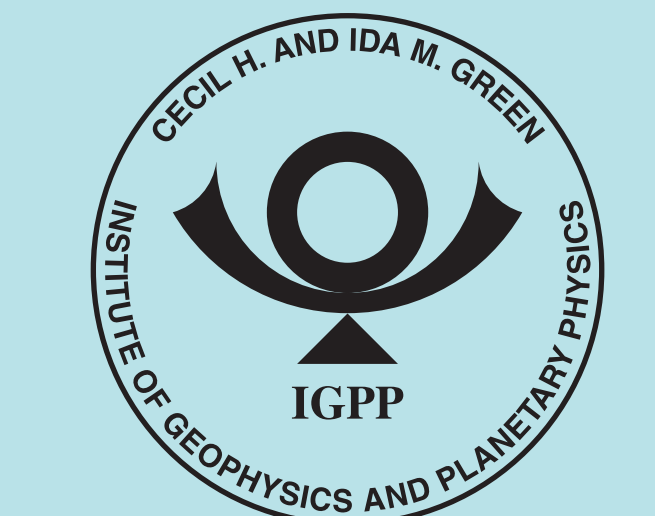


50 Years of Global Seismic Observations

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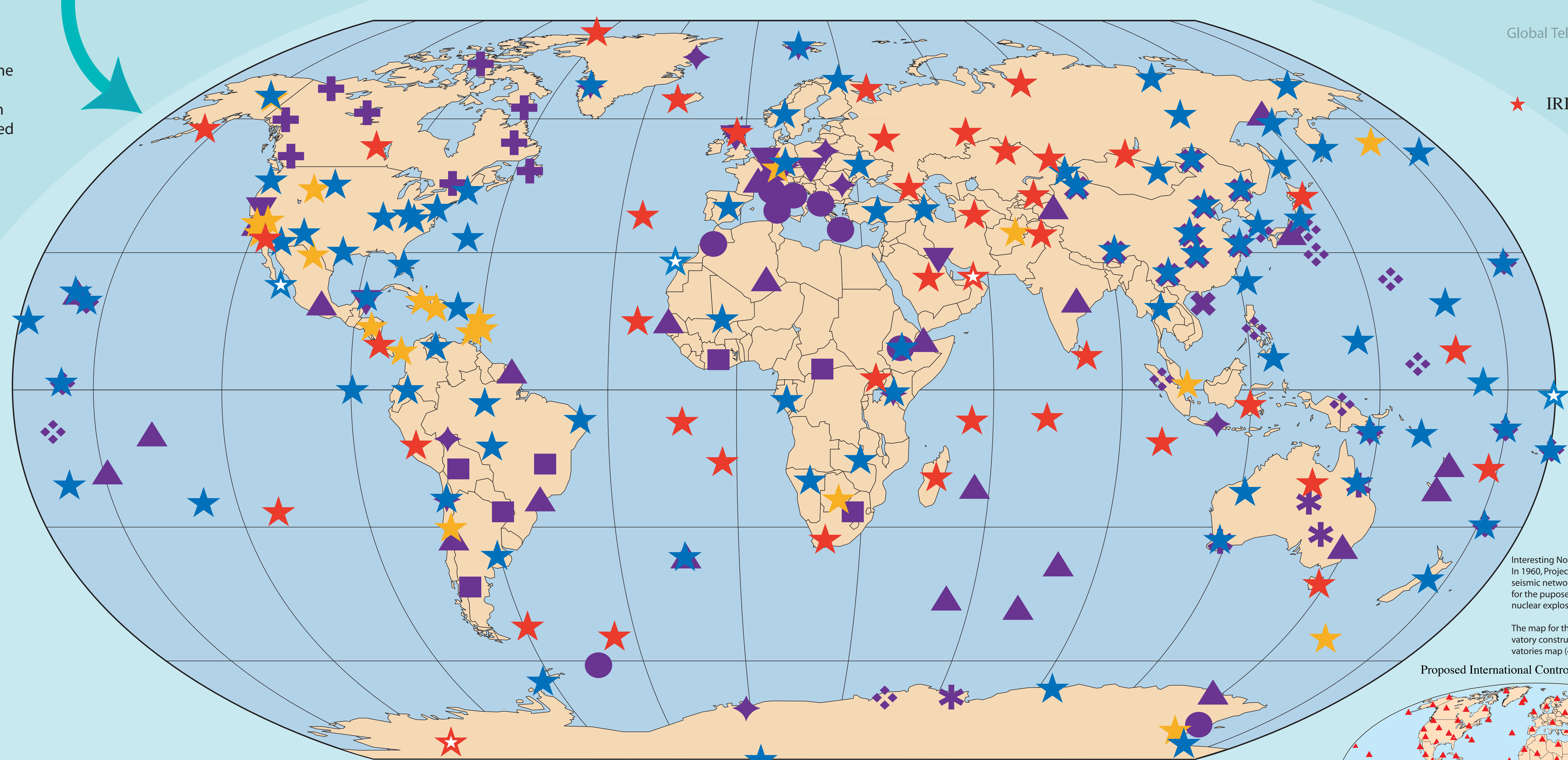
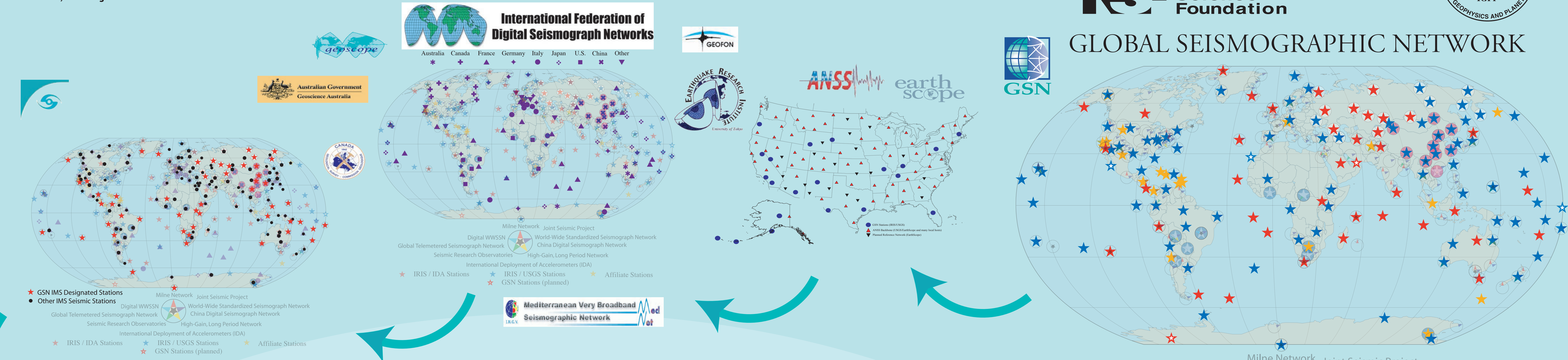
GLOBAL SEISMOGRAPHIC NETWORK

Abstract

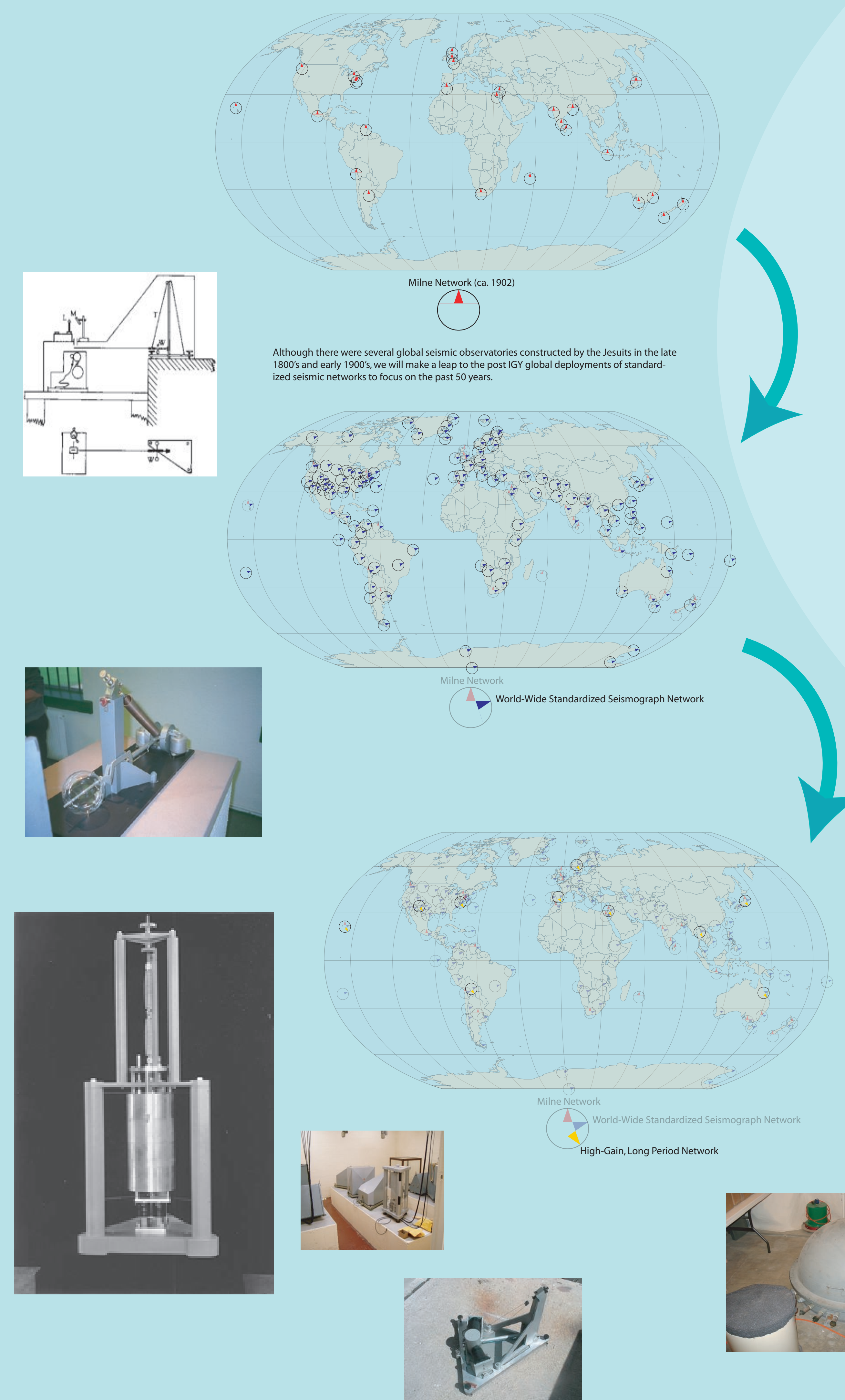
Seismological recordings have been made on Earth for hundreds of years in some form or another, however, global monitoring of earthquakes only began in the 1890s when John Milne created 40 seismic observatories to measure the waves from these events. Shortly after the International Geophysical Year (IGY), a concerted effort was made to establish and maintain a more modern standardized seismic network on the global scale. In the early 1960s, the World-Wide Standardized Seismograph Network (WWSSN) was established through funding from the Advanced Research Projects Agency (ARPA) and was installed and maintained by the USGS's Albuquerque Seismological Laboratory (then a part of the US Coast and Geodetic Survey). This network of identical seismic instruments consisted of 120 stations in 60 countries and allowed the monitoring, and verification for the Limited Test Ban treaty. Although the network was motivated by nuclear test monitoring, the WWSSN facilitated numerous advances in observational seismology.

From the IGY to the present, the network has been upgraded (High-Gain Long-Period Seismograph Network, Seismic Research Observatories, Digital WWSSN, Global Telemetered Seismograph Network, etc.) and expanded (International Deployment of Accelerometers, US National Seismic Network, China Digital Seismograph Network, Joint Seismic Project, etc.), bringing the modern day Global Seismographic Network (GSN) to a current state of approximately 150 stations. The GSN consists of state-of-the-art very broadband seismic transducers, continuous power and communications, and ancillary sensors including geodetic, geomagnetic, microbarographic, meteorological and other related instrumentation. Beyond the GSN, the system of global network observatories includes contributions from other international partners (e.g., GEOSCOPE, GEOFON, MEDNET, F-Net, CTBTO), forming an even larger backbone of permanent seismological observatories as a part of the International Federation of Digital Seismograph Networks.

50 years of seismic network operations have provided valuable data for earth science research. Developments in communications and other technological advances have expanded the role of the GSN in rapid earthquake analysis, tsunami warning, and nuclear test monitoring. With such long-term observations, scientists are now getting a glimpse of Earth structure changes on human time scales, such as the rotation of the inner core, as well as views into climate processes. Continued observations for the next 50 years will enhance our image of the Earth and its processes.



In the beginning ...



- ★ IRIS / IDA Stations
 - ★ IRIS / USGS Stations
 - ★ GSN Affiliate Stations
 - ★ GSN Stations (planned)
- Australia Canada France Germany Italy Japan U.S. China Other
- * (Purple star)
 - + (Purple plus)
 - ▲ (Purple triangle)
 - ◆ (Purple diamond)
 - (Purple circle)
 - ◇ (Purple diamond)
 - (Purple square)
 - × (Purple cross)
 - ▼ (Purple inverted triangle)

Interesting Note:
 In 1960, Project VELA of the ARPA proposed a 170 station seismic network called the International Control System ... for the purpose of detecting and identifying clandestine nuclear explosions.
 The map for the ICS is shown below. After 50 years of observatory construction, the current open global seismic observatory map (center large map) looks strikingly similar.

