

**STATE ENVIRONMENTAL HEALTH INDICATORS COLLABORATIVE (SEHC)
CLIMATE CHANGE INDICATORS**

Indicator: CC3: Population Vulnerability

Measure(s): CC3.2: Coastal vulnerability

MEASURE DESCRIPTION

CC3.2: Coastal vulnerability	
Last updated:	August 17, 2008
Measurement units:	Meters
Geographic scale:	Coastal Census block groups for the contiguous U.S.
Time scale:	Coastal Vulnerability Index 2001, Census Data 2000
Significance/background:	Rising sea levels has the potential to affect significant portions of coastal United States, threatening health, infrastructure and industry.
Rationale:	Identifying affected areas and affected populations is a critically important first step in the development of management plans and mitigation strategies.
Data resources:	Block group data: http://www.census.gov/geo/www/cob/bg2000.html Coastal vulnerability data: http://pubs.usgs.gov/dds/dds68/ Fact sheet on coastal vulnerability: http://pubs.usgs.gov/fs/fs76-00/fs07600.pdf
Limitations:	This measure provides a general indication of the population living in close proximity to high risk areas but does not reflect any individuals true exposure. Data is several years old. Area based population measures such as block groups do not permit finer assessment of where, specifically, people live within a block group.
Related indicators (from other projects):	
Recommendations:	

HOW-TO GUIDE: CC3.2 Coastal vulnerability

Determine the number of vulnerable persons by block group:

1. Obtain US Census data by visiting factfinder.census.gov. Click on “get data” under “Getting Detailed Data”/“Decennial Census”. Click on Census 2000 Summary File 3 (SF 3) -Sample Data and then on “Detailed Tables”. Click on the tab at the top called “geo within geo”. Under “Show me all” choose “.....Census Tracts”, Under “Within” choose the state or county you’re interested in and then, when the “Select one or more....” gets populated chose “All Block Groups”. Click add and then click Next.
2. On the next screen on the tab “show all tables” select P1 (Total Population) and Add to the current table selection, then click on “Show Result”.
3. Once it shows you the results, click on “Print/Download” at the top and chose “Download”. In the pop-up box where it says “database compatible” choose “Microsoft Excel” and leave clicked “include descriptive data element names”. Click on OK and download the file.
4. Find the file you just downloaded called output.zip and unzip the file. This file includes total population numbers for each block group you selected.
5. If you decide you want to aggregate by county, you will need the state/county FIPS code which is buried within the GEO_ID2 field. You create a new column to hold the state/county FIPS and populate that column by typing =MID(B3,1,5) where B3 represents the column (“B”) and cell (“3”) holding the GEO_ID2. The 1 is the starting point and the 5 is the number of characters. To find the name associated with the state/county FIPS code download the file: www.census.gov/popest/geographic/codes02.xls
6. The “Coastal Vulnerability to Sea-Level Rise” data can be found at: <http://pubs.usgs.gov/dds/dds68/>
7. Click on “GIS Data files” and scroll down to “Link to Zip File”. Here you should download and unzip the “CVI.zip” file which contains shapefiles of the atlantic, pacific, and gulf coasts.
8. Bring the 3 CVI shapefiles into GIS along with the Block Group data (Block Group data will need to be joined to an existing Block Group shapefile based on the FIPS code).
9. Next, using the free GIS extension, Hawth’s Tools (<http://www.spatial ecology.com/htools/>), generate the centroids of the block group polygons using the “Generate Polygon Centroid Points” under the “Vector Editing Tools”. This will create a new point shapefile of the centroid locations for each block group.
10. Merge the 3 coastal shapefiles into one using the “Merge” tool under “Data Management Tools/General/Merge”.
11. We are only interested in block group centroids within 5km of the coast; therefore in GIS, go to “Selection/Select By Location”. Check your centroid shapefile and we want “are within a distance of” the coastal data shapefile. Check the box “Apply a buffer ...” and put in the distance 5 kilometers. This will give you a selection of the centroids that are located within 5km of the coast. Export this selection of centroids and name it something meaningful in your project folder.
12. Right-click on the new centroid shapefile and go to “Joins and Relates” and “Joins...”. Under “What do you want to join to this layer?”, click on “Join data from another layer based on spatial location”. Under step 2, choose the bottom selection “Each point will be given all the attributes of the point...”. This will append the corresponding CVI data to the centroid data along with a distance field.
13. Once the CVI data is appended to the centroid data, join the centroid data to the block group shapefile by FIPS code. This will allow you to view the number of people in each block group along with that block group’s CVI risk score. You can now limit to those block groups whose closest coastal segment is very high risk (CVI=”Very”).