

# Microscopía virtual con Google Earth

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# Microscopía Virtual

- Múltiples empresas
- Diferentes formatos de imagen
- Visores gratuitos pero incompatibles
- Servidores
  - Complejos
  - Muy caros
  - Incompatibles
  - Altas exigencias (IP Pública, líneas dedicadas, puertos específicos ...)



© 2012 MapLink/Tele Atlas  
 Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
 US Dept. of State Geographer  
 © 2012 Google

Google earth

3

13:08

Alt. ojo 11676.22 km



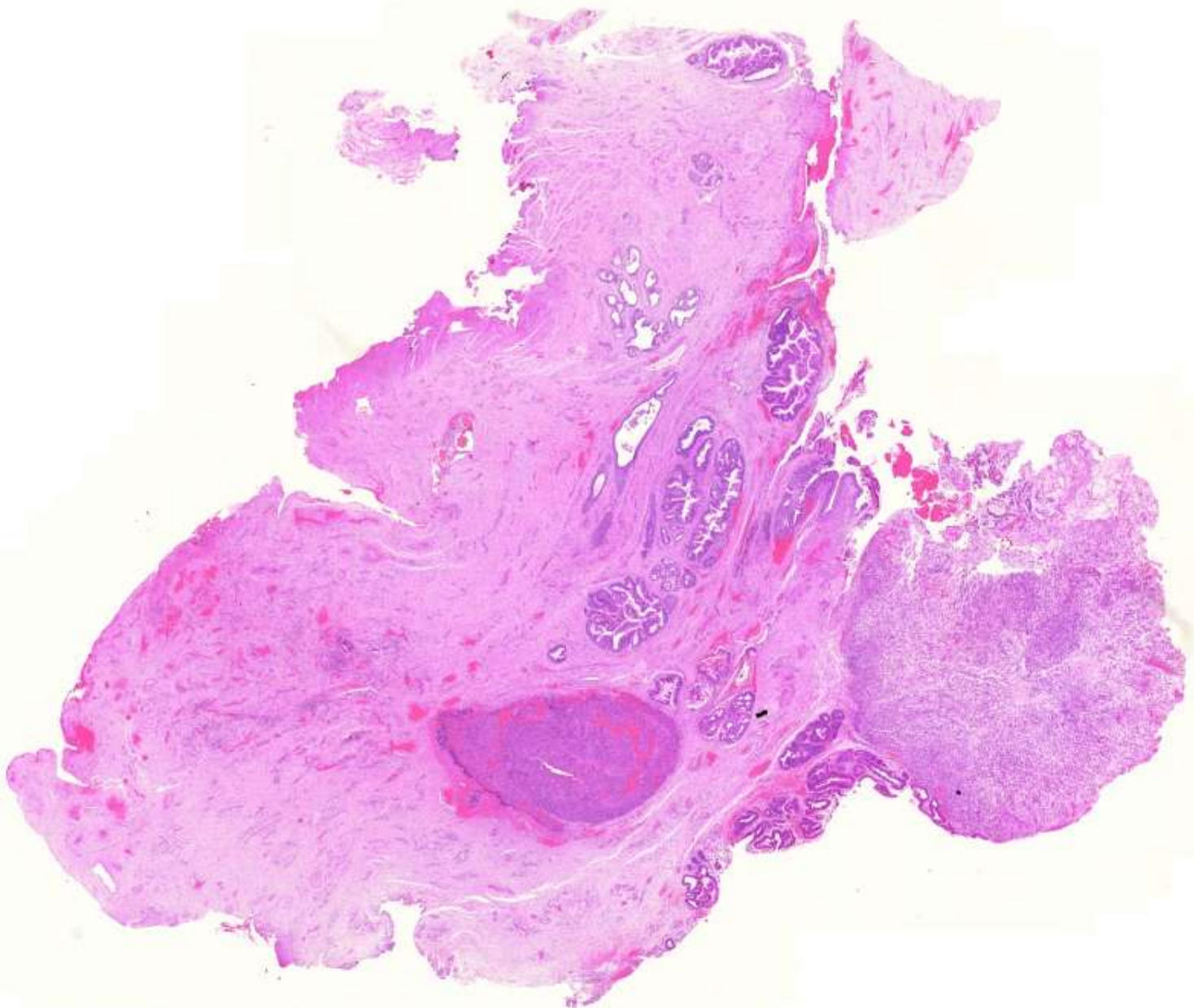
© 2012 Cnes/Spot Image  
Image © 2012 TerraMetrics  
Image U.S. Geological Survey  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

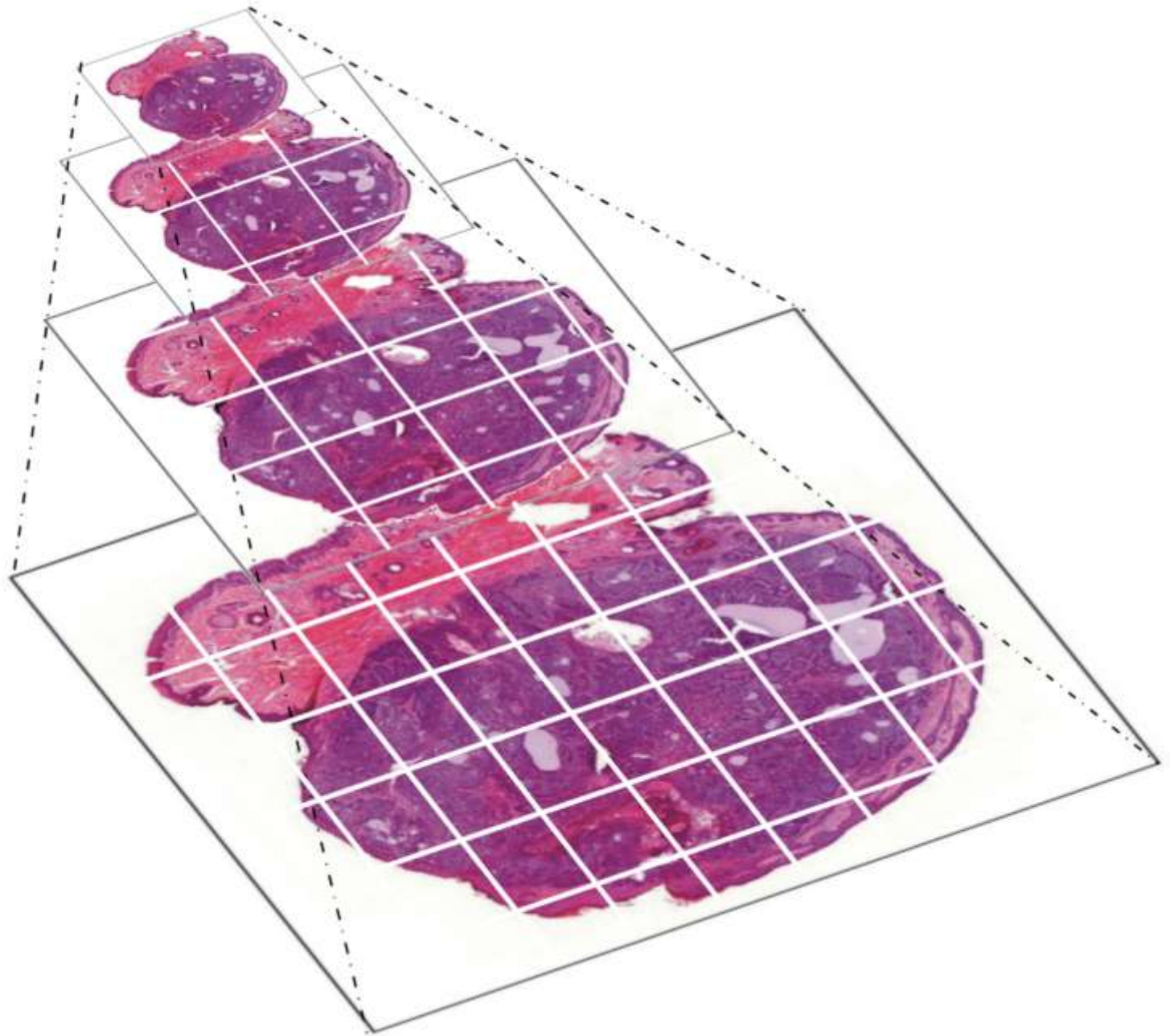
Google earth  
4

13:08

lat. 47.439884° long. 20.796724° elev. 555 m

Alt. ojo 5384.64 km





# Google Maps API Tutorial

This tutorial is intended to help you create your own interactive maps using the Google API.

Do take a look at the [Google documentation](#).

There are two ways to use this tutorial:

1. Read it and try to understand the principles involved.
2. Use the example files as templates. Paste the code into your own web page and change the API key and data. Read the "potential pitfalls" sections, and try to avoid them.

**Using the Google Map API is not easy if you don't have much Javascript experience.**

If you find the Google documentation too difficult to understand, it's not because it's badly written it's just that the subject is not easy.

## What's New

[What's New](#) Recent changes to the tutorial.

## Instant Maps

[Part 1](#) Making instant maps with the Google Wizard

[Part 2](#) Making instant maps by embedding maps.google.com

## The Basics

```
fom.kml: Bloc de notas
Archivo Edición Formato Ver Ayuda
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Placemark>
    <name>FOM</name>
    <description>Fundación oftalmológica del Mediterráneo</description>

    <Point>
    <coordinates>-0.4060,39.4808</coordinates>
    </Point>
  </Placemark>
</kml>
```



```
fom.kml: Bloc de notas
Archivo Edición Formato Ver Ayuda
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Placemark>
<name>FOM</name>
<description>Fundación Oftalmológica del Mediterráneo</description>
<LookAt>
<longitude>-0.4060</longitude>
<latitude>39.4808</latitude>
  <altitude>4000.0</altitude>
  <altitudeMode>absolute</altitudeMode>
</LookAt>
<Point>
<coordinates>-0.4060,39.4808</coordinates>
</Point>
</Placemark>
</kml>
```

```
foto4.kml: Bloc de notas
Archivo Edición Formato Ver Ayuda
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Folder>

    <GroundOverlay>

      <Icon>
        <href>829a.jpg</href>
      </Icon>

      <LatLonBox>
        <north>37.91904192681665</north>
        <south>37.46543388598137</south>
        <east>15.35832653742206</east>
        <west>14.60128369746704</west>
        <rotation>-0.1556640799496235</rotation>
      </LatLonBox>
    </GroundOverlay>
  </Folder>
</kml>
```



FOM

Mislata

©2012 Tele Atlas

Google earth 11

575 m  
13:08

Fecha de las imágenes: 11/12/2007 2001

lat. 39.475038° long. -0.405000° elev. 20 m

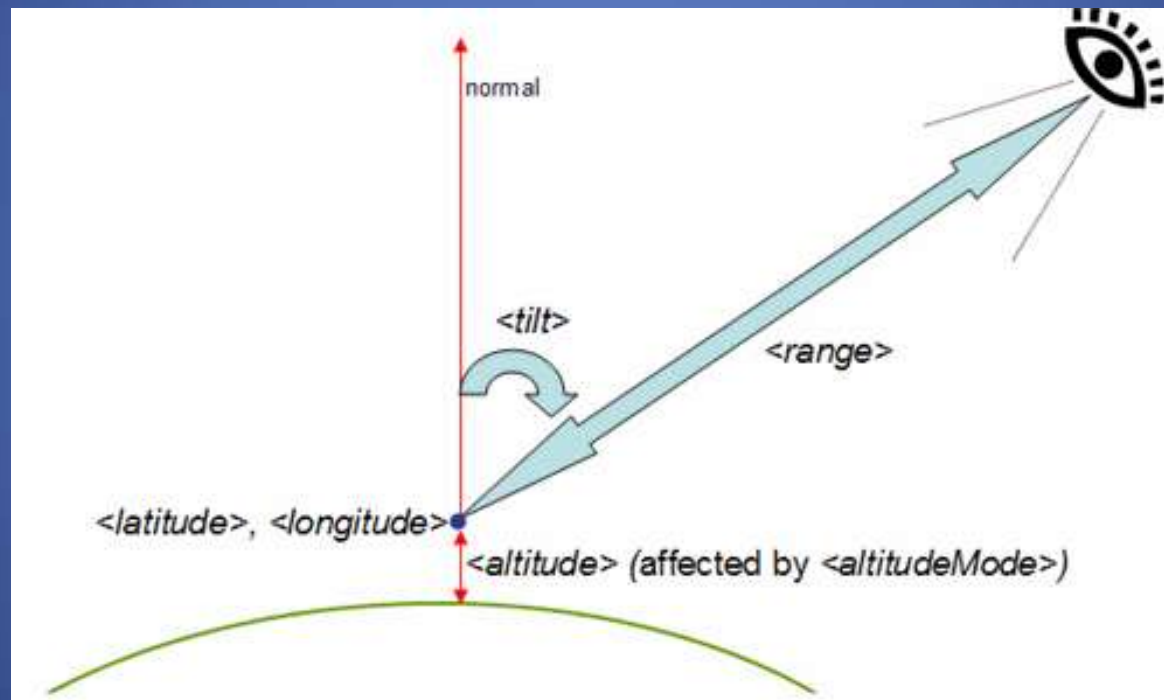
Alt. ojo 2.50 km

Archivo Edición Formato Ver Ayuda

```
<?xml version="1.0" encoding="utf-8"?>
<kml xmlns="http://earth.google.com/kml/2.1">
  <Document>
    <name>772.jpg</name>
    <description></description>
    <style>
      <ListStyle id="hidechildren">
        <listItemType>checkHideChildren</listItemType>
      </ListStyle>
    </style>

    <LookAt>
      <longitude>-0.40000000000000</longitude>
      <latitude>39.46168495210515</latitude>
      <altitude>0</altitude>
      <range>2391</range>
      <tilt>0</tilt>
      <heading>0</heading>
    </LookAt>
    <NetworkLink>
      <name>0/0/0.png</name>
      <Region>
        <Lod>
          <minLodPixels>128</minLodPixels>
          <maxLodPixels>-1</maxLodPixels>
        </Lod>
        <LatLonAltBox>
          <north>39.48986801069280</north>
          <south>39.45336990421029</south>
          <east>-0.37350189351749</east>
          <west>-0.41000000000000</west>
        </LatLonAltBox>
      </Region>
      <Link>
        <href>http://e-pat.org/vs/COMP/772/0/0/0.kmz</href>
        <viewRefreshMode>onRegion</viewRefreshMode>
      </Link>
    </NetworkLink>
  </Document>
</kml>
```

# Kml parameters



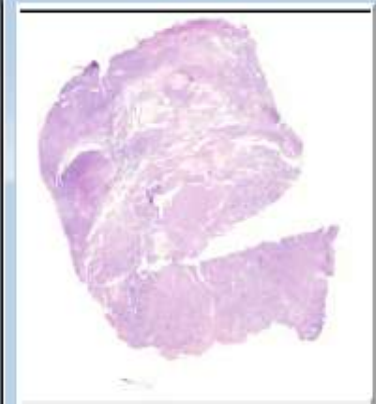




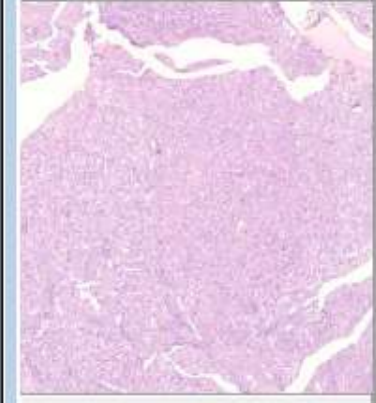
Local

- Slides
- quiste epi prolif
- denia2
- 091203

MC-Gomez



Fit scanned area



400%

Preview

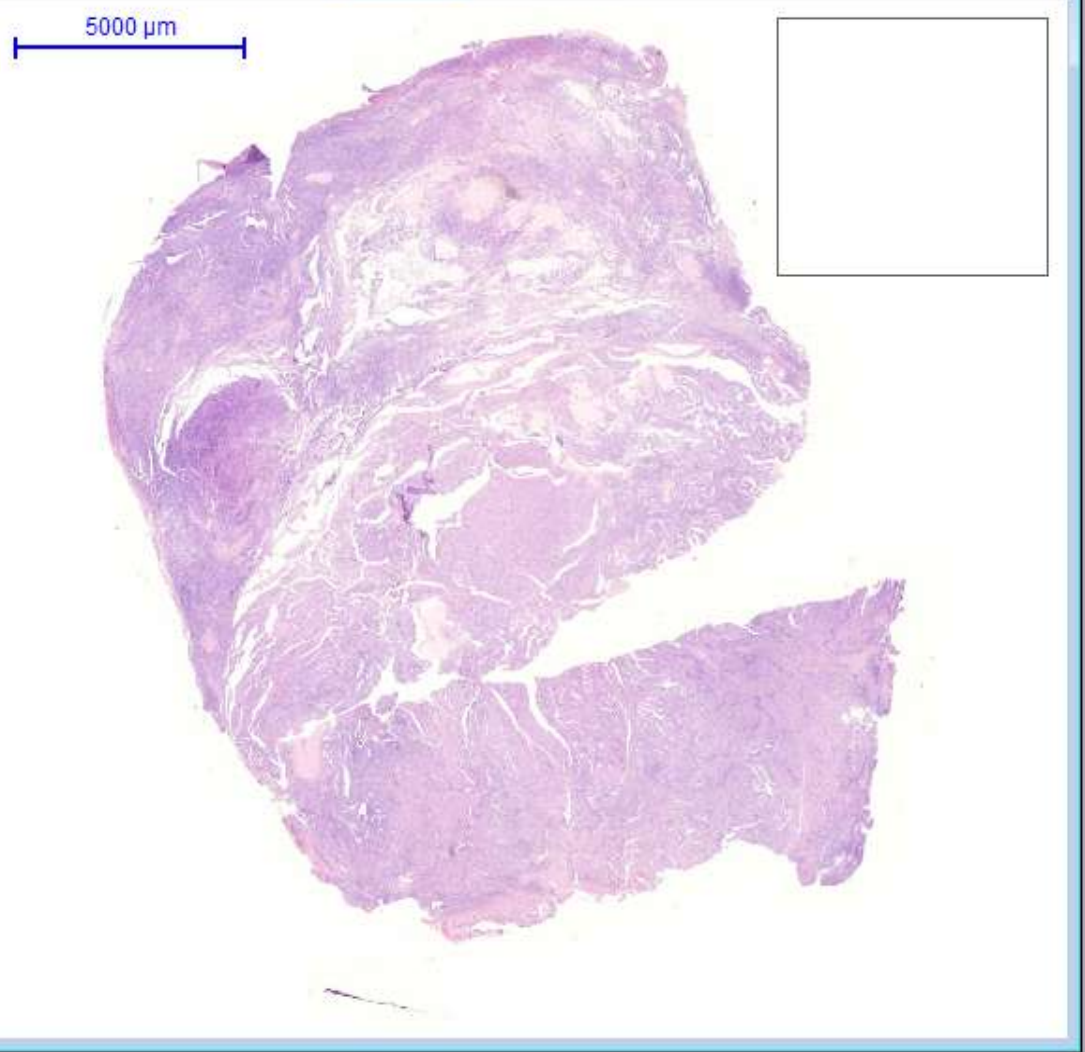
Tracking history

Preview and tracking history

Delete Tracking History

Magnification: 0,3 Progress:

Fit 1X 2X 5X 10X 20X 40X 1:1



Original Settings

Slide type: Brightfield      Image file format: JPEG      Quality factor: 70%

Output Settings

File format: TIFF Image

Magnification: 1:1

Tile size: 256 x 256

Overlap: %

Image codec: JPEG

- Uncompressed
- JPEG

Quality: 90

- Burn in slide annotations
- Burn in slide markers
- Z to Slides

Output Channels: Current view

Output Image Information

Selected image information:

Image type:	TIFF Image
Image size:	60444 x 149464 Pixel
Tile size:	256 x 256 Pixels
Number of tiles:	138408
Estimated image file size:	1321 Megabytes

Aggregated Export Information

Number of exported images: 0  
Estimated total disk size: 9,8 Kilobytes

ROI Selection

Available regions:

Whole Slide

Regions to be exported:

- >
- <-
- =>
- <=

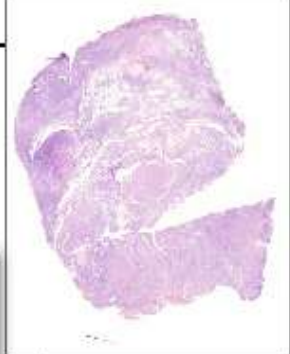
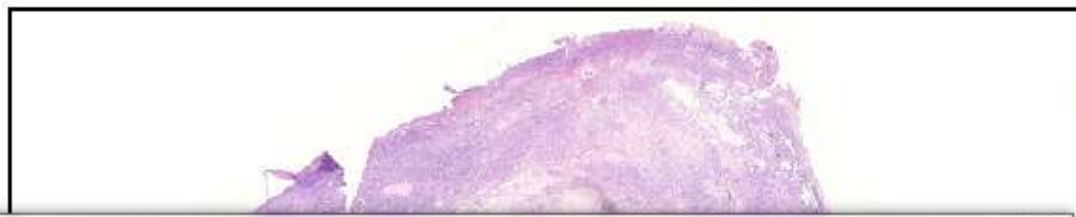
Selected Region of Interest







MC-Gomez.mrxs - Mirax image



### Extract Image Region

Output File...

Description:

Left:  9,59GB (1,10GB)  
 Top:  ratio 8,8

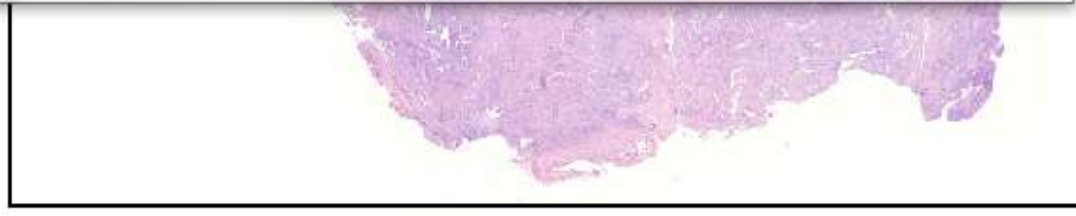
Width:  →   100 % Thumbnail:   
 Height:  →   100 % Label:

Macro:

ICC Profile:  Embed  Apply  Ignore

Output/Compression

SVS:  JPEG2000  JPEG  
 JP2:  JPEG2000 (KDU 6.0)  
 TIF:  LZW  None  
 JPG:  JPEG Quality:   
 CWS:  JPEG Tile Size:




# GDAL: Geospatial Data Abstraction Library

<http://www.gdal.org/>

**Main Page** | **Related Pages** | **Classes** | **Files**

## GDAL - Geospatial Data Abstraction Library

Select language: [English][Russian][Portuguese][French/Francais]

 GDAL is a translator library for raster geospatial data formats that is released under an X/MIT style Open Source license by the Open Source Geospatial Foundation. As a library, it presents a **single abstract data model** to the calling application for all supported formats. It also comes with a variety of useful **commandline utilities** for data translation and processing. The **NEWS** page describes the May 2012 GDAL/OGR 1.9.1 release.

The related OGR library (which lives within the GDAL source tree) provides a similar capability for simple features vector data.

Master: <http://www.gdal.org>  
Download: [ftp at remotesensing.org](ftp://remotesensing.org), [http at download.osgeo.org](http://download.osgeo.org)

### User Oriented Documentation

- [Wiki](#) - Various user and developer contributed documentation and hints
- [Downloads](#) - Ready to use binaries (executables)
- [Supported Formats](#) : GeoTIFF, Erdas Imagine, SDTS, ECW, MrSID, JPEG2000, DTED, NITF, ...
- [GDAL Utility Programs](#) : gdalinfo, gdal\_translate, gdaladdo, gdalwarp, ...
- [GDAL FAQ](#)
- [GDAL Data Model](#)
- [GDAL/OGR Governance and Community Participation](#)
- [GDAL Service Provider Listings \(not vetted\)](#)
- [Sponsors, Acknowledgements and Credits](#)
- [Software Using GDAL](#)

### Developer Oriented Documentation

- [Building GDAL From Source](#)
- [Downloads - source code](#)
- [API Reference Documentation](#)
- [GDAL API Tutorial](#)
- [GDAL Driver Implementation Tutorial](#)
- [GDAL Warp API Tutorial](#)
- [OGRSpatialReference Tutorial](#)
- [GDAL C API](#)
- [GDAL Algorithms C API](#)

100%

## GDAL Utilities

The following utility programs are distributed with GDAL.

- [gdalinfo](#) - report information about a file.
- [gdal\\_translate](#) - Copy a raster file, with control of output format.
- [gdaladdo](#) - Add overviews to a file.
- [gdalwarp](#) - Warp an image into a new coordinate system.
- [gdalindex](#) - Build a MapServer raster tileindex.
- [gdalbuildvrt](#) - Build a VRT from a list of datasets.
- [gdal\\_contour](#) - Contours from DEM.
- [gdaldem](#) - Tools to analyze and visualize DEMs.
- [rgb2pct.py](#) - Convert a 24bit RGB image to 8bit paletted.
- [pct2rgb.py](#) - Convert an 8bit paletted image to 24bit RGB.
- [gdal\\_merge.py](#) - Build a quick mosaic from a set of images.
- [gdal2tiles.py](#) - Create a TMS tile structure, KML and simple web viewer.
- [gdal\\_rasterize](#) - Rasterize vectors into raster file.
- [gdaltransform](#) - Transform coordinates.
- [nearblack](#) - Convert nearly black/white borders to exact value.
- [gdal\\_retile.py](#) - Retiles a set of tiles and/or build tiled pyramid levels.
- [gdal\\_grid](#) - Create raster from the scattered data.
- [gdal\\_proximity.py](#) - Compute a raster proximity map.
- [gdal\\_polygonize.py](#) - Generate polygons from raster.
- [gdal\\_sieve.py](#) - Raster Sieve filter.
- [gdal\\_fillnodata.py](#) - Interpolate in nodata regions.
- [gdallocationinfo](#) - Query raster at a location.
- [gdalsrsinfo](#) - Report a given SRS in different formats. (GDAL >= 1.9.0)
- [gdalmove.py](#) - Transform the coordinate system of a file (GDAL >= 2.0)
- [gdal-config](#) - Get options required to build software using GDAL.

### Creating New Files

Access an existing file to read it is generally quite simple. Just indicate the name of the file or dataset on the commandline. However, creating a file is more complicated. It may be necessary to indicate the the format to create, various creation options affecting how it will be created and perhaps a coordinate system to be assigned. Many of these options are handled similarly by different GDAL utilities, and are introduced here.

**-of format**

# gdal2tiles.py

generates directory with TMS tiles, KMLs and simple web viewers

## SYNOPSIS

```
gdal2tiles.py [-title "Title"] [-publishurl http://yourserver/dir/]  
              [-nogooglemaps] [-noopenlayers] [-nokml]  
              [-googlemapskey KEY] [-forcekml] [-v]  
              input_file [output_dir]
```

## DESCRIPTION

This utility generates a directory with small tiles and metadata, following OSGeo Tile Map Service Specification. Simple web pages with viewers based on Google Maps and OpenLayers are generated as well - so anybody can comfortably explore your maps on-line and you do not need to install or configure any special software (like mapserver) and the map displays very fast in the webbrowser. You only need to upload generated directory into a web server.

GDAL2Tiles creates also necessary metadata for Google Earth (KML SuperOverlay), in case the supplied map uses EPSG:4326 projection.

World files and embedded georeference is used during tile generation, but you can publish a picture without proper georeference too.

### **-p PROFILE, --profile=PROFILE:**

Tile cutting profile (mercator,geodetic,raster) - default 'mercator' (Google Maps compatible).

### **-r RESAMPLING, --resampling=RESAMPLING:**

Resampling method (average,near,bilinear,cubic,cubicspline,lanczos,antialias) - default 'average'.

### **-s SRS, --s\_srs=SRS:**

The spatial reference system used for the source input data.

### **-z ZOOM, --zoom=ZOOM:**

Zoom levels to render (format:'2-5' or '10').

### **-e, --resume:**

Resume mode. Generate only missing files.

### **-a NODATA, --srcnodata=NODATA:**

NODATA transparency value to assign to the input data.

### **-v, --verbose**

Generate verbose output of tile generation.

### **-h, --help**

Show help message and exit.

# <http://www.maptiler.org/>



## MapTiler - Map Tile Cutter

Map Overlay Generator for Google Maps and Google Earth

Simple way how to publish your maps...

[Beta Version Available](#)

[Download the beta version \(instructions for testers\)](#)

[Screenshots](#)

Look at [MapTiler Help Center](#) or join [MapTiler User Group](#)  
[Source Code Repository](#)



### Tile Profile

Source Data Files

Spatial Reference

Tile Details

Destination

Viewers

Viewer Details

Rendering

## MapTiler - Tile Generator for Map Mashups

### Selection of the tile profile

MapTiler generates tiles for fast online map publishing.

#### What kind of tiles would you like to generate?

Google Maps compatible (Spherical Mercator)

Mercator tiles compatible with Google, Yahoo or Bing maps and OpenStreetMap. Suitable for mashups and overlay with these popular interactive maps. [More info.](#)

Google Earth (KML SuperOverlay)

Tiles and KML metadata for 3D visualization in Google Earth desktop application or in the web browser plugin.

WGS84 Plate Carree (Geodetic)

Compatible with most existing WMS servers, with the OpenLayers base map, Google Earth and other applications using WGS84 coordinates ([EPSG:4326](#)).

Image Based Tiles (Raster)

Tiles based on the dimensions of the picture in pixels (width and height). Stand-alone presentation even for images without georeference.





Tile Profile

Source Data Files

Spatial Reference

Tile Details

Destination

Viewers

Viewer Details

Rendering

## MapTiler - Tile Generator for Map Mashups

### Details about the tile pyramid

In this step you should specify the details related to rendered tile pyramid.

#### Zoom levels to generate:

Minimum zoom:  Maximum zoom:

Note: The selected zoom levels are calculated from your input data and should be OK in most cases.

#### Please choose a file format

Hybrid JPEG+PNG - only for Google Earth

Note: We recommend to [postprocess the produced PNG tiles with the PNGQ utility](#).



[Tile Profile](#)[Source Data Files](#)[Spatial Reference](#)[Tile Details](#)[Destination](#)[Viewers](#)[Viewer Details](#)[Rendering](#)

## MapTiler - Tile Generator for Map Mashups

### Destination folder and address

Please select a directory where the generated tiles should be saved. Similarly you can specify the Internet address where will you publish the map.

#### Where to save the generated tiles?

Result directory:

#### The Internet address (URL) for publishing the map:

Destination URL:

Note: You should specify the URL if you need to generate the correct KML for Google Earth.

[Tile Profile](#)[Source Data Files](#)[Spatial Reference](#)[Tile Details](#)[Destination](#)[Viewers](#)[Viewer Details](#)[Rendering](#)

## MapTiler - Tile Generator for Map Mashups

### Tile rendering

Now you can start the rendering of the map tiles. It can be a time consuming process especially for large datasets... so be patient please.

#### Rendering progress:



Rendering the base tiles



Thank you for using MapTiler application. This is an open-source project - you can help us to make it better. Join the [MapTiler User Group](#) to speak with other MapTiler users and tell us about the maps you are publishing! You can also [suggest improvements](#) or [report bugs](#).

Please consider [donation via PayPal or Credit Card](#). We welcome contribution to the source code, help with documentation, localization or with user support. Thanks belongs to [those who have already helped!](#)

Authors of this utility provide [commercial support](#) related to the map tile rendering, geodata processing and customization of open-source GIS tools. We have developed also a [fast parallelized utility](#) for efficient tile rendering on Multi-Core processors and on clusters like Amazon EC2.

Stop

Render

```
<?xml version="1.0" encoding="utf-8"?>
<kml xmlns="http://earth.google.com/kml/2.1">
  <Document>
    <name>1154.jpg</name>
    <LookAt>
      <longitude>12.30500000000000</longitude>
      <latitude>45.38680822670539</latitude>
      <altitude>0</altitude>
      <range>55499</range>
      <tilt>0</tilt>
      <heading>0</heading>
    </LookAt>
    <NetworkLink>
      <name>0/0/0.png</name>
      <Region>
        <Lod>
          <minLodPixels>128</minLodPixels>
          <maxLodPixels>-1</maxLodPixels>
        </Lod>
        <LatLonAltBox>
          <north>45.68234555302614</north>
          <south>45.19361645341078</south>
          <east>12.69872909961535</east>
          <west>12.21000000000000</west>
        </LatLonAltBox>
      </Region>
      <Link>
        <href>0/0/0.kmz</href>
        <viewRefreshMode>onRegion</viewRefreshMode>
      </Link>
    </NetworkLink>
  </Document> </kml>
```














- Favoritos
- Descargas
- Escritorio
- Sitios recientes

- Bibliotecas
- Documentos
- Imágenes
- Música
- TV
- Videos

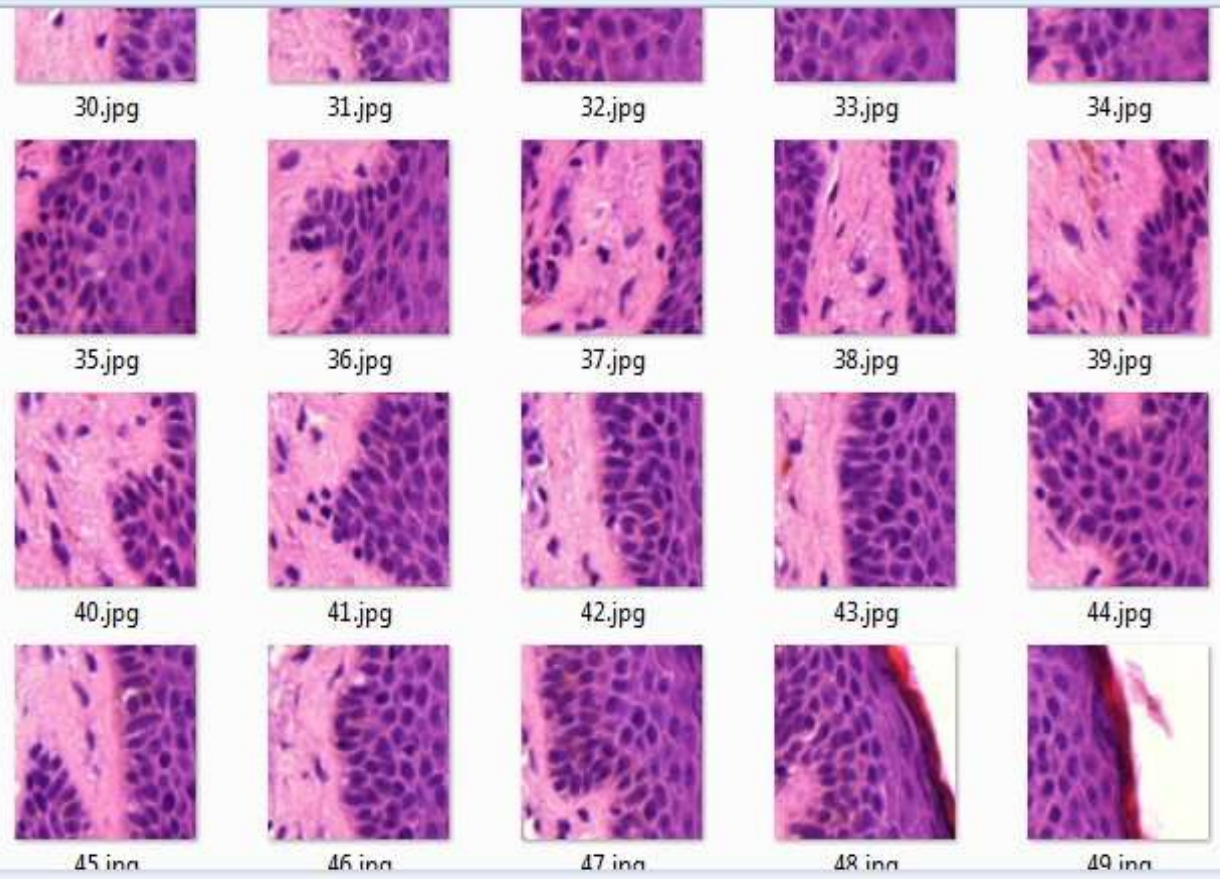
Grupo en el hogar

- Equipo
- Disco local (C:)
- TOSHIBA EXT (E:)
- TREKSTOR (K:)

Nombre	Fecha de modifica...	Tipo	Tamaño
0	06/09/2010 1:15	Carpeta de archivos	
1	06/09/2010 1:15	Carpeta de archivos	
2	06/09/2010 1:15	Carpeta de archivos	
3	06/09/2010 1:15	Carpeta de archivos	
4	06/09/2010 1:15	Carpeta de archivos	
5	06/09/2010 1:14	Carpeta de archivos	
6	06/09/2010 1:10	Carpeta de archivos	
7	06/09/2010 1:06	Carpeta de archivos	
doc.kml	06/09/2010 1:15	Archivo KML	2 KB

Nombre	Fecha de modifica...	Tipo	Tamaño
 0	06/09/2010 1:15	Carpeta de archivos	
 1	06/09/2010 1:15	Carpeta de archivos	
 2	06/09/2010 1:15	Carpeta de archivos	
 3	06/09/2010 1:15	Carpeta de archivos	
 4	06/09/2010 1:15	Carpeta de archivos	
 5	06/09/2010 1:15	Carpeta de archivos	
 6	06/09/2010 1:15	Carpeta de archivos	
 7	06/09/2010 1:15	Carpeta de archivos	
 8	06/09/2010 1:15	Carpeta de archivos	
 9	06/09/2010 1:15	Carpeta de archivos	
 10	06/09/2010 1:15	Carpeta de archivos	
 11	06/09/2010 1:15	Carpeta de archivos	
 12	06/09/2010 1:15	Carpeta de archivos	

- Sitios recientes
- Bibliotecas
  - Documentos
  - Imágenes
  - Música
  - TV
  - Videos
- Grupo en el hogar
- Equipo
  - Disco local (C:)
  - TOSHIBA EXT (E:)
  - TREKSTOR (K:)
  - Unidad de CD (L:) WD SmartWare
  - My Book 3.0 (M:)
  - My Passport (N:)
  - MUSHKIN (Q:)



87 elementos



# Software de imágenes panorámicas aplicable a Microscopia Virtual

- Zoomify
- Silverlight Deep Zoom
- HD View
- Gigapan
- Pano2VR

# Conclusiones

- Hacen falta estándares gráficos para imágenes de microscopia virtual
- Google Earth y otros programas son fácilmente adaptables
- El precio del software de MV debe reducirse para lograr una más rápida implantación
- El uso de software gratuito puede ayudar a los patólogos a familiarizarse con esta tecnología