

West Africa Coastal Vulnerability Mapping:
Social Vulnerability Indices

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DESCRIPTION

This data set includes three indices that were a product of the analysis presented in the report, "Mapping the Exposure of Socioeconomic and Natural Systems of West Africa to Coastal Climate Stressors" (de Sherbinin et al., 2014; de Sherbinin et al., 2015). The table below lists the indicators used and the processing completed to produce the indices.

Title:	Social Vulnerability Indices
Index Codes:	SVI, PEI, PACI
Rationale:	Social Vulnerability Indices (SVI) provide a measure of social vulnerability and "defenselessness" in the face of climate stressors in the West Africa region.
Data Set:	The Social Vulnerability Indices (SVI, PEI, and PACI) were developed using the six indicators in the table below. Because areas of high population density and growth (high vulnerability) are generally associated with urban areas that have lower levels of poverty and higher degrees of adaptive capacity (low vulnerability), to some degree the population factors cancel out the poverty and adaptive capacity indicators.

SOCIAL VULNERABILITY INDICATORS

Indicator Code	Indicator	Date or Date Range
POP	Population density (CIESIN, 2018a)	2010
POPG	Population growth (CIESIN, 2018b)	2000 to 2010
POV	Subnational poverty and extreme poverty (HarvestChoice, 2012)	2005
MEDUC	Maternal education levels (ICF International, 2013)	circa 2008
MARK	Market accessibility (travel time to markets) (Nelson, 2008)	circa 2000
CONF	Conflict data for political violence (Raleigh et. al., 2010)	1997 to 2013

To account for this, the data set includes two sub-indices in addition to the overall Social Vulnerability Index (SVI): the Population Exposure Index (PEI), composed only of population density (POP) and population growth (POPG), and the Poverty and Adaptive Capacity Index (PACI), composed of subnational poverty (POV), maternal education levels (MEDUC), market accessibility (MARK), and conflict (CONF). These sub-indices allow us to isolate the population indicators from the poverty and conflict metrics. Map metadata for each of the data layers included in this component is found in Annex 1, Section A-1.2 of the report, "Mapping the Exposure of Socioeconomic and Natural Systems of West Africa to Coastal Climate Stressors" (de Sherbinin et al, 2014).

Units:

The indicators were converted from raw values to indices on a 0–100 scale, where 100 equals higher levels of social vulnerability.

Limitations:

Spatial Extent:

The spatial extent of the Social Vulnerability Indices rasters is the 200 km coastal zone of the ten Guinea Current countries of coastal West Africa: Guinea-Bissau, Guinea, Sierra Leone, Liberia, Cote d'Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon.

Spatial Resolution:	30 arc-second (~1 km)
Time Period:	Time period of the input data sets varies. See table above in the Data Set section.
Additional Notes:	

ACCESSING THE DATA

SEDAC URL: <http://sedac.ciesin.columbia.edu/data/collection/wacvm>.

Permanent URL: <https://doi.org/10.7927/H4H41PCK>.

The data are available as compressed zipfiles of GeoTIFFs or shapefiles. Downloaded files need to be uncompressed in a single folder using either WinZip (Windows file compression utility) or similar application before they can be accessed by your GIS software package. Users should expect an increase in the size of downloaded data after decompression.

The data are stored in geographic coordinates of decimal degrees based on the World Geodetic System spheroid of 1984 (WGS84).

DISCLAIMER

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USE CONSTRAINTS

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RECOMMENDED CITATION(S)

Data set:

Center for International Earth Science Information Network (CIESIN), Columbia University. 2018. West Africa Coastal Vulnerability Mapping: Social Vulnerability Indices. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). <https://doi.org/10.7927/H4H41PCK>. Accessed DAY MONTH YEAR.

REFERENCES

Center for International Earth Science Information Network (CIESIN), Columbia University. 2018a. West Africa Coastal Vulnerability Mapping: GPW Version 4 Population Density, Preliminary Release 1, 2010. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). <https://doi.org/10.7927/H4J10131>. Accessed DAY MONTH YEAR.

Center for International Earth Science Information Network (CIESIN), Columbia University. 2018b. West Africa Coastal Vulnerability Mapping: GPW Version 4 Population Growth, Preliminary Release 1, 2000-2010. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). <https://doi.org/10.7927/H4DB7ZR7>. Accessed DAY MONTH YEAR.

de Sherbinin, A., Chai-Onn, T., Jaiteh, M., Mara, V., Pistolesi, L., and Schnarr, E. 2014. Mapping the Exposure of Socioeconomic and Natural Systems of West Africa to Coastal Climate Stressors. Technical Report for the USAID African and Latin American Resilience to Climate Change (ARCC) project. Washington, DC: USAID. http://sedac.ciesin.columbia.edu/downloads/docs/wacvm/tbw04-02wacoastalmappingresults_cleared.pdf.

de Sherbinin, A., T. Chai-Onn, M. Jaiteh, V. Mara, L. Pistolesi, E. Schnarr, and S. Trzaska. 2015. Data Integration for Climate Vulnerability Mapping in West Africa. ISPRS International Journal of Geo-Information 4(4):2561-2582. <https://doi.org/10.3390/ijgi4042561>.

HarvestChoice. 2012. "Sub-national Poverty and Extreme Poverty Prevalence." International Food Policy Research Institute, Washington, DC., and University of Minnesota, St. Paul, MN. Available online at <http://harvestchoice.org/node/4751>.

ICF International. 1998-2013. Demographic and Health Surveys (various) [Datasets]. Calverton, Maryland: ICF International [Distributor], 2013.

Nelson, A. 2008. Estimated travel time to the nearest city of 50,000 or more people in year 2000. Global Environment Monitoring Unit - Joint Research Centre of the European Commission, Ispra Italy. Available at <http://forobs.jrc.ec.europa.eu/products/gam>. Accessed 9/3/2013.

Raleigh, C., A. Linke, H. Hegre, and J. Karlsen. 2010. Introducing ACLED-Armed Conflict Location and Event Dataset: Special Data Feature. *Journal of Peace Research* 47(5): 651-660. <https://doi.org/10.1177/0022343310378914>.