OBJETIVOS DE DESARROLLO SOSTENIBLE
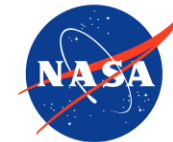# SUSTAINABLE DEVELOPMENT GOALS

Geodesy Supporting the
United Nations Sustainable Development Goals

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NASA **Jet Propulsion Laboratory**
California Institute of Technology

17 objetivos para transformar nuestro mundo

Los Objetivos de desarrollo sostenible son el plan maestro para conseguir un futuro sostenible para todos. Se interrelacionan entre sí e incorporan los desafíos globales a los que nos enfrentamos día a día, como la pobreza, la desigualdad, el clima, la degradación ambiental, la prosperidad, y la paz y la justicia.

17 Goals to Transform Our World

The Sustainable Development Goals are a master plan to achieve a sustainable future for all. They interrelate with each other and incorporate the global challenges we face every day, such as poverty, inequality, climate, environmental degradation, prosperity, and peace and justice.

OBJETIVOS DE DESARROLLO SOSTENIBLE

1 FIN DE LA POBREZA

2 HAMBRE CERO

3 SALUD Y BIENESTAR

4 EDUCACIÓN DE CALIDAD

5 IGUALDAD DE GÉNERO

6 AGUA LIMPIA Y SANEAMIENTO

7 ENERGÍA ASEQUIBLE Y NO CONTAMINANTE

8 TRABAJO DECENTE Y CRECIMIENTO ECONÓMICO

9 INDUSTRIA, INNOVACIÓN E INFRAESTRUCTURA

10 REDUCCIÓN DE LAS DESIGUALDADES

11 CIUDADES Y COMUNIDADES SOSTENIBLES

12 PRODUCCIÓN Y CONSUMO RESPONSABLES

13 ACCIÓN POR EL CLIMA

14 VIDA SUBMARINA

15 VIDA DE ECOSISTEMAS TERRESTRES

16 PAZ, JUSTICIA E INSTITUCIONES SÓLIDAS

17 ALIANZAS PARA LOGRAR LOS OBJECTIVOS

Geodesy and the

OBJETIVOS DE DESARROLLO SOSTENIBLE

SUSTAINABLE DEVELOPMENT GOALS

- The *2030 Agenda for Sustainable Development* provides a universal development agenda for all countries and stakeholders to use as a blueprint of action for people, the planet and prosperity.

- The agenda is anchored by seventeen Sustainable Development Goals (SDGs), associated Targets, and a global **Indicator** framework.

- Collectively, these elements enable countries and the global community to **measure, manage and monitor progress** on economic, social and environmental sustainability.

- A significant opportunity exists to **address these challenges** by bringing together data and applying information about people and places into national monitoring and evaluation systems to improve human and environmental conditions.

Geodesy and the OBJETIVOS DE DESARROLLO SOSTENIBLE SUSTAINABLE DEVELOPMENT GOALS

- The *2030 Agenda* specifically demands new data acquisition and integration approaches to improve the quality, coverage and availability of data to support the implementation of the development agenda at all levels.

- The *2030 Agenda* includes efforts "to exploit the contribution to be made by a wide range of data, **including Earth observation and geospatial information,** while ensuring national ownership in supporting and tracking progress" on the SDGs.

Geodesy and the

OBJETIVOS DE DESARROLLO SOSTENIBLE
SUSTAINABLE DEVELOPMENT GOALS

- **Earth observations and derived information have already played key roles in supporting sustainable development.** Serving the *2030 Agenda*, they can play insightful roles in **monitoring targets, planning, tracking progress**, and helping nations and other stakeholders **make informed decisions**, plans, and on-going adjustments that will contribute toward achieving the SDGs.

- **Combined with demographic and statistical data**, these sources enable nations to analyze and model conditions, create maps and other visualizations, evaluate impacts across sectors and regions, monitor change over time in a consistent and standardized manner, and improve accountability.
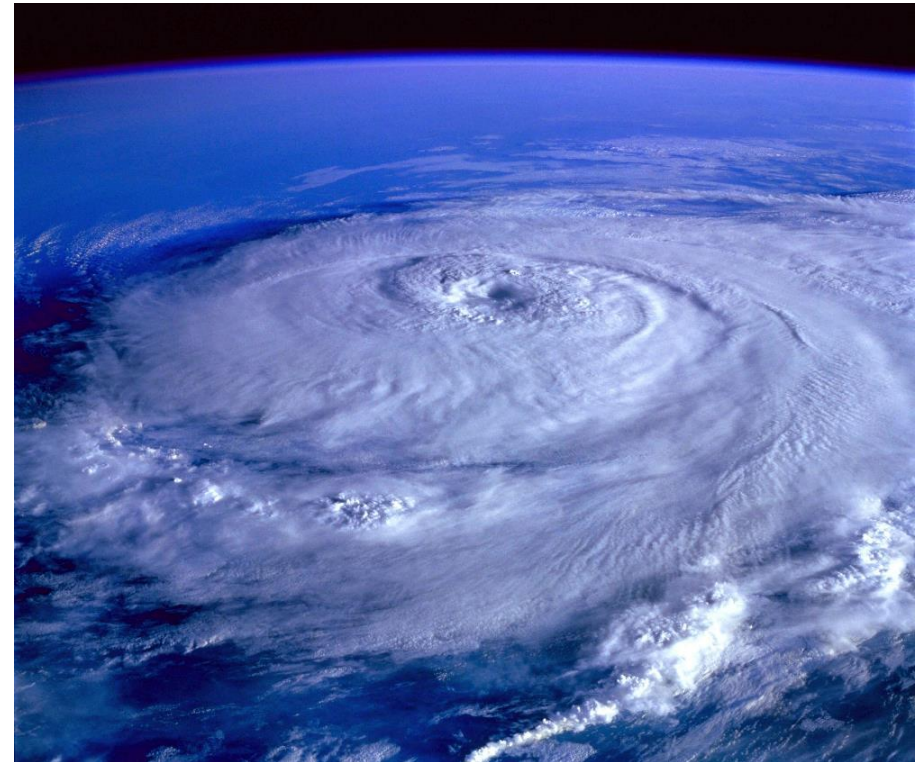
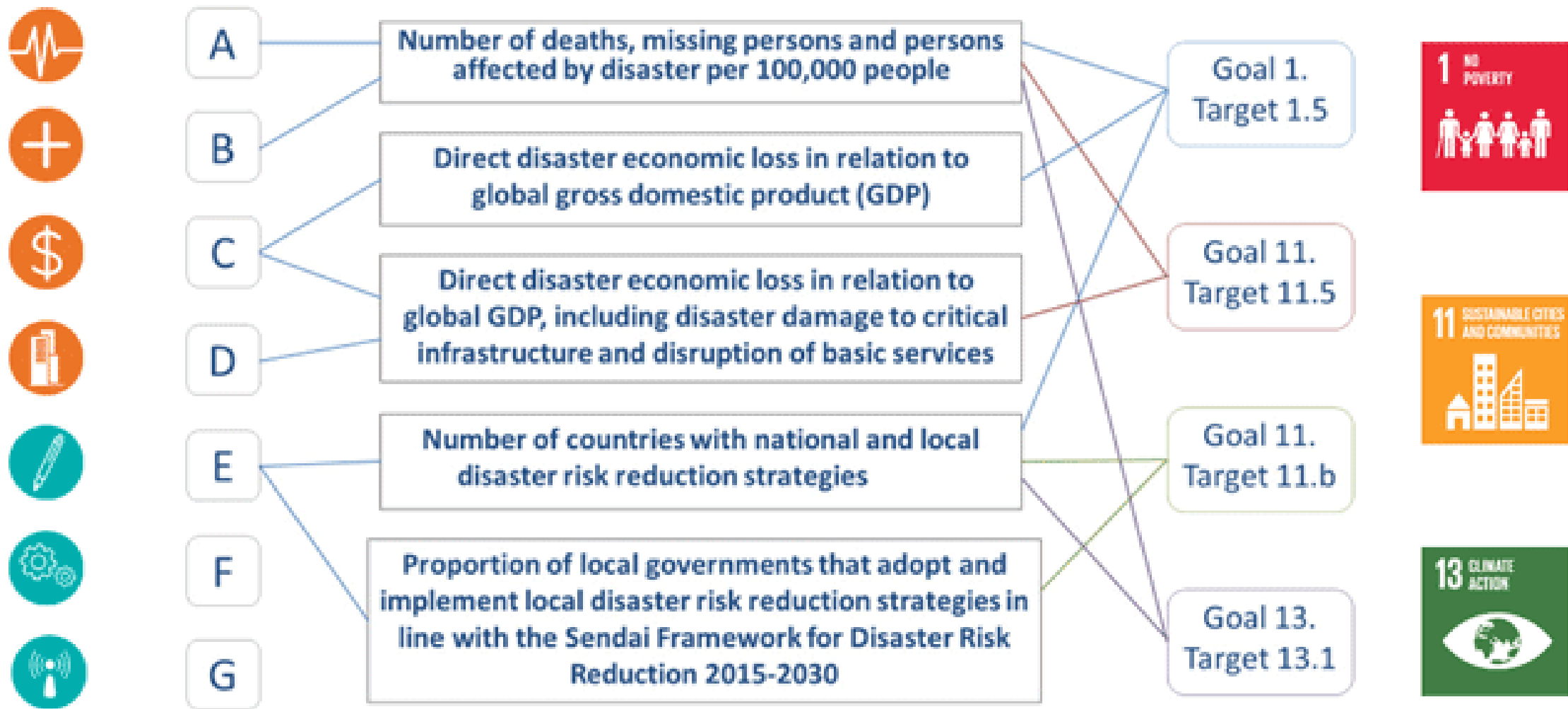# Disaster Risk Reduction (Sendai Framework) & the SDGs

Aligning disaster-related SDGs with the Sendai Framework for Disaster Risk Reduction.

GEO is working to support the Sendai Framework and to address disaster-related goals, targets and indicators of the 2030 Agenda:
- 3 SDGs
  - 1: End poverty in all its forms everywhere
  - 11: Make cities and human settlements inclusive, safe, resilient and sustainable.
  - 13: Take urgent action to combat climate change and its impacts
- 4 SDGs Targets
- 11 SDGs indicators
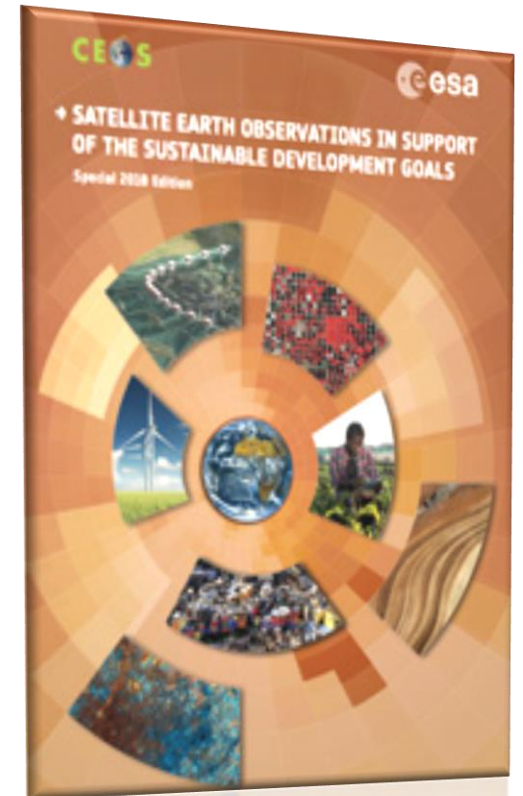
Image Courtesy UNDRR PreventionWeb

Geodesy underpins Earth Observations in support of the Sustainable Development Goals

- SDGs represent a data-driven, evidence-based approach to sustainable development

- The SDG Global Indicator Framework is the means by which national governments can practically monitor achievement on, and report progress toward, the SDG Targets

- The 2030 Agenda for Sustainable Development aims to assist countries to measure, manage and monitor progress on economic, social and environmental sustainability, with the basic principle that no one is left behind.

- The aim is to integrate the principles of sustainable development into national policies and processes.

➢ Download book: http://eohandbook.com/sdg

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SATELLITE EARTH OBSERVATIONS IN SUPPORT OF THE SUSTAINABLE DEVELOPMENT GOALS
Special 2018 Edition

EARTH OBSERVATIONS FOR THE SUSTAINABLE DEVELOPMENT GOALS

GEO **GROUP ON EARTH OBSERVATIONS**

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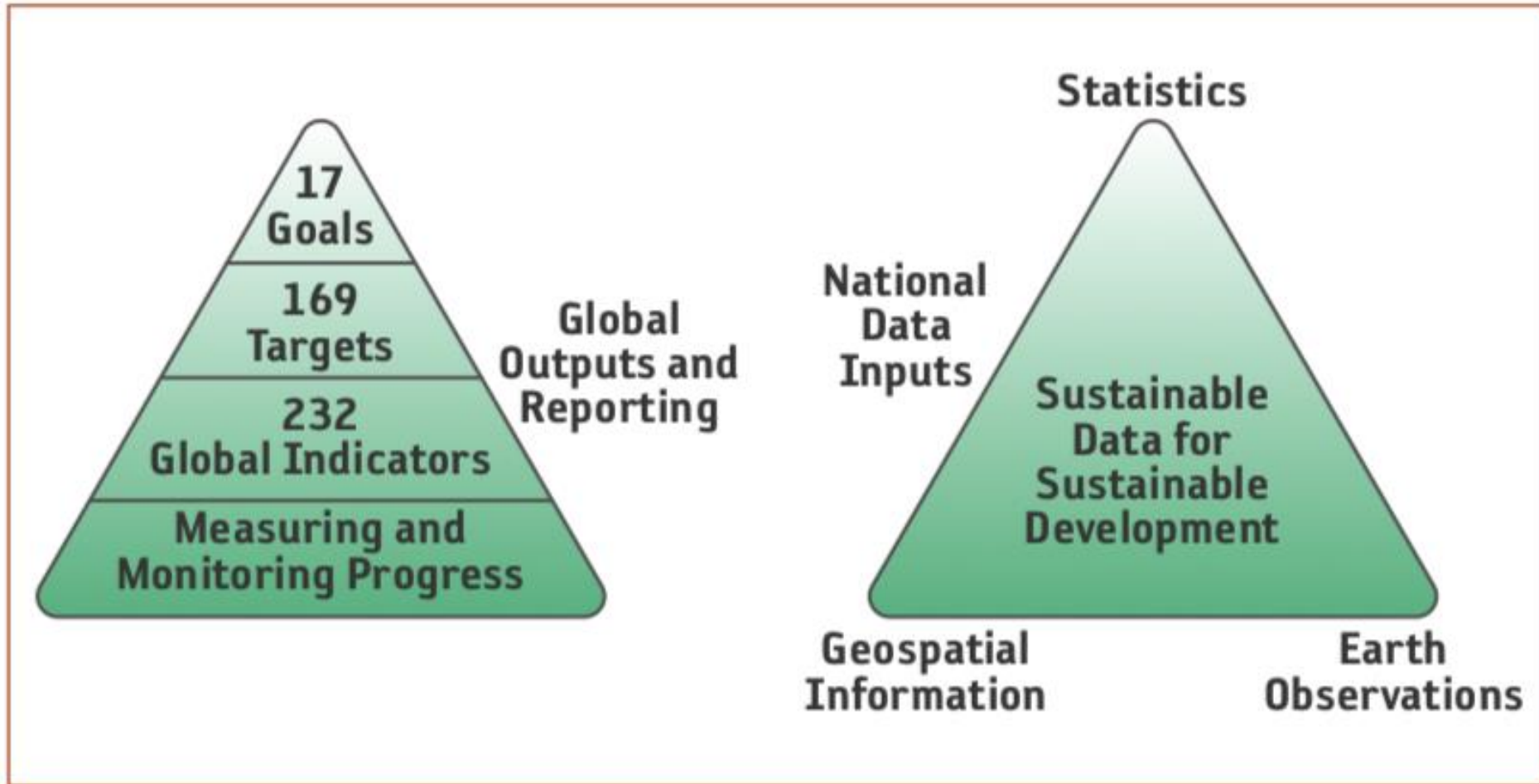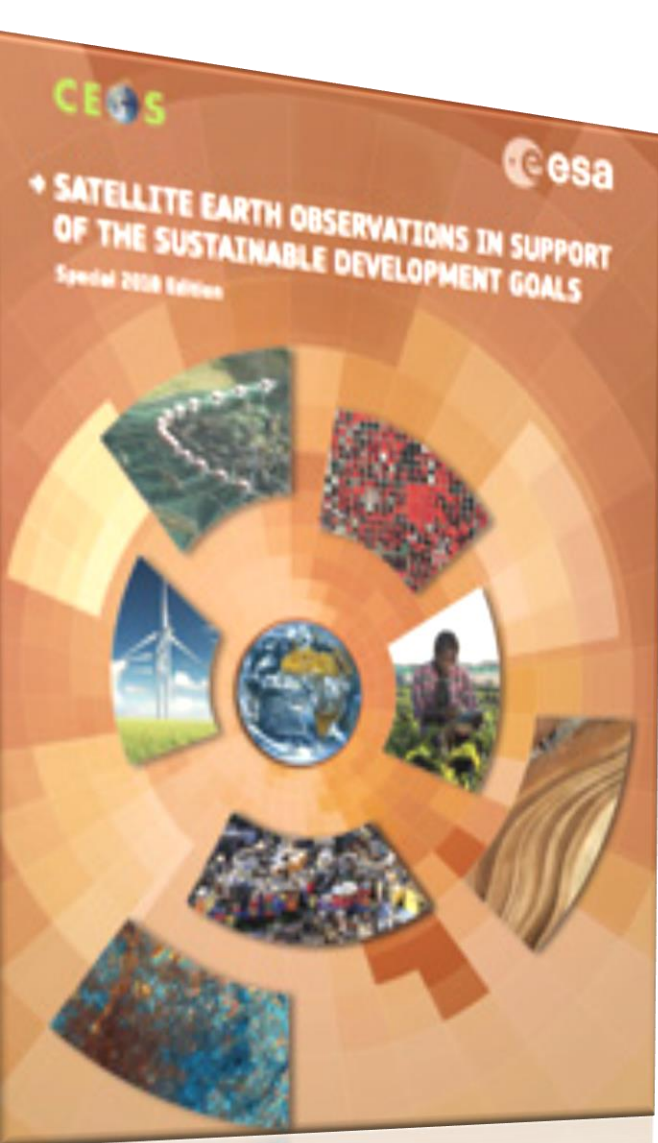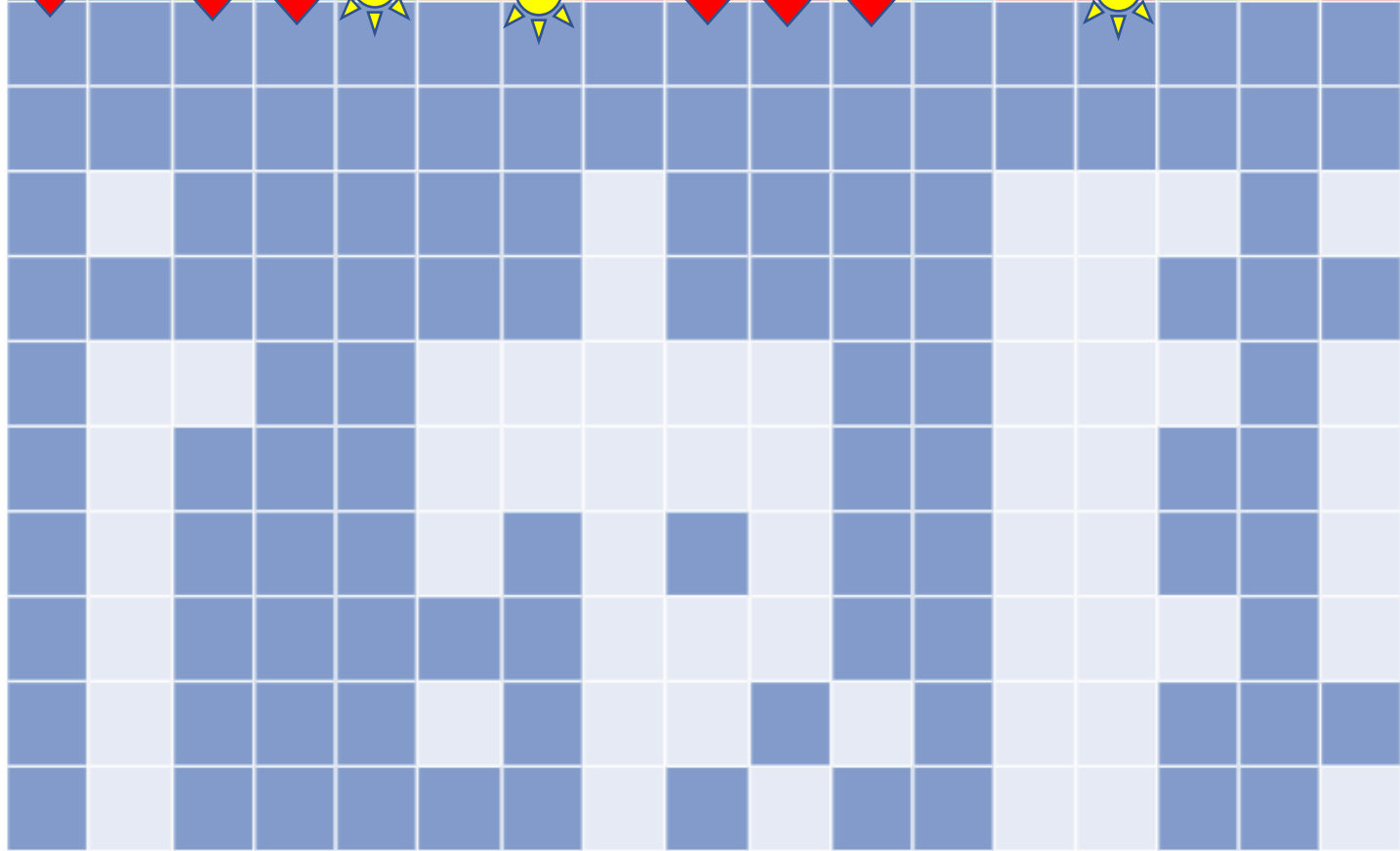The Committee on Earth Observation Satellites

Figure 2: Reporting progress through the use of global Indicators, and key areas of national data inputs for the production of the SDG report on the global and regional progress toward the SDG Goals and Targets.

SUSTAINABLE DEVELOPMENT GOALS

Columns (left to right):
- 17 Partnerships for the goals
- 16 Peace, justice and strong institutions
- 15 Life on land
- 14 Life below water
- 13 Climate action
- 12 Responsible consumption and production
- 11 Sustainable cities and communities
- 10 Reduced inequalities
- 9 Industry, innovation and infrastructure
- 8 Decent work and economic growth
- 7 Affordable and clean energy
- 6 Clean water and sanitation
- 5 Gender equality
- 4 Quality education
- 3 Good health and well-being
- 2 Zero hunger
- 1 No poverty

Rows:
- Population distribution
- Cities and infrastructure mapping
- Elevation and topography
- Land cover and use mapping
- Oceanographic observations
- Hydrological and water quality observations
- Atmospheric and air quality monitoring
- Biodiversity and ecosystem observations
- Agricultural monitoring
- Hazards, disasters and environmental impact monitoring

EARTH OBSERVATION AND GEOSPATIAL INFORMATION LINKAGES TO SDG GOALS, TARGETS AND INDICATORS

SUSTAINABLE DEVELOPMENT GOALS

Target (Contribute to progress on the Target, not necessarily the Indicator)									Goal		Indicator (Direct measure or indirect support to the Indicator)				
							1.4	1.5	1	No poverty	1.4.2				
						2.3	2.4	2.c	2	Zero hunger	2.4.1				
					3.3	3.4	3.9	3.d	3	Good health and well-being	3.9.1				
									4	Quality education					
								5.a	5	Gender equality	5.a.1				
	6.1	6.3	6.4	6.5	6.6	6.a	6.b	6	Clean water and sanitation	6.3.1	6.3.2	6.4.2	6.5.1	6.6.1
						7.2	7.3	7.a	7.b	7	Affordable and clean energy	7.1.1				
								8.4	8	Decent work and economic growth					
					9.1	9.4	9.5	9.a	9	Industry, innovation and infrastructure	9.1.1	9.4.1			
						10.6	10.7	10.a	10	Reduced inequalities					
	11.1	11.3	11.4	11.5	11.6	11.7	11.b	11.c	11	Sustainable cities and communities	11.1.1	11.2.1	11.3.1	11.6.2	11.7.1
				12.2	12.4	12.8	12.a	12.b	12	Responsible consumption and production	12.a.1				
					13.1	13.2	13.3	13.b	13	Climate action	13.1.1				
		14.1	14.2	14.3	14.4	14.6	14.7	14.a	14	Life below water	14.3.1	14.4.1	14.5.1		
	15.1	15.2	15.3	15.4	15.5	15.7	15.8	15.9	15	Life on land	15.1.1	15.2.1	15.3.1	15.4.1	15.4.2
								16.8	16	Peace, justice and strong institutions					
17.2	17.3	17.6	17.7	17.8	17.9	17.16	17.17	17.18	17	Partnerships for the goals	17.6.1	17.18.1			

4 EDUCACIÓN DE CALIDAD

11 CIUDADES Y COMUNIDADES SOSTENIBLES

13 ACCIÓN POR EL CLIMA

							2.3							
	3.3	3.4	3.9	3.d		**3**	Good health and well-being	3.9.1						

4 Quality education

6.1	6.3	6.4	6.5	6.6	6.a	6.b	**6** Clean water and sanitation	6.3.1	6.3.2	6.4.2	6.5.1	6.6.1

11.1	11.3	11.4	11.5	11.6	11.7	11.b	11.c	**11 Sustainable cities and communities**	11.1.1	11.2.1	11.3.1	11.6.2	11.7.1

9.1	9.4	9.5	9.a	**9**	Industry, innovation and infrastructure	9.1.1	9.4.1		
10.6	10.7	10.a	**10** Reduced inequalities					
11.1	11.3	11.4	11.5	11.6	11.7	11.b	11.c	**11** Sustainable cities and communities	11.1.1	11.2.1	11.3.1	11.6.2	11.7.1

13.1	13.2	13.3	13.b	**13 Climate action**	13.1.1

							14 Life below water					
15.1	15.2	15.3	15.4	15.5	15.7	15.8	15.9	**15** Life on land	15.1.1	15.2.1	15.3.1	15.4.1	15.4.2
16.8								**16** Peace, justice and strong institutions					
17.2	17.3	17.6	17.7	17.8	17.9	17.16	17.17	17.18	**17** Partnerships for the goals	17.6.1	17.18.1

QUALITY EDUCATION:
WHY IT MATTERS

What is the goal here?

Ensure inclusive and quality education for all and promote lifelong learning.

Why does education matter?

Education enables upward socioeconomic mobility and is a key to escaping poverty. Education is also essential to achieving many other Sustainable Development Goals (SDGs).

When people are able to get quality education they can break from the cycle of poverty. Education helps to reduce inequalities and to reach gender equality. In fact, one extra year of education is associated with a reduction of the Gini coefficient by 1.4 percentage points.

Education empowers people everywhere to live more healthy and sustainable lives. Education is also crucial to fostering tolerance between people and contributes to more peaceful societies.

EDUCACIÓN DE CALIDAD:
POR QUÉ ES IMPORTANTE

¿Cuál es el objetivo en este caso?

Garantizar una educación inclusiva y equitativa de calidad y promover oportunidades de aprendizaje permanente para todos.

¿Por qué es importante la educación?

La educación es la clave para poder alcanzar otros muchos Objetivos de Desarrollo Sostenible (ODS). Cuando las personas pueden acceder a una educación de calidad, pueden escapar del ciclo de la pobreza.

Por consiguiente, la educación contribuye a reducir las desigualdades y a lograr la igualdad de género.

También empodera a las personas de todo el mundo para que lleven una vida más saludable y sostenible. La educación es también fundamental para fomentar la tolerancia entre las personas, y contribuye a crear sociedades más pacíficas.

Geodesy Contributions to SDG 4 Quality Education

TARGET 4.3: By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university

De aquí a 2030, asegurar el acceso igualitario de todos los hombres y las mujeres a una formación técnica, profesional y superior de calidad, incluida la enseñanza universitaria

- **INDICATOR 4.3.1:** Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex

- *Tasa de participación de los jóvenes y adultos en la enseñanza y formación académica y no académica en los últimos 12 meses, desglosada por sexo*

TARGET 4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

De aquí a 2030, aumentar considerablemente el número de jóvenes y adultos que tienen las competencias necesarias, en particular técnicas y profesionales, para acceder al empleo, el trabajo decente y el emprendimiento

- **INDICATOR 4.4.1:** Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill

- *Proporción de jóvenes y adultos con competencias en tecnología de la información y las comunicaciones (TIC), desglosada por tipo de competencia técnica*

Geodesy Contributions to SDG 4 Quality Education

TARGET 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

De aquí a 2030, asegurar que todos los alumnos adquieran los conocimientos teóricos y prácticos necesarios para promover el desarrollo sostenible, entre otras cosas mediante la educación para el desarrollo sostenible y los estilos de vida sostenibles, los derechos humanos, la igualdad de género, la promoción de una cultura de paz y no violencia, la ciudadanía mundial y la valoración de la diversidad cultural y la contribución de la cultura al desarrollo sostenible

- **INDICATOR 4.7.1:** Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment

- *Grado en que i) la educación para la ciudadanía mundial y ii) la educación para el desarrollo sostenible, incluida la igualdad de género y los derechos humanos, se incorporan en todos los niveles de a) las políticas nacionales de educación, b) los planes de estudio, c) la formación del profesorado y d) la evaluación de los estudiantes*

TARGET 4.B: By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries

De aquí a 2020, aumentar considerablemente a nivel mundial el número de becas disponibles para los países en desarrollo, en particular los países menos adelantados, los pequeños Estados insulares en desarrollo y los países africanos, a fin de que sus estudiantes puedan matricularse en programas de enseñanza superior, incluidos programas de formación profesional y programas técnicos, científicos, de ingeniería y de tecnología de la información y las comunicaciones, de países desarrollados y otros países en desarrollo

- **INDICATOR 4.B.1:** Volume of official development assistance flows for scholarships by sector and type of study

- *Volumen de la asistencia oficial para el desarrollo destinada a becas, desglosado por sector y tipo de estudio*

Sustainable Development Goal 11 is to make cities and human settlements inclusive, safe, resilient and sustainable

TARGET 11.5: By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

De aquí a 2030, reducir significativamente el número de muertes causadas por los desastres, incluidos los relacionados con el agua, y de personas afectadas por ellos, y reducir considerablemente las pérdidas económicas directas provocadas por los desastres en comparación con el producto interno bruto mundial, haciendo especial hincapié en la protección de los pobres y las personas en situaciones de vulnerabilidad

- **INDICATOR 11.5.2:** Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services

- *Pérdidas económicas directas en relación con el PIB mundial, daños en la infraestructura esencial y número de interrupciones de los servicios básicos atribuidos a desastres.*

Sustainable Development Goal 11 is to make cities and human settlements inclusive, safe, resilient and sustainable

TARGET 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

De aquí a 2030, reducir el impacto ambiental negativo per capita de las ciudades, incluso prestando especial atención a la calidad del aire y la gestión de los desechos municipales y de otro tipo

- **INDICATOR 11.6.2:** Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)

- *Niveles medios anuales de partículas finas en suspensión (por ejemplo, PM2.5 y PM10) en las ciudades (ponderados según la población)*

Geodesy Contributions to SDG 11 Sustainable Cities and Communities

Sustainable Development Goal 11 is to make cities and human settlements inclusive, safe, resilient and sustainable

TARGET 11.B: By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels

De aquí a 2020, aumentar considerablemente el número de ciudades y asentamientos humanos que adoptan e implementan políticas y planes integrados para promover la inclusión, el uso eficiente de los recursos, la mitigación del cambio climático y la adaptación a él y la resiliencia ante los desastres, y desarrollar y poner en práctica, en consonancia con el Marco de Sendai para la Reducción del Riesgo de Desastres 2015-2030, la gestión integral de los riesgos de desastre a todos los niveles

- **INDICATOR 11.B.2:** Number of countries with national and local disaster risk reduction strategies

- *Proporción de gobiernos locales que adoptan y aplican estrategias locales de reducción del riesgo de desastres en consonancia con las estrategias nacionales de reducción del riesgo de desastres*

Sustainable Development Goal 13 is to take urgent action to combat climate change and its impacts

TARGET 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

Fortalecer la resiliencia y la capacidad de adaptación a los riesgos relacionados con el clima y los desastres naturales en todos los países

- **INDICATOR 13.1.2:** Number of countries with national and local disaster risk reduction strategies
- *Número de países que adoptan y aplican estrategias nacionales de reducción del riesgo de desastres en consonancia con el Marco de Sendái para la Reducción del Riesgo de Desastres 2015-2030*

13 ACCIÓN POR EL CLIMA

SUSTAINABLE DEVELOPMENT GOALS

Sustainable Development Goal 13 is to take urgent action to combat climate change and its impacts

TARGET 13.2: Integrate climate change measures into national policies, strategies and planning.

Incorporar medidas relativas al cambio climático en las políticas, estrategias y planes nacionales

- **INDICATOR 13.2.1:** Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)

- *Número de países que han comunicado el establecimiento o la puesta en marcha de una política, estrategia o plan integrado que aumente su capacidad para adaptarse a los efectos adversos del cambio climático y que promueven la resiliencia al clima y un desarrollo con bajas emisiones de gases de efecto invernadero sin comprometer por ello la producción de alimentos (por ejemplo, un plan nacional de adaptación, una contribución determinada a nivel nacional, una comunicación nacional o un informe bienal de actualización)*

Geodesy Contributions to SDG 13 Climate Action

Sustainable Development Goal 13 is to take urgent action to combat climate change and its impacts

TARGET 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Mejorar la educación, la sensibilización y la capacidad humana e institucional respecto de la mitigación del cambio climático, la adaptación a él, la reducción de sus efectos y la alerta temprana

- **INDICATOR 13.3.1:** Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula

- *Número de países que han incorporado la mitigación del cambio climático, la adaptación a él, la reducción de sus efectos y la alerta temprana en los planes de estudios de la enseñanza primaria, secundaria y terciaria*

- **INDICATOR 13.3.2:** Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions

- *Número de países que han comunicado una mayor creación de capacidad institucional, sistémica e individual para implementar actividades de adaptación, mitigación y transferencia de tecnología, y medidas de desarrollo*

OBJETIVOS DE DESARROLLO SOSTENIBLE

13 ACCIÓN POR EL CLIMA

SUSTAINABLE DEVELOPMENT GOALS

Sustainable Development Goal 13 is to take urgent action to combat climate change and its impacts

TARGET 13.B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries, including focusing on women, youth and local and marginalized communities
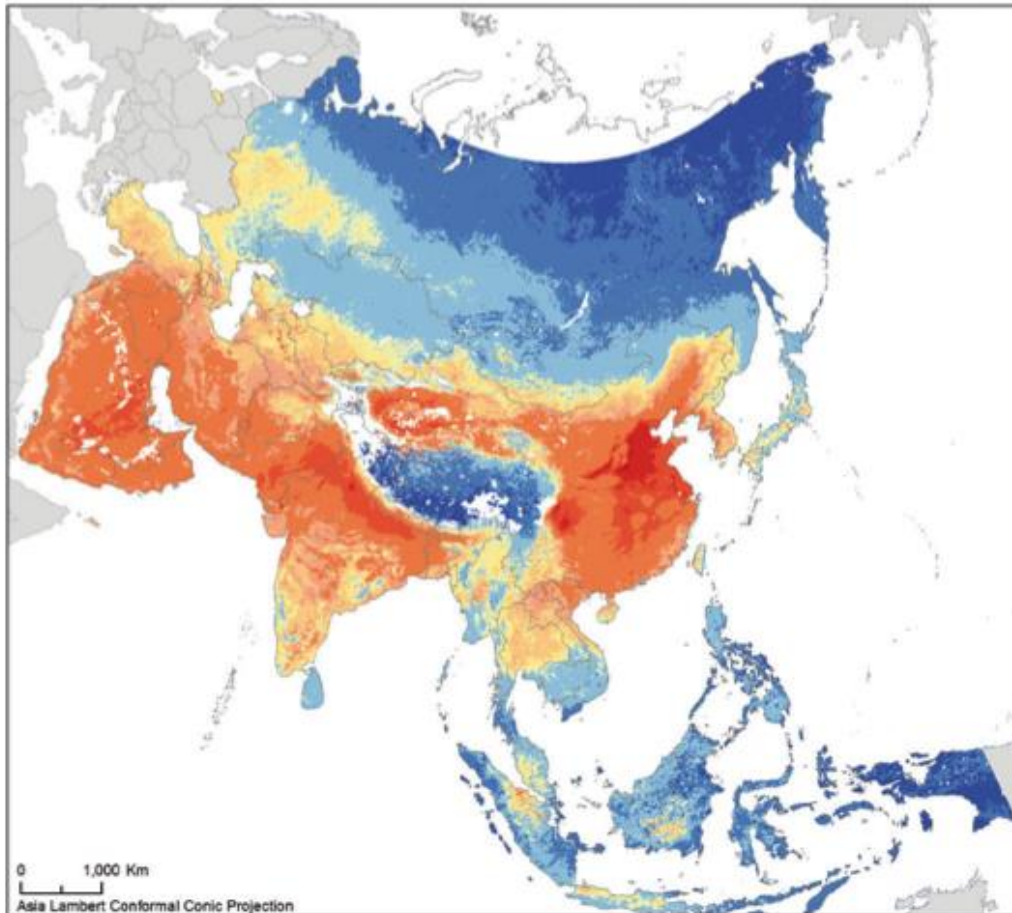
Promover mecanismos para aumentar la capacidad para la planificación y gestión eficaces en relación con el cambio climático en los países menos adelantados y los pequeños Estados insulares en desarrollo, haciendo particular hincapié en las mujeres, los jóvenes y las comunidades locales y marginadas

- **INDICATOR 13.B.1:** Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalized communities

- *Número de países menos adelantados y pequeños Estados insulares en desarrollo que reciben apoyo especializado, y cantidad de apoyo, en particular financiero, tecnológico y de creación de capacidad, para los mecanismos de desarrollo de la capacidad de planificación y gestión eficaces en relación con el cambio climático, incluidos los centrados en las mujeres, los jóvenes y las comunidades locales y marginadas*
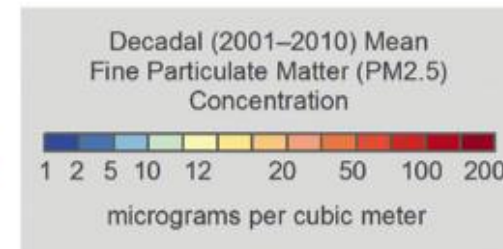
11 SUSTAINABLE CITIES AND COMMUNITIES

Target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
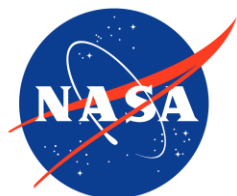
MEASURING AIR QUALITY IN CITIES AND ACROSS REGIONS

Global Annual PM2.5 Grids from MODIS, MISR and SeaWiFS Aerosol Optical Depth (AOD), 2001–2010: Asia

Measurements from satellites provide information on air quality in communities and regions. For example, this map shows baseline data on particulate matter that could be used by statistical agencies, public health organizations, and environmental protection officials to develop more in-depth indicators, for example by deploying sensor networks to efficiently generate complete national data in near real-time.

CIESIN Columbia University, April 2015

0   1,000 Km

Asia Lambert Conformal Conic Projection

Decadal (2001–2010) Mean
Fine Particulate Matter (PM2.5)
Concentration

1 2 5 10 12   20   50   100 200

micrograms per cubic meter

CEOS

The Committee on Earth Observation Satellites

jpl.nasa.gov

Some take-home resources

➤ **International GNSS Service**
  ➤ Information, data and product access: IGS.org

➤ **GGOS Paper on GNSS-Enhance Tsunami Early Warning Systems**
  • Download report: bit.ly/gtews2018

➤ **GGIM-World Bank
Integrated Geospatial Information Framework**
  bit.ly/GGIMWBigif

➤ **UN Global Geospatial Information Management + GGRF**
  • Committee of Experts: ggim.un.org
  • Subcommittee on Geodesy: ggim.un.org/UNGGIM-wg1/
  • Information about the GGRF: www.unggrf.org

➤ **Sendai Framework for Disaster Risk Reduction**
  • Global Assessment Report 2019: gar.unisdr.org
  • Interactive Story Map: arcg.is/1f9OXP
  • Sendai Framework Monitor: sendaimonitor.unisdr.org

➤ **Sustainable Development Goals**
  • Group on Earth Observations support of SDGs: eo4sdg.org

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