

Developing Cooperative Educational and Research Seismic Stations

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



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





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

Prices are effective April 9, 2010, and are subject to change. For current pricing and sample configurations, visit www.usarray.org/researchers/adopt#3.

Initial Outlay for Transportable Array Station:

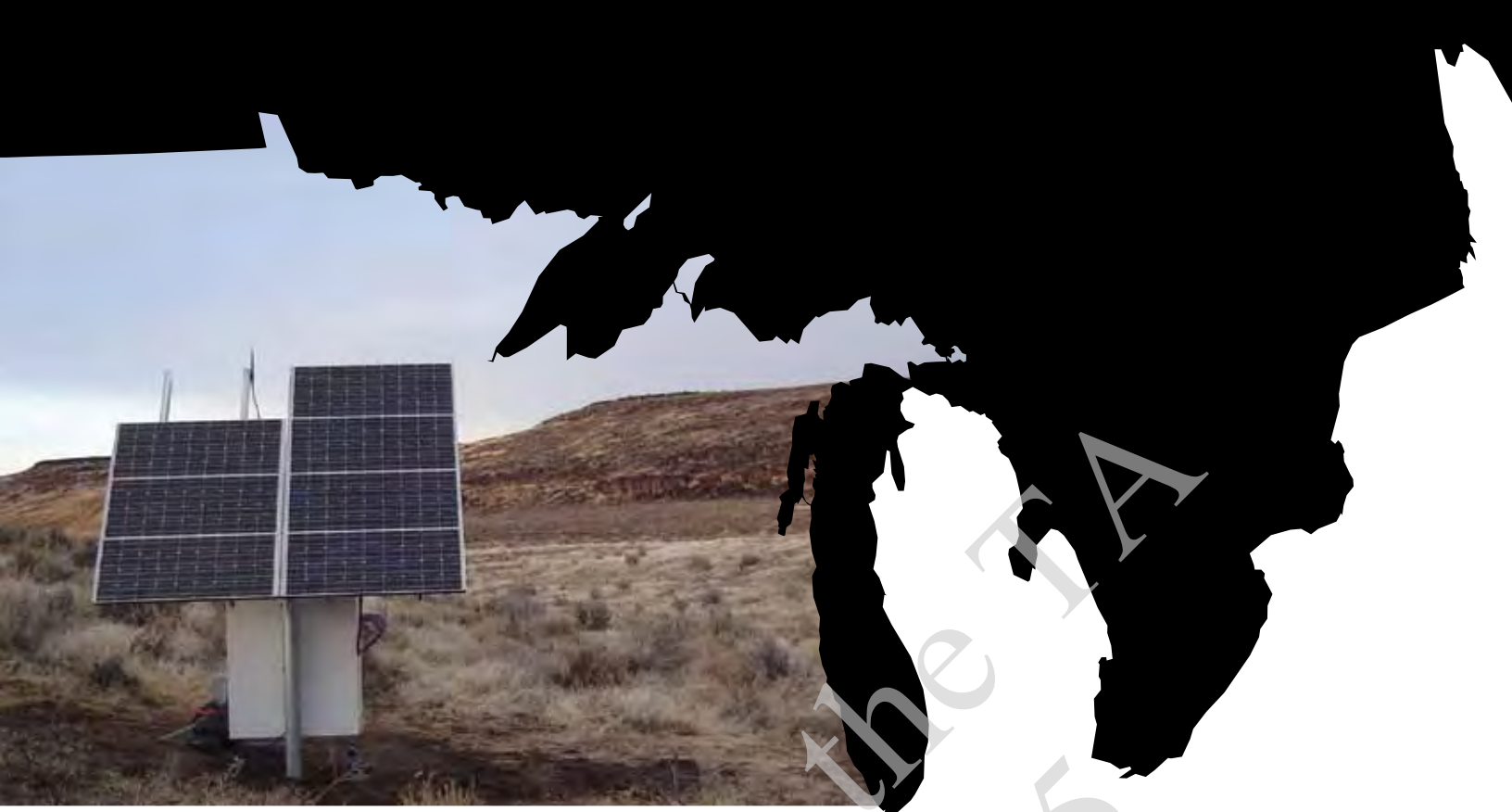
I. Standard Vault Equipment

	STS-2	CMG-3T	T240
Sensor	\$18,500	\$12,000	\$18,000
Vault Equipment	\$16,800	\$16,800	\$16,800
QEP & Environ Channels	\$3,850	\$3,850	\$3,850
Demobilization Credit	(\$2,075)	(\$2,075)	(\$2,075)
TOTAL	\$37,075	\$30,575	\$36,575

II. Communications & Power

Options (choose one)	
Cell	\$1,000
Radio to Terminal	\$2,750
Radio to AC VSAT	\$4,000
Radio to Solar VSAT	\$12,250
Radio to Internet	\$2,750

NOTE: A standard TA installation now includes a QEP and Environmental Channels. Excluding the purchase of the sensor, vault equipment, QEP, Environmental Channels 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 system costs an additional \$1,100. Standard power for the vault is one solar panel and one battery. Each additional battery costs \$200 and each additional solar panel costs \$450.



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 9 to 12 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:

www.iris.edu/earthscope/usarray/_US-TA-OpStationList.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.

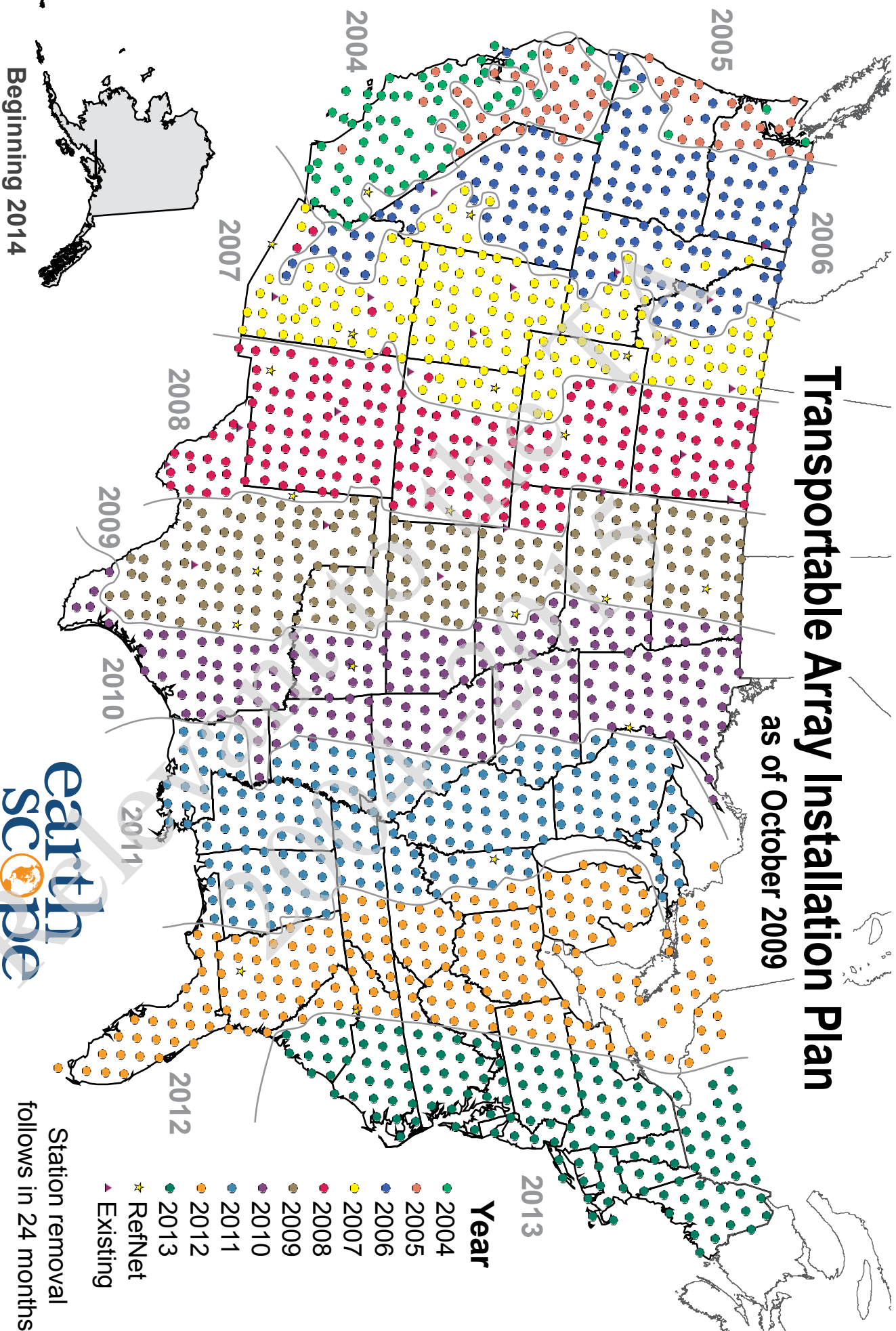
Transportable Array Installation Schedule: See following page

Maintenance & Operations Option (EARN):

Not all organizations have the necessary operations and maintenance support infrastructure to keep their newly acquired TA stations running. Organizations that adopt TA stations have the option to sign on for a subscription-based program (EARN Services) that provides the technical services to ensure that former Transportable Array stations continue operating and contributing data to the IRIS Data Management Center. Subscription rates are based on the communications technology present at the stations, and average around \$5000/year. See the *Education and Research Network Support Services* brochure for more information.

Transportable Array Installation Plan

as of October 2009



Station removal follows in 24 months

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.