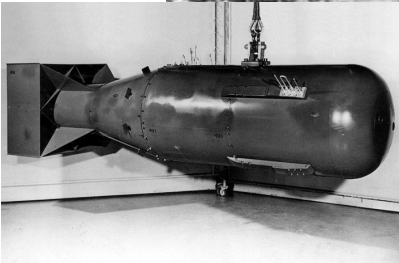




# Absolute Devastation: Hiroshima & Nagasaki

## Hiroshima

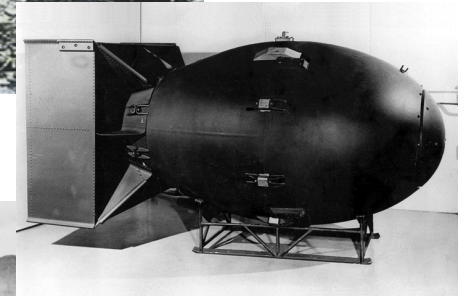
6 August 1945- "Little Boy"



118,000 killed  
80,000 wounded

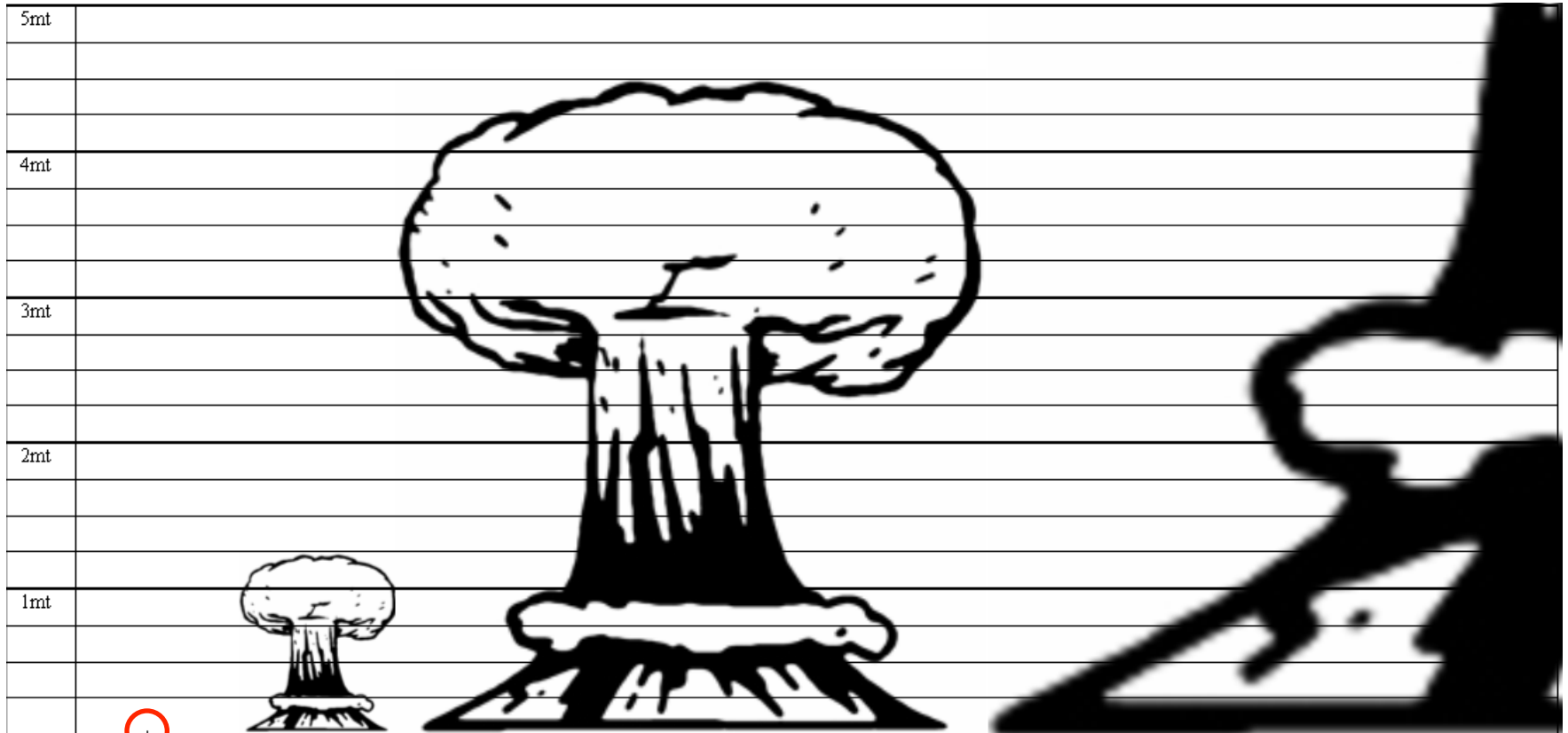
## Nagasaki

9 August 1945- "Fat Man"



74,000 killed  
75,000 wounded

# Scale comparison



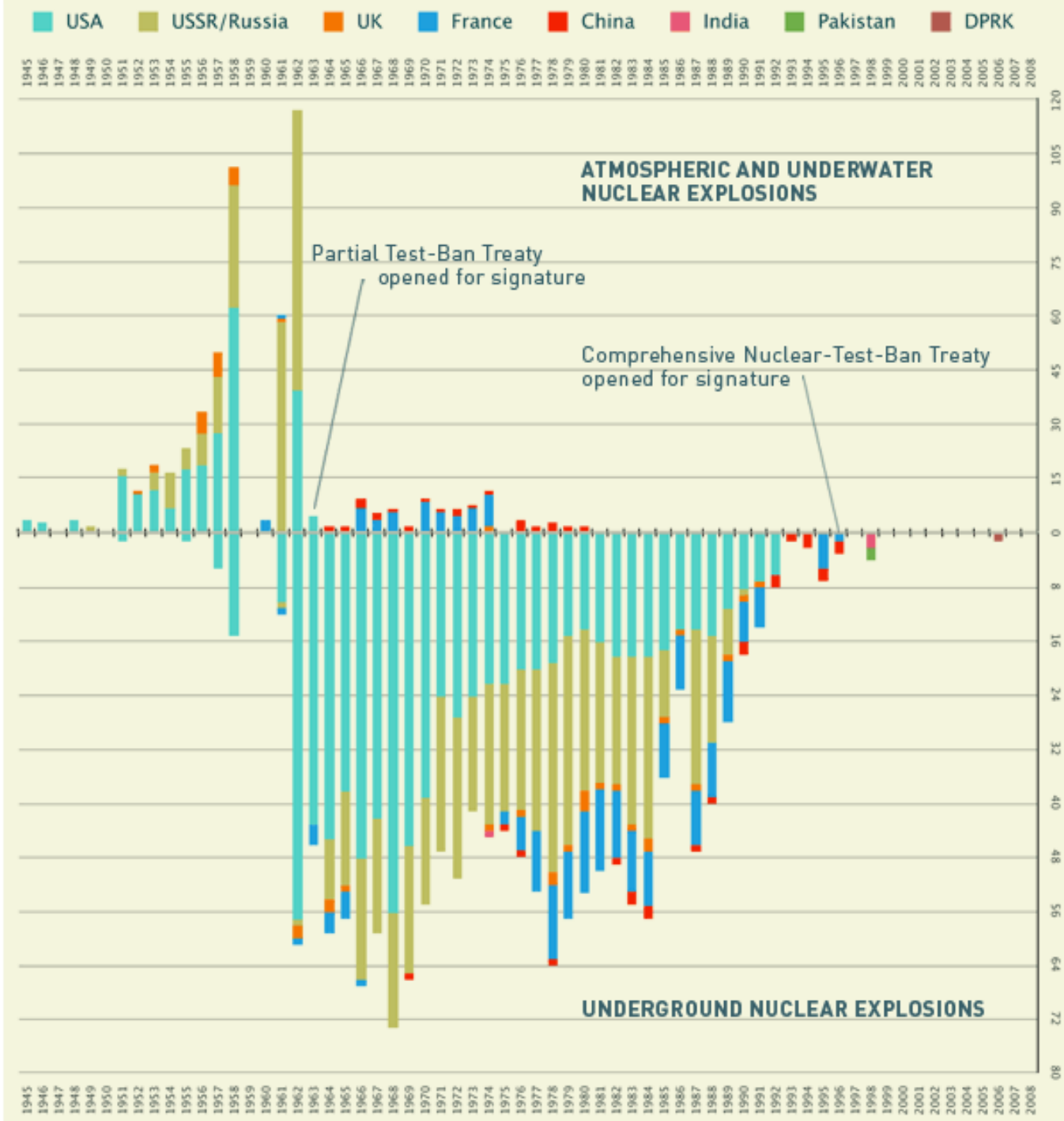
**U.S. B83 bomb**  
1200 kt

**Chinese DF-5A warhead**  
4,5 mt

**Soviet Tzar Bomba**  
50 mt

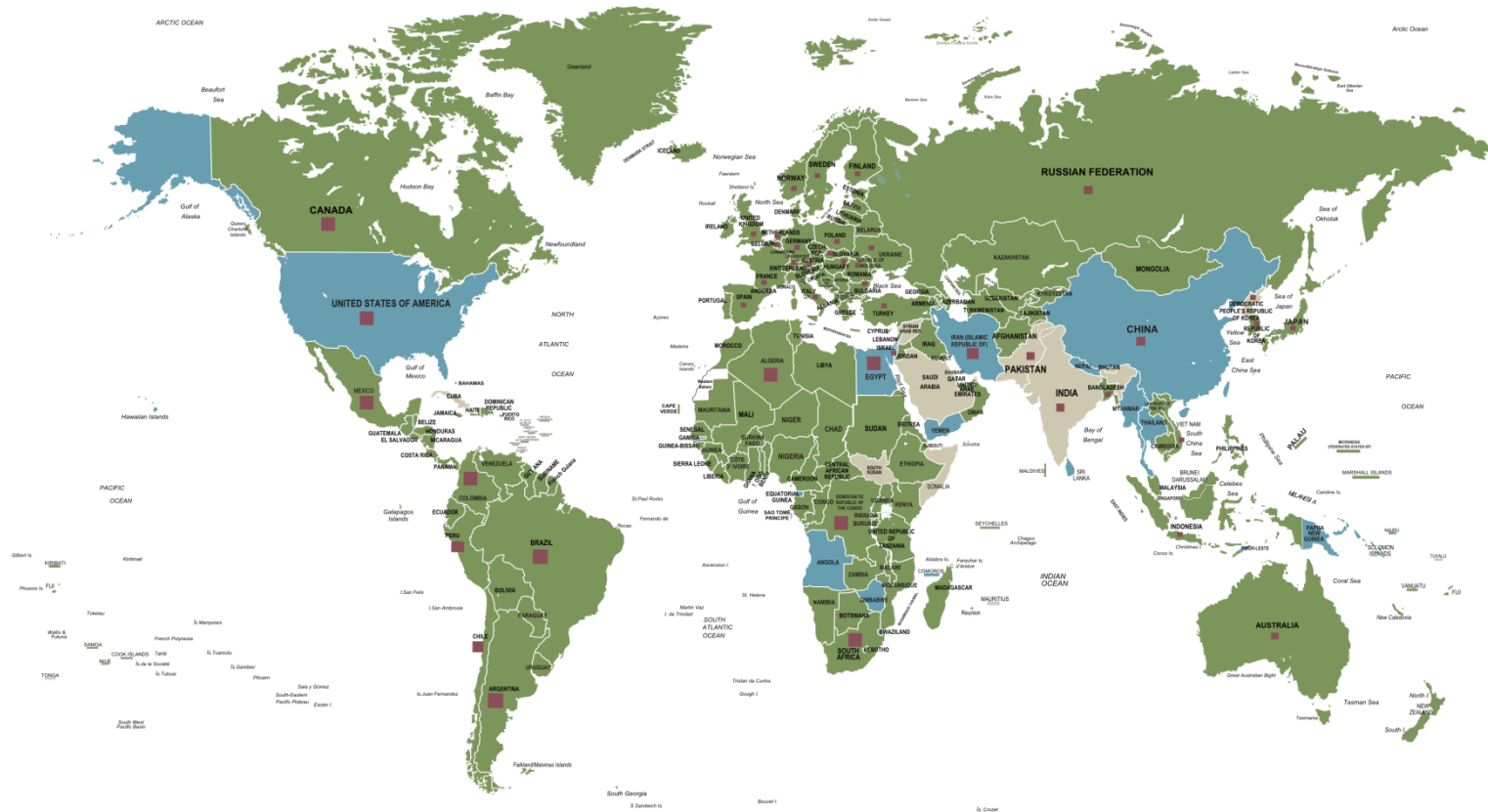
**Hiroshima**  
15 kt

# Atmospheric and Underground Nuclear Testing



# A treaty approaching universality

Latest Ratification: Republic of the Congo on 2 September 2014



	<b>SIGNATORY STATES</b>	<b>RATIFYING STATES</b>	<b>NON-SIGNATORY STATES</b>
<b>TOTAL STATES 196</b>	183	163	13
<b>44 STATES LISTED IN ANNEX 2 TO THE TREATY</b>	41	36	3

The boundaries and presentation of material on this map do not imply the expression of any opinion on the part of the Provisional Technical Secretariat of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO PrepCom) concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

For further information please refer to our website: <http://www.ctbto.org>

## International Monitoring System

377 facilities:

- Seismic
- hydro-acoustic
- Infrasound
- Radionuclide, noble gas, laboratories

*IDC & GCI*



## Consultation and Clarification

Right to clarify matters indicating possible non-compliance



## On-Site Inspection

Conduct of on-site verification activities



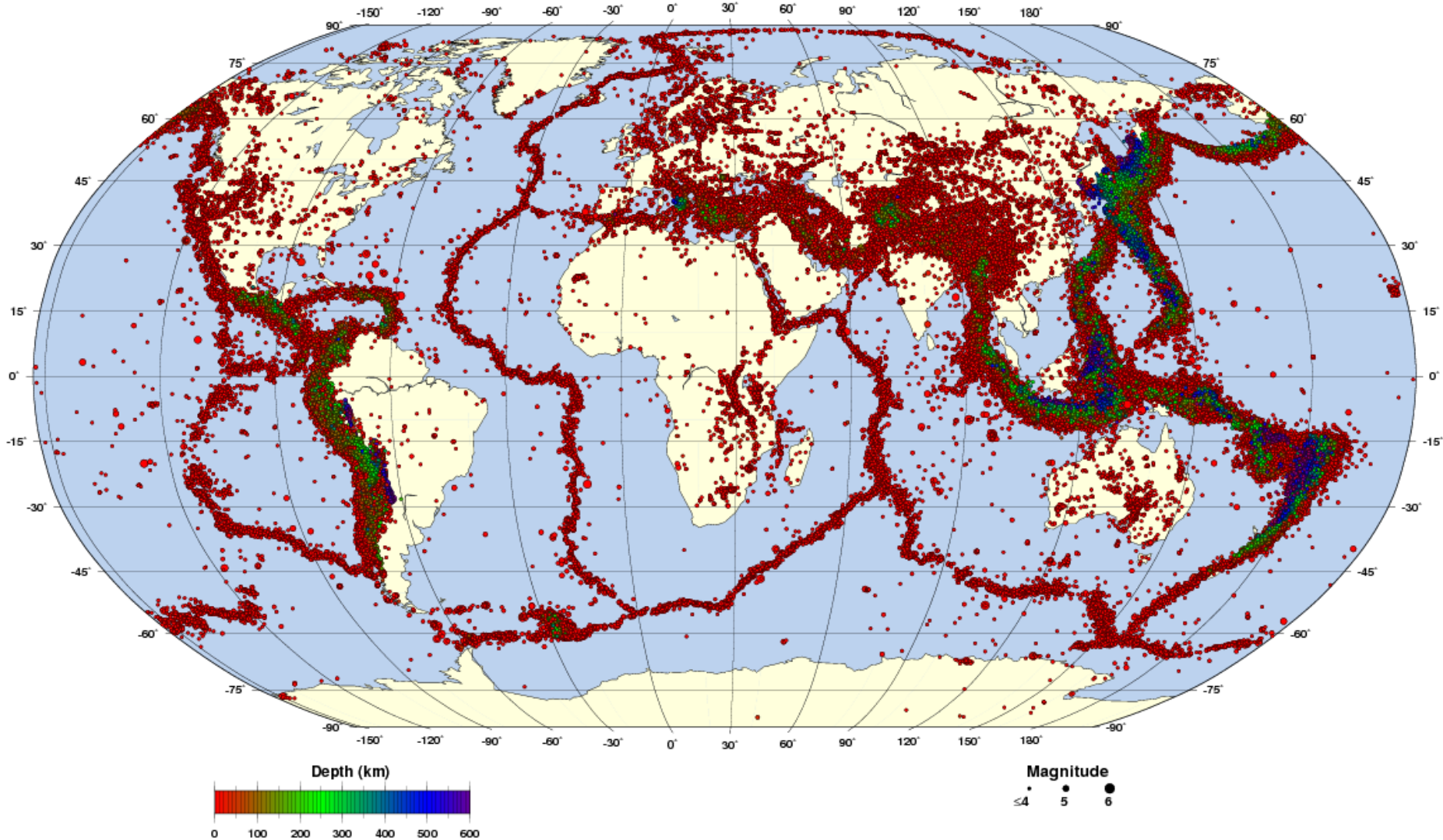
## Confidence Building Measures

Large chemical Explosions:  
Prevent misinterpretations and calibrate seismic IMS component

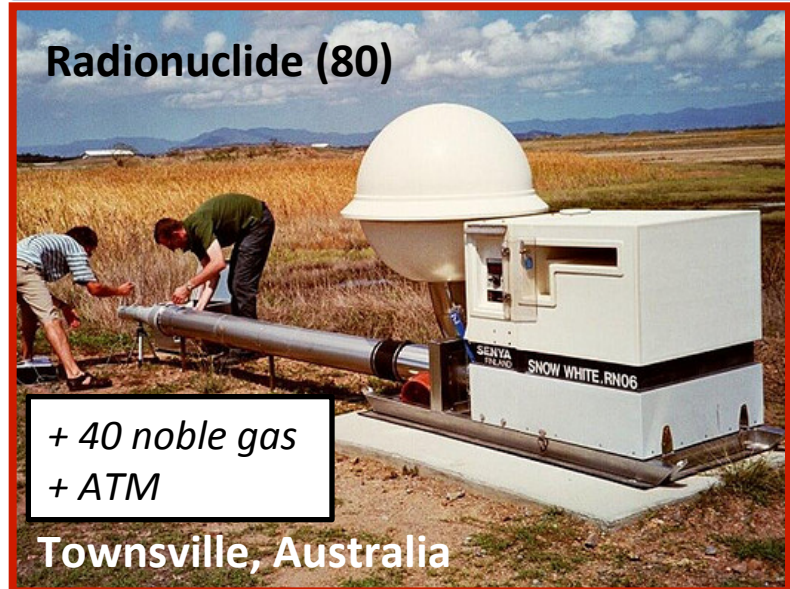
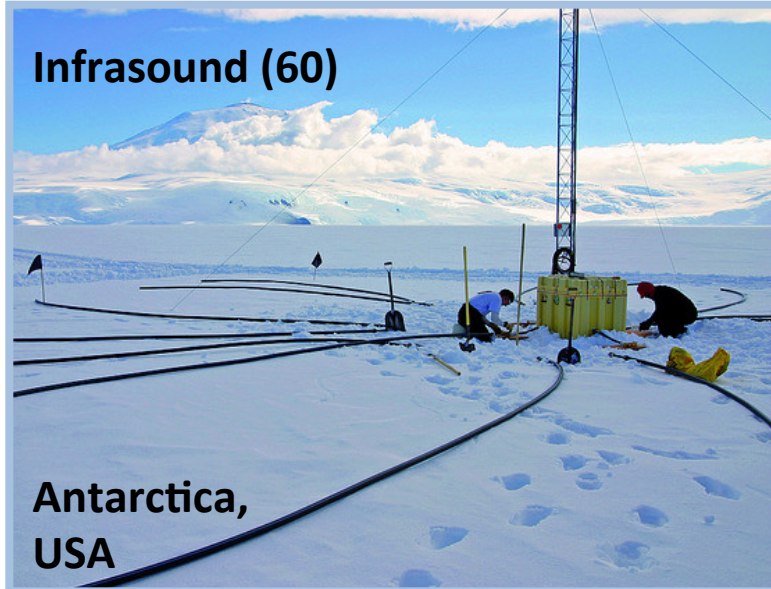
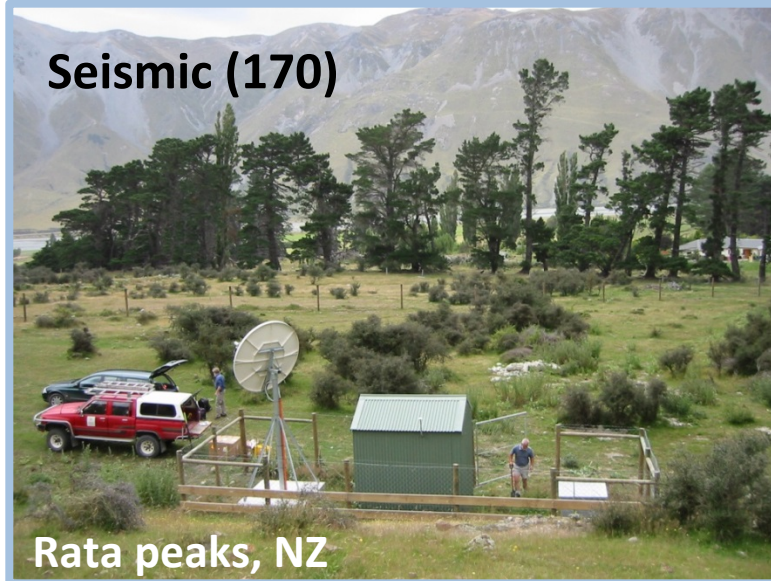


# Events Located by the IDC from February 2000 – November 2014

443,305 events

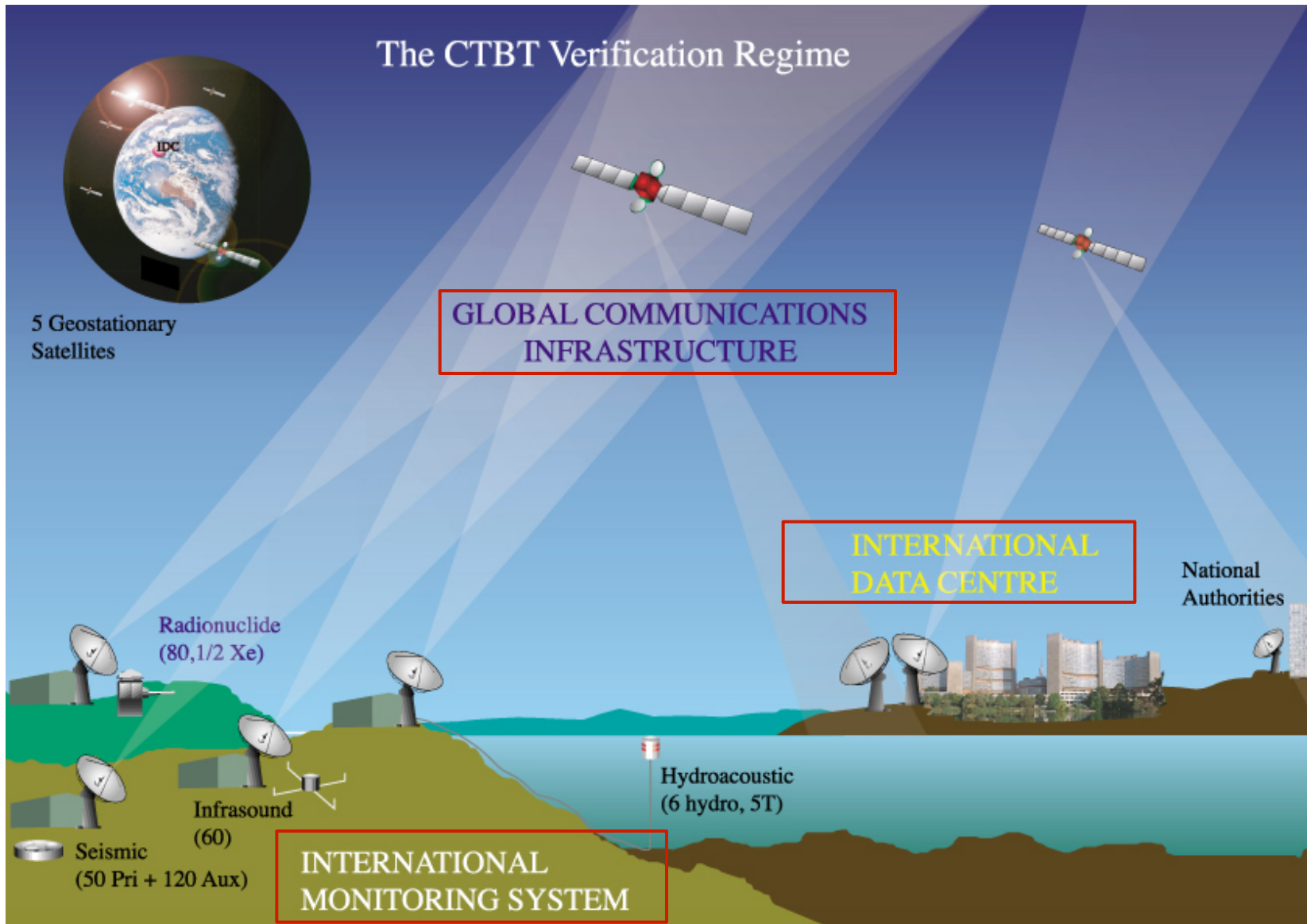


# CTBT Verification System: Monitoring technologies

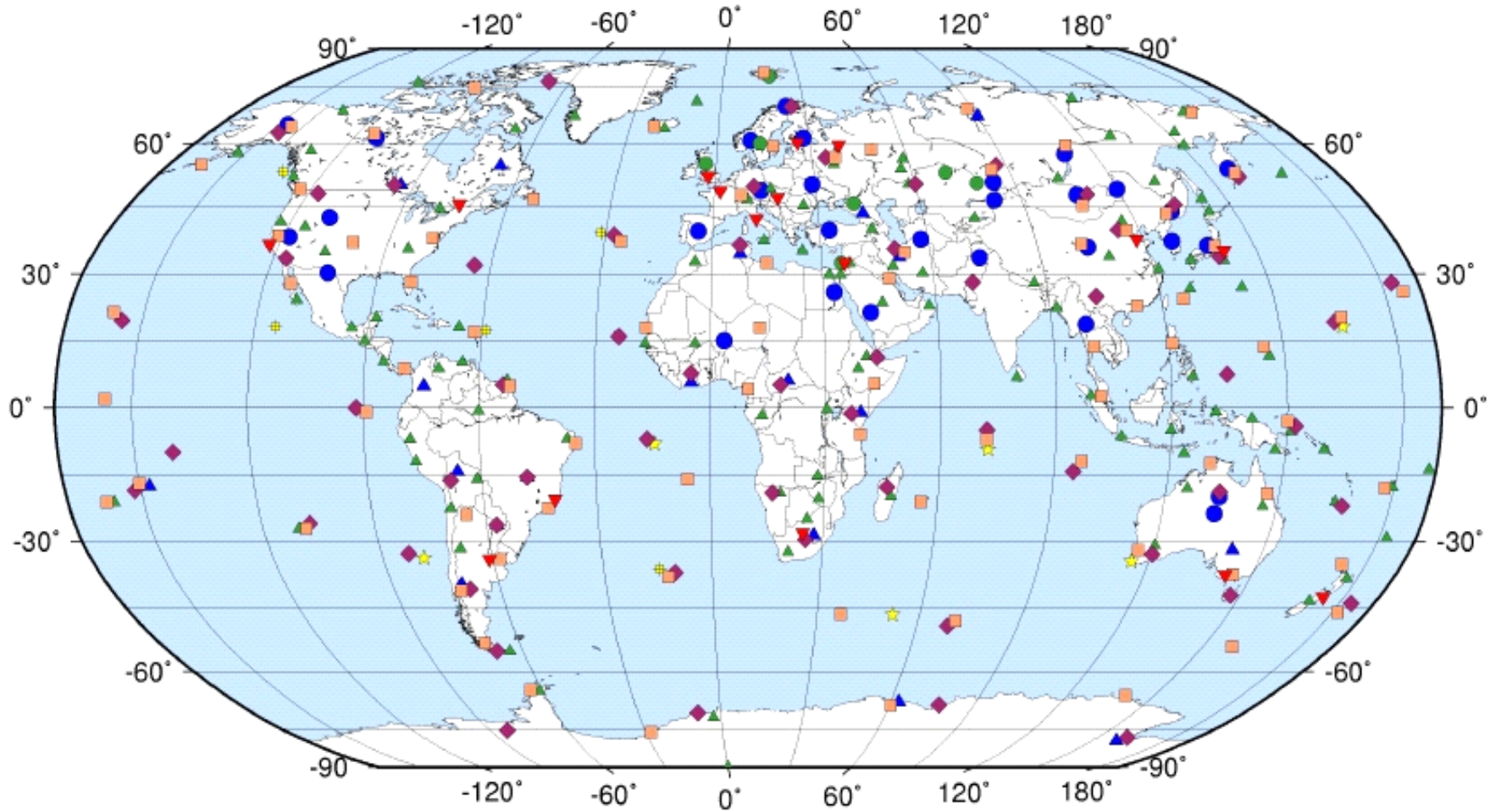




# Data transmission from IMS to GCI to IDC



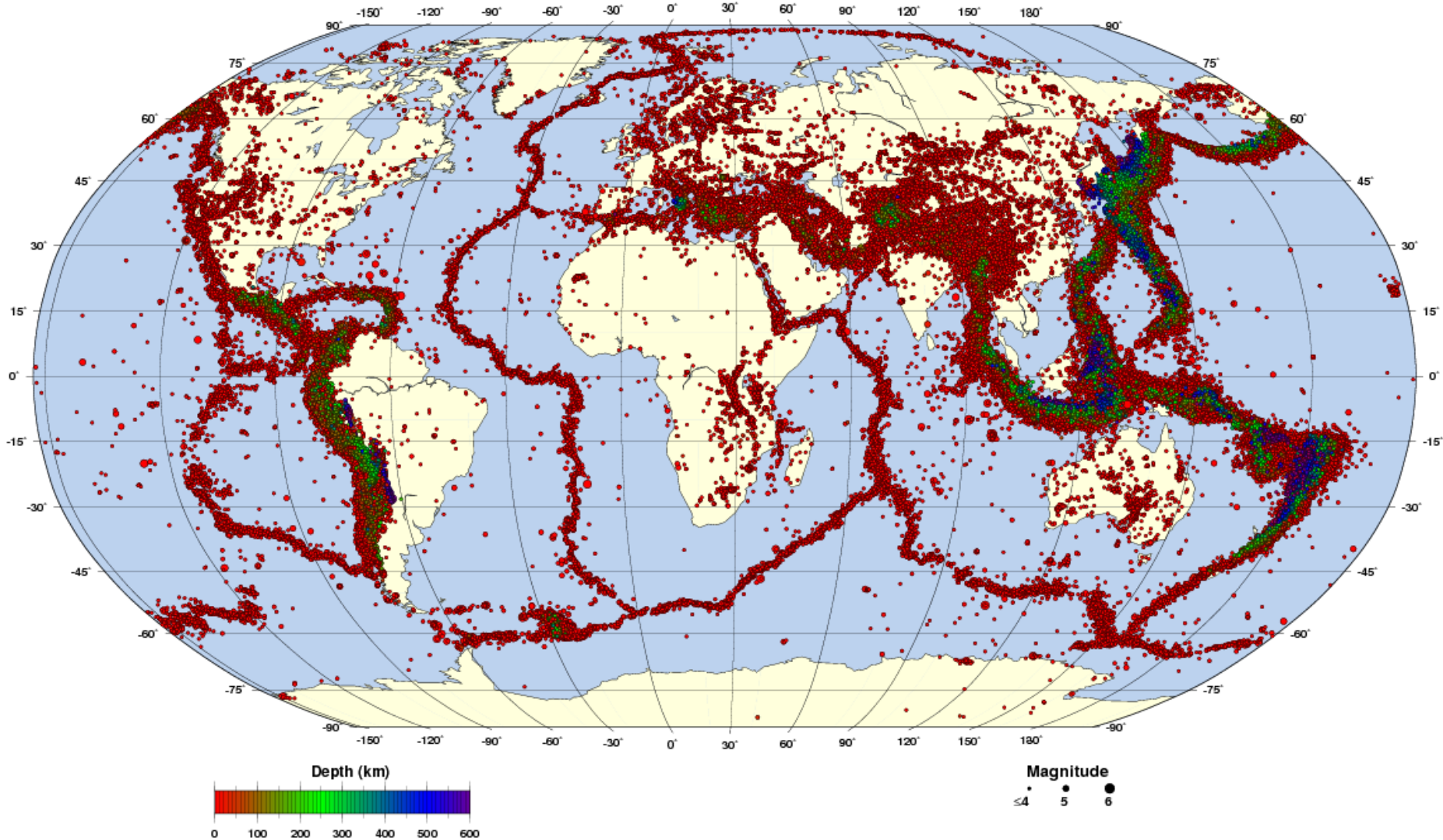
# International Monitoring System: 337 facilities



- |                                  |                                    |                                      |                        |
|----------------------------------|------------------------------------|--------------------------------------|------------------------|
| ● Seismic Primary Array          | ● Seismic Auxiliary Array          | ★ Hydroacoustic (hydrophone) Station | ◆ Infrasound Station   |
| ▲ Seismic Primary 3-comp Station | ▲ Seismic Auxiliary 3-comp Station | ■ Hydroacoustic (T-phase) Station    | ■ Radionuclide Station |
|                                  |                                    |                                      | ■ Radionuclide Lab     |

# Events Located by the IDC from February 2000 – November 2014

443,305 events



# Civil and scientific applications

**Radiation releases**



**Fukushima**  
**March 2011**

**Tsunami warning**



**Sumatra**  
**December 2004**

**Aviation hazards**



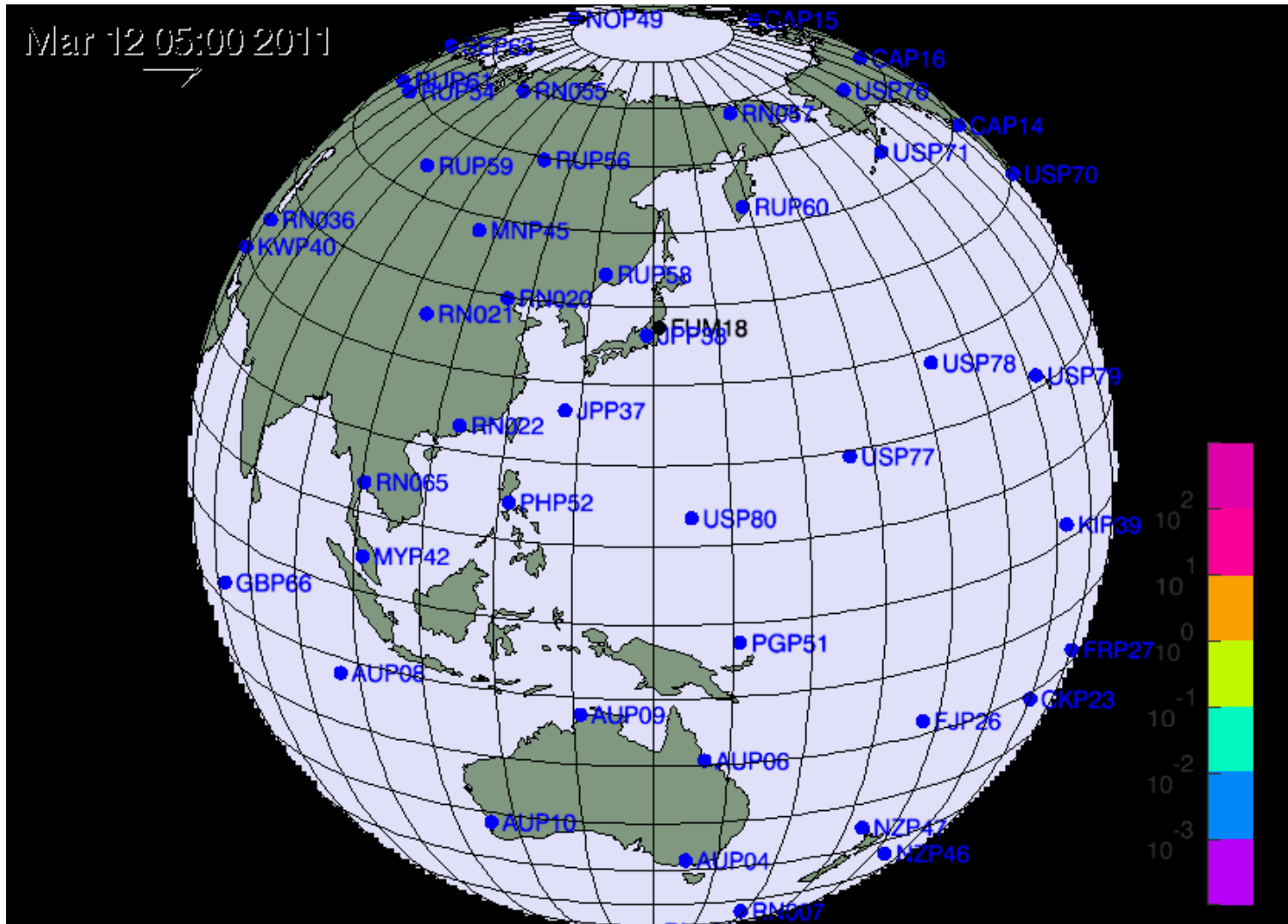
**Eyjafjallajökul**  
**March 2010**

**Meteorites**



**Urals**  
**February 2013**

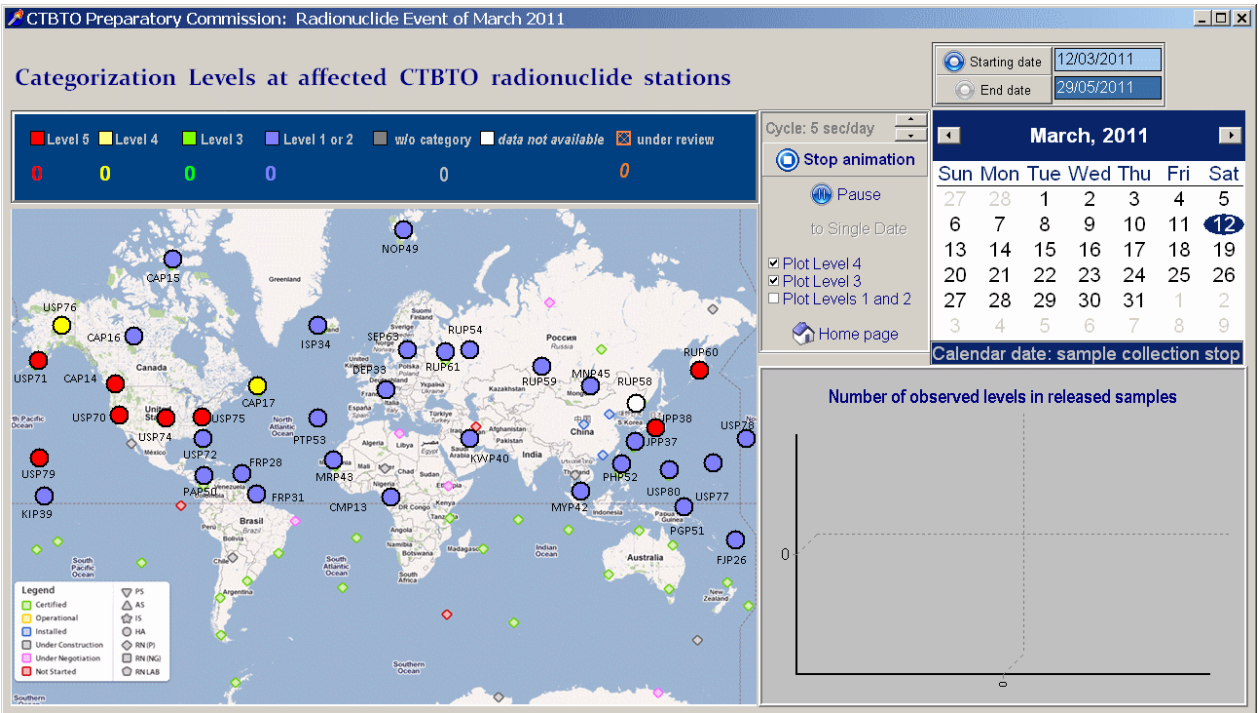
# Atmospheric transport model (ATM) for the release



# Particulate detections at the IMS Network After Fukushima Accident

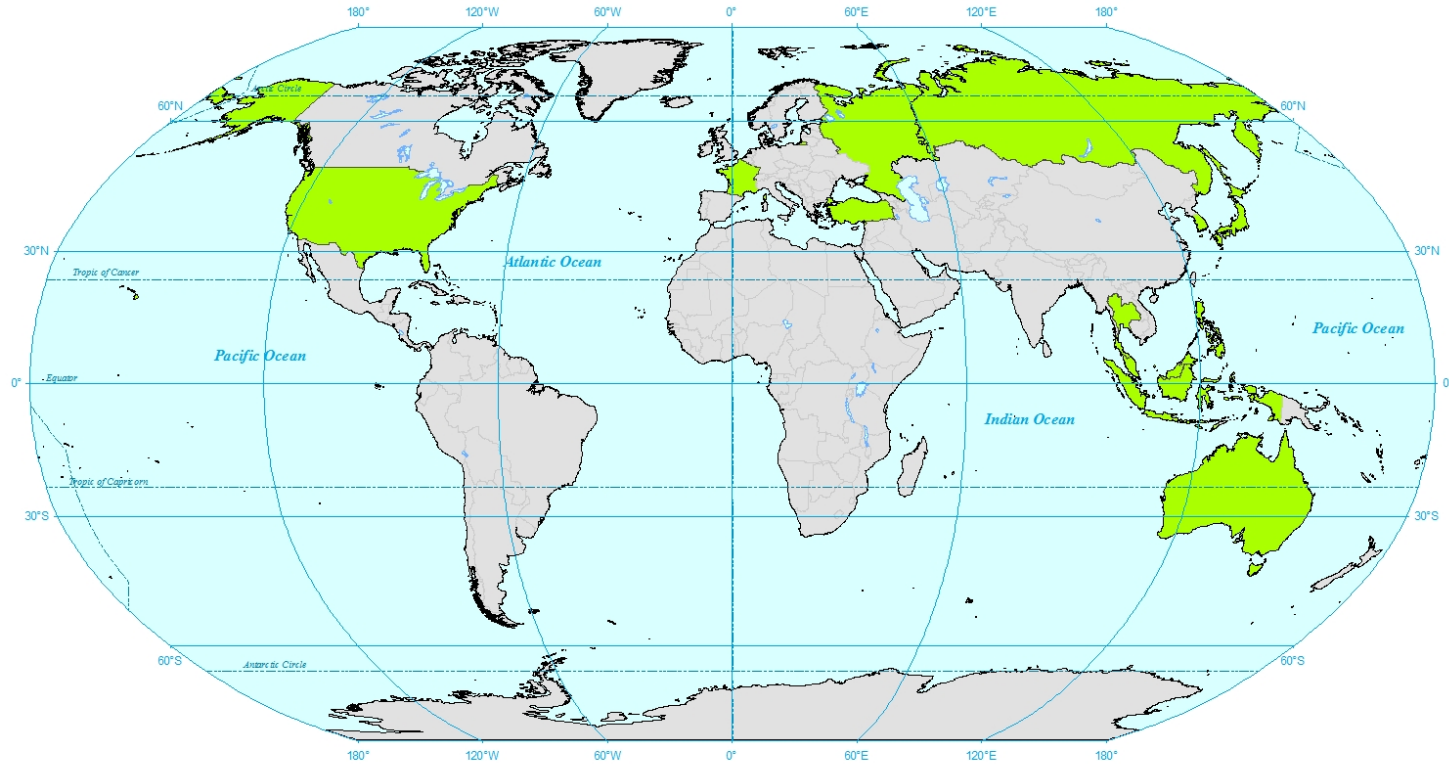
This picture show time development of detections for each day after the accident.

**Level 5** = multiple fission products detected, **Level 4** = one fission products detected, **Level 3** = fission products typical for the station detected  
**Level 1 and 2** = only natural radioactivity detected



Situation in July 2011, more than 40 stations have detected the event and all but closest station (Takasaki, Japan) are back to normal background radiation. More than 1600 samples contained radiation originating from Fukushima NPP.

# (October 2013)



### Tsunami Agreements



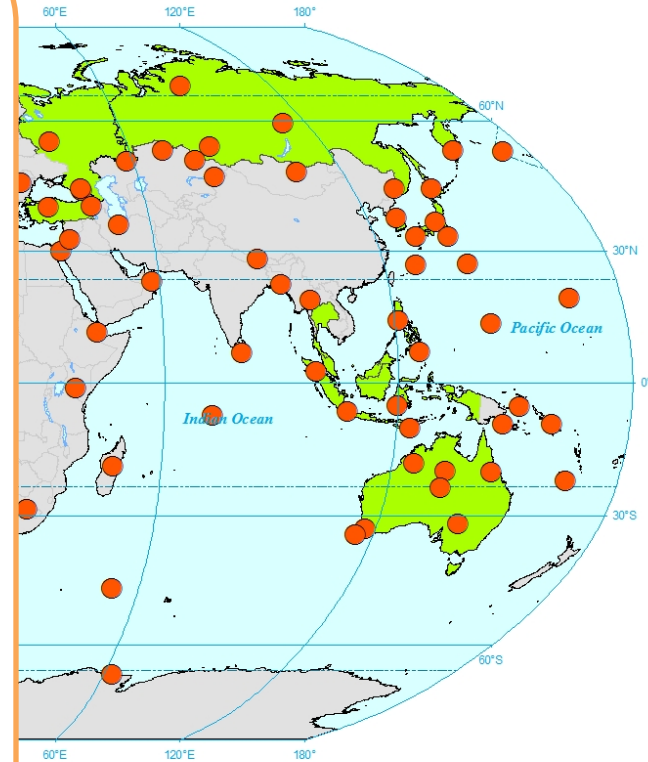
Agreement Signed



No Agreement

# Stations for Tsunami Warning (October 2013)

- Data forwarding configured for Tsunami Warning Centres in 11 States
  - Australia
  - France
  - Indonesia
  - Japan
  - Philippines
  - Thailand
  - USA
  - Turkey
  - Malaysia
  - Republic of Korea
  - Russian Federation



Legend:  
Green box: Agreement signed  
Grey box: No Agreement  
Red circle: Stations for Tsunami Warning



## Educating and Training the Next Generation of CTBT Experts

Live lecture courses



iTunes U



Partnerships with universities



universität wien



Emphasis on using innovative and engaging tools

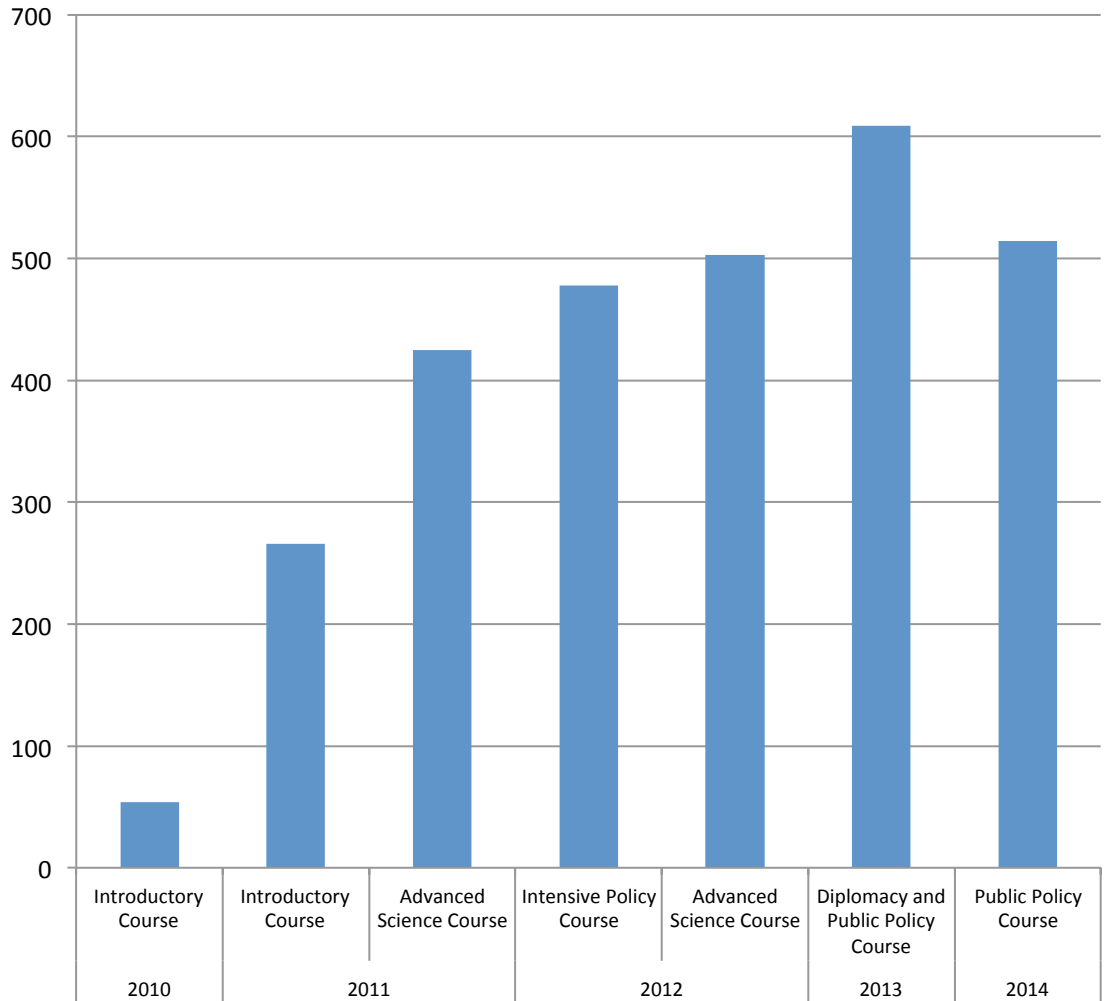
For more info: [education.ctbto.org](http://education.ctbto.org)

# Education and Outreach Activities

- A total of 3,052 registered participants
- To date, 986 certificates of successful completion issued



Registered Participants



Made possible by generous voluntary contributions from the Kingdom of Norway and the European Union

# E-Learning Platform Statistics since 2012

Sessions

95,561

Users

26,059

Pages/Session

10

Avg. Session Duration

12 minutes

% New Users

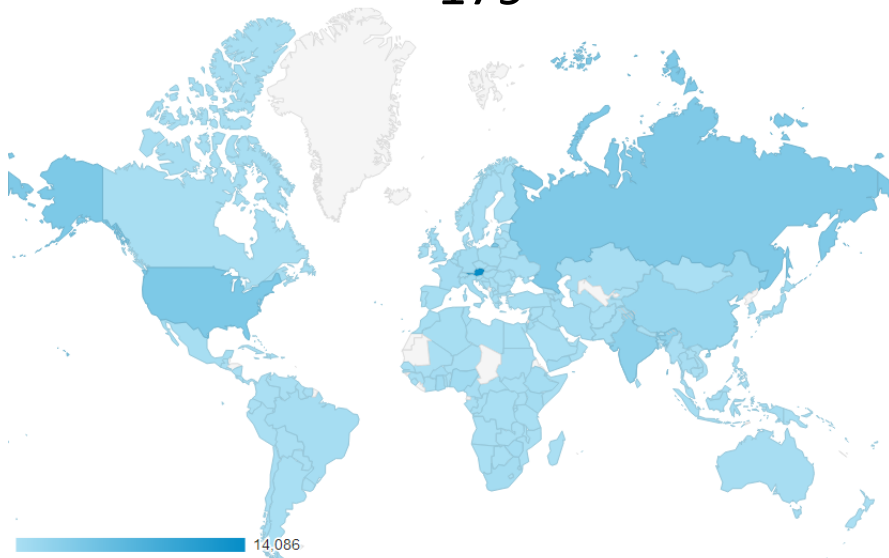
27.23

Page views

992,822

Number of Countries

179



cdi capacity development initiative E-LEARNING PLATFORM

CTBTO PREPARATORY COMMISSION

You are not logged in. (Login)

Home

### About the Capacity Development Initiative

The Capacity Development Initiative (CDI) of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) is a multidisciplinary, free of charge training programme based on modern, innovative and cost-effective methods. By expanding the pool of experts on the political, legal and technical aspects of the CTBT, CDI increases awareness and stimulates understanding of the Treaty with a view toward its entry into force and universalization. This initiative comprises a series of courses ranging from introductory levels to more advanced levels, which are offered in Vienna and are available online in real time via the e-Learning platform.

The CTBTO is developing [partnerships](#) with institutions worldwide, including academic and research institutions, international organisations, and other stakeholders invested in education and training. With an expanded network of partnering institutions, the CDI approach truly represents mass educational collaboration.

The CTBTO would like to highlight the generous contributions provided by Austria, Norway and the EU toward the CDI. Without such substantial contributions, these initiatives would not be possible. Through their generous contributions, Austria, Norway and the EU demonstrate a shared vision with the CTBTO to train and educate the next generation of experts on the CTBT.

### CTBT Tutorial

**About the Tutorial**

The CTBT Tutorial is an introductory resource on the basics of the Comprehensive Nuclear-Test-Ban Treaty. The tutorial consists of modules on the following topics: Introduction to the Treaty; Entry-into-Force and Universalization; International Monitoring System (IMS); International Data Centre (DC); and On-Site Inspections (OSI).

No registration required.

**Access the tutorial in the following languages:**

- Arabic
- Chinese
- English
- French
- Portuguese
- Russian
- Spanish

### CDI E-Learning Platform Resources

- [CDI E-Learning Platform Minimum System Requirements](#)
- [Capacity Development Initiative Legal Disclaimer](#)
- [CTBTO Public Website](#)

### Technical Support

If you encounter any problems using the e-learning platform, please contact the CDI team: [cdi@ctbto.org](mailto:cdi@ctbto.org)

Subscribe - CTBT Education and Outreach Mailing List

Please subscribe to the [CTBT Education and Outreach Mailing List](#) to receive CTBT course, online module, event and registration information and updates.

Training the next generation of CTBT experts

(Statistics as of 17 Dec 2014)



Made possible by generous voluntary contributions from the Kingdom of Norway and the European Union