

Center for International Earth  
Science Information Network  
EARTH INSTITUTE | COLUMBIA UNIVERSITY

The Center for International Earth Science Information Network (CIESIN) is a data and research center of Columbia University's Earth Institute that addresses human interactions with the environment. Our focus is on the impacts of human activities and institutional arrangements on the environment, and, in turn, how environmental changes affect society.

CIESIN has several core programs and collaborates widely with partners around the world on projects related to environmental change and sustainability.

The Center for International Earth Science Information Network (CIESIN) is located at the Lamont Campus of Columbia University in Palisades, New York. Its international staff have advanced training in a range of fields, including geography, demography, political science, economics, natural resource management, information management, library science, geospatial technologies, software engineering, and computer science.  
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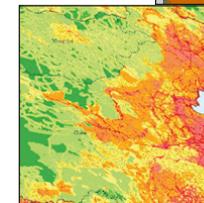
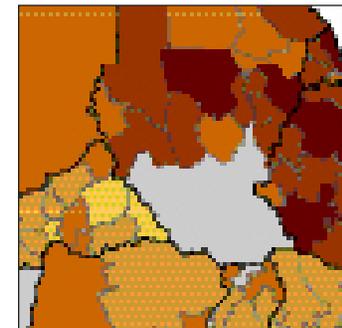
THE EARTH INSTITUTE  
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The Earth Institute, Columbia University, mobilizes the sciences, education and public policy to achieve a sustainable earth. Through interdisciplinary research among more than 500 scientists in diverse fields, the Institute is adding to the knowledge necessary for addressing the challenges of the 21st century and beyond. With over two dozen associated degree curricula and a vibrant fellowship program, the Earth Institute is educating new leaders to become professionals and scholars in the growing field of sustainable development. We work alongside governments, businesses, non-profit organizations and individuals to devise innovative strategies to protect the future of our planet.

[www.earth.columbia.edu](http://www.earth.columbia.edu)



Programs and Projects



## Programs

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### **NASA Socioeconomic Data and Applications Center**

**(SEDAC):** One of twelve NASA Earth Science Data Centers, providing access to socioeconomic and environmental data, for integration with NASA earth science and remote sensing data. [www.sedac.ciesin.columbia.edu](http://www.sedac.ciesin.columbia.edu)

### **Intergovernmental Panel on Climate Change (IPCC)**

**Socioeconomic Data Distribution Centre (DDC):** A data center operated collaboratively by SEDAC, the UK's British Atmospheric Data Centre, and the World Data Center Climate in Hamburg, Germany, with access to key data sets used in IPCC assessments and reports. [www.sedac.ipcc-data.org/ddc](http://www.sedac.ipcc-data.org/ddc)

**Environmental Performance Index (EPI):** A collaboration with Yale University, in association with the World Economic Forum, to measure progress toward environmental goals; the 2018 EPI assesses 180 countries. [www.epi.yale.edu](http://www.epi.yale.edu)

**Africa Soil Information Service (AfSIS):** To support digital soils mapping of 42 sub-Saharan African countries by Earth Institute and African researchers, CIESIN is helping build information systems for collection, analysis, and dissemination of soils data to end users. Funded by the Gates Foundation and AGRA. [www.africasoils.net/](http://www.africasoils.net/)

**Population-Environment Research Network (PERN):** PERN promotes online scientific exchange to further research on population and the environment. Sponsored by the IUSSP. [www.populationenvironmentresearch.org](http://www.populationenvironmentresearch.org)

**Environment and Security:** CIESIN is part of a number of initiatives and projects assessing the impacts of environmental stress, especially climate change, on national and global security concerns. Among the workshops, trainings, and academic courses offered is a Massive Online Course CIESIN helped lead. [www.ciesin.columbia.edu/esp.html](http://www.ciesin.columbia.edu/esp.html)

### **Research Translation Core (RTC) for Columbia University**

**Superfund Research Program (CU SRP):** Led by the School of Public Health and sponsored by the National Institute of Environmental Health Sciences, the RTC communicates scientific information on the health effects, geochemistry, and remediation of arsenic/manganese in groundwater. [www.superfund.ciesin.columbia.edu](http://www.superfund.ciesin.columbia.edu)

## Recent Awards

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**Geo-referenced Infrastructure and Demographic Data for Development (GRID3):** A project with Flowminder and UNFPA to develop/disseminate high-resolution geo-referenced data, for development goals. Funded by the Gates Foundation and DFID.

### **GIS-Based Graphical User Interface Tools for Analyzing Solar-Thermal Desalination Systems and High-Potential Implementation Regions:**

Funded by the US DOE, this project led by Columbia University will use state-of-the-art solar-thermal desalination models to develop software that supports the planning and valuation of solar-thermal and hybrid technologies. CIESIN will integrate spatial data and geographic Information system functions with the models.

**Mapping Water Infrastructure in the Hudson Valley:** An award by the New York State Water Resources Institute at Cornell University, in collaboration with the NYS DEC Hudson River Estuary Program, for a pilot project to assist communities in mapping wastewater infrastructure for flood resilience planning.

**Estimating and Mapping Off-Grid Populations:** High-resolution satellite imagery, volunteered geographic information, and modeling will be leveraged to provide data on the location and size of villages within mangrove areas of six data-poor countries in West Africa, via an online interface. Partners include the Connectivity Lab at Facebook and Wetlands International Africa.

## Selected Collaborative Projects

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**POPGRID Data Collective:** An ongoing effort to spur the development and use of high-quality, highly-usable georeferenced data on population, human settlements, and infrastructure. Web site and map viewer developed by CIESIN. Supported by the Gates Foundation and SEDAC. <https://www.popgrid.org/>

**High Resolution Settlement Layer:** A joint effort between Facebook, Columbia University, and the World Bank using high resolution satellite imagery and census data, to develop human population distribution estimates, providing unprecedented levels of detail, especially for rural areas. <https://ciesin.columbia.edu/data/hrs/>

**SERVIR-West Africa:** CIESIN and the International Research Institute for Climate and Society are developing applications based on remote sensing to address food security, fresh water availability, and hazards in several countries in West Africa. <https://www.servirglobal.net/>

**Assessment of Potential Flood Impacts to Buildings in the Hudson Valley/Long Island Regions:** A project to develop building footprint data and conduct a flood scenario impact analysis, supported by the New York State Energy Research and Development Authority Climate Change Adaptation Research and Strategies Program.

**Improving Estimates of Building Exposure to Hazards:** CIESIN and ImageCAT, Inc. are using remote sensing data to improve estimates of building exposure to earthquake and other hazards. Funded by the NASA Applied Sciences Program.

**Population and Infrastructure on Our Human Planet:** CIESIN and the University of Louisville, ImageCat, Inc., NASA Goddard Space Flight Center, Baruch College, and Yale University are helping developing countries better utilize population and related data in sustainable development monitoring and decision making. Funded by the NASA Applied Sciences program under the Human Planet Initiative of the Group on Earth Observations.

### **USAID West Africa Biodiversity and Climate Change**

**(WA-BICC):** This project addresses direct and indirect drivers of natural resource degradation to improve livelihoods and natural ecosystems across the region. An implementing partner with Tetratech/ARD, CIESIN is helping improve forest conservation and building coastal climate resilience. [1.usa.gov/1T5xWlq](http://1.usa.gov/1T5xWlq)

### **Estimating Total Ecosystem Carbon in Blue Carbon and Tropical Peatland Ecosystems:**

CIESIN is using open satellite data to map mangrove extent and change in West Africa and select areas of Southeast Asia. Led by the Biospheric Sciences Laboratory at NASA Goddard Space Flight Center, with NASA's Jet Propulsion Laboratory, the University of Maryland, and the U.S. Forest Service.

**Global High Resolution Population Denominators:** Partnering with WorldPop and University of Louisville, CIESIN is using a statistical model based on census and biophysical data to create a high-resolution (100 m) global surface of population. Funded by the Bill and Melinda Gates Foundation.

**Computational Thinking in Ecosystems:** This project builds on a previous collaboration with NYSCI and Design I/O for young people, using hands-on tools to develop computer programming in the study of ecological systems. Supported by the STEM+Computing Partnership initiated by the NSF. [1.usa.gov/1UivPhx](http://1.usa.gov/1UivPhx)

**Consortium for Climate Risk in the Urban Northeast:** The Earth Institute and four academic institutions are addressing climate change risks in the urban Northeast under an award from the NOAA Regional Integrated Sciences and Assessments initiative. CIESIN is supporting training and outreach and operates the project Web site. [www.ccrun.org/](http://www.ccrun.org/)

**Mapping the Missing Millions:** A project led by Oregon State University addresses the issue of approximately 250 million people estimated missing from Sustainable Development Goal progress assessments. A global database of informal settlement location, schema, and SDG indicators will be developed.

**Task Group on Citizen Science and the Validation, Curation, and Management of Crowdsourced Data:** This CODATA-WDS task group focuses on data-generating citizen science, crowdsourcing, and volunteered geographic information projects. <http://bit.ly/2uPpELU>