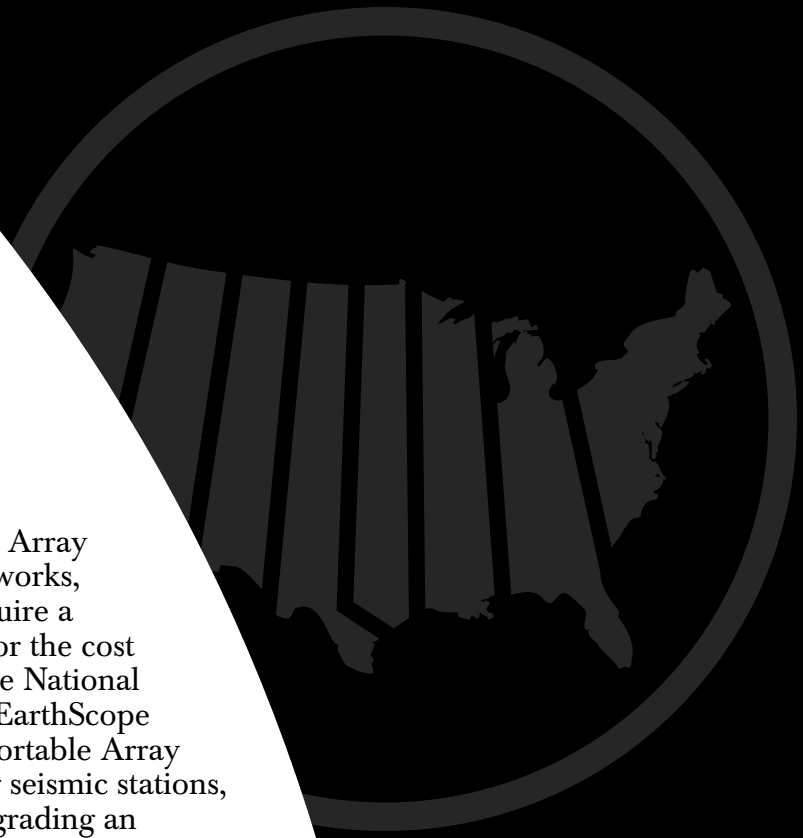
Developing Cooperative Educational and Research Seismic Stations

A discussion regarding the transition of TA station installations into regional network assets.

earthscope USArray



The presence of the USArray's Transportable Array provides a unique opportunity for regional networks, educational institutions, or other entities to acquire a state-of-the art, fully operating seismic station for the cost of equipment. USArray, in cooperation with the National Science Foundation, the agency that funds the EarthScope program, will coordinate the transfer of Transportable Array stations to organizations interested in operating seismic stations, starting a seismic network, or expanding or upgrading an existing network. This program enables adopting organizations to gain an asset at significant savings while enhancing their monitoring and educational capabilities, and cooperating in national-level research.

Organizations can obtain an operating, high-quality, proven earthquake recording station for less than the total cost of equipment in order to:

- use as an educational resource
- record ground motion from local, regional, and global events
- supplement an existing seismic network or start a new network
- expand U.S. seismic recording capability

What is the Transportable Array?

EarthScope's USArray program is installing permanent and temporary seismic stations across the United States to better understand continental evolution, structure, and dynamics, and deep Earth structure. One USArray component, the Transportable Array, consists of a network of 400 high-quality, portable broadband seismometers that are being placed in temporary sites across the United States. The array is being

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deployed from west to east on a regular grid with 70-km (42-mi) spacing. Each station records ground motion for about two years before it is dismantled and the equipment is re-installed at another location on the eastern edge of the array. When completed, this program will have occupied over 1600 locations in the conterminous United States.

Advantages to Adopting a Transportable Array Station

- A proven, installed station is obtained for less than the cost of the equipment alone.
- Permitting, construction, and installation costs are borne by USArray.
- One-time costs are clearly defined.
- First-time operators are provided with an established operational structure.
- Transportable Array station design has demonstrated scientific value and technical feasibility.
- Individual station performance is available for review prior to adoption.
- Operations and maintenance support of stations over the long term can benefit from access to Transportable Array volume-pricing contracts for equipment and engineered solutions, and engineering support services.
- The station contributes data to the Advanced National Seismic System, a nationwide network of earthquake sensor systems that continuously monitor earthquakes and other seismic disturbances throughout the United States and provide real-time information for emergency response personnel.

Transition of Transportable Array Stations

Initial Outlay for Transportable Array Station:

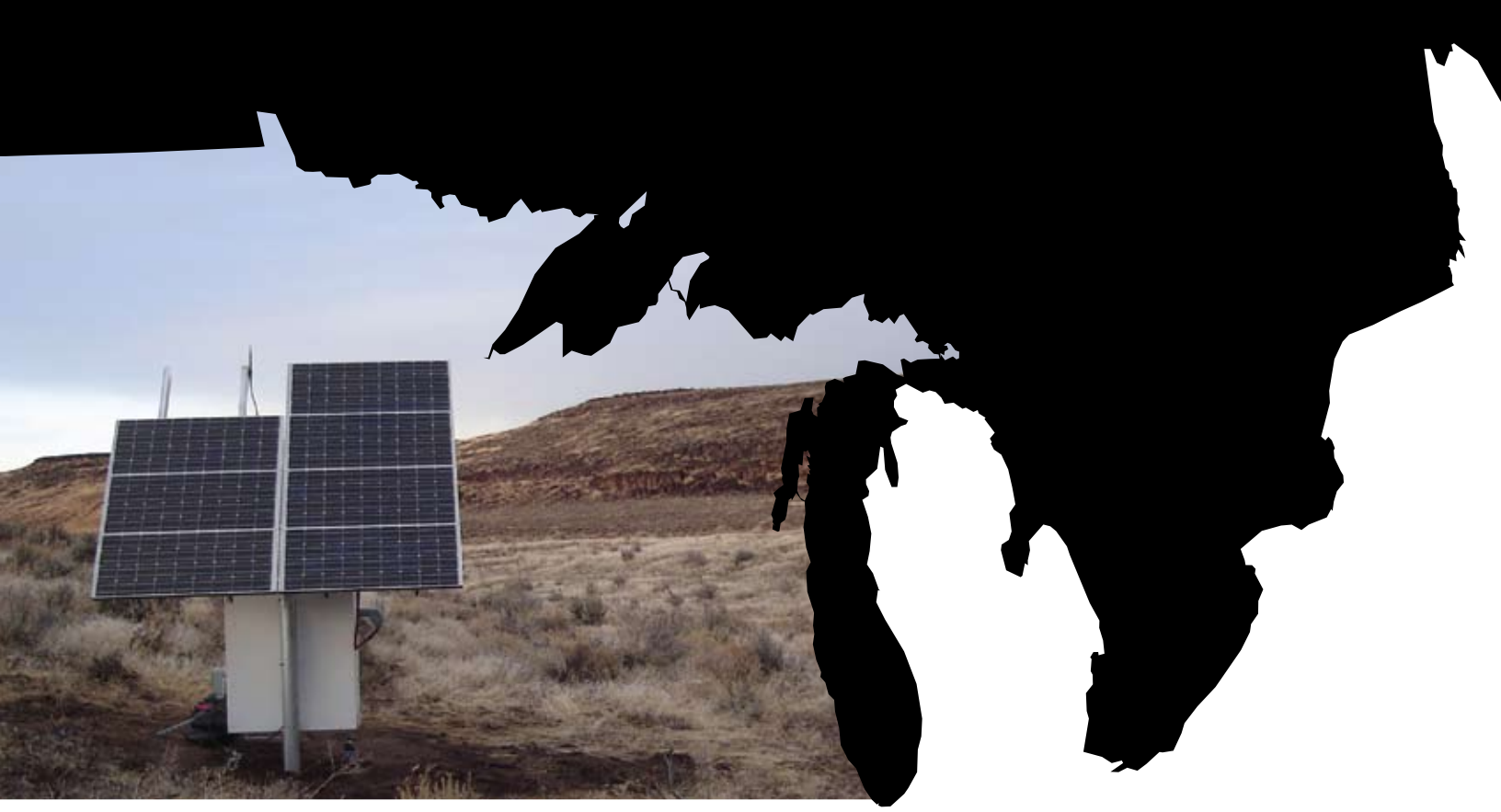
I. Vault Equipment

	STS-2	CMG-3T	T240
Sensor	$18,500	$15,200	$18,500
Data Acquisition System	$9,700	$9,700	$9,700
Power & Cables	$5,120	$5,120	$5,120
Demobilization Credit	($4,150)	($4,150)	($4,150)
TOTAL	**$29,170**	**$25,870**	**$ 29,170**

II. Communications & Power

Options (choose one)	
Cell	$1,200
Radio to Terminal	$2,750
Radio to AC VSAT	$4,350
Radio to Internet	$2,750
Radio to Solar VSAT	$9,830

NOTE: Excluding the purchase of vault equipment and communications and power systems specified above, the average cost for permitting, excavation, construction, and installation of a Transportable Array station is $21,000. A 6-channel DAS costs an additional $1,400. Standard power for the vault consists of one solar panel and one battery. If there are two batteries and two solar panels, the additional cost for the power is $500. Examples of initial outlay costs are provided at http://www.iris.edu/USArray/researchers/adopt.html#adopt3



Early Planning is Essential

As the Transportable Array moves into a new area, USArray personnel make a concerted effort to work with local and regional organizations to optimize sites for Transportable Array stations, upgrade or construct new vaults, and introduce new broadband instrumentation. During the initial contact phase, it is recommended that organizations interested in adopting a Transportable Array station begin to plan for this transition. USArray is obligated to deploy and dismantle Transportable Array stations at a fixed rate and should be notified of intentions to adopt stations at least six months before the planned station removal date to minimize the impact on the Transportable Array field schedule.

A list of currently operating stations and futures sites is available online at:

http://www.iris.edu/earthscope/usarray/_US-TA-StationList.htm

Conditions for Adoption:

1. New operator must replace TA equipment by transfer of funds to IRIS within 30 days of receiving an invoice for station equipment to be adopted.
2. New operator must obtain a permit from the landowner for continued operation beyond the Transportable Array permit duration.
3. Data from the station must be made publicly available via the IRIS Data Management Center.
4. The Transportable Array installation schedule cannot be disrupted by the new operator's field operations or equipment acquisition procedures.

Transportable Array Installation Schedule: See following page

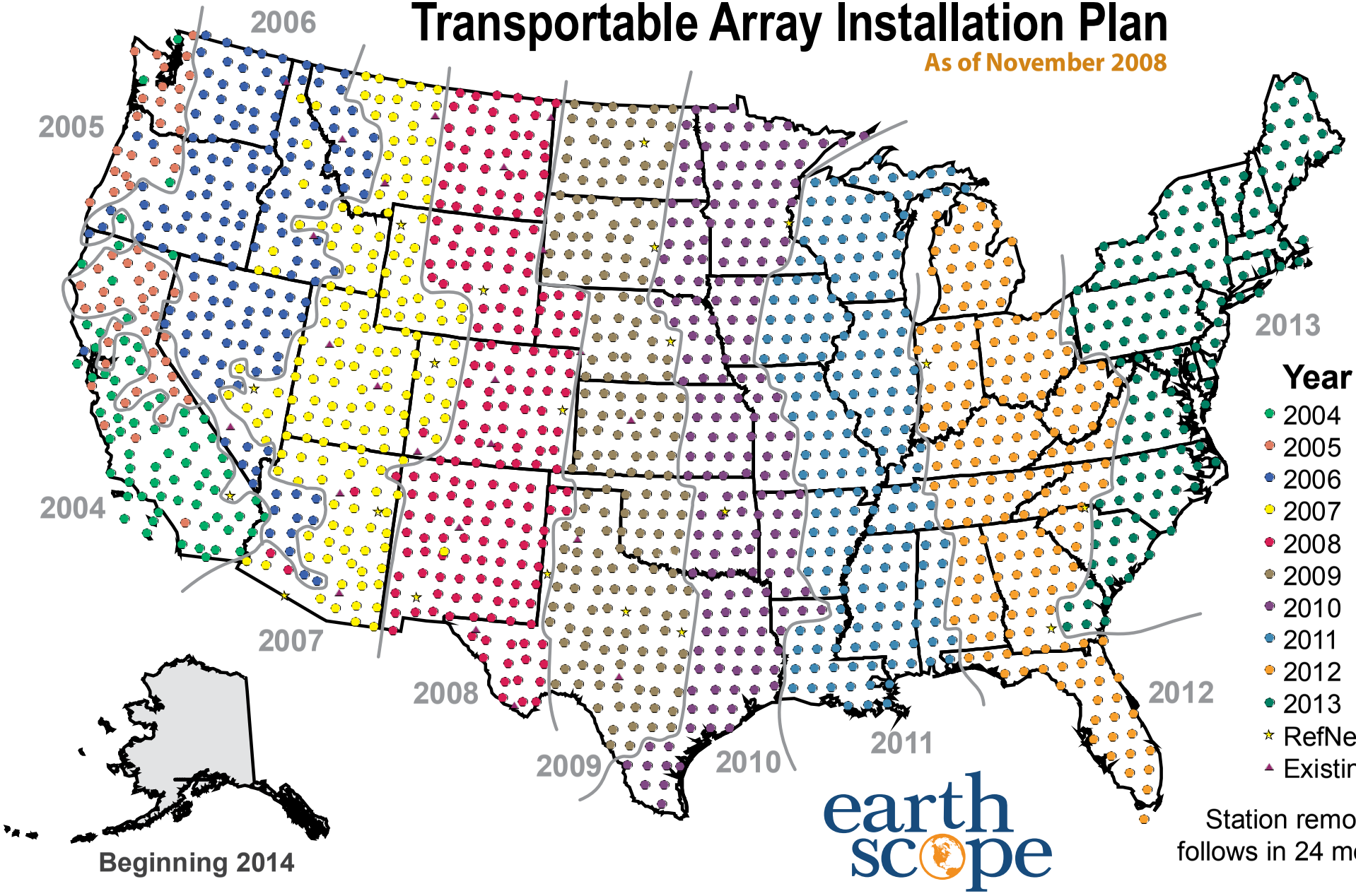
Maintenance & Operations Outlay:

The estimate for annual operation and maintenance recurring costs is $4,000 with additional monthly costs for telemetry, as shown in the table below.

Options	Per Month
Cell	$100
Radio to Terminal	$100
Radio to VSAT	$130
Radio to Internet	$10

Transportable Array Installation Plan

As of November 2008



To initiate the adoption process or request more information, contact:
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EarthScope is funded by the National Science Foundation. The Incorporated Research Institutions for Seismology (IRIS) is constructing, operating and maintaining the Transportable Array, a component of EarthScope's USArray program. IRIS is a consortium of more than 100 universities dedicated to exploring Earth's interior through the collection and distribution of seismographic data.

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