Visit <u>https://land.copernicus.eu/en/products/corine-land-cover</u> and create an account.

| A | CORINE Land Cover 2018 (vector/raster 100 m), Europe, 6-yearly |
|---|---|
| | Provides pan-European CORINE Land Cover inventory for 44 thematic classes for the 2018 reference year. The dataset has a Minimum Mapping Unit (MMU) of 25 hectares (ha) for areal phenomena and a Minimum Mapping Width (MMW) of 100 m for linear phenomena and is available as vector and as 100 m raster data. |
| | View more Download View in the data viewer |
| | CORINE Land Cover 2012 (vector/raster 100 m), Europe, 6-yearly Provides pan-European CORINE Land Cover inventory for 44 thematic classes for the 2012 reference year. The dataset has a Minimum Mapping Unit (MMU) of 25 hectares (ha) for areal phenomena and a Minimum Mapping Width (MMW) of 100 m for linear phenomena and is available as vector and as 100 m raster data. |
| | View more Download View in the data viewer |
| | CORINE Land Cover 2006 (vector/raster 100 m), Europe, 6-yearly Provides pan-European CORINE Land Cover inventory for for 44 thematic classes the 2006 reference year. The dataset has a Minimum Mapping Unit (MMU) of 25 hectares (ha) for areal phenomena and a Minimum Mapping Width (MMW) of 100 m for linear phenomena and is available as vector and as 100 m raster data. |
| | View more Download View in the data viewer |

Download corine land cover for two years of your choice (1990, 2000, 2006, 2012 and 2018 are available). For example, I chose 2006 and 2018. When selecting "Download" it will ask you to Log in. When you log in, go to the bottom of the page and select the first one, which is a raster layer and "Add to cart".

| File | Area of interest | Version | Resolution | Туре | Format | Size |
|-------------------------------------|------------------|------------|------------|--------|---------|--------|
| ✓ u2018_clc2018_v2020_20u1_raster10 | Om Europe | v2020_20u1 | 100 m | Raster | Geotiff | 125 MB |
| u2018_clc2018_v2020_20u1_fgdb | Europe | v2020_20u1 | - | Vector | GDB | 5 GB |
| u2018_clc2018_v2020_20u1_geoPacka | age Europe | v2020_20u1 | - | Vector | GPKG | 4 GB |
| Add to cart Show cart | : | | | | | |

Go to cart, select the layer and "Process Download Request". Then select "downloading process page", find the layer and select "Download file".

| ~ | Static info | Configurable | | Projection (?) | Timeseries | |
|---|---|--------------|---------|----------------|------------|---|
| / | Name: CORINE Land Cover 2018 (vector/raster 100 m), | Type: | Raster | | | Û |
| | Europe, 6-yearly | Collection: | - | | | |
| | Source: Pre-packaged | Format: ⑦ | Geotiff | | | |
| | Area: Europe | Layer/Band: | - | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Unzip all the folders (there are many) until you end up in this structure:



Repeat all the steps for the other year of your choice. The land cover raster is in "DATA" folder, the one with TIF format.

| French_DOMs | 0 | 3/7/2024 3:21 PM | File folder | |
|--------------------------------------|---|------------------|------------------|------------|
| U2012_CLC2006_V2020_20u1.tfw | • | 3/7/2024 3:21 PM | TFW File | 1 KB |
| Q U2012_CLC2006_V2020_20u1 | • | 3/7/2024 3:21 PM | TIF File | 195,999 KB |
| U2012_CLC2006_V2020_20u1.tif.aux.xml | 0 | 3/7/2024 3:21 PM | XML File | 2 KB |
| U2012_CLC2006_V2020_20u1.tif.ovr | 0 | 3/7/2024 3:21 PM | OVR File | 46,589 KB |
| U2012_CLC2006_V2020_20u1.tif.vat.cpg | • | 3/7/2024 3:21 PM | CPG File | 1 KB |
| U2012_CLC2006_V2020_20u1.tif.vat | 0 | 3/7/2024 3:21 PM | OpenOffice.org 1 | 16 KB |
| U2012_CLC2006_V2020_20u1.tif.xml | 0 | 3/7/2024 3:21 PM | XML File | 24 KB |
| | | | | |

Open it with QGIS and this window will pop up:



Select OK. Corine uses LAEA coordinate reference system (European), but it is necessary to transform it into WGS 84, so it will overlay your island data. Right click on the layer->Export->Save as... Enter a file name and select where you want to save it. On CRS (Coordinate Reference System) select EPSG:4326 – WGS 84 and then OK. Repeat it for both years. After saving, I recommend you close the current QGIS session and open the files you just saved in another QGIS session. This will make sure your projection is in QGS 84 (you can check it at the lower right corner). Also, open the islands' shapefile.

Next step is cropping Land Cover only for the islands area.

Raster->Extraction->Clip Raster by Mask Layer. Input layer must be one of your rasters and mask layer, your islands shapefile. Data in the area outside the islands will appear black, so you need to state that all zero values must be "nodata" values. To do that, add "0" (zero) where it says, "Assign a specific nodata value to output bands". Do the same for both rasters and then save them.

Now, add a legend with all the corine categories. The raster files you downloaded include the legend layer, which assigns every value to the corine categories.

Double click on the layers you made in the previous step->Symbology and in the lower left corner:

Style->Load style. Find the "Legend" folder of downloaded corine data and select "clc_legend_qgis_raster" file and then "OK". Corine Land Cover includes three levels of data categories which are explained in the table below:

| Level 1 | Level 2 | Level 3 |
|-----------------|---------------------------------------|--|
| | 1.1 Urban fabric | 1.1.1 Continuous urban fabric |
| | 1.1 Orban fabric | 1.1.2 Discontinuous urban fabric |
| | | 1.2.1 Industrial or commercial units |
| | 1.2 Industrial, commercial and | 1.2.2 Road and rail networks and associated land |
| 1 4 | transport units | 1.2.3 Port areas |
| 1. Artificial | | 1.2.4 Airports |
| surfaces | | 1.3.1 Mineral extraction sites |
| | 1.3 Mine, dump and construction sites | 1.3.2 Dump sites |
| | | 1.3.3 Construction sites |
| | 1.4 Artificial, non-agricultural | 1.4.1 Green urban areas |
| | vegetated areas | 1.4.2 Sport and leisure facilities |
| | | 2.1.1 Non-irrigated arable land |
| | 2.1 Arable land | 2.1.2 Permanently irrigated land |
| | | 2.1.3 Rice fields |
| | | 2.2.1 Vineyards |
| | 2.2 Permanent crops | 2.2.2 Fruit trees and berry plantations |
| 2. Agricultural | | 2.2.3 Olive groves |
| areas | 2.3 Pastures | 2.3.1 Pastures |
| | | 2.4.1 Annual crops associated with permanent crops |
| | | 2.4.2 Complex cultivation patterns |
| | 2.4 Heterogeneous agricultural areas | 2.4.3 Land principally occupied by agriculture, with |
| | | 2.4.4 Agro-forestry areas |
| | | 3.1.1 Broad-leaved forest |
| | 3.1 Forests | 3.1.2 Coniferous forest |
| | | 3.1.3 Mixed forest |
| | | 3.2.1 Natural grasslands |
| | 3.2 Scrub and/or herbaceous | 3.2.2 Moors and heathland |
| 3. Forest and | vegetation associations | 3.2.3 Sclerophyllous vegetation |
| areas | | 3.2.4 Transitional woodland-shrub |
| | | 3.3.1 Beaches, dunes, sands |
| | | 3.3.2 Bare rocks |
| | 3.3 Open spaces with little or no | 3.3.3 Sparsely vegetated areas |
| | vegetation | 3.3.4 Burnt areas |
| | | 3.3.5 Glaciers and perpetual snow |
| | 4.1 Inland watlands | 4.1.1 Inland marshes |
| | 4.1 Infand wettands | 4.1.2 Peat bogs |
| 4. Wet-lands | | 4.2.1 Salt marshes |
| | 4.2 Maritime wetlands | 4.2.2 Salines |
| | | 4.2.3 Intertidal flats |
| | 5.1 Inland waters | 5.1.1 Water courses |
| | | 5.1.2 Water bodies |
| 5. Water bodies | | 5.2.1 Coastal lagoons |
| | 5.2 Marine waters | 5.2.2 Estuaries |
| | | 5.2.3 Sea and ocean |

In the map you see Level 3 categories. There is a way converting your data into the first level.

Enable "Processing Toolbox Panel" when you right click on the empty grey area at the upper menu. When it appears, search for "reclassify by layer".



I am giving you an excel file where I have columns of min and max values of Level 3 categories and a column of Level 1 categories.

| Reclassify by Layer | × |
|---|---|
| Parameters Log | Reclassify by layer |
| Raster layer | This algorithm reclassifies a raster band by |
| F mask_2018 [EPSG:4326] | assigning new class values based on the ranges specified in a vector table. |
| Band number | |
| Band 1 (Gray) | v |
| Layer containing class breaks | |
| | - CD 🔧 🔤 |
| Selected features only | Select File |
| Minimum class value field | Browse for Layer |
| | · · · · · · · · · · · · · · · · · · · |
| Maximum class value field | |
| | ▼ |
| Output value field | |
| | |
| Advanced Parameters | |
| Output no data value | |
| -9999.000000 | |
| Range boundaries | |
| min < value <= max | • • |
| Use no data when no range matches value | - |
| | |
| | % Cancel |
| Run as Batch Process | Run Close Help |

As shown in picture, select the excel file from your computer. For minimum class value field select "min", for the maximum "max" and for output value select "val". In the advanced parameters, go to the drop down menu of "Range boundaries", select the third option "min<=value<=max" and then "Run". Repeat for the other year and save the layers.

Double click on the layers you made to access Symbology. On the Palleted/Unique values->Classify to see the categories of Level 1. Change the colors according to each category and add on "Lebel" the names of Level 1 categories.

| - Reclassified | raster — Symbology | |
|------------------------|------------------------|--|
| Rand Rend | Multiband color | |
| • band Kend | Paletted/Unique values | |
| Render type | Singleband gray | |
| Grav band | Singleband pseudocolor | |
| | Hillshade | |
| Color gradier | Contours | |
| | Min 1 | |
| Contrast enhancemen | Stretch to MinMax | |

You can now map the land cover Level 1 categories for each year.

Final step, go to Raster->Raster Calculator and write: "reclass_2018@1" - "reclass_2006@1" (replace the names of your rasters accordingly), to see the changes. You must insert Output layer to make the process.

| reclass_20 | 06@1 | | | Output la | yer | | | | |
|---------------|---------------|----------|---------|--------------|------------------|--------|---------|----------|----|
| reciass_20 | 10@1 | | | Output fo | rmat | GeoTIF | F | | • |
| | | | | Selected | Layer Extent | | | | |
| | | | | X min | 19.37309 | \$ | X max | 29.60254 | \$ |
| | | | | Y min | 34.79971 | \$ | Y max | 40.79805 | \$ |
| | | | | Columns 7988 | | | Rows | 4684 | \$ |
| | | | | Output C | RS | EPSG:4 | 326 - W | GS 84 💌 | |
| | | | | | esult to project | t | | | |
| Operator + | s | sqrt | COS | sin | ta | n | log10 | (| |
| - | | ^ | acos | asin | ata | n | In |) | |
| < | > | = | != | <= | > | - | AND | OR | |
| abs | min | max | | | | | | | |
| ster Calcı | lator Express | ion | | | | | | | |
| | 2012018 - | | 2006918 | | | | | | |
| | _2018@1 - | recrass_ | 200661 | | | | | | |
| reclass | | | | | | | | | |

Zero values indicate no change. Double click the change layer->Transparency and add "0" (zero) in "Additional no data value" field.

Assign all changes into one with "reclassify by table" (you will find it from Processing Toolbox). Insert raster with changes. Go to the three dots on the right of "Reclassification table"->Add row and insert the minimum value of your raster and the maximum value of your raster. Fill "value" column with "1" (one) -> OK.

| A Reclassificati | on table | | | | Reclassify by table |
|------------------|-----------|---|-------|---------------|--|
| Reclassificati | on table | | | | This algorithm reclassifies a raster band assigning new class values based on the ranges coordination a fixed table. |
| Minimun | n Maximum | | Value | Add Row | runges specified in a fixed table. |
| -4 | 4 | 1 | | Remove Row(s) | |
| | | | | Remove All | |
| | | | | ОК | |
| | | | | Cancel | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

In "Range boundaries" from the drop down menu select the third option "min <=value<=max" and select the option "Use NoData when no range matches value"->Run. Now, you only have the changes with 1 value.

Your result will be something like this:

