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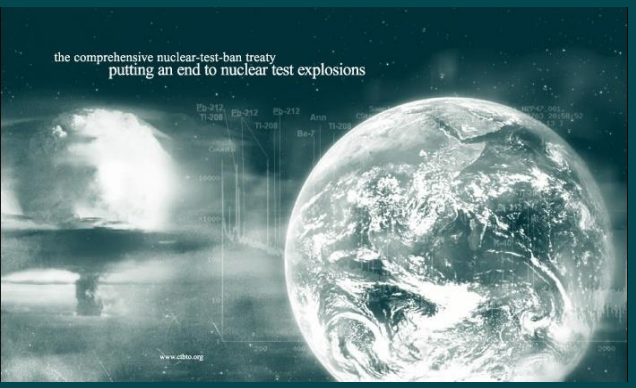

Overview of the **History of Nuclear Testing** 1945 until today

Presented at the
Vienna Conference on the Humanitarian Impact of Nuclear Weapons
8 and 9 December 2014 in the Hofburg Palace Vienna, Austria

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Capacity Building and Training Section
International Data Centre Division
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Vienna International Centre, P.O. Box 1200, A-1400 Vienna, Austria

Overview

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I. History of nuclear tests

II. History of the CTBT

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I. Nuclear Testing

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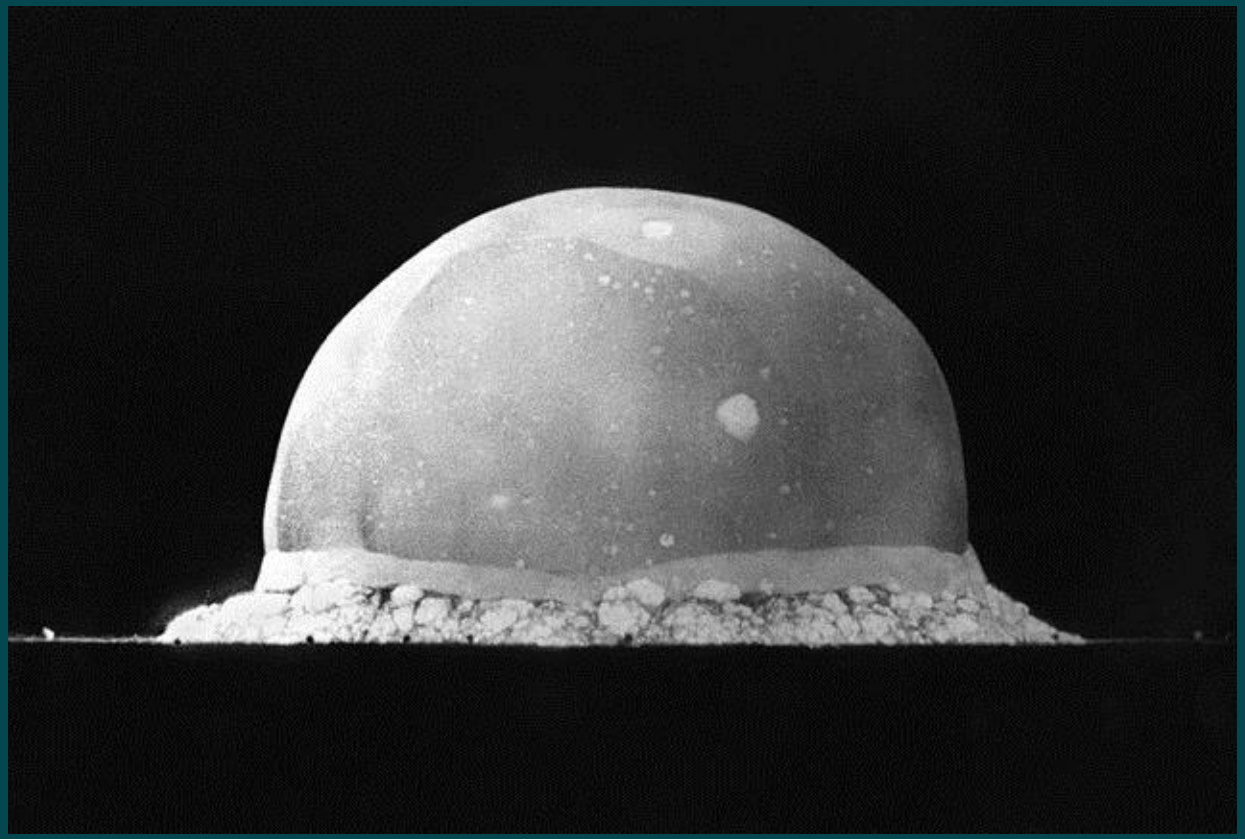

Trinity - first ever nuclear test – 16 July 1945

Nuclear Tests
1945 - today

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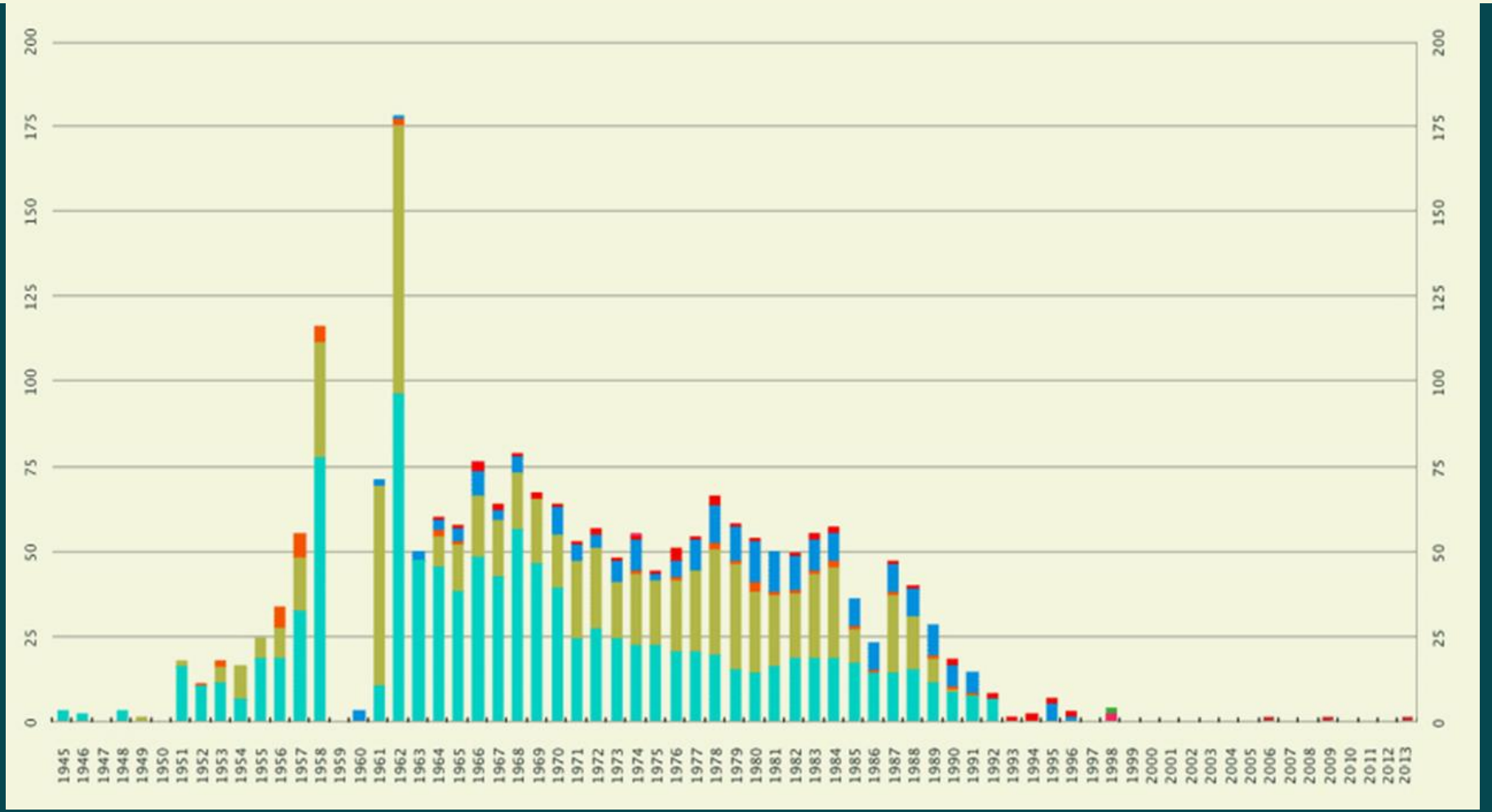

Sites of nuclear explosions

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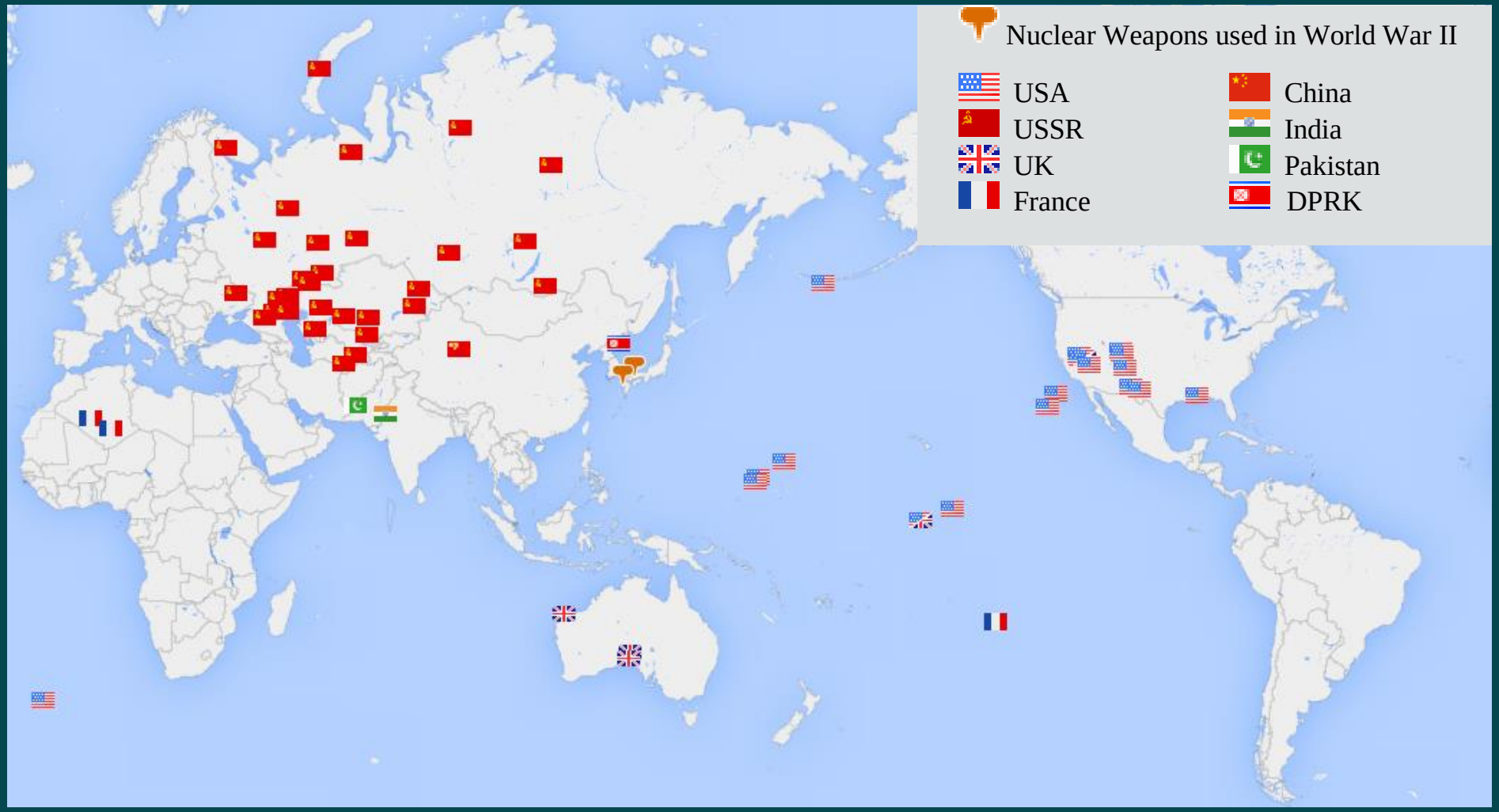

2000+ nuclear explosions

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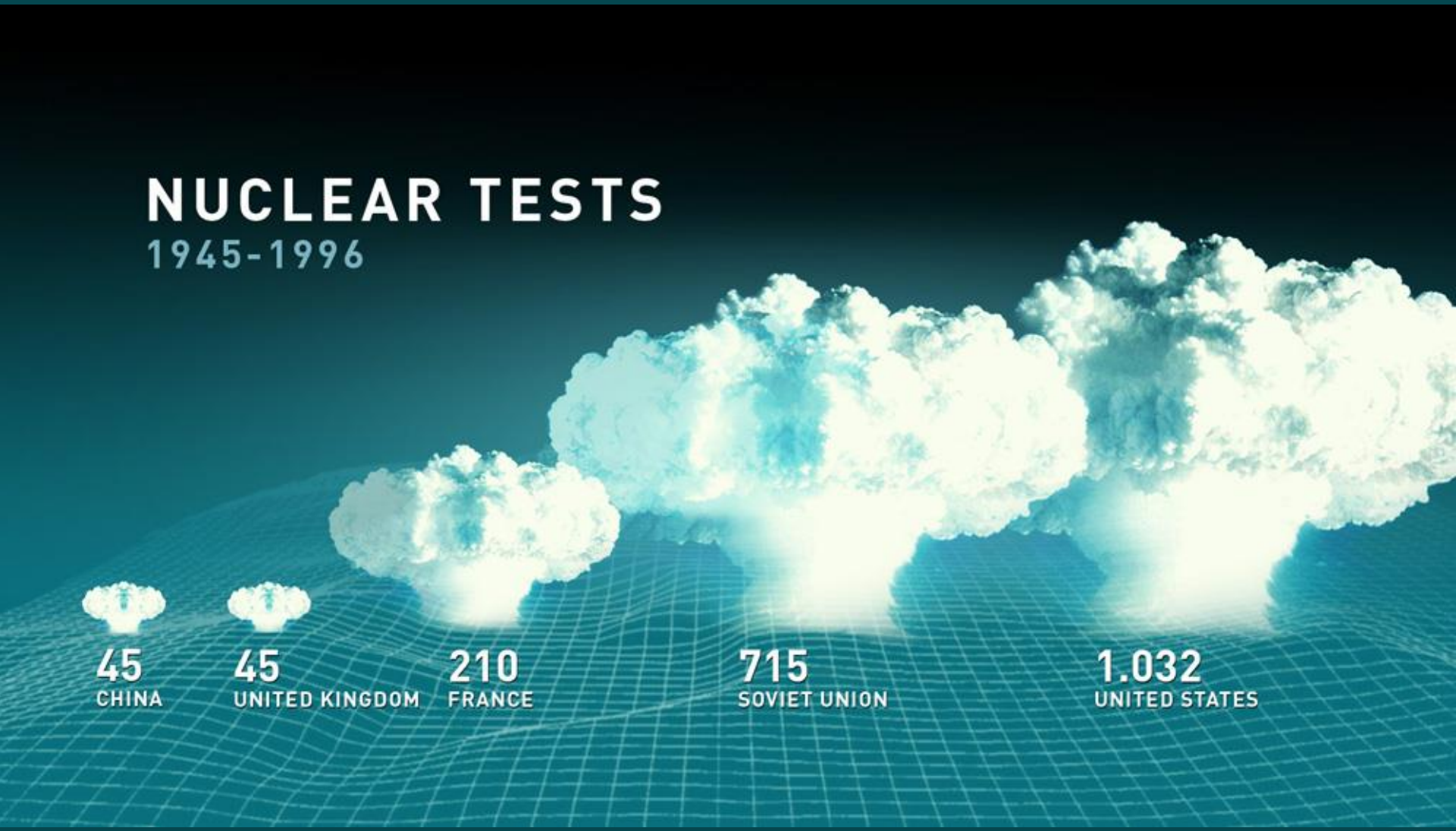

Scale comparison

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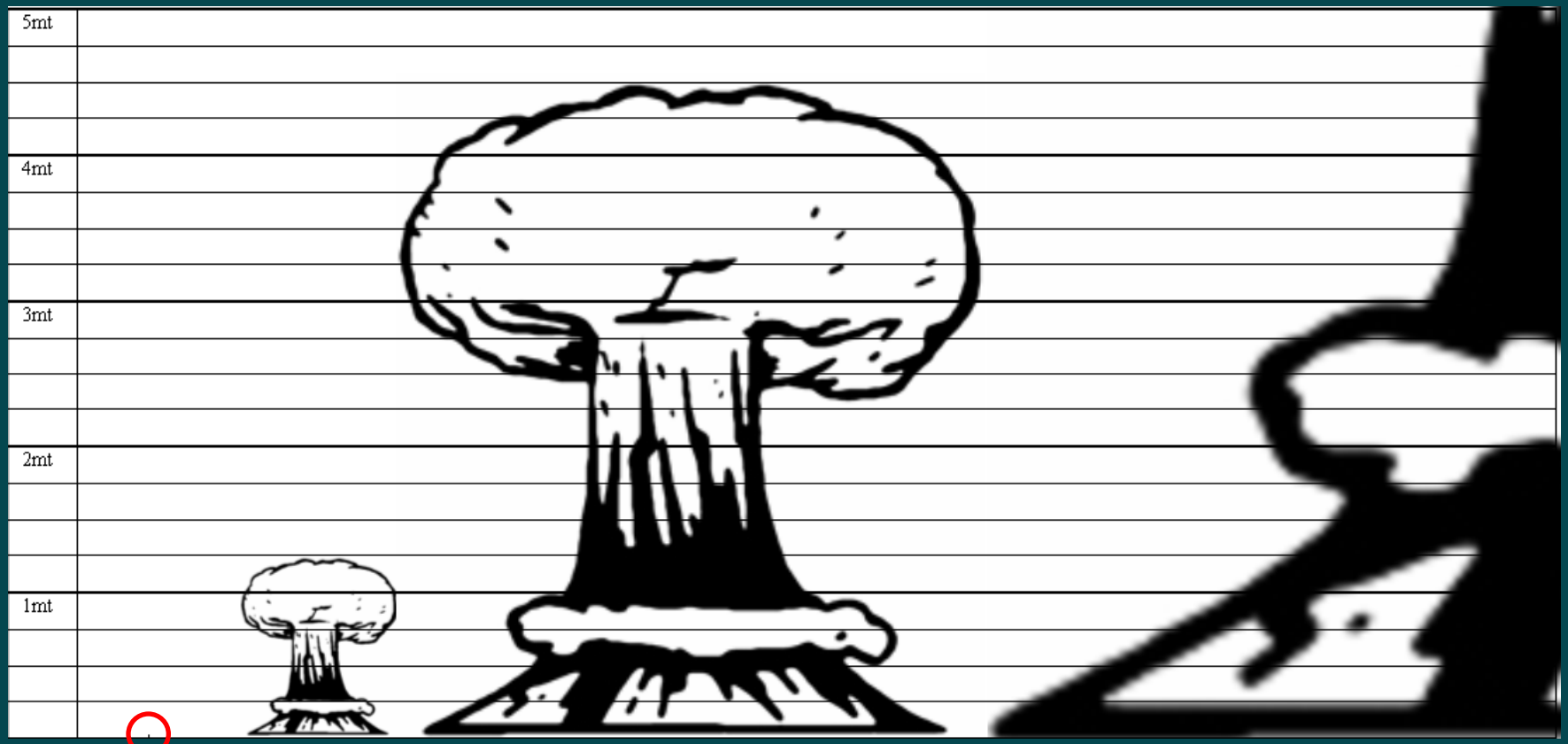

Hiroshima
13 kt TNT equivalent

U.S. B83 bomb
1200 kt

Chinese DF-5A warhead
4,5 Mt

Soviet Tzar Bomba
50 Mt


All atmospheric testing
= 29,600 Hiroshima bombs
= a Hiroshima bomb twice every day
for 35 years

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II. The CTBT

1963:
Partial Test Ban Treaty

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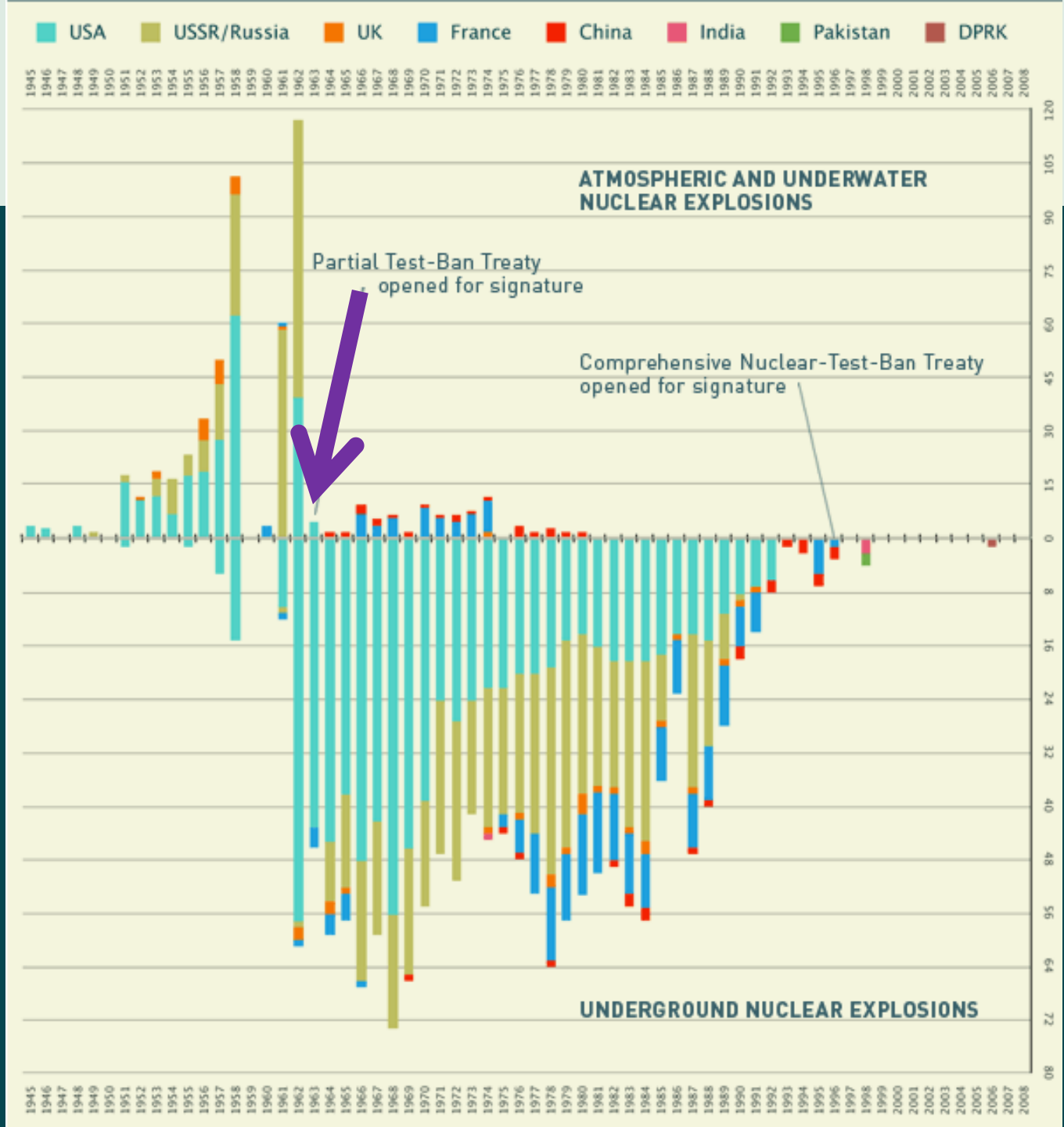
President Kennedy ratifying the PTBT on 7 October 1963.

Atmospheric and Underground Nuclear Testing



Venting

Baneberry

18 December 1970

Nevada Test Site

Other partial limits

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1961: Antarctic Treaty

1967: Outer Space Treaty

1974: Threshold Test Ban Treaty (TTBT)

1976: Peaceful Nuclear Explosions Treaty (PNET)

The Comprehensive Nuclear -Test-Ban Treaty CTBT

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Opened for signature on 24 September 1996.

All five nuclear weapons States, including
the United States, China and Russia, signed on the first day.

Nuclear Tests
1945 - today

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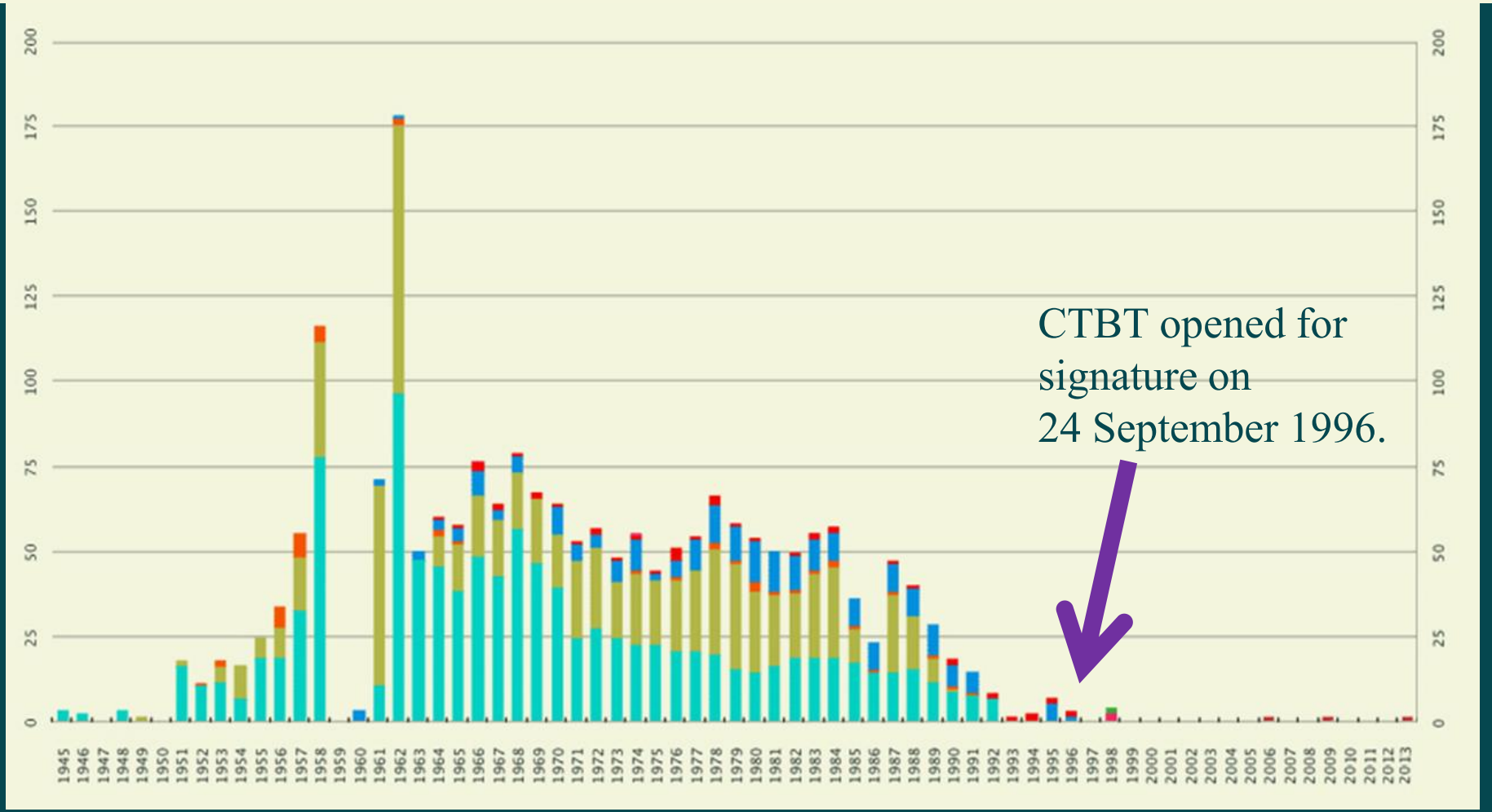

Sites of nuclear explosions

Tests after 24 September 1996

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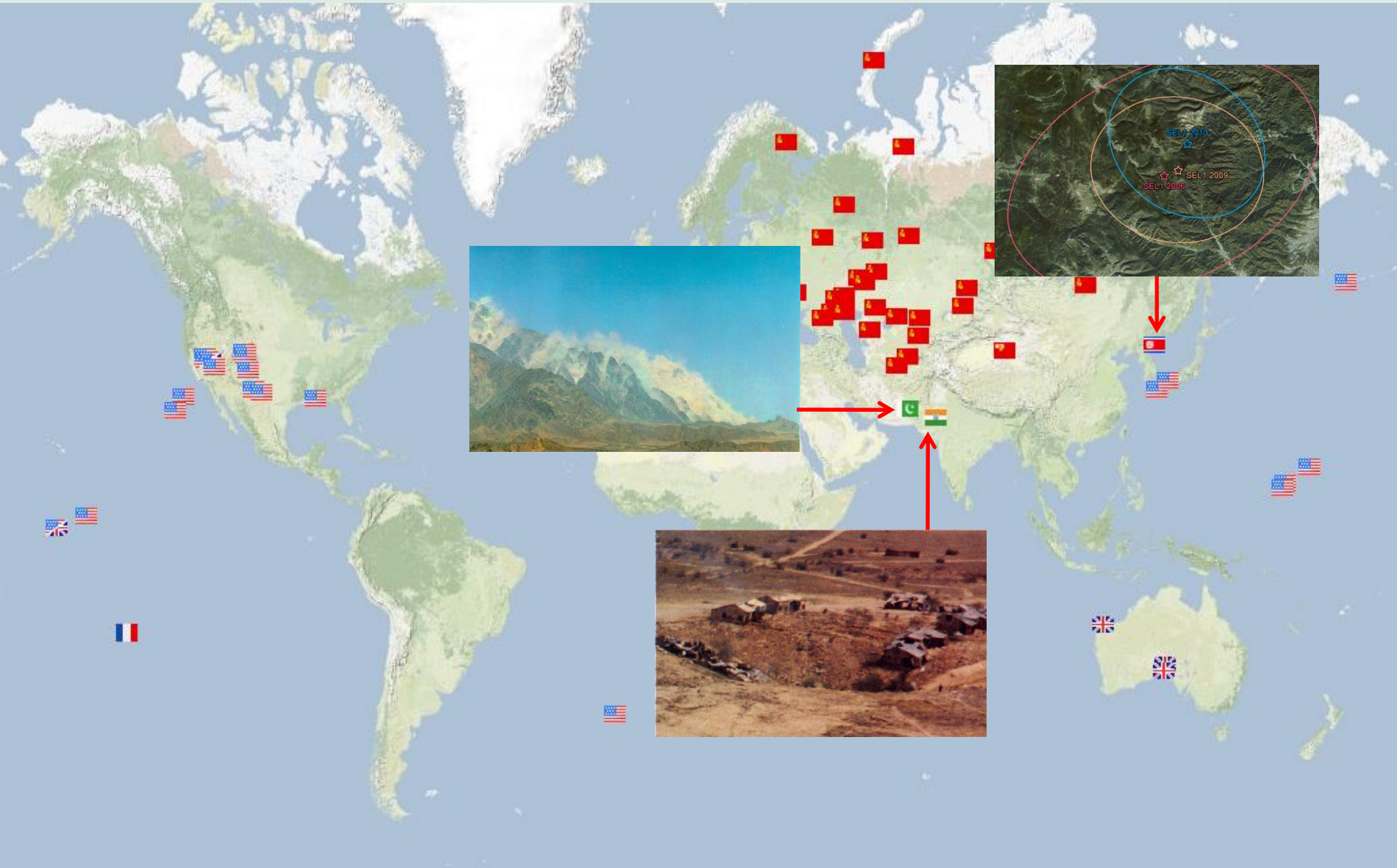

CTBT today
183 signatures, 163 ratifications

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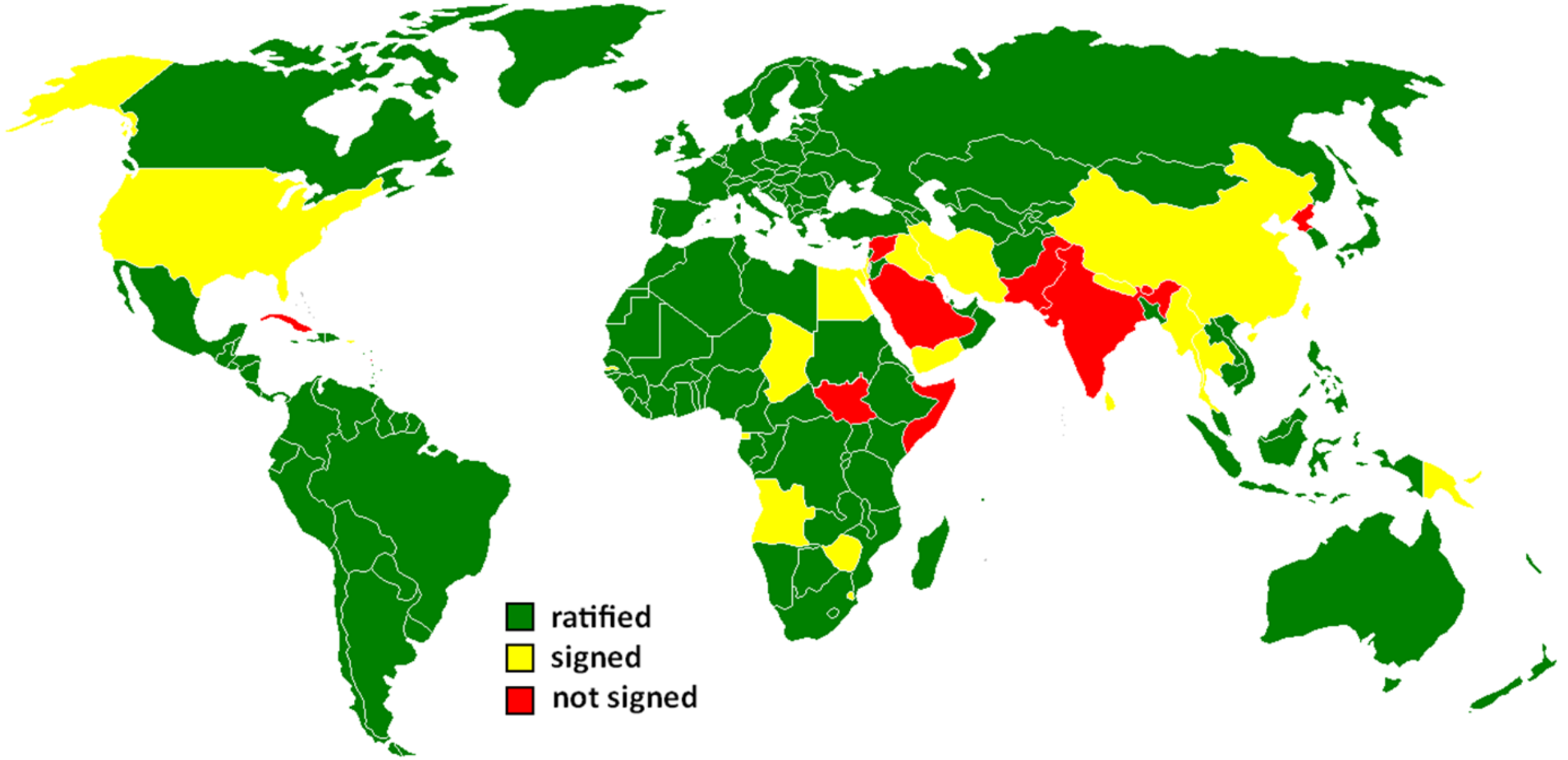

Entry into force provision
Annex II to the Treaty

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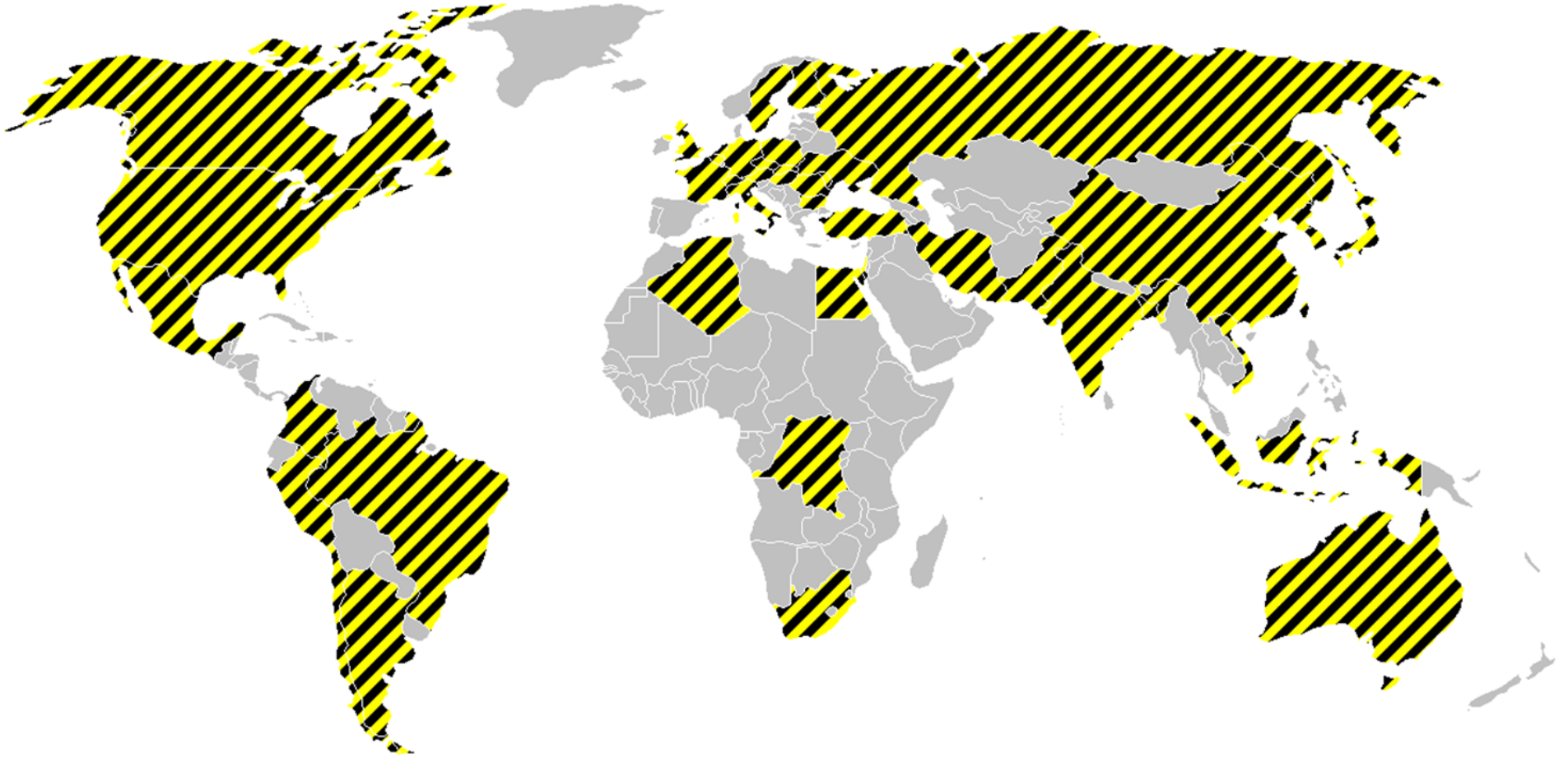
44 States whose ratification is required for the Treaty to enter into Force:



Entry into force: 8 to go

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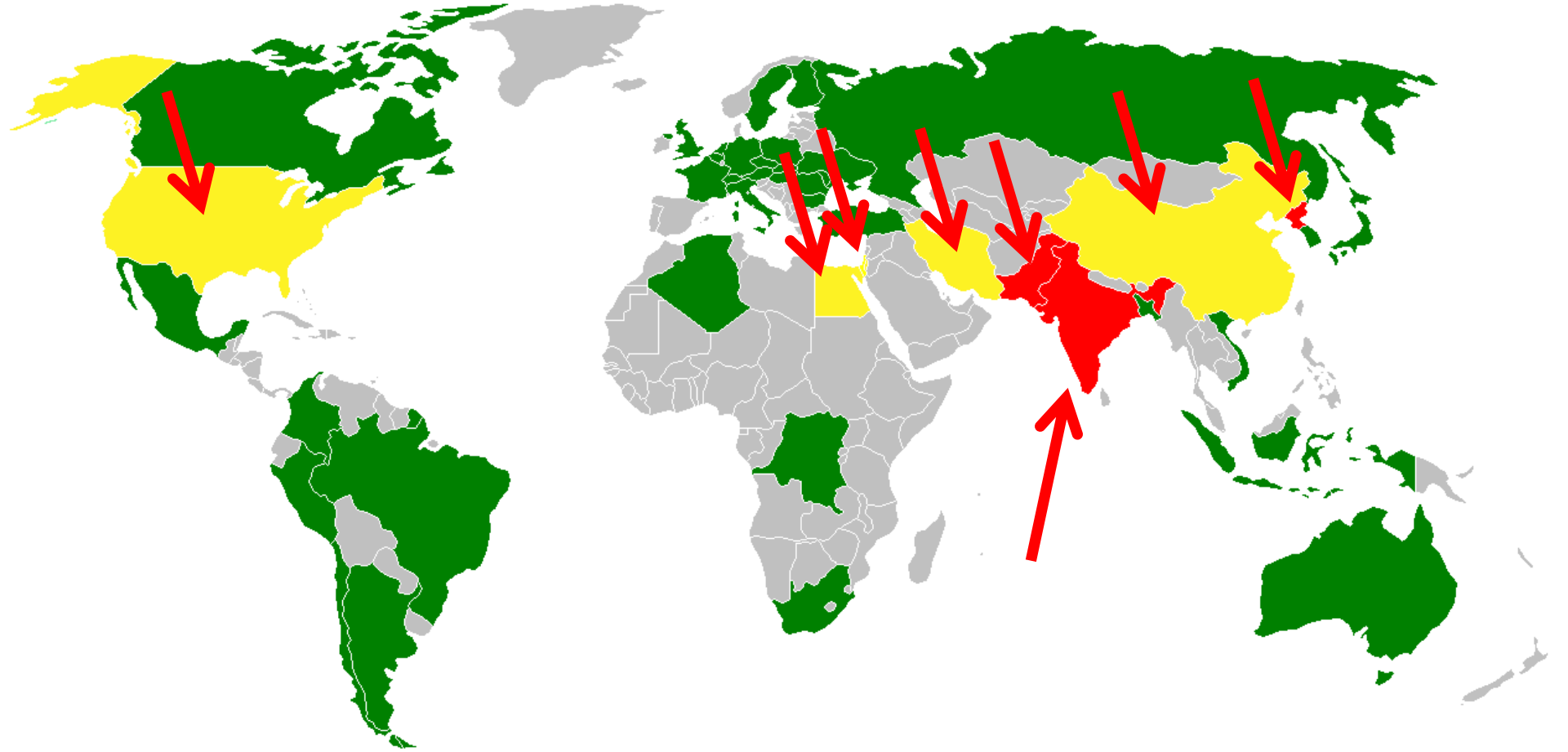
44 States whose ratification is required for the Treaty to enter into Force:



Elements of the CTBT Verification Regime

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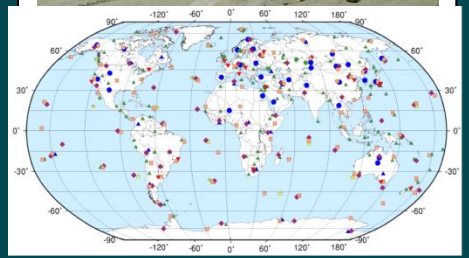
Confidence Building Measures

Large chemical Explosions: Prevent misinterpretations and calibrate seismic IMS component

International Monitoring System

321 stations: seismic, hydro-acoustic, infrasound, radionuclide

IDC&GCI



Consultation and Clarification

Right to clarify matters indicating possible non-compliance

On-Site Inspection

IFE = Integrated Field Experiment
3 November - 9 December 2014

The complete International Monitoring System: 337

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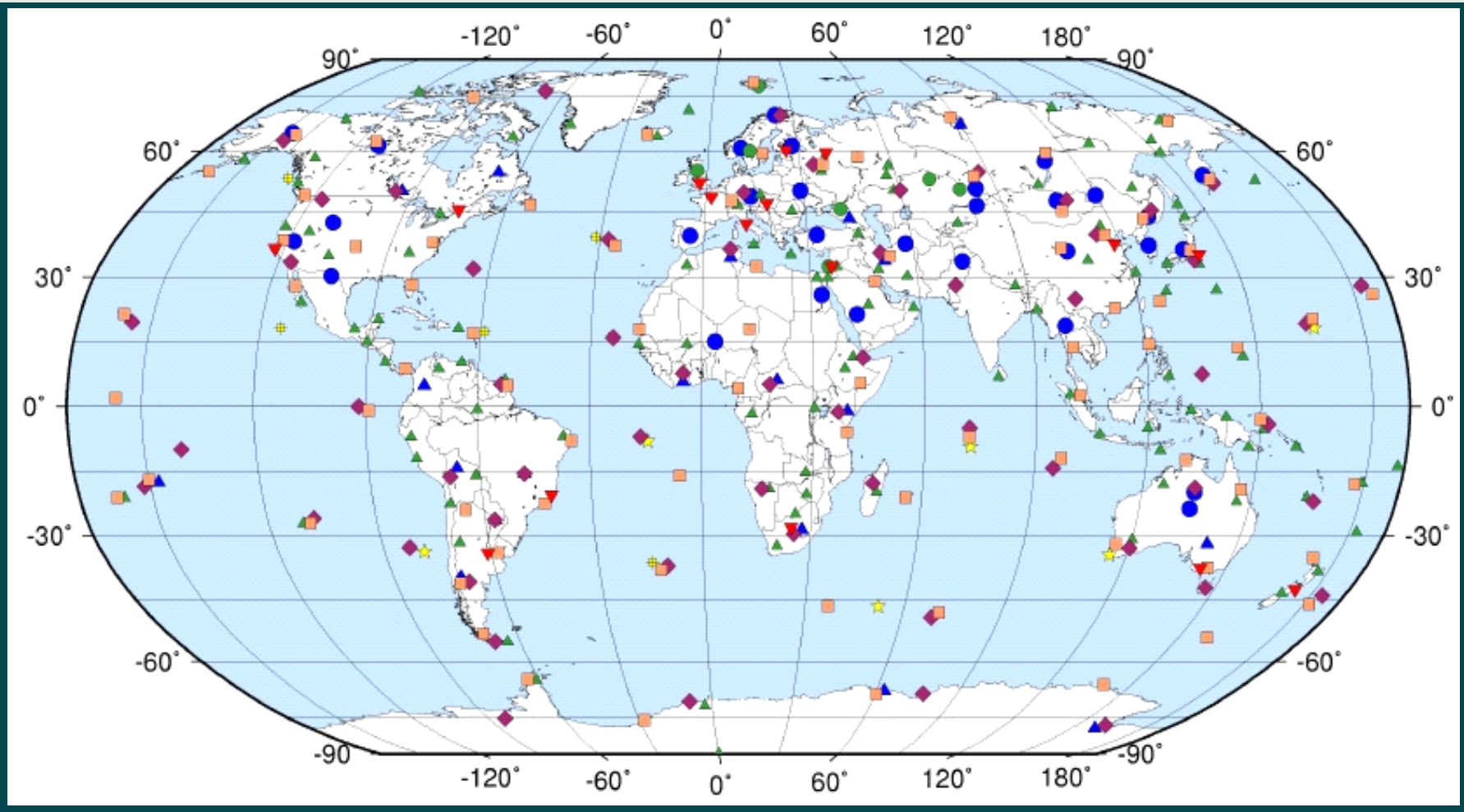

- Seismic Primary Array
- Seismic Primary 3-comp Station
- Seismic Auxiliary Array
- Seismic Auxiliary 3-comp Station
- Hydroacoustic (hydrophone) Station
- Hydroacoustic (T-phase) Station
- Infrasound Station
- Radionuclide Station
- Radionuclide Lab

Demonstrated effectiveness of the International Monitoring System

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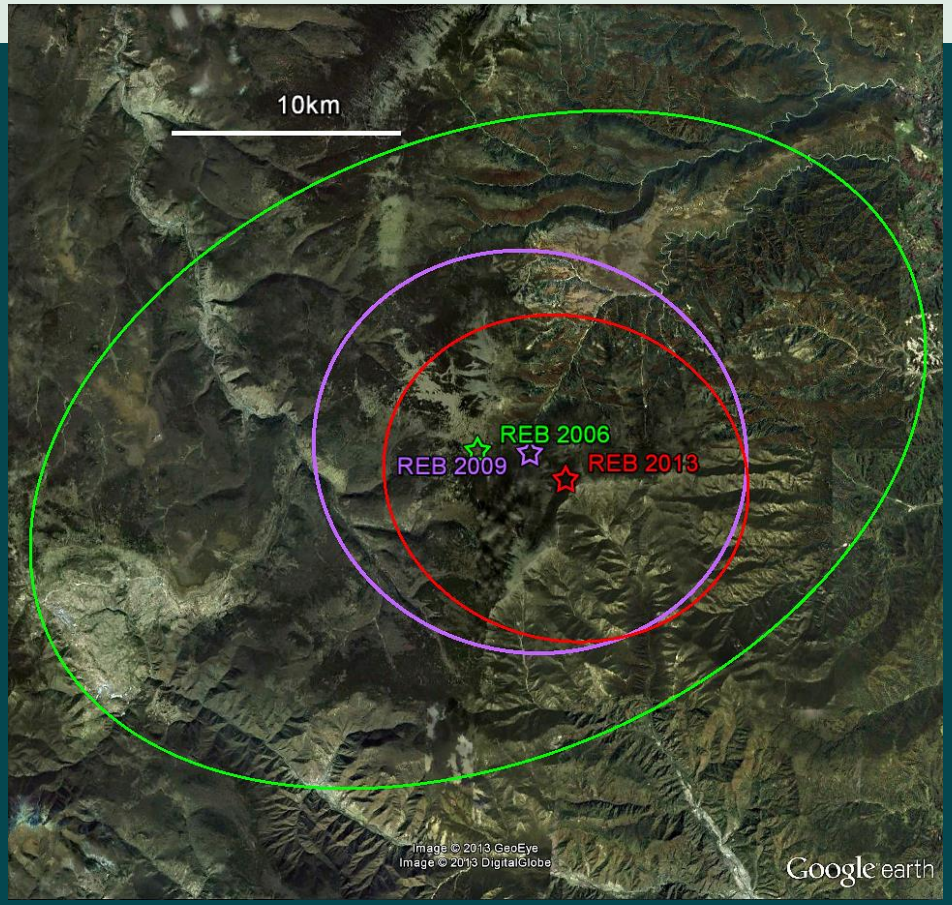

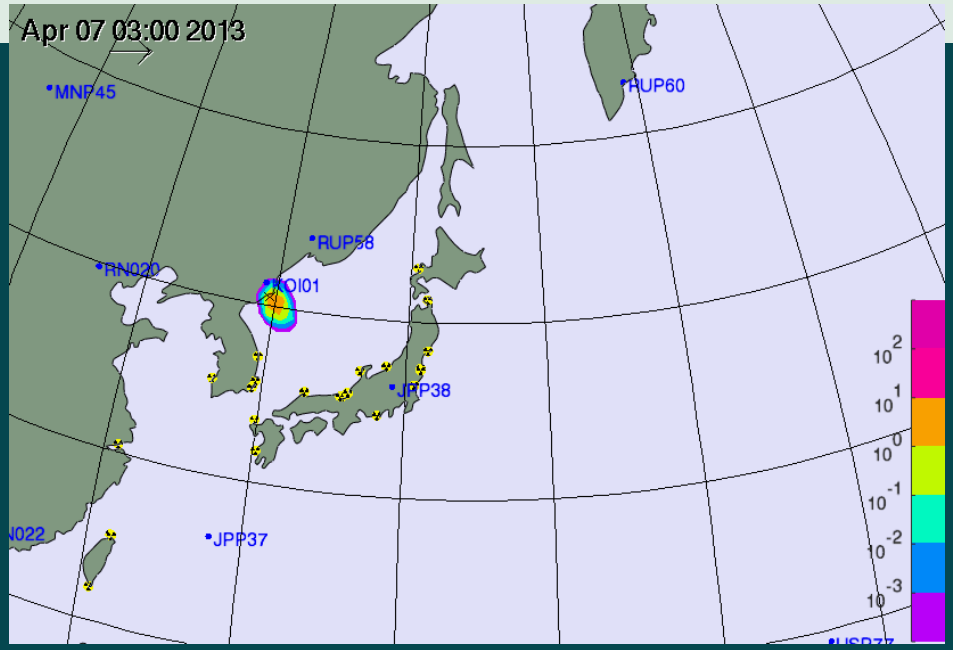

Error Ellipses for 2006, 2009 and 2013 DPRK Announced Nuclear Tests

- Xenon-131m and xenon-133
- Detected at Takasaki, Japan, and Ussuriysk, Russia
- Estimated date of fission coincides with 12 February 2013
- DPRK site identified as possible source using ATM

Civil and Scientific Applications

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International Monitoring System data can be applied for

Emergency Preparedness and Response After Fukushima Accident

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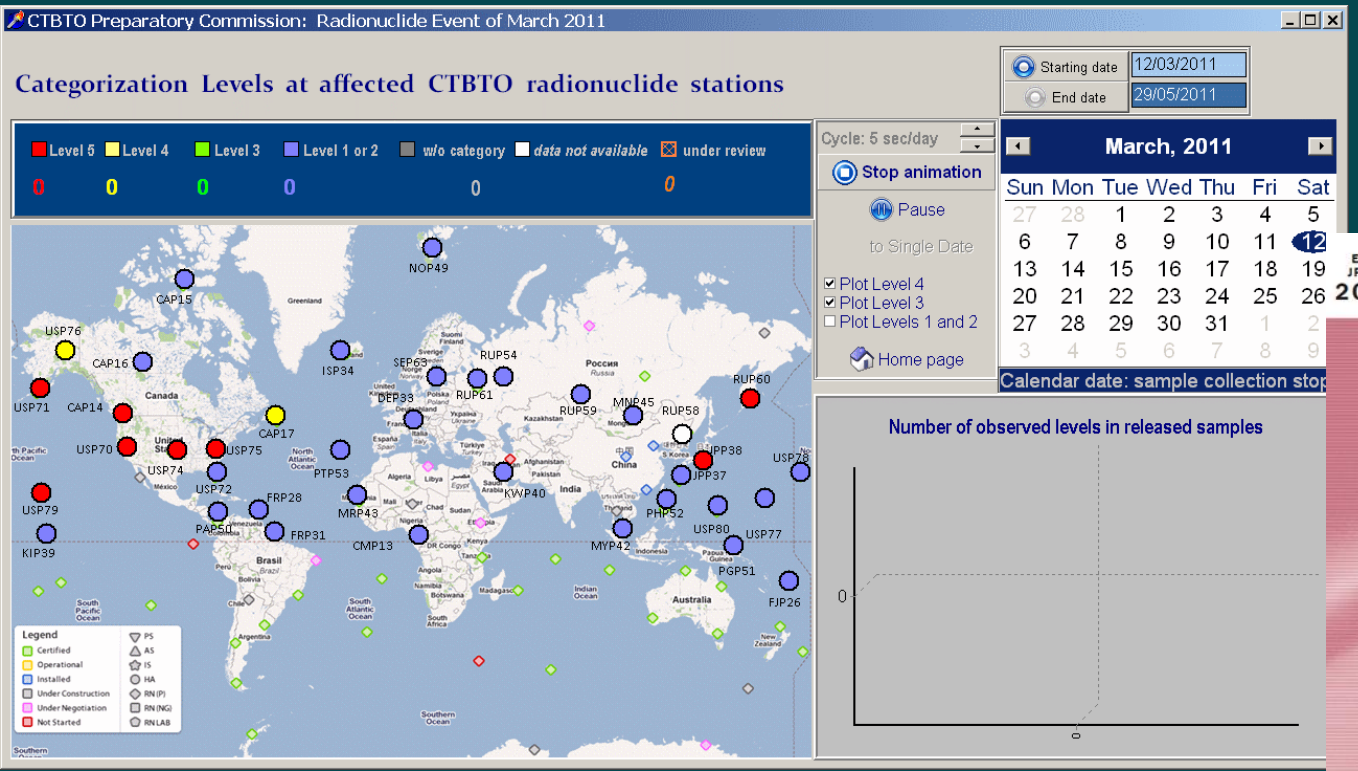
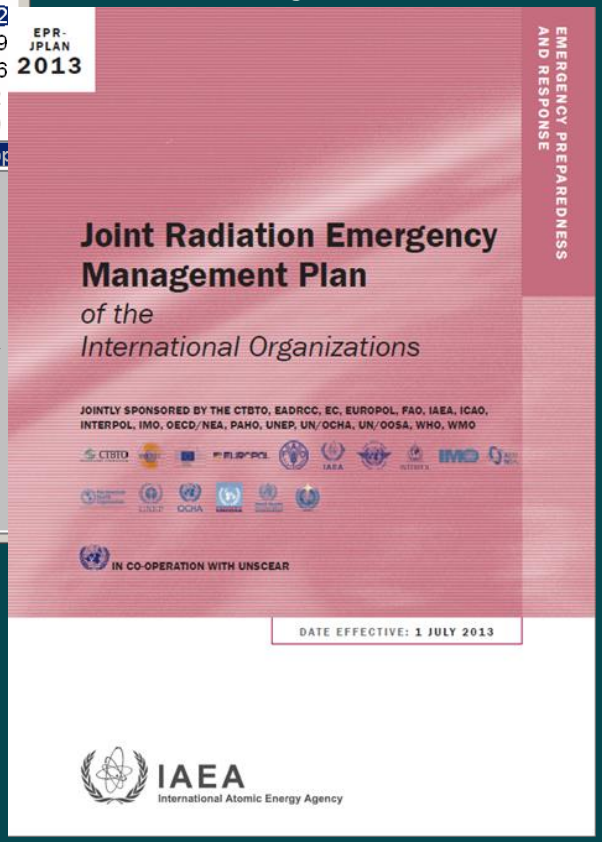
This picture show time development of detections for each day after the accident. **Level 5** = multiple fission products detected, **Level 4** = one fission products detected, **Level 3** = fission products typical for the station detected. **Level 1 and 2** = only natural radioactivity detected



CTBTO operates a unique global network of highly-sensitive detectors of atmospheric radioactivity.



CTBTO member of the Inter-Agency Committee on Radiological and Nuclear Emergencies **(IACRNE) since 14.3.2012**

Entry into force

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It is important
to bring the CTBT into force
in order to close the door
on nuclear testing
for good.

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THANK YOU

The figures used in this presentation are approximate and based on official government sources, as well as on information provided by research institutions such as the Natural Resources Defence Council in Washington D.C., and the Stockholm International Peace Research Institute (SIPRI).


NUKEMAP3D
http://nuclearsecrecy.com

http://nuclearsecrecy.com/nukemap/
Author: Alex Wellerstein

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NUKEMAP 2.42 : FAQ

You might also try: NUKEMAP 3D

1. **Drag** the marker to wherever you'd like to target.

Or you can select a preset...

Or type in the name of a city: Vienna Go

2. **Enter a yield** (in kilotons): 20

Or you can select a preset...

3. **Basic options:** *Height of burst:* [?] ○ Airburst ◉ Surface

Other effects: ☑ Casualties ☑ Radioactive fallout

Advanced options: ▸

4. **Click** the "Detonate" button below.

Detonate | Clear all effects | Launch multiple | Center ground zero | Probe location

Note that you can drag the target marker after you have detonated the nuke.

Calculating casualties... this can take upwards of a minute or two depending on how many people are using this site. Thank you for your patience!

Effects radii for 20 kiloton surface burst (smallest to largest):

Fireball radius: 260 m (0.22 km²)
Maximum size of the nuclear fireball; relevance to lived effects depends on height of detonation. If it touches the ground, the amount of radioactive fallout is significantly increased.

Air blast radius (20 psi): 0.59 km (1.1 km²)
At 20 psi overpressure, heavily built concrete buildings are severely damaged or demolished; fatalities approach 100%.

Radiation radius (5000 rem): 0.97 km (2.94 km²)
5000 rem radiation dose. 100% fatal exposure.

Air blast radius (5 psi): 1.24 km (4.85 km²)
At 5 psi overpressure, most residential buildings collapse, injuries are universal, fatalities are widespread.

Radiation radius (1000 rem): 1.27 km (5.06 km²)
1000 rem radiation dose; with immediate medical treatment, 95% mortality can be expected. Dying takes between several hours and several weeks.

Radiation radius (600 rem): 1.37 km (5.9 km²)