

Implementation of the Global Geodetic Reference Frame (GGRF) in Latin America

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GGOS Efforts in Support of the United Nations Sendai Framework for Disaster Risk Reduction

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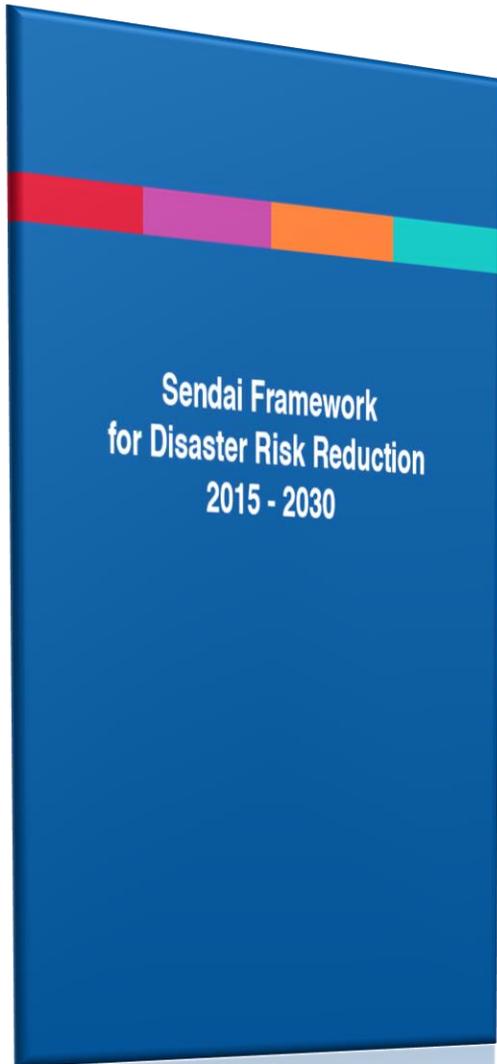


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The Sendai Framework for Disaster Risk Reduction

Marco de Sendai para la Reducción del Riesgo de Desastres



Sendai Framework for Disaster Risk Reduction 2015-2030 adopted at the Third UN World Conference in Sendai, Japan, on 18 March 2015.

El Marco de Sendai para la Reducción del Riesgo de Desastres 2015-2030 se adoptó en la tercera Conferencia Mundial de las Naciones Unidas celebrada en Sendai (Japón) el 18 de marzo de 2015.

Supported by the United Nations Office for Disaster Risk Reduction (UNDRR) at the request of the UN General Assembly.

Significant focus on disaster risk management as opposed to disaster management. Focus is on natural and man-made hazards and related environmental, technological, biological hazards and risks.

The Sendai Framework addresses the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters caused by natural or man-made hazards; as well as environmental, technological and biological hazards and risks.

SUBSTANTIALLY REDUCE

-  A. Global disaster mortality
-  B. Number of affected people
-  C. Economic loss in relation to GDP
-  D. Damage to critical infrastructure and services disruption

SEVEN TARGETS TO ACHIEVE BY 2030


SENDAI FRAMEWORK
FOR DISASTER RISK REDUCTION 2015-2030

-  E. Number of countries with national and local DRR strategies by 2020
-  F. International cooperation to developing countries
-  G. Availability and access to early warning systems and DRR information

SUBSTANTIALLY INCREASE

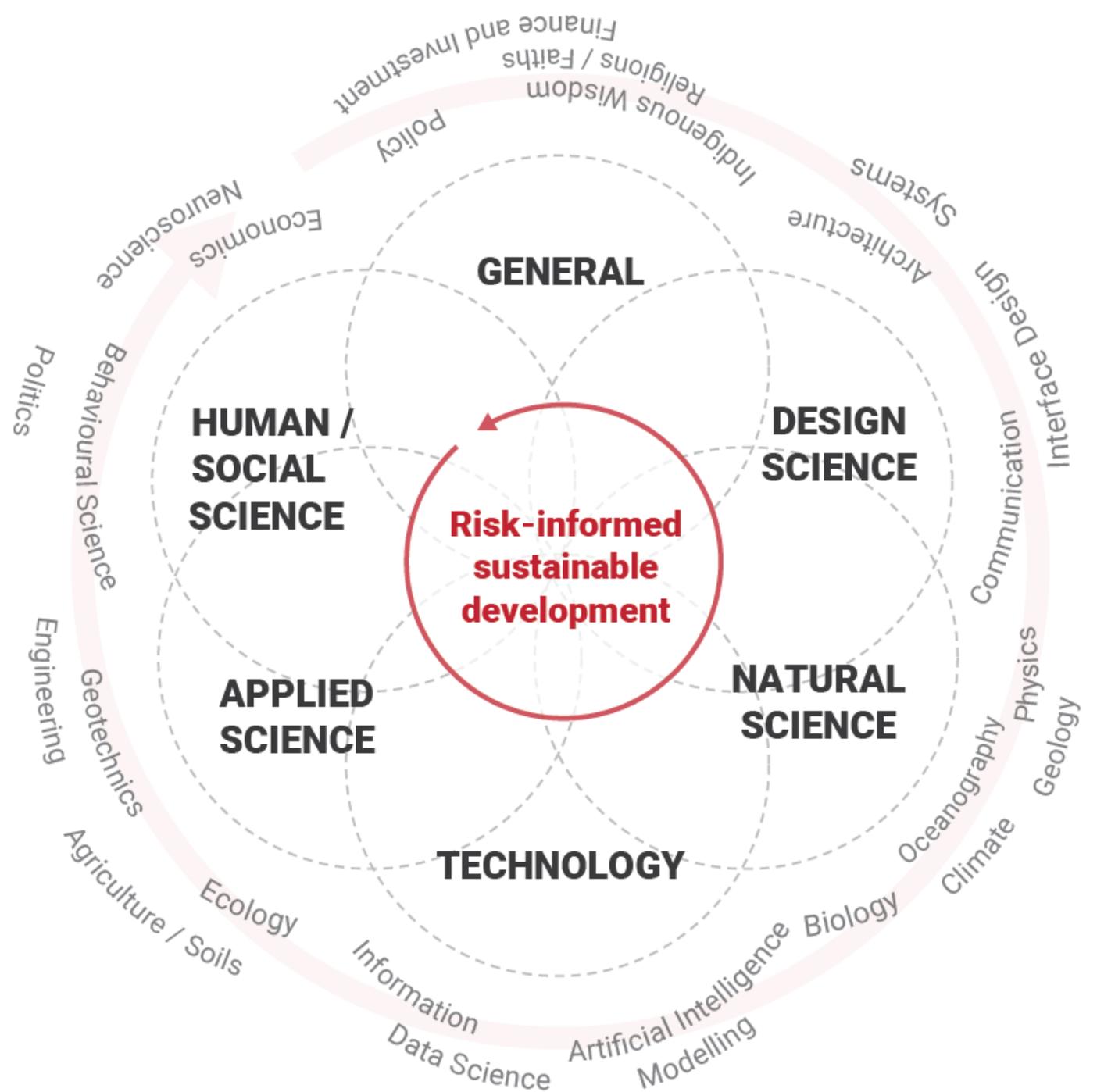


GVR

Global Assessment Report
on Disaster Risk Reduction

2019

The Global Assessment Report on DRR is a biennial snapshot contextualising progress in realising the global targets of the Sendai Framework, and contributes to the High Level Political Forum on Sustainable Development.



The Sendai Framework for Disaster Risk Reduction: Addressing Earth Observations

Leveraging disaster-related geospatial and Earth observation data

The 2030 Agenda requires data to understand needs, to study and define solutions, and to monitor progress. The leveraging of disaster-related geospatial and EO data and tools in the pursuit of SDGs and the goals and targets of the Paris Agreement, NUA and other related agreements is essential.

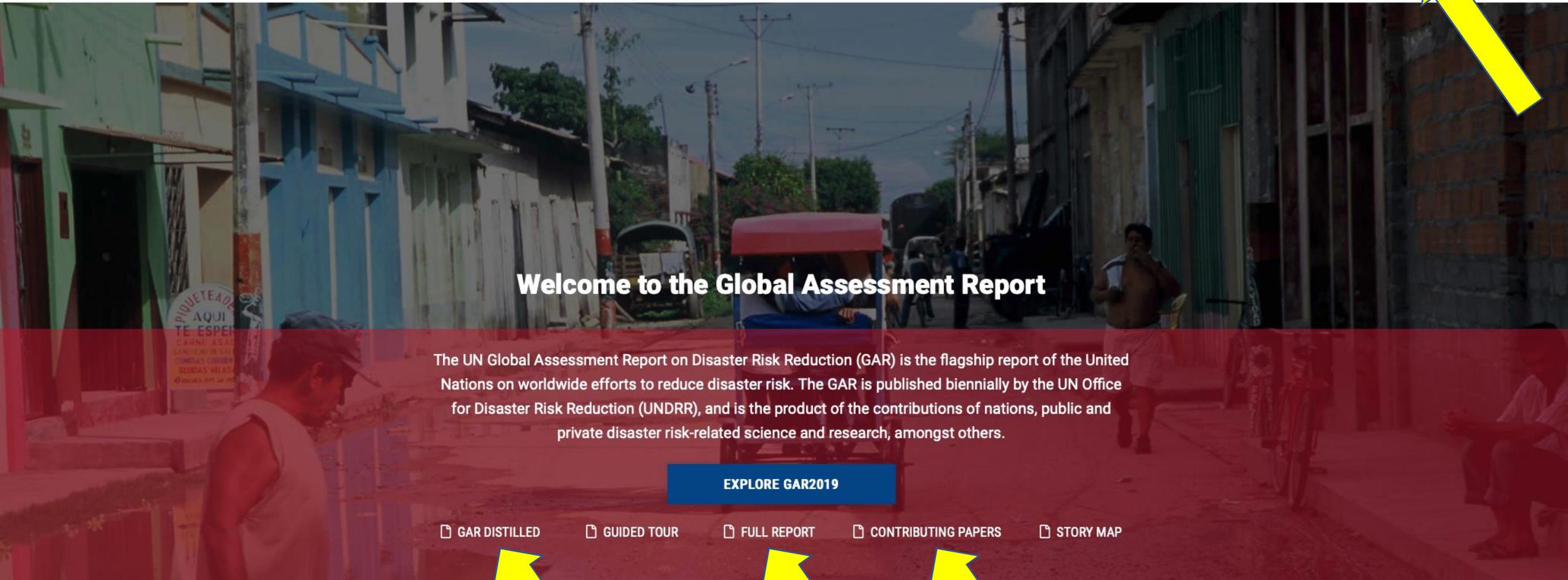
Advancements in open data provided from satellites have made more advanced models possible. Landsat and Copernicus are the two contemporary examples by the United States Geological Survey/NASA and ESA, respectively. Landsat provides the longest temporal records of moderate resolution multispectral data of the Earth's surface, while Copernicus is providing the highest-resolution imagery available openly and globally. In 2014, the Sentinel-1 mission provided a polar-orbiting, all-weather, day and night radar imaging mission for land and ocean services. In 2015, Sentinel-2A was launched followed by Sentinel-2B in 2017, providing spatial resolutions of 10, 20 and 60 m. This has improved the resolution previously available and provides high-resolution imagery to be used in various hazard models. The fact that the data is open has resulted in a boom in scientific research based on satellite data.



Recommendations

Invest: Resource challenges are always the first-cited obstacle to better risk management. EO, computing power, mitigation measures, regulatory enforcement and safety nets should be invested in, as should reducing inequality and improving participation, access and education.

Leverage: The movement towards open data, collaborative science and cloud computing is in a golden age. The value of information is such that impulses towards hoarding, insularity, competition and protection could come to



Welcome to the Global Assessment Report

The UN Global Assessment Report on Disaster Risk Reduction (GAR) is the flagship report of the United Nations on worldwide efforts to reduce disaster risk. The GAR is published biennially by the UN Office for Disaster Risk Reduction (UNDRR), and is the product of the contributions of nations, public and private disaster risk-related science and research, amongst others.

[EXPLORE GAR2019](#)[GAR DISTILLED](#)[GUIDED TOUR](#)[FULL REPORT](#)[CONTRIBUTING PAPERS](#)[STORY MAP](#)

Inside GAR 2019

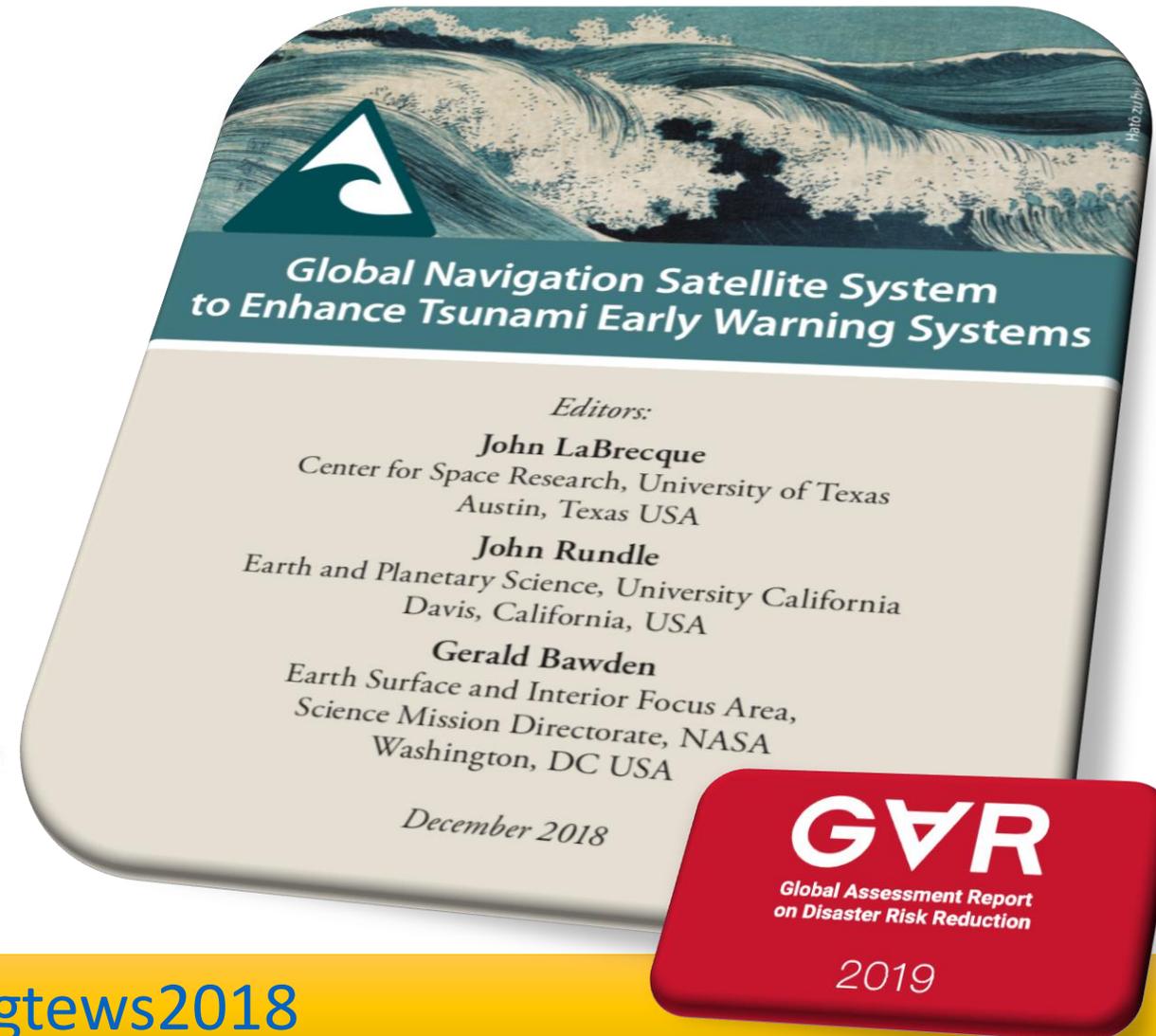
[GAR 2019 guided tour](#)**Chapter 1: How we got to now**

This chapter provides background on a decades-long shift that has brought us to the Sendai Framework. It traces how a shared global policy commitment has emerged from the idea of managing disasters and seeking to mainstream DRR, to an approach of managing the wider risk environment.

Connecting Geodesy with United Nations Initiatives : GNSS Enhanced Tsunami Early Warning Systems

Geodetic observations have a clear role in helping to reduce the risk of disasters, as well as contribute to disaster preparedness with better mitigation and response.

GGOS-Geohazards Working Group successfully submitted content for the 2019 UN Global Assessment Report on Disaster Risk Reduction (GAR19), which is a major UN report addressing disaster risk reduction that contributes to regional and global platforms for disaster risk reduction, as well as the high-level political forum on sustainable development



Download GTEWS report: <http://bit.ly/gtews2018>

2017 Sendai Workshop Recommendations

1. The GGOS/IUGG, APRU and the UN-GGIM are encouraged coordinate efforts to develop a GNSS Shield Consortium for the Indo-Pacific.
2. The GNSS Shield Consortium should work to encourage software, data exchange, and continued improvement of network design and performance.
3. Strengthen broadband communication to underserved regions of the GNSS Shield.
4. Work with national organizations including those mandated for natural hazards mitigation to develop agreements for inclusion of their GNSS receivers within the GNSS Shield.
5. Design an optimal GNSS Shield network for both crustal displacement and high resolution TEC monitoring.
6. Understand the operational requirements of existing tsunami warning systems and determine the steps required to interface these tsunami warning systems.

GNSS Enhanced Tsunami Early Warning Systems in

2019 Global Assessment Report on Disaster Risk Reduction



Global Assessment
Report 2019:
gar.unisdr.org

2.2.2

Feedback loops of asynchronous operations of system components

An adverse event affecting the functioning of an individual system component can cause reverberations or ripples within the larger system and lead to a breakdown of related system components and potentially the complete system.

Box 2.4. Systems reverberations – global navigation satellite system

In supply chains and traffic systems, applications using global navigation satellite systems – notably the global positioning system (GPS) – have been expanding exponentially, delivering innovative and efficiency-enhancing capabilities, revolutionizing the operations across entire supply chains. Efficiency gains through just-in-time delivery systems have been remarkable in the logistics sector and also in related sectors such as financial services (e.g. settlement systems), food systems and health (e.g. manufacturing).* A failure in a GPS will cause deliveries to be delayed. Order and delivery jams could cause, through positive feedback loops, the simultaneous failure of many services that are likely otherwise assumed

to be independent of each other. It is entirely plausible that the malfunctioning of a relatively small service delivery system, originally designed to assure the synchronization of business operations reaping efficiency gains, could cause large-scale breakdown of food and health systems at local or even national or global scale.

* Beneficial efficiency gains must be measured against new risks posed; for example, the potential deleterious effect of just-in-time food delivery programmes on the resilience of communities.

Global navigation satellite system enhancement for tsunami early warning systems

SOURCE(S): UNITED NATIONS OFFICE FOR DISASTER RISK REDUCTION (UNDRR)

The demonstrated early warning capability of Global Navigation Satellite Systems (GNSS) to accurately, rapidly, and cost effectively measure deformation of the Earth's surface and the response of the ionosphere to this deformation was the factual basis for the GNSS Tsunami Early Warning Systems Workshop (GTEWS) and this report. GTEWS 2017 was held in Sendai, Japan to review the principles of GNSS positioning, the geophysics of mega-thrust earthquakes, and GTEWS techniques in utilizing GNSS displacement and ionospheric imaging to advance global tsunami warning. This report explores the development history of GNSS Tsunami Early Warning Systems, their tsunami early warning technology and requirements, prototype networks, and the workshop findings and recommendations.

This paper is a contribution to the 2019 edition of the Global Assessment Report on Disaster Risk Reduction (GAR 2019).

To cite this paper:

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GGOS Contributing Paper to the GAR is available for viewing and download



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LaBrecque, John; Rundle, John; Bawden, Gerald (eds.)

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37 p.

Supporting Sendai

Coordinating Earth Observations for Disasters

GEO supports implementation of Sendai Framework targets E,F and G through engagement with UNISDR.

E: Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020;

F: *Substantially enhance international cooperation to developing countries* through adequate and sustainable support to complement their national actions for implementation of the present framework by 2030;

G: Substantially increase the **availability of and access to multi-hazard early warning systems** and disaster risk information and assessments to people by 2030.

New International Initiative Supporting GNSS Enhanced Tsunami Early Warning Systems



Geodesy for the Sendai Framework Community Activity (Working Group)

Focused on supporting geodetic development and capacity building for disaster risk reduction and resilience

Work addressing geodetic elements of targets and indicators of the Sendai Framework for Disaster Risk Reduction

Integration with UN Sustainable Development Goals and World Bank Integrated Geospatial Information Framework

Led by IAG, GGOS, and IUGG representatives;

new participants are welcome!

Disaster Risk Reduction

A GEO Priority Engagement Area

GEO supports Disaster Risk Reduction by improving coordination of Earth observations to increase ability to disaster forecasting, preparation, mitigation, management and recovery.



@GEOSEC2025
www.earthobservations.org

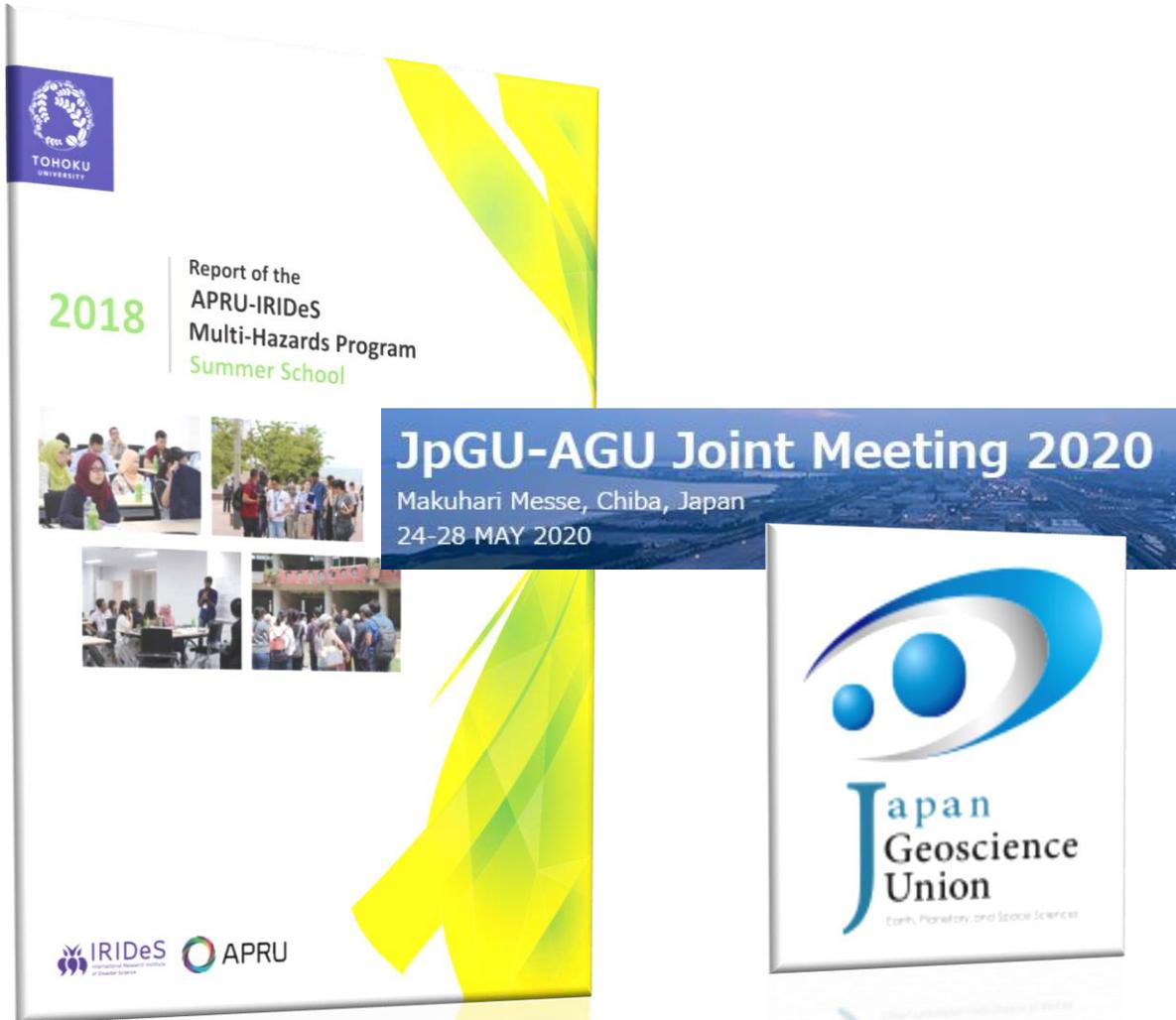


GEO WEEK 2019
MINISTERIAL
SUMMIT #GEOWEEK19
4-9 NOVEMBER / CANBERRA, AUSTRALIA



Inaugural “Geodesy4Sendai” side event
at GEO Ministerial Summit
Tuesday, 5 November 2019 (8:30am)
Canberra, Australia

GTEWS/geodesy4sendai Workshop 2020



- Next GTEWS workshop, now organized as a project of the GEO Community Activity “geodesy4sendai” is in development, and scheduled to take place **June 1-5, 2020 in Sendai.**
- Organized to complement relevant sessions at JpGU-AGU 2020 (to be held one week before the workshop in Chiba, Japan)
- Followed by APRU-IRIDeS Multi-Hazards Summer School (held one week before and after the GTEWS Workshop at Tohoku University)



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jpl.nasa.gov

Muchas
Gracias

El Marco de Sendai también expresa lo siguiente:

- la necesidad de comprender mejor el riesgo de desastres en todas sus dimensiones relativas a la exposición,
- la vulnerabilidad y características de las amenazas;
- el fortalecimiento de la gobernanza del riesgo de desastres, incluidas las plataformas nacionales;
- la rendición de cuentas en la gestión del riesgo de desastres;
- la necesidad de prepararse para “reconstruir mejor”;
- el reconocimiento de las partes interesadas y sus funciones;
- la movilización de inversiones que tengan en cuenta los riesgos a fin de impedir la aparición de nuevos riesgos;
- la resiliencia de la infraestructura sanitaria, del patrimonio cultural y de los lugares de trabajo;
- el fortalecimiento de la cooperación internacional y las alianzas de trabajo mundiales y la elaboración de políticas de los donantes y programas que tengan en cuenta los riesgos, incluidos los préstamos y el apoyo

The Sendai Framework also expresses the following:

- **the need to better understand disaster risk in all its dimensions related to exposure,**
- the vulnerability and characteristics of threats;
- strengthening disaster risk governance, including national platforms;
- accountability in disaster risk management;
- the need to prepare to “rebuild better”;
- recognition of interested parties and their functions;
- the mobilization of investments that take risks into account in order to prevent the emergence of new risks;
- the resilience of health infrastructure, cultural heritage and workplaces;
- the strengthening of international cooperation and global labor partnerships and the development of donor policies and programs that take into account risks, including loans and financial support provided by international financial institutions.