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Needs from SDGs Tracking and Anslyisis

United Nation GA adopted the Global Indicator Framework (GIF) for the 2030 SDGs in its resolution A/RES/71/313 On 6th July 2017,

[from the preambular of the GIF]

Sustainable Development Goal indicators should be disaggregated, where relevant, by income, sex, age, race, ethnicity, migratory status, disability **and geographic location,** or other characteristics, in accordance with the Fundamental Principles of Official Statistics

[from the foreword of the SDGs Report 2017 by UN Secretary General]

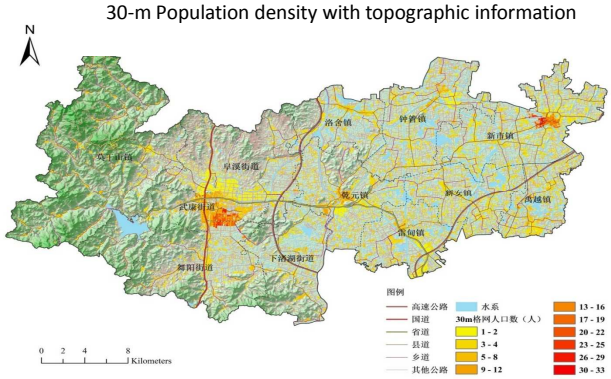
the need for reliable, timely accessible and disaggregated data to measure progress, *inform decision-making and ensure that everyone is counted*

My Experience in Deqing

Populations data needs to be disaggregated into geographical space with the help of ancillary geospatial data for in-depth SDG indicator measurement

镇名 Town names	人口 population
武康街道	89944
阜溪街道	26008
下渚湖街道	23999
舞阳街道	52180
洛舍镇	20553
钟管镇	43856
莫干山镇	31643
乾元镇	49644
雷甸镇	37592
新安镇	31730
新市镇	72395
禹越镇	33297

30-m Population density with topographic information



Enabling integrated geospatial and statistical analysis

My Experience in Deqing

Populations data needs to be disaggregated into geographical space with the help of ancillary geospatial data for in-depth SDG indicator measurement

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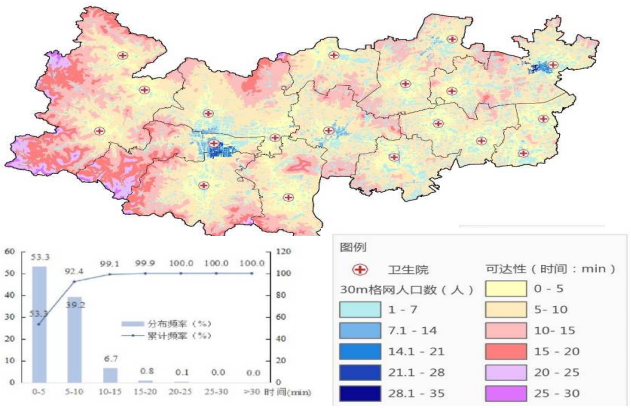
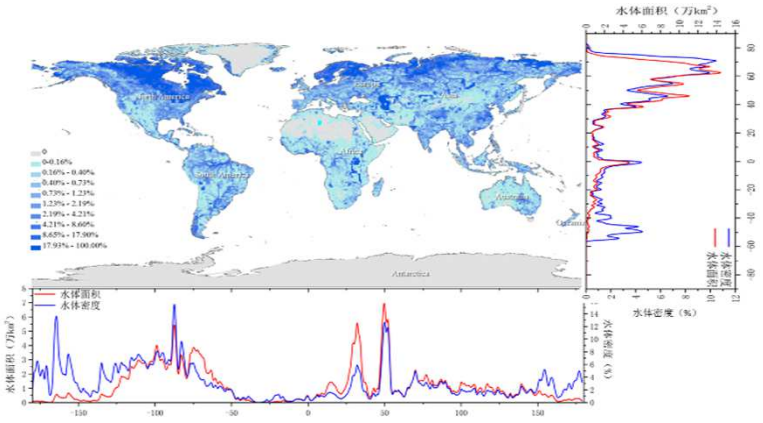
Coverage Analysis of Essential Health Services (3.8.1)



Geospatial Aggregation

Downscale high-resolution datasets into desirable scales- often called generalization in cartographic community.



Global water ratio and distribution along latitude and longitude in 2010

Cao, Chen et al. 2014. Preliminary analysis of spatiotemporal pattern of global land surface water. Science China: Earth Sciences, 57:2330–2339

Geospatial Aggregation

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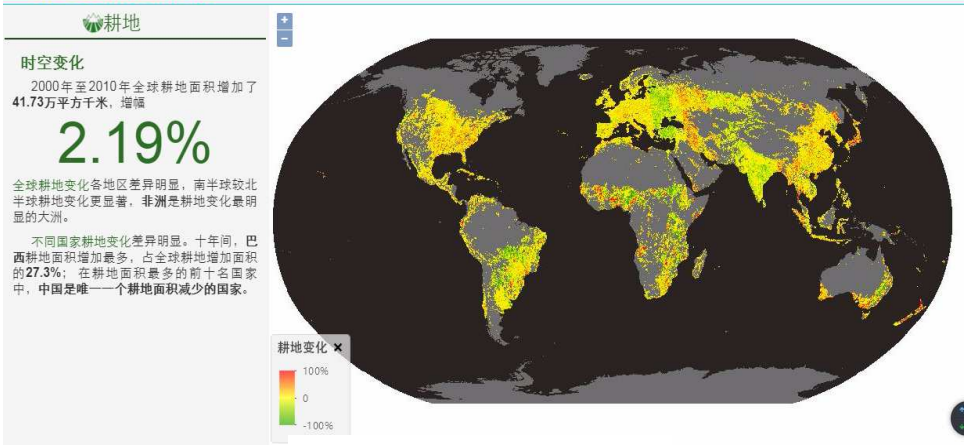

www.globeland30.org

Previous works

- Previous disaggregation and aggregation works by statistical communities were focused mainly on people-centric variables (such as gender, age, income, education, race, ethnicity, and disability)
- A geographic location perspective needs to be taken into consideration. Sophisticated methods and efficient tools need to be developed.
- It is becoming one of the major challenges for measuring SDGs indicators and monitoring SDG progress.

IAEG-SDGs: WGGI Established a New Task Stream

In April 2018, the Inter-Agency Expert Group on SDGs: Working Group for Geospatial Information (IAEG-SDGs: WGGI) established a Task Stream:

- Mandate: provide expertise and advice to IAEG-SDGs and the larger statistical/geospatial community as to how geographical disaggregation and aggregation can reliably and consistently contribute to SDG indicators measuring, analysis and monitoring
- **Working period**: 2018-2019
- **Co-leads** of Task Streams: Macarena Perez Garcia (chili)

  Jun Chen (China)

Content

Scope of Task

This task stream seeks to identify existing exemplars, develop good practices for key challenging issues, and document methodologies on geospatial disaggregation and aggregation for supporting SDGs.

- Identify exemplars
- Develop good practices
- Document methodology

Identify exemplars

- to identify existing exemplars from member's countries or organizations about their activities or experiences on geospatial disaggregation and aggregation for supporting SDGs.

  - desirable to have a diverse set of examples from different regions and circumstances so that it has the greatest breadth of impact to various Member States.

  - good examples can also be provided by the invited experts.

- to summarize the methodology and application of these exemplars for facilitating the knowledge sharing

Develop good practices

- to identify methodological gaps in disaggregation by geographic location and aggregation (such as the spatialization of population density, rural and urban disaggregation from land cover data sets)
- to encourage / mobilize members and experts to provide solution and to develop good practices;

Document Methodology

- to develop a generic conceptual framework on geospatial disaggregation and aggregation for supporting SDGs, as an expansion of the existing Global Statistical Geospatial Framework (which gives guidance how to aggregate with geographic location)
- To document the available methodology and tools which can be used in geospatial disaggregation and aggregation

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3 **Expected deliverables**

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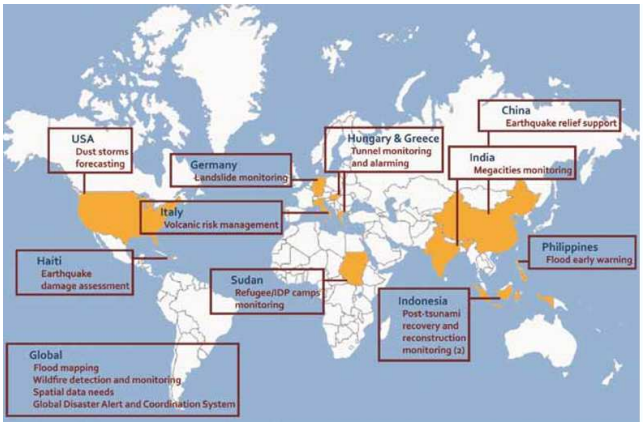
Expected Deliverables

This task stream is expecting to deliver two major outputs:

- A booklet on "Supporting SDGs with geospatial disaggregation and aggregation – examples and good practices":
- A technical guideline on 'geospatial disaggregation and aggregation for supporting SDGs":

A booklet

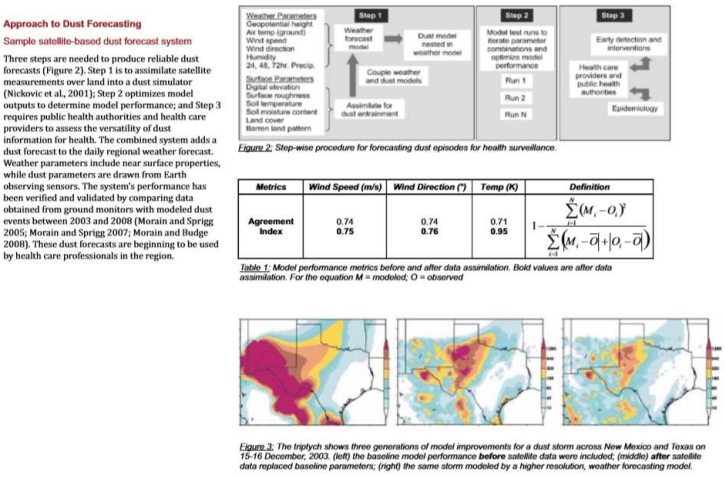
The booklet may be organized like this:



select about 10-12 good practices or exemplars from different regions from the world by the task stream members

A booklet

The booklet may be organized like this:



Approach to Dust Forecasting

Sample satellite-based dust forecast system

Three steps are needed to produce reliable dust forecasts (Figure 2). Step 1 is to assimilate satellite measurements over land into a dust simulator (Nickovic et al., 2001); Step 2 optimizes model outputs to determine model performance; and Step 3 requires public health authorities and health care providers to assess the versatility of dust information for health. The combined system adds a dust forecast to the daily regional weather forecast. Weather parameters include near surface properties, while dust parameters are drawn from Earth observing sensors. The system's performance has been verified and validated by comparing data obtained from ground monitors with modeled dust events between 2003 and 2008 (Morain and Sprigg 2005; Morain and Sprigg 2007; Morain and Budge 2008). These dust forecasts are beginning to be used by health care professionals in the region.

Figure 2: Step-wise procedure for forecasting dust episodes for health surveillance.

Metrics	Wind Speed (m/s)	Wind Direction (°)	Temp (K)	Definition
Agreement Index	0.74 **0.75**	0.74 **0.76**	0.71 **0.95**	$1-\frac{\sum_{i=1}^{N}(M_i-O_i)^2}{\sum_{i=1}^{N}\left(\lvert M_i-\bar{O}\rvert+\lvert O_i-\bar{O}\rvert\right)}$

Table 1: Model performance metrics before and after data assimilation. Bold values are after data assimilation. For the equation M = modeled; O = observed

*Figure 3: The triptych shows three generations of model improvements for a dust storm across New Mexico and Texas on 15-16 December, 2003. (left) the baseline model performance **before** satellite data were included; (middle) **after** satellite data replaced baseline parameters; (right) the same storm modeled by a higher resolution, weather forecasting model.*

demonstrate how SDG indicators can be disaggregated from a geographic location perspective.

A booklet

- A call for best practices will be sent or circulated to member nations, UN organizations and other invited experts.
- The targeted readers include the IAEG-SDG, decision makers, statistical professionals and even citizens.

A technical guideline

Geospatial disaggregation and aggregation for supporting SDGs

- It will present the concepts and methodologies for implementing disaggregation by geographic location and aggregation of geocoded unit level data for SDGs indicators measuring, analysis and monitoring.
- The target readers include the IAEG-SDG and statistical professionals.

A draft content

1 Introduction

- 1.1 Needs of Data Disaggregation and Aggregation for SDG
- 1.2 Multiplicity and Diversity of Data for SDG

2 Data preprocessing

- 2.1 Unification of Space-Time Reference Framework
- 2.2 Geocoding of Statistical data
- 2.3 Normalization of Statistical data

3 Disaggregation for SDG

- 3.1 Interpolation with Area/Distance Weighting
- 3.2 Dasymetric Disaggregation
- 3.3 Stochastic Allocation

4. Aggregation for SDG

- 4.1 Classification/Clustering
- 4.2 Interpolation/Resampling
- 4.3 Simplification/Typification
- 4.4 Smoothing/Filtering

A draft content

5 tools/resources

- 5.1 Software tools
- 5.2 Available resources

6． Examples and Recommendations

- 6.1 Selected examples
- 6.2 Recommendations

References

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Invite Experts

This task stream will be participated by members from IAEG-SDGs: WGGI and invited international experts. A close collaboration will be established with the UN-GGIM Expert Group on Integration of Statistical and Geospatial Information

	Names	Society	Affiliation and Correspondence	Expected contribution
1	Zhilin Li	ISPRS	Professor, Hong Kong Polytechnic University	the state-of-the-art of geospatial disaggregation and aggregation; new approaches;
2	Sisi Zlatanova	ISPRS	Professor, Melbourne University	Aggregation and disaggregation of urban and moble data
3	Songnian LI	ISPRS	Professor, Rayson University	Geospatial knowledge portal and technical gideline
4	Monica Sester	ICA	Professor, Hannover University, Germany	Aggregation and disaggregation of maps and land cover data
5	Robert Weibel	ICA	Professor, Department of Geography, University of Zurich	Aggregation of map and other geographical data
6	Liqiu Meng	ICA	Prof. Munich Tech. Uni., Germany	disaggregation for Population data
7	Andrew J Tatem	IGU	Professor, Uni. of Southampton, UK	disaggregation for Population data
8	Giles Foody	IGU	Professor, University of Nottingham	Super-resolution of image data
9	Martin Brady		Australian Bureau of Statistics, Canberra, Australia	Integrating with Global Statistical Geospatial Framework
10	Xuesheng Zhao		Prof. China University of Mining & Technology, Beijing	Global discrete grids and rural/ urban disaggregation
11	Yungang Hu		Associate professor, Beijing University of Civil Engineering and Architecture	Disaggregation for roads and traspotation networks
	.....		...	

Preliminary Plan

- 2018 Dec: Send out call for good practices/ exemplars, start preparations for a booklet
- 2019 April: Organize a Tele-mtg to discuss the conceptual framework, select the good practices, and prepare the draft technical guideline
- 2019 Aug: Organize a workshop in Chile or China, discuss the Booklet and the technical guideline
- 2019 Nov: Summaries and prepare a report to IAEG-SDGs

Content

Summary

- Geospatial disaggregation and aggregation plays an important role in supporting SDG indicators measuring, analysis and monitoring.
- The new task stream of IAEG-SDGs:WGGI plans to develop and deliver two outputs, i.e, one booklet and one technical guideline
- You are welcome to join us in providing your expertise and good practices, and editing the booklet and guideline!