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Ground Based Nuclear Explosion Monitoring Research & Engineering

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Since the beginning of the atomic age there have been many multilateral and bilateral agreements, and unilateral declarations to limit or abolish nuclear detonations. All of these agreements (i.e. treaties) involve some type of monitoring. Because of the importance placed on monitoring, dedicated research has been on going for decades. This talk reviews the history of nuclear testing, the more important treaty milestones, and key monitoring research accomplishments, and describes the interrelationship of these events.

In addition, some examples of the research accomplished by the US Department of Energy, National Nuclear Security Agency's, Ground-Based Nuclear Explosion Monitoring Research and Engineering Program, and the US Department of Defense programs are described. This research builds on the broad base of US monitoring expertise. The areas of research include: Seismic Regional Characterization and Wave Propagation, Seismic Event Detection and Location, Seismic Identification and Source Characterization, Hydroacoustic Monitoring, Radionuclide Monitoring, Infrasound Monitoring. Reports from these research projects are published in the annual Monitoring Research Review (<https://www.nemre.nnsa.doe.gov/proceedings>).