

**IMAGING THE EARTH'S INTERIOR:
DETAILED STUDIES OF THE EARTH AND
OF THE SEISMIC SOURCE WITH NEW
GLOBAL AND TRANSPORTABLE ARRAYS**

**A Proposal to the
NATIONAL SCIENCE FOUNDATION
from
IRIS: THE INCORPORATED RESEARCH
INSTITUTIONS FOR SEISMOLOGY**

Duration: 10 years
Requested Starting Date: January 1, 1985
Amount Requested: \$107M for initial 5 years
Estimated: \$281M 10-year total

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APPENDIX 1D

IRIS — USGS Letter of Understanding

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APPENDIX 1D
IRIS - USGS LETTER OF UNDERSTANDING

1. INTRODUCTION

This cooperative agreement establishes a coordinated position between the U.S. Geological Survey (USGS) and the Incorporated Research Institutions for Seismology (IRIS) concerning joint activities that will be undertaken to develop and manage a new global seismographic network sponsored primarily by the National Science Foundation (NSF).

IRIS is a consortium of non-profit research institutions that has been organized for the purpose of promoting and guiding a major initiative to improve facilities for seismological observations and research. Major goals that pertain to this agreement are: (1) to establish a permanent global network of 100 modern broadband seismograph systems with satellite communication links for telemetry of the data in real time to data centers; (2) to establish the data collection facilities needed to organize and establish a scientific data processing center to serve as a nucleus for processing and analyzing the large volume of data that will be created. The technical program will involve both the upgrading of existing networks and data management facilities and the installation of new stations and facilities. The objectives and benefits of the new seismograph network are described in an IRIS report entitled "*Science Plan for a New Global Seismographic Network*".

One of the important roles of the USGS is to provide earthquake information and data services to the public. The USGS Albuquerque Seismological Laboratory has a 23-year history in the development, installation, and management of global seismographic networks, including the World-Wide Standardized Seismograph Network (WWSSN) and the Global Digital Seismograph Network (GSDN), together with the data processing facilities needed to collect, merge, and distribute the data to research scientists. The existing networks, and the cooperative agreements under which the stations are operated in more than 60 countries, constitute a valuable infrastructure from which a modern telemetered network can evolve. The past work at the Albuquerque Laboratory in this field has led to the formation of a group of experienced personnel and development of extensive technical and logistical network support facilities. The contribution of these resources through the active participation of the USGS in development and management of the new network will substantially reduce program costs and help to insure the success of the IRIS initiative.

Since the USGS and IRIS have common goals and objectives with respect to global seismograph networks and related activities, it will be advantageous to set up a cooperative arrangement whereby each organization contributes to the program. The purpose of this agreement is to establish guidelines that will govern program coordination and the division of IRIS and USGS responsibilities. This agreement is not intended to limit the USGS or IRIS in developing or operating other networks or performing related activities.

2. JOINT RESPONSIBILITIES

2.1. Technical Plan

IRIS and the USGS will jointly develop a *Technical Plan for a New Global Seismograph Network*, which will serve as the master planning document for development of the new network. Material for the plan will be drawn from the Science Plan, the work of IRIS Technical Committees, and other sources. The document will be revised and updated periodically to reflect current planning, scheduling, and budgeting.

2.2. Instrumentation Plans and Concepts

The development of concepts, plans, and preliminary budget estimates for network instrumentation, communication, and data collection will be a joint responsibility of IRIS and the USGS. It is understood that the development of concepts and plans will be assigned by IRIS to Technical Committees established under the IRIS Standing Committee for the Global Seismic Network. The USGS representatives are on the Committee that is responsible for planning tasks that may involve the USGS.

2.3. Network Configuration Plans

The development of network configuration plans and priorities for siting new stations, relocating existing stations, and selecting existing stations to be upgraded with new instruments will be a joint responsibility of IRIS and the USGS. It is understood that this planning may be assigned to an IRIS Technical Committee on which the USGS will be represented.

2.4. Data Collection and Initial Distribution

The establishment of procedures to be used for collection and initial distribution of the network data, the determination of any costs that may be assessed for the data, and the selection of organizations that will receive network data on a regular basis will be a joint responsibility of IRIS and the USGS. The USGS and IRIS may provide network data to other organizations and individuals as well. IRIS also plans to establish a seismological data center which will institute procedures for general distribution of the data.

2.5. Data Exchange

The establishment of formal data exchange agreements with international scientific organizations or foreign governments will be a joint responsibility of IRIS and the USGS.

2.6. Technical Evaluation of Proposals

Any source evaluation boards convened for the purpose of evaluating major technical proposals submitted by commercial firms for network instrumentation and related hardware and software include representatives of IRIS and the USGS, and may include outside experts as well.

2.7. Funding

IRIS will initiate requests to NSF for the additional funds needed for IRIS and USGS activities related to the development, installation, and operational support of the new or upgraded network or associated communication and data collection facilities. The USGS will endeavor to provide funds at least at current levels to support the existing or upgraded networks and related activities.

3. IRIS RESPONSIBILITIES

3.1. Scientific Guidance

IRIS will provide the guidance needed to insure that the data produced by the new network and the procedures used to organize and distribute the data adequately meet the needs of the scientific community.

3.2. Technology Studies

IRIS will initiate and fund technology studies that may be needed to investigate or develop innovative techniques for the acquisition, telemetry, or management of network data.

3.3. Scientific Data Center

IRIS will plan and initiate the establishment of a scientific data center that will be used for the processing and analysis of network data for research purposes.

3.4. Plans and Priorities

IRIS will have responsibility for final approval of the Technical Plan, detailed instrumentation plans and specifications for new network instruments and new data collection facilities, and for network configuration plans and priorities for siting new stations and selecting existing stations to be upgraded.

4. USGS RESPONSIBILITIES

The USGS will be responsible for the management and administration of tasks that may be assigned to the USGS within the context of this cooperative agreement, including the following.

4.1. Test and Evaluation

The USGS will be responsible for performing test and evaluation of new instruments and systems purchased by or for the USGS. Test plans may be developed jointly and results will be provided to IRIS.

4.2. Station Agreements

The USGS will be responsible for negotiating and executing agreements with individual stations or foreign governments for operation of network stations and communication facilities. The USGS is responsible for decisions regarding the modification of existing agreements with stations in the USGS-managed network.

4.3. Station Sites

The siting of new stations (at locations designated by IRIS) and any site testing or site preparation that may be required will be the responsibility of the USGS working together with the host organization.

4.4. Installation and Training

The installation of station and communication equipment and training of station operators will be the responsibility of the USGS.

4.5. Network Support

The USGS will be responsible for the management and support of the network and communication facilities, a depot maintenance center, and any regional maintenance centers that may be established.

4.6. Data Collection

The USGS will be responsible for management and operation of the data processing facilities used to collect, validate, organize, merge, and distribute the digital data to data centers.

4.7. Earthquake Information

The USGS will develop and perform routine standardized processing of network data for earthquake information which will continue to be published and disseminated by the National Earthquake Information Center.

5. PROGRAM COORDINATION

5.1. Policy and Management Coordination

IRIS and the USGS will designate a Program Coordinator from their respective organizations. The IRIS/USGS Program Coordinators will resolve issues of policy and management that affect the joint activities; they will establish the management procedures needed for general review and oversight of the activities assigned to the USGS; and they will establish the administrative arrangements that may be needed in the performance of joint activities.

5.2. Technical Coordination

IRIS and the USGS will designate a Technical Coordinator from their respective organizations. The IRIS/USGS Technical Coordinators will establish liason between IRIS and the USGS on technical matters during the planning and establishment of the network; they will work closely with the Technical Committees to insure that the interrelated work of the various Committees is coordinated and integrated; and they will be jointly responsible for drafting the Technical Plan.