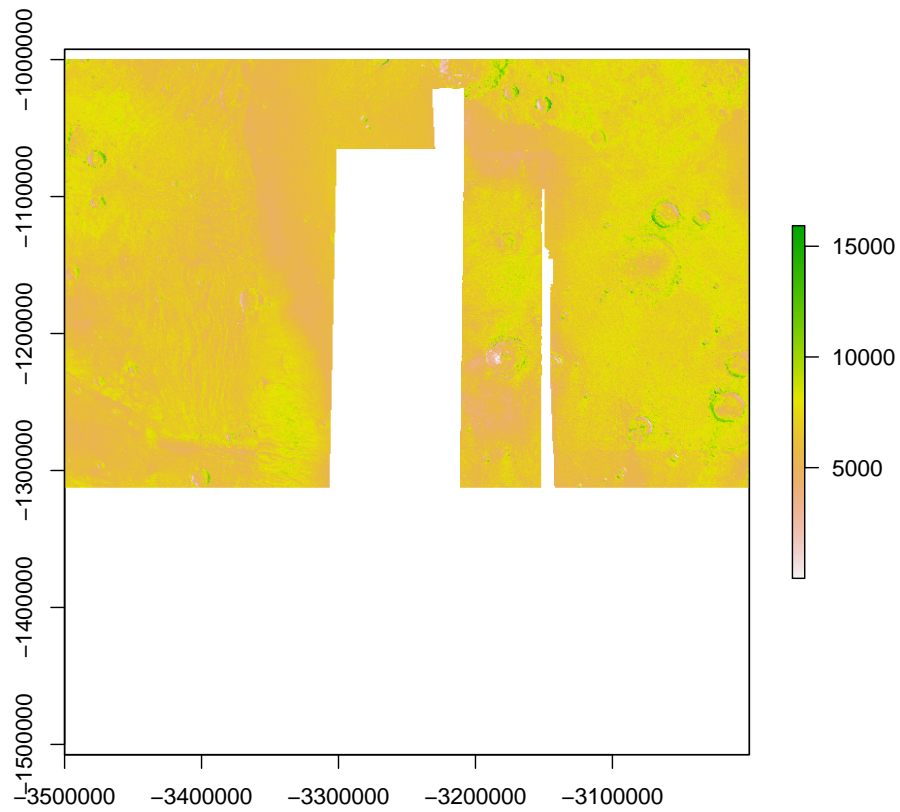
```
## [1] "tile_-007-001.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -3500006, -3000006, -500006.2, -6.25 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-007-001.tif
## names      : tile_.007.001
## values     : 0, 28000 (min, max)
```



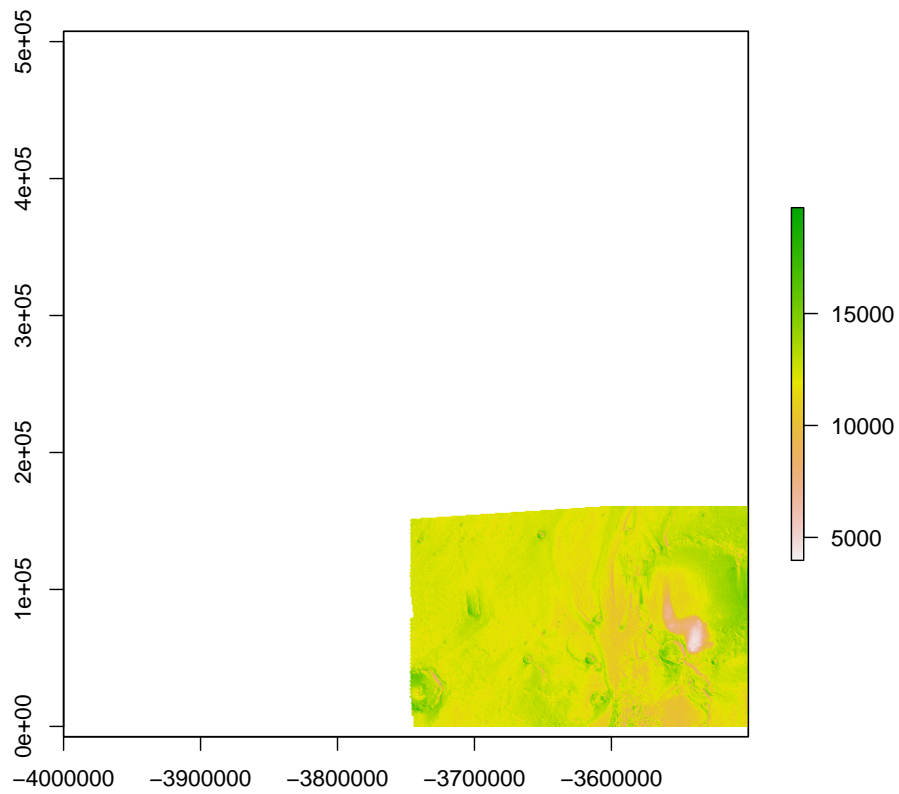
```
## [1] "tile_-007-002.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -3500006, -3000006, -1000006, -500006.2 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-007-002.tif
## names      : tile_.007.002
## values     : 0, 28000 (min, max)
```

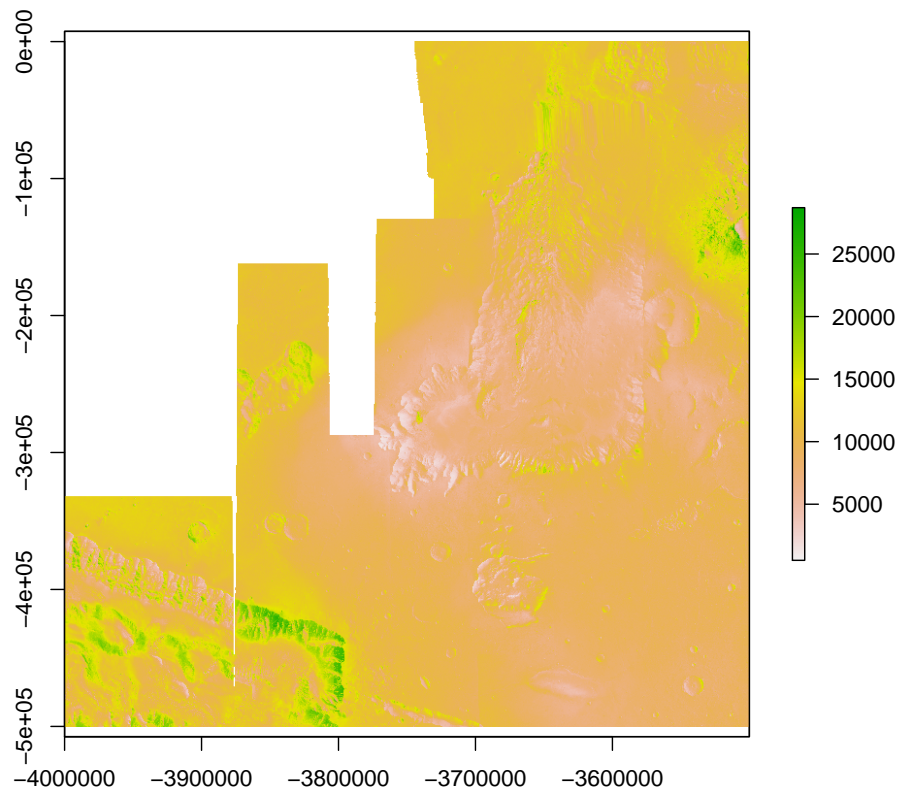
```
## [1] "tile_-007-003.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -3500006, -3000006, -1500006, -1000006 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-007-003.tif
## names      : tile_.007.003
## values     : 0, 28000 (min, max)
```



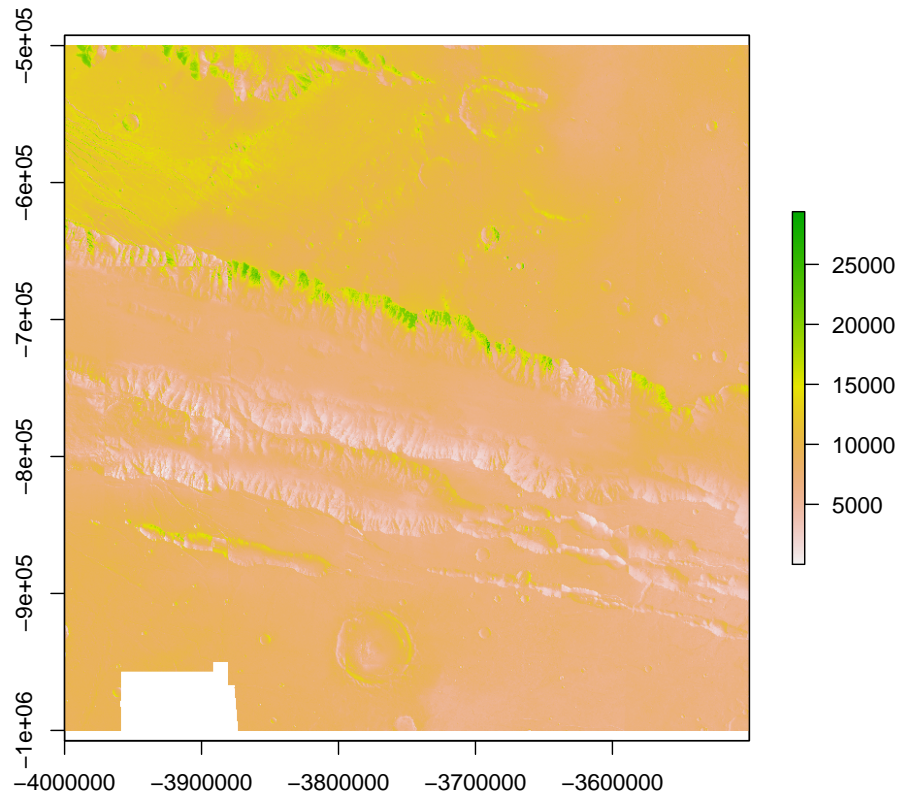
```
## [1] "tile_-008+000.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -4000006, -3500006, -6.25, 499993.8 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-008+000.tif
## names      : tile_.008.000
## values     : 0, 28000 (min, max)
```



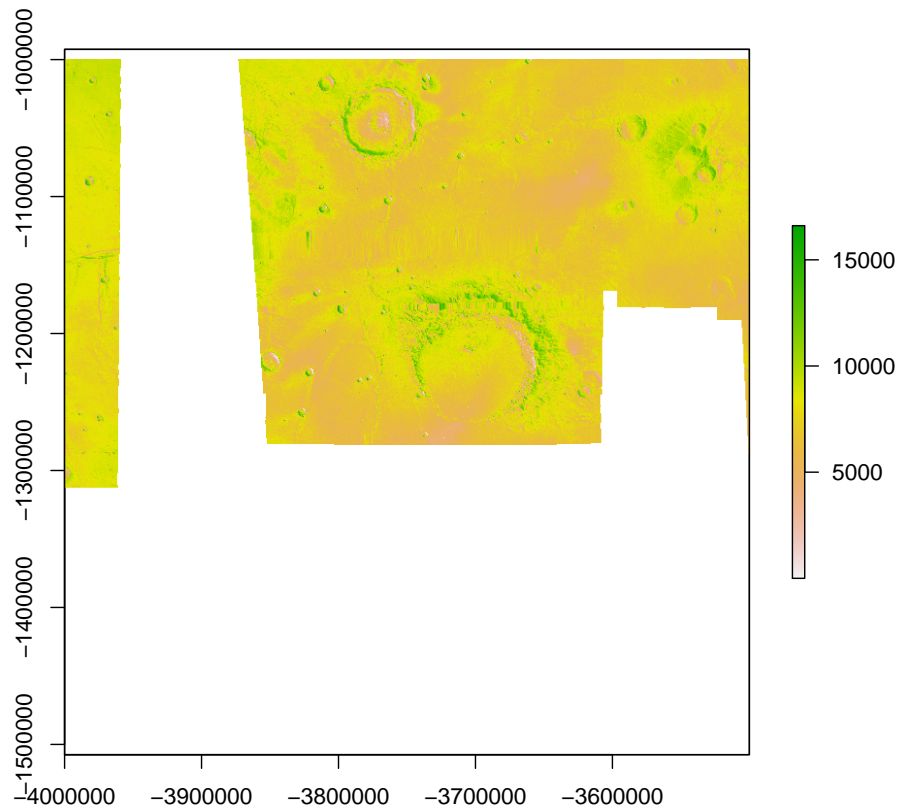
```
## [1] "tile_-008-001.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -4000006, -3500006, -500006.2, -6.25 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-008-001.tif
## names      : tile_.008.001
## values     : 0, 28000 (min, max)
```



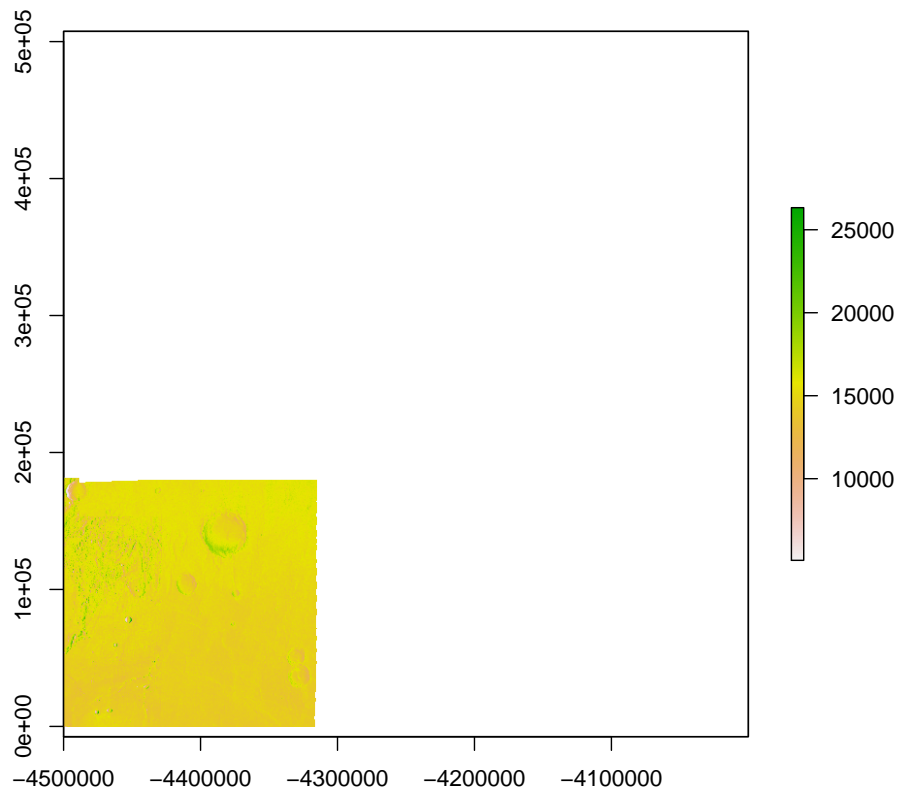
```
## [1] "tile_-008-002.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -4000006, -3500006, -1000006, -500006.2 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-008-002.tif
## names      : tile_.008.002
## values     : 0, 28000 (min, max)
```



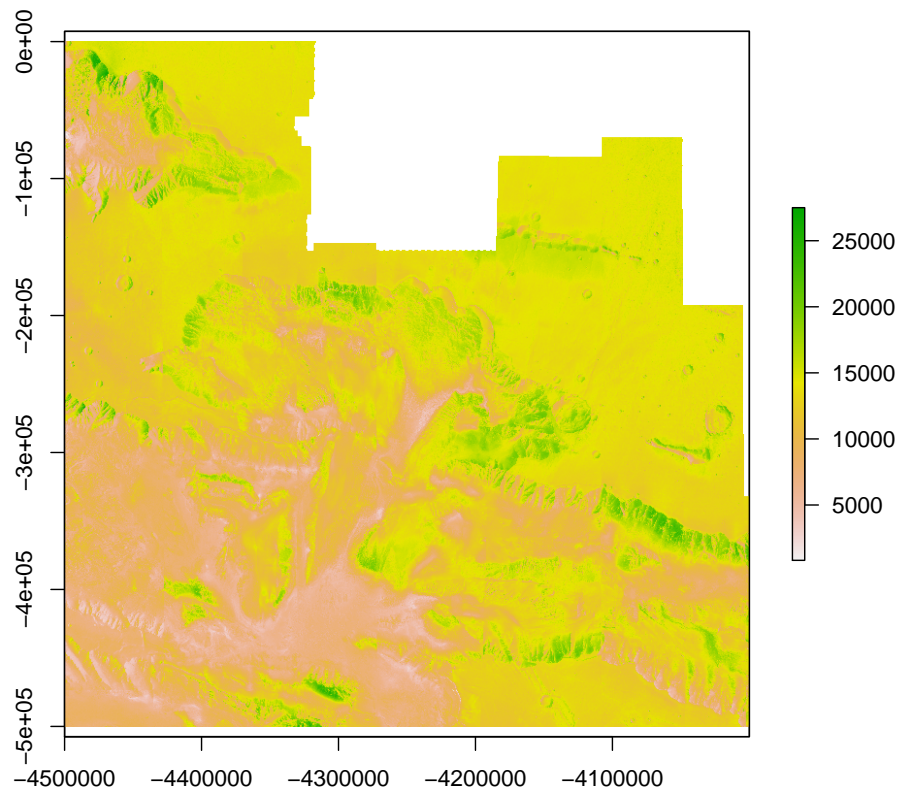
```
## [1] "tile_-008-003.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -40000006, -35000006, -15000006, -10000006 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-008-003.tif
## names      : tile_.008.003
## values     : 0, 28000 (min, max)
```



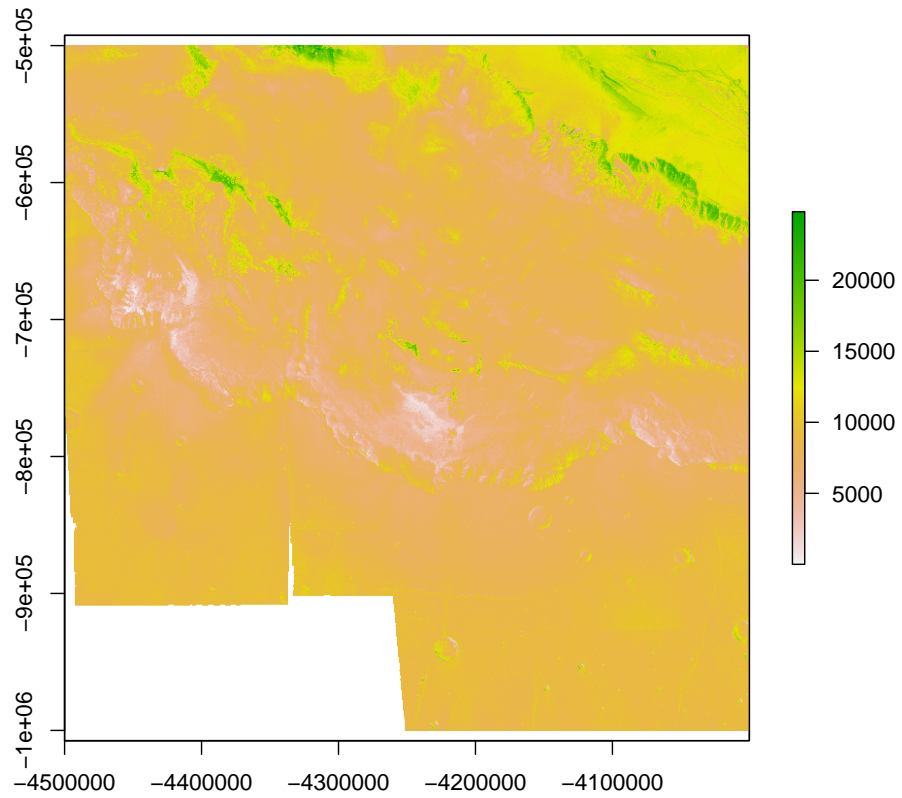
```
## [1] "tile_-009+000.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -4500006, -4000006, -6.25, 499993.8 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-009+000.tif
## names      : tile_.009.000
## values     : 0, 28000 (min, max)
```



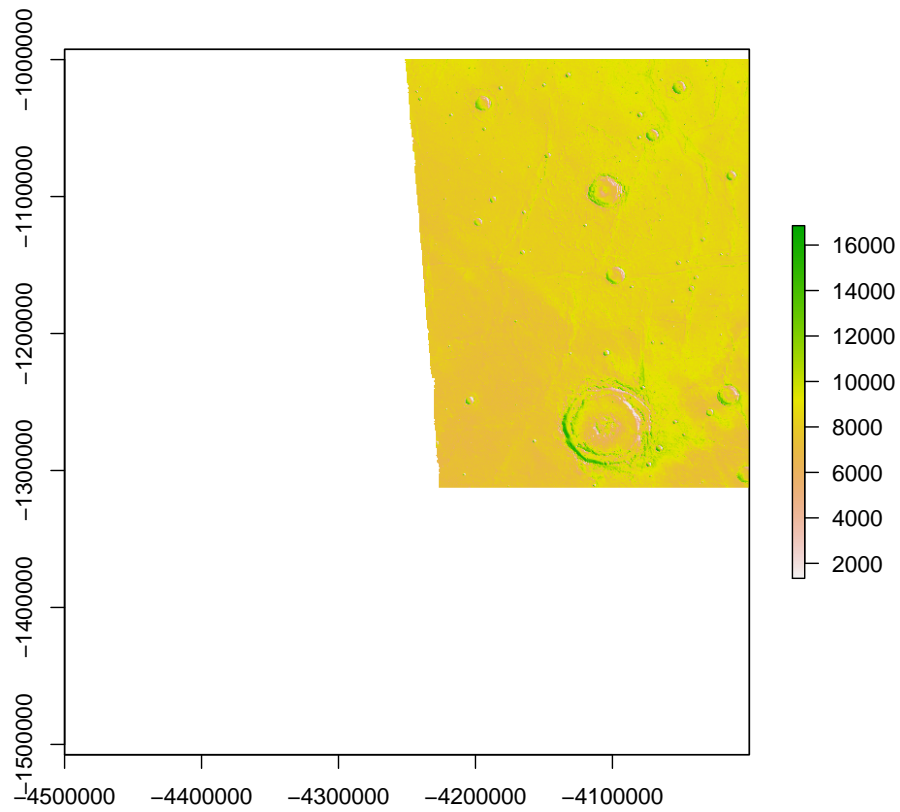
```
## [1] "tile_-009-001.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -4500006, -4000006, -500006.2, -6.25 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-009-001.tif
## names      : tile_.009.001
## values     : 0, 28000 (min, max)
```



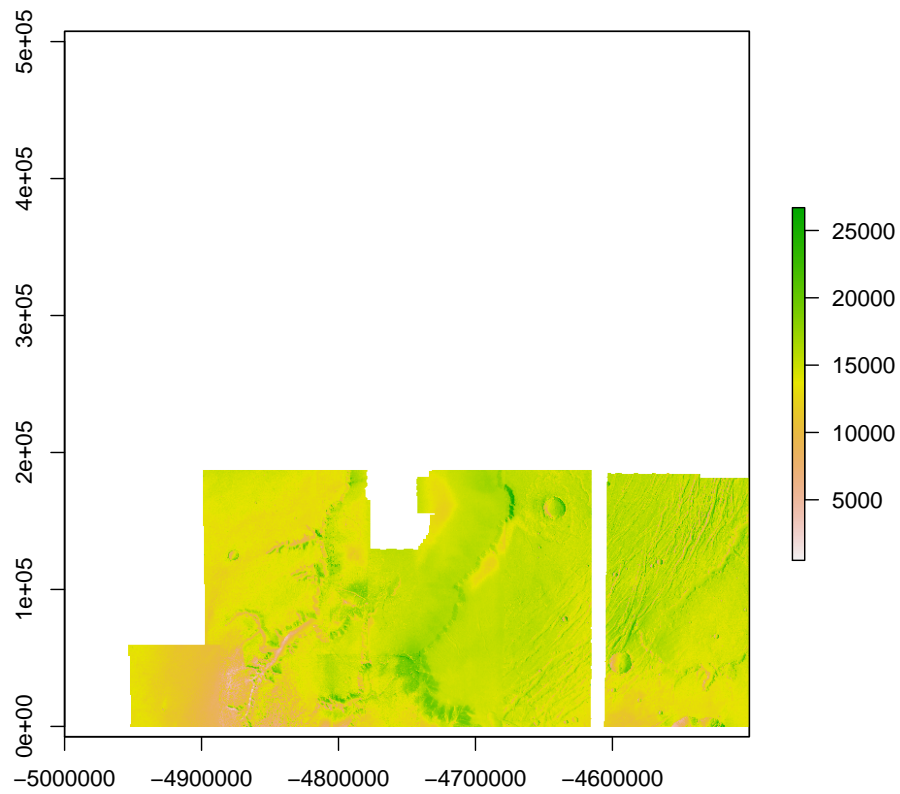
```
## [1] "tile_-009-002.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -4500006, -4000006, -1000006, -500006.2 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-009-002.tif
## names      : tile_.009.002
## values     : 0, 28000 (min, max)
```

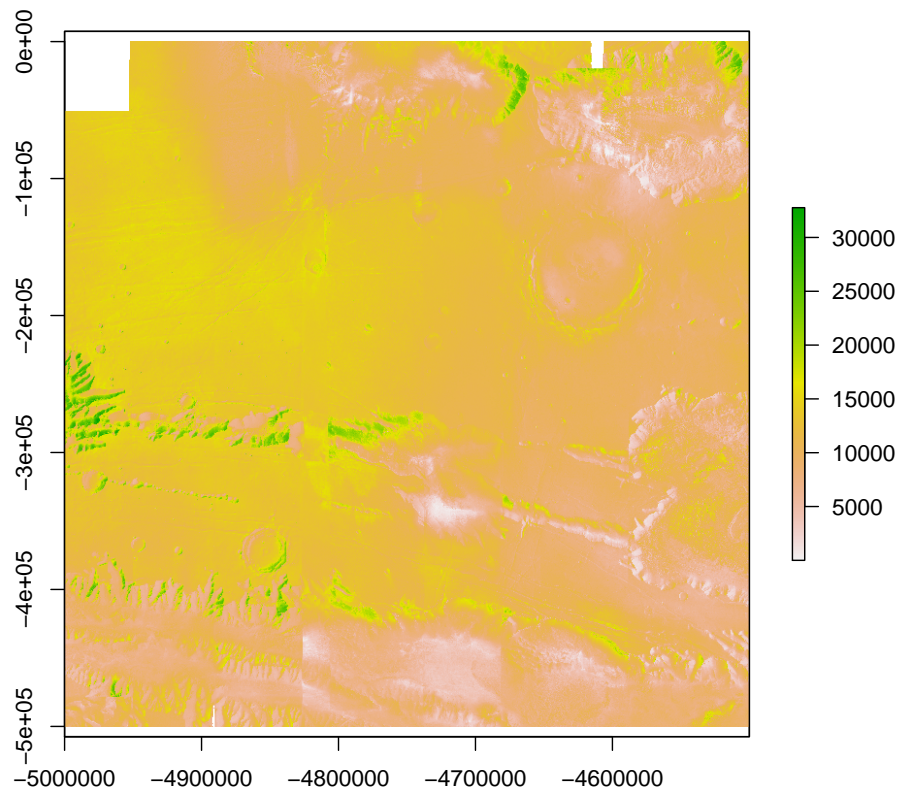
```
## [1] "tile_-009-003.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -4500006, -4000006, -1500006, -1000006 (xmin, xmax, ymin, ymax)
## crs       : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source    : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-009-003.tif
## names     : tile_.009.003
## values    : 0, 28000 (min, max)
```



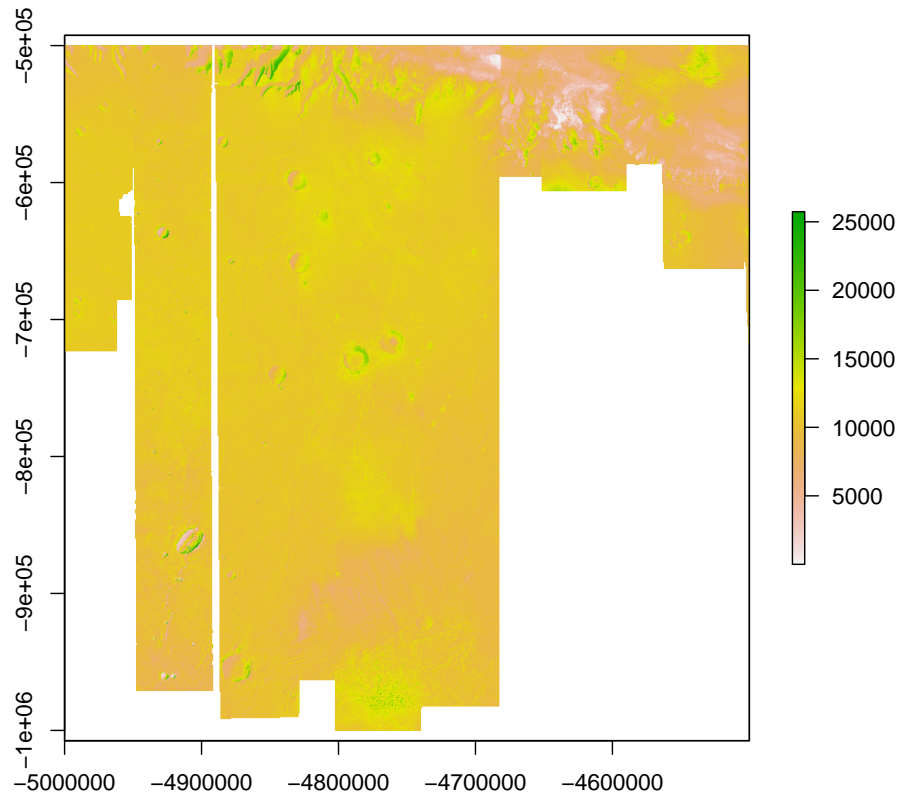
```
## [1] "tile_-010+000.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -5000006, -4500006, -6.25, 499993.8 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-010+000.tif
## names      : tile_.010.000
## values     : 0, 28000 (min, max)
```



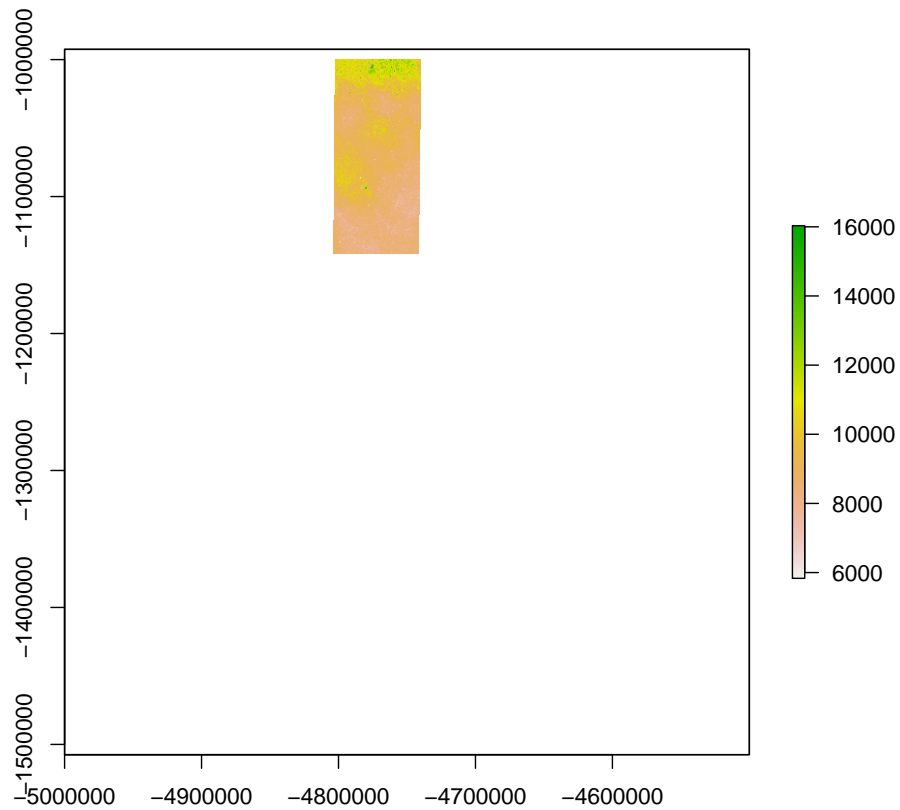
```
## [1] "tile_-010-001.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -5000006, -4500006, -500006.2, -6.25 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-010-001.tif
## names      : tile_.010.001
## values     : 0, 28000 (min, max)
```



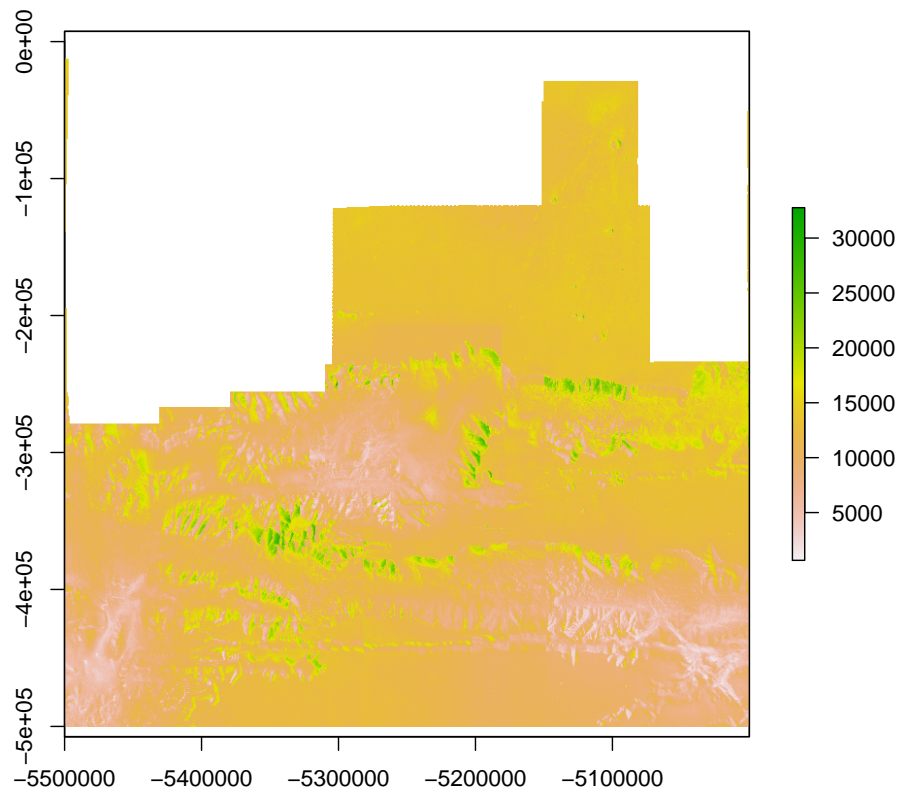
```
## [1] "tile_-010-002.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -5000006, -4500006, -1000006, -500006.2 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-010-002.tif
## names      : tile_.010.002
## values     : 0, 28000 (min, max)
```



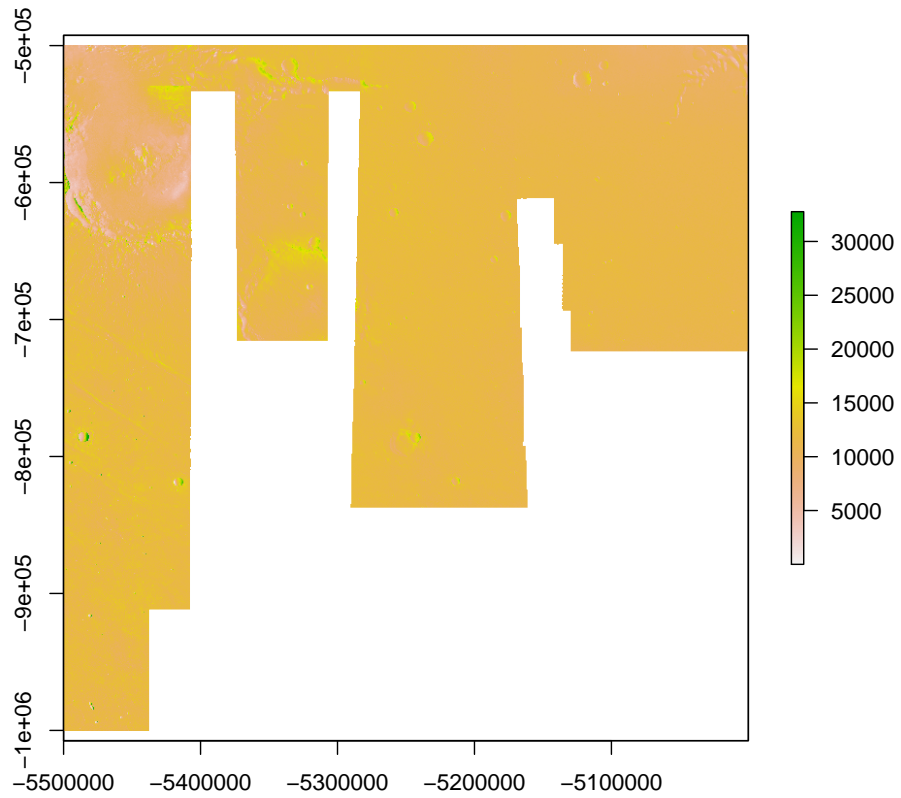
```
## [1] "tile_-010-003.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -5000006, -4500006, -1500006, -1000006 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-010-003.tif
## names      : tile_.010.003
## values     : 0, 28000 (min, max)
```



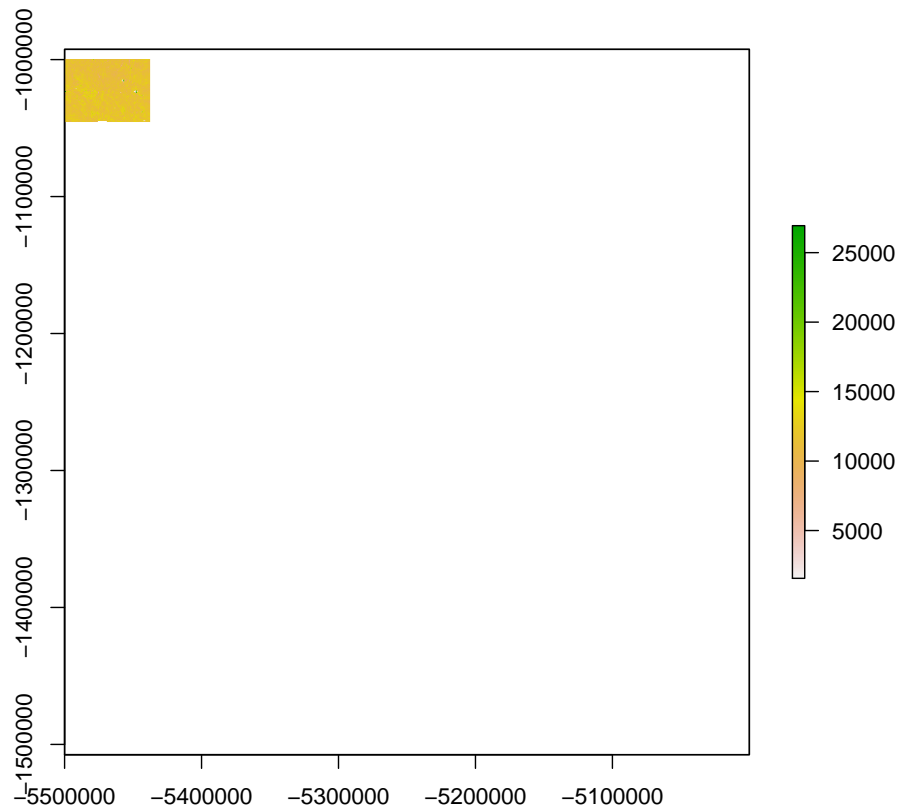
```
## [1] "tile_-011-001.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -5500006, -5000006, -500006.2, -6.25 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-011-001.tif
## names      : tile_.011.001
## values     : 0, 28000 (min, max)
```



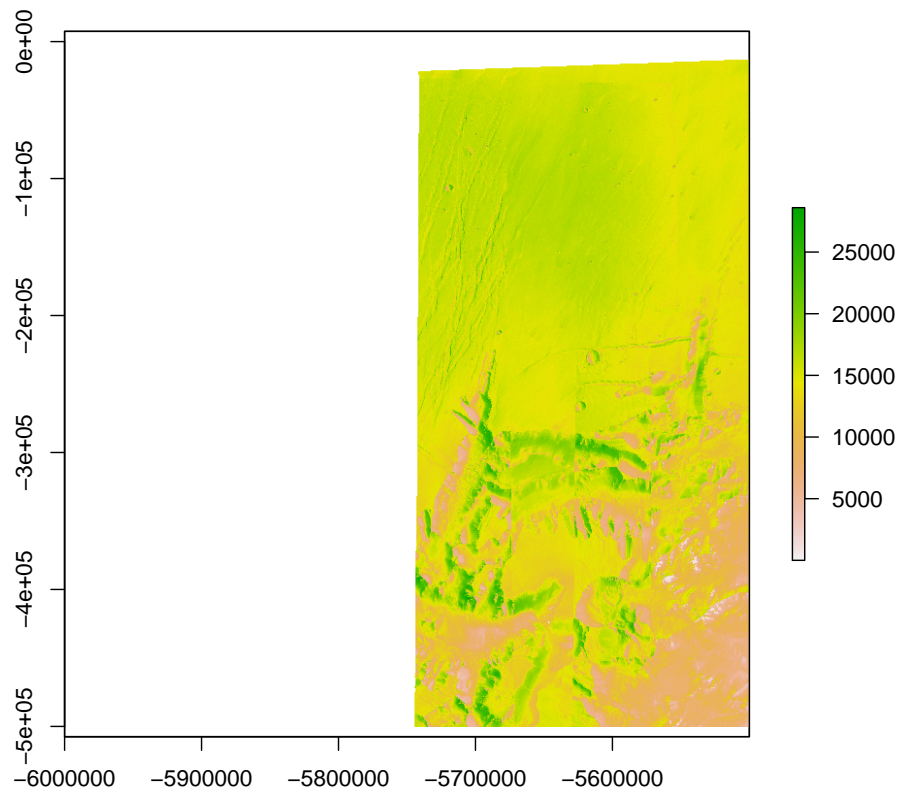
```
## [1] "tile_-011-002.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -5500006, -5000006, -1000006, -500006.2 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-011-002.tif
## names      : tile_.011.002
## values     : 0, 28000 (min, max)
```



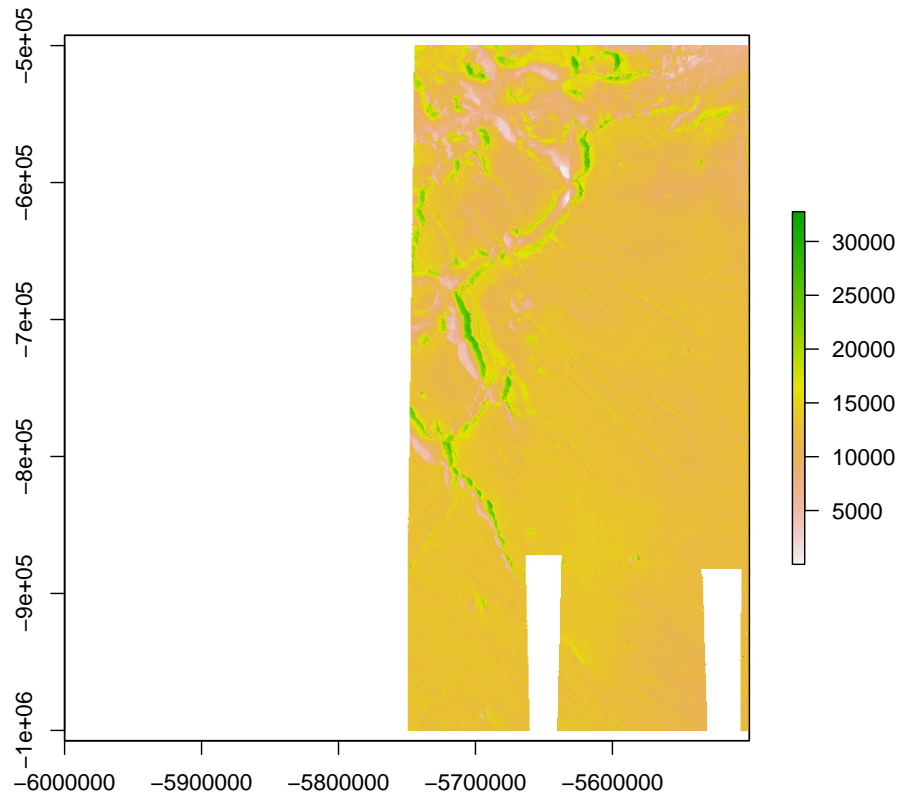
```
## [1] "tile_-011-003.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -5500006, -5000006, -1500006, -1000006 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-011-003.tif
## names      : tile_.011.003
## values     : 0, 28000 (min, max)
```

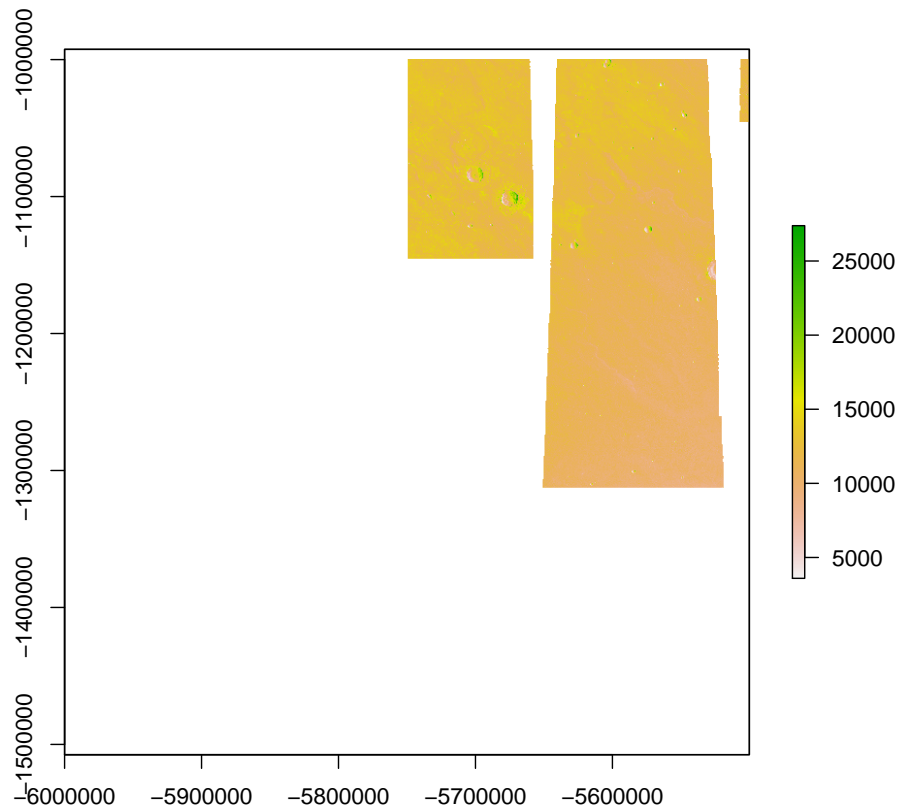
```
## [1] "tile_-012-001.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -6000006, -5500006, -500006.2, -6.25 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-012-001.tif
## names      : tile_.012.001
## values     : 0, 28000 (min, max)
```



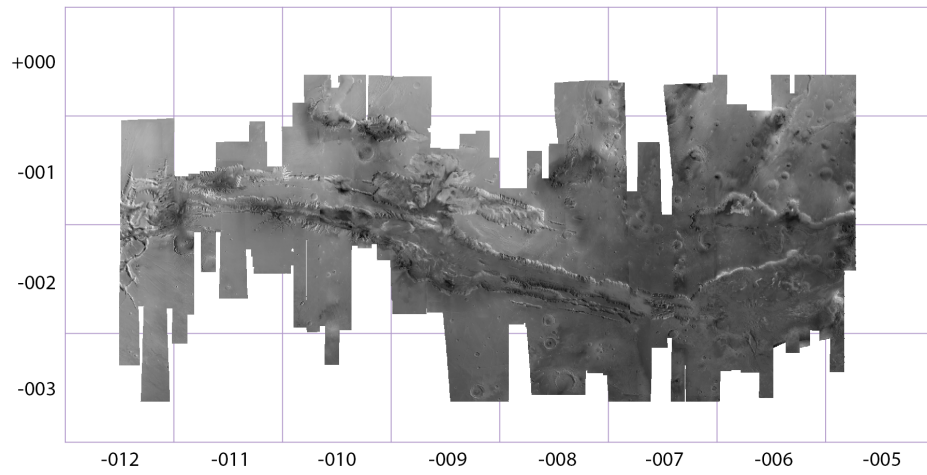
```
## [1] "tile_-012-002.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -6000006, -5500006, -1000006, -500006.2 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-012-002.tif
## names      : tile_.012.002
## values     : 0, 28000 (min, max)
```



```
## [1] "tile_-012-003.tif"
## class      : RasterLayer
## dimensions : 40000, 40000, 1.6e+09 (nrow, ncol, ncell)
## resolution : 12.5, 12.5 (x, y)
## extent     : -6000006, -5500006, -1500006, -1000006 (xmin, xmax, ymin, ymax)
## crs        : +proj=eqc +lat_ts=0 +lat_0=0 +lon_0=0 +x_0=0 +y_0=0 +a=3396000 +b=3396000
## source     : /home/bgrieger/gdrive/Valles Marineris/VM-HRSC-ORI-mosaic-tiles/tile_-012-003.tif
## names      : tile_.012.003
## values     : 0, 28000 (min, max)
```



All 30 tiles have the same resolution (12.5 m per pixel) and the same number of pixels ($40\,000 \times 40\,000$). However, the actual present data in 18 of the 30 tiles covers only significantly smaller fraction of the $40\,000 \times 40\,000$ pixel. For efficiency in data transfer and data handling, I suggested to put these tiles on smaller, appropriately sized canvases. However, after discussion with the data provider, I saw the advantage of this simple tile scheme. But to enable the user to really take advantage of it, I suggested to include a diagram illustrating the tiling scheme in the PUG. Here is what they came up with:



I think this will be a useful addition to the PUG. If the final PUG is fine, the dataset can go public.