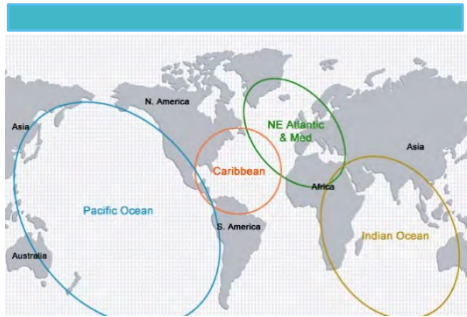


# Function C

# Tsunami Warning Services



- Four Intergovernmental Groups coordinating basin-based Tsunami early Warning and Mitigation Systems, with a strong technical component (observations, modelling, forecasting) and reinforced preparedness and awareness programmes.



Exercise Pacific Wave 2020 (PacWave20)



**First National Tsunami Ready Board in NEAM region established by Italy (May 2021)**



- Tsunami Service Providers (TSP) covering all basins to provide tsunami information (statements or threat information) to National Tsunami Warning Centres and/or Tsunami Warning Focal Points
- Regular full-scale or table-top drills and exercises, in all basins: CARIBE WAVE 20 & 21, IOWave20, NEAMWave21 and PACWAVE20, CARIBE WAVE 22 planning ongoing
- **World Tsunami Awareness Day (WTAD) – 5<sup>th</sup> November each year: a joint effort with UNDRR**





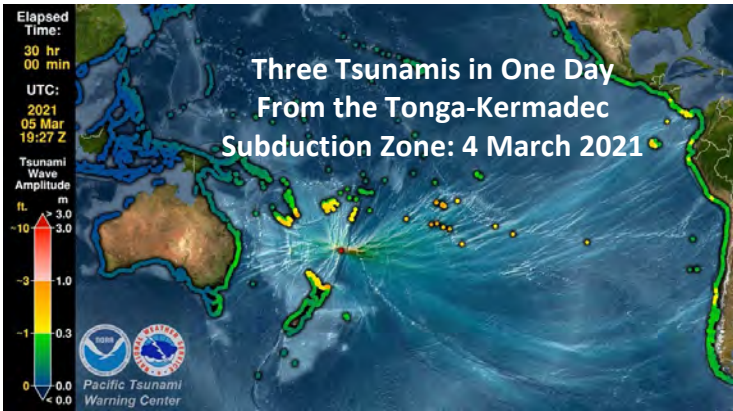
# Function C

# Tsunami Warning Services



**COVID19**  
Short-term and long-term assessments

School as COVID19 Isolation Centre, Barbados



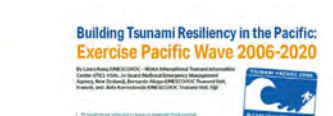
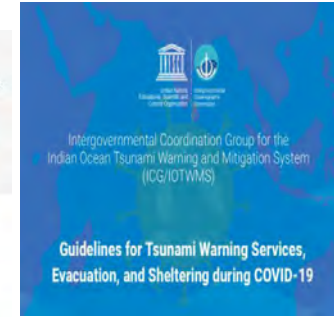
Days of month

Day	Number of visits	Pages	Hits	Bandwidth
01 Jan 2022	627	5,400,598	5,402,049	31.73 GB
02 Jan 2022	707	5,369,073	5,371,089	30.80 GB
03 Jan 2022	698	5,379,758	5,382,121	33.02 GB
04 Jan 2022	686	5,173,125	5,176,542	33.19 GB
05 Jan 2022	632	5,399,447	5,402,559	43.28 GB
06 Jan 2022	711	5,586,308	5,590,162	38.22 GB
07 Jan 2022	638	5,619,002	5,621,726	34.43 GB
08 Jan 2022	544	5,513,520	5,515,011	49.46 GB
09 Jan 2022	519	5,845,165	5,846,224	42.69 GB
10 Jan 2022	547	6,003,484	6,006,237	32.78 GB
11 Jan 2022	691	5,879,492	5,883,278	36.84 GB
12 Jan 2022	610	5,791,845	5,794,642	48.48 GB
13 Jan 2022	794	5,780,757	5,785,301	51.43 GB
14 Jan 2022	842	5,660,308	5,665,813	63.27 GB
15 Jan 2022	11,915	6,025,590	6,204,804	86.69 GB
16 Jan 2022	10,228	5,933,313	6,028,196	90.88 GB
17 Jan 2022	3,194	5,709,711	5,734,622	97.99 GB
18 Jan 2022	1,027	2,662,918	2,669,308	39.98 GB
19 Jan 2022	0	0	0	0

Volcanic eruption explosion on the island of Hunga-Tonga-Hunga-Ha'apai, Tonga

04:15 UTC JAN 15 2022

- Tonga NTWC tsunami warning at 4:31 UTC
- Fiji NTWC issued a tsunami advisory at 6:35 UTC
- Vanuatu NTWC issued a tsunami advisory at 7:30 UTC
- Samoa issued a Tsunami Watch at 8:30 UTC
- Solomon Islands NTWC - No Threat at 9:25 UTC
- PTWC issued Pacific Ocean Threat message at 06:23 UTC

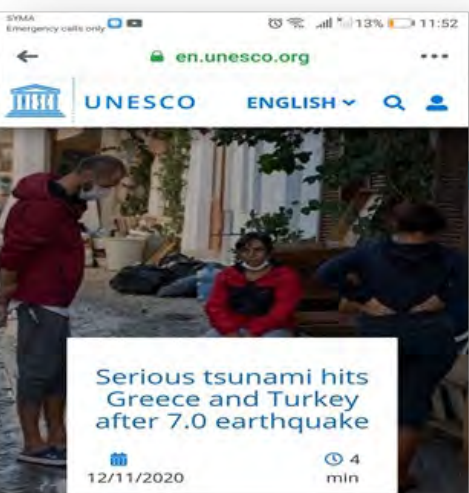


# Support for 27 IOTWMS Member States

- **Funding for 2022-2023 (AUD\$430K/year) secured from Government of Australia, through Australian Bureau of Meteorology, to support the ICG/IOTWMS Secretariat and its programme and performance management, coordination, advocacy, and training activities**
- **Support for further five years announced by Government of Indonesia, through BMKG, to support Indian Ocean Tsunami Information Centre (IOTIC) and its training, community awareness and preparedness activities. Extension of current Memorandum of Understanding initiated in January 2022 for completion in June 2022**
- **Phase 1 of the UNESCAP Project “Strengthening tsunami warning in the North West Indian Ocean through regional cooperation” successfully managed and completed 31 October 2022.**
- **Funding secured for Phase 2 of the UNESCAP Project to begin early 2023.**







- Project “*Strengthening the Resilience of Coastal Communities in the North-East Atlantic and Mediterranean Region to the Impact of Tsunamis and Other Sea Level-Related Coastal Hazard*”
- **Approved** by the European Union (EU) Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO)

# PROJECT GOALS

1. Improved understanding of tsunami and sea-level related risks.
2. Better communication strategies to govern sea-level related risk
3. Enhanced real time detection and monitoring capacities
4. Improved framework for the sustainability of the existing Inexpensive Device for Sea Level (IDSL) Network
5. Improved alert/warning capacity
6. **At least seven Tsunami Ready recognized communities by 2023**



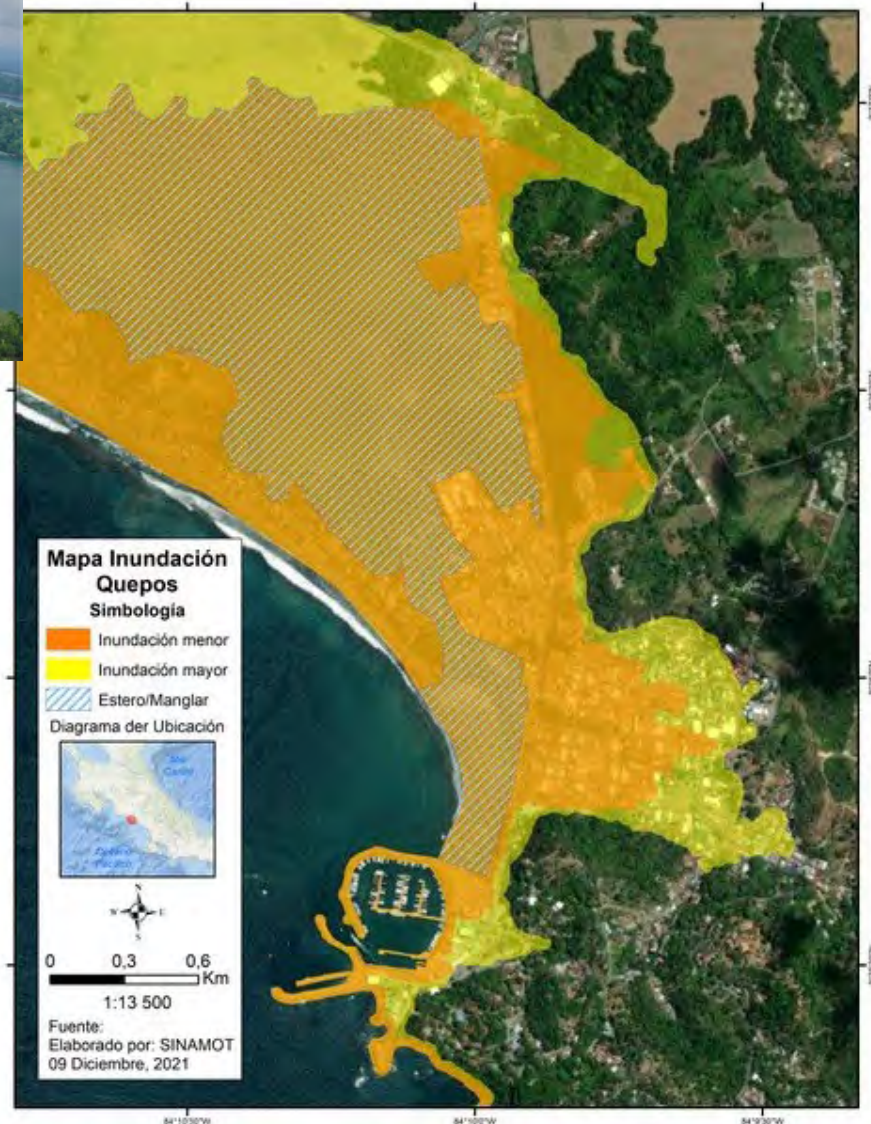
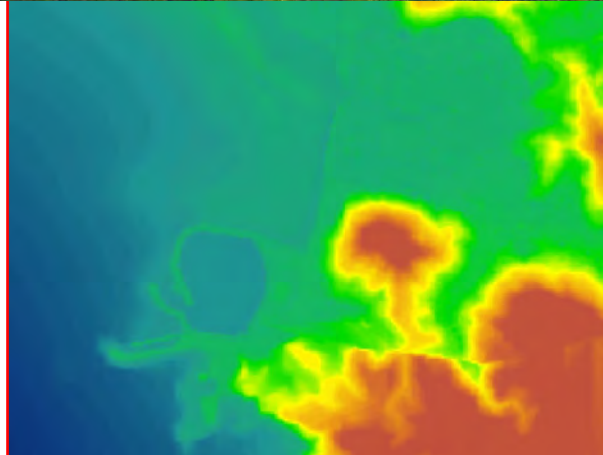
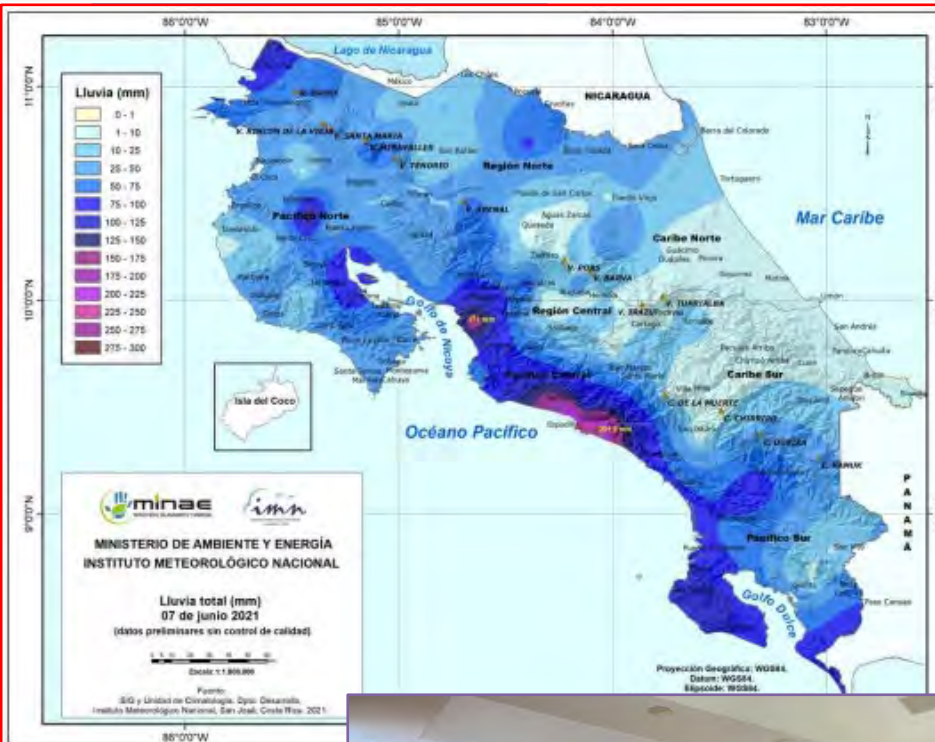
CoastWAVE Project



Tsunami Ready Recognized Communities







Community workshops

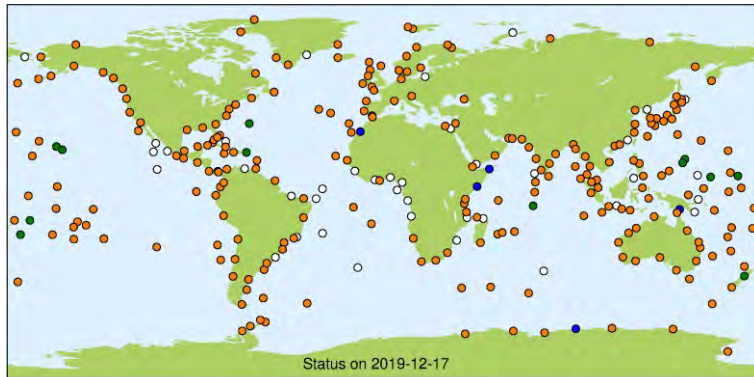


Hazard assessments

TSU-MAB Joint Initiative: Integrated approach to coastal hazards in the Savegre Biosphere Reserve, Costa Rica saving lives, protecting biodiversity



December 2019

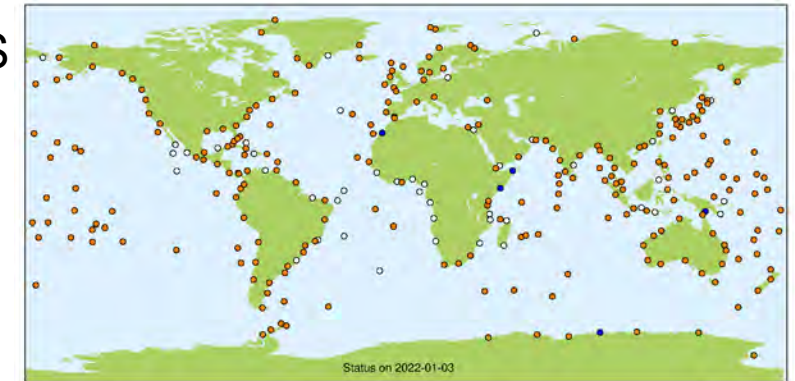


Active in all streams (12)  
Active in some streams (238)  
Not active in any streams (39)  
Never active in any streams (5)

Status Map shows stations reporting via at least one GLOSS data pathway

- December 2019: **85% stations reporting (250/294)**
- May 2020: **84% stations reporting (247/294)**
- Today (18/1/2022): **83% stations reporting (244/294)**

Jan 2022



Active in all streams (0)  
Active in some streams (244)  
Not active in any streams (45)  
Never active in any streams (5)

Standard settings examples

- Manual on Sea-level Measurements and Interpretation, Volume V: now available in 4 languages [IOC/2016/MG/14 VOL.5/Rev.](#)
- Quality control of in situ sea level observations: a review and progress towards automated quality control, volume 1 published: [IOC/2020/MG/83Vol.1](#)



**unesco**

Intergovernmental  
Oceanographic  
Commission

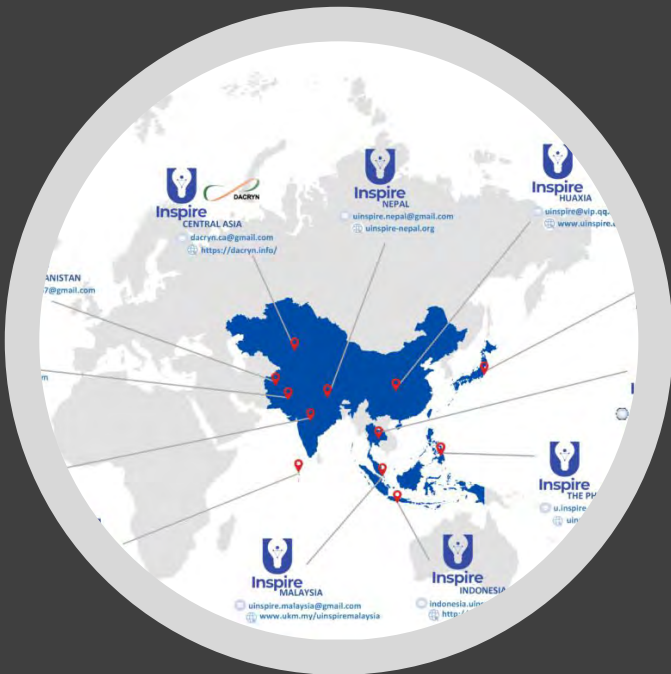
# Challenges - Threats

- Seismic generated tsunamis are short-fuse rare events, which are hard to warn for and maintain community awareness
- **Non-Seismic generated tsunamis** (submarine landslides, volcano collapses, etc) are even rarer and more difficult to detect and warn for
- How to make all the world's at-risk communities prepared for the tsunami threat, especially those of SIDS and LICs
- **Member States are wonderfully diverse** in their cultures and community arrangements, so national community education and warning systems must be individually tailored to take into account these differences









**LET'S TALK DRR**  
A Series of UNESCO and U-INSPIRE Alliance  
Virtual Conversation on Science, Engineering,  
Technology & Innovation for Disaster Risk Reduction

**DRR Talk #2**  
**KNOWLEDGE MANAGEMENT FOR RESILIENCE**

Friday, 20 November 2020  
10.00 - 03.30 PM (GMT+7)

Registration will be provided  
Organized by:

**Dr Nigel Thomas Crawhall**  
Chief of Section,  
Small Islands and Indigenous Knowledge,  
Natural Sciences Sector, UNESCO

**Prof Dilanthi Amarunga**  
Professor of Disaster Risk Reduction and  
Management, University of Huddersfield,  
United Kingdom

**Ms Maria Julie Anne Culibar**  
Teaching Staff at  
the University of Auckland/  
U-INSPIRE Philippines

Moderator:  
**Dr Mizan Bustanul**  
U-INSPIRE Indonesia/  
Post-doctoral researcher, UNLHAS

Zoom Reg: [bit.ly/LETS-TALK-DRR2](https://bit.ly/LETS-TALK-DRR2)

[facebook.com/unescokarta/live](https://facebook.com/unescokarta/live)

**Artificial Intelligence for Disaster**

Speakers:  
**Lorenzo Nava**  
Department of Geosciences,  
Italy

**Dr. Madina Mansurova**  
Head of Department of Artificial  
Big Data, Al-Farabi Kazakh Nat  
Kazakhstan

**Badal Pokharel**  
School of Civil and Environmen  
The University of New South W

**Halda Aditya Belhaman**  
Weather Modification Techni  
Agency for Assessment and  
of Technology, Indonesia

Moderator:  
**Kshitij Dahal**  
U-Inspire Alliance

Registration:  
<http://bit.ly/ChocoTalkDRR3>  
Live YouTube: **U-INSPIRE Alliance**

Note: Grab a chocolate bar or a cacao drink, coffee or anything that can create a beautiful relaxing atmosphere. Have a seat, lay back and enjoy our webinar.

E-certificate will be provided

CHOCOLATE TALK

We must engage and seek the help, energy and motivation of the younger generation and utilise groups such as U-INSPIRE to work with local communities



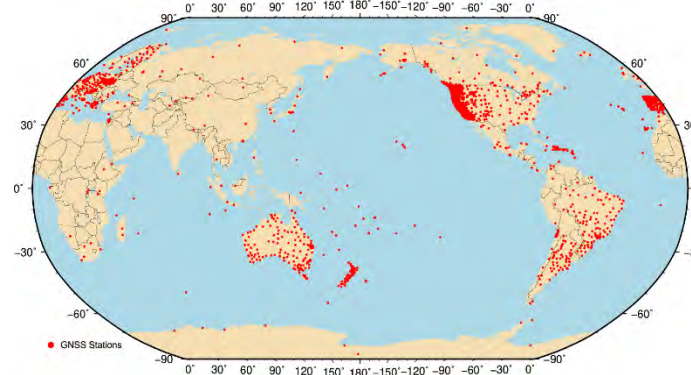


# UNDOS Tsunami Programme

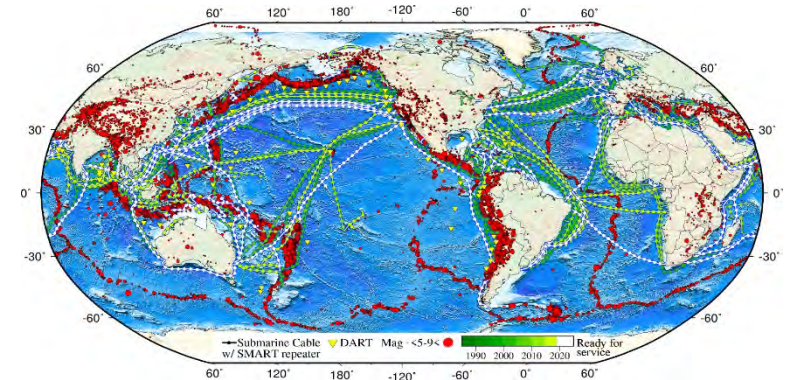


Includes a **Science Plan** being developed for tsunami warning & mitigation system development. The vision is based on two over-arching aspects:

1. **Explore technological and observational advances** to lower uncertainties and improve timeliness of tsunami detection and warnings.
2. Match these capability advancements with improved community preparedness efforts, including striving for **100% Tsunami Ready or comparable recognition of all at-risk coastlines.**



Eg use of **Global Navigation Satellite System**



Eg instrumentation of sub-sea communication (**SMART**) cables



**Tsunami Ready Coalition**



# UN Decade Goal - 100% of tsunami at-risk communities Tsunami Ready by 2030



TSUNAMI READY INDICATORS		Date of evaluation:		
Stage of achievement		Initial stage	Medium stage	Final stage
<b>I MITIGATION (MIT)</b>				
1	MIT-1. Tsunami hazard zones are mapped and designated			
2	MIT-2. The number of people at risk in the tsunami hazard zone is estimated			
3	MIT-3. Available economic, infrastructural, political, and social resources are identified			
4	MIT-4. Tsunami information is publicly displayed.			
<b>II PREPAREDNESS (PREP)</b>				
5	PREP-1. Easily understood tsunami evacuation maps are developed.			
6	PREP-2. Outreach and public awareness and education resources are available and distributed.			
7	PREP-3. Outreach or educational activities <u>are held at least 3 times a year.</u>			
8	PREP-4. A Tsunami community exercise is conducted at least every two years			
<b>III RESPONSE (RESP)</b>				
9	RESP-1. A community tsunami emergency operations plan (EOP) has been prepared			
10	RESP-2. The capacity to manage emergency response operations during a tsunami has been established.			
11	RESP-3. Redundant and reliable means to timely receive 24-hour official tsunami alerts have been identified.			
12	RESP-4. Redundant and reliable means to timely disseminate 24-hour official tsunami alerts to the public have been identified.			



## UNESCO/IOC Tsunami Ready programme:

- 14 communities recognized in 11 MS of Caribbean and Adjacent Regions (10 TR communities in SIDs)
- 3 renewals/recognitions in finalisation: BVI, SKN, Old Harbour Bay, Jamaica
- On-going TR projects, funded initiatives (1 community each) :
  - Aus Aid - Grenada
  - IOC – Puerto Plata, Dominican Republic
  - NORAD – Barbados, Jamaica, Trinidad and Tobago
  - USAID/BHA – Barbados, Dominica, St. Lucia
- Tsunami Ready Viewer Platform

