



## Preparing requests for annotating gridded areas in Env-DATA

Steps to prepare a request for annotating over a gridded area using the Env-DATA System. For more information see [www.movebank.org/node/6607](http://www.movebank.org/node/6607). These requests provide raster output for analysis and visualization over a bounding box. We recommend that users ensure that the output resolution reflects that of the original products, which varies by source. Here are general steps to calculate the input parameters:

**1) Define the corners and range of the bounding box of interest.** Write down the following:

Range (longitude, degrees):

Range (latitude, degrees):

NW corner (long, lat):

SE corner (long, lat):

**2) Identify the environmental datasets/variables you want to annotate and their resolutions.** A summary of resolutions is on Movebank under Env-DATA > Data Products, or you can browse on Movebank—click on the "i" next to any variable to see the resolution.

**3) Calculate the pixel size (number of values) for the grid.** This should be roughly the same as or less than the resolution of the source product. If you want > 2000 pixels in lat or long, we recommend breaking the results into multiple tiles. Do this separately for latitude and longitude if needed. Here's the basic equation:

number of pixels = range requested (in degrees) \* source resolution (in pixels/degree)

Remember that 1 degree = 60 arc-minutes = 3600 arc-seconds. If you need to convert between degrees and meters, the longitudinal conversion depends on the latitude. You can calculate this for the latitude of your area at <https://msi.nga.mil/msisitecontent/staticfiles/calculators/degree.html>

**Examples:** Calculations for three products available in EnvDATA to cover the fisher study area in LaPoint et al. (2013, doi:10.5441/001/1.2tp2j43g). Bolded values are what you enter at "Define the grid to annotate".

1) The range of the dataset is  
location.long: -73.94– -73.39  
location.lat: 42.70–42.85

To define our bounding box, let's round up and use a slightly larger area to make calculations easy and give some extra background to the maps.

Range (longitude): -74– -73 = 1 deg  
Range (latitude): 42.5–43 = 0.5 deg  
NW corner (long, lat): **-74, 43**  
SE corner (long, lat): **-73, 42.5**

2) Here are three example data products....

ASTER DEM: 1 arc-second (~23 m at 43 deg lat)  
GlobCover: 20 arc-seconds (~450 m at 43 deg lat)  
GRUMP Population Density: 30 arc-second (~700 m at 43 deg lat)

3) ....and the calculations.

ASTER DEM

longitude: 1 deg \* 3600 arc-sec/deg = 3600 pixels  
latitude: 0.5 deg \* 3600 pixels = 1800

We don't need this resolution at the size of our map so let's just use half: **1800** in longitude and **900** in latitude.

GlobCover

longitude: 1 deg \* 3600 arc-sec/deg \* 1 pixel/20 arc-sec = **180** pixels  
latitude: 0.5 deg \* 180 pixels = **90** pixels

GRUMP Population Density

longitude: 1 deg \* 3600 arc-sec/deg \* 1 pixel/30 arc-sec = **120** pixels  
latitude 0.5 deg \* 120 pixels = **60** pixels