2016 ENVIRONMENTAL PERFORMANCE INDEX – INDICATOR METADATA

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Indicator: Environmental Risk Exposure *(ERE)*

Objective / Issue Category: Environmental Health / Health Impacts

What it Measures: Summary environmental risk exposure evaluates how much of the burden of disease observed in a given year can be attributed to past exposure to environmental risk factors, which include: unsafe water (unsafe sanitation); air pollution (ambient particulate matter pollution, household air pollution, and ozone pollution). These estimates are calculated for 188 countries.

Rationale for Inclusion: This summary statistic relates the causes of observed health effects more precisely than the preceding indicator, child mortality, could achieve as a proxy measure. For example, it reduces the wide variability seen in child mortality rates from developed to developing countries, and it incorporates multiple causes of health effects, i.e. comorbidity, more accurately.

INDICATOR CREATION

Unit of Measurement: Unitless Scale, 0 - 1
Method / Description: The ERE indicator was calculated by IHME for all age groups and genders, weighted by the percentage of disability-adjusted life years (DALY) attributed to a risk factor in a given country.
Target: High Performance Benchmark: 0.063 (1st percentile) Low Performance Benchmark: 0.93 (99th percentile)
Target Source: Expert opinion

DATA SOURCES

Institute for Health Metrics and Evaluation (IHME)
Source (1) Citation: Forouzanfar, M. H., Alexander, L., Anderson, H. R., Bachman, V. F., Biryukov, S., Brauer, M., ... & Ali, M. K. (2015). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet.
Variable / Units: Unitless
Method: The EPI score for this indicator provides a weighted average using the percent contribution of each risk factor to a country's disability adjusted life years (DALYs).
Year of Publication: 2015
Covered Time: 1990-2010, 2013 (5-year intervals)
URL: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00128-2/abstract

Date Data Obtained: 9/4/2015
Data Type: Tabular

Indicators: Air Pollution - PM 2.5 Average Exposure *(PM25)*

Objective / Issue Category: Environmental Health / Air Quality

What it Measures: Air Pollution - Average Exposure to $PM_{2.5}$ (fine particulate matter in micrograms per cubic meter (µg/m3); Health Risk Exposure to $PM_{2.5}$

Rationale for Inclusion: Suspended particulates contribute to acute lower respiratory infections and other diseases such as cancer. Fine particulates or $PM_{2.5}$ (particulates with a diameter of 2.5 microns and smaller) lodge deep in lung tissue and are far more injurious to health than coarser particulates. Average annual concentrations of greater than 10 micrograms per cubic meter are known to be injurious to human health.

INDICATOR CREATION (PM25)

Unit of Measurement: Population weighted exposure to $PM_{2.5}$ in micro-grams per cubic meter
Method / Description: These data were derived from a model that was parameterized by data on Aerosol Optical Depth (AOD) from NASA's MODIS, SeaWiFS, and MISR satellite instruments, and the GEOS-Chem chemical transport model. The model covered all areas south of 70 degree north Latitude and north of 70 degree south latitude. van Donkelaar et al. estimated annual global surface $PM_{2.5}$ concentrations at a 10 x 10 km spatial resolution.
Additional Notes: Maldives' data were taken from Seychelles, as the geospatial grids used to calculate the ground-based exposures to $PM_{2.5}$ do not calculate values for the Maldives
Target: High Performance Benchmark: 10 micrograms/m3 Low Performance Benchmark: 99th percentile (31.12 micrograms/m3)
Target Source: World Health Organization

INDICATOR CREATION (PM25R)

Unit of Measurement: Unitless Scale, 0 - 1
Method / Description: The PM25R is a unitless measure of the health risk posed by fine particulate pollution on a unitless scale from 0 to 1, with 0 indicating no risk and 1 corresponding to maximum risk.
Target: High Performance Benchmark: 0.063 (1st percentile) Low Performance Benchmark: 0.93 (99th percentile)
Target Source: Expert opinion

DATA SOURCES

[PM25] Source (1) Citation: van Donkelaar, A., R. V. Martin, M. Brauer and B. L. Boys, Use of Satellite Observations

for Long-Term Exposure Assessment of Global Concentrations of Fine Particulate Matter, Environmental Health Perspectives, 2015. doi: 10.1289/ehp.1408646.
Variable / Units: µg/m3
Method: These data were derived from a model that was parameterized by data on Aerosol Optical Depth (AOD) from NASA's MODIS, SeaWiFS, and MISR satellite instruments, and the GEOS-Chem chemical transport model. The model covered all areas south of 70 degree north Latitude and north of 70 degree south latitude. van Donkelaar et al. estimated annual global surface PM2.5 concentrations at a 10 x 10 km spatial resolution, and then created three year moving averages from 2000 to 2014. Population-weighted average exposure values were calculated using population data from the Global Rural Urban Mapping Project (2011) database.
Year of Publication: 2015
Covered Time: 2000-2014
URL: http://ehp.niehs.nih.gov/1408646/
Date Data Obtained: 6/1/2015
Data Type: Gridded

[PM25R] - Source (2) Citation: Forouzanfar, M. H., Alexander, L., Anderson, H. R., Bachman, V. F., Biryukov, S., Brauer, M., ... & Ali, M. K. (2015). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet.
Variable / Units: Unitless
Method: See paper for detailed methodology
Year of Publication: 2015
Covered Time: 1990-2010, 2013 (5-year intervals)
URL: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00128-2/abstract
Date Data Obtained: 9/4/2015
Data Type: Tabular

Indicator: Air Pollution – PM2.5 Exceedance *(PM25EXBL)*

Objective / Issue Category: Environmental Health / Air Quality

What it Measures: Average percentage of the population whose exposure to $PM_{2.5}$ is above the interim health targets of 10, 15, 25, and 35 µg/m3.

Rationale for Inclusion: Suspended particulates contribute to acute lower respiratory infections and other diseases such as cancer. Fine particulates or $PM_{2.5}$ (particulates with a diameter of 2.5 microns and smaller) lodge deep in lung tissue and are far more injurious to health than coarser particulates. Average annual concentrations of greater than 10 micrograms per cubic meter are known to be injurious to human health.1 The World Health Organization has also set three interim health targets of 15, 25 and 35 (µg/m3).

INDICATOR CREATION

Unit of Measurement: Population weighted exposure to $PM_{2.5}$ in micro-grams per cubic meter
Method / Description: These data were derived from a model that was parameterized by data on Aerosol Optical Depth (AOD) from NASA's MODIS, SeaWiFS, and MISR satellite instruments, and the GEOS-Chem chemical transport model. The model covered all areas south of 70 degree north Latitude and north of 70 degree south latitude. van Donkelaar et al. estimated annual global surface PM2.5 concentrations at a 10 x 10 km spatial resolution.
Target: High Performance Benchmark: 0 Low Performance Benchmark: 0.73 (99th percentile, proportion of the population exposed to $PM_{2.5}$ thresholds)
Target Source: World Health Organization

DATA SOURCES

Source (1) Citation: van Donkelaar, A., R. V. Martin, M. Brauer and B. L. Boys, Use of Satellite Observations for Long-Term Exposure Assessment of Global Concentrations of Fine Particulate Matter, Environmental Health Perspectives, 2015. doi: 10.1289/ehp.1408646.
Variable / Units: µg/m3
Method: These data were derived from a model that was parameterized by data on Aerosol Optical Depth (AOD) from NASA's MODIS, SeaWiFS, and MISR satellite instruments, and the GEOS-Chem chemical transport model. The model covered all areas south of 70 degree north Latitude and north of 70 degree south latitude. van Donkelaar et al. estimated annual global surface PM2.5 concentrations at a 10 x 10 km spatial resolution, and then created three year moving averages from 2000 to 2014. Population-weighted average exposure values were calculated using population data from the Global

Rural Urban Mapping Project (2011) database.
Year of Publication: 2015
Covered Time: 2000-2014
URL: http://ehp.niehs.nih.gov/1408646/
Date Data Obtained: 6/1/2015
Data Type: Gridded

Indicator: Average Exposure to Nitrogen Dioxide - NO2 *(NO2)*

Objective / Issue Category: Environmental Health / Air Quality

What it Measures: Average exposure to NO_2

Rationale for Inclusion: The result of fossil fuel combustion, nitrogen dioxide can irritate the lungs and lower resistance to respiratory infections such as influenza. Nitrogen oxides contribute to ozone formation, which is also known to contribute to smog and human health impacts.

INDICATOR CREATION

Unit of Measurement: Average exposure, in ppb
Method / Description: The authors used observations of NO_2 tropospheric column densities from three satellite instruments in combination with chemical transport modeling to produce a global 17-year record of ground-level NO_2 at 0.1° x 0.1° resolution. We calculated linear trends in population-weighted annual mean NO_2 concentrations in different regions around the world as defined by the Global Burden of Disease Study.
Target: High Performance Benchmark: 0 Low Performance Benchmark: 6.6 (99th percentile)
Target Source: Expert opinion

DATA SOURCES

Source (1) Citation: "Long-Term Trends Worldwide in Ambient NO_2 Concentrations Inferred from Satellite Observations" by Jeffrey A. Geddes, Randall V. Martin, Brian L. Boys, and Aaron van Donkelaar in Environmental Health Perspectives
Variable / Units: Average exposure, in ppb
Method: The authors used observations of NO_2 tropospheric column densities from three satellite instruments in combination with chemical transport modeling to produce a global 17-year record of ground-level NO_2 at 0.1° x 0.1° resolution. We calculated linear trends in population-weighted annual mean NO_2 concentrations in different regions around the world as defined by the Global Burden of Disease Study.
Year of Publication: 2015
Covered Time: 1996 - 2012
URL: http://ehp.niehs.nih.gov/1409567/
Date Data Obtained: 8/27/2015
Data Type: Gridded

Indicator: Household Air Quality *(HAP + HAPR)*

Objective / Issue Category: Environmental Health / Air Quality

What it Measures: The percentage of the population burning solid fuel (biomass such as wood, crop residues, dung, charcoal and coal)

Rationale for Inclusion: Cooking with solid fuels over open fires or in simple stoves exposes households to daily pollutant concentrations that lie between those of second-hand smoke exposure and active smoking. (See: Considering Smoking as an Air Pollution Problem for Environmental Health). Solid fuel combustion is associated with increased mortality from pneumonia and other acute lower respiratory diseases among children. Among adults it is connected to increased mortality from chronic obstructive pulmonary disease and, where coal is used, lung cancer. The most recent Global Burden of Disease project (GBD 2010) found household air pollution responsible for around 3.5 million premature deaths worldwide. A measure of solid fuel use (as a useful proxy for household air pollution) served as an estimation of health impacts from household air pollution in the GBD 2010 and, until 2007, as an indicator of environmental sustainability in a MDG.

INDICATOR CREATION (HAP)

Unit of Measurement: Percentage of population using solid fuel
Method / Description: These data are estimates for primary cooking fuel use only, not secondary cooking fuel. They only present solid cooking fuel use (e.g., biomass and coal) and do not specify other less-than-clean such as kerosene. They do not cover fuel used in space heating, although this is sometimes difficult to separate from cooking countries such as China.
Additional Notes: The MDGs 1990-2010 dataset contains both country data and estimated data based on model. The specifics of each data type are explained in the "nature" and "footnote" columns after each year. The 2013 WHO data are estimates. Taiwan's data was imputed based on a regional GDP model.
Target: High Performance Benchmark: 0 Low Performance Benchmark: 100
Target Source: Expert opinion

INDICATOR CREATION (HAPR)

Unit of Measurement: Unitless Scale, 0 - 1
Method / Description: The HAPR is a unitless measure of the health risk posed by household air pollution on a unitless scale from 0 to 1, with 0 indicating no risk and 1 corresponding to maximum risk.
Target: High Performance Benchmark: 0.063 (1st percentile)

Low Performance Benchmark: 0.93 (99th percentile)
Target Source: Expert opinion

DATA SOURCES

[HAP] Source (1) Citation: World Health Organization 2015 Statistics (Global Health Observatory Data Repository-Public health and environment->Household air pollution->Exposure)
Variable / Units: average exposure, in ppb
Method: See publication for detailed methods
Year of Publication: 2015
Covered Time: 2013
URL: http://apps.who.int/gho/data/node.imr.WHS5_512?lang=en
Date Data Obtained: 7/14/2015
Data Type: Excel spreadsheet

[HAP] Source (2) Citation: Millennium Development Goals Indicators (time series)
Variable / Units: % of population using solid fuel
Method: See link below for detailed methods
Year of Publication: 2012
Covered Time: 1990-2010
URL: http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=712&crid=
Date Data Obtained: 7/14/2015
Data Type: Excel spreadsheet

[HAPR] - Source (2) Citation: Forouzanfar, M. H., Alexander, L., Anderson, H. R., Bachman, V. F., Biryukov, S., Brauer, M., ... & Ali, M. K. (2015). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet.
Variable / Units: Unitless
Method: See publication for detailed methods
Year of Publication: 2015
Covered Time: 1990-2010, 2013 (5-year intervals)
URL: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00128-2/abstract

Date Data Obtained: 9/4/2015
Data Type: Tabular

Indicators: Unsafe Sanitation *(ACSAT + ACSATR)*

Objective / Issue Category: Environmental Health / Water & Sanitation

What it Measures: Access to Sanitation measures the proportion of a country's total population with access to an improved drinking water source as a main source of drinking water.

Rationale for Inclusion: Access to adequate sanitation is vital for maintaining healthy drinking water supplies, minimizing contact with dangerous bacteria and viruses, and minimizing environmental threats associated with improper waste management.

INDICATOR CREATION (ACSAT)

Unit of Measurement: Percentage of population with access to improved sanitation.
Method / Description: “Improved” sanitation sources include connection to a public sewer, connection to a septic system, pour-flush latrine, simple pit latrine, or ventilated pit latrine. The system is considered “improved” if it hygienically separates human excreta from human contact and is not public or shared, only private. "Not improved" are: service or bucket latrines (where excreta are manually removed), public latrines, and latrines with an open pit. The total population of a country may comprise either all typical residents of the country (de jure population) or all persons present in the country (de facto population) at the time of the census. For purposes of international comparisons, the de facto definition is recommended.
Additional Notes: Taiwan data are provided by Taiwan's Ministry of Environment. Brunei's data were taken from the 2014 Environmental Performance Index.
Target: High Performance Benchmark (raw data): 100 Low Performance Benchmark (raw data): 11.572 (1st percentile)
Target Source: Expert opinion, Millennium Development Goal-7.C

INDICATOR CREATION (ACSATR)

Unit of Measurement: Unitless Scale, 0 - 1
Method / Description: The ACSATR is a unitless measure of the health risk posed by unsafe sanitation on a unitless scale from 0 to 1, with 0 indicating no risk and 1 corresponding to maximum risk.
Target: High Performance Benchmark: 0.063 (1st percentile) Low Performance Benchmark: 0.93 (99th percentile)
Target Source: Expert opinion

DATA SOURCES

[ACSAT] Source (1) Citation: WHO / UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation
Variable / Units: Percentage of population with access to improved sanitation
Method: Estimates are based on data from nationally representative household surveys and national censuses, which are generally conducted every 3-4 years globally. In the past data were reported by JMP in 5-year intervals. According to the JMP methodology, yearly data are interpolated by using linear regression to compute values for all years.
Year of Publication: 2015
Covered Time: 1990-2015 (yearly values)
URL: http://www.wssinfo.org/data-estimates/tables/
Date Data Obtained: 8/17/2015
Data Type: Tabular

[ACSATR] Source (2) Citation: Forouzanfar, M. H., Alexander, L., Anderson, H. R., Bachman, V. F., Biryukov, S., Brauer, M., ... & Ali, M. K. (2015). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet.
Variable / Units: Unitless
Method: The EPI score for this indicator provides a weighted average using the percent contribution of each risk factor to a country's disability adjusted life years (DALYs).
Year of Publication: 2015
Covered Time: 1990-2010, 2013 (5-year intervals)
URL: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00128-2/abstract
Date Data Obtained: 9/4/2015
Data Type: Tabular

Indicators: Drinking Water Quality *(*WATSUP + WATQ*)*

Objective / Issue Category: Environmental Health / Water & Sanitation

What it Measures: Access to Drinking Water (WATUP) measures the proportion of a country's total population with access to an improved drinking water source as a main source of drinking water. Drinking Water Quality (WATQ) measures the health risk exposure to unsafe drinking water.

Rationale for Inclusion: Access to Drinking Water is the best currently available proxy for access to clean drinking water. Access to reliable, safe water reduces exposure to pollution, disease, and harmful contaminants, thereby promoting health and wellbeing. For example, diarrhea is the leading cause of death among children, and is directly caused by consumption of contaminated water. This indicator, however, lacks information about water quality. The Drinking Water Quality indicator assesses the health risk when individuals are exposed to unsafe drinking water.

INDICATOR CREATION (WATSUP)

Unit of Measurement: Percentage of population with access to improved drinking water source.
Method / Description: The indicator is computed as the number of people with access to an improved drinking water source in relation to the total population, expressed as a percentage. An "improved" drinking water source" is defined as a facility or delivery point that protects water from external contamination - particularly fecal contamination. This includes piped water into a dwelling, plot or yard; public tap or standpipe; tubewell or borehole; protected spring; and rainwater collection.
Additional Notes: Taiwan data are provided by Taiwan's Ministry of Environment. Bermuda's value is from the year 2010, Bermuda Department of Statistics, 2013 Environmental Statistics Compendium. Brunei's value is for the year 2010, "Brunei Darussalam's Long Term Development Plan for Water & Wastewater" by HE Yang, Minister of Development, Brunei at Singapore International Water Week, 2010.
Target: High Performance Benchmark: 100 Low Performance Benchmark: 48.967 (1st percentile)
Target Source: Expert opinion, Millennium Development Goal-7.C

INDICATOR CREATION (WATQ)

Unit of Measurement: Unitless Scale, 0 - 1
Method / Description: Health risk exposure calculated from data on the proportion of households with access to different water sources (unimproved, improved except piped, piped water supply) and reported use of household water treatment methods (boiling or filtering; chlorinating or solar filtering; no treatment).

Target: High Performance Benchmark (raw data): 0.9694629 (95th percentile); 0.9886523 (99th percentile) Low Performance Benchmark (raw data): 0
Target Source: Expert Opinion

DATA SOURCES

[WATSUP] Source (1) Citation: WHO / UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation
Variable / Units: Percentage of population with access to improved drinking water source.
Method: Estimates are based on data from nationally representative household surveys and national censuses, which are generally conducted every 3-4 years globally. In the past data were reported by JMP in 5-year intervals. According to the JMP methodology, yearly data are interpolated by using linear regression to compute values for all years.
Year of Publication: 2015
Covered Time: 1990-2015 (yearly values)
URL: http://www.wssinfo.org/data-estimates/tables/
Date Data Obtained: 8/17/2015
Data Type: Tabular

[WATQ] Source (2) Citation: Forouzanfar, M. H., Alexander, L., Anderson, H. R., Bachman, V. F., Biryukov, S., Brauer, M., ... & Ali, M. K. (2015). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet.
Variable / Units: Unitless Scale, 0 - 1
Method: Estimates are based on data from nationally representative household surveys and national censuses, which are generally conducted every 3-4 years globally. In the past data were reported by JMP in 5-year intervals. According to the JMP methodology, yearly data are interpolated by using linear regression to compute values for all years.
Year of Publication: 2015
Covered Time: 1990-2010, 2013 (5-year intervals)
URL: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00128-2/abstract
Date Data Obtained: 9/4/2015
Data Type: Tabular

Indicator: Wastewater Treatment *(WASTECXN)*

Objective / Issue Category: Ecosystem Vitality / Water Resources

What it Measures: The percentage of collected, generated, or produced wastewater that is treated, normalized by the population connected to centralized wastewater treatment facilities.

Rationale for Inclusion: Wastewater from industrial or household sources can contain a variety of contaminants that are detrimental to both human and ecosystem health. Wastewater treatment is a measure of what percentage of wastewater is treated before it is released back into ecosystems. The percentage of wastewater treated represents a measure of largely urban waste collection and treatment, since few rural areas are connected to sewage systems.

INDICATOR CREATION

Unit of Measurement: Percentage of wastewater that receives treatment weighted by connection to wastewater treatment rate.
Method / Description: Source data were collated with these other datasets to create a country-year time series. A source-type hierarchy was used to find a value for each data point: 1) Country-level statistical data and reports; 2) OECD and EuroStat values were then used ("population connected to a wastewater treatment plant") and; 3) United Nations Statistics Division's "Population connected to wastewater treatment" variable; 4) percentage of wastewater treated to secondary and tertiary treatment levels from the Global Water Intelligence and the Pinsent-Masons Water Yearbook; 5) FAO-AQUASTAT values ("Total volume of wastewater treated" / "Total volume of wastewater collected"*100) for a given year, country. Due to sparse and inconsistent time-series data, the decadal averages were then taken within the dataset to produce summary values. The final wastewater treatment performance scores were determined by multiplying the wastewater treatment summary values with the sewerage connection values to arrive at an overall total percentage of wastewater treated.
Additional Notes: Data points were averaged in 5- year increments from 1993 to 2013. The most recent data were used to score countries, except for Belize, British Virgin Islands, French Guiana, Guadeloupe, Dominica, Trinidad and Tobago, Lebanon, Martinique, Puerto Rico, Suriname, and the Marshall Islands, where data from an older 5-year average had to be used. Taiwan data are provided by Taiwan's Ministry of Environment. Antigua and Barbuda, Bahamas, Barbados, Brunei Darussalam, Comoros, Grenada, Kiribati, Maldives, Seychelles, Samoa, Sao Tome and Principe, Solomon Islands, Somalia, Suriname, Timor-Leste, Tonga and Vanuatu, and Cape Verde's data are imputed estimates from the 2014 EPI. Sao Tome and Principe and Samoa's data were produced from regional averages.

Target: High Performance Benchmark: 100 Low Performance Benchmark: 0
Target Source: Expert opinion

DATA SOURCES

Source (1) Citation: Malik, O. (2013). Global database of National Wastewater Treatment. New Haven: Yale Center for Environmental Law and Policy. Updated in 2015.
Variable / Units: Treatment rate in percentage; Connection rate in percentage
Method: The performance of wastewater treatment is measured by volume of wastewater treated over time, and performance metrics are established by public or privately owned or operated utilities for a municipal area. Surveys of utilities are often a source of performance data, as well as estimated volumes of water discharged into the environment with or without treatment, and volumes receiving treatment before being reused in the local water supply. The research team collected country-level official statistical records and reports. Where country-level data were not available, city-level data were sought, along with peer-reviewed literature for a given country's performance. If the data source was considered to be reputable, the values were recorded as national percentages for urban or combined urban/rural areas. The definitions on performance vary with the reporting, but we checked to verify the comparability by running correlations against similar datasets on wastewater treatment performance.
Year of Publication: 2013 and updated in 2015
Covered Time: 1995-2015
URL: See wastewater issue profile at www.epi.yale.edu
Date Data Obtained: May - September, 2015 (updated data)
Data Type: Tabular

Source (2) Citation: OECD Statistics
Variable / Units: Treatment rate in percentage; Connection rate in percentage
Method: For treatment rate, "public total treatment (connected to a wastewater treatment plant)" was used. For connection rate "total public sewerage (% of resident population connected to urban wastewater collecting system)" was used
Year of Publication: 2015
Covered Time: 1990-2013
URL: http://stats.oecd.org/
Date Data Obtained: 8/1/2015
Data Type: Tabular

Source (3) Citation: Eurostat
Variable / Units: Treatment rate in percentage; Connection rate in percentage
Method: For treatment rate, "population connected to a wastewater treatment plant" was used. For connection rate "population connected to urban wastewater collecting system" was used
Year of Publication: 2015
Covered Time: 2002-2015
URL: http://ec.europa.eu/eurostat/data/database
Date Data Obtained: 8/1/2015
Data Type: Tabular

Source (4) Citation: United Nations Statistics Division
Variable / Units: Treatment rate in percentage; Connection rate in percentage
Method: For treatment rate, "percentage of population whose wastewater is treated at wastewater treatment plants" was used. For connection rate "percentage of population connected to the wastewater collecting systems (sewerage)" was used
Year of Publication: 2011
Covered Time: 1990, 1995-2009
URL: http://unstats.un.org/unsd/ENVIRONMENT/Time%20series.htm#InlandWaterResources
Date Data Obtained: 8/1/2015
Data Type: Tabular

Source (5) Citation: Global Water Intelligence Water and Wastewater Indicators
Variable / Units: Treatment rate in percentage; Connection rate in percentage
Method: For treatment rate, percentage of wastewater produced that is treated to a secondary or tertiary level was used. For connection rate "percentage of the population of the country who are able to discharge wastewater into a piped wastewater network" was used
Year of Publication: 2015
Covered Time: 2011
URL: https://www.globalwaterintel.com/research/global-picture/global-picture/datasets-2
Date Data Obtained: 7/24/2015
Data Type: Tabular

Source (6) Citation: Pinsent Masons Water Yearbooks
Variable / Units: Treatment rate in percentage; Connection rate in percentage
Method: For treatment rate, percentage of wastewater produced that is treated to a secondary or tertiary level was used. For connection rate "percentage of the population of the country who are able to discharge wastewater into a piped wastewater network" was used. The latest yearbook (2012-2013) and historical editions were used
Year of Publication: 2013
Covered Time: 2011
URL: http://wateryearbook.pinsentmasons.com/
Date Data Obtained: 8/1/2015
Data Type: Tabular

Source (7) Citation: FAO. 2015. AQUASTAT Main Database, Food and Agriculture Organization of the United Nations (FAO).
Variable / Units: Treatment rate in percentage (billion cubic meters per year)
Method: "collected municipal wastewater" divided by "treated municipal wastewater"
Year of Publication: 2015
Covered Time: 1989-2014
URL: http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en
Date Data Obtained: 8/1/2015
Data Type: Tabular

Indicator: Species Protection *(PSPU)*

Objective / Issue Category: Ecosystem Vitality / Biodiversity & Habitat

What it Measures: The extent of a species' range protected as a proportion of a country's biomes (national weight)

Rationale for Inclusion: Parks and protected areas can be thought of as "necessary but not sufficient" for biodiversity and habitat protection, because it is not feasible to protect every species and habitat type with this tool. This indicator is important because it looks beyond parks and protected areas to address how countries are dealing with species conservation within its borders more broadly.

INDICATOR CREATION

Unit of Measurement: Percentage
Method / Description: This unweighted indicator is a simple average of species protection within a country. Rasters at 30 arc-second/pixel (~1km) were created for the parks, where each pixel represents the unique combination of parks present, another for country codes, and one each for the range maps. Then Google Earth Engine was used to generate tables of country, species, and parks, which are joined to a lookup table from the park identifications to the IUCN World Database on Protected Areas.
Target: High Performance Benchmark: 17% (CBD Aichi Target 11) Low Performance Benchmark: 0%
Target Source: Expert opinion

DATA SOURCES

Source (1) Citation: Jetz, W., et al. (2015). Map of Life.
Variable / Units: Percentage of area
Method: See method/description above.
Year of Publication: 2015
Covered Time: 1990-2015
URL: www.mol.org
Date Data Obtained: 9/25/2015
Data Type: Geospatial

Source (2) Citation: UNEP-WCMC (2015), The World Database on Protected Areas (WDPA) March Release. Cambridge, UK: UNEP-WCMC.

Variable / Units: Protected Areas
Method: Information is gathered from several resources to create this interactive database, including species data from the Global Biodiversity Information Facility and protected areas descriptions from Wikipedia. The database also expands on the World Database on Protected Areas from the UNEP-WCMC, which includes key attributes or field information - such as name, designation, area, establishment data, IUCN protected area management category, establishment data - as well as the delineated boundary or location (latitude/longitude) for the site.
Year of Publication: 2013
Covered Time: 2000-2015
URL: http://www.protectedplanet.net (and see http://blog.protectedplanet.net/post/102485175019/2014-protected-planet-report for 2014 update description)
Date Data Obtained: 8/1/2015
Data Type: Geospatial - GIS polygon shapefile

Indicator: Species Protection – Weighted *(PSPW)*

Objective / Issue Category: Ecosystem Vitality / Biodiversity & Habitat

What it Measures: Adjusts according to the proportion of a species' global habitat represented within a country's protected areas (global stewardship weight)

Rationale for Inclusion: Parks and protected areas can be thought of as "necessary but not sufficient" for biodiversity and habitat protection, because it is not feasible to protect every species and habitat type with this tool. This indicator is important because it looks beyond parks and protected areas to address how countries are dealing with species conservation within its borders more broadly.

INDICATOR CREATION

Unit of Measurement: Percentage
Method / Description: This weighted indicator represents the average percentage of species range area that is protected, weighted by the country's relative stewardship. Rasters at 30 arc-second/pixel (~1km) were created for the parks, where each pixel represents the unique combination of parks present, another for country codes, and one each for the range maps. Then Google Earth Engine was used to generate tables of country, species, and parks, which are joined to a lookup table from the park identifications to the IUCN World Database on Protected Areas.
Target: High Performance Benchmark: 17% (CBD Aichi Target 11) Low Performance Benchmark: 0%
Target Source: Expert opinion

DATA SOURCES

Source (1) Citation: Jetz, W., et al. (2015). Map of Life.
Variable / Units:
Method:
Year of Publication: 2015
Covered Time: 1990-2015
URL: www.mol.org
Date Data Obtained: 9/25/2015
Data Type: Geospatial

Source (2) Citation: UNEP-WCMC (2015), The World Database on Protected Areas (WDPA) March Release.

Cambridge, UK: UNEP-WCMC.
Variable / Units: Protected Areas
Method: Information is gathered from several resources to create this interactive database, including species data from the Global Biodiversity Information Facility and protected areas descriptions from Wikipedia. The database also expands on the World Database on Protected Areas from the UNEP-WCMC, which includes key attributes or field information - such as name, designation, area, establishment data, IUCN protected area management category, establishment data - as well as the delineated boundary or location (latitude/longitude) for the site.
Year of Publication: 2013
Covered Time: 2000-2015
URL: http://www.protectedplanet.net (and see http://blog.protectedplanet.net/post/102485175019/2014-protected-planet-report for 2014 update description)
Date Data Obtained: 8/1/2015
Data Type: Geospatial - GIS polygon shapefile

Indicator: Protection of Terrestrial Biomes - Domestic *(PACOVD)*

Objective / Issue Category: Ecosystem Vitality / Biodiversity & Habitat

What it Measures: The Terrestrial Protected Areas (National Biome Weight) indicator assesses the protection of biomes weighted by the proportion of a country's territory the biome occupies.

Rationale for Inclusion: This indicator measures the degree to which a country achieves the target of protecting 17% of each terrestrial biome within its borders, weighted by the domestic contribution of each terrestrial biome. The Convention on Biological Diversity (CBD) established the 17% target at its 10th Conference of the Parties in Nagoya, Japan.* We treat protected status as a necessary but not sufficient condition for an ecological region to be "effectively conserved." How well protected areas are managed, the strength of the legal protections extended to them, and the actual outcomes on the ground, are all vital elements of a comprehensive assessment of effective conservation. Such measures are not available on a widespread basis, though there are efforts underway to fill critical gaps.

INDICATOR CREATION

Unit of Measurement: Percentage of terrestrial biome area that is protected, weighted by domestic biome area
Method / Description: The Center for International Earth Science Information Network (CIESIN) developed a time series protected area (PA) coverage based on the date of establishment field in the World Conversation Monitoring Centre's World Database on Protected Areas. Where boundaries were missing, we drew circles around PA centroids (buffered points) based on the PA area. We exclude proposed sites that are not yet officially designated. We removed all overlaps between different protected areas by dissolving the boundaries so as to create a PA mask. We overlaid the PA mask on biome data from Olson et al. (2001) and a CIESIN generated country-level administrative boundary file, and we calculated the percentage of each biome under protection by country. All biome protection percentages were capped at 17% so that higher protection in one biome cannot be used to offset lower protection in another. The final indicator is a weighted average of the percentage of land area protected in each biome, with weights derived from the proportion of the national territory falling in each biome.
Additional Notes: The weighted percentage of biomes under protected status, where the weight is determined by the relative size of biomes within a country. Countries are not rewarded for protecting beyond 17% of any given biome (i.e., scores are capped at 17% per biome) so that higher levels of protection of some biomes cannot be used to offset lower levels of protection of other biomes.

Target: High Performance Benchmark: 17% (CBD Aichi Target 11) Low Performance Benchmark: 0%
Target Source: Convention on Biological Diversity

DATA SOURCES

Source (1) Citation: UNEP-WCMC (2015), The World Database on Protected Areas (WDPA) March Release. Cambridge, UK: UNEP-WCMC.
Variable / Units: Protected Areas
Method: Information is gathered from several resources to create this interactive database, including species data from the Global Biodiversity Information Facility and protected areas descriptions from Wikipedia. The database also expands on the World Database on Protected Areas from the UNEP-WCMC, which includes key attributes or field information - such as name, designation, area, establishment data, IUCN protected area management category, establishment data - as well as the delineated boundary or location (latitude/longitude) for the site.
Year of Publication: 2015
Covered Time: 2000-2015
URL: http://www.protectedplanet.net
Date Data Obtained: 4/2/2015
Data Type: Geospatial - GIS polygon shapefile

Source (2) Citation: Olson, D.M., Dinerstein, E., Wikramanayake, E.D., Burgess, N. D., Powell, G.V.N., Underwood, E.C., D'Amico, J.A., Itoua, I., Strand, H.E., Morrison, J.C., Loucks, C.J., Allnutt, T.F., Ricketts, T.H., Kura, Y., Lamoreux, J.F., Wettengel, W.W., Hedao, P., Kassem, K.R. (2001). Terrestrial ecoregions of the world: a new map of life on Earth. Bioscience 51(11):933-938.
Variable / Units: WWF Ecoregions of the World
Method: The global dataset was built on previous biogeographical studies and synthesized information from regional workshops. The ecoregions fall under two higher-order classifications: biomes and biogeographic realms, which provide a framework for making comparisons among units and identifying representative habitats and species assemblages.
Year of Publication: 2001
Covered Time: circa 2000
URL: http://worldwildlife.org/publications/terrestrial-ecoregions-of-the-world
Date Data Obtained: 2003

Data Type: Geospatial - ESRI Shapefile

Indicator: Protection of Terrestrial Biomes - Global *(PACOVW)*

Objective / Issue Category: Ecosystem Vitality / Biodiversity & Habitat

What it Measures: Terrestrial Protected Areas (Global Contribution) reflects the protection of biomes weighted by their globally proportional abundance.

Rationale for Inclusion: This indicator measures the degree to which a country achieves the target of protecting 17% of each terrestrial biome within its borders, weighted by the global contribution of each terrestrial biome. The Convention on Biological Diversity (CBD) established the 17% target at its 10th Conference of the Parties in Nagoya, Japan.* We treat protected status as a necessary but not sufficient condition for an ecological region to be "effectively conserved." How well protected areas are managed, the strength of the legal protections extended to them, and the actual outcomes on the ground, are all vital elements of a comprehensive assessment of effective conservation. Such measures are not available on a widespread basis, though there are efforts underway to fill critical gaps.

INDICATOR CREATION

Unit of Measurement: Percentage of terrestrial biome area that is protected, weighted by domestic biome area
Method / Description: The Center for International Earth Science Information Network (CIESIN) developed a time series protected area (PA) coverage based on the date of establishment field in the World Conversation Monitoring Centre's World Database on Protected Areas. Where boundaries were missing, we drew circles around PA centroids (buffered points) based on the PA area. We exclude proposed sites that are not yet officially designated. We removed all overlaps between different protected areas by dissolving the boundaries so as to create a PA mask. We overlaid the PA mask on biome data from Olson et al. (2001) and a CIESIN generated country-level administrative boundary file, and we calculated the percentage of each biome under protection by country. All biome protection percentages were capped at 17% so that higher protection in one biome cannot be used to offset lower protection in another. The final indicator is a weighted average of the percentage of land area protected in each biome, with weights derived from the proportion of the world's land surface falling in each biome.
Additional Notes: The weighted percentage of biomes under protected status, where the weight is determined by the relative size of biomes within a country. Countries are not rewarded for protecting beyond 17% of any given biome (i.e., scores are capped at 17% per biome) so that higher levels of protection of some biomes cannot be used to offset lower levels of protection of other biomes.
Target: High Performance Benchmark: 17% (CBD Aichi Target 11) Low Performance Benchmark: 0%

Target Source: Convention on Biological Diversity

DATA SOURCES

Source (1) Citation: UNEP-WCMC (2015), The World Database on Protected Areas (WDPA) March Release. Cambridge, UK: UNEP-WCMC.
Variable / Units: Protected Areas
Method: Information is gathered from several resources to create this interactive database, including species data from the Global Biodiversity Information Facility and protected areas descriptions from Wikipedia. The database also expands on the World Database on Protected Areas from the UNEP-WCMC, which includes key attributes or field information - such as name, designation, area, establishment data, IUCN protected area management category, establishment data - as well as the delineated boundary or location (latitude/longitude) for the site.
Year of Publication: 2015
Covered Time: 2000-2015
URL: http://www.protectedplanet.net
Date Data Obtained: 4/2/2015
Data Type: Geospatial - GIS polygon shapefile

Source (2) Citation: Olson, D.M., Dinerstein, E., Wikramanayake, E.D., Burgess, N. D., Powell, G.V.N., Underwood, E.C., D'Amico, J.A., Itoua, I., Strand, H.E., Morrison, J.C., Loucks, C.J., Allnutt, T.F., Ricketts, T.H., Kura, Y., Lamoreux, J.F., Wettengel, W.W., Hedao, P., Kassem, K.R. (2001). Terrestrial ecoregions of the world: a new map of life on Earth. Bioscience 51(11):933-938.
Variable / Units: WWF Ecoregions of the World
Method: The global dataset was built on previous biogeographical studies and synthesized information from regional workshops. The ecoregions fall under two higher-order classifications: biomes and biogeographic realms, which provide a framework for making comparisons among units and identifying representative habitats and species assemblages.
Year of Publication: 2001
Covered Time: circa 2000
URL: http://worldwildlife.org/publications/terrestrial-ecoregions-of-the-world
Date Data Obtained: 2003
Data Type: Geospatial - ESRI Shapefile

Indicator: Marine Protected Areas *(MPAEEZ)*

Objective / Issue Category: Ecosystem Vitality / Biodiversity & Habitat

What it Measures: Marine Protected Areas measures the percentage of country's exclusive economic zone (EEZ) that is under protection.

Rationale for Inclusion: Marine Protected Areas (MPAs) are an essential insurance policy for the future of both marine life and local people. They safeguard the ocean's rich diversity of life and provide safe havens for endangered species, as well as commercial fish populations. Well-designed networks of ecologically representative MPAs can also allow better security against environmental change, such as global warming.

INDICATOR CREATION

Unit of Measurement: The percentage of each country's exclusive economic zone (EEZ, 0-200 nautical miles) that is under protection by a nationally designated marine protected area (MPA).
Method / Description: CIESIN developed a time series marine protected area (MPA) coverage based on the date of establishment field in the World Conversation Monitoring Centre's World Database on Protected Areas. Where boundaries were missing, we drew circles around PA centroids (buffered points) based on the PA area. We exclude proposed sites that are not yet officially designated as well as internationally designated protected areas (e.g., Ramsar and World Heritage sites) except where they are also listed as nationally designated protected areas. We removed all overlaps between different protected areas by dissolving the boundaries so as to create a MPA mask. We overlaid the MPA mask on the EEZ area from the VLIZ Maritime Boundaries Geodatabase, and we calculated the percentage of the EEZ that is protected. For landlocked countries and countries with very high ratios of land area to coastline (Slovenia, Bosnia, Democratic Republic of the Congo, Iraq, Jordan), we do not include a score for MPAEEZ in the calculation of their Biodiversity & Habitat policy category scores.
Transformation Needed for Aggregation: Logarithmic (alpha value of 0.000255309 applied prior to transformation)
Target: High Performance Benchmark: 10 Low Performance Benchmark: 0
Target Source: Convention on Biological Diversity

DATA SOURCES

Source (1) Citation: UNEP-WCMC (2015), The World Database on Protected Areas (WDPA) March Release. Cambridge, UK: UNEP-WCMC.
Variable / Units: Protected Areas

Method: Information is gathered from several resources to create this interactive database, including species data from the Global Biodiversity Information Facility and protected areas descriptions from Wikipedia. The database also expands on the World Database on Protected Areas from the UNEP-WCMC, which includes key attributes or field information - such as name, designation, area, establishment data, IUCN protected area management category, establishment data - as well as the delineated boundary or location (latitude/longitude) for the site.
Year of Publication: 2015
Covered Time: 2000-2015
URL: http://www.protectedplanet.net
Date Data Obtained: 4/2/2015
Data Type: Geospatial - GIS polygon shapefile

Source (2) Citation: VLIZ Maritime Boundaries Geodatabase VLIZ (2014). Maritime Boundaries Geodatabase, version 8.
Variable / Units: World EEZ Geodatabase
Method: Boundaries are calculated from the baseline on offshore using different types of baselines.
Year of Publication: 2014
Covered Time: 2014
URL: http://www.marineregions.org/
Date Data Obtained: 9/30/2015
Data Type: Geospatial - Geodatabase feature class

Indicator: Nitrogen Use Efficiency *(NUE)*

Objective / Issue Category: Ecosystem Vitality / Agriculture

What it Measures: Nitrogen Use Efficiency measures appropriate management of nitrogen resources for agricultural production.

Rationale for Inclusion: Applying nitrogen (N) to cropland is a critical method of increasing crop production without furthering land conversions. Excessive applications, however, can have significant environmental impacts. N not taken up by crops is often lost to the environment through nitrogen leaching, ammonia volatilization, and nitrous oxide emissions. This can negatively affect air and water quality, lead to ozone layer depletion, and exacerbate climate change Monitoring the appropriate use of these agricultural inputs acts as a proxy for their potential to do environmental harm, and encourages countries to be more judicious in their applications.

INDICATOR CREATION

Unit of Measurement: Ratio
Method / Description: The indicator was developed using the following formula: (Nitrogen in crop yield) / (Nitrogen in fertilizer applications + nitrogen deposition + nitrogen fixation + nitrogen in manure applied to cropland). Nitrogen in harvested crops and fixation were calculated on a per crop (or product) basis then agglomerated at the country level. N in fertilizer and in manure were calculated by applying a fraction of N applied to cropland to the total N consumed by a country's agricultural industry, as identified by FAOSTAT. Nitrogen deposition rates were calculated on a per country basis using maps of crop distribution and linear interpolations of historical deposition trends. Three-year rolling averages were calculated for the final indicator.
Additional Notes: NUE data for Georgia, Armenia, Azerbaijan, Belarus, Ukraine, Russia, Czech Republic are all derived from USSR data. NUE data for Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro and Macedonia were derived from former Yugoslav Republic data. American Samoa, Andorra, Benin, Bermuda, British Virgin Islands, Cayman Islands, Djibouti, Eritrea, Faeroe Islands, French Guiana, Guadeloupe, Guam, Kazakhstan, Kiribati, Kuwait, Maldives, Marshall Islands, Martinique, Micronesia, Montserra, Nauru, Niue, Oman, Qatar, Tokelau, Tuvalu, Saint Pierre and Miquelon, Saint Vincent and the Grenadines, Solomon Islands, Seychelles, Singapore, Somalia, Vanuatu, Wallis and Futuna were not scored based on low agricultural output and crop yield. Taiwan received a regional average score for NUE.
Target: High Performance Benchmark: 70 Low Performance Benchmark: 0
Target Source: Expert opinion

DATA SOURCES

Source (1) Citation: Lassaletta, L. et al. (2014). Food and feed trade as a driver in the global nitrogen cycle: 50-year trends. Biogeochemistry 118:225-241; Bouwman, a. F., Beusen, a. H. W., & Billen, G. (2009). Human alteration of the global nitrogen and phosphorus soil balances for the period 1970-2050. Global Biogeochemical Cycles, 23(4).; FAOSTAT.
Variable / Units: Nitrogen in crop yield (NYIELD) / Kg N
Method: NYIELD is the product of a crop's yield level (Y) and the crop nitrogen content (NC) as defined by Bouwman et al. (2005) and Lassaletta et al. (2014). Annual crop yield per country is provided by the FAOSTAT. Nyield is calculated for each year (yr), country (co), and crop type (cr) (Zhang et al., 2015).
Year of Publication: 2015
Covered Time: 1960 - 2012
URL: http://www.nature.com/nature/journal/v528/n7580/abs/nature15743.html
Date Data Obtained: 12/3/2015
Data Type: Database

Source (2) Citation: Zhang et al. 2015
Variable / Units: Nitrogen in manure applied to cropland / Kg N
Method: Nitrogen in manure applied to cropland was calculated by multiplying total N applied to soils (provided by FAOSTAT), in kg, by an associated fraction of manure applied to cropland (Zhang et al., 2015)
Year of Publication: 2015
Covered Time: 1960 - 2012
URL: http://www.nature.com/nature/journal/v528/n7580/abs/nature15743.html
Date Data Obtained: 12/03/2015
Data Type: Database

Source (3) Citation: Zhang et al. 2015
Variable / Units: Nitrogen deposition (NDEP) / Kg N
Method: Annual N deposition rates per country were calculated using maps of nitrogen deposition and crop distribution. Maps for N deposition for 1950, 2000, and 2050 were calculated using linear interpolation methods. The aggregate amount of countrywide nitrogen deposition per crop type was divided by the total amount of harvested area. Maps for N deposition from 1960-2011 were calculated using linear interpolation methods. N deposition rates for the 1961-2011 period were calculated using 2000 crop distribution data due to lack of historical records.

Year of Publication: 2015
Covered Time: 1960 - 2012
URL: http://www.nature.com/nature/journal/v528/n7580/abs/nature15743.html
Date Data Obtained: 12/03/2015
Data Type: Database

Source (4) Citation: Herridge, D. F., Peoples, M. B., & Boddey, R. M. (2008). Global inputs of biological nitrogen fixation in agricultural systems. Plant and Soil, 311(1-2), 1–18; FAOSTAT.
Variable / Units: Nitrogen fixation (NDEP) / Kg N
Method: Average N fixation rates for major legume crops were calculated by multiplying each country's annual area harvested of each leguminous crop type (provided by FAOSTAT), in ha, by its associated nitrogen fixing rate (NFR), in kg N ha-1. Nitrogen fixation rates are provided by Herridge et al. (2008). Thus: Nfixco,cr,yr = Yco,cr,yr * NFRcr.
Year of Publication: 2008
Covered Time: 1960 - 2012
URL: http://lira.pro.br/wordpress/wp-content/uploads/2012/10/herridge-et-al-2008.pdf
Date Data Obtained: 10/2015
Data Type: Database

Indicator: Nitrogen Use Balance *(NBALANCE)*

Objective / Issue Category: Ecosystem Vitality / Agriculture

What it Measures: Nitrogen Use Balance measures appropriate management of nitrogen resources for agricultural production

Rationale for Inclusion: Applying nitrogen (N) to cropland is a critical method of increasing crop production without furthering land conversions. Excessive applications, however, can have significant environmental impacts. N not taken up by crops is often lost to the environment through nitrogen leaching, ammonia volatilization, and nitrous oxide emissions. This can negatively affect air and water quality, lead to ozone layer depletion, and exacerbate climate change Monitoring the appropriate use of these agricultural inputs acts as a proxy for their potential to do environmental harm, and encourages countries to be more judicious in their applications.

INDICATOR CREATION

Unit of Measurement: Kilograms of Nitrogen per hectare (kg of N/ha)
Method / Description: The indicator was developed using the following formula: (Nitrogen in fertilizer applications + nitrogen deposition + nitrogen fixation + nitrogen in feedstuff imports) - (Nitrogen in crop yield + nitrogen in manure applied to cropland). Nitrogen in harvested crops and fixation were calculated on a per crop (or product) basis then agglomerated at the country level. N in fertilizer and in manure were calclated by applying a fraction of N applied to cropland to the total N consumed by a country's agricultural industry, as identified by FAOSTAT. Nitrogen deposition rates were calculated on a per country basis using maps of crop distribution and linear interpolations of historical deposition trends.
Additional Notes: NBALANCE data for Georgia, Armenia, Azerbaijan, Belarus, Ukraine, Russia, Czech Republic are all derived from USSR data. NBALANCE data for Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro and Macedonia were derived from former Yugoslav Republic data. American Samoa, Andorra, Benin, Bermuda, British Virgin Islands, Cayman Islands, Djibouti, Eritrea, Faeroe Islands, French Guiana, Guadeloupe, Guam, Kazakhstan, Kiribati, Kuwait, Maldives, Marshall Islands, Martinique, Micronesia, Montserra, Nauru, Niue, Oman, Qatar, Tokelau, Tuvalu, Saint Pierre and Miquelon, Saint Vincent and the Grenadines, Solomon Islands, Seychelles, Singapore, Somalia, Vanuatu, Wallis and Futuna were not scored based on low agricultural output and crop yield. Taiwan received a regional average score for NBALANCE.
Target: All countries who scored within an acceptable range of NBALANCE between 0 and 79 kg/N/ha were given a score of 100. Countries performing outside the acceptable range received a score according to the following function: 100*exp(-0.001*(NBALANCE-50)^2).
Target Source: Zhang et al. (2015)

DATA SOURCES

Source (1) Citation: Lassaletta, L. et al. (2014). Food and feed trade as a driver in the global nitrogen cycle: 50-year trends. Biogeochemistry 118:225-241; Bouwman, a. F., Beusen, a. H. W., & Billen, G. (2009). Human alteration of the global nitrogen and phosphorus soil balances for the period 1970-2050. Global Biogeochemical Cycles, 23(4).; FAOSTAT.
Variable / Units: Nitrogen in crop yield (NYIELD) / Kg N
Method: NYIELD is the product of a crop's yield level (Y) and the crop nitrogen content (NC) as defined by Bouwman et al. (2005) and Lassaletta et al. (2014). Annual crop yield per country is provided by the FAOSTAT. Nyield is calculated for each year (yr), country (co), and crop type (cr) (Zhang et al., 2015).
Year of Publication: 2015
Covered Time: 1960 - 2012
URL: http://www.nature.com/nature/journal/v528/n7580/abs/nature15743.html
Date Data Obtained: 12/3/2015
Data Type: Database

Source (2) Citation: Zhang et al. 2015
Variable / Units: Nitrogen in manure applied to cropland / Kg N
Method: Nitrogen in manure applied to cropland was calculated by multiplying total N applied to soils (provided by FAOSTAT), in kg, by an associated fraction of manure applied to cropland (Zhang et al., 2015)
Year of Publication: 2015
Covered Time: 1960 - 2012
URL: http://www.nature.com/nature/journal/v528/n7580/abs/nature15743.html
Date Data Obtained: 12/03/2015
Data Type: Database

Source (3) Citation: Zhang et al. 2015
Variable / Units: Nitrogen deposition (NDEP) / Kg N
Method: Annual N deposition rates per country were calculated using maps of nitrogen deposition and crop distribution. Maps for N deposition for 1950, 2000, and 2050 were calculated using linear interpolation methods. The aggregate amount of countrywide nitrogen deposition per crop type was divided by the total amount of harvested area. Maps for N deposition from 1960-2011 were calculated using linear interpolation methods. N deposition rates for the 1961-2011 period were calculated using 2000 crop distribution data due to lack of historical records.

Year of Publication: 2015
Covered Time: 1960 - 2012
URL: http://www.nature.com/nature/journal/v528/n7580/abs/nature15743.html
Date Data Obtained: 12/03/2015
Data Type: Database

Source (4) Citation: Herridge, D. F., Peoples, M. B., & Boddey, R. M. (2008). Global inputs of biological nitrogen fixation in agricultural systems. Plant and Soil, 311(1-2), 1–18; FAOSTAT.
Variable / Units: Nitrogen fixation (NDEP) / Kg N
Method: Average N fixation rates for major legume crops were calculated by multiplying each country's annual area harvested of each leguminous crop type (provided by FAOSTAT), in ha, by its associated nitrogen fixing rate (NFR), in kg N ha-1. Nitrogen fixation rates are provided by Herridge et al. (2008). Thus: Nfixco,cr,yr = Yco,cr,yr * NFRcr.
Year of Publication: 2008
Covered Time: 1960 - 2012
URL: http://lira.pro.br/wordpress/wp-content/uploads/2012/10/herridge-et-al-2008.pdf
Date Data Obtained: 10/2015
Data Type: Database

Indicator: Tree Cover Loss *()*

Objective / Issue Category: Ecosystem Vitality / Forests

What it Measures: The Forest Cover Loss Indicator measures the loss in the sum of annual tree cover between 2000 and 2014 in areas with greater than 30 percent tree cover, divided by 2000 forest extent. It factors in areas of tree cover loss across a range of causes including anthropogenic deforestation, natural and anthropogenic forest fires, clearing trees for agriculture, logging, plantation harvesting, and tree mortality due to natural causes.

Rationale for Inclusion: Reduction in the extent of forest cover has significant negative implications for ecosystem services and habitat protection.

INDICATOR CREATION

Unit of Measurement: Forest loss in >30% tree cover, as compared to 2000 levels (unitless)
Method / Description: Hansen et al. (2013) used 650,000 Landsat 7, 30-meter resolution satellite images to quantify the area of forest loss. As defined in Hansen et al. (2013), trees were defined as all vegetation taller than 5m in height. Forest loss was defined as a standard-replacement disturbance or the complete removal of tree cover canopy at the Landsat pixel scale. Results were disaggregated by reference percent tree cover stratum (e.g. >30% crown cover to ~0% crown cover) and by year.
Additional Notes: Countries with less than 200 sq. km. (according to FAO FRA 2010) of >30% tree cover in 2000 or less than 2% of land area covered by >30% tree cover were not given a score for this category. These countries include: Afghanistan, Algeria, Antigua and Barbuda, Bahrain, Barbados, Benin, Botswana, Brunei Darussalam, Burkina Faso, Cape Verde, Chad, Comoros, Djibouti, Dominica, Egypt, Eritrea, Grenada, Iceland, Iran, Iraq, Israel, Jordan, Kazakhstan, Kiribati, Kuwait, Kyrgyz Republic, Lesotho, Libya, Luxembourg, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Micronesia, Morocco, Namibia, Niger, Oman, Pakistan, Qatar, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal, Seychelles, Singapore, Somalia, Sudan, Syria, Tajikistan, Gambia, Timor-Leste, Tonga, Trinidad and Tobago, Tunisia, Turkmenistan, United Arab Emirates, Uzbekistan, and Yemen.
Target: High Performance Benchmark: 0 (5th percentile). Low Performance Benchmark: 0.17 (95th percentile).
Target Source: Expert opinion, lack of globally agreed upon targets for forest cover loss.

DATA SOURCES

Source (1) Citation: Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013.

"Hansen/UMD/Google/USGS/NASA Tree Cover Loss and Gain Area." University of Maryland, Google, USGS, and NASA. Accessed through Global Forest Watch in August 2015. www.globalforestwatch.org.
Variable / Units: Forest loss in > 30% tree cover, as compared to 2000 levels
Method: Hansen et al. (2013) used 650,000 Landsat 7, 30-meter resolution satellite images to quantify the area of forest loss. As defined in Hansen et al. (2013), trees were defined as all vegetation taller than 5m in height. Forest loss was defined as a stand-replacement disturbance or the complete removal of tree cover canopy at the Landsat pixel scale. Results were disaggregated by reference percent tree cover stratum (e.g. >30% crown cover to ~0% crown cover) and by year.
Year of Publication: 2015
Covered Time: 2000 - 2014
URL: http://earthenginepartners.appspot.com/science-2013-global-forest/download_v1.2.html
Date Data Obtained: 8/20/2015
Data Type: Tabular
Citation: Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. Hansen/UMD/Google/USGS/NASA Tree Cover Loss and Gain Area. University of Maryland, Google, USGS, and NASA. Accessed through Global Forest Watch on 23 Aug 2015. www.globalforestwatch.org.
URL: http://www.sciencemag.org/lookup/doi/10.1126/science.1244693 for foundational publication, updated data available at http://earthenginepartners.appspot.com/science-2013-global-forest/download_v1.2.html

Indicator: Fish Stocks *(FSOC)*

Objective / Issue Category: Ecosystem Vitality / Fisheries

What it Measures: Fish Stocks measures the percentage of a country's total catch - within its exclusive economic zone (EEZ) - that is comprised of species that are overexploited or collapsed, weighted by the quality of fish catch data.

Rationale for Inclusion: Overfishing is harmful to marine life. Overfishing occurs in fisheries that have been exploited at levels that exceed the capacity for replacement by reproduction and growth of the exploited species.

INDICATOR CREATION

Unit of Measurement: Fraction of fish stocks overexploited and collapsed by exclusive economic zone (EEZ).
Method / Description: The FSOC indicator was calculated as a weighted average of the percentage of fish stocks overexploited or collapsed, divided by the area of the EEZ.
Additional Notes: NBALANCE data for Georgia, Armenia, Azerbaijan, Belarus, Ukraine, Russia, Czech Republic are all derived from USSR data. NBALANCE data for Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro and Macedonia were derived from former Yugoslav Republic data. American Samoa, Andorra, Benin, Bermuda, British Virgin Islands, Cayman Islands, Djibouti, Eritrea, Faeroe Islands, French Guiana, Guadeloupe, Guam, Kazakhstan, Kiribati, Kuwait, Maldives, Marshall Islands, Martinique, Micronesia, Montserrat, Nauru, Niue, Oman, Qatar, Tokelau, Tuvalu, Saint Pierre and Miquelon, Saint Vincent and the Grenadines, Solomon Islands, Seychelles, Singapore, Somalia, Vanuatu, Wallis and Futuna were not scored based on low agricultural output and crop yield. Taiwan received a regional average score for NBALANCE.
Target: High Performance Benchmark: 0 Low Performance Benchmark: 99.2 (99th percentile)
Target Source: Expert opinion

DATA SOURCES

Source (1) Citation: Sea Around Us, University of British Columbia Fisheries Centre
Variable / Units: Fraction of catch within EEZ from overexploited or collapsed fish stocks
Method: "The Sea Around Us (SAU) Stock Status Plots used to establish stock status are created in four steps.* The first step is the definition of a stock. SAU defines a stock to be a taxon (either at species, genus or family level of taxonomic assignment) that occurs in the catch records for at least 5 consecutive years, over a minimum of a 10 year time span, and which has a total catch in an area of at least 1,000 tonnes over the time span. Secondly, SAU assesses the status of the stock for every year, relative to the peak catch. SAU defines

five states of stock status for a catch time series. This definition is assigned to every taxon meeting the definition of a stock for a particular spatial area considered (e.g., EEZ, LME).

1. Developing - before the year of peak catch and less than 50% of the peak catch;
2. Exploited - before or after the year of peak catch and more than 50% of the peak catch;
3. Overexploited - after the year of peak catch and less than 50% but more than 10% of the peak catch;
4. Collapsed - after the year of peak catch and less than 10% of the peak catch;
5. Rebuilding - occurs after the year of peak catch and after the stock has collapsed (after the postmaximum minimum catch, Figure 3), when catch has recovered to between 10% and 50% of the peak.

Thirdly, SAU creates the graph of number of stocks by status by tallying the number of stocks in a particular state in a given year, and presenting these as percentages. Finally, the cumulative catch of stock by status in a given year is summed over all stocks and presented as a percentage in the catch by stock status graph. The combination of these two figures represents the complete Stock Status Plot. The numbers for this indicator are taken from the overexploited and collapsed numbers of stocks over total numbers of stocks per EEZ.

SAU used a different method to determine stock status for their 2015 data update. Instead of relying exclusively on FAO landings data, which tended to have spotty coverage in many parts of the world (personal communication, SAU), historical catch data since 1950 was reconstructed based on the following seven steps:**

1. Identification, sourcing and comparison of baseline reported catch times series, i.e., a) FAO (or other international reporting entities) reported landings data by FAO statistical areas, taxon and year; and b) national data series by area, taxon and year;
2. Identification of sectors (e.g., subsistence, recreational), time periods, species, gears etc., not covered by (1), i.e., missing data components. This is conducted via extensive literature searches and consultations with local experts;
3. Sourcing of available alternative information sources on missing data identified in (2), via extensive searches of the literature (peer-reviewed and grey, both online and in hard copies) and consultations with local experts. Information sources include social science studies (anthropology, economics, etc.), reports, colonial archives, data sets and expert knowledge;
4. Development of data 'anchor points' in time for each missing data component, and expansion of anchor point data to country-wide catch estimates;
5. Interpolation for time periods between data anchor points, either linearly or assumption-based for commercial fisheries, and generally via per capita (or perfisher) catch rates for non-commercial sectors;
6. Estimation of total catch times series, combining reported catches (1) and interpolated, country-wide expanded missing data series (5); and
7. Quantifying the uncertainty associated with each reconstruction.

* Kleisner, K, and Pauly D. (2011). Stock catch status plots of fisheries for regional seas. In Christensen, V, Lai, S, Palomares, MLD, Zeller, D, and Paul, D. (Eds). The State of Biodiversity and Fisheries in Regional Seas. Fisheries Centre Research Reports. ** D. Pauly and D. Zeller, editors. 2015. Catch Reconstruction: concepts, methods and data sources. Online Publication. Sea Around Us (www.seaaroundus.org). University of British Columbia. http://www.seaaroundus.org/doc/Methods/CatchReconstructionMethod/Methods-Catch-tab-Sept-25-2015(1).pdf
Year of Publication: 2015
Covered Time: 1950 - 2010
URL: http://www.seaaroundus.org/
Date Data Obtained: 10/2015
Data Type: Tabular

Source (2) Citation: Pauly, D. and D. Zeller (2016). Catch reconstructions reveal that global marine fisheries catches are higher than reported and declining. Nature Communications, 7, 10244.
Variable / Units: Quality of fish catch data per sector by EEZ.
Method: Pauly and Zeller surveyed experts involved in fish catch reconstruction to score data by EEZ from a scale of 1 to 4, with 4 being the highest quality data and 1 being the least-quality data . These data were used to downweight FSOC scores for countries. A data quality rating of 1 means a country only receives 25% of its score; a rating of 2 means a country receives 50% of its FSOC score; a quality rating of 3 receives 75%; a quality rating of 4 receives full marks.
Year of Publication: 2016
Covered Time: 1950-1969, 1970-1989, 1990-2010.
URL: http://www.nature.com/ncomms/2016/160119/ncomms10244/full/ncomms10244.html
Date Data Obtained: 12/2015
Data Type: PDF

Indicator: Trend in Carbon Intensity *(CO2NEW)*

Objective / Issue Category: Ecosystem Vitality / Climate and Energy

What it Measures: This indicator measures countries' abilities to reduce the intensity of carbon emissions per unit GDP from 2002 to 2012, relative to a country's economic peers.

Rationale for Inclusion: Climate change is among the direst environmental challenges. Still, too little progress has been made to mitigate its effects, aid vulnerable populations to adapt, account for loss and damage already experienced, or to move the policy conversation toward consensus on the problem's scope, origins, or potential solutions. Because of the absence of internationally-agreed upon national targets for CO2 emission reductions, indicators in the Climate and Energy issue category are not proximity-to-target performance indicators like others in the EPI. Instead, they are relative measures of how well countries are reducing carbon intensity of emissions over roughly the last decade (2000 to 2010) relative to each other. Carbon dioxide emissions contribute to climate change. CO2 per unit GDP is a common metric employed in countries to assess the intensity in the output of carbon dioxide emissions.

INDICATOR CREATION

Unit of Measurement: Change in CO2 emissions per unit GDP from 2002 to 2012.
Method / Description: The percentage of a country's GDP due to oil and mineral rents were first 42subtracted from GDP per PPP. All data were log-transformed. The Trend in Carbon Intensity was calculated by dividing CO2 emissions from 2002 to 2012 by GDP PPP in constant international dollars for each year. Data was interpolated to fill in gaps and extrapolated when necessary to reach the time series endpoints. A regression was used to calculate the slope (trend) over the 10-year period of 2002-2012. Time series used for Spain is 2002 to 2008. Note: the raw data for this indicator in the 2016EPI_Raw_Data.xls file is denoted CO2GDPd1, which is the slope or trend of CO2 emissions per unit GDP from 2002 to 2012, non-relative to a country's economic peers.
Target: High Performance Benchmark (raw data): -0.23 Low Performance Benchmark (raw data): 0.13
Target Source: Expert opinion

DATA SOURCES

Source (1) Citation: World Resources Institute – Climate Analysis Indicators Tool (CAIT), v. 2.0
Variable / Units: Carbon dioxide emissions (kg CO2)
Method: WRI CAIT's database of CO2 emissions is compiled from several sources: Carbon Dioxide Information Analysis Center (CDIAC), International Energy Agency (IEA), Energy Information Agency (EIA), Food and Agriculture Organization (FAO), and the U.S.

Environmental Protection Agency (U.S. EPA). Detailed methods are described at http://cait2.wri.org/docs/CAIT2.0_CountryGHG_Methods.pdf.
Year of Publication: 2014
Covered Time: 1990 – 2012
URL: http://cait2.wri.org/wri
Date Data Obtained: 6/1/2015
Data Type: Tabular

Source (2) Citation: World Bank
Variable / Units: Gross Domestic Product Purchasing Power Parity (GDP PPP) (current international dollars, in millions US dollars); Mineral rents - % of GDP; Oil rents - % of GDP.
Method: The contributions of oil and mineral rents to each country's GDP have been removed so that countries who mainly trade, rather than consume these commodities to produce their GDP are not unfairly penalized.
Year of Publication: 2014
Covered Time: 1960 – 2014
URL: http://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD
Date Data Obtained: 7/5/2015
Data Type: Tabular

Source (3) Citation: International Energy Association
Variable / Units: Gross Domestic Product Purchasing Power Parity (GDP PPP) (2005 US dollars)
Method: For information on definitions, methodologies, sources ad coverage, please consult the documentation at: http://www.iea.org/statistics/topics/CO2emissions/.
Note: All data except Swaziland
Year of Publication: 2015
Covered Time: 1971 – 2013
URL: http://www.iea.org/statistics/topics/CO2emissions/
Date Data Obtained: 11/6/2015
Data Type: Tabular

Source (4) Citation: Mineral and Oil Rents - % of GDP
Variable / Units: percentage %

Method: Mineral rents are the difference between the value of production for a stock of minerals at world prices and their total costs of production. Oil rents are the difference between the value of crude oil production at world prices and total costs of production. The sum of mineral and oil rents as % of a country's GDP were subtracted before calculation
Year of Publication: 2014
Covered Time: 1970 – 2013
URL: http://data.worldbank.org/indicator/NY.GDP.MINR.RT.ZS;
Date Data Obtained: 11/6/2015
Data Type: Tabular

Source (5) Citation: World Resources Institute – Climate Analysis Indicators Tool (CAIT), v. 2.0
Variable / Units: Gross Domestic Product Purchasing Power Parity (GDP PPP) (2011 International dollars)
Method: WRI CAIT's database of CO2 emissions is compiled from several sources: Carbon Dioxide Information Analysis Center (CDIAC), International Energy Agency (IEA), Energy Information Agency (EIA), Food and Agriculture Organization (FAO), and the U.S. Environmental Protection Agency (U.S. EPA). Detailed methods are described at http://cait2.wri.org/docs/CAIT2.0_CountryGHG_Methods.pdf.
Notes: Only used Swazailand's data to do gap filling
Year of Publication: 2014
Covered Time: 1971 – 2013
URL: http://cait2.wri.org/wri
Date Data Obtained: 12/2015
Data Type: Tabular

Indicator: Trend in Carbon Intensity per kWh *(CO2KWHd1)*

Objective / Issue Category: Ecosystem Vitality / Climate and Energy

What it Measures: Trend in CO2 Emissions per kilowatt hour (kWh) of electricity produced, determined for most countries as a trend from 2002 to 2012. For those countries that already perform at the lowest levels of carbon intensity per kWh of electricity produced, a score is calculated as an absolute level of CO2 emissions per kWh of electricity and heat produced, divided by the total amount of electricity and heat production.

Rationale for Inclusion: Because the power sector is the largest contributor to CO2 emissions, in most countries responsible for well over one-quarter of global carbon emissions, the CO2 per kWh indicator measures countries' ability to reduce the carbon intensity of electricity and heat production.

INDICATOR CREATION

Unit of Measurement: Change in CO2 emissions from electricity and heat production.
Method / Description: CO2 emissions per kilowatt hour represents the ratio of CO2 emissions to the electricity and heat generated by thermal power plants, including conventional electricity plants and combined heat and power, nuclear, hydro (excluding pumped storage production), waste, geothermal, and all other renewables.
Additional notes: Countries that already have a low level of CO2 emissions per KWH automatically receive a score of 100, regardless of their trend in CO2 emissions per kWh of electricity and heat production. These countries are in the 5th percentile of countries by CO2/kWh and include: Iceland, Paraguay, Nepal, Togo, Dem. Rep. Congo, Ethiopia, Namibia, Tajikistan, Mozambique, Zambia, Albania, Benin, Eritrea, Congo, Botswana, Costa Rica, Haiti, Cambodia, Gabon, Luxembourg, Georgia, Armenia, El Salvador, Montenegro, Nicaragua, Cameroon, Kyrgyz Republic, Latvia, Kenya, Malta, Sudan, Senegal, Mauritius, Angola, Guatemala, Jamaica, Honduras, Panama, Tanzania, Myanmar, Ghana, Uruguay, Zimbabwe, Cyprus, Moldova, Cote d'Ivoire, Switzerland, Lithuania, Bolivia, Brunei Darussalam, Yemen.
Target: High Performance Benchmark ((raw data): -0.25 Low Performance Benchmark (raw data): 0.53
Target Source: Expert opinion

DATA SOURCES

Source (1) Citation: World Resources Institute - Climate Analysis Indicators Tool (CAIT), v. 2.0
Variable / Units: Carbon dioxide emissions (kg CO2)
Method: WRI CAIT's database of CO2 emissions is compiled from several sources: Carbon

Dioxide Information Analysis Center (CDIAC), International Energy Agency (IEA), Energy Information Agency (EIA), Food and Agriculture Organization (FAO), and the U.S. Environmental Protection Agency (U.S. EPA). Detailed methods are described at http://cait2.wri.org/docs/CAIT2.0_CountryGHG_Methods.pdf.
Year of Publication: 2014
Covered Time: 2002 - 2012
URL: http://cait2.wri.org/wri
Date Data Obtained: 10/1/2015
Data Type: Tabular

Indicator: Access to Electricity *(ACCESS)*

Objective / Issue Category: Ecosystem Vitality / Climate and Energy

What it Measures: For some countries, such as Least Developing Countries (LDCs), emissions are as important as transitioning people to more sustainable and accessible forms of energy.

Rationale for Inclusion: In 2012 the UN General Assembly declared that year the International Year of Sustainable Energy for All. Three global objectives, to be achieved by 2030, were established: to ensure universal access to modern energy services (including electricity and clean, modern cooking solutions), to double the global rate of improvement in energy efficiency, and to double the sharer of renewable energy in the global energy mix. Together, these goals comprise the Sustainable Energy for All initiative, and around 70 countries have formally embraced these goals. As 2012 drew to a close, the UN General Assembly announced a "Decade of Sustainable Energy for All" stretching from 2014 to 2024.

INDICATOR CREATION

Unit of Measurement: Percent of population with access to electricity.
Method / Description: This indicator is not included in the calculation of the EPI. It is only displayed for reference to the calculation of Climate and Energy for LDCs.
Target: High Performance Benchmark (raw data): 100 Low Performance Benchmark (raw data): 0
Target Source: UN General Assembly – Sustainable Energy Access for All

DATA SOURCES

Source (1) Citation: World Bank, Sustainable Energy for All Initiative
Variable / Units: Population
Method: Refer to World Bank website below for detailed methods
Year of Publication: 2015
Covered Time: 1990, 2000, 2010, 2012
URL: http://data.worldbank.org/data-catalog/sustainable-energy-for-all
Date Data Obtained: 7/2015
Data Type: Tabular