

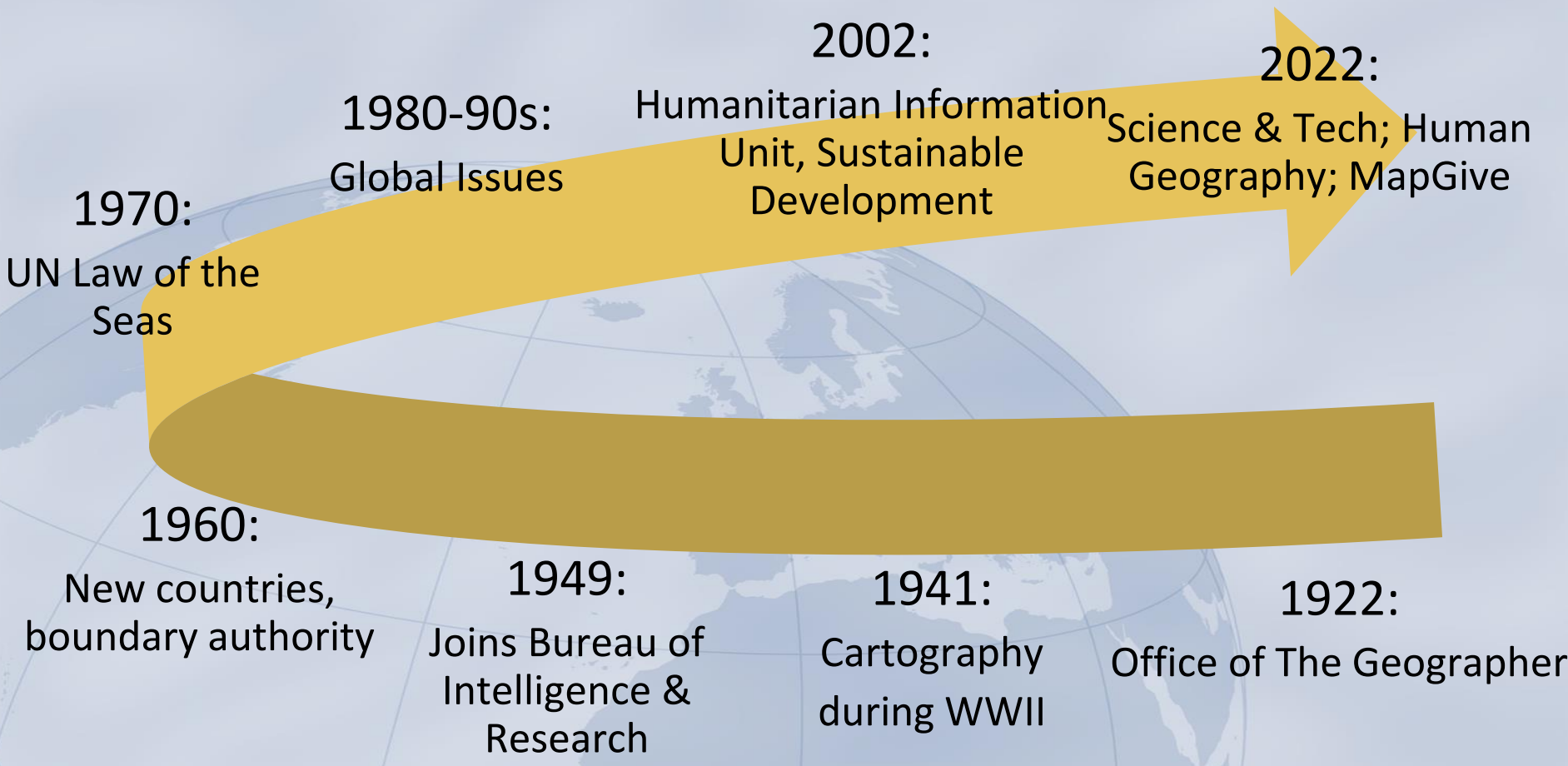


Global Participatory Mapping Partnerships for Resilience & Sustainability

Dr. Lee Schwartz and Ms. Laura Cline
Office of The Geographer & Global Issues
U.S. Department of State

UN World Geospatial Information Congress
October 13, 2022, Hyderabad, India
TP10E – Effective Multistakeholder Partnerships

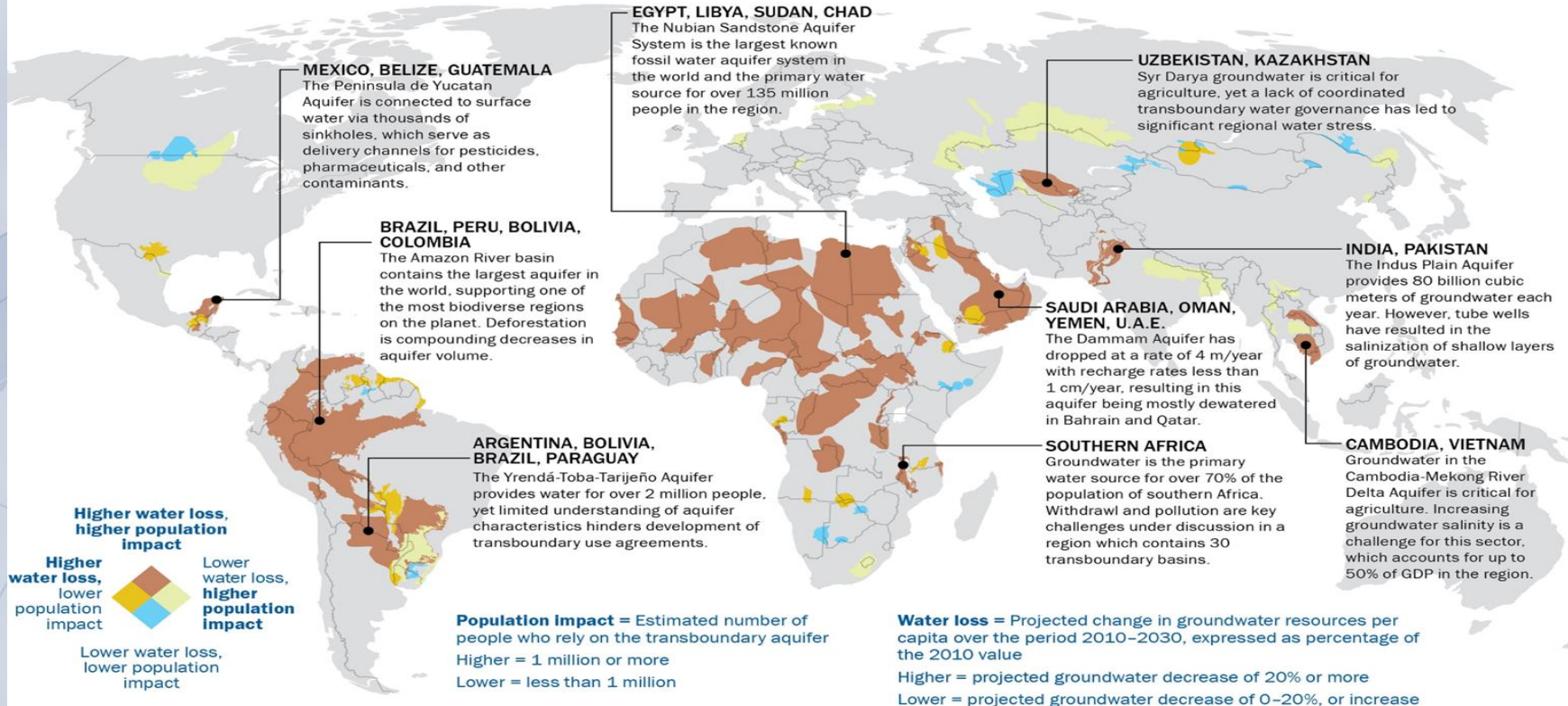
100 years of Geography at the US Department of State



World Water Day, March 22, 2022

Aquifer Depletion Across Boundaries

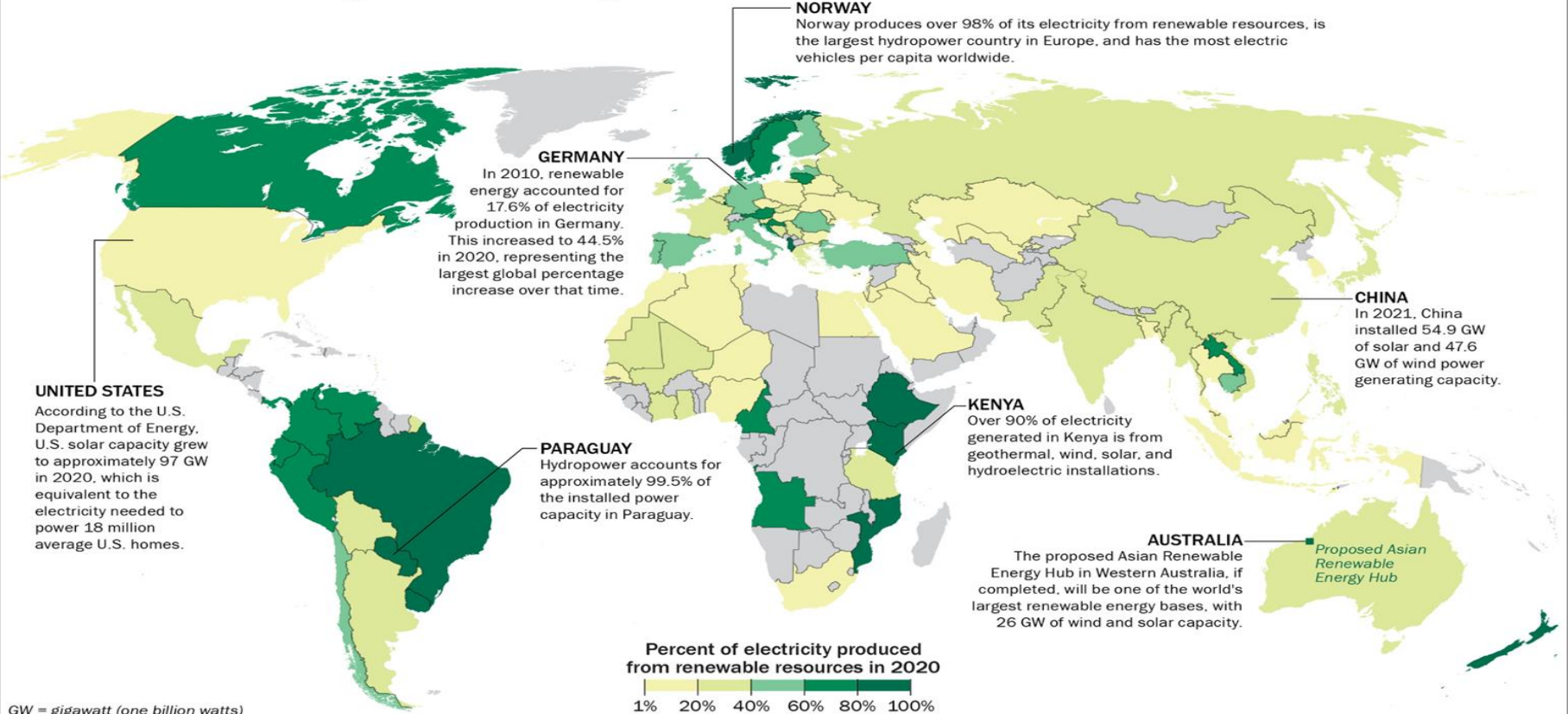
World Water Day in 2022 highlights the importance and challenges of managing groundwater in a changing climate, while also recognizing 25% of the global population lacks access to safe water. Groundwater reserves represent the largest portion of freshwater on the planet, yet increasing human population sizes, changes in climate, and the transboundary nature of many aquifers are presenting challenges to managing and sharing these resources.



Earth Day, April 22, 2022

Electricity Produced from Renewable Resources

Earth Day's 2022 theme, "Invest in Our Planet," recognizes the urgent need for investment in green technology and infrastructure. A transition to renewable resources for energy production is critical to greenhouse gas emissions reductions, which are necessary for reducing global warming. Several countries generate the majority of their electrical energy with renewable resources and many more are on a positive trajectory in this regard, yet significant investments in the transition to renewable energy are still needed in all regions.



GW = gigawatt (one billion watts)

Promoting a Geographic Approach to Partnerships

In addition to cartographic and analytic production, the Office of the Geographer engages in public diplomacy by enabling external partners via geospatial technologies, support for tradecraft, and data creation/sharing/dissemination.

- Humanitarian Information Unit: <https://www.hiu.state.gov>
- Commercial Satellite Imagery provision to key partners
- GeoNode: <https://geonode.state.gov>
- MapGive: <https://mapgive.state.gov>
- Secondary Cities: <https://secondarycities.state.gov/>
- Cities' COVID Mitigation Mapping: <https://mapgive.state.gov/c2m2>
- Worldwide Human Geography Data Working Group: focus on human security
<https://www.wwhgwd.org>
- Regional Hubs - Participatory Mapping Partnerships (centers of geospatial excellence)

MapGive **Cities' COVID-19 Mitigation Mapping (C2M2)** cities

Secondary **Cities (2C)** initiative cities

GDEST site visit countries

MapGive **Participatory Mapping Hub (PMP)** regional areas of focus

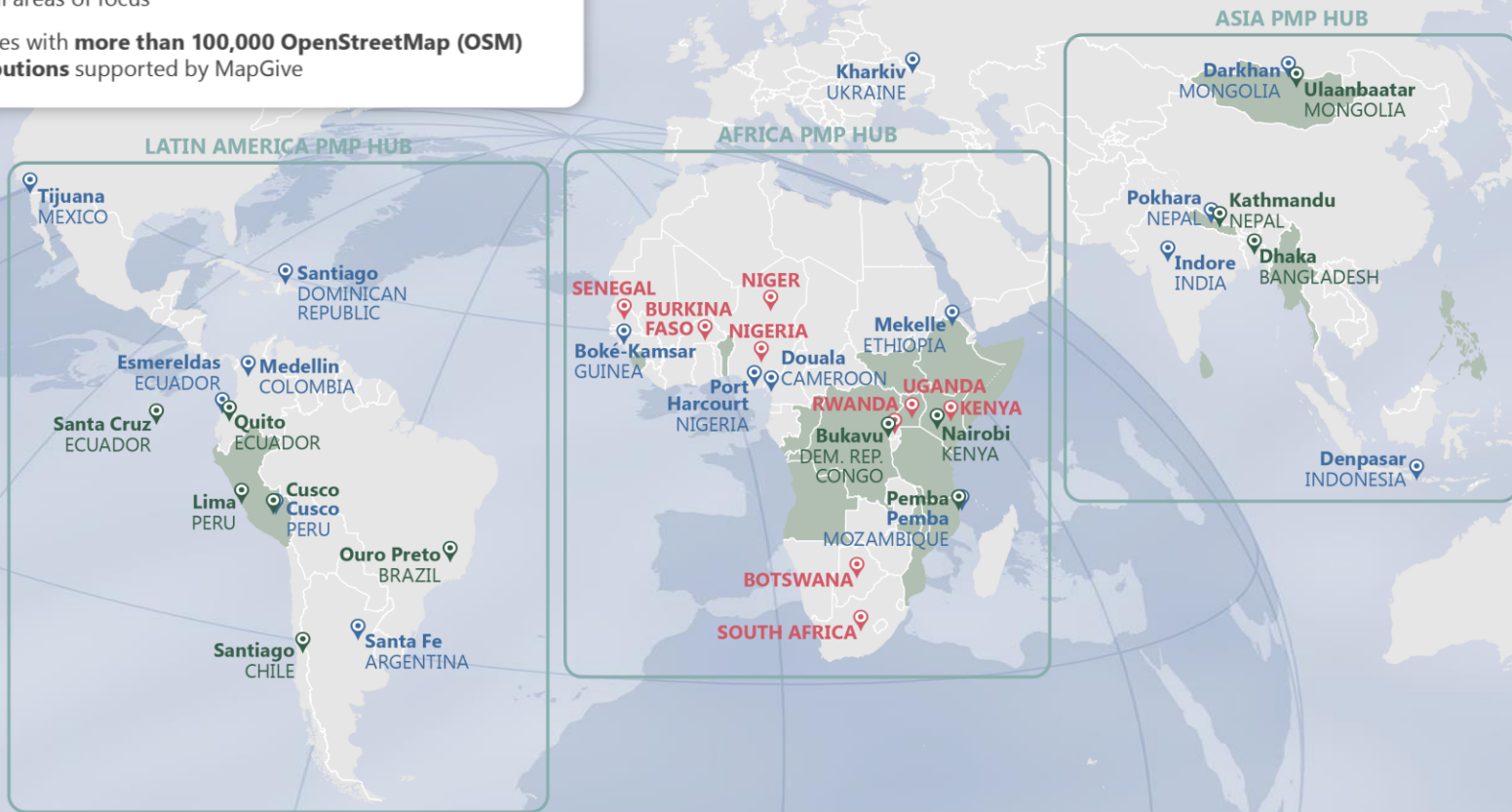
Countries with **more than 100,000 OpenStreetMap (OSM) contributions** supported by MapGive

GGI Geography Outreach

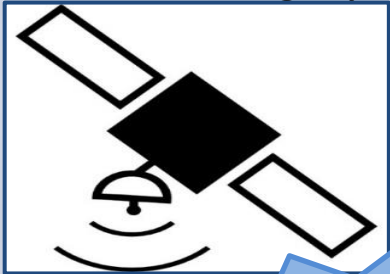


GGI
OFFICE OF THE GEOGRAPHER

MAP GIVE



High resolution satellite imagery



Collaborative Process

Collaborative Remote Mapping



MAP GIVE

Drawing Our Resources Together

MapGive Mapathons



OpenStreetMap

Participatory Mapping & Field Data Collection



User defined – platform & software agnostic

OpenData Sharing



GeoNode



The MapGive Initiative

An initiative within the Office of the Geographer that supports the growth of the global open mapping community and the creation of open geographic data for humanitarian and development purposes.

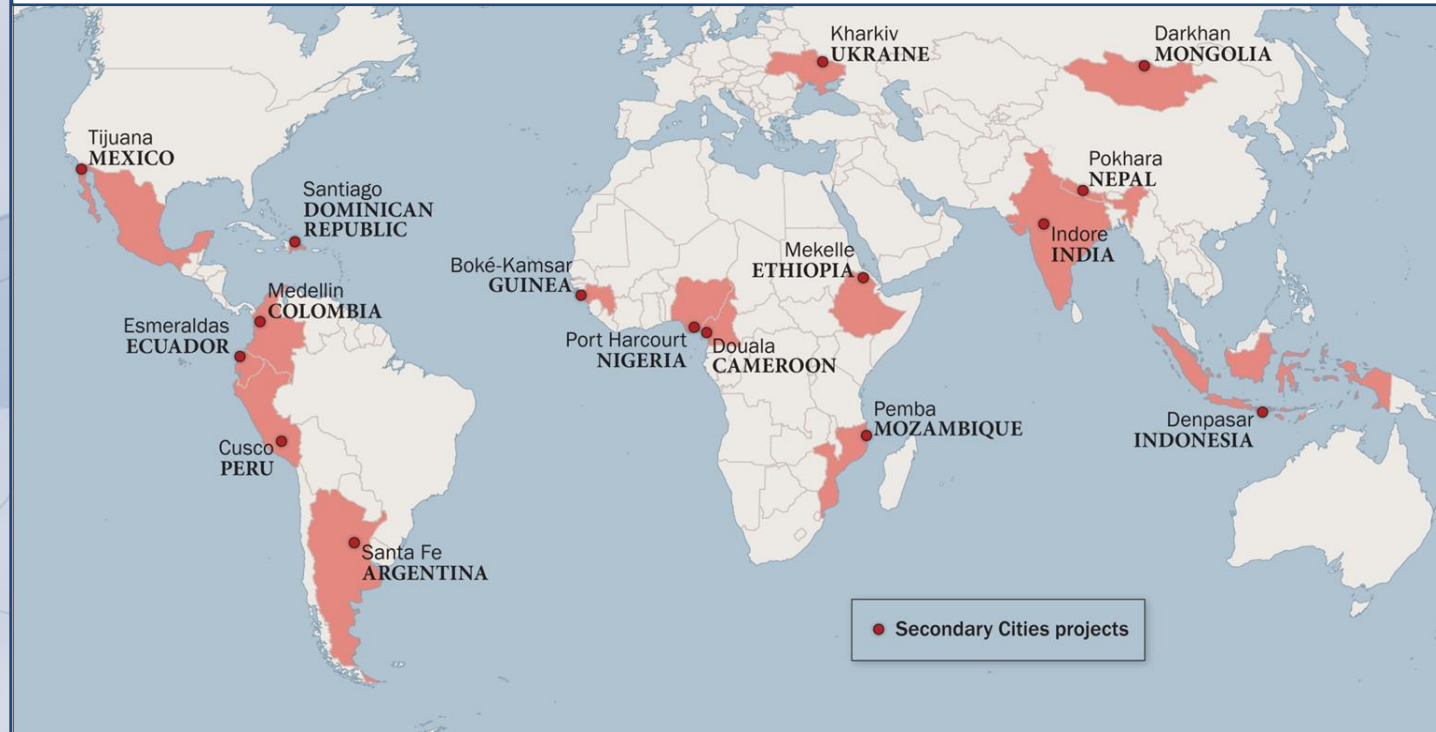
Satellite imagery for OSM remote mapping

Public diplomacy, outreach, and education

Local participatory mapping for sustainability, resilience, and emergency preparedness

The Secondary Cities (2C) Initiative

Community-based participatory mapping provides unique activity & relationship context



Mapping human geography and environmental sustainability for local communities

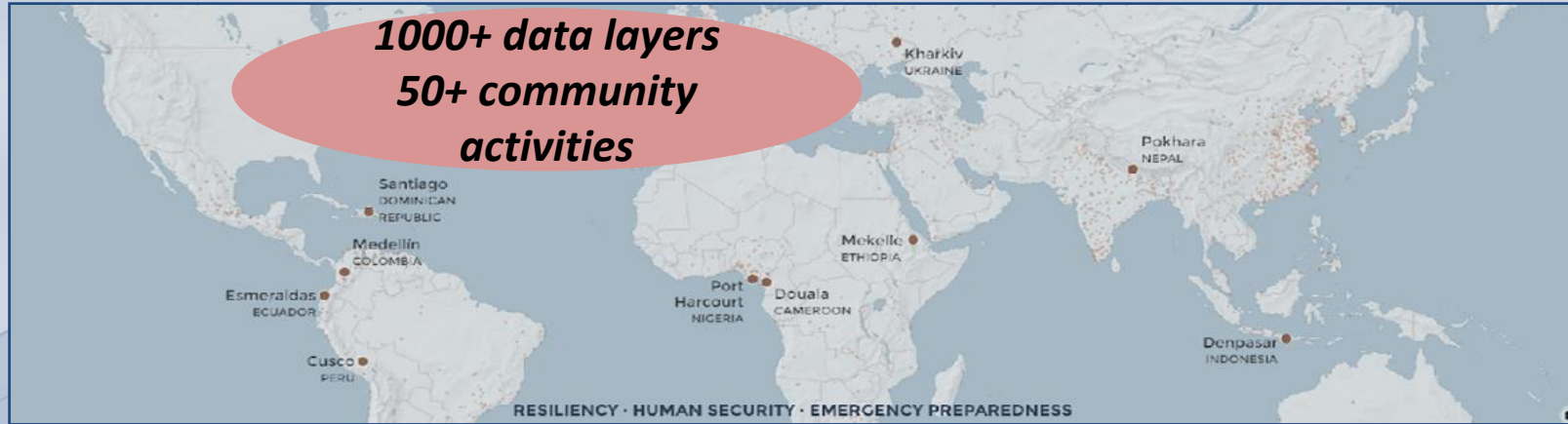
Why map cities further?

- Urban areas are rapidly growing;
- Regional nodes for migration, economic activity or development;
- Under-examined places;
- Lack of geospatial data at scale for mapping and planning.



Geospatial data are required
– at the appropriate scale and collected by local stakeholders –
to allow for better understanding, explaining, managing, (and mapping) of the
urban environment.

Mapping Sustainability Topics – Secondary Cities (2C)



Latin America Secondary Cities

Cusco: **Waste management & recycling**

Medellin: **Urban growth**

Esmeraldas: **Security & risk**

Santiago: **Water management in vulnerable neighborhoods**

Santa Fe: **Flooding & security**

Tijuana: **Water & waste**

Africa Secondary Cities

Mekelle: **Water resources**

Douala: **Emergency preparedness & flooding**

Port Harcourt: **Vulnerable populations & access to infrastructure**

Boke-Kamsar: **Transit & Water**

Pemba: **Disaster Response**

Asia Secondary Cities

Denpasar: **Ocean Waste Management**

Pokhara: **Emergency preparedness**

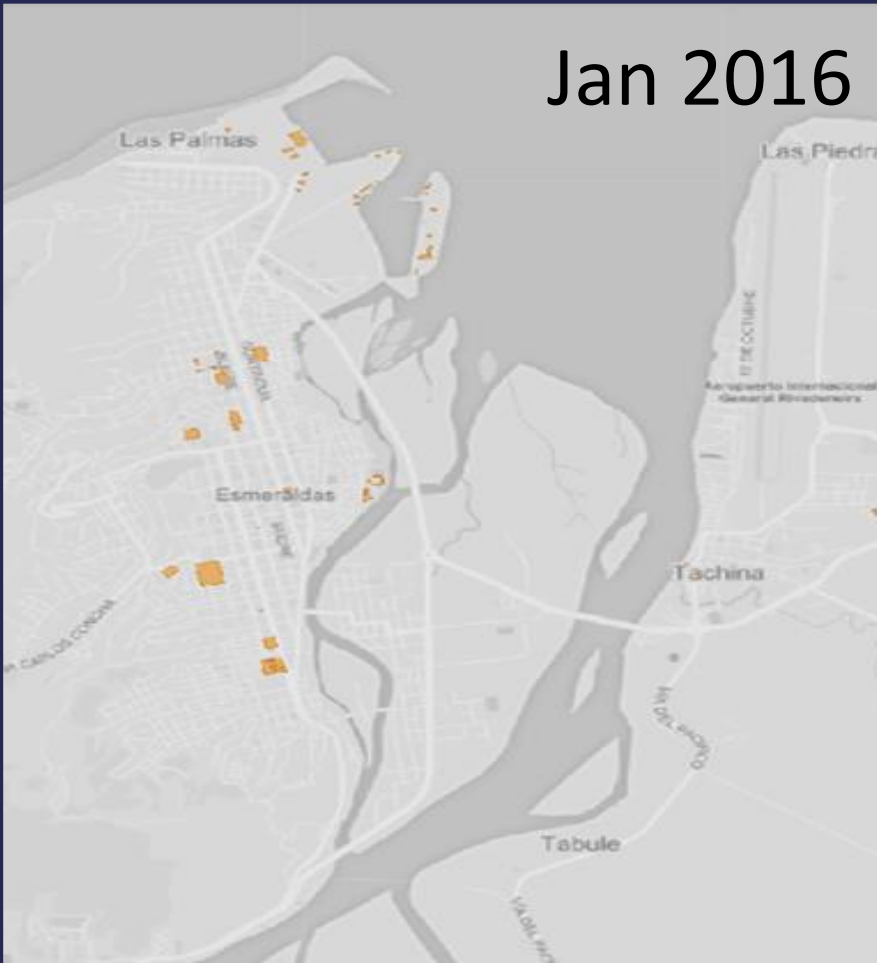
Kharkiv: **Mobility, Safety & Accessibility**

Indore: **Access to Healthcare**

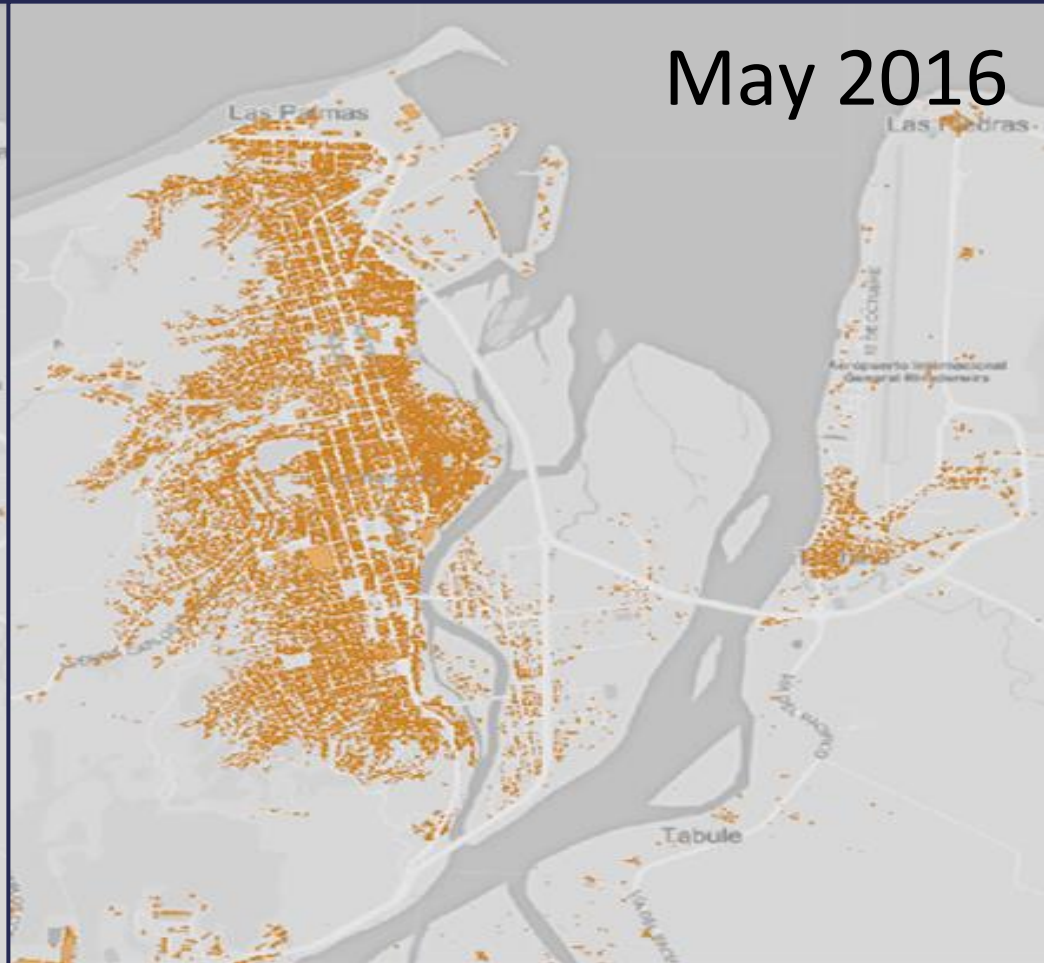
Darkhan: **Ger communities**

Esmeraldas: Remote Mapping

Jan 2016



May 2016



Addressing Local (Sustainable) Development Concerns with Mapping

Shrimp farms



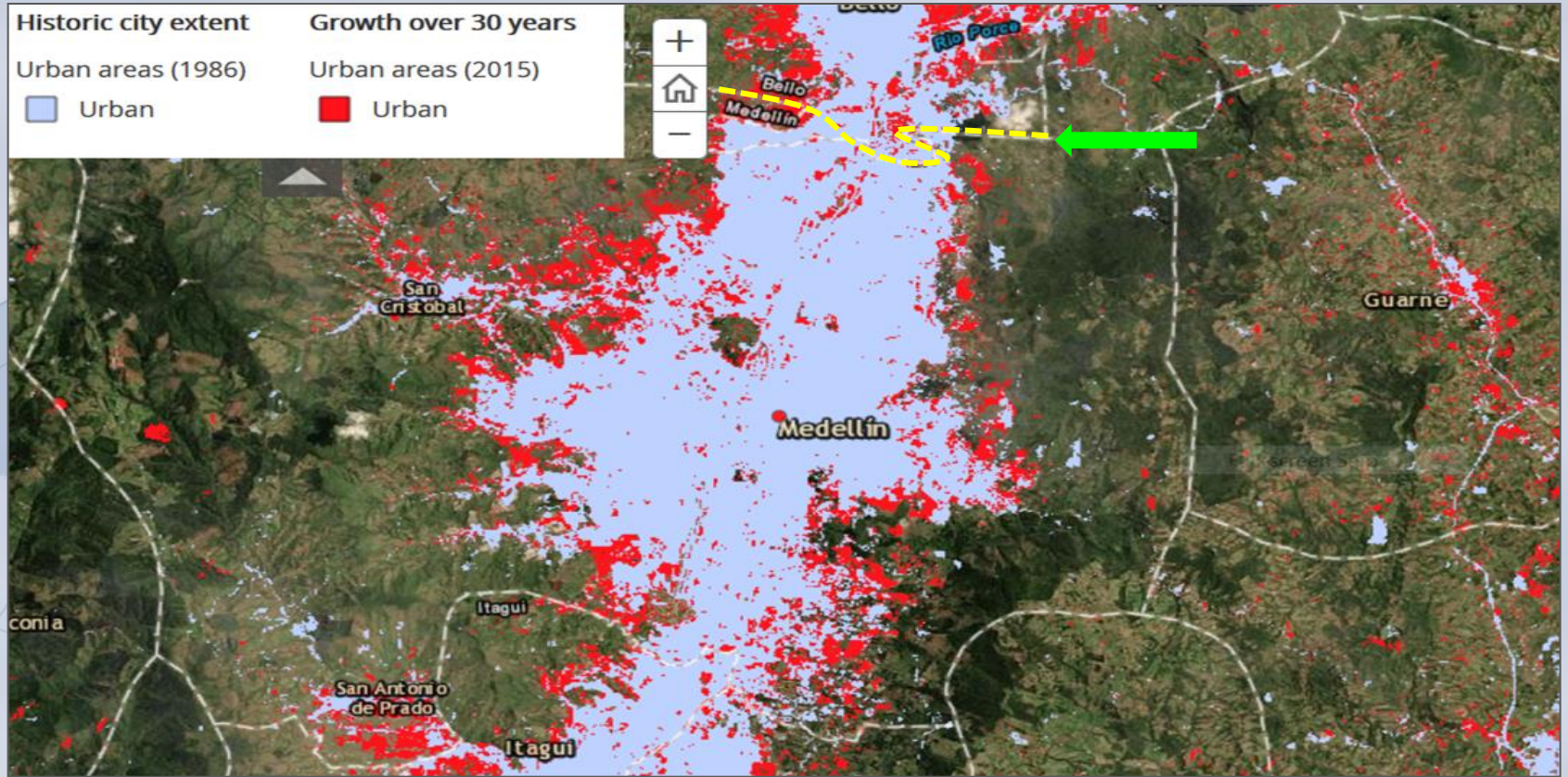
Marine terminal



Beachfront development



Changes to Demographics and Land cover change



Medellín, Colombia

Data is online at SecondaryCities.state.gov

Secondary CITIES

ABOUT FAQ STORY PARTNERS DATA EVENTS RESOURCES

2C STORY MAP

PARTNERS

Our lead partners facilitate relationships with local partners in the field and work with embassy and local government officials, universities, and non-governmental organizations

American Association of Geographers
Colorado State University
Humanitarian Information Unit

2C project and partners support any one or combination of open source and proprietary **geospatial tools and technologies** for data generation, data management and sharing, data visualization, and remote sensing. 2Cs has established a partnership with **Esri** to use their **ArcGIS** software products.

DATA

Human Geography data collected during each Secondary City project are available via the **Secondary Cities GeoNode**

DATA INTEGRITY

[Ethics](#) [Metadata](#) [QA/QC](#)

Data Integrity is the maintenance and assurance of accuracy and consistency of data over its entire life cycle. Integrity is essential to project design as well as data creation, generation, development, analysis, and management.

Secondary CITIES


DATA MAPS ABOUT CATEGORIES

Search 2C GeoNode SIGN IN


Secondary Cities GeoNode

Building partnerships to create geospatial data on secondary cities (2C)


Cities




Cusco, Peru




Denpasar, Indonesia




Douala, Cameroon




Esmeraldas, Ecuador




Kharkiv, Ukraine




Medellin, Colombia




Mekelle, Ethiopia



Pokhara, Nepal

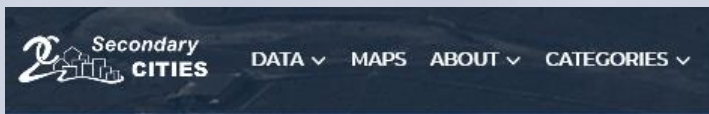


Port Harcourt, Nigeria



Santiago, Dominican Republic

Data can be searched by City, Categories, and Keywords



▼ CITY

- Cusco, Peru
- Denpasar, Indonesia
- Douala, Cameroon
- Esmeraldas, Ecuador
- Kharkiv, Ukraine
- Medellin, Colombia
- Mekelle, Ethiopia
- Pokhara, Nepal
- Port Harcourt, Nigeria
- Santiago, Dominican Republic

▼ KEYWORDS

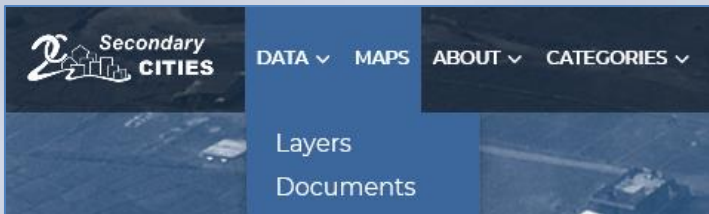
water

- Water 71
- Watershed 30
- Watersheds 3
- water 3
- Safe_Water 2
- Fresh Water 1
- Inland Water 1
- Micro Watershed 1
- Pollution water 1
- Safe water 1

- Boundaries
- Demographics
- Economy
- Education
- Energy
- Environment
- Ethnicity
- Finance
- Geology and Soils
- Governance
- Hazards and Natural Disasters
- Health
- Hydrography
- Imagery
- Land Ownership
- Land Use and Land Cover
- Recreation
- Religion
- Safety
- Shelter
- Solid Waste
- Telecommunications and Innovation
- Topography
- Transportation
- Urban Planning
- Wastewater
- Water and Sanitation

Data include

- Global datasets downloaded
- Local datasets downloaded
- Local official data
- Local newly created data



Explore Documents

Upload Documents

Cart

Add resources through the "Add to cart" buttons.

31 datasets found

Filters

- KEYWORDS
- DOCUMENT TYPE
 - Text (1)
 - Other (1)
 - Presentation (27)
 - Archive (2)
- CATEGORIES
- DATE
- EXTENT
- CITY
- DATA PROVIDER TYPE

DOUALA : Work Présentation SATE
Presentation at South Africa
2C_Douala | 30 Aug 2017 | 77 views | 0 likes | 0 stars

PLACE DU GOUVERNEMENT
No abstract provided
2C_Douala | 11 Aug 2017 | 93 views | 0 likes | 0 stars

Ethics Guidelines for Secondary Cities Initiative
Introduction to ethics for participatory mapping in secondary cities.
Igerlin | 28 Jul 2017 | 127 views | 0 likes | 0 stars

Explore Layers

Medellin

116 datasets found for *Medellin*

Cart

Add resources through the "Add to cart" buttons.

Filters

- KEYWORDS
- TYPE
- CATEGORIES
- DATE
- EXTENT
- CITY
 - Cusco, Peru
 - Denpasar, Indonesia
 - Douala, Cameroon
 - Esmeraldas, Ecuador
 - Kharkiv, Ukraine
 - Medellin, Colombia
 - Mekelle, Ethiopia
 - Pokhara, Nepal
 - Port Harcourt, Nigeria
 - Santiago, Dominican Republic
- DATA PROVIDER TYPE

SOLID WASTE

Medellin: Solid Waste Collection Centers
Municipal locations of solid waste collection centers that are engineered and dedicated to the weighing, sorting, purchase and sale of solid waste.
Collection Centers | Medellin | Solid Waste
2C_Medellin | 15 Oct 2017 | 22 views | 0 likes | 0 stars

SAFETY

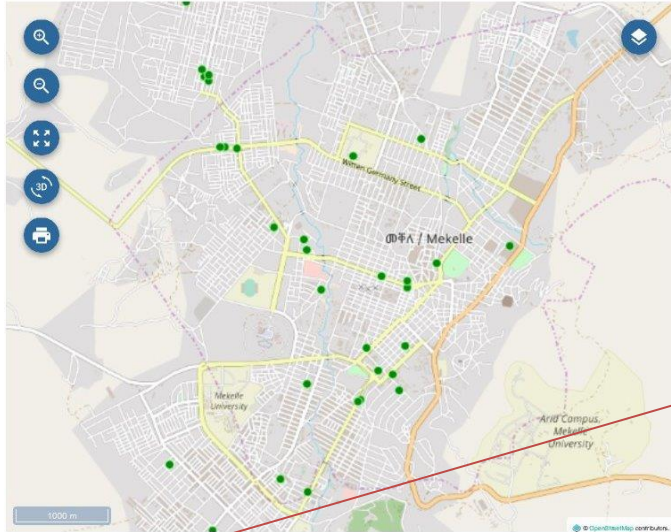
Medellin: Quality of Life Survey (Survey Locations)
Locations of surveyees and their responses (coded) to quality of life questions in the neighborhood of Boston.
Medellin | Quality of Life | Survey
2C_Medellin | 15 Oct 2017 | 27 views | 0 likes | 0 stars

TRANSPORTATION

Medellin: Passenger Transport Corridors
Existing and planned routes of urban passenger transport (metro, suburban, tram, BRT, cable car, bus, etc) throughout municipality.
Corridors | Medellin | Sustainable | Transport
2C_Medellin | 15 Oct 2017 | 10 views | 0 likes | 0 stars

Documents include training materials and partner presentations.

Mekelle: Hospital



[Info](#)
[Attributes](#)
[Share](#)
[Ratings](#)
[Comments](#)

[Download Layer](#)

[Metadata Detail](#)

[Download Metadata](#)

Legend

Maps using this layer

This layer is not currently used in any maps.

Create a map using this layer

Click the button below to generate a new map based on this layer.

[Create a Map](#)

About

Owner, Point of Contact, Metadata Author



Title Mekelle: Hospital
Abstract Location of hospitals in Mekelle.
Publication Date Oct. 15, 2017, 5:05 a.m.
Type Vector Data
Keywords [Hospital](#), [Mekelle](#)
Category [Health](#)
Owner [2C_Mekelle](#)

[More info](#) -

Capturing important attribute information about each type of feature for community use

[Info](#)
[Attributes](#)
[Share](#)
[Ratings](#)
[Comments](#)

Attribute Name	Label	Description
F17		
F16		
F15		
F14		
F13		
F12		
F11		
Remark		
Number_of		
Year_of_es		
Compound		
Level_of_o		
Type		
Descriptio		
way_point		
Y		
X		

Measuring the city

- SDG 11.3.1 Measurement for Land Consumption
- Challenges with data, scale, & boundaries
- Analysis & Visualization for Decision Making
- Research generated for continued study



Open Access Article

SDG Indicator 11.3.1 and Secondary Cities: An Analysis and Assessment

by Melinda Laituri ^{1,*} , Danielle Davis ¹ , Faith Sternlieb ² and Kathleen Galvin ³

¹ Department of Ecosystem Science and Sustainability, Colorado State University, Fort Collins, CO 80523-1476, USA

² Lincoln Institute of Land Policy, 11010 North Tatum Boulevard, Suite D-101, Phoenix, AZ 85028, USA

³ Department of Anthropology and Geography, Colorado State University, Fort Collins, CO 80523-1787, USA

* Author to whom correspondence should be addressed.

Academic Editors: Giuseppe Borruso, Ginevra Balletto, Beniamino Murgante, Carmelo Maria Torre and Hartmut Asche

Analysis & Visualization for Decision Making

ISPRS Int. J. Geo-Inf. **2021**, *10*(11), 713; <https://doi.org/10.3390/ijgi10110713>



Dissemination through Story Telling



MAPPING FOR RESILIENCY AND EMERGENCY PREPAREDNESS

  **Secondary CITIES**

[ABOUT](#) [FAQ](#) [STORY](#) [PARTNERS](#) [DATA](#) [EVENTS](#)

Cities

Mapping for Resiliency, Human Security, and Emergency Preparedness

16:20

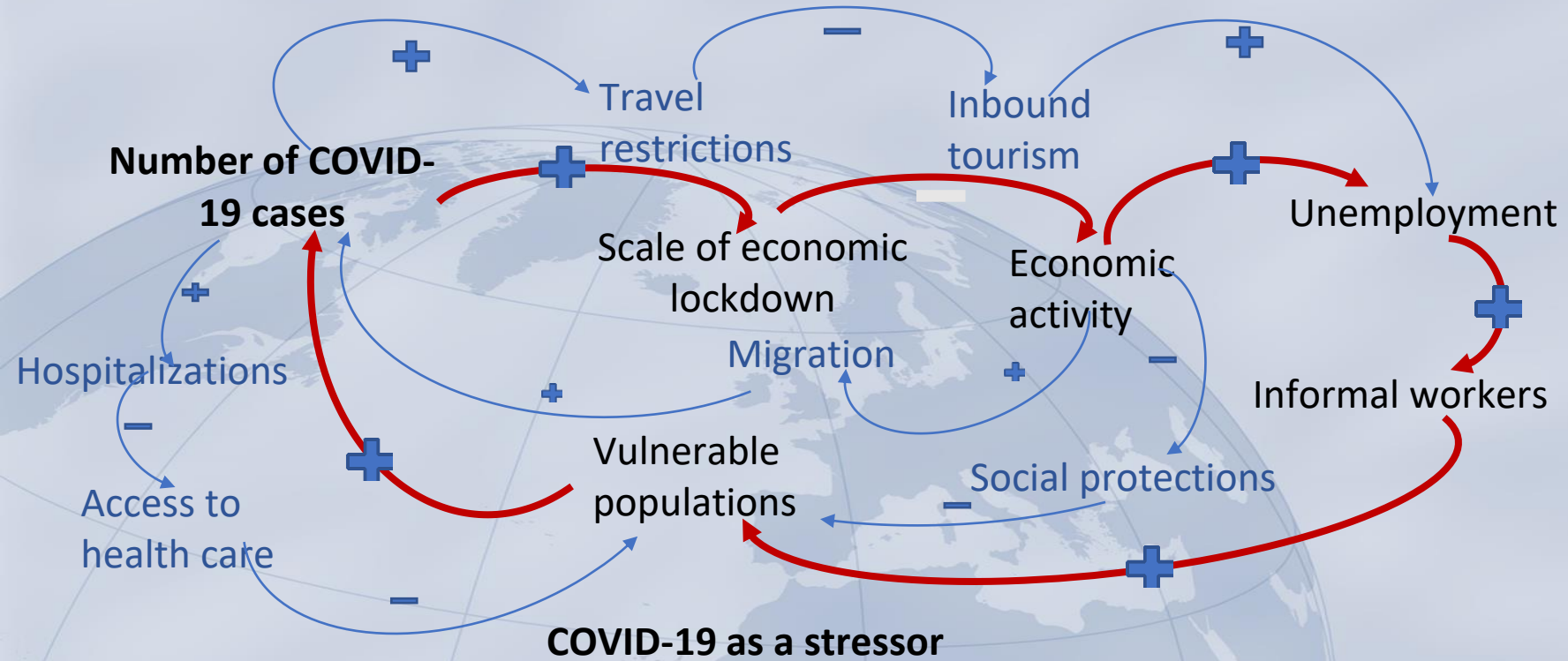
“By 2030, almost **60%** of the world”



The screenshot shows a website interface. At the top, there is a dark blue header with the title 'MAPPING FOR RESILIENCY AND EMERGENCY PREPAREDNESS' in white. To the right of the title is the 'Secondary Cities' logo, which includes a stylized house icon and the text 'Secondary CITIES'. Below the header is a navigation menu with links for 'ABOUT', 'FAQ', 'STORY', 'PARTNERS', 'DATA', and 'EVENTS'. The main content area features a large aerial photograph of a densely populated city. On the left side of the main content area, there is a dark vertical sidebar with a home icon at the top, a list of circular navigation dots, and the text 'Cities' in yellow. Below this, the text 'Mapping for Resiliency, Human Security, and Emergency Preparedness' is displayed in white. At the bottom of the sidebar, there is a timestamp '16:20', a white downward-pointing chevron, and a quote: 'By 2030, almost 60% of the world'. At the very bottom of the sidebar, there is a blue double arrow icon pointing downwards.

Intersection of Sustainability Themes – a Causal Loop Diagram

Considering potential trends for COVID-19 urban second order impacts



Resources:

<https://www.hrw.org/news/2020/08/26/impact-covid-19-childrens-education-africa#>

https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf

Community-wide Dissemination via App

1 Easy-to-use comprehensive portal allows browse all available health services



2 Compare available service and make informed decision



3 Leave reviews of health service experience to inform other users and customers



6 Based on OpenStreetMap - an open-access data, allowing anyone to update the information



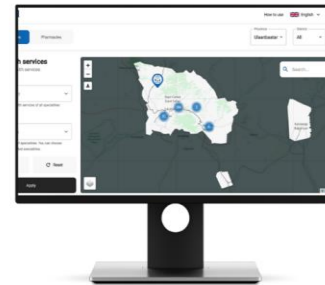
C2M2 ULAANBAATAR HEALTH PORTAL



4 Available as a website and mobile app



5 Map-based portal allows location and navigation



The health service information can be access via

WWW.I-MED.MN

or

by downloading from PlayStore on Android phone by searching

[IMED MONGOLIA](#)

Successful Participatory Mapping Activities

- Unique partner-provided and partner-created datasets
- Complements imagery-based methodologies with participatory mapping for data *creation*
- Include local government, university, NGO, & industry partners



Photos: Secondary Cities Cusco Geospatial data workshop, July 2015

Sustaining Capacity - Sharing Best Practices

- **Technology Development**

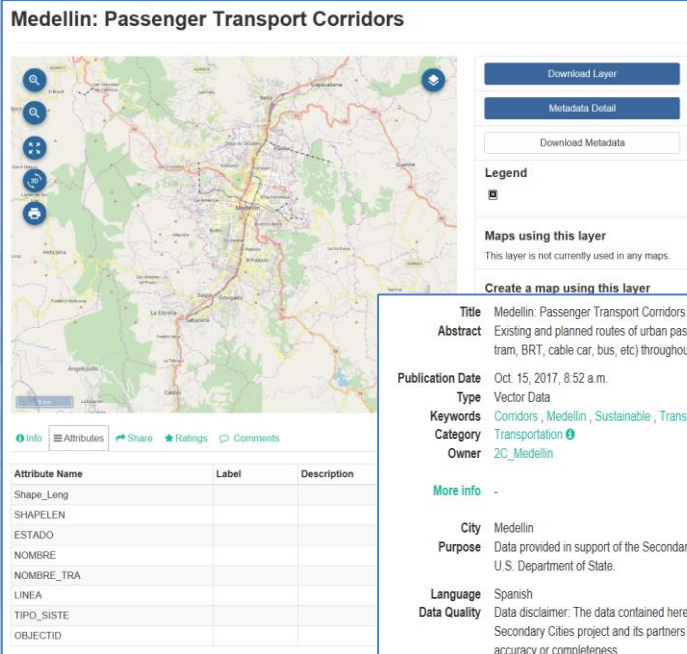
- Access & sharing
- Interoperability

- **Consolidating Int'l HG Standards**

- Participatory mapping ethics
- Metadata standards
- Data protocols

- **Building networks for the future**

- Crossing cultures & languages
- Internships



Medellin: Passenger Transport Corridors

Download Layer
Metadata Detail
Download Metadata

Legend

Maps using this layer
This layer is not currently used in any maps.

Create a map using this layer

Title Medellin: Passenger Transport Corridors
Abstract Existing and planned routes of urban passenger transport (metro, suburban, tram, BRT, cable car, bus, etc) throughout municipality.

Publication Date Oct 15, 2017, 8:52 a.m.
Type Vector Data
Keywords Corridors, Medellin, Sustainable, Transport
Category Transportation
Owner 2C_Medellin

More info -

City Medellin
Purpose Data provided in support of the Secondary Cities (2C) project, an initiative of the U.S. Department of State.

Language Spanish
Data Quality Data disclaimer: The data contained herein is provided as a public service. The Secondary Cities project and its partners make no guarantees concerning its accuracy or completeness.

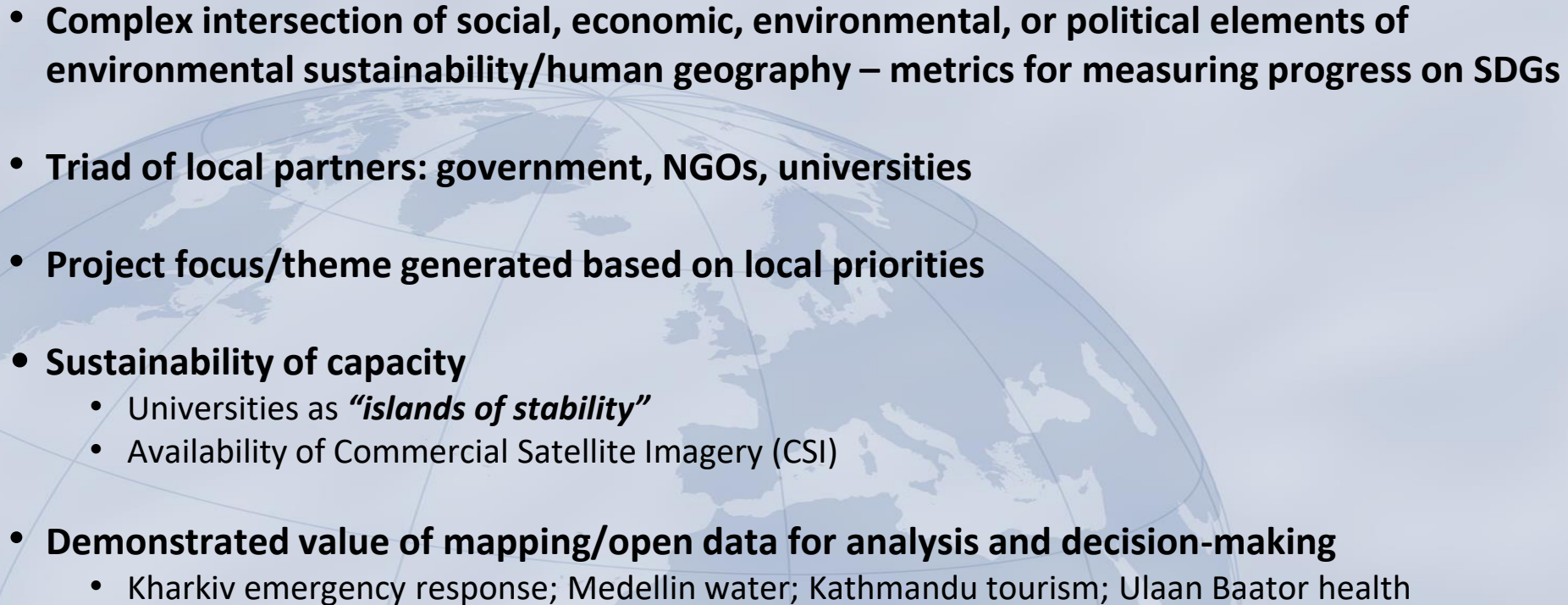
Lineage Unknown

Supplemental Information This data layer was provided by the municipality in 2017. The date of creation for this layer is unknown but can be assumed to be after 2000.

Data Provider Name GIS Group, City Hall Medellin, Administrative Department of Planning (DNP)
Data Provider Type Local Downloaded Data
Data Provider Sandra Rocio Cortes, Medellin Administrative Department of Planning, +57 (574) 44 44 148
Contact
Data Provider Url <https://geomedellin-m-medellin.opendata.arcgis.com/dataset...>



Lessons for *project* sustainability – building partnerships for analysis, visualization, and dissemination

- Complex intersection of social, economic, environmental, or political elements of environmental sustainability/human geography – metrics for measuring progress on SDGs
 - Triad of local partners: government, NGOs, universities
 - Project focus/theme generated based on local priorities
 - **Sustainability of capacity**
 - Universities as *“islands of stability”*
 - Availability of Commercial Satellite Imagery (CSI)
 - **Demonstrated value of mapping/open data for analysis and decision-making**
 - Kharkiv emergency response; Medellin water; Kathmandu tourism; Ulaan Baator health
- 

Participatory Mapping Partnership (PMP) Network Partners & Select Expertise

LATIN AMERICA HUB

Quito, Ecuador

Mapping urban
poverty in
Andean region

—
*Consequences of total
collapse of economy in
tourism towns in
Latin America*

Santa Cruz, Ecuador

Cusco, Peru

Ouro Preto, Brazil

—
*Mobility and migration of
Venezuelan migrants*

Quito, Ecuador

Lima, Peru

Santiago, Chile

AFRICA HUB

**Regional mini
technical exchanges**

Open source geospatial
tools for data generation

—
Access to health

**Bukavu, Democratic
Republic of the Congo**

—
*Social impacts
to education*

Nairobi, Kenya

—
*Impacts on
informal economy*

Pemba, Mozambique

ASIA HUB

Kathmandu, Nepal

Economic impacts
of tourism due to
government shutdown

—
*Disaster preparedness
and recovery from country-
wide shutdown; impact of
borders reopening in
economy and health*

Ulaanbaatar, Mongolia

—
*Economic impacts;
urban to rural migration*
Dhaka, Bangladesh

For more information, please contact Mapgive@state.gov

Thank you



<https://hiu.state.gov>
<https://mapgive.state.gov>

