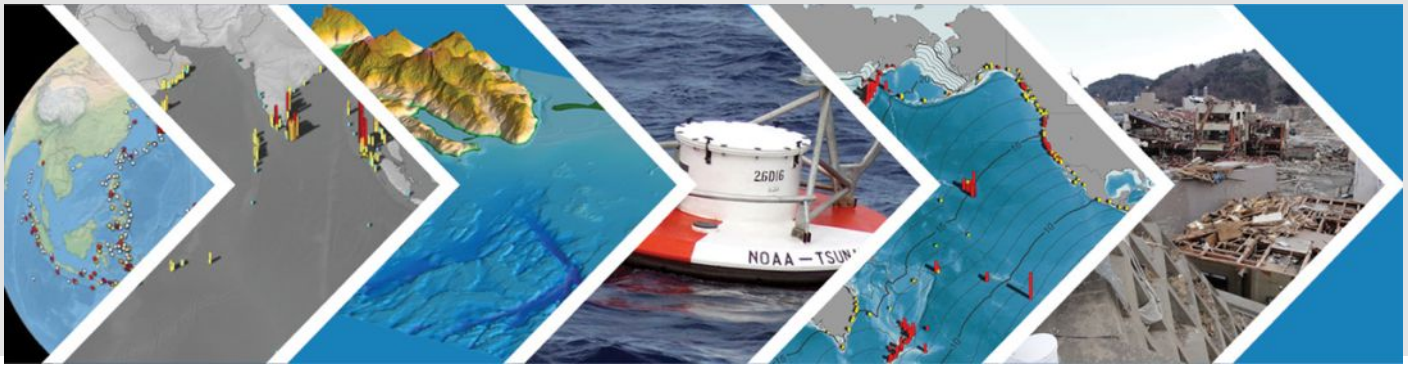
NOAA/NCEI-WDS Integrated Tsunami Data: Support Research, Forecasts, Warnings, Response, Hazard and Risk Assessments

NOAA National Centers for Environmental Information (NCEI, *formerly National Geophysical Data Center (NGDC)*)
World Data Service for Geophysics (WDS)
Boulder, United States
and
Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, United States,

ICSU World Data System

- International Council of Science (ICSU)/World Data System (WDS)
  - Created in 2008--Builds on 50-year legacy of the ICSU World Data Centers
  - 87 Regular Members
- NOAA/NCEI Boulder, Colorado, USA and co-located World Data Service (WDS) for Geophysics provide **long-term archive, data management, and access to global tsunami data**
  - global tsunami event data, damage photos, raw and processed water Level data from NOAA observational networks, and development of digital elevation models (DEMs)



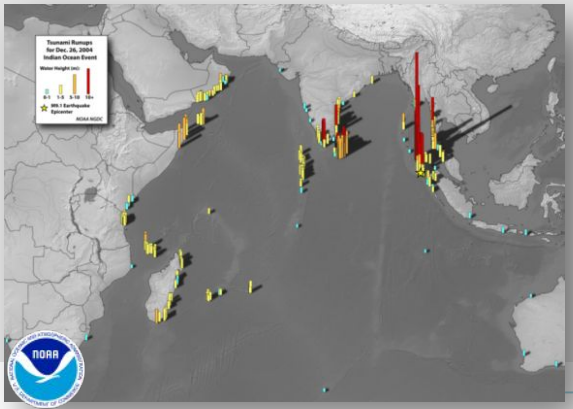
Historical Tsunami Data

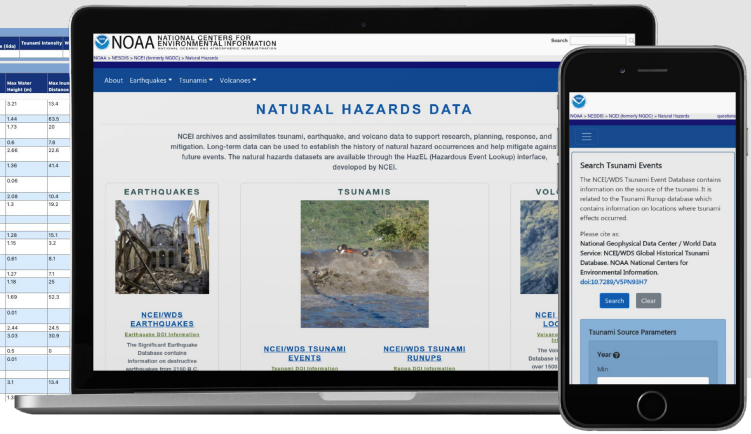
Know the past to better understand the future

The historical tsunami database is a scientifically curated list of historical tsunami source events and tsunami water height locations throughout the world that range in date from 2000 B.C. to the present. These data support:

- Forecast and Warning, tsunami model validation, coastal hazard assessments and community resiliency

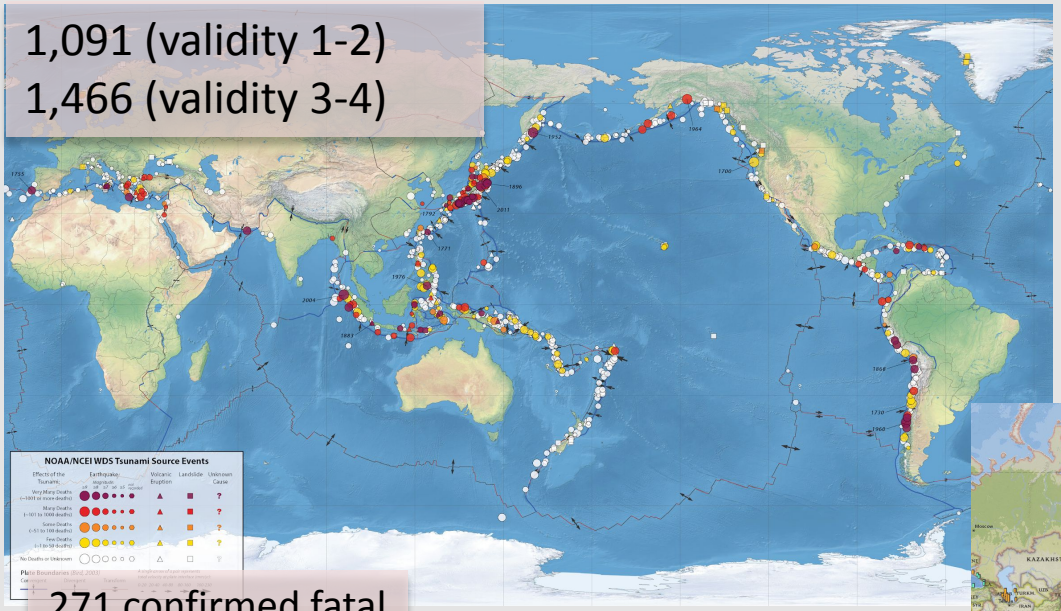
- ***Authoritative source*** for historical tsunami event data
- Database is continuously updated based on new sources
- ***User interface*** provides a REST API for programmatic access, flexible sorting, and filtering of data through a new graphical user interface that will make tsunami datasets more discoverable. **https://www.ngdc.noaa.gov/hazel**





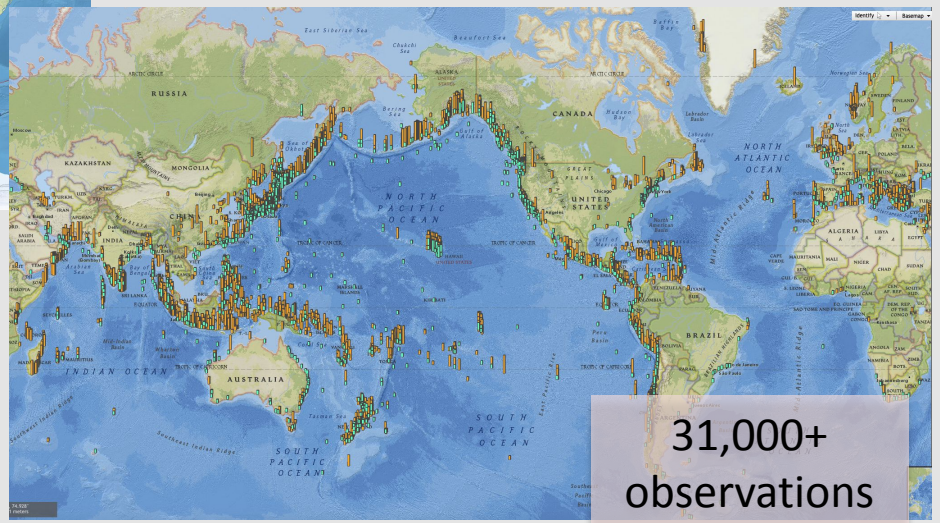
Tsunami Source Events and Observations

- Date, location, latitude/longitude, cause (e.g. earthquake, volcanic eruption), maximum water height, socio-economic data (deaths, injuries, damage), source references



271 confirmed fatal tsunami events. Deadliest event: 2004 Sumatra with over 227,000 deaths

- Eyewitness, field survey, tide gauge, DART
  - Location name, latitude/longitude, wave arrival time, water height, socio-economic (deaths, injuries, damage), references



31,000+ observations

Source Documents

Over 8,000 documents that describe damage and effects from tsunami, earthquake, and volcano events. Types of documents:

- Diaries, ships logs, newspaper reports
- Tsunami, Earthquake, Volcano catalogs
- **National Reports** from ICGs (e.g., PTWS, Caribe-EWS)
- NOAA National Weather Service Tsunami Warning Centers
- NOAA/IOC/UNESCO International Tsunami Information Center (ITIC)
- Web articles, e-mail, journal articles
- International Tsunami Survey Teams


DISASTERS

Magnitude 7.7 earthquake st western coast of Canada, ts warning issued

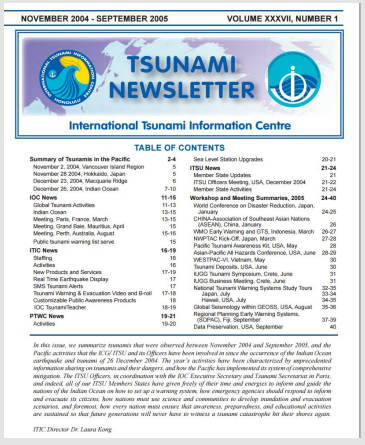
Published October 28, 2012 · Associated Press

VANCOUVER, British Columbia – A magnitude 7.7 earthquake struck off the west coast of Canada and a tsunami warning was issued, authorities said, but there were no immediate reports of major damage.

The U.S. Geological Survey said the quake hit the Queen Charlotte Islands just after 8 p.m. local time Saturday at a depth of about 3 miles (5 kilometers) and was centered 96 miles (155 kilometers) south of Masset, British Columbia. It was one of the biggest earthquakes around Canada in decades and was felt across a wide area around British Columbia.

The National Weather Service issued a tsunami warning for coastal areas of British Columbia, southern Alaska and Hawaii. The first wave of the small tsunami, about 4 inches (101.6 millimeters), hit the southeast Alaska coastal community of Craig.

Dennis Sinnott of the Canadian Institute of Ocean Science said a 69 centimeter (27 inch) wave was recorded off Langara Island on the northeast tip of Haida Gwaii, formerly called the Queen Charlotte Islands. Another 55 centimeter (21 inch) wave hit Winter Harbour on the northeast coast of Vancouver Island.


NOVEMBER 2004 - SEPTEMBER 2005 VOLUME XXXVII, NUMBER 1

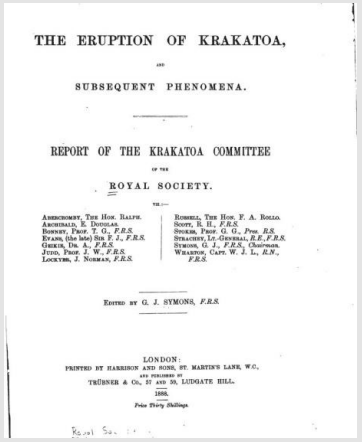
TSUNAMI NEWSLETTER

International Tsunami Information Centre

TABLE OF CONTENTS

In this issue, we summarize tsunamis that were observed between November 2004 and September 2005, and the Pacific activities that the ICG/ITSU and its Officers have been involved in since the occurrence of the Indian Ocean earthquake and tsunami of 26 December 2004. The year's activities have been characterized by unprecedented information sharing on tsunamis and their dangers, and how the Pacific has implemented its system of comprehensive mitigation. The ITSU Officers, in coordination with the IOC Executive Secretary and Tsunami Secretariat in Paris, and indeed, all of our ITSU Members States have given freely of their time and energies to inform and guide the nations of the Indian Ocean on how to set up a warning system, how emergency agencies should respond to inform and evacuate its citizens, how nations must see science and communities to develop inundation and evacuation scenarios, and foremost, how every nation must ensure that awareness, preparedness, and educational activities are sustained so that future generations will never have to witness a tsunami catastrophe hit their shores again.

ITIC Director Dr. Laura Kong


THE ERUPTION OF KRAKATOA,

AND

SUBSEQUENT PHENOMENA.

REPORT OF THE KRAKATOA COMMITTEE

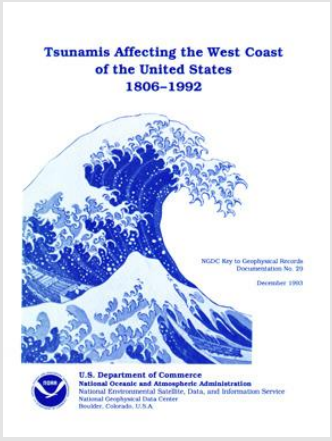
OF THE

ROYAL SOCIETY.

EDITED BY G. J. SYMONS, *F.R.S.*

LONDON:
PRINTED BY HARRISON AND SONS, ST. MARTIN'S LANE, W.C.,
AND PUBLISHED AT
TRÜBNER & Co., 57 AND 59, LUDGATE HILL.
1888.

Price Thirty Shillings.

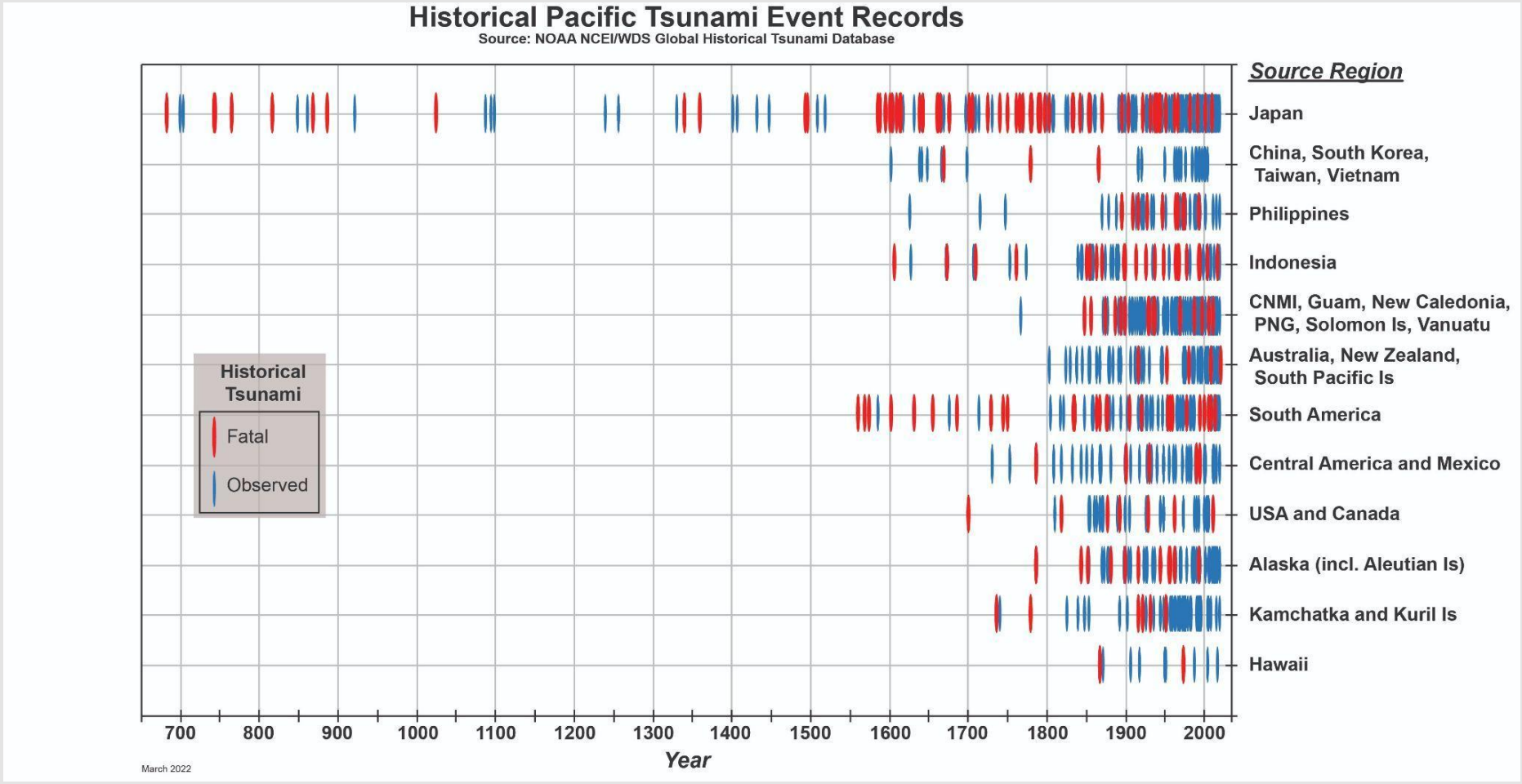

Tsunamis Affecting the West Coast of the United States 1806–1992

NGDC Key to Geophysical Records Documentation No. 29

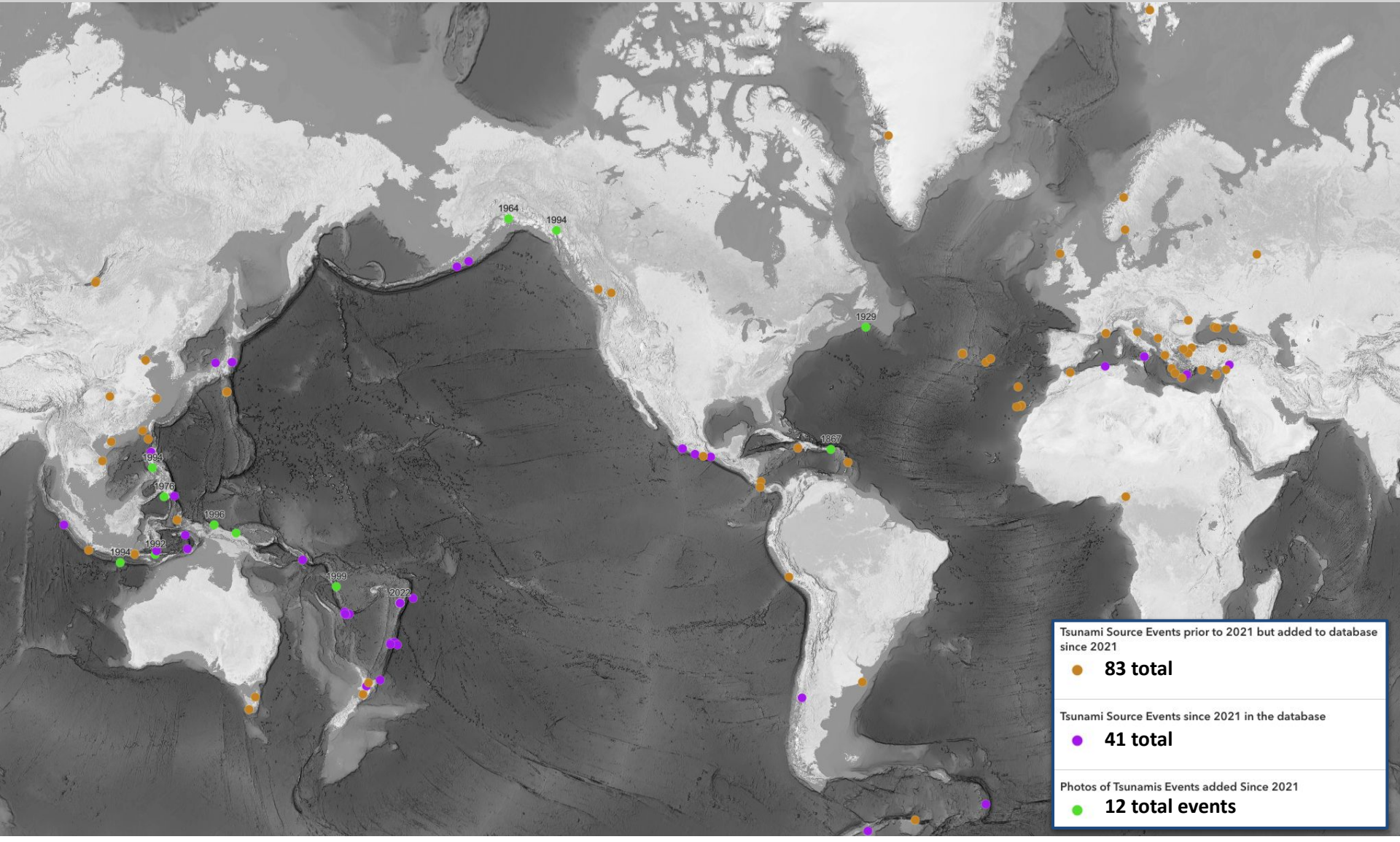
December 1993

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service
National Geophysical Data Center
Boulder, Colorado, U.S.A.

Gaps in records



Tsunami Source Event data since 2021



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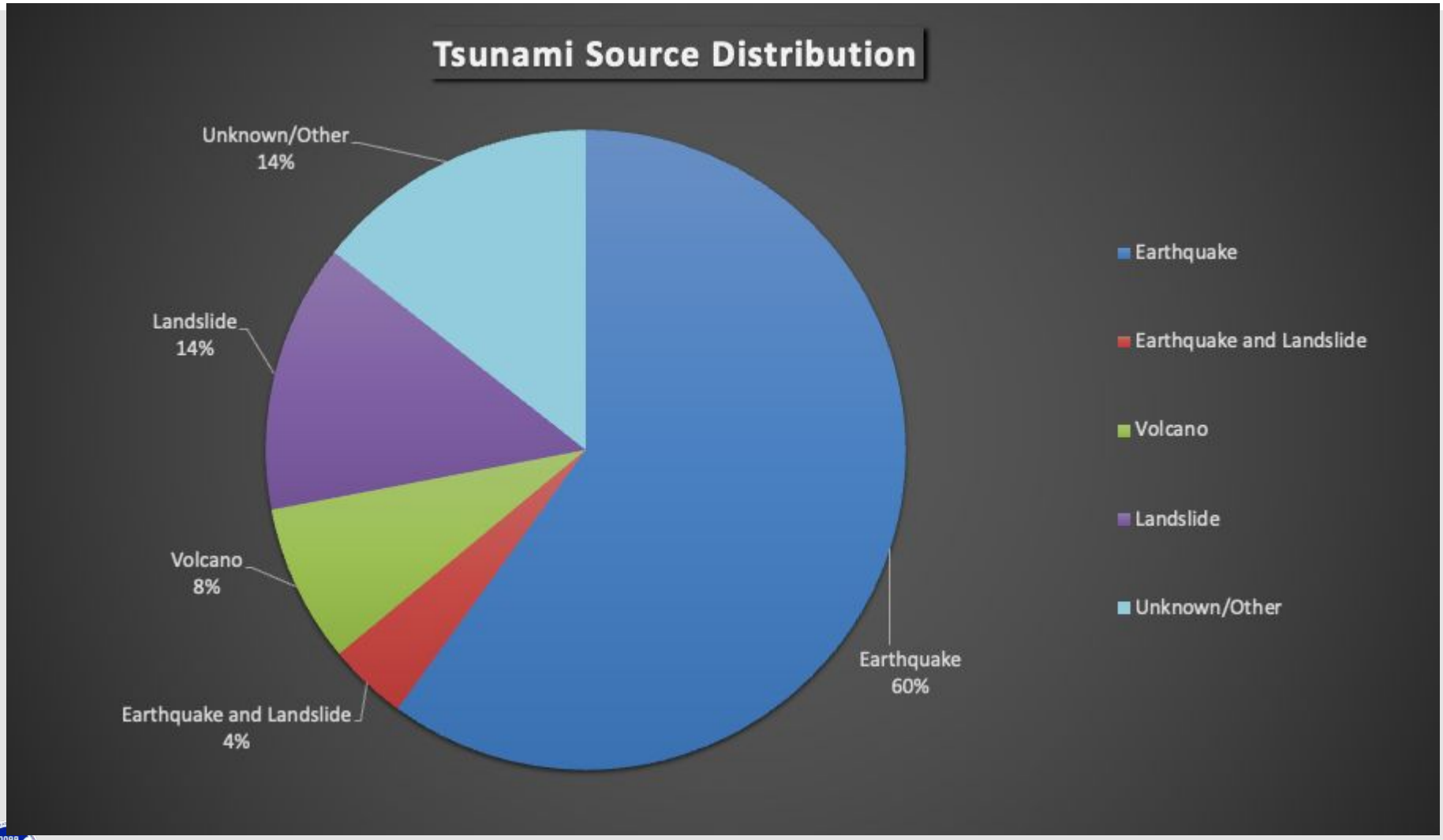

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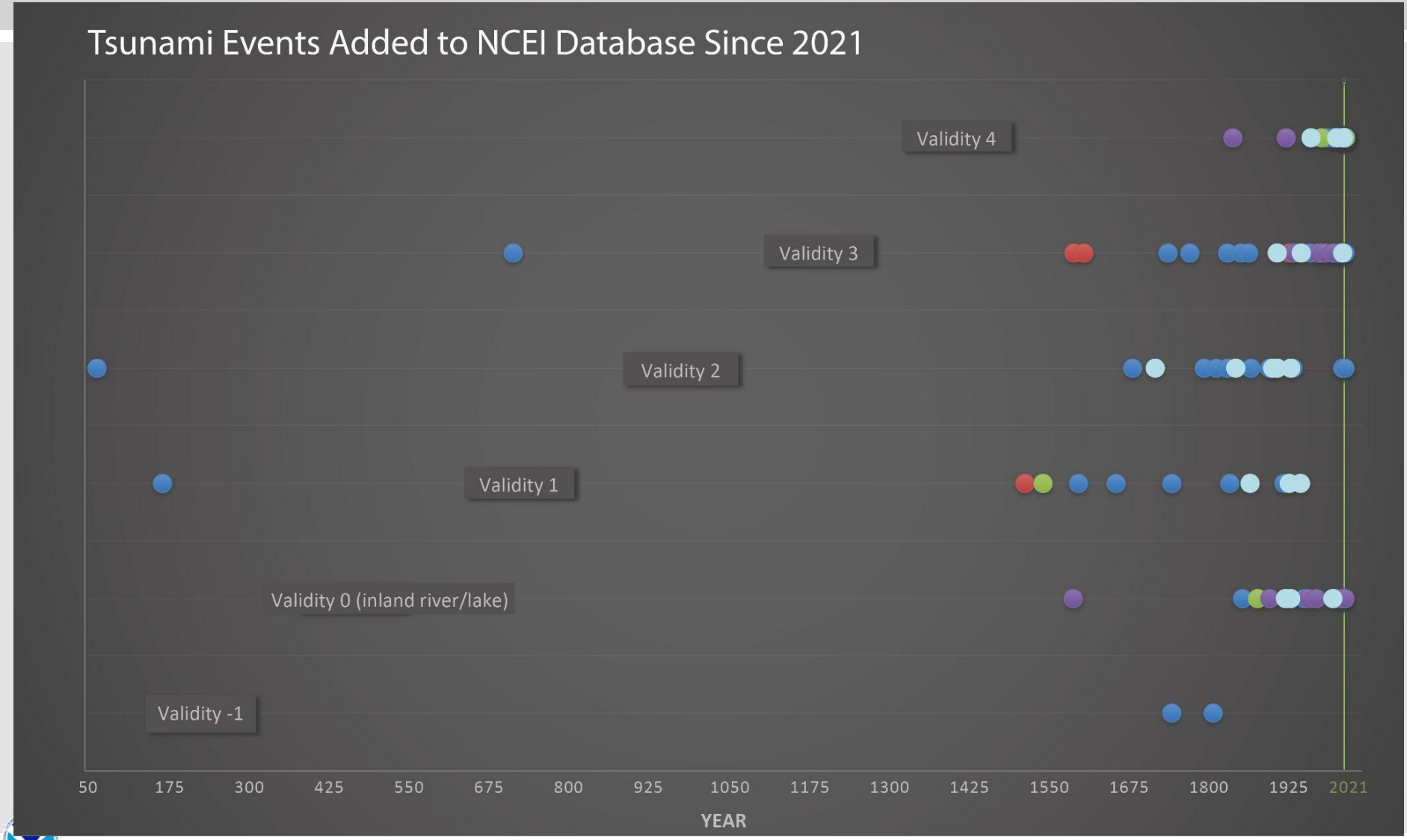
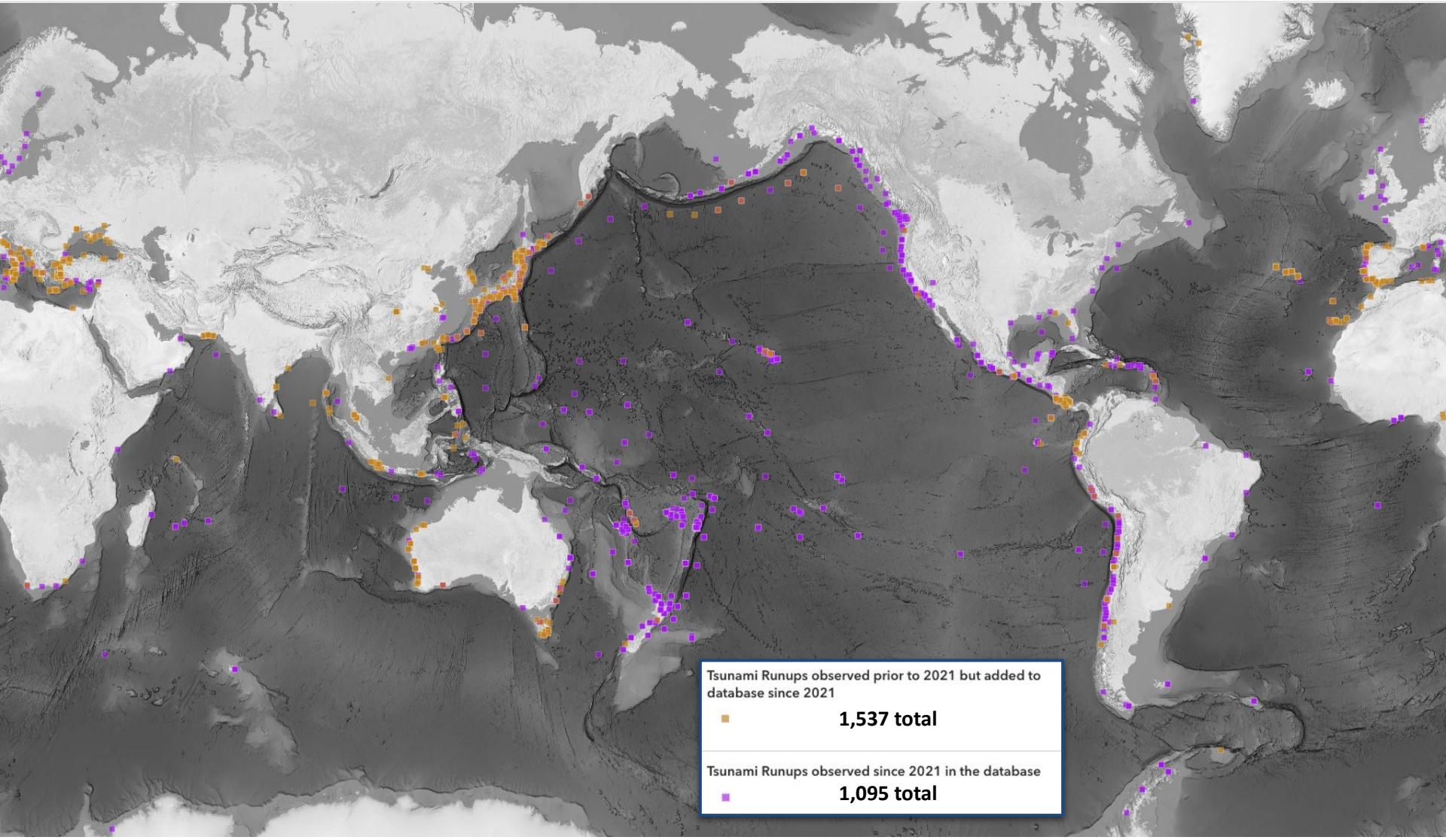


Tsunami Runup data since 2021



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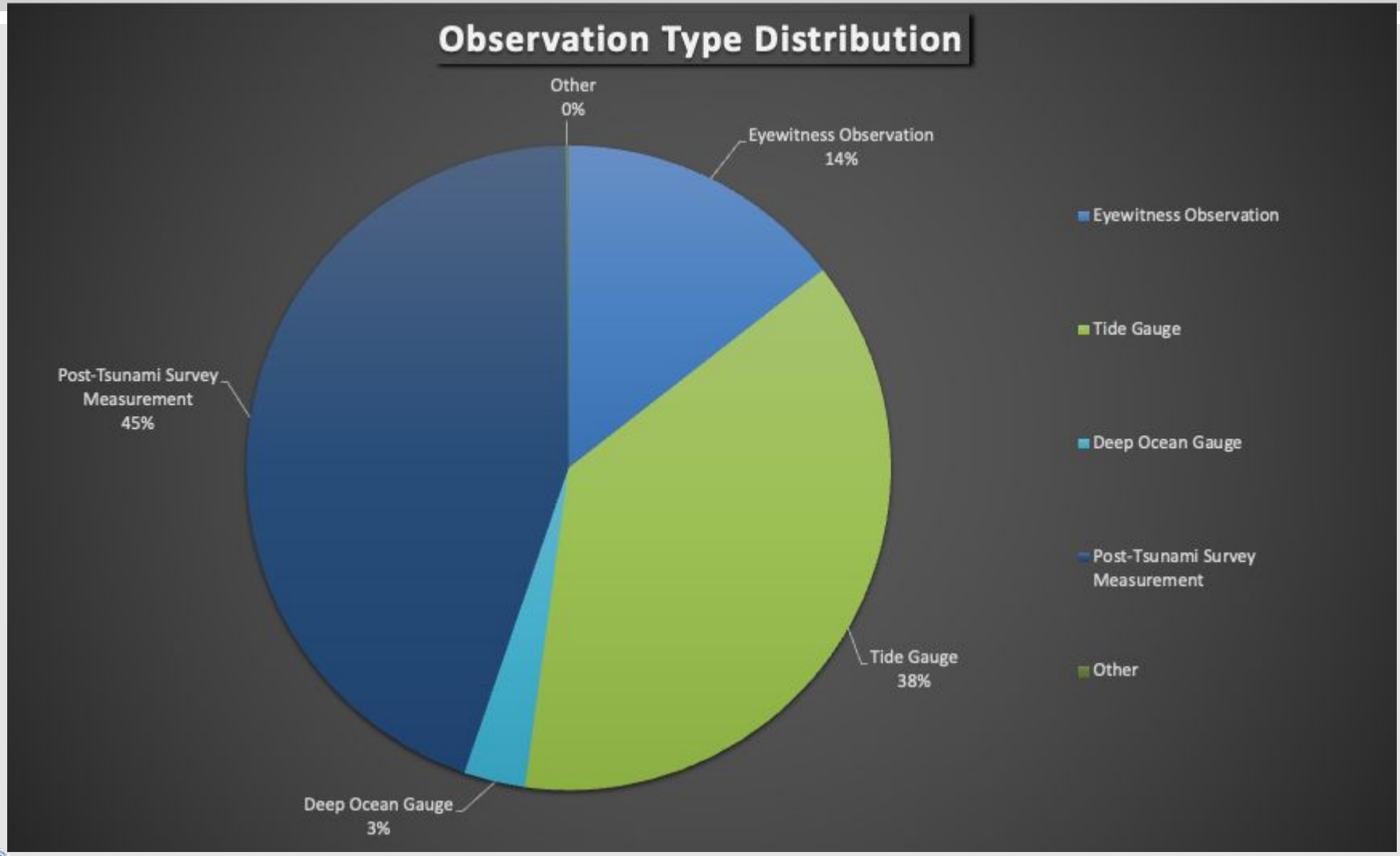
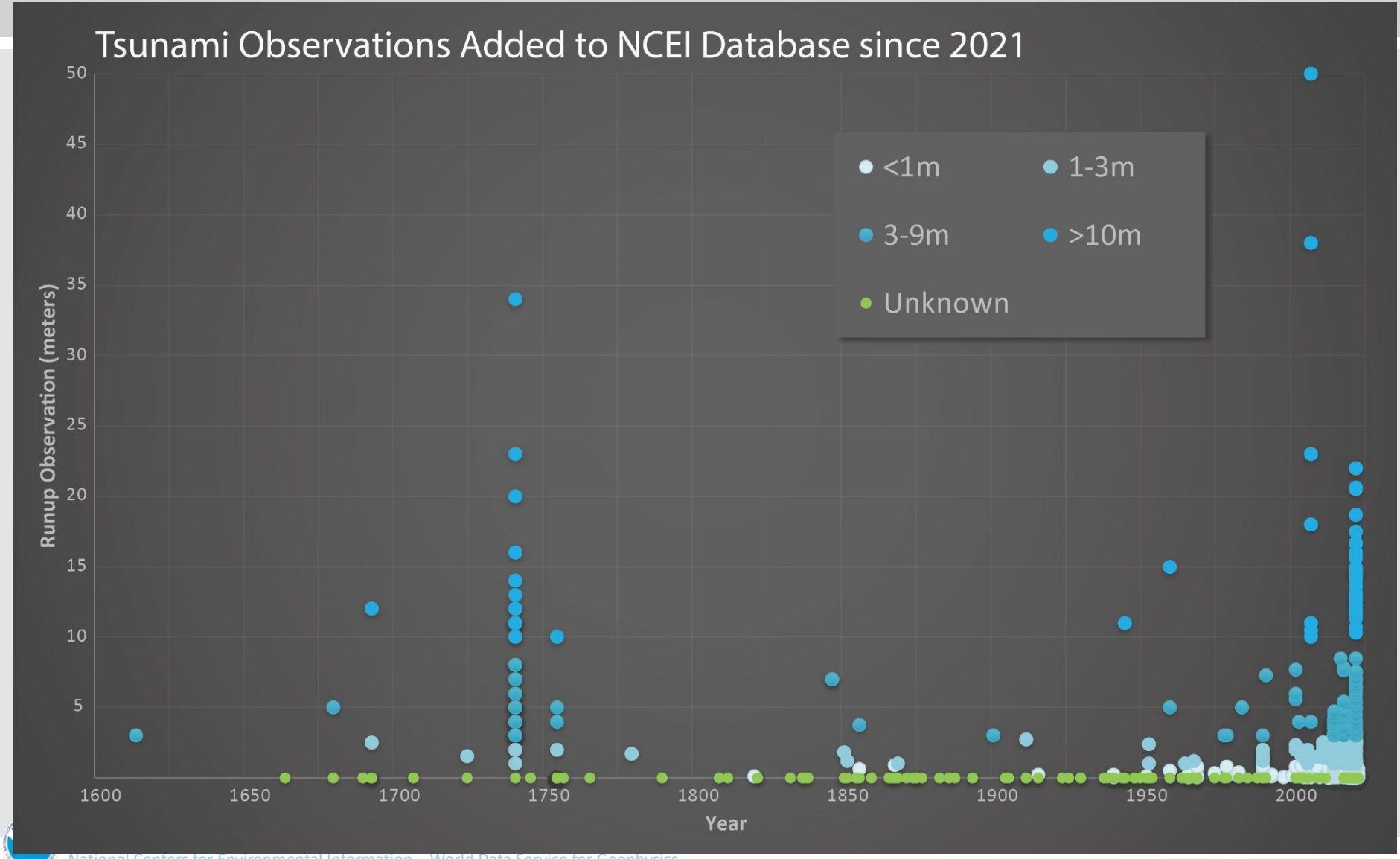


Tsunami Runup data since 2021



NCEI and ITIC Collaborative Projects

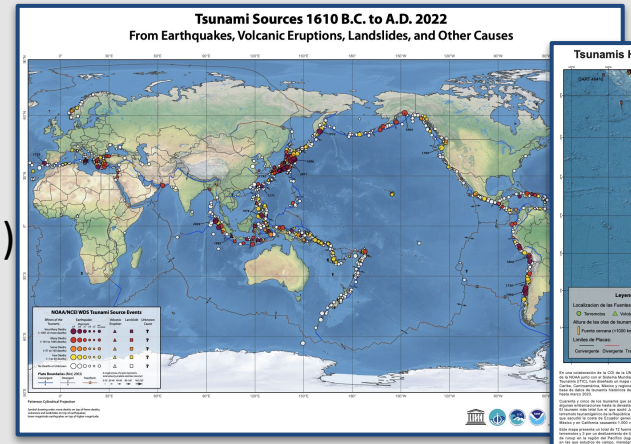
Global posters:

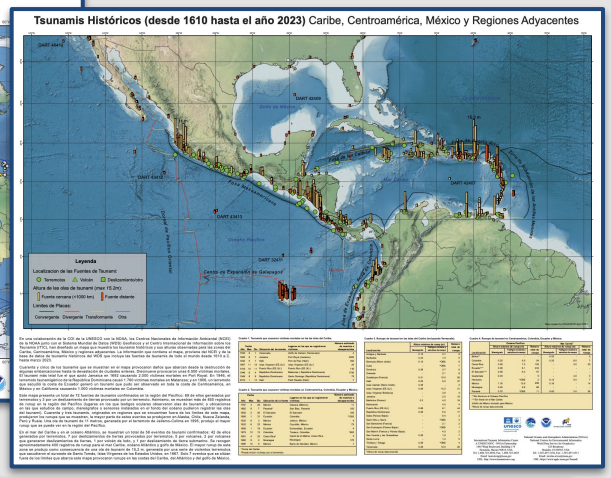
- Tsunamis (2022 & 2023)
- Significant earthquake (2022)
- Significant volcanic eruptions (2022)

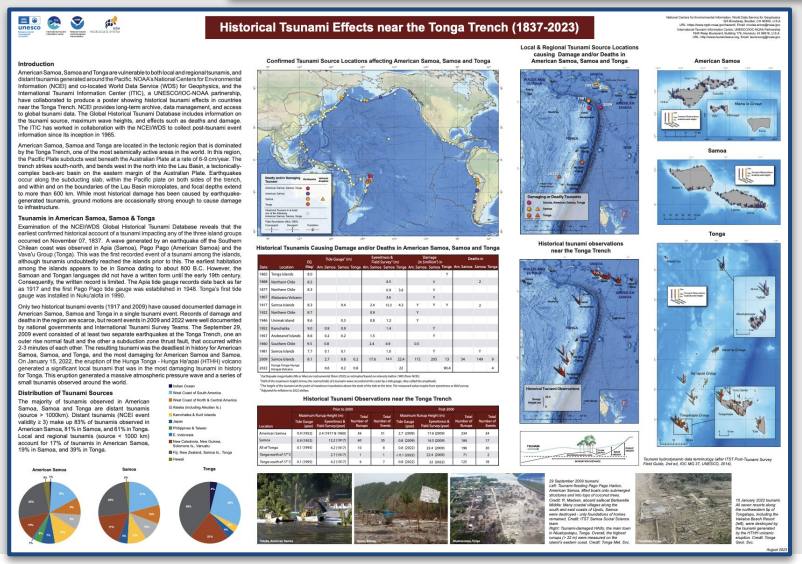
Regional:

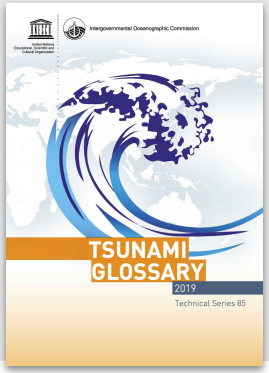
- Caribbean and adjacent regions (English & Spanish)
- Tonga Trench

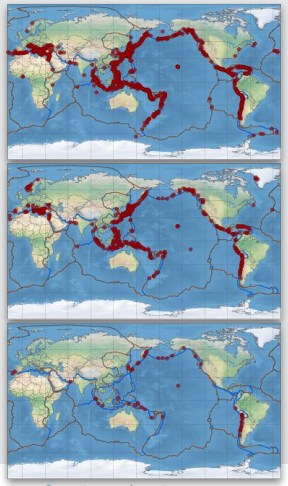
Assisted in updating UNESCO IOC Tsunami Glossary







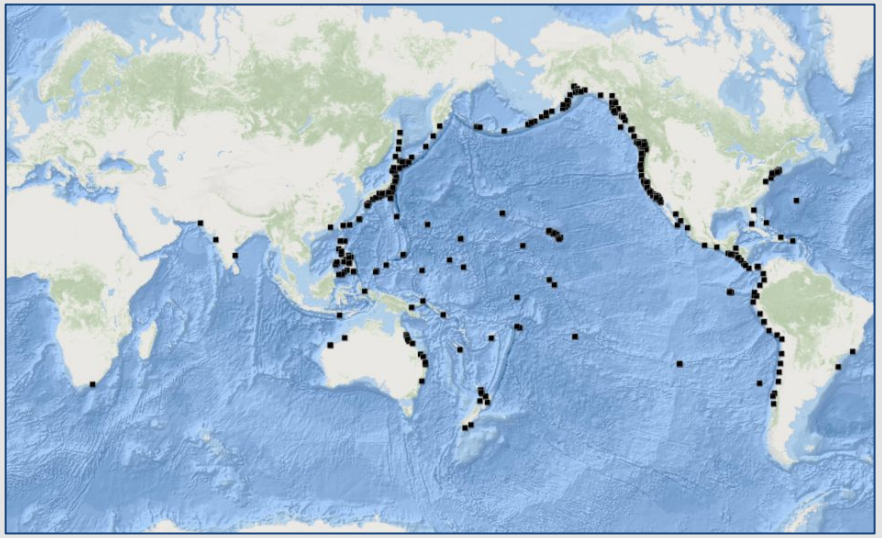


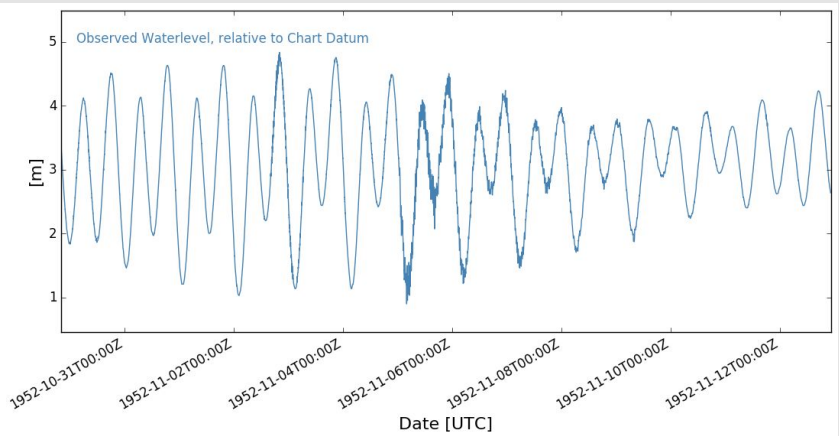


Analog Data Records (Marigrams)

https://www.ngdc.noaa.gov/hazel/view/hazards/tsunami/marigram-search

- Over 3,400 historic paper records (between 1854 and 1994)
  - ~2650 images online
  - **More scans expected in 2024**
    - Recent request on smaller tsunami events
- Collected from U.S. and international stations
  - ~2500 U.S. and U.S. territories
  - ~980 international stations
- Digitized 47 marigram records over 9 significant historical tsunami events.





Summary

NCEI and the co-located World Data Service for Geophysics continues to:

- **Maintain and update a global historical tsunami event database**
- **Steward water level data for tsunami research**
- **Develop high-resolution DEMs to support a variety of programs**
- **Look for partners to work with on detailed information in their region to support these products**

Encourage ICG/PTWS Member States to submit tsunami data for archiving

Thank you!

National Centers for Environmental Information (NCEI)
World Data Service for Geophysics

http://ngdc.noaa.gov
haz.info@noaa.gov
dem.info@noaa.gov

ICSU WORLD DATA SYSTEM

CIRES
COOPERATIVE INSTITUTE FOR RESEARCH IN ENVIRONMENTAL SCIENCES

NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION